Technical Data

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



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.

# 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<br>Supports as many as 8 axis of motion | 4 |
| | 1756-EN3TR | EtherNet/IP bridge, embedded switch, copper<br>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.

## 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<br>• Act as an adapter for I/O on remote EtherNet/IP links<br>• Communicate with other EtherNet/IP devices (messages and HMI)<br>• Bridge EtherNet/IP links to route messages to devices on other networks | 1756-EN2F bridge<br>1756-EN2T bridge<br>1756-ENBT bridge |
| Support device level ring (DLR) and linear topologies | 1756-EN2TR bridge<br>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<br>• Communicate with other EtherNet/IP or generic Ethernet devices (messaging only; no I/O control)<br>• Bridge EtherNet/IP links to route messages to devices on other networks | 1756-EWEB web server |

**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<br>No isolation between USB and backplane<br>Type tested @ 510V AC for 60 s | 30V (continuous), basic insulation type, Ethernet network to backplane<br>No isolation between USB and backplane<br>Type tested @ 853V AC for 60 s | 30V (continuous), basic insulation type, Ethernet network to backplane<br>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<br>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<br>Allow -1 dB at End of Life (EOL) | -19 dBm into 62.5/125 µm fiber, N/A = 0.275<br>-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.

**Table 2 - Environmental Specifications - 1756 EtherNet/IP Modules**

| Attribute | 1756-EN2F | 1756-EN2T | 1756-EN2TR, 1756-EN3TR | 1756-ENBT, 1756-EWEB |
|---|---|---|---|---|
| Temperature, operating<br>IEC 60068-2-1 (Test Ad, Operating Cold)<br>IEC 60068-2-2 (Test Bd, Operating Dry Heat)<br>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<br>IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold)<br>IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat)<br>IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock) | -40…85 °C (-40…185 °F) | | | |
| Relative humidity<br>IEC 60068-2-30 (Test Db, Unpackaged damp heat) | 5…95% noncondensing | | | |
| Vibration<br>IEC 60068-2-6 (Test Fc, Operating) | 2 g @ 10…500 Hz | | | |
| Shock, operating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock) | 30 g | | | |
| Shock, nonoperating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock) | 50 g | | | |
| Emission<br>CISPR 11 | Group 1, Class A | | | |
| ESD immunity<br>IEC 61000-4-2 | 6 kV contact discharges<br>8 kV air discharges | | | |
| Radiated RF immunity<br>IEC 61000-4-3 | 10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz<br>10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz<br>10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz<br>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<br>10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz<br>10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz<br>1V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz |
| EFT/B immunity<br>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<br>IEC 61000-4-5 | — | ±2 kV line-earth (CM) on Ethernet ports | | |
| Conducted RF immunity<br>IEC 61000-4-6 | — | 10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz | | |

**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.<br>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.<br>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.<br>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:<br>• EN 61326-1; Meas./Control/Lab., Industrial Requirements<br>• EN 61000-6-2; Industrial Immunity<br>• EN 61000-6-4; Industrial Emissions<br>• 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:<br>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"<br>• 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<br>No isolation between USB and backplane<br>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) |

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

| Attribute | 1756-EN2TXT |
|---|---|
| Wire category [(2)] | 2 - on Ethernet ports<br>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<br>IEC 60068-2-1 (Test Ad, Operating Cold)<br>IEC 60068-2-2 (Test Bd, Operating Dry Heat)<br>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<br>IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold),<br>IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat)<br>IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock) | -40…85 °C (-40…185 °F) |
| Relative humidity<br>IEC 60068-2-30 (Test Db, Unpackaged damp heat) | 5…95% noncondensing |
| Vibration<br>IEC 60068-2-6 (Test Fc, Operating) | 2 g @ 10…500 Hz |
| Shock, operating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock) | 30 g |
| Shock, nonoperating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock) | 50 g |
| Emissions<br>CISPR 11 | Group 1, Class A |
| ESD immunity<br>IEC 61000-4-2 | 6 kV contact discharges<br>8k V air discharges |
| Radiated RF immunity<br>IEC 61000-4-3 | 10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz<br>10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz<br>10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz<br>3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz |
| EFT/B immunity<br>IEC 61000-4-4 | ±2 kV at 5 kHz on Ethernet ports |
| Surge transient immunity<br>IEC 61000-4-5 | ±2 kV line-earth (CM) on Ethernet ports |
| Conducted RF immunity<br>IEC 61000-4-6 | 10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz |

**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.<br>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:<br>• EN 61326-1; Meas./Control/Lab., Industrial Requirements<br>• EN 61000-6-2; Industrial Immunity<br>• EN 61000-6-4; Industrial Emissions<br>• 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:<br>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"<br>• 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<br>*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 |

# 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<br>• Integrates enterprise and manufacturing environments<br>• Manages multicast traffic<br>• Requires diagnostics data<br>• Requires security options | Stratix 8300™ modular, managed switch |
| • Integrates enterprise and manufacturing environments<br>• Manages multicast traffic<br>• Requires diagnostics data<br>• Requires security options | Stratix 8000™ modular, managed switch |
| • Integrates plant floor devices<br>• Manages multicast traffic<br>• Requires diagnostics data<br>• Requires security options | Stratix 6000™ fixed, managed switch |
| • Requires easy setup and direct replacement of switches<br>• 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.

**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)<br>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<br>1756-CN2R/B<br>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<br>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.

**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<br>Redundant: 30V (continuous), basic insulation type, ControlNet A/B to backplane, and ControlNet A to ControlNet B<br>No isolation between NAP or USB and backplane<br>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<br>3 - on USB ports | | 1 - on ControlNet ports<br>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.

**Table 10 - Environmental Specifications - 1756 ControlNet Modules**

| Attribute | 1756-CN2/B, 1756-CN2R/B | 1756-CNB/E, 1756-CNBR/E |
|---|---|---|
| Temperature, operating<br>IEC 60068-2-1 (Test Ad, Operating Cold)<br>IEC 60068-2-2 (Test Bd, Operating Dry Heat)<br>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<br>IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold)<br>IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat)<br>IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock) | -40…85 °C (-40…185 °F) | |
| Relative humidity<br>IEC 60068-2-30 (Test Db, Unpackaged Damp Heat) | 5…95% noncondensing | |
| Vibration<br>IEC 60068-2-6 (Test Fc, Operating) | 2 g @ 10…500 Hz | |
| Shock, operating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock) | 30 g | |
| Shock, nonoperating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock) | 50 g | |
| Emissions<br>CISPR 11 | Group 1, Class A | |
| ESD immunity<br>IEC 61000-4-2 | 6 kV contact discharges<br>8 kV air discharges | |
| Radiated RF immunity<br>IEC 61000-4-3 | 10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz<br>10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz<br>10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz<br>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<br>10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz<br>10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz<br>1V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz |
| EFT/B immunity<br>IEC 61000-4-4 | ±3 kV at 5 kHz on ControlNet ports | ±2 kV at 5 kHz on ControlNet ports |
| Surge transient immunity<br>IEC 61000-4-5 | ±2 kV line-earth (CM) on ControlNet ports | |
| Conducted RF immunity<br>IEC 61000-4-6 | 10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz | |

**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.<br>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.<br>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:<br>• EN 61326-1; Meas./Control/Lab., Industrial Requirements<br>• EN 61000-6-2; Industrial Immunity<br>• EN 61000-6-4; Industrial Emissions<br>• 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:<br>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"<br>• 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.

**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<br>No isolation between USB and backplane<br>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<br>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.

**Table 13 - Environmental Specifications - 1756 ControlNet-XT Module**

| Attribute | 1756-CN2RXT/B |
|---|---|
| Temperature, operating<br>IEC 60068-2-1 (Test Ad, Operating Cold)<br>IEC 60068-2-2 (Test Bd, Operating Dry Heat)<br>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<br>IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold)<br>IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat)<br>IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock) | -40…85 °C (-40…185 °F) |
| Relative humidity<br>IEC 60068-2-30 (Test Db, Unpackaged Damp Heat) | 5…95% noncondensing |
| Vibration<br>IEC 60068-2-6 (Test Fc, Operating) | 2 g @ 10…500 Hz |
| Shock, operating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock) | 30 g |
| Shock, nonoperating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock) | 50 g |
| Emissions<br>CISPR 11 | Group 1, Class A |
| ESD immunity<br>IEC 61000-4-2 | 6 kV contact discharges<br>8 kV air discharges |
| Radiated RF immunity<br>IEC 61000-4-3 | 10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz<br>10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz<br>10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz<br>3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz |
| EFT/B immunity<br>IEC 61000-4-4 | ±2 kV at 5 kHz on ControlNet ports |
| Surge transient immunity<br>IEC 61000-4-5 | ±1 kV line-earth (CM) on ControlNet port |
| Conducted RF immunity<br>IEC 61000-4-6 | 10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz |

**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.<br>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:<br>• EN 61326-1; Meas./Control/Lab., Industrial Requirements<br>• EN 61000-6-2; Industrial Immunity<br>• EN 61000-6-4; Industrial Emissions<br>• 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:<br>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"<br>• 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.

# 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)<br>250 Kbps (250 m max)<br>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<br>Type tested at 853V AC for 60 s<br>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).<br>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<br>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.

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

| Attribute | 1756-DNB/E |
|---|---|
| Temperature, operating<br>IEC 60068-2-1 (Test Ad, Operating Cold)<br>IEC 60068-2-2 (Test Bd, Operating Dry Heat)<br>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<br>IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold)<br>IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat)<br>IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock) | -40…85 °C (-40…185 °F) |
| Relative humidity<br>IEC 60068-2-30 (Test Db, Unpackaged Damp Heat) | 5…95% noncondensing |
| Vibration<br>IEC 60068-2-6 (Test Fc, Operating) | 2 g @ 10…500 Hz |
| Shock, operating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock) | 30 g |
| Shock, nonoperating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock) | 50 g |
| Emissions<br>CISPR 11 | Group 1, Class A |
| ESD immunity<br>IEC 61000-4-2 | 6 kV contact discharges<br>8 kV air discharges |
| Radiated RF immunity<br>IEC 61000-4-3 | 10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz<br>10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz<br>10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz<br>3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz |
| EFT/B immunity<br>IEC 61000-4-4 | ±3 kV at 5 kHz on DeviceNet ports |
| Surge transient immunity<br>IEC 61000-4-5 | ±2 kV line-earth (CM) on DeviceNet ports |
| Conducted RF immunity<br>IEC 61000-4-6 | 10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz |

**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.<br>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.<br>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:<br>• EN 61326-1; Meas./Control/Lab., Industrial Requirements<br>• EN 61000-6-2; Industrial Immunity<br>• EN 61000-6-4; Industrial Emissions<br>• 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:<br>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"<br>• 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:<br>• Thick-trunk round media systems use thick cable for maximum DeviceNet trunk line length.<br>• 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.

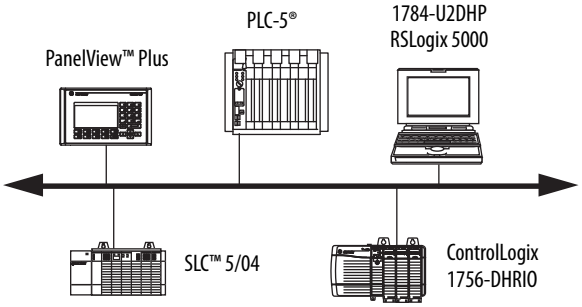
# DH+ and Remote I/O Networks

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

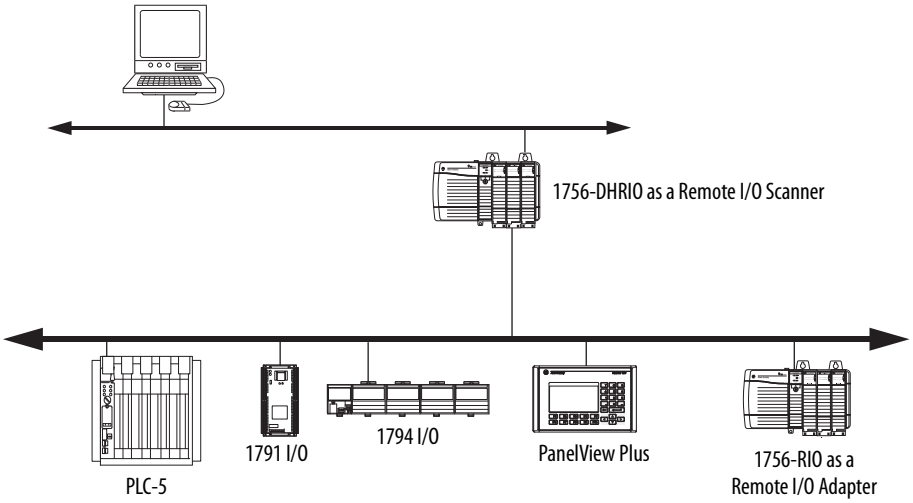


**Table 18 - Technical Specifications - 1756 DH+ and Remote I/O Modules**

| 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<br>32 logical rack connections per remote I/O channel<br>16 block-transfer connections per remote I/O channel | Remote I/O scanner or adapter<br>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<br>No isolation between DHRIO A and Programming port<br>Type tested at 877V DC for 60 s | 50V (continuous), basic insulation type, RIO communication lines to backplane<br>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<br>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.

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

| Attribute | 1756-DHRIO | 1756-RIO/B |
|---|---|---|
| Temperature, operating<br>IEC 60068-2-1 (Test Ad, Operating Cold)<br>IEC 60068-2-2 (Test Bd, Operating Dry Heat)<br>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<br>IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold)<br>IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat)<br>IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock) | -40…85 °C (-40…185 °F) | |
| Relative humidity<br>IEC 60068-2-30 (Test Db, Unpackaged Damp Heat) | 5…95% noncondensing | |
| Vibration<br>IEC 60068-2-6 (Test Fc, Operating) | 2 g @ 10…500 Hz | |
| Shock, operating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock) | 30 g | |
| Shock, nonoperating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock) | 50 g | |
| Emissions<br>CISPR 11 | Group 1, Class A | |
| ESD immunity<br>IEC 61000-4-2 | 6 kV contact discharges<br>8 kV air discharges | |
| Radiated RF immunity<br>IEC 61000-4-3 | 10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz<br>10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz<br>10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz<br>3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz | |
| EFT/B immunity<br>IEC 61000-4-4 | ±4 kV at 5 kHz on DHRIO ports | ±2 kV at 5 kHz on RIO ports |
| Surge transient immunity<br>IEC 61000-4-5 | ±2 kV line-earth (CM) on DHRIO ports | |
| Conducted RF immunity<br>IEC 61000-4-6 | 10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz | |

**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.<br>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.<br>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:<br>• EN 61326-1; Meas./Control/Lab., Industrial Requirements<br>• EN 61000-6-2; Industrial Immunity<br>• EN 61000-6-4; Industrial Emissions<br>• 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:<br>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"<br>• 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<br>32 logical rack connections per remote I/O channel<br>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<br>No Isolation between DHRIO A and Programming port<br>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<br>3 - on local programming port[1] |

**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<br>IEC 60068-2-1 (Test Ad, Operating Cold)<br>IEC 60068-2-2 (Test Bd, Operating Dry Heat)<br>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<br>IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold)<br>IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat)<br>IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock) | -40…85 °C (-40…185 °F) |
| Relative humidity<br>IEC 60068-2-30 (Test Db, Unpackaged Damp Heat) | 5…95% noncondensing |
| Vibration<br>IEC 60068-2-6 (Test Fc, Operating) | 2 g @ 10…500 Hz |
| Shock, operating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock) | 30 g |
| Shock, nonoperating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock) | 50 g |
| Emissions<br>CISPR 11 | Group 1, Class A |
| ESD immunity<br>IEC 61000-4-2 | 6 kV contact discharges<br>8 kV air discharges |
| Radiated RF immunity<br>IEC 61000-4-3 | 10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz<br>10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz<br>10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz<br>3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz |
| EFT/B immunity<br>IEC 61000-4-4 | ±4 kV at 5 kHz on DHRIO ports |
| Surge transient immunity<br>IEC 61000-4-5 | ±2 kV line-earth (CM) on DHRIO ports |
| Conducted RF immunity<br>IEC 61000-4-6 | 10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz |

**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.<br>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:<br>• EN 61326-1; Meas./Control/Lab., Industrial Requirements<br>• EN 61000-6-2; Industrial Immunity<br>• EN 61000-6-4; Industrial Emissions<br>• 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:<br>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"<br>• 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:<br>• Preconfigured modem<br>• Communication module<br>• DIN rail mounting hardware<br>• 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<br>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<br>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. |

**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<br>Fieldbus to system backplane and Ethernet network to system backplane<br>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<br>Type tested @ 500V AC for 60 s | |
| Module location | DIN rail or panel | | | |
| Power supply | User-supplied 24V DC | | | |
| Ports | 2 H1 FOUNDATION Fieldbus<br>1 Ethernet RJ45 | 4 H1 FOUNDATION Fieldbus<br>1 Ethernet RJ45 | 2 H1 FOUNDATION Fieldbus<br>1 ControlNet BNC | 4 H1 FOUNDATION Fieldbus<br>1 ControlNet BNC |
| Wire category(3) | 2 - on shielded Fieldbus port<br>3 - on power port<br>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<br>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<br>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<br>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%).

**Table 25 - Environmental Specifications - 1757 FOUNDATION Fieldbus Modules**

| Attribute | 1757-FFLD2, 1756-FFLD4 | 1757-FFLDC2, 1757-FFLDC4 |
|---|---|---|
| Temperature, operating<br>IEC 60068-2-1 (Test Ad, Operating Cold)<br>IEC 60068-2-2 (Test Bd, Operating Dry Heat)<br>IEC 60068-2-14 (Test Nb, Operating Thermal Shock) | 0…60 °C (32…140 °F) | |
| Temperature, storage<br>IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold)<br>IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat)<br>IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock) | -40…85 °C (-40…185 °F) | |
| Relative humidity<br>IEC 60068-2-30 (Test Db, Unpackaged Damp Heat) | 5…95% noncondensing | |
| Vibration<br>IEC 60068-2-6 (Test Fc, Operating) | 5 g @ 10…500 Hz | |
| Shock, operating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock) | 15 g | |
| Shock, nonoperating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock) | 30 g | |
| Emissions<br>CISPR 11 | Group 1, Class A | |
| ESD immunity<br>IEC 61000-4-2 | 6 kV contact discharges<br>8 kV air discharges | |
| Radiated RF immunity<br>IEC 61000-4-3 | 1V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz<br>10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz<br>10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz<br>10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz | 10V/m with 1 kHz sine-wave 80% AM from 80…2700 MHz<br>10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz<br>10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz |
| EFT/B immunity<br>IEC 61000-4-4 | ±2 kV at 5 kHz on power ports<br>±2 kV at 5 kHz on shielded Fieldbus ports<br>±2 kV at 5 kHz on Ethernet ports | ±2 kV at 5 kHz on shielded Fieldbus ports<br>±2 kV at 5 kHz on ControlNet ports |
| Surge transient immunity<br>IEC 61000-4-5 | ±2 kV line-earth (CM) on shielded Fieldbus ports<br>±2 kV line-earth (CM) on shielded Ethernet ports | ±2 kV line-earth (CM) on shielded Fieldbus ports<br>±2 kV line-earth (CM) on shielded ControlNet ports |
| Conducted RF immunity<br>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<br>IEC 61000-4-8 | 30 A/m long duration at 50 Hz | |

**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:<br>• EN 61326-1; Meas./Control/Lab., Industrial Requirements<br>• EN 61000-6-2; Industrial Immunity<br>• EN 61000-6-4; Industrial Emissions<br>• 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:<br>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"<br>• 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<br>DB-9 RS-232, DTE connection | 1747-CP3, 1761-CBL-AC00 |
| Port 2<br>mini-DIN 8 RS-232 connection | 1761-CBL-AP00, 1761-CBL-PM02 |

**Table 27 - Technical Specifications - 1756-DH485 Module**

| Attribute | 1756-DH485 |
|---|---|
| Communication rate | 19.2 Kbps<br>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<br>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.

**Table 28 - Environmental Specifications - 1756-DH485 Module**

| Attribute | 1756-DH485 |
|---|---|
| Temperature, operating<br>IEC 60068-2-1 (Test Ad, Operating Cold)<br>IEC 60068-2-2 (Test Bd, Operating Dry Heat)<br>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<br>IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold)<br>IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat)<br>IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock) | -40…85 °C (-40…185 °F) |
| Relative humidity<br>IEC 60068-2-30 (Test Db, Unpackaged Damp Heat) | 5…95% noncondensing |
| Vibration<br>IEC 60068-2-6 (Test Fc, Operating) | 2 g @ 10…500 Hz |
| Shock, operating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock) | 30 g |
| Shock, nonoperating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock) | 50 g |
| Emissions<br>CISPR 11 | Group 1, Class A |
| ESD immunity<br>IEC 61000-4-2 | 4 kV contact discharges<br>8 kV air discharges |
| Radiated RF immunity<br>IEC 61000-4-3 | 10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz<br>10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz<br>1V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz |
| EFT/B immunity<br>IEC 61000-4-4 | ±2 kV at 5 kHz on communication ports |
| Surge transient immunity<br>IEC 61000-4-5 | ±1 kV line-earth (CM) on communication ports |
| Conducted RF immunity<br>IEC 61000-4-6 | 10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz |
| Magnetic field immunity<br>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:<br>• EN 61326-1; Meas./Control/Lab., Industrial Requirements<br>• EN 61000-6-2; Industrial Immunity<br>• EN 61000-6-4; Industrial Emissions<br>• 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.

## 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<br>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:<br>• Preconfigured modem<br>• Communication module<br>• DIN rail mounting hardware<br>• 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<br>Control field - 1 byte<br>Data field - 24 bytes<br>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 |

**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<br>IEC 60068-2-1 (Test Ad, Operating Cold)<br>IEC 60068-2-2 (Test Bd, Operating Dry Heat)<br>IEC 60068-2-14 (Test Nb, Operating Thermal Shock) | 0…60 °C (32…140 °F) |
| Temperature, storage<br>IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold)<br>IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat)<br>IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock) | -40…85 °C (-40…185 °F) |
| Relative humidity<br>IEC 60068-2-30 (Test Db, Unpackaged Damp Heat) | 5…95% noncondensing |
| Vibration<br>IEC 60068-2-6 (Test Fc, Operating) | 2 g @ 10…500 Hz |
| Shock, operating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock) | 30 g |
| Shock, nonoperating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock) | 50 g |
| Emissions<br>CISPR 11 | Group 1, Class A |
| ESD immunity<br>IEC 61000-4-2 | 6 kV contact discharges<br>8 kV air discharges |
| Radiated RF immunity<br>IEC 61000-4-3 | 1V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz<br>10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz<br>10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz |

**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<br>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:<br>• EN 61131-2; Programmable Controllers (Clause 8, Zone A & B)<br>• EN 61326-1; Meas./Control/Lab., Industrial Requirements<br>• EN 61000-6-2; Industrial Immunity<br>• 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<br>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 |

# Important User Information

Solid-state equipment has operational characteristics differing from those of electromechanical equipment. Safety Guidelines for the Application, Installation and Maintenance of Solid State Controls (publication SGI-1.1 available from your local Rockwell Automation sales office or online at http://www.rockwellautomation.com/literature/) describes some important differences between solid-state equipment and hard-wired electromechanical devices. Because of this difference, and also because of the wide variety of uses for solid-state equipment, all persons responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this publication are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

No patent liability is assumed by Rockwell Automation, Inc. with respect to use of information, circuits, equipment, or software described in this manual.

Reproduction of the contents of this manual, in whole or in part, without written permission of Rockwell Automation, Inc., is prohibited.

# Documentation Feedback

Your comments will help us serve your documentation needs better. If you have any suggestions on how to improve this document, complete this form, publication RA-DU002, available at http://www.rockwellautomation.com/literature/.



Rockwell Otomasyon Ticaret A.Ş., Kar Plaza İş Merkezi E Blok Kat:6 34752 İçerenköy, İstanbul, Tel: +90 (216) 5698400

**www.rockwellautomation.com**

**Power, Control and Information Solutions Headquarters**

Americas: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444
Europe/Middle East/Africa: Rockwell Automation NV, Pegasus Park, De Kleetlaan 12a, 1831 Diegem, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640
Asia Pacific: Rockwell Automation, Level 14, Core F, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846

Publication 1756-TD003D-EN-E - January 2012