
FnIO G – Series :

GT-5112

GT-5112 (2Channels, High Speed Counter, Encoder Input, 24Vdc)

Specification

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Specification

History

Rev	Pages	Remarks	Date	Editor
1.00			2018/12/28	Jun, Seokhyun
1.01			2019/03/15	Jun, Seokhyun
1.02			2019/03/27	Jun, Seokhyun
1.03		Release	2020/04/21	Soyeong, Park
1.10	8-9	Change Count Mode & Parameter Data size	2020/06/05	Soyeong, Park
1.11	4-6	Edit Certification, Specification/Change Diagram	2023/08/03	Soyeong, Park
1.12	9	Change Mode Specification	2023/09/01	Soyeong, Park
1.13	5	Add Encoder 1x Data Size Specification	2024/06/13	Soyeong, Park
1.14	5, 8-9	Add Additional Frequency Mode (with Decimal Precision)	2025/06/02	Soyeong, Park

Specification

1. ENVIRONMENT SPECIFICATION

Environmental specification	
Operating Temperature	-40°C ~60°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	Based on IEC 60068-2-6, 4g
Industrial Emissions	EN61000-6-4/All : 2011
Industrial Immunity	EN61000-6-2 : 2019
Installation Position	Vertical and horizontal installation is available
Product Certifications	CE, UL, UKCA

Specification

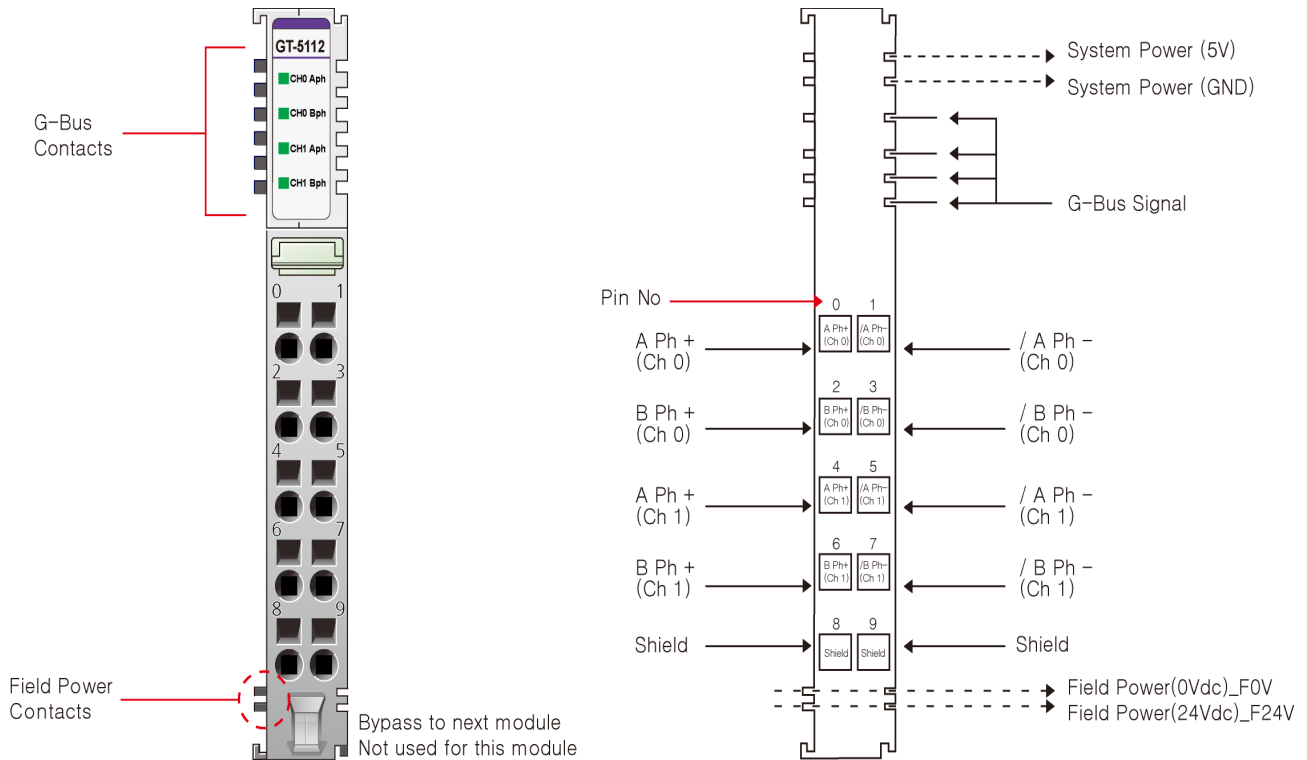
2. GT-5112 (2 Channels High Speed Counter / Encoder)

2.1. GT-5112 Specification

Items		Specification
Input specification		
Number of channel		2 channel - High Speed Counter, Encoder, Frequency measurement Pulse width & Period measurement
Indicators		4 green terminal input
Input voltage		24Vdc nominal (Max 28.8Vdc)
Input current		3mA @ 24Vdc
Input frequency	Counter Mode	0~300kHz
	Encoder Mode	0~300kHz @Encoder 1x
		0~750kHz @Encoder 2x, Encoder 4x
Frequency Measurement with Decimal		0~10kHz (Accuracy : 0.3%)
Counting mode*	Counter Mode	1-Input Mode : Up,Down, Frequency Measurement, Pulse Width & Period measurement 2-Input Mode : Up/Inhibit, Up/Reset, Down/Inhibit, Down/Reset, UP/Down,Clock/Direction
	Encoder Mode	2-Input Mode : Encoder 1x, Encoder 2x, Encoder 4x
Counter size	Encoder 1x	31bit-wide/channel
	Others (Mode)	32bit-wide/channel
General specification		
Power dissipation		Max. 65mA @ 5Vdc
Isolation		I/O to Logic : photocoupler isolation
UL field power		Supply Voltage : 24Vdc nominal, Class 2
Field power		Not used Field power bypass to next expansion module
Wiring		I/O Cable Max. 2.0mm ² (AWG 14)
Weight		60g
Module size		12mm x 99mm x 70mm
Environment condition		Refer to ‘1. Environment Specification’

*Refer to 2.4. Mapping data from the image table

2.2. GT-5112 Wiring Diagram



Pin No.	Signal Description	Signal Description	Pin No.
0	Aph Input+ Ch# 0	/Aph Input - Ch# 0	1
2	Bph Input+ Ch# 0	/Bph Input - Ch# 0	3
4	Aph Input+ Ch# 1	/Aph Input - Ch# 1	5
6	Bph Input+ Ch# 1	/Bph Input - Ch# 1	7
8	Shield	Shield	9

2.3. GT-5112 LED Indicator

2.3.1. LED Indicator



LED No.	LED Function / Description	LED Color
0	Aph Input Ch# 0	Green
1	Bph Input Ch# 0	Green
2	Aph Input Ch# 1	Green
3	Bph Input Ch# 1	Green

2.3.2. Channel Status LED

Status	LED	To indicate
No Signal	Off	No Input Signal
On Signal	Green	Input Signal detected

2.4. Mapping data from the image table

● Input Image Value

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0				Counter Value Ch#0 LL				
Byte1				Counter Value Ch#0 LH				
Byte2				Counter Value Ch#0 HL				
Byte3				Counter Value Ch#0 HH				
Byte4				Counter Value Ch#1 LL				
Byte5				Counter Value Ch#1 LH				
Byte6				Counter Value Ch#1 HL				
Byte7				Counter Value Ch#1 HH				

- Each channel has 4-byte Input
- Counter value represents counter, frequency(Hz), pulse width (0.1usec) or pulse period (0.1usec).

● Output Image Value

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	CR 0	CS 0	-	Additional Function #0	Count Mode ch#0			
Byte1	CR 1	CS 1	-	Additional Function #1	Count Mode ch#1			

- CR 0,1 : Counter Reset for Ch#0, Ch#1
- CS 0,1 : Counter Stop (Inhibit Input) for Ch#0, Ch#1
- Additional Function Ch#0,1 : Function added in count mode. (only for frequency measurement mode)
- Count Mode Ch#0,1 : Count Mode for Ch#0, Ch#1 respectively

■ Count Mode Ch#0, Ch#1 (+Additional Function Ch#0, Ch#1)

Value	Count Mode	Description
B' 0 0000 (0x00)	Up	Up Counter - Aph Input acts as Up Clock - Bph Input is not used
B' 0 0001 (0x01)	Down	Down Counter - Aph Input acts as Down Clock - Bph Input is not used
B' 0 0010 (0x02)	-	-
B' 0 0011 (0x03)	-	-
B' 0 0100 (0x04)	Up Clock & Inhibit	Up Counter with Inhibit - Aph Input acts as Up Clock Input - Bph Input acts as Inhibit function for Up Clock Input
B' 0 0101 (0x05)	Up Clock & Reset	Up Counter with Reset - Aph Input acts as Up Clock Input - Bph Input acts as Reset function to Counter
B' 0 0110 (0x06)	Down Clock & Inhibit	Down Counter with Inhibit - Aph Input acts as Down Clock Input - Bph Input acts as Inhibit function for Down Clock Input
B' 0 0111 (0x07)	Down Clock & Reset	Down Counter with Reset - Aph Input acts as Down Clock Input - Bph Input acts as Reset function to Counter

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B' 0 1000 (0x08)	Up Clock & Down Clock	Up & Down Counter - Aph Input acts as Up Clock Input - Bph Input acts as Down Clock Input
B' 0 1001 (0x09)	Clock & Direction	Up & Down with Direction - Aph Input acts as Clock Input - Bph Input acts as Direction Input (Low = Up Count, High = Down Count)
B' 0 1010 (0x0A)	Encoder 1x *	Encoder 1x - Aph Input acts as Encoder's A phase Input - Bph Input acts as Encoder's B phase Input
B' 0 1011 (0x0B)	Encoder 2x	Encoder 2x - Aph Input acts as Encoder's A phase Input - Bph Input acts as Encoder's B phase Input
B' 0 1100 (0x0C)	Encoder 4x	Encoder 4x - Aph Input acts as Encoder's A phase Input - Bph Input acts as Encoder's B phase Input
B' 0 1101 (0x0D)	Frequency Measurement 1sec Update	Simple Frequency Measurement, updated by 1sec, Hz Unit - Aph Input acts as Frequency Input - Bph Input is not used
B' 1 1101 (0x1D) (Additional Function)	Frequency Measurement with decimal (3-precision) ****	Frequency Measurement, capable of displaying up to 3-decimal places. (0.001Hz Unit Ex) if 1.235Hz = 1235(Dec)) - Aph Input acts as Frequency Input - Bph Input is not used
B' 0 1110 (0x0E)	Pulse Width Measurement **	Simple Pulse Width Measurement, 0.1usec Unit - Pulse Width(32bit), if 1234, then Pulse High(On) width is 123.4usec (*3) - Aph Input acts as Pulse Input - Bph Input is not used
B' 0 1111 (0x0F)	Pulse Width & Period Measurement ***	Simple Pulse Width & Period Measurement, 0.1usec Unit, - Available in case of Pulse Input $\geq 200\text{Hz}$ ($\leq 2.5\text{msec}$, Pulse On Width) - Pulse Width(16bit, Low Word) + Pulse Period(16bit, High Word) (*4) - Aph Input acts as Pulse Input - Bph Input is not used

* Frequency range of the Encoder x1 mode is different from Encoder x2/x4 mode frequency range.

(Encoder 1x : ~300kHz / Encoder 2x/4x : ~750kHz)

** Pulse Width, B'1110(0xE) measures Aph Input's High(On) Pulse Width(32bit) in 0.1usec unit.

*** Pulse Width & Period, B'1111(0xF) measures Aph's Pulse High(On) Width(16bit) & Period(16bit) in 0.1usec unit.

**** Frequency Measurement with decimal Mode (0x1D) is 0.001Hz unit. This mode requires setting the additional function bit of the output image data.

2.5. Parameter Data

- Valid Parameter length : 4Bytes
- Parameter Data

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Reserved							
Byte1	Reserved							
Byte2	Reserved							
Byte3	Reserved							