

Product Information Note

PlantCruise by Experion[®] Algorithm Block Process Solutions



Honeywell's PlantCruise by Experion Custom Algorithm Block (CAB) Solutions allow users to employ their own algorithms to create custom function blocks, which can be applied to fully realize the robustness and execution capabilities of the C300 controller.

With Honeywell's PlantCruise by Experion Custom Algorithm Block (CAB) Solutions, industrial organizations can meet their process-specific control requirements using their Intellectual property in a secure execution environment.

The CAB Solutions allow users to define custom control strategies and enable flexible and tight control with complex calculations running directly in the control environment. These blocks supplement standard PlantCruise by Experion platform function blocks, and with control running directly in the C300 controller, provide the full robustness required for a critical process automation applications.

Developing control strategies with CAB functionality allows process plants to:

- Decrease production costs and increase yields by implementing complex calculations and tighter control
- Reduce engineering and maintenance costs with an efficient and simple programming language accessed through an integrated environment
- Minimize errors and re-work with a flexible and powerful execution environment that includes an advanced debug capability, built-in functions, and the ability to re-use blocks
- Prevent control execution disasters and avoid accidental programming mistakes with integrated security features and a controlled programming environment.

Powerful Development Environment Improves Engineering Efficiency

Honeywell's CAB development environment is built upon Microsoft[®] Visual Studio[®] software. The CAB Developer tool extends features of the Visual Studio environment to provide an

industrial control-oriented environment tightly integrated with Honeywell's PlantCruise by Experion platform.

CAB Developer provides a modern and comprehensive programming language that supports complex calculations, but requires very little training. Control engineers can take advantage of the Microsoft.NET platform and Visual Basic.NET programming language, which is widely used among program developers. This ensures a faster learning curve with easy program maintenance. In addition, its object-oriented environment delivers performance and optimization benefits.

CAB for C300 has been designed so that after completing the algorithm development, running the CAB in the C300 controller does not require the .Net environment, thus eliminating dependency on any Microsoft component.

Building a CAB Block is a simple four-step process:

- Define the custom parameter
- Write the code
- Build the CAB block type from the code
- Create a CAB instance from the CAB block type and reuse as often as needed

The tools facilitating these steps are integrated within the development environment, ensuring an efficient and quick process. A single PlantCruise by Experion tool environment transports data between Microsoft applications such as Excel and the CAB environment, improving ease-of-use and development efficiency.

New CAB custom libraries appear with other PlantCruise by Experion Control Builder libraries to facilitate easy and fast programming. This provides a single, integrated engineering environment. As soon as a CAB is saved, it instantly becomes available for use in Control Builder like any other function block in the library. Instantiating and configuring a CAB is the same as any

non-custom block for use within Control Builder. You can even export and import CAB types between PlantCruise by Experion systems. Using generic CAB blocks reduces engineering time and maintains loop and function block consistency.

PlantCruise by Experion's integrated tool environment with CAB Developer eliminates manual efforts to copy solutions between the development tool and the execution environment.

Powerful Development Features Reduce Engineering and Maintenance Costs

The integrated CAB Developer environment provides many timesaving features. For example, a powerful debugging capability allows for setting breakpoints, establishing flow control for branch coverage, and changing variable values while stepping through the code — thus providing greater control of the debug session code. This reduces rework and ensures better quality code the first time a CAB program is deployed on process.

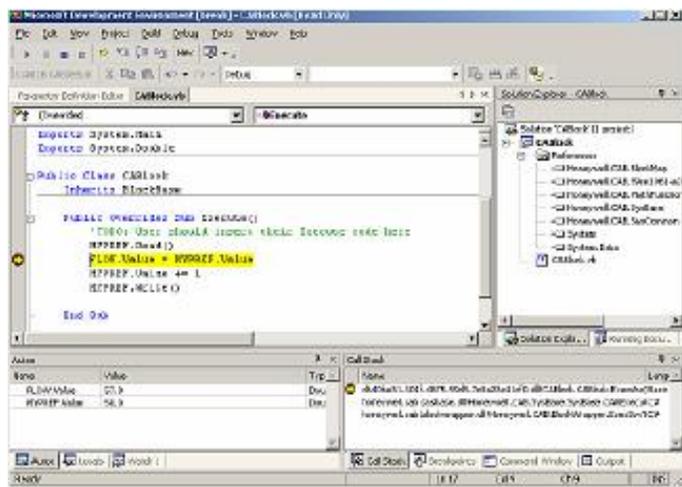


Fig.1: CAB Debug Environment

With this functionality, there is no need to manually step through code or insert temporary messages to determine intermediate values. Exception messages are descriptive and shown with line numbers, providing quick navigation to the error location. It is easy to write sophisticated, high-quality control programs with the rich capability and debugging features of the CAB Developer.

Custom parameter definition in control modules assists in building required system configuration parameters, resulting in improved operator and engineering effectiveness.

Utilizing Visual Basic syntax, nested loops and case statements, engineers can program complex logic with fewer lines of code. This helps optimize code and improve run-time performance.

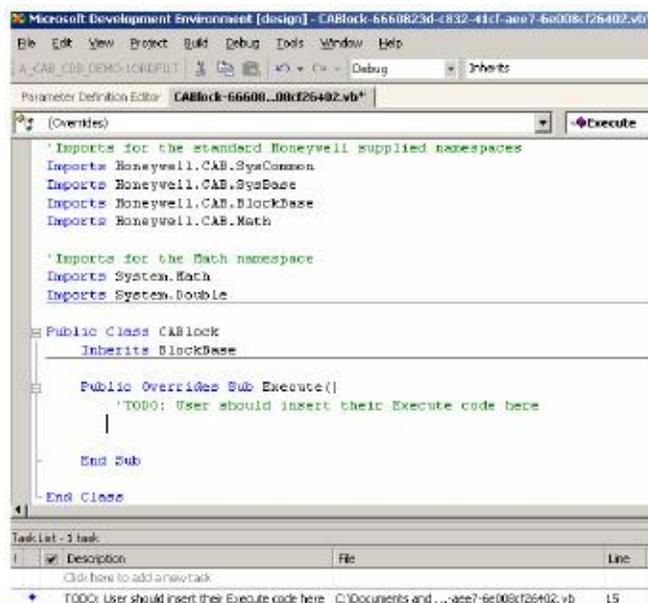


Fig.2: CAB Development Environment

CAB provides the flexibility to view, validate, review and edit the configured parameters and program code based on an intuitive user interface. CAB pre-fetches and post-stores data so that many CABs can run in different time slots. This powerful and flexible environment supports a wide range of functionality that enables creation of simple function blocks as well as complex applications. Honeywell's Batch Digester is an example of a large and complex batch program successfully implemented with CABs.

The following features also support an efficient development and user environment:

- CAB Developer: Provides automatic, CAB-type documentation, offering the ability to manage versions and resulting in easy code maintenance.
- CAB-type Property Window: Displays validation information to review configured parameters and program source code in an intuitive user interface from both Control Builder and the operator detail display.
- Pre-built Function Libraries within CAB Developer: Facilitate faster CAB programming and help maintain clean code to reduce the development cycle.
- Auto Color-coding: Enhances readability and maintenance of custom programs to provide better control over programs when modifications are necessary, or when different engineers are maintaining the same code.

Integrated Security Features Prevent Engineering and Control Errors

The use of CAB types provides security benefits to a plant or mill. Configurable alarms (e.g., errors, read/write violations and block terminations) help detect problems early and prevent disasters. In addition, several integrated features prevent development or execution errors:

- Honeywell has integrated the VB.Net compiler with a process control compiler check function called Function Limiter. This prevents the use of any VB.Net constructs that could be adverse to a process control mission (for example, a message box that stops all processes until a user response is received).
- The system terminates the block automatically on memory violations, preventing crashing the controller environment.
- The system terminates the block automatically if excessive execution is detected, preventing possible disasters caused by locking up the controller environment.

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For More Information

Learn more about how Honeywell's PlantCruise by Experion solution can improve plant performance, visit our website www.honeywellprocess.com or contact your Honeywell account manager.

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