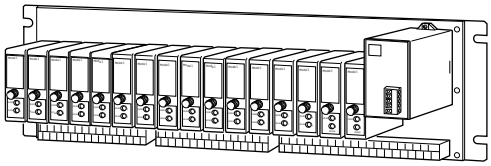
Super-mini Signal Conditioners Mini-M Series

COMMUNICATION CONTROLLER

(DeviceNet)

Functions & Features

- Receiving up to 16 Mini-M modules
- Enabling interfacing analog I/Os to DeviceNet
- Power supplied through printed wiring on the base



MODEL: M2BD-[1][2]-[3][4]

ORDERING INFORMATION

- Code number: M2BD-[1][2]-[3][4]

Specify a code from below for each of [1] through [4].
(e.g. M2BD-161-R/UL)

Power input specification for each I/O modules must be the same as that of the base.

[1] CAPACITY

04: 4 positions
08: 8 positions
16: 16 positions

[2] I/O TYPE

1: Input
2: Output

[3] POWER INPUT

AC Power
K: 85 – 132 V AC
(Operational voltage range 85 – 132 V, 47 – 66 Hz)
(CE or UL not available)
DC Power
R: 24 V DC
(Operational voltage range 24 V ±10 %, ripple 10 %p-p max.)

[4] OPTIONS

Standards & Approvals
blank: Without UL or CE
/UL: UL approval, CE marking

RELATED PRODUCTS

- Programming Unit (model: PU-2x)

GENERAL SPECIFICATIONS

Capacity: 4, 8 or 16 positions
Connection
DeviceNet: Euro type connector terminal (applicable wire size: 0.2 to 2.5 mm^2, stripped length 7 mm)
I/O: M3 screw terminals (torque 0.8 N·m)
Power input: M3 screw terminals (torque 0.8 N·m)
Screw terminal: Nickel-plated steel
Isolation: I/O to DeviceNet to power to FG1
Power indicator: Green LED turns on with power supplied.

DeviceNet COMMUNICATION

Transmission cable: Approved for DeviceNet
Node address setting: DIP switch; 00 – 63
Baud rate setting: DIP switch
125 kbps (factory default), 250 kbps, 500 kbps
MS (Module Status) indicator: Bi-color (green/red) LED indicates device status.
NS (Network Status) indicator: Bi-color (green/red) LED indicates status of the communication link.

INPUT SPECIFICATIONS

Input modules: Mini-M series; output 1 – 5 V DC;
(Each input must be isolated by signal conditioners. Non-isolated modules such as M2BW is not usable.)

■ **Analog Input**

Input range: See each I/O module spec.
Voltage at the field I/O terminals limited within 30 V DC for UL.
Isolation: transformer (by Mini-M module)
A/D conversion output: 16-bit binary
Signal range 0 – 100 % is converted into hexadecimal 0000 – 1770 (0 – 6000). -15 to 0 % is represented by 2's complements.
Overall range is represented by hexadecimal FC7C – 1AF4 (-900 – +6900), for -15 – +115 %.
Note: In the firmware version 3.00 or later, analog input range 0 – 100% can be converted into hexadecimal 0000 – 2710 (0 – 10000).
In addition, negative values of analog input range -15 to 0% can be converted into signed absolute values.
Refer to the instruction manual for details.

OUTPUT SPECIFICATIONS

Output modules: Model M2VS; input 1 – 5 V DC

■ **Analog Output**

Output range: See model M2VS spec.

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Isolation: Transformer
D/A conversion output: 16-bit binary
Signal range 0 – 100 % is converted into hexadecimal 0000 – 1770 (0 – 6000). -15 to 0 % is represented by 2's complements.
Overall range is represented by hexadecimal FC7C – 1AF4 (-900 – +6900), for -15 – +115 %.
Note: In the firmware version 3.00 or later, analog output range 0 – 100% can be converted into hexadecimal 0000 – 2710 (0 – 10000).
In addition, negative values of analog output range -15 to 0% can be converted into signed absolute values.
Refer to the instruction manual for details.

INSTALLATION

Power Consumption:
•**AC**:
approx. 6 VA without I/O module
approx. 30 VA with 4 modules (M2DY)
approx. 50 VA with 8 modules (M2DY)
approx. 90 VA with 16 modules (M2DY)
Current consumption:
•**DC**
approx. 0.25 A without I/O module
approx. 1 A with 4 modules (M2DY)
approx. 1.5 A with 8 modules (M2DY)
approx. 2.5 A with 16 modules (M2DY)
Supply voltage to network: 11 – 25 V DC supplied through the network terminal block
Supply current to network: 60 mA max. @ 24 V
Operating temperature: -5 to +55°C (23 to 131°F)
Operating humidity: 30 to 90 %RH (non-condensing)
Atmosphere: No corrosive gas or heavy dust
Mounting: Surface
Weight: Without I/O module
M2BD-04 1.2 kg (2.6 lb)
M2BD-08 1.5 kg (3.3 lb)
M2BD-16 2 kg (4.4 lb)

PERFORMANCE in percentage of span

A/D conversion: Accuracy of input module ±0.1%
D/A conversion: Accuracy of M2VS ±0.1 %
Permissible power failure duration: ≤ 10 msec.
Insulation resistance: ≥ 100 MΩ with 500 V DC
Dielectric strength: 1000 V AC @1 minute (power to I/O module to DeviceNet module to FG1)

STANDARDS & APPROVALS

EU conformity:
EMC Directive
EMI EN 61000-6-4
EMS EN 61000-6-2
Low Voltage Directive
EN 61010-1
Measurement Category II (input)
Pollution Degree 2
Input or output to power: Reinforced insulation (300 V)
Input to output: Basic insulation (300 V)
RoHS Directive
Approval:
UL/C-UL nonincendive Class I, Division 2,
Groups A, B, C, and D
(ANSI/ISA-12.12.01, CAN/CSA-C22.2 No.213)
UL/C-UL general safety requirements
(UL 3111-1, CAN/CSA-C22.2 No.1010-1)

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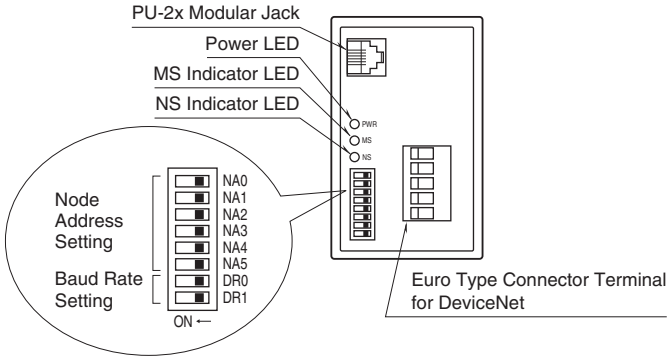
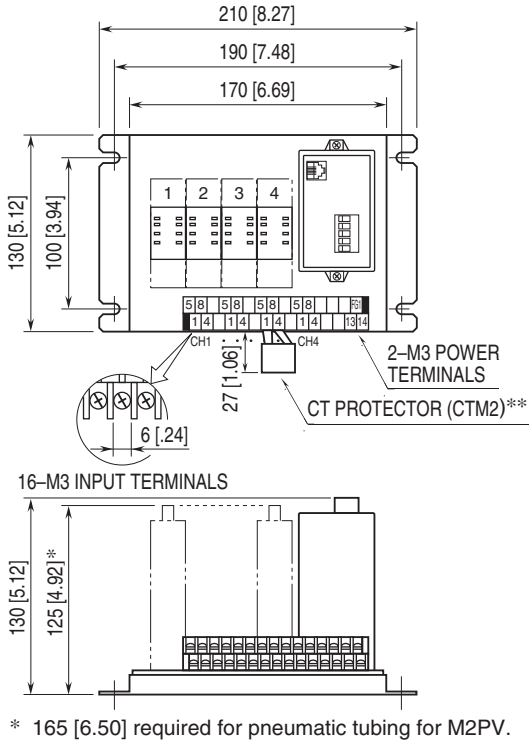
COMM. MODULE FRONT PANEL



Refer to the instruction manual for detailed procedures.

EXTERNAL DIMENSIONS unit: mm [inch]

■ M2BD-041 (INPUT BASE)



* 165 [6.50] required for pneumatic tubing for M2PV.

** Attached to M2CA and M2CE.

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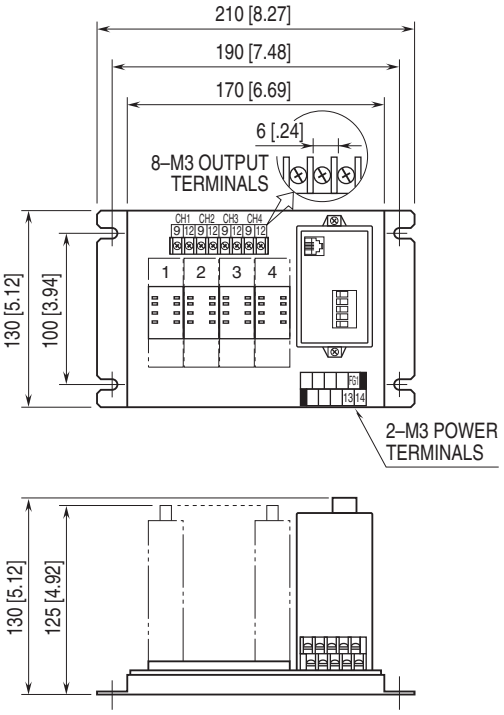
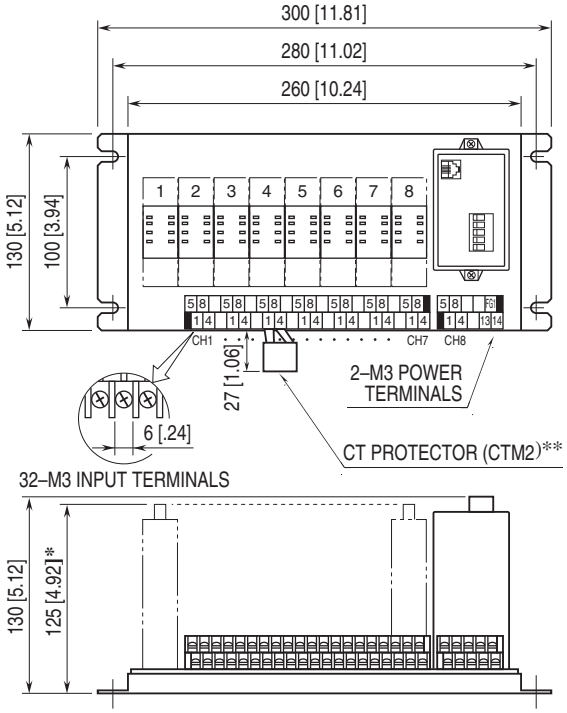
■ M2BD-042 (OUTPUT BASE)



■ M2BD-081 (INPUT BASE)



* 165 [6.50] required for pneumatic tubing for M2PV.

** Attached to M2CA and M2CE.

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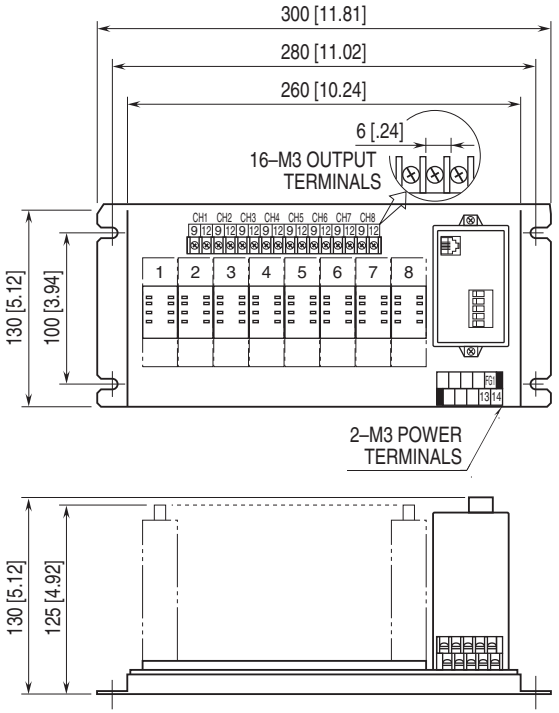
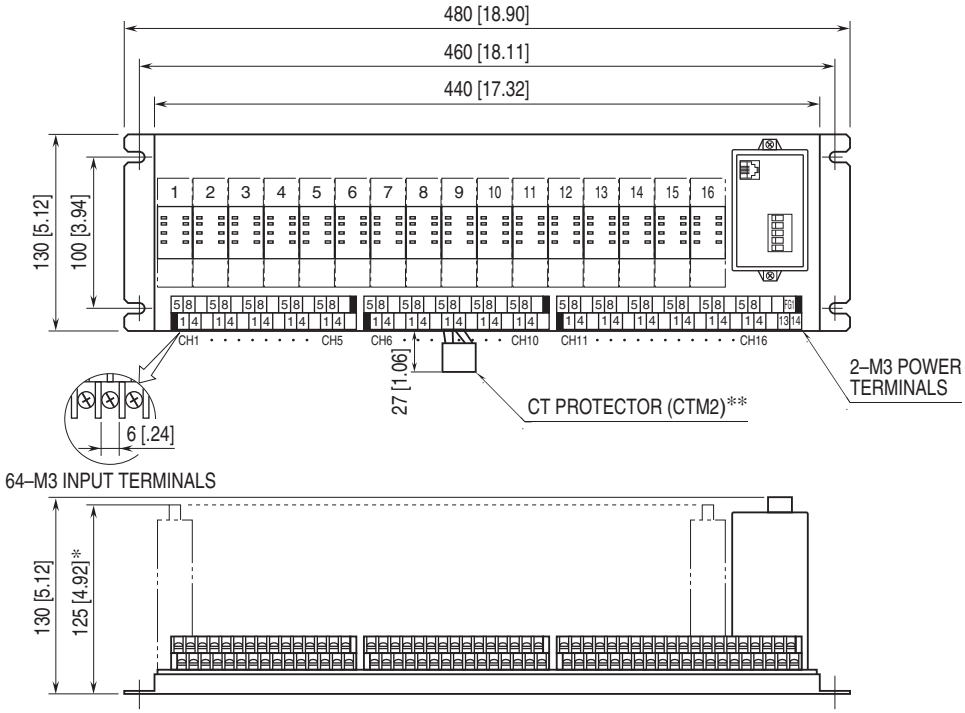
■ M2BD-082 (OUTPUT BASE)



■ M2BD-161 (INPUT BASE)



* 165 [6.50] required for pneumatic tubing for M2PV.
** Attached to M2CA and M2CE.

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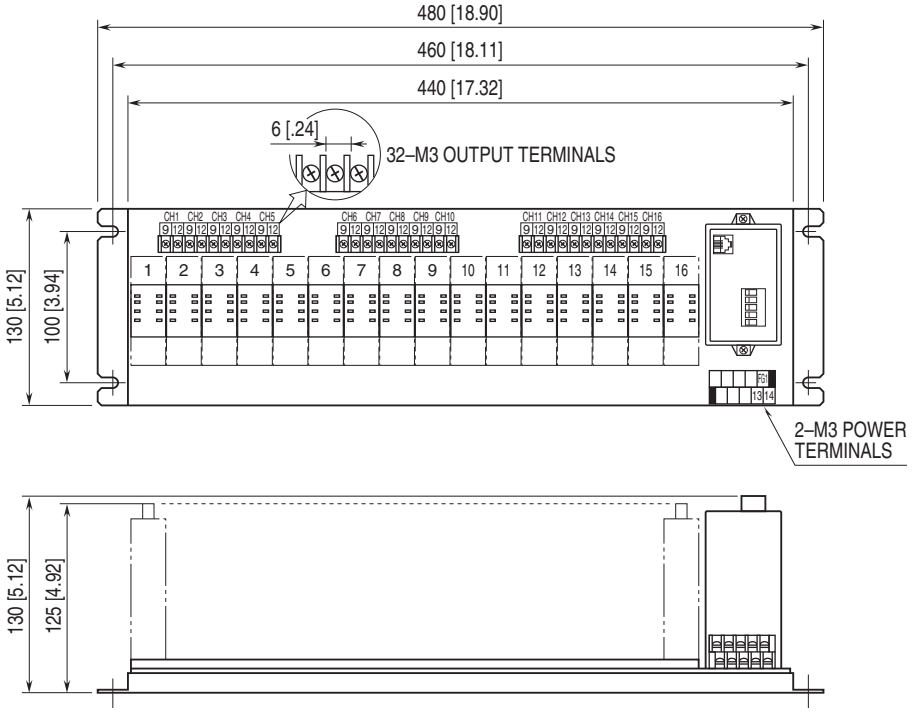
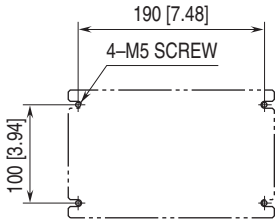
■ M2BD-162 (OUTPUT BASE)

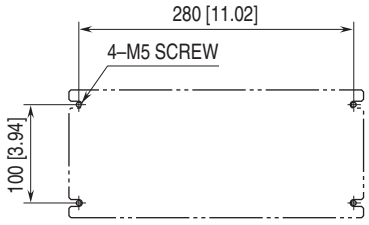


MOUNTING REQUIREMENTS unit: mm [inch]

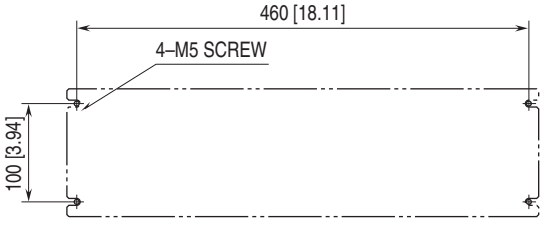
■ M2BD-04



■ M2BD-08



■ M2BD-16



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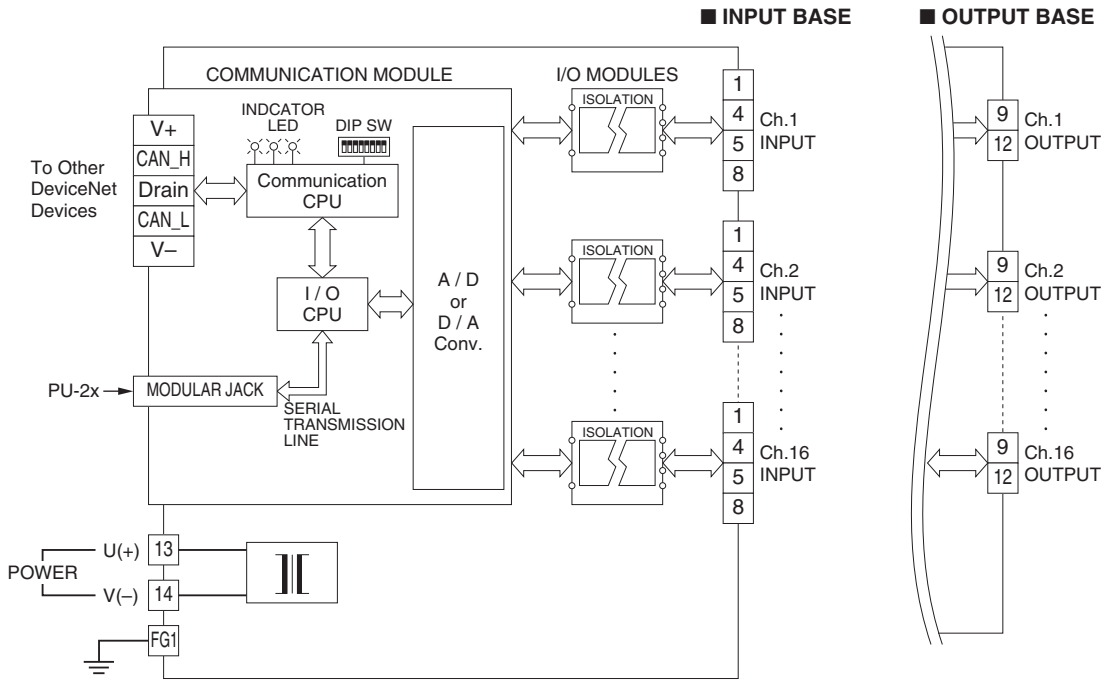
SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

Note: In order to improve EMC performance, bond the FG1 terminal to ground.

Caution: FG1 terminal is NOT a protective conductor terminal.



Specifications are subject to change without notice.

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