MN-3254 Series User's Manual

(Version 1.0)

Distributed Motionnet 16-ch Isolated DI, 16-ch Isolated DO Module

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MN-3254 Series Motionnet 16 Input 16 Output I/O Module

The MN-3254(T) is an I/O expansion device for Motionnet systems, and is equipped with 16 isolated digital input channels and 16 isolated digital output channels. Each Motionnet communication line can be connected to up to 64 modules, meaning that the I/O can be expanded to up to 1024 input channels and 1024 output channels.

The communication time required by each MN-325x is 15.1us. If 64 modules have been connected, signals for 2048 points on 64 modules can be sent and received within 0.97 msec. The update of the I/O status is completed automatically through the Motionnet system at a constant interval, and setting interrupts for specific input points that the customer wants to monitor can help prevent CPU time from being wasted by repetitive polling when there is nothing else for the issuing process to do. Each input port can be specified as either NPN or PNP (12~24 V), and the internal flywheel diodes of each output port can be individually connected to different sources of power (each port is comprise of 8 I/O signals).

The content of this manual is divided into 6 parts: 1. Dimensions, 2. Features, 3. Internal circuit, 4. I/O Signal connectors, 5. Jumper and switch setting, 6. LED function description.

1. Dimensions of MN-3254

Front View   Back View   Right Side View
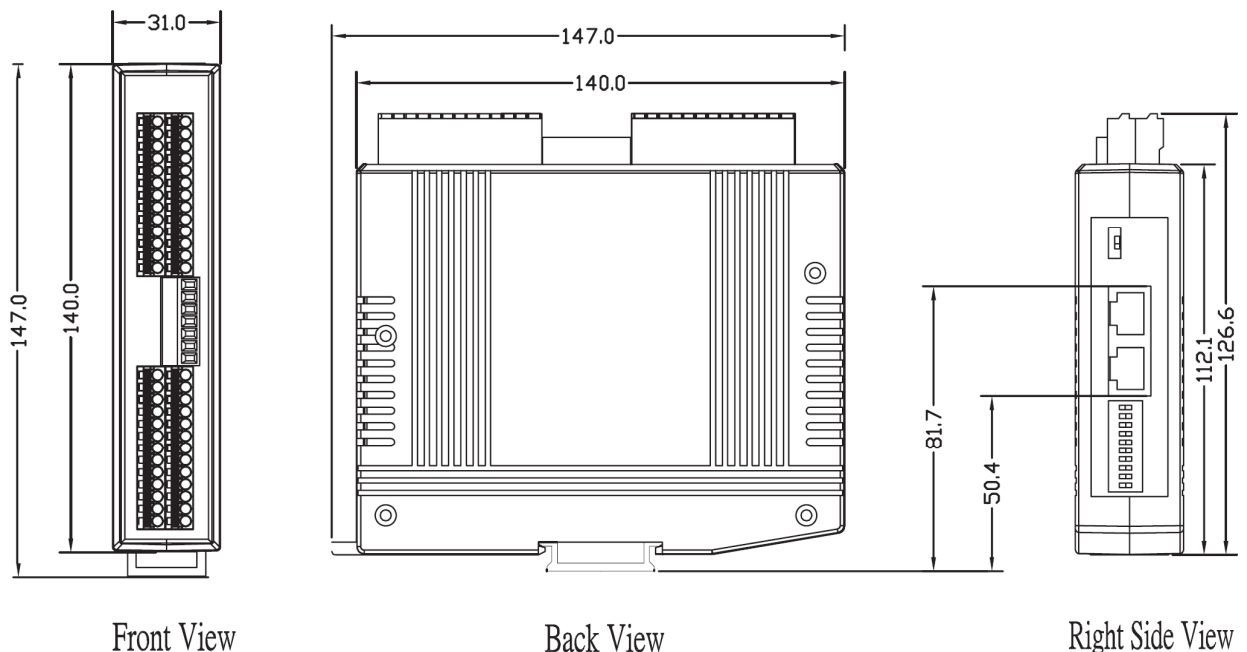
Dimensions of MN-3254

2. Features of MN-3254 Series

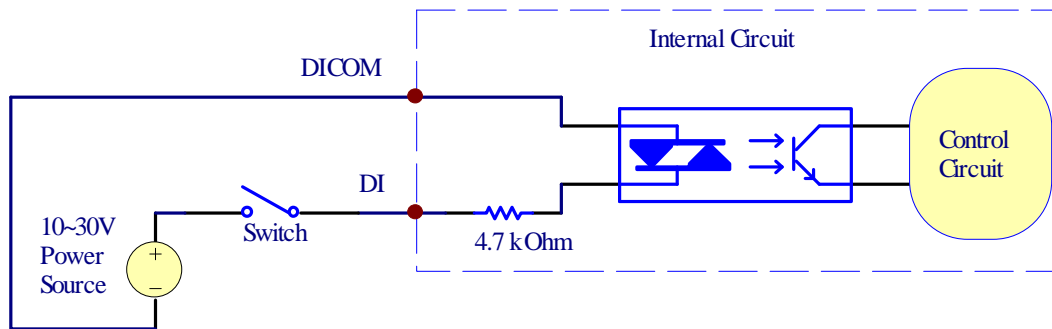| Digital Output	
Output Channels	16
Output Type	Open Collector (Sink), with internal flywheel diode
Load Voltage	+30 V_{DC} Max.
Load Current	200 mA max. for each channel
Isolation Voltage	3000 Vrms
Digital Input	
Input Channels	16
Input Type	Sink/Source (NPN/PNP), selectable for each port
On Voltage Level	+10 ~ 30V_{DC}
Off Voltage Level	+3 V_{DC} Max.
Input Impedance	4.7K Ohm
Isolation Voltage	3000 Vrms
Interface	
LED Indicators	Communication state(Link, Error)
	Input/output state
	Internal 3.3 V Power
	Termination resistor switch
Communication Speed	Selectable 2.5, 5, 10 or 20 Mbps by DIP Switch
Cyclic Scan Time	15.1 µs per device (20 Mbps)
Power	
Voltage Range	24V_{DC} +/-5% (1000V isolated)
Power Consumption	2W Max.
Protection	Reverse voltage and over current protection
Connection	7-Pin removable terminal block
Mechanical	
Case	Plastic
Flammability	UL 94V-0
Dimensions	31mm x 147mm x 126.6 mm (W x L x H)
Installation	DIN-Rail mounting
Environmental	
Operating Temperature	0 ~ + 60°C
Storage Temperature	-20 ~ +80°C
Operating Humidity	10 ~ 85%; Non-condensing
Storage Humidity	5 ~ 95%; Non-condensing

3. Internal circuit of MN-3254 Series

Digital Input

NPN Connection
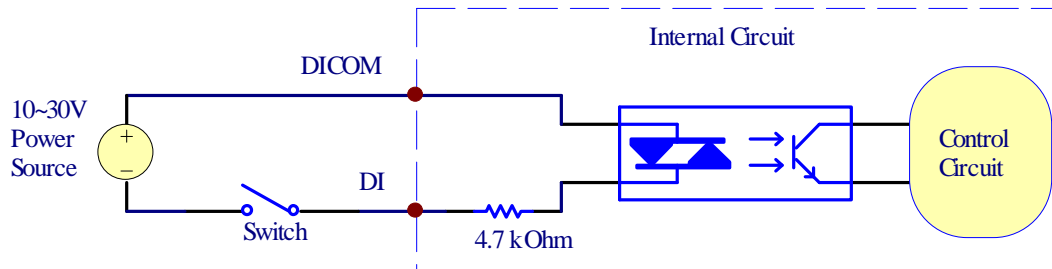
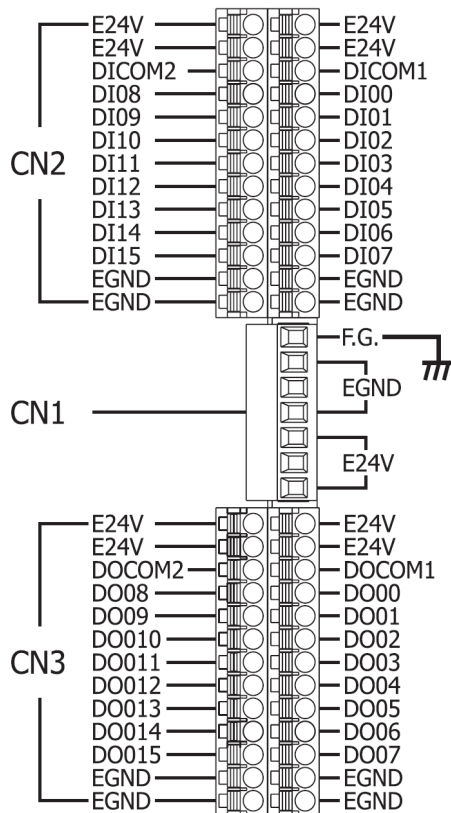## PNP Connection

Digital Output

NPN Connection
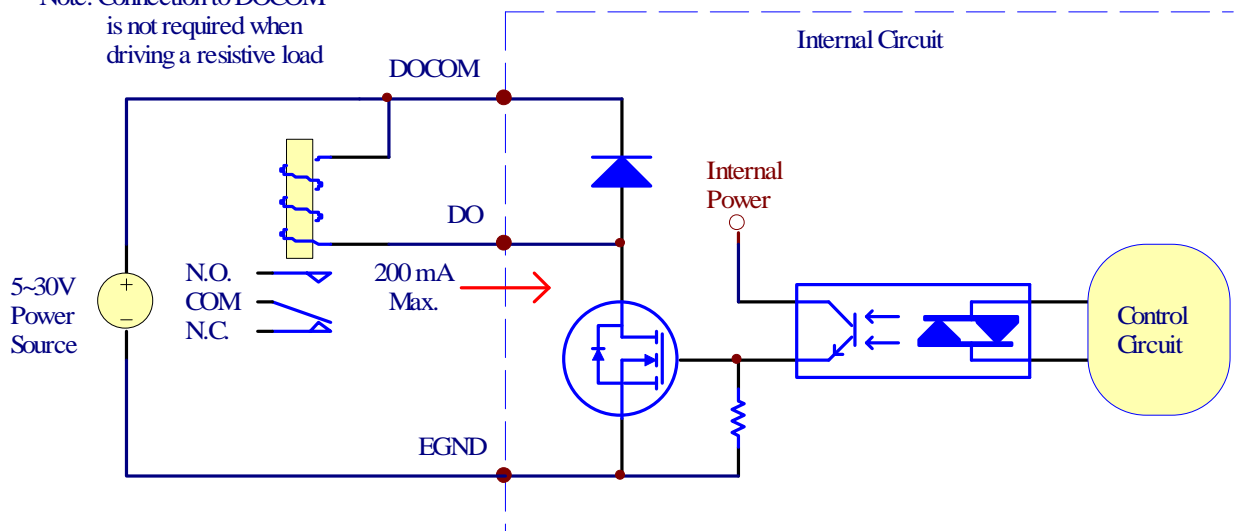
4. I/O Signal connectors of MN-3254 Series

∩ CN1 ~ CN3

NO.	Pin Define.	Specifications	I/O Define.
CN1 Pin Assignments			
1	F.G.	Frame Ground	-
2~4	EGND	External Ground	Input
5~7	E24V	External 24V(+)	Input
CN2A (Right) Pin Assignments			
1~2	E24V	External 24V(+)	Connect to CN1
3	DICOM1	Common terminal of DI00~DI07	Input
4~11	DI00~DI07	Digital input Ch. 00~07	Input
12~13	EGND	External Ground	Connect to CN1
CN2B (Left) Pin Assignments			
1~2	E24V	External 24V(+)	Connect to CN1
3	DICOM2	Common terminal of DI08~DI15	Input
4~11	DI08~DI15	Digital input Ch. 08~15	Input
12~13	EGND	External Ground	Connect to CN1
CN3A (Right) Pin Assignments			
1~2	E24V	External 24V(+)	Connect to CN1
3	DOCOM1	Common Anode for Flywheel Diodes of DO00~DO07	Input
4~11	DO00~DO07	Digital Output Ch. 00~07	Output
12~13	EGND	External Ground	Connect to CN1
CN3B (Left) Pin Assignments			
1~2	E24V	External 24V(+)	Connect to CN1
3	DOCOM2	Common Anode for Flywheel Diodes of DO08~DO15	Input
4~11	DO08~DO15	Digital Output Ch. 08~15	Output
12~13	EGND	External Ground	Connect to CN1

## ∩ RJ1 (RJ45 phone jack, only available in MN-3254)

RJ1 is the snap in connector for Motionnet communication signals. Table below shows the detailed description of these signal.
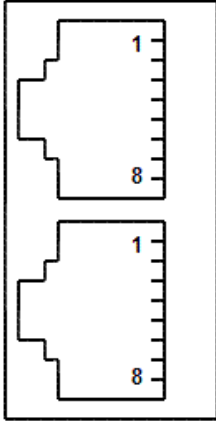
No	Name	I/O	Note
1~2	N.C.	-	-
3	Data+	I/O	Positive line of the differential communicaiton signal pair
4~5	N.C.	-	-
6	Data−	I/O	Negative line of the differential communicaiton signal pair
7~8	N.C.	-	-

∩ CN4 (5-pin Removable Terminal block, Pitch 5.08 , only available in MN-3254T)

CN4 is the screw terminal for Motionnet communication signals. Table below shows the detailed description of these signal
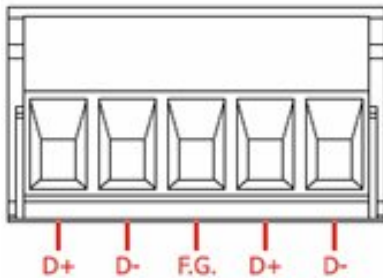
No	Name	I/O	Note
1	Data+	I/O	Positive line of the differential communicaiton signal pair
2	Data−	I/O	Negative line of the differential communicaiton signal pair
3	FGND	GND	Frame Ground
4	Data+	I/O	Positive line of the differential communicaiton signal pair
5	Data−	I/O	Negative line of the differential communicaiton signal pair

5. Jumper and switch setting

∩ SW1

This switch is used to set the on board termination resistor. The on board termination resistor is enabled when the switch is set to "ON". Please be sure to enable the termination resistor only on the last slave module of each line.
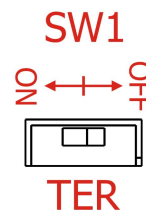
n SW2

Users can set the slave address, communication speed and the expire time and action of watch dog timer. Please refer below for detailed description.

Position	Name	Function	Description
1	A0	Address Setting	Every slave module should be assigned a unique address in a Motionnet communication line and up to 64 slave modules can be connected in one line. A0 is the least significant (represent '1' when it is set to ON) while A5 is the most significant (represent '32' when it is set to ON)
2	A1		
3	A2		
4	A3		
5	A4		
6	A5		
7	S0	Speed Selection	Every slave module should use the same communicaiton speed as the one set in the master card in a Motionnet communication line for proper operation. Table below shows the setting of communicaiton speed. <table><tr><td>S0</td><td>S1</td><td>Communication Speed</td></tr><tr><td>OFF</td><td>OFF</td><td>20 Mps (default)</td></tr><tr><td>ON</td><td>OFF</td><td>10 Mbps</td></tr><tr><td>OFF</td><td>ON</td><td>5 Mbps</td></tr><tr><td>ON</td><td>ON</td><td>2.5 Mbps</td></tr></table>
8	S1		
9	CLR/KP	Watch Dog Timer (WDT) Setting	This bit is used to set the action when the WDT expired. KP: All output will be holded CLR: All output will be cleared
10	5/20		This bit is used to set the expire time of the WDT. The WDT will expired if consecutive communication error occure for the preset period of time. 5: The expire time is 5 ms (default) 20: The expire time is 20 ms

6. LED function description

The LEDs are used to indicate meaningful status. Please refer below for the detailed description of LEDs.
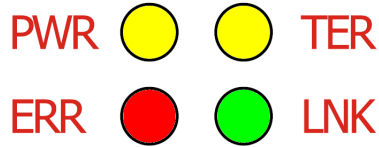
- **PWR (Power OK, Yellow)**

  It shows the status of internal power of this module. This LED will be turned on when the power is good.

- **TER (Terminator On, Yellow)**

  It shows the status of on board termination resistor. This LED will be turned on when the termination resistor is enabled.

- **LNK (Link, Green)**

  This LED will be turned on when the communication is successfully established.

- **ERR (Communication Error, Red)**

  This LED will be turned on when the slave module receives an error frame such as a CRC error which means the the communication quality has been influenced by external noise.

- **DI00~DI15 (DI status, Green/Yellow)**

  The LED will be turned on when the corresponding DI channel is turned on. The color of the LED will be Green when the corresponding DI is configured as NPN input and it will be Yellow when the corresponding DI is configured as PNP input.

- **DO00~DO15 (DO status, Red)**

  The LED will be turned on when the corresponding DO channel is turned on.

7. Rivision History

Rev 1.0   2015/04/10 Initial Version