

FnIO M – Series :

M5642

***M5642 (2 Channels, Pulse Output, Trapezoidal Acceleration,
24Vdc/0.5A, Push-pull type, Emergency Stop, 2DI, 18RTB)***

Specification

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Specification

History

Rev	Pages	Remarks	Date	Editor
1.00			2024/02/26	Soyeong, Park
1.01	8-9	Add Emergency stop status bit	2024/08/29	Soyeong, Park
1.02	1, 5	Edit Description	2025/03/13	Soyeong, Park

Specification

1. ENVIRONMENT SPECIFICATION

Environmental specification	
Operating Temperature	-25°C~60°C
UL Temperature	-25°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	IEC 60068-2-6, 4g
Industrial Emissions	EN 61000-6-4/A11 : 2011
Industrial Immunity	EN 61000-6-2 : 2019
Installation Position	Vertical and horizontal installation is available.
Product Certifications	UL, ATEX, CE, UKCA

Specification

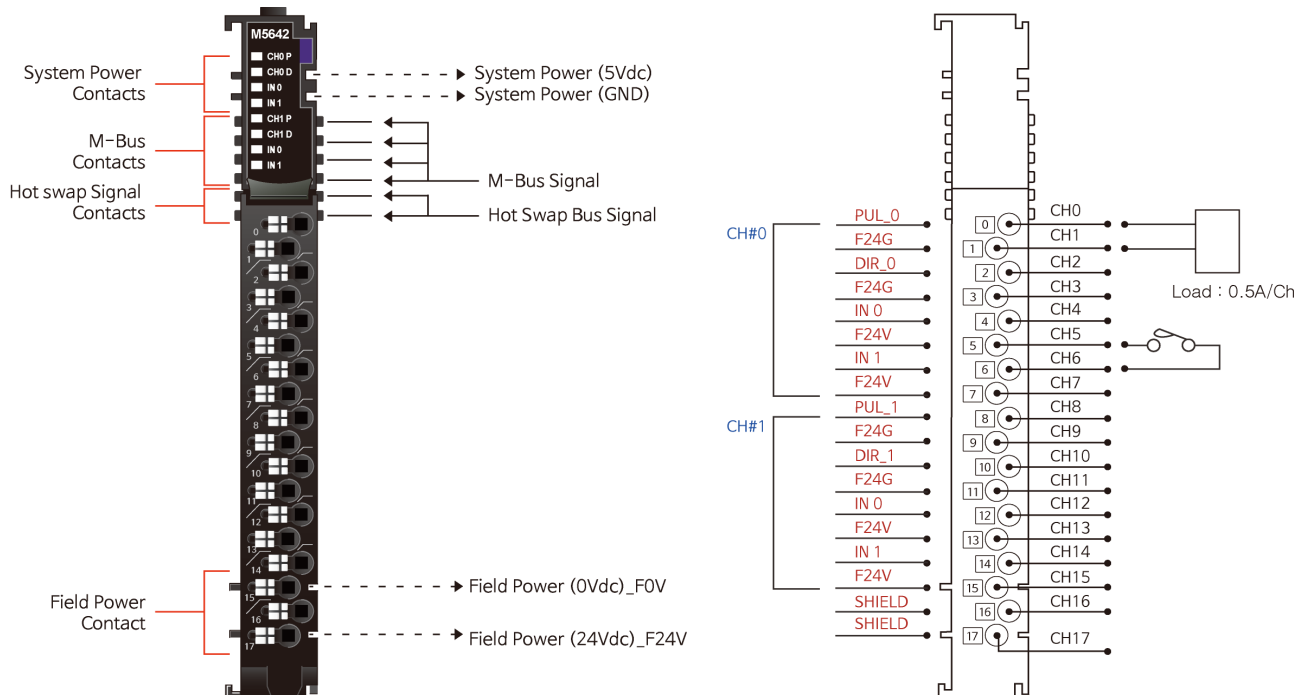
2. M5642 (2 Channels, Pulse Output, Trapezoidal Acceleration, 24Vdc/0.5A, Push-pull, Emergency Stop, 2DI)

2.1. M5642 Specification

Items	Specification
Output Specification	
Number of channel	2 Channels
Number of output	2 Output, Push-pull type
Indicators	4 Green LEDs - 2 Green Pulse LEDs - 2 Green Direction LEDs
Output voltage	Nominal 24Vdc (Depends on Field Power)
Output current	0.5A per channel, 2.0A per Module *automatically switch current (sink/source) according to external load. *Operating Temperature -25°C ~ 45°C : Max. 0.5A per channel 45°C ~ 60°C : Max. 0.3A per channel
Pulse output frequency	1-300kHz
Pulse output duty	About 50%
Pulse output quantity with one command	Continuous Pulse Output, Max. +1~+2147483647(0x7FFFFFFF) : Pulse Direction Output OFF. Max. -1~-2147483648(0x80000000) : Pulse Direction Output ON.
Pulse output counter	Signed 32bit-wide
Function	Trapezoidal Acceleration
Protection	Short Protection
Common Type	4 Common, Field Power 0V is Common
Digital Input Specification	
Input per module	4 points sink type
Indicators	4 Green input status
Input On-state voltage	24Vdc nominal 15~28.8Vdc
OFF-state voltage	7.0Vdc @25°C
On-state current	2.3mA @24Vdc 2.7mA @28.8Vdc
Input signal delay	OFF to ON : Max. 0.3ms @24Vdc ON to OFF : Max. 0.3ms @24Vdc
Nominal input impedance	10.2K
General specification	
Power dissipation	Max. 75mA @ 5.0Vdc
Isolation	I/O to Logic : Photocoupler Isolation Field power : Not Connected
UL Field Power	Supply voltage : 24Vdc nominal, Class 2
Field Power	Supply voltage : 24Vdc Norminal Voltage range : 18V ~ 28.8Vdc Power Dissipation : Max. 45mA@24Vdc except load.
Single Wire	0.205mm - 1.3mm (24-16 AWG)
Torque	0.8Nm(7 lb-in)
Weight	70g
Module Size	12mm x 110mm x 75mm
Hot Swap	Possible
Environment Condition	Refer to '1. Environment Specification'

Specification

2.2. M5642 Wiring Diagram

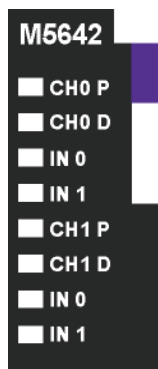


Pin No.	Signal Description	Series No	Through Air	Over Surface	CTI
		RTB18C	1.5mm	1.5mm	175≤CTI≤400
0	Pulse Output Channel #0	Spacings : The following minimum spacing in inches (millimeters) shall be maintained between uninsulated live parts of opposite polarity; and between an uninsulated live part and a grounded Part including any mounting surface or exposed metal part.			
1	Field Power 0V, Common				
2	Direction Output Channel #0				
3	Field Power 0V, Common				
4	Emergency Stop Input Channel #0				
5	Field Power 24V				
6	Digital Input Channel #0				
7	Field Power 24V				
8	Pulse Output Channel #1				
9	Field Power 0V, Common				
10	Direction Output Channel #1				
11	Field Power 0V, Common				
12	Emergency Stop Input Channel #1				
13	Field Power 24V				
14	Digital Input Channel #1				
15	Field Power 24V				
16	Shield				
17	Shield				

Specification

2.3. M5642 LED Indicator

2.3.1. LED Indicator



LED No.	LED Function / Description	LED Color
0	Pulse Output Channel #0	Green
1	Direction Output Channel #0	Green
2	Emergency Stop Input #0	Green
3	Digital Input Channel #0	Green
4	Pulse Output Channel #1	Green
5	Direction Output Channel #1	Green
6	Emergency Stop Input #1	Green
7	Digital Input Channel #1	Green

2.3.2. Channel Status LED

Status	LED	To indicate
No Signal	Off	No Input / Output Signal
On signal	Green	Input / Output Signal detected

2.4. Mapping Data from the Image Table

- Input Image Value

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Pulse Output Counter CH#0 LL							
Byte1	Pulse Output Counter CH#0 LH							
Byte2	Pulse Output Counter CH#0 HL							
Byte3	Pulse Output Counter CH#0 HH							
Byte4	Pulse Output Counter CH#1 LL							
Byte5	Pulse Output Counter CH#1 LH							
Byte6	Pulse Output Counter CH#1 HL							
Byte7	Pulse Output Counter CH#1 HH							
Byte8	-	-	Emergen bit CH#0**	Emergen IN CH#0*	-	--	-	DI CH#0
Byte9	-	-	Emergen bit CH#1**	Emergen IN CH#1*	-	-	-	DI CH#1

- A Pulse Output Counter is a signed 32bit-wide data.

* Emergen IN CH#0,1 (Emergency Stop Input 0,1)

- When **rising signal** is detected on the input channel, this bit is set(1).
- If this bit is set(1), the pulse output function is disabled.

** Emergen bit CH#0,1 (Emergency Stop Status 0,1)

- This bit is set when the emergency stop function is implemented.
- After the emergency stop function is performed, this bit must be reset(0) to operate the product.

You can reset(0) using the Emergen CLR bit of the output image value.

■ Emergency Stop Function

Emergen bit	Emergen IN	Description
0	0	Normal Operation
1	0	Stand by state (must be clear emergen bit)
0	1	X (There is no such case.)
1	1	Emergency Stop

Specification

• Output Image Value

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Frequency CH#0 Low Byte							
Byte1	Frequency CH#0 High Byte							
Byte2	Frequency CH#1 Low Byte							
Byte3	Frequency CH#1 High Byte							
Byte4	Pulse Output Qty CH#0 LL							
Byte5	Pulse Output Qty CH#0 LH							
Byte6	Pulse Output Qty CH#0 HL							
Byte7	Pulse Output Qty CH#0 HH							
Byte8	Pulse Output Qty CH#1 LL							
Byte9	Pulse Output Qty CH#1 LH							
Byte10	Pulse Output Qty CH#1 HL							
Byte11	Pulse Output Qty CH#1 HH							
Byte12	RUN0	ECP0	ACC0	CLR0	Emergen CLR 0*	.	Multiple	
Byte13	RUN1	ECP1	ACC1	CLR1	Emergen CLR 1*	.	Multiple	

- RUN0,1 : Pulse Output Run

- ECP0,1 (Enable Continuous Pulse) : If this bit '1' and Pulse Output Qty is not 0, pulse output always runs.

- ACC0,1 (Enable Acceleration Function) : it doesn't work when parameter value 0 or frequency value is less than 3K.

- CLR0,1 : Clear real pulse output counter. (Input Image Value)

* Emergen CLR 0,1 : Clear Emergen bit (Input Image Value)

- When the Emergen CLR bit changes from 0 to 1 (0→1), the clear function is performed.

Note: The Emergen CLR function must be performed after the emergency stop input is removed.

■ Multiple 0,1 (Frequency Multiple Selection)

Value	Description
0 (B'00)	x1 Frequency Multiple
1 (B'01)	x10 Frequency Multiple
2 (B'10)	x100 Frequency Multiple
3 (B'11)	x1000 Frequency Multiple

- If Pulse Frequency = 123 and Frequency Multiple = 2, Real Pulse Output is 12.3KHz (123*100)

2.5. Parameter Data

• Valid Parameter length: 4 Bytes

• Parameter Data

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Acceleration Time CH#0 L							
Byte1	Acceleration Time CH#0 H							
Byte2	Acceleration Time CH#1 L							
Byte3	Acceleration Time CH#1 H							

- The unit is msec. If 1000, then Acceleration Time 1000msec.

- The maximum is 10000. (10,000msec = 10sec)

2.6. Example

2.6.1. Example of Acceleration Function

* This Function is available when the frequency is over 3k and the Parameter value is not 0.

- Setting for CH0 (same as CH1)

Example → Frequency = 25kHz / Pulse Count = 50,000 / Acceleration Time = 1,000msec (1sec)

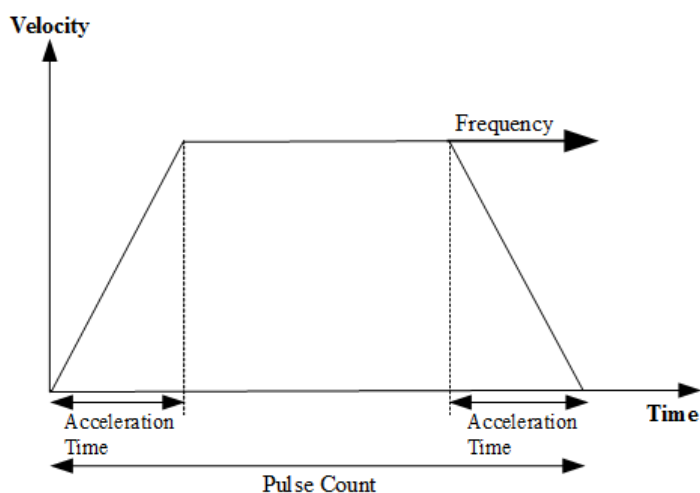
Frequency			
Byte0 (Low Byte)	0x19	Byte1 (High Byte)	0x00

Pulse Output Qty							
Byte4 (LL)	0x50	Byte5 (LH)	0xC3	Byte6 (HL)	0x00	Byte7 (HH)	0x00

Control Byte (Byte12) = 0xA3							
Bit7(RUN)	Bit6(ECP)	Bit5(ACC)	Bit4(CLR)	Bit3(None)	Bit3(None)	Bit1-0 (Multiple)	
1	0	1	0	-	-	0	3

Parameter (Acceleration Value)			
Byte0 (Low Byte)	0xE8	Byte1 (High Byte)	0x03

- Result



※ If the Counter value is not sufficient, the maximum velocity may not be reached.