

Special IO Module

GT-5352

User Manual



Version 1.0

DOCUMENT CHANGE SUMMARY				
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Table of Contents

1.	Important Notes.....	4
1.1.	Safety Instruction.....	5
1.1.1.	Symbols.....	5
1.1.2.	Safety Notes.....	5
1.1.3.	Certification.....	5
2.	Specification.....	6
2.1.	GT-5352.....	6
2.1.1.	Wiring Diagram.....	6
2.1.2.	LED Indicator.....	7
2.1.3.	Specification.....	8
2.1.4.	Mapping data into the image table.....	9
2.1.5.	Configuration Parameter Data.....	10
3.	Environment Specification.....	11
4.	Dimension.....	12
5.	Mounting.....	13
5.1	I/O Inserting and Removing Devices.....	13
5.2	RTB (Removable Terminal Block).....	14
6.	G-Bus Pin Description.....	15

1. Important Notes

Solid state equipment has operational characteristics differing from those of electromechanical equipment.

Safety Guidelines for the Application, Installation and Maintenance of Solid State Controls describes some important differences between solid state equipment and hard-wired electromechanical devices.

Because of this difference, and also because of the wide variety of uses for solid state equipment, all persons responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable.

In no event will CREVIS be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, CREVIS cannot assume responsibility or liability for actual use based on the examples and diagrams.

Warning!



- ✓ **If you don't follow the directions, it could cause a personal injury, damage to the equipment or explosion**
- Do not assemble the products and wire with power applied to the system. Else it may cause an electric arc, which can result into unexpected and potentially dangerous action by field devices. Arching is explosion risk in hazardous locations. Be sure that the area is non-hazardous or remove system power appropriately before assembling or wiring the modules.
- Do not touch any terminal blocks or IO modules when system is running. Else it may cause the unit to an electric shock or malfunction.
- Keep away from the strange metallic materials not related to the unit and wiring works should be controlled by the electric expert engineer. Else it may cause the unit to a fire, electric shock or malfunction

Caution!


- ✓ **If you disobey the instructions, there may be possibility of personal injury, damage to equipment or explosion. Please follow below Instructions.**
- Check the rated voltage and terminal array before wiring. Avoid the circumstances over 50°C of temperature. Avoid placing it directly in the sunlight.
- Avoid the place under circumstances over 85% of humidity.
- Do not place Modules near by the inflammable material. Else it may cause a fire.
- Do not permit any vibration approaching it directly.
- Go through module specification carefully, ensure inputs, output connections are made with the specifications. Use standard cables for wiring.
- Use Product under pollution degree 2 environment.

1.1. Safety Instruction

1.1.1. Symbols

<p>DANGER</p> 	<p>Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death property damage, or economic loss</p>
<p>IMPORTANT</p>	<p>Identifies information that is critical for successful application and understanding of the product</p>
<p>ATTENTION</p> 	<p>Identifies information about practices or circumstances that can lead to personal injury, property damage, or economic loss. Attentions help you to identity a hazard, avoid a hazard, and recognize the consequences</p>

1.1.2. Safety Notes

<p>DANGER</p> 	<p>The modules are equipped with electronic components that may be destroyed by electrostatic discharge. When handling the modules, ensure that the environment (persons, workplace and packing) is well grounded. Avoid touching conductive components, RBUS Pin.</p>
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1.1.3. Certification

c-UL-us UL Listed Industrial Control Equipment, certified for U.S. and Canada

See UL File E235505

CE Certificate

EN 61000-6-2; Industrial Immunity

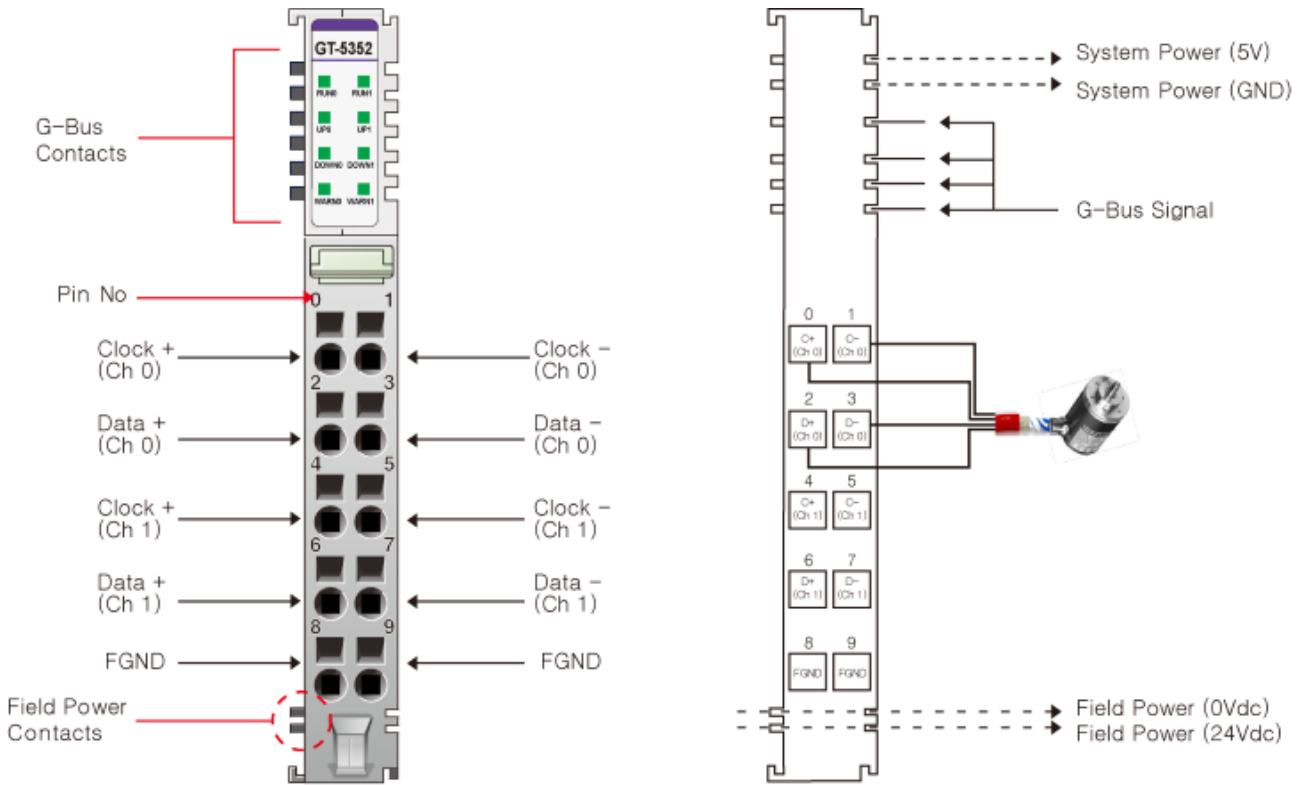
EN 61000-6-4; Industrial Emissions

Reach, RoHS (EU, CHINA)

2. Specification

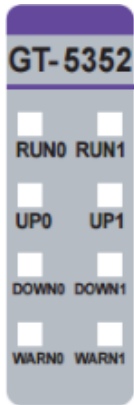
2.1. GT-5352

2.1.1. Wiring Diagram



Pin No.	Signal Description	Signal Description	Pin No.
0	Pulse Output + Ch# 0	Pulse Output - Ch# 0	1
2	Input Data + Ch# 0	Input Data - Ch# 0	3
4	Pulse Output + Ch# 1	Pulse Output - Ch# 1	5
6	Input Data + Ch# 1	Input Data - Ch# 1	7
8	Field Ground	Field Ground	9

2.1.2. LED Indicator



LED No.	LED Function / Description	LED Color
RUN0	Run state Ch#0	Green
RUN1	Run state Ch#1	Green
UP0	Encoder is rotating counter clockwise. Ch#0	Green
UP1	Encoder is rotating counter clockwise. Ch#1	Green
DOWN0	Encoder is rotating clockwise. Ch#0	Green
DOWN1	Encoder is rotating clockwise. Ch#1	Green
WARN0	Warning state (WFP, WSSIF, WSSID) Ch#0	Green
WARN1	Warning state (WFP, WSSIF, WSSID) Ch#1	Green

2.1.3. Specification

Items	Specification
Input Specification	
Number of Channel	2 Channel - Synchronous Serial Interface Module
Indicators	8 Green LEDs RUN0, RUN1, UP0, UP1, DOWN0, DOWN1, WARN0, WARN1
SSI Data Rate	Channel 0, 1 – 125K, 250K, 500K, 1M, 2M(default 250K)
SSI Data Width	Max. 30bit
SSI Data Delay Time	100usec ~ 10msec(default 200us)
SSI Output	C+, C- : Ch0,1 RS422 Differential Output
SSI Input	D+, D- : Ch0,1 RS422 Differential Input
SSI Data Code Type	Gray Code or Natural Binary
Receiver Common Mode Input Voltage (Data Input Voltage)	-7~7Vdc
Output Voltage (Clock Output Voltage)	-0.5~4.3Vdc
Special features	Adjustable baud rate, delay and data length
General specification	
Power Dissipation	60mA maximum @ 5.0Vdc
Isolation	I/O to Logic : Photo coupler isolation I/O to Field Power : Non-Isolation
Field Power	Supply voltage : 24Vdc nominal Voltage range : 70°C 18~26.4Vdc 60°C 18~32Vdc Power Dissipation : Max. 30mA @ 24Vdc
Wiring	I/O Cable Max. 2.0mm2(AWG 14)
Weight	60g
Module Size	12mm x 90.5mm x 65mm
Environment Condition	Refer to '1. Environment Specification'

2.1.4. Mapping data into the image table

- Input Image Data – 10Byte

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	SSI Data LL Ch#0							
1	SSI Data LH Ch#0							
2	SSI Data HL Ch#0							
3	SSI Data HH Ch#0							
4	SSI Data LL Ch#1							
5	SSI Data LH Ch#1							
6	SSI Data HL Ch#1							
7	SSI Data HH Ch#1							
8	RUN Ch#0	WARN Ch#0	DEC Ch#0	INC Ch#0	—	WFP Ch#0	WSSIF Ch#0	WSSID Ch#0
9	RUN Ch#1	WARN Ch#1	DEC Ch#1	INC Ch#1	—	WFP Ch#1	WSSIF Ch#1	WSSID Ch#1

- SSI Data word is a 32bit-wide data. Ch#0,1
- RUN : SSI Clock Output Enabled Flag
- WARN : Warning. Any warning has occurred, WFP, WSSIF or WSSID.
- DEC : SSI Data Decrement. It was set, it lasts until INC.
- INC : SSI Data Increment. It was set, it lasts DEC.
- WFP : Warning of Field Power (SSI Power).
- WSSIF : Warning of SSI Frame. The last bit of frame data is not trailed with 0.
- WSSID : Warning of SSI Data. SSI Data is 0 during gap of frames. Generally when invalid wiring or cross wiring.

- Output Image Data – 4Byte

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	RUN Ch#0	GRAY Ch#0	--	SSI Data Length (0~30) Ch#0				
1	SSI Data Delay Time Selection Ch#0				SSI Data Rate Selection Ch#0			
2	RUN Ch#1	GRAY Ch#1	--	SSI Data Length (0~30) Ch#1				
3	SSI Data Delay Time Selection Ch#1				SSI Data Rate Selection Ch#1			

- RUN : SSI Clock Output Command, 1:Run, 0:Stop
- GRAY : Conversion Binary to Gray code. 1:Gray, 0:Binary (It has effect on Current SSI Data.)
- SSI Data Length : Sensor Resolution Bit + Sensor Number of turn Bit.
Example) Sensor Resolution (Step/Revolution)=8192 => 13bit, Sensor Number of turn=4092 => 12bit
SSI Data Length must be 25 (13bit + 12bit).

✓ SSI Data Rate Selection

Value	Description	
	Ch#0	Ch#1
0(B`0000)	250Kbps (Default)	
1(B`0001)	125Kbps	
2(B`0010)	250Kbps	
3(B`0011)	500Kbps	
4(B`0100)	1Mbps	
5(B`0101)	2Mbps	

✓ SSI Data Delay Time Selecton

Value	Description	Value	Description
0(B`0000)	200usec (Default)	8(B`1000)	800usec
1(B`0001)	100usec	9(B`1001)	900usec
2(B`0010)	200usec	10(B`1010)	1msec
3(B`0011)	300usec	11(B`1011)	2msec
4(B`0100)	400usec	12(B`1100)	3msec
5(B`0101)	500usec	13(B`1101)	4msec
6(B`0110)	600usec	14(B`1110)	5msec
7(B`0111)	700usec	15(B`1111)	10msec

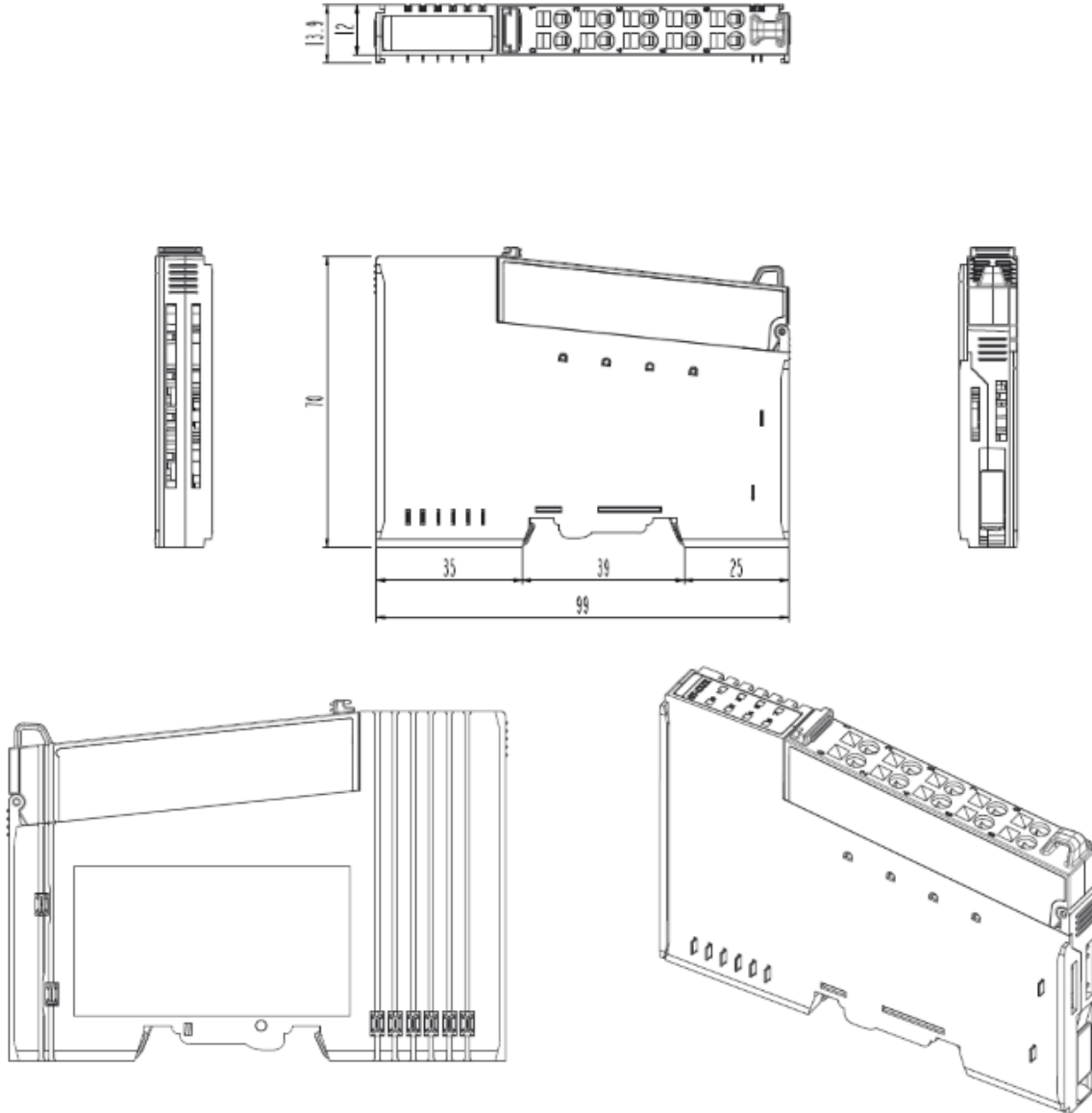
2.1.5. Configuration Parameter Data – 8byte

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Reserved							
1	Reserved							
2	Reserved							
3	Reserved							
4	Reserved							
5	Reserved							
6	Reserved							
7	Reserved							

3. Environment Specification

Environmental specification	
Operating Temperature	-40°C~70°C
UL Temperature	-20°C~60°C
Storage Temperature	-40°C~85°C
Relative Humidity	5% ~ 90% non-condensing
Mounting	DIN rail
General specification	
Shock Operating	IEC 60068-2-27
Vibration Resistance	Sine Vibration - 5 ~ 25Hz : ±1.6mm - 25 ~ 300Hz : 4g - Sweep Rate : 1 Oct/min, 20 Sweeps Random Vibration - 10 ~ 40 Hz : 0.0125 g ² /Hz - 40 ~ 100 Hz : 0.0125 → 0.002 g ² /Hz - 100 ~ 500 Hz : 0.002 g ² /Hz - 500 ~ 2000 Hz : 0.002 → 1.3 x 10 ⁻⁴ g ² /Hz - Test time : 1hrs for each test
EMC Resistance	EN61000-6-2 : 2005 EN 61000-6-4 : 2007+A1:2011
Installation Pos. / Protect. Class	Variable/IP20
Product Certifications	CE, UL

4. Dimension



5. Mounting

Caution!

- **Hot surface!**

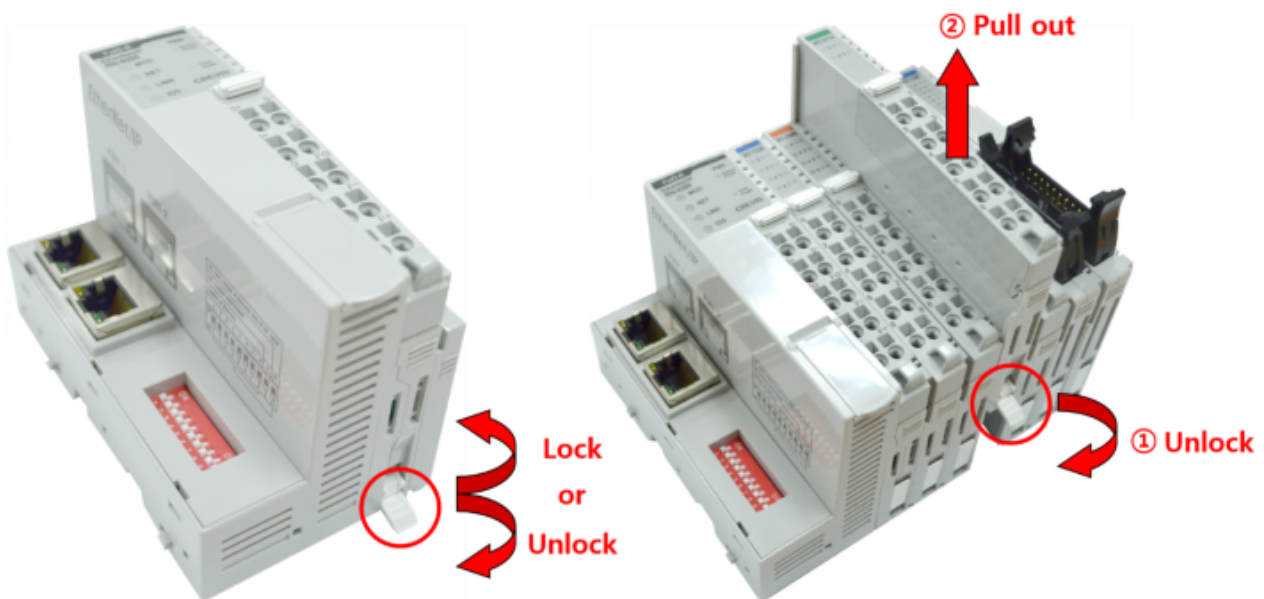
The surface of the housing can become hot during operation. If the device was operated at high ambient temperatures, allow it to cool off before touching it.

Notice!

- **Perform work on devices only if they are de-energized!**

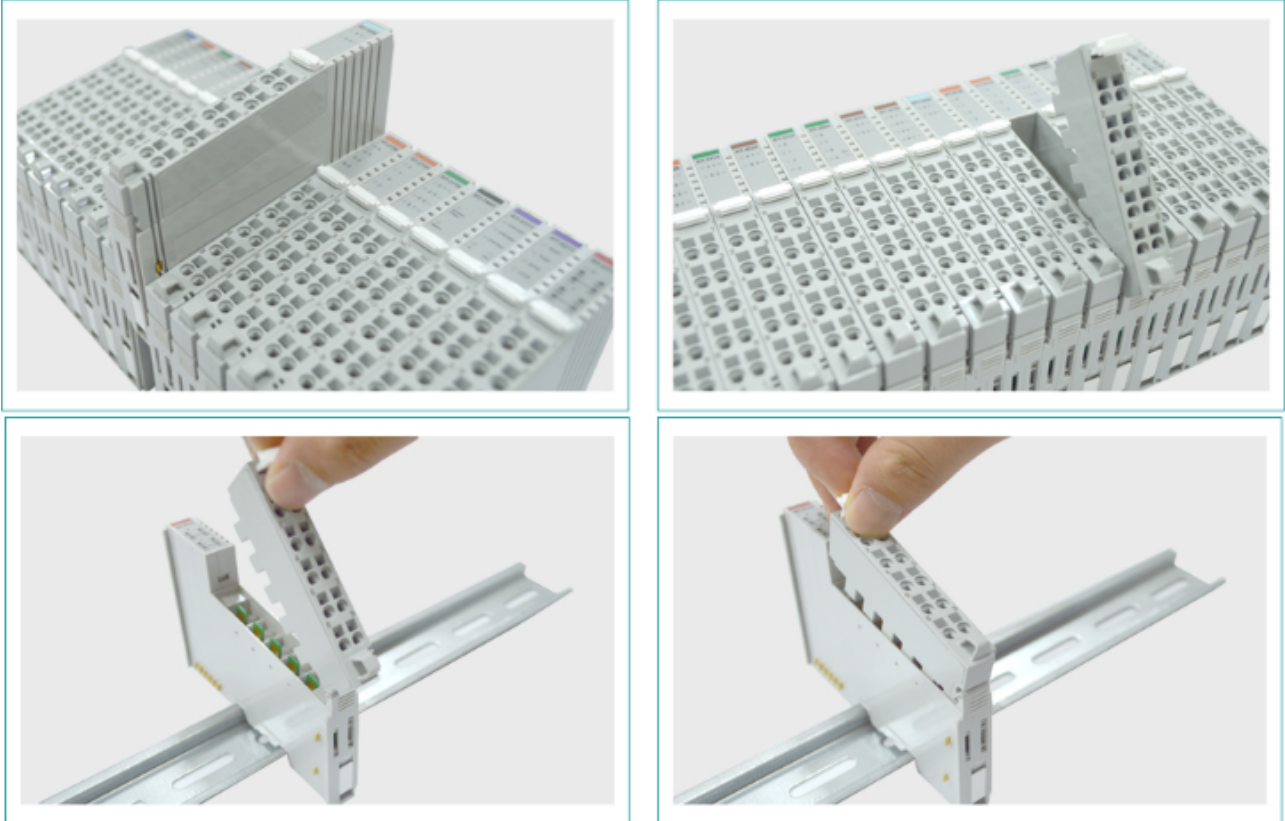
Working on energized devices can damage them. Therefore, turn off the power supply before working on the devices.

5.1 I/O Inserting and Removing Devices



- As above figure in order to safeguard the FnIO module from jamming, it should be fixed onto the DIN rail with locking level. To do so, fold on the upper of the locking lever.
To pull out the FnIO module, unfold the locking lever as below figure.

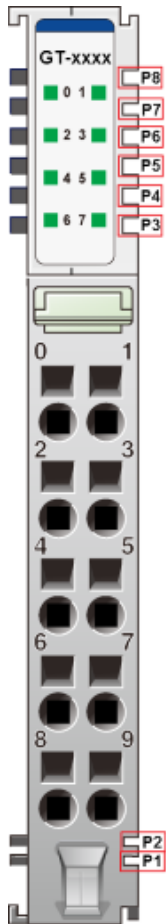
5.2 RTB (Removable Terminal Block)



- Whole terminal block can be combined and removed for the convenience if its maintenance.
- There is a locking switch on the RTB for the easy combination and easy removal.
- Easy combination and easy removal for IO modules on the din rail through One Touch Locking Switch.

6. G-Bus Pin Description

Communication between the RN series and the expansion module as well as system / field power supply of the bus modules is carried out via the internal bus. It is comprised of 6 data pin and 2 field power pin.



*Please refer to the table below regarding the pin description from P1 to P8.

No.	Description
P1	Field Power (VCC)
P2	Field Power (GND)
P3	GBUS CLK
P4	GBUS MISO
P5	GBUS MOSI
P6	GBUS Token
P7	System Power (GND)
P8	System Power (VCC)



Do not touch data and field power pins in order to avoid soiling and damage by ESD noise.