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 AS**, that generates only the code (AS) that implements the control algorithm. The AS is the same one that will run in the final HW target and in all the control design phases;

• **ACG for RCP**, that generates the code for performing the RCP activity by means of the RCP Manager tool (*Rapid Control Prototyping* operative mode);

• **ACG for HW Target**, that generates the code for the final target (*Target* operative mode);

• **ACG for HIL**, that generates the code for performing the Hardware-in-the-loop activity by means of the HIL Manager tool (*Hardware-in-the-loop* operative sub-mode).

• **ACG for FVT**, that generates the code for performing the Final Validation Test activity by means of the TARGET Manager tool (*Final Validation Test* operative sub-mode).

ACG Highlights

• **Optimised automatic code generation feature**

• **Automatic code generation for:**

  – **Application Software**

  – **Rapid Control Prototyping**

  – **Hardware Target**

  – **Hardware-In-the-Loop**

  – **Final Validation Test**

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.
Required modules: ACGAS

ACG for AS

The ACG for AS 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).
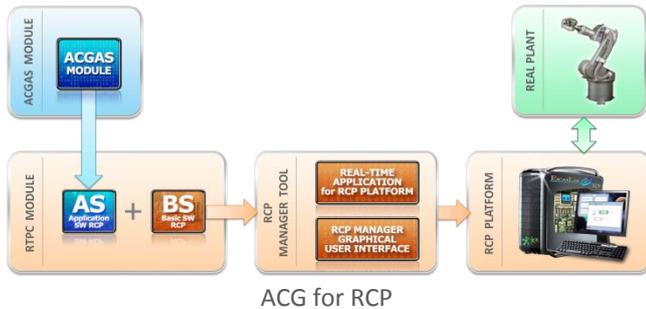
Code Generation

ACG for Rapid Control Prototyping

The *ACG for Rapid Control Prototyping* (RCP) is the EICASLAB feature aiming at generating the BS which allows to manage the RCP activities through the RCP Manager tool.
Required modules: ACGAS , RCP.

ACG for RCP

ACG for Hardware Target

The *ACG for HW Target* is the EICASLAB feature aiming at generating the target-dependent source code for a set of pre-selected targets.
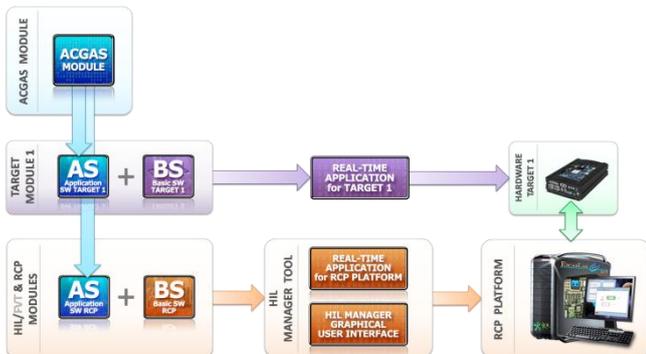*Required modules*: ACGAS , TARGET.

ACG for Hardware Target

ACG for Hardware-in-the-loop

The *ACG for HIL* is the EICASLAB feature aiming at generating the BS necessary for performing the Hardware-In-the-Loop activities through the HIL Manager tool.
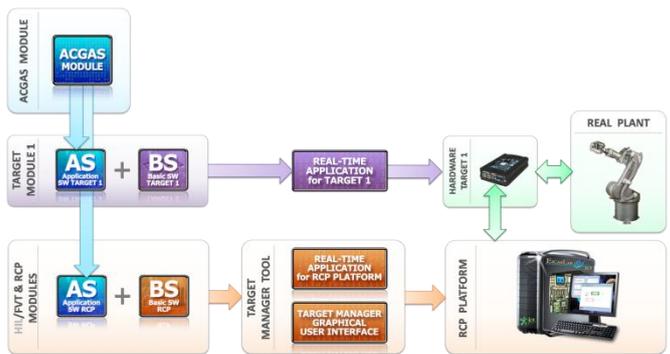*Required modules*: ACGAS , RCP, TARGET, HIL/FVT.

ACG for HIL

ACG for Final Validation Test

The *ACG for FVT* is the EICASLAB feature aiming at generating the BS necessary for performing the Final Validation Test activities through the TARGET Manager tool.
Required modules: ACGAS , RCP, TARGET, HIL/FVT.

ACG for FVT

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!