

# CompactLogix Communication Modules Specifications

## 1768 CompactLogix Catalog Numbers

1768-ENBT, 1768-EWEB, 1768-CNB, 1768-CNBR

## 1769 Compact I/O Catalog Numbers

1769-SDN, 1769-ADN, 1769-AENTR

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## Networks

You can configure your system for information exchange between a range of devices and computing platforms and operating systems. Select a CompactLogix controller with integrated communication or the appropriate communication device for the networks that meet your needs.

| Application   | Network             | 1769-L23x Controller  | 1769-L3x Controller  | 1768-L4x, 1768-L4xS Controller   | CompactLogix 5370 L1 controllers   | CompactLogix 5370 L2 controllers  | CompactLogix 5370 L3 controllers   |
|---|---------------------|---|--|--|--|---|--|
| <ul style="list-style-type: none"> <li>Plant management (material handling)</li> <li>Configuration, data collection, safety, and control on a single, high-speed network</li> <li>Inclusion of commercial technologies (such as video over IP)</li> <li>Internet/Intranet connection</li> </ul>   | EtherNet/IP network | <ul style="list-style-type: none"> <li>1769-L23E-QB1B controller</li> <li>1769-L23E-QBFC1B controller</li> </ul>    | <ul style="list-style-type: none"> <li>1769-L32E controller</li> <li>1769-L35E controller</li> </ul>   | <ul style="list-style-type: none"> <li>1768-ENBT bridge</li> <li>1768-EWEB web server</li> </ul>                                   | <ul style="list-style-type: none"> <li>1769-L16ER controller</li> <li>1769-L18ER controller</li> <li>1769-L18ERM controller</li> </ul> | <ul style="list-style-type: none"> <li>1769-L24ER controller</li> <li>1769-L27ERM controller</li> </ul> | <ul style="list-style-type: none"> <li>1769-L30ER controller</li> <li>1769-L30ERM controller</li> <li>1769-L33ER controller</li> <li>1769-L33ERM controller</li> <li>1769-L36ERM controller</li> </ul> |
| <ul style="list-style-type: none"> <li>High-speed transfer of time-critical data between controllers and I/O devices</li> <li>Deterministic and repeatable data delivery</li> <li>Media redundancy</li> <li>Intrinsic safety</li> <li>Redundant controller systems</li> </ul>   | ControlNet network  | Not available   | <ul style="list-style-type: none"> <li>1769-L32C controller (nonredundant media)</li> <li>1769-L35CR controller (redundant media)</li> </ul> | <ul style="list-style-type: none"> <li>1768-CNB bridge (nonredundant media)</li> <li>1768-CNBR bridge (redundant media)</li> </ul> | Not available  |   |  |
| <ul style="list-style-type: none"> <li>Connections of low-level devices directly to plant floor controllers, without interfacing them through I/O modules</li> <li>Data sent as needed</li> <li>More diagnostics for improved data collection and fault detection</li> <li>Less wiring and reduced start-up time than a traditional, hard-wired system</li> </ul> | DeviceNet network   | <ul style="list-style-type: none"> <li>1769-SDN scanner</li> <li>1769-ADN adapter</li> </ul>                        |  |  | Not available  | 1769-SDN scanner  |  |
| <ul style="list-style-type: none"> <li>Modems</li> <li>Supervisory control and data acquisition (SCADA)</li> </ul>  | Serial network      | <ul style="list-style-type: none"> <li>Built-in serial port on the controller</li> <li>1769-ASCII module</li> </ul> |  |  | Not available  |   |  |
| Connections to existing DH-485 networks   | DH-485 network      | Built-in serial port with a 1761-NET-AIC linking device   |  |  | Not available  |   |  |

**Table 1 - Environmental Specifications - 1768 Communication Modules**

| Attribute  | 1768-ENBT, 1768-EWEB  | 1768-CNB, 1768-CNBR  |
|--|---|--|
| 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, nonoperating<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 Nonoperating 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)   | 30 g  |  |
| Shock, nonoperating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock)  | 50 g  |  |
| Emissions  | CISPR 11 (IEC 61000-6-4):<br>Group 1, Class A   | CISPR 11 (IEC 61000-6-4):<br>Class A                             |
| ESD Immunity   | IEC 61000-4-2:<br>6 kV contact discharges<br>8 kV air discharges  | IEC 61000-4-2:<br>6 kV contact discharges<br>8 kV air discharges |
| Radiated RF Immunity   | IEC 61000-4-3:<br>10V/m with 1 kHz sine-wave 80% AM from 80...2700 MHz<br>10V/m with 200 Hz 50% Pulse 100% AM at 900 MHz<br>10V/m with 200 Hz 50% Pulse 100% AM at 1890 MHz<br>10V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz |  |
| EFT/B Immunity   | IEC 61000-4-4:<br>±2kV at 5 kHz on communications ports   |  |
| Surge Transient Immunity   | IEC 61000-4-5:<br>±2 kV line-earth (CM) on communications ports   | IEC 61000-4-5:<br>±1 kV line-earth(CM) on communications ports   |
| Conducted RF Immunity  | IEC 61000-4-6:<br>10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz   |  |

**Table 2 - Environmental Specifications - 1769 Communication Modules**

| Attribute  | 1769-AENTR  | 1769-SDN, 1769-ADN  |
|--|---|---|
| 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, nonoperating<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 Nonoperating 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)   | 15 g  | 30 g  |
| Shock, nonoperating<br>IEC 60068-2-27 (Test Ea, Unpackaged Shock)  | 30 g  | 50 g  |
| Emissions  | CISPR 11 (IEC 61000-6-4):<br>Class A  | CISPR 11 (IEC 61000-6-4):<br>Group 1, Class A   |
| ESD Immunity   | IEC 61000-4-2:<br>6 kV contact discharges<br>8 kV air discharges  |   |
| Radiated RF Immunity   | IEC 61000-4-3:<br>10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz<br>10V/m with 200 Hz 50% Pulse 100% AM at 900 MHz<br>10V/m with 200 Hz 50% Pulse 100% AM at 1890 MHz<br>10V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz | IEC 61000-4-3:<br>10V/m with 1 kHz sine-wave 80% AM from 30...2000 MHz<br>10V/m with 200 Hz 50% Pulse 100% AM at 900 MHz<br>1V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz |
| EFT/B Immunity   | IEC 61000-4-4:<br>±3 kV at 5 kHz on communications ports  | IEC 61000-4-4:<br>±2 kV at 5 kHz on communications ports  |
| Surge Transient Immunity   | IEC 61000-4-5:<br>±2 kV line-earth (EM) on communications ports   |   |
| Conducted RF Immunity  | IEC 61000-4-6:<br>10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz   | IEC 61000-4-6:<br>10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz   |

## Communication Connections

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

- 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 programming 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 network protocol (EtherNet/IP) 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 your application  | Select for a 1769-L3x controller  | Select for a 1769-L3x controller  | Select for a 1769-L4x, 1769-L4xS controller | Select for a CompactLogix 5370 controller       |
|--|---|---|---|---|
| <ul style="list-style-type: none"> <li>• Controls standard and safety I/O modules and drives</li> <li>• Requires an adapter for distributed 1756 I/O on EtherNet/IP links</li> <li>• Communicates with other EtherNet/IP devices (messages and HMI)</li> <li>• Bridges EtherNet/IP links to route messages to devices on other networks</li> </ul> | 1769-L23E-QB1B or 1769-L23E-QBFC1B controller with integrated EtherNet/IP port                | 1769-L32E or 1769-L35E controller with integrated EtherNet/IP port                | 1768-ENBT bridge                            | All CompactLogix 5370 L1, L2 and L3 controllers |
| <ul style="list-style-type: none"> <li>• Requires remote access via an Internet browser to tags in a local controller</li> <li>• Support custom web page</li> <li>• Bridges EtherNet/IP links to route messages to devices on other networks (no I/O support)</li> </ul>   | —   | —   | 1768-EWEB web server                        | —   |
| Uses 1769-I/O as remote I/O via EtherNet   | 1769-L23E-QB1B or 1769-L23E-QBFC1B controller with integrated EtherNet/IP port and 1769-AENTR | 1769-L32E or 1769-L35E controller with integrated EtherNet/IP port and 1769-AENTR | 1769-AENTR                                  | 1769-AENTR                                      |

For controller specifications, see CompactLogix Controllers Specifications, publication [1769-TD005](#).

**Table 3 - Technical Specifications - 1768 and 1769 EtherNet/IP Modules**

| Attribute                        | 1768-ENBT, 1768-EWEB   | 1769-AENTR <sup>(1)</sup>   |
|----------------------------------|--|---|
| EtherNet/IP communication rate   | 10/100 Mbps  | 10/100 Mbps   |
| Logix communication connections  | 128  | 128   |
| TCP/IP communication connections | 64   | 96  |
| Current draw @ 5V DC             | N/A  | 500 mA  |
| Current draw @ 5.2V DC           | 834 mA   | N/A   |
| Current draw @ 24V DC            | 0 mA   | N/A   |
| Power consumption                | 4.34 W   | N/A   |
| Power dissipation                | 4.38 W   | N/A   |
| Isolation voltage                | 30V (continuous), functional insulation type, Ethernet to system<br>Tested at 710V DC for 60 s   | 50V (continuous), basic insulation type<br>Tested at 710V DC for 60 s |
| Weight, approx.                  | 0.213 kg (7.5 oz)  | 0.280 kg (0.61 lb)  |
| Dimensions (HxWxD), approx.      | 132 x 56.7 x 105.1 mm (5.20 x 2.23 x 4.12 in.)   | 118 x 50 x 87 mm (4.65 x 1.97 x 3.43 in.)                             |
| Slot width                       | 1  | 1   |
| Module location                  | DIN rail or panel mount  | DIN rail or panel mount   |
| Mounting screw torque            | 1.16 N•m (10 lb•in) - use M4 or #8 screws  | 1.16 N•m (10 lb•in) - use M4 or #8 screws                             |
| Ports                            | 1 Ethernet RJ45 Category 5   | 2 Ethernet RJ45 Category 5  |
| Wire size                        | Ethernet connections:<br>RJ45 connector according to IEC 60603-7, 2 or 4 pair Category 5e minimum cable according to TIA 568-B.1 or Category 5 cable according to ISO/IEC 24702. |   |
| Wire category                    | 2 - on communication ports <sup>(2)</sup>  | 1 - on communication ports <sup>(1)</sup>                             |
| North American temperature code  | T4A  | T3C   |
| Enclosure type rating            | None (open-style)  | None (open-style)   |

(1) The 1769-AENTR adapter must be used with one of the following Rockwell Automation power supply models: 1769-PA2, 1769-PB2, 1769-PA4, or 1769-PB4.

(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 4 - Certifications - 1768 and 1769 EtherNet/IP Modules**

| Certification <sup>(1)</sup> | 1768-ENBT, 1768-EWEB   | 1769-AENTR   |
|------------------------------|--|--|
| 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 E194870.   | UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E322657.<br>UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E334470.  |
| CE                           | European Union 2004/108/EC 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) | European Union 2004/108/EC 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) |
| RCM                          | Australian Radiocommunications Act, compliant with:<br>AS/NZS CISPR 11; Industrial Emissions   | Australian Radiocommunications Act, compliant with:<br>AS/NZS CISPR 11; Industrial Emissions   |
| Ex                           | European Union 94/9/EC ATEX Directive, compliant with:<br>EN 60079-15; Potentially Explosive Atmospheres, Protection "n"<br>EN 60079-0; General Requirements<br>II 3 G Ex nA IIC T4 X  | N/A  |
| KC                           | Korean Registration of Broadcasting and Communications Equipment, compliant with:<br>Article 58-2 of Radio Waves Act, Clause 3   | Korean Registration of Broadcasting and Communications Equipment, compliant with:<br>Article 58-2 of Radio Waves Act, Clause 3   |
| EtherNet/IP                  | ODVA conformance tested to EtherNet/IP specifications  | ODVA conformance tested to EtherNet/IP specifications  |

(1) When 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 <sup>2</sup> (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 <sup>2</sup> (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, includes: <ul style="list-style-type: none"> <li>• Pre-configured modem</li> <li>• Communication module</li> <li>• DIN rail mounting hardware</li> <li>• Associated cables</li> </ul> |

## 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                               |
|---|--------------------------------------|
| <ul style="list-style-type: none"> <li>• Requires Layer 3 routing</li> <li>• Integrates enterprise and manufacturing environments</li> <li>• Manages multicast traffic</li> <li>• Requires diagnostics data</li> <li>• Requires security options</li> </ul> | Stratix 8300 modular, managed switch |
| <ul style="list-style-type: none"> <li>• Integrates enterprise and manufacturing environments</li> <li>• Manages multicast traffic</li> <li>• Requires diagnostics data</li> <li>• Requires security options</li> </ul>                                     | Stratix 8000 modular, managed switch |
| <ul style="list-style-type: none"> <li>• Integrates plant floor devices</li> <li>• Manages multicast traffic</li> <li>• Requires diagnostics data</li> <li>• Requires security options</li> </ul>   | Stratix 6000 fixed, managed switch   |
| <ul style="list-style-type: none"> <li>• Requires easy set up and direct replacement of switches</li> <li>• Is a small, isolated network</li> </ul>   | Stratix 2000 unmanaged switch        |

## Stratix Managed Switch Specifications

| Feature                  | Stratix 8000 and 8300   |                     |                    |                     |                         |                         | Stratix 6000 |             |
|--------------------------|-------------------------|---------------------|--------------------|---------------------|-------------------------|-------------------------|--------------|-------------|
|                          | Base<br>1783-MS06T      | Base<br>1783-RMS06T | Base<br>1783-MS10T | Base<br>1783-RMS10T | Expansion<br>1783-MX08T | Expansion<br>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 <sup>(1)</sup> |                     |                    |                     |                         |                         | —            | —           |
| Fiber ports              | 0...10 <sup>(1)</sup>   |                     |                    |                     |                         |                         | —            | 1           |
| 10/100 copper ports      | 4...24 <sup>(1)</sup>   |                     |                    |                     |                         |                         | 4            | 8           |
| 100 base LC fiber ports  | 0...8 <sup>(1)</sup>    |                     |                    |                     |                         |                         |              |             |
| SFP slots                | 2 <sup>(2)</sup>        |                     |                    |                     |                         |                         |              | 1           |
| 10/100/1000 copper ports | 2 <sup>(2)</sup>        |                     |                    |                     |                         |                         |              | —           |
| 100 Mbs fiber support    | Yes                     |                     |                    |                     |                         |                         | No           | No          |
| 1 G fiber support        | Yes                     |                     |                    |                     |                         |                         | No           | Yes         |
| CompactFlash memory      | Yes                     |                     |                    |                     |                         |                         | No           | No          |
| Power requirements       | 24/48V DC               |                     |                    |                     |                         |                         | 8...48V DC   |             |

(1) Maximum port counts require expansion ports.

(2) Two ports each can be used for SFP or 10/100/1000 copper.

## Stratix Unmanaged Switch Specifications

| Feature                 | Stratix 2000  |            |               |            |
|-------------------------|---------------|------------|---------------|------------|
|                         | 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 Mbs fiber support   | Yes           | —          | Yes           | —          |
| CompactFlash memory     | No            | No         | No            | No         |
| Power requirements      | 810...5V 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 uses | Select for a 1769-L3x controller                      | Select for a 1769-L4x, 1769-L4xS controller |
|--------------------------|---|---|
| • Single media           | 1769-L32C controller with integrated ControlNet port  | 1768-CNB bridge                             |
| • Redundant media        | 1769-L35CR controller with integrated ControlNet port | 1768-CNBR bridge                            |

For controller specifications, see CompactLogix Controllers Specifications, publication [1769-TD005](#).

### 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 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 5 - Technical Specifications - 1768 ControlNet Modules**

| Attribute                       | 1768-CN8   | 1768-CNBR                             |
|---------------------------------|--|---------------------------------------|
| Configuration                   | Standard   | Redundant                             |
| ControlNet communication rate   | 5 Mbps   |                                       |
| Logix communication connections | 48   |                                       |
| Number of nodes, max            | 99   |                                       |
| Current draw @ 5.2V DC          | 1 A  |                                       |
| Current draw @ 24V DC           | 0 A  |                                       |
| Power dissipation               | 5.14 W   |                                       |
| Thermal dissipation             | 17.5 BTU/hr  |                                       |
| Isolation voltage               | 30V (continuous), functional insulation type, ControlNet to backplane<br>No isolation between NAP and Backplane<br>Type tested at 500V AC for 60 s, ControlNet network to system |                                       |
| Weight, approx.                 | 0.260 kg (0.57 lb)   | 0.293 kg (0.64 lb)                    |
| Dimensions (HxWxD), approx.     | 132 x 56.7 x 105.1 mm (5.20 x 2.23 x 4.12 in.)   |                                       |
| Slot width                      | 1  |                                       |
| Module location                 | DIN rail or panel mount  |                                       |
| Mounting screw torque           | 1.16 N•m (10 lb•in) - use M4 or #8 screws  |                                       |
| Ports                           | 1 ControlNet BNC<br>1 ControlNet RJ45  | 2 ControlNet BNC<br>1 ControlNet RJ45 |
| ControlNet cable                | Quad shield RG6 coaxial cable  |                                       |
| Wire category                   | 2 - on communication ports <sup>(1)</sup>  |                                       |
| North American temperature code | T4A  |                                       |
| 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 6 - Certifications - 1768 ControlNet Modules**

| Certification <sup>(1)</sup> | 1768-CN8, 1768-CNBR   |
|------------------------------|---|
| 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:<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:<br>AS/NZS CISPR 11; Industrial Emissions  |
| KC                           | Korean Registration of Broadcasting and Communications Equipment, compliant with:<br>Article 58-2 of Radio Waves Act, Clause 3  |
| CI                           | ControlNet International conformance tested to ControlNet specifications  |

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

## Accessories - ControlNet Network

| Category         | Cat. No.    | Description  |
|------------------|-------------|--|
| <b>Taps</b>      | 1786-TPR    | T-tap right angle                                    |
|                  | 1786-TPS    | T-tap straight                                       |
|                  | 1786-TPYR   | Y-tap right angle                                    |
|                  | 1786-TPYS   | Y-tap straight                                       |
| <b>Cables</b>    | 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 |
| <b>Other</b>     | 1786-XT     | ControlNet termination resistor                      |
| <b>Repeaters</b> | 1786-RPA    | ControlNet modular-repeater adapter                  |
|                  | 1786-RPCD   | ControlNet coaxial-hub repeater                      |
|                  | 1786-RPFRL  | ControlNet fiber-ring repeater, long                 |
|                  | 1786-RPFRXL | ControlNet fiber-ring repeater, extra long           |
|                  | 1786-RPFS   | ControlNet fiber-ring repeater, short                |
|                  | 1786-RPFM   | ControlNet fiber-ring repeater, medium               |

<http://www.roc-electric.com/>

## 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.

| If your application   | Select                     |
|---|----------------------------|
| <ul style="list-style-type: none"> <li>Communicates with other DeviceNet devices (I/O and messages)</li> <li>Requires explicit messaging</li> <li>Uses the controller as a master or slave</li> <li>Uses the controller serial port for other communication</li> <li>Requires higher performance than the 1769-NET-DNI interface</li> </ul> | 1769-SDN DeviceNet scanner |
| <ul style="list-style-type: none"> <li>Uses any CompactLogix controller</li> <li>Accesses as many as 30 remote Compact I/O modules</li> <li>Sends remote I/O data back to a scanner or controller</li> </ul>  | 1769 DeviceNet adapter     |

**Table 7 - Technical Specifications - 1769 DeviceNet Modules**

| Attribute                       | 1769-SDN <sup>(1)</sup>  | 1769-ADN                                 |
|---------------------------------|--|--|
| 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   | 30                                       |
| Current draw @ 5V DC            | 440 mA   | Series A 450 mA<br>Series B 500 mA       |
| Current draw @ 24V DC           | 0 mA   |  |
| DeviceNet current range         | 11...25V DC  |  |
| DeviceNet current draw          | 110 mA @ 24V DC Class 2/SELV   | 90 mA @ 24V DC Class 2/SELV              |
| Power dissipation               | 4.7 W  | 4.7 W                                    |
| Isolation voltage               | 30V (continuous), basic insulation type, DeviceNet to backplane<br>Type tested at 710V DC for 60 s |  |
| Weight, approx.                 | 0.280 kg (0.61 lb)   |  |
| Dimensions (HxWxD), approx.     | 118 x 50 x 87 mm (4.65 x 1.97 x 3.43 in.)  |  |
| Slot width                      | 1  |  |
| Module location                 | DIN rail or panel mount  |  |
| Mounting screw torque           | 1.16 N•m (10 lb•in) - use M4 or #8 screws  |  |
| Power supply distance rating    | 4 modules  | Series A 4 modules<br>Series B 5 modules |
| Ports                           | 1 DeviceNet open-style 5-pin linear plug   |  |
| DeviceNet connector torque      | 0.56...0.79 N•m (5...7 lb•in)  |  |
| Wire size                       | 802.3 compliant shielded or unshielded twisted pair  |  |
| Wire category                   | 2 - on communication ports <sup>(2)</sup>  |  |
| North American Temperature Code | T3C  | T4A                                      |
| Enclosure type rating           | None (open-style)  |  |

(1) The 1769-SDN does not support CIP Safety (safety communication).

(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 8 - Certifications - 1769 DeviceNet Modules**

| Certification <sup>(1)</sup> | 1769-SDN  | 1769-ADN   |
|------------------------------|---|--|
| 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 E10314.               | 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:<br>EN 61000-6-2; Industrial Immunity<br>EN 61000-6-4; Industrial Emissions |  |
| C-Tick                       | Australian Radiocommunications Act, compliant with:<br>AS/NZS CISPR 11; Industrial Emissions  |  |
| ODVA                         | ODVA conformance tested to DeviceNet specifications   |  |

(1) When 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. <ul style="list-style-type: none"> <li>Thick-trunk round media systems use thick cable for maximum DeviceNet trunk line length.</li> <li>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 has thermoplastic elastomers (TPE) for additional chemical resistance.</li> </ul> |

For more information on selecting DeviceNet media, see the NetLinx Selection Guide, publication [NETS-SG001](#).

## Serial Network

The controller serial port is compatible with RS-232 serial communication. The serial port supports the DF1 protocol to communicate with other devices on the serial link.

| Use this DF1 mode | For   |
|-------------------|---|
| Point-to-point    | Communication between a controller and other DF1-compatible devices by using DF1 full-duplex protocol.                  |
| DF1 radio modem   | SCADA applications where controllers exchange data via radio transmission.  |
| DF1 master        | Control of polling and message transmission between the master and each slave by using DF1 half-duplex polled protocol. |
| DF1 slave         | Using the controller as a slave station in a master/slave serial network by using DF1 half-duplex protocol.             |
| User mode (ASCII) | Communication between a controller and an ASCII device, such as a bar code reader.                                      |

The controller you choose determines the number of serial ports that are available.

**Table 9 - Serial Port Options Based on Controller**

| If you need      | Identified as   | With this protocol                                      | Select  |
|------------------|---|---|---|
| One serial port  | Channel 0 (fully isolated)                            | DF1, DH-485, ASCII                                      | 1768-L43<br>1769-L35CR, 1769-L32C<br>1769-L35E, 1769-L32E<br>1769-L23E-QB1B, 1769-L23E-QBFC1B |
| Two serial ports | Channel 0 (fully isolated)<br>Channel 1 (nonisolated) | Channel 0: DF1, DH-485, ASCII<br>Channel 1: DF1, DH-485 | 1769-L31<br>1769-L23-QBFC1B   |

If you connect the controller to a nonisolated port (channel 1) on the controller to a computer, modem, or ASCII device, install an isolator (such as the 1761-NET-AIC interface converter) between the controller and the end device.

## Modbus Support

To use Logix5000 controllers on a Modbus network, you connect through the serial port and execute a specific ladder logic routine. The controller project is available with RSLogix 5000 Enterprise programming software. For more information, see [Using Logix5000 Controllers as Masters or Slaves on Modbus Application Solution](#), publication [CIG-AP129](#).

## 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. However, 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, networks in the NetLinx open architecture are the recommended networks.

You need a 1761-NET-AIC converter for each controller you want to put 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 |

### 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 | <ul style="list-style-type: none"> <li>• 20.4...28.8V DC power source required</li> <li>• Typical 120 mA 24V DC current draw</li> </ul>   |
| 9300-RADKIT   | Remote access dial-in kit  | 56 Kbps modem connection to devices on a DH+ network, includes: <ul style="list-style-type: none"> <li>• Pre-configured modem</li> <li>• Communication module</li> <li>• DIN rail mounting hardware</li> <li>• Associated cables</li> </ul> |

## Additional Resources

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

| Resource  | Description   |
|---|---|
| Industrial Automation Wiring and Grounding Guidelines, publication <a href="#">1770-4.1</a> | Provides general guidelines for installing a Rockwell Automation industrial system. |
| Product Certifications website, <a href="http://www.ab.com">http://www.ab.com</a>           | 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.

## 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.

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