

# YASKAWA Electric Corporation

## Machine Controller MP2000 Series

### Ethernet Driver

---

Supported version

TOP Design Studio

V1.0 or higher



## 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".

- 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. External device setting** [Page 10](#)

Describes how to set up communication for external devices.
- 5. Supported addresses** [Page 14](#)

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

# 1. System configuration

The system configuration of TOP and "YASKAWA Electric Corporation – MP2000 Series Ethernet" is as follows.

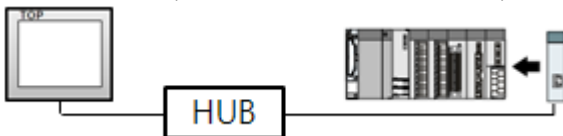
Series	CPU	Link I/F	Communication method	System setting	Cable	
MP2000	MP2300 MP2200	Ethernet Port on <b>218IF-01</b>	Ethernet( UDP )	<a href="#">3. TOP communication setting</a> <a href="#">4.1 Extended MEMOBUS</a> <a href="#">4.3 MP Extension</a>	Twisted pair cable <b>*Note 1)</b>	
			Ethernet( TCP )			
		Ethernet Port on <b>218IF-02</b>	Ethernet( UDP )			
			Ethernet( TCP )			
	MP2310 MP2300S	Ethernet Connector on <b>CPU unit</b>	Ethernet( UDP )	<a href="#">3. TOP communication setting</a> <a href="#">4.2 Extended MEMOBUS</a> <a href="#">4.3 MP Extension</a>		
			Ethernet( TCP )			
		Ethernet Port on <b>218IF-01</b>	Ethernet( UDP )			<a href="#">3. TOP communication setting</a> <a href="#">4.1 Extended MEMOBUS</a> <a href="#">4.3 MP Extension</a>
			Ethernet( TCP )			
	Ethernet Port on <b>218IF-02</b>	Ethernet( UDP )				
		Ethernet( TCP )				
	MP2400	Ethernet Connector on <b>CPU unit</b>	Ethernet( UDP )	<a href="#">3. TOP communication setting</a> <a href="#">4.2 Extended MEMOBUS</a> <a href="#">4.3 MP Extension</a>		
			Ethernet( TCP )			

**\*Note 1)** Twisted pair cable

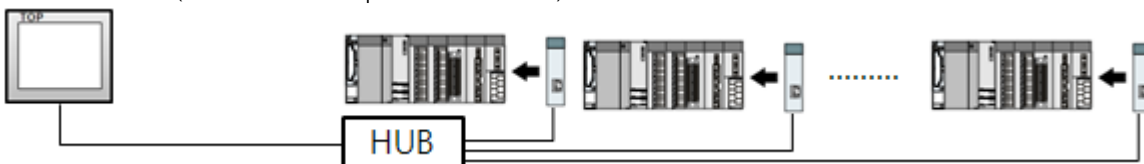
- Refer to STP (Shielded Twisted Pair Cable) or UTP (Unshielded Twisted Pair Cable) Category 3, 4, 5.
- Depending on the network configuration, you can connect to components such as the hub and transceiver, and in this case, use a direct cable.

## ■ Connectable configuration

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

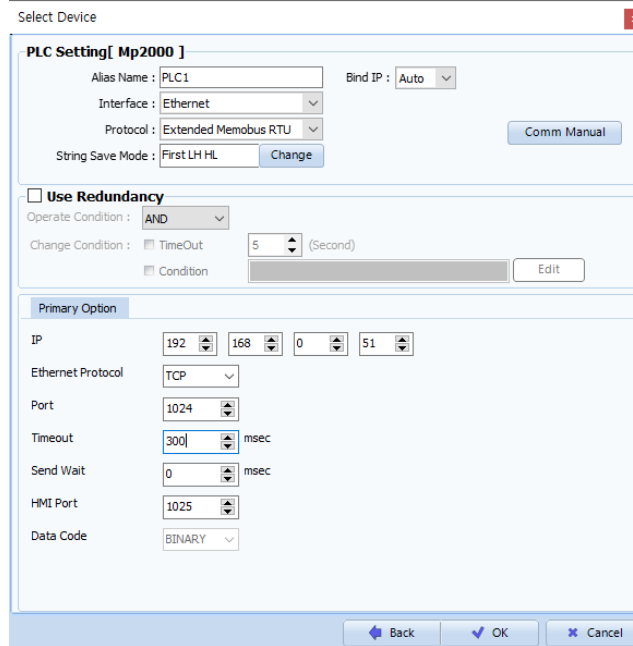
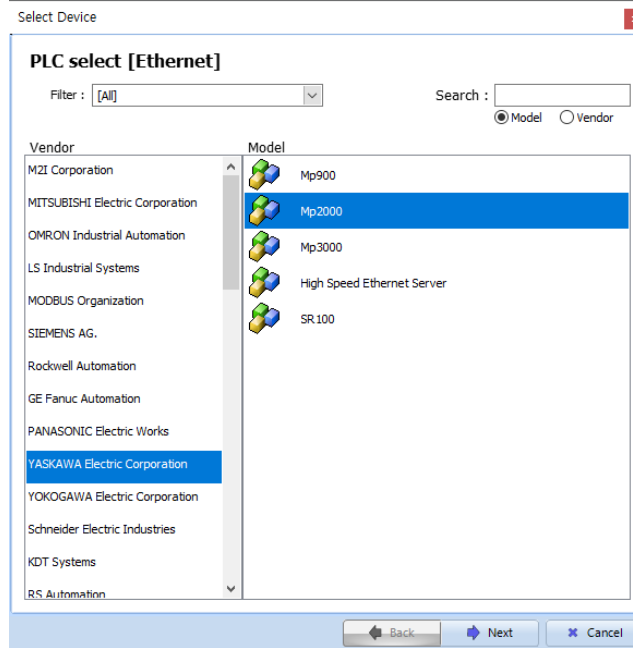


- 1:N connection (one TOP and multiple external devices) connection



## 2. External device selection

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



Settings		Contents									
TOP	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. Please select "YASKAWA Electric Corporation".									
	PLC	Select the external device to be connected to the TOP. <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: black; color: white;">Model</th> <th style="background-color: black; color: white;">Interface</th> <th style="background-color: black; color: white;">Protocol</th> </tr> </thead> <tbody> <tr> <td>MP2000 Series</td> <td>Ethernet</td> <td>Set Users</td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="background-color: #e1eef6;">Supported Protocol</th> </tr> </thead> <tbody> <tr> <td>Extended MEMOBUS RTU</td> <td>MP Extension</td> </tr> </tbody> </table> 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.	Model	Interface	Protocol	MP2000 Series	Ethernet	Set Users	Supported Protocol		Extended MEMOBUS RTU
Model	Interface	Protocol									
MP2000 Series	Ethernet	Set Users									
Supported Protocol											
Extended MEMOBUS RTU	MP Extension										

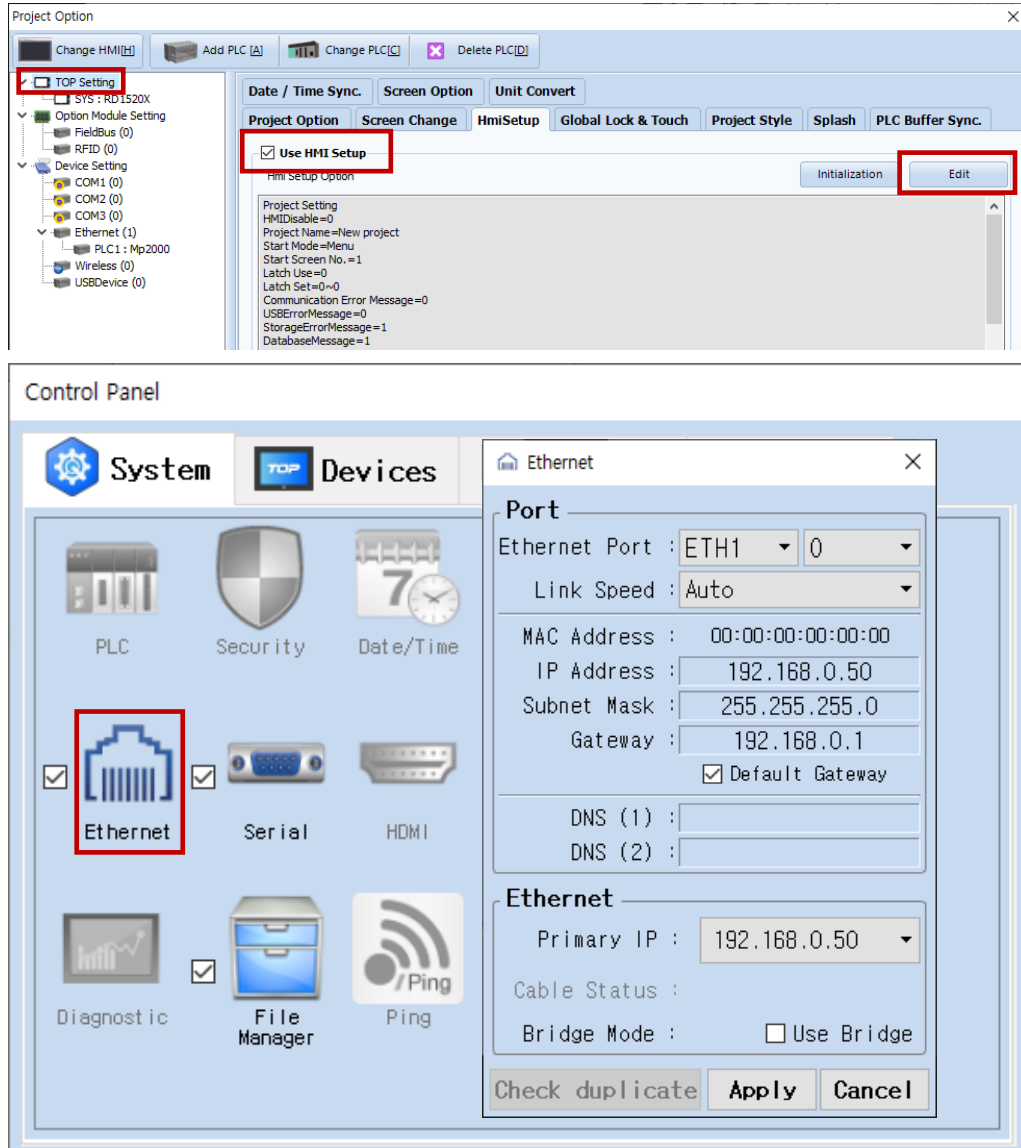
### 3. TOP communication setting

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.



Items	TOP	External device	Remarks
IP Address* <a href="#">Note 1</a> <a href="#">Note 2</a> )	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, 192 . 168 . 0 . 0) should match.

\*[Note 2](#)) Do not use duplicate IP addresses over the same network.

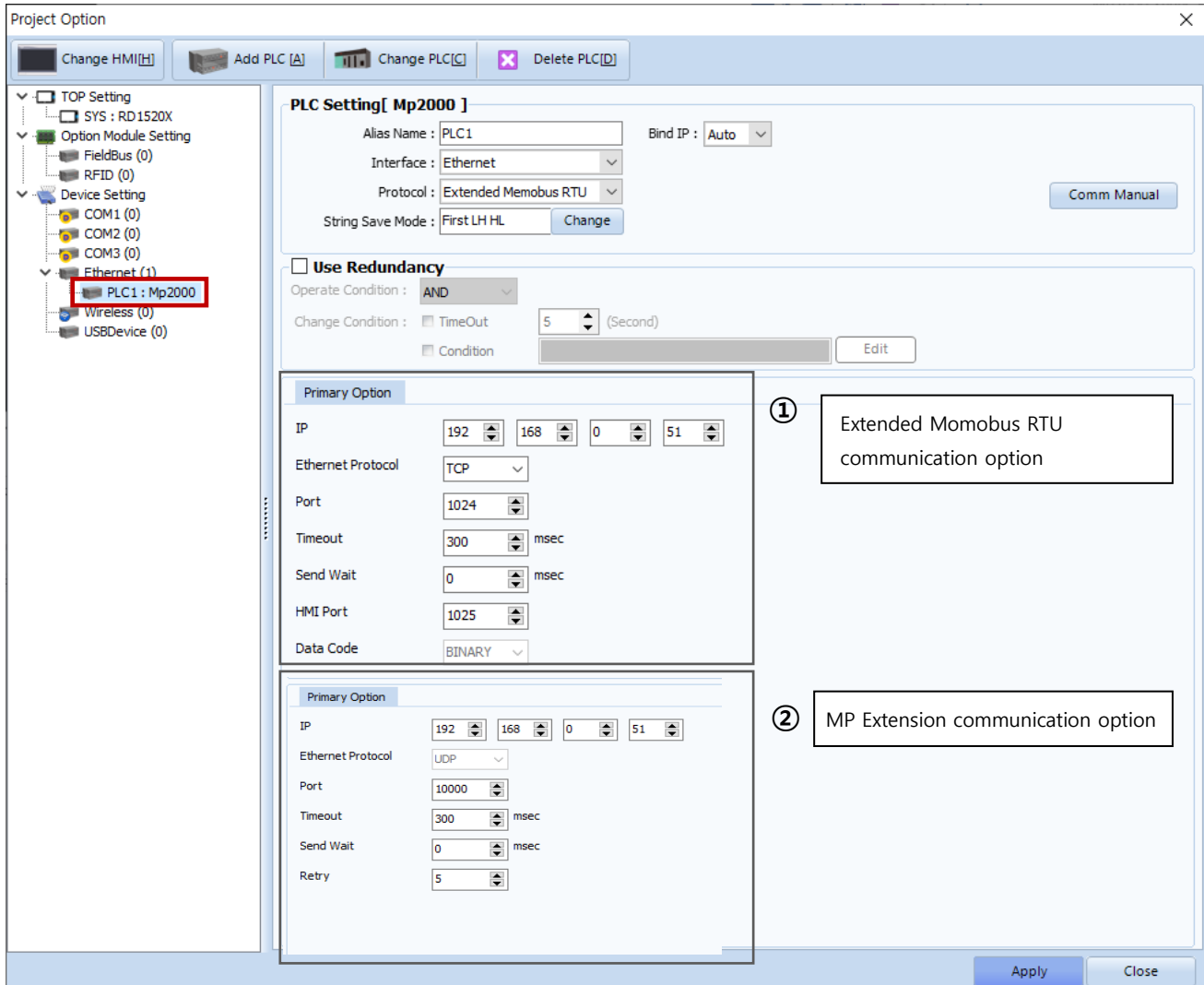
\* The above settings are examples recommended by the company.

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**

■ [ Project > Project properties > PLC settings > ETHERNET) > “PLC1 : Mp2000”]

– Set the options of the communication driver of MP2000 Series Ethernet in TOP Design Studio.



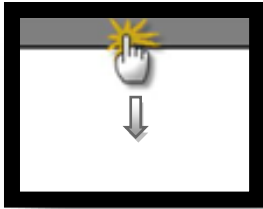
\* The above settings are examples recommended by the company.

Items	Settings	Remarks
Interface	Select "Ethernet".	<a href="#">Refer to "2. External device selection"</a> .
Protocol	Select the communication protocol between the TOP and an external device.	<a href="#">Refer to "2. External device selection"</a> .
<b>① Communication option items when selecting the Extended Memobus RTU</b>		
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 an 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.	
HMI Port	Enter the Ethernet communication port number of the TOP.	
Data Code	Select the data code between the TOP and an external device.	
<b>② Communication option items when selecting the MP Extension Ethernet</b>		
IP	Enter the IP address of the external device.	
Port	Enter the Ethernet communication port number of an 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.	
Ethernet Protocol	Select the Ethernet protocol between the TOP and an external device.	

### 3.2. Communication setting in TOP

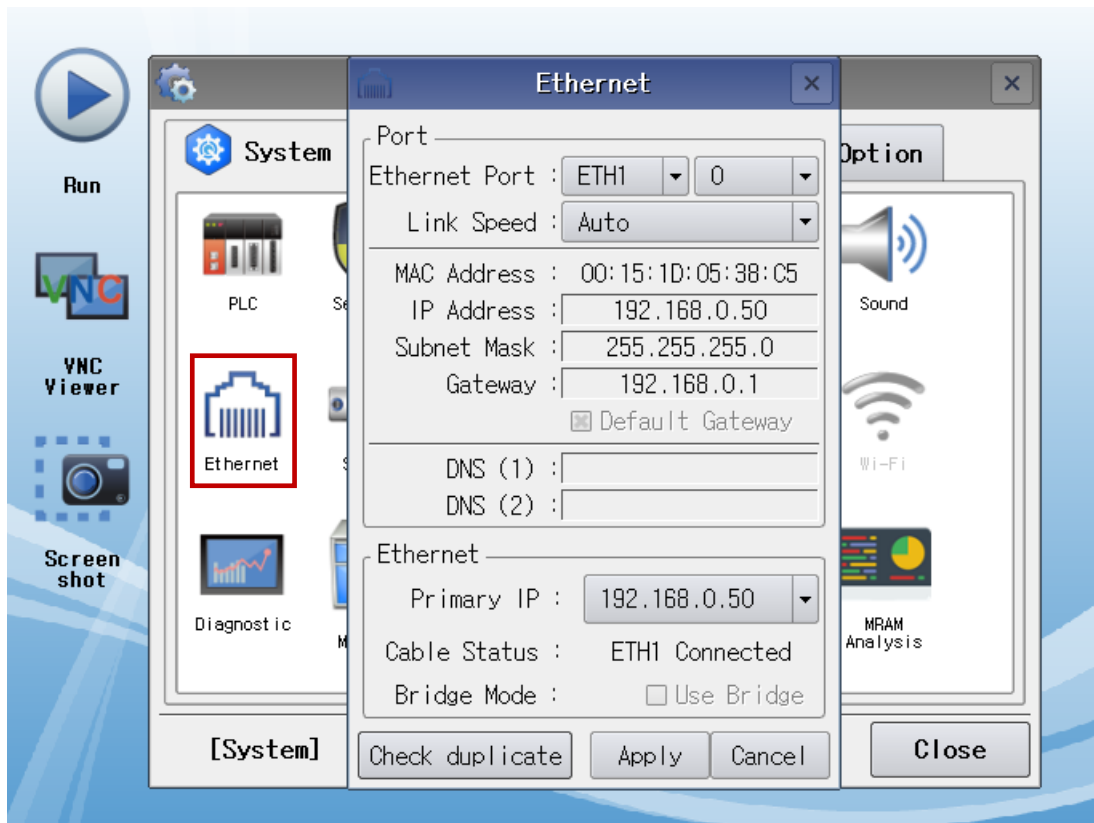
\* This is a setting method when "Use HMI Setup" in the setting items in "3.1 TOP Design Studio" is not checked.

- 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 ]



Items	TOP	External device	Remarks
IP Address* <a href="#">Note 1</a> ) <a href="#">Note 2</a> )	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, 192 . 168 . 0 . 0) should match.

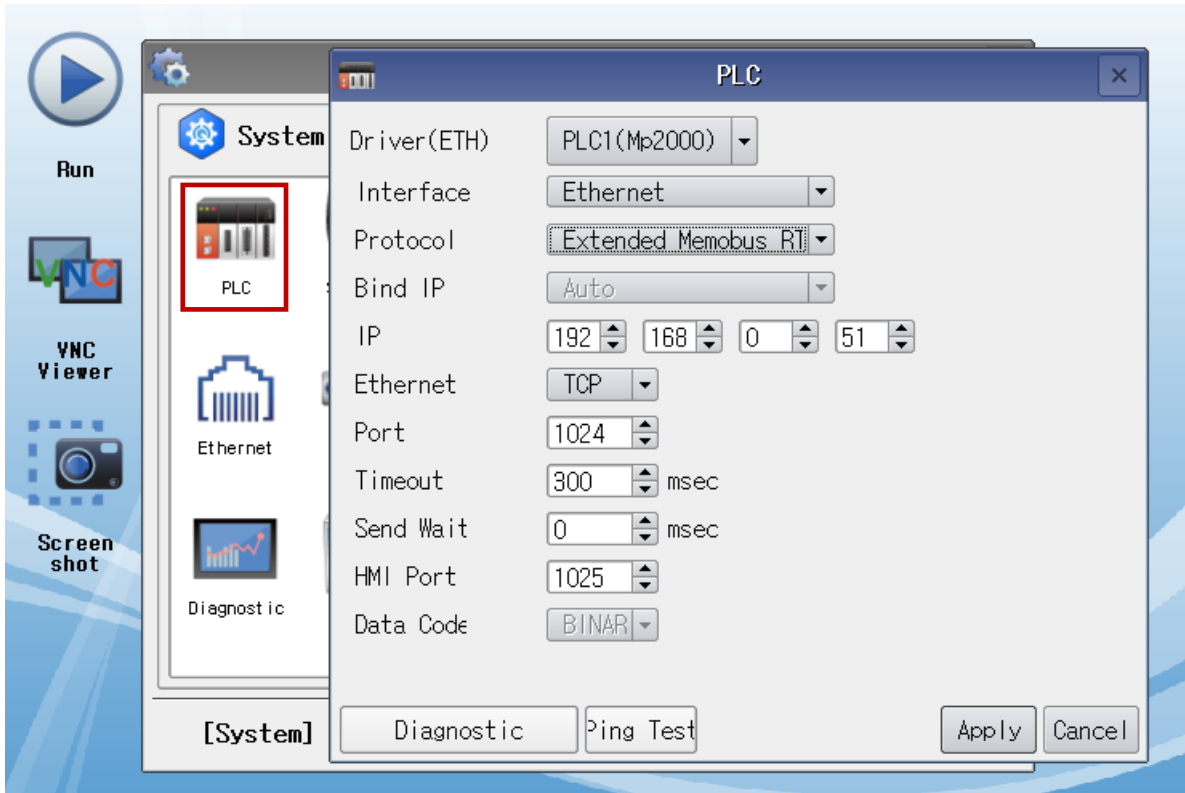
\*[Note 2](#)) Do not use duplicate IP addresses over the same network.

\* 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 ]



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

Items	Settings	Remarks
Interface	Select "Ethernet".	<a href="#">Refer to "2. External device selection".</a>
Protocol	Select the communication protocol between the TOP and an external device.	
<b>Communication option items when selecting the Extended Memobus RTU</b>		
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 an 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.	
HMI Port	Enter the Ethernet communication port number of the TOP.	
Data Code	Select the data code between the TOP and an external device.	
<b>Communication option items when selecting the MP Extension Ethernet</b>		
IP	Enter the IP address of the external device.	
Port	Enter the Ethernet communication port number of an 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.	
Ethernet Protocol	Select the Ethernet protocol between the TOP and an external device.	

### 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 port (ETH1/ETH2) 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.

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

- 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	Check		Remarks	
System configuration	How to connect the system	OK	NG	<a href="#">1. System configuration</a>	
	Connection cable name	OK	NG		
TOP	Version information	OK	NG	<a href="#">2. External device selection</a> <a href="#">3. Communication setting</a>	
	Port in use	OK	NG		
	Driver name	OK	NG		
	Other detailed settings	OK	NG		
	Relative prefix	Project setting	OK		NG
		Communication diagnostics	OK		NG
	Ethernet port setting	IP Address	OK		NG
Subnet Mask		OK	NG		
Gateway		OK	NG		
External device	CPU name	OK	NG	<a href="#">4. External device setting</a>	
	Communication port name (module name)	OK	NG		
	Protocol (mode)	OK	NG		
	Setup Prefix	OK	NG		
	Other detailed settings	OK	NG		
	Ethernet port setting	IP Address	OK		NG
		Subnet Mask	OK		NG
Gateway		OK	NG		
Check address range		OK	NG	<a href="#">5. Supported addresses</a> (For details, please refer to the PLC vendor's manual.)	



## 4. External device setting

### 4.1 Extended MEMOBUS – 218IF-01/02

Set as below using "MP Series" Ladder Software "MPE720". For more detailed setting method than that described in this example, refer to the PLC user manual.



Do not use duplicate IP addresses over the same network.

■ **Operation I** : "PC and PLC connection method" : set communications as follows(Operation II, Operation III), but before connect PC and PLC.

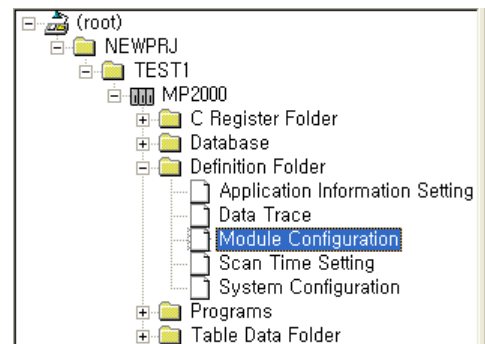
1. Run "Communication Manager" program.  
( Path : Start → Program → "YE\_Applications" → "Communication Manager" )
2. Run "Logical Port Setting" to set the port type and details.  
( Path : File → Setting... )
3. After PC and PLC are connected, save, and follow below operation.

■ **Operation II** : "MPE720" Create Project : (root) > [Group Folder] > [Order Folder] > [Controller Folder] Register

1. To register the device you want to use in "MPE720", follow "[Group Folder] > [Order Folder] > [Controller Folder]" path.

(Caution) In the "MPE720" left project window, Right-Click, and follow the parent path through the [New] entry.

2. Register the Controller Type for the device you wish to use in the Controller Configuration window, which appears when registering a new [Controller Folder]
3. Double-click the newly registered [Controller Folder] to bring up the [Log on to the controller] window and enter "User Name" and "Password" to form project folders as shown on the left.



■ **Operation III** : "Communication Setting" : [Engineering Manager] – [Module Configuration] window

1. [Definition Folder] – [Module Configuration] double click to bring up [Engineering Manager] – [Module Configuration] window.
2. In the Module Configuration window, register the appropriate [Rack] – [Slot] location [Module Type].
3. Double-click the appropriate [Slot Number] to display the Settings window. The information to be set is as follows.

Transmission Parameters | Status

CP-218 Transmission Parameters

Station Setting  
 IP Address : 192 . 168 . 0 . 51 ( 0 - 255 )

MEMOBUS Setting  
 Response Time : 0 s ( 0 - 255 )  
 Count of Retry : 0 time ( 0 - 255 )

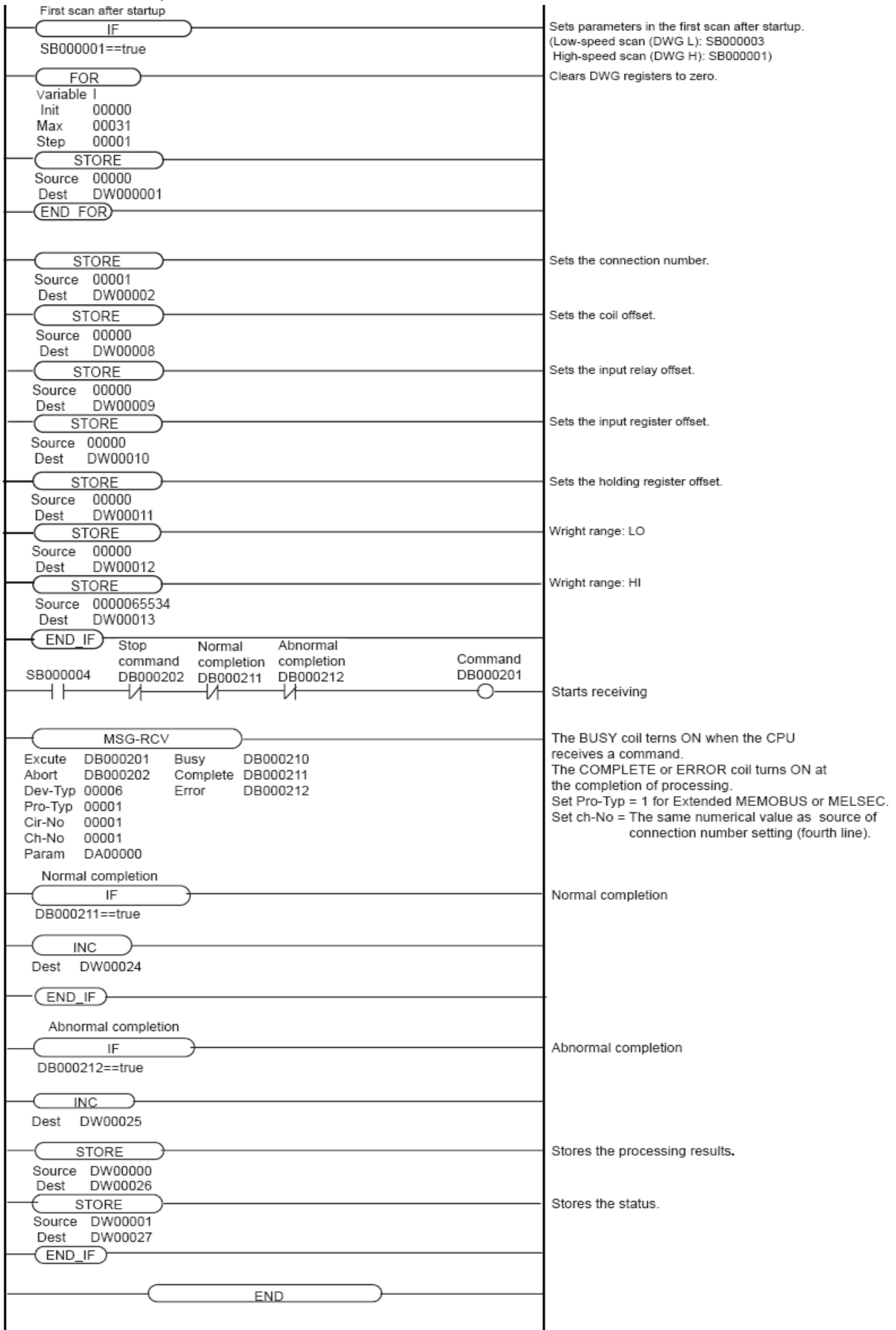
CP-218 Connection Parameter

ON	Local Port	Node IP Address	Node Port	Connect Type	Protocol Type	Code	
01	01024	192.168.000.050	01025	TCP	Extended MEMOBUS	BIN	
02	----						

Items	Settings	Remarks
Transmission parameter	Station Setting IP Address	192.168.0.51 PLC IP address
Connection parameter	Local Port	1024 PLC Port number
	Node IP Address	192.168.0.50 HMI IP Address
	Node Port	1025 HMI Port Number
	Connect Type	TCP Set Users
	Protocol Type	Extended MEMOBUS <b>Fixed</b>
	Code	BIN <b>Fixed</b>

■ Operation IV : Ladder Program : MSG-RCV function

1. Register the [MSG-RCV] function ([Instruction Pallet] menu - [System] tab)) into the [Ladder Works] Software, referring to the example below. Refer to the Ladder Software manual for more information. (※Caution: Set the value of [Dev-Type] to "6" for 218IF-01 and "218IF-02 to "16".)



## 4.2 Extended MEMOBUS - CPU Built-in Ethernet Port

Set as below using "MP Series" Ladder Software "MPE720". For more detailed setting method than that described in this example, refer to the PLC user manual.



Do not use duplicate IP addresses over the same network.

**■ Operation I** : "PC and PLC connection method" : set communications as follows(Operation II, Operation III), but before connect PC and PLC.

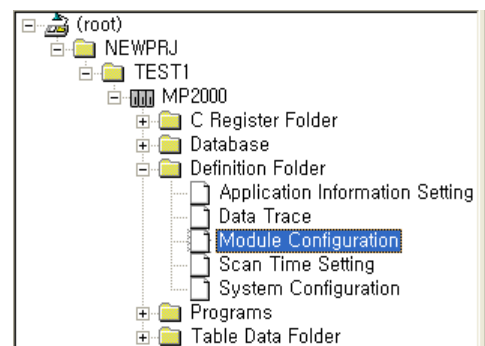
1. Run "Communication Manager" program.  
( Path : Start → Program → "YE\_Applications" → "Communication Manager" )
2. Run "Logical Port Setting" to set the port type and details.  
( Path : File → Setting... )
3. After PC and PLC are connected, save, and follow below operation.

**■ Operation II** : "MPE720" Create Project : (root) > [Group Folder] > [Order Folder] > [Controller Folder] Register

1. To register the device you want to use in "MPE720", follow "[Group Folder] > [Order Folder] > [Controller Folder]" path.

**(Caution)** In the "MPE720" left project window, Right-Click, and follow the parent path through the [New] entry.

2. Register the Controller Type for the device you wish to use in the Controller Configuration window, which appears when registering a new [Controller Folder]
3. Double-click the newly registered [Controller Folder] to bring up the [Log on to the controller] window and enter "User Name" and "Password" to form project folders as shown on the left.



**■ Operation III** : "Communication Setting" : [Engineering Manager] – [Module Configuration] window

1. [Definition Folder] – [Module Configuration] double click to bring up [Engineering Manager] – [Module Configuration] window.
2. In the Module Configuration window, register the appropriate [Rack] – [Slot] location [Module Type].
3. Double-click the [Slot Number] which the Ethernet UNIT is connected to display the Settings window.[Transmission Parameter] tab settings information is as follows.

Items	Settings	Remarks
IP Address	192.168.0.51	PLC IP address
Subnet Mask	255.255.255.0	PLC Subnet Mask

4. From [Transmission Parameter] tab – click [Easy Setting], in [Message Communication Easy Setting] window set as follows, Click "OK" to save settings information.

Items	Settings	Remarks
MP Series Port No.	1024	PLC Port number
Communication protocol Type	Extended MEMOBUS	<b>Fixed</b>
Connect type	TCP	Set Users
code	BIN	<b>Fixed</b>
Node Port IP Address	192.168.0.50	HMI IP Address
Other Device Port No.	1025	HMI Port Number

5. Double-click [Setting] to set [Automatically Accepted] to "Enable" in the [Automatically Accepted Setting] window and save the settings by clicking "OK".

### 4.3 MP Extension - 218IF-01/02

Set as below using "MP Series" Ladder Software "MPE720". For more detailed setting method than that described in this example, refer to the PLC user manual.



Do not use duplicate IP addresses over the same network.

**■ Operation I : "PC and PLC connection method"** : set communications as follows(Operation II, Operation III), but before connect PC and PLC.

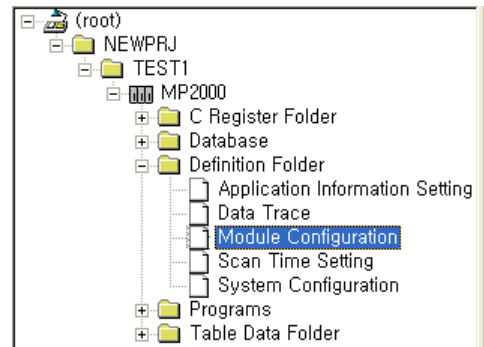
1. Run "Communication Manager" program.  
( Path : Start → Program → "YE\_Applications" → "Communication Manager" )
2. Run "Logical Port Setting" to set the port type and details.  
( Path : File → Setting... )
3. After PC and PLC are connected, save, and follow below operation.

**■ Operation II : "MPE720" Create Project** : (root) > [Group Folder] > [Order Folder] > [Controller Folder] Register

1. To register the device you want to use in "MPE720", follow "[Group Folder] > [Order Folder] > [Controller Folder]" path.

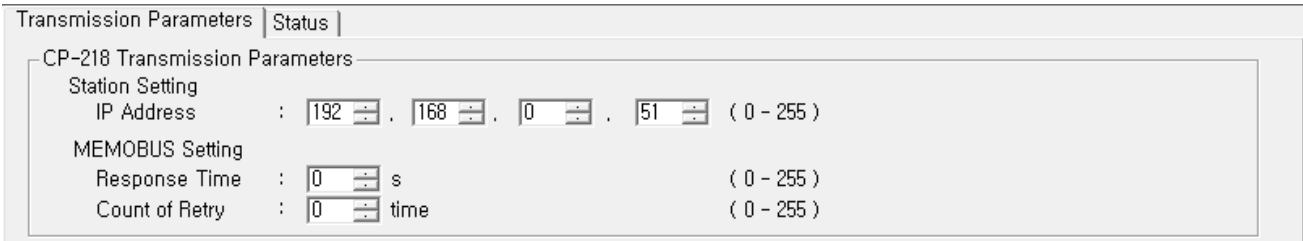
**(Caution)** In the "MPE720" left project window, Right-Click, and follow the parent path through the [New] entry.

2. Register the Controller Type for the device you wish to use in the Controller Configuration window, which appears when registering a new [Controller Folder]
3. Double-click the newly registered [Controller Folder] to bring up the [Log on to the controller] window and enter "User Name" and "Password" to form project folders as shown on the left.



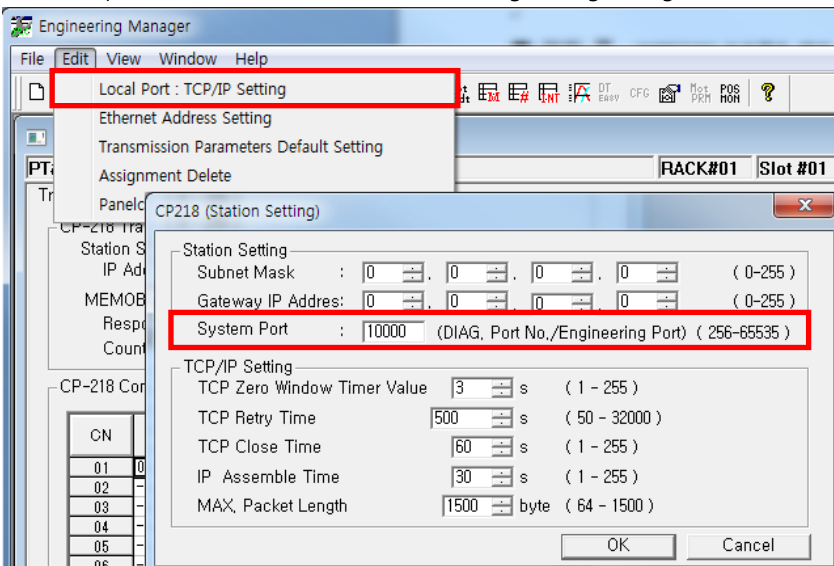
**■ Operation III : "Communication Setting"** : [Engineering Manager] – [Module Configuration] window

1. [Definition Folder] – [Module Configuration] double click to bring up [Engineering Manager] – [Module Configuration] window.
2. In the Module Configuration window, register the appropriate [Rack] – [Slot] location [Module Type].
3. Double-click the corresponding [Slot Number] to display the setting window. Set the IP address of the external device as follows.



Items	Settings	Remarks
Transmission Parameters Station Setting IP Address	192.168.0.51	PLC IP address

4. Set the port number of the external device in [Engineering Manager] - [Edit] - [Local Port: TCP/IP Setting] as follows.



## 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.

### ■ Extended Memobus

Device		Bit Address	Word Address	32bit	Remarks
MB	Coil	MB000000 ~ MB65535F	MB00000 ~ MB65535	L/H	
IB	Discrete Input	IB00000 ~ IBFFFFF	IB0000 ~ IBFFFF		*Note 1)
IW	Input Register	-	IW0000 ~ IWFFFF		*Note 1)
MW	Holding Register	-	MW00000 ~ MW65535		

\*Note 1) Cannot be written

### ■ MP Extension

Device		Bit Address	Word Address	32bit	Remarks
SB	System Register	SB00000 ~ SB8191F	SB0000 ~ SB8191	L/H	
SW		SW0000.0 ~ SW8191.F	SW0000 ~ SW8191		
IB	Input Register	IB00000 ~ IBFFFFF	IB0000 ~ IBFFFF		
IW		IW0000.0 ~ IWFFFF.F	IW0000 ~ IWFFFF		
OB	Output Register	OB00000 ~ OBFFFFF	OB0000 ~ OBFFFF		*Note 1)
OW		OW0000.0 ~ OWFFFF.F	OW0000 ~ OWFFFF		*Note 1)
MB	Data Register	MB000000 ~ MB65535F	MB00000 ~ MB65535		
MW		MW00000.0 ~ MW65535.F	MW00000 ~ MW65535		

\*Note 1) Cannot be written