# **RS** Automation

# **X8** Series

# X8\_Xnet Ethernet

V1.0 or higher

Supported version TOP Design Studio



# CONTENTS

We would like to thank our customers for using M2I's "Touch Operation Panel (M2I TOP) Series". Read this manual and familiarize yourself with the connection method and procedures of the "TOP and external device".

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2. External device selection

### Page 2

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

#### Page 3

Select a TOP model and an external device.

## **3.** TOP communication setting Page 4

Describes how to set the TOP communication.

# 4. External device setting Page 9

Describes how to set up communication for external devices.

## 5. Supported addresses

## Page 11

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



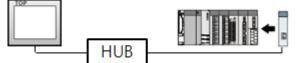
# 1. System configuration

The system configuration of TOP and "RS Automation – X8 Series" is as follows:

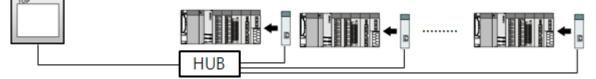
Series CI	CPU	Link I/F	Communication method	System setting	Cable
	(8-M32DDT (8-M14DDT	CPU Port	Ethernet (TCP)	3.1 Settings example 1 (Page 4)	Twisted pair Cable*Note 1)

Connectable configuration

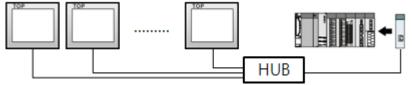
• 1:1 connection (one TOP and one external device) connection



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



• N:1 connection (multiple TOPs and one external device) connection





# 2. External device selection

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

PLC select [Et	hernetl					
Filter : [All]	lieneej		$\sim$	Search :		
				(	Model	○ Vendor
Vendor	_	Model				
YASKAWA Electric Corpo	oration ^		NX Series			
YOKOGAWA Electric Cor	rporation	80	X8 Series			
Schneider Electric Indus	tries	Ĩ				
KDT Systems						
RS Automation						
FATEK Automation Corp	oration					
DST ROBOT						
BACnet						
SEMI Organization						
EMOTIONTEK						
FUJI Electric Co., Ltd.						
OPTICON						
PATLITE						
Giddings & Lewis Motion	Control V					
ect Device						
	eries ]					
elect Device PLC Setting[ X8 Se Alias Name	PLC1		Bind IP : Auto	~		
PLC Setting[ X8 S Alias Name Interface	: PLC1 : Ethernet		~	~		
PLC Setting[ X8 Se Alias Name Interface Protocol	: PLC1 : Ethernet : Xnet TCP		~	~	Com	ım Manual
PLC Setting[ X8 S Alias Name Interface	: PLC1 : Ethernet : Xnet TCP	Char	~	~	Com	nm Manual
PLC Setting[ X8 Sr Alias Name Interface Protocol String Save Mode	: PLC1 : Ethernet : Xnet TCP : First HL HL	Cha	~	×	Con	ım Manual
PLC Setting[ X8 Si Alias Name Interface Protocol String Save Mode Use Redundance Operate Condition :	: PLC1 : Ethernet : Xnet TCP : First HL HL		v v	~	Con	nm Manual
PLC Setting[X8 Si Alias Name Interface Protocol String Save Mode Use Redundance Operate Condition : A Change Condition :	: PLC1 : Ethernet : Xnet TCP : First HL HL		~	×		ım Manual
PLC Setting[X8 Si Alias Name Interface Protocol String Save Mode Use Redundance Operate Condition : A Change Condition :	: PLC1 : Ethernet : Xnet TCP : First HL HL : V ND V TimeOut		v v	×		
PLC Setting[X8 Sc Alias Name Interface Protocol String Save Mode Operate Condition : Change Condition :	: PLC1 : Ethernet : Xnet TCP : First HL HL Y ND TimeOut Condition	5	v nge (Second)	×		
PLC Setting[X8 Sr Alias Name Interface Protocol String Save Mode Use Redundance Operate Condition : A Change Condition : E Primary Option IP	: PLC1 : Ethernet : Xnet TCP : First HL HL V ND 1 TimeOut 1 Condition 192  1 1	5	v v	×		
PLC Setting[X8 Sv Alias Name Interface Protocol String Save Mode Use Redundance Operate Condition : Change Condition : Primary Option IP Ethernet Protocol	EPLC1 Ethernet Xnet TCP First HL HL TimeOut Condition	5	v nge (Second)	×		
PLC Setting[X8 SV Alias Name Interface Protocol String Save Mode Use Redundanc Operate Condition : A Change Condition : Primary Option IP Ethernet Protocol Port	: PLC1 : Ethernet : Xnet TCP : First HL HL Y ND ImeOut Condition 192 1 1024	5 <b>*</b>	v nge (Second)	×		
PLC Setting[X8 Sv Alias Name Interface Protocol String Save Mode String Save Mode Charge Condition : C Charge Condition : C Primary Option IP Ethernet Protocol Port Timeout	: PLC1 : Ethernet : Xnet TCP : First HL HL Y ND V TimeOut Condition 192 1 1024 2 300 2	5 68 🜒	v nge (Second)	~		
PLC Setting[X8 SV Alias Name Interface Protocol String Save Mode Use Redundanc Operate Condition : A Change Condition : Primary Option IP Ethernet Protocol Port	: PLC1 : Ethernet : Xnet TCP : First HL HL Y ND ImeOut Condition 192 1 1024	5 <b>*</b>	v nge (Second)	×		
PLC Setting[X8 Sv Alias Name Interface Protocol String Save Mode String Save Mode Charge Condition : C Charge Condition : C Primary Option IP Ethernet Protocol Port Timeout	: PLC1 : Ethernet : Xnet TCP : First HL HL Y ND V TimeOut Condition 192 1 1024 2 300 2	5 <b>(</b>	v nge (Second)	×		
PLC Setting[X8 Sv Alias Name Interface Protocol String Save Mode String Save Mode Charge Condition : C Charge Condition : C Primary Option IP Ethernet Protocol Port Timeout	: PLC1 : Ethernet : Xnet TCP : First HL HL Y ND V TimeOut Condition 192 1 1024 2 300 2	5 <b>(</b>	v nge (Second)	×		
PLC Setting[X8 Sv Allas Name Interface Protocol String Save Mode String Save Mode Change Condition : C Change Condition : C Primary Option IP Ethernet Protocol Port Timeout	: PLC1 : Ethernet : Xnet TCP : First HL HL Y ND V TimeOut Condition 192 1 1024 2 300 2	5 <b>(</b>	v nge (Second)	×		

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 "RS Autoamtion".
	PLC	Select the external device to be connected to the TOP. Select "X8 Xnet". Please check the system configuration in Chapter 1 to see if the external device you want to connect is a model whose system 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 properties > TOP settings] → [Project option > Check "Use HMI settings" > Edit > Ethernet ]
  - Set the TOP communication interface in TOP Design Studio.

Project Option	>
Change HMI[H] Kadd P	LC [A] The Change PLC[C] Change PLC[D]
TOP Setting	Date / Time Sync. Screen Option Unit Convert
Coption Module Setting	Project Option Screen Change HmiSetup Global Lock & Touch Project Style Splash PLC Buffer Sync.
	✓ Use HHI Setup       Initialization       Edit         Hmi Setup Option       Initialization       Edit         Project Setting       HulDisable=0       *         HMIDisable=0       Froject Name=New project       *         Start Soreen No.=1       Latch Set=0-0       *         Latch Set=0-0       USBEFGrowNessage=0       USBEFGrowNessage=1         DatabaseVessage=1       5       *

Control Panel	
🔯 System 🛛 🔤 Devices	🚔 Ethernet 🛛 🗙
PLC Security Date/Time	Port         Ethernet Port :         ETH1 ▼ 0 ▼         Link Speed :         Auto ▼         MAC Address :       00:00:00:00:00         IP Address :       192.168.0.50         Subnet Mask :       255.255.255.0         Gateway :       192.168.0.1         ☑ Default Gateway         DNS (1) :
Diagnostic File Manager Ping	Ethernet Primary IP : 192.168.0.50 Cable Status : Bridge Mode : Use Bridge Check duplicate Apply Cancel

Items	ТОР	External device	Remarks
IP Address*Note 1) Note 2)	192.168.0.50	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 address of TOP and the external device (the first three digits of the IP <u>192 . 168 . 0</u>. 0 ) must be the same.

\*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

- [ Project > Project properties > PLC settings > ETHERNET > "PLC1 : RS Automation X8 Series
  - Set the options of the communication driver of Control/Compact Logix Series Ethernet in TOP Design Studio.

Project Option		×
Change HMI[H] Mdd PLC [A] The Change PLC[C] Change PLC[C]		
PLC Setting X8 Series ] PC Setting X8 Series ] Pice Setting Fieldbas (0) Protocol: [Net TCP V Protocol: [Net TCP V String Save Mode : First HL HL Change Protocol: [Net TCP V Prot 192 © 168 © 0 © 1 © Prot 1924 © Prot 1924 © Tmeout 300 © meec Send Wait 0 © meec Send Wait 0 © meec		nm Manual
* The above settings are examples recommended by the company.	Apply	Close

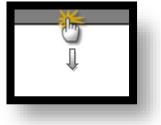
Items	Settings	Remarks
Interface	Select "Ethernet".	Refer to "2. External
Protocol	Select "EtherNet/IP".	device selection".
IP	Enter the IP address of the external device.	
TimeOut (ms)	Set the time for the TOP to wait for a response from an external device.	
SendWait (ms)	Set the waiting time between TOP's receiving a response from an external device	
	and sending the next command request.	
Port	Enter "1024", the Ethernet communication port number of the external device.	Fixed



### 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 ]

	<b>ö</b>	💼 Ethernet 🗙	×
Run	🔯 System	Port Ethernet Port : ETH1 • 0 • Link Speed : Auto •	Detion
MC	PLC Se	MAC Address : 00:15:1D:05:38:C5 IP Address : 192.168.0.50	Sound
VNC Viewer	<u>م</u>	Subnet Mask : 255.255.255.0 Gateway : 192.168.0.1 Befault Gateway	(((.
	Ethernet	DNS (1) : DNS (2) : DNS (2) :	Wi-Fi
Screen shot	Diagnostic M	Primary IP : 192.168.0.50 • Cable Status : ETH1 Connected	MRAM Analysis
		Bridge Mode : Use Bridge	
	[System]	Check duplicate Apply Cancel	Close

Items	ТОР	External device	Remarks
IP Address*Note 1) Note 2)	192.168.0.50	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.

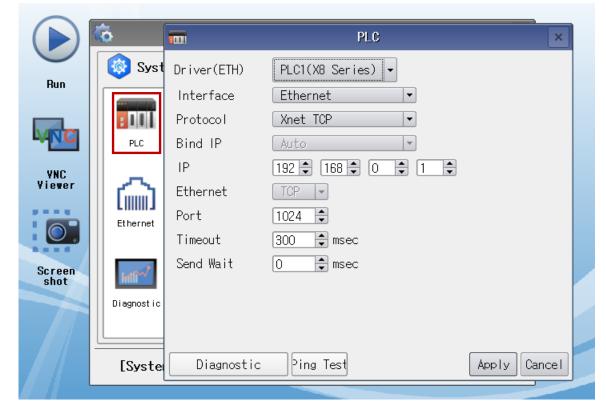
 $\ast$  The above settings are  $\underline{examples}$  recommended by the company.

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

■ [Main screen > Control panel > PLC ]



\* The above settings are examples recommended by the company.

Items	Settings	Remarks
Interface	Select "Ethernet".	Refer to "2. External
Protocol	Select "EtherNet/IP".	device selection".
IP	Enter the IP address of the external device.	
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.	
Port	Enter "1024", the Ethernet communication port number of the external device.	Fixed



## **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 whether the Eth port settings you want to use are the same as those of the external device in [Control panel > Ethernet].
- 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	Contents		Ch	eck	Remarks
System	How to connect the system		OK	NG	1 Custom configuration
configuration	Connection cable name	5	OK	NG	1. System configuration
ТОР	Version information	Version information		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	OK	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)		OK	NG	
	Setup Prefix		OK	NG	4. Estemat device estimat
	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		OK	NG	<u>5. Supported addresses</u> (For details, please refer to the PLC vendor's manual.)



# 4. External device setting

Set as below using "X8 Series Ladder Software XGPC".

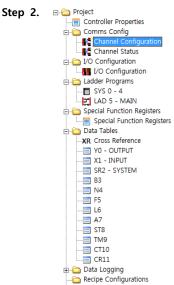
Reboot the external device after downloading the configuration

For a more detailed setting method than described in this example, refer to the user manual of the external device.



Check the node address and line control method.

#### Step 1. Upload the PC and XGPC S/W.



H Data Monitors

Step 3.

IP Config		*
IP Config Method	Static IP	-
MAC Address	00:0F:73:FF:F1:4F	
IP Address	192.168.1.10	
Subnet Mask	255.255.255.0	
Default Gateway	192.168.0.1	
Domain Name		E
Primary DNS	0.0.0.0	
Secondary DNS	0.0.0.0	
Port Config		
Negotiation AutoNegotiate -		
Port Speed 10 Mbps Half Duplex Only		
Protocol Enable Config		
Xnet over IP	1(Enable)	-
Modbus TCP	O(Disable)	-
EtherNet/IP	O(Disable)	* * * *
Web Server	1(Enable)	-
SNMP Server	1(Enable)	-
Duplicate IP Detection	1(Enable)	-
TCP Control Confia		*
General Channel		

From the Channel Configuration window, configure the Parameter.

## IP Config

▷ IP Config Method : Static IP

From the tool bar left of the XGPC S/W, double click Channel Configuration.

( X8-M Toolbar  $\rightarrow$  'Comms Config'  $\rightarrow$  'Channel Configuration'  $\rightarrow$  'Ethernet' )

- BOOTH Client: If BOOTP is selected, X8 PLC tries to acquire network-related parameters through BOOTP request when the power is turned on.

- DHCP Client: If DHCP is selected, the DHCP server automatically assigns network-related parameters to the X8 PLC when logging into the TCP/IP network.

- Static IP: If Static IP is selected, you can input and set IP address, Subnet mask, Default gateway, Domain name and DNS at the bottom.

- Port Config
- ▷ Negotiation : AutoNegotiate ▷ Port Speed : Half Duplex
- Protocol Enable Config \*Remark1)

> Xnet over IP : 1(Enable)

(Check '1(Enable)' when using the X8 official communication protocol.)

- \*Remark 1) Protocol Enable Conifg additional description
- Xnet Over IP: When using X8 official communication protocol
- Modbus TCP: When using Modbus protocol of MODICON
- EtherNet/IP: When using a protocol officially supported by ODVA
- Web Server: When using X8 PLC communication for HTTP communication
- Duplicate IP Detection: Used for detecting duplicated IP

Xnet over IP Config

▷ Local TCP Port Number : ex)1024 ( TCP connect 'Port' Number )

Check the above information and press confirm.

**Step 4.** From the top tool bar go to 'Online'  $\rightarrow$  Click 'Download'.



# 5. 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.

Contents		Bit Address	Word Address	32 Bit	Remarks
Input	Х	1.0.0.0 ~ 1.1535.0.15	1.0.0 ~ 1.1535.0		
Output	Y	0.0.0.0 ~ 0.1535.0.15	0.0.0 ~ 0.1535.0		
Input(by slot)	X(by slot)	1.0.0.0 ~ 1:96.511.15	1.0.0 ~ 1.96.511		*Note 1)
Output(by slot)	Y(by slot)	0.0.0.0 ~ 0.96.0.15	0.0.0 ~ 0.96.511		*Note 1)
System Register	SR	2.0.0.0 ~ 2.127.0.15	2.0.0 ~ 2.127.0		
Binary	В	3.0.0.0 ~ 1535.1535.0.15	3.0.0 ~ 1535.1535.0		
Integer	Ν	3.0.0.0 ~ 1535.1535.0.15	3.0.0 ~ 1535.1535.0		
Floating Point	F	-	3.0.0 ~ 1535.1535.0		
Long	L	3.0.0.0 ~ 1535.1535.0.15	3.0.0 ~ 1535.1535.0		
ASCII	А	3.0.0.0 ~ 1535.1535.0.15	3.0.0 ~ 1535.1535.0		
String	ST	-	3.0.0 ~ 1535.799.41		
Timer	TM	3.0.0.0 ~ 1535.1535.4.15	3.0.0 ~ 1535.1535.4		*Note 2)
Timer Preset	TM Preset	3.0.1.0 ~ 1535.1535.1.31	3.0.1 ~ 1535.1535.1	V	
Timer Accumulator	TM Accumulator	3.0.3.0 ~ 1535.1535.3.31	3.0.3 ~ 1535.1535.3	V	
Counter	СТ	3.0.0.0 ~ 1535.1535.4.15	3.0.0 ~ 1535.1535.4		*Note 3)
Counter Preset	CT Preset	3.0.1.0 ~ 1535.1535.1.31	3.0.1 ~ 1535.1535.1	V	
Counter Accumulator	CT Accumulator	3.0.3.0 ~ 1535.1535.3.31	3.0.3 ~ 1535.1535.3	V	
Control	CR	3.0.0.0 ~ 1535.1535.4.15	3.0.0 ~ 1535.1535.4		*Note 4)
Control Length	CR Length	3.0.1.0 ~ 1535.1535.1.31	3.0.1 ~ 1535.1535.1		
Control Position	CR Position	3.0.3.0 ~ 1535.1535.3.31	3.0.3 ~ 1535.1535.3		

#### \*Note 1) X (by slot), Y (by slot) Device Format

Ex) Configurations for 1, 2, 3, and 4 of X (by slot) are as follows: (Same for Y (by slot).)

Notation	Х	1	.2	.3	.4
Description	Device Name	Table Address	Slot Number	Word Offset	Bit Position

#### \*Note 2) TM Address Details

Details for each bit of the 16 bit data of the TM address are as follows.

8th Bit	9th Bit	13th Bit	14th Bit	15th Bit
Time Base 0	Time Base 1	Done	Timer Timing	Enable

#### \*Note 3) CT Address Details

Details for each bit of the 16 bit data of the CT address are as follows.

11th Bit	12th Bit	13th Bit	14th Bit	15th Bit
Underflow	Overflow	Done	Count Down	Count Up

#### \*Note 4) CR Address Details

Details for each bit of the 16 bit data of the CR address are as follows.

8th Bit	9th Bit	10th Bit	11th Bit
Found	Inhibit	Unload	Error
12th Bit	13th Bit	14th Bit	15th Bit
Empty	Done	Enable. Unload	Enable