Ethernet/IP Explicit Messageing Driver

Supported version TOP Design Studio

V1.4.11.51 or higher



CONTENTS

We want to thank our customers who use the Touch Operation Panel.

1. System configuration Page 2

Describes the devices required for connection, the setting of each device, cables, and configurable systems.

2. External device selection Page 3

Select a TOP model and an external device.

3. TOP communication setting Page 4

Describes how to set the TOP communication.

4. Supported addresses

Page 9

Refer to this section to check the addresses which can communicate with an external device.



1. System configuration

The system configuration of TOP and "ODVA -Ethernet/IP Explicit Messaging Driver" is as follows:

Series	CPU	Link I/F	Communication method	Communication setting	Cable
Ethernet/IP Explicit Messaging	Explicit message server-	Ethernet port on the External Device	TCP	<u>3. TOP</u> communication setting	Twisted pair Cable ^{*Note 1)}

*Note 1) Twisted pair cable

- Refer to STP (Shielded Twisted Pair Cable) or UTP (Unshielded Twisted Pair Cable) Category 3, 4, 5.

- Depending on the network configuration, you can connect to components such as the hub and transceiver, and in this case, use a direct cable.

Connectable configuration

• 1:1 connection (one TOP and one external device) connection



• 1:N connection (one TOP and multiple external devices) connection





2. External device selection

■ Select a TOP model and a port, and then select an external device.

PLC select [Et	hernet]				
Filter : [All]		\sim	S	earch :	
				Model	○ Vendor
Vendor		Model			
ROOTECH	^	EtherN	let/IP Explicit Messag	jing	
IDEC Corporation					
LENZE					
BECKHOFF Automation					
FASTECH Co., Ltd.					
ODVA					
HYOSUNG					
HB TECH					
DNP					
FANUC Co., Ltd.					
BOOSTER					
Robots and Design					
	ance				
Cobesys Automation And	ance				
PLC Setting[Ether	Net/IP Expl	icit Messaging]		
PLC Setting[Etheri Alias Name :	Net/IP Expl	icit Messaging] Bind IP : Auto	×	I
PLC Setting[Etheri Alias Name : Interface :	Net/IP Expl PLC1 Ethernet	icit Messaging] Bind IP : Auto	Y	
PLC Setting[Ether Alias Name : Interface : Protocol :	Net/IP Expl PLC1 Ethernet Ethernet/IP E	icit Messaging] Bind IP : Auto	Cor	nm Manual
PLC Setting[Etheri Alias Name : Interface : Protocol : String Save Mode :	Net/IP Expl PLC1 Ethernet Ethernet/IP E First LH HL	icit Messaging] Bind IP : Auto	✓ Cor	nm Manual
PLC Setting[Ether Alias Name : Interface : Protocol : String Save Mode : Use Redundance Operate Condition : AN Change Condition :	Net/IP Expl PLC1 Ethernet Ethernet/IP E First LH HL Y ID ~ TimeOut	icit Messaging xplicit Messa Change 5 (Seco] Bind IP : Auto	✓ Cor	nm Manual
PLC Setting[Ether Alias Name : Interface : Protocol : String Save Mode : Use Redundance Operate Condition : Change Condition :	Net/IP Expl PLC1 Ethernet Ethernet/IP E First LH HL V ID ~ TimeOut Condition	icit Messaging] Bind IP : Auto	Cor	nm Manual
PLC Setting[Ether Alas Name : Interface : Protocol : String Save Mode : Use Redundance Operate Condition : Change Condition :	Net/IP Expl PLC1 Ethernet Ethernet/IP E: First LH HL U U TimeOut Condition	icit Messaging] Bind IP : Auto	Cor	nm Manual
PLC Setting[Ether Alas Name : Interface : Protocol : String Save Mode : Use Redundanc Operate Condition : Change Condition : Primary Option IP	Net/IP Expl PLC1 Ethernet Ethernet/IP E FrstLH HL y ID Condition 192 () 1	icit Messaging] Bind IP : Auto	✓ Cor	mm Manual
PLC Setting[Ether Alias Name : Interface : Protocol : String Save Mode : Use Redundance Operate Condition : Change Condition : Primary Option IP Ethernet Protocol	Net/IP Expl PLC1 Ethernet/IP E FirstLH HL y D Condition 192 1 17CP	icit Messaging] Bind IP : Auto and)	✓ Cor	mm Manual
PLC Setting[Ether Alias Name : Interface : Protocol : String Save Mode : Use Redundance Operate Condition : Change Condition : Primary Option IP Ethernet Protocol Port	Net/IP Expl PLC1 Ethernet Ethernet/IP E FirstLH HL V ID V ID V ImeOut Condition 192 192 102 102 102 102 102 102 102 10	icit Messaging] Bind JP : Auto and)	✓ Cor	mm Manual
PLC Setting[Ether Alias Name : Interface : Protocol : String Save Mode : Use Redundance Operate Condition : Primary Opton IP Ethernet Protocol Port Timeout	Net/IP Expl PLC1 Ethernet/IP E FirstLHHL Y D Condition 192 192 102 192 102 102 102 102 102 102 102 10	icit Messaging] Bind JP : Auto	Cor	nm Manual
PLC Setting[Ether Alias Name : Interface : Protocol : String Save Mode : Use Redundanc Operate Condition : Primary Opton IP Ethernet Protocol Port Timeout Send Wait	Net/IP Expl P.C1 Ethernet/IP E FirstLH HL Y D TImeOut Condition 192 (*) 1 TCP 44818 (*) 1000 (*) 0 0	icit Messaging	Bind JP : Auto	Cor	mm Manual
PLC Setting[Ether Alias Name : Interface : Protocol : String Save Mode : Use Redundanc Operate Condition : Change Condition : Primary Option IP Ethernet Protocol Port Timeout Send Wait	Net/IP Expl PLC1 Ethernet/IP E FirstLH HL Y ID V TImeOut Condition 192 1 1000 0 0 0	icit Messaging] Bind IP : Auto	Cor	mm Manual
PLC Setting[Ether Alias Name : Interface : Protocol : String Save Mode : Use Redundance Operate Condition : Change Condition : Primary Option IP Ethernet Protocol Port Timeout Send Wait Explicit Request Type	Net/IP Expl PLC1 Ethernet/IP E FirstLHHL Y ID Condition 192 102 102 102 102 102 102 102 102	icit Messaging] Bind IP : Auto	Cor	mm Manual
PLC Setting[Ether Alas Name : Interface : Protocol : String Save Mode : Use Redundanc Operate Condition : Change Condition : Primary Option IP Ethernet Protocol Port Timeout Send Wait Explicit Request Type	Net/IP Expl PLC1 Ethernet/IP E FirstLH HL V D Condition 192 100 192 100 100 100 100 100 100 100 10	icit Messaging] Bind IP : Auto	Cor	mm Manual
PLC Setting[Ether Alias Name : Interface : String Save Mode : Use Redundanc Operate Condition : Change Condition : Primary Option IP Ethernet Protocol Port Timeout Send Wait Explicit Request Type	Net/IP Expl PLC1 Ethernet/IP E FirstLH HL y D TimeOut Condition 192 2 1 100 1 100 1 0 2 UCM	icit Messaging	Bind IP : Auto	Cor	mm Manual

Settings		Contents			
ТОР	Model	Check the TOP display and process to select the touch model.			
External device	Vendor	Select the vendor of the external device to be connected to TOP. Select "ODVA".			
PLC Select the external device to be connected to the			connected to the TOP.		
		Model	Interface	Protocol	
		Ethernet/IP	Ethernet	Ethernet/IP	
		Explicit Messaging		Explicit Messaging	
		Please check the system config	the external device you want to		
		connect is a model whose syste	m can be configured.		



3. TOP communication setting

The communication can be set in TOP Design Studio or TOP main menu. The communication should be set in the same way as that of the external device.

3.1 Communication setting in TOP Design Studio

(1) Communication interface setting

- [Project > Project Property > TOP Setting] → [Project Options > "Use HMI Setup" Check > Edit > Ethernet]
 - Set the TOP communication interface in TOP Design Studio.



Items	ТОР	External device	Remarks
IP Address*Note 1) Note 2)	192.168.0.100	192.168.0.51	
Subnet Mask	255.255.255.0	255.255.255.0	
Gateway	192.168.0.1	192.168.0.1	

*Note 1) The network addresses of the TOP and the external device (the first three digits of the IP, <u>192</u>. <u>168</u>. <u>0</u>. 0) should match.

*Note 2) Do not use duplicate IP addresses over the same network.

 * The above settings are $\underline{examples}$ recommended by the company.

Items	Description
IP Address	Set an IP address to be used by the TOP to use over the network.
Subnet Mask	Enter the subnet mask of the network.
Gateway	Enter the gateway of the network.



(2) Communication option setting

■ [Project > Project Property > PLC Settings > ETHERNET > "PLC1 : Ethernet/IP Explicit Messaging"]

- Set the options of the Ethernet/IP Explicit Messaging communication driver in TOP Design Studio.

Items	Settings	Remarks
Interface	Select "Ethernet".	Refer to "2. External
Protocol	Select "Ethernet/IP Explicit Messaging".	device selection".
IP	Enter the IP address of the external device.	
Ethernet Protocol	Select the Ethernet protocol between the TOP and an external device.	Fixed
Port	Enter the Ethernet communication port number of an external device.	Fixed
TimeOut (ms)	Set the time for the TOP to wait for a response from an external device.	
SendWait (ms)	Set the waiting time between TOP's receiving a response from an external device	
	and sending the next command request.	
Explicit Request Type	Set Explicit Messaging communication connection type.	



3.2. Communication setting in TOP

* This is a setting method when "Use HMI Setup" in the setting items in "3.1 TOP Design Studio" is not checked.

■ Touch the top of the TOP screen and drag it down. Touch "EXIT" in the pop-up window to go to the main screen.



(1) Communication interface setting

■ [Main Screen > Control Panel > Ethernet]

	õ	Ethernet ×	×
Bun	🔯 System	Port Ethernet Port : ETH1 • 0 •	Option
		Link Speed : Auto	1)
MC	PLC Se	MAC Address : 00:15:1D:05:38:C5 IP Address : 192.168.0.100	Sound
VNC Viewer	 •	Subnet Mask : 255.255.255.0 Gateway : 192.168.0.1	
	Ethernet S	DNS (1) : DNS (2) :	Wi-Fi
Screen shot	htti	Ethernet Primary IP : 192,168.0.100	2
	Diagnostic M	Cable Status : ETH1 Connected	MRAM Analysis
	[System]	Check duplicate Apply Cancel	Close

Items	ТОР	External device	Remarks
IP Address*Note 1) Note 2)	192.168.0.100	192.168.0.51	
Subnet Mask	255.255.255.0	255.255.255.0	
Gateway	192.168.0.1	192.168.0.1	

*Note 1) The network addresses of the TOP and the external device (the first three digits of the IP, <u>192</u>. <u>168</u>. <u>0</u>. 0) should match.

*Note 2) Do not use duplicate IP addresses over the same network.

* The above settings are examples recommended by the company.

Items	Description
IP Address	Set an IP address to be used by the TOP to use over the network.
Subnet Mask	Enter the subnet mask of the network.
Gateway	Enter the gateway of the network.



(2) Communication option setting

■ [Main Screen > Control Panel > PLC]

	~ 0			
	¢	1001	PLC	×
	🔯 System	Driver(ETH)	PLC1(EtherNet/IP Explicit Messaging)	•
Run		Interface	Ethernet 🔹	
		Protocol	Ethernet/IP Explici -	
WNC	PLC	Bind IP	Auto 💌	
VNC		IP	192 🗘 168 🗘 0 🗘 🗗 🗘	
∀iewer	l 🏠 l	Ethernet	TCP -	
	Ethernet	Port	44818	
		Timeout	1000 🖨 msec	
Screen	wow	Send Wait	0 🖨 msec	
shot		Explicit Requ	iest Ty UCMM ▼	
	Dragnostre			
	[System]	Diagnostic	Ping Test Apply	Cancel
	Settings			Remarks

Items	Settings	Remarks
Interface	Select "Ethernet".	Refer to "2. External
Protocol	Select "Ethernet/IP Explicit Messaging".	device selection".
IP	Enter the IP address of the external device.	
Ethernet Protocol	Select the Ethernet protocol between the TOP and an external device.	Fixed
Port	Enter the Ethernet communication port number of an external device.	Fixed
TimeOut (ms)	Set the time for the TOP to wait for a response from an external device.	
SendWait (ms)	Set the waiting time between TOP's receiving a response from an external device	
	and sending the next request command request.	
Explicit Request Type	Set Explicit Messaging communication connection type.	*Note 1)

*Note 1)

UCMM : Unconnected Message Manger

Connected : Class 3



3.3 Communication diagnostics

■ Check the interface setting status between the TOP and an external device.

- Touch the top of the TOP screen and drag it down. Touch "EXIT" in the pop-up window to go to the main screen.
- Check if the ETH port settings you want to use in [Control Panel > Ethernet] are the same as those of the external device.
- Diagnosis of whether the port communication is normal or not
- Touch "Communication diagnostics" in [Control Panel > PLC].
- The Diagnostics dialog box pops up on the screen and determines the diagnostic status.

ОК	Communication setting normal
Time Out Error	Communication setting abnormal
	- Check the cable, TOP, and external device setting status. (Reference: Communication diagnostics sheet)

Communication diagnostics sheet

- If there is a problem with the communication connection with an external terminal, please check the settings in the sheet below.

Items	Conte	nts	Check		Remarks
System	How to connect the sys	stem	OK	NG	1 Custom configuration
configuration	Connection cable name	2	OK	NG	1. System configuration
ТОР	DP Version information		OK	NG	
	Port in use		OK	NG	
	Driver name		OK	NG	
	Other detailed settings		OK	NG	
	Relative prefix	Project setting	OK	NG	2. External device selection
		Communication diagnostics	ОК	NG	3. Communication setting
	Ethernet port setting	IP Address	OK	NG	
		Subnet Mask	OK	NG	
		Gateway	OK	NG	
External device	CPU name		OK	NG	
	Communication port name (module name)		OK	NG	
	Protocol (mode)		ОК	NG	
	Setup Prefix		OK	NG	4 Eutomal device setting
	Other detailed settings		OK	NG	4. External device setting
	Ethernet port setting	IP Address	OK	NG	
		Subnet Mask	OK	NG	
		Gateway	OK	NG	
	Check address range		ОК	NG	<u>5. Supported addresses</u> (For details, please refer to the PLC vendor's manual.)



4. Supported addresses

The devices available in TOP are as follows:

The device range (address) may differ depending on the CPU module series/type. The TOP series supports the maximum address range used by the external device series. Please refer to each CPU module user manual and be take caution to not deviate from the address range supported by the device you want to use.

Support Class

Class Name	Class	Class Name	Class
	(Hex)		(Hex)
Identity	01	Message Router	02
DeviceNet	03	Assembly	04
Connection	05	Connection Manager	06
Register	07	Discrete Input Point	08
Discrete Output Point	09	Analog Input Point	0A
Analog Output Point	OB	Presence Sensing	OE
Parameter	0F	Parameter Group	10
Group	12	Discrete Input Group	1D
Discrete Output Group	1E	Discrete Group	1F
Analog Input Group	20	Analog Output Group	21
Analog Group	22	Position Sensor	23
Position Controller Supervisor	24	Position Controller	25
Block Sequencer	26	Command Block	27
Motor Data	28	Control Supervisor	29
AC/DC Drive	2A	Acknowledge Handler	2B
Overload	2C	Softstart	2D
Selection	2E	S-Device Supervisor	30
S-Analog Sensor	31	S-Analog Actuator	32
S-Single Stage Controller	33	S-Gas Calibration	34
Trip Point	35	File	37
S-Partial Pressure	38	Connection Configuration	F3
Port	F4	TCP/IP Interface	F5
Ethernet Link	F6	Vendor defined	-



Supported data type

Data Type	Byte Size	Remarks
BOOL	1 Byte	*Note 1)
SINT	1 Byte	
INT	2 Byte	
DINT	4 Byte	
REAL	4 Byte	
USINT	1 Byte	
UINT	2 Byte	
UDINT	4 Byte	
BYTE	1 Byte	
WORD	2 Byte	
DWORD	4 Byte	
STRING	1 byte per character	
SHORT_STRING	1 byte per character,	
	1 byte length indicator	
STRUCT	-	*Note 2)

*Note 1) 0 : false (off) , 1 : true (on)

*Note 2)

Structural types defined in ODVA and external device documents

For STRUCT, use the same structure member type and array size as in ODVA and external device documents.

Structure definitions must be made in TOP Design Studio.

Support Service code

Get_Attribute_Single (0x0E) Set_Attribute_Single (0x10)



■ TOP Design Studio Address Registration Method

. In TOP Design Studio, run "Import Addresses" in the PLC communication settings.

	Hat/TD Fundait Magazina	,			
	Net/ IP Explicit Messaging	Rind TD + Auto			
Allas Name :	Ethernet	Auto V			lase and Address
Interface :	Ethernet /D Suelisit Manage 14				Import Address
Shina Sava Mada	Ethernet H HI				Comm Manual
String Save Mode :	nist in ni Change				
Operate Condition :	y ND V				
Change Condition :	TimeOut 5 📩 (Secor	nd)			
	Condition		Edit		
Primary Option					
IP	192 🛋 168 🛋 0 🛋	1			
Ethernet Protocol					
Enemetriotocor					
Port	44818				
Timeout	1000 🐑 msec				
Send Wait	0 sec				
Explicit Request Type	UCMM ~				
		10110120001		Apply	Close
🔤 Import ODVA Add	ress			_	- D X
Import / Export		Check	Address		
Import[I]		Che	k AddressiC1 D	elete Error Data[T]	
Export					
Search					
Keyword :		Data Type : ALI		~	Search[S]
Select / Unselect[L]		Add[A]	Delete[D]	Edit[E]	Structure[S]
lag Name	Data	зТуре	Descript	ion	
Total count : 0	Search count :				



" ODVA Import Address Window Function Description

Export : Export the ODVA address currently registered in TOP Design Studio to a CSV file.

Import : Import the exported ODVA address CSV file from TOP Design Studio.

Structure: Defines structure type. (Same definition as the structure of the external device.)

Add: Add ODVA address.

When adding an address, set and add the Class ID, Instance ID, Attribute ID, and DataType that you want to use to communicate with the external device.

TDS	Import Address E	dit Screen				×
	Name : Comment :	VAR0000				
	Class :	Identity 0x1	A	(Hex)	
	Instance :	0	÷			
	Attribute :	0	*			
	Data Type :	BOOL	~			
	🗖 Use Array					
	Length :	1	-			
			ОК		Can	cel