Rational. Statemate

Data Port Reference Guide

Rational Statemate
Dataport Reference Guide

Before using the information in this manual, be sure to read the “Notices” section of the Help or the PDF file available from Help > List of Books.

This edition applies to IBM® Rational® Statemate® 4.6 and to all subsequent releases and modifications until otherwise indicated in new editions.

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Dataport Library Overview

The Dataport library provides:

- Functions to perform a wide variety of database extraction operations. Using the library's functions, you can extract information pertaining to an element from the specification database.

  You can use information extracted from the database for a variety of applications, such as:

  - To plot portions of Rational Statemate charts using your own plotter package. To do this, extract the graphic information of the relevant elements and then use this information as input data for your plotter.
  - To analyze data stored in the database. To do this, extract the relevant data and then use your own software to perform the analysis.
  - To extract textual information describing Rational Statemate elements for use in specification-related applications.

- Functions to perform a variety of operations on elements extracted from the specification database. For example, you can alphabetically order a list of extracted states using their names.
- Functions to activate Rational Statemate utilities from your program. For example, you can generate a plot of a chart using the Rational Statemate *plot* function.

Function Types

There are four types of Dataport functions:

- Single-element functions - Provide information on discrete Rational Statemate elements in the specification database. For example, you can retrieve the contents of the Description field in a particular state's form.
- Query functions - Extract lists of elements from the database, that conform to a specific criterion. For example, you can extract a list of activities from the database that are control activities. Most of these functions correspond directly to queries with the search facility.
- Utility functions - Perform operations on lists. Most of these functions do not extract information from the database, but rather manipulate the information you have already retrieved.
- Project management functions - Extract information about the Rational Statemate project, manager, and members.

Dataport Interface

The Rational Statemate Dataport functions have a C language interface. They can be called from C language programs, as well as from programs written in other languages that can call C functions.

Working with the Dataport

To use the Dataport library, you extract information from the specification database by including calls to various Dataport functions in your program. An explanation of function calls, parameters, and returned values is provided in the following sections.

In addition to Dataport function calls, programs designed to extract database information must also include a file of definitions, for example a definition of data-types.

After you finish writing and compiling your program, you must link it with the Dataport Library image. These procedures are explained in Using Dataport Functions.

Using Dataport Functions

This section provides information on how to use Dataport functions within a program. It provides information on the following topics:

- Dataport Function Calls
- Calling Conventions
- Using Functions in C Language Programs
- Preparing and Executing Programs

Dataport Function Calls

Dataport function calls can appear anywhere in your program once an initialization procedure is performed. Here are some examples of valid function calls.

In this example, the state named S1 is retrieved from the database and the variable state_id is assigned to it. The state's ID is retrieved; ID is a value that Rational Statemate uses to identify each element in the database. The state_id can be used later in other function calls.

```
state_id = stm_r_st ("S1", &status);
```

Function calls are frequently used in sequence. For example, the ID for state S1 in this function call has already been retrieved. The sample here retrieves the synonym of this state.

```
synonym = stm_r_st_synonym (state_id, &status);
```

This function creates a list (which contains the state), assigns it to the variable state_list, then extracts the substates of S1.

```
state_list = stm_list_create (state_id,
  end_of_list, &status);
sub_st = stm_r_st_physical_sub_of_st (state_list,
  &status);


for (s = (stm_id) stm_list_first_element(
    sub_st, &status);
    status == stm_success;
    s = (stm_id) stm_list_next_element(
        sub_st, &status)
)
```

Prints a list of all substates of state s.

```
printf ("\n %s", stm_r_st_name (s, &status));
```

Refer to Sample Program for an example of how to call Dataport functions in a C program.

Calling Conventions

Dataport functions provide you with information about particular Rational Statemate elements in the database. To extract this information, you call the specific function that retrieves the information you want. You specify the particular Rational Statemate elements that interest you as input arguments to the function. The function returns a status code as an output argument, which indicates whether the function call was successful.

Function Name

Single-element and query functions use the following prefix:

```
stm_r_
```

This prefix designates the function as a Rational Statemate database retrieval function.

Utility functions use the following prefix:

```
stm_
```

Element Type Abbreviations

Database extraction functions use two-character abbreviations to identify the type of Rational Statemate elements referenced in function calls. The following table lists the element types and their abbreviation.

Element	Abbreviation
A-flow-lines (basic)	ba
A-flow-lines (compound)	af
A-flow-lines (local)	laf
Actions	an
Actors	actor
Activities	ac
Boundary boxes	bb
Charts	ch
Combinational assignments	ca
Conditions	co
Connectors	cn
Data-items	di
Data-stores	ds
Enumerated value	en
Events	ev
Fields	fd
Information-flows	if
Lifelines	ll
Local data	ld
Messages	msg
Mixed (multiple types)	mx
M-flow-lines (basic)	bm
M-flow-lines (compound)	mf
M-flow-lines (local)	lmf
Modules	md
Module-occurrences	om
Notes	nt
Off-page activities	oa
Reference sequence diagrams	ref_sd
Routers	router
Separators	sep
States	st
Subroutines	sb
Subroutine parameters	sp
Timing constraints	tc

Element	Abbreviation
Transitions (basic)	bt
Transitions (compound)	tr
Use cases	uc
User-defined types	dt

For example, stm_r_ac_name retrieves the name of an activity, whereas stm_r_st_name retrieves the name of a state.

The naming structure for each type of function is explained in the section that describes each specific type. Note that element type and the information to be extracted are contained in the function name and are not passed as arguments.

Arrow elements (transitions on a statechart, a-flow-lines (control and data flow lines on an activity chart) and m-flow-lines on a module chart) can be either basic or compound:

- A basic arrow connects a box (state, activity, module) or connector to another box or connector.
- Compound arrows result from the combination of a number of basic arrows joined together by connectors.

Function Input Arguments

Database extraction functions require input arguments in order to locate Rational Statemate elements in the database. Input arguments consist of elements or lists of elements for which information is sought.

Some functions require additional input arguments. Each argument must be declared to be of a data type recognized by the Dataport library (or by the C compiler). This document includes a complete list of input arguments for each type of database extraction function in the sections that describe the specific function type.

Refer to the appropriate function sections for lists of arguments relevant for each function.

Example

To print out the synonym of the state S1 (if no synonym is defined in the state's form, print *missing synonym*), use the following statements:

```
int             status;
stm_id          state_id;
stm_short_name  synonym;
                .
                .
                .
state_id = stm_r_st ("S1", &status);
synonym = stm_r_st_synonym (state_id, &status);
if (status == stm_missing_synonym)
  printf ("\n synonym:  *missing synonym*");
else
  printf ("\n synonym: %s", synonym);
```

The `stm_id` data-type is defined in the Dataport Library definition file, `dataport.h`. Refer to Data Types for a complete list of data-type definitions.

Function Return Values

Library function return values are assigned to data types declared in the library definition file `dataport.h`. These data-types are defined in the C language. Refer to Data Types for the maximum length of return values.

For example, a function that retrieves the name of a Statemate element, returns a value of type `stm_element_name` (declared as `char *` in the library definition file), whereas a function that retrieves a state's ID returns a value of type `stm_id` (declared as `long int`).

The return values of data-types declared as strings, `char*`, such as `stm_element_name`, are usually limited in length.

The returned strings are defined as `static` in the functions. You should copy them if they are needed for later use.

Special Cases of Return Values

The following are special cases of return values:

- Return values of filename

  A number of Dataport functions store extracted information in files, such as a function that retrieves an element's long description. This function returns the name of the file that contains the requested information. The filename returned is of type stm_filename. This data-type is declared as char * in the library definition file.

  Note: The returned string is defined as static in the functions. Copy the string if it is required for later use.

- Return values of enumerated types

  There are several functions that return a finite number of discrete values. These values are not necessarily integers, and no particular order is assumed for these values.

  For example, the function stm_r_st_type extracts the state type for the state specified in the function call. The possible state types are:

  stm_st_diagram

  stm_st_and

  stm_st_or

  stm_st_instance

  stm_st_reference

  stm_st_basic

  Your program can contain statements such as:

  ```
  if (stm_r_st_type (st_id, &status) == stm_st_basic)
  ```

  For such return values, there are special enumerated data-types declared in the definition file. For example, the previous state types belong to the enumerated type stm_state_type. Refer to for the list of enumerated data-types. Refer to Single-Element Functions, Query Functions, and Utility Functions for the possible values and the corresponding data-types that particular functions return.

- Return values of pointers to records

  There are several functions that return a pointer to records with the textual and graphical information of an element.

  Note: The records are defined as static in the functions; You should copy the records if they are needed for later use.

- Return values when the function call fails

  When a function call fails, the function status code reflects the failure by returning the following values:

Function Type	Return Value
list	NIL
string	NIL
Boolean	false
stm_id	0

  By testing the value returned by the function, you can pinpoint function call failures. To determine what went wrong, use the function status code.

Using Functions in C Language Programs

The Dataport has a C language interface. To use its functions in a program, you must follow specific procedures to access both the library and your database.

Include Files

Every program that calls Dataport functions must include the definitions for its library data-types and constants. The definitions are contained in the `dataport.h` file.

To incorporate these definitions, include the file by writing the following statement at the beginning of your program:

```
#include dir_name/include/dataport.h
```

Substitute the value of the environment variable `STM_ROOT` for the `dir_name` variable.

Information Retrieval Process

Perform the following operations when using Dataport functions:

1. Initialize the retrieval process, via the `stm_init_uad` function.
2. Call the Dataport functions to retrieve database information.
3. Include the following line in your program, after the last Dataport function call:

   ```
   stm_finish_uad();
   ```

Initializing the Retrieval Process

To initialize the retrieval process, add the following statement to your program before any calls to Dataport library functions:

```
stm_init_uad (proj_name, w_area, trans_mode, &status)
```

In this call:

- proj_name - The name of the Rational Statemate project containing the information of interest.
- w_area - The directory pathname of your workarea in which the specification database is found.
- trans_mode (transaction on mode) - The transaction mode. This specifies the manner in which you want to handle database transactions, using manual_transaction or automatic_transaction modes.

This function returns true if successful, or false if unsuccessful. If unsuccessful, check the status argument for the reason the function failed.

Note

The stm_init_uad function automatically changes the current directory to the workarea directory. Therefore, all references to files in the program have to take this into account. Also, when the program terminates, it does not return to the original directory.

The following example shows how to initialize the retrieval process in a C program. In this example, you are prompted for the name of the project to open.

```
main( )
{
int status, success;
char     name[32];
char     dir[30];
printf ("Enter name of Statemate project: ");
scanf ("%s", name);
printf ("Enter directory pathname
        for your Workarea: ");
scanf ("%s", dir);
success =
  stm_init_uad (name, dir, automatic_transaction,
      &status);
if (!success)
  printf ("Init function failed.
         Reason: status code %d", status);
}
```

Note

- The project name (in this case, the content of the variable) is not case sensitive.
- It is recommended that you write the function in the form shown in the example (success=...; if(!success)...;) to ensure that the function succeeds before continuing.

Transaction Handling

The transaction mode determines how database modifications are reflected in your retrievals. The transaction modes are automatic_transaction and self_transaction.

Use automatic_transaction mode in the following cases:

- The database is not being updated during the information retrieval.
- The database is being updated by processes running in parallel to your program, but you are not interested in these updates.
- Your program uses the load and unload functions to change the database contents, and you want to use the updated database in your program each time it changes.

Refer to Automatic Transaction Mode for more information,

Use self_transaction mode if your information retrieval is to reflect database changes done by other processes at the same time your program is working, and you do not use load and unload functions in your program. Refer to Self Transaction Mode for more information.

Automatic Transaction Mode

In automatic_transaction mode, an implicit start_transaction is performed when you initialize the retrieval process and an implicit commit_transaction is performed when you finish the retrieval process.

Whenever you use load and unload functions to change the contents of the database, the program implicitly closes the read transaction, starts the read/write transaction, commits the changes, and implicitly starts a new read transaction.

The following is an example of how to use automatic_transaction:

```
main()
{
  int status, success;
  stm_list st_list;
  stm_id el;
   success = stm_init_uad ("PROJ", "/local/proj",
             automatic_transaction, &status);
   if (!success)
   {
     printf ("cause of failure is: %d", status);
     return;
   }
/*                                  */
/*  once initialization is done,          */
/*  retrieval can be done at any time.     */
/*                                  */
   st_list = stm_r_st_name_of_st ("*", &status);
   for (el = (stm_id)
    stm_list_first_element (st_list, 0);el!=NIL;
    el =(stm_id)stm_list_next_element (st_list, 0))
   {
     printf ("\n%s", stm_r_st_name (el, 0));
   }
/*                                  */
/*      The resulting output is:          */
/*              state_a                 */
/*              state_b                 */
/*              state_c                 */
/*              state_d                 */
/*                                  */
stm_finish_uad();
```

Self Transaction Mode

Use self_transaction mode when working with applications that are sensitive to database changes performed by a process that runs in parallel with your program. When you operate using the self_transaction mode, you must explicitly perform a start_transaction before you call Dataport retrieval library functions. This is done by including the following statement in your program:

```
stm_start_transaction();
```

For each start_transaction, you must perform an explicit commit_transaction to conclude the database retrievals by including the following statement in your program:

```
stm_commit_transaction();
```

You can start and commit transactions at any stage of your program. However, before retrieving additional data following a commit_transaction, you must first perform another start_transaction. Perform a new start_transaction whenever you want to refresh the image of the database so subsequent retrievals accurately reflect the database information.

The following is the structure of the self_transaction mode:

```
main()
{
  int status, success;
  stm_list st_list;
  stm_id el;
   success = stm_init_uad ("PROJ", "/local/proj",
              self_transaction, &status);
   if (!success)
   {
     printf ("cause of failure is: %d", status);
     return;
   }
/*                                    */
/*  once initialization is done,          */
/*  a start_transaction statement is      */
/*  needed in this mode.                  */
/*                                    */
  stm_start_transaction ();
  st_list = stm_r_st_name_of_st ("*", &status);
   for (el = (stm_id)
    stm_list_first_element (st_list, 0);el!=NIL;
    el = (stm_id)stm_list_next_element(st_list, 0))
   {
     printf ("\n%s", stm_r_st_name (el, 0));
   }

/*                                    */
/*   retrievals are done for now, so a     */
/*   commit_transaction is performed.      */
/*                                    */
/*    stm_commit_transaction();           */
/*      The resulting output is:          */
/*              state_a                   */
/*              state_b                   */
/*              state_c                   */
/*              state_d                   */
```

```
/*                                      */
/*   During the course of this output      */
/*   another process has updated the       */
/*   database, drawing a new state since   */
/*   this last transaction took place.     */
/*                                      */
/*   If the same retrieval is done again,  */
/*   different results should be found!    */
/*   To insure that the program "sees"     */
/*   the changes, start_transaction is     */
/*   performed again.                      */
/*                                      */
   stm_start_transaction ();
   st_list = stm_r_st_name_of_st ("*", &status);
   for (el = (stm_id)
    stm_list_first_element (st_list, 0);el!=NIL;
    el =(stm_id)stm_list_next_element (st_list, 0))
   {
     printf ("\n%s", stm_r_st_name (el, 0));
   }
/*                                      */
/*      The resulting output is:          */
/*               state_a                */
/*               state_b                */
/*               state_c                */
/*               state_d                */
/*               state_e                */
/*                                      */
/*  The last state, e, is new to the list  */
/*                                      */
  stm_commit_transaction ();
  stm_finish_uad ();
}
```

Preparing and Executing Programs

C programs containing Dataport function calls must be linked with the Dataport library. To execute a program containing calls to Dataport functions, follow the procedure for your operating system. The definitions in the dataport.h file can be used for debugging purposes.

Windows Systems

Define the environment variable STM_ROOT as follows:

```
SET STM_ROOT=root name
```

Contact your Rational Statemate manager for the name of the root directory of the Rational Statemate tree. For example:

```
SET STM_ROOT=C:\IBM Rational\stmm\4.6
```

Use the following command to compile and link:

```
PROGRAM= my_prog.exe
DLL= <STM_ROOT>\bin\dataport.dll
DLIB= <STM_ROOT>\lib\dataport.lib
SRCS= my_prog.c
HDRS= my_prog.h

CFLAGS= /DDLL_LINK /I<STM_ROOT>\include
LIBS= kernel32.lib
all: $(PROGRAM) $(DLL) $(HDRS)

$(PROGRAM): $(SRCS) $(DLIB)
cl $(CFLAGS) $(SRCS) $(DLIB) $(LIBS)

clean:
 -del $(PROGRAM) >nul: 2>&1
 -del *.obj >nul: 2>&1
 -del *.pdb >nul: 2>&1
 -del *.ilk >nul: 2>&1
 -del *.mdp >nul: 2>&1
 -del *.opt >nul: 2>&1
```

In this syntax:

- prog.o —The name you want to assign to the executable image
- prog.h —The header file
- myprog.c —The name of the file containing the C program

Use the following command to execute your program:

```
prog
```

UNIX Systems

Define the environment variable STM_ROOT as follows:

```
% setenv STM_ROOT root_name
```

Contact your Rational Statemate manager for the name of the root directory of the Rational Statemate tree.

Use the following command to compile and link:

```
cc -o <program> <otherflags> <myprog.c>  \
   $STM_ROOT/lib/dataport.o \
   $STM_ROOT/lib/libgcc.a $STM_ROOT/lib/x_stubs.o \
   -lm -lsocket -lnsl -L/usr/ucblib -lucb -ldl
```

In this syntax:

- program —The name you want to assign to the executable image
- otherflags —Can include -g or -O
- myprog.c —The name of the file containing the C program

Use the following command to execute your program:

```
program
```

In this syntax, program is the name of the executable image.

Optional qualifiers, such as debug, can be added in the compile, link, and execute stages. Refer to your operating system reference manuals for the available options.

Sample Program

This section contains a sample C program that shows you how to use the Rational Statemate Dataport to extract information about activities from the specification database. The information extracted is both textual (such as activity name, synonym, short description, and so on) and graphical (such as the Cartesian coordinates of the activity's box).

Sample C Program

The sample C program is as follows:

```
#include <stdio.h>

#include "dataport.h"
#define GET_STR(S)
  {int i;for(i=0;(S[i++]=getchar())!='\n';);
       S[--i]='\0';}

int status=0;
FILE *fd;
char array[80];

void draw_line (color, x1, y1, x2, y2)
stm_color color;
stm_coordinate x1, y1, x2, y2;
{
 printf("\n line from %f, %f to %f, %f in color %d",
        x1, y1, x2, y2, color);
}

void draw_string (s, color, x1, y1)
char *s;
stm_color color;
stm_coordinate x1,y1;
{
 printf ("\n string %s at %f, %f in color %d\n",
         s, x1, y1, color);
}
static char *activity_type (search_for)
stm_activity_typesearch_for;
{

static struct search_activity_type {
  stm_activity_typeact_type;
  char         *name;
} ActivityType[] = {
  {stm_ac_diagram,"DIAGRAM"},
  {stm_ac_reference,"REFERENCE"},
```

```
  {stm_ac_internal,”INTERNAL”},
  {stm_ac_instance,”INSTANCE”},
  {stm_ac_control,”CONTROL”},
  {stm_ac_control_instance,”CONTROL_INSTANCE”},
  {stm_ac_external,”EXTERNAL”},
  {NULL,    ”NULL”},
}
struct search_activity_type*sat;

  for (sat = ActivityType; sat->name != NULL; sat++)
    if (sat->act_type == search_for)
      return sat->name;
  return "";          /* error!*/
}

static char *activity_termination_type(search_for)
stm_activity_terminationsearch_for;
{
static struct search_activity_termination {
  stm_activity_terminationact_term_type;
  char                        *name;
} ActivityTerminationType[] = {
 {stm_ac_missing, ”MISSING”      },
 {stm_ac_self_termination, ”SELF_TERMINATION”      },
 {stm_ac_controlled_termination,
                        ”CONTROLLED_TERMINATION”},
 {NULL,              ”NULL”      },
}
struct search_activity_termination*sat;

  for (sat = ActivityTerminationType;
            sat->name != NULL;sat++)
     if (sat->act_term_type == search_for)
            return sat->name;
    return "";      /* error!*/
}

void activity_text_output(ac_text)
stm_ac_text_ptr ac_text;
{
   printf("\n\n\n\n\n activity textual information\n");
   printf("============================\n");
   printf("\n activity name: %s", ac_text->ac_name);
   printf("\n activity in chart: %d",
          ac_text->ac_chart);
   printf("\n activityuniquename:%s",
          ac_text->ac_uniquename);
   printf("\n activity synonym: %s",
          ac_text->ac_synonym);
   printf("\n activity type: %s",(ac_text->ac_type));
   printf("\n activity termination: %s",
          activity_termination_type (ac_text->ac_termination));
   printf("\n activity short description: %s",
          ac_text->ac_short_des);
   printf("\n activity long description:\n\n");
   if ((fd=fopen(ac_text->ac_long_des, "r")) == ZNIL)
       printf("\n\n cannot open file for printing");
   while (fgets(array,81,fd)!=ZNIL) printf("%s",array);
}
void activity_graphic_output (ac_graphic, ac_name)
stm_ac_graphic_ptr ac_graphic;
stm_name ac_name;

{
```

```
  int i = 0;
  stm_coordinate prev_x;
  stm_coordinate prev_y;


printf("\n\n activity graphical information\n");
  printf("============================\n");

  draw_string (ac_name, ac_graphic->ac_name_color,
       ac_graphic->ac_x_coor, ac_graphic->ac_y_coor);


  for  (i=1; i<=ac_graphic->ac_polygon.points_no;i++)
  {
     prev_x = ac_graphic->ac_polygon.outline[i-1].x;
     prev_y = ac_graphic->ac_polygon.outline[i-1].y;
     draw_line(ac_graphic->ac_color,prev_x,prev_y,
     ac_graphic->ac_polygon.outline
               [i % ac_graphic->ac_polygon.points_no].x,
            ac_graphic->ac_polygon.outline
           [i % ac_graphic->ac_polygon.points_no].y);
  }
}

void activities_info (ac_list)

stm_list ac_list;
{
  stm_ac_text_ptr    ac_textual;
  stm_ac_graphic_ptr ac_graphical;
  stm_id                el;


  for (el = (stm_id) stm_list_first_element (ac_list, &status);

      status == stm_success;
      el= (stm_id)stm_list_next_element (ac_list, &status))
  {

      ac_textual = stm_r_ac_text (el, &status);
 if (status == stm_success)
     activity_text_output (ac_textual);

 ac_graphical=stm_r_ac_graphic(el,&status);
 if (status == stm_success)
   activity_graphic_output(ac_graphical,
ac_textual->ac_name);
  }
}

void activity_boxes()
{
  char     ac_name[32];
  stm_id   ac_id;
  stm_list ac_list,acs_list;

printf("\n enter activity name: ");
  GET_STR(ac_name);
  ac_id=stm_r_ac(ac_name,&status);
  if (status!=stm_success)
  {
   printf("illegal activity name"); return;
  }
```

```
  ac_list=stm_list_create(ac_id,end_of_list,&status);
  acs_list=stm_r_ac_physical_sub_of_ac(ac_list,&status);

  if (status!=stm_success)
  {
   printf("error during execution"); return;
  }
  acs_list=stm_list_union(ac_list, acs_list, &status);
  activities_info(acs_list);
}

main( )
{
  char pname[32];

  printf("enter name of project: ");
  GET_STR(pname);
  success=stm_init_uad(pname, "/usr/sam/proj",
                  self_transaction, &status);
  if (success)
  {
    stm_start_transaction();
    activity_boxes();
    stm_commit_transaction();
  }
  else
  printf(cause of failure 15:%d,status);
  stm_finish_uad();
}
```

Program Description

For clarity, the program is explained in sections, not necessarily in the order in which it is written. The most general part, the main section of the program, is described first, then the individual functions are described.

Main Section and Program Setup

```
main( )
```

This section is the main part of the program. It calls the individual routines that are included in the C program.

```
{
 char pname[32];
 printf("enter name of project: ");
 GET_STR(pname);
```

The program begins by prompting for the name of the project.

```
success=stm_init_uad(pname,"/usr/sam/proj",
   self_transaction,&status);
```

The extraction is initialized by this function call. Your user's authorization to use the database is checked. You must be a member of the project that contains the specified activity-chart. If you are a member, the database is opened.

The parameter value `self_transaction` declares that you control the transaction handling, rather than having it done automatically. If the function is not successful, check the value of status to find out the reason for the failure.

```
stm_start_transaction();
```

This statement permits database operations. The statement must appear here because the `self_transaction` parameter was used in the `init` statement.

```
activity_boxes();
```

This calls the primary routine.

```
stm_commit_transaction();
stm_finish_uad();
}
```

This example does not have functions that write to the database; therefore, the `commit` statement here serves only to conclude the transactions.

The `finish` statement concludes the Data operations and closes the database.

Creating the Lists

```
void activity boxes()
```

This primary function creates a list of activities. The list is composed of a specified activity together with its subactivities. You are prompted for the parent activity.

```
{
  char     ac_name[32];
  stm_id   ac_id;
  stm_list  ac_list,acs_list;
```

ac_name holds the name of the activity, ac_id holds the ID number of the activity, and ac_list and acs_list hold the list of activities.

```
printf ("\n enter activity name: ");
GET_STR (ac_name);
ac_id = stm_r_ac (ac_name, &status);
if (status!=stm_success)
  {
    printf ("illegal activity name");
    return;
  }
```

The element ID that corresponds to the element name is retrieved. The status check determines whether the retrieval was successful. If the activity name is not unique or if it is incorrect, an error message is printed and the function is aborted.

```
ac_list = stm_list_create (ac_id, end_of_list, &status);
```

This statement creates a list of the single activity of interest. This list is then used as an input parameter for the routine stm_r_ac_physical_sub_of_ac .

```
acs_list = stm_r_ac_physical_sub_of_ac (ac_list, &status);
```

This statement creates a list of the subactivities for the input activity list (which, in this case, contains only a single activity).

```
if (status != stm_success)
{
  printf ("error during execution");
  return;
}
```

The status of the operation is checked for success (in this case, the check is redundant). An error could be caused if the activity in ac_list is deleted from the database by some other process while the sample C program is being executed. This situation can occur when the entire program is performed under more than one transaction.

```
acs_list = stm_list_union (ac_list, acs_list, &status);
```

This statement merges the two lists that contain the parent activity and its subactivities.

```
activities_info(acs_list);
}
```

The last statement of this function calls the function `activities_info`, which retrieves information for each element in a list of activities.

Retrieving the Information

```
void activities_info (ac_list)
stm_list ac_list;
```

This function retrieves both the textual and graphical information contained in the database.

```
{
  stm_ac_text_ptr ac_textual;
  stm_ac_graphic_ptr ac_graphical;
  stm_id el;
```

These statements declare variables to point to the textual and graphical records, and to include the ID for an activity. The structure of these records is defined in `statapi.h`.

```
for (el = (stm_id) stm_list_first_element (ac_list,
    &status);
    status == stm_success;
    el = (stm_id) stm_list_next_element (ac_list,
    &status)
)
stm_list_next_element (ac_list, &status))
```

These statements loop through each element in the activity list. The status of `stm_list_next_element` is not equal to `stm_success` when there are no more elements in the list.

```
{
  ac_textual = stm_r_ac_text (el, &status);
  if (status == stm_success)
      activity_text_output (ac_textual);
```

This statement retrieves the textual information for an activity. If successful, it writes the information into the report.

```
  ac_graphical = stm_r_ac_graphic (el, &status);
  if (status == stm_success)
     activity_graphic_output (ac_graphical,
        ac_textual->ac_name);
  }
}
```

This statement retrieves the graphical information for an activity. If successful, it calls the graphic output routine, passing the name for the activity.

Writing the Graphical Information

```
void activity_graphic_output(ac_graphic,ac_name)
```

This function defines the output of the graphical information retrieved from the database. In this example, the information is written into the report. The information can also be passed to an actual drawing routine, if desired.

The name of the activity, `ac_name`, is passed as a second parameter because the activity name is used in a graphic drawing such as a plot, although this information is part of the element's textual record.

```
stm_ac_graphic_ptr ac_graphic;
stm_name ac_name;
```

`ac_graphic` is a pointer to an activity's graphical record; `ac_name` is the name of the activity.

```
{
 int           i = 0;
 stm_coordinate prev_x;
 stm_coordinate  prev_y;
```

Declares the following variables:

- `i` —Controls the loop of the routine.
- `prev_x` and `prev_y` —Store the previous coordinates from which the line is drawn.

```
printf ("\n\n activity graphical information\n");
printf ("==============================\n");
```

These statements are the title of the output; they begin the retrieved information for each activity retrieved.

```
draw_string (ac_name, ac_graphic->ac_name_color,
   ac_graphic->ac_x_coor,ac_graphic->ac_y_coor);
```

This uses the routine `draw_string` to plot the activity name. It sends as parameters the string that holds the name, color, and X-Y coordinates where the name is drawn.

```
for  (i=1; iac_polygon.points_no; i++)
```

Plots the element. It loops through the coordinates and draw lines between the control points of the box representing the activity.

```
{
  prev_x = ac_graphic->ac_polygon.outline[i-1].x;
  prev_y = ac_graphic->ac_polygon.outline[i-1].y;
  draw_line(ac_graphic->ac_color,prev_x,prev_y,
    ac_graphic->ac_polygon.outline
        [i % ac_graphic->ac_polygon.points_no].x,
    ac_graphic->ac_polygon.outline
        [i % ac_graphic->ac_polygon.points_no].y);
  }
}
```

For each coordinate, the following parameters are passed to the draw_line routine:

- The color of the activity
- The X-Y coordinates to start and end the line

The draw_line function is called for each side of the activity individually.

Note

The lines of code beginning with ac_graphic to .x and ac_graphic to .y should be entered on a single line, which cannot be shown in the example.

Writing the Textual Information

```
void activity_text_output(ac_text)
```

This function defines how textual information retrieved from the database is output. In this example, this information is written into the report. It can also be manipulated by your own report generator, if desired.

```
stm_ac_text_ptr ac_text;
```

Declares the pointer to the activity's textual record.

```
printf("\n\n\n\n\n activity textual information\n");
printf("============================\n");
```

These statements generate a title for the output; they precede the retrieved information for each activity.

```
printf("\n activity name: %s", ac_text->ac_name);
printf("\n activity in chart: %d", ac_text->ac_chart);
printf("\n activity unique name: %s",
     ac_text->ac_uniquename);
printf("\n activity synonym: %s", ac_text->ac_synonym);
printf("\n activity type:%s",
     activity_type(ac_text->ac_type));
printf("\n activity termination: %s",
     activity_termination_type (
     ac_text->ac_termination));
printf("\n activity short description: %s",
     ac_text->ac_short_des);
printf("\n activity long description:\n\n");
```

Prints the information retrieved from the activity's fields.

```
if ((fd = fopen (ac_text->ac_long_des, "r")) == NIL)
    printf("\n\n cannot open file for printing");
while (fgets(array,81,fd) != NIL) printf("%s", array);
```

These statements loop through the element's long description, printing the lines one by one until a null string is reached.

Drawing the Names of the Elements

```
void draw_string (s, color, x1, y1)
```

This function draws the element's name.

```
char *s;
```

This is the name of the activity.

```
stm_color color;
```

This is the color to be used for the activity name.

```
stm_coordinate x1, y1;
```

This is the coordinate location for placing the activity name.

```
{
 printf("\n string %s at %f, %f in color %d\n",
       s, x1, y1, color);
}
```

The information is printed in a textual report. However, you can write a program routine to use this information in a plot.

Drawing the Activity Box

```
void draw_line(color, x1, y1, x2, y2)
```

This function draws the activity.

```
stm_color color;
```

This sets the color to be used for the activity.

```
stm_coordinate x1, y1, x2, y2;
```

This sets the coordinate locations for the activity's control points.

```
{
  printf("\n line from %f, %f to %f, %f in color %d",
        x1, y1, x2, y2, color);
}
```

The information is printed in a textual report. However, you can write a program routine to use this information in a plot.

Constructing the Activity Type

```
static char      *activity_type (search_for)
stm_activity_type  search_for;
{
static struct search_activity_type {
  stm_activity_type  act_type;
  char               *name;
}

ActivityType[] = {
  {stm_ac_diagram,          "DIAGRAM"},
  {stm_ac_reference,        "REFERENCE"},
  {stm_ac_internal,         "INTERNAL"},
  {stm_ac_instance,         "INSTANCE"},
  {stm_ac_control,          "CONTROL"},
  {stm_ac_control_instance, "CONTROL_INSTANCE"},
  {stm_ac_external,         "EXTERNAL"},
  {NULL,                    NULL},
}
struct search_activity_type  *sat;

  for (sat = ActivityType; sat->name != NULL; sat++)
    if (sat->act_type == search_for)
        return sat->name;
    return "";               /* error!  */
```

This routine matches a string for output to the type of the activity.

Constructing the Activity Termination Type

```
static char *activity_termination_type(search_for)
stm_activity_termination  search_for;
{
static struct search_activity_termination {
  stm_activity_termination  act_term_type;
  char                      *name;
}
ActivityTerminationType[] = {
  {stm_ac_missing,            "MISSING"},
  {stm_ac_self_termination,    "SELF_TERMINATION"},
  {stm_ac_controlled_termination,
      "CONTROLLED_TERMINATION"}, {NULL,NULL},
}
struct search_activity_termination   *sat;

   for (sat = ActivityTerminationType;
        sat->name != NULL; sat++)
     if (sat->act_term_type == search_for)
         return sat->name;
    return "";      /* error!  */
}
```

This routine matches a string for output to the termination type of the activity.

Global Variable Declarations

```
int status = 0;
```

This holds the status of function calls.

```
FILE *fd;
```

This is the file pointer to the file containing the long description.

```
char array[80];
```

This is an array used to hold each line of the long description for output to the report.

Program Definitions

```
#define GET_STR(S)
 {int i; for (i=0;(S[i++] = getchar())!='\n';);
  S[--i]='\0';}
```

This defines a routine to read characters entered at the keyboard.

Include File Statements

```
#include <stdio.h>
```

This includes the standard I/O library.

```
#include "dataport.h"
```

This includes the Dataport Library definitions. In this example, the sample program is assumed to have the same directory path as the file of definitions.

Program Output

The following is the output when the sample C program is executed. Information for an activity-chart in the ACCM project is extracted.

```
enter name of project: ACCM
enter activity name: MAIN_AC
activity textual information
==========================
activity name: SC_ACTIVITIES
activity in chart: 12
activity unique name: SC_ACTS_CH:SC_ACTIVITIES
activity synonym: SCA
activity type: INTERNAL
activity termination: MISSING
activity short description: Speed Controller
Activities
activity long description:
activity graphical information
============================
string SC_ACTIVITIES at 5.000000,14.208320 in color 7
line from 4.625000,14.791700 to 4.625000,4.541660 in color 8
line from 4.625000,4.541660 to 19.958320,4.541660 in color 8 line from
19.958320,4.541660 to 19.958320,14.791700 in color  8
line from 19.958320,14.791700 to 4.625000,14.791700 in color 8
activity textual information
==========================
activity name: CONTROL_SC
activity in chart: 14
activity unique name: SC_X12:CONTROL_SC
activity synonym: CSC
activity type: CONTROL
activity termination: MISSING
activity short description: Manage Speed Controller
activity long description:
!PURPOSE
This activity determines when the capabilities of the Speed Controller are
activated.
```

!END_PURPOSE

!BRIEF_DESCRIPTION

This control activity is described by a statechart.

!END_BRIEF_DESCRIPTION

activity graphical information

==========

string CONTROL_SC at 10.583320,13.041700 in color 13 line from 9.958330,13.791700 to 9.958330,12.791700 in color 3 line from 9.958330,12.791700 to 14.666700,12.791700 in color 3 line from 14.666700,12.791700 to 14.666700,13.791700 in color 3 line from 14.666700,13.791700 to 9.958330,13.791700 in color 3

activity textual information

==========

activity name: SET_CRS_SPEED

activity in chart: 19

activity unique name: SETTING:SET_CRS_SPEED

activity synonym: SDCS

activity type: INTERNAL

activity termination: SELF_TERMINATION

activity short description: Set Desired Cruising Speed

activity long description:

!PURPOSE This activity stores the current speed as the desired cruising speed.

!END_PURPOSE

!BRIEF_DESCRIPTION

The activity reads the current speed and records it in the data-store that stores the desired cruising speed.

!END_BRIEF_DESCRIPTION

activity textual information

==========

activity name: CALIBRATE

activity in chart: 19

activity unique name: SETTING:CALIBRATE

activity synonym: CRPM

activity type: INTERNAL

activity termination: SELF_TERMINATION

activity short description: Calibrate Rotations per Mile

activity long description:

!PURPOSE

The activity counts and updates the number of drive shaft rotations in a measured mile for different tire sizes.

!END_PURPOSE

!BRIEF_DESCRIPTION

--- TBD

!END_BRIEF_DESCRIPTION

activity graphical information

==========

string CALIBRATE at 15.291700,10.583320 in color 7 line from 14.791655,11.354160 to 14.791655,10.312480 in color 8 line from 14.791655,10.312480 to 19.124985,10.312480 in color 8 line from 19.124985,10.312480 to 19.124985,11.354160 in color 8 line from 19.124985,11.354160 to 14.791655,11.354160 in color 8

activity textual information

==========

activity name: MEASURE_SPEED

activity in chart: 18

activity unique name: CHECK:MEASURE_SPEED

activity synonym: MDCS

activity type: INTERNAL

activity termination: CONTROLLED_TERMINATION

activity short description: Measure Distance and Current Speed activity long description:

!PURPOSE

This activity calculates the current speed, and updates the total mileage of the car.

!END_PURPOSE

activity graphical information

==========

string SET_CRS_SPEED at 5.625000,10.666700 in color 7 line from 5.333330,11.500000 to 5.333330,10.458320 in color 8 line from 5.333330,10.458320 to 9.666660,10.458320 in color 8 line from 9.666660,10.458320 to 9.666660,11.500000 in color 8 line from 9.666660,11.500000 to 5.333330,11.500000 in color 8

!BRIEF_DESCRIPTION

The activity measures the distance traveled in a brief time interval, and calculates the average speed over this time. It adds the distance to the total mileage and updates the mileage store.

!END_BRIEF_DESCRIPTION

activity graphical information

==========

string MEASURE_SPEED at 15.375000,6.416660 in color 7

line from 14.875035,7.229170 to 14.875035,6.187490 in color 8 line from 14.875035,6.187490 to 19.208365,6.187490 in color 8 line from 19.208365,6.187490 to 19.208365,7.229170 in color 8 line from 19.208365,7.229170 to 14.875035,7.229170 in color 8

activity textual information

==========

activity name: MAINTAIN_SPEED

activity in chart: 25

activity unique name: OPERATE:MAINTAIN_SPEED

activity synonym: MDS

activity type: INTERNAL

activity termination: CONTROLLED_TERMINATION

activity short description: Maintain Desired Speed

activity long description:

!PURPOSE

This activity keeps the speed of the vehicle at a desired value.

!END_PURPOSE

!BRIEF_DESCRIPTION

This activity compares the current speed to the desired speed and controls the throttle accordingly.

!END_BRIEF_DESCRIPTION

activity graphical information

==========

string MAINTAIN_SPEED at 5.916660,6.875000 in color 7 line from 5.374995,7.645840 to 5.374995,6.604160 in color 8 line from 5.374995,6.604160 to 9.708325,6.604160 in color 8 line from 9.708325,6.604160 to 9.708325,7.645840 in color 8 line from 9.708325,7.645840 to 5.374995,7.645840 in color 8

activity textual information

==========

activity name: ACCELERATE

activity in chart: 25

activity unique name: OPERATE:ACCELERATE

activity synonym: CTBAP

activity type: INTERNAL

activity termination: CONTROLLED_TERMINATION

activity short description:

Control Throttle by Accelerator Pedal

activity long description:

!PURPOSE

This activity controls the speed according to the accelerator pedal position which is determined by the driver.

!END_PURPOSE

!BRIEF_DESCRIPTION

--- TBD

!END_BRIEF_DESCRIPTION

activity graphical information

==========

string ACCELERATE at 7.750000,5.166660 in color 7

line from 7.249995,5.937500 to 7.249995,4.895820 in color 8 line from 7.249995,4.895820 to 11.583325,4.895820 in color 8 line from 11.583325,4.895820 to 11.583325,5.937500 in color 8

line from 11.583325,5.937500 to 7.249995,5.937500 in color 8

Single-Element Functions

This section provides information about the single-element extraction functions. For each function, the following information is provided:

- Return value type
- The elements for which it is relevant
- Description
- Syntax
- Arguments
- Status codes

The two characters xx in the function names denote element type abbreviations. Refer to Element Type Abbreviations for the list of element abbreviations. Refer to Data Types for a list of the data types.

Overview of Dataport Single Element Functions

Single-element functions provide information about discrete Rational Statemate elements in the database. Using single-element functions, you can retrieve any information attached to a particular element. This information is usually entered into the database from forms. Data extraction is a multi-stage procedure. Generally, when working with a Rational Statemate element, you know the element's name (path name). You can retrieve more information about an element, such as the element's synonym or what attributes are defined in the element's form, using the single-element functions.

Complete the following steps to obtain more information about a Rational Statemate element:

1. Specify the element name or synonym. Receive the element ID.
2. Specify the ID and the information requested. Receive the extracted information
3. Use the extracted information.

The element ID is an internal representation that Rational Statemate uses to identify each element. You do not see the ID; you extract it from the database using one function and pass it along to another to process your information request.

Note

- Multiple functions can be called in succession for the same element. Each extracts different types of information.
- There are functions that extract records of information on an element. You can then use fields of this record, instead of using the individual functions for each type of information.

Calling Single-Element Functions

Extracting information from your database is at least a two-stage process.

Stage 1

Pass the element name or synonym as a function argument to get the element ID. The function calling sequence is as follows:

```
stm_r_xx (name, status)
```

In this syntax:

- stm_r_—Designates the function as a Rational Statemate database retrieval function.
- xx—The two-character element type abbreviation.
- name—The name of the element for which information is requested. The input argument name contains the name (path name) or synonym that uniquely identifies the element of interest. The name can be a variable or a literal string (enclosed by single apostrophe marks).
- status—The return function status code.

  For example:

  ```
  stm_r_st('S1', &status)
  ```

  This function call returns the ID for state S1. The value returned by the function is a Rational Statemate element of the type specified by xx. In this example, the value returned by the function is of type STATE.

Stage 2

Pass the element ID as a function argument to get the information requested. The function calling sequence is as follows:

```
stm_r_ xx _info (inarg, ..., &status)
or
stm_r_info (inarg, ..., &status)
```

In this syntax:

- stm_r_—Designates the function as a Rational Statemate database retrieval function.
- xx—The two-character element type abbreviation. Note that in some functions, these two characters are omitted.
- info—The type of information to be extracted from the database.
- inarg—The required input arguments.
- status—The return function status code.

For example:

```
stm_r_ac_description (a, &status)
or
stm_r_description (a, &status)
```

This function call retrieves the contents of the description field for the activity whose ID is contained in the variable a.

There is one function whose calling sequence differs from that shown above. This function, stm_r_element_type, receives an element ID as input and returns the element type. The function returns an enumerated type value of the form stm_state, stm_activity, and so on.

Note

In addition to the Stage 1 functions, there are other ways to obtain an element's ID. In Stage 2 functions, IDs are passed as arguments to identify elements in the database.

Single-Element Function Input Arguments

The following table lists the input arguments for single-element functions.

Argument	Function	Data Type
name	The name of the Rational Statemate element. It can be an element name, path name, or synonym, including the chart name, (for example, K:L.M).	stm_element_name, stm_short_name, or stm_pathname
element ID	The value that Rational Statemate uses to identify each element in the database. Rational Statemate assigns a unique ID to every element.	stm_id
attribute name	The name of an attribute defined in the form for a Rational Statemate element (in the Attribute field).	stm_attr_name
begin keyword	The string of text appearing in the long description attached to the specified Rational Statemate element. This string represents the beginning of the portion of the long description that you want to extract from the database.	char * (string)
end keyword	The string of text appearing in the long description attached to the specified element. This string represents the end of the portion of the long description that you want to extract from the database.	char * (string)
filename	The path name of a system file. Long descriptions (and portions thereof) are copied to the system file specified in this argument. Information is copied to a file as follows: • If you specify a directory name and file name, the text is copied to this file. • If you specify a file name, the file is written to the current workarea. • If you specify neither a directory name nor a file name (you pass an empty string, "", as the argument), the file is written to the /tmp directory. The file is erased from this directory after you finish working with the Dataport. The name of the file is the value returned by the function.	stm_filename

Single-Element Function Examples

This section provides several examples of single-element functions used to extract information from the Rational Statemate database.

Example 1: Returning a State's Synonym and Description

To find the synonym and the short description for a state as it appears in the state's form (the pathname CH:SSS.S1 uniquely identifies the state), include the following code in the program:

```
stm_id            state_id;
stm_description   state_desc;
stm_short_name    state_syn;
int               status;

state_id  = stm_r_st ("CH:SSS.S1", &status);
state_syn = stm_r_st_synonym (state_id, &status);
state_desc = stm_r_st_description (state_id, &status);
```

Two consecutive function calls are used to extract the synonym and the short description of the same element. The assigned variable and the function return value must have compatible data types; therefore, state_id is declared as stm_id .

Example 2: Returning Enumerated Type Values

To return enumerated type values, include the following code:

```
stm_id              state_id;
stm_element_name    state_name;
char                *state_type;
stm_state_type      st_type;
int                 status;
                    .
                    .
                    .
state_id = stm_r_st (state_name, &status);
st_type = stm_r_st_type (state_id, &status);
  switch  (st_type) {
    case  stm_st_or:
          strcpy (state_type,"or"); break;
    case  stm_st_and:
          strcpy (state_type,"and"); break;
                    .
                    .
                    .
}

printf ("The state %s is of type %s",
       state_name, state_type);
```

Example 3: Writing a Portion of the Long Description

To output the portion of a long description appearing between the strings "!BEGIN" and "!END" for state S1, use the following code:

```
stm_id          state_id;
stm_filename    descr_file;
                .
                .
                .
state_id = stm_r_st ("S1", &status);
descr_file = stm_r_st_keyword (state_id,
   "!BEGIN", "!END", "", &status);
                .
                .
                .
```

The fourth input parameter (the empty string) of the function stm_r_st_keyword determines the file name to which the extracted text is written. If the string is empty, as it is in this case, the function creates a temporary file. The name of this file is returned by the function (in this case, the assignment statement stores the returned file name in descr_file).

Example 4: Extracting Textual Information

To extract an entire record of all textual information for an activity, and then use the individual fields in subsequent calls, use the following code:

```
stm_id            act_id;
stm_ac_text_ptr   act_textual;
stm_description   act_desc;
stm_short_name    act_syn;
int               status;
                  .
                  .
                  .
act_id    = stm_r_ac ("AAA.A1", &status);
act_textual= stm_r_ac_text (act_id, &status);
act_syn   = act_textual->ac_synonym;
act_desc  = act_textual->ac_short_des;
```

Note the difference between this example and the previous example. In Example 1, single functions are used for each type of information; here, the whole record is extracted and the information from each field is used later.

List of Functions

As previously mentioned, the extraction functions take the form:

stm_r_<element_type><task>

For example, stm_r_uc_attr_name returns the names of attributes associated with the specified use case. Because this function can retrieve values for other elements besides use cases, it is denoted as stm_r_xx_attr_name. This function would be included in the A section (for attr_name).

For ease-of-use, the functions are presented in alphabetical order, by task. The functions are as follows:

Function	Description
stm_check_out_item	Checks out a chart file (or any other configuration item file) into the current workarea
stm_r_ac_mini_spec_hyper	Returns a string with the mini-spec, including hyperlinks to referenced elements.
stm_r_ac_subroutine_bind	Returns the subroutine binding connected to the specified activity
stm_r_ac_subroutine_bind_enable	Determines whether the subroutine bound to the specified activity is enabled or disabled.
stm_r_ac_subroutine_bind_expr	Returns the subroutine binding expression that is connected to the specified activity.
stm_r_ac_termination	Returns the activity termination type specified in the activity form.
stm_r_actual_parameter_exp	Returns the actual binding of the formal parameter name in the specified instance chart or component.
stm_r_actual_parameter_type	Returns the type of the formal parameter name in the specified instance chart or component.
stm_r_inherited_gds	Retrieves the description of the specified continuous chart.
stm_r_ch_access_status	Returns the status of charts in the workarea, that is, Read, Update, or New.
stm_r_ch_creator	Returns the date (as a string) on which the specified chart was created.
stm_r_ch_creator	Returns the name of the Rational Statemate user who created the specified chart.
stm_r_ch_modification_date	Returns the date in which the version of the chart in the workarea was saved in the databank.
stm_r_ch_modification_status	Returns the chart modification status of the specified chart.
stm_r_ch_usage_type	Returns the usage type for a chart.

stm_r_ch_version	Returns the version of the specified chart.
stm_r_cn_value	Returns a value associated with a diagram connector.
stm_r_co_default_val	Returns the default value associated with the specified element.
stm_r_ddb_list_names	Returns the names of the lists created by the property sheet.
stm_r_design_attr	Retrieves the information on the element's Design-Attributes as would appear when using the Info tool within Rational Statemate.
stm_r_dt_enum_values	Returns a list of the enum values ids for the specified User Defined Type.
stm_r_element_type	Returns the element type of the specified element.
stm_r_elem_in_ddb_list	Return a list of stm_id's stored in a specified list_name.
stm_r_formal_parameter_names	Returns a list of names of formal parameters that appear in bindings of instance boxes and components.
stm_r_gds_visibility_mode	Returns the visibility mode for the specified global definition set (GDS).
stm_r_hyper_key	Retrieves the unique key for the specified element.
stm_r_included_gds	Returns the list of global definition sets contained in the specified chart.
stm_r_inherited_gds	Retrieves the list of global definition sets that are "inherited" (included indirectly) by the specified chart.
stm_r_md_implementation	Retrieves the implementation type for the specified module.
stm_r_md_purpose	Returns the purpose of the module.
stm_r_msg_all	Returns the textual information associated with a specified element.
stm_r_msg_defined_in_scen	Returns the list of messages in chronological order that are part of a scene, defined by a separator.
stm_r_msg_graphic	Returns the graphical information associated with the specified element.
stm_r_msg_included_in_ord_insig	Returns a list of messages that are bounded by an order-insignificant element.
stm_r_msg_where_tc_begins	Returns the message where the timing constraint begins.
stm_r_msg_where_tc_ends	Returns the message where the timing constraint ends.
stm_r_next_msg	Returns the message after (in time) the decomposed sequence diagram.
stm_r_nt_body	Returns a list of strings.
stm_r_omd	Returns the ID of the module that corresponds to the module occurrence.
stm_r_ord_insig_all	Returns the textual information associated with a specified element
stm_r_ord_insig_graphic	Returns the graphical information associated with the specified element.
stm_r_parameter_binding	Returns the parameter expression from generic charts and components.

stm_r_previous_msg	Returns the message previous (in time) to the decomposed sequence diagram.
stm_r_sb_action_lang	Retrieves the action language of the specified subroutine.
stm_r_sb_action_lang_expression	Retrieves the action language expression of the specified subroutine.
stm_r_sb_action_lang_local_data	Retrieves the action language local data associated with the specified subroutine.
stm_r_sb_ada_user_code	Returns the Ada code that was manually written for the specified subroutine.
stm_r_sb_ansi_c_user_code	Returns the ANSI C code that was manually written for the specified subroutine.
stm_r_sb_connected_chart	Returns the ID of the procedural statechart connected to the specified subroutine.
stm_r_sb_connected_flowchart	Returns the global data associated with the specified subroutine.
stm_r_sb_global_data_mode	Returns the mode of a subroutine's global variable.
stm_r_sb_kr_c_user_code	Returns the K&R C code that was manually written by the user for the specified subroutine.
stm_r_sb_parameters	Retrieves the parameters of the subroutine.
stm_r_sb_proc_sch_local_data	Retrieves the local data of the procedural statechart implemented by the specified subroutine.
stm_r_sb_proc_fch_local_data	Retrieves the subroutine's return type.
stm_r_sb_return_user_type	Retrieves the user-defined type ID returned by the subroutine.
stm_r_sb_return_user_type_name_type	Retrieves the subroutine's return user type and name type.
stm_r_sep_all	Returns the textual information associated with a specified element
stm_r_sep_graphic	Returns the graphical information associated with the specified element.
stm_r_st_andlines	Returns a list of the and-lines associated with the specified state.
stm_r_st_static_reactions	Returns the static reactions defined for the specified state element.
stm_r_st_static_reactions_hyper	Returns a string with the static reactions, including hyperlinks to referenced elements.
stm_r_stubs_name	Returns the list of stub names for an instance of a component.
stm_r_tc_all	Returns the textual information associated with a specified element.
stm_r_tc_graphic	Returns the graphical information associated with the specified element.
stm_r_tr_attr_enforced	Returns the enforced attributes specified by attr_name .

stm_r_tr_attr_name	Returns the names of attributes associated with the specified element. Attributes are associated with elements through element forms.
stm_r_tr_attr_val	Returns the values associated with a particular attribute name for the specified element.
stm_r_tr_longdes	Returns the long description of the specified Transition.
stm_r_tr_notes	Returns a list of strings each one is a line in the Transition Note related to the specified Transition
stm_r_tt_cell	Returns the string of the specified cell (row & column) in a Truth-Table associated with the specified element.
stm_r_tt_cell_hyper	Retrieves the contents of the specified cell in the given truth table, including hyperlinks to referenced elements.
stm_r_tt_cell_type	Returns the type of the specified cell (row & column) in a Truth-Table associated with the specified element.
stm_r_tt_num_of_col	Retrieves the number of columns (including blank ones) in the specified truth table, as viewed in the truth table editor.
stm_r_tt_num_of_in	Retrieves the number of input columns in the specified truth table.
stm_r_tt_num_of_out	Retrieves the number of output columns in the specified truth table.
stm_r_tt_num_of_row	Retrieves the number of rows (including blank ones) in the specified truth table, as viewed in the truth table editor
stm_r_tt_row	Retrieves the values in the specified row in the truth table.
stm_r_tt_row_hyper	Returns a list of strings that represents a row in the truth table, including hyperlinks to referenced elements.
stm_r_xx	Retrieves the element ID of the specified element.
stm_r_xx_all	Returns both the textual and graphical information associated with a specified element.
stm_r_xx_array_lindex	Returns the left index of an element array.
stm_r_xx_array_rindex	Returns the right index of an element array.
stm_r_xx_attr_enforced	Returns the enforced attributes specified by attr_name .
stm_r_xx_attr_name	Returns the names of attributes associated with the specified element.
stm_r_xx_attr_val	Retrieves attribute values associated with a particular attribute name for the specified element.
stm_r_xx_bit_array_lindex	Returns the left index of a bit array.
stm_r_xx_bit_array_rindex	Returns the right index of a bit array.
stm_r_xx_cbk_binding	Retrieves the callback binding for specified elements.
stm_r_xx_cbk_binding_enable	Retrieves the enabled callback bindings.
stm_r_xx_cbk_binding_expression	Retrieves the callback binding expressions.
stm_r_xx_chart	Returns the chart ID for the specified element.
stm_r_xx_combinationals	Returns a list of strings.

stm_r_xx_containing_fields	Returns the list of union or record elements that contain fields.
stm_r_xx_data_type	Returns the element subtype, including its data type and data structure.
stm_r_xx_default_val()	Returns the default value associated with the specified element.
stm_r_xx_definition_type	Returns the definition type of the specified textual element.
stm_r_xx_des_attr_name	Returns the names of Design-Attributes associated with the specified element.
stm_r_xx_des_attr_val	Retrieves the values of a given Design-Attribute values associated with the specified element.
stm_r_xx_description	Returns the short description of the specified element.
stm_r_xx_displayed_name	Returns the name of a chart, as it appears in the graphic editor where the specified element is located.
stm_r_xx_explicit_defined_xx	Returns the definition expression of the specified element found in the Definition field of the element's form, including hyperlinks to referenced elements.
stm_r_xx_expression	Returns the definition expression of the specified element found in the Definition field of the element's form.
stm_r_xx_ext_link	Returns the file name associated with the "Link to External File" entry in the element's properties of the specified element.
stm_r_xx_graphic	Returns the graphical information associated with the specified element.
stm_r_xx_instance_name	Returns the name of the instance as it appears in the chart for a specific hierarchical Rational Statemate element.
stm_r_xx_keyword	Retrieves a portion of the element's long description.
stm_r_xx_labels	Returns a list of strings that consists of all the labels of the specified compound transition or message.
stm_r_xx_labels_hyper	Returns a list of strings of message or transition labels, with hyperlinks to referenced elements.
stm_r_xx_longdes	Retrieves the long description attached to the specified element.
stm_r_xx_max_val	Returns the maximum value of the specified element.
stm_r_xx_min_val	Returns the minimum value of the specified element.
stm_r_xx_mini_spec	Returns a string with mini-spec reactions or actions.
stm_r_xx_mode	Returns the parameter or router mode.
stm_r_xx_name	Returns the element name.
stm_r_xx_note	Returns the notes from a requirement record or timing constraint.
stm_r_xx_notes	Returns the notes in the specified element.
stm_r_xx_number_of_bits	Returns the number of bits in the element.

stm_r_xx_of_enum_type	Retrieves the enumerated type ID (a user-defined type) for the specified element.
stm_r_xx_of_enum_type_name_type	Retrieves the enumerated name type for the specified elements.
stm_r_xx_parameter_mode	Retrieves the parameter mode, including subroutine parameters and the parameters of generic charts and components.
stm_r_xx_reactions	Returns the static reactions of the specified state.
stm_r_xx_select_implementation	Retrieves the implementation type of the specified element.
stm_r_xx_string_length	Retrieves the string length of the specified element.
stm_r_xx_structure_type	Returns the structure or type of the specified textual element. The structure or type can be single, array, or queue.
stm_r_xx_synonym	Retrieves the synonym of the specified element. The synonym is defined in the element's form.
stm_r_xx_text	Returns the textual information associated with a specified element.
stm_r_xx_truth_table	Returns the elements that are implemented as truth tables.
stm_r_xx_truth_table_expression	Returns the truth table expression for all named elements.
stm_r_xx_truth_table_local_data	Returns the list of local data elements defined in the truth table related to the input subroutine.
stm_r_xx_type	Retrieves element subtypes for the specified element.
stm_r_xx_type_expression	Returns the type expression for the specified element.
stm_r_xx_uniquename	Returns the unique path name for the specified element.
stm_r_xx_user_type	Returns the user-defined type ID referenced by the element.
stm_r_xx_user_type_name_type	Returns the user-defined type ID referenced by the element.

stm_check_out_item

Function Type

None

Description

Checks out a chart file (or any other configuration item file) into the current workarea.

Note

If the version string parameter is an empty string or NULL, the function regards the latest version of the chart/file in the Databank

Syntax

stm_check_out_item (file_name, ext, version, with_lock, error_func, &status)

Status Codes

- stm_success
- stm_error_in_load_operation

Arguments

Argument Name	Input/Output	Argument Type	Argument Description
item_name	Input	char *	Name of chart/file to check-out

ext	Input	char *	Rational Statemate chart/file extensions. The possible values are as follows: x sch – Statechart x ach - Activity charts x mch - Module-charts x fch – Flowcharts x dic - Global Definition Set files x qch - Sequence-Diagrams x uch - Use-Case-Diagrams x vsm - Continuous Diagrams x pnl – Panel files x scp - Simulation SCL files x cnf - Simulation status files x wpf - Waveform Profiles x dyn_set - Simulation analysis profiles x mon - Monitor files x chk_mdl_set - Check Model Profiles ² dgl - Documentor templates x inc - Documentor include files x pnl - Prototype panels x config - Configuration files x tv - Task View files x mak - Makefiles x oil - OIL files x cfg - CFG files x c - Source(c) files x h - Header (h) files x rgenset - Rapid Prototyper Profiles x trg - Target files x rtrg - Rapid Target files x crd - Card files x rconfig - Rhapsody block Configuration files x ccf - Component Configuration files x dat - VSM Data files x wav - VSM Wave files x mat - VSM Mat. Files x m - VSM M. files
version	Input	char *	Version of the chart/file
with_lock	Input	int	A Boolean argument that indicates whether to lock the chart/file

error_func	input	void (*) (const char* err_msg).	pointer to a function of the following prototype: void err_func(const char* err_msg) If the error_func pointer is not NULL, this function will be called with an error message string, when the returned status is not stm_success . The error function may be called more than once during one checkout operation, with different error messages.
status	output	int	The function status code.

stm_r_ac_mini_spec_hyper

Returns a string with the mini-spec, including hyperlinks to referenced elements.

Function Type

stm_expression

For Elements

activity	ac

Syntax

Arguments

Argument	Input/ Output	Type	Description
elem	In	stm_id	The element ID.
format	In	char *	Either FrameMaker or Microsoft Word.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_id_not_found
- stm_unresolved

stm_r_ac_subroutine_bind

Returns the subroutine binding connected to the specified activity.

Function Type

stm_list

For Elements

activity	ac

Syntax

stm_r_ac_subroutine_bind (ac_id, &status)

Arguments

Argument	Input/ Output	Type	Description
ac_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_unresolved
- stm_id_not_found
- stm_missing_subroutine_binding

stm_r_ac_subroutine_bind_enable

Determines whether the subroutine bound to the specified activity is enabled or disabled.

Function Type

int (predefined constant)

For Elements

activity	ac

Syntax

stm_r_ac_subroutine_bind_enable (ac_id, &status)

Arguments

Argument	Input/ Output	Type	Description
ac_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_unresolved
- stm_id_not_found

Return Values

Although the return value of this function is of type int, Dataport enables you to reference this value by name. The possible values are as follows:

- stm_ac_cbk_enable
- stm_ac_cbk_disable
- stm_ac_cbk_bind_missing

stm_r_ac_subroutine_bind_expr

Returns the subroutine binding expression that is connected to the specified activity.

Function Type

stm_expression

For Elements

activity	ac

Syntax

stm_r_ac_subroutine_bind_expr (ac_id, &status)

Arguments

Argument	Input/ Output	Type	Description
ac_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_id_not_found
- stm_unresolved
- stm_missing_subroutine_binding

stm_r_ac_termination

Returns the activity termination type specified in the activity form.

Function Type

stm_activity_termination

For Elements

activity	ac

Syntax

stm_r_ac_termination (act_id, &status)

Arguments

Argument	Input/ Output	Type	Description
act_id	In	stm_id	The activity whose termination type you want to retrieve.
status	Out	int	Function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_id_not_found
- stm_unresolved

Return Values

The function output has an enumerated type, stm_activity_termination, with three possible values:

- stm_ac_self_termination
- stm_ac_controlled_termination
- stm_ac_missing

Example

To determine the termination type of the activity A1 and if the activity is self-terminated write the activity's name, use the following statements:

```
stm_id                      act_id;
stm_activity_termination    act_term_type;
int                         status;
   .
   .
act_id = stm_r_ac ("A1", &status);
act_term_type = stm_r_ac_termination (act_id, &status);
if(act_term_type == stm_ac_self_termination)
   printf ("\n Self-terminated activity:", "A1");
   .
   .
   .
```

stm_r_ac_xx_ac

Provides a list of activities.

Funtion type:

stm_list

For Elements:

actor	
boundary box	bb
ext_ll	
external router	
lifeline	ll
router	router
use case	use

Syntax:

STM_R_AC_XX_AC (IN el_list: LIST OF ACTIVITY, OUT status: INTEGER):LIST OF XX;

Arguments:

Argument	Input/ Output	Type	Description
activities_list	in	stm_list	List of Activities
status	out	int	Function Status Code

Status Codes:

- stm_success
- stm_nil_list

stm_r_actual_parameter_exp

Returns the actual binding of the formal parameter name in the specified instance chart or component.

Function Type

stm_expression

For Elements

activity	ac
condition	co
data-item	di
event	ev

Syntax

stm_r_actual_parameter_exp (xx_inst_boxid,formal_param_name, &status)

Arguments

Argument	Input/ Output	Type	Description
xx_inst_boxid	In	stm_id	The element ID.
formal_param_name	In	String	The formal parameter name. If this is a data-element (from the information stub matrix in the DDE), the function returns the corresponding data-element. If this argument is the stub's name, the function returns the information flowing on the arrow connected to that stub.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_name_not_found

stm_r_actual_parameter_type

Returns the type of the formal parameter name in the specified instance chart or component.

Note

If there is an information-flow stub, the function returns stm_information_flow .

Function Type

stm_element_type

For Elements

activity	ac
condition	co
data-item	di
event	ev

Syntax

stm_r_actual_parameter_type (inst_boxid, formal_param_name, &status)

Arguments

Argument	Input/ Output	Type	Description
inst_boxid	In	stm_id	The element ID.
formal_param_name	In	string	The formal parameter name.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_name_not_found

stm_r_cd_info

Retrieves the description of the specified continuous chart.

Function Type

stm_expression

For Elements

chart	ch

Syntax

stm_r_cd_info (ch, &status)

Arguments

Argument	Input/ Output	Type	Description
cd	In	stm_id	The chart.
status	Out	int	The function status code.

Status Codes

- stm_id_out_of_range
- stm_null_string
- stm_success

stm_r_changes_log

Documents all the changes made to specified charts in a log file.

Function Type

stm_list

For Elements

chart	ch

Syntax

stm_r_changes_log (ch_lst, ascending, per_date,dont_format, &status)

Arguments

Argument	Input/ Output	Type	Description
ch_lst	In	stm_id LIST OF CHART	The list of charts to track.
ascending	In	stm_boolean BOOLEAN	Determines whether the changes are listed in ascending order TRUE).
per_date	In	stm_boolean BOOLEAN	Determines whether the changes are listed chronologically (TRUE).
dont_format	In	stm_boolean BOOLEAN	Determines whether the log file is formatted. If this is TRUE, each log entry is inserted into a returned list element. If it is FALSE, each field of the log entry is inserted into a returned list element.
status	Out	int	The function status code.

Status Codes

- stm_id_out_of_range
- stm_not_chart_id
- stm_id_not_found
- stm_success

stm_r_ch_access_status

Returns the status of charts in the workarea, that is, Read, Update, or New.

Function Type

stm_chart_access_status

Syntax

stm_r_ch_access_status (ch_id, int *status)

Status Codes

- stm_success
- stm_id_out_of_range
- stm_name_not_found

Return Values

- stm_chac_readonly
- stm_chac_update
- stm_chac_new

stm_r_ch_creation_date

Returns the date (as a string) on which the specified chart was created.

Note: This function is relevant only for charts that were explicitly defined using one of the graphic editors.

Function Type

stm_date

For Elements

chart	ch

Syntax

stm_r_ch_creation_date (ch_id, &status)

Arguments

Argument	Input/ Output	Type	Description
ch_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_not_found
- stm_id_out_of_range
- stm_unresolved

Example

To return the chart date, use the following statements:

```
stm_id      chart_id;
int         status;
            .
            .
chart_id = stm_r_ch ("TOP", &status);
printf ("\n Chart created on: %s",
   stm_r_ch_creation_date (chart_id, &status));
            .
            .
```

The date output is the date on which the chart named TOP was created.

stm_r_ch_creator

Returns the name of the Rational Statemate user who created the specified chart.

Note: This function is relevant only for charts that were explicitly created using one of the graphic editors.

Function Type

stm_user_name

For Elements

chart	ch

Syntax

stm_r_ch_creator (ch_id, &status)

Arguments

Argument	Input/ Output	Type	Description
ch_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_id_not_found
- stm_unresolved

Example

To return the name of the user who created the chart, use the following statements:

```
stm_id      chart_id;
int         status;
            .
            .
            .
chart_id = stm_r_ch ("TOP", &status);
printf ("\n Chart created by: %s",
   stm_r_ch_creator (chart_id, &status));
            .
            .
            .
The name output is the name of the user who created the chart named
TOP.
```

stm_r_ch_modification_date

Returns the date in which the version of the chart in the workarea was saved in the databank.

Note: This function is relevant only for charts that were explicitly defined using one of the graphics editors.

Function Type

stm_date

For Elements

chart	ch

Syntax

stm_r_ch_modification_date (ch_id, &status)

Arguments

Argument	Input/ Output	Type	Description
ch_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_id_not_found
- stm_unresolved

Example

To return the date of the last modification for a chart, use the following statements:

```
stm_id      chart_id;
   int      status;
               .
               .
chart_id = stm_r_ch ("TOP", &status);
printf ("\n Chart modified on: %s",
   stm_r_ch_modification_date (chart_id, &status));
               .
               .
The date output is the date on which the chart named TOP was last
modified.
```

stm_r_ch_modification_status

Returns the chart modification status of the specified chart. The possible values are:

- U—Unmodified
- M—Modified
- N—New
- D—Deleted

Function Type

stm_chart_mod_status

For Elements

chart	ch

Syntax

stm_r_ch_modification_status (ch_id, &status)

Arguments

Argument	Input/ Output	Type	Description
ch_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_not_found
- stm_id_out_of_range
- stm_unresolved

stm_r_ch_usage_type

Returns the usage type for a chart.

Function Type

stm_chart_usage

For Elements

chart	ch

Syntax

stm_r_ch_usage_type (ch_id, &status)

Arguments

Argument	Input/ Output	Type	Description
ch_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_id_not_found

Return Value

Although the return value of this function is of type int, Dataport enables you to reference this value by name. The possible values are:

- stm_ch_usage_generic
- stm_ch_usage_normal
- stm_ch_usage_ref_generic
- stm_ch_usage_ref_offpage
- stm_ch_usage_ref_describing

stm_r_ch_version

Returns the version of the specified chart.

Function Type

char *

For Elements

chart	ch

Syntax

stm_r_ch_version (ch, &status)

Arguments

Argument	Input/ Output	Type	Description
ch	In	stm_id	The chart whose version you want to retrieve.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_not_found
- stm_id_out_of_range
- stm_unresolved

stm_r_cn_value

Returns a value associated with a diagram connector. The value is a string (maximum 32 characters) reflecting an associated number or label. The input argument cn_id is an element ID of a diagram connector.

Function Type

char *

For Elements

diagram connector	

Syntax

stm_r_cn_value (cn_id, &status)

Arguments

Argument	Input/ Output	Type	Description
cn_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_id_not_found
- stm_not_diagram_connector

Example

To assign (to cn_value) the label of a specific diagram connector (identified by cn_id), use the following statement:

```
.
    .
cn_value = stm_r_cn_value (cn_id, &status);
    .
    .
```

stm_r_co_default_val

Returns the default value associated with the specified element.

Function Type

char *

Syntax

stm_r_co_default_val (st_id, int &status)

Arguments

Argument	Input/ Output	Type	Description
status	Out	int	The function status code.

Status Codes

stm_success

stm_r_ddb_list_names

Returns the names of the lists created by the properties browser.

Function Type

stm_list

Syntax

stm_r_ddb_list_names (&status)

Arguments

Argument	Input/ Output	Type	Description
status	Out	int	The function status code.

Status Codes

stm_success

stm_r_design_attr

Retrieves the information on the element's User Attributes as would appear when using the Info tool within Rational Statemate.

Syntax

stm_r_design_attr (stm_id, int *status)

Arguments

Argument	Input/ Output	Type	Description
stm_id	In		The ID of the element being queried.
int	Out		The status of the query.
status	Out	int	The function status code.

stm_r_dt_enum_values

Returns a list of the enum values for the specified User Defined Type.

Function Type

stm_list

For Elements

User-defined type

Syntax

stm_r_dt_enum_values (dt_id, &status)

Arguments

Argument	Input/ Output	Type	Description
dt_id	In	stm_id	The User-Defined Type ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range

stm_r_element_type

Returns the element type of the specified element.

Function Type

stm_element_type

For Elements

All types

Syntax

stm_r_element_type (id, &status)

Arguments

Argument	Input/ Output	Type	Description
id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_id_not_found

Return Values

The return value belongs to the enumerated type stm_element_type. This type has the following values corresponding to the Rational Statemate element types:

Element Type	Value
a-flow-line (basic)	stm_a_flow_line
a-flow-line (compound)	stm_compound_a_flow_line
action	stm_action
activity	stm_activity
chart	stm_chart
condition	stm_condition
connector in activity-chart	stm_a_connector
connector in module-chart	stm_m_connector

Element Type	Value
connector in statechart	stm_s_connector
data-item	stm_data_item
data-store	stm_data_store
decomposed sequence diagram	stm_decomposed_sd
event	stm_event
external lifeline	stm_external_lifeline
flow label	stm_flow_label
information-flow	stm_information_flow
lifeline	stm_lifeline
m-flow-line (basic)	stm_label
m-flow-line (compound)	stm_m_flow_line
message	stm_message
module	stm_compound_m_flow_line
module occurrence	stm_module
order insignificant	stm_order_insignificant

Element Type	Value
router	stm_router stm_external_router
separator	stm_separator
subroutine	stm_subroutine
state	stm_module_occurrence
timing constraint	stm_timing_constraint
transition (basic)	stm_state
transition (compound)	stm_transition
transition label	stm_compound_transition

Example

To list all the conditions appearing in the Definition field for the condition C1, generate a list of elements (of type mixed) using the query function stm_r_mx_in_definition_of_co. Elements in this list are all the elements (not necessarily conditions) appearing in the Definition field of the condition C1. Search this list for conditions and if any are found, print them.

The program contains the following statements:

```
stm_id              cond_id;
stm_list            elmnt_list, co_list;
stm_id              el;
stm_element_type    el_type;
int                 status;
    .
    .
cond_id = stm_r_co ("C1", &status);
co_list = stm_list_create (cond_id, end_of_list,
   &status);
elmnt_list = stm_r_mx_in_definition_of_co (co_list,
   &status);
for (el = (stm_id)
  stm_list_first_element (elmnt_list, &status);
  status == stm_success;
  el = (stm_id)
      stm_list_next_element (elmnt_list, &status))
  {
   el_type = stm_r_element_type (el, &status);
   if (el_type == stm_condition)
      printf ("\n Condition Name:%s",
            stm_r_co_name (el, &status));
  }
    .
    .
    .
```

stm_r_elem_in_ddb_list

Return a list of stm_id's stored in a specified list_name.

Function Type

stm_list

Syntax

stm_r_elem_in_ddb_list (list_name, &status)

Arguments

Argument	Input/ Output	Type	Description
list_name	In		Path name to the list.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_no_such_list

stm_r_formal_parameter_names

Returns a list of names of formal parameters that appear in bindings of instance boxes and components.

Function Type

stm_list

For Elements

action	an
condition	co
data-item	di
event	ev

Syntax

stm_r_formal_parameter_names (inst_box_id, &status)

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range

stm_r_gds_visibility_mode

Returns the visibility mode for the specified Global Definition Set (GDS).

Function Type

int

For Elements

element ID	

Syntax

stm_r_gds_visibility_mode (gds_id, &status)

Arguments

Argument	Input/ Output	Type	Description
gds_id	In	stm_id CHART	The GDS whose visibility you want to retrieve.
status	Out	int	The function status code.

Status Codes

- stm_id_out_of_range
- stm_success

Return Values

Although the return value of this function is of type INTEGER, the Dataport enables you to reference this value by name. The name is internally defined as a predefined constant in DGL. The possible values are as follows:

- stm_explicit_usage
- stm_public_usage

stm_r_hyper_key

Retrieves the unique key for the specified element.

Function Type

char *

For Elements

element ID	ac

Syntax

stm_r_hyper_key (el, &status)

Arguments

Argument	Input/ Output	Type	Description
el	In	stm_id	The element ID whose key you want.
status	Out	int	The function status code.

Status Codes

- stm_id_out_of_range
- stm_success

stm_r_included_gds

Returns the list of global definitions contained in the specified chart.

Function Type

stm_list

For Elements

chart	ch

Syntax

stm_r_included_gds (ch_id, &status)

Arguments

Argument	Input/ Output	Type	Description
ch_id	In	stm_id	The chart
status	Out	int	The function status code

Status Codes

- stm_id_out_of_range
- stm_use_all_public_gds
- stm_success

stm_r_inherited_gds

Retrieves the list of global definition sets that are “inherited” (included indirectly) by the specified chart.

Function Type

stm_list

For Elements

chart	ch

Syntax

stm_r_inherited_gds (ch_id, &status)

Arguments

Argument	Input/ Output	Type	Description
ch_id	In	stm_id	The chart.
status	Out	int	The function status code.

Status Codes

- stm_id_out_of_range
- stm_use_all_public_gds
- stm_success

stm_r_md_implementation

Retrieves the implementation key for the specified module.

Function Type

char *

For Elements

module	md

Syntax

stm_r_md_implementation (md_id, &status)

Arguments

Argument	Input/ Output	Type	Description
md_id	In	stm_id	The module ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_id_not_found
- stm_unresolved
- stm_not_instance

stm_r_md_purpose

Returns the purpose of the module.

Function Type

stm_module_purpose_type

For Elements

module	md

Syntax

stm_r_md_purpose (id, &status)

Arguments

Argument	Input/ Output	Type	Description
id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_not_found
- stm_id_out_of_range

stm_r_msg_all

Returns the textual information associated with a specified element.

The information is retrieved into a structured data type (record) that varies according to the type of element referenced.

Function Type

stm_msg_all_ptr

For Elements

Message

Syntax

stm_r_msg_all (msg_id, &status)

Arguments

Argument	Input/ Output	Type	Description
msg_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_unresolved
- stm_id_not_found

stm_r_msg_defined_in_scen

Returns the list of messages in chronological order that are part of a scene, defined by a separator.

Function Type

stm_list

For Elements

List of separators	sep_lst

Syntax

stm_r_msg_defined_in_scen (sep_list, &status)

Arguments

Argument	Input/ Output	Type	Description
sep_lst	In	stm_list	A list of element IDs
status	Out	int	The function status code

Status Codes

- stm_success
- stm_id_out_of_range

stm_r_msg_graphic

Returns the graphical information associated with the specified element.

Function Type

stm_msg_graphic_pt

For Elements

Message

Syntax

stm_r_msg_graphic (msg_id, &status)

Arguments

Argument	Input/ Output	Type	Description
msg_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_unresolved
- stm_id_not_found

stm_r_msg_included_in_ord_insig

Returns a list of messages that are included by an order-insignificant element.

Function Type

stm_list

For Elements

List of order insignificance	ord_insig_list

Syntax

stm_r_msg_included_in_ord_insig (ord_insig_list, &status)

Arguments

Argument	Input/ Output	Type	Description
ord_insig_list	In	stm_list	A list of elements
status	Out	int	The function status code

Status Codes

- stm_success
- stm_id_out_of_range
- stm_not_order_insignificant

stm_r_msg_where_tc_begins

Returns the message where the timing constraint begins.

Function Type

stm_id

For Elements

message	msg

Syntax

stm_r_msg_where_tc_begins (tc_id, &status)

Arguments

Argument	Input/ Output	Type	Description
tc_id	In	stm_id TIMING CONSTRAINT	The timing constraint.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_not_timing_constraint

stm_r_msg_where_tc_ends

Returns the message where the timing constraint ends.

Function Type

stm_id

For Elements

message	msg

Syntax

stm_r_msg_where_tc_ends (tc_id, &status)

Arguments

Argument	Input/ Output	Type	Description
tc_id	In	stm_id	The timing constraint.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_not_timing_constraint

stm_r_next_msg

Returns the message after (in time) the decomposed sequence diagram.

Function Type

stm_id

For Elements

decomposed SD	dec_sd

Syntax

stm_r_next_msg (dec_sd_id, &status)

Arguments

Argument	Input/ Output	Type	Description
dec_sd_id	In	stm_id REFERENCED_SD	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_not_decomposed_sd
- stm_message_not_found

stm_r_nt_body

Returns a list of strings. Each string contains the context of a note attached to the specified chart.

Function Type

char *

For Elements

chart	ch

Syntax

stm_r_nt_body (id, &status)

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID
status	Out	int	The function status code

Status Codes

- stm_success
- stm_id_not_found
- stm_id_out_of_range

stm_r_omd

Returns the ID of the module that corresponds to the module occurrence.

Function Type

stm_id

For Elements

module occurrence	om

Syntax

stm_r_omd (id, &status)

Arguments

Argument	Input/ Output	Type	Description
id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_id_not_found

Example

To determine the module occurrences for each module, use the following statements:

```
    stm_list          md_list, om_list;
    stm_id            om_id;
    int               status;
                      .
                      .
om_list = stm_r_om_of_md (md_list, &status);
for(om_id = (stm_id)
   stm_list_first_element (om_list, &status);
   status == stm_success;
   om_id = (stm_id)
   stm_list_next_element (om_list, &status))
printf ("module occurrence %d corresponds to
   module %s", om_id, stm_r_md_name (
   stm_r_omd (om_id, &status), &status));
```

stm_r_ord_insig_all

Returns the textual information associated with a specified element.

The information is retrieved into a structured data type (record) that varies according to the type of element referenced.

Function Type

stm_ord_insig_all_ptr

For Elements

Order Insignificant Line

Syntax

stm_r_ord_insig_all (ord_insig_id, &status)

Arguments

Argument	Input/ Output	Type	Description
ord_insig_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_unresolved
- stm_id_not_found

stm_r_ord_insig_graphic

Returns the graphical information associated with the specified element.

Function Type

stm_ord_insig_graphic_ptr

For Elements

Order Insignificant Line

Syntax

stm_r_ord_insig_graphic (ord_insig_id, &status)

Arguments

Argument	Input/ Output	Type	Description
ord_insig_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_unresolved
- stm_id_not_found

stm_r_parameter_binding

Returns the parameter expression info generic charts and components.

Function Type

stm_expression

For Elements

chart	ch

Syntax

stm_r_parameter_binding (xx_paramid_in_gen, inst_boxid,&status)

Arguments

Argument	Input/ Output	Type	Description
xx_paramid_in_gen	In	stm_id	The element ID.
inst_boxid	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_param_not_compatible
- stm_name_not_found
- stm_not_a_parameter

stm_r_previous_msg

Returns the message previous (in time) to the decomposed sequence diagram.

Function Type

stm_id

For Elements

decomposed SD	dec_sd

Syntax

stm_r_previous_msg (dec_sd_id, &status)

Arguments

Argument	Input/ Output	Type	Description
dec_sd_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_not_decomposed_sd
- stm_message_not_found

stm_r_sb_action_lang

Retrieves the action language of the specified subroutine.

Function Type

stm_list

For Elements

subroutine	sb

Syntax

stm_r_sb_action_lang (sb_id, &status)

Arguments

Argument	Input/ Output	Type	Description
sb_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_id_not_found
- stm_missing_statemate_action_lang
- stm_unresolved

stm_r_sb_action_ lang_expression

Retrieves the action language expression of the specified subroutine.

Function Type

stm_expression

For Elements

subroutine	sb

Syntax

stm_r_sb_action_lang_expression (sb_id, &status)

Arguments

Argument	Input/ Output	Type	Description
sb_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_missing_statemate_action_lang
- stm_unresolved

stm_r_sb_action_lang_local_data

Retrieves the action language local data associated with the specified subroutine.

Function Type

stm_list

For Elements

subroutine	sb

Syntax

stm_r_sb_action_lang_local_data (sb_id, &status)

Arguments

Argument	Input/ Output	Type	Description
sb_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_missing_local_data
- stm_id_not_found
- stm_id_out_of_range

stm_r_sb_ada_user_code

Returns the Ada code that was manually written for the specified subroutine.

Function Type

stm_list

For Elements

subroutine	sb

Syntax

stm_r_ada_user_code (sb_id, &status)

Arguments

Argument	Input/ Output	Type	Description
sb_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_missing_global_data
- stm_missing_local_data
- stm_missing_subroutine_params
- stm_missing_user_code
- stm_no_connected_chart

stm_r_sb_ansi_c_user_code

Returns the ANSI C code that was manually written for the specified subroutine.

Function Type

stm_list

For Elements

subroutine	sb

Syntax

stm_r_sb_ansi_c_user_code (sb_id, &status)

Arguments

Argument	Input/ Output	Type	Description
sb_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_missing_user_code

stm_r_sb_connected_chart

Returns the ID of the procedural statechart connected to the specified subroutine.

Function Type

stm_id

For Element

subroutine	sb

Syntax

stm_r_sb_connected_chart (sb_id, &status)

Arguments

Argument	Input/ Output	Type	Description
sb_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_not_found
- stm_id_out_of_range
- stm_no_connected_chart

stm_r_sb_connected_statechart

Returns the ID of the procedural statechart connected to the specified subroutine.

Function Type

stm_list

For Element

subroutine	sb

Syntax

stm_r_sb_connected_statechart(sb_id, &status);

Arguments

Argument	Input/ Output	Type	Description
sb_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_not_found
- stm_id_out_of_range
- stm_no_connected_chart

stm_r_sb_connected_flowchart

Returns the ID of the Flowchart connected to the specified subroutine.

Function Type

stm_list

For Element

subroutine	sb

Syntax

stm_r_sb_connected_flowhart (sb_id, &status)

Arguments

Argument	Input/ Output	Type	Description
sb_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_not_found
- stm_id_out_of_range
- stm_no_connected_chart

stm_r_sb_global_data

Function Type

stm_list

For Elements

subroutine	sb

Syntax

stm_r_sb_global_data (sb_id, &status)

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_missing_global_data
- stm_id_out_of_range
- stm_id_not_found

stm_r_sb_global_data_mode

Returns the mode of a subroutine's global variable.

Function Type

stm_parameter_mode

For Elements

subroutine	sb

Syntax

stm_r_sb_global_data_mode (fn_id, stm_id pd_id, int *status)

Arguments

Argument	Input/ Output	Type	Description
fn_id			The subroutine ID.
pd_id			The global variable ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_missing_global_data
- stm_id_out_of_range
- stm_id_not_found

stm_r_sb_kr_c_user_code

Returns the K&R C code that was manually written by the user for the specified subroutine.

Function Type

stm_list

For Elements

subroutine	sb

Syntax

stm_r_sb_kr_c_user_code (sb_id, &status)

Arguments

Argument	Input/ Output	Type	Description
sb_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_missing_user_code

stm_r_sb_parameters

Retrieves the parameters of the subroutine.

Function Type

stm_list

For Elements

subroutine	sb

Syntax

stm_r_sb_paramaters (sb_id, &status)

Arguments

Argument	Input/ Output	Type	Description
sb_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_not_a_parameter
- stm_missing_subroutine_params

stm_r_sb_proc_sch_local_data

Retrieves the local data of the procedural chart implemented by the specified subroutine.

Function Type

stm_list

For Elements

subroutine	sb

Syntax

stm_r_sb_proc_sch_local_data (sb_id, &status)

Arguments

Argument	Input/ Output	Type	Description
sb_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_missing_local_data
- stm_no_connected_chart

stm_r_sb_proc_fch_local_data

Retrieves the local data of the Flowchart implemented by the specified subroutine.

Function Type

stm_list

For Elements

subroutine	sb

Syntax

stm_r_sb_proc_fch_local_data (sb_id, &status)

Arguments

Argument	Input/ Output	Type	Description
sb_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_missing_local_data
- stm_no_connected_chart

stm_r_sb_return_type

Retrieves the subroutine's return type.

Function Type

stm_sb_return_type

For Elements

subroutine	sb

Syntax

stm_r_sb_return_type (sb_id, &status)

Arguments

Argument	Input/ Output	Type	Description
sb_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_id_not_found

stm_r_sb_return_user_type

Retrieves the user-defined type ID returned by the subroutine.

Function Type

stm_id

For Elements

subroutine	sb

Syntax

stm_r_sb_return_user_type (sb_id, &status)

Arguments

Argument	Input/ Output	Type	Description
sb_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_id_not_found
- stm_missing_user_type

stm_r_sb_return_u ser_type_name_type

Retrieves the subroutine's returuser type and name type.

Function Type

stm_name_type

For Elements

subroutine	sb

Syntax

stm_r_sb_return_user_type_name_type (sb_id, &status)

Arguments

Argument	Input/ Output	Type	Description
sb_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_id_not_found
- stm_missing_user_type

stm_r_sep_all

Returns the textual information associated with a specified element.

The information is retrieved into a structured data type (record) that varies according to the type of element referenced.

Function Type

stm_sep_all_ptr

For Elements

Partition Line

Syntax

stm_r_sep_all (sep_id, &status)

Arguments

Argument	Input/ Output	Type	Description
sep_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_unresolved
- stm_id_not_found

stm_r_sep_graphic

Returns the graphical information associated with the specified element.

Function Type

stm_sep_graphic_ptr

For Elements

Partition Line

Syntax

stm_r_sep_graphic (sep_id, &status)

Arguments

Argument	Input/ Output	Type	Description
sep_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_unresolved
- stm_id_not_found

stm_r_st_andlines

Returns a list of the and-lines associated with the specified state. The input argument id is an element ID of an and-state .

Function Type

stm_and_line_list

For Elements

and-state	

Syntax

stm_r_st_andlines (id, &status)

Arguments

Argument	Input/ Output	Type	Description
id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_not_found
- stm_id_out_of_range
- stm_not_an_and_state
- stm_unresolved

Note

Refer to Data Types for the exact structure of the returned value.

Example

To return a list of the and-lines for a specified state_id , use the following call:

```
stm_id              state_id;
int                 status;
stm_and_line_list   st_list;
   .
   .
if (stm_r_st_type (state_id, &status) == stm_st_and)
st_list = stm_r_st_andlines (state_id, &status);
```

stm_r_st_static_reactions

Returns the static reactions defined for the specified state element.

Function Type

stm_expression

For Elements

state	st

Syntax

stm_r_st_static_reactions (st_id, &status)

Arguments

Argument	Input/ Output	Type	Description
st_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_not_found
- stm_id_out_of_range
- stm_unresolved
- stm_missing_label

stm_r_st_static_reactions_hyper

Returns a string with the static reactions, including hyperlinks to referenced elements.

Function Type

STRING

For Elements

state	st

Syntax

stm_r_st_static_reactions_hyper (elem, format, &status)

Arguments

Argument	Input/ Output	Type	Description
elem	In	stm_id	The element ID.
format	In	STRING	Either FrameMaker or Word.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_id_not_found
- stm_unresolved

stm_r_stubs_name

Returns the list of stub names for an instance of a component.

Function Type

stm_list

For Elements

activity	ac

Syntax

stm_r_stubs_name (xx_id, &status)

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_error_in_file
- stm_id_out_of_range
- stm_illegal_parameter
- stm_id_not_found
- stm_file_not_found
- stm_missing_name
- stm_missing_field

stm_r_tc_all

Returns the textual information associated with a specified element.

The information is retrieved into a structured data type (record) that varies according to the type of element referenced.

Function Type

stm_tc_all_ptr

For Elements

Timing Constraint

Syntax

stm_r_tc_all (tc_id, &status)

Arguments

Argument	Input/ Output	Type	Description
tc_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_unresolved
- stm_id_not_found

stm_r_tc_graphic

Returns the graphical information associated with the specified element.

Function Type

stm_tc_graphic_ptr

For Elements

Timing Constraint

Syntax

stm_r_tc_graphic (tc_id, &status)

Arguments

Argument	Input/ Output	Type	Description
tc_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_unresolved
- stm_id_not_found

stm_r_tr_attr_enforced

Returns the enforced attributes specified by attr_name .

Function Type

stm_boolean

For Elements

Transition

Syntax

stm_r_tr_attr_enfoced(stm_id st_id, stm_attr_name st_attr_name, stm_name st_attr_val int *status)

Arguments

Argument	Input/ Output	Type	Description
status	Out	int	The function status code.

stm_r_tr_attr_name

Returns the names of attributes associated with the specified element. Attributes are associated with elements through element forms.

Function Type

stm_list

For Elements

Transition

Syntax

stm_r_tr_attr_name(stm_id st_id, int *status)

Arguments

Argument	Input/ Output	Type	Description
status	Out	int	The function status code.

stm_r_tr_attr_val

Returns the values associated with a particular attribute name for the specified element.

Function Type

stm_list

For Elements

Transition

Syntax

stm_r_tr_attr_val(stm_id st_id, stm_attr_name st_attr_name, int *status)

Arguments

Argument	Input/ Output	Type	Description
status	Out	int	The function status code.

stm_r_tr_longdes

Returns the long description of the specified Transition.

Function Type

char *

For Elements

Transition

Syntax

stm_r_tr_longdes(stm_id st_id, stm_filename st_file, int *status)

Arguments

Argument	Input/ Output	Type	Description
status	Out	int	The function status code.

stm_r_tr_notes

Returns a list of strings each one is a line in the Transition Note related to the specified Transition.

Function Type

stm_list

For Elements

Transition

Syntax

stm_r_tr_notes (tr_id, &status)

Arguments

Argument	Input/ Output	Type	Description
tr_id	In	stm_id	The Transition ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_missing_note

stm_r_tt_cell

Retrieves the contents of the specified cell in the given truth table.

Function Type

char *

For Elements

action	an
activity	ac
subroutine	sb

Syntax

stm_r_tt_cell (el, row_num, col_num, &status)

Arguments

Argument	Input/ Output	Type	Description
el	In	stm_id	The element ID
row_num	In	int	The row number of the cell
col_num	In	int	The column number of the cell
status	Out	int	The function status code

Status Codes

- stm_success
- stm_id_out_of_range
- stm_id_not_found
- stm_unresolved
- stm_missing_truth_table
- stm_truth_table_invalid_row
- stm_truth_table_invalid_column

stm_r_tt_cell_hyper

Retrieves the contents of the specified cell in the given truth table, including hyperlinks to referenced elements.

Function Type

char *

For Elements

action	an
activity	ac
subroutine	sb

Syntax

stm_r_tt_cell_hyper (el, row_num, col_num, format, &status);

Arguments

Argument	Input/ Output	Type	Description
el	In	stm_id	The element ID
row_num	In	int	The row number of the cell
col_num	In	int	The column number of the cell
format			
status	Out	int	The function status code

Status Codes

- stm_success
- stm_id_out_of_range
- stm_id_not_found
- stm_unresolved
- stm_missing_truth_table
- stm_truth_table_invalid_row
- stm_truth_table_invalid_column

stm_r_tt_cell_type

Retrieves the data-type of the specified cell in the given truth table.

Function Type

char

For Elements

action	an
activity	ac
subroutine	sb

Syntax

stm_r_tt_cell_type (el, row_num, col_num, &status)

Arguments

Argument	Input/ Output	Type	Description
el	In	stm_id	The element ID
row_num	In	int	The row number of the cell
col_num	In	int	The column number of the cell
status	Out	int	The function status code

Status Codes

- stm_success
- stm_id_out_of_range
- stm_id_not_found
- stm_unresolved
- stm_missing_truth_table
- stm_truth_table_invalid_row
- stm_truth_table_invalid_column

Return Values

Although the return value of this function is of type int, Dataport allows you to reference this value by name. The name is internally defined as a predefined constant. The possible values are:

- stm_tt_cell_type_missing
- stm_tt_cell_rpn_same_as_down
- stm_tt_cell_rpn
- stm_tt_cell_dont_care
- stm_tt_is_generate_ev
- stm_tt_is_not_generate_ev
- stm_tt_cell_empty_same_as_up
- stm_tt_cell_empty_same_as_up_and_down
- stm_tt_is_empty_cell

stm_r_tt_num_of_col

Retrieves the number of columns (including blank ones) in the specified truth table, as viewed in the truth table editor.

Function Type

int

For Elements

truth table	tt	

Syntax

function stm_r_tt_num_of_col (el, &status)

Arguments

Argument	Input/ Output	Type	Description
el	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_missing_truth_table
- stm_success

stm_r_tt_num_of_in

Retrieves the number of input columns in the specified truth table.

Function Type

int

For Elements

truth table	tt	

Syntax

stm_r_tt_num_of_in (el_id, &status)

Arguments

Argument	Input/ Output	Type	Description
el_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_missing_truth_table
- stm_success

stm_r_tt_num_of_out

Retrieves the number of output columns in the specified truth table.

Function Type

int

For Elements

truth table	tt	

Syntax

stm_r_tt_num_of_out (el_id, &status)

Arguments

Argument	Input/ Output	Type	Description
el_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_missing_truth_table
- stm_success

stm_r_tt_num_of_row

Retrieves the number of rows (including blanks) in the specified truth table, as viewed in the truth table editor.

Function Type

int

For Elements

truth table	tt	

Syntax

stm_r_tt_num_of_row (el_id, &status)

Arguments

Argument	Input/ Output	Type	Description
el_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_missing_truth_table
- stm_success

stm_r_tt_row

Returns a list of strings that represents a row in the truth table. Each string in the list includes the text in the truth table cell. The row's index range is [0..num_of_rows-1]. Row 0 returns the list of table header strings.

Function Type

stm_list

For Elements

truth table	tt	

Syntax

stm_r_tt_row (el, row_num, &status)

Arguments

Argument	Input/ Output	Type	Description
el	In	stm_id	The element ID.
row_num	In	int	The row number to retrieve.
status	Out	int	The function status code.

Status Codes

- stm_truth_table_invalid_row
- stm_missing_truth_table
- stm_success

stm_r_tt_row_hyper

Returns a list of strings that represents a row in the truth table, including hyperlinks to referenced elements. Each string in the list includes the text in the truth table cell. The row's index range is [0..num_of_rows-1] . Row 0 returns the list of table header strings.

Function Type

stm_list

For Elements

truth table	tt	

Syntax

stm_r_tt_row (el, row_num, format &status)

Arguments

Argument	Input/ Output	Type	Description
el	In	stm_id	The element ID.
row_num	In	int	The row number to retrieve.
format			
status	Out	int	The function status code.

Status Codes

- stm_truth_table_invalid_row
- stm_missing_truth_table
- stm_success

stm_r_xx

Retrieves the element ID of the specified element. This ID is an internal representation that Rational Statemate uses to identify each element in the database. Because Rational Statemate requires the ID to locate elements, this function is usually often the first one called when using dataport functions.

Function Type

stm_id

For Elements

action	an
activity	ac
actor	actor
boundary box	bb
chart	ch
condition	co
data-item	di
data-store	ds
enumerated value	en
event	ev
field	fd
function	fn
information-flow	if
lifeline	ll
local data	ld
module	md
off-page activity chart	oac
off-page module	omd
router	router
state	st
subroutine	sb
subroutine parameter	sp
use case	uc
user_defined_type	dt

Syntax

stm_r_xx (name, &status)

Arguments

Argument	Input/ Output	Type	Description
name	In	stm_element_name or stm_pathname	A Rational Statemate element name or synonym. Note the following: • This can be an element name (path name) or synonym. Hierarchical elements must be identified uniquely by specifying a unique path name. • The name can include the chart name (for example, A:B). • The name is not case-sensitive.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_illegal_address
- stm_illegal_name
- stm_name_not_found
- stm_name_not_unique

Example

Identify the ID of an event, EV1. Once the ID has been determined, you can use it to retrieve information about EV1 from the database, as follows:

```
stm_id          ev_id;
int             status;
stm_short_name  synonym;
    .
    .
ev_id = stm_r_ev ("EV1", &status);
IF (status == stm_success)
    synonym = stm_r_ev_synonym (ev_id, &status);
    .
    .
    .
```

The ID for EV1 is assigned to the variable ev_id .

Note: ev_id is declared to be of type stm_id .

stm_r_xx_all

Description

Returns both the textual and graphical information associated with a specified element.

Note

- You can call this function without indicating its specific element type, as follows:

  stm_r_all (id, &status)

- The information is retrieved into a structured data type (record) that varies according to the type of element referenced.

Function Type

stm_xx_all_ptr

For Elements

activity	ac		
a-flow-line (basic)	ba		
combinational assignment		ca	
connector	cn		
data-store	ds		
m-flow-line (basic)	bm		
module		md	
module-occurrence	om		
note		nt	
off-page activity	oa		
state	st		
transition (basic)	bt		

Syntax

stm_r_xx_all (xx_id, &status)

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_unresolved
- stm_id_not_found

Note

When stm_unresolved is returned, a record is received with the fields name, unique name, type, and chart. The remainder of the text fields are empty. The remainder of the graphical fields contain -1.

Example

To retrieve several fields (graphical and text) attached to a specific state whose ID is st_id, use the first statement to retrieve all the information regarding the specific state (st_id), then extract the particular fields from the record.

```
stm_id              st_id;
int                 status;
stm_st_all_ptr      st_record;
stm_element_name    name;
stm_short_name      synonym;
stm_color           color;
   .
   .
st_record = stm_r_st_all (st_id, &status);
name = st_record->st_name;
synonym = st_record->st_synonym;
color = st_record->st_color;
```

stm_r_xx_array_lindex

Returns the right index of an element array.

You can call this function without indicating the specific element type, as follows:

stm_r_array_rindex (id, &status)

Function Type

stm_const_expression

For Elements

condition	co
data-item	di
event	ev
field	fd
local data	ld
subroutine parameter	sp
user-defined type	dt

Syntax

stm_r_xx_array_rindex (xx_id, &status)

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_not_found
- stm_id_out_of_range

stm_r_xx_array_rindex

Returns the right index of an element array.

You can call this function without indicating the specific element type, as follows:

```
stm_r_array_rindex (id, &status)
```

Function Type

stm_const_expression

For Elements

condition	co
data-item	di
event	ev
field	fd
local data	ld
subroutine parameter	sp
user-defined type	dt

Syntax

```
stm_r_xx_array_rindex (xx_id, &status)
```

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_not_found
- stm_id_out_of_range

stm_r_xx_attr_enforced

Returns the enforced attributes specified by attr_name .

You can call this function without indicating the specific type, as follows:

stm_r_attr_enforced (id, attr_name, attr_val, status)

Function Type

stm_boolean

For Elements

action	an
activity	ac
actor	actor
boundary box	bb
chart	ch
condition	co
data-item	di
data-store	ds
event	ev
field	fd
information-flow	if
lifeline	ll
module	md
router	router
state	st
subroutine	sb
transition	tr
use case	uc
user-defined type	dt

Syntax

stm_r_xx_attr_enforced (xx_id, attr_name, attr_val,&status)

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
attr_name	In	string	The attribute name.
attr_val	In	string	The attribute value.
status	Out	int	The function status code. If no attributes exist for the specified element, status receives the value stm_attribute_name_not_found .

Status Codes

- stm_success
- stm_attribute_name_not_found
- stm_id_not_found
- stm_id_out_of_range
- stm_illegal_name
- stm_unresolved

stm_r_xx_attr_name

Returns the names of attributes associated with the specified element. Attributes are associated with elements via element forms.

You can call this function without indicating the specific element type, as follows:

```
stm_r_attr_name (id, &status)
```

Function Type

stm_list

For Elements

action	an
activity	ac
actor	actor
boundary box	bb
chart	ch
condition	co
data-item	di
data-store	ds
event	ev
field	fd
information-flow	if
lifeline	ll
module	md
router	router
state	st
subroutine	sb
transition	tr
use case	uc
user-defined type	dt

Syntax

```
stm_r_xx_attr_name (xx_id, &status)
```

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
status	Out	int	The function status code. If no attributes exist for the specified element, status receives the value stm_attribute_name_not_found .

Status Codes

- stm_success
- stm_attribute_name_not_found
- stm_id_not_found
- stm_id_out_of_range
- stm_unresolved

Example

To perform operations on the attributes of the state WAIT, retrieve a list of its attribute names using the following statements:

```
stm_id          st_id;
    stm_attr_name   attrib;
    stm_list        attr_list;
    int             status;
       .
       .
    st_id = stm_r_st ("WAIT", &status);
    attr_list = stm_r_st_attr_name (st_id, &status);
    for (attrib = (stm_attr_name)
         stm_list_first_element (attr_list, &status);
         status == stm_success;
      attrib = (stm_attr_name)
        stm_list_next_element (attr_list, &status))
       .
       .
       .
attr_list contains a list of attribute names for WAIT. In the for loop,
perform the operations on each item in the list of attributes (such as
retrieving and printing the corresponding values).
```

stm_r_xx_attr_val

Retrieves attribute values associated with a particular attribute name for the specified element. You can call this function without indicating the specific element type, as follows:

```
stm_r_attr_val (id, attr_name, &status)
```

Function Type

stm_list

For Elements

action	an
activity	ac
actor	actor
boundary box	bb
chart	ch
condition	co
data-item	di
data-store	ds
event	ev
field	fd
information-flow	if
lifeline	ll
module	md
router	router
state	st
subroutine	sb
transition	tr
use case	uc
user-defined type	dt

Syntax

```
stm_r_xx_attr_val (xx_id, attr_name, &status)
```

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
attr_name	In	stm_attr_name	The attribute name. The attribute name is not case-sensitive.
status	Out	int	The function status code. If attr_name does not exist for the specified element, status receives the value stm_attribute_name_not_found.

- Attribute values may exist for attributes with no name. If you supply contiguous apostrophes ('') for attr_name, you retrieve all values for unnamed attributes.
- In most cases, attributes have only one value; however, there are some cases where more than one attribute value is simultaneously meaningful. For example, a module has an attribute implementation. The attributes software and hardware might both be meaningful for some modules. Therefore, Rational Statemate provides the capability of assigning multiple values to attributes, and the function returns a list of these values. When there is a single value, this list consists of one component.

Status Codes

- stm_success
- stm_attribute_name_not_found
- stm_id_not_found
- stm_id_out_of_range
- stm_illegal_name
- stm_unresolved

Example

To extract the attribute values of the attribute refer for the state WAIT and perform several operations on each of these values, use the following statements:

```
stm_id          st_id;
stm_attr_val    attrib;
stm_list        attr_list;
int             status;
   .
   .
st_id = stm_r_st("WAIT", &status);
attr_list = stm_r_st_attr_val (st_id, "refer", &status);
for (attrib = (stm_attr_val)
    stm_list_first_element (attr_list, &status);
    status == stm_success;
    attrib = (stm_attr_val)
    stm_list_next_element (attr_list, &status))
```

stm_r_xx_bit_array_lindex

Returns the left index of a bit array.

You can call this function without indicating the specific element type, as follows:

```
stm_r_bit_array_lindex (id, &status)
```

Function Type

char *

For Elements

data-item	di
field	fd
local data	ld
subroutine parameter	sp
user-defined type	dt

Syntax

```
stm_r_xx_bit_array_lindex (xx_id, &status)
```

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_not_found
- stm_id_out_of_range

stm_r_xx_bit_array_rindex

Returns the right index of a bit array.

You can call this function without indicating the specific element type, as follows:

```
stm_r_bit_array_rindex (id, &status)
```

Function Type

char *

For Elements

data-item	di
field	fd
local data	ld
subroutine parameter	sp
user-defined type	dt

Syntax

```
stm_r_xx_bit_array_rindex (xx_id, &status)
```

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID
status	Out	int	The function status code

Status Codes

- stm_success
- stm_id_not_found
- stm_id_out_of_range

stm_r_xx_cbk_binding

Retrieves the callback binding for specified elements.

You can call this function without indicating the specific element type, as follows:

```
stm_r_cbk_binding (id, &status)
```

Function Type

stm_list

For Elements

activity	ac
condition	co
data-item	di
event	ev
state	st

Syntax

```
stm_r_xx_cbk_binding (xx_id, &status)
```

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_not_found
- stm_id_out_of_range
- stm_missing_cbk_binding
- stm_unresolved

stm_r_xx_cbk_binding_enable

Retrieves the enabled callback bindings.

You can call this function without indicating the specific element type, as follows:

```
stm_r_cbk_binding_enable (id, &status)
```

Function Type

char

For Elements

activity	ac
condition	co
data-item	di
event	ev
state	st

Syntax

```
stm_r_xx_cbk_binding_enable (id, &status)
```

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_not_found
- stm_id_out_of_range
- stm_missing_cbk_binding

Return Values

Although the return value of this function is of type int, dataport enables you to reference this value by name. The following table lists the possible values allowed by each Rational Statemate element subtype.

Element	Element Subtype
activity	stm_ac_cbk_enable
	stm_ac_cbk_disable
	stm_ac_cbk_bind_missing
condition	stm_co_cbk_enable
	stm_co_cbk_disable
	stm_ac_cbk_bind_missing
data-item	stm_di_cbk_enable
	stm_di_cbk_disable
	stm_di_cbk_bind_missing
event	stm_ev_cbk_enable
	stm_ev_cbk_disable
	stm_ev_cbk_bind_missing
state	stm_st_cbk_enable
	stm_st_cbk_disable
	stm_st_cbk_bind_missing

stm_r_xx_cbk_bin ding_expression

Retrieves the callback binding expressions.

You can call this function without indicating the specific element type, as follows:

stm_r_cbk_binding_expression (id, &status)

Function Type

stm_expression

For Elements

activity	ac
condition	co
data-item	di
event	ev
state	st

Syntax

stm_r_xx_cbk_binding_expression (id, &status)

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_not_found
- stm_id_out_of_range
- stm_missing_cbk_binding
- stm_unresolved

stm_r_xx_cbk_binding _expression_hyper

Retrieves the callback binding expression with hyperlinks to referenced elements.

You can call this function without indicating the specific element type, as follows:

stm_r_cbk_binding_expression_hyper (id, &status)

Function Type

stm_expression

For Elements

activity	ac
condition	co
data-item	di
event	ev
state	st

Syntax

stm_r_xx_cbk_binding_expression_hyper (id, char* formator int*status)

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
format	In	string	Either FrameMaker or Word.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_not_found
- stm_id_out_of_range
- stm_missing_cbk_binding
- stm_unresolved

stm_r_xx_chart

Returns the chart ID for the specified element.

- You can call this function without indicating the specific element type, as follows:

  ```
  stm_r_chart (id, &status)
  ```

- For compound arrows, this function retrieves the chart only when all the arrow segments are in the same element. Otherwise, it returns the value 0.

Function Type

stm_id

Syntax

```
stm_r_xx_chart (xx_id, &status)
```

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID
status	Out	int	The function status code

Status Codes

- stm_success
- stm_id_out_of_range
- stm_id_not_found

Example

To return the name of the chart in which state is found, use the following statements:

```
stm_id      state_id, chart_id;
   int      status;
                .
                .
                .
state_id = stm_r_st ("S1", &status);
chart_id = stm_r_st_chart (state_id, &status);
printf ("chart name is: %s", stm_r_ch_name (chart_id,
  &status));
                .
                .
```

For Elements

a-flow-line (basic)	ba	
a-flow-line (compound)	af	
action		an
activity		ac
actor		actor
boundary box		bb
condition		co
connector		cn
data-item		di
data-store		ds
event		ev
field		fd
function		fn
information-flow	if	
lifeline	ll	
local data	ld	
m-flow-line (basic)	bm	
m-flow-line (compound)	mf	
module		md
module-occurrence		om
note		nt
router		router
state		st
subroutine		sb
subroutine parameter	sp	
transition (basic)	bt	
transition (compound)	tr	

stm_r_xx_combinationals

Returns a list of strings. Each element of the list holds one combination assignment, which is connected to the specified element.

You can call this function without indicating the specific element type:

```
stm_r_combinationals (id, &status)
```

Function Type

stm_list

For Elements

activity	ac
chart	ch

Syntax

```
stm_r_xx_combinationals (xx_id, &status)
```

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_error_in_file
- stm_missing_field
- stm_missing_label
- stm_missing_name
- stm_file_not_found
- stm_id_not_found
- stm_id_out_of_range
- stm_illegal_parameter

stm_r_xx_containing_fields

Returns the list of union or record elements that contain fields.

You can call this function without indicating the specific element type:

```
stm_r_containing_fields (id, &status)
```

Function Type

stm_list

For Elements

data-item	di
user-defined type	dt

Syntax

```
stm_r_xx_containing_fields (xx_id, &status)
```

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID
status	Out	int	The function status code

Status Codes

- stm_success
- stm_id_not_found
- stm_id_out_of_range
- stm_missing_field
- stm_unresolved

stm_r_xx_data_type

Returns the element subtype, including its data type and data structure. For example:

stm_xx_union_array, stm_xx_integer, stm_xx_real_queue

You can call this function without indicating the specific element type:

stm_r_data_type (id, &status)

Function Type

char

For Elements

data-item	di
field	fd
local data	ld
subroutine parameter	sp
user-defined type	dt

Syntax

stm_r_xx_data_type (xx_id, &status)

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID
status	Out	int	The function status code

Status Codes

- stm_success
- stm_error_in_file
- stm_file_not_found
- stm_illegal_parameter
- stm_missing_field

stm_r_xx_default_val()

Returns the default value associated with the specified element. You can call this function without indicating the specific element type: stm_r_ default _val (id, &status) .

Function Type

char*

For Elements

di	data item
dt	user-defined type
fd	field
co	condition

Syntax

stm_r_xx_ default _val(xx_id, &status)

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
status	Out	int	The function code status.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_id_not_found

stm_r_xx_definition_type

Returns the definition type of the specified textual element.

Note

- You can call this function without indicating the specific element type:

  stm_r_definition_type (id, &status)

- The enumerated type that reflects whether the textual element has a form. The nature of the definition field in the form is stm_definition_type, whose values are:
  - stm_reference —The element has no form.
  - stm_primitive —The definition field is empty.
  - stm_compound —The definition field contains a compound expression.
  - stm_constant —The definition field contains a constant.
  - stm_alias —The definition field contains an identifier, a bit array, a component, or a slice (relevant for only).
  - stm_explicit —The info_flow has a form.
  - stm_predefined —Predefined function.

Function Type

stm_definition_type

For Elements

action	an
condition	co
data-item	di
enumerated value	en
event	ev
function	fn
information-flow	if
local data	ld
subroutine	sb
subroutine parameter	sp

Note: These types are not explicitly specified, but derived from the specification.

Syntax

stm_r_xx_definition_type (xx_id, &status)

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_not_found

Return Values

Although the return value of this function is of type int, Dataport allows you to reference this value by name. The name is normally defined as a predefined constant. The following table lists the possible values allowed for each Rational Statemate element subtype.

Element	Abbreviation	Element Sub-Type
action	an	stm_an_reference
		stm_an_primitive
		stm_an_compound
condition	co	stm_co_reference
		stm_co_primitive
		stm_co_compound
		stm_co_constant
data-item	di	stm_di_reference
		stm_di_primitive
		stm_di_compound
		stm_di_constant
		stm_di_alias
event	ev	stm_ev_reference
		stm_ev_primitive
		stm_ev_compound
field	fd	stm_fd_primitive

information-flow	if	stm_if_reference
		stm_if_explicit
local data	ld	stm_sp_defined
subroutine	sb	stm_sb_reference
		stm_sb_predefined
		stm_sb_function
		stm_sb_procedure
		stm_sb_task
subroutine parameter	sp	stm_sp_defined
user-defined type	dt	stm_dt_reference
		stm_dt_primitive

stm_r_xx_des_attr_name

Returns the names of Design-Attributes associated with the specified element.

Function Type

stm_list

For Elements

activity	ac
chart	ch
condition	co
data-item	di
data-type	dt
field	fd
subroutine	sb
data-store	ds
block	bl
event	ev
information-flow	if
actions	an
module	md
state	st
transition	tr
subroutine parameter	sp
local data	ld

Syntax

stm_r_xx_des_attr_name (xx_id, &status)

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The Element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_id_not_found
- stm_auto_defined
- stm_attribute_name_not_found

stm_r_xx_des_attr_val

Retrieves the values of a given Design-Attribute values associated with the specified element.

Function Type

stm_list

For Elements

activity	ac		
chart		ch	
condition	co		
data-item	di		
data-type	dt		
field	fd		
subroutine	sb		
data-store	ds		
block		bl	
event		ev	
information-flow	if		
actions		an	
module		md	
state		st	
transition	tr		
subroutine parameter		sp	
local data	ld		

Syntax

stm_r_xx_des_attr_val (xx_id st_id, xx_attr_name &status)

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The Element ID.
xx_attr_name	In	stm_attr_name	The Design Attribute Name.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_id_not_found
- stm_auto_defined
- stm_attribute_name_not_found

stm_r_xx_description

Returns the short description of the specified element. The short description is defined in the element's form.

You can call this function without indicating the specific element type:

```
stm_r_description (id, &status)
```

Function Type

stm_description

For Elements

action	an
activity	ac
actor	actor
boundary box	bb
chart	ch
condition	co
data-item	di
data-store	ds
event	ev
field	fd
information-flow	if
lifeline	ll
local data	ld
module	md
router	router
state	st
subroutine	sb
subroutine parameter	sp
user-defined type	dt

Syntax

```
stm_r_xx_description (xx_id, &status)
```

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
status	Out	int	The function status code. If no description exists in the element's form, status receives the value stm_missing_short_description .

Status Codes

- stm_success
- stm_unresolved
- stm_id_out_of_range
- stm_id_not_found
- stm_missing_short_description

Example

To retrieve the contents of the short description field in the form of state SSS.S1, use the following statements.

```
stm_id          state_id;
stm_description  state_desc;
int             status;
   .
   .
state_id = stm_r_st ("SSS.S1", &status);
state_desc = stm_r_st_description (state_id, &status);
   .
   .
   .
```

state_desc contains the short description for the state SSS.S1 (whose ID is state_id).

stm_r_xx_displayed_name

Returns the name of a chart, as it appears in the graphic editor where the specified element is located.

You can call this function without indicating the specific element type, as follows:

```
stm_r_displayed_name (id, &status)
```

Function Type

stm_id

For Elements

activity	ac
data-store	ds
module	md
module-occurrence	om
off-page activity	oa
router	router
state	st

Syntax

```
stm_r_xx_displayed_name (xx_id, &status)
```

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID
status	Out	int	The function status code

Status Codes

- stm_success
- stm_id_not_found
- stm_id_out_of_range

stm_r_xx_explicit_defined_xx

Provides a status list.

Function type:

For Elements

actor	ac
boundary box	bb
use case	uc

Syntax:

stm_list stm_r_xx_explicit_defined_xx(stm_list xx_list, int* status)

Arguments

Arguement	Input/ Ouput	Type	Description
xx_list	Input	stm_list	List of elements of type xx.
status	Output	int	Function of the status code.

Status Codes:

- stm_success
- stm_nil_list

stm_r_xx_expr_hyper

Returns the definition expression of the specified element found in the Definition field of the element's form, including hyperlinks to referenced elements.

Function Type

stm_expression

For Elements

a-flow-lines (basic)	ba
action	an
condition	co
data-item	di
event	ev
m-flow-line (basic)	bm
subroutine action language	sb_action_lang
transitions (basic)	bt
user-defined type	dt

Syntax

stm_r_xx_expr_hyper (elem, format, &status)

Arguments

Argument	Input/ Output	Type	Description
elem	In	st_id	The element ID.
format	In	char*	Either FrameMaker or Word.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_id_not_found
- stm_unresolved
- stm_primitive_element

stm_r_xx_expression

Returns the definition expression of the specified element found in the Definition field of the element's form. For arrows, this function returns the label attached to the arrow. The function is performed for basic arrows (arrow segments that connect boxes and connectors).

- You can call this function without indicating the specific element type:

  stm_r_expression (id, &status)

- This function is valid for compound textual elements, which are defined as an expression using the Definition field of its form.

Function Type

stm_expression

For Elements

a-flow-line (basic)	ba
action	an
condition	co
data-item	di
event	ev
field	fd
m-flow-line (basic)	bm
transition (basic)	bt
user-defined type	dt

Syntax

stm_r_xx_expression (xx_id, &status)

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
status	Out	int	The function status code. If xx_id belongs to a primitive (not a compound) element, status receives the value stm_primitive_element.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_id_not_found
- stm_unresolved
- stm_primitive_element

Example

To retrieve the definition of C1 from the database for a system that contains a condition C1 (where C1 is defined as C2 or C3 in the form of C1) , use the following function calls:

```
stm_id          cond_id;
stm_expression  cond_def;
int             status;
  .
  .
cond_id = stm_r_co ("C1", &status);
cond_def = stm_r_co_expression (cond_id, &status);
  .
  .
  .
```

cond_def is assigned as the string value "C2 or C3" .

stm_r_xx_ext_link

Returns the file name associated with the "Link to External File" entry in the element's properties of the specified element.

Note

You can call this function without indicating its specific element type, as follows:

```
stm_r_ext_link (id, &status)
```

Function Type

char*

For Elements

action	an
activity	ac
actor	actor
block	bl
boundary box	bb
chart	ch
condition	co
data-item	di
data-store	ds
event	ev
field	fd
information-flow	if
lifeline	ll
router	router
subroutine	sb
use case	uc
user-defined type	dt

Syntax

```
stm_r_sb_ext_link(xx_id,&status)
```

Arguments

Argument	Input/ Output	Type	Description
xx_is	In	stm_id	The element ID.
Status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_name_not_found
- stm_id_not_found
- stm_auto_defined
- stm_missing_external_link

stm_r_xx_graphic

Returns the graphical information associated with the specified element.

Note

- You can call this function without indicating the specific element type, as follows:

  stm_r_graphic(id,&status)

- The information is retrieved into a structured data type (record), which varies according to the type of element referenced.
- Each environment module can have several occurrences with the same name in a chart. Call the query function stm_r_om_of_md to get the graphical information of its occurrences, then use the function stm_r_om_graphic for each occurrence.

Function Type

stm_xx_graphic_ptr

For Elements

activity	ac
basic a-flow-line	ba
basic m-flow-line	bm
basic transition	bt
combinational assignment	ca
connector	cn
data-store	ds
module	md
module-occurence	om
note	nt
off-page activity	oa
state	st

Syntax

stm_r_xx_graphic (xx_id, &status)

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_unresolved
- stm_id_not_found
- stm_missing_graphic_data

Note

When stm_unresolved is returned, no record is received.

Example

To retrieve graphical information attached to a specific state whose ID is st_id, use the first statement regarding the specific state id ( ), then extract the particular fields from the record.

```
stm_id               st_id;
  int                status;
  stm_st_graphic_ptr   st_record;
  stm_color            color;
    .
    .
st_record = stm_r_st_graphic (st_id, &status);
    .
color = st_record->st_color;
    .
    .
```

Refer to Sample Program for a more detailed example of how the fields of the graphical record are used.

stm_r_xx_instance_name

Returns the name of the instance as it appears in the chart for a specific hierarchical Rational Statemate element.

- You can call this function without indicating the specific element type:

  stm_r_instance_name (id, &status)

- This function is relevant only for states, internal modules, and regular or control activities, because only these elements can have instances.

Function Type

stm_instance_name

For Elements

activity	ac
module	md
state	st

Syntax

stm_r_xx_instance_name (xx_id, &status)

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_id_not_found
- stm_unresolved
- stm_not_instance

Example

To return the name of an instance for state named S1@S1_def, use the following statements:

```
stm_id       state_id;
int          status;
             .
             .
             .
state_id = stm_r_st ("S1", &status);
printf ("\n Instance  Name: %s",
   stm_r_st_instance_name (state_id, &status));
             .
             .
             .
```

The name is written to the output is S1@S1_def.

stm_r_xx_keyword

Retrieves a portion of the element's long description. An element's long description is attached to its form.

You can call this function without indicating the specific element type:

```
stm_r_keyword (id, begin_keyword, end_keyword, filename, &status)
```

Function Type

char *

For Elements

action	an
activity	ac
actor	actor
boundary box	bb
chart	ch
condition	co
data-item	di
data-store	ds
event	ev
field	fd
information-flow	if
lifeline	ll
module	md
router	router
state	st
subroutine	sb
use case	uc
user-defined type	dt

Syntax

```
stm_r_xx_keyword (xx_id, begin_keyword, end_keyword,filename, &status)
```

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID
begin_keyword	In	char *	The beginning of the portion of the string in the long description to extract
end_keyword	In	char *	The end of the portion of the string in the long description to extract
filename	In	stm_filename	The name of the file to contain the long description
status	Out	int	The function status code

Note

- The arguments begin_keyword and end_keyword are strings of text appearing in the element's long description. The portion extracted from the database begins with the line following begin_keyword and extends to the line preceding end_keyword.
- If the value of begin_keyword does not appear in the long description, the function creates an empty file; status then receives the value stm_starting_keyword_not_found.
- If the value of end_keyword does not appear in the long description, the entire long description (from the line following the value of begin_keyword) is retrieved; status receives the value stm_ending_keyword_not_found.
- The values of begin_keyword and end_keyword must appear at the beginning of a line in the long description.
- filename follows the conventions of the operating system. It returns the value of the argument filename (when one is specified). If an empty string (two contiguous quotation marks) is specified for filename, Rational Statemate creates a temporary file where it stores the text. The name of this temporary file is returned by this function.
- If no long description exists for the element, status receives the value stm_missing_long_description.

Status Codes

- stm_success
- stm_unresolved
- stm_id_out_of_range
- stm_id_not_found
- stm_can_not_open_file
- stm_name_not_found
- stm_missing_long_description
- stm_starting_keyword_not_found
- stm_ending_keyword_not_found

Example

The long description for the state WAIT contains the following section:

```
!BHV_DESCR
When the assembly process reaches the critical stage where all parts
must be carefully selected, mounted and assembled, we wait for the
interrupt signal to tell us that all the required parts are in place
before continuing. This state acts as a synchronization point in the
assembly process.
!END_DESCR
```

To extract the portion of the long description beginning with "When the ... " and ending with "... assembly process " using the following function call:

```
stm_id        state_id;
stm_filename  descr_file;
int           status;
   .
   .
   .
state_id = stm_r_st ("WAIT", &status);
descr_file = stm_r_st_keyword (state_id, "!BHV_DESCR",
  "!END_DESCR", "", &status);
   .
   .
   .
```

The portion of the long description is written to a file. The name of the file is returned in descr_file .

stm_r_xx_labels

Returns a list of strings that consists of all the labels of the specified compound transition or message. The labels appear on the transition segments that comprise the specified compound transition, or on the message. The syntax of these labels is trigger/action.

Note

To divide the labels into their trigger and action parts, use the utility routines stm_trigger_of_reaction and stm_action_of_reaction.

Function Type

stm_list

For Elements

message	msg
transition	tr

Syntax

stm_r_xx_labels (tr_id, &status)

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_unresolved
- stm_id_out_of_range
- stm_id_not_found
- stm_missing_label

Example

To extract all labels of messages exiting from state L1, use the following statements:

```
stm_id          lifeline_id;
int             status;
stm_list        labels, ll_lst;
stm_list        messages;
stm_id          msg;
stm_expression  lab;
                .
                .
lifeline_id = stm_r_ll ("L1", &status);

ll_lst = stm_list_create (lifeline_id, end_of_list,
  &status);

messages = stm_r_msg_from_source_ll (ll_lst, &status);

for (msg = (stm_id) stm_list_first_element (messages,
    &status);
    status == stm_success;
    msg = (stm_id) stm_list_next_element (messages,
       &status))
    {
        labels = stm_r_msg_labels (msg, &status);
         if (status == stm_success)

        {
            for (lab = (char*) stm_list_first_element
                (labels, &status);
            status == stm_success;
            lab = (char*) stm_list_next_element
                (labels, &status))
            .
            .
        }
     }
```

stm_r_xx_labels_hyper

Returns a list of strings of message or transition labels, with hyperlinks to referenced elements.

Function Type

stm_list

For Elements

message		msg
transition	tr	

Syntax

stm_r_xx_labels_hyper (message, format, &status)

Arguments

Argument	Input/ Output	Type	Description
elem_id	In	stm_id	The element ID.
format	In	string	Either FramrMaker or Word.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_id_not_found
- stm_unresolved

stm_r_xx_longdes

Retrieves the long description attached to the specified element.

You can call this function without indicating the specific element type:

```
stm_r_longdes (id, filename, &status)
```

Function Type

char *

For Elements

action	an
activity	ac
actor	actor
boundary box	bb
chart	ch
condition	co
data-item	di
data-store	ds
event	ev
field	fd
information-flow	if
lifeline	ll
module	md
requirement	rt
router	router
state	st
subroutine	sb
transition	tr
use case	uc
user-defined type	dt

Syntax

```
stm_r_xx_longdes (xx_id, filename, &status)
```

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
filename	In	stm_filename	The name of the file that contains the long description.
status	Out	int	The function status code.

- The filename follows the conventions of the host operating system.
- This function returns the value of the argument filename when one is specified. If an empty string ('') is specified, Rational Statemate creates a temporary file where it stores the text. The name of this temporary file is returned by the function.
- If no long description exists for the element, status receives the value stm_missing_long_description.

Status Codes

- stm_unresolved
- stm_success
- stm_id_out_of_range
- stm_id_not_found
- stm_can_not_open_file
- stm_missing_long_description

Example

To retrieve the long description for the activity A1, use the following statements:

```
stm_id          act_id;
stm_filename    long_des_file;
int             status;
    .
    .
act_id = stm_r_ac ("A1", &status);
long_des_file =  stm_r_ac_longdes (act_id, "text.txt",
    &status);
     .
     .
     .
```

The long description for the activity A1 is written to the system file text.txt. This file resides in the directory that is the current workarea. The variable long_des_file contains the string 'text.txt' following statement execution.

stm_r_xx_max_val

Returns the maximum value of the specified element.

You can call this function without indicating the specific element type:

```
stm_r_max_val (id, &status)
```

Function Type

char *

For Elements

data-item	di
field	fd
local data	ld
subroutine parameter	sp
user-defined type	dt

Syntax

```
stm_r_xx_max_val (xx_id, &status)
```

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_not_found
- stm_id_out_of_range

stm_r_xx_min_val

Returns the minimum value of the specified element.

You can call this function without indicating the specific element type:

```
stm_r_min_val (id, &status)
```

Function Type

char *

For Elements

user-defined type	dt

Syntax

```
stm_r_xx_min_val (xx_id, &status)
```

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_not_found
- stm_id_out_of_range

stm_r_xx_mini_spec

Returns a string with mini-spec reactions or actions.

You can call this function without indicating the specific element type:

```
stm_r_mini_spec (id, &status)
```

Function Type

stm_expression

For Elements

activity	ac

Syntax

```
stm_r_xx_mini_spec (xx_id, &status)
```

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_id_not_found
- stm_unresolved
- stm_missing_label

stm_r_xx_mode

Returns the parameter or router mode.

Function Type

stm_xx_mode

For Elements

parameter	parameter
router	router

Syntax

stm_r_xx_mode (elem_id, &status)

Arguments

Argument	Input/ Output	Type	Description
elem_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_id_not_found
- stm_unresolved

stm_r_xx_name

Returns the element name. For hierarchical elements, the function returns the name associated with the box. Because hierarchical elements can share the same name, the return value does not necessarily uniquely identify an element. To return a unique name, use the function stm_r_xx_uniquename .

- This function returns a pointer to a static area of memory. Subsequent calls to this procedure overwrite the old string. If the name needs to be preserved, use the strdup() function from the string library.
- You can call this function without indicating the specific element type:

  stm_r_name (id, &status)

- For boxes that have no names, this function returns the definition chart name. For example, for box @ABC, this function returns ABC.

Function Type

stm_element_name

Syntax

stm_r_xx_name (xx_id, &status)

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
status	Out	int	The function status code.

For Elements

action	an
activity	ac
actor	actor
boundary box	bb
chart	ch
condition	co
data-item	di
data-store	ds
enumerated value	en
event	ev
field	fd
function	fn
information-flow	if
lifeline	ll
local data	ld
module	md
router	router
state	st
subroutine	sb
subroutine parameter	sp
use case	uc
user-defined type	dt

Status Codes

- stm_success
- stm_error_in_file
- stm_id_out_of_range
- stm_id_not_found
- stm_missing_name
- stm_missing_field
- stm_illegal_parameter
- stm_file_not_found

Example

To retrieve and print the name of a state in a statechart, use the following statements:

```
stm_id          state_id;
int             status;
   .
   .
state_id = stm_r_st ("S1.S3", &status);
printf ("%s", stm_r_st_name (state_id, &status));
   .
   .
```

In this example, the state name is provided to the function and this value is used to retrieve the same state name from the database. The purpose of this example is to demonstrate the value returned by this function, in contrast to the value returned by the function `stm_r_xx_uniquename`.

stm_r_xx_note

Returns the notes from a requirement record or timing constraint.

Function Type

char *

For Elements

requirement	rt
timing constraint	tc

Syntax

stm_r_xx_note (rt_id, &status)

Arguments

Argument	Input/ Output	Type	Description
rt_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_missing_field
- stm_illegal_parameter
- stm_file_not_found
- stm_error_in_file

stm_r_xx_notes

Returns the note for the specified input transition.

Function Type

stm_list

For Elements

chart	ch

Syntax

stm_r_xx_notes (tr_id, &status)

Arguments

Argument	Input/ Output	Type	Description
tr_id	In	stm_id	The transition ID.
status	Out	int	The function status code.

Status Codes

- stm_id_out_of_range
- stm_missing_note
- stm_success

stm_r_xx_number_of_bits

Returns the number of bits in the element.

You can call this function without indicating the specific element type, as follows:

```
stm_r_number_of_bits (id, &status)
```

Function Type

char *

For Elements

data-item	di
field	fd
local data	ld
subroutine parameter	sp
user-defined type	dt

Syntax

```
stm_r_xx_number_of_bits (xx_id, &status)
```

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_not_found
- stm_id_out_of_range

stm_r_xx_of_enum_type

Retrieves the enumerated type ID (a user-defined type) for the specified element.

You can call this function without indicating the specific element type:

```
stm_r_of_enum_type (id, &status)
```

Function Type

stm_id

For Elements

data-item	di
field	fd
local data	ld
subroutine parameter	sp
user-defined type	dt

Syntax

```
stm_r_xx_of_enum_type (xx_id, &status)
```

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_id_not_found
- stm_missing_of_enum_type

stm_r_xx_of_enum _type_name_type

Retrieves the enumerated name type for the specified elements.

You can call this function without indicating the specific element type:

```
stm_r_of_enum_type_name_type (id, &status)
```

Function Type

stm_name_type

For Elements

data-item	di
field	fd
local data	ld
subroutine parameter	sp
user-defined type	dt

Syntax

```
stm_r_xx_of_enum_type_name_type (xx_id, &status)
```

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_id_not_found
- stm_missing_of_enum_type

stm_r_xx_parameter_mode

Retrieves the parameter mode, including subroutine parameters and the parameters of generic charts and components.

You can call this function without indicating the specific element type:

```
stm_r_parameter_mode (xx_id, &status)
```

Function Type

stm_parameter_mode

For Elements

chart	ch
subroutine parameter	sp

Syntax

```
stm_r_xx_parameter_mode (xx_id, &status)
```

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_not_a_parameter

Return Values

Although the return value of this function is of type int, Dataport enables you to reference this value by name. The possible values are:

- stm_in_parameter
- stm_out_parameter
- stm_inout_parameter
- stm_constant_parameter

stm_r_xx_reactions

Returns the static reactions of the specified state. The syntax of these reactions is trigger/action .

- To divide the static reactions into their trigger and action parts, use the utility routines stm_trigger_of_reaction and stm_action_of_reaction .
- You can call this function without indicating the specific element type:

  stm_r_reactions (st_id, &status)

Function Type

stm_list

For Elements

activity	ac
state	st

Syntax

stm_r_xx_reactions (xx_id, &status)

Arguments

Argument	Input/ Output	Type	Description
xx_st_id	In	stm_id	The state ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_unresolved
- stm_id_out_of_range
- stm_id_not_found
- stm_missing_label

Example

To extract all static reactions of state S1, use the following statements:

```
stm_id          state_id;
int             status;
stm_list        reactions;
stm_expression  react;
                .
                .
state_id = stm_r_st ("S1", &status);
reactions = stm_r_st_reactions (state_id, &status);
if(status == stm_success)
  for(react = (string)
    stm_list_first_element (reactions, &status);
    status == stm_success;
    react = (string)
    stm_list_next_element (reactions, &status)){
              .
              .
    }
```

stm_r_xx_select_implementation

Retrieves the implementation type of the specified element.

Function Type

stm_sb_select_implementation

For Elements

action	an
activity	ac
subroutine	sb

Syntax

stm_r_xx_select_implementation (xx_id, &status)

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_out_of_range
- stm_id_not_found

Return Values

Although the return value of this function is of type int, Dataport enables you to reference this value by name. The possible values are as follows:

- stm_sb_action_lang
- stm_sb_procedural_sch
- stm_sb_kr_c_code
- stm_sb_ansi_c_code
- stm_sb_ada_code
- stm_sb_vhdl_code
- stm_sb_verilog_code
- stm_sb_truth_table_code

- stm_sb_best_match
- stm_sb_none

stm_r_xx_string_length

Retrieves the string length of the specified element.

You can call this function without indicating the specific element type:

```
stm_r_string_length (id, &status)
```

Function Type

stm_const_exp

For Elements

field	fd
local data	ld
subroutine parameter	sp
user-defined type	dt

Syntax

```
stm_r_xx_string_length (xx_id, &status)
```

Arguments

Argument	Input/Output	Type	Description
xx_id	In	stm_id	The element ID
status	Out	int	The function status code

Status Codes

- stm_success
- stm_missing_field
- stm_illegal_parameter
- stm_file_not_found
- stm_error_in_file

stm_r_xx_structure_type

Returns the structure or type of the specified textual element. The structure or type can be single, array, or queue.

You can call this function without specifying an element type:

```
stm_r_structure_type (id, &status)
```

Function Type

stm_list

For Elements

condition	co		
data-item	di		
event		ev	
field	fd		
local data	ld		
subroutine parameter		sp	
user-defined type	dt		

Syntax

```
stm_r_xx_structure_type (xx_id, &status)
```

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_id_not_found

Return Values

Although the return value of this function is of type int , Dataport enables you to reference this value by name. The following are all possible values allowed for each Rational Statemate element subtype.

Element Type	Element Subtype
condition	stm_co_array
	stm_co_missing
	stm_co_single
data-item	stm_di_array
	stm_di_queue
	stm_di_single
event	stm_ev_array
	stm_ev_missing
	stm_ev_single
field	stm_fd_array
	stm_fd_queue
	stm_fd_single
local data	stm_ld_array
	stm_ld_queue
	stm_ld_single
subroutine parameter	stm_sp_array
	stm_sp_queue
	stm_sp_single
user-defined type	stm_dt_array
	stm_dt_queue
	stm_dt_single

stm_r_xx_synonym

Retrieves the synonym of the specified element. The synonym is defined in the element's form.

You can call this function without indicating the specific element type:

```
stm_r_synonym (id, &status)
```

Function Type

stm_short_name

For Elements

action	an
activity	ac
actor	actor
boundary box	bb
chart	ch
condition	co
data-item	di
data-store	ds
event	ev
field	fd
information-flow	if
lifeline	ll
module	md
router	router
state	st
subroutine	sb
use case	uc
user-defined type	dt

Syntax

```
stm_r_xx_synonym (xx_id, &status)
```

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
status	Out	int	The function status code. If no synonym is defined in the element's form, status receives the value stm_missing_synonym .

Status Codes

- stm_success
- stm_unresolved
- stm_missing_subroutine_params
- stm_id_out_of_range
- stm_id_not_found
- stm_missing_synonym

Example

To write out the synonym of activity A1, use the following statements:

```
stm_id    act_id;
int       status;
    .
    .
act_id = stm_r_ac ("A1", &status);
printf ("Synonym:%s", stm_r_ac_synonym (act_id,
    &status));
    .
    .
    .
```

stm_r_xx_text

Returns the textual information associated with a specified element.

You can call this function without indicating the specific element type:

```
stm_r_text(id,&status)
```

The information is retrieved into a structured data type (record), which varies according to the type of element referenced.

Function Type

stm_xx_text_ptr

For Elements

a-flow-line (basic)	ba
action	an
activity	ac
block	bl
chart	ch
connector	cn
combinational assignment	ca
condition	co
data-item	di
data-store	ds
event	ev
field	fd
function	fn
information-flow	if
local data	ld
module	md
note	nt
state	st
subroutine	sb
subroutine parameter	sp
user-defined type	dt

Syntax

stm_r_xx_text (xx_id, &status)

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_file_not_found
- stm_id_out_of_range
- stm_id_not_found
- stm_missing_synonym
- stm_error_in_file
- stm_unresolved
- stm_illegal_parameter —When this status code is returned, a record is received with the fields name, unique name, type, and text. The rest of the text fields are empty.

Example

To retrieve several fields attached to a specific state whose ID is st_id, use the first statement. Thereafter, extract from the record the particular fields.

```
stm_id              st_id;
int                 status;
stm_st_text_ptr     st_record;
stm_element_name    name;
stm_short_name      synonym;
   .
   .
st_record = stm_r_st_text (st_id, &status);
   .
name = st_record->st_name;
synonym = st_record->st_synonym;
   .
   .
```

When retrieved, the information is assigned to a specific record that can be examined thereafter for the desired information.

stm_r_xx_truth_table

Returns the elements that are implemented as truth tables.

Function Type

stm_list

For Elements

action	an
activity	ac
subroutine	sb

Syntax

stm_r_xx_truth_table (xx_id, &status)

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_error_in_file
- stm_id_out_of_range
- stm_illegal_parameter
- stm_id_not_found
- stm_file_not_found
- stm_missing_name
- stm_missing_field

stm_r_xx_truth_table_expression

Returns the truth table expression for all named elements.

Function Type

stm_expression

For Elements

action	an
activity	ac
subroutine	sb

Syntax

stm_r_xx_truth_table_expression (xx_id, &status)

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_error_in_file
- stm_id_out_of_range
- stm_illegal_parameter
- stm_id_not_found
- stm_file_not_found
- stm_missing_name
- stm_missing_field

stm_r_xx_truth_table_local_data

Returns the list of local data elements defined in the truth table related to the input subroutine.

Function Type

stm_list

For Elements

action	an
activity	ac
subroutine	sb

Syntax

stm_r_xx_truth_table_local_data (sb_id, &status)

Arguments

Argument	Input/ Output	Type	Description
sb_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_error_in_file
- stm_id_out_of_range
- stm_illegal_parameter
- stm_id_not_found
- stm_file_not_found
- stm_missing_name
- stm_missing_field

stm_r_xx_type

Function Type

stm_element_type

For Elements

a-flow-line (basic)	ba
a-flow-line (compound)	af
action	an
activity	ac
actor	actor
boundary box	bb
chart	ch
condition	co
connector	cn
data-item	di
data-store	ds
event	ev
field	fd
function	fn
information-flow	if
lifeline	ll
module	md
module-occurrence	om
note	nt
off-page activity	oa
router	router
state	st
subroutine	sb
use case	uc
user-defined type	dt

Description

Retrieves element subtypes for the specified element. Most Rational Statemate elements are divided into classes, referred to as subtypes. For example, a state can belong to one of a number of subtypes, such as and, or, basic, diagram, instance, or reference.

You can call this function without indicating the specific element type:

```
stm_r_type (id, &status)
```

Syntax

```
stm_r_xx_type (xx_id, &status)
```

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_id_not_found

Return Values

The return value of the function belongs to an enumerated type. The enumerated type depends on the particular element type for which the function is performed. The enumerated type is named stm_element_type, where element varies as shown in the following table.

Element Type	Function Type	Element Subtype
a-flow-line	stm_a_flow_line_type	stm_af_control
		stm_af_data
action	stm_action_type	stm_an_compound
		stm_an_reference
activity	stm_activity_type	stm_ac_control
		stm_ac_control_instance
		stm_ac_diagram
		stm_ac_external
		stm_ac_instance
		stm_ac_internal
		stm_ac_reference
ba-flow-line	stm_ba_flow_line_type	stm_ba_control
		stm_ba_data
chart	stm_chart_type	stm_ch_activity
		stm_ch_module
		stm_ch_reference_activity
		stm_ch_reference_module
		stm_ch_reference_state
		stm_ch_state
condition	stm_condition_type	stm_co_compound
		stm_co_primitive
		stm_co_reference

Element Type	Function Type	Element Subtype
connector	stm_connector_type	stm_cn_composition
		stm_cn_condition
		stm_cn_control
		stm_cn_deep_history
		stm_cn_default
		stm_cn_diagram
		stm_cn_history
		stm_cn_joint
		stm_cn_junction
		stm_cn_selection
		stm_cn_termination
data-item	stm_data_item_type	stm_di_compound
		stm_di_alias
		stm_di_constant
		stm_di_primitive
		stm_di_reference
data-store	stm_data_store_type	stm_ds_internal
		stm_ds_reference
event	stm_event_type	stm_ev_compound
		stm_ev_primitive
		stm_ev_reference
field	stm_field_type	stm_fd_primitive
information-flow	stm_information_flow_type	stm_if_explicit
		stm_if_reference
module	stm_module_type	stm_md_diagram
		stm_md_subsystem
		stm_md_environment
		stm_md_reference
		stm_md_instance
		stm_md_storage_module
router	stm_router_type	stm_router_external
		stm_router_internal

Element Type	Function Type	Element Subtype
state	stm_state_type	stm_st_diagram
		stm_st_and
		stm_st_or
		stm_st_instance
		stm_st_reference
		stm_st_basic
subroutine	stm_subroutine_type	stm_sb_reference
user-defined type		stm_dt_primitive
		stm_dt_reference

Note

The value stm_st_component is not used.

Example

To retrieve the type of state READY and execute some statements if the state is a state, use the following statements:

```
stm_id          st_id;
stm_state_type  st_type;
int             status;
   .
   .
st_id = stm_r_st ("READY", &status);
st_type = stm_r_st_type (st_id, &status);
if(st_type == stm_st_or)
   .
   .
   .
```

stm_r_xx_type_expression

Returns the type expression for the specified element. The expression is the same as used in the properties, reports, and Info.

You can call this function without indicating the specific type:

```
stm_r_type_expression (id, &status)
```

Function Type

stm_expression

For Elements

condition	co
data-item	di
data-store	ds
event	ev
field	fd
local data	ld
subroutine parameter	sp
user-defined type	dt

Syntax

```
stm_r_xx_type_expression (xx_id, status)
```

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_id_not_found
- stm_unresolved

stm_r_xx_uniquename

Returns the unique path name for the specified element. The name returned by the function contains the minimum number of levels necessary to uniquely identify an element in its chart. It is especially relevant to boxes.

You can call this function without indicating the specific element type:

```
stm_r_uniquename (id, &status)
```

Function Type

char *

For Elements

action	an
activity	ac
actor	actor
boundary box	bb
chart	ch
condition	co
data-item	di
data-store	ds
event	ev
field	fd
function	fn
information-flow	if
lifeline	ll
local data	ld
module	md
router	router
state	st
subroutine	sb
subroutine parameter	sp
use case	uc
user-defined type	dt

Syntax

```
stm_r_xx_uniquename (xx_id, &status)
```

Arguments

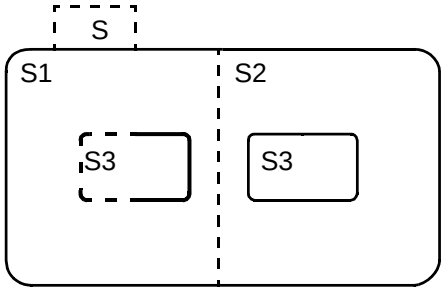
Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_id_not_found
- stm_missing_synonym

Example

Consider the following statechart:



To retrieve the unique name of the highlighted state, use the following statements:

```
stm_id          state_id;
int             status;
   .
   .
state_id = stm_r_st ("S1.S3", &status);
printf ("Unique Name:%s", stm_r_st_uniquename (
    state_id, &status));
   .
   .
   .
```

The state name printed is S1.S3 (not S.S1.S3 or S3). In this example, a unique state name is provided, and this value is used to retrieve the same unique state name from the database. This example demonstrates the value returned by this function, in contrast to the value returned by the function stm_r_xx_name .

stm_r_xx_user_type

Function Type

stm_id

For Elements

data-item	di		
field	fd		
local data	ld		
subroutine parameter			sp
user-defined type	dt		

Description

Returns the user-defined type ID referenced by the element.

You can call this function without indicating the specific element type:

```
stm_r_user_type (id, &status)
```

Syntax

```
stm_r_xx_user_type (xx_id, &status)
```

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_id_not_found
- stm_missing_user_type
- stm_success
- stm_ntc_name
- stm_ntc_synonym
- stm_ntc_unknown

stm_r_xx_user_type_name_type

Returns the name type of the user-defined type referenced by the element.

You can call this function without indicating the specific element type:

```
stm_r_user_type_name_type (id, &status)
```

Function Type

stm_name_type

For Elements

data-item	di
field	fd
local data	ld
subroutine parameter	sp
user-defined type	dt

Syntax

```
stm_r_xx_user_type_name_type (xx_id, &status)
```

Arguments

Argument	Input/ Output	Type	Description
xx_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_id_not_found
- stm_missing_user_type

stm_open_truth_table

Opens a Truth-Table which is connected to the specified element and highlights the specifies line in it. Returns stm_success if request was successfully sent, and stm_id_out_of_range otherwise.

Function Type

stm_boolean

For Elements

action	an
activity	ac
Subroutine	sb

Syntax

stm_open_truth_table(stm_id id, int line, int *status)

Arguments

Argument	Input/ Output	Type	Description
id	In	stm_id	The element ID.
line	In	int	The line in the Truth-Table to be Highlighted.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range

stm_calculate_element_magic_number

Returns a number that reflects a status specified element. A change in the element's definition is reflected by a change in the returned number.

Function Type

long

For Elements

All types

Syntax

stm_calculate_element_magic_number(el_id, &status)

Arguments

Argument	Input/ Output	Type	Description
el_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_missing_local_data
- stm_no_connected_chart

stm_get_element_create_stamp

Returns a number that reflects the creation time of a specified element.

Function Type

long

For Elements

All types

Syntax

stm_get_element_create_stamp(el_id, &status)

Arguments

Argument	Input/ Output	Type	Description
el_id	In	stm_id	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_not_found
- stm_id_out_of_range
- stm_no_connected_chart

Query Functions

This section describes the query functions. The functions are organized into sections by element types returned by functions. Within each section, functions are organized by type of element in the input list.

For each query function, the following information is provided:

- Description
- Query (if it exists)

Each function returns an output list. The output argument status is the function status code.

Overview

Query functions extract lists of elements from a database that conform to a specific criterion.

The property sheet enables you to query the Rational Statemate database. This tool uses a comprehensive set of predefined queries to obtain information. All these queries operate on a list of Rational Statemate elements, called the input list. Each query generates an output list of elements that meet a criterion designated by the specific query. Generally, elements in the output list are related to elements in the input list in one of two ways:

- The output list is a subset of input list elements that have a specific characteristic. For example, the output list consists of all And-states in the input list.
- Elements in the output list fulfill a specific relationship to elements in the input list. For example, the output list consists of all states that are descendants of states in the input list.

Most query functions correspond to queries from the property sheet. These functions give you the same information that the corresponding queries do. Most functions require you to provide an input list as an input argument. This input list generally consists of elements of a particular type. The function returns a list of elements of the same or different type (as the input list).

The retrieval process is as follows:

1. Generate the input list.
2. Specify the query and input list. Receive the output list. Note that other procedures may be performed before you use the retrieved information.
3. Use the output list.

Most functions require you to provide an input list as an input argument. This input list generally consists of elements of a particular type. The function returns a list of elements of the same type as that of the input list, or of a different type.

Calling Query Functions

Most of the query functions use the following calling sequence:

```
stm_r_yy_relation_xx (xx_list, &status)
```

In this syntax:

- stm_r_—Designates the function as a RationalStatemate database retrieval function.
- yy—The two-character type abbreviation for elements in the output list.
- relation—The relationship between the input and output lists (describes the query to be applied to the input list).
- xx—The two-character type abbreviation for elements in the input list.
- xx_list—The input list to the function.
- status—The return function status code. There are three possible status codes: stm_success, stm_nil_list, and stm_missing_element_in_list

For example:

```
stm_r_st_and_st (state_list, &status)
```

This function returns the states from the input list state_list that are and-states.

The following function returns the activities performed throughout the states in state_list:

```
stm_r_st_ac_throughout_st (state_list, &status)
```

The following sections document the query functions that use a different calling sequence.

By Attributes

The by_attributes function returns all elements in the input list that have an attribute attr_name, whose value is attr_val.

The syntax is as follows:

```
stm_r_xx_by_attributes_xx (xx_list, attr_name, attr_val, &status)
```

In this syntax:

- stm_r_—Designates the function as a Rational Statemate database retrieval function.
- xx—The two-character type abbreviation for elements in the input and output lists.
- by_attributes—The criterion to be met by elements in the input list.
- xx_list—The input list to the function.
- attr_name—A pattern for the attribute name.
- attr_val—A pattern for the attribute value to be matched.
- status—The return function status code. There are three possible status codes: stm_success, stm_nil_list, and stm_missing_element_in_list.

For example:

```
stm_r_md_by_attributes_md (module_list, "LANGUAGE", "PASCAL", &status)
```

This function returns all modules in module_list that have an attribute LANGUAGE, whose value is PASCAL.

Note

If you use stm_r_xx_by_attributes_xx to search for a specific attribute without regard to the attribute's value, enter the attribute's name with an "*" (asterisk). The search returns all elements with the attribute name and their assigned values. If you need to find an attribute that has no attribute value (empty), enter the attribute name with empty quotation marks ("").

By Structure Type

The by_structure_type function returns all elements in the input list that have a structure type xx_structure_type.

The syntax of the by_structure_type function is as follows:

```
stm_r_xx_by_structure_type_xx (xx_list, xx_structure_type, &status)
```

In this syntax:

- stm_r_—Designates the function as a RationalStatemate database retrieval function
- xx—The two-character type abbreviation for elements in the input and output list
- by_structure_type—The structure type referenced
- xx_list—The input list to the function
- xx_structure_type—The structure type referenced (array, single, or queue in the element's form)
- status—The return function status code

For example:

```
stm_r_di_by_structure_type_di (di_list, stm_di_array, &status)
```

This function returns all data items in di_list that have an array structure type.

Name and Synonym Patterns

The name_of and synonym_of functions search the entire database for elements whose name (or synonym) matches the pattern specified in the argument pattern.

The syntax is as follows:

```
stm_r_xx_name_of_xx (pattern, &status)

stm_r_xx_synonym_of_xx (pattern, &status)
```

In this syntax:

- stm_r_—Designates the function as a Rational Statemate database retrieval function
- xx—The two-character type abbreviation of elements in the output list
- name_of or synonym_of—The criterion to be met (specifies that the query “Element whose name matches a pattern” or “Element whose synonym matches a pattern” is to be applied)
- pattern—A character string you supply as an input argument
- status—The return function status code

These functions search the entire database for elements whose names (or synonyms) match the pattern specified in the argument pattern.

For example:

```
stm_r_ev_name_of_ev ("EV*", &status)
```

This function returns all events from the database whose names begin with the string EV.

In another example, to retrieve all the charts in the database use the following:

```
stm_r_ch_name_of_ch ("*", &status)
```

The output list contains all the charts in the database, including reference charts.

Query Function Input Arguments

The following table lists the input arguments for query functions.

Argument	Description	Data Type
xx_list	An input list of elements upon which you perform a query.	stm_list
attribute name	The name of an attribute defined in the Attribute field of a Rational Statemate element form. This pattern may include wildcards (? and *).	stm_attr_name
attribute value	The value of an attribute defined in the Attribute field of a Rational Statemate element form.	stm_attr_val
pattern	An alphanumeric string to match a Rational Statemate element name (or synonym). Two special characters can be used as wildcards: • A question mark (?) indicates that any character can occupy this position • An asterisk (*) indicates that any number of characters (including 0) can occupy this position.	char * (string)

Examples of Query Functions

This section provides several examples of query functions used to extract database information.

Example 1

To build an input list for query functions, use the following statements:

```
stm_id       act_id;
stm_list     list, act_list;
int          status;
             ...

act_id = stm_r_ac("A1", &status);
list = stm_list_create (act_id, end_of_list, &status);
act_list = stm_r_ac_physical_sub_of_ac (list, &status);
                  .
                  .
```

The variable `act_id` contains the ID of the activity A1. The input list is built by calling the `stm_list_create` function. In this case, the input list consists of only one element. You would use the same function to build a list of multiple elements.

Note that the input list is built from element IDs, not from element names.

Example 2

To return all the basic states that are descendants of state S1, use the following statements:

```
stm_id          st_id;
int             status;
stm_list        list;
stm_list        descen_states, basic_states;
                  .
                  .

st_id = stm_r_st ("S1", &status);
list =
  stm_list_create (st_id, end_of_list, &status);
descen_states = stm_r_st_physical_desc_of_st (list,
      &status);
basic_states = stm_r_st_basic_st (descen_states,
      &status);
                  .
                  .
```

Example 3

To return the name of all events in the database whose names begin with the string EV, use the following statements:

```
  stm_id      eve;
  stm_list    ev_list;
  int         status;
              .
              .
              .
ev_list = stm_r_ev_name_of_ev ("EV*", &status);
for (eve = (stm_id)
       stm_list_first_element (ev_list, &status);
   status == stm_success;
   eve = (stm_id) stm_list_next_element (ev_list,
       &status))
   printf ("\n %s", stm_r_ev_name (eve, &status));
```

List of Query Functions

The query functions are grouped alphabetically first by output list type, then by input list type. The output types are as follows:

- Activities (ac)
- A-Flow-Lines (af, ba, laf)
- Actions (an)
- Actors (actor)
- Boundary Boxes (bb)
- Callbacks
- Combinational Assignments (ca)
- Charts (ch)
- Connectors (cn)
- Conditions (co)
- Data-Items (di)
- Data-Stores (ds)
- Events (ev)
- Fields (fd)
- Functions (fn)
- Information-Flows (if)
- M-Flow-Lines (bf, lmf, mf)
- Modules (md)
- Mixed (mx)
- Module-Occurrences (om)
- Routers (router)
- Subroutines (sb)
- States (st)
- Timing Constraint (tc)
- Transitions (tr)

Activities (ac)

This section documents the query functions that return a list of activities.

Input List Type: ac

stm_r_ac_actor_ac	Query： Purpose：Returns a list of activities from the input list that are of the requested type Syntax： stm_r_ac_actor_ac (stm_list activities_list, int* status);
stm_r_ac_basic_ac	Query：Basic activities Purpose：Returns the activities in the input list that have no descendants Syntax： stm_r_ac_basic_ac (stm_list in_list, int *status);
stm_r_ac_boundary_box_ac	Query： Purpose：Returns a list of activities from the input list that are of the requested type Syntax： stm_r_ac_boundary_box_ac (stm_list activities_list, int* status);
stm_r_ac_by_attributes_ac	Query：Activities by attributes Purpose：Returns the activities in the input list that match the specified attribute name and value Syntax： stm_r_ac_by_attributes_ac (stm_list in_list, char* attr_name, char* attr_value, int *status);
stm_r_ac_callback_binding_ac	Query：Activities with callback bindings Purpose：Returns the activities in the input list that have callback bindings Syntax： stm_r_ac_callback_binding_ac (stm_list in_list, int *status);

stm_r_ac_component_instance_ac	Query：Activities that are instances of components Purpose：Returns the activities in the input list that have instances of components Syntax： stm_r_ac_component_ac (stm_list in_list, int *status);
stm_r_ac_continuous_instance_ac	Query：Activities with continuous instances Purpose：Returns the activities in the input list that have continuous instances Syntax： stm_r_ac_continuous_instance_ac (stm_list in_list, int *status);
stm_r_ac_control_ac	Query：Control activities Purpose：Returns the activities in the input list that are control activities Syntax： stm_r_ac_control_ac (stm_list in_list, int *status);
stm_r_ac_control_terminated_ac	Query：Controlled-terminated activities Purpose：Returns the activities in the input list that are control-terminated activities Syntax： stm_r_ac_control_terminated_ac (stm_list in_list, int *status);
stm_r_ac_data_store_ac	Query：Data-stores Purpose：Returns the activities in the input list that are data-stores Syntax： stm_r_ac_data_store_ac (stm_list in_list, int *status);
stm_r_ac_def_of_instance_ac	Query：Definition activities of a given activity Purpose：Returns the definition activities (top-level in the definition chart) for instances in the input list Syntax： stm_r_ac_def_of_instance_ac (stm_list in_list, int *status);
stm_r_ac_defined_environment_ac	Query：Environment activities Purpose：Returns the activities in the input list that were defined as environment activities Syntax： stm_r_ac_defined_environment_ac (stm_list in_list, int *status);

stm_r_ac_explicit_defined_ac	Query：Activities explicitly defined Purpose：Returns from the input list those activities that were explicitly defined Syntax： stm_r_ac_explicit_defined_ac (stm_list in_list, int *status);
stm_r_ac_ext_11_ac	Query： Purpose：Returns a list of activities from the input list that are of the requested type Syntax： stm_r_ac_ext_11_ac (stm_list activities_list, int* status);
stm_r_ac_external_ac	Query：External activities Purpose：Returns the activities in the input list that are external Syntax： stm_r_ac_external_ac (stm_list in_list, int *status);
stm_r_ac_external_router_ac	Query： Purpose：Returns a list of activities from the input list that are of the requested type Syntax： stm_r_ac_external_router_ac (stm_list activities_list, int* status);
stm_r_ac_generic_instance_ac	Query：Generic instance activities Purpose：Returns the activities in the input list that are instances of generic charts Syntax： stm_r_ac_generic_instance_ac (stm_list in_list, int *status);
stm_r_ac_imp_best_match_ac	Query：Activities whose selected implementation is Best Match Purpose：Returns the activities in the input list that are implemented as the Best Match using Select Implementation in the properties Syntax： stm_r_ac_imp_best_match_ac (stm_list in_list, int *status);

stm_r_ac_imp_mini_spec_ac	Query：Activities implemented in a mini-spec Purpose：Returns the activities in the input list that are implemented in a mini-spec Syntax： stm_r_ac_imp_mini_spec_ac (stm_list in_list, int *status);
stm_r_ac_imp_none_ac	Query：Activities whose selected implementation is None Purpose：Returns the activities in the input list that are not implemented Syntax： stm_r_ac_imp_none_ac (stm_list in_list, int *status);
stm_r_ac_imp_sb_bind_ac	Query：Activities implemented with subroutine bindings Purpose：Returns the activities in the input list that are implemented as Subroutine Binding using Select Implementation in the properties Syntax： stm_r_ac_imp_sb_bind_ac (stm_list in_list, int *status);
stm_r_ac_imp_truth_table_ac	Query：Activities implemented in a truth table Purpose：Returns the activities in the input list that were implemented in a truth table Syntax： stm_r_ac_imp_truth_table_ac (stm_list in_list, int *status);
stm_r_ac_instance_ac	Query：Instance activities Purpose：Returns those activities in the input list that are instances Syntax： stm_r_ac_instance_ac (stm_list in_list, int *status);
stm_r_ac_instance_of_def_ac	Query：Instance activities of a given definition activity Purpose：Returns the instance activities for definition activities (top-level activities in a definition chart) in the input list Syntax： stm_r_ac_instance_of_def_ac (stm_list in_list, int *status);

stm_r_ac_internal_ac	Query：Internal activities Purpose：Returns the activities in the input list that are internal activities (not external or control) Syntax： stm_r_ac_internal_ac (stm_list in_list, int *status);
stm_r_ac_is_occurrence_of_ac	Query：Activity occurrences of a given activity Purpose：Returns the activities for which the activities in the input list appear in the Is activity field of their form Syntax： stm_r_ac_is_occurrence_of_ac (stm_list in_list, int *status);
stm_r_ac_is_principal_of_ac	Query：Principal activities of a given activity Purpose：Returns the activities appearing in the Is activity field of the activities in the input list Syntax： stm_r_ac_is_principal_of_ac (stm_list in_list, int *status);
stm_r_ac_lifeline_ac	Query： Purpose：Returns a list of activities from the input list that are of the requested type Syntax： stm_r_ac_lifeline_ac (stm_list activities_list, int* status);
stm_r_ac_logical_desc_of_ac	Query：Logical descendants of a given activity Purpose：Returns the logical descendants of the activities in the input list, taking into account the translation of instances to their definition charts Syntax： stm_r_ac_logical_desc_of_ac (stm_list in_list, int *status);
stm_r_ac_logical_parent_of_ac	Query：Logical parent activities of a given activity Purpose：Returns the logical parent activities of the activities in the input list, taking into account the translation of instances to their definition charts Syntax： stm_r_ac_logical_parent_of_ac (stm_list in_list, int *status);

stm_r_ac_logical_sub_of_ac	Query：Logical subactivities of a given activity Purpose：Returns the logical subactivities of the activities in the input list, taking into account the translation of instances to their definition charts Syntax： stm_r_ac_logical_sub_of_ac (stm_list in_list, int *status);
stm_r_ac_mini_spec_ac	Query：Activities having mini-specs Purpose：Returns the activities in the input list that have a mini-spec Syntax： stm_r_ac_mini_spec_ac (stm_list in_list, int *status);
stm_r_ac_name_of_ac	Query：Activities whose names match a given pattern Purpose：Returns all the activities whose names match a given pattern Syntax： stm_r_ac_name_of_ac (char* pattern, int *status);
stm_r_ac_offpage_instance_ac	Query：Offpage instance activities Purpose：Returns the activities in the input list that are instances of offpage charts Syntax： stm_r_ac_offpage_instance_ac (stm_list in_list, int *status);
stm_r_ac_physical_desc_of_ac	Query：Physical descendants of a given activity Purpose：Returns the physical descendants (those within the same chart) for the activities in the input list Syntax： stm_r_ac_physical_desc_of_ac (stm_list in_list, int *status);
stm_r_ac_physical_parent_of_ac	Query：Physical parent activities of a given activity Purpose：Returns the physical parent activities (those within the same chart) for the activities in the input list Syntax： stm_r_ac_physical_parent_of_ac (stm_list in_list, int *status);
stm_r_ac_physical_sub_of_ac	Query：Physical subactivities of a given activity Purpose：Returns the physical subactivities (those within the same chart) for the activities in the input list Syntax： stm_r_ac_physical_sub_of_ac (stm_list in_list, int *status);

stm_r_ac_procedure_like_ac	Query：Procedure-like activities Purpose：Returns the activities in the input list that are procedure-like activities Syntax： stm_r_ac_procedure_like_ac (stm_list in_list, int *status);
stm_r_ac_resolved_to_ext_ac	Query：Activities resolved to a given external activity Purpose：Returns the activities (internal, external, or environment) to which the external activities in the input list are resolved Syntax： stm_r_ac_resolved_to_ext_ac (stm_list in_list, int *status);
stm_r_ac_router_ac	Query： Purpose：Returns a list of activities from the input list that are of the requested type Syntax： stm_r_ac_router_ac (stm_list activities_list, int* status);
stm_r_ac_self_terminated_ac	Query：Self-terminated activities Purpose：Returns the activities in the input list that are self-terminated Syntax： stm_r_ac_self_terminated_ac (stm_list in_list, int *status);
stm_r_ac_subroutine_binding_ac	Query：Activities with subroutine bindings Purpose：Returns the activities in the input list that have subroutine bindings (regardless of the implementation setting in the properties) Syntax： stm_r_ac_subroutine_binding_ac (stm_list in_list, int *status);
stm_r_ac_synonym_of_ac	Query：Activities whose synonyms match a given pattern Purpose：Returns all the activities whose synonyms match the specified pattern Syntax： stm_r_ac_synonym_of_ac (char* pattern, int *status);

stm_r_ac_unresolved_ac	Query：Unresolved activities Purpose：Returns the unresolved activities in the input list Syntax： stm_r_ac_unresolved_ac (stm_list in_list, int *status);
stm_r_ac_use_case_ac	Query： Purpose：Returns a list of activities from the input list that are of the requested type Syntax： stm_r_ac_use_case_ac (stm_list activities_list, int* status);

Input List Type: af

stm_r_ac_source_of_af	Query：Activities that are sources for a given a-flow-line Purpose：Returns the activities that are sources of a-flow-lines in the input list Syntax： stm_r_ac_source_of_af (stm_list in_list, int *status);
stm_r_ac_target_of_af	Query：Activities that are targets of a given a-flow-line Purpose：Returns the activities that are targets for a-flow-lines in the input list Syntax： stm_r_ac_target_of_af (stm_list in_list, int *status);

Input List Type: ch

stm_r_ac_def_or_unres_in_ch	Query：Activities defined or unresolved in a given chart Purpose：Returns activities that are explicitly defined or unresolved in the charts of the input list Syntax： stm_r_ac_def_or_unres_in_ ch (stm_list in_list, int *status);
stm_r_ac_defined_in_ch	Query：Activities defined in a given chart Purpose：Returns the activities that are explicitly defined in the charts of the input list Syntax： stm_r_ac_defined_in_ch (stm_list in_list, int *status);
stm_r_ac_described_by_ch	Query：Control activities described by a given statechart Purpose：Returns the control activities described by statecharts in the input list Syntax： stm_r_ac_described_by_ch (stm_list in_list, int *status);
stm_r_ac_instance_of_ch	Query：Activities instance of a given chart Purpose：Returns the instance activities defined by the charts in the input list Syntax： stm_r_ac_instance_of_ch(stm_listin_list, int *status);
stm_r_ac_root_in_ch	Query：Root activities of a given chart Purpose：Returns the internally defined activities (of type diagram) attached to the charts in the input list Syntax： stm_r_ac_root_in_ch(stm_listin_list, int *status);

stm_r_ac_top_level_in_ch	Query：Top-level activities of a given chart Purpose：Returns the top-level activities (not contained in any box) of the charts in the input list Syntax： stm_r_ac_top_level_in_ch (stm_list in_list, int *status);
stm_r_ac_unresolved_in_ch	Query：Activities unresolved in a given chart Purpose：Returns activities that are unresolved in the charts of the input list Syntax： stm_r_ac_unresolved_in_ch (stm_list in_list, int *status);

Input List Type: ds

stm_r_ac_parent_of_ds	Query：Parent activities of a given data-store Purpose：Returns the activities that encapsulate the specified data-stores from the input list Syntax： stm_r_ac_parent_of_ds (stm_list in_list, int *status);

Input List Type: md

stm_r_ac_carried_out_by_md	Query：Activities carried out by a given module. Purpose：Returns the activities carried out by modules in the input list. The module appears in the Implemented by Module field of the activity's form. Syntax： stm_r_ac_carried_out_by_md (stm_list in_list, int *status);

Input List Type: mx

stm_r_ac_affecting_mx	Query：Activities in which a given element is affected. Purpose：Returns the activities that affect (modify, generate, or activate) the elements (for example, events, data-items, or activities) in the input list. Syntax： stm_r_ac_affecting_mx (stm_list in_list, int *status);
stm_r_ac_meaningly_affecting_mx	Query: Activities in which a given element is affected. Purpose: Identical to stm_r_ac_affecting_mx, but when the input list includes an ID of a record/union, stm_r_ac_meaningly_affecting_mx will also return elements that affect a field of the record/union, and not necessarily the whole record/union element. Syntax: stm_r_ac_meaningly_affecting_mx (stm_list in_list, int *status);
stm_r_ac_meaningly_using_mx	Query：Activities in which a given element is used. Purpose：Identical to stm_r_ac_using_mx, but when the input list includes an ID of a record/union, stm_r_ac_meaningly_using_mx will also return elements that use a field of the record/union, and not necessarily the whole record/union element. Syntax： stm_r_ac_meaningly_using_mx (stm_list in_list, int *status);
stm_r_ac_using_mx	Query：Activities in which a given element is used. Purpose：Returns the activities that use (evaluate) the elements (basic events, conditions, data-items, states, and activities) in the input list. Syntax： stm_r_ac_using_mx (stm_list in_list, int *status);

Input List Type: router

stm_r_ac_parent_of_router	Query：Parent activities of a given router Purpose：Returns the activities that encapsulate the specified routers from the input list Syntax： stm_r_ac_parent_of_router (stm_list in_list, int *status);

Input List Type: st

stm_r_ac_throughout_st	Query：Activities performed throughout a given state Purpose：Returns the activities performed throughout states in the input list (as defined in the Activities Within/Throughout field of the state's form) Syntax： stm_r_ac_throughout_st (stm_list in_list, int *status);
stm_r_ac_within_st	Query：Activities performed within a given state Purpose：Returns the activities performed within states in the input list (as defined in the Activities Within / Throughout field of the state's form) Syntax： stm_r_ac_within_st (stm_list in_list, int *status);

Input List Type: uc

stm_r_ac_associates_uc	Query：Activities performed throughout a given state Purpose：Returns the activities that associate with use-cases in the input list. Syntax： stm_r_ac_associates_uc (stm_list in_list, int *status);
stm_r_uc_associates_ac	Query：Activities performed throughout a given state Purpose：Returns the use cases that associate with activities in the input list. Syntax： stm_r_uc_associates_ac (stm_list in_list, int *status);
stm_r_uc_explicit_defined_uc	Query： Purpose：Extracts a list of elements from the input list that are explictly defined elements of the requested type Syntax： stm_r_bb_explicit_defined_uc (stm_list bb_list, int *status);

A-Flow-Lines (af, ba, laf)

This section lists the equ functions that return a list of a-flow-lines.

Two abbreviations are used in these functions:

- af —Global (compound) a-flow-lines
- ba—Basic a-flow-lines
- laf —Local a-flow-lines

Output List Type: af

Input List Type: ac

stm_r_af_from_source_ac	Query：A-flow-lines whose source is a given activity Purpose：Returns global compound a-flow-lines that originate at activities in the input list Syntax： stm_r_af_from_source_ac (stm_list in_list, int *status);
stm_r_af_input_to_ac	Query：A-flow-lines input to a given activity within chart Purpose：Returns all local compound a-flow-lines that originate outside and terminate at (or inside) activities in the input list Syntax： stm_r_af_input_to_ac (stm_list in_list, int *status);
stm_r_af_output_from_ac	Query：A-flow-lines output from a given activity Purpose：Returns all global compound a-flow-lines that originate at (or inside) and terminate outside activities in the input list Syntax： stm_r_af_output_from_ac (stm_list in_list, int *status);
stm_r_af_to_target_ac	Query：A-flow-lines whose target is a given activity Purpose：Returns global a-flow-lines that terminate at activities in the input list Syntax： stm_r_af_to_target_ac (stm_list in_list, int *status);

Input List Type: co

stm_r_af_within_flows_co	Query：A-flow-lines through which a given condition flows Purpose：Returns the a-flow-lines through which conditions in the input list actually flow Syntax： stm_r_af_within_flows_co (stm_list in_list, int *status);
stm_r_af_within_labels_co	Query：A-flow-lines labeled with a given condition Purpose：Returns the a-flow-lines labeled with conditions in the input list Syntax： stm_r_af_within_labels_co (stm_list in_list, int *status);

Input List Type: di

stm_r_af_within_flows_di	Query：A-flow-lines through which a given data-item flows Purpose：Returns the a-flow-lines through which data-items in the input list actually flow Syntax： stm_r_af_within_flows_di (stm_list in_list, int *status);
stm_r_af_within_labels_di	Query：A-flow-lines labeled by a given data-item Purpose：Returns the a-flow-lines labeled with data-items in the input list Syntax： stm_r_af_within_labels_di (stm_list in_list, int *status);

Input List Type: ds

stm_r_af_from_source_ds	Query：A-flow-lines whose source is a given data-store Purpose：Returns global compound a-flow-lines that originate at data-stores in the input list Syntax： stm_r_af_from_source_ds (stm_list in_list, int *status);
stm_r_af_to_target_ds	Query：A-flow-lines whose target is a given data-store Purpose：Returns global compound a-flow-lines that terminate at data-stores in the input list Syntax： stm_r_af_to_target_ds (stm_list in_list, int *status);

Input List Type: ev

stm_r_af_within_flows_ev	Query：A-flow-lines through which a given event flows Purpose：Returns the a-flow-lines through which events in the input list actually flow Syntax： stm_r_af_within_flows_ev (stm_list in_list, int *status);
stm_r_af_within_labels_ev	Query：A-flow-lines through which a given event flows Purpose：Returns the a-flow-lines labeled with events in the input list Syntax： stm_r_af_within_labels_ev (stm_list in_list, int *status);

Input List Type: if

stm_r_af_within_flows_if	Query：A-flow-lines through which a given information-flow flows Purpose：Returns the a-flow-lines through which information-flows in the input list actually flow Syntax： stm_r_af_within_flows_if (stm_list in_list, int *status);
stm_r_af_within_labels_if	Query：A-flow-lines labeled with a given information-flow Purpose：Returns the a-flow-lines labeled with information-flows in the input list Syntax： stm_r_af_within_labels_if (stm_list in_list, int *status);

Input List Type: laf

stm_r_af_containing_laf	Query：None Purpose：Returns the global a-flow-lines (which might spread over several charts) that contain the local a-flow-lines (those within charts) in the input list Syntax： stm_r_af_containing_laf (stm_list l, int *status);

Input List Type: mx

stm_r_af_from_source_mx	Query：A-flow-lines whose source is a given element Purpose：Returns global compound a-flow-lines whose source is an element from the input list Syntax： stm_r_af_from_source_mx (stm_list in_list, int *status);
stm_r_af_to_target_mx	Query：A-flow-lines whose target is given element Purpose：Returns global compound a-flow-lines whose target is an element from the input list Syntax： stm_r_af_to_target_mx (stm_list in_list, int *status);
stm_r_af_within_flows_mx	Query：A-flow-lines through which a given element flows Purpose：Returns the a-flow-lines through which elements in the input list actually flow Syntax： stm_r_af_within_flows_mx (stm_list in_list, int *status);
stm_r_af_within_labels_mx	Query：A-flow-lines labeled by a given element Purpose：Returns the a-flow-lines labeled with elements in the input list Syntax： stm_r_af_within_labels_mx (stm_list in_list, int *status);

Input List Type: router

stm_r_af_from_source_router	Query：A-flow-lines whose source is a given router Purpose：Returns global compound a-flow-lines whose source is a router from the input list Syntax： stm_r_af_from_source_ router (stm_list in_list, int *status);
stm_r_af_to_target_router	Query：A-flow-lines whose target is given router Purpose：Returns global compound a-flow-lines whose target is a router from the input list Syntax： stm_r_af_to_target_router (stm_list in_list, int *status);

Output List Type: ba

Input List Type: af

stm_r_ba_contained_in_af	Query：None Purpose：Returns the basic a-flow-lines that contain the a-flow-lines in the input list Syntax： stm_r_ba_contained_in_af (stm_list l, int *status);

Output List Type: ba

Input List Type: ch

stm_r_ba_defined_in_ch	Query：None Purpose：Returns the a-flow-lines defined in the input list of charts Syntax： stm_r_ba_defined_in_ch (stm stm_list in_list, int *status);

Output List Type: bt

Input List Type: ch

stm_r_bt_defined_in_ch	Query：None Purpose：Returns the basic transitions defined in the input list of charts Syntax： stm_r_bt_defined_in_ch (stm stm_list in_list, int *status);

Output List Type: laf

Input List Type: ac

stm_r_laf_from_source_ac	Query：A-flow-lines whose source is a given activity Purpose：Returns local compound a-flow-lines that originate at activities in the input list Syntax： stm_r_laf_from_source_ac (stm_list in_list, int *status);
stm_r_laf_input_to_ac	Query：A-flow-lines input to a given activity Purpose：Returns all the local a-flow-lines Syntax： stm_r_laf_input_to_ac (stm_list in_list, int *status);
stm_r_laf_output_from_ac	Query：A-flow-lines output from a given activity within chart Purpose：Returns all local compound a-flow-lines that originate at (or inside) and terminate outside activities in the input list Syntax： stm_r_laf_output_from_ac (stm_list in_list, int *status);
stm_r_laf_to_target_ac	Query：A-flow-lines whose target is a given activity within chart Purpose：Returns local a-flow-lines (those within charts) that terminate at activities in the input list Syntax： stm_r_laf_to_target_ac (stm_list in_list, int *status);

Input List Type: af

stm_r_laf_contained_in_af	Query：None Purpose：Returns the local a-flow-lines that contain the global a-flow-lines in the input list Syntax： stm_r_laf_contained_in_af (stm_list l, int *status);

Input List Type: ds

stm_r_laf_from_source_ds	Query：A-flow-lines whose source is a given data-store within chart Purpose：Returns local compound a-flow-lines that originate at data-stores in the input list Syntax： stm_r_laf_from_source_ds (stm_list in_list, int *status);
stm_r_laf_to_target_ds	Query：A-flow-lines whose target is a given data-store within chart Purpose：Returns local compound a-flow-lines that terminate at data-stores in the input list Syntax： stm_r_laf_to_target_ds (stm_list in_list, int *status);

Input List Type: mx

stm_r_laf_from_source_mx	Query：A-flow-lines whose source is a given element within chart Purpose：Returns local compound a-flow-lines whose source is an element from the input list Syntax： stm_r_laf_from_source_mx(stm_listin_list, int *status);
stm_r_laf_to_target_mx	Query：A-flow-lines whose target is given element within chart Purpose：Returns local compound a-flow-lines whose target is an element from the input list Syntax： stm_r_laf_to_target_mx (stm_list in_list, int *status);

Input List Type: router

stm_r_laf_from_source_router	Query：A-flow-lines whose source is a given router within chart Purpose：Returns local compound a-flow-lines whose source is a router from the input list Syntax： stm_r_laf_from_source_ router (stm_list in_list, int *status);
stm_r_laf_to_target_router	Query：A-flow-lines whose target is given router within chart Purpose：Returns local compound a-flow-lines whose target is a router from the input list Syntax： stm_r_laf_to_target_router (stm_list in_list, int *status);

Actions (an)

This section documents the query functions that return a list of actions.

Input List Type: an

stm_r_an_by_attributes_an	Query：Actions by attribute Purpose：Returns the actions in the input list that match a given attribute and value Syntax: stm_r_an_by_attributes_an (stm_list in_list, char* attr_name, char* attr_value, int *status);
stm_r_an_explicit_defined_an	Query：Actions explicitly defined Purpose：Returns the actions of the input list that were explicitly defined Syntax： stm_r_an_explicit_defined_an (stm_list in_list, int *status);
stm_r_an_imp_best_match_an	Query：Actions whose selected implementation is Best Match Purpose：Returns the actions in the input list implemented as the Best Match using Select Implementation in the properties Syntax： stm_r_an_imp_best_match_an (stm_list in_list, int *status);
stm_r_an_imp_definition_an	Query：Actions with a defined implementation Purpose：Returns the actions in the input list that have a defined implementation in the properties Syntax： stm_r_an_imp_definition_an (stm_list in_list, int *status);
stm_r_an_imp_none_an	Query：Actions whose selected implementation is None Purpose：Returns the actions in the input list that are not implemented using Select Implementation Syntax： stm_r_an_imp_none_an (stm_list in_list, int *status);

stm_r_an_imp_truth_table_an	Query：Actions implemented in a truth table Purpose：Returns the actions in the input list that are implemented with a truth table in the properties Syntax： stm_r_an_imp_truth_table_ an (stm_list in_list, int *status);
stm_r_an_name_of_an	Query：Actions whose names match a given pattern Purpose：Returns all the actions whose names match a specified pattern Syntax： stm_r_an_name_of_an (char* pattern, int *status);
stm_r_an_synonym_of_an	Query：Actions whose synonyms match a given pattern Purpose：Returns all the actions whose synonyms match a specified pattern Syntax： stm_r_an_synonym_of_an (char* pattern, int *status);
stm_r_an_unresolved_an	Query：Unresolved actions Purpose：Returns the unresolved actions in the input list Syntax： stm_r_an_unresolved_an (stm_list in_list, int *status);

Input List Type: ch

stm_r_an_def_or_unres_in_ch	Query：Actions defined or unresolved in a given chart Purpose：Returns the actions that are explicitly defined or unresolved in the charts of the input list Syntax： stm_r_an_def_or_unres_in_ ch (stm_list in_list, int *status);
stm_r_an_defined_in_ch	Query：Actions defined in a given chart Purpose：Returns the actions that are explicitly defined in the charts of the input list Syntax： stm_r_an_defined_in_ch (stm_list in_list, int *status);
stm_r_an_unresolved_in_ch	Query：Actions unresolved in a given chart Purpose：Returns the actions that are unresolved in the charts of the input list Syntax： stm_r_an_unresolved_in_ch (stm_list in_list, int *status);

Actors (actor)

This section documents the query function that returns a list of actors.

Output List Type: actor

stm_r_actor_explicit_defined_actor	Query： Purpose：Extracts a list of elements from the input list that are explictly defined elements of the requested type Syntax： stm_r_actor_explicit_defined_actor (stm_list actor_list, int *status);

Output List Type: ch

stm_r_actor_defined_in_ch	Query：Actors of a given chart Purpose：Returns the actors of the charts in the input list Syntax： stm_r_actor_defined_in_ch (stm_list in_list, int *status);

Boundary Boxes (bb)

This section documents the query function that returns a list of boundary boxes.

Output List Type: bb

stm_r_bb_explicit_defined_bb	Query： Purpose：Extracts a list of elements from the input list that are explictly defined elements of the requested type Syntax： stm_r_bb_explicit_defined_bb (stm_list bb_list, int *status);

Output List Type: ch

stm_r_bb_defined_in_ch	Query：Boundary boxes of a given chart Purpose：Returns the boundary boxes of the charts in the input list Syntax： stm_r_bb_defined_in_ch (stm_list in_list, int *status);

Combinational Assignments (ca)

This section documents the query function that returns a list of combinational assignments.

Output List Type: mx

stm_r_ca_contained_in_mx	Syntax: stm_r_ca_contained_in_mx (stm_list mx_l, int *status);

Charts (ch)

This section documents the query functions that return a list of charts.

Input List Type: ac

stm_r_ch_define_ac	Query：Charts in which a given activity is defined Purpose：Returns the charts in which the activities in the input list are explicitly defined or unresolved Syntax： stm_r_ch_define_ac (stm_list in_list, int *status);
stm_r_ch_defining_ac	Query：Activity-charts defining a given activity Purpose：Returns the activity-charts that define the instance activities in the input list Syntax： stm_r_ch_defining_ac (stm_list in_list, int *status);
stm_r_ch_defining_cd_inst_ac	Query： Purpose： Syntax： stm_r_ch_defining_cd_inst_ac (stm_list in_list, int *status);
stm_r_ch_describing_ac	Query：Statecharts describing a given control activity Purpose：Returns the statecharts that describe the control activities in the input list Syntax： stm_r_ch_describing_ac (stm_list in_list, int *status);

Input List Type: an

stm_r_ch_define_an	Query：Charts in which a given action is defined Purpose：Returns the charts in which the actions in the input list are explicitly defined or unresolved Syntax： stm_r_ch_define_an (stm_list in_list, int *status);

Input List Type: ch

stm_r_ch_activitychart_ch	Query：Activity-charts Purpose：Returns the activity-charts in the input list Syntax： stm_r_ch_activitychart_ch (stm_list in_list, int *status);
stm_r_ch_ancestors_of_ch	Query：Ancestors of a given chart Purpose：Returns the ancestors (in the static structure) of the charts in the input list Syntax： stm_r_ch_ancestors_of_ch (stm_list in_list, int *status);
stm_r_ch_by_attributes_ch	Query：Chart by attribute Purpose：Returns the charts in the input list that match the specified attribute name and value Syntax： stm_r_ch_by_attributes_ch (stm_list in_list, char* attr_name, char* attr_value, int *status);
stm_r_ch_descendants_of_ch	Query：Descendants of a given chart Purpose：Returns the descendants (in the static structure) of the charts in the input list Syntax： stm_r_ch_descendants_of_ch (stm_list in_list, int *status);
stm_r_ch_dictionary_ch	Query：Global definition sets (GDSs) Purpose：Returns the GDSs in the input list Syntax： stm_r_ch_dictionary_ch (stm_list in_list, int *status);
stm_r_ch_explicit_defined_ch	Query：Charts explicitly defined Purpose：Returns the charts of the input list that were explicitly defined Syntax： stm_r_ch_explicit_defined_ch (stm_list in_list, int *status);

stm_r_ch_flowchart_ch	Query： Purpose： Syntax： stm_r_ch_flowchart_ch (stm_list in_list, int *status);
stm_r_ch_generic_ch	Query：Generic charts Purpose：Returns the generic charts in the input list Syntax： stm_r_ch_generic_ch (stm_list in_list, int *status);
stm_r_ch_modulechart_ch	Query：Module-charts Purpose：Returns the charts in the input list that are module-charts Syntax： stm_r_ch_modulechart_ch (stm_list in_list, int *status);
stm_r_ch_name_of_ch	Query：Charts whose names match a given pattern Purpose：Returns all the charts whose names match the specified pattern Syntax： stm_r_ch_name_of_ch (char* pattern, int *status);
stm_r_ch_offpage_ch	Query：Offpage charts Purpose：Returns the offpage charts in the input list Syntax： stm_r_ch_offpage_ch (stm_list in_list, int *status);
stm_r_ch_parent_ch	Query：Returns the parent charts of a given chart Purpose：Returns the parents (in the static structure) of the charts in the input list Syntax： stm_r_ch_parent_ch (stm_list in_list, int *status);
stm_r_ch_procedural_sch_ch	Query：Procedural statecharts Purpose：Returns the charts in the input list that are procedural statecharts Syntax： stm_r_ch_procedural_sch_ch (stm_list in_list, int *status);

stm_r_ch_referenced_all_by_ch	Query：Charts referenced in all levels by a given chart Purpose：Returns all charts referenced (instantiated) by all levels of charts in the input list Syntax： stm_r_ch_referenced_all_by_ch (stm_list in_list, int *status);
stm_r_ch_referenced_by_ch	Query：Charts referenced by a given chart Purpose：Returns all charts referenced (instantiated) by the charts in the input list Syntax： stm_r_ch_referenced_by_ch (stm_list in_list, int *status);
stm_r_ch_root_ch	Query：Root charts Purpose：Returns the root-level charts (that have no parent) in the input list Syntax： stm_r_ch_root_ch (stm_list in_list, int *status);
stm_r_ch_seq_diag_ch	Query： Purpose： Syntax： stm_r_ch_seq_diag_ch (stm_list in_list, int *status);
stm_r_ch_statechart_ch	Query：Statecharts Purpose：Returns the charts in the input list that are statecharts Syntax： stm_r_ch_statechart_ch (stm_list in_list, int *status);
stm_r_ch_subchart_ch	Query：Subchart of the specified chart Purpose：Returns the subcharts (in the static structure) of the charts in the input list Syntax： stm_r_ch_subchart_ch (stm_list in_list, int *status);
stm_r_ch_unresolved_ch	Query：Unresolved charts Purpose：Returns the unresolved charts (used but not defined) in the input list Syntax： stm_r_ch_unresolved_ch (stm_list in_list, int *status);

stm_r_ch_use_case_ch	Query： Purpose： Syntax： stm_r_ch_use_case_ch (stm_list in_list, int *status);
stm_r_ch_with_notes_ch	Query： Purpose： Syntax： stm_r_ch_with_notes_ch (stm_list in_list, int *status);

Input List Type: co

stm_r_ch_define_co	Query：Charts in which a given condition is defined Purpose：Returns the charts in which the conditions in the input list are explicitly defined or unresolved Syntax： stm_r_ch_define_co (stm_list in_list, int *status);

Input List Type: di

stm_r_ch_define_di	Query：Charts in which a given data-item is defined Purpose：Returns the charts in which the data-items in the input list are explicitly defined or unresolved Syntax： stm_r_ch_define_di (stm_list in_list, int *status);

Input List Type: ds

stm_r_ch_define_ds	Query：Charts in which a given data-store is defined Purpose：Returns the charts in which the data-stores in the input list are explicitly defined or unresolved Syntax： stm_r_ch_define_ds (stm_list in_list, int *status);

Input List Type: dt

stm_r_ch_define_dt	Query：Charts and GDSs in which a given user-defined type is defined Purpose：Returns the charts in which the user-defined types in the input list are explicitly defined or unresolved Syntax： stm_r_ch_define_dt (stm_list in_list, int *status);

Input List Type: ev

stm_r_ch_define_ev	Query：Charts in which a given event is defined Purpose：Returns the charts in which the events in the input list are explicitly defined or unresolved Syntax： stm_r_ch_define_ev (stm_list in_list, int *status));

Input List Type: fd

stm_r_ch_define_fd	Query：Charts and GDSs in which a given field is defined Purpose：Returns the charts in which the fields in the input list are defined (in a structured data-item or user-defined type) Syntax： stm_r_ch_define_fd (stm_list in_list, int *status);

Input List Type: if

stm_r_ch_define_if	Query：Charts in which a given information-flow is defined Purpose：Returns the charts in which the information-flows in the input list are explicitly defined or unresolved Syntax： stm_r_ch_define_if (stm_list in_list, int *status);

Input List Type: md

stm_r_ch_define_md	Query：Charts in which a given module is defined Purpose：Returns charts in which the modules in the input list are explicitly defined or unresolved Syntax： stm_r_ch_define_md (stm_list in_list, int *status);
stm_r_ch_defining_md	Query：Module-charts defining a given module Purpose：Returns the module-charts that define the instance modules in the input list Syntax： stm_r_ch_defining_md (stm_list in_list, int *status);
stm_r_ch_describing_md	Query：Activity-charts describing a given module Purpose：Returns the activity-charts that describe the modules in the input list Syntax： stm_r_ch_describing_md (stm_list in_list, int *status);

Input List Type: mx

stm_r_ch_define_mx	Query：Charts in which a given element is defined Purpose：Returns the charts in which the elements in the input list are explicitly defined Syntax： stm_r_ch_define_mx (stm_list in_list, int *status);
stm_r_ch_defining_mx	Query：Charts defining a given element Purpose：Returns the charts that define the elements in the input list Syntax： stm_r_ch_defining_mx (stm_list in_list, int *status);
stm_r_ch_describing_mx	Query：Statecharts describing a given control activity Purpose：Returns the charts that describe the elements in the input list Syntax： stm_r_ch_describing_mx (stm_list in_list, int *status);

Input List Type: nt

stm_r_ch_with_nt	Query：Charts in which a given note is defined Purpose：Returns the charts in which the notes in the input list are defined Syntax： stm_r_ch_with_nt (stm_list in_list, int *status);

Input List Type: router

stm_r_ch_define_router	Query：Charts in which a given router is defined Purpose：Returns the charts in which the routers in the input list are explicitly defined or unresolved Syntax： stm_r_ch_define_router (stm_list in_list, int *status);

Input List Type: sb

stm_r_ch_connected_to_sb	Query：Charts connected to a given subroutine Purpose：Returns the procedural Statecharts that are connected to the subroutines in the input list Syntax： stm_r_ch_connected_to_sb (stm_list in_list, int *status);
stm_r_sch_connected_to_sb	Query：Statecharts connected to a given subroutine Purpose：Returns the procedural Statecharts that are connected to the subroutines in the input list Syntax： stm_r_sch_connected_to_sb (stm_list in_list, int *status);
stm_r_fch_connected_to_sb	Query：Flowcharts connected to a given subroutine Purpose：Returns the Flowcharts that are connected to the subroutines in the input list Syntax： stm_r_fch_connected_to_sb (stm_list in_list, int *status);
stm_r_ch_define_sb	Query：Charts in which a given subroutine is defined Purpose：Returns the charts in which the subroutines in the input list are explicitly defined or unresolved Syntax： stm_r_ch_define_sb (stm_list in_list, int *status);

Input List Type: st

stm_r_ch_define_st	Query：Charts in which a given state is defined Purpose：Returns the charts in which the states in the input list are explicitly defined or unresolved Syntax： stm_r_ch_define_st (stm_list in_list, int *status);
stm_r_ch_defining_st	Query：Statecharts defining a given state Purpose：Returns the statecharts that define the instance states in the input list Syntax： stm_r_ch_defining_st (stm_list in_list, int *status);

Connectors (cn)

This section documents the queries that return a list of connectors.

Input List Type: ba

stm_r_cn_source_of_ba	Query：History connectors sources of a given transition Purpose：Returns the connectors that are sources of basic a-flow-lines in the input list Syntax： stm_r_cn_source_of_ba (stm_list in_list, int *status);
stm_r_cn_target_of_ba	Query：Termination or history connectors targets of a given transition Purpose：Returns the connectors that are targets of basic a-flow-lines in the input list Syntax： stm_r_cn_target_of_ba (stm_list in_list, int *status);

Input List Type: bm

stm_r_cn_source_of_bm	Query：History connectors sources of a given transition Purpose：Returns the connectors that are sources of basic m-flow-lines in the input list Syntax： stm_r_cn_source_of_bm (stm_list in_list, int *status);
stm_r_cn_target_of_bm	Query：Termination or history connectors targets of a given transition Purpose：Returns the connectors that are targets of basic m-flow-lines in the input list Syntax： stm_r_cn_target_of_bm (stm_list in_list, int *status);

Input List Type: bt

stm_r_cn_source_of_bt	Query：History connectors sources of a given transition Purpose：Returns the connectors that are sources of basic transitions in the input list Syntax： stm_r_cn_source_of_bt (stm_list in_list, int *status);
stm_r_cn_target_of_bt	Query：Termination or history connectors targets of a given transition Purpose：Returns the connectors that are targets of basic transitions in the input list Syntax： stm_r_cn_target_of_bt (stm_list in_list, int *status);

Input List Type: cn

stm_r_cn_deep_history_cn	Query：Deep history connectors Purpose：Returns all the deep history connectors in the input list Syntax： stm_r_cn_deep_history_cn (stm_list in_list, int *status);
stm_r_cn_history_cn	Query：History connectors Purpose：Returns all the history connectors in the input list Syntax： stm_r_cn_history_cn (stm_list in_list, int *status);
stm_r_cn_termination_cn	Query：Termination connectors Purpose：Returns all the history connectors in the input list Syntax： stm_r_cn_termination_cn (stm_list in_list, int *status);

Input List Type: st

• stm_r_cn_history_or_term_in_st	Query：Termination or history connectors in a given state Purpose：Returns the termination and history connectors contained in the states in the input list Syntax： stm_r_cn_history_or_term_in_st (stm_list in_list, int *status);
• stm_r_cn_in_st	Query：Connectors in a given state Purpose：Returns the connectors contained in the states in the input list Syntax： stm_r_cn_in_st (stm_list in_list, int *status);

Input List Type: tr

stm_r_cn_source_of_tr	Query：History connectors sources of a given transition Purpose：Returns the history connectors that are sources of transitions in the input list Syntax： stm_r_cn_source_of_tr (stm_list in_list, int *status);
stm_r_cn_target_of_tr	Query：Termination or history connectors targets of a given transition Purpose：Returns the termination and history connectors that are targets of transitions in the input list Syntax： stm_r_cn_target_of_tr (stm_list in_list, int *status);

Conditions (co)

This section documents the query functions that return a list of conditions.

Input List Type: af

stm_r_co_flowing_through_af	Query：Conditions flowing through a given a-flow-line Purpose：Returns the conditions actually flowing through a-flow-lines in the input list Syntax： stm_r_co_flowing_through_af (stm_list in_list, int *status);
stm_r_co_labeling_af	Query：Conditions labeling a given a-flow-line Purpose：Returns the conditions which label the a-flow-lines in the input list Syntax： stm_r_co_labeling_af (stm_list in_list, int *status);

Input List Type: ch

stm_r_co_def_or_unres_in_ch	Query：Conditions defined or unresolved in a given chart Purpose：Returns conditions that are explicitly defined or unresolved in the charts of the input list Syntax： stm_r_co_def_or_unres_in_ch (stm_list in_list, int *status);
stm_r_co_defined_in_ch	Query：Conditions defined in a given chart Purpose：Returns the conditions that are explicitly defined in the charts of the input list Syntax： stm_r_co_defined_in_ch (stm_list in_list, int *status);
stm_r_co_unresolved_in_ch	Query：Conditions unresolved in a given chart Purpose：Returns conditions that are unresolved in the charts of the input list Syntax： stm_r_co_unresolved_in_ch (stm_list in_list, int *status);

Input List Type: co

stm_r_co_array_co	Query：Conditions by subtype Purpose：Returns the conditions in the input list that are defined as array Syntax： stm_r_co_array_co (stm_list in_list, int *status);
stm_r_co_by_attributes_co	Query：Conditions by attributes Purpose：Returns the conditions in the input list that match the specified attribute name and value Syntax : stm_r_co_by_attributes_co (stm_list in_list, char* attr_name, char* attr_value, int *status);
stm_r_co_by_structure_type_co	Query：None Purpose：Returns the conditions in the input list that have the specified structure type (for example, single or array) Syntax： stm_r_co_by_structure_type_co (stm_list in_list, char structure_type, int *status);
stm_r_co_callback_binding_co	Query：Conditions with callback bindings Purpose：Returns the conditions of the input list that have callback bindings Syntax： stm_r_co_callback_binding_co (stm_list in_list, int *status);
stm_r_co_explicit_defined_co	Query：Conditions explicitly defined Purpose：Returns the conditions of the input list that were explicitly defined Syntax： stm_r_co_explicit_defined_co (stm_list in_list, int *status);
stm_r_co_name_of_co	Query：Conditions whose names match a given pattern Purpose：Returns all the conditions whose names match the specified pattern Syntax： stm_r_co_name_of_co (char* pattern, int *status);

stm_r_co_single_co	Query：Conditions by subtype Purpose：Returns the conditions in the input list that are defined as single Syntax： stm_r_co_single_co (stm_list in_list, int *status);
stm_r_co_synonym_of_co	Query：Conditions whose synonyms match a given pattern Purpose：Returns all the conditions whose synonyms match the specified pattern Syntax： stm_r_co_synonym_of_co (char* pattern, int *status);
stm_r_co_unresolved_co	Query：Unresolved conditions Purpose：Returns the unresolved conditions in the input list Syntax： stm_r_co_unresolved_co (stm_list in_list, int *status);

Input List Type: di

stm_r_co_contained_in_di	Query：Conditions contained in a given data-item Purpose：Returns the conditions contained in data-items from the input list (conditions appearing in the Consists of field of a data-item) Syntax： stm_r_co_contained_in_di (stm_list in_list, int *status);

Input List Type: if

stm_r_co_contained_in_if	Query：Conditions contained in a given information-flow Purpose：Returns the conditions contained in information-flows from the input list (conditions appearing in the Consists of field of an information-flow) Syntax： stm_r_co_contained_in_if (stm_list in_list, int *status);

Input List Type: mf

stm_r_co_flowing_through_mf	Query：Conditions flowing through a given m-flow-line Purpose：Returns the conditions actually flowing through m-flow-lines in the input list Syntax： stm_r_co_flowing_through_mf (stm_list in_list, int *status);
stm_r_co_labeling_mf	Query：Conditions labeling a given m-flow-line Purpose：Returns the conditions that label the m-flow-lines in the input list Syntax： stm_r_co_labeling_mf (stm_list in_list, int *status);

Data-Items (di)

This section documents the query functions that return a list of data-items.

Input List Type: af

stm_r_di_flowing_through_af	Query：Data-items flowing through a given a-flow-line Purpose：Returns the data-items actually flowing through a-flow-lines in the input list Syntax： stm_r_di_flowing_through_af (stm_list in_list, int *status);
stm_r_di_labeling_af	Query：Data-items labeling a given a-flow-line Purpose：Returns the data-items which label the a-flow-lines in the input list Syntax： stm_r_di_labeling_af (stm_list in_list, int *status);

Input List Type: ch

stm_r_di_def_or_unres_in_ch	Query：Data-items defined or unresolved in a given chart Purpose：Returns the data-items explicitly defined or unresolved in the charts of the input list Syntax： stm_r_di_def_or_unres_in_ch (stm_list in_list, int *status);
stm_r_di_defined_in_ch	Query：Data-items defined in a given chart Purpose：Returns the data-items explicitly defined in the charts of the input list Syntax： stm_r_di_defined_in_ch(stm_listin_list, int *status);
stm_r_di_unresolved_in_ch	Query：Data-items unresolved in a given chart Purpose：Returns the data-items that are unresolved in the charts of the input list Syntax： stm_r_di_unresolved_in_ch (stm_list in_list, int *status);

Input List Type: co

stm_r_di_containing_co	Query：Data-item containing a given condition Purpose：Returns the data-items containing the conditions in the input list (as defined in the Consists of field of the data-item's form) Syntax： stm_r_di_containing_co (stm_list in_list, int *status);

Input List Type: di

stm_r_di_array_di	Query：Data-items by subtype Purpose：Returns the data-items in the input list that are defined as array Syntax： stm_r_di_array_di (stm_list in_list, int *status);
stm_r_di_array_missing_di	Query：Array of data-items by subtype Purpose：Returns the arrays of data-items in the input list for which no type is defined Syntax： stm_r_di_array_missing_di (stm_list in_list, int *status);
stm_r_di_basic_di	Query：Basic data-items Purpose：Returns the data-items in the input list that are basic (not defined using other data-items) Syntax： stm_r_di_basic_di (stm_list in_list, int *status);
stm_r_di_bit_di	Query：Basic data-items Purpose：Returns the data-items in the input list that are defined as Bit in the Structure /Type field of the data-item form Syntax： stm_r_di_bit_di (stm_list in_list, int *status);
stm_r_di_bit_queue_di	Query：Data-items by subtype Purpose：Returns the data-items in the input list that are defined as queue of bits Syntax： stm_r_di_bit_queue_di (stm_list in_list, int *status);
stm_r_di_bits_array_di	Query：Data-items by subtype Purpose：Returns the data-items in the input list that are defined as array of bit array Syntax： stm_r_di_bits_array_di (stm_list in_list, int *status);

stm_r_di_bits_di	Query：Data-items by subtype Purpose：Returns the data-items in the input list that are defined as bit-array in the Structure /Type field of the data-item form Syntax： stm_r_di_bits_di (stm_list in_list, int *status);
stm_r_di_bits_queue_di	Query：Data-items by subtype Purpose：Returns the data-items in the input list that are defined as queue of bit array Syntax： stm_r_di_bits_queue_di (stm_list in_list, int *status);
stm_r_di_by_attributes_di	Query：Data-items by attributes Purpose：Returns the data-items in the input list that match the specified attribute name and value Syntax : stm_r_di_by_attributes_di (stm_list in_list, char* attr_name, char* attr_value, int *status);
stm_r_di_by_structure_type_di	Query：None Purpose：Returns the data-items in the input list that have a particular structure type (for example, single, array, or queue) Syntax : stm_r_di_by_structure_type_di (stm_list in_list, char structure_type, int *status);
stm_r_di_callback_binding_di	Query：Data-items with callback bindings Purpose：Returns the data-items of the input list that have callback bindings Syntax： stm_r_di_callback_binding_di (stm_list in_list, int *status);
stm_r_di_explicit_defined_di	Query：Data-items explicitly defined Purpose：Returns the data-items of the input list that were explicitly defined Syntax： stm_r_di_explicit_defined_di (stm_list in_list, int *status);

stm_r_di_integer_di	Query：Integer subtype Purpose：Returns the data-items in the input list that are defined as integer in the Structure /Type field of the data-item's form Syntax： stm_r_di_integer_di (stm_list in_list, int *status);
stm_r_di_integer_array_di	Query：Data-items by subtype Purpose：Returns the data-items in the input list that are defined as array of integer Syntax： stm_r_di_integer_array_di (stm_list in_list, int *status);
stm_r_di_integer_queue_di	Query：Data-items by subtype Purpose：Returns the data-items in the input list that are defined as queue of integer Syntax： stm_r_di_integer_queue_di (stm_list in_list, int *status);
stm_r_di_list_di	Query： Purpose： Syntax： stm_r_di_list_di (stm_list in_list, int *status);
stm_r_di_missing_di	Query：Data-item by subtype Purpose：Returns the data-items in the input list for which no type is defined Syntax： stm_r_di_missing_di (stm_list in_list, int *status);
stm_r_di_name_of_di	Query：Data-items whose names match a given pattern Purpose：Returns all the data-items whose names match the specified pattern Syntax： stm_r_di_name_of_di (char* pattern, int *status);
stm_r_di_parent_of_di	Query：Parent data-items of a given data-item Purpose：Returns the data-items containing the data-items from the input list (as defined in the Consists of field of the data-item's form) Syntax： stm_r_di_parent_of_di (stm_list in_list, int *status);

stm_r_di_queue_di	Query：Data-items by subtype Purpose：Returns the data-items in the input list that are defined as queue Syntax： stm_r_di_queue_di (stm_list in_list, int *status);
stm_r_di_queue_missing_di	Query：Queues of data-items by subtype Purpose：Returns the queues of data-items in the input list for which no type is defined Syntax： stm_r_di_queue_missing_di (stm_list in_list, int *status);
stm_r_di_real_di	Query：Real subtype Purpose：Returns the data-items from the input list that are defined as Real (Float) in the Structure /Type field of the data-item's form Syntax： stm_r_di_real_di (stm_list in_list, int *status);
stm_r_di_real_array_di	Query：Data-items by subtype Purpose：Returns the data-items in the input list that are defined as real Syntax： stm_r_di_real_array_di (stm_list in_list, int *status);
stm_r_di_real_queue_di	Query：Data-items by subtype Purpose：Returns the data-items in the input list that are defined as queue of real Syntax： stm_r_di_real_queue_di (stm_list in_list, int *status);
stm_r_di_record_array_di	Query：Data-items by subtype Purpose：Returns the data-items in the input list that are defined as array of record Syntax： stm_r_di_record_array_di (stm_list in_list, int *status);

stm_r_di_record_di	Query：Record subtype Purpose：Returns the data-items from the input list that are defined as Record in the Structure /Type field of the data-item's form Syntax： stm_r_di_record_di (stm_list in_list, int *status);
stm_r_di_single_di	Query：Data-items by subtype Purpose：Returns the data-items in the input list that are defined as single Syntax： stm_r_di_single_di (stm_list in_list, int *status);
stm_r_di_string_array_di	Query：Data-items by subtype Purpose：Returns the data-items in the input list that are defined as array of string Syntax： stm_r_di_string_array_di (stm_list in_list, int *status);
stm_r_di_string_di	Query：String subtype Purpose：Returns the data-items from the input list that are defined as String in the Structure /Type field of the data-item's form Syntax： stm_r_di_string_di (stm_list in_list, int *status);
stm_r_di_string_queue_di	Query：Data-items by subtype Purpose：Returns the data-items in the input list that are defined as queue of string Syntax： stm_r_di_string_queue_di (stm_list in_list, int *status);
stm_r_di_subdata_item_of_di	Query：Subdata-item of a given data-item Purpose：Returns the data-items that are components of data-items in the input list (as defined in the Consists of field of the data-item's form) Syntax： stm_r_di_subdata_item_of_ di (stm_list in_list, int *status);

stm_r_di_synonym_of_di	Query：Data-items whose synonyms match a given pattern Purpose：Returns all the data-items whose synonyms match the specified pattern Syntax： stm_r_di_synonym_of_di (char* pattern, int *status);
stm_r_di_union_array_di	Query：Data-items by subtype Purpose：Returns the data-items in the input list that are defined as array Syntax： stm_r_di_union_array_ di (stm_list in_list, int *status);
stm_r_di_union_di	Query：Data-items by subtype Purpose：Returns the data-items in the input list that are defined as union Syntax： stm_r_di_union_di (stm_list in_list, int *status);
stm_r_di_unresolved_di	Query：Unresolved data-items Purpose：Returns the unresolved data-items in the input list Syntax： stm_r_di_unresolved_di (stm_list in_list, int *status);
stm_r_di_user_type_di	Query：Data-items by subtype Purpose：Returns the data-items in the input list that are defined as user-defined type Syntax： stm_r_di_user_type_di (stm_list in_list, int *status);
stm_r_di_user_type_array_di	Query：Data-items by subtype Purpose：Returns the data-items in the input list that are defined as array of user-defined type Syntax： stm_r_di_user_type_array_ di (stm_list in_list, int *status);
stm_r_di_user_type_queue_di	Query：Data-items by subtype Purpose：Returns the data-items in the input list that are defined as queue of user-defined type Syntax： stm_r_di_user_type_queue_ di (stm_list in_list, int *status);

Input List Type: fd

stm_r_di_containing_fd	Query：Data-items containing a given field Purpose：Returns the data-items (records or unions) in which the fields in the input list are defined Syntax： stm_r_di_containing_fd (stm_list in_list, int *status);

Input List Type: if

stm_r_di_contained_in_if	Query：Data-items contained in a given information-flow Purpose：Returns the data-items contained in information-flow from the input list (as defined in the Consists of field of the information-flow's form) Syntax： stm_r_di_contained_in_if (stm_list in_list, int *status);

Input List Type: mf

stm_r_di_flowing_through_mf	Query：Data-items flowing through a given m-flow-line Purpose：Returns the data-items actually flowing through m-flow-lines in the input list Syntax： stm_r_di_flowing_through_mf (stm_list in_list, int *status);
stm_r_di_labeling_mf	Query：Data-items labeling a given m-flow-line Purpose：Returns the data-items which label the m-flow-lines in the input list Syntax： stm_r_di_labeling_mf (stm_list in_list, int *status);

Data-Stores (ds)

This section documents the query functions that return a list of data-stores.

Input List Type: ac

stm_r_ds_contained_in_ac	Query：Data-stores contained in a given activity Purpose：Returns the data-stores contained directly in activities from the input list Syntax： stm_r_ds_contained_in_ac (stm_list in_list, int *status);
stm_r_ds_in_ac	Query：Data-stores in a given activity Purpose：Returns the data-stores contained in the activities from the input list Syntax： stm_r_ds_in_ac (stm_list in_list, int *status);

Input List Type: af

stm_r_ds_target_of_af	Query：Data-stores that are targets of a given a-flow-line Purpose：Returns the data-stores that are targets of a-flow-lines in the input list Syntax： stm_r_ds_target_of_af (stm_list in_list, int *status);

Input List Type: ch

stm_r_ds_def_or_unres_in_ch	Query：Data-stores defined or unresolved in a given chart Purpose：Returns the data-stores that are explicitly defined or unresolved in the charts of the input list Syntax： stm_r_ds_def_or_unres_in_ch (stm_list in_list, int *status);
stm_r_ds_defined_in_ch	Query：Data-stores defined in a given chart Purpose：Returns the data-stores that are explicitly defined in the charts of the input list Syntax： stm_r_ds_defined_in_ch (stm_list in_list, int *status);
stm_r_ds_unresolved_in_ch	Query：Data-stores unresolved in a given chart Purpose：Returns the data-stores that are unresolved in the charts of the input list Syntax： stm_r_ds_unresolved_in_ch (stm_list in_list, int *status);

Input List Type: ds

stm_r_ds_by_attributes_ds	Query：Data-stores by attributes Purpose：Returns the data-stores in the input list that match a given attribute name and value Syntax stm_r_ds_by_attributes_ds (stm_list in_list, char* attr_name, char* attr_value, int *status);
stm_r_ds_explicit_defined_ds	Query：Data-stores explicitly defined Purpose：Returns the data-stores of the input list that were explicitly defined Syntax： stm_r_ds_explicit_defined_ds (stm_list in_list, int *status);
stm_r_ds_is_occurrence_of_ds	Query：Data-store occurrences of a given data-store Purpose：Returns the data-stores for which the data-stores in the input list appear in the Is Data-store field of their form Syntax： stm_r_ds_is_occurrence_of_ds (stm_list in_list, int *status);
stm_r_ds_is_principal_of_ds	Query：Principal data-stores of a given data-store Purpose：Returns the data-stores for which the data-stores in the input list appear in the Is Data-store field of their form Syntax： stm_r_ds_is_principal_of_ds (stm_list in_list, int *status);
stm_r_ds_name_of_ds	Query：Data-store whose names match a given pattern Purpose：Returns all the data-stores whose names match the specified pattern Syntax： stm_r_ds_name_of_ds (char* pattern, int *status);
stm_r_ds_synonym_of_ds	Query：Data-store whose synonyms match a given pattern Purpose：Returns all the data-stores whose synonyms match the specified pattern Syntax： stm_r_ds_synonym_of_ds (char* pattern, int *status);

stm_r_ds_unresolved_ds	Query：Unresolved data-stores Purpose：Returns the unresolved data-stores in the input list Syntax： stm_r_ds_unresolved_ds (stm_list in_list, int *status);

Input List Type: md

stm_r_ds_resides_in_md	Query：Data-stores residing in a given module. Purpose：Returns the data-stores residing in modules from the input list. The module appears in the Resides in Module field of the data-store's form. Syntax： stm_r_ds_resides_in_md (stm_list in_list, int *status);

User-Defined Types (dt)

This section documents the query functions that return a list of data-types.

Input List Type: ch

stm_r_dt_def_or_unres_in_ch	Query：User-defined types defined or unresolved in a given chart Purpose：Returns the user-defined types that are explicitly defined or unresolved in the charts in the input list Syntax： stm_r_dt_def_or_unres_in_ch (stm_list in_list, int *status);
stm_r_dt_defined_in_ch	Query：User-defined types defined in a given chart Purpose：Returns the user-defined types that are explicitly defined in the charts in the input list Syntax： stm_r_dt_defined_in_ch (stm_list in_list, int *status);
stm_r_dt_unresolved_in_ch	Query：User-defined types unresolved in a given chart Purpose：Returns the user-defined types that are unresolved in the charts in the input list Syntax： stm_r_dt_unresolved_in_ch (stm_list in_list, int *status);

Input List Type: dt

stm_r_dt_array_dt	Query：User-defined types by subtype Purpose：Returns the user-defined types in the input list that are defined as array Syntax： stm_r_dt_array_dt (stm_list in_list, int *status);
stm_r_dt_array_missing_dt	Query：Arrays of user-defined type by subtype Purpose：Returns the arrays of user-defined types in the input list for which no type is defined Syntax： stm_r_dt_array_missing_dt (stm_list in_list, int *status);
stm_r_dt_bit_dt	Query：User-defined types by subtype Purpose：Returns the user-defined types in the input list that are defined as bit Syntax： stm_r_dt_bit_dt (stm_list in_list, int *status);
stm_r_dt_bit_queue_dt	Query：User-defined types by subtype Purpose：Returns the user-defined types in the input list that are defined as queue of bit Syntax： stm_r_dt_bit_queue_dt (stm_list in_list, int *status);
stm_r_dt_bits_array_dt	Query：User-defined types by subtype Purpose：Returns the user-defined types in the input list that are defined as array of bit array Syntax： stm_r_dt_bits_array_dt (stm_list in_list, int *status);
stm_r_dt_bits_dt	Query：User-defined types by subtype Purpose：Returns the user-defined types in the input list that are defined as bit array Syntax： stm_r_dt_bits_dt (stm_list in_list, int *status);

stm_r_dt_bits_queue_dt	Query：User-defined types by subtype Purpose：Returns the user-defined types in the input list that are defined as queue of bit array Syntax： stm_r_dt_bits_queue_dt (stm_list in_list, int *status);
stm_r_dt_by_attributes_dt	Query：User-defined types by attribute Purpose：Returns the user-defined types in the input list that match a given attribute and value Syntax： stm_r_dt_by_attributes_dt (stm_list in_list, char* attr_name, char* attr_value, int *status);
stm_r_dt_by_structure_type_dt	Query：None Purpose：Returns the user-defined types in the input list that have a given structure type (for example, single, array or queue) Syntax： stm_r_dt_by_structure_type_dt (stm_list in_list, char structure_type, int *status);
stm_r_dt_condition_array_dt	Query：User-defined types by subtype Purpose：Returns the user-defined types in the input list that are defined as array of condition Syntax： stm_r_dt_condition_array_ dt (stm_list in_list, int *status);
stm_r_dt_condition_dt	Query：User-defined types by subtype Purpose：Returns the user-defend types in the input list that are defined as condition Syntax： stm_r_dt_condition_dt (stm_list in_list, int *status);
stm_r_dt_condition_queue_dt	Query：User-defined types by subtype Purpose：Returns the user-defined types in the input list that are defined as queue of condition Syntax： stm_r_dt_condition_queue_ dt (stm_list in_list, int *status);

stm_r_dt_enums_dt	Query：User-defined types defined as enumerated types Purpose：Returns the user-defined types in the input list that are defined as enumerated types Syntax： stm_r_dt_enums_dt (stm_list in_list, int *status);
stm_r_dt_explicit_defined_dt	Query：User-defined types explicitly defined Purpose：Returns the user-defined types in the input list that are explicitly defined Syntax： stm_r_dt_explicit_defined_dt (stm_list in_list, int *status);
stm_r_dt_integer_dt	Query：User-defined types by subtype Purpose：Returns the user-defined types in the input list that are defined as integer Syntax： stm_r_dt_integer_dt(stm_list in_list, int *status);
stm_r_dt_integer_array_dt	Query：User-defined types by subtype Purpose：Returns the user-defined types in the input list that are defined as array of integer Syntax： stm_r_dt_integer_array_dt (stm_list in_list, int *status);
stm_r_dt_integer_queue_dt	Query：User-defined types by subtype Purpose：Returns the user-defined types in the input list that are defined as queue of integer Syntax： stm_r_dt_integer_queue_dt (stm_list in_list, int *status);
stm_r_dt_missing_dt	Query：User-defined type by subtype Purpose：Returns the user-defined types in the input list for which no type is defined Syntax： stm_r_dt_missing_dt(stm_list in_list, int *status);
stm_r_dt_name_of_dt	Query：User-defined types whose names match a given pattern Purpose：Returns all user-defined types whose names match the specified pattern Syntax： stm_r_dt_name_of_dt (char* pattern, int *status);

stm_r_dt_queue_dt	Query：User-defined types by subtype Purpose：Returns the user-defined types in the input list that are defined as queue Syntax： stm_r_dt_queue_dt (stm_list in_list, int *status);
stm_r_dt_queue_missing_dt	Query：Queues of user-defined type by subtype Purpose：Returns the queues of user-defined types in the input list for which no type is defined Syntax： stm_r_dt_queue_missing_dt (stm_list in_list, int *status);
stm_r_dt_real_array_dt	Query：User-defined types by subtype Purpose：Returns the user-defined types in the input list that are defined as real Syntax： stm_r_dt_real_array_dt (stm_list in_list, int *status);
stm_r_dt_real_dt	Query：User-defined types by subtype Purpose：Returns the user-defined types in the input list that are defined as real Syntax： stm_r_dt_real_dt (stm_list in_list, int *status);
stm_r_dt_real_queue_dt	Query：User-defined types by subtype Purpose：Returns the user-defined types in the input list that are defined as queue of real Syntax： stm_r_dt_real_queue_dt (stm_list in_list, int *status);
stm_r_dt_record_array_dt	Query：User-defined types by subtype Purpose：Returns the user-defined types in the input list that are defined as array of record Syntax： stm_r_dt_record_array_dt (stm_list in_list, int *status);
stm_r_dt_record_dt	Query：User-defined types by subtype Purpose：Returns the user-defined types in the input list that are defined as record Syntax： stm_r_dt_record_dt (stm_list in_list, int *status);

stm_r_dt_single_dt	Query：User-defined types by subtype Purpose：Returns the user-defined types in the input list that are defined as single Syntax： stm_r_dt_single_dt (stm_list in_list, int *status);
stm_r_dt_string_array_dt	Query：User-defined types by subtype Purpose：Returns the user-defined types in the input list that are defined as array of string Syntax： stm_r_dt_string_array_dt (stm_list in_list, int *status);
stm_r_dt_string_dt	Query：User-defined types by subtype Purpose：Returns the user-defined types in the input list that are defined as string Syntax： stm_r_dt_string_dt (stm_list in_list, int *status);
stm_r_dt_string_queue_dt	Query：User-defined types by subtype Purpose：Returns the user-defined types in the input list that are defined as queue of string Syntax： stm_r_dt_string_queue_dt (stm_list in_list, int *status);
stm_r_dt_synonym_of_dt	Query：User-defined types whose synonyms match a given pattern Purpose：Returns all user-defined types whose synonyms match the specified pattern Syntax : stm_r_dt_synonym_of_dt (char* pattern, int *status);
stm_r_dt_union_dt	Query：User-defined type by subtype Purpose：Returns the user-defined types in the input list that are defined as union Syntax： stm_r_dt_union_dt (stm_list in_list, int *status);
stm_r_dt_union_array_dt	Query：User-defined type by subtype Purpose：Returns the user-defined types in the input list that are defined as array of union Syntax： stm_r_dt_union_array_dt(stm_listin_list, int *status);

stm_r_dt_unresolved_dt	Query：Unresolved user-defined types Purpose：Returns the unresolved user-defined types in the input list Syntax： stm_r_dt_unresolved_dt (stm_list in_list, int *status);
stm_r_dt_user_type_array_dt	Query：User-defined types by subtype Purpose：Returns the user-defined types in the input list that are defined as array of another user-defined type Syntax： stm_r_dt_user_type_array_ dt (stm_list in_list, int *status);
stm_r_dt_user_type_dt	Query：User-defined types by subtype Purpose：Returns the user-defined types in the input list that are defined as other user-defined type Syntax： stm_r_dt_user_type_dt (stm_list in_list, int *status);
stm_r_dt_user_type_queue_dt	Query：User-defined types by subtype Purpose：Returns the user-defined types in the input list that are defined as queue of another user-defined type Syntax： stm_r_dt_user_type_queue_ dt (stm_list in_list, int *status);

Input List Type: fd

stm_r_dt_containing_fd	Query：User-defined types containing a given field Purpose：Returns the user-defined types (records or unions), in which the fields in the input list are defined Syntax： stm_r_dt_containing_fd (stm_list in_list, int *status);

Events (ev)

This section documents the query functions that return a list of events.

Input List Type: af

stm_r_ev_flowing_through_af	Query：Events flowing through the specified a-flow-line Purpose：Returns the events actually flowing through a-flow-lines in the input list Syntax： stm_r_ev_flowing_through_ af (stm_list in_list, int *status);
stm_r_ev_labeling_af	Query：Events labeling a given a-flow-line Purpose：Returns the events that label the a-flow-lines in the input list Syntax： stm_r_ev_labeling_af (stm_list in_list, int *status);

Input List Type: ch

stm_r_ev_def_or_unres_in_ch	Query：Events defined or unresolved in a given chart Purpose：Returns the events that are explicitly defined or unresolved in the charts of the input list Syntax： stm_r_ev_def_or_unres_in_ ch (stm_list in_list, int *status);
stm_r_ev_defined_in_ch	Query：Events defined in a given chart Purpose：Returns the events that are explicitly defined in the charts of the input list Syntax： stm_r_ev_defined_in_ch (stm_list in_list, int *status);
stm_r_ev_unresolved_in_ch	Query：Events unresolved in a given chart Purpose：Returns the events that are unresolved in the charts of the input list Syntax： stm_r_ev_unresolved_in_ch (stm_list in_list, int *status);

Input List Type: ev

stm_r_ev_array_ev	Query：Events by subtype Purpose：Returns the events in the input list that are defined as array Syntax： stm_r_ev_array_ev (stm_list in_list, int *status);
stm_r_ev_by_attributes_ev	Query：Events by attributes Purpose：Returns the events in the input list that match the specified attribute name and value Syntax： stm_r_ev_by_attributes_ev (stm_list in_list, char* attr_name, char* attr_value, int *status);
stm_r_ev_by_structure_type_ev	Query：None Purpose：Returns the events in the input list that have the specified structure type (for example, single or array) Syntax： stm_r_ev_by_structure_type_ev (stm_list in_list, char structure_type, int *status);
stm_r_ev_callback_binding_ev	Query：Events with callback bindings Purpose：Returns the events in the input list that have callback bindings Syntax： stm_r_ev_callback_binding_ev (stm_list in_list, int *status);
stm_r_ev_explicit_defined_ev	Query：Events explicitly defined Purpose：Returns the events of the input list that were explicitly defined Syntax： stm_r_ev_explicit_defined_ev (stm_list in_list, int *status);
stm_r_ev_name_of_ev	Query：Events whose names match a given pattern Purpose：Returns all the events whose names match the specified pattern Syntax： stm_r_ev_name_of_ev (char* pattern, int *status);

stm_r_ev_single_ev	Query：Events by subtype Purpose：Returns the events in the input list that are defined as single Syntax： stm_r_ev_single_ev (stm_list in_list, int *status);
stm_r_ev_synonym_of_ev	Query：Events whose synonyms match a given pattern Purpose：Returns all the events whose synonyms match the specified pattern Syntax： stm_r_ev_synonym_of_ev (char* pattern, int *status);
stm_r_ev_unresolved_ev	Query：Unresolved events Purpose：Returns the unresolved events in the input list Syntax： stm_r_ev_unresolved_ev (stm_list in_list, int *status);

Input List Type: if

stm_r_ev_contained_in_if	Query：Events contained in a given information-flow Purpose：Returns the events contained in information-flows from the input list (events used in the Consists of field of the information-flow's form) Syntax： stm_r_ev_contained_in_if (stm_list in_list, int *status);

Input List Type: mf

stm_r_ev_flowing_through_mf	Query：Events flowing through a given m-flow-line Purpose：Returns the events actually flowing through m-flow-lines from the input list Syntax： stm_r_ev_flowing_through_ f (stm_list in_list, int *status);
stm_r_ev_labeling_mf	Query：Events labeling a given m-flow-line Purpose：Returns the events that label the m-flow-lines in the input list Syntax： stm_r_ev_labeling_mf (stm_list in_list, int *status);

Fields (fd)

This section documents the queries that return a list of fields.

Input List Type: ch

stm_r_fd_defined_in_ch	Query：Fields defined in a given chart Purpose：Returns the fields that are part of the structured data-items in the input list Syntax： stm_r_fd_defined_in_ch (stm_list in_list, int *status);

Input List Type: di

stm_r_fd_contained_in_di	Query：Fields by subtype Purpose：Returns the fields in the input list that are defined as array Syntax： stm_r_fd_contained_in_di (stm_list in_list, int *status);

Input List Type: dt

stm_r_fd_contained_in_dt	Query：Fields contained in user-defined type (UDT) Purpose：Returns the fields that are part of the structured UDTs in the input list Syntax： stm_r_fd_contained_in_dt (stm_list in_list, int *status);

Input List Type: fd

stm_r_fd_array_fd	Query：Fields by subtype Purpose：Returns the fields in the input list that are defined as array Syntax： stm_r_fd_array_fd (stm_list in_list, int *status);
stm_r_fd_array_missing_fd	Query：Array of fields by subtype Purpose：Returns the array of fields in the input list for which no type is defined Syntax： stm_r_fd_array_missing_fd (stm_list in_list, int *status);
stm_r_fd_bit_fd	Query：Fields by subtype Purpose：Returns the fields in the input list that are defined as bit Syntax： stm_r_fd_bit_fd (stm_list in_list, int *status);
stm_r_fd_bit_queue_fd	Query：Fields by subtype Purpose：Returns the fields in the input list that are defined as queue of bit Syntax： stm_r_fd_bit_queue_fd (stm_list in_list, int *status);
stm_r_fd_bits_array_fd	Query：Fields by subtype Purpose：Returns the fields in the input list that are defined as bit array Syntax： stm_r_fd_bits_array_fd (stm_list in_list, int *status);
stm_r_fd_bits_fd	Query：Fields by subtype Purpose：Returns the fields in the input list that are defined as bit array Syntax： stm_r_fd_bits_fd (stm_list in_list, int *status);

stm_r_fd_bits_queue_fd	Query：Fields by subtype Purpose：Returns the fields in the input list that are defined as queue of bit array Syntax： stm_r_fd_bits_queue_fd (stm_list in_list, int *status);
stm_r_fd_by_attributes_fd	Query：Fields by attribute Purpose：Returns the fields in the input list that match the specified attribute and value Syntax : stm_r_fd_by_attributes_fd (stm_list in_list, char* attr_name, char* attr_value, int *status);
stm_r_fd_by_structure_type_fd	Query：None Purpose：Returns the fields in the input list that have the specified structure type (for example, single or array) Syntax： stm_r_fd_by_structure_type_fd (stm_list in_list, char structure_type, int *status);
stm_r_fd_condition_fd	Query：Fields by subtype Purpose：Returns the fields in the input list that are defined as condition Syntax： stm_r_fd_condition_fd (stm_list in_list, int *status);
stm_r_fd_condition_array_fd	Query：Fields by subtype Purpose：Returns the fields in the input list that are defined as array of condition Syntax： stm_r_fd_condition_array_ fd (stm_list in_list, int *status);
stm_r_fd_condition_queue_fd	Query：Fields by subtype Purpose：Returns the fields in the input list that are defined as queue of condition Syntax： stm_r_fd_condition_ queue_fd (stm_list in_list, int *status);
stm_r_fd_explicit_defined_fd	Query：Fields explicitly defined Purpose：Returns the fields in the input list that are explicitly defined Syntax： stm_r_fd_explicit_defined_fd (stm_list in_list, int *status);

stm_r_fd_integer_array_fd	Query：Fields by subtype Purpose：Returns the fields in the input list that are defined as array of integer Syntax： stm_r_fd_integer_array_fd (stm_list in_list, int *status);
stm_r_fd_integer_fd	Query：Fields by subtype Purpose：Returns the fields in the input list that are defined as integer Syntax： stm_r_fd_integer_fd (stm_list in_list, int *status);
stm_r_fd_integer_queue_fd	Query：Fields by subtype Purpose：Returns the fields in the input list that are defined as queue of integer Syntax： stm_r_fd_integer_queue_fd (stm_list in_list, int *status);
stm_r_fd_missing_fd	Query：Fields by subtype Purpose：Returns the fields in the input list for which no type is defined Syntax： stm_r_fd_missing_fd (stm_list in_list, int *status);
stm_r_fd_name_of_fd	Query：Fields whose names match a given pattern Purpose：Returns all fields whose name matches the specified pattern Syntax： stm_r_fd_name_of_fd (char* pattern, int *status);
stm_r_fd_queue_fd	Query：Fields by subtype Purpose：Returns the fields in the input list that are defined as queue Syntax： stm_r_fd_queue_fd (stm_list in_list, int *status);
stm_r_fd_queue_missing_fd	Query：Queues of field by subtype Purpose：Returns the queues of fields in the input list for which no type is defined Syntax： stm_r_fd_queue_missing_fd (stm_list in_list, int *status);

stm_r_fd_real_array_fd	Query：Fields by subtype Purpose：Returns the fields in the input list that are defined as array of real Syntax： stm_r_fd_real_array_fd (stm_list in_list, int *status);
stm_r_fd_real_fd	Query：Fields by subtype Purpose：Returns the fields in the input list that are defined as real Syntax： stm_r_fd_real_fd (stm_list in_list, int *status);
stm_r_fd_real_queue_fd	Query：Fields by subtype Purpose：Returns the fields in the input list that are defined as queue of real Syntax： stm_r_fd_real_queue_fd (stm_list in_list, int *status);
stm_r_fd_single_fd	Query：Fields by subtype Purpose：Returns the fields in the input list that are defined as single Syntax： stm_r_fd_single_fd (stm_list in_list, int *status);
stm_r_fd_string_array_fd	Query：Fields by subtype Purpose：Returns the fields in the input list that are defined as array of string Syntax： stm_r_fd_string_array_fd (stm_list in_list, int *status);
stm_r_fd_string_fd	Query：Fields by subtype Purpose：Returns the fields in the input list that are defined as string Syntax： stm_r_fd_string_fd (stm_list in_list, int *status);
stm_r_fd_string_queue_fd	Query：Fields by subtype Purpose：Returns the fields in the input list that are defined as queue of string Syntax： stm_r_fd_string_queue_fd (stm_list in_list, int *status);

stm_r_fd_user_type_array_fd	Query：Fields by subtype Purpose：Returns the fields in the input list that are defined as array of user-defined type Syntax： stm_r_fd_user_type_array_ fd (stm_list in_list, int *status);
stm_r_fd_user_type_fd	Query：Fields by subtype Purpose：Returns the fields in the input list that are defined as user-defined type Syntax： stm_r_fd_user_type_fd (stm_list in_list, int *status);
stm_r_fd_user_type_queue_fd	Query：Fields by subtype Purpose：Returns the fields in the input list that are defined as queue of user-defined type Syntax： stm_r_fd_user_type_queue_ fd (stm_list in_list, int *status);

Input List Type: mx

stm_r_fd_contained_in_mx	Query：Fields contained in a given element Purpose：Returns the fields that are part of the structured elements (data-items and user-defined types) in the input list Syntax： stm_r_fd_contained_in_mx (stm_list in_list, int *status);

Functions (fn)

This section documents the queries that return a list of functions.

Input List Type: ch

stm_r_fn_name_of_fn	Query：Function names that match a given pattern Purpose：Returns all the functions whose names match the specified pattern Syntax： stm_r_fn_name_of_fn (char* pattern, int *status);
stm_r_fn_unresolved_in_ch	Query：Functions unresolved in a given chart Purpose：Returns the functions that are unresolved in the charts of the input list Syntax : stm_r_fn_unresolved_in_ch (stm_list in_list, int *status);

Information-Flows (if)

This section documents the queries that return a list of information-flows.

Input List Type: af

stm_r_if_basic_flowing_af	Query：Basic information-flows flowing through a given a-flow-line. Purpose：Returns information-flows that are not decomposed to other information items, and are flowing through a-flow-lines in the input list. Syntax： stm_r_if_basic_flowing_af (stm_list in_list, int *status);
stm_r_if_flowing_through_af	Query：Information-flows flowing through a given a-flow-line. Purpose：Returns the information-flows flowing through a-flow-lines in the input list. Note：This function returns the highest information-flows, as opposed to stm_r_if_basic_ flowing_af, which returns the lowest level. Syntax： stm_r_if_flowing_through_ af (stm_list in_list, int *status);
stm_r_if_labeling_af	Query：Information-flows labeling a given a-flow-line. Purpose：Returns the information-flows that label a-flow-lines in the input list. Syntax： stm_r_if_labeling_af (stm_list in_list, int *status);

Input List Type: ch

stm_r_if_def_or_unres_in_ch	Query：Information-flows defined or unresolved in a given chart Purpose：Returns the information-flows that are explicitly defined or unresolved in the charts of the input list Syntax： stm_r_if_def_or_unres_in_ ch (stm_list in_list, int *status);
stm_r_if_defined_in_ch	Query：Information-flows defined in a given chart Purpose:Returns the information-flows that are explicitly defined in the charts of the input list Syntax： stm_r_if_defined_in_ch (stm_list in_list, int *status);
stm_r_if_unresolved_in_ch	Query：Information-flows unresolved in a given chart Purpose：Returns the information-flows that are unresolved in the charts of the input list Syntax： stm_r_if_unresolved_in_ch (stm_list in_list, int *status);

Input List Type: co

stm_r_if_containing_co	Query：Information-flows containing a given condition Purpose：Returns the information-flows containing conditions from the input list (conditions appearing in the Consists of field of the information-flow's form) Syntax： stm_r_if_containing_co (stm_list in_list, int *status);

Input List Type: di

stm_r_if_containing_di	Query : Information-flows containing a given data-item Purpose : Returns the information-flows containing data-items from the input list (data-items appearing in the Consists of field of the information-flow's form) Syntax : stm_r_if_containing_di (stm_list in_list, int *status);

Input List Type: ev

stm_r_if_containing_ev	Query : Information-flows containing a given event Purpose : Returns the information-flows containing events from the input list (events appearing in the Consists of field of the information-flow's form) Syntax : stm_r_if_containing_ev (stm_list in_list, int *status);

Input List Type: if

stm_r_if_basic_if	Query：Basic information-flows Purpose：Returns the information-flows in the input list that are basic (those not defined using other information-flows) Syntax： stm_r_if_basic_if (stm_list in_list, int *status);
stm_r_if_by_attributes_if	Query：Information-flows by attributes Purpose：Returns the information-flows in the input list that match a particular attribute name and value Syntax： stm_r_if_by_attributes_if (stm_list in_list, char* attr_name, char* attr_value, int *status);
stm_r_if_contained_in_if	Query：Information-flows contained in a given information-flow Purpose：Returns the information-flows that are contained in information-flows from the input list (as defined in the Consists of field) Syntax： stm_r_if_contained_in_if (stm_list in_list, int *status);
stm_r_if_containing_if	Query：Information-flows containing a given information-flow Purpose：Returns the information-flows that contain information-flows from the input list (as defined in the Consists of field) Syntax： stm_r_if_containing_if (stm_list in_list, int *status);
stm_r_if_explicit_defined_if	Query：Information-flows explicitly defined Purpose：Returns the information-flows of the input list that were explicitly defined Syntax： stm_r_if_explicit_defined_if (stm_list in_list, int *status);

stm_r_if_name_of_if	Query：Information-flow names that match a given pattern Purpose：Returns all the information-flows whose names match the specified pattern Syntax： stm_r_if_name_of_if (char* pattern, int *status);
stm_r_if_synonym_of_if	Query：Information-flow synonyms that match a given pattern Purpose：Returns all the information-flows whose synonyms match the specified pattern Syntax： stm_r_if_synonym_of_if (char* pattern, int *status);
stm_r_if_unresolved_if	Query：Unresolved information-flows Purpose：Returns the unresolved information-flows in the input list Syntax： stm_r_if_unresolved_if (stm_list in_list, int *status);

Input List Type: mf

stm_r_if_basic_flowing_mf	Query：Basic information-flows flowing through a given m-flow-line. Purpose：Returns the information-flows that are not decomposed to other information items and are flowing through m-flow-lines in the input list. Syntax： stm_r_if_basic_flowing_mf (stm_list in_list, int *status);
stm_r_if_flowing_through_mf	Query：Information-flows flowing through a given m-flow-line. Purpose：Returns the information-flow flowing through m-flow-lines in the input list. Note：This function returns the highest information-flows as opposed to stm_r_if_basic_flowing_mf , which returns the lowest level. Syntax： stm_r_if_flowing_through_ mf (stm_list in_list, int *status);
stm_r_if_labeling_mf	Query：Information-flows labeling a given m-flow-line. Purpose：Returns the information-flow labeling m-flow-lines in the input list. Syntax： stm_r_if_labeling_mf (stm_list in_list, int *status);

M-Flow-Lines (bf, lmf, mf)

This section documents the queries that return a list of m-flow-lines. The types are as follows:

- bf —Basic m-flow-lines
- lmf —Local m-flow-lines
- mf—Global (compound) m-flow-lines

Output List Type: bf

Input List Type: co

stm_r_bf_within_flows_co	Query：A-flow-lines through which a given condition flows Purpose：Returns the a-flow-lines through which conditions from the input list actually flow Syntax： stm_r_af_within_flows_co (stm_list in_list, int *status);
stm_r_bf_within_labels_co	Query：A-flow-lines labeled by a given condition Purpose：Returns the a-flow-lines labeled with conditions in the input list Syntax： stm_r_af_within_labels_co (stm_list in_list, int *status);

Input List Type: di

stm_r_bf_within_flows_di	Query：A-flow-lines through which a given data-item flows Purpose：Returns the a-flow-lines through which data-items from the input list actually flow Syntax： stm_r_af_within_flows_di (stm_list in_list, int *status);
stm_r_bf_within_labels_di	Query：A-flow-lines labeled by a given data-item Purpose：Returns the a-flow-lines labeled with data-items in the input list Syntax： stm_r_af_within_labels_di (stm_list in_list, int *status);

Input List Type: ev

stm_r_bf_within_flows_ev	Query：A-flow-lines through which a given event flows Purpose：Returns the a-flow-lines through which events from the input list actually flow Syntax： stm_r_bf_within_flows_ev (stm_list in_list, int *status);
stm_r_bf_within_labels_ev	Query：A-flow-lines labeled by a given event Purpose：Returns the a-flow-lines labeled with events in the input list Syntax： stm_r_bf_within_labels_ev (stm_list in_list, int *status);

Input List Type: if

stm_r_bf_within_flows_if	Query：A-flow-lines through which a given information-flow flows Purpose：Returns the a-flow-lines through which information-flows from the input list actually flow Syntax： stm_r_bf_within_flows_if (stm_list in_list, int *status);
stm_r_bf_within_labels_if	Query：A-flow-lines labeled by a given information-flow Purpose：Returns the a-flow-lines labeled with information-flows in the input list Syntax： stm_r_bf_within_labels_if (stm_list in_list, int *status);

Input List Type: mx

stm_r_bf_from_source_mx	Query：A-flow-lines whose source is a given element Purpose：Returns basic a-flow-lines that originate at elements in the input list Syntax： stm_r_af_from_source_mx(stm_listin_list, int *status);
stm_r_bf_to_target_mx	Query：A-flow-lines whose target is a given element Purpose：Returns the basic a-flow-lines whose target is an element from the input list Syntax： stm_r_bf_to_target_mx (stm_list in_list, int *status);
stm_r_bf_within_flows_mx	Query：A-flow-lines through which a given element flows Purpose：Returns the a-flow-lines through which elements from the input list actually flow Syntax： stm_r_af_within_flows_mx (stm_list in_list, int *status);
stm_r_bf_within_labels_mx	Query：A-flow-lines labeled by a given elements Purpose：Returns the a-flow-lines labeled with elements in the input list Syntax： stm_r_af_within_labels_mx (stm_list in_list, int *status);

Output List Type: lmf

Input List Type: md

stm_r_lmf_from_source_md	Query：M-flow-lines whose source is a given module within chart Purpose：Returns the local compound m-flow-lines (those within charts) whose source is a module from the input list Syntax： stm_r_lmf_from_source_md (stm_list in_list, int *status);
stm_r_lmf_input_to_md	Query：M-flow-lines input to a given module within the chart Purpose：Returns all the local compound m-flow-lines that originate outside and terminate at (or inside) modules in the input list Syntax： stm_r_lmf_input_to_md (stm_list in_list, int *status);
stm_r_lmf_output_from_md	Query：M-flow-lines output from a given module within that chart Purpose：Returns all the local compound m-flow-lines that originate at (or inside) and terminate outside modules in the input list Syntax： stm_r_lmf_output_from_md (stm_list in_list, int *status);
stm_r_lmf_to_target_md	Query：M-flow-lines whose target is a given module Purpose：Returns the local m-flow-lines whose target is a module from the input list Syntax： stm_r_lmf_to_target_md (stm_list in_list, int *status);

Input List Type: mf

stm_r_lmf_contained_in_mf	Query：None Purpose：Returns the local m-flow-lines that contain the global m-flow-lines in the input list Syntax： stm_r_lmf_contained_in_mf (stm_list l, int *status);

Output List Type: mf

Input List Type: co

stm_r_mf_within_flows_co	Query：M-flow-lines through which a given condition flows Purpose：Returns the m-flow-lines through which conditions from the input list actually flow Syntax： stm_r_mf_within_flows_co (stm_list in_list, int *status);
stm_r_mf_within_labels_co	Query：M-flow-lines labeled by a given condition Purpose：Returns the m-flow-lines that are labeled by the conditions in the input list Syntax： stm_r_mf_within_labels_co (stm_list in_list, int *status);

Input List Type: di

stm_r_mf_within_flows_di	Query：M-flow-lines through which a given data-item flows Purpose：Returns the m-flow-lines through which data-items from the input list actually flow Syntax： stm_r_mf_within_flows_di (stm_list in_list, int *status);
stm_r_mf_within_labels_di	Query：M-flow-lines labeled by a given data-item Purpose：Returns the m-flow-lines that are labeled by the data-items in the input list Syntax： stm_r_mf_within_labels_di (stm_list in_list, int *status);

Input List Type: ev

stm_r_mf_within_flows_ev	Query：M-flow-lines through which a given event flows Purpose：Returns the m-flow-lines through which events from the input list actually flow Syntax： stm_r_mf_within_flows_ev (stm_list in_list, int *status);
stm_r_mf_within_labels_ev	Query：M-flow-lines labeled by a given event Purpose：Returns the m-flow-lines that are labeled by the events in the input list Syntax： stm_r_mf_within_labels_ev (stm_list in_list, int *status);

Input List Type: if

stm_r_mf_within_flows_if	Query：M-flow-lines through which a given information-flow flows Purpose：Returns the m-flow-lines through which information-flows from the input list actually flow Syntax： stm_r_mf_within_flows_if (stm_list in_list, int *status);
stm_r_mf_within_labels_if	Query：M-flow-lines labeled with a given information-flow Purpose：Returns the m-flow-lines that are labeled with information-flows in the input list Syntax： stm_r_mf_within_labels_if (stm_list in_list, int *status);

Input List Type: lmf

stm_r_mf_containing_lm	Query：None Purpose：Returns the global m-flow-lines (which might spread over several charts) that contain the local m-flow-lines (those within charts) in the input list Syntax： stm_r_mf_containing_lmf (stm_list l, int *status);
stm_r_mf_containing_lmf	Query：None Purpose：Returns the global m-flow-lines (which might spread over several charts) that contain the local m-flow-lines (those within charts) in the input list Syntax： stm_r_mf_containing_lmf (stm_list l, int *status);

Input List Type: md

stm_r_mf_from_source_md	Query：M-flow-lines whose source is a given module Purpose：Returns the global compound m-flow-lines (those that might spread over several charts) whose source is a module from the input list Syntax： stm_r_mf_from_source_md(stm_listin_list, int *status));
stm_r_mf_input_to_md	Query：M-flow-lines input to a given module Purpose：Returns all the global compound m-flow-lines that originate outside and terminate at (or inside) modules in the input list Syntax： stm_r_mf_input_to_md (stm_list in_list, int *status);
stm_r_mf_output_from_md	Query：M-flow-lines output from a given module Purpose：Returns all the global compound m-flow-lines that originate at (or inside) and terminate outside modules in the input list Syntax： stm_r_mf_output_from_md(stm_listin_list, int *status);

stm_r_mf_to_target_md	Query：M-flow-lines whose target is a given module Purpose：Returns the global compound m-flow-lines whose target is a module from the input list Syntax： stm_r_mf_to_target_md (stm_list in_list, int *status);
stm_r_lmf_to_target_md	Query：M-flow-lines whose target is a given module Purpose：Returns the local compound m-flow-lines whose target is a module from the input list Syntax： stm_r_lmf_to_target_md (stm_list in_list, int *status);

Input List Type: mx

stm_r_mf_within_flows_mx	Query：M-flow-lines through which a given element flows Purpose：Returns the m-flow-lines through which elements from the input list actually flow Syntax： stm_r_mf_within_flows_mx (stm_list in_list, int *status);
stm_r_mf_within_labels_mx	Query：M-flow-lines that are labeled by a given information-flow Purpose：Returns the m-flow-lines that are labeled with elements in the input list Syntax： stm_r_mf_within_labels_mx (stm_list in_list, int *status);

Modules (md)

This section documents the queries that return a list of modules.

Input List Type: ac

stm_r_md_carrying_out_ac	Query：Modules carrying out a given activity. Purpose：Returns the modules carrying out activities in the input list. The modules appear in the Implemented by Module field of an activity's form. Syntax： stm_r_md_carrying_out_ac (stm_list in_list, int *status);

Input List Type: ch

stm_r_md_def_or_unres_in_ch	Query：Modules defined or unresolved in a given chart Purpose：Returns the modules that are explicitly defined or unresolved in the charts of the input list Syntax： stm_r_md_def_or_unres_in ch (stm_list in_list, int *status);
stm_r_md_defined_in_ch	Query：Modules defined in a given chart Purpose：Returns the modules that are explicitly defined in the charts of the input list Syntax： stm_r_md_defined_in_ch (stm_list in_list, int *status);
stm_r_md_described_by_ch	Query：Modules described by a given activity-chart Purpose：Returns the modules described by activity-charts in the input list Syntax： stm_r_md_described_by_ch (stm_list in_list, int *status);

stm_r_md_instance_of_ch	Query：Modules instance of a given chart Purpose：Returns the instance modules defined by the charts in the input list Syntax： stm_r_md_instance_of_ch (stm_list in_list, int *status);
stm_r_md_root_in_ch	Query：Root modules of a given chart Purpose：Returns the internally defined modules (of type diagram) attached to the charts in the input list Syntax： stm_r_md_root_in_ch (stm_list in_list, int *status);
stm_r_md_top_level_in_ch	Query：Top-level modules of a given chart Purpose：Returns the top level modules (not contained in any box) of the charts in the input list Syntax： stm_r_md_top_level_in_ch (stm_list in_list, int *status);
stm_r_md_unresolved_in_ch	Query：Modules unresolved in a given chart Purpose：Returns the modules that are unresolved in the charts of the input list Syntax： stm_r_md_unresolved_in_ch (stm_list in_list, int *status);

Input List Type: ds

stm_r_md_contains_ds	Query：Modules in which a given data-store resides. Purpose：Returns the modules in which data-stores from the input list resides. The modules appear in the Resides in Module field of a data-store's form. Syntax： stm_r_md_contains_ds (stm_list in_list, int *status);

Input List Type: md

stm_r_md_basic_md	Query：Basic modules Purpose：Returns the modules in the input list that are basic modules (those that have no descendants) Syntax： stm_r_md_basic_md (stm_list in_list, int *status);
stm_r_md_bus_md	Query：Bus modules Purpose：Returns the modules in the input list that are bus modules Syntax： stm_r_md_bus_md (stm_list in_list, int *status);
stm_r_md_by_attributes_md	Query：Modules by attributes Purpose：Returns the modules in the input list that match a particular attribute name and value Syntax： stm_r_md_by_attributes_md (stm_list in_list, char* attr_name, char* attr_value, int *status);
stm_r_md_control_md	Query：Control modules Purpose：Returns the modules in the input list that are control modules Syntax： stm_r_md_control_md (stm_list in_list, int *status);
stm_r_md_def_of_instance_md	Query：Definition modules of a given module Purpose：Returns the definition modules (top level modules in a definition chart) for instances in the input list Syntax： stm_r_md_def_of_instance_ md (stm_list in_list, int *status);
stm_r_md_defined_environment_md	Query：Environment modules Purpose：Returns the modules from the input list that were defined as environment modules Syntax： stm_r_md_defined_ environment_md (stm_list in_list, int *status);

stm_r_md_environment_md	Query：Environment modules Purpose：Returns the modules in the input list that are environment modules Syntax： stm_r_md_environment_md (stm_list in_list, int *status);
stm_r_md_explicit_defined_md	Query：Modules explicitly defined Purpose：Returns the modules of the input list that were explicitly defined Syntax： stm_r_md_explicit_defined_md (stm_list in_list, int *status);
stm_r_md_external_md	Query：External modules Purpose：Returns the modules in the input list that are external Syntax： stm_r_md_external_md (stm_list in_list, int *status);
stm_r_md_generic_instance_md	Query：Generic instance modules Purpose：Returns the modules in the input list that are instances of generic charts Syntax： stm_r_md_generic_instance_md (stm_list in_list, int *status);
stm_r_md_instance_md	Query：Instance modules Purpose：Returns the instance modules from the modules in the input list Syntax： stm_r_md_instance_md (stm_list in_list, int *status);
stm_r_md_instance_of_def_m	Query：Instance modules of a given definition module Purpose：Returns the instance modules for definition modules (top-level modules in a definition chart) in the input list Syntax： stm_r_md_instance_of_def_ md (stm_list in_list, int *status);
stm_r_md_library_md	Query：Library modules Purpose：Returns the modules from the input list that are library modules Syntax： stm_r_md_library_md (stm_list in_list, int *status);

stm_r_md_logical_desc_of_md	Query：Logical descendants of a given module Purpose：Returns the logical descendants of the modules in the input list, taking into account the translation of instances to their definition charts Syntax： stm_r_md_logical_ desc_of_md (stm_list in_list, int *status);
stm_r_md_logical_parent_of_md	Query：Logical parent modules of a given module Purpose：Returns the logical parent modules of the modules in the input list, taking into account the translation of instances to their definition charts Syntax： stm_r_md_logical_parent_of_md (stm_list in_list, int *status);
stm_r_md_logical_sub_of_md	Query：Logical submodules of a given module Purpose：Returns the logical submodules of the modules in the input list, taking into account the translation of instances to their definition charts Syntax： stm_r_md_logical_sub_of_md (stm_list in_list, int *status);
stm_r_md_name_of_md	Query：Modules whose names match a given pattern Purpose：Returns all the modules whose names match the specified pattern Syntax： stm_r_md_name_of_md (char* pattern, int *status);
stm_r_md_offpage_instance_md	Query：Offpage instance modules Purpose：Returns the modules in the input list that are instances of offpage charts Syntax： stm_r_md_offpage_instance_md (stm_list in_list, int *status);
stm_r_md_physical_desc_of_md	Query：Physical descendants of a given module Purpose：Returns the physical descendants (those within the same chart) for the modules in the input list Syntax： stm_r_md_physical_desc_of_md (stm_list in_list, int *status);

stm_r_md_physical_parent_of_md	Query：Physical parent modules of a given module Purpose：Returns the physical parent modules (those within the same chart) for the modules in the input list Syntax： stm_r_md_physical_parent_ of_md (stm_list in_list, int *status);
stm_r_md_physical_sub_of_md	Query：Physical submodules of a given module Purpose：Returns the physical submodules (those within the same chart) for the modules in the input list Syntax： stm_r_md_physical_sub_of_ md (stm_list in_list, int *status);
stm_r_md_regular_md	Query：Regular modules Purpose：Returns the modules from the input list that are regular modules (not environment or storage) Syntax： stm_r_md_regular_md (stm_list in_list, int *status);
stm_r_md_resolved_to_ext_md	Query：Modules resolved to a given external module Purpose：Returns the modules (internal, external, or environment) to which the external modules in the input list are resolved Syntax： stm_r_md_resolved_to_ext_ md (stm_list in_list, int *status);
stm_r_md_storage_md	Query：Storage modules Purpose：Returns the modules from the input list that are storage modules Syntax： stm_r_md_storage_md (stm_list in_list, int *status);
stm_r_md_synonym_of_md	Query：Modules whose synonyms match a given pattern Purpose：Returns all the modules whose synonyms match the specified pattern Syntax： stm_r_md_synonym_of_md (char* pattern, int *status);
stm_r_md_unresolved_md	Query：Unresolved modules Purpose：Returns the unresolved modules in the input list Syntax： stm_r_md_unresolved_md (stm_list in_list, int *status);

Input List Type: mf

stm_r_md_source_of_mf	Query：Modules that are sources of a given m-flow-line Purpose：Returns the modules that are sources of m-flow-lines from the input list Syntax： stm_r_md_source_of_mf (stm_list in_list, int *status);
stm_r_md_target_of_mf	Query：Modules that are targets of a given m-flow-line Purpose：Returns the modules that are targets of m-flow-lines from the input list Syntax： stm_r_md_target_of_mf (stm_list in_list, int *status);

Input List Type: router

stm_r_md_contains_router	Query：Modules in which a given router resides. Purpose：Returns the modules in which routers from the input list resides. The modules appear in the Resides in Module field of a router's form. Syntax： stm_r_md_contains_router (stm_list in_list, int *status);

Mixed (mx)

This section documents the queries that return a list of elements.

Input List Type: af

stm_r_mx_flowing_through_af	Query：Elements flowing through a given a-flow-line Purpose：Returns the information elements (conditions, events, data-items, and basic information-flows) that actually flow through the a-flow-lines in the input list Syntax： stm_r_mx_flowing_through af (stm_list in_list, int *status);
stm_r_mx_labeling_af	Query：Elements labeling a given a-flow-line Purpose：Returns the elements that label a-flow-lines in the input list Syntax： stm_r_mx_labeling_af (stm_list in_list, int *status);
stm_r_mx_source_of_af	Query：Elements that are sources of a given a-flow-line Purpose：Returns the elements (activities and data-stores) that are sources of a-flow-lines in the input list Syntax： stm_r_mx_source_of_af (stm_list in_list, int *status);
stm_r_mx_target_of_af	Query：Elements that are targets of a given a-flow-line Purpose：Returns the elements (activities and data-stores) that are sources of a-flow-lines in the input list Syntax： stm_r_mx_target_of_af (stm_list in_list, int *status);

Input List Type: ac

stm_r_mx_affected_by_ac	Query：Elements affected by a given activity. Purpose：Returns the elements (data-items, conditions, and events) affected (modified or generated) by activities, in mini-specs, and combinational assignments in the input list. Syntax： stm_r_mx_affected_by_ ac (stm_list in_list, int *status);
stm_r_mx_influence_ac	Query：Elements that are referenced by or influence a given activity. Purpose：Returns the elements used in all levels by the activities in the input list. This includes all logical descendant activities, a-flow-lines that enter or exit these activities, elements that appear in the various fields of these activities, and in the labels of the flow-lines and their components. Syntax： stm_r_mx_influence_ac (stm_list in_list, int *status);
stm_r_mx_influenced_by_ac	Query：Elements that refer to, or are influenced by, a given activity. Purpose：Returns the elements that directly or indirectly use the activities in the input list. This query identifies all the elements, in all levels, that refer to or affect the input activities. Syntax： stm_r_mx_influenced_by_ac (stm_list in_list, int *status);
stm_r_mx_refer_to_ac	Query：Elements that refer to a given activity. Purpose：Returns the elements that directly refer to activities in the input list. This query identifies where input activities are used. Syntax： stm_r_mx_refer_to_ac (stm_list in_list, int *status);

stm_r_mx_referenced_by_ac	Query：Elements that are referenced by a given activity. Purpose：Returns the elements that appear in the activities of the input list. This includes all physical descendant activities, a-flow-lines that enter or exit these activities, elements that appear in the various fields of these activities, and in the labels of the flow-lines. Syntax： stm_r_mx_referenced_by_ac (stm_list in_list, int *status);
stm_r_mx_resolved_to_ext_ac	Query：Elements resolved to a given external activity. Purpose：Returns the activities and modules (internal, external, or environment) to which the external activities in the input list are resolved. Syntax： stm_r_mx_resolved_to_ext_ ac (stm_list in_list, int *status);
stm_r_mx_used_by_ac	Query：Elements used by a given activity. Purpose：Returns the elements (data-items, conditions, and events) used (evaluated) by activities in mini-specs and combinational assignments in the input list. Syntax： stm_r_mx_used_by_ac (stm_list in_list, int *status);

Input List Type: an

stm_r_mx_in_definition_of_an	Query：Elements appearing in the definition of a given action. Purpose：Returns the elements that appear in the Definition field of actions (in the action's form) in the input list. This query identifies the elements that are used directly by the actions in the input list. Syntax： stm_r_mx_in_definition_of_an (stm_list in_list, int *status);
stm_r_mx_influence_value_of_an	Query：Elements that influence the value of a given action. Purpose：Returns the elements that appear in the Definition field of actions in the input list, and those that appear in the definitions of these elements (for all levels). This query identifies the elements that are used directly or indirectly by the actions in the input list. Syntax： stm_r_mx_influence_value_ of_an (stm_list in_list, int *status);
stm_r_mx_influenced_by_an	Query：Elements that refer to, or are influenced by, a given action. Purpose：Returns the elements that directly or indirectly use the actions in the input list. This query identifies all the elements, in all levels, that use the input actions. Syntax： stm_r_mx_influence_value_ of_an (stm_list in_list, int *status);
stm_r_mx_refer_to_an	Query：Elements that refer to a given action. Purpose：Returns the elements that directly use the actions in the input list. This query identifies where the input actions appear. Syntax： stm_r_mx_influence_value_ of_an (stm_list in_list, int *status);

Input List Type: ba

stm_r_mx_source_of_ba	Query：Elements affected by a given activity. Purpose：Returns the elements that are sources of basic a-flow-lines in the input list. Syntax： stm_r_mx_source_of_ ba (stm_list in_list, int *status);
stm_r_mx_target_of_ba	Query：Elements affected by a given activity. Purpose：Returns the elements that are targets of basic a-flow-lines in the input list. Syntax： stm_r_mx_influence_value_ of_an (stm_list in_list, int *status);

Input List Type: bm

stm_r_mx_source_of_bm	Query：Elements affected by a given activity. Purpose：Returns the elements that are sources of basic m-flow-lines in the input list Syntax： stm_r_mx_source_of_ bm (stm_list in_list, int *status);
stm_r_mx_target_of_bm	Query：Elements affected by a given activity. Purpose：Returns the elements that are targets of basic m-flow-lines in the input list Syntax： stm_r_mx_target_of_ bm (stm_list in_list, int *status);

Input List Type: bt

stm_r_mx_source_of_bt	Query：Elements affected by a given activity. Purpose：Returns the elements that are sources of basic transitions in the input list Syntax： stm_r_mx_source_of_ bt (stm_list in_list, int *status);
stm_r_mx_target_of_bt	Query：Elements affected by a given activity. Purpose：Returns the elements that are targets of basic transitions in the input list Syntax： stm_r_mx_target_of_ bt (stm_list in_list, int *status);

Input List Type: ch

stm_r_mx_constant_parameter_ch	Query：Constant parameters in a given chart Purpose：Returns the constant formal parameters of generic charts and components in the input list Syntax： stm_r_mx_constant_ parameter_ch (stm_list in_list, int *status);
stm_r_mx_def_or_unres_in_ch	Query：Elements that are defined or unresolved in a given chart Purpose：Returns the elements that are explicitly defined or unresolved in the charts of the input list Syntax： stm_r_mx_def_or_unres_in_ ch (stm_list in_list, int *status);
stm_r_mx_defined_in_ch	Query：Elements that are defined in a given chart Purpose：Returns the elements that are explicitly defined in the charts of the input list Syntax： stm_r_mx_defined_in_ch (stm_list in_list, int *status);

stm_r_mx_in_parameter_ch	Query：In parameters in a given chart Purpose：Returns the formal in parameters of generic charts and components in the input list Syntax： stm_r_mx_in_parameter_ch (stm_list in_list, int *status);
stm_r_mx_influence_value_of_ch	Query：Elements referenced or influenced by a given chart Purpose：Returns the elements that are used directly or indirectly (referenced or affected) by the charts of the input list Syntax： stm_r_mx_influence_value_ of_ch (stm_list in_list, int *status);
stm_r_mx_inout_parameter_ch	Query：Inout parameters in a given chart Purpose：Returns the formal inout parameters of generic charts and components in the input list Syntax： stm_r_mx_inout_parameter_ ch (stm_list in_list, int *status);
stm_r_mx_instance_of_ch	Query：Element instance of a given chart Purpose：Returns the element instances defined by the charts in the input list Syntax： stm_r_mx_instance_of_ch(stm_listin_list, int *status);
stm_r_mx_out_parameter_ch	Query：Out parameters in a given chart Purpose：Returns the formal out parameters of generic charts and components in the input list Syntax： stm_r_mx_out_parameter_ch (stm_list in_list, int *status);
stm_r_mx_parameter_of_ch	Query：Parameters in a given chart Purpose：Returns the formal parameters of generic charts and components in the input list Syntax： stm_r_mx_parameter_of_ch (stm_list in_list, int *status);

stm_r_mx_referenced_by_ch	Query：Elements referenced by a given chart Purpose：Returns the elements that appear in the charts of the input list Syntax： stm_r_mx_referenced_by_ch (stm_list in_list, int *status);
stm_r_mx_root_in_ch	Query：Root elements of a given chart Purpose：Returns the internally defined elements (of type diagram) attached to the charts in the input list Syntax： stm_r_mx_root_in_ch (stm_list in_list, int *status);
stm_r_mx_text_def_unres_in_ch	Query：Textual elements defined or unresolved in a given chart Purpose：Returns the textual elements that are explicitly defined or unresolved in the charts of the input list Syntax： stm_r_mx_text_def_unres_in_ch (stm_list in_list, int *status);
stm_r_mx_text_unresolved_in_ch	Query：Textual elements unresolved in a given chart Purpose：Returns the textual elements that are unresolved in the charts of the input list Syntax： stm_r_mx_text_def_unres_ in_ch (stm_list in_list, int *status);
stm_r_mx_textual_defined_in_ch	Query：Textual elements that are defined in a given chart Purpose：Returns the textual elements that are explicitly defined in the charts of the input list Syntax： stm_r_mx_textual_defined_ in_ch (stm_list in_list, int *status);
stm_r_mx_unresolved_in_ch	Query：Elements unresolved in a given chart Purpose：Returns elements that are unresolved in the charts of the input list Syntax： stm_r_mx_unresolved_in_ch (stm_list in_list, int *status);

Input List Type: co

stm_r_mx_in_definition_of_co	Query：Elements appearing in the definition of a given condition. Purpose：Returns the elements that appear in the Definition field of conditions (in the condition's form) in the input list. This query identifies the elements that are used directly by the conditions in the input list. Syntax： stm_r_mx_in_definition_of_co (stm_list in_list, int *status);
stm_r_mx_influence_value_of_co	Query：Elements that influence the value of a given condition. Purpose：Returns the elements that appear in the Definition field of the conditions in the input list, and those that appear in the definitions of these elements (for all levels). This query identifies the elements that directly or indirectly influence the conditions in the input list. Syntax： stm_r_mx_influence_value_ of_co (stm_list in_list, int *status);
stm_r_mx_influenced_by_co	Query：Elements that refer to, or are influenced by, a given condition. Purpose：Returns the elements that directly or indirectly use the conditions in the input list. Syntax： stm_r_mx_influenced_by_co (stm_list in_list, int *status);
stm_r_mx_refer_to_co	Query：Elements that refer to a given condition. Purpose：Returns the elements that directly use the conditions in the input list. This query identifies where the input conditions appear. Syntax： stm_r_mx_refer_to_co (stm_list in_list, int *status);

Input List Type: di

stm_r_mx_in_definition_of_di	Query：Elements appearing in the definition of a given data-item. Purpose：Returns the elements that appear in the Definition and the Consists of fields of data-items (in the data-item's form) in the input list. This query identifies the elements that are directly used by the data-items in the input list. Syntax： stm_r_mx_in_definition_of_di (stm_list in_list, int *status);
stm_r_mx_influence_value_of_di	Query：Elements that influence the value of a given data-item. Purpose：Returns the elements that appear in the Definition and Consists of fields of data-items in the input list, and those that appear in the fields of these elements (for all levels). This query identifies the elements that directly or indirectly influence the data-items in the input list. Syntax： stm_r_mx_influence_value_ of_dt (stm_list in_list, int *status);
stm_r_mx_influenced_by_di	Query：Elements that refer to, or are influenced by, a given data-item. Purpose：Returns the elements that directly or indirectly use the data-items in the input list. This query identifies all the elements, in all levels, that refer to or affect the input data-items. Syntax： stm_r_mx_influenced_by_di (stm_list in_list, int *status);
stm_r_mx_refer_to_di	Query：Elements that refer to the specified data-item. Purpose：Returns the elements that directly use the data-items in the input list. This query identifies where the input data-items appear. Syntax： stm_r_mx_refer_to_di (stm_list in_list, int *status);

Input List Type: ds

stm_r_mx_refer_to_ds	Query：Elements that refer to a given data-store Purpose：Returns the elements directly affected by data-stores in the input list Syntax： stm_r_mx_refer_to_ds (stm_list in_list, int *status);

Input List Type: dt

stm_r_mx_in_definition_of_dt	Query：Elements that appear in the definition of a given user-defined type Purpose：Returns the elements that appear in the definition form of the user-defined types in the input list Syntax： stm_r_mx_in_definition_of_dt (stm_list in_list, int *status);
stm_r_mx_influence_value_of_dt	Query：Elements that influence the definition of a given user-defined type Purpose：Returns the elements, data-items and user-defined types, that appear in the definition form of the user-defined types in the input list, and those that appear in the definition form of these elements—in all levels Syntax： stm_r_mx_influence_ value_of_dt (stm_list in_list, int *status);
stm_r_mx_influenced_by_dt	Query：Elements that refer to or influenced by a given user-defined type Purpose：Returns the elements that directly or indirectly use in their definition the user-defined types in the input list. Syntax： stm_r_mx_influenced_by_dt (stm_list in_list, int *status);
stm_r_mx_refer_to_dt	Query：Elements that refer to a given user-defined type Purpose：Returns the elements that use in their definition form the user-defined types in the input list Syntax： stm_r_mx_refer_to_dt (stm_list in_list, int *status);

Input List Type: ev

stm_r_mx_in_definition_of_ev	Query：Elements appearing in the definition of a given event. Purpose：Returns the elements that appear in the Definition field of events (in the event's form) in the input list. This query identifies the elements that are directly used by the events in the input list. Syntax： stm_r_mx_in_definition_of_ev (stm_list in_list, int *status);
stm_r_mx_influence_value_of_ev	Query：Elements that influence the value of a given event. Purpose：Returns the elements that appear in the Definition field of events in the input list, and those that appear in the definitions of these elements (for all levels). This query identifies the elements that are used directly or indirectly by the events in the input list. Syntax： stm_r_mx_influence_value_ of_ev (stm_list in_list, int *status);
stm_r_mx_influenced_by_ev	Query：Elements that refer to, or are influenced by, a given event. Purpose：Returns the elements that directly or indirectly use the events in the input list. This query identifies all the elements, in all levels, that refer to or affect the input events. Syntax： stm_r_mx_influenced_by_ev (stm_list in_list, int *status);
stm_r_mx_refer_to_ev	Query：Elements that refer to a given event. Purpose：Returns the elements that directly use the events in the input list. This query identifies where the input events appear. Syntax： stm_r_mx_refer_to_ev (stm_list in_list, int *status);

Input List Type: fd

stm_r_mx_containing_fd	Query：Elements containing a given field. Purpose：Returns the data-items and user-defined types in which the fields in the input list are defined. Syntax： stm_r_mx_containing_fd (stm_list in_list, int *status);
stm_r_mx_in_de finition_of_fd	Query：Elements that appear in the definition of a given field. Purpose：Returns the elements that appear in the type definition of the fields in the input list. Syntax： stm_r_mx_in_definition_of_fd (stm_list in_list, int *status);
stm_r_mx_influence_value_of_f	Query：Elements that influence the definition of a given field. Purpose：Returns the elements, data-items, and user-defined types that appear in the type definition of the fields in the input list, and those that appear in the definition form of these elements (in all levels). Syntax： stm_r_mx_influence_value_ of_fd (stm_list in_list, int *status);
stm_r_mx_influenced_by_fd	Query：Elements that refer to, or are influenced by, a given field. Purpose：Returns the elements that directly refer to the fields in the input list. This query identifies where the fields in the input list are used. Syntax： stm_r_mx_influenced_by_fd (stm_list in_list, int *status);
stm_r_mx_refer_to_fd	Query：Elements that refer to a given field. Purpose：Returns the elements that directly refer to the fields in the input list. This query identifies where the fields in the input list are used. Syntax： stm_r_mx_refer_to_fd (stm_list in_list, int *status);

Input List Type: fn

stm_r_mx_influenced_by_fn	Query：Elements that refer to, or are influenced by, a given function Purpose：Returns the elements that indirectly or directly use the functions in the input list. This query identifies all the elements, in all levels, that refer to the input functions. Syntax： stm_r_mx_influenced_by_fn (stm_list in_list, int *status);
stm_r_mx_refer_to_fn	Query：Elements that refer to a given function. Purpose：Returns the elements that directly use the functions in the input list. This query identifies where the input functions appear. Syntax： stm_r_mx_refer_to_fn (stm_list in_list, int *status);

Input List Type: if

stm_r_mx_in_definition_of_if	Query：Elements appearing in the definition of a given a information-flow. Purpose：Returns the elements listed in the Consists of field (in the information-flow's forms) for information-flows in the input list. This query identifies the elements that are used directly by the information-flows in the input list. Syntax： stm_r_mx_in_definition_of_if (stm_list in_list, int *status);
stm_r_mx_influence_value_of_if	Query：Elements that influence the value of a given information-flow. Purpose：Returns the elements contained in the information-flows in the input list (as listed in the Consists of field), for all levels of decomposition. This query identifies the elements that are directly or indirectly contained in the information-flows of the input list. Syntax： stm_r_mx_influence_value_ of_if (stm_list in_list, int *status);

stm_r_mx_influenced_by_if	Query：Elements that refer to, or are influenced by, a given information-flow Purpose：Returns the elements that directly or indirectly use the information-flows in the input list. This query identifies all the elements, in all levels, that refer to the input information-flows. Syntax： stm_r_mx_influenced_by_if (stm_list in_list, int *status);
stm_r_mx_refer_to_if	Query：Elements that refer to a given information-flow. Purpose：Returns the elements that directly use the information-flows in the input list. This query identifies where the input information-flows appear. Syntax： stm_r_mx_refer_to_if (stm_list in_list, int *status);

Input List Type: md

stm_r_mx_influence_md	Query：Elements that are referenced by or influence a given module. Purpose：Returns the elements that are used in all levels by the modules in the input list. Syntax： stm_r_mx_influence_md (stm_list in_list, int *status);
stm_r_mx_influenced_by_md	Query：Elements that refer to, or are influenced by, a given module Purpose：Returns the elements that directly or indirectly use the modules in the input list Syntax： stm_r_mx_influenced_by_ev (stm_list in_list, int *status);
stm_r_mx_refer_to_md	Query：Elements that refer to a given module. Purpose：Returns the elements that directly refer to modules in the input list. Syntax： stm_r_mx_refer_to_md (stm_list in_list, int *status);

stm_r_mx_referenced_by_md	Query：Elements that are referenced by a given module. Purpose：Returns the elements that appear in the modules of the input list. Syntax： stm_r_mx_referenced_by_md (stm_list in_list, int *status);
stm_r_mx_resolved_to_ext_md	Query：Elements resolved to a given external module. Purpose：Returns the elements to which the external modules in the input list are resolved. Syntax： stm_r_mx_resolved_to_ext_ md (stm_list in_list, int *status);

Input List Type: mf

stm_r_mx_flowing_through_mf	Query：Elements flowing through a given m-flow-line Purpose：Returns the information elements (conditions, events, data-items and basic information-flows) that actually flow through the m-flow-lines in the input list Syntax： stm_r_mx_flowing_through_ mf (stm_list in_list, int *status);
stm_r_mx_information_through_mf	Query： Purpose： Syntax： stm_r_mx_information_ through_mf (stm_list in_list, int *status);
stm_r_mx_labeling_mf	Query：Elements labeling a given m-flow-line Purpose：Returns the elements that label m-flow-lines in the input list Syntax： stm_r_mx_labeling_mf (stm_list in_list, int *status);

Input List Type: msg

stm_r_mx_labeling_msg	Query：Elements labeling a given message Purpose：Returns those elements that appear in labels of messages in the input list Syntax： stm_r_mx_labeling_msg (stm_list in_list, int *status);

Input List Type: mx

stm_r_mx_affected_by_mx	Query：Elements affected by a given element. Purpose：Returns the elements (primitive data-items, conditions, events, and activities) that are affected (modified, generated, started, stopped, and so on) by elements (states in static reactions or transitions in labels) in the input list. Syntax： stm_r_mx_affected_by_mx(stm_listin_list, int *status);
stm_r_mx_affecting_mx	Query：Elements in which a given element is affected. Purpose：Returns the elements (states and transitions) that affect (modify, generate, or activate) the elements (for example, events, data-items, or activities) in the input list. Syntax： stm_r_mx_affecting_mx (stm_list in_list, int *status);
stm_r_mx_by_attributes_mx	Query：Elements by attributes Purpose：Returns the elements in the input list that match a particular attribute name and value Syntax： stm_r_mx_by_attributes_mx (stm_list in_list, char* attr_name, char* attr_value, int *status);
stm_r_mx_callback_binding_mx	Query：Elements with callback bindings. Purpose：Returns the elements in the input list that have callback bindings. Syntax： stm_r_mx_callback_binding_mx (stm_list in_list, int *status);

stm_r_mx_comb_elements_mx	Query：None. Purpose：Returns the elements (data-items and conditions) in the input list that are combinational elements. Syntax： stm_r_mx_comb_elements_mx (stm_list mx_l, int *status);
stm_r_mx_component_ instance_mx	Query：Activities or blocks that are instances of components. Purpose：Returns the activities or blocks in the input list that have instances of components. Syntax： stm_r_mx_component_ instance_mx (stm_list in_list, int *status);
stm_r_mx_def_of_instance_mx	Query：Definition elements of a given element. Purpose：Returns the definition elements (top-level) for instances in the input list. Syntax： stm_r_mx_def_of_instance_ mx (stm_list in_list, int *status);
stm_r_mx_explicit_defined_mx	Query：Elements explicitly defined. Purpose：Returns the elements of the input list that were explicitly defined. Syntax： stm_r_mx_explicit_defined_mx (stm_list in_list, int *status);
stm_r_mx_generic_instance_mx	Query：None. Purpose：Returns the boxes (states, activities, and modules) in the input list that are instances of generic charts. Syntax： stm_r_mx_generic_instance_mx (stm_list in_list, int *status);
stm_r_mx_in_definition_of_mx	Query：Elements that appear in the definition of a given element. Purpose：Returns the elements that appear in the various fields of the element's form, or in labels of elements in the input list. This query identifies the elements that are used directly by the elements in the input list. Syntax： stm_r_mx_in_definition_of_mx (stm_list in_list, int *status);

stm_r_mx_influence_value_of_mx	Query：Elements that influence the value of a given element. Purpose：Returns the elements that appear in various form's fields or labels of elements in the input list, and those that appear in the fields of these elements (for all levels). This query identifies the elements that directly or indirectly influence the elements in the input list. Syntax： stm_r_mx_influence_value_ of_mx (stm_list in_list, int *status);
stm_r_mx_influenced_by_mx	Query：Elements that refer to or influenced by a given element. Purpose：Returns the elements that directly or indirectly use the elements in the input list. This query identifies all the elements, in all levels, that refer to or affect the input elements. Syntax： stm_r_mx_influenced_by_mx (stm_list in_list, int *status);
stm_r_mx_instance_mx	Query：Element instance of a given element Purpose：Returns the instance elements defined by the elements in the input list Syntax： stm_r_mx_instance_mx (stm_list in_list, int *status);
stm_r_mx_instance_of_def_mx	Query：Instance elements Purpose：Returns the instance elements for definition elements (top-level) in the input list. Syntax： stm_r_mx_instance_of_def_ mx (stm_list in_list, int *status);
stm_r_mx_logical_desc_of_mx	Query：Logical descendants of a given element Purpose：Returns the logical descendants of the elements in the input list Syntax： stm_r_mx_logical_desc_of_ mx (stm_list in_list, int *status);
stm_r_mx_logical_parent_of_mx	Query：Logical parent elements of a given element. Purpose：Returns the logical parent elements of the elements in the input list, taking into account the translation of instances to their definition charts. Syntax： stm_r_mx_logical_sub_of_mx (stm_list in_list, int *status);

stm_r_mx_logical_sub_of_mx	Query：Logical subelements of a given element Purpose：Returns the logical subelements of the elements in the input list Syntax： stm_r_mx_logical_sub_of_mx (stm_list in_list, int *status);
stm_r_mx_meaningly_affecting_mx	Query: Activities in which a given element is affected. Purpose: Identical to stm_r_mx_affecting_mx, but when the input list includes an ID of a record/union, stm_r_mx_meaningly_affecting_mx will also return elements that affect a field of the record/union, and not necessarily the whole record/union element. Syntax: stm_r_mx_meaningly_affecting_mx (stm_list in_list, int *status);
stm_r_mx_meaningly_using_mx	Query：Activities in which a given element is used. Purpose：Identical to stm_r_mx_using_mx, but when the input list includes an ID of a record/union, stm_r_mx_meaningly_using_mx will also return elements that use a field of the record/union, and not necessarily the whole record/union element. Syntax： stm_r_mx_meaningly_using_mx (stm_list in_list, int *status);
stm_r_mx_name_of_mx	Query：Element whose names match a given pattern Purpose：Returns all the elements whose names match the specified pattern Syntax： stm_r_mx_name_of_mx (char* pattern, int *status);
stm_r_mx_offpage_instance_mx	Query：None. Purpose：Returns the boxes (states, activities, and modules) in the input list that are instances of offpage charts. Syntax： stm_r_mx_offpage_instance_mx (stm_list in_list, int *status);
stm_r_mx_parameter_mx	Query：Elements that are parameters. Purpose：Returns the elements in the input list that are declared as formal parameters of a generic chart. Syntax： stm_r_mx_parameter_mx (stm_list in_list, int *status);

stm_r_mx_physical_desc_of_mx	Query：Physical descendants of a given element Purpose：Returns the physical descendants (those within the same chart) for the elements in the input list Syntax： stm_r_mx_physical_desc_of_mx (stm_list in_list, int *status);
stm_r_mx_physical_parent_of_mx	Query：Physical parent elements of a given element Purpose：Returns the physical parent elements (those within the same chart) for the elements in the input list Syntax： stm_r_mx_physical_parent_ of_mx (stm_list in_list, int *status);
stm_r_mx_physical_sub_of_mx	Query：Physical subelements of a given element Purpose：Returns the physical subelements (those within the same chart) for the elements in the input list Syntax： stm_r_mx_physical_sub_of_ mx (stm_list in_list, int *status);
stm_r_mx_refer_to_mx	Query：Elements that refer to a given element. Purpose：Returns the elements that directly refer to elements in the input list. This query identifies where the input elements are used. Syntax： stm_r_mx_refer_to_mx (stm_list in_list, int *status);
stm_r_mx_resolved_to_ext_mx	Query：Elements resolved to a given external box. Purpose：Returns the activities and modules (internal, external, or environment) to which the external activities and modules in the input list are resolved. Syntax： stm_r_mx_resolved_to_ext_ mx (stm_list in_list, int *status);
stm_r_mx_synonym_of_mx	Query：Elements whose synonyms match a given pattern Purpose：Returns all the elements whose synonyms match the specified pattern Syntax： stm_r_mx_synonym_of_mx(char*pattern,int *status);

stm_r_mx_unresolved_mx	Query：Unresolved elements. Purpose：Returns the unresolved elements in the input list. Syntax： stm_r_mx_unresolved_mx (stm_list in_list, int *status);
stm_r_mx_used_by_mx	Query：Elements used by a given element. Purpose：Returns the elements (primitive events, conditions, data-items, states, and activities) that are used (evaluated by the elements, such as states in static reactions and transitions in labels) in the input list. Syntax： stm_r_mx_used_by_mx(stm_listin_list,int *status);
stm_r_mx_using_mx	Query：Elements in which a given element is used. Purpose：Returns the elements (states in static reactions and transitions in labels) that use (evaluate) the elements (basic events, conditions, data-items, states, and activities) in the input list. Syntax： stm_r_mx_using_mx (stm_list in_list, int *status);
stm_r_mx_with_combinationals_mx	Query：None. Purpose：Returns the elements (activities and state charts) in the input list that have combinational assignments. Syntax： stm_r_mx_with_combinationals_mx(stm_list mx_l, int *status);

Function Relationships

The following functions are related, but have subtle differences:

- stm_r_mx_influenced_by_mx
- stm_r_mx_affected_by_mx
- stm_r_mx_used_by_mx
- stm_r_mx_affecting_mx

The following matrix shows their relationships. In the matrix, opposite functions go from left to right, whereas cause and effect functions go up and down.

influenced by	used by
Function	
affected by	affecting

For example:

- If x is influenced by y, then y is used by x.
- If n is affected by m, then m is affecting n.

Consider the following statement:

```
if x is true then Function will set y=5
```

In this statement, x influences Function and Function affects y. This is shown in the matrix as follows:

- Elements above the double line influence Function.
- Elements below the double line are affected by Function.

For example, x is used by Function to determine whether to set the value of y, and Function is affecting y by setting its value.

There are four possible relationships between set functions: two opposites and two cause and effects.

- Opposite: influenced by and used by
- Opposite: affected by and affecting
- Cause and effect: influenced by and affected by
- Cause and effect: used by and affecting

To illustrate the relationships, consider the following static reaction in a state called STATE

[D]/X=5 if D is true, then set x=y

The following table shows the relationships.

Relation Type	Description
Opposite: influenced and used by	STATE reads D to determine whether to perform an action, and D gives STATE the cue to set X=Y. In other words, STATE is influenced by D, and D is used by STATE
Opposite: affected by and affecting	X's value is set by STATE and STATE sets the value of X. In other words, X is affected by STATE, and STATE is affecting X.
Cause and effect: influenced by and affected by	STATE reads y to determine which value should be assigned to X, and while in STATE, X can be set to y. In other words, when STATE is influenced by y, it results in X being affected by STATE
Cause and effect: used by and affecting	If y is true, STATE sets the value of X. y is influencing STATE, STATE is affecting X. In other words, when y is used by STATE, it results in STATE affecting X.

Input List Type: router

stm_r_mx_flowing_from_router	Query：Elements flowing from a given router Purpose：Returns the elements actually flowing from routers in the input list Syntax： stm_r_mx_flowing_from_ router (stm_list in_list, int *status);
stm_r_mx_flowing_to_router	Query：Elements flowing to a given router Purpose：Returns the elements actually flowing to routers in the input list Syntax： stm_r_mx_flowing_to_router (stm_list in_list, int *status);
stm_r_mx_refer_to_router	Query：Elements that refer to a given router. Purpose：Returns the elements that directly refer to routers in the input list. This query identifies where the routers are used. Syntax： stm_r_mx_refer_to_router (stm_list in_list, int *status);
stm_r_mx_resolved_to_ext_router	Query：Elements resolved to a given router. Purpose：Returns the elements to which the external routers in the input list are resolved. Syntax： stm_r_mx_resolved_to_ext_ router (stm_list in_list, int *status);

Input List Type: sb

stm_r_mx_influenced_by_sb	Query：Elements that refer to, or are influenced by, a given subroutine Purpose：Returns the elements that directly or indirectly use the subroutines in the input list Syntax： stm_r_mx_influenced_by_sb (stm_list in_list, int *status);
stm_r_mx_refer_to_sb	Query：Elements that refer to a given subroutine Purpose：Returns the elements that directly refer to subroutines in the input list Syntax： stm_r_mx_refer_to_sb (stm_list in_list, int *status);

Input List Type: st

stm_r_mx_affected_by_st	Query：Elements affected by a given state. Purpose：Returns the elements (data-items, conditions, and events) that are affected (modified or generated) by states (in mini-specs and combinational assignments) in the input list. Syntax： stm_r_mx_affected_by_st (stm_list in_list, int *status);
stm_r_mx_influence_st	Query：Elements that are referenced by or influence a given state. Purpose：Returns the elements that are used in all levels by the states in the input list. This includes all logical descendant states, the transitions that enter or exit these states, and the elements that appear in the various fields of these states, the labels of the transitions, and their components. Syntax： stm_r_mx_influence_st (stm_list in_list, int *status);

stm_r_mx_influenced_by_st	Query：Elements that refer to, or are influenced by a given state. Purpose：Returns the elements that directly or indirectly use the states in the input list. This query identifies all the elements, in all levels, that refer to or affect the input states. Syntax： stm_r_mx_influenced_by_st (stm_list in_list, int *status);
stm_r_mx_refer_to_st	Query：Elements that refer to a given state. Purpose：Returns the elements that directly refer to states in the input list. This query identifies where the input states are used. Syntax： stm_r_mx_refer_to_st (stm_list in_list, int *status);
stm_r_mx_referenced_by_st	Query：Elements that are referenced by a given state. Purpose：Returns the elements that appear in the states of the input list. This includes all physical descendant states, the transitions that enter or exit these states, and the elements that appear in the various fields of these states and in the labels of the transitions. Syntax： stm_r_mx_referenced_by_st (stm_list in_list, int *status);
stm_r_mx_used_by_st	Query：Elements used by a given state. Purpose：Returns the elements (data-items, conditions, and events) that are used (evaluated) by states (in mini-specs and combinational assignments) in the input list. Syntax： stm_r_mx_used_by_st (stm_list in_list, int *status);

Input List Type: tr

stm_r_mx_affected_by_tr	Query：Elements affected by a given transition Purpose：Returns the elements (data-items, conditions, and events) that are affected (modified, generated) by transitions (in mini-specs and combinational assignments) in the input list Syntax： stm_r_mx_affected_by_tr(stm_listin_list, int *status);
stm_r_mx_labeling_tr	Query：Elements labeling a given transition Purpose：Returns those elements that appear in labels of the transitions in the input list Syntax： stm_r_mx_labeling_tr (stm_list in_list, int *status);
stm_r_mx_source_of_tr	Query：Elements that are sources of a given transition Purpose：Returns the elements (states and connectors) that are sources of transitions in the input list Syntax： stm_r_mx_source_of_tr (stm_list in_list, int *status);
stm_r_mx_target_of_tr	Query：Elements that are targets of a given transition Purpose：Returns elements (states and connectors) that are targets of transitions in the input list Syntax： stm_r_mx_target_of_tr (stm_list in_list, int *status);
stm_r_mx_used_by_tr	Query：Elements used by a given transition Purpose：Returns the elements (data-items, conditions, and events) that are used (evaluated) by transitions (in mini-specs and combinational assignments) in the input list Syntax： stm_r_mx_used_by_tr (stm_list in_list, int *status);

Module-Occurrences (om)

This section documents the query that returns a list of module-occurrences.

Input List Type: md

stm_r_om_in_md	Query：Module-occurrences contained in a given module Purpose：Returns the module-occurrences contained in modules from the input list Syntax： stm_r_om_in_md (stm_list in_list, int *status);

Routers (router)

This section documents the queries that return a list of routers.

Output List Type: router

Input List Type: ac

stm_r_router_contained_in_ac	Query：Routers contained in a given activity Purpose：Returns the routers contained directly in activities from the input list Syntax： stm_r_router_contained_in_ac (stm_list in_list, int *status);
stm_r_router_in_ac	Query：Router in a given activity Purpose：Returns the routers directly and indirectly contained in the activities from the input list Syntax： stm_r_router_in_ac (stm_list in_list, int *status);

Input List Type: af

stm_r_router_source_of_af	Query：Routers that are sources of a given a-flow-line Purpose：Returns the routers that are sources of a-flow-lines in the input list Syntax： stm_r_router_source_of_af (stm_list in_list, int *status);
stm_r_router_target_of_af	Query：Routers that are targets of a given a-flow-line Purpose：Returns the routers that are sources of a-flow-lines in the input list Syntax： stm_r_router_target_of_af (stm_list in_list, int *status);

Input List Type: ch

stm_r_router_def_or_unres_in_ch	Query：Routers defined or unresolved in a given chart Purpose：Returns the routers that are explicitly defined or unresolved in the charts of the input list Syntax： stm_r_router_def_or_unres_in_ch (stm_list in_list, int *status);
stm_r_router_defined_in_ch	Query：Routers defined in a given chart Purpose：Returns the routers that are explicitly defined in the charts of the input list Syntax： stm_r_router_defined_in_ch (stm_list in_list, int *status);
stm_r_router_unresolved_in_ch	Query：Routers unresolved in a given chart Purpose：Returns the routers that are unresolved in the charts of the input list Syntax： stm_r_router_unresolved_in_ch (stm_list in_list, int *status);

Input List Type: md

stm_r_router_resides_in_md	Query：Routers residing in a given module. Purpose：Returns the routers residing in modules from the input list. The module appears in the Resides in Module field of the router's form. Syntax： stm_r_router_resides_in_md (stm_list in_list, int *status);

Input List Type: router

stm_r_router_by_attr_router	Query：Routers by attributes Purpose：Returns the routers in the input list that match a given attribute name and value Syntax： stm_r_router_resides_in_md (stm_list in_list, int *status);
stm_r_router_exp_def_router	Query：Routers that are explicitly defined Purpose：Returns from the input list those routers that were explicitly defined Syntax： stm_r_router_exp_def_ router (stm_list in_list, int *status);
stm_r_router_name_of_router	Query：Routers whose names match a given pattern Purpose：Returns all routers whose name matches a given pattern Syntax： stm_r_router_name_of_ router (char* pattern, int *status));
stm_r_router_res_to_ext_router	Query：Routers resolved by a given external router Purpose：Returns the routers (internal and external) to which the external routers in the input list are resolved Syntax： stm_r_router_res_to_ext_ router (stm_list in_list, int *status);
stm_r_router_synonym_of_router	Query：Routers whose synonyms match a given pattern Purpose：Returns all routers whose synonyms match a given pattern Syntax： stm_r_router_synonym_of_ router (char* pattern, int *status);

stm_r_router_unresolved_router	Query：Unresolved routers Purpose：Returns the unresolved routers in the input list Syntax： stm_r_router_unresolved_ router (stm_list router_list, int *status);
stm_r_router_unresolved_in_ch	Query : Unresolved in a given chart. Purpose : Returns routers that are unresolved in the charts of the input list. Syntax : stm_r_router_unresolved_in_ch (stm_list in_list, int*status);
stm_r_mx_refer_to_router	Query : Elements that refer to a given router. Purpose : Returns the elements that directly refer to routers in the input list. This query identifies where input routers are used. Syntax : stm_r_mx_refer_to_router (stm_list in_list, int *status);
stm_r_md_contains_router	Query : Modules in which a given datastoreresides. Purpose : Returns the modules in which routers from the input list resides. The modules appear in the Resides in Module field of a Router's form Syntax : stm_r_md_contains_router (stm_list in_list, int *status);
stm_r_ch_define_router	Query : Charts in which a given router is defined Purpose : Returns the charts in which the routers in the input list are explicitly defined or unresolved. Syntax : stm_r_ch_define_router (stm_list in_list, int *status);
stm_r_laf_from_source_router	Query : A-flow-lines whose source is a given router Purpose : Returns local compound aflow- lines that originate at routers in the input list Syntax : stm_r_laf_from_source_router (stm_list in_list, int *status);
stm_r_laf_to_target_router	Query : A-flow-lines whose target is a given router within chart Purpose : Returns local a-flow-lines (those within charts) that terminate at routers in the input list Syntax : stm_r_laf_to_target_router (stm_list in_list, int *status);

stm_r_router_name_of_router	Query : Routers whose names match a given pattern. Purpose : Returns all the routers whose names match a given pattern Syntax : stm_r_router_name_of_router (char* pattern, int *status);
stm_r_router_synonym_of_router	Query : Routers whose synonyms match a given pattern, Purpose : Returns all the routers whose synonyms match the specified pattern Syntax : stm_r_ac_synonym_of_ac (char* pattern, int *status);

Subroutines (sb)

This section documents the queries that return a list of subroutines.

Input List Type: ch

stm_r_sb_connected_to_ch	Query：Subroutines that are connected to a given procedural statechart Purpose：Returns the subroutines in the input list that are connected to the specified procedural statechart Syntax： stm_r_sb_connected_to_ch (stm_list in_list, int *status);
stm_r_sb_connected_to_sch	Query: Subroutines that are connected to a given procedural statechart Purpose: Returns the subroutines in the input list that are connected to the specified procedural statechart Syntax: stm_r_sb_connected_to_sch (stm_list in_list, int *status);
stm_r_sb_connected_to_fch	Query：Subroutines that are connected to a given Flowcharts Purpose：Returns the subroutines in the input list that are connected to the specified Flowchart Syntax： stm_r_sb_connected_to_fch (stm_list in_list, int *status);
stm_r_sb_defined_in_ch	Query：Subroutines defined in a given chart Purpose：Returns the subroutines that are explicitly defined in the charts in the input list Syntax： stm_r_sb_defined_in_ch (stm_list in_list, int *status);
stm_r_sb_def_or_unres_in_ch	Query：Subroutines defined or unresolved in a given chart Purpose：Returns the subroutines that are explicitly defined or unresolved in the charts in the input list Syntax： stm_r_sb_def_or_unres_in_ ch (stm_list in_list, int *status);

stm_r_sb_unresolved_in_ch	Query：Subroutines unresolved in a given chart Purpose：Returns the subroutines that are unresolved in the charts in the input list Syntax： stm_r_sb_unresolved_in_ch (stm_list in_list, int *status);

Input List Type: sb

stm_r_sb_ada_sb	Query：Subroutines written in Ada Purpose：Returns subroutines in the input list that are written in Ada and stored in the database using the Implementation menu Syntax： stm_r_sb_ada_sb (stm_list in_list, int *status);
stm_r_sb_ansi_c_sb	Query：Subroutines written in ANSI C Purpose：Returns subroutines in the input list that are written in ANSI C and stored in the database using the Implementation menu Syntax： stm_r_sb_ansi_c_sb (stm_list in_list, int *status);
stm_r_sb_bit_sb	Query：Subroutines by subtype Purpose：Returns the subroutines in the input list that are defined as bit Syntax： stm_r_sb_bit_sb (stm_list in_list, int *status);
stm_r_sb_bits_sb	Query：Subroutines by subtype Purpose：Returns the subroutines in the input list that are defined as bit array Syntax： stm_r_sb_bits_sb (stm_list in_list, int *status);
stm_r_sb_by_attributes_sb	Query：Subroutines by attributes Purpose：Returns the subroutines in the input list that match the specified attribute name and value Syntax：stm_r_sb_by_attributes_sb (stm_list in_list, char* attr_name, char* attr_value, int *status);

stm_r_sb_explicit_defined_sb	Query：Subroutines that are explicitly defined Purpose：Returns the subroutines in the input list that are explicitly defined Syntax： stm_r_sb_explicit_defined_sb (stm_list in_list, int *status);
stm_r_sb_fn_with_side_effect_sb	Query：Function subroutines with potential side-effects Purpose：Returns the function subroutines in the input list that have potential side-effects Syntax： stm_r_sb_fn_with_side_ effect_sb (stm_list in_list, int *status);
stm_r_sb_function_sb	Query：Subroutines defined as functions Purpose：Returns the subroutines in the input list that are defined as functions Syntax： stm_r_sb_function_sb (stm_list in_list, int *status);
stm_r_sb_globals_usage_sb	Query：Subroutines that have global data Purpose：Returns all subroutines in the input list that have global data Syntax： stm_r_sb_globals_usage_sb (stm_list in_list, int *status);
stm_r_sb_imp_action_lang_sb	Query：Subroutines whose selected implementation is Action Language Purpose：Returns the subroutines in the input list that are implemented in the Rational Statemate Action Language using Select Implementation Syntax： stm_r_sb_imp_action_lang_ sb (stm_lis in_list, int *status);
stm_r_sb_imp_ada_code_sb	Query：Subroutines whose selected implementation is Ada Code Purpose：Returns the subroutines in the input list that are implemented in Ada using Select Implementation in the properties Syntax： stm_r_sb_imp_ada_code_sb (stm_list in_list, int *status);

stm_r_sb_imp_ansi_c_code_sb	Query：Subroutines whose selected implementation is ANSI C Code Purpose：Returns the subroutines in the input list that are implemented in ANSI C using Select Implementation Syntax： stm_r_sb_imp_ansi_c_code_ sb (stm_list in_list, int *status);
stm_r_sb_imp_best_match_sb	Query：Subroutines whose selected implementation is Best Match Purpose：Returns the subroutines in the input list that are implemented as the Best Match using Select Implementation Syntax： stm_r_sb_imp_best_match_sb (stm_list in_list, int *status);
stm_r_sb_imp_kr_c_code_sb	Query：Subroutines whose selected implementation is K&R C Code Purpose：Returns the subroutines in the input list that are implemented in K&R C using Select Implementation Syntax： stm_r_sb_imp_kr_c_code_sb (stm_list in_list, int *status);
stm_r_sb_imp_none_sb	Query：Subroutines whose selected implementation is None Purpose：Returns the subroutines in the input list that are not implemented (None) using Select Implementation Syntax： stm_r_sb_imp_none_sb (stm_list in_list, int *status);
stm_r_sb_imp_procedural_sch_sb	Query：Subroutines whose selected implementation is Procedural Statechart Purpose：Returns the subroutines in the input list that are implemented as Procedural Statecharts using Select Implementation Syntax： stm_r_sb_imp_procedural_ sch_sb (stm_list in_list, int *status);
stm_r_sb_integer_sb	Query：Subroutines by subtype Purpose：Returns the subroutines in the input list that are defined as integer Syntax： stm_r_sb_integer_sb (stm_list in_list, int *status);

stm_r_sb_kr_c_sb	Query：Subroutines written in K&R C Purpose：Returns subroutines in the input list that are written in K&R C and stored in the database using the Implementation menu Syntax： stm_r_sb_kr_c_sb (stm_list in_list, int *status);
stm_r_sb_missing_sb	Query：Subroutines by subtype Purpose：Returns the subroutines in the input list for which no type is defined Syntax： stm_r_sb_missing_sb (stm_list in_list, int *status);
stm_r_sb_name_of_sb	Query：Subroutines whose names match a given pattern Purpose：Returns all subroutines whose name matches the specified pattern Syntax： stm_r_sb_name_of_sb (char* pattern, int *status);
stm_r_sb_parameters_sb	Query：Subroutines that have parameters Purpose：Returns all subroutines in the input list that have parameters Syntax： stm_r_sb_parameters_sb (stm_list in_list, int *status);
stm_r_sb_procedural_sch_sb	Query：Subroutines designed as procedural statecharts Purpose：Returns subroutines in the input list that are designed as procedural statecharts and stored in the database using the Implementation menu Syntax： ch_sch_sb (stm_list in_list, int *status);
stm_r_sb_procedural_fch_sb	Query：Subroutines designed as Flowchart Purpose：Returns subroutines in the input list that are designed as Flowcharts and stored in the database using the Implementation menu Syntax : stm_r_sb_procedural_fch_sb (stm_list in_list, int *status);
stm_r_sb_procedure_sb	Query：Subroutines defined as procedures Purpose：Returns the subroutines in the input list that are defined as procedures Syntax： stm_r_sb_procedure_sb (stm_list in_list, int *status);

stm_r_sb_real_sb	Query：Subroutines by subtype Purpose：Returns the subroutines in the input list that are defined as real Syntax： stm_r_sb_real_sb (stm_list in_list, int *status);
stm_r_sb_statemate_action_sb	Query：Subroutines written in the Rational Statemate action language Purpose：Returns subroutines in the input list that are written in the Rational Statemate action language and stored in the database using the Implementation menu Syntax： stm_r_sb_statemate_action_sb (stm_list in_list, int *status);
stm_r_sb_string_sb	Query：Subroutines by subtype Purpose：Returns the subroutines in the input list that are defined as string Syntax： stm_r_sb_string_sb (stm_list in_list, int *status);
stm_r_sb_synonym_of_sb	Query：Subroutines whose synonyms match a given pattern Purpose：Returns all subroutines whose synonyms match the specified pattern Syntax： stm_r_sb_synonym_of_sb (char* pattern, int *status);
stm_r_sb_task_sb	Query：Subroutines defined as tasks Purpose：Returns the subroutines in the input list that are defined as tasks Syntax： stm_r_sb_task_sb (stm_list in_list, int *status);

stm_r_sb_unresolved_sb	Query：Unresolved subroutines Purpose：Returns the unresolved subroutines in the input list Syntax： stm_r_sb_unresolved_sb (stm_list in_list, int *status);
stm_r_sb_user_type_sb	Query：Subroutines by subtype Purpose：Returns the subroutines in the input list that are defined as user-defined type Syntax： stm_r_sb_user_type_sb (stm_list in_list, int *status);

States (st)

This section documents the queries that return a list of states.

Input List Type: ac

stm_r_st_done_throughout_ac	Query：States in which a given activity is performed throughout Purpose：Returns the states for which activities in the input list are performed throughout that state (as specified in Activities Within /Throughout field in the state's form) Syntax： stm_r_st_done_throughout_ ac (stm_list in_list, int *status);
stm_r_st_done_within_ac	Query：States in which a given activity is performed within them Purpose：Returns the states in which activities in the input list are performed within that state (as specified in Activities Within /Throughout field in the state's form) Syntax： stm_r_st_done_within_ac (stm_list in_list, int *status);

Input List Type: ch

stm_r_st_def_or_unres_in_ch	Query：States defined or unresolved in a given chart Purpose：Returns the states that are explicitly defined or unresolved in the charts of the input list Syntax： stm_r_st_def_or_unres_in_ ch (stm_list in_list, int *status);
stm_r_st_defined_in_ch	Query：States defined in a given chart Purpose：Returns the states that are explicitly defined in the charts of the input list Syntax： stm_r_st_defined_in_ch (stm_list in_list, int *status);
stm_r_st_instance_of_ch	Query：State instances of a given chart Purpose：Returns the instance states defined by the charts in the input list Syntax： stm_r_st_instance_of_ch (stm_list in_list, int *status));
stm_r_st_root_in_ch	Query：Root states of a given chart Purpose：Returns the internally defined states (of type diagram) attached to the charts in the input list Syntax： stm_r_st_root_in_ch (stm_list in_list, int *status);
stm_r_st_top_level_in_ch	Query：Top-level states of a given chart Purpose：Returns the top-level states (not contained in any box) of the charts in the input list Syntax： stm_r_st_top_level_in_ch (stm_list in_list, int *status);
stm_r_st_unresolved_in_ch	Query：States unresolved in a given chart Purpose：Returns the states that are unresolved in the charts of the input list Syntax： stm_r_st_unresolved_in_ch (stm_list in_list, int *status);

Input List Type: cn

stm_r_st_containing_cn	Query：States containing a given connector Purpose：Returns the states that encapsulate specified connectors from the input list Syntax： stm_r_st_containing_cn (stm_list in_list, int *status);

Input List Type: mx

stm_r_st_affecting_mx	Query：States in which a given element is affected. Purpose：Returns the states that affect (modify, generate, or activate) the elements (for example, events, data-items, or activities) in the input list. Syntax： stm_r_st_affecting_mx (stm_list in_list, int *status);
stm_r_st_meaningly_affecting_mx	Query: Activities in which a given element is affected. Purpose: Identical to stm_r_st_affecting_mx , but when the input list includes an ID of a record/union, stm_r_st_meaningly_affecting_mx will also return elements that affect a field of the record/union, and not necessarily the whole record/union element. Syntax : stm_r_st_meaningly_affecting_mx (stm_list in_list, int *status);
stm_r_st_meaningly_using_mx	Query：Activities in which a given element is used. Purpose：Identical to stm_r_st_using_mx , but when the input list includes an ID of a record/union, stm_r_st_meaningly_using_mx will also return elements that use a field of the record/union, and not necessarily the whole record/union element. Syntax： stm_r_st_meaningly_using_mx (stm_list in_list, int *status);

stm_r_st_using_mx	Query：States in which a given element is used. Purpose：Returns the states in static reactions that use (evaluate) the elements (basic events, conditions, data-items, states, and activities) in the input list. Syntax： stm_r_st_using_mx (stm_list in_list, int *status);

Input List Type: st

stm_r_st_and_st	Query：And states. Purpose：Returns the states in the input list that are And-states. Syntax： stm_r_st_and_st (stm_list in_list, int *status);
stm_r_st_basic_st	Query：Basic states. Purpose：Returns the states in the input list that are basic (states that have no descendants). Syntax： stm_r_st_basic_st (stm_list in_list, int *status);
stm_r_st_by_attributes_st	Query：States by attributes. Purpose：Returns the states in the input list that match a given attribute name and value. Syntax： stm_r_st_by_attributes_st (stm_list in_list, char* attr_name, char* attr_value, int *status);
stm_r_st_callback_binding_st	Query：States with callback bindings. Purpose：Returns the states in the input list that have callback bindings. Syntax： stm_r_st_callback_binding_st (stm_list in_list, int *status);
stm_r_st_def_of_instance_st	Query：Definition states of a given state. Purpose：Returns the definition states (top-level in the definition chart) for instances in the input list. Syntax： stm_r_st_def_of_instance_ st (stm_list in_list, int *status);

stm_r_st_default_entry_to_st	Query：Default entry to the default state. Purpose：Returns the default states of the or-states in the input list. Syntax： stm_r_st_default_entry_to_st (stm_list in_list, int *status);
stm_r_st_explicit_defined_st	Query：States explicitly defined. Purpose：Returns the states in the input list that were explicitly defined. Syntax： stm_r_st_explicit_defined_st (stm_list in_list, int *status);
stm_r_st_generic_instance_st	Query：Generic instance states. Purpose：Returns the states in the input list that are instances of generic charts. Syntax： stm_r_st_generic_instance_st (stm_list in_list, int *status);
stm_r_st_history_connector_st	Query：States containing a history connector. Purpose：Returns the states in the input list that contain a history connector. Syntax： stm_r_st_history_connector_st (stm_list in_list, int *status);
stm_r_st_instance_of_def_st	Query：Instance states of a given definition state. Purpose：Returns the instance states for definition states (top-level states in a definition chart) in the input list. Syntax： stm_r_st_instance_of_def_ st (stm_list in_list, int *status);
stm_r_st_instance_st	Query：Instance states. Purpose：Returns those states in the input list that are instance states. Syntax： stm_r_st_instance_st (stm_list in_list, int *status);

stm_r_st_logical_desc_of_st	Query：Logical descendants of a given state. Purpose：Returns the logical descendants (children, grandchildren, and so on) of states in the input list, taking into account the translation of instances to their definition charts. Syntax： stm_r_st_logical_desc_of_ st (stm_list in_list, int *status);
stm_r_st_logical_parent_of_st	Query：Logical parent states of a given state. Purpose：Returns the logical parent states of the states in the input list, taking into account the translation of instances to their definition charts. Note：This query provides similar output as stm_r_st_physical_ parent_of_st , but for states that are substates of a top-level state in a definition chart, this query also returns the instance box. Syntax： stm_r_st_logical_parent_of_st (stm_list in_list, int *status);
stm_r_st_logical_sub_of_st	Query：Logical substates of a given state. Purpose：Returns the logical substates of the states in the input list, taking into account the translation of instances to their definition charts. Syntax： stm_r_st_logical_sub_of_st (stm_list in_list, int *status);
stm_r_st_name_of_st	Query：States whose names match a given pattern Purpose：Returns all the states whose names match the specified pattern Syntax： stm_r_st_name_of_st (char* pattern, int *status);
stm_r_st_offpage_instance_st	Query：Offpage instance states. Purpose：Returns the states in the input list that are instances of offpage charts. Syntax： stm_r_st_offpage_instance_st (stm_list in_list, int *status);
stm_r_st_physical_desc_of_st	Query：Physical descendants of a given state. Purpose：Returns the physical descendants (those within the same chart) for the states in the input list. Syntax： stm_r_st_physical_desc_of_st (stm_list in_list, int *status);

stm_r_st_physical_parent_of_st	Query：Physical parent states of a given state. Purpose：Returns the physical parent states (those within the same chart) for the states in the input list. Syntax： stm_r_st_physical_desc_of_st (stm_list in_list, int *status);
stm_r_st_physical_sub_of_st	Query：Physical substates of a given state. Purpose：Returns the physical substates (those within the same chart) for the states in the input list. Syntax： stm_r_st_physical_sub_of_ st (stm_list in_list, int *status);
stm_r_st_reaction_activity_st	Query：States having reactions or activities. Purpose：Returns the states from the input list that have static reactions or activities performed within or throughout the state. Syntax： stm_r_st_reaction_activity_st (stm_list in_list, int *status);
stm_r_st_synonym_of_st	Query：States whose synonyms match a given pattern Purpose：Returns all the states whose synonyms match the specified pattern Syntax： stm_r_st_synonym_of_st (char* pattern, int *status);
stm_r_st_unresolved_st	Query：Unresolved states. Purpose：Returns the unresolved states in the input list. Syntax： stm_r_st_unresolved_st (stm_list in_list, int *status);

Input List Type: tr

stm_r_st_source_of_tr	Query：States that are sources of a given transition Purpose：Returns the states that are sources of transitions in the input list Syntax： stm_r_st_source_of_tr (stm_list in_list, int *status);
stm_r_st_target_of_tr	Query：States that are targets of a given transition Purpose：Returns the states that are targets of transitions in the input list Syntax： stm_r_st_target_of_tr (stm_list in_list, int *status);

Timing Constraint (tc)

This section documents the query that returns a list of timing constraints.

Input List Type: ch

stm_r_tc_defined_in_ch	Query：Timing constraints defined in a given chart Purpose：Returns the timing constraints that are explicitly defined in the charts of the input list Syntax： stm_r_tc_defined_in_ch (stm_list in_list, int *status);

Transitions (tr)

This section documents the queries that return a list of transitions. The following abbreviations are used:

- bt—Basic transition
- tr—Compound transition

Output List: tr

Input List Type: cn

stm_r_tr_from_source_cn	Query: Transitions whose source is a given connector Purpose: Returns the transitions in the input list whose source is a termination or history connector Syntax: stm_r_tr_from_source_cn (stm_list in_list, int *status);
stm_r_tr_to_target_cn	Query: Transitions whose target is a given connector Purpose: Returns the transition in the input list whose target is a termination or history connector Syntax: stm_r_tr_to_target_cn (stm_list in_list, int *status);

Input List Type: enforced

stm_r_tr_by_attributes_enforced	Query: Transitions whose source is a given connector Purpose: Returns the transitions in the input list that match the specified attribute name and value Syntax: stm_r_tr_by_attributes_enforced (stm_list in_list, int char* attr_name, char* attr_value, int *status);

Input List Type: mx

stm_r_tr_affecting_mx	Query：Transitions in which a given element is affected. Purpose：Returns the transitions that affect (modify, generate, or activate) the elements (for example, events, data-items, or activities) in the input list. Syntax： stm_r_tr_affecting_mx (stm_list in_list, int *status);
stm_r_tr_from_source_mx	Query：Transitions whose source is a given element Purpose：Returns transitions that originate at elements in the input list Syntax： stm_r_tr_from_source_mx(stm_listin_list, int *status);
stm_r_tr_meaningly_affecting_mx	Query: Activities in which a given element is affected. Purpose: Identical to stm_r_tr_affecting_mx, but when the input list includes an ID of a record/union, stm_r_tr_meaningly_affecting_mx will also return elements that affect a field of the record/union, and not necessarily the whole record/union element. Syntax: stm_r_tr_meaningly_affecting_mx (stm_list in_list, int *status);
stm_r_tr_meaningly_using_mx	Query：Activities in which a given element is used. Purpose：Identical to stm_r_tr_using_mx, but when the input list includes an ID of a record/union, stm_r_tr_meaningly_using_mx will also return elements that use a field of the record/union, and not necessarily the whole record/union element. Syntax： stm_r_tr_meaningly_using_mx (stm_list in_list, int *status);
stm_r_tr_to_target_mx	Query：Transitions whose target is a given element Purpose：Returns the transitions whose target is an element from the input list Syntax： stm_r_tr_to_target_mx (stm_list in_list, int *status);

stm_r_tr_using_mx	Query：Transitions in which a given element is used. Purpose：Returns the transitions in labels that use (evaluate) the elements (basic events, conditions, data-items, states, and activities) in the input list. Syntax： stm_r_tr_using_mx (stm_list in_list, int *status);

Input List Type: st

stm_r_tr_default_of_st	Query：Transitions that are the default entrance of a given state Purpose：Returns the default entrances (compound transitions) of the states in the input list Syntax： stm_r_tr_default_of_st (stm_list in_list, int *status));
stm_r_tr_from_source_st	Query：Transitions whose source is the specified state Purpose：Returns the transitions whose source is a state appearing in the input list Syntax： stm_r_tr_from_source_st (stm_list in_list, int *status);
stm_r_tr_to_target_st	Query：Transitions whose target is a given state Purpose：Returns the transitions whose target is a state appearing in the input list. Syntax： stm_r_tr_to_target_st (stm_list in_list, int *status);

Input List Type: tr

stm_r_tr_by_attributes_tr	Query： Purpose：Returns the Transitions in the input list that match the specified attribute name and value. Syntax： stm_r_tr_by_attributes_tr (stm_list in_list, char* attr_name, char* attr_value, int *status);
stm_r_tr_default_tr	Query：Default transition Purpose：Returns, of all the transitions in the input list that are default transitions Syntax： stm_r_tr_default_tr (stm_list in_list, int *status);

Utility Functions

Utility functions enable you to manipulate lists. For example, you could use utility functions to determine whether a particular element exists in a list of Rational Statemate elements. Or, you could sort these lists to make reports easier to read. You can also use utility functions to manipulate strings of characters—to locate string patterns in a given string and to extract portions of strings. Most utility functions for lists can manipulate lists of any item type, but are usually used for lists of Rational Statemate elements.

Utility functions do not extract information from the database; however, some utility functions use database information to complete their operations. These functions enable you to manipulate the information you have already retrieved using single-element or query functions.

Generating Lists

To perform operations on lists, it is sometimes necessary for you to prepare the lists yourself. (Lists are also generated as output from other Dataport functions, such as query functions.) There are two such situations:

- Creating a list from a number of discrete elements
- Loading a list that was stored in the specification database via queries

The created lists are of type `stm_list`. You can store them (using an assignment statement) in a variable of this type to be used in subsequent statements.

Creating a List

Call the following function to create a list of Rational Statemate elements:

```
stm_list_create (e1, e2,..., end_of_list, &status);
```

In this syntax:

- `e1` and `e2`—The element IDs that constitute the list
- `end_of_list`—A constant, defined in `dataport.h`, that signifies the end of the parameter sequence of list items
- `status`—The function return status

Loading a List

You can perform operations on lists that you store in the workarea using the property sheet. To access these lists, call the following function in your C program:

```
stm_list_load (list_name, &status);
```

In this syntax:

- list_name —A string identifying the list that you stored using the property sheet
- &status —The function return status

Calling List Utility Functions

Most of the utility functions operate on lists using the following calling sequence:

```
stm_list_operation (list, &status);
```

In this syntax:

- stm_list—Designates the function as a Rational Statemate list manipulation function
- operation—The kind of list operation performed
- list—The list to be operated on
- status—The return function status code

The type of value returned by the function depends on the particular function. The returned value can be a list, a Rational Statemate element, a string, or an integer. For example:

```
stm_list_sort_by_name (event_list, &status)
```

This function alphabetically sorts the events in event_list according to their names.

The following sections document the utility functions that use a different calling sequence.

Calling Report and Plot Functions

Some utility functions enable you to produce predefined Rational Statemate reports and generate plots of charts. All these functions produce output addressed to a specific plotter or word processor. This means that the output is written in a specific language, determined by one of the arguments of the function call.

Producing Predefined Reports

There is a set of routines that generate and write Rational Statemate predefined reports of the Reports tool, such as Tree, Property, Interface, and so on. The output contains commands for a word processor that is determined by one of the input arguments. There are different calling sequences for each type of report, but the following is the general form:

```
stm_uad_report_name (report_specific_arguments,
  file_name, wp, append, with_header, p_width, p_height)
```

In this syntax:

- report_name —One of the predefined report types, such as tree.
- report_specific_arguments —A list of different arguments for the various types of reports.
- file_name —A string that includes the file into which the output is written.
- wp—A string that includes the word processor name whose commands are included in the output. The possible values for this parameter are: runoff, nroff, and interleaf.
- append —A Boolean value which when true indicates that the output is appended to the contents of the output file. This parameter also determines whether or not a page header is omitted.
- with_header —A Boolean value which when true indicates that the set-up commands of the work processor is included in the output. These commands usually appear only once in a file to be processed by the word processor.
- p_width —The width of the output page in characters. For Interleaf, the width is given in inches.
- p_height - The length of the output pages in lines. For Interleaf, the length is given in inches.

For example, the following sequence produces a tree report:

```
stm_uad_rpt_tree (elist, 5, "my_file", "runoff", false,
  true, 80, 60)
```

The tree report is produced for all elements in elist, to a depth of 5 in the hierarchy.

Generating Chart Plots

The following function generates plots of charts:

```
stm_plot
```

Refer to stm_plot for more information.

Calling Functions on Reactions

The following two functions enable you to extract the trigger part and the action part from a reaction string, trigger/action:

```
stm_trigger_of_reaction (reaction, &status)
stm_action_of_reaction (reaction, &status)
```

They operate on a reaction string that was extracted by single-element functions that return lists of transition labels and state reactions of states.

The return values of the two functions are a string of type string_expression. Because they are defined as static in the functions, you should copy them for later use.

Calling Functions of the Workarea

The following four functions deal with the contents of the workarea and enable you to load, unload, or save charts and other configuration items:

- stm_load
- stm_save
- stm_unload
- stm_unload_all

In general, use these functions when you want to change the contents of the workarea while running the program, not interactively.

Utility Function Examples

This section shows how to use utility function calls to perform common tasks.

Example 1

To return the number of subactivities existing for the activity A1, use the following statements:

```
stm_id        act_id, cntrl_act;
stm_list      list, act_list, cntrl_act_list;
int           status, list_length;
              .
              .
              .
act_id=stm_r_ac("A1", &status);
list=stm_list_create (act_id, end_of_list, &status);
act_list=stm_ac_physical_sub_of_ac (list, &status);
list_length=stm_list_length (act_list, &status);
```

Example 2

To return the activity from Example 1, which is the control activity, use the following statements:

```
              .
              .
              .
cntrl_act_list = stm_ac_control_ac (act_list &status);
cntrl_act = (stm_id)stm_list_first_element
          (cntrl_act_list, &status);
              .
              .
              .
```

The list cntrl_act_list consists of only one element. Extract the first element (in this case, the only element) of the list and assign this control activity's ID to cntrl_act.

List of Utility Functions

The following pages document the utility functions. The functions are presented in alphabetical order, as listed in the following table.

Function	Description
stm_action_of_reaction	Extracts the action part of the specified reaction
stm_add_attribute	Enables you to add new attributes to a property element.
stm_backup	Creates a back up of the workarea in a session to a selected directory.
stm_commit_transaction	Closes any open database transactions. It is done explicitly if you are working in the self_transaction mode.
stm_decode_color	Decodes the the color's value as it is retrieved from the database.
stm_delete_attributes	Removes an attribute entry from the properties for an element.
stm_dispose_all	Disposes of all the records that were previously allocated and retrieved.
stm_dispose_graphic	Disposes of the record of type stm_xx_graphic that was previously allocated and retrieved by the function stm_r_xx_graphic () .
stm_dispose_text	Disposes of the record of type stm_xx_text , which was previously allocated and retrieved by the function stm_r_xx_text() .
stm_do_command_line	Sends a message to the open Rational Statemate main tool to execute a command line using the same syntax of STMM CLI.
stm_exit_simulation	Allows exit of a Simulation session by profile name.
stm_finish_uad	Completes the information retrieval session so the database is closed for transactions. This is performed after the last Dataport function call.
stm_frm_Reset_id	Resets the Framemaker ID's counter (after calling stm_plot using Framemaker).
stm_get_db_status	Returns a number of type stm_id . This number is changed when the database is changed.
stm_init_uad	Initializes the database for information retrieval by the Dataport functions, and checks the user access rights and user license.
stm_internal_refresh	Notifies STM that data was changed outside the tool.
stm_list_add_id_element	Adds a new element to a list of element IDs.
stm_list_add_ptr_element	Adds a new element to a list of element pointers.

stm_list_contains_id_element	Determines whether the specified ID appears in the given list.
stm_list_contains_ptr_element	Determines whether the specified item appears in the given list.
stm_list_create_ids_list	Creates a list of items using their IDs.
stm_list_create_ptr_list	Creates a list of items.
stm_list_create_id_list_with_args	Creates a list of items using the specified IDs.
stm_list_create_pt_r_list_with_args	Creates a list of items.
stm_list_delete_id_element	Deletes the specified element from a list of element IDs.
stm_list_delete_ptr_element	Deletes the specified element from a list of element pointers.
stm_list_destroy	Deallocates the memory used by the specified list.
stm_list_extraction	Extracts the elements from the input list.
stm_list_extraction_by_chart	Extracts the elements from the input list that belong to the specified chart.
stm_list_extraction_by_chart_id	Extracts the elements from the input list that are defined in the pecified chart.
stm_list_extraction_by_type	Extracts elements of the specified type from the given list of Rational Statemate elements.
stm_list_first_id_element	Returns the first item appearing in the list passed as an input argument.
stm_list_first_ptr_element	Returns the first item appearing in the list passed as an input argument.
stm_list_intersect_ids_lists	Extracts elements that are common to the two specified input lists.
stm_list_intersect_ptr_lists	Extracts elements that are common to the two specified ptr lists.
stm_list_last_id_element	Returns the last item appearing in the list passed as an input argument.
stm_list_last_ptr_element	Returns the last item appearing in the list passed as an input argument.
stm_list_length	Returns the length of the specified list.
stm_list_load	Loads a previously saved list into memory to be used by the program.
stm_list_next_id_element	Returns the next item appearing in the list passed as an input argument.
stm_list_next_ptr_element	Returns the next item appearing in the list passed as an input argument.
stm_list_previous_id_element	Returns the previous item appearing in the list passed as an input argument.
stm_list_previous_ptr_element	Returns the previous item appearing in the list passed as an input argument.
stm_list_purge	Erases the input list's pointers and the list elements.

stm_list_sort	Alphabetically sorts the specified list of strings.
stm_list_sort_alphabetically_by_branches	Alphabetically sorts the specified list of strings by branches.
stm_list_sort_alpha_betically_by_levels	Alphabetically sorts the specified list of strings by levels.
stm_list_sort_by_attr_value	Sorts the specified list of Rational Statemate elements by the value of the given attribute.
stm_list_sort_by_branches	Sorts the specified list of hierarchical Rational Statemate elements by branches.
stm_list_sort_by_chart	Alphabetically sorts the input list of named Rational Statemate elements, by the name of the chart to which they belong.
stm_list_sort_by_levels	Alphabetically sorts the input list of named Rational Statemate elements, by the name of the chart to which they belong.
stm_list_sort_by_name	Sorts the specified list of Rational Statemate elements alphabetically by name.
stm_list_sort_by_synonym	Sorts the specified list of Rational Statemate elements alphabetically by their synonyms.
stm_list_sort_by_type	Sorts the specified list of Rational Statemate elements by type.
stm_list_subtract_ids_lists	Creates a new list of those elements of the first input list that are not found in the second input list.
stm_list_subtraction_ptr_lists	Creates a new list of those elements of the first input list that are not found in the second input list.
stm_list_subtract_ids_lists	Creates a new list of those elements of the first input list that are not found in the second input list.
stm_list_union_ids_lists	Merges the elements of two specified ids lists.
stm_list_union_ptr_lists	Merges the elements of two specified ptr lists.
stm_load	Loads a chart file (or any other configuration item file) into the current workarea.
stm_multiline_to_one	Converts the specified multiline string (with new lines) to a one-line string (without the new lines).
stm_multiline_to_strings	Converts the specified multiline expression to a list of strings.
stm_open_truth_table	Opens a Truth Table that is connected to the specified element and highlights the specified line in it.
stm_plot	Generates a plot file with the indicated parameters, such as plot size, output device, and so on.
stm_plot_ext	May return one of two status codes.
stm_plot_hyper_exp	Generates the hyperlinks in a sequence diagram.
stm_plot_with_autonumber	Prints a sequence diagram with numbered scenarios.
stm_plot_with_break	Breaks a sequence diagram across multiple pages.
stm_plot_with_headerline	Prints a sequence diagram with the names of lifelines on every page.

stm_r_global_interface_report	Return the global interface report for the elements in the input list
stm_r_local_interface_report	Return the local interface report for the elements in the input list.
stm_run_simulation_profile	Sends a message to Rational Statemate to open and execute a Simulation profile by the name passed as a parameter.
stm_save	Saves a chart (or any other configuration item file) from the current workarea to an external file.
stm_start_transaction	Enables transaction operations on the database.
stm_start_transaction_rw	Enables read/write transaction operations on the database.
stm_trigger_of_reaction	Returns the trigger part of a reaction (label of transition or static reaction).
stm_uad_attribute	Writes the predefined attribute report to the specified output file.
stm_uad_dictionary	Writes the predefined property report to the specified output file.
stm_uad_interface	Writes the predefined attribute report to the specified output file.
stm_uad_list	Writes the predefined list report to the specified output file.
stm_uad_n2	Writes the predefined N2-chart report to the specified output file.
stm_uad_protocol	Writes the predefined protocol report to the specified output file.
stm_uad_resolution	Writes the predefined resolution report to the specified output file.
stm_uad_state_interface	Writes the predefined state interface report to the specified output file.
stm_uad_structure	Writes the predefined structure report to the specified output file.
stm_uad_tree	Writes the predefined tree report to the specified output file.
stm_unload	Unloads (deletes from the current workarea) a chart or any other configuration item file.
stm_unload_all	Unloads all charts from the current workarea and clears all database fields.

stm_action_of_reaction

Extracts the action part of the specified reaction (the label of the transition or static reaction). The syntax of a reaction is trigger/action.

- The reaction is achieved by the single-element functions stm_r_st_reactions or stm_r_tr_labels.
- The function returns an empty string when the action is missing.

Function Type

stm_expression

Syntax

stm_action_of_reaction (reaction, &status)

Arguments

Argument	Input/Output	Type	Description
reaction	In	char *	The reaction to decompose
status	Out	int	The function status code

Status Codes

- stm_success

Example

To list all actions that are triggered when S1 is in a static reactions (assume that S1 has several static reactions), include the following calls in your program:

```
stm_id          st_id;
   int          status;
   stm_list     reactions;
   stm_expression  rct;

   st_id = stm_r_st ("S1", status);
   reactions = stm_r_st_reactions (st_id, status);
   printf ("\n Actions of reactions in S1:");
   for (rct = (string)
      stm_list_first_element (reactions, &status);
      status == stm_success;
      rct = (string)
      stm_list_next_element (reactions, &status))
      printf ("\n %S", stm_action_of_reaction (
         rct, &status));
```

stm_add_attribute

Enables you to add new attributes to a properties element.

- Initialization of the program must be performed in self_transaction mode; stm_init_uad with self_transaction.
- Use stm_start_transaction_rw() instead of stm_start_transaction().
- Use stm_commit_transaction() at the end of each transaction.

Function Type

void

For Elements

activity	ac
block	bl
chart	ch
condition	co
data-item	di
data-store	ds
event	ev
field	fd
function	fn
information-flow	if
module	md
state	st
transition	
user-defined type	dt

Syntax

stm_add_attribute (id, attr_name, attr_val, &status)

Arguments

Argument	Input/ Output	Type	Description
id	In	stm_id	The element ID
attr_name	In	char *	The attribute name. This name must be uppercase, alpha-numeric, or empty (with a maximum length of 31).
Attr_value	In	char *	The attribute value. The value can be any text string, with a maximum length of 300.
status	Out	int	Function status code

Status Codes

- stm_success
- stm_id_out_of_range
- stm_id_not_found
- stm_illegal_attribute_name
- stm_illegal_attribute_value
- stm_duplicate_attribute_pair
- stm_not_in_rw_transaction

Example

The following example inserts an attribute into state S1.

```
#include <dataport.h>

main(argc, argv)
char **argv;
int    argc;
{
   int      status;
   stm_id    state_id;

   if (argc!=3)
   {
       printf ("Usage %s PROJECT workarea\n", argv[0]);

      exit (0);
   }
   if (!stm_init_uad(argv[1], argv[2], self_transaction,
       &status))
   {
      printf ("can't open workarea %s\n", argv[2]);
      exit(1);
   }
   stm_start_transaction_rw ();
   state_id = stm_r_st ("S1", &status);
```

```
    stm_add_attribute (state_id, "FRED", "A Value",
      &status);
    stm_commit_transaction();
}
```

stm_backup

Creates a back up of the workarea in session to a selected directory.

Syntax

stm_backup (char* destination, char* mess, int *status)

Arguments

Argument	Input/ Output	Type	Description
char*	In	destination	The destination directory for the backup.
char*	Out	mess	Messages related to the backup operation.
int	Out	status	The status of the query (stm_error_in_backup or stm_success).
status	Out	int	Function status code

stm_decode_color

Decodes the color's value as it is retrieved from te datavbase, suing APIs like stm_r_ac_graphic(). The stm_decode_color API receives the color value received from the database and converts it into a structure (struct stm_color_all) that has the true color values in its fields, as well as the fill style of the graphical shape.

Syntax

stm_dolor_all stm_decode_color (unsigned long color, int *status

stm_delete_attributes

Removes an attribute entry from the properties for an element.

- Initialization of the program must be done in self_transaction mode, that is use stm_init_uad with self_transaction .
- Use stm_start_transaction_rw() , instead of stm_start_transaction() .
- Use stm_commit_transaction() at the end of each transaction.

Function Type

void

For Elements

action	an
activity	ac
block	bl
chart	ch
condition	co
data-item	di
data-store	ds
event	ev
field	fd
function	fn
information-flow	if
module	md
state	st
transition	
user-defined type	dt

Syntax

stm_delete_attributes (id, attr_name, attr_val, &status)

Arguments

Argument	Input/ Output	Type	Description
id	In	stm_id	The element ID.
attr_name	In	string	The attribute name. This name must be uppercase, alpha-numeric, or empty (with a maximum length of 31).
attr_value	In	string	The attribute value. The value can be any text string, with a maximum length of 300.
status	Out	int	Function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_id_not_found
- stm_illegal_attribute_name
- stm_illegal_attribute_value

- stm_elements_without_attributes
- stm_attribute_cannot_be_deleted
- stm_not_in_rw_transaction

stm_dispose_all

Disposes of all the records that were previously allocated and retrieved.

Function Type

void

Syntax

stm_dispose_all (gen_all_ptr)

Arguments

Argument	Input/ Output	Type	Description
gen_all_ptr	In	void **	A pointer to the data to be disposed of.

stm_dispose_graphic

Disposes of the record of type stm_xx_graphic that was previously allocated and retrieved by the function stm_r_xx_graphic () .

Function Type

void

Syntax

stm_dispose_graphic (elm_graphic_data)

Arguments

Argument	Input/ Output	Type	Description
elm_graphic_data	In	stm_xx_graphic_ptr	A pointer to the graphical data of the element to be disposed.

Status Codes

- stm_dispose_rt_allocation
- stm_dispose_rt_tex

stm_dispose_text

Disposes of the record of type stm_xx_text , which was previously allocated and retrieved by the function stm_r_xx_text() .

Function Type

void

Syntax

stm_dispose_text (elm_textual_data)

Arguments

Argument	Input/ Output	Type	Description
elm_textual_data	In	stm_xx_text_ptr	A pointer to the textual data to be disposed.

stm_do_command_line

Sends a message to the open Rational Statemate main tool to exectue a command line using the same syntax of STMM CLI.

There is no need to include the '-wa' and '-project' switches - the CLI command will be executed on the workarea currently open by Rational Statemate main.

A new switch '-queue' can be used in the command line for this API, in conjunction with one of the supported CLI tools (e.g. '-simulation', '-checkmodel', and so forth), to allow queuing of several tool profiles. The queued profiles will be executed consequtially (When running Simulation, the input_file (specified after "-i") should have a 'quit' command at the end, to terminate the simulation session and allow execution of the next profile in the queue).

Function Type

stm_boolean

Syntax

```
stm_do_command_line(string command_line , int* status);
```

stm_exit_simulation

Allows exit of a Simulation session by profile name.

Function Type

stm_boolean

Syntax

stm_exit simulation ()

Example

The information retrieval process in a program concludes with the following:

```
stm_finish_uad();
        .
        .
```

Arguments

Argument	Input/ Output	Type	Description
profile_name	In	char	The name of the Simulation.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_error_in_open_socket_to_statemate

stm_finish_uad

Completes the information retrieval session so database is closed for transactions. This is performed after the last Dataport function call.

Function Type

void

Syntax

stm_finish_uad ()

Example

The information retrieval process in a program concludes with the following:

```
stm_finish_uad();
        .
        .
```

stm_frm_Reset_id

Resets the Framemaker's ID counter (after calling stm_plot using Framemaker).

Function type:

void

Syntax:

stm_frm_reset_id()

stm_get_db_status

Returns a number of type stm_id . This number is changed when the database is changed.

Note

The return type is int , which is the same type as stm_id .

Syntax

```
stm_get_db_status (stm_id)
```

stm_init_uad

Initializes the database for information retrieval by the Datapool functions, and checks the user access rights and user license.

The stm_init_uad function automatically changes the current directory to the workarea directory. All references to files inside the program have to take this into account. When the program terminates, it does not return to the original directory.

Function Type

stm_boolean

Syntax

```
stm_init_uad (proj_name, workarea, trans_mode, &status)
```

Arguments

Argument	Input/ Output	Type	Description
proj_name	In	char *	The name of the project.
workarea	In	char *	The pathname to the workarea directory.
trans_mode	In	stm_transaction	The transaction mode. The possible values are as follows: • automatic_transaction - An implicit start_transaction is performed when you initialize and an implicit commit_transaction is performed when you finish the retrieval process • self_transaction - You can control when the start_transaction and commit_transaction is performed for an accurate picture of the database when the functions are used.
status	Out	int	The function status code.

Status Codes

- stm_no_updated_pmdb
- stm_no_updated_projdb
- stm_no_legal_operator
- stm_deadlock
- stm_not_member_of_project
- stm_nonexistent_project
- stm_empty_file_of_licensed_host
- stm_no_file_of_licensed_host
- stm_cannot_chdir_to_work_area

Example

To initialize the database, use the following statements:

```
int     success, status;
          .
          .
success = stm_init_uad ("A5S700", "/a5/general",
            automatic_transaction, &status);
          .
          .
          .
```

This function initializes the workarea for project A5S700, which is found in the directory /a5/general. The transactions are started automatically and finished automatically by the init and finish functions. The status should be checked in case the function fails and returns false.

stm_internal_refresh

Notifies Rational Statemate that data was changed outside the tool, such that in the next refresh, values are recalculated. The function return value is stm_true and the status value is stm_success if the message was successfully sent to Rational Statemate.

Function Type

stm_boolean

Syntax

stm_internal_refresh (int *status)

stm_list_add_id_element

Adds a new element to a list of element IDs.

Function Type

stm_list

Syntax

stm_list_add_id_element (list, element, &status)

Arguments

Argument	Input/ Output	Type	Description
list	In	stm_list	The list of Rational Statemate elements.
element	In	stm_list_id_elemen	The element ID.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range
- stm_nil_list

Example

To add a new element use the following statement (the element id has been assigned to st_id):

```
stm_id       st_id;
    stm_list     st_list;
    int          status;
                 .
                 .
    st_id = stm_r_st ("S1", &status);
    st_list = stm_list_add_id_element (st_list, st_id,
      &status);
                 .
                 .
```

stm_list_add_ptr_element

Adds a new element to a list of element pointers.

Function Type

stm_list

Syntax

stm_list_add_ptr_element (list, element, &status)

Arguments

Type	Description
stm__list_ptr_elm	The element pointer.

Status Codes

- stm_success
- stm_nil_list

Example

To add a new element, use the following statement (the element id has been assigned to st_id and the element name has been assigned to st_name):

```
stm_id st_id;stm_element_name st_name;stm_list st_list;
int status;..st_name = stm_r_st_name(st_id, &status);
st_list = stm_list_add_ptr_element (st_list, st_name, &status);
.
.
```

stm_list_contains_id_element

Determines whether the specified ID appears in the given list.

Function Type

int

Syntax

stm_list_contains_id_element (list, item, &status)

Arguments

Argument	Input/ Output	Type	Description
list	In	stm_list	The list to search.
item	In	stm_list_id_elm	The item to look for.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_nil_list

Example

To check a list of Rational Statemate elements for the presence of activity A1 and assign the elements to the list elmnt_list, use the following statement:

```
stm_list      elmnt_list;
  stm_id        st_id;
  int           status;
      .
      .
  if (stm_list_contains_id_element (elmnt_list,
    (stm_list_id_elm)st_id, &status))
      .
      .
```

If A1 appears in elmnt_list, the statements following the if statement are executed. Note that the ID of A1 (and not its name) is passed to the function.

stm_list_contains_ptr_element

Determines whether the specified item appears in the given list.

Function Type

int

Syntax

stm_list_contains_ptr_element (list, item, &status)

Arguments

Argument	Input/ Output	Type	Description
list	In	stm_list	The list to search.
item	In	stm_list_ptr_elm	The item to look for.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_nil_list

Example

To check a list of Rational Statemate elements for the presence of activity A1 and assign the elements to the list elmnt_list, use the following statement:

```
stm_list          elmnt_list;
  stm_list_ptr_elm   st_name;
  int               status;
      .
      .
  if (stm_list_contains_ptr_element (elmnt_list,
    (stm_list_elm)st_name, &status))
      .
      .
```

If A1 appears in elmnt_list, the statements following the if statement are executed. Note that the name of A1 (and not its ID) is passed to the function.

stm_list_create_ids_list

Creates a list of items using their IDs. The number of arguments varies according to the number of elements to be included in the list. The list is terminated by the predefined constant end_of_id_list .

Function Type

stm_list

Syntax

stm_list_create_ids_list (item1, item2..., end_of_id_list, &status)

Arguments

Argument	Input/ Output	Type	Description
item1	In	stm_id	The first element in the list.
item2	In	stm_id	The next element in the list (and so on).
end_of_id_list	In	stm_id	The end of the list.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range

Example

To create a list that contains the activity named A2 and the state S8, retrieve their IDs from the database and create the list using the following statements:

```
stm_id          ac_id, st_id;
int             status;
stm_list        list;
                .
                .
ac_id = stm_r_ac ("A2", &status);
st_id = stm_r_st ("S8", &status);
list = stm_list_create_ids_list (st_id, ac_id, end_of_id_list,
   &status);
                .
                .
```

stm_list_create_ptr_list

Creates a list of items. The number of arguments varies according to the number of elements to be included in the list. The list is terminated by the predefined constant end_of_ptr_list.

Function Type

stm_list

Syntax

stm_list_create_ptr_list (item1, item2..., end_of_list, &status)

Arguments

Argument	Input/ Output	Type	Description
item1	In	stm_list_ptr_id	The first element in the list.
item2	In	stm_list_ptr_id	The next element in the list (and so on).
end_of_ptr_list	In	char*	The end of the list.
status	Out	int	The function status code.

Status Codes

- stm_success

Example

To create a list that contains the names of the activity named ac2 and the state st8, create the list using the following statements:

```
stm_id              ac_id, st_id;
int                 status;
stm_element_name    ac_name,st_name
stm_list            list;
                    .
                    .
ac_name = stm_r_ac_name ("ac_id", &status);
st_name = stm_r_st_name ("st_id", &status);
list = stm_list_create_ptr_list (st_name, ac_name, end_of_ptr_list,
&status);
                    .
                    .
```

stm_list_create_id_ list_with_args

Creates a list of items using the specified IDs.

Function Type

stm_list

Syntax

stm_list_create_id_list_with_args (args, &status)

Arguments

Argument	Input/ Output	Type	Description
args	In	stm_id*	Array of stm_id's to insert to the list
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_id_out_of_range

stm_list_create_ptr_list_with_args

Creates a list of items.

Function Type

stm_list

Syntax

stm_list_create_ptr_list_with_args (args, &status)

Arguments

Argument	Input/ Output	Type	Description
args	In	stm_list_ptr_elm*	Array of stm_list_ptr_elm's to insert to the list.
status	Out	int	The function status code.

Status Codes

- stm_success

stm_list_delete_id_element

Deletes the specified element from a list of element IDs.

Function Type

stm_list

Syntax

stm_list_delete_id_element (list, element, &status)

Arguments

Argument	Input/Output	Type	Description
list	In	stm_list	The list of Rational Statemate elements
element	In	stm_id	The ID of the element to delete
status	Out	int	The function status code

Status Codes

- stm_success
- stm_list_element_does_not_exist
- stm_nil_list

Example

To remove the element ID st_id from a list, use the following statement:

```
stm_list   st_list;
stm_id     st_id;
int        status;
           .
           .
st_list = stm_list_delete_id_element (st_list, st_id,
   &status);
           .
           .
```

stm_list_delete_ptr_element

Deletes the specified element from a list of element pointers.

Function Type

stm_list

Syntax

stm_list_delete_ptr_element (list, element, &status)

Arguments

Status Codes

- stm_success
- stm_list_element_does_no0 9 72..26 1.02 re f 71.52 sf 71.528a00ono0/Tess

List of Utility Functions

stm_list_extraction

Extracts the elements from the input list.

Function Type

stm_list

Syntax

stm_list_extraction (ex_type, list, &status)

stm_list_extraction (ex_type, el_list, status)

Arguments

Argument	Input/ Output	Type	Description
ex_type	In	int	The type to extract from the list.
list	In	stm_list	The list of Rational Statemate elements.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_nil_list

stm_list_extraction_by_chart

stm_list_extraction_by_chart_id

Extracts the elements from the input list that are defined in the specified chart.

Function Type

stm_list

Syntax

stm_list_extraction_by_chart_id (stm_id chart_id, stm_list list, int* status)

Arguments

Argument	Input/ Output	Type	Description
chart_id	In	stm_chart_id	Chart fro which to extract elements.
list	In	stm_list	The list of Rational Statemate elements.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_nil_list

stm_list_extraction_by_type

Extracts elements of the specified type from the given list of Rational Statemate elements.

Function Type

stm_list

Syntax

stm_list_extraction_by_type (element_type, list, &status)

Arguments

Status Codes

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stm_list_first_id_element

Returns the first item appearing in the list passed as an input argument. This function may be applied to lists containing Rational Statemate ids.

Function Type

stm_list_id_elm

Syntax

stm_list_first_id_element (list, &status)

Arguments

Argument	Input/ Output	Type	Description
list	In	stm_list	The list of ids.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_nil_list
- stm_list_ielement_does_not_exist

Example

To find out which activity in the list of activities assigned to the variable act_list is a control activity, use the following statements:

```
stm_list     cntrl_act_list, act_list;
stm_id       cntrl_act;
int          status;
             .
             .
cntrl_act_list = stm_ac_control_ac (act_list, &status);
cntrl_act = (stm_id)
stm_list_first_id_element (cntrl_act_list, &status);
             .
             .
```

First, extract all control activities from the input list act_list. The list cntrl_act_list consists of only one element. Extract the first element (in this case the only element) of the list and assign this control activity's ID to cntrl_act.

stm_list_first_ptr_element

Function Type

stm_list_elm

Description

Returns the first item appearing in the list passed as an input argument. This function may be applied to lists containing pointers.

Syntax

stm_list_first_ptr_element (list, &status)

Arguments

Argument	Input/ Output	Type	Description
list	In	stm_list	The list of items.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_nil_list
- stm_list_element_does_not_exist

stm_list_intersect_ids_lists

Function Type

stm_list

Description

Extracts elements that are common to the two specified input lists.

Note

The two lists must be both lists of stm_id's

Syntax

stm_list_intersect_ids_lists (list1, list, &status)

Arguments

Argument	Input/ Output	Type	Description
list1	In	stm_list	The first list to compare
list2	In	stm_list	The second list to compare
status	Out	int	The function status code

Status Codes

- stm_success
- stm_nil_list
- stm_cannot_compare_lists

Example

To produce the intersection list list3 from list1 and list2, use the following statements:

```
stm_list    list1,list2,list3;
int         status;
            .
            .
list3 = stm_list_intersect_ids_list (list1, list2, &status);
            .
            .
```

stm_list_intersect_ptr_lists

Function Type

stm_list

Description

Extracts elements that are common to the two specified ptr lists.

Note

The two lists must be both lists of stm_list_ptr_elm's.

Syntax

stm_list_intersect_ptr_lists (list1, list, &status)

Arguments

Argument	Input/ Output	Type	Description
list1	In	stm_list	The first list to compare
list2	In	stm_list	The second list to compare
status	Out	int	The function status code

Status Codes

- stm_success
- stm_nil_list
- stm_cannot_compare_lists

Example

To produce the intersection list list3 from list1 and list2, use the following statements:

```
stm_list    list1,list2,list3;
int         status;
            .
            .
list3 = stm_list_intersect_ptr_lists (list1, list2, &status);
            .
            .
```

stm_list_last_id_element

Function Type

stm_list_id_elm

Description

Returns the last item appearing in the list passed as an input argument. This function can be applied to lists containing stm_id's.

Syntax

stm_list_last_id_element (list, &status)

Arguments

Argument	Input/ Output	Type	Description
list	In	stm_list	The list of items. Items in the input list must be stm_id's.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_nil_list
- stm_list_element_does_not_exist

Example

To find the last item in the list of states S1, S2, S3, and S4 assigned to the variable state_list, use the following statements:

```
stm_list    state_list;
stm_id      state_id;
int         status;
            .
            .
state_id = (stm_id) stm_list_last_id_element (state_list,
   &status);
printf ("The last state in the list is: %s\n",
   stm_r_st_name (state_id, &status));
            .
            .
```

stm_list_last_ptr_element

Function Type

stm_list_ptr_elm

Description

Returns the last item appearing in the list passed as an input argument. This function can be applied to lists containing stm_list_ptr_elm's.

Syntax

stm_list_last_ptr_element (list, &status)

Arguments

Argument	Input/ Output	Type	Description
list	In	stm_list	The list of items. Items in the input list must be stm_list_ptr_elm's.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_nil_list
- stm_list_element_does_not_exist

stm_list_length

Function Type

int

Description

Returns the length of the specified list.

Syntax

stm_list_length (list, &status)

Arguments

Argument	Input/ Output	Type	Description
list	In	stm_list	The list of items. Items in the input list can be of any element type.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_nil_list

Example

To verify that an extracted list of all the events from the database whose name matched a certain pattern (assigned to st_list) contains no more than 3000 elements, use the following statements:

```
stm_list   st_list;
int        status;
           .
           .
if (stm_list_length (st_list, &status) < 3000)
           .
           .
```

stm_list_load

Function Type

stm_list

Description

Loads a previously saved list into memory to be used by the program. Lists can be saved by several tools in Rational Statemate, such as search.

Syntax

stm_list_load (list_name, &status)

Arguments

Argument	Input/ Output	Type	Description
list_name	In	char *	The list to load
status	Out	int	The function status code

Status Codes

- stm_success
- stm_no_such_list

Example

To load a list saved as the name EXT_SIGNALS into memory, use the following call:

```
stm_list  list;
int       status;
          .
          .
list = stm_list_load ("EXT_SIGNALS", &status);
          .
          .
```

Once a list has been loaded, you can operate on it using any of the Dataport functions.

stm_list_next_id_element

Function Type

stm_list_id_elm

Description

Returns the next item appearing in the list passed as an input argument. This function can be applied to lists containing stm_list_id_elm's..

Syntax

stm_list_next_id_element (list, &status)

Arguments

Argument	Input/ Output	Type	Description
list	In	stm_list	The list of items. Items in the input list must be stm_list_id_elm's.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_nil_list
- stm_list_element_does_not_exist

Example

To find the next element in the list of states, S1, S2, S3, and S4 (appearing in this order) assigned to the variable state_list, use the following statements:

```
stm_list  state_list;
stm_id    state_id;
int       status;
          .
          .
state_id =  (stm_id)  stm_list_first_id_element (
       state_list, &status);
printf ("The first state in the list is: %s\n",
   stm_r_st_name (state_id, &status));
state_id = (stm_id) stm_list_next_id_element (state_list,
       &status);
printf ("The second state in the list is: %s\n",
       stm_r_st_name (state_id, &status));
          .
          .
```

This function can be used in a for loop (in conjunction with stm_list_first_id_element) to

stm_list_next_ptr_element

Function Type

stm_list_ptr_elm

Description

Returns the next item appearing in the list passed as an input argument. This function can be applied to lists containing stm_list_ptr_elm's..

Syntax

stm_list_next_ptr_element (list, &status)

Arguments

Argument	Input/ Output	Type	Description
list	In	stm_list	The list of items. Items in the input list must be stm_list_ptr_elem's..
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_nil_list
- stm_list_element_does_not_exist

stm_list_previous_id_element

Function Type

stm_list_id_elm

Description

Returns the previous item appearing in the list passed as an input argument. This function can be applied to lists containing stm_list_id_elm's.

Note that "previous" refers to the item physically located before the current item in the list. The "current" item is determined using the utility function stm_list_last_id_element .

Syntax

stm_list_previous_id_element (list, &status)

Arguments

Argument	Input/ Output	Type	Description
list	In	stm_list	The list of items. Items in the input list must be stm_list_id_elm's.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_nil_list
- stm_list_element_does_not_exist

Example

In the list of states S1, S2, S3, and S4 (appearing in this order) assigned to the variable state_list, locate the state S4 by calling stm_list_last_ids_element; S4 becomes the current item. To find the previous element in the list, use the following statements:

```
stm_list    state_list;
stm_id      state_id;
int         status;
            .
            .
state_id = (stm_id) stm_list_last_element (
       state_list, &status);
state_id =  (stm_id)  stm_list_previous_id_element (
       state_list, &status);
printf ("State of interest is: %s\n",
   stm_r_st_name (state_id, &status));
            .
            .
```

This function can be used in a for loop (in conjunction with stm_list_last_id_element) to

stm_list_previous_ptr_element

Function Type

stm_list_ptr_elm

Description

Returns the previous item appearing in the list passed as an input argument. This function can be applied to lists containing stm_list_id_elm's.

Note that "previous" refers to the item physically located before the current item in the list. The "current" item is determined using the utility function stm_list_last_ptr_element .

Syntax

stm_list_previous_ptr_element (list, &status)

Arguments

Argument	Input/ Output	Type	Description
list	In	stm_list	The list of items. Items in the input list cmust be stm_list_ptr_elm's.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_nil_list
- stm_list_element_does_not_exist

stm_list_purge

Erases the input lis pointers and the list elements.

Note

- This function is intended for use only with lists of strings. You should not purge a list of Rational Statemate elements (IDs) because it can cause serious problems in your program. (Compare with stm_list_destroy.)
- The returned value is false when the input list is a nil list.
- After the function operation, list cannot be used as an input argument in list functions.

Function Type

int

Syntax

stm_list_purge (list, &status)

Arguments

Argument	Input/ Output	Type	Description
list	In	stm_list	The list to purge.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_nil_list

Example

To deallocate the space associated with the list of names, name_list (and the strings included in this list are not referenced by other pointers in your program), use the following statements:

```
.
    .
list = stm_r_st_attr_name (st_id, &status);
if (stm_list_purge (list, &status))
      printf ("list purged");
    .
    .
```

stm_list_sort

Function Type

stm_list

Description

Alphabetically sorts the specified list of strings.

Syntax

stm_list_sort (list, &status)

Arguments

Argument	Input/ Output	Type	Description
list	In	stm_list_elm	The list of strings to be sorted
status	Out	int	The function status code

Status Codes

- stm_success
- stm_nil_list

Example

To sort a list of strings alphabetically, use the following statement:

```
stm_list  unsorted_list, sorted_list;
int       status;
          .
          .
sorted_list = stm_sort_list (unsorted_list, &status);
          .
          .
```

stm_list_sort_alphabet ically_by_branches

Sorts a list of hierarchical Rational Statemate elements by branch. Elements appearing within each branch are ordered alphabetically.

This function is relevant only for a list of hierarchical elements. If the function is applied to a list of non-hierarchical elements, status receives the value stm_elements_not_hierarchical.

Function Type

stm_list

Syntax

stm_list_sort_alphabetically_by_branches (list, &status)

Arguments

Argument	Input/ Output	Type	Description
list	Input	stm_list	The list of Rational Statemate hierarchical elements
status	Input	int	The function status code

Status Codes

- stm_success
- stm_nil_list
- stm_elements_not_hierarchical

stm_list_sort_alphab etically_by_levels

Sorts a list of hierarchical Rational Statemate elements by level. Elements appearing within each level are ordered alphabetically.

This function is relevant only for a list of hierarchical elements. If the function is applied to a list of non-hierarchical elements, status receives the value stm_elements_not_hierarchical.

Function Type

stm_list

Syntax

stm_list_sort_alphabetically_by_levels (list, &status)

Arguments

Argument	Input/ Output	Type	Description
list	Input	stm_list	The list of Statemate hierarchical elements
status	Input	int	The function status code

Status Codes

- stm_success
- stm_nil_list
- stm_elements_not_hierarchical

stm_list_sort_by_attr_value

Sorts the specified list of Rational Statemate elements by the value of the given attribute.

Note that the function receives and returns a list of element IDs, not a list of element names.

Function Type

stm_list

Syntax

stm_list_sort_by_attr_value (list, attr_name, &status)

Arguments

Argument	Input/ Output	Type	Description
list	In	stm_list LIST OF ELEMENT	The list of Rational Statemate element IDs to be sorted.
attr_name	In	stm_attr_name STRING	The attribute to use as the sorting key.
status	Out	int INTEGER	The function status code. The function returns the status code. stm_elements_without_attributes if you apply this function to a list of elements that do not have the specified attribute.

Status Codes

- stm_success
- stm_nil_list
- stm_elements_without_attributes

Example

To sort activities by the name of an attribute called code, use the following function calls:

```
stm_list   act_list, ord_act_list;
stm_id     el;
int        status;
           .
           .
ord_act_list = stm_list_sort_by_attr_value (
       act_list,"code", &status);
printf("\n Ordered list of activities:");
           .
           .
```

This example prints a particular list of activities from the database. Assume you extracted the activities of interest using single element and query functions and built a list of such activities. This list is assigned to the variable act_list .

stm_list_sort_by_branches

When Rational Statemate uses this function to sort a specified list of elements by branches and it encounters two or more charts at the same level of hierarchy, it sorts them alphabetically by name.

Function Type

stm_list

Description

Sorts the specified list of hierarchical Rational Statemate elements by branches.

Note

This function is relevant only for a list of hierarchical elements. If the function is applied to a list of non-hierarchical elements, status receives the value stm_elements_not_hierarchical.

Syntax

stm_list_sort_by_branches (list, &status)

Arguments

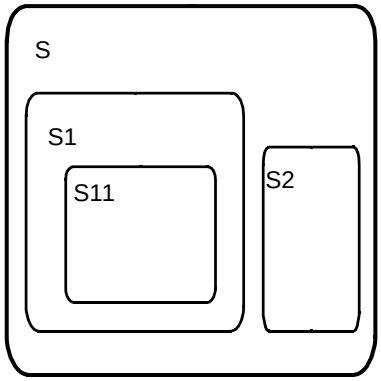
Argument	Input/ Output	Type	Description
list	In	stm_list	The list of Rational Statemate elements.
status	Out	int	The function status code.

Status Codes

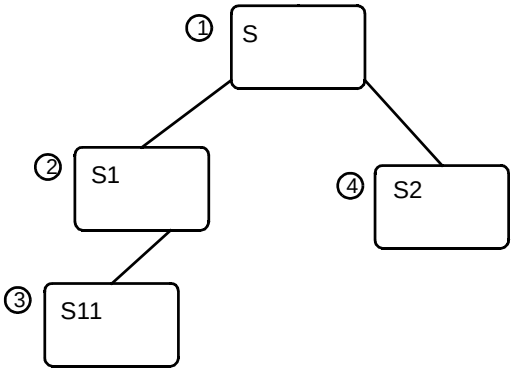
- stm_success
- stm_nil_list
- stm_elements_not_hierarchical

Example

Hierarchical elements in a chart can be ordered by branches. Consider the following statechart:



Hierarchically, the states can be drawn as shown in the following figure.



The set of elements, {S1,S11 }, comprise a branch. Assume you perform a sort_by_branch function on statechart S. The sorted order would be: S1 , S11, S2.

The order in which branches appear in the output is arbitrary. However, the order of states appearing within each branch is ordered from top-to-bottom (S1 to S11, for example).

stm_list_sort_by_chart

Alphabetically sorts the input list of named Rational Statemate elements, by the name of the chart to which they belong. The input list consists of Rational Statemate elements.

This function receives and returns a list of element IDs, not a list of element names.

Function Type

stm_list

Syntax

stm_list_sort_by_chart (el_list, &status)

Arguments

Argument	Input/ Output	Type	Description
el_list	In	stm_list	The list of Rational Statemate box elements.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_nil_list

Example

To sort a list of items by the chart they belong to, use the following statements:

```
stm_list   st_list, sorted_by_chart
int        status;
           .
           .
st_list = stm_r_st_name_of_st ("*", &status);
sorted_by_chart = stm_list_sort_by_chart (st_list,&status);
```

A list of all named statuses is retrieved, then sorted. The sort function orders the list by chart name.

stm_list_sort_by_levels

When Rational Statemate uses this function to sort a specified list of elements by levels and it encounters two or more charts at the same level of the hierarchy, it sorts them alphabetically by name.

Function Type

stm_list

Description

Sorts a list of hierarchical Rational Statemate elements by level.

This function is relevant only for a list of hierarchical elements. If the function is applied to a list of non-hierarchical elements, status receives the value stm_elements_not_hierarchical.

Syntax

stm_list_sort_by_levels (list, &status)

Arguments

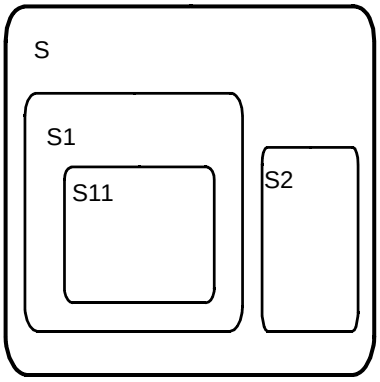
Argument	Input/ Output	Type	Description
list	In	stm_list	The list of Rational Statemate box elements.
status	Out	int	The function status code.

Status Codes

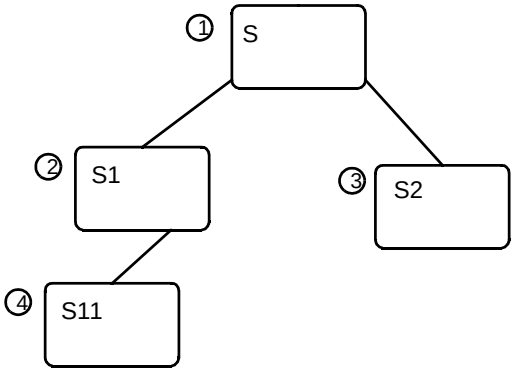
- stm_success
- stm_nil_list
- stm_elements_not_hierarchical

Example

Hierarchical elements in a chart can be ordered by level, as shown in the following statechart.



Hierarchically, the states can be drawn as shown in the following figure.



The set of elements, { S1, S2 }, comprise a level. If you perform a sort_by_level function on statechart S, the sorted order would be: S, S1, S2, S11.

The order of elements within the same level appear in an arbitrary order in the output. For example, S2 might appear before S1 because they are of the same level. However, the order of levels is top-to-bottom.

stm_list_sort_by_name

Sorts the specified list of Rational Statemate elements alphabetically by name.

Note

- The function returns the status code stm_elements_without_name when you attempt to apply this function to a list that contains unnamed elements.
- The function receives and returns a list of element IDs, not a list of element names.

Function Type

stm_list

Syntax

stm_list_sort_by_name (list, &status)

Arguments

Argument	Input/ Output	Type	Description
list	In	stm_list	The list of Statemate elements to be sorted. This input lists consists of element IDs.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_nil_list
- stm_elements_without_name

Example

To sort a list of items by name, use the following statements:

```
stm_list   st_list, sorted_st_list;
int        status;
           .
           .
st_list = stm_r_st_name_of_st ("*", &status);
sorted_st_list = stm_list_sort_by_name (st_list,
       &status);
           .
           .
```

A list of all named states in an unspecified order is retrieved from the database, then the sort function orders the list.

stm_list_sort_by_synonym

Sorts the specified list of Rational Statemate elements alphabetically by their synonyms.

Note

- The function returns the status code stm_elements_without_name when you attempt to apply this function to a list that contains unnamed elements.
- The function receives and returns a list of element IDs, not a list of element names.

Function Type

stm_list

Syntax

stm_list_sort_by_synonym (list, &status)

Arguments

Argument	Input/ Output	Type	Description
list	In	stm_list LIST OF ELEMENT	The list of Statemate elements to be sorted. This input lists consists of element IDs.
status	Out	int INTEGER	The function status code.

Status Codes

- stm_success
- stm_nil_list
- stm_elements_without_synonym

Example

To sort a list of items by synonym, use the following statements:

```
stm_list      st_list, sorted_st_list;
int           status;
              .
              .
st_list = stm_r_st_name_of_st ("*", &status);
sorted_st_list = stm_list_sort_by_synonym (st_list,
      &status);
              .
              .
```

A list of all named states in an unspecified order is retrieved from the database, then the sort function orders the list alphabetically, according to the synonyms.

stm_list_sort_by_type

Sorts the specified list of Rational Statemate elements by type.

Note that the function receives and returns a list of element IDs, not a list of element names.

Syntax

stm_list_sort_by_type (el_list, &status)

Arguments

Argument	Input/ Output	Type	Description
el_list	In	stm_list	The list of Statemate element IDs to be sorted
status	Out	int	The function status code

Status Codes

- stm_success
- stm_nil_list

stm_list_subtract_ids_lists

Creates a new list of those elements of the first input list that are not found in the second input list.

Note

The two input lists must be lists stm_list_id_elm's.

Function Type

stm_list

Syntax

stm_list_id_subtract-ids_lists (list1, list2, &status)

Arguments

Argument	Input/ Output	Type	Description
list1	In	stm_list	The first list of Rational Statemate elements.
list2	In	stm_list	The second list of Statemate elements.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_nil_list
- stm_cannot_compare_lists

Example

The following example creates list3 by subtracting list2 from list1 :

```
stm_list  list1, list2, list3;
int       status;
          .
          .
list3 = stm_list_subtract_ids_lists (list1, list2, &status);
          .
          .
```

stm_list_subtraction_ptr_lists

Creates a new list of those elements of the first input list that are not found in the second input list.

Note

The two input lists must stm_list_ptr_elm's.

Function Type

stm_list

Syntax

stm_list_subtract_ptr_lists (list1, list2, &status)

Arguments

Argument	Input/ Output	Type	Description
list1	In	stm_list	The first list of Rational Statemate elements.
list2	In	stm_list	The second list of Statemate elements.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_nil_list
- stm_cannot_compare_lists

Example

The following example creates list3 by subtracting list2 from list1 :

```
stm_list  list1, list2, list3;
int       status;
          .
          .
list3 = stm_list_subtract_ptr_lists (list1, list2, &status);
          .
          .
```

stm_list_union_ids_lists

Function Type

stm_list

Description

Merges the elements of two specified ids lists.

Note

- Elements in both input lists appear in the output list only once.
- The two input lists must be both lists of stm_id_elm's.

Syntax

stm_list_union_ids_lists (list2, list2, &status)

Arguments

Argument	Input/ Output	Type	Description
list1	In	stm_list	The first list.
list2	In	stm_list	The second list.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_nil_list
- stm_cannot_compare_lists

Example

To produce the union list list3 from list1 and list2, use the following statements:

```
stm_list    list1,list2,list3;
int         status;
              .
              .
list3 = stm_list_union_ids_list (list1, list2, &status);
```

stm_list_union_ptr_lists

Function Type

stm_list

Description

Merges the elements of two specified ptr lists.

Note

- Elements in both input lists appear in the output list only once.
- The two input lists must be both lists of stm_list_ptr_elm's.

Syntax

stm_list_union_ptr_lists (list2, list2, &status)

Arguments

Argument	Input/ Output	Type	Description
list1	In	stm_list	The first list.
list2	In	stm_list	The second list.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_nil_list
- stm_cannot_compare_lists

Example

To produce the union list list3 from list1 and list2, use the following statements:

```
stm_list    list1,list2,list3;
int         status;
              .
              .
list3 = stm_list_union_ptr_lists (list1, list2, &status);
              .
```

stm_load

Function Type

None

Description

Loads a chart file (or any other configuration item file) into the current workarea. It is one of the four utility functions (stm_load, stm_save, stm_unload, and stm_unload_all) that provide an interface between the RationalStat user workarea and external files.

> **Note:** You must work in automatic transaction mode when using this function by specifying automatic_transaction as the trans_mode (third) argument of the stm_init_uad function. Your program should contain lines similar to the following:

```
int success, status;
   ...
success = stm_init_uad ("MY_PROJECT",
    "/local/my_work_area", automatic_transaction,
    &status);
if (!success)
...
```

Syntax

```
stm_load (file_name, item_name, version, mode, enforce,
      message, &status)
```

Arguments

Argument	Input/ Output	Type	Description
file_name	In	char *	The full path name for the file (which is usually a chart file). This file can reside in any directory.
item_name	In	char *	The possible item name and type values are as follows: sch – Statechart ach - Activity-charts mch - Module-charts fch – Flowcharts dic - Global Definition Set files qch - Sequence-Diagrams uch - Use-Case-Diagrams vsm - Continuous Diagrams pnl – Panel files scp - Simulation SCL files cnf - Simulation status files wpf - Waveform Profiles dyn_set - Simulation analysis profiles mon - Monitor files chk_mdl_set - Check Model Profiles dgl - Documentor templates inc - Documentor include files pnl - Prototype panels config - Configuration files tv - Task View files mak - Makefiles oil - OIL files cfg - CFG files c - Source(c) files h - Header (h) files rgenset - Rapid Prototyper Profiles trg - Target files rtrg - Rapid Target files crd - Card files rconfig - Rhapsody block Configuration files ccf - Component Configuration files dat - VSM Data files wav - VSM Wave files mat - VSM Mat. files m - VSM M. files
version	In	char *	The version number. The version contained in this string is recorded in the workarea.

Argument	Input/ Output	Type	Description
mode	In	char *	The mode - u for update, r for read. No lock files are created by this function, even when mode is u (update).
enforce	In	int	If this is 1, it enforces the load - even in cases when the new or modified item with the same name already exists in the workarea. If this is 0, the load operation fails, in these cases, with the corresponding status code and error message.
message	Out	char *	A buffer that holds the error message, if an error occurs. This buffer can hold 127 characters.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_illegal_expression_in_chart
- stm_error_in_chart
- stm_exceeded_max_id_number
- stm_illegal_version
- stm_not_loaded_because_type
- stm_not_loaded_because_modified
- stm_not_loaded_because_new
- stm_cannot_create_file
- stm_cannot_open_chart_file
- stm_illegal_load_mode
- stm_cannot_copy_file
- stm_file_not_found
- stm_chart_is_active

Example

To load the first version of a statechart named MY_CHART from the databank located at /local/my_bank in read mode and enforce the option, use the following statement:

```
#define ENFORCE 1
int     status;
char    mess[128];
.
.
stm_load ("/local/my_bank/chart/my_chart.sch.1",
      "my_chart.sch", "1", 'r', ENFORCE, message, &status);
if (status != stm_success)
.
.
```

stm_multiline_to_one

Function Type

stm_expression

Description

Converts the specified multiline string (with new lines) to a one-line string (without the new lines).

Syntax

stm_multiline_to_one (string)

Arguments

Argument	Input/ Output	Type	Description
string	In	char *	The multiline string.

stm_multiline_to_strings

Function Type

stm_list

Description

Converts the specified multiline expression to a list of strings.

Syntax

stm_multiline_to_strings (string)

Arguments

Argument	Input/Output	Type	Description
string	In	char *	The multiline expression

stm_open_truth_table

Function Type

stm_boolean

Description

Opens a Truth Table that is connected to the specified element and highlights the specified line in it. Returns stm_success if request was successfully sent. Otherwise, it returns stm_id_out_of_range .

Syntax

stm_open_truth_table(stm_id id, int line,int *status)

stm_plot

Generates a plot file with the indicated parameters, such as plot size, output device, and so on. The plot parameters are the same for all the different plot types (statecharts, activity charts, or module charts).

The output is designated for a particular device (one of the output devices defined in Rational Statemate). The destination of the plot output is specified by one of the parameters. If its destination is not specified, the plot is included as part of the output segment file.

When working with Interleaf, the plot uses the following definitions, which should be included at the beginning of the file:

```
<!Font Definitions F46 = Typewriter 10 >
<!Class, caption, Font = F46>
<!Class, plot, Font = F46>
<!Master Frame,
      Name = PltFrm,
      Placement = Following Anchor,
      Horizontal Alignment =Center,
      Same Page = Yes,
      Diagram = V6, (g9,0,0)>
```

Function Type

int

Syntax

```
stm_plot (id, plot_file, width, height, with_labels,with_names, with_notes,
device, date_position,title_position, title, do_rotate, with_file_header,
actual_height)
```

Arguments

Argument	Input/ Output	Type	Description
id	In	stm_id	The ID number of the Rational Statemate chart to be plotted.
plot_file	In	stm_filename	The name of the file destination to which the plot is written. The operating system path name conventions are followed. You can specify a full path name to any directory for which you have write access. If you specify a simple file name, the plot is written to your workarea.
width	In	double	The maximum possible width of the plot (in inches).

Argument	Input/ Output	Type	Description
height	In	double	The maximum possible length of the plot (in inches). If you specify a plot size (width and height parameters) that is larger than the paper size defined for the specific printer, the plot simply uses the maximum allowable height and width defined for that printer.
with_labels	In	stm_boolean	Determines whether labels are plotted (TRUE) or not (FALSE).
with_names	In	stm_boolean	Determines whether names are plotted (TRUE) or not (FALSE).
with_notes	In	stm_boolean	Determines whether notes are plotted (TRUE) or not (FALSE).
device	In	char*	Specifies the plotting device. This can be a supported formatting language if the plot is to be handled by a formatting processing system that has its own graphics language. To configure a new plotter or printer, select Utilities > Output Devices from the main Rational Statemate window. Plots created using Word format in the Output Device dialog box are HPGL files. To import these files into Word, rename them as .HGL or .PLT files.
date_position	In	stm_plt_position	The position of the date. This is an integer parameter of type stm_plt_position That indicates where to place the plot date. The possible values are as follows: • stm_plt_none - The date is not included. • stm_plt_top - The date is placed at the top of the plot. • stm_plt_bottom - The date is placed at the bottom of the plot.

Argument	Input/ Output	Type	Description
title_position	In	stm_plt_position	The title position. This is an integer parameter of type stm_plt_position that indicates where to place the plot title. The possible values are as follows: • stm_plt_none - The title is not included. • stm_plt_top - The title is placed at the top of the plot. • stm_plt_bottom - The title is placed at the bottom of the plot.
title	In	char*	Specifies the title to be printed with the plot.
do_rotate	In	stm_boolean	Determines whether the orientation of the plot is landscape (TRUE) or portrait (FALSE).
with_file_header	In	stm_boolean	Indicates whether a header is added to the file (TRUE). Use this option if you do not want the plot as part of the document (FALSE).
actual_height	Out	double	Specifies the actual height (in inches) of the plotted output.

Status Codes

- stm_success
- stm_can_not_open_file
- stm_id_out_of_range
- stm_not_enough_memory
- stm_id_not_found
- stm_empty_chart
- stm_unknown_plotter
- stm_plot_failure
- stm_unresolved
- stm_illegal_parameter

Example

To create a plot of a chart with an id in a file, use the following statements:

```
stm_id              chart_id;
int                 status;
double              real_ht;
stm_plt_position    date_position;
stm_plt_position    title_position;
date_position = stm_plt_bottom;
title_position = stm_plt_bottom;
chart_id = stm_r_ch ("XL25", &status);
stm_plot (chart_id, "sam/p_xl25", 5.0, 7.0,
      stm_true, stm_true, stm_false, "eps100h",
      date_position, title_position, "System XL25",
      stm_true, stm_false, &real_ht);
```

This produces a plot for the activity-chart XL25 in landscape orientation, limited to a maximum size of 5x7 inches, that prints full labels and notes, but excludes notes. The plot is output to the file specified by the path sam/p_xl25. This file is suitable for printing on an Epson FX100 graphics printer. The date and the title System XL25 appear at the bottom of the plot. The actual scaled height of the plot is returned in the variable real_ht.

stm_plot_ext

Generates a plot file with the indicated parameters, such as plot size, output device, and so on. The plot parameters are the same for all the different plot types (statecharts, activity charts, or module charts). The output is designated for a particular device (one of the output devices defined in Rational Statemate). The destination of the plot output is specified by one of the parameters. If its destination is not specified, the plot is included as part of the output segment file.

The function can generate the hyperlinks in the chart, print a sequence diagram with numbered scenarios, break a sequence diagram across multiple pages and print a sequence diagram with the names of lifelines on every page.

Function Type

int

Syntax

```
stm_plot_ext (id, plot_file_name, width, height, device, data_position,
title_position, title, actual_h, pages_in_x, pages_in_y, page_index_in_x,
page_index_in_y, headerline_y, options)
```

Arguments

Argument	Input/ Output	Type	Description
id	In	stm_id	The ID number of the Rational Statemate chart of be plotted
plot_file_name	IN	stm_filename	The name of the file destination to which the plot is written. The operating system pathname conventions are followed. You can specify a full path name to any directory for which you have writeaccess.If you specify a simple file name, the plot is written to your workarea.
width	In	double	The maximum possible width of the plot (in inches).
height	In	double	The maximum possible length of the plot (ininches).If you specify a plot size (width and height parameters) that is larger than the paper size defined for the specific printer, the plot simply uses the maximum allowable height and width defined for that printer.

Argument	Input/ Output	Type	Description
device	In	char*	Specifies the plotting device. This can be a supported formatting language if the plot is to be handled by a formatting processing system that has its own graphics language.To configure a new plotter or printer, select Utilities > Output Devices from the main Statemate window.Plots created using Word format in the Output Device dialog box are HPGL files. To import these files into Word, rename them as .HGL or .PLT files.
data_position	In	stm_plt_position	The position of the date.This is an integer parameter of type stm_plt_position That indicates where to place the plot date. The possible values are as follows: • stm_plt_none - The date is not included. • stm_plt_top - The date is placed at the top of the plot. • stm_plt_bottom - The date is placed atthe bottom of the plot.
title_position	In	stm_plot_position	This is an integer parameter of type stm_plt_position that indicates where to place the plot title. The possible values are as follows: • stm_plt_none - The title is not included. • stm_plt_top - The title is placed at the top of the plot. • stm_plt_bottom - The title is placed at the bottom of the plot.
title	In	char*	Specifies the title to be printed with the plot.
actual_h	Out	double	Specifies the actual height (in inches) of the plotted output.

Argument	Input/ Output	Type	Description
pages_in_x	Out	int	Specifies how many pages the tool attempted to break the SD into along the x-axis. Note that ifpages_in_x==0 and pages_in_y==0, the tool calculates a break pages scheme and assigns these variables so they can be read by the user after the call.
page_index_in_x	Out	int	Specifies how many pages the tool attempted to break the SD into along the x-axis. Note that ifpages_in_x==0 and pages_in_y==0, the tool calculates a break pages scheme and assigns these variables so they an be read by the user after the call.
page_index_in_y	Out	int	Specifies how many pages the tool attempted to break the SD into along the y-axis.
headerline_y	In	double	Defines the vertical coordinate on the page of the header line. This is usually 1.0.
options	In	list	A list of strings of the form 'key=value'. See notes below for supported options

Status Codes

This function may return one of the two following status codes:

- stm_success
- stm_can_not_open_file
- stm_id_out_of_range
- stm_not_enough_memory
- stm_id_not_found
- stm_empty_chart
- stm_unknown_plotter
- stm_plot_failure
- stm_unresolved
- stm_illegal_parameter
- stm_plot_illegal_option_key
- stm_plot_illegal_option_val

Note: The following are valid values for the “options” argument

- stm_plot_option_hyperlink_ext_act_to_graphics
  - For External-Activity :

    When this option is 'no', the External_activity is hyperlinked to the 'Dictionary' description, if it exists, of the Activity it resolves to. When the 'Dictionary' description is empty, no link is created.

    When this option is 'yes', the External-Activity is hyperlinked to the chart in which the Activity it resolves to is in. If the resolved Activity is an Off-Page Activity, the link is to the off-page chart. If the resolved Activity is an Instance of generic, the link is to the generic chart. If the External-Activity resolves to a higher-level unresolved External-Activity, then the link is to the Chart where the Upper most instance of this External-Activity. If the External-Activity does not resolve to any Activity, no hyperlink is created.
  - For External-Router:

    When this options is 'no', External_router is hyperlinked to the 'Dictionary' description, if it exists, of the Router it resolves to. When the 'Dictionary' description is empty, no link is created, and When this option is 'yes', External-Router is hyperlinked to the chart that the Router it resolves to is in.

- hyperlink_lifeline_to_graphics

  When this option is 'no', Lifelines are hyperlinked to the 'Dictionary' description, if it exists, of the Activity they resolve to.

  When this option is 'yes', Lifelines are hyperlinked to the chart that the Activity they resolve to are in. If the resolved Activity is an Off-Page Activity, the link is to the off-page chart. If the resolved Activity is an Instance of generic, the link is to the generic chart. If the Lifeline resolves to an unresolved External- Activity, no link is created. If the Lifeline does not resolve to any Activity, no hyperlink is created.

stm_plot_hyper_exp

Function Type

int

Description

Generates the hyperlinks in a sequence diagram.

Syntax

stm_plot_hyper_exp (id, plot_file, width, height, with_labels, with_names, with_notes, with_hyperlink, device, date_position, title_position, title, do_rotate, with_file_header, actual_height, with_breakpages, pages_in_x, pages_in_y, page_index_in_x, page_index_in_y, with_hyperlink_exp)

Arguments

Argument	Input/ Output	Type	Description
id	In	stm_id	The ID number of the Rational Statemate chart to be plotted.
plot_file	In	stm_filename	The name of the file destination to which the plot is written. The operating system path name conventions are followed. You can specify a full path name to any directory for which you have write access. If you specify a simple file name, the plot is written to your workarea.
width	In	double	The maximum possible width of the plot (in inches).
height	In	double	The maximum possible length of the plot (in inches). If you specify a plot size (width and height parameters) that is larger than the paper size defined for the specific printer, the plot simply uses the maximum allowable height and width defined for that printer.
with_labels	In	stm_boolean	Determines whether labels are plotted (TRUE) or not (FALSE).
with_names	In	stm_boolean	Determines whether names are plotted (TRUE) or not (FALSE).
with_notes	In	stm_boolean	Determines whether notes are plotted (TRUE) or not (FALSE).

Argument	Input/ Output	Type	Description
with_hyperlink	In	stm_boolean	Specifies whether to generate hyperlinks for lifelines and referenced sequence diagrams (TRUE).
device	In	char*	Specifies the plotting device. This can be a supported formatting language if the plot is to be handled by a formatting processing system that has its own graphics language. To configure a new plotter or printer, select Utilities > Output Devices from the main Rational Statemate window. Plots created using Word format in the Output Device dialog box are HPGL files. To import these files into Word, rename them as .HGL or .PLT files.
date_position	In	stm_plt_ position	The position of the date. This is an integer parameter of type stm_plt_position that indicates where to place the plot date. The possible values are as follows: • stm_plt_none - The date is not included. • stm_plt_top - The date is placed at the top of the plot. • stm_plt_bottom - The date is placed at the bottom of the plot.
title_position	In	stm_plt_ position	The title position. This is an integer parameter of type stm_plt_position that indicates where to place the plot title. The possible values are as follows: • stm_plt_none - The title is not included. • stm_plt_top - The title is placed at the top of the plot. • stm_plt_bottom - The title is placed at the bottom of the plot.
title	In	char*	Specifies the title to be printed with the plot.

Argument	Input/ Output	Type	Description
do_rotate	In	stm_boolean	Determines whether the orientation of the plot is landscape (TRUE) or portrait (FALSE).
with_file_header	In	stm_boolean	Indicates whether a header is added to the file (TRUE). Use this option if you do not want the plot as part of the document (FALSE).
actual_height	Out	double	Specifies the actual height (in inches) of the plotted output.
with_breakpages	In	stm_boolean	Specifies whether to break the SD across multiple pages (true).
pages_in_x	Out	int	Specifies how many pages the tool attempted to break the SD into along the x-axis. Note that if pages_in_x==0 and pages_in_y==0 , the tool calculates a break pages scheme and assigns these variables so they can be read by the user after the call.
pages_in_y	Out	int	Specifies how many pages the tool attempted to break the SD into along the y-axis.
page_index_in_x	In	int	Plots the ith page in the x-axis.
page_index_in_y	In	int	Plots the ith page in the y-axis.
with_hyperlink_exp	In	stm_boolean	Specifies whether to generate hyperlinks for message labels (true).

Status Codes

- stm_success
- stm_can_not_open_file
- stm_id_out_of_range
- stm_not_enough_memory
- stm_id_not_found
- stm_empty_chart
- stm_unknown_plotter
- stm_plot_failure
- stm_unresolved
- stm_illegal_parameter

stm_plot_with_autonumber

Function Type

int

Description

Prints a sequence diagram with numbered scenarios.

Syntax

stm_plot_with_autonumber (id, plot_file, width, height, with_labels, with_names, with_notes, with_hyperlink, plot_type, title_position, title, do_rotate, with_file_header, actual_y, with_breakpages, pages_in_x, pages_in_y, page_index_in_x, page_index_in_y, with_hyperlink_exp, with_headerline, headerline_y, with_autonumber)

Arguments

Argument	Input/ Output	Type	Description
id	In	stm_id	The ID number of the Rational Statemate chart to be plotted.
plot_file	In	stm_filename	The name of the file destination to which the plot is written. The operating system path name conventions are followed. You can specify a full path name to any directory for which you have write access. If you specify a simple file name, the plot is written to your workarea.
width	In	double	The maximum possible width of the plot (in inches).
height	In	double	The maximum possible length of the plot (in inches). If you specify a plot size (width and height parameters) that is larger than the paper size defined for the specific printer, the plot simply uses the maximum allowable height and width defined for that printer.

Argument	Input/ Output	Type	Description
with_labels	In	stm_boolean	Determines whether labels are plotted (true) or not (false).
with_names	In	stm_boolean	Determines whether names are plotted (true) or not (false).
with_notes	In	stm_boolean	Determines whether notes are plotted (true) or not (false).
with_hyperlink	In	stm_boolean	Specifies whether to generate hyperlinks for lifelines and referenced sequence diagrams (true).
plot_type	In	char*	Specifies the plotting device. This can be a supported formatting language if the plot is to be handled by a formatting processing system that has its own graphics language. To configure a new plotter or printer, select Utilities > Output Devices from the main Rational Statemate window. Plots created using Word format in the Output Device dialog box are HPGL files. To import these files into Word, rename them as .HGL or .PLT files.
date_position	In	stm_plt_position	The date position. This is an integer parameter of type stm_plt_position that indicates where to place the plot date. The possible values are as follows: • stm_plt_none - The date is not included. • stm_plt_top - The date is placed at the top of the plot. • stm_plt_bottom - The date is placed at the bottom of the plot.

Argument	Input/ Output	Type	Description
title_position	In	stm_plt_position	The title position. This is an integer parameter of type stm_plt_position that indicates where to place the plot title. The possible values are as follows: • stm_plt_none - The title is not included. • stm_plt_top - The title is placed at the top of the plot. • stm_plt_bottom - The title is placed at the bottom of the plot.
title	In	char*	Specifies the title to be printed with the plot.
do_rotate	In	stm_boolean	Determines whether the orientation of the plot is landscape (true) or portrait (false).
with_file_header	In	stm_boolean	Indicates whether a header is added to the file (true). Use this option if you do not want the plot as part of the document (false).
actual_height	Out	double	Specifies the actual height (in inches) of the plotted output.
with_breakpages	In	stm_boolean	Specifies whether to break the SD across multiple pages (true).
pages_in_x	Out	int	Specifies how many pages the tool attempted to break the SD into along the x-axis. Note that if pages_in_x==0 and pages_in_y==0, the tool calculates a break pages scheme and assigns these variables so they can be read by the user after the call.
pages_in_y	Out	int	Specifies how many pages the tool attempted to break the SD into along the y-axis.
page_index_in_x	In	int	Plots the ith page in the x-axis.

Argument	Input/ Output	Type	Description
page_index_in_y	In	int	Plots the ith page in the y-axis.
with_hyperlink_ exp	In	stm_boolean	Specifies whether to generate hyperlinks for message labels (true).
with_headerline	In	stm_boolean	Specifies whether to print the names of the lifelines on every page (true).
headerline_y	In	double	Defines the vertical coordinate on the page of the headerline. This is usually 1.0.
with_autonumber	In	stm_boolean	Specifies whether to print the SD scenario numbers (true).

Status Codes

- stm_success
- stm_can_not_open_file
- stm_id_out_of_range
- stm_not_enough_memory
- stm_id_not_found
- stm_empty_chart
- stm_unknown_plotter
- stm_plot_failure
- stm_unresolved
- stm_illegal_parameter

stm_plot_with_break

Function Type

int

Description

Breaks a sequence diagram across multiple pages.

Syntax

```
stm_plot_with_break (id, plot_file, width, height,
   with_labels, with_names, with_notes,
   with_hyperlink, plot_type, date_position,
   title_position, title, do_rotate, with_file_header,
   actual_height, with_breakpages, pages_in_x,
   pages_in_y, page_index_in_x, page_index_in_y)
```

Arguments

Argument	Input/ Output	Type	Description
id	In	stm_id	The ID number of the Rational Statemate chart to be plotted.
plot_file	In	stm_filename	The name of the file destination to which the plot is written. The operating system path name conventions are followed. You can specify a full path name to any directory for which you have write access. If you specify a simple file name, the plot is written to your workarea. If you do not specify a value (''), the plot is included as part of the output segment file.
width	In	double	The maximum possible width of the plot (in inches).
height	In	double	The maximum possible length of the plot (in inches). If you specify a plot size (width and height parameters) that is larger than the paper size defined for the specific printer, the plot simply uses the maximum allowable height and width defined for that printer.
with_labels	In	stm_boolean	Determines whether labels are plotted (TRUE) or not (FALSE).
with_names	In	stm_boolean	Determines whether names are plotted (TRUE) or not (FALSE).

Argument	Input/ Output	Type	Description
with_notes	In	stm_boolean	Determines whether notes are plotted (TRUE) or not (FALSE).
with_hyperlink	In	stm_boolean	Specifies whether to generate hyperlinks for lifelines and referenced sequence diagrams (TRUE).
plot_type	In	char*	Specifies the plot type. This can be a supported formatting language if the plot is to be handled by a formatting processing system that has its own graphics language. To configure a new plotter or printer, select Utilities > Output Devices from the main Rational Statemate window. Plots created using Word format in the Output Device dialog box are HPGL files. To import these files into Word, rename them as .HGL or .PLT files.
date_position	In	stm_plt_position	The date position. This is an integer parameter of type stm_plt_position that indicates where to place the plot date. The possible values are as follows: • stm_plt_none - The date is not included. • stm_plt_top - The date is placed at the top of the plot. • stm_plt_bottom - The date is placed at the bottom of the plot.
title_position	In	stm_plt_position	The title position. This is an integer parameter of type stm_plt_position that indicates where to place the plot title. The possible values are as follows: • stm_plt_none - The title is not included. • stm_plt_top - The title is placed at the top of the plot. • stm_plt_bottom - The title is placed at the bottom of the plot.
title	In	char*	Specifies the title to be printed with the plot.
do_rotate	In	stm_boolean	Determines whether the orientation of the plot is landscape (TRUE) or portrait (FALSE).

Argument	Input/ Output	Type	Description
with_file_header	In	stm_boolean	Indicates whether a header is added to the file (TRUE). Use this option if you do not want the plot as part of the document (FALSE).
actual_height	Out	double	Specifies the actual height (in inches) of the plotted output.
with_breakpages	In	stm_boolean	Specifies whether to break the SD across multiple pages (TRUE).
pages_in_x	Out	int	Specifies how many pages the tool attempted to break the SD into along the x-axis. Note that if pages_in_x==0 and pages_in_y==0 , the tool calculates a break pages scheme and assigns these variables so they can be read by the user after the call.
pages_in_y	Out	int	Specifies how many pages the tool attempted to break the SD into along the y-axis.
page_index_in_x	In	int	Plots the ith page in the x-axis.
page_index_in_y	In	int	Plots the ith page in the y-axis.

Status Codes

- stm_success
- stm_can_not_open_file
- stm_id_out_of_range
- stm_not_enough_memory
- stm_id_not_found
- stm_empty_chart
- stm_unknown_plotter
- stm_plot_failure
- stm_unresolved
- stm_illegal_parameter

Notes

Function parameters are as follows:

```
boolean with_hyperlink (IN) /* generate hyperlinks */
boolean with_breakpages (IN) /* enable break pages */
integer pages_in_x (OUT) /* try to break to # of pages in x axis */
integer pages_in_y (OUT) /* try to break to # of pages in y axis */
```

Note: If pages_in_x == 0 and pages_in_y==0 , the tool calculates a break pages scheme and assigns these values so they can be read by the user after the call.

```
integer page_index_in_x (IN) /*plot the ith page in x axis */
integer page_index_in_y (IN) /*plot the ith page in y axis */
```

Call the function STM_PLOT_SET_DATA() before plotting a sequence diagram using STM_PLOT_WITH_BREAK. Call the function STM_PLOT_RESET_DATA() after finishing the sequence diagram multiple pages plot.

stm_plot_with_headerline

Prints a sequence diagram with the names of lifelines on every page.

Function Type

int

Syntax

```
stm_plot_with_headerline (id, plot_file, width, height, with_labels,
with_names, with_notes, with_hyperlink, plot_type, title_position, title,
do_rotate, with_file_header,actual_y, with_breakpages, pages_in_x,
pages_in_y, page_index_in_x, page_index_in_y, with_hyperlink_exp,
with_headerline, headerline_y,)
```

Arguments

Argument	Input/ Output	Type	Description
id	In	stm_id	The ID number of the Rational Statemate chart to be plotted.
plot_file	In	stm_filename	The name of the file destination to which the plot is written. The operating system path name conventions are followed. You can specify a full path name to any directory for which you have write access. If you specify a simple file name, the plot is written to your workarea.
width	In	double	The maximum possible width of the plot (in inches).
height	In	double	The maximum possible length of the plot (in inches). If you specify a plot size (width and height parameters) that is larger than the paper size defined for the specific printer, the plot simply uses the maximum allowable height and width defined for that printer.
with_labels	In	stm_boolean	Determines whether labels are plotted (TRUE) or not (FALSE).
with_names	In	stm_boolean	Determines whether names are plotted (TRUE) or not (FALSE).
with_notes	In	stm_boolean	Determines whether notes are plotted (TRUE) or not (FALSE).
with_hyperlink	In	stm_boolean	Specifies whether to generate hyperlinks for lifelines and referenced sequence diagrams (TRUE).

Argument	Input/ Output	Type	Description
plot_type	In	char*	Specifies the plot type. This can be a supported formatting language if the plot is to be handled by a formatting processing system that has its own graphics language. To configure a new plotter or printer, select Utilities > Output Devices from the main Rational Statemate window. Plots created using Word format in the Output Device dialog box are HPGL files. To import these files into Word, rename them as .HGL or .PLT files.
date_position	In	stm_plt_ position	The date position. This is an integer parameter of type stm_plt_position that indicates where to place the plot date. The possible values are as follows: • stm_plt_none - The date is not included. • stm_plt_top - The date is placed at the top of the plot. • stm_plt_bottom - The date is placed at the bottom of the plot.
title_position	In	stm_plt_ position	The title position. This is an integer parameter of type stm_plt_position that indicates where to place the plot title. The possible values are as follows: • stm_plt_none - The title is not included. • stm_plt_top - The title is placed at the top of the plot. • stm_plt_bottom - The title is placed at the bottom of the plot.
title	In	char*	Specifies the title to be printed with the plot.
do_rotate	In	stm_boolean	Determines whether the orientation of the plot is landscape (TRUE) or portrait (FALSE).
with_file_header	In	stm_boolean	Indicates whether a header is added to the file (TRUE). Use this option if you do not want the plot as part of the document (FALSE).
actual_height	Out	double	Specifies the actual height (in inches) of the plotted output.

Argument	Input/ Output	Type	Description
with_breakpages	In	stm_boolean	Specifies whether to break the SD across multiple pages (TRUE).
pages_in_x	Out	int	Specifies how many pages the tool attempted to break the SD into along the x-axis. Note that if pages_in_x==0 and pages_in_y==0 , the tool calculates a break pages scheme and assigns these variables so they can be read by the user after the call.
pages_in_y	Out	int	Specifies how many pages the tool attempted to break the SD into along the y-axis.
page_index_in_x	In	int	Plots the ith page in the x-axis.
page_index_in_y	In	int	Plots the ith page in the y-axis.
with_hyperlink_exp	In	stm_boolean	Specifies whether to generate hyperlinks for message labels (TRUE).
with_headerline	In	stm_boolean	Specifies whether to print the names of the lifelines on every page (TRUE).
headerline_y	In	double	Defines the vertical coordinate on the page of the headerline. This is usually 1.0.

Status Codes

- stm_success
- stm_can_not_open_file
- stm_id_out_of_range
- stm_not_enough_memory
- stm_id_not_found
- stm_empty_chart
- stm_unknown_plotter
- stm_plot_failure
- stm_unresolved
- stm_illegal_parameter

stm_r_global_interface_report

Function Type

stm_list

Description

Returns the global interface report for the elements in the input list (box_lst).

Syntax

stm_r_global_interface_report (box_lst, sort_by_elm, &status)

Arguments

Argument	Input/ Output	Type	Description
box_list	in	stm_list	List of elements.
sort_by_elm	in	stm_boolean	The way the global interface report is.
status	out	int	The function status code.

Status Codes

- stm_id_out_of_range
- stm_success

stm_r_local_interface_report

Function Type

stm_list

Description

Returns the local interface report for the elements in the input list (box_lst).

Syntax

stm_r_local_interface_report (box_lst, &status)

Arguments

Argument	Input/ Output	Type	Description
box_lst	in	stm_list	List of elements.
status	out	int	The function status code.

Status Codes

- stm_id_out_of_range
- stm_success

stm_run_simulation_profile

Function Type

stm_Boolean

Description

Sends a message to Rational Statemate to open and execute a Simulation profile by the name passed as a parameter.

Syntax

stm_run_simulation_profile (string profile_name, int* status)

stm_save

Function Type

None

Description

Saves a chart (or any other configuration item) from the current workarea to an external file. It is one of the four utility functions (stm_load, stm_save, stm_unload, and stm_unload_all) that provide an interface between the workarea of the Rational Statemate user and external files.

You must work in the automatic_transaction mode when using this function by specifying automatic_transaction as the third argument (trans_mode) of the stm_init_uad function. Your program should contain the following call:

```
int success, status;
...
success = stm_init_uad ("MY_PROJECT",
      "/local/my_work_area", automatic_transaction,
      &status);
if (!success)
...
```

Syntax

stm_save (file_name, item_name, message, &status)

Arguments

Argument	Input/Output	Type	Description
file_name	In	char *	The full path name for the file. Any name in any directory can be specified for file_name. In charts, the chart is converted into an ASCII format and written to the specified file. The specified file should not exist before calling this function. Note that no description or lock files are created by this function.

Argument	Input/Output	Type	Description
item_name	In	char *	The item name and type. The possible values are as follows: • ach - Activity-charts • cgenset - Compilation profiles • chk_mdl_set - Check Model profiles • cnf - Simulation status files • config - Configuration files • dgl - Documentor templates • dic - Global definition sets • dyn_set - Simulation analysis profiles • inc - Documentor include files • mch - Module-charts • pnl - Panels of the Prototyper • req - Requirement files • sch - For statecharts • scp - Simulation SCL files
message	Out	char *	A buffer that holds the error message, if an error occurs. This buffer can hold 127 characters.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_error_in_save_operation
- stm_chart_not_in_database
- stm_file_not_in_work_area
- stm_cannot_copy_file

Example

The following call saves a statechart in the workarea named SYSTEM_CHART to an external file named saved_chart in the /tmp directory:

```
int  status;
char mess[128];
.
.
stm_save ("system_chart.sch", "/tmp/saved_chart",
       message, &status);
if (status != stm_success)
.
.
```

stm_start_transaction

Function Type

void

Description

Enables transaction operations on the database. If you are retrieving information from a database that has changed since the last transaction opening (start), it is important to do a commit followed by another start before doing a new function. This sequence establishes access to database changes because it refreshes the database image in memory.

> Note: This function is relevant only in self_transaction mode. In the automatic_transaction mode, the start and commit functions are performed automatically.

Syntax

stm_start_transaction ()

Example

To enable transaction operations on a database, use the following statements:

```
stm_start_transaction();
stm_r...                -- a retrieval function
        .
        .
```

stm_start_transaction_rw

Function Type

void

Description

Enables read/write transaction operations on the database.

Syntax

stm_start_transaction_rw ()

stm_trigger_of_reaction

Function Type

stm_expression

Description

Returns the trigger part of a reaction (label of a transition or static reaction). The syntax of the reaction is trigger/action .

Note

- The reaction is achieved by the following single-element functions:
  - stm_r_st_reactions
  - stm_r_tr_labels
- The function returns an empty string when the trigger is missing.

Syntax

stm_trigger_of_reaction (reaction, &status)

Arguments

Argument	Input/ Output	Type	Description
reaction	In	char *	The reaction to decompose
status	Out	int	The function status code

Status Codes

stm_success

Example

To list all events that have influence on S1, which has several static reactions, use the following statements:

```
    stm_id            st_id;
    int               status;
    stm_list          reactions;
    stm_expression  rct;

st_id = stm_r_st ("S1", status);
reactions = stm_r_st_reactions (st_id, status);
printf ("\n Triggers of reaction is S1:");
 for (rct= (string)
      stm_list_first_element (reaction, &status);
      status == stm_success;
      rct = (string)
      stm_list_next_element (reaction, &status))
      printf ("\n %S", stm_trigger_of_reaction (rct,
        status));
```

stm_uad_attribute

Function Type

int

Description

Writes the predefined attribute report to the specified output file. The output contains commands for the specified word processor.

Syntax

```
stm_uad_attribute (elist, attrs, attr_title, file_name,wp, append,
with_header, p_width, pheight)
```

Arguments

Argument	Input/ Output	Type	Description
elist	In	stm_list	Lists the Rational Statemate elements for which the report is produced.
attrs	In	stm_list	Lists the names of the attributes for which the report should be generated. If this list is empty, the report retrieves all the attributes for each element.
attr_title	In	stm_attr_name	Specifies the attribute whose value precedes the element name in the report.
file_name	In	stm_filename	The name of the output file.
wp	In	char*	The target word processor.
append	In	stm_boolean	Determines whether the new information is appended to the output file, if it already exists.
with_header	In	stm_boolean	Specifies whether to include set-up commands to the word processor (true).
p_width	In	int	Specifies the page width.
p_height	In	int	Specifies the page length.

Status Codes

- stm_success
- stm_unknown_plotter
- stm_can_not_open_file

stm_uad_dictionary

Function Type

int

Description

Writes the predefined dictionary report to the specified output file. The output contains commands for the designated word processor.

Syntax

```
stm_uad_dictionary (elist, ldes, attr, attr_title,file_name, wp, append,
with_header, p_width, pheight)
```

Arguments

Argument	Input/ Output	Type	Description
elist	In	stm_list	Lists the Rational Statemate elements for which the report is produced.
ldes	In	stm_boolean	If this is true, the long description of each element is included in the report.
attr	In	stm_boolean	If this is true, include the element's attributes in the report.
attr_title	In	stm_attr_name	Specifies the attribute whose value precedes the element name in the report.
file_name	In	stm_filename	The name of the output file.
wp	In	char*	The target word processor.
append	In	stm_boolean	Determines whether the new information is appended to the output file, if it already exists.
with_header	In	stm_boolean	Specifies whether to include set-up commands to the word processor (true).
p_width	In	int	Specifies the page width.
p_height	In	int	Specifies the page length.

Status Codes

- stm_success
- stm_unknown_plotter
- stm_can_not_open_file

stm_uad_interface

Function Type

int

Description

Writes the predefined attribute report to the specified output file. The output contains commands for the specified word processor.

Syntax

stm_uad_attribute (elist, attrs, attr_title, file_name,wp, append,
with_header, p_width, pheight)

Arguments

Argument	Input/ Output	Type	Description
elist	In	stm_list	Lists the Rational Statemate elements for which the report is produced.
attrs	In	stm_list	Lists the names of the attributes for which the report should be generated. If this list is empty, the report retrieves all the attributes for each element.
attr_title	In	stm_attr_name	Specifies the attribute whose value precedes the element name in the report.
file_name	In	stm_filename	The name of the output file.
wp	In	char*	The target word processor.
append	In	stm_boolean	Determines whether the new information is appended to the output file, if it already exists.
with_header	In	stm_boolean	Include set-up commands to the word processor.
p_width	In	int	Specifies the page width.
p_height	In	int	Specifies the page length.

Status Codes

- stm_success
- stm_unknown_plotter
- stm_can_not_open_file

stm_uad_list

Function Type

int

Description

Writes the predefined list report to the specified output file. The output contains commands for the designated word processor.

Syntax

stm_uad_list (elist, file_name, wp, append, with_header,p_width, pheight)

Arguments

Argument	Input/ Output	Type	Description
elist	In	stm_list	The list of elements for which the report is produced.
file_name	In	stm_filename	The name of the output file.
wp	In	char*	The target word processor.
append	In	stm_boolean	Determines whether the new information is appended to the output file, if it already exists.
with_header	In	stm_boolean	Specifies whether to include set-up commands to the word processor (true).
p_width	In	int	Specifies the page width.
p_height	In	int	Specifies the page length.

Status Codes

- stm_success
- stm_unknown_plotter
- stm_can_not_open_file

stm_uad_n2

Function Type

int

Description

Writes the predefined N2-chart report to the specified output file. The output contains commands for the designated word processor.

Syntax

```
stm_uad_n2 (elist, names, level, env, chart, dis, ftype, file_name, wp,
append, with_header, p_width, pheight)
```

Arguments

Argument	Input/ Output	Type	Description
elist	In	stm_list	A list expression, which must be of the type list of modules or list of activities, that specifies the elements in the diagonal.
names	In	char	Specifies whether to display the names (N) or synonyms (S) of the elements that appear on the diagonal of the matrix.
level	In	char	Specifies whether the sub-box (B) or parent box (P) is placed on the diagonal of the matrix.
env	In	stm_boolean	If this is true, the environment is added to the matrix.
chart	In	char	Indicates whether activity-chart (A) or module-chart (M) arrows are taken into account when the report is generated.
dis	In	char	Specifies the kind of information to appear in the report. The possible values are as follows: • I - Flow labels • P - Parent information items • B - Basic information items
ftype	In	char	Specifies the kind of information flows to show in the report. The possible values are as follows • D - Data-flows • C - Control-flows • B - Both data- and control-flows

Argument	Input/ Output	Type	Description
file_name	In	stm_filename	The name of the output file.
wp	In	char*	The target word processor.
append	In	stm_boolean	Determines whether the new information is appended to the output file, if it already exists.
with_header	In	stm_boolean	Specifies whether to include set-up commands to the word processor (true).
p_width	In	int	Specifies the page width.
p_height	In	int	Specifies the page length.

Status Codes

- stm_success
- stm_unknown_plotter
- stm_can_not_open_file

stm_uad_protocol

Function Type

int

Description

Writes the predefined protocol report to the specified output file. The output contains commands for the specified word processor.

Syntax

stm_uad_protocol (elist, attr_title, file_name, wp,append, with_header, p_width, pheight)

Arguments

Argument	Input/ Output	Type	Description
elist	In	stm_list	Lists the Rational Statemate elements for which the report is produced.
attr_title	In	stm_attr_name	Specifies the attribute whose value precedes the element name in the report.
file_name	In	stm_filename	The name of the output file.
wp	In	char*	The target word processor.
append	In	stm_boolean	Determines whether the new information is appended to the output file, if it already exists.
with_header	In	stm_boolean	Specifies whether to include set-up commands to the word processor (true).
p_width	In	int	Specifies the page width.
p_height	In	int	Specifies the page length.

Status Codes

- stm_success
- stm_unknown_plotter
- stm_can_not_open_file

stm_uad_resolution

Function Type

int

Description

Writes the predefined resolution report to the specified output file. The output contains commands for the specified word processor.

Syntax

stm_uad_resolution (clist, type, file_name, wp, append,with_header, p_width, pheight)

Arguments

Argument	Input/ Output	Type	Description
clist	In	stm_list	Lists the Rational Statemate charts for which the report is produced.
type	In	stm_attr_name	Specifies the type of element to include in the report. The possible values are as follows: • stm_textual • stm_graphical • stm_mixed • stm_state • stm_module • stm_activity • stm_data_store
file_name	In	stm_filename	The name of the output file.
wp	In	char*	The target word processor.
append	In	stm_boolean	Determines whether the new information is appended to the output file, if it already exists.
with_header	In	stm_boolean	Specifies whether to include set-up commands to the word processor (true).
p_width	In	int	Specifies the page width.
p_height	In	int	Specifies the page length.

Status Codes

- stm_success
- stm_unknown_plotter
- stm_can_not_open_file

stm_uad_state_interface

Function Type

int

Description

Writes the predefined state interface report to the specified output file. The output contains commands for the specified word processor.

Syntax

stm_uad_state_interface (elist, file_name, wp, append,with_header, p_width, pheight)

Arguments

Argument	Input/ Output	Type	Description
elist	In	stm_list	Lists the Rational Statemate elements for which the report is produced.
file_name	In	stm_filename	The name of the output file.
wp	In	char*	The target word processor.
append	In	stm_boolean	Determines whether the new information is appended to the output file, if it already exists.
with_header	In	stm_boolean	Specifies whether to include set-up commands to the word processor (true).
p_width	In	int	Specifies the page width.
p_height	In	int	Specifies the page length.

Status Codes

- stm_success
- stm_unknown_plotter
- stm_can_not_open_file

stm_uad_structure

Function Type

int

Description

Writes the predefined structure report to the specified output file. The output contains commands for the specified word processor.

Syntax

stm_uad_structure (elist, width, file_name, wp, append,with_header, p_width, pheight)

Arguments

Argument	Input/ Output	Type	Description
elist	In	stm_list	Lists the Rational Statemate elements for which the report is produced.
width	In	int	The report width, in inches.
file_name	In	stm_filename	The name of the output file.
wp	In	char*	The target word processor.
append	In	stm_boolean	Determines whether the new information is appended to the output file, if it already exists.
with_header	In	stm_boolean	Specifies whether to include set-up commands to the word processor (true).
p_width	In	int	Specifies the page width.
p_height	In	int	Specifies the page length.

Status Codes

- stm_success
- stm_unknown_plotter
- stm_can_not_open_file

stm_uad_tree

Function Type

int

Description

Writes the predefined tree report to the specified output file. The output contains commands for the specified word processor.

Syntax

stm_uad_tree (elist, depth, file_name, wp, append,with_header, p_width, pheight)

Arguments

Argument	Input/ Output	Type	Description
elist	In	stm_list	Lists the Rational Statemate elements for which the report is produced.
depth	In	int	Specifies the hierarchical level to which the report should be generated. To include all levels, use the value 99.
file_name	In	stm_filename	The name of the output file.
wp	In	char*	The target word processor.
append	In	stm_boolean	Determines whether the new information is appended to the output file, if it already exists.
with_header	In	stm_boolean	Specifies whether to include set-up commands to the word processor (true).
p_width	In	int	Specifies the page width.
p_height	In	int	Specifies the page length.

Status Codes

- stm_success
- stm_unknown_plotter
- stm_can_not_open_file

stm_unload

Function Type

void

Description

Unloads (deletes from the current workarea) a draft or any other configuration item file. It is one of the four utility functions (stm_load, stm_save, stm_unload, and stm_unload_all) that provide an interface between the workarea of the Rational Statemate user and external files.

You must work in the automatic_transaction mode when using this function by specifying automatic_transaction as the third argument (trans_mode) of the stm_init_uad function. Your program should contain lines similar to the following:

```
int success, status;
.
.
success = stm_init_uad ("MY_PROJECT",
      "/local/my_work_area", automatic_transaction,
      &status);
if (!success)
.
.
```

Syntax

stm_unload (item_name, enforce, message, &status)

Arguments

Argument	Input/ Output	Type	Description
item_name	In	char *	The item name and type. The possible values are as follows: • ach - Activity-charts • cgenset - Compilation profiles • chk_mdl_set - Check Model profiles • cnf - Simulation status files • config - Configuration files • dgl - Documentor templates • dic - Global definition sets • dyn_set - Simulation analysis profiles • inc - Documentor include files • mch - Module-charts • req - Requirement files • sch - Statecharts • scp - Simulation SCL files
enforce	In	stm_boolean	If this is true, it enforces the load—even in cases when the new or modified item with the same name already exists in the workarea. If this is false, the load operation fails, in these cases, with the corresponding status code and error message.
message	Out	char *	A buffer that holds the error message, if an error occurs. This buffer can hold 127 characters.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_chart_not_in_database
- stm_file_not_in_work_area
- stm_chart_is_active
- stm_not_unloaded_modified
- stm_not_unloaded_new

Example

To unload (delete from the current workarea) an activity-chart named bad_chart , use the following statements:

```
#define DONT_ENFORCE 0
int   status;
char  mess[128];
.
.
stm_unload ("bad_chart.ach", DONT_ENFORCE, message,
      &status);
if (status != stm_success)
.
.
```

To avoid losing information, do not enforce the operation in case this chart is new or modified.

stm_unload_all

Function Type

void

Description

Unloads all charts from the current workarea and clears all database fields. It is one of the four utility functions (stm_load, stm_save, stm_unload, and stm_unload_all) that provide an interface between the workarea of the internal Statemate user and external files.

This function is not equivalent to calling the stm_unload function for each chart in the database. The differences between these two functions are as follows:

- stm_unload takes a fixed amount of time regardless of the number of charts in the database. It does not perform an unload of individual charts, but rather cleans all database data. Usually this function clears the database much faster than by unloading individual charts one by one.
- stm_unload_all clears the internal ID counter of charts in the database, whereas the stm_unload function does not. This counter starts from 0 when the workarea database is initially created and is incremented each time a chart is created or loaded into the database. It is not decremented when charts are unloaded (deleted). When this counter reaches the value of 1023, no more charts can be loaded or created in the database. There are two ways to reset this counter: calling the stm_unload_all function from a program, or interactively via the Delete charts from the Workarea option of Rational Statemate with the Delete all and Without confirmation flags set.

  Note: When using this function, you must work in the automatic transaction mode by specifying automatic_transaction as the third argument (trans_mode) of the stm_init_uad function. Your program should contain lines similar to the following:

```
int success, status;
...
success = stm_init_uad("MY_PROJECT",
              "/local/my_work_area",
                  automatic_transaction, &status);
if (!success)
 ....
```

Syntax

```
stm_unload_all (message, &status)
```

Arguments

Argument	Input/ Output	Type	Description
message	Out	char *	A buffer that holds the error message, if an error occurs. This buffer can hold 127 characters.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_chart_is_active

Project Management

This section describes special project management functions. For each function, the following information is provided:

- Description
- Syntax
- Arguments
- Status codes

The following table lists the project management functions.

Function	Description
stm_r_pm_member_workareas	Returns the workareas of the specified user.
stm_r_pm_operator_projects	Returns a list of all the projects in which the specified user is a member.
stm_r_pm_project_databank	Returns the databank name of the specified project in the project management database.
stm_r_pm_project_manager	Returns the manager of the specified project in the project management database.
stm_r_pm_project_members	Returns a list of all the members of the specified project in the project management database.
stm_r_pm_projects	Returns a list of all the projects in the project management database.

stm_r_pm_member_workareas

Function Type

stm_list

Description

Returns the workareas of the specified user.

Syntax

stm_r_pm_member_workareas (o_name, p_name, &status)

Arguments

Argument	Input/ Output	Type	Description
o_name	In	char *	The name of the user.
p_name	In	char *	The name of the project.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_nonexistent_project
- stm_not_member_of_project

stm_r_pm_operator_projects

Function Type

stm_list

Description

Returns a list of all the projects in which the specified user is a member.

Syntax

stm_r_pm_operator_projects (oname, &status)

Arguments

Argument	Input/ Output	Type	Description
o_name	In	char *	The name of the user.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_no_projects

stm_r_pm_project_databank

Function Type

char *

Description

Returns the databank name of the specified project in the project management database.

Syntax

stm_r_pm_project_databank (pname, &status)

Arguments

Argument	Input/ Output	Type	Description
pname	In	char *	The name of the project.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_nonexistent_project

stm_r_pm_project_manager

Function Type

char *

Description

- Returns the manager of the specified project in the project management database.

Syntax

stm_r_pm_project_manager (pname, &status)

Arguments

Argument	Input/ Output	Type	Description
pname	In	char	The name of the project.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_nonexistent_project

stm_r_pm_project_members

Function Type

stm_list

Description

Returns a list of all the members of the specified project in the project management database.

Syntax

stm_r_pm_project_members (pname, &status)

Arguments

Argument	Input/ Output	Type	Description
pname	In	char *	The name of the project.
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_nonexistent_project

stm_r_pm_projects

Function Type

stm_list

Description

Returns a list of all the projects in the project management database.

Syntax

stm_r_pm_projects (&status)

Arguments

Argument	Input/ Output	Type	Description
status	Out	int	The function status code.

Status Codes

- stm_success
- stm_no_projects

Data Types

This section lists Dataport datatypes and their definitions. The data types are defined in the dataport.h file, which you must include in your C program. For ease of use, the datatypes are presented in alphabetical order. In these definitions, element is defined as a Rational Statemate element.

```
/************************************ general definitions *************/

#if defined (STM4NT) || defined (DLL_LINK)
typedef __int64 stm_id;/* The unique identifying number of an*/
                        /* element designated by statemate.*/
#else
typedef long long  stm_id;      /* The unique identifying number of an*/
                        /* element designated by statemate.*/
#endif

typedef char *stm_list;/* general structure of lists*/

typedef stm_id stm_list_id_elm;/* general structure of element list*/
typedef char *stm_list_ptr_elm;/* general structure of element list*/

typedef char *stm_element_name;/* name of an element*/
                        /* maximum length of 64*/

typedef char *stm_short_name;/*maximum length of 16*/

typedef char *stm_pathname;/* Path-name includes the names of all*/
                        /* the ancestors until the element is*/
                        /* uniquely defined.  The format is:*/
                        /* NAME.NAME.NAME...*/
                        /*maximum length of 1024*/
```

```
typedef char *stm_attr_name;/* attribute name*/
                        /*maximum length of 31*/

typedef char *stm_attr_val;/* attribute value*/
                        /*maximum length of 64*/

typedef char *stm_description;/* short description in element's form*/
                        /*maximum length of 80*/

typedef char *stm_expression;/* element expression in definition*/
                        /*unlimited length*/

typedef char *stm_nt_note;   /* note                        */
                        /*maximum length of 256*/

typedef char *stm_filename;/* path-name of file*/
                        /*maximum length of 512*/

typedef char *stm_date;/* statemate date*/

typedef char *stm_user_name;/* name of user*/

typedef char *stm_const_exp;/* constant integer or identifier */
                        /*maximum length of 64     */

typedef char *stm_displayed_name;/*             */

typedef char *stm_rt_number;/* rt number*/
                        /*maximum length of 18*/

typedef char *stm_rt_name;/* rt name*/
                        /* maximum length of 60*/

typedef char *stm_rt_note;/* rt note*/
                        /*maximum length of 16000*/
```

```
typedef char *stm_rt_text_contents;/* rt text*/
                        /* maximum length of 16000*/
typedef char stm_name_type;

typedef char *stm_ch_version;   /*  maximum length of 80 */

typedef char *stm_pm_operator_name;  /* operator name, maximum length of 12
*/
typedef char *stm_pm_project_name;   /* project name, maximum length of 16  */
typedef char *stm_pm_databank;       /* databank path-name              */
typedef char *stm_pm_workarea;       /* workarea path-name              */

#ifndef NIL
#define NIL (0x0)/* universal (untyped) nil pointer*/
#endif

#define err_result -1/* if the result of 0 is legal when*/
                        /* returning an integer*/

#define err_char ' '/* return err-value for char functions*/

#define end_of_id_list ((stm_id)-1) /* end of parameter list in function */
                        /* stm_create_list_ids_list */
#define end_of_ptr_list ((char *)-1)/* end of parameter list in function */
                        /* stm_create_list_ptr_list*/
#define end_of_list ((char *)-1)   /* end of parameter list in function*/
                        /* stm_create_list*/

/* Constant strings used with function stm_plt_ext(): */
#define stm_plot_option_with_labels          "with_labels"
#define stm_plot_option_with_names             "with_names"
#define stm_plot_option_with_notes           "with_notes"
#define stm_plot_option_with_hyperlink         "with_hyperlink"
#define stm_plot_option_do_rotate           "do_rotate"
#define stm_plot_option_with_header            "with_header"
```

```
#define stm_plot_option_with_breakpages              "with_breakpages"
#define stm_plot_option_with_headerline              "with_headerline"
#define stm_plot_option_with_autonumber              "with_autonumber"
#define stm_plot_option_avoid_margins                "avoid_margins"
#define stm_plot_option_hyperlink_ext_act_to_graphics
"hyperlink_ext_act_to_graphics"
#define stm_plot_option_hyperlink_lifeline_to_graphics
"hyperlink_lifeline_to_graphics"
#define stm_plot_option_hyperlink_generic_instance_to_chart
"hyperlink_generic_instance_to_chart"



typedef enum
{
  automatic_transaction,
  self_transaction
}
stm_transaction;

typedef enum {
  uad_normal_mode,
  uad_component_mode
} uad_comp_mode_enum;

typedef struct uad_workarea_mode{
  uad_comp_mode_enum       mode;
  char*                    name;
} uad_workarea_mode;



typedef charstm_element_type;
#define stm_chart'C'
#define stm_state'S'
#define stm_transition't'
#define stm_compound_transition'T'
#define stm_condition'c'
```

```
#define stm_event'E'
#define stm_action'N'
#define stm_function'n'   /* for 1.0 compatability */
#define stm_subroutine'n'
#define stm_activity'A'
#define stm_data_store'D'
#define stm_a_flow_line'f'
#define stm_compound_a_flow_line 'F'
#define stm_data_item'd'
#define stm_data_type'P'
#define stm_field'i'
#define stm_information_flow'I'
#define stm_module'M'
#define stm_box_occurrence'O'
#define stm_m_flow_line'w'
#define stm_compound_m_flow_line 'W'
#define stm_s_connector's'
#define stm_a_connector'a'
#define stm_m_connector'm'
#define stm_label'L'
#define stm_flow_label'l'
#define stm_note'o'
#define stm_module_occurrence'O'  /*  for compatability with 4.1 */
#define stm_block              'B'
#define stm_local_data         'g'
#define stm_subroutine_parameter 'p'
#define stm_lifeline 'b'
#define stm_external_lifeline 'j'
#define stm_message 'k'
#define stm_referenced_sd 'q'
#define stm_timing_constraint 'r'
#define stm_order_insignificant 'u'
#define stm_separator 'v'
#define stm_actor 'R'
#define stm_boundry_box 'y'
#define stm_use_case 'U'
```

```
#define stm_router 'Q'
#define stm_external_router 'J'

/*  for compatability with 2.5 */

typedef char *stm_name;/* name of an element*/



/*****************************************************************************/
typedef int  stm_boolean;

#define stm_true   1
#define stm_false  0



/***************************************** global definitions ***********/
typedef charstm_definition_type;
#define stm_reference   'Z'    /* element has no form                    */
#define stm_primitive   'P'    /* The definition field is empty          */
#define stm_compound    'C'    /* The definition field contains compound
exp.*/
#define stm_constant    'K'    /* The definition field contains a constant
*/
#define stm_alias       'M'    /* The definition field contains identifier
*/
                        /* bit-array component or slice. (di only)    */
#define stm_implicit'?'    /* Not on use                              */
#define stm_explicit'M'    /* Explicit information-flow               */
#define stm_predefined'U'    /* Predefined STATEMATE functions.       */

typedef char  stm_structure_type;
#define stm_single      'G'
#define stm_array       'A'
#define stm_queue       'Q'
#define stm_missing     ' '

#define stm_if_implicit stm_implicit
```

```
/********************************************** graphic definitions
**********/

typedef charstm_plt_position;
#define stm_plt_none'N'
#define stm_plt_top'T'
#define stm_plt_bottom'B'

typedef unsigned long stm_color;
typedef charstm_color_type;
#define stm_white            0
#define stm_misty_rose       1
#define stm_pink2            2
#define stm_hot_pink_1       3
#define stm_hot_pink_2       4
#define stm_hot_pink_3       5
#define stm_deep_pink        6
#define stm_deep_pink3       7
#define stm_pink             8
#define stm_pale_violet_red  9
#define stm_indian_red       10
#define stm_red              11
#define stm_red_2            12
#define stm_red_3            13
#define stm_fire_brick       14
#define stm_red_4            15
#define stm_peach_puff       16
#define stm_orange           17
#define stm_orange_2         18
#define stm_dark_orange      19
#define stm_sienna_1         20
#define stm_orange_red       21
#define stm_orange_red_2     22
#define stm_orange_red_3     23
#define stm_beige            24
```

```
#define stm_tan              25
#define stm_light_golden_rod  26
#define stm_yellow           27
#define stm_yellow_3         28
#define stm_dark_golden_rod   29
#define stm_dark_golden_rod_4 30
#define stm_saddle_brown      31
#define stm_darksea_green_1   32
#define stm_pale_green        33
#define stm_spring_green      34
#define stm_green            35
#define stm_green_3          36
#define stm_green_4          37
#define stm_forest_green      38
#define stm_dark_green        39
#define stm_light_cyan        40
#define stm_light_blue        41
#define stm_deep_sky_blue     42
#define stm_dodger_blue       43
#define stm_blue             44
#define stm_blue_3           45
#define stm_dodger_blue_4     46
#define stm_navy             47
#define stm_thistle          48
#define stm_violet           49
#define stm_magenta          50
#define stm_medium_purple     51
#define stm_purple_1         52
#define stm_purple_2         53
#define stm_medium_purple_4   54
#define stm_purple_4         55
#define stm_grey_90          56
#define stm_light_grey        57
#define stm_grey_70          58
#define stm_grey_60          59
#define stm_grey_50          60
```

```
#define stm_grey_40          61
#define stm_dark_slate_grey   62
#define stm_black            63
#define stm_background_color  64
#define stm_foreground_color  65

typedef char stm_fill_style_type;
#define stm_no_fill    0
#define stm_fill_solid 1

typedef int   stm_text_font;
typedef int   stm_text_size;
typedef int   stm_text_bold;
typedef int   stm_text_italic;

#define stm_font_Fixed             0
#define stm_font_Courier           1
#define stm_font_Helvetica         2
#define stm_font_Times             3
#define stm_font_LucidaTypewriter   4
#define stm_font_User_font1        5
#define stm_font_User_font2        6

typedef struct stm_text_attributes {
  stm_text_font       font;
  stm_text_size       size;
  stm_text_bold       bold;
  stm_text_italic     italic;
} stm_text_attributes;
typedef stm_text_attributes  *stm_text_attributes_ptr;


typedef struct stm_color_all {
  stm_color_type      foreground_color;
  stm_color_type      background_color;
  stm_fill_style_type bg_fill_style;
```

```
} stm_color_all;

#define stm_maxpoints 256/*  The maximum number of points a*/
                              /*  polygon can have*/

typedef unsigned charstm_num_points;
typedef doublestm_coordinate;

typedef struct stm_point
 {
   stm_coordinatex;
   stm_coordinatey;
 }
stm_point;

                  /* All points of a polygon appear in sequential order*/

typedef stm_point *stm_points;/* array of points*/
typedef struct stm_polygon
 {
   stm_num_pointspoints_no;/* number of points in the polygon */
   stm_pointsoutline;/* coordinates of the points   */
 }
stm_polygon;
typedef stm_polygon  *stm_polygon_ptr;

/********************************************** textual definitions
**********/

/* type of indexes */
typedef charstm_ntc_type;
#define    stm_ntc_name       'N'
#define    stm_ntc_synonym    'S'
#define    stm_ntc_unknown    ' '
#define    stm_ntc_constant   'C'
```

```
/****************************************** chart definitions
**************/

typedef charstm_chart_type;
#define stm_ch_state'S'
#define stm_ch_activity'A'
#define stm_ch_block'B'
#define stm_ch_module'M'
#define stm_ch_flow'F'
#define stm_ch_dictionary        'D'
#define stm_ch_continuous_diagram       'O'
#define stm_ch_reference_state's'
#define stm_ch_reference_activity'a'
#define stm_ch_reference_block  'b'
#define stm_ch_reference_module'm'
#define stm_ch_sequence_diagram'Q'
#define stm_ch_use_case_diagram'U'

typedef charstm_chart_usage;
#define stm_ch_usage_generic        'G'
#define stm_ch_usage_normal         'N'
#define stm_ch_usage_ref_generic    'R'
#define stm_ch_usage_ref_offpage    'O'
#define stm_ch_usage_ref_describing 'D'
#define stm_ch_usage_procedural     'P'
#define stm_ch_usage_ref_procedural 'C'

typedef char stm_chart_mod_status;
#define stm_chmo_unmodified           'U'
#define stm_chmo_modified             'M'
#define stm_chmo_new                  'N'
#define stm_chmo_deleted              'D'

typedef char stm_chart_access_status;
#define stm_chac_readonly             'R'
```

```
#define stm_chac_update              'U'
#define stm_chac_new                 'N'
#define stm_chac_reference           'Z'

                              /* chart record*/
typedef struct stm_ch_text
 {
   stm_element_type    element_type;   /* type of element            */
   stm_element_namech_name;/* name of chart*/
   stm_chart_typech_type;/* chart type*/
   stm_chart_usage     ch_usage;       /* chart usage                */
   stm_descriptionch_short_des;/* short description*/
   stm_filenamech_long_des;/* file containing long descrip*/
   stm_user_namech_user_name;/* name of creator of chart*/
   stm_datech_creation_date;
                              /* chart creation date*/
   stm_datech_modification_date;
                              /* chart modification date*/
   stm_ch_version      ch_version;     /* chart version              */
   stm_chart_mod_status ch_modification_status;
                                 /* chart modification status    */
   stm_chart_access_status ch_access_status;
                                 /* chart access status    */
 }
stm_ch_text;
typedef stm_ch_text *stm_ch_text_ptr;

/********************************** states definitions **************/

typedef charstm_state_type;
#define stm_st_diagram'D'
#define stm_st_and'A'
#define stm_st_or'O'
#define stm_st_component'C'
#define stm_st_instance'I'
#define stm_st_reference'Z'
```

```
#define stm_st_basic'B'

typedef charstm_st_enable_disable;
#definestm_st_cbk_enable       'E'
#definestm_st_cbk_disable      'D'
#definestm_st_cbk_bind_missing ' '

/* The structure of state and-lines contains the coordinates of the*/
/* lines and the components that compose the state.*/

typedef struct stm_and_line *stm_and_line_list;
typedef struct stm_and_line
 {
   stm_polygonpoly_line;/* all the points of the line*/
   stm_and_line_listnext_line;/* pointer to next and-line*/
 }
stm_and_line;

                              /* text fields of state*/
typedef struct stm_st_text
 {
   stm_element_type    element_type;   /* type of element               */
   stm_idst_chart;/* id of chart this element is in */
   stm_state_typest_type;/* state type  */
   stm_element_namest_name;/* name of state  */
   stm_short_namest_synonym;/* synonym name of state  */
   stm_descriptionst_short_des;/* short description  */
   stm_filenamest_long_des;/* file containing long descrip  */
   stm_pathnamest_uniquename;/* unique name of state  */
   char     pad;      /* unused  */
 }
stm_st_text;
typedef stm_st_text *stm_st_text_ptr;

                              /* graphic fields of state*/
typedef struct stm_st_graphic
```

```
 {
   stm_element_type    element_type;      /* type of element            */
   stm_colorst_color;   /* color of state */
   stm_coordinatest_x_coor;   /* x coordinate of state name */
   stm_coordinatest_y_coor;   /* y coordinate of state name */
   stm_colorst_name_color;   /* color of state name */
   stm_polygonst_polygon;   /* all the points that create */
                            /* the state outline */
   stm_displayed_name  st_displayed_name; /* name as appear in SGE      */

   stm_text_attributes       st_text_attributes;
 }
stm_st_graphic;
typedef stm_st_graphic *stm_st_graphic_ptr;

typedef struct stm_st_all
 {
   stm_st_graphicst_all_graphic;
   stm_st_textst_all_text;
 }
stm_st_all;
typedef stm_st_all  *stm_st_all_ptr;

/************************************ transitions definitions
*************/

                            /* graphic fields of transition*/
typedef struct stm_bt_graphic
 {
   stm_element_type    element_type;   /* type of element             */
   stm_colorbt_color;/* color of transition*/
   stm_polygonbt_arrow;/* all the points that make the*/
                            /* arrow*/
   stm_colorla_color;          /* color of label on transition */
   stm_coordinate           la_x_coor;/* x coordinate of label*/
   stm_coordinate           la_y_coor;/* y coordinate of label*/
```

```
    stm_text_attributes       la_text_attributes;

    stm_colornt_color;          /* color of note*/
    stm_coordinate          nt_x_coor;/* x coordinate of note*/
    stm_coordinate          nt_y_coor;/* y coordinate of note*/
    stm_text_attributes       nt_text_attributes;
}
stm_bt_graphic;
typedef stm_bt_graphic *stm_bt_graphic_ptr;

typedef struct stm_bt_all
  {
    stm_bt_graphicbt_all_graphic;
    stm_expressionbt_expression;
    stm_listbt_note_text_lst;
    stm_idbt_chart;/* id of chart this element is in */
  }
stm_bt_all;
typedef stm_bt_all  *stm_bt_all_ptr;

/************************************** Timing Constraint definitions
*************/
typedef struct stm_tc_graphic
  {
   stm_element_type       element_type;     /* type of element
*/
    stm_colortc_color;          /* color of Arrow*/
    stm_polygontc_arrow;          /* all the points that make the arrow*/

    stm_colorplace_holder1;
    stm_coordinate          place_holder2;
    stm_coordinate          place_holder3;

    stm_colornt_color;          /* color of note*/
    stm_coordinate          nt_x_coor;/* x coordinate of note*/
    stm_coordinate          nt_y_coor;/* y coordinate of note*/
```

```
    stm_text_attributes       nt_text_attributes;
  }
stm_tc_graphic;
typedef stm_tc_graphic *stm_tc_graphic_ptr;

typedef struct stm_tc_all
  {
    stm_tc_graphic          tc_all_graphic;
    char*          tc_note_text;
    stm_idtc_chart;/* id of chart this element is in */
  }
stm_tc_all;
typedef stm_tc_all  *stm_tc_all_ptr;

/****************************************** Order Insignificant definitions
************/
typedef struct stm_ord_insig_graphic
  {
   stm_element_type       element_type;     /* type of element
*/
    stm_colorord_insig_color;    /* color of Arrow*/
    stm_polygonord_insig_arrow;    /* all the points that make the arrow*/

    stm_colorplace_holder1;
    stm_coordinate          place_holder2;
    stm_coordinate          place_holder3;

    stm_colornt_color;          /* color of note*/
    stm_coordinate          nt_x_coor;/* x coordinate of note*/
    stm_coordinate          nt_y_coor;/* y coordinate of note*/

    stm_text_attributes       nt_text_attributes;
  }
stm_ord_insig_graphic;
typedef stm_ord_insig_graphic *stm_ord_insig_graphic_ptr;

typedef struct stm_ord_insig_all
```

```
 {
   stm_ord_insig_graphicord_insig_all_graphic;
   char*          ord_insig_note_text;
   stm_idord_insig_chart;/* id of chart this element is in */
 }
stm_ord_insig_all;
typedef stm_ord_insig_all  *stm_ord_insig_all_ptr;



/****************************************** Separator definitions
************/
typedef struct stm_sep_graphic
 {
  stm_element_type       element_type;     /* type of element
*/
   stm_colorsep_color;          /* color of Arrow*/
   stm_polygonsep_arrow;          /* all the points that make the arrow*/

   stm_colorplace_holder1;
   stm_coordinate          place_holder2;
   stm_coordinate          place_holder3;

   stm_colornt_color;          /* color of note*/
   stm_coordinate          nt_x_coor;/* x coordinate of note*/
   stm_coordinate          nt_y_coor;/* y coordinate of note*/

   stm_text_attributes       nt_text_attributes;
 }
stm_sep_graphic;
typedef stm_sep_graphic *stm_sep_graphic_ptr;

typedef struct stm_sep_all
 {
   stm_sep_graphic          sep_all_graphic;
   char*          sep_note_text;
   stm_idsep_chart;/* id of chart this element is in */
 }
```

```
stm_sep_all;
typedef stm_sep_all  *stm_sep_all_ptr;

/************************************** Message definitions *************/
typedef struct stm_msg_graphic
 {
  stm_element_type       element_type;     /* type of element
*/
   stm_colormsg_color;          /* color of Arrow*/
   stm_polygonmsg_arrow;          /* all the points that make the arrow*/

   stm_colorla_color;          /* color of label*/
   stm_coordinate          la_x_coor;/* x coordinate of label*/
   stm_coordinate          la_y_coor;/* y coordinate of label*/
   stm_text_attributes       la_text_attributes;

   stm_colornt_color;          /* color of note*/
   stm_coordinate          nt_x_coor;/* x coordinate of note*/
   stm_coordinate          nt_y_coor;/* y coordinate of note*/
   stm_text_attributes       nt_text_attributes;
 }
stm_msg_graphic;
typedef stm_msg_graphic *stm_msg_graphic_ptr;

typedef struct stm_msg_all
 {
   stm_msg_graphic          msg_all_graphic;
   stm_expression          msg_label_expression;
   char*          msg_note_text;
   stm_idmsg_chart;/* id of chart this element is in */
 }
stm_msg_all;
typedef stm_msg_all  *stm_msg_all_ptr;
```

```
/************************************** condition definitions
*************/

typedef charstm_condition_type;
typedef charstm_co_definition_type;
#define stm_co_compoundstm_compound
#define stm_co_primitivestm_primitive
#define stm_co_implicitstm_implicit
#define stm_co_referencestm_reference
#define stm_co_constant stm_constant

typedef charstm_co_structure_type;
#define stm_co_array           'A'
#define stm_co_missing          ' '
#define stm_co_single          'G'

typedef charstm_co_enable_disable;
#definestm_co_cbk_enable       'E'
#definestm_co_cbk_disable      'D'
#definestm_co_cbk_bind_missing ' '
                              /* condition record*/
typedef struct stm_co_text
 {
   stm_element_type    element_type;    /* type of element              */
   stm_idco_chart; /* id of chart this element is in */
   stm_condition_typeco_type; /* condition type   */
   stm_co_definition_type co_def_type;  /* definition type              */
   stm_co_structure_type co_struct_type;/* structure type        */
   stm_element_nameco_name; /* name of condition   */
   stm_short_nameco_synonym; /* synonym name of condition   */
   stm_descriptionco_short_des; /* short description   */
   stm_filenameco_long_des; /* file containing long descrip   */
   stm_expressionco_expression; /* expression of condition   */
   stm_const_exp       co_lindex;       /* left-index                   */
   stm_const_exp       co_rindex;       /* right-index                   */
   stm_const_exp       co_default_val;
```

```
 }
stm_co_text;
typedef stm_co_text *stm_co_text_ptr;

/********************************************** event definitions
**************/

typedef charstm_event_type;
typedef charstm_ev_definition_type;
#define stm_ev_compoundstm_compound
#define stm_ev_primitivestm_primitive
#define stm_ev_implicitstm_implicit
#define stm_ev_referencestm_reference

typedef charstm_ev_structure_type;
#define stm_ev_array           'A'
#define stm_ev_missing          ' '
#define stm_ev_single          'G'

typedef charstm_ev_enable_disable;
#definestm_ev_cbk_enable       'E'
#definestm_ev_cbk_disable      'D'
#definestm_ev_cbk_bind_missing ' '
                              /* event record*/
typedef struct stm_ev_text
 {
   stm_element_type    element_type;    /* type of element              */
   stm_idev_chart; /* id of chart this element is in */
   stm_event_typeev_type; /* event type   */
   stm_ev_definition_type ev_def_type;  /* definition type              */
   stm_ev_structure_type ev_struct_type;/* structure type        */
   stm_element_nameev_name; /* name of event   */
   stm_short_nameev_synonym; /* synonym name of event   */
   stm_descriptionev_short_des; /* short description   */
   stm_filenameev_long_des; /* file containing long descrip   */
   stm_expressionev_expression; /* expression of event   */
```

```
   stm_const_exp       ev_lindex;       /* left-index                  */
   stm_const_exp       ev_rindex;       /* right-index                 */
  }
stm_ev_text;
typedef stm_ev_text *stm_ev_text_ptr;

/********************************************** actions definitions
********/

typedef charstm_action_type;
typedef charstm_an_definition_type;
#define stm_an_compoundstm_compound
#define stm_an_primitivestm_primitive
#define stm_an_referencestm_reference
#define stm_an_implicitstm_implicit

typedef charstm_an_select_implementation;
#define stm_an_truth_table_imp      'T'
#define stm_an_definition_imp       'D'
#define stm_an_best_match           'B'
#define stm_an_none                 ' '

                              /* action record*/
typedef struct stm_an_text
  {
    stm_element_type    element_type;   /* type of element              */
    stm_idan_chart;/* id of chart this element is in */
    stm_action_typean_type;/* action type  */
    stm_element_namean_name;/* name of action  */
    stm_short_namean_synonym;/* synonym name of action  */
    stm_descriptionan_short_des;/* short description  */
    stm_filenamean_long_des;/* file containing long descrip  */
    stm_expressionan_expression;/* expression of action  */
    stm_an_definition_type an_def_type; /* definition type              */
    stm_an_select_implementation  an_select_implementation;
                                  /* selected implementation       */
```

```
 }
stm_an_text;
typedef stm_an_text *stm_an_text_ptr;

/********************************************** subroutines definitions
********/

typedef charstm_subroutine_type;
typedef charstm_sb_definition_type;
#define stm_sb_predefined  stm_predefined
#define stm_sb_reference   stm_reference
#define stm_sb_function    'F'
#define stm_sb_procedure   'R'
#define stm_sb_task        'T'

typedef charstm_sb_select_implementation;
#define stm_sb_kr_c_code          'K'
#define stm_sb_ansi_c_code        'N'
#define stm_sb_ada_code           'A'
#define stm_sb_vhdl_code          'V'
#define stm_sb_verilog_code       'R'
#define stm_sb_procedural_sch     'G'
#define stm_sb_procedural_fch     'F'
#define stm_sb_action_lang        'S'
#define stm_sb_best_match         'D'
#define stm_sb_truth_table        'T'
#define stm_sb_lookup_table       'L'
#define stm_sb_external_tool_code 'E'
#define stm_sb_none               ' '


typedef charstm_sb_return_type;
#define stm_sb_missing          ' '
#define stm_sb_integer          'I'
#define stm_sb_real             'F'
#define stm_sb_string           'S'
```

```
#define stm_sb_bit              'B'
#define stm_sb_bit_array        'W'
#define stm_sb_condition        'C'
#define stm_sb_user_type         'U'


                            /* subroutine record*/
typedef struct stm_sb_text
 {
   stm_element_type    element_type;   /* type of element               */
   stm_idsb_chart;/* id of chart this element is in */
   stm_sb_return_type  sb_return_type; /* subroutine return type  */
   stm_sb_definition_type sb_def_type; /* function/procedure/task        */
   stm_element_namesb_name; /* name of subroutine   */
   stm_short_namesb_synonym; /* synonym of subroutine   */
   stm_descriptionsb_short_des;  /* short description   */
   stm_filenamesb_long_des;  /* file containing long descrip  */
   stm_id              sb_return_user_type;
                       /* for sb return-type define as user_def_type */
   stm_name_type       sb_return_user_type_name_type;
                       /* for sb return-type define as user_def_type */
   stm_sb_select_implementation sb_select_implementation; /*selected
implementation */
   stm_id              sb_connected_chart;  /* for sb with procedural sch
*/
   stm_id               sb_connected_flowchart;  /* for sb with procedural
sch   */
 }
stm_sb_text;
typedef stm_sb_text *stm_sb_text_ptr;


/*************** functions definitions (for 1.0 compatibility) ********/


typedef charstm_function_type;
typedef charstm_fn_definition_type;
#define stm_fn_referencestm_reference
#define stm_fn_predefinedstm_predefined
```

```
#define stm_fn_text            stm_sb_text
#define stm_fn_text_ptr        stm_sb_text_ptr

#define fn_chart               sb_chart
#define fn_type                sb_return_type
#define fn_def_type            sb_def_type
#define fn_name                sb_name



/********************************************** activities definitions
********/

typedef charstm_activity_type;
#define stm_ac_diagram'D'
#define stm_ac_internal'I'
#define stm_ac_control'C'
#define stm_ac_external'X'
#define stm_ac_reference'Z'
#define stm_ac_instance'@'
#define stm_ac_control_instance'*'
#define stm_ac_data_store'S'
#define stm_ac_environment      'N'
#define stm_ac_router           'R'
#define stm_ac_external_router  'F'


typedef charstm_activity_termination;
#define stm_ac_missing' '
#define stm_ac_self_termination'S'
#define stm_ac_controlled_termination'C'
#define stm_ac_procedure_like           'P'

typedef charstm_ac_enable_disable;
#definestm_ac_cbk_enable       'E'
#definestm_ac_cbk_disable      'D'
```

```
#definestm_ac_cbk_bind_missing ' '

typedef charstm_ac_select_implementation;

#define stm_ac_mini_spec_imp        'M'
#define stm_ac_subroutine_bind_imp  'S'
#define stm_ac_truth_table_imp      'T'
#define stm_ac_best_match_imp       'B'
#define stm_ac_none                 ' '
                              /* text fields of activity*/
typedef struct stm_ac_text
 {
  stm_element_type   element_type;     /* type of element            */
   stm_idac_chart;    /* id of chart this element is in */
   stm_activity_typeac_type;    /* activity type      */
   stm_element_nameac_name;    /* name of activity      */
   stm_short_nameac_synonym;    /* synonym name of activity      */
   stm_descriptionac_short_des;    /* short description      */
   stm_filenameac_long_des;    /* file containing long descrip   */
   stm_pathnameac_uniquename;    /* unique name of activity      */
  stm_activity_termination ac_termination;/* how the activity terminates
*/
   stm_ac_select_implementation  ac_select_implementation; /* selected
implementation */
 }
stm_ac_text;
typedef stm_ac_text *stm_ac_text_ptr;

                              /* graphic fields of activity*/
typedef struct stm_ac_graphic
 {
  stm_element_type    element_type;     /* type of element            */
   stm_colorac_color;   /* color of activity    */
   stm_coordinateac_x_coor;   /* x coordinate of activity name */
   stm_coordinateac_y_coor;   /* y coordinate of activity name */
   stm_colorac_name_color;   /* color of activity name    */
   stm_polygonac_polygon;   /* all the points that create    */
```

```
                                /* the activity outline    */
    stm_displayed_name  ac_displayed_name; /* name as appear in AGE        */

    stm_text_attributes       ac_text_attributes;
   }
stm_ac_graphic;
typedef stm_ac_graphic *stm_ac_graphic_ptr;

typedef struct stm_ac_all
 {
    stm_ac_graphicac_all_graphic;
    stm_ac_textac_all_text;
 }
stm_ac_all;
typedef stm_ac_all  *stm_ac_all_ptr;
/********************************************** blocks definitions ********/

typedef charstm_block_type;
#define stm_bl_diagram'D'
#define stm_bl_internal'I'
#define stm_bl_control'C'
#define stm_bl_external'X'
#define stm_bl_reference'Z'
#define stm_bl_instance'@'
#define stm_bl_control_instance'*'

typedef charstm_bl_enable_disable;
#definestm_bl_cbk_enable       'E'
#definestm_bl_cbk_disable      'D'
#definestm_bl_cbk_bind_missing ' '

typedef charstm_bl_select_implementation;
#define stm_bl_mini_spec_imp        'M'
#define stm_bl_subroutine_bind_imp  'S'
#define stm_bl_truth_table_imp      'T'
#define stm_bl_best_match_imp       'B'
```

```
#define stm_bl_none                ' '

                              /* text fields of block*/
typedef struct stm_bl_text
 {
  stm_element_type   element_type;     /* type of element            */
   stm_idbl_chart;    /* id of chart this element is in */
   stm_block_typebl_type;    /* block type      */
   stm_element_namebl_name;    /* name of block      */
   stm_short_namebl_synonym;    /* synonym name of block      */
   stm_descriptionbl_short_des;    /* short description      */
   stm_filenamebl_long_des;    /* file containing long descrip   */
   stm_pathnamebl_uniquename;    /* unique name of block      */
   stm_bl_select_implementation  bl_select_implementation; /*selected
implementation */
 }
stm_bl_text;
typedef stm_bl_text *stm_bl_text_ptr;

                              /* graphic fields of block*/
typedef struct stm_bl_graphic
 {
  stm_element_type    element_type;     /* type of element            */
   stm_colorbl_color;   /* color of block    */
   stm_coordinatebl_x_coor;   /* x coordinate of block name */
   stm_coordinatebl_y_coor;   /* y coordinate of block name */
   stm_colorbl_name_color;   /* color of block name    */
   stm_polygonbl_polygon;   /* all the points that create    */
                                 /* the block outline    */
  stm_displayed_name  bl_displayed_name; /* name as appear in AGE        */

   stm_text_attributes       bl_text_attributes;
  }
stm_bl_graphic;
typedef stm_bl_graphic *stm_bl_graphic_ptr;
```

```
typedef struct stm_bl_all
 {
   stm_bl_graphicbl_all_graphic;
   stm_bl_textbl_all_text;
 }
stm_bl_all;
typedef stm_bl_all  *stm_bl_all_ptr;

/****************************************** data_stores definitions
*********/
typedef charstm_data_store_type;
#define stm_ds_internal'S'
#define stm_ds_reference'Z'

                              /* text fields of data_store*/
typedef struct stm_ds_text
 {
   stm_element_type    element_type;   /* type of element               */
   stm_idds_chart;/* id of chart this element is in */
   stm_data_store_typeds_type;/* type of data-store  */
   stm_element_nameds_name;/* name of data_store  */
   stm_short_nameds_synonym;/* synonym name of data_store  */
   stm_descriptionds_short_des;/* short description  */
   stm_filenameds_long_des;/* file containing long descrip  */
   stm_pathnameds_uniquename;/* unique name of data_store  */
   char     pad;      /* unused  */
 }
stm_ds_text;
typedef stm_ds_text *stm_ds_text_ptr;

                              /* graphic fields of data_store*/
typedef struct stm_ds_graphic
 {
  stm_element_type    element_type;     /* type of element             */
   stm_colords_color;   /* color of data_store      */
   stm_coordinateds_x_coor;   /* x coordinate of data_store name */
```

```
    stm_coordinateds_y_coor;   /* y coordinate of data_store name */
    stm_colords_name_color;   /* color of data_store name      */
    stm_polygonds_polygon;   /* all the points that create      */
                                /* the data_store outline      */
   stm_displayed_name  ds_displayed_name; /* name as appear in AGE
*/

    stm_text_attributes       ds_text_attributes;
   }
stm_ds_graphic;
typedef stm_ds_graphic *stm_ds_graphic_ptr;

typedef struct stm_ds_all
 {
    stm_ds_graphicds_all_graphic;
    stm_ds_textds_all_text;
 }
stm_ds_all;
typedef stm_ds_all  *stm_ds_all_ptr;



/****************************************** a_flow_lines definitions
**********/

typedef charstm_ba_flow_line_type;
#define stm_ba_control'C'
#define stm_ba_data'D'

typedef charstm_a_flow_line_type;
#define stm_af_control'C'
#define stm_af_data'D'

typedef struct stm_ba_text
 {
    stm_element_type    element_type;   /* type of element              */
    stm_idba_chart;/* id of chart this element is in */
    stm_ba_flow_line_type ba_type;/* type of a_flow_lines  */
```

```
    stm_expression   ba_expression;/* expression on a_flow_lines  */
  }
stm_ba_text;
typedef stm_ba_text *stm_ba_text_ptr;

                          /* graphic fields of a_flow_lines */
typedef struct stm_ba_graphic
  {
    stm_element_type    element_type;   /* type of element            */
    stm_colorba_color;/* color of a_flow_lines*/
    stm_polygonba_arrow;/* all the points that make the */
                          /* arrow*/
    stm_colorfl_color;/* color of flow_label*/
    stm_coordinatefl_x_coor;/* x coordinate of flow_label*/
    stm_coordinatefl_y_coor;/* y coordinate of flow_label*/

    stm_colorplace_holder1;
    stm_coordinate          place_holder2;
    stm_coordinate          place_holder3;

    stm_text_attributes       fl_text_attributes;
}
stm_ba_graphic;
typedef stm_ba_graphic *stm_ba_graphic_ptr;

typedef struct stm_ba_all
  {
    stm_ba_graphicba_all_graphic;
    stm_ba_textba_all_text;
  }
stm_ba_all;
typedef stm_ba_all  *stm_ba_all_ptr;

/****************************************** data_items definitions
************/
```

```
typedef charstm_data_item_type;
typedef charstm_di_definition_type;
#define stm_di_primitive   stm_primitive
#define stm_di_compound    stm_compound
#define stm_di_constant    stm_constant
#define stm_di_alias       stm_alias
#define stm_di_reference   stm_reference
#define stm_di_implicit   stm_implicit

typedef charstm_di_structure_type;
#define stm_di_single   'G'
#define stm_di_array    'A'
#define stm_di_queue    'Q'

typedef charstm_di_data_type;
#define stm_di_missing          ' '
#define stm_di_missing_single   'G'
#define stm_di_integer          'I'
#define stm_di_real             'F'
#define stm_di_string           'S'
#define stm_di_bit              'B'
#define stm_di_bit_array        'W'
#define stm_di_record           'R'
#define stm_di_union            'O'
#define stm_di_missing_array    'A'
#define stm_di_integer_array    'N'
#define stm_di_real_array       'L'
#define stm_di_string_array     'T'
#define stm_di_bit_array_array  'Y'
#define stm_di_record_array     'P'
#define stm_di_union_array      'V'
#define stm_di_user_type        'U'
#define stm_di_user_type_array  'X'
#define stm_di_missing_queue    'Q'
#define stm_di_integer_queue    'D'
#definestm_di_real_queue       'E'
```

```
#definestm_di_string_queue     'K'
#definestm_di_bit_queue        'b'
#definestm_di_bit_array_queue  'M'
#definestm_di_user_type_queue  'J'

typedef charstm_di_enable_disable;
#definestm_di_cbk_enable       'E'
#definestm_di_cbk_disable      'D'
#definestm_di_cbk_bind_missing ' '

#define stm_di_group   '?'
#define stm_di_list    '?'

                              /* fields of data_items*/
typedef struct stm_di_text
 {
   stm_element_type    element_type;     /* type of element              */
    stm_iddi_chart;  /* id of chart this element is in */
    stm_data_item_typedi_type;  /* data_item type                */
   stm_di_definition_type di_def_type;   /* definition type              */
   stm_di_structure_type di_struct_type; /* data_item structure type      */
    stm_element_namedi_name;  /* name of data_item    */
    stm_short_namedi_synonym;  /* synonym name of data_item    */
    stm_descriptiondi_short_des;  /* short description    */
    stm_filenamedi_long_des;  /* file containing long descrip   */
    stm_expressiondi_expression;  /* expression of data-item    */
   stm_const_exp       di_lindex;       /* left-index                   */
   stm_const_exp       di_rindex;       /* right-index                   */
   stm_const_exp       di_length;       /* of integer                   */
   stm_const_exp       di_min_val;      /* of integer and bit-array      */
   stm_const_exp       di_max_val;      /* of integer and bit-array      */
   stm_const_exp       di_min_rval;     /* of real                      */
   stm_const_exp       di_max_rval;     /* of real                      */
   stm_const_exp       di_default_val;  /* of integer, real, bit, bit-array
and string */
   stm_const_exp       di_ba_lindex;    /* bit-array left-index         */
```

```
   stm_const_exp       di_ba_rindex;     /* bit-array right-index          */
   stm_iddi_user_type;     /* for di defined as user_def type*/
   stm_name_type       di_user_type_name_type;
                             /* for di defined as user_def type*/
   stm_iddi_of_enum_type;  /* for di defined as array x to y of enum-type*/
   stm_name_type       di_of_enum_type_name_type;
                              /* for di defined as array x to y of
enum-type*/
   stm_list            di_contains;      /* for di defined as record/union */
 }
stm_di_text;
typedef stm_di_text *stm_di_text_ptr;

/********************************* user_defined_types definitions
***********/

typedef charstm_data_type_type;
typedef charstm_dt_definition_type;
#define stm_dt_primitive   stm_primitive
#define stm_dt_reference   stm_reference

typedef charstm_dt_structure_type;
#define stm_dt_single   'G'
#define stm_dt_array    'A'
#define stm_dt_queue    'Q'

typedef charstm_dt_data_type;
#define stm_dt_missing          ' '
#define stm_dt_missing_single   'G'
#define stm_dt_integer          'I'
#define stm_dt_real             'F'
#define stm_dt_string           'S'
#define stm_dt_bit              'B'
#define stm_dt_bit_array        'W'
#define stm_dt_record           'R'
#define stm_dt_union            'O'
#define stm_dt_missing_array    'A'
```

```
#define stm_dt_integer_array    'N'
#define stm_dt_real_array       'L'
#define stm_dt_string_array     'T'
#define stm_dt_bit_array_array  'Y'
#define stm_dt_record_array     'P'
#define stm_dt_union_array      'V'
#define stm_dt_user_type        'U'
#define stm_dt_user_type_array  'X'
#define stm_dt_condition        'C'
#define stm_dt_condition_array  'H'
#define stm_dt_missing_queue    'Q'
#define stm_dt_integer_queue    'D'
#definestm_dt_real_queue       'E'
#definestm_dt_string_queue     'K'
#definestm_dt_bit_queue        'b'
#definestm_dt_bit_array_queue  'M'
#definestm_dt_user_type_queue  'J'
#definestm_dt_condition_queue  'Z'
#definestm_dt_enum_type        'e'

#define stm_dt_group   '?'
#define stm_dt_list    '?'

                              /* fields of user-defined-type */
typedef struct stm_dt_text
 {
   stm_element_type    element_type;     /* type of element              */
    stm_iddt_chart;  /* id of chart this element is in */
    stm_data_item_typedt_type;  /* user_def_type type            */
   stm_definition_type dt_def_type;   /* definition type               */
   stm_dt_structure_type dt_struct_type; /* user_def_type structure type
*/
    stm_element_namedt_name;  /* name of user_def_type    */
    stm_short_namedt_synonym;  /* synonym of user_def_type       */
    stm_descriptiondt_short_des;  /* short description    */
    stm_filenamedt_long_des;  /* file containing long descrip   */
```

```
    stm_expressiondt_expression;  /* expression of data-type    */
    stm_const_exp       dt_lindex;       /* left-index                  */
    stm_const_exp       dt_rindex;       /* right-index                 */
    stm_const_exp       dt_length;       /* of integer                  */
    stm_const_exp       dt_min_val;      /* of integer and bit-array      */
    stm_const_exp       dt_max_val;      /* of integer and bit-array      */
    stm_const_exp       dt_min_rval;     /* of real                     */
    stm_const_exp       dt_max_rval;     /* of real                     */
   stm_const_exp     dt_default_val;  /* of integer, real, bit, bit-array,
string and enum*/
    stm_const_exp       dt_ba_lindex;    /* bit-array left-index          */
    stm_const_exp       dt_ba_rindex;    /* bit-array right-index         */
    stm_iddt_user_type;     /* for dt defined as user_def type*/
    stm_name_type       dt_user_type_name_type;
                            /* for dt defined as user_defined type*/
    stm_iddt_of_enum_type;     /* for dt defined as array x to y of enum-
type*/
    stm_name_type       dt_of_enum_type_name_type;
                             /* for dt defined as array x to y of
enum-type*/
    stm_list          dt_contains;     /* for dt defined as record/union */
  }
stm_dt_text;
typedef stm_dt_text *stm_dt_text_ptr;

/************************************** fields definitions ************/

typedef charstm_fd_definition_type;
#define stm_fd_primitive   stm_primitive

typedef charstm_fd_structure_type;
#define stm_fd_single   'G'
#define stm_fd_array    'A'
#define stm_fd_queue    'Q'

typedef charstm_fd_data_type;
#define stm_fd_missing          ' '
```

```
#define stm_fd_missing_single   'G'
#define stm_fd_integer          'I'
#define stm_fd_real             'F'
#define stm_fd_string           'S'
#define stm_fd_bit              'B'
#define stm_fd_bit_array        'W'
#define stm_fd_missing_array    'A'
#define stm_fd_integer_array    'N'
#define stm_fd_real_array       'L'
#define stm_fd_string_array     'T'
#define stm_fd_bit_array_array  'Y'
#define stm_fd_user_type        'U'
#define stm_fd_user_type_array  'X'
#define stm_fd_condition        'C'
#define stm_fd_condition_array  'H'
#define stm_fd_missing_queue    'Q'
#define stm_fd_integer_queue    'D'
#definestm_fd_real_queue       'E'
#definestm_fd_string_queue     'K'
#definestm_fd_bit_queue        'b'
#definestm_fd_bit_array_queue  'M'
#definestm_fd_user_type_queue  'J'
#definestm_fd_condition_queue  'Z'

#define stm_fd_group   '?'
#define stm_fd_list   '?'

                              /* fields of field*/
typedef struct stm_fd_text
 {
   stm_element_type    element_type;     /* type of element              */
    stm_idfd_chart;  /* id of chart this element is in */
    stm_data_item_typefd_type;  /* field type                    */
   stm_definition_type fd_def_type;   /* definition type               */
   stm_fd_structure_type fd_struct_type; /* field structure type         */
    stm_element_namefd_name;  /* name of field    */
```

```
    stm_short_namefd_synonym;  /* synonym of field        */
    stm_descriptionfd_short_des;  /* short description    */
    stm_filenamefd_long_des;  /* file containing long descrip   */
    stm_expressionfd_expression;  /* expression of field     */
    stm_const_exp       fd_lindex;       /* left-index                  */
    stm_const_exp       fd_rindex;       /* right-index                 */
    stm_const_exp       fd_length;       /* of integer                  */
    stm_const_exp       fd_min_val;      /* of integer and bit-array      */
    stm_const_exp       fd_max_val;      /* of integer and bit-array      */
    stm_const_exp       fd_min_rval;     /* of real                     */
    stm_const_exp       fd_max_rval;     /* of real                     */
    stm_const_exp       fd_default_val;  /* of integer, real, bit, bit-array
and string */
    stm_const_exp       fd_ba_lindex;    /* bit-array left-index          */
    stm_const_exp       fd_ba_rindex;    /* bit-array right-index         */
    stm_idfd_user_type;     /* for fd defined as user_def type*/
    stm_name_type       fd_user_type_name_type;
                            /* for fd defined as user_defined type*/
    stm_idfd_of_enum_type;     /* for fd defined as array x to y of enum-
type*/
    stm_name_type       fd_of_enum_type_name_type;
                             /* for fd defined as array x to y of
enum-type*/
    stm_list            fd_contains;     /* for fd defined as record/union */
  }
stm_fd_text;
typedef stm_fd_text *stm_fd_text_ptr;

/****************************************** parameters definitions
**********/

typedef char    stm_parameter_mode;
#define stm_in_parameter        'I'
#define stm_out_parameter       'O'
#define stm_inout_parameter     'B'
#define stm_constant_parameter  'C'

typedef struct stm_sb_global {
```

```
  stm_element_name    sb_global_name;
  stm_parameter_mode  sb_global_mode;
}stm_sb_global,*stm_sb_global_ptr;


/****************************************** local_data definitions ******/

typedef charstm_ld_definition_type;
#define  stm_ld_defined     'L'

typedef charstm_ld_structure_type;
#define stm_ld_single   'G'
#define stm_ld_array    'A'
#define stm_ld_queue    'Q'

typedef charstm_ld_data_type;
#define stm_ld_missing          ' '
#define stm_ld_missing_single   'G'
#define stm_ld_integer          'I'
#define stm_ld_real             'F'
#define stm_ld_string           'S'
#define stm_ld_bit              'B'
#define stm_ld_bit_array        'W'
#define stm_ld_missing_array    'A'
#define stm_ld_integer_array    'N'
#define stm_ld_real_array       'L'
#define stm_ld_string_array     'T'
#define stm_ld_bit_array_array  'Y'
#define stm_ld_user_type        'U'
#define stm_ld_user_type_array  'X'
#define stm_ld_missing_queue    'Q'
#define stm_ld_integer_queue    'D'
#define stm_ld_real_queue       'E'
#define stm_ld_string_queue     'K'
#define stm_ld_bit_queue        'b'
#define stm_ld_bit_array_queue  'M'
```

```
#define stm_ld_user_type_queue  'J'
#define stm_ld_condition        'C'
#define stm_ld_condition_array  'H'
#define stm_ld_condition_queue  'Z'

typedef struct stm_ld_text
 {
   stm_element_type    element_type;     /* type of element              */
    stm_idld_chart;  /* id of chart this element is in */
    stm_ld_data_typeld_type;  /* local_data type                */
   stm_ld_definition_type ld_def_type;   /* definition type              */
   stm_ld_structure_type ld_struct_type; /* local_data structure type
*/
    stm_element_nameld_name;  /* name of local_data    */
    stm_descriptionld_short_des;  /* short description    */
   stm_const_exp       ld_lindex;       /* left-index                   */
   stm_const_exp       ld_rindex;       /* right-index                  */
   stm_const_exp       ld_length;       /* of integer                   */
   stm_const_exp       ld_min_val;      /* of integer and bit-array      */
   stm_const_exp       ld_max_val;      /* of integer and bit-array      */
   stm_const_exp       ld_min_rval;     /* of real                      */
   stm_const_exp       ld_max_rval;     /* of real                      */
   stm_const_exp      ld_default_val;   /* of integer, real, bit, bit-array
and string */
   stm_const_exp       ld_ba_lindex;    /* bit-array left-index         */
   stm_const_exp       ld_ba_rindex;    /* bit-array right-index        */
    stm_idld_user_type;     /* for ld defined as user_def type*/
    stm_name_type       ld_user_type_name_type;
                          /* for ld defined as user_def type*/
    stm_idld_of_enum_type;  /* for ld defined as array x to y of enum-type*/
    stm_name_type       ld_of_enum_type_name_type;
                         /* for ld defined as array x to y of
enum-type*/
 }
stm_ld_text;

typedef stm_ld_text   *stm_ld_text_ptr;
```

```
typedef struct stm_sb_local {
   stm_element_nameld_name;  /* name of local_data    */
   stm_ld_data_typeld_type;  /* local_data type                */
   stm_ld_structure_type ld_struct_type; /* local_data structure type
*/
   stm_descriptionld_short_des;  /* short description    */
   stm_const_exp      ld_lindex;       /* left-index                */
   stm_const_exp      ld_rindex;       /* right-index                */
   stm_const_exp      ld_length;       /* of integer                */
   stm_const_exp      ld_min_val;      /* of integer and bit-array      */
   stm_const_exp      ld_max_val;      /* of integer and bit-array      */
   stm_const_exp      ld_ba_lindex;    /* bit-array left-index          */
   stm_const_exp      ld_ba_rindex;    /* bit-array right-index         */
   stm_element_nameld_user_type;     /* for ld defined as user_def type*/
   stm_element_nameld_of_enum_type;  /* for ld defined as array x to y of
enum-type*/
}stm_sb_local,*stm_sb_local_ptr;


/************************************ procedure-parameters definitions
******/


typedef charstm_sp_definition_type;
#define  stm_sp_defined     'P'


typedef charstm_sp_structure_type;
#define stm_sp_single   'G'
#define stm_sp_array    'A'
#define stm_sp_queue    'Q'


typedef charstm_sp_data_type;
#define stm_sp_missing          ' '
#define stm_sp_missing_single   'G'
#define stm_sp_integer          'I'
#define stm_sp_real             'F'
#define stm_sp_string           'S'
#define stm_sp_bit              'B'
```

```
#define stm_sp_bit_array        'W'
#define stm_sp_missing_array    'A'
#define stm_sp_integer_array    'N'
#define stm_sp_real_array       'L'
#define stm_sp_string_array     'T'
#define stm_sp_bit_array_array  'Y'
#define stm_sp_user_type        'U'
#define stm_sp_user_type_array  'X'
#define stm_sp_missing_queue    'Q'
#define stm_sp_integer_queue    'D'
#define stm_sp_real_queue       'E'
#define stm_sp_string_queue     'K'
#define stm_sp_bit_queue        'b'
#define stm_sp_bit_array_queue  'M'
#define stm_sp_user_type_queue  'J'
#define stm_sp_condition        'C'
#define stm_sp_condition_array  'H'
#define stm_sp_condition_queue  'Z'


typedef struct stm_sp_text
  {
    stm_element_type    element_type;     /* type of element              */
    stm_idsp_chart;  /* id of chart this element is in */
    stm_sp_data_typesp_type;  /* subroutine_param type          */
    stm_sp_definition_type sp_def_type;   /* definition type              */
    stm_sp_structure_type sp_struct_type; /* subroutine_param structure
type*/
    stm_element_namesp_name;  /* name of subroutine_param    */
    stm_descriptionsp_short_des;  /* short description    */
    stm_const_exp       sp_lindex;        /* left-index                   */
    stm_const_exp       sp_rindex;        /* right-index                  */
    stm_const_exp       sp_length;        /* of integer                   */
    stm_const_exp       sp_min_val;       /* of integer and bit-array      */
    stm_const_exp       sp_max_val;       /* of integer and bit-array      */
    stm_const_exp       sp_min_rval;      /* of real                      */
    stm_const_exp       sp_max_rval;      /* of real                      */
```

```
    stm_const_exp       sp_ba_lindex;     /* bit-array left-index          */
    stm_const_exp       sp_ba_rindex;     /* bit-array right-index         */
    stm_idsp_user_type;     /* for sp defined as user_def type*/
    stm_name_type       sp_user_type_name_type;
                              /* for sp defined as user_def type*/
    stm_idsp_of_enum_type;  /* for sp defined as array x to y of enum-type*/
    stm_name_type       sp_of_enum_type_name_type;
                              /* for sp defined as array x to y of
enum-type*/
    stm_parameter_mode  sp_param_mode;
  }
stm_sp_text;
```

```
  int         n_rows;
  int         n_columns;
  int         num_in;
  int         num_out;
  stm_boolean  action_exists;
  stm_boolean  default_exists;
  char        ***cells;
}stm_truth_table_rec, *stm_truth_table_rec_ptr;

typedef char stm_tt_cell_type;
#define stm_tt_cell_type_missing              'M'
#define stm_tt_cell_rpn_same_as_down          'D'
#define stm_tt_cell_rpn                       'R'
#define stm_tt_cell_dont_care                 'D'
#define stm_tt_is_generate_ev                 'G'
#define stm_tt_is_not_generate_ev             'N'
#define stm_tt_cell_empty_same_as_up          'U'
#define stm_tt_cell_empty_same_as_up_and_down   'B'
#define stm_tt_is_empty_cell                  'E'



/****************************************** information_flow definitions
******/

typedef charstm_information_flow_type;
typedef charstm_if_definition_type;
#define stm_if_referencestm_reference
#define stm_if_explicitstm_explicit

                              /* fields of information_flow*/
typedef struct stm_if_text
 {
   stm_element_type    element_type;   /* type of element              */
   stm_idif_chart;/* id of chart this element is in */
   stm_information_flow_type if_type;/* information_flow type  */
```

```
    stm_element_nameif_name;/* name of information_flow  */
    stm_short_nameif_synonym;/* synonym name  */
    stm_descriptionif_short_des;/* short description  */
    stm_filenameif_long_des;/* file containing long descrip  */
  }
stm_if_text;
typedef stm_if_text *stm_if_text_ptr;

/****************************************** modules definitions
************/

typedef charstm_module_type;
#define stm_md_diagram'D'
#define stm_md_subsystem'S'
#define stm_md_environment'N'
#define stm_md_reference'Z'
#define stm_md_instance'@'
#define stm_md_missing' '

typedef charstm_module_purpose_type;
#define stm_md_regular'R'
#define stm_md_storage'S'
#define stm_md_controller'C'
#define stm_md_library'L'
#define stm_md_bus'B'
#define stm_md_p_missing' '

                          /* text fields of module*/
typedef struct stm_md_text
  {
   stm_element_type    element_type;     /* type of element             */
    stm_idmd_chart;   /* id of chart this element is in */
    stm_module_typemd_type;   /* module type     */
    stm_element_namemd_name;   /* name of module     */
    stm_short_namemd_synonym;   /* synonym name of module         */
    stm_descriptionmd_short_des;      /* short description            */
```

```
    stm_filenamemd_long_des;   /* file containing long descrip   */
    stm_pathnamemd_uniquename;   /* unique name of module     */
    stm_module_purpose_type md_purpose_type; /* module purpose type     */
  }
stm_md_text;
typedef stm_md_text *stm_md_text_ptr;

                              /* graphic fields of module*/
typedef struct stm_md_graphic
  {
```

```
#define stm_om_name'N'
#define stm_om_synonym'S'
#define stm_om_missing' '

                        /* graphic fields of*/
                        /* module_occurrence*/
typedef struct stm_om_graphic
 {
  stm_element_type    element_type;     /* type of element             */
   stm_module_name_type om_name_type;   /* module_occurrence name type   */
   stm_colorom_color;   /* color of module_occurrence    */
   stm_coordinateom_x_coor;   /* x coordinate of m_o name    */
   stm_coordinateom_y_coor;   /* y coordinate of m_o name    */
   stm_colorom_name_color;   /* color of m_o name    */
   stm_polygonom_polygon;   /* all the points that create    */
                            /* the module_occurrence outline */
  stm_displayed_name  om_displayed_name; /* name as appear in MGE        */

   stm_text_attributes       om_text_attributes;
 }
stm_om_graphic;
typedef stm_om_graphic *stm_om_graphic_ptr;

typedef struct stm_om_all
 {
   stm_om_graphicom_all_graphic;
   stm_idom_chart;/* id of chart this element is in */
   stm_idomd_id;         /* id of module this box is
                            occurrence of                */
 }
stm_om_all;
typedef stm_om_all  *stm_om_all_ptr;

/****************************** activity_occurrences definitions
**************/
```

```
typedef charstm_activity_name_type;
#define stm_oa_name'N'
#define stm_oa_synonym'S'
#define stm_oa_missing' '

                        /* graphic fields of*/
                        /* activity_occurrence*/
typedef struct stm_oa_graphic
 {
  stm_element_type   element_type;    /* type of element            */
  stm_activity_name_type oa_name_type;  /* activity_occurrence name type
*/
   stm_coloroa_color;   /* color of activity_occurrence    */
   stm_coordinateoa_x_coor;   /* x coordinate of a_o name      */
   stm_coordinateoa_y_coor;   /* y coordinate of a_o name      */
   stm_coloroa_name_color;   /* color of a_o name      */
   stm_polygonoa_polygon;   /* all the points that create      */
                          /* the activity_occurrence outline */
  stm_displayed_name  oa_displayed_name; /* name as appear in MGE
*/

   stm_text_attributes       oa_text_attributes;
 }
stm_oa_graphic;
typedef stm_oa_graphic *stm_oa_graphic_ptr;

typedef struct stm_oa_all
 {
   stm_oa_graphicoa_all_graphic;
   stm_idoa_chart;/* id of chart this element is in */
   stm_idoac_id;        /* id of activity this box is     */
                        /* occurrence of                  */
 }
stm_oa_all;
typedef stm_oa_all  *stm_oa_all_ptr;
```

```
/************************************** m_flow_lines definitions
**********/

                              /* graphic fields of m_flow_lines */
typedef struct stm_bm_graphic
 {
   stm_element_type    element_type;   /* type of element             */
   stm_colorbm_color;/* color of m_flow_lines*/
   stm_polygonbm_arrow;/* all the points that make the*/
                              /* arrow*/
   stm_colorfl_color;/* color of flow_label*/
   stm_coordinatefl_x_coor;/* x coordinate of flow_label*/
   stm_coordinatefl_y_coor;/* y coordinate of flow_label*/

   stm_colorplace_holder1;
   stm_coordinate          place_holder2;
   stm_coordinate          place_holder3;

   stm_text_attributes       fl_text_attributes;
 }
stm_bm_graphic;
typedef stm_bm_graphic *stm_bm_graphic_ptr;

typedef struct stm_bm_all
 {
   stm_bm_graphicbm_all_graphic;
   stm_expressionbm_expression;
   stm_idbm_chart;/* id of chart this element is in */
 }
stm_bm_all;
typedef stm_bm_all  *stm_bm_all_ptr;

/************************************** connectors definitions
**********/

typedef charstm_connector_type;
#define stm_cn_diagram'R'
```

```
#define stm_cn_default'D'
#define stm_cn_history'H'
#define stm_cn_deep_history     'P'
#define stm_cn_condition'C'
#define stm_cn_selection'S'
#define stm_cn_junction'J'
#define stm_cn_joint'T'
#define stm_cn_termination'M'
#define stm_cn_control'N'
#define stm_cn_composition'O'

typeosi define stm_cn_joint'T'
```

```
 {
   stm_cn_graphiccn_all_graphic;
   stm_cn_textcn_all_text;
 }
stm_cn_all;
typedef stm_cn_all  *stm_cn_all_ptr;

/********************************************** notes definitions
**********/

typedef struct stm_nt_text
 {
   stm_element_type    element_type;   /* type of element              */
   stm_idnt_chart;/* id of chart this element is in */
   stm_nt_note        nt_body;
 }
stm_nt_text;
typedef stm_nt_text *stm_nt_text_ptr;

typedef struct stm_nt_graphic
 {
   stm_element_type    element_type;   /* type of element             */
   stm_colornt_color;/* color of note*/
   stm_coordinatent_x_coor;/* x coordinate of note pivot*/
   stm_coordinatent_y_coor;/* y coordinate of note pivot*/

   stm_text_attributes       nt_text_attributes;
 }
stm_nt_graphic;
typedef stm_nt_graphic *stm_nt_graphic_ptr;

typedef struct stm_nt_all
 {
   stm_nt_graphicnt_all_graphic;
   stm_nt_textnt_all_text;
 }
```