

# ControlLogix EtherNet/IP Bridge Module

Catalog Number 1756-ENBT

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### About This Publication

This publication describes enhancements, anomalies, and other concepts related to the ControlLogix<sup>®</sup> EtherNet/IP Bridge Module firmware, revisions 6.006, 6.005, 6.002, 6.001, 4.008, 4.007, 4.006, 4.003, 3.009, 3.008, 3.004, 3.003, 3.002, 2.004, and 2.003. We recommend upgrading to the latest firmware revision to take advantage of improved functionality.

Information newly-added to these release notes is indicated by change bars like the one shown to the left of this paragraph.

### Required System Components

Use the following versions of software with the 1756-ENBT module:

- RSLogix<sup>™</sup> 5000 software
  - As new firmware revisions of the 1756-ENBT module are released, previous versions of RSLogix 5000 software may not have those newer 1756-ENBT module firmware revisions available in the Logix 5000 device selection list. To use a newer firmware revision of the 1756-ENBT module with an older version of the RSLogix 5000 software, add an older 1756-ENBT firmware revision to the project and select compatible keying as the keying option. For example, if using version 16.00.00 of RSLogix 5000 software, selecting a 4.005 firmware revision with compatible keying will allow a revision 6.006 1756-ENBT module to function.

- For I/O control, use RSLogix 5000 software version 8.02.00 or later. However, the 1756-ENBT module works with the 1756-ENET/B selection in version 7.00.00 if the Compatible keying option is used.
- For Gateway applications, there are no software compatibility issues with RSLogix 5000 software.
- RSLinx® Classic software, version 2.30.01 or later

## Enhancements

These firmware revisions contains these enhancements:

- [Enhancements with Revision 6.005 on page 3](#)
- [Enhancements with Revision 6.001 on page 3](#)
- [Enhancements with Revision 4.008 on page 4](#)
- [Enhancements with Revision 4.007 on page 4](#)
- [Enhancements with Revision 4.003 on page 4](#)
- [Enhancements with Revision 3.009 on page 4](#)
- [Enhancements with Revision 3.003 on page 4](#)
- [Enhancements with Revision 3.002 on page 5](#)
- [Enhancements with Revision 2.003 on page 5](#)

**Table 1 - Enhancements with Revision 6.005**

Revision	Description
6.005	Various security enhancements.

**Table 2 - Enhancements with Revision 6.001**

Revision	Description
6.001	<p>Adds support for updating the 802.3 MAC destination address in pre-built I/O packets when a gratuitous Address Resolution Protocol (ARP) request is received from a redundant chassis pair.</p> <p>When using produce/consume tags between this module and a redundant chassis pair with RSLogix 5000 software version 19.50, this prevents the loss of 3...5 seconds of data if the primary controller switches over.</p> <p style="text-align: right;">Lgx00095033, Lgx00095269</p>

**Table 3 - Enhancements with Revision 4.008**

Revision	Description
4.008	Enhanced web server security.

**Table 4 - Enhancements with Revision 4.007**

Revision	Description
4.007	Decoupling the link between a TCP connection and the associated CIP connection. As a result, TCP connections can be closed without affecting existing CIP connections.

**Table 5 - Enhancements with Revision 4.003**

Revision	Description
4.003	ControlLogix system redundancy.

**Table 6 - Enhancements with Revision 3.009**

Revision	Description
3.009	Setting the IP address or upgrading firmware more quickly after power is applied to the module due to a reduction of wait time required after module power is applied.

**Table 7 - Enhancements with Revision 3.003**

Revision	Description
3.003	<ul style="list-style-type: none"><li>• Embedded electronic data sheet (EDS) file - the module contains its own EDS file within its firmware. This feature requires the use of RSNetWorx™ software, version 5.0 or later.</li><li>• Dynamic Host Configuration Protocol (DHCP) - when connected to a network with a DHCP server, that server automatically assigns an IP address to the module. This feature requires the use of RSLogix 5000 software, version 13 or later, or RSLinx® software, version 2.43 or later.</li><li>• Email - by using a MSG instruction, the controller can send email through the module.</li></ul>

**Table 8 - Enhancements with Revision 3.002**

Revision	Description
3.002	<p data-bbox="238 272 916 415">Duplicate IP address detection. When you change the IP address or connect the module to an EtherNet/IP network, the module checks to make sure that the IP address assigned to this module is not the same as that for any other device on the network. If the module determines that there is a conflict (some other device on the network already has the IP address), the EtherNet/IP port of the module goes into Conflict mode, during which the module does the following:</p> <ul data-bbox="238 415 916 514" style="list-style-type: none"> <li data-bbox="238 415 916 446">• OK status indicator blinks red.</li> <li data-bbox="238 446 916 476">• Network (NET) status indicator is solid red.</li> <li data-bbox="238 476 916 514">• Front display indicates the conflict.</li> </ul> <p data-bbox="238 521 916 627">Automatic IP address swapping when used in a ControlLogix redundancy system. During a switchover, the module now swaps its IP address with its partner module in the other redundant chassis. The automatic IP address swapping lets you use the same IP address to communicate with a primary module regardless of which chassis is primary.</p> <p data-bbox="238 635 916 687">Enhanced embedded web pages for the 1756-ENBT module to make them easier to manage and easier to use.</p>

**Table 9 - Enhancements with Revision 2.003**

Revision	Description
2.003	<p data-bbox="238 839 916 914">Beginning with this revision of the firmware, a sub-minor revision has been added when the revision number is scrolled on the display. For revision 2.3 firmware, the display will scroll 2.03.10, where 2 = major revision, .03 = minor revision, and .10 = sub-minor revision.</p> <p data-bbox="238 914 916 1020">This does not affect how you use and refer to firmware revisions of released products; continue to use the major and minor revision numbers only. Electronic keying in RSLogix 5000 software keys to the major and minor revisions. The sub-minor number cannot be used for keying.</p> <p data-bbox="238 1028 916 1134">Redundancy support for EtherNet/IP explicit messaging in a ControlLogix redundancy system (such as in HMI applications). With this firmware revision, the 1756-ENBT module can be placed directly in a redundant chassis. Minimum 1756-ENBT requirements for ControlLogix redundancy support include the following:</p> <ul data-bbox="238 1134 916 1194" style="list-style-type: none"> <li data-bbox="238 1134 916 1164">• Hardware, CAT REV E0</li> <li data-bbox="238 1164 916 1194">• Firmware revision 2.3</li> </ul>

**IMPORTANT**

Automatic IP address swapping is compatible only with revision 13 (or later) of the ControlLogix redundancy release. To determine the exact revision of firmware to use with redundancy, refer to the ControlLogix Redundancy System Release Notes at <http://www.rockwellautomation.com/support>.

## Corrected Anomalies

These firmware revisions contain these corrected anomalies:

- [Corrected Anomalies with Revision 6.006 on page 6](#)
- [Corrected Anomalies with Revision 6.005 on page 7](#)
- [Corrected Anomalies with Revision 6.005 on page 7](#)
- [Corrected Anomalies with Revision 6.002 on page 8](#)
- [Corrected Anomalies with Revision 6.001 on page 9](#)
- [Corrected Anomalies with Revision 4.008 on page 9](#)
- [Corrected Anomalies with Revision 4.007 on page 10](#)
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- [Corrected Anomalies with Revision 3.004 on page 11](#)
- [Corrected Anomalies with Revision 3.003 on page 11](#)
- [Corrected Anomalies with Revision 2.004 on page 12](#)
- [Corrected Anomalies with Revision 2.003 on page 12](#)

**Table 10 - Corrected Anomalies with Revision 6.006**

Revision	Description
6.006	<p><b>CORRECTED:</b> When used in a standard redundancy system with the 1756-SRM or 1756-RM module, E0300 errors on these modules will not cause a switchover. This occurs when using standard redundancy systems running the 1756-Lxx Standard Redundancy Bundle version 16.057 or earlier.</p> <p style="text-align: right;">Lgx00128342</p>

**Table 11 - Corrected Anomalies with Revision 6.005**

Revision	Description
6.005	<p><b>CORRECTED:</b> An Information Disclosure of product-specific information unintended for normal use results when the affected product receives a malformed CIP packet.</p> <p style="text-align: right;">Lgx00126653</p>
	<p><b>CORRECTED:</b> A Denial of Service (DOS) condition and a product recoverable fault result when affected product receives a malformed CIP packet. Receipt of such a message from an unauthorized source causes a disruption of communication to other products in a controller platform or system. Recovery from a successful exploitation of this vulnerability requires the product to be reset by cycling power to the chassis or removal and reinsertion of the module.</p> <p style="text-align: right;">Lgx00126652</p>

**Table 12 - Corrected Anomalies with Revision 6.004**

Revision	Description
6.004	<p><b>CORRECTED:</b> Added support for new MAC ID range.</p>

**Table 13 - Corrected Anomalies with Revision 6.002**

Revision	Description
6.002	<p><b>CORRECTED:</b> A backplane communication error may occur and trigger a complex sequence of events which can result in a 1756-L6X or 1756-L55 controller experiencing a major nonrecoverable fault, or cause other communications modules to assert. This anomaly can be triggered by using a 1756-ENBT module with unconnected message traffic in a system that does not include one or more of the following modules in the same chassis with the 1756-ENBT module:</p> <ul style="list-style-type: none"> <li>• 1756-EN2F</li> <li>• 1756-EN2T</li> <li>• 1756-EN2TR</li> <li>• 1756-EN3TR</li> <li>• 1756-EN2TXT</li> <li>• 1756-CN2/B</li> <li>• 1756-CN2R/B</li> <li>• 1756-CN2RXT</li> <li>• 1756-DNB/C</li> <li>• 1756-DNB/D</li> <li>• 1756-L7X</li> <li>• 1756-RM</li> </ul> <p>If you are experiencing controller faults or communications module asserts in your system, contact Rockwell Automation Technical Support for assistance.</p> <p style="text-align: right;">Lgx00094315</p>
	<p><b>CORRECTED:</b> Unused FTP capability was removed from the module.</p> <p style="text-align: right;">Lgx00119132</p>



**Table 14 - Corrected Anomalies with Revision 6.001**

Revision	Description
6.001	<b>CORRECTED:</b> Modifying the Host name field for the 1756-ENBT module causes messages to fail until the 1756-ENBT module is reset. Lgx00114900
	<b>CORRECTED:</b> Ethernet Master Library accepts an invalid Host ID. Lgx00110968
	<b>CORRECTED:</b> An exception error caused the module to fail. Lgx0011507
	<b>CORRECTED:</b> Rarely, and under specific circumstances, an ARP probe caused an IP address conflict. Lgx00048561

**Table 15 - Corrected Anomalies with Revision 4.008**

Revision	Description
4.008	<b>CORRECTED:</b> Unable to set module static IP address when gateway address is 0.0.0.0. Lgx00090840
	<b>CORRECTED:</b> 1756-ENBT module needed to be reset after a change to the gateway address. Lgx00087097
	<b>CORRECTED:</b> 1756-ENBT module accepted an invalid gateway address. Lgx00087096

**Table 16 - Corrected Anomalies with Revision 4.007**

Revision	Description
4.007	<p><b>CORRECTED:</b> When connecting to a device with a more rapid response time (for example, a computer or a 1756-EN2T module), the 1756-ENBT module's attempt to open the TCP connection may time out.</p> <p>The timeout occurs because the faster device has sent a reply to the 1756-ENBT module before the 1756-ENBT module socket is fully open and the module is unprepared to receive the reply. The 1756-ENBT module misses the reply and the TCP connection times out.</p> <p>Firmware revision 4.007 corrects this issue by preparing the 1756-ENBT module to receive the reply earlier.</p> <p style="text-align: right;">Lgx00079880</p>
	<p><b>CORRECTED:</b> Module asserts when several users access the module's website at a given time.</p> <p>Firmware revision 4.007 corrects this anomaly by making more memory available for the website to function properly when accessed by several users.</p> <p style="text-align: right;">Lgx00080499</p>
	<p><b>CORRECTED:</b> When the 1756-ENBT module's subnet mask is set to 000.000.000, the module is not recognized on the network.</p> <p>Firmware revision 4.007 corrects this issue by using a default subnet mask if 000.000.000 is entered.</p> <p style="text-align: right;">Lgx00078991</p>

**Table 17 - Corrected Anomalies with Revision 4.006**

Revision	Description
4.006	<p><b>CORRECTED:</b> In some applications, the data from the backplane that is multi-cast by the 1756-ENBT module is delayed. This delay results in the safety I/O connections being dropped by the controller.</p> <p style="text-align: right;">Lgx00074401</p>
	<p><b>CORRECTED:</b> When large numbers of safety I/O modules are used in an application, the 1756-ENBT module may halt communication and a STOP OS error is displayed on the module. This error occurs because the interrupt stack size is exceeded. Firmware revision 4.006 corrects this anomaly by increasing the interrupt stack size.</p> <p style="text-align: right;">Lgx00075528</p>

**Table 18 - Corrected Anomalies with Revision 4.003**

Revision	Description
4.003	<p><b>CORRECTED:</b> Sometimes you would not get a reply when you pinged a 1756-ENBT module.</p> <p style="text-align: right;">Lgx00062979</p>

**Table 19 - Corrected Anomalies with Revision 3.008**

Revision	Description
3.008	<p><b>CORRECTED:</b> Module appears to lock up during powerup from short-duration power cycles. The module status indicator is solid green and all other status indicators are off. No communication is possible from the Ethernet port or from the backplane. The display hangs with PASS.</p> <p><b>CORRECTED:</b></p> <ul style="list-style-type: none"> <li>• When a poorly-formed Class 3 message is received on the backplane or over an Ethernet network, the module may appear to lock up.</li> <li>• Bad UDP checksum would be created when the UDP do-not-fragment bit is set. This bit is used only when you write a custom EtherNet/IP driver.</li> <li>• When processing an open message that is not correctly sized, the module could lock up. The firmware now verifies the size of a forward open message and processes it without system lock up.</li> </ul>

**Table 20 - Corrected Anomalies with Revision 3.004**

Revision	Description
3.004	<p><b>CORRECTED:</b> A secondary chassis synchronized even if a module was not connected to the EtherNet/IP network.</p> <p><b>CORRECTED:</b> Module erroneously reported a duplicate IP address under these conditions:</p> <ul style="list-style-type: none"> <li>• High HMI traffic</li> <li>• Secondary chassis was powering up (depended on your configuration)</li> </ul>

**Table 21 - Corrected Anomalies with Revision 3.003**

Revision	Description
3.003	<p><b>CORRECTED:</b> When DNS services are used with firmware revision 3.2, the module may lock up.</p>

### Table 22 - Corrected Anomalies with Revision 2.004

Revision	Description
2.004	<b>CORRECTED:</b> When multiple controllers own a remote 1756-ENBT rack that uses rack optimization, inputs from that remote rack may not update in the controller tag databases. No errors would be reported by the controllers.
	<b>CORRECTED:</b> When using RSLinx software version 2.4x.x in certain conditions, an unusually high volume of messages appears to be processed by the 1756-ENBT module. The module may appear to be locked up due to high volume; however, it is really overloaded. The temporary workaround is to remove the Ethernet connector.

### Table 23 - Corrected Anomalies with Revision 2.003

Revision	Description
2.003	<b>CORRECTED:</b> Erroneous generation of UDP checksum.
	<b>CORRECTED:</b> A module-in-use error is falsely reported when the product is running near capacity.

## Application Notes

The following notes may apply to your application and use of the 1756-ENBT module.

### Ethernet Switch Port Configuration

The 1756-ENBT module supports the following Ethernet network settings:

- 10 M half-duplex
- 10 M full-duplex
- 100 M half-duplex
- 100 M full-duplex

Depending on the module and firmware revision, different port configurations are required.

#### *Modules with Firmware Revision 1.40 or Earlier*

Mode selection is done automatically based on the IEEE 802.3u autonegotiation protocol. If a module is connected to a port on a 10/100 M switch, you must set this port to autonegotiate.

If this port is set manually to one of the modes listed in the section [Ethernet Switch Port Configuration on page 13](#), a mismatch between module and switch modes of operation may occur. This will result in significant reduction of system performance.

#### *Modules with Firmware Revision 1.61 or Later*

Starting with version 12.00.00 of RSLogix 5000 software, you can manually configure the communication rate and duplex of the 1756-ENBT module. Additionally, you can manually configure the communication rate and duplex on both the 1756-ENBT module and the switch port that is connected to the module. However, the configurations must match on both devices.

### **Changing Ports on an Ethernet Switch - autonegotiation setting only**

If you change the connection of the module from one port to another port, whether the new port is on the same or a different switch (or a hub), do the following.

1. Disconnect the cable from the port to which the module is currently connected.
2. Wait until the module Link Status indicator is off.
3. Connect the cable to the new port.

This procedure will restart the autonegotiation process at the module side. Another option is to restart the module itself.

### **Changing the Subnet Mask**

After setting or changing the subnet mask on an already configured 1756-ENBT module, you must cycle power on the module for the subnet mask to take effect.

### **Diagnostic Counters**

RSLogix 5000 software and RSLinx software display many diagnostic counters for the 1756-ENBT module. However, some of these fields are not supported by the module. The fields that are not supported are permanently displayed as 0.

## Internet Group Management Protocol (IGMP) Support

The 1756-ENBT module supports the following versions of IGMP:

- Version 1.0 (firmware revision 2.4 and earlier)
- Version 2.0 (firmware revision 3.2 and later)

## Performance Considerations

- In general, the 1756-ENBT module is capable of supporting 5000 packets/second. However, it is possible in some applications, depending on the combination of connection count, RPI settings, and communication formats, that the product may be able to achieve only 4000 packets/second.
- When performing both implicit and explicit communication in an EtherNet/IP system by using the 1756-ENBT module, communication, such as that for HMI, may slow I/O communication performance in applications with high node count (64 and above). Adjust RPI values or use additional 1756-ENBT modules to achieve desired performance in the system.

## Additional Resources

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

Resource	Description
EtherNet/IP Modules in Logix5000™ Control Systems User Manual, publication <a href="#">ENET-UM001</a>	Provides information about using all types of EtherNet/IP modules in a ControlLogix system.
ControlLogix Redundancy System User Manual, publication <a href="#">1756-UM523</a>	Provides information about redundancy in the ControlLogix system, including a section about using EtherNet/IP modules.
ControlLogix EtherNet/IP Bridge Module Installation Instructions, publication <a href="#">1756-IN019</a>	Provides information about installation procedures and product specifications.
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.

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