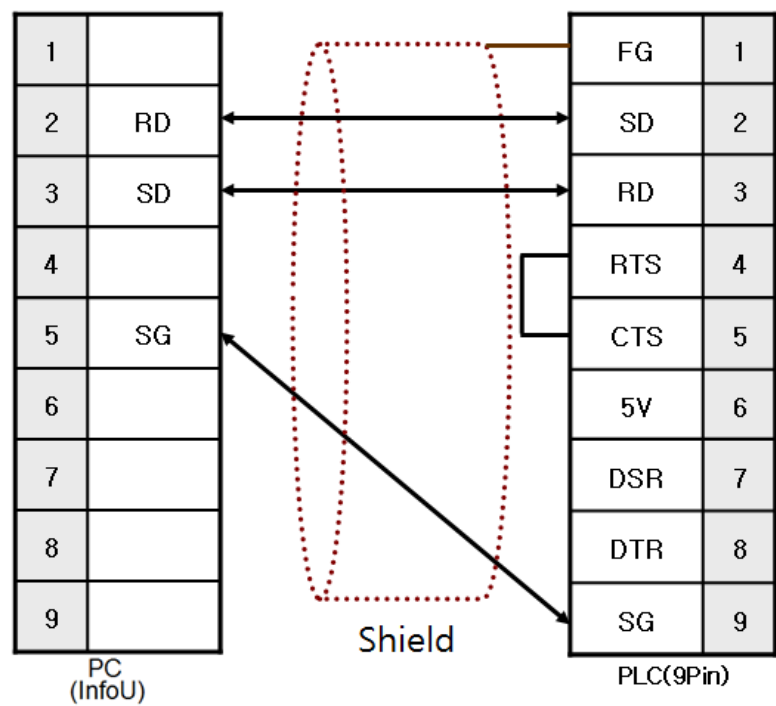


Chapter 18 Omron: CS/CJ PLC

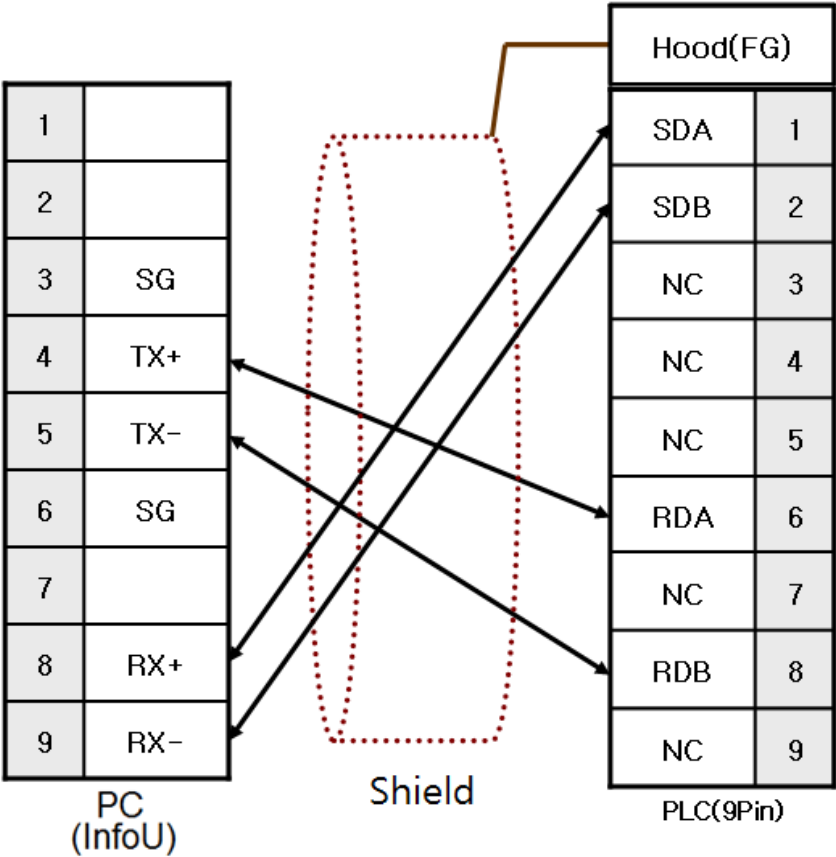
18.1 Wiring Diagram

18.1.1 Link method: Cnet

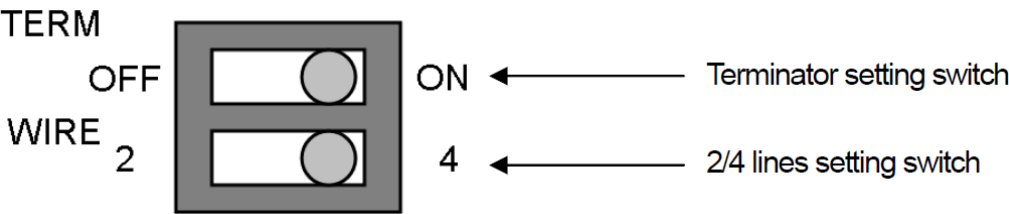
The wiring for RS-232C is as below.



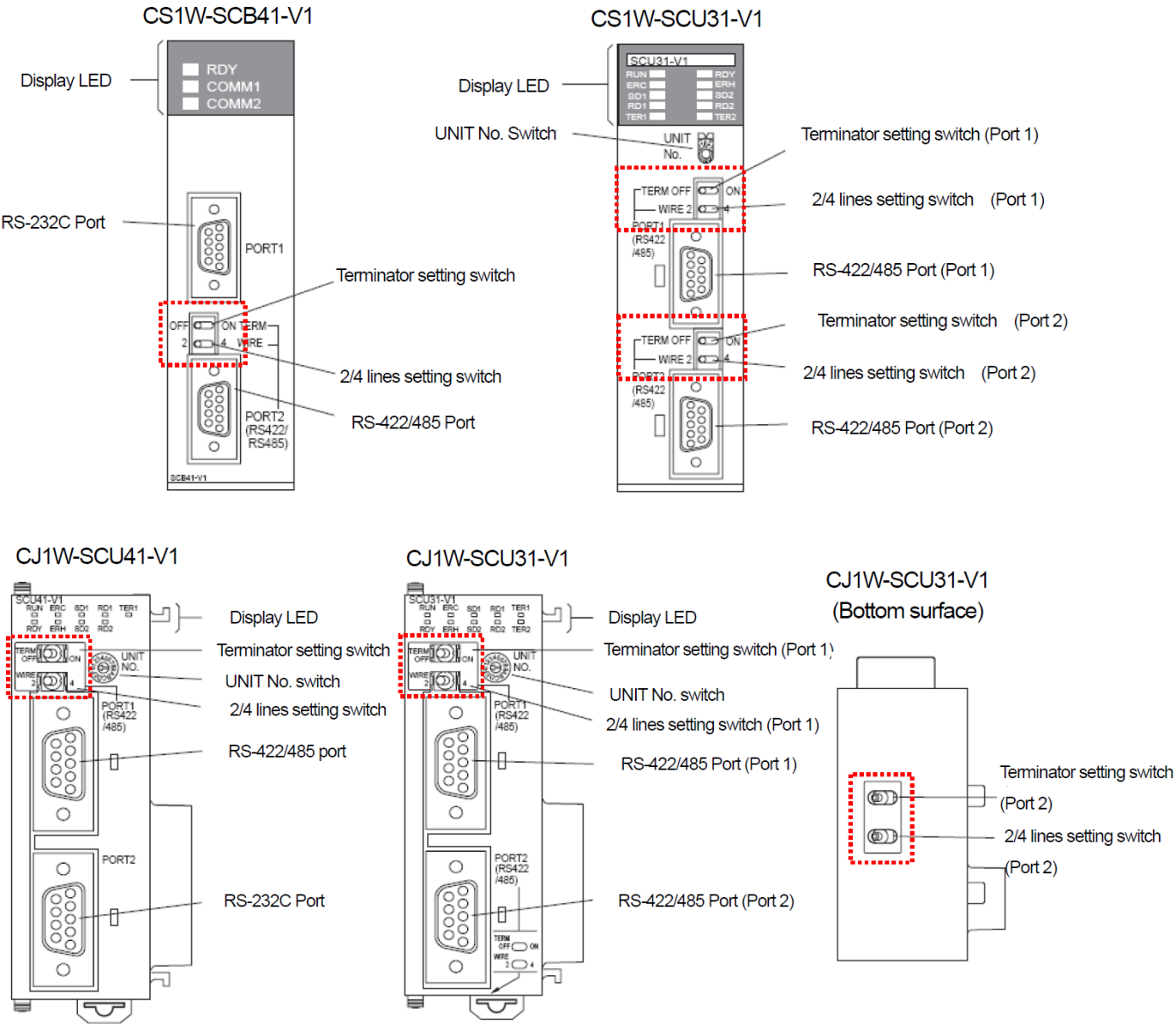
The wiring for RS-422/485 is as below.



OMRON's Host Link protocol provides 4 lines wiring method only not 2 lines.
Put the switch at '4' position as shown at below picture.
A terminator resistor is embedded so make the switch to set terminate resistor 'ON'.



Setting switcher are different depending on communication module so for setting, refer to the below pictures.



Notice

1. Suggestions

- ☞ A shielded wire is recommended for stable communication. (For detailed wiring, refer to the OMRON Communication manual.)
- ☞ When applying 1:N connection through RS-422/485 communication mode, set(ON) the terminator switch for the last communication module only.

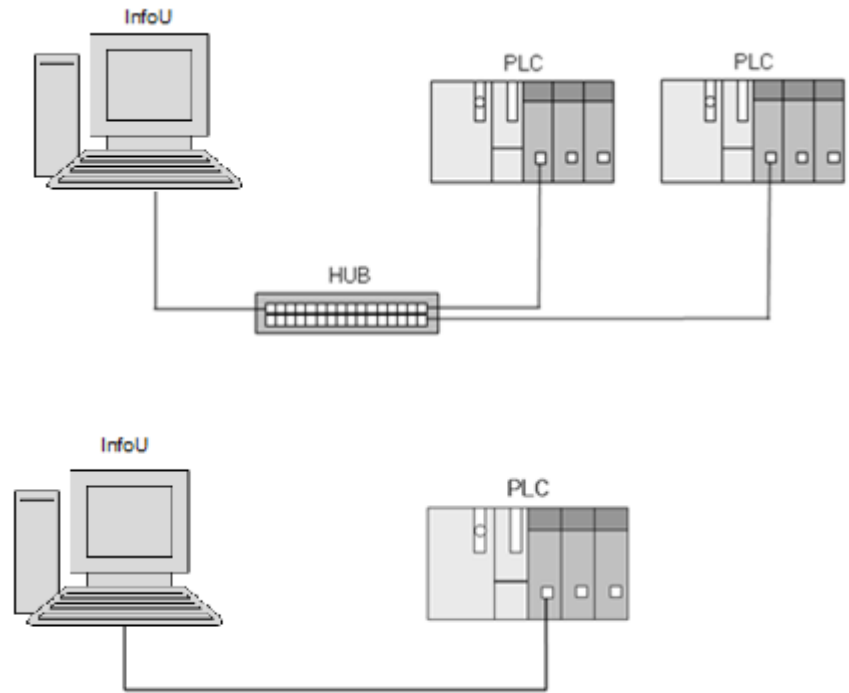
2. Term Description

- ☞ Host Link indicates connection between host PC and OMRON PLC and XGT Panel communicates with OMRON PLC with this way.

18.1.2 Link method: FEnet

(1) Ethernet specification

Ethernet can be connected in 2 ways as below figure.



Notice

When connecting hub-node, direct cable has to be used and cross cable has to be used when connecting 1:1.

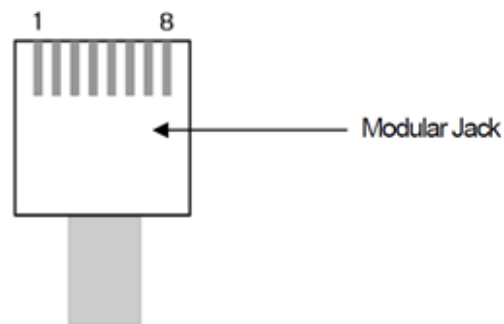
(2) Ethernet cable

Ethernet cable gets specified into 2 cables according to its type.

When communicating through LAN, connected to network equipment like a hub, direct cable is used. (In case of hub-node connection) Direct connection is available among equipments and in this case, cross cable is used.

Method for wiring a direct cable is as follows.

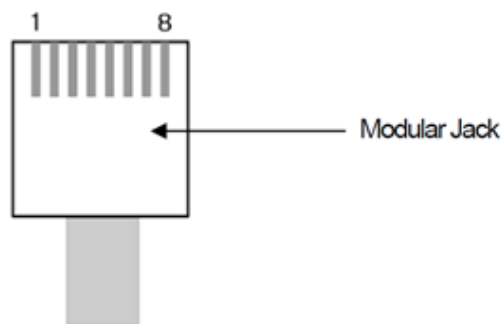
1	White-oragne	White-oragne	1
2	Orange	Orange	2
3	White-green	White-green	3
4	Blue	Blue	4
5	White-blue	White-blue	5
6	Green	Green	6
7	White-brown	White-brown	7
8	Brown	Brown	8



‘White-yellow’, ‘White-green’, ‘White-blue’, ‘White-brown’ from above figure is indicated on the coating of the cable. For example, ‘white-blue’ has blue stripes on white coating.

Method for wiring of cross cable is as follows.

1	White-oragne	White-green	1
2	Orange	Green	2
3	White-green	White-oragne	3
4	Blue	Blue	4
5	White-blue	White-blue	5
6	Green	Orange	6
7	White-brown	White-brown	7
8	Brown	Brown	8



Notice

- ☞ Use according to the connection method.
- ☞ Wire the cable by using a modular tool. Bad connection may occur.
- ☞ If the lock part of the modular jack gets damaged, it may not get fixed to the RJ45 connector (Ethernet connector) and bad connection may occur.
- ☞ The UTP cable is made out of solid wire material. Therefore, it may break when heavily bent or shaken.
- ☞ It is advisory to use a plug cover when wiring cables.

18.2 I/O Driver Setting

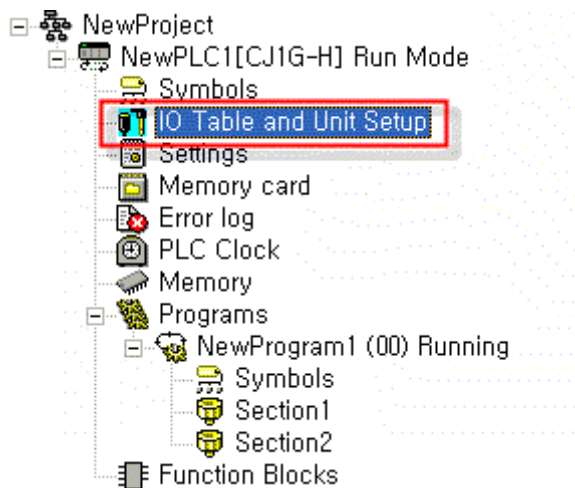
18.2.1 Link method: Cnet

(1) PLC Setting

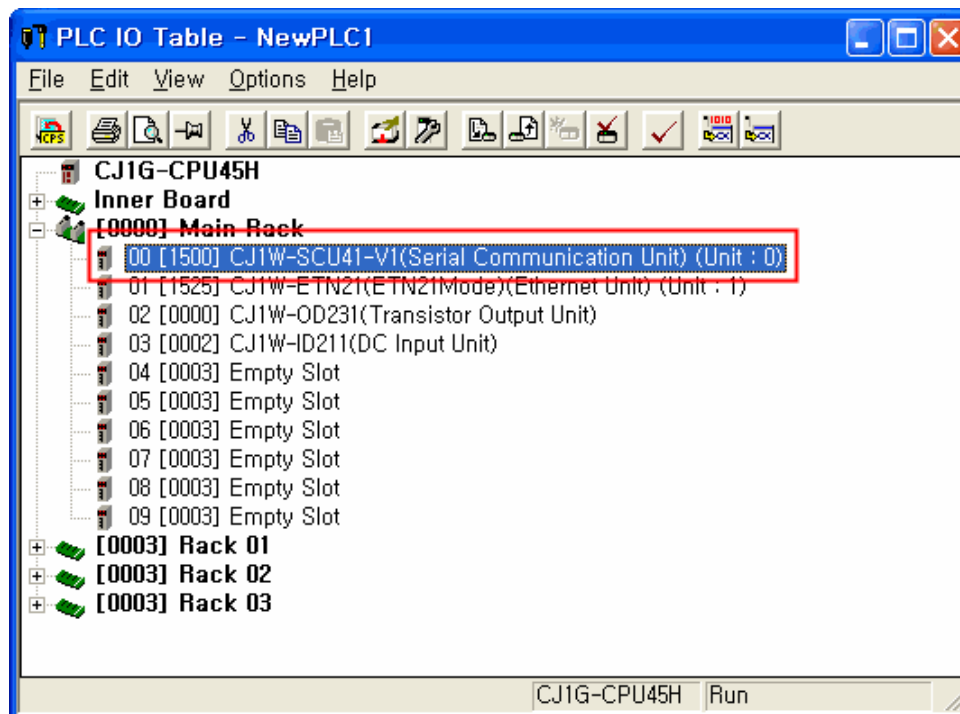
You can set the communication parameter for PLC at CX-Programmer and for more details, refer to OMRON Communication manual.

The simple description on communication setting will be provided hereupon.

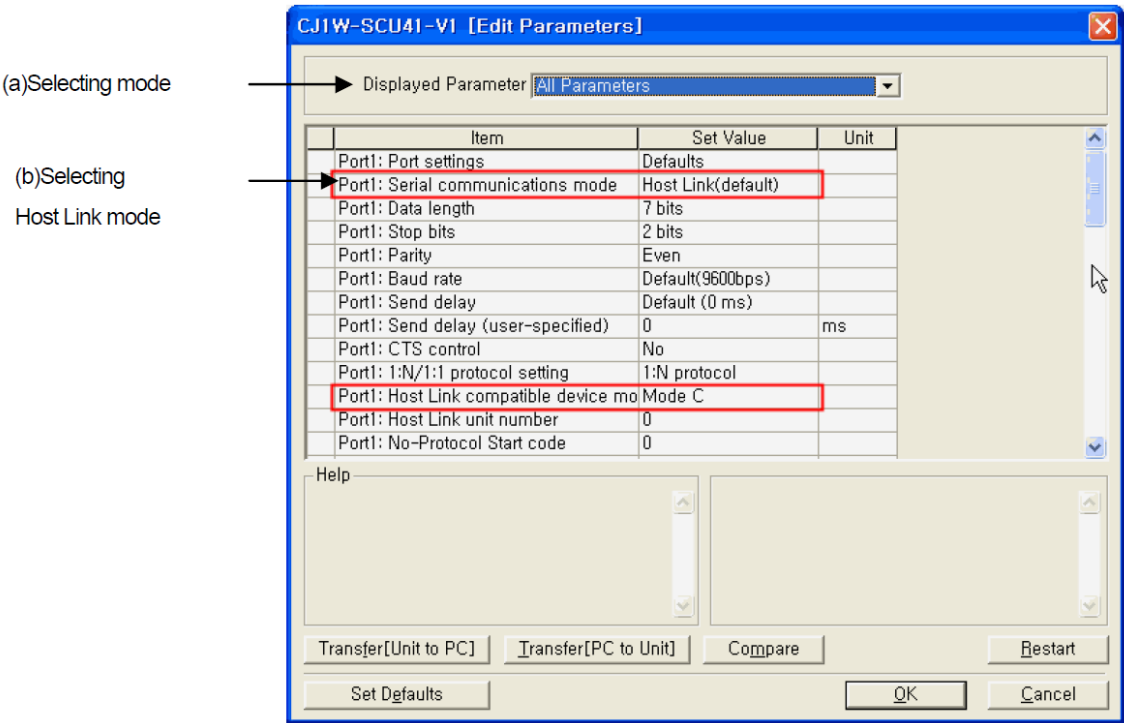
- Step1: Select 'IO Table and Unit Setup' at a project screen.



- Step2: If IO setting screen is displayed, select the communication module installed to PLC as below.



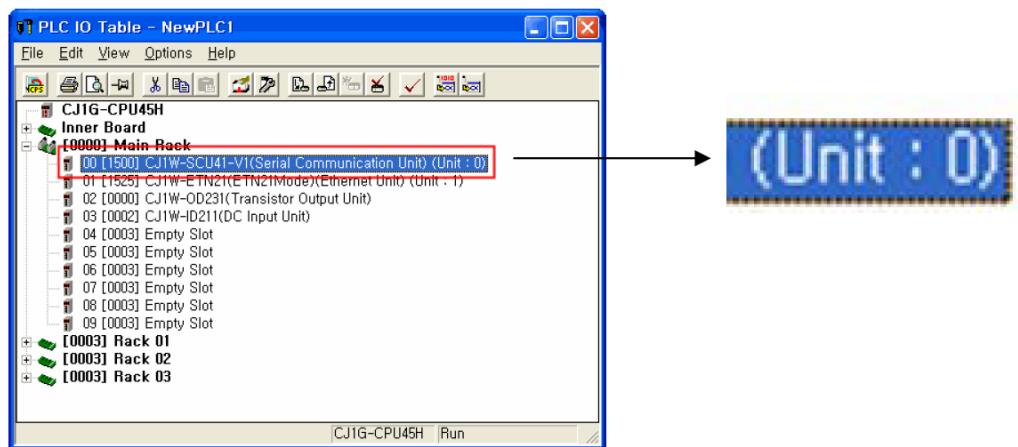
- Step3: If the communication setting screen is displayed as below, set communication parameters.



- a. Select 'Host Link' for the mode (Serial communications mode).
- b. Select 'Mode C' for Host Link mode(Host Link compatible device mode).
- c. The basic settings are as above but if you need to change communication settings at your discretion, change the Port Settings from 'Defaults' into 'User settings' as the following picture.

Item	Set Value	Unit
Port1: Port settings	User settings	
Port1: Serial communications mode	Host Link(default)	
Port1: Data length	7 bits	
Port1: Stop bits	2 bits	
Port1: Parity	Even	
Port1: Baud rate	115200bps	
Port1: Send delay	Default (0 ms)	
Port1: Send delay (user-specified)	0	ms
Port1: CTS control	No	
Port1: 1:N/1:1 protocol setting	1:N protocol	
Port1: Host Link compatible device mode	Mode C	
Port1: Host Link unit number	0	
Port1: No-Protocol Start code	0	

- Step4: Select 'Unit No.' at communication module. At this time, 'Unit No.' should be input when adding a new communication module at 'Step1' or you can select it at IO Setting screen as below.

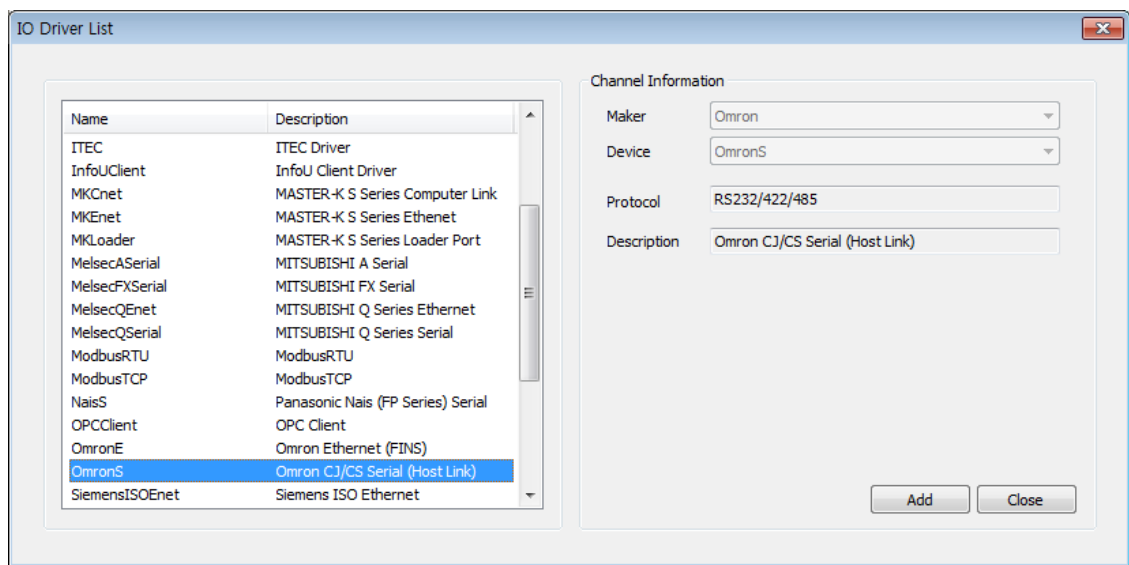


Notice

1. Suggestions to set PLC
 - ☞ This manual covers the simple description on setting so for setting communication, make sure to refer to OMRON manual.
 - ☞ The details on setting OMRON PLC can be changed without a previous notice, before setting communication, make sure to check OMRON Communication manual.
2. Checking communication status
 - ☞ There are SD, RD LED for Cnet module. If you have a normal communication, you can see that LED flashes fast.

(2) InfoU Setting: OmronS

1) Add Channel



Select “OmronS” from the I/O driver list and press “Add”.

- Channel Name: Input a channel name.
- Description: Input some information on the channel.
- COM Port #1: Select a serial port of PC.
- Baud Rate: Select a communication speed.
- Parity Bit: Select a parity bit.
- Data Bit: Select a data bit.
- Stop Bit: Select a stop bit.
- Time Out : It refers to a certain time period during which any response to the request for data is not made and after passing such a time period, the system will declare timeout to move on to the next process. The time period to be set will be a base to judge communication errors.
- Period: It refers to an interval to request data.
- Use RTS: Check ☒ in the box only when using Channel 485 and 422.
- Delay Time (Before): Information used only in Channel 485 and 422. The delay time right before requesting Data to PLC
- Delay Time (After): Information used only in Channel 485 and 422. The delay time right after requesting Data to PLC.
- Save: If 'Save' button is pressed, Channel information will be saved and the saved information will add to the left "Configuration Information" tree.

The dialog box is titled "Omron Serial Configuration Information". It has two main sections: "Configuration Information" on the left and "Channel Information" on the right.

Configuration Information: A tree view showing the hierarchy: "Omron Serial Driver Configuration Information" > "[New Channel]" > "OmronS" > "[New Station]". The "OmronS" node is selected.

Channel Information:

- Channel Name: OmronS
- Description: (empty)
- ☐ Line Redundancy ☐ Device Redundancy
- COM Port #1: COM1
- COM Port #2: (empty)
- COM Port #3: (empty)
- COM Port #4: (empty)
- Baud Rate: 38400
- Parity Bit: No Parity
- Data Bit: 8
- Stop Bit: 1
- Timeout: 2000 msec [1000 ~ 3000]
- Retry: 3 [1 ~ 5]
- ☐ Use RTS
- Delay Time (Before): 0 msec
- Delay Time (After): 15 msec

Buttons: "Save" and "Close".

2) Add Station

The dialog box is titled "Omron Serial Configuration Information". It has two main sections: "Configuration Information" on the left and "Station Information" on the right.

Configuration Information: A tree view showing the hierarchy: "Omron Serial Driver Configuration Information" > "[New Channel]" > "OmronS" > "[New Station]". The "[New Station]" node is selected.

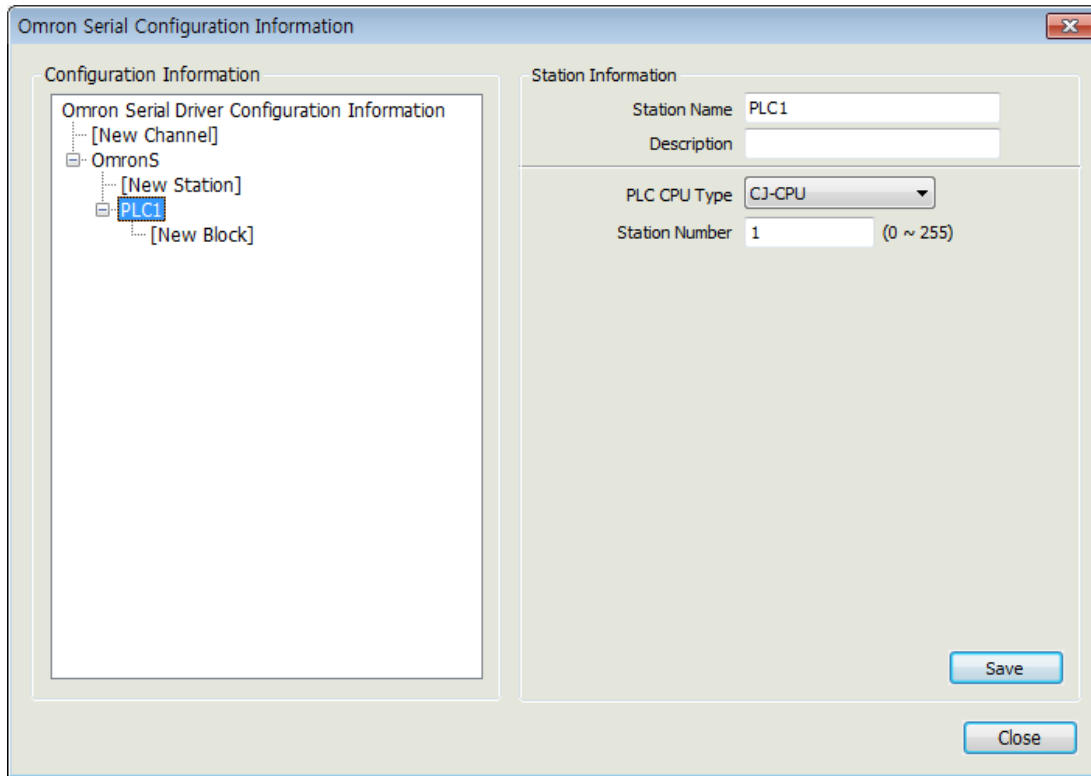
Station Information:

- Station Name: (empty)
- Description: (empty)
- PLC CPU Type: CJ-CPU
- Station Number: 1 (0 ~ 255)

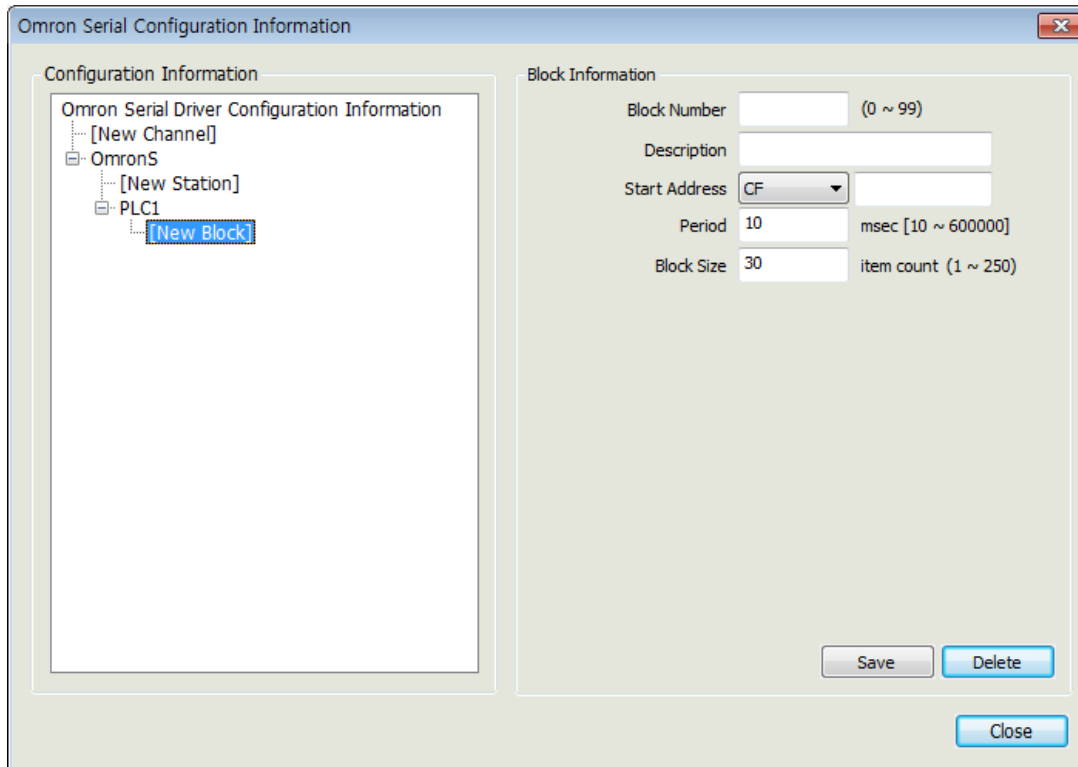
Buttons: "Save" and "Close".

- Select [New Station] from "Configuration Information" tree.
- Station Name: Input a station name.

- Description: Input some information on the station.
- PLC CPU Type: Select a PLC CPU type.
- Station Number: Input the number of PLC Cnet Module.
- Save: If 'Save' button is pressed, Station information will be saved and the saved information will add to the left "Configuration Information" tree.



3) Add Block



- Select [New Block] from “Configuration Information” tree.
- Block Number: This number is a unique code of the block. The user needs to designate a different code to each block.
- Description: Input some information on the block.
- Start Address: Input the Block’s Start Address.
 - Start Address : Memory Type (CIO, WR, HR, AR, TF, CF, EM0)+ Start Address
 - Block Size : A number of items to be loaded

Example 1) Start Address: C1010, Block Size: If it is 100, 100 words will be loaded starting from the 10th word of CIO memory (starting from 0)

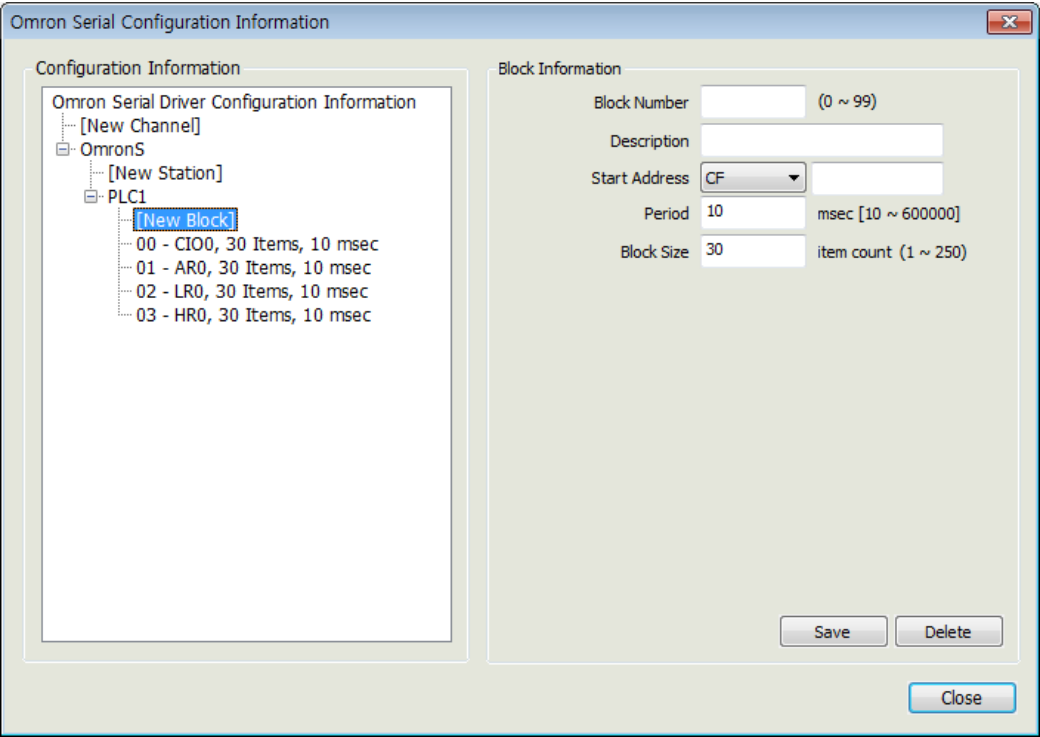
Example 2) Start Address: TF20, Block Size: If it is 20, 20 status bits will be loaded starting from the 20th status bit of TF memory (starting from 0)

Caution) CIO, LR, HR, AR, TIM, CNT, DM, EM, EM0, EM1, EM2, EM3, EM4, EM5, EM6, EM7, EM8, EM9, EMA, EMB AND EMC ARE DEVICES IN WORD UNIT.

Caution) TF and CF are devices in Bit unit.

Caution) If there are more than 30 devices in WORD unit and more than 120 devices in Bit unit, they can be read with multi frames.

- Period: Input an interval to collect data of the relevant block (unit: msec).
- Block Size: A number to read for each corresponding delimiter.
- Save: If 'Save' button is pressed, Block information will be saved and the saved information will add to the left "Configuration Information" tree.
- Delete: If "Delete" button is pressed, the currently selected Block will be deleted.



4) I/O Address

- Example of Analog Input Address
CIO_100: Load the value of the 100th word in CIO Area.
EM7_20000: Load the value of the 20000th Word in EM7 Area.
- Example of Digital Input Address
CIO_90A: Load the 10(A)th bit value of the 90th word in CIO Area.
EM7_07: Load the 7th bit value of the 0th word in EM7 Area.
TF_123: Load the completion flag value of the timer in Timer Flag Area.
- Omron PLC Memory Device Map

Memory Code	Description	Data Type	CS/CJ CPU Memory Address	CV CPU Memory Address	Remarks	Address Example
CIO	CIO Area	WORD	0~6143	0~2555		AI : CIO_xxxx (xxxx : 0~6143) CIO_100 DI : CIO_xxxx0~F(xxxx : 0~6143) CIO_100A

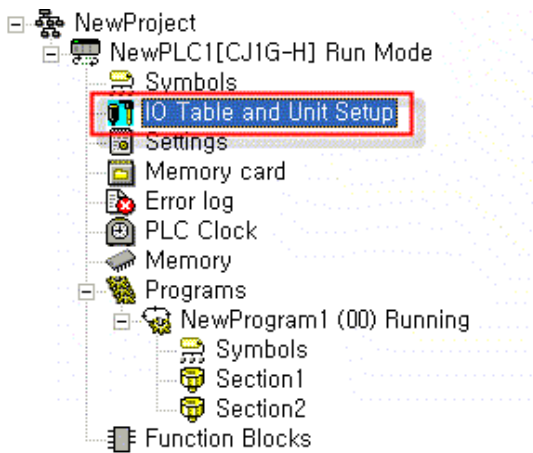
LR	CIO1000~CIO1199		0~199	—		AI : WR_xxxx (xxxx : 0~511) WR_100 DI : WR_xxxx0~F(xxxx : 0~511) WR_0F
HR	Holding Bit Area		0~511			AI : HR_xxxx (xxxx : 0~511) HR_234 DI : HR_xxxx0~F(xxxx : 0~511) HR_19
AR	Auxiliary Bit Area		0~959		0~959 0~447 (Read only), 448~959 (Read /Write)	AI : AR_xxxx (xxxx : 0~511) AR_800 DI : AR_xxxx0~F(xxxx : 0~511) AR_9001
TF	Timer Area	Completion Flag(BIT)	0~2047	0~2047 or 0~1023	Read only	DI : TF_xxxx(xxxx : 0~4095), TF_2047
CF	Counter Area					DI : CF_xxxx(xxxx : 0~4095), CF_2048
TIM	Timer Area PV	WORD	0~2047	0~2047 or 0~1023		AI : TIM_xxxx (xxxx : 0~4095) TIM_1000
CNT	Counter Area PV					AI : CNT_xxxx (xxxx : 0~4095) CNT_2000
DM	DM Area		0~9999	0~9999		AI : DM_xxxxx (xxxxx : 0~32767) DM_10000 DI : DM_xxxxx0~F(xxxxx : 0~32767) DM_900E
EM0~EM7	EM Area					AI : EM0_xxxxx (xxxxx : 0~32767) EM0_9000 DI : EM0_xxxxx0~F(xxxxx : 0~32767) EM0_7000A
EM7~EMC				—	AI : EMA_xxxxx (xxxxx : 0~32767) EMA_9000 DI : EMA_xxxxx0~F(xxxxx : 0~32767) EMA_7000A	
EM				0~9999		AI : EM_xxxxx (xxxxx : 0~32767) EM_9000 DI : EM_xxxxx0~F(xxxxx : 0~32767) EM_7000A

18.2.2 Link method: FEnet

(1) PLC Setting

You can set the communication parameter of PLC at CX-Programmer and for more details, refer to OMRON Communication manual.

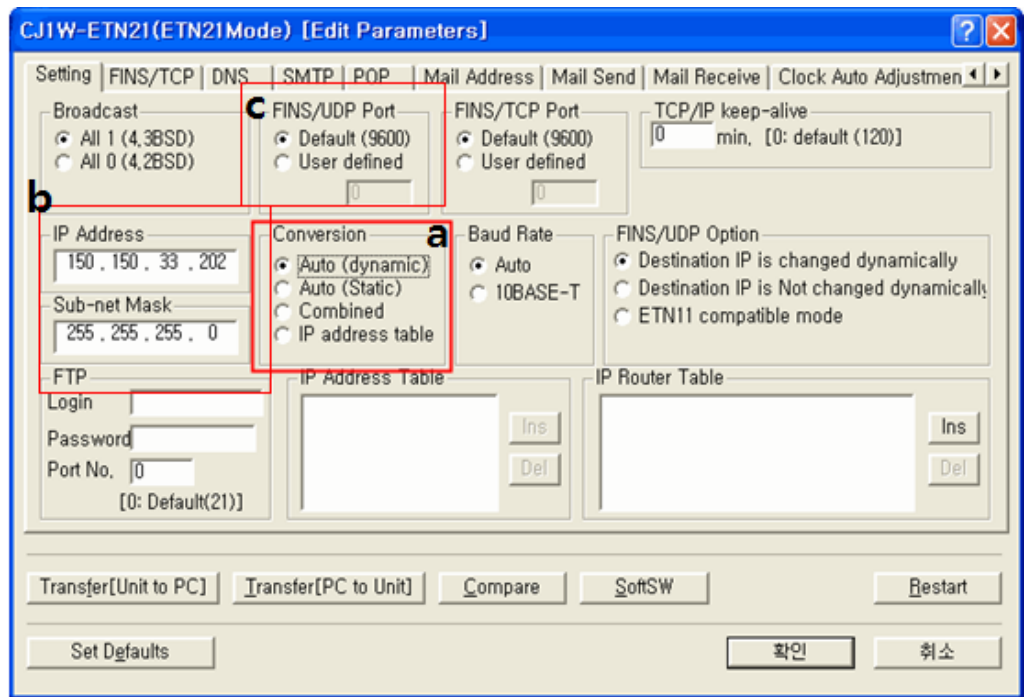
- Step1: Select 'IO Table and Unit Setup' a project screen.



- Step2: If IO setting screen is displayed, select Ethernet communication module installed to PLC.

- Step3.1: You can set the Ether module with two communication protocol module types. First, you can see how to set UTP/IP.

- a. Select 'Auto (dynamic)' mode at the below setting screen.



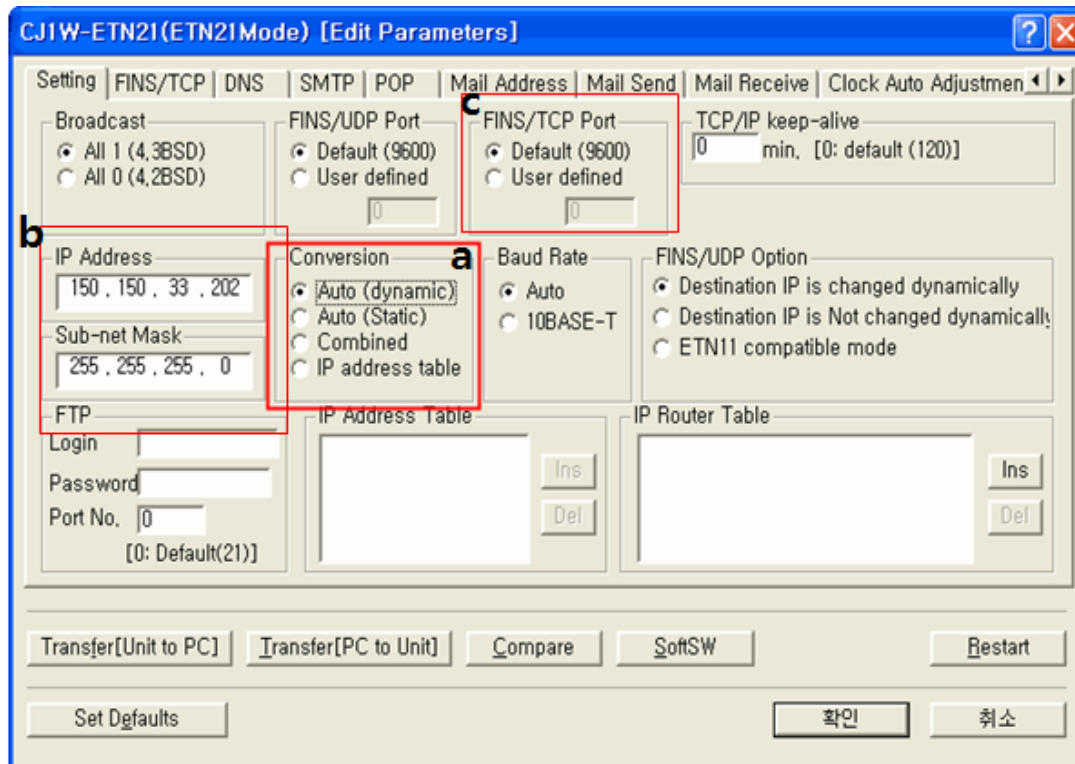
- b Set IP address and Sub-net Mask. Set Sub-net Mask as '255.255.255.0' like the picture and IP address

should have the same 3 digits(XXX.XXX.XXX.~) as InfoU(namely, it should be connected to the same network.)

c. Select the port as 'Default(9600)'.

• Step3.2: Now, you can see how to set TCP/IP.

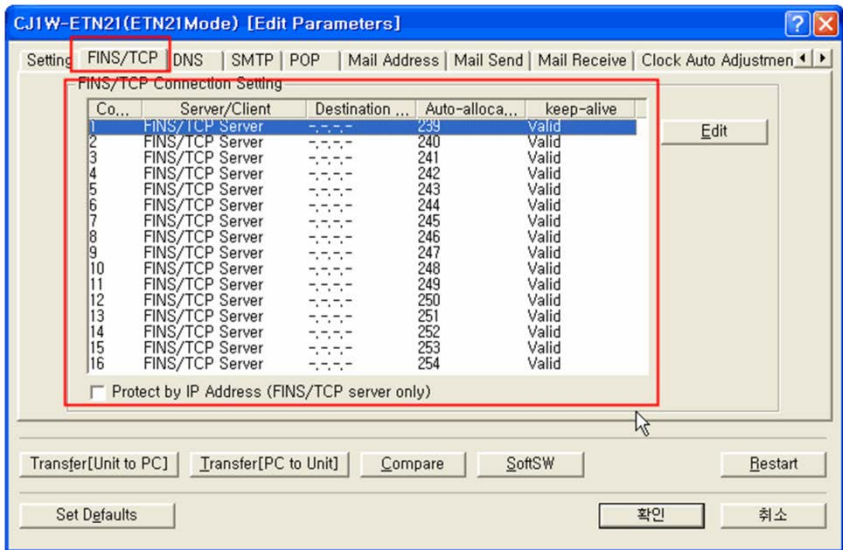
a. Select 'Auto(dynamic)' mode at the below display screen.



b. Set IP address and Sub-net Mask. Set Sub-net Mask as '255.255.255.0' like the picture and IP address should have the same 3 digits (XXX.XXX.XXX. ~) as InfoU (namely, it should be connected to the same network.)

c. Set the port as 'Default (9600)'.

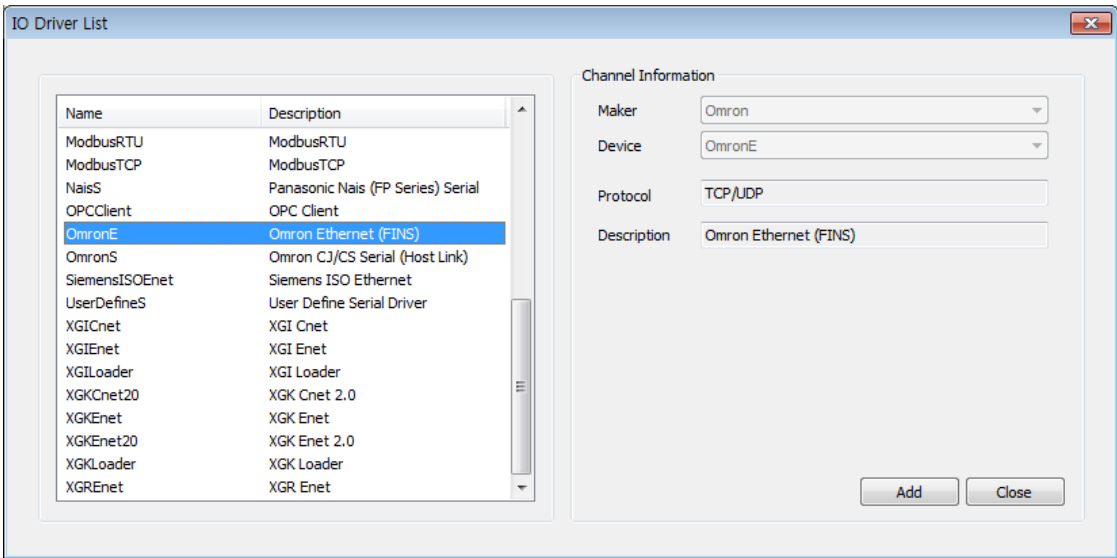
d. Set FINS/TCP Server as below, which is basically set so check it.



Notice

- 1. Checking communication status
 - There are SD, RD LED for Cnet module. If you have a normal communication, you can see that LED flashes fast.
- 2. Suggestions to set PLC
 - This manual covers the simple description on setting so for setting communication, make sure to refer to OMRON manual.
 - The details on setting OMRON PLC can be chanted without a previous notice, before setting communication, make sure to check OMRON Communication manual.

- (2) InfoU Setting: OmronE
 - 1) Add Channel



Select “OmronE” from the I/O driver list and press “Add”.

- Channel Name: Input a channel name.
- Description: Input some information on the channel.
- Serve IP Address #1: Input PC's IP Address.
- Server IP Address #2: If Line Redundancy will be used, input the second IP Address to be used.
- Time Out : It refers to a certain time period during which any response to the request for data is not made and after passing such a time period, the system will declare timeout to move on to the next process. The time period to be set will be a base to judge communication errors.
- Retry: Set up the number of times to retry when communication fails.
- Start Offset Address: Select either 0 or 1. It sets up whether to start from either 0 or 1.
- Save: If 'Save' button is pressed, Channel information will be saved and the saved information will add to the left "Configuration Information" tree.

The dialog box is titled "Omron FINS Configuration Information". It has two main sections: "Configuration Information" on the left and "Channel Information" on the right.

Configuration Information: A tree view showing "Omron FINS Driver Configuration Information" with sub-items "[New Channel]", "OmronE", and "[New Station]". "OmronE" is selected.

Channel Information:

- Channel Name: OmronE
- Description: (empty)
- PC IP Address #1: 127 . 0 . 0 . 1
- PC IP Address #2: 0 . 0 . 0 . 0
- Timeout: 2000 msec [1000 ~ 3000]
- Retry: 3 [1 ~ 5]

Buttons: "Save" and "Close".

2) Add Station

The dialog box is titled "Omron FINS Configuration Information". It has two main sections: "Configuration Information" on the left and "Station Information" on the right.

Configuration Information: A tree view showing "Omron FINS Driver Configuration Information" with sub-items "[New Channel]", "OmronE", and "[New Station]". "[New Station]" is selected.

Station Information:

- Station Name: (empty)
- Description: (empty)
- PLC CPU Type: CJ-CPU (dropdown)
- ☐ Line Redundancy ☐ Device Redundancy
- PLC IP Address #1-1: 0 . 0 . 0 . 0
- PLC IP Address #1-2: 0 . 0 . 0 . 0
- PLC IP Address #2-1: 0 . 0 . 0 . 0
- PLC IP Address #2-2: 0 . 0 . 0 . 0
- Port: 9600
- PLC Network Addr: 1 [1~127]
- PLC Node Addr: 1 [1~126]
- PC Network Addr: 1 [1~127]
- PC Node Addr: 100 [1~126]
- Unit ID: 0

Buttons: "Save" and "Close".

- Select [New Station] from "Configuration Information" tree.
- Station Name: Input a station name.
- Description: Input some information on the station.
- Line Redundancy: Check ☒ in the box to use Line Redundancy.
- Device Redundancy: Check ☒ in the box to use Device Redundancy.
- PLC IP Address #1-1: Input PLC's IP Address.
- PLC IP Address #1-2: Input PLC's IP Address. Input the address when using Line Redundancy.
- PLC IP Address #2-1: Input PLC's IP Address. Input the address when using Device Redundancy.
- PLC IP Address #2-2: Input PLC's IP Address. Input the address when using Line Redundancy along

with Device Redundancy.

- Communication Type: Select either TCP or UDP.
- Port: For FINS, a default value 9600 is set before it leaves the factory but it is allowed to change PLC setting values if other ports are preferred.
- PC Node Addr: Input the network address of the Omron PLC device to be communicated with. Default '1'
- PC Node Addr: Input the node address of the Omron PLC device to be communicated with. Default '1'
- PC Node Addr: Input the network address of the PC (InfoU PC) being communicated with. Default '1'
- PC Node Addr: Input the node address of the PC (InfoU PC) being communicated with. Default '100'
- Unit ID: Select one among 0 through F. (Prefix)
- Save: If 'Save' button is pressed, Station information will be saved and the saved information will add to the left "Configuration Information" tree.

Omron FINS Configuration Information

Configuration Information

Omron FINS Driver Configuration Information

- [New Channel]
- OmronE
 - [New Station]
 - PLC01
 - [New Block]

Station Information

Station Name PLC01

Description

PLC CPU Type CJ-CPU

☐ Line Redundancy ☐ Device Redundancy

PLC IP Address #1-1	192	.	168	.	0	.	10
PLC IP Address #1-2	0	.	0	.	0	.	0
PLC IP Address #2-1	0	.	0	.	0	.	0
PLC IP Address #2-2	0	.	0	.	0	.	0

Port 9600

PLC Network Addr 1 [1~127]

PLC Node Addr 1 [1~126]

PC Network Addr 1 [1~127]

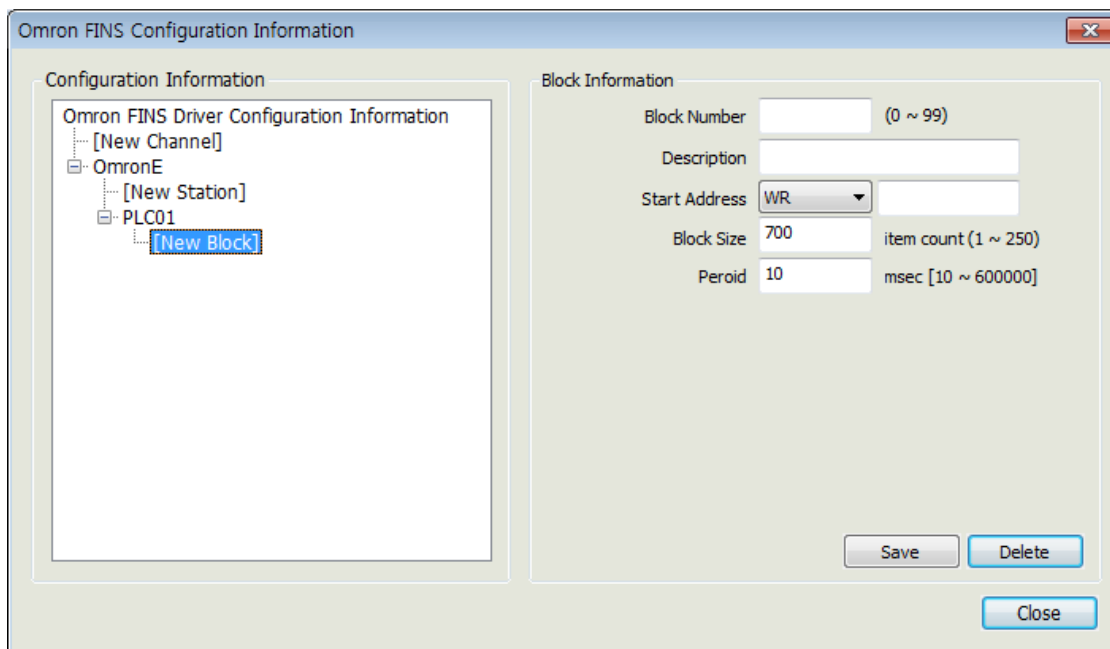
PC Node Addr 100 [1~126]

Unit ID 0

Save

Close

3) Add Block



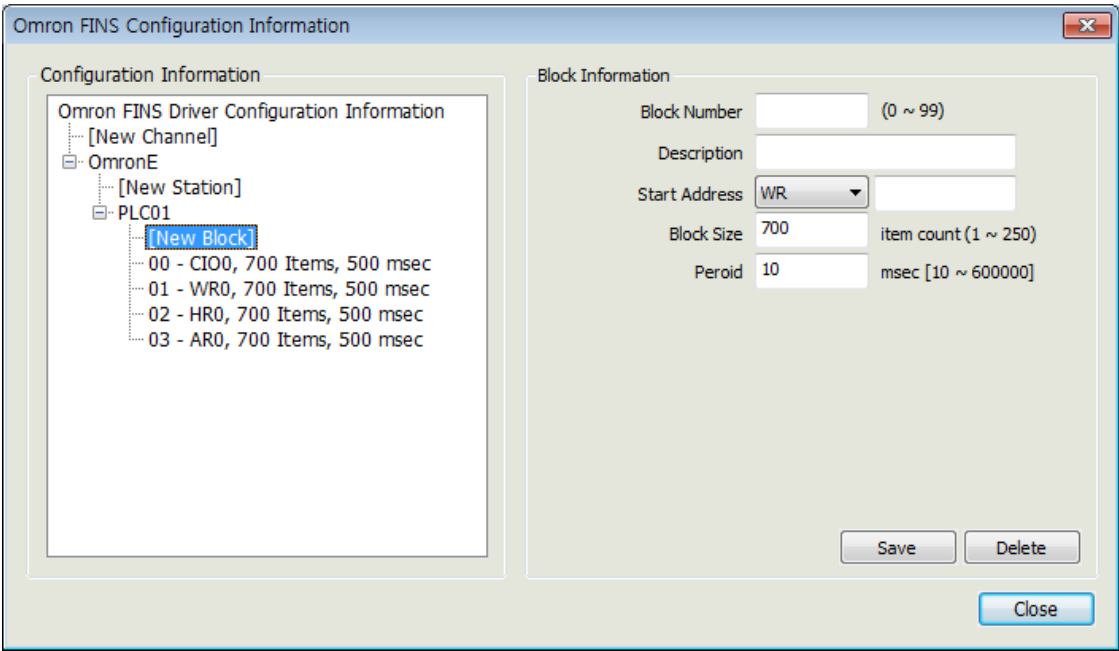
- Select [New Block] from “Configuration Information” tree.
- Block Number: This number is a unique code of the block. The user needs to designate a different code to each block.
- Description: Input some information on the block.
- Start Address: Input the Block’s Start Address.
 - Start Address : Memory Type (CIO, WR, HR, AR, TF, CF, EM0)+ Start Address
 - Block Size : A number of items to be loaded

Example 1) Start Address: C1010, Block Size: If it is 100, 100 words will be loaded starting from the 10th word of CIO memory (starting from 0)

Example 2) Start Address: TF20, Block Size: If it is 20, 20 status bits will be loaded starting from the 20th status bit of TF memory (starting from 0)

※ CIO, WR, HR, AR, TIM, CNT, DM, EM, EM0, EM1, EM2, EM3, EM4, EM5, EM6, EM7, EM8, EM9, EMA, EMB, EMC, EM_CURR, DR은 WORD단위의 디바이스이며, IR은 DWORD단위의 디바이스이다. TKF, TKS, TF and CF are devices in Bit unit.

- Period: Input an interval to collect data of the relevant block (unit: msec).
- Block Size: A number to read for each corresponding delimiter.
- Save: If ‘Save’ button is pressed, Block information will be saved and the saved information will add to the left “Configuration Information” tree.
- Delete: If “Delete” button is pressed, the currently selected Block will be deleted.



4) I/O Address

- Example of Analog Input Address
CIO_100 : Load the value of the 100th word in CIO Area
EM7_20000 : Load the value of the 20000th Word in EM7 Area.
- Example of Digital Input Address
CIO_90A: Load the 10(A)th bit value of the 90th word in CIO Area.
EM7_07: Load the 7th bit value of the 0th word in EM7 Area.
TF_123: Load the completion flag value of the timer in Timer Flag Area.

• Omron PLC Memory Device Map

Memory Code	Description	Data Type	CS/CJ CPU Memory Address	CV CPU Memory Address	Remark	Address Example
CIO	CIO Area	WORD	0~6143	0~2555		AI : CIO_xxxx (xxxx : 0~6143) CIO_100 DI : CIO_xxxx0~F(xxxx : 0~6143) CIO_100A
WR	Work Area		0~511			AI : WR_xxxx (xxxx: 0~511) WR_100 DI : WR_xxxx0~F(xxxx : 0~511) WR_0F

HR	Holding Bit Area					AI : HR_xxxx (xxxx : 0~511) HR_234 DI : HR_xxxx0~F(xxxx : 0~511) HR_19
AR	Auxiliary Bit Area		0~959	0~959	0~447 (Read Only), 448~959 (Read/ Write)	AI : AR_xxxx (xxxx : 0~511) AR_800 DI : AR_xxxx0~F(xxxx : 0~511) AR_9001
TF	Timer Area	Completion Flag (BIT)	0~4095	0~2047 or 0~1023	Read Only	DI : TF_xxxx(xxxx : 0~4095), TF_2047
CF	Counter Area					DI : CF_xxxx(xxxx : 0~4095), CF_2048
TIM	Timer Area PV	WORD	0~4095	0~2047 or 0~1023		AI : TIM_xxxx (xxxx : 0~4095) TIM_1000
CNT	Counter Area PV					AI : CNT_xxxx (xxxx : 0~4095) CNT_2000
DM	DM Area		0~32767	0~ 32767		AI : DM_xxxxx (xxxxx : 0~32767) DM_10000 DI : DM_xxxxx0~F(xxxxx : 0~32767) DM_900E
EM0~EM7	EM Area					AI : EM0_xxxxx (xxxxx : 0~32767) EM0_9000 DI : EM0_xxxxx0~F(xxxxx : 0~32767) EM0_7000A
EM7~EMC						AI : EMA_xxxxx (xxxxx : 0~32767) EMA_9000 DI : EMA_xxxxx0~F(xxxxx : 0~32767) EMA_7000A
EM						AI : EM_xxxxx (xxxxx : 0~32767) EM_9000 DI : EM_xxxxx0~F(xxxxx : 0~32767) EM_7000A
EM_CURR			O of 0th (Current Bank No)		AI : EM_0	
TKF	Task Flag BIT	BIT	0~31		Read Only	DI : TKF_xxxx(xxxx : 0~31), TKF_21
TKS	Task Flag Status					

IR	Index Register	DWORD	0~15			AI : IR_xxxx (xxxx : 0~15) IR_5
DR	Data Register	WORD		0~15		AI : DR_xxxxx (xxxxx : 0~15) DR_9 DI : DR_xxxxx0~F(xxxxx : 0~15) DR_1A

18.3 Available Device

InfoU에서 사용 가능한 디바이스는 통신 드라이버의 입출력 주소를 참고하시기 바랍니다.

Notice

- ☞ Use it within device area.
- ☞ The range of device may be different depending on CPU module so refer to each CPU module manual.