

## 2.2-5. Counter/Frequency/PWM

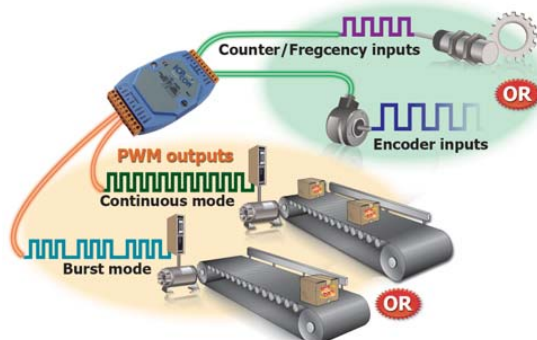
### ▣ PWM Introduction

PWM (Pulse width modulation) is a powerful technique for controlling analog circuits. It uses digital outputs to generate a waveform with variant duty cycle and frequency to control analog circuits. I-8088W and I-87088W have 8 PWM output channels and 8 digital inputs. It can be used to develop powerful and cost effective analog control system.

### ▣ PWM Features

- Automatic generation of PWM outputs by hardware, without software intervention.
- Software and hardware trigger mode for PWM output
- Individual and synchronous PWM output
- Burst mode PWM operation for standby
- DI channel can be configured as simple digital input channel or hardware trigger source of the PWM output.

### ▣ Applications

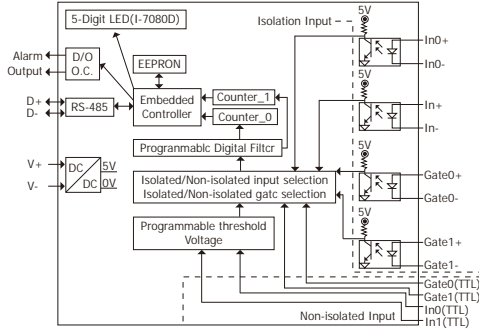


Counter/Frequency/PWM Module					
Model Name	I-7080(D)	I-7080B(D)	I-7083(D)	I-7083B(D)	I-7088
	M-7080(D)	M-7080B(D)			M-7088
Pictures					
<b>Digital Input</b>					
Channel	2		3		8
Contact	Wet				
Sink/Source (NPN/PNP)	Sink				
On Voltage Level	+3.5 ~ +30 Vdc		5 V: +3.5 ~ +5 Vdc 12 V with 1 kΩ external resistor: +5 ~ +12 Vdc 24 V with 2 kΩ external resistor: +7 ~ +24 Vdc		+3.5 ~ +5 Vdc
Off Voltage Level	+1 Vdc Max.		+2 Vdc Max.		+1 Vdc Max.
Programmable Filter	2 us to 65 ms				-
Programmable Threshold Voltage	+0.1 ~ +5 Vdc				-
Counter/Encoder Bits	32-bit				
Counter Mode	Up				Up
Encoder Mode			CW/CCW, Pulse/Dir., AB Phase		-
Frequency Mode	Yes				-
Virtual Battery Backup	-	Yes	-	Yes	-
Frequency Accuracy	1 Hz or 10 Hz				-
Max. Speed	100 KHz				1 MHz
<b>Digital Output</b>					
Channel	2				8
Type	Open Collector				PWM, TTL
Sink/Source (NPN/PNP)	Sink				Sink
Load Voltage	+3.5 ~ +30 Vdc				+3.5 ~ +5 Vdc
Max. Load Current	30 mA/Channel				10 mA/Channel
Power-on Value	Yes				-
Safe Value	Yes				-
PWM	Frequency	-			1 Hz ~ 500 KHz
	Duty Cycle	-			0.1 ~ 99.9%
	Mode	-			Burst, Continuous
	Burst Count	-			1 ~ 65535
	Trigger Start	-			Hardware or Software
<b>System</b>					
Dual Watchdog			Yes		
ESD (IEC 61000-4-2)			+/-4 kV		
EFT (IEC 61000-4-4)			+/-4 kV		
Intra-Module Isolation, Field-to-Logic	3000 Vdc		2500 Vrms		2500 Vrms
Power Consumption	2 W; 2.2 W for (D) version		1 W; 1.5 W for (D) version		2.4 W

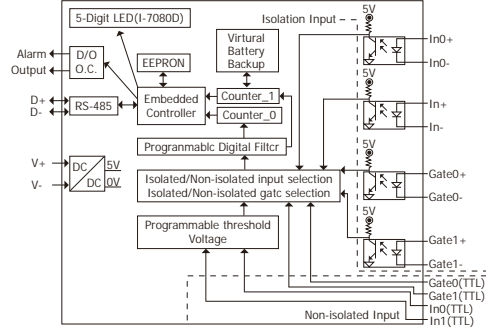


### Internal I/O Structure

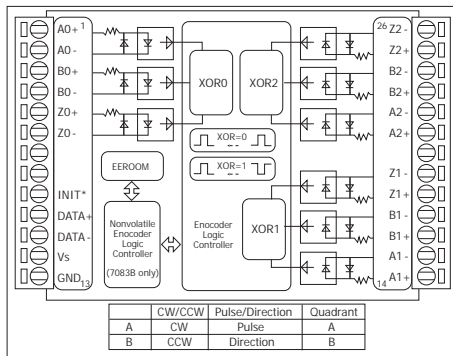
**I-7080(D)/M-7080(D)**



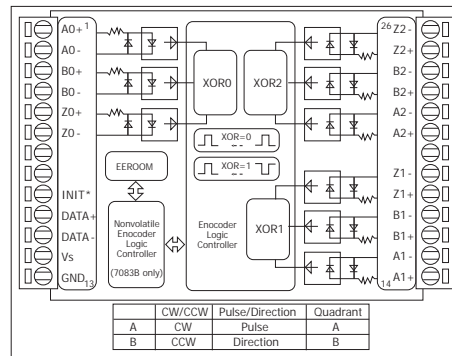
**I-7080B(D)/M-7080B(D)**



**I-7083(D)**



**I-7083B(D)**



**I-7088(D)/M-7088(D)**

