DATA SHEET

vibro-meter®

VM600^{Mk2}/ VM600 XMx16 + XIO16T extended condition monitoring modules

VM600^{Mk2} XMV16

VM600^{Mk2} XIO16T

KEY FEATURES AND BENEFITS

- VibroSight® compatible hardware from the vibro-meter® product line
- VM600^{Mk2}/VM600 high-performance condition monitoring
- 16 dynamic channels and 4 tachometer channels (also configurable as DC inputs)
- Individually configurable inputs, channel filters, processing and outputs – with simultaneous data acquisition (fixed frequency or order tracked)
- 24-bit data acquisition and high SNR data processing, with data quality checks
- Up to 20 processed outputs per channel
- High-resolution spectra (FFT): up to 6400 lines every 500 ms, up to 3200 lines every 200 ms, up to 1600 lines every 100 ms
- Data aggregation of internal spectra (up to 100 ms) every 1 s
- Pre-trigger and post-trigger data logging at up to 100 ms
- Multiple alarms per processed output with configurable limits, hysteresis and time delay

KEY BENEFITS AND FEATURES *(continued)*

- Supports signal sharing in VM600^{Mk2}/VM600 racks
- Gigabit Ethernet communications
- Live insertion and removal of modules (hot-swappable)
- Fully software configurable
- Compatible with VM600^{Mk2}/VM600 system racks (ABE04x) and slimline racks (ABE056)

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APPLICATIONS

- Machinery vibration monitoring and analysis, including rotor dynamics
- Rolling-element bearing analysis
- Hydro air-gap and magnetic-flux monitoring and analysis
- Combustion monitoring and analysis, including combustion dynamics and dynamic pressure pulsation

DESCRIPTION

Introduction

The VM600^{Mk2}/VM600 XMx16 + XIO16T extended condition monitoring modules are designed for operation with the VM600^{Mk2}/VM600 rack-based machinery monitoring systems, from Meggitt's vibro-meter® product line. A XMx16 + XIO16T module consists of a processing module and a input/output (interface) module that provide 16 dynamic and 4 tachometer channels of high-performance machinery condition monitoring.

Note: The XMV16 + XIO16T module is optimised for machinery vibration monitoring applications and the XMC16 + XIO16T module is optimised for machinery combustion monitoring applications.

Extended condition monitoring modules

The XMx16 + XIO16T extended condition monitoring modules are latest-generation condition monitoring modules, which together with the VibroSight® software, offer several key advantages over the CMC16/IOC16T card pair and VM600 CMS software that they replace: state-of-the-art technology, stronger system capabilities (increased amplitude and spectral resolution, more buffer memory for pre-event and post-event data, more powerful module-level processing, faster data acquisition and storage rates), improved software interface with powerful high-resolution plots, integrated data management, and simplified network access with open interfaces.

An XMx16 + XIO16T module provides all of the interfacing and signal processing functions required of an intelligent data acquisition system and is a central element in VM600^{Mk2}/VM600 rack-based machinery monitoring solutions. The modules are designed for operation with the VibroSight® software: they acquire and analyse vibration data before communicating the results directly to a host computer running VibroSight® using the on-board Ethernet controller.

The XMx16 processing module is installed in the front of the rack and the XIO16T module is installed in the rear. Either a VM600^{Mk2}/VM600 standard rack (ABE04x) or slimline rack (ABE056) can be used and each module connects directly to the rack's backplane using two connectors.

The XMx16 + XIO16T is fully software configurable and can be programmed to capture data based on time (for example, continuously at scheduled intervals), events, machine operating conditions or other system variables. Individual measurement channel parameters including frequency bandwidth, spectral resolution, windowing function and averaging can also be configured to meet the needs of specific applications.

XMx16 processing module

The XMx16 processing module performs the analogue to digital conversion and all of the digital signal processing functions, including the processing for each waveform and spectrum, and the associated processed outputs (extracted data). The module acquires and processes data in high-resolution (24-bit A DC) to generate waveforms and spectra using three different measurement modes: principal, auxiliary and direct.

Principal mode is the main data acquisition mode and performs continuous data acquisition that is suitable for the normal operation of machinery, such as increasing vibration levels and transient operations. The waveforms and spectra acquired in principal mode are used to generate the associated processed outputs (extracted data). To complement the principal mode, the auxiliary mode is used to obtain more detailed waveforms and spectra at reduced update rates. The direct mode is used to obtain a digitised continuous long-duration waveform from a dynamic input channel for the time leading up to an alarm event and uses a third-party program for data visualisation.

DESCRIPTION (*continued*)

On a XMx16 module, the processing cycle times depend on the resolution of the waveforms (points) / spectra (lines) configured for the principal and auxiliary measurement modes. These internal processing cycle times help determine the rate at which the waveforms, spectra, and extracted data are available as outputs from the module.

While measurements are available from a XMx16 module at data update rates up to 100 ms, the VibroSight® software data update rate is 1 s. That is, XMx16 modules are polled by a VibroSight Server at a maximum data rate of once per second. For example, a module with a principal measurement mode configured for a data update rate of 100 ms provides VibroSight® with every tenth waveform, spectrum and associated extracted data. Although more of the XMx16 module's internal measurement data is used if averaging is configured for a waveform or spectrum. However, in order to avoid the potential loss of important information in the XMx16 module's internal measurement data, spectral data aggregation can be used to capture the peaks in the intermediate (internal) spectra, without significantly increasing network traffic.

The 20 available processed outputs per channel can provide any configurable band based on the asynchronously (fixed frequency) or synchronously (order-tracked) acquired waveforms and spectra. A range of qualifier functions are available, including RMS, peak, peak-to-peak, true peak, true peak-to-peak and DC (Gap). Outputs are available for display to any standard (metric or imperial).

Various methods of averaging can be performed at the processing block level and at the output (extracted data) level. Spectral data aggregation over one second is also available to capture any bursts or spikes in internal XMx16 module spectra. The multi-channel processing functions supported include shaft absolute vibration, full spectrum, orbit and filtered orbit, shaft centerline and S_{max}.

Events are generated when values exceed one of five user configurable severities or exceed rate-of-change alarms. The amount of pre-event data stored in the XMx16 module's on-board buffer memory is configurable and can be used for the data logging of pre-trigger (event) static data up to every 100 milliseconds and dynamic data every 1 second. Data logging of post-trigger (event) static data up to every 100 ms is also available for up to 1 hour.

Machine states, such as full load (onload), overspeed and transient are detected from checks of the reference speed against trigger levels. These states can be used by the software's machine operating conditions to control system behaviour. Typically, higher density logging is available depending on machine operating conditions, configurable speed and time intervals, or any other process parameter.

XIO16T input/output module

The XIO16T input/output module acts as a signal interface for the XMx16 processing module, performs all of the analogue signal conditioning and also supports the external communications. In addition, it protects all inputs against signal surges and EMI to meet EMC standards.

The XIO16T module's inputs are fully software configurable and can accept signals representing speed and phase reference (for example, from TQxxx sensors) and vibration derived from acceleration, velocity and/or displacement (for example, from CAxxx, CExxx, CVxxx and TQxxx sensors). The inputs also accept any dynamic or quasi-static signals that are appropriately signal conditioned.

Externally, the XIO16T module interfaces to the transmission cables coming from sensors / measurement chains using rear connectors. Internally, input signals can be shared between modules in a VM600 rack, including with MPC4^{Mk2}/MPC4 machinery protection modules/ cards, using the VM600^{Mk2}/VM600 rack's Tacho bus and Raw bus, thereby reducing external wiring requirements.

Applications information

As part of a VM600^{Mk2}/VM600 system, XMx16 + XIO16T extended condition monitoring modules are ideal for the high-performance condition monitoring of critical assets such as gas, steam or hydro turbines and other high-value rotating machines in a wide range of industrial applications.

For further information, contact your local Meggitt representative.

SPECIFICATIONS

Speed and phase reference (tachometer) inputs

Number of independent channels	: 4
Speed measurement	: 1 to 100000 RPM (0.017 Hz to 1.667 kHz)
Speed measurement resolution	: 5 ns
Edge detection	: Rising or falling
Input signal type	: Tachometer channels 1 and 2 support voltage and current inputs. Tachometer channels 3 and 4 support voltage inputs only.
Current measuring resistor	: 200 Ω
Tachometer voltage range	: −20 to +20 V_{DC}
Tachometer current range	: −30 to +30 mA
Input impedance	: ≥100 kΩ
Maximum pulses per revolution	: Up to 128 for speed calculation. 1 only for phase reference.
Triggering thresholds	: Rising at 2/3 of peak-to-peak value. Falling at 1/3 of peak-to-peak value.
Input voltage range	: 0.8 to 500 $V_{PEAK-PEAK}$ in range 0.3 Hz to 10 kHz. 2.0 to 500 $V_{PEAK-PEAK}$ in range 10 kHz to 50 kHz.
Minimum input voltage for reliable detection	
• Square-wave input signal	: 0.8 $V_{PEAK-PEAK}$ (0.016 Hz to 10 kHz). 2.0 $V_{PEAK-PEAK}$ (10 kHz to 50 kHz).
• Sinusoidal input signal	: 10.0 $V_{PEAK-PEAK}$ (0.016 Hz to 1 Hz). 2.0 $V_{PEAK-PEAK}$ (1 Hz to 10 Hz). 0.8 $V_{PEAK-PEAK}$ (10 Hz to 10 kHz). 2.0 $V_{PEAK-PEAK}$ (10 kHz to 50 kHz).
Range of DC component	: −20 to +20 V
Maximum common mode voltage	: ±50 V
Protection filters	: Filtered for protection against EMI (electromagnetic interference), conforming to CE standards
VM600^{Mk2}/VM600 rack tachometer signal sharing	
• XMC16, XMV16 and XMVS16	: To and from the VM600^{Mk2}/VM600 Tacho bus

Dynamic inputs

Number of independent channels	: 16
A/D converter	: 24 bit
Maximum sampling rate	: 98 kHz
Dynamic input (voltage)	: −30 to +30 V (20 V_{DC} + 10 V_{AC}) (input impedance ≥ 200 kΩ)
Dynamic input (current)	: −25 to +25 mA (current measuring resistor = 100 Ω)
Accuracy	
• Amplitude	: 1% of input FSD over a reduced operating temperature range of 0 to 55°C (32 to 131°F). 2% of input FSD over the full operating temperature range of 0 to 65°C (32 to 149°F).
• Phase	: −1.35° (up to 1 kHz bandwidth, no HP filter). −6.70° (up to 5 kHz bandwidth, no HP filter).
Measurement range	
• AC	: 0.1, 0.25, 0.5, 1.0, 2.5, 5.0, 10.0 V_{PEAK} FSD
• AC/DC	: 5.0, 10.0 V_{PEAK} FSD
• DC	: −20 to +20 V

SPECIFICATIONS *(continued)*

Frequency bandwidth	
• AC	: 0.10 Hz to 38 kHz (HP filter at −3 dB). An optional (software configurable) high-pass filter can be added to the AC path to increase the HP cutoff frequency to 1.0 Hz, 3.0 Hz or 10.0 Hz.
• DC	: DC to 1.0 Hz (LP filter at −3 dB)
Signal to noise ratio (SNR)	: 115 dB (1 kHz measurement bandwidth with 2.5 V_{PEAK} FSD). 105 dB (10 kHz measurement bandwidth with 2.5 V_{PEAK} FSD). 100 dB (full bandwidth).
Crosstalk attenuation	: Typically 80 dB
Maximum common mode voltage	: 50 V
CMRR	: 75 dB at 50/60 Hz
Protection filters	: Filtered for protection against EMI (electromagnetic interference), conforming to CE standards
VM600^{Mk2}/VM600 rack dynamic signal sharing	
• XMC16 and XMV16	: From the VM600^{Mk2}/VM600 Raw bus only. Note: The Raw bus is typically used to share sensor signals between MPC4^{Mk2} / MPC4 modules (machinery protection) and XMx16 modules (condition monitoring). For example, MPC4 modules put signal(s) on the bus and XMx16 modules take them.
• XMVS16	: VM600^{Mk2}/VM600 Raw bus not supported

Principal mode

The principal data acquisition mode is the main acquisition mode for XMx16 modules and is used to obtain measurements (waveforms, spectra and extracted data) from a dynamic input channel. The measurements are acquired continuously by VibroSight® (every 1 second), making the principal mode suitable for monitoring machinery that is operating under nominal, steady state conditions such as increasing vibration levels, and for the capture of transients. Principal mode measurements can be displayed in the VibroSight Vision software and logged to a VibroSight Server database.

Fixed-frequency bandwidth (asynchronous)	: 40 Hz to 38 kHz (configurable)
Order-tracking speed range (synchronous)	: 15 to 100000 RPM
Order-tracking bandwidth (synchronous)	: 1.56, 3.125, 6.25, 12.5, 25, 50, 100, 200 and 400 orders
Measurement resolution	: 256 to 16384 point waveform / 100 to 6400 line spectrum
FFT window	: Blackman, Blackman-Harris, Flat top, Hann (Hanning), Hamming, Rectangular
Data sampling rate	: 2.56 x frequency bandwidth
Update rate (internal to module)	
• 100 to 1600 line spectra (256 to 4096 point waveforms)	: 100 ms
• 3200 line spectra (8192 point waveforms)	: 200 ms
• Spectrum size of 6400 lines (16384 point waveforms)	: 500 ms
Averaging	
• Time domain	: Complex averaging with a configurable exponential decay factor
• Frequency domain	: Mean, peak-hold or RMS averaging with a configurable exponential decay factor
Spectral data aggregation	: Peak-hold spectrum generated from the module's internal spectra (from the proceeding 1 s time period)

SPECIFICATIONS *(continued)*

Extracted variable	: 20 per processing block (configurable)
Extracted variable type	: Amplitude, phase and frequency (configurable)
Integration count	: 0, 1 or 2
Qualifiers (rectifiers)	: Time domain qualifiers: true peak, true RMS, true peak-to-peak, minimum, maximum, average, electrical DC and common-mode voltage. Frequency domain qualifiers: RMS, peak (scaled peak) and peak-to-peak (scaled peak-to-peak).
VibroSight® software update rate	
• Via VibroSight Server	: 1 s
• Via device (direct) connection to module	: Up to 100 ms
Data logging rate	
• Scheduled (time based)	: 1 s maximum for all data (waveform, spectra and extracted data)
• Pre-trigger (alarm event based)	: 100 ms maximum for static data (extracted data), depending on the XMx16 module buffer memory allocated to static data
• Post-trigger (alarm event based)	: 100 ms maximum for static data (extracted data), for up to 1 hour

Auxiliary mode

To complement the measurements obtained using the principal data acquisition mode, the auxiliary data acquisition mode allows more detailed measurement data (such as higher-resolution waveforms and spectra) to be obtained from the machinery being monitored, at reduced update rates. Auxiliary mode measurements can be displayed in the VibroSight Vision software and logged to a VibroSight Server database

Fixed-frequency bandwidth (asynchronous)	: 40 Hz to 38 kHz (configurable)
Order-tracking speed range (synchronous)	: 15 to 100000 RPM
Order-tracking bandwidth (synchronous)	: 1.56, 3.125, 6.25, 12.5, 25, 50, 100, 200 and 400 orders
Measurement resolution	: 256 to 16384 point waveform / 100 to 6400 line spectrum
FFT window	: Rectangular, Hanning, Hamming, Flat top, Blackman and Blackman-Harris
Data sampling rate	: 2.56 x frequency bandwidth
Integration count	: 0, 1 or 2
Averaging	: Time domain (complex) and frequency domain (mean, RMS, peak hold)
Data logging rate	: 10 min maximum, on a scheduled basis

Direct mode

The direct data acquisition mode is used to obtain a digitised continuous long-duration waveform from a dynamic input channel for the time leading up to an alarm event. Direct mode data is a resampled waveform taken directly from the XMx16 module itself with no processing (such as FFT, averaging or filtering) applied. This pre-event direct data is recorded in files on a local hard disk drive of the computer running the VibroSight Server. Direct mode measurements cannot be displayed in the VibroSight Vision software so a third-party program is required for data visualisation.

Fixed-frequency bandwidth (asynchronous)	: 40 Hz to 38 kHz (configurable)
Data sampling rate	: 2.56 x frequency bandwidth
Recording rate	: Configurable pre-event logging duration (up to 15360000 samples), for up to 15 alarm events

SPECIFICATIONS *(continued)*

Pre-event data (buffers)

XMx16 module buffer for static data (extracted data) – principal mode and auxiliary mode

- On-board memory : A maximum of 1140 static data sets (extracted data) for all processing blocks
- Data logging rate : 100 ms and/or 1 s

XMx16 module buffer for dynamic data (waveforms and spectra) – principal mode and auxiliary mode

- On-board memory : A maximum of 42 dynamic data sets (waveforms and/or spectra) for a processing block
- Data logging rate : 100 ms, 1 s and/or 10 s

VibroSight Server software buffer – direct mode

- Host computer memory (hard disk drive) : A maximum of 15360000 samples (continuous long-duration waveform) per processing block
- Data storage rate : "Streamed" to file

Time synchronisation

Time reference for XMx16 : Network time protocol (NTP) server

Protocol used between VM600^{Mk2}/VM600 modules and host computer : Network time protocol (NTP)

Communication interfaces

External (Ethernet)

- Number : 1 port / 2 connectors.
  Available on ETHERNET connectors of the XMx16 + XIO16T module (see **Connectors on page 9**).
- Network interface : 1000BASE-T
- Data transfer rate : Up to 1000 Mbps (1 Gbps)
- Maximum distances : The Ethernet port on the XMx16 can support a distance of up to 100 m at 1000 Mbps (1000BASE-T compliant).
  The Ethernet port on the XIO16T can support a distance of up to 60 m at 1000 Mbps.
  For distances greater than the specified maxima, the modules operate at reduced data transfer rates.
  Note: The Ethernet port/connectors (ETHERNET) is used to connect a XMx16 + XIO16T module to a computer or network. Either the connector on the XMx16 or the connector on the associated XIO16T can be used. However, for long distance transmission (over 60 m) it is recommended to use the connector (port) on the front panel of the XMx16 processing module.
- Protocols : TCP/IP (proprietary protocols) for communication with a computer running software such as VibroSight®

SPECIFICATIONS *(continued)*

System communications

External : System communication interface (Ethernet) for communication with VibroSight® software running on an external computer

Internal – VM600^{Mk2}/VM600 rack buses : XMC16, XMV16 and XMVS16 can use VM600^{Mk2}/VM600 Tacho bus (up to 6 lines) to share tachometer input signals between modules in a rack.
XMC16 and XMV16 can use VM600^{Mk2}/VM600 Raw bus (up to 32 lines) to share dynamic input signals between modules in a rack.

Note: Generally, in a VM600^{Mk2} rack (ABE4x), the Raw bus is used to share dynamic input signals between processing modules, the Tacho bus is used to share tachometer (speed) input signals between processing modules, and the Open collector (OC) bus is used by processing modules to drive relay modules, all in the same rack. For example, the Raw bus and the Tacho bus are commonly used to share sensor signals (vibration and speed respectively) between different machinery protection modules and/or condition monitoring modules.

External communication links/connections

- Connection to a computer/network : The system communication interface (ETHERNET connectors on XMx16 + XIO16T module) can be used for connections/ communications between the XMx16 + XIO16T module and a computer/network, using standard Ethernet cabling.
See **Connectors on page 9**.
- VibroSight® software : Used for the configuration and operation of VM600^{Mk2}/VM600 systems

Configuration

XMx16 + XIO16T module : Fully software configurable via/over Ethernet, using a computer running the VibroSight® software

Environmental

Temperature

- Operating : 0 to 65°C (32 to 149°F)
- Storage : −40 to 85°C (−40 to 185°F)

Humidity

- Operating : 0 to 90% relative humidity (RH), non-condensing
- Storage : 0 to 95% relative humidity (RH), non-condensing

Approvals

Conformity : EAC marking, Eurasian Customs Union (EACU) certificate/ declaration of conformity

Electromagnetic compatibility : TR CU 020/2011

Electrical safety : TR CU 004/2011

Russian federal agency for technical regulation and metrology (Rosstandart) : Pattern approval certificate OC.C.28.004.A N° 60224

SPECIFICATIONS *(continued)*

Power supply to module (input)

Power source	: VM600^{Mk2}/VM600 rack power supply
Supply voltages	: +5 V_{DC} and ±12 V_{DC}
Consumption from +5 V_{DC} supply	: <14 W
Consumption from +12 V_{DC} supply	: <8 W
Consumption from −12 V_{DC} supply	: <4 W
Total power consumption (XMx16 + XIO16T module	: <26 W

Status indicators (LEDs)

XMx16

• STATUS and DATA	: Multicolour LEDs used to indicate the status of the XMx16 + XIO16T module, such as normal operation, configuration status or problems
• ETHERNET	: ETHERNET connector link and activity LEDs to indicate the status of the system Ethernet communications
• ACT and LINK	: Separate Activity and Link LEDs used to indicate the status of the system Ethernet communications

XIO16T

• STATUS	: LED used to indicate the configuration status of the XMx16 + XIO16T module and if it is communicating (exchanging data)
• ETHERNET	: ETHERNET connector link and activity LEDs to indicate the status of the system Ethernet communications

Connectors

XMx16

• ETHERNET	: 8P8C (RJ45) modular jack, female. System Ethernet for communication between the XMx16 + XIO16T module and a computer running the VibroSight® software (or a CPUx module). See also **Communication interfaces on page 7**.

XIO16T

• J1	: 12-pin S2L connector (male), compatible with 12-pin B2CF plug-in connectors (female) with PUSH IN spring connections and B2L plug-in connectors (female) with tension clamp spring connections. Control signal inputs (DSI) and open collector (OC) outputs – reserved for future use.
• J2	: 12-pin S2L connector (male), compatible with 12-pin B2CF plug-in connectors (female) with PUSH IN spring connections and B2L plug-in connectors (female) with tension clamp spring connections. Inputs (analog signals) for the tachometer channels (CH1 to CH4).
• J3	: 24-pin S2L connector (male), compatible with 24-pin B2CF plug-in connectors (female) with PUSH IN spring connections and B2L plug-in connectors (female) with tension clamp spring connections. Inputs (analog signals) for the dynamic channels (CH1 to CH8).
• J4	: 24-pin S2L connector (male), compatible with 24-pin B2CF plug-in connectors (female) with PUSH IN spring connections and B2L plug-in connectors (female) with tension clamp spring connections. Inputs (analog signals) for the dynamic channels (CH9 to CH16).

SPECIFICATIONS *(continued)*

• ETHERNET	: 8P8C (RJ45) modular jack, female. System Ethernet for communication between the XMx16 + XIO16T module and a computer running the VibroSight® software (or a CPUx module). See also **Communication interfaces on page 7**.

Notes
The connectors are removable to simplify installation and mounting.
B2CF plug-in connectors are recommended for all new installations, due to issues arising from the incorrect use of the B2L plug-in connectors. See **Recommendations for reliable connections on page 12**.

Physical

XMx16

• Height	: 6U (262 mm, 10.3 in)
• Width	: 20 mm (0.8 in)
• Depth	: 187 mm (7.4 in)
• Weight	: 0.39 kg (0.86 lb) approx.

XIO16T

• Height	: 6U (262 mm, 10.3 in)
• Width	: 20 mm (0.8 in)
• Depth	: 125 mm (4.9 in)
• Weight	: 0.32 kg (0.71 lb) approx.

ORDERING INFORMATION

To order please specify

Type	Designation	Ordering number (PNR)
	Different versions of the VM600^{Mk2} XMx16 + XIO16T modules:	
XMC16	Extended monitoring module for combustion	600-052
XMV16	Extended monitoring module for vibration	600-053
XMVS16	Extended monitoring module for vibration (Note: Same as XMV16 but without support for the VM600 Raw bus)	600-054
XIO16T	Extended input/output module (for combustion or vibration)	620-002-000-213
	Different versions of the VM600 XMx16 + XIO16T modules:	
XMC16	Extended monitoring module for combustion	600-002
XMV16	Extended monitoring module for vibration	600-003
XMVS16	Extended monitoring module for vibration (Note: Same as XMV16 but without support for the VM600 Raw bus)	600-016
XIO16T	Extended input/output module (for combustion or vibration)	620-002-000-113

Notes

The VM600^{Mk2} versions and the VM600 versions of the XMx16 + XIO16T extended monitoring modules are the same, except for the specific artwork/branding/finish. More specifically, the front panels of the modules are bare aluminium for the VM600^{Mk2} versions (PNRs 600-05x and 620-002-000-213) and painted for the VM600 versions (PNRs 600-00x, 600-01x and 620-002-000-113).

The VM600^{Mk2}/VM600 XMC16 + XIO16T extended monitoring modules are optimised for combustion applications, such as combustion dynamics and dynamic pressure pulsation monitoring and analysis. Accordingly, XMC16 + XIO16T modules are compatible with the VibroSight® software's optional "Combustion monitoring" application specific package.

The VM600^{Mk2}/VM600 XMV16 + XIO16T extended monitoring modules are optimised for vibration applications, such as high-performance machinery vibration monitoring and analysis, including rolling-element bearing analysis and/or Hydro air-gap and magnetic-flux monitoring and analysis. Accordingly, XMV16 + XIO16T modules are compatible with the VibroSight® software's optional "Hydro air-gap monitoring" application specific package.

The VM600^{Mk2}/VM600 XMVS16 + XIO16T extended monitoring modules are the same as the XMV16 + XIO16T modules (that is, same features and capabilities) except that the XMVS16 + XIO16T do not support the VM600^{Mk2}/VM600 rack's Raw bus. Accordingly, XMVS16 + XIO16T modules cannot be used to share dynamic (vibration) channel signals via the VM600 Raw bus. In practice, this means that all of the dynamic (vibration) input signals for an XMVS16 processing module must be wired to the connectors on the associated XIO16T module.

ACCESSORIES

Type	Designation	Ordering number (PNR)
Tachometer inputs cable	Cable assembly for use with the XIO16T module's J1 or J2 connectors (12-pin)	957.18.40.0617
Dynamic inputs cable	Cable assembly for use with the XIO16T module's J3 or J4 connectors (24-pin)	957.18.40.0616

Notes

As shown, one end of these 1.5 m cable assemblies uses a B2CF connector (left) for connection to the XIO16T module, while the other end provides male BNC connectors (right) for connecting each input signal.

RECOMMENDATIONS FOR RELIABLE CONNECTIONS

It is highly recommended to terminate all wires connected to the B2CF plug-in connectors used by J1, J2, J3 and J4 of the XIO16T input/output module by crimping them with the ferrules supplied in the XIO16T wire-end ferrule kit, in order to help ensure consistent and reliable connections.

Accordingly, the XIO16T wire-end ferrule kit – containing 100 x H0,34/12 TK ferrules and 100 x H0,5/16 OR ferrules – is supplied with each VM600^{Mk2}/VM600 rack that contains XMx16 + XIO16T extended condition monitoring modules, and with all spare XIO16T modules.

Refer to the *Interfacing to the XIO16T card: recommendations for reliable connections application note* (VibroSight application note 007) and *XIO16T Wire-end ferrule kit instruction sheet* for further information.

RELATED PRODUCTS

VM600^{Mk2} (second generation)

ABE04x	VM600^{Mk2}/VM600 system racks	: Refer to corresponding data sheet
ABE056	VM600^{Mk2}/VM600 slimline rack	: Refer to corresponding data sheet
ASPS	VM600^{Mk2}/VM600 auxiliary sensor power supply	: Refer to corresponding data sheet
CPUM^{Mk2} + IOCN^{Mk2}	VM600^{Mk2} rack controller and communications interface module	: Refer to corresponding data sheet
MPC4^{Mk2} + IOC4^{Mk2}	VM600^{Mk2} machinery protection and condition monitoring module	: Refer to corresponding data sheet
RLC16^{Mk2}	VM600^{Mk2} relay module	: Refer to corresponding data sheet
RPS6U	VM600^{Mk2}/VM600 rack power supplies	: Refer to corresponding data sheet

VM600 (first generation)

ABE04x	VM600^{Mk2}/VM600 system racks	: Refer to corresponding data sheet
ABE056	VM600^{Mk2}/VM600 slimline rack	: Refer to corresponding data sheet
AMC8 and IOC8T	VM600 analog monitoring card pair	: Refer to corresponding data sheet
ASPS	VM600^{Mk2}/VM600 auxiliary sensor power supply	: 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 and IOC4T	VM600 machinery protection card pair	: Refer to corresponding data sheets
RLC16	VM600 relay card	: Refer to corresponding data sheet
RPS6U	VM600^{Mk2}/VM600 rack power supplies	: Refer to corresponding data sheet

Meggitt (Meggitt PLC) is a leading international engineering company, headquartered in England, that designs and delivers high-performance components and subsystems for aerospace, defence and selected energy markets. Meggitt comprises four customer-aligned divisions: Airframe Systems, Engine Systems, Energy & Equipment and Services & Support.

The Energy & Equipment division includes the Energy Sensing and Controls product group that specialises in sensing and monitoring solutions for a broad range of energy infrastructure, and control valves for industrial gas turbines, primarily for the Power Generation, Oil & Gas and Services markets. Energy & Equipment is headquartered in Switzerland (Meggitt SA) and incorporates the vibro-meter® product line, which has over 65 years of sensor and systems expertise and is trusted by original equipment manufacturers (OEMs) globally.

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

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