MEGGiTT
smart engineering for
extreme environments

CPUM and IOCN

VM600 modular CPU card and input/output card

FEATURES

- From the Vibro-Meter® product line
- 'One-Shot' configuration of VM600 cards using a direct Ethernet or RS-232 serial connection from an external computer, such as a laptop, notebook or industrial PC, running the VM600 MPSx software
- Common alarm reset for machinery protection cards (MPC4 and AMC8) in a VM600 rack
- Front-panel display for visualisation of monitored outputs and alarm limits
- VM600 MPS rack (CPUM) security
- Fieldbus communications interfaces with support for industry standard protocols: Modbus and PROFINET
- Redundant Modbus communications can be configured for improved availability
- Two Ethernet connections and up to three serial connections (RS-232/RS-422/RS-485) can be accommodated simultaneously

APPLICATIONS

- System controller for a VM600 rack
- Communications gateway between a VM600 rack and third-party systems, such as a DCS or PLC
- Machinery protection, condition monitoring and/or combustion monitoring

CPUM IOCN

DESCRIPTION

The CPUM is a modular central processing unit (CPU) card intended for use in the VM600 series of machinery protection system and condition monitoring system racks from Meggitt Sensing Systems' Vibro-Meter® product line. Depending on the system requirements, the CPUM can be used alone in the rack (installed in the front card cage) or in conjunction with the associated IOCN input/output card (installed in slot 0 of the rear card cage, directly behind the CPUM).

The modular, highly versatile design of the CPUM means that all VM600 rack configuration, display and communications interfacing can be performed from a single card in a "networked" rack. The CPUM card acts as a "rack controller" and allows an Ethernet link to be established between the rack and a computer running one of the VM600 MPSx software packages (MPS1 or MPS2).

The CPUM card consists of a carrier board with two PC/104 type slots that can accept different PC/104 modules: a CPU module and an optional serial communications module.

All CPUM cards are fitted with a CPU module that supports two Ethernet connections and two serial connections. That is, both the Ethernet redundant and serial redundant versions of the card.

Note: The primary Ethernet connection is used for communication with the VM600 MPSx software via a network and for Modbus TCP and/or PROFINET communications. The secondary Ethernet connection is used for redundant Modbus TCP communications. The primary serial connection is used for communication with the VM600 MPSx software via a direct connection. The secondary serial connection is used for Modbus RTU communications.

Optionally, a CPUM card can be fitted with a serial communications module (in addition to the CPU module) in order to support additional serial connections. This is the serial redundant version of the card.

The CPUM module's primary Ethernet and serial connections are available via the 'NET' and 'RS232' connectors on the front panel of the CPUM. However, if the associated IOCN card is used, the primary Ethernet connection can be routed to the '1' connector on the front panel of the IOCN (instead of the 'NET' connector). When the associated IOCN card is used, the secondary Ethernet and serial connections are available via the '2' and 'RS' connectors on the front panel of the IOCN.

The IOCN card is an network interface (input/output) card for use with the CPUM card that provides connectors for the CPUM's communications interfaces. The IOCN card's '1' and '2' Ethernet connectors provide access to the primary and secondary Ethernet connections, and the 'RS' serial connector provides access to the secondary serial connection.

In addition, the IOCN card includes two pairs of 'A' and 'B' serial connectors that provide access to the additional serial connections (from the optional serial communications module) that can be used to configure multi-drop RS-485 networks of VM600 racks.

The CPUM front panel features an LCD display that shows the level of a selected monitored output in bar-graph and digital form, with the Alert and Danger levels also indicated on the bar-graph. The signal identification (slot and output number) is shown at the top of the display.

The SLOT and OUT (output) keys on the CPUM front panel are used to select which signal to display. The ALARM RESET button on the front panel resets all latched alarms (and associated relays) for the entire rack.

LEDs on the CPUM front panel indicate the OK, Alert (A) and Danger (D) status for the currently selected signal. When Slot 0 is selected, the LEDs indicate the overall status of the whole rack. When the DIAG (diagnostic) LED shows green continuously, the CPUM card is operating normally, and when the DIAG LED blinks, the CPUM card is operating normally but access to the CPUM card is restricted due to VM600 MPS rack (CPUM) security.

For security reasons, the CPUM card supports features that can be used to limit the functionality of the MPS that is available via the CPUM to Ethernet-based connections, helping to reduce the possibility of interference in the operation of the MPS and the machinery being monitored.

VM600 MPS rack (CPUM) security consists of two specific levels of protection integrated in the CPUM card: CPUM access lock (a "hardware" security feature) and MPS password validation (a "software" security feature). Refer to the *VM600 machinery protection system hardware manual* and the *VM600 MPS1 software manual* for further information.

For specific applications, contact your nearest Meggitt Sensing Systems representative.

SPECIFICATIONS

CPUM card

CPU module

Module type	: PFM-541I or equivalent
Processor type	: AMD Geode™ LX800
Processor speed	: 500 MHz
Memory	: 256 MB DRAM
Power supply to card (input) (taken from VM600 rack power supply)	: 5 V_{DC}, <1.8 A
Operating system	: QNX
Communications ports (connections)	
• *Primary Ethernet*	: Network interface: 10/100BASE-TX. Data transfer rate: Up to 100 Mbps. Function: VM600 rack configuration and communications using the VM600 MPSx software, and Modbus TCP and/or PROFINET. Connector: 'NET' (CPUM card) *or* '1' (IOCN card).
• *Secondary Ethernet (requires the IOCN card)*	: Network interface: 10/100BASE-TX. Data transfer rate: Up to 100 Mbps. Function: Redundant Modbus TCP communications. Connector: '2' (IOCN card).
• *Primary serial*	: Network interface: RS-232. Data transfer rate: Up to 115.2 kBaud. Function: VM600 rack configuration and communications using the VM600 MPSx software. Connector: 'RS232' (CPUM card).
• *Secondary serial (requires the IOCN card)*	: Network interface: RS-232 *or* RS-485. Data transfer rate: Up to 115.2 kBaud. Function: Modbus RTU communications. Connector: 'RS' (IOCN card).

Note: The CPU module is fitted to all versions of the CPUM card.

Serial communications module

Module type	: AIM104-COM4 or equivalent
Power supply to modules (input) (taken from VM600 rack power supply)	: 5 V_{DC}, <220 mA
Isolation	: >100 V_{DC}
Communications ports (connections)	
• *Additional serial*	: Network interface: Two isolated RS-422 and/or RS-485. Data transfer rate: Up to 115.2 kBaud. Function: Modbus RTU communications. Connectors: Two 'A' and two 'B' (IOCN card).

Note: The serial communications module is only fitted to the serial redundant version of the CPUM card.

Note: Jumpers on the CPUM card are used to configure the required operation of Ethernet and serial connections and connectors. Refer to the *VM600 machinery protection system hardware manual* for further information.

SPECIFICATIONS *(continued)*

LED indicators

Diag	: Green LED used to indicate the status of the CPUM card: off, normal operation and status of VM600 MPS rack (CPUM) security
OK	: Green LED used to indicate the status of the OK system check (sensor OK link check) for the currently selected measurement channel
A (Alert)	: Yellow LED used to indicate the status of the alarm monitoring (Alert or Alert−) for the currently selected measurement channel
D (Danger)	: Red LED used to indicate the status of the alarm monitoring (Danger or Danger−) for the currently selected measurement channel

Note: In addition to the LED indicators, the front-panel display is fitted to all versions of the CPUM card.

Buttons

ALARM RESET	: Used to reset all latched alarms (and associated relays) in the entire VM600 rack
OUT− and OUT	: Used to select a measurement channel for the currently selected card (slot)
SLOT− and SLOT	: Used to select a slot (card) in the VM600 rack

Connectors

NET	: 8P8C (RJ45), female. Used for the primary Ethernet connection.
RS232	: DE-9 (9-pin D-sub), female Used for the primary serial connection.

IOCN card

Connectors

RS	: 6P6C (RJ11/RJ25), female. Used for the secondary serial connection.
A	: Two 6P6C (RJ11/RJ25), female. Used for additional serial connections (requires the optional serial communications module).
B	: Two 6P6C (RJ11/RJ25), female. Used for additional serial connections (requires the optional serial communications module).
1	: 8P8C (RJ45), female. Can be used for the primary Ethernet connection (instead of the ‘NET’ connector).
2	: 8P8C (RJ45), female. Used for the secondary Ethernet connection.

Note: Jumpers on the IOCN card are used to configure the required operation of serial connections and connectors. Refer to the *VM600 machinery protection system hardware manual* for further information.

SPECIFICATIONS *(continued)*

General

Electrical

Supply voltage	: 5 V_{DC} ±5%
Power consumption	
• *CPUM*	: <10 W
• *IOCN*	: <2 W
RS-485 isolation	: 500 V_{DC}

Environmental

Temperature	
• *Operating*	: −20 to 65°C (−4 to 149°F)
• *Storage*	: −25 to 80°C (−13 to 176°F)
Humidity	: 0 to 90% relative humidity, non-condensing

Approvals

Conformity	: CE marking, European Union (EU) declaration of conformity. EAC marking, Eurasian Customs Union (EACU) certificate/declaration of conformity.
Electromagnetic compatibility	: TR CU 020/2011
Electrical safety	: TR CU 004/2011
Environmental management	: RoHS compliant
Russian federal agency for technical regulation and metrology (Rosstandart)	: Pattern approval certificate CH.C.28.004.A N° 60224, dated 11.11.2015

Physical

CPUM	
• *Height*	: 6U (262 mm, 10.3 in)
• *Width*	: 40 mm (1.6 in)
• *Depth*	: 187 mm (7.4 in)
• *Weight*	: 0.40 kg (0.88 lb) approx.
IOCN	
• *Height*	: 6U (262 mm, 10.3 in)
• *Width*	: 20 mm (0.8 in)
• *Depth*	: 125 mm (4.9 in)
• *Weight*	: 0.25 kg (0.55lb) approx.

ORDERING INFORMATION

To order please specify

Type	Designation	Ordering number
CPUM	Different versions of the VM600 modular CPU card:	
	– Ethernet redundant Modular CPU card with a CPU module that supports two Ethernet interfaces and two serial interfaces. This CPUM supports Ethernet interfaces on the front panel (CPUM) and the rear panel (IOCN), a serial interface (RS-232) on the front panel (CPUM) and a serial interface (isolated RS-232/RS-485) on the rear panel (IOCN).	601-003-000-VVV**3**\610-1CC-CCC (equivalent to a 200-595-0Ss-33h with a configuration)
	– Ethernet redundant varnished Same as the Ethernet redundant version, with a conformal coating for additional environmental protection.	601-003-000-VVV**3V**\610-1CC-CCC (equivalent to a 200-595-0Ss-33hl with a configuration)
	– Serial redundant Modular CPU card with a CPU module that supports two Ethernet interfaces and two serial interfaces, and a serial communications module that supports additional serial interfaces. This CPUM supports Ethernet interfaces on the front panel (CPUM) and the rear panel (IOCN), a serial interface (RS-232) on the front panel (CPUM) and a serial interface (isolated RS-232/RS-485) on the rear panel (IOCN). It also supports two additional serial interfaces (RS-422/RS-485) on the rear panel (IOCN).	601-003-000-VVV**5**\610-1CC-CCC (equivalent to a 200-595-0Ss-53h with a configuration)
IOCN	Different versions of the input/output card for the CPUM:	
	– Standard	200-566-000-1Hh
	– Varnished Same as the standard version, with a conformal coating for additional environmental protection	200-566-000-1HhL

Notes
The different versions of the CPUM card are supplied pre-configured with different configurations, as denoted by the 9-digit code in the ordering number (610-1CC-CCC).
“1CC-CCC” represents the different configurations that can be used by a finished product. For example, 610-100-000 corresponds to the ‘standard’ configuration that is uploaded to a CPUM card (200-595-0Ss-HHh), if no other configuration is specified. For information on other configurations, contact Meggitt Sensing Systems.
“Ss” represents the firmware (embedded software) version and “Hh” the hardware version of a card. “S/H” increments for major modifications that can affect product interchangeability and “s/h” increments for minor modifications that have no effect on interchangeability.
“VVV” represents the different firmware (embedded software) versions and hardware versions that can be used by a finished product.
For information on ordering a VM600 CPUM/IOCN as a part of a VM600 system rack, refer to the ABE040 and ABE042 VM600 system rack data sheet.

RELATED PRODUCTS

ABE040 and ABE042	VM600 system rack	: Refer to corresponding data sheet
AMC8 and IOC8T	VM600 analog monitoring card and input/output card	: Refer to corresponding data sheet
MPC4 and IOC4T	VM600 machinery protection card and input/output card	: Refer to corresponding data sheets
RLC16	VM600 relay card	: Refer to corresponding data sheet

Headquartered in the UK, Meggitt PLC is a global engineering group specializing in extreme environment components and smart sub-systems for aerospace, defence and energy markets.

Meggitt Sensing Systems is the operating division of Meggitt specializing in sensing and monitoring systems, which has operated through its antecedents since 1927 under the names of ECET, Endevco, Ferroperm Piezoceramics, Lodge Ignition, Sensorex and Vibro-Meter. Today, these operations are integrated under one strategic business unit called Meggitt Sensing Systems, headquartered in Switzerland and providing complete systems, using these renowned brands, from a single supply base.

The Meggitt Sensing Systems facility in Fribourg, Switzerland was formerly known as Vibro-Meter SA, but is now Meggitt SA. This site produces a wide range of vibration and dynamic pressure sensors capable of operation in extreme environments, leading-edge microwave sensors, electronics monitoring systems and innovative software for aerospace and land-based turbo-machinery.

In this publication, a dot (.) is used as the decimal separator and thousands are separated by thin spaces. Example: 12345.67890.

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Meggitt Sensing Systems has offices in more than 30 countries. For a complete list, please visit our website.

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