Series 5 Vanguard

Main Processor Unit

MCP-1002 / MCP-1004

- *LED Indicators*
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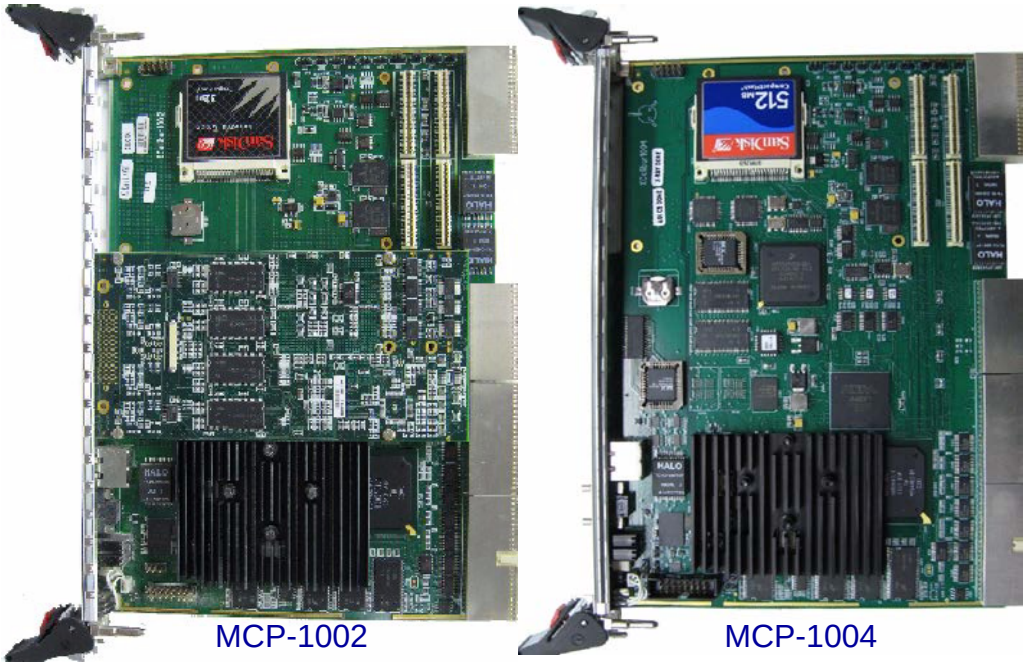

Figure 1 *MCP-1002 and MCP-1004 Main Processor Cards*

Description

This document specifies the Vanguard MCP-1002 and MCP-1004 processor cards, used in simplex and duplex systems. These processor cards can execute multiple turbomachinery control applications simultaneously, running at various execution rates. They must be used with their dedicated TMPU-1002 transition module (see DS5128).

Note: The MCP-1002 and MCP-1004 processors are functionally equivalent and completely interchangeable. They use the same TMPU-1002 transition module.

Note: The MCP-1002 and MCP-1004 processors are not interchangeable with the MPU-750 processor or its TMPU-750 transition module. Do not mix the new MCP processors with the older MPU-750 processor in the same chassis or you can damage the cards.

Installation

The MCP cards must be installed properly into their appropriate slot in the Vanguard (simplex or duplex) chassis. Refer to the supported chassis data sheets and installation manuals for proper installation procedures:

- *Vanguard Simplex (CPCI-8-S2-NPS) Chassis* [DS5108]
- *Vanguard Simplex (CPCI-8-S2-NPS1) Chassis* [DS5119]
- *Vanguard Duplex (CPCI-10-D2-NPS) Chassis* [DS5109]
- *Vanguard Duplex (CPCI-10-D2-NPS1) Chassis* [DS5118]
- *Vanguard Simplex System Installation* [UM5101]
- *Vanguard Duplex System Installation* [UM5105]

Connections

Electrical connections to the chassis bus and the transition module are provided by the cPCI bus connectors. Serial and Ethernet connections are located on the MPU Transition module. See *MPU Transition Module (TMPU-1002)* [DS5128] for connector locations.

Serial Ports

The MCP provides four serial ports routed to Ports 1,2, 3 and 4 on the MPU Transition Module (TMPU-1002). These ports are wired as an RS-422 / RS-485 interface, and they support asynchronous baud rates up to 300K bits/second.

An additional RS-232 front-panel serial port is available for maintenance. This port is wired as an RS-232 interface with a subminiature D-shell connector. Refer to Figure 2 for pin assignments.

Ethernet Ports

The MCP provides three independent Ethernet communications ports. Two Ethernet ports (E1 and E2) are located on the MPU Transition Module (TMPU-1002). These ports are used for TrainTools communication.

Note: If more Ethernet connections are needed, a minumum of layer 2 switches must be used. Layer 1 switches, i.e., hubs or repeaters, cannot be used.

An additional front-panel Ethernet port is available for maintenance. This port supports a single 10Base-T/ 100Base-TX connection. It's IP address is set to (10.5.1.1). Refer to Figure 2 for pin assignments.

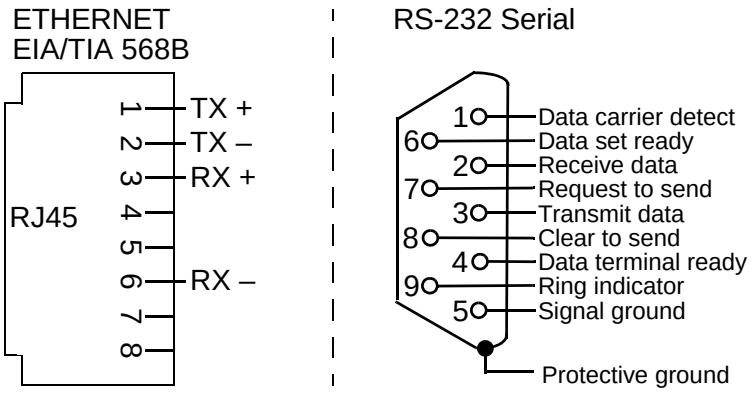

Figure 2 *Front-Panel Ethernet and Serial Maintenance Port Pin Assignments*

LED Indicators

There are eight LEDs and an additional HOT SWAP LED located on the bottom of the MCP front panels, as shown in the adjacent picture.

The HOT SWAP LED indicator is used during the card-replacement process. The remaining LEDs are illustrated and identified in Figure 3, and described in Table 1. The front panel also contains a RESET button that is described further below.

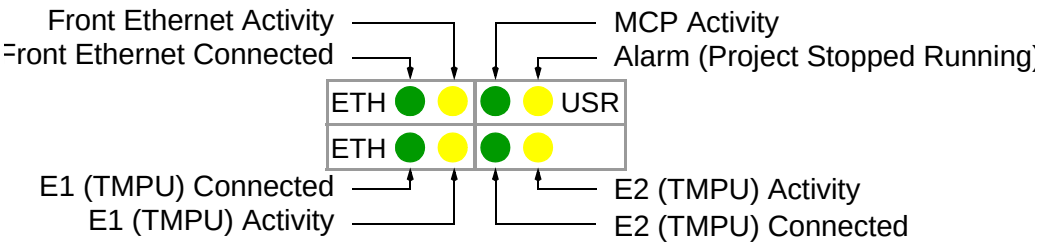

Figure 3 MCP Processor Front Panel LED Indicators

Table 1 MCP Processor LED Indicators

LED INDICATORS	DESCRIPTION
ETH (top left)	Green ON: Front Ethernet Connected
	Orange Flashing: Indicates Front Ethernet Activity
USR (top right)	Green Rapid Flashing: MCP Activity
	Orange ON: Applications are NOT running. Orange OFF: Applications are running and Controller is Healthy. Orange Flashing: Applications are running but Controller is NOT Healthy.
ETH (bottom left)	Green ON: E1 (TMPU) Ethernet Connected
	Orange Flashing: Indicates E1 (TMPU) Ethernet Activity
ETH (bottom right)	Green ON: E2 (TMPU) Ethernet Connected
	Orange Flashing: Indicates E2 (TMPU) Ethernet Activity
Hot Swap	Blue ON: Ready for Card Insertion or Removal

RESET Button

The MCP processors also contain a RESET button located on the bottom of the MCP front panels, as shown in the picture beneath the LED Indicators header. Pressing this switch will abort any operation and restart the processor.

Caution:

Do not press the reset switch unless instructed to do so by Compressor Controls Corporation documentation or a CCC field engineer.

Power Circuits

The MCP processors provide in-line, slow-blow fuses for all voltages, including +5 Vdc, +3.3 Vdc, and PMC +5 Vdc. Fuses are provided for +12 Vdc and –12 Vdc. These fuses are intended for fault protection and should not be replaced in the field

Configuration Settings

The MCP processors contain several factory set configuration jumpers. Default jumper settings and their descriptions are shown in Table 2.

Caution: All jumpers are factory set and **must not be changed** in the field. Damage to the card could occur if the jumpers are set incorrectly.

Table 2 MCP Processor Configuration (Jumper) Settings

TYPE	DESCRIPTION	TYPE	DESCRIPTION
J200	OPEN (default): Enable system slot auto detection Closed: Ignore system slot auto detection	J1870	Open - Boot from expansion flash CLOSED (default): Boot from socketed flash
J650	OPEN (default): Compact PCI-X rate 100Mhz Closed: Compact PCI-X rate 133Mhz	J1871	OPEN (default): Reset Closed - Stay in Reset
J651	OPEN (default): Local PCI-X rate 100Mhz Closed: Local PCI-X rate 133Mhz	J1872	Open - System Controller boot from EEPROM CLOSED - System Controller boot from EEPROM disabled (default)
J710	1–2 - PMC 1 enumeration and interrupt handling 2–3 - PMC 2 enumeration and interrupt handling OPEN (default): PMC is installed	J1500	OPEN (default): Socketed Flash Write Protect Disabled Closed: Socketed Flash Write Protect Enabled
J801	Open: Local PCI rate auto rate CLOSED (default): Local PCI rate 33Mhz	J1501	OPEN (default): Expansion Flash Write Protect Disabled Closed- Expansion Flash Write Protect Enabled
J802	1–2 - PCI bus to PCI operation (default) 2–3 - PCI bus to PCI-X operation at 66 Mhz Open: PCI bus auto detection	J1501	OPEN (default): Expansion Flash Write Protect Disabled Closed- Expansion Flash Write Protect Enabled
J803	Open - Compact PCI rate auto rate CLOSED (default): PCI rate 33Mhz	J3400 (1004)	OPEN (default): JTAG Disabled Closed: JTAG Enabled (Factory Only)
J804	1–2 - Compact PCI bus to PCI operation (default) 2–3 - Compact PCI bus to PCI-X 66 Mhz operation Open: Compact PCI bus auto detection	J3401 (1004)	OPEN (default): JTAG Disabled Closed: JTAG Enabled (Factory Only)

Specifications

Table 3 provides the MCP processor specifications. Additional specifications are located in the following Series 5 data sheets:

- *Vanguard Control System Hardware Specifications* [DS5001]
- *Vanguard Environmental Specifications* [DS5002]
- *Vanguard Control System Parts List* [DS5003]

Caution: The MCP cards contain a lithium cell battery. Refer to DS5002 for proper disposal instructions.

Table 3 MCP Processor Specifications

MCP Part Numbers	MCP-1002 (Main Processor card with Flash card) MCP-1004 (Main Processor card with Flash card)
Operating System	Use OS 2.14 or later
CompactFlash card	Industrial grade CompactFlash; Part Number: FMC-128 or larger
Matching TMPU	TMPU-1002 transition module
Compatible IOCs	Simplex IOC-555-S: Revision L and later Duplex IOC-555-D: Revision L and later
Card Power	30 W typical (+5 Vdc & +3.3 Vdc)
Processor	PowerPC 750GX @ 1 GHz
Clock	RTC with 8 Kbits of NVRAM
Serial Ports	Front: One RS-232 @ 9600 to 300K baud, for maintenance TMPU: Four RS-485 @ 9600 to 300K baud, with ESD protection
Ethernet	Front: One 10Base-T / 100Base-TX, for maintenance TMPU: Two 10Base-T / 100Base-TX
Chassis	CompactPCI 6 U
Card Weight	1.2 lbs (413.7 grams)
Dimensions	9.2" high x 0.8" wide x 6.3" deep (234 x 20 x 160 mm)

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