Select Family: MicroLogix 1100 or 1400 Controller

Step 1 - Select:

- controller family - based on memory, I/O, added functionality, programming instructions and dimensions
- consider future expansion requirements
- consider requirement for online editing
- consider the need for networked communication

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

Features

MicroLogix Controllers Feature Comparison Chart

Controller	MicroLogix 1100	MicroLogix 1400
Bulletin Number	**1763**	**1766**
Memory (in user words) User Program/User Data		
Up to 1 KB		
Up to 6 KB		
Up to 7 KB		
Up to 8 KB	4 KB/4 KB	
Up to 14 KB		
Up to 20 KB		10 KB/10 KB
Online editing	✓	✓
Nonvolatile program and data	Battery back-up static RAM	Battery back-up static RAM
Memory Module (for program back-up and transport)	Optional	Optional
I/O		
Embedded Digital I/O, max	16	32
Embedded Analog I/O	Two 0…10V DC inputs on all controllers	Four 0…10V DC inputs on some controllers Two 0...10V DC outputs on some controllers
Local Expansion I/O, max	144	256
Thermocouple/RTD	Expansion	Expansion
Added Functionality		
Trim Potentiometers	Two (digital)	Two (digital)
PID	✓	✓
High Speed Counters (embedded)	One @ 40 kHz	Up to six @ 100 kHz
Real Time Clock	✓	✓
Motion: Pulse Width Modulated	2 @ 40 kHz	3 @ 40 kHz
Motion: Pulse Train Outputs	2 @ 40 kHz	3 @ 100 kHz
Data Access Tool	✓	✓
Data Logging	128 KB	128 KB
Recipe Storage	Uses up to 64 KB data logging memory	Uses up to 64 KB data logging memory
Floating Point Math	✓	✓
Programming		
Windows - RSLogix 500 Software	✓	✓
RSLogix Micro	✓	✓
Communication		
RS-232 Ports	(1) 8-pin mini DIN	(1) 8-pin mini DIN (1) 9-pin D-shell
DeviceNet Peer-to-Peer Messaging, slave I/O	With 1761-NET-DNI	With 1761-NET-DNI
EtherNet/IP	✓	✓
Web Server Capabilities	✓	✓
DH-485	Network with 1763-NC01	Network with 1763-NC01

Select Communication

Step 2 - Select:

- communication network - based on application requirements
- communication interface device - if required
- record your selection in the Selection Record (starts on page 86)

Communication Networks

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

- Channel 0 Isolated RS-232/RS-485 Combo port (MicroLogix 1100 and 1400 controllers only)
- EtherNet/IP port (MicroLogix 1100 and 1400 controllers only)
- DNP3 over IP (MicroLogix 1400 controller only)
- Modbus TCP/IP (MicroLogix 1400 controller only)
- For RS-232 communication:
  - 300, 600, 1200, 4800, 9600 bps; 19.2 and 38.4 Kbps
  - RTS/CTS hardware handshake signals
  - Connection to DH-485, DeviceNet and Ethernet networks through the 1761-NET-AIC, 1761-NET-DNI and 1761-NET-ENI interface modules, respectively (MicroLogix 1500 controllers also connect to DeviceNet network via the 1769-SDN DeviceNet Scanner Module)
  - Connection to modems for remote communication
  - ASCII messaging provides dial-out capability (except MicroLogix 1000 controller)
  - DF1 half-duplex slave
  - DF1 half-duplex master (except MicroLogix 1000 controller)
  - DNP3 slave (MicroLogix 1400 controller only)
  - Modbus RTU master/slave through the 1761-NET-AIC module (MicroLogix 1100 and 1400 controllers also connect to Modbus RTU master/slave directly through 1763-NC01 cable to Channel 0)

Important: The MicroLogix 1100 and 1400 controllers do not provide 24V DC power for network interface whereas all other MicroLogix controllers do. The 24V DC comms power must be provided externally when 1761-NET-AIC or 1761-NET-ENI or 1761-NET-ENIW modules are used with a MicroLogix 1100 and 1400 controller. MicroLogix 1100 and 1400 controllers provide direct connection to RS-485 networks by using the same pins used by other MicroLogix controllers for 24V DC communication power.

MicroLogix 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(1) DH-485 via the 1761-NET-AIC Advanced Interface Converter(2)
• Data sharing between 64 devices • Better diagnostics for improved data collection and fault detection • Less wiring and reduced start-up time than traditional, hard-wired systems • Program upload, download, and monitoring • Peer-to-peer communication • Connection of low-level multi-vendor devices directly to plant floor controllers (when using the 1769-SDN scanner)	DeviceNet network via the 1761-NET-DNI DeviceNet Interface
• Program upload, download, and monitoring • Peer-to-peer communication • E-mail communication • 10/100 Base-T port with embedded status indicators • Web server capability via the 1761-NET-ENIW module	EtherNet/IP network directly through Channel 1 10/100 Mbps communication port(3) EtherNet/IP network via the 1761-NET-ENI Ethernet Interface or 1761-NET-ENIW Web-Enabled Ethernet Interface(2)
• Connection to third party devices for remote data collection in a SCADA system (for example, telephone modems, radio modems, and leased lines.) • Remote Terminal Unit (RTU) functions	Modbus RTU master/slave directly through channel) RS-485 port using 1763-NC01 cable(2) Modbus RTU slave via the 1761-NET-AIC Advanced Interface Converter(2) Modbus RTU master via the 1761-NET-AIC Advanced Interface Converter(2) DNP3 slave via RS-232(4) DNP3 over IP(4) Modbus TCP/IP(4)

(1) MicroLogix 1100 and 1400 controllers only.

(2) MicroLogix 1100 and 1400 controllers do not provide 24V DC power for network interface devices. External 24V DC module power must be supplied.

(3) Direct EtherNet/IP connections through MicroLogix 1100 and 1400 controllers provide web server capabilities as well as support for email communication.

(4) MicroLogix 1400 controllers only.

MicroLogix Network Interface Devices

The following information describes the functionality of the MicroLogix interface modules. For most applications, the embedded RS-485 and Ethernet/IP functionality of the MicroLogix 1100 and 1400 communication ports replaces the 1761-NET-AIC, 1761-NET-ENI, and the 1761-NET ENIW (or AIC+, ENI, and ENIW) modules.

The network interface devices can be mounted on a panel or DIN rail.

AIC+ Advanced Interface Converter (Catalog Number 1761-NET-AIC)

The AIC+ is an isolated, RS-232 to RS-485 electrical signal converter for supporting serial, half-duplex, multi-drop protocols, such as:

- DH-485.
- DF1 half-duplex master/slave.
- Modbus RTU (a single master can communicate with a maximum of 31 slave devices).

Since RS-232 ports can only be connected point-to-point between two devices, an AIC+ (or similar device) is required whenever a MicroLogix controller is configured for one of these protocols and needs to communicate with more than one other device at a time. The AIC+ also provides electrical isolation between each of its three ports for a more stable network and protection for connected devices.

When using the 1763-NC01 cable, the MicroLogix 1100 and 1400 controller provides isolated connection to RS-485 networks directly from the Channel 0 combo port.

Any MicroLogix controller can connect to either of the two RS-232 ports on the AIC+. When Channel 0 on a MicroLogix controller is connected to Port 2 (RS-232 8-pin mini-DIN) of the AIC+, the interface module can draw its power from the MicroLogix controller. In all other cases, including using MicroLogix 1100 and 1400 controllers, the AIC+ must be powered from an external, 24V DC power supply. The AIC+ can also be used as an RS-232 to RS-485 converter and port isolator for any other Allen-Bradley controller or terminal with an RS-232 port.

Since the AIC+ is not a protocol converter, all devices connected to a single AIC+ (or a network of AIC+s) must be configured for the same communication protocol.

DH-485 Network Specifications

Attribute	1761-NET-AIC
Number of Nodes, max	32 per multidrop network
Length, max	1219 m (4000 ft) per multidrop network

Network 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	5 m (16 ft)	2711-CBL-PM05
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	10 m (32 ft)	2711-CBL-PM10
8-pin Mini DIN to 8-pin Mini DIN	5 m (16 ft)	2711-CBL-HM05		6-pin Phoenix to RJ45 (DH-485)	3 m (10 ft)	1761-CBL-AS03
8-pin Mini DIN to 8-pin Mini DIN	10 m (32 ft)	2711-CBL-HM10		6-pin Phoenix to RJ45 (DH-485)	9 m (30 ft)	1761-CBL-AS09
9-pin D Shell to 9-pin D Shell	0.5 m (1.5 ft)	1761-CBL-AC00		8-pin Mini DIN to 8-pin Mini DIN	15 m (49.2 ft)	2707-NC9(1)
9-pin D Shell to 9-pin D Shell	3 m (10 ft)	1747-CP3		8-pin Mini DIN to 6-pin DH-485 terminal	30 cm (11.8in.)	1763-NC01 series A
8-pin Mini DIN to 9-pin D Shell	0.5 m (1.5 ft)	1761-CBL-AP00(1)		RJ-45 to RJ-45	100 m (328 ft), max	Ethernet Cable(2)
8-pin Mini DIN to 9-pin D Shell	2 m (6.5 ft)	1761-CBL-PM02(1)				

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

(2) Commercially available.

Programming Cable Selection

Programming Cable Selection Chart - Programming Device to Controller

Programming Device	MicroLogix 1000, 1100, 1200, 1400, and 1500 Channel 0 (8-pin Mini DIN) MicroLogix 1200 Programming/HMI Port (8-pin Mini DIN)		MicroLogix 1100 and 1400 Channel 1 (RJ-45)		MicroLogix 1400 Channel 2 MicroLogix 1500 with 1764-LRP Processor Channel 1 (9-pin RS-232)	
	Cat. No.	Length	Cat. No.	Length	Cat. No.	Length
Personal Computer (9-pin D Shell)	1761-CBL-PM02	2 m (6.5 ft)	---		1747-CP3	3m (10 ft)
Personal Computer (RJ-45)	---		Ethernet Cable(1)	100 m (328 ft), max	---	
Hand-Held Programmer (1761-HHP)	1761-CBL-HM02	2 m (6.5 ft)	---		---	

(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 an SLC 500, MicroLogix, or other Rockwell Automation controllers and on PanelView terminals. The 1747-UIC features a USB connector as well as both an RS-232 and an RS-485 port. Use the RS-232 port to connect to SLC 5/03, 5/04, 5/05 (Channel 0), MicroLogix, CompactLogix, FlexLogix, ControlLogix controllers, PanelView 300 or higher terminals, or the AIC+ interface. Use the RS-485 port to connect to SLC 5/01, 5/02, 5/03 controllers (Channel 1), PanelView 300 or higher terminals, or the 1747-AIC isolated link coupler.

USB to DH-485 Interface Converter Specifications

Cat. No.	1747-UIC
USB Power Consumption	<100 mA (low power)
USB Speed	USB 1.1 (12 Mbps)
DH-485 Baud Rate	19.2 Kbps

Master List of Catalog Numbers

Cat. No.	Description	Quantity Selected
1769-OF4VI	Compact 4-channel Voltage Isolated Analog Output Module	
1769-OF8C	Compact 8-point Analog Current Output Module	
1769-OF8V	Compact 8-point Analog Voltage Output Module	
1769-OG16	Compact TTL Output Module	
1769-OV16	Compact Solid State 16-point 24V DC Sink Output Module	
1769-OV32T	Compact Current Sinking 24V DC Output Module	
1769-OW16	Compact 16-Output AC/DC Relay Module	
1769-OW8	Compact 8-Output AC/DC Relay Module	
1769-OW8I	Compact Individually Isolated 8-Output AC/DC Relay Module	
1769-PA2	Compact 124/240V AC Expansion Power Supply	
1769-PA4	Compact 124/240V AC Expansion Power Supply	
1769-PB2	Compact 24V DC Expansion Power Supply	
1769-PB4	Compact 24V DC Expansion Power Supply	
1769-SDN	CompactLogix DeviceNet Scanner Module	
1769-SM1	Compact I/O to DPI/SCANport Module	
1769-SM2	Compact I/O to DSI Communication Module	
MicroLogix Communication Interface Devices		
1761-NET-AIC	MicroLogix Advanced Interface Converter Module	
1761-NET-DNI	MicroLogix DeviceNet Interface Module	
1761-NET-ENI	MicroLogix Ethernet/IP Interface Module	
1761-NET-ENIW	MicroLogix Ethernet/IP Interface Module with Web Server Functionality	
Programming Tools and Software		
1747-UIC	Universal Serial Bus (USB) to DH-485 Interface Converter	
1761-HHM-K08	8 KB Memory Module for MicroLogix 1000 Hand-Held Programmer	
1761-HHM-K64	64 KB Memory Module for MicroLogix 1000 Hand-Held Programmer	
1761-HHP-B30	MicroLogix 1000 Hand-Held Programmer	
9324-RL0100ENE	RSLogix 500 Starter	
9324-RL0300ENE	RSLogix 500 Programming for the SLC 500 and MicroLogix Families	
9324-RL0700NXENE	RSLogix 500 Professional	
9324-RLM0100ENE	RSLogix Micro Starter	
9324-RLM0800ENE	RSLogix Micro Professional	
Cables		
1747-CP3	SLC 5/03, SLC 5/04, and SLC 5/05 RS-232 Programmer Cable	
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)	
1761-CBL-PM02	RS-232 Operating/Programming Cable, 8-Pin Mini DIN to 9-Pin D Shell (MicroLogix), 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 300 Micro to MicroLogix), 5 m (16.4 ft)	