

MIGRATION GUIDE

RT-LAB 11.0

Latest Update: March 7, 2016



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MAIN CHANGES

RT-LAB 11 is the result of a lengthy period of considerable efforts from OPAL-RT developers. The new version of this well-known real-time simulation software environment is more robust than the previous ones and attempts to repair known issues and to enhance the user experience. A major new release of any software usually demands some adaptation from users and this document intends to summarize specific changes related to software operation, in order to facilitate migrating from previous versions to RT-LAB 11.

RT-LAB comes with further detailed documentation, such as an Installation Guide, User Guide, C API and Python API references. For any questions not covered by these documentations, please contact the OPAL-RT support team (support@opal-rt.com).

No need for administrator privileges

RT-LAB no longer requires administrator privileges to be used, it can be operated by any user. This scenario is much more consistent with most institutional and academic environments. Administrator privileges will be required only in particular situations, such as: first launch of RT-LAB, MATLAB auto-repair operation and model compilation after changing the current MATLAB version.

MetaController behaviour

In previous RT-LAB versions, the MetaController had to be manually launched and closed. The behaviour of this important component has been reviewed in this new version: from now on, launching / closing RT-LAB will automatically launch / close the MetaController.

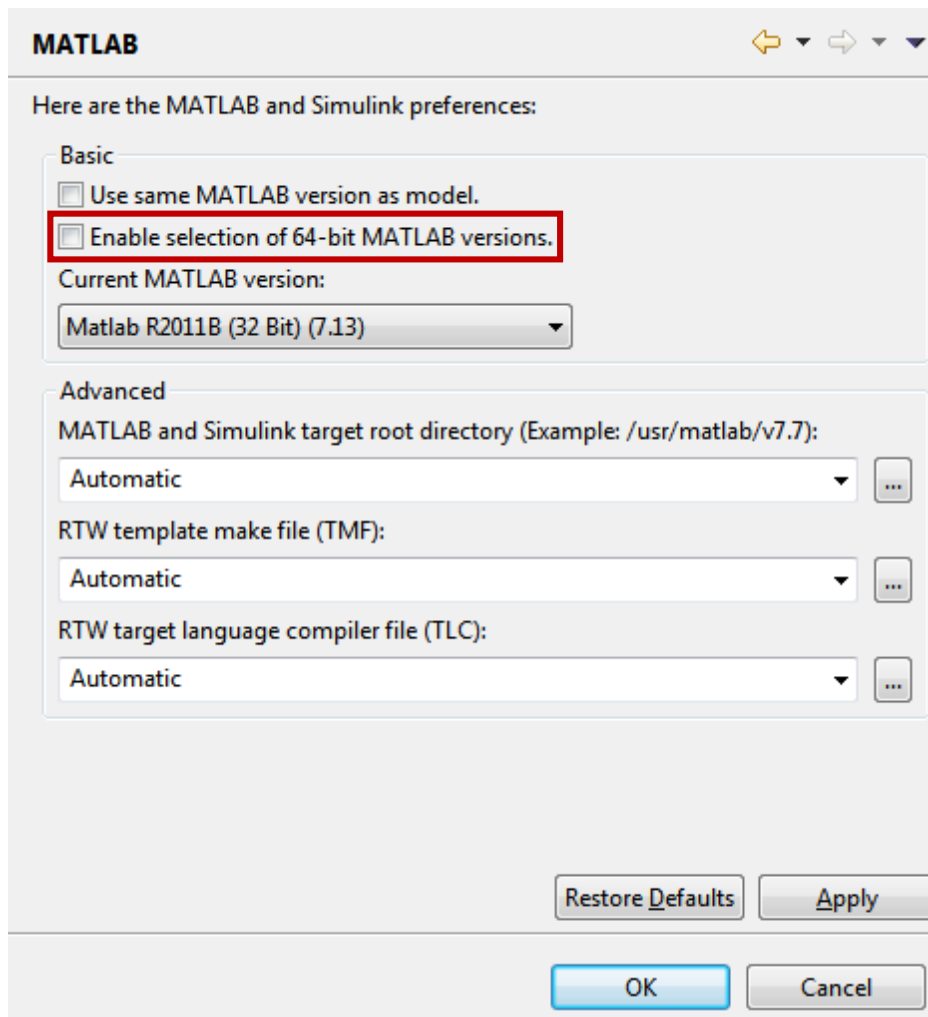
MATLAB auto-repair operation

The management of MATLAB versions has been improved in this version of RT-LAB. Previously, installing MATLAB after having installed RT-LAB could lead to some unpleasant issues. Now, these products can be safely installed in any order; every time RT-LAB launches a MATLAB instance, it verifies whether the required files already exist in the appropriate folder. If these files are not there, RT-LAB creates them (this requires administrator privileges).

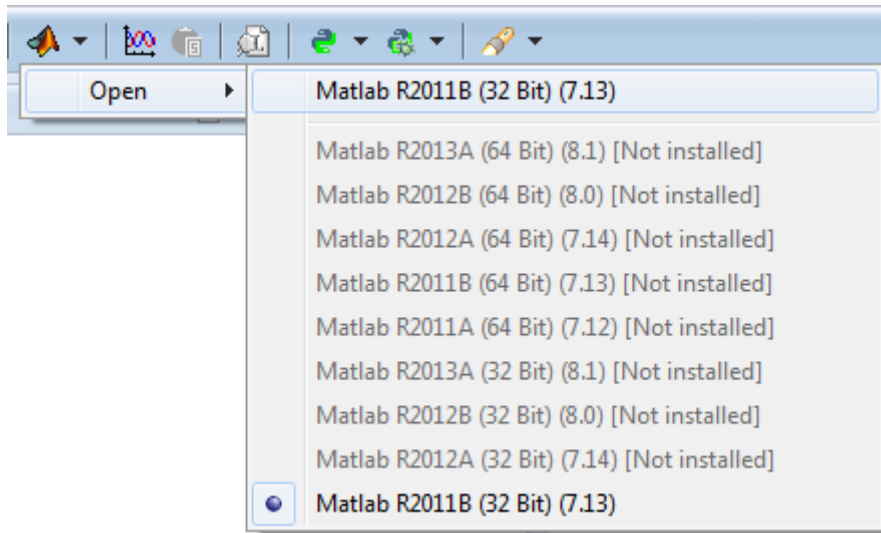
Using 64-bit versions of MATLAB

The 64-bit versions of MATLAB are not enabled by default because some RT-LAB features are not supported by those versions. However, if your application needs a 64-bit version of MATLAB, you can enable RT-LAB to show these versions by checking the following option:

Window > Preferences > RT-LAB > Simulation tools > MATLAB > Enable selection of 64-bit MATLAB versions



All components that enumerate MATLAB versions will be affected by this configuration. For example, the figure below shows the contents of the MATLAB icon (on the toolbar) after enabling the 64-bit versions.

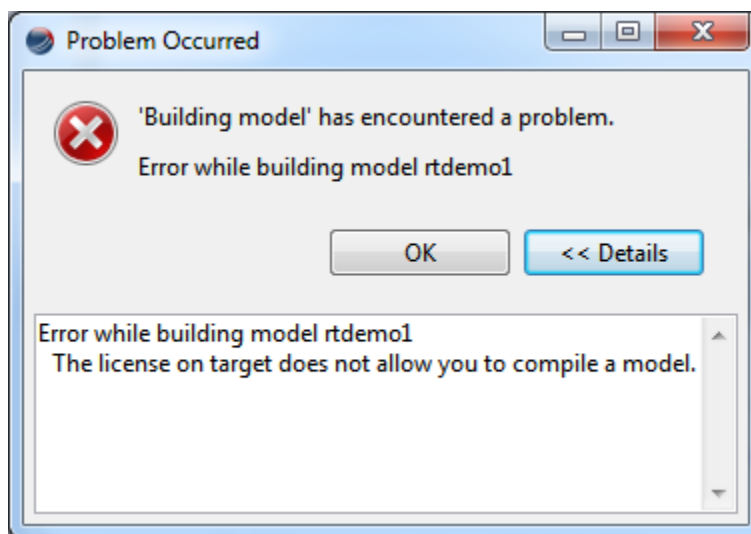


Runtime and development licenses

RT-LAB targets accept two types of licenses for model compilation permissions:

- **Runtime license:** allows the user to use all RT-LAB features, **except** model compilation. This license is for users who only need to run their models on the target.
- **Development license:** allows the user to perform all build steps on the target, **including** model compilation.

If you wish to compile a model, but your target has a runtime license, the build process will display the following message. If this is your case, please request a development license.



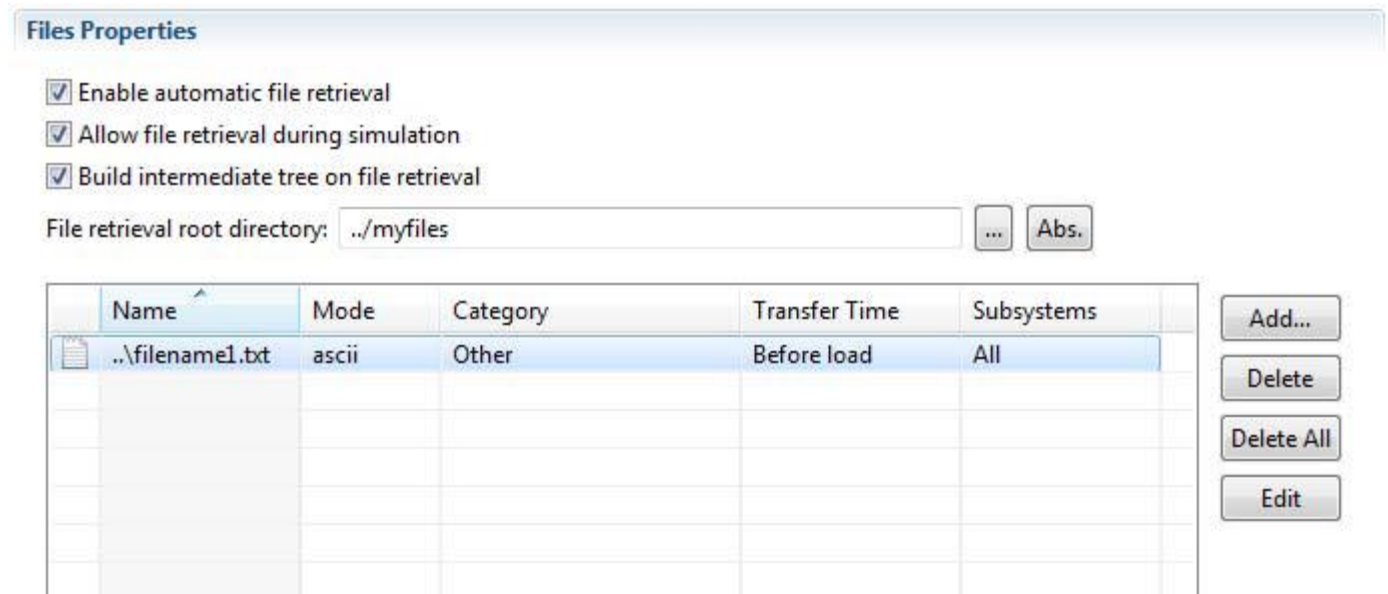
Relocation of files

The following files have been moved from their previous folders to more intuitive locations:

- **Controller.log** used to be a single logfile common to all projects, stored in the folder %RTLAB_ROOT%/common/bin/. From now on, each project has its own separate file, stored in its folder. The size of such file is limited to 10MB (editable in Hardware.config); RT-LAB will automatically create another file if the current one exceeds maximum size.
- **Hardware.config**, **MetaController.state** and other files have been moved from %RTLAB_ROOT%/common/bin to %ProgramData%/OPAL-RT/RT-LAB/%VERSION%/.

Files for asynchronous processes and S-Functions

For models containing asynchronous processes and/or S-Functions, RT-LAB automatically detects the required files for such components and adds them to the list of extra files. In order to repair known issues related to the mixture of asynchronous processes and S-Functions files, the “Files Properties” page of the model editor has been reviewed, allowing the user to choose the category of extra files. The category is automatically detected by RT-LAB but can be changed by the user. If an extra file is not automatically added to this list, the user can also perform this operation manually. Please refer to the User Guide for further information.



Makefile for asynchronous processes

Improving the way asynchronous processes are managed by RT-LAB has required the use of additional libraries when compiling the user code. For that reason, existing custom makefiles used by asynchronous processes must be updated as shown below.

The following lines:

```
LIBPATH = -L.
```

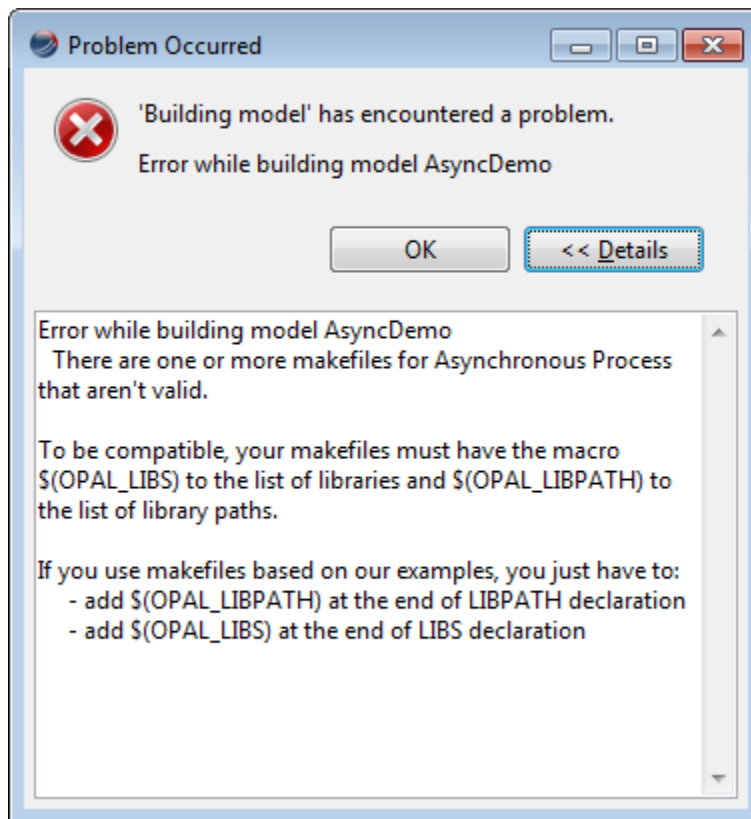
```
LIBS := -IOpalAsyncApiCore -IOpalCore -IOpalUtils $(LIB_TARGET)
```

Must be replaced, respectively, by:

```
LIBPATH = -L. $(OPAL_LIBPATH)
```

```
LIBS := -IOpalAsyncApiCore -IOpalCore -IOpalUtils $(LIB_TARGET) $(OPAL_LIBS)
```

Trying to compile an asynchronous process without editing its makefile will lead to the following error message window:



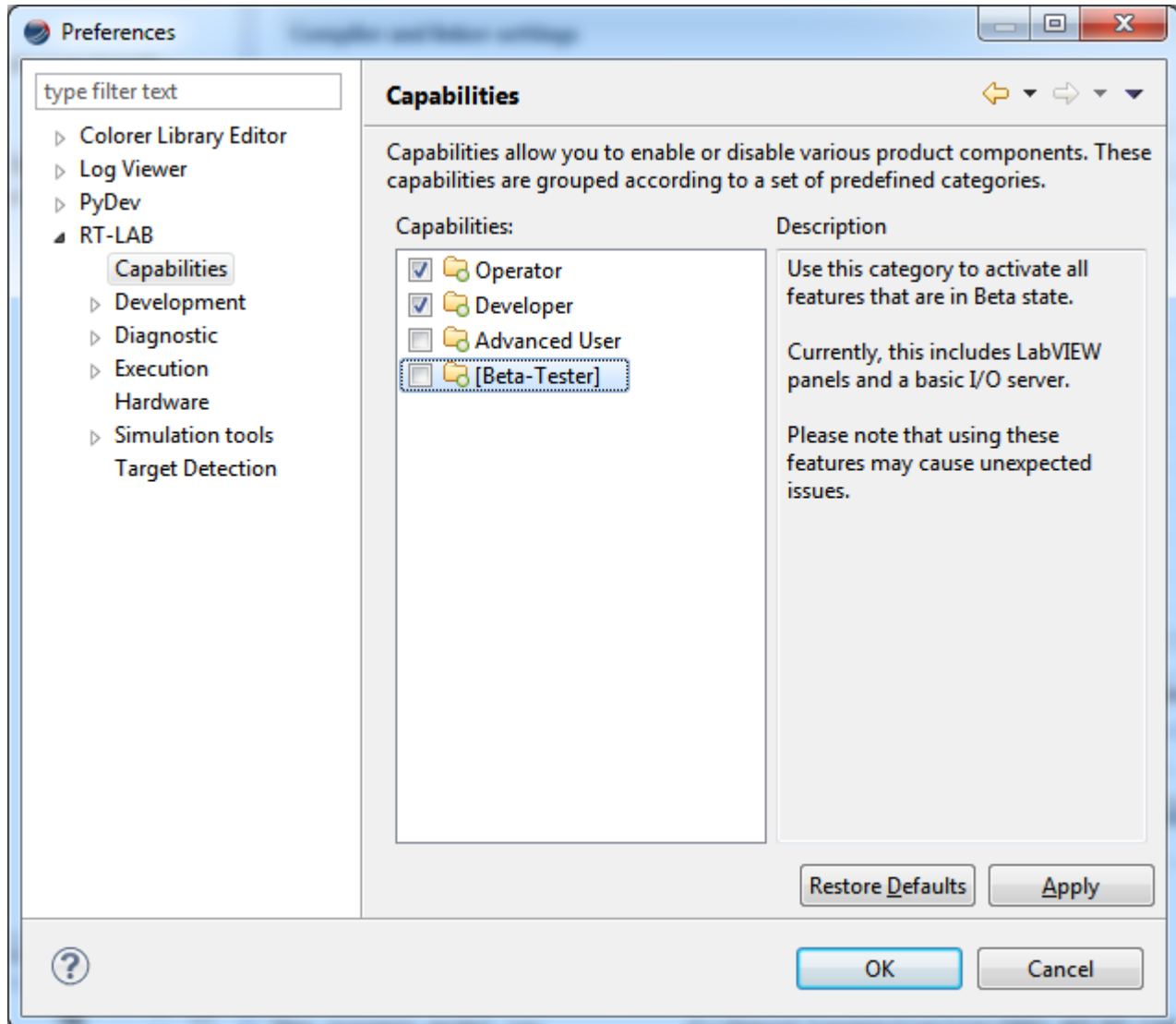
The compilation log will also display the following message:

```
----- Validating sources files -----
C:/Users/.../AsyncProcess.mk... Missing $(OPAL_LIBS) and $(OPAL_LIBPATH)
??? Error during validation source files.
```

Beta capabilities

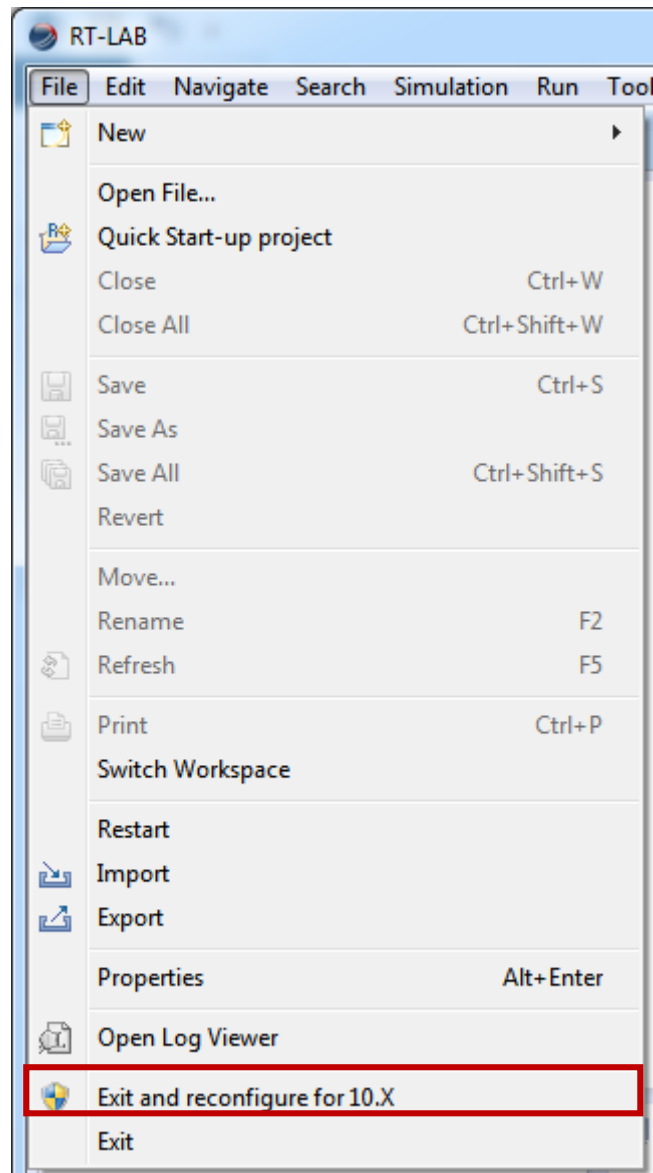
RT-LAB offers beta capabilities, allowing users to test LabVIEW panels and the I/O server. Please note that such features are not yet completed and may lead to unexpected behaviour. Beta capabilities are disabled by default; you can enable them as follows (figure below):

Window > Preferences > RT-LAB > Capabilities > Beta-Tester



Exiting RT-LAB

If you are closing RT-LAB and intend to use a version older than 11.x at a later time, you will have to exit the software by selecting *File > Exit and reconfigure for 10.x*. This procedure is necessary because some properties of older versions are not compatible with this new version and they must be reconfigured, so that the operating system can launch an older version of RT-LAB. On the other hand, upgrading from older versions to RT-LAB 11.x is an automatic process that does not require any special procedure.



COMPATIBILITY

In order to improve the stability and the upcoming features of the software, the following products are no longer compatible with RT-LAB 11:

- **Windows XP:** Microsoft ended support of Windows XP in April 2014. As a result, RT-LAB 11 compatibility with Windows starts from Windows Vista,
- **QNX:** Support for QNX as a target OS will end with RT-LAB 11. Please contact OPAL-RT technical support to see how you can migrate to Red Hat Enterprise Linux,
- **MATLAB** versions: RT-LAB 11 will end support of MATLAB versions older than R2011B

	R2007B	R2008A	R2008B	R2009A	R2009B	R2010A	R2010B	R2011A	R2011B	R2012A	R2012B	R2013A	R2013B	R2014A	R2014B	R2015ASP1	R2015B
RT-LAB 10.6.x	✓	✓	✓	✓	✓	✓	✓	✓	✓								
RT-LAB 10.7.x					✓	✓	✓	✓	✓	✓	✓	✓					
RT-LAB 11.0.x									✓	✓	✓	✓	*		✓	*	

* : Partial support of R2013B that does not include Artemis or RT-Events

- OPAL-RT's **TestDrive** is no longer supported with RT-LAB 11. The next generation of the product will be integrated in an upcoming version of RT-LAB,
- OPAL-RT's **Dinamo** is no longer supported with RT-LAB 11.

The following products have been updated for RT-LAB 11, please ask for the latest version to be used with your system:

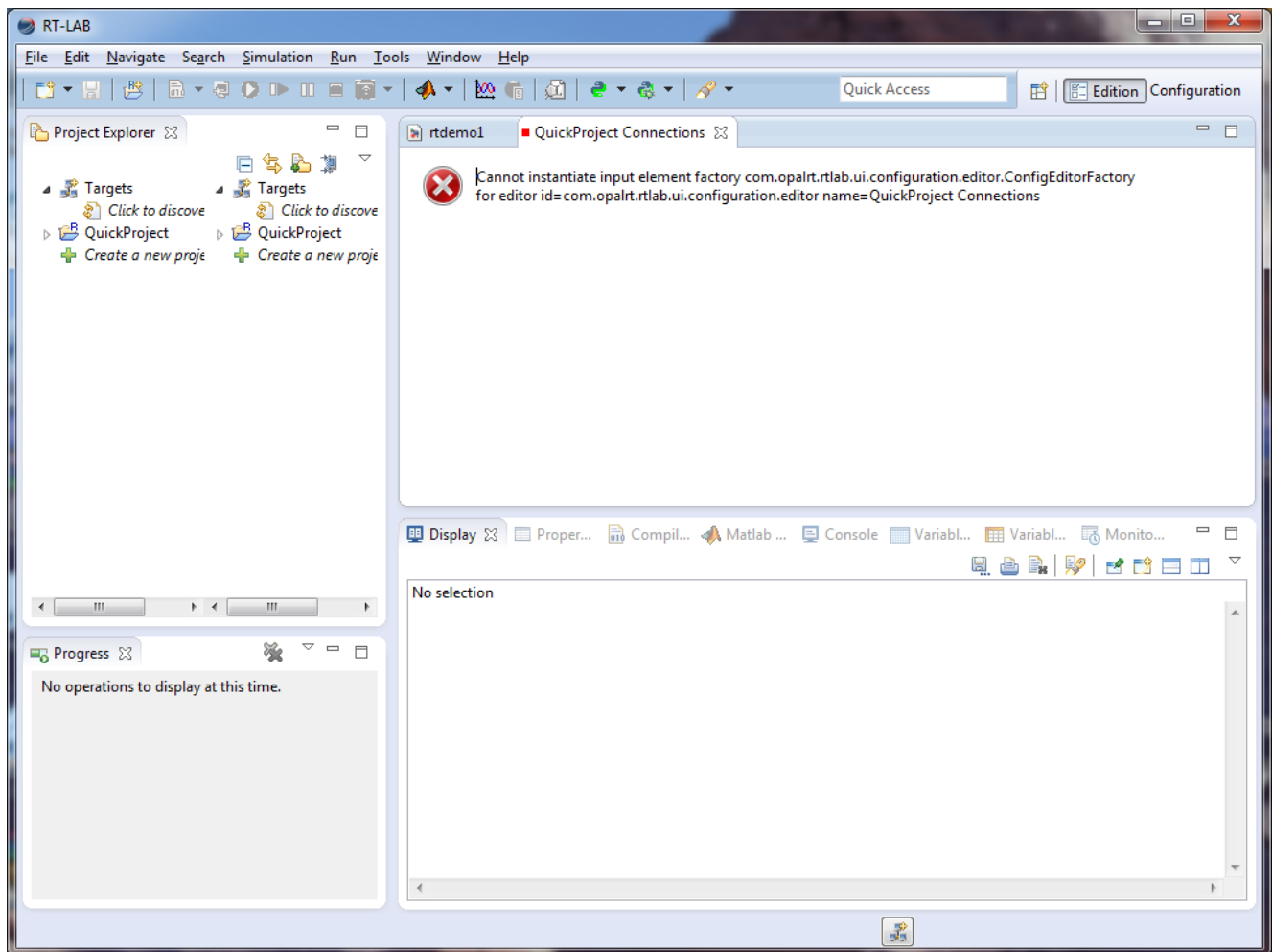
- **Artemis,**
- **RT-Events**

For further information regarding the compatibility between RT-LAB 11 and other products, please refer to the Installation Guide or contact OPAL-RT technical support (support@opal-rt.com)

KNOWN ISSUES

Older workspaces

If the user loads a RT-LAB 11 workspace in an older version, some components may present error messages and/or the project explorer may be duplicated.



This problem may happen if the user opens perspectives or components (views or editors) from RT-LAB 11 that do not exist in older versions. Fixing this problem is quite simple: the user should simply close the incompatible views and editors, close all perspectives and then reopen them. This problem arises only when migrating from RT-LAB 11 to older versions. For future RT-LAB versions, the management of perspectives has been improved so that this problem will no longer happen.

Modification of network interfaces

The handling of network interfaces has been significantly improved, allowing users to operate RT-LAB on machines with multiple network interfaces, a configuration that was not supported in previous versions. There are, however, some known issues that may occur in very particular situations, for example: RT-LAB must be closed and all models must be stopped before any modification in network configuration (e.g. if Wi-Fi is activated while using RT-LAB).

Multiple subsystems and Dolphin connections

Pausing and resuming a model with multiple subsystems per core and Dolphin connections will make RT-LAB to stop working properly. The following procedure will cause a crash of RT-LAB: (1) load a model with real-time communication link set to Dolphin (proper hardware required); (2) run; (3) pause; (4) run. Even if such problem has never been reported by users, it has been detected during internal tests.