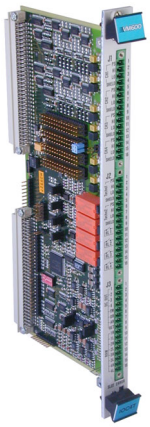
MEGGITT

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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## 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)*

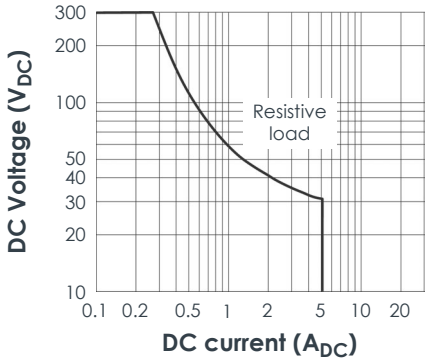
### Analog (DC) outputs

| | |
|---|---|
| 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.<br><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.<br>EAC marking, Eurasian Customs Union (EACU) certificate / declaration of conformity. |
| Electromagnetic compatibility | : EN 50081-2 and EN 50082-2.<br>IEC/EN 61000-6-2 and IEC/EN 61000-6-4.<br>TR CU 020/2011. |
| Electrical safety | : IEC/EN 61010-1.<br>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.<br>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.<br>Inputs (analog signals) for dynamic measurement channels 1 to 4. |
| J2 | : 16-contact screw-terminal connector.<br>Inputs (analog signals) for tachometer (speed) channels 1 to 2.<br>Outputs (contacts) for relays RL1 to RL4. |
| J3 | : 16-contact screw-terminal connector.<br>Outputs (analog signals) for DC outputs 1 to 4.<br>Inputs (digital signals) for DSI control signals: AR, DB and TM.<br>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.