GREENPOWER

STK CPS MASTER

Supported version TOP Design Studio V1.4.9.84 or higher

CONTENTS

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

1. System configuration

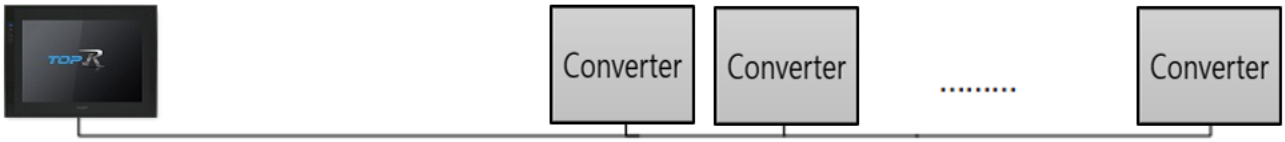
The system configuration of TOP and "GREENPOWER – STK CPS Master" is as follows:

Series	CPU	Communication method	System setting	Cable
GREENPOWER – STK CPS	Converter	RS–485	3.1 Settings example 1 (Page 4)	4. Cable table Page 10

■ Connection configuration

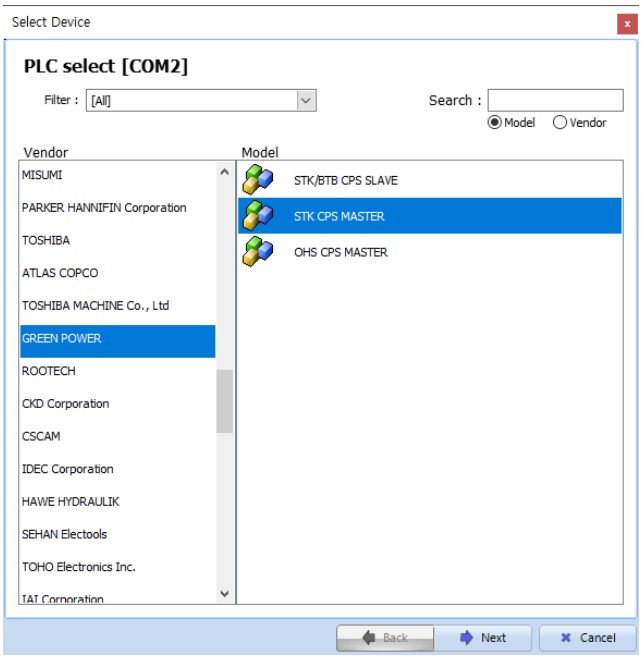
・1:1 connection

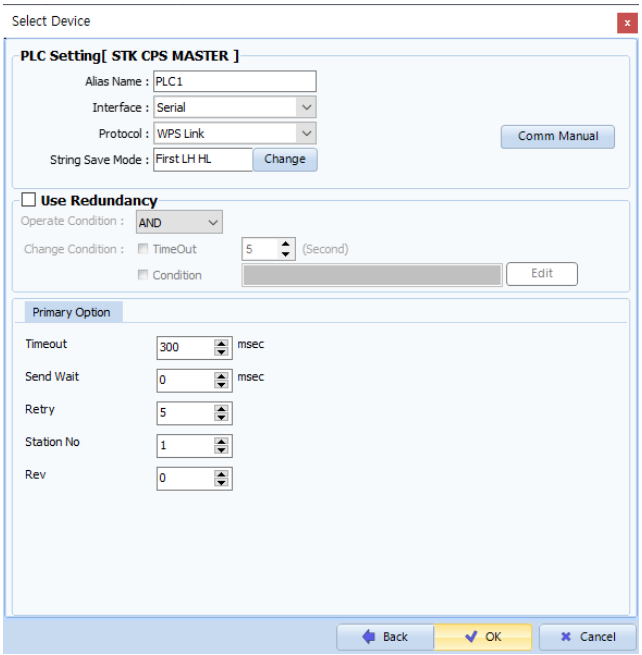
・1:N connection



2. External device selection

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





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 to be connected to TOP. Select “GREENPOWER”.
	PLC	Select an external device to connect to TOP.

Model	Interface	Protocol
STK CPS MASTER	Serial	WPS Link

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

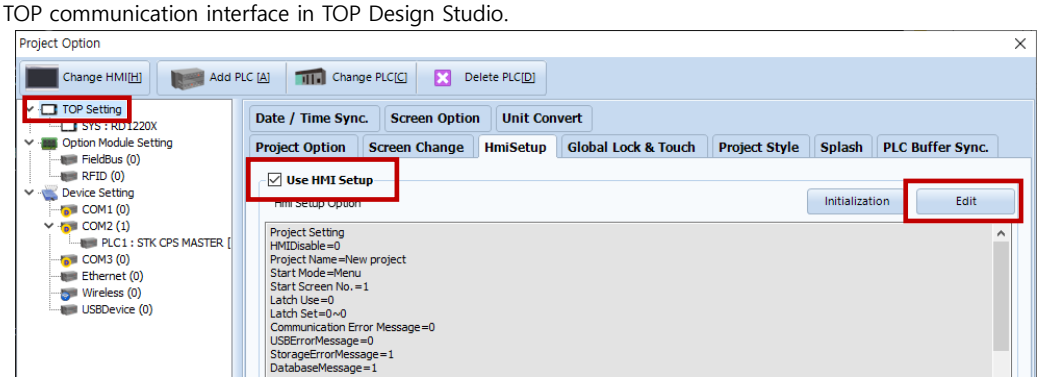
The communication can be set in TOP Design Studio or TOP main menu. The communication should be set in the same way as that of the external device.

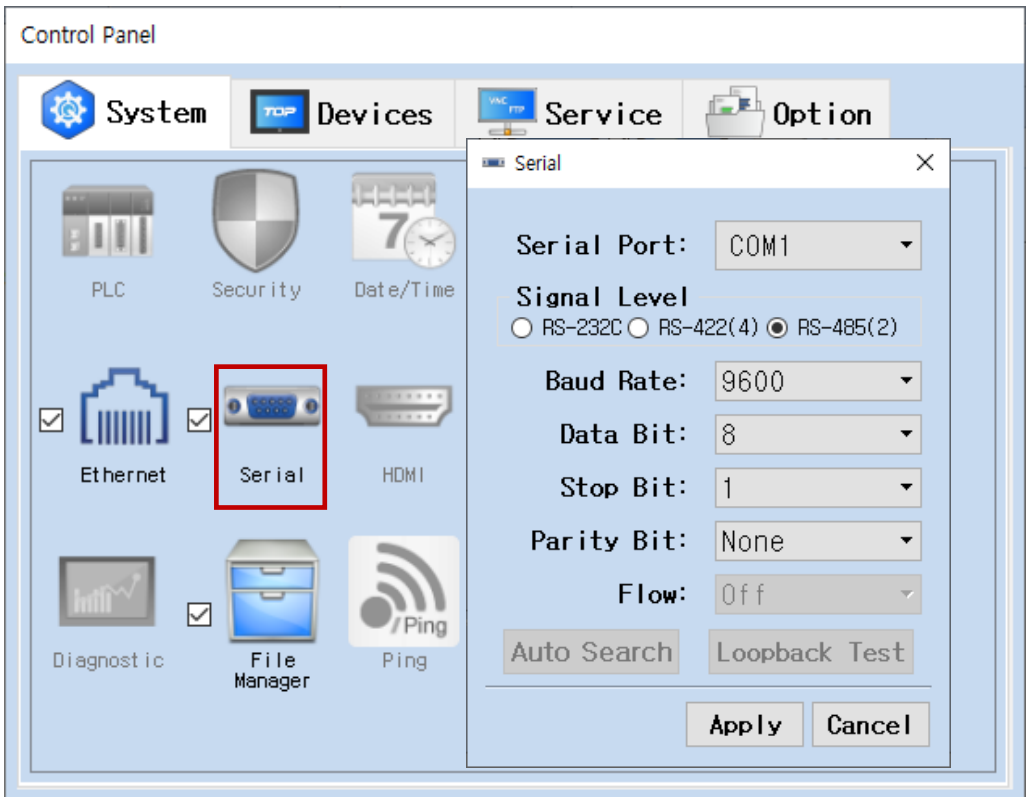
3.1 Communication setting in TOP Design Studio

(1) Communication interface setting

■ [Project > Project Property > TOP Setting] → [HMI Setup > "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	9600		
Data Bit	8		
Stop Bit	1		
Parity Bit	none		

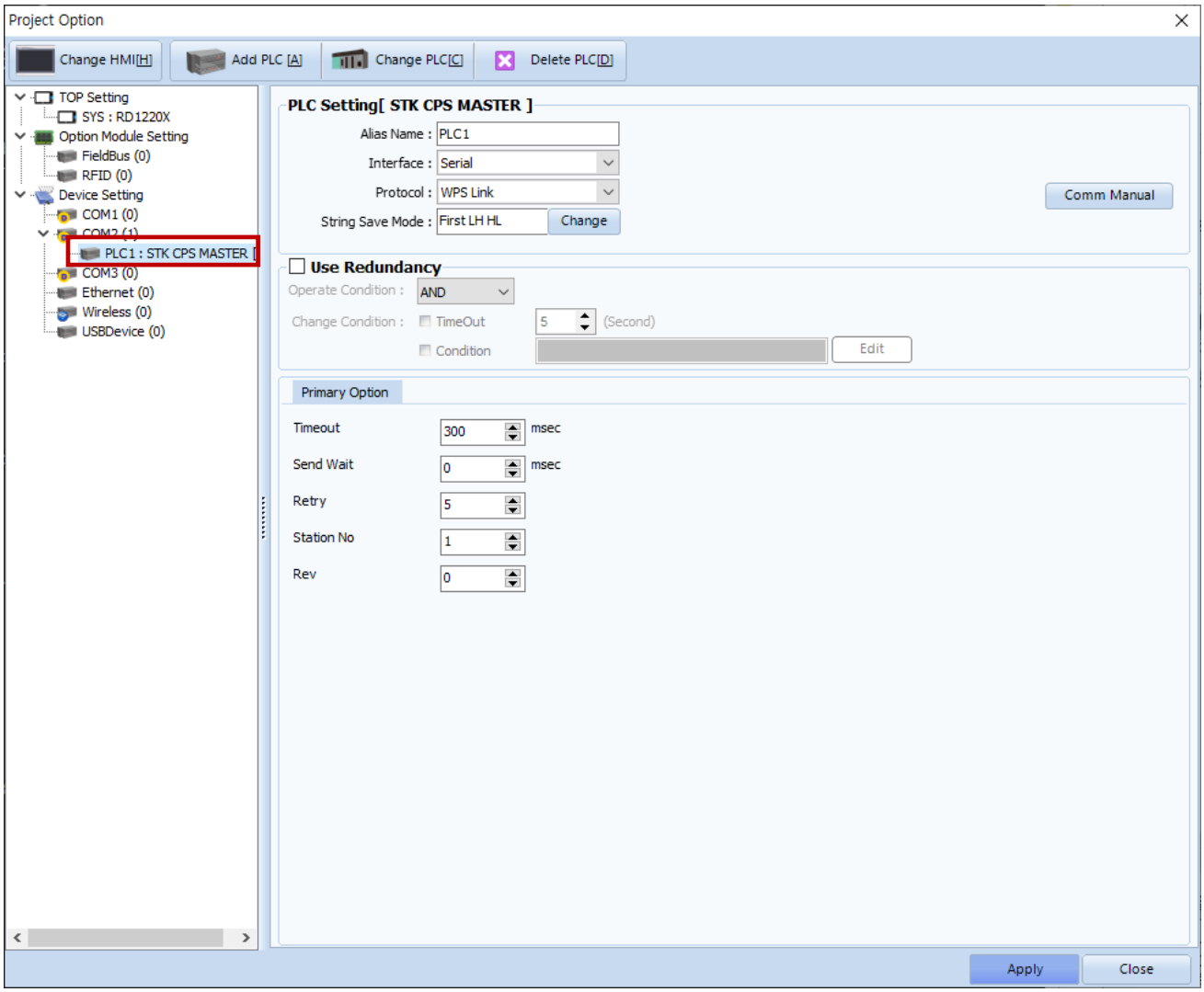
* The above settings are examples recommended by the company.

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 > Device Setting > COM > "PLC1 : STK CPS MASTER"]

– Set the options of the STK CPS MASTER communication driver in TOP Design Studio.

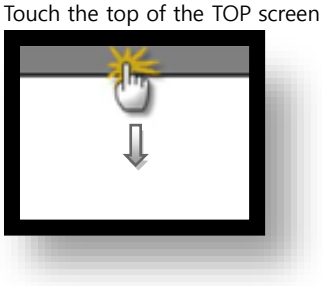


Items	Settings	Remarks
Interface	Select "Serial".	Refer to "2. External device selection".
Protocol	Select "WPS Link".	
TimeOut (ms)	Set the time for the TOP to wait for a response from an external device.	
SendWait (ms)	Set the waiting time between TOP's receiving a response from an external device and sending the next command request.	
Retry	Configure the amount of request attempts from TOP to external device.	
Station No	Prefix	
Rev	Revised version	

3.2. Communication setting in TOP

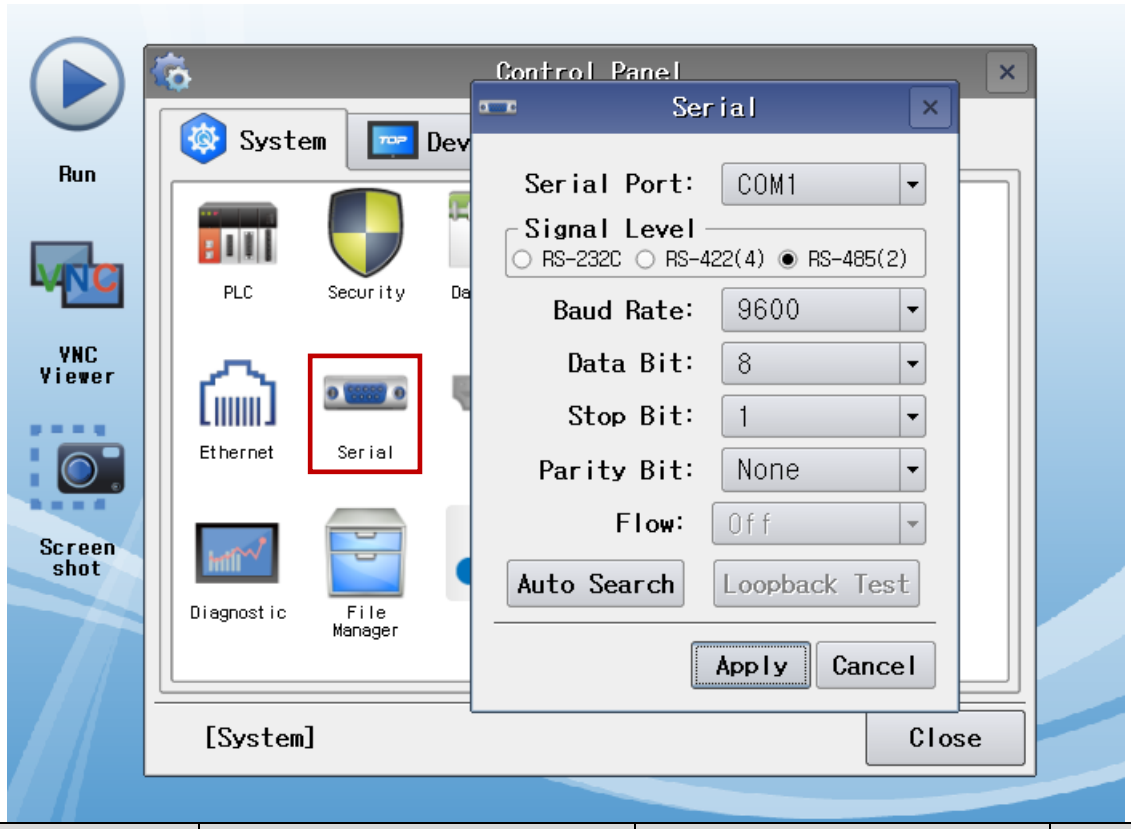
*** This is a setting method when "Use HMI Setup" in the setting items in "3.1 TOP Design Studio" is not checked.**

■ 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]



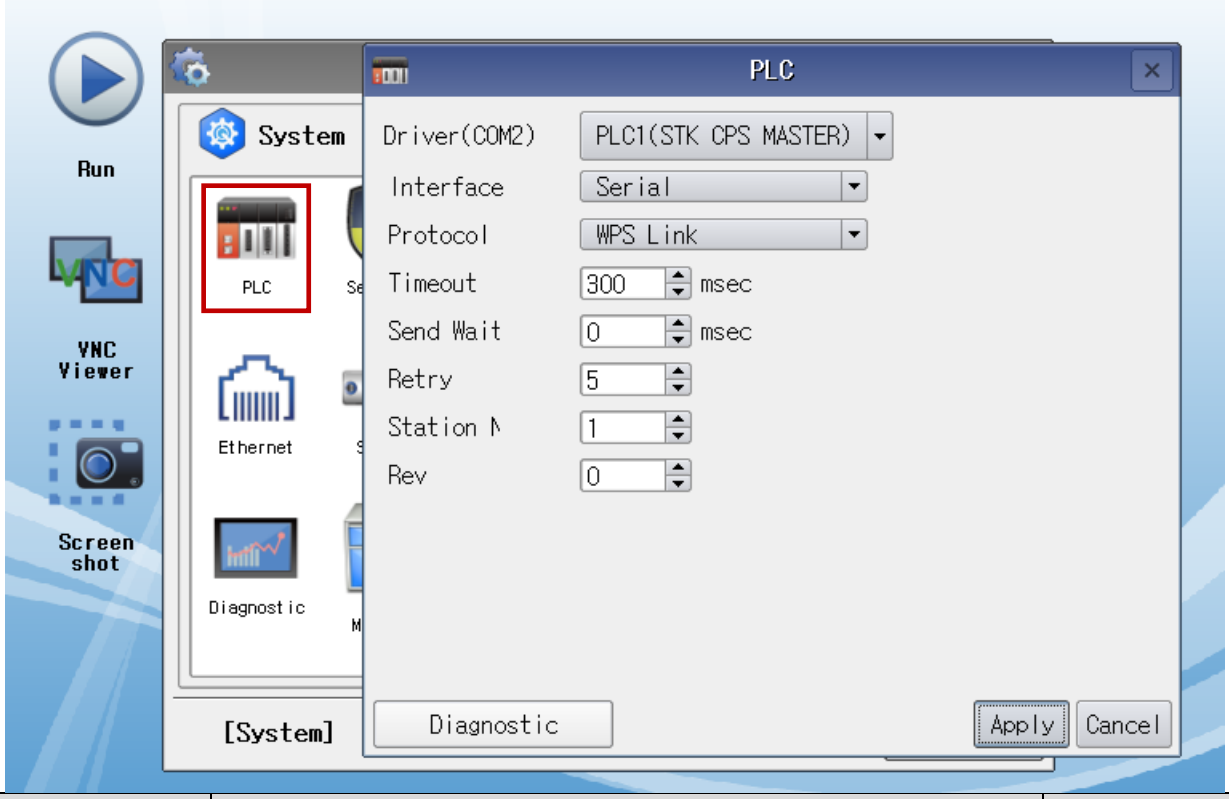
Items	TOP	External device	Remarks
Signal Level (port)	RS-485	RS-485	
Baud Rate	9600		
Data Bit	8		
Stop Bit	1		
Parity Bit	none		

* 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 "Serial".	Refer to "2. External device selection".
Protocol	Select "WPS Link".	
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	Configure the amount of request attempts from TOP to external device.	
Station No	Prefix	
Rev	Revised version	

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	
	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	5. Supported addresses (For details, please refer to the PLC vendor's manual.)

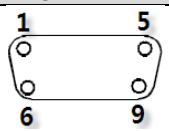
4. External device setting

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 "**GREENPOWER – STK CPS MASTER**")

■ **RS-485** (1:1 connection)

TOP			Cable connection	PLC	
Pin arrangement*Note 1)	Signal name	Pin number		Signal name	
 Based on communication cable connector front, D-SUB 9 Pin male (male, convex)	RDA(+)	1		SDA(+)	
				SDB(-)	
				RDA(+)	
	RDB(-)	4		RDB(-)	
	SG	5		SG	
	SDA(+)	6			
	SDB(-)	9			

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

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.

Device	Data	R/W	Size	Description
G00	ID	R	16bit	**Unit category**
G01	Status	R	16bit	**Unit status information** **0 : STOP** **1 : RUN** **2 : Fault** **3 : Warning** **4 : FailOver**
G02	Voltage	R	16bit	**Rectified voltage**
G03	Voltage	R	16bit	**Boost voltage**
G04	Current	R	16bit	**Boost current 1**
G05	Current	R	16bit	**Boost current 2**
G06	Current	R	16bit	**Inverter output current**
G07	Current	R	16bit	**Track current**
G08	Frequency	R	16bit	**Output frequency**
G09	Temp	R	16bit	**Converter heat sink temperature**
G10	Error code	R	16bit	**Converter Error Code**
G11	Voltage RS	R	16bit	Input voltage RS
G12	Voltage ST	R	16bit	Input voltage ST
G13	Voltage TR	R	16bit	Input voltage TR
G14	Current R	R	16bit	Input current R -
G15	Current S	R	16bit	Input current S
G16	Current T	R	16bit	Input current t -
G17	Total kw	R	16bit	3-phase Total Power
G18	Kwh	R	16bit	Power

Converter Error list

Error_Code	Error Name	Description	Converter LCD window
1	Erec_peakVoltage	Input voltage greater than 420 V results in overvoltage	Erec P.V
2	Erec_OverVoltage	Input voltage greater than 400 V results in overvoltage	Erec O.V
3	Erec_UnderVoltage	Input voltage lesser than 230 V results in undervoltage	Erec U.V
4	Eboost_PeakVoltage	DC voltage greater than 650 V results in overvoltage	Eboost P.V
5	Eboost_OverVoltage	DC voltage greater than 680 V results in overvoltage	Eboost O.V
6	Eboost_UnderVoltage	**BOE B10 - Unused**	Eboost U.V
7	Ebuck_PeakVoltage	**BOE B10 - Unused**	Ebuck P.V
8	Ebuck_OverVoltage	**BOE B10 - Unused**	Ebuck O.V
9	Ebuck_UnderVoltage	**BOE B10 - Unused**	Ebuck U.V
10	Iboost_PeakCurrent	Boost IGBT greater than 140 A results in overcurrent	Iboost P.C
11	Iboost_OverCurrent	Boost IGBT greater than 150 A results in overcurrent	Iboost O.C
12	Iboost2_PeakCurrent	Boost IGBT greater than 140 A results in overcurrent	Iboost2 P.C
13	Iboost2_OverCurrent	Boost IGBT greater than 150 A results in overcurrent	Iboost2 O.C
14	Ibuck_PeakCurrent	**BOE B10 - Unused**	Ibuck P.C
15	Ibuck_OverCurrent	**BOE B10 - Unused**	Ibuck O.C
16	Isrc_PeakCurrent	Track current greater than 180 A	Isrc P.C
17	Isrc_OverCurrent	Track current greater than 170 A	Isrc O.C
18	Isrc_UnderCurrent	Track current lesser than 100 A	Isrc U.C
19	Isrc_FO_PeakCurrent	**BOE B10 - Unused**	F/O Isrc P.C.
20	Isrc_FO_OverCurrent	**BOE B10 - Unused**	F/O Isrc O.C.
21	Isrc_FO_UnderCurrent	**BOE B10 - Unused**	F/O Isrc U.C.
22	Iout_PeakCurrent	Inv IGBT current greater than 180 A	Iout P.C
23	Iout_OverCurrent	Inv IGBT current greater than 170 A	Iout O.C
24	Boost1_Gate_Fault	Boost1 IGBT malfunction	BoostA GateFault
25	Boost2_Gate_Fault	Boost2 IGBT malfunction	BoostB GateFault
26	Buck_Gate_Fault	BOE B10 - Unused	Buck GateFault
27	Inv1_Gate_Fault	Inverter1 IGBT malfunction	InvA GateFault
28	Inv2_Gate_Fault	Inverter2 IGBT malfunction	InvB GateFault
29	Initial_Charge_Fail	Failed initial charging during RUN operation	InitCharge Fail
30	EMO_Stop_Int	Internal emergency operation for converter	EMO Stop Int

Error_Code	Error Name	Description	Converter LCD window
31	EMO_Stop_Ext	Internal emergency operation for converter	EMO Stop Ext
32	Interlock_by_Ext	External interlock	Ext Interlock
33	Fuse_Open	Input Fuse Open	Fuse Open
34	Sag_Gen_Fault	Power outage lasts longer than 1 s	Sag Gen Fault
35	Main_Fan_Fault	Faulty operation of main fan	Main Fan Fault
36	HeatSink_OverHeat_80	Heat sink overheats to 80 °C (Bimetal)	HeatSink OverHeat
37	IGBT_OverHeat	IGBT overheats to 80 °C (NTC)	IGBT OverHeat
38	Track_Cable_OverHeat	Track Power Cable 90 °C thermal wire operation	OutCable OverHeat
39	Inside_Cable_OverHeat	Converter's Internal Power Cable 90 °C thermal wire operation	InCable OverHeat
40	Busbar_OverHeat	Output busbar overheats to 80 °C (Bimetal)	Busbar OverTemp
41	FO_Track_Cable_OverHeat	**BOE B10 - Unused**	F/O OutCable O.T.
42	FO_Inside_Cable_OverHeat	**BOE B10 - Unused**	F/O InCable O.T.
43	FO_Busbar_OverHeat	**BOE B10 - Unused**	F/O Busbar O.T.
44	Panel_OverTemp_Fault	**BOE B10 - Unused**	Panel O.T Fault
45	Smoke_Detect_Fault	**BOE B10 - Unused**	INT Smoke Fault
46	Regulator Fault(Interlock)	Regulator Fault (Bypass break)	Regulator Fault
47	eeprom_ad_check_sum_fail	Controller EEPROM Data Load error	Ad Data R/W Fail
48	eeprom_sys_check_sum_fail	Controller EEPROM Data Load error	Sys Data R/W Fail
49	eeprom_gain_check_sum_fail	Faulty controller EEPROM data load	GainData R/W Fail
50	Watchdog_fault	Faulty controller operation	WatchDog Fault
51	CANA_comm_Fail	**BOE B10 - Unused**	CANA Comm Fail
52	CANB_comm_Fail	**BOE B10 - Unused**	CANB Comm Fail
53	Master_Output_MC_Fail	**BOE B10 - Unused**	Master F/O MC Fail
54	Slave_Output_MC_Fail	**BOE B10 - Unused**	Slave F/O MC Fail
55	EXT_Input_Check_Fault	**BOE B10 - Unused**	EXT Input Fault
56	AD_Connector_Open	**BOE B10 - Unused**	AD Connector OPEN
57	est_Eboost_PV	**BOE B10 - Unused**	est Eboost PV
58	est_Eboost_OV	**BOE B10 - Unused**	est Eboost OV
59	Reserved	Reserved	Reserved
60	Reserved	Reserved	Reserved
61	Reserved	Reserved	Reserved
62	Reserved	Reserved	Reserved
63	Reserved	Reserved	Reserved
64	Reserved	Reserved	Reserved
65	FailOver_MC_Short	**BOE B10 - Unused**	Failover MC Short
66	CPS2_Main_MC_Short	**BOE B10 - Unused**	Failover MC Short
67	CPS2_Sub_MC_Short	**BOE B10 - Unused**	Failover MC Short

Error_Code	Error Name	Description	Converter LCD window
68	Reserved	Reserved	Reserved
69	Reserved	Reserved	Reserved
70	Reserved	Reserved	Reserved
71	Reserved	Reserved	Reserved
72	Reserved	Reserved	Reserved
73	Cap OverHeat	Resonating capacitor overheats to 75 °C (Bimetal)	Cap OverTemp
74	Reserved	Reserved	Reserved
75	Reserved	Reserved	Reserved
76	Reserved	Reserved	Reserved
77	Reserved	Reserved	Reserved
78	Reserved	Reserved	Reserved
79	Reserved	Reserved	Reserved
80	Reserved	Reserved	Reserved
81	HeatSink_OverHeat_60	Heat sink overheats to 60 °C (Bimetal)	HeatSink Warning
82	Panel_OverTemp_Warning	**BOE B10 - Unused**	Panel O.T Warning
83	IGBT_OverHeat_Waning	IGBT overheats to 60 °C	IGBT O.T Warning
84	Main_Fan_Warning	Main fan malfunction	Main Fan Warning
85	Sub_FAN1_Warning	Side FAN1 malfunction	Side FAN1 Warning
86	Sub_FAN2_Warning	Side FAN2 malfunction	Side FAN2 Warning
87	Sub_FAN3_Warning	Side FAN3 malfunction	Side FAN3 Warning
88	Sub_FAN4_Warning	Side FAN4 malfunction	Side FAN4 Warning
89	Fail-Over	**BOE B10 - Unused**	Fail-Over
90	Reserved	Reserved	Reserved
91	Reserved	Reserved	Reserved
92	Reserved	Reserved	Reserved
93	Reserved	Reserved	Reserved
94	Reserved	Reserved	Reserved
95	Reserved	Reserved	Reserved
96	Reserved	Reserved	Reserved
97	RS232_Comm_Fail	Failed communication with watt-hour meter	RS232 Comm Fail
98	RS485_Comm_Fail	Master Panel Communication Fail	RS485 Comm Fail
99	BlueTooth_Fail	**BOE B10 - Unused**	BlueTooth_Fail
100	Reserved	Reserved	Reserved
101	Reserved	Reserved	Reserved
102	Reserved	Reserved	Reserved
103	Reserved	Reserved	Reserved
104	Reserved	Reserved	Reserved
105	Reserved	Reserved	Reserved

Error_Code	Error Name	Description	Converter LCD window
106	Reserved	Reserved	Reserved
107	Reserved	Reserved	Reserved
108	Reserved	Reserved	Reserved
109	Reserved	Reserved	Reserved
110	Reserved	Reserved	Reserved
111	Reserved	Reserved	Reserved
112	Reserved	Reserved	Reserved