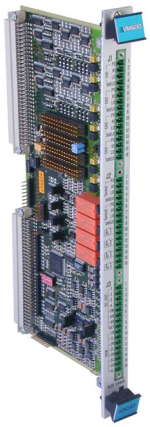
MEGGITT

DATA SHEET

Vibro-Meter®

VM600 IOC4T input/output card



KEY FEATURES AND BENEFITS

- From the Vibro-Meter® product line
- Signal interface card with 4 dynamic signal inputs and 2 tachometer (speed) inputs, for the MPC4 machinery protection card
- Screw-terminal connectors (48 terminals) for all input/output connections
- Contains 4 relays which can be attributed to alarm signals, under software control
- 32 fully-programmable open-collector outputs (jumper selectable) to IRC4 and RLC16 relay cards
- Buffered "raw" sensor signals and analog output signals (voltage or current) for vibration channels
- EMI protection for all inputs and outputs
- Live insertion and removal of cards (hot-swappable)
- Available in "standard" and "separate circuits" versions

APPLICATIONS

- Machinery protection and/or basic condition monitoring

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DESCRIPTION

IOC4T card

The IOC4T input /output card acts as a signal interface for the VM600 series MPC4 machinery protection card, from Meggitt's Vibro-Meter® product line. It is installed in the rear of a VM600 rack and connects directly to the rack backplane via two connectors.

Each IOC4T card is associated with a corresponding MPC4 card and is mounted directly behind it in the VM600 rack (ABE04x or ABE056). The IOC4T operates in slave mode and communicates with the MPC4, through connector P2, using an Industry Pack (IP) interface.

The front panel of the IOC4T (rear of the VM600 rack) contains terminal strip connectors for wiring to the transmission cables coming from measurement chains (sensors and /or signal conditioners). The screw-terminal connectors are also used to input all signals from and output all signals to any external control system.

The IOC4T card protects all inputs and outputs against electromagnetic interference (EMI) and signal surges and also meets electromagnetic compatibility (EMC) standards.

The IOC4T connects the raw dynamic (vibration) and speed signals from the sensors to the MPC4. These signals, once processed, are passed back to the IOC4T and made available on the terminal strip on its front panel (rear of VM600). For the dynamic signals, four on-board digital-to-analog converters (DACs) provide calibrated signal outputs in the range 0 to 10 V. In addition, four on-board voltage-to-current converters allow the signals to be provided as current outputs in the range 4 to 20 mA (jumper selectable).

The IOC4T contains four local relays that can be attributed to any specific alarm signals under software control. For example, these may be used to signal an MPC4 fault or a problem detected by a common alarm (Sensor OK, Alarm and Danger) in a typical application.

In addition, 32 digital signals representing alarms are passed to the rack backplane and may be used by optional RLC16 relay cards and / or IRC4 intelligent relay cards mounted in the rack (jumper selectable).

Applications information

When used as a card pair with an MPC4 machinery protection card, the IOC4T is highly suitable for machinery monitoring and protection in a wide range of industrial applications.

For further information on the use of MPC4/IOC4T card pairs in general, refer to the *VM600 machinery protection system (MPS) hardware manual* and the *VM600 MPSx software manuals*. For information on the use of MPC4/IOC4T card pairs in functional safety contexts, refer to the refer to the *VM600 functional safety manual*.

For specific applications, contact your local Meggitt representative.

SPECIFICATIONS

Dynamic signal inputs

Filtering : Filtered for protection against electromagnetic interference (conforms to EC standards).
Refer to the VM600 MPC4 machinery protection card data sheet for further information.

Buffered dynamic signal outputs

Filtering : Filtered for protection against electromagnetic interference (conforms to EC standards).
Refer to the VM600 MPC4 machinery protection card data sheet for further information.

Speed/phase reference inputs

Filtering : Filtered for protection against electromagnetic interference (conforms to EC standards).
Refer to the VM600 MPC4 machinery protection card data sheet for further information.

Discrete signal interface (DSI) inputs

Control signal

- Alarm reset (AR) : A closed contact between the DSI AR and DSI RET inputs resets (clears) the alarms latched by the MPC4/IOC4T card pair.
  Note: The alarm reset input (DSI AR) is edge-sensitive and a high-to-low transition is required to activate the reset.
- Danger bypass (DB) : A closed contact between the DSI DB and DSI RET inputs inhibits (bypasses) the danger relay outputs
- Trip multiply (TM) : A closed contact between the DSI TM and DSI RET inputs multiplies the alarm levels by a scale factor (software configurable), to enable adaptive monitoring.

Operating principle : Detection of an open circuit or a closed circuit on the input

Alarm outputs

Alarm relays : 4 per IOC4T card.
The MPC4 card can drive the four local relays on the IOC4T card, as well the relays on RLC16 relay cards and/or IRC4 intelligent relay cards using the VM600 rack's Raw bus or Open Collector (OC) bus.
For IOC4T card relay features, see **Relay characteristics on page 4**.
For further information on RLC16 or IRC4 relay cards, refer to the corresponding data sheet.

Note: In a VM600 rack (ABE4x), the Open Collector (OC) bus and/or Raw bus can be used to connect up to 32 outputs from an MPC4/IOC4T card pair to RLC16 relay cards or IRC4 intelligent relay cards in the same rack, if additional relays are required.

SPECIFICATIONS *(continued)*

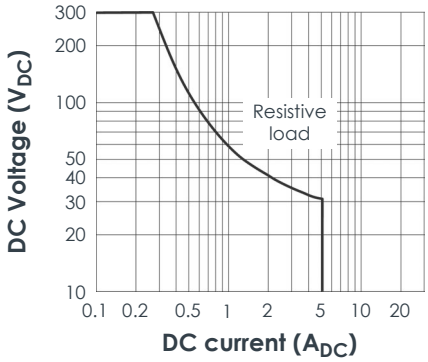
Analog (DC) outputs

Number of outputs	: 4 per IOC4T card (one per MPC4 dynamic signal channel)
Signal range	: Current output (4 to 20 mA) or voltage output (0 to 10 V), individually selectable by a jumper on the IOC4T for each output. Note: For current outputs, the analog output is actually driven in a slightly wider 2 to 23 mA range, proportional to the input signal.
Accuracy	: ≤±1.5%
Linearity error	: ≤±0.5%
Admissible load on output	: >100 kΩ for voltage output. <325 Ω for current output.

Relay characteristics

Relay names	: RL1 to RL4
Type	: PE014005
Contact arrangement	: 1 x NC or 1 x NO contact per relay (user configurable). The selected contacts are available on J2.
Nominal rated voltage	: 250 V_{AC}
Nominal rated current	: 5 A_{AC}
Maximum breaking capacity (without contact protection)	: 1250 VA

Maximum DC load breaking capacity curve:



Operate / release / bounce time	: Typically 8 / 8 / 6 ms
Dielectric strength test voltages	
• Between open contacts	: 1000 V_{AC}
• Between contact and coil	: 4000 V_{AC}
Mechanical life	: 15 x 10^6 operations
Electrical life	: >10^5 operations

⚠ **When used in a VM600 slimline rack (ABE056) with a DC power supply, the relay contacts on an IOC4T card have a maximum switching voltage of 70 V_{DC} / 33 $V_{AC\ (RMS)}$ (46.7 $V_{AC\ (PEAK)}$).**

SPECIFICATIONS *(continued)*

Environmental

Temperature

• Operating	: −25 to 65°C (−13 to 149°F)
• Storage	: −40 to 85°C (−40 to 185°F)

Humidity

• Operating	: 0 to 90% non-condensing
• Storage	: 0 to 95% non-condensing

Approvals

Conformity	: CE marking, European Union (EU) declaration of conformity. EAC marking, Eurasian Customs Union (EACU) certificate / declaration of conformity.
Electromagnetic compatibility	: EN 50081-2 and EN 50082-2. IEC/EN 61000-6-2 and IEC/EN 61000-6-4. TR CU 020/2011.
Electrical safety	: IEC/EN 61010-1. TR CU 004/2011.
Vibration	: IEC 60255-21-1 (Class 2)
Insulation coordination for measuring relays and protection equipment	: Separate circuits according to IEC 60255-5 for the "separate circuits" version of the IOC4T
Safety integrity level	: SIL 1 according to IEC 61508
Environmental management	: RoHS compliant
Russian federal agency for technical regulation and metrology (Rosstandart)	: Pattern approval certificate CH.C.28.004.A N° 60224

Communications

MPC4 to IOC4T bus	: Similar to industry pack (IP)

Configuration

MPC4/IOC4T card pair	: Software configurable via an RS-232 or Ethernet connection, using a computer running the VM600 MPSx software. Hardware configurable using jumpers on the MPC4/IOC4T card pair.

Note: Configuration via an Ethernet connection requires a CPUx card acting as a rack controller in the VM600 rack.

Status indicators (LEDs)

SLOT ERROR	: Used to indicate indicates whether the IOC4T is installed in the correct slot of the VM600 rack

Power supply to card (input)

Power source	: VM600 rack power supply
Supply voltages	: +5 V_{DC} and ±12 V_{DC}
Consumption from +5 V_{DC} supply	: 1.5 W
Consumption from ±12 V_{DC} supply	: 0.7 W, plus an additional 0.25 W per current output used

SPECIFICATIONS *(continued)*

Connectors

J1	: 16-contact screw-terminal connector. Inputs (analog signals) for dynamic measurement channels 1 to 4.
J2	: 16-contact screw-terminal connector. Inputs (analog signals) for tachometer (speed) channels 1 to 2. Outputs (contacts) for relays RL1 to RL4.
J3	: 16-contact screw-terminal connector. Outputs (analog signals) for DC outputs 1 to 4. Inputs (digital signals) for DSI control signals: AR, DB and TM. Outputs (analog signals) for buffered "raw" sensor outputs for dynamic measurement channels 1 to 4.

Physical

Height	: 6U (262 mm, 10.3 in)
Width	: 20 mm (0.8 in)
Depth	: 125 mm (4.9 in)
Weight	: 0.25 kg (0.55 lb) approx.

ORDERING INFORMATION

To order please specify

Type	Designation	Ordering number (PNR)
IOC4T	Different versions of the input/output card (for the MPC4):	
	– Standard	200-560-000-1Hh
	– Separate circuits	200-560-000-2Hh

Notes
Versions of the IOC4T card are available with a conformal coating ("varnish") applied to the circuitry of the card for additional environmental protection against chemicals, dust, moisture and temperature extremes.

In 2017, the MPC4 / IOC4T machinery protection card pairs were improved to (1) be RoHS compliant and (2) provide a reduced buffered dynamic signal output impedance, which required a redesign of the underlying buffered "raw" dynamic signal output circuitry. Accordingly, the different versions of the MPC4/IOC4T machinery protection card pairs in use are:

- Later versions of the MPC4 (PNRs 200-510-SSS-115, 200-510-SSS-214 and 200-510-SSS-313 or later) and IOC4T (PNR 200-560-000-114 and 200-560-000-212 or later), which are RoHS compliant and have an output impedance of 50 Ω.
- Earlier versions of the IOC4T (PNRs 200-510-SSS-114, 200-510-SSS-213 and 200-510-SSS-312 or earlier) and IOC4T (PNR 200-560-000-113 and 200-560-000-211 or earlier), which are not RoHS compliant and have an output impedance of 2000 Ω.

"SSS" represents the firmware (embedded software) version and "Hh" the hardware version. "H" increments are for major modifications that can affect product interchangeability. "h" increments are for minor modifications that have no effect on interchangeability.

RELATED PRODUCTS

ABE04x	VM600 system racks	: Refer to corresponding data sheet
ABE056	VM600 slimline rack	: Refer to corresponding data sheet
AMC8 and IOC8T	VM600 analog monitoring card pair	: Refer to corresponding data sheet
CPUM and IOCN	VM600 modular CPU card and input/output card. Note: With a front-panel display and support for Modbus RTU/TCP or PROFINET.	: Refer to corresponding data sheet
CPUR and IOCR	VM600 rack controller and communications interface card pair. Note: With rack controller redundancy and support for Modbus RTU/TCP.	: Refer to corresponding data sheet
CPUR2 and IOCR2	VM600 rack controller and communications interface card pair. Note: With mathematical processing of fieldbus data and support for Modbus TCP and PROFIBUS.	: Refer to corresponding data sheet
IRC4	VM600 intelligent relay card	: Refer to corresponding data sheet
MPC4	VM600 machinery protection card	: Refer to corresponding data sheets
MPC4G2 and IOC4G2	VM600 machinery protection card pair	: Refer to corresponding data sheet
RLC16	VM600 relay card	: Refer to corresponding data sheet
RLC16G2	VM600 relay card	: Refer to corresponding data sheet
XMx16 and XIO16T	VM600 condition monitoring card pairs	: Refer to corresponding data sheet

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