



I-87084W

4-/8-channel Counter/Frequency/Encoder Module

Introduction

The I-87084W-G is a 32-bit high-speed Counter/Frequency/Encoder input module that offers a variety of mode options, including "Up Counter", "Frequency Input", "Up/Down Counter", "Direct/Pulse Counter" and "A/B Phase Counter" modes. The mode combinations can be individual set for all 8 channels, where some channels can be set to "Up Counter" mode and other channels can be simultaneously set to "Frequency", "Up/Down Counter" or "Encoder input" mode. The built-in digital filter is valid for both non-isolated and isolated and can filter out noise where the high/low pulse width is smaller than the minimum high/low width of the digital filter. The I-87084W-G provides a virtual battery backup function in counter mode, and isolated or non-isolated mode is jumper-selectable.

System Specifications

Communication	
Interface	RS-485
Format	N, 8, 1
Baud Rate	1200 to 115200 bps
Protocol	DCON
Dual Watchdog	Yes, Module (1.6 Seconds), Communication (Programmable)
LED Indicators/Display	
System LED Indicators	Yes, 1 as Power/Communication Indicator
I/O LED Indicators	8 as Digital Input Indicators
Isolation	
Intra-module Isolation, Field-to-Logic	2000 VDC
EMS Protection	
ESD (IEC 61000-4-2)	±4 kV Contact for each Terminal
	±8 kV Air for Random Point
Power	
Power Consumption	0.6 W
Mechanical	
Dimensions (L × W × H)	115 mm × 30 mm × 102 mm
Environment	
Operating Temperature	-25 to +75°C
Storage Temperature	-40 to +85°C
Humidity	10 to 95% RH, Non-condensing

Features

- 8 Up Counter/Frequency Channels or 4 Encoder Input Channels
- Programmable Digital Filter
- Isolated or Non-isolated Input
- 32-bit Counter
- Individual Channel Configuration
- Virtual Battery Backup to Preserve Counter Values
- Maximum Frequency of up to 1 MHz
- ±4 kV ESD Protection
- Preset Values for Counter Input
- RoHS Compliant
- Wide Operating Temperature Range: -25 to +75°C



Applications

- Counter measurement
- Frequency measurement
- Encoder motion control

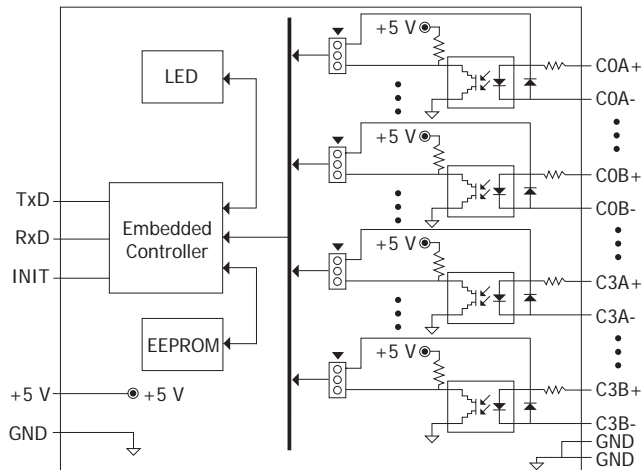
I/O Specifications

Counter/Frequency/Encoder Input		
Channels	4-channel Up/Down Counter (CW/CCW) 4-channel Dir/Pulse Counter (Bi-direction) 4-channel A/B Phase (Quadrant Counting) 8-channel Up Counter 8-channel Frequency	
Contact	Wet	
Sink/Source (NPN/PNP)	Sink	
TypeS	Counter, Frequency or Encoder	
Counter/Encoder-bits	32-bit (4,294,967,295)	
Isolated	ON Voltage Level	+3.5 VDC ~ +30 VDC
	OFF Voltage Level	+1 VDC Max.
Non-isolated	ON Voltage Level	+2.4 VDC ~ +5 VDC
	OFF Voltage Level	+0.8 VDC Max.
Programmable Digital Filter	1 ~ 32767 µs	
Individual Channel Configuration	Yes	
Counter Mode	Up or Up/Down	
Encoder Mode	CW/CCW, Dir/Pulse, AB Phase	
Frequency Mode	Yes	
Max. Speed	Isolated	3.5 VDC ~ 10 VDC: 200 kHz 10 VDC ~ 30 VDC: 150 kHz
	Non-isolated	1 MHz
Frequency Accuracy	1 Hz ~ 200 kHz = ±0.025% of Input Frequency (Note1) 200 kHz ~ 1 MHz = ±0.1% of Input Frequency	
Virtual Battery Backup to preserve Counter Values	Yes	

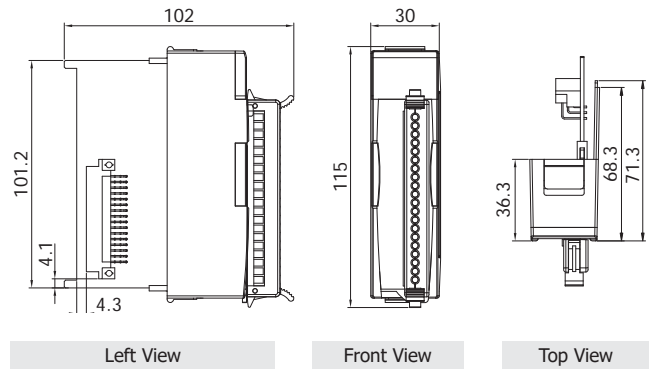
Note1:

Frequency Range	Frequency Error (typical)
1 Hz ~ 10 Hz	0.01 Hz
10 Hz ~ 10 KHz	0.5 Hz
10 KHz ~ 100 KHz	15 Hz
100 KHz ~ 200 KHz	30 Hz

Internal I/O Structure



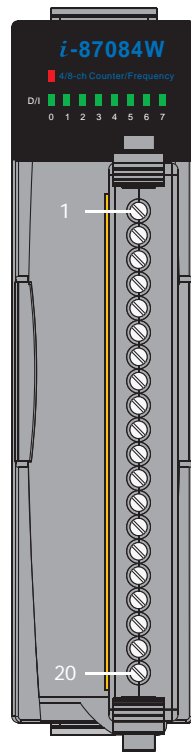
Dimensions (Units: mm)



Wire Connections

Counter Type	Isolated	Non-isolated
Dir/Pulse	Pulse+ CxA+ Pulse- CxA- Dir+ CxB+ Dir- CxB-	Pulse+ CxA+ Dir+ CxB+ Pulse- & Dir- GND
Up/Down	Up+ CxA+ Up- CxA- Down+ CxB+ Down- CxB-	Up+ CxA+ Down+ CxB+ Up- & Down- GND
Up	Up0+ CxA+ Up0- CxA- Up1+ CxB+ Up1- CxB-	Up0+ CxA+ Up1+ CxB+ Up0- & Up1- GND
A/B Phase	A0+ CxA+ A0- CxA- B0+ CxB+ B0- CxB-	A0+ CxA+ B0+ CxB+ A0- & B0- GND
Frequency Type	Isolated	Non-isolated
Frequency	Freq0+ CxA+ Freq0- CxA- Freq1+ CxB+ Freq1- CxB-	Freq0- CxA+ Freq1- CxB+ Freq0- & Freq1- GND

Pin Assignments



Terminal No.	Pin Assignment
01	C0A+
02	C0A-
03	C0B+
04	C0B-
05	C1A+
06	C1A-
07	C1B+
08	C1B-
09	C2A+
10	C2A-
11	C2B+
12	C2B-
13	C3A+
14	C3A-
15	C3B+
16	C3B-
17	GND
18	GND
19	N.C
20	N.C

Ordering Information

I-87084W-G CR	4-/8-channel Counter/Frequency/Encoder Module (Gray Cover) (RoHS)
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Accessories

SG-770 CR	7-channel Differential or 14-channel Single-ended Surge Protector (RoHS)
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