# **Industrial Protocols User's Guide**

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www.moxa.com/product



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# 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 T	уре	Function Code	Function Name	Note
Bit access	Physical Discrete Inputs	2	Read Discrete Inputs	
	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	
	Image: First 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 Informa		•	
0x0000	1 word	HEX	Vendor ID = $0x1393$
0x0001	1 word		Unit ID (Ethernet = 1)
0x0002	1 word	HEX	Product Code = 0x0003
0x0010	20 words	ASCII	Vendor Name = "Moxa"
			Word 0 Hi byte = $M'$
			Word 0 Lo byte = $o'$
			Word 1 Hi byte = 'x'
			Word 1 Lo byte = `a'
			Word 2 Hi byte = $10'$
			Word 2 Lo byte = $\0'$
0x0030	20 words	ASCII	Product Name = "EDS-408A"
			Word 0 Hi byte = $E'$
			Word 0 Lo byte = $D'$
			Word 1 Hi byte = 'S'
			Word 1 Lo byte = $-'$
			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
0x0051	2 words		Firmware Version
			Word 0 Hi byte = major (A)
			Word 0 Lo byte = minor (B)
			Word 1 Hi byte = release (C)
			Word 1 Lo byte = build (D)
0x0053	2 words	HEX	Firmware Release Date
			For example:
			Word $0 = 0 \times 0609$
			Word $1 = 0 \times 0705$
			Firmware was released on 2007-05-06 at 09
			oʻclock
0x0055	3 words	HEX	Ethernet MAC Address
			Ex: MAC = 00-01-02-03-04-05

Address Offset	Data Type	Interpretation	Description Word 0 Hi byte = 0 x 00
			Word 0 Lo byte = $0 \times 00$
			Word 1 Hi byte = $0 \times 01$
			Word 1 Lo byte = $0 \times 02$ Word 1 Lo byte = $0 \times 03$
			Word 2 Hi byte = $0 \times 04$
0.0050	4		Word 2 Lo byte = $0 \times 05$
0x0058	1 word	HEX	Power 1
			0x0000: Off
0.0050			0x0001: On
0x0059	1 word	HEX	Power 2
			0x0000: Off
			0x0001: On
0x005A	1 word	HEX	Fault LED Status
			0x0000: No
			0x0001: Yes
0x0080	1 word	HEX	DI1
			0x0000:Off
			0x0001:On
0x0081	1 word	HEX	DI2
			0x0000:Off
			0x0001:On
0x0082	1 word	HEX	DO1
			0x0000:Off
			0x0001:On
0x0083	1 word	HEX	DO2
			0x0000:Off
			0x0001:On
Port Information	1		
0x1000 to	1 word	HEX	Port 1 to 8 Status
0x1011			0x0000: Link down
			0x0001: Link up
			0x0002: Disable
			0xFFFF: No port
0x1100 to	1 word	HEX	Port 1 to 8 Speed
0x1111			0x0000: 10M-Half
0/12222			0x0001: 10M-Full
			0x0002: 100M-Half
			0x0003: 100M-Full
			0xFFFF: No port
0x1200 to	1 word	HEX	Port 1 to 8 Flow Ctrl
0x1211	1 11010	iiex	0x0000:Off
UNIZII			0x0001:On
			0xFFFF:No port
0x1300 to	1 word	HEX	Port 1 to 8 MDI/MDIX
0x1300 to	1 Word	HEX	0x0000: MDI
0/1311			0x0001: MDIX
			0xFFFF: No port
0x1400 to	20 words	ASCII	Port 1 to 8 Description
0x1400 to 0x1413 (Port 1)	20 00103		Port Description = "100TX,RJ45."
571415 (1011 I)			Word 0 Hi byte = $1'$
0x1414 to			Word 0 Lo byte = $0'$
0x1414 to 0x1427 (Port 2)			Word 1 Hi byte = $0'$
UNITZ/ (IUILZ)			Word 1 Lo byte = $T'$
			 Word 4 Hi byte = `4'
			Word 4 Lo byte = $4'$ Word 4 Lo byte = $5'$
			Word 5 Hi byte = '.'
			Word 5 Lo byte = $(0')$
Packets Informa	tion		
0x2000 to	2 words	HEX	Port 1 to 8 Tx Packets
0x2000 to 0x2023	2 worus		
0.2023			Ex: port 1 Tx Packet Amount = 44332211
			Received MODBUS response:
			0x44332211 Word 0 = 4433
0.2100 +	2		Word 1 = 2211
0x2100 to	2 words	HEX	Port 1 to 8 Rx Packets
0x2123			Ex: port 1 Rx Packet Amount = 44332211
			Received MODBUS response:
			0x44332211
			Word $0 = 4433$
			Word 1 = 2211

Address Offset	Data Type	Interpretation	Description
0x2200 to	2 words	HEX	port 1 to 8 Tx Error Packets
0x2223			Ex: port 1 Tx Error Packet Amount = 44332211
			Received MODBUS response:
			0x44332211 Word 0 = 4433
			Word $0 = 4433$ Word $1 = 2211$
0x2300 to	2 words	HEX	port 1 to 8 Rx Error Packets
0x2323	2 Worus		Ex: port 1 Rx Error Packet Amount = 44332211
072323			Received MODBUS response:
			0x44332211
			Word $0 = 4433$
			Word $1 = 2211$
Redundancy Inf	ormation		
0x3000	1 word	HEX	Redundancy Protocol
			0x0000:None
			0x0001:RSTP
			0x0002:Turbo Ring
			0x0003:Turbo Ring V2
			0x0004:Turbo Chain
			0x0005: MSTP
0x3100	1 word	HEX	RSTP Root
			0x0000: Not Root
			0x0001: Root
0.0000			0xFFFF: RSTP Not Enable
0x3200 to	1 word	HEX	RSTP Port 1 to 8 Status 0x0000: Port Disabled
0x3211			0x0000: Port Disabled 0x0001: Not RSTP Port
			0x0001: Not RSTP Port 0x0002: Link Down
			0x0003: Blocked
			0x0004: Learning
			0x0005: Forwarding
			0xFFFF: RSTP Not Enable
0x3300	1 word	HEX	TurboRing Master/Slave
			0x0000: Slave
			0x0001: Master
			0xFFFF: Turbo Ring Not Enable
0x3301	1 word	HEX	TurboRing 1st Port status
			0x0000: Port Disabled
			0x0001: Not Redundant Port
			0x0002: Link Down
			0x0003: Blocked
			0x0004: Learning
0	1		0x0005: Forwarding
0x3302	1 word	HEX	Ox0000: Port Disabled
			0x0001: Not Redundant Port
			0x0002: Link Down
			0x0003: Blocked
			0x0004: Learning
			0x0005:Forwarding
0x3303	1 word	HEX	TurboRing Coupling
			0x0000: Off
			0x0001: On
			0xFFFF: Turbo Ring is Not Enabled
0x3304	1 word	HEX	TurboRing Coupling Port Status
			0x0000: Port Disabled
			0x0001: Not Coupling Port
			0x0002: Link Down
			0x0003: Blocked
			0x0005: Forwarding
0.0005			0xFFFF: Turbo Ring is Not Enabled
0x3305	1 word	HEX	TurboRing Coupling Control Port Status
			0x0000: Port Disabled
			0x0001: Not Coupling Port
			0x0002: Link Down
			0x0003: Blocked
			0x0005: Forwarding
			0x0006: Inactive 0x0007:Active
			0xFFFF:Turbo Ring is Not Enabled
0x3500	1 word	HEX	TurboRing V2 Coupling Mode
07000	1 WOIG		0x0000: None
			0x0001: Dual Homing

Address Offset	Data Type	Interpretation	Description
			0x0002: Coupling Backup
			0x0003: Coupling Primary
0.050/			0xFFFF:Turbo Ring V2 is Not Enabled
0x3501	1 word	HEX	TurboRing V2 Coupling Port Primary Status
			(Used in Dual Homing, Coupling Backup, and
			Coupling Primary)
			0x0000:Port Disabled
			0x0001: Not Coupling Port 0x0002: Link Down
			0x0002: Link Down 0x0003: Blocked
			0x0004: Learning
			0x0005: Forwarding
			0xFFFF: Turbo Ring V2 is Not Enabled
0x3502	1 word	HEX	TurboRing V2 Coupling Port Backup Status
			(Only using in Dual Homing)
			0x0000: Port Disabled
			0x0001: Not Coupling Port
			0x0002: Link Down
			0x0003: Blocked
			0x0004: Learning
			0x0005: Forwarding
			0xFFFF: Turbo Ring V2 Not Enable
0x3600	1 word	HEX	TurboRing V2 Ring 1 status
			0x0000: Healthy
			0x0001: Break
0x3601	1 word	HEX	0xFFFF:Turbo Ring V2 Not Enable TurboRing V2 Ring 1 Master/Slave
0X3001	1 WORU	HEX.	0x0000: Slave
			0x0001: Master
			0xFFFF: Turbo Ring V2 Ring 1 Not Enable
0x3602	1 word	HEX	TurboRing V2 Ring 1 1st Port Status
0,5002	1 Word		0x0000: Port Disabled
			0x0001: Not Redundant Port
			0x0002: Link Down
			0x0003: Blocked
			0x0004:Learning
			0x0005:Forwarding
			0xFFFF:Turbo Ring V2 Ring 1 is Not Enabled
0x3603	1 word	HEX	TurboRing V2 Ring 1's 2nd Port Status
			0x0000: Port Disabled
			0x0001: Not Redundant Port
			0x0002: Link Down
			0x0003: Blocked
			0x0004: Learning
			0x0005: Forwarding
0.000			0xFFFF: Turbo Ring V2 Ring 1 is Not Enabled
0x3680	1 word	HEX	TurboRing V2 Ring 2 Status
			0x0000: Healthy
			0x0001: Break 0xFFFF: Turbo Ring V2 Ring 2 is Not Enabled
0x3681	1 word	HEX	TurboRing V2 Ring 2 Master/Slave
0X3001	1 WOLD		0x0000: Slave
			0x0001: Master
			0xFFFF: Turbo Ring V2 Ring 2 is Not Enabled
0x3682	1 word	HEX	TurboRing V2 Ring 2's 1st Port Status
0,5002	1 Word		0x0000: Port Disabled
			0x0001: Not Redundant
			0x0002: Link Down
			0x0003: Blocked
			0x0004: Learning
			0x0005: Forwarding
			0xFFFF: Turbo Ring V2 Ring 2 is Not Enabled
0x3683	1 word	HEX	TurboRing V2 Ring 2's 2nd Port Status
			0x0000: Port Disabled
			0x0001: Not Redundant
			0x0002: Link Down
			0x0003: Blocked
			0x0004: Learning
			0x0005: Forwarding
			0xFFFF: Turbo Ring V2 Ring 2 is Not Enabled
0x3700	1 word	HEX	Turbo Chain Switch Roles
		1	0x0000: Head

Address Offset	Data Type	Interpretation	Description
			0x0001: Member
			0x0002: Tail
			0xFFFF: Turbo Chain is Not Enabled
0x3701	1 word	HEX	Turbo Chain 1st Port status
			0x0000: Link Down
			0x0001: Blocking
			0x0002: Blocked
			0x0003: Forwarding
			0xFFFF: Turbo Ring V2 Ring 2 Not Enable
0x3702	1 word	HEX	Turbo Chain 2nd Port status
0/10/02	2	,	0x0000: Link Down
			0x0001: Blocking
			0x0002: Blocked
			0x0003: Forwarding
			0xFFFF: Turbo Ring V2 Ring 2 Not Enable
MSTP Register			OXITTI. TUBO KING V2 KING 2 NOT LINDDE
0x4000 ~ 0x407F	1 word 0x0102	HEX	MCTD CICT Dout Date / Dout Chata
$0x4000 \sim 0x407F$	1 word, 0x0103	NEX	MSTP CIST Port Role / Port State
	=> port role =		0x00: DisabledPort / 0x00 Port Disabled
	DesignatedPort		0x01: DesignatedPort / 0x01 Discarding
	port state =		0x02: RootPort / 0x02 Learning
	Forwarding		0x03: AlternatePort / 0x03 Forwarding
			0x04: BackupPort
			0x06: Not MSTP Port / 0x06Not MSTP Port
			0xFFFF: MSTP Not Enable
0x4080 ~ 0x40FF	1 word, 0x0103	HEX	MSTP MSTI1 Port Role / Port State
	=> port role =		0x00: DisabledPort / 0x00 Port Disabled
	DesignatedPort		0x01: DesignatedPort / 0x01Discarding
	port state =		0x02: RootPort / 0x02Learning
	Forwarding		0x03: AlternatePort / 0x03Forwarding
			0x04: BackupPort
			0x05: MasterPort
			0x06: Not MSTP Port / 0x06Not MSTP Port
			0xFFFF: MSTP Not Enable
0x4100 ~ 0x417F	1 word, 0x0103	HEX	MSTP MSTI2 Port Role / Port State
0/11200 0/112/1	=> port role =	,	0x00: DisabledPort / 0x00 Port Disabled
	DesignatedPort		0x01: DesignatedPort / 0x01Discarding
	port state =		0x02: RootPort / 0x02Learning
	Forwarding		0x03: AlternatePort / 0x03Forwarding
	Torwarding		0x04: BackupPort
			0x05: MasterPort
			0x06: Not MSTP Port / 0x06Not MSTP Port
0	1		0xFFFF: MSTP Not Enable
0x4180 ~ 0x41FF	1 word, 0x0103	HEX	MSTP MSTI3 Port Role / Port State
	=> port role =		0x00: DisabledPort / 0x00 Port Disabled
	DesignatedPort		0x01: DesignatedPort / x01Discarding
	port state =		0x02: RootPort / 0x02Learning
	Forwarding		0x03: AlternatePort / 0x03Forwarding
			0x04: BackupPort
			0x05: MasterPort
			0x06: Not MSTP Port / 0x06Not MSTP Port
			0xFFFF: MSTP Not Enable
0x4200 ~ 0x427F	1 word, 0x0103	HEX	MSTP MSTI4 Port Role / Port State
	=> port role =		0x00: DisabledPort / 0x00 Port Disabled
	DesignatedPort		0x01: DesignatedPort / 0x01Discarding
	port state =		0x02: RootPort / 0x02Learning
	Forwarding		0x03: AlternatePort / 0x03Forwarding
	-		0x04: BackupPort
			0x05: MasterPort
			0x06: Not MSTP Port / 0x06Not MSTP Port
			0xFFFF: MSTP Not Enable
0x4280 ~ 0x42FF	1 word, 0x0103	HEX	MSTP MSTI5 Port Role / Port State
	=> port role =		0x00: DisabledPort / 0x00 Port Disabled
	DesignatedPort		0x01: DesignatedPort / 0x01Discarding
	port state =		0x02: RootPort / 0x02Learning
	Forwarding		0x03: AlternatePort / 0x03Forwarding
			0x05: MasterPort
			0x06: Not MSTP Port / 0x06Not MSTP Port
			0xFFFF: MSTP Not Enable
0x4300 ~ 0x437F	1 word, 0x0103	HEX	MSTP MSTI6 Port Role / Port State
	=> port role =		0x00: DisabledPort / 0x00 Port Disabled
	Decignated	1	0x01: DesignatedPort / 0x01Discarding
	DesignatedPort		0x02: RootPort / 0x02Learning

Address Offset	Data Type	Interpretation	Descript	ion
	port state =		0x03:	AlternatePort / 0x03Forwarding
	Forwarding		0x04:	BackupPort
			0x05:	MasterPort
			0x06:	Not MSTP Port / 0x06Not MSTP Port
			0xFFFF:	MSTP Not Enable
0x4380 ~ 0x43FF	1 word, 0x0103	HEX	MSTP MS	TI7 Port Role / Port State
	=> port role =		0x00:	DisabledPort / 0x00 Port Disabled
	DesignatedPort		0x01:	DesignatedPort / 0x01Discarding
	port state =		0x02:	RootPort / 0x02Learning
	Forwarding		0x03:	AlternatePort / 0x03Forwarding
			0x04:	BackupPort
			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.

```
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

# **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.
4	Get	Revision		(Struct.)	The version of the Identity object
			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:

<b>Common Service List</b>
----------------------------

Service	Implementation		Service Name	Description
Code	Class	Instance	1	
0x01	$\checkmark$	$\checkmark$	Get_Attributes_All	Returns the contents of all attributes of the class
0x0E	✓	$\checkmark$	Get_Attribute_Single	Used to read an object instance attribute.
0x10		$\checkmark$	Set_Attribute_Single	Used to write an object instance attribute
0x05		$\checkmark$	Reset	Invokes the reset service for the device

<b>Product Code</b>	Model Name	Product Code	Model Name	Product Code	Model Name
0x0001	n/a	0x0012	EDS-G509	0x0023	TN-5510-PoE
0x0002	n/a	0x0013	EDS-P510	0x0024	TN-5508-PoE
0x0003	EDS-726	0x0014	EDS-516A-MM-M12	0x0025	n/a
0x0004	n/a	0x0015	IKS-6526SB	0x0026	IKS-6524
0x0005	EDS-518A	0x0016	EDS-608	0x0027	n/a
0x0006	EDS-405A	0x0017	IKS-6726-PoE	0x0028	n/a
0x0007	EDS-408A	0x0018	EDS-611	0x0029	EDS-P506A
0x0008	EDS-505A	0x0019	EDS-616	0x002A	PT-7728-PTP
0x0009	EDS-508A	0x001A	EDS-619	0x002B	PT-510
0x000A	EDS-510A	0x001B	TN-5518	0x002C	PT-508
0x000B	EDS-516A	0x001C	TN-5516	0x002D	n/a
0x000C	EDS-728	0x001D	TN-5510	0x002E	n/a
0x000D	PT-7728	0x001E	TN-5508	0x002F	IKS-G6524
0x000E	EDS-828	0x001F	EOM-104	0x0030	ICS-G7526
0x000F	PT-7828	0x0020	PT-G7509	0x0031	ICS-G7528
0x0010	PT-7710	0x0021	TN-5518-PoE	0x0032	n/a
0x0011	IKS-6726 or PT7728S old	0x0022	TN-5516-PoE	0x0033	IPS-P408
0x0034	TN-5818	0x0045	EDS-G508E	0x0056	n/a
0x0035	IKS-G6824	0x0046	EDS-G512E	0x0057	RedBox
0x0036	ICS-G7826	0x0047	EDS-G516E	0x0058	PT-7728-S-CN
0x0037	ICS-G7828	0x0048	EDS-D102	0x006C	EDS-G512E- 8POE
0x0038	ICS-G7748	0x0049	TN-5816v2	0x0061	ICS-G7528A
0x0039	ICS-G7750	0x004A	n/a	0x0060	ICS-G7526A
0x003A	ICS-G7752	0x004B	n/a	0x005F	ICS-G6524A
0x003B	ICS-G7848	0x004C	n/a	0x0064	ICS-G7828A
0x003C	ICS-G7850	0x004D	n/a	0x0063	ICS-G7826A
0x003D	ICS-G7852	0x004E	n/a	0x0062	ICS-G6824A
0x003E	IKS-6852	0x004F	EDS-408A-SS-ST-BP	0x0067	ICS-G7752A
0x003F	IKS-6728	0x0050	EDS-510A-3SFP-2SSC	0x0066	ICS-G7750A
0x0040	PT-7528	0x0051	n/a	0x0065	ICS-G7748A
0x0041	PT-7528-PTP	0x0052	IEX-402-VDSL	0x006A	ICS-G7852A
0x0042	TN-5510-2DSL	0x0053	IKS-6728-8PoE	0x0069	ICS-G7850A
0x0043	EDS-828-G52	0x0054	EDS-510E	0x0068	ICS-G7848A
0x0072	IKS-6728A- 8POE				
0x0075	IKS-6728A	1		1	1
0x0074	IKS-6726A				
0x008E	EDS-528E	1		1	
0x006B	EDS-518E	1		1	
0x00A2	EDS-P506E				
0x008F	PT-G7828				
0x00A1	PT-G7728		1		

#### **Product Code Table**

# **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	Configurat ion 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
3	Get/Set	Configurat ion 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 physical link object
5	Get/Set	Interface Configurat		(Struct.)	TCP/IP network interface configuration
		ion	IP Address	UDINT (32)	The device's IP address
			Network Mask	UDINT (32)	The device's network mask
			Gateway Address	UDINT (32)	Default gateway address
			Name Server	UDINT (32)	Primary name server
			Name Server2		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	Implementation		Service Name	Description
Code	Class	Instance		
0 x 01	$\checkmark$	$\checkmark$	Get_Attributes_All	Returns the contents of all attributes of the class
0 x 0E	✓	$\checkmark$	Get_Attribute_Single	Used to read an object instance attribute
0 x 10		$\checkmark$	Set_Attribute_Single	Used to modify an object instance attribute

## **Ethernet Link Object**

The Class code of Ethernet Link object is **Oxf6** (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).

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 devic	
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	

#### **Class Attribute List**

#### 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).
4	Get	Interface Counters		(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.
			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.
5	Get	Media Counters		(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.
			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.

Image: Provide the second se						
Image: Section of the sectio				Transmissi	UDINT (32)	transmission attempt is delayed
Amount of the second					UDINT (32)	Number of times a collision is detected later than 512 bit times
Image: state in the s					UDINT (32)	
Sense Frors         Condition was lost or never asserted when attempting to transmit a frame.           6         Get/Set         Interface Control         MAC Received Errors         UDINT (32)         Received frames that exceed the maximum permitted frame size.           6         Get/Set         Interface Control         (Struct.)         Configuration for physical interface field due to an internal MAC sublayer receive error.           6         Get/Set         Interface Control         (Struct.)         Configuration for physical interface.           10         Get         Interface Control         (Struct.)         Bit 0: Auto-Negotiate Value 0: Force Value 1: Auto-Negotiate           10         Get         Interface Label         Speed at which the interface shall be forced to operate.           100         Get         Interface Media Type         SHRING         Human readable identification           101         Get         Interface Media Type         STRING         Human readable identification           101         Get         Interface Media Type         STRING         Heinex.         Value 0: Disabled Broadcast Storm Protection.           102         Get/Set         Unitrafice Utilization Alarm Upper Threshold         USINT (8)         Not supported           103         Get         Interface Utilization Alarm Lower Threshold         USINT (8)         <				Transmit		fails due to an internal MAC sublayer transmit error.
Frame Too Long         UDINT (32)         Received frame size.           MAC Receive         WAC Receive         UDINT (32)         Frames for which reception on an interface fails due to an internal Processor           6         Get/Set         Interface Control         (Struct.)         Configuration for physical interface.           6         Get/Set         Interface Control         (Struct.)         Configuration for physical interface.           6         Get/Set         Interface Lobel         WORD (16)         Bit 0: Auto-Negotiate Value 0: Force Value 0: Force Value 1: Auto-Nego Bit 1: Half/Full Duplex Value 1: Auto-Nego Bit 1: Half/Full Duplex Value 1: full otplex Value 1: full otplex           10         Get         Interface Lobel         SHORT_STRING         Human readable identification           100         Get         Interface Media Type         STRING         Media type           102         Get/Set         Broadcast Storm Protection         USINT (8)         Value 0: Disable Broadcast Storm Protection.           103         Get         Interface Utilization Alarm Upper Threshold         USINT (8)         RX interface utilization upper limit in percentage           104         Get/Set         Utilization Alarm Upper Threshold         USINT (8)         Not supported           105         Get/Set         Port Link Alarm         USINT (8)         Value 0: I				Sense	UDINT (32)	condition was lost or never asserted when attempting to
Get/Set         Interface Control         Receive Errors         Interface Sublayer receive error.           6         Get/Set         Interface Control         Control Bits         (Struct.)         Configuration for physical interface.           6         Get/Set         Interface Control         WORD (16)         Bit 0: Auto-Negotate Value 0: half duplex Value 1: Auto-Nego Bit 1: Half/Full Duplex Value 1: Auto-Nego           10         Get         Interface Label         UINT (16)         Speed at Which the interface shall be forced to operate.           10         Get         Interface Media Type         SHORT_STRING         Human readable identification           101         Get         Interface Media Type         STRING         Media type           101         Get         Interface Media Type         STRING         Media type           102         Get/Set         Interface Media Type         USINT (8)         Value 0: Disabled Broadcast Storm Protection.           103         Get         Interface Utilization Alarm Upper Threshold         USINT (8)         RX interface utilization upper limit in percentage           105         Get/Set         Utilization Alarm Lower Threshold         USINT (8)         Value 0: Ignore Value 1: On (Relay 1) Value 2: On (Relay 2)           106         Get/Set         Port Traffic-Overload Alarm         UDINT(32) <td></td> <td></td> <td></td> <td></td> <td>UDINT (32)</td> <td>Received frames that exceed the</td>					UDINT (32)	Received frames that exceed the
6         Get/Set         Interface Control         (Struct.)         Configuration for physical interface.           6         Get/Set         Interface Control Bits         WORD (16)         Bit 0: Auto-Negotiate Value 1: Auto-Nego Bit 1: Half/full upplex Value 1: Auto-Nego           6         Interface Label         Forced Interface         UINT (16)         Speed at which the interface shall be forced to operate.           10         Get         Interface Port Index         UDINT (32)         Port index.           101         Get         Interface Media Type         STRING         Human readable identification           101         Get         Interface Media Type         STRING         Media type           102         Get/Set         Broadcast Storm Protection         Value 0: Disabled Broadcast Storm Protection.         Value 0: Disabled Broadcast Storm Protection.           103         Get         Interface Utilization         USINT (8)         RX interface utilization upper Inreshold           104         Get/Set         Utilization Alarm Lower Threshold         USINT (8)         RX interface utilization upper Value 2: On (Relay 1) Value 2: On (Relay 2)           106         Get/Set         Port Link Alarm         USINT (8)         Value 0: Ignore Value 3: Off (Relay 1)           107         Get/Set         Port Traffic-Overload Alarm         UDI				Receive	UDINT (32)	interface fails due to an internal
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101         Get         Interface Media Type         STRING         Media type           102         Get/Set         Broadcast Storm         USINT (8)         Value 0: Disabled Broadcast           102         Get/Set         Protection         USINT (8)         Value 0: Disabled Broadcast Storm           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 Lower Threshold         USINT (8)         Value 0: Ignore Value 1: On (Relay 1) Value 2: On (Relay 1) Value 4: Off (Relay 1) Value 2: Enable(Relay 1) Value 2: Enable(Relay 1) Value 2: Enable(Relay 1) Value 2: Enable(Relay 2)           107         Get         Rx Unicast Packet UDINT(32)         Number of TX multicast packets per second           109         Get         Tx Multicast Packet UDINT(32)         Number of TX multicast packets per second           110         Get         Rx Multicast Packet Rate         UD		Get	Interface Label			Human readable identification
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113         Get         Rx Broadcast Packet         UDINT(32)         Number of RX broadcast packets	112	Get	Tx Broadcast Packet		UDINT(32)	Number of TX broadcast packets
	113	Get	Rx Broadcast Packet		UDINT(32)	

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	Link Status	0 indicates an inactive link;
		1 indicates an active link.
1	Half/Full Duplex	0 indicates half duplex;
		1 indicates full duplex.
2-4	Negotiation Status	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;
		recommended defaults are 10Mbps and half duplex.
		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.
5	Manual Setting Requires	0 indicates the interface can activate changes to link parameters
	Reset	(auto-negotiate, duplex mode, interface speed) automatically. 1
		indicates the device requires a Reset service be issued to its Identity
		Object in order for the changes to take effect.
6	Local Hardware	0 indicates the interface detects no local hardware fault; 1 indicates a
	Fault	local hardware fault is detected. The meaning of this is product-
		specific. For example, an AUI/MII interface might detect no
		transceiver attached, or a radio modem might detect no antenna
		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	Implementation		Service Name	Description
Code	Class Instance			
0x0E	✓	$\checkmark$	Get_Attribute_Single	Used to read an object instance attribute
0x10		$\checkmark$	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**

Γ	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 Implementation		entation	Service Name	Description
Code	Class	Instance		
0x0E	✓	✓	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
Input	Switch Fault Status	UDINT (32)	Please refer to Moxa Networking Object Attr ID 2.
	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
1	Get	Object_list		(Struct.)	A list of supported objects
			Number	UINT (16)	Number of supported classes in the classes array
			Classes	Array of UINT (16)	List of supported class codes
2	Get	Number Available		UINT (16)	Maximum number of connections supported
3	Get	Number Active		UINT (16)	Number of connections currently used by system components
4	Get	Active Connections		Array of UINT (16)	A list of the connection IDs of the currently active connections

#### **Common Service List**

Service	Implem	entation	Service Name	Description
Code	Class	Instance		
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	Implem	entation	Service Name	Description
Code	Class	Instance	1	
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 Info		(Array of Struct.)	
			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)
3	Get	Link Object		(Struct.)	
			Path Length	UINT (16)	Number of 16 bit words in the following path.
			Link Path	Padded EPATH	Logical path segments that identify the object for this port.

4	Get	Port Name	SHORT_STR ING	String which names the physical network port. The maximum number of characters in the string is 64.
5	Get	Port Type Name	SHORT_STR ING	String which names the port type. The maximum number of characters in the string is 64.
6	Get/Set	Port Description	SHORT_STR ING	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	Implementation		Service Name	Description
Code	Class	Instance		
0x0E	✓	$\checkmark$	Get_Attribute_Single	Used to read an object instance attribute
0x10		$\checkmark$	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**

Access Rule	Name	Data Type	Description
Get	Firmware Version	UDINT (32)	Switch firmware version
Get	System Fault	UDINT (32)	Switch fault status
	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 1: alarm
			Bit 3: Port link up
			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 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)
	Rule Get	RuleGetFirmware VersionGetSystem Fault	RuleUDINT (32)GetFirmware VersionUDINT (32)GetSystem FaultUDINT (32)

Value 1: Alarm           Bit 11: D 2(0n)           Value 0: No alarm           Value 0: Not support           Value 0: Off           Value 0: Not support           Value 0: Off           Value 0: Orseix           ULINT (64)           Switch per port lankstaus           Bit mask, the LSB indicates the first port.           Value 1: Disable           Get/Set         GetP Set           IGMP Enhanced         USINT (8)           Mode         USINT (8)           Override relay warning setting           Override relay warning setting <td< th=""><th></th><th></th><th></th><th></th><th colspan="3"></th></td<>							
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Get         Port Link Status         ULINT (64)         Switch per port link status Bit mask, the LSB indicates the first port. Value 0: Link down Value 1: Link up           7         Get/Set         IGMP Snooping Enable         USINT (8)         IGMP snooping enable: Value 0: Disable           8         Get/Set         Query Interval         UDINT (32)         Query interval range from 20 to 600 secs           9         Get/Set         IGMP Enhanced Mode         USINT (8)         IGMP enhanced mode 0: Disable(default)           14         Get/Set         Relay 1         USINT (8)         Override relay warning setting 0: Disable(default)           15         Get/Set         Relay 1         USINT (8)         Override relay warning setting 0: Disable(default)           16         Get/Set         Power 1 Relay Warning         USINT (8)         Override relay warning setting 0: Disable (default)           17         Get/Set         Power 2 Relay Warning         USINT (8)         Power input 1 failure (on->off) 0: Disable (default)           18         Get/Set         D1 1 (0ff) Relay Warning         USINT (8)         Power input 2 failure (on->off) 0: Disable (default)           11         Gable (relay 2)         D1 1 (0ff)         USINT (8)         D1 1 (0ff) 0: Disable (default)           12         Gable (relay 2)         D1 1 (0ff)         USINT (8)	5	Get/Set	Port Enable	ULINT (64)			
Get         Port Link Status         ULINT (64)         Value 1: Disable           6         Get         Port Link Status         ULINT (64)         Switch per port link status Bit mask, the LSB indicates the first port. Value 0: Link up           7         Get/Set         IGMP Snooping Enable         USINT (8)         IGMP snooping enable: Value 0: Disable           8         Get/Set         Query Interval         UDINT (32)         Query interval range from 20 to 600 secs           9         Get/Set         IGMP Enhanced Mode         USINT (8)         IGMP enhanced mode 0: Disable(default)           14         Get/Set         Relay 1         USINT (8)         Override relay warning setting 0: Disable(default)           15         Get/Set         Relay 2         USINT (8)         Override relay warning setting 0: Disable (default)           16         Get/Set         Power 1 Relay Warning         USINT (8)         Power input 1 failure (on->off)           17         Get/Set         Power 2 Relay Warning         USINT (8)         Power input 2 failure (on->off)           18         Get/Set         DI 1 (0ff) Relay Warning         USINT (8)         DI 1 (0ff)           19         Get/Set         DI 1 (on) Relay Warning         USINT (8)         DI 1 (0ff)           19         Get/Set         DI 2 (0ff) Relay War					BIT MASK, THE LSB INDICATES THE FIRST PORT.		
6         Get         Port Link Status         ULINT (64)         Switch per port link status           7         Get/Set         IGMP Snooping Enable         USINT (8)         IGMP snooping IGMP snooping enable: Value 0: Disable Value 1: Enable           8         Get/Set         IGMP Snooping Get/Set         USINT (8)         IGMP enoping enable: Value 0: Disable (Value 0: Disable 0: Disable(default)           14         Get/Set         Relay 1         USINT (8)         IGMP enhanced 0: Disable(default)           15         Get/Set         Relay 2         USINT (8)         Override relay warning setting 0: Disable(default)           16         Get/Set         Relay 2         USINT (8)         Override relay warning setting 0: Disable(default)           16         Get/Set         Power 1 Relay Warning         USINT (8)         Power input 1 failure (on->off)           17         Get/Set         Power 2 Relay Warning         USINT (8)         Power input 2 failure (on->off)           18         Get/Set         DI 1 (0ff)         USINT (8)         DI 1 (0ff)           18         Get/Set         DI 1 (0ff)         USINT (8)         DI 1 (0ff)           19         Get/Set         DI 2 (0ff)         USINT (8)         DI 1 (0ff)           21         Get/Set         DI 2 (0ff)         USINT (8)							
7       Get/Set       IGMP Snooping Enable       USINT (8)       IGMP snooping enable: Value 0: Disable Value 0: Disable         8       Get/Set       IGMP Enhanced Mode       UDINT (8)       IGMP enhanced mode 0: Disable(default)         14       Get/Set       Relay 1       USINT (8)       IGMP enhanced mode 0: Disable(default)         15       Get/Set       Relay 2       USINT (8)       Override relay warning setting 0: Disable(default)         16       Get/Set       Power 1 Relay Warning       USINT (8)       Override relay warning setting 0: Disable (default)         17       Get/Set       Power 1 Relay Warning       USINT (8)       Power input 1 failure (on->off) 0: Disable (default)         18       Get/Set       Power 2 Relay Warning       USINT (8)       Power input 2 failure (on->off) 0: Disable (default)         18       Get/Set       DI 1 (0ff) Relay Warning       USINT (8)       DI 1 (0ff) 0: Disable (default)         19       Get/Set       DI 1 (0ff) Relay Warning       USINT (8)       DI 1 (0ff) 0: Disable (default)         11       Fnable (relay 1) 2: Enable (relay 2)       DI 1 (0ff)       USINT (8)       DI 1 (0ff) 0: Disable (default)         11       Fnable (relay 1)       2: Enable (relay 2)       DI 1 (0ff)         20       Get/Set       DI 2 (0ff) Relay Warning       USINT	6	Get	Port Link Statue	LII INT (64)			
Value 0: Link down Value 1: Link up           7         Get/Set         IGMP Snooping Enable         USINT (8)         IGMP snooping enable: Value 0: Disable           8         Get/Set         Query Interval         UDINT (32)         Query interval range from 20 to 600 secs           9         Get/Set         IGMP Enhanced Mode         USINT (8)         IGMP enhanced mode 0: Disable(default)           14         Get/Set         Relay 1         USINT (8)         Override relay warning setting 0: Disable(default)           15         Get/Set         Relay 2         USINT (8)         Override relay warning setting 0: Disable (default)           16         Get/Set         Power 1 Relay Warning         USINT (8)         Power input 1 failure (on->off) 0: Disable (default)           17         Get/Set         Power 2 Relay Warning         USINT (8)         Power input 1 failure (on->off) 0: Disable (default)           18         Get/Set         D1 1 (0ff) Relay Warning         USINT (8)         D1 1 (0ff) 0: Disable (default)           19         Get/Set         D1 2 (0ff) Relay Warning         USINT (8)         D1 1 (0ff) 0: Disable (default)           1         Enable (relay 2)         D1 2 (0ff)         USINT (8)         D1 1 (0ff) 0: Disable (default)           2         Get/Set         D1 2 (0ff) Relay Warning         USINT (8)	Ŭ	000					
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16       Get/Set       Power 1 Relay Warning       USINT (8)       Power input 1 failure (on->off)         0: Disable (default)       1: Enable (relay 1)       2: Enable (relay 2)         17       Get/Set       Power 2 Relay Warning       USINT (8)       Power input 2 failure (on->off)         18       Get/Set       DI 1 (0ff) Relay Warning       USINT (8)       Power input 2 failure (on->off)         18       Get/Set       DI 1 (0ff) Relay Warning       USINT (8)       DI 1 (0ff)         19       Get/Set       DI 1 (on) Relay Warning       USINT (8)       DI 1 (0ff)         19       Get/Set       DI 1 (on) Relay Warning       USINT (8)       DI 1 (0n)         20       Get/Set       DI 2 (0ff) Relay Warning       USINT (8)       DI 2 (0ff)         21       Get/Set       DI 2 (0ff) Relay Warning       USINT (8)       DI 2 (0ff)         22       Get/Set       DI 2 (on) Relay Warning       USINT (8)       DI 2 (0f)         22       Get/Set       DI 2 (on) Relay Warning       USINT (8)       DI 2 (0n)         22       Get/Set       UI 2 (on) Relay Warning       USINT (8)       DI 2 (0n)         23       Get       Turbo Ring Break Relay Warning       USINT (8)       Turbo Ring Master only)         23       <							
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17       Get/Set       Power 2 Relay Warning       USINT (8)       Power input 2 failure (on->off)         0:       Disable (default)       1: Enable (relay 1)         18       Get/Set       DI 1 (Off) Relay Warning       USINT (8)       DI 1 (Off)         19       Get/Set       DI 1 (on) Relay Warning       USINT (8)       DI 1 (Off)         19       Get/Set       DI 1 (on) Relay Warning       USINT (8)       DI 1 (On)         20       Get/Set       DI 2 (Off) Relay Warning       USINT (8)       DI 2 (Off)         21       Get/Set       DI 2 (on) Relay Warning       USINT (8)       DI 2 (Off)         21       Get/Set       DI 2 (on) Relay Warning       USINT (8)       DI 2 (On)         22       Get/Set       DI 2 (on) Relay Warning       USINT (8)       DI 2 (On)         22       Get/Set       DI 2 (on) Relay Warning       USINT (8)       DI 2 (On)         22       Get/Set       Turbo Ring Break Relay Warning       USINT (8)       Turbo ring break (Ring Master only)         0: Disable (default)       1: Enable (relay 1)       2: Enable (relay 1)       2: Enable (relay 1)         23       Get       CPU Usage       USINT (8)       Percent of usage (0 to100)         24       Get       Device Up Time </td <td></td> <td></td> <td></td> <td></td> <td></td>							
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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			Relay Warning				
23GetCPU UsageUSINT (8)Percent of usage (0 to100)24GetDevice Up TimeUDINT (32)Number of seconds since the device was powered up							
24 Get Device Up Time UDINT (32) Number of seconds since the device was powered up	23	Get	CPU Usage	USINT (8)			
					Number of seconds since the device was powered up		

26	Get	Redundant Device Mode	UDINT (32)	Bit mask of device roles. Bits 0= RSTP Bits 1= Turbo Ring Bits 2= Turbo Ring v2 Bits 3= Turbo Chain Bits 4= MSTP
27	Get/Set	Reset Device	USINT (8)	Reboot and reset to default 1: Reboot the device 2: Reset to default

#### **Common Service List**

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

/endor:	Allen-Bradley		
Гуре:	1769-L32E CompactLogix5332E Controller	~	OK
Revision:	18 🗸		Cancel
	Redundancy Enabled		Help
Name:	EDS_408A_A0I		
Description:		_	
		~	
Chassis Type:		~	
Slot	0 🗧 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 Fault Handler  Power-Up Handler			
	Select M	odule	
Add-On-Defined     Mole-Defined     Mole-Defined     Mole-Defined     Mole-Defined     Module-Defined     Module-Defined	Module Comm Digital Drives HMI Specia	6	Vendor
Arrow Module	B		Find Add Favorite
CompactB Paste	Ctrl+V By Categ	jory By Vendor Fav	vorites

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 E	t 10/100 Mbps Ethernet Port on DriveLogix5730	Allen-Bradley
ETHERNET-BRID	GE Generic EtherNet/IP CIP Bridge	Allen-Bradley
ETHERNET-MODI	J 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 🖄
		>
	Find	Add Favorite
By Category B	v Vendor Favorites	

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

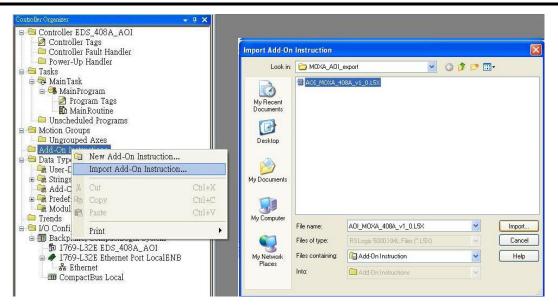
	ETHERNET-MODULE Generic Etherne Allen-Bradley LocalENB					
Name:	EDS_408A	Connection Para	ameters Assembly			
Description:	The MOXA managed switch		Instance:	Size:		
		Input	2	5	*	(32-bit)
	×	Output:	1	2	*	(32-bit)
Comm Format:	Data - DINT 🛛 😽	Configuration:	3	0	*	(8-bit)
Address / H	ost Name	Coningulation.	<u> </u>		*	(0-bit)
IP Addre:	ss: 192 . 168 . 34 . 253	Status Input:			-	
O Host Nar	ne:	Status Output:				
🗹 Open Modu	le Properties	ОК	Can	cel		Help

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.

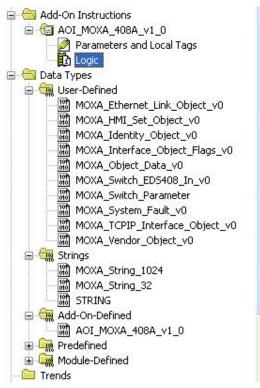
🚊 😁 I/O Configuration
😑 🎹 Backplane, CompactLogix System
- 🔂 1769-L32E EDS_408A_AOI
😑 🛷 1769-L32E Ethernet Port LocalENB
🖻 器 Ethernet
🚽 🥔 1769-L32E Ethernet Port LocalENB
ETHERNET-MODULE EDS_408A
CompactBus Local

## 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.
- **NOTE** 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.

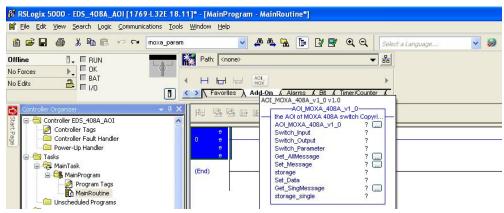


2. After importing, the controller organizer window shows all AOI for Moxa Ethernet switches under the **Add-On Instructions** folder.



## Add an instance of the AOI in your application

1. 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.

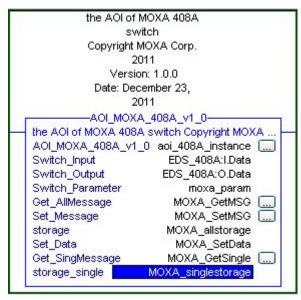


### Create and configure tags for the AOI

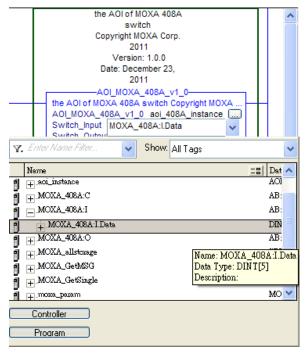
1. Right click on the ? in the field of each tag, select New Tag and input a Name for each new tag.

<b>尚 </b> 國 國	abcd ab cd ab • <ab></ab>		AOI_MO>	(A_408A_v1_0	
0 e - e		New Tag	the AOI of MOX	(A 408A switch Cop ?	oyri
New Tag Name:	aoi 408A instance			Ctrl+X ? Ctrl+C ?	
Description:		Cancel	tion	Ctrl+V ? Del ?	
	~		ement rand Description	Alt+Ins ? Ctrl+D	
Туре:	Base Connection		ion Defaults ion Defaults	-	
Alias For: Data Type:	A0I_M0XA_408A_v1_0	e Force	e:	Ctrl+G	
Scope:	DS_408A_AOI	tion <u>H</u> e	ip	F1	
External Access:	Read/Write	e Parar e All Ur	neter hknown Parameters		
Style:	×		ion Logic ion Definition		
Dpen Con	figuration	ies		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 al	l 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

 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])

Message Configuration - MOXA_GetMSG	8
Configuration*       Communication       Tag         Message Type:       CIP Generic         Service       Custom       •         Service       1       (Hex)         Code:       1       (Hex)         Instance:       1       Attribute:         Instance:       1       (Hex)	Source Element: Source Length: Destination MOXA_allstorage[0] New Tag
Enable    Enable Waiting    Start     Error Code: Extended Error Code: Error Path: Error Text: OK	<ul> <li>○ Done</li> <li>○ Done</li> <li>○ Done Length: 0</li> <li>○ Timed Out ◆</li> <li>○ Timed Out ◆</li> <li>○ Cancel</li> <li>○ Apply</li> <li>→ Help</li> </ul>

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

#### Configuration Communication\* Tag Browse... <u>Path:</u> O Broadcas Message Path Browser Communicati Path: MOXA\_408A ( CIP M0XA\_408A CIP Wath Source IE ⇒ 1/0 Configuration ⇒ ∰ Backplane, CompactLogix System → № 1769-L32E M0XA\_Switch\_A0I ⇒ № 1769-L32E Ethernet Port LocalENB Connecte Ethernet A 1769-L32E Ethernet Port LocalENB ETHERNET-MODULE MOX4\_4084 CompactBus Local O Enable O ) Error Cc Error Path: Error Text: OK Cancel Help

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 Config	uration - MOXA_SetMSG		
Message Type:	(Hex) Class: [6 (H	Source Element: Source Length: ex) Destination ex)	M0XA_SetData
Enableable Ena Error Codeode: Error Path: Error Text:	ble Waitingting Startitart Extended Error Code		Done Length: 0 Timed Out ← Apply Help

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

Configuration	Communication Tag	
💿 Path:	Browse.	
	Message Path Browser	3
	Path: EDS408A EDS408A	
O CIP V Sour	□       Configuration         □       1769L32E ED_408A_A01         □       1769L32E Ethernet Port LocalENB         □       -%         □       1769L32E Ethernet Port LocalENB         □       -%         □       1769L32E Ethernet Port LocalENB	(Octal)
) Enable ) Error Cc rror Path: rror Text:	THERNET-MODULE EDS408A	

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])

Configurati	on <sup>*</sup> Comr	nunication 1	Гад		
Message	Туре:	CIP Gene	eric	~	
Service Type:	Get Attrib	ute Single		Source Element: Source Length:	
Service Code:		Hex) Class:	f6 (He	ex) Destination	0 🗢 (Bytes) 0XA_Singlestorage[0] 🗸
Instance:	1	Attribut	te: 1 (He	exj	New Tag
) Enable	() Ena	ble Waiting	🔾 Start	🔾 Done	Done Length: 0
) Error Co rror Path: rror Text:	ode:	Extend	ded Error Code	:	🔲 Timed Out 🗲
HULLENC					

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

Configuration	Message Path Browser	
Path:	Path: EDS408A EDS408A	
Communic CIP CIP W Source Conne	CompactBus Local     CompactBus Local     CompactLogix System     Dia 1769-L32E Ethernet Port LocalENB     CompactBus Local     CompactBus Local	(Octal)
⊖ Enable ⊖ Error Co⊨		
Fror Path:	OK Cancel Help	

### Download the configured AOI to the Rockwell PLC

 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	Go Online
D_408A_AO	ETHERNET\192.168.34.29\Backplane	Upload
		Download
		Close
		Help

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_		Name	그림 스 Value	+	Force M
Controller Faul	New Tag Ctrl+W	🛨 aoi_408A_instance		{}	
		+ EDS_408A:C		{}	
🖂 Tasks	Monitor Tags	± EDS_408A:1		{}	
AinTask     AinProgra     AinProgra     AinRe     Discheduled P     Motion Groups	Edit Tags	± EDS_408A:0		{}	
	rogra Verify	+ MOXA_allstorage		{}	
				{}	
		+ MOXA_GetSingle		{}	
	•	+ moxa_param		{}	
Ungrouped Axes		+ MOXA_SetData		{}	
Add-On Instructions     AOI MOXA 408A v1 0		+ MOXA_SetMSG		{}	
Parameters a		+ MOXA singlestorage		{}	

lame		Value 🔶	Force Mask 🗲	Style	Data Type
= moxa_param.Switch_Idnetity	,	{}	{}		M0XA_Ident
😐 moxa_param.Switch_Idne	etity.Vendor_ID	991		Decimal	INT
🛨 moxa_param.Switch_Idne	etity.Device_Type	775		Decimal	INT
😟 moxa_param.Switch_Idnetity.Product_Code		7		Decimal	INT
🛨 moxa_param.Switch_Idne	atity.Major_Revision	0		Decimal	SINT
🛨 moxa_param.Switch_Idne	atity.Minor_Revision	0		Decimal	SINT
🛨 moxa_param.Switch_Idne	etity.Serial_Number	16#0000_259d		Hex	DINT
🛨 moxa_param.Switch_Idne	etity.Product_Name	'EDS-408A'	{}		STRING
🛨 moxa_param.Switch_Idne	etity.Assigned_Na	313	{}		MOXA_String
🗄 😐 moxa_param.Switch_Idne	etity.Geographic		{}		MOXA_String
主 moxa_param.Switch_TCPIP		{}	{}		MOXA_TCPI
🖻 moxa_param.Switch_Vendo	r	{}	{}		MOXA_Vend
🛨 moxa_param.Switch_Ver	dor.System_Firm	524291		Decimal	DINT
🛨 moxa_param.Switch_Ver	dor.System_Fault	8192		Decimal	DINT
+ moxa_param.Switch_Ver	dor.Switch_Port	0		Decimal	SINT
+ moxa_param.Switch_Ver	dor.Port_Exist	{}	{}	Decimal	DINT[2]
🛨 moxa_param.Switch_Ver	dor.Port_Enbale	{}	{}	Decimal	DINT[2]
🕂 🛨 moxa_param.Switch_Ver	dor.Port_Link_St	{}	{}	Decimal	DINT[2]
+ moxa_param.Switch_Ver	dor.IGMP_Snoop	0		Decimal	SINT
🛨 moxa_param.Switch_Ver	dor.Query_Interval	125		Decimal	DINT
🛨 moxa_param.Switch_Ver	dor.IGMP_Enhan	0		Decimal	SINT
🛨 moxa_param.Switch_Ver	dor.Relay_1	0		Decimal	SINT
+ 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"
Product Code	INT	EDS-405A=0x0006, EDS-408A=0x0007,
		EDS-505A=0x0008, EDS-508A=0x0009,
		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	DINT	Interface capability flags
Capability		
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_	Interface status flags
	Object_Flags_v0	
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
Out O state	DINT	Discards)
OutOctets	DINT	Octets sent on the interface
OutUcastPackets OutNucastPackets	DINT DINT	Unicast packets sent on the interface
OutDiscards	DINT	Non-unicast packets sent on the interface Outbound packets discarded
OutErrors	DINT	Outbound packets that contain errors
Alignment Errors	DINT	Frames received that are not an integral number of octets in
Alighment Litors	DINI	length
FCS Errors	DINT	Frames received that do not pass the FCS check
Single Collisions	DINT	Successfully transmitted frames which experienced exactly one
		collision
Multiple Collisions	DINT	Successfully transmitted frames which experienced more than
		one collision
SQE Test Errors	DINT	Number of times SQE test error message is generated
Deferred	DINT	Frames for which first transmission attempt is delayed because
Transmissions		the medium is busy
Late Collisions	DINT	Number of times a collision is detected later than 512 bit-times
		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
		sublayer transmit error
Carrier Sense Errors	DINT	Times that the carrier sense condition was lost or never
France Testing	DINT	asserted when attempting to transmit a frame
Frame Too Long MAC Receive Errors	DINT DINT	Frames received that exceed the maximum permitted frame size
MAC Receive Errors	DINI	Frames for which reception on an interface fails due to an 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	INT	Speed at which the interface shall be forced to operate. Speed
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 Port Link Alarm	CINT	100)
PORT LINK AIARM	SINT	0: Ignore, 1: On (Relay 1),
		2: On (Relay 2),
		3: Off (Relay1),
		4: Off (Relay2)
Port TrafficOverload	SINT	0: Disable,
Alarm		1: Enable(Relay 1),
		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	Number of TX multicast packets per second
Rate		
Rx Multicast Packet	DINT	Number of RX multicast packets per second
Rate	DINT	
Tx Broadcast Packet	DINT	Number of TX broadcast packets per second
Rate		

Rx Broadcast Packet Rate	DINT	Number of RX broadcast packets per second
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
Redundant Port Status	DINT	Bit 0 = Disable, Bit 1 = Not Redundant port, Bit 2 = Link down, 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	DINT	Switch firmware version
Version		
System Fault Status	DINT	Switch fault status
Switch Port Number	SINT	Switch max port number
Port Exist	DINT[2]	Switch per port exist
Port Enable	DINT[2]	Switch per port exist
		0:Enable
		1:Disable
Port Link Status	DINT[2]	Switch per port link status
IGMP Snooping	SINT	IGMP snooping enable:
		0: Disable
		1: Enable
Query Interval	DINT	Query Interval range from 20~600 sec
IGMP Enhanced Mode	SINT	IGMP enhanced mode
		0: Disable (default)
		1: Enable
Relay 1	SINT	Override relay warning setting
		0: Disable (default)
		1: Enable
Relay 2	SINT	Override relay warning setting
		0: Disable (default)
		1: Enable
Power 1 Relay Warning	SINT	Power input 1 failure (on $\rightarrow$ off)
		0: Disable (default)
		1: Enable(relay 1)
		2: Enable(relay 2)
Power 2 Relay Warning	SINT	Power input 2 failure (on $\rightarrow$ off)
		0: Disable (default)
		1: Enable(relay 1)
	CINT	2: Enable(relay 2)
DI 1 Off Relay Warning	SINT	DI 1 (off)
		0: disable (default)
		1: Enable(relay 1) 2: Enable(relay 2)
DI 1 On Relay Warning	SINT	DI 1 (on)
DI I Oli Relay Warning	51111	0: Disable (default)
		1: Enable(relay 1)
		2: Enable(relay 2)
DI 2 Off Relay Warning	SINT	DI 2 (off)
Di z on Keldy Warning	SINT	0: Disable (default)
		1: Enable(relay 1)
		2: Enable(relay 2)
DI 2 On Relay Warning	SINT	DI 2 (on)
		0: Disable (default)
		1: Enable(relay 1)
		2: Enable(relay 2)
Turbo Ring Break Relay	SINT	Turbo Ring Break (Ring Master Only )
Warning		0: Disable (default)
_		1: Enable (relay 1)
		2: Enable (relay 2)
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

Redundant Device Mode	DINT	Bit 0: RSTP, Bit 1: Turbo Ring, Bit 2: Turbo Rong v2, Bit 3: Turbo Chain, Bit 4: MSTP
Reset Device	SINT	1: restart the device 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.

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

Pre-Configured Tags	Name
Identity Object (0x01)	
*	Vendor ID
*	Device Type
*	Product Code
	Revision
	Status
*	Serial Number
*	Product Name
<u>^</u>	Assigned Name
	Geographic Location
TCP/IP Interface Object (0xf	
TCF/IF Internace Object (0x)	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 (0xf6)-	by port
*	Interface Speed
*	Interface Flags
	Link Status
	Half/Full Duplex
	Negotiation Status
	Manual Setting Requires Reset
	Local Hardware Fault
*	Physical Address
	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 Discalus
*	Media Counters
	Interface Central
*	Interface Control
*	Interface Control Control Bits Forced interface Speed

	Tuboufa and a bla	
	Interface Lable	
	Interface Description	
	Interface Port Description	
<b>\•</b> /	Broadcast Storm Protection	
*	Interface Utizatiion	
	Utilization Alarm Upper Threshold	
	Utilization Alarm Lower Threshold	
	Port Link Alarm	
<b>\•</b> /	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)		
	Port Type	
	Port Number	
	Link Object	
	Port Name	
	Port Type Name	
	Port Description	
	Node Address	
	Port Key	
MOXA Networking Obj	ect (0x404)	
*	ect (0x404) Firmware Version	
	ect (0x404) Firmware Version System Fault Status	
*	ect (0x404) Firmware Version System Fault Status Switch Port Number	
* * *	ect (0x404) Firmware Version System Fault Status Switch Port Number Port Exist	
** * * *	ect (0x404) Firmware Version System Fault Status Switch Port Number Port Exist Port Enable	
* * *	ect (0x404) Firmware Version System Fault Status Switch Port Number Port Exist	
** * * *	ect (0x404) Firmware Version System Fault Status Switch Port Number Port Exist Port Enable	
** * * *	ect (0x404) Firmware Version System Fault Status Switch Port Number Port Exist Port Enable Port Link Status IGMP Snooping Enable Query Interval	
** ** ** **	ect (0x404)         Firmware Version         System Fault Status         Switch Port Number         Port Exist         Port Enable         Port Link Status         IGMP Snooping Enable	
** ** ** **	ect (0x404)         Firmware Version         System Fault Status         Switch Port Number         Port Exist         Port Enable         Port Link Status         IGMP Snooping Enable         Query Interval         IGMP Enhanced Mode         Relay1	
** ** ** **	ect (0x404)         Firmware Version         System Fault Status         Switch Port Number         Port Exist         Port Enable         Port Link Status         IGMP Snooping Enable         Query Interval         IGMP Enhanced Mode	
** ** ** **	ect (0x404)         Firmware Version         System Fault Status         Switch Port Number         Port Exist         Port Enable         Port Link Status         IGMP Snooping Enable         Query Interval         IGMP Enhanced Mode         Relay1         Relay2         Power 1 relay waring	
** ** ** **	ect (0x404)         Firmware Version         System Fault Status         Switch Port Number         Port Exist         Port Enable         Port Link Status         IGMP Snooping Enable         Query Interval         IGMP Enhanced Mode         Relay1         Relay2         Power 1 relay waring         Power 2 relay waring	
** ** ** **	ect (0x404)         Firmware Version         System Fault Status         Switch Port Number         Port Exist         Port Enable         Port Link Status         IGMP Snooping Enable         Query Interval         IGMP Enhanced Mode         Relay1         Relay2         Power 1 relay waring         DI 1(off) relay warning	
** ** ** **	ect (0x404)         Firmware Version         System Fault Status         Switch Port Number         Port Exist         Port Enable         Port Link Status         IGMP Snooping Enable         Query Interval         IGMP Enhanced Mode         Relay1         Relay2         Power 1 relay waring         DI 1(off) relay warning         DI 1(on) relay warning	
** ** ** **	beet (0x404)         Firmware Version         System Fault Status         Switch Port Number         Port Exist         Port Enable         Port Link Status         IGMP Snooping Enable         Query Interval         IGMP Enhanced Mode         Relay1         Relay2         Power 1 relay waring         DI 1(off) relay warning         DI 1(on) relay warning         DI 2(off) relay warning	
** ** ** **	beet (0x404)         Firmware Version         System Fault Status         Switch Port Number         Port Exist         Port Enable         Port Link Status         IGMP Snooping Enable         Query Interval         IGMP Enhanced Mode         Relay1         Relay2         Power 1 relay waring         DI 1(off) relay warning         DI 1(on) relay warning         DI 2(off) relay warning         DI 2(on) relay warning	
** ** ** **	beet (0x404)         Firmware Version         System Fault Status         Switch Port Number         Port Exist         Port Enable         Port Link Status         IGMP Snooping Enable         Query Interval         IGMP Enhanced Mode         Relay1         Relay2         Power 1 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	
** ** ** **	beet (0x404)         Firmware Version         System Fault Status         Switch Port Number         Port Exist         Port Enable         Port Link Status         IGMP Snooping Enable         Query Interval         IGMP Enhanced Mode         Relay1         Relay2         Power 1 relay waring         DI 1(off) relay warning         DI 1(on) relay warning         DI 2(off) relay warning         DI 2(on) relay warning         CPU usage	
**       **       **       **       **       **       **       **       **       **       **       **       **       **       **       **       **       **	beet (0x404)         Firmware Version         System Fault Status         Switch Port Number         Port Exist         Port Enable         Port Link Status         IGMP Snooping Enable         Query Interval         IGMP Enhanced Mode         Relay1         Relay2         Power 1 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	
**       ** <td>beet (0x404)         Firmware Version         System Fault Status         Switch Port Number         Port Exist         Port Enable         Port Link Status         IGMP Snooping Enable         Query Interval         IGMP Enhanced Mode         Relay1         Relay2         Power 1 relay waring         DI 1(off) relay warning         DI 1(on) relay warning         DI 2(off) relay warning         DI 2(on) relay warning         CPU usage</td> <td></td>	beet (0x404)         Firmware Version         System Fault Status         Switch Port Number         Port Exist         Port Enable         Port Link Status         IGMP Snooping Enable         Query Interval         IGMP Enhanced Mode         Relay1         Relay2         Power 1 relay waring         DI 1(off) relay warning         DI 1(on) relay warning         DI 2(off) relay warning         DI 2(on) relay warning         CPU usage	
**       **       **       **       **       **       **       **       **       **       **       **       **       **       **       **       **       **	beet (0x404)         Firmware Version         System Fault Status         Switch Port Number         Port Exist         Port Enable         Port Link Status         IGMP Snooping Enable         Query Interval         IGMP Enhanced Mode         Relay1         Relay2         Power 1 relay waring         DI 1(off) relay warning         DI 1(off) relay warning         DI 2(off) relay warning         DI 2(on) relay warning         CPU usage         Device Up Time	
**       **	kect (0x404)         Firmware Version         System Fault Status         Switch Port Number         Port Exist         Port Enable         Port Link Status         IGMP Snooping Enable         Query Interval         IGMP Enhanced Mode         Relay1         Relay2         Power 1 relay waring         DI 1(off) relay warning         DI 1(on) relay warning         DI 2(off) relay warning         DI 2(on) relay warning         CPU usage         Device Up Time         Reset MIB Counts	
**       **	beet (0x404)         Firmware Version         System Fault Status         Switch Port Number         Port Exist         Port Enable         Port Link Status         IGMP Snooping Enable         Query Interval         IGMP Enhanced Mode         Relay1         Relay2         Power 1 relay waring         DI 1(off) relay warning         DI 1(off) relay warning         DI 2(off) relay warning         DI 2(on) relay warning         CPU usage         Device Up Time         Reset MIB Counts         Redundant device mode	
**       **	beet (0x404)         Firmware Version         System Fault Status         Switch Port Number         Port Exist         Port Enable         Port Link Status         IGMP Snooping Enable         Query Interval         IGMP Enhanced Mode         Relay1         Relay2         Power 1 relay waring         DI 1(off) relay warning         DI 1(off) relay warning         DI 2(off) relay warning         DI 2(off) relay warning         DI 2(on) relay warning         CPU usage         Device Up Time         Reset MIB Counts         Redundant device mode	
**         **	Firmware Version         System Fault Status         Switch Port Number         Port Exist         Port Enable         Port Link Status         IGMP Snooping Enable         Query Interval         IGMP Enhanced Mode         Relay1         Relay2         Power 1 relay waring         DI 1(off) relay warning         DI 1(off) relay warning         DI 2(off) relay warning         DI 2(off) relay warning         CPU usage         Device Up Time         Reset MIB Counts         Redundant device mode         reset device	
**         **	Firmware Version         System Fault Status         Switch Port Number         Port Exist         Port Enable         Port Link Status         IGMP Snooping Enable         Query Interval         IGMP Enhanced Mode         Relay1         Relay2         Power 1 relay waring         DI 1(off) relay warning         DI 2(off) relay warning         DI 2(off) relay warning         DI 2(on) relay warning         CPU usage         Device Up Time         Reset MIB Counts         Redundant device mode         reset device         Switch Fault Status	
**         **	Firmware Version         System Fault Status         Switch Port Number         Port Exist         Port Enable         Port Link Status         IGMP Snooping Enable         Query Interval         IGMP Enhanced Mode         Relay1         Relay2         Power 1 relay waring         DI 1(off) relay warning         DI 2(off) relay warning         DI 2(off) relay warning         CPU usage         Device Up Time         Reset MIB Counts         Redundant device mode         reset device	

# **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_     Controller Tags	<sup>mo1</sup>	Name	1	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	Edit Tags	+ EDS_408A:0		{}	
Progra	Verify	+ MOXA_allstorage		()	
MainRo	Export Tags	HOXA_GetMSG		{}	
Unscheduled P		+ MOXA_GetSingle		{}	
🗉 🔠 Motion Groups	Print •	+ moxa_param		{}	
Ungrouped Axes		+ MOXA_SetData		{}	
Charge Axes     Charge Ax		+ MOXA_SetMSG		{}	
Parameters a	_v1_o	+ MOXA singlestorage		{}	

## **Monitor Tags for Identity Object**

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

Forces Controller OK Controller OK Edits L/D OK		+ -(L)- Bit 🔏 Timer/Counter	×		
Controller Organizer 🚽 🕂 🕻	Scope: 🛐 EDS408A_Demc 😪 Show: All Ta	gs		Y.	Enter Name Filter
Controller EDS408A_Demo_20120711 Controller Tags Controller Fault Handler	Name III A	Value 🔸	Force Mask 🗲	Style	Data Type
Controller Fault Handler	+ EDS408A:I	{}	{}		AB:ETHERN
🗀 Power-Up Handler	+ EDS408A:0	{}	{}		AB:ETHERN
Tasks	± MOXA allstorage	{}	{}	Decimal	SINT[200]
🖂 Main1ask	± MOXA GetMSG	{}	{}		MESSAGE
- Program Tags	- moxa param	{}	{}		MOXA Switc
- 🔂 MainRoutine	+ moxa param.Switch Input	{}	{}		MOXA Switc
- Unscheduled Programs Motion Groups	+ moxa param.Switch Output	0		Decimal	DINT
limit of output and the second	moxa_param.Switch Idnetity	{}	{}	Decimar	MOXA Identi
Add-On Instructions	+ moxa_param.Switch_Idnetity.Vendor	991		Decimal	INT
AOI_MOXA_408A_v1_0	+ moxa_param.Switch_Idnetity.Device	775		Decimal	INT
Data Types User-Defined		7.3		Decimal	INT
Strings	moxa_param.Switch_Idnetity.Produc				
Add-On-Defined	+ moxa_param.Switch_Idnetity.Major	0		Decimal	SINT
🙀 Predefined	moxa_param.Switch_Idnetity.Minor	0		Decimal	SINT
Trends	moxa_param.Switch_Idnetity.Serial	16#0000_259d		Hex	DINT
I/O Configuration	moxa_param.Switch_Idnetity.Produc	'EDS-408A'	{}		STRING
Backplane, CompactLogix System	📃 🗄 moxa_param.Switch_Idnetity.Assign		{}		MOXA_String
1769-L32E EDS408A_Demo_20120711	+ moxa_param.Switch_Idnetity.Geogra	11	{}		MOXA_String

## **Monitor Tags for TCPIP Object**

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

Forces			
Controller Organizer - 7 × Controller EDS408A Demo 201	Scope: DS408A_Demc V Show: All Tags	▼ X.	Enter Name Filter
Controller EDS408A_Demo_201 Controller Tags Controller Fault Handler	Name 28/4	Value 🔶	Force Mask + Style
Controller Fault Handler	+ EDS408A:0	()	()
- 🛄 Power-Up Handler	+ MOXA_allstorage	{}	{} Decimal
Tasks	+ MOXA_GetMSG	()	{}
🖃 🕞 MainProgram	😑 moxa_param	{}	{}
Program Tags	+ moxa_param.Switch_Input	()	{}
MainRoutine	+ moxa_param.Switch_Output	0	Decimal
Motion Groups	+ moxa param.Switch Idnetity	()	{}
- Ungrouped Axes	E-moxa param.Switch TCPIP	{}	{}
Add-On Instructions	+ moxa param.Switch TCPIP.Status	0	Decimal
AOI_MOXA_408A_v1_0 Data Types	moxa_param.Switch_TCPIP.Configuration_Capab.		Decimal
User-Defined	E moxa_param.Switch_TCPIP.Configuration_Control		Decimal
Strings	+ moxa param.Switch TCPIP.Path Size	0	Decimal
Add-On-Defined	+ 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 Backplane, CompactLogix S	+ moxa_param.Switch_TCPIP.Network_Mask	-256	Decimal
1769-L32E EDS408A D	+ moxa param.Switch TCPIP.Gateway Address	0	Decimal
😑 🥔 1769-L32E Ethemet Por	E moxa param.Switch TCPIP.Name Server 1	16#0000 0000	Hex
Ethemet	+ moxa param.Switch TCPIP.Name Server 2	16#0000 0000	Hex
1769-L32E Ethe	+ moxa param.Switch TCPIP.Domain Name		{}
- 10 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.

Na	meA	Value		+	Force M	lask 🗲	Style	
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	moxa_param.Switch_Ethernet_Link[1].Interfac			{}	{	}		
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	moxa_param.Switch_Ethernet_Link[1].Interf			0			Decimal	ŝ.
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	moxa_param.Switch_Ethernet_Link[1].Physi			0			Decimal	É.
	🕂 moxa_param.Switch_Ethernet_Link[1].Physi			-112			Decimal	Ê.
	🛨 moxa_param.Switch_Ethernet_Link[1].Physi			-24			Decima	
	moxa_param.Switch_Ethernet_Link[1].Physi			21			Decimal	Ľ.
	🛨 moxa_param.Switch_Ethernet_Link[1].Physi			-87			Decima	Ę.
	🗄 moxa_param.Switch_Ethernet_Link[1].Physi			-104			Decima	ř.
	moxa_param.Switch_Ethernet_Link[1].InOctets			0			Decima	
	+ moxa_param.Switch_Ethernet_Link[1].InUcast			0			Decimal	8
	🛨 moxa_param.Switch_Ethernet_Link[1].InNucas			0			Decimal	É.
	moxa_param.Switch_Ethernet_Link[1].InDiscards			0			Decimal	l.
	moxa_param.Switch_Ethernet_Link[1].InErrors			0			Decima	
) me	+ moxa param Switch Ethernet Link[1]OutOctets Monitor Tags (Edit Tags /	-=[A]	< Value	0		Force	Decimal	>
•			<				Decima	>
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Name		Value 🔶	Force Mask *
	😑 moxa_param.Switch_Ethernet_Link[1].Interface_Port_Descript		{}
	+ moxa_param.Switch_Ethernet_Link[1].Broascast_Storm_Prote	0	
	moxa_param.Switch_Ethernet_Link[1].Interface_Utilization	0	
	moxa_param.Switch_Ethernet_Link[1].Utilization_Alarm_Upper	0	
	🗄 moxa_param.Switch_Ethernet_Link[1].Utilization_Alarm_Lower	0	
	Toxa_param.Switch_Ethernet_Link[1].Port_Link_Alarm	0	
	moxa_param.Switch_Ethernet_Link[1].Port_TrafficOverload_Al	0	
	🖻 moxa_param.Switch_Ethernet_Link[1].Tx_Unicast_Packet_Rate	. 9	
	Toxa_param.Switch_Ethernet_Link[1].Rx_Unicast_Packet_R	10	
	moxa_param.Switch_Ethernet_Link[1].Tx_Multicast_Packet	0	
	🗄 moxa_param.Switch_Ethernet_Link[1].Rx_Multicast_Packet	0	
	moxa_param.Switch_Ethernet_Link[1].Tx_Broadcast_Packet	0	
	■ moxa_param.Switch_Ethernet_Link[1].Rx_Broadcast_Packet	0	
	moxa_param.Switch_Ethernet_Link[1].Tx_Multicast_Packet	0	
	+ moxa_param.Switch_Ethernet_Link[1].Rx_Multicast_Packet	0	
	moxa_param.Switch_Ethernet_Link[1].Tx_Broadcast_Packet	0	
	moxa_param.Switch_Ethernet_Link[1].Rx_Broadcast_Packet	0	
	moxa_param.Switch_Ethernet_Link[1].Redundant_Port_Status	2	
Ŧ	moxa_param.Switch_Ethernet_Link[2]	()	{}
+	moxa_param.Switch_Ethernet_Link[3]	()	{}
+	moxa_param.Switch_Ethernet_Link[4]	{}	{}
ŧ	moxa_param.Switch_Ethernet_Link[5]	()	{}
±	moxa param.Switch Ethernet Link[6] <b>Ionitor Tags /</b> Edit Tags /	{}	{}

# Monitor Tags for Moxa Networking Object

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

Name	A 82	Value	÷	Force Mask *	Style	1
moxa_	param.Switch_Vendor.Port_Enbale		{}	{}	Decimal	1
± mo:	xa_param.Switch_Vendor.Port_Enbale[0]		0		Decimal	
	xa_param.Switch_Vendor.Port_Enbale[1]		0		Decimal	
E moxa_	param.Switch_Vendor.Port_Link_Status		{}	{}	Decimal	
+ mo:	xa_param.Switch_Vendor.Port_Link_Status[0]		3		Decimal	
± mo:	xa_param.Switch_Vendor.Port_Link_Status[1]		0		Decimal	
🛨 moxa_	param.Switch_Vendor.IGMP_Snooping		0		Decimal	
+ moxa_	param.Switch_Vendor.Query_Interval		125		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	
+ moxa pa	ram.Switch <u>Ethernet Link</u>		{}	{}		

# **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  $\ensuremath{\mathbb{R}}$  View Studio software and select Site Edition (Local).

Application T	ype Selection	1		
		Factor	ry <b>Talk<sup>*</sup> View</b> Studio	
Select the type of type of the	of application you Site Edition (Local)	u would like to Machine Edition	configure:	
			Continue	Exit

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

New Existing	ion (Local) Application
Application name: Description:	EDS_408A_Platform
Language:	English (United States), en-US
	CreateCancel

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.

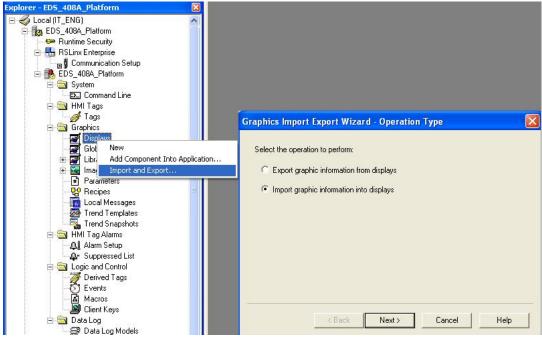
🖃 🎻 Local (IT_ENG)		
EDS_408A_Platform		
🛛 🖙 Runtime Secu 🛛 Delete		
Add New Server	Rockwell Automation Device Server (RSLinx Enterprise)	
E System	OPC Data Server	
	Tag Alarm and Event Server	
<ul> <li>Security</li> <li>HMI Tags</li> <li>Tags Properties</li> <li>Graphics</li> <li>Graphics</li> <li>Global Objects</li> <li>Global Objects</li> <li>Global Objects</li> <li>Recipes</li> <li>Recipes</li> <li>Cal Messages</li> <li>Trend Templates</li> <li>Trend Templates</li> <li>Trend Snapshots</li> <li>HMI Tag Alarms</li> <li>Al Alarm Setup</li> <li>Suppressed List</li> <li>Derived Tags</li> <li>Events</li> <li>Macros</li> <li>Clent Keys</li> <li>Al Alag</li> </ul>		
└ 쯝 Data Log Models	OK Cancel Apply H	lelp

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

Device Shortcuts	Primary
Add Remove Apply	■       ■       RSLinx Enterprise, IT_ENG         ●       ■       1789-A17, Backplane         ●       ♣       EtherNet, Ethernet         ●       ♣       EtherNet, Ethernet         ●       ●       ■       CompactLogix System, CompactLogix System         ●       ●       ●       0, 1769-L32E/A, ED_408A_AOI         ●       ●       0, 1769-L32E/A, ED_408A_AOI
RSLinx Enterprise	2 192.168.34.253, , ED5-408A
You've made the following changes to the shortcut 'PL Primary path edited - Old: - New: CompactLogix System.ED_408A_AOI Press Yes to apply changes. Press No to discard changes	
	Mode; Online Not Browsing

## 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**.



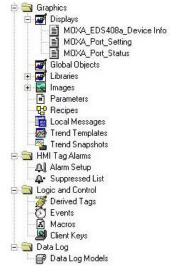
2. Select No and Multiple displays batch import file

raphics 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? $\hfill \label{eq:product}$ Yes	Select the type of file to import:
No	<ul> <li>Multiple displays batch import file</li> </ul>
	2 <u></u>
<back next=""> Cancel Help</back>	<back next=""> Cancel Help</back>

- 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.

	Import Export e multiple display b		iple Import File		
C LI	importing vate new objects or Select Multiple		- Instant File		
Whe can a over	Look in: My Recent Documents Desktop My Documents My Computer	FTView Fa	ceplat <u>EDS_408A_Platform.xml</u> 108a_Device Info.xml Setting.xml Status.xml		
	My Network Places	File name: Files of type:	BatchImport_EDS_408 Batch Import Files (*.xr		Open Cancel

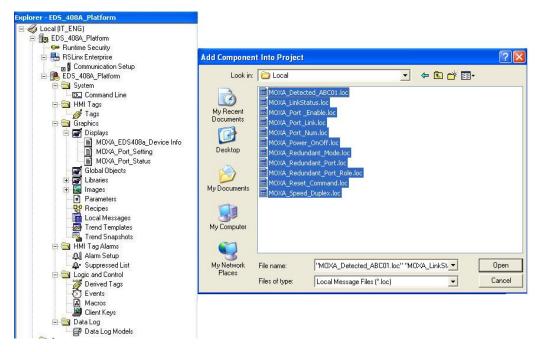
4. After import, these objects will appear under **Displays** in the Explorer window.



### 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..

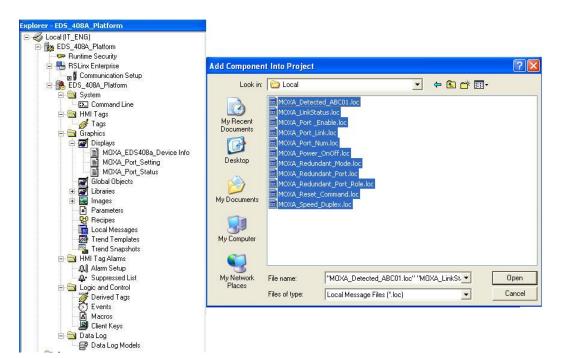


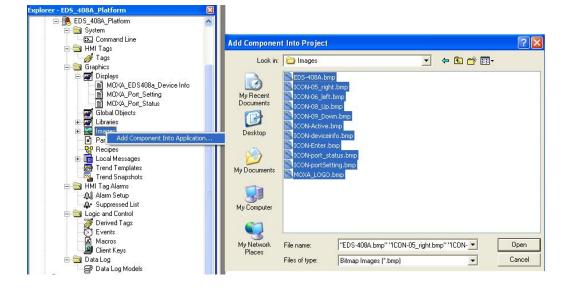
- 2. After import, these objects will appear under "Local Message" in the Explorer window.
  - Ē Local Messages Ē. MOXA\_Detected\_ABC01 Ē Ē MOXA\_LinkStatus Ē MOXA\_Port\_Enable MOXA\_Port\_Link Ē MOXA\_Port\_Num MOXA\_Power\_OnOff Ē MOXA\_Redundant\_Mode MOXA\_Redundant\_Port MOXA\_Redundant\_Port\_Role 1 MOXA\_Reset\_Command Ē MOXA\_Speed\_Duplex

## 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)

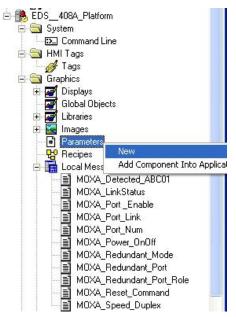
**NOTE** Moxa provides sample image files for selected switches, which are available for download at the Moxa website or from the software CD.



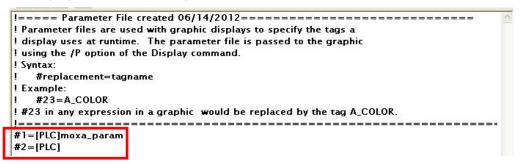


## **Create a New Parameter**

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.



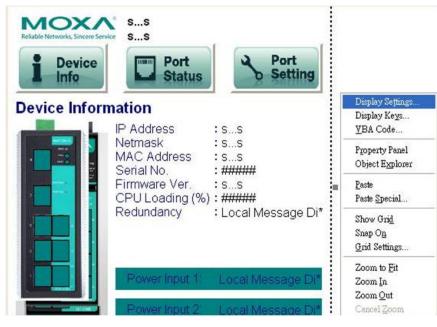
In the parameter definition, the shortcut PLC was created earlier. (Refer to Create a FactoryTalk® View Shortcut to PLC)

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 Setting**.



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.

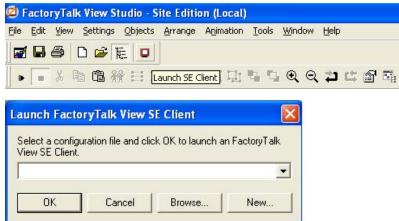
erties Behavior	
Display Type	Size
C Overlay	Specify Size in Pixels
Keen at Back	Width: 567 Height: 623
On Top	Width: 1567 Height: 1623
Allow Multiple Running Copies	Resize
Cache After Displaying	Allow Display to be Resized
No     C Yes	When Resized
	C Pan 💽 Scale
L Always Updating	
🔽 Title Bar	Position
	Generation     Specify Position in Pixels
Insert Variable.	
	X:0 Y:0
System Menu	Securitu Code: 🛛 👻 👻
Minimize Button	Security Code: 🛛 🔭 💽
Size to Main Window at Runtime	Background Color:
Show Last Acquired Value	
Maximum Tag Update Rate:	
1 seconds	

## 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



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

actoryTalk Vie	w SE Client Cor	figuration Nan	ne	Þ
Type the name of	a new configuration	n file:		
EDS-408A				
Type or browse fo	or the location to sto liew	re this configuration	n:	
Help	About	Cancel	< Back	Next >

3. Select the application type **Local** 

FactoryTalk Vie	ew SE Client Ap	plication Type		
Select the type of Network	f SE application the	client will connect t	0	
Help	About	Cancel	< Back	Next>

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

	pplication Name		<b>\</b>
Type the name of the application yo	ou want to connect t	o:	
EDS_408A_Platform		•	
Open FactoryTalk View SE Clie	nt as view-only		
Enable on-screen keyboard			
F Allow display code debugging			
Select the initial runtime language:			
Select the initial runtime language: English (United States), en-US		<b>•</b>	
		<u> </u>	
		•	

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

Components		
Initial display:	MOXA_EDS408a_Device Info	•
Display parameters:	[	
Initial client key file:	<u></u>	•
Startup macro:	[	•
Shutdown macro:	[	•

7.

Help

About.

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 system		plates		
	menu and close bu	tton		
Show Mir	n/Max buttons			
Maximize wind	dow			
Show Diagno	stics List			
🔽 Allow und	docking of Diagnost	ics List		
Disable switch	h to other applicatio	ns		
the cotu		ho configura	tion	
	p and save t SE Client Com			
	en CE Client is new	configured		
FactoruTalk Vi		coningaroa.		
FactoryTalk Vi		en click Finish		
	ption below, and the	en click Finish.		
ave, click an o discard, click Ca	ption below, and the		ient now	
FactoryTalk Vi	ew SE Cliencis now			



Cancel

< Back

Finish

## **Device Information**

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

MOXA_Switch_Dev	🜌 MOXA_Switch_DeviceInfo - /MOXA_SWITCH_DEMO 📰 🗖 🔀			
Reliable Networks, Sincere Serv	EDS-408A Managed Redundant Switch 09604			
1 Device Info	Port Status Port Setting			
Device Inform	nation			
	IP Address       : 192.168.127.253         Netmask       : 255.255.255.0         MAC Address       : 00-90-E8-15-A9-7F         Serial No.       : 09604         Firmware Ver.       : V3.1         CPU Loading (%)       : 0         Redundancy       : None			
الطط	Power Input 1: On			
	Power Input 2: Off			
	<ul> <li>Link Up</li> <li>Power On</li> <li>Link Down</li> <li>Power Down</li> </ul>			

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
	Grey	Link Down	
Power Status	Amber	Power On	Current power link state
	Grey	Power Off	

## **Port Status**

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

🖉 MOXA_Port_Status - /EDS408A_Platform//	
Povice Po	d Redundant Switch 09496
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	
Speed	10/Half	Selected port speed and mode
	10/Full	
	100/Half	
	100/Full	
	1000/Half	
	Unknown	
Redundant Port Status	Disable	Selected port redundancy status
	Not Redundant Port	
	Link Down	
	Blocking	
	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 - /EDS	408A_Platform//	
MOXA	EDS-408A Managed Redun	dant Switch 09496
Device Info	Port Status	Setting
Port Setting		
	Port 2	•
Enable : Enable Speed : Auto		
Set Speed: Auto 10/Half 10/Full 100/Half 100/Full	Set Enable: Disable Enable	Activate

Field	Values	Description	
Port Index	Port 3	Selected port number	
Speed	10/Half 10/Full 100/Half 100/Full 1000/Half	Selected port speed and mode	
	Unknown		
Enable	Enable	Selected port enable or	
	Disable	disable	

# Introduction

This section is supported only with EDS-400A-PN, EDS-510E, and EDS-G500E series devices.

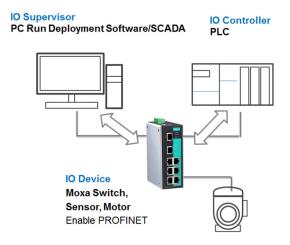
PROFINET is a communication standard for automation of PROFIBUS & PROFINET International (PI). It is 100% Ethernet-compatible as defined in IEEE standards. With PROFINET, applications can be implemented for production and process automation, safety applications, and the entire range of drive technology. 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		
	⊙ Enable	(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



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.
- no profinetio to disable PROFINET I/O.

EDS-408A-SS-SC-PN# con	
EDS-408A-SS-SC-PN(config)#	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	x x x x x x				x
Company Code (OUI)					(	Conse	ecutiv	/e Nu	ımbei	-

# **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
Device	Input	0	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
			3	RSTP status	0 is disabled, 1 is enabled
			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
Port	Input	1	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
			3	Port 4 Connection	0 is not connected, 1 is connected
			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

Path: MOXA/SIMATIC 300(1)/CPU 315-2 PN/DP							
	Addae ss	Symbol	Display format	t Status value	Modify value	^	
1	I 0.0	1	BOOL	true			
2	I 0.1		BOOL	false			
3	I 0.2		BOOL	true			
4	I 0.3		BOOL	false			
5	I 0.4		BOOL	true			
6	I 0.5		BOOL	false			
7	I 0.6		BOOL	false			
в	I 0.7	•	BOOL			~	
<	1					>	
×	R <u>o</u> w un cond	Not Effective	Update Force Symbol v un immediately	rith F5			
V	Monit	e 📘	R: Status Value	🔲 <u>H</u> nable Perij	pheral Outputs		
Г	Modif	/	📭 Modify Value	🔲 I/O Display			

Monitor Port I/O Cyclic Data in SIMATIC STEP 7

Path: MOXANSIMATIC 300(1)/CPU 315-2 PN/DP									
	Add	02:55	Symbol		Display formet	St	atus value	Modify value	^
1	Ι	1.0			BOOL		false		
2	Ι	1.1			BOOL		true		
	I	1.2			BOOL		true		
ł	Ι	1.3			BOOL		false		
;	I	1.4			BOOL	Г	false		
,	Ι	1.5			BOOL		false		
7	Ι	1.6			BOOL	Γ	false		
3	Ι	1.7			BOOL				V
<									>
>	R	w I	ot Effective	Update I	Force Symbol w	ith	<b>F</b> 5		
F	unec	mdi	ionally	– Run immed	iately				
	Mo		-	Ger Status		Г		pherel Outputs	
-	Мо					_	10.01		
		_		Modif:	y vanue	-	I/O <u>D</u> isplay		
e	2	<u>I</u> ris	ger					RUNNING	

## **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	

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

### **Device Status**

#### **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
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:

- 1. 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

New Project		
User projects Libraries N	Aultiprojec ts	
Name	Storage path	<u>~</u>
<b>₽</b> 91002	C.Progrem FilesSier	nensiStep7is7proji10
Add to current multiproje	ot	
Na <u>m</u> e:		<u>Т</u> уре:
MOXA		Project 💌
, Storage location (path):		ELibrary
C:\Program Files\Siemens\Ste	p7\s7proj	<u>B</u> rowse
OK	Car	ncel Help

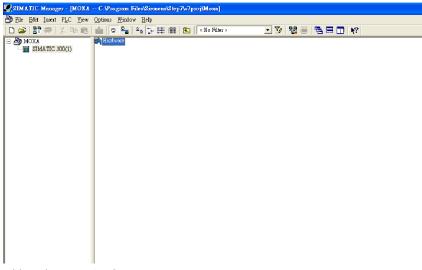
Name your project in the Name field then click OK.

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 Files	Siemens\Step7\s7proj\M	oxa]			
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AD MOXA							
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1	Сору	Ctrl+C					
1	Paste	Ctrl+V					
	Delete	Del					
	Insert New Ol	oject 🕨	SIMATIC 400 Station				
1	PLC	•	SIMATIC 300 Station SIMATIC H Station				
1	Rename	F2	SIMATIC PC Station				
1	Object Proper	ties Alt+Return	Other Station.				
			SIMATIC S5				
1			PG/PC				
			MPI PROFIBUS				
1			Industrial Ethernet				
			PTP				
1			Foundation Fieldbus				
1			S7 Program				
1			M7 Program	]			
1							
1							
1							

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.

By HW Config - [SIMATIC 300(1) (Configuration) MOXA]		
🏙 Station Edit Insert ELC Yiew Options Window Help		- 8 ×
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		+ 💼 CPU 314C-2 PM/DP + 💼 CPU 314C-2 P/P
		- CPU 315
		🗉 🧰 CPU 315-2 DP
		<ul> <li>CPU 315-2 PN/DP</li> <li>CPU 315F-2 DP</li> </ul>
		+ CPU 315F-2 DF + CPU 315F-2 PN/DP
	1 6	+ 🧰 CPU 316
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		+ CPU 317-2 + CPU 317-2 PN/DP
		+ - CPU 317-2 PM/DP
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		# 🧰 CPU 318-2
(m) SIMATIC 200(1)		<ul> <li>CPU 319-3 PN/DP</li> <li>CPU 319F-3 PN/DP</li> </ul>
Slot Designation		- CPU 614
Sion Designation		• 🧰 СРU М7
		FM-300
		Gateway IM-300
		M7-EXTENSION
		PS-300
	•	RACK-300
	1 60	SM-300
	🕀 📆 S	IMATIC 400
	🕀 🌆 S	IMATIC PC Based Control 300400
		SIMATIC PC Station
	6ES7 39	0-1???0-0AA0 ts in various lengths
·		
Press F1 to get Help.		

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.

B IIW Config - [SIMATIC 300(1) (Configuration) MOXA]		
🛤 Sation Edit Insett PLC Yiew Options Window Help		_ 8 :
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8		EPU 315 CPU 315-2 DP
9		* _ CPU 315-2 DF
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11		🗄 🧰 CPU 315F-2 PM/DP
		🗄 🧰 CPU 316
		🖲 🧰 CPU 316-2 DP
		CPU 317-2     CPU 317-2     CPU 317-2     CPU 317-2     PN/DP
· · · · · · · · · · · · · · · · · · ·		E CPU 317F-2 PN/DP
		* 💼 CPU 318-2
		🗄 🧰 CPU 319-3 PN/DP
() UR		😟 🧰 CPU 319F-3 PN/DP
Slot I Module Order number Firmware MPI address I address Q address Comment		🗄 🧰 CPU 614
		😟 🚞 CPU M7
		FM-300 Gateway
3		IM-300
4		M7-EXTENSION
5		PS-300
		RACK-300
		E Reil
		SM-300
10	🙂 🔢 🖇	SIMATIC 400
		SIMATIC PC Based Control 300/400 SIMATIC PC Station
	6ES7 39 Availabl	ID-1???O-0.A.A.O E in versious lengths
Insertion possible		Ch

Search PRODINET Ethernet devices

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

PLC View Options Window Help		
<u>D</u> ownload Upload	Ctrl+L	
Download Module Identification		
Upload Module Ide <u>n</u> tification to PG		
Faulty Modules		
Module Information	Ctrl+D	
<u>O</u> perating Mode Clear/Reset	Ctrl+I	
Set Time of Day		
<u>M</u> onitor/Modify		
Updat <u>e</u> Firmware		
Save De <u>v</u> ice Name to Memory Card		
Ethernet	Þ	<u>E</u> dit Ethernet Node
PROFIBUS	•	Verify Device Name
<u>S</u> ave Service Data		<u>A</u> ssign Device Name

#### Then click Browse

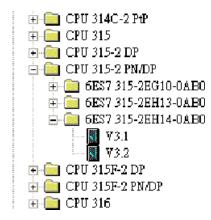
t Ethernet Node		
Sthemet node		Nodes accessible online
MAC address:		Brows
et IP configuration		
Use IP parameters		
IP address:		Gateway © Do not use router
Subnet mas <u>k</u> :		∩ <u>U</u> se router
		Address:
Client ID:	tion	
.ssign device name		
<u>D</u> evice name:	J	Assign Name
leset to factory settings –		Reset

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>Stop</u> ∑ Fast search	!         IP address           192.168.127.253         192.168.127.33	MAC address 00-90-E8-25-FF 00-1B-1B-16-E6	Device type MOXA Eth S7-300	Name dut408 pn-io
Elash	MAC address: 00-9	00-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"

W II W Config - [SIMATIC 300(1) (Configuration): 2 MOXA]		
DUR         1         3         4         5         6         7         8         9         10         11         9         10         11         11         12         00 UR         2000000000000000000000000000000000000		Ind         Ind           ind:         Ind
3         -		⊕ PCP M7     ⊕ PF4-300     ⊕ Pf4-300     ⊕ Gravey     €27 315-22814-0.4E0     Stavey     €27 315-22814-0.4E0     €27 315
l Insertion possible	0	Chg

PROFINET I/O Ethernet subnet project accomplished

Eq. 1.W Config - [SIMATIC 300(1) (Configuration): 2 MOXA]		- C 🕹 🚨
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	Find:	ntint
	Profile:	Standard
PROFINET Blenet FROFINET-0-System (100)           1         Image: Profile and P		
		E CPU 317-2 PM/DP CPU 317F-2
FROFINET Eftemet: PROFINET-IO-System (100)		🗄 🦲 CPU 317F-2 PM/DP
Device Number II Paddres, Device Name Order number Firmware Disgnostic address Initial state Shared Comment		# CPU 318-2 # CPU 319-3 PM/DP
Device Number 1 Padrice. Device Neme Under number Princeare Dagnothe address Indexi state Stated Comment		* 🔄 CPU 3195-3 PMDP
	⊕-( ⊕-(	CPU 614     CPU 614     CPU 617     PM-300     Golavay     System 40400     Colorea     Colorea
	-Control	work memory; 0.05ms/1000 instructions; PROFINET on; 37 Communication (lossibile PErPCs); PROFINET IO list; supports RT/IRT; PROFINET interface and 2 ports;
Investige possible		Che

# **GSD** File Installation

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

SIMATIC Manager - [1108_4	08PFNtest C:\Program Files\Siemens\Step7\s7proj\1108_408]
🞒 File Edit Insert PLC Yiew	<u>Options W</u> indow <u>H</u> elp
🗅 🚅 🔡 🛲 🕺 🖻 🛍	🚵 🧟 💁 📴 📜 🏥 🏥 🔁 < No Filter > 💌
□ - 월 1108_408PFN test	CPU 315-2 PN/DP

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.

🖳 HW Config - [SIMATIC	300 Station (Configuration)	0605_408]			
D Station Edit Insert PLC	∑ <u>Y</u> iew <u>Options</u> <u>W</u> indow <u>H</u> elp				_ 8 ×
0 🚔 🐂 🖬 🕵 🎒	Customize	Ctrl+Alt+E			
0) UR 1 2 CPU315-	Specify Module Configure <u>N</u> etwork Symbol Table <u>R</u> eport System Error	Ctrl+Alt+T		Find: Profile:	□x n†n↓ Standard
XI MPI/DP X2 FN-IO X2 FI Port I	<u>E</u> dit Catalog Profile <u>U</u> pdate Catalog		PROFINET-IO-System (100)		PROFIBUS DP PROFIBUS-PA PROFINET IO
X2 P2 Port 2 3 4	Install <u>H</u> W Updates Install <u>G</u> SD File		(1) dut408		📄 Additional Field Devices 😥 🦳 Gateway
5	Find in Service & Supp	ort			Network Components      E      EtherDevice Switch
7 8 9 9 10 11 11 11 11 11 11 11 11 11 11 11 11	Create GSD file for I-D	evice	]	×	

- 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

	iew Options <u>W</u> indow	FTerb		- 8
	a 🖻 🛛 🔬 🎒 🖻 🖻	⊐ <b>₩ k</b> ?		
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(1) dut408	I address Q address	Diagnostic address:	Comment	<ul> <li>⊕ EDS-406A-1MCS-SC</li> <li>⊕ EDS-406A-2M-SSC</li> <li>⊕ EDS-406A-2M-SC</li> <li>⊕ EDS-406A-3M-SC</li> <li>⊕ EDS-406A-3M-SC</li> <li>⊕ EDS-406A-MM-ST</li> <li>⊕ EDS-406A-FFN</li> <li>⊕ EDS-406A-FFN</li> <li>⊕ EDS-406A-ST-SC</li> </ul>
(1) dut408 ot M. Order number		2042*		⊕         EDS-4408.4 M23.8C           ⊕         EDS-4408.4 M13.8T           ⊕         EDS-4408.4 M4.8C           ⊕         EDS-4408.4 M8.8C           ⊕         EDS-4008.4 M8.8C           ⊕         EDS-5008.4 M8.8C
(1) dut408 ot M Order number dut40007-000408- 1 X1				⊕         ■ DD-408.4 M/X3/SC           ⊕         ■ DD-408.4 M/X3/ST           ⊕         ■ DD-408.4 M/X3/SC           ⊕         ■ DD-408.4 P/M           ⊕         ■ DD-508.4 M/X3/SC           ⊕         ■ DD-508.4 M/X3/SC           ⊕         ■ DD-508.4 M/X3/SC           ⊕         ■ DD-508.4 M/X3/SC
(1) dut408 ot M. Order number dut40007-000408- 1 X1 1 X1 Pl		2042*		⊕         EDS-4008.4 M23-SC           ⊕         EDS-4008.4 M23-ST           ⊕         EDS-4008.4 M4-SC           ⊕         EDS-4008.4 SS-SC           ⊕         EDS-5008           ⊕         EDS-5108           ⊕         EDS-516A
(1) dut408 t M. Order number <i>dut4(0007-000408-1</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>I</i> <i>XI</i> <i>XI</i> <i>I</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i>XI</i> <i></i>		2042* 2041* 2040* 2039* 2038*		⊕         EDS-408.4-1M23-SC           ⊕         EDS-408.4-2M13-ST           ⊕         EDS-408.4-2M13-ST           ⊕         EDS-408.4-2M1-ST           ⊕         EDS-508.4           ⊕         EDS-508.4           ⊕         EDS-508.4           ⊕         EDS-508.4           ⊕         EDS-508.4           ⊕         EDS-508.4
(1) dut408 ot M. Order number <i>dut40007-000408-</i> <i>1 XI PI</i> <i>1 XI PI</i>		2042* 2041* 2040* 2039* 2038* 2038*		⊕         EDS-4008.4 M23-SC           ⊕         EDS-4008.4 M23-ST           ⊕         EDS-4008.4 M4-SC           ⊕         EDS-4008.4 ST           ⊕         EDS-4008.4 ST           ⊕         EDS-4008.4 ST           ⊕         EDS-5008           ⊕         EDS-5108           ⊕         EDS-516A           ⊕         EDS-516A           ⊕         EDS-512E
1)         dut408           at         M.         Order number           at         attic 0007-000408-           at         Att		2042 * 2041 * 2040 * 2039 * 2038 * 2038 * 2037 * 2036 *		⊕         EDS-4408.4 MM2S/SC           ⊕         EDS-4408.4 MM2S/C           ⊕         EDS-4408.4 MM-SC           ⊕         EDS-408.4 MM-SC           ⊕         EDS-408.4 MM-SC           ⊕         EDS-408.4 MM-SC           ⊕         EDS-408.4 ST           ⊕         EDS-508.4           ⊕         EDS-508.4           ⊕         EDS-508.4           ⊕         EDS-508.6           ⊕         EDS-508.6           ⊕         EDS-508.6           ⊕         EDS-508.6           ⊕         EDS-508.6
I)         dut408           at         M.         Order number           att         At         At           At         At         At		2042 * 2041 * 2041 * 2039 * 2038 * 2038 * 2037 * 2036 * 2035 *		⊕         EDS-408.4-1M23.SC           ⊕         EDS-408.4-2M13.ST           ⊕         EDS-408.4-3M-3C           ⊕         EDS-408.4-3M-3C           ⊕         EDS-408.4-MA-SC           ⊕         EDS-408.4-MA-SC           ⊕         EDS-408.2-FN           ⊕         EDS-408.4-SS SC           ⊕         EDS-408.2-SS SC           ⊕         EDS-5164           ⊕         EDS-516A
1)         dut408           ot         M.         Order number           i         MMC0007-000408-           i         XI		2002* 2001* 2009* 2009* 2009* 2008* 2007* 2005* 2005* 2005* 2005* 2005*		⊕         EDS-408.4 M23.8C           ⊕         EDS-408.4 M13.8T           ⊕         EDS-408.4 M4.8C           ⊕         EDS-408.4 M4.9C           ⊕         EDS-408.4 M4.9C           ⊕         EDS-408.4 M4.9C           ⊕         EDS-408.4 M4.9C           ⊕         EDS-408.4 FM           ⊕         EDS-408.4 FM           ⊕         EDS-408.4 SS-0C           ⊕         EDS-408.4 SS-0C           ⊕         EDS-506.4 FM           ⊕         EDS-505.4 FM           ⊕         ED
(1)         dut08           (1)         dut08           (1)         dut07-000108-           (1)         dut1           (1)         dut1 <td></td> <td>2042 * 2041 * 2041 * 2039 * 2038 * 2038 * 2037 * 2036 * 2035 *</td> <td></td> <td>⊕         EDS-408.4-M23.SC           ⊕         EDS-408.4-M13.ST           ⊕         EDS-408.4-M4.SC           ⊕         EDS-508.4-M4.SC           ⊕         EDS-5108           ⊕         EDS-516A           ⊕         EDS-516A           ⊕         EDS-50508           ⊕         EDS-5162           ⊕         EDS-5162           ⊕         EDS-5162           ⊕         EDS-510E           ⊕         EDS-510E           ⊕         EDS-510E           ⊕         EDS-510E           ⊕         EDS-510E           ⊕         EDS-510E           ⊕         EDS-510E</td>		2042 * 2041 * 2041 * 2039 * 2038 * 2038 * 2037 * 2036 * 2035 *		⊕         EDS-408.4-M23.SC           ⊕         EDS-408.4-M13.ST           ⊕         EDS-408.4-M4.SC           ⊕         EDS-508.4-M4.SC           ⊕         EDS-5108           ⊕         EDS-516A           ⊕         EDS-516A           ⊕         EDS-50508           ⊕         EDS-5162           ⊕         EDS-5162           ⊕         EDS-5162           ⊕         EDS-510E
(1) dut408 t M. Order number M. Order number J. XI P 1. XI P		2002* 2001* 2009* 2009* 2009* 2008* 2007* 2005* 2005* 2005* 2005* 2005*		⊕         EDS-408.4 M23.8C           ⊕         EDS-408.4 M13.8T           ⊕         EDS-408.4 M4.8C           ⊕         EDS-408.4 FM           ⊕         EDS-408.4 FM           ⊕         EDS-408.4 FM           ⊕         EDS-508.4 SS OC           ⊕         EDS-5108

• 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.

<u>Station</u> <u>E</u> dit Inse	rt <u>PLC V</u> iew <u>O</u> ptions <u>W</u> indow <u>H</u> elp	
〕 <mark>☞</mark> ╬~ ₪ Ę	e Download Ctrl+L Upload	
🗃 (0) UR	Download Module Identifi <u>c</u> ation Upload Module Ide <u>n</u> tification to PG	
1	Faulty Modules	
2 CP XI ME X2 PI R PW X2 PI R Por X2 P2 R Por 3	Module Information Ctri+D     Operating Mode Ctri+I     Clear/Reset	Ethemet(
4 5	Update Firmware	
6 7	Save Device Name to Memory Card	
8	Efhernet	Edit Ethernet Node
9 10	PROFIBUS	Verify Device Name
11	Save Service Data	Assign Device Name

After the Edit Ethernet Node dialog box appears, click Browse

Sthemet node		
		Nodes accessible online
AAC <u>a</u> ddress:		<u>B</u> rowse
et IP configuration		
• Use I <u>P</u> parameters		
IP address:		Gateway
TL angless:	1	• Do not use router
Subnet mas <u>k</u> :		C Use router
		Address:
Obtain IP address fr	om a DHCP server	
Identified by		
🕫 Client ID	C MAC address	C Device name
Client ID:		
Assign IP Configure	dion	
Assign device name		
Device name:		Assign Name
	2	
Reset to factory settings		
in the second second		Reset
		Weser
Close		

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

		MAC address	Device type	Name
Sjop t search	192.168.12 192.168.12 192.168.12	7.253 00-90-E8-25-E	F EtherDevic	
	<			

- 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

		Nodes accessible online
MAC address:	00-90-E8-25-FF-FC	Biows
et IP configuration		
Use IP parameter	rs	
IP address:	192.168.127.253	Gateway
Subnet mas <u>k</u> :	255.255.255.0	C Use router Address: 192.168.127.253
Obtain IP addres Identified by	s <u>f</u> rom a DHCP server	
Client ID	$m{C}$ MAC address	C Device name
Aşsign IP Confi	guration	
Assign device name		
<u>D</u> evice name:	dut408	Assign Name
	0.00	
Reset to factory settin	-Bo	

- **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

		Nodes accessible online
MAC address:	00-90-E8-25-CC-FC	Browse
Set IP configuration		
⊂ Use I <u>P</u> paramete	15	
		Gateway
IP address:	192.168.127.253	🕫 Do not use router
Subnet mas <u>k</u> :	255.255.255.0	C Use router
		Address: 192.168.127.253
Client ID:	-	
	1	
Aşsign IP Confi	guration	
		Assign Name
Assign device name Device name:	,	Assign Name
Assign device name Device name:	,	Assign Name
Assign device name	,	

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.

Short description:	EDS-408A-PFN	
	EDS-408A-PFN	<u></u>
Order No./ firmware:	0007-000408-0000 / \73.1	<u> </u>
Family:	MOXA EtherDevice Switch	
Device name:	eds408	
	Change Release Number	106.xml
- <u>N</u> ode in PROFINET I	· · · · · · · · · · · · · · · · · · ·	
- <u>N</u> ode in PROFINET I D <u>e</u> vice number:	O System	O-System (100)
1. The second	O System	0-System (100)
D <u>e</u> vice number:	O System 1  PROFINET-IO 192.168.127.253 Ethemet.	0-System (100)
D <u>e</u> vice number: IP address:	O System 1  PROFINET-IO 192.168.127.253 Ethemet.	0-System (100)
Device number: IP address: ☞ Assign IP address	O System 1  PROFINET-IO 192.168.127.253 Ethemet.	O-System (100)

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

l		🔪 (1) dut408A			
	Slot	Module 🚺	Order number	I address	Q address
	0	🚡 do#408A	0007-000408-00		
	ΧI	XI			
	XIA	XI PI			
	XIA	XI P2			
	XI A	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

ral   Addresses   Parameters			
	Value		
n 🔄 Parameters			
🚽 🔄 Device parameters			
_ 🖃 Status change	No alarms		
🖃 Redundant power supply	No alarms		
Device status			

- 5. Configuring I/O cycle
  - a. Select the switch and double-click the **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**.

Properties - PN-IO (PN-IO)				
General   Addresses IO Cycle				
Update Time				
<u>M</u> ode:	Fixed update time	•		
	- 24 million - 14	Factor	Send clock	[ms]
Update time [ms]:	128.000	128 💌	x 1.000	
- Watchdog Time	128.000 256.000 512.000			
Number of accepted update cycle	512.000 ts with missing IO data		3	•
			384.000	
Watchdog time [ms]:			1504,000	
OK			Cancel	Help

- 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.

eneral   Addresses   Topology   Option	s Parameters	
	Value	
🖃 🚔 Parameters		
📥 🔄 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

Transmission medium / duplex:	Automatic settings	•
Disable autonegotiation	Automatic artinaz TP 100 Mbps full duplex TP 10 Mbps half duplex TP 10 Mbps half duplex TP 100 Mbps half duplex	
Boundaries	TP 100 Mbps half duplex	
🗖 End of gmc domain		
🗖 End of detection of accessible nod	les	
🗖 End of topology discovery		

# Save and Load the Project into the PLC

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

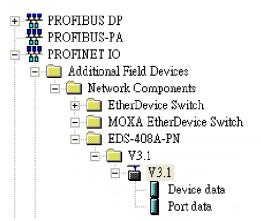
After the project is configured, SIMATIC STEP 7 will load all information required for data exchange to the I/O Controller (PLC), including the IP addresses of the connected I/O devices.

👪 HW Config - [SIMATIC 300 Station (Configuration) 0605_408]	
🕅 Station Edit Insert PLC View Options Window Help	
D 😂 🖫 🖷 🐘 🎒 💼 💼 🏙 🎰 🚯 🗖 🚼 🕺	
Image: CPU315-2 PM/DP(1)         Image: CPU315-2 PM/DP(1)           X1         MB2/DP           X2         PN-JO           X2 Pl         Port 1           X2 Pl         Port 2           3	
	>

## **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							оресну моаше	
9 10							Delete	Del
.1							<u>G</u> o To <u>Filter Assigned Modules</u>	
	(1) dut408						<u>M</u> onitor/Modify	
lot	Module	Order number	I address	Q address	Diagnostic address:	Cor	<u>E</u> dit Symbols	
7	a dat408	0007-000408-0000		1	2042*		Object Properties	Alt+Return Ctrl+Alt+O
1	XI				2041*		Open Object With	
PI	XI PI				2040*		Change Access	
P2	XI P2			2	2039*	-		
I P3	XI P3			14	2038*		Assign Asset ID	
l P4	XI P4				2037*		Product Support Information	Ctrl+F2
1 PS	XI P5				2036*		FAQs	Ctrl+F7
l P6	XI P6				2035*		Find Manual	Ctrl+F6
I P7	XI P7				2034*	-	Philo Mantoat	Cul+P0
I 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.

at	h:	1	1108_408PFN	est/SIMATIC 300(1)/CPU	315-2 PN/DP		
	Ad	lduess	Symbol	Display for	mat Status value	Modify value	T
1	I	0.0	l.	BOOL	true		1
2	I	0.1		BOOL	true		
3	I	0,2		BOOL	false		
4	Ι	0.3		BOOL	false		
5	I	0.4		BOOL	false		
6	Ι	0.5		BOOL	true		
7	Ι	0.6		BOOL	false		and the second
8	Ι	0.7		BOOL			
<	1					>	
Г Г	un M	– condi (onito lodi <u>f</u> y		Update Force Symbol Run immediately 607 Status Value	1	niphenal Outputs y <b>&amp; RUNNING</b>	

To monitor Port data, follow the same steps, drag Port data in the side bar and drop it onto slot 2.

(1) EDS-408A-PN Slot 🚺 Module Order number 
 0
 EDS-408A-PN
 0007-000408-00

 XI
 XI
 XI

 XI I
 XI PI
 XI
 XI A 🚺 XI P2 XI A 🚺 XI P3 XI A \llbracket XI P4 XI A 📲 XI PS XI A 🚺 XI P6 XI A 🛽 XI P7 XI A 🚺 XI P8 1 Device data 2 Port data

MOXA PROFINET I/O cyclic data in the slot 1 and 2

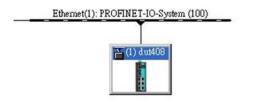
Then right click. Select **Monitor/Modify.** You will see a monitoring window.

🛗 Monitor/Modify - Po	ort data - (R-/S2)			×
Online via essigned CPU ser	vices			
	TIC 300(1)/CPU 315-2 PN/D	P		_
		1	1 17	_
Adduess Symbol		at Status value	Modify value	^
1 I 1.0	BOOL	false		
2 I 1.1	BOOL	truë		
<sup>3</sup> 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 <b>F</b> 5		
		VIDERS		
Run conditionally	Run immediately			
Monitor	🔐 Status Value	🔲 Enable Peri	pheral Outputs	
Modi <u>f</u> y	📭 Modify Value	🔲 1/0 <u>D</u> isplay		
😋 Irigger			RUNNING	
			W RUNNING	
Close			Help	

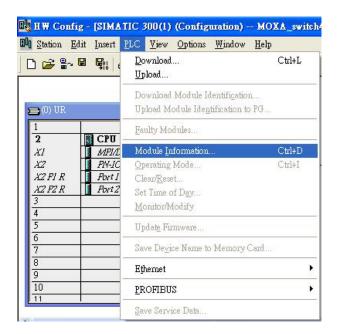
## **Module Information**

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 Network Con	IO Device Diagnostics nection	Communication Diagno Statistics	ostics   Inte: Identification	rface
Port	Statistical va		Current	-
Port 1 (X1 P1)	Dropped rec	eived packets - no resources	D	
Port 1 (X1 P1)	Bad received	l packets	Ō	
Port 1 (X1 P1)	Received oc		15718	
Port 1 (X1 P1)	Dropped sen	it packets - no resources	0	
Port 1 (X1 P1)		kets - transmit collisions	0	
Port 1 (X1 P1)	Sent octets		2422725	
Port 2 (X1 P2)	Dropped rec	eived packets - no resources	0	
Port 2 (X1 P2)	Bad received	l packets	0	
Port 2 (X1 P2)	Received oc	tets	0	
Port 2 (X1 P2)	Dropped sen	it packets - no resources	0	
Port 2 (X1 P2)		kets - transmit collisions	0	
Port 2 (X1 P2)	Sent octets		0	
Port 3 (X1 P3)		eived packets - no resources	0	
Port 3 (X1 P3)	Bad received		0	
Port 3 (X1 P3)	Received oc		1307731	
Port 3 (X1 P3)	Dropped sen	it packets - no resources	0	~
Port 2 /171 P2)	Rad cont nor	kete - transmit collisions	n	0.0

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.

<b>Module Information - EDS-408A-PN</b>		
Path: MOXA_switch408APN\SIMATIC 300( Status: 🗙 Error	(1)VC Operating mode of the CPU	i: 🕜 STOP
Network Connection	Statistics	Identification
General IO Device Diagnostics	Communication Diagnosti	cs Interface
IO controller: pn-io Manufacturer's description 553	Device ID:	16# 0007
Standard diagnostics:		Hex. Format
Channel-specific diagnostics:		
Slot Channel Error		
0.X1 Power supply 1 0.X1 P5 Link down (16	l error (16# 0000, 16# 0000000) 5# 0000, 16# 00000000)	
Help on selected diagnostic row:	Display	
Close Update Print.		Help

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.

hysical <u>P</u> roperties:	To the test	a.m.	34-3-
Name Port 3 (X1 P3)	<ul> <li>Port status</li> <li>OK</li> </ul>	Automatic settings	Mode TP 100 Mbps full du
etails of Port:	Port 3 (X1 P3)		

## **Topology Editor**

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

a <sup>r</sup> a Topology Editor	
Table view Graphic view Offline/online comparison	
Interconnection table	Selection range
✓         Show station name           Filter:         Show all ports	Filter: Show all ports
Port Partner port Cable len Signal del Comment	
□- dut408	E-SIMATIC 300(1)
X1 P1 (X1 P1)	
X1 P2 (X1 P2)	
X1 P3 (X1 P3) SIMATIC 300(1) \PN-IO(CPU 31 0.00	
X1 P4 (X1 P4) X1 P5 (X1 P5)	
X1 P5 (X1 P5)	
X1 P7 (X1 P7)	
X1 P8 (X1 P8)	
SIMATIC 300(1)	<u>*</u>
E-PN-IO(CPU 315-2 PN/DP)	Passive Components
Port 1 (X2 P1 R) dut408 \ X1 P3 (X1 P3) 0.00	
Port 2 (X2 P2 R)	E-SCALANCE X100
	+-PC Modules
	+- Standard IE
< >	
	1
Online Update Object Properties Export Options	Add
OK	Cancel Help

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

00.445	ured topology (offline)			Detected topology (online)	
Ei	ter: Show all devices	•	<u>S</u> tart	3 devices found	
oject name	Partner port	Cable data	Object name	Partner port	Cable data
dut408					
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		
PN-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		12
			Port 1		
			Port 2		
			Port 3		
			Port 4		
			Port 5	dut408 \ Port 5	-(-)
			Port 6	dut408 \ Port 6	-(-)
			<	ur internet interne	

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

"; Topology Editor	
Table view Graphic view Offline/online comparison   SIMATIC 300 Station PN-IO(CPU315-2 PN/DP(1)) dut408 dut408 0 0 0 0 0 0 0 0 0 0 0 0 0	Ministure View Ministure View Passive Components SCALANCE X100 + SCALANCE X100 + SCALANCE VV - medium converter + PC Modules - Standard IE - SIMATIC HM
Online Update Object Properties Options Print	
OK	Cancel Help