Technical Data

Original Instructions

Allen-Bradley
by ROCKWELL AUTOMATION

Micro800 Programmable Controllers

Micro810 Controller Catalog Numbers 2080-LC10-12AWA, 2080-LC10-12QWB, 2080-LC10-12DWD, 2080-LC10-12QBB

Micro820 Controller Catalog Numbers 2080-LC20-20AWB, 2080-LC20-20AWBR, 2080-LC20-20QWB, 2080-LC20-20QWBR, 2080-LC20-20QBB, 2080-LC20-20QBBR

Micro850 Controller Catalog Numbers 2080-L50E-24AWB, 2080-L50E-24QWB, 2080-L50E-24QVB, 2080-L50E-24QBB, 2080-L50E-48AWB, 2080-L50E-48QWB, 2080-L50E-48QWBK, 2080-L50E-48QVB, 2080-L50E-48QBB

Micro870 Controller Catalog Numbers 2080-L70E-24AWB, 2080-L70E-24QWB, 2080-L70E-24QWBK, 2080-L70E-24QWBN, 2080-L70E-24QWBNK, 2080-L70E-24QBB, 2080-L70E-24QBBK, 2080-L70E-24QBBN

Expansion I/O Modules Catalog Numbers 2085-IQ16, 2085-IQ16K, 2085-IQ32T, 2085-OV16, 2085-OB16, 2085-IA8, 2085-IM8, 2085-OA8, 2085-OW8, 2085-OW16, 2085-OW16K, 2085-IF4, 2085-IF8, 2085-IF8K, 2085-OF4, 2085-OF4K, 2085-IRT4, 2085-EP24VDC, 2085-ECR

Plug-in Modules Catalog Numbers 2080-IQ4, 2080-OB4, 2080-OV4, 2080-IQ4OB4, 2080-IQ4OV4, 2080-OW4I, 2080-IF2, 2080-IF2K, 2080-IF4, 2080-OF2, 2080-RTD2, 2080-TC2, 2080-MEMBAK-RTC, 2080-MEMBAK-RTC2, 2080-TRIMPOT6, 2080-MOT-HSC, 2080-DNET20, 2080-SERIALISOL

Accessories Catalog Numbers 2080-LCD, 2080-USBADAPTER, 2080-REMLCD, 2080-PS120-240VAC, 2080-PSAC-12W, 2080-SD-2GB

Summary of Changes

This publication contains the following new or updated information. This list includes substantive updates only and is not intended to reflect all changes.

Topic	Page
Removed Micro830 catalogs	throughout
Removed 2080-LC50 and 2080-LC70 catalogs	throughout
Added firmware revision for PCCCC command format support	3
Updated Micro820 Embedded RTC specifications	12

Rockwell Automation recognizes that some of the terms that are currently used in our industry and in this publication are not in alignment with the movement toward inclusive language in technology. We are proactively collaborating with industry peers to find alternatives to such terms and making changes to our products and content. Please excuse the use of such terms in our content while we implement these changes.

Micro800 Controller Overview

Micro800™ controllers are designed for low-cost, standalone machines. These small-size programmable logic controllers (PLCs) are available in different form factors based on the number of I/O points that are embedded in the base, with a range of features that are 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 with the programming capabilities of a micro PLC. The Micro810 controllers come in a 12-point form factor.

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

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 modules. Micro850 controllers include additional communication connection options through an embedded 10/100 Base-T Ethernet port. 2080-L50E-xxx controllers also support additional DF1 protocol modes.

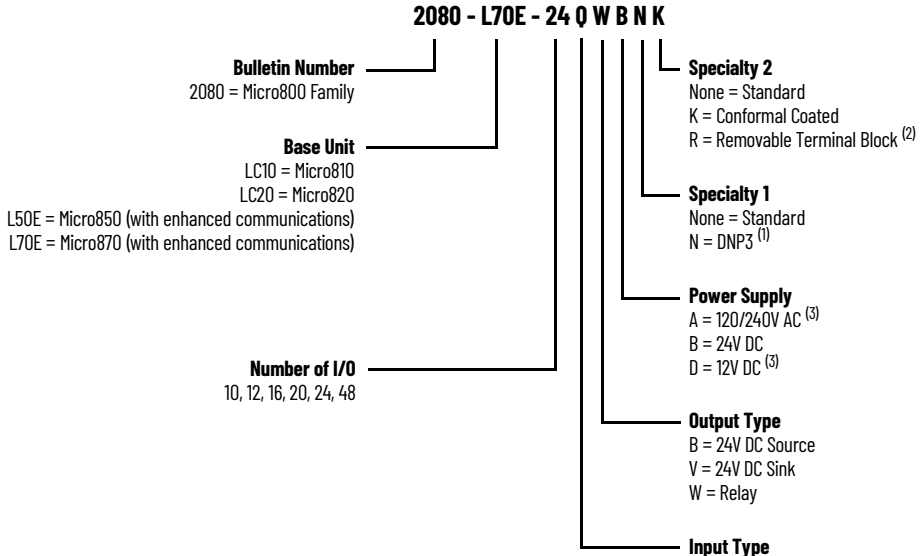
Micro870® controllers offer a higher level of scalability, flexibility, and customization. Designed for large standalone machine applications, the Micro870 controller comes with large memory capacity to enable more modular programs and use of user-defined function blocks. 2080-L70E-xxx controllers also support additional DF1 protocol modes and DNP3 protocol is supported in 2080-L70E-xxxN controllers.

With firmware revision 21.011 or later, Micro850 (2080-L50E) and Micro870 (2080-L70E) controllers support Kinetix® 5100 and PowerFlex® 520-series drives that are connected using a Class 1 EtherNet/IP™ connection with predefined instructions and tags, and generic profile tags for all other EtherNet/IP devices.

With firmware revision 22.011 or later, Micro870 (2080-L70E) controllers supports PCCC command format which allows Micro870 to communicate using the legacy commands in MicroLogix™ controllers.

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

Micro800 Catalog Number Details



(1) Available for Micro870 controllers only.
(2) Available for Micro820 controllers only.
(3) Available for Micro810 controllers only.

Micro800 Controller Comparison

Feature Comparison

Attribute	Micro810	Micro820	Micro850		Micro870
	12-point	20-point	24-point	48-point	24-point
Communication ports, embedded	USB 2.0 (with USB adapter)	10/100 Base-T Ethernet port (RJ45) RS-232/RS-485 non-isolated combo serial	USB 2.0 (non-isolated) RS-232/RS-485 non-isolated combo serial 10/100 Base-T Ethernet port (RJ45)		
Embedded digital I/O points (1)	12	19	24	48	24
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 expansion I/O and plug-in modules (see page 24 and 36)		
Number of plug-in modules	0	2	3	5	3
Maximum digital I/O (2)	12	35	132	192	304
Expansion I/O supported	–	–	All expansion I/O modules (see page 24)		
Ethernet node supported(3)	–	–	8		
Types of accessories or plug-ins supported	LCD display with backup memory module USB adapter	Most plug-in modules (see page 36 for selection and exceptions)			
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 (4)	<0.25 ms	<4 ms	<0.25 ms		
Software	Connected Components Workbench™ (5)				

(1) See the individual Micro800 controller sections for more information.
(2) For Micro820 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 and Micro870 controllers, the maximum number of digital I/O supported includes the base, plug-ins, and expansion I/O.
(3) For Micro850 and Micro870 controllers, Ethernet nodes are supported from version 21 onwards.
(4) Includes reading and writing I/O, program execution, and communications overhead.
(5) 2080-LxxE controllers are supported from version 20 onwards.

Micro800 Controllers Programming Comparison (with Connected Components Workbench software)

Attribute	Micro810 12-point	Micro820 20-point	Micro850 24-point	Micro850 48-point	Micro870 24-point
Program steps[1]	2 K	10 K	10 K	10 K	20 K
Data bytes	2 KB	20 KB	20 KB	20 KB	40 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)				

(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 Controllers Communication Options

Controller	USB Programming Port	Embedded Serial Port, Serial Port Plug-in				Embedded Ethernet		
		CIP Serial/DF1 [1]	Modbus RTU	ASCII/Binary	DNP3	EtherNet/IP	Modbus TCP	DNP3
Micro810	Yes (with adapter)	No						
Micro820	Yes (with 2080-REMLCD)	Yes	Master/Slave	Yes	No	Yes	Yes	No
Micro850	Yes	Yes	Master/Slave	Yes	No	Yes	Yes	No
Micro870	Yes	Yes[2]	Master/Slave	Yes	Yes [3]	Yes	Yes	Yes [2][3]

(1) 2080-L*xx*E controllers support CIP™ Serial/DF1 Full-Duplex, Half-Duplex, and Radio Modem. All other controllers (except Micro810) support CIP Serial/DF1 Full-Duplex only.
(2) The 2080-L70E controller supports PCCC format in DF1 modes from Connected Components Workbench software version 22 onwards.
(3) Applies to 2080-L70E-*xxx*N controllers only.

Micro800 Controllers Analog I/O and TC/RTD Comparison

Attribute	Micro810	Micro820	Micro850 (with expansion I/O)	Micro870 (with expansion I/O)
Performance level	Low		High	
Isolation to controller (increased noise immunity)	None		Yes	
Resolution and nominal accuracy	Analog Input: 10-bit, 5% (2% with calibration)		Analog Input: 14-bit input, ±0.1% Analog Output: 12-bit output, 0.133%, current, 0.425% voltage TC: ±0.5…±3.0 °C (±0.9…±5.4 °F) RTD: ±0.2…±0.6 °C (±0.36…±1.08 °F)	
Input update rate and filtering	Update rate only dependent on program scan, limited 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 Controllers

Micro800 Controller Family

Controller	Bulletin Number	Description	Page
Micro810	2080-LC10	Micro810 12-point programmable controllers	6
Micro820	2080-LC20	Micro820 20-point programmable controllers	9
Micro850	2080-L50E	Micro850 24-point and 48-point programmable controllers	13
Micro870	2080-L70E	Micro870 24-point programmable controllers	16

Environmental specifications and certifications for Micro800 controllers are provided on page 22.

Micro810 Controllers

As the smallest of the Micro800 family, the Micro810 controller is available in a 12-point version, with two 8 A and two 4 A outputs that eliminate the need for external relays. The Micro810 controller features embedded smart relay function blocks that can be configured from a 1.5" LCD and keypad. The function blocks include Delay OFF/ON Timer, Time of Day, Time of Week and Time of Year for applications that require a programmable timer and lighting control. Programming can also be done through a program download via USB programming port, using Connected Components Workbench software.

Number and Types of Inputs/Outputs for Micro810 Catalogs

Catalogs	Inputs				Outputs			Analog Out 0...10V DC	Analog In 0...10V (shared with DC In)	PTO/PWM Support	Embedded HSC Support (1)
	120V AC	120/240 V AC	24V DC/ V AC	12V DC	Relay	24V DC Source	24V DC Sink				
2080-LC10-12AWA	–	8	–	–	4	–	–	–	–	–	–
2080-LC10-12QWB	–	–	8	–	4	–	–	–	4	–	–
2080-LC10-12DWD	–	–	–	8	4	–	–	–	4	–	–
2080-LC10-12QBB	–	–	8	–	–	4	–	–	4	–	–

(1) Maximum number of embedded HSC supported.

General Specifications – Micro810 Controllers

Attribute	2080-LC10-12AWA	2080-LC10-12QWB	2080-LC10-12DWD	2080-LC10-12QBB
Number of I/O	8 inputs (4 digital, 4 analog/digital, configurable) 4 outputs			
Supply voltage range	85...263V DC	20.4...26.4V DC	10.8...13.2V DC	11.4...26.4V DC
Supply frequency range (AC supply)	47...63 Hz	—		
Voltage range	100...240V AC, 50/60 Hz	24V DC Class 2	12V DC Class 2	12/24V DC Class 2
Power consumption, max	5V A	3 W		
I/O rating, input	120...240V AC	24V DC, 8 mA	12V DC, 8 mA	24V DC, 8 mA
I/O rating, output	Relay 00 and 01: 8 A @ 240V AC, B300, R300, General Use Relay 02 and 03: 4 A @ 240V AC, C300, R150, General Use			24V DC, 1 A, 25 °C (77 °F) 24V DC, 0.5 A, 55 °C (131 °F)
Fuse, type	Rated 250V 3.15 A-RADIAL			
AC input filter setting (1)	16 ms for all embedded inputs			
Isolation voltage	250V (continuous), Reinforced Insulation Type, I/O to Aux and Network, Inputs to Outputs. Type tested for 60 s @ 3250V DC, I/O to Aux and Network, Inputs to Outputs.	250V (continuous), Reinforced Insulation Type, I/O to Aux and Network, Inputs to Outputs. Type tested for 60 s @ 720V DC, Inputs to Aux and Network, 3250V DC Outputs to Aux and Network, Inputs to Outputs.		50V (continuous), Reinforced Insulation Type, I/O to Aux and Network, Inputs to Outputs. Type tested for 60 s @ 720V DC, I/O to Aux and Network, Inputs to Outputs.
Wire size				

	Min	Max	
Solid	0.32 mm^2 (22 AWG)	2.1 mm^2 (14 AWG)	Rated @ 90 °C (194 °F) insulation max
Stranded	0.32 mm^2 (22 AWG)	1.3 mm^2 (16 AWG)	

Wiring category	2 – on signal ports 2 – on power ports
Wire type	Use copper conductors only

General Specifications – Micro810 Controllers (Continued)

Attribute	2080-LC10-12AWA	2080-LC10-12QWB	2080-LC10-12DWD	2080-LC10-12QBB
Insulation-stripping length	7 mm (0.28 in.)			
Terminal screw torque	0.5…0.6 N•m (4.4…5.3 lb•in) using a 0.6 x 3.5 mm screwdriver. **Note:** Use a handheld screwdriver to hold down the screws at the side.			
Dimensions (HxWxD)	91 x 75 x 59 mm (3.58 x 2.95 x 2.32 in.)			
Shipping weight, approx.	0.203 kg (0.448 lb)			
Enclosure type rating	None (open-style)			
North American temp code	T5			

(1) In Connected Components Workbench software, go to the Embedded I/O configuration window to reconfigure the filter setting for each input group.

Non-isolated AC Input Specifications – AWA

Attribute	Value
On-state voltage, min	79V AC
On-state voltage, nom	120/240V AC
On-state voltage, max	265V AC
Off-state voltage, max	40V AC
Off-state current, max	0.095 mA
Operating frequency	47…63 Hz
Operating frequency, nom	50/60 Hz
Input impedance	423.7 kΩ

Isolated AC Input Specifications – QWB, QBB, DWD

Attribute	Inputs 0…3
On-state voltage, nom	12/24V AC @ 50/60 Hz
Off-state voltage, min	4V AC @ 50/60 Hz
Operating frequency, nom	50/60 Hz

DC Input Specifications – QWB, QBB, DWD

Attribute	Non-isolated, Shared with Analog Input (Inputs 4…7)	Isolated (Inputs 0…3)
Voltage category	24V DC sink/source	
On-state voltage, min	9.8V DC	
On-state voltage, nom	12/24V DC	
On-state voltage, max	28.8V DC	
Off-state voltage, max	5V DC	
Off-state current, max	0.5 mA	1.5 mA
On-state current, min	0.75 mA @ 10.8V DC 1.0 mA @ 15V DC	1.8 mA @ 10.8V DC 2.7 mA @ 15V DC
On-state current, nom	2.1 mA @ 24V DC	6 mA @ 24V DC
On-state current, max	2.7 mA @ 28.8V DC	7.5 mA @ 28.8V DC
Nominal impedance	14.1 kΩ (non-isolated)	3.74 kΩ (isolated)
IEC input compatibility	Type 1	Type 3

Analog Input Specifications – QWB, QBB, DWD

Attribute	Inputs 4…7
Input type	DC voltage
Input voltage range	0…10V DC
Input voltage, max	26.4V DC
Value of LSB	10 mV
Input resolution	10-bit
Input data count range	0…1023
Smoothing	None, smoothing

Analog Input Specifications – QWB, QBB, DWD (Continued)

Attribute	Inputs 4...7
Overall accuracy	5% of full-scale (2% with calibration) 25...55 °C (77...131 °F)
Noise rejection	50/60 Hz
Common mode rejection	40 dB, DC to 60 Hz with smoothing filter
Nominal impedance	14.1 kΩ (non-isolated)

DC Output Specifications – QBB

Attribute	Value
User supply voltage, min	10V DC
User supply voltage, max	26.4V DC
On-state voltage drop	1V @ max load current 2.5V @ max surge current
Current ratings (each point)	0.5 A @ 55 °C (131 °F), max 1.0 A @ 30 °C (86 °F), max 1.0 mA, min
Surge current, peak	4.0 mA
Surge current, max duration	10 ms
Controller current	3 A
Turn-on time, max	0.1 ms
Turn-off time, max	1.0 ms

Relay Output Specifications – AWA, QWB, DWD

Attribute	Value
Output rating	Relay 00 and 01: 8 A @ 240V AC, B300, R300, General Use Relay 02 and 03: 4 A @ 240V AC, C300, R150, General Use
Voltage, min	5V AC/DC
Voltage, max	250V AC, 30V DC @ rated current. See Micro810 Controller High Current Relay Chart on page 18 and Micro800 Controller Low Current Relay Chart on page 19.
Turn-on time	15 ms
Turn-off time	5 ms
Mechanical	10,000,000 cycles
Electrical with rated load	50,000 cycles

Embedded RTC

Attribute	Value
Resolution READ_RTC()	1 sec
Accuracy	±12 sec/month @ 25 °C (77 °F) ±160 sec/month @ 0...55 °C (32...131 °F)
Power off	Supercap – 5 days @ 40 °C (104 °F) or lower Supercap life – 5 years @ 40 °C (104 °F), 14.5 years @ 25 °C (77 °F)

Micro820 Controllers

As one of the smaller controllers in the Micro800 family, the Micro820 controller comes as a 20-point form factor, with six catalogs available for selection. The Micro820 controller is designed for smaller standalone machines and remote automation projects.

Number and Types of Inputs/Outputs for Micro820 Catalogs

Catalogs	Inputs				Outputs			Analog Out 0...10V DC	Analog In 0...10V (shared with DC In)	PTO/PWM Support	Embedded HSC Support (1)
	120V AC	120/240 V AC	24V DC/ V AC	12V DC	Relay	24V DC Source	24V DC Sink				
2080-LC20-20AWB	8	–	4	–	7	–	–	1	4	–	–
2080-LC20-20AWBR	8	–	4	–	7	–	–	1	4	–	–
2080-LC20-20QWB	–	–	12	–	7	–	–	1	4	–	–
2080-LC20-20QWBR	–	–	12	–	7	–	–	1	4	–	–
2080-LC20-20QBB	–	–	12	–	–	7	–	1	4	1 (PWM)	–
2080-LC20-20QBBR	–	–	12	–	–	7	–	1	4	1 (PWM)	–

(1) Maximum number of embedded HSC supported.

General Specifications – Micro820 Controllers

Attribute	2080-LC20-20AWB, 2080-LC20-20AWBR	2080-LC20-20QWB, 2080-LC20-20QWBR	2080-LC20-20QBB, 2080-LC20-20QBBR
Number of I/O	20 (12 inputs, 8 outputs)		
Dimension (HxWxD)	90 x 104 x 75 mm (3.54 x 4.09 x 2.95 in.)		
Shipping weight, approx.	0.38 kg (0.83 lb)		
Wire size	**For Fixed Terminal Blocks:**		
	Min / **Max** /		
	Solid: 0.14 mm^2 (26 AWG) / 2.5 mm^2 (14 AWG) / Rated @ 90 °C (194 °F) insulation max		
	Stranded: 0.14 mm^2 (26 AWG) / 1.5 mm^2 (16 AWG) / Rated @ 90 °C (194 °F) insulation max		
	For Removable Terminal Blocks:		
	Min / **Max** /		
	Solid and Stranded: 0.2 mm^2 (24 AWG) / 2.5 mm^2 (14 AWG) / Rated @ 90 °C (194 °F) insulation max		
	For RS-232/RS-485 Serial Port:		
	Min / **Max** /		
	Solid: 0.14 mm^2 (26 AWG) / 1.5 mm^2 (16 AWG) / Rated @ 90 °C (194 °F) insulation max		
	Stranded: 0.14 mm^2 (26 AWG) / 1.0 mm^2 (18 AWG) / Rated @ 90 °C (194 °F) insulation max		
Wiring category (1)	2 – on signal ports 2 – on power ports 2 – on communication ports		
Wire type	Use copper conductors or shielded cables		
Terminal screw torque	**For removable and fixed terminal blocks:** 0.5...0.6 N•m (4.4...5.3 lb•in) using a 0.6 x 3.5 mm screwdriver. **Note:** Use a handheld screwdriver to hold down the screws at the side. **For RS-232/RS-485 serial port:** 0.22...0.25 N•m (1.95...2.21 lb•in) using 0.4 x 2.5 x 80 mm 2-component grip with non-slip grip screwdriver.		
Input circuit type	120V AC – for inputs 4...11 only	24V DC sink/source (standard)	
Output circuit type	Relay		24V DC source (standard and high-speed)
Power input	24V DC		
Power consumption, max	5.62 W – without plug-in modules 8.5 W – with plug-in modules		
Power dissipation, max	6 W		
Power supply voltage range	20.4...26.4 V DC, Class 2		
Auxiliary power supply output for thermistor	10V		
I/O rating, input	120V AC 16 mA	24V DC, 8.8 mA	

General Specifications – Micro820 Controllers (Continued)

Attribute	2080-LC20-20AWB, 2080-LC20-20AWBR	2080-LC20-20QWB, 2080-LC20-20QWBR	2080-LC20-20QBB, 2080-LC20-20QBBR
I/O rating, output	2 A, 240V AC 2 A, 24V DC		24V DC, 1 A per point (Surrounding air temperature 30 °C (86 °F)) 24V DC, 0.3 A per point (Surrounding air temperature 65 °C (149 °F))
Isolation voltage	250V (continuous), Reinforced Insulation Type, Output to Aux and Network, Inputs to Outputs. 150V (continuous), Reinforced Insulation Type, Input to Aux and Network. Type tested for 60 s @ 3250V DC Output to Aux and Network, Inputs to Outputs. Type tested for 60 s @ 1950V DC Input to Aux and Network.	250V (continuous), Reinforced Insulation Type, Output to Aux and Network, Inputs to Outputs. 50V (continuous), Reinforced Insulation Type, Input to Aux and Network. Type tested for 60 s @ 720V DC, Inputs to Aux and Network, 3250V DC Outputs to Aux and Network, Inputs to Outputs.	50V (continuous), Reinforced Insulation Type, I/O to Aux and Network, Inputs to Outputs. Type tested for 60 s @ 720V DC, I/O to Aux and Network, Inputs to Outputs.
Pilot duty rating	C300, R150		–
Insulation-stripping length	7 mm for removable and fixed terminal blocks 5 mm for RS-232/RS-485 serial port		
Enclosure type rating	None (open-style)		
North American temp code	T4		

(1) Use this Conductor Category information for planning conductor routing. See Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

Analog Input Specifications – I-00...I-03

Attribute	Value
Number of inputs	4
Type	Voltage (single-ended)
Data range	0...4095
Input voltage range	0...10V DC
Maximum input	26.4V DC
Input impedance	14.14 kΩ
Resolution	12-bit, 2.44 mV/count
Smoothing	None
Input time constant, typical	1.44 ms
Input filter	2.3 kHz
Isolation	None
Accuracy (25...55 °C) (77...131 °F)	5% of full-scale (2% with calibration)

AC Input Specifications – I-04...I-11 for AWB(R)

Attribute	Value
Number of inputs	8
On-state voltage, min	79V AC
On-state voltage, nom	120V AC
On-state voltage, max	125V AC
On-state current, min	5 mA
On-state current, max	16 mA
Input frequency, min	47 Hz
Input frequency, nom	50/60 Hz
Input frequency, max	63 Hz
Off-state voltage, max	20V AC
Off-state current, max	2.5 mA
Inrush current, max	250 mA @ 125V AC
Inrush delay time constant, max	22 ms

Analog Output Specifications

Attribute	Value
Output count range	0...4008
Output type	Voltage
Output voltage range	0...10V
Voltage output maximum load, resistive	>1000 Ω
Accuracy	2% of full-scale for voltage
Resolution	12-bit, 2.495 mV/count
Output update rate (with no output capacitance), max	20 ms
Channel-to-bus isolation	None
Channel-to-channel isolation	None

DC Input Filter Specifications – I-04...I-11 for QWB(R), QBB(R)

Nominal Filter Setting (ms) Inputs 4 and Higher	Minimum ON Delay (ms)	Maximum ON Delay (ms)	Minimum OFF Delay (ms)	Maximum OFF Delay (ms)
0	0	0.1	0	0.1
8	5	8	5	8
16	10	16	10	16
32	20	32	20	32

DC Input Specifications

Attribute	Non-isolated, Shared with Analog Input (Inputs 00...03)	Isolated (Inputs 04...11) 2080-LC20-20QWB(R), 2080-LC20-20QBB(R) Only
Voltage category	24V DC sink	24V DC sink/source
On-state voltage, nom	12/24V DC	24V DC
On-state voltage range	9.8...26.4V DC	10...26.4V DC @ 65 °C (149 °F) 10...30V DC @ 30 °C (86 °F)
Off-state voltage, max	5V DC	
Off-state current, max	0.5 mA	1.5 mA
On-state current, min	0.75 mA @ 10.8V DC 1.0 mA @ 15V DC	1.8 mA @ 10.8V DC 2.7 mA @ 15V DC
On-state current, nom	2.1 mA @ 24V DC	8.5 mA @24V DC
On-state current, max	2.6 mA @ 26.4V	12.0 mA @ 30V DC
Nominal impedance	14.1 kΩ (non-isolated)	3.74 kΩ (isolated)
IEC input compatibility	Type 1	Type 3

DC Output Specifications – QBB(R)

Attribute	Standard Outputs (0-00...0-05)	High-speed Output (0-06) [1]
User supply voltage, min	10V DC	
User supply voltage, max	26.4V DC	
Load current, min	10 mA	
On-state voltage drop	1V @ max load current 2.5V @ max surge current	1.5V @ max load current
Current ratings per point	0.3 A @ 65 °C (149 °F), max 1.0 A @ 30 °C (86 °F), max 1.0 mA, max leakage	100 mA (high-speed operation) 1.0 A @ 30 °C (86 °F) 0.3 A @ 65 °C (149 °F) (standard operation) 1.0 mA, max leakage

DC Output Specifications – QBB(R) (Continued)

Attribute	Standard Outputs (0-00...0-05)	High-speed Output (0-06) [1]
Surge current per point Peak current Surge duration, max Rate of repetition @ 30 °C (86 °F), max Rate of repetition @ 65 °C (149 °F), max	 4.0 A 10 ms once each second once every two seconds	
Controller current, max	3 A	–
Turn-on time, max	0.1 ms	0.2 µs
Turn-off time, max	1.0 ms	2.5 µs
Response time, max	10 ms	
Frequency rate	–	2%

(1) High-speed output operation is greater than 5 kHz.

Relay Output Specifications – 0-00...0-06 for QWB(R), QAWB(R)

Attribute	Value
Voltage, min	5V AC/DC
Voltage, max	250V AC
Turn-on time	10 ms
Turn-off time	10 ms
Life	10,000,000 cycles (mechanical) 100,000 cycles (electrical with UL test load)

Relay Contact Ratings

Maximum Volts	Amperes		Amperes Continuous	Volt-Amperes	
	Make	Break		Make	Break
120V AC	15 A	1.5 A	2 A	1800V A	1800V A
240V AC	7.5 A	0.75 A			
24V DC	1 A		1 A	28V A	
125V DC	0.22 A				

Auxiliary Power Supply for Thermistor Applications

Attribute	Value
Output voltage, min	9.5V
Output voltage, typical	10.04V
Output voltage, max	10.5V
Output current, typical	10 mA
Output current, max	20 mA

Embedded RTC

Attribute	Value
Resolution	1 sec
Accuracy, typical	±60 sec/month @ 25 °C (77 °F)
Power off	Supercap – 4 days @ 25 °C (77 °F) Supercap life, typical – 5 years @ 40 °C (104 °F), 14.5 years @ 25 °C (77 °F)

Micro850 Controllers

Micro850 controllers are suitable for applications that require more digital and analog I/O or higher performance analog I/O. These controllers can support up to four expansion I/O and come in 24-point and 48-point form factors with an embedded Ethernet port.

Number and Types of Inputs/Outputs for Micro850 Catalogs

Catalogs	Inputs				Outputs			Analog Out 0...10V DC	Analog In 0...10V (shared with DC In)	PTO/PWM Support (1)	Embedded HSC Support (2)	Ethernet Nodes (3)
	120V AC	120/240 V AC	24V DC/ V AC	12V DC	Relay	24V DC Source	24V DC Sink					
2080-L50E-24AWB	14	–	–	–	10	–	–	–	–	–	–	8
2080-L50E-24QWB	–	–	14	–	10	–	–	–	–	–	4	8
2080-L50E-24QVB	–	–	14	–	–	–	10	–	–	2 (PTO/PWM)	4	8
2080-L50E-24QBB	–	–	14	–	–	10	–	–	–	2 (PTO/PWM)	4	8
2080-L50E-48AWB	28	–	–	–	20	–	–	–	–	–	–	8
2080-L50E-48QWB	–	–	28	–	20	–	–	–	–	–	6	8
2080-L50E-48QWBK	–	–	28	–	20	–	–	–	–	–	6	8
2080-L50E-48QVB	–	–	28	–	–	–	20	–	–	3 (PTO/PWM)	6	8
2080-L50E-48QBB	–	–	28	–	–	20	–	–	–	3 (PTO/PWM)	6	8

(1) You need firmware revision 6.011 or later to use PWM output.
(2) Maximum number of embedded HSC supported.
(3) For Micro850 (2080-L50E) controllers with firmware revision 21.011 or later.

General Specifications – Micro850 24-point Controllers

Attribute	2080-L50E-24AWB	2080-L50E-24QWB	2080-L50E-24QVB	2080-L50E-24QBB
Number of I/O	24 (14 inputs, 10 outputs)			
Dimensions (HxWxD)	90 x 158 x 80 mm (3.54 x 6.22 x 3.15 in.)			
Shipping weight, approx.	0.423 kg (0.933 lb)			
Wire size	<table><tr><th></th><th>Min</th><th>Max</th><th></th></tr><tr><td>Solid and Stranded</td><td>0.14 mm^2 (26 AWG)</td><td>2.5 mm^2 (14 AWG)</td><td>Rated @ 90 °C (194 °F) insulation max</td></tr></table>			
Wiring category (1)	2 – on signal ports 2 – on power ports 2 – on communication ports			
Wire type	Use copper conductors only			
Terminal screw torque	0.4...0.5 N•m (3.5...4.4 lb•in) using a 0.6 x 3.5 mm screwdriver. Note: Use a handheld screwdriver to hold down the screws at the side.			
Input circuit type	120V AC	12/24V sink/source (standard) 24V sink/source (high-speed)		
Output circuit type	Relay		24V DC sink (standard and high-speed)	24V DC source (standard and high-speed)
Power consumption, max	8 W – without plug-in modules and expansion I/O modules 28 W – with plug-in modules and expansion I/O modules			
Power supply voltage range	21.4...26.4V DC Class 2			
I/O rating, input	120V AC 16 mA	24V, 8.8 mA		
I/O rating, output	2 A, 240V AC, 2 A, 24V DC		24V DC, Class 2, 1 A per point (Surrounding air temperature 30 °C (86 °F)) 24V DC, Class 2, 0.3 A per point (Surrounding air temperature 65 °C (149 °F))	
Isolation voltage	250V (continuous), Reinforced Insulation Type, Output to Aux and Network, Inputs to Outputs. Type tested for 60 s @ 3250V DC Output to Aux and Network, Inputs to Outputs. 150V (continuous), Reinforced Insulation Type, Input to Aux and Network. Type tested for 60 s @ 1950V DC Input to Aux and Network.	250V (continuous), Reinforced Insulation Type, Output to Aux and Network, Inputs to Outputs. Type tested for 60 s @ 3250V DC Output to Aux and Network, Inputs to Outputs. 50V (continuous), Reinforced Insulation Type, Input to Aux and Network Type tested for 60 s @ 720V DC, Inputs to Aux and Network.	50V (continuous), Reinforced Insulation Type, I/O to Aux and Network, Inputs to Outputs. Type tested for 60 s @ 720V DC, I/O to Aux and Network, Inputs to Outputs.	
Pilot duty rating	C300, R150		—	

General Specifications – Micro850 24-point Controllers (Continued)

Attribute	2080-L50E-24AWB	2080-L50E-24QWB	2080-L50E-24QVB	2080-L50E-24QBB
Insulation-stripping length	7 mm (0.28 in.)			
Enclosure type rating	None (open-style)			
North American temp code	T4			

(1) Use this Conductor Category information for planning conductor routing. See Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

General Specifications – Micro850 48-point Controllers

Attribute	2080-L50E-48AWB	2080-L50E-48QWB, 2080-L50E-48QWBK,	2080-L50E-48QVB	2080-L50E-48QBB
Number of I/O	48 (28 inputs, 20 outputs)			
Dimensions (HxWxD)	90 x 238 x 80 mm (3.54 x 9.37 x 3.15 in.)			
Shipping weight, approx.	0.725 kg (1.60 lb)			
Wire size	**Min** / **Max**			
	Solid and Stranded: 0.2 mm^2 (24 AWG) – 2.5 mm^2 (14 AWG)		Rated @ 90 °C (194 °F) insulation max	
Wiring category (1)	2 – on signal ports 2 – on power ports 2 – on communication ports			
Wire type	Use copper conductors only			
Terminal screw torque	0.4…0.5 N•m (3.5…4.4 lb•in) using a 0.6 x 3.5 mm screwdriver. Use a handheld screwdriver to hold down the screws at the side.			
Input circuit type	120V AC	24V DC sink/source (standard and high-speed)		
Output circuit type	Relay		24V DC sink (standard and high-speed)	24V DC source (standard and high-speed)
Power consumption, max	11 W – without plug-in modules and expansion I/O modules 33 W – with plug-in modules and expansion I/O modules			
Power supply voltage range	21.4…26.4V DC Class 2			
I/O rating, input	120V AC, 16 mA	24V DC, 8.8 mA		
I/O rating, output	2 A, 240V AC 2 A, 24V DC		24V DC, 1 A per point (Surrounding air temperature 30 °C (86 °F)) 24V DC, 0.3 A per point (Surrounding air temperature 65 °C (149 °F))	
Isolation voltage	250V (continuous), Reinforced Insulation Type, Output to Aux and Network, Inputs to Outputs. Type tested for 60 s @ 3250V DC Output to Aux and Network, Inputs to Outputs. 150V (continuous), Reinforced Insulation Type, Input to Aux and Network. Type tested for 60 s @ 1950V DC Input to Aux and Network.	250V (continuous), Reinforced Insulation Type, I/O to Aux and Network, Inputs to Outputs. Type tested for 60 s @ 3250V DC Output to Aux and Network, Inputs to Outputs. 50V (continuous), Reinforced Insulation Type, Input to Aux and Network. Type tested for 60 s @ 720V DC, Inputs to Aux and Network.	50V (continuous), Reinforced Insulation Type, I/O to Aux and Network, Inputs to Outputs. Type tested for 60 s @ 720V DC, I/O to Aux and Network, Inputs to Outputs.	
Pilot duty rating	C300, R150		–	
Insulation-stripping length	7 mm (0.28 in.)			
Enclosure type rating	None (open-style)			
North American temp code	T4			

(1) Use this Conductor Category information for planning conductor routing. See Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

Input Specifications – Micro850 Controllers

Attribute	AWB	QWB(K), QVB, QBB	
	120V AC Input	High-speed DC Input	Standard DC Input
Input group to backplane isolation	Verified by one of the following dielectric tests: – 48AWB only • 1950V DC for 2 s • 150V DC working voltage (IEC Class 2 reinforced insulation)	Verified by one of the following dielectric tests: • 720V DC for 2 s • 50V DC working voltage (IEC Class 2 reinforced insulation)	
Voltage category	110V AC	24V sink/source	
Input frequency, min	47 Hz	–	
Input frequency, nom	50/60 Hz	–	

Input Specifications – Micro850 Controllers (Continued)

Attribute	AWB	QWB(K), QVB, QBB	
	120V AC Input	High-speed DC Input	Standard DC Input
Input frequency, max	63 Hz	–	
On-state voltage range	79...132V AC 47...63 Hz 132V, 60 Hz max – 48AWB only	16.8...26.4V DC @ 65 °C (149 °F) 16.8...30.0V DC @ 30 °C (86 °F)	10...26.4V DC @ 65 °C (149 °F) 10...30.0V DC @ 30 °C (86 °F)
On-state voltage, nom	120V AC	24V DC	
Off-state voltage, max	20V AC	5V DC	
Off-state current, max	1.5 mA 2.5 mA @ 120V AC – 24AWB only		
On-state current, min	5 mA @ 79V AC	5.0 mA @ 16.8V DC	1.8 mA @ 10V DC
On-state current, nom	12 mA @ 120V AC	8.8 mA @ 24V DC 7.66 mA @ 24V DC – 16QVB, 16QWB only	8.5 mA @ 24V DC 6.15 mA @ 24V DC – 16QVB, 16QWB only
On-state current, max	16 mA @ 132V AC	12.0 mA @ 30V DC	
Inrush current, max	250 mA @ 120V AC	–	
Inrush delay time constant, max	22 ms – 24AWB only	–	
Nominal impedance	12 kΩ @ 50 Hz – 48AWB only 10 kΩ @ 60 Hz – 48AWB only	3 kΩ	3.74 kΩ
IEC input compatibility	Type 3		

Isolated AC Input Specifications – Micro850 Controllers

Attribute	QWB(K), QVB, QBB
On-state voltage, nom	12/24V AC @ 50/60 Hz
Off-state voltage, min	4V AC @ 50/60 Hz
Operating frequency, nom	50/60 Hz

Output Specifications – Micro850 Controllers

Attribute	AWB, QWB(K)	QVB, QBB	
	Relay Output	High-speed Output	Standard Output
Output voltage, min	5V DC, 5V AC	10.8V DC	10V DC
Output voltage, max	125V DC, 265V AC	26.4V DC	
Load current, min	10 mA		
Load current, max	2.0 A	100 mA (high-speed operation) 1.0 A @ 30 °C (86 °F) 0.3 A @ 65 °C (149 °F) (standard operation)	1.0 A @ 30 °C (86 °F) 0.3 A @ 65 °C (149 °F) (standard operation)
Surge current, per point	See Relay Contacts Ratings - Micro850 Controllers on page 15	4.0 A every 1 s @ 30 °C (86 °F); every 2 s @ 65 °C (149 °F) (1)	
Current, per common, max	5 A	–	
Turn-on time, max	10 ms	2.5 µs	0.1 ms
Turn-off time, max	10 ms	2.5 µs	1.0 ms

(1) Applies for general-purpose operation only. Does not apply for high-speed operation.

Relay Contacts Ratings - Micro850 Controllers

Maximum Volts	Amperes		Amperes Continuous	Volt-Amperes	
	Make	Break		Make	Break
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				

Micro870 Controllers

Micro870 controllers are designed for large standalone machine applications and come with great memory capacity to enable more modular program and user-defined function blocks. These controllers are capable of communicating on various networks and with devices through EtherNet/IP, Serial, and USB ports.

Number and Types of Inputs/Outputs for Micro870 Catalogs

Catalogs	Inputs				Outputs			Analog Out 0...10V DC	Analog In 0...10V (shared with DC In)	PTO/PWM Support	Embedded HSC Support (1)	Ethernet Nodes(2)
	120V AC	120/240 V AC	24V DC/ V AC	12V DC	Relay	24V DC Source	24V DC Sink					
2080-L70E-24AWB	14	–	–	–	10	–	–	–	–	–	–	8
2080-L70E-24QWB	–	–	14	–	10	–	–	–	–	–	4	8
2080-L70E-24QWBK	–	–	14	–	10	–	–	–	–	–	4	8
2080-L70E-24QWBN	–	–	14	–	10	–	–	–	–	–	4	8
2080-L70E-24QWBNK	–	–	14	–	10	–	–	–	–	–	4	8
2080-L70E-24QBB	–	–	14	–	–	10	–	–	–	2 (PTO/PWM)	4	8
2080-L70E-24QBBK	–	–	14	–	–	10	–	–	–	2 (PTO/PWM)	4	8
2080-L70E-24QBBN	–	–	14	–	–	10	–	–	–	2 (PTO/PWM)	4	8

(1) Maximum number of embedded HSC supported.
(2) For Micro870 (2080-L70E) controllers with firmware revision 21.011 or later.

General Specifications – Micro870 Controllers

Attribute	2080-L70E-24AWB	2080-L70E-24QWB, 2080-L70E-24QWBK	2080-L70E-24QWBN 2080-L70E-24QWBNK	2080-L70E-24QBB, 2080-L70E-24QBBK	2080-L70E-24QBBN
Number of I/O	24 (14 inputs, 10 outputs)				
Dimensions (HxWxD)	90 x 157 x 80 mm (3.54 x 6.22 x 3.15 in.)				
Shipping weight, approx.	0.47 kg (1.04 lb)				
Wire size	**Min** / **Max** / Solid and Stranded: 0.2 mm^2 (24 AWG) – 2.5 mm^2 (14 AWG) – Rated @ 90 °C (194 °F) insulation max				
Wiring category(1) (2)	2 – on signal ports 2 – on power ports 2 – on communication ports				
Wire type	Use copper conductors only				
Insulation-stripping length	7 mm (0.28 in.)				
Terminal screw torque	0.4...0.5 N•m (3.5...4.4 lb•in) using a 0.6 x 3.5 mm screwdriver. Use a handheld screwdriver to hold down the screws at the side.				
Input circuit type	12/24V sink/source (standard) 24V sink/source (high-speed)				
Output circuit type	Relay			24V DC source (standard and high-speed)	
Power consumption, max	8 W – without plug-in modules and expansion I/O modules 28 W – with plug-in modules and expansion I/O modules				
Power supply voltage range	21.4...26.4V DC Class 2, or Limited Voltage Limited Current Source (LVLC)				
I/O rating, input	120V AC, 16 mA	24V, 8.8 mA 24V AC, 50/60 Hz, 8.8 mA			
I/O rating, output	2 A, 240V AC, 50/60 Hz, General Use 5 A, 24V0 AC, 50/60 Hz, Resistance			24V DC, Class 2, 1 A per point (Surrounding air temperature 30 °C (86 °F)) 24V DC, Class 2, 0.3 A per point (Surrounding air temperature 65 °C (149 °F))	
Isolation voltage	250V (continuous), Reinforced Insulation Type, Output to Aux and Network, Inputs to Outputs. Type tested for 60 s @ 3250V DC Output to Aux and Network, Inputs to Outputs. 150V (continuous), Reinforced Insulation Type, Input to Aux and Network. Type tested for 60 s @ 1950V DC, Inputs to Aux and Network.	250V (continuous), Reinforced Insulation Type, Output to Aux and Network, Inputs to Outputs. Type tested for 60 s @ 3250V DC Output to Aux and Network, Inputs to Outputs. 50V (continuous), Reinforced Insulation Type, Input to Aux and Network. Type tested for 60 s @ 720V DC, Inputs to Aux and Network.		50V (continuous), Reinforced Insulation Type, I/O to Aux and Network, Inputs to Outputs. Type tested for 60 s @ 720V DC, I/O to Aux and Network, Inputs to Outputs.	
DNP3 support	–	–	Yes. SAV2 and SAV5	–	Yes. SAV2 and SAV5

General Specifications – Micro870 Controllers (Continued)

Attribute	2080-L70E-24AWB	2080-L70E-24QWB, 2080-L70E-24QWBK	2080-L70E-24QWBN 2080-L70E-24QWBNK	2080-L70E-24QBB, 2080-L70E-24QBBK	2080-L70E-24QBBN
Pilot duty rating	C300, R150			–	
Enclosure type rating	None (open-style)				
North American temp code	T4				

(1) Use this Conductor Category information for planning conductor routing. See Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.
(2) Use this Conductor Category information for planning conductor routing as described in the appropriate System Level Installation Manual.

Input Specifications – Micro870 Controllers

Attribute	AWB	QWB(K), QWBN, QBB(K), QBBN	
	120V AC Input	High-speed DC Input	Standard DC Input
Input group to backplane isolation	–	Verified by one of the following dielectric tests: • 720V DC for 2 s • 50V DC working voltage (IEC Class 2 reinforced insulation)	
Voltage category	–	24V sink/source 24V AC, 50/60 Hz	
On-state voltage range	79...132V AC	16.8...26.4V DC @ 65 °C (149 °F) 16.8...30.0V DC @ 30 °C (86 °F)	10...26.4V DC @ 65 °C (149 °F) 10...30.0V DC @ 30 °C (86 °F)
Off-state voltage, max	20V AC	5V DC	
Off-state current, max	2.5 mA @ 120V AC	1.5 mA	
On-state current, min	5 mA	5.0 mA @ 16.8V DC	1.8 mA @ 10V DC
On-state current, nom	–	7.6 mA @ 24V DC	6.15 mA @ 24V DC
On-state current, max	16 mA	12.0 mA @ 30V DC	
Input frequency, min	47 Hz	–	
Input frequency, nom	50/60 Hz	–	
Input frequency, max	63 Hz	–	
Inrush current, max	250 mA @ 120V AC	–	
Inrush delay time constant, max	22 ms – 24AWB only	–	
Nominal impedance	–	3 kΩ	3.74 kΩ
IEC input compatibility	Type 3		

Output Specifications – Micro870 Controllers

Attribute	AWB, QWB(K), QWBN	QBB(K), QBBN	
	Relay Output	High-speed Output	Standard Output
Output voltage, min	5V DC, 5V AC	10.8V DC	10V DC
Output voltage, max	125V DC, 265V AC	26.4V DC	26.4V DC
Load current, min	10 mA		
Load current, continuous, max	2 A	100 mA (high-speed operation) 1 A @ 30 °C (86 °F) 0.3 A @ 65 °C (149 °F) (standard operation)	1 A @ 30 °C (86 °F) 0.3 A @ 65 °C (149 °F) (standard operation)
Surge current, per point	See Relay Contacts Ratings - Micro870 Controllers on page 17	4 A for 10 ms every 1 s @ 30 °C (86 °F); every 2 s @ 65 °C (149 °F) (1)	
Current, per common, max	5 A	–	
Turn-on time, max	10 ms	2.5 µs	0.1 ms
Turn-off time, max	10 ms	2.5 µs	1 ms

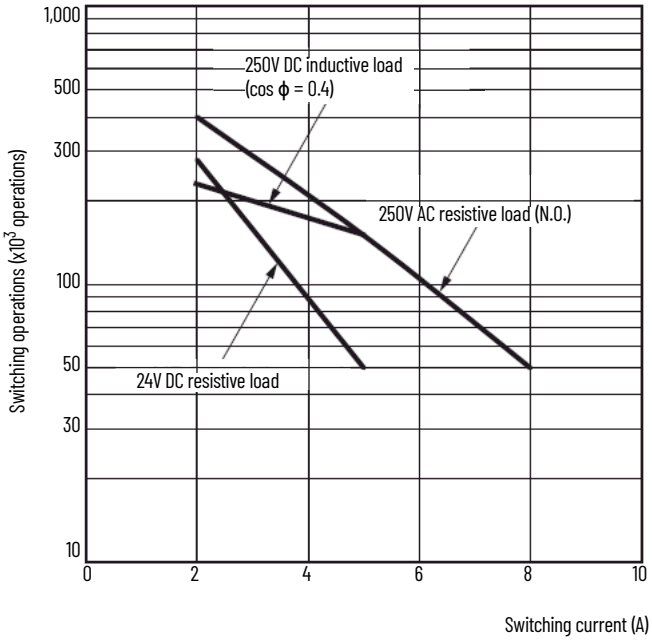
(1) Applies for general-purpose operation only. Does not apply for high-speed operation.

Relay Contacts Ratings - Micro870 Controllers

Maximum Volts	Amperes		Amperes Continuous	Volt-Amperes	
	Make	Break		Make	Break
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		0.22 A		

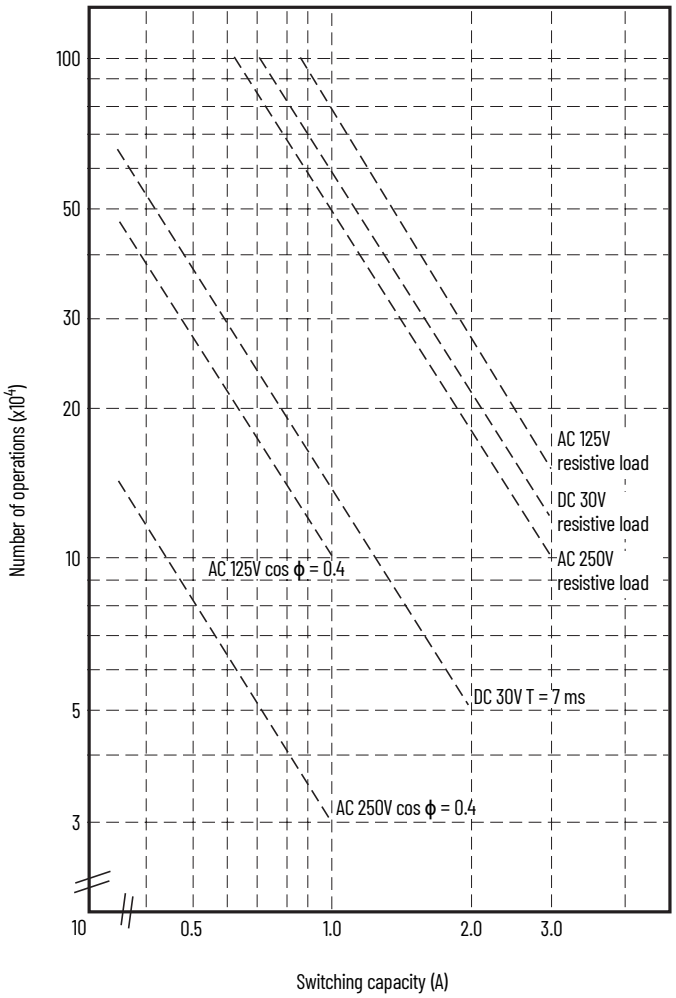
Micro800 Controller Relay Charts

Micro810 Controller High Current Relay Chart



Maximum Volts	IEC 947	Amperes		Amperes Continuous	Volt-Amperes	
		Make	Break		Make	Break
120V AC	AC-15	30 A	3 A	8 A	3600V A	3600V A
240V AC		15 A	1.5 A			
125V DC	DC-13	0.22 A		1 A	28V A	
250V DC		0.11 A				
24V DC		1.2 A		5 A		

Micro820, Micro850, Micro870 Controller Relay Chart, and Micro810 Controller Low Current Relay Chart



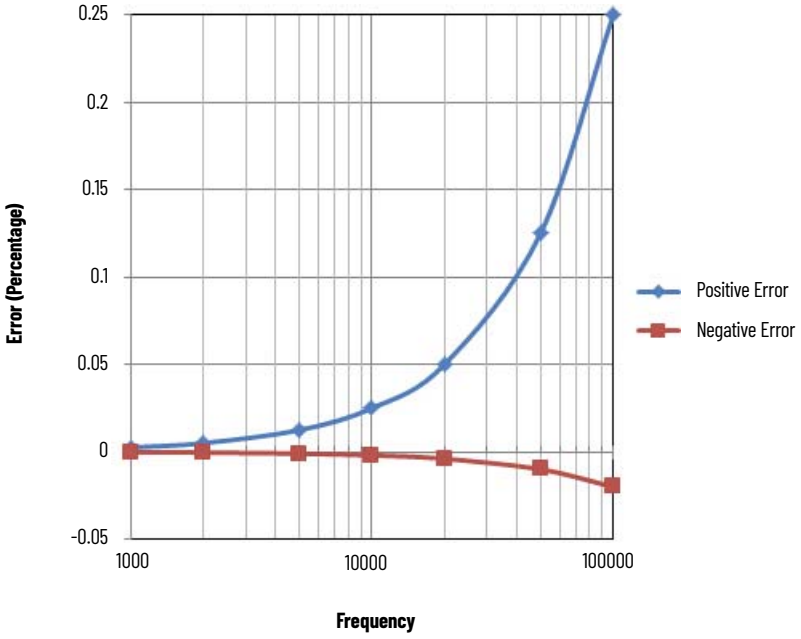
Maximum Volts	IEC 947	Amperes		Amperes Continuous	Volt-Amperes	
		Make	Break		Make	Break
120V AC	AC-15	15 A	1.5 A	4 A	1800V A	1800V A
240V AC		7.5 A	0.75 A			
125V DC	DC-13	0.22 A		1 A	28V A	
24V DC		1.2 A		4 A		

PTO/PWM Output Duty Cycle Error

Turn-on/off time for the PTO/PWM output port is 0.2 µs and 2.5 µs max, respectively. Duty cycle error is:
Positive error = 2.5 µs * F
Negative error = -0.2 µs * F

To get the duty cycle error at a certain frequency, for example, frequency is set to 20 kHz, and duty cycle is set to 30% in Connected Components Workbench software, then the actual duty cycle is 30% (+5/-0.4%).

The following plot shows duty cycle error vs. frequency.



PTO/PWM Typical Readings

PTO/PWM Typical Readings

Frequency (kHz)	%Duty Cycle	Expected Duty Cycle		Typical Duty Cycle (1.27 kΩ load)
		Minimum %	Maximum %	%Duty Cycle
5	5%	4.90%	6.25%	5.48%
5	10%	9.90%	11.25%	10.5%
5	20%	19.90%	21.25%	20.5%
5	40%	39.90%	41.25%	40.5%
5	55%	54.90%	56.25%	55.5%
5	65%	64.90%	66.25%	65.5%
5	75%	74.90%	76.25%	75.5%
5	95%	94.90%	96.25%	95.5%
10	5%	4.80%	7.50%	5.9%
10	10%	9.80%	12.50%	11.0%
10	20%	19.80%	22.50%	21.0%
10	40%	39.80%	42.50%	40.9%
10	55%	54.80%	57.50%	55.9%
10	65%	64.80%	67.50%	65.9%
10	85%	84.80%	87.50%	85.9%
10	95%	94.80%	97.50%	95.9%
25	5%	4.50%	11.25%	7.25%
25	10%	9.50%	16.25%	12.3%
25	20%	19.50%	26.25%	22.4%
25	40%	39.50%	46.25%	42.3%
25	55%	54.50%	61.25%	57.3%
25	65%	64.50%	71.25%	67.3%
25	85%	84.50%	91.25%	87.3%
25	95%	94.50%	100.00%	97.0%
50	5%	4.00%	17.50%	9.7%
50	10%	9.00%	22.50%	14.8%

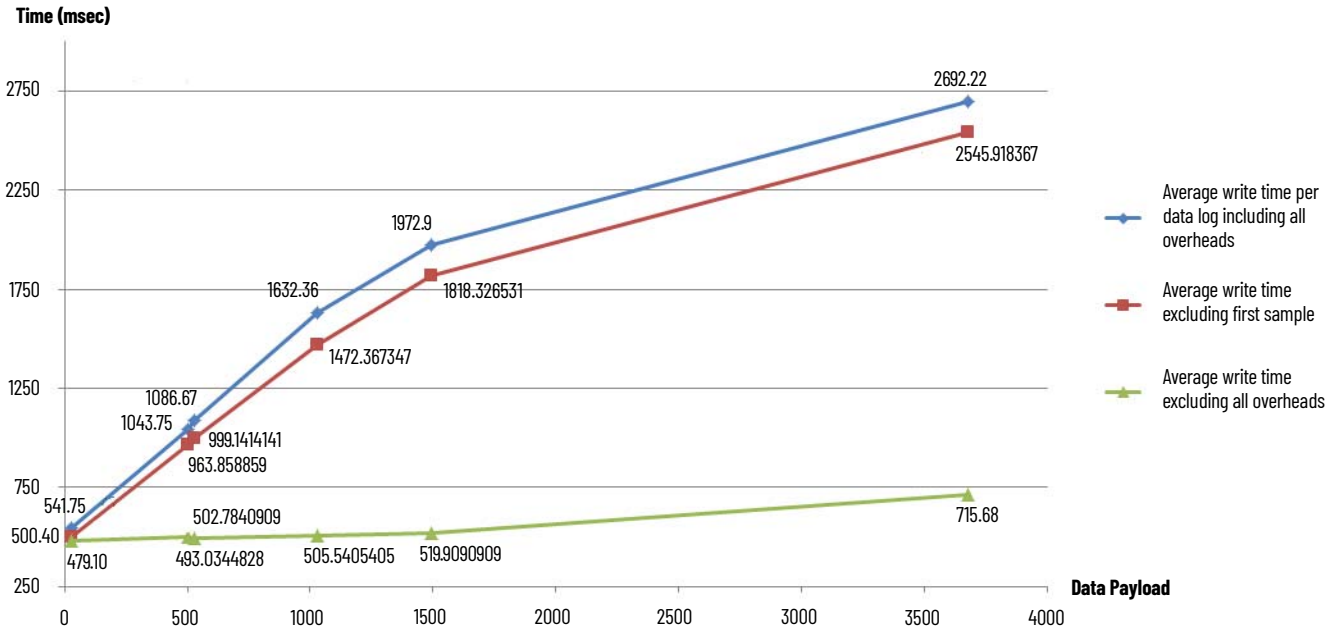
PTO/PWM Typical Readings (Continued)

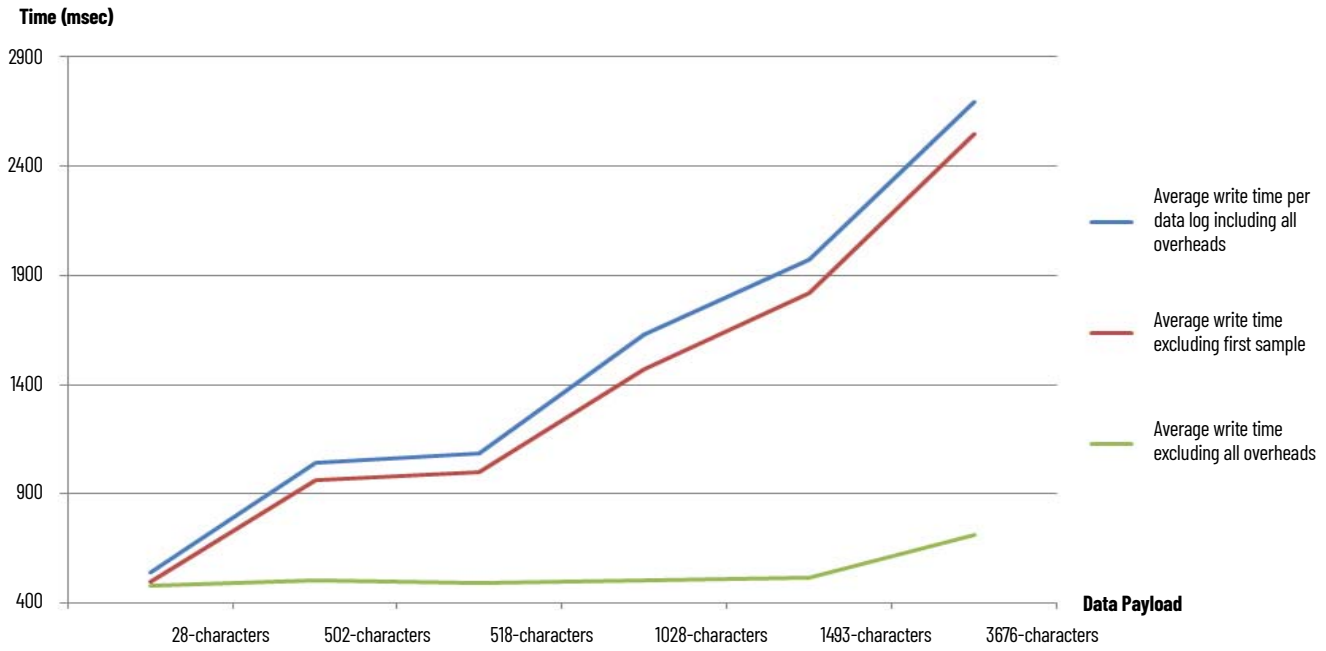
Frequency (kHz)	%Duty Cycle	Expected Duty Cycle		Typical Duty Cycle (1.27 kΩ load)
		Minimum %	Maximum %	%Duty Cycle
50	20%	19.00%	32.50%	24.7%
50	40%	39.00%	52.50%	44.7%
50	55%	54.00%	67.50%	59.6%
50	65%	64.00%	77.50%	69.6%
50	85%	84.00%	97.50%	89.5%
50	95%	94.00%	100.00%	98.1%
100	5%	3.00%	30.00%	14.7%
100	10%	8.00%	35.00%	19.5%
100	20%	18.00%	45.00%	29.6%
100	40%	38.00%	65.00%	49.3%
100	55%	53.00%	80.00%	64.0%
100	65%	63.00%	90.00%	73.8%
100	85%	83.00%	100.00%	92.4%
100	95%	93.00%	100.00%	98.0%

Data Log Performance

Data Log – Data Payload vs. Performance Time

Parameter	Number of Characters					
	28	502	518	1028	1493	3676
Average write time per data log file including all overheads	541.75 ms	1043.75 ms	1086.67 ms	1632.36 ms	1972.9 ms	2696.22 ms
Average write time excluding first sample	500.40 ms	963.86 ms	999.14 ms	1472.37 ms	1818.33 ms	2545.92 ms
Average write time excluding all overheads	479.10 ms	493.03 ms	502.78 ms	505.54 ms	519.91 ms	715.68 ms





Environmental Specifications

Environmental Specifications – Micro800 Controllers

Attribute	Value
Temperature, operating	IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock): **For Micro810 controllers:** 0…55 °C (32…131 °F) **For Micro820, Micro850, Micro870 controllers:** -20…+65 °C (-4…+149 °F)
Temperature, surrounding air, max	**For Micro810 controllers:** 55 °C (131 °F) **For Micro820, Micro850, Micro870 controllers:** 65 °C (149 °F)
Temperature, storage	IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock): -40…+85 °C (-40…+185 °F)
Relative humidity	IEC 60068-2-30 (Test Db, Unpackaged Damp Heat): 5…95% noncondensing
Vibration	IEC 60068-2-6 (Test Fc, Operating): 2 g @ 10…500 Hz
Shock, operating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): **For Micro810 controllers:** 30 g **For Micro820, Micro850, Micro870 controllers:** 25 g
Shock, nonoperating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): **For Micro810 controllers:** 30 g – DIN rail mount 30 g – Panel mount **For Micro820, Micro850, Micro870 controllers:** 25 g – DIN rail mount 45 g – Panel mount
Emissions	IEC 61000-6-4
ESD immunity	IEC 61000-4-2: 6 kV contact discharges 8 kV air discharges

Environmental Specifications – Micro800 Controllers (Continued)

Attribute	Value
Radiated RF immunity	IEC 61000-4-3: 10V/m with 1 kHz sine-wave 80% AM from 80…6000 MHz
EFT/B immunity	IEC 61000-4-4: ±2 kV @ 5 kHz on power ports ±2 kV @ 5 kHz on signal ports **For Micro820, Micro850, Micro870 controllers only:** ±1 kV @ 5 kHz on communication ports
Surge transient immunity	IEC 61000-4-5: **For Micro810 controllers:** ±1 kV line-line(DM) and ±2 kV line-earth(CM) on power ports ±1 kV line-line(DM) and ±2 kV line-earth(CM) on signal ports ±2 kV line-earth(CM) on shielded ports **For Micro820, Micro850, Micro870 controllers:** ±1 kV line-line(DM) and ±2 kV line-earth(CM) on signal ports ±1 kV line-earth(CM) on communication ports
Conducted RF immunity	IEC 61000-4-6: 10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz
Voltage variation	**For Micro810 controllers only:** IEC 61000-4-11: 60% dip for 5 and 50 periods on AC supply ports 30% dip for 0.5 period @ 0° and 180° on AC supply ports 100% dip for 0.5 period @ 0° and 180° on AC supply ports ±10% fluctuations for 15 min on AC supply ports > 95% interruptions for 250 periods on AC supply ports

Certifications

Certifications – Micro800 Controllers

Certification (when product is marked) (1)	Value
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E322657. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E334470.
CE	European Union 2014/30/EU EMC Directive, compliant with: EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2014/35/EU LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11) European Union 2011/65/EU RoHS, compliant with: EN IEC 63000; Technical Documentation
RCM	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
Morocco	Arrêté ministériel n° 6404-15 du 1 er muharram 1437 Arrêté ministériel n° 6404-15 du 29 ramadan 1436
UKCA	2016 No. 1091 – Electromagnetic Compatibility Regulations 2016 No. 1101 – Electrical Equipment (Safety) Regulations 2012 No. 3032 – Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations
EtherNet/IP	**For Micro820, Micro850, Micro870 controllers only:** ODVA conformance tested to EtherNet/IP specifications.

(1) See the Product Certification link at rok.auto/certifications for Declaration of Conformity, Certificates, and other certification details.

Micro800 Expansion I/O Modules

Micro850 and Micro870 controllers support a range of discrete and analog expansion I/O modules to extend the functionality of the controllers.

The Micro800 platform also supports expansion I/O modules from the Rockwell Automation PartnerNetwork™ program. For a list of supported products, use the Technology Partner Locator tool at locator.rockwellautomation.com/Technology and search for "Micro800 System" under Platform.

Discrete Expansion I/O Modules

Micro800 discrete expansion I/O modules are input/output modules that provide On/Off detection and actuation. Discrete input modules interface to sensing devices and detect whether they are On or Off. These modules convert AC or DC On/Off signals from user devices to appropriate logic level for use within the processor. Output modules may be used to drive various output devices. Typical output devices that are compatible with the outputs include motor starters, solenoids, and indicators.

Discrete Expansion I/O Modules

I/O Type	Catalog Number	Description	Page
DC input	2085-IQ16, 2085-IQ16K	16-point 24V DC sink/source input module	24
	2085-IQ32T	32-point 24V DC sink/source input module	
DC output	2085-OV16	16-point 12/24V DC sink transistor output module	25
	2085-OB16	16-point 12/24V DC source transistor output module	
AC input	2085-IA8	8-point 120V AC input module	26
	2085-IM8	8-point 240V AC input module	
AC output	2085-OA8	8-point 120/240V AC triac output module	27
Relay output	2085-OW8	8-point AC/DC relay output module	28
	2085-OW16, 2085-OW16K	16-point AC/DC relay output module	
Power supply	2085-EP24VDC	Expansion I/O power supply for Micro870 controllers	34
Bus terminator	2085-ECR	Terminate the end of the serial communication bus	35

Environmental specifications and certifications for Micro800 expansion I/O modules are provided on page 32.

Specifications – Discrete DC Input Expansion I/O Modules [1]

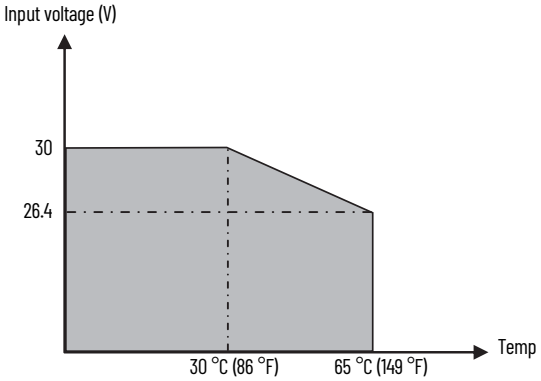
Attribute	2085-IQ16, 2085-IQ16K			2085-IQ32T
Number of inputs	16 sink/source			32 sink/source
Dimensions (HxWxD)	44.5 x 90 x 87 mm (1.75 x 3.54 x 3.42 in.)			
Shipping weight, approx.	260 g (9.17 oz)			
Bus current draw, max	170 mA @ 5V DC			190 mA @ 5V DC
Wire size		Min	Max	
	Solid	0.34 mm^2 (22 AWG)	2.5 mm^2 (14 AWG)	Rated @ 90 °C (194 °F) or greater, 1.2 mm (3/64 in.) insulation max
	Stranded	0.20 mm^2 (22 AWG)	2.5 mm^2 (14 AWG)	
Wiring category [2]	2 – on signal ports			
Terminal screw torque, max	0.5...0.6 N•m (4.4...5.3 lb•in) [3]			
Input circuit type	24V AC/DC sink/source or 24V AC 50/60 Hz			
Power dissipation, total	4.5 W			7 W
Power supply	24V DC			
Status indicators	Channel status - 16 yellow			Channel status - 32 yellow
Isolation voltage	50V (continuous), Reinforced Insulation Type, channel to system Type tested @ 715V DC for 60 s			
Insulation-stripping length	10 mm			
Enclosure type rating	None (open-style)			
North American temp code	T4A			T4

Specifications – Discrete DC Input Expansion I/O Modules [1] (Continued)

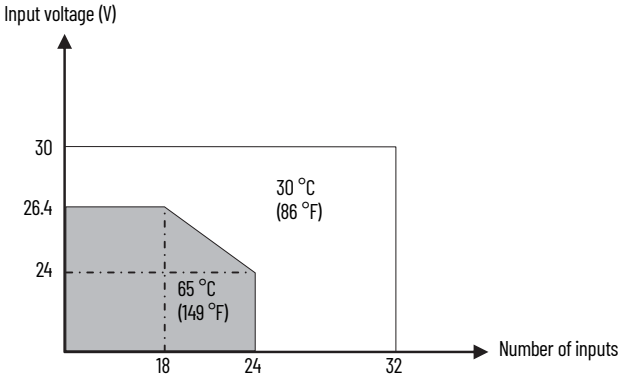
Attribute	2085-IQ16, 2085-IQ16K	2085-IQ32T
Operating voltage range	10...30V DC, Class 2 21.6...26.4V AC, 50/60 Hz, Class 2 See Derating Curve for 2085-IQ16 on page 25 and Derating Curve for 2085-IQ32T on page 25	
Off-state voltage, max	5V DC	
Off-state current, max	1.5 mA	1.2 mA
On-state current, min	1.8 mA @ 10V DC	
On-state current, nom	6.0 mA @ 24V DC	5.2 mA @ 24V DC
On-state current, max	8.0 mA @ 30V DC	7.0 mA @ 30V DC
Input impedance, max	3.9 kΩ	4.6 kΩ
IEC input compatibility	Type 3	Type 1

(1) Meets IEC Type 1 24V DC Input Specifications.
(2) Use this Conductor Category information for planning conductor routing. See Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.
(3) RTB hold down screws should be tightened by hand. They should not be tightened using a power tool.

Derating Curve for 2085-IQ16



Derating Curve for 2085-IQ32T



Specifications – Discrete DC Output Expansion I/O Modules

Attribute	2085-OV16	2085-OB16
Number of outputs	16 sinking	16 sourcing
Operating voltage range	10...30V DC	
On-state voltage, min	10V DC	
On-state voltage, nom	24V DC	
On-state voltage, max	30V DC	
On-state current, max	0.5 A @ 30V DC, per output 8 A, per module	
Dimensions (HxWxD)	44.5 x 90 x 87 mm (1.75 x 3.54 x 3.42 in.)	
Shipping weight, approx.	220 g (7.76 oz)	
Bus current draw, max	200 mA @ 5V DC	

Specifications – Discrete DC Output Expansion I/O Modules (Continued)

Attribute	2085-OV16			2085-OB16
Wire size		**Min**	**Max**	
	Solid	0.34 mm^2 (22 AWG)	2.5 mm^2 (14 AWG)	Rated @ 90 °C (194 °F) or greater, 1.2 mm (3/64 in.) insulation max
	Stranded	0.20 mm^2 (22 AWG)	2.5 mm^2 (14 AWG)	
Wiring category (1)	2 – on signal ports			
Insulation-stripping length	10 mm (0.39 in.)			
Terminal screw torque, max	0.5…0.6 N•m (4.4…5.3 lb•in) (2)			
Output circuit type	24V DC sink			24V DC source
Power dissipation, total	5 W			
Power supply	24V DC, Class 2			
Status indicators	Channel status - 16 yellow			
Isolation voltage	50V (continuous), Reinforced Insulation Type, channel to system Type tested @ 720V AC for 60 s			
Enclosure type rating	None (open-style)			
North American temp code	T4			

(1) Use this Conductor Category information for planning conductor routing. See Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.
(2) RTB hold down screws should be tightened by hand. They should not be tightened using a power tool.

Specifications – Discrete AC Input Expansion I/O Modules

Attribute	2085-IA8			2085-IM8
Number of inputs	8			
Voltage category	120V AC			240V AC
Operating voltage range	74…120V AC			159…240V AC
Off-state voltage, max	20V AC			40V AC
Off-state current, max	2.5 mA			
On-state current, min	5.0 mA @ 74V AC			4.0 mA @ 159V AC
On-state current, max	12.5 mA @ 120V AC			7.0 mA @ 240V AC
Input impedance, max	22.2 kΩ			
Inrush current, max	450 mA			
Input filter time Off to On On to Off	≤20 ms			
IEC type compliance	Type 3			
Dimensions (HxWxD)	28 x 90 x 87 mm (1.10 x 3.54 x 3.42 in.)			
Shipping weight, approx.	140 g (4.93 oz)			
Bus current draw, max	5V DC, 150 mA			
Wire size		**Min**	**Max**	
	Solid	0.34 mm^2 (22 AWG)	2.5 mm^2 (14 AWG)	Rated @ 90 °C (194 °F) or greater, 1.2 mm (3/64 in.) insulation max
	Stranded	0.20 mm^2 (22 AWG)	2.5 mm^2 (14 AWG)	
Insulation-stripping length	10 mm (0.39 in.)			
Wiring category (1)	2 – on signal ports			
Wire type	Copper			
Terminal screw torque, max	0.5…0.6 N•m (4.4…5.3 lb•in) (2)			
Power supply	120V AC			240V AC
Power dissipation, total	2.36 W			2.34 W
Enclosure type rating	None (open-style)			

Specifications – Discrete AC Input Expansion I/O Modules (Continued)

Attribute	2085-IA8	2085-IM8
Status indicators	Channel status - 8 yellow	
Isolation voltage	150V (continuous), Reinforced Insulation Type, channel to system Type tested @ 1950V DC for 60 s	240V (continuous), Reinforced Insulation Type, channel to system Type tested @ 3250V DC for 60 s
North American temp code	T4	

(1) Use this Conductor Category information for planning conductor routing. See Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.
(2) RTB hold down screws should be tightened by hand. They should not be tightened using a power tool.

Specifications – Discrete AC Output Expansion I/O Module

Attribute	2085-OA8
Number of outputs	8
Voltage category	120V/230V AC
Operating voltage range	120…240V AC
Output voltage, min	85V AC
Output voltage, max	240V AC
Off-state current, max	2.5 mA
On-state current, min	10 mA per output
On-state current, max	0.5 A per output
On-state current, per module, max	4 A
Off-state voltage drop, max	1.5V AC @ 0.5 A 2.5V AC @ 10 mA
Fusing	Not protected. A suitable rating fuse is recommended to protect outputs.
Output signal delay Off to On On to Off	 9.3 ms for 60 Hz, 11 ms for 50 Hz 9.3 ms for 60 Hz, 11 ms for 50 Hz
Surge current, max	5 A
Dimensions (HxWxD)	28 x 90 x 87 mm (1.10 x 3.54 x 3.42 in.)
Shipping weight, approx.	140 g (4.93 oz)
Bus current draw, max	5V DC, 180 mA
Wire size	See nested table below
Insulation-stripping length	10 mm (0.39 in.)
Wiring category (1)	2 – on signal ports
Wire type	Copper
Terminal screw torque, max	0.5…0.6 N•m (4.4…5.3 lb•in) (2)
Input/output circuit type	120/240V AC output
Power supply	120/240V AC
Power dissipation, total	5.19 W
Enclosure type rating	None (open-style)
Status indicators	Channel status - 8 yellow
Isolation voltage	240V (continuous), Reinforced Insulation Type, channel to system Type tested @ 3250V DC for 60 s
North American temp code	T4

Wire size:

	Min	Max	
Solid	0.34 mm^2 (22 AWG)	2.5 mm^2 (14 AWG)	Rated @ 90 °C (194 °F) or greater, 1.2 mm (3/64 in.) insulation max
Stranded	0.20 mm^2 (22 AWG)	2.5 mm^2 (14 AWG)	

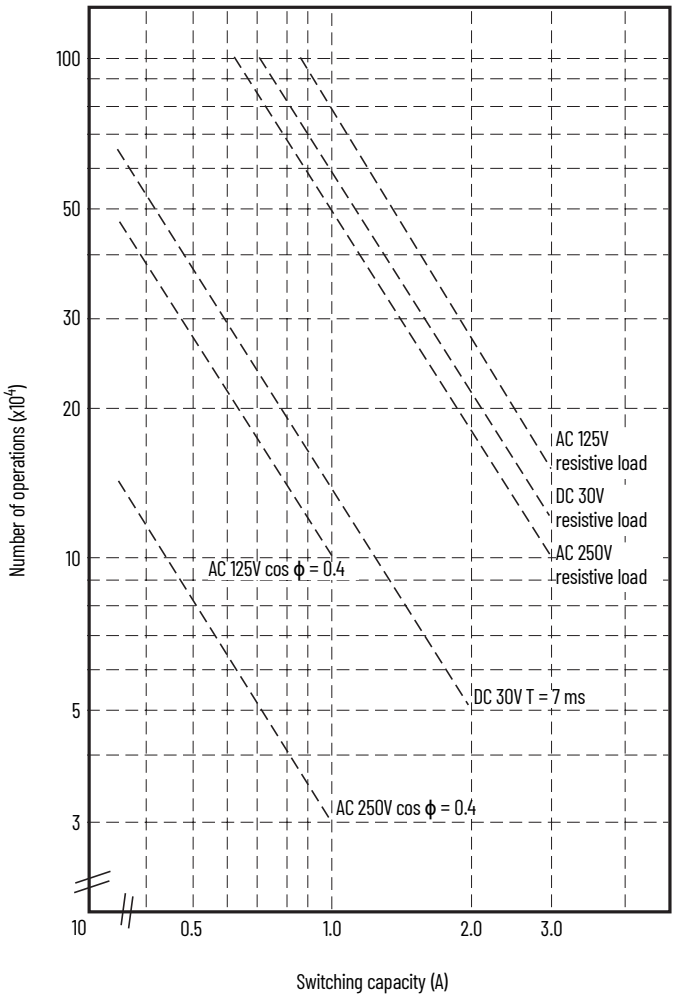
(1) Use this Conductor Category information for planning conductor routing. See Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.
(2) RTB hold down screws should be tightened by hand. They should not be tightened using a power tool.

Specifications – Discrete Relay Output Expansion I/O Modules

<table>
<tr><th>Attribute</th><th>2085-0W8</th><th>2085-0W16, 2085-0W16K</th></tr>
<tr><td>Number of outputs</td><td>8 relay</td><td>16 relay</td></tr>
<tr><td>Dimensions (HxWxD)</td><td>28 x 90 x 87 mm (1.10 x 3.54 x 3.42 in.)</td><td>44.5 x 90 x 87 mm (1.75 x 3.54 x 3.42 in.)</td></tr>
<tr><td>Shipping weight, approx.</td><td>140 g (4.93 oz)</td><td>300 g (10.58 oz)</td></tr>
<tr><td>Wire size</td><td colspan="2"><table><tr><th></th><th>Min</th><th>Max</th><th></th></tr><tr><td>Solid</td><td>0.34 mm^2 (22 AWG)</td><td>2.5 mm^2 (14 AWG)</td><td rowspan="2">Rated @ 90 °C (194 °F) or greater, 1.2 mm (3/64 in.) insulation max</td></tr><tr><td>Stranded</td><td>0.20 mm^2 (22 AWG)</td><td>2.5 mm^2 (14 AWG)</td></tr></table></td></tr>
<tr><td>Insulation strip length</td><td colspan="2">10 mm (0.39 in.)</td></tr>
<tr><td>Wiring category[1]</td><td colspan="2">2 – on signal ports</td></tr>
<tr><td>Wire type</td><td colspan="2">Copper</td></tr>
<tr><td>Terminal screw torque, max</td><td colspan="2">0.5...0.6 NN•m (4.4...5.3 lb•in)[2]</td></tr>
<tr><td>Bus current draw, max</td><td>5V DC, 120 mA
24V DC, 50 mA</td><td>5V DC, 160 mA
24V DC, 100 mA</td></tr>
<tr><td>Load current, max</td><td colspan="2">2 A</td></tr>
<tr><td>Power dissipation, total</td><td>2.72 W</td><td>5.14 W</td></tr>
<tr><td>Relay contact
(0.35 power factor)</td><td colspan="2"><table><tr><th rowspan="2">Maximum Volts</th><th colspan="2">Amperes</th><th rowspan="2">Amperes Continuous</th><th colspan="2">Volt-Amperes</th></tr><tr><th>Make</th><th>Break</th><th>Make</th><th>Break</th></tr><tr><td>120V AC</td><td>15 A</td><td>1.5 A</td><td rowspan="2">2.0 A</td><td rowspan="2">1800V A</td><td rowspan="2">180V A</td></tr><tr><td>240V AC</td><td>7.5 A</td><td>0.75 A</td></tr><tr><td>24V DC</td><td colspan="2">1.0 A</td><td rowspan="2">1.0 A</td><td colspan="2" rowspan="2">28V A</td></tr><tr><td>125V DC</td><td colspan="2">0.22 A</td></tr></table></td></tr>
<tr><td>Minimum load, per point</td><td colspan="2">10 mA per point</td></tr>
<tr><td>Off-state leakage, max</td><td colspan="2">1.5 mA</td></tr>
<tr><td>Status indicators</td><td>Channel status - 8 yellow</td><td>Channel status - 16 yellow</td></tr>
<tr><td>Isolation voltage</td><td colspan="2">240V (continuous), Reinforced Insulation Type, channel to system
Type tested @ 3250V DC for 60 s</td></tr>
<tr><td>Pilot duty rating</td><td colspan="2">C300, R150</td></tr>
<tr><td>Enclosure type rating</td><td colspan="2">None (open-style)</td></tr>
<tr><td>North American temp code</td><td colspan="2">T4</td></tr>
</table>

(1) Use this Conductor Category information for planning conductor routing. See Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.
(2) RTB hold down screws should be tightened by hand. They should not be tightened using a power tool.

Relay Life Chart for 2085-0W8, 2085-0W16, and 2085-0W16K



Analog Expansion I/O Modules

Analog expansion I/O modules are interface modules that convert analog signals to digital values for inputs and convert digital values to analog signals for outputs. Controllers can then use these signals for control purposes.

Analog Expansion I/O Modules

I/O Type	Catalog Number	Description	Page
Input	2085-IF4	4-channel 14-bit isolated voltage/current input	29
	2085-IF8, 2085-IF8K	8-channel 14-bit isolated voltage/current input	
Output	2085-OF4, 2085-OF4K	4-channel 12-bit isolated voltage/current output	30

Environmental specifications and certifications for Micro800 expansion I/O modules are provided on page 32.

Specifications – Analog Input Expansion I/O Modules

Attribute	2085-IF4	2085-IF8, 2085-IF8K
Number of inputs	4	8
Resolution Voltage Current	14 bits (13 bits plus sign bit) 1.28 mV/cnt unipolar; 1.28 mV/cnt bipolar 1.28 µA/cnt	
Data format	Left justified, 16-bit 2s complement	
Conversion type	SAR	
Update rate	<2 ms per enabled channel without 50/60 Hz rejection <8 ms for all channel 8 ms with 50/60 Hz rejection	

Specifications – Analog Input Expansion I/O Modules (Continued)

Attribute	2085-IF4	2085-IF8, 2085-IF8K
Step response time up to 63%	4…60 ms without 50/60 Hz rejection – depends on number of enabled channels and filter setting 600 ms with 50/60 Hz rejection	
Input current terminal, user configurable	4…20 mA (default) 0…20 mA	
Input voltage terminal, user configurable	±10V 0…10V	
Input impedance Voltage terminal Current terminal	 >1 MΩ <100 Ω	
Absolute accuracy	±0.10% Full Scale @ 25 °C (77 °F)	
Accuracy drift with temp Voltage terminal Current terminal	 0.00428% Full Scale/° C 0.00407% Full Scale/° C	
Calibration required	Factory calibrated. No customer calibration supported.	
Overload, max	30V continuous or 32 mA continuous, one channel at a time.	
Channel diagnostics	Over and under range or open circuit condition by bit reporting	
Dimensions (HxWxD)	28 x 90 x 87 mm (1.1 x 3.54 x 3.42 in.)	44.5 x 90 x 87 mm (1.75 x 3.54 x 3.42 in.)
Shipping weight, approx.	140 g (4.93 oz)	270 g (9.52 oz)
Bus current draw, max	5V DC, 100 mA 24V DC, 50 mA	5V DC, 110 mA 24V DC, 50 mA
Wire size	See nested table below	
Wiring category[1]	2 – on signal ports	
Wire type	Shielded	
Terminal screw torque	0.5…0.6 N•m (4.4…5.3 lb•in) [2]	
Power dissipation, total	1.7 W	1.75 W
Enclosure type rating	None (open-style)	
Status indicators	1 green health 4 red error	1 green health 8 red error
Isolation voltage	50V (continuous), Reinforced Insulation Type, channel to system Type tested @ 720V DC for 60 s	
North American temp code	T4A	T5

	Min	Max	
Solid	0.34 mm^2 (22 AWG)	2.5 mm^2 (14 AWG)	Rated @ 90 °C (194 °F) or greater, 1.2 mm (3/64 in.) insulation max
Stranded	0.20 mm^2 (22 AWG)	2.5 mm^2 (14 AWG)	

(1) Use this Conductor Category information for planning conductor routing. See Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.
(2) RTB hold down screws should be tightened by hand. They should not be tightened using a power tool.

Specifications – Analog Output Expansion I/O Modules

Attribute	2085-OF4, 2085-OF4K
Number of outputs	4
Resolution Voltage Current	12 bits unipolar; 11 bits plus sign bipolar 2.56 mV/cnt unipolar; 5.13 mV/cnt bipolar 5.13 µA/cnt
Data format	Left justified, 16-bit 2s complement
Step response time up to 63%	2 ms
Conversion rate, max	2 ms per channel
Output current terminal, user configurable	0 mA output until module is configured 4…20 mA (default) 0…20 mA
Output voltage terminal, user configurable	±10V 0…10V
Current load on voltage output, max	3 mA
Absolute accuracy Voltage terminal Current terminal	 0.133% Full Scale @ 25 °C (77 °F) or better 0.425% Full Scale @ 25 °C (77 °F) or better

Specifications – Analog Output Expansion I/O Modules (Continued)

Attribute	2085-OF4, 2085-OF4K			
Accuracy drift with temp Voltage terminal Current terminal	0.0045% Full Scale/° C 0.0069% Full Scale/° C			
Resistive load on mA output	15…500 Ω @ 24V DC			
Dimensions (HxWxD)	28 x 90 x 87 mm (1.1 x 3.54 x 3.42 in.)			
Shipping weight, approx.	200 g (7.05 oz)			
Bus current draw, max	5V DC, 160 mA 24V DC, 120 mA			
Wire size		**Min**	**Max**	
	Solid	0.34 mm^2 (22 AWG)	2.5 mm^2 (14 AWG)	Rated @ 90 °C (194 °F) or greater, 1.2 mm (3/64 in.) insulation max
	Stranded	0.20 mm^2 (22 AWG)	2.5 mm^2 (14 AWG)	
Wiring category[1]	2 – on signal ports			
Wire type	Shielded			
Terminal screw torque	0.5…0.6 N•m (4.4…5.3 lb•in)[2]			
Power dissipation, total	3.7 W			
Enclosure type rating	None (open-style)			
Status indicators	1 green health			
Isolation voltage	50V (continuous), Reinforced Insulation Type, channel to system Type tested @ 720V DC for 60 s			
North American temp code	T4A			

(1) Use this Conductor Category information for planning conductor routing. See Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.
(2) RTB hold down screws should be tightened by hand. They should not be tightened using a power tool.

Specialty Expansion I/O Module

The 2085-IRT4 expansion I/O module allows you to configure a sensor type for each of four input channels that linearizes analog signal into a temperature value.

Specialty Expansion I/O Module

I/O Type	Catalog Number	Description	Page
Temperature input	2085-IRT4	4-channel thermocouple/RTD input	31

Environmental specifications and certifications for Micro800 expansion I/O modules are provided on page 32.

Specifications – Specialty Expansion I/O Module

Attribute	2085-IRT4			
Number of inputs	4			
Dimensions (HxWxD)	44.5 x 90 x 87 mm (1.75 x 3.54 x 3.42 in.)			
Shipping weight, approx.	220 g (7.76 oz)			
Bus current draw, max	5V DC, 160 mA 24V DC, 50 mA			
Wire size		**Min**	**Max**	
	Solid	0.34 mm^2 (22 AWG)	2.5 mm^2 (14 AWG)	Rated @ 90 °C (194 °F) or greater, 1.2 mm (3/64 in.) insulation max
	Stranded	0.20 mm^2 (22 AWG)	2.5 mm^2 (14 AWG)	
Wiring category[1]	2 – on signal ports			
Terminal screw torque	0.5…0.6 N•m (4.4…5.3 lb•in)[2]			
Input type, thermocouple	B, C, E, J, K, TXK/XK (L), N, R, S, T			

Specifications – Specialty Expansion I/O Module (Continued)

Attribute	2085-IRT4
Input type, RTD	100 Ω Pt α = 0.00385 Euro 200 Ω Pt α = 0.00385 Euro 100 Ω Pt α = 0.003916 U.S 200 Ω Pt α = 0.003916 U.S. 100 Ω Nickel 618 200 Ω Nickel 618 120 Ω Nickel 672 10 Ω Copper 427 mV range: 0…100 mV Ohm input: 0…500 Ω
Resolution	16 bits
Channel update time, typical	12…500 ms per enabled channel
Input impedance	>10 MΩ
Accuracy Thermocouple input RTD input	 ±0.5…±3.0 °C (±0.9…±5.4 °F) ±0.2…±0.6 °C (±0.36…±1.08 °F)
Power dissipation, total	2 W
Enclosure type rating	None (open-style)
Status indicators	1 green health
Isolation voltage	50V (continuous), Reinforced Insulation Type, channel to system Type tested @ 720V DC for 60 s
North American temp code	T4

(1) Use this Conductor Category information for planning conductor routing. See Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.
(2) RTB hold down screws should be tightened by hand. They should not be tightened using a power tool.

Environmental Specifications

Environmental Specifications – Micro800 Expansion I/O Modules

Attribute	Value
Temperature, operating	IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock): -20…+65 °C (-4…+149 °F)
Temperature, surrounding air, max	65 °C (149 °F)
Temperature, nonoperating	IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock): -40…+85 °C (-40…+185 °F)
Relative humidity	IEC 60068-2-30 (Test Db, Unpackaged Damp Heat): 5…95% noncondensing
Vibration	IEC 60068-2-6 (Test Fc, Operating): 2 g @ 10…500 Hz
Shock, operating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 25 g
Shock, nonoperating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 25 g – DIN rail mount 35 g – Panel Mount
Emissions	IEC 61000-6-4
ESD immunity	IEC 61000-4-2: 6 kV contact discharges 8 kV air discharges
Radiated RF immunity	IEC 61000-4-3: 10V/m with 1 kHz sine-wave 80% AM from 80…6000 MHz
EFT/B immunity	IEC 61000-4-4: ±2 kV @ 5 kHz on signal ports ±2 kV @ 100 kHz on signal ports
Surge transient immunity	IEC 61000-4-5: ±1 kV line-line(DM) and ±2 kV line-earth(CM) on signal ports
Conducted RF immunity	IEC 61000-4-6: 10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz

Certifications

Certifications – Micro800 Expansion I/O Modules

Certification (when product is marked)[1]	Value
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E322657. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E334470
CE	European Union 2014/30/EU EMC Directive, compliant with: EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2011/65/EU RoHS, compliant with: EN IEC 63000; Technical Documentation **For 2085-IA8, 2085-IM8, 2085-OA8, 2085-OW8, 2085-OW16, 2085-OW16K only:** European Union 2014/35/EU LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
RCM	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
Morocco	Arrêté ministériel n° 6404-15 du 29 ramadan 1436 **For 2085-IA8, 2085-IM8, 2085-OA8, 2085-OW8, 2085-OW16, 2085-OW16K only:** Arrêté ministériel n° 6404-15 du 1 er muharram 1437
UKCA	2016 No. 1091 – Electromagnetic Compatibility Regulations 2012 No. 3032 – Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations **For 2085-IA8, 2085-IM8, 2085-OA8, 2085-OW8, 2085-OW16, 2085-OW16K only:** 2016 No. 1101 – Electrical Equipment (Safety) Regulations

(1) See the Product Certification link at rok.auto/certifications for Declaration of Conformity, Certificates, and other certification details.

Expansion I/O Power Supply

Use only in a Micro870 system with more than four expansion I/O modules.

Specifications - Expansion I/O Power Supply

Attribute	2085-EP24VDC
I/O module capacity	4 modules, each module power limited to 4.2 W
Input voltage rating	21.4...26.4V DC Class 2 or Limited Voltage Limited Current Source (LVLC)
Input voltage, nominal	24V DC Verify that the external 24V power supply has a minimum ride-through time of 10 ms at max load.
Power consumption, max	24 W
Inrush current, max	6 A for 10 ms
Bus side power rating, max	24V DC (±10%) @ 700 mA 5V DC (±5%) @ 900 mA Maximum bus power limited to 16.8 W
Input overvoltage protection	Reverse polarity protected
Interruption	Output voltage stays within specifications when input drops out for 10 ms @ 24V with max load. More than 10 ms interruption can cause the Micro870 controller to fault.
Module location	Between Micro800 expansion I/O modules
Limitations	No isolation provided between input power to Bulletin 2085 bus power
Indicators	1 green – 5V system power
Dimensions (HxWxD)	110.0 x 36.2 x 87.0 mm (4.3 x 1.4 x 3.4 in.)
Shipping weight, approx.	0.09 kg (0.02 lb)
Wire size	See nested table below
Wiring category[1]	1 – on power ports
Removable Terminal Block (RTB) screw torque[2]	0.5...0.6 N•m (4.4...5.3 lb•in)
Enclosure type rating	None (open-style)
North American temp code	T4

	Min	Max	
Solid	0.34 mm^2 (22 AWG)	2.5 mm^2 (14 AWG)	Rated @ 90 °C (194 °F) or greater, 1.2 mm (3/64 in.) insulation max
Stranded	0.20 mm^2 (22 AWG)	2.5 mm^2 (14 AWG)	

(1) Use this Conductor Category information for planning conductor routing. See Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.
(2) RTB hold down screws should be tightened by hand. They should not be tightened using a power tool.

Environmental Specifications – Expansion I/O Power Supply

Attribute	2085-EP24VDC
Temperature, operating	IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock): -20...+65 °C (-4...+149 °F)
Temperature, surrounding air, max	65 °C (149 °F)
Temperature, nonoperating	IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock): -40...+85 °C (-40...+185 °F)
Relative humidity	IEC 60068-2-30 (Test Db, Unpackaged Damp Heat): 5...95% noncondensing
Vibration	IEC 60068-2-6 (Test Fc, Operating): 2 g @ 10...500 Hz
Shock, operating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 25 g
Shock, nonoperating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 25 g – DIN rail mount 35 g – Panel mount
Emissions	IEC 61000-6-4

Environmental Specifications – Expansion I/O Power Supply (Continued)

Attribute	2085-EP24VDC
ESD immunity	IEC 61000-4-2: 6 kV contact discharges 8 kV air discharges
Radiated RF immunity	IEC 61000-4-3: 10V/m with 1 kHz sine-wave 80% AM from 80…6000 MHz
EFT/B immunity	IEC 61000-4-4: ±2 kV @ 5 kHz on power ports
Surge transient immunity	IEC 61000-4-5: ±1 kV line-line(DM) and ±2 kV line-earth(CM) on power ports
Conducted RF immunity	IEC 61000-4-6: 10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz

Certifications – Expansion I/O Power Supply

Certification (when product is marked)(1)	2085-EP24VDC
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E322657. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E334470
CE	European Union 2014/30/EU EMC Directive, compliant with: EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2011/65/EU RoHS, compliant with: EN IEC 63000; Technical Documentation
RCM	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
Morocco	Arrêté ministériel n° 6404-15 du 29 ramadan 1436
UKCA	2016 No. 1091 – Electromagnetic Compatibility Regulations 2012 No. 3032 – Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations

(1) See the Product Certification link at rok.auto/certifications for Declaration of Conformity, Certificates, and other certification details.

Bus Terminator

The bus terminator, 2085-ECR, serves as an end cap and terminates the end of the serial communication bus. It is required whenever an expansion I/O module is connected to the controller and should be connected to the last expansion I/O module in the system.

Micro800 Plug-in Modules

Micro800 plug-in modules extend the functionality of embedded I/O without increasing the footprint of the controller. It improves performance by adding additional processing power or capabilities and adds additional communication functionality. Micro820, Micro830®, Micro850, and Micro870 controllers support plug-in modules.

The Micro800 platform also supports plug-in modules from the Rockwell Automation PartnerNetwork program. For a list of supported products, use the Technology Partner Locator tool at locator.rockwellautomation.com/Technology and search for "Micro800 System" under Platform.

Digital Plug-in Modules

Digital Plug-in Modules

I/O Type	Catalog Number	Description	Page
Input	2080-IQ4	4-point 12/24V DC sink/source input module	36
Output	2080-OB4	4-point 12/24V DC source output module	37
	2080-OV4	4-point 12/24V DC sink output module	
Combination	2080-IQ4OB4	8-point 12/24V DC sink/source input, 12/24V DC source output module	37
	2080-IQ4OV4	8-point 12/24V DC sink/source input, 12/24V DC sink output module	
Relay output	2080-OW4I	4-point AC/DC relay output module	38

Environmental specifications and certifications for Micro800 plug-in modules are provided on page 46.

Specifications – Digital Input Plug-in Module

Attributes	2080-IQ4			
Number of inputs	4			
On-state voltage, min	9V DC 10.25V AC (rms)			
On-state voltage, max	30V DC 30V AC (rms)			
On-state current, min	2 mA @ 9V DC 2 mA @ 9V AC (rms)			
On-state current, nom	3 mA @ 24V DC			
On-state current, max	5 mA			
Off-state voltage, max	5V DC 3.5V AC (rms)			
Off-state current, max	1.5 mA			
IEC compatibility	Type 3			
Input impedance	0...3V, >4 KΩ 3...12V, 3.5 KΩ min 12...30V, >4 KΩ <10 KΩ			
Input filter time, ON to OFF	8...10 ms AC/DC			
Mounting torque	0.2 N•m (1.48 lb•in)			
Status indicators	Channel status - 4 yellow			
Terminal base screw torque	0.22...0.25 N•m (1.95...2.21 lb•in) using a 2.5 mm (0.10 in.) screwdriver			
Isolation voltage	50V (continuous), Basic Insulation Type, Inputs to Backplane Type tested for 60 s @ 720V DC, Inputs to Backplane			
Wire size		**Min**	**Max**	
	Solid	0.2 mm^2 (24 AWG)	2.5 mm^2 (14 AWG)	Rated @ 90 °C (194 °F) or greater, 1.2 mm (3/64 in.) insulation max
	Stranded			
Wiring category (1)	2 – on signal ports 2 – on power ports			
Enclosure type rating	None (open-style)			
North American temp code	T4			

(1) Use this Conductor Category information for planning conductor routing. See Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

Specifications – Digital Output Plug-in Modules

Attributes	2080-OB4	2080-OV4
Number of outputs	4 source	4 sink
On-state voltage, min	10V DC	
On-state voltage, nom	24V DC	
On-state voltage, max	30V DC	
On-state current, min	5.0 mA @ 10V DC	
On-state current, nom	3.0 mA @ 24V DC	
On-state current, max	0.5 A, steady state 2 A, surge for 2 s, min	
Power supply voltage, min	10.8V DC	
Power supply voltage, max	30V DC	
Mounting torque	0.2 N•m (1.48 lb•in)	
Status indicators	Channel status - 4 yellow	
Terminal base screw torque	0.22…0.25 N•m (1.95…2.21 lb•in) using a 2.5 mm (0.10 in.) screwdriver	
Isolation voltage	50V (continuous), Basic Insulation Type, Inputs to Outputs, I/Os to Backplane Type tested for 60 s @ 720V DC, I/Os to Backplane	
Wire size	**Min** / **Max** Solid / Stranded: 0.2 mm^2 (24 AWG) – 2.5 mm^2 (14 AWG); Rated @ 90 °C (194 °F) or greater, 1.2 mm (3/64 in.) insulation max	
Wiring category (1)	2 – on signal ports 2 – on power ports	
Enclosure type rating	None (open-style)	
North American temp code	T4	

(1) Use this Conductor Category information for planning conductor routing. See Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

Specifications – Digital Combination Plug-in Modules

Attributes	2080-IQ4OB4	2080-IQ4OV4
Number of I/O	4 channel inputs/source outputs combination	4 channel inputs/sink outputs combination
Inputs		
On-state voltage, min	9.0V DC 10.25V AC (rms)	
On-state voltage, max	30V DC 30V AC (rms)	
On-state current, min	2.0 mA @ 9V DC 2.0 mA @ 9V AC (rms)	
On-state current, nom	3.0 mA @ 24V DC	
On-state current, max	5.0 mA	
Off-state voltage, max	5V DC 3.5V AC (rms)	
Off-state current, max	1.5 mA	
IEC compatibility	Type 3	
Input impedance	0…3V, >4 KΩ 3…12V, 3.5 KΩ min 12…30V, >4 KΩ <10 KΩ	
Input filter time, ON to OFF	8…10 ms AC/DC	
Outputs		
On-state voltage, min	10V DC	
On-state voltage, nom	24V DC	
On-state voltage, max	30V DC	
On-state current, min	5.0 mA @ 10V DC 2 A, surge for 2 s	
On-state current, max	0.5 A max, steady state	
Power supply voltage, min	10.8V DC	
Power supply voltage, max	30V DC	

Specifications – Digital Combination Plug-in Modules (Continued)

Attributes	2080-IQ4OB4	2080-IQ4OV4
Mounting torque	0.2 N•m (1.48 lb•in)	
Status indicators	Channel status - 8 yellow	
Terminal base screw torque	0.22…0.25 N•m (1.95…2.21 lb•in) using a 2.5 mm (0.10 in.) screwdriver	
Isolation voltage	50V (continuous), Basic Insulation Type, Inputs to Outputs, I/Os to Backplane Type tested for 60 s @ 720V DC, I/Os to Backplane	
Wire size		

	Min	Max	
Solid Stranded	0.2 mm^2 (24 AWG)	2.5 mm^2 (14 AWG)	Rated @ 90 °C (194 °F) or greater, 1.2 mm (3/64 in.) insulation max

Wiring category (1)	2 – on signal ports 2 – on power ports
Enclosure type rating	None (open-style)
North American temp code	T4

(1) Use this Conductor Category information for planning conductor routing. See Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

Specifications – Digital Relay Output Plug-in Module

Attribute	2080-OW4I
Number of outputs	4-channel relay
Inrush current	<120 mA @ 3.3V <120 mA @ 24V
Backplane power	3.3V DC, 38 mA
Output current, resistive	2 A @ 5…30V DC 2 A @ 125V AC 2 A @ 240V AC
Output current, inductive	1.0 A steady state @ 5…28V DC 0.93 A steady state @ 30V DC 2.0 A steady state, 15 A make @ 125V AC, PF – cos θ = 0.4 2.0 A steady state, 7.5 A make @ 240V AC, PF – cos θ = 0.4
Output power, resistive, max	250VA for 125V AC resistive loads 480VA for 240V AC resistive loads 60VA for 30V DC resistive loads
Output power, inductive break, max	180VA for 125V AC inductive loads 180VA for 240V AC inductive loads 28VA for 28.8V DC inductive loads
Minimum load, per point	10 mA
Initial contact resistance of relay, max	30 mΩ
Output delay time, max Off to On On to Off	10 ms
Mounting torque	0.2 N•m (1.48 lb•in)
Status indicators	Channel status - 8 yellow
Terminal base screw torque, max	0.19 N•m (1.7 lb•in) using a 2.5 mm (0.10 in.) screwdriver
Wire size	

	Min	Max	
Solid	0.05 mm^2 (30 AWG)	1.31 mm^2 (16 AWG)	Rated @ 90 °C (194 °F) or greater, 1.2 mm (3/64 in.) insulation max

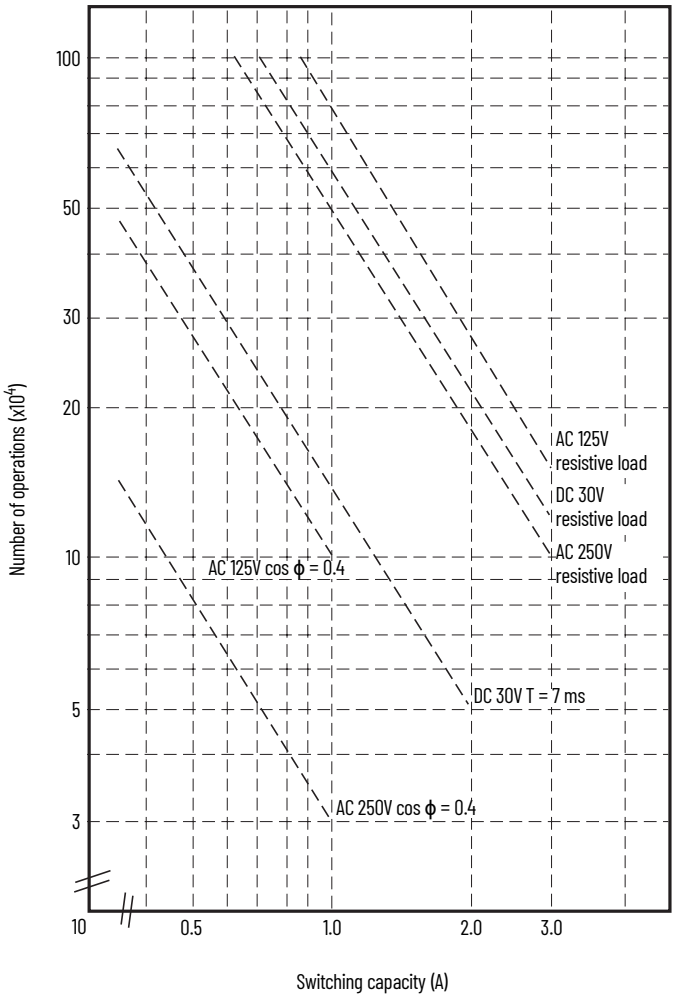
Wiring category (1)	2 – on signal ports 2 – on power ports
Wire type	Copper
Insulation-stripping length	5 mm
Pilot duty rating	C300, R150
Enclosure type rating	None (open-style)
North American temp code	T4

(1) Use this Conductor Category information for planning conductor routing. See Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

Relay Contacts Ratings (0.35 power factor) – 2080-OW4I

Maximum Volts	Amperes		Amperes Continuous	Volt-Amperes	
	Make	Break		Make	Break
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				

Relay Life Chart for 2080-OW4I



Analog Plug-in Modules

Analog Plug-in Modules

I/O Type	Catalog Number	Description	Page
Input	2080-IF2, 2080-IF2K	2-channel non-isolated unipolar voltage/current analog input module	40
	2080-IF4	4-channel non-isolated unipolar voltage/current analog input module	
Output	2080-OF2	2-channel non-isolated unipolar voltage/current analog output module	40

Environmental specifications and certifications for Micro800 plug-in modules are provided on page 46.

Specifications – Analog Input Plug-in Modules

Attribute	2080-IF2, 2080-IF2K	2080-IF4
Number of inputs	2 unipolar non-isolated	4 unipolar non-isolated
Voltage range	0…10V DC	
Current range	0…20 mA	
Input impedance Voltage mode Current mode	 >100 kΩ 250 Ω	
Resolution, max	12 bits unipolar, with software selected option for 50 Hz, 60 Hz, 250 Hz, 500 Hz	
Data range	0…65535	
Overall accuracy (1) Voltage terminal Current terminal	 ±1% full scale @ 25 °C (77 °F) ±1% full scale @ 25 °C (77 °F)	
Non-linearity (in percent full scale)	±0.1%	
Repeatability (2)	±0.1%	
Module error over full temperature range Voltage Current	-20…+65 °C (-4…+149 °F) ±1.5% ±2.0%	
Input channel configuration	Through configuration software or the user program	
Field input calibration	Not required	
Update time	180 ms per enabled channel	
Input group to bus isolation	None	
Channel to channel isolation	None	
Power consumption	<60 mA @ 3.3V	
Operating altitude	2000 m	
Cable length, max	10 m	
Mounting torque	0.2 N•m (1.48 lb•in)	
Terminal screw torque	0.22…0.25 N•m (1.95…2.21 lb•in) using a 2.5 mm (0.10 in.) screwdriver	
Wire size	See nested table below	
Enclosure type rating	None (open-style)	
North American temp code	T4	

	Min	Max	
Solid	0.14 mm^2 (26 AWG)	1.5 mm^2 (16 AWG)	Rated @ 90 °C (194 °F) or greater, 1.2 mm (3/64 in.) insulation max
Stranded	0.14 mm^2 (26 AWG)	1.0 mm^2 (17 AWG)	

(1) Includes offset, gain, non-linearity, and repeatability error terms.
(2) Repeatability is the ability of the input module to register the same reading in successive measurements for the same input signal.

Specifications – Analog Output Plug-in Module

Attribute	2080-OF2
Number of outputs	2 unipolar non-isolated
Voltage range	0…10V DC
Current range	0…20 mA
Resolution, max	12 bits unipolar
Output count range	0…65535
D/A Conversion Rate (all channels), max	2.5 ms
Step Response to 63% (1)	5 ms
Current load in voltage output, max	10 mA
Voltage resistive load, min	1 kΩ
Current resistive load	500 Ω
Inductive load (current outputs), max	0.01 mH

Specifications – Analog Output Plug-in Module (Continued)

Attribute	2080-OF2			
Capacitive load (voltage outputs), max	0.1 µF			
Overall accuracy (2) Voltage terminal Current terminal	 ±1% full scale @ 25 °C (77 °F) ±1% full scale @ 25 °C (77 °F)			
Non-linearity (in percent full scale)	±0.1%			
Repeatability (3)	±0.1%			
Output error over full temperature range Voltage Current	-20…+65 °C (-4…+149 °F) ±1.5% ±2.0%			
Open and short-circuit protection	Yes			
Output overvoltage protection	Yes			
Input group to bus isolation	None			
Channel to channel isolation	None			
Power consumption	<60 mA @ 24V			
Operating altitude	2000 m			
Cable length, max	10 m			
Mounting torque	0.2 N•m (1.48 lb•in)			
Terminal screw torque	0.22…0.25 N•m (1.95…2.21 lb•in) using a 2.5 mm (0.10 in.) screwdriver			
Wire size		**Min**	**Max**	
	Solid	0.14 mm^2 (26 AWG)	1.5 mm^2 (16 AWG)	Rated @ 90 °C (194 °F) or greater, 1.2 mm (3/64 in.) insulation max
	Stranded	0.14 mm^2 (26 AWG)	1.0 mm^2 (17 AWG)	
Enclosure type rating	None (open-style)			
North American temp code	T4			

(1) Step response is the period of time between when the D/A converter was instructed to go from minimum to full range until the device is at 63% of full range.
(2) Includes offset, gain, non-linearity, and repeatability error terms.
(3) Repeatability is the ability of the input module to register the same reading in successive measurements for the same input signal.

Specialty Plug-in Modules

Specialty Plug-in Modules

I/O Type	Catalog Number	Description	Page
RTD input	2080-RTD2	2-channel non-isolated RTD module	41
Thermocouple input	2080-TC2	2-channel non-isolated thermocouple module	
Memory backup and high accuracy RTC	2080-MEMBAK-RTC	Memory backup and high accuracy RTC, 1 MB	42
	2080-MEMBAK-RTC2	Memory backup and high accuracy RTC, 4 MB	
Trimpot input	2080-TRIMPOT6	6-channel trimpot analog input module	42
High-speed counter	2080-MOT-HSC	High-speed counter module	43

Environmental specifications and certifications for Micro800 plug-in modules are provided on page 46.

Specifications – Analog RTD and Thermocouple Input Plug-in Modules

Attribute	2080-RTD2	2080-TC2
Number of inputs	2-channel non-isolated RTD	2-channel non-isolated Thermocouple
Input impedance	>300 KΩ	
Common mode rejection ratio	100 dB @ 50/60Hz	
Normal mode rejection ratio	70 dB @ 50/60 Hz	
Resolution	14-bit	
CJC error	-	±1.2 °C @ 25 °C (±2.16 °F @ 77 °F)
Accuracy	±1.0 °C @ 25 °C (±1.8 °F @ 77 °F)	

Specifications – Analog RTD and Thermocouple Input Plug-in Modules (Continued)

Attribute	2080-RTD2	2080-TC2
RTD types supported	100 Ω Platinum 385, 200 Ω Platinum 385, 500 Ω Platinum 385, 1000 Ω Platinum 385, 100 Ω Platinum 392, 200 Ω Platinum 392, 500 Ω Platinum 392, 1000 Ω Platinum 392, 10 Ω Copper 427, 120 Ω Nickel 672, 604 Ω Nickel-Iron 518	–
Thermocouple types supported	–	J, K, N, T, E, R, S, B
Open circuit detection time	8…1212 ms	8…1515 ms
Power consumption	3.3V, 40 mA	
Mounting torque	0.2 N•m (1.48 lb•in)	
Terminal screw torque	0.22…0.25 N•m (1.95…2.21 lb•in) using a 2.5 mm (0.10 in.) screwdriver	
Wire size	**Min** / **Max** Solid: 0.14 mm² (26 AWG) / 1.5 mm² (16 AWG) Stranded: 0.14 mm² (26 AWG) / 1.0 mm² (17 AWG) Rated @ 90 °C (194 °F) or greater, 1.2 mm (3/64 in.) insulation max	
Enclosure type rating	None (open-style)	
North American temp code	T4	

Specifications – Memory Backup and High Accuracy RTC Plug-in Modules

Attribute	2080-MEMBAK-RTC(1)(2)	2080-MEMBAK-RTC2(2)
Resolution READ_RTC()	1 s	
Accuracy	± 5 sec/month @ 25 °C (77 °F) ± 9 sec/month @ -20…+65 °C (-4…+149 °F)	
Power off, battery	3.5 years from date of manufacture @ 25…65 °C (77…149 °F) 2.5 years from date of manufacture @ 0 °C (32 °F)	
Mounting torque	0.2 N•m (1.48 lb•in)	
Terminal screw torque	0.22…0.25 N•m (1.95…2.21 lb•in) using a 2.5 mm (0.10 in.) screwdriver	
Operating altitude	2000 m	
Enclosure type rating	None (open-style)	
North American temp code	T4	

(1) 2080-MEMBAK-RTC is not supported on Micro820, Micro850 (2080-L50E only), and Micro870 controllers.
(2) 2080-MEMBAK-RTCx is not supported on Micro820 controllers.

IMPORTANT Battery life does not include controller ON time. For example, if the controller is ON for 16 hours every day for 365 days, and the module starts being used after 1 year of manufacturing, battery life is 8.5 years (1 year initial time + 2.5 years of Off time out of 7.5 years).

Specifications – Trimpot Analog Input Plug-in Module

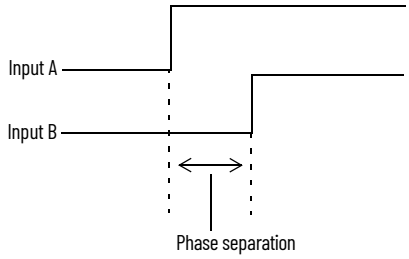
Attribute	2080-TRIMPOT6
Number of inputs	6-channel trimpot
Data range	0…255
Mounting torque	0.2 N•m (1.48 lb•in)
Operating altitude	2000 m
Enclosure type rating	None (open-style)
North American temp code	T4
Temperature, operating	-20…+65 °C (-4…+149 °F)
Temperature, surrounding air, max	65 °C (149 °F)
Temperature, nonoperating	-40…+85 °C (-40…+185 °F)

Specifications – High-speed Counter Plug-in Module

Attribute	2080-MOT-HSC
Number of I/O	1 quadrature (ABZ) differential input, 16 (1 physical, 15 virtual) outputs
Maximum count	48 bits
Input voltage range	0…30V DC
Input on-state voltage range	2.6…30V DC
Input off-state voltage, max	1.0V DC
Input current range	2.0…9.0 mA
Input on-state current, min	2.0 mA
Input off-state leakage current, max	1.5 mA
Input impedance, nom	3580 Ω
Input frequency, max	250 kHz (50% duty)
Pulse width, min	2 µs
Phase separation, min	500 ns(1)
Output voltage range	5…30V DC
Output on-state current, max	0.5 A
Output on-state current, min	1 mA
Output on-state voltage drop, max	0.5V DC
Output off-state leakage current, max	0.5 mA
Turn-on time, max	2 ms
Turn-off time, max	2 ms
Reverse polarity protection	None
Isolation voltage	Input module: 50V (continuous), Basic Insulation Type, Inputs/Outputs to Backplane Type tested for 60 s @ 720V DC, Inputs/Outputs to Backplane
Dimensions (HxWxD), approx	62 x 31.5 x 20 mm (2.44 x 1.24 x 0.79 in.)
Terminal screw torque	0.22…0.25 N•m (1.95…2.21 lb•in) using a 2.5 mm (0.10 in.) screwdriver
Bus current draw	60 mA @ 3.3V DC
Recommended cable	Individually shielded, twisted-pair cable (or the type recommended by the encoder or sensor manufacturer)
Wire size	See nested table below
Wiring category (2)	2 – on signal ports
Enclosure type rating	None (open-style)
North American temp code	T4

	Min	Max	
Solid	0.14 mm^2 (26 AWG)	1.5 mm^2 (16 AWG)	Rated @ 90 °C (194 °F) or greater, 1.2 mm (3/64 in.) insulation max
Stranded	0.14 mm^2 (26 AWG)	1.0 mm^2 (17 AWG)	

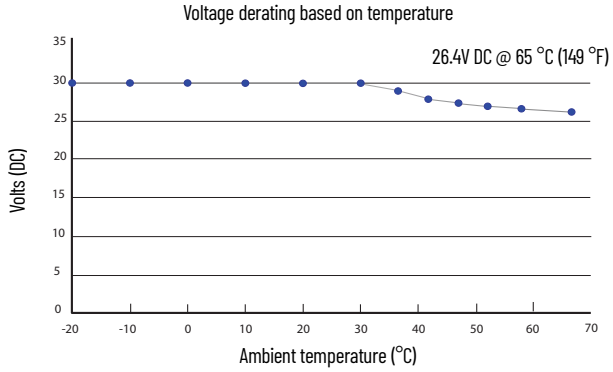
(1) Phase separation is the recognition of phase time of A input and B input.



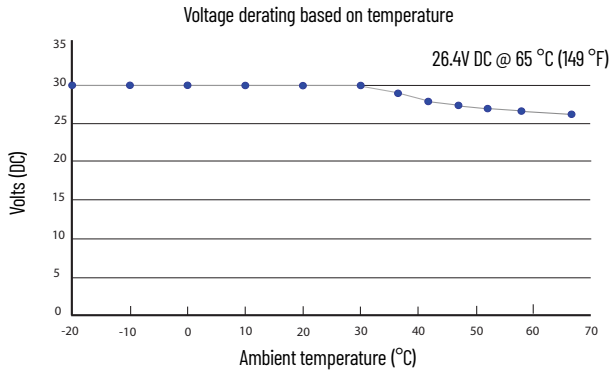
(2) Use this Conductor Category information for planning conductor routing. See Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

Temperature Derating for 2080-MOT-HSC

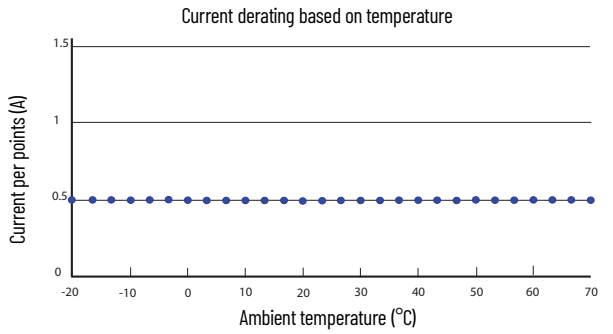
Maximum Input Voltage – 24V DC Operation



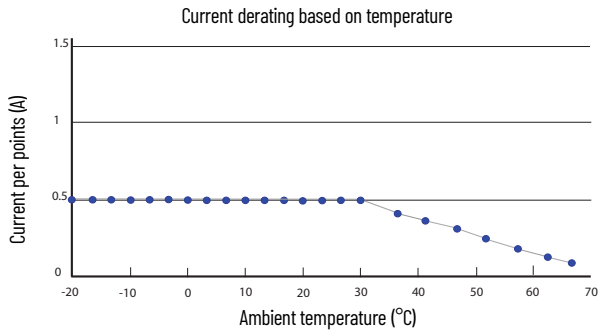
Maximum Output Voltage – 24V DC Operation



Maximum Output Current per Point – 5V DC Operation



Maximum Output Current per Point – 24V DC Operation



Communication Plug-in Modules

Communication Plug-in Modules

Communication Type	Catalog Number	Description	Page
DeviceNet	2080-DNET20	20-node DeviceNet® scanner module	45
Serial Port	2080-SERIALISOL	RS-232/RS-485 isolated serial port module	45

Environmental specifications and certifications for Micro800 plug-in modules are provided on page 46.

Specifications – DeviceNet Scanner Plug-in Module

Attribute	2080-DNET20			
Number of nodes, max	20 nodes for I/O operation			
DeviceNet communication rate, max	125 Kbps – 420 m (1378 ft) 250 Kbps – 200 m (656 ft) 500 Kbps – 75 m (246 ft)			
DeviceNet current	24V DC, 300 mA Class 2			
Network protocol	I/O slave messaging: Poll Command			
Backplane power consumption	50 mA @ 24V DC			
Power dissipation, max	1.44 W			
Isolation voltage	50V (continuous) Type tested for 60 s @ 500V AC between backplane and DeviceNet			
Wire size		**Min**	**Max**	
	Solid	0.25 mm^2 (24 AWG)	2.5 mm^2 (14 AWG)	Rated @ 75 °C (167 °F) or greater, 1.2 mm (3/64 in.) insulation max
	Stranded			
Wire type	Copper			
Wiring category (1)	1 – on power ports 2 – on communication ports			
Status indicators	Module status – red/green Network status – red/green			
Preferred power supply	1606-XLSDNET4			
Mounting torque	0.2 N•m (1.48 lb•in)			
Terminal screw torque	0.5…0.6 N•m (4.4…5.3 lb•in) using a 2.5 mm (0.10 in.) screwdriver			
Dimensions (HxWxD), approx	62 x 31.5 x 20 mm (2.44 x 1.24 x 0.78 in.)			
Weight, approx	35 g (1.23 oz.)			
Enclosure type rating	None (open-style)			
North American temp code	T4			

(1) Use this Conductor Category information for planning conductor routing. See Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

Specifications – RS-232/RS-485 Isolated Serial Port Plug-in Module

Attribute	2080-SERIALISOL			
Mounting torque	0.2 N•m (1.48 lb•in)			
Terminal screw torque	0.22…0.25 N•m (1.95…2.21 lb•in) using a 2.5 mm (0.10 in.) screwdriver			
Wire size		**Min**	**Max**	
	Solid	0.14 mm^2 (26 AWG)	1.5 mm^2 (16 AWG)	Rated @ 90 °C (194 °F) or greater, 1.2 mm (3/64 in.) insulation max
	Stranded	0.14 mm^2 (26 AWG)	1.0 mm^2 (17 AWG)	
Isolation voltage	500V AC			
Enclosure type rating	None (open-type)			
North American temp code	T4			

Environmental Specifications

Environmental Specifications – Micro800 Plug-in Modules

Attributes	Value
Temperature, operating	IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock): -20…+65 °C (-4…+149 °F)
Temperature, surrounding air, max	65 °C (149 °F)
Temperature, nonoperating	IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock): -40…+85 °C (-40…+185 °F)
Relative humidity	IEC 60068-2-30 (Test Db, Unpackaged Damp Heat): 5…95% noncondensing
Vibration	IEC 60068-2-6 (Test Fc, Operating): 2 g @ 10…500 Hz
Shock, operating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 25 g
Shock, nonoperating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 25 g – DIN rail mount 35 g – Panel mount
Emissions	IEC 61000-6-4
ESD immunity	IEC 61000-4-2: 6 kV contact discharges 8 kV air discharges
Radiated RF immunity	IEC 61000-4-3: 10 V/M with 1 kHz sine-wave 80%AM from 80…6000 MHz
EFT/B immunity	IEC 61000-4-4: ±2 kV @ 5 kHz on signal ports ±2 kV @ 5 kHz on shielded ports - 2080-RTD2, 2080-TC2 only **For 2080-DNET20, 2080-SERIALISOL only:** ±4 kV @ 5 kHz on power ports – 2080-DNET20 only ±2 kV @ 5 kHz on communication ports
Surge transient immunity	IEC 61000-4-5: **For 2080-IQ4, 2080-OB4, 2080-OV4, 2080-IQ4OB4, 2080-IQ4OV4, 2080-OW4I only:** ±1 kV line-line(DM) and ±2 kV line-earth(CM) on signal ports **For 2080-IF2, 2080-IF2K, 2080-IF4, 2080-OF2, 2080-RTD2, 2080-TC2, 2080-MOT-HSC only:** ±2 kV line-earth(CM) on shielded ports **For 2080-DNET20, 2080-SERIALISOL only:** ±1 kV line-line(DM) and ±2 kV line-earth(CM) on power ports – 2080-DNET20 only ±2 kV line-earth(CM) on communication ports
Conducted RF immunity	IEC 61000-4-6: 10V rms with 1 kHz sine-wave 80%AM from 150 kHz…80 MHz

Certifications

Certifications – Micro800 Plug-in Modules

Certification (when product is marked)[1]	Value
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E322657. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E334470
CE	European Union 2014/30/EU EMC Directive, compliant with: EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2014/35/EU LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11) European Union 2011/65/EU RoHS, compliant with: EN IEC 63000; Technical Documentation
RCM	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
Morocco	Arrêté ministériel n° 6404-15 du 1 er muharram 1437 – 2080-OW4I only Arrêté ministériel n° 6404-15 du 29 ramadan 1436
UKCA	2016 No. 1091 – Electromagnetic Compatibility Regulations 2016 No. 1101 – Electrical Equipment (Safety) Regulations – 2080-OW4I only 2012 No. 3032 – Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations
DeviceNet	ODVA conformance tested to DeviceNet specifications – 2080-DNET20 only

(1) See the Product Certification link at rok.auto/certifications for Declaration of Conformity, Certificates, and other certification details.

Micro800 Accessories

Micro800 Accessories

Accessory	Catalog Number	Description	Page
LCD display	2080-LCD	1.5" LCD display and keypad module for Micro810 controllers	48
USB adapter	2080-USBADAPTER	USB adapter for Micro810 controllers	49
Remote LCD display	2080-REMLCD	Remote LCD display for Micro820 controllers	49
External power supply	2080-PS120-240VAC	External AC power supply	51
	2080-PSAC-12W		
Memory card	2080-SD-2GB	2 GB microSD card for Micro800 controllers	52
Embedded serial port cables	See selection table	Embedded serial port cables for Micro830, Micro850, and Micro870 controllers	53

LCD Display

For Micro810 controllers only.

General and Environmental Specifications – LCD Display

Attribute	2080-LCD
North American temp code	T5
Temperature, operating	IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock): -20…+55 °C (-4…+131 °F)
Temperature, surrounding air, max	55 °C (131 °F)
Temperature, nonoperating	IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock): -40…+85 °C (-40…+185 °F)

Certifications – LCD Display

Certification (when product is marked)[1]	Value
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E322657. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E334470
CE	European Union 2014/30/EU EMC Directive, compliant with: EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2011/65/EU RoHS, compliant with: EN 63000; Technical Documentation
RCM	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
Morocco	Arrêté ministériel n° 6404-15 du 29 ramadan 1436
UKCA	2016 No. 1091 – Electromagnetic Compatibility Regulations 2012 No. 3032 – Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations

(1) See the Product Certification link at rok.auto/certifications for Declaration of Conformity, Certificates, and other certification details.

USB Adapter

For Micro810 controllers only.

General and Environmental Specifications – USB Adapter

Attribute	2080-USBADAPTER
USB cable connector type	USB type A-B male-male
North American temp code	T5
Temperature, operating	-20…+55 °C (-4…+131 °F)
Temperature, surrounding air, max	55 °C (131 °F)
Temperature, nonoperating	-40…+85 °C (-40…+185 °F)

Certifications – USB Adapter

Certification (when product is marked)(1)	2080-USBADAPTER
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E322657. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E334470
CE	European Union 2014/30/EU EMC Directive, compliant with: EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2011/65/EU RoHS, compliant with: EN IEC 63000; Technical Documentation
RCM	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
Morocco	Arrêté ministériel n° 6404-15 du 29 ramadan 1436
UKCA	2016 No. 1091 – Electromagnetic Compatibility Regulations 2012 No. 3032 – Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations

(1) See the Product Certification link at rok.auto/certifications for Declaration of Conformity, Certificates, and other certification details.

Remote LCD Display

For Micro820 controllers only.

Specifications – Remote LCD Display

Attribute	2080-REMLCD			
Dimensions (HxWxD)	97 x 130 x 35.5 mm (3.82 x 5.12 x 1.40 in.)			
Display type	192 x 64 pixel monochrome			
Display size	48 x 106.5 mm (1.89 x 4.19 in.)			
Backlight	25,000 hrs @ 25 °C (77 °F) LED; tricolor backlight (RGB)			
Operator input	Tactile keys (function keys, arrow keys, ESC, and OK keys)			
Programming port	USB to serial converter for programming the controller			
Input supply voltage	12V/24V DC (±10%)			
Input supply current, max	90 mA @ 12V 60 mA @ 24V			
Power consumption, max	1.5 W			
Weight, approx.	405 g (0.89 lb) – includes packaging weight			
Wire size		**Min**	**Max**	
	Single-wire gauge	0.14 mm^2 (26 AWG)	1.5 mm^2 (16 AWG)	Rated @ 90 °C (194 °F) or greater, 1.2 mm (3/64 in.) insulation max
	Dual-wire gauge	0.14 mm^2 (26 AWG)	0.75 mm^2 (18 AWG)	
Wire type	Copper			

Specifications – Remote LCD Display (Continued)

Attribute	2080-REMLCD
Wiring category[1]	3 – on power port 3 – on communication port
Enclosure type ratings	Meets IP65 (when front panel mounted)
North American temp code	T4

(1) Use this Conductor Category information for planning conductor routing. See Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

Environmental Specifications – Remote LCD Display

Attribute	2080-REMLCD
Temperature, operating	IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock): -20…+50 °C (-4…+122 °F)
Temperature, surrounding air, max	50 °C (122 °F)
Temperature, nonoperating	IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock): -30…+80 °C (-22…+176 °F)
Relative humidity	IEC 60068-2-30 (Test Db, Unpackaged Damp Heat): 5…95% noncondensing
Vibration	IEC 60068-2-6 (Test Fc, Operating): 2 g @ 12…500 Hz
Shock, operating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 25 g
Shock, nonoperating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 25 g – DIN rail mount 45 g – Panel mount
Emissions	IEC 61000-6-4
ESD immunity	IEC 61000-4-2: 4 kV contact discharges 8 kV air discharges
Radiated RF immunity	IEC 61000-4-3: 10V/m with 1 kHz sine-wave 80% AM from 80…6000 MHz

Certifications – Remote LCD Display

Certification (when product is marked)[1]	2080-REMLCD
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E322657. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E334470
CE	European Union 2014/30/EU EMC Directive, compliant with: EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2011/65/EU RoHS, compliant with: EN IEC 63000; Technical Documentation
RCM	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
Morocco	Arrêté ministériel n° 6404-15 du 29 ramadan 1436
UKCA	2016 No. 1091 – Electromagnetic Compatibility Regulations 2012 No. 3032 – Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations

(1) See the Product Certification link at rok.auto/certifications for Declaration of Conformity, Certificates, and other certification details.

External Power Supply

Specifications – External Power Supply

Attribute	2080-PS120-240VAC	2080-PSAC-12W
Dimensions (HxWxD)	90 x 45 x 80 mm (3.55 x 1.78 x 3.15 in.)	90 x 39 x 75 mm (3.54 x 1.54 x 2.95 in.)
Shipping weight, approx	0.34 kg (0.75 lb)	0.2 kg (0.44 lb)
Supply voltage range(1)	100…120V AC, 1 A 200…240V AC, 0.5 A	100…120V AC, 0.7 A 200…240V AC, 0.4 A
Supply frequency	47…63 Hz	
Supply power	24V DC, 1.6 A	24V DC, 0.9 A @ 50 °C (122 °F) 24V DC, 0.5 A @ 65 °C (149 °F)
Inrush current, max	24 A @ 132V for 10 ms 40 A @ 263V for 10 ms	25 A @ 132V for 10 ms 40 A @ 265V for 10 ms
Line loss ride-through	–	10…3000 ms @ 88V AC
Power consumption(2) (Output power)	38.4 W @ 100V AC 38.4 W @ 240V AC	21.6 W @ 50 °C (122 °F) 12 W @ 65 °C (149 °F)
Power dissipation (Input power)	45.1 W @ 100V AC 44.0 W @ 240V AC	27 W (115V AC), 26.7 W (230V AC) @ 50 °C (122 °F) 15.4 W (115V AC), 15.2 W (230V AC) @ 65 °C (149 °F)
Isolation voltage	250V (continuous), Primary to Secondary: Reinforced Insulation Type. Type tested for 60 s @ 3000V AC primary to secondary and 1500V AC primary to earth ground.	250V (continuous), Primary to Secondary: Reinforced Insulation Type. Type tested for 60 s @ 2300V AC primary to secondary and 1350V AC primary to earth ground.
Output ratings, max	24V DC, 1.6 A, 38.4 W	24V, 0.9 A, 21.6 W @ 50 °C (122 °F) 24V, 0.5 A, 12 W @ 65 °C (149 °F)
Enclosure type rating	None (open-style)	
Wire size	**Min** / **Max** Solid: 0.32 mm² (22 AWG) / 2.1 mm² (14 AWG) Stranded: 0.32 mm² (22 AWG) / 1.3 mm² (16 AWG) Rated @ 90 °C (194 °F) or greater, 1.2 mm (3/64 in.) insulation max	
Wire type	Copper	
Terminal screw torque	0.5…0.6 N•m (4.4…5.3 lb•in) using a 2.5 mm (0.10 in.) screwdriver	
Wiring category(3)	2 - on power ports	
Insulation-stripping length	7 mm (0.28 in.)	5 mm (0.197 in.)
North American temp code	T4A	T4

(1) Any fluctuation in voltage source must be within 85…264V. Do not connect the adapter to a power source that has fluctuations outside of this range.
(2) 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.
(3) Use this Conductor Category information for planning conductor routing. See Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

Environmental Specifications – Micro800 External AC Power Supply

Attribute	2080-PS120-240VAC	2080-PSAC-12W
Temperature, operating	IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock): -20…+65 °C (-4…+149 °F)	
Temperature, surrounding air, max	65 °C (149 °F)	
Temperature, nonoperating	IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock): -40…+85 °C (-40…+185 °F)	
Relative humidity	IEC 60068-2-30 (Test Db, Unpackaged Damp Heat): 5…95% noncondensing	
Vibration	IEC 60068-2-6 (Test Fc, Operating): 2 g @ 12…500 Hz	
Shock, operating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 30 g	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 25 g
Shock, nonoperating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 50 g	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 25 g – DIN rail mount 45 g – Panel mount
Emissions	IEC 61000-6-4	

Environmental Specifications – Micro800 External AC Power Supply (Continued)

Attribute	2080-PS120-240VAC	2080-PSAC-12W
ESD immunity	IEC 61000-4-2: 6 kV contact discharges 8 kV air discharges	
Radiated RF immunity	IEC 61000-4-3: 10V/m with 1 kHz sine-wave 80% AM from 80…6000 MHz	
EFT/B immunity	IEC 61000-4-4: ±2 kV @ 5 kHz on power ports	
Surge transient immunity	IEC 61000-4-5: ±1 kV line-line(DM) and ±2 kV line-earth(CM) on power ports	
Conducted RF immunity	IEC 61000-4-6: 10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz	
Voltage variation	IEC 61000-4-11: 30% dips for 1 period at 0° and 180° on AC supply ports 60% dips for 5 and 50 periods on AC supply ports ±10% fluctuations for 15 min on AC supply ports >95% interruptions for 250 periods on AC supply ports	IEC 61000-4-11: 30% dips for 25 cycles 60% dips for 10 cycles 100% dips for 0.5 and 1 cycle >95% interruptions for 250 cycles

Certifications – Micro800 External AC Power Supply

Certification (when product is marked)(1)	Value
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E322657. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E334470
CE	European Union 2014/30/EU EMC Directive, compliant with: EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2014/35/EU LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11) European Union 2011/65/EU RoHS, compliant with: EN IEC 63000; Technical Documentation
RCM	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
Morocco	Arrêté ministériel n° 6404-15 du 1 er muharram 1437 Arrêté ministériel n° 6404-15 du 29 ramadan 1436
UKCA	2016 No. 1091 – Electromagnetic Compatibility Regulations 2016 No. 1101 – Electrical Equipment (Safety) Regulations 2012 No. 3032 – Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations

(1) See the Product Certification link at rok.auto/certifications for Declaration of Conformity, Certificates, and other certification details.

MicroSD Card

The 2080-SD-2GB microSD card provides 2 GB of storage capacity for project backup and restore, data logging, and recipes.

Embedded Serial Port Cables

For Micro830, Micro850, and Micro870 controllers.

Embedded Serial Port Cable Selection Chart

Connectors	Length	Cat. No.	Connectors	Length	Cat. No.
8-pin Mini DIN to 8-pin Mini DIN	0.5 m (1.5 ft)	1761-CBL-AM00 (1)	8-pin Mini DIN to 9-pin D-shell	0.5 m (1.5 ft)	1761-CBL-AP00 (1)
8-pin Mini DIN to 8-pin Mini DIN	2 m (6.5 ft)	1761-CBL-HM02 (1)	8-pin Mini DIN to 9-pin D-shell	2 m (6.5 ft)	1761-CBL-PM02 (1)
8-pin Mini DIN to 8-pin Mini DIN (with lock mechanism on both connectors)	2 m (6.5 ft)	1761-CBL-AH02	8-pin Mini DIN with lock mechanism to 9-pin D-shell	2 m (6.5 ft)	1761-CBL-PH02
—			8-pin Mini DIN to 6-pin RS-485 terminal block	30 cm (11.8 in.)	1763-NC01 series A

(1) Series C or later for Class I Div 2 applications.

Additional Resources

These documents contain additional information concerning related products from Rockwell Automation. You can view or download publications at rok.auto/literature.

Additional Resources

Resource	Description
Micro800 Programmable Controller Family Selection Guide, publication 2080-SG001	Provides information to help you select the Micro800 controller, plug-ins, expansion I/O, and accessories, based on your requirements.
Micro800 Programmable Controller External AC Power Supply Installation Instructions, publication 2080-IN001	Information on mounting and wiring the optional external power supply.
Micro800 Programmable Controllers Installation Instructions, publication 2080-IN013	Describes how to install and wire your Micro800 programmable controller.
Micro800 16-point and 32-point 12/24V Sink/Source Input Modules Installation Instructions, publication 2085-IN001	Information on mounting and wiring the expansion I/O modules (2085-IQ16, 2085-IQ32T).
Micro800 Bus Terminator Module Installation Instructions, publication 2085-IN002	Information on mounting and wiring the expansion I/O bus terminator (2085-ECR).
Micro800 16-point Sink and 16-point Source 12/24V DC Output Modules Installation Instructions, publication 2085-IN003	Information on mounting and wiring the expansion I/O modules (2085-OV16, 2085-OB16).
Micro800 8-point and 16-point AC/DC Relay Output Modules Installation Instructions, publication 2085-IN004	Information on mounting and wiring the expansion I/O modules (2085-OW8, 2085-OW16).
Micro800 8-point Input and 8-point Output AC Modules Installation Instructions, publication 2085-IN005	Information on mounting and wiring the expansion I/O modules (2085-IA8, 2085-IM8, 2085-OA8).
Micro800 4-channel and 8-channel Analog Voltage/current Input and Output Modules Installation Instructions, publication 2085-IN006	Information on mounting and wiring the expansion I/O modules (2085-IF4, 2085-IF8, 2085-OF4).
Micro800 4-channel Thermocouple/RTD Input Module Installation Instructions, publication 2085-IN007	Information on mounting and wiring the expansion I/O module (2085-IRT4).
Micro870 Programmable Controllers 24V DC Expansion Power Supply Installation Instructions, publication 2085-IN008	Information on mounting and wiring the optional external power supply for expansion I/O modules.
Micro800 RS-232/RS-485 Isolated Serial Port Plug-in Module Wiring Diagrams, publication 2080-WD002	Information on mounting and wiring the Micro800 RS-232/RS-485 Isolated Serial Port Plug-in Module.
Micro800 Non-isolated Unipolar Analog Input Plug-in Module Wiring Diagrams, publication 2080-WD003	Information on mounting and wiring the Micro800 Non-isolated Unipolar Analog Input Plug-in Module.
Micro800 Non-isolated Unipolar Analog Output Plug-in Module Wiring Diagrams, publication 2080-WD004	Information on mounting and wiring the Micro800 Non-isolated Unipolar Analog Output Plug-in Module.
Micro800 Non-isolated RTD Plug-in Module Wiring Diagrams, publication 2080-WD005	Information on mounting and wiring the Micro800 Non-isolated RTD Plug-in Module.
Micro800 Non-isolated Thermocouple Plug-in Module Wiring Diagrams, publication 2080-WD006	Information on mounting and wiring the Micro800 Non-isolated Thermocouple Plug-in Module.
Micro800 Memory Backup and High Accuracy RTC Plug-In Module Wiring Diagrams, publication 2080-WD007	Information on mounting and wiring the Micro800 Memory Backup and High Accuracy RTC Plug-In Module.
Micro800 6-channel Trimpot Analog Input Plug-In Module Wiring Diagrams, publication 2080-WD008	Information on mounting and wiring the Micro800 6-Channel Trimpot Analog Input Plug-In Module.
Micro800 Digital Relay Output Plug-in Module Wiring Diagrams, publication 2080-WD010	Information on mounting and wiring the Micro800 Digital Relay Output Plug-in Module.

Additional Resources (Continued)

Resource	Description
Micro800 Digital Input, Output, and Combination Plug-in Modules Wiring Diagrams, publication 2080-WD011	Information on mounting and wiring the Micro800 Digital Input, Output, and Combination Plug-in Modules.
Micro800 High-speed Counter Plug-in Module Wiring Diagrams, publication 2080-WD012	Information on mounting and wiring the High-Speed Counter Plug-in module.
Micro800 DeviceNet Plug-in Module Wiring Diagrams, publication 2080-WD013	Information on mounting and wiring the Micro800 DeviceNet Plug-in module.
Micro800 Programmable Controllers: Getting Started with Motion Control Using a Simulated Axis Quick Start, publication 2080-QS001	Provides quick start instructions for implementing a motion control project in Connected Components Workbench software.
Micro800 Programmable Controllers: Getting Started with CIP Client Messaging Quick Start, publication 2080-QS002	Provides quick start instructions for using CIP GENERIC and CIP Symbolic Messaging.
Micro800 Programmable Controllers: Getting Started with PanelView Plus Quick Start, publication 2080-QS003	Provides quick start instructions for using global variables for Micro800 controllers together with PanelView™ Plus HMI terminals.
Configuring Micro800 Controllers on FactoryTalk Linx Gateway Quick Start, publication 2080-QS005	Provides quick start instructions for configuring a Micro800 controller on FactoryTalk® Linx Gateway.
Setting up Micro800 Controllers for Implicit (Class 1) Communications with POINT I/O Modules Configured as Generic Devices Quick Start, publication 2080-QS006	Provides quick start instructions on how to set up Micro800 controllers to use Class 1 communications with POINT I/O™ adapters.
Micro810 Programmable Controllers User Manual, publication 2080-UM001	Describes how to install, configure, use, and troubleshoot your Micro810 controller.
Micro820 Programmable Controllers User Manual, publication 2080-UM005	Describes how to install, configure, use, and troubleshoot your Micro820 controller.
Micro830, Micro850, and Micro870 Programmable Controllers User Manual, publication 2080-UM002	Describes how to install, configure, use, and troubleshoot your Micro830, Micro850, and Micro870 controllers.
Micro800 Expansion I/O Modules User Manual, publication 2080-UM003	Describes how to install, configure, use, and troubleshoot your Micro800 expansion I/O modules.
Micro800 Plug-in Modules User Manual, publication 2080-UM004	Describes how to install, configure, use, and troubleshoot your Micro800 plug-in modules.
Micro800 Programmable Controllers General Instructions Reference Manual, publication 2080-RM001	Information on instruction sets for developing programs for use in Micro800 control systems.
EtherNet/IP Network Devices User Manual, publication ENET-UM006	Describes how to configure and use EtherNet/IP devices to communicate on the EtherNet/IP network.
Ethernet Reference Manual, publication ENET-RM002	Describes basic Ethernet concepts, infrastructure components, and infrastructure features.
System Security Design Guidelines Reference Manual, publication SECURE-RM001	Provides guidance on how to conduct security assessments, implement Rockwell Automation products in a secure system, harden the control system, manage user access, and dispose of equipment.
UL Standards Listing for Industrial Control Products, publication CMPNTS-SR002	Assists original equipment manufacturers (OEMs) with construction of panels, to help ensure that they conform to the requirements of Underwriters Laboratories.
American Standards, Configurations, and Ratings: Introduction to Motor Circuit Design, publication IC-AT001	Provides an overview of American motor circuit design based on methods that are outlined in the NEC.
Industrial Components Preventive Maintenance, Enclosures, and Contact Ratings Specifications, publication IC-TD002	Provides a quick reference tool for Allen-Bradley industrial automation controls and assemblies.
Safety Guidelines for the Application, Installation, and Maintenance of Solid-state Control, publication SGI-1.1	Designed to harmonize with NEMA Standards Publication No. ICS 1.1-1987 and provides general guidelines for the application, installation, and maintenance of solid-state control in the form of individual devices or packaged assemblies incorporating solid-state components.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, rok.auto/certifications	Provides declarations of conformity, certificates, and other certification details.

Rockwell Automation Support

Use these resources to access support information.

Technical Support Center	Find help with how-to videos, FAQs, chat, user forums, Knowledgebase, and product notification updates.	rok.auto/support
Local Technical Support Phone Numbers	Locate the telephone number for your country.	rok.auto/phonesupport
Technical Documentation Center	Quickly access and download technical specifications, installation instructions, and user manuals.	rok.auto/techdocs
Literature Library	Find installation instructions, manuals, brochures, and technical data publications.	rok.auto/literature
Product Compatibility and Download Center (PCDC)	Download firmware, associated files (such as AOP, EDS, and DTM), and access product release notes.	rok.auto/pcdc

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Rockwell Automation maintains current product environmental compliance information on its website at rok.auto/pec.

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