Honeywell’s Experion LX 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 Experion LX 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 Experion LX 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.

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 Experion LX 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 Experion LX 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 Experion LX systems. Using
generic CAB blocks reduces engineering time and maintains loop
and function block consistency.

Experion LX’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.

**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.

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**FCAB 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.
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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