

# 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-EN2TSC

ControlLogix-XT Catalog Numbers 1756-EN2TXT, 1756-EN2TRXT, 1756-CN2RXT, 1756-DHRIOXT

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



## Available Communication Modules

| Network            | Cat. No.                | Description                                                                                                                                           | Page |
|--------------------|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| EtherNet/IP        | 1756-EN2F               | EtherNet/IP bridge, fiber, 256 Logix connections                                                                                                      | 5    |
|                    | 1756-EN2T               | EtherNet/IP bridge, copper, 256 Logix connections                                                                                                     | 5    |
|                    | 1756-EN2TSC             | EtherNet/IP secure communication module                                                                                                               | 5    |
|                    | 1756-EN2TR              | EtherNet/IP bridge, embedded switch, copper<br>Supports as many as 8 axis of motion                                                                   | 5    |
|                    | 1756-EN3TR              | EtherNet/IP bridge, embedded switch, copper<br>Supports as many as 128 axis of motion                                                                 | 5    |
|                    | 1756-ENBT               | EtherNet/IP bridge, copper, 128 Logix connections                                                                                                     | 5    |
|                    | 1756-EWEB               | Ethernet web server, 128 Logix connections, Class 3 messaging only                                                                                    | 5    |
|                    | 1756-EN2TXT             | ControlLogix-XT™, EtherNet/IP bridge, copper, 256 Logix connections                                                                                   | 7    |
|                    | 1756-EN2TRXT            | ControlLogix-XT EtherNet/IP bridge module with embedded switch                                                                                        | 7    |
| ControlNet         | 1756-CN2/B, 1756-CN2R/B | ControlNet bridge, 128 Logix connections <sup>(1)</sup>                                                                                               | 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 <sup>(1)</sup>                                                                              | 11   |
| DeviceNet          | 1756-DNB/E              | DeviceNet bridge                                                                                                                                      | 19   |
| Data Highway Plus™ | 1756-DHRIO              | Data Highway Plus/Remote I/O module                                                                                                                   | 22   |
|                    | 1756-DHRIOXT            | ControlLogix-XT, Data Highway Plus/Remote I/O module                                                                                                  | 22   |
| Remote I/O         | 1756-DHRIO              | Data Highway Plus/Remote I/O module                                                                                                                   | 22   |
|                    | 1756-RIO/B              | Remote I/O module                                                                                                                                     | 22   |
|                    | 1756-DHRIOXT            | ControlLogix-XT, Data Highway Plus/Remote I/O module                                                                                                  | 22   |
| Serial             | 1756-DH485              | Compatible with RS-232 serial communication, supports the DF1 protocol, send and receive messages, does not support remote programming and monitoring | 26   |
| SynchLink™         | 1756-SYNCH              | SynchLink fiber-optic communication link                                                                                                              | 29   |

(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 with the Studio 5000 environment
- Controller access with 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                                    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Control I/O modules and drives</li> <li>• Act as an adapter for I/O on remote EtherNet/IP links</li> <li>• Communicate with other EtherNet/IP devices (messages and HMI)</li> <li>• Bridge EtherNet/IP links to route messages to devices on other networks</li> </ul>                | 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<br>1756-EN2TRXT redundant bridge      |
| Secure access to a control system from within the plant network                                                                                                                                                                                                                                                                | 1756-EN2TSC bridge                                       |
| <ul style="list-style-type: none"> <li>• Use an Internet browser to remotely access tags in a ControlLogix controller</li> <li>• Communicate with other EtherNet/IP or generic Ethernet devices (messaging only; no I/O control)</li> <li>• Bridge EtherNet/IP links to route messages to devices on other networks</li> </ul> | 1756-EWEB web server                                     |

**Table 1 - Technical Specifications - 1756 EtherNet/IP Modules**

| Attribute                                                                                    | 1756-EN2F                                                                                 | 1756-EN2T,<br>1756-EN2TSC                                                                                                                          | 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                                                                                                                                              | 3.7 W                                                                                                    |             |
| Thermal dissipation                                                                          | 21.28 BTU/hr                                                                              | 17.4 BTU/hr                                                                                                                                        | 17.4 BTU/hr                                                                                                                                        | 12.6 BTU/hr                                                                                              |             |
| 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 <sup>(1)</sup>                                                                      | USB 1.1, full speed (12 Mbps)                                                             |                                                                                                                                                    |                                                                                                                                                    | —                                                                                                        |             |
| Wiring category <sup>(2)</sup>                                                               | 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,<br>1756-EN2TSC                                 | 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 (IEC 61000-6-4)                                                                                                                                                                          | 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 <sup>(1)</sup> | 1756-EN2F, 1756-EN2T, 1756-EN2TSC                                                                                                                                                                                                                                                                                                       | 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: <ul style="list-style-type: none"><li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li><li>• EN 61000-6-2; Industrial Immunity</li><li>• EN 61000-6-4; Industrial Emissions</li><li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li></ul> |                        |                                                                                                                                                                                              |           |
| 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: <ul style="list-style-type: none"><li>• EN 60079-15; Potentially Explosive Atmospheres, Protection “n”</li><li>• EN 60079-0; General Requirements</li><li>• II 3 G Ex nA IIC T4 Gc X</li></ul>                                                                     |                        |                                                                                                                                                                                              |           |
| FM                           | <b>All modules except 1756-EN2TSC:</b> FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations                                                                                                                                                                                                            |                        |                                                                                                                                                                                              |           |
| KC                           | 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                                                                                                                                                                                                                                                                                   |                        |                                                                                                                                                                                              |           |

(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, 1756-EN2TRXT                                                                                                                          |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| 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                                                                                                                                              |
| Thermal dissipation              | 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-A7XT, 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                                                                                                |