

## Logix Controllers Comparison

| Characteristic         | <b>1756 ControlLogix®</b><br>1756-L71, 1756-L72, 1756-L73, 1756-L73XT, 1756-L74, 1756-L75<br><br><b>1756 GuardLogix®</b><br>1756-L71S, 1756-L72S, 1756-L73S                                                                                                                                                       | <b>CompactLogix™</b><br>1769-L30ER, 1769-L30ER-NSE, 1769-L30ERM, 1769-L33ER, 1769-L33ERM, 1769-L36ERM                                                                                                                      | <b>CompactLogix</b><br>1769-L24ER-BB1B, 1769-L24ER-QBFC1B, 1769-L27ERM-QBFC1B                                                                                                                                    | <b>CompactLogix</b><br>1769-L16ER-BB1B, 1769-L18ER-BB1B, 1769-L18ERM-BB1B                                                                                                                     |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Controller tasks:      | <ul style="list-style-type: none"> <li>32;</li> <li>100 programs/task</li> </ul>                                                                                                                                                                                                                                  | <ul style="list-style-type: none"> <li>32;</li> <li>100 programs/task</li> </ul>                                                                                                                                           | <ul style="list-style-type: none"> <li>32;</li> <li>100 programs/task</li> </ul>                                                                                                                                 | <ul style="list-style-type: none"> <li>32;</li> <li>100 programs/task</li> </ul>                                                                                                              |
| Event tasks            | Consumed tag, EVENT instruction triggers, Module Input Data changes, and motion events                                                                                                                                                                                                                            | Consumed tag, EVENT instruction triggers and motion events                                                                                                                                                                 | Consumed tag, EVENT instruction triggers and motion events                                                                                                                                                       | Consumed tag, EVENT instruction triggers and motion events                                                                                                                                    |
| User memory            | <ul style="list-style-type: none"> <li>1756-L71: 2 MB</li> <li>1756-L72: 4 MB</li> <li>1756-L73: 8 MB</li> <li>1756-L73XT: 8 MB</li> <li>1756-L74: 16 MB</li> <li>1756-L75: 32 MB</li> <li>1756-L71S: 2 MB + 1 MB safety</li> <li>1756-L72S: 4 MB + 2 MB safety</li> <li>1756-L73S: 8 MB + 4 MB safety</li> </ul> | <ul style="list-style-type: none"> <li>1769-L30ER, 1769-L30ER-NSE, 1769-L30ERM: 1MB</li> <li>1769-L33ER, 1769-L33ERM: 2 MB</li> <li>1769-L36ERM: 3 MB</li> </ul>                                                           | <ul style="list-style-type: none"> <li>1769-L24ER: 750 KB</li> <li>1769-L27ERM: 1 MB</li> </ul>                                                                                                                  | <ul style="list-style-type: none"> <li>1769-L16ER: 384 KB</li> <li>1769-L18ER, 1769-L18ERM: 512 KB</li> </ul>                                                                                 |
| Memory card            | Secure Digital                                                                                                                                                                                                                                                                                                    | Secure Digital                                                                                                                                                                                                             | Secure Digital                                                                                                                                                                                                   | Secure Digital                                                                                                                                                                                |
| Built-in ports         | 1 port USB Client                                                                                                                                                                                                                                                                                                 | <ul style="list-style-type: none"> <li>Dual-port EtherNet/IP</li> <li>1 port USB Client</li> </ul>                                                                                                                         | <ul style="list-style-type: none"> <li>Dual-port EtherNet/IP</li> <li>1 port USB Client</li> </ul>                                                                                                               | <ul style="list-style-type: none"> <li>Dual-port EtherNet/IP</li> <li>1 port USB Client</li> </ul>                                                                                            |
| Communication options  | <ul style="list-style-type: none"> <li>EtherNet/IP</li> <li>ControlNet</li> <li>DeviceNet</li> <li>Data Highway Plus</li> <li>Remote I/O</li> <li>SynchLink</li> <li>USB Client</li> </ul>                                                                                                                        | <ul style="list-style-type: none"> <li>EtherNet/IP               <ul style="list-style-type: none"> <li>Embedded switch</li> <li>Single IP address</li> </ul> </li> <li>DeviceNet</li> <li>USB Client</li> </ul>           | <ul style="list-style-type: none"> <li>EtherNet/IP               <ul style="list-style-type: none"> <li>Embedded switch</li> <li>Single IP address</li> </ul> </li> <li>DeviceNet</li> <li>USB Client</li> </ul> | <ul style="list-style-type: none"> <li>EtherNet/IP               <ul style="list-style-type: none"> <li>Embedded switch</li> <li>Single IP address</li> </ul> </li> <li>USB Client</li> </ul> |
| Controller connections | 500                                                                                                                                                                                                                                                                                                               | 256                                                                                                                                                                                                                        | 256                                                                                                                                                                                                              | 256                                                                                                                                                                                           |
| Network connections    | Per network module: <ul style="list-style-type: none"> <li>40 ControlNet (CNB)</li> <li>100 ControlNet (CN2/A)</li> <li>128 ControlNet (CN2/B)</li> <li>128 EtherNet/IP; 64 TCP (ENBT)</li> <li>256 EtherNet/IP; 128 TCP (EN2x)</li> <li>256 Ethernet (ENxT(R))</li> </ul>                                        | <ul style="list-style-type: none"> <li>1769-L30ER, 1769-L30ER-NSE, 1769-L30ERM: 16 EtherNet/IP; 120 TCP</li> <li>1769-L33ER, 1769-L33ERM: 32 EtherNet/IP; 120 TCP</li> <li>1769-L36ERM: 48 EtherNet/IP; 120 TCP</li> </ul> | <ul style="list-style-type: none"> <li>1769-L24ER-QB1B: 8 EtherNet/IP; 120 TCP</li> <li>1769-L24ER-BFC1B: 8 EtherNet/IP; 120 TCP</li> <li>1769-L27ERM-QBFC1B: 16 EtherNet/IP; 120 TCP</li> </ul>                 | <ul style="list-style-type: none"> <li>1769-L16ER-BB1B: 4 EtherNet/IP; 120 TCP</li> <li>1769-L18ER-BB1B: 8 EtherNet/IP; 120 TCP</li> <li>1769-L18ERM-BB1B: 8 EtherNet/IP; 120 TCP</li> </ul>  |
| Controller redundancy  | Full support                                                                                                                                                                                                                                                                                                      | Backup via DeviceNet                                                                                                                                                                                                       | Backup via DeviceNet                                                                                                                                                                                             | None                                                                                                                                                                                          |
| Simple motion          | <ul style="list-style-type: none"> <li>Stepper</li> <li>Servo via DeviceNet</li> <li>Analog or networked AC drive</li> </ul>                                                                                                                                                                                      | <ul style="list-style-type: none"> <li>Servo via DeviceNet</li> <li>Analog or Networked AC drive</li> </ul>                                                                                                                | <ul style="list-style-type: none"> <li>Servo via DeviceNet</li> <li>Analog or Networked AC drive</li> </ul>                                                                                                      | Analog or Networked AC drive                                                                                                                                                                  |
| Integrated motion      | <ul style="list-style-type: none"> <li>EtherNet/IP</li> <li>SERCOS interface</li> <li>Analog options:               <ul style="list-style-type: none"> <li>Encoder input</li> <li>LDT input</li> <li>SSI input</li> </ul> </li> </ul>                                                                             | EtherNet/IP:<br>1769-L30ERM, 1769-L33ERM, 1769-L36ERM                                                                                                                                                                      | EtherNet/IP:<br>1769-L27-ERM-QBFC1B                                                                                                                                                                              | EtherNet/IP:<br>1769-L18ERM-BB1B                                                                                                                                                              |
| Programming languages  | <ul style="list-style-type: none"> <li>Relay ladder</li> <li>Structured text</li> <li>Function block</li> <li>Sequential function chart</li> <li>Safety task: relay ladder, safety application instructions</li> </ul>                                                                                            | <ul style="list-style-type: none"> <li>Relay ladder</li> <li>Structured text</li> <li>Function block</li> <li>Sequential function chart</li> </ul>                                                                         | <ul style="list-style-type: none"> <li>Relay ladder</li> <li>Structured text</li> <li>Function block</li> <li>Sequential function chart</li> </ul>                                                               | <ul style="list-style-type: none"> <li>Relay ladder</li> <li>Structured text</li> <li>Function block</li> <li>Sequential function chart</li> </ul>                                            |

## ControlNet Communication Modules

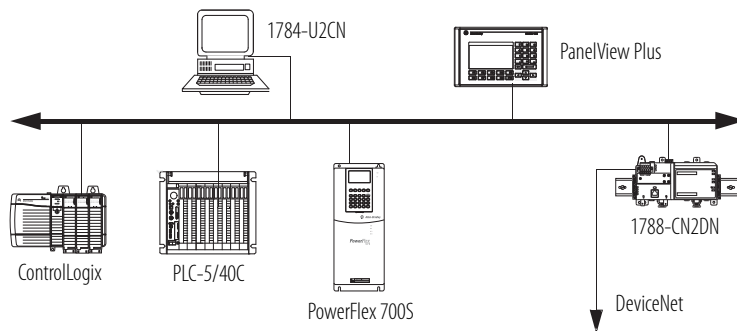
The ControlNet network combines the functionality of an I/O network and a peer-to-peer network, providing high-speed performance. The ControlNet network provides deterministic, repeatable transfers of critical control data.

| Cat. No.    | Description                                                              | Communication Rate | Logix Connections  | Number of Nodes |
|-------------|--------------------------------------------------------------------------|--------------------|--------------------|-----------------|
| 1756-CN2/B  | ControlNet bridge, standard media                                        | 5 Mbps             | 128 <sup>(1)</sup> | 99              |
| 1756-CN2R/B | ControlNet bridge, redundant media                                       | 5 Mbps             | 128 <sup>(1)</sup> | 99              |
| 1756-CNB    | ControlNet bridge, standard media                                        | 5 Mbps             | 64 <sup>(2)</sup>  | 99              |
| 1756-CNBR   | ControlNet bridge, redundant media                                       | 5 Mbps             | 64 <sup>(2)</sup>  | 99              |
| 1756-CN2RXT | ControlLogix-XT, extended temperature ControlNet bridge, redundant media | 5 Mbps             | 128 <sup>(1)</sup> | 99              |

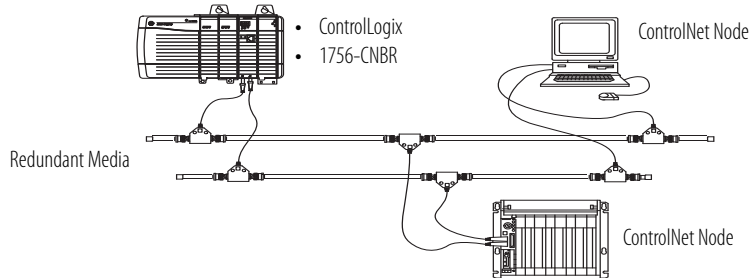
(1) 128 connections are available for standard use. An extra three connections are reserved for redundant control.

(2) Recommend using only 40 . . . 48 Logix connections for I/O.

### Example Configuration—ControlNet Network



### Example Configuration—Redundant ControlNet Media



For information on ControlNet media, see the ControlNet Media System Components List, publication [AG-PA002](#).

## Standard ControlLogix Controllers

The ControlLogix controller is part of the Logix5000 family of controllers. A ControlLogix system includes the following:

- The ControlLogix controller, available in different combinations of user memory
- Studio 5000 environment
- 1756 ControlLogix I/O modules that reside in a 1756 chassis
- Separate communication modules for network communication



| Feature                                 | 1756-L71, 1756-L72, 1756-L73, 1756-L74, 1756-L75                                                                                                                                                                                          |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Controller tasks                        | <ul style="list-style-type: none"> <li>• 32 tasks</li> <li>• 100 programs/task</li> <li>• Event tasks: all event triggers</li> </ul>                                                                                                      |
| Built-in communication ports            | 1 port USB Client                                                                                                                                                                                                                         |
| Communication options                   | <ul style="list-style-type: none"> <li>• EtherNet/IP</li> <li>• ControlNet</li> <li>• DeviceNet</li> <li>• Data Highway Plus</li> <li>• Remote I/O</li> <li>• SynchLink</li> <li>• Third-party process and device networks</li> </ul>     |
| Built-in port                           | USB Client                                                                                                                                                                                                                                |
| Controller connections supported, max   | 500                                                                                                                                                                                                                                       |
| Network connections, per network module | <ul style="list-style-type: none"> <li>• 256 EtherNet/IP; 128 TCP (1756-EN2x, 1756-EN3x)</li> <li>• 128 EtherNet/IP; 64 TCP (1756-ENBT)</li> <li>• 128 ControlNet (1756-CN2/B, 1756-CN2R/B)</li> <li>• 64 DeviceNet (1756-DNB)</li> </ul> |
| Controller redundancy                   | Full support                                                                                                                                                                                                                              |
| Integrated motion                       | <ul style="list-style-type: none"> <li>• EtherNet/IP connection</li> <li>• SERCOS interface</li> <li>• Analog options (encoder input, LDT input, SSI input)</li> </ul>                                                                    |
| Programming languages                   | <ul style="list-style-type: none"> <li>• Relay ladder</li> <li>• Structured text</li> <li>• Function block</li> <li>• Sequential function chart (SFC)</li> </ul>                                                                          |

## GuardLogix Controllers

A GuardLogix controller is a ControlLogix controller that also provides safety control.



| Application | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SIL 1, 2, 3 | <p>The GuardLogix controller system is type-approved and certified for use in safety applications up to and including SIL 3 according to IEC 61508, and applications up to and including PLe/Cat.4 according to ISO 13849-1. For more information, see the following:</p> <ul style="list-style-type: none"> <li>GuardLogix Controllers Systems Safety Reference Manual, publication <a href="#">1756-RM093</a>.</li> <li>GuardLogix Controllers User Manual, publication <a href="#">1756-UM020</a>.</li> <li>GuardLogix Safety Application Instruction Set Reference Manual, publication <a href="#">1756-RM095</a>.</li> </ul> |

The GuardLogix system is a dual controller solution. You must use a primary controller and a safety partner to achieve SIL 3/PLe/Cat. 4.

| Primary Controller              | Safety Partner |
|---------------------------------|----------------|
| 1756-L71S, 1756-L72S, 1756-L73S | 1756-L7SP      |
| 1756-L73SXT                     | 1756-L7SPXT    |



During development, safety and standard have the same rules, multiple programmers, online editing, and forcing are all allowed. Once the project is tested and ready for final validation, you set the Safety Task to a SIL 3 integrity level, which the GuardLogix controller enforces. When safety memory is locked and protected, the safety logic can't be modified and all safety functions operate with SIL 3 integrity. On the standard side of the GuardLogix controller, all functions operate like a regular Logix controller.

Use Guard I/O modules for field device connectivity on Ethernet or DeviceNet networks, and for safety interlocking between GuardLogix controllers use Ethernet or ControlNet networks. Multiple GuardLogix controllers can share safety data for zone to zone interlocking, or one GuardLogix controller can use remote distributed safety I/O between different cells/areas.

The GuardLogix controller has the standard features of a ControlLogix controller and these safety-related features.

| Feature                                 | 1756-LSP, 1756-L71S, 1756-L72S, 1756-L73S, 1756-L7SP, 1756-L73SXT, 1756-L7SPXT                                                                                                                                                    |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Safety communication options            | <p>Standard and safety</p> <ul style="list-style-type: none"> <li>EtherNet/IP</li> <li>ControlNet</li> <li>DeviceNet</li> </ul>                                                                                                   |
| Network connections, per network module | <ul style="list-style-type: none"> <li>256 EtherNet/IP; 128 TCP (1756-EN2x, 1756-EN3x)</li> <li>128 EtherNet/IP; 64 TCP (1756-ENBT)</li> <li>128 ControlNet (1756-CN2/B, 1756-CN2R/B)</li> <li>64 DeviceNet (1756-DNB)</li> </ul> |
| Controller redundancy                   | Not supported                                                                                                                                                                                                                     |
| Safety Task Programming languages       | Relay ladder                                                                                                                                                                                                                      |

## 1756 System Software

| If you have                                                                                                                                      | You need                                                                                                              | Order                                                                                         |
|--------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| 1756 ControlLogix controller                                                                                                                     | Studio 5000 Logix Designer application                                                                                | 9324 series <sup>(1)</sup>                                                                    |
| 1756 SERCOS or analog motion module                                                                                                              |                                                                                                                       |                                                                                               |
| 1756-CN2, 1756-CN2R<br>1756-CN2RXT<br>1756-CNB, 1756-CNBR<br>ControlNet communication module                                                     | RSNetWorx™ for ControlNet software                                                                                    | 9324 series <sup>(1)</sup> (RSNetWorx option)<br>or<br>9357-CNETL3 (RSNetWorx for ControlNet) |
| 1756-DNB<br>DeviceNet communication module                                                                                                       | RSNetWorx for DeviceNet software                                                                                      | 9324 series <sup>(1)</sup> (RSNetWorx option)<br>or<br>9357-DNETL3 (RSNetWorx for DeviceNet)  |
| 1756-EN2F, 1756-EN2T<br>1756-EN2TX<br>1756-EN2TR, 1756-EN3TR<br>1756-ENBT, 1756-EWEB<br>EtherNet/IP communication module<br>(set the IP address) | RSLink software<br>or<br>BOOTP/DHCP server utility to set IP addresses<br>Optional RSNetWorx for EtherNet/IP software | 9324 series <sup>(1)</sup><br>Optional 9357-ENETL3 (RSNetWorx for EtherNet/IP)                |
| 1756-DHRIO, 1756-DHRIOXT communication module<br>1756-DH485 communication module                                                                 | RSLink software                                                                                                       | 9324 series <sup>(1)</sup>                                                                    |
| 1757-FFLD2, 1757-FFLD4<br>1757-FFLDC2, 1757-FFLDC4<br>Foundation Fieldbus linking device                                                         | RSFieldbus configuration software                                                                                     | 9308 series                                                                                   |
| Communication card in a workstation                                                                                                              | RSLink software                                                                                                       | 9324 series <sup>(1)</sup>                                                                    |

(1) All 9324 packages include RSLink Classic Light.