

16 CHANNEL DIGITAL INPUT MODULE
Ref No: m11A/om/101
Issue No: 03

masibus

User Manual

16 CHANNEL DIGITAL INPUT MODULE

MAS-DI-16-D-

Masibus Automation & Instrumentation Pvt. Ltd.

B/30, GIDC Electronics Estate,
Sector-25, Gandhinagar-382044, Gujarat, India
Web: www.masibus.com

Contents

1. INTRODUCTION	03
1.1 Purpose of the manual	
1.2 Overview	
1.3 Product ordering code	
2. SPECIFICATIONS.....	04
2.1 Electrical Specification	
2.2 Mechanical Specification	
2.3 Environmental condition	
3. TERMINAL CONNECTIONS.....	05
3.1 Connection Details	
3.2 Wiring diagram & Circuit Diagram	
4. I/O module Operation.....	06
5. SAFETY AND WARNING PRECAUTIONS.....	07
5.1 Safety Precautions	
5.2 Warning Precautions	
6. MAINTENANCE.....	07

Figures

Figure 1: On/Off –State Voltage Range	04
Figure 2: Terminal connection	05
Figure 3: Wiring Diagram & Circuit Diagram	06
Figure 4: Block Diagram of I/O Module.....	06

Tables

Table 1: Product ordering code	03
Table 2: Electrical Specification	04
Table 3: Connection Details	05
Table 4: Operation Details	06

Note:

Information in this manual is subject to change without prior notice or permission.

1. INTRODUCTION

1.1 Purpose of the manual

- This manual should be provided to the end user. Keep an extra copy or copies of the manual in a safe place.
- Read this manual carefully to gain a thorough understanding of how to operate this product before starting operation.
- This manual describes the functions of this product. Masibus does not guarantee the application of these functions for any particular purpose.

1.2 Overview

- **MAS-DI-16-D-XXXXX** I/O Modules are used to detect on/off voltage levels.

- It can interface to AC or DC voltage levels.
- The modules feature input filtering, 5300V optical isolation, and built-in surge protection to enhance the reliability of operation in noisy industrial environments.
- Typical applications for AC input modules include sensing the presence or absence of voltage, and sensing contact closure from sources such as proximity switches, limit switches, float switches, selector switches, push buttons, toggle switches, and thermostats.
- Both sinking and sourcing versions of the fast response input module are available.

1.3 Product ordering code

Model No	INPUT TYPE	Input Voltage		Output Type		Output Protection		Output Connection	
MAS-DI-16-D-XXXXX	X	X		X		X		X	
	AC	1	230VAC	0	SOURCE	0	NON FUSE	0	D-TYPE
		2	110VAC	1	SINK	1	WITH FUSE	1	FRC
	DC	1	220VDC						
		2	110VDC						
		3	48VDC						
		4	24VDC						
		5	12VDC						

Table 1: Product Ordering Code

2. SPECIFICATIONS

2.1 ELECTRICAL SPECIFICATION:

2.1.1 INPUT VOLTAGE:

Voltage Category	Operating voltage	Number of input	On state voltage (Von)	Nominal Input Current	Off state voltage (Voff)	Response Time
12V(DC)	7-15V(DC)	16	≥ 7V(DC)	3mA at 12 VDC	≤ 4V(DC)	≤2mSec
24V(DC)	15-30V(DC)	16	≥ 15V(DC)	3mA at 24 VDC	≤ 5V(DC)	≤ 2mSec
48V(DC)	30-55V(DC)	16	≥ 30V(DC)	3.2mA at 48 VDC	≤ 9V(DC)	≤ 2mSec
110V(DC)	70-132V(DC)	16	≥ 75V(DC)	2mA at 110VDC	≤ 30V(DC)	≤ 15mSec
220V(DC)	110-250V(DC)	16	≥ 110V(DC)	2mA at 220VDC	≤ 50V(DC)	≤ 20mSec
110V(AC)	70-132V(AC)	16	≥ 70V(AC)	12 mA at 120VAC	≤ 30V(AC)	≤ 100mSec
230V(AC)	110-265V(AC)	16	≥ 110V(AC)	12 mA at 230VAC	≤ 50V(AC)	≤ 100mSec

Table2: Electrical Specification

On/Off –State Voltage Range:

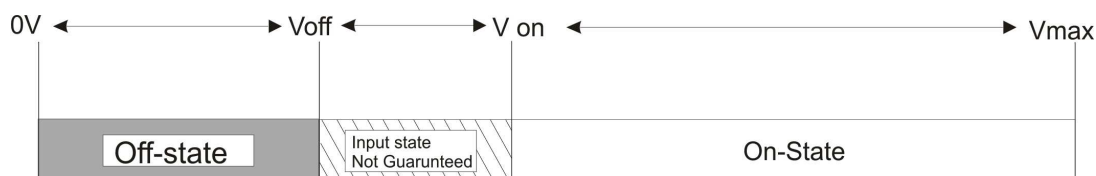


Figure 1: On/Off –State Voltage Range

2.1.2 OUTPUT VOLTAGE:

Signal Type: Open Collector

Nominal Voltage: 24VDC

Nominal Current: 5mA

Maximum Voltage: 28VDC

Output ON Status LED: Green

2.1.3 EXTERNAL POWER SUPPLY

: 24V DC

2.2 MECHANICAL SPECIFICATION

Terminals: Phoenix make PCB type Terminal block can accept up to 2.5 square mm Wire.

Case: Phoenix make Profile UM-72.

Size:200mm (L)X 90mm (W)X 60mm (H)

Mounting: DIN RAIL

Connections: Power, Input & Output as shown in figure.

Weight: 0.250 Kg.

2.3 ENVIRONMENTAL SPECIFICATION

Operating temperature: 0°C to 55°C

Insulation Resistance: Greater than 200MΩ between all Input channels and output Channels at 500V DC.

Electrical Isolation: 1500Vac between all input channels and output Channels.

Humidity: 30% to 85% RH non-condense

3. TERMINAL CONNECTION, WIRING DIAGRAM & CIRCUIT DIAGRAM

3.1 Terminal connection

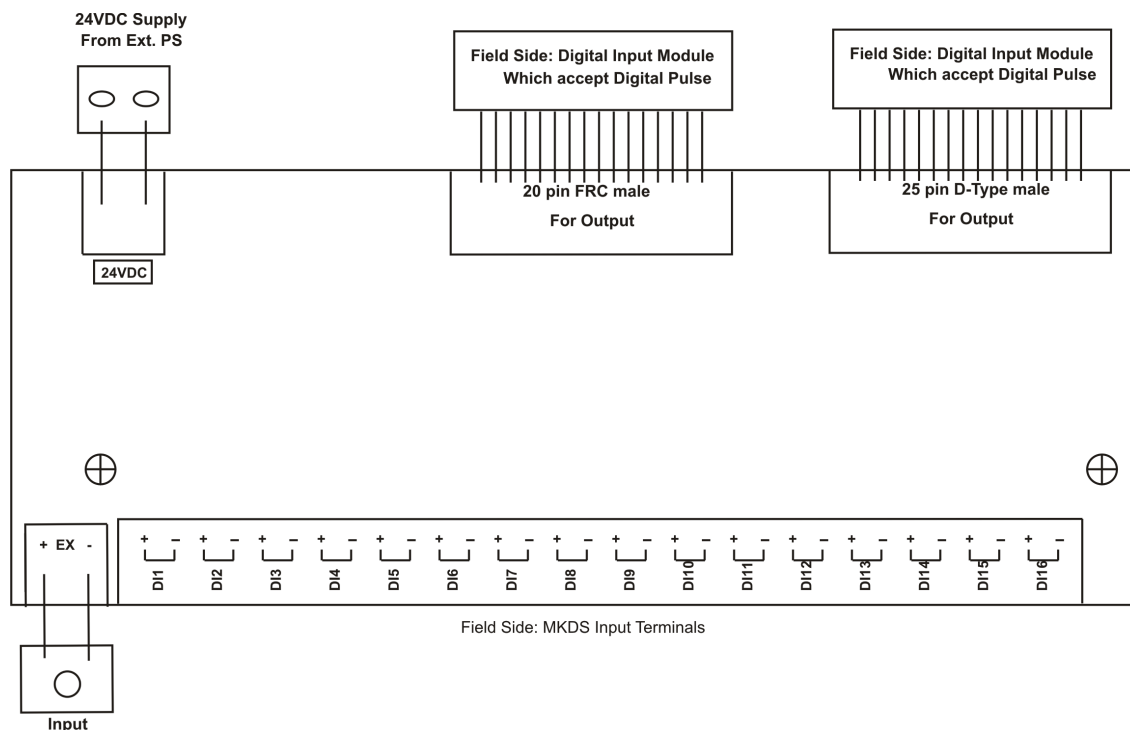


Figure 2: Terminal connection

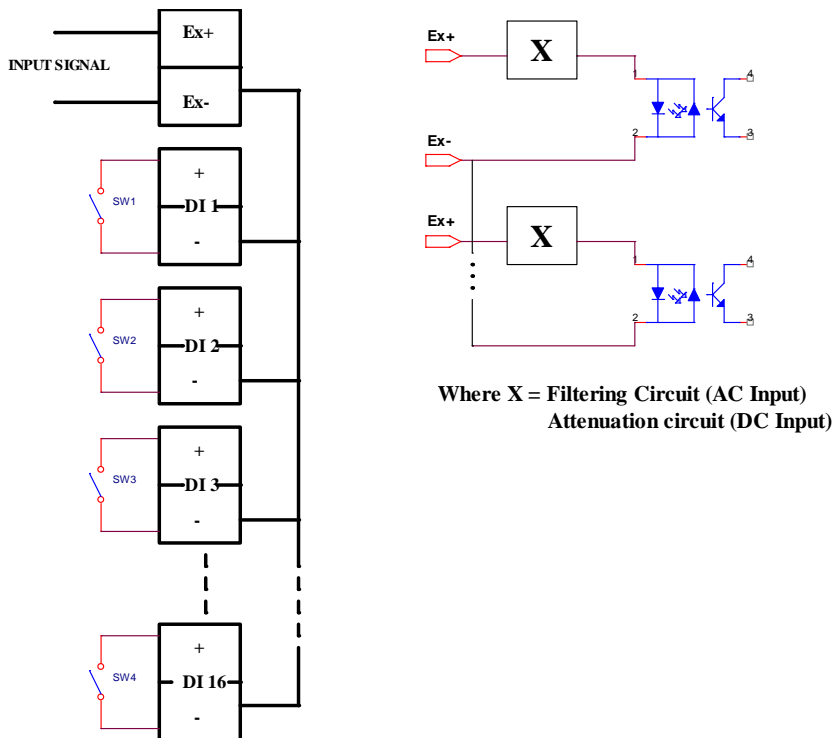
3.1.1 Connection Details:

Terminals	25 pin D-Type Connector	20 pin FRC Connector
1	DI 16	DI 16
2	DI 15	DI 15
3	DI 14	DI 14
4	DI 13	DI 13
5	DI 12	DI 12
6	DI 11	DI 11
7	DI 10	DI 10
8	DI 9	DI 9
9	DI 8	DI 8
10	DI 7	DI 7
11	DI 6	DI 6

12	DI 5	DI 5
13	DI 4	DI 4
14	DI 3	DI 3
15	DI 2	DI 2
16	DI 1	DI 1
17	NC	NC
18	NC	NC
19	NC	+24V
20	NC	GND
21	NC	
22	NC	
23	NC	
24	+24V	
25	GND	

Table3: Connection Details

3.2 Wiring Diagram & Circuit Diagram:



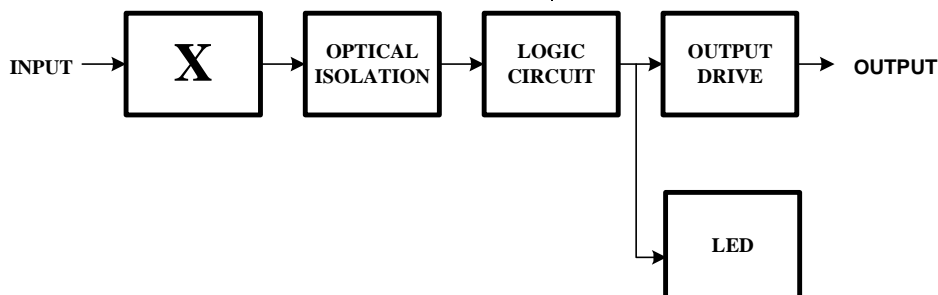
Where X = Filtering Circuit (AC Input)
 Attenuation circuit (DC Input)

Figure.3: Wiring Diagram & Circuit Diagram:

4. I/O MODULE OPERATION:

- An input module respond to an input signal in following manner:
- Input filtering limits the effect of voltage transients caused by contact bounce and/or electrical noise. If not filtered, voltage transients could produce false data. All input modules use input filtering.

- Optical isolation shields back plane circuits and module logic circuits from possible damage due to electrical transients.
- Logic circuit processes the signal & determines the output signal.
- An output LED indicates the status of the output signal.
- Block Diagram of I/O Module is shown in figure 4



Where X = Filtering Circuit (AC Input)
 Attenuation circuit (DC Input)

Figure.4: Block Diagram of I/O Module

5. SAFETY AND WARNING PRECAUTIONS

5.1. Safety Precautions

- ⚠ Dangerous voltages capable of causing death are sometimes present in this instrument. Before installation or beginning of any troubleshooting procedures the power to all equipment must be switched off and isolated. Units suspected of being faulty must be disconnected and removed first and brought to a properly equipped workshop for testing and repair. Component replacement and interval adjustments must be made by a company person only.

5.2 Warning Precautions

- ⚠ Make all terminations without applying aux. supply. This decreases the chances for shock, fuse blowing / tripping and damage to unit, because of wrong connection or loose connections. All supplies and mainly SMPS supplies draw huge spike currents when power is on. If connections are made while the power is on, power-on huge currents are applied more frequently than in normal case, which may result in damage to some components.
- ⚠ Hanging wires exert unwanted pressure on terminations and should be avoided.
- ⚠ The terminations should be done using correct type of lugs and should never be done using soldered ends or free wires.
- ⚠ Route the wiring through an approved cable housing to minimize the risk of accidental damage.

NOTE:

UNPACKING: Upon receipt of the shipment remove the unit from the carton and inspect the unit for shipping damage. If any damage due to transit, report and claim with the carrier. Write down the model number, serial number, and date code for future reference, when communicating with our *Customer Support Division*.

6. MAINTANCE

- ⚠ Before installation or beginning of any troubleshooting procedures the power to all equipment must be switched off and isolated. Units suspected of being faulty must be disconnected and removed first and brought to a properly equipped workshop for testing and repair. Component replacement and interval adjustments must be made by a company person only.