



# Connected Components Workbench™ Software Release 10.00

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Rockwell Automation SummerDays  
2017. 09. 20.-21., Velké Karlovice



**PUBLIC**

# Agenda

**Rockwell  
Automation**

## **What is Connected Components?**

Connected Components Workbench Software and Accelerator Toolkit

What's New in Release 10.00

# What Is Connected Components?

<http://www.rockwellautomation.com/go/cc>

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## ***Simpler, Faster, More Cost-effective Machine Building***

- Enabled by Micro800® controllers, PowerFlex® Drives, PanelView™ 800 HMI, Guardmaster® 440C-CR30 Configurable Safety Relay, SMC™ Soft Starters, Kinetix® 3 Servo Drives, **GuardShield™ 450L-B Light Curtain**
- Connected Components Workbench™ Programming Software (CCW) is the single software that simplifies standalone machine development by programming all your products with one software
- Connected Components Accelerator Toolkit (CCAT) makes it quicker and easier to implement common control tasks – Reduce your design time by up to 50%



*GuardShield Light Curtain – newly supported in Release 10.00*

# Micro800 Controller Family

**Rockwell Automation**

Nano PLC

Micro PLC

Each controller is cost and performance optimized for specific applications

Performance/Features

**Micro810**  
Programmable relay  
replacer and timer  
8A relay outputs, Analog inputs



12pts

20-36pts



**Micro820** **EtherNet/IP**  
For smaller standalone machines  
and remote automation



Embedded Analog I/O



10-88pts



**Micro830**  
For standalone  
machines with motion



24-132pts



**Micro850**  
For standalone machines  
with motion and more I/O  
and Ethernet connectivity.

**EtherNet/IP**



Local I/O

# PanelView 800 Feature Overview

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800 MHz CPU

3 Sizes – 4", 7", 10"

Built-in Memory  
128 MB / 256 MB

High-Resolution Display  
with LED Backlight

65K Colors  
Touch screen

Built-in Real-Time Clock

Multiple  
Communications

microSD™ for  
Datalog /  
Recipe / File Transfer

IP65, NEMA 4X  
Rated

Quick Lever  
Panel Mount

Landscape / Portrait  
Applications

Tactile Keypad  
(4")

Class 1 Division 2  
Certified

# Agenda

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What is Connected Components?

**Connected Components Workbench Software and Accelerator Toolkit**

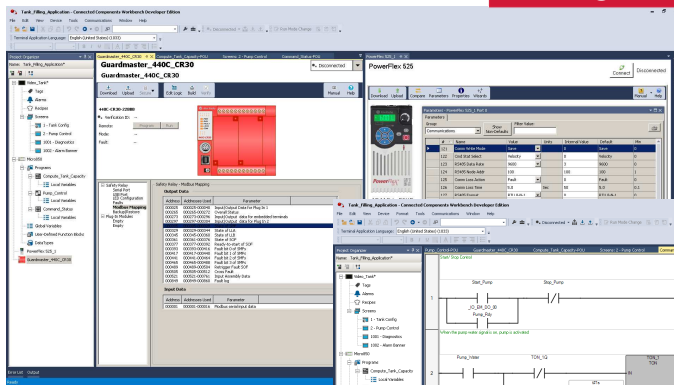
What's New in Release 10.00

# Connected Components Workbench Software

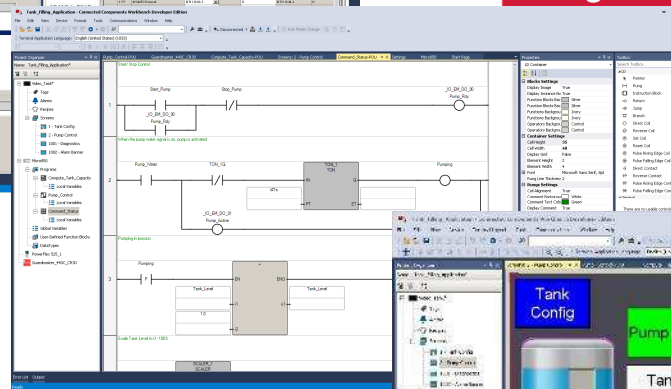
## Single Software for All Your Component Devices

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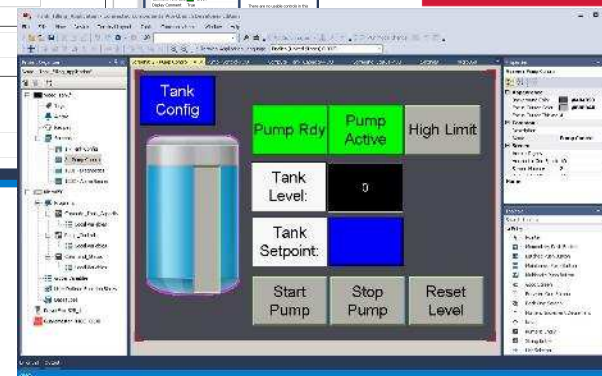
**Configure**



**Program**



**Visualize**



## ***Lower the cost to Design, Develop and Deliver your machine***

- **Easy to Configure**
  - Single software package for all your essential components reduces time to create and maintain your machine design
  - PowerFlex drive wizards make configuration easier
  - Guardmaster configurable safety relay editor makes safety logic intuitive
- **Easy to Program**
  - Micro800 controller supports your choice of IEC-61131 PLC programming languages (Ladder Diagram, Function Block Diagram, Structured Text) to suit your application
  - User-defined function blocks speed machine development
  - Standard PLCopen® motion instructions with PTO Motion Axis and HSC Feedback Axis removes the complexity from simple positioning applications
- **Easy to Visualize**
  - Micro800 variable names can be referenced directly by HMI tags, which result in less complexity and time-saving benefits



# Connected Components Workbench Software Release 10.01: Overview

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- Additional language support for French, German, Italian, Portuguese Simplified Chinese and Spanish
  - Users can switch languages without having to uninstall and reinstall
  - Base Installation package only includes English user manuals
    - Additional languages are available in a separate User Manual installation package
- PanelView 800 Firmware v4.012 included which adds support for more CompactLogix 5370 controllers (L2, L3)

# Workbench Software Comparison of Standard versus Developer Editions

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- Developer Edition is for machine developers to reduce their time to Design, Develop and Deliver
- Standard Edition is meant to be installed on many Personal Computers (PCs) to help ensure availability for simple debugging and configuring devices

	Standard Edition	Developer Edition
Price	Free for download or on DVD	Contact local distributor or Rockwell Automation® Sales
Common environment to configure all your common devices	Yes	Yes
Project import/export	Yes	Yes
Archive manager	No	Yes
Micro800 Programming		
- IEC 61131-3 ladder diagram, function block diagram, structured text	Yes	Yes
- User-defined function block	Yes	Yes
- Run mode change	No	Yes
- User-defined data types	No*	Yes
- Spy List Used	Existing lists	New lists can be created
- Intellectual Property Protection	No**	Yes

\* – requires Developer Edition to create new data types, which can be used in Standard Edition.

\*\* - requires Developer Edition to create passwords, which can be used in Standard Edition.

# Workbench Software – Easy to Acquire

## ***Order Information***

- Recommended upgrade from previous releases to Release 10.00
  - **Windows® 10 support**
  - Micro800 ladder editor enhancements, new FIFO and PID instructions
  - Guardmaster 440C-CR30 function block editor enhancements
  - PanelView™ 800 support for Virtual Network Computing (VNC) Server, Upload
- Standard Edition – [free for download](#) or order free DVD
- Developer Edition – contact your local distributor or Rockwell Automation® salesperson for pricing
  - Individual lifetime license using FactoryTalk® Activation. Requires Tech Connect contract or toolkit to upgrade to future releases.
  - OEM and Enterprise Toolkits with yearly activations are also supported
  - Catalog Number 9328-CCWDEVxxE
    - xx → EN-English, PT-Portuguese, FR-French, IT-Italian, DE-German, ES-Spanish, ZH-Simplified Chinese (non-English versions available approximately 3 months after English)

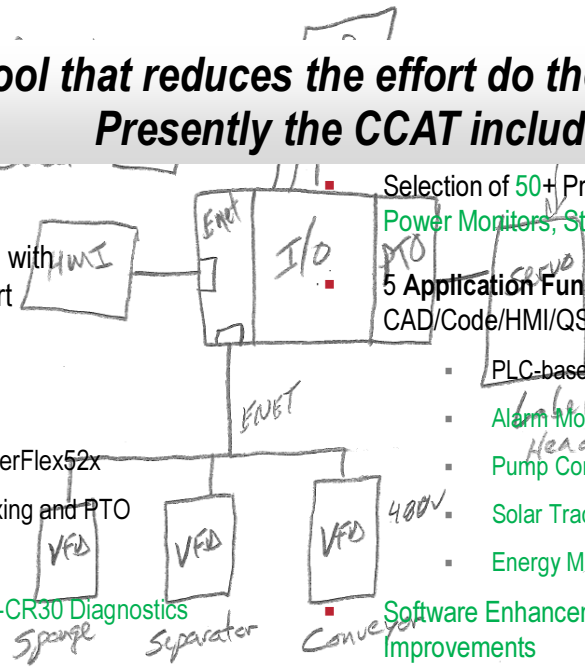
# Connected Components Accelerator Toolkit (CCAT)

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How many days or weeks would it take to start from this machine sketch and produce: BOM, CAD drawings, controller Logic, HMI application, Project Documentation?

**The CCAT is a tool that reduces the effort do these tasks by 50% - 75%!  
Presently the CCAT includes:**

- Release 9 enhancements
- Selection of 50+ Product lines (Safety I/O, 440C-CR30, Power Monitors, Stratix® switches)
- 11 **Device** Building Blocks with CAD/Code/HMI/Quick Start
  - Starters
  - Soft Starters
  - PowerFlex4M, PowerFlex52x
  - Kinetix 3/300, Indexing and PTO
  - 900TC
  - Guardmaster 440C-CR30 Diagnostics
  - Power Monitors
- 5 **Application Functionality** Building Blocks with CAD/Code/HMI/QS
  - PLC-based Temp Control
  - Alarm Monitoring
  - Pump Control
  - Solar Tracking
  - Energy Management for CIP Energy Object devices
  - Software Enhancements and Documentation Improvements



# Agenda

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What is Connected Components?

Connected Components Workbench Software and Accelerator Toolkit

What's New in Release 10.00

**Connected Components Workbench Software**

# Windows 10 Support

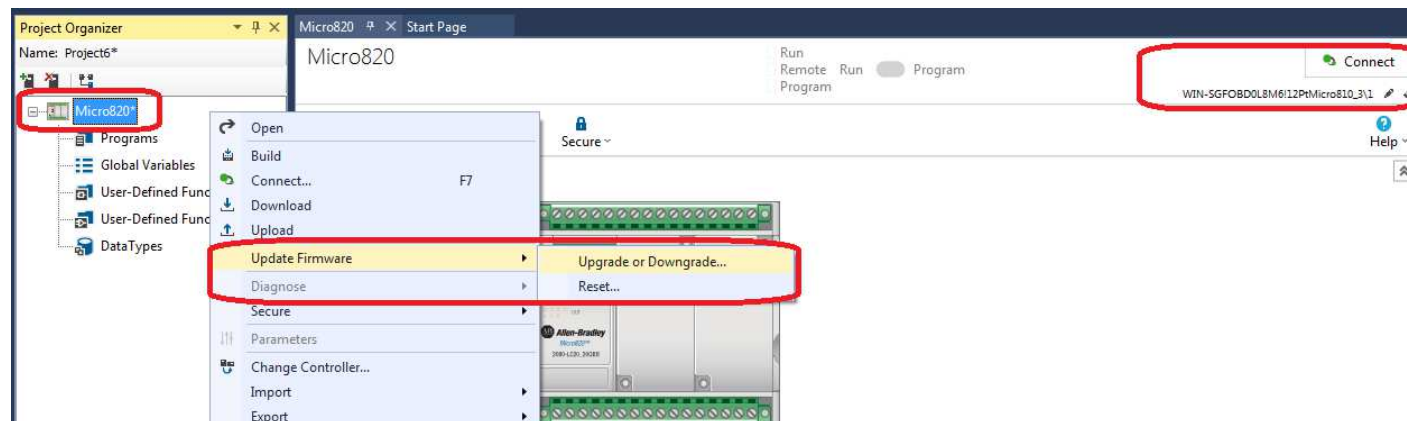
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- Workbench software and supported devices are Windows 10 compliant
- RSLinx® Classic 3.81 has a couple of exceptions
  - Legacy ControlNet and DH+™ PCI card drivers that are typically not used with the Workbench software

# Connected Components Workbench Software Release 10.00 Overview

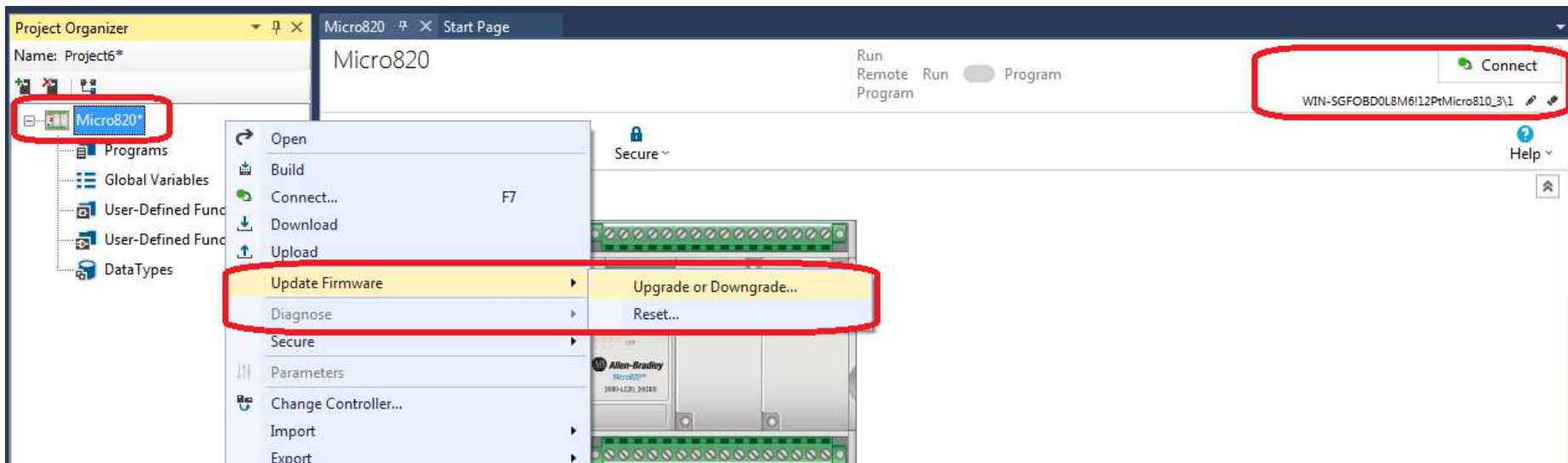
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- Windows 10 Support
- ControlFLASH™ supports new more secure DMK format
- ControlFLASH capabilities embedded into Workbench software for easier firmware updates



# Easier Firmware Updates

- ControlFLASH capabilities embedded into Workbench software
  - Supported by Micro800, PanelView 800, Guardmaster 440C-CR30, GuardShield 450L-B
- Context sensitive – Uses current path and device project revision





# ControlFLASH DMK File Format

- Transition to ControlFLASH DMK file format for device firmware
  - More secure format
- Only current release of device firmware is installed
  - Older device firmware is not included to encourage transition to DMK file format

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What is Connected Components?

Connected Components Workbench Software and Accelerator Toolkit

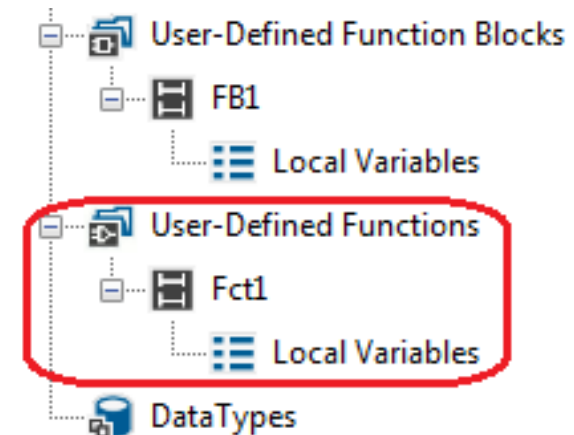
What's New in Release 10.00

**Micro800 Controllers**

# Micro800 Release 10.00 Overview

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- Design Time Performance Improvements
  - Build/Download/Upload times decreased by 36% to 58%, Run Mode Change times decreased by 30% to 61%
  - Automatic renaming of variables throughout project
- Programming Enhancements
  - Indirect Bit Addressing using Variable
  - User-Defined Functions – simplified UDFB with reduced memory usage
  - Additional FIFO and PID Instructions
  - Enhanced Memory Diagnostics
- Ladder Logic Usability Enhancements
  - Improved Ladder Drag and Drop
  - Improved Keyboard Navigation of Rungs and Instructions
- Optional Module – single project for multiple machine configurations
- Download Data Protection – protected variables are not overwritten during project download



# Design Time Performance Increases

- Build times decreased by up to 55%

	R10 Average Time	R9 Average Time	Improvement Percent
Large_Data_POU_M850	18.8425	42.79895	55.97%
Medium_Data_POU_M850	12.98161111	40.24435	67.74%
Small_Data_POU_M850	6.174166667	15.06985	59.03%

Average Improvement Percent
60.92%

Processor: Intel Core i7-2600 CPU @ 3.4GHz, RAM: 4.00GB, OS: Win7 Professional 64 bit

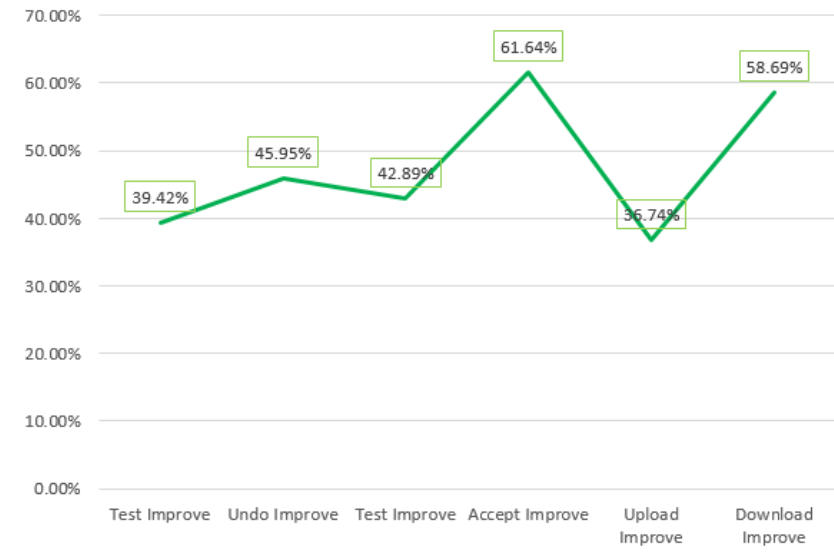
- Download times decreased by up to 58%
- Upload times decreased by up to 36%
- *Results vary by project and PC*

# Online Change (Online Edits) Performance Increases

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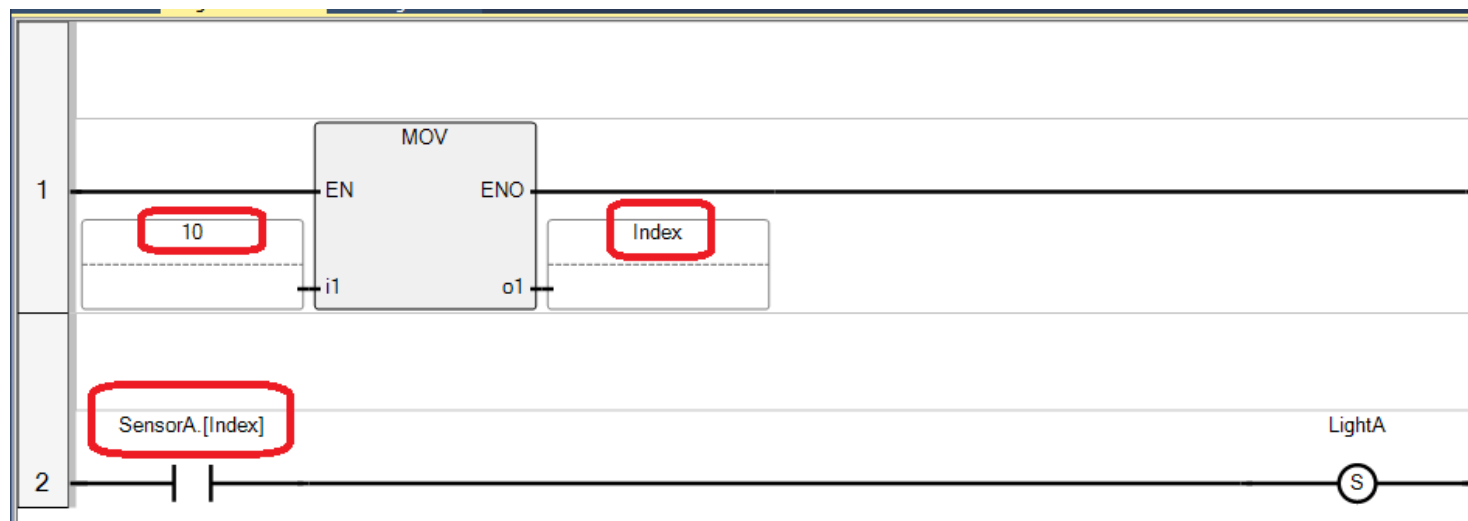
- Run Mode Change times decreased by 30% on average
- Test Logic time decreased by up to 39%
- Undo time decreased by up to 45%
- Accept time decreased by up to 61%
- *Results vary by project and PC*

**Average Improvement Percent  
for All Size Project**



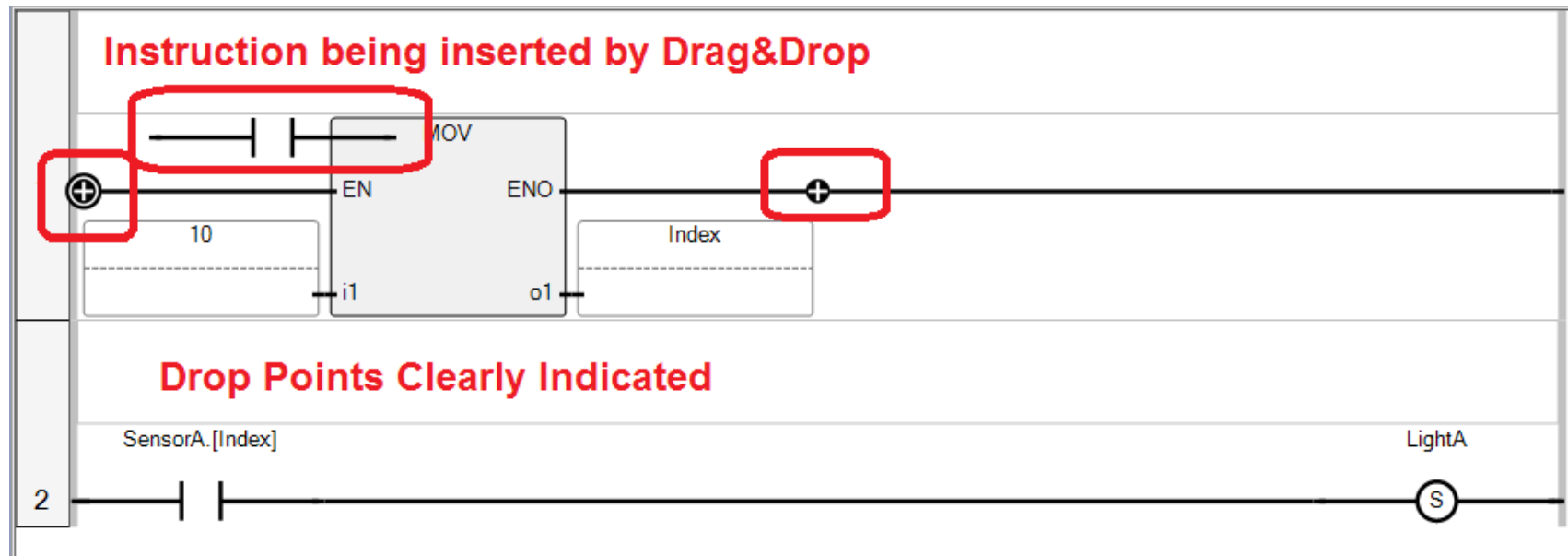
# Indirect Bit Addressing Using a Variable

- Bits of an integer can be referenced using an index variable
  - Defined Words and constants also supported
- Uses 8X less memory than using array of BOOL
  - Index data type must be SINT



# Ladder Editor Drag and Drop Improved

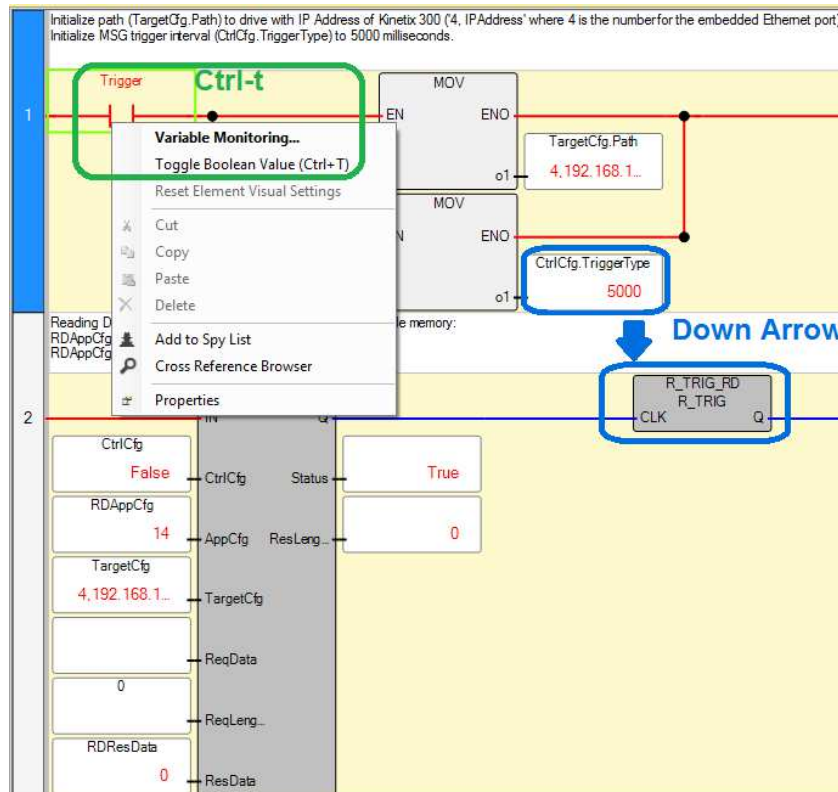
- Drag and drop of instructions with more visible drag and drop points
- Similar improvement for rungs



# Ladder Editor Keyboard Improvements

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- Control-t to toggle Boolean values when online with controller to aid in debugging

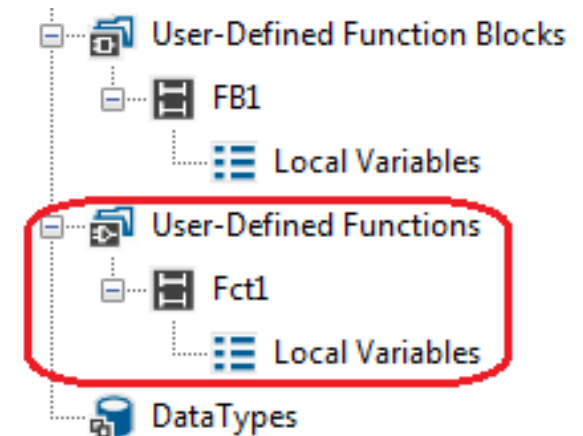


- More intuitive arrow key navigation of rungs and instructions



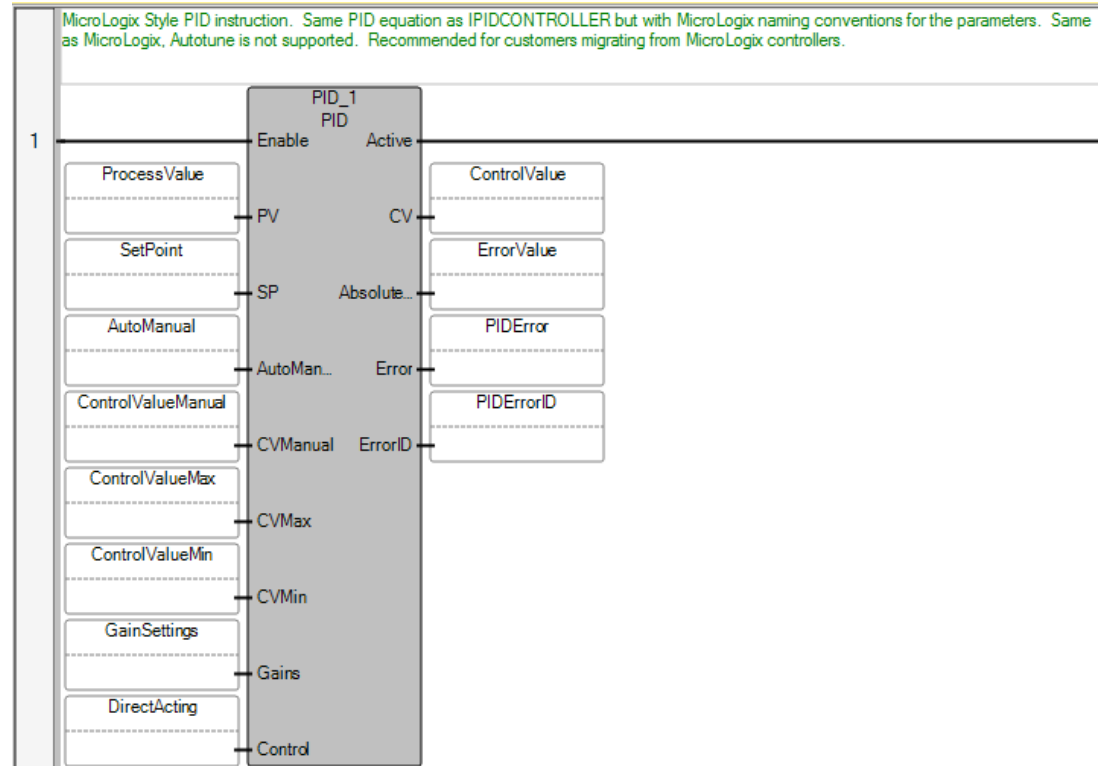
# User-defined Function

- User-defined Function (UDF) is a simpler version of current User-defined Function Block (UDFB)
  - Targeted for simpler calculations such as converting from Fahrenheit to Celsius
- UDF does not support multiple instances BUT can use significantly less memory than UDFB
  - Only one output parameter is supported
- UDF is similar to Subroutine (whereas UDFB is similar to an Add-On Instruction in Logix Designer)



# Additional MicroLogix Instructions

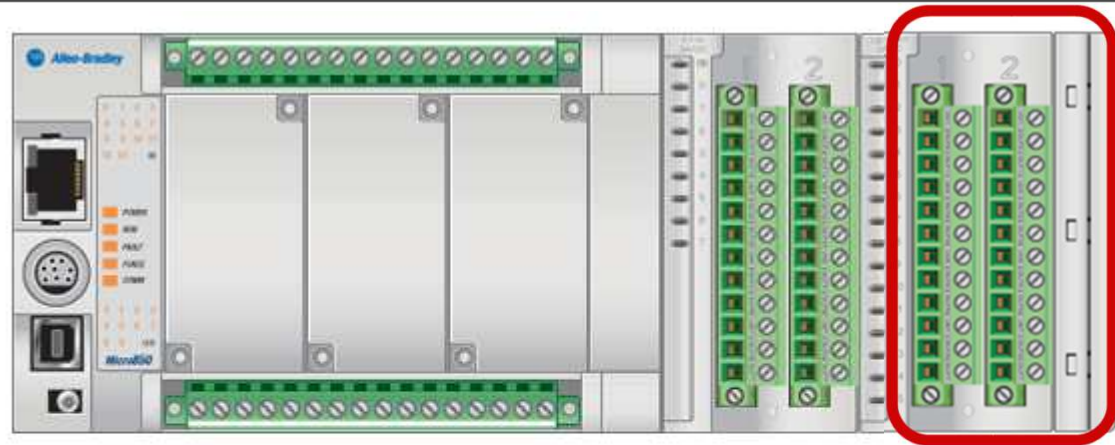
- Instructions added to aid in MicroLogix™ migration
- FIFO instructions (FFL, FFU)
- PID instruction
  - Intuitive Parameter names similar to MicroLogix PID instruction



# Optional Module Feature for OEMs

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- Target to OEM Machine Builders who use the same controller project for machines that have variable amounts of I/O
- No need to have 3 different projects for small, medium, and large machines, which vary in I/O quantity
- Similar to MicroLogix Do-Not-Fault and Logix Inhibit Module features



Optional Module

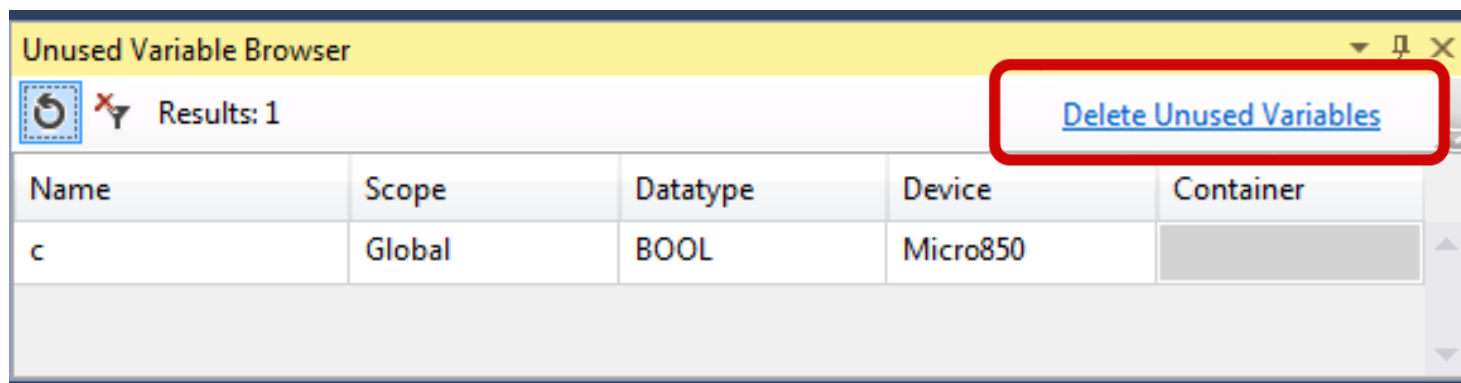
## Expansion Modules

Slot	Catalog ID	When module is not present
1	2085-IF8	Fault controller (required module)
2	2085-IQ16	Do not fault controller (optional module)

# Cross-reference Browser

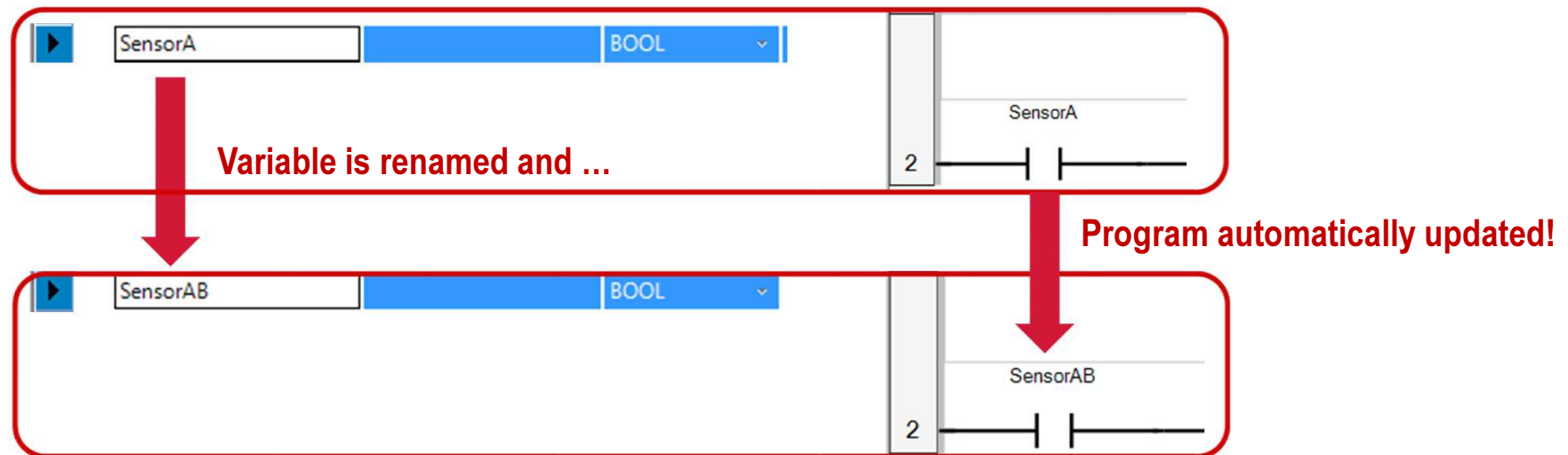
## Delete Unused Variables

- Easier to delete unused variables from cross-reference browser
- No need to delete variables individually one at a time



# Automatic Renaming of Variables throughout Project

- Renaming variable will result in all references to the variable being automatically renamed. Includes PanelView 800 Tag Mapping!
- Example of renaming variable SensorA → SensorAB

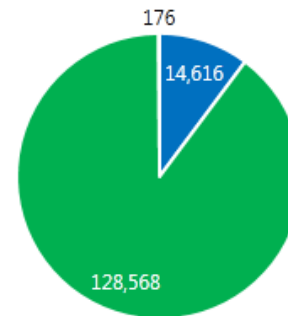


# Improved Memory Diagnostics

- Embedded Project size now listed as part of the Memory Diagnostics
- Embedded Project contains Comments, Symbolic Variable Names
  - Non-executable parts of the project
- Aids when project does not build due to too many comments in the project or too many long variable names

## Controller - Memory

Memory usage is only updated after a [build](#)



Maximum Memory 143,360 bytes

### Current Allocation

Data	14,616 bytes	<a href="#">i</a>
Program	176 bytes	(14 Steps)

### Available Space

Data	50,920 bytes	or
Program	128,568 bytes	(10,714 Steps)

### Embedded Project

Contains all the files necessary to create the controller project. Includes project comments, configuration and variable names.



Allocated	276,480 bytes
Used	35,192 bytes
Free	241,288 bytes

# Download Data Protection Enhancement

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- Data Protection helps user to prevent up to 60 variables from being overwritten during Download and Project Restore from memory module
  - Micro820™, Micro830®, Micro850®
- Equivalent to the ability of MicroLogix to disable data files from being downloaded and restore

No.	Variable Name	Variable Type
1	Recipe1	Real
2	Recipe2	Dint
3	Recipe3	Bool

The background table shows the following variables:

Variable Name	Type
_IO_X2_DI_09	BOOL
_IO_X2_DI_10	BOOL
_IO_X2_DI_11	BOOL
_IO_X2_DI_12	BOOL
_IO_X2_DI_13	BOOL
_IO_X2_DI_14	BOOL
_IO_X2_DI_15	BOOL
Recipe1	REAL
Recipe2	DINT
Recipe3	BOOL [1..10]



## Data Log Extractor tool for use with micro 800

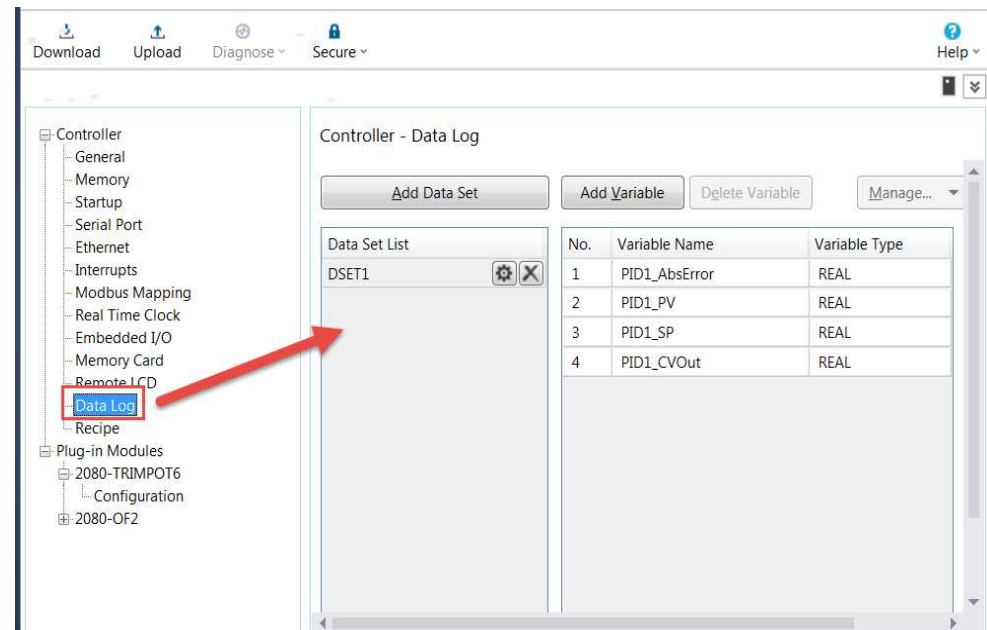
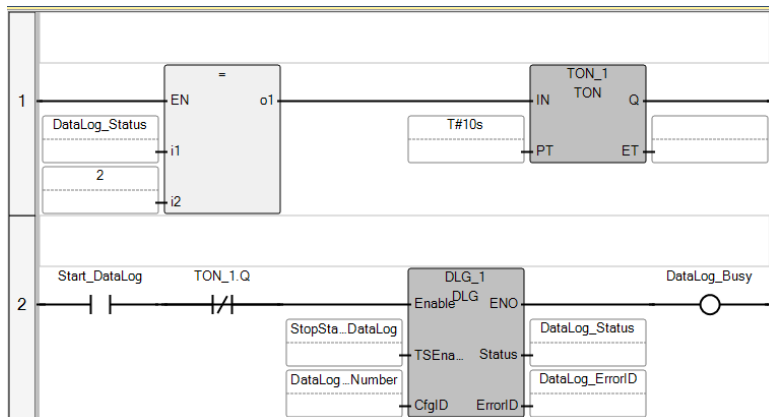


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# Micro820 Data Log Extractor tool

- Creating a datalog is done by setting the datalog under the controller setting in the CCW project
- Up to 10 datasets can be created with 128 variables per dataset
- Use the DLG instruction to create the



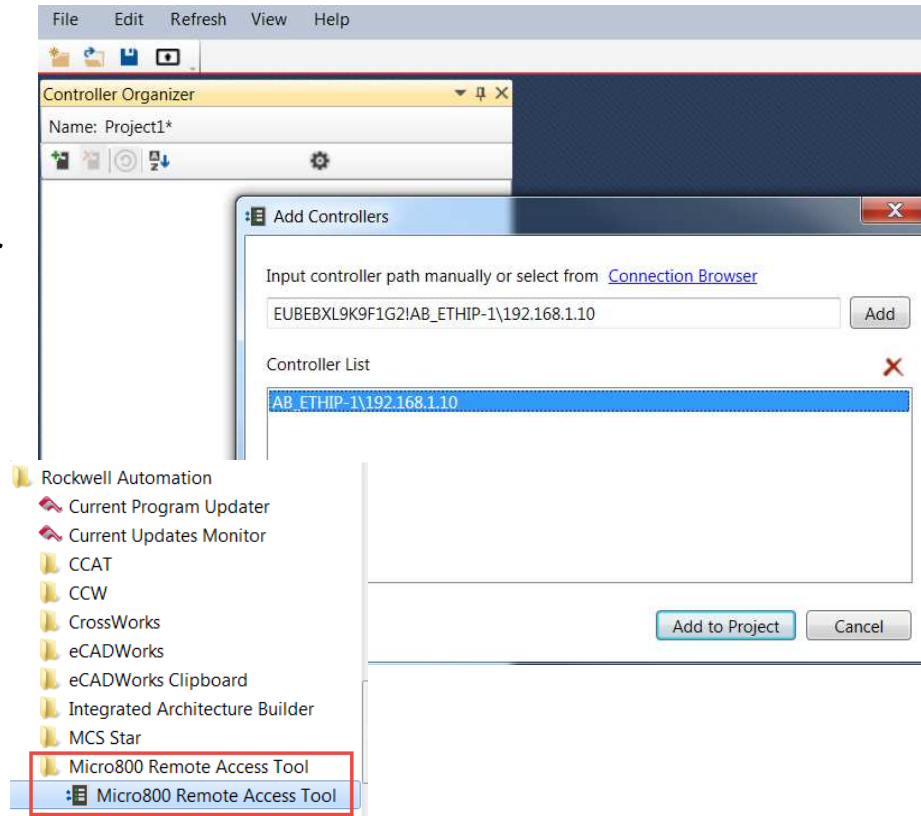
## Micro820 Data Log Extractor tool

- Remote retrieval data logs from Micro820 microSD card
  - CCW not required
  - No need for operator to be present at PC during data log retrieval
  - End User or OEM can remotely retrieve data logs using automatic scheduler
- Tool includes a utility to download/upload files to/from microSD
  - Update FW or project remotely
  - No need to remove microSD and connect it to a PC
- RSLinx Classic is required
  - EtherNet/IP, USB, CIP Serial supported
  - Can be used with 3rd party products, such as modems
- Electronic help is included in the installation files

# Micro820 Data Log Extractor tool

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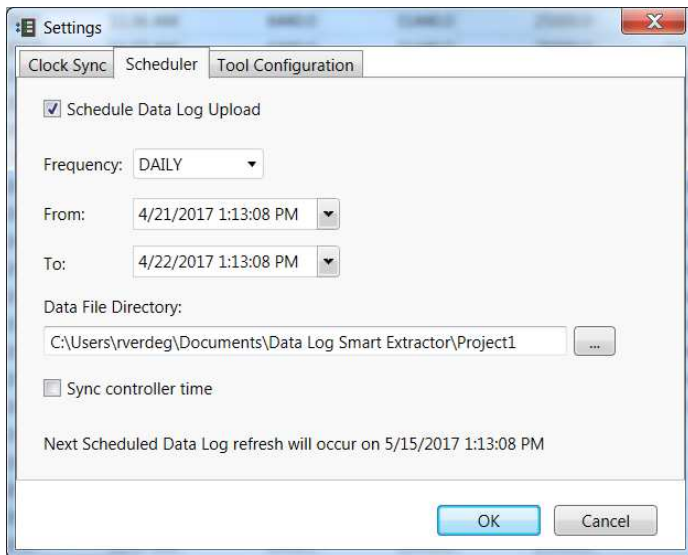
- With the extractor tool it is possible to get logged data from the SD card mounted in the micro820 controller:
  - Its a seperate tool and can be found under the RA folder after install
  - Create a new project and add the  $\mu$ 800 controller
  - Press the refresh button to read the data



# Micro820 Data Log Extractor tool

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- The data can be exported to an Excel file for data analytics, trending, etc
- It is possible to set a scheduler to get the data automatically



The screenshot shows the 'Micro820-Data Log' window. The 'Controller Organizer' on the left shows 'Project1' with a 'Micro820' device selected. The main window displays a table of data logs. A red arrow points to the 'Refresh' button in the toolbar.

DataSet	Date	Time	Variable1	Variable2	Variable3	Variable4
DSET1	5/14/2017	11:22 AM	545.0	25545.0	25000.0	35673.22
DSET1	5/14/2017	11:22 AM	545.0	25545.0	25000.0	34128.93
DSET1	5/14/2017	11:22 AM	545.0	25545.0	25000.0	32722.19
DSET1	5/14/2017	11:36 AM	6440.0	31440.0	25000.0	33360.57
DSET1	5/14/2017	11:37 AM	6440.0	31440.0	25000.0	23145.28
DSET1	5/14/2017	11:37 AM	6440.0	31440.0	25000.0	21631.83
DSET1	5/14/2017	11:37 AM	6440.0	31440.0	25000.0	20100.66
DSET1	5/14/2017	11:37 AM	6440.0	31440.0	25000.0	18041.89
DSET1	5/14/2017	11:37 AM	6440.0	31440.0	25000.0	16555.95
DSET1	5/14/2017	11:37 AM	6440.0	31440.0	25000.0	14506.21
DSET1	5/14/2017	11:37 AM	6440.0	31440.0	25000.0	13070.34
DSET1	5/14/2017	11:37 AM	6440.0	31440.0	25000.0	11029.23
DSET1	5/14/2017	11:37 AM	6440.0	31440.0	25000.0	9563.65
DSET1	5/14/2017	11:37 AM	6440.0	31440.0	25000.0	7464.043

# Agenda

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What is Connected Components?

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What's New in Release 10.00

**PanelView 800 Graphic Terminals**

# PanelView 800 Release 10.00 Overview

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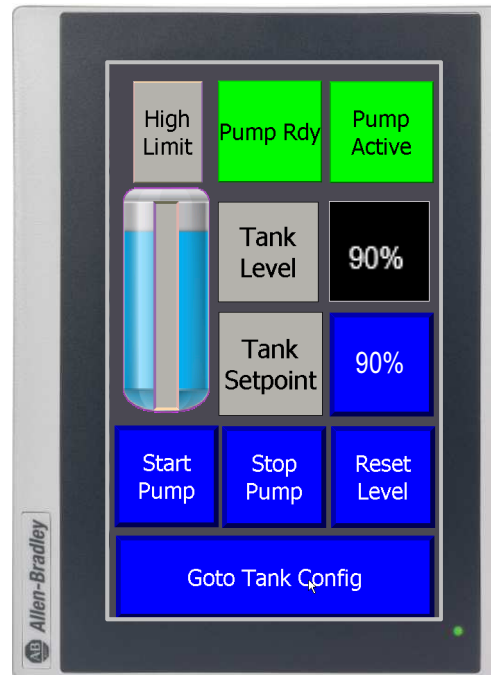
- VNC Server for remote monitoring
- Upload applications over EtherNet/IP™
- Support for Micro800 DATE and TIME data types
- Support for pasting tags from Excel into Tag Editor
- Terminal Password Protection
- Modify/Delete Recipe Names from terminal
- Modify Controller Ethernet address from terminal
- Disable/Enable Communication Port from terminal
- Firmware version 4 required



***Mobile Phone as VNC  
Client to PanelView 800***

# VNC Server for Remote Monitoring

- Remote Monitoring of the terminal using VNC Server
- Operators, supervisors can monitor terminal applications remotely using PC, tablet, mobile phone
  - Password Authentication for Read and Read/Write modes
- Also use it for Troubleshooting, Demos, and so on, and in turn increase your productivity



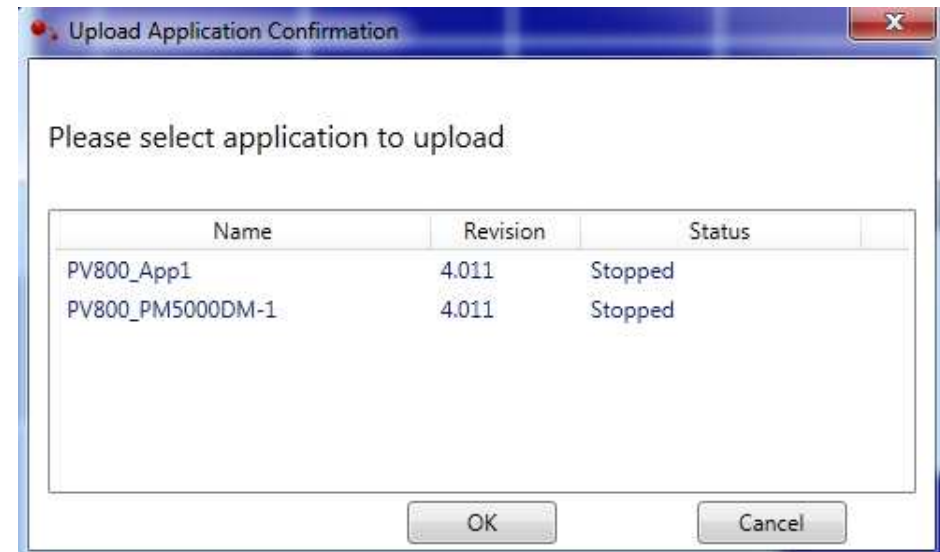
**PanelView 800 in  
Portrait Mode**



**Mobile Phone as VNC  
Client to PanelView 800**

# Upload Applications Over EtherNet/IP

- Upload of applications from Terminal using CCW over EtherNet/IP
  - Choose which application to upload
  - Shows the status and revision
  - Upload application and make your edits if necessary, and download again
- Programmers workflow improvement
  - Saves times and increases productivity





# Micro800 TIME and DATE

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- Now, map Micro800 TIME and DATE data type as External Tag
- Eases the programming of applications that require the TIME and DATE data types to be mapped in PanelView 800
- Saves time and increases productivity

The screenshot displays the Rockwell Automation software interface. On the left, the Project Organizer shows a tree view of the project structure, including Micro800, Programs, and PV800\_App1. The main window shows the Tag Editor for 'Prog1-POU'. The Tag Editor table lists tags: 'Shift' (32 bit integer, Shift, PLC-1) and 'In\_Time' (Unsigned 32 bit integer, v\_Time, PLC-1). The 'v\_Time' tag is highlighted in red. A Variable Selector dialog box is open, showing the 'v\_Time' tag selected in the 'User Global Variables - Micro800' tab. The dialog box also shows the 'Name' field set to 'v\_Time', 'Type' set to 'TIME', and 'Global Scope' set to 'Micro800'.

Tag Name	Data Type	Address	Controller	Description
Shift	32 bit integer	Shift	PLC-1	
In_Time	Unsigned 32 bit integer	v_Time	PLC-1	

Name	Alias	Logical Value	Data Type	Dimension	Comr
v_Time		T#5s	TIME		

**Note:** Requires Micro800 firmware revision 10.0xx

# Improved Copy and Pasting of Tags

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- Added support for maintaining tags in Excel spreadsheets
  - Use copy and paste to enter tags into Tag Editor
  - Saves time and increases productivity
- When pasting tags into Tag Editor, screen objects referencing the tags will maintain their tag references
  - No need to reenter the tag information

The screenshot shows the Rockwell Automation software interface. On the left is the Project Organizer showing a tree view of the project structure. On the right is the Tag Editor window, which has tabs for External, Memory, System, and Global Connections. The Tag Editor displays a table of tags with columns for Tag Name, Data Type, Address, Controller, and Description. The 'Valve1' tag is selected. Below the table is a Properties panel for the selected tag, showing sections for Connections and Navigation.

Tag Name	Data Type	Address	Controller	Description
Shift	32 bit integer	Shift	PLC-1	
In_Time	Unsigned 32 bi...	v_Time	PLC-1	
Valve1	Boolean	_IO_EM_DO_00	PLC-1	
Valve2	Boolean	_IO_EM_DO_01	PLC-1	
Valve3	Boolean	_IO_EM_DO_02	PLC-1	

**Connections**

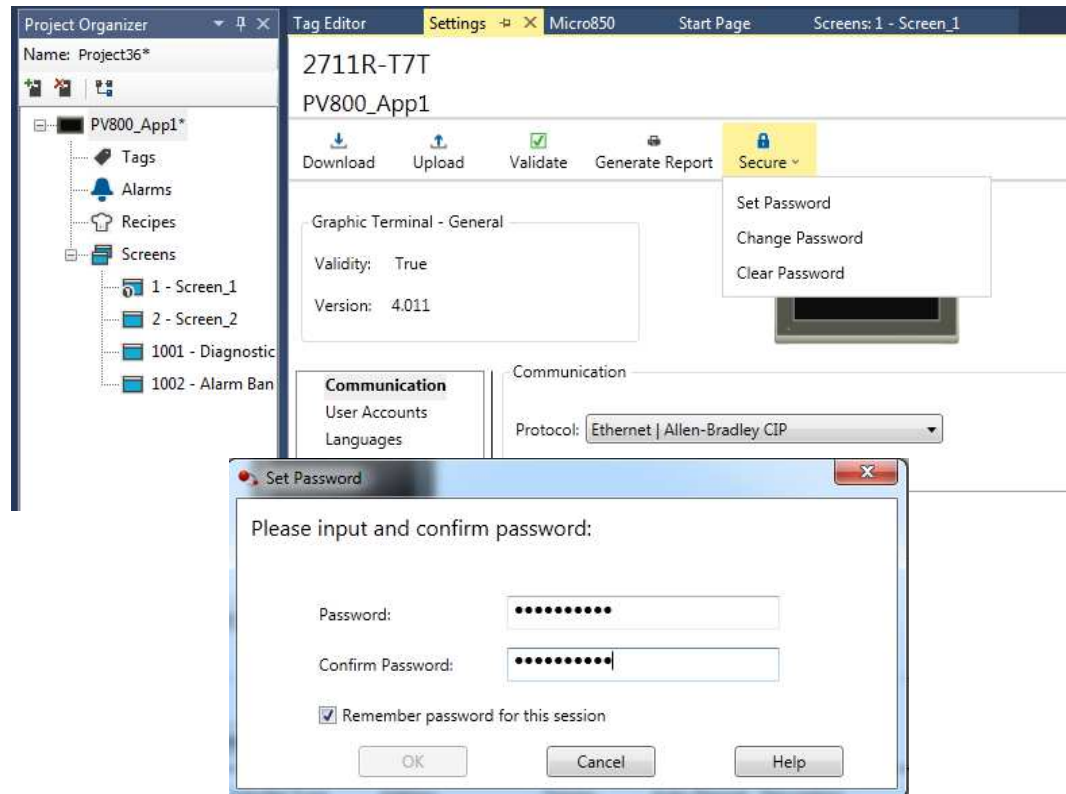
Indicator Tag	
Visibility Tag	Valve1
Write Tag	

**Navigation**

Accept Focus	False
Enable Touch	True
Enable Touch Indica	True
Function Key	None
Touch Indication Co	#00F800
Touch Indication W	2

# Terminal Password Protection

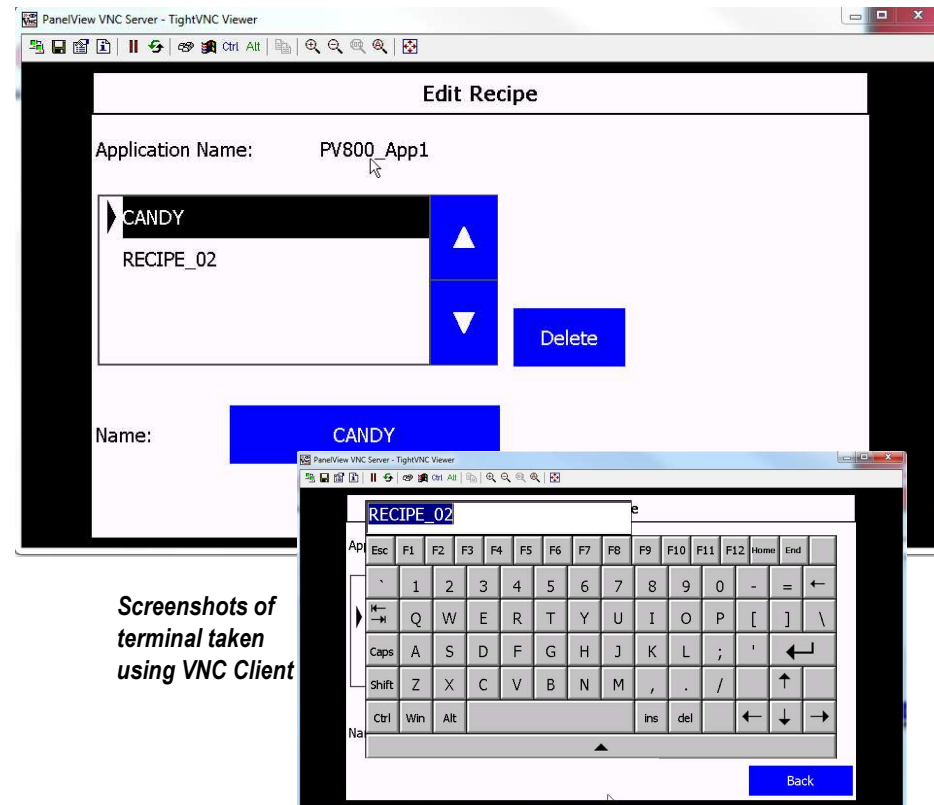
- Secure your terminal by password protection
- Authentication is required to download/upload applications
- Use in conjunction with existing user account authorization for the application screens



# Recipe Enhancement

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- Recipe Enhancements to Modify/Delete the Recipe Names on the terminal
  - End users can rename the recipes on the terminal without using CCW Software
- Recipes are arranged according to the recipe names on terminal by special character, numbers and alphabets
- Saves time and increases productivity

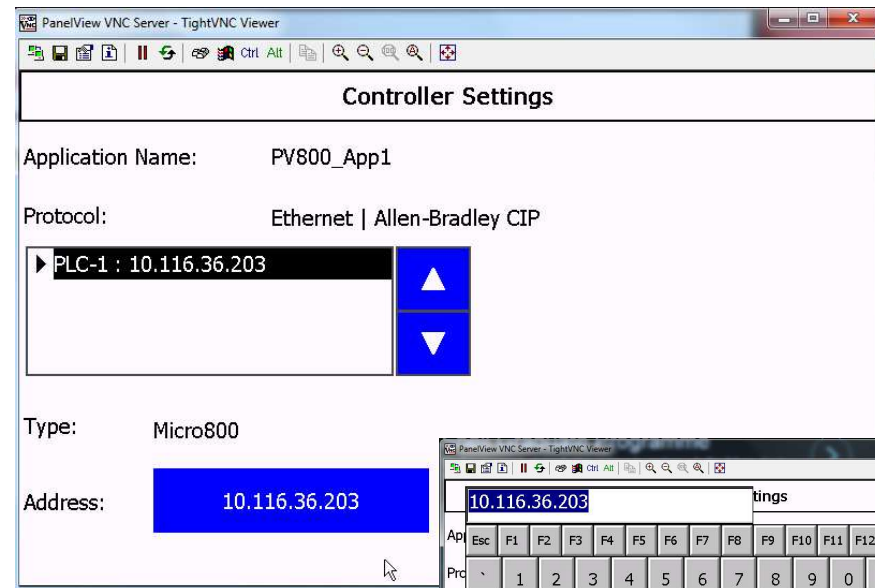


Screenshots of  
terminal taken  
using VNC Client

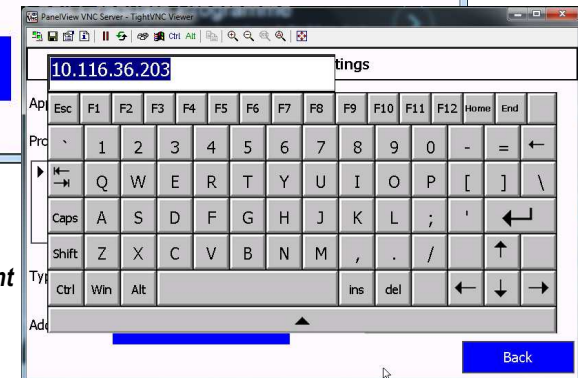
# Modify Controller Address from Terminal

Rockwell  
Automation

- Controller address settings of the application can be edited from terminal
  - No need of using CCW software
  - End users can configure the controllers address as required by their network on the terminal
- Saves time and increases productivity



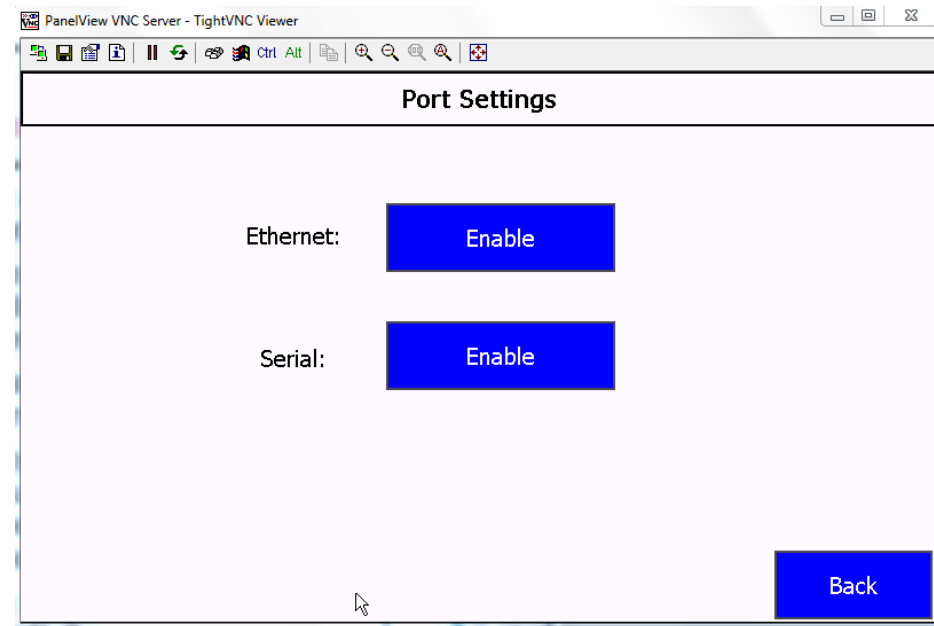
Screenshots of  
terminal taken  
using VNC Client



# Enable/Disable Communication Ports

**Rockwell  
Automation**

- Unused Ports can be Enabled/Disabled from the terminal
  - Disable Ethernet or Serial Port on the terminal
- Helps protect your terminal from unauthorized access by disabling the ports that are not in use by the application



*Screenshots of  
terminal taken  
using VNC Client*

# Agenda

**Rockwell  
Automation**

What is Connected Components?

Connected Components Workbench Software and Accelerator Toolkit

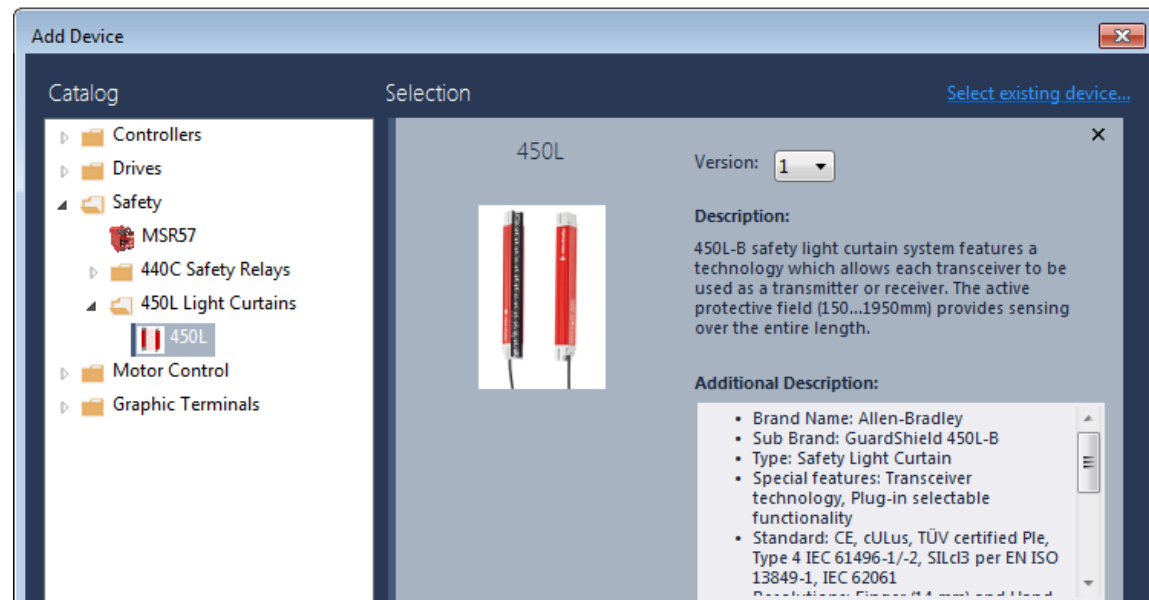
What's New in Release 10.00

**GuardShield 450L-B Safety Light Curtain**

# GuardShield 450L-B Safety Light Curtain

**Rockwell  
Automation**

- Support for 450L-B Light Curtain
- Configured over USB
- Each light curtain functions as both receiver and transmitter
  - Simplifies stocking and replacement





LISTEN.  
THINK.  
SOLVE.

## Questions?



PUBLIC



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