ControlLogix EtherNet/IP Network Devices

Catalog Numbers 1756-EN2F, 1756-EN2T, 1756-EN2TP, 1756-EN2TPK, 1756-EN2TPXT, 1756-EN2TR, 1756-EN2TRK, 1756-EN2TRXT, 1756-EN2TXT, 1756-EN3TR, 1756-EN3TRK, 1756-EN4TR, 1756-EN4TRK, 1756-ENBT, 1756-EWEB

Allen-Bradley
by ROCKWELL AUTOMATION

User Manual

Original Instructions

Important User Information

Read this document and the documents listed in the additional resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

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

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

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Throughout this manual, when necessary, we use notes to make you aware of safety considerations.

WARNING: Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.

ATTENTION: Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard, and recognize the consequence.

IMPORTANT Identifies information that is critical for successful application and understanding of the product.

Labels may also be on or inside the equipment to provide specific precautions.

SHOCK HAZARD: Labels may be on or inside the equipment, for example, a drive or motor, to alert people that dangerous voltage may be present.

BURN HAZARD: Labels may be on or inside the equipment, for example, a drive or motor, to alert people that surfaces may reach dangerous temperatures.

ARC FLASH HAZARD: Labels may be on or inside the equipment, for example, a motor control center, to alert people to potential Arc Flash. Arc Flash will cause severe injury or death. Wear proper Personal Protective Equipment (PPE). Follow ALL Regulatory requirements for safe work practices and for Personal Protective Equipment (PPE).

ControlLogix Network Device Status Indicators

Appendix A

About This Publication

This manual describes how you can use ControlLogix® EtherNet/IP™ communication modules with a Logix 5000™ controller and communicate with various devices on the Ethernet/IP network.

Use this manual if you program applications that use EtherNet/IP networks with these Logix 5000 controllers:

- CompactLogix™ controller
- ControlLogix controller

Conventions

Be sure to understand these concepts and tools:

- FactoryTalk® Linx
- Logix Designer
- ControlFLASH Plus™
- HMIs
- SNMP tools

Download Firmware, AOP, EDS, and Other Files

Download firmware, associated files (such as AOP, EDS, and DTM), and access product release notes from the Product Compatibility and Download Center at rok.auto/pcdc.

Summary of Changes

This manual was revised to add or update the information that is listed in this table.

Topic	Page
ControlLogix EtherNet/IP Specifications	10
Simple Network Management Protocol	13
How to Determine if the Module is in Explicit Protected Mode	19
Redundant PRP Architecture with Redbox Switches	43
Diagnostic Web Pages	50

Additional Resources

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

Resource	Description
1756 EtherNet/IP Communication Modules Installation Instructions, publication 1756-IN050	Provides information on installing EtherNet/IP™ modules.
1756 ControlLogix Communication Modules Specifications, publication 1756-TD003	Specifications for ControlLogix communication modules.
ControlLogix Redundancy User Manual, publication 1756-UM535	Provides information specific to redundancy systems.
Deploying Device Level Ring within a Converged Plantwide Ethernet Architecture Design and Implementation Guide, publication ENET-TD015	Highlights the key IACS application requirements, technology, and supporting design considerations to help with the successful design and deployment of these specific use cases within the CPwE framework.
Ethernet Design Considerations Reference Manual, publication ENET-RM002	Provides details about how to use EtherNet/IP communication modules with Logix 5000 controllers and communicate with other devices on the EtherNet/IP network.
EtherNet/IP Device Level Ring Application Technique, publication ENET-AT007	Describes DLR network operation, topologies, configuration considerations, and diagnostic methods.
EtherNet/IP Media Planning and Installation Manual This manual is available from the Open DeviceNet® Vendor Association (ODVA) at: http://www.odva.org.	Provides details about how to install, configure, and maintain linear and Device Level Ring (DLR) networks by using Rockwell Automation EtherNet/IP devices that are equipped with embedded switch technology.
EtherNet/IP Network Devices User Manual, publication ENET-UM006	Describes how to use EtherNet/IP communication modules in Logix 5000 control systems.
EtherNet/IP Parallel Redundancy Protocol Application Technique, publication ENET-AT006	Describes how you can configure a Parallel Redundancy Protocol (PRP) network with a compatible device or switch.
EtherNet/IP Socket Interface Application Technique, publication ENET-AT002	Describes the socket interface that you can use to program MSG instructions to communicate between a Logix5000 controller via an EtherNet/IP module and Ethernet devices that do not support the EtherNet/IP application protocol, such as bar code scanners, RFID readers, or other standard Ethernet devices.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, rok.auto/certifications.	Provides declarations of conformity, certificates, and other certification details.
Troubleshoot EtherNet/IP Networks Application Technique, publication ENET-AT003	Provides details about how to assign IP addresses to and how to troubleshoot EtherNet/IP networks and devices.

You can view or download publications at https://www.rockwellautomation.com/global/literature-library/overview.page. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

ControlLogix EtherNet/IP Network Device Overview

Overview

EtherNet/IP™ networks are communication networks that offer a comprehensive suite of messages and services for many automation applications.

This open network standard uses commonly available Ethernet communication products to support real-time I/O messaging, information exchange, and general messaging.

ControlLogix Network Device Features

The ControlLogix® EtherNet/IP network devices:

- Facilitate high-speed data transfer between Logix 5000™ controllers and remote I/O modules.
- Connect to multiple EtherNet/IP network topologies.

Figure 1 shows how Rockwell Automation EtherNet/IP communication modules fit into a control system.

Figure 1 - EtherNet/IP Communication Modules in a Control System

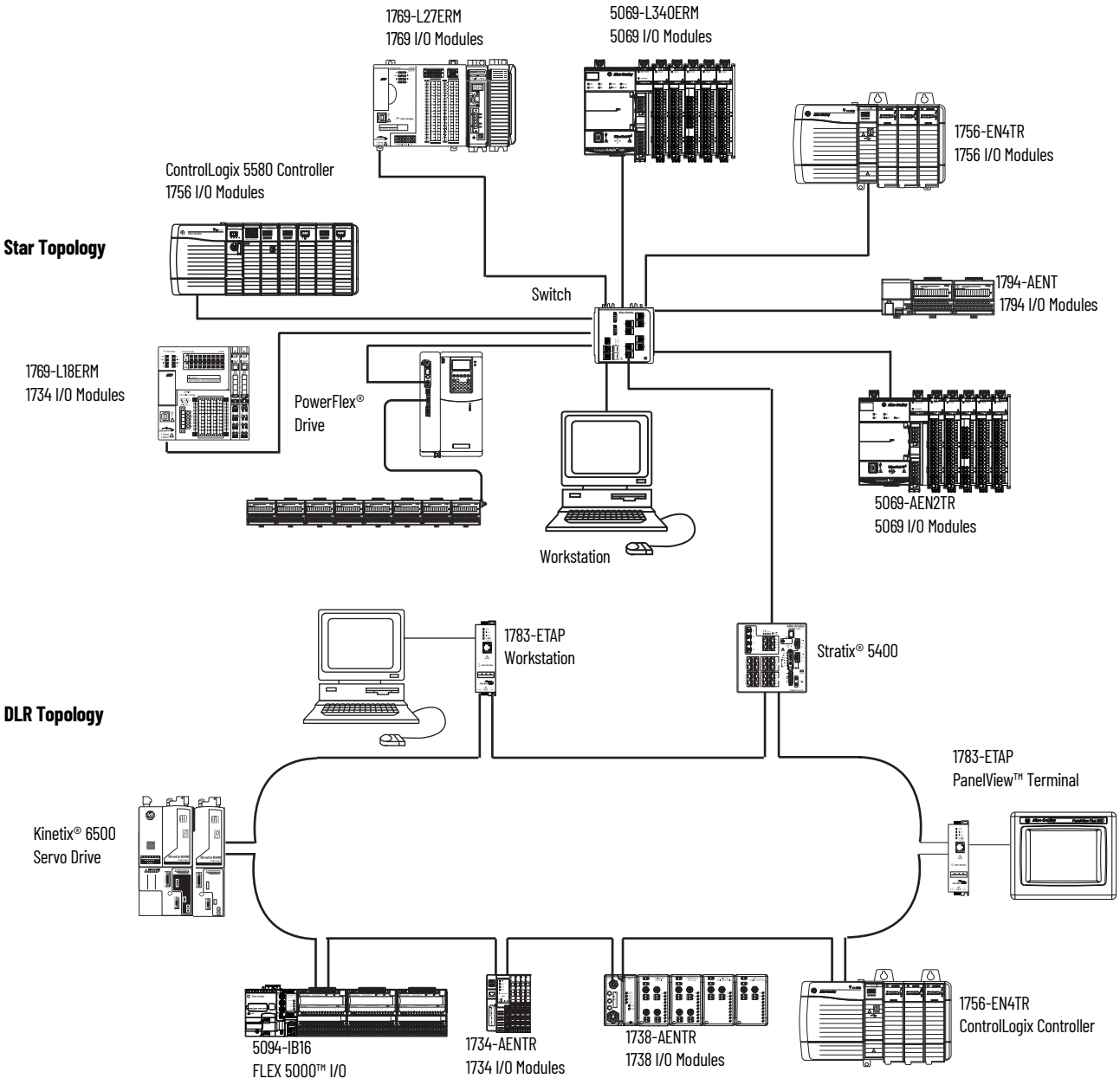


Table 1 - EtherNet/IP Communication Modules

Cat. No.[1]	Description	Media	Communication Rate	Integrated Motion on the EtherNet/IP Network Axes, Max
1756-EN2F	EtherNet/IP bridge, fiber	Fiber	10/100 Mbps	8
1756-EN2T 1756-EN2TK	EtherNet/IP bridge, copper	Copper	10/100 Mbps	8
1756-EN2TP, 1756-EN2TPK	EtherNet/IP bridge, PRP support, copper	Copper	10/100 Mbps	8
1756-EN2TPXT	ControlLogix-XT, extended temperature EtherNet/IP bridge, PRP support	Copper	10/100 Mbps	8
1756-EN2TR, 1756-EN2TRK	EtherNet/IP bridge, embedded switch, copper	Dual copper	10/100 Mbps	8
1756-EN2TXT	ControlLogix-XT™, extended temperature EtherNet/IP bridge, copper, for extreme environments	Copper	10/100 Mbps	8
1756-EN2TRXT	ControlLogix-XT, extended temperature EtherNet/IP bridge, embedded switch, copper	Dual copper	10/100 Mbps	8
1756-EN3TR, 1756-EN3TRK	EtherNet/IP bridge, embedded switch, copper	Dual copper	10/100 Mbps	128
1756-EN4TR, 1756-EN4TRK	EtherNet/IP bridge, embedded switch, copper	Copper	10/100 Mbps 1 Gbps	256
1756-EN4TRXT	ControlLogix-XT, extended temperature EtherNet/IP bridge, embedded switch, copper	Copper	10/100 Mbps 1 Gbps	256
1756-ENBT, 1756-ENBTK	EtherNet/IP bridge, copper	Copper	10/100 Mbps	–
1756-EWEB	Ethernet web server module	Copper	10/100 Mbps	–

(1) A catalog number ending in a K denotes a conformal coating.

EtherNet/IP Network Specifications

Table 2 - ControlLogix EtherNet/IP Connections Specifications[1]

Cat. No.	Connections		CIP Unconnected Messages (backplane + Ethernet)
	TCP	CIP[2]	
1756-ENBT	64	128	64 + 64
1756-EN2F	128	256	128 + 128
1756-EN2T	128	256	128 + 128
1756-EN2TP	128	256	128 + 128
1756-EN2TR	128	256	128 + 128
1756-EN3TR	128	256	128 + 128
1756-EN4TR	512	1000 I/O 528 [3]	256+256
1756-EWEB	64	128	128 + 128

(1) Includes the K conformal coating catalog numbers and the XT extreme environment catalog numbers.

(2) CIP™ connections can be used for all explicit or all implicit applications. For example, a 1756-ENBT module has a total of 128 CIP connections that can be used for any combination of connections.

(3) There are 1000 I/O connections and 528 messaging/HMI connections.

Table 3 - ControlLogix EtherNet/IP Data Specifications[1]

Cat. No.	Produced/Consumed Tags		Socket Services	Duplicate IP Detection (starting revision)
	Number of Multicast Tags, Max[2]	Unicast Available in RSLogix 5000 Software		
1756-EN2F	32	Version 16.03.00 or later	Yes	All Revisions
1756-EN2T		Version 16.03.00 or later	Yes	
1756-EN2TP		Version 24.00.00 or later	Yes	
1756-EN2TR		Version 17.01.02 or later	Yes	
1756-EN3TR		Version 18.02.00 or later	Yes	
1756-EN4TR		Version 24.00.00 or later	Yes	
1756-ENBT		Version 16.03.00 or later	No	Revision 3.3
1756-EWEB	N/A		Yes	Revision 2.2

(1) Includes the K conformal coating catalog numbers and the XT extreme environment catalog numbers.

(2) Each controller can send a maximum of 32 multicast produced tags to one single consuming controller. If these same tags are sent to multiple consumers, the maximum number is 31.

Table 4 - ControlLogix EtherNet/IP Specifications[1]

Cat. No.	Firmware Revision	RSLogix 5000 Software Version	RSLinx Software Version	Packet Rate Capacity (packets/second)[2]		Support for Extended Environment[3]	Integrated Motion on the EtherNet/IP Network Axes
				I/O	HMI/MSG		
1756-ENBT	Any	8.02.00 or later	2.30 or later	5000	900	No	N/A
1756-EN2F	2.x	15.02.00 or later	2.51 or later	10,000	2000	No	N/A
	3.6 or later	18.02.00 or later[4]		25,000[5]			Up to 8 axes supported[5]
1756-EN2T	2.x or earlier	15.02.00 or later	2.51 or later	10,000	2000	No	N/A
	3.6 or later	18.02.00 or later[4]		25,000[5]			Up to 8 axes supported[5]
1756-EN2TXT	2.x	15.02.00 or later	2.51 or later	10,000	2000	Yes	N/A
	3.6 or later	18.02.00 or later[4]		25,000[5]			Up to 8 axes supported[5]
1756-EN2TP	Any	24.00.00 or later[4]	4.10 or later	25,000[5]	2000	No	Up to 8 axes supported[5]
1756-EN2TPXT	10.x or later	24.00.00 or later	4.10 or later	25,000[5]	2000	Yes	Up to 8 axes supported[5]
1756-EN2TR	2.x	17.01.02 or later	2.55 or later	10,000	2000	No	N/A
	5.x or later	18.02.00 or later[4]	2.56 or later	25,000[5]			Up to 8 axes supported[5]
1756-EN2TRXT	5.028 or later	20.01.00 or later	2.56 or later	25,000[5]	2000	Yes	Up to 8 axes supported[5]

Table 4 - ControlLogix EtherNet/IP Specifications[1]

Cat. No.	Firmware Revision	RSLogix 5000 Software Version	RSLinx Software Version	Packet Rate Capacity (packets/second)[2]		Support for Extended Environment[3]	Integrated Motion on the EtherNet/IP Network Axes
				I/O	HMI/MSG		
1756-EN3TR	3.6 or later	18.02.00 or later[4]	2.56 or later	25,000[5]	2000	No	Up to 128 axes supported[5]
1756-EN4TR	Any	24.00.00 or later[6]	4.10 or later	• 50,000 without CIP Security • 25,000 with integrity • 15,000 with integrity and confidentiality	• 3,700 without CIP Security • 2,700 with integrity • 1,700 with integrity and confidentiality	No	Up to 256 axes supported[5]
1756-EN4TRXT	Any	24.00.00 or later[6]	4.10 or later	• 50,000 without CIP Security • 25,000 with integrity • 15,000 with integrity and confidentiality	• 3,700 without CIP Security • 2,700 with integrity • 1,700 with integrity and confidentiality	Yes	Up to 256 axes supported[5]

(1) Includes the K conformal coating catalog numbers.

(2) I/O numbers are maximums; they assume no HMI/MSG. HMI/MSG numbers are maximums, they assume no I/O. Packet rates vary depending on packet size. For more details, see Troubleshoot EtherNet/IP Application Technique, publication ENET-AT003, and the EDS file for a specific catalog number.

(3) Module operates in a broad temperature spectrum, -20…70 ºC (-4…158 ºF), and meets ANSI/ISA-S71.04-1985 Class G1, G2 and G3, as well as cULus, Class 1 Div 2, C-Tick, CE, ATEX Zone 2 and SIL 2 requirements for increased protection against salts, corrosives, moisture/condensation, humidity, and fungal growth.

(4) This version is required to use CIP Sync™ technology, Integrated Motion on the EtherNet/IP Network, or Exact Match keying.

(5) This value assumes the use of a1756-L8x or a 1756-L7x ControlLogix controller. For a 1756-L6x ControlLogix controller, see ControlLogix Controllers User Manual, publication 1756-UM001.

(6) CIP Security requires FactoryTalk Linx version 6.11.00 or later.

EtherNet/IP Network

The Ethernet Industrial (EtherNet/IP) network protocol is an open industrial-networking standard that supports both real-time I/O messaging and message exchange. The EtherNet/IP network uses
off-the-shelf Ethernet communication chips and physical media.

If you need to	Select this interface
Control I/O modules and drives Act as an adapter for I/O on remote EtherNet/IP links Communicate with other EtherNet/IP devices (messages and HMI) Bridge EtherNet/IP links to route messages to devices on other networks	1756-EN2F, 1756-EN2FK 1756-EN2T, 1756-EN2TK, 1756-EN2TXT 1756-EN2TP, 1756-EN2TPK, 1756-EN2TPXT 1756-EN2TR, 1756-EN2TRK, 1756-EN2TRXT 1756-EN4TR, 1756-EN4TRK, 1756-EN4TRXT 1756-ENBT, 1756-ENBTK
Support device level ring (DLR) and linear topologies	1756-EN2TR, 1756-EN2TRK, 1756-EN2TRXT 1756-EN3TR, 1756-EN3TRK 1756-EN4TR, 1756-EN4TRK, 1756-EN4TRXT
Support for Parallel Redundancy Protocol	1756-EN2TP, 1756-EN2TPK 1756-EN2TPXT
Support for Redundant Adapters(1)	1756-EN4TR, 1756-EN4TRK, 1756-EN4TRXT
Provide control in environments where temperatures range from -25…70 °C (-13…158 °F)	1756-EN2TPXT 1756-EN2TRXT 1756-EN2TXT 1756-EN4TRXT
Secure access to a control system from within the plant network	1756-EN4TR, 1756-EN4TRK, 1756-EN4TRXT
Use an Internet browser to remotely access tags in a ControlLogix controller Communicate with other EtherNet/IP or generic Ethernet devices (messaging only; no I/O control) Bridge EtherNet/IP links to route messages to devices on other networks	1756-EWEB, 1756-EWEBK web server

(1) Redundant Adapters require version 3.001 and higher firmware. See the Product Compatibility and Download Center (PCDC) for that firmware.

Simple Network Management Protocol

SNMP enables the device to be remotely managed through other network management software. SNMP defines the method of communication among the devices and also denotes a manager for the monitoring and supervision of the devices. For more information about SNMP, see the Ethernet Reference Manual, publication ENET-RM002.

Cat. No.	Default Status	Ability to Disable SNMP
1756-EN2F	On	No
1756-EN2T		
1756-EN2TP		
1756-EN2TR		
1756-EN3TR		
1756-EN4TR	Off	Yes

SNMP Passwords for these modules can be changed. For information on how to change the SNMP Password, see SNMP Password and MIB Configuration, Technote 34413.

Enable SNMP

To enable SNMP, follow the configuration in Figure 2 and Figure 3.

Figure 2 - Message Configuration On

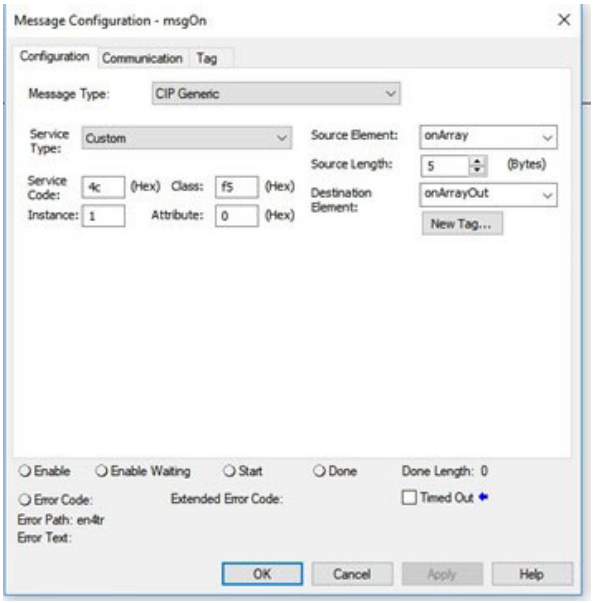
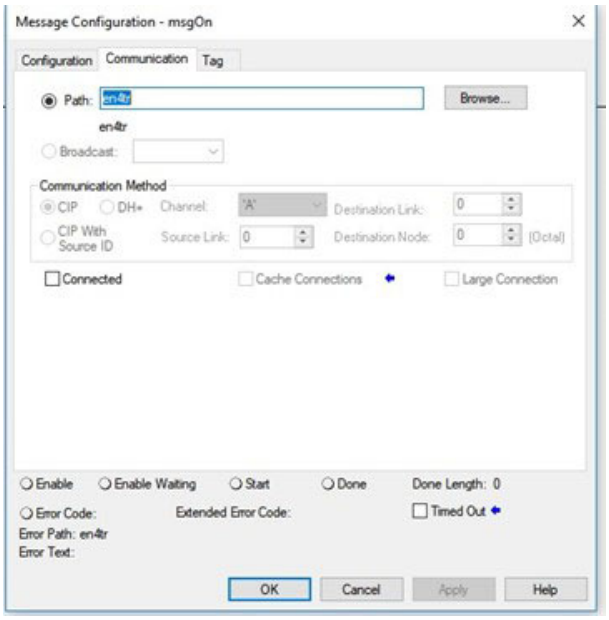


Figure 3 - Message Communication Off



The content of onArray must match Figure 4.

Figure 4 - onArray

onArray	{...}	{...}	Decimal	USINT[5]
onArray[0]	1		Decimal	USINT
onArray[1]	161		Decimal	USINT
onArray[2]	0		Decimal	USINT
onArray[3]	17		Decimal	USINT
onArray[4]	1		Decimal	USINT

Disable SNMP

To disable SNMP, follow the configuration in Figure 5 and Figure 6.

Figure 5 - Message Configuration Off

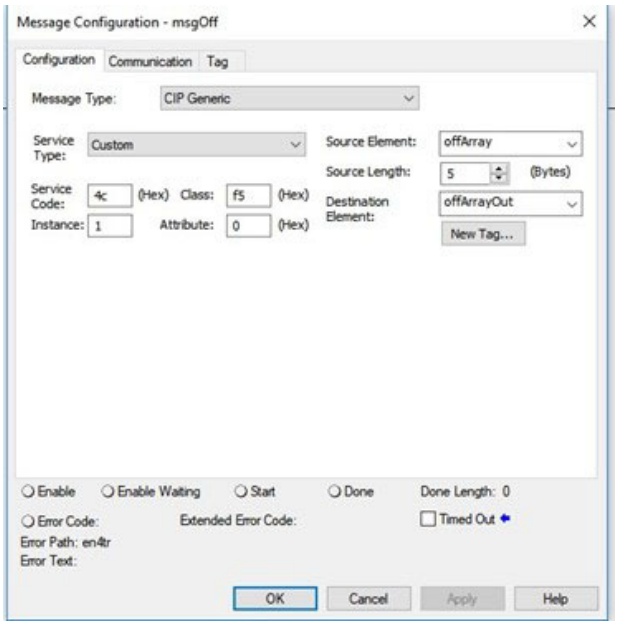
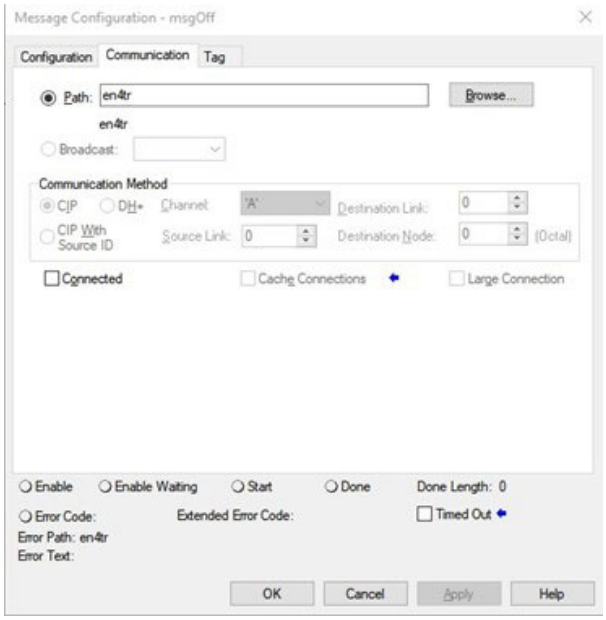


Figure 6 - Message Communication Off



The content of onArray must match Figure 7.

Figure 7 - offArray

offArray	{...}	{...}	Decimal	USINT[5]
offArray[0]	1		Decimal	USINT
offArray[1]	161		Decimal	USINT
offArray[2]	0		Decimal	USINT
offArray[3]	17		Decimal	USINT
offArray[4]	0		Decimal	USINT

There are two additional tables to store result of IANA port administrator state change operation.

Figure 8 - onArrayOut

onArrayOut	{...}	{...}	Decimal	USINT[10]
offArrayOut	{...}	{...}	Decimal	USINT[10]

Electronic Keying

Electronic Keying reduces the possibility that you use the wrong device in a control system. It compares the device that is defined in your project to the installed device. If keying fails, a fault occurs. These attributes are compared in the following table.

Attribute	Description
Vendor	The device manufacturer.
Device Type	The general type of the product, for example, digital I/O module.
Product Code	The specific type of the product. The Product Code maps to a catalog number.
Major Revision	A number that represents the functional capabilities of a device.
Minor Revision	A number that represents behavior changes in the device.

The following Electronic Keying options are available.

Keying Option	Description
Compatible Module	Lets the installed device accept the key of the device that is defined in the project when the installed device can emulate the defined device. With Compatible Module, you can typically replace a device with another device that has the following characteristics: • Same catalog number • Same or higher Major Revision • Minor Revision as follows: – If the Major Revision is the same, the Minor Revision must be the same or higher. – If the Major Revision is higher, the Minor Revision can be any number.
Disable Keying	Indicates that the keying attributes are not considered when attempting to communicate with a device. With Disable Keying, communication can occur with a device other than the type specified in the project. **ATTENTION**: Be cautious when using Disable Keying; if used incorrectly, this option can lead to personal injury or death, property damage, or economic loss. We strongly recommend that you do not use Disable Keying. If you use Disable Keying, you must take full responsibility for understanding whether the device being used can fulfill the functional requirements of the application.
Exact Match	Indicates that all keying attributes must match to establish communication. If any attribute does not match precisely, communication with the device does not occur.

Carefully consider the implications of each keying option when selecting one.

IMPORTANT Changing Electronic Keying parameters online interrupts connections to the device and any devices that are connected through the device. Connections from other controllers can also be broken.

If an I/O connection to a device is interrupted, the result can be a loss of data.

For more detailed information on Electronic Keying, see Electronic Keying in Logix 5000 Control Systems Application Technique, publication LOGIX-AT001.

Protected Mode

The 1756-EN2F, 1756-EN2T, 1756-EN2TP, 1756-EN2TR, 1756-EN3TR, and 1756-EN4TR support explicit protected mode.(1) When in this mode, the module does not allow any configuration changes.

Enabling Explicit Protected Mode

To enable the module in an “explicit protected mode state”, follow these steps.

1. Set the rotary switches to position ‘900’.
2. Power up the device, and wait for the display to scroll, “Protected Mode – Change Switch Settings”.
3. Power down the device.
4. Set the switches for normal operation.
5. Power up the device.
6. The device is now in Explicit Protected Mode.

Operation in Explicit Protected Mode

While working in protected mode, the module rejects any CIP™ explicit messages that would change the configuration of the module. For example, you cannot change the IP address, speed, or duplex settings when the module had Explicit Protected Mode enabled.

Disabling Explicit Protected Mode

To disable the “explicit protected mode state”, follow these steps.

1. Set the rotary switches on position ‘000’.
2. Power up the device, and wait for the display to scroll, “Unprotected Mode – Change Switch Settings”.
3. Power down the device.
4. Set the switches for normal operation.
5. Power up the device.
6. The device is now in Unprotected Mode.

(1) For 1756-EN2F, 1756-EN2T, EN3TR, and 1756-EN2TR Versions 11.001 and later.
For 1756-EN2TP and 1756-EN4TR all versions.

Protected Mode in a Redundant Adapter Pair

The 1756-EN4TR supports explicit protected mode in a redundant adapter pair. In this mode, the module does not allow any configuration changes.

Enabling Explicit Protected Mode in a Redundant Adapter Pair (RAP)

To enable the module in an “explicit protected mode state in RAP”, follow these steps.

1. Put your system in a qualified state.
2. Remove the secondary device from the chassis, put it in explicit mode using the methods found on page 17, and insert module back into the chassis.

   The system is qualified with the message “Explicit Protected Mode Mismatch” on the module display.
3. Force a switchover either using AOP service or disconnect the cable.
4. Remove secondary (previous primary) device, put it in explicit mode and insert module back.

   The system has enabled explicit protected mode.

Disabling Explicit Protected Mode in a Redundant Adapter Pair

To disable the module in an “explicit protected mode state in RAP”, follow these steps.

1. Put your system in a qualified state.
2. Remove the secondary device from the chassis, put it in non-protected mode using the methods found on page 17, and insert module back into the chassis.

   The system is qualified with the message “Explicit Protected Mode Mismatch” on the module display.
3. Force a switchover either using AOP service or disconnect the cable.
4. Remove secondary (previous primary) device, put it in non-protected mode and insert module back.

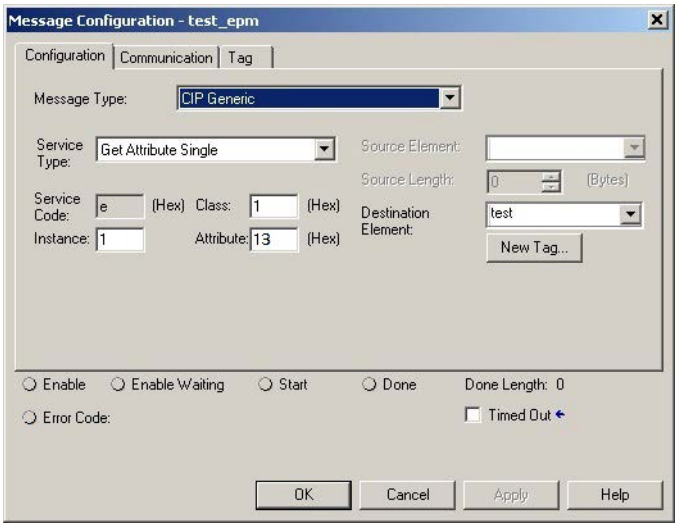
   The system has disabled explicit protected mode.

How to Determine if the Module is in Explicit Protected Mode

To determine if your module is in explicit protected mode, either view the AOP Module information page, or create a Generic CIP message. Set the following parameters:

- Service Type: Get Single Attribute
- Class = 1
- Instance = 1
- Attribute = 13(Hex)

The Destination Element Tag must be the INT type. Bit 3 is explicit protected mode and a value of 1 indicates that protected mode is enabled.

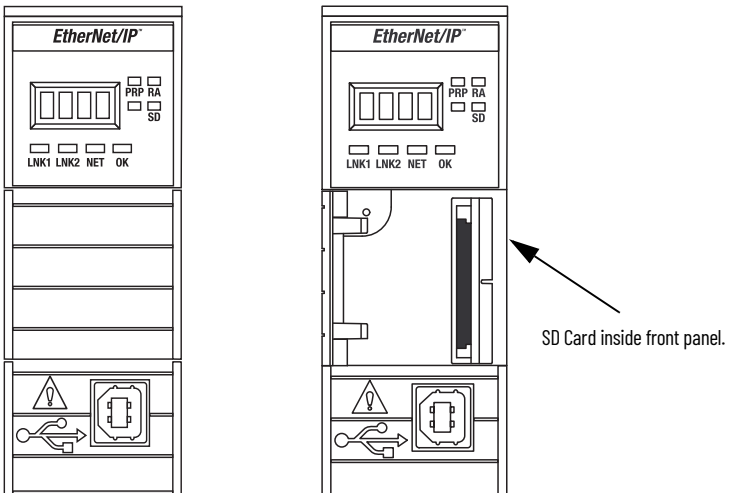


Secure Digital Card

Secure Digital Card

The 1756-EN4TR supports the use of a Secure Digital (SD) card to store configuration data, for example, the IP address or network communication rate for each port.

The SD card slot is inside the front panel of the module.



When the card is powered up, the device uses the configuration from the card if the configuration does not exist in the device. When a blank card is inserted, or powered up, the configuration is copied from the device to the card that was inserted.

If the module powers up with a configuration that does not match the configuration on the already inserted SD card, the configuration on the SD card is used.

If the module is already powered, and an SD card is inserted, a warning message is displayed.

To see other potential error messages, see Table 8 on page 49.

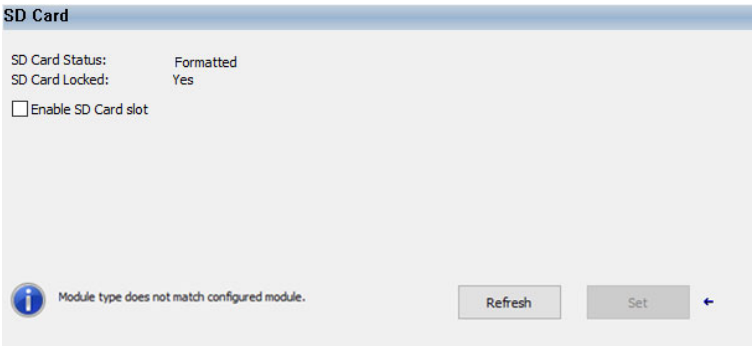
To change these results, do one of two things. One option is to do an out of box reset on the module, if you want to use the configuration on the SD card. A second option is to modify one of the configuration settings on the device, if you want to use the configuration on the device.

IMPORTANT If an SD card with a valid configuration is inserted into a 1756-EN4TR module that does not match, an error is displayed on the status display on the front of the module warning of this mis-configuration. If the SD card is intended to be used in the 1756-EN4TR module it must be cleared by external means and re-inserted. If this is not done prior to the next power cycle of the 1756-EN4TR with the non-matching configuration, this configuration is copied to the 1756-EN4TR with all settings including the IP Address from the original module possibly causing an IP Address conflict.

Enable/Disable Secure Digital Card

To enable or disable the SD card, use one of the following methods.

- Using CIP Message Set Attribute Single:
  - Class 3A4(hex), Instance 1, Attribute 4, 1-Byte
  - To Enable set source tag to 0
  - To Disable set source tag value to 1
- Enable/Disable using the Add-on Profile.



The 1756-EN4TR supports the use of a 1784-SD1 (1 GB) and 1784-SD2 (2 GB) card. You can use third-party SD cards with the device. You can use SD cards with as much as 32 GB of memory.

IMPORTANT Rockwell Automation does not test the use of third-party SD cards with the device.

If you use an SD card other than those cards that are available from Rockwell Automation, unexpected results can occur. For example, you can experience data corruption or data loss.

SD cards that are not provided by Rockwell Automation can have different industrial, environmental, and certification ratings as those cards that are available from Rockwell Automation. These cards can have difficulty with survival in the same industrial environments as the industrially rated versions available from Rockwell Automation.

CIP Security

CIP Security™ is a standard, open communication mechanism that helps to provide a secure data transport across an EtherNet/IP™ network. It lets CIP-connected devices authenticate each other before transmitting and receiving data.

CIP Security uses the following security properties to help devices protect themselves from malicious communication:

- Device Identity and Authentication
- Data Integrity and Authentication
- Data Confidentiality

Rockwell Automation uses the following products to implement CIP Security:

- FactoryTalk® Services Platform, version 6.11 or later, with the following components enabled:
  - FactoryTalk Policy Manager
  - FactoryTalk System Services
- FactoryTalk Linx, version 6.11 or later
- Studio 5000® Design Environment, version 32.00.00 or later
- CIP Security-enabled Rockwell Automation® products, for example, the product described in this publication

For more information on CIP Security, including which products support CIP Security, see the CIP Security with Rockwell Automation Products Application Technique, publication SECURE-AT001.

IMPORTANT	CIP Security is supported with the 1756-EN4TR, however, it is not yet supported when the 1756-EN4TR is in redundant adapter mode. If an 1756-EN4TR is installed and using CIP Security, and it is reconfigured to be part of a redundant adapter pair, the module will lose its CIP Security configuration. When this occurs, the I/O chassis will lose communication with the controller. At this point, the CIP Security policy must be redeployed.(1)

(1) CIP Security is not supported in redundant adapters. See Chapter 3 on page 29.

Parallel Redundancy Protocol

Parallel Redundancy Protocol (PRP) is defined in international standard IEC 62439-3 and provides high-availability in Ethernet networks. PRP technology creates seamless redundancy by sending duplicate frames to two independent network infrastructures, which are known as LAN A and LAN B.

A PRP network includes the following components.

Component	Description
LAN A and LAN B	Redundant, active Ethernet networks that operate in parallel.
Double attached node (DAN)	An end device with PRP technology that connects to both LAN A and LAN B.
Single attached node (SAN)	An end device without PRP technology that connects to either LAN A or LAN B. A SAN does not have PRP redundancy.
Redundancy box (RedBox)	A switch with PRP technology that connects devices without PRP technology to both LAN A and LAN B.
Virtual double attached node (VDAN)	An end device without PRP technology that connects to both LAN A and LAN B through a RedBox. A VDAN has PRP redundancy and appears to other nodes in the network as a DAN.
Infrastructure switch	A switch that connects to either LAN A or LAN B and is not configured as a RedBox.

For more information about PRP, see the EtherNet/IP Parallel Redundancy Protocol Application Technique, publication ENET-AT006.

Device Level Ring (DLR)

Device Level Ring (DLR) is an EtherNet/IP protocol defined by the Open DeviceNet Vendors' Association (ODVA). DLR provides a means to detect, manage, and recover from single faults in a ring-based network.

A DLR network includes the following types of ring nodes.

Node	Description
Ring supervisor	A ring supervisor provides these functions: Manages traffic on the DLR network Collects diagnostic information for the network A DLR network requires at least one node to be configured as ring supervisor. By default, the supervisor function is disabled on supervisor-capable devices.
Ring participants	Ring participants provide these functions: Process data that is transmitted over the network. Pass on the data to the next node on the network. Report fault locations to the active ring supervisor. When a fault occurs on the DLR network, ring participants reconfigure themselves and relearn the network topology.
Redundant gateways (optional)	Redundant gateways are multiple switches connected to a single DLR network and also connected together through the rest of the network. Redundant gateways provide DLR network resiliency to the rest of the network.

Depending on their firmware capabilities, both devices and switches can operate as supervisors or ring nodes on a DLR network. Only switches can operate as redundant gateways.

For more information about DLR, see the EtherNet/IP Device Level Ring Application Technique, publication ENET-AT007.

Notes:

Connect to the EtherNet/IP Network

EtherNet/IP™ networks are communication networks that offer a comprehensive suite of messages and services for many automation applications.

The following are examples of applications that use EtherNet/IP networks:

- Real-Time Control
- Time Synchronization
- Motion

This open network standard uses commonly available Ethernet communication products to support real-time I/O messaging, information exchange, and general messaging.

EtherNet/IP networks also support CIP Safety™, which makes the simultaneous transmission of safety and standard control data and diagnostics information over a common network possible.

Set the IP Address

The following conditions are required to set the IP address.

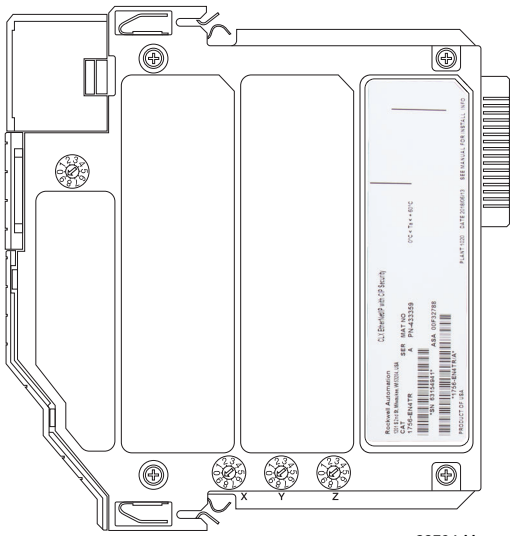
Requirements

To set the IP address, have the following:

- EtherNet/IP or USB drivers that are installed on the programming workstation
- MAC ID from the device, which is on the label on the side of the device
- Recommended IP address for the device

Set the IP Address with Rotary Switches

This graphic shows the rotary switches on a 1756 EtherNet/IP communication module. The three rotary switches at the bottom of the module, labeled X, Y, and Z, can be used for setting the IP address.If the rotary switches are not set to a valid number, the module attempts to use the BOOTP/DHCP server to set the IP address.



At power-up, the module reads the rotary switches to determine if they are set to a valid number for the last portion of the IP address. Valid numbers range from 001...254.

If the settings are a valid number, these conditions result:

- IP address = 192.168.1.xxx (where xxx represents the switch settings)
- Subnet mask = 255.255.255.0
- Gateway address = 192.168.1.1

Some modules now provide a gateway address of 0.0.0.0 when the network address is set with rotary switches.

- The module does not have a host name that is assigned to it, nor does it use any Domain Name System

We recommend that you set the rotary switches to a valid number before installing the module.

IMPORTANT For more information on how to use the BOOTP/DHCP server to set the IP address, see EtherNet/IP Network Configuration Manual, publication ENET-UM006

Mode Rotary Switch

The rotary switch in the upper left corner of the module is reserved for redundancy features. The default position of the switch is 9 for DLR, linear, or star topologies. The switch must be set to 7 for a redundant adapter with DLR or star topologies.

If the switch is in a position that is not implemented, the module displays the message "Unsupported mode. Change rotary switch setting" on the status display. The module does not respond on any port until the mode switch is set to the correct position and is power-cycled.

Table 5 shows the capabilities of the mode rotary switch.

Table 5 - Mode Rotary Switch Capabilities

Switch Position	Capability
9	DLR or Single-port
8	PRP or Single-port
7	Redundant Adapter and DLR or single-port topologies
6	Redundant Adapter and PRP

IMPORTANT If you use a redundant adapter pair, the mode rotary switches must be set to the same value.

Other Methods to Set the IP Address

The 1756-EN4TR module supports the following additional methods to change the IP address:

- BOOTP/DHCP utility
- RSLinx® Classic software
- Using Secure Digital Card
- For more information on how to use these methods, see EtherNet/IP Network Configuration Manual, publication ENET-UM006.

Reset the Module IP Address to Factory Default Value

You can reset the configuration of the module to its factory default value with the following method.

If the module has rotary switches, set the switches to 888 and cycle power.

Redundant Adapter Considerations Setting the IP Address

The following are considerations when using two 1756-EN4TR modules as a Redundant Adapter Pair.

- Default Class C addresses like 192.168.1.x can be set using rotary switches on the module in any mode. This includes the mode switch set at 7 or 9.
- IP address assignments other than default Class C can only be set in normal mode, where the switch is set to 9.
- Both 1756-EN4TR modules must be set to the same IP address before switching to Redundant Adapter Mode, where the switch is set to 7.
- You must reserve an IP+1 address that is taken automatically by the secondary.

  For example, if the primary address is 192.168.1.1, the address 192.168.1.2 must be reserved.

To set the IP address for redundant adapters use the following steps.

1. Insert one module into chassis in the standard mode (rotary switch set to 9).
2. Set the IP address on the module.
3. Remove the module from the chassis.
4. Insert a second module into the chassis.
5. Set the same IP address on the second module as you set on the first module.
6. Put both modules in redundant adapter mode, and put the modules in slots 0 and 1.

Connect Redundant EtherNet/IP Adapters

Redundant 1756-EN4TR adapters can be used for added resiliency at the adapter level. One adapter acts as the primary and controls the I/O, while the other adapter acts as a secondary and can take over as the primary if needed. Redundant Adapter functionality is available starting in revision 3.001 firmware.

Redundant Design Considerations

There are some details and rules to consider with redundant design considerations in the following list.

- Only I/O modules are supported in the redundant adapter chassis. The redundant chassis does not support the following.
  - motion modules
  - communication modules such as DHRIO and DeviceNet
  - controllers
- Redundant adapters must reside in slots 0 and 1 only.
- The fourth rotary switch on the redundant 1756-EN4TR adapter needs to be set to number 7 for redundant adapter with DLR or single-port topologies. Position 6 is for a redundant adapter with PRP, which will be supported in a future firmware version.

ATTENTION: For redundant adapter functionality, two 1756-EN4TR adapters must have matching configurations, including IP addresses and rotary switches, in both slot 0 and 1.
If you are using one 1756-EN4TR adapter, it functions as one adapter.
If a redundant adapter is in slot 0 or slot 1, then both of those slots must contain a redundant adapter. No other types of modules can be part of the pair.

Redundant System Components

The following features will be supported with the 1756-EN4TR redundant adapter pair in a future firmware revision.

- CIP Safety™ modules
- PRP
- CIP Security™

Redundant adapters can be used with redundant controllers or one controller.

For more information on redundancy, see the ControlLogix Redundancy User Manual.

Redundant Switchovers

During redundant adapter operation, if certain conditions occur to the primary adapter, control is switched to the secondary adapter. These conditions cause a switchover:

- Major fault/assert on the adapter
- Failure of the adapter
- Removal of the adapter
- A program-prompted command to switchover
- An AOP-prompted command to switchover
- The adapter loses both Ethernet links

Switchover Considerations

Each 1756-EN4TR adapter uses one IP address as the primary IP address for all communication on the EtherNet/IP™ network. The redundant adapter pair consists of one active and one stand-by adapter.

The two adapters negotiate which is the primary, depending on the status of the system. If the primary adapter is unable to perform its role, for example, if a fault occurs in the primary adapter, then the secondary adapter becomes the new primary, assuming the IP address of the first primary adapter and taking over the role of communication. The primary adapter is the only adapter of the pair that produces data on the EtherNet/IP network.

On power-up, the primary is chosen from a pair of devices. The secondary adapter uses the primary IP address +1. For example, if the primary adapter has an IP address of ‘N’, then the secondary adapter has an IP address of ‘N+1’.

The primary adapter is always active and is responsible for monitoring all inputs and outputs, monitoring diagnostics in the system, and reading and writing data to and from I/O simultaneously. The secondary adapter is waiting to take over communication, if the primary switches over.

If there is a switchover, the IP address swapping between the primary adapter and the secondary adapter takes no longer than 50 ms from the time of the initiating fault. The secondary adapter is the new primary and handles all communication. Depending on the RPI's configured, the observed switchover time can appear longer. Transmission time imposed by network infrastructure has to be considered when calculating overall switchover time. No connection drops occur during this switchover process.

This IP address swap is transparent to the user. You can detect which adapter the primary adapter is by examining the four character display indicator near the top of each adapter. On the primary adapter, the network status indicator is steady green. On the secondary adapter, the network status indicator flashes green.

Once a swap occurs, the 'new' primary adapter remains the primary unless there is a reason to swap over again. When the previous primary adapter is reinserted or reconnected, both adapters start the qualification process again with the adapter that was reconnected becoming the new qualified secondary.

Status Display Codes

Table 6 shows the different status codes that can appear on the adapter related to the Redundant Adapter feature.

Table 6 - Primary and Secondary Operation Modes

Status Code	Description
PwrUp	Power Up/ Unknown
DS	Disqualified secondary
QS	Qualified secondary
PwQs	Primary with qualified secondary partner
PwDS	Primary with disqualified secondary
PwNS	Primary with no secondary
DSwP	Disqualified secondary with primary

Adapter Qualification

In a Redundant Adapter configuration, one adapter takes the Primary role and a second adapter becomes Qualified Secondary ready to take I/O control in the event that the primary becomes disqualified.

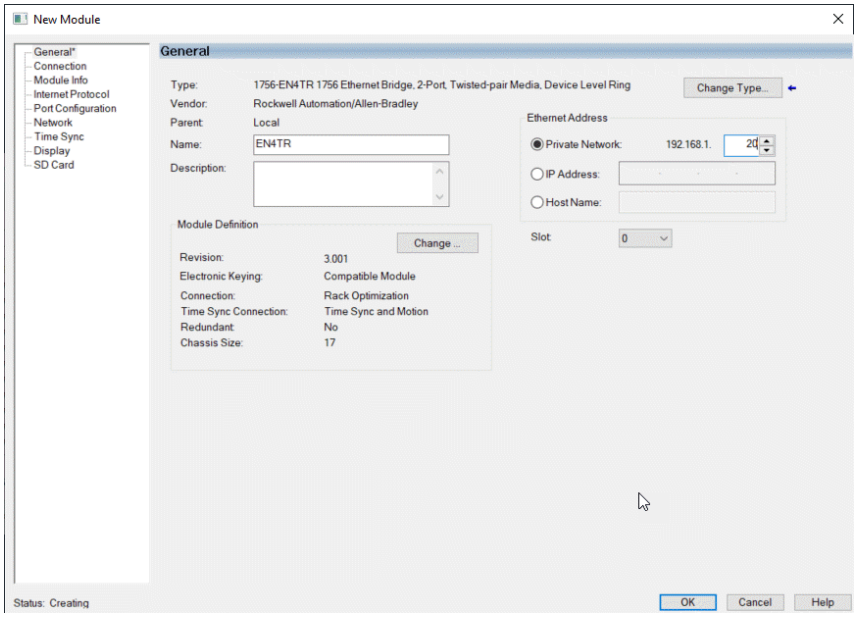
To complete the qualification process the following conditions must be met. The modules must:

- have the same firmware revision.
- reside in slots 0 and 1 of the same chassis.
- be initially set to the same IP address.
- have at least one Ethernet port link active.
- be connected to the same Ethernet network.

Configure a 1756-EN4TR Redundant Adapter Pair

To configure a 1756-EN4TR redundant adapter pair, use the following steps.

1. To set the IP address, see page 28.
2. Make sure you are using Logix Designer in the offline mode.
3. In the I/O configuration tree, add the 1756-EN4TR in slot 0.
4. Name your module and enter the IP Address.

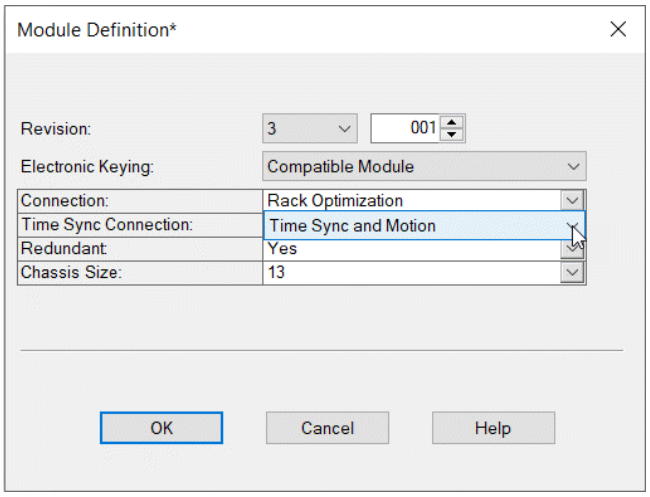


IMPORTANT Do not put any devices in slot 1 in the I/O configuration tree.

5. Click change under the module definition pane, and select "Yes" for redundancy.

6. If you have one of the following modules in your chassis, Select Time Sync and Motion.
   - 1756-IB16IF
   - 756-OB16IEF
   - 1756-OB16IEFS

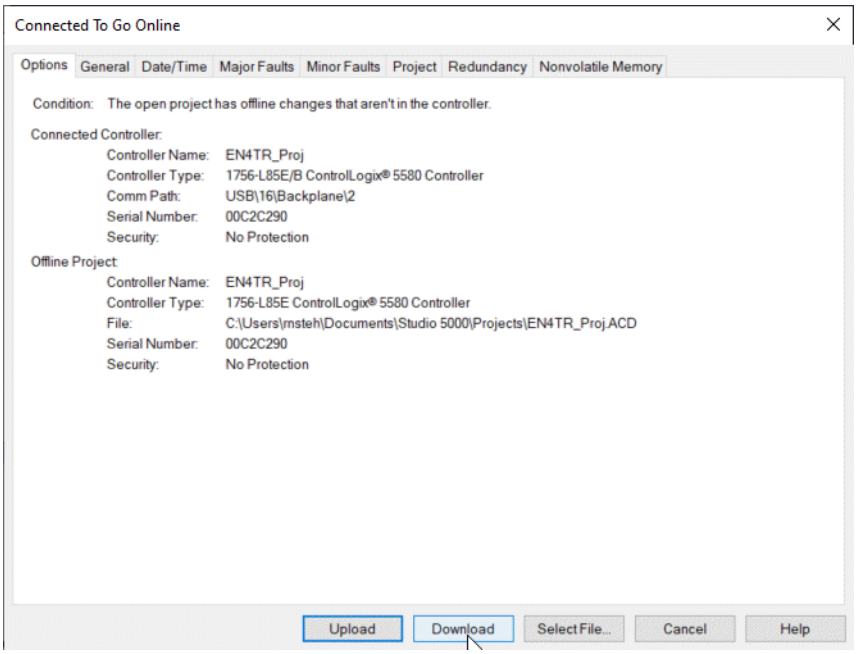
   When a chassis is configured for a 1756-EN4TR redundant adapter pair and the I/O chassis contains any of the preceding modules, then the 1756-EN4TR modules must be configured as Time Sync and Motion or unexpected connection drops can occur.



7. Power the adapters, and the synchronization process starts. Once synchronization has completed, one adapter reports as PwQS and the other adapter reports as QS. This status displays on the adapter.

   The adapter that reports as QS has an IP address that was incremented by one, which was incremented by the firmware in the module.

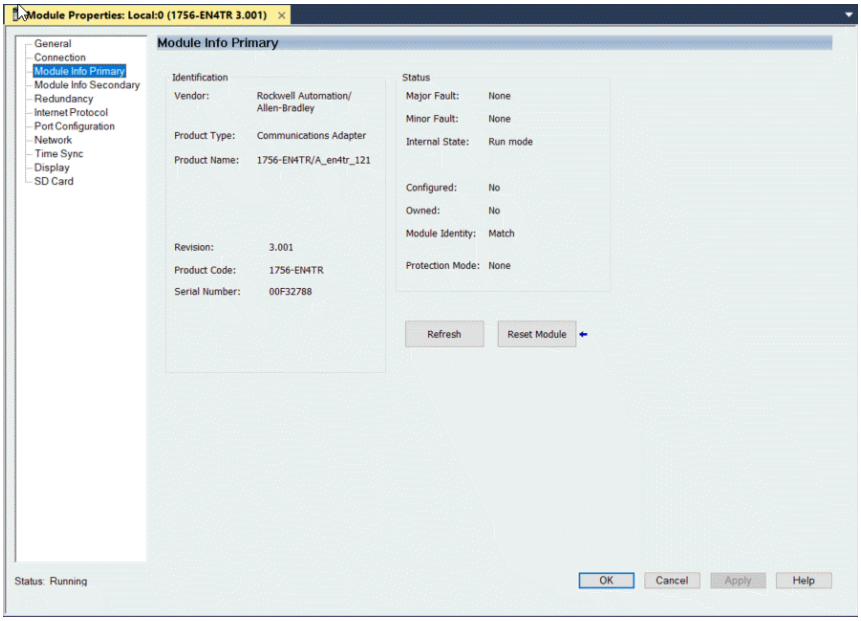
8. Go online with the project and click Download.



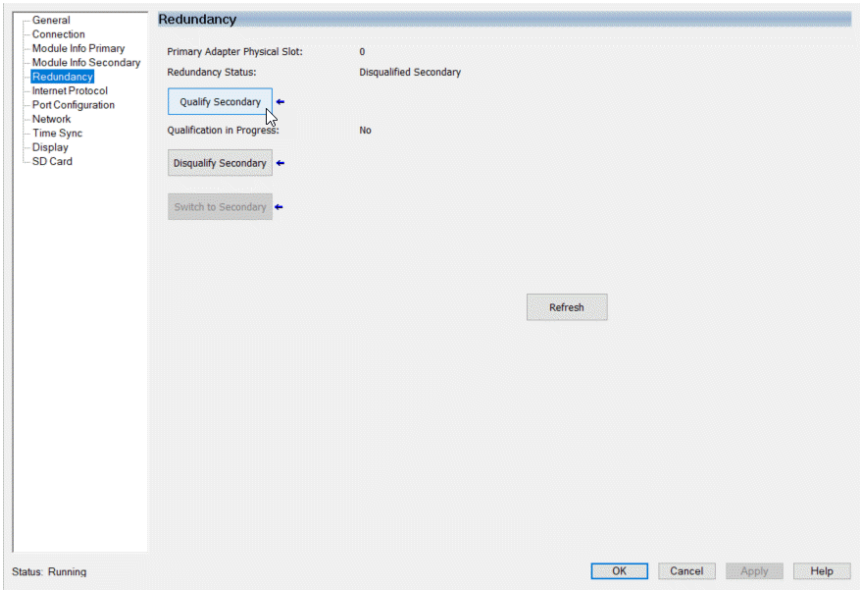
9. Examine the AOP screens by right-clicking on the module and select Properties.

You can now see options in your configuration tree for Module Info Primary, Module Info Secondary, and Redundancy.

The image below shows the Module Info Primary Tab.

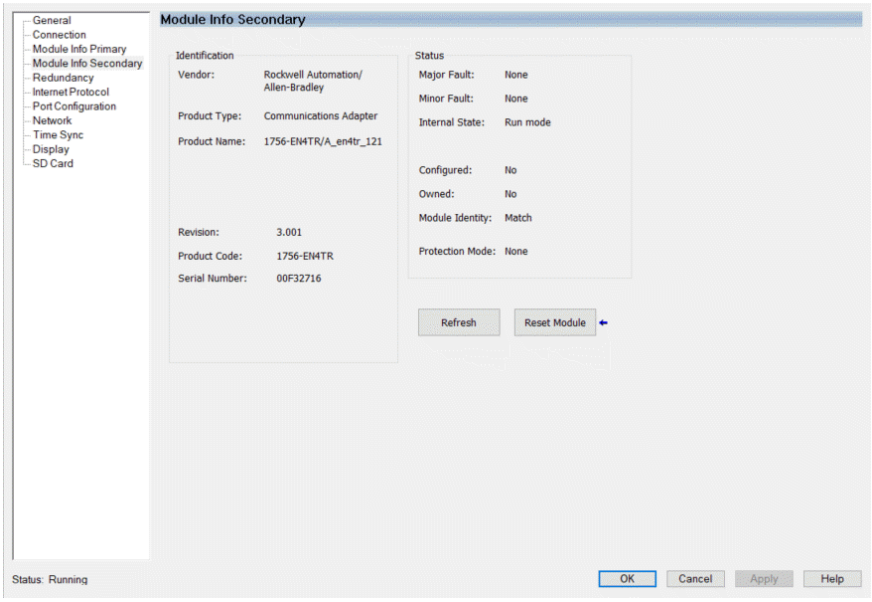


10. Under the Redundancy tab, click Qualify Secondary.



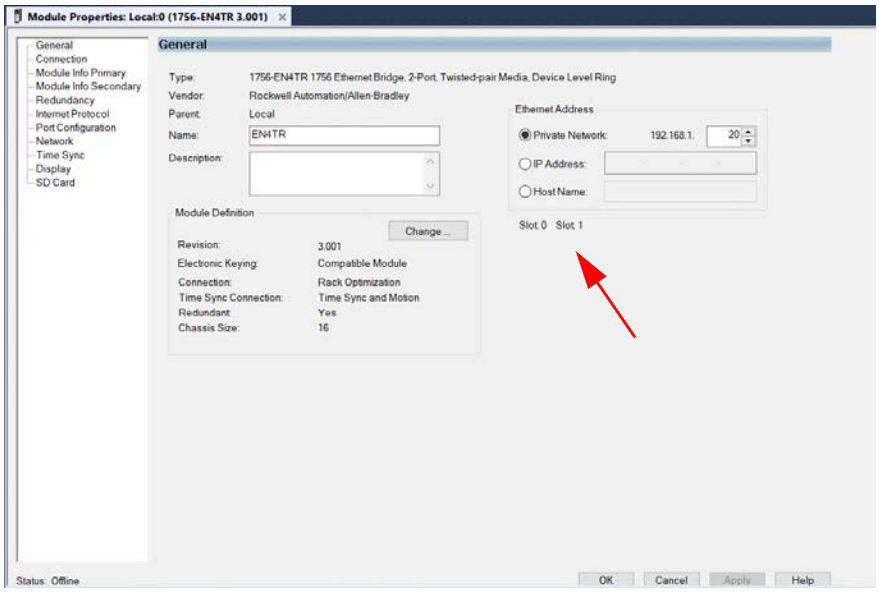
11. Click the Module Info Secondary page and examine the information.

    In the Status table, notice the Configured section says “No”, if it is not qualified.

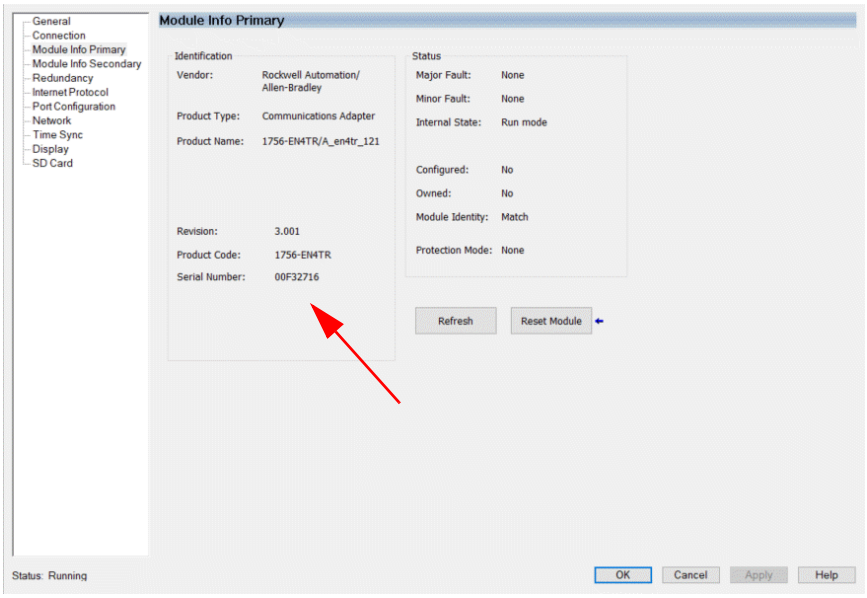


12. To verify that the redundancy feature created a redundant adapter system, click on the general tab.

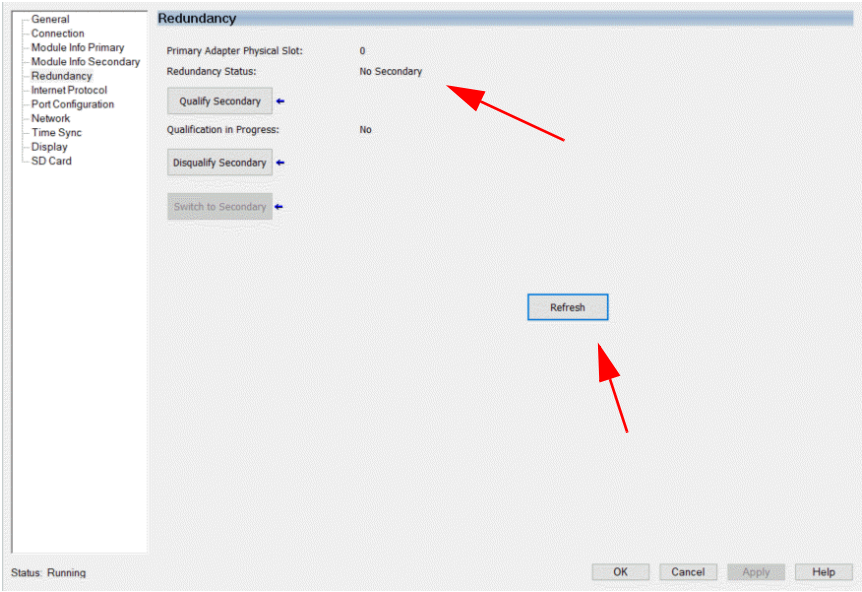
    You should see the properties for the module defined with both Slot 0 and Slot 1.



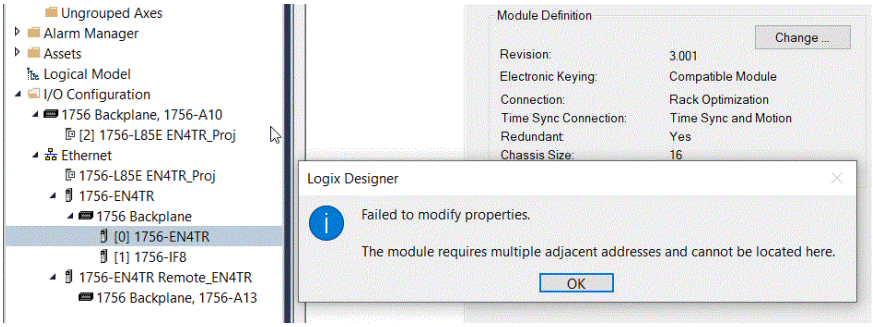
If the primary module was in slot 1 and a switchover occurred, you can see a change in the serial number of the module to match the module in slot 1.



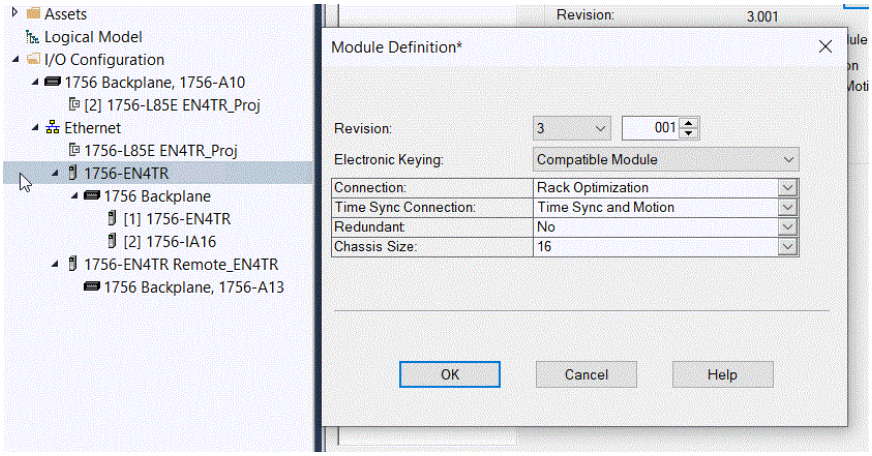
13. To confirm a switchover occurred and there is no longer a secondary, on the redundancy page, click refresh. You should see “No Secondary” appear.



In the following figure, there is an example of an I/O module in slot 1. Even with a 1756-EN4TR in slot 0, with any other module apart from a second 1756-EN4TR in slot 1 (in this example it is the 1756-IF8) you cannot enable redundancy. On the module redundancy page, any attempt made to change the redundant function to "yes" will result in the following error.



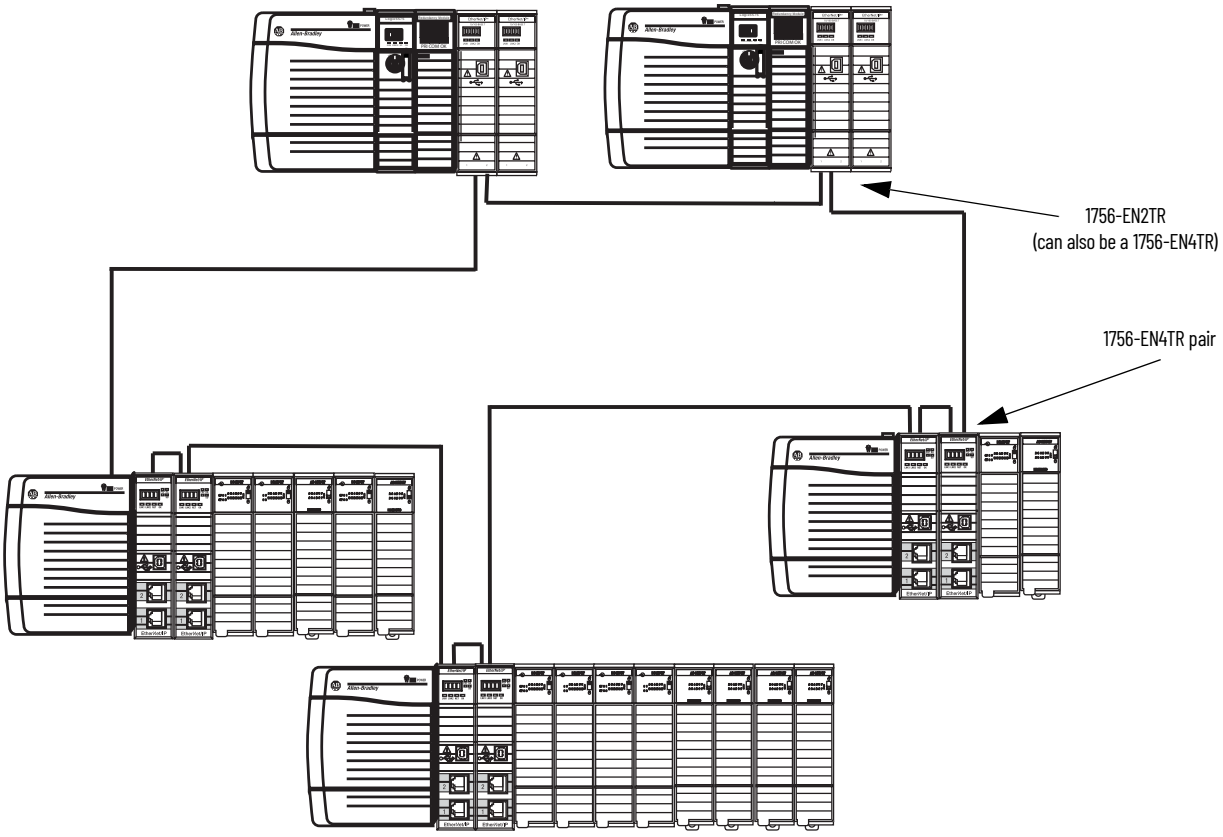
If you try to make a redundancy system starting in any other slot in the chassis other than slot 0, the redundancy option will not be available on the module definition configuration screen. The redundant adapter must be present in slot 0.



Redundant Architecture

The following figures show DLR and Star Topology with the 1756-EN4TR module. DLR provides higher resiliency than a single star. Linear topologies are not recommended because any break or firmware flashing of devices in the line causes loss of communications to downstream devices.

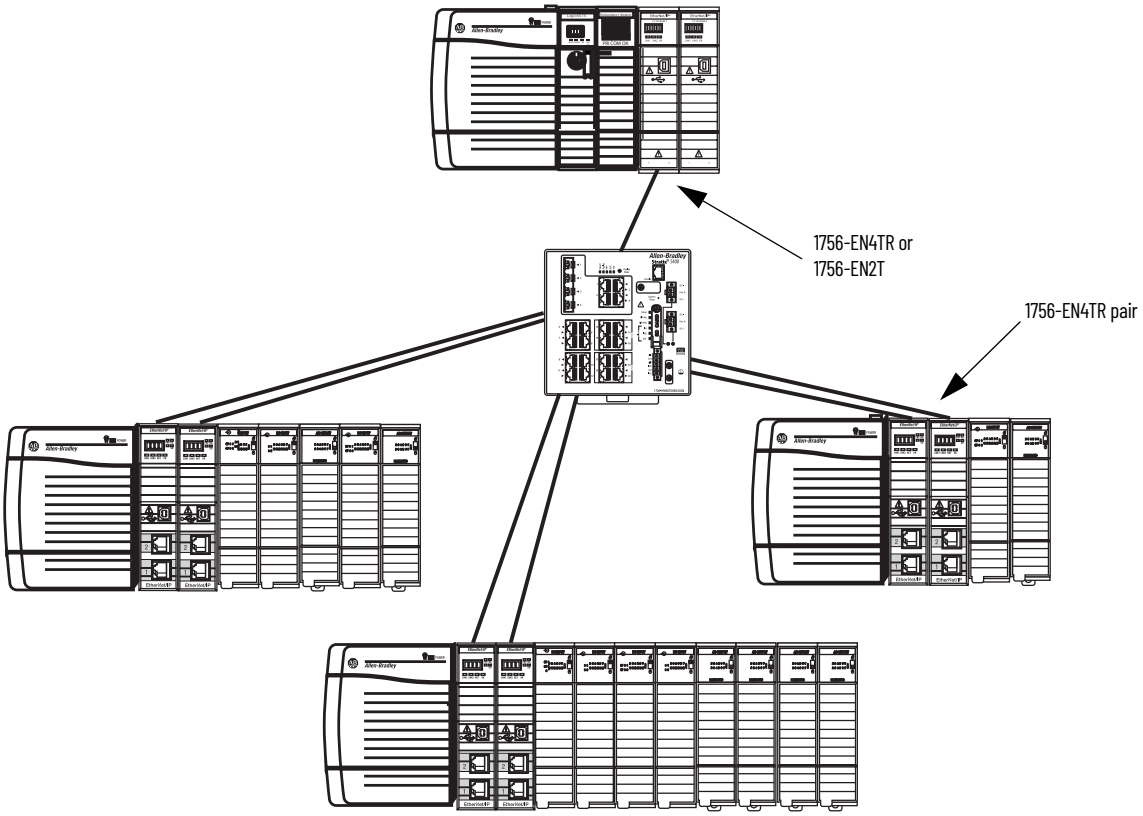
Figure 9 - Redundant 1756-EN4TR Adapters in DLR Topology



Configure all DLR devices on the ring to be at the same speed on all links as defined in the Deploying Device Level Ring within a Converged Plantwide Ethernet Architecture design and implementation guide, ENET-TD015.

Redundant adapters can be used in a star configuration, as shown in Figure 10. However, the switch at the center of the star is a single point of failure. DLR provides for higher resiliency.

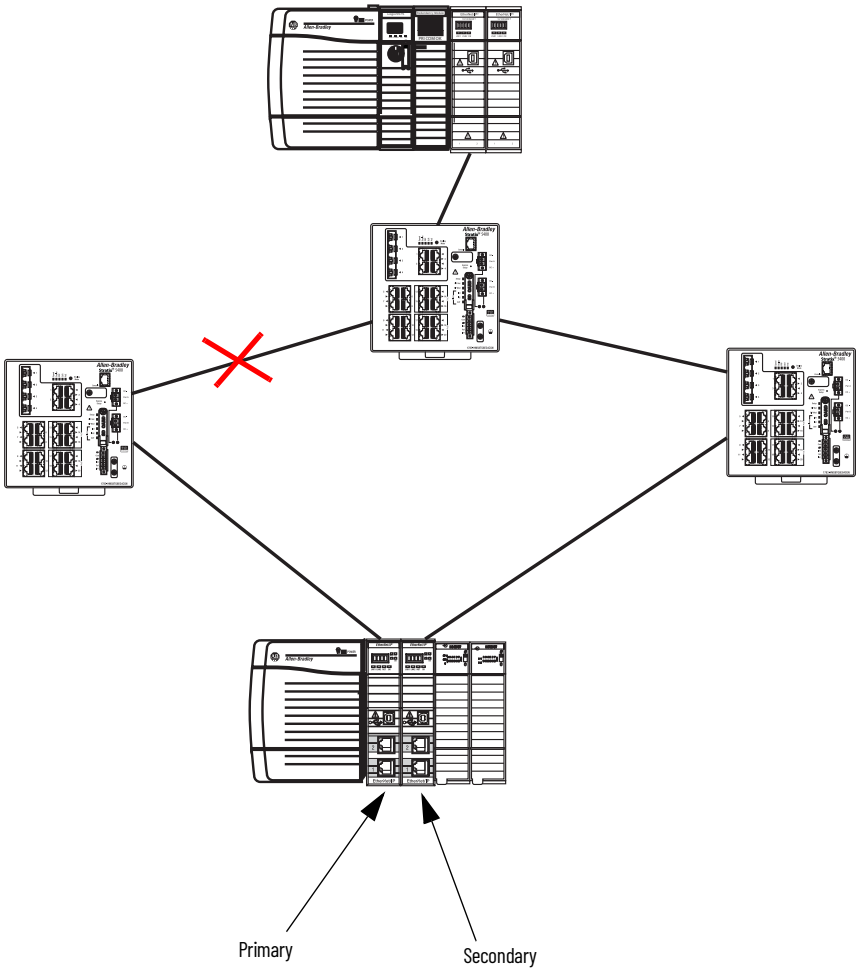
Figure 10 - Redundant 1756-EN4TR Adapters in Star Topology with a Single Switch



Redundant Architecture Network Considerations

In a star topology with a single switch, if a link is broken between the switch and the primary redundant adapter, a switchover will occur. With multiple switches, for example as shown in Figure 11, if a link is broken between two switches, a switchover will not occur because the link to the redundant adapter is still in place.

Figure 11 - Invalid Topology: Network Break does not Cause Switchover

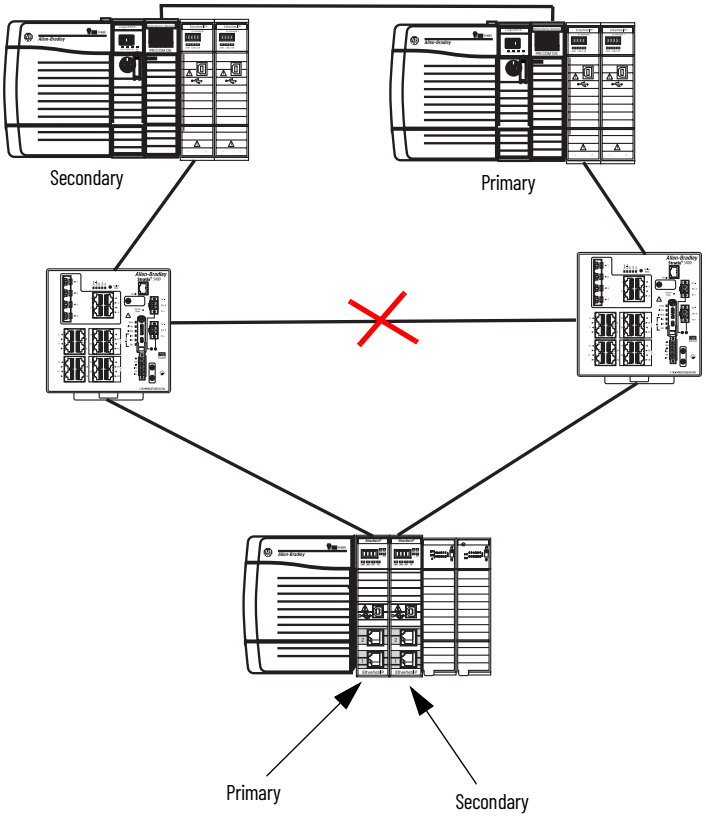


The Primary Adapter does not detect data connection loss on non-directly connected links. For example in Figure 12, the secondary adapter disqualifies because it cannot detect the primary adapter.

This action occurs even though the secondary adapter still has a healthy path to the primary controller.

Similarly, the secondary controller in the redundant controller pair disqualifies because it cannot detect the primary.

Figure 12 - Invalid Topology: Network Break Results in Loss of Control

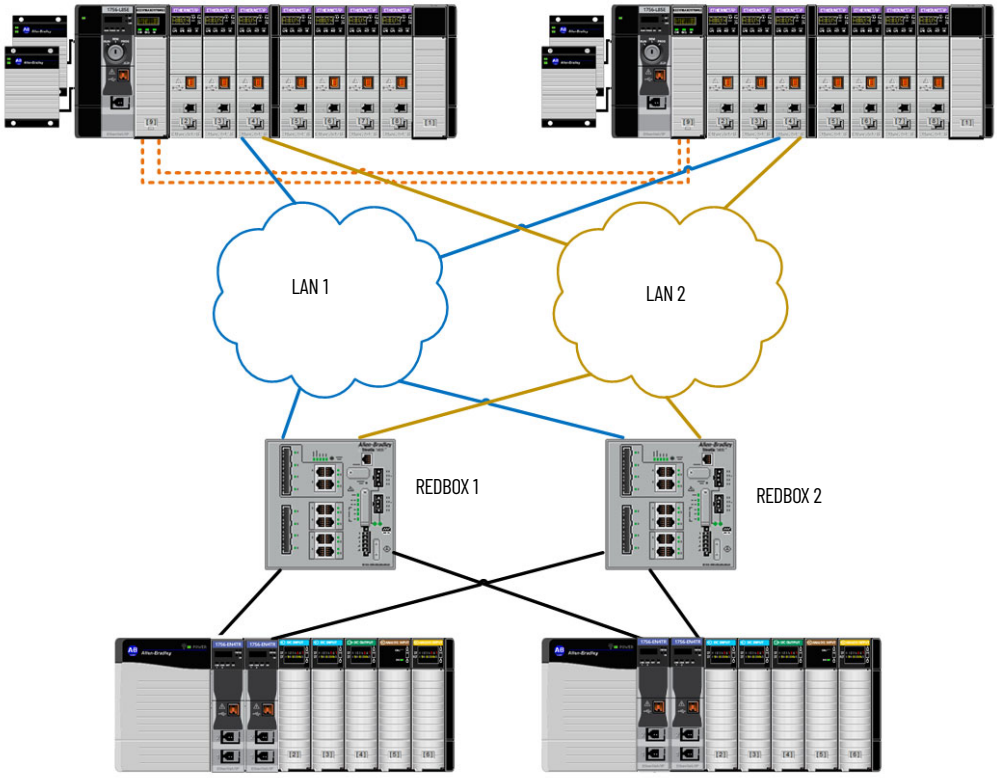


Redundant PRP Architecture with Redbox Switches

PRP network, including Redbox switches, must be properly designed, built and configured based on CPwE guidelines.

The proposed architecture can be significantly simplified in the future, once native PRP support added to 1756-EN4TR functionality.

For more information, see the Deploying Parallel Redundancy Protocol within a Converged Plantwide Ethernet Architecture Technical Data.



Notes:

ControlLogix Network Device Status Indicators

Status Indicators

The following graphics show the status indicators for these modules (extended-temperature versions not shown).

Figure 13 - 1756-EN2F, 1756-EN2T (Single-port Modules)

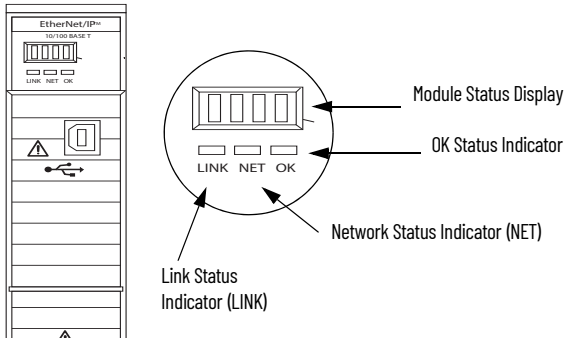


Figure 14 - 1756-EN2TR, 1756-EN3TR (Dual-port Modules)

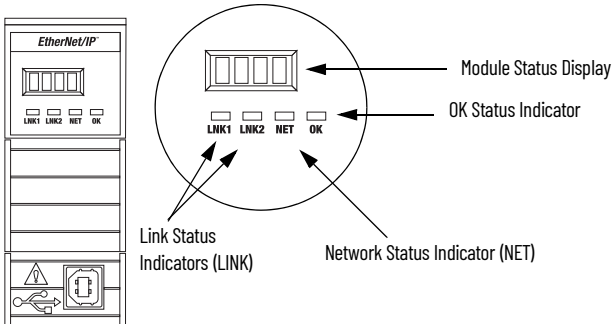


Figure 15 - 1756-EN2TP (Dual-port Module)

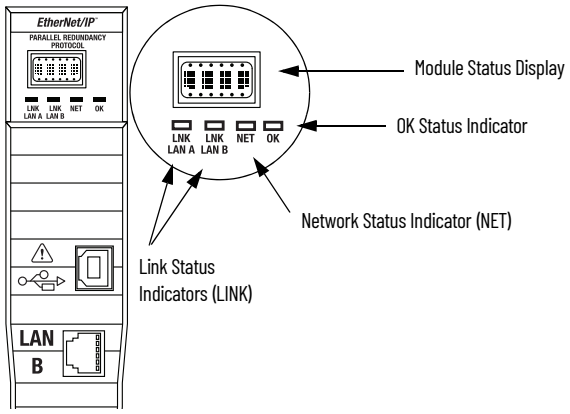


Figure 16 - 1756-EN4TR (Dual-port Module)(1)

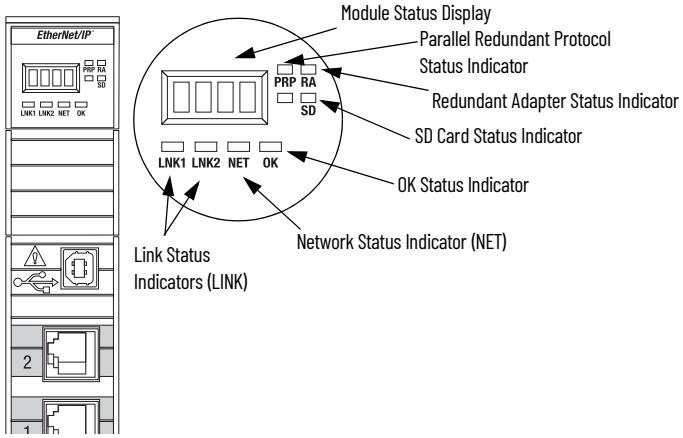
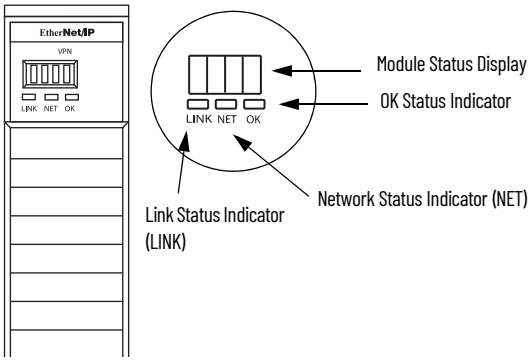
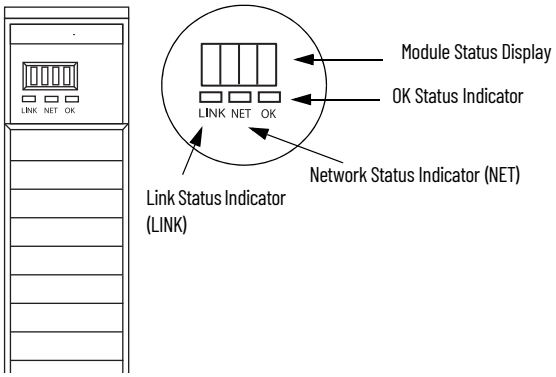


Figure 17 - 1756-ENBT (Single-port Module)



(1) Parallel Redundant Protocol and Redundant Adapter features are not available in the initial release. Check the Product Compatibility and Download Center (PCDC) to see if it is available in your firmware revision.

Figure 18 - 1756-EWEB (Single-port Module)



Single-Port Module Status Indicators

Table 7 - Single-port Module Status Indicators

Status Indicator	Description	Status	State
Module Status Display	Alphanumeric display that scrolls messages. For example, when a module is operating normally, the display scrolls the module's IP address.	—	—
Link Status (LINK)	Indicates the current state of the module regarding transmission of data on the EtherNet/IP™ network.	Off	One of these conditions exists: • The module is not powered. – Verify that there is chassis power. – Verify that the module is completely inserted into the chassis and backplane. – Make sure that the module has been configured. • No link exists on the port.
		Flashing green	Activity exists on the port.
		Green	The port is active, but not receiving traffic.
OK Status (OK)	Indicates the current state of the module. For example, this status indicator indicates if the module is executing power-up testing, in the process of a firmware update or operating normally.	Off	The module is not powered. • Verify that there is chassis power. • Verify that the module is completely inserted into the chassis and backplane. • Make sure that the module has been configured.
		Flashing green	The module is not configured. The Module Status display scrolls: BOOTP or DHCP<Mac_address_of_module> For example: BOOTP 00:0b:db:14:55:35 Configure the module.
		Green	The module is operating correctly. The IP address scrolls across the Module Status display.
		Flashing red	The module detected a recoverable minor fault. Check the module configuration. If necessary, reconfigure the module.
		Red	The module detected an unrecoverable major fault. Cycle power to the module. If this power cycle does not clear the fault, replace the module.
Network Status (NET)	Indicates if CIP™ connections are established.	Off	One of these conditions exists: • The module is not powered. – Verify that there is chassis power. – Verify that the module is completely inserted into the chassis and backplane. – Make sure that the module has been configured. • The module is powered but does not have an IP address. Assign an IP address to the module.
		Flashing green	The controller has an IP address and one of these conditions exists: • The module has not established any CIP connections. If connections are configured for this module, check the connection originator for the connection error code. • All connections to the device have timed out or been closed.

Table 7 - Single-port Module Status Indicators

Status Indicator	Description	Status	State
Network Status (NET)	Indicates if CIP connections are established.	Green	The module has established at least 1 CIP connection and is operating properly. The IP address scrolls across the Module Status display.
		Red	The module is in conflict mode. It shares an IP address with another device on the network. The current IP address scrolls across the Module Status display. The display scrolls: OK <IP_address_of_this_module> Duplicate IP <Mac_address_of_duplicate_node_detected> For example: OK 10.88.60.196 Duplicate IP - 00:00:BC:02:34:B4 Change the IP address of the module.
		Flashing green/flashing red	The module is performing its power-up testing.

Dual-Port Module Status Indicators

Table 8 - Dual-port Module Status Indicators

Status Indicator	Description	Status	State
Module Status Display	Alphanumeric display that scrolls messages. For example, when a module is operating normally, the display scrolls the module's IP address.	—	—
OK	Indicates the current state of the module. For example, this status indicator indicates if the module is executing power-up testing, in the process of a firmware update or operating normally.	Off	The module is not powered. • Verify that there is chassis power. • Verify that the module is completely inserted into the chassis and backplane. • Make sure that the module has been configured.
		Flashing green	The module is not configured. The Module Status display scrolls: BOOTP or DHCP<Mac_address_of_module> For example: BOOTP 00:0b:db:14:55:35 Configure the module.
		Green	The module is operating correctly. The Module Status display scrolls: OK <IP_address_of_this_module> For example: OK 10.88.60.160
		Flashing red	The module detected a recoverable minor fault. Check the module configuration. If necessary, reconfigure the module.
		Red	The module detected an unrecoverable major fault. Cycle power to the module. If this power cycle does not clear the fault, replace the module.
		Both of these conditions exist: • Status Indicator is Red • Module Status Display is scrolling: Image Update Needed	The module's main firmware image must be updated. Follow these steps: 1. Update the firmware image. 2. Cycle power to the module.
		Flashing red and green	The module is performing its power-up testing.
Network Status (NET)	Indicates if CIP connections are established. **IMPORTANT:** The new-series 1756-EN2TR and 1756-EN3TR modules have a NET status indicator. The older-series 1756-EN2TR and 1756-EN3TR modules do not have a NET status indicator.	Off	One of these conditions exists: • The module is not powered. – Verify that there is chassis power. – Verify that the module is completely inserted into the chassis and backplane. – Make sure that the module has been configured. • The module is powered but does not have an IP address. Assign an IP address to the module.
		Flashing green	The controller has an IP address and one of these conditions exists: • The module has not established any CIP connections. If connections are configured for this module, check the connection originator for the connection error code. • All connections to the device have timed out or been closed.
		Green	The module has established at least 1 CIP connection and is operating properly. The IP address scrolls across the Module Status display.
		Red	The module is in conflict mode. It shares an IP address with another device on the network. The module's current IP address scrolls across the Module Status display. The display scrolls: OK <IP_address_of_this_module> Duplicate IP <Mac_address_of_duplicate_node_detected> For example: OK 10.88.60.196 Duplicate IP - 00:00:BC:02:34:B4 Change the module's IP address.
		Flashing green/flashing red	The module is performing its power-up testing.

Table 8 - Dual-port Module Status Indicators

Status Indicator	Description	Status	State
Link Status (LINK 1, LINK 2)		Off	One of these conditions exists: • The module is not powered. – Verify that there is chassis power. – Verify that the module is completely inserted into the chassis and backplane. – Make sure that the module has been configured. • No link exists on the port. • The port is administratively disabled. • The port is disabled due to rapid ring faults (LNK2).
		Flashing green	Activity exists on the port.
		Green	One of these conditions exists: • A link exists on the port, but no traffic is being received. • The ring network is operating normally on active ring supervisor (LNK2). • A ring partial network fault was detected on the active ring supervisor (LNK2).
Link Status (LAN A, LAN B)		Flashing red	When the corresponding LAN A/B Parallel Redundancy Protocol (PRP) Warning bit is set.
SD[1]	The SD indicator shows if the SD card is in use	Off	No activity is occurring with the SD card. You can safely remove the card, if necessary.
		Flashing green	The module is reading from or writing to the SD card. **IMPORTANT**: Do not remove the SD card while the module is reading or writing. Let the read/write complete without interruption. If you interrupt the read/write, data corruption or loss can occur.
		Solid green	
		Flashing red	One of the following exists: • The SD card does not have a valid file system. • The SD card drew excessive current and power has been removed from the card.
		Solid red	The module does not recognize the SD card.
Parallel Redundancy Protocol (PRP)[1]	Check Firmware Revision for availability of this feature.		
Redundant Adapter (RA)[1]	Major revision 3.001 or higher.		

(1) Status indicators only available on the 1756-EN4TR, 1756-EN4TRK, 1756-EN4TRXT.

Diagnostic Web Pages

The number and type of diagnostic fields vary by module catalog number, series, and revision number.

IMPORTANT The diagnostic web pages have many fields that you can use to monitor the operating state of your EtherNet/IP module.

To troubleshoot problems, you diagnose as a result of monitoring the diagnostic web pages of the EtherNet/IP modules, refer to publication ENET-AT003, Troubleshoot EtherNet/IP Networks.

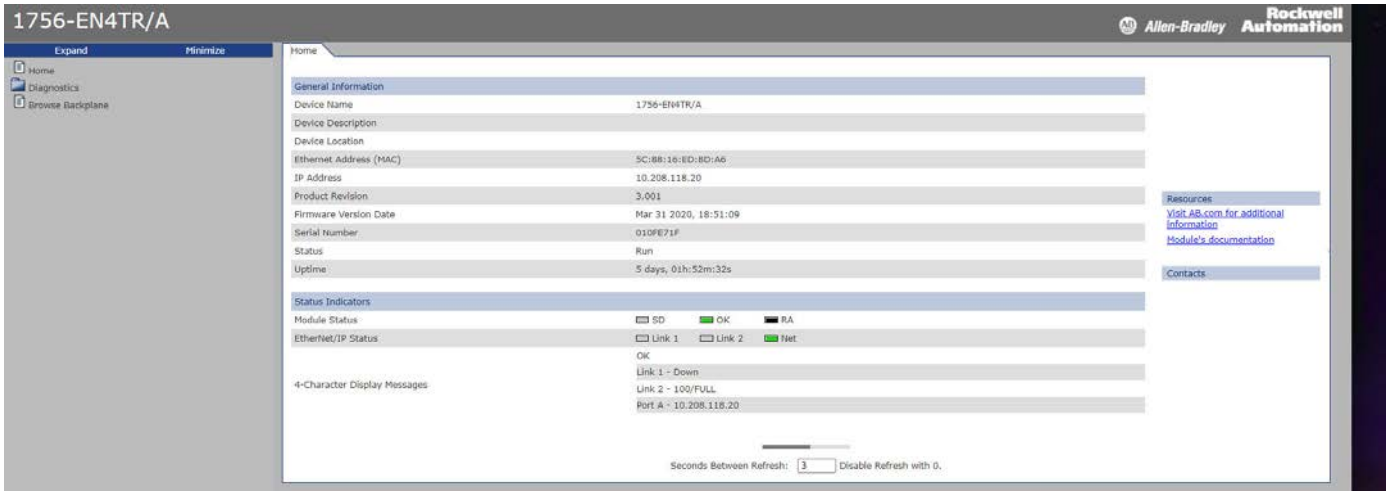
Access the Diagnostic Web Pages

To troubleshoot most possible problems with your EtherNet/IP communication module, you must access the diagnostic web pages for the module.

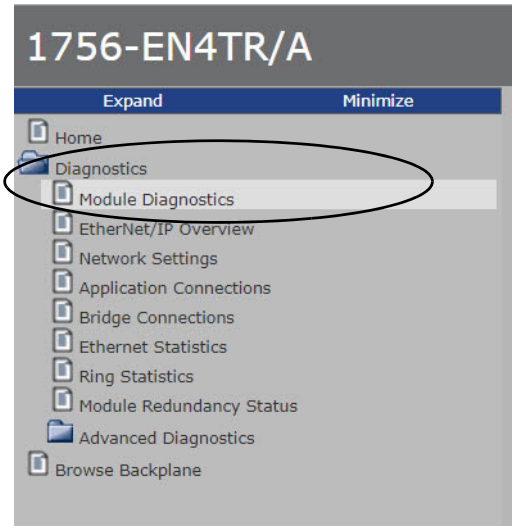
To access the EtherNet/IP communication module diagnostic web pages, follow these steps.

1. Open your web browser.
2. In the Address field, type your EtherNet/IP communication module Internet Protocol (IP) address and press Enter.

   The diagnostic web home page appears.



3. Open the Diagnostics folder in the left-most navigation bar and click the link for each diagnostic web page you must monitor.



For more information on diagnostics, see ENET-AT003.

Notes:

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Rockwell Automation Support

Use these resources to access support information.

Technical Support Center	Find help with how-to videos, FAQs, chat, user forums, and product notification updates.	rok.auto/support
Knowledgebase	Access Knowledgebase articles.	rok.auto/knowledgebase
Local Technical Support Phone Numbers	Locate the telephone number for your country.	rok.auto/phonesupport
Literature Library	Find installation instructions, manuals, brochures, and technical data publications.	rok.auto/literature
Product Compatibility and Download Center (PCDC)	Download firmware, associated files (such as AOP, EDS, and DTM), and access product release notes.	rok.auto/pcdc

Documentation Feedback

Your comments help us serve your documentation needs better. If you have any suggestions on how to improve our content, complete the form at rok.auto/docfeedback.

Waste Electrical and Electronic Equipment (WEEE)

At the end of life, this equipment should be collected separately from any unsorted municipal waste.

Rockwell Automation maintains current product environmental information on its website at rok.auto/pec.

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Publication 1756-UM004C-EN-P - June 2021
Supersedes Publication 1756-UM004B-EN-P - April 2020