

FnIO G – Series :

GT-5122

GT-5122 (2Ch, High Speed Counter, 5~24Vdc Encoder Input)

Specification

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Specification

History

REV.	PAGES	REMARKS	DATE	Editor
1.00	9		Dec 09, 2020	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 DNVGL-CG-0039 : Vibration Class B, 4g
Industrial Emissions	EN61000-6-4/All : 2011
Industrial Immunity	EN61000-6-2 : 2005
Installation Position	Vertical and horizontal installation is available
Product Certifications	CE, UL, FCC

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2. GT-5122 (2 CHANNELS HIGH SPEED COUNTER / ENCODER)

2.1. GT-5122 Specification

Items	Specification
Input specification	
Number of channel	2 channel - Encoder, High Speed Counter, Frequency measurement Pulse width & Period measurement
Indicators	6 green terminal input
Input voltage	5~24Vdc nominal
Input current	4mA @ 5Vdc 11mA @ 24Vdc
Min on-state voltage	4.8≥Vdc
Input frequency	0~750kHz Encoder Mode *(Except Encoder x1) 0~500kHz 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
Gate Function Mode	Store/Continue Store/Wait/Resume Store-Reset/Wait/Start Store-Reset/Start
Counter size	32bit-wide/channel
Digital Input Specification	
Input per module	2 point sink type
Indicators	2 green terminal input LEDs
Input On-state Voltage	24Vdc nominal 15Vdc~28.8Vdc
On-stat Current	2.3mA @ 24Vdc 2.7mA @ 28.8Vdc
Input Signal Delay	OFF to ON : Max. 0.3ms ON to OFF : Max. 0.3ms
Nominal Input Impedance	11.7kΩ
Digital Output Specification	
Output per module	2 point source type
Indicators	2 green terminal output LEDs
Output Voltage Range	24Vdc nominal 15Vdc ~ 28.8Vdc
On-state Voltage Drop	Max 0.5Vdc @25°C
On-state Min. Current	1mA per channel
Off-state Leakage Current	Max. 20uA
Output Signal Delay	OFF to ON : Max. 0.3ms ON to OFF : Max. 0.3ms
Output Current Rating	Max. 0.3A / Channel
Protection	Reverse voltage protection Short circuit protection

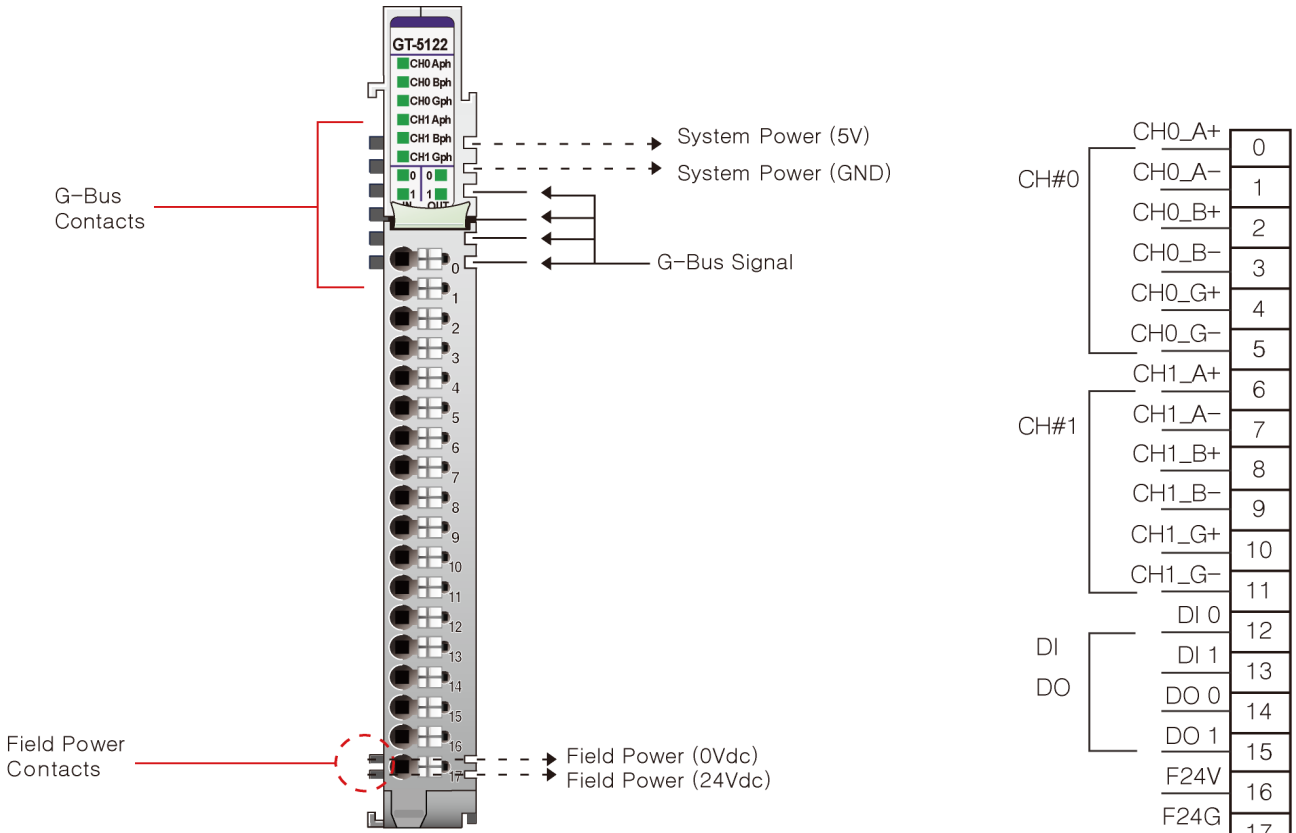
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General specification	
Power dissipation	Max. 120mA @ 5Vdc
Isolation	I/O to Logic : photocoupler isolation
UL field power	Supply Voltage : 24Vdc nominal, Class 2
Field power	Supply voltage : 24Vdc nominal Voltage range : 15~28.8Vdc Power dissipation : 15mA@24Vdc
Wiring	I/O Cable Max. 0.75mm ² (AWG 18)
Weight	63g
Module size	12mm x 99mm x 70mm
Environment condition	Refer to '1. Environment Specification'

*Encoder x1 Mode Input frequency : ~350kHz

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2.2. GT-5122 Wiring Diagram

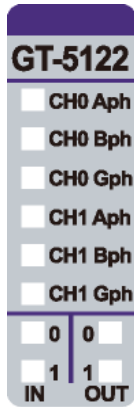


Pin No.	Signal Description	Signal Description	Pin No.
0	Aph Input+ Ch# 0	/Aph Input - Ch# 0	1
2	Bph Input+ Ch# 0	/Bph Input - Ch# 0	3
4	Gph Input+ Ch# 0	/Gph Input - Ch# 0	5
6	Aph Input+ Ch# 1	/Aph Input - Ch# 1	7
8	Bph Input+ Ch# 1	/Bph Input - Ch# 1	9
10	Gph Input+ Ch# 1	/Gph Input - Ch# 1	11
12	Input Channel 0	Input Channel 1	13
14	Output Channel 0	Output Channel 1	15
16	Field Power 24V	Common(Field Power 0V)	17

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2.3. GT-5122 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	Gph Input Ch# 0	Green
3	Aph Input Ch# 1	Green
4	Bph Input Ch# 1	Green
5	Gph Input Ch# 1	Green
6	Input Channel 0	Green
7	Input Channel 1	Green
8	Output Channel 0	Green
9	Output Channel 1	Green

2.3.2. Channel Status LED

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

2.4. GT-5122 IO Input Image Data – 10byte

Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Current Counter Value CH#0 LL when IDS = 0 Store Counter Value CH#0 LL when IDS = 1							
Byte 1	Current Counter Value CH#0 LH when IDS = 0 Store Counter Value CH#0 LH when IDS = 1							
Byte 2	Current Counter Value CH#0 HL when IDS = 0 Store Counter Value CH#0 HL when IDS = 1							
Byte 3	Current Counter Value CH#0 HH when IDS = 0 Store Counter Value CH#0 HH when IDS = 1							
Byte 4	Current Counter Value CH#1 LL when IDS = 0 Store Counter Value CH#1 LL when IDS = 1							
Byte 5	Current Counter Value CH#1 LH when IDS = 0 Store Counter Value CH#1 LH when IDS = 1							
Byte 6	Current Counter Value CH#1 HL when IDS = 0 Store Counter Value CH#1 HL when IDS = 1							
Byte 7	Current Counter Value CH#1 HH when IDS = 0 Store Counter Value CH#1 HH when IDS = 1							
Byte 8		SGIN CH#0	SBIN CH#0	SAIN CH#0	SDN CH#0	SUP CH#0	Out Status CH#0	Inp Status CH#0
Byte 9		SGIN CH#1	SBIN CH#1	SAIN CH#1	SDN CH#1	SUP CH#1	Out Status CH#1	Inp Status CH#1

- Each channel has 4-byte Input

- Counter value represents counter, frequency(Hz), pulse width (0.1usec) or pulse period (0.1usec).

(When IDS = 0)

- IDS : Input Data Selection (Setting by Output Data)

- Status Bit

The Status High can only read.

SUP : Status Counter Up

SDN : Status Counter Down

SAIN : Status A Terminal Input

SBIN : Status B Terminal Input

SGIN : Status G Terminal Input

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2.5. GT-5122 IO Output Image Data – 2byte

Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Gate Function Ch#0				Count Mode Ch#0			
Byte 1	Gate Function Ch#1				Count Mode Ch#1			
Byte 2	-	-	HRST 0	CR 0	CS 0	HP 0	DO 0	IDS 0
Byte 3	-	-	HRST 1	CR 1	CS 1	HP 1	DO 1	IDS 1

- Count Mode Ch#0, 1 : Count Mode for Ch#0, Ch#1 respectively
- HRST 0, 1 : current counter value, stored counter value Reset for Ch#0, Ch#1
- CR 0,1 : Counter Reset for Ch#0, Ch#1
- CS 0,1 : Counter Stop (Inhibit Input) for Ch#0, Ch#1
- HP 0,1 : Homing Position Enable/Disable, when this function is enabled, the counter value set to preset value when a pulse is detected on input channel
- DO 0, 1 : General purpose Digital Output
- IDS : Input Data Selection (0 : Current counter value, 1 : Store counter value)

■ Count Mode Ch#0, Ch#1

Value	Count Mode	Description
B' 0000 (0x0)	Up	Up Counter - Aph Input acts as Up Clock - Bph Input is not used
B' 0001 (0x1)	Down	Down Counter - Aph Input acts as Down Clock - Bph Input is not used
B' 0010 (0x2)	-	-
B' 0011 (0x3)	-	-
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 1x (*1)	Encoder 1x - Aph Input acts as Encoder's A phase Input - Bph Input acts as Encoder's B phase Input

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B' 1011 (0xB)	Encoder 2x	Encoder 2x - Aph Input acts as Encoder's A phase Input - Bph Input acts as Encoder's B phase Input
B' 1100 (0xC)	Encoder 4x	Encoder 4x - Aph Input acts as Encoder's A phase Input - Bph Input acts as Encoder's B phase Input
B' 1101 (0xD)	Frequency Measurement 1sec Update (*2)	Simple Frequency Measurement, updated by 1sec, Hz Unit - Aph Input acts as Frequency Input - Bph Input is not used
B' 1110 (0xE)	Pulse Width Measurement (*3)	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 (*4)	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 the same as the counting mode.
- Frequency, B' 1101(0xD) can't be used with other channel's Count Mode = 0x0, 0x1, 0x4 ~ 0xA
- 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.

■ Gate Mode Ch#0, Ch#1

Value	Description
B' 0000 (0x0)	Gate Function Disabled
B' 0001 (0x1)	Store/Continue
B' 0010 (0x2)	Store/Wait/Resume-
B' 0011 (0x3)	Store-Reset/Wait/Start-
B' 0100 (0x4)	Store-Reset/Start
Others	Gate Function Disabled

2.6. GT-5122 Configuration Parameter Data – 8byte

Bit No	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Preset Value CH#0 LL							
Byte 1	Preset Value CH#0 LH							
Byte 2	Preset Value CH#0 HL							
Byte 3	Preset Value CH#0 HH							
Byte 4	Preset Value CH#1 LL							
Byte 5	Preset Value CH#1 LH							
Byte 6	Preset Value CH#1 HL							
Byte 7	Preset Value CH#1 HH							

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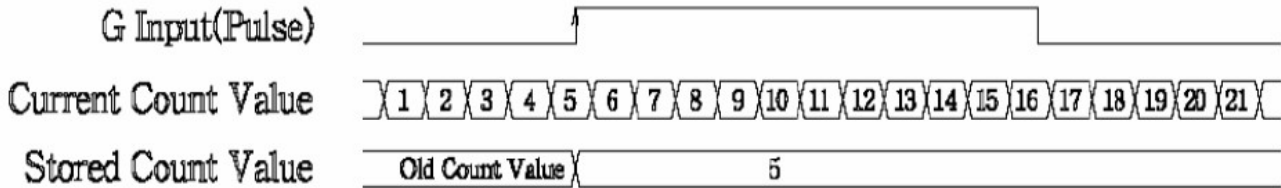
■ Gate Mode (Gate Function)

This Gate Function will operate in one of five modes (Store/Continue, Store/Wait/Resume, Store-Reset/Wait/ and Store-Reset/Start).

* Store/Continue

When G Ph are raising edge, The Stored Count Value register will get counting value by Current Count Value register. Next Current Count Value will do counting continue.

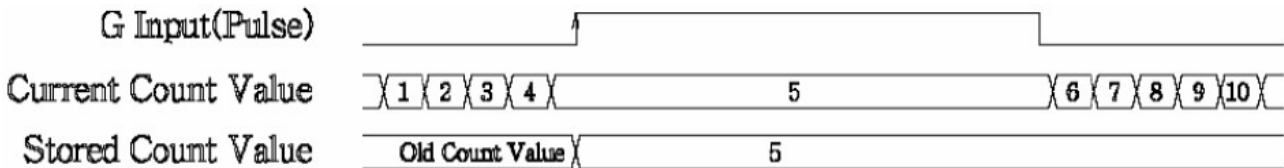
Below example picture shows timing waveforms of Store/Continue.



* Store/Wait/Resume

When G Ph are rising edge, The Stored Count Value register will get counting value by Current Count Value register and waits the Current Count Value until falling edge. Next G Ph will be falling edge and Current Count Value register resume counting.

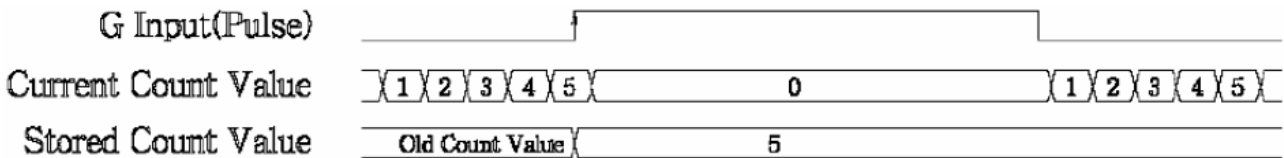
Below example picture shows timing waveforms of Store/Wait/Resume.



* Store-Reset/Wait/Start

When G Ph are rising edge, The Stored Count Value register will get counting value by Current Count Value register and Current Count Value register reset at the same time. The Current Count Value register wait until G Ph falling edge. Next Current Count Value register start counting.

Below example picture shows timing waveforms of Store-Reset/Wait/Start.



* Store-Reset/Start

When G Ph are rising edge, The Stored Count Value register will get counting value by Current Count Value register and Current Count Value register reset at the same time and the register start counting.

Below example picture shows timing waveforms of Store-Reset/Start.

