USI-0001

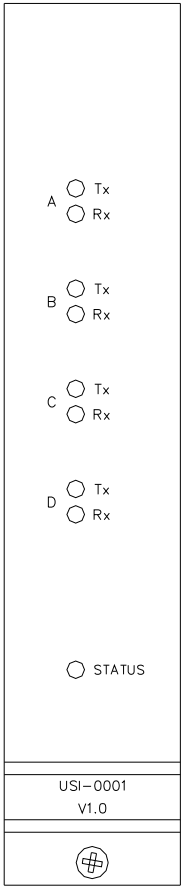
Universal Safety Interface

Description

The USI-0001 communication module handles Ethernet and Serial communication with external devices, e.g. Experion™ PKS and Safety Builder. It is located in the Controller chassis (see section “CPCHAS-0001” on page 87 or “CPCHAS-0002” on page 116).

Figure 161 on page 266 shows the front view of the USI-0001 module.

Figure 161 Front view of the USI-0001 module



The main function of communication modules is handling the communication to and from external devices and other Safety Managers. The USI-0001 has four (4) independent communication channels. See Table 43 on page 267 for the relevant details.

Table 43 The communication channels of the USI-0001 module

Channel	Description	Connector	Connects to	Communication cable
A	10/100 Mb Ethernet[1] Communication Channels	RJ45	UCOM-HSE	CCI-HSE-01
B				
C	General purpose Serial Communication Channels	10-pins AMP	DCOM-232/485	CCI-UNI-01
D				

1 The Ethernet interfaces are auto-ranging, they automatically select between 10 and 100 Mb.

Furthermore, the USI-0001 communication module acts as hardware firewall, protecting the safety functions within Safety Manager.

The module consists of the following items:

- A Motorola 8260 communication processor.
- EEPROM to store specific module data, such as the two MAC-addresses and the hardware revision number.
- 8 Mbyte Flash memory to store the system and application program. The flash content is copied to SRAM at startup and is executed from there. The flash content can be updated without removing the USI-0001 from the Controller chassis.
- 4 Mbyte Local SRAM (with Error Detecting and Correcting logic) for system and application program and information.
- 256 kilobyte shared RAM for data exchange between the USI-0001 and the Control Processor.
- Two dual-speed fast ethernet transceivers
- Two general purpose serial communication controller channels.

LED Indicators

Table 44 on page 268 lists LEDs that are visible at the front side of the USI-0001 module.

Table 44 LED indicators of the USI-0001 module

LED	Status	Description
Tx N[1]	Green	Data is being transmitted on channel N*.
	Off	No data is being transmitted on channel N*.
Rx N*	Green	Data is being received on channel N*.
	Off	No data is being received on channel N*.
STATUS	Green	No hardware errors are detected in the module.
	Red	One or more hardware errors are detected in the module.
	Off	Power down or booting

1 N = 1, 2, 3 or 4.

Reset mechanism

The USI-0001 module resets hardware via the following mechanisms:

- Power-up or power-dip.
- If the Quad Processor Pack (key switch) goes in ‘STOP’ mode.
- If the Quad Processor Pack generates a COMmunication RESet.

The communication *channels* are reset (go offline) if:

- the module resets, or
- the dedicated watchdog times out.



Note:

A dedicated watchdog has been added to prevent a possible communication lock-out on the communication lines, if the processor on the USI-0001 gets a fatal error (e.g. program hang-up or loss of clock).

Hot swap

The USI-0001 module has ‘hot swap’ features.

This means that the module may be placed or removed in a running system. The application program will not be interrupted by these actions.

Additional specifications

The USI-0001 module has a galvanic isolation of:

- ≥ 2.5 kVdc between the 5 Vdc and the Ethernet signal.
- ≥ 1.5 kVdc between the Ethernet signal and the casing of the USI-0001.
- ≥ 1.5 kVdc between the 5 Vdc and the casing of the USI-0001.

If a memory error in the USI-0001 module is detected, the Quad Processor Pack will get an interrupt.

The USI-0001 module has a power-up self-test (diagnostics) phase for testing of the following components:

- Processor address- and data registers
- Local RAM
- Shared RAM
- Exception Handling
- Software integrity

Power-up self-tests are required to reduce the risk of defective hardware or corrupted software being used.

Technical data

The USI-0001 has the following specifications.

General	Type numbers[1] [2]:	FS-USI-0001 V1.2
		FC-USI-0001 CCV1.2
	Operating temperature:	–5°C — +70°C (+23°F — +158°F)
	Storage temperature:	–40°C — +85°C (–40°F — +185°F)
	Relative humidity:	10 — 95% (non condensing)
	Approvals:	CE, TUV, UL, CSA, FM
Power	5 V supply voltage:	5 Vdc ±5%
	5 V supply current:	max 1.2A
Physical	Dimensions:	176 × 35.2 × 212 mm (H × W × D) 6.93 × 1.4 × 8.35 in (H × W × D)
	Weight:	0.7 kg

1 FS-type modules are non conformal coated modules.
FC-type modules are conformal coated modules. Conformal coated modules have the letters "CC" preceding the version number.

2 Modules with suffix code V1.1 or CCV1.1 and higher have an improved design. Modules with suffix code V1.2 or CCV1.2 or higher have an improved ethernet request handle.