

# **FnIO G – Series :**

## ***GT-5112***

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

# Specification

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## History

REV.	PAGES	REMARKS	DATE	Editor
Rev 1.00	9		Dec 28, 2018	Jun, Seokhyun
Rev 1.01			Mar 15, 2019	Jun, Seokhyun
Rev 1.02			Mar 27, 2019	Jun, Seokhyun

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## 1. ENVIRONMENT SPECIFICATION

<b>Environmental specification</b>	
Operating Temperature	-20°C~70°C
UL Temperature	-20°C~60°C
Storage Temperature	-40°C~85°C
Relative Humidity	5% ~ 90% non-condensing
Mounting	DIN rail
<b>General specification</b>	
Shock Operating	IEC 60068-2-27
Vibration Resistance	Based on IEC 60068-2-6 Sine Vibration <ul style="list-style-type: none"> <li>- 5 ~ 25Hz : ±1.6mm</li> <li>- 25 ~ 300Hz : 4g</li> <li>- Sweep Rate : 1 Oct/min, 20 cycles</li> </ul> Random Vibration <ul style="list-style-type: none"> <li>- 10 ~ 40 Hz : 0.0125 g<sup>2</sup>/Hz</li> <li>- 40 ~ 100 Hz : 0.0125 → 0.002 g<sup>2</sup>/Hz</li> <li>- 100 ~ 500 Hz : 0.002 g<sup>2</sup>/Hz</li> <li>- 500 ~ 2000 Hz : 0.002 → 1.3 x 10<sup>-4</sup> g<sup>2</sup>/Hz</li> <li>- Test time : 1hrs for each test</li> </ul>
Industrial Emissions	EN61000-6-4/All : 2011
Industrial Immunity	EN 61000-6-2 : 2005
Installation Pos. / Protect. Class	Variable/IP20
Product Certifications	CE, UL

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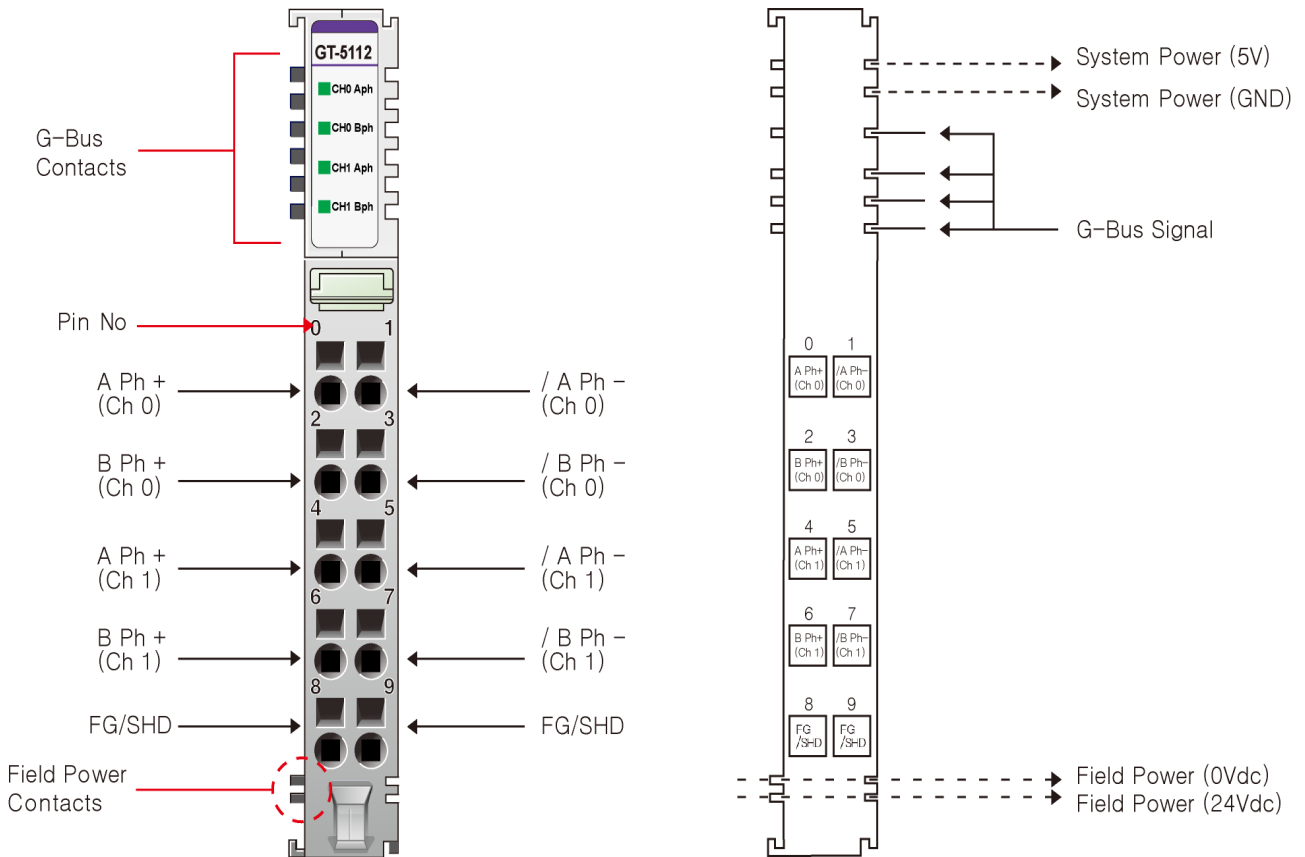
## 2. GT-5112 (2 CHANNELS HIGH SPEED COUNTER / ENCODER)

### 2.1. GT-5112 Specification

Items	Specification
<b>Input Specification</b>	
Number of Channel	2 Channel - Encoder, High Speed Counter, Frequency measurement Pulse width & Period measurement
Indicators	4 Green Terminal Input LEDs
Input Voltage	24Vdc nominal (Max 28.8Vdc)
Input Current	3.0mA @ 24Vdc
Min On-State Volt/Current	≥16.5Vdc (25°C) / 2.0mA
Input Frequency	0~600KHz Encoder Mode 0~600kHz Counting Mode
Counting Mode	1-Input Mode : Up,Down 2-Input Mode : Encoder 4x, Encoder 2x, Up/Inhibit, Up/Reset, Down/Inhibit, Down/Reset, UP/Down, Clock/Direction, Frequency Measurement, Pulse Width & Period measurement
Counter Size	32bit-wide/Channel
<b>General specification</b>	
Power Dissipation	65mA maximum @ 5.0Vdc
Isolation	I/O to Logic : Photocoupler isolation I/O to Field Power : Non-Isolation
Field Power (Bypass)	Not used Field power bypass to next expansion module
Wiring	I/O Cable Max. 2.0mm <sup>2</sup> (AWG 14)
Weight	60g
Module Size	12mm x 90.5mm x 65mm
<b>Environment Condition</b>	<b>Refer to '1. Environment Specification'</b>

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## 2.2. GT-5112 Module 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



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

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## 2.3.1. Channel Status LED

Status	LED is	To indicate
No Signal	Off	Normal Operation
On Signal	Green	Normal Operation

## 2.4. GT-5112 IO Input Image Data – 8byte

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0					Counter Value Ch#0 LL			
1					Counter Value Ch#0 LH			
2					Counter Value Ch#0 HL			
3					Counter Value Ch#0 HH			
4					Counter Value Ch#1 LL			
5					Counter Value Ch#1 LH			
6					Counter Value Ch#1 HL			
7					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).

## 2.5. GT-5112 IO Output Image Data – 2byte

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	CR 0	CS 0	--	--	Count Mode ch#0			
1	CR 1	CS 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
- Count Mode Ch#0,1 : Count Mode for Ch#0, Ch#1 respectively

### ■ Count Mode Ch#0, Ch#1

Value	Count Mode	Description
B' 0000 (0x0)	Encoder 4x	Encoder 4x - Aph Input acts as Encoder's A phase Input - Bph Input acts as Encoder's B phase Input
B' 0001 (0x1)	Encoder 2x	Encoder 2x - Aph Input acts as Encoder's A phase Input - Bph Input acts as Encoder's B phase Input
B' 0010 (0x2)	Up	Up Counter - Aph Input acts as Up Clock - Bph Input is not used
B' 0011 (0x3)	Down	Down Counter - Aph Input acts as Down Clock - Bph Input is not used
B' 0100 (0x4)	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' 0101 (0x5)	Up Clock & Reset	Up Counter with Reset - Aph Input acts as Up Clock Input - Bph Input acts as Reset function to Counter
B' 0110 ( 0x6 )	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' 0111 ( 0x7 )	Down Clock & Reset	Down Counter with Reset - Aph Input acts as Down Clock Input - Bph Input acts as Reset function to Counter
B' 1000 ( 0x8 )	Up Clock & Down Clock	Up & Down Counter - Aph Input acts as Up Clock Input - Bph Input acts as Down Clock Input
B' 1001 ( 0x9 )	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' 1010 ( 0xA )	Encoder 4x (*1)	Encoder 4x - Aph Input acts as Encoder's A phase Input - Bph Input acts as Encoder's B phase Input
B' 1011 ( 0xB )	Encoder 2x (*1)	Encoder 2x - Aph Input acts as Encoder's A phase Input - Bph Input acts as Encoder's B phase Input
B' 1100 ( 0xC )	Frequency Measurement (*2) 1 sec Update	Simple Frequency Measurement, updated by 1sec, Hz Unit - Aph Input acts as Frequency Input - Bph Input is not used
B' 1101 ( 0xD )	Frequency Measurement 100 msec ( 0.1sec ) Update	Simple Frequency Measurement, updated by 100msec, Hz Unit - Available in case of Pulse Input >= 10Hz - Aph Input acts as Frequency Input - Bph Input is not used



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B' 1110 ( 0xE )	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' 1111 ( 0xF )	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

- This encoder mode is perfectly same with mode B'0000, B'0001. This is for using Encoder module easily.
- Frequency, B'1100(0xC) and B'1101(0xD) can't be used with other channel's Count Mode = 0x2 ~ 0x9
- 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.

## 2.6. GT-5112 Configuration Parameter Data – 2byte

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