# **SENGENUITY**

V1.4.3.2 or higher

## WSR-T2



Supported version TOP Design Studio

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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

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• 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.

PLC select [CO	DM2]						
Filter : [All]			$\sim$		Search :		
					0	Model 🔿	Vendor
Vendor		Mode	el				
TOHO Electronics Inc.		`   🌽	WSR-T2				
IAI Corporation							
МКР							
TEMCOLINE Co., Ltd.							
LINMOT							
CHINO Corporation							
KOLVER Srl							
SENGENUITY							
PELCO							
FASTECH Co., Ltd.							
HYOSUNG		1					
NMEA							
AJINEXTEK Co., Ltd.							
IEC Standard	~						
elect Device							
PLC Setting[ WSR	-T2 ]						_
PLC Setting[ WSR Alias Name	- <b>T2 ]</b> : PLC1						-
PLC Setting[ WSR Alias Name Interface	- <b>T2 ]</b> : PLC1 : Computer Lini	k	~				
PLC Setting[ WSR Alias Name Interface Protocol	-T2] : PLC1 : Computer Link : WsrT2 Link	k C	<ul><li>✓</li><li>✓</li><li>→</li></ul>		(	Comm M	anual
PLC Setting[ WSR Alias Name Interface Protocol String Save Mode	- <b>T2]</b> : PLC1 : Computer Lini : WsrT2 Link : First LH HL	k C	→ → hange		(	Comm M	anual
PLC Setting[ WSR Alias Name Interface Protocol String Save Mode	-T2] : PLC1 : Computer Lini : WsrT2 Link : First LH HL : F	k C	v v hange		(	Comm M	anual
PLC Setting[ WSR Alias Name Interface Protocol String Save Mode Use Redundanc Operate Condition : A Change Condition :	-T2] : PLC1 : Computer Link : WsrT2 Link : First LH HL : First LH HL : MD	k C	hange		(	Comm M	anual
PLC Setting[ WSR Alias Name Interface Protocol String Save Mode Use Redundanc Operate Condition : Change Condition :	-T2] : PLC1 : Computer Lini : WsrT2 Link : First LH HL -Y ND 1 TimeOut 1 Condition	k C	hange	)	(	Comm M	anual
PLC Setting[ WSR Alias Name Interface Protocol String Save Mode Use Redundanc Operate Condition : Change Condition :	-T2] : PLC1 : Computer Link : WarT2 Link : First LH HL EY ND ImeOut 1 Condition	k 5	hange	)		Comm M	anual
PLC Setting[ WSR Alias Name Interface Protocol String Save Mode Use Redundanc Operate Condition : Change Condition : Primary Option Timeout	-T2] : PLC1 : Computer Lini : WsrT2 Link : First LH HL -Y ND - TimeOut 1 Condition	k C	v v ↓ (Second			Comm M	anual
PLC Setting[ WSR Alias Name Interface Protocol String Save Mode Use Redundant Operate Condition : A Change Condition : C Primary Option Timeout Send Wait	-T2] : PLC1 : Computer Lini : WarT2 Link : First LH HL : Y Y : TimeOut : Condition : 300 : 0	k 5 ] msec	v v hange (Second			Comm M	anual
PLC Setting[ WSR Alias Name Interface Protocol String Save Mode Use Redundance Operate Condition : Change Condition : Primary Option Timeout Send Wait Retry	-T2] : PLC1 : Computer Lini : WarT2 Link : First LH HL : Y ND V : TimeOut : Condition : 300 : 5 : 5 : 5 : 5 : 5 : 5 : 5 : 5 : 5 :	k C	hange	)		Comm M	anual
PLC Setting[ WSR Alias Name Interface Protocol String Save Mode Use Redundanc Operate Condition : Change Condition : Primary Option Timeout Send Wait Retry NOPE TO SYS ADDR	-T2] : PLC1 : Computer Lini : WarT2 Link : First LH HL : Y ND V 1 TimeOut 300	k C	→ hange (Second			Comm M	anual
PLC Setting[ WSR Alias Name Interface Protocol String Save Mode Use Redundanc Operate Condition : Change Condition : Primary Option Timeout Send Wait Retry NODE ID SYS ADDR	-T2] : PLC1 : Computer Lini : WarT2 Link : First LH HL : TimeOut 1 Condition 300 5 5 0 6 6 7 9	k 5 ] msec ] msec	hange (Second			Comm M	anual
PLC Setting[ WSR Alias Name Interface Protocol String Save Mode Use Redundanc Operate Condition : Primary Option Timeout Send Wait Retry NODE ID SYS ADDR	-T2] : PLC1 : Computer Link : WerT2 Link : First LH HL 	k C	↓ hange (Second			Comm M	anual
PLC Setting[ WSR Alias Name Interface Protocol String Save Mode Use Redundance Operate Condition : A Change Condition : C Primary Option Timeout Send Wait Retry NODE ID SYS ADDR	-T2] : PLC1 : Computer Linit : WerT2 Link : First LH HL : TreOut Condition  300	k 5 ] msec ] ]	hange			Comm M	anual
PLC Setting[ WSR Alias Name Interface Protocol String Save Mode Use Redundance Operate Condition : A Change Condition : C Primary Option Timeout Send Wait Retry NODE ID SYS ADDR	-T2] : PLC1 : Computer Lini : WarT2 Link : First LH HL : Y ND ∨ 1 TimeOut Condition 300 € 5 € 0 € 0	k 5 ] msec ] msec	↓ hange (Second			Comm M	anual
PLC Setting[ WSR Alias Name Interface Protocol String Save Mode Use Redundance Operate Condition : Change Condition : Primary Option Timeout Send Wait Retry NODE ID SYS ADDR	-T2] : PLC1 : Computer Lini : WarT2 Link : Frst LH HL : Frst LH HL Condition 300 € 5 € 0 €	k 5 ] msec ] msec	hange			Comm M	anual

Sett	tings	Contents			
TOP	Model	Check the TOP display and pr	Check the TOP display and process to select the touch model.		
External device	Vendor	Select the vendor of the exter	rnal device to be connected to TOP.		
		Select "SENGENUITY".			
	PLC	Select an external device to c	Select an external device to connect to TOP.		
		Model	Interface	Protocol	
		WSR-T2	Computer Link	WsrT2 Link	
		Please check the system con connect is a model whose system	figuration in Chapter 1 to see if the stem can be configured.	e external device you want to	



# 3. TOP communication setting

The communication can be set in TOP Design Studio or TOP main menu. The communication should be set in the same way as that of the external device.

### 3.1 Communication setting in TOP Design Studio

#### (1) Communication interface setting

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



tems TOP		External device	Remarks		
Signal Level (port)	RS-485	RS-485			
Baud Rate	1152	115200			
Data Bit	8				
Stop Bit	1				
Parity Bit	NOI	NE			
* The above settings ar	e <u>examples</u> recommended by the comp	any.			
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 be	tween 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 : SENGENUITY WSR-T2 ]

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

PLC			×	
Driver PLC2(WS	R-T2)	▼ COM1	•	
Interface: Computer Link				
Protocol: PC Li	nk	•		
TimeOut (ms)	5000			
SendWait (ms)	0			
Retry	5			
StationNo	7			
Diagnostic				
			Cancel Apply	

Items	Settings	Remarks
Interface	Select "Computer Link".	Refer to "2. External
Protocol	Select the communication protocol between the TOP and an external device.	device selection".
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	ТОР	External device	Remarks
Signal Level (port)	RS-485	RS-485	
Baud Rate	1152	00	
Data Bit	8		
Stop Bit	1		
Parity Bit	nor	ie	

\* 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 ]

	õ	<b>101</b>	PLC		×
Bus	🔯 Syste	Driver(COM2)	PLC1(WSR-T2) -		
nan		Interface	Computer Link 🔻	·	
		Protocol	WsrT2 Link 🔻	·	
	PLC	Timeout	300 🖨 msec		
YNC		Send Wait	0 🖨 msec		
Viewer	6	Retry	5		
	Ethernet	NODE ID S	7		
Screen shot	Intil				
	Diagnostic				
		<b></b>		[]	
	[System]	Diagnostic		Apply	Cancel
tome	Sottings				Pomarks
nterface	Select "Com	puter Link".			Refer to "2. Exte
	Coloct the e	mmunication proto	and both some the TOD and an a	vtornal dovica	dovice colectio

Protocol	Select the communication protocol between the TOP and an external device.	device selection".
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.

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



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



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



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