# Foxboro CP60 P0961FR

## 01 Control execution architecture

## A distributed control station

The CP60 executes a stored process-control application while connected FBMs translate signals from sensors and actuators. Its duties span regulation, logical decisions, timing, sequencing, data acquisition and alarm handling. The processor therefore sits above the individual channel-conversion functions of the I/O modules.

## Functional signal path

| | |
|---|---|
| **01** | An FBM acquires or drives its assigned field signal. |
| **02** | The appropriate field interface transfers data over the Ethernet trunk. |
| **03** | The processor executes the configured control, logic or sequence functions. |
| **04** | Resulting output data and alarm information are communicated to their destinations. |

## Control functions

**Regulation**
Continuous control calculations act on acquired process variables.

**Logic and timing**
Discrete conditions and timing functions coordinate process actions.

**Sequential operation**
Configured steps organize an ordered process progression.

**Alarm handling**
Detection and notification are integrated with the control application.

## Processor and channel roles

The CP60 does not replace the electrical input and output specifications of the attached FBMs. Channel ranges, field wiring and signal conversion remain properties of those modules. Processor capacity and network design determine how the distributed signals participate in the overall application.

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## 02 Memory and execution boundaries

## Core processing characteristics

| Characteristic | Value |
| --- | --- |
| Control processor clock | 133 MHz |
| Memory capacity | 8 MB |
| Memory correction | ECC; single-bit error detection and correction |
| Maximum FBM allocation | 120 per CP60; scan-period dependent |
| Maximum configured blocks | 4000; scan-period and block-type dependent |

## What is included in a capacity count

| Object | Capacity treatment |
| --- | --- |
| Control blocks | Part of the configured block population. |
| Compounds | Included in the same 4000-block ceiling. |
| ECBs | Counted alongside application and data objects. |
| Data blocks | Included rather than treated as free infrastructure. |
| Auxiliary devices | HIUs, mass flowmeters and panel display stations count as FBMs. |

## Two different reliability mechanisms

ECC memory detects and corrects single-bit errors in the stored information. Fault-tolerant pairing compares external communication behavior across two processors and identifies a defective member. These mechanisms act at different boundaries and should not be treated as interchangeable.

## Execution settings affect scale

Shorter scan periods and a different block-type mixture can change the workload even when the object count is unchanged. The maximum FBM and block figures describe upper limits, while the configured execution demand determines the practical station size.

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## 03 Process-I/O interfaces and group limits

## Communication rates

| Interface characteristic | Value |
|---|---|
| Ethernet trunk standard | 10BASE2 |
| Trunk transmission rate | 10 Mbps |
| Module Fieldbus via FCM | 2 Mbps; HDLC, EIA RS-485 |
| Module Fieldbus via FBI10E/DCM10E | 268.75 kbps; HDLC, EIA RS-485 |

## I/O allocation rules

| Allocation | Maximum |
|---|---|
| FCM10E/FCM10Ef group limit | 30 FBMs per interface or redundant pair |
| FBI group limit | 24 FBMs per interface or redundant pair |
| Trunk interface-module limit | 30 FCM/DCM/WFCM/FBI modules in total |
| WFCM10E/WFCM10Ef group limit | 36 FBMs per interface or redundant pair |

## Count the correct population

An FBM count and a trunk-interface count describe different equipment. Thirty FBMs behind an FCM group do not mean thirty interfaces on the trunk. Conversely, adding interface hardware does not remove the processor-wide FBM or application limits.

## Architectural distinctions

**DIN-rail subsystem**
An FCM provides the local 2 Mbps communication path.

**Y-Module subsystem**
The FBI/DCM arrangement uses the lower-rate module Fieldbus.

**Single station**
One processor runs a non-fault-tolerant control station.

**Paired station**
Two processors support one fault-tolerant application.

## Retain interface-specific limits

Use the allowance for the actual FCM, WFCM or FBI arrangement. The different group maxima cannot be substituted for one another merely because the devices ultimately share a CP60 trunk.

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## 04 Distance and electrical specifications

## Communication distance limits

| Path characteristic | Limit |
| --- | --- |
| 10BASE2 coaxial segment limit | 185 m |
| Optical extension limit | 2 km per extension |
| Coaxial trunk segment arrangement | Up to 3 segments joined by 2 optical extensions |
| CP60-to-farthest-FBM path limit | 20 km combined coaxial and optical path |
| Y-Module Fieldbus cable limit | 10 m |

## Supply and operating conditions

| Condition | Rating |
| --- | --- |
| Typical input voltage | 39 V DC |
| Maximum power per module | 15 W |
| Operating temperature | 0 to +60 °C |
| Operating humidity | 5–95% RH, noncondensing |
| Operating altitude | -300 to +3000 m |
| Storage temperature | -40 to +70 °C |

## Combined-distance example

Three 185 m coaxial segments and two 2 km optical extensions total 4.555 km by arithmetic. This example illustrates path accounting only: actual converter placement, topology and local module-Fieldbus sections must also satisfy their own limits.

## Power accounting

A fault-tolerant pair contributes a calculated maximum of 30 W from the two 15 W processors. The complete installation must also account for its field interfaces, FBMs and other powered equipment; this processor subtotal is not a complete cabinet power rating.

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## 05 Availability and diagnostic interpretation

## Mechanism and engineering meaning

| Mechanism | Meaning |
| --- | --- |
| Parallel processing | Both processors receive and process the station information. |
| Message comparison | External-interface communication is checked for disagreement. |
| Fault isolation | Self-diagnostics identify the defective member after a detected fault. |
| Continued control | The non-defective processor assumes the control responsibility. |
| Error checks | Nodebus and Fieldbus interfaces perform error detection and address verification. |
| Watchdog and runtime tests | Processor health remains under supervision during operation. |

## Availability is not a larger application

Redundancy protects station operation against a processor failure. The paired architecture retains the same control application and capacity constraints; it does not turn the installation into two separately sized control stations.

## Observe more than a green indicator

Healthy processor indication should be accompanied by the expected application execution, field data and pair state. A station can continue operating while it has lost its intended redundancy, so continued process response alone is not a complete availability assessment.

## Explore other Foxboro catalogue pages

**Foxboro FBM202 P0926EQ**

**Foxboro FBM201 P0914SQ**

## Technical basis

Foxboro PSS 21H-1B7 B3, Control Processor 60, February 2006.