# **Industrial Protocols User Guide**

Version 6.3, September 2022

www.moxa.com/products



## **Industrial Protocols User Guide**

The software described in this manual is furnished under a license agreement and may be used only in accordance with the terms of that agreement.

## **Copyright Notice**

© 2022 Moxa Inc. All rights reserved.

## Trademarks

The MOXA logo is a registered trademark of Moxa Inc. All other trademarks or registered marks in this manual belong to their respective manufacturers.

## Disclaimer

- Information in this document is subject to change without notice and does not represent a commitment on the part of Moxa.
- Moxa provides this document as is, without warranty of any kind, either expressed or implied, including, but not limited to, its particular purpose. Moxa reserves the right to make improvements and/or changes to this manual, or to the products and/or the programs described in this manual, at any time.
- Information provided in this manual is intended to be accurate and reliable. However, Moxa assumes no
  responsibility for its use, or for any infringements on the rights of third parties that may result from its
  use.
- This product might include unintentional technical or typographical errors. Changes are periodically
  made to the information herein to correct such errors, and these changes are incorporated into new
  editions of the publication.

# **Technical Support Contact Information**

www.moxa.com/support

# **Table of Contents**

1.	MODBUS/TCP MAP	4
	Introduction	4
	Data Format and Function Code	4
	Configuring MODBUS/TCP on Moxa Switches	4
	MODBUS Data Map and Information Interpretation of Moxa Switches	5
2.	EtherNet/IP	12
	Introduction	
	Messaging Types	
	Configuring EtherNet/IP on Moxa Switches	
	CIP Objects of EtherNet/IP	
	Identity Object	
	TCP/IP Interface Object	
	Ethernet Link Object	
	Assembly Object	
	Message Router Object	
	Connection Manager Object	
	Port Object	
	Moxa Networking Object (Vendor Specific)	
	Electronic Data Sheet (EDS) File	
	Rockwell RSLogix 5000 Add-On Instructions (AOI)	
	AOI Installation	
	CIP Tags	
	Monitoring AOI Tags	
	Rockwell FactoryTalk® View Faceplate	
	FactoryTalk® View Faceplate Installation	
	Introduction to the Moxa Custom Faceplate	
3.	PROFINET I/O	
	Introduction	
	PROFINET Environmental Introductions	
	PROFINET Networking Structure	
	PROFINET I/O Devices	
	PROFINET Protocols	61
	Device descriptions	
	Configuring PROFINET I/O on Moxa Switches	
	Enable PROFINET I/O	
	Addressing of I/O Data in PROFINET I/O Based on Slot and Sub-Slots	
	PROFINET Attributes	
	PROFINET Cyclic I/O Data	
	PROFINET I/O Parameters	
	Step 7 Integration	
	Overview of Operation Procedure	
	Create a PROFINET I/O Subnet Project	
	GSD File Installation	
	Device Configuration	
	Save and Load the Project into the PLC	
	Monitoring the Switch	

# Introduction

MODBUS TCP is a protocol commonly used for the integration of a SCADA system. It is also a vendorneutral communication protocol used to monitor and control industrial automation equipment such as PLCs, sensors, and meters. In order to be fully integrated into industrial systems, Moxa's switches support Modbus TCP/IP protocol for real-time monitoring in a SCADA system.

# **Data Format and Function Code**

MODBUS TCP supports different types of data format for reading. The primary four types of them are:

Data Access Type		Function Code	Function Name	Note
	Physical Discrete Inputs	2	Read Discrete Inputs	
Bit access	Internal Bits or Physical Coils	1	Read Coils	
Word access	Physical Input Registers	4	Read Input Registers	Moxa Support
(16-bit access)	Physical Output Registers	3	Read Holding Registers	

Moxa switches support Function Code 4 with 16-bit (2-word) data access for read-only information.

# **Configuring MODBUS/TCP on Moxa Switches**

#### Type 1

Modbus	
	Enable
	Activate

Select the checkbox and click **Activate** to enable the Modbus TCP.

#### Type 2: New UI 2.0

Modbus TCP is enabled by default. To disable Modbus TCP, uncheck Enable Modbus TCP then click Apply.

Industrial Protocol	
EtherNet/IP	
Enable EtherNet/IP Note: IGMP snooping will be automatically enabled when EtherNet/IP is activated.	
Modbus TCP	
Enable Modbus TCP	
PROFINET I/O	
Enable PROFINET I/O	
	Apply

# **MODBUS Data Map and Information Interpretation of Moxa Switches**

The data map addresses of Moxa switches shown in the following table start from **MODBUS address 30001** for Function Code 4. For example, the address offset 0x0000 (hex) equals MODBUS address 30001, and the address offset 0x0010 (hex) equals MODBUS address 30017. Note that all the information read from Moxa switches are in hex mode. To interpret the information, refer to the ASCII table for the translation (e.g. 0x4D = M', 0x6F = o').

Address Offset	Data Type	Interpretation	Description		
System Information					
0x0000	1 word	HEX	Vendor ID = 0x1393		
0x0001	1 word		Unit ID (Ethernet = 1)		
0x0002	1 word	HEX	Product Code = $0x0003$		
			Vendor Name = "Moxa"		
			Word 0 Hi byte = `M'		
			Word 0 Lo byte = 'o'		
0x0010	20 words	ASCII	Word 1 Hi byte = 'x'		
			Word 1 Lo byte = 'a'		
			Word 2 Hi byte = `\0'		
			Word 2 Lo byte = $\0'$		
			Product Name = "EDS-408A"		
			Word 0 Hi byte = 'E'		
			Word 0 Lo byte = $D'$		
			Word 1 Hi byte = 'S'		
			Word 1 Lo byte = '-'		
0x0030	20 words	ASCII	Word 2 Hi byte = '4'		
			Word 2 Lo byte = `0'		
			Word 3 Hi byte = '8'		
			Word 3 Lo byte = 'A'		
			Word 4 Hi byte = `\0'		
			Word 4 Lo byte = $\0'$		
0x0050	1 word		Product Serial Number		

Address Offset	Data Type	Interpretation	Description
			Firmware Version
			Word 0 Hi byte = major (A)
0x0051	2 words		Word 0 Lo byte = minor $(B)$
			Word 1 Hi byte = release (C)
			Word 1 Lo byte = build (D)
			Firmware Release Date
			For example:
			Word $0 = 0 \times 0609$
0x0053	2 words	HEX	Word $1 = 0 \times 0705$
			Firmware was released on 2007-05-06 at 09
			o'clock
			Ethernet MAC Address
			Ex: MAC = 00-01-02-03-04-05
			Word 0 Hi byte = $0 \times 00$
00055	2		Word 0 Lo byte = $0 \times 01$
0x0055	3 words	HEX	Word 1 Hi byte = $0 \times 02$
			Word 1 Lo byte = $0 \times 03$
			Word 2 Hi byte = $0 \times 04$
			Word 2 Lo byte = $0 \times 05$
			Power 1
0x0058	1 word	HEX	0x0000: Off
			0x0001: On
			Power 2
0x0059	1 word	HEX	0x0000: Off
			0x0001: On
			Fault LED Status
0x005A	1 word	HEX	0x0000: No
			0x0001: Yes
			DI1
0x0080	1 word	HEX	0x0000:Off
			0x0001:On
			DI2
0x0081	1 word	HEX	0x0000:Off
			0x0001:On
			D01
0x0082	1 word	HEX	0x0000:Off
			0x0001:On
			D02
0x0083	1 word	HEX	0x0000:Off
			0x0001:On
Port Information	้		
			Port 1 to 8 Status
0x1000 to			0x0000: Link down
0x1011	1 word	HEX	0x0001: Link up
0X1011			0x0002: Disable
			0xFFFF: No port
			Port 1 to 8 Speed
			0x0000: 10M-Half
0x1100 to	1 word	HEX	0x0001: 10M-Full
0x1111	1 WOLU		0x0002: 100M-Half
			0x0003: 100M-Full
			0xFFFF: No port
			Port 1 to 8 Flow Ctrl
0x1200 to	1 word	HEX	0x0000:Off
0x1211	1 word		0x0001:On
			0xFFFF:No port
			Port 1 to 8 MDI/MDIX
0x1300 to	1 word		0x0000: MDI
0x1311	1 word	HEX	0x0001: MDIX
			0xFFFF: No port
	1	1	

Address OffsetData TypeInterpretationDescription0x1400 to 0x1413 (Port 1)20 wordsASCIIPort 1 to 8 Description = "100TX,RJ45." Word 0 Hi byte = '1' Word 0 Lio byte = '0' Word 1 Lio byte = '0' Word 1 Lio byte = '0' Word 4 Lio byte = 'Y' Word 4 Lio byte = 'S' Word 5 Hi byte = 'Y' Word 5 Lio byte = 'S' Word 5 Lio byte = 'Y' Word 0 Lio byte = 'Y' Word 5 Lio byte = 'Y' Word 5 Lio byte = 'Y' Word 5 Lio byte = 'Y' Word 0 Lio byte = 'Y' Word 5 Lio byte = 'Y' Word 5 Lio byte = 'Y' Word 0 Lio byte = 'Y' Word 1 Lio 8 Tx Packets Ex: port 1 Tx Packet Amount = 443322 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2100 to 0x21232 wordsHEXPort 1 to 8 Tx Packets Ex: port 1 Tx Packet Amount = 443322 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x22232 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x22232 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x22232 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2300 to2 wordsHEXReceived MODBUS response: 0x4332211 Word 0 = 4433 Word 1 = 2211 Port 1 to 8 Tx Error Packet Amount = 4 Received MODBUS response:	11
Ox1400 to 0x1413 (Port 1)Port Description = "100TX,RJ45." Word 0 Hi byte = '1' Word 0 Li byte = '1' Word 0 Li byte = '1' Word 1 Li byte = '1' Word 1 Li byte = '0' Word 1 Li byte = '1' Word 1 Li byte = '1' Word 4 Li byte = '1' Word 5 Li byte = '1' Word 6 Li byte = '1' Word 1 = 2211 Word 0 = 4433 Word 1 = 22110x2100 to 0x21232 wordsHEXPort 1 to 8 Tx Packets Ex: port 1 Tx Packet Amount = 443322 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x22232 wordsHEXPort 1 to 8 Tx Error Packets Ex: port 1 Tx Error Packet Amount = 4 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x22232 wordsHEXPort 1 to 8 Tx Error Packet Amount = 4 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x22232 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2300 to 0x2300 to2 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 2211	11
UX1400 to 0x1413 (Port 1)20 wordsASCIIWord 0 Lo byte = `0' Word 1 Hi byte = '0' Word 1 Hi byte = '0' Word 1 Hi byte = '0' Word 4 Hi byte = `1' Word 4 Lo byte = `T' Word 5 Hi byte = `.' Word 5 Lo byte = `\0'Packets InformationPort 1 to 8 Tx Packets Ex: port 1 Tx Packet Amount = 4433221 Word 0 = 4433 Word 1 = 22110x2000 to 0x20232 wordsHEXPort 1 to 8 Rx Packets Ex: port 1 to 8 Rx Packets Ex: port 1 Rx Packet Amount = 4433221 Word 0 = 4433 Word 1 = 22110x2100 to 0x21232 wordsHEXPort 1 to 8 Rx Packets Ex: port 1 Rx Packet Amount = 443322 Word 0 = 4433 Word 1 = 2211 Word 0 = 4433 Word 1 = 22110x2200 to 0x22232 wordsHEXPort 1 to 8 Tx Pror Packets Ex: port 1 Rx Packet Amount = 443322 Word 0 = 4433 Word 1 = 2211 Word 0 = 4433 Word 1 = 22110x2200 to 0x22232 wordsHEXPort 1 to 8 Tx Fror Packet Amount = 4 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x2232 wordsHEXReceived MODBUS response: 0x4432211 Word 0 = 4433 Word 1 = 22110x2300 to 0x2232 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 2211	11
0x1413 (Port 1) 0x1414 to 0x1427 (Port 2)20 wordsASCIIWord 1 Lis byte = '0' Word 1 Lis byte = '0' Word 4 His byte = '1' Word 4 Lis byte = 'S' Word 5 His byte = '.' Word 5 Lis byte = '.' Word 5 His byte = '.' Word 5 Lis byte = '.' Word 5 His byte = '.' Word 5 Lis byte = '.' Word 5 His byte = '.' Word 6 His byte = '.' Word 0 = 4433 Word 1 = 2211 Word 0 = 4433 Word 1	11
Ox1414 to 0x1427 (Port 2)20 wordsASCIIWord 1 Hi byte = '0' Word 1 Lio byte = 'T' Word 4 Hi byte = 'A' Word 4 Lio byte = 'S' Word 5 Hi byte = '.' Word 5 Lio byte = '\0'Packets InformationPort 1 to 8 Tx Packets Ex: port 1 Tx Packet Amount = 443322 0x2000 to 0x2023Port 1 to 8 Tx Packets Ex: port 1 Tx Packet Amount = 443322 Word 0 = 4433 Word 1 = 22110x2100 to 0x21232 wordsHEXPort 1 to 8 Rx Packets Ex: port 1 Rx Packet Amount = 443322 Word 0 = 4433 Word 1 = 22110x2100 to 0x21232 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x2232 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x2232 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x2232 wordsHEXReceived MODBUS response: 0x4332211 Word 0 = 4433 Word 1 = 22110x200 to 0x2232 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x200 to 0x2232 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2300 to 0x2300 to2 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 2211	11
0x1414 to 0x1427 (Port 2)20 wordsASCIIWord 1 Lo byte = 'T' Word 4 Hi byte = 'A' Word 4 Lo byte = 'S' Word 5 Li byte = '.' Word 5 Lo byte = '\0'Packets Information0x2000 to 0x20232 wordsHEXPort 1 to 8 Tx Packets Ex: port 1 Tx Packet Amount = 443322 Word 0 = 4433 Word 1 = 2211 Word 0 = 4433 Word 1 = 22110x2100 to 0x21232 wordsHEXPort 1 to 8 Rx Packets Ex: port 1 Rx Packet Amount = 443322 Word 1 = 2211 Word 0 = 4433 Word 1 = 22110x2100 to 0x21232 wordsHEXPort 1 to 8 Rx Packets Ex: port 1 Rx Packet Amount = 443322 Word 1 = 2211 Word 0 = 4433 Word 1 = 2211 Word 0 = 4433 Word 1 = 22110x2200 to 0x2220 to 0x22232 wordsHEXPort 1 to 8 Tx Error Packet Amount = 4 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x2232 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x2232 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2300 to2 wordsHEXReceived MODBUS response: 0x4332211 Word 0 = 4433 Word 1 = 2211	11
UX1414 to 0x1427 (Port 2)Word 4 Hi byte = '4' Word 4 Lo byte = '5' Word 5 Hi byte = '.' Word 5 Lo byte = '.' Word 6 Ex: port 1 Tx Packet Amount = 44332211 Word 0 = 4433 Word 1 = 22110x2100 to 0x21232 wordsHEXPort 1 to 8 Tx Packet Amount = 4433221 Word 0 = 4433 Word 1 = 22110x2200 to 0x22232 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x2232 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x2232 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x2232 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2300 to 0x2300 to2 wordsHEXReceived MODBUS response: 0x211	11
Word 4 Hi byte = 4' Word 4 Lo byte = '5' Word 5 Hi byte = '.' Word 5 Lo byte = '\0'Packets InformationPort 1 to 8 Tx Packets Ex: port 1 Tx Packet Amount = 443322 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2100 to 0x21232 wordsHEXPort 1 to 8 Rx Packets Ex: port 1 to 8 Rx Packets Ex: port 1 Rx Packet Amount = 443322 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2100 to 0x21232 wordsHEXPort 1 to 8 Rx Packets Ex: port 1 Rx Packet Amount = 443322 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x22232 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x2232 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x2232 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2300 to 0x2300 to2 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2300 to 0x2300 to2 wordsHEXReceived MODBUS response: 0x4433221 Word 1 = 22110x2300 to 0x2300 to2 wordsHEXReceived MODBUS response:	11
Word 4 Lo byte = '5' Word 5 Hi byte = '.' Word 5 Lo byte = '\0'Packets InformationPort 1 to 8 Tx Packets Ex: port 1 Tx Packet Amount = 443322 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2100 to 0x21232 wordsHEXPort 1 to 8 Rx Packets Ex: port 1 Tx Packet Amount = 443322 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2100 to 0x21232 wordsHEXPort 1 to 8 Rx Packets Ex: port 1 Rx Packet Amount = 443322 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x22232 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x2232 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x2232 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2300 to 0x2300 to2 wordsHEXReceived MODBUS response: 0x2100x2300 to2 wordsHEXReceived MODBUS response: 0x2300 to	11
Packets InformationWord 5 Hi byte = `.' Word 5 Lo byte = `\0'Packets InformationPort 1 to 8 Tx Packets Ex: port 1 Tx Packet Amount = 443322 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2100 to 0x21232 wordsHEXPort 1 to 8 Rx Packets Ex: port 1 Rx Packet Amount = 443322 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2100 to 0x21232 wordsHEXPort 1 to 8 Rx Packets Ex: port 1 Rx Packet Amount = 443322 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x22232 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x2232 wordsHEXPort 1 to 8 Tx Error Packets Ex: port 1 Tx Error Packet Amount = 4 Word 0 = 4433 Word 1 = 22110x2300 to2 wordsHEXReceived MODBUS response: 0x4332211 Word 0 = 4433 Word 1 = 22110x2300 to2 wordsHEXReceived MODBUS response: 0x4332211 Word 0 = 4433 Word 1 = 2211	11
Word 5 Lo byte = '\0'Packets Information0x2000 to 0x20232 wordsHEXPort 1 to 8 Tx Packets Ex: port 1 Tx Packet Amount = 443322 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2100 to 0x21232 wordsHEXPort 1 to 8 Rx Packets Ex: port 1 Rx Packet Amount = 443322 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x2200 to 0x22232 wordsHEXPort 1 to 8 Tx Error Packets Ex: port 1 Rx Error Packets Ex: port 1 to 8 Tx Error Packets Ex: port 1 to 8 Tx Error Packets Ex: port 1 to 8 Rx Error Packets Ex: port 1 Tx Error Packets Ex: port 1 Tx Error Packets Ex: port 1 Tx Error Packets Ex: port 1 to 8 Rx Error Packets Ex: port 1 to 8 Rx Error Packets Ex: port 1 Tx Error Packets Ex:	11
Packets Information0x2000 to 0x20232 wordsHEXPort 1 to 8 Tx Packets Ex: port 1 Tx Packet Amount = 443322 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2100 to 0x21232 wordsHEXPort 1 to 8 Rx Packets Ex: port 1 Tx Packet Amount = 443322 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x22232 wordsHEXPort 1 to 8 Tx Error Packets Ex: port 1 Tx Error Packets Ex: port 1 Tx Error Packets Ex: port 1 Tx Error Packet Amount = 4 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x22232 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 2211 Port 1 to 8 Tx Error Packet Amount = 4 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 2211 Port 1 to 8 Rx Error Packet Amount = 4 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 2211 Port 1 to 8 Rx Error Packets Ex: port 1 Tx Error Packets Ex: port 1 Tx Error Packets Ex: port 1 Tx Error Packets Ex: port 1 to 8 Rx Error Packets Ex: port 1 Tx Error Packet Amount = 4 Received MODBUS response:	11
0x2000 to 0x20232 wordsHEXEx: port 1 Tx Packet Amount = 443322 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2100 to 0x21232 wordsHEXPort 1 to 8 Rx Packets Ex: port 1 Rx Packet Amount = 443322 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x22232 wordsHEXPort 1 to 8 Tx Error Packets Ex: port 1 to 8 Tx Error Packet Amount = 4 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x22232 wordsHEXPort 1 to 8 Tx Error Packets Ex: port 1 Tx Error Packet Amount = 4 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2300 to2 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2300 to2 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 2211	11
0x2000 to 0x20232 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2100 to 0x21232 wordsHEXPort 1 to 8 Rx Packets Ex: port 1 Rx Packet Amount = 443322 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x22232 wordsHEXPort 1 to 8 Tx Error Packets Ex: port 1 Tx Error Packet Amount = 4 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x22232 wordsHEXPort 1 to 8 Tx Error Packets Ex: port 1 Tx Error Packet Amount = 4 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2300 to2 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2300 to2 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 2211	
0x20232 wordsHEX0x44332211 Word 0 = 4433 Word 1 = 22110x2100 to 0x21232 wordsHEXPort 1 to 8 Rx Packets Ex: port 1 Rx Packet Amount = 443322 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x22232 wordsHEXPort 1 to 8 Tx Error Packets Ex: port 1 Tx Error Packet Amount = 4 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x22232 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2300 to2 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2300 to2 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 2211	
0x20232 wordsHEX0x44332211 Word 0 = 4433 Word 1 = 22110x2100 to 0x21232 wordsHEXPort 1 to 8 Rx Packets Ex: port 1 Rx Packet Amount = 443322 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x22232 wordsHEXPort 1 to 8 Tx Error Packets Ex: port 1 Tx Error Packet Amount = 4 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x22232 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2300 to2 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2300 to2 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 2211	
Word 1 = 22110x2100 to 0x21232 wordsHEXPort 1 to 8 Rx Packets Ex: port 1 Rx Packet Amount = 443322 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x22232 wordsHEXPort 1 to 8 Tx Error Packets Ex: port 1 to 8 Tx Error Packet Amount = 4 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x22232 wordsHEXPort 1 to 8 Tx Error Packets Ex: port 1 Tx Error Packet Amount = 4 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2300 to2 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2300 to2 wordsHEXReceived MODBUS response: 0x2300 to	
0x2100 to 0x21232 wordsHEXPort 1 to 8 Rx Packets Ex: port 1 Rx Packet Amount = 443322 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x22232 wordsHEXPort 1 to 8 Tx Error Packets Ex: port 1 Tx Error Packet Amount = 4 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x2200 to 0x2232 wordsHEXPort 1 to 8 Tx Error Packets Ex: port 1 Tx Error Packet Amount = 4 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2300 to2 wordsHEXReceived MODBUS response: 0x2300 to	
0x2100 to 0x21232 wordsHEXPort 1 to 8 Rx Packets Ex: port 1 Rx Packet Amount = 443322 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x22232 wordsHEXPort 1 to 8 Tx Error Packets Ex: port 1 Tx Error Packet Amount = 4 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x2200 to 0x2232 wordsHEXPort 1 to 8 Tx Error Packets Ex: port 1 Tx Error Packet Amount = 4 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2300 to2 wordsHEXReceived MODBUS response: 0x2300 to	
0x2100 to 0x21232 wordsHEXEx: port 1 Rx Packet Amount = 443322 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x22232 wordsHEXport 1 to 8 Tx Error Packets Ex: port 1 Tx Error Packet Amount = 4 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x22232 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2300 to2 wordsHEXReceived MODBUS response: 0x4332211 Word 0 = 4433 Word 1 = 22110x2300 to2 wordsHEXReceived MODBUS response: 0x2300 to	
0x2100 to 0x21232 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x22232 wordsHEXport 1 to 8 Tx Error Packets Ex: port 1 Tx Error Packet Amount = 4 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2300 to2 wordsHEXReceived MODBUS response: 0x4332211 Word 0 = 4433 Word 1 = 22110x2300 to2 wordsHEXReceived MODBUS response: 0x4332211 Word 0 = 4433 Bort 1 to 8 Rx Error Packets Ex: port 1 Rx Error Packet Amount = 4 Received MODBUS response:	11
0x2123HEX0x44332211 Word 0 = 4433 Word 1 = 22110x2200 to 0x22232 wordsHEXport 1 to 8 Tx Error Packets Ex: port 1 Tx Error Packet Amount = 4 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2300 to2 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Ex: port 1 to 8 Rx Error Packets Ex: port 1 to 8 Rx Error Packets Ex: port 1 Rx Error Packets Ex: port 1 Rx Error Packet Amount = 4 Received MODBUS response:	
Word 0 = 4433 Word 1 = 22110x2200 to 0x22232 wordsHEXport 1 to 8 Tx Error Packets Ex: port 1 Tx Error Packet Amount = 4 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2300 to2 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Ex: port 1 to 8 Rx Error Packets Ex: port 1 to 8 Rx Error Packets Ex: port 1 Rx Error Packets Ex: port 1 Rx Error Packets Ex: port 1 Rx Error Packet Amount = 4 Received MODBUS response:	
Word 1 = 22110x2200 to 0x22232 wordsHEXport 1 to 8 Tx Error Packets Ex: port 1 Tx Error Packet Amount = 4 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2300 to2 wordsHEXReceived MODBUS response: 0x44332211 Word 0 = 4433 Ex: port 1 to 8 Rx Error Packets Ex: port 1 to 8 Rx Error Packets Ex: port 1 Rx Error Packet Amount = 4 Received MODBUS response:	
0x2200 to 0x22232 wordsHEXport 1 to 8 Tx Error Packets Ex: port 1 Tx Error Packet Amount = 4 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2300 to2 wordsHEXPort 1 to 8 Rx Error Packets Ex: port 1 Rx Error Packet Amount = 4 Received MODBUS response:	
0x2200 to 0x22232 wordsHEXEx: port 1 Tx Error Packet Amount = 4 Received MODBUS response: 0x44332211 Word 0 = 4433 Word 1 = 22110x2300 to2 wordsHEXReceived MODBUS response: Distribution of the second secon	
0x2200 to 0x2223       2 words       HEX       Received MODBUS response: 0x4332211 Word 0 = 4433 Word 1 = 2211         0x2300 to       2 words       HEX       Received MODBUS response: 0x4332211 Word 0 = 4433 Ex: port 1 to 8 Rx Error Packets Ex: port 1 Rx Error Packet Amount = 4 Received MODBUS response:	1222211
0x2223 0x2223 0x2300 to 2 words HEX 0x2300 to 2 words HEX 0x2300 to 2 words HEX 0x2300 to 2 words HEX 0x2300 to 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	552211
Word 0 = 4433         Word 1 = 2211         port 1 to 8 Rx Error Packets         Ex: port 1 Rx Error Packet Amount = 4         0x2300 to       2 words         HEX	
Word 1 = 2211         word 1 = 2211         port 1 to 8 Rx Error Packets         Ex: port 1 Rx Error Packet Amount = 4         0x2300 to       2 words         HEX       Received MODBUS response:	
port 1 to 8 Rx Error Packets0x2300 to2 wordsHEXReceived MODBUS response:	
0x2300 to 2 words HEX EEx: port 1 Rx Error Packet Amount = 4 Received MODBUS response:	
0x2300 to 2 words HEX Received MODBUS response:	1222211
	1222211
0x2323 0x44332211	
Word $0 = 4433$	
Word 1 = 2211           Redundancy Information	
Redundancy Protocol	
0x0000:None	
0x0001:RSTP	
0x3000 1 word HEX 0x0002:Turbo Ring	
0x0002:1000 Ring 0x0003:Turbo Ring V2	
0x0003:Turbo Ring V2 0x0004:Turbo Chain	
0x0004:10rbo Chain 0x0005: MSTP	
RSTP Root	
0x3100 1 word HEX 0x00001 Not Root	
0x0001: Root	
OxFFFF: RSTP Not Enable	
RSTP Port 1 to 8 Status	
0x0000: Port Disabled	
0x0001: Not RSTP Port	
0x3200 to 0x0002: Link Down	
0x3211 0x0003: Blocked	
0x0004: Learning	
0x0005: Forwarding	
0xFFFF: RSTP Not Enable	
TurboRing Master/Slave	
0x0000: Slave	

Address Offset	Data Type	Interpretation	Description
			TurboRing 1st Port status
			0x0000: Port Disabled
		HEX	0x0001: Not Redundant Port
0x3301	1 word		0x0002: Link Down
			0x0003: Blocked
			0x0004: Learning
			0x0005: Forwarding
			TurboRing 2nd Port status
			0x0000: Port Disabled
			0x0001: Not Redundant Port
0x3302	1 word	HEX	0x0002: Link Down
			0x0003: Blocked
			0x0004: Learning
			0x0005:Forwarding
			TurboRing Coupling
			0x0000: Off
0x3303	1 word	HEX	0x0001: On
			0xFFFF: Turbo Ring is Not Enabled
			TurboRing Coupling Port Status
			0x0000: Port Disabled
			0x0001: Not Coupling Port
0x3304	1 word	HEX	0x0002: Link Down
			0x0003: Blocked
			0x0005: Forwarding
			0xFFFF: Turbo Ring is Not Enabled
			TurboRing Coupling Control Port Status
	1 word	HEX	0x0000: Port Disabled
			0x0001: Not Coupling Port
			0x0002: Link Down
0x3305			0x0003: Blocked
			0x0005: Forwarding
			0x0006: Inactive
			0x0007:Active
			0xFFFF:Turbo Ring is Not Enabled
			TurboRing V2 Coupling Mode
	1 word	HEX	0x0000: None
			0x0001: Dual Homing
0x3500			0x0002: Coupling Backup
			0x0003: Coupling Primary
			0xFFFF:Turbo Ring V2 is Not Enabled
			TurboRing V2 Coupling Port Primary Status
			(Used in Dual Homing, Coupling Backup, and
			Coupling Primary)
			0x0000:Port Disabled
			0x0001: Not Coupling Port
0x3501	1 word	HEX	0x0002: Link Down
			0x0003: Blocked
			0x0004: Learning
			0x0005: Forwarding
			0xFFFF: Turbo Ring V2 is Not Enabled
			TurboRing V2 Coupling Port Backup Status
			(Only using in Dual Homing)
			0x0000: Port Disabled
			0x0001: Not Coupling Port
0x3502	1 word	HEX	0x0002: Link Down
			0x0003: Blocked
			0x0004: Learning
			0x0005: Forwarding
			0xFFFF: Turbo Ring V2 Not Enable
			0x0005: Forwarding

Address Offset	Data Type	Interpretation	Description
Address Offset		Interpretation	TurboRing V2 Ring 1 status
			0x0000: Healthy
0x3600	1 word	HEX	0x00001: Break
			0xFFFF:Turbo Ring V2 Not Enable
			TurboRing V2 Ring 1 Master/Slave
			0x0000: Slave
0x3601	1 word	HEX	0x0000: Slave
			0xFFFF: Turbo Ring V2 Ring 1 Not Enable TurboRing V2 Ring 1 1st Port Status
			0x0000: Port Disabled
			0x00001: Not Redundant Port
			0x0001: Not Redundant Port
0x3602	1 word	HEX	0x0002: Elik Down 0x0003: Blocked
			0x0004:Learning
			0x0005:Forwarding
			0xFFFF:Turbo Ring V2 Ring 1 is Not Enabled TurboRing V2 Ring 1's 2nd Port Status
			0x0000: Port Disabled
			0x0001: Not Redundant Port
0x3603	1 word	HEX	0x0002: Link Down
			0x0003: Blocked
			0x0004: Learning
			0x0005: Forwarding
			0xFFFF: Turbo Ring V2 Ring 1 is Not Enabled
			TurboRing V2 Ring 2 Status
0x3680	1 word	HEX	0x0000: Healthy
		,	0x0001: Break
			0xFFFF: Turbo Ring V2 Ring 2 is Not Enabled
			TurboRing V2 Ring 2 Master/Slave
0x3681	1 word	HEX	0x0000: Slave
			0x0001: Master
			0xFFFF: Turbo Ring V2 Ring 2 is Not Enabled
			TurboRing V2 Ring 2's 1st Port Status
			0x0000: Port Disabled
			0x0001: Not Redundant
0x3682	1 word	HEX	0x0002: Link Down
			0x0003: Blocked
			0x0004: Learning
			0x0005: Forwarding
			0xFFFF: Turbo Ring V2 Ring 2 is Not Enabled
			TurboRing V2 Ring 2's 2nd Port Status
			0x0000: Port Disabled
			0x0001: Not Redundant
0.000			0x0002: Link Down
0x3683	1 word	HEX	0x0003: Blocked
			0x0004: Learning
			0x0005: Forwarding
			0xFFFF: Turbo Ring V2 Ring 2 is Not Enabled
			Turbo Chain Switch Roles
			0x0000: Head
0x3700	1 word	HEX	0x0000: Head 0x0001: Member
0,3700	- word		0x0001: Member 0x0002: Tail
			0x6002: Tall 0xFFFF: Turbo Chain is Not Enabled
			Turbo Chain 1st Port status
			0x0000: Link Down
		HEX	0x00001: Blocking
0x3701	1 word		0x0001: Blocking 0x0002: Blocked
			0x0002: Blocked 0x0003: Forwarding
			-
			0xFFFF: Turbo Ring V2 Ring 2 Not Enable

Address Offset	Data Type	Interpretation	Description	
			Turbo Chain	2nd Port status
			0x0000: Linl	k Down
0,2702	1 word		0x0001: Blo	cking
0x3702	1 word	HEX	0x0002: Blo	cked
			0x0003: For	warding
			0xFFFF: Turt	oo Ring V2 Ring 2 Not Enable
MSTP Register				
				Port Role / Port State
	1 1 0 0100		0x00:	DisabledPort / 0x00 Port Disabled
	1 word, 0x0103		0x01:	DesignatedPort / 0x01 Discarding
0 4000 0 4075	=> port role =		0x02:	RootPort / 0x02 Learning
0x4000 ~ 0x407F	DesignatedPort	HEX	0x03:	AlternatePort / 0x03 Forwarding
	port state =		0x04:	BackupPort
	Forwarding		0x06:	Not MSTP Port / 0x06Not MSTP
			Port	
			0xFFFF:	MSTP Not Enable
				Port Role / Port State
			0x00:	DisabledPort / 0x00 Port Disabled
	1 word, 0x0103		0x01:	DesignatedPort / 0x01Discarding
	=> port role =		0x02:	RootPort / 0x02Learning
0x4080 ~ 0x40FF	DesignatedPort	HEX	0x03:	AlternatePort / 0x03Forwarding
	port state = Forwarding		0x04:	BackupPort
			0x05:	MasterPort
			0x06:	Not MSTP Port / 0x06Not MSTP
			Port	MCTD Net Freble
			0xFFFF:	MSTP Not Enable
	1 word, 0x0103 => port role = DesignatedPort port state = Forwarding	НЕХ	0x00:	Port Role / Port State DisabledPort / 0x00 Port Disabled
			0x00: 0x01:	DesignatedPort / 0x00 Port Disabled
			0x01: 0x02:	RootPort / 0x02Learning
			0x02: 0x03:	AlternatePort / 0x02Learning
0x4100 ~ 0x417F			0x03: 0x04:	BackupPort
			0x04: 0x05:	MasterPort
			0x05: 0x06:	Not MSTP Port / 0x06Not MSTP
			Port	
			0xFFFF:	MSTP Not Enable
			-	Port Role / Port State
			0x00:	DisabledPort / 0x00 Port Disabled
			0x01:	DesignatedPort / x01Discarding
	1 word, 0x0103		0x02:	RootPort / 0x02Learning
	=> port role =		0x03:	AlternatePort / 0x03Forwarding
0x4180 ~ 0x41FF	DesignatedPort	HEX	0x04:	BackupPort
	port state =		0x05:	MasterPort
	Forwarding		0x06:	Not MSTP Port / 0x06Not MSTP
			Port	
			0xFFFF:	MSTP Not Enable
			MSTP MSTI4	Port Role / Port State
			0x00:	DisabledPort / 0x00 Port Disabled
	1 word 0:0102		0x01:	DesignatedPort / 0x01Discarding
	1 word, 0x0103		0x02:	RootPort / 0x02Learning
0.4200 0.4275	=> port role =		0x03:	AlternatePort / 0x03Forwarding
0x4200 ~ 0x427F	DesignatedPort	HEX	0x04:	BackupPort
	port state =		0x05:	MasterPort
	Forwarding		0x06:	Not MSTP Port / 0x06Not MSTP
			Port	
			0xFFFF:	MSTP Not Enable
			0.1111.	

Address Offset	Data Type	Interpretation	Description	1	
			MSTP MSTI5	Port Role / Port State	
			0x00:	DisabledPort / 0x00 Port Disabled	
	1 word 0x0102		0x01:	DesignatedPort / 0x01Discarding	
	1 word, 0x0103		0x02:	RootPort / 0x02Learning	
0x4280 ~ 0x42FF	=> port role =	HEX	0x03:	AlternatePort / 0x03Forwarding	
084200 ~ 0842FF	DesignatedPort		0x04:	BackupPort	
	port state = Forwarding		0x05:	MasterPort	
	Forwarding		0x06:	Not MSTP Port / 0x06Not MSTP	
			Port		
			0xFFFF:	MSTP Not Enable	
			MSTP MSTI6	MSTP MSTI6 Port Role / Port State	
	1 word, 0x0103 => port role = DesignatedPort port state = Forwarding		0x00:	DisabledPort / 0x00 Port Disabled	
		НЕХ	0x01:	DesignatedPort / 0x01Discarding	
			0x02:	RootPort / 0x02Learning	
0x4300 ~ 0x437F			0x03:	AlternatePort / 0x03Forwarding	
0,4500 ** 0,4571			0x04:	BackupPort	
			0x05:	MasterPort	
			0x06:	Not MSTP Port / 0x06Not MSTP	
			Port		
			0xFFFF:	MSTP Not Enable	
			MSTP MSTI7	' Port Role / Port State	
			0x00:	DisabledPort / 0x00 Port Disabled	
	1 word, 0x0103		0x01:	DesignatedPort / 0x01Discarding	
	=> port role =		0x02:	RootPort / 0x02Learning	
0x4380 ~ 0x43FF	DesignatedPort	HEX	0x03:	AlternatePort / 0x03Forwarding	
	port state =		0x04:	BackupPort	
	Forwarding		0x05:	MasterPort	
			0x06:	Not MSTP Port / 0x06Not MSTP	
			Port		
			0xFFFF:	MSTP Not Enable	

# Introduction

EtherNet/IP is an Industrial Ethernet Protocol defined by the ODVA association. The protocol is open to the public and vendors can implement EtherNet/IP into their industrial devices without incurring a license fee. Many vendors have adopted this protocol as the standard communication protocol between devices. For example, Rockwell Automation uses EtherNet/IP as the standard protocol for their Logix controllers over Ethernet networks.

To allow complete integration with a Rockwell system, Moxa switches not only provide a full-functioning of industrial network infrastructure, but also enable the SCADA system to monitor the status of the switches as well as that of the PLCs, .making the switches part of a Rockwell system.

# **Messaging Types**

EtherNet/IP supports two types of communication methods for EtherNet/IP devices: Explicit Messaging and Implicit Messaging. Explicit Messaging is unscheduled and is used for a request/response communication procedure (or client/server procedure). Explicit Messaging uses TCP/IP over Ethernet. Implicit Messaging is scheduled and is used for a producer/consumer communication with UDP over Ethernet. Implicit Messaging is also called I/O Messaging.

# **Configuring EtherNet/IP on Moxa Switches**

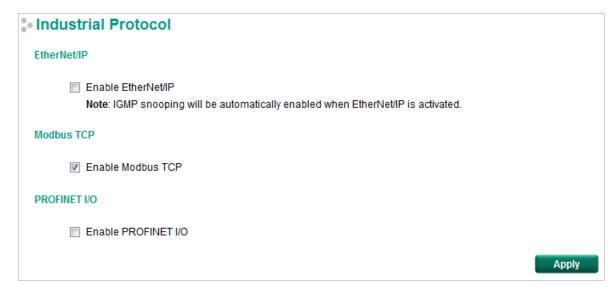
#### Type 1:



Check the **Enable** checkbox to enable EtherNet/IP. With EtherNet/IP enabled, IGMP Snooping and IGMP Query functions will be enabled automatically to be properly integrated in Rockwell systems for multicast Implicit (I/O) Messaging.

#### Type 2: New UI2.0

The default Modbus TCP support is enabled. To disable the Modebus TCP support, uncheck the **Enable Modbus TCP** then click **Apply** to activate the setting.



# **CIP Objects of EtherNet/IP**

Several communication objects are defined in CIP (Common Industrial Protocol). Moxa switches support the following objects for PLCs and SCADA systems to monitor:

- Identity Object
- TCP/IP Interface Object
- Ethernet Link Object
- Assembly Object
- Message Router Object
- Connection Manager Object
- Port Object
- Moxa Networking Object (Vendor Specific)

The supported attributes and services of the above objects are introduced in the table below, including the access rules for each attribute. To understand the details of each attribute of the standard objects, refer to the official documents of CIP introduction (Vol. 1) and the EtherNet/IP Adaptation of CIP (Vol. 2).

# **Identity Object**

The Class code of Identity object is **0x01** (Defined in CIP Vol1, 5-2).

There is **one** instance of this object in our product. It stores the information of the production and the device. The following tables summarize the class attributes and the instance attributes.

Attr ID	Access Rule	Name	Data Type	Description
1	Get	Revision	UINT (16)	Revision of this object
2	Get	Max Instance	UINT (16)	Maximum instance number of an object currently created in this class level of the device
3	Get	Number of Instances	UINT (16)	Number of object instances currently created in this class level of the device.
6	Get	Maximum ID Number Class Attributes	UINT (16)	The attribute ID number of the last class attribute of the class definition implemented in the device
7	Get	Maximum ID Number Instance Attributes	UINT (16)	The attribute ID number of the last instance attribute of the class definition implemented in the device

#### **Class Attribute List**

#### **Instance Attribute List**

Attr ID	Access Rule	Name	(Struct.)	Data Type	Description
1	Get	Vendor ID		UINT (16)	991, the vendor ID of Moxa.
2	Get	Device Type		UINT (16)	0 x 307, "Managed Ethernet Switch".
3	Get	Product Code		UINT (16)	Please refer to Product Code Table.
				(Struct.)	The version of the Identity object
4	Get	Revision	Major	USINT (8)	The structure member, major
			Minor	USINT (8)	The structure member, minor.
5	Get	Status		WORD (16)	Not used
6	Get	Serial Number		UDINT (32)	The serial number of each device
7	Get	Product Name		SHORT_ STRING	The product name in human-readable format
15	Get/Set	Assigned Name		STRINGI	The assigned switch name For example: "Managed Redundant Switch xxxxx". (xxxxx is series number.)
17	Get/Set	Geographic Location		STRINGI	The assigned switch location The default string is "Switch Location".

The Identity Object Instance supports the following CIP Common services:

#### **Common Service List**

Service	Impler	nentation	-Service Name	Description
Code	Class	Instance	Service Name	Description
0x01	$\checkmark$	V	Get_Attributes_All	Returns the contents of all attributes of the class
0x0E	✓	<b>√</b>	Get_Attribute_Single	Used to read an object instance attribute.
0x10		<b>√</b>	Set_Attribute_Single	Used to write an object instance attribute
0x05		$\checkmark$	Reset	Invokes the reset service for the device

#### **Product Code Table**

Product Code	Model Name	Product Code	Model Name	Product Code	Model Name
0x0001	EDS-518A	0x001D	EOM-104FO	0x0050	ICS-G7828A
0x0002	EDS-405A	0x0020	EDS-P506A	0x0050	ICS-G7826A
0x0003	EDS-408A	0x0021	PT-7728-PTP	0x0050	IKS-G6824A
0x0004	EDS-505A	0x0022	PT-510	0x0051	ICS-G7752A
0x0005	EDS-508A	0x002C	PT-508	0x0051	ICS-G7750A

Product Code	Model Name	Product Code	Model Name	Product Code	Model Name
0x0006	EDS-510A	0x002D	PT-7528	0x0051	ICS-G7748A
0x0007	EDS-516A	0x0033	EDS-G508E	0x0052	ICS-G7852A
0x0009	PT-7728	0x0033	EDS-G512E	0x0052	ICS-G7850A
0x000B	PT-7828	0x0033	EDS-G516E	0x0052	ICS-G7848A
0x000C	PT-7710	0x0033	EDS-G512E-8POE	0x0053	EDS-518E
0x000F	EDS-G509	0x003B	EDS-408A-SS-ST-BP	0x0056	IKS-6728A-8POE
0x0010	EDS-P510	0x003C	EDS-510A-3SFP-2SSC	0x0057	RedBox
0x0013	EDS-608	0x0040	EDS-P510A-8PoE	0x0058	IKS-6728A
0x0015	EDS-611	0x0041	IEX-402-VDSL	0x0058	IKS-6726A
0x0016	EDS-616	0x0043	EDS-510E	0x0064	EDS-528E
0x0017	EDS-619	0x004F	ICS-G7528A	0x0065	PT-G7828
0x0018	EOM-104	0x004F	ICS-G7526A	0x0070	PT-G7728
0x0019	PT-G7509	0x004F	IKS-G6524A	0x0071	EDS-P506E

# **TCP/IP Interface Object**

The Class code of TCP/IP Interface object is **0xf5** (Defined in CIP Vol2, 5-3). There is **one** instance of this object.

The following tables summarize the attributes of this object.

Attr ID	Access Rule	Name	Data Type	Description
1	Get	Revision	UINT (16)	Revision of this object.
2	Get	Max Instance	UINT (16)	Maximum instance number of an object currently created in this class level of the device
3	Get	Number of Instances	UINT (16)	Number of object instances currently created at this class level of the device
6	Get	Maximum ID Number Class Attributes	UINT (16)	The attribute ID number of the last class attribute of the class definition implemented in the device
7	Get	Maximum ID Number Instance Attributes	UINT (16)	The attribute ID number of the last instance attribute of the class definition implemented in the device

#### **Class Attribute List**

#### **Instance Attribute List**

Attr ID	Access Rule	Name	(Struct.)	Data Type	Description
1	Get	Status		DWORD (32)	Interface status 0 = The Interface Configuration attribute has not been configured. 1 = The Interface Configuration attribute contains valid configuration obtained from BOOTP, DHCP or non-volatile storage.
2	Get	Configurati on Capability		DWORD (32)	Interface capability flags Bit map of capability flags: Bit 0: BOOTP Client Bit 1: DNS Client Bit 2: DHCP Client Bit 3: DHCP-DNS Update Bit 4: Configuration Settable

Attr ID	Access Rule	Name	(Struct.)	Data Type	Description
3	Get/Set	Configurati on Control		DWORD (32)	Interface control flags Bit map of control flags: Bit 0 to 3: Startup Configuration 0 = The device shall use the interface configuration values previously stored (for example, in non-volatile memory or via hardware witches). 1 = The device shall obtain its interface configuration values via BOOTP. 2 = The device shall obtain its interface configuration values via DHCP upon start-up. 3 to15 = Reserved.
4	Get	Physical Link Object	Path Size Path	(Struct.) UINT (16) Padded EPATH	Path to physical link object Size of Path Logical segments identifying the
				(Struct.)	physical link object TCP/IP network interface configuration
			IP Address	UDINT (32)	The device's IP address
			Network Mask	UDINT (32)	The device's network mask
5	Get/Set	Interface Configurati	Gateway Address	UDINT (32)	Default gateway address
		on	Name Server	UDINT (32)	Primary name server
			Name Server2	UDINT (32)	Secondary name server
			Domain Name	STRING	Default domain name
6	Get/Set	Host Name		STRING	Host name

The TCP/IP Object Instance supports the following CIP Common services:

#### **Common Service List**

Service	Impler	nentation	Service Name	Description	
Code	Class	Instance	Service Mallie	Description	
0 x 01	$\checkmark$	✓	Get_Attributes_All	Returns the contents of all attributes of the class	
0 x 0E	✓	✓	Get_Attribute_Single	Used to read an object instance attribute	
0 x 10		✓	Set_Attribute_Single	Used to modify an object instance attribute	

# **Ethernet Link Object**

The Class code of Ethernet Link object is **0xf6** (Defined in CIP Vol2, 5-4). For each switch port, there is an instance of this class. The following table shows the mapping of instance number and the switch port number.

Instance Number	Mapping to
0	Ethernet Link class
1	1st switch port
2	2nd switch port
3	3rd switch port

The following tables summarize the attributes of the Ethernet Link object.

There are some vendor specific attributes in the table (Starting from attribute Id 100).

#### **Class Attribute List**

Attr	ID Access Rule	Name	Data Type	Description
1	Get	Revision	UINT (16)	Revision of this object

Attr ID	Access Rule	Name	Data Type	Description
2	Get	Max Instance	UINT (16)	Maximum instance number of an object currently created in this class level of the device
3	Get	Number of Instances	UINT (16)	Number of object instances currently created in this class level of the device
6	Get	Maximum ID Number Class Attributes	UINT (16)	The attribute ID number of the last class attribute of the class definition implemented in the device
7	Get	Maximum ID Number Instance Attributes	UINT (16)	The attribute ID number of the last instance attribute of the class definition implemented in the device
100	Get	Moxa-specific Revision	UINT (16)	Revision of Moxa specific attributes and services

#### Instance attribute list

Attr ID	Access Rule	Name	(Struct.)	Data Type	Description
1	Get	Interface Speed		UDINT (32)	Interface speed currently in use (Speed in Mbps, e.g., 0, 10, 100, 1000, etc.)
2	Get	Interface Flags		DWORD (32)	Refer to the Interface Flags table.
3	Get	Physical Address		ARRAY of 6 USINT(8)	MAC layer address (The System MAC address).
				(Struct.)	Counters relevant to the receipt of packets.
			In Octets	UDINT (32)	Octets received on the interface.
			In Ucast Packets	UDINT (32)	Unicast packets received on the interface.
			In NUcast Packets	UDINT (32)	Non-unicast packets received on the interface.
			In Discards	UDINT (32)	Inbound packets received on the interface but are discarded.
4 Get	Get	Interface Counters	In Errors	UDINT (32)	Inbound packets that contain Errors (does not include In Discards).
			Out Octets	UDINT (32)	Octets sent on the interface.
			Out Ucast Packets	UDINT (32)	Unicast packets sent on the interface.
			Out NUcast Packets	UDINT (32)	Non-unicast packets sent on the interface.
			Out Discards	UDINT (32)	Discarded outbound packets.
			Out Errors	UDINT (32)	Outbound packets that contain errors.
				(Struct.)	
			Alignment Errors	UDINT (32)	Received frames that are not an integral number of octets in length.
			FCS Errors	UDINT (32)	Received frames that do not pass the FCS check.
5	Get		Single Collisions	UDINT (32)	Successfully transmitted frames which experienced exactly one collision.
			Multiple Collisions	UDINT (32)	Successfully transmitted frames which experienced more than one collision.
			SQE Test Errors	UDINT (32)	Number of times the SQE test error message is generated.

Attr ID	Access Rule	Name	(Struct.)	Data Type	Description
			Deferred Transmissi ons	UDINT (32)	Frames for which first transmission attempt is delayed because the medium is busy. Number of times a collision is
			Late Collisions	UDINT (32)	detected later than 512 bit times into the transmission of a packet.
			Excessive Collisions	UDINT (32)	Frames for which transmission fails due to excessive collisions.
			MAC Transmit Errors	UDINT (32)	Frames for which transmission fails due to an internal MAC sublayer transmit error.
			Carrier Sense Errors	UDINT (32)	Times that the carrier sense condition was lost or never asserted when attempting to transmit a frame.
			Frame Too Long	UDINT (32)	Received frames that exceed the maximum permitted frame size.
			MAC Receive Errors	UDINT (32)	Frames for which reception on an interface fails due to an internal MAC sublayer receive error.
				(Struct.)	Configuration for physical interface.
6	Get/Set	Interface Control	Control Bits	WORD (16)	Bit 0: Auto-Negotiate Value 0: Force Value 1: Auto-Nego Bit 1: Half/Full Duplex Value 0: half duplex Value 1: full duplex Bit 2 to 15: Reserved, all zero
			Forced Interface Speed	UINT (16)	Speed at which the interface shall be forced to operate.
10	Get	Interface Label		SHORT_STRING	Human readable identification
100	Get	Interface Port Index		UDINT (32)	Port index.
101	Get	Interface Media Type		STRING	Media type
102	Get/Set	Broadcast Storm Protection		USINT (8)	Value 0: Disabled Broadcast Storm Protection. Value 1: Enable Broadcast Storm Protection. (Only selected products support this function)
103	Get	Interface Utilization		USINT (8)	RX interface utilization in percentage
104	Get/Set	Utilization Alarm Upper Threshold		USINT (8)	RX interface utilization upper limit in percentage
105	Get/Set	Utilization Alarm Lower Threshold		USINT (8)	Not supported
106	Get/Set	Port Link Alarm		USINT (8)	Value 0: Ignore Value 1: On (Relay 1) Value 2: On (Relay 2) Value 3: Off (Relay 1) Value 4: Off (Relay 2)
107	Get/Set	Port Traffic-Overload Alarm		USINT (8)	Value 0: Disable Value 1: Enable(Relay 1) Value 2: Enable(Relay 2)

Attr ID	Access Rule	Name	(Struct.)	Data Type	Description
108	Get	Tx Unicast Packet Rate		UDINT(32)	Number of TX unicast packets per second
109	Get	Rx Unicast Packet Rate		UDINT(32)	Number of RX unicast packets per second
110	Get	Tx Multicast Packet Rate		UDINT(32)	Number of TX multicast packets per second
111	Get	Rx Multicast Packet Rate		UDINT(32)	Number of RX multicast packets per second
112	Get	Tx Broadcast Packet Rate		UDINT(32)	Number of TX broadcast packets per second
113	Get	Rx Broadcast Packet Rate		UDINT(32)	Number of RX broadcast packets per second
114	Get	Tx Multicast Packet		UDINT(32)	Total number of TX multicast packets
115	Get	Rx Multicast Packet		UDINT(32)	Total number of RX multicast packets
116	Get	Tx Broadcast Packet		UDINT(32)	Total number of TX broadcast packets
117	Get	Rx Broadcast Packet		UDINT(32)	Total number of RX broadcast packets
118	Get	Redundant Port Status		UDINT(32)	Bit 0 = Disable Bit 1 = Not Redundant port Bit 2 = Link down Bit 3 = Blocking Bit 4 = Learning Bit 5 = Forwarding

#### **Interface Flags**

Bit(s)	Called	Definition
		0 indicates an inactive link;
0	Link Status	1 indicates an active link.
		0 indicates half duplex;
1	Half/Full Duplex	1 indicates full duplex.
		Indicates the status of link auto-negotiation
		0 = Auto-negotiation in progress.
		1 = Auto-negotiation and speed detection failed. Using default values
		for speed and duplex. Default values are product-dependent;
2-4	Negotiation Status	recommended defaults are 10Mbps and half duplex.
2-4	Negociation Status	2 = Auto negotiation failed but detected speed. Duplex was defaulted.
		Default value is product-dependent; recommended default is half
		duplex.
		3 = Successfully negotiated speed and duplex.
		4 = Auto-negotiation not attempted. Forced speed and duplex.
		0 indicates the interface can activate changes to link parameters
-	Manual Setting Requires	(auto-negotiate, duplex mode, interface speed) automatically. 1
5	Reset	indicates the device requires a Reset service be issued to its Identity
		Object in order for the changes to take effect.
		0 indicates the interface detects no local hardware fault; 1 indicates a
		local hardware fault is detected. The meaning of this is product-
	Local Hardware	specific. For example, an AUI/MII interface might detect no
6		transceiver attached, or a radio modem might detect no antenna
	Fault	attached. In contrast to the soft, possibly self-correcting nature of the
		Link Status being inactive, this is assumed a hard-fault requiring user
		intervention.
7~31	Reserved.	Shall be set to zero

The Ethernet Link Object Instance supports the following CIP common services:

#### **Common Service List**

Service	Impler	nentation	Service Name	Description	
Code	Class	Instance	Service Mallie		
0x0E	✓	✓	Get_Attribute_Single	Used to read an object instance attribute	
0x10		V	Set_Attribute_Single	Used to modify an object instance attribute	

# **Assembly Object**

The Moxa switch support **static** assembly object for CIP I/O messaging.

The Class code is **0x04** (Defined in CIP Vol 1, 5-5).

There are three instances of this object as the following.

	Instance Number	Size (32 bit)
Input	2	5
Output	1	2
Configuration	3	0

The **Input** means the data is produced by switch which includes the information and status report to the originator for monitoring. The **Output** means the data is generated by the originator (remote host) and is consumed by switch.

#### **Class Attribute List**

Attr ID	Access Rule	Name	Data Type	Description
1	Get	Revision	UINT (16)	Revision of this object

#### **Instance Attribute List**

Attr ID	Access Rule	Name	(Struct.)	Data Type	Description
3	Get/Set	Data		Array of BYTE	The implicit messaging content
4	Get	Size		UINT (16)	Number of bytes in Attr. 3

#### **Common Service List**

Service	ervice Implementation		Service Name	Description	
Code	Class	Instance		Description	
0x0E	✓	$\checkmark$	Get_Attribute_Single	Used to read an object instance attribute	
0x10		$\checkmark$	Set_Attribute_Single	Used to modify an object instance attribute	

For the definition of the I/O messaging, see the following table for details.

#### I/O Messaging Content

Direction	I/O data	Size	Value & Description
	Switch Fault Status	UDINT (32)	Please refer to Moxa Networking Object Attr ID 2.
Input	Port Exist	ULINT (64)	Please refer to Moxa Networking Object Attr ID 4.
	Port Link Status	ULINT (64)	Please refer to Moxa Networking Object Attr ID 6.
Output	Port Enable	ULINT (64)	Please refer to Moxa Networking Object Attr ID 5.

# **Message Router Object**

The object within a node that distributes messaging requests to the appropriate application objects.

The supported messaging connections are as the following:

- Explicit Messaging
- Unconnected Messaging
- Implicit messaging

When using the UCMM to establish an explicit messaging connection, the target application object is the Message Router object (Class Code 2).

#### **Class Attribute List**

Attr ID	Access Rule	Name	Data Type	Descriptions
1	Get	Revision	UINT (16)	Revision of this object

#### **Instance Attribute List**

Attr ID	Access Rule	Name	(Struct.)	Data Type	Description
				(Struct.)	A list of supported objects
1	Get	Object list	Number	UINT (16)	Number of supported classes in the
1 0	Gel	Object_list	Number 0		classes array
			Classes	Array of UINT (16)	List of supported class codes
ъ	Get	Number		UINT (16)	Maximum number of connections
2	Gel	Available			supported
3	Get	Number		UINT (16)	Number of connections currently used
5	Gel	Active		01111 (10)	by system components
4	Get	Active		Array of UINT (16)	A list of the connection IDs of the
4	Gel	Connections		Anay of OINT (10)	currently active connections

#### **Common Service List**

Service	Implementation		Service Name	Description		
Code Class		Instance		Description		
0x0E		$\checkmark$	Get_Attribute_Single	Used to read an object instance attribute		

# **Connection Manager Object**

The Connection Manager Class allocates and manages the internal resources associated with both I/O and Explicit Messaging connections.

The class code is **0x06**. There is one instance of this object.

The supported connection trigger type is *cyclic* and *change of state*.

The instance attribute list is introduced as the following.

#### **Class Attribute List**

Attr ID	Access Rule	Name	Data Type	Description
1	Get	Revision	UINT (16)	Revision of this object

#### Instance Attribute List

Attr ID	Access Rule	Name	Data Type	Description
1	Get/Set	Open Requests	UINT(16)	Number of Forward Open service requests received

#### **Common Service List**

Service	Implen	nentation	Service Name	Description
Code	Class	Instance		Description
0x0e	√	$\checkmark$	Get_Attribute_Single	Returns the contents of the specified attribute
0x10		✓	Set_Attribute_Single	Used to modify an object instance attribute
0x4E		✓	Forward_Close	Closes a connection
0x54		$\checkmark$	Forward_Open	Opens a connection

# **Port Object**

The port object represents the underlying interface of CIP which is EtherNet/IP.

The class code is **0xf4**. There is one instance of this object.

The instance attribute "**Port Type**" identifies the CIP adaptation.

#### **Class Attribute List**

Attr ID	Access Rule	Name	(Struct.)	Data Type	Description
1	Get	Revision		UINT (16)	Revision of this object
2	Get	Max Instance		UINT (16)	Maximum instance number of an object currently created in this class level of the device
3	Get	Number of Instances		UINT (16)	Number of object instances currently created at this class level of the device.
8	Get	Entry Port		UINT (16)	The attribute ID number of the last class attribute of the class definition implemented in the device
9	Get	Port Instance		(Array of Struct.)	
9	Gel	Info	Port Type	UINT (16)	Enumerates the type of port
			Port Number	UINT (16)	CIP port number associated with this port

#### **Instance Attribute List**

Attr ID	Access Rule	Name	(Struct.)	Data Type	Description
1	Get	Port Type		UINT (16)	Enumerates the type of port. 4 = EtherNet/IP.
2	Get	Port Number		UINT (16)	CIP port number associated with this port. (Value 1 is reserved for internal product use)
				(Struct.)	
3	Get	Link Object	Path Length	UINT (16)	Number of 16 bit words in the following path.
5	Gel	Link Object	Link Path	Padded EPATH	Logical path segments that identify the object for this port.
4	Get	Port Name		SHORT_STRI NG	String which names the physical network port. The maximum number of characters in the string is 64.
5	Get	Port Type Name		SHORT_STRI NG	String which names the port type. The maximum number of characters in the string is 64.
6	Get/Set	Port Description		SHORT_STRI NG	String which describes the port. The maximum number of characters in the string is 64.
7	Get	Node Address		Padded EPATH	Node number of this device on port. The range within this data type is restricted to a Port Segment.
9	Get	Port Key		Packed EPATH	Electronic key of network/chassis this port is attached to. This attribute shall be limited to format 4 of the Logical Electronic Key segment.

#### **Common Service List**

Service	Implen	nentation	Service Name	Description
Code	Class	Instance		Description
0x0E	✓	✓	Get_Attribute_Single	Used to read an object instance attribute
0x10		✓	Set_Attribute_Single	Used to modify an object instance attribute

# Moxa Networking Object (Vendor Specific)

The Moxa Networking object includes system information and status.

It can also be used to do the device diagnostic & configuration through explicit messaging.

The class code is **0x404**.

## **Class Attribute List**

Attr ID	Access Rule	Name	Data Type	Description
1	Get	Revision	UINT (16)	Revision of this object

#### **Instance Attribute List**

Attr ID	Access Rule	Name	Data Type	Description
1	Get	Firmware Version	UDINT (32)	Switch firmware version
2	Get	System Fault Status	UDINT (32)	Switch fault status Bit 0: Reserved Value 0: Ok Value 1: Fail Bit 1: Reserved Value 0: Ok Value 1: Fail Bit 2: Port utilization alarm Value 0: No alarm Value 0: No alarm Value 1: alarm Bit 3: Port link up Value 0: No alarm Value 0: No alarm Value 1: Alarm Bit 4: Port link down Value 0: No alarm Value 1: Alarm Bit 5: Turbo ring break(Ring Master only) Value 0: No alarm Value 1: Alarm Bit 6: Power Input 1 fail Value 0: No alarm Value 1: Alarm Bit 7: Power Input 2 fail Value 0: No alarm Value 1: Alarm Bit 7: Power Input 2 fail Value 0: No alarm Value 1: Alarm Bit 8:DI 1(off) Value 0: No alarm Value 1: Alarm Bit 9: DI 1(on) Value 0: No alarm Value 1: Alarm Bit 10: DI 2(off) Value 0: No alarm Value 1: Alarm Bit 11: DI 2(on) Value 0: No alarm Value 1: Alarm Bit 12: Reserved Value 1: Alarm Bit 12: Reserved Value 0: Not support Value 1: On Bit 14: Power supply 2 Value 0: Off Value 1:On Bit 14: Power supply 2 Value 0: No Value 1:On
3	Get	Switch Port Number	USINT (8)	Switch max port number
				switch per port exist
4	Get	Port Exist	ULINT (64)	Bit mask, the LSB indicates the first port. Value 0: Not exist Value 1: Exist

Attr ID	Access Rule	Name	Data Type	Description
				Switch per port enable
5	Get/Set	Port Enable	ULINT (64)	Bit mask, the LSB indicates the first port.
				Value 0: Enable Value 1: Disable
				Switch per port link status
				Bit mask, the LSB indicates the first port.
6	Get	Port Link Status	ULINT (64)	Value 0: Link down
				Value 1: Link up
		ICMD Consistent		IGMP snooping enable:
7	Get/Set	IGMP Snooping	USINT (8)	Value 0: Disable
		Enable		Value 1: Enable
8	Get/Set	Query Interval	UDINT (32)	Query interval range from 20 to 600 secs
		IGMP Enhanced		IGMP enhanced mode
9	Get/Set	Mode	USINT (8)	0: Disable(default)
				1: Enable
	a . /a .			Override relay warning setting
14	Get/Set	Relay 1	USINT (8)	0: Disable(default)
				1: Enable
15	Cat/Cat	Dolov 2		Override relay warning setting 0: Disable (default)
15	Get/Set	Relay 2	USINT (8)	1: Enable
				Power input 1 failure (on->off)
		Power 1 Relay		0: Disable (default)
16	16 Get/Set	Warning	USINT (8)	1: Enable (relay 1)
				2: Enable (relay 2)
				Power input 2 failure (on->off)
	a . /a .	Power 2 Relay Warning	USINT (8)	0: Disable (default)
17	Get/Set			1: Enable (relay 1)
				2: Enable (relay 2)
				DI 1 (0ff)
18	Get/Set	DI 1 (0ff)	USINT (8)	0: Disable (default)
10	000,000	Relay Warning	001111 (0)	1: Enable (relay 1)
				2: Enable (relay 2)
				DI 1 (0n)
19	Get/Set	DI 1 (on)	USINT (8)	0: Disable (default)
		Relay Warning	(0)	1: Enable (relay 1) 2: Enable (relay 2)
				DI 2 (Off)
		DI 2 (0ff)		0: Disable (default)
20	Get/Set	Relay Warning	USINT (8)	1: Enable (relay 1)
		iteray marining		2: Enable (relay 2)
				DI 2 (0n)
24		DI 2 (on)		0: Disable (default)
21	Get/Set	Relay Warning	USINT (8)	1: Enable (relay 1)
				2: Enable (relay 2)
				Turbo ring break (Ring Master only)
22	Get/Set	Turbo Ring Break	USINT (8)	0: Disable (default)
~~	Jey Jei	Relay Warning		1: Enable (relay 1)
				2: Enable (relay 2)
23	Get	CPU Usage	USINT (8)	Percent of usage (0 to100)
24	Get	Device Up Time	UDINT (32)	Number of seconds since the device was powered up
25	Get/Set	Reset MIB Counts	USINT (8)	Reset port MIB counters.
				Bit mask of device roles.
		Deduct 1 D		Bits 0 = RSTP
26	Get	Redundant Device	UDINT (32)	Bits 1= Turbo Ring
		Mode		Bits 2= Turbo Ring v2 Bits 3= Turbo Chain
				Bits 3= Turbo Chain Bits 4= MSTP
	1	1	1	דונוין –ד טוט

Attr ID	Access Rule	Name	Data Type	Description
27	Get/Set	Reset Device	USINT (8)	Reboot and reset to default 1: Reboot the device 2: Reset to default

#### **Common Service List**

Service	Implen	nentation	-Service Name	Description
Code	Class	Instance	Service Maine	Description
0x0E	✓	$\checkmark$	Get_Attribute_Single	Used to read an object instance attribute
0x10		✓	Set_Attribute_Single	Used to modify an object instance attribute

# **Electronic Data Sheet (EDS) File**

The EDS (Electronic Data Sheet) file contains electronic descriptions of all relevant communication parameters and objects of an EtherNet/IP device. It is required for RSLogix 5000 to recognize Moxa switch and its CIP capability.

The list includes the sections which are described in our EDS file.

- [File]
- [Device]
- [Device Classification]
- [Port]

Icon should be 32 \* 32 in pixel.

# Rockwell RSLogix 5000 Add-On Instructions (AOI)

The Rockwell RSLogix 5000 Add-On Instructions (AOI) encapsulates Moxa switch supported EtherNet/IP functions in a common interface logic component. In RSLogix 5000 programming, users could use the AOI to communicate with Moxa switches and need not know the internal logic.

Our AOI would provide logic of Moxa switch configuration and monitoring by using EtherNet/IP in explicit messaging and implicit messaging. The AOI also provides some tags for RSLogix 5000/SCADA programming.

# **AOI Installation**

To install the AOI, you must use Rockwell RSLogix 5000 version 18 or later and Moxa managed Ethernet switches with firmware version 3.0 or later.

#### The Five Major Stages of Installing the AOI

- 1. Add Moxa switch to the I/O configuration tree
- 2. Import the Add-On Instruction (AOI)
- 3. Add an instance of the AOI in your application
- 4. Create and configure tags for the AOI
- 5. Download the configured AOI to Rockwell PLC

#### Add Moxa switch to the I/O configuration tree

In order to import the AOI, the first step is to create a new Ethernet Module in RSLogix 5000.

1. Open RSLogix 5000 and create a new controller.

Click **Type** and select the Rockwell PLC model of the PLC connected to the Moxa switch. Input a **Name** and **Description** for this new controller.

уре:			-
урс.	1769-L32E CompactLogix5332E Controller	*	OK
evision:	18 👻		Cancel
	Redundancy Enabled		Help
Name:	EDS_408A_A0I		
Description:		_	
		×	
Chassis Type:		~	
Slot	0 C Safety Partner Slot: <none></none>		
Create In:	C:\RSLogix 5000\Projects	-	Browse

2. Add an Ethernet Module to the I/O Configuration.

In the controller organizer window, select **I/O Configuration**, right click **Ethernet** under the PLC Ethernet port of the PLC connected to a Moxa switch, and select **New Module**.

Controller Organizer	👻 🎙 🗙						
Controller EDS_408A_AOI  Controller Tags Controller Cont		Select Module	Description				Vendor
CompactB New Module	Ctrl+V	By Category	By Vendor	Favorites	1	Find	Add Favorite
Print	•				ок С	Cancel	Help

3. Under the **Communications** group, select **Generic Ethernet Module** to represent Moxa Ethernet switches

Module		Description	Vendor
	1783-ETAP1F	3 Port Ethernet Tap, 1 Fiber/2 Twisted-Pair Media	Allen-Bradley
	- 1783-ETAP2F	3 Port Ethernet Tap, 2 Fiber/1 Twisted-Pair Media	Allen-Bradley
	- 1788-EN2DN/A	1788 Ethernet to DeviceNet Linking Device	Allen-Bradley
	- 1788-ENBT/A	1788 10/100 Mbps Ethernet Bridge, Twisted-Pair Media	Allen-Bradley
	- 1788-EWEB/A	1788 10/100 Mbps Ethernet Bridge w/Enhanced Web Serv.	. Allen-Bradley
	1794-AENT	1794 10/100 Mbps Ethernet Adapter, Twisted-Pair Media	Allen-Bradley
	- Drivelogix5730 Et	10/100 Mbps Ethernet Port on DriveLogix5730	Allen-Bradley
	ETHERNET-BRIDGE	Generic EtherNet/IP CIP Bridge	Allen-Bradley
	ETHERNET-MODU	Generic Ethernet Module	Allen-Bradley
	- EtherNet/IP	SoftLogix5800 EtherNet/IP	Allen-Bradley
	PSSCENA	Ethernet Adapter, Twisted-Pair Media	Parker Hannif
	- Stratix 8000	26 Port Managed Switch	Allen-Bradley
	- Stratix 8000	22 Port Managed Switch	Allen-Bradley
<			>
			C
		Find	Add Favorite
	Category By Ve	endor Favorites	

4. Configure the Ethernet module with the correct name, description, IP address and connection parameters and click **OK**.

Type: Vendor: Parent:	ETHERNET-MODULE Generic Ethernet Module Allen-Bradley LocalENB						
Name:	EDS_408A	Connection Para	Assembly				
Description:	The MOXA managed switch	Input:	Instance:	Size:	*	(32-bit)	
	~	Output:	1	2	* *	(32-bit)	
Comm Forma	t: Data - DINT 💌	Configuration:	3	0	*	(8-bit)	
💿 IP Addr	ess: 192 . 168 . 34 . 253	Status Input:					
🔿 Host Na	me:	Status Output:					

- 5. After finishing configuration, the new Ethernet module representing the Moxa Ethernet switch will appear under the **I/O Configuration** list in the controller organizer window.
  - in the second se

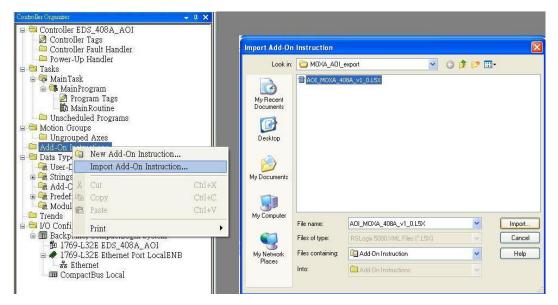
📲 Backp	lane, CompactLogix System
17	lane, CompactLogix System 769-L32E EDS_408A_AOI
😑 🛷 13	769-L32E Ethernet Port LocalENB
<u> </u>	5 Ethernet
	🛷 1769-L32E Ethernet Port LocalENB
	ETHERNET-MODULE EDS_408A
i 🕮 G	ompactBus Local

## **Import the Add-On Instruction (AOI)**

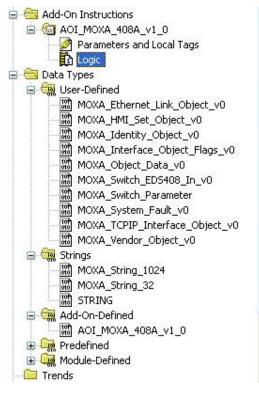
1. In the controller organizer window, right click the **Add-On Instructions** folder, select **Import Add-On Instructions** and select the correct AOI file (xxx.L5X) to import.

## ΝΟΤΕ

The AOI file is available from the Moxa website or in the software CD. Please make sure to use the latest switch firmware and AOI for programming.

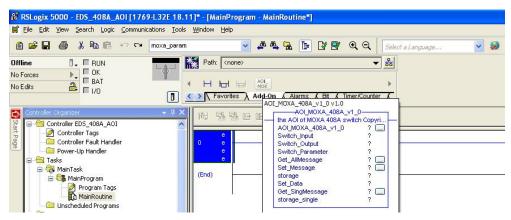


2. After importing, the controller organizer window shows all AOI for Moxa Ethernet switches under the **Add-On Instructions** folder.



## Add an instance of the AOI in your application

Double click the **MainRoutine** in the Controller Organizer to start the ladder programming. Add the AOI for the specific Moxa Ethernet switch to create a new rung.

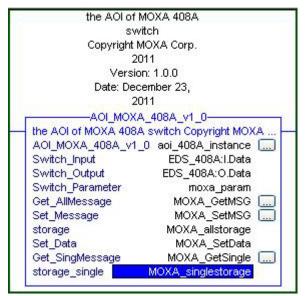


## Create and configure tags for the AOI

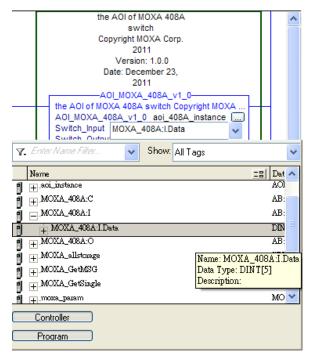
1. Right click on the ? in the field of each tag, select New Tag and input a Name for each new tag.

电 醫歷	abcd ab 💌 <ab></ab>				
0 e e e		New T	the AOI of MO)	XA_408A_v1_0 (A 408A switch	
New Tag Name:	aoi_408A_instance	СК	truction nstruction	Ctrl+X Ctrl+C Ctrl+V	? ? ? ? ?
Description:	<		Instruction dder Element in Operand Description	Del Alt+Ins Ctrl+D	?
Type: Alias For:	Base Connection		nstruction Defaults Instruction Defaults B Force		
Data Type: Scope:	AOI_MOXA_408A_v1_0		tion <u>H</u> elp	Ctrl+G F1	
External Access: Style:	Read/Write		e Parameter e All Unknown Parameters struction Logic	5	
Constant	iguration		nstruction Definition	Alt+Enter	

2. Add a **Name** for all AOI tags.



For "Switch\_Input" and "Switch\_Output", use the scrollbar to select the tag name.



For all other tags, manually type the tag names:

AOI Tag	Reference Tag Name
AOI_MOXA_408A_v1_0	aoi_408A_instance
Switch_Input	MOXA_408A:I.Data
Switch_Output	MOXA_408A:O.Data
Switch_Parameter	moxa_param
Get_AllMessage	MOXA_GetMSG
Set_Message	MOXA_SetMSG
storage	MOXA_allstorage
Set_Data	MOXA_SetData
Get_SingMessage	MOXA_GetSingle
storage_single	MOXA_singlestorage

3. Click the square button to the right of the **Get\_AllMessage** tag and configure all parameters as follows:

(Service Code	: 1; Class: 1	; Instance: 1;	Attribute: 1;	Destination:	MOXA_allstorage[0])
---------------	---------------	----------------	---------------	--------------	---------------------

Configurati	on <sup>*</sup> Commu	inication Ta	ag 🛛		
Message	Туре:	CIP Generi	ic	~	
Service Type:	Custom		*	Source Element: Source Length:	0 🗘 (Bytes)
Service Code: Instance:		ex) Class: Attribute	1 (Hex) :1 (Hex)	- Destination	MOXA_allstorage[0]
) Enable	O Enabl	e Waiting	⊖ Start	🔾 Done	Done Length: 0

Click the **Communication** tab and set up the communication path to the Moxa Ethernet switch for **Get\_AllMessage**.

	Browse	
Broadcast: Communication CIP CIP CIP Vith Source ID CIP CIP Vith Connected	Message Path Browser  Path: MOXA_408A  MOXA_408A  Backplane, CompactLogis System Backplane, CompactLogis System Di 17694.32E themet Port LocalENB Backplane t Tr694.32E themet Port LocalENB ETHERNET#MODULE MOXA_408A  TFTERNET#MODULE MOXA_408A	
) Error Cc Error Path: Error Text:	III CompactBus Local	

4. Click the square button to the right of the **Set\_Message** tag and configure all parameters as follows: (Service Code: 10; Class: f6; Instance: 1; Attribute: 1; Source Ethernet: MOXA\_SetData)

Message C	onfigurat	ion - MOX	A_SetMSG		
Configuration Message Service Type: Service Code:	Type: Set Attribut	unication T CIP Gene e Single ex) Class:	-	Source Element: Source Length: Destination	MOXA_SetData
Instance: Enableable Error Codeo Error Path: Error Text:	Enable W		Start/tart led Error Code:	Doneone [	New Tag Done Length: 0 Timed Out ←

Click the **Communication** tab and set up the communication path to the Moxa Ethernet switch for **Set\_Message**.

Configuration	Communication Tag	
	Message Path Browser	e
O Broa	Path: EDS408A EDS408A	]
CIPN Sour	□       □       I/O Configuration         □       □       Backplane, CompactLogix System         □       □       17694.32E ED_4084_A0I         □       ↓       17694.32E Ethernet Port LocalENB         □       ↓       ↓         □       ↓	(Octal)
<ul> <li>Enable</li> <li>Error Cc</li> <li>Error Path:</li> <li>Error Text:</li> </ul>	ETHERNET-MODULE EDS408A     TO CompactBus Local	
Error Text:	OK Cancel Help	Help

5. Click the square button to the right of the **Get\_SingMessage** tag and configure all parameters as follows:

(Service Code: e; Class: f6; Instance: 1; Attribute: 1; Destination: MOXA\_Singlestorage[0])

Message Type:       CIP Generic         Service       Get Attribute Single         Type:       Source Lement:         Service       e         (Hex)       Class:         (Hex)       Class:         (Hex)       Class:         (Hex)       Class:         (Hex)       Class:         (Hex)       Class:         (Hex)       Destination         (DXA_Singlestorage[0]          New Tag         (New Tag)         (New Tag)         (Particular)         (Particular)	Aessage C Configuration	_		A_GetSingle		Đ
Type:       Det Attribute Single         Service       e         Code:       (Hex)         Instance:       1         Attribute.       1         (Hex)       Destination         Destination       DXA_Singlestorage[0]          New Tag         Enable       Enable Waiting         Start       Done         Done Length:       0         Error Code:       Extended Error Code:	Message	Туре:	CIP Gene	ric	~	
⊖ Error Code: Extended Error Code:	Service ( Type: Service ( Code:	e (ŀ	Hex) Class:	f6 (Hex	Source Length: Destination	0 (Bytes) 0XA_Singlestorage(0)
Error Path:					🔾 Done	

Click the **Communication** tab and set up the communication path to the Moxa Ethernet switch for **Get\_SingMessage**.

Configuration	Communication Tag	
	Message Path Browser	×
⊙ Path:	Path: EDS4084	
O Broade	EDS408A	
Communic	🖃 😁 I/O Configuration 🖻 🗐 Backplane, CompactLogix System	
CIP	1769-L32E ED_408A_AOI	
O CIP W Source	ia I 1769-L32E Ethernet Port LocalENB	(Octal)
	▲ 1769-L32E Ethernet Port LocalENB	
Conne 🗌	ETHERNET-MODULE EDS408A	
	CompactBus Local	
) Enable		
) Error Co		-
rror Path:	OK Cancel Help	
rror Text:		

## Download the configured AOI to the Rockwell PLC

1. Click the **Network** Icon, select the Rockwell PLC connected to the Moxa switch and click **Download** to install the AOI configuration to the PLC.

Controller	Path	
D_408A_A0		Go Online
	5	Upload
		Download
		Close
		Help
Show Bolu	Paths Matching Serial Number in Project Reset	Path List Set Project Pat

2. After finishing configuration, go to the controller organizer window, right click **Controller Tags** and select **Monitor Tags** to check if each tag can display the correct value transferred from the Ethernet device.

Controller EDS_408A	_401	Name	<u>=</u> ∎ ∆ Value	+	Force M
Controller Faul	📝 New Tag Ctrl+W	🛨 aoi_408A_instance		{}	
📄 Power-Up Han		+ EDS_408A:C		{}	
🖂 Tasks	Monitor Tags	± EDS_408A:I		{}	
🖃 🤯 MainTask 🖃 🕞 MainProgra	Edit Tags	+ EDS_408A:0		{}	
Progra	Verify	+ MOXA_allstorage		{}	
	Export Tags			{}	
Unscheduled P		+ MOXA_GetSingle		{}	
Motion Groups     Print	Print •	+ moxa_param		{}	
		+ MOXA_SetData		{}	
		+ MOXA_SetMSG		{}	
		+ MOXA_singlestorage		{}	

Name <u>=8</u> 4	Value 😽	Force Mask 🗲	Style	Data Type	
moxa_param.Switch_Idnetity	{}	{}		MOXA_Ident	i
🛨 moxa_param.Switch_Idnetity.Vendor_ID	991		Decimal	INT	
moxa_param.Switch_Idnetity.Device_Type	775		Decimal	INT	
😐 moxa_param.Switch_Idnetity.Product_Code	7		Decimal	INT	ľ
😐 moxa_param.Switch_Idnetity.Major_Revision	0		Decimal	SINT	
😐 moxa_param.Switch_Idnetity.Minor_Revision	0		Decimal	SINT	
🛨 moxa_param.Switch_Idnetity.Serial_Number	16#0000_259d		Hex	DINT	
😐 moxa_param.Switch_Idnetity.Product_Name	'EDS-408A'	{}		STRING	
😐 moxa_param.Switch_Idnetity.Assigned_Na	11	{}		MOXA_String	-
😐 moxa_param.Switch_Idnetity.Geographic		{}		MOXA_String	-
+ moxa_param.Switch_TCPIP	{}	{}		MOXA_TCPI	
moxa_param.Switch_Vendor	] {}	{}		MOXA_Vend	ł
😐 moxa_param.Switch_Vendor.System_Firm	524291		Decimal	DINT	
😐 moxa_param.Switch_Vendor.System_Fault	8192		Decimal	DINT	
🛨 moxa_param.Switch_Vendor.Switch_Port	0		Decimal	SINT	l
🛨 moxa_param.Switch_Vendor.Port_Exist	{}	{}	Decimal	DINT[2]	l
🛨 moxa_param.Switch_Vendor.Port_Enbale	{}	{}	Decimal	DINT[2]	
🛨 moxa_param.Switch_Vendor.Port_Link_St	{}	{}	Decimal	DINT[2]	
😐 moxa_param.Switch_Vendor.IGMP_Snoop	0		Decimal	SINT	
😐 moxa_param.Switch_Vendor.Query_Interval	125		Decimal	DINT	į
🛨 moxa_param.Switch_Vendor.IGMP_Enhan	0		Decimal	SINT	l
moxa_param.Switch_Vendor.Relay_1	0		Decimal	SINT	ľ
🔲 🗄 moxa_param.Switch_Vendor.Relay_2	0		Decimal	SINT	

#### NOTE

Only Moxa pre-configured tags will display the correct values. Refer to the CIP Tags section below for detailed information.

## Sample AOI Project

For easier AOI installation, Moxa has also provided a sample AOI project, in which all the parameters are configured with default values. The sample project is a (.ACD) file, which is available for download from the Moxa website or software CD. You may import the sample project in RSLogix 5000, and directly download this AOI to the PLC with minimal installation steps. But to use the sample project, you still must change or set up the parameters below.

- 1. Change the controller type used in the real environment.
- 2. Change the controller and Moxa switch's IP address.
- 3. Setup the Project path.

## NOTE

The sample AOI project only supports RSLogix 5000 version 18.

# **CIP** Tags

There are tags for each CIP object. The tags correspond to the object's attributes.

# **Tags for Identity Object**

Data Type: MOXA\_Identity\_Object\_v0

Name	Data Type	Description
Vendor ID	INT	991, MOXA Vendor ID
Device Type	INT	0x307, "Managed Ethernet Switch"
		EDS-405A=0x0006, EDS-408A=0x0007,
Product Code	INT	EDS-505A=0x0008, EDS-508A=0x0009,
	1111	EDS-510A=0x000A, EDS-516A=0x000B,
		EDS-G509=0x0012
Major Revision	SINT	The structure member, major
Minor Revision	SINT	The structure member, minor
Serial Number	DINT	Switch serial number
Product Name	STRING	Switch model name
Assigned Name	STRING	User assigned switch name
Geographic Location	STRING	User assigned switch location

# **Tags for TCPIP Object**

Data Type: MOXA\_TCPIP\_Interface\_Object\_v0

Name	Data Type	Description
Status	DINT	Interface status
Configuration Capability	DINT	Interface capability flags
Configuration Control	DINT	Interface control flags
Path Size	INT	Size of Path
Object Path 1	INT	Logical segments identifying the physical link object
Object Path 2	INT	Logical segments identifying the physical link object
IP Address	DINT	The device's IP address
Network Mask	DINT	The device's network mask
Gateway Address	DINT	Default gateway address
Name Server 1	DINT	Primary name server
Name Server 2	DINT	Secondary name server
Domain Name	STRING	Default domain name
Host Name	STRING	Host name

# **Tags for Ethernet Link Object**

Name	Data Type	Description
Interface Speed	DINT	Interface speed currently in use. Speed in Mbps (e.g., 0, 10, 100, 1000, etc.)
Interface Flags	MOXA_Interface_ Object_Flags_v0	Interface status flags
Physical Address	SINT[6]	MAC layer address
InOctets	DINT	Octets received on the interface
InUcastPackets	DINT	Unicast packets received on the interface
InNucastPackets	DINT	Non-unicast packets received on the interface
InDiscards	DINT	Inbound packets received on the interface but discarded
InErrors	DINT	Inbound packets that contain errors (does not include In Discards)
OutOctets	DINT	Octets sent on the interface
OutUcastPackets	DINT	Unicast packets sent on the interface
OutNucastPackets	DINT	Non-unicast packets sent on the interface
OutDiscards	DINT	Outbound packets discarded
OutErrors	DINT	Outbound packets that contain errors

Name	Data Type	Description
		Frames received that are not an integral number of octets in
Alignment Errors	DINT	length
FCS Errors	DINT	Frames received that do not pass the FCS check
		Successfully transmitted frames which experienced exactly one
Single Collisions	DINT	collision
	DINT	Successfully transmitted frames which experienced more than
Multiple Collisions	DINT	one collision
SQE Test Errors	DINT	Number of times SQE test error message is generated
Deferred Transmissions	DINT	Frames for which first transmission attempt is delayed because
Deferred Transmissions	DINI	the medium is busy
Late Collisions	DINT	Number of times a collision is detected later than 512 bit-times
	DINI	into the transmission of a packet
Excessive Collisions	DINT	Frames for which transmission fails due to excessive collisions
MAC Transmit Errors	DINT	Frames for which transmission fails due to an internal MAC
MAC TRAISINIC LITUIS	DINI	sublayer transmit error
Carrier Sense Errors	DINT	Times that the carrier sense condition was lost or never asserted
	DINI	when attempting to transmit a frame
Frame Too Long	DINT	Frames received that exceed the maximum permitted frame size
MAC Receive Errors	DINT	Frames for which reception on an interface fails due to an
PIAC RECEIVE EITOIS	DINI	internal MAC sublayer receive error
Control Bits	INT	0 Auto-negotiate 0 indicates 802.3 link auto-negotiation is
	1111	disabled. 1 indicates auto-negotiation is enabled
Forced Interface Speed	INT	Speed at which the interface shall be forced to operate. Speed in
		Mbps (10, 100, 1000, etc.)
Interface Label	STRING	Label like "TX5"
Interface Port Index	DINT	Port index
Interface Port	STRING	Port description
Description		
Broadcast Storm	SINT	Only on MOXA IKS, PT, EDS-516A/518A, and EDS-728/828
Protection	-	series
Interface Utilization	SINT	Percentage of entire interface bandwidth being used (0-100)
Utilization Alarm Upper	SINT	Upper percentage at which to declare an utilization alarm (0-
Threshold		100)
Utilization Alarm Lower	SINT	Lower percentage at which to declare an utilization alarm (0-
Threshold		100) 0. Japan
		0: Ignore, 1: On (Relay 1),
Port Link Alarm	SINT	2: On (Relay 2),
	SINT	3: Off (Relay1),
		4: Off (Relay2)
		0: Disable,
Port TrafficOverload	SINT	1: Enable(Relay 1),
Alarm	-	2: Enable(Relay 2)
Tx Unicast Packet Rate	DINT	Number of TX unicast packets per second
Rx Unicast Packet Rate	DINT	Number of RX unicast packets per second
Tx Multicast Packet	DINT	
Rate	DINT	Number of TX multicast packets per second
Rx Multicast Packet		Number of BX multicast packate per easered
Rate	DINT	Number of RX multicast packets per second
Tx Broadcast Packet		Number of TV broadcast packets per second
Rate	DINT	Number of TX broadcast packets per second
Rx Broadcast Packet	DINT	Number of RX broadcast packets per second
Rate		
Tx Multicast Packet	DINT	Total number of TX multicast packets
Rx Multicast Packet	DINT	Total number of RX multicast packets
Tx Broadcast Packet	DINT	Total number of TX multicast packets
Rx Broadcast Packet	DINT	Total number of RX broadcast packets

Name	Data Type	Description
		Bit 0 = Disable,
		Bit 1 = Not Redundant port,
Dodundant Dort Status		Bit 2 = Link down,
Redundant Port Status	DINI	Bit 3 = Blocking,
		Bit 4 = Learning,
		Bit 5 = Forwarding

### **Tags for Moxa Networking Object**

Data Type: MOXA\_Vendor\_Object\_v0

Name	Data Type	Description
System Firmware Version	DINT	Switch firmware version
System Fault Status	DINT	Switch fault status
Switch Port Number	SINT	Switch max port number
Port Exist	DINT[2]	Switch per port exist
		Switch per port exist
Port Enable	DINT[2]	0:Enable
		1:Disable
Port Link Status	DINT[2]	Switch per port link status
		IGMP snooping enable:
IGMP Snooping	SINT	0: Disable
		1: Enable
Query Interval	DINT	Query Interval range from 20~600 sec
		IGMP enhanced mode
IGMP Enhanced Mode	SINT	0: Disable (default)
		1: Enable
		Override relay warning setting
Relay 1	SINT	0: Disable (default)
		1: Enable
		Override relay warning setting
Relay 2	SINT	0: Disable (default)
		1: Enable
		Power input 1 failure (on $\rightarrow$ off)
Dowor 1 Dolow Worping	SINT	0: Disable (default)
ower 1 Relay Warning	51111	1: Enable(relay 1)
		2: Enable(relay 2)
		Power input 2 failure (on $\rightarrow$ off)
Power 2 Relay Warning	SINT	0: Disable (default)
Fower 2 Relay Warning	31111	1: Enable(relay 1)
		2: Enable(relay 2)
		DI 1 (off)
DI 1 Off Relay Warning	SINT	0: disable (default)
Di i On Kelay Warning	51111	1: Enable(relay 1)
		2: Enable(relay 2)
		DI 1 (on)
DI 1 On Relay Warning	SINT	0: Disable (default)
Di i On Keldy Warning	51111	1: Enable(relay 1)
		2: Enable(relay 2)
		DI 2 (off)
DI 2 Off Relay Warning	SINT	0: Disable (default)
	51111	1: Enable(relay 1)
		2: Enable(relay 2)
		DI 2 (on)
DI 2 On Relay Warning	SINT	0: Disable (default)
		1: Enable(relay 1)
		2: Enable(relay 2)
		Turbo Ring Break (Ring Master Only )
Turbo Ring Break Relay	SINT	0: Disable (default)
Warning		1: Enable (relay 1)
		2: Enable (relay 2)

Name	Data Type	Description
CPU Usage	SINT	Percent of usage (0-100)
Device Up Time	DINT	Number of seconds since device was powered up
Reset Mib Counter	SINT	Reset port MIB counters
		Bit 0: RSTP,
Redundant Device Mode	DINT	Bit 1: Turbo Ring,
		Bit 2: Turbo Rong v2,
		Bit 3: Turbo Chain,
		Bit 4: MSTP
Reset Device	SINT	1: restart the device
Reset Device	51111	2: reset to default

### **Pre-configured Tags in the Moxa AOI**

The Moxa AOI supports all the CIP tags listed in the tables above. But in the AOI, we only pre-configure logic links between selected tags and Moxa switches. To monitor the non-configured tags, PLC programmers need to create the links manually. Otherwise, in RSLogix 5000, the value column of these tags will display as "0". If you experience problems creating new links, please contact Moxa technical support for assistance.

### NOTE

For pre-configured tags, Moxa has already created the logic links between the CIP tags and Moxa Ethernet switches so RSLogix 5000 can get/set the switch information correctly.

Pre-Configured Tage	s Name
Identity Object (0x0	)1)
*	Vendor ID
*	Device Type
*	Product Code
	Revision
	Status
*	Serial Number
*	Product Name
	Assigned Name
	Geographic Location
TCP/IP Interface Of	oject (0xf5)
	Status
	Configuration Capability
	Configuration Control
	Physical Link Object
	Interface Configuration
*	IP Address
*	Network Mask
	Gateway Address
	Name Server
	Name Server 2
	Domain Name
*	Host Name
Ethernet Link Object	
*	Interface Speed
*	Interface Flags
	Link Status
	Half/Full Duplex
	Negotiation Status
	Manual Setting Requires Reset
	Local Hardware Fault
*	Physical Address

The table below specifies all the pre-configured tags in Moxa AOI with a % mark.

Pre-Configured Tags	Name
	Interface Counters
	In Octets
	In Ucast Packets
	In Nucast Packets
	In Discards
*	In Errors
	Out Octets
	Out Ucast Packets
	Out Nucast Packets
	Out Discards
*	Out Errors
	Media Counters
	Interface Control
*	Control Bits
*	Forced interface Speed
	Interface Lable
	Interface Description
	Interface Port Description
	Broadcast Storm Protection
*	Interface Utizatiion
	Utilization Alarm Upper Threshold
	Utilization Alarm Lower Threshold
	Port Link Alarm
	Port Traffic-Overload Alarm
*	Tx Unicast Packet Rate
*	Rx Unicast Packet Rate
*	Tx Multicast Packet Rate
*	Rx Multicast Packet Rate
*	Tx Broadcast Packet Rate
*	
*	Rx Broadcast Packet Rate Tx Multicast Packet
	Rx Multicast Packet
	Tx Broadcast Packet
	Rx Broadcast Packet
×	
»	Redundant port status
Port Object (0xf4)	Dort Turno
	Port Type Port Number
	Link Object Port Name
	Port Type Name
	Port Description
	Node Address
	Port Key
MOXA Networking Obje	
	Firmware Version
* *	
*	System Fault Status
<b>₩</b>	Switch Port Number
*	Port Exist
*	Port Enable
*	Port Link Status
	IGMP Snooping Enable
*	Query Interval
*	IGMP Enhanced Mode
	Relay1
	Relay2
	Power 1 relay waring

Pre-Configured Tags	Name
	Power 2 relay waring
	DI 1(off) relay warning
	DI 1(on) relay warning
	DI 2(off) relay warning
	DI 2(on) relay warning
	Turbo Ring Break relay warning
*	CPU usage
	Device Up Time
*	Reset MIB Counts
*	Redundant device mode
	reset device
I/O message Object	
*	Switch Fault Status
*	Port Exist
*	Port Link Status
*	Port Enable

## **Monitoring AOI Tags**

In RSLogix 5000, you can monitor the values of all configured tags by selecting "Monitor Tags" in the controller organizer window. It can also be used to check that the AOI is installed correctly.

### NOTE

Only Moxa pre-configured tags will display the correct values. Refer to the **CIP Tags** section above for detailed information.

Controller EDS_408A_A     Controller Tags		Name 18 4	Value 🔶	Force M
Controller Faul 🧖	New Tag Ctrl+W	🛨 aoi_408A_instance	{}	
Power-Up Han		+ EDS_408A:C	()	
🖬 🛅 Tasks	Monitor Tags	+ EDS_408A:I	{}	
AinProgra     V     MainProgra     V     MoinRc     L     MainRc     L     Unscheduled P	Edit Tags	EDS_408A:0	{}	
	Verify	+ MOXA_allstorage	()	
	Export Tags	HOXA_GetMSG	{}	
		+ M0XA_GetSingle	{}	
🖹 🚔 Motion Groups	Print •	+ moxa_param	()	
Ungrouped Axes		+ MOXA_SetData	{}	
Add-On Instructions		+ MOXA_SetMSG	{}	
Parameters and		+ MOXA_singlestorage	{}	

### **Monitor Tags for Identity Object**

Click **moxa\_param Switch\_Identity** and expand the list to check the values for Identity tags.

Edits A Battery Fault	Favorites Add-On Alarms	Bit 🔏 Timer/Counter		Y. Enter Name Fi	llev
Controller EDS408A_Demo_20120711	Name _== △	Value 🔶	Force Mask 🗲	Style Data Typ	e [ſ
Controller Fault Handler	± EDS408A:I	{}	{}	AB:ETHE	RN
🛅 Power-Up Handler	+ EDS408A:0	{}	{}	AB:ETHE	RN
Tasks RainTask	+ MOXA allstorage	{}	{}	Decimal SINT[200	ŋ
- S MainProgram	± MOXA GetMSG	{}	{}	MESSAG	E
- 🙋 Program Tags	moxa_param	{}	{}	MOXA S	witc
MainRoutine	to moxa param.Switch Input	{}	{}	MOXA S	witc
- Conscheduled Programs Motion Groups	+ moxa param.Switch Output	0		Decimal DINT	
i Ungrouped Axes	The moxa_param.Switch_Idnetity	{}	{}	MOXA Id	lenti
Add-On Instructions	+ moxa param.Switch Idnetity.Vendor	991		Decimal INT	
- 🕼 AOI_MOXA_408A_∨1_0 Data Types	+ moxa param.Switch Idnetity.Device	775		Decimal INT	
User-Defined	+ moxa param.Switch Idnetity.Produc	7		Decimal INT	
Strings	+ moxa param.Switch Idnetity.Major	0		Decimal SINT	
Add-On-Defined	+ moxa_param.Switch_Idnetity.Minor	0		Decimal SINT	
Module-Defined	+ moxa_param.Switch_Idnetity.Serial	16#0000 259d		Hex DINT	
Trends	+ moxa_param.Switch_Idnetity.Produc	'EDS-408A'	{}	STRING	
I/O Configuration Backplane, CompactLogix System	+ moxa_param.Switch_Idnetity.Assign	11	{}	MOXA_S	tring

### **Monitor Tags for TCPIP Object**

Click **moxa\_param Switch\_TCPIP** and expand the list to check the values for TCPIP tags.

Forces Controller O Edits A Forces I/O OK				
Controller Organizer	Scope: 🛱 EDS408A_Dema 🖌 Show: All Tags	V. 2	Enter Name Filter	Co.
Controller EDS408A_Demo_201	Name _== △	Value 🔶	Force Mask *	Style
Controller Fault Handler	+ ED\$408A:0	{}	{}	
- 🛅 Power-Up Handler	+ MOXA allstorage	{}	{}	Decimal
Tasks AlimTask	+ MOXA GetMSG	{}	{}	
🔄 🥞 Main lask	moxa_param	()	{}	
Program Tags	+ moxa param.Switch Input	()	{}	
🔤 🛅 MainRoutine	+ moxa param.Switch Output	о П		Decimal
- Unscheduled Programs Motion Groups	+ moxa param.Switch Idnetity		{}	D COMING
- Ungrouped Axes	E moxa param.Switch TCPIP	{}	{}	
Add-On Instructions	moxa_param.Switch_TCPIP     moxa_param.Switch_TCPIP.Status	(,		Decimal
-🕼 AOI_MOXA_408A_v1_0		0		Decimal
Data Types Desr-Defined	+ moxa_param.Switch_TCPIP.Configuration_Capab	-	8	
Strings	+ moxa_param.Switch_TCPIP.Configuration_Control			Decimal
Add-On-Defined	moxa_param.Switch_TCPIP.Path_Size	0		Decimal
🙀 Predefined	moxa_param.Switch_TCPIP.Object_Path_1	0		Decimal
🙀 Module-Defined	+ moxa_param.Switch_TCPIP.Object_Path_2	0		Decimal
Trends	moxa_param.Switch_TCPIP.IP_Address	-1062723062		Decimal
I/O Configuration	+ moxa_param.Switch_TCPIP.Network_Mask	-256		Decimal
1769-L32E EDS408A D	+ moxa_param.Switch_TCPIP.Gateway_Address	0		Decimal
😑 🛷 1769-L32E Ethernet Por	moxa param.Switch TCPIP.Name Server 1	16#0000 0000		Hex
E Kethemet	+ moxa param.Switch TCPIP.Name Server 2	16#0000 0000		Hex
1769-L32E Ethe ETHERNET-MC	+ moxa param.Switch TCPIP.Domain Name		{}	
- CompactBus Local	moxa_param.Switch_TCPIP.Host_Name	'Managed Redundant Switch 09629		

### **Monitor Tags for Ethernet Link Object**

Click **moxa\_param Switch\_Ethernet\_Link** and expand the list to check the values for per port Ethernet Link tags.

lame <u>==</u> a	Value	*	Force Mask 🕈	Style	
moxa_param.Switch_Ethernet_Link[1]		{}	{}		
moxa_param.Switch_Ethernet_Link[1].Interfac		100		Decimal	
moxa_param.Switch_Ethernet_Link[1].Interfac		{}	{}		
moxa_param.Switch_Ethernet_Link[1].Interf		1		Decimal	
moxa_param.Switch_Ethernet_Link[1].Interf		1		Decimal	
moxa_param.Switch_Ethernet_Link[1].Interf		0		Decimal	
moxa_param.Switch_Ethernet_Link[1].Interf		1		Decimal	
moxa_param.Switch_Ethernet_Link[1].Interf		0		Decimal	
moxa_param.Switch_Ethernet_Link[1].Interf		0		Decimal	
moxa_param.Switch_Ethernet_Link[1].Interf		0		Decimal	
moxa_param.Switch_Ethernet_Link[1].Physical		{}	{}	Decimal	
Tomoxa_param.Switch_Ethernet_Link[1].Physi		0		Decimal	
+ moxa_param.Switch_Ethernet_Link[1].Physi		-112		Decimal	
🛨 moxa_param.Switch_Ethernet_Link[1].Physi		-24		Decimal	
+ moxa_param.Switch_Ethernet_Link[1].Physi		21		Decimal	
moxa_param.Switch_Ethernet_Link[1].Physi		-87		Decimal	
📃 🕒 moxa_param.Switch_Ethernet_Link[1].Physi		-104		Decimal	
moxa_param.Switch_Ethernet_Link[1].InOctets		0		Decimal	
moxa_param.Switch_Ethernet_Link[1].InUcast		0		Decimal	
moxa_param.Switch_Ethernet_Link[1].InNucas		0		Decimal	
moxa_param.Switch_Ethernet_Link[1].InDiscards		0		Decimal	
moxa_param.Switch_Ethernet_Link[1].InErrors		0		Decimal	
moxa_param.S <u>witch_Ethernet_Link[1].OutOctets</u>	<	0		Decimal	

ame	그림 스	Value	•	Force Mask 🗲	Style
🛨 moxa_param.Switch_Ethernet_L	ink[1].InErrors		0		Decir
+ moxa_param.Switch_Ethernet_L	ink[1].OutOctets		0		Decir
+ moxa_param.Switch_Ethernet_L	ink[1].OutUcastPackets		0		Decir
+ moxa_param.Switch_Ethernet_L	ink[1].OutNucastPackets		0		Decir
🛨 moxa_param.Switch_Ethernet_L	ink[1].OutDiscards		0		Decir
🛨 moxa_param.Switch_Ethernet_L	ink[1].OutErrors		0		Decir
+ moxa_param.Switch_Ethernet_L	ink[1].Alignment_Errors		0		Decir
🛨 moxa_param.Switch_Ethernet_L	ink[1].FCS_Errors		0		Decir
🛨 moxa_param.Switch_Ethernet_L	ink[1].Single_Collisions		0		Decir
+ moxa_param.Switch_Ethernet_L	ink[1].Multiple_Collisions		0		Decir
+ moxa_param.Switch_Ethernet_L	ink[1].SQE_Test_Errors		0		Decir
+ moxa_param.Switch_Ethernet_L	ink[1].Deferred_Transmi		0		Decir
👘 🕂 moxa_param.Switch_Ethernet_L	ink[1].Late_Collisions		0		Decir
🛨 moxa_param.Switch_Ethernet_L	ink[1].Excessive_Collisio		0		Decir
+ moxa_param.Switch_Ethernet_L	ink[1].MAC_Transmit_Er		0		Decir
+ moxa_param.Switch_Ethernet_L	ink[1].Carrier_Sense_Err		0		Decir
+ moxa_param.Switch_Ethernet_L	ink[1].Frame_Too_Long		0		Decir
+ moxa_param.Switch_Ethernet_L	ink[1].MAC_Receive_Er		0		Decir
🗄 moxa_param.Switch_Ethernet_L	ink[1].Control_Bits		1		Decir
🗄 moxa_param.Switch_Ethernet_L	ink[1].Forced_Interface		0		Decir
🗄 moxa_param.Switch_Ethernet_L	ink[1].Interface_Label			{}	
🗄 moxa_param.Switch_Ethernet_L	ink[1].Interface_Port_In		0		Decir
+ moxa param.S <u>witch Ethernet L</u>	ink[1].Interface Port D		11	{}	
Monitor Tags / Edit Tags /		<			>

Name	<u>a   8 -</u>	Value 🗧	Force Mask *	
	+ moxa_param.Switch_Ethernet_Link[1].Interface_Port_Descript		{}	Contract of the
	+ moxa_param.Switch_Ethernet_Link[1].Broascast_Storm_Prote		)	
	+ moxa_param.Switch_Ethernet_Link[1].Interface_Utilization		)	
	+ moxa_param.Switch_Ethernet_Link[1].Utilization_Alarm_Upper		)	ľ
	+ moxa_param.Switch_Ethernet_Link[1].Utilization_Alarm_Lower		)	
	+ moxa_param.Switch_Ethernet_Link[1].Port_Link_Alarm		)	
	+ moxa_param.Switch_Ethernet_Link[1].Port_TrafficOverload_Al		)	
	+ moxa_param.Switch_Ethernet_Link[1].Tx_Unicast_Packet_Rate	2	9	
	+ moxa_param.Switch_Ethernet_Link[1].Rx_Unicast_Packet_R	10	)	
	+ moxa_param.Switch_Ethernet_Link[1].Tx_Multicast_Packet		)	
	Tomoxa_param.Switch_Ethernet_Link[1].Rx_Multicast_Packet		)	
	+ moxa_param.Switch_Ethernet_Link[1].Tx_Broadcast_Packet		)	
	+ moxa_param.Switch_Ethernet_Link[1].Rx_Broadcast_Packet		)	
	moxa_param.Switch_Ethernet_Link[1].Tx_Multicast_Packet		)	
	+ moxa_param.Switch_Ethernet_Link[1].Rx_Multicast_Packet		)	
	+ moxa_param.Switch_Ethernet_Link[1].Tx_Broadcast_Packet		)	
	moxa_param.Switch_Ethernet_Link[1].Rx_Broadcast_Packet		)	
	😑 moxa_param.Switch_Ethernet_Link[1].Redundant_Port_Status		2	
B	moxa_param.Switch_Ethernet_Link[2]	{]	{}	
1	F moxa_param.Switch_Ethernet_Link[3]	{)	{}	
Ð	F moxa_param.Switch_Ethernet_Link[4]	{]	{}	
B	-moxa_param.Switch_Ethernet_Link[5]	()	{}	
	moxa param.Switch Ethernet Link[6]	()	{}	
• / V	Monitor Tags / Edit Tags /	Lesson and the second s	>	-

### Monitor Tags for Moxa Networking Object

Click **moxa\_param Switch\_Vendor** and expand the list to check the values for Moxa custom tags.

Name 📰 🛆	Value *	Force Mask +	Style	
moxa_param.Switch_Vendor.Port_Enbale	{	} {}	Decimal	
moxa_param.Switch_Vendor.Port_Enbale[0]		0	Decimal	
moxa_param.Switch_Vendor.Port_Enbale[1]		0	Decimal	
moxa_param.Switch_Vendor.Port_Link_Status	(	} {}	Decimal	
moxa_param.Switch_Vendor.Port_Link_Status[0]		3	Decimal	
moxa_param.Switch_Vendor.Port_Link_Status[1]		0	Decimal	
+ moxa_param.Switch_Vendor.IGMP_Snooping		0	Decimal	
+ moxa_param.Switch_Vendor.Query_Interval	12	5	Decimal	
+ moxa_param.Switch_Vendor.IGMP_Enhanced_M		0	Decimal	
+ moxa_param.Switch_Vendor.Relay_1		0	Decimal	
+ moxa_param.Switch_Vendor.Relay_2		0	Decimal	
+ moxa_param.Switch_Vendor.Power_1_Relay_W		0	Decimal	
moxa_param.Switch_Vendor.Power_2_Relay_W		0	Decimal	
+ moxa_param.Switch_Vendor.DI_1_Off_Relay_W		0	Decimal	
+ moxa_param.Switch_Vendor.DI_1_0n_Relay_W		0	Decimal	
+ moxa_param.Switch_Vendor.DI_2_Off_Relay_W		0	Decimal	
+ moxa_param.Switch_Vendor.DI_2_On_Relay_W		0	Decimal	
+ moxa_param.Switch_Vendor.Turbo_Ring_Break		0	Decimal	
+ moxa_param.Switch_Vendor.CPU_Usage		1	Decimal	
+ moxa_param.Switch_Vendor.Device_Up_Time		0	Decimal	
😟 moxa_param.Switch_Vendor.Reset_Mib_Counter		0	Decimal	
+ moxa_param.Switch_Vendor.Redundant_Device		2	Decimal	

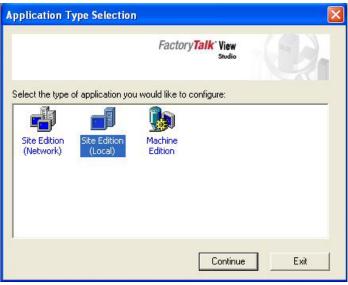
# **Rockwell FactoryTalk® View Faceplate**

### FactoryTalk® View Faceplate Installation

To install the faceplate, you must have Rockwell FactoryTalk® View Studio SE (Site Edition) version 5 or later and a Moxa managed Ethernet switch with firmware version 3.0 or later.

### Create a FactoryTalk® View Shortcut to the PLC

1. Start the FactoryTalk® View Studio software and select Site Edition (Local).



2. Add a new Site Edition (Local) and enter the Application name.

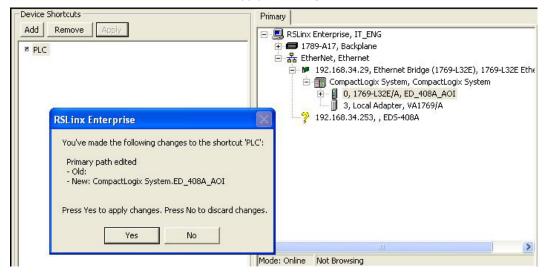
New/Open Site Edit	ion (Local) Application	X
New Existing		
Application name:	EDS_408A_Platform	
Description:		
Language:	English (United States), en-US	
		Import
-	Create	Cancel

3. Configure a shortcut to the PLC that is running the Moxa AOI.

In the Explorer window, right click the newly-added application, select **Add New Server** and **Rockwell Automation Device Server (RSLinx Enterprise)**, and click **OK**.

Scal (IT_ENG)	
EDS_408A_Platform Runtime Secu Delete	
EDS_408A_P ⊟ 📆 System Add New Server ♦	Rockwell Automation Device Server (RSLinx Enterprise)
Comm Security	OPC Data Server Tag Alarm and Event Server
E 🔄 HMI Tags Properties	RSLinx Enterprise Server Properties
Graphics     Jisplays     Jibraies     Jibraies     Jisplays     Jibraies     Jisplays	General Alarms and Events Alarms Alar
Alam Setup     Alam Setup     Alam Setup     Setup Setup     Setup Setup     Setup Setup     Setup Setu	Computer hosting the RSLinx Enterprise server: localhost
	OK Cancel Apply Help

4. The shortcut is named PLC. Click "Yes" to apply the configuration.



### Import FactoryTalk® View Faceplate Graphics

1. Right click Display in the FactoryTalk® View Explorer window, select **Import and Export** and choose **Import graphic information into displays**.

Explorer - EDS_408A_Platform		
🔁 Command Line		
⊡ 🔄 HMI Tags 	Graphics Import Export Wizard - Operation Type	X
Glot New Libr Add Component Into Application	Select the operation to perform:	
🛨 🚾 Imaj Import and Export	C Export graphic information from displays	
Parameters Recipes Local Messages	Import graphic information into displays	
🖻 🚔 HMI Tag Alarms		
<b>A</b> ∬ Alarm Setup <b>A</b> ∗ Suppressed List		
⊡ 🔂 Logic and Control		
[C] Events [A] Macros		
🔜 💭 Client Keys		
🖻 🔄 Data Log	Kext > Cancel H	elp

2. Select No and Multiple displays batch import file.

Graphics Import Export Wizard - Backup	×	Graphics Import Export Wizard - Import File Type	×
Do you want to backup the displays that will be modified by the import?		Select the type of file to import: Single display import file Multiple displays batch import file	
< Back Next > Cancel Help	_	Back Next > Cancel Help	

3. Import all graphics files for FactoryTalk® View faceplate display.

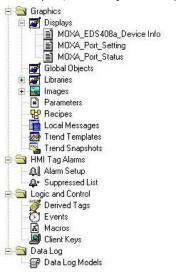
### •

#### NOTE

Moxa provides sample graphics files for selected switches, which are available for download at the Moxa website or from the software CD.

Select the i	multiple display b	atch import file:				
When imp	porting e new objects or	n the display				
C U Se	-		ch Import File			R
Whet can a overr	Look in:	FTView Fa	aceplat	• (m	🖻 👉 🎫	
	My Recent Documents Desktop					
	My Documents My Computer					
	My Network	File name:	BatchImport_EDS_408	A Distant uni		Oper
	Places	rile name:	paterimport_EDS_408	e_riauoim.xmi		Canc

4. After import, these objects will appear under **Displays** in the Explorer window.

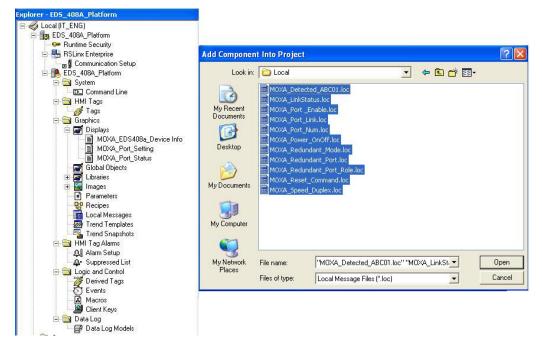


### Import FactoryTalk® View Faceplate Local Message

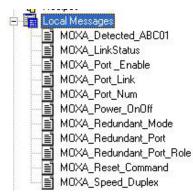
1. Right click Local Message in the FactoryTalk® View Explorer window, select Add Component Into Application and import all the local message files (.loc).

### NOTE

Moxa provides sample local message files for selected switches, which are available for download at the Moxa website or from the software CD.



2. After import, these objects will appear under "Local Message" in the Explorer window.



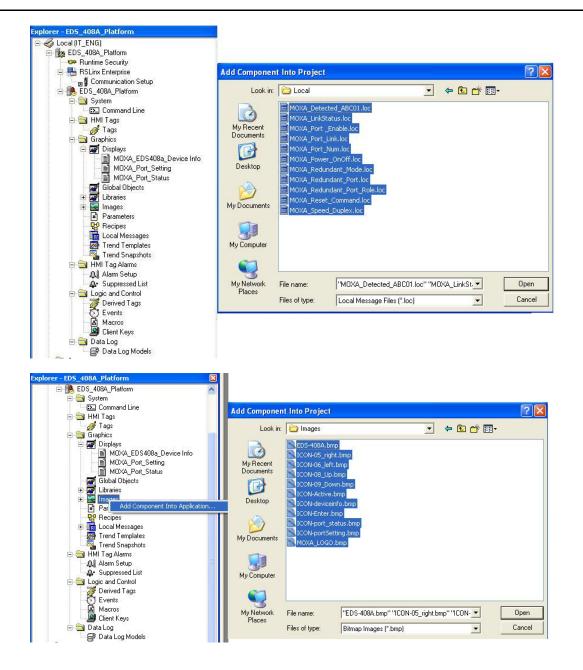
### Import FactoryTalk® View Faceplate Images

Right click **Images** in the FactoryTalk® View Explorer window, select **Add Component Into Application** and import all the image files (.bmp).

### •

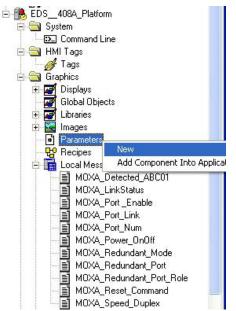
### NOTE

Moxa provides sample image files for selected switches, which are available for download at the Moxa website or from the software CD.

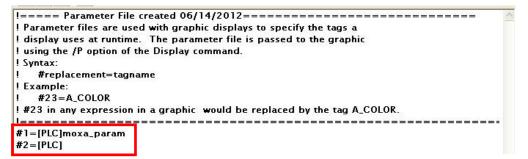


### **Create a New Parameter**

1. Right click **Parameters** in the FactoryTalk® View Explorer window, and select **New**.



- 2. Create a parameter file that will be associated with the display.
  - Manually input "#1=[PLC]moxa\_param", and "#2=PLC" in the file.



In the parameter definition, the shortcut PLC was created earlier. (Refer to Create a FactoryTalk® View Shortcut to PLC)

Another important piece is **moxa\_param**, which is the name of the Switch\_Parameters tag created for the MOXA\_SWITCH\_AOI in your RSLogix project. (Refer to **Create and configure tags for the AOI**)



### **Configure FactoryTalk® View Faceplate Display**

1. Right click all parameter tabs under **Displays** in the FactoryTalk® View Explorer window, and select **Display Settings**.

Reliable Networks, Sincere Service	ss ss Port Status	Port Setting		
Device Inform	nation			Display Settings
	IP Address	: SS		Display Ke <u>y</u> s <u>V</u> BA Code
	Netmask MAC Address Serial No.	: SS : SS : ######		Property Panel Object Explorer
	Firmware Ver. CPU Loading (%)	:ss :#######		<u>P</u> aste Paste <u>S</u> pecial
	Redundancy	: Local Message Di*		Show Gri <u>d</u> Snap O <u>n</u> <u>G</u> rid Settings
	Power Input 1:	Local Message Di*		Zoom to <u>F</u> it Zoom <u>I</u> n Zoom <u>O</u> ut
Concession and incose of	Power Input 2:	Local Message Di*	1	Cancel <u>Z</u> oom

2. Configure **Display Type** and **Size** as shown.

For the Moxa custom faceplate, you need to configure three parameters: MOXA\_Device Info; MOXA\_Port\_Setting; MOXA\_Port\_Status.

Display Settings	
Properties Behavior	
Oisplay Type C Replace Overlay Keep at Back C On Top	Size C Use Current Size Specify Size in Pixels Width: 567 Height: 623
Allow Multiple Running Copies     Cache After Displaying	Resize Allow Display to be Resized When Resized C Pan  © Scale
I Title Bar Insert Variable	Position © Use Current Position © Specify Position in Pixels × 0 Y 0
<ul> <li>System Menu</li> <li>Minimize Button</li> <li>Maximize Button</li> <li>Size to Main Window at Runtime</li> <li>Show Last Acquired Value</li> <li>Maximum Tag Update Rate:</li> <li>1</li> </ul>	Security Code:
0K	Cancel Set as Default Help

### Sample FactoryTalk® View Faceplate Project

For easier FactoryTalk® View Faceplate installation, Moxa also provides a sample project, in which all the parameters are configured with default values. The sample project is a (.APA) file, which is available for download from the Moxa website or software CD. You may import the sample project in FactoryTalk® View Faceplate Site Edition (SE).

#### Setting Up a FactoryTalk® View SE Client

1. Launch FactoryTalk® SE client.



Launch FactoryTalk View SE Client 🛛 🛛 🔀							
Select a configur	ation file and cliq	ck OK to launch ar	n FactoryTalk				
View SE Client.							
1			<u> </u>				

2. Set up the new configuration file name and path.

	a new configuratio	n <b>figuration Nam</b>		
EDS-408A				
Type or browse for	the location to sto	re this configuration	ĸ	
C:\FactoryTalk Vi				

3. Select the application type **Local**.

FactoryTalk Vie	w SE Client App	lication Type		
	SE application the		to:	
Help	About	Cancel	< Back	Next >

4. Enter the name of the application and select the language.

actoryTalk View	w SE Client App	lication Name		
Type the name of	the application you	want to connect to	<b>)</b> :	
EDS_408A_Platf	orm		•	
C Open Factory	Falk View SE Client	as view-only		
Enable on-scr	een keyboard			
🔲 Allow display o	ode debugging			
Select the initial ru	17 JAN			
English (United S	tates), en-US		<b>_</b>	
Help	About	Cancel	< Back	Next>

5. Configure the FactoryTalk® View SE Client Components and set **Initial Display** to **MOXA\_Device\_Info**.

Components				
Initial display:	MOX	A_EDS408a_De	vice Info	-
Display parameters:				
Initial client key file:				•
Startup macro:				<u>•</u>
Shutdown macro:				•

6. Configure the FactoryTalk® View SE Window Properties and input **Title bar text** with the text you would like to appear in the title bar.

Show title ba			
Title bar text:	EDS408A Fac		
Show system	n menu and close bu	utton	
🔽 Show M	in/Max buttons		
Maximize wir	ndow		
Show Diagn	ostics List		
🔽 Allow un	docking of Diagnos	stics List	
C Disable swite	h to other application	ons	

7. Finish the setup and save the configuration

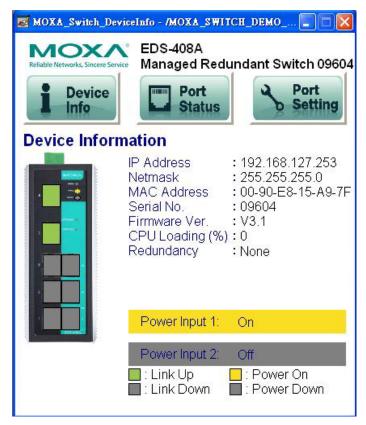
FactoryTalk View SE Client Completion Options	X
The FactoryTalk View SE Client is now configured.	
To save, click an option below, and then click Finish.	
To discard, click Cancel.	
<ul> <li>Save configuration and open FactoryTalk View SE Client now</li> </ul>	
C Save configuration and exit	
Help About Cancel < Back Finish	

### **Introduction to the Moxa Custom Faceplate**

The Moxa custom Faceplate consists of three main displays: Device Information, Port Status, and Port Setting. Click the tabs at the top of the screen to change between different displays.

### **Device Information**

The device information display shows general switch information and power and link status.



The following table describes fields and values.

Field	Values	Description
IP Address	192.168.192.253 (factory default)	Switch IP address
Netmask	255.255.255.0	Switch subnet mask
MAC Address	00:90:E8:xx:xx:xx	MAC address of switch
Serial No.	Max. 5 characters	Switch serial number
Firmware Ver.	V3.1	Software version of switch
CPU Loading (%)	0-100%	CPU loading percentage
Redundant Protocol	RSTP Turbo Ring Turbo Ring v2 Turbo Chain MSTP	Redundant protocol setting
Power Input 1	On Off	Power supply 1 status
Power Input 2	On Off	Power supply 2 status
Model name	EDS-XXX	Switch model name
Switch name	Max. 30 characters	User assigned switch name

Field	Color	State	Description	
Link Status	Green	Link Up	Current port link state	
Link Status	Grey	Link Down		

Field	Color	State	Description	
Power Status	Amber	Power On	Current power link state	
	Grey	Power Off	Current power link state	

### **Port Status**

The port status display shows information for a selected switch port. Use the right/left buttons to select a switch port.

B MOXA_Port_Status - /EDS408A_Platform//	
Device     Po	Redundant Switch 09496
Port Status	
Port 2	
Link Status	: Link Up
Speed	: 100/Half
Redundant Port Status	: Forwarding
Tx Unicast (Packet/sec)	: 119
Rx Unicast (Packet/sec)	: 148
Tx Multicast (Packet/sec)	: 0
Rx Multicast (Packet/sec)	: 0
Tx Broadcast (Packet/sec)	: 0
Rx Broadcast (Packet/sec)	: 0
Tx Packet Error	: 0
Rx Packet Error	: 3084

Field	Values	Description	
Port Index	Port 3	Selected port number	
Link status	Link up	Selected port link status	
	Link down		
	10/Half		
	10/Full		
Speed	100/Half	Selected port speed and mode	
Speed	100/Full	Sciected port speed and mode	
	1000/Half		
	Unknown		
	Disable		
	Not Redundant Port		
Redundant Port Status	Link Down	Selected port redundancy status	
	Blocking	Sciected port redundancy status	
	Learning		
	Forwarding		
Tx Unicast (Packet/sec)		The Tx unicast packets per second	
Rx Unicast (Packet/sec)		The Rx unicast packets per second	
Tx Multicast (Packet/sec)		The Tx multicast packets per second	
Rx Multicast (Packet/sec)		The Rx multicast packets per second	
Tx Broadcast (Packet/sec)		The Tx broadcast packets per second	
Rx Broadcast (Packet/sec)		The Rx broadcast packets per second	
Tx Packet Error		The number of Tx packet error	
Rx Packet Error		The number of Rx packet error	

### **Port Setting**

The Port Setting allows some switch port settings to be changed. Use the right/left buttons to select a switch port and click the **Activate** button to save the change.

MOXA_Port_Setting	- /EDS408A_Platform//				
EDS-408A Managed Redundant Switch 09496					
Device Port Info Status Setting					
Port Setti	ng				
	Port 2				
Enable : Enab Speed : Auto	ble				
Set Speed: Auto 10/Half 10/Full 100/Half 100/Full	Set Enable: Disable Enable	Activate			
Field	Values	Description			
Port Index Speed	Port 3 10/Half 10/Full 100/Half 100/Full 1000/Half Unknown	Selected port number Selected port speed and mode			
Enable	Enable Disable	Selected port enable or disable			

# Introduction

This section is only supported by the EDS-400A-PN, EDS-510E, EDS-528E, and EDS-G500E Series.

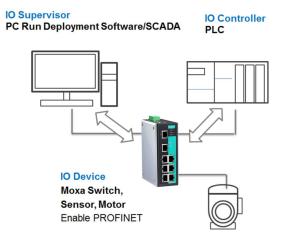
PROFINET is a communication standard for automation of PROFIBUS & PROFINET International (PI). It is 100% Ethernet-compatible as defined in IEEE standards. With PROFINET, applications can be implemented for production and process automation, safety applications, and the entire range of drive technology. With its integrated Ethernet-based communication, PROFINET satisfies a wide range of requirements, from data-intensive parameter assignment to extremely fast I/O data transmission.

PROFINET I/O is used for data exchange between I/O controllers (PLC, etc.) and I/O devices (field devices). This specification defines a protocol and an application interface for exchanging I/O data, alarms, and diagnostics. And its real-time (RT) solution allows response time in the range of 5 ms, which corresponds to today's PROFIBUS DP applications.

## **PROFINET Environmental Introductions**

### **PROFINET Networking Structure**

PROFINET I/O follows the Provider/Consumer model for data exchange. PROFINET forms logical link relationships between network character types. They are shown below.



There are 3 major character types defined by PROFINET I/O, including I/O controller, I/O supervisor, and I/O devices. Switches are considered I/O devices.

### I/O Controller

This is typically the programmable logic controller (PLC) on which the automation program runs. The I/O controller provides output data to the configured I/O-devices in its role as provider and is the consumer of input data of I/O devices.

### I/O Supervisor

This can be a programming device, personal computer (PC), or human machine interface (HMI) device for commissioning or diagnostic purposes.

### **I/O Device**

An I/O device is a distributed I/O field device that is connected to one or more I/O controllers via PROFINET I/O. The I/O device is the provider of input data and the consumer of output data.

### **PROFINET I/O Devices**

The MOXA switch is a PROFINET I/O device. A device model describes all field devices in terms of their possible technical and functional features. It is specified by the DAP (Device Access Point) and the defined modules for a particular device family. A DAP is the access point for communication with the Ethernet interface and the processing program.

### **PROFINET Protocols**

#### DCP

In PROFNET I/O, each field device has a symbolic name that uniquely identifies the field device within a PROFINET I/O system. This name is used for assigning the IP address and the MAC address. The DCP protocol (Dynamic Configuration Protocol) integrated in every I/O device is used for this purpose.

#### DHCP

Because DHCP (Dynamic Host Configuration Protocol) is in widespread use internationally, PROFINET has provided for optional address setting via DHCP or via manufacturer-specific mechanisms.

#### **PROFINET Type LLDP**

Automation systems can be configured flexibly in a line, star, or tree structure. To compare the specified and actual topologies, to determine which field devices are connected to which switch port, and to identify the respective port neighbor, LLDP according to IEEE 802.1AB was applied in PROFINET I/O.

PROFINET filed bus exchange existing addressing information with connected neighbour devices via each switch port. The neighbor devices are thereby unambiguously identified and their physical location is determined.

### **Device descriptions**

#### **GSD** file

The GSD files (General Station Description) of the field devices to be configured are required for system engineering. This XML-based GSD describes the properties and functions of the PROFINET I/O field devices. It contains all data relevant for engineering as well as for data exchange with the device.

Find your field device GSD file in the CD or download the GSD file from the MOXA web site.

# **Configuring PROFINET I/O on Moxa Switches**

### **Enable PROFINET I/O**

### **Enable PROFINET in WEB UI**

#### Type 1

PROFINET IO		
	<ul> <li>Enable</li> </ul>	(Enable LLDP automatically after activating)
	O Disable	
	Activate	

Select the **Enable** option and click **Activate** to enable PROFINET I/O. With PROFINET I/O enabled, PROFINET type LLDP will be enabled automatically.

Select the **Disable** option and click **Activate** to disable PROFINET I/O, the switch will disable PROFINET type LLDP and use standard LLDP.

PROFINET special model is enabled by default on the EDS-400A-PN series switches.

#### Type 2: New UI 2.0

• Industrial Protocol	
EtherNet/IP	
Enable EtherNet/IP Note: IGMP snooping will be automatically enabled when EtherNet/IP is activated.	
Modbus TCP	
Enable Modbus TCP	
PROFINET I/O	
Enable PROFINET I/O	
	Apply

The default PROFINET I/O setting of EDS E series is disabled. To enable the PROFINET I/O support, check the **Enable PROFINET I/O** and click **Apply**.

_₹		
_		

### NOTE

Enabling PROFINET will prevent MXview (2.2 and earlier versions) from performing auto-detection of network topology. Auto-detection of network topology is only supported by versions of MXview 2.3 and later. To use auto-detection in earlier versions of MXview (2.2 and earlier), you should first disable PROFINET I/O, perform MXview auto-detection of network topology, and then enable PROFINET I/O.

### CLI

The CLI (command line interface) can be used to enable or disable PROFINET for the switch. Command List:

- profinetio
- to enable PROFINET I/O. to disable PROFINET I/O. no profinetio



## Addressing of I/O Data in PROFINET I/O **Based on Slot and Sub-Slots**

The concept of the MOXA PROFINET switch with GSD version 2 is shown the table below. In this structure, each switch port represents one sub-slot.

s	Slot 0					
	Sub Slot 0	Sub Slot 0X8000	Sub Slot 0X8001	Sub Slot 0X8002	Sub Slot 0X8003	
	DAP	IO Data	Port 1	Port 2	Port 3	

### **Manufacturer Information**

Each PROFINET device is addressed based on a MAC address. This address is unique worldwide. The company code (bits 47 to 24) can be obtained from the IEEE Standards Department free of charge. This part is called the OUI (organizationally unique identifier).

Table, MOXA OUI

Bit Value 4724						Bit	Valu	ie 23	0		
0	0	0	2	2	9	х	х	х	х	х	х
Company Code (OUI)					(	Conse	ecutiv	/e Nu	imbei	-	

## **PROFINET Attributes**

The PROFINET I/O connection can be configured for both cyclic I/O data and I/O parameters. I/O parameters are acyclic I/O data. These are major setup and monitor attributes in PROFINET.

#### Cyclic I/O Data

Cyclic I/O data are always sent between the PLC and Switches at the specified periodic time. These data are transmitted almost real time. For example, status information from the Switches, and variables to be written to the Switch would typically be part of the cyclic data.

#### **I/O Parameters**

PROFINET I/O parameters are defined for device configuration and status monitoring. These data are useful for infrequent data transfers, or for very large data transfers. Only transfer when needed

Alarm

Alarms are mainly PROFINET I/O transmitted high-priority events. Alarm data are exchanged between an I/O device and an I/O controller. Once an event triggers it, the switch will send the alarm to the PLC immediately. Enable or disable these alarms by setting I/O parameters.

## **PROFINET Cyclic I/O Data**

The MOXA PROFINET switch provides PROFINET I/O cyclic data and includes the following items:

### NOTE

The default transfer frequency of PROFINET Cyclic I/O data is 128 ms. There are 3 options available in SIMATIC STEP 7: 128/256/512 ms.

#### **PROFINET Cyclic I/O Data Table**

Category	Direction	Byte	Bit	Name	Description
			0	Device status	0 is failed status, 1 is OK.
			1	Power 1	0 is unavailable, 1 is OK
			2	Power 2	0 is unavailable, 1 is OK
Device	Input	0	3	RSTP status	0 is disabled, 1 is enabled
Device	Input	U	4	Turbo Ring v1	0 is disabled, 1 is enabled
			5	Turbo Ring v2	0 is disabled, 1 is enabled
			6	Turbo Chain	0 is disabled, 1 is enabled
			7	Turbo Ring v2 status	0 is broken, 1 is healthy
			0	Port 1 Connection	0 is not connected, 1 is connected
			1	Port 2 Connection	0 is not connected, 1 is connected
			2	Port 3 Connection	0 is not connected, 1 is connected
Port	Input	1	3	Port 4 Connection	0 is not connected, 1 is connected
FOIL	Input	T	4	Port 5 Connection	0 is not connected, 1 is connected
			5	Port 6 Connection	0 is not connected, 1 is connected
			6	Port 7 Connection	0 is not connected, 1 is connected
			7	Port 8 Connection	0 is not connected, 1 is connected

You can monitor these attributes in SIMATIC STEP 7. Operation steps are in the Chapter "Monitoring the Switch"

Monitor Device I/O Cyclic Data in SIMATIC STEP 7.

iii		Monito	r/Modify - De	vice data - (l	R-/S1)			×	
C	Onl	ine via a	ussigned CPU serv	rices					
j	Path: MOXA/SIMATIC 300(1)/CPU 315-2 FN/DP								
		Addre ss	; Symbol		Display format	Status value	Modify value		
	1	I 0.0	-		BOOL	true			
	2	I 0.1	[		BOOL	false	L		
	3	I 0.2	2		BOOL	true			
	4	I 0.3	}		BOOL	false		1 🗉	
	5	I 0.4	l		BOOL	true		-	
	6	I 0.4	;		BOOL	false		-	
	7	I 0.6	5		BOOL	false		-	
	8	I 0.1	7		BOOL			~	
	<						);		
	×	Row	Not Effective	Update F	orce Symbol w	ith F5			
1	р		itionally	⊣ - ⊢Run immedi	in the last				
	- K V			60. Status		🗖 Enable Periph	erel Outpute		
	Ē	Modif					ora o apais		
	ľ			Modify	Value	🔲 I/O <u>D</u> isplay			
	😨 Irigger								
		Close					Help		

Monitor Port I/O Cyclic Data in SIMATIC STEP 7.

Path: MOXAVSIMATIC 300(1)/CPU 315-2 PN/DP									
	Address	Symbol	Display format	Status value	Modify value				
1	I 1.0		BOOL	false					
2	I 1.1		BOOL	truê					
3	I 1.2		BOOL	true					
4	I 1.3		BOOL	false					
5	I 1.4		BOOL	false					
6	I 1.5		BOOL	false					
7	I 1.6		BOOL	false	-				
8	I 1.7		BOOL						
<					>				
Row Not Effective       Update Force Symbol with F5         Run conditionally       Run immediately         Monitori       Image: Status Value         Modify       Image: Modify Value         Inigger       Image: Not Effective									

### **PROFINET I/O Parameters**

MOXA defines comprehensive PROFINET I/O parameters for more flexible settings and monitoring. There attributes are readable or writable. PROFINET I/O parameters use PROFINET acyclic data to achieve communication in the network. You can use the SIMATIC STEP 7 tool or engineering deployment software to edit it. There are 3 categories of parameters, including Device Parameters, Device Status and Port Parameters. The following tables provide parameter information:

- **r/w:** Read and Write
- ro: Read Only

#### **Device parameters**

These parameters control PROFINET Alarm functions. PROFINET Alarm is a message which sends from switch to PLC immediately once the event is triggered.

Byte	Name	Access	Value	Description	Default Value
0	Status Alarm	rw	0	Do not send any alarms	0: No alarms
			1	Send alarm if any status change	
1	Power Alarm 1	rw	0	Do not send power failed alarms	0: No alarms
			1	Send alarm if power supply 1 fails	
2	Power Alarm 2	rw	0	Do not send power failed alarms	0: No alarms
			1	Send alarm if power supply 2 fails	

#### **Device Status**

Byte	Name	Access	Value	Description						
0	Device Status	ro	0	Unavailable						
			1	ОК						
			2	Device bootup fails						
1	Fault Status	ro	0	Unavailable						
			1	ОК						
			2	Device detect fault						
2	Power 1 Status	ro	0	Unavailable						
			1	ОК						
			2	Power 1 fails						
3	Power 2 Status	ro	0	Unavailable						

Byte	Name	Access	Value	Description
			1	ОК
			2	Power 2 fails
4	DI 1 Status	ro	0	Unavailable
			1	Closed
		2		Open
5	DI 2 Status	ro	0	Unavailable
			1	Closed
			2	Open
6	Redundant Mode	ro	0	Unavailable
			1	RSTP
			2	Turbo Ring V1
			3	Turbo Ring V2
			4	Turbo Chain
7	Ring Status	ro	0	Unavailable
			1	Healthy
			2	Break
8	Redundant Port 1 Status	ro	0	Unavailable
			1	Link is up
			2	Link is down
9	Redundant Port 2 Status	ro	0	Unavailable
			1	Link is up
			2	Link is down
10	Ring Coupling Mode	ro	0	Unavailable
			1	Backup
			2	Primary
			3	Dual homing
11	Coupling Port 1 Status	ro	0	Unavailable
			1	Link is up
			2	Link is down
12	Coupling Port 2 Status	ro	0	Unavailable
			1	Link is up
			2	Link is down
13	Connection	ro	0	Unavailable
			1	ОК
			2	Connection failure

#### **Port Parameters**

Byte	Name	Access	Value	Description
0	– Port Alarm	rw	0	Do not send alarm
			1	Send alarm when port link down
1	Port Admin State	rw	0	Unavailable
			1	Off
			2	On
2	Port Link State	ro	0	Unavailable
			1	Link is up
			2	Link is down
3	Port Speed	ro	0	Unavailable
			1	10
			2	100
			3	1000
4	Port duplex	ro	0	Unavailable
			1	Half
			2	Full
5	Port Auto-negotiation	ro	0	Unavailable
			1	Off
			2	On
6	Port flow control	ro	0	Unavailable
			1	Off
			2	On

Byte	Name	Access	Value	Description
7	Port MDI/MDIX	ro	0	Unavailable
			1	MDI
			2	MDIX

# **Step 7 Integration**

### **Overview of Operation Procedure**

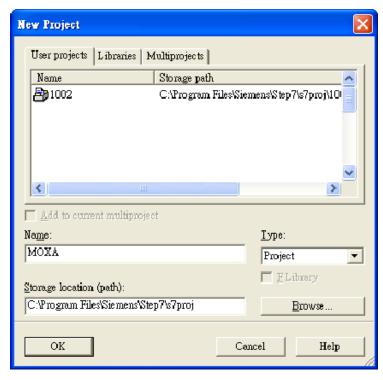
The following steps show how to integrate the switch into a PROFINET network:

- Enable PROFINET on the switch
   Enable PROFIENT in switch web UI or by CLI commands

   Create a PROFINET I/O subnet project in STEP 7
- Create a PROFINET I/O Ethernet project for deploying environment
- 3. **GSD file installation** Import MOXA switch GSD into the project
- Device configuration
   Search and discover the switch in STEP 7. Configure PROFINET attributes such as IP address, device name and I/O parameters.
- 5. **Save and load the project into the PLC** Load this project and into the PLC
- Monitoring the Switch Use STEP 7 to monitor switch attributes

## **Create a PROFINET I/O Subnet Project**

In SIMATIC Manager menu bar, click File > New Project.



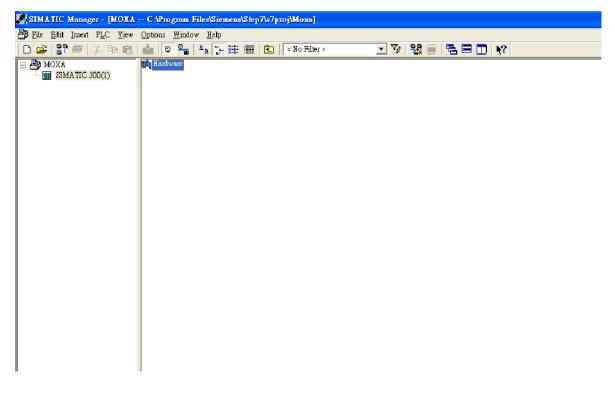
Name your project in the Name field then click OK.

### Insert a station in your project

Right click in category column > **Insert New Object** > your PLC series (here we select SIMATIC 300 station).

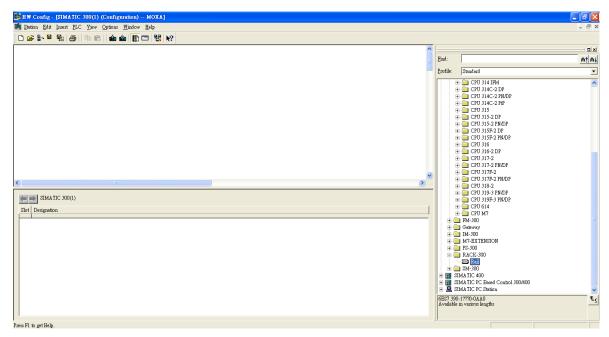
🋃 SIMATIC Man	ager - [MOXA	C:\Program File	s\Siemens\Step7\s7proj\M	ожа]			
🎒 File Edit Inse							
	X 🖻 🖪	💼 😨 💁 🖣	2 📜 🏭 🗰 🖉 🖉 🗠	) Filter >	💽 🎾 🔡 🗐	) 🖷 🗖 🔟 🕅	
🛃 MOX A							
	Cut	Cttl+X					
	Copy Paste	Ctrl+C Ctrl+V					
	Delete	Del	-				
	Insert New C		SIMATIC 400 Station	1			
	PLC	•01001					
	Rename Object Prope	F2 rties Alt+Return	SIMATIC H Station SIMATIC PC Station Other Station SIMATIC S5 PG/PC				
			MPI PROFIBUS Industrial Ethernet PTP Foundation Fieldbus				
			S7 Program M7 Program	]			

Then you can see the new object in the project. Double click on the **Hardware**.

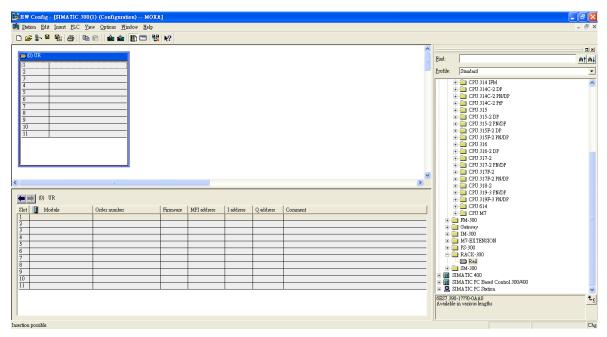


### Add Rack in HW Config

After double-clicking on HW, you will see the **HW Config** window.



Drag a rack from the side bar to main dashboard. In here, we drag **Rail**, which is under the Rack-300 folder, to the main screen.



### Search PRODINET Ethernet devices

Use Edit Ethernet Node to browse device information in PROFINET networks. Click **PLC > Ethernet > Edit Ethernet Node**.

<u>PLC V</u> iew Options <u>W</u> indow <u>H</u> elp		
<u>D</u> ownload Upload	Ctrl+L	
Download Module Identification Upload Module Identification to PG Faulty Modules		
Module Information Operating Mode Clear/ <u>R</u> eset Set Time of D <u>a</u> y <u>M</u> onitor/Modify	Ctrl+D Ctrl+I	
Updat <u>e</u> Firmware		
Save Device Name to Memory Card		
Ethernet	Þ	<u>E</u> dit Ethernet Node
PROFIBUS	•	<u>V</u> erify Device Name <u>A</u> ssign Device Name
<u>S</u> ave Service Data	L	

Then click Browse.

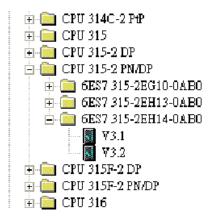
Edit Ethernet Node		X
Ethernet node		<b>X</b> 1 1 1
MAC <u>a</u> ddress:		Nodes accessible online
Set IP configuration		
• Use IP parameters		
IP address: Subnet mas <u>k</u> :		Gateway © Do not use router © Use router Address:
○ Obtain IP address from	n a DHCP server	
Client ID	C MAC address	C De <u>v</u> ice name
Client ID:		
Assign IP Configurati	on	
Assign device name		
Device name:		Assign Name
Reset to factory settings —		Reset
Close		Help

Click **Start** to search devices. Use STEP 7 through PROFINET DCP to discover devices in networks. Find PLC/switch IP addresses, MAC addresses, and device names here.

Browse Network - 2	Nodes			×
<u>Start</u> Stop ▼ Fast search	IP address           192.168.127.2           192.168.127.3			Name dut408 pn-io
Flash	MAC address:	00-90-E8-25-FF-FC	-	>
		,		
OK			Cancel	Help

### Add PLC CPU in HW Config

Select your PLC CPU and drag it to the rack slot 2. Please select by PLC you used. Here we will select 6ES7-315-2EH14-0AB0 V3.1.



Then click Properties, the Ethernet interface dialog will pop out. Fill in your PLC **IP address** in "IP address" column. Then click **New** in subnet to create a new Ethernet subnet. Here we will create a subnet named "PROFINET Ethernet".

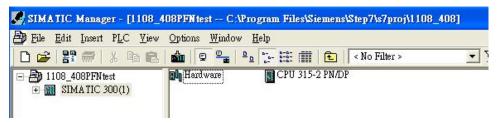
B∰ H₩ Config - [SIMATIC 300(1) (Configuration): 2 MOXA]				ōX
34 Station Edit Insert FLC View Options Window Help				- 8 ×
🗅 😅 💱 🖷 🦓 🚑 🕒 🛍 🏙 🏙 🚯 🗔 💥 👀				
		<u> </u>		
		<u>F</u> ind:		nt ni
		Profile:	Standard	•
🗩 (I) UR			H- CPU 313C	~
			🖻 🦲 CPU 313C-2 DP	_
2	Properties - Ethernet interface PN-IO (R0/S2.2)			
3			🗄 🧰 CPU 314 IFM	
5	General Parameters		CPU 314C-2 DP     CPU 314C-2 PN/DP     CPU 314C-2 PN/DP	
6			H CPU 314C-2 PM/DP	
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	If a subnet is selected, the next available addresses are suggested.		🗄 🧰 CPU 315	
9	nie next svamone successes are sufficient.		CPU 315-2 DP     CPU 315-2 PN/DP	
10			+ 6ES7 315-2EG10-0AB0	
11	IP address: 192.168.127.33 Gateway © Do not use router		🗄 🦲 6ES7 315-2EH13-0AB0	
	Subnet mask: 255.255.255.0 C Use router		EST 315-2EH14-0AB0 →	
	Use different method to obtain IP address Address:		V3.1	
			E CPU 315F-2 DP	
	Subnet: not networked New		CPU 315F-2 PN/DP	
	PROFINET Ethemet		CPU 316     CPU 316-2 DP	
	Properties	-	CPU 317-2	
<	Dejete		E CPU 317-2 PN/DP	
	· · · · · · · · · · · · · · · · · · ·	-	CPU 317F-2 CPU 317F-2 PN/DP	
(0) UR			- CPU 318-2	
Slot 📕 Module Order number M	OK Cancel Help		🕀 🦲 CPU 319-3 PN/DP	
			CPU 319F-3 PN/DP     CPU 614	
23			H CPU M7	
4	E		🗀 FM-300	
5		1.1	🚊 Gateway	~
<b>b</b> 7		6ES7 3 384 KT	115-2EH14-0AB0 3 work memory: 0.05ms/1000 instructions: PROFINET	<u>∧</u> ₹ <u>&lt;</u>
8		connec	3 work memory; 0.05ms/1000 instructions; PROFINET tion; S7 Communication (loadable FBs/PCs); PROFINET IO oller; supports RT/IRT; PROFINET interface and 2 ports;	
		[]-Contr	oner, supports KINKI, FROPINE I menace and 2 point;	<b>×</b>
Insertion possible				Chg

PROFINET I/O Ethernet subnet project accomplished.

B HW Config - [SIMATIC 300(1) (Configuration): 2 MOXA]			F	×
💵 Station Edit Insert ELC Yiew Options Window Help			- 8	×
D 😂 🐎 🖩 🎭 🖨 🐚 🖻 🎒 🗰 👘 🗊 🗁 👯 📢				
				×
	<u>Find</u> :		nta	ni
	Profile:	Standard		•
PROFINET Ethemet: PROFINET-IO-System (100)		i 🔁 CPU 313C		_
OUX         Image: CPU 315-2 PMOP           XI         Ampontant Linking Trees years (vol)           XI         PROP           XI         PROP           XI         PROP           AMPOR         Provide           32         Provide           5				
<		CPU 317-2 CPU 317-2 CPU 317-2 PN/DP CPU 317F-2		
PROFINET Ethemet: PROFINET-IO-System (100)		🗄 🦲 CPU 317F-2 PN/DP		
Device Number 🚺 IP eddres Device Name Order number Firmware Diagnostic address Initial state Shared Commont		CTV 318-2     CTV 319-2 PM/DP     CTV 319-3 PM/DP     CTV 319F3 PM/DP     CTV 319F3 PM/DP     CTV 144     CTV 144     GTV 147     CTV 147     Gtv 430     Gdtv439     Gdtv439		~
	6ES7 31 384 KB connecti -Control	5-2EH14-0AB0 work memory; 0.05ms/1000 instructions; PROFINET on; S7 Communication (loadable FBsFCs); PROFINET IO ler; supports RTART; PROFINET interface and 2 ports;	<ul> <li></li> <li></li> </ul>	E≤
. Insertion possible			C	Chg

## **GSD** File Installation

- 1. Open SIMATIC manager on your PC.
- 2. Open your project.
- 3. Open hardware configuration.



4. Install the GSD file:

Put the GSD file and icon file on your PC at the same folder Select "Install GSD File" and install the GSD file just saved.

🖳 H W Config -	ISIMATIC 300 Stati	ion (Configuration) 06	05_408]			
III Station Edit	Insert PLC View	<u>Options W</u> indow <u>H</u> elp				_ 8 ×
0 🚔 🔓 🖬	R: 8 0 0	Customize	Ctrl+Alt+E			
(0) UR 1 2 XI	CPU315-2 PN/DF	Specify Module Configure <u>N</u> etwork <u>Symbol Table</u> <u>Report System Error</u>	Ctrl+Alt+T		<u>F</u> ind: <u>P</u> rofile:	Standard
X2 X2 P1	PN-10	Edit Catalog Profile Update Catalog Install <u>H</u> W Updates Install <u>GSD</u> File		PROFINET-IO-System (100)		PROFIBUS PR PROFIDUS-PA PROFIDET IO Additional Field Devices Gateway
5 6 7 8 9 10 11		End in Service & Support.				Hetwork Components           EtherDevice Switch           Ethernet Switch           MACH 100 Switch Family L2 Profes           MACH 100GE Switch Family L2 Profes           MOXA EtherDevice Switch           EDS-405A-PN           EDS-405A-PN           EDS-408A-1M2S-SC           EDS-408A-3M-SC           EDS-408A-3M-SC           EDS-408A-3M-SC

5. You will find the new MOXA switch under PROFINET IO > Additional Field Devices > Network Components > MOXA EtherDevice Switch.

6. Use Drag & Drop to pull the MOXA switch onto the bus cable. And you can see the MOXA switch icon displayed on the screen.

	Insert PLC View	v Options	Window H	elp			- 8
ş 💁 🖬	R. 8   Po I	a    🏜 i	â 🕞 🗖	₩ №?			
)) UR						<u> </u>	: <u>0</u>
i) UK						Eind:	mta
	CPU315-2 PN/I	0P(1)	_			Profile:	Standard
H	MPI/DP		_				
				Ethernet(1): PRO	DFINET-IO-System (100)	三番茄	PROFIBUS DF PROFIBUS-PA
PI P2	Fort I Fort 2		_			- <b>#</b>	PROFINET IO
r2	PDP12		_		(1) dut408		Additional Field Devices
					(I) (III 408		🗄 🦲 Gateway
		-					🖻 🧰 Network Components
					<b>H</b>		庄 🧰 EtherDevice Switch
							🗉 🦲 Ethernet Switch
							🗉 🦲 MACH 100 Switch Family L2 Profes
							🕀 🦲 MACH 100GE Switch Family L2 Pr
							🖻 🦲 MOXA EtherDevice Switch
							+ EDS-408A + EDS-408A-1M2S-SC
							+ EDS-408A-1M2S-SC + EDS-408A-2M1S-ST
		-				<b>V</b>	
					>		T EDS 408A-MM-SC
						-	🛨 🧰 EDS-408A-MM-ST
🌒 (1) d	lut408						🛨 🦲 EDS-408A-PFN
	Order number	I address	Q address	Diagnostic address:	Comment		🕀 🧰 EDS-408A-PN
	. Urder number	1 address	Q address	Diagnostic address:	Comment		🗉 🧰 EDS-408A-SS-SC
	0007 000000 0			2042*		-	🗄 🦲 EDS-508A
da14	0007-000408-00					- 14 8	🛨 🧰 EDS-510E
dat4				2010*			
XI	/			2040* 2039*		-	EDS-516A
XI XI XI PI XI PZ	1			2039*		-	🛨 🦲 EDS-G508E
dut4           XI           XI PI           XI PI           XI PI           XI PI           XI PI           XI PI	1 2 7			2039* 2038*			😨 🧰 EDS-G508E 🗉 🧰 EDS-G512E
dut4           XI           XI PI	1 2 7 1			2039* 2038* 2037*			<ul> <li>         ■ EDS-G508E      </li> <li>         ■ EDS-G512E      </li> <li>         ■ EDS-G516E      </li> </ul>
dat44	1 2 7 7 5			2039* 2038*			<ul> <li>EDS-G508E</li> <li>EDS-G512E</li> <li>EDS-G516E</li> <li>Gateway</li> </ul>
dut41           XI           XIPI	1 2 7 7 7 5			2039* 2038* 2037* 2036*			
dut4i           XI           XIPI	7 7 7 7 7 7 7 7			2039* 2038* 2037* 2036* 2035*		-	EDS-G508E     EDS-G512E     EDS-G512E     EDS-G516E     EDS-G516E     HMI     IMI     IO
dut4it           XI           XI PI           XI PI	7 7 7 5 5 7 7 8 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0	2039* 2038* 2037* 2036* 2035* 2035*			
dut4ii           XI           XI PI	7 7 7 5 5 7 7 8 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0	2039* 2038* 2037* 2036* 2035* 2035*		- E	EDS-G508E     EDS-G512E     Gateway     HMI     IO
dut4it           XI           XI PI           XI PI	7 7 7 5 5 7 7 8 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0	2039* 2038* 2037* 2036* 2035* 2035*		- E	EDS-G508E     EDS-G512E     Gateway     HMI     IO
dot#it       XI       XI PI       Device	7 7 7 5 5 7 7 8 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0	2039* 2038* 2037* 2036* 2035* 2035*		- E	

Product Icons

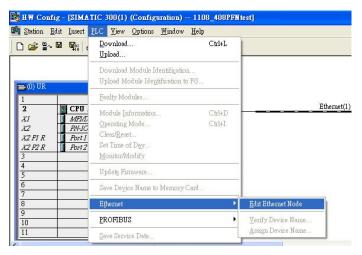
Ex. File Name: EDS-405A.bmp, EDS-408A.bmp, EDS-510E.bmp, EDS-G508E.bmp, EDS-G512E-4GSFP.bmp, EDS-G516E-4GSFP.bmp



## **Device Configuration**

1. Browse the switch

Select **PLC > Ethernet > Edit Ethernet Node** to open the Browse dialog.



#### After the **Edit Ethernet Node** dialog box appears, click **Browse**.

Ethernet node	
	Nodes accessible online
MAC address:	Browse
Set IP configuration	
• Use IP parameters	
	Gateway
IP address:	
Subnet mas <u>k</u> :	C Use router
	Address:
Client ID	C MAC address C Deyice name
Client ID Client ID:	C MAC address C Deylce name
Client ID: Assign IP Configuration	
Client ID:	
Client ID: Assign IP Configuration Assign device name	n
Client ID: Assign IP Configuration Assign device name Device name:	n

Select your target switch and click  $\ensuremath{\textbf{OK}}$  .

- 2. Assign IP address and Device name.
  - a. Give the switch an IP address and subnet mask
    - Click Assign IP configuration.
  - b. Give the switch a name
  - Click Assign Name.
  - c. Click **Close** to finish.

themet node		
		Nodes accessible online
IAC address:	00-90-E8-25-FF-FC	Browse
et IP configuration -		
Use I <u>P</u> parameter	\$	
		Gateway
IP address:	192.168.127.253	• Do not use router
Subnet mas <u>k</u> :	255.255.255.0	⊂ <u>U</u> se router
		Address: 192.168.127.253
° Obtain IP address	from a DHCP server	
Identified by		
Client ID	$m{C}$ MAC address	C Device name
Client ID:		
Aşsign IP Config	uration	
ssign device name -		
Device name:	dut408	Assign Name
eset to factory settin	82	
		Reset

### NOTE

The field **Device name** does not allow any empty spaces in the name. If the device name is entered with a space, the system will remove words after the space automatically.

- 3. Set IP address and device for your project
  - a. Double-click the switch icon to open switch property menu.
  - b. Set the **Device name** and **IP address** corresponding with those you have just assigned in STEP 7.
    - Use IP parameters
       Manual input of IP address and Subnet mask.
    - **Obtain IP address from a DHCP server** 
      - Select MAC address then click Assign IP configuration.

themet node		
		Nodes accessible online
AC address:	00-90-E8-25-CC-FC	Browse
et IP configuration		
Use IP paramete	rs	
		Gateway
IP address:	192.168.127.253	😨 Do not use router
Subnet mask:	255.255.255.0	C Use router
		Address: 192.168.127.253
-	c we down	C During and
Identified by Client ID Client ID:	☞ MAC address	C Device name
C Client ID		← Degice name
C Client ID Client ID: [ Agsign IP Config		û Deyjce name
Client ID:		C Deyjce name
← Client ID Client ID: Agsign IP Confi Lssign device name	guation	

After the IP has been assigned by DHCP, click **Browse** again to check the assigned IP address.

c. Click Save and Compile then click download to Module.

Properties - eds408		
General		
Short description:	EDS-408A-PFN	
	EDS-408A-PFN	<u> </u>
Order No./ firmware:	0007-000408-0000 / ∀3.1	
Family:	MOXA EtherDevice Switch	
Device name:	eds408	
<u>Node in PROFINET 1</u>	Change Release Number O System	
		-
D <u>e</u> vice number:	1 PROFINET-IO-System (100)	
IP address:	192.168.127.253 Ethemet	
✓ <u>A</u> ssign IP address	via IO controller	
Comment:		
		^
		2
OK	Cancel	Help

- 4. Configuring device properties
  - a. Select the switch and double-click the first **sub-module slot 0** to set device properties.

=	🔰 (1) dut408A			
Slot	Module 🚺	Order number	I address	Q address
0	🞽 do#408A	0007-000408-00		
XI	XI 🛛			
XIA	🛛 XI PI			
XIA	XI P2			
XIA	XI P3			
XIA	XI P4			
XIA	XI PS			
XIA	🛛 XI P6			
XIA	📕 XI P7			
XIA	XI P8			
1	📕 Device data		0	
2	🚦 Port data		1	

- b. Select **Parameters** and change the device parameter settings.
- c. Click Save and Compile, then click download to Module.

	Value
Parameters	
Device parameters	
- E Status change	No alarms No alarms
Redundant power supply Device status	No alarms
10.0	

- 5. Configuring I/O cycle
  - a. Select the switch and double-click the  ${\bf sub-module\ X1}$  to set the I/O cycle.
  - b. Select **IO Cycle** and change the I/O cycle settings. Click **Save and Compile**, then click **download to Module**.

eneral   Addresses IO Cycle Update Time			
Mode:	Fixed update time	•	
		Factor	Send clock [ms]
Update time [ms]:	128.000 💌 =	128 - 2	¢ 1.000
Watchdog Time	128 000 256.000 512.000		
Number of accepted update	e cycles with missing IO data:		3
Watchdog time [ms]:			384.000

- 6. Configuring port property
  - a. Select the switch and double-click the **sub-module X1 PN** to set port property.
  - b. Select Parameters.
  - c. Change the port parameters settings.
  - d. Click Save and Compile then click download to Module.

	Value	5115
arameters	value	
- Port parameter		
- Alarms	On	
Admin state	Active	

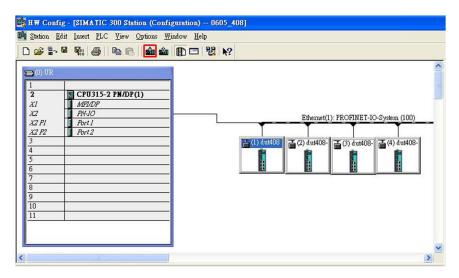
- 7. Configuring connection options
  - a. Select the switch and double-click the **sub-module X1 PN** to set port options.
  - b. Select **Options**.
  - c. Change the port option settings.
  - d. Click Save and Compile, then click download to Module.

Properties - X1 - X1 P1 (X1 P1)			X
General   Addresses   Topology Options	Perameters		
Connection			
Transmission medium / duplex:	Automatic settings		•
Disable autonegotiation	Automatic settings TP 100 Mbps full duplex TP 10 Mbps full duplex TP 10 Mbps full duplex TP 100 Mbps half duplex		
Boundaries	TP 100 Mbps half duplex		
🖵 End of grac domain			
☐ End of detection of accessible node:			
F End of topology discovery			
0			
OK		Cancel	Help

# Save and Load the Project into the PLC

Click the icon (in red box) to download project configuration to the PLC.

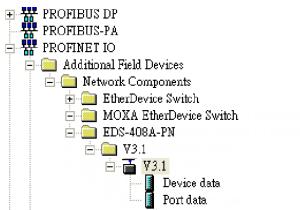
After the project is configured, SIMATIC STEP 7 will load all information required for data exchange to the I/O Controller (PLC), including the IP addresses of the connected I/O devices.



## **Monitoring the Switch**

#### **Monitor PROFINET I/O Cyclic Data**

MOXA switches provide PROFINET I/O cyclic data for real-time monitoring. In side bar you can see **Device** data and **Port data**.



Use Drag & Drop to pull the Device data onto slot 1. Right-click on slot 1, then select Monitor/Modify.

9 10							Delete	Del
.1							<u>G</u> o To <u>F</u> ilter Assigned Modules	
a mb	(1) dut408						<u>M</u> onitor/Modify	
ot	Module	Order number	I address	Q address	Diagnostic address:	Cor	<u>E</u> dit Symbols	
,	a dat408	0007-000408-0000			2042*		Object Properties	Alt+Return Ctrl+Alt+O
1	XI				2041*		Open Object With	
I PI	XIPI				2040*		Change Access	
I P2	XI P2			2	2039*	-		
1 P3	XI P3				2038*		Assign Asset ID	
1 P4	XI P4			14	2037*		Product Support Information	Ctrl+F2
I P5	XI P5			1	2036*		FAQs	Ctrl+F7
1 P6	XI P6			1	2035*		Find Manual	Ctrl+F6
1 P7	XI P7			1	2034*	-	Philo Pitanoai	CultPo
1 P8	XI P8				2033*		Start Device Tool	
	Device data		0			-		

Use Monitor to check the input data value. In this dialog, you can see the status value of each address. Please refer to the **PROFINET Cyclic I/O data table** in Chapter 5.1 to see the meaning of each bit. For example, address 0.1 is Bit 1 in the **PROFINET Cyclic I/O data table**. It represents Power 1 status of the switch. 1 means Power 1 exists and Green will be displayed in the **Modify/monitor** window.

### NOTE

Refer to the **PROFINET Cyclic I/O data table** in chapter 5.1 for the meanings of each address.

Path:	1	1108_408PFNtest\SI	MATIC 300(1)/CPU 31	5-2 PN/DP		
Ad	lvess	Symbol	Display forma	t Status value	Modify value	2
1 I	0.0		BOOL	true		
2 I	0.1		BOOL	true		
3 I	0.2		BOOL	false		
4 I	0.3		BOOL	false		
5 I	0.4		BOOL	false		
6 I	0.5		BOOL	true		
7 I	0.6		BOOL	false		
8 I	0.7		BOOL			
<						>
Run (	- ondit		Update Force Symbol un immediately <u>Status Value</u> Modify Value	with F5		

To monitor Port data, follow the same steps, drag **Port data** in the side bar and drop it onto **slot 2**. MOXA PROFINET I/O cyclic data in the slot 1 and 2.

<b>(</b>	(1) EDS-408A-PI	4
Slot	🚺 Module	Order number
0	EDS-408A-PN	0007-000408-06
XI	🚺 XI	
XI I	🚺 XI PI	
XI I	XI P2	
XL	🚺 XI P3	
XI A	🚺 XI P4	
XI I	🚺 XI PS	
XI I	📕 XI P6	
XII	🚺 XI F7	
XLI	📕 XI P8	
1	🚦 Device data	
2	📱 Port data	

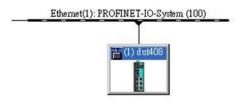
Then right click. Select **Monitor/Modify**. You will see a monitoring window.

at	h:	signed CPU services MOXAVSIMATIC 300(1	)/CPU 315-2 PN/DP			
	Address	Symbol	Display format	Status value	Modify value	1
1	I 1.0		BOOL	false		1
2	I 1.1		BOOL	truë		
3	I 1.2		BOOL	true		
4	I 1.3		BOOL	false		
5	I 1.4		BOOL	false		
6	I 1.5		BOOL	false		
7	I 1.6		BOOL	false		1
8	I 1.7		BOOL			V
<						
F	un condi Monito Modify	tionally Run in	date Force Symbol w nmediately Status Value Iodify Value	☐ Enable Perip ☐ L/O Display	heral Outputs () <b>RUNNING</b>	

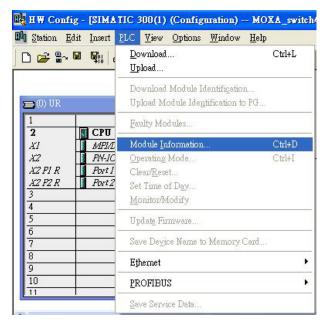
### **Module Information**

MOXA switch supports SIMATIC STEP 7 Ethernet traffic information monitoring and PROFINET alarms. These attributes can be monitored in module information dialog. Following are the steps of operation.

Select MOXA switch icon on the screen.



Then, click menu bar **PLC > Module Information** 



The module information dialog will then pop up.

### **Port Statistics Output**

Select **Statics** tags. Find out each port traffic information list below.

General	IO Device Diagnostics	Communication Dia	enostics	Interface
Network	Connection	Statistics	Identi	fication
Port	Statistical valu	le	Cun	rent 🗖
Port 1 (X1 P1)	Dropped recei	ived packets - no resources	0	
Port 1 (X1 P1)	Bad received		Ō	
Port 1 (X1 P1)	Received octe	ts	157	18
Port 1 (X1 P1)	Dropped sent	packets - no resources	0	
Port 1 (X1 P1)	Bad sent pack	ets - transmit collisions	0	
Port 1 (X1 P1)	Sent octets		2423	2725
Port 2 (X1 P2)	Dropped recei	ived packets - no resources	0	
Port 2 (X1 P2)	Bad received ;		0	
Port 2 (X1 P2)	Received octe		0	
Port 2 (X1 P2)		packets - no resources	0	
Port 2 (X1 P2)		ets - transmit collisions	0	
Port 2 (X1 P2)	Sent octets		0	
Port 3 (X1 P3)		ived packets - no resources	0	
Port 3 (X1 P3)	Bad received ;		0	
Port 3 (X1 P3)	Received octe			7731
Port 3 (X1 P3)		packets - no resources	0	~
Port 2 /3/1 P2)	Rad cont norb	ete - transmit collisions	n	2

Statistics tab lists each port traffic status and the number of packets. Click **Update** to refresh the data.

### **I/O Device Diagnostics**

Moxa PROFINET switches support PROFINET alarms. These alarm messages will be sent by the switch immediately when an event is triggered. These alarms can be enabled/disabled using PROFINET I/O parameters(see chapter **PROFINET I/O Parameters**).

Select IO Device Diagnostics tab to view alarms received by the PLC.

h: 🛛 MOXA tus: 🔀 Erro		N'SIMATIC 300(1)\C	Operating mode	of the CPU: (	🔊 STOP
	work Connectio	m	Statistics	) Id	entification
General	IO De	evice Diagnostics	Communicatio	n Diagnostics	Interface
IO controller		pn-io			
Manufacture	r's description	553	Devi	ce ID:	16# 0007
					Hex. Format
<u>S</u> tandard dia,	gnosues:				
	cific diagnostics				
Slot	cific diagnostics	Error	/16# 0000_16# 00	0000003	
				000000)	
Slot 0.X1 0.X1 P5	Channel	Error Power supply 1 error Link down (16# 000	0, 16# 00000000)	000000)	
Slot 0.X1 0.X1 P5	Channel	Error Power supply 1 error Link down (16# 000		1000000)	

The **Channel-specific diagnostics** field is displaying link-down alarm information. Click **Update** to refresh the data.

### **Communication Diagnosis**

Select a sub-module and use "PLC: Module Information" to see the diagnostic data.

Name	Port status	Settings	Mode
Port 3 (X1 P3)	OK	Automatic settings	TP 100 Mbps full du
	Port 3 (X1 P3) s: 00-90-E8-25-FF-FC		

## **Topology Editor**

MOXA devices support SIMATIC STEP 7 Topology editor. Click Topology Editor. View each port's connection status in table view tag.

ə'g Topology Editor		
Table view Graphic view Offline/online comparison		
Interconnection table		Selection range
I▼ Show station name	Filter: Show all ports	Filter: Show all ports
Port Partner port	Cable len Signal del Comment	() - dut408
⊡- dut408		+- SIMATIC 300(1)
X1 P1 (X1 P1) X1 P2 (X1 P2)		T .
X1 P3 (X1 P3) SIMATIC 300(1) \PN	-IO(CPU 31 0.00	
🔲 X1 P4 (X1 P4)		
X1 P5 (X1 P5)		
🔲 X1 P6 (X1 P6)		
X1 P7 (X1 P7)		
X1 P8 (X1 P8)		
SIMATIC 300(1) - PN-IO(CPU 315-2 PN/DP)		
Port 1 (X2 P1 R) dut408 \ X1 P3 (X1 F	3) 0.00	Passive Components
Port 2 (X2 P2 R)	0, 0.00	E − SCALANCE X100
		E-SCALANCE W
		medium converter
		+ SIMATIC HMI
<		
<u>Quline</u> <u>Update</u> Object Properties	<u>Export</u> <u>Options</u>	Add
OK		Cancel Help

In the **Offline/Online Comparison** tab, you can compare device partner ports. Click S**tart** to discover connection relationships.

	gured topology (offline)			Detected topology (online)	
E	Ellter: Show all devices		<u>S</u> tart 3 devi	ces found	
ect name	Partner port	Cable data	Object name	Partner port	Cable dat
dut408		1917			
X1 P1 (X1 P1)			Port 1		
X1 P2 (X1 P2)			Port 2		
X1 P3 (X1 P3)			Port 3	pn-io \ Port 1	-(-)
X1 P4 (X1 P4)			Port 4	chrisch-test \ Port 1	-(-)
X1 P5 (X1 P5)			Port 5	dut2408 \ Port 5	-(-)
X1 P6 (X1 P6)			Port 6	dut2408 \ Port 6	-(-)
X1 P7 (X1 P7)			Port 7		
X1 P8 (X1 P8)			Port 8		
N-IO(CPU 315-2 PN/DP	)		🖃 – pn-io		
Port 1 (X2 P1 R)			Port 1	dut408 \ Port 3	-(-)
Port 2 (X2 P2 R)			Port 2		
			dut2408		
			Port 1		
			Port 2		
			Port 3		
			Port 4		
			Port 5	dut408 \ Port 5	-(-)
			Port 6	dut408 \ Port 6	-(-)
			<		

You can also draw the connection of each port manually in Graphic view tab.

a's Topology Editor	
Table view Graphic view Offline/online comparison	
SIMATIC 300 Station PN-IO(CPU315-2 PV/DP(1)) dut408 dut408	Ministure View
Opline         Update         Object Properties         Options         Print	
OK	CancelHelp