

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

FOXBORO

FCP270

FIELD CONTROL PROCESSOR MODULE

Used with the applicable Foxboro I/A Series DCS configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Schneider Electric / Foxboro official product specification

Field Control Processor 270 (FCP270)



The Field Control Processor 270 is a distributed, optionally fault-tolerant, field-mounted controller that performs process control and alarming functions according to a user-defined control strategy.

OVERVIEW

The Field Control Processor 270 (FCP270) is a distributed, optionally fault-tolerant, field-mounted controller module. The FCP270 performs regulatory, logic, timing, and sequential control together with connected Fieldbus Modules. It also performs data acquisition and alarm detection and notification. The FCP270 connects to the Foxboro Evo control network via standard fiber optic 100 Mbps Ethernet.

The fault-tolerant version of the FCP270 consists of two processor modules. These modules install in adjacent FCP270 slots in a supported FCP270 baseplate for high speed communication between the modules (see Figure 1).

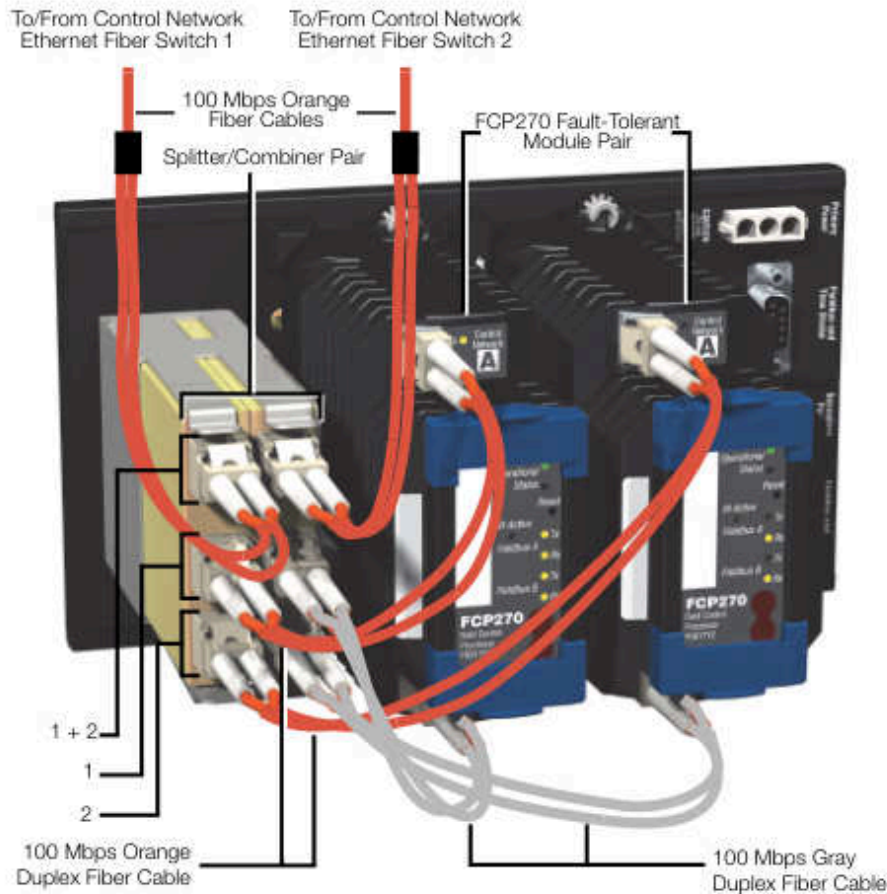


Figure 1. Fault-Tolerant FCP270 Module Pair Mounted on 2-Position Modular Baseplate

FEATURES

- ▶ Performs regulatory, logic, timing, and sequential control together with connected Fieldbus Modules (FBMs)
- ▶ Performs data acquisition and alarm detection and notification
- ▶ Supports up to 32 200 Series FBMs - referring to both Compact or standard types
- ▶ Supports up to 128 200 Series FBMs (Compact or standard) with a Fieldbus Expansion Module 100 (FEM100)
- ▶ Supports up to 64 of the 100 Series FBMs
- ▶ No Fieldbus Communication Module is required
- ▶ Connects to the Foxboro Evo control network via standard fiber optic 100 Mbps Ethernet
- ▶ Uses a rugged, die cast aluminum housing for mounting in a non-vented field enclosure
- ▶ Can operate in Class G3 harsh environments
- ▶ Is CE certified for field mounting in enclosures
- ▶ Supports both the 2 Mbps or 268 Kbps HDLC fieldbuses simultaneously with the FBI200 allowing connections to both 200 Series and 100 Series FBMs (affects the total number of each type of FBM supported)

- ▶ Supports the extension of the 268 Kbps HDLC fieldbus with the FBI100 to the 100 Series FBMs
- ▶ Offers unique, patented, fault-tolerant operation using two control modules to greatly improve reliability relative to other process controllers
- ▶ Uses versatile control algorithms and a wide variety of FBMs to provide control capabilities for a broad range of process applications
- ▶ Supports time synchronization using optional external time from GPS satellites
- ▶ Offers on-line image update of a fault-tolerant FCP270 without shutting down the process
- ▶ Uses soft letterbugs configurable via the I/A Series® system Letterbug Configurator running on a Pocket PC
- ▶ Supports self-hosting mode with I/A Series software v8.4-v8.8 or Foxboro Evo™ Control Core Services v9.0 or later.

REMOTE MOUNTING

The FCP270 flattens and simplifies the Foxboro Evo Process Automation System architecture, which only requires field enclosures plus workstations and Ethernet switches. For more information on The Foxboro Evo control network architecture, refer to PSS 21H-7C2 B3.

The field-mounted FCP270 is an integral part of the highly-distributed control network where controllers are closely aligned to specific process units mounted in close proximity to their I/O and the actual equipment being controlled. Coordination between process units takes place via a fiber optic 100 Mbps Ethernet network.

The FCP270 is packaged in a rugged, die cast aluminum housing that does not require venting due to its efficient design. The FCP270 is CE certified, and it can be mounted without expensive special cabinets to prevent electronic emissions. The FCP270 can be mounted in Class G3 harsh environments.

ENHANCED RELIABILITY (FAULT-TOLERANCE)

The unique and patented fault-tolerant operation of the FCP270 greatly improves reliability relative to other process controllers. The fault-tolerant version of the FCP270 consists of two modules operating in parallel, with two Ethernet connections to The Foxboro Evo control network. The two FCP270 modules, married as a fault-tolerant pair, provide continuous operation of the controller 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. Messages only leave the controller when both controllers agree on the message being sent (bit for bit match). 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.

This fault-tolerant solution has the following major advantages over controllers that are merely redundant:

- ▶ No bad messages are sent to the field or to applications using controller data because no message is allowed out of the controller unless both modules match bit for bit on the message being sent.
- ▶ The secondary controller is synchronized with the primary one, which ensures up to the moment data in the event of a primary controller failure.
- ▶ The secondary controller will have latent flaws detected prior to any switchover because it is performing exactly the same operations as the primary controller.

SPLITTER/COMBINER

Fault-tolerant FCP270 modules connect to a pair of fiber optic splitter/combiners (see Figure 1) that connect to Ethernet switches in the Foxboro Evo control network. For each module, the splitter/combiner pair provides separate transmit/receive fiber connections for Ethernet switch 1 and 2. Fiber cables are connected so that the splitter/combiners pass inbound traffic from either switch to both modules, and pass outbound traffic from the primary module to either switch.

The splitter/combiner pair mounts in an assembly that fastens to the FCP270 baseplates. The splitter/combiner is a passive device that uses no electrical power.

ENHANCED COMMUNICATIONS

The Foxboro Evo architecture uses The Foxboro Evo control network with 100 Mbps data communications between the FCP270s and the Ethernet switches (see Figure 2).

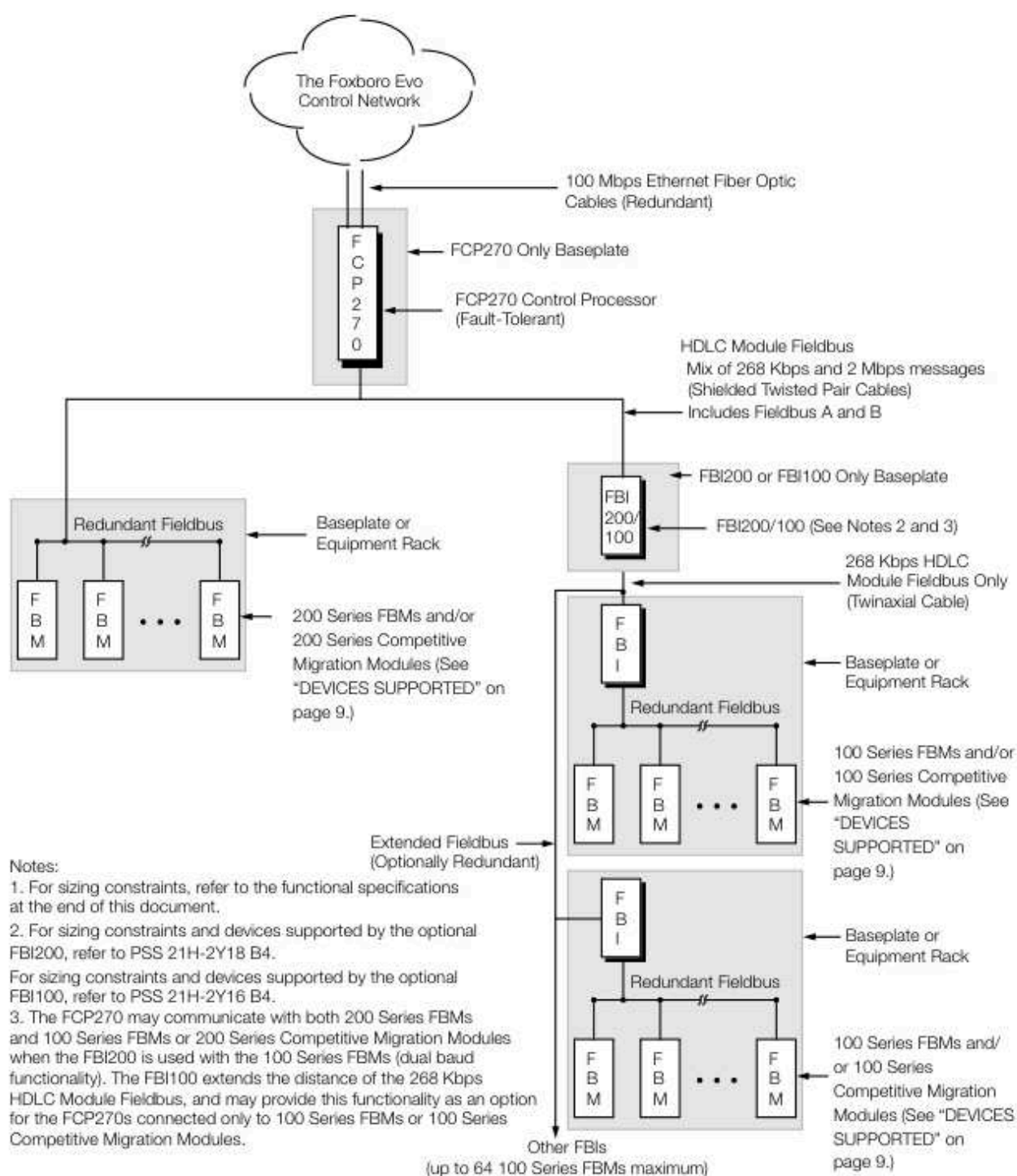


Figure 2. Typical FCP270 Network Configuration with Dual Baud Functionality (Simplified)