Micro800™ programmable logic controller (PLC) family

Customer presentation

June 2019

Rockwell Automation

Agenda

1 Micro800™ family overview

2 Connected Components Workbench™ software overview

3 Advantages of Micro800™ control system

4 Order information

5 Applications for Micro800™ control system

6 Overview of resources

Micro800™ controller family

Each controller is cost and performance optimized for specific applications

Performance/Features

Memory and I/O

12 pts.

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

20-36 pts.

Micro820®
For smaller standalone machines and remote automation

EtherNet/IP

Embedded Analog I/O

10-88 pts.

Micro830®
For standalone machines with motion

PLCopen motion control

24-192 pts.

Micro850®
For standalone machines with motion, more I/O, and Ethernet connectivity

EtherNet/IP

PLCopen motion control

24-304 pts.

Micro870®
For larger standalone machines with motion, even more I/O, more memory and Ethernet connectivity

EtherNet/IP

PLCopen motion control

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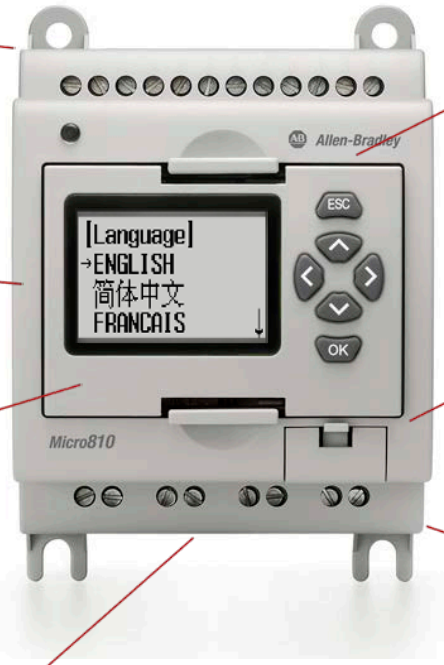
Micro810® controller anatomy

Smart relay micro PLC, 12-point

8 inputs
12/24V sink/source,
120/240V AC

Embedded 12/24/120/240V
power supply models

LCD display with
memory backup function
(removable)



4-ch 0-10V
10-bit analog input
(shared with DC inputs)

USB
(removable adapter)

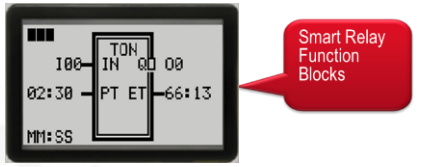
DIN rail or panel mount

4 outputs 5/8A high current relays,
24V DC source transistor models

Micro810® controller

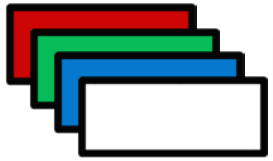
Smart relay micro PLC, 12-point

- Micro810® controller has the price of a smart relay with the programming capabilities of a micro PLC. As part of the Micro800™ controller family, the Micro810® controller shares the same programming environment as Micro820®, Micro830®, Micro850® and Micro870® controllers.
- Embedded smart relay function blocks configured from 1.5 in. LCD and keypad
  - No software or program download required
  - Use in relay applications that require a small amount of logic (up to 4 function blocks) such as programmable timer, lighting control and more
  - Function blocks include Delay OFF/ON Timer, Time of Day, Time of Week, Time of Year, Counter
- High current (8 A) relay outputs replace the need for external relays
- Up to 4 configurable analog input channels
- Program download via USB programming port (adapter required)
- Optional 1.5 in. LCD display can be inserted onto front of controller and removed under power
  - Used to configure controller and to monitor I/O status
  - Contains Memory Backup function
  - Run/Program mode switching
  - LCD password
- LCD instruction allows LCD display and keypad to be used as simple 4-line text display with 6 buttons available as inputs



Micro820® controller anatomy

Ethernet enabled for remote automation, 20-point



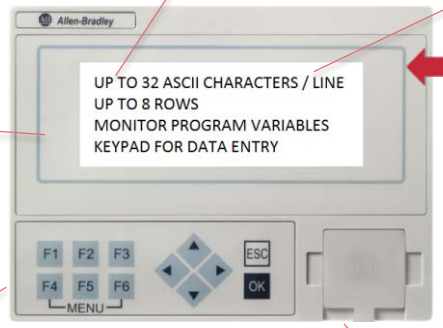
4-color backlight

RS232/485
Serial port
(RS-232 to remote LCD)

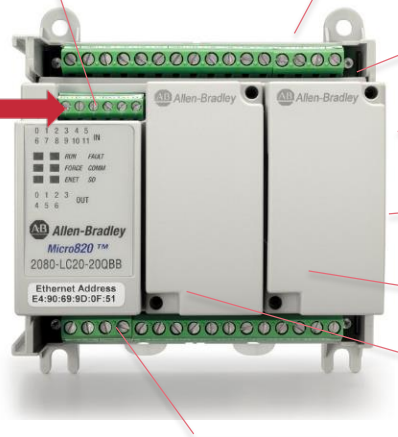
Built-in RTC

4 analog input
1 analog output
(0-10V)

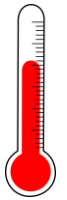
ASCII Text



IP65



Up to 4
10K Thermistor
inputs



2 plug-ins for expansion

microSD card slot
for backup, datalog, recipe

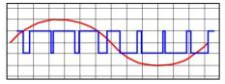
Built-in controller system menu
(set IP address)

USB for program
download to controller

Ethernet

EtherNet/IP

5 kHz PWM
(no pulse train output (PTO) motion)



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Micro820® controller

Ethernet enabled for remote automation, 20-point

- Designed for simpler standalone machines and remote automation application
- Function as a remote terminal unit (RTU) for SCADA applications with support for CIP and Modbus over serial and Ethernet communications
- Embedded support for 4 thermistor temperature inputs can function as a direct digital control (DDC) for building management systems (BMS)
- Embedded 4 channel analog input and 1 channel analog output for speed or torque control
- EtherNet/IP for Connected Components Workbench™ programming, RTU applications and human machine interface (HMI) connectivity
- 5 kHz PWM output for controlling solenoids and valves
- Built-in real-time clock (RTC) with no battery required
- microSD card slot for program transfer, datalog and recipe management. Supported formats are FAT 32/16 with maximum card size at 32 GB. The microSD card class speeds supported are Class 6 and 10 SDSC and SDHC.
- Models available with removable terminal blocks for easier wiring and installation
- Supports up to 2 plug-in modules
- Optional remote 3.5 in. LCD display available, which connects to controller's embedded RS-232 port

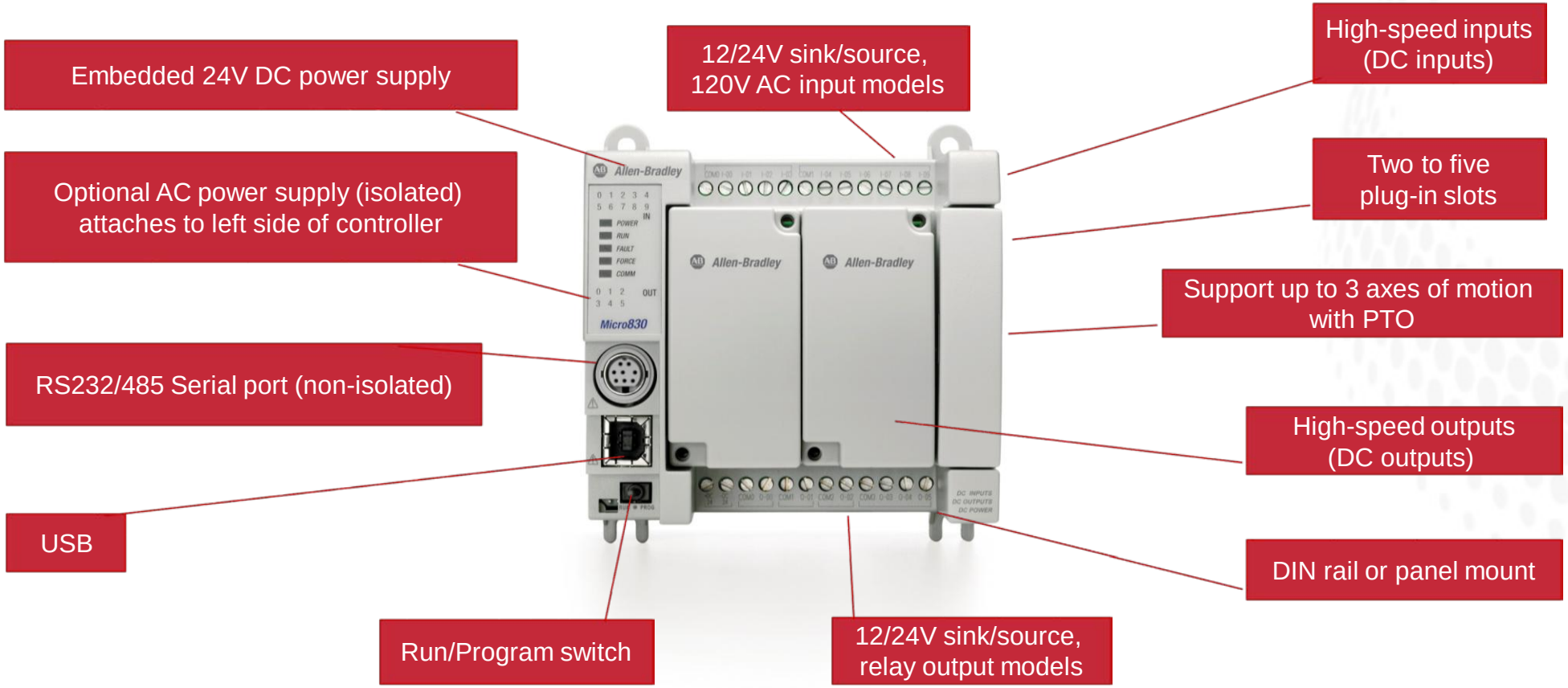
Remote LCD display

Works as an essential accessory for Micro820® controller

- Micro800™ remote LCD display connects to the embedded RS-232 port and works as an essential accessory for the Micro820® controller
- Used as a simple HMI with 4 or 8 lines of ASCII text
- A tactile keypad with 6 programmable function keys
- System menu is available in multiple languages for direct viewing and editing of controller variables
- Ethernet address of the controller can be easily set from the menu
- Configurable startup screen
- 4 backlight colors available, can be programmed for alarm function
- Rated IP65 and suitable for front panel mounting. Supports DIN rail mounting next to the controller
- USB port for program download to controller

Micro830® controller anatomy

Flexible with simple motion, 10/16/24/48-point



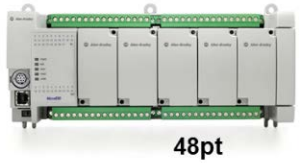
Micro830® controller

Flexible with simple motion, 10/16/24/48-point

- Designed for standalone machine control applications
- Highly flexible and customizable - “Pay for only what you need”
  - Supports up to 5 plug-in slots
  - Plug-ins customize base unit with additional digital and analog I/O, communication modules and application-specific modules
  - Expandable up to 88 digital I/O, 20 Analog I/O, 6 Serial ports
- Form factor that is based on number of I/O points being embedded in the base: 10, 16, 24 or 48 points
  - Entire family shares plug-ins and accessories
  - Removable terminal blocks available on 24-point and 48-point models for easier wiring
- Embedded Communications
  - USB programming
  - Non-isolated serial port (RS232/485) for communications to HMI
  - CIP, Modbus RTU (Master/Slave), ASCII
- Embedded motion capabilities with up to 3 axes of motion on Transistor output models provide
  - High speed (100usec) interrupts - supported on DC input models and allows as many as six 100 kHz High-Speed Counter inputs (HSC) with PLS support
  - Up to three 100 kHz pulse train outputs (PTO)
  - Single axis moves supported via motion instructions
  - Touch Probe is for registering the exact position of an axis that is based on an asynchronous event. It is embedded in controller hardware and so is more accurate than interrupts alone.

10pt, 16pt

24pt



48pt

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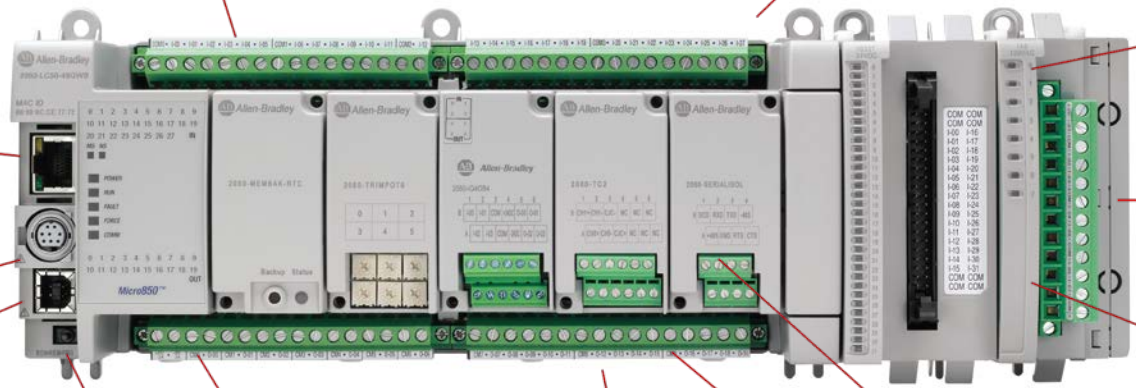
Micro850® controller anatomy

Customizable with plug-in and expansion



Embedded 24V DC power supply

Support up to 3 axes of motion with PTO

High-speed inputs and outputs (DC inputs/outputs)

Up to 4 expansion I/O modules

Ethernet

Bus terminator 2085-ECR

RS232/485 Serial port (non-isolated)

Support a maximum of 192 I/O points

USB

12/24V sink/source, relay output models

Up to 5 plug-in slots

Optional AC power supply (isolated) attaches to left side of controller

Run/Program Switch

DIN rail or panel mount

Removable terminal blocks on both controller and expansion I/O

Micro850® controller

Customizable with plug-in and expansion

- Designed for larger standalone machine applications that require Ethernet connectivity and higher density, higher precision analog and digital I/O as compared to Micro830® controller
- Equipped with the same form factor, plug-in support, instruction/data size and motion capabilities as Micro830® 24-point and 48-point controllers
- All capabilities of Micro830® controller plus additional capabilities:
    - Embedded Ethernet port supports EtherNet/IP and Modbus TCP/IP
    - Support up to four Micro800™ Expansion I/O modules (Bulletin 2085). Expandable up to 192 digital I/O
- Micro800™ Expansion I/O module snaps firmly to the right side of Micro850® controller to form a solid block. This feature creates ease of installing the Micro850® controller and expansion I/O modules onto the panel.

Micro870® controller

Highest memory and I/O

- 2x the program and data memory capacity of Micro850® controller
- Up to 20,000 steps
- Additional memory provides more programming freedom
  - Less need to optimize memory consumption
  - Enables more modular programming with user-defined function blocks and user-defined functions

NEW
- 2080-LC70-24AWB: 14-pt AC input, 10-pt relay output

- 2080-LC70-24QBB: 14-pt DC input, 10-pt DC output
- 2080-LC70-24QWB: 14-pt DC input, 10-pt relay output

- Up to 8 expansion I/O modules
- Up to 304 local I/O

2085-EP24VDC
- Expansion power supply module is required when configuring more than 4 expansion I/O modules

EtherNet/IP
- Ethernet, Serial and USB ports
- Native EtherNet/IP, Modbus-TCP/IP, Modbus RTU, ASCII
- Open socket programming

2080-MEMBAK-RTC2
- New memory backup module with larger memory capacity to support Micro870® projects
- Compatible with both Micro850® and Micro870® controllers

PLCopen motion control
- PID with autotune
- Four 100 kHz high-speed counter (HSC)
- Two 100 kHz pulse train output (PTO)
- PLCopen motion instructions

Plug-in modules to customize base controller with more I/O and communication ports

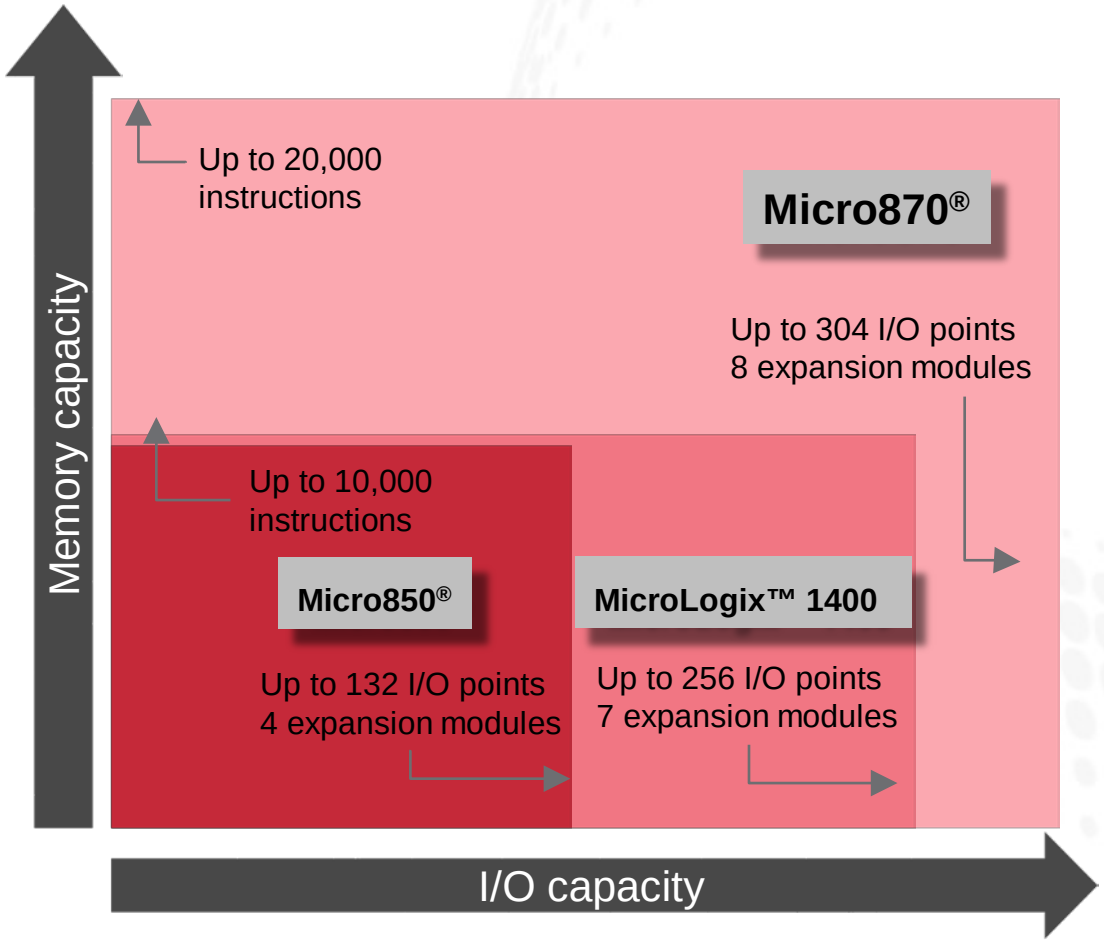
- 2080-LC70-24QBB and 2080-LC70-24QWB: Connected Components Workbench™ software Version 11 or later required
- 2080-LC70-24AWB: Connected Components Workbench™ software Version 12 or later required

Micro870® controller scales the Micro800™ family up to CompactLogix™ 5370 L1 controller

Micro870® controller

Do more with Micro870® controller

- Higher I/O capacity in Micro870® controller supports a wider range of OEM applications
  - Examples: Multi-track intermittent VFFS machines, large standalone curing machine, gas cabinet in semiconductor, pipe heating systems, mono-layer blown film extrusion, large heat exchange systems, large welding machine and so on.
  - Watch Suitable applications for Micro870® controllers on YouTube to learn more
- Additional memory in Micro870® controller provides more programming freedom, reduces machine development time
  - Enables more modular programming with user-defined function blocks and user-defined functions
  - Less need to optimize memory consumption
  - Allows machine builder to maintain just one large program for all machine models and configurations
- Watch Micro870® controller overview video on YouTube to learn more



Micro800™ Expansion I/O for Micro870® and Micro850® controllers

Bulletin 2085

- Single (26 mm) and double wide (46 mm) form factors minimize panel space. On average 20% narrower than Bulletin 1762 I/O
- Digital I/O, analog I/O, TC/RTD modules
- Power supply expansion I/O (2085-EP24VDC)
  - Only used on Micro870® control systems with 5 or more expansion I/O modules

Panel and DIN rail mounting

No extra parts required

Easy to view

Light-emitting diodes (LEDs)

Robust and easy-to-mount

Attaches to right side of controller and locks securely into place

Easy wiring with removable terminal blocks

Secure robustly to module with screws

14 AWG wire support

Channel to route wiring to top and/or bottom

Secure wires with wrap hooks tie

Micro800™ plug-in modules and accessories

Customize your applications with space-saving plug-in modules

- Change the “personality” of the base unit controller with plug-in modules
- Extends the functionality of the controller without increasing the panel space
- Allows highly customizable hardware configurations
- Wide range of plug-ins available for Micro820®, Micro830®, Micro850® and Micro870® controllers

Plug-in types

- Analog input/output (2-channel/4-channel, non-isolated)
  - Up to 20 Analog inputs
- Digital I/O
  - Double the amount of digital I/O without increasing footprint of controller
- Resistance Temperature Detector/Thermocouple (2-channel, non-isolated)
  - Makes temperature control possible when used with PID with autotuning
- Trim Potentiometer (6-channel, analog input)
  - Low-cost method of adding six analog presets for speed, position and temperature control
  - Allows simple tuning or adjustment of system without personal computer (PC)
- Serial Port RS232/485 (isolated)
  - Address even the most intensive serial communications tasks with CIP, Modbus RTU and ASCII protocol support
  - Up to 5 additional serial ports

Micro800™ plug-in modules and accessories

Customize your applications with space-saving plug-in modules

More plug-in types

- *Backup Memory with High Accuracy real-time clock
  - Can be used to clone/update Micro800™ application code
  - Adds precision real-time clock function without needing to calibrate or update
- DeviceNet scanner
  - Enhances Micro800™ communication capabilities up to 20 nodes of PowerFlex® AC drives or CompactBlock™ LDX I/O
  - Reduces wiring and installation costs for larger standalone machines that have distributed drives and I/O
- Motion high-speed counter
  - Supports Touch Probe input in hardware for exact registration of axis
  - Provides position verification for servo feedback and encoder feedback modes

New addition

- **Application-specific plug-ins from Encompass™ partners**
  - Spectrum Controls microSD card plug-in** module for Micro830®, Micro850® and Micro870® controllers
  - Features supported application code backup/restore, datalog and recipe
- **Accessory**
  - Catalog number: 2080-SD-2GB
  - Description: 2 GB microSD Card

*Backup Memory with High Accuracy real-time clock plug-in is not supported on Micro820® controller.
**Not supported on Micro810® and Micro820® controllers

Comparison between Micro800™ Expansion I/O versus plug-ins

Features	Plug-In	Expansion I/O
		
Terminal block	Nonremovable	Removable terminal block
Input isolation	Non-isolated analog input	Isolated analog input
Analog resolution and accuracy	• 12-bit resolution for analog I/O • 1% accuracy for analog I/O • 1 °C accuracy for TC/RTD	• 14-bit resolution for input • 12-bit resolution for output • 0.1% accuracy for analog I/O • 0.5 °C accuracy for TC/RTD
Filter times	Fixed 50/60Hz filter	Configurable filter times
I/O density	2...8 points	4...32 points
Footprint	No increase in controller footprint	Width of controller increases with expansion I/O
Different variety of modules	• Isolated Serial port, Trimpot, • Memory back-up, RTC, DeviceNet, HSC, digital I/O, analog I/O, Encompass™ partners' product	Digital and analog I/O modules only

Get better I/O performance with expansion I/O

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Micro800™ optional power supply

- Catalog number 2080-PS120-240VAC
  - Output is regulated 1.6 A at 24V DC for Micro800™ controllers
  - Typically used with smaller systems when user does not have their own existing 24V DC power supply
  - Used to provide isolated 24V DC power for noisy environments
  - Typically used with Micro820®, Micro830®, Micro850® and Micro870® controllers as these controllers do not have integrated AC to DC power supply
- Catalog number 2080-PSAC-12W
  - Output is regulated 0.5 A at 24V DC for Micro800™ controllers
  - Typically used with Micro820®, Micro830® 10/16-point controllers
- For more information, refer to the individual installation instructions
  - 2080-PS120-240VAC Installation Instructions (2080-IN001)
  - 2080-PSAC-12W Installation Instructions (2080-IN011)

2080-PS120-240VAC

2080-PSAC-12W

Note: Depending on application power requirements, a larger external power supply may be required.

Optional power supply can be attached to left side of controller base unit – all wiring is external

Agenda

1 Micro800™ family overview

2 Connected Components Workbench™ software overview

3 Advantages of Micro800™ control system

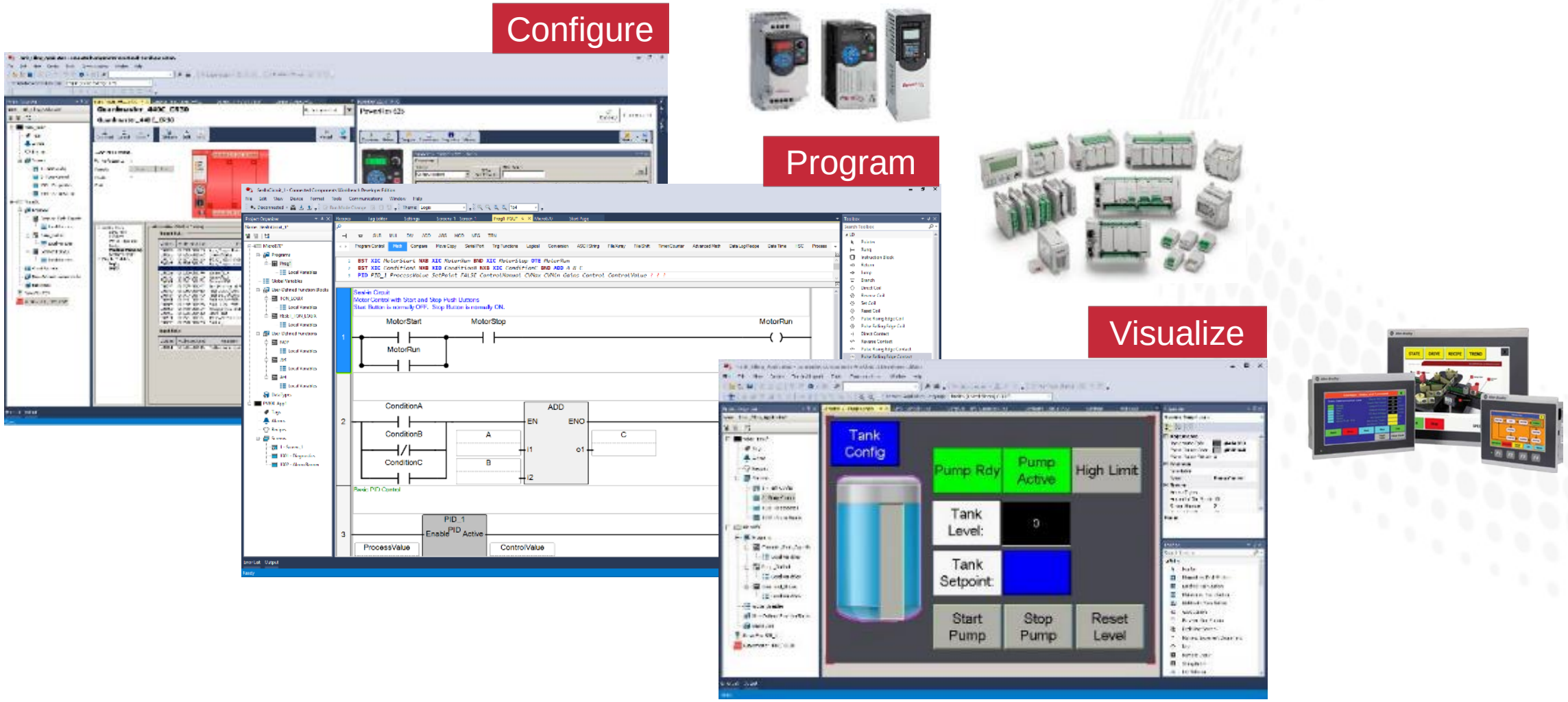
4 Order information

5 Applications for Micro800™ control system

6 Overview of resources

Connected Components Workbench™ software

One software package for device configuration, controller programming and integration with human machine interface (HMI)



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Connected Components Workbench™ software

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® software configurable safety relay editor makes safety logic intuitive
- **Easy to program**
  - Micro800™ controllers support your choice of IEC-61131 PLC programming languages (ladder diagram, function block diagram, structured text) to suit your application
  - Ladder editor with Logix Theme switches from default IEC to Logix instruction names
  - Familiar Instruction toolbar and ASCII text input for RSLogix 500® and Studio 5000 Logix Designer® users
  - User-defined function blocks speed up machine development
  - Standard PLCopen motion instructions with pulse train output (PTO) motion axis and high-speed counter (HSC) feedback axis removes the complexity from simple positioning applications
- **Easy to visualize**
  - Micro800™ controllers variable names can be referenced directly by human machine interface (HMI) tags, which result in less complexity and time-saving benefits
  - CompactLogix™ 5370 tag names can be imported from L5X files

Software comparison of Standard versus Developer Editions

- 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
- Feature Pack is free for both Standard and Developer Editions

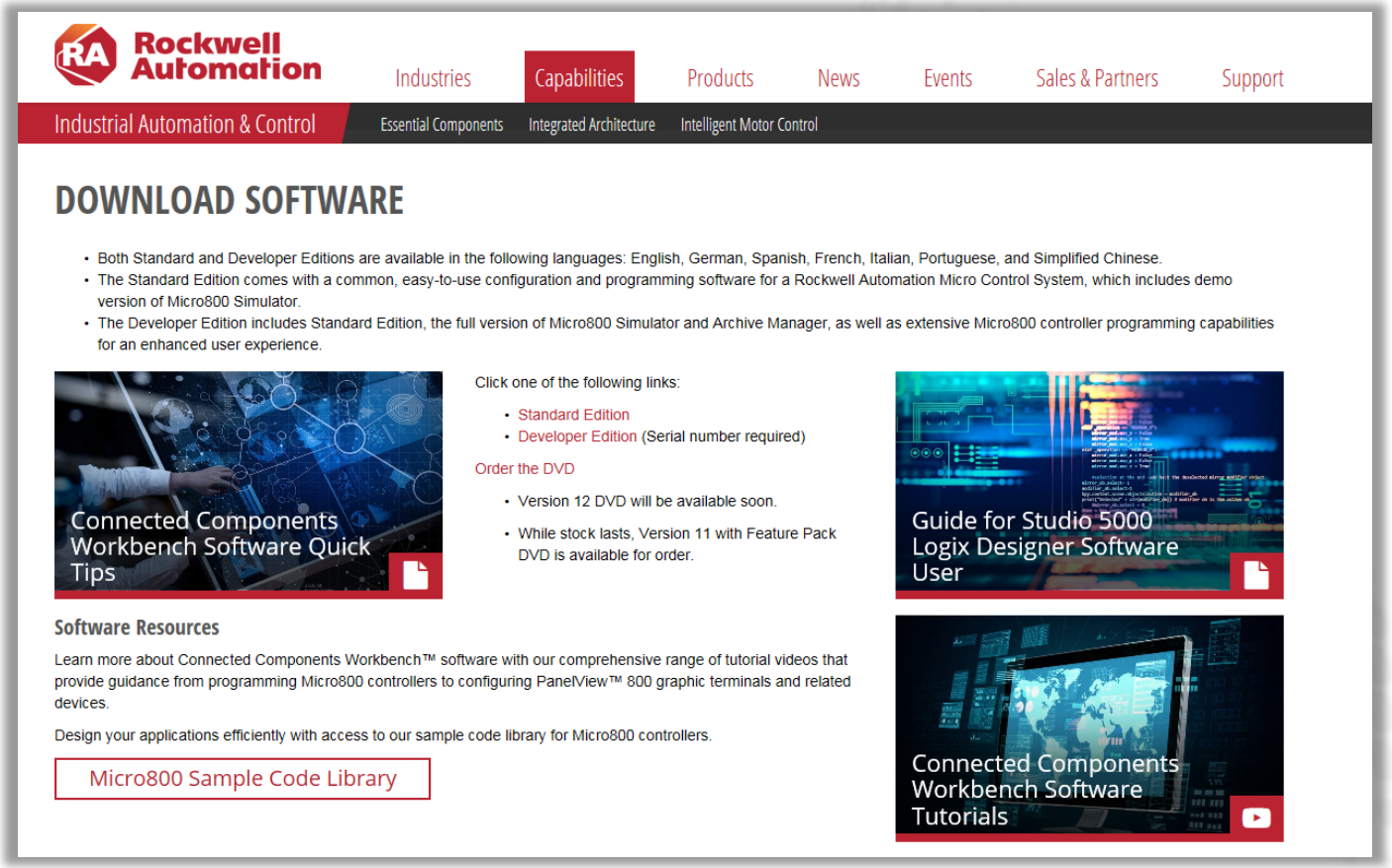
** Requires Developer Edition to create data types, which can be used in Standard Edition.*
*** Requires Developer Edition to create passwords, which can be used in Standard Edition.*

	Standard Edition	Developer Edition
Price	Free for download	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™ controller programming		
IEC 61131-3 ladder diagram (LD), function block diagram (FBD), and structured text (ST)	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
Micro800™ Simulator	Demo Mode – Run Mode for 10 minutes	Full Mode – Run Mode for 24 hours

Easy to acquire

Connected Components Workbench™ software

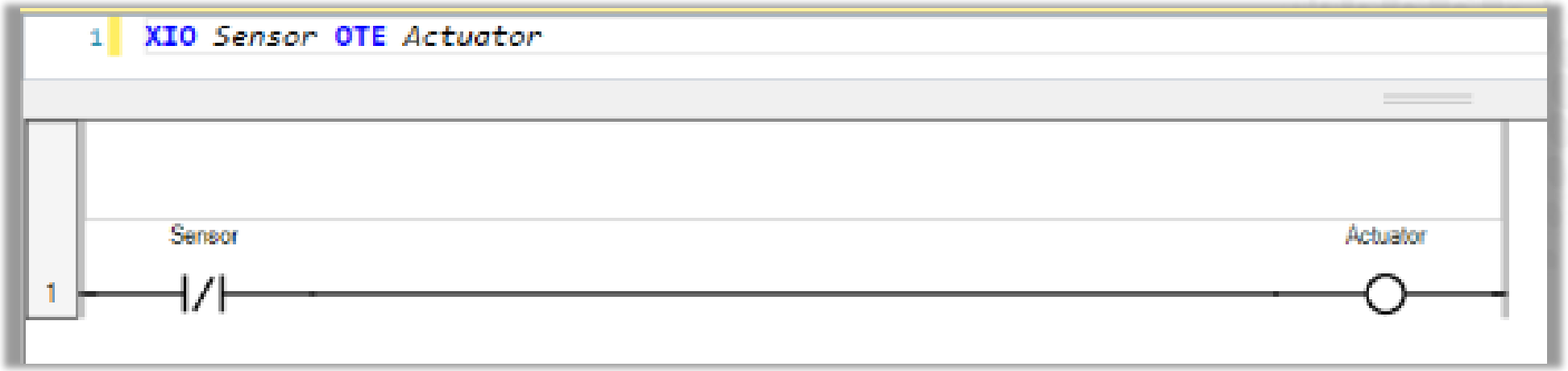
- Standard Edition Free for download
  - Free DVD available after Version 12 release of Multilanguage device manuals
- Developer Edition – contact your local distributor or Rockwell Automation® salesperson for pricing
  - Individual lifetime license using FactoryTalk® Activation. Requires TechConnect℠ contract or toolkit to upgrade to future versions.
  - OEM and Enterprise Toolkits with yearly activations are also supported
  - From May 2018 onwards - Order Catalog Number 9328-CCWDEVENE/9328-CCWDEVENM for all languages (English, Chinese, Portuguese, French, Italian, German, Spanish)



ASCII text input pane

Type in ladder logic instead of using mouse

- ASCII text entry for faster ladder logic editing from keyboard
- Modify the ladder program using ASCII instructions, which are the same as RSLogix 500® and Studio 5000 Logix Designer® software
- Graphical view of ladder is updated on-the-fly simultaneously



Logix Theme, copy and paste enable code reusability

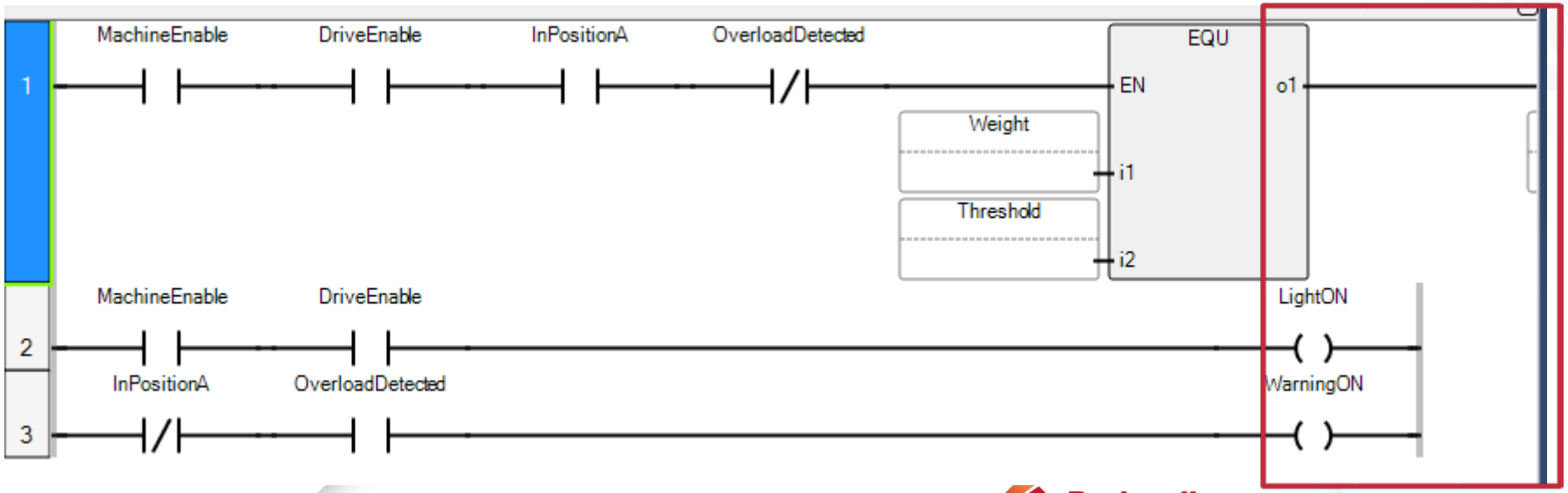
Share code between Micro800™ and Logix controllers

- Reuse ladder logic between Connected Components Workbench™ logic, Studio 5000 Logix Designer® and RSLogix 500® program
- Share ladder logic between Connected Components Workbench™ and Studio 5000 Logix Designer® or RSLogix 500® project by doing a copy-and-paste operation in either direction
    - Enables easy logic transfer from the existing Studio 5000 Logix Designer® or RSLogix 500® project to a Connected Components Workbench™ project, and vice versa
- Supported workflows are:
    - Copy ladder logic ASCII text from or to Studio 5000 Logix Designer® or RSLogix 500® program
    - Copy ladder logic graphically from Studio 5000 Logix Designer® or RSLogix 500® program and paste to Connected Components Workbench™ ladder logic ASCII text
    - Copy ladder logic graphically from Studio 5000 Logix Designer® or RSLogix 500® and paste graphically to Connected Components Workbench™ program

Ladder diagram

Improved view of ladder logic which contains long rungs

- Similar to RSLogix 500® and Studio 5000 Logix Designer® software, rungs will be right justified individually so that long rungs will not affect viewing of shorter rungs
- New Ladder Diagram Container property ‘Fit to Window Width’ is supported
- Newly created programs will default to the recommended property settings of Fit to Window Width to True and Coil Alignment to False
    - These settings are required to enable individual right justification



Short Rungs 2 and 3 are not cut off due to Long Rung 1

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Micro800™ Simulator

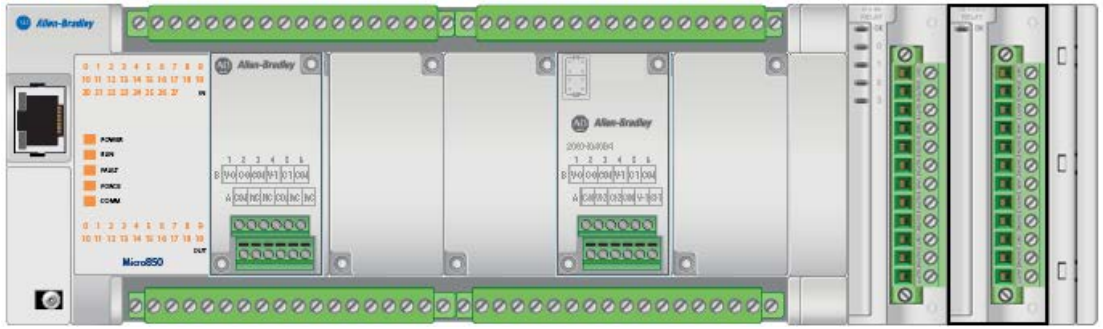
Basic simulator environment for developers

- Micro800™ Simulator for code development, training, demos
  - Includes interfaces to read/write digital and analog I/O
  - Allows experimentation and debugging of application code in a controlled environment without the need for hardware
- Micro800™ Simulator is supported in both Standard and Developer Editions
  - Standard Edition simulator can only stay in run mode for a limited time (10 minutes) for demo purposes
  - Developer Edition can stay in run mode for 24 hours to provide a full development and debugging environment

Micro800™ Simulator capabilities

2080-LC50-48QWB-SIM

includes Ethernet, plug-ins and expansion I/O



Simulation of Machine I/O

- Three methods to simulate I/O
- Controller graphic – Click on terminal block
- Virtual I/O wiring – Outputs wired to Inputs
- External program – Java, C#, HTML5

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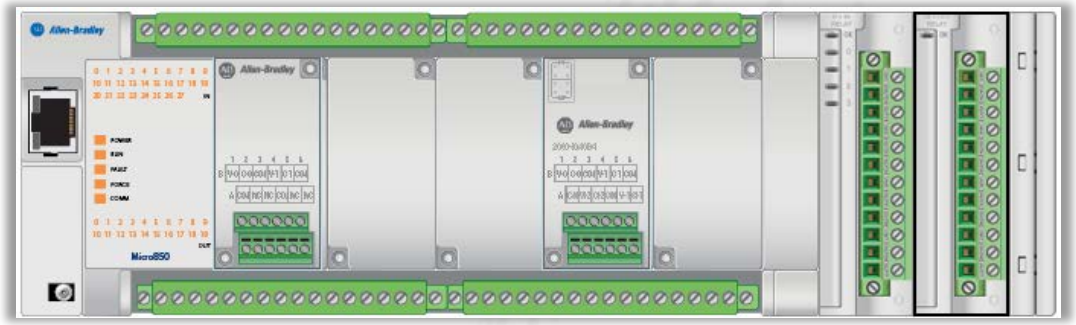
Micro800™ Simulator

Basic simulator environment for details

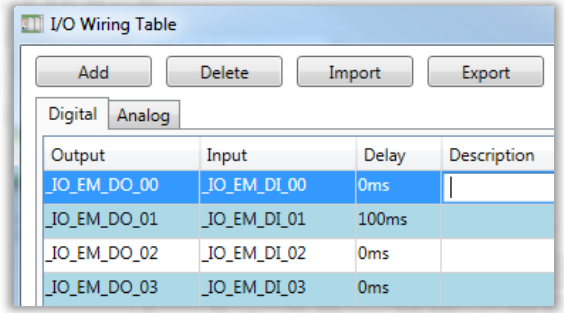
- Micro850® 48-point controller program and instruction execution are similar to real controller
  - Same firmware as the real Micro850® 2080-LC50-48QWB running on a PC
- Most plug-ins and expansion I/O can be configured
- Ethernet port supports EtherNet/IP program download and communications to external devices such as PanelView™ 800 graphic terminals and PowerFlex® drives
- No support for USB, Modbus TCP, Serial communications
  - Refer to Simulator Help menu for more simulation limitations
- Requires a high-performance PC with two processor cores especially if Trend is also used
  - Refer to Release Note for PC minimum requirements
- Controller performance is slower and less deterministic than a real Micro800™ controller
  - Cannot be used as a soft programmable logic controller (PLC)
  - Running as a Windows application with no real-time support

Micro800™ Simulator

Basic simulator environment with machine I/O modeling



- Ability to ‘simulate’ machine application logic and I/O
  - User can model the real machine to some extent
- Machine logic and I/O are simulated by three methods
  - Controller graphical view – For simple demos and logic testing
    - Click on terminal block to toggle digital inputs and use keyboard to enter analog inputs
    - Visually see digital and analog values
  - Virtual I/O wiring – Simulate machine in Micro800™ controller program
    - Configure mapping table of outputs to inputs
    - Controller project contains both application code and machine simulation logic
  - I/O interface – Simulate machine as a separate Windows program
    - Inputs.xml file can be written to by any Windows program
    - Outputs.xml file can be read by any Windows program
    - Requires user to be able to program in another language such as Java, C#, HTML5



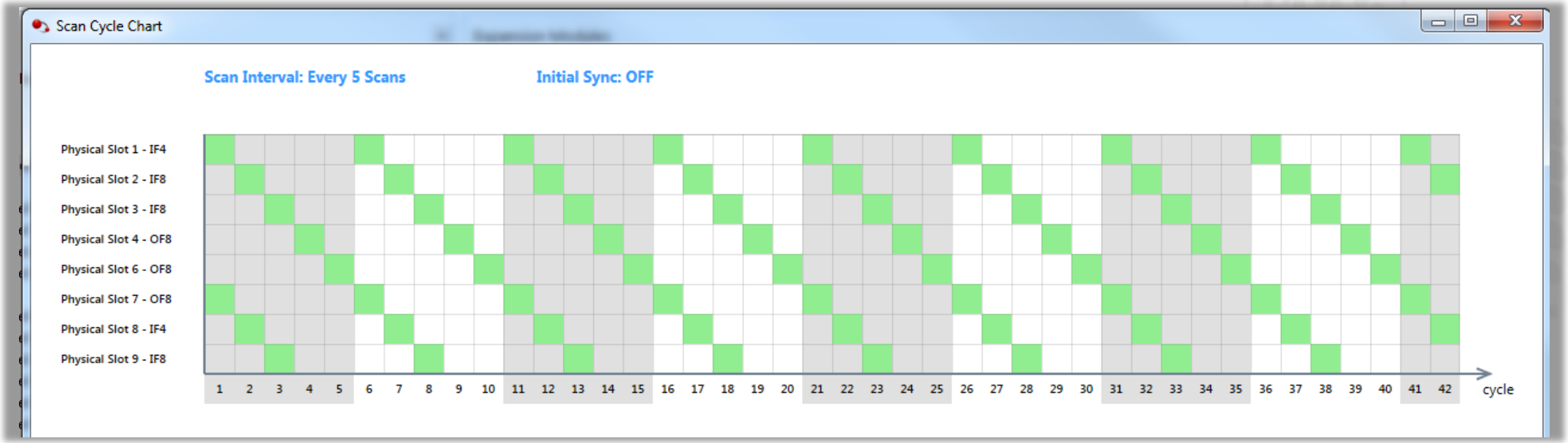

```
<?xml version="1.0" encoding="UTF-8"?>
<Micro800Simulator>
  <EmbeddedInputs>
    <EmbeddedInput Index="0"
VariableName="_IO_EM_DI_00">False</E
mbeddedInput>
```


Rockwell Automation

Micro870® Expansion I/O optimization

Micro870® controller supports control over expansion I/O scan interval for better program cycle times

- Micro870® controllers support optimizing scan interval for slower modules
  - Select either Balanced Processor Loading or Synchronized Scanning of All Modules
- By optimizing the scan interval, the program cycle time will be faster by eliminating over scanning of slower (analog) modules, which allows faster scanning of faster (digital) modules
- Scan Cycle Chart available to view scanning sequence graphically



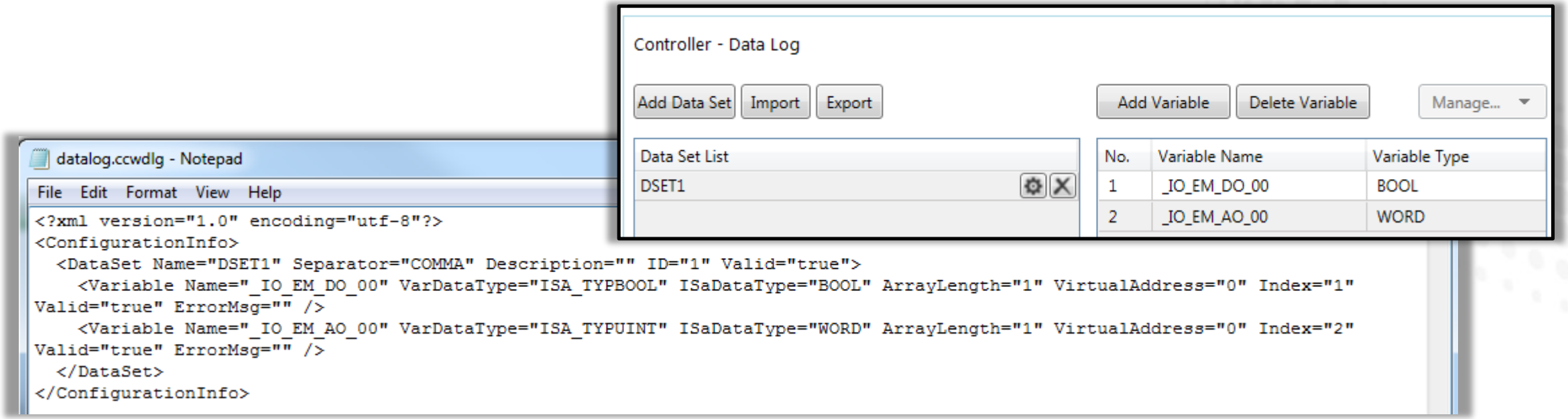
Instructions and security

- Additional Micro800™ instructions are supported
  - COM_IO_WDOG – useful in applications with multiple controllers that require sharing of data
    - Will watchdog external communications writing or reading controller digital I/O variables and declares an error if communication times out
  - SCL - similar to Logix function block diagram
    - SCL instruction for scaling inputs with alarm indicators if out of range
  - AFI - similar to Logix Always False ladder diagram instruction
    - Can be used while debugging to disable a branch or rung of logic without having to delete the branch or rung permanently
  - NOP - similar to Logix No Operation ladder diagram instruction
    - Can be used as a placeholder for future edits or to help document the program
- Modbus TCP server enable/disable for enhanced security
  - The server state is disabled by default for newly created projects
    - Go to Controller tree > Ethernet > Modbus TCP to enable the server if needed

Datalog and recipe

Micro820®, Micro830®, Micro850®, and Micro870® controllers now with microSD card support

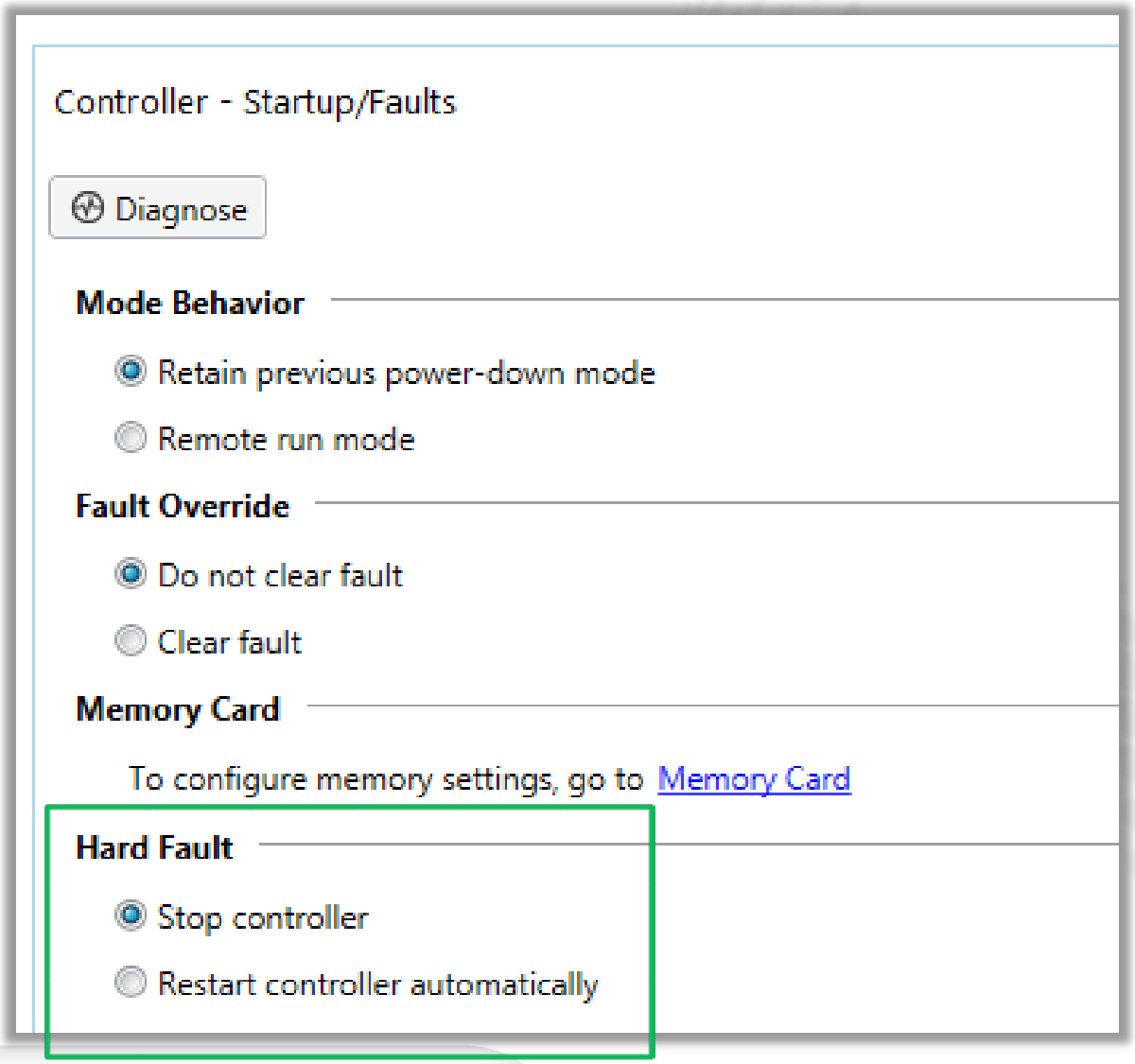
- Datalog and recipe are now available for Micro830®, Micro850®, and Micro870®
  - Requires Spectrum Controls 2080-SDMEMRTC-SC plug-in and a microSD card
- Datalog and recipe configurations can be exported or imported for
  - XML format for easy editing (.ccwdlg)



Controller fault handling

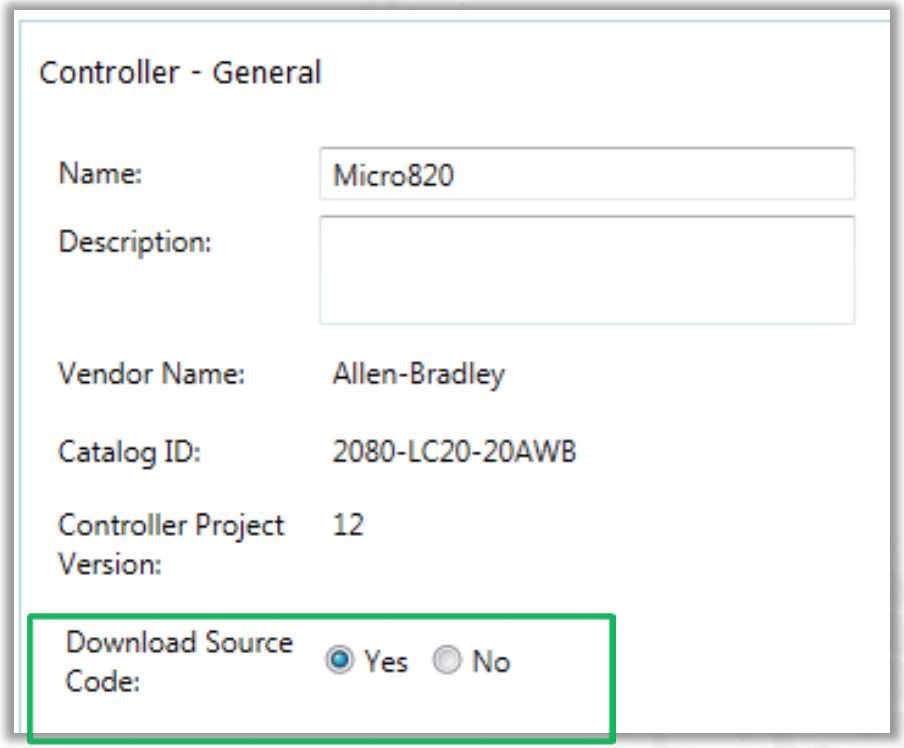
Ability to auto-restart without operator intervention

- Option to specify the controller behavior when a nonrecoverable hard fault occurs (for example, noise)
- Allows you to stop the controller or restart the controller
    - Restart is done without the need to turn power OFF and then ON to the controller



Performance and source code protection

- Avoid downloading the source code for faster build and download
  - During program development, there is usually no need to download source code since it already exists on the developer's PC
- Helps prevent unwanted upload of the source code
  - Even if password to the controller is known, project source code cannot be uploaded
- Warning: If Download Source Code is set to NO, software cannot go online with the controller unless the originally downloaded project is already open. Upload and Discover will not be possible
  - Newly created projects will default to Yes



Go to Controller Tree > General > Download Source Code to change

Agenda

1 Micro800™ family overview

2 Connected Components Workbench™ software overview

3 Advantages of Micro800™ control system

4 Order information

5 Applications for Micro800™ control system

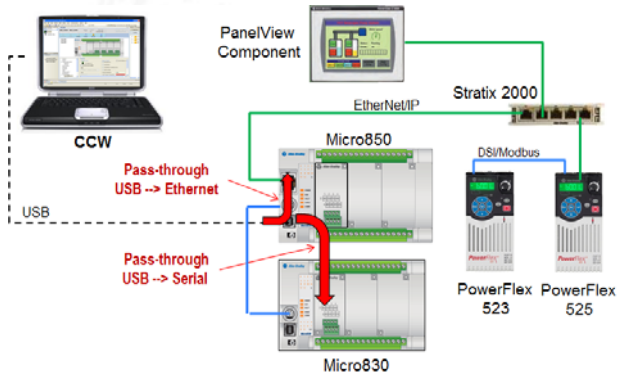
6 Overview of resources

Flexibility, scalability and reuse with Micro800™ controllers

- Plug-in concept offers high **flexibility** to customize your controller to your application need
  - Up to 5 slots – multiple serial ports made possible.
  - Wide variety of plug-in modules that are offered in Micro800™ control system
  - Special application plug-ins from Rockwell Automation® Encompass™ partners
  - Saves space
- Highly **scalable**. For more I/O, there are Micro800™ Expansion I/O modules and CompactBlock™ LDX I/O on DeviceNet
  - Micro850® controller supports up to 192 digital I/O with expansion I/O
  - Micro870® controller supports up to 304 digital I/O with expansion I/O
  - Additional 320 I/O with CompactBlock™ LDX I/O on DeviceNet
- Controller Change supports **reuse** of project that is developed on one controller to the other

Micro800™ controllers offer a wide variety of connectivity options

- Offers a wide variety of communication options for device connectivity to meet your application needs
- Plug and play USB port makes it easy to connect Connected Components Workbench™ software to Micro800™ controllers
    - Improves efficiency during machine development and commissioning phase
- CIP pass-through saves time and effort while configuring your system and collecting data
- Supports CIP Symbolic and EtherNet/IP, deal for communication to Logix products
- DeviceNet scanner for distributed I/O
- Supports Modbus and ASCII protocols for connectivity to third-party devices.



EtherNet/IP™

DeviceNet™

Micro800™ controller	USB programming port	Serial port			Ethernet		DeviceNet (via plug-in)
		CIP Serial (Client/Server)	Modbus RTU (Master/Slave)	ASCII/Binary	EtherNet/IP Client/Server)	Modbus TCP (Client/Server)	DeviceNet scanner
Micro810®	Yes[1]	No	No	No	No	No	No
Micro820®	Yes[2]	Yes	Yes	Yes	Yes	Yes	Yes
Micro830®	Yes	Yes	Yes	Yes	No	No	Yes
Micro850®	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Micro870®	Yes	Yes	Yes	Yes	Yes	Yes	Yes

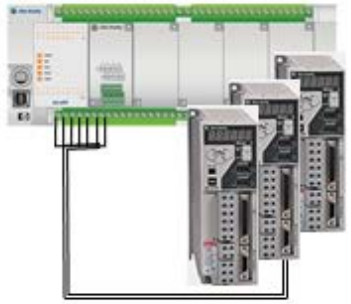
Note: 1: Via USB adaptor (2080-USBADAPTER) 2: Via Remote LCD (2080-REMLCD)

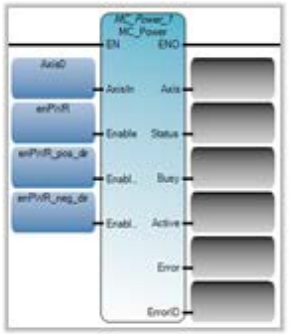
Rockwell Automation

Micro800™ component motion

Easy to program, cost-effective solution

- Touch probe is a low-cost method to achieve **accurate position registration**
- High-speed counter (HSC) motion plug-in supports pulse frequencies up to 250 kHz, for **accurate position feedback** from encoders and servo drives
- **Easy motion programming.** Simple to use axis configurations screens; Axis Monitor shows important information about the status of axes; commonly used PLCopen instruction reduces learning curve





One software for all essential devices

- Connected Components Workbench™ software offers controller programming, device configuration and HMI design editor in one software package
  - Improves efficiency and productivity during machine development
- Connected Components Workbench™ software is easy to acquire, easy to configure, easy to program
- Free download for Standard Edition

Micro800™ controllers

PanelView™ 800 graphic terminals

Guardmaster® 440C-CR30 software configurable safety relay

GuardShield™ 450L Light Curtain

CompactBlock™ LDX I/O

Kinetix® 3 servo drives

PowerFlex® 4-series

PowerFlex® 520-series

PowerFlex® 7-series

SMC™-50 soft starters

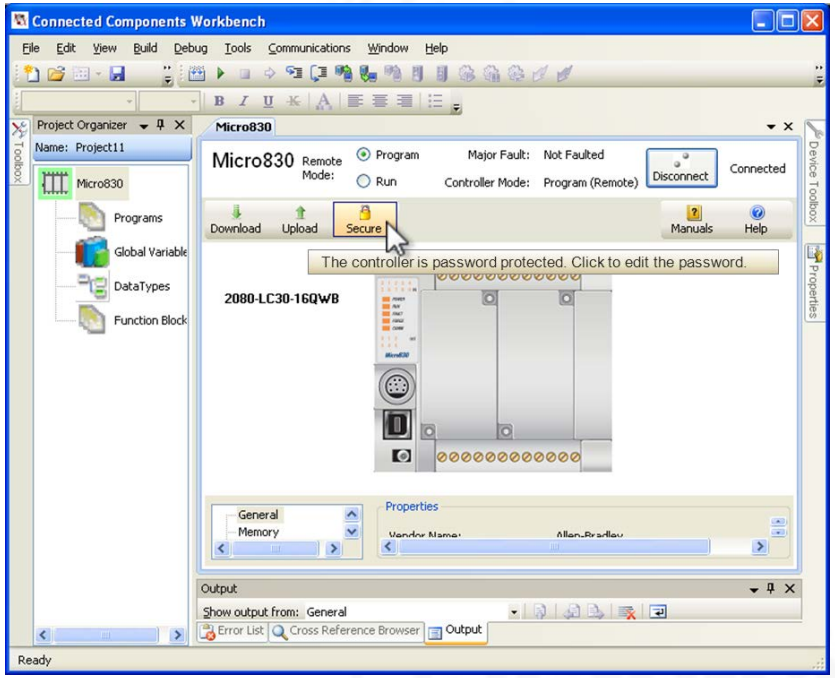
SMC™ Flex soft starters

E200™ Electronic overload relay

Rockwell Automation

Password for security and IP protection

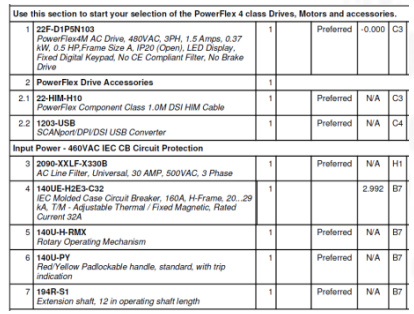
- Improves security and intellectual property protection for Micro800™ controllers
  - Supports creation of strong passwords
  - Controller enforces whether access is granted to controller
  - Supports display of protection status and user name to determine current user
  - Password is encrypted in all communications with Connected Components Workbench™ software
  - No backdoor password (If password is lost, need to update controller!)
- Password protection for UDFB in Connected Components Workbench™ software Developer edition

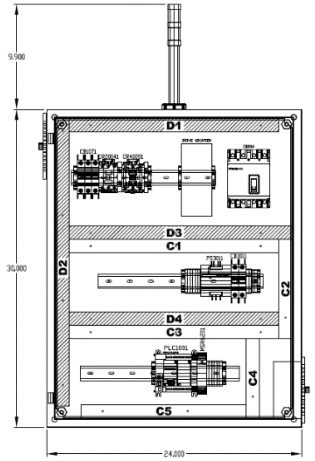


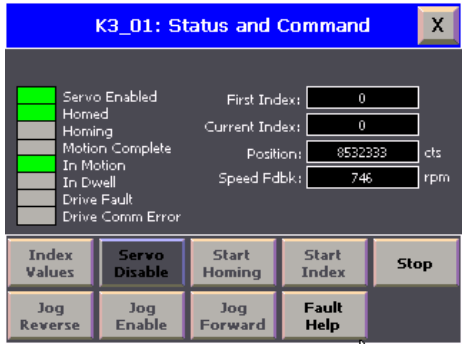
Machine application starter kit reduces development time

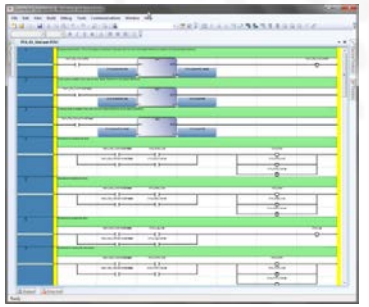
- Machine application starter kit includes white paper, sample code, bill of materials (BOM) and wiring diagram of typical Micro800™ applications that help to
  - Improve design productivity and time to market
  - Reduce machine conversion time

- Download available starter kits
  - Vertical form fill seal solution
  - Labeling machine solution
  - Shrink sleeving solution
  - Horizontal form fill seal solution





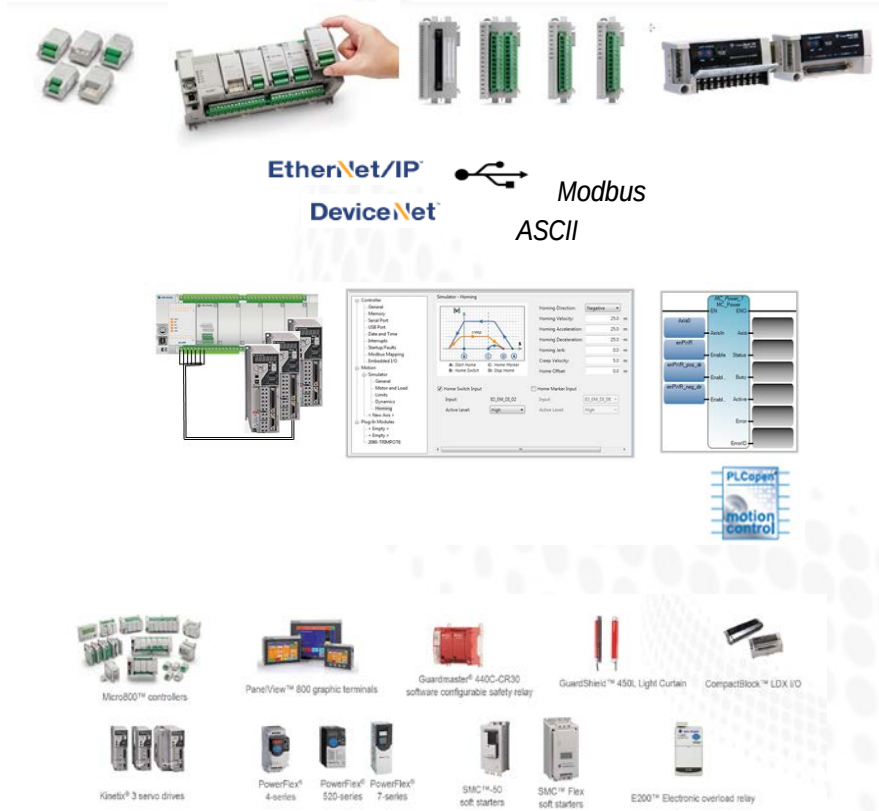




Why Micro800™ controllers and Connected Components Workbench™ software?

Advantages of Micro800™ controllers and Connected Components Workbench™ software

- Greater flexibility and scalability with Micro800™ plug-in and expansion I/O modules
- Micro800™ controllers support a wide variety of network communication options: Ethernet, USB, Serial, DeviceNet
- Wide operating temperature range -20…+65 °C (-4…+149 °F)
- Micro800™ controllers component motion: faster embedded high-speed counter, Touch Probe feature for motion, easy-to-configure motion axis
- All controllers are CE and UL certified
- One software for all essential devices: easy to configure, program and visualize
- Application sample code reduces machine development time, improves time to market
- Password for security and IP protection
- Basic simulator environment for code development, training and demo
- Rockwell Automation global and local customer support infrastructure



Micro800™ controllers and Connected Components Workbench™ software offer cost-effective and easy to implement solutions, helping machine builders stay competitive.

Agenda

1 Micro800™ family overview

2 Connected Components Workbench™ software overview

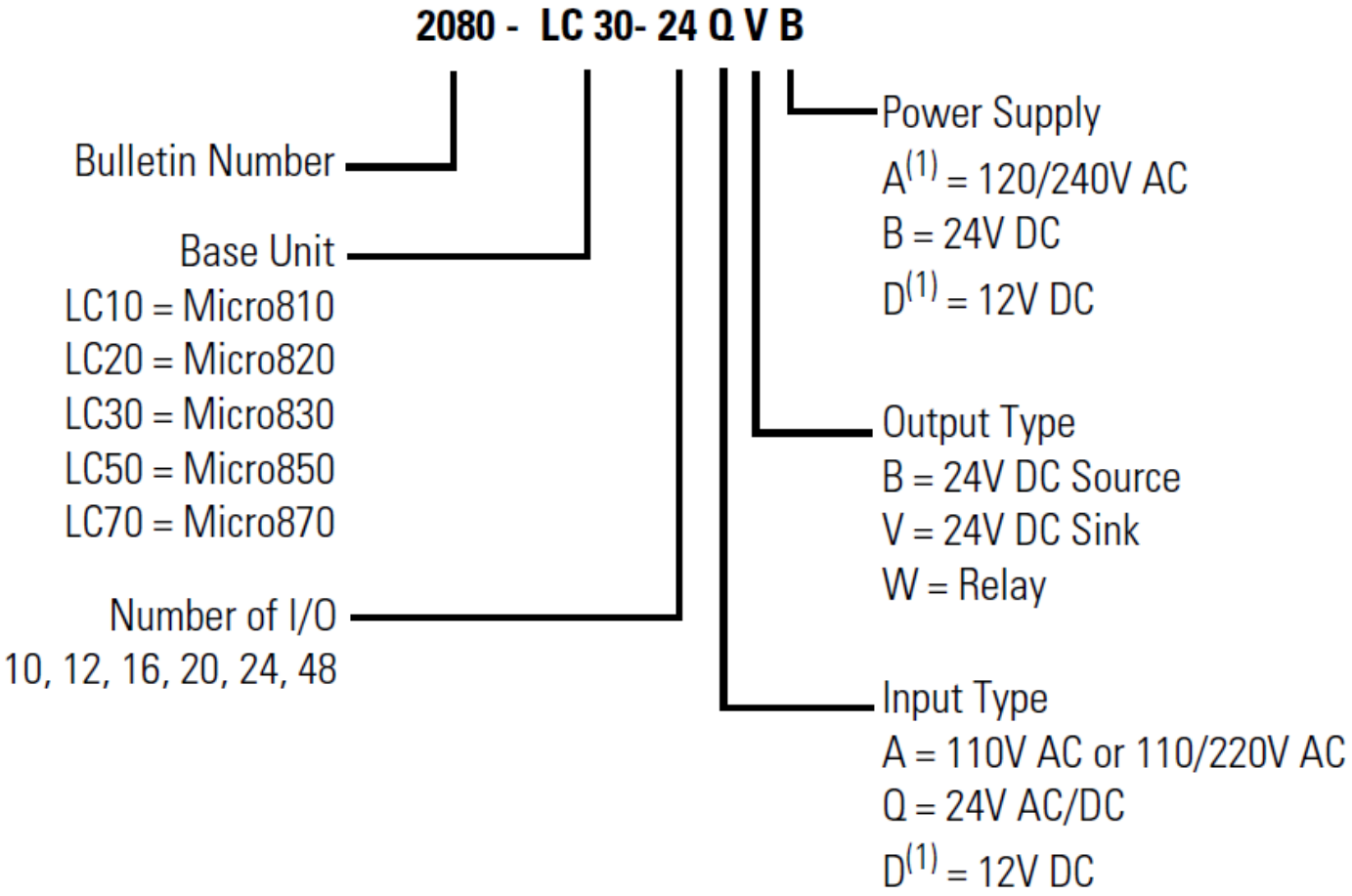
3 Advantages of Micro800™ control system

4 Order information

5 Applications for Micro800™ control system

6 Overview of resources

Micro800™ controller catalog details



For more information, see Micro800™ selection guide

(1) Available for Micro810 only.

Micro810® catalog

Catalog #	Inputs				Outputs		Analog In 0-10V (shared with DC In)
	120V AC	240V AC	24V DC/V AC	12V DC	Relay	24V DC SRC	
Controllers							
2080-LC10-12QWB	-	-	8	-	4	-	4
2080-LC10-12AWA	8		-	-	4	-	-
2080-LC10-12QBB	-	-	8	-	-	4	4
2080-LC10-12DWD	-	-	-	8	4	-	4
Accessories							
2080-LCD	-	-	-	-	-	-	-
2080-USBADAPTER	-	-	-	-	-	-	-

Micro820® catalog

Catalog #	Inputs			Outputs		Analog In 0-10V (shared with DC In)	Analog Out 0-10V	PWM support
	120V AC	240V AC	24V DC/ V AC	Relay	24V DC source			
Controllers								
2080-LC20-20QBB	-	-	12	-	7	4	1	1
2080-LC20-20QWB	-	-	12	7	-	4	1	-
2080-LC20-20AWB	8	-	4	7	-	4	1	-
2080-LC20-20QBBR	-	-	12	-	7	4	1	1
2080-LC20-20QWBR	-	-	12	7	-	4	1	-
2080-LC20-20AWBR	8	-	4	7	-	4	1	-
Accessories								
2080-REMLCD	-	-	-	-	-	-	-	-

Micro830® catalog

Catalog #	Inputs		Outputs		
	110V AC	24V DC/V AC	Relay	24V Sink	24V Source
2080-LC30-10QWB	-	6	4	-	-
2080-LC30-10QVB	-	6	-	4	-
2080-LC30-16AWB	10	-	6	-	-
2080-LC30-16QWB	-	10	6	-	-
2080-LC30-16QVB	-	10	-	6	-
2080-LC30-24QBB		14	-	-	10
2080-LC30-24QVB	-	14	-	10	-
2080-LC30-24QWB	-	14	10	-	-
2080-LC30-48AWB	28	-	20	-	-
2080-LC30-48QBB	-	28	-	-	20
2080-LC30-48QVB	-	28	-	20	-
2080-LC30-48QWB	-	28	20	-	-

Micro850® catalog

Catalog #	Inputs		Outputs		
	110V AC	24V DC/V AC	Relay	24V Sink	24V Source
2080-LC50-24AWB	14	-	10	-	-
2080-LC50-24AWB	14	-	10	-	-
2080-LC50-24QVB	-	14	-	10	-
2080-LC50-24QWB	-	14	10	-	-
2080-LC50-48AWB	28	-	20	-	-
2080-LC50-48QBB	-	28	-	-	20
2080-LC50-48QVB	-	28	-	20	-
2080-LC50-48QWB	-	28	20	-	-

Micro870® catalog

Catalog #	Inputs		Outputs		
	120V AC	24V DC/V AC	Relay	24V Sink	24V Source
2080-LC70-24AWB	14	-	10	-	-
2080-LC70-24QWB	-	14	10	-	-
2080-LC70-24QBB	-	14	-	-	10

Micro800™ plug-in and accessory

Category	Catalog number	Description	Controller support
Digital I/O	2080-IQ4	4-point digital input, 12/24V DC, sink/source, Type3	Micro820®, Micro830® and Micro850®
	2080-OB4	4-point digital output, 12/24V DC, source	
	2080-OV4	4-point digital output, 12/24V DC, sink	
	2080-OW4I	4-point relay output, individually isolated, 2 A	
	2080-IQ4OB4	8-point combo: 4-point digital input, 12/24V DC, sink/source, Type3, and 4-point digital output, 12/24V DC, source	
	2080-IQ4OV4	8-point combo: 4-point digital input, 12/24V DC, sink/source, Type3, and 4-point digital output, 12/24V DC, sink	
Analog I/O	2080-IF4	4-channel analog input, 0-20mA, 0-10V, non-isolated 12 bit	
	2080-IF2	2-channel analog input, 0-20mA, 0-10V, non-isolated 12 bit	
	2080-OF2	2-channel analog output 0-20mA, 0-10V, non-isolated 12 bit	
Specialty	2080-RTD2	2-channel RTD, non-isolated, ±1.0 °C	
	2080-TC2	2-channel TC, non-isolated, ±1.0 °C	
	2080-TRIMPOT6	6-channel Trimpot analog input	
	2080-MOT-HSC	High-speed counter, 250 kHz, differential line receiver, 1 digital output	
Communications	2080-SERIALISOL	RS232/485 isolated serial port	
	2080-DNET20	DeviceNet scanner, 20-node	
Backup memory	2080-MEMBAK-RTC	Memory backup and high accuracy RTC, 1 MB	Micro830® and Micro850®
	2080-MEMBAK-RTC2	Memory backup and high accuracy RTC, 4 MB	Micro870®
Memory storage card	2080-SD-2GB	2 GB microSD card	Micro820®, Micro830®, Micro850®, Micro870®

Micro800™ Expansion I/O for Micro870® and Micro850® controllers

Category	Catalog number	Description	Controller support
Digital I/O	2085-IQ16	16-point digital input, 12/24V DC, sink/source	Micro850® and Micro870®
	2085-IQ32T	32-point digital input, 12/24V DC, sink/source	
	2085-OV16	16-point digital output, 12/24V DC, sink	
	2085-OB16	16-point digital output, 12/24V DC, source	
	2085-OW8	8-point relay output, 2 A	
	2085-OW16	16-point relay output, 2 A	
	2085-IA8	8-point 120V AC input	
	2085-IM8	8-point 240V AC input	
	2085-OA8	8-point 120/240V AC output	
Analog I/O	2085-IF4	4-channel analog input, 0 mA ~ 20 mA, -10V ~ +10V, isolated, 14 bit	
	2085-IF8	8-channel analog input, 0 mA ~ 20 mA, -10V ~ +10V, isolated, 14 bit	
	2085-OF4	4-channel analog output, 0 mA ~ 20 mA, -10V ~ +10V, isolated, 12 bit	
Specialty	2085-IRT4	4-channel RTD and TC, isolated, ±0.5 °C	
Bus terminator	2085-ECR	End cap terminator	
Expansion power supply	2085-EP24VDC	Expansion power supply module	Micro870®

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Micro800™ successes

Customer Success Stories

- Central States Industrial Sets New Standard in Clean-In-Place Mobility
- Flexicon Meets Growing Demand for Agile Bulk Handling Equipment With Connected Components Workbench™ Software

- **Packaging**
  - Intermittent VFFS machine, HFFS
  - Labeler machine
  - Liquid filling/packaging
  - Stretch wrapper
  - Case erector, cartoning
  - Sleever
- **Process**
  - Water pump control
  - Ballast Water Treatment
  - Cooling, drying, filtering equipment
  - Cleaning and degreasing machine
  - Heating system for poultry
- **Manufacturing and Assembly**
  - Hydraulic press
  - PVC pipe socketing machine
  - Laser Marking machine
  - Furniture assembly
  - Automatic surface finishing and cleaning tool


Packaging


Process


Manufacturing & Assembly

- **Energy**
  - Solar tracking application
  - Small wind turbines
  - Battery chargers
- **Material Handling**
  - PCB board loader/unloader
  - Sorting equipment
- **Others**
  - Car Wash station
  - Door controller
  - Trash compactor


Power & Energy


Material Handling

Micro800™ controllers had successes in the various OEM focused applications and projects, worldwide.

Selecting Micro800™ controllers based on requirements

	No communication to other devices	Distributed over a wide area/ over long distances		Distributed over a wide area/ over long distances	
	No motion/position control required		Motion/position control and more I/O		

Feature	Micro810®	Micro820®	Micro830®	Micro850®	Micro870®
Typical Application	• Lighting control • Heating and cooling • Compressor control • Elevator control	• Air handling Unit • Remote water pump management • Stretch wrapper • Car wash system • DDC in building management system	• Adhesive labeler (up to 200 labels/min) • Cartoner • Solar panel positioning • Sleeving machine (up to 400 sleeves/min) • Intermittent vertical and horizontal form, fill, and seal (up to 80packs/min) • Material handling		
LCD	Yes (embedded LCD)	Yes (Remote LCD)	-	-	
Embedded analog	Yes (4 AI)	Yes (4AI, 1AO)	-	-	
Maximum local digital I/O points	12	35	88	192	304
Plug-ins	-	Yes	Yes	Yes	Yes
Serial port	-	Yes	Yes	Yes	Yes
Ethernet	-	Yes	-	Yes	Yes
Motion and high-speed I/O	-	-	Yes	Yes	Yes
Expansion I/O	-	-	-	Yes	Yes

Application videos on YouTube

Vertical Form Fill and Seal

Stretch Wrapper

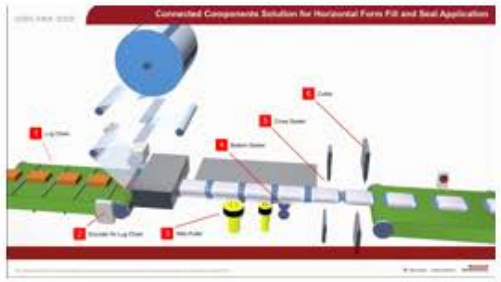
Adhesive Labeler

Spray Dryer

Material Handling

Solar Tracker

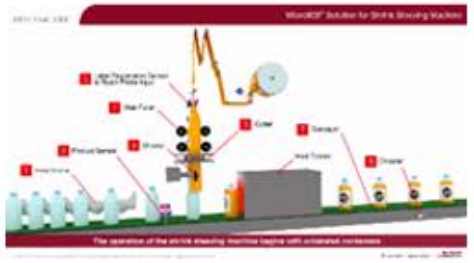
Air Handling Unit



Horizontal Form Fill Seal

Flying Shear

Water Pump Control



Sleeving Machine

Watch on YouTube

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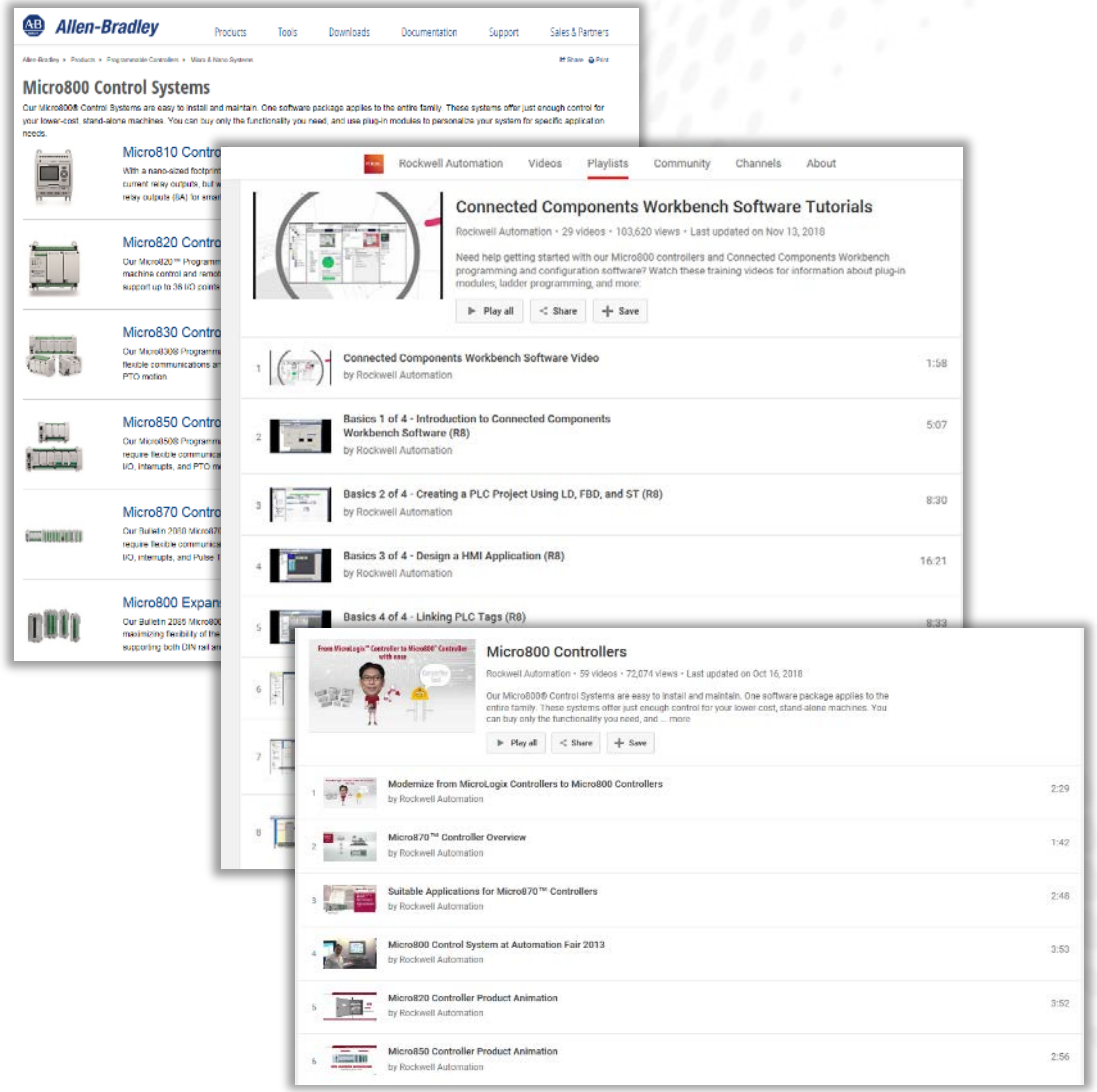
Resource

- Micro800™ controllers brochure with A2 poster
- Web ab.com and ra.com
  - Micro800™ control systems
  - Connected Components Workbench™ software
  - Documentation for related products - Search on Literature Library
- Videos on YouTube
  - Application videos
  - Micro800™ controllers
  - PanelView™ 800 graphic terminals
  - Connected Components Workbench™ software tutorials
- Social Media
  - Like and follow us on: Facebook, LinkedIn, Instagram, Twitter



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Watch Micro800™ videos on YouTube

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