



MicroLogix Programmable Controllers

Bulletins 1766 Controllers and 1762 Expansion I/O



Allen-Bradley

by ROCKWELL AUTOMATION

Selection Guide

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.

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What's New

This publication contains the following new or updated information. This list includes substantive updates only and is not intended to reflect all changes. Translated versions are not always available for each revision.

Topic	Page
Updated template	Throughout
Removed catalogs for MicroLogix 1100 controllers and accessories	Throughout
Removed catalogs for MicroLogix 1200 controllers and accessories	Throughout
Added inclusive language acknowledgment	2
Updated certifications	4, 6, 7
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MicroLogix Programmable Controllers Overview

The MicroLogix™ family of controllers provides five levels of control. Small on size, big on performance, the MicroLogix controller offers control capabilities in an affordable, compact package. The MicroLogix 1400 controllers further enhance the MicroLogix family by expanding the application coverage area while offering great new features at an affordable price.

MicroLogix 1400 Controller



The MicroLogix 1400 controller is designed to broaden application coverage through the available embedded analog inputs, Ethernet communication, faster high-speed counter (HSC), and pulse train output (PTO) capabilities. MicroLogix 1400 controllers maintain the same critical features that you have come to expect from the MicroLogix 1100 controller, and expands that capability with more I/O, faster HSC/PTO, and an additional serial port. MicroLogix 1400 controllers complement our low-end controllers for applications that require up to 256 digital I/O.

Each MicroLogix 1400 controller includes 20 digital inputs and 12 digital outputs. In addition, several models include 4 embedded analog inputs and 2 embedded analog outputs. The controller can also expand its I/O capabilities by using the same modules as the MicroLogix 1200 controllers. Up to 7 of the 1762 expansion I/O modules can be used with a MicroLogix 1400 controller.

You can use the latest version of our world-class RSLogix 500® programming software to program the MicroLogix 1400 controller. RSLogix 500 Starter, Standard, and Professional applications, and RSLogix™ Micro software, all support the MicroLogix 1400 controller, including its online editing capabilities.

Each controller has 2 serial ports with DF1/DH485/Modbus RTU/DNP3/ASCII protocol support and a built-in Ethernet port, which supports EtherNet/IP™, Modbus TCP/IP and DNP3 over IP.

An embedded LCD screen lets you monitor the controller and I/O status, and change bit and integer data.

Advantages for the MicroLogix 1400 Controller

- Large memory (10 KB user program with 10 KB user data) to solve various applications
- True online editing allows tuning of program, including PID, without going offline
- Support for MicroLogix 1400 controller online editing in RSLogix 500 Professional, Standard, and Starter software version 8.1 and later, and RSLogix Micro
- Mode switch for Run/Remote/Program through LCD keypad operation
- Time-based or event-triggered data logging capability stores controller data records with optional time stamp in a separate 128 Kbyte memory area for later analysis (for example, trending and I/O status during alarm condition data)
- Recipe storage (up to 64 KB that is deducted from Data Logging memory) that is accessible by your ladder program, enabling quick and easy batch changes of program data for timers, counters, and other data types
- High-performance expansion I/O options (up to seven 1762 I/O modules, in any combination)
- Twelve high-speed inputs (except 1766-L32AWA and 1766-L32AWAA controllers) that can be used individually as latching (pulse-catch) inputs, event interrupts, or alternately combined as three 100 kHz high-speed counters featuring 10 modes of operation
- Two available built-in 0...10V DC analog outputs (for controllers with analog I/O options) with 12-bit resolution (not isolated)

- Three high-speed outputs that can be configured as 100 kHz pulse train output (PTO) or 40 kHz as pulse width modulation (PWM) outputs (only on 1766-L32BXB and 1766-L32BXBA controllers)
- Multiple input commons let you use the controller for either sinking or sourcing input devices, and multiple output commons provide individual isolation in multi-voltage output applications
- One, 1 ms, selectable timed interrupt (STI)
- High-resolution, 1 ms timers
- Communication Channel 0 provides isolated RS-232 or RS-485 electrical compatibility (selectable through the choice of communication cables)
- Through RS-232, we support all serial protocols
- Through RS-485, we support direct interface to DH-485, DF1 half-duplex master/slave, ASCII, and Modbus RTU master/slave networks, DNP 3 slave using the 1763-NC interface
- Communication channel 1 consists of an embedded RJ45 port that supports EtherNet/IP, Modbus TCP/IP, and DNP3 over IP. This 10/100 Mbps port supports BOOTP and DHCP.
- Communication channel 2 provides a 9-pin, non-isolated RS-232 port supporting all serial protocols
- Communication toggle selection that allows the controller's Channel 0 port to toggle between user-configured communication parameters and factory default settings for an easy way to switch from Modbus RTU or ASCII protocols (which do not support programming) to DF1 full-duplex (to upload/download, monitor, or edit your program). So a programming computer is able to connect to a controller with an unknown or incorrect communication-parameter settings for troubleshooting.
- Embedded real-time clock
- Embedded web server with email functionality
- Optional memory module for external program backup, for program transport, and transfer to another controller. Program and data in the controller is also battery backed for secure storage.
- Data file download protection prevents critical user data from being altered via program downloads from programming computers or memory modules
- Built-in LCD provides access to binary and integer files that can be changed, or optionally protected, for monitor only access by an operator
- LCD instruction allows the controller to output messages to the LCD, and optionally receive user input
- IP address can be monitored and configured directly through the built-in LCD
- Two built-in digital trim potentiometers
- 32-bit signed integer math
- Floating point and double integer data file support
- Built-in PID capabilities
- Fingersafe removable terminal blocks meet global safety standards
- Customizable OEM logos on the LCD display
- Regulatory agency certifications for the worldwide market (CE, RCM, cUL, and UL including Class 1 Division 2 Hazardous Location, where product is marked^(a))

(a) See the Product Certification link at [rok.auto/certifications](https://www.rockwellautomation.com/certifications) for Declaration of Conformity, Certificates, and other certification details.

MicroLogix Controller System-selection Checklist

Use the following checklist as a guide to complete your own system specification. Skip any sections that do not apply.

✓	Step	See Page
	1 Select Family: MicroLogix 1400 Controller • Controller family - Based on memory, I/O, added functionality, programming instructions and dimensions • Consider future expansion requirements • Consider requirements for online editing • Consider the need for networked communication	6
	2 Select Communication • Communication network - Based on application requirements • Communication interface device - If necessary	10
	3 Select Programming Tools and Software Programming software - the appropriate RSLogix™ package for your application	11
	4 Select Network and Programming Cables Cables - review device port identification to find cable in the selection chart)	11
	5 Select MicroLogix 1400 Controllers • I/O modules - Digital, analog, and temperature • Perform system expansion calculations	13
	6 Select I762 Expansion I/O I/O modules - digital, analog, and temperature/I/O modules - digital, analog, and temperature	17
	7 Select Replacement Parts	22
	8 Complete Your Selection Listing All catalog numbers required for your system specification	22

Select Family: MicroLogix 1400 Controller

Review the Features, Programming Instructions, Controller Specifications, and Controller Dimensions to determine which level of MicroLogix controller is required.

Features

Table 1 - MicroLogix 1400 Controller Features Chart

Bulletin Number	1766
Memory (in user words) User Program/User Data	
Up to 20 KB	10 KB/10 KB
Online editing	✓
Nonvolatile program and data	Battery backup static RAM
Memory module (For program back-up and transport)	Optional
I/O	
Embedded digital I/O, max	32
Embedded analog I/O	Four 0...10V DC inputs on some controllers Two 0...10V DC outputs on some controllers
Local expansion I/O, max	256
Thermocouple/RTD	Expansion
Added Functionality	
Trim Potentiometers	2, digital
PID	✓
High-speed counters (Embedded)	Up to 6 @ 100 kHz
Real-time clock	✓
Motion: Pulse width modulation (PWM)	3 @ 40 kHz
Motion: Pulse train outputs (PTO)	3 @ 100 kHz
Data access tool	✓
Data logging	128 KB
Recipe storage	Uses up to 64 KB data logging memory
Floating point math	✓
Programming	
RSLogix 500/Micro Software	✓
RSLogix Micro	✓
Communication	
RS-232 ports	One 8-pin mini DIN One 9-pin D-shell
EtherNet/IP	✓
Web server capabilities	✓
DH-485	Network with 1763-NC01
SCADA RTU – DF1 half-duplex slave	✓
SCADA RTU – DF1 radio modem	✓
SCADA RTU – Modbus RTU slave	✓
SCADA RTU – Modbus RTU master	✓
ASCII – Read/write	✓
DNP3 over IP	✓
Modbus TCP/IP	✓
Operating Power	
120/240V AC	✓
24V DC	✓
Agency Certifications	
CE, RCM, UL, and cUL (Including Class I Division 2 Hazardous Location)	✓

Programming Instructions

MicroLogix controllers have the range of functionality necessary to address diverse applications. The controllers use the following types of instructions:

- Basic instructions (for example, Examine if Closed, Examine if Open)
- Data comparison instructions (for example, Equal, Greater than or Equal, Less than or Equal)
- Data manipulation instructions (for example, Copy, Move)
- Math instructions (for example, Add, Subtract, Multiply)
- Program flow control instructions (for example, Jump, Subroutine)
- Application specific instructions (for example, Programmable Limit Switch, Sequencer)
- High-speed counter instructions
- High-speed pulse train output (PTO) and pulse width modulation (PWM) instructions
- Communication instructions including ASCII
- Recipe instructions
- Data logging instructions
- LCD instructions
- Trigonometry instructions
- Advanced math instructions (for example, X Power Y, Compute)
- Advanced timing instructions (for example, Read High-speed Clock, Compute Time Difference)

Controller Specifications

Table 2 - MicroLogix 1400 Controller General Specifications

Attribute	Value
Memory size and type	20 KB battery backed RAM: • 10 KB user program • 10 KB user data
Data elements	Configurable, user-defined file structure, 10 KB max data size
Throughput	2 ms (for a typical 1 KB word user program)

Table 3 - MicroLogix 1400 Controller Environmental Specifications

Attribute	Value
Operating temperature	-20...+60 °C (-4...+140 °F)
Storage temperature	-40...+85 °C (-40...+185 °F)
Relative humidity	5...95%, noncondensing
Vibration	10...500 Hz 3g, 0.030 in. max peak-to-peak,
Shock, operating	30 g 3 pulses in each direction, each axis
Shock, nonoperating	50 g panel mounted 40 g DIN rail mounted 3 pulses in each direction, each axis
Agency certifications	• UL Listed Industrial Control Equipment for use in Class 1 Division 2, Hazardous Locations, Groups A, B, C, D • cUL Listed Industrial Control Equipment for use in Canada • CE marked for all applicable directives • RCM marked for all applicable acts
ESD immunity	EN 61000-4-2 4 kV contact 8 kV air
Radiated RF immunity	EN 61000-4-3 10 V/m, 26...1000 MHz (alternatively, 80...1000 MHz) 80% amplitude modulation, +900 MHz keyed carrier
EFT/B immunity	EN 61000-4-4 2 kV, 5 kHz Communication cable: 1 kV, 5 kHz

Table 3 - MicroLogix 1400 Controller Environmental Specifications (Continued)

Attribute	Value
Surge transient immunity	EN 61000-4-5 ±1 kV line-line (DM) and ±2 kV line-earth (CM) on AC power ports ±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	EN 61000-4-6 10V, 150 kHz...80 MHz
Radiated emissions	EN 55011 30...1000 MHz
Line related tests	EN 61000-4-11 60% dip for 10 periods on AC supply ports 30% dip for 25 periods at 0° and 180° on AC supply ports 100% dip for 250 periods at 0° and 180° on AC supply ports 100% dip for 0.5 periods, arbitrary angle, on AC supply ports

MicroLogix 1400 Controller Dimensions

Figure 1 - MicroLogix 1400 Controller Dimension Drawing

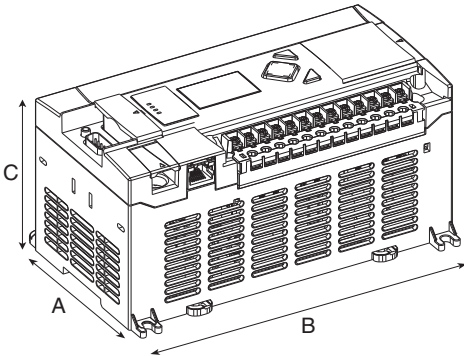


Table 4 - MicroLogix 1400 Controller Dimensions

Dimension	Value
A	90 mm (3.5 in.)
B	180 mm (7.08 in.)
C	87 mm (3.43 in.)

Figure 2 - MicroLogix 1200 Expansion I/O Module Dimension Drawing

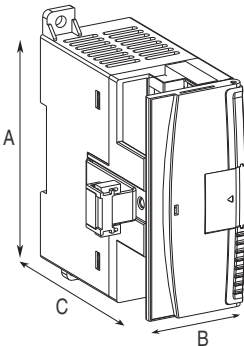


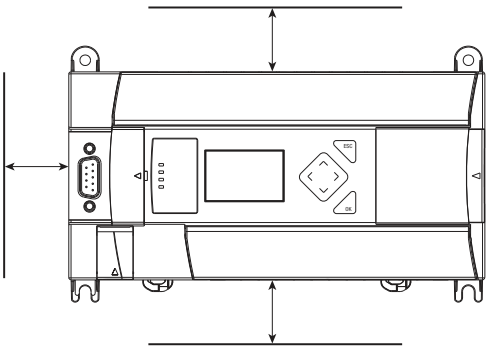
Table 5 - MicroLogix 1200 Expansion I/O Dimensions

Dimension	Value
A	90 mm (3.5 in.)
B	40 mm (1.57 in.)
C	87 mm (3.43 in.)

Controller spacing

The controller mounts horizontally, with the expansion I/O extending to the right of the controller. Allow 50 mm (2 in.) of space on all but the right side for adequate ventilation, as shown in [Figure 3](#).

Figure 3 - Controller Spacing



DIN rail mounting

The maximum extension of the latch is 14 mm (0.55 in.) in the open position. A screwdriver is required for removal of the controller. The controller can be mounted to EN 50022-35 x 7.5 or EN 50022-35 x 15 DIN rails. DIN rail mounting dimensions are shown in [Figure 4](#).

Figure 4 - DIN Rail Mounting

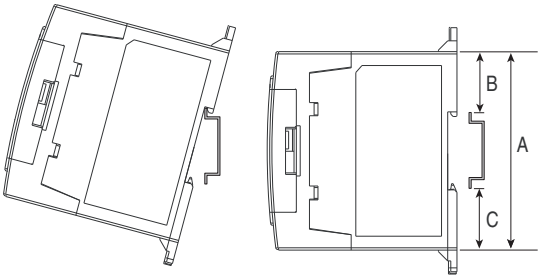
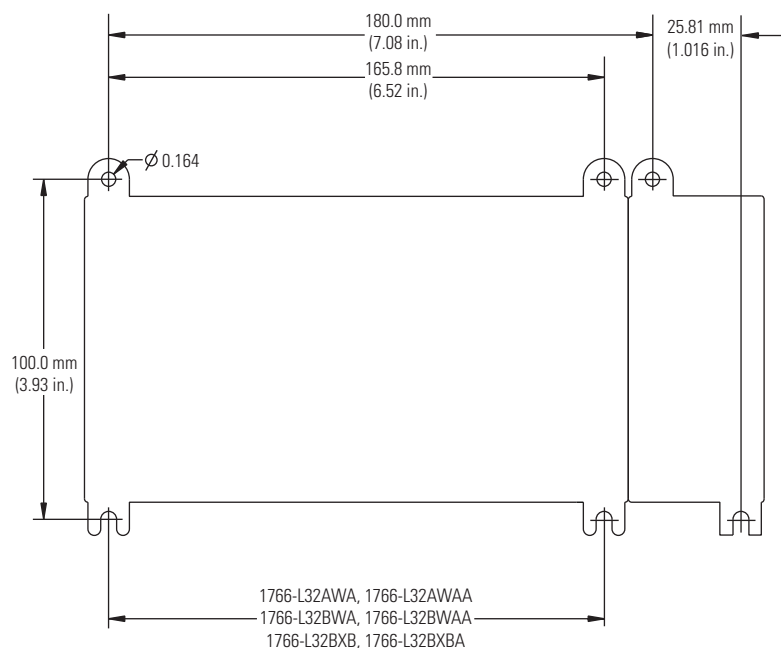


Table 6 - DIN Rail Mounting Dimensions

Dimensions	Value
A	90 mm (3.5 in.)
B	27.5 mm (1.08 in.)
C	27.5 mm (1.08 in.)

Figure 5 - MicroLogix 1400 Controller System Mounting Dimension

Select Communication Network

Communication Networks

MicroLogix 1400 controllers allow you to choose the network that best meets your needs.

- Channel 0 Isolated RS-232/RS-485 Combo port
- EtherNet/IP port
- DNP3 over IP
- Modbus TCP/IP
- For RS-232 communication:
 - 300, 600, 1200, 4800, 9600 bps; 19.2 and 38.4 Kbps
 - RTS/CTS hardware handshake signals
 - Connection to modems for remote communication
 - ASCII messaging provides dial-out capability
 - DF1 half-duplex slave
 - DF1 half-duplex master
 - DNP3 slave
 - Modbus RTU master/slave
 - DF1 full-duplex
 - DF1 radio modem

Table 7 - MicroLogix 1400 Controller Network Options

RS-232 unless otherwise noted	
If your application requires	Use this network
- Connection to dial-up modems for remote program maintenance or data collection - Connection to leased-line or radio modems for use in SCADA systems - Remote Terminal Unit (RTU) functions - Program upload, download, and monitoring	DF1 full-duplex DF1 half-duplex slave/master DF1 radio modem
- Plant-wide and cell-level data sharing with program maintenance - Data sharing between 32 controllers - Peer-to-peer communication - Program upload, download, and monitoring - Compatibility with multiple Allen-Bradley® HMI devices	DH-485 directly through channel 0 RS-485 port using 1763-NC01 cable
- Program upload, download, and monitoring - Peer-to-peer communication - Email communication 10/100 Base-T port with embedded status indicators	EtherNet/IP network directly through Channel 1 10/100 Mbps communication port ⁽¹⁾
- Connection to third-party devices for remote data collection in a SCADA system (for example, telephone modems, radio modems, and leased lines) - RTU functions	Modbus RTU master/slave directly through channel) RS-485 port using 1763-NC01 cable(2) DNP3 slave via RS-232 DNP3 over IP(4) Modbus TCP/IP(4)

(1) Direct EtherNet/IP connections through MicroLogix 1400 controllers provide web server capabilities and support for email communication.

Select Programming Tools and Software

Programming Software

The RSLogix 500 and RSLogix Micro ladder-logic programming packages help you maximize performance, save project development time, and improve productivity. These products have been developed to operate on Windows® operating systems. You can use the RSLogix 500 and RSLogix Micro software to program the MicroLogix 1400 controller.

Table 8 - RSLogix 500 and RSLogix Micro Selection Chart

Catalog Number	Description
9324-RL0100ENE	RSLogix 500 Starter Edition programming software
9324-RL0300ENE	RSLogix 500 Standard Edition programming software
9324-RL0700NXENE	RSLogix 500 Professional Edition programming software You can download RSLogix™ Emulate 500, RSNetWorx™ for DeviceNet®, and RSNetWorx for ControlNet® software from the Rockwell Automation Product Compatibility and Download Center (PCDC) at rok.auto/pcdc .
9324-RLM0100ENE	RSLogix Micro Starter software
9324-RLM0800ENE	RSLogix Micro Developer software

Select Network and Programming Cables

Cables come in several lengths and connector styles to provide connectivity between MicroLogix 1400 controllers and other devices.

Network Cable Selection

Table 9 - Controller and Computer Port Identification

Device	Communication Port Description	Connector Type
MicroLogix 1400	RS-232/RS-485 communication port (Channel 0, no 24V DC power for communication interface modules)	8-pin mini DIN (Isolated)
	10/100Mbps EtherNet/IP communication port (Channel 1)	RJ45
	Communication port (Channel 2)	9-pin D-shell
Computer	Serial communication port	9-pin D-shell
	Ethernet communication port	RJ45

Table 10 - Network Cable Selection Chart

Connectors	Length	Catalog Number	Connectors	Length	Catalog Number
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	2 m (6.5 ft.)	1761-CBL-PM02 ⁽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	5 m (16 ft.)	2711-CBL-PM05
8-pin mini DIN to 8-pin mini DIN	5 m (16 ft.)	2711-CBL-HM05	8-pin mini DIN to 9-pin D-shell	10 m (32 ft.)	2711-CBL-PM10
8-pin mini DIN to 8-pin mini DIN	10 m (32 ft.)	2711-CBL-HM10	6-pin Phoenix to RJ45 (DH-485)	3 m (10 ft.)	1761-CBL-AS03
9-pin D-shell to 9-pin D-shell	0.5 m (1.5 ft.)	1761-CBL-AC00	6-pin Phoenix to RJ45 (DH-485)	9 m (30 ft.)	1761-CBL-AS09
9-pin D-shell to 9-pin D-shell	3 m (10 ft.)	1747-CP3	8-pin mini DIN to 8-pin mini DIN	15 m (49.2 ft.)	2707-NC9 ⁽¹⁾
8-pin mini DIN with lock mechanism to 9-pin D-shell	2 m (6.5 ft.)	1761-CBL-PH02 ⁽²⁾	8-pin mini DIN to 6-pin DH-485 terminal	30 cm (11.8 in.)	1763-NC01 series A
8-pin mini DIN with lock mechanism to 8-pin mini DIN with lock mechanism	2 m (6.5 ft.)	1761-CBL-AH02 ⁽²⁾	RJ45 to RJ45	100 m (328 ft.), max	Ethernet cable ⁽³⁾
8-pin mini DIN to 9-pin D-shell	0.5 m (1.5 ft.)	1761-CBL-AP00 ⁽¹⁾	—		

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

(2) Series A for Class 1 Div 2 applications.

(3) Commercially available.

Programming Cable Selection

Table 11 - Programming Cable Selection Chart - Programming Device to MicroLogix 1400 Controller

Programming Device	Channel 0 (8-pin mini DIN)		Channel 1 (RJ45)		Channel 2	
	Catalog Number	Length	Catalog Number	Length	Catalog Number	Length
Computer (9-pin D-shell)	1761-CBL-PM02	2 m (6.5 ft.)	—		1747-CP3	3 m (10 ft.)
Computer (RJ45)	—		Ethernet cable ⁽¹⁾	100 m (328 ft.), max	—	

(1) Commercially available.

1747-UIC Universal Serial Bus to DH-485 Interface Converter

This device allows a computer with a USB port to interface to DH-485 ports on a MicroLogix controller or other Rockwell Automation controllers and on PanelView™ terminals. The 1747-UIC features a USB connector plus an RS-232 and an RS-485 port. Use the RS-232 port to connect to MicroLogix, CompactLogix™, ControlLogix® controllers, PanelView 550 or higher terminals, or the AIC+ interface. Use the RS-485 port to connect to PanelView 550 or higher terminals, or the 1747-AIC isolated link coupler.

Table 12 - 1747-UIC Specifications

Attribute	Value
USB power consumption	<100 mA (low power)
USB speed	USB 1.1 (12 Mbps)
DH-485 communication rate	19.2 Kbps

Select MicroLogix 1400 Controllers

MicroLogix 1400 Base Units

The base unit houses embedded inputs, outputs, power supply, and communication ports. The base unit also provides the interface to expansion I/O when required by an application.

Figure 6 - MicroLogix 1400 Controller Catalog Number Detail

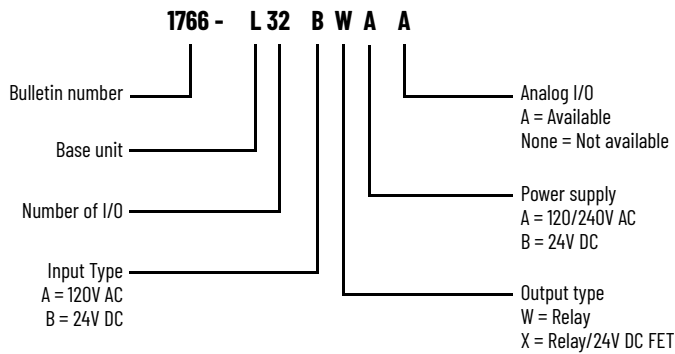
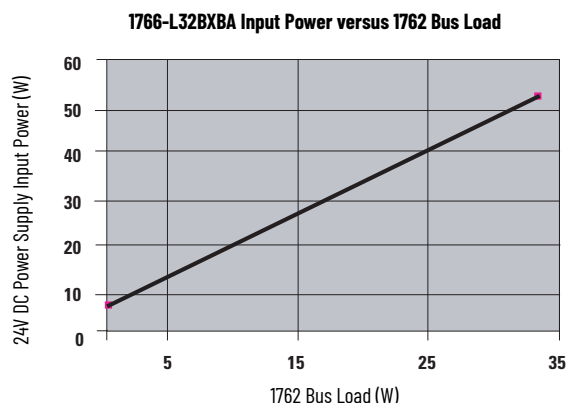


Table 13 - MicroLogix 1400 Controller Power and I/O Configuration

Catalog Number	Line Voltage	Number of Inputs	Number of Outputs	Embedded Analog I/O
1766-L32BWA	120/240V AC	(12) Fast 24V DC (8) Normal 24V DC	(12) Relay	—
1766-L32AWA	120/240V AC	(20) 120V AC	(12) Relay	—
1766-L32BXB	24V DC	(12) Fast 24V DC (8) Normal 24V DC	(6) Relay (3) Fast 24V DC (3) Normal 24V DC	—
1766-L32BWAA	120/240V AC	(12) Fast 24V DC (8) Normal 24V DC	(12) Relay	(4) Voltage Inputs (2) Voltage Outputs
1766-L32AWAA	120/240V AC	(20) 120V AC	(12) Relay	(4) Voltage Inputs (2) Voltage Outputs
1766-L32BXBBA	24V DC	(12) Fast 24V DC (8) Normal 24V DC	(6) Relay (3) Fast 24V DC (3) Normal 24V DC	(4) Voltage Inputs (2) Voltage Outputs

Table 14 - MicroLogix 1400 Controller Power Supply Specifications

Attribute	1766-L32AWA, 1766-L32AWAA	1766-L32BWA, 1766-L32BWAA	1766-L32BXB, 1766-L32BXBBA
Power supply voltage	100...240V AC (-15%, 10%) at 47...63 Hz		24V DC (-15%, 10%) Class 2 SELV
Power consumption	100VA	120VA	7.5...53 W
Power supply inrush current, max	120V AC: 25 A for 8 ms 240V AC: 40 A for 4 ms		24V DC: 15 A for 20 ms
24V DC sensor power	—	24V DC at 250 mA, 400µF capacitance, max	—

Figure 7 - MicroLogix 1400 Controller DC Input Power Requirements for 1766-L32BXB and 1766-L32BXBA Units**Table 15 - MicroLogix 1400 Controller Digital Input Specifications**

Attribute	1766-L32AWA, 1766-L32AWAA	1766-L32BWA, 1766-L32BWAA, 1766-L32BXB, 1766-L32BXBA	
		Inputs 0...11 (12 high-speed DC inputs)	Inputs 12 and above (8 standard DC inputs)
On-state voltage range	79...132V AC	4.5...24V DC 4.5...26.4V DC @ 60 °C (140 °F) 4.5...30V DC @ 30 °C (86 °F)	10...24V DC 10...26.4V DC @ 60 °C (140 °F) 10...30V DC @ 30 °C (86 °F)
Off-state voltage range	0...20V AC	0...1.5V DC	0...5V DC
Operating frequency	47...63 Hz	0 Hz...100 kHz	0 Hz...1 kHz (scan time dependent)
On-state current, min	5.0 mA @ 79V AC	7.1 mA @ 4.5V DC	3.2 mA @ 10V DC
On-state current, nom	12 mA @ 120V AC	9.9 mA @ 24V DC	5.3 mA @ 24V DC
On-state current, max	16.0 mA @ 132V AC	10.5 mA @ 30V DC	5.5 mA @ 30V DC
Off-state leakage current, max	2.5 mA, max	0.2 mA, max	1.5 mA, max
Impedance, nom	12 k Ω @ 50 Hz 10 k Ω @ 60 Hz	2.4 k Ω	4.5 k Ω
Inrush current, max	250 mA		

Table 16 - MicroLogix 1400 Controller Analog Input Specifications

Attribute	Value
Voltage input range	0...10.0V DC - 1 LSB
Type of data	12-bit unsigned integer
Input coding (0...10V DC)	0...4095
Voltage impedance	>199 Ω
Input resolution	12 bit
Non-linearity (In percent full scale)	$\pm 0.5\%$ of full scale
Overall accuracy	$\pm 1.0\%$ of full scale
Update time	100, 20, 16.67, 4 ms (Selectable)
Voltage input overvoltage protection	10.5V DC
Field wiring to logic isolation	Non-isolated with internal logic

Table 17 - MicroLogix 1400 Controller Analog Output Specifications

Attribute	Value
Voltage output range	0...10.0V DC - 1 LSB
Type of data	12-bit unsigned integer
Step response	2.5 ms @ 95%
Output coding (0...10V DC)	0...4095
Load range voltage output	>1 k Ω
Output resolution	12 bit
Analog output setting time	3 ms, max

Table 17 - MicroLogix 1400 Controller Analog Output Specifications (Continued)

Attribute	Value
Overall accuracy	±1.0% of full scale
Electrical isolation	Non-isolated with internal logic
Cable length	30 m (98 ft.) shielded cable

Specifications for MicroLogix 1400 Controller Outputs

Table 18 - Relay and FET Outputs

Attribute	1766-L32AWA, 1766-L32AWAA, 1766-L32BWA, 1766-L32BWAA	1766-L32BXB, 1766-L32BXBA
Controlled load, max	1440VA	1080VA
Continuous current, max		
Current per channel and group common	2.5 A per channel 8 A max channel 8...11 common	2.5 A per channel
Current per controller @ 150V, max	28 A or the total of per-point loads, whichever is less	—
Current per controller @ 240V, max	20 A or the total of per-point loads, whichever is less	—

Table 19 - Relay Outputs

Attribute	Value
Turn on time/Turn off time, max	10 ms ⁽¹⁾
Load current	10 mA

(1) Scan time dependent.

Table 20 - Relay Contact Rating⁽¹⁾

Voltage, max	Amperes		Amperes Continuous	Voltamperes	
	Make	Break		Make	Break
240V AC	7.5 A	0.75 A	2.5 A	1800VA	180VA
120V AC	15 A	1.5 A			
250V DC	0.11 A		1.0 A	28VA	
125V DC	0.22 A		1.0 A	28VA	

(1) Pilot Duty Rating (at Relay Contact Ratings): C300, R300.

Table 21 - 1766-L32BXB, 1766-L32BXBA FET Outputs

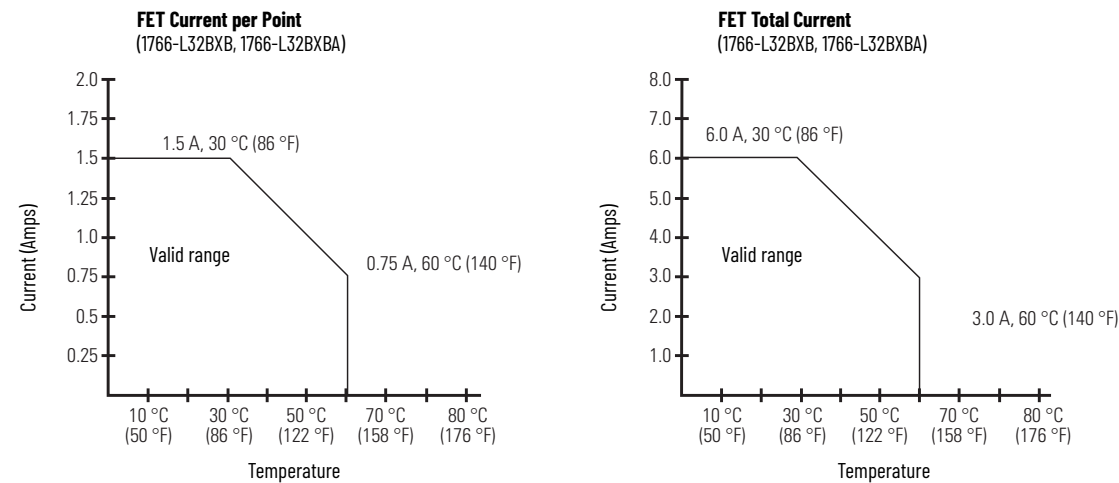
Attribute	General Operation	High-speed Operation (Outputs 2, 3, and 4 only) ⁽¹⁾
Power supply voltage (Class 2)	24V DC (-15%, +10%)	24V DC (-15%, +10%)
On-state voltage drop @ maximum load current	1V DC	Not applicable
On-state voltage drop @ maximum surge current	2.5V DC	Not applicable
Current rating per point, maximum load	See Figure 8	100 mA
Current rating per point, minimum load	1.0 mA	20 mA
Current rating per point, maximum leakage	1.0 mA	1.0 mA
Surge current per point, peak current	4.0 A	Not applicable
Surge current per point, maximum surge duration	10 ms	Not applicable
Surge current per point, maximum rate of repetition @ 30 °C (86 °F)	Once every second	Not applicable

Table 21 - 1766-L32BXB, 1766-L32BXBA FET Outputs (Continued)

Attribute	General Operation	High-speed Operation (Outputs 2, 3, and 4 only) ⁽¹⁾
Surge current per point, maximum rate of repetition @ 65 °C (149 °F)	Once every 2 seconds	Not applicable
Turn on time, max	11 µs	28 ns
Turn off time, max	89 µs	2.3 µs

(1) Outputs 2, 3, and 4 are designed to provide increased functionality over the other FET outputs. Outputs 2, 3, and 4 may be used like the other FET transistor outputs, but in addition, within a limited current range, they may be operated at a higher speed. Outputs 2, 3, and 4 also provide a pulse train output (PTO) or pulse width modulation output (PWM) function.

Figure 8 - MicroLogix 1400 Controller FET Standard Outputs



MicroLogix 1400 Memory Module (1766-MM1)

The controller is shipped with a memory module port cover in place. You can order the memory module to provide removable backup of your User Program and User Data, or to transport your program between controllers.

Memory modules allow:

- User programs and data to be stored as a backup
- Transport programs for use with other controllers
- Special safety/security features for press control and other critical applications
- Auto-recovery, through a power cycle, after a controller fault
- Comparison of programs
- Data file and memory module write protection
- Removal and insertion under power (RIUP)

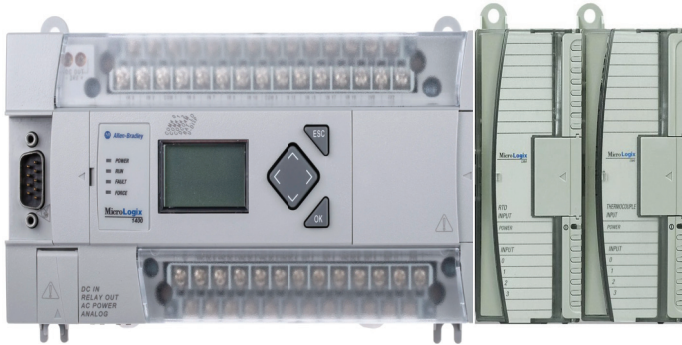
Select 1762 Expansion I/O

MicroLogix 1400 controllers expand by using the 1762 I/O platform. The 1762 I/O expansion modules provide excellent functionality in a small sized low-cost package. Various modules complement and extend the capabilities of MicroLogix 1400 controllers by maximizing the flexibility of I/O count and type.

The MicroLogix 1400 system design allows modules to be either DIN rail or panel mounted. The DIN latches and screw mounting holes are an integral part of the package design.

Controller I/O can be expanded by using up to seven expansion modules per controller.

Figure 9 - 1762 Expansion I/O Modules Connected to a MicroLogix 1400 Controller



Advantages

- Rackless design, eliminating added system costs and inventory
- Small footprint with high-density I/O, minimizing panel space requirements
- Integral high-performance I/O bus
- Software keying to help prevent incorrect positioning within the system
- Feature-rich I/O functionality addresses a wide range of applications
- AC/DC relay, 24V DC, 120V AC and 240V AC voltages
- Thermocouple/mV and RTD/Resistance temperature input modules

Available Modules

Table 22 - 1762 Expansion I/O Modules

Catalog Number	Description
Digital	
1762-IA8	8-point 120V AC input module
1762-IQ8	8-point sink/source 24V DC input module
1762-IQ8OW6	8-point sink/source 24V DC input/6-point AC/DC relay output combination module
1762-IQ16	16-point sink/source 24V DC input module
1762-OA8	8-point 120/240V AC triac output module
1762-OB8	8-point sourcing 24V DC output module
1762-OB16	16-point sourcing 24V DC output module
1762-OW8	8-point AC/DC relay output module
1762-OW16	16-point AC/DC relay output module
1762-OX6I	6-point isolated AC/DC relay output module
1762-OV32T	32-point solid-state 24V DC sink output module
1762-OB32T	32-point solid-state 24V DC source output module
1762-IQ32T	32-point DC input module
Analog	
1762-IF4	4-channel voltage/current analog input module
1762-OF4	4-channel voltage/current analog output module
1762-IF20F2	Combination 2-channel input 2-channel output voltage/current analog module

Table 22 - 1762 Expansion I/O Modules (Continued)

Catalog Number	Description
Specialty	
1762-IR4	4-channel RTD/resistance input module
1762-IT4	4-channel thermocouple/mV input module

1762 Digital I/O

Table 23 - 1762 Digital Expansion Input Modules Specifications

Attribute	1762-IA8	1762-IQ8	1762-IQ8OW6 (Inputs)	1762-IQ16	1762-IQ32T
Voltage category	100/120V AC	24V DC (sink/source) ⁽¹⁾	24V DC (sink/source) ⁽¹⁾	24V DC (sink/source) ⁽¹⁾	24V DC sink/source ⁽¹⁾
Operating voltage range	79...132V AC @ 47...63 Hz	10...26.4V DC @ 55 °C (131 °F) 10...30V DC @ 30 °C (86 °F)	10...26.4V DC @ 65 °C (149 °F) 10...30V DC @ 30 °C (86 °F)	10...26.4V DC 10...30V DC ⁽²⁾⁽³⁾	10...26.4V DC 10...30V DC
Number of inputs	8	8	8	16	32
Number of commons	1	1	Inputs: 2 Outputs: 1	2	4
Bus current draw, max	50 mA @ 5V DC (0.25 W)	50 mA @ 5V DC (0.25 W)	110 mA @ 5V DC (0.55 W) 80 mA @ 24V DC (1.92 W)	70 mA @ 5V DC (0.35 W) ⁽³⁾	170 mA @ 5V DC 0 mA @ 24V DC
Heat dissipation, max	2.0 total watts	3.7 total watts	5.0 total watts @ 30V 4.4 total watts @ 26.4V	5.4 total watts @ 30V 4.3 total watts @ 26.4V ⁽³⁾	5.4 total watts @ 26.4V 6.8 total watts @ 30.0V
Signal delay, max	On delay: 20.0 ms Off delay: 20.0 ms	On delay: 8.0 ms Off delay: 8.0 ms	On delay: 8.0 ms Off delay: 8.0 ms	On delay: 8.0 ms Off delay: 8.0 ms	On delay: 8.0 ms Off delay: 8.0 ms
Off-state voltage, max	20V AC	5V DC	5V DC	5V DC	5V DC
Off-state leakage current, max	2.5 mA	1.5 mA	1.5 mA	1.5 mA	1.0 mA
On-state voltage, min	79V AC, min 132V AC, max	10V DC	10V DC	10V DC	10V DC
On-state current, min	5.0 mA @ 79V AC, 47 Hz	2.0 mA @ 10V DC	2.0 mA @ 10V DC	2.0 mA @ 10V DC	1.6 mA @ 10V DC 2 mA @ 15V DC
On-state current, nom	12.0 mA @ 120V AC, 60 Hz	8.0 mA @ 24V DC	8.0 mA @ 24V DC	8.0 mA @ 24V DC	—
On-state current, max	16.0 mA @ 132V AC, 63 Hz	12.0 mA @ 30V DC	12.0 mA @ 30V DC	12.0 mA @ 30V DC	5.7 mA @ 26.4V DC 6.5 mA @ 30V DC
Inrush current, max	250 mA	—	250 mA	—	—
Impedance, nom	12 kΩ @ 50 Hz 10 kΩ @ 60 Hz	3 kΩ	3 kΩ	3 kΩ	4.7 kΩ
Isolated groups	Group 1: Inputs 0...7 (Internally connected commons)	Group 1: Inputs 0...7 (Internally connected commons)	Group 1: Inputs 0...3 Group 2: Inputs 4...7 Group 3: Outputs 0...5	Group 1: Inputs 0...7 Group 2: Inputs 8...15	Group 1: Inputs 0...7 Group 2: Inputs 8...15 Group 3: Inputs 16...23 Group 4: Inputs 24...31
Input group to backplane isolation	Verified by one of the following dielectric tests: 1517V AC for 1 s or 2145V DC for 1 s 132V AC working voltage (IEC Class 2 reinforced insulation)	Verified by one of the following dielectric tests: 1200V AC for 1 s or 1697V DC for 1 s 75V DC working voltage (IEC Class 2 reinforced insulation)	Verified by one of the following dielectric tests: Input Group to Backplane isolation - 1200V AC for 1 s or 1697V DC for 1 s 75V DC working voltage (IEC Class 2 reinforced insulation) Output Group to Backplane isolation - 1836V AC for 1 s or 2596V DC for 1 s 265V AC working voltage (IEC Class 2 reinforced insulation) Input Group to Output Group isolation - 1836V AC for 1 s or 2596V DC for 1 s 265V AC working voltage (basic insulation) 150V AC working voltage (IEC Class 2 reinforced insulation)	Verified by one of the following dielectric tests: 1200V AC for 1 s or 1697V DC for 1 s 75V DC working voltage (IEC Class 2 reinforced insulation)	Verified by one of the following dielectric tests: 1,200V AC for 2 s or 1,697V DC for 2 s 75V DC working voltage (IEC Class 2 reinforced insulation)

(1) Sinking/Sourcing Inputs - Sourcing/sinking describes the current flow between the I/O module and the field device. Sourcing I/O circuits supply (source) current to sinking field devices. A current sourcing field device drives sinking I/O circuits. Field devices connected to the negative side (DC Common) of the field power supply are sinking field devices. Field devices connected to the positive side (+V) of the field supply are sourcing field devices.

(2) See MicroLogix 1762-IQ16 DC Input Module Installation Instructions, publication [1762-IN010](#) for the derating chart.

(3) Only applicable to Series B I/O modules.

Table 24 - 1762 Digital Expansion Output Modules Specifications

Attribute	1762-0A8	1762-0B8	1762-0B16	1762-0B32T	1762-0V32T
Voltage category	100...240V AC	24V DC	24V DC	24V DC source	24V DC sink
Operating voltage range	85...265V AC @ 47...63 Hz	20.4...26.4V DC	20.4...26.4V DC	10.2...26.4V DC	
Number of outputs	8	8	16	32	
Number of commons	2	1	1	2	
Bus current draw, max	115 mA @ 5V DC (0.575 W)	115 mA @ 5V DC (0.575 W)	175 mA @ 5V DC (0.88 W)	175 mA @ 5V DC 0 mA @ 24V DC	
Heat dissipation, max	2.9 total watts	1.61 total watts	2.9 total watts @ 30 °C (86 °F) 2.1 total watts @ 55 °C (131 °F)	3.4 W @ 26.4V DC	2.7 W @ 26.4V DC
Signal delay, max - resistive load	On delay: 1/2 cycle Off delay: 1/2 cycle	On delay: 0.1 ms Off delay: 1.0 ms	On delay: 0.1 ms Off delay: 1.0 ms	On delay: 0.5 ms Off delay: 4.0 ms	
Off-state leakage, max	2 mA @ 132V 2.5 mA @ 265V	1.0 mA	1.0 mA	0.1 mA @ 26.4V DC	
On-state current, min	10 mA	1.0 mA	1.0 mA	1.0 mA	
On-state voltage drop, max	1.5V @ 0.5 A	1.0V DC	1.0V DC	0.3V DC @ 0.5 A	
Continuous current per point, max	0.25 A @ 55 °C (131 °F) 0.5 A @ 30 °C (86 °F)	0.5 A @ 55 °C (131 °F) 1.0 A @ 30 °C (86 °F)	0.5 A @ 55 °C (131 °F) 1.0 A @ 30 °C (86 °F)	0.5 A @ 60 °C (140 °F)	
Continuous current per common, max	1.0 A @ 55 °C (131 °F) 2.0 A @ 30 °C (86 °F)	4.0 A @ 55 °C (131 °F) 8.0 A @ 30 °C (86 °F)	4.0 A @ 55 °C (131 °F) 8.0 A @ 30 °C (86 °F)	2.0 A @ 60 °C (140 °F)	
Continuous current per module, max	2.0 A @ 55 °C (131 °F) 4.0 A @ 30 °C (86 °F)	4.0 A @ 55 °C (131 °F) 8.0 A @ 30 °C (86 °F)	4.0 A @ 55 °C (131 °F) 8.0 A @ 30 °C (86 °F)	4.0 A @ 60 °C (140 °F)	
Surge current, max	5.0 A ⁽¹⁾	2.0 A ⁽²⁾	2.0 A ⁽²⁾	2.0 A, repeatable every 2 s @ 60 °C (140 °F) for 10 ms	

(1) Repeatability is once every 2 seconds for a duration of 25 ms.

(2) Repeatability is once every 2 seconds @ 55 °C (131 °F), once every second @ 30 °C (86 °F) for a duration of 10 ms.

Table 25 - 1762 Digital Expansion Relay Output Modules Specifications

Attribute	1762-IQ80W6 (Outputs)	1762-0W8	1762-0W16	1762-0X6I
Voltage category	AC/DC normally open relay	AC/DC normally open relay	AC/DC normally open relay	AC/DC Type C Relay
Operating voltage range	5...265V AC 5...125V DC	5...265V AC 5...125V DC	5...265V AC 5...125V DC	5...265V AC 5...125V DC
Number of outputs	6	8	16	6 (N.C., N.O.)
Number of commons	Inputs: 2 Outputs: 1	2	2	6
Bus current draw, max	110 mA @ 5V DC (0.55 W) 80 mA @ 24V DC (1.92 W)	80 mA @ 5V DC (0.40 W) 90 mA @ 24V DC (2.16 W)	140 mA @ 5V DC (0.70 W) 180 mA @ 24V DC (4.32 W) ⁽¹⁾	110 mA @ 5V DC (0.55 W) 110 mA @ 24V DC (2.64 W)
Heat dissipation, max	5.0 total watts @ 30V 4.4 total watts @ 26.4V	2.9 total watts	6.1 watts ⁽¹⁾	2.8 watts
Signal delay, max - Resistive load	On delay: 10 ms Off delay: 10 ms	On delay: 10 ms Off delay: 10 ms	On delay: 10 ms Off delay: 10 ms	On delay: 10 ms Off delay: 20 ms
Off-state leakage, max	0 mA	0 mA	0 mA	0 mA
On-state current, min	10 mA @ 5V DC	10 mA @ 5V DC	10 mA	100 mA
On-state voltage drop, max	N/A	N/A	N/A	N/A
Continuous current per point, max	2.5 A (See Table 30)			7 A (See Table 30)
Continuous current per common, max	8 A	8 A	8 A	7 A (See Table 30)
Continuous current per module, max	8 A	16 A	16 A	30 A
Surge current, max	See Table 30			

(1) Only applicable to Series B I/O modules

1762 Analog Modules

Table 26 - 1762 Analog Expansion Modules Common Specifications

Attribute	1762-IF4	1762-IF20F2	1762-OF4
Bus current draw, max	40 mA @ 5V DC 50 mA @ 24V DC	40 mA @ 5V DC 105 mA @ 24V DC	40 mA @ 5V DC 165 mA @ 24V DC
Analog normal operating range	Voltage: -10...+10V DC Current: 4...20 mA	Voltage: 0...10V DC Current: 4...20 mA	Voltage: 0...0V DC Current: 4...20 mA
Full scale ⁽¹⁾ analog ranges	Voltage: -10.5...+10.5V DC Current: -21...+21 mA	Voltage: 0...0.5V DC Current: 0...21 mA	Voltage: 0...0.5V DC Current: 0...21 mA
Resolution	15 bits (bipolar) ⁽²⁾	12 bits (unipolar)	12 bits (unipolar)
Repeatability ⁽³⁾	±0.12% ⁽²⁾	±0.12% ⁽²⁾	±0.12% ⁽²⁾
Input and output group to system isolation	30V AC/30V DC rated working voltage ⁽⁴⁾ (N.E.C. Class 2 required) (IEC Class 2 reinforced insulation) Type test: 500V AC or 707V DC for 1 minute		30V AC/30V DC rated working voltage (IEC Class 2 reinforced insulation) Type test: 500V AC or 707V DC for 1 minute

(1) The overrange or underrange flag is set when the normal operating range is exceeded. The module continues to convert the analog input up to the maximum full scale range.

(2) Only applicable to Series B I/O modules.

(3) Repeatability is the ability of the input module to register the same reading in successive measurements for the same input signal.

(4) Rated working voltage is the maximum continuous voltage that can be applied at the terminals with respect to earth ground.

Table 27 - 1762 Analog Expansion Input Modules Specifications

Attribute	1762-IF4	1762-IF20F2
Number of inputs	4 differential (Bipolar)	2 differential (Unipolar)
Update time (Typical)	130, 250, 290, 450, 530 ms (Selectable)	2.5 ms
A/D converter type	Successive approximation	Successive approximation
Common mode voltage range ⁽¹⁾	±27V	±27V
Common mode rejection ⁽²⁾	>55 dB @ 50 Hz and 60 Hz	>55 dB @ 50 Hz and 60 Hz
Non-linearity (In percent full scale)	±0.12% ⁽²⁾	±0.12% ⁽²⁾
Typical overall accuracy ⁽³⁾	±0.32% full scale @ -20...+65 °C (-4...+149 °F) ⁽⁴⁾ ±0.24% full scale @ 25 °C (77 °F)	±0.55% full scale @ -20...+65 °C (-4...+149 °F) ⁽⁴⁾ ±0.3% full scale @ 25 °C (77 °F)
Input impedance	Voltage terminal: 200 kΩ Current Terminal: 275 Ω	Voltage terminal: 200 kΩ Current Terminal: 250 Ω
Current input protection	±32 mA	±32 mA
Voltage input protection	±30V	±30V
Channel diagnostics	Over or under range or open circuit condition by bit reporting for analog inputs	

(1) For proper operation, both the plus and minus input terminals must be within ±27V of analog common.

(2) $V_{cm} = 1 V_{pk-pk}$ AC

(3) $V_{cm} = 0$ (Includes offset, gain, non-linearity, and repeatability error terms)

(4) Only applicable to Series B I/O modules.

Table 28 - 1762 Analog Expansion Output Modules Specifications

Attribute	1762-IF20F2	1762-OF4
Number of outputs	2 single-ended (Unipolar)	4 single-ended (Unipolar) ⁽²⁾
Update time (Typical)	4.5 ms	2.5 ms
D/A converter type	Resistor string	R-2R ladder voltage switching
Resistive load on current output	0...500 Ω (Includes wire resistance)	0...500 Ω (Includes wire resistance)
Load range on voltage output	>1 kΩ	>1 kΩ
Reactive load, current output	<0.1 mH	<0.1 mH
Reactive load, voltage output	<1 μF	<1 μF
Typical overall accuracy ⁽¹⁾	±1.17% full scale @ -20...+65 °C (-4...+149 °F) ⁽²⁾ ±0.5% full scale @ 25 °C (77 °F)	±1.17% full scale @ -20...+65 °C (-4...+149 °F) ⁽²⁾ ±0.5% full scale @ 25 °C (77 °F)
Output ripple range 0...500 Hz (Referred to output range)	< ±0.1%	< ±0.1%
Non-linearity (In percent full scale)	< ±0.59% ⁽²⁾	< ±0.59% ⁽²⁾
Open and short-circuit protection	Continuous	Continuous
Output protection	±32 mA	±32 mA

(1) Includes offset, gain, non-linearity, and repeatability error terms.

(2) Only applicable to Series B I/O modules.

1762 Temperature Input Modules

Use these modules as a cost-effective means of addressing process applications that require temperature measurement and control. Each channel can be individually configured by using RSLogix 500 programming software. On-screen configuration lets you choose the input type, filtering frequency, data format, and status data. Onboard scaling is also provided.

Table 29 - 1762 Temperature Expansion Input Modules Specifications

Attribute	1762-IT4	1762-IR4
Bus current draw, max	40 mA @ 5V DC 50 mA @ 24V DC	40 mA @ 5V DC 50 mA @ 24V DC
Number of channels	4 input channels plus a CJC sensor	4 input channels
Accepted inputs	Thermocouples types: J, K, T, E, R, S, B, N, C Millivolt input ranges: ± 50 mV and ± 100 mV	RTDs: Platinum (385 and 3916), Copper (426), Nickel (672 and 618), Nickel-Iron (518) Resistance Ranges: 0...3000 Ω
Filter frequency	10 Hz...1 kHz	10 Hz...1 kHz
Temperature units	$^{\circ}\text{C}$ or $^{\circ}\text{F}$	$^{\circ}\text{C}$ or $^{\circ}\text{F}$
Data formats	Raw/Proportional, Engineering Units, Engineering Units x 10, Scaled-for-PID, Percent Range	
Accuracy @ 25 $^{\circ}\text{C}$ (77 $^{\circ}\text{F}$)	Thermocouple Inputs: $\pm 0.5... \pm 3.0$ $^{\circ}\text{C}$ ($\pm 0.9... \pm 5.4$ $^{\circ}\text{F}$) depending on thermocouple type Millivolt Inputs: $\pm 15... \pm 20$ mV	With Autocalibration enabled RTD Inputs: $\pm 0.2... \pm 0.6$ $^{\circ}\text{C}$ ($\pm 0.36... \pm 1.08$ $^{\circ}\text{F}$) depending on RTD type Resistance Inputs: $\pm 0.5... \pm 1.5$ Ω depending on resistance value
Accuracy @ 0...55 $^{\circ}\text{C}$ (32...131 $^{\circ}\text{F}$)	Thermocouple Inputs: $\pm 0.8... \pm 10$ $^{\circ}\text{C}$ ($\pm 1.5... \pm 18$ $^{\circ}\text{F}$) depending on thermocouple type Millivolt Inputs: $\pm 25... \pm 30$ mV	With Autocalibration enabled RTD Inputs: $\pm 0.4... \pm 1.1$ $^{\circ}\text{C}$ ($\pm 0.72... \pm 1.98$ $^{\circ}\text{F}$) depending on RTD type Resistance Inputs: $\pm 0.25... \pm 2.5$ Ω depending on resistance value
Channel update time (Typical)	7...303 ms per enabled channel + CJC update time, depending on filter selection (CJC update time is equal to the largest enabled channel's update time)	6...303 ms per enabled channel, depending on filter selection
Channel diagnostics	Overrange or underrange and open-circuit by bit reporting	Overrange or underrange or broken input by bit reporting
Calibration	The module performs autocalibration on channel enable and on a configuration change between channels. You can also program the module to calibrate every five minutes.	
Common mode noise rejection	115 dB min @ 50 Hz (With 10 Hz or 50 Hz filter) 115 dB min @ 60 Hz (With 10 Hz or 60 Hz filter)	110 dB min @ 50 Hz (With 10 Hz or 50 Hz filter) 110 dB min @ 60 Hz (With 10 Hz or 60 Hz filter)
Normal mode noise rejection	85 dB min @ 50 Hz (With 10 Hz or 50 Hz filter) 85 dB min @ 60 Hz (With 10 Hz or 60 Hz filter)	70 dB min @ 50 Hz (With 10 Hz or 50 Hz filter) 70 dB min @ 60 Hz (With 10 Hz or 60 Hz filter)
Input group to system isolation	720V DC for 1 minute	707V DC for 1 minute
Channel-to-channel isolation	± 10 V DC	± 10 V DC
Repeatability ⁽¹⁾	Thermocouples @ 25 $^{\circ}\text{C}$ (77 $^{\circ}\text{F}$) and 10 Hz filter selected: $\pm 0.1... \pm 2.0$ $^{\circ}\text{C}$ ($\pm 0.18... \pm 3.6$ $^{\circ}\text{F}$) depending on thermocouple type Millivolt Inputs: ± 6 μV	± 0.1 $^{\circ}\text{C}$ (± 0.18 $^{\circ}\text{F}$) for Nickel and Nickel-Iron ± 0.2 $^{\circ}\text{C}$ (± 0.36 $^{\circ}\text{F}$) for other RTD inputs ± 0.04 Ω for 150 Ω resistances ± 0.2 Ω for other resistances
Input impedance	>10 M Ω	>10 M Ω

(1) Repeatability is the ability of the input module to register the same reading in successive measurements for the same input signal.

Table 30 - 1762 Relay Contact Rating

Voltage, max	Amperes		Amperes Continuous	Voltamperes	
	Make	Break		Make	Break
240V AC	7.5 A	0.75 A	2.5 A ⁽¹⁾	1800VA	180VA
120V AC	15 A	1.5 A			
125V DC	0.22 A ⁽²⁾		1.0 A	28VA	
24V DC	1.2 A ⁽¹⁾		2.0 A		

(1) 1.5 A above 40 $^{\circ}\text{C}$ (104 $^{\circ}\text{F}$).

(2) For DC voltage applications, the make/break ampere rating for relay contacts can be determined by dividing 28VA by the applied DC voltage. For example, 28 VA/48V DC = 0.58 A.
For DC voltage applications less than 48V, the make/break ratings for relay contacts cannot exceed 2 A.
For DC voltage applications greater than 48V, the make/break ratings for relay contact cannot exceed 1 A.

Select Replacement Parts

Table 31 - MicroLogix 1400 Replacement Parts

Description	Catalog Number
Replacement battery	1747-BA
Replacement removable terminal block - (1) 25-pt double row, (1) 29-point double row for all 1766-L32xxxx	1762-RPLRTB40

Complete Your Selection Listing

Table 32 - Master List of Catalog Numbers

Catalog Number	Description	Quantity Selected
MicroLogix 1400 Controllers and Accessories		
1766-L32BWA	MicroLogix 1400 32-point AC controller	
1766-L32AWA	MicroLogix 1400 32-point AC controller	
1766-L32BXB	MicroLogix 1400 32-point DC controller	
1766-L32BWAA	MicroLogix 1400 32-point AC controller with analog I/O	
1766-L32AWAA	MicroLogix 1400 32-point AC controller with analog I/O	
1766-L32BxBA	MicroLogix 1400 32-point DC controller with analog I/O	
1766-MM1	MicroLogix 1400 memory module	
1762 Expansion I/O		
1762-IA8	8-point 120V AC input module	
1762-IF2OF2	Combination 2-channel input 2-channel output voltage/current analog module	
1762-IF4	4-channel voltage/current analog input module	
1762-IQ16	16-point sink/source 24V DC input module	
1762-IQ8	8-point sink/source 24V DC input module	
1762-IQ8OW6	8-point sink/source 24V DC input/6-point AC/DC relay output combination module	
1762-IR4	4-channel RTD/resistance input module	
1762-IT4	4-channel thermocouple/mV input module	
1762-OA8	8-point 120/240V AC triac output module	
1762-OB16	16-point sourcing 24V DC output module	
1762-OB8	8-point sourcing 24V DC output module	
1762-OF4	4-channel voltage/current analog output module	
1762-OW16	16-point AC/DC relay output module	
1762-OW8	8-point AC/DC relay output module	
1762-OX6I	6-point isolated AC/DC relay output module	
1762-OV32T	Solid-state 24V DC sink output module	
1762-OB32T	Solid-state 24V DC source output module	
1762-IQ32T	DC input module	
Programming Tools and Software		
1747-UIC	Universal serial bus (USB) to DH-485 interface converter	
9324-RL0100ENE	RSLogix 500 Starter Edition programming software	
9324-RL0300ENE	RSLogix 500 Standard Edition programming software	
9324-RL0700NXENE	RSLogix 500 Professional Edition programming software	
9324-RLM0100ENE	RSLogix Micro Starter software	
9324-RLM0800ENE	RSLogix Micro Professional software	
Cables		
1761-CBL-AC00	RS-232 operating cable, 9-pin D-shell to 9-pin D-shell (MicroLogix), 0.5 m (1.5 ft.)	
1761-CBL-AM00	RS-232 operating cable, 8-pin mini DIN to 8-pin mini DIN (MicroLogix), 0.5 m (1.5 ft.)	
1761-CBL-AP00	RS-232 operating cable, 8-pin mini DIN to 9-pin D-shell (MicroLogix), 0.5 m (1.5 ft.)	
1761-CBL-AS03	Controller/DH-485 cable, 6-pin Phoenix to RJ45, 3 m (10 ft.)	
1761-CBL-AS09	Controller/DH-485 cable, 6-pin Phoenix to RJ45, 9.5 m (31 ft.)	
1761-CBL-HM02	RS-232 operating/programming cable, 8-pin mini DIN to 8-pin mini DIN (MicroLogix), 2 m (6.5 ft.)	

Table 32 - Master List of Catalog Numbers (Continued)

Catalog Number	Description	Quantity Selected
1761-CBL-PM02	RS-232 operating/programming cable, 8-pin mini DIN to 9-pin D-shell (MicroLogix), 2 m (6.5 ft.)	
1761-CBL-PH02	RS-232 operating/programming cable, 8-pin mini DIN with lock mechanism to 9-pin D-shell, 2 m (6.5 ft.)	
1761-CBL-AH02	RS-232 operating/programming cable, 8-pin mini DIN with lock mechanism to 8-pin mini DIN with lock mechanism, 2 m (6.5 ft.)	
1763-NC01	DH-485 cable, 8-pin mini DIN to 6-pin Phoenix	
2711-CBL-HM05	RS-232 operating cable, 8-pin mini DIN to 8-pin mini DIN (PanelView micro to MicroLogix), 5 m (16.4 ft.)	
2711-CBL-HM10	RS-232 operating cable, 8-pin mini DIN to 8-pin mini DIN (PanelView micro to MicroLogix), 10 m (32.7 ft.)	
2711-CBL-PM05	RS-232 operating/programming cable, 9-pin D-shell to 8-pin mini DIN (PanelView micro to SLC™ or PLC), 5 m (16.4 ft.)	
2711-CBL-PM10	RS-232 operating/programming cable, 9-pin D-shell to 8-pin mini DIN (PanelView micro to SLC or PLC), 10 m (32.7 ft.)	
Replacement Parts		
1747-BA	Lithium battery (For RAM memory retention) for MicroLogix 1400 controllers	
1762-RPLRTB40	Replacement terminal block for all 1766-L32xxxx controllers	

For More Information

Visit the MicroLogix 1400 controller product [webpage](#) to learn more about MicroLogix 1400 products. Visit the Rockwell Automation Product Compatibility and Download Center (PCDC) at rok.auto/pcdc to download firmware updates for MicroLogix 1400 controllers.

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
MicroLogix 1200 120V AC Input Module Installation Instructions, publication 1762-IN002	Provides information on how to mount and wire the expansion I/O module, 1762-IA8.
MicroLogix 1200 Relay Output Module Installation Instructions, publication 1762-IN003	Provides information on how to mount and wire the expansion I/O module, 1762-OW8.
MicroLogix 1200 24V DC Input Module Installation Instructions, publication 1762-IN004	Provides information on how to mount and wire the expansion I/O module, 1762-IQ8.
MicroLogix 1762-IF20F2 Analog Input/Output Module Installation Instructions, publication 1762-IN005	Provides information on how to mount and wire the expansion I/O module, 1762-IF20F2.
MicroLogix 1200 Solid-state Output Module Installation Instructions, publications 1762-IN007	Provides information on how to mount and wire the expansion I/O module, 1762-OA8.
MicroLogix 1200 Solid-state 24V DC Source Output Module Installation Instructions, publication 1762-IN008	Provides information on how to mount and wire the expansion I/O module, 1762-OB8.
MicroLogix 1762-OW16 Relay Output Module Installation Instructions, publication 1762-IN009	Provides information on how to mount and wire the expansion I/O module, 1762-OW16.
MicroLogix 1762-IQ16 DC Input Module Installation Instructions, publication 1762-IN010	Provides information on how to mount and wire the expansion I/O module, 1762-IQ16.
MicroLogix 1200 16-point Solid-state 24V DC Source Output Module Installation Instructions, publication 1762-IN011	Provides information on how to mount and wire the expansion I/O module, 1762-OB16.
MicroLogix 1762-IF4 Analog Input Module Installation Instructions, publication 1762-IN012	Provides information on how to mount and wire the expansion I/O module, 1762-IF4.
MicroLogix 1200 Thermocouple/mV Input Module Installation Instructions, publication 1762-IN013	Provides information on how to mount and wire the expansion I/O module, 1762-IT4.
MicroLogix 1200 RTD/Resistance Input Module Installation Instructions, publication 1762-IN014	Provides information on how to mount and wire the expansion I/O module, 1762-IR4.
MicroLogix Analog Output Module Installation Instructions, publication 1762-IN016	Provides information on how to mount and wire the expansion I/O module, 1762-OF4.
MicroLogix 1200 Isolated Relay Output Module Installation Instructions, publication 1762-IN017	Provides information on how to mount and wire the expansion I/O module, 1762-OB16.

Additional Resources (Continued)

Resource	Description
MicroLogix 1200 DC Input/Relay Output Combination Module Installation Instructions, publication 1762-IN018	Provides information on how to mount and wire the expansion I/O module, 1762-IQ80W6.
MicroLogix 1762-IQ32T DC Input Module Installation Instructions, publication 1762-IN019	Provides information on how to mount and wire the expansion I/O module, 1762-IQ32T.
MicroLogix 1762-OB32T Solid State 24V DC Source Output Module Installation Instructions, publication 1762-IN020	Provides information on how to mount and wire the expansion I/O module, 1762-OB32T.
MicroLogix 1762-0V32T Solid State 24V DC Sink Output Module Installation Instructions, publication 1762-IN021	Provides information on how to mount and wire the expansion I/O module, 1762-0V32T.
MicroLogix 1400 Programmable Controllers Installation Instructions, publication 1766-IN001	Provides information on how to mount and wire the MicroLogix 1400 controllers.
MicroLogix 1200 Programmable Controllers and Expansion I/O User Manual, publication 1762-UM001	Describes how to wire, use, and troubleshoot the 1762 expansion I/O modules.
MicroLogix 1200 Thermocouple/mV Input Module User Manual, publication 1762-UM002	Describes how to wire, use, and troubleshoot the expansion I/O module, 1762-IT4.
MicroLogix 1200 RTD/Resistance Input Module User Manual, publication 1762-UM003	Describes how to wire, use, and troubleshoot the expansion I/O module, 1762-IR4.
MicroLogix 1400 Programmable Controllers User Manual, publication 1766-UM001	Describes how to install, use, and troubleshoot MicroLogix 1400 controllers.
MicroLogix 1400 Embedded Web Server User Manual, publication 1766-UM002	Describes how to use the web server feature of MicroLogix 1400 controllers.
MicroLogix 1400 Programmable Controllers Reference Manual, publication 1766-RM001	Describes how to configure, program, and troubleshoot MicroLogix 1400 controllers.
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.
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 Selection and Configuration website, rok.auto/systemtools	Helps configure complete, valid catalog numbers and build complete quotes based on detailed product information.
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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