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We want to thank our customers who use the Touch Operation Panel.

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Select a TOP model and an external device.

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Describes how to set up communication for external devices.

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Describes the cable specifications required for connection.

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

1. System configuration

The system configuration of TOP and "SENGENUITY:WSR-T2" is as follows:

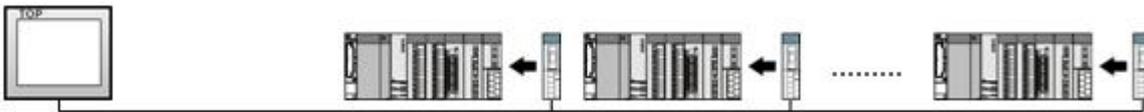
Series	Module	Link I/F	Communication method	System setting	Cable
SENGENUITY:WSR-T2	-	-	RS-485	3.1 Settings example 1 (Page 4)	5.1. Cable table 1 (Page 9)

■ Connectable configuration

- 1:1 connection (one MASTER and one TOP) connection

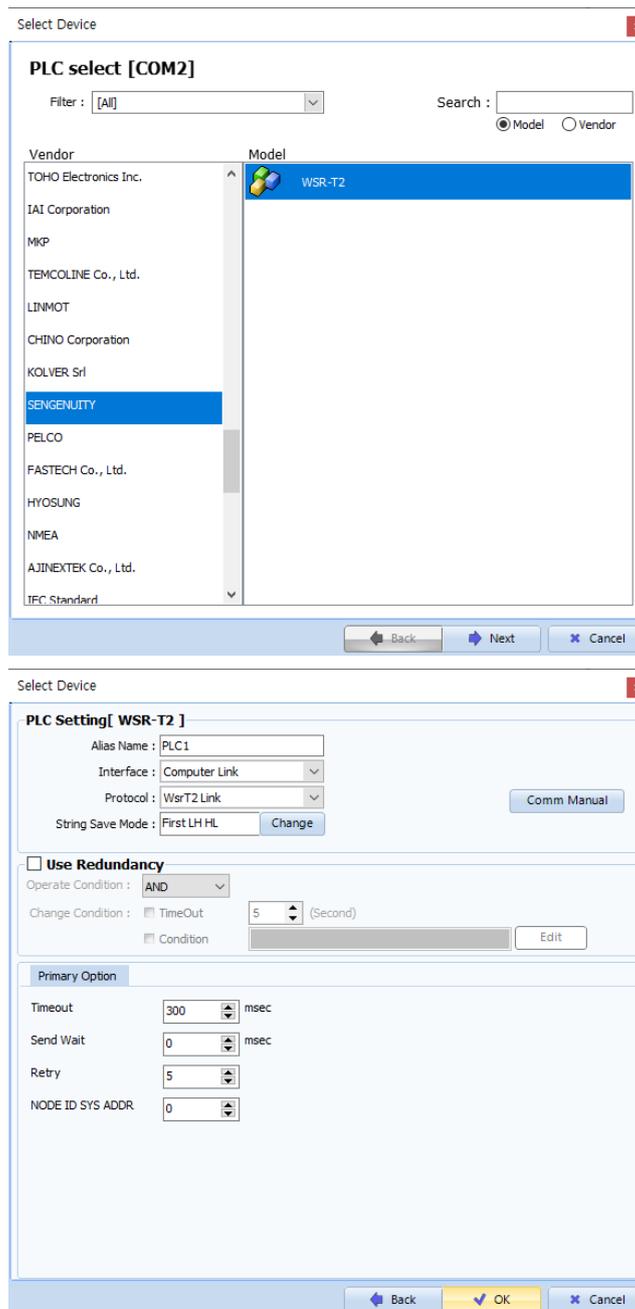


- 1:N (one TOP and multiple external devices) connection – configuration which is possible in RS422/485 communication.



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. Select "SENGENUITY".					
	PLC	Select an external device to connect to TOP. <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Model</th> <th>Interface</th> <th>Protocol</th> </tr> </thead> <tbody> <tr> <td>WSR-T2</td> <td>Computer Link</td> <td>WsrT2 Link</td> </tr> </tbody> </table> <p>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.</p>	Model	Interface	Protocol	WSR-T2	Computer Link
Model	Interface	Protocol					
WSR-T2	Computer Link	WsrT2 Link					

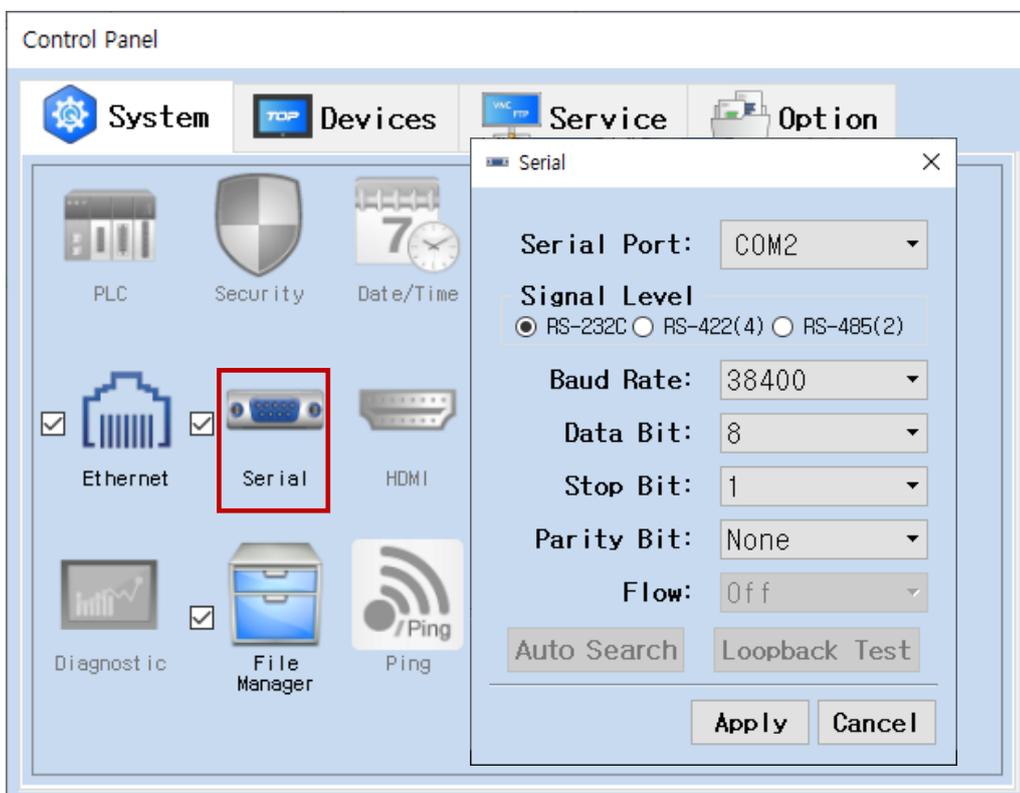
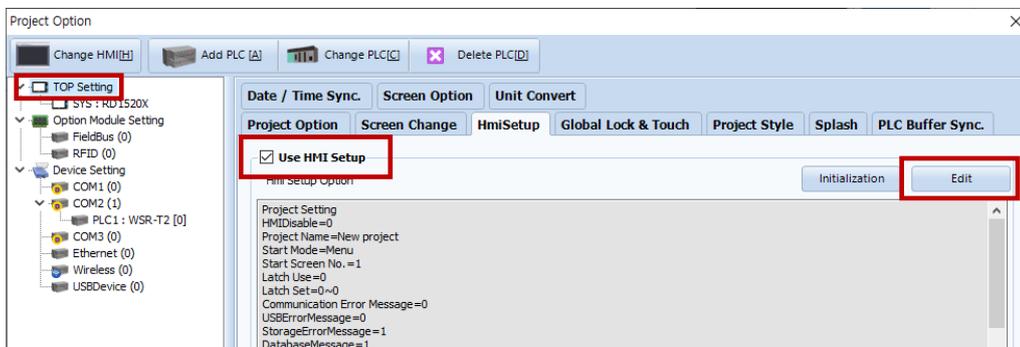
3. TOP communication setting

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 Property > TOP Setting] → [Project Options > "Use HMI Setup" Check > Edit > Serial]
- Set the TOP communication interface in TOP Design Studio.



Items	TOP	External device	Remarks
Signal Level (port)	RS-485	RS-485	
Baud Rate		115200	
Data Bit		8	
Stop Bit		1	
Parity Bit		NONE	

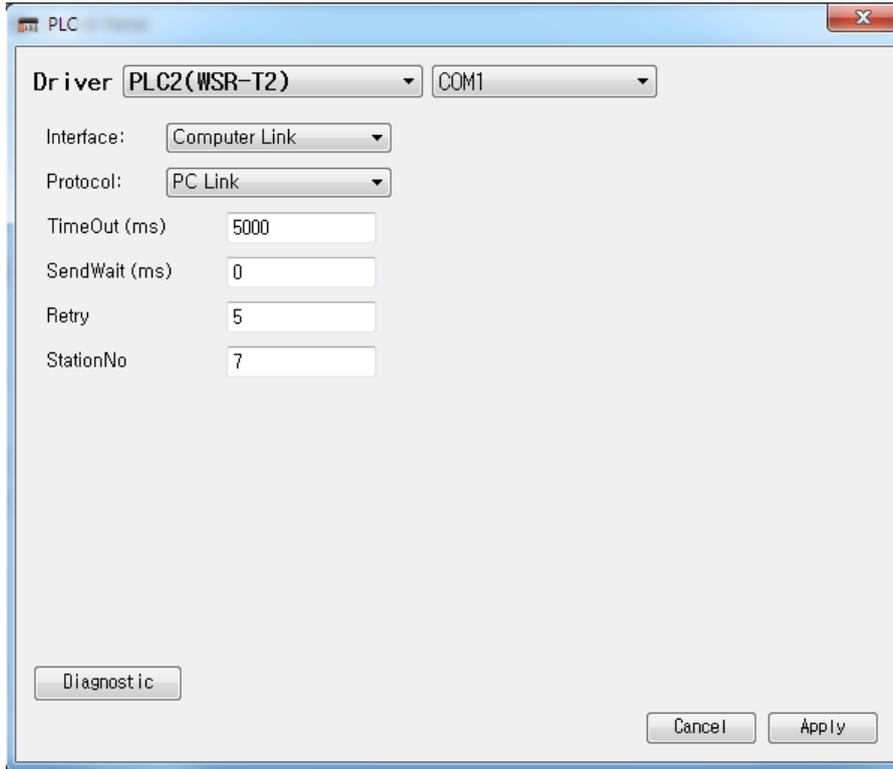
* The above settings are examples recommended by the company.

Items	Description
Signal Level	Select the serial communication method between the TOP and an external device.
Baud Rate	Select the serial communication speed between the TOP and an external device.
Data Bit	Select the serial communication data bit between the TOP and an external device.
Stop Bit	Select the serial communication stop bit between the TOP and an external device.
Parity Bit	Select the serial communication parity bit check method between the TOP and an external device.

(2) Communication option setting

- [Project > Project Property > PLC Settings > COM > "PLC1 : SENGUITY WSR-T2]

Set the options of the communication driver in TOP Design Studio.

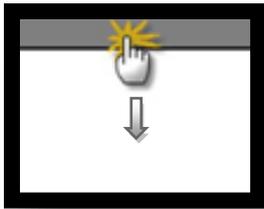


Items	Settings	Remarks
Interface	Select "Computer Link".	Refer to "2. External device selection".
Protocol	Select the communication protocol between the TOP and an external device.	
TimeOut (ms)	Set the time for the TOP to wait for a response from an external device.	
SendWait (ms)	Set the waiting time between TOP's receiving a response from an external device and sending the next command request.	
Retry	Retry attempts	
StationNO	StationNO system buffer Address	

3.2. Communication setting in TOP

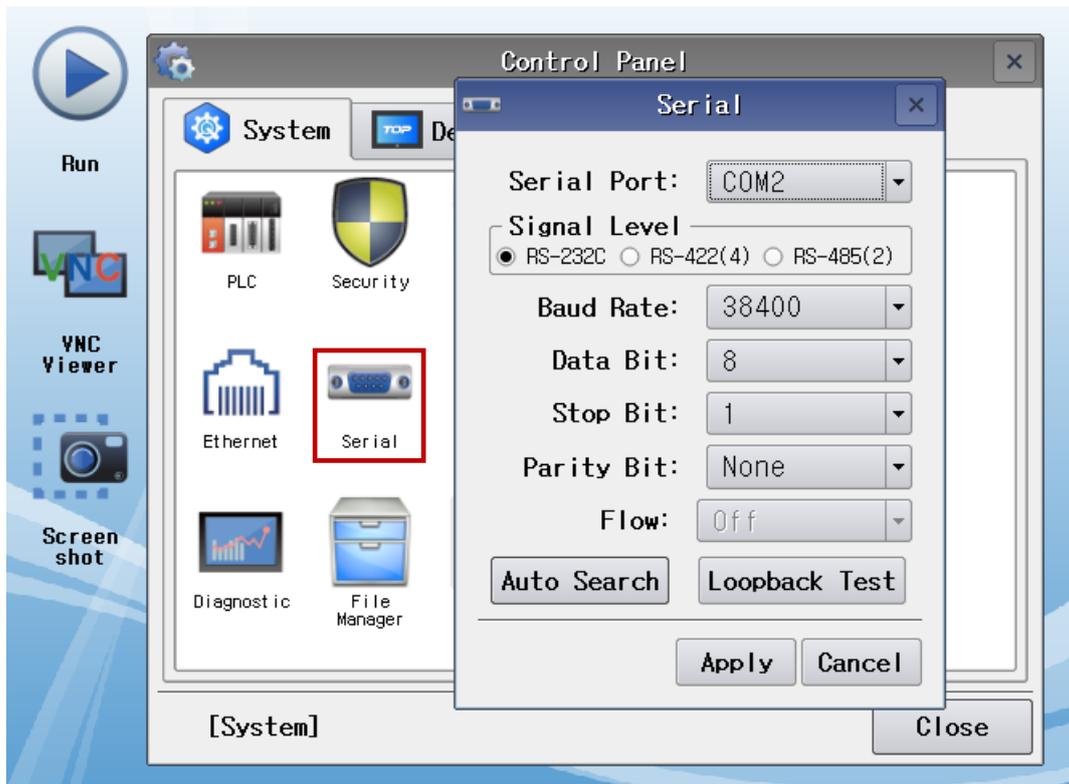
* This is a setting method when "Use HMI Setup" in the setting items in "3.1 TOP Design Studio" is not checked.

- 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 > Serial]



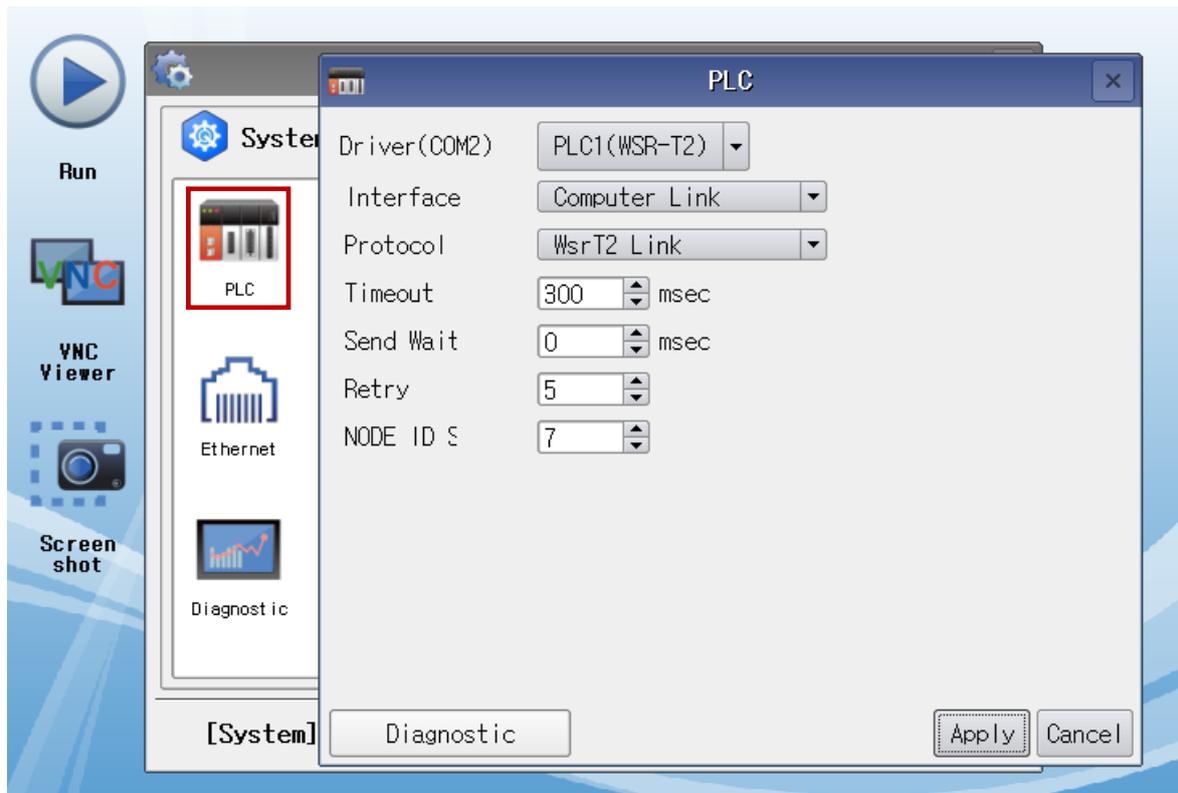
Items	TOP	External device	Remarks
Signal Level (port)	RS-485	RS-485	
Baud Rate	115200		
Data Bit	8		
Stop Bit	1		
Parity Bit	none		

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

Items	Description
Signal Level	Select the serial communication method between the TOP and an external device.
Baud Rate	Select the serial communication speed between the TOP and an external device.
Data Bit	Select the serial communication data bit between the TOP and an external device.
Stop Bit	Select the serial communication stop bit between the TOP and an external device.
Parity Bit	Select the serial communication parity bit check method between the TOP and an external device.

(2) Communication option setting

■ [Main Screen > Control Panel > PLC]



Items	Settings	Remarks
Interface	Select "Computer Link".	Refer to "2. External device selection" .
Protocol	Select the communication protocol between the TOP and 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.	
Retry	Retry attempts	
StationNO	StationNO system buffer Address	

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 if the COM port settings you want to use in [Control Panel > Serial] are the same as those of the external device.

- 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.

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

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

Items	Contents	Check		Remarks	
System configuration	How to connect the system	OK	NG	1. System configuration	
	Connection cable name	OK	NG		
TOP	Version information	OK	NG	2. External device selection 3. Communication setting	
	Port in use	OK	NG		
	Driver name	OK	NG		
	Other detailed settings	OK	NG		
	Relative prefix	Project setting	OK		NG
		Communication diagnostics	OK		NG
	Serial Parameter	Transmission Speed	OK		NG
Data Bit		OK	NG		
Stop Bit		OK	NG		
Parity Bit		OK	NG		
External device	CPU name	OK	NG	4. External device setting	
	Communication port name (module name)	OK	NG		
	Protocol (mode)	OK	NG		
	Setup Prefix	OK	NG		
	Other detailed settings	OK	NG		
	Serial Parameter	Transmission Speed	OK		NG
		Data Bit	OK		NG
		Stop Bit	OK		NG
Parity Bit		OK	NG		
Check address range		OK	NG	6. Supported addresses (For details, please refer to the PLC vendor's manual.)	

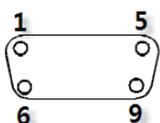
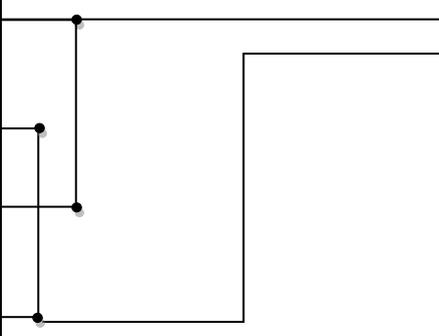
4. External device setting

Refer to the vendor's user manual to identically configure the communication settings of the external device to that of the TOP.

5. Cable table

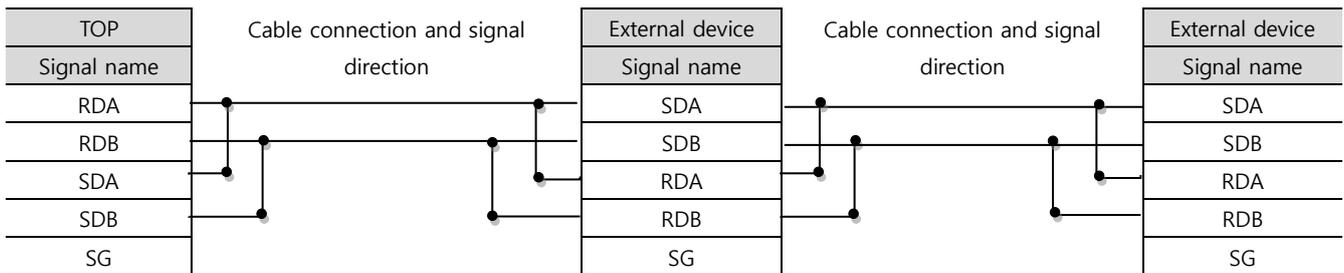
This chapter introduces a cable diagram for normal communication between the TOP and the corresponding device.
 (The cable diagram described in this section may differ from the recommendations of "SENGENUITY WSR-T2")

■ RS-485

TOP COM			Cable connection	External device	
Pin arrangement* Note 1)	Signal name	Pin number		Signal name	
 <p>Based on communication cable connector front, D-SUB 9 Pin male (male, convex)</p>	RDA	1		A+	
				2	B-
				3	
	RDB	4			
	SG	5			
	SDA	6			
				7	
				8	
	SDB	9			

***Note 1)** The pin arrangement is as seen from the connecting side of the cable connection connector.

■ 1:N connection – Refer to 1:1 connection to connect in the following way.



6. 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.

Command	Bit address range	Word address range	R/W	Device description
SETADDR	-	0~5000	W	Set WSR-T2 Address
VI	-	0~5000	R	Value Interrogation
CAL_SEN	-	0~5000	W	Calibrate Sensor
SAVE_CAL	-	0~5000	W	Store Calibration
WS_PARA	-	0~5000	W	Sensor Parameters
RS_PARA	-	0~5000	R	Sensor Parameters

Command	Detailed usage method
SETADDR	Currently unsupported
VI	<p>Value Interrogation: read-only</p> <p>VI 30</p> <p>SYS 30 = SENSOR NO</p> <p>SYS 31 = PARAM NO (0 fixed)</p> <p>SYS 32 = STATUS</p> <p>SYS 33 = TEMP</p> <p>Run the command by referring to the information in SYS 30-33. Save the information obtained by communication below.</p> <p>SYS 34 = MAG</p> <p>SYS 35 = STDDEV</p>
CAL_SEN	<p>Calibrate Sensor : Write-only</p> <p>CAL_SEN 40</p> <p>SYS 40 = SENSOR NO</p> <p>SYS 41 = PARAM NO (0 fixed)</p> <p>SYS 42 = TEMP</p> <p>SYS 43 = AVERAGE/SUCCESS</p> <p>Run the command by referring to the information in SYS 40-43. Save the information obtained by communication below.</p> <p>SYS 44 = STDDEV</p> <p>SYS 45 = MAG</p> <p>SYS 46 = STATUS</p> <p>SYS 47 = SUCCESS</p>
SAVE_CAL	<p>Store Calibration : Write-only</p> <p>SAVE_CAL 50</p> <p>SYS 50 = SENSOR NO</p> <p>SYS 51 = PARAM NO (0 fixed)</p> <p>SYS 52 = FIRST SENSOR</p> <p>SYS 53 = LAST SENSOR</p> <p>Run the command by referring to the information in SYS 50-53. Save the information obtained by communication below.</p> <p>SYS 54 = FIRST SENSOR</p> <p>SYS 55 = LAST SENSOR</p>

<p>WS_PARA</p>	<p>Sensor Parameters : Write-only</p> <p>WS_PARA 60</p> <p>SYS 60 = SENSOR NO</p> <p>SYS 61 = PARAM NO (0~2)</p> <p>Run writing of the information in SYS 61-62 and the values in the address below.</p> <p>For PARAM 2</p> <p>SYS 62 = MAG_THRES</p> <p>SYS 63 = PA_LEVEL</p> <p>SYS 64 = PPS_LEVEL</p> <p>SYS 65 = ANTENNA</p> <p>SYS 66 = ALC</p> <p>SYS 67 = MAG_TARGET</p> <p>For PARAM 1</p> <p>SYS 62 = CUR_LO(msb)</p> <p>SYS 63 = CUR_LO(lsb)</p> <p>SYS 64 = CUR_HI(msb)</p> <p>SYS 65 = CUR_HI(lsb)</p> <p>For PARAM 0</p> <p>SYS 62 = MIN_LO(msb)</p> <p>SYS 63 = MIN_LO(lsb)</p> <p>SYS 64 = MAX_HI(msb)</p> <p>SYS 65 = MAX_HI(lsb)</p>
<p>RS_PARA</p>	<p>Sensor Parameters : Read-only</p> <p>WS_PARA 60</p> <p>SYS 60 = SENSOR NO</p> <p>SYS 61 = PARAM NO (0 fixed)</p> <p>Run the command by referring to the information in SYS 61-62. Save the information obtained by communication below.</p> <p>SYS 62 = MAG_THRES</p> <p>SYS 63 = PA_LEVEL</p> <p>SYS 64 = PPS_LEVEL</p> <p>SYS 65 = ANTENNA</p> <p>SYS 66 = ALC</p> <p>SYS 67 = MAG_TARGET</p> <p>SYS 68 = CUR_LO(msb)</p> <p>SYS 69 = CUR_LO(lsb)</p> <p>SYS 70 = CUR_HI(msb)</p> <p>SYS 71 = CUR_HI(lsb)</p> <p>SYS 72 = MIN_LO(msb)</p> <p>SYS 73 = MIN_LO(lsb)</p> <p>SYS 74 = MAX_HI(msb)</p> <p>SYS 75 = MAX_HI(lsb)</p>