MBSysC : Error handling

www.robotran.be

February 2019

1 Introduction

This file describes the error handling under C implementation of Robotran, called MBSysC. See the online source files [1] and the Robotran website [2].
First, the main structure of the error handling is introduced and information about specific modules errors are given. Second, the detailled file containing precisely all the errors in the C code is attached to this document.

This file is for the MBsysC (Robotran) users and assumes a good knowledge of MBsysC documentation [3] and Robotran tutorial [4].

2 General structure

Through all MBsysC code, a three-digits error code shows itself when an error occur, along with messages that are prompted in the command window. **Please read carefully these messages as they contain a lot of information for debugging your code.**

The three digits can help you to quickly know where the error comes from. It is based on three levels (Fig. 1) :

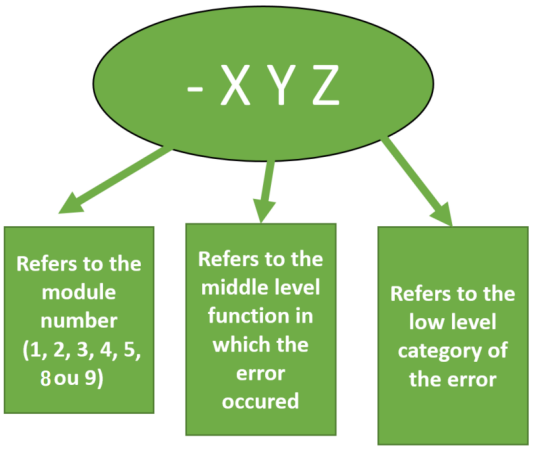


FIGURE 1 – Three digits based error code

1. https://git.immc.ucl.ac.be/robotran/mbsysc
2. http://www.robotran.be/
3. http://www.robotran.be/documentation/MBsysC/html/
4. http://robotran-doc.git-page.immc.ucl.ac.be/TutorialModellingFeatures/output_tuto/c-code/

- First, the number X of the module is shown :

```
1 partionning
2 equilibrium
3 modal
4 dirdyn
5 solvekin
8 Empty Functions
9 loading
```

- Second, a so-called middle level number Y is related to errors in functions that are present in several modules (closing geometry for example).
  Numbers from -X10 to -X19 are specific for the X module !

- The third number Z corresponds to low-level errors linked to basic operations like numerical ones (rank computation for example).

The errors numbers with X=8 are dedicated to mismatching between the .mbs model file and the provided symbolic files and functions. The high level module (partionning, equilibrium ...) generating the errors is not traced as this error can (should) be reached by almost all modules. The error goes from number -801 to -810, each number is associated to a missing symbolic function.

Fig. 2 contains the code for the last two levels.

Note that errors containing -X00 are related to the initialization of a module, probably due to wrong parameters from the user.

Any error ending by 9 (-XY9) is related to writing/opening files errors (except for -X19 and -809 of course).

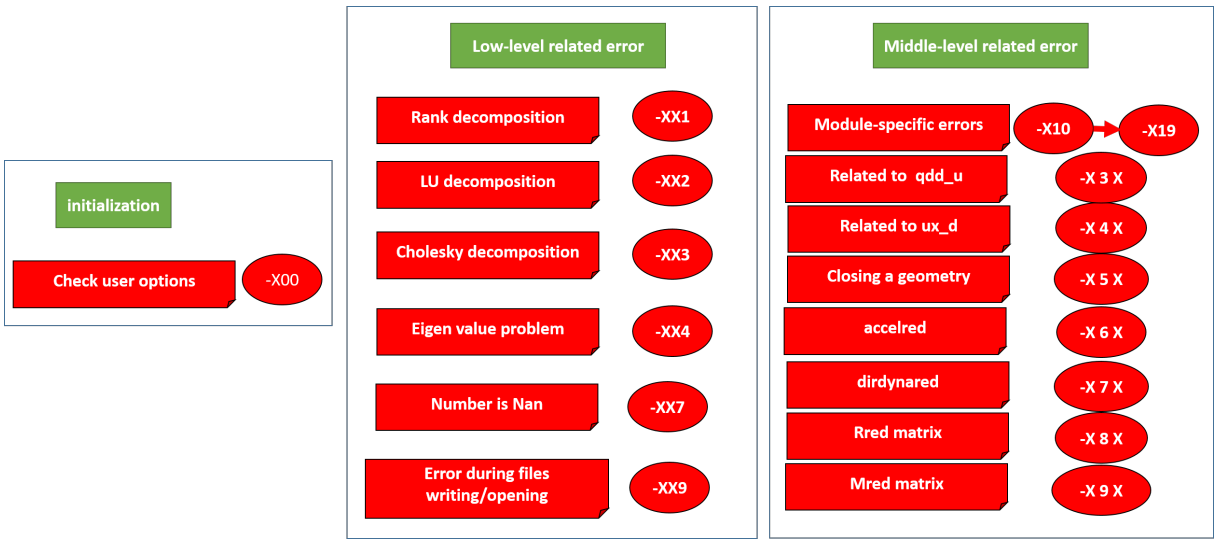


FIGURE 2 – Low and middle levels of error code

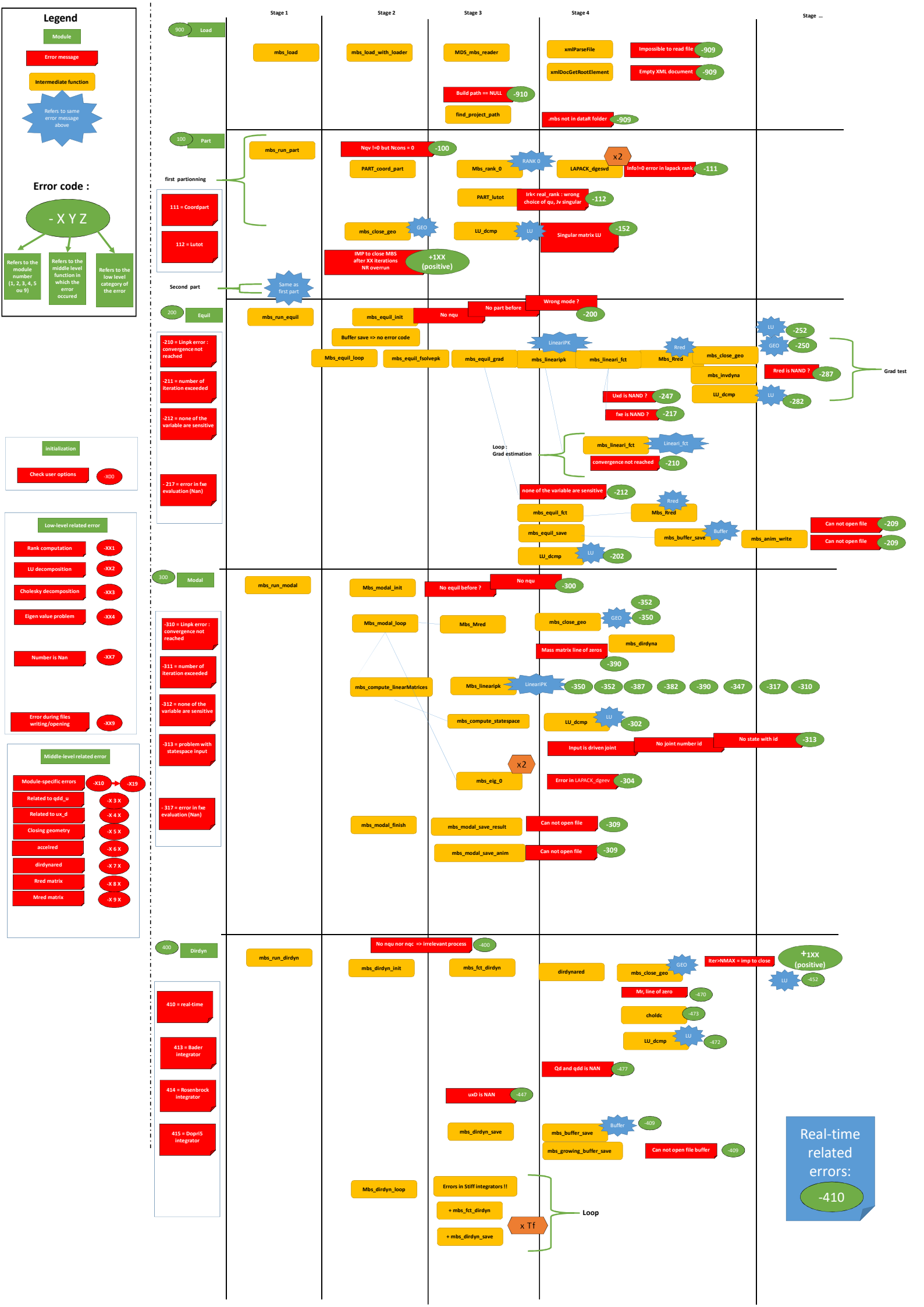
Example Error code -152 : 1 means partionning module, 5 closing a geometry and 2 problem during a LU decomposition.

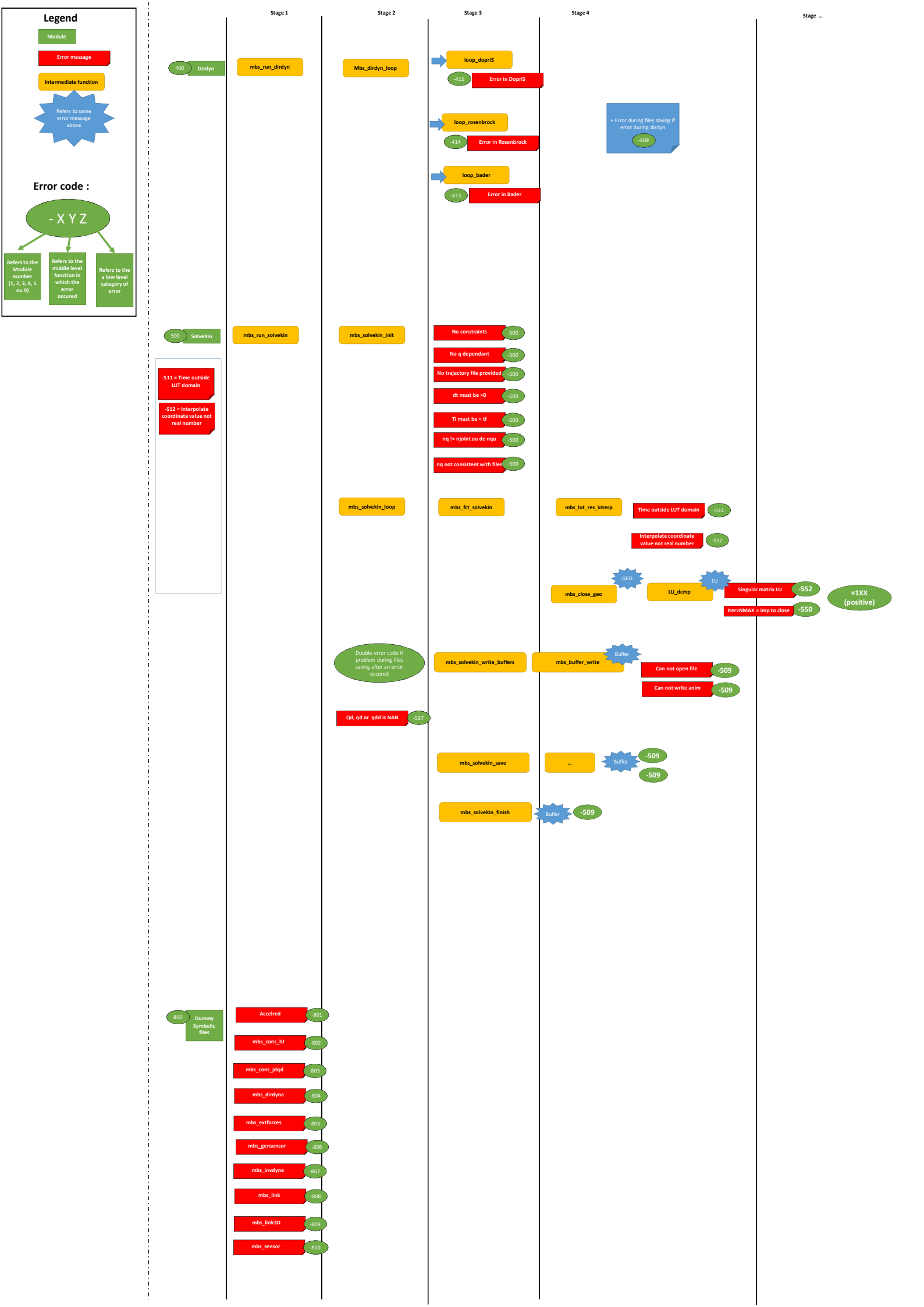
3 Detailled errors map

Nexts pages, the document containing the precise map of errors in MBsysC is shown. Be careful, some **updates** may be possible. Any remarks can be given to the Robotran developper team.

Reading and understanding these pages are not mandatory to debug your code.

The messages in the command window should be clear enough to help you debug your code !


Legend
Module
Error message
Intermediate function
Refers to same error message above
Error code :
- X Y Z
Refers to the module number (1, 2, 3, 4, 5 ou 9)
Refers to the middle level function in which the error occured
Refers to the low level category of the error
initialization
Check user options
-X00
Low-level related error
Rank computation
-XX1
LU decomposition
-XX2
Cholesky decomposition
-XX3
Eigen value problem
-XX4
Number is Nan
-XX7
Error during files writing/opening
-XX9
Middle-level related error
Module-specific errors
-X10
-X19
Related to qdd_u
-X 3 X
Related to ux_d
-X 4 X
Closing geometry
-X 5 X
accelred
-X 6 X
dirdynared
-X 7 X
Rred matrix
-X 8 X
Mred matrix
-X 9 X
Stage 1
Stage 2
Stage 3
Stage 4
Stage ...
900
Load
mbs_load
mbs_load_with_loader
MDS_mbs_reader
xmlParseFile
Impossible to read file
-909
xmlDocGetRootElement
Empty XML document
-909
Build path == NULL
-910
find_project_path
.mbs not in dataR folder
-909
100
Part
mbs_run_part
first partionning
111 = Coordpart
112 = Lutot
Nqv !=0 but Ncons = 0
-100
PART_coord_part
Mbs_rank_0
RANK 0
x2
LAPACK_dgesvd
Info!=0 error in lapack rank
-111
PART_lutot
Irk< real_rank : wrong choice of qu, Jv singular
-112
mbs_close_geo
GEO
LU_dcmp
LU
Singular matrix LU
-152
IMP to close MBS after XX iterations NR overrun
+1XX (positive)
Second part
Same as first part
200
Equil
mbs_run_equil
-210 = Linpk error : convergence not reached
-211 = number of iteration exceeded
-212 = none of the variable are sensitive
- 217 = error in fxe evaluation (Nan)
mbs_equil_init
No nqu
No part before
Wrong mode ?
-200
Buffer save => no error code
Mbs_equil_loop
mbs_equil_fsolvepk
mbs_equil_grad
LinearIPK
mbs_linearipk
mbs_linearI_fct
Rred
Mbs_Rred
mbs_close_geo
LU
-252
GEO
-250
mbs_invdyna
Rred is NAND ?
-287
Grad test
LU_dcmp
LU
-282
Uxd is NAND ?
-247
fxe is NAND ?
-217
Loop :
Grad estimation
mbs_lineari_fct
Lineari_fct
convergence not reached
-210
none of the variable are sensitive
-212
mbs_equil_fct
Rred
Mbs_Rred
mbs_equil_save
mbs_buffer_save
Buffer
mbs_anim_write
Can not open file
-209
Can not open file
-209
LU_dcmp
LU
-202
300
Modal
mbs_run_modal
-310 = Linpk error : convergence not reached
-311 = number of iteration exceeded
-312 = none of the variable are sensitive
-313 = problem with statespace input
- 317 = error in fxe evaluation (Nan)
Mbs_modal_init
No equil before ?
No nqu
-300
Mbs_modal_loop
Mbs_Mred
-352
mbs_close_geo
GEO
-350
mbs_dirdyna
Mass matrix line of zeros
-390
mbs_compute_linearMatrices
Mbs_linearipk
LinearIPK
-350
-352
-387
-382
-390
-347
-317
-310
mbs_compute_statespace
LU_dcmp
LU
-302
Input is driven joint
No joint number id
No state with id
-313
x2
mbs_eig_0
Error in LAPACK_dgeev
-304
mbs_modal_finish
mbs_modal_save_result
Can not open file
-309
mbs_modal_save_anim
Can not open file
-309
400
Dirdyn
mbs_run_dirdyn
410 = real-time
413 = Bader integrator
414 = Rosenbrock integrator
415 = Dopri5 integrator
No nqu nor nqc => irrelevant process
-400
mbs_dirdyn_init
mbs_fct_dirdyn
dirdynared
mbs_close_geo
GEO
Iter>NMAX = imp to close
+1XX (positive)
LU
-452
Mr, line of zero
-470
choldc
-473
LU_dcmp
LU
-472
Qd and qdd is NAN
-477
uxD is NAN
-447
mbs_dirdyn_save
mbs_buffer_save
Buffer
-409
mbs_growing_buffer_save
Can not open file buffer
-409
Mbs_dirdyn_loop
Errors in Stiff integrators !!
+ mbs_fct_dirdyn
x Tf
+ mbs_dirdyn_save
Loop
Real-time related errors:
-410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Refers to the a low level category of error
Stage 1
Stage 2
Stage 3
Stage 4
Stage ...
400
Dirdyn
mbs_run_dirdyn
Mbs_dirdyn_loop
loop_dopri5
-415
Error in Dopri5
loop_rosenbrock
-414
Error in Rosenbrock
loop_bader
-413
Error in Bader
+ Error during files saving if error during dirdyn
-409
500
SolveKin
mbs_run_solvekin
mbs_solvekin_init
No constraints
-500
No q dependant
-500
No trajectory file provided
-500
dt must be >0
-500
Ti must be < tf
-500
nq != njoint ou de nqu
-500
nq not consistent with files
-500
-511 = Time outside LUT domain
-512 = Interpolate coordinate value not real number
mbs_solvekin_loop
mbs_fct_solvekin
mbs_lut_res_interp
Time outside LUT domain
-511
Interpolate coordinate value not real number
-512
GEO
mbs_close_geo
LU
LU_dcmp
Singular matrix LU
-552
Iter>NMAX = imp to close
-550
+1XX (positive)
Double error code if problem during files saving after an error occured
mbs_solvekin_write_buffers
mbs_buffer_write
Buffer
Can not open file
-509
Can not write anim
-509
Qd, qd or qdd is NAN
-537
mbs_solvekin_save
...
Buffer
-509
-509
mbs_solvekin_finish
Buffer
-509
800
Dummy Symbolic files
Accelred
-801
mbs_cons_hJ
-802
mbs_cons_jdqd
-803
mbs_dirdyna
-804
mbs_extforces
-805
mbs_gensensor
-806
mbs_invdyna
-807
mbs_link
-808
mbs_link3D
-809
mbs_sensor
-810