# **RS** Automation

## **NX Series**

## **Ethernet Driver**

V1.4.11.16 or higher

Supported version TOP Design Studio



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4. External device setting

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Describes how to set up communication for external devices.

### 5. Supported addresses

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

## 1. System configuration

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

Series	Model	Interface	Communication method	System setting	Cable
NX	CPU750A CPU750B CPU750C CPU760C CPU760CM CPU750D	EtherNet Unit (NX-ETHERNET)	Ethernet (TCP/UDP)	<u>3. TOP</u> communication <u>setting</u> <u>4. External device</u> <u>setting</u>	Twisted pair cable <sup>*Note 1)</sup>

\*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



• 1:N connection



## 2. External device selection

Select an external device to connect to TOP.

							-
PLC select [E	thernet]						
Filter : [All]			$\sim$		Search :		
						Model	() Vendor
Vendor		Mod	el				
RS Automation		^ <mark> </mark>	NX Ser	ies			
FATEK Automation Corp	poration	8	X8 Seri	es			
DST ROBOT		<b>_</b>					
BACnet							
SEMI Organization							
EMOTIONTEK							
FUJI Electric Co., Ltd.							
OPTICON							
PATLITE							
Giddings & Lewis Motion	n Control						
DELTA TALL Data Sunta	me						
VELTA TAU Data Syste	113						
KEYENCE Corporation							
CEYON Technology							
Digital Electronics Corpo	oration	¥					
PLC Setting[ NX S	eries ]			Bind IP : Auto	~		
Alias Name							
Alias Name Interface	: Ethernet		$\sim$				
Alias Name Interface Protocol	: Ethernet : SECTOCOL		~			Com	im Manual
Alias Name Interface Protocol String Save Mode	: Ethernet : SECTOCOL : First HL HL	(	∨ ∨ Change			Con	im Manual
Alias Name Interface Protocol String Save Mode	: Ethernet : SECTOCOL : First HL HL		∽ Change			Con	nm Manual
Alias Name Interface Protocol String Save Mode Use Redundan Operate Condition :	Ethernet SECTOCOL First HL HL		Change			Con	im Manual
Alias Name Interface Protocol String Save Mode Use Redundan Operate Condition :	Ethernet SECTOCOL First HL HL CY AND V	· 5	Change	ind)		Con	im Manual
Alias Name Interface Protocol String Save Mode Use Redundan Operate Condition : Change Condition :	Ethernet SECTOCOL First HL HL CY I TimeOut Condition	, 5	Change	nd)		Con	im Manual
Alias Name Interface Protocol String Save Mode Use Redundan Operate Condition : Change Condition :	Ethernet SECTOCOL First HL HL CY TimeOut Condition	· 5	Change	ind)		Con	im Manual
Alias Name Interface Protocol String Save Mode Use Redundan Operate Condition : Change Condition : Primary Option IP	Ethernet SECTOCOL First HL HL Cy TimeOut Condition 192	5	Change	nd)		Con	im Manual
Alias Name Interface Protocol String Save Mode Use Redundan Operate Condition : Change Condition : Primary Option IP Ethernet Protocol	Ethernet Ethernet EFrist HL HL CY TimeOut Torpeople TCP	5	Change	nd)		Con	im Manual
Alias Name Interface Protocol String Save Mode Use Redundan Operate Condition : Change Condition : Primary Option IP Ethernet Protocol Port	Ethernet SECTOCOL SECTOC	5 5 168	Change	ind)		Con	iiit
Alias Name Interface Protocol String Save Mode	Ethernet SECTOCOL SECTOC	5 168 ( ) ) ) ) ) ) ) ) ) ) ) ) ) ) ) ) ) ) )	Change	nd)		Con	im Manual
Alias Name Interface Protocol String Save Mode	Ethermet           SECTOCOL           SECTOCOL           First HL HL           Cy           TimeOut           TimeOut           192           5000           1000           0	5 168	Change	nd)		Con	im Manual
Alias Name Interface Protocol String Save Mode	Ethermet           SECTOCOL           SECTOCOL           First HL HL           TimeOut           TimeOut           Condition           TCP           S000           1000           0           %	( 5 168 ↓ ✓ ♥ ♥ msec ♥ ■	Change	nd)		Con	im Manual
Alias Name Interface Protocol String Save Mode Use Redundan Operate Condition : Change Condition : Primary Option IP Ethernet Protocol Port Timeout Send Wait Command Header Src Station No.	Ethermet           SECTOCOL           SECTOCOL           First HL HL           TimeOut           TimeOut           Condition           192           S000           1000           0           %           2	5 168 € ✓ ♦ msec ↓ 168	Change	nd)			int Manual
Alias Name Interface Protocol String Save Mode Use Redundan Operate Condition : Change Condition : Primary Option IP Ethernet Protocol Port Timeout Send Wait Command Header Src Station No. Det Station No.	Ethermet           SECTOCOL           SECTOCOL           First HL HL           TimeOut           TimeOut           Condition           192           S000           1000           0           9%           2           1	168 € 168 € 1	Change	nd)		Con	int Manual
Alias Name Interface Protocol String Save Mode Use Redundan Operate Condition : Primary Option IP Ethernet Protocol Port Timeout Send Wait Command Header Src Station No. Det Station No.	Ethermet           SECTOCOL           SECTOCOL           First HL HL           TimeOut           TimeOut           Condition           192           TCP           5000           1000           0           1000           0           1           0           1           1	168 4 5 168 4 7 168 4 168 4 168 16 168 16 16 168 16 16 16 16 16 16 16 16 16 16 16 16 16 1	Change (Seco	nd)			im Manual

Sett	tings		Contents		
ТОР	Model	Check the display and process of TOP to select the touch model.			
External device	Vendor	Select the vendor of the external Select "RS Automation".			
	PLC	Select the external device to be connected to the TOP.			
		Model	Interface	Protocol	
		NX Series	Ethernet	SECTOCOL	
		Please check the system configu connect is a model whose system	uration in Chapter 1 to see if th n can be configured.	ne external device you want to	

### 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

- $\blacksquare [Project] \rightarrow [Property] \rightarrow [TOP Setting] \rightarrow [HMI Setup] \rightarrow [Use HMI Setup Check] \rightarrow [Edit] \rightarrow [Ethernet]$
- Set the TOP communication interface in TOP Design Studio.

Project Option				×
Change HMI[H] Add P	C [A] TI Change PLC[C] X Delete PLC[D]			
TOP Setting	Date / Time Sync. Screen Option Unit Convert	t .		
Option Module Setting     FieldBurg (0)	Project Option Screen Change HmiSetup Gl	obal Lock & Touch Project Style	Splash PLC	Buffer Sync.
	✓ Use HHI Setup         Hmi Setup Option         Project Name=New project         Start Node=Menu         Start Screen No. = 1         Latch Use=0         Latch Set=0         StorageErrorMessage=0         USBerrorMessage=1         DatabaseMessage=1		Initialization	Edit

Control Panel	
Sustan Daviasa	🔓 Ethernet 🛛 🗙
System     Devices     PLC     Security     Date/Time     Image: Devices	Port Ethernet Port : ETH1 ▼ 0 ▼ Link Speed : Auto ▼ MAC Address : 00:00:00:00:00 IP Address : 192.168.0.100 Subnet Mask : 255.255.255.0 Gateway : 192.168.0.1 ☑ Default Gateway DNS (1) : DNS (2) :
Diagnostic File Manager Ping	Ethernet Primary IP : 192.168.0.100 • Cable Status : Bridge Mode : Use Bridge Check duplicate Apply Cancel

Items	ТОР	External device	Remarks
IP Address	192.168.0.100	192.168.0.50	
Subnet Mask	255.255.255.0	255.255.255.0	
Gateway	192.168.0.1	192.168.0.1	

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

Items	Description
IP Address	Set the IP address of the TOP.
Subnet Mask	Enter the subnet mask of the network.
Gateway	Enter the gateway of the network.

#### (2) Communication option setting

- [Project] → [Project Property] → [Device Setting > Ethernet > NX Series]
  - Set the options of the NX Series communication driver in TOP Design Studio.

Change HMILEI       Imit Change PLC[G]       Delete PLC[D]         Imit Change PLC[G]       Imit Change PLC[G]       Delete PLC[D]         Imit Change PLC[G]       Imit Change PLC[G]       Imit Change PLC[G]         Imit Change PLC[G]       Imit Change PLC[G]       Imit Change PLC[G]         Imit Change       Imit Change       Imit Change         Imit Save Mode :       First HL HL       Imit Change         Imit Save Mode :       Imit Change       Imit Change         I	Project Option		 ×
PLC Setting[ NX Series ]   Option Models Setting   PLC Setting[ NX Series ]   Alas Name : PLC1   Bind IP : Auto    Proteods Setting   Protocol : ECTOCOL   Protocol : ECTOCOL   Proteods Setting   Operate Condition : MN   Primary Option   IP   192 (Second)   Port   5000 (Protocol)   Port   5000 (Protocol)   Timeout   1000 (Protocol)   Series Station No.   2 (Port   Solo (Protocol)   Tore Setting   Port   Solo (Protocol)   Tore Setting   Station No.   2 (Protocol)   Station No.   2 (Protocol)   Tore Settion No.   2 (Protocol)   Port   Station No.   2 (Protocol)   Protocol   Protocol (Protocol)   Protocol (Protocol) <t< td=""><td>Change HMI[<u>H</u>] Add</td><td>LC [A] TI Change PLC[C] Delete PLC[D]</td><td></td></t<>	Change HMI[ <u>H</u> ] Add	LC [A] TI Change PLC[C] Delete PLC[D]	
	Change HMI[] TOP Setting Option Module Setting Fieldbus (0) COM1 (0) COM2 (0) COM2 (0) COM3 (0) CO	C (A) Change PLC[C) C Delete PLC[D]     PLC Setting[ IX Series ]     Allas Name : PLC1   Bind IP : Auto    Protocol : SECTOCOL Protocol : SECTOCOL Change Condition : AND Change Condition : TimeOut C Condition Ethernet Protocol Top Port S000 Timeout 1000 msec Send Wait 0 msec Send Wait 0 msec Send Wait 0 msec Sc Station No. 1 me Network Local	mm Manual

Items	Settings	Remarks
Interface	Select "Ethernet".	Refer to "2. External
Protocol	Select the communication protocol between the TOP and an external device.	device selection".
IP	Enter the IP address of the external device.	
Ethernet Protocol	Select the Ethernet protocol between the TOP and an external device.	
Port	Enter the Ethernet communication port number of the external device.	
Timeout	Set the time for the TOP to wait for a response from an external device.	
Send Wait	Set the waiting time between TOP's receiving a response from an external	
	device and sending the next command request.	
Command Header	Select header for SECTOCOL. Changes the maximum length of the message.	
	%: 118 characters	
	<: 2048 characters (restrictions based on model)	
Src Station No.	Set the prefix of TOP.	
Dst Station No.	Enter the prefix of PLC.	
Network	Select the network configuration between TOP and external device.	
Number of Routers	Configure the number of routers connecting the TOP and external device.	
1 <sub>st</sub> Router Station No.	Enter the prefix of the 1st router.	
1 <sub>st</sub> Router Loop No.	Enter the link unit number of the 1st router.	
2 <sub>nd</sub> Router Station No.	Enter the prefix of the 2nd router.	
2 <sub>nd</sub> Router Loop No.	Enter the link unit number of the 2nd router.	
5 <sub>th</sub> Router Station No.	Enter the prefix of the 5th router.	
5 <sub>th</sub> Router Loop No.	Enter the link unit number of the 5th router.	



#### 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 <u>drag</u> it down. Touch "EXIT" in the pop-up window to go to the main screen.



#### (1) Communication interface setting

■ [Control Panel] → [Ethernet]

	õ	Ethernet ×	×
Run	🔯 System	PortEthernet Port : ETH1 • 0 •	Option
		Link Speed : Auto 💌	<b>_</b> ))
VNC	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 R Default Gateway	(((
	Ethernet	DNS (1) : DNS (2) :	Wi-Fi
Screen shot		Ethernet Primary IP : 192.168.0.100 -	
	M	Cable Status : ETH1 Connected Bridge Mode : 🔲 Use Bridge	Analysis
	[System]	Check duplicate Apply Cancel	Close

Items	ТОР	External device	Remarks
IP Address	192.168.0.100	192.168.0.50	
Subnet Mask	255.255.255.0	255.255.255.0	
Gateway	192.168.0.1	192.168.0.1	

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

Items	Description
IP Address	Set the IP address of the TOP.
Subnet Mask	Enter the subnet mask of the network.
Gateway	Enter the gateway of the network.



#### (2) Communication option setting

■ [Control Panel]  $\rightarrow$  [PLC]

	<b>Ö</b>		PLC	×
Bun	🔯 Syste	Driver(ETH)	PLC1(NX Series) -	
		Interface	Ethernet 🔹	<u> </u>
		Protocol	SECTOCOL	
WNC	PLC	Bind IP	Auto	
VNC		IP	192 🗘 168 🖨 0 🖨 50 🖨	
Viewer		Ethernet	TCP 💌	
	Ethernet	Port	5000	
$\bigcirc$		Timeout	1000 🖨 msec	
Screen	· · · · ·	Send Wait	0 🖨 msec	
shot	Diagnostic	Command Header	- % -	
		Src Station No	p.2	
		Dst Station No	p.1	-
	[System	Diagnostic	Ping Test	Apply Cancel

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

Items	Settings	Remarks
Interface	Select "Ethernet".	Refer to "2. External
Protocol	Select the communication protocol between the TOP and an external device.	device selection".
IP	Enter the IP address of the external device.	
Ethernet Protocol	Select the Ethernet protocol between the TOP and an external device.	
Port	Enter the Ethernet communication port number of the external device.	
Timeout	Set the time for the TOP to wait for a response from an external device.	
Send Wait	Set the waiting time between TOP's receiving a response from an external	
	device and sending the next command request.	
Command Header	Select header for SECTOCOL. Changes the maximum length of the message.	
	%: 118 characters	
	<: 2048 characters (restrictions based on model)	
Src Station No.	Set the prefix of TOP.	
Dst Station No.	Enter the prefix of PLC.	
Network	Select the network configuration between TOP and external device.	
Number of Routers	Configure the number of routers connecting the TOP and external device.	
1 <sub>st</sub> Router Station No.	Enter the prefix of the 1st router.	
1 <sub>st</sub> Router Loop No.	Enter the link unit number of the 1st router.	
2 <sub>nd</sub> Router Station No.	Enter the prefix of the 2nd router.	
2 <sub>nd</sub> Router Loop No.	Enter the link unit number of the 2nd router.	
5 <sub>th</sub> Router Station No.	Enter the prefix of the 5th router.	
5 <sub>th</sub> Router Loop No.	Enter the link unit number of the 5th router.	



#### **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 that the settings of the connected ports in [Control Panel]  $\rightarrow$  [Ethernet] are the same as the settings of the external device.
- Diagnosis of whether the port communication is normal or not
- Touch "Communication diagnostics" in [Control Panel]  $\rightarrow$  [PLC].
- Check whether communication is connected or not.

Communication	Communication setting normal	
diagnostics		
succeeded		
Error message	Communication setting abnormal	
	- Check the cable, TOP, and external device settings. (Refer to Communication diagnostics sheet.)	

Communication diagnostics sheet

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

Items	Contents		Check		Remarks	
System	How to connect the system		OK	NG	1 System configuration	
configuration	Connection cable name	OK	NG	1. System configuration		
ТОР	Version information Port in use Driver name Other detailed settings		OK	NG		
			OK	NG		
			OK	NG		
			OK	NG		
	Relative prefix	Project setting	OK	NG	2. External device selection	
		Communication	ОК	NG	3. TOP communication setting	
		diagnostics				
	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 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			OK	NG	5. Supported addresses	



## 4. External device setting

Configure the Ethernet, IP, and port number of the external device by referring to the vendor's user manual. For TCP, configure to "Unpassive".



## 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.

Address	Bit	Word	32 bit	Remarks
External input relay	X0000 ~ X511F	WX000 ~ WX511		*Note 1)
External output relay	Y0000 ~ Y511F	WY000 ~ WY511		*Note 1)
Internal relay	R0000 ~ R886F	WR000 ~ WR886		*Note 1)
Link relay	L0000 ~ L639F	WL000 ~ WL639		*Note 1)
Special relay	R9000 ~ R910F	F WR900 ~ WR910		*Note 1)
Timer	T0000 ~ T3071	-		
Counter	C0000 ~ C3071	-	L/H	
Data register	DT00000.00 ~ DT10239.15	DT00000 ~ DT10239		
	DT90000 ~ DT90511.15	DT90000 ~ DT90511		
File register	FL00000.00 ~ FL32764.15	FL00000 ~ FL32764		
Link register	LD00000.00 ~ LD08447.15	LD0000 ~ LD8447		
Timer/counter set value	SV00000.00 ~ SV03071.15	SV0000 ~ SV3071		
Timer/counter elapsed value	EV00000 ~ EV03071.15	EV0000 ~ EV3071		

\*Note 1) When using a bit address, mark the bit location as "0-F(hexadecimal)". The position above the lowest position should be a decimal.