SIEMENS AG.

SIMETIC S7 3964(R)/RK512

Compatible version	OS	Over 4.0
	XDesignerPlus	Over 4.0.0.0

CONTENTS

Thank you for using M2I's ¡°Touch Operation Panel(M2I TOP) Series¡. Please read out this manual and make sure to learn connection method and process of TOP – External device"

1. System configuration Page 2

It explains device for connection, setup of, cable and structural system.
Please choose proper system referring to this point.

2. Selecting TOP model and external devices Page 3

Select TOP model and external device..

3. Example of system settings Page 4

It explains setup example for communication connection between the device and external terminal.
Select example according to the system you choose in "1. System structure"

4. Communication settings details Page 12

It explains the way of configuring TOP communication.
If external setup is changed, make sure to have same setup of TOP with external device by referring to this chapter.

5. Cable diagram Page 15

Explains cable specifications required for access.
Select proper cable specifications according to the system you chose in "1. System configuration".

6. Support address Page 17

Check available addresses to communicate with external devices referring to this chapter.

1. System configuration

The system configuration of TOP and "SIEMENS AG. - SIEMETIC S7 3964(R)/RK512" is as below.

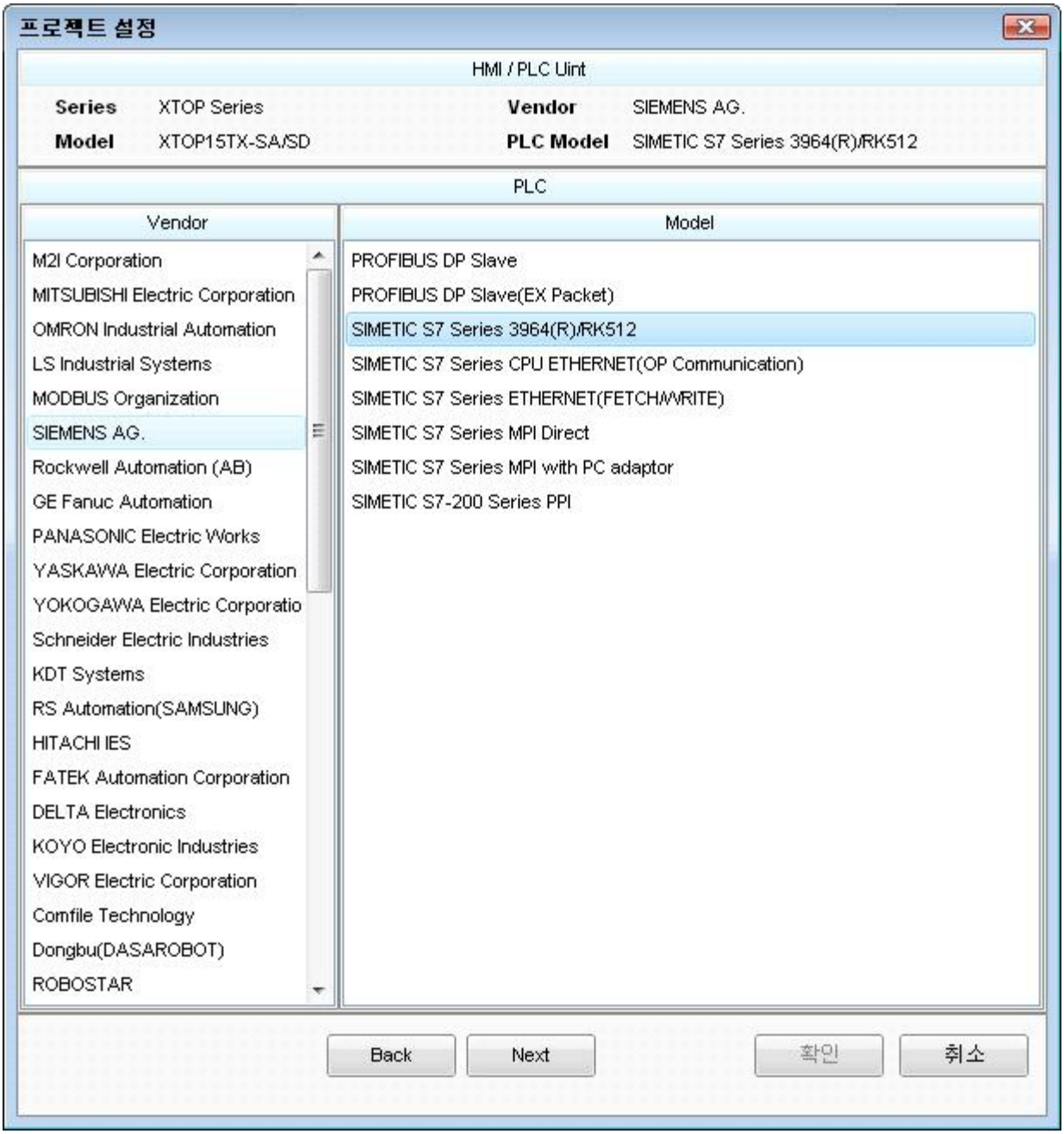
Series	CPU	Link I/F	Method	System settings	Cable
SIMETIC S7-300	CPU312 IFM CPU313 CPU314 CPU314 IFM CPU315 CPU315(F)-2 DP CPU315(F)-2 PN/DP CPU316 CPU316-2 DP CPU317-2 DP CPU317F-2 CPU318-2 CPU317-2 PN/DP CPU319-3 PN/DP CPU614 CPU388	CP341	RS-232C	3.1 설정 예제 13.1 Setting Example 1 (Page 4)	5.1 Cable Diagram 1 (Page 15)
		CP341	RS-422 (4 wire)	3.2 설정 예제 23.2 Setting Example 1 (Page 8)	5.2 Cable Diagram 2 (Page 16)
SIMETIC S7-400	CPU412-1 CPU412-2 DP CPU413-1 CPU413-2 DP CPU414-1 CPU414-2 DP CPU414-3 DP CPU416-1 CPU416-2 DP CPU416-3 DP CPU417-4 CPU414-3PN/DP CPU416-3PN/DP CPU417 CPU486	CP441-2	RS-232C	3.1 설정 예제 13.1 Setting Example 1 (Page 4)	5.1 Cable Diagram 1 (Page 15)
			RS-422 (4 wire)	3.2 설정 예제 23.2 Setting Example 1 (Page 8)	5.2 Cable Diagram 2 (Page 16)

■ Connection configuration

・1:1 connection (TOP 1 vs. external device)

2. Selecting TOP model and external devices

Select the external devices to connect to TOP.



Setting details		Contents
TOP	Series	Select the name of a TOP series that is to be connected to PLC. Before downloading the settings, install the OS version specified in the table below according to TOP series. Series: XTOP / HTOP — Version name: V4.0
	Name	Select the model name of TOP product.
External device	Manufacturer	Select the manufacturer of external devices to be connected to TOP. Select "SIEMENS AG".
	PLC	Select the model series of external devices to be connected to TOP. Please choose "SIEMETIC S7 3964(R)/RK512". Please check, in the "1. System configuration", if the relevant external device is available to set a

		system configuration.

3. Example of system settings

The setup of communication interface between TOP and SIEMTIC S7 is recommended as below.

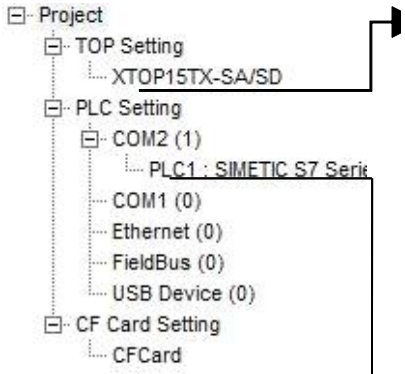
3.1 Example of settings 1

The system is set as below.

Details		TOP	SIEMTIC S7 Series	Remark
Serial level (port/channel)		RS-232C (COM2)	RS-232C	User settings
Serial baud rate	[BPS]	76800		User settings
Serial data bit	[Bit]	8		User settings
Serial stop bit	[Bit]	1		User settings
Serial parity bit	[Bit]	EVEN		User settings
Motion mode		RK512		User settings

((1) XDesignerPlus setup

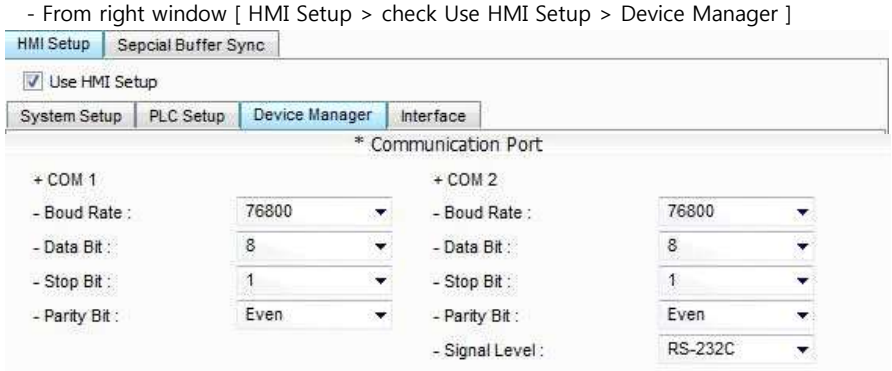
After setting the below details in [Project > Project Settings], download the detailed settings using TOP tool.



■ [Project > Project property > Project > Settings > TOP Name]

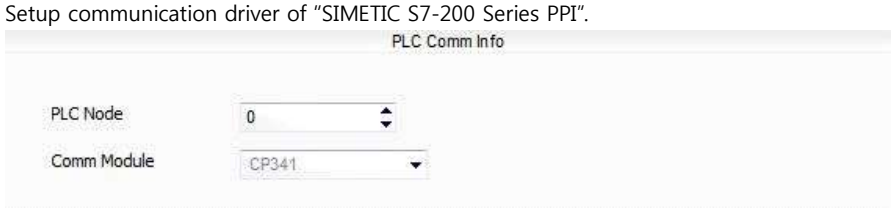
Set the communication interface of TOP tool.

- From right window [HMI Setup > check Use HMI Setup > Device Manager]



■ External device settings

Setup communication driver of "SIMETIC S7-200 Series PPI".



– PLC Node No. : Input Node address of External device.

(2) External device settings

Setup as below using SIEMTIC S7 Ladder Software STEP 7. Please refer the PLC user manual for more detailed information if you need.

> Setup PLC node address lower than "Highest Node Address".

1. Create a new project in [New Project] at upper bar of main menu of [SIMETIC Manager].

2. Select menu [Insert] > [Station] > [1 SIMETIC 400 Station] or [2 SIMETIC 300 Station].

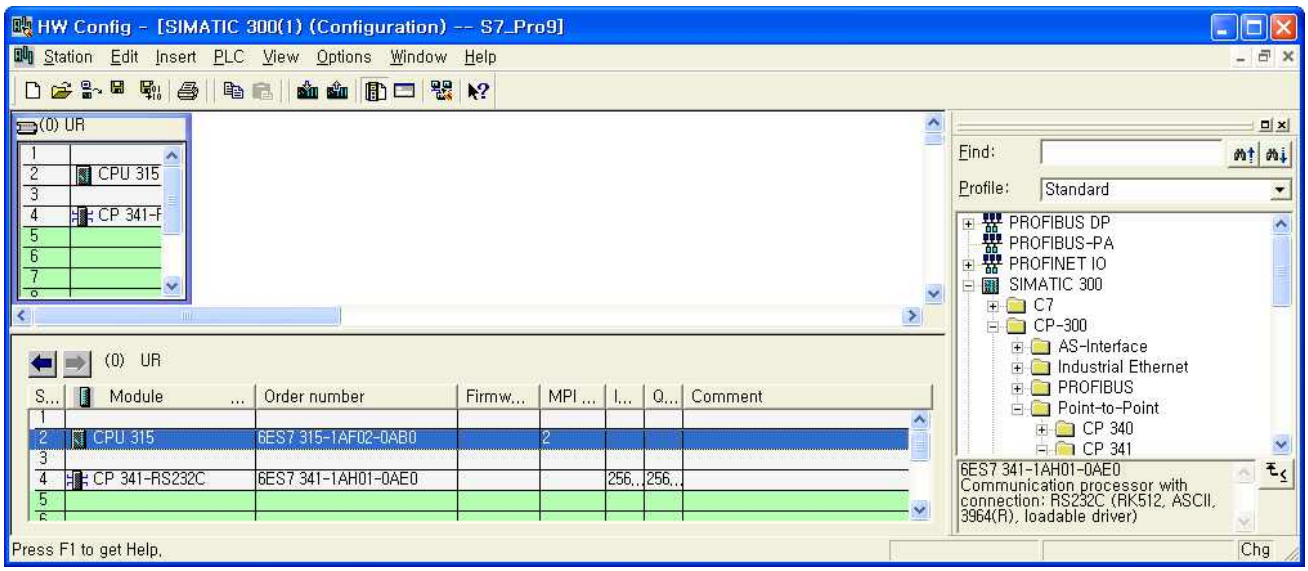
3. Double click added "[SIMETIC 400(1)]" or [SIMETIC 300(1)] CPU > Relevant CPU [Hardware] (New [HW Config] window appears.

4. Open "[SIMATIC 400] > [RACK-400]" or "[SIMATIC 300] > [RACK-300]" at left tree window in [HW Config], select Base unit model, and register it using Drag & Drop to the right bottom.

5. Select [SIMATIC 400] > [PS-400] or [PS-300] and then appropriate power supply unit, and drag & drop it to the current Rack.

6. Select [SIMATIC 400] > [CPU-400] or [CPU-300] and then appropriate CPU unit and drag& drop it to the current Rack.
(If [Properties] – PROFIBUS interface DP] windows appears, press [Cancel] to finish).

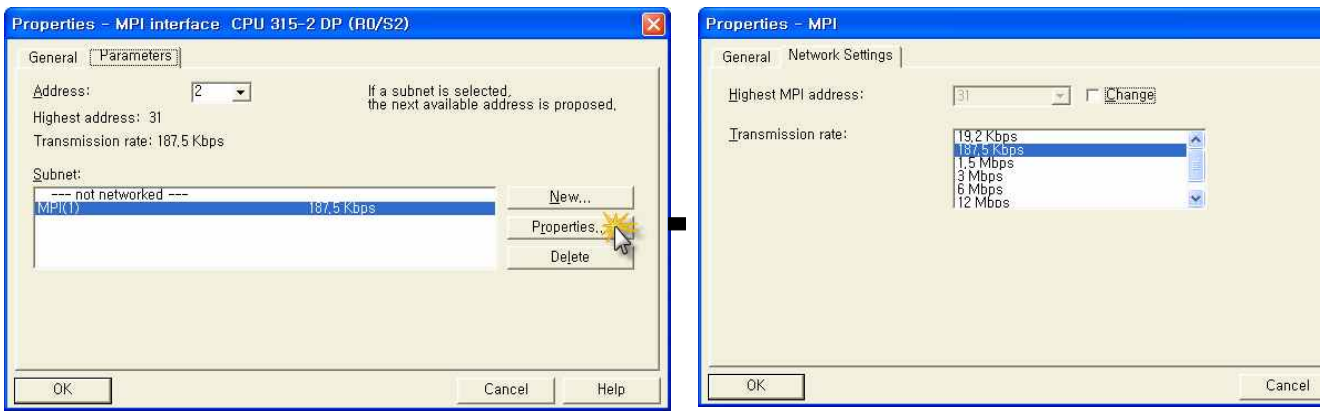
7. Select [SIMATIC 400] > [CPU-400] or [CPU-300] and then appropriate CPU unit and drag& drop it to the current Rack.



8. Double click registered CPU name. → A new relevant CPU [Properties] window appears.

9. Select [Interface] > [Properties] at [General] tap in [Properties] to popup [Properties - MPI interface CPU xxx-xxx] window.

10. Setup MPI port station number and transmission rate as below at [Properties - MPI interface CPU xxx-xxx] window's [Parameter] tap, (Transmission speed change: Click [Properties] > [Properties] window [Network Settings] tap)



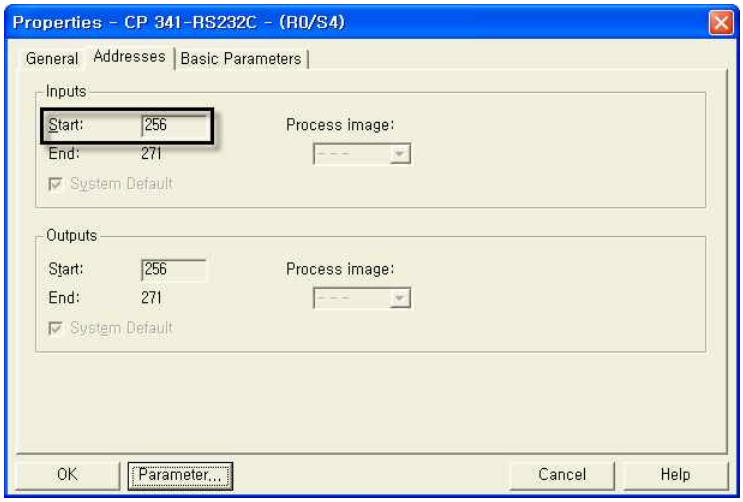
Details	Contents
Staion number	2 (Default)
Transmission rate	187500bps (Default)

11. Click [OK] to save the setting details on the [Properties] window.

12. Double click serial communication unit that is registered before on [HW Config] window. (A new [Properties] window will be

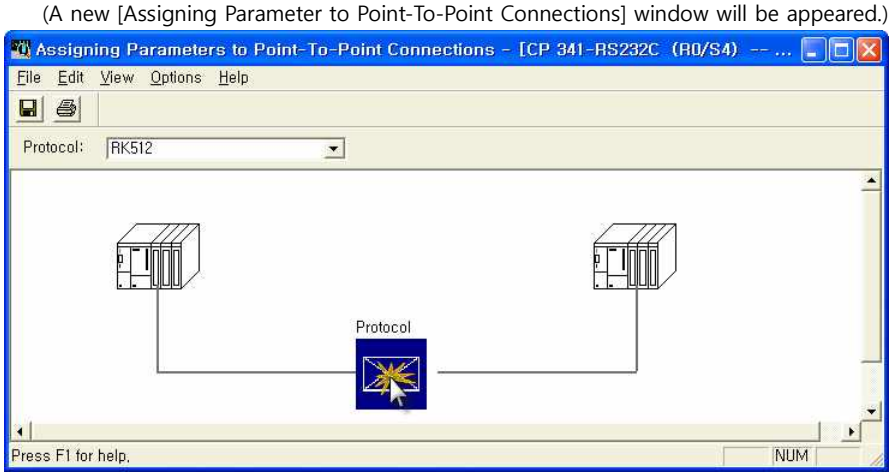
appeared.)

13. This confirms the Input Start Address from [Inputs]>[Start] in [Properties] > [Addresses] Tap.



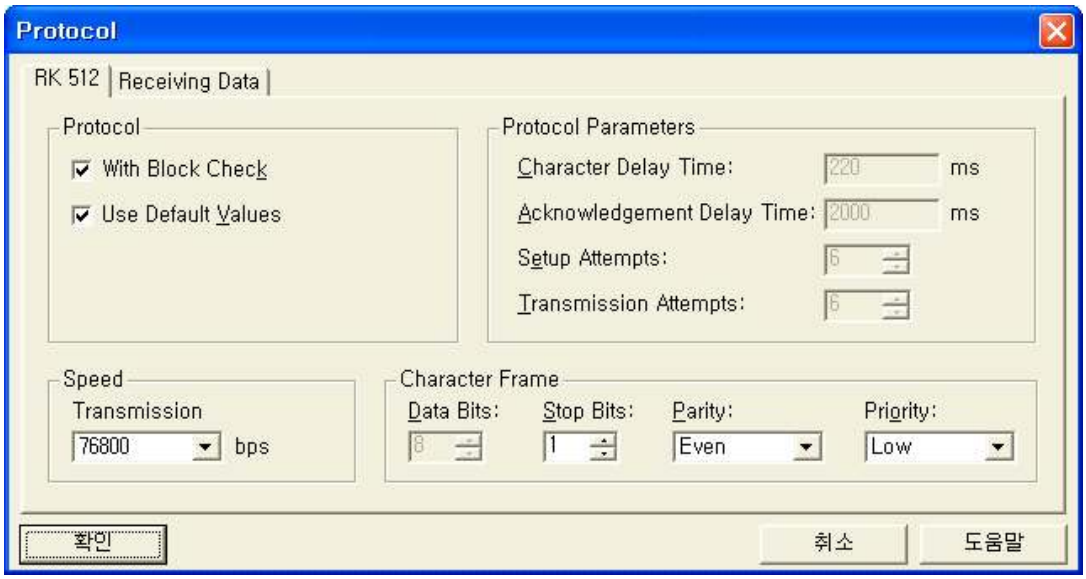
14. Click [Parameter...] key in the down side of [Properties] window.

(A new [Assigning Parameter to Point-To-Point Connections] window will be appeared.)



15. Set the [Protocol] to [RK512] from [Assigning Parameter to Point-To-Point Connections] window.

16. Input as below on [RK512] Protocol detail settings after double clicking [Protocol] box in the middle of screen.



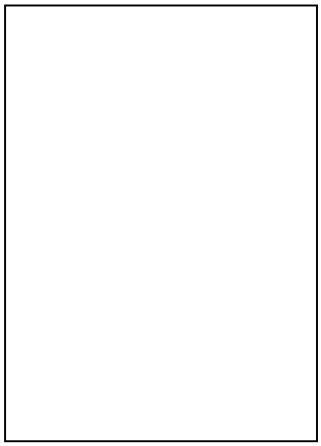
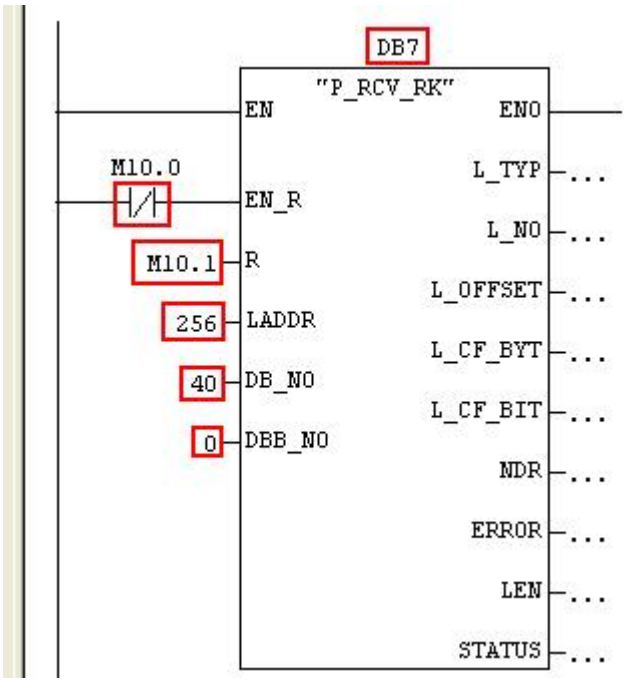
Details	Setting Information	Details	Setting Information
With Block Check	Check	Stop Bits	1
Use Default Values	Check	Parity	Even
Transmission Rate	76800 bps	Priority	Low

17. After saving settings by following [File] > [Save], execute [Assigning Parameter to Point-To-Point Connections] turn off the window.

18. Save hardware setting information by selecting [Station] > [Save and Compile].

19. [SIMATIC Manager] on window project tree, select [Name of the CPU that is registered in HW Config] and select [Blocks], double click [OB1]. (If [Properties] window pops up, click [ok].) (Run Ladder software [LAD/STL/FBD])

20. Set the parameter from Ladder software [LAD/STL/FBD]. Please set up after selecting one of examples below following by [Language for selected Blocks] > [STL] or [LAD].

[Language for selected Blocks] > [STL]	[Language for selected Blocks] > [LAD]
 CALL "P_RCV_RK" , DB7 EN_R :=TRUE R :=FALSE LADDR :=256 DB_NO := DBB_NO := L_TYP := L_NO := L_OFFSET := L_CF_BYT := L_CF_BIT := NDR := ERROR := LEN := STATUS :=	 (예) [Libraries] > [CP 341] > [FB7 P_RCV_RK CP341]

◆ Description

Details	Contents
DB7	DB number that P_RCV_RK will apply for communication receiving.
EN_R	Communication can be possible when 'EN_R' sets to ON
R	Input Reset
LADDR	Input Start Address number that has been confirmed on sequence 13th
DB_NO	Input DB that will be used. Read and Write on communication where it has been given.

21. Compile by selecting [Station] > [Save and Compile], and download setup details into PLC.

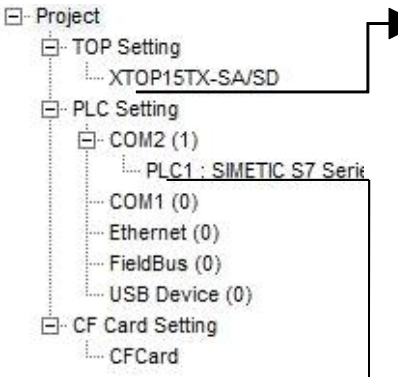
3.2 Example of Settings 2

The system is set as below.

Details		TOP	SIEMTIC S7 Series	Remark
Serial level (port/channel)		RS-422 (4 wire, COM2)	RS-422	User settings
Serial baud rate	[BPS]	76800		User settings
Serial data bit	[Bit]	8		User settings
Serial stop bit	[Bit]	1		User settings
Serial parity bit	[Bit]	EVEN		User settings
Motion mode		RK512		User settings

(1) XDesignerPlus setup

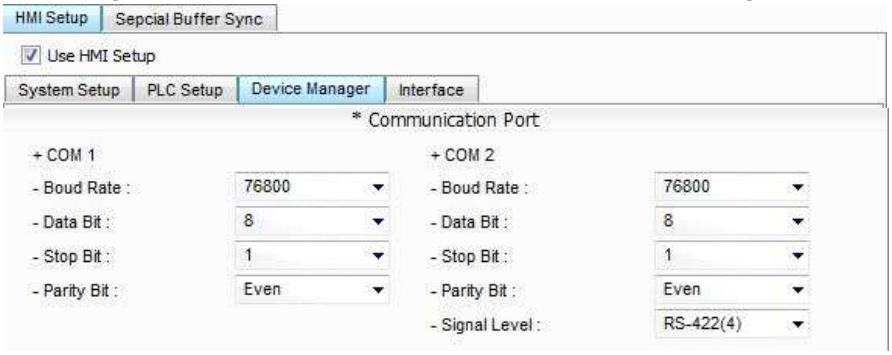
After setting the below details in [Project > Project Settings], download the detailed settings using TOP tool.



■ [Project > Project property > Project > Settings > TOP Name]

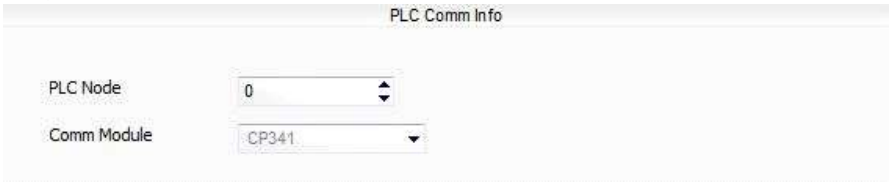
Set the communication interface of TOP tool.

- From right window [HMI Setup > check Use HMI Setup > Device Manager]



■ External device settings

Setup communication driver of "SIMETIC S7-200 Series PPI".



– PLC Node No. : Input Node address of External device.

(2) External device settings

Setup as below using SIEMTIC S7 Ladder Software STEP 7. Please refer the PLC user manual for more detailed information if you need.

> Setup PLC node address lower than "Highest Node Address".

1. Create a new project in [New Project] at upper bar of main menu of [SIMETIC Manager].

2. Select menu [Insert] > [Station] > [1 SIMETIC 400 Station] or [2 SIMETIC 300 Station].

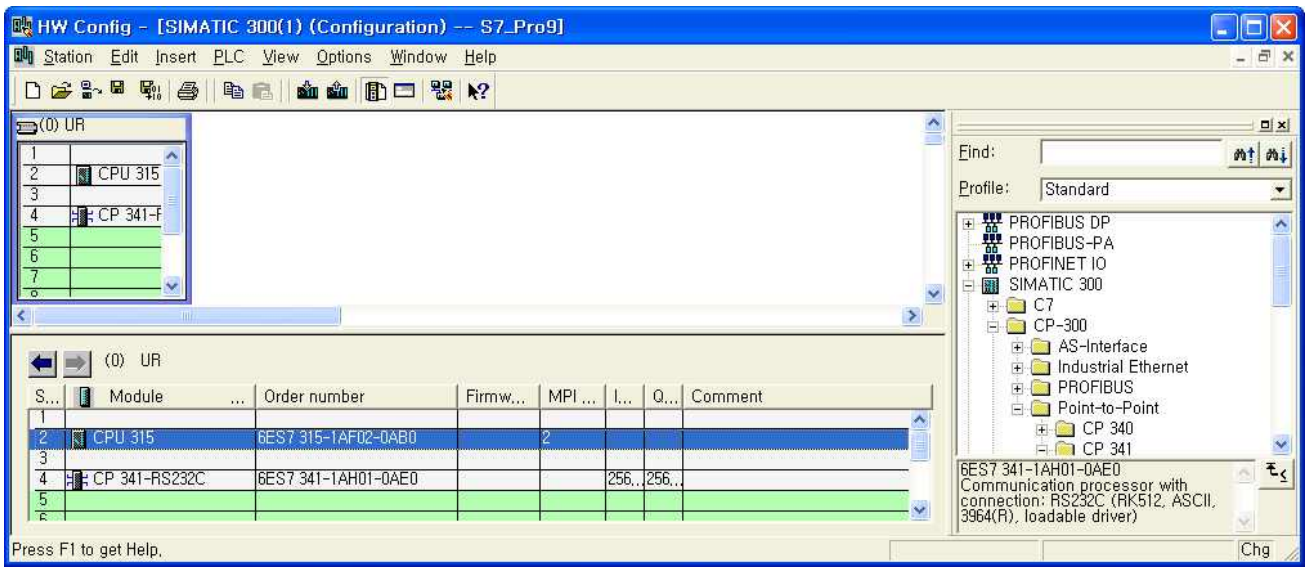
3. Double click added "[SIMETIC 400(1)]" or [SIMETIC 300(1)] CPU > Relevant CPU [Hardware] (New [HW Config] window appears.

4. Open "[SIMATIC 400] > [RACK-400]" or "[SIMATIC 300] > [RACK-300]" at left tree window in [HW Config], select Base unit model, and register it using Drag & Drop to the right bottom.

5. Select [SIMATIC 400] > [PS-400] or [PS-300] and then appropriate power supply unit, and drag & drop it to the current Rack.

6. Select [SIMATIC 400] > [CPU-400] or [CPU-300] and then appropriate CPU unit and drag& drop it to the current Rack.
(If [Properties] – PROFIBUS interface DP] windows appears, press [Cancel] to finish).

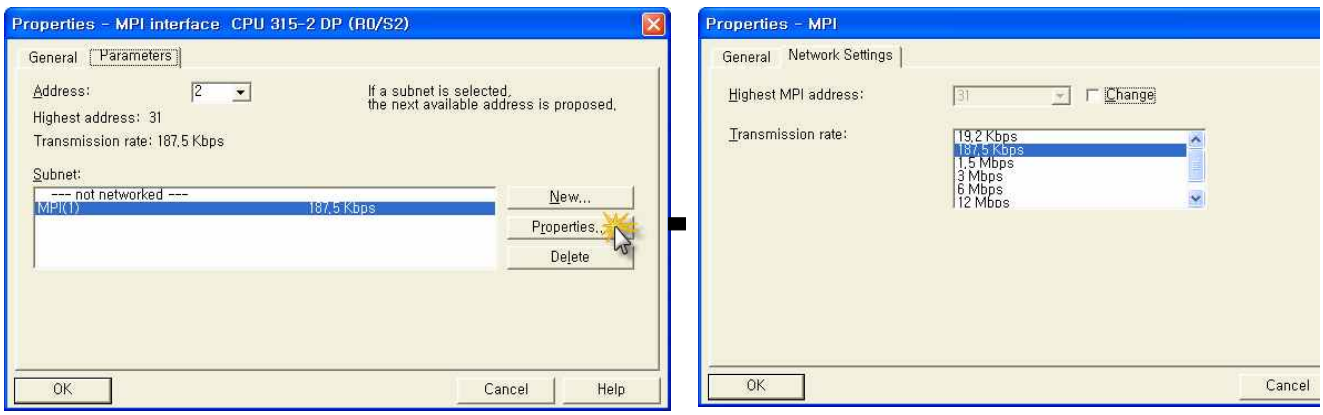
7. Select [SIMATIC 400] > [CPU-400] or [CPU-300] and then appropriate CPU unit and drag& drop it to the current Rack.



8. Double click registered CPU name. → A new relevant CPU [Properties] window appears.

9. Select [Interface] > [Properties] at [General] tap in [Properties] to popup [Properties - MPI interface CPU xxx-xxx] window.

10. Setup MPI port station number and transmission rate as below at [Properties - MPI interface CPU xxx-xxx] window's [Parameter] tap, (Transmission speed change: Click [Properties] > [Properties] window [Network Settings] tap)



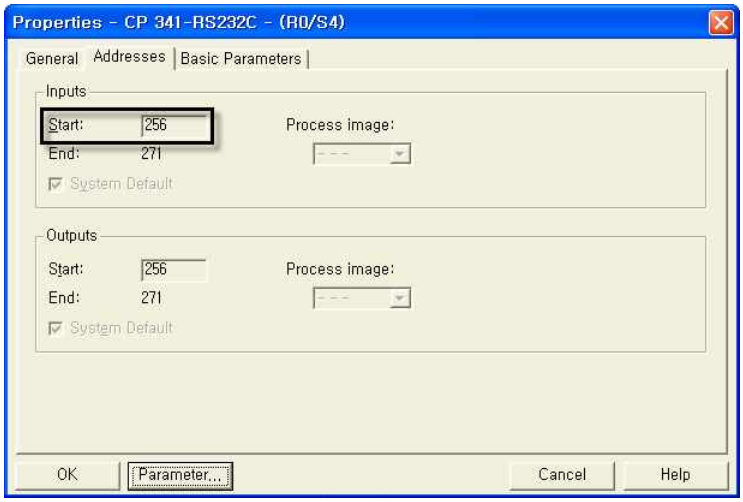
Details	Contents
Staion number	2 (Default)
Transmission rate	187500bps (Default)

11. Click [OK] to save the setting details on the [Properties] window.

12. Double click serial communication unit that is registered before on [HW Config] window. (A new [Properties] window will be

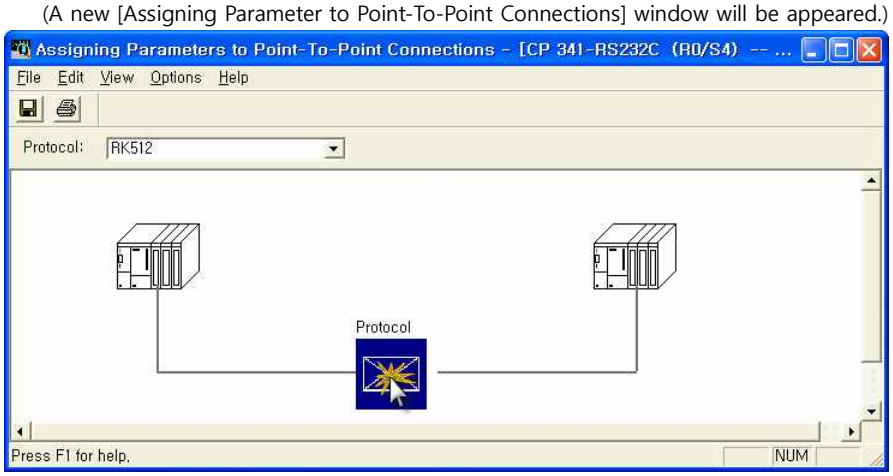
appeared.)

13. This confirms the Input Start Address from [Inputs]>[Start] in [Properties] > [Addresses] Tap.



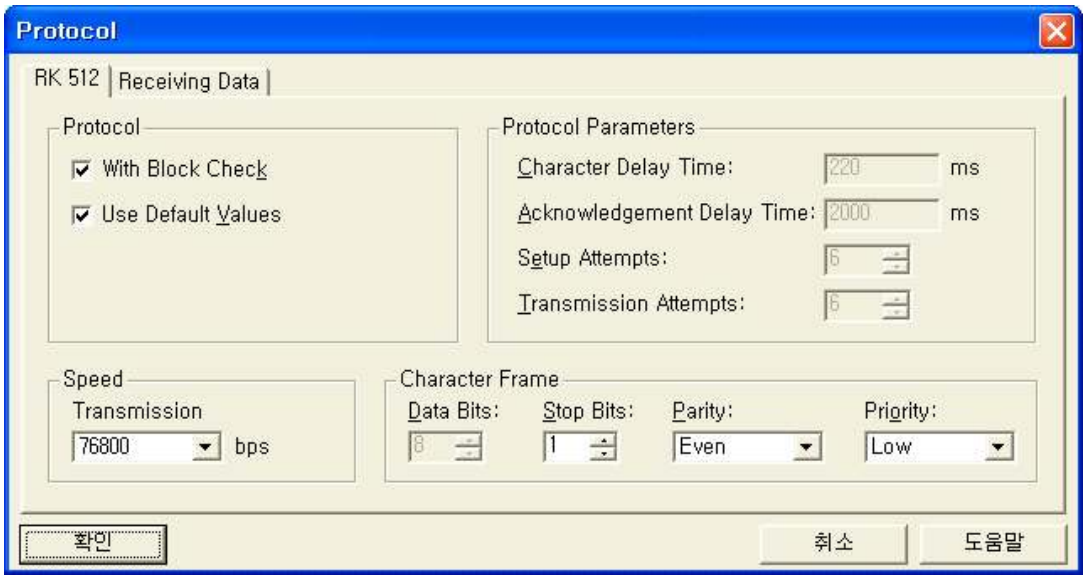
14. Click [Parameter...] key in the down side of [Properties] window.

(A new [Assigning Parameter to Point-To-Point Connections] window will be appeared.)



15. Set the [Protocol] to [RK512] from [Assigning Parameter to Point-To-Point Connections] window.

16. Input as below on [RK512] Protocol detail settings after double clicking [Protocol] box in the middle of screen.



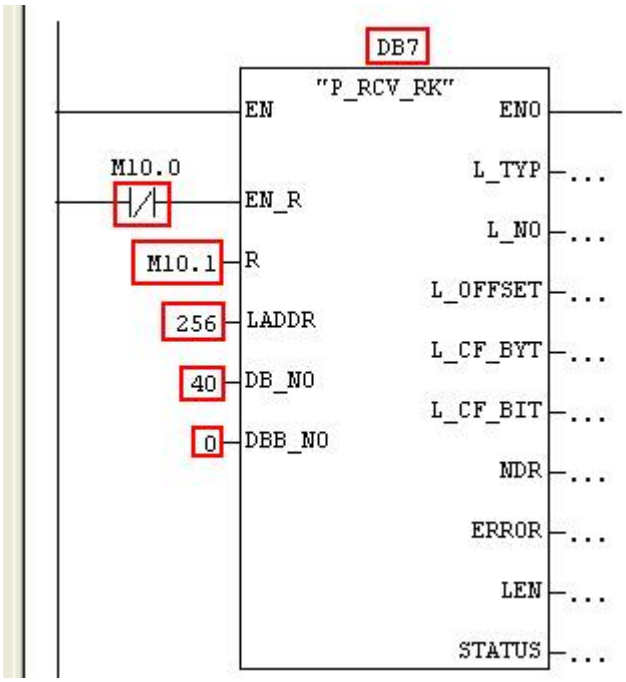
Details	Setting Information	Details	Setting Information
With Block Check	Check	Stop Bits	1
Use Default Values	Check	Parity	Even
Transmission Rate	76800 bps	Priority	Low

17. After saving settings by following [File] > [Save], execute [Assigning Parameter to Point-To-Point Connections] turn off the window.

18. Save hardware setting information by selecting [Station] > [Save and Compile].

19. [SIMATIC Manager] on window project tree, select [Name of the CPU that is registered in HW Config] and select [Blocks], double click [OB1]. (If [Properties] window pops up, click [ok].) (Run Ladder software [LAD/STL/FBD])

20. Set the parameter from Ladder software [LAD/STL/FBD]. Please set up after selecting one of examples below following by [Language for selected Blocks] > [STL] or [LAD].

[Language for selected Blocks] > [STL]	[Language for selected Blocks] > [LAD]
CALL "P_RCV_RK" , DB7 EN_R :=TRUE R :=FALSE LADDR :=256 DB_NO := DBB_NO := L_TYP := L_NO := L_OFFSET := L_CF_BYT := L_CF_BIT := NDR := ERROR := LEN := STATUS :=	 (예) [Libraries] > [CP 341] > [FB7 P_RCV_RK CP341]

◆ Description

Details	Contents
DB7	DB number that P_RCV_RK will apply for communication receiving.
EN_R	Communication can be possible when 'EN_R' sets to ON
R	Input Reset
LADDR	Input Start Address number that has been confirmed on sequence 12th
DB_NO	Input DB that will be used. Read and Write on communication where it has been given.

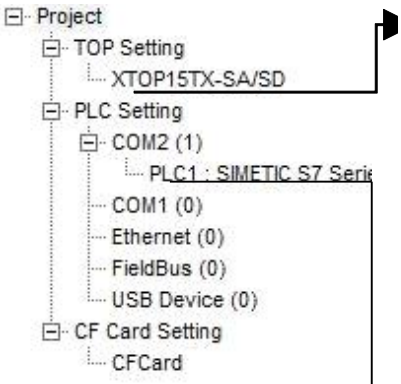
21. Compile by selecting [Station] > [Save and Compile], and download setup details into PLC.

4. Communication settings details

Communication settings are available at XDesignerPlus or TOP main menu. Communication settings must be identical with the external devices.

4.1 XDesignerPlus settings details

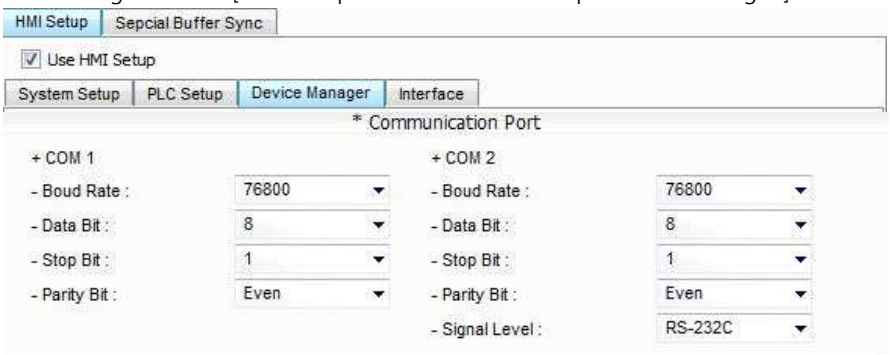
Select [Project > Project property] to show the below window.



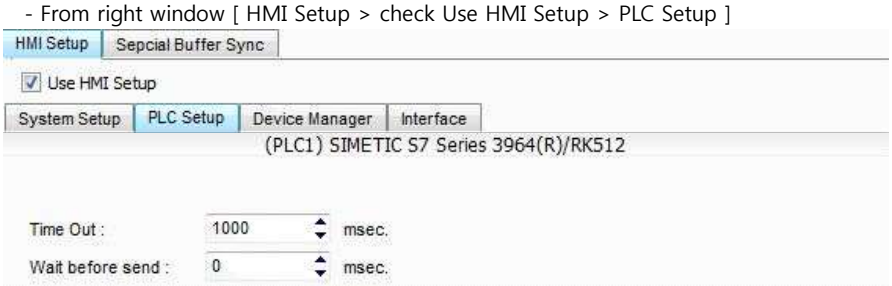
■ [Project > Project property > Project > Settings > TOP Name]

Set the communication interface of TOP tool.

- From right window [HMI Setup > check Use HMI Setup > Device Manager]



- From right window [HMI Setup > check Use HMI Setup > PLC Setup]



■ External device settings

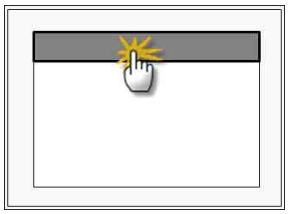
Setup communication driver of "SIMETIC S7-200 Series PPI".

■ Communication Interface Settings

Details	Contents
Signal level	External device – select serial communication method between TOPs. (COM1 supplies RS-232C only)
Baud rate	External device – select serial communication speed between TOPs.
Data bit	External device – select serial communication data bit between TOPs.
Stop bit	External device – select serial communication stop bit between TOPs.
Parity bit	External device – select serial communication parity bit check method between TOPs.
Time out [x100 mSec]	Set up TOP's response waiting time from external device at [0 – 5000] x 1 mSec.
Transmitting Delay Time [x10 mSec] Receiving Wait Time [x10 mSec]	Set up TOP's waiting time between response receiving – next command request transmission from external device at [0 – 5000] x 1 mSec.
PLC address [0~65535]	Address of other device. Select between [0 - 65535].

4.2 TOP main menu setup item

- When a buzzer is on during the power reset, touch 1 spot at the upper LCD to move to "TOP Management Main" display.
- Set up driver interface at TOP according to below **Step1 → Step2**.
  (Press "TOP COM 2/1 setup" in **Step 1** to change setup at **Step 2**.)



Step 1. [PLC setup] - Setup driver interface.

PLC setup	
PLC Address : 00 Timeout : 1000 [mSec] Delay time of transmission : 0 [mSec] TOP COM 2/1 : RS – 232C , 76800 , 8 , 1 , NONE TOP COM 2/1 setup communication test	Communication Interface Settings

Step 1–Reference.

Details	Contents
PLC address [0~65535]	Address of other device. Select between [0 - 65535].
Timeout [x1 mSec]	Set up TOP's response waiting time from external device at [0 – 5000] x 1 mSec.
Delay time of transmission [x1 mSec]	Set up TOP's waiting time between response receiving – next command request transmission from external device at [0 – 5000] x 1 mSec.
TOP COM 2/1	TOP's Interface setup to external device.

Step 2. [PLC setup] >[TOP COM2/COM1 setup] – Setup relevant port's serial parameter.

Port Settings	
* Serial communication + COM-1 Port - Baud rate : 76800 [BPS] - Data bit : 8 [BIT] - Stop bit : 1 [BIT] - Parity bit : NONE [BIT] - Signal level : RS – 232C	COM 1 Port Communication Interface Settings
+ COM-2 Port - Baud rate : 76800 [BPS] - Data bit : 8 [BIT] - Stop bit : 1 [BIT] - Parity bit : NONE [BIT] - Signal level : RS – 232C	COM-2 Port Communication Interface Settings

Step 2–Reference.

Details	Contents
Baud rate	External device – select serial communication speed between TOPs.
Data bit	External device – select serial communication data bit between TOPs.
Stop bit	External device – select serial communication stop bit between TOPs.
Parity bit	External device – select serial communication parity bit check method between TOPs.
Signal level	External device – select serial communication method between TOPs.

4.3 Communication diagnosis

■ TOP - Confirming interface setting condition between external devices

- Move to Menu by clicking the top side of LCD screen as resetting the power of TOP.
- Confirms if Port [COM 2 or COM 1] setting that is willing to use in [Communication Settings] matches with the setting of external devices.

■ Port Communication Issue Diagnosis

- PLC Setup > TOP [COM 2 or COM 1] click "Communication Diagnosis" button.
- Diagnosis dialog box will pop up on the screen, you can judge by following information that are shown on box no. 3 section.

OK!	**Communication setting succeeded**
Time Out Error!	Communication setting error - Error in the setting situation of Cable and TOP / External device **(reference : Communication Diagnosis sheet)**

■ Communication Diagnosis Sheet

- Please refer to the information below if you have a problem between external devices and communication connection.

Designer Version		O.S Version				
Details	Contents				Confirm	
System configuration	Name of CPU				OK	NG
	Name of confront port that is communicating				OK	NG
	System Connection Method	1:1	1:N	N:1	OK	NG
Connection Cable	Name of Cable				OK	NG
PLC setup	Setup address				OK	NG
	Serial baud rate	[BPS]			OK	NG
	Serial data bit	[BIT]			OK	NG
	Serial Stop bit	[BIT]			OK	NG
	Serial parity bit	[BIT]			OK	NG
	Assigned Address Limit				OK	NG
TOP setup	Setup port	COM 1	COM 2		OK	NG
	Name of Driver				OK	NG
	Confront Address	Project Property Setup			OK	NG
		Diagnosing Communication			OK	NG
	Serial baud rate	[BPS]			OK	NG
	Serial data bit	[BIT]			OK	NG
	Serial Stop bit	[BIT]			OK	NG
	Serial parity bit	[BIT]			OK	NG

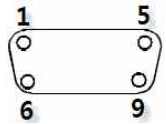
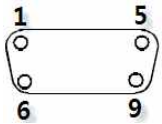
5. Cable diagram

This Chapter is to introduce the Cable diagram for regular communication between TOP and relative devices. (The Cable diagram which are going to be introduced in this chapter might be different than what "SIEMENS AG." recommends.)

5.1 Cable diagram 1

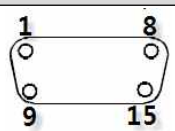
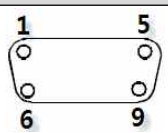
■ 1 : 1 Connection

(A) XTOP COM 2 Port (9 pin)

XTOP COM2			Cable Connection	External device		
pin arangement * caution 1)	Name of Signal	Pin Number		Pin Number	Name of Signal	**pin arangement * caution 1)**
 Front View of D-SUB 9 Pin male (Male, convex)	CD	1		1	CD	 Front View of D-SUB 9 Pin male (Male, convex)
	RD	2		2	RD	
	SD	3		3	SD	
	DTR	4		4	DTR	
	SG	5		5	SG	
	DSR	6		6	DSR	
	RTS	7		7	RTS	
	CTS	8		8	CTS	
		9		9	RI	

*Caution1) Pin arrangement is shown from connecting face in cable connection connecter.

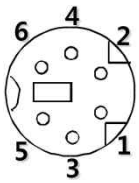
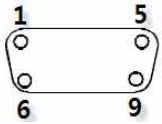
(B) XTOP COM 2 Port (15 pin)

XTOP COM2			**Cable Connection**	**External device**		
pin arangement * caution 1)	Name of Signal	Pin Number		Pin Number	Name of Signal	**pin arangement * caution 1)**
 Front View of D-SUB 15 Pin male(Male convex)	CD	1		1	CD	 Front View of D-SUB 9 Pin male (Male, convex)
	RD	2		2	RD	
	SD	3		3	SD	
	DTR	4		4	DTR	
	SG	5		5	SG	
	DSR	6		6	DSR	
	RTS	7		7	RTS	
	CTS	8		8	CTS	
		9		9	RI	

*Caution1) Pin arrangement is shown from connecting face in cable connection connecter.

(C) XTOP/ATOP COM 1 Port (6 Pin)

XTOP/ATOP COM 1 Port			Cable Connection	External device		
pin arangement * caution 1)	Name of	Pin Number		Pin Number	Name of	**pin arangement * caution 1)**

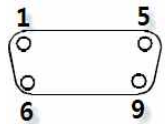
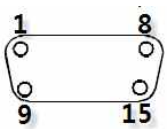
	Signal				Signal	
 Front View of D-SUB 6 Pin male (Male, convex)		1		1	CD	 Front View of D-SUB 9 Pin male (Male, convex)
	RD	2		2	RD	
	SG	3		3	SD	
		4		4	DTR	
		5		5	SG	
	SD	6		6	DSR	
				7	RTS	
				8	CTS	
				9		

*Caution1) Pin arrangement is shown from connecting face in cable connection connecter.

5.2 Cable diagram 2

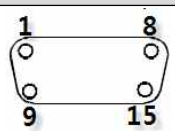
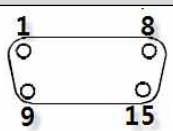
■ 1 : 1 Connection

(A) XTOP COM 2 Port (9 pin)

XTOP COM2			Cable Connection	External device		
pin arangement * caution 1)	Signal	Pin		Pin	Signal	**pin arangement * caution 1)**
 Front View of D-SUB 9 Pin male (Male, convex)	RDA	1		1		 Front View of D-SUB 15 Pin male(Male convex)
		2		2	T(A)	
		3		3		
	RDB	4		4	R(A)	
	SG	5		5		
	SDA	6		6		
		7		7		
		8		8	GND	
	SDB	9		9	T(B)	
				10		
				11	R(B)	

*Caution1) Pin arrangement is shown from connecting face in cable connection connecter.

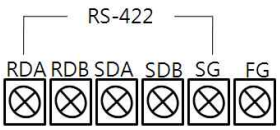
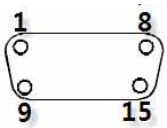
(B) XTOP COM 2 Port (15 pin)

XTOP COM2			**Cable Connection**	**External device**		
pin arangement * caution 1)	Signal	Pin		Pin	Signal	**pin arangement * caution 1)**
 Front View of D-SUB 15 Pin male (Male convex)	–	1		1		 Front View of D-SUB 15 Pin male (Male convex)
	(생략)			2	T(A)	
				3		
				4	R(A)	
				5		
	–	10		6		
	RDA	11		7		
	RDB	12		8	GND	
	SDA	13		9	T(B)	
	SDB	14		10		

	SG	15		11	R(B)	

*Caution1) Pin arrangement is shown from connecting face in cable connection connecter.

(C) ATOP COM 2 Port (Terminal Block 5 pin)

XTOP COM2		Cable Connection	External device		
pin arangement * caution 1)	Signal		Pin	Signal	**pin arangement * caution 1)**
 Front View of Terminal Block 5 Pin	RDA		1		 Front View of D-SUB 15 Pin male (Male convex)
	RDB		2	T(A)	
	SDA		3		
	SDB		4	R(A)	
	SG		5		
			6		
			7		
			8	GND	
			9	T(B)	
			10		
			11	R(B)	

*Caution1) Pin arrangement is shown from connecting face in cable connection connecter.

6. Support address

Devices that are usable with TOP is as below.

There might be difference in the range of device (address) by type / series of CPU module TOP series supports the maximum address range that external device series use Please refer each CPU module user manual carefully for devices that you desired to use to prevent not getting out of range.

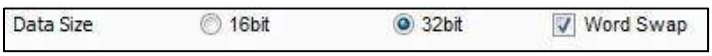
	Support address		Support address		32 bits	Remark
External Input Relay * caution1)	I00000.0 – I00127.7	E00000.0 – E00127.7	IW00000 – IW00126	EW00000 – EW00126	**H/L** *caution4caution5)	Not writable
External Output Relay * caution2)	Q00000.0 – Q00127.7	A00000.0 – A00127.7	QW00000 – QW00126	AW00000 – AW00126		Not writable
Data length	DB00001 : DBX00000 – DB65535 : DBX65533.7		DB00001 : DBW00000 – DB65535 : DBW65532			—
Internal Memory	M00000.0 – M00511.7		MW00000 – MW00510			Not writable
Timer*caution3)	—		T00000 – T00255			Not writable
Counter*caution3)	—		C00000 – C00255	Z00000 – Z00255		Not writable

*Caution1) Input Device (I,IW) might not be able to input read on the address of IW0 ~ IW2 because depends on the type of CPU, it becomes subordinate in the integrated I/O. Please refer to the PLC Manual.

*Caution2) Output Device (Q, QW, QD) can write value only in the Run Mode. Output value will be reset if it's STOP Mode.

*Caution3) Device Restricted to Read only

*Caution 4) Regarding on Word device, 32 but Data will be saved in the order of from High / Low, 16 bit each.

(Example) VW00000 (32bit data, 0x12345678) ➔ VW00000(16bit, 0x1234) VW00002(16bit, 0x5678)

*Caution5) Checks "Word Swap" function when Double word address is being used.