# SHINSUNG E&G Co., Ltd.

# **MCUL32 Series**

V1.4.6.39 or higher

# **Serial Driver**

Supported version TOP Design Studio



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

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**3.** TOP communication setting

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#### 4. External device setting Page 10

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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 "SHINSUNG E&G Co., Ltd. – MCUL32 Series" is as follows.

Series	Link I/F	Communication method	Communication setting	Cable
MCUL32	PC Comm. Port (RJ-11/RJ-12)	RS-485	<u>3. TOP</u> communication setting <u>4. External device</u> setting	<u>5. Cable table</u>

■ Connectable configuration

 $\cdot$  1:1 (one TOP and one external device) connection





### 2. External device selection

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

					×
PLC select [CO	DM1]				
Filter : [All]	-		~	Search :	
				Model	() Vendor
Vendor	^	Model			•
MINIEREA Co. 114			ASI Systems : ASIC/2 Serie	25	
MINEBEA Co., Ltd.		<b>\$</b>	ESCO : IGBT Rectifier		
Azbii Corporation		8	OKY : DVC		
KORO TECHNOLOGY		8	ILSHINBIO : FD FRONT		
ROBUSTAR		80	SHINSUNG E&G : MCUL32	Series	
EDmpapst		8	SPEEDTECH : PUI-2000 Se	ries	
CoDeSys Automation Al	liance		JISANG : Rectifier		
Ophir Optronics Solution	ns Ltd.	<b>~</b>	ASN + T&H Sepsor		
SERVOMEX					
Tiger Optics, LLC			SNC : How Meter		
B & R Automation			SEORIM : PMC3000		
Peripheral Device	_		MEMORY MAP SLAVE		
OTHERS Manufacture			WILLINGS : Master-K		
	•	<u>∧</u> _			•
			Back	🃫 Next	X Cancel
Select Device					
PLC Setting[ SHIN	SUNG E <u>G</u> : MC	UL32 S	eries ]		
PLC Setting[ SHIN Alias Name	SUNG E <u>G</u> : MC : PLC1	UL32 S	eries ]		
PLC Setting[ SHIN Alias Name Interface	SUNG E <u>G</u> : MC : PLC1 : Serial	UL32 S	eries ]		
PLC Setting[ SHIN: Alias Name Interface Protocol	SUNG E <u>G</u> : MC : PLC1 : Serial : MCUL32	XUL32 S	Series ]	Сог	mm Manual
PLC Setting[ SHIN Alias Name Interface Protocol	SUNG E <u>G</u> : MC : PLC1 : Serial : MCUL32	UL32 S	ieries]	Con	mm Manual
PLC Setting[ SHIN Alias Name Interface Protocol	SUNG E <u>G</u> : MC : PLC1 : Serial : MCUL32	SUL32 S	ieries ]	Con	mm Manual
PLC Setting[ SHIN Alias Name Interface Protocol	SUNG E <u>G</u> : MC : PLC1 : Serial : MCUL32 -Y ND ~ 1 TimeOut	5	ieries ]	Cor	mm Manual
PLC Setting[ SHIN Alias Name Interface Protocol	SUNG E <u>G</u> : MC : PLC1 : Serial : MCUL32 SY ND ~ 1 TimeOut 1 Condition	SUL32 S	ieries ]	Cor	mm Manual
PLC Setting[ SHIN Alias Name Interface Protocol Use Redundant Operate Condition : A Change Condition : C Primary Option	SUNG E <u>G</u> : MC : PLC1 : Serial : MCUL32 	5	(Second)	Cor	mm Manual
PLC Setting[ SHI]K Alias Name Interface Protocol Operate Condition : A Change Condition : E Primary Option Timeout	SUNG E <u>G</u> : MC : [PLC1 : [Serial : [MCUL32 Y ND ~ 1 TimeOut 1 Condition	SUL32 S	image: second decision	Cor	mm Manual
PLC Setting[ SHIN Alas Name Interface Protocol Use Redundan Operate Conditon : A Change Conditon : A Primary Option Timeout Send Wait	SUNG E <u>G</u> : MC : [PLC1 : Serial : MCUL32 Y ND ~ 1 TimeOut 1 Condition 300 0 0 0	5 msec	ieries ]	Cor	mm Manual
PLC Setting[ SHIN Alias Name Interface Protocol	SUNG E <u>G</u> : MC : PLC1 : Serial : MCU132 V ND ~ 1 TimeOut 1 Condition 300 © 0 © 5 ©	5 msec msec	ieries ]	Cor	mm Manual
PLC Setting[ SHIN Alias Name Interface Protocol Use Redundanc Operate Condition : A Change Condition : C Primary Option Timeout Send Wait Retry MCULI ID	SUNG E <u>G</u> : MC : PLC1 : Serial : MCU.32 	S msec msec	ieries ]	Cor	mm Manual
PLC Setting[ SHIN Alias Name Interface Protocol Use Redundanc Operate Condition : A Change Co	SUNG EG : MC : PLC1 : Serial : MCUL32 	S msec msec	ieries ]	Cor	mm Manual
PLC Setting[ SHIN Alias Name Interface Protocol Use Redundant Operate Condition : A Change Condition : A Change Condition : A Primary Option Timeout Send Wait Retry MCUL ID • Settings for reading of Trigger	SUNG E <u>G</u> : MC : [PLC1 : Serial : MCUL32 Y ND Y 1 TimeOut 1 Condition 300 5 5 1 1 5 5 1 5 5 5 1 5 5 5 5 5 5 5 5 5 5 5 5 5	IUL32 S	eries ] ↓ ↓ ↓ (Second)	Cor	mm Manual
PLC Setting[ SHIN Alas Name Interface Protocol Use Redundant Operate Condition : A Change Condition : A Change Condition : A Primary Option Timeout Send Wait Retry MCUL ID • Settings for reading of Trigger Comm. Complete	SUNG E <u>G</u> : MC : [PLC1 : Serial : MCUL32 Y ND ~ 1 TimeOut 1 Condition 300 © 5 © 1 © 1 © 5 © 1 © 5 S 1 ©	IUL32 S 5 msec msec	eries] ✓ ✓ (Second) 00000.00 © C = = 00000.00 © C = = 00000.0	Cor	mm Manual
PLC Setting[ SHINK Alas Name Interface Protocol Operate Condition : A Change Condition : C Primary Option Timeout Send Wait Retry MCUL ID • Settings for reading of Trigger Comm. Complete Comm. Error	SUNG E <u>G</u> : MC : [PLC1 : Serial : MCUL32 Y ND ~ TimeOut Condition 300 5 1 0 5 1 SYS SYS SYS CV	IUL32 S 5 msec msec v ( v ( v (	eries ] ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	Cor	mm Manual
PLC Setting[ SHINK Alas Name Interface Protocol Operate Condition : A Change Condition : C Primary Option Timeout Send Wait Retry MCUL ID • Settings for reading of Trigger Comm. Complete Comm. Error	SUNG EG : MC : PLC1 : Serial : MCUL32 Y ND ~ TimeOut Condition 300 0 5 0 1 0 5 0 1 0 5 0 5 0 5 0 5 0 5 0 5 0 5 0 5	s s msec msec	eries ] ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓		mm Manual

Settings		Contents
TOP	Model	Check the display and process of TOP to select the touch model.
External device	Vendor	Select the vendor of the external device.
		Select "OTHERS Manufacture".
	External device	Select external device.
		Select "SHINSUNG E&G: MCUL32 Series".
		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.



# 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 > Serial ]
  - Set the TOP communication interface in TOP Design Studio.

Project Option					×
Change HMI[H]	dd PLC [A]	ange PLC[ <u>C]</u> 🔀 De	elete PLC[D]		
TOP Setting	Date / Time Sy	vnc. Screen Option	unit Convert		
Option Module Setting     FieldBus (0)	Project Option	Screen Change	HmiSetup Global Lock & Touch	Project Style Splash PLC	Buffer Sync.
↓ FID (0) ✓ ✓ ✓ Device Setting	- 🗹 Use HMI S	etup		Initialization	Edit
COM1 (1) PLC1 : SHINSUNG E&G :	Project Setting			Initialization	Luit
	HMIDisable=0 Project Name=1	New project			
Wireless (0)	Start Screen No Latch Use=0	0.=1			
	Communication USBErrorMessa	Error Message=0 ge=0			
	StorageErrorMe DatabaseMessa	essage=1 age=1			
Control Panel					
Control ranei					
Suctom			Serui ee	Detion	
		evices	== Service	option	
			🚥 Serial		×
			Serial Port:	COM1	<b>-</b>
PLC	Security	Date/Time	C' I -I I		
				422(4) 💿 BS-485(2)	
പപ്പാപ	0 1000 0		Baud Rate:	9600	▼
			Data Bit:	8	<b>-</b>
Ethernet	Serial	HDMT			
			Stop Bit:	1	▼
			Parity Bit:	None	-
Land V		3	F1	04.6	
		/Ping	Flow:	UTT	
Diagnostic	File	Ping	Auto Search	Loopback Tes	t
	Manager				
				Apply Cance	el
			L		

Items	ТОР	External device	Remarks
Signal Level (port)	RS-485	RS-485	
Baud Rate	960	0	
Data Bit	8		
Stop Bit	1		
Parity Bit	NON	NE	

\* 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 properties > PLC settings > COM > "PLC1 : SHINSUNG E&G : MCUL32 Series"]
  - Set the options of the communication driver of MCUL32 Series in TOP Design Studio.

Project Option			×
Change HMI[H] Add P	LC [A] TIT Change PLC[C] Celete PLC[D]		
Change HMI[H]	LC (A)       Image PLC(C)       Image Delete PLC(D)         PLC Setting[SHINSUNG EG: MCUL32 Series]         Alias Name :       PLC1         Interface :       Serial         Protocol :       MCUL32         Operate Condition :       MND         Change Condition :       Image Condition         Edit       Edit         Primary Option       Timeout         300       msec         Send Wait       0         ID       1         • Settings for reading of FFU status         Trigger       SYS         Complete       SYS         Complete       SYS         Output       32         Vert V ALST       SV         Vert V ALST       SV         Vert V ALST       SV         Vert V ALST       SV	Co	mm Manual
		Apply	Close

Items	Settings	Remarks
Interface	Select "Serial".	2. External device
Protocol	Select the communication protocol between the TOP and an external 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 request.	
Retry	Configures the number of attempts for communication upon failure.	
MCUL ID	Enter the ID of MCUL to be connected.	
Setting for FFU status	read	
Trigger	Set the address that operates the Read.	
Comm. Complete	Set the address that turns ON when communication is normally completed.	
Comm. Error	Set the address that turns ON when there is an error in communication.	
Number of FFU	Enter the number of FFUs.	
PV, ALST, SV, mmAq	Check FFU data to read status.	
FFU Read Data	Set the starting address to save FFU data.	



#### 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	960	0	
Data Bit	8		
Stop Bit	1		
Parity Bit	NOI	NE	

\* 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

■ [ Main screen > Control panel > PLC ]

	<b>*</b>		
	0		×
	🔯 Syster	Driver(COM1) PLC1(SHINSUNG E&G : MCUL32 Se	ries) 🔹
Run		Interface Serial 🔹	
		Protocol MCUL32 💌	
VNC	PLC	Timeout 300 🖨 msec	
VNC		Send Wait 0 🚔 msec	
Viewer	പ	Retry 5	
	Ethernet	MCUL ID 1	
	Linener	Settings for reading of FFU status	
Screen	· mit	Trigger SYS:00000.00:1:16:DEC:R	
shot	MILL Y	Comm. Complete SYS:00000.01:1:1:DEC:W	
	Diagnostic	Comm. Error SYS:00000.02:1:1:DEC:W	
		Number of FFU 32 🔷	<b>_</b>
	[System]	Diagnostic	Apply Cancel
	L		
s	Settings		Remarks
fa.co.	Coloct "Coriol"		2. Eutomodulati

Items	Settings	Remarks
Interface	Select "Serial".	2. External device
Protocol	Select the communication protocol between the TOP and an external 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 request.	
Retry	Configures the number of attempts for communication upon failure.	
MCUL ID	Enter the ID of MCUL to be connected.	
Setting for FFU status	read	
Trigger	Set the address that operates the Read.	
Comm. Complete	Set the address that turns ON when communication is normally completed.	
Comm. Error	Set the address that turns ON when there is an error in communication.	
Number of FFU	Enter the number of FFUs.	
PV, ALST, SV, mmAq	Check FFU data to read status.	
FFU Read Data	Set the starting address to save FFU data.	



#### **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	Check		Remarks	
System	How to connect the sy	stem	OK	NG	1 System configuration	
configuration	Connection cable name	e	OK	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	01/	NC	2. External device selection	
		diagnostics	ÜK	JK NG	3. Communication setting	
	Serial Parameter	Transmission	OK	NG		
		Speed	OK NG			
		Data Bit	OK	NG		
		Stop Bit	OK	NG		
		Parity Bit	OK	NG		
External device	CPU name		OK	NG		
	Communication port n	OK	NG			
	Protocol (mode)	OK	NG			
	Setup Prefix		OK			NG
	Other detailed settings		OK	NG	4. External device cetting	
	Serial Parameter	Transmission	OK	NG	4. External device setting	
		Speed	ÜK			
		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.)	



# 4. External device setting

Set the equivalent communication settings to that of the TOP by referring to the vendor's user manual.



## 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 chapter may differ from the recommendations of "SHINSUNG E&G Co., Ltd.".)

#### ■ **RS-485** (1:1 connection)



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

#### ■ **RS-485** (1:1 connection)

COM				Exter	rnal device
Din arrangement	Signal	Cable connection	Pin	Signal	
Pin anangement	name		number	name	
	+		1		A
	-		2		
0	SG		3	+	
101 56			4	-	16
64 -			5		.0
( <b>E</b>			6		Based on
Carl 1					communication cable
0					connector front,
					6 pin male RJ-12
					(Male, convex)



### 6. Operation and processing of data requests

Describes the FFU status read request operation of the MCUL32 Series communication driver, and the processing method of response data.

The MCUL32 communication driver requests FFU data to the external device (MCUL32) by the bit value of the trigger address. The trigger address can be set in the communication option setting window.

When the FFU status read trigger bit value is ON, status data is saved as many as the number of FFUs in the order of FFU ID, PV, AL&ST, SV, pressure (mmAq) from the address set in FFU Read Data. (Only checked PV, AL&ST, SV, pressure (mmAq) are requested and processed.)

Ex 1) If FFU Read Data address is set to D00100, Number of FFU is set to 32, and PV, ALST, SV and mmAq are all checked, the data is saved as follows.

D00100 : FFU ID 1 D00101: PV value of No.1 FFU D00102: AL&ST value of No.1 FFU D00103: SV value of No.1 FFU D00104: Pressure value (mmAq) of No.1 FFU D00105 : FFU ID 2 D00106: PV value of No.2 FFU D00107: AL&ST value of No.2 FFU D00108: SV value of No.2 FFU D00109: Pressure value (mmAq) of No.2 FFU ••• D00255 : FFU ID 32 D00256: PV value of No.32 FFU D00257: AL&ST value of No.32 FFU

D00256: PV value of No.32 FFU D00257: AL&ST value of No.32 FFU D00258: SV value of No.32 FFU D00259: ressure value (mmAq) of No.32 FFU

Ex 2) If FFU Read Data address is set to D00100, Number of FFU is set to 32, and PV and SV are all checked, the data is saved as follows.

D00100 : FFU ID 1 D00101: PV value of No.1 FFU D00102: SV value of No. 1 FFU D00103 : FFU ID 2 D00104: PV value of No. 2 FFU D00105: SV value of No. 2 FFU ... D00193 : FFU ID 32 D00194: PV value of No. 32 FFU D00195: SV value of No. 32 FFU