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GTC-700

Instruction Manual



Read in detail for correct use.

Gas & Flame Detection System



Thank you very much for purchasing a product from Gastron Co. Ltd.

Our Gastron Co.Ltd. is a company specialized in Gas Detector & Gas Monitoring System and have been recognized by many customers for the best quality and use convenience. We always seek to help our customers to find the product they need and we continuously research to develop gas detectors that satisfies our customers. From now on, you can solve all problems related to gas detectors with the products of Gastron. We Gastron will be responsible for your satisfaction.

This user manual describes operation and simple maintenance methods etc. for the gas detector. Please read carefully and store it in a safe place. Using it as a reference will help a lot when you have a question during use.

- For accurate operation of the gas detector, please perform an inspection and a calibration at least once per 6 months.
(* In reference to KOSHA GUIDE: P-135/6-2018 / 7.2 In-house inspection, section 2)
- For accurate operation of the gas detector, inspection and calibration using a reference gas before measurement is recommended.
- Failure to calibrate may result in malfunction of the equipment due to aging of the sensor.
- Only an individual specialized in gas detector may disassemble the device.
- Wire specification for the power cable must be decided in reference to the "Installation cable length" section.
- Please contact our company's technical support, e-mail, or website for inquiries related to inspection and calibration of the gas detector.

The product and manual are subject to change without a notice for the product's functional improvement and ease of use.

* KOSHA GUIDE : P-135/6-2018

Calibration must be performed at a frequency requested by the manufacturer and shall be performed quarterly when the calibration period is not specified.

In case of a problem after purchasing the product, please contact the address below.

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GTC-700 Series Analog Mux Controller has various built-in functions and equipped with micro-processor and high resolution A/D converter. GTC-700 is constructed as central studio system and consists of one common unit that performs collection and display of measurement data and data communication and a 8-channel analog input unit that measures analog input signal (0 - 20 mA). Analog input unit can be expanded up to 16-channels depending on the service environment.

GTC-700 Series is built with FND digital display (mA value) and LED that displays status of analog input channel, operation status of internal network, and power on status for the main power. It has RS-485 port and Ethernet port for data network.

2. Characteristics

GTC-700 Series Analog Multiplexer Controller is convenient to build the monitoring system with RS-485 & Ethernet network. It can construct max. 128 detectors with 1 set of controller. It enables expansion of controller to construct 128 or more detectors. (Max. 32 sets, 4096 channels)

Analog input (0 - 20 mA) port is grounded to protect the system safely in an event of thunderbolt or surge. It is equipped with high performance microprocessor to scan 128-channels within 1 sec (0.64 sec). Each channel can be span calibrated for accuracy of measurement and calibrated to compensate the cable route.

3.1. Basic Specification (Based on 128 Channel)

ITEMS	SPECIFICATION	
Input Signal	Analog 4-20mA (0~ 20mA)	
Input Voltage	Absolute min:	18V
	Nominal:	24V
	Absolute max:	30V
	Ripple maximum allowed:	1V pk-pk
Max. Wattage	Common Unit	58mA@24VDC(normal)
	Analog Unit	32mA@24VDC(normal)
	For 128-channel configuration	595mA@24VDC(normal)
Max. Wattage	Common Unit	1.39W@24VDC (normal)
	Analog Unit	0.768W@24VDC (normal)
	For 128-channel configuration	14.28W @24VDC (normal)
Measuring Value Display	Common Unit	4-Digit Seven Segment x 2
	Analog Unit	Power, Error, Status LED
Output Signal	Isolation RS-485 MODBUS, MODBUS TCP/IP	
Cable Connection Length and Wire Requirement	Power	Approx. 40 m when CVVS,CVVSb with shield AWG23 are used.
	RS485	STP (Shielded Twisted Pair) Max. 1 km
	TCP/IP	CAT5 cable or equivalent RJ45 Max. 100m
Approval	CE	

3.2. Mechanical Specifications (Based on 128 Channel)

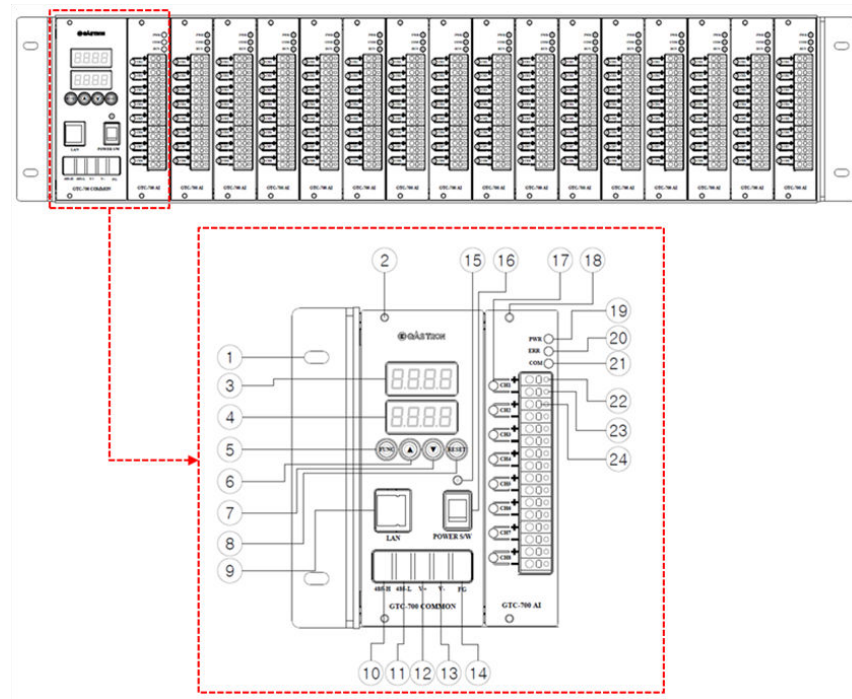
ITEMS	SPECIFICATION
Dimension	593.5(W) x 132.5(H) x 120(D) mm
Weight including Sensor	App. 4.7kg
Mounting Type	Wall mount
Body Material	aluminum alloy

3.3. Environmental Specifications

ITEMS	SPECIFICATION
Operation Temperature	0 to 55 °C
Storage Temperature	0 to 55 °C
Operation Humidity	5 to 99% RH (Non-condensing)
Pressure Range	90 to 110KPa

4.1. External Components

- GTC-700 consists of 1 common unit and 16 analog input units. The analog input units are names as Slot1, Slot2, ... Slot 16 from the left and min. 1 to max. 16 slots can be selected for configuration.



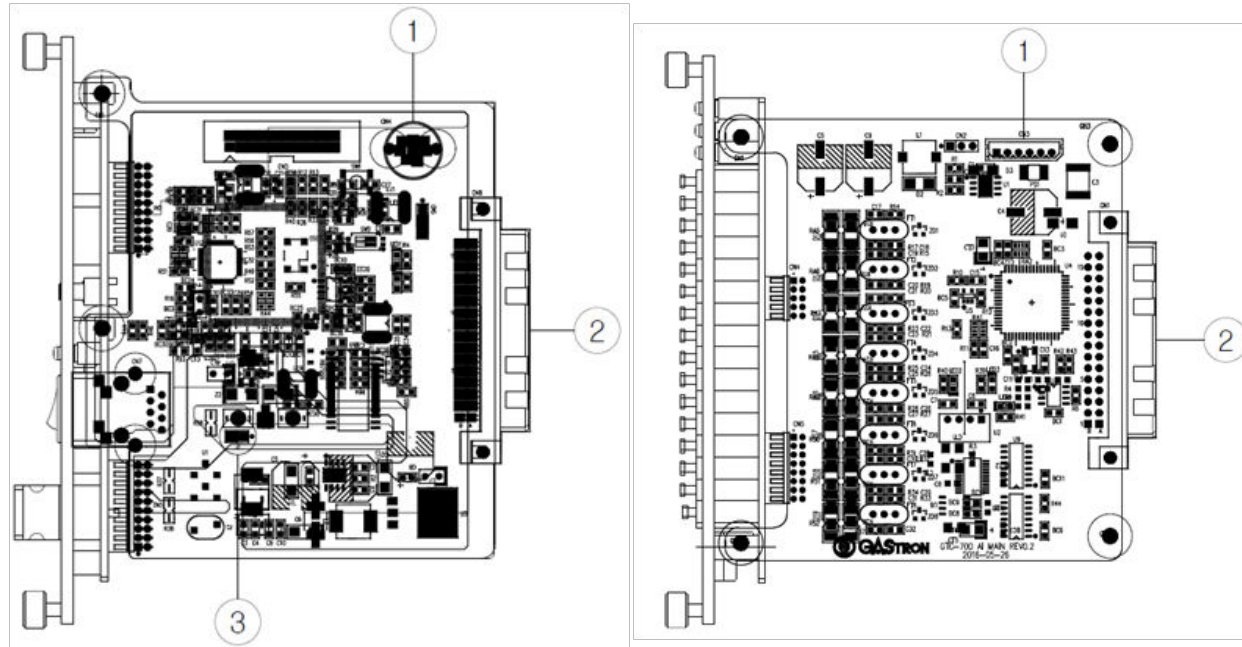
[Figure 1. GTC-700 External Components]

NO	NAME	DESCRIPTIONS
1	Mount hole	Mount hole for fixing the product
2	Common Unit holder	It is used for detachment or fixing of Common unit.
3	First FND	It displays measuring channel and main/sub menu.
4	Second FND	It displays measurement and menu setting value of the selected channel.
5	Function key	It is used to enter a setting mode or move between menu.
6	Up key	It is used to move between measuring channel and to adjust setting.
7	Down key	It is used to move between measuring channel and to adjust setting.
8	Reset key	It is used to return to the previous step in setting modes or to the main screen.

NO	NAME	DESCRIPTIONS
9	Ethernet Connector	Ethernet Network Connector
10	RS-485-H Terminal	RS-485 Network High Line Connection Terminal
11	RS-485-L Terminal	RS-485 Network Low Line Connection Terminal
12	Main Power Terminal (V+)	Device Power '+' Connection Terminal (Normal 24 VDC)
13	Main Power Terminal (V-)	Device Power '-' Connection Terminal (Normal 24 VDC)
14	Frame Ground Terminal	Frame Ground Terminal
15	Main Power Status LED	LED for main power status, It lights on when power turns on.
16	Main Power Switch	Power ON/OFF Switch
17	Analog Input Channel Status LED	It displays measurement status Orange light turns on below 3.9 mA. Green light turns on between 4 ~ 20 mA. Red light turns on above ~ 21 mA.
18	Analog Input Unit holder	It is used for detachment or fixing of analog input unit.
19	Analog Input Unit Power Status LED	LED for power status of analog input unit. It lights on when power turns on.
20	Analog Input Unit Error Status LED	It displays error status of analog input unit. It lights on upon an event of error.
21	Analog Input Unit Com. Status LED	It displays network status of analog input unit and common unit. It flashes during normal network.
22	Positive Analog Input Terminal	External 0 ~ 20 mA current signal '+' Input terminal
23	Negative Analog Input Terminal	External 0 ~ 20 mA current signal '-' Input terminal
24	Analog Input Terminal Unlock Button	Press to remove analog input terminal

[Table 1. Power Configuration Description]

4.2. Internal Components



[Figure 2. Common Unit Configuration]

[Figure 3. Analog Input Unit]

NO	NAME	DESCRIPTIONS
1	Common Unit F/W Download Connector	Used to change Common Unit F/W.
2	Common Unit to Motherboard Connector	When common unit is equipped, it is connected to mother B/D/.
3	RS-485 termination Jumper	Connected when RS-485 terminating resistor is used.

[Table 2. Common Unit Configuration Description]

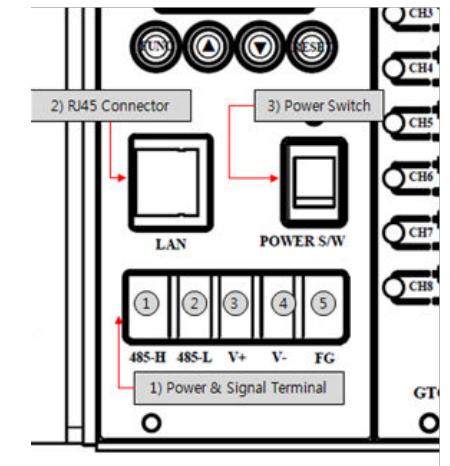
NO	NAME	DESCRIPTIONS
1	Analog Unit F/W Download Connector	Used to change Analog Unit F/W.
2	Analog Unit to Motherboard Connector	When Analog unit is equipped, it is connected to mother B/D/.

[Table 3. Analog Unit Configuration Description]

- It is prohibited for an individual, other than an approved user or a technician responsible for installation and repair from the head office, to install a gas leak detector on site or open the cover of the installed gas leak detector and manipulate it. This may cause serious loss of life and property from fire, explosion, and etc. In addition, please check whether there is any remaining explosive gas or combustible material in the surroundings. Power must be turned off before performing work.

5.1. Power and External Signal Configuration

- To supply power to the product, construct using the power and signal terminals located on the front part of the common unit.



[Figure 4. Common Unit Terminal Configuration]

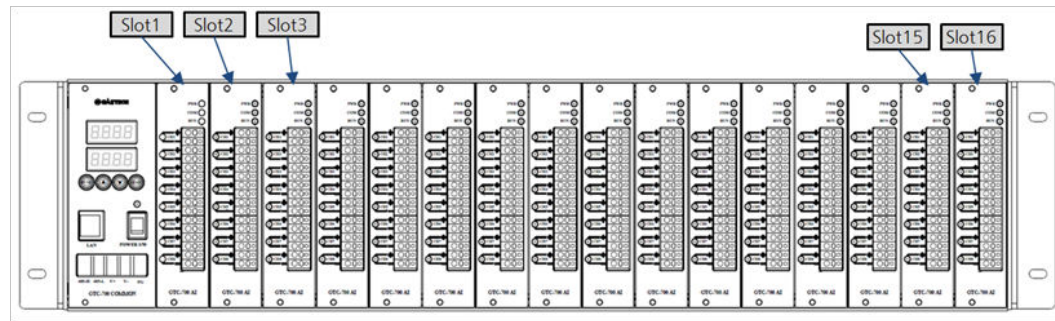
TYPE	TERMINAL NAME	DESCRIPTION
1) Power & Signal Terminal	①485-H	MODBUS 485 network terminal, connected to RS485 A terminal (TRXD+ or P) of an external device.
	②485-L	MODBUS 485 network terminal, connected to RS485 B terminal (TRXD- or N) of an external device.
	③V+	"+" terminal for device power supply (provides normal 24 V). Connected to the external power supply.
	④V-	"-" terminal for device power supply (provides normal 24 V). Connected to the external power supply.
	⑤FG	Frame Ground terminal that is connected to the power supply for the device.
2) RJ45 Connector	LAN	RJ45 connector for MODBUS TCP/IP network.
3) Power Switch	Power S/W	Power ON/OFF Switch

[Table 4. Common Unit Terminal Description]

- After checking wiring and power voltage, turn on the power switch located at the front part.
- To sync with an external PC or PLC, use the LAN connector in the common unit or the RS485 terminal (485-H, 485-L) in the power & signal terminal.

5.2. Channel Configuration

- GTC-700 can be configured with 16 slots (possible for max. 128 signal input) and 8 signal inputs of 4-20 mA are possible in each slot.
- Configured analog input unit must be set from the left side and it is numbered as slot1 from the left.



[Figure 5. Slot Configuration]

■ Channel configuration per slot is as shown in the table below.

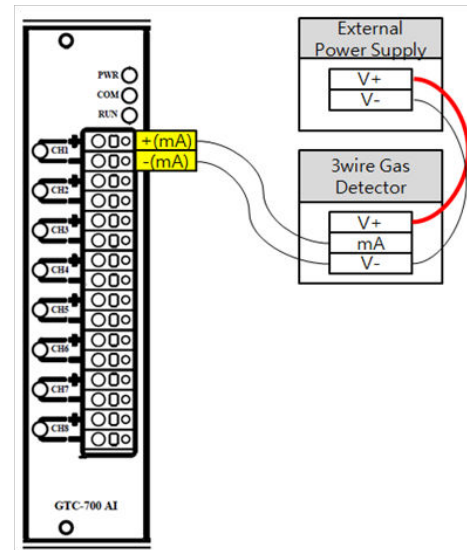
NO	SLOT NO	CHANNEL NO	CHANNEL DISPLAY NO	NOTE
1	Slot1	1	CH.1-1	
2		2	CH.1-2	
3		3	CH.1-3	
4		4	CH.1-4	
5		5	CH.1-5	
6		6	CH.1-6	
7		7	CH.1-7	
8		8	CH.1-8	
9	Slot2	9	CH.2-1	
10		10	CH.2-2	
11		11	CH.2-3	
12		12	CH.2-4	
13		13	CH.2-5	
14		14	CH.2-6	
15		15	CH.2-7	
16		16	CH.2-8	
.....				
121	Slot16	121	CH.16-1	
122		122	CH.16-2	
123		123	CH.16-3	
124		124	CH.16-4	
125		125	CH.16-5	
126		126	CH.16-6	
127		127	CH.16-7	
128		128	CH.16-8	

[Table 5. Slot Configuration]

5.3. Input Signal Configuration

5.3.1. 3-wire Type Gas detector Connection Method

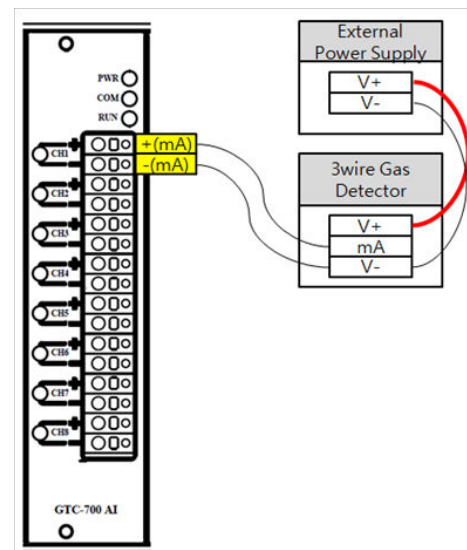
- When the gas detector has 3-wire (V+, mA, V-) for power and 420 mA output components, connect to the Analog as shown in Figure 5.
- Connecting cable must comprise of CVVS or shield cable with CVVSB 0.7 sq or higher



[Figure 6. 3-Wire Gas Detector Connection Method]

5.3.2. 2-wire Type Gas detector Connection Method

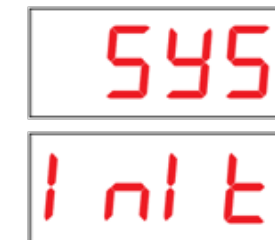
- When the gas detector output has 2-wire (V+, V-), connect to the Analog input unit as shown in Figure on the right.
- Connecting cable must comprise of CVVS or shield cable with CVVSB 0.7 sq or higher.



[Figure 6. 3-Wire Gas Detector Connection Method]

6.1. Power ON

- Check wirings for operation power, detection parts, alarm parts, and concentration display.
- Check the power input then turn ON the power S/W.
- Check whether power LED at alarm and concentration display parts light on.
- Perform self-test.



- When power turns on, PWR LED lights on then it performs system initialization for approx. 2 sec.



- Firmware version information is displayed on the common unit FND.







- Upon an event of error during self-test, the analog input unit number is displayed on the first FND in the common unit and the error status LED of the analog input unit lights on.

- It displays error code (E-01~E-07) on the second FND.
※ In an event of error during measurement including the initialization process, it always displays error code and after removal of the cause of error, it returns to measuring mode.

6.2. Measuring Mode

- After power on, when there is no error from "SELF TEST", it automatically enters Measuring Mode.

	<ul style="list-style-type: none"> - It displays measurement of channel 1-1 (Channel 1 of Analog Unit 1) - It displays the current 11.58 mA input status of channel 1-1.
	
	<ul style="list-style-type: none"> - Using UP (▲) or DOWN (▼) key, the user can check measurements of channel 1-1 ~ channel 16-8. - It displays 0 because there is no input in the currently selected channel 16-8.
	<ul style="list-style-type: none"> - For the channel status LED of analog input unit in measuring mode, orange lights on for values below 4 mA, green lights on for values in a range of 4 mA ~ 20 mA, and red lights on for values exceeding 20 mA.

6.3. Operation Setting








- GTC-700 has 6 setting modes as shown below.
- Each mode can be entered after pressing FUNC key for 2 sec or longer followed by password input.
- Using UP (▲) or DOWN (▼) key, the user can select a mode then edit it. When there is no key input for 10 sec longer within the same menu, it automatically returns to measuring mode.
- When RESET key is pressed during mode set-up, it returns to measuring mode.







LEVEL1	LEVEL2	LEVEL3	DEFAULT
F1/CONF (Configuration Mode)	ADD (MODBUS RS485 Address)	OFF, 1~32	OFF
	PSWD (Password)	0~99 (Password Setting)	00
	SCAN (Scan Display)	ON or OFF	OFF
	END		
F2/CAL (Calibration Mode)	Channel select	Select 1-1 ~ 16-8 calibration channel	1-1
	1A20	20 mA Signal Input	-
	CAL Result	Display Calibration Result	FAIL/SUCC
	TEST	Display Measurement	-
F3/ SAD (Signal Correction Mode)	END		
	Channel select	Select 1-1 ~ 16-8 Compensation Channel	1-1
	0.00	-1.00 ~ +1.00mA Compensation Input	0.00
F4 (TEST Mode)	DSP(display)	Test all LED and FND	-
	Cur	1-1 ~ 16-8 Channel Test Available	test
	END		
F5/485 (MODBUS RS485 Setting Mode)	baud(Baud Rate)	Baud rate Setting (4800 ~ 115200)	38400
	Sbit (stop bit)	1 or 2	1
	Prtly(parity bit)	Even , Odd or none	none
	END		
F6/NET (MODBUS TCP/IP Setting Mode)	IP	Address(XXX . XXX . XXX . XXX)	192.168. 001.201
	Snet(subnet mask)	Address(XXX . XXX . XXX . XXX)	255.255. 255.000
	Gate(gateway)	Address(XXX . XXX . XXX . XXX)	192.168. 001.254
	Nac(mac)	Address(XX-XX-XX-XX-XX-XX)	6C-E9-83-00-00
	END		

[Table 6. Operation Setting Mode Default Settings]

6.3.1. Configuration Mode





■ When "FUNC" key is pressed for 2 sec or longer in measuring mode, it enters password input step.

 	<p>- After entering password using UP (▲) or DOWN (▼) key followed by pressing FUNC (Function) key, it enters Function Mode. (Default = "00")</p>
	<p>- It displays "FAIL" message in an event of password error.</p>
 	<p>- Using UP (▲) or DOWN (▼) key, select "[F1]/CONF" (Configuration menu) then press FUNC key to enter sub-menu setting.</p>
 	<p>- It is a menu that sets Modbus Slave Address. - For address input, pressing UP (▲) or DOWN (▼) key increases or decreases number. Setting range is OFF~32 and default is OFF. - After setting the address, press FUNC key to save the setting and move to the next menu.</p>

 	<p>- It is password change menu. - The password is for entering device setting menu and pressing UP (▲) or DOWN (▼) key increases or decreases number for password. - Password can be set in a range between '00~99 and default is '00'. - After setting the password, press FUNC key to save the setting and move to the next menu.</p>
 	<p>- It is a function to automatically change measuring channel. When it is set to On, it changes from channel 1-1 to 16-8 in an order each sec and displays the measurement in measuring mode. - Default setting is 'OFF'. Press FUNC key to save the setting and move to the next menu.</p>
 	<p>- It displays end of configuration menu. Pressing FUNC key changes to the initial menu page "[F1]/CONF".</p>

6.3.2. Calibration Mode

■ It is a mode that can calibrate 4-20 mA signal input.



	<ul style="list-style-type: none"> - Pressing FUNC key for 2 sec or longer followed by password input enable menu selection. - Use UP (▲) or DOWN (▼) key to select "CAL" (Calibration menu) then press FUNC key to move to the channel selection menu to perform calibration. - Press RESET key to return to measuring mode.
	<ul style="list-style-type: none"> - By pressing UP (▲) or DOWN (▼) key, the user can move between channels (1-1 ~ 16-8) for calibration. - Pressing RESET key moves to the previous step.
	<ul style="list-style-type: none"> - Using a current generator, input 20 mA output into the analog input terminal (positive/negative) of the channel to be calibrated then press FUNC key to perform calibration. - Pressing RESET key moves to the previous step.
	<ul style="list-style-type: none"> - When the calibration runs normally, "CAL/SUCC" message flashes 2 times then it moves to the next menu, which is test menu. - When the calibration fails, "CAL/FAIL" message flashes 2 times then it moves to the previous menu.







- When the calibration is performed normally, the current measurement displays.
- It changes the value from current generator and checks whether the output is the same value.
- Pressing FUNC key calibrates the next channel
- Pressing RESET key moves to the previous calibration step.





6.3.3. Signal Compensation Mode





■ It is a mode to adjust 4-20 mA signal input compensation.

	<ul style="list-style-type: none"> - Pressing FUNC key for 2 sec or longer followed by password input enable menu selection. - Using UP (▲) or DOWN (▼) key, select "[F3]/SAD" then press FUNC key to perform calibration on each channel. - It is a function that compensates the difference from the wire. - Press RESET key to return to measuring mode.
	<ul style="list-style-type: none"> - By pressing UP (▲) or DOWN (▼) key, the user can move between channels (1-1 ~ 16-8) for compensation. - Pressing RESET key moves to the previous step.

	<ul style="list-style-type: none"> - Use UP (▲) or DOWN (▼) key to select a channel for setting then press FUNC key to compensate the selected channel. - UP (▲) or DOWN (▼) keys can be used to set a value in a range of -1.00 ~ 1.00 in 0.01 unit. When it is set to -1.00, displayed value becomes 19.00 for a measurement of 20.00. - After calibration, SAD setting initializes to 0. - Pressing RESET key moves to the previous step.
	
	<ul style="list-style-type: none"> - When it runs normally, "SUCC" message flashes 2 times then it moves to the next menu - When it fails, "CAL/FAIL" message flashes 2 times then it moves to the previous menu.
	





6.3.4. TEST Mode

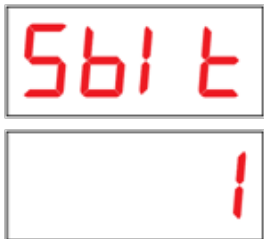



	<ul style="list-style-type: none"> - Pressing FUNC key for 2 sec or longer followed by password input enable menu selection. - Using UP (▲) or DOWN (▼) key, select "tEst" then press FUNC key to move to sub-menu of test - Press RESET key to return to measuring mode.
	
	<ul style="list-style-type: none"> - It is the display test menu. Pressing FUNC key runs the test. - It tests condition of two common unit FNDs and LED of analog input unit. - For two common unit FNDs, text "8" flashes and moves in clockwise direction in an order. For LED of analog input unit, power status LED lights on and Error/Com./Channel (Red & Green) Status LEDs flash in an order. - Pressing FUNC key ends the test and moves to the next test menu.
	

	<ul style="list-style-type: none"> - It is the current test menu. - Pressing FUNC key enables testing from ch. 1-1.
	
	<ul style="list-style-type: none"> - Pressing FUNC key increases a channel and pressing UP (▲) or DOWN (▼) key set a value. - Text "t" flashes continuously and it can be set in a range of 0.0 ~ 20.00 (0.5 unit). - It delivers set value upon a request from network master.
	

6.3.5. RS485 MODBUS Network Configuration





- It sets RS485 MODBUS network option, which is an external interface of the device.





	<ul style="list-style-type: none"> - Pressing FUNC key for 2 sec or longer followed by password input enable menu selection. - Using UP (▲) or DOWN (▼) key, select "485" then press FUNC key to move to sub-menu of 485 setting. - It is a setting for network with external master device (PLC). - Press RESET key to return to measuring mode.
	
	<ul style="list-style-type: none"> - It is Baud rate setting menu. - Use UP (▲) or DOWN (▼) key to select a network speed to be used. (4.8 / 9.6 / 19.2 / 38.4 / 57.6 / 115.2 kbps) - Pressing FUNC key sets the selected network speed and moves to the next network setting menu.
	


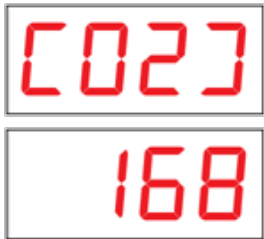


	<ul style="list-style-type: none"> - It is stop bit setting menu. - Use UP (▲) or DOWN (▼) key to select between 1 or 2. - Pressing FUNC key sets the selected bit and moves to the next network setting menu.
	<ul style="list-style-type: none"> - It is parity bit setting menu. - Use UP (▲) or DOWN (▼) key to select between even/odd/none. - Pressing FUNC key sets the selected bit and moves to the next network setting menu.
	<ul style="list-style-type: none"> - When there is a change, it returns to the selected menu. - To complete the change of setting, use UP (▲) or DOWN (▼) key in the selected menu to select UP-y. If the change is not wanted, select UP-n. - When UP-y is selected, it runs system initialization and changes to measuring mode. - When UP-n is selected, it changes to the next menu.
	<ul style="list-style-type: none"> - There is no change during menu setting. It displays the end of the selected menu. - After approx. 1 sec, it moves to the initial menu for network setting.


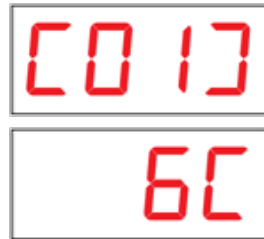


6.3.6. MODBUS TCP/IP Network Configuration Mode

	<ul style="list-style-type: none"> - Pressing FUNC key for 2 sec or longer followed by password input enable menu selection. - Using UP (▲) or DOWN (▼) key, select "nEt" then press FUNC key to move to sub-menu of network setting. - Press RESET key to return to measuring mode.
	<ul style="list-style-type: none"> - It is IP address setting menu. Pressing FUNC key moves to the IP address setting menu. - Default setting is 192.168.1.201.
	<ul style="list-style-type: none"> - It is the first IP address setting menu. - Use UP (▲) or DOWN (▼) key to select between 0 ~ 255. - Pressing FUNC key sets the selected address and moves to the next address setting menu.
	<ul style="list-style-type: none"> - It is the second IP address setting menu. - Use UP (▲) or DOWN (▼) key to select between 0 ~ 255. - Pressing FUNC key sets the selected address and moves to the next address setting menu.


	<ul style="list-style-type: none"> - It is the third IP address setting menu. - Use UP (▲) or DOWN (▼) key to select between 0 ~ 255. - Pressing FUNC key sets the selected address and moves to the next address setting menu.
	<ul style="list-style-type: none"> - It is the fourth IP address setting menu. - Use UP (▲) or DOWN (▼) key to select between 0 ~ 255. - Pressing FUNC key sets the selected address and IP address setting completes. It moves to the next network setting menu.
	<ul style="list-style-type: none"> - It is subnet mask address setting menu. - Default setting is 255.255.255.0.
	<ul style="list-style-type: none"> - It is the first subnet mask setting menu. - Use UP (▲) or DOWN (▼) key to select between 0 ~ 255. - Pressing FUNC key sets the selected address and moves to the next address setting menu.

	<ul style="list-style-type: none"> - It is the second subnet mask setting menu. - Use UP (▲) or DOWN (▼) key to select between 0 ~ 255. - Pressing FUNC key sets the selected address and moves to the next address setting menu.
	<ul style="list-style-type: none"> - It is the third subnet mask setting menu. - Use UP (▲) or DOWN (▼) key to select between 0 ~ 255. - Pressing FUNC key sets the selected address and moves to the next address setting menu.
	<ul style="list-style-type: none"> - It is the fourth subnet mask setting menu. - Use UP (▲) or DOWN (▼) key to select between 0 ~ 255. - Pressing FUNC key sets the selected address and moves to the next address setting menu.
	<ul style="list-style-type: none"> - It is gateway address setting menu. - Default setting is 192.168.1.254.

	<ul style="list-style-type: none"> - It is the first gateway setting menu. - Use UP (▲) or DOWN (▼) key to select between 0 ~ 255. - Pressing FUNC key sets the selected address and moves to the next address setting menu.
	<ul style="list-style-type: none"> - It is the second gateway setting menu. - Use UP (▲) or DOWN (▼) key to select between 0 ~ 255. - Pressing FUNC key sets the selected address and moves to the next address setting menu.
	<ul style="list-style-type: none"> - It is the third gateway setting menu. - Use UP (▲) or DOWN (▼) key to select between 0 ~ 255. - Pressing FUNC key sets the selected address and moves to the next address setting menu.
	<ul style="list-style-type: none"> - It is the fourth gateway setting menu. - Use UP (▲) or DOWN (▼) key to select between 0 ~ 255. - Pressing FUNC key sets the selected address and moves to the next address setting menu.

	<ul style="list-style-type: none"> - It is mac address setting menu. - Pressing FUNC key moves to the menu for checking detailed mac address. - Default setting is 6C, E9, 83, 00,00,00. (Hexadecimal).
	<ul style="list-style-type: none"> - It is the first mac address setting menu. - Use UP (▲) or DOWN (▼) key to select a value between 00 ~ FF (hexadecimal).
	<ul style="list-style-type: none"> - It is the second mac address setting menu. - Use UP (▲) or DOWN (▼) key to select a value between 00 ~ FF (hexadecimal).
	<ul style="list-style-type: none"> - It is the third mac address setting menu. - Use UP (▲) or DOWN (▼) key to select a value between 00 ~ FF (hexadecimal).

	<ul style="list-style-type: none"> - It is the fourth mac address setting menu. - Use UP (▲) or DOWN (▼) key to select a value between 00 ~ FF (hexadecimal).
	<ul style="list-style-type: none"> - It is the fifth mac address setting menu. - Use UP (▲) or DOWN (▼) key to select a value between 00 ~ FF (hexadecimal).
	<ul style="list-style-type: none"> - It is the sixth mac address setting menu. - Use UP (▲) or DOWN (▼) key to select a value between 00 ~ FF (hexadecimal).
	<ul style="list-style-type: none"> - When there is a change, it returns to the selected menu. - To complete the change of setting, use UP (▲) or DOWN (▼) key in the selected menu to select UP-y. If the change is not wanted, select UP-n. - When UP-y is selected, it runs system initialization and changes to measuring mode. - When UP-n is selected, it changes to the next menu.

	<ul style="list-style-type: none"> - There is no change during menu setting. It displays the end of the selected menu. - After approx. 1 sec, it moves to the initial menu for network setting.
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7.1. RS485 MODBUS Interface

7.1.1. Network Setting

- Baud rate : 57600 bps(4800, 9600, 19200, 38400, 57600, 115200 bps)
- Stop bit : 1 Stop(1 or 2 stop)
- Parity : Even parity(Odd,Even)
- For details, please go to www.modbus.org

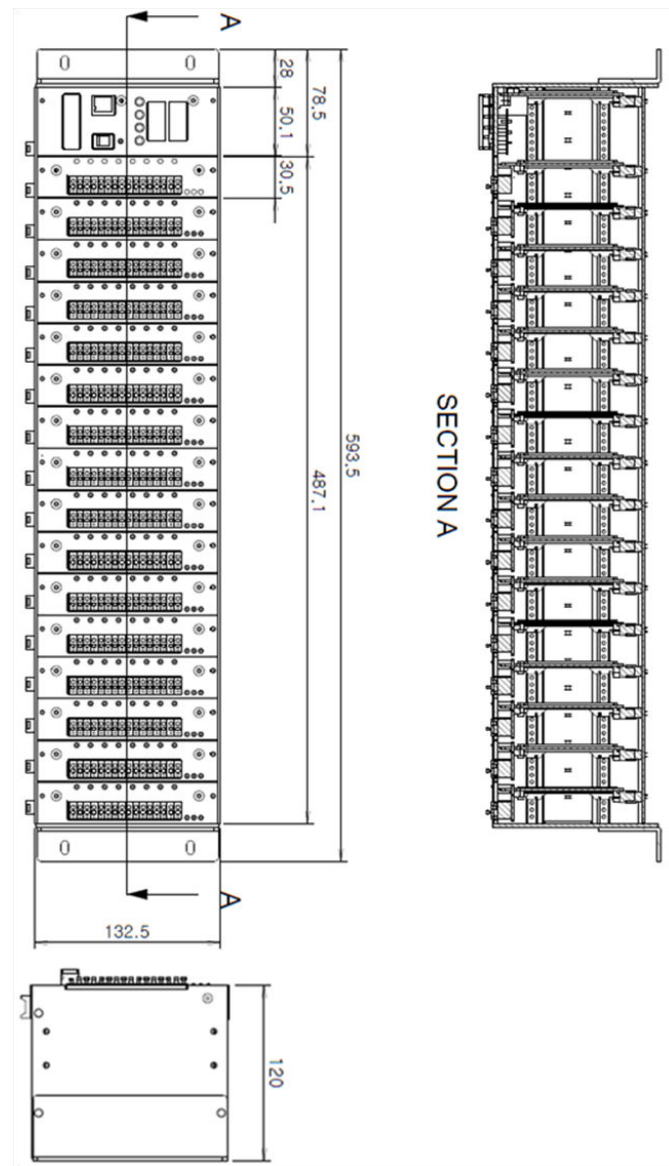
7.1.2. RS485 MODBUS Register (Used Commonly with MODBUS TCP/IP)

TYPE	ADDRESS	DESCRIPTION	TYPE
Measurement (uA)	30001 ~ 30128	30001: Channel 1-1 Measurement	Unsigned Integer
		30128: Channel 16-8 Measurement	
Reserved	30129		
Error Code	30130 ~ 30145	Analog Input Unit Error Code	Unsigned Integer (Refer to section 9. Error code)
		30130: Unit1 Condition	
		30145: Unit16 Condition	
Heart bit	30191	Repeats 0 and 1	Unsigned Integer
	30192	Increase by 1	Unsigned Integer

[Table 7.MODBUS Register]

MESSAGE	VALUE	DESCRIPTION & CONDITION	RECOVERY
E-01	0x0001	Analog Input Unit LED driver failure	Change the failed channel card
E-02	0x0002	Analog Input Unit A/D converter failure	Change the failed channel card
E-03	0x0003	Analog Input Unit LED driver & A/D converter failure	Change the failed channel card
E-04	0x0004	Analog Input Unit EEPROM failure	Change the failed channel card
E-05	0x0005	Analog Input Unit LED driver & EEPROM failure	Change the failed channel card
E-06	0x0006	Analog Input Unit A/D converter & EEPROM failure	Change the failed channel card
E-07	0x0007	Analog Input Unit LED driver, A/D converter & EEPROM failure	Change the failed channel card

[Table 8. Fault List]



[Figure 8. GTC-700 Drawing]

VERSION	CONTENTS	DATE
1.0	Initial Revision of Manual	2016. 10. 05