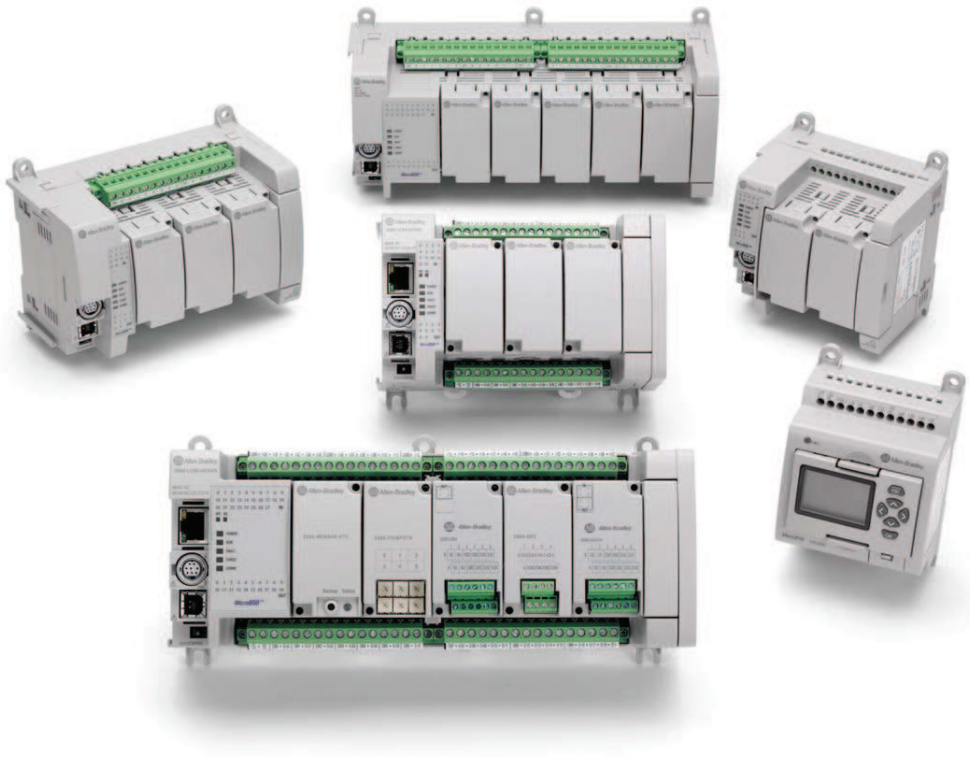
Select a Micro800 Controller



Micro800™ controllers are designed for low-cost, standalone machines. These economical small-size PLCs are available in different form factors based on the number of I/O points embedded in the base, with a range of features intended to address different requirements. The Micro800 family shares programming environment, accessories and plug-ins that allow machine builders to personalize the controller for specific capabilities.

Micro810™ controllers function as a smart relay with high current relay outputs, but with the programming capabilities of a micro PLC. The Micro810 controllers come in a 12-point form factor.

Micro820™ controllers are specifically designed for smaller standalone machines and remote automation projects. It has embedded Ethernet and serial ports and a microSD™ slot for datalogging and recipe management. These controllers come as 20-point form factors that can accommodate up to two plug-in modules. It also supports the Micro800 Remote LCD (2080-REMLCD) module to allow easier configuration of such settings as IP address and functions as a simple IP65 text display.

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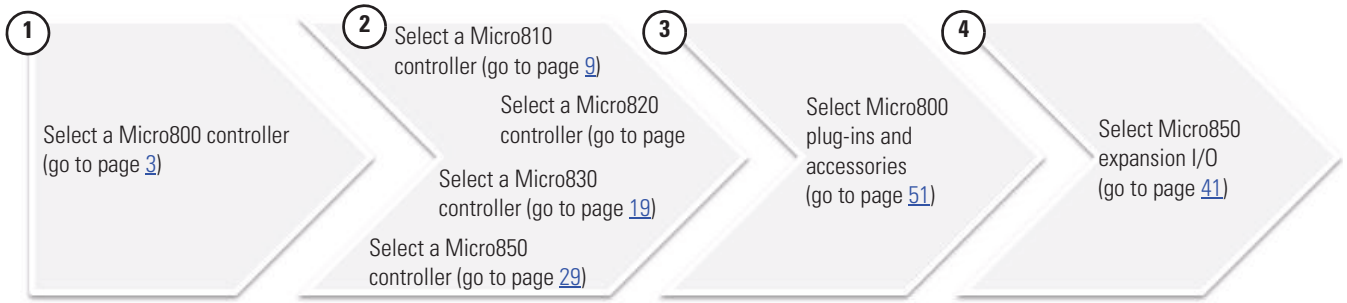
Micro830™ controllers are designed for standalone machine control applications. They have flexible communications and I/O capabilities with up to five plug-ins. They come as a 10-, 16-, 24-, or 48-point form factors.

Micro850™ expandable controllers are designed for applications that require more digital and analog I/O or higher performance analog I/O. They can support up to four expansion I/O. Micro850 controllers include additional communication connection options through an embedded 10/100 Base-T Ethernet port.

Several Micro830 and Micro850 controllers support basic positioning through embedded pulse train outputs (PTO). These controllers also allow you to configure up to six high speed counters (HSC), and choose from nine HSC operation modes. HSC is supported on all Micro830 and Micro850 catalogs, except on 2080-LCxx-xxAWB. PTO is only supported on Micro830 and Micro850 catalog numbers that end in BB or VB.

This selection guide serves to help you identify the right controller, plug-ins, expansion I/O, and accessories, based on your requirements.

Choose a Micro800 Controller



Micro800 Controllers Comparison

Features

Attribute	Micro810	Micro820	Micro830				Micro850	
	12-point	20-point	10-point	16-point	24-point	48-point	24-point	48-point
Communication ports, embedded	USB 2.0 (with USB adapter)	10/100 Base T Ethernet port (RJ-45) RS232/RS485 non-isolated combo serial	USB 2.0 (non-isolated) RS232/RS485 non-isolated combo serial				USB 2.0 (non-isolated) RS232/RS485 non-isolated combo serial 10/100 Base T Ethernet port (RJ-45)	
Embedded digital I/O points(1)	12	19	10	16	24	48	24	48
Base analog I/O channels	Four 24V DC digital inputs are shared as 0…10V analog inputs (DC input models only)	One 0…10V analog output Four 24V DC digital inputs can be configured as 0…10V analog inputs (DC input models only) and via plug-in modules	Via plug-in modules				Via plug-in modules and expansion I/O	
Number of plug-in modules	0	2	2	2	3	5	3	5
Maximum digital I/O(2)	12	35	26	32	48	88	132	
Types of accessories or plug-ins supported	• LCD display with backup memory module • USB adapter	• Micro800 Remote LCD (2080-REMLCD) • All-plug-in modules except 2080-MEMBAK-RTC (see page 51)	All plug-in modules (see page 51)					
Expansion I/O supported	—	—	—				All expansion I/O modules (see page 41)	
Power supply	Embedded 120/240V AC and 12/24V DC options	Base unit has embedded 24V DC power supply, optional external 120/240V AC power supply available						
Basic instruction speed	2.5 µs per basic instruction	0.30 µs per basic instruction						
Minimum scan/cycle time(3)	<0.25 ms	<4 ms	<0.25 ms					
Software	Connected Components Workbench							

(1) See Number and Types of Inputs/Outputs for Micro810, Micro820, Micro830, and Micro850 Catalogs on page 6.

(2) For Micro820 and Micro830 controllers, the number of maximum digital I/O assumes 8-point digital I/O plug-ins (for example, 2080-IQ4OB4) are used on all available plug-in slots. For Micro850 controllers, the maximum number of digital I/O supported between the base, plug-ins, and expansion I/O is 132.

(3) Including reading and writing I/O, program execution, and communications overhead.

Micro800 Controller Programming Comparison (with Connected Components Workbench)

Attribute	Micro810 12-point	Micro820 20-point	Micro830 10/16-point	Micro830 24-point	Micro830 48-point	Micro850 24-point	Micro850 48-point
Program steps(1)	2 K	10 K	4 K	10 K	10 K	10 K	10 K
Data bytes	2 KB	20 KB	8 KB	20 KB	20 KB	20 KB	20 KB
IEC 61131-3 languages	Ladder diagram, function block diagram, structured text						
User defined function blocks	Yes						
Floating point	32-bit and 64-bit						
PID Loop Control	Yes (number limited only by memory)						
Embedded serial port protocols	None	Modbus RTU Master/Slave, ASCII/Binary, CIP Serial					

(1) Estimated Program and Data size are "typical" – program steps and variables are created dynamically. 1 Program Step = 12 data bytes. The number of bytes per instruction can vary greatly from program to program and from programming language to programming language.

Micro800 Communication Options

Controller	USB programming port	Embedded Serial Port, Serial Port Plug-In			Embedded Ethernet	
		CIP Serial	Modbus RTU	ASCII/Binary	EtherNet/IP	Modbus TCP
Micro810	Yes (with adapter)	No				
Micro820	Yes (with 2080-REMLCD)	Yes	Master/Slave	Yes	Yes	Yes
Micro830	Yes	Yes	Master/Slave	Yes	No	No
Micro850	Yes	Yes	Master/Slave	Yes	Yes	Yes

Micro800 Controllers Analog I/O and TC/RTD Comparison

Attribute	Micro810	Micro820	Micro800 (with plug-ins)	Micro850 (with expansion I/O)
Performance level	LOW	LOW	MEDIUM	HIGH
Isolation to controller (increased noise immunity)	None	None	None	Yes
Resolution and Nominal Accuracy	Analog Input: 10-bit, 5% (2% with calibration)	Analog I/O: 12-bit, 5% (2% with calibration)	Analog I/O: 12-bit, 1% TC/RTD: ±1 °C CJC for TC: ±1.2 °C	Analog Input: 14-bit input, ±0.1% Analog Output: 12-bit output, 0.133%, current, 0.425% voltage TC: ±0.5 … ±3.0 °C RTD: ±0.2 … ±0.6 °C
Input update rate and filtering	Update rate only dependent on program scan, limited filtering	Update rate only dependent on program scan, limited filtering	200 ms/ch, 50/60 Hz filtering	8 ms all channels with or without 50/60 Hz filtering
Recommended maximum shielded cable length(1)	10 m			100 m

(1) These numbers are guidelines only. Maximum cable length is dependent on the application and other factors such as cable type, installation, required accuracy, sensor, and so on.

Micro800 Power Requirements(1)

Controller/Module	Power Requirement
Micro810 12-point (with or without LCD)	3 W (5V A for AC module)
Micro820 20-point(2) (without plug-ins, max)	5.62 W
Micro830 and Micro850 (without plug-in/expansion I/O) 10/16-point 24-point 48-point	 5 W 8 W 11 W
Plug-in modules, each	1.44 W
Expansion I/O (system bus power consumption)	2085-IQ16 – 0.85 W 2085-IQ32T – 0.95 W 2085-IA8 – 0.75 W 2085-IM8 – 0.75 W 2085-OA8 – 0.90 W 2085-OB16 – 1.00 W 2085-OV16 – 1.00 W 2085-OW8 – 1.80 W 2085-OW16 – 3.20 W 2085-IF4 – 1.70 W 2085-IF8 – 1.75 W 2085-OF4 – 3.70 W 2085-IRT4 – 2.00 W

(1) When setting up a Micro800 system, verify that total power consumption of the controller, plug-in and expansion I/O does not exceed the output power capacity of the power supply used. See External Power Supply (2080-PS120-240VAC) on page 59 for power supply specifications.

(2) Micro820 controllers require a maximum of 8.5 W with plug-ins.

Micro800 Plug-in Modules and Accessories – Features and Compatibility

Plug-in / Accessory	Supported by Micro810	Supported by Micro820	Supported by Micro830/Micro850	Feature
1.5" LCD and Keypad 2080-LCD	Yes	No	No	• backup module for Micro810 controllers • configure Smart Relay Function Blocks
Micro810 USB Adapter 2080-USBADAPTER	Yes	No	No	USB programming access
External Power Supply 2080-PS120-240VAC	Yes	Yes	Yes	optional controller power supply
RS232/485 Isolated Serial Port 2080-SERIALISOL	No	Yes	Yes	• adds additional serial communications with Modbus RTU and ASCII protocols • isolated for increased noise immunity
Digital Input, Output, Relay, and Combination Modules 2080-IQ4, 2080-IQ4OB4, 2080-IQ4OV4, 2080-OB4, 2080-OV4, 2080-OW4I	No	Yes	Yes	• 4-channel inputs/outputs or combination modules • configurable as voltage and current inputs • sink or source output • 4-channel relay outputs
High Speed Counter 2080-MOT-HSC	No	Yes	Yes	• Up to a minimum of 250 KHz differential line driver for improved noise immunity and additional dedicated I/O • One Quadrature (ABZ) differential inputs alternately configurable for pulse internal, pulse with external direction, A-up and B-down input configurations, and quadrature mode • User-configurable minimum and maximum values, preset, and Z operation
DeviceNet Scanner 2080-DNET20	No	Yes	Yes	• Scanner mode – scan devices such as CompactBlock™ LDX, PowerFlex® drives, overloads and sensors
Remote LCD 2080-REMLCD	No	Yes	No	• Operator interface for configuring such settings as IP address on Micro820 controller • With RS232 and USB ports
Non-isolated Unipolar Analog Input/Output 2080-IF2, 2080-IF4, 2080-OF2	No	Yes	Yes	• adds up to 20 embedded analog I/O with 12-bit resolution (with 48-point controllers) • 2 channels for 2080-IF2, 2080-OF2 • 4 channels for 2080-IF4
Non-isolated Thermocouple 2080-TC2	No	Yes	Yes	• for temperature control, when used with PID • 2 channels for 2080-TC2 and 2080-RTD2
Non-isolated RTD 2080-RTD2	No	Yes	Yes	
Memory Module with RTC 2080-MEMBAK-RTC	No	No	Yes	• backup project data and application code • high accuracy real-time clock
6-Channel Trim Potentiometer Analog Input 2080-TRIMPOT6	No	Yes	Yes	adds six analog presets for speed, position and temperature control

Catalog	Output power, inductive break, max	Pilot duty rating	Minimum load, per point	Initial contact resistance of relay, max	Output delay time, max
2080-OW4I	180 VA for 125V AC inductive loads 180 VA for 240V AC inductive loads 28 VA for 28.8V DC inductive loads 28 VA for 48V DC inductive loads 28 VA for 125V DC inductive loads	C300, R150	10 mA	30 mΩ	10 ms ON or OFF

Catalog	Relay contact, (0.35 power factor)					
	Volts, max	Amperes		Amperes Continuous	Volt-Amperes	
		Make	Break		Make	Break
2080-OW4I	120V AC	15 A	1.5 A	2.0 A	1800V A	180V A
	240V AC	7.5 A	0.75 A			
	24V DC	1.0 A		1.0 A	28V A	
	125V DC	0.22 A				

Catalog	Operating temperature	Non-operating temperature	Surrounding air, max	Relative humidity	Vibration	Shock, operating	Shock, non-operating
2080-OW4I	-20...65 °C (-4…149 °F)	-40...85 °C (-40…185 °F)	65 °C (149 °F)	5…95% noncondensing	2 g @ 10…500 Hz	10 g	DIN rail mounting: 25 g Panel mounting: 35 g

Analog Input and Output Plug-ins

Specifications (2080-IF2, 2080-IF4, 2080-OF2)

Catalog	Number of inputs/ outputs	Voltage range	Current range	Power consumption	Input impedance	Voltage resistive load
2080-IF2	2 inputs, unipolar non-isolated	0…10V	0…20 mA	<60 mA @ 3.3V	>100 kΩ for voltage mode 250 Ω for current mode	
2080-IF4	4 inputs, unipolar non-isolated					
2080-OF2	2 outputs, unipolar non-isolated			<60 mA @ 24V	–	1 kΩ, min

Catalog	Current resistive load	Mounting torque	Terminal screw torque	Wire size	Operating temp.	Non-operating temp.	Surrounding air, max	North American temp code
2080-IF2	–	0.2 Nm (1.48 lb-in.)	0.22…0.25 Nm (1.95…2.21 lb-in.) using a 2.5 mm (0.10 in.) flat-blade screwdriver	**Solid**: 0.14 mm^2 (26 AWG), min 1.5 mm^2 (16 AWG), max **Stranded**: 0.14 mm^2 (26 AWG), min 1.0 mm^2 (18 AWG), max rated @ 90 °C (194 °F) insulation max	-20...65 °C (-4…149 °F)	-40...85 °C (-40…185 °F)	65 °C (149 °F)	T4
2080-IF4								
2080-OF2	500 Ω							