Foxboro CP40B

Official Technical Reference Excerpt

Foxboro CP40B combines Style B hardware with high block-processing performance, expanded memory and optional fault-tolerant operation.

VERIFIED PRODUCT ROLE

Characteristic 1

Provides a single CP40B or matched CP40B fault-tolerant pair for its control processor 40 style b function.

Characteristic 2

Handles high-capacity process control and I/O coordination through the documented Foxboro system path.

Characteristic 3

Works with the Style B enclosure and its controlled network and Fieldbus interfaces.

Characteristic 4

Front indicators report processor startup status and support diagnostic interpretation.

MANUFACTURER DOCUMENT

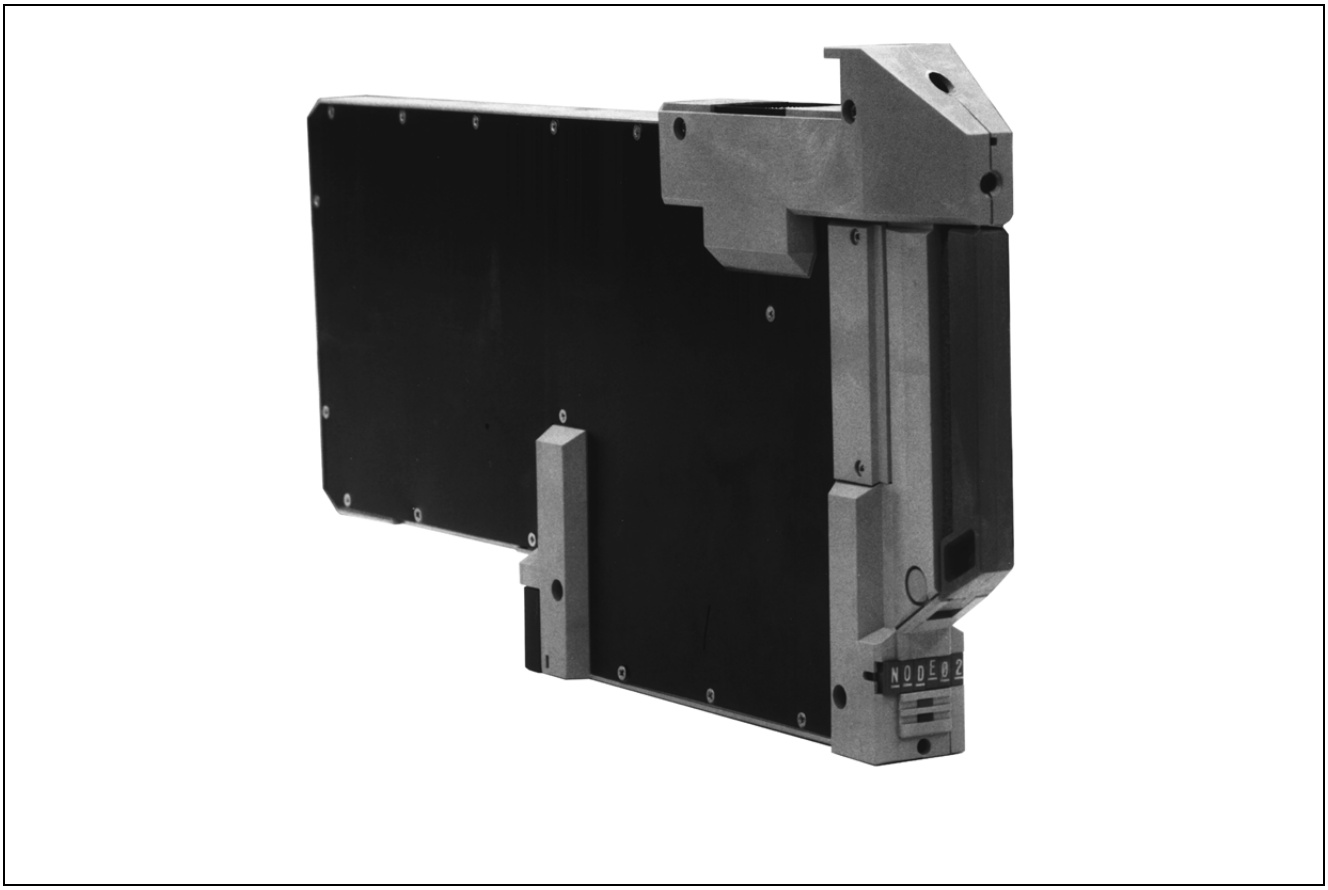
Manufacturer source	Invensys, I/A Series Hardware Control Processor 40 Style B, PSS 21H-1B5 B3.
Evidence boundary	Technical statements are limited to the identified product or applicable manufacturer family.
Selection control	Use the complete ordering string and verify the installed system before purchase or installation.

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FOXBORO®

PSS 21H-1B5 B3

I/A Series® Hardware
Control Processor 40, Style B



The Control Processor 40, Style B (CP40B) is a high-end optionally fault-tolerant station in the Control Processor family (CP30B, CP40B, CP50) that has:

- a large memory capacity to support a great number of blocks
- a fast processor for increased block processing

With high performance, the CP40B is both economical and in line with today's advancing technology. Other members of the CP family are easily upgraded to CP40B capabilities.

The Control Processor 40, Style B performs regulatory, logic, timing, and sequential control together with connected:

- Fieldbus Modules (FBMs)
- Fieldbus Cluster I/O Cards (FBCs)
- SPECTRUM Migration Integrator I/O
- SPEC 200 Migration Integrator I/O
- SPEC 200 MICRO Migration Integrator I/O

It also performs data acquisition (via the Fieldbus Modules), alarm detection and notification, and may optionally serve as an interface for one or more Panel Display Stations.

The non-fault-tolerant version of the Control Processor 40, Style B is a single-width processor module. The fault-tolerant version consists of two single-width processor modules, both of type CP40B.

Enhanced Reliability

The Control Processor 40, Style B offers optional fault-tolerance for enhanced reliability. The fault-tolerant control processor configuration consists of two modules operating in parallel with two separate connections to the Nodebus and to the 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 40, Style B 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 (reboot) without removing the module from the enclosure.

Diagnostics

The Control Processor 40, Style B 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 are temporarily loaded into the system for the purpose of performing comprehensive tests and checks on various system stations and devices. Using off-line diagnostics, you can isolate and/or confirm a suspected fault in the control processor.

Fieldbus Modules

Fieldbus Modules provide connection of digital I/O, analog I/O, and Intelligent Transmitters to control processors. There are two types of Fieldbus Modules: main and expansion. Some main modules can be expanded using an expansion module.

A wide range of Fieldbus Modules is available to perform the signal conversion necessary to interface the control processor with field sensors and actuators. For further information on the Fieldbus Modules, refer to the Fieldbus Modules Product Specification Sheet (PSS).

Fieldbus Flexibility

The Control Processor 40, Style B is used in three different Fieldbus configurations, which provide broad flexibility in Fieldbus implementation:

- Local Fieldbus (Figure 1) - Used only within the enclosure, the local bus can extend up to 10 m (30 ft). Up to 24 Fieldbus Modules (excluding expansion modules) attach directly to the local bus, which is redundant.

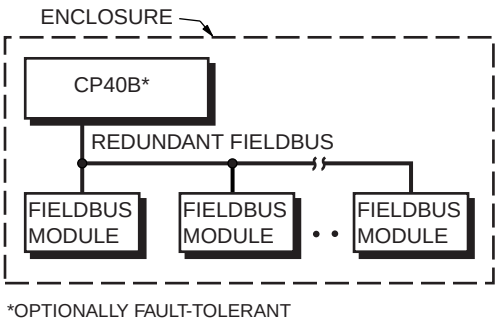


Figure 1. Local Fieldbus (Typical Configuration)

SPEC 200 MICRO Control Interfacing

For migration of SPEC 200 MICRO control to I/A Series systems, the Control Processor 40, Style B interfaces via a single or redundant I/A Series Fieldbus with the SPEC 200 MICRO Control Integrator subsystem. This subsystem consists of individual Control Integrators, and Fieldbus Isolators attached within the SPEC 200 MICRO rack (NCM or SPEC 200 2ANU).

Control is via the software resident in the Control Integrator and in the SPEC 200 MICRO I/O Equipment Control Blocks (ECBs) operating at the CP level. Figure 9 illustrates a typical configuration with multiple Control Integrators in the SPEC 200 MICRO subsystem. (Refer to SPEC 200 MICRO Control Integrators Product Specification Sheetfor additional information.)

Control Processor 40, Style B Upgrade

Upgrading a Control Processor 30, Control Processor 10, Tank Processor 10, or Display Processor 10 to a CP40B involves:

- Replacing the existing Control Processor with a CP40B
- Modifying the System Definition Utility to identify the new station as a CP40B
- Upgrading to the appropriate software license for the new station and installing the new software
- Loading existing compounds to the CP40B

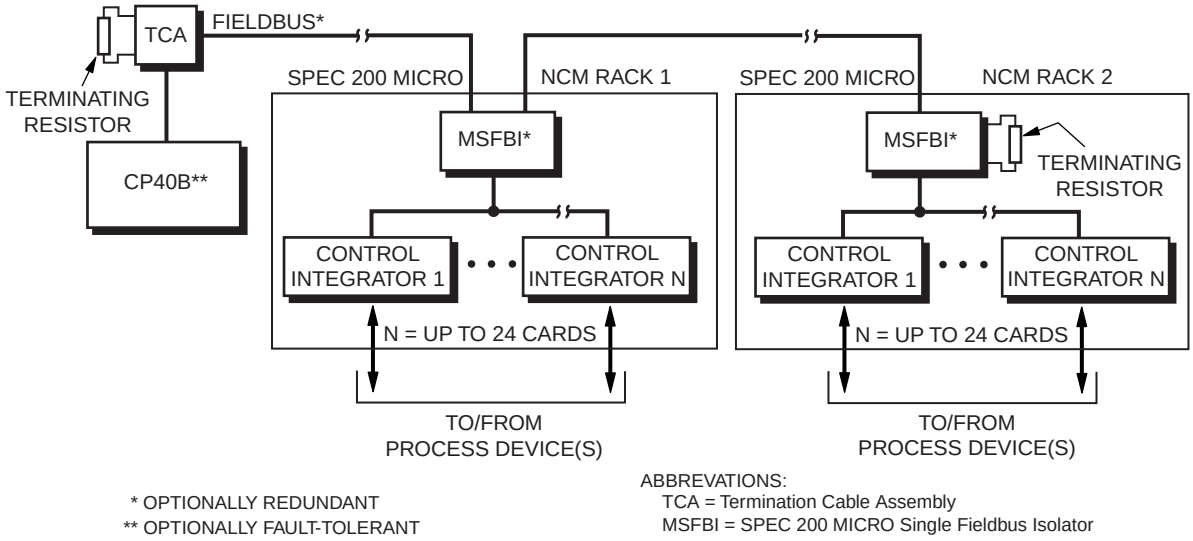


Figure 9.
Twinaxial Fieldbus SPEC 200 MICRO Control Subsystem Interface Configuration (Typical Configuration)

Related models and source control

Use these live ApterPower pages for comparison. Verify each complete ordering string independently.

RELATED PRODUCT REFERENCES

Westinghouse 5X00121G01	Technical-reference companion. Review the complete ordering string before selection.
Westinghouse 5X00300G01	Technical-reference companion. Compare the required interface and system position.
Westinghouse 5X00419G01	Technical-reference companion. Confirm the execution independently for the intended task.

EXACT-SELECTION CONTROLS

Product identity	Confirm the complete CP40B marking.
System interface	the Style B enclosure and its controlled network and Fieldbus interfaces
Technical boundary	Use CP40B only with the Style B enclosure and its controlled network and Fieldbus interfaces; verify every interface and the controlled project configuration before energizing or pressurizing the subsystem.
Source	Invensys, I/A Series Hardware Control Processor 40 Style B, PSS 21H-1B5 B3.

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