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Allen-Bradley

1756 ControlLogix Communication Modules Specifications

Standard ControlLogix Catalog Numbers 1756-EN2F, 1756-EN2T, 1756-EN2TR, 1756-EN3TR, 1756-ENBT, 1756-EWEB, 1756-CN2, 1756-CN2R, 1756-CNB, 1756-CNBR, 1756-DNB, 1756-DHRIO, 1756-RIO, 1756-DH485, 1756-SYNCH, 1756-EN2TXT, 1756-CN2RXT, 1756-DHRIOXT, 1757-FFLD2, 1757-FFLD4, 1757-FFLDC2, 1757-FFLDC4

ControlLogix-XT Catalog Numbers 1756-EN2TXT, 1756-CN2RXT, 1756-DHRIOXT

Linking Device Catalog Numbers 1757-FFLD2, 1757-FFLD4, 1757-FFLDC2, 1757-FFLDC4

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Separate communication-interface modules are available for different networks. Install multiple communication-interface modules into the ControlLogix® backplane to configure a gateway to bridge or route control and information data between different networks. You do not need a ControlLogix controller in the chassis.

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Additional Resources

These documents contain additional information concerning related products from Rockwell Automation®.

Resource	Description
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, http://www.ab.com	Provides declarations of conformity, certificates, and other certification details.

You can view or download publications at http://www.rockwellautomation.com/literature/. To order paper copies of technical documentation, contact your local Allen-Bradley® distributor or Rockwell Automation sales representative.

Available Communication Modules

Network	Cat. No.	Description	Page
EtherNet/IP	1756-EN2F	EtherNet/IP bridge, fiber, 256 Logix connections	4
	1756-EN2T	EtherNet/IP bridge, copper, 256 Logix connections	4
	1756-EN2TR	EtherNet/IP bridge, embedded switch, copper Supports as many as 8 axis of motion	4
	1756-EN3TR	EtherNet/IP bridge, embedded switch, copper Supports as many as 128 axis of motion	4
	1756-ENBT	EtherNet/IP bridge, copper, 128 Logix connections	4
	1756-EWEB	Ethernet web server, 128 Logix connections, Class 3 messaging only	4
	1756-EN2TXT	ControlLogix-XT™, EtherNet/IP bridge, copper, 256 Logix connections	6
ControlNet	1756-CN2/B, 1756-CN2R/B	ControlNet bridge, 128 Logix connections(1)	11
	1756-CNB, 1756-CNBR	ControlNet bridge, 64 connections; recommend using only 40…48 Logix connections for I/O	11
	1756-CN2RXT	ControlLogix-XT, ControlNet bridge, 128 Logix connections(1)	11
DeviceNet	1756-DNB/E	DeviceNet bridge	17
Data Highway Plus™	1756-DHRIO	Data Highway Plus/Remote I/O module	21
	1756-DHRIOXT	ControlLogix-XT, Data Highway Plus/Remote I/O module	23
Remote I/O	1756-DHRIO	Data Highway Plus/Remote I/O module	21
	1756-RIO/B	Remote I/O module	21
	1756-DHRIOXT	ControlLogix-XT, Data Highway Plus/Remote I/O module	23
Foundation Fieldbus	1757FFLD2, 1757-FFLD4	Foundation Fieldbus linking device bridges from an Ethernet network to either two or four H1 ports	25
	1757-FFLDC2, 1757-FFLDC4	Foundation Fieldbus linking device bridges from a ControlNet network to either two or four H1 ports	25
Serial	1756-DH485	Compatible with RS-232 serial communication, supports the DF1 protocol, send and receive messages, does not support remote programming and monitoring	28
SynchLink™	1756-SYNCH	SynchLink fiber-optic communication link	31

(1) 128 connections are available for standard use. An additional three connections are reserved for redundant control.

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Communication Connections

A ControlLogix system uses connections to establish communication links between devices. The types of connections include the following:

- Controller-to-local I/O modules or local communication modules
- Controller-to-remote I/O or remote communication modules
- Controller-to-remote I/O (rack-optimized) modules
- Produced and consumed tags
- Messages
- Controller access by RSLogix™ 5000 software
- Controller access by RSLinx® software for HMI or other applications

You indirectly determine the number of connections the controller uses by configuring the controller to communicate with other devices in the system. The limit of connections may ultimately reside in the communication module you use for the connection. If a message path routes through a communication module, the connection related to the message also counts towards the connection limit of that communication module.

EtherNet/IP Network



The Ethernet Industrial (EtherNet/IP) network protocol is an open industrial-networking standard that supports both real-time I/O messaging and message exchange. The EtherNet/IP network uses off-the-shelf Ethernet communication chips and physical media.

If you need to	Select this interface
• Control I/O modules and drives • Act as an adapter for I/O on remote EtherNet/IP links • Communicate with other EtherNet/IP devices (messages and HMI) • Bridge EtherNet/IP links to route messages to devices on other networks	1756-EN2F bridge 1756-EN2T bridge 1756-ENBT bridge
Support device level ring (DLR) and linear topologies	1756-EN2TR bridge 1756-EN3TR bridge
Provide control in environments where temperatures range from -25…70 ° C (-13…158 ° F)	1756-EN2TXT bridge
• Use an Internet browser to remotely access tags in a ControlLogix controller • Communicate with other EtherNet/IP or generic Ethernet devices (messaging only; no I/O control) • Bridge EtherNet/IP links to route messages to devices on other networks	1756-EWEB web server

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Table 1 - Technical Specifications - 1756 EtherNet/IP Modules

Attribute	1756-EN2F	1756-EN2T	1756-EN2TR, 1756-EN3TR	1756-ENBT	1756-EWEB
EtherNet/IP communication rate	100 Mbps	10/100 Mbps	10/100 Mbps	10/100 Mbps	10/100 Mbps
Logix communication connections	256			128	
TCP/IP communication connections	128			64	
Current draw @ 5.1V DC	1.2 A	1 A	1 A	700 mA	
Current draw @ 24V DC	3 mA	3 mA	3 mA	3 mA	
Power dissipation	6.2 W	5.1 W	5.1 W	3.65 W	
Isolation voltage	No isolation between USB and system	30V (continuous), basic insulation type, Ethernet network to backplane No isolation between USB and backplane Type tested @ 510V AC for 60 s	30V (continuous), basic insulation type, Ethernet network to backplane No isolation between USB and backplane Type tested @ 853V AC for 60 s	30V (continuous), basic insulation type, Ethernet network to backplane Type tested @ 707V DC for 60 s	
Slot width	1				
Module location	Chassis-based, any slot				
Chassis	1756-A4, 1756-A7, 1756-A10, 1756-A13, 1756-A17				
Power supply, standard	1756-PA72/C, 1756-PA75/B, 1756-PB72/C, 1756-PB75/B, 1756-PC75/B, 1756-PH75/B				
Power supply, redundant	756-PA75R, 1756-PB75R, 1756-PSCA2				
Ethernet port	1 Ethernet fiber	1 Ethernet RJ45 Category 5		1 Ethernet RJ45 Category 5	
Ethernet cable	Multimode fiber, LC connector	802.3 compliant shielded or unshielded twisted pair			
USB port(1)	USB 1.1, full speed (12 Mbps)			—	
Wire category(2)	3 - on USB ports	2 - on Ethernet ports 3 - on USB ports		2 - on Ethernet ports	
North American temperature code	T4A				
IEC temperature code	T4				
Enclosure type rating	None (open-style)				
Transmitter launch power at Beginning of Life (BOL), min Allow -1 dB at End of Life (EOL)	-19 dBm into 62.5/125 µm fiber, N/A = 0.275 -22.5 dBm into 50/125 µm fiber, N/A = 0.20	—			

(1) The USB port is intended for temporary local programming purposes only and not intended for permanent connection. Do not use the USB port in hazardous locations.

(2) Use this conductor category information for planning conductor routing as described in the system level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

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Table 2 - Environmental Specifications - 1756 EtherNet/IP Modules

Attribute	1756-EN2F	1756-EN2T	1756-EN2TR, 1756-EN3TR	1756-ENBT, 1756-EWEB
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)	0…60 °C (32…140 °F)			
Temperature, surrounding air, max	60 °C (140 °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)	30 g			
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g			
Emission CISPR 11	Group 1, Class A			
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…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz			10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 1V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz
EFT/B immunity IEC 61000-4-4	—	±2 kV at 5 kHz on Ethernet ports	±3 kV at 5 kHz on Ethernet ports	±2 kV at 5 kHz on Ethernet ports
Surge transient immunity IEC 61000-4-5	—	±2 kV line-earth (CM) on Ethernet ports		
Conducted RF immunity IEC 61000-4-6	—	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz		

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Table 3 - Certifications - 1756 EtherNet/IP Modules

Certification[1]	1756-EN2F, 1756-EN2T	1756-EN2TR, 1756-EN3TR	1756-ENBT	1756-EWEB
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.			
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.	—	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.	
CE	European Union 2004/108/IEC 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)			
C-Tick	Australian Radiocommunications Act, compliant with AS/NZS CISPR 11; Industrial Emissions			
Ex	European Union 94/9/EC ATEX Directive, compliant with the following: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4X			
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations			
TÜV	—		TÜV Certified for Functional Safety: Capable of SIL 2	—
EtherNet/IP	ODVA conformance tested to EtherNet/IP specifications			

(1) When product is marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

Table 4 - Technical Specifications - 1756 EtherNet/IP-XT Module

Attribute	1756-EN2TXT
EtherNet/IP communication rate	10/100 Mbps
Logix communication connections	256
TCP/IP communication connections	128
Current draw @ 5.1V DC	1 A
Current draw @ 24V DC	3 mA
Power dissipation	5.2 W
Power consumption	17.7 BTU/hr
Isolation voltage	30V (continuous), basic insulation type, Ethernet network to backplane No isolation between USB and backplane Type tested @ 853V AC for 60 s
Slot width	1
Module location	Chassis-based, any slot
Chassis	1756-A4LXT, 1756-A5XT, 1756-A7LXT
Power supply, standard	1756-PAXT, 1756-PBXT
Power supply, redundant	None
Ethernet port	1 Ethernet RJ45 Category 5
Ethernet cable	802.3 compliant shielded or unshielded twisted pair
USB port[1]	USB 1.1, full speed (12 Mbps)

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Table 4 - Technical Specifications - 1756 EtherNet/IP-XT Module (Continued)

Attribute	1756-EN2TXT
Wire category (2)	2 - on Ethernet ports 3 - on USB ports
North American temperature code	T4A
IEC temperature code	T4
Enclosure type rating	None (open-style)

(1) The USB port is intended for temporary local programming purposes only and not intended for permanent connection. Do not use the USB port in hazardous locations.

(2) Use this conductor category information for planning conductor routing as described in the system level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

Table 5 - Environmental Specifications - 1756 EtherNet/IP-XT Module

Attribute	1756-EN2TXT
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)	-25…70 °C (-13…158 °F)
Temperature, surrounding air, max	70 °C (158 °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)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions CISPR 11	Group 1, Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8k V air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz
EFT/B immunity IEC 61000-4-4	±2 kV at 5 kHz on Ethernet ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on Ethernet ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz

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Table 6 - Certifications - 1756 EtherNet/IP-XT Module

Certification[1]	1756-EN2TXT
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2004/108/IEC EMC Directive, compliant with the following: • 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)
C-Tick	Australian Radiocommunications Act, compliant with AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with the following: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4X
TÜV	TÜV Certified for Functional Safety: Capable of SIL 2
EtherNet/IP	ODVA conformance tested to EtherNet/IP specifications

(1) When product is marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

Accessories—Ethernet Network

Cat. No.	Description	Specifications
1585J-M8PBJM-*x*	Ethernet RJ45 patchcord *x* = 2 (2 m), 5 (5 m), or 10 (10 m)	8-conductor, Teal Riser PVC Cable (flex Rated cable also available)
1585J-M8CC-H	RJ45 insulation displacement connector (IDC)	0.128…0.325 mm^2 (26…22 AWG), Cat. 6, IDC, no tool required
1585J-M8CC-C	RJ45 crimp connector with boot, qty = 50 pieces	0.128…0.205 mm^2 (26…24 AWG), Cat. 5e, requires crimp tool for assembly
1585A-JCRIMP	Crimp tool	—
9300-RADES	Remote access dial-in kit	56 Kbps modem connection to devices on an Ethernet network

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Stratix Switches

To effectively manage real-time control and information flow throughout the manufacturing and IT enterprise, Rockwell Automation offers a full portfolio of industrial Ethernet switches and media, including a line of Stratix switches integrated with Cisco technology. The Stratix line of switches includes modular managed, fixed managed, and unmanaged switches.

If your application	Select
• Requires Layer 3 routing • Integrates enterprise and manufacturing environments • Manages multicast traffic • Requires diagnostics data • Requires security options	Stratix 8300™ modular, managed switch
• Integrates enterprise and manufacturing environments • Manages multicast traffic • Requires diagnostics data • Requires security options	Stratix 8000™ modular, managed switch
• Integrates plant floor devices • Manages multicast traffic • Requires diagnostics data • Requires security options	Stratix 6000™ fixed, managed switch
• Requires easy setup and direct replacement of switches • Is a small, isolated network	Stratix 2000™ unmanaged switch

Table 7 - Stratix Managed Switch Specifications

	Stratix 8000 and Stratix 8300						Stratix 6000	
	Base	Base	Base	Base	Expansion	Expansion		
Feature	**1783-MS06T**	**1783-RMS06T**	**1783-MS10T**	**1783-RMS10T**	**1783-MX08T**	**1783-MX08F**	**1783-EMS04T**	**1783-EMS08T**
Ports per module	6		10		8		4	9
Layer 3 routing	No	Yes	No	Yes	No	No	No	No
Total ports, max	Up to 26(1)						—	—
Fiber ports	0…10(1)						—	1
10/100 copper ports	4…24(1)						4	8
100 base LC fiber ports	0…8(1)						—	—
SFP slots	2(2)						—	1
10/100/1000 copper ports	2(2)						—	—
100 Mbps fiber support	Yes				—	Yes	No	No
1 G fiber support	Yes				—	—	No	Yes
CompactFlash memory	Yes						No	No
Power requirements	24/48V DC (18…60V DC)						24V DC (12…48V DC)	

(1) Maximum port counts require expansion ports.
(2) Two ports each can be used for SFP or 10/100/1000 copper.

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Table 8 - Stratix Unmanaged Switch Specifications

	Stratix 2000			
Feature	**1783-US03T01F**	**1783-US05T**	**1783-US06T01F**	**1783-US08T**
Ports per module	4	5	7	8
Fiber ports	1	—	1	—
10/100 copper ports	3	5	6	8
100 base LC fiber ports	1	—	1	—
100 Mbps fiber support	Yes	—	Yes	—
CompactFlash memory	No	No	No	No
Power requirements	20V AC (10…24V AC) 24V DC (10…35V DC)			

ControlNet Network



The ControlNet network is an open, control network for real-time, high-throughput applications. The ControlNet network uses the Common Industrial Protocol (CIP) to combine the functionality of an I/O network and a peer-to-peer network providing high-speed performance for both functions. The ControlNet network gives you deterministic, repeatable transfers of all mission-critical control data in addition to supporting transfers of non-time-critical data. I/O updates and controller-to-controller interlocking always take precedence over program uploads and downloads, and messaging.

If your application requires	Select this interface
128 ControlNet connections per communication module	1756-CN2/B 1756-CN2R/B 1756-CN2RXT/B
Control in environments where temperatures range from -25…70 ° C (-13…158 ° F)	1756-CN2RXT
40…48 ControlNet connections per communication module	1756-CNB 1756-CNBR

Connect to Other Devices via a ControlNet Network

The RSLogix 5000 Enterprise Series software supports a generic ControlNet module that allows connections to ControlNet nodes for which there is no specific support currently available in the programming software. A module configured as a generic ControlNet module communicates with the controller in the form of input, output, status, and configuration tags.

For example, use the generic module configuration to set up communication between a ControlLogix controller and a 1203-CN1 ControlNet communication module. Then use the CIP generic MSG instruction type to send and receive messages from the 1203-CN1 module.

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Table 9 - Technical Specifications - 1756 ControlNet Modules

Attribute	1756-CN2/B	1756-CN2R/B	1756-CNB/E	1756-CNBR/E
Configuration	Standard	Redundant	Standard	Redundant
ControlNet communication rate	5 Mbps			
Logix communication connections	128		40…48	
Connections supported, max	131[3]		64	
Number of nodes, max	99			
Current draw @ 5.1V DC	1100 mA	1300 mA	970 mA	
Current draw @ 24V DC	3 mA		1.7 mA	
Power dissipation	5.7 W	6.7 W	5.14 W	
Thermal dissipation	19.5 BTU/hr	22.9 BTU/hr	17.5 BTU/hr	
Isolation voltage	Standard: 30V (continuous), basic insulation type, ControlNet network to backplane Redundant: 30V (continuous), basic insulation type, ControlNet A/B to backplane, and ControlNet A to ControlNet B No isolation between NAP or USB and backplane Type tested at 500V AC for 60 s			
Weight, approx.	0.26 kg (0.57 lb)	0.293 kg (0.64 lb)	0.26 kg (0.57 lb)	0.293 kg (0.64 lb)
Slot width	1			
Module location	Chassis-based, any slot			
Chassis	1756-A4, 1756-A7, 1756-A10, 1756-A13, 1756-A17			
Power supply, standard	1756-PA72/C, 1756-PA75/B, 1756-PB72/C, 1756-PB75/B, 1756-PC75/B, 1756-PH75/B			
Power supply, redundant	1756-PA75R, 1756-PB75R, 1756-PSCA2			
ControlNet port	1 ControlNet BNC	2 ControlNet BNC	1 ControlNet BNC	2 ControlNet BNC
ControlNet cable	1786-RG6 quad shield RG6 coaxial cable			
USB port[1]	USB 1.1, full speed (12 Mbps)		—	—
NAP port	—	—	1 NAP RJ45	1 NAP RJ45
NAP cable	—	—	1786-CP	
Wire category[2]	1 - on ControlNet ports 3 - on USB ports		1 - on ControlNet ports 3 - on NAP ports	
North American temperature code	T4A			
IEC temperature code	T4			
Enclosure type rating	None (open-style)			

(1) The USB port is intended for temporary local programming purposes only and not intended for permanent connection. Do not use the USB port in hazardous locations.

(2) Use this conductor category information for planning conductor routing as described in the system level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

(3) 128 connections are available for standard use. An additional three connections are reserved for redundant control.

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Table 10 - Environmental Specifications - 1756 ControlNet Modules

Attribute	1756-CN2/B, 1756-CN2R/B	1756-CNB/E, 1756-CNBR/E
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)	0…60 °C (32…140 °F)	
Temperature, surrounding air, max	60 °C (140 °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)	30 g	
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g	
Emissions CISPR 11	Group 1, Class A	
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…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz	10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 1V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz
EFT/B immunity IEC 61000-4-4	±3 kV at 5 kHz on ControlNet ports	±2 kV at 5 kHz on ControlNet ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on ControlNet ports	
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz	

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Table 11 - Certifications - 1756 ControlNet Modules

Certification[1]	1756-CN2/B, 1756-CN2R/B, 1756-CNB/E, 1756-CNBR/E
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with the following: • 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)
C-Tick	Australian Radiocommunications Act, compliant with AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with the following: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4X
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
TÜV	TÜV Certified for Functional Safety: Capable of SIL 2
CI	ControlNet International conformance tested to ControlNet specifications

(1) When product is marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

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Table 12 - Technical Specifications - 1756 ControlNet-XT Module

Attribute	1756-CN2RXT/B
Configuration	Redundant
ControlNet communication rate	5 Mbps
Logix communication connections	128
Connections supported, max	131(3)
Number of nodes, max	99
Current draw @ 5.1V DC	1300 mA
Current draw @ 24V DC	3 mA
Power dissipation	6.7 W
Thermal dissipation	22.9 BTU/hr
Isolation voltage	30V (continuous), basic insulation type, ControlNet A/B to backplane, and ControlNet A to ControlNet B No isolation between USB and backplane Type tested at 500V AC for 60 s
Weight, approx.	0.293 kg (0.64 lb)
Slot width	1
Module location	Chassis-based, any slot
Chassis	1756-A4LXT, 1756-A5XT, 1756-A7LXT
Power supply, standard	1756-PAXT, 1756-PBXT
Power supply, redundant	None
ControlNet port	2 ControlNet BNC
ControlNet cable	1786-RG6 quad shield RG6 coaxial cable
USB port(1)	USB 1.1, full speed (12 Mbps)
Wire category(2)	2 - on ControlNet ports 3 - on USB port
North American temperature code	T4A
IEC temperature code	T4
Enclosure type rating	None (open-style)

(1) The USB port is intended for temporary local programming purposes only and not intended for permanent connection. Do not use the USB port in hazardous locations.

(2) Use this conductor category information for planning conductor routing as described in the system level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

(3) 128 connections are available for standard use. An additional three connections are reserved for redundant control.

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Table 13 - Environmental Specifications - 1756 ControlNet-XT Module

Attribute	1756-CN2RXT/B
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)	-25…70 °C (-13…158 °F)
Temperature, surrounding air, max	70 °C (158 °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)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions CISPR 11	Group 1, Class A
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…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz
EFT/B immunity IEC 61000-4-4	±2 kV at 5 kHz on ControlNet ports
Surge transient immunity IEC 61000-4-5	±1 kV line-earth (CM) on ControlNet port
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz

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Table 14 - Certifications - 1756 ControlNet-XT Module

Certification(1)	1756-CN2RXT/B
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2004/108/IEC EMC Directive, compliant with the following: • 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)
C-Tick	Australian Radiocommunications Act, compliant with AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with the following: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4X
TÜV	TÜV Certified for Functional Safety: Capable of SIL 2
CI	ControlNet International conformance tested to ControlNet specifications

(1) When product is marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

Accessories—ControlNet Network

Cat. No.	Description
Taps	
1786-TCT2BD1	T-tap straight IP67 rated
1786-TPR	T-tap right angle
1786-TPS	T-tap straight
1786-TPYR	Y-tap right angle
1786-TPYS	Y-tap straight
Cables	
1786-CP	Programming cable to ControlNet RJ45 port
1786-RG6	ControlNet network, shield high-flex cable
1756-RG6F	ControlNet network, quad-shield high-flex coax cable
Other	
1786-TNCLXT4	ControlNet IP67 termination resistor
1786-XT	ControlNet termination resistor
Repeaters	
1786-RPA	ControlNet modular repeater adapter
1786-RPCD	ControlNet coaxial hub repeater
1786-RPFRL	ControlNet fiber ring repeater, long distance
1786-RPFRXL	ControlNet fiber ring repeater, extra long distance
1786-RPFS	ControlNet fiber repeater, short distance
1786-RPFM	ControlNet fiber repeater, medium distance

For more information, see ControlNet Media System Components List, publication AG-PA002.

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DeviceNet Network



The DeviceNet network is an open, low-level network that provides connections between simple industrial devices, such as sensors and actuators, and higher-level devices, such as controllers and computers. The DeviceNet network uses the proven Common Industrial Protocol (CIP) to provide the control, configure, and data collection capabilities for industrial devices.

ATTENTION: If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Table 15 - Technical Specifications - 1756-DNB/E DeviceNet Module

Attribute	1756-DNB/E
DeviceNet communication rate	125 Kbps (500 m max) 250 Kbps (250 m max) 500 Kbps (100 m max)
Number of nodes, max	64
Current draw @ 5.1V DC	400 mA
Current draw @ 24V DC	0 mA
DeviceNet current draw @ 24V DC	60 mA
DeviceNet voltage range	11...25V DC CL 2/SELV
Power dissipation	3.5 W
Thermal dissipation	11.9 BTU/hr
Isolation voltage	50V (continuous), basic insulation type, DeviceNet network to backplane Type tested at 853V AC for 60 s No isolation between USB and backplane
Slot width	1
Module location	Chassis-based, any slot
Chassis	1756-A4, 1756-A7, 1756-A10, 1756-A13, 1756-A17
Power supply, standard	1756-PA72/C, 1756-PA75/B, 1756-PB72/C, 1756-PB75/B, 1756-PC75/B, 1756-PH75/B
Power supply, redundant	1756-PA75R, 1756-PB75R, 1756-PSCA2
DeviceNet power	To comply with the CE low voltage directive (LVD), the DeviceNet network must be powered from a source compliant with the safety extra low voltage (SELV) or protected extra low voltage (PELV). To comply with UL restrictions, the DeviceNet network must be powered from a source compliant with Class 2 or limited voltage/current.
DeviceNet port	1 DeviceNet open-style 5-or 10-pin linear plug
DeviceNet connector torque	0.56…0.79 N•m (5…7 lb•in)
USB port(1)	USB 2.0, full speed (12 Mbps)
Wire category(2)	1—On DeviceNet ports 3—On USB ports
North American temperature code	T4A
IEC temperature code	T4
Enclosure type rating	None (open-style)

(1) The USB port is intended for temporary local programming purposes only and not intended for permanent connection. Do not use the USB port in hazardous locations.

(2) Use this conductor category information for planning conductor routing as described in the system level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1. Refer to the DeviceNet Media Design and Planning Guide, publication DNET-UM072, for information specific to your DeviceNet network.

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Table 16 - Environmental Specifications - 1756-DNB/E DeviceNet Module

Attribute	1756-DNB/E
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)	0…60 °C (32…140 °F)
Temperature, surrounding air, max	60 °C (140 °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)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions CISPR 11	Group 1, Class A
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…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz
EFT/B immunity IEC 61000-4-4	±3 kV at 5 kHz on DeviceNet ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on DeviceNet ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz

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Table 17 - Certifications - 1756-DNB/E DeviceNet Module

Certification[1]	1756-DNB/E
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with the following: • 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)
C-Tick	Australian Radiocommunications Act, compliant with AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with the following: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4X
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
ODVA	ODVA conformance tested to DeviceNet specifications

(1) When product is marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

Accessories—DeviceNet Network

Cat. No.	Description
KwikLink™ Lite flat media	KwikLink Lite flat media is a newer, ODVA-approved solution for wiring DeviceNet networks. Drop-lines for connecting nodes are added by using the KwikLink Lite two-piece connectors. This cable system supports the intermixing of DeviceNet cable types (thin-round with flat). All of the KwikLink Lite connectors provide insulation displacement technology with reduced assembly time.
KwikLink flat media	The KwikLink flat media system provides a modular cabling method with its flat four-wire cable and Insulation Displacement Connectors (IDCs). The KwikLink system allows nodes to be added to the network without severing the trunkline. Cutting or stripping of the trunkline is eliminated, as is the need for predetermined cable lengths.
Round media	Round trunk cable is available in bulk spools or as pre-molded cordsets or patchcords in varying lengths. A wide variety of rugged, durable DeviceNet components is available for use in round trunk systems. Stainless steel versions of round cable system components are also available: • Thick-trunk round media systems use thick cable for maximum DeviceNet trunk line length. • Round media thin-trunk systems use thin cable to reduce maximum trunk line distances with a more compact and cost-effective installation for some applications. Thin-cable outer jacket material is TPE for additional chemical resistance.

For more information on selecting DeviceNet media, see the NetLinx™ Selection Guide, publication NETS-SG001.

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DH+ and Remote I/O Networks

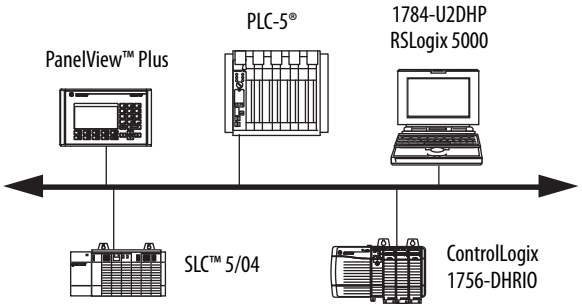


The Data Highway Plus network supports messaging between devices. The remote I/O link connects to remote I/O chassis and other intelligent devices.

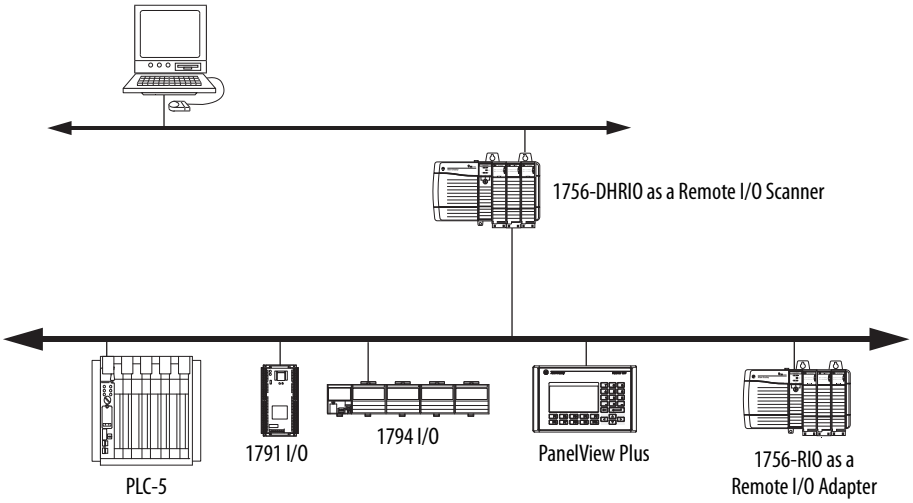
The 1756-DHRIO module supports messaging between devices on DH+™ networks. The remote I/O functionality enables the module to act as a scanner for transferring digital and block-transfer data to and from remote I/O devices.

The 1756-RIO module can act as a scanner or adapter on a remote I/O network. In addition to digital and block-transfer data, the 1756-RIO module transfers analog and specialty data without message instructions.

Example Configuration—DH+ Network



Example Configuration—Remote I/O Network



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Table 18 - Technical Specifications - 1756 DH+ and Remote I/O Modules

Attribute	1756-DHRIO	1756-RIO/B
Communication rate	57.6 Kbps, 115.2 Kbps, 230.4 Kbps	57.6 Kbps, 115.2 Kbps, 230.4 Kbps
Remote I/O communication	Remote I/O scanner only 32 logical rack connections per remote I/O channel 16 block-transfer connections per remote I/O channel	Remote I/O scanner or adapter 32 physical racks (0…76), any combination of rack size and block transfers
Connections supported, max	32	10 scheduled I/O
Current draw @ 5.1V DC	850 mA	450 mA
Current draw @ 24V DC	1.7 mA	5 mA
Power dissipation	4.5 W	2.5 W
Thermal dissipation	15.4 BTU/hr	8.5 BTU/hr
Isolation voltage	30V (continuous), basic insulation type, DHRIO A/B to backplane, and DHRIO A/programming port to DHRIO B No isolation between DHRIO A and Programming port Type tested at 877V DC for 60 s	50V (continuous), basic insulation type, RIO communication lines to backplane Type tested at 500V AC for 60 s
Slot width	1	
Module location	Chassis-based, any slot	
Chassis	1756-A4, 1756-A7, 1756-A10, 1756-A13, 1756-A17	
Power supply, standard	1756-PA72/C, 1756-PA75/B, 1756-PB72/C, 1756-PB75/B, 1756-PC75/B, 1756-PH75/B	
Power supply, redundant	1756-PA75R, 1756-PB75R, 1756-PSCA2	
Ports	2, individually selectable for DH+ or remote I/O	1 for remote I/O
Screw terminal torque	—	0.5…0.6 N•m (5…7 lb•in)
Wire size	0.519 mm^2 (20 AWG) Belden 9463 copper twinaxial	
Wire category(1)	1 - on DHRIO ports 3 - on local programming port	2 - on RIO ports
North American temperature code	T4A	
IEC temperature code	T4	—
Enclosure type rating	None (open-style)	

(1) Use this conductor category information for planning conductor routing as described in the system level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

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Table 19 - Environmental Specifications - 1756 DH+ and Remote I/O Modules

Attribute	1756-DHRIO	1756-RIO/B
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)	0…60 °C (32…140 °F)	
Temperature, surrounding air, max	60 °C (140 °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)	30 g	
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g	
Emissions CISPR 11	Group 1, Class A	
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…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz	
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on DHRIO ports	±2 kV at 5 kHz on RIO ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on DHRIO ports	
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz	

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Table 20 - Certifications - 1756 DH+ and Remote I/O Modules

Certification[1]	1756-DHRIO	1756-RIO
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.	
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.	—
CE	European Union 2004/108/IEC EMC Directive, compliant with the following: • 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)	
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions	
Ex	European Union 94/9/EC ATEX Directive, compliant with the following: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4X	—
TÜV	TÜV Certified for Functional Safety: Capable of SIL 2	—

(1) When product is marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

Table 21 - Technical Specifications - 1756 DH+ and Remote I/O XT Module

Attribute	1756-DHRIOXT
Communication rate	57.6 Kbps, 115.2 Kbps, 230.4 Kbps
DH+ communication connections	32 DH+ messages per DH+ module
Remote I/O communication connections	Remote I/O scanner only 32 logical rack connections per remote I/O channel 16 block-transfer connections per remote I/O channel
Connections supported, max	32
Current draw @ 5.1V DC	850 mA
Current draw @ 24V DC	1.7 mA
Power dissipation	4.5 W
Thermal dissipation	15.4 BTU/hr
Isolation voltage	30V (continuous), basic insulation type, DHRIO A/B to backplane, and DHRIO A/programming port to DHRIO B No Isolation between DHRIO A and Programming port Type tested at 853V AC for 60 s
Slot width	1
Module location	Chassis-based, any slot
Chassis	1756-A4LXT, 1756-A5XT, 1756-A7LXT
Power supply, standard	1756-PBXT
Power supply, redundant	None
Ports	2, individually selectable for DH+ or remote I/O
Screw terminal torque	0.5…0.6 N•m (5…7 lb•in)
Wire size	0.519 mm^2 (20 in.) Belden 9463 copper twinaxial
Wire category	1 - on DHRIO ports 3 - on local programming port[1]

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Table 21 - Technical Specifications - 1756 DH+ and Remote I/O XT Module (Continued)

Attribute	1756-DHRIOXT
North American temperature code	T4A
IEC temperature code	T4
Enclosure type rating	None (open-style)

(1) Use this conductor category information for planning conductor routing as described in the system level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

Table 22 - Environmental Specifications - 1756 DH+ and Remote I/O XT Module

Attribute	1756-DHRIOXT
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)	-25…70 °C (-13…158 °F)
Temperature, surrounding air, max	70 °C (158 °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)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions CISPR 11	Group 1, Class A
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…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on DHRIO ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on DHRIO ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz

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Table 23 - Certifications - 1756 DH+ and Remote I/O XT Module

Certification[1]	1756-DHRIOXT
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2004/108/IEC EMC Directive, compliant with the following: • 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)
C-Tick	Australian Radiocommunications Act, compliant with AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with the following: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4X
TÜV	TÜV Certified for Functional Safety: Capable of SIL 2

(1) When product is marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

Accessories—DH+ and Remote I/O Networks

Cat. No.	Description	Specifications
1770-CD	Cable to connect communication module to DH+ network	Belden 9463 twinaxial
9300-RADKIT	Remote access dial-in kit	56 Kbps modem connection to devices on a DH+ network, including the following: • Preconfigured modem • Communication module • DIN rail mounting hardware • Associated cables

FOUNDATION Fieldbus Network



The FOUNDATION Fieldbus network is a communication network created by the Fieldbus Foundation. It is a protocol designed for robust, distributed control of process control applications. Devices connected by a FOUNDATION Fieldbus network can be used for sophisticated, highly-distributed process control.

If your application bridges from	Select	Description
EtherNet/IP network	1757-FFLD2 1757-FFLD4	The 1757-FFLD*x* linking device bridges from an Ethernet/IP network to either two or four H1 ports. Each H1 port can support the recommended maximum 8…10 devices. Each H1 network can support a maximum of 16 publisher and 16 subscriber VCR connections.
ControlNet network	1757-FFLDC2 1757-FFLDC4	The 1757-FFLDC*x* linking device bridges from a ControlNet network to either two or four H1 ports. Each H1 port can support the recommended maximum 8…10 devices. Each H1 network can support a maximum of 64 publisher and 64 subscriber VCR connections. The 1757-FFLDC*x* linking device is compatible with ControlLogix redundancy and supports redundant ControlNet media.

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Table 24 - Technical Specifications - 1757 FOUNDATION Fieldbus Modules

Attribute	1757-FFLD2	1757-FFLD4	1757-FFLDC2	1757-FFLDC4
Foundation Fieldbus communication rate	31.25 Kbps			
EtherNet/IP communication rate	10/100 Mbps		—	
ControlNet communication rate	—		5 Mbps	
Number of H1 networks per linking device, max[1]	2	4	2	4
Number of Fieldbus devices per H1 network, max	16 (8…10 recommended)			
Number of Fieldbus devices per linking device, max	32	64	32	64
Current draw @ 24V DC[2] [3]	300 mA		450 mA	
Inrush current	1.5 A			
Power dissipation	—		9.6 W	
Isolation voltage	50V (continuous), basic insulation type Fieldbus to system backplane and Ethernet network to system backplane Type tested @ 500V AC for 60 s		50V (continuous), basic insulation type tested at 500V AC for 60 s, Fieldbus to system backplane, ControlNet network to system backplane, and ControlNet Channel A to ControlNet Channel B Type tested @ 500V AC for 60 s	
Module location	DIN rail or panel			
Power supply	User-supplied 24V DC			
Ports	2 H1 FOUNDATION Fieldbus 1 Ethernet RJ45	4 H1 FOUNDATION Fieldbus 1 Ethernet RJ45	2 H1 FOUNDATION Fieldbus 1 ControlNet BNC	4 H1 FOUNDATION Fieldbus 1 ControlNet BNC
Wire category[3]	2 - on shielded Fieldbus port 3 - on power port 2 - on communication port			
Wire size	DC power connection: 0.2…1.5 mm^2 (26…16 AWG) solid or stranded copper wire rated at 75 °C (167 °F) or greater, 1.2 mm (0.05 in.) insulation, max Fieldbus connections: 0.8 mm^2 (18 AWG) solid or stranded shielded twisted pair copper wire rated at 75 °C (167 °F) or greater, 1.2 mm (0.05 in.) insulation, max Ethernet connections: RJ45 connector according to IEC 6003-7, 2 or 4 pair Category 5e min cable according to TIA 568-B.1, or Category 5 cable according to ISO/IEC 24702		DC power connection: 0.2…1.5 mm^2 (26…16 AWG) solid or stranded copper wire rated at 75 °C (167 °F) or greater 1.2 mm (3/64 in.) insulation max Fieldbus connections: 0.8 mm^2 (18 AWG) solid or stranded shielded twisted-pair copper wire rated at 75 °C (167 °F) or greater 1.2 mm (3/64 in.) insulation max	
Screw terminal torque	0.34 N•m (3 lb•in) on power and Fieldbus wire connections			
Panel mount screw torque	1.1…1.8 N•m (10…16 lb•in)			
North American temperature code	T4			
IEC temperature code	T4			
Enclosure type rating	None (open-style)			

(1) Each network defined as a Foundation Fieldbus 31.25 Kbps H1 network.
(2) 24V DC (± 20%).
(3) 24V DC (±10%).

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Table 25 - Environmental Specifications - 1757 FOUNDATION Fieldbus Modules

Attribute	1757-FFLD2, 1756-FFLD4	1757-FFLDC2, 1757-FFLDC4
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)	0…60 °C (32…140 °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)	5 g @ 10…500 Hz	
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	15 g	
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g	
Emissions CISPR 11	Group 1, Class A	
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges	
Radiated RF immunity IEC 61000-4-3	1V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz 10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz	10V/m with 1 kHz sine-wave 80% AM from 80…2700 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz
EFT/B immunity IEC 61000-4-4	±2 kV at 5 kHz on power ports ±2 kV at 5 kHz on shielded Fieldbus ports ±2 kV at 5 kHz on Ethernet ports	±2 kV at 5 kHz on shielded Fieldbus ports ±2 kV at 5 kHz on ControlNet ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on shielded Fieldbus ports ±2 kV line-earth (CM) on shielded Ethernet ports	±2 kV line-earth (CM) on shielded Fieldbus ports ±2 kV line-earth (CM) on shielded ControlNet ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz on power ports, shielded Fieldbus ports, and Ethernet ports	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz on ControlNet and shielded Fieldbus ports
Magnetic field immunity IEC 61000-4-8	30 A/m long duration at 50 Hz	

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Table 26 - Certifications - 1757 Foundation Fieldbus Modules

Certification[1]	1757-FFLD2, 1757-FFLD4	1757-FFLDC2, 1757-FFLDC4
c-UL-us	UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.	
CE	European Union 2004/108/IEC EMC Directive, compliant with the following: • 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)	
C-Tick	Australian Radiocommunications Act, compliant with AS/NZS CISPR 11; Industrial Emissions	
Ex	European Union 94/9/EC ATEX Directive, compliant with the following: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA nL IIC	
FF	Foundation Fieldbus H1 CTK Registered	
ODVA - EtherNet/IP	ODVA conformance tested to EtherNet/IP specifications	—
CI	—	ControlNet International conformance tested to ControlNet specifications

(1) When product is marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

Accessories—Foundation Fieldbus Network

Cat. No.	Description
DIN rail	35 x 7.5 or 35 x 15 DIN (EN 50 022), zinc-plated yellow chromate steel

DH-485 Network

On the DH-485 network, the controller can send and receive messages to and from other controllers on the network. The DH-485 connection does support remote programming and monitoring via RSLogix 5000 software. Excessive traffic over a DH-485 connection can adversely affect overall performance and can lead to timeouts and loss in RSLogix 5000 configuration performance.

IMPORTANT Use Logix5000™ controllers on DH-485 networks only when you want to add controllers to an existing DH-485 network. For new applications with Logix5000 controllers, we recommend open architecture networks.

You need a 1761-NET-AIC converter for each controller on the DH-485 network. You can have two controllers per one 1761-NET-AIC converter, but you need a different cable for each controller. Connect one controller to port 1 (9-pin connector) and one controller to port 2 (mini-DIN connector).

To connect to this port	Use this cable
Port 1 DB-9 RS-232, DTE connection	1747-CP3, 1761-CBL-AC00
Port 2 mini-DIN 8 RS-232 connection	1761-CBL-AP00, 1761-CBL-PM02

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Table 27 - Technical Specifications - 1756-DH485 Module

Attribute	1756-DH485
Communication rate	19.2 Kbps 9600 Kbps
Current draw @ 5.1V DC	850 mA
Current draw @ 24V DC	1.7 mA
Power dissipation	4.5 W
Thermal dissipation	15.4 BTU/hr
Isolation voltage	50V (continuous), basic insulation type, DH485 A/B to backplane, and DH485 A to DH485 B Type tested at 750V DC for 60 s
Slot width	1
Module location	Chassis
Power supply, standard	1756-PA72/C, 1756-PA75/B, 1756-PB72/C, 1756-PB75/B, 1756-PC75/B, 1756-PH75/B
Power supply, redundant	1756-PA75R, 1756-PB75R, 1756-PSCA2
Ports	2 DH-485 9-pin, D-shell
Wire category(1)	2 - on DH485 ports
Wire type	Belden 9463 twinaxial
North American temperature code	T5
Enclosure type rating	None (open-style)

(1) Use this conductor category information for planning conductor routing as described in the system level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

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Table 28 - Environmental Specifications - 1756-DH485 Module

Attribute	1756-DH485
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)	0…60 °C (32…140 °F)
Temperature, surrounding air, max	60 °C (140 °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)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions CISPR 11	Group 1, Class A
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…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 1V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz
EFT/B immunity IEC 61000-4-4	±2 kV at 5 kHz on communication ports
Surge transient immunity IEC 61000-4-5	±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
Magnetic field immunity IEC 61000-4-8	30 A/m @ 50 Hz

Table 29 - Certifications - 1756-DH485 Module

Certification(1)	1756-DH485
c-UL-us	UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CSA	CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with the following: • 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)
C-Tick	Australian Radiocommunications Act, compliant with AS/NZS CISPR 11; Industrial Emissions

(1) When product is marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

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Accessories—DH-485 Network

Cat. No.	Description	Specifications
1747-CP3	9-pin D-shell, straight; 9-pin D-shell, right angle	3 m (9.8 ft)
1761-CBL-AC00	9-pin D-shell, right angle; 9-pin D-shell, right angle	45 cm (17.7 in.)
1761-CBL-AP00	9-pin D-shell, right angle; 8-pin mini-DIN	45 cm (17.7 in.)
1761-CBL-PM02	9-pin D-shell, straight; 8-pin mini-DIN	2 m (6.5 ft)
1761-NET-AIC	Advanced Interface Converter (AIC+) connects each channel on the 1756-DH485 module to the DH-485 network	20.4…28.8V DC power source required Typical 120 mA 24V DC current draw
9300-RADKIT	Remote access dial-in kit	56 Kbps modem connection to devices on a DH+ network, including the following: • Preconfigured modem • Communication module • DIN rail mounting hardware • Associated cables

SynchLink Communication

The SynchLink module provides time synchronization and data broadcasting capabilities for distributed motion and coordinated drive control. The 1756-SYNCH SynchLink module connects a ControlLogix chassis to a SynchLink fiber-optic communication link. The module does the following:

- Coordinates Coordinated System Time across multiple ControlLogix chassis
- Moves a limited amount of data from one chassis to another at a high speed
- Lets one controller consume motion axes data from a controller in another chassis

Table 30 - Technical Specifications - 1756-SYNCH Module

Attribute	1756-SYNCH
SynchLink data rate	5 Mbps
Operating wavelength	650 nm (red)
Type of communication	Synchronous
Frame period	50 µs
Frame parameters	3 Flags - 3 bytes Control field - 1 byte Data field - 24 bytes CRC field - 2 bytes
Current draw @ 5.1V DC	1200 mA
Current draw @ 24V DC	3 mA
Power dissipation	6.19 W
Thermal dissipation	21.1 BTU/hr
Slot width	1
Module location	Chassis-based, any slot
Chassis	1756-A4, 1756-A7, 1756-A10, 1756-A13, 1756-A17
Power supply, standard	1756-PA72/C, 1756-PA75/B, 1756-PB72/C, 1756-PB75/B, 1756-PC75/B, 1756-PH75/B

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Table 30 - Technical Specifications - 1756-SYNCH Module (Continued)

Attribute	1756-SYNCH
Power supply, redundant	1756-PA1756-PA75R, 1756-PB75R, 1756-PSCA2
Ports	2 fiber optic
Cable fiber type	200/230 micron HCS (Hard Clad Silica)
Cable fiber termination type	Versalink V-System
Cable length	1…300 m (3.28…984.2 ft)
Enclosure type rating	None (open-style)

Table 31 - Environmental Specifications - 1756-SYNCH Module

Attribute	1756-SYNCH
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)	0…60 °C (32…140 °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)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions CISPR 11	Group 1, Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	1V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz 10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz

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Table 32 - Certifications - 1756-SYNCH Module

Certification[1]	1756-SYNCH
UL	UL Listed Industrial Control Equipment. See UL file E65584
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA file LR69960C
CE	European Union 2004/108/EC EMC Directive, compliant with the following: • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions
C-Tick	Australian Radiocommunications Act, compliant with AS/NZS CISPR 11; Industrial Emissions
TÜV	TÜV Certified for Functional Safety Capable of SIL 2
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations

(1) When product is marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

Accessories—SynchLink Network

Cat. No.	Description
1403-CF*xxx*	Fiber-optic cable assembly (Rockwell Automation)
HCP-M0200T V01RK	Lucent Technologies 200 µm simplex cable

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