

I/A Series[®] Hardware

DIN Rail Mounted Fieldbus Module Baseplate



The DIN rail mounted Fieldbus Module baseplate provides a convenient, secure facility for the mounting of DIN rail mounted Fieldbus Modules (FBMs) and Fieldbus Communications Modules (FCMs). Its eight mounting positions can accommodate up to eight FBMs or a combination of FBMs and FCMs. The baseplate also provides the necessary connectors for redundant power, redundant module Fieldbus, and termination cables.

PLUG-IN MODULES

The DIN rail mounted FBMs accommodated by the baseplate are compact, plug-in modular assemblies used to interface field devices with the host control station. The FCMs, having the same form factor as the FBMs, perform signal interface functions.

For example, FCM10Es are used to interface the Ethernet trunk Fieldbus with the 2 Mbps module Fieldbus, and FCM2Fs are used for fiber optic communications extensions between baseplates. The FBMs and FCMs plug onto the baseplate by means of their two, 48-pin connectors, and each is fastened in place by two screws.

BASEPLATE MOUNTING

The baseplate is available in two basic mounting configurations — horizontal DIN rail mount or vertical DIN rail mount. Either of these configurations can be employed internal to, or external to an enclosure; however, in all cases the DIN rail must be amply supported, whether by means of metal braces, a backplate, or a supporting wall.

NOTE

CE compliance requires the use of a metal enclosure and Foxboro’s power distribution unit.

In addition to DIN rail mounting of the baseplate, a mounting kit is available for mounting the baseplate horizontally in a standard, 483 mm (19 in) rack. The kit provides a 25.4 mm (1 in) mounting depth, to meet clearance requirements at the front of the 19-inch rack.

BASEPLATE IMPLEMENTATION

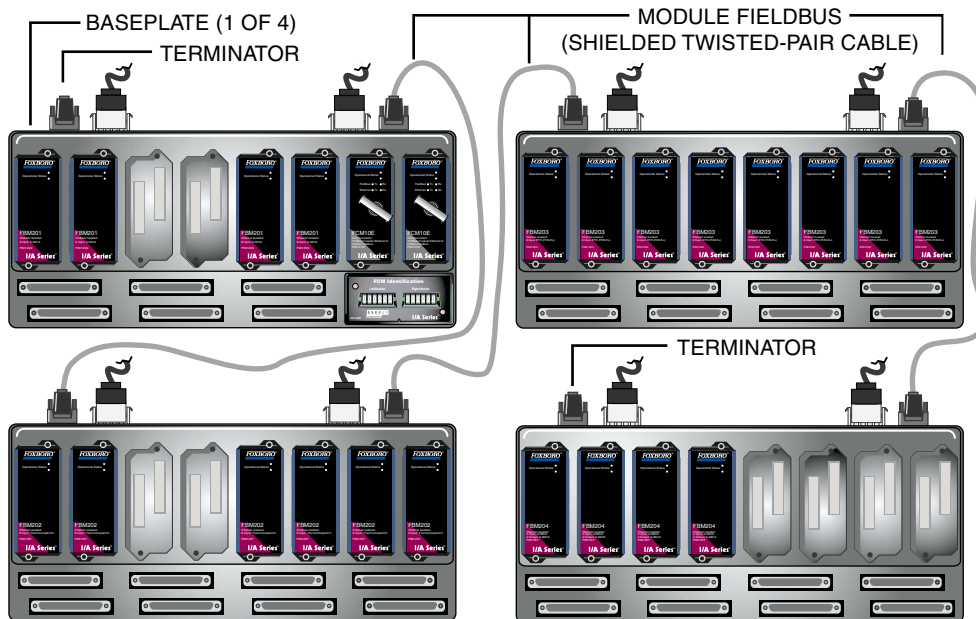
A grouping of up to four baseplates per FCM (pair) can be connected together, for mounting of up to 32 modules (30 FBMs and 2 FCMs). Multiple groups of baseplates can be connected to the Ethernet trunk Fieldbus, either directly (via Ethernet connectors) or through one or more multiport fiber optic converters (hubs). (Refer to PSS 21H-2W1 B3 for information on the various DIN rail mounted FBM subsystem communication topologies). Module Fieldbus interconnection between baseplates is made by shielded twisted-pair cable for local configurations and/or by fiber optic cable for remote configurations.

Using fiber optic topologies (refer to PSS 21H-2W1 B3), baseplates can be separated up to 10 km (6.2 mi).

Figure 1 shows baseplate implementation using only shielded twisted-pair cable connections. This configuration is used when the four (maximum) baseplates are mounted in the same general location. Using shielded twisted-pair cable, the baseplates can be interconnected up to 60 m (196 ft) total cable distance. Shielded twisted-pair cables are available in lengths of 0.25 m (10 in), 1 m (3.3 ft), 3 m (9.9 ft), 5 m (16.5 ft), 10 m (33 ft), 20 m (66 ft), 30 m (99 ft) and 60 m (198 ft), allowing placement of the baseplates (up to four in a group) in one or more enclosures.

Figure 2 shows how baseplate implementation can be extended using fiber optic cabling. In this configuration, up to three module Fieldbus segments can be fiber optic, allowing the baseplates to be dispersed over a wider area. The FCM2Fs provide three different fiber optic cabling distances between baseplates: 2 km (1.24 mi), 4 km (2.48 mi), or 10 km (6.2 mi). Refer to PSS 21H-2Y3 B3 for additional information on baseplate implementation using this configuration.

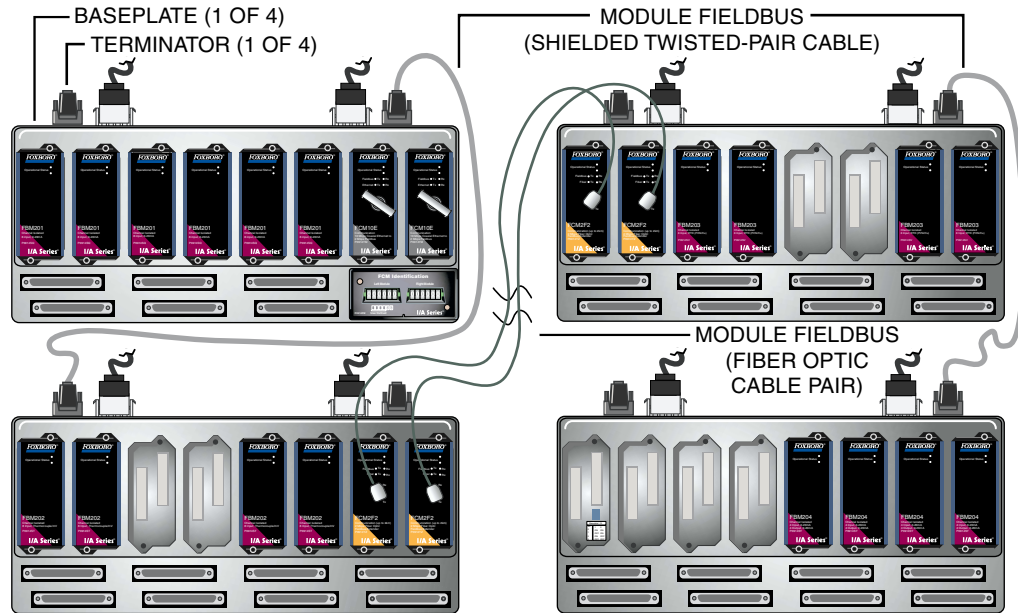
Figure 3 shows the key elements of a typical baseplate.



NOTES:

1. MAXIMUM BASEPLATE QUANTITY IS FOUR, PER CABLE DROP.
2. MAXIMUM TOTAL CABLE RUN OF ALL MODULE FIELDBUS CABLES IS 60 m (198 ft).

Figure 1. Baseplate Connections (Example) Using Shielded Twisted-Pair Cabling



NOTES:

1. MAXIMUM BASEPLATE QUANTITY IS FOUR.
2. THE FIBER OPTIC EXTENSION CAN BE BETWEEN ANY TWO BASEPLATES, WITH UP TO THREE EXTENSIONS PER BASEPLATE GROUPING.
3. FOR MAXIMUM FIBER OPTIC CABLING DISTANCES, REFER TO PSS 21H-2W1 B3.

Figure 2. Baseplate Connections (Example) Using Shielded Twisted-Pair and Fiber Optic Cabling

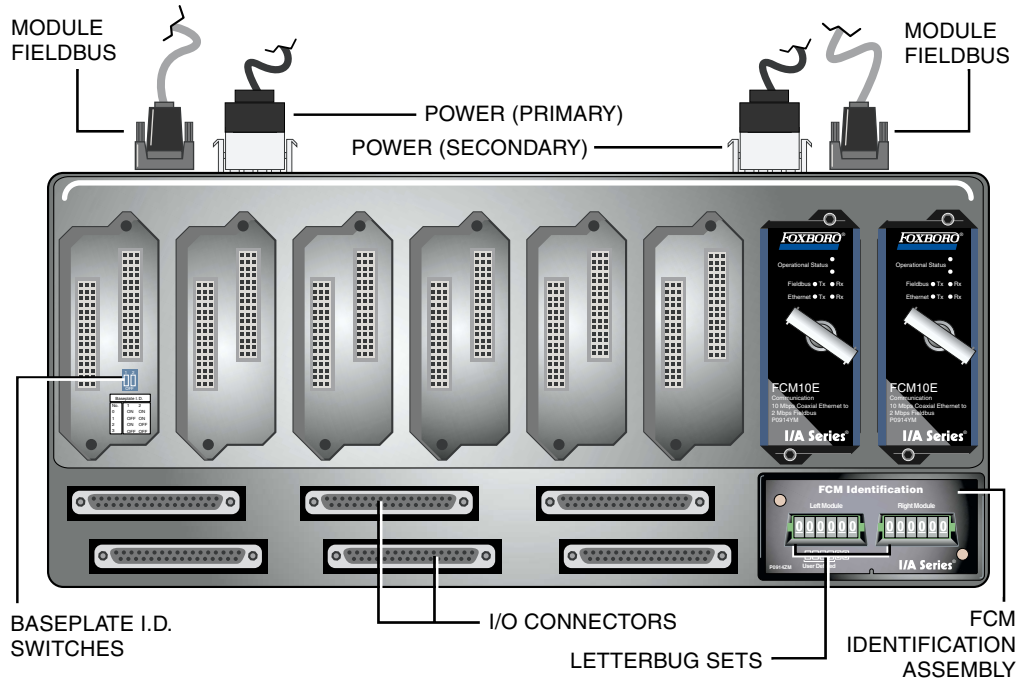


Figure 3. Baseplate Details

MODULE IDENTIFICATION

Baseplate-mounted FBMs and FCMs (FCM10E or FCM10Ef) are identified to the system software by means of a unique, 6-character string called a “letterbug”. The letterbug string for a particular FBM or FCM (FCM10E or FCM10Ef) is established from three factors:

- Setting of physical letterbug set(s) for the FCM(s) on the first baseplate in the group of up to four.
- The number of the baseplate (0-3) in the group of up to four, as set by means of the pair of baseplate I.D. switches on each baseplate (see Figure 3).
- The physical position (1-8) of the module on the baseplate.

Figure 4 shows examples of how the FBMs and FCMs assume unique letterbug addresses in accordance with these three factors. As shown in this figure, physical letterbug sets are user-installed for the FCMs (up to two) on the first baseplate of the

grouping. The first four characters in these letterbug sets are user-assigned, and are unique for all modules in the baseplate grouping. The fifth character reflects the setting of the baseplate I.D. switches (0 for the first baseplate), and the sixth character reflects the position (theoretically 0 for FCMs) on the baseplate. (Note the last two characters in the FCM letterbug set(s) are always zero, and that both letterbug sets for a redundant FCM pair must be identical.)

The letterbugs for all FBMs mounted in the baseplate grouping are not physically installed, but are derived (and reported to system software) from the three factors mentioned previously. Accordingly, each FBM in the baseplate grouping has the same unique first four characters (user-assigned for the FCMs), each has a fifth character derived from the baseplate number (0-3), and each has a sixth character derived from the physical position (1-8) of the FBM on the baseplate.

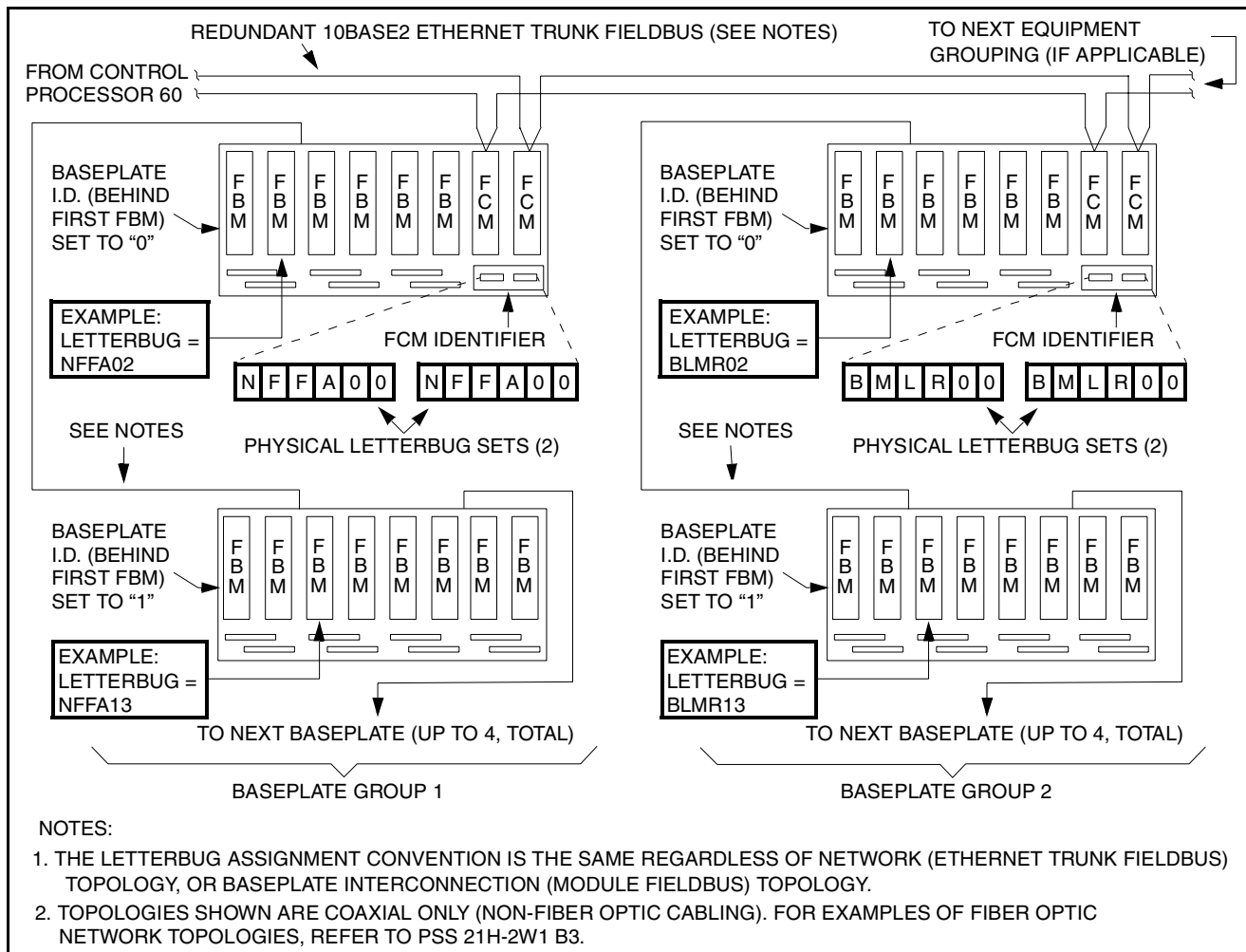


Figure 4. Examples of Baseplate Letterbug Assignments

MODULE PLACEMENT AND REMOVAL

The following rules must be observed with regard to placement of modules (FCMs or FBMs) on the baseplate. (Refer to PSS 21H-2W1 B3 for the various communication topologies used with the baseplates.)

- Non-redundant FBMs – Non-redundant FBMs can be placed in any available positions.
- Redundant FBMs – On the horizontal baseplate, redundant FBMs are placed in adjacent odd/even paired positions working from right to left. On the vertical baseplate, redundant FBMs may be placed in any adjacent odd/even paired positions.

- FCM10E or FCM10Ef – These modules are used only on the first baseplate (in a group of up to four). On the horizontal baseplate, these modules are placed in positions 7 and 8; on the vertical baseplate, the modules are placed in the first two positions (1 and 2).
If a single (non-redundant) FCM10E or FCM10Ef module is to be installed, it must be installed in position 7 on the horizontal baseplate, or position 1 on the vertical baseplate. [The slot next to it (to the right of it) must remain empty.]
- FCM2F2/4/10 – These modules are placed in the first one or two positions, or the last one or two positions on the baseplate. If a single (nonredundant) FCM2F2/4/10 module is installed, the slot next to it (position 2 and/or position 8) may be used for FBM installation.

FCMs and FBMs can be easily removed/replaced from the baseplate without removing field device termination cabling, power, or communications cabling.

FUNCTIONAL SPECIFICATIONS

Process I/O Communications

NUMBER OF BASEPLATES

Up to 4 per Ethernet trunk cable drop, or up to 4 per drop from a multiport fiber optic converter (hub)

MODULE FIELDBUS SHIELDED TWISTED-PAIR CABLING

Cable Lengths

0.25 m (10 in), 1 m (3.3 ft), 3 m (9.9 ft), 5 m (16.5 ft), 10 m (33 ft), 20 m (66 ft), 30 m (99 ft) and 60 m (198 ft)

Overall Module Fieldbus Cable Length

60 m (198 ft) total allowable cable length

MODULE FIELDBUS FIBER OPTIC CABLING

Implementation

Requires use of FCM2Fs (see PSS 21H-2Y3 B3)

Distance

2 km (1.24 miles), 4 km (2.28 miles), or 10 km (6.2 miles) per fiber optic cable run depending on module selected.

Total Distance

Total fiber optic cable run in a configuration using a series of fiber optic runs cannot exceed 10 km (6.2 miles).

Power Requirements

INPUT VOLTAGE RANGE (REDUNDANT)

24 V dc +15%, -10%

Regulatory Compliance

ELECTROMAGNETIC COMPATIBILITY (EMC)

European EMC Directive 89/336/EEC

EN 50081-2 Emission standard

EN 50082-2 Immunity standard

IEC 61000-4-2 ESD Immunity

Contact 4 kV, air 8 kV

IEC 61000-4-3 Radiated Field Immunity

10 V/m at 80 to 1000 MHz

IEC 61000-4-4 Electrical Fast Transient/burst Immunity

2 kV

Regulatory Compliance (Cont.)

ELECTROMAGNETIC COMPATIBILITY (EMC) (CONT.)

IEC 61000-4-5 Surge Immunity
2 kV

IEC 61000-4-6 Immunity to Conducted Disturbances
10 V

IEC 61000-4-8 Power Frequency Magnetic Field Immunity
30 A/m

IEC 61000-4-11 Voltage Dips, Short Interruptions and Voltage Variations Immunity

IEC 364-1 Insulation coordination for equipment within low-voltage systems, overvoltage category 1

PRODUCT SAFETY

European Low Voltage Directive 73/23/EEC

PRODUCT CERTIFICATION

Underwriters Laboratories (US and Canadian Certification)

UL/UL-C listed as suitable for use in Class I, Groups A-D, Division 2, temperature code T4 enclosure based systems. Conditions of use are as specified in the *DIN Rail Mounted FBM Subsystem User's Guide* (B0400FA).

CENELEC (DEMKO)

CENELEC certified EEx nA IIC T4 for use in CENELEC certified Zone 2 enclosure based systems. Conditions of use are as specified in the *DIN Rail Mounted FBM Subsystem User's Guide* (B0400FA).

EUROPEAN UNION COMPLIANCE

Meets all applicable European Union directives including the Explosive Atmospheres (ATEX) directive 94/9/EC, and bears the CE mark.

NOTE

CE compliance requires the use of a metal enclosure and Foxboro's power distribution unit.

ENVIRONMENTAL SPECIFICATIONS(a)

Operating

TEMPERATURE

-20 to +70°C (-4 to +158°F)

RELATIVE HUMIDITY

5 to 95% (noncondensing)

ALTITUDE

-300 to +3,000 m (-1,000 to +10,000 ft)

Storage

TEMPERATURE

-40 to +70°C (-40 to +158°F)

RELATIVE HUMIDITY

5 to 95% (noncondensing)

ALTITUDE

-300 to +12,000 m (-1,000 to +40,000 ft)

Contamination (Non-Enclosure Mounted)

Class G3 (Harsh) as defined in ISA Standard S71.04

Contamination (Enclosure Mounted)

Class G3 (Harsh) as defined in ISA Standard S71.04.

Pollution degree 2 as defined in IEC 664-1.

(a) The environmental limits of the baseplate may be enhanced by the type of enclosure containing the baseplate. [Refer to the applicable Product Specification Sheet (PSS) which describes the specific type of enclosure that is to be used.]

PHYSICAL SPECIFICATIONS

Mounting

DIN RAIL

Baseplate mounts on a non-isolated, mechanically supported horizontal or vertical DIN rail, which can be internal to, or external to an enclosure. The baseplate attaches to the DIN rail by means of two fasteners.

RACK MOUNT

A mounting kit (P0930AY) is available for horizontal mounting of the baseplate in a standard, 483 mm (19-inch) rack. This kit provides a 25.4 mm (1 inch) mounting depth.

Construction

MATERIAL

ABS, inflammability UL94 V0

DIN RAIL FASTENER

Chromated Steel, 2 per baseplate

Color

Black

Mass (Without Modules)

0.91 kg (2.0 lb)

Rack Mounting Bracket

Material: Steel, Cold-Rolled, 0.0598 mm (16 Gauge)

DIMENSIONS – NOMINAL

VERTICAL BASEPLATE

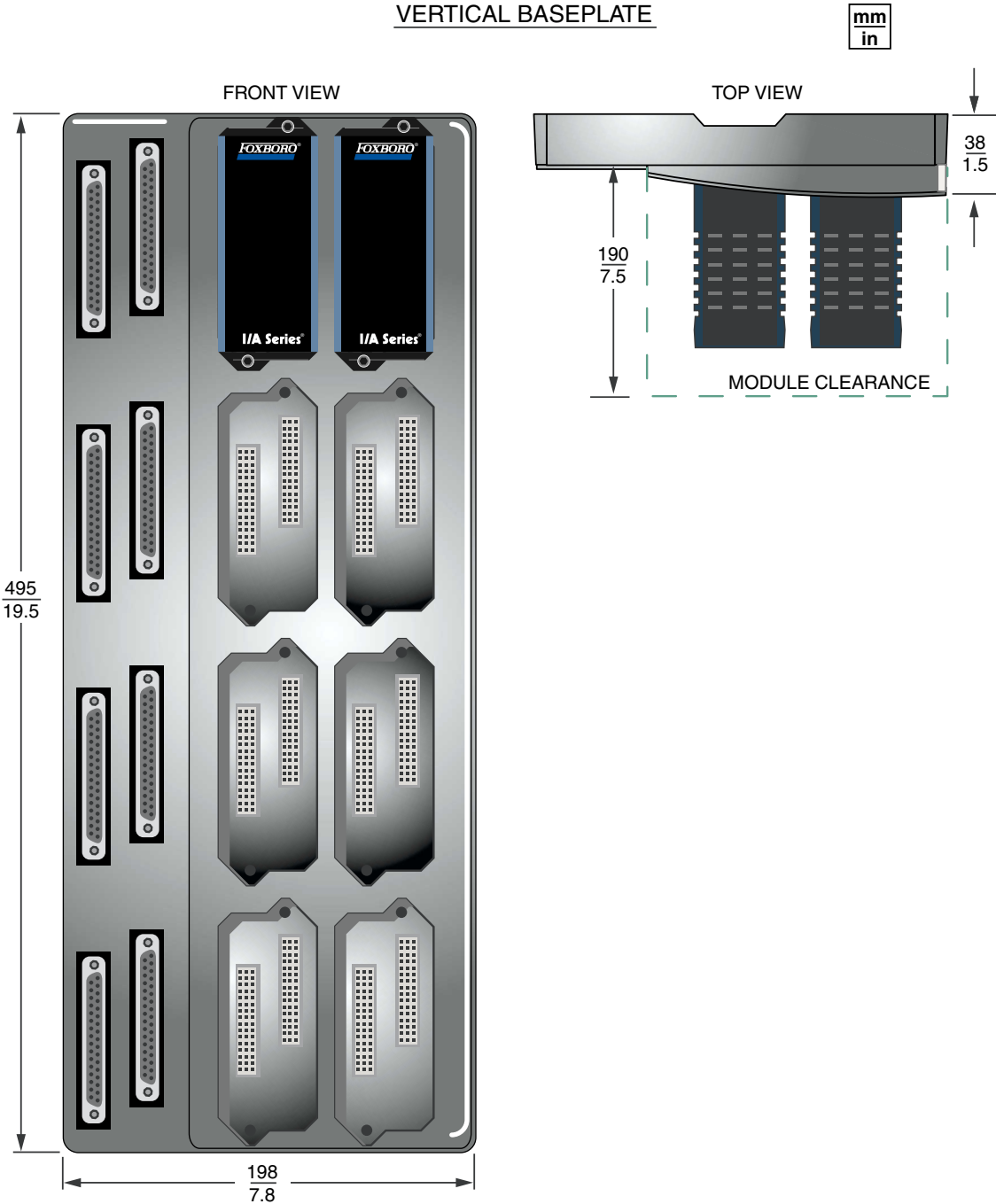


Figure 5. Baseplate Dimensions for Vertical DIN Rail Mounting

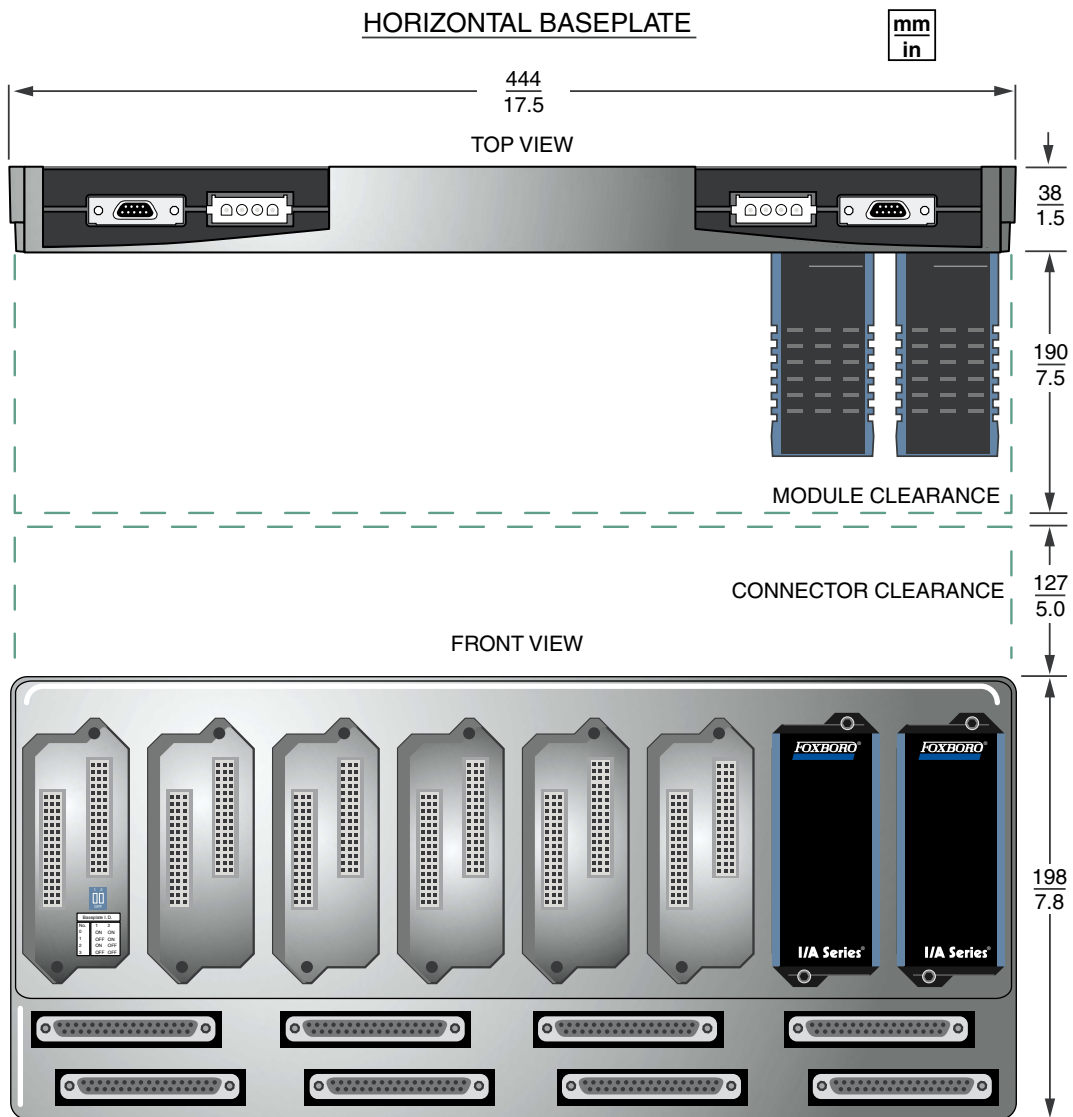


Figure 6. Baseplate Dimensions for Horizontal DIN Rail Mounting

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