



AUTOMATIC CODE GENERATION

The *Automatic Code Generation* (ACG) is the EICASLAB feature that allows to generate both the *Application Software* (AS) and the *Basic Software* (BS) corresponding to the designed control strategy for performing the overall Rapid Control Prototyping tests and for being transferred in the final target.

AUTOMATIC CODE GENERATION

The final goal of EICASLAB consists in generating the real-time software code to be transferred in the final hardware network of targets that will pilot the plant to be controlled.

The generated software code is subdivided in two main components:

- Application Software (AS), that represents the “target independent” part of the final code, implementing the control algorithm designed in EICASLAB;
- Basic Software (BS), that represents the “target dependent” part of the final code: it schedules activities of each microprocessor, manages the microprocessor clock, the HW I/O interfaces, etc.

The EICASLAB ACG assists the control designer in generating the control software in all the control design phases, providing the following types of automatic code generation:

- **ACG for Application Software**, that generates only the code (AS) that implements the control algorithm. The generated AS can be tested and debugged in a simulated environment by means of the SIM tool (*Modelling and Like Real-time simulation phase*);
- **ACG for Rapid Control Prototyping**, that generates the code for performing the RCP activity (*Rapid Control Prototyping phase*);
- **ACG for HW Target**, that generates the code for the final target (*Target phase*);
- **ACG for HIL**, that generates the code for performing the Hardware In the Loop activity (*Target phase*).

ACG Highlights

- Optimised automatic code generation feature
- Automatic code generation for Application Software
- Automatic code generation for Rapid Control Prototyping
- Automatic code generation for Hardware Target
- Automatic code generation for Hardware In the Loop

ACG for Application Software

The *ACG for Application Software* is the EICASLAB feature aiming at generating in ANSI C language the AS of the designed control algorithm, optimised in order to be easily integrated with any Basic Software. This feature requires the ACGAS module.



ACG for AS

The ACG for Application Software provides two advanced features:

- the possibility to test the generated AS in a whole simulated environment – the SIM tool – before transferring it in the final target. The AS, running in the SIM tool, is the same one that will run in the final HW target;
- the possibility to export the Application Software (AS) that can be easily integrated with the Basic Software (**Application Software Export** feature).

Code Generation



ACG for Rapid Control Prototyping

The *ACG for Rapid Control Prototyping* (RCP) is the EICASLAB feature aiming at generating also the complementary source code, the BS, which together with the AS provides a standalone Multi-core and Multi-threading RT application, the RCP Manager tool, able to perform a complete RCP test. This feature requires that both the ACGAS module and the RTPC module are enabled in EICASLAB.

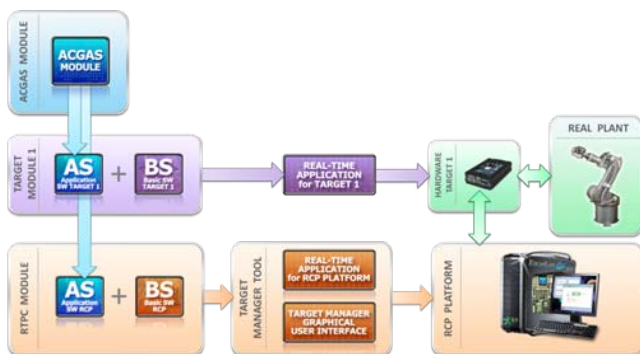
In order to configure the ACG for RCP, EICASLAB allows to provide a set of properties for correctly performing the overall RCP activity. A description of the RTPC module is provided in the brochure "EICASLAB RCP".



ACG for RCP

ACG for Hardware Target

The *ACG for HW Target* is the EICASLAB feature aiming at generating also the target-dependent source code which, together with the AS, provides the control software code for a set of pre-selected targets. This feature requires that both the ACGAS module and the HW Target module are enabled in EICASLAB.

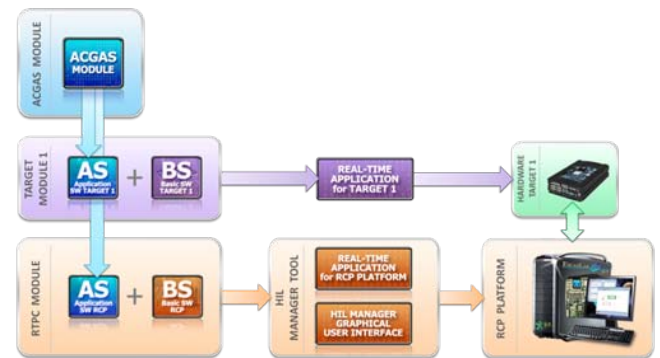


ACG for Hardware Target

ACG for Hardware In the Loop

Once the control software code is installed in the final Hardware Target (ACG for specific Hardware Target), the Hardware In the Loop (HIL) tests may be performed, consisting in piloting – instead of the actual plant – the plant simulated in EICASLAB and running on your PC, suitable configured and connected through the necessary hardware interfaces with the final Hardware Target.

The *ACG for HIL* is the EICASLAB feature aiming at generating the source code necessary for performing the Hardware In the Loop activity. This feature requires the HIL module, that has the following EICASLAB modules dependencies: ACGAS module and HW Target module.



ACG for HIL

MANUAL & DOCUMENTATION

The EICASLAB ACG provides the user with all the necessary support for the Automatic Code Generation:

- a specific chapter of the EICASLAB User Manual is devoted to illustrate the overall ACG module capabilities and help the user to make profit in using the EICASLAB software for the ACG;
- the EICASLAB website can be directly accessed to get information, to contact us, to ask additional support for the ACG or enjoy the advantages of the EICASLAB Consultancy services.

Our service support is dedicated to our Customers with the aim to guarantee them with the best assistance they need.



Welcome to EICASLAB Suite.
Welcome to Innovation!