Honeywell

Safety Manager
Hardware Reference

Release 151

QPP-0001

Quad Processor Pack

Description

The Quad Processor Pack (QPP-0001) is the processing module of Safety Manager and is located in the Controller chassis (see section "CPCHAS-0001" on page 87).

Attention

You can only remove or replace the QPP-0001 module safely when the key switch is in STOP!


A non-redundant Controller contains one QPP-0001 module, a redundant Controller contains two QPP-0001 modules.

The slot of the Quad Processor Packs within the Controller chassis is pre-determined (see "Location of Control Processor modules" on page 89).

The Quad Processor Pack (QPP-0001) is the heart of Safety Manager. It controls all system operations. The QPP-0001 module reads the IO input signals and executes the Controller File as created by the user in graphical Functional Logic Diagrams (FLDs). The results of the Controller File are then transmitted to the output interfaces. In Safety Manager configurations with a redundant Controller, the two QPP-0001 modules synchronize their operation through a dedicated redundant communication link between the two Control Processors. Continuous testing of the Safety Manager hardware by the QPP-0001 module ensures safe control of the process as well as extensive system and process equipment diagnostics.

The QPP-0001 module has two processors and two memory sets. Hardware data-comparators compare every read and write action of the processors, and trip the watchdog if any difference in the data is detected. Additional test hardware enables full testing of the QPP-0001 module to achieve diagnostic coverage higher than 99%. This allows one QPP-0001 module to run applications up to and including SIL3 without time limitation. Redundant Controller configurations result in a 2oo4D voting architecture.

Figure 151 the front view of the QPP-0001
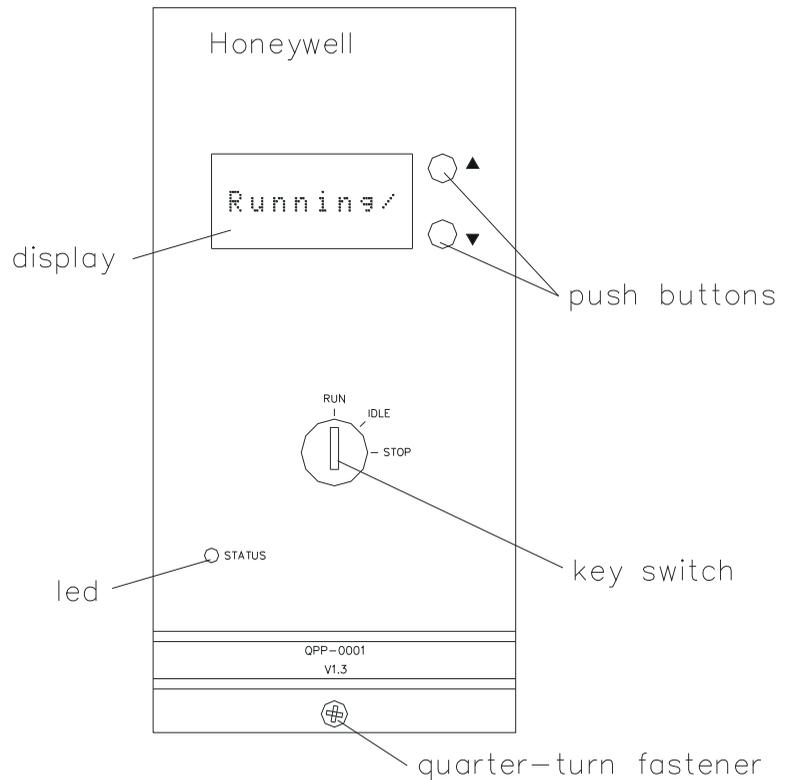
The QPP-0001 has the following components:

• two processors running synchronously

• flash memory for system and application program

• RAM with battery backup (battery located in BKM-0001)

• a redundant communication link with the other Control Processor

• RAM for the redundant communication link data

• data comparators for the processors and their memory

• data exchange with its communication modules

• watchdog (fully testable) with:

    - minimum and maximum execution time monitor

    - memory error handler

    - 1oo2D functionality

- 24V and 5V monitoring
- emergency Shut Down Input (24V)
- two outputs (for non-redundant resp. redundant IO)
• four IObus drivers
• diagnostics display
• temperature monitors
• real time clock

Processors

The QPP-0001 module has two processors running synchronously during process control. During an (application-) download they may get out of sync, but after the download they will re-synchronize.

The processors run the system program (including extensive self tests and diagnostic routines) and the application program.

Memory

The QPP-0001 module has the following on-board memory:

• 2×2 Mbyte flash for the system and application program.
• 2×256 kbyte SRAM with battery backup (for IO, markers, counters, timers and registers).
• 2×512 kilobyte SRAM for data-exchange with the other Control Processor.

The flash contents can be updated without removing the QPP-0001 from the Controller chassis.

User interface

The QPP-0001 module has the following features for indicating the Controller status and allowing the user to start, stop, reset, power-up and power-down the Control Processor:

• User Interface Display (see page 243)
• Processor Status Key Switch (see page 245)
• Status LED (see page 246)

User interface display

The QPP module has a user interface display that informs the user of the status of the Control Processor and all the IO related to it.

The eight-digit display shows one message at a time, and the user can scroll between messages with the use of the buttons on the right-hand side of the display (see Figure 152 on page 243).

Many messages, like diagnostic messages, are divided into sub-messages, called stages (see Table 35 on page 244). The user interface display automatically scrolls through these stages within the current message.

When left alone for 30 seconds, the user interface display returns to the default status message.

Figure 152 the user interface display of the QPP-0001 and the QPP-0002