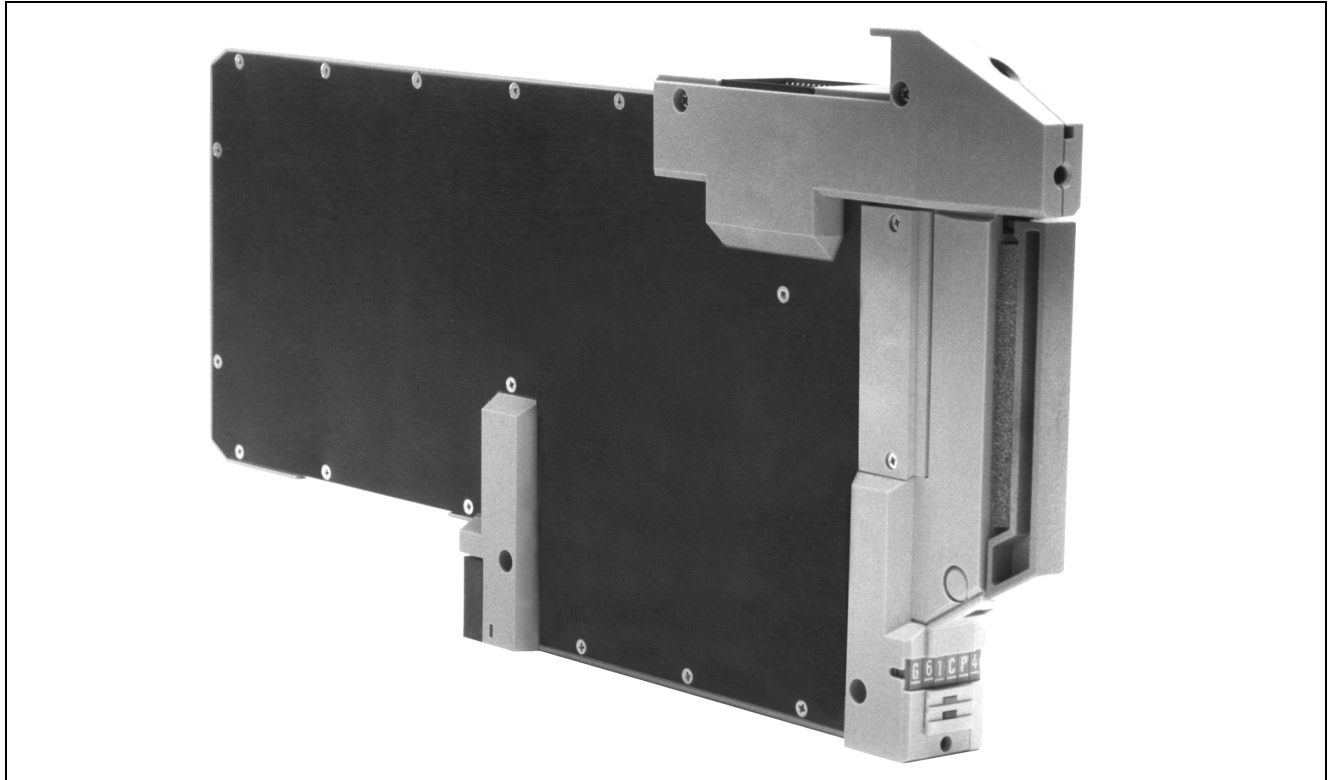


I/A Series® Hardware

Control Processor 60



The Control Processor 60 is an optionally fault-tolerant station that performs regulatory, logic, timing, and sequential control together with connected Fieldbus Modules (FBMs). It also performs data acquisition (via the Fieldbus Modules) and alarm detection and notification.

The Control Processor 60 supports two basic types of FBMs, those included in the DIN rail mounted FBM subsystem (FBM201, FBM202, and so forth), and Y-Module form factor FBMs (FBM01, FBM02, and so forth). The CP60 also supports communication with the Hydrostatic Interface Unit (HIU), Mass Flowmeter, Panel Display Stations, Cluster I/O Migration, SPECTRUM Migration, and Competitor Migration DCS Fieldbus Modules. For details, see “Devices Supported” on page 2.

The Control Processor 60 communicates with all associated devices via a 10 Mbps Ethernet trunk Fieldbus. The interface between the devices (FBMs) and the 10 Mbps Ethernet trunk Fieldbus is via Fieldbus Communications Modules (FCM10E or FCM10Ef modules) and/or DIN Fieldbus Converter Modules (DCM10E or DCM10Ef) or Fieldbus Isolators (FBI10E modules).

The non-fault-tolerant version of the Control Processor 60 is a single-width processor module. The fault-tolerant version consists of two single-width processor modules.

Enhanced Reliability

The fault-tolerant Control Processor 60 configuration consists of two modules operating in parallel, with two separate connections to the I/A Series® Nodebus and the Ethernet trunk Fieldbus.

The two control processor modules, married together as a fault-tolerant pair, are designed to provide continued operation of the unit in the event of virtually any hardware failure occurring within one module of the pair. Both modules receive and process information simultaneously, and faults are detected by the modules themselves. One of the significant methods of fault detection is comparison of communication messages at the module external interfaces. Upon detection of a fault, self-diagnostics are run by both modules to determine which module is defective. The non-defective module then assumes control without affecting normal system operations.

To further ensure reliable communications, the fault-tolerant control processor performs error detection and address verification tests in its Nodebus and Fieldbus interfaces.

For enhanced reliability during maintenance operations, the Control Processor 60 is equipped with a recessed reset button, located at the front of the module. This feature allows you to manually force a module power off and on (rebooting) without removing the module from the enclosure.

Diagnostics

The Control Processor 60 uses three types of diagnostic tests to detect and/or isolate faults:

- Power-up self-checks
- Run-time and watchdog timer checks
- Off-line diagnostics.

Power-up self-checks are self-initiated when power is applied to the control processor. These checks perform sequential tests on the various control processor functional elements. Red and green indicators at the front of the control processor module reflect the successful (or unsuccessful) completion of the various phases of the control processor startup sequence.

The run-time and watchdog timer checks provide continuous monitoring of control processor functions during normal system operations. The operator is informed of a malfunction by means of printed or displayed system messages.

Off-line diagnostics can be temporarily used for performing comprehensive tests and checks on various control process functions and devices. Using the off-line diagnostics via System Management, a

suspected fault in the control processor can be isolated and/or confirmed.

Devices Supported

The following devices are supported by the Control Processor 60.

- All DIN rail mounted subsystem FBMs (FBM201, FBM202, and so forth)
- All Y-Module form factor FBMs (FBM01, FBM02, and so forth)
- Foxboro Hydrostatic Interface Unit (HIU)
- Foxboro Mass Flowmeter
- Foxboro Panel Display Stations
- Cluster I/O using FBP10 Migration Integrator
- DCS Fieldbus Modules for Honeywell® TDC 2000 Systems (H2Mxx series of FBMs)
- DCS Fieldbus Modules for Honeywell® TDC 3000 Systems (H3Mxx series of FBMs)
- DCS Fieldbus Modules for the Bailey NET90® and INFI90® Systems
- DCS Fieldbus Modules for the Fisher PROVOX® Controller Series, Series 10 and Series 20 Systems
- DCS Fieldbus Modules for Westinghouse® Process Control WDPF® Systems
- SPECTRUM Migration Integrators (FBP11, FBP12, FBP13 and FBP14)
- SPEC 200™ Control Integrator FBMs
- SPEC 200 MICRO™ Control Integrator FBMs
- SPEC 200 CCM Control Integrator FBMs

The Foxboro Gas Chromatograph is not supported.

Fieldbus Modules

Fieldbus Modules (FBMs) provide the necessary conversion of digital I/O, analog I/O, and Intelligent Transmitter signals, allowing the corresponding signal values to be communicated to the control processor. A wide range of FBMs is available to perform the various types of signal conversion necessary to interface the control processor with field sensors and actuators.

For further information on FBMs and other supported devices, refer to the FBM specific Product Specification Sheets.

Fieldbus Flexibility

The Control Processor 60 is used in two basic network configurations, which provide broad flexibility in I/O subsystem implementation:

- Direct Network Configuration (Figure 1) – In this configuration, a direct connection is made between the control processor and the FCM(s) and/or DCM10E or FBI10E modules, with the possible option of a fiber optic extension.

- Active Star Network Configuration (Figure 2) – In this configuration, a multiport fiber optic converter (hub) further extends the overall Fieldbus distance, while adding application versatility and security.

Either configuration supports up to 120 Fieldbus Modules. (For configuration purposes, the HIUs, Mass Flowmeters and Panel Display Stations count as FBMs.) For maximum cabling distances, refer to the “Functional Specifications” at the end of this PSS.

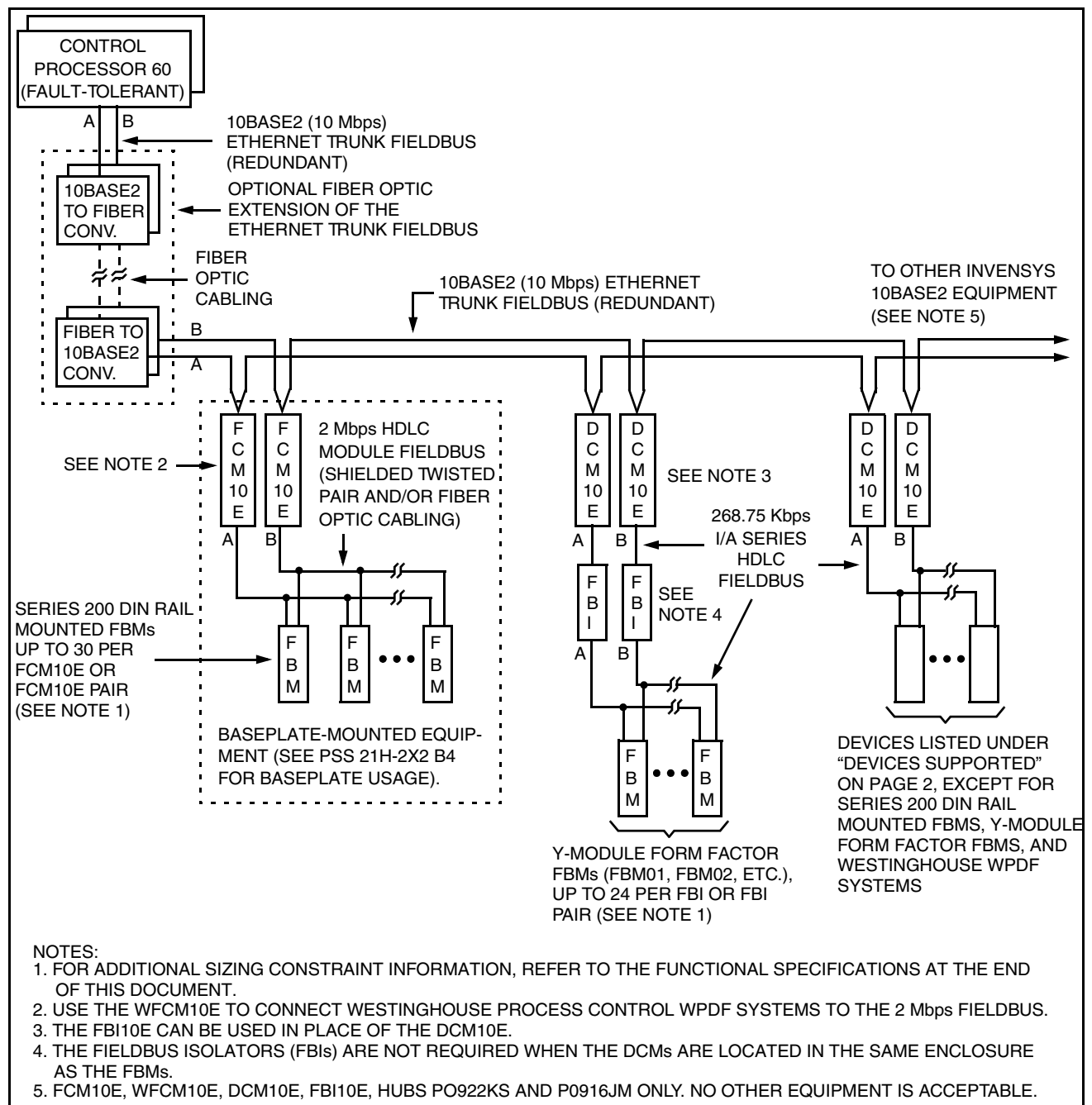


Figure 1. Typical Direct Network Configuration

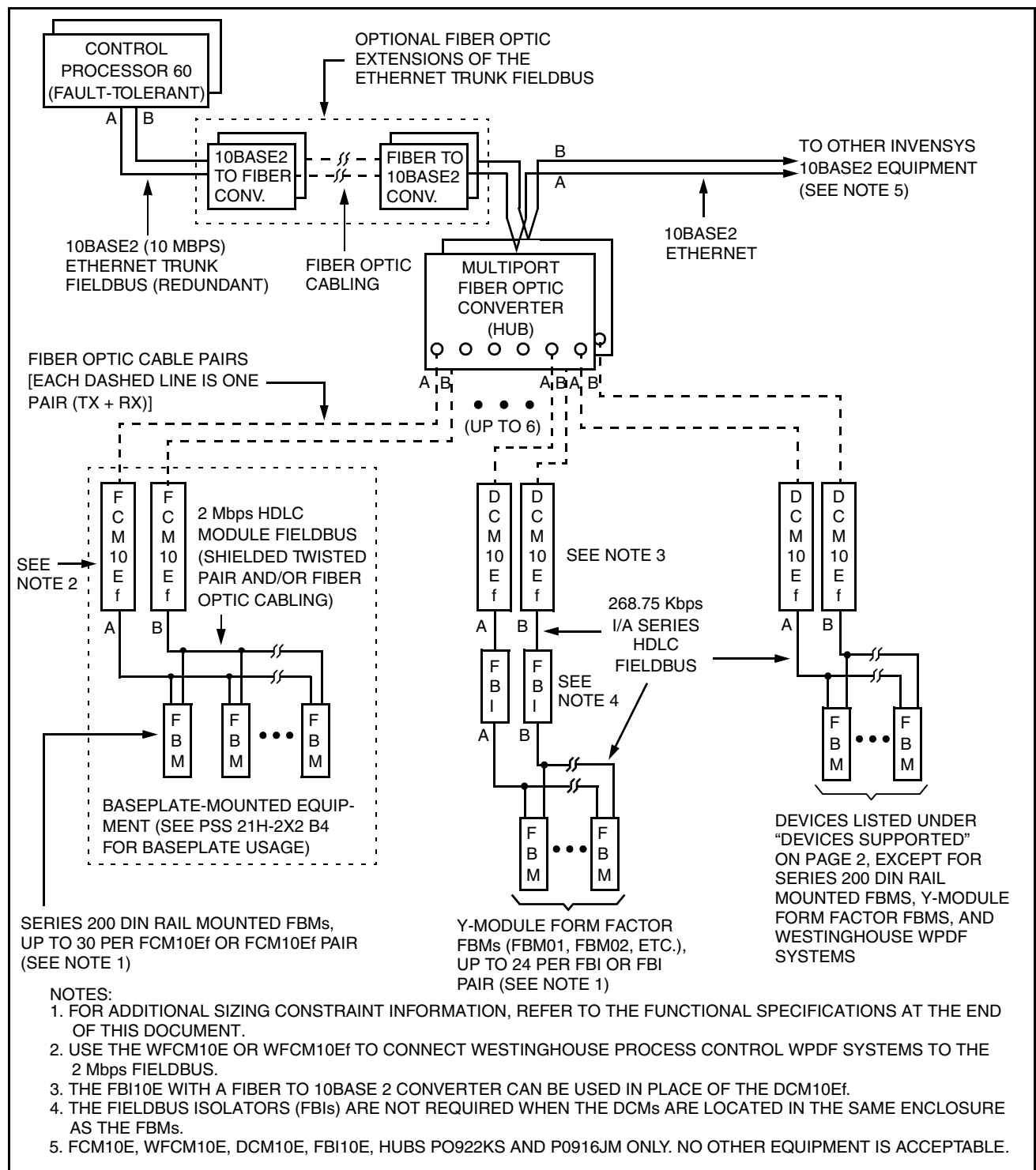


Figure 2. Typical Active Star Network Configuration

FUNCTIONAL SPECIFICATIONS

Processor Type

CONTROL PROCESSOR

Microprocessor-based AMD 486 DX5 (running at 133 MHz) with stored programs, using high-speed communication capability.

NODEBUS PROCESSOR

82596CA LAN Coprocessor

FIELDBUS PROCESSOR

AMD 386 Ethernet Processor

Memory

SIZE

8 MB storage

ERROR DETECTION

ECC providing single-bit error detection and correction.

Process I/O Communications (with FBMs)

ETHERNET TRUNK FIELDBUS

Type

10Base2

Transmission Rate

10 Mbps

MODULE FIELDBUS, VIA FCM

Type

HDLC, EIA RS-485

Transmission Rate

2 Mbps

MODULE FIELDBUS, VIA FBI10E OR DCM10E

Type

HDLC, EIA RS-485

Transmission Rate

268.75 Kbps

Cable Lengths – Ethernet Trunk Fieldbus

ETHERNET TRUNK FIELDBUS(a), 10BASE2

COAXIAL CABLING ONLY

185 m (607 ft) maximum(b)

FIBER OPTIC EXTENSION (BETWEEN BNC TO FIBER-ST CONVERTERS)

2 km (1.24 mi) maximum, each extension(b)

MAXIMUM ETHERNET TRUNK SEGMENTS

Three 10Base2, joined by two fiber optic extensions

FIBER DISTANCE FROM HUB TO FCM10Ef,

DCM10Ef, OR FIBER CONVERTER FOR FBI10E

2 km (1.24 mi) maximum(b)

Cable Lengths – Module Fieldbus

DIN RAIL MOUNTED FBMS

Refer to PSS 21H-2W1 B3

Y-MODULE FORM FACTOR FBMS

10 m (30 ft)

Cable Lengths – Combined

CONTROL PROCESSOR 60 TO FURTHEST FBM (USING COMBINED COAXIAL AND FIBER OPTIC CABLING)

20 km (12.4 mi)

Process I/O Capacity

FIELDBUS MODULES(c)

- 120 FBMs maximum per Control Processor 60, depending on selected scan periods.(d)
- 30 FBMs maximum per FCM10E or FCM10Ef module or redundant module pair
- 36 FBMs maximum per WFCM10E or WFCM10Ef module or redundant module pair
- 24 FBMs maximum per FBI10E or FBI module, or redundant module pair

FCM/DCM/WFCM/FBI MODULES

30 (maximum total) FCM10E, FCM10Ef, DCM10E, DCM10Ef, WFCM10E, WFCM10Ef, or FBI10E modules, all of one kind or in any combination, per Ethernet trunk Fieldbus

Maximum Blocks Configured

The maximum number of blocks that can be configured for use with the CP60 (or redundant CP60 pair) is 4000. (The number of blocks used depends on scan periods and block type selection.) The blocks in question include all types (control blocks, ECBs, compounds, data blocks, and so forth).

Power Requirements

INPUT VOLTAGE (REDUNDANT VOLTAGE)

39 V dc typical

CONSUMPTION (SINGLE MODULE)

15 W, maximum

Indicators

Red and green light-emitting diodes (LEDs) indicate operational status.

Internal Diagnostics

Self-checking performed at power-up. Run-time checks and the watchdog timer function performed during operation.

(a) The Ethernet trunk Fieldbus connects between the Control Processor 60 and the FCMs and/or DCM10E or FBI10E modules in the Direct Network Configuration (Figure 1), and between the Control Processor 60 and the hub(s) in the Active Star configuration (Figure 2).

(b) In any specific application, individual maximum cable lengths may be affected by (limited by) the overall maximum allowable cable length (20 km) between the Control Processor 60 and the farthest FBM.

(c) For configuration purposes, HIUs, Mass Flowmeters, Panel Display Stations, etc. are counted as FBMs.

(d) Refer to *Control Processor 60 (CP60) Sizing Guidelines and Excel Workbook* (B0400BK).

ENVIRONMENTAL SPECIFICATIONS(a)

Operating	Storage
TEMPERATURE	TEMPERATURE
0 to 60° C (32 to 140° F)	-40 to +70° C (-40 to +158° F)
RELATIVE HUMIDITY	RELATIVE HUMIDLY
5 to 95% (noncondensing)	5 to 95% (noncondensing)
ALTITUDE	ALTITUDE
-300 to +3,000 m (-1,000 to +10,000 ft)	-300 to +12,000 m (-1,000 to +40,000 ft)

(a) The environmental ranges can be extended by the type of enclosure containing the module. [Refer to the applicable Product Specification Sheet (PSS) which describes the specific enclosure that is to be used.]

PHYSICAL SPECIFICATIONS

Configuration	Mounting
Single-width processor module. The fault-tolerant version consists of two single-width processor modules, with an interconnecting fault-tolerant connector.	May be placed in any of the following I/A Series mounting structures: – 1x8 Mounting Structure – Industrial Enclosures, Structural Foam or Metal – Field Enclosure, Structural Foam or Metal In the fault-tolerant version, the two modules must be mounted in adjacent mounting structure slots to allow for installation of the interconnecting fault-tolerant connector.
Mass (Maximum)	
1.7 kg (3.75 lb) for a single, non-fault-tolerant module.	

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