MEGGiTT Vibro-Meter®

Upgrading your condition monitoring system to VibroSight® and VM600 XMV16

Introduction

Meggitt is always committed to providing the best technology and solutions for industrial machinery protection systems (MPS) and condition monitoring systems (CMS). We are constantly improving existing products and developing new products, in order to help drive our industry forward.

Since the era of condition monitoring solutions based on the VM600 CMS software and VM600 CMC16/IOC16T card pairs (CMS/CMC16), our products have evolved markedly*. To the extent that our equivalent solutions today based on the latest generation VibroSight® software and VM600 XMV16/XIO16T card pairs (VibroSight®/XMV16) enable condition-based maintenance programmes which are easier to use, higher performing and more cost-effective than ever before.

Accordingly, we strongly recommend that existing CMS/CMC16 systems are replaced with the VibroSight®/XMV16 systems in order to take advantage of the speed and the power of the VibroSight® software and avoid problems of reliability and obsolescence.

Photo of VM600 rack containing XMV16/XIO16T conditioning monitoring card pairs and MPC4/IOC4T machinery protection card pairs

* VibroSight®/XMV16 solutions officially replaced CMS/CMC16 solutions in 2013 and CMS/CMC16 systems were discontinued in 2014.

Why upgrade?

VibroSight®/XMV16 condition monitoring system benefits and features

Continuous software development and the latest technologies characterise the condition monitoring solutions based on the VibroSight® software and VM600 XMV16/XIO16T card pairs. As a result, VibroSight®/XMV16 solutions provide many benefits and features when compared against existing systems:

VibroSight® is fast because it uses data repositories consisting of a specialised and proprietary system of files designed and highly optimised for the high-speed storage and retrieval of data.

- **Continuous, accurate and detailed data acquisition** – seamless data with enhanced measurement resolution (24-bit) and update rate (100 ms) for more accurate machine transient analysis.

- **Custom monitoring approach** – VibroSight® software uses VibroSight® historical data repositories, highly-optimised data handling and integrated data management to significantly reduce the performance bottlenecks associated with the use of standard databases in machinery monitoring systems.

- **Enhanced condition monitoring capabilities** – VibroSight® data analysis tools support enhanced data interpretation to enable a rapid and efficient detection of early signs of failure. For example, multiple run-ups can be displayed in parallel to support a precise and more accurate analysis of machine critical speed characteristics.

- **Flexible and scalable solution** – expanding and/or extending the monitoring system is cost effective and straightforward, simply requiring that the VibroSight® software licence is updated to add measurement channels, communication interfaces (such as Modbus and OPC client/server tags) and application specific packages (such as ‘hydro monitoring’, ‘combustion monitoring’ and ‘mathematical outputs’).

Why upgrade?

VibroSight®/XMV16 condition monitoring system benefits and features (*continued*)

- **Fully integrated solution** – industry standard communication interfaces (Modbus RTU, Modbus TCP, OPC DA and OPC HDA) for ease of data sharing with third-party plant supervisory and control systems such as DCS, PLC and/or SCADA. In addition, VibroSight® data repositories can import and log process data in order to support a complete analysis of machine operation and correlation with plant processes, from a single repository.

- **Enterprise-wide applications** – remote data access and data transfer, including automatic VibroSight® data repository synchronisation, enables remote monitoring and diagnostics even for systems in cyber-secure environments using ‘data diodes’ or firewalls and helps ensure data integrity in environments with ureliable networks.

- **Common software platform for all machinery monitoring** – VibroSight® software supports both VM600 rack cards and VibroSmart® distributed monitoring system (DMS) devices, which are ideal for the monitoring of balance of plant (BOP) equipment, enabling an enterprise-level view of all plant machinery health to support condition-based (predictive) maintenance programmes.

- **No obsolescence issues** – the product lifetime of VibroSight®/XMV16 solutions is just starting.

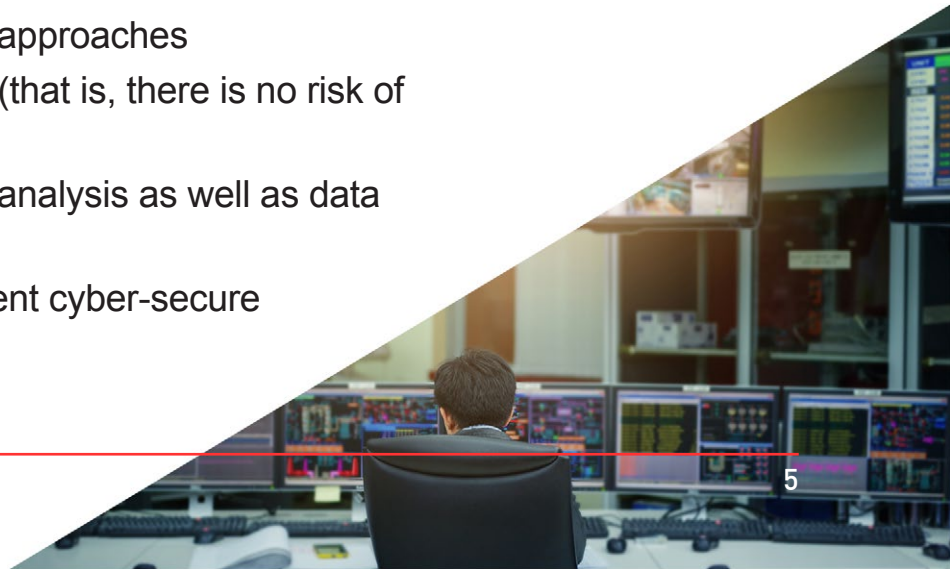
VibroSight® software

VibroSight® is the latest generation software from Meggitt for the effective monitoring of all rotating machinery. It is designed for the configuration, operation and management of monitoring system hardware such as VM600 rack-based systems and VibroSmart® distributed monitoring systems and offers a single comprehensive machinery condition monitoring platform at plant and/or enterprise levels.

The VibroSight® software uses a client-server architecture and VibroSight® historical data repositories in order to stream live data or display historical data recorded over months in just fractions of a second. And unlike some competitor's products, VibroSight® has an active development team so there are regular new releases bringing new features and functionality.

Benefits

- Highly-integrated software suite with a user-friendly interface for a system that is easy and straightforward to understand and to use
- Seamless and open access to data
- Unrivalled capabilities to manage and display very large quantities of data
- Highly-configurable monitoring system for various custom monitoring approaches
- Data integrity maintained and guaranteed in all operational situations (that is, there is no risk of data loss)
- Integrated data management tools enabling simple and efficient data analysis as well as data backup and purging
- Designed for remote data access and data transfer in the most stringent cyber-secure environments.



VM600 XMV16/XIO16T hardware

The VM600 XMV16/XIO16T card pair was developed using the latest technology for more, higher-quality data. For example, these enhanced measurements enable analysis of smaller amplitude signals, continuous data acquisition provides seamless data, and the faster data update rates support more detailed event analysis.

Comparison of XMV16/XIO16T and CMC16/IOC16T card pairs

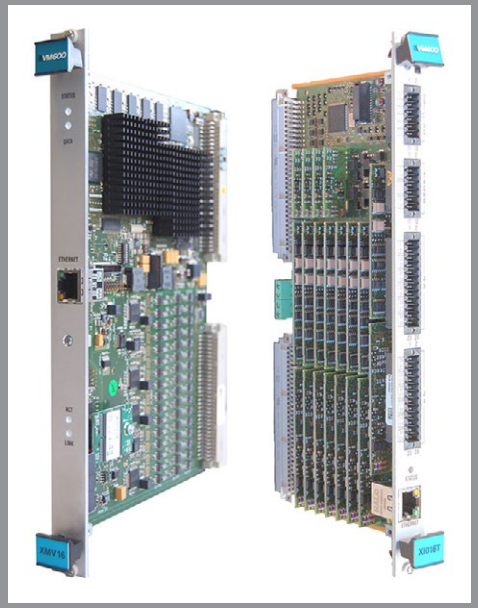
Feature	XMV16/XIO16T	CMC16/IOC16T
Channel count	20 channels: 16 dynamic and 4 tachometer. Note: Up to 240 channels per VM600 rack (12 card pairs).	16 channels: 16 dynamic, of which up to 4 of can be configured as tachometer. Note: Up to 192 channels per VM600 rack (12 card pairs).
Tachometer channel speed range	1 to 100000 RPM	15 to 30000 RPM
Dynamic channel bandwidth	0 to 38 kHz	0 to 20 kHz
Dynamic channel analog to digital converter (ADC)	24 bit	12 bit
Dynamic channel signal to noise ratio (SNR)	105 dB	70 dB
Data acquisition	Continuous (simultaneous)	Quasi-continuous (sequential)
Data update rate	100 ms (guaranteed)	1 s (depending on machine speed and system performance)
Number of measurements (data extractions)	20 per dynamic channel / 320 per card pair	10 per dynamic channel / 160 per card pair
Spectrum resolution	Up to 6400 lines	Up to 400 lines

VM600 XMV16/XIO16T hardware

Comparison of XMV16/XIO16T and CMC16/IOC16T card pairs (*continued*)

Feature	XMV16/XIO16T	CMC16/IOC16T
Maximum throughput	16 x 6400 line spectra every 100 ms	16 x 6400 line spectra every 1 to 2 s
Triggering (alarm)	Both pre-trigger and post-trigger data logging	Only post-trigger data logging
Time sychronisation	Computer clock or network time protocol (NTP)	Computer clock
Communications	1 Gbps 'Gigabit' Ethernet (1000BASE-T), directly on XMV16 and XIO16T cards	10/100 Mbps Ethernet (100BASE-T), indirectly via CPUx card
Hardware configuration	Fully software configurable (automatic)	Jumpers and switches (manual)

Photo of XMV16/XIO16T card pair



VibroSight® data display and analysis

In VibroSight® Vision, an extensive catalogue of plots is available to support the display, visualisation and analysis of measurement data for vibration and other applications. In order to display your data in the way that you want, VibroSight® Vision projects and plots are fully customisable for arrangement and layout of windows, unit preferences (metric, imperial or custom) and conventions such as default angle and plot organisation.

*A VibroSight® Vision Polar plot displaying a measurement configured with an 'acceptance region' alarm is equivalent to the 'Acceptance region plot' in some competitor's products.

Plot catalogue

Whenever a plot is updated in VibroSight® Vision, the available measurement data is automatically and rapidly processed in order to optimally select the data points required to accurately display the data in plots such as:

- **Basic plots** – Trend, Table, Bar Chart, Spider, Waveform, Long Waveform, Polar Waveform, Spectrum
- **Composed plots** – Bode, Polar, Acceptance region*, Orbit, Shaft Centerline, Correlation
- **3D plots** – Corbit (cascaded orbit), Waterfall/Cascade, Spectrogram.

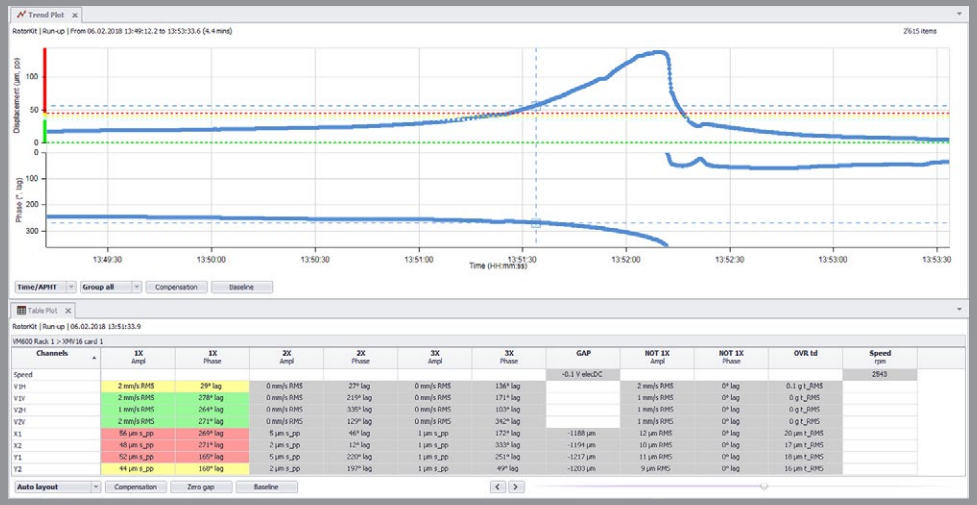
Cursors and zooming

Data navigation tools such as cursors and zooming are optimised to facilitate the interpretation of the data. Main and delta cursors support the analysis of data in a single plot. The main cursor can be synchronised across multiple different plots in order to make it easier to find and analyse all of the measurement data corresponding to a particular event or time period. Similarly, zooming supports the analysis of data in more detail in a single plot, and zooming can also be synchronised across multiple different plots.

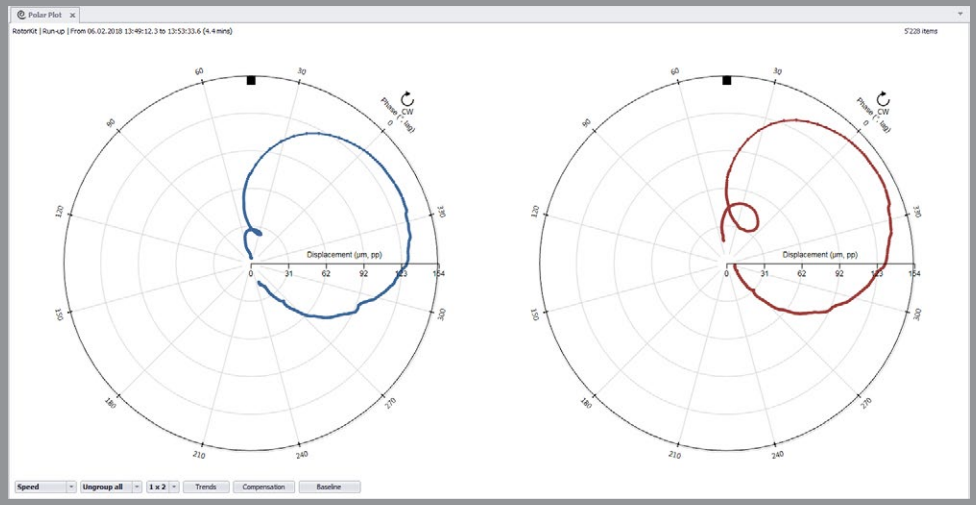
Data export

The measurement data displayed in a VibroSight® Vision plot can be quickly and easily exported as an image or as data to help information sharing and the writing of condition monitoring reports.

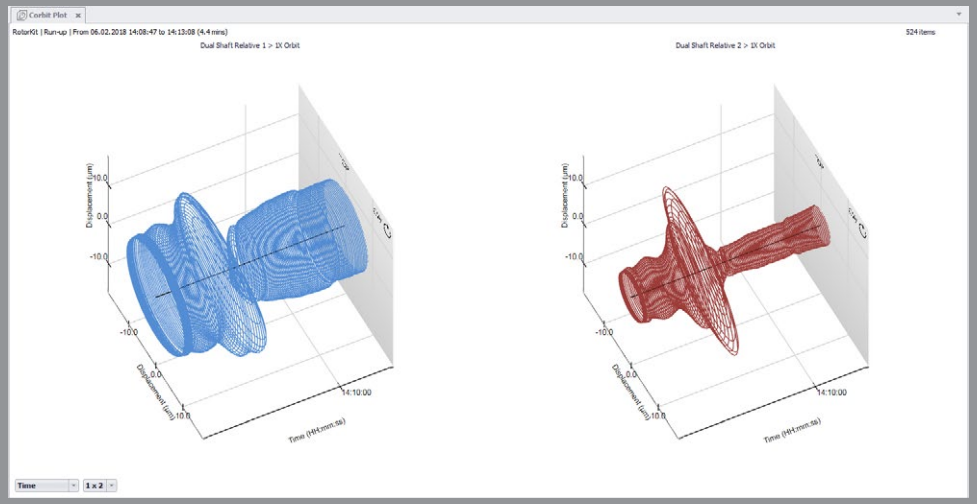
Example VibroSight® Vision plots



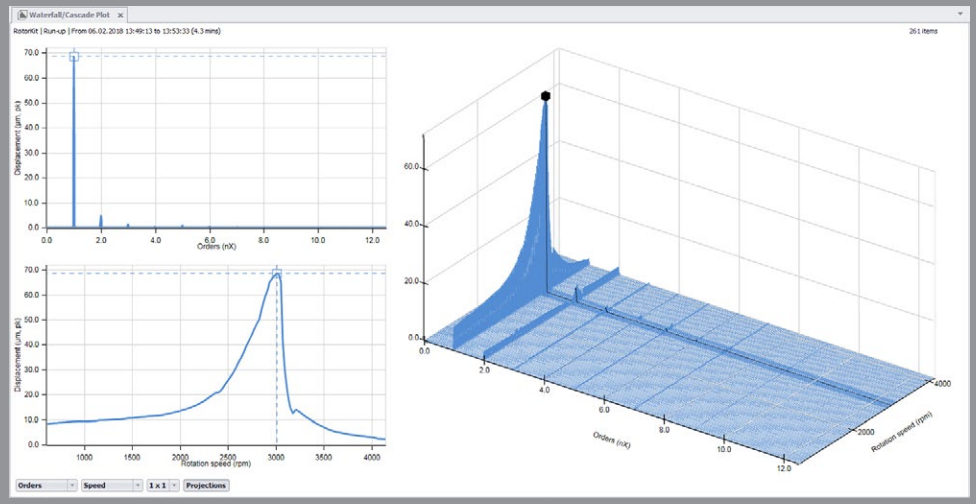
Trend plot (top) and Table plot (bottom)



Polar plot



Corbit (cascaded orbit) plot



Waterfall/Cascade plot

VibroSight® integrated data management

Just as “great power comes with great responsibility”, lots of data requires a data management strategy.

VibroSight®/XMV16 systems are highly configurable and can be used to capture as much (or as little) data as your condition-based maintenance programme requires. So even though VibroSight® and its data repositories have been specifically designed to guarantee high-performance with ultra-fast data retrieval and display, and the cost of data storage keeps falling, having a workable data management strategy remains as important as ever in order to protect your valuable data.

Good data management improves overall system performance and operational efficiency, and helps ensure quick recovery with minimal data loss due to various random events such as human error, hardware failure or cyber-security attacks (malware). This is why VibroSight® integrates support for data management that simplifies the configuration and execution of standard data repository copy, purge and backup operations:

- **Offline data storage** – typically used for regular copies of the most recent data in the data repository used by the VibroSight® Server, in order to send data to other systems or for offline data analysis.
- **Data purge** – typically used for regular purges of the data repository used by the VibroSight® Server (after the data has been copied to offline data storage).
- **Data repository backup** – used for regular (daily) backups of the data repository used by the VibroSight® Server, essential for data recovery in the unlikely event of catastrophic hard disk drive failure.

These data management operations are configured in VibroSight® Configurator and then automatically scheduled and run by the VibroSight® Server as a series of smaller ‘incremental’ operations that provide the required data management without reducing the overall system performance. VibroSight® Server also reports the status of the data management so you can be confident that your data will be there when you need it.

How to upgrade?

VM600 XMV16/XIO16T condition monitoring card pairs are 100% compatible with existing VM600 racks, power supplies and cards such as MPC4/IOC4T machinery protection card pairs, AMC8/IOC8T analog monitoring card pairs and RLC16 relay cards. As before, this allows condition monitoring and machinery protection from a single rack while still supporting the ‘segregation’ required by the API 670 standard for machinery protection systems. Just as importantly, it helps to keeps costs down and makes upgrading easy.

The 64-bit version of VibroSight® takes full advantage of the power of 64-bit computing (more memory and a faster bus architecture) to improve overall system performance, which is important for large-scale applications.

Upgrading an existing CMS/CMC16 system to a VibroSight®/XMV16 system is as simple as:

- **Replacing the CMC16/IOC16T card pairs with XMV16/XIO16T card pairs**
  Existing measurement chains (sensors, signal conditioners, galvanic separation units and cabling) can be reused or repurposed to further reduce costs.

- **Replacing the VM600 CMS software with the VibroSight® software**
  VibroSight® is available as 64-bit software for more demanding machinery monitoring applications or as 32-bit software for less demanding applications.

- **Connecting the XMV16/XIO16T card pairs and the computer running VibroSight® via an (Ethernet) network**
  XMV16/XIO16T card pairs support Gigabit Ethernet data transfer rates of up to 1000 Mbps (1 Gbps).

In order to access legacy data from an existing CMS/CMC16 system, the VM600 CMS software must be used in parallel with VibroSight®. If required, both VibroSight® and the VM600 CMS software can run on the same computer.

MEGGiTT Vibro-Meter®

So what are you waiting for?

Greater efficiency, higher productivity, better output, and reduced safety risks are all waiting for you.
To learn more about how Meggitt Vibro-Meter® condition monitoring systems can help your power plant reach its goals, simply speak to your local contact today.

Alternatively, visit our new website at:
www.meggittsensing.com/energy

Browse technical information 24/7 and find the right product for your application.

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