Industrial Protocols User Guide for SDS Series

Version 1.0, January 2024

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Industrial Protocols User Guide for SDS Series

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

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

Configuring MODBUS/TCP on Moxa Switches

	PROFINET	Modbus TCP EtherNet/IP SNN	IP	
MOKA	Port 🧭			
	Static Port Lock	1		
	IP-Port Binding	0		
H H	Redundancy Proto	ocol: Disable 🖋		
	VLAN 🖍			
	Management	VLAN: 1		
	VID Name	Access	Trunk	Hybrid
	1	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, G1, G2		

- Switch Profile

Modbus TCP is enabled by default, indicated by **Modbus TCP** button highlighted in green. To disable Modbus TCP, click the **Modbus TCP** button. The button will turn gray to indicate that it has been disabled.

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 Inform			
0x0000	1 word	HEX	Vendor ID = 0x1393
0x0001	1 word		Unit ID (Ethernet = 1)
0x0002	1 word	HEX	Product Code = 0x0003
			Vendor Name = "Moxa"
			Word 0 Hi byte = 'M'
			Word 0 Lo byte = 'o'
0x0010	20 words	ASCII	Word 1 Hi byte = 'x'
			Word 1 Lo byte = a'
			Word 2 Hi byte = $\sqrt{0'}$
			Word 2 Lo byte = $\sqrt{0'}$
			Product Name = "EDS-408A"
			Word 0 Hi byte = E'
			Word 0 Lo byte = D'
			Word 1 Hi byte = 'S'
			Word 1 Lo byte = `-'
0x0030	20 words	ASCII	Word 2 Hi byte = $4'$
			Word 2 Lo byte = $0'$
			Word 3 Hi byte = $8'$
			Word 3 Lo byte = A'
			Word 4 Hi byte = $\sqrt[0]{0'}$
			Word 4 Lo byte = $\sqrt{0'}$
0x0050	1 word		Product Serial Number
			Firmware Version
			Word 0 Hi byte = major (A)
0x0051	2 words		Word 0 Lo byte = minor (B)
			Word 1 Hi byte = release (C)
			Word 1 Lo byte = build (D)
			Firmware Release Date
			For example:
0.0050			Word $0 = 0 \times 0609$
0x0053	2 words	HEX	Word $1 = 0 \times 0705$
			Firmware was released on 2007-05-06 at 09
			o'clock
			Ethernet MAC Address
			Ex: MAC = 00-01-02-03-04-05
			Word 0 Hi byte = 0×00
00055	2		Word 0 Lo byte = 0×01
0x0055	3 words	HEX	Word 1 Hi byte = 0×02
			Word 1 Lo byte = 0×03
			Word 2 Hi byte = 0×04
			Word 2 Lo byte = 0×05
			Power 1
0x0058	1 word	HEX	0x0000: Off
			0x0001: On
			Power 2
0x0059	1 word	HEX	0x0000: Off
			0x0001: On
			Fault LED Status
	1		
0x005A	1 word	HEX	0x0000: No

Address Offset	Data Type	Interpretation	Description
0x005B	6 words	ASCII	Product 12-digit full Serial Number
			DI1
0x0080	1 word	HEX	0x0000:Off
			0x0001:On
			DI2
0x0081	1 word	HEX	0x0000:Off
			0x0001:On
			D01
0x0082	1 word	HEX	0x0000:Off
			0x0001:On
			D02
0x0083	1 word	HEX	0x0000:Off
			0x0001:On
Port Information	I		
			Port 1 to 8 Status
0x1000 to			0x0000: Link down
0x1000 to 0x1011	1 word	HEX	0x0001: Link up
0X1011			0x0002: Disable
			0xFFFF: No port
			Port 1 to 8 Speed
			0x0000: 10M-Half
0x1100 to	1 word	HEX	0x0001: 10M-Full
0x1111			0x0002: 100M-Half
			0x0003: 100M-Full
			0xFFFF: No port
			Port 1 to 8 Flow Ctrl
0x1200 to	1 word	HEX	0x0000:Off
0x1211	1 WORD		0x0001:On
			0xFFFF:No port
			Port 1 to 8 MDI/MDIX
0x1300 to	1 word	HEX	0x0000: MDI
0x1311	1 Word		0x0001: MDIX
			0xFFFF: No port
			Port 1 to 8 Description
			Port Description = "100TX,RJ45."
0x1400 to			Word 0 Hi byte = $1'$
0x1413 (Port 1)			Word 0 Lo byte = $0'$
		10077	Word 1 Hi byte = '0'
0x1414 to	20 words	ASCII	Word 1 Lo byte = T'
0x1427 (Port 2)			 Word 4 Hi byte = `4'
			Word 4 Lo byte = 3°
			Word 5 Hi byte = '.'
			Word 5 Lo byte = $10'$
Packets Informa	tion		
			Port 1 to 8 Tx Packets
			Ex: port 1 Tx Packet Amount = 44332211
0x2000 to			Received MODBUS response:
0x2023	2 words	HEX	0x44332211
			Word $0 = 4433$
			Word $1 = 2211$
			Port 1 to 8 Rx Packets
			Ex: port 1 Rx Packet Amount = 44332211
0x2100 to	2 words		Received MODBUS response:
0x2123		HEX	0x44332211
			Word $0 = 4433$
			Word $1 = 2211$
L		1	

Address Offset	Data Type	Interpretation	Description
			port 1 to 8 Tx Error Packets
	2 words	НЕХ	Ex: port 1 Tx Error Packet Amount = 44332211
0x2200 to			Received MODBUS response:
0x2223			0x44332211
			Word 0 = 4433
			Word 1 = 2211
			port 1 to 8 Rx Error Packets
			Ex: port 1 Rx Error Packet Amount = 44332211
0x2300 to	2 words	HEX	Received MODBUS response:
0x2323			0x44332211
			Word 0 = 4433
			Word 1 = 2211
Redundancy Info	ormation		
			Redundancy Protocol
			0x0000:None
			0x0001:RSTP
0x3000	1 word	HEX	0x0002:Turbo Ring
			0x0003:Turbo Ring V2
			0x0004:Turbo Chain
			0x0005: MSTP
			RSTP Root
0x3100	1 word	HEX	0x0000: Not Root
	1 11010		0x0001: Root
			0xFFFF: RSTP Not Enable RSTP Port 1 to 8 Status
			0x0000: Port Disabled
			0x0000: Port Disabled 0x0001: Not RSTP Port
0x3200 to			0x0001: Not KSTP Port 0x0002: Link Down
0x3200 to 0x3211	1 word	HEX	0x0002: Elik Down
0X3211			0x0004: Learning
			0x0005: Forwarding
			0xFFFF: RSTP Not Enable
			TurboRing Master/Slave
			0x0000: Slave
0x3300	1 word	HEX	0x0001: Master
			0xFFFF: Turbo Ring Not Enable
			TurboRing 1st Port status
			0x0000: Port Disabled
			0x0001: Not Redundant Port
0x3301	1 word	HEX	0x0002: Link Down
			0x0003: Blocked
			0x0004: Learning
			0x0005: Forwarding
			TurboRing 2nd Port status
			0x0000: Port Disabled
			0x0001: Not Redundant Port
0x3302	1 word	HEX	0x0002: Link Down
			0x0003: Blocked
			0x0004: Learning
			0x0005:Forwarding
			TurboRing Coupling
0x3303	1 word	HEX	0x0000: Off
			0x0001: On
			0xFFFF: Turbo Ring is Not Enabled
			TurboRing Coupling Port Status
			0x0000: Port Disabled
0.2204	1 word		0x0001: Not Coupling Port
0x3304	1 word	HEX	0x0002: Link Down 0x0003: Blocked
			0x0003: Blocked 0x0005: Forwarding
			0x0005: Forwarding 0xFFFF: Turbo Ring is Not Enabled
			over the rando rang is not chabled

Address Offset	Data Type	Interpretation	Description
			TurboRing Coupling Control Port Status
			0x0000: Port Disabled
			0x0001: Not Coupling Port
			0x0002: Link Down
0x3305	1 word	HEX	0x0003: Blocked
0,5505	1 Word		0x0005: Forwarding
			0x0006: Inactive
			0x0007:Active
			0xFFFF:Turbo Ring is Not Enabled
			TurboRing V2 Coupling Mode
			0x0000: None
0x3500	1 word	HEX	0x0001: Dual Homing
			0x0002: Coupling Backup
			0x0003: Coupling Primary
			0xFFFF:Turbo Ring V2 is Not Enabled
			TurboRing V2 Coupling Port Primary Status
			(Used in Dual Homing, Coupling Backup, and
			Coupling Primary)
			0x0000:Port Disabled
			0x0001: Not Coupling Port
0x3501	1 word	HEX	0x0002: Link Down
			0x0003: Blocked
			0x0004: Learning
			0x0005: Forwarding
			0xFFFF: Turbo Ring V2 is Not Enabled
	1 word	HEX	TurboRing V2 Coupling Port Backup Status
			(Only using in Dual Homing)
			0x0000: Port Disabled
			0x0001: Not Coupling Port
0x3502			0x0002: Link Down
073302	1 Word	IILX	0x0003: Blocked
			0x0004: Learning
			0x0005: Forwarding
			0xFFFF: Turbo Ring V2 Not Enable
			TurboRing V2 Ring 1 status
			0x0000: Healthy
0x3600	1 word	HEX	0x0001: Break
			0xFFFF:Turbo Ring V2 Not Enable
			TurboRing V2 Ring 1 Master/Slave
0x3601	1 word	HEX	0x0000: Slave
			0x0001: Master
			0xFFFF: Turbo Ring V2 Ring 1 Not Enable
			TurboRing V2 Ring 1 1st Port Status
			0x0000: Port Disabled
			0x0001: Not Redundant Port
0x3602	1 word	HEX	0x0002: Link Down
010002	1 11010		0x0003: Blocked
			0x0004:Learning
			0x0005:Forwarding
			0xFFFF:Turbo Ring V2 Ring 1 is Not Enabled
			TurboRing V2 Ring 1's 2nd Port Status
			0x0000: Port Disabled
			0x0001: Not Redundant Port
			0x0002: Link Down
0x3603	1 word	HEX	0x0003: Blocked
			0x0004: Learning
			0x0005: Forwarding
			0xFFFF: Turbo Ring V2 Ring 1 is Not Enabled
		I	VALLET TO DO KING VZ KING I IS NOT LINDIEU

Address Offset	Data Type	Interpretation	Description
			TurboRing V2 Ring 2 Status
	1 word	НЕХ	0x0000: Healthy
0x3680			0x0001: Break
			0xFFFF: Turbo Ring V2 Ring 2 is Not Enabled
			TurboRing V2 Ring 2 Master/Slave
0.000			0x0000: Slave
0x3681	1 word	HEX	0x0001: Master
			0xFFFF: Turbo Ring V2 Ring 2 is Not Enabled
			TurboRing V2 Ring 2's 1st Port Status
			0x0000: Port Disabled
			0x0001: Not Redundant
0	4		0x0002: Link Down
0x3682	1 word	HEX	0x0003: Blocked
			0x0004: Learning
			0x0005: Forwarding
			0xFFFF: Turbo Ring V2 Ring 2 is Not Enabled
			TurboRing V2 Ring 2's 2nd Port Status
			0x0000: Port Disabled
			0x0001: Not Redundant
			0x0002: Link Down
0x3683	1 word	HEX	0x0003: Blocked
			0x0004: Learning
			0x0005: Forwarding
			0xFFFF: Turbo Ring V2 Ring 2 is Not Enabled
			Turbo Chain Switch Roles
			0x0000: Head
0x3700	1 word	HEX	0x0001: Member
			0x0002: Tail
			0xFFFF: Turbo Chain is Not Enabled
			Turbo Chain 1st Port status
			0x0000: Link Down
0	4		0x0001: Blocking
0x3701	1 word	HEX	0x0002: Blocked
			0x0003: Forwarding
			0xFFFF: Turbo Ring V2 Ring 2 Not Enable
			Turbo Chain 2nd Port status
			0x0000: Link Down
0x3702	1 word	HEX	0x0001: Blocking
0X3702	1 WOLU		0x0002: Blocked
			0x0003: Forwarding
			0xFFFF: Turbo Ring V2 Ring 2 Not Enable
MSTP Register			
			MSTP CIST Port Role / Port State
			0x00: DisabledPort / 0x00 Port Disabled
	1 word, 0x0103		0x01: DesignatedPort / 0x01 Discarding
	=> port role =		0x02: RootPort / 0x02 Learning
0x4000 ~ 0x407F	DesignatedPort	HEX	0x03: AlternatePort / 0x03 Forwarding
	port state =		0x04: BackupPort
	Forwarding		0x06: Not MSTP Port / 0x06Not MSTP
			Port
	1		0xFFFF: MSTP Not Enable

Address Offset	Data Type	Interpretation	Description	
				Port Role / Port State
			0x00:	DisabledPort / 0x00 Port Disabled
	1 word, 0x0103		0x01:	DesignatedPort / 0x01Discarding
			0x02:	RootPort / 0x02Learning
	=> port role =		0x03:	AlternatePort / 0x03Forwarding
0x4080 ~ 0x40FF	DesignatedPort	HEX	0x04:	BackupPort
	port state =		0x05:	MasterPort
	Forwarding		0x06:	Not MSTP Port / 0x06Not MSTP
			Port	
			0xFFFF:	MSTP Not Enable
			MSTP MSTI2	Port Role / Port State
			0x00:	DisabledPort / 0x00 Port Disabled
	1 1 0 0100		0x01:	DesignatedPort / 0x01Discarding
	1 word, 0x0103		0x02:	RootPort / 0x02Learning
0 4100 0 4175	=> port role =		0x03:	AlternatePort / 0x03Forwarding
0x4100 ~ 0x417F	DesignatedPort	HEX	0x04:	BackupPort
	port state =		0x05:	MasterPort
	Forwarding		0x06:	Not MSTP Port / 0x06Not MSTP
			Port	
			0xFFFF:	MSTP Not Enable
			MSTP MSTI3	Port Role / Port State
			0x00:	DisabledPort / 0x00 Port Disabled
	1 1 0 0100		0x01:	DesignatedPort / x01Discarding
	1 word, 0x0103		0x02:	RootPort / 0x02Learning
	=> port role =		0x03:	AlternatePort / 0x03Forwarding
0x4180 ~ 0x41FF	DesignatedPort	HEX	0x04:	BackupPort
	port state = Forwarding		0x05:	MasterPort
			0x06:	Not MSTP Port / 0x06Not MSTP
			Port	·
			0xFFFF:	MSTP Not Enable
			MSTP MSTI4	Port Role / Port State
			0x00:	DisabledPort / 0x00 Port Disabled
	1		0x01:	DesignatedPort / 0x01Discarding
	1 word, 0x0103		0x02:	RootPort / 0x02Learning
0	=> port role =		0x03:	AlternatePort / 0x03Forwarding
0x4200 ~ 0x427F	DesignatedPort	HEX	0x04:	BackupPort
	port state =		0x05:	MasterPort
	Forwarding		0x06:	Not MSTP Port / 0x06Not MSTP
			Port	
			0xFFFF:	MSTP Not Enable
			MSTP MSTI5	Port Role / Port State
			0x00:	DisabledPort / 0x00 Port Disabled
	1 word, 0x0103		0x01:	DesignatedPort / 0x01Discarding
	=> port role =		0x02:	RootPort / 0x02Learning
0x4280 ~ 0x42FF	DesignatedPort	HEX	0x03:	AlternatePort / 0x03Forwarding
	port state =		0x04:	BackupPort
	Forwarding		0x05:	MasterPort
			0x06:	Not MSTP Port / 0x06Not MSTP
			Port	
			0xFFFF:	MSTP Not Enable
				Port Role / Port State
			0x00:	DisabledPort / 0x00 Port Disabled
	1 word, 0x0103		0x01:	DesignatedPort / 0x01Discarding
	=> port role =		0x02:	RootPort / 0x02Learning
0x4300 ~ 0x437F	DesignatedPort	HEX	0x03:	AlternatePort / 0x03Forwarding
	port state =		0x04:	BackupPort
	Forwarding		0x05:	MasterPort
			0x06:	Not MSTP Port / 0x06Not MSTP
			Port	
			0xFFFF:	MSTP Not Enable
			571111	

Address Offset	Data Type	Interpretation	Description	1
0x4380 ~ 0x43FF	1 word, 0x0103 => port role = DesignatedPort port state = Forwarding	HEX	MSTP MSTI7 0x00: 0x01: 0x02: 0x03: 0x04: 0x05: 0x06: Port 0xFFFF:	Port Role / Port State DisabledPort / 0x00 Port Disabled DesignatedPort / 0x01Discarding RootPort / 0x02Learning AlternatePort / 0x03Forwarding BackupPort MasterPort Not MSTP Port / 0x06Not MSTP 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

Switch Profile				
	PROFINET	Modbus TCP EtherNet/IP SNI	MP	
Married Townson	Port 🥖			
	Static Port Lock	0		
	IP-Port Binding	0		
— —	Redundancy Proto	col: Disable 💉		
	VLAN 💉			
	Management	VLAN: 1		
	VID Name	Access	Trunk	Hybrid
	1	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, G1, G2		

EtherNet/IP is disabled by default, indicated by **EtherNet/IP** button highlighted in gray. To enable EtherNet/IP, click the **EtherNet/IP** button. The button will turn green to indicate that it has been enabled.

505-3016-2GTX

CIP Objects of EtherNet/IP

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

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

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

Identity Object

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

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

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

Class Attribute List

Instance Attribute List

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

The Identity Object Instance supports the following CIP Common services:

Common Service List

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

Product Code Table

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

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

TCP/IP Interface Object

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

The following tables summarize the attributes of this object.

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

Class Attribute List

Instance Attribute List

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

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

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

Common Service List

Service	Impler	mentation	Service Name	Description	
Code	Class	Instance	Service Maine	Description	
0 x 01	\checkmark	√	Get_Attributes_All	Returns the contents of all attributes of the class	
0 x 0E	√	v	Get_Attribute_Single	Used to read an object instance attribute	
0 x 10		×	Set_Attribute_Single	Used to modify an object instance attribute	

Ethernet Link Object

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

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

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

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

Class Attribute List

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

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

Instance attribute list

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

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

Attr ID	Access Rule	Name	(Struct.)	Data Type	Description
108	Get	Tx Unicast Packet Rate		UDINT(32)	Number of TX unicast packets per second
109	Get	Rx Unicast Packet Rate		UDINT(32)	Number of RX unicast packets per second
110	Get	Tx Multicast Packet Rate		UDINT(32)	Number of TX multicast packets per second
111	Get	Rx Multicast Packet Rate		UDINT(32)	Number of RX multicast packets per second
112	Get	Tx Broadcast Packet Rate		UDINT(32)	Number of TX broadcast packets per second
113	Get	Rx Broadcast Packet Rate		UDINT(32)	Number of RX broadcast packets per second
114	Get	Tx Multicast Packet		UDINT(32)	Total number of TX multicast packets
115	Get	Rx Multicast Packet		UDINT(32)	Total number of RX multicast packets
116	Get	Tx Broadcast Packet		UDINT(32)	Total number of TX broadcast packets
117	Get	Rx Broadcast Packet		UDINT(32)	Total number of RX broadcast packets
118	18 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

Using default values
-dependent;
ex.
Duplex was defaulted.
ed default is half
ed and duplex.
link parameters
automatically. 1
ssued to its Identity
re fault; 1 indicates a
this is product-
t detect no
etect no antenna
rrecting nature of the
d-fault requiring user
5 - 12 5 - 20
a is t

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

Common Service List

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

Assembly Object

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

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

There are three instances of this object as the following.

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

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

Class Attribute List

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

Instance Attribute List

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

Common Service List

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

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

I/O Messaging Content

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

Message Router Object

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

The supported messaging connections are as the following:

- Explicit Messaging
- Unconnected Messaging
- Implicit messaging

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

Class Attribute List

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

Instance Attribute List

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

Common Service List

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

Connection Manager Object

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

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

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

The instance attribute list is introduced as the following.

Class Attribute List

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

Instance Attribute List

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

Common Service List

Service	Implen	nentation	Service Name	Description
Code	Class	Instance		Description
0x0e	√	✓	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 $\ensuremath{\textbf{0xf4}}$. There is one instance of this object.

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

Class Attribute List

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

Instance Attribute List

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

Common Service List

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

Moxa Networking Object (Vendor Specific)

The Moxa Networking object includes system information and status.

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

The class code is **0x404**.

Class Attribute List

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

Instance Attribute List

Attr ID	Access Rule	Name	Data Type	Description
1	Get	Firmware Version	UDINT (32)	Switch firmware version
2	Get	System Fault Status	UDINT (32)	Switch fault status Bit 0: Reserved Value 0: Ok Value 1: Fail Bit 1: Reserved Value 0: Ok Value 1: Fail Bit 2: Port utilization alarm Value 0: No alarm Value 0: No alarm Value 1: alarm Bit 3: Port link up Value 0: No alarm Value 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 5: 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 8: DI 1(off) Value 0: No alarm Value 1: Alarm Bit 9: DI 1(on) Value 0: No alarm Value 1: Alarm Bit 10: DI 2(off) Value 0: No alarm Value 1: Alarm Bit 11: DI 2(on) Value 0: No alarm Value 1: Alarm Bit 12: Reserved Value 0: Not support Value 1: Alarm Bit 12: Reserved Value 0: Off Value 1:On Bit 14: Power supply 2 Value 0: Off Value 1:On Bit 15~31: Reserved.
3	Get	Switch Port Number	USINT (8)	Switch max port number
		number		switch per port exist
4	Get	Port Exist	ULINT (64)	Bit mask, the LSB indicates the first port. Value 0: Not exist Value 1: Exist

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

Attr ID	Access Rule	Name	Data Type	Description
27	Get/Set	Reset Device	USINT (8)	Reboot and reset to default 1: Reboot the device 2: Reset to default
28	Get	Full Serial Number	SHORT_STRI NG	The 12-digit full serial number of each device

Common Service List

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

Electronic Data Sheet (EDS) File

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

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

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

Icon should be 32 * 32 in pixel.

Rockwell RSLogix 5000 Add-On Instructions (AOI)

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

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

AOI Installation

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

The Five Major Stages of Installing the AOI

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

Add Moxa switch to the I/O configuration tree

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

1. Open RSLogix 5000 and create a new controller.

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

уре:			
урс.	1769-L32E CompactLogix5332E Controller	*	
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 Sover-Up Ha	Select Module	Description	Vendor
器 Ethern ① New Module	Du Catagoni Bi	Vendor Favorites	Find Add Favorite
Paste Ctrl+V Print	By Category By		DK Cancel Help

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

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

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

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

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

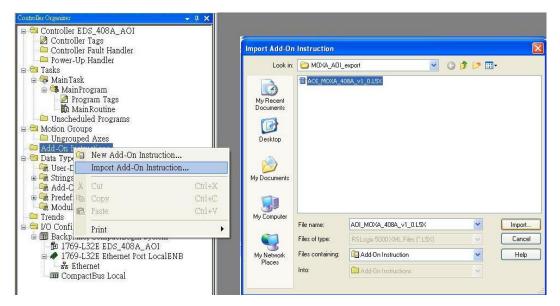
🛯 📶 Bac	kplane, CompactLogix System
1	1769-L32E EDS_408A_AOI
	1769-L32E Ethernet Port LocalENB
	器 Ethernet
	🛷 1769-L32E Ethernet Port LocalENB
	ETHERNET-MODULE EDS_408A
	CompactBus Local

Import the Add-On Instruction (AOI)

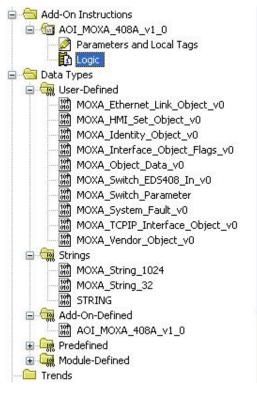
1. In the controller organizer window, right click the **Add-On Instructions** folder, select **Import Add-On Instructions** and select the correct AOI file (xxx.L5X) to import.

ΝΟΤΕ

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

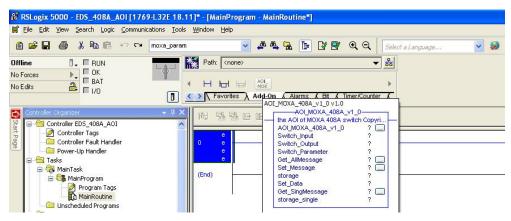


2. After importing, the controller organizer window shows all AOI for Moxa Ethernet switches under the **Add-On Instructions** folder.



Add an instance of the AOI in your application

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

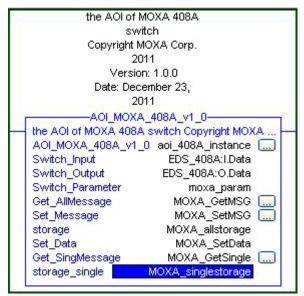


Create and configure tags for the AOI

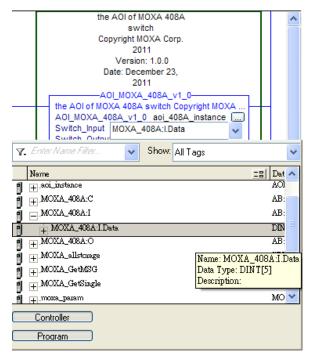
1. Right click on the ? in the field of each tag, select New Tag and input a Name for each new tag.

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

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



For "Switch_Input" and "Switch_Output", use the scrollbar to select the tag name.



For all other tags, manually type the tag names:

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

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

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

Message Type: CIP Generic Service Custom Type: Source Element: Service (Hex) Code: (Hex) Instance: Attribute: Instance: Attribute: Wew Tag	lessage C Configurati		ion - MOX unication 1	A_GetMSG		Σ
Type: Custoffit Source Length: 0 (Bytes) Service 1 (Hex) Class: 1 (Hex) Destination MOXA_allstorage[0] Instance: 1 Attribute: 1 (Hex) New Tag	Message	Туре:	CIP Gene	ric	~	
⊖ Enable ⊖ Enable Waiting ⊖ Start ⊖ Done Done Length: 0	Type: Service Code:	1 (Н	<i>.</i>	1(Hex	Source Length:	MOXA_allstorage[0]
⊖ Error Code: Extended Error Code: ☐ Timed Out ← Error Path: Error Text:	 Error Co Error Path: 				🔾 Done	

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

	Browse	
Broadcast: Communication CIP CIP CIP Vith Source ID CIP CIP Vith Connected	Message Path Browser Path: MOXA_408A MOXA_408A Beakplane, CompactLogis System Beakplane, CompactLogis System Tr594.32E themet Port LocalENB Tr594.32E themet Tr594.32E themet Port LocalENB	
) Error Cc Error Path: Error Text:	III CompactBus Local	

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

Message C	onfigurati	on - MOX	A_SetMSG		
Configuratio Message Service Type: Service	Type: Set Attribut	nication T CIP Gene e Single ex) Class:	-	Source Element: Source Length:	MOXA_SetData
Code: Instance:	1	Attribut	e: 1 (Hex)	Destination	New Tag
Enableable	Enable W	aitingting	Startitart	Doneone	Done Length: 0
Error Code:) Error Path: Error Text:	de:	Extend	led Error Code:		_ Timed Out ←
			ОК	Cancel	Apply Help

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

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

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

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

l <mark>essage C</mark> Configuration	_		A_GetSingle		(
Message	Туре:	CIP Gene	ric	~	
Service Type: Service Code: Instance:		ute Single Hex) Class: Attribut	[f6] (Hex) e: 1 (Hex)	Destination	0 (Bytes) 0XA_Singlestorage[0] v New Tag
) Enable) Error Co Error Path:		ole Waiting Extend	⊖ Start led Error Code:	🔾 Done	Done Length: 0
Error Text:			ОК	Cancel	Apply Help

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

Configuration	Communication Too	
	Message Path Browser	
	Path: EDS408A	
O Broade	EDS408A	
Communic	🖃 😋 I/O Configuration 😑 🎹 Backplane, CompactLogix System	
() CIP	1769-L32E ED_408A_AOI	
O CIP W Source	ia - ♣ 1769-L32E Ethernet Port LocalENB	(Octal)
	1769-L32E Ethernet Port LocalENB	
Conne 🗌	ETHERNET-MODULE EDS408A	
) Enable		
) Error Co		
rror Path: rror Text:	OK Cancel Help	

Download the configured AOI to the Rockwell PLC

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

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

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

Controller ED5_408A		Name	<u>=</u> ≣ ∆ Value	÷	Force M.
Controller Faul		🛨 aoi_408A_instance		{}	
		+ EDS_408A:C		{}	
📇 Tasks	Monitor Tags	± EDS_408A:I		{}	
MainTask MainProgra MainProgra MoinProgra MoinRe Unscheduled P Motion Groups	Edit Tags	+ EDS_408A:0		{}	
	Verify	+ MOXA_allstorage		{}	
	Export Tags			{}	
		+ MOXA_GetSingle		{}	
	Print 🕨	+ moxa_param		{}	
Gungrouped Axès Gungrouped Axès				{}	
		+ MOXA_SetMSG		{}	
		+ MOXA_singlestorage		{}	

Name 📰 🗠	Value 🔶	Force Mask 🗲	Style	Data Type	1
moxa_param.Switch_Idnetity	{}	{}		MOXA_Ident	i
💼 moxa_param.Switch_Idnetity.Vendor_ID	991		Decimal	INT	ľ
🗐 moxa_param.Switch_Idnetity.Device_Type	775		Decimal	INT	
moxa_param.Switch_Idnetity.Product_Code	7		Decimal	INT	
😐 moxa_param.Switch_Idnetity.Major_Revision	0		Decimal	SINT	
+ moxa_param.Switch_Idnetity.Minor_Revision	0		Decimal	SINT	
+ moxa_param.Switch_Idnetity.Serial_Number	16#0000_259d		Hex	DINT	
+ moxa_param.Switch_Idnetity.Product_Name	'EDS-408A'	{}		STRING	
😐 moxa_param.Switch_Idnetity.Assigned_Na	11	{}		MOXA_String	-
😐 moxa_param.Switch_Idnetity.Geographic		{}		MOXA_String	
+ moxa_param.Switch_TCPIP	{}	{}		MOXA_TCPI	and a local data
moxa_param.Switch_Vendor	{}	{}		MOXA_Vend	ł
🛨 moxa_param.Switch_Vendor.System_Firm	524291		Decimal	DINT	
🛨 moxa_param.Switch_Vendor.System_Fault	8192		Decimal	DINT	ļ
+ moxa_param.Switch_Vendor.Switch_Port	0		Decimal	SINT	į
+ moxa_param.Switch_Vendor.Port_Exist	{}	{}	Decimal	DINT[2]	l
🛨 moxa_param.Switch_Vendor.Port_Enbale	{}	{}	Decimal	DINT[2]	ĺ
+ moxa_param.Switch_Vendor.Port_Link_St	{}	{}	Decimal	DINT[2]	ĺ
moxa_param.Switch_Vendor.IGMP_Snoop	0		Decimal	SINT	l
😐 moxa_param.Switch_Vendor.Query_Interval	125		Decimal	DINT	l
🛨 moxa_param.Switch_Vendor.IGMP_Enhan	0		Decimal	SINT	l
+ moxa_param.Switch_Vendor.Relay_1	0		Decimal	SINT	ĺ
+ 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.

CIP Tags

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

Tags for Identity Object

Data Type: MOXA_Identity_Object_v0

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

Tags for TCPIP Object

Data Type: MOXA_TCPIP_Interface_Object_v0

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

Tags for Ethernet Link Object

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

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

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

Tags for Moxa Networking Object

Data Type: MOXA_Vendor_Object_v0

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

Name	Data Type	Description
CPU Usage	SINT	Percent of usage (0-100)
Device Up Time	DINT	Number of seconds since device was powered up
Reset Mib Counter	SINT	Reset port MIB counters
		Bit 0: RSTP,
Redundant Device Mode	DINT	Bit 1: Turbo Ring,
		Bit 2: Turbo Rong v2,
		Bit 3: Turbo Chain,
		Bit 4: MSTP
Reset Device	SINT	1: restart the device
Reset Device	51101	2: reset to default

Pre-configured Tags in the Moxa AOI

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

NOTE

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

Pre-Configured Ta	ags Name
Identity Object (0	Jx01)
*	Vendor ID
*	Device Type
*	Product Code
	Revision
	Status
*	Serial Number
*	Product Name
	Assigned Name
	Geographic Location
TCP/IP Interface	
	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
	ject (0xf6)- by port
*	Interface Speed
*	Interface Flags
	Link Status
	Half/Full Duplex
	Negotiation Status
	Manual Setting Requires Reset
	Local Hardware Fault
*	Physical Address

The table below specifies all the pre-configured tags in Moxa AOI with a <u>*</u> mark.

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

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

Monitoring AOI Tags

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

NOTE

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

Controller EDS_408A_A Controller Tags		NameA	Value 🗲	Force M
Controller Faul 🧖	New Tag Ctrl+W	🛨 aoi_408A_instance	{}	
Power-Up Han		+ EDS_408A:C	{}	
🖬 🛅 Tasks	Monitor Tags		{}	
Progra	Edit Tags	± EDS_408A:0	{}	
	Verify	HOXA_allstorage	{}	
	Export Tags	HOXA_GetMSG	{}	
		H-M0XA_GetSingle	{}	
🖹 🔠 Motion Groups	Print •	+ moxa_param] {}	
Ungrouped Axes		HOXA_SetData	{}	
Add-On Instructions		+ MOXA_SetMSG	{}	
Parameters and		+ MOXA_singlestorage	{}	

Monitor Tags for Identity Object

Click **moxa_param Switch_Identity** and expand the list to check the values for Identity tags.

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

Monitor Tags for TCPIP Object

Click **moxa_param Switch_TCPIP** and expand the list to check the values for TCPIP tags.

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

Monitor Tags for Ethernet Link Object

Click **moxa_param Switch_Ethernet_Link** and expand the list to check the values for per port Ethernet Link tags.

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

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

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

Monitor Tags for Moxa Networking Object

Click **moxa_param Switch_Vendor** and expand the list to check the values for Moxa custom tags.

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

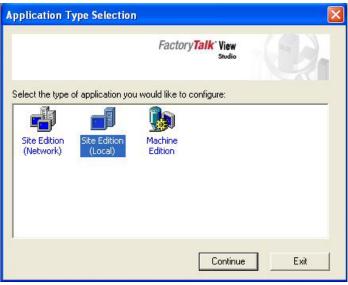
Rockwell FactoryTalk® View Faceplate

FactoryTalk® View Faceplate Installation

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

Create a FactoryTalk® View Shortcut to the PLC

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



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

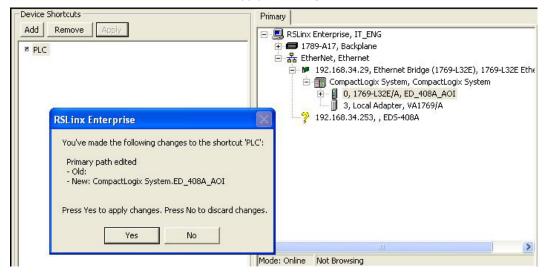
New/Open Site Editi	ion (Local) Application	X
New Existing		
Application name:	EDS_408A_Platform	
Description:		
Language:	English (United States), en-US	
	Create	Cancel

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

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

- ≪y Local (IT_ENG) - 133 EDS_408A_Platform - Secu Delete	
Add New Server	Rockwell Automation Device Server (RSLinx Enterprise)
D Comm Security □ → → HMI Tags	OPC Data Server Tag Alarm and Event Server
Tags Properties	RSLinx Enterprise Server Properties
Displays	General Alarms and Events
	Name RSLinx Enterprise
- 🔁 Recipes - Eccal Messages - 🌌 Trend Templates	Description
Derived Tags Events I Macros	Computer hosting the RSLinx Enterprise server: localhost
금- 🔄 Data Log 느 쯝 Data Log Models	
	OK Cancel Apply Help

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



Import FactoryTalk® View Faceplate Graphics

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

Explorer - EDS_408A_Platform		
Command Line		
⊡ 🔄 HMI Tags 	Graphics Import Export Wizard - Operation Type	
Glot New Libr Add Component Into Application.	Select the operation to perform:	
🕒 🔛 Imaj Import and Export	C Export graphic information from displays	
Parameters Proces Local Messages Trend Templates	Import graphic information into displays	
□ 🖓 Trend Snapshots □ 😋 HMI Tag Alarms		
Goric and Control Gorice and Control Gorice and Control Gorice and Control Gorice and Control		
Client Keys		
Data Log Data Log Data Log Models	<back next=""> Cancel I</back>	Help

2. Select No and Multiple displays batch import file.

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

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

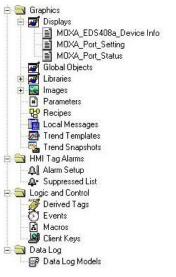
•

NOTE

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

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

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

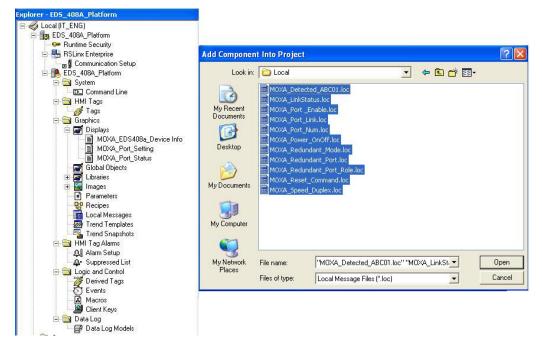


Import FactoryTalk® View Faceplate Local Message

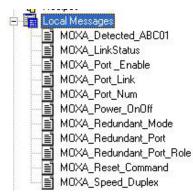
1. Right click Local Message in the FactoryTalk® View Explorer window, select Add Component Into Application and import all the local message files (.loc).

NOTE

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



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



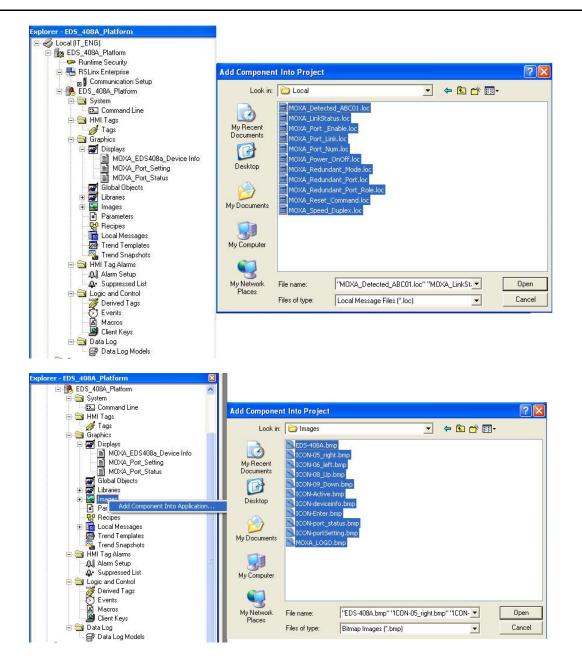
Import FactoryTalk® View Faceplate Images

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



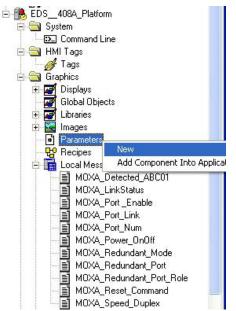
NOTE

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



Create a New Parameter

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



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



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

Another important piece is **moxa_param**, which is the name of the Switch_Parameters tag created for the MOXA_SWITCH_AOI in your RSLogix project. (Refer to **Create and configure tags for the AOI**)



Configure FactoryTalk® View Faceplate Display

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

Reliable Networks, Sincere Servi		Port Setting		
Device Inform	nation			Display Settings
	IP Address	: SS		Display Keys <u>V</u> BA Code
	Netmask MAC Address Serial No.	: SS : SS : ######		P <u>r</u> operty Panel Object E <u>x</u> plorer
	Firmware Ver. CPU Loading (%)	:ss :#######	-	<u>P</u> aste Paste <u>S</u> pecial
	Redundancy	: Local Message Di*		Show Gri <u>d</u> Snap O <u>n</u> <u>G</u> rid Settings
	Power Input 1	Local Message Di*		Zoom to <u>F</u> it Zoom In Zoom <u>O</u> ut
Contraction Contract	Power Input 2	Local Message Di*		Cancel Zoom

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

For the Moxa custom faceplate, you need to configure three parameters: MOXA_Device Info; MOXA_Port_Setting; MOXA_Port_Status.

Display Settings	
Properties Behavior	
Display Type C Replace C Overlay Koop of Back C On Top	Size C Use Current Size Specify Size in Pixels Width: 567 Height: 623
 Allow Multiple Running Copies Cache After Displaying No Yes Always Updating 	Resize Allow Display to be Resized When Resized C Pan © Scale
Insert Variable	Position © Use Current Position © Specify Position in Pixels × 0 Y: 0
 System Menu Minimize Button Maximize Button Size to Main Window at Runtime Show Last Acquired Value Maximum Tag Update Rate: seconds 	Security Code:
OK	Cancel Set as Default Help

Sample FactoryTalk® View Faceplate Project

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

Setting Up a FactoryTalk® View SE Client

1. Launch FactoryTalk® SE client.



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

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

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

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

FactoryTalk View	v SE Client App	plication Type		
Select the type of	SE application the	client will connect I	to:	
Help	About	Cancel	< Back	Next >

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

actoryTalk View	w SE Client App	lication Name	č.	×
Type the name of	the application you	want to connect to	o:	
EDS_408A_Platf	orm		-	
C Open Factory	Falk View SE Client	as view-only		
Enable on-scr	een keyboard			
🔲 Allow display o	ode debugging			
Select the initial ru	intime language:			
English (United S	tates), en-US		-	
				3
Help	About	Cancel	< Back	Next >

5. Configure the FactoryTalk® View SE Client Components and set **Initial Display** to **MOXA_Device_Info**.

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

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

Show title ba			
Title bar text:	EDS408A Faceplate	s	
Show system	menu and close button		
🔽 Show Mi	n/Max buttons		
 Maximize win Show Diagno 			
	locking of Diagnostics Li	st	
Disable switc	n to other applications		

7. Finish the setup and save the configuration

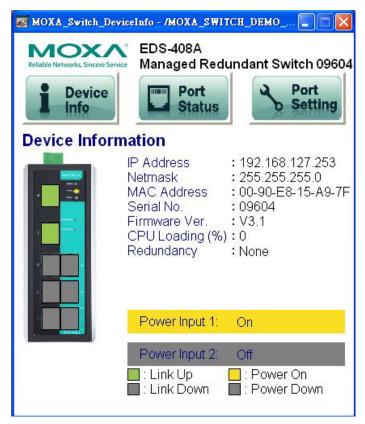
actoryTalk Vi	ew SE Client Com	pletion Optio	ns	Đ
The FactoryTalk	: View SE Client is nov	w configured.		
To save, click a	n option below, and th	hen click Finish.		
To discard, click	. Cancel.			
 Save config 	uration and open Fac	toryTalk View SE	Client now	
C Save config	uration and exit			
Help	About	Cancel	< Back	Finish
			, DOCK	1 11 11311

Introduction to the Moxa Custom Faceplate

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

Device Information

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



The following table describes fields and values.

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

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

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

Port Status

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

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

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

Port Setting

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

MOXA_Port_Setting	- /EDS408A_Platform//	
MO	EDS-408/ Managed	م Redundant Switch 09496
1 Device Info	e Por Sta	
Port Settin	Ig	
1	Port 2	
Enable : Enabl Speed : Auto	le	
Set Speed: Auto 10/Half 10/Full 100/Half 100/Full	Set Enable:	Activate
Field Port Index	Values Port 3	Description
Speed	10/Half 10/Full 100/Full 100/Full 1000/Half Unknown	Selected port number Selected port speed and mode
Enable	Enable Disable	Selected port enable or disable

Introduction

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

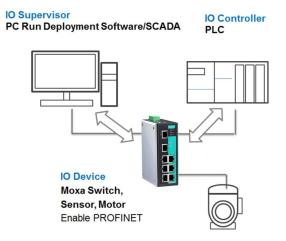
PROFINET is a communication standard for automation of PROFIBUS & PROFINET International (PI). It is 100% Ethernet-compatible as defined in IEEE standards. With PROFINET, applications can be implemented for production and process automation, safety applications, and the entire range of drive technology.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

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

PROFINET Environmental Introductions

PROFINET Networking Structure

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



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

I/O Controller

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

I/O Supervisor

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

I/O Device

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

PROFINET I/O Devices

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

PROFINET Protocols

DCP

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

DHCP

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

PROFINET Type LLDP

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

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

Device descriptions

GSD file

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

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

Configuring PROFINET I/O on Moxa Switches

Enable PROFINET I/O

Enable PROFINET in WEB UI

Switch Profile

	PROFINET	Modbus TCP	EtherNet/IP	SNMI		
MORA I	Port 🥖					
	Static Port Lock	c 🖉				
	IP-Port Binding	1				
H-Q.	Redundancy Pr	rotocol: Disable	0			
	VLAN 💉					
	Manageme	ent VLAN: 1				
	VID Nar	me Access			Trunk	Hybrid
	1	1, 2, 3, 4, 5, 6, G1, G2	7, 8, 9, 10, 11, 12,	13, 14,		
505-3016-2GTX						

PROFITNET I/O is disabled by default, indicated by **PROFITNET I/O** button highlighted in gray. To enable PROFITNET I/O, click the **PROFITNET I/O** button. The button will turn green to indicate that it has been enabled.



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.

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 in the table below. In this structure, each switch port represents one sub-slot.

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

Manufacturer Information

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

Table. MOXA OUI

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

PROFINET Attributes

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

Cyclic I/O Data

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

• I/O Parameters

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

• Alarm

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

PROFINET Cyclic I/O Data

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



NOTE

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

PROFINET Cyclic I/O Data Table

Category	Direction	Byte	Bit	Name	Description
			0	Device status	0: failed
			0	Device status	1: OK
			1	Power 1	0: unavailable
			T	Power 1	1: OK
			2	Power 2	0: unavailable
			Z	POWER 2	1: OK
Device	Input	0	3	RSTP status	0: disabled
			J	KJTF Status	1: enabled
			4	Turbo Ring v1	0: failed
			5	Turbo Ring v2	-1: OK
			6	Turbo Chain	1. 01
			7	Turbo Ring v2 status	0: broken
			5		1: healthy
		1	0	Port 1 Connection	
			1	Port 2 Connection	
			2	Port 3 Connection	
Port	Input		3	Port 4 Connection	0: not connected
	input	1	4	Port 5 Connection	1: connected
			5	Port 6 Connection	
			6	Port 7 Connection	
			7	Port 8 Connection	
			0	Port 9 Connection	
			1	Port 10 Connection	
			2	Port 11 Connection	
Port	Input	2	3	Port 12 Connection	0: not connected
	input	2	4	Port 13 Connection	1: connected
			5	Port 14 Connection	
			6	Port 15 Connection	
			7	Port 16 Connection	

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.

ŭ		Mc	nitor	/Modify - Dev	vice data - (1	R-/S1)				X
	Online via assigned CPU services									
	Path: MOXA/SIMATIC 300(1)/CPU 315-2 PN/DP									
		A	ddae ss	Symbol		Display format	St	atus value	Modify value	^
	1	Ι	0.0			BOOL		true		
	2	Ι	0.1			BOOL		false		
	3	Ι	0.2			BOOL		true		
	4	Ι	0,3			BOOL		false		
	5	Ι	0.4			BOOL		true		
	6	Ι	0.5			BOOL		false		
	7	Ι	0.6			BOOL	F	false		
	8	Ι	0.7			BOOL	-			~
	<								>	
	×	1	R <u>o</u> w I	Not Effective	Update F	orce Symbol w	rith	F5		
	D		oondi	tionally	⊐ ⊢Run immed:	inta ha				
			<u>(</u> onito	-	66; Status	-		Enable Periph	erel Outeute	
			fodify		00, 0000	10100	1	Entrop to the pro-	orde o dep dato	
		1	toany	′	Modify	v Value	Γ	I/O <u>D</u> isplay		
	😳 Irigger									
		C	loæ						Help	

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

Path: MOXASIMATIC 300(1)/CPU 315-2 PN/DP							
	Address	Symbol	Display format	Status value	Modify value		
1	I 1.0		BOOL	false			
2	I 1.1		BOOL	truð			
3	I 1.2		BOOL	true			
4	I 1.3		BOOL	false			
5	I 1.4		BOOL	false			
6	I 1.5		BOOL	false			
7	I 1.6		BOOL	false			
8	I 1.7		BOOL		1		
<					>		
Row Not Effective Update Force Symbol with F5 Run conditionally Run immediately Image: Status Value Image: Enable Peripheral Outputs							
Г	Modify	· 🛛	Modify Value	🔲 I/O <u>D</u> isplay			

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	
U		I VV	1	Send alarm if any status change		
1	Power Alarm 1	rw	0	Do not send power failed alarms	0: No alarms	
1		I VV	1	Send alarm if power supply 1 fails		
2	Power Alarm 2	rw	0	Do not send power failed alarms	0: No alarms	
Z		1 VV	1	Send alarm if power supply 2 fails		
3	MRP Enable	RW	0	MRP Disable	0: Disable	
	(SDS-3000 Only)		1	MRP Enable		
4	MRP Role (SDS-	S- RW 0 MRP Manager		MRP Manager	1: Client	
	3000 Only)		1	MRP Client		
5	MRP Recovery	RW	0	200ms	0: 200ms	
	Time (SDS-3000 Only)		1	500ms		
6	MRP React Link	RW	0	React link change off	0: off	
	Change (SDS- 3000 Only)		1	React link change on		
7	MRP Redundant 1st Port Number (SDS-3000 Only)	RW		Port number	1	

Byte	Name	Access	Value	Description	Default Value
8		RW		Port number	2
	2nd Port Number (SDS-3000 Only)				
9	MRP Vlan ID	RW		MRP Vlan ID	1
	(SDS-3000 Only)				

Device Status

Byte	Name	Access	Value	Description
			0	Unavailable
0	Device Status	ro	1	OK
			2	Device bootup fails
			0	Unavailable
1	Fault Status	ro	1	ОК
			2	Device detect fault
			0	Unavailable
2	Power 1 Status	ro	1	ОК
			2	Power 1 fails
			0	Unavailable
3	Power 2 Status	ro	1	OK
-			2	Power 2 fails
			0	Unavailable
4	DI 1 Status	ro	1	Closed
1.		10	2	Open
			0	Unavailable
5	DI 2 Status	ro	1	Closed
5	DI 2 Status	10	2	
			2	Open Unavailable
			-	RSTP
c	De due de et Me de		1	
6	Redundant Mode	ro	2	Turbo Ring V1
			3	Turbo Ring V2
			4	Turbo Chain
_			0	Unavailable
7	Ring Status	ro	1	Healthy
			2	Break
			0	Unavailable
8	Redundant Port 1 Status	ro	1	Link is up
			2	Link is down
			0	Unavailable
9	Redundant Port 2 Status	ro	1	Link is up
			2	Link is down
			0	Unavailable
10	Ring Coupling Mode	ro	1	Backup
10		10	2	Primary
			3	Dual homing
			0	Unavailable
11	Coupling Port 1 Status	ro	1	Link is up
			2	Link is down
			0	Unavailable
12	Coupling Port 2 Status	ro	1	Link is up
			2	Link is down
			0	Unavailable
13	Connection	ro	1	ОК
			2	Connection failure
14	MRP Role Status (SDS-3000 Only)	RO	0	Disable
			1	Manager
			2	Client
15	MRP 1st Port Status (SDS-3000 Only)	RO	0	MRP Disabled
			1	Port Link Down
			2	Port Disabled
L	1		-	. ere bloubled

Byte	Name	Access	Value	Description
			3	Port Blocking
			4	Port Forwarding
16	MRP 2nd Port Status (SDS-3000 Only)	RO	0	MRP Disabled
			1	Port Link Down
			2	Port Disabled
			3	Port Blocking
			4	Port Forwarding
17	MRP Status (SDS-3000 Only)	RO	0	Disable
			1	Initiation
			2	Awaiting Connection
			3	Primary Ring Port Link Up
			4	Ring Open
			5	Ring Closed
			6	Unknown
			7	Data Exchange Idle
			8	Pass Through
			9	Data Exchange Idle
			10	Pass Through Idle

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

4. 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	fultiprojects	
Name	Storage path	
A 1002	C:\Program Files\Sie:	mens\Step7\s7proj\10
<		2
Add to current multiproje	st	
Na <u>m</u> e:		<u>Т</u> уре:
MOXA		Project 💌
AL 1		🗖 🗄 Library
Storage location (path): C:\Program Files\Siemens\Ste	n7\s7nmi	Browse
	prosproj	<u></u>
OK	Ca	ncel Help
		incor incip

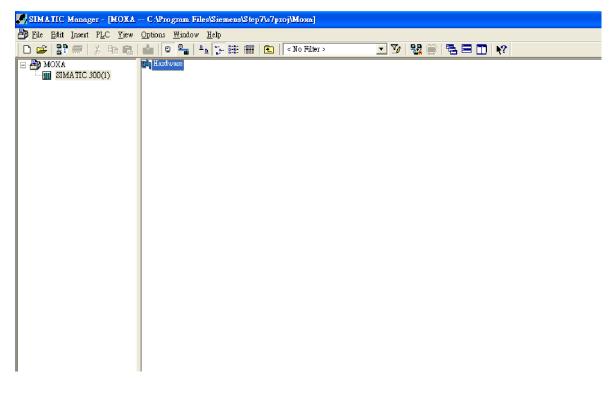
Name your project in the Name field then click OK.

Insert a station in your project

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

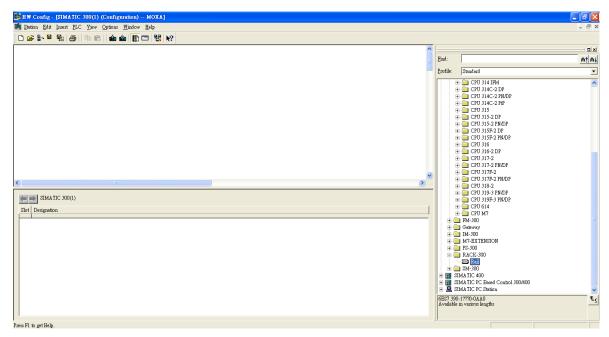
SIMATIC Mana	ager - [MOXA -	- C:\Program Files	\Siemens\Step7\s7proj\	Можа]				
🞒 File Edit Inser								
	X B B	💼 😇 🗣 🖕		No Filter >	- 🎾 🐮	: 🗑 🔁 🗖	\?	
MOX A								
	Cut	Chd+X						
	Copy Paste	Ctrl+C Ctrl+V						
	Delete	Del						
	Insert New Ob PLC	ject 🕨	SIMATIC 400 Station SIMATIC 300 Station					
			SIMATIC H Station					
	Rename Object Propert	F2 ies Alt+Return	SIMATIC PC Station					
			Other Station SIMATIC S5					
			PG/PC					
			MPI	-				
			PROFIBUS					
			Industrial Ethernet PTP					
			Foundation Fieldbus					
			S7 Program	-				
			M7 Program					
				_				

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

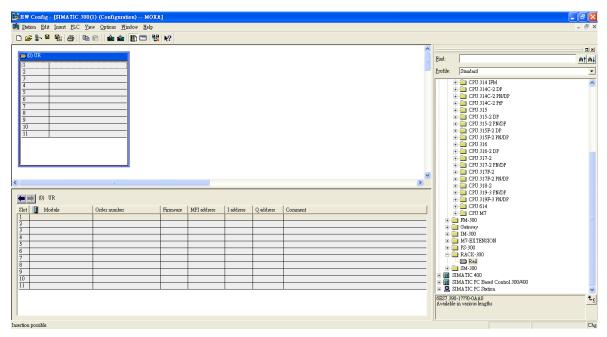


Add Rack in HW Config

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



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



Search PRODINET Ethernet devices

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

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

Then click Browse.

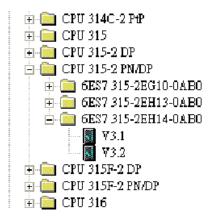
Edit Ethernet Node
Ethernet node
Nodes accessible online MAC address:
Set IP configuration © Use IP parameters
IP address: Gateway © Do not use router Subnet mask: © Use router Address:
C Obtain IP address from a DHCP server Identified by
© Client ID ℃ MAC address ℃ Deyice name Client ID:
Assign IP Configuration
Assign device name
Device name:
Reset to factory settings
<u>Close</u> Help

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

Browse Network - 2	Nodes			×
<u>Start</u> Sjop ▼ F <u>a</u> st search	! IP address 192.168.127.2 192.168.127.3			Name dut408 pn-io
<u>F</u> lash	MAC address:	00-90-E8-25-FF-FC		
ОК			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".

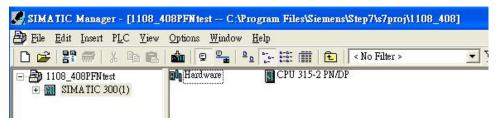
📴 HW Config - [SIMATIC 300(1) (Configuration): 2 MOXA]				l 🛛 🗙
에 Station Edit Insert PLC View Options Window Help				- 8 ×
D 😅 🖫 🗣 🚭 🕒 🖻 💼 🎰 🎒 🗔 💥 👀				
	A	Ī		크츠
		Find:		ntni
		Profile:	Standard	
		riome.	,	•
🚍 ()) UR			CPU 313C CPU 313C-2 DP	^
1			CPU 313C-2 P#	
2	Properties - Ethernet interface PN-IO (R0/S2.2)		🗄 🧰 CPU 314	
4	General Parameters		CPU 314 IFM CPU 314C-2 DP	
5			CPU 314C-2 Dr	
7			🗄 🦲 CPU 314C-2 PtP	
8	If a subnet is selected, the next available addresses are suggested.		🗎 🧰 CPU 315	
9			CPU 315-2 DP CPU 315-2 PN/DP	
10			• = 6ES7 315-2EG10-0AB0	
11	IP address: 192.168.127.33 Gateway © Do not use router		E 6ES7 315-2EH13-0AB0	
	Subnet mask: 255 255 255 0		ES7 315-2EH14-0AB0	-
	Use different method to obtain IP address		V3.1 V3.2	
	Use allierent method to obtain ir adaress <u>A</u> ddress:		+ CPU 315F-2 DP	
	Subnet:		E CPU 315F-2 PN/DP	
	not networked PROFINET Ethemet		🖶 🧰 CPU 316	
	Properties		CPU 316-2 DP CPU 317-2	
۷	Delete		CPU 317-2 PN/DP	
	Degete	-	😑 🧰 CPU 317F-2	
(0) UR			🗄 🧰 CPU 317F-2 PN/DP	
Slot Module Order number Firmware M	OK Cancel Help			
1			CPU 319F-3 PN/DP	
2			😟 🧰 CPU 614	
3			🗄 🧰 СРИ М7	
4 5	E		Def FM-300	-
6		1.1	15-2EH14-0AB0	X
7		384 KE	3 work memory; 0.05ms/1000 instructions; PROFINET	^ ₹ <u><</u>
8	✓	-Contro	3 work memory; 0.05ms/1000 instructions; PROFINET tion; S7 Communication (loadable FBs/PCs); PROFINET IO oller; supports RT/IRT; PROFINET interface and 2 ports;	~
		Jeonad		
Insertion possible				Chg

PROFINET I/O Ethernet subnet project accomplished.

B HW Config - [SIMATIC 300(1) (Configuration): 2 MOXA]) 🗗 🔀
💵 Station Edit Insert ELC View Options Window Help			- 8 ×
			미치
	Find:		nt ni
	Profile:	Standard	•
PROFINET Ethemet PROFINET-IO-System (100)			~
		🗉 🦲 CPU 313C-2 DP	-
2 CPU 315-2 PM/DP		EPU 313C-2 PP CPU 314	
XI MEV/DP		+	
X2 I PV-JO		🕂 🦲 CPU 314C-2 DP	
A271K F0/12		🗉 🧰 CPU 314C-2 PN/DP	
3		🗄 🧰 CPU 314C-2 P#	
4		- CPU 315 CPU 315-2 DP	
5		- CPU 315-2 DF	
<u>6</u> 7		• • • 6ES7 315-2EG10-0AE0	
		6ES7 315-2EH13-0AB0	
		😑 🦲 6ES7 315-2EH14-0AB0	_
10		V3.1	
11		₩ ₹3.2	
		CPU 315F-2 DP CPU 315F-2 PN/DP CPU 315F-2 PN/DP	
		- CPU 315-2 FMDF	
		- CPU 316-2 DP	
· · · · · · · · · · · · · · · · · · ·		🗄 🦲 CPU 317-2	
		🗄 🧰 CPU 317-2 PN/DP	
		🗉 🧰 CPU 317F-2	
PROFINET Ethemet: PROFINET-IO-System (100)		CPU 317F-2 PN/DP CPU 318-2	
Device Number II Paddres Device Name Order number Firmware Diagnostic address Initial state Shared Comment		- CPU 318-2	
Deve Names 1 and the Origination of the Cate Names Annya Displace contest industries where Cate Annya Contract		- 🧰 CPU 319F-3 PN/DP	
		🗉 🧰 CPU 614	
		🗄 🧰 CPU M7	
		FM-300 Gateway	_
	1		<u> </u>
	6ES7 31	5-2EH14-0AB0 work memory; 0.05ms/1000 instructions; PROFINET	🔼 🔁
	connecti	on; S7 Communication (loadable FBs/FCs); PROFINET IO ler; supports R T/IR T; PROFINET interface and 2 ports;	
	-Control	ler; supports RIARI; PROFINET interface and 2 ports;	~
Insertion possible			Chg

GSD File Installation

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



4. Install the GSD file:

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

🖳 H W Config -	SIMATIC 300 Stat	ion (Configuration) 06	05_408]			
00 Station Edit	Insert PLC View	Options <u>W</u> indow <u>H</u> elp				_ 8 ×
0 🚔 🔓 🖬	\$: 6 B B	Customize	Ctrl+Alt+E			
(0) UR 1 2 XI	CPU315-2 PN/DF	Specify Module Configure Network Symbol Table Report System Error	Ctrl+Alt+T		<u>F</u> ind: <u>P</u> rofile:	Standard.
X2 X2 P1	PN-10 Port 1 Port 2	Edit Catalog Profile Update Catalog Install <u>H</u> W Updates Install <u>GSD File</u>		PROFINET-IO-System (100)		ROFIBUS DP ROFIDUS-PA PROFINET IO Additional Field Devices Cateway
5 6 7 8 9 10 11		End in Service & Support.				Hetwork Component Hetwork Component Hetwork Switch Heternet Switch MACH 100 Switch Family L2 Profes MACH 100 Switch Family L2 Profes MACH 100 Switch Family L2 Profes MACH 200 Switch Family L2 Profes MACH 200 Switch Family L2 Profes Dis-405A-100-50 Dis-405A-100-50 Dis-405A-100-50 Dis-405A-100-50 Dis-405A-100-50 Dis-405A-30-50 Dis-405A-30-50 Dis-405A-30-50 Dis-405A-30-50 Dis-405A-30-50

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

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

	Insert PLC View	v Options	Window H	elp			- 8
ş 💁 🖬	R. 8 Po I	a 🏜 i	â (P) 🗆	₩ №?			
)) UR						<u> </u>	: <u>0</u>
i) UK						Eind:	mta
	CPU315-2 PN/I	0P(1)	_			Profile:	Standard
H	MPI/DP		_				
				Ethernet(1): PRO	DFINET-IO-System (100)	三番茄	PROFIBUS DF PROFIBUS-PA
PI P2	Fort I Fort 2		_			- #	PROFINET IO
r2	PDP12		_		(1) dut408		Additional Field Devices
					(I) (III 408		🗄 🦲 Gateway
		-					🖻 🧰 Network Components
					H		庄 🧰 EtherDevice Switch
							🗉 🦲 Ethernet Switch
							🗉 🦲 MACH 100 Switch Family L2 Profes
							🕀 🦲 MACH 100GE Switch Family L2 Pr
							🖻 🦲 MOXA EtherDevice Switch
							+ EDS-408A + EDS-408A-1M2S-SC
							+ EDS-408A-1M2S-SC + EDS-408A-2M1S-ST
		-				V	+ - EDS-408A-3M-SC
					>		T EDS 408A-MM-SC
						-	🛨 🧰 EDS-408A-MM-ST
🌒 (1) d	lut408						🛨 🦲 EDS-408A-PFN
	Order number	I address	Q address	Diagnostic address:	Comment		🕀 🧰 EDS-408A-PN
	. Urder number	1 address	Q address	Diagnostic address:	Comment		🗉 🧰 EDS-408A-SS-SC
	10007 000409 0			2042*		-	🗄 🦲 EDS-508A
da14	0007-000408-00					- 14 8	🛨 🧰 EDS-510E
dat4				2010*			
XI	/			2040* 2039*		-	EDS-516A
XI XI XI PI XI PZ	1			2039*		-	🛨 🦲 EDS-G508E
dut4 XI XI PI XI PI XI PI XI PI XI PI XI PI	1 2 7			2039* 2038*			😨 🧰 EDS-G508E 🗉 🧰 EDS-G512E
dut4 XI XI PI	1 2 7 1			2039* 2038* 2037*			 ■ EDS-G508E ■ EDS-G512E ■ EDS-G516E
dat44	1 2 7 7 5			2039* 2038*			 EDS-G508E EDS-G512E EDS-G516E Gateway
dut41 XI XIPI	1 2 7 7 7 5			2039* 2038* 2037* 2036*			
dut4i XI XIPI	7 7 7 7 7 7 7 7			2039* 2038* 2037* 2036* 2035*		-	EDS-G508E EDS-G512E EDS-G512E EDS-G516E EDS-G516E HMI IMI IO
dut4it XI XI PI XI PI	7 7 7 5 5 7 7 8 6 0 7		0	2039* 2038* 2037* 2036* 2035* 2035*			EDS-G508E EDS-G512E Gateway HMI IO
dut4ii XI XI PI	7 7 7 5 5 7 7 8 6 0 7		0	2039* 2038* 2037* 2036* 2035* 2035*		- E	EDS-G508E EDS-G512E Gateway HMI IO
dut4it XI XI PI XI PI	7 7 7 5 5 7 7 8 6 0 7		0	2039* 2038* 2037* 2036* 2035* 2035*		- E	EDS-G508E EDS-G512E Gateway HMI IO
dot#it XI XI PI Device	7 7 7 5 5 7 7 8 6 0 7		0	2039* 2038* 2037* 2036* 2035* 2035*		- E	

> Product Icons

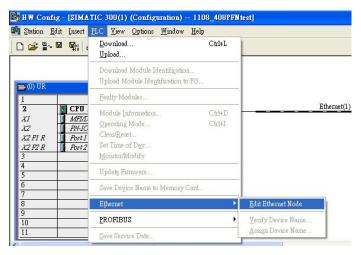
Ex. File Name: EDS-405A.bmp, EDS-408A.bmp, EDS-510E.bmp, EDS-G508E.bmp, EDS-G512E-4GSFP.bmp, EDS-G516E-4GSFP.bmp



Device Configuration

1. Browse the switch

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



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

themet node		
	Nodes accessible online	
IAC address:	Browse	
et IP configuration		
Use I <u>P</u> parameters		
m 11	Gateway	
IP address:	O Do not use router O	
Subnet mas <u>k</u> :	C Use router	
	Address:	
Client ID:	C MAC address C Deyice name	
Assign IP Configur	ration	
ssign device name —		1
-	Assign Name	-
ssign device name — Device name: eset to factory settings		

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

192.168.127.33 00-1B-1B-16-E6 S7-300 pn-io	Start	I IP addre		MAC address	Device type	Name
8	Sjop Fast search	192.168	.127.253	00-90-E8-25-FF	EtherDevic	dut408 pn-io

- 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.

t Ethernet Node			
Sthemet node		Nodes accessible online	
AAC address:	00-90-E8-25-FF-FC	Browse	
et IP configuration – • Use IP parameters			
IP address:	192.168.127.253	Gateway © Do not use router	
Subnet mas <u>k</u> :	255.255.255.0	C Use router Address: 192.168.127.253	
Obtain IP address Identified by	from a DHCP server		
Client ID Client ID:	€ MAC address	C Device name	
Agsign IP Configu	ration		
Assign device name —			
<u>D</u> evice name:	dut408	Assign Name	
leset to factory settin;	\$		
		Reset	
Close			Help

NOTE

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

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

themet node		
		Nodes accessible online
AC address:	00-90-E8-25-CC-FC	Browse
et IP configuration		
⊂ Use I <u>P</u> paramete	rs	
		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
C Client ID	22erbbs J&M •	C Device name
C Client ID Client ID:		C De <u>v</u> ice name
		← De <u>v</u> ice name
Client ID: [Aşsign IP Confi		← Degice name
Client ID: Assign IP Confi ssign device name		C Degice name
Client ID:	guration	

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

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

Properties - eds408		
General		
Short description:	EDS-408A-PFN	
	EDS-408A-PFN	
Order No / firmware:	0007-000408-0000 / ∀3.1	<u> </u>
Family:	MOXA EtherDevice Switch	
Device name:	ed:#408	
- <u>N</u> ode in PROFINET		
D <u>e</u> vice number:	1 PROFINET-IO-System (100)	
IP address:	192.168.127.253 Ethemet	
✓ Assign IP address	: via IO controller	
Comment:		
		~
		~
	Cancel	Help
	Califer	neth

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

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

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

	Value
Parameters	
Device parameters	
Status change Deductore and a second secon	No alarms No alarms
Redundant power supply Device status	No alarms
10.0	

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

Update Time	II have been a second sec		
<u>M</u> ode:	Fixed update time	-	
Update time [ms]:	128.000	Factor	Send clock [ms]
Watchdog Time	256,000 512,000		
Number of accepted update	cycles with missing IO data:		3
Watchdog time [ms]:			384.000

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

	Value	515
arameters	value	
- Port parameter		
- Alarms	On	
Admin state	Active	

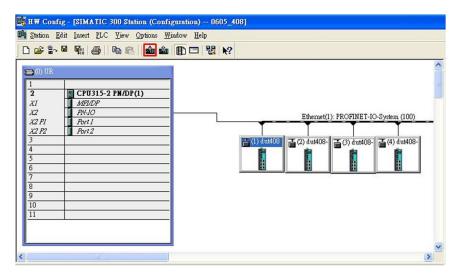
- 7. Configuring connection options
 - a. Select the switch and double-click the **sub-module X1 PN** to set port options.
 - b. Select **Options**.
 - c. Change the port option settings.
 - d. Click Save and Compile, then click download to Module.

Properties - X1 - X1 P1 (X1 P1)			
General Addresses Topology Option	ns Perameters		
Connection			
Transmission medium / duplex:	Automatic settings		•
Disable autonegotiation	Automatic settings TP 100 Mbps full duplex TP 10 Mbps full duplex TP 10 Mbps full duplex TP 100 Mbps full duplex		
Boundaries	TP 100 Mbps half duplex		
🖵 End of gmc domain			
	es		
📕 End of topology discovery			
		Cancel	Help

Save and Load the Project into the PLC

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

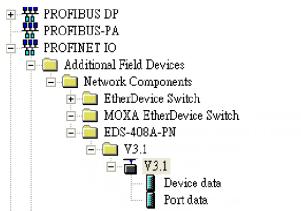
After the project is configured, SIMATIC STEP 7 will load all information required for data exchange to the I/O Controller (PLC), including the IP addresses of the connected I/O devices.



Monitoring the Switch

Monitor PROFINET I/O Cyclic Data

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



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

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

Path:	1	1108_408PFN te:	MSIMATIC 300(1)/CPU 31	15-2 PN/DP		
A	ldæss	Symbol	Display forms	at Status value	Modify value	2
1 I	0.0	Î.	BOOL	true		٦
2 I	0.1		BOOL	twe		
3 I	0.2		BOOL	false		
4 I	0.3		BOOL	false		
5 I	0.4		BOOL	false		
6 I	0.5		BOOL	true		
7 I	0.6		BOOL	false		
8 I	0.7		BOOL			
<						>
Run		Not Effective tionally	Update Force Symbol Run immediately & Status Value	with F5	pheral Outputs	

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

-	(1) EDS-408A-PI	4
Slot	🚺 Module	Order number
0	🚡 EDS-408A-PN	0007-000408-00
XI	🚺 XI	
XI I	🚺 XI PI	
XI I	📕 XI P2	
XII	🚺 XI P3	
XI I	🚺 XI P4	
XI I	🚺 XI PS	
XI I	🚺 XI P6	
XI I	🚺 XI F7	
XII	📕 XI P8	
1	Device data	
2	🚦 Port data	

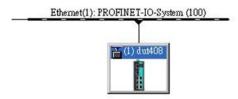
Then right click. Select **Monitor/Modify**. You will see a monitoring window.

2n Pat		signed CPU services MOXAVSIMATIC 300()	1)/CPU 315-2 PN/DP			
	Address	Symbol	Display format	Status value	Modify value	
1	I 1.0		BOOL	false		
2	I 1.1		BOOL	truë		
3	I 1.2		BOOL	true		
4	I 1.3		BOOL	false		
5	I 1.4		BOOL	false		
6	I 1.5		BOOL	false		
7	I 1.6		BOOL	false		-
8	I 1.7		BOOL			
<						>
F	un condi Monite Modifi	tionally Run i	odate Force Symbol w mmediately Status Value Modify Value	└── Enable Perip └── I/O <u>D</u> isplay	oheral Outputs	

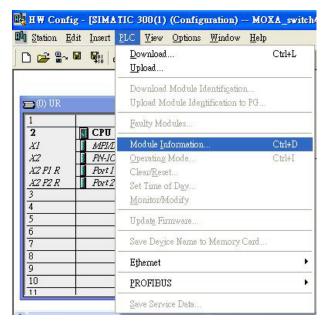
Module Information

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

Select MOXA switch icon on the screen.



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



The module information dialog will then pop up.

Port Statistics Output

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

General	IO Device Diagnostics Communication	Diagnostics	Interface
Network C	onnection Statistics	Identifi	cation
Port	Statistical value	Curre	nt 🖍
Port 1 (X1 P1)	Dropped received packets - no resourc	es Ö	1
Port 1 (X1 P1)	Bad received packets	0	
Port 1 (X1 P1)	Received octets	15710	3
Port 1 (X1 P1)	Dropped sent packets - no resources	0	
Port 1 (X1 P1)	Bad sent packets - transmit collisions	0	
Port 1 (X1 P1)	Sent octets	2422	725
Port 2 (X1 P2)	Dropped received packets - no resourc	es O	
Port 2 (X1 P2)	Bad received packets	0	
Port 2 (X1 P2)	Received octets	0	
Port 2 (X1 P2)	Dropped sent packets - no resources	0	
Port 2 (X1 P2)	Bad sent packets - transmit collisions	0	
Port 2 (X1 P2)	Sent octets	0	
Port 3 (X1 P3)	Dropped received packets - no resourc	es O	
Port 3 (X1 P3)	Bad received packets	0	
Port 3 (X1 P3)	Received octets	1307	731
Port 3 (X1 P3)	Dropped sent packets - no resources	0	~
Port 2 /1 1 23	Rad sant nackate - transmit collisions	n	

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.

6 Module Information - EDS-408A-PN		
Path: MOXA_switch408APNVSIMATIC 300(1)/C Status: 🗙 Error	Operating mode of the CPU:	🐨 STOP
Network Connection	Statistics	Identification
General IO Device Diagnostics	Communication Diagnostics	Interface
IO controller: pn-io Manufacturer's description 553	Device ID:	16# 0007
		Hex. Format
Standard diagnostics:		Hex. rommun
Channel-specific diagnostics:		
Slot Channel Error		3
	(16# 0000, 16# 00000000)	
0.X1 P5 Link down (16# 000	0, 16# 00000000)	
Help on selected diagnostic row:	isplay	
Close Update Print	J	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.

nysical <u>P</u> roperties: Name	Port status	Settings	Mode
Port 3 (X1 P3)	OK	Automatic settings	TP 100 Mbps full du
shile of Post	D+ 2 /071 D2)		
	Port 3 (X1 P3)		
nterface MAC address	Port 3 (X1 P3) s: 00-90-E8-25-FF-FC 1 sss: 00-1B-1B-16-E6-E3		

Topology Editor

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

a ^r g Topology Editor	
Table view Graphic view Offline/online comparison	
Interconnection table	Selection range
✓ Show station name Filter: Show all ports	Filter: Show all ports
	+- 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 P6 (X1 P6)	
X1 P7 (X1 P7)	
X1 P8 (X1 P8)	
□ - SIMATIC 300(1) □- PN-IO(CPU 315-2 PM/DP)	
Port 1 (X2 P1 R) dut408 \ X1 P3 (X1 P3) 0.00	Passive Components
Port 2 (X2 P2 R)	+ SCALANCE X100
	E-SCALANCE W
	medium converter
	PC Modules
	- Shimile Ind
Quline Update Object Properties Export Options	≜dd
OK	Cancel Help

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

	Eilter: Show all devices	•	Start 3 de	vices found	
ject name	Partner port	Cable data	Object name	Partner port	Cable dat
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/DF	y)		🖃 - pn-io		
Port 1 (X2 P1 R)			Port 1	dut408 \ Port 3	-(-)
Port 2 (X2 P2 R)			Port 2		
			dut2408		
			Port 1		
			Port 2		
			Port 3		
			Port 4		
			Port 5	dut408 \ Port 5	-(-)
			Port 6	dut408 \ Port 6	-(-)
			<	III	

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

"g Topology Editor	X
Table view Graphic view Offline/online comparison SIMATIC 300 Station PN-IO(CPU315-2 PN/DP(1))	Ministure View
Move picture mode descrivated Ogline Update Object Properties Options Print	- SCALANCE X100 - SCALANCE X100 - SCALANCE W - medium converter - PC Modules - Standard IE - SIMATIC HMI
OK	CancelHelp