RELEASE NOTES

Machinery Protection System

VM600 MPSx Software
version 2.7 build 036

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REVISION RECORD SHEET

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PREFACE

About these release notes

These release notes provide important information about the VM600 MPSx software from Meggitt Sensing Systems. They are applicable to all installations using the version of VM600 MPSx software described by this document, namely:

- VM600 MPS1 software version 2.7 build 036 (CD part number 209-500-100-027)
- VM600 MPS2 software version 2.7 build 036 (CD part number 209-500-200-027).

The release notes contain information about changes from previous versions, such as new features and improvements, solved problems, bug fixes, and compatibility (hardware and software).

Users who are familiar with previous versions of the VM600 MPSx software may also find it useful to refer to the respective release notes included in this document.

Important information to read before installing

The version of VM600 MPSx software included on the CD may not be the latest version and may be different from any version already installed.

In order to ensure the reliable operation of a VM600 system, the version of the VM600 MPSx software used (that is, MPS1 or MPS2) must be compatible with the versions of firmware running on the VM600 cards. For further information, see 5 Compatibility.

Particular versions of VM600 MPSx software can be obtained from the following Meggitt FTP site (web browser recommended):
• Host: https://ftp.mss.mymeggitt.com
• Login ID: mps
• Password: F0j3S6YB

NOTE:	On this FTP site, the “Latest” folder always contains the latest official release of the VM600 MPSx software.

Please contact Meggitt Sensing Systems Customer Support if you require further assistance.

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1 Introduction

This document relates to version 2.7 build 036 of the MPS1 and MPS2 configuration software packages for use with VM600 series machinery protection systems from Meggitt Sensing Systems' Vibro-Meter® product line.

It contains important information about changes from previous versions, hard- and software compatibility, solved problems, improvements, new features and bug fixes, compared to the previous release.

For more general information on the VM600 MPSx software, or the entire machinery protection system, please refer to the following Meggitt Sensing Systems (MSS) documentation (included on the CD-ROM, as well as into the installed system by the installation routine):

-  *VM600 MPS1 software for machinery protection systems software manual*, (MSS document ref. MAMPS1-SW/E)
-  *VM600 MPS2 software for machinery protection systems software manual*, (MSS document ref. MAMPS2-SW/E)
-  *VM600 machinery protection system (MPS) hardware manual*, *standard version*, (MSS document ref. MAMPS-HW/E)
-  *VM600 machinery protection system (MPS) hardware manual*, *CSA version*, (MSS document ref. MAMPS-HW/E-CSA)
-  *VM600 networking manual*, (MSS document ref. MAVM600-NET/E)
-  *VM600 functional safety manual*, (MSS document ref. MAVM600-FS/E)
-  *Firmware (embedded software) upgrades for cards in a VM600 rack manual*, (MSS document ref. MAVM600-FW/E).

Users who are familiar with previous versions may also refer to the respective release notes included in their installation Media Kits:

- **Software Release 2.7 build 030** is described in: *VM600 MPSx software version 2.7 build 030 release notes ("ReleaseNotes.pdf")*
- **Software Release 2.7 build 020** is described in: *VM600 MPSx software version 2.7 build 020 release notes ("ReleaseNotes.pdf")*
- **Software Release 2.7 build 012** is described in: *VM600 MPSx software version 2.7 build 012 release notes ("ReleaseNotes.pdf")*
- **Software Release 2.7 build 011** is described in: *VM600 MPSx software version 2.7 build 011 release notes ("ReleaseNotes.pdf")*
- **Software Release 2.7 build 010** is described in: *VM600 MPSx software version 2.7 build 010 release notes ("ReleaseNotes.pdf")*
- **Software Release 2.7 build 000** is described in: *VM600 MPSx software version 2.7 build 000 release notes ("ReleaseNotes.pdf")*

- **Software Release 2.6 build 001** is described in: *VM600 MPSx software version 2.6 build 001 release notes ("ReleaseNotes.pdf")*
- **Software Release 2.6 build 000** is described in: *VM600 MPSx software version 2.6 build 000 release notes ("ReleaseNotes.pdf")*
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- **Software Release 2.4 build 000** is described in: *VM600 MPS V2_4_000 Release Notes_rev1.pdf*
- **Software Release 2.3 build 000** is described in: *VM600 MPS V2_3_000 Release Notes_rev1.pdf*
- **Software Release 2.2 build 005** is described in: *VM600 MPS V2_2_005 Release Notes_rev1.pdf*
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- **Software Release 2.0 build 007** is described in: *VM600 MPS V2_0_007 Release Notes_rev1.pdf*
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- **Software Release 2.0 build 002** is described in: *VM600 MPS V2_0_002 Release Notes_rev1.pdf*
- **Software Release 2.0 build 001** is described in: *VM600 MPS V2_0_001 Release Notes_rev1.pdf*

2 New features

2.1 VM600 MPSx software release 2.0 build 009

2.1.1 Add Refresh Database File menu item.

Added “Refresh Database Files” menu item at the Database level which forces all files in a database to have their header information updated to the latest release level. If some files cannot be updated an HTML window is displayed indicating which files weren’t updated. This most likely occurs because the file has the read-only attribute set. It can also occur if another external program has the file opened.

2.1.2 Add capacity to set max number of data points.

Added a “Maximum Number of Data Points” field in the General Info page of the Machine Window. This field allows the user to specify on a per machine basis the maximum number of data points to store per output when the system is recording data. This change forced changes to Machine Information (*.ma”), Machine Data (*.dat), and Machine Average Data (*.avg) files. These files are automatically updated when the user begins an MPS session.

2.1.3 Improvements to RLC and IOC Jumper Matrix displays.

The RLC and IOC Jumper Matrix pages at the rack level now display Jumper Information as an HTML display for a nicer looking display and for cleaner print-out.

2.1.4 Historic Chart now indicates if new data is available

If the user was recording data and then displayed Historic Chart information there was no indication in the Historic Chart display if new data was available to be displayed. A new toolbar button (Refresh) was created and is enabled when new data arrives.

2.1.5 Tool bar button sizes and images have been changed.

The tool bar button sizes and bitmaps have been changed to be more consistent with those in CMS software, in particular the “VMConfig” module.

2.1.6 Consistency Check logic is being added.

Various consistency checks and appropriate logic has been added, similar to the CMS consistency checks:

All MPS files must have read and write access. Flag as an error any files that don’t have the proper access rights. Give write access to all files on auto-fix.

A minimal database requires that the "dbinfo.db" file exists. Flag this as an error if one doesn't exist. Create this file on auto-fix.

In the past there was a problem where machine files may not have the proper file type specified. This checks for this problem and corrects it in auto-fix mode.

Racks may have board configurations with blank tags. This check updates these tags to the default tags.

2.2 VM600 MPSx software release 2.0 build 010

2.2.1 The CPU Present radio button requires changes

The CPU Present button presented in the Rack Window has been changed to a CheckBox button to more accurately reflect its usage.

2.2.2 Storage of the window size and position when the window is closed

This information is used when MPS software is subsequently initiated the next time. In order to be more user friendly, the latest configured windows size and position are retained into the OS registry.

2.2.3 The Registry in now used to store information previously stored in the "mps.inf" file

This includes the following information:

- Software\Vibro-Meter\VM600 MPS Software\MPSx\Settings\Language
- Software\Vibro-Meter\VM600 MPS Software\MPSx\Settings\Master
- Software\Vibro-Meter\VM600 MPS Software\MPSx\Settings\MultiRateEnable
- Software\Vibro-Meter\VM600 MPS Software\MPSx\Settings\PollRate
- Software\Vibro-Meter\VM600 MPS Software\MPSx\Settings\SerialFlag
- Software\Vibro-Meter\VM600 MPS Software\MPSx\Settings\SimulateFlag
- Software\Vibro-Meter\VM600 MPS Software\MPSx\Settings\Super
- Software\Vibro-Meter\VM600 MPS Software\MPSx\Settings\User
- Software\Vibro-Meter\VM600 MPS Software\MPSx\Settings\ViewType.

2.2.4 AMC 8 presentation of the Bar Chart

The presentation of individual bar charts can be altered to improve their readability.

Min/Max levels are now more intelligently clipped.

2.2.5 Inactivity Dialog Box changes

Inactivity Dialog box has been removed and the status line now used to inform the user of the privilege change

2.3 VM600 MPSx software release 2.1 build 001

2.3.1 Print All Pages Option added for IOC and RLC Jumper Windows.

Added the “Print All Pages” option for IOC and RLC windows so that all boards on a rack can have their jumper window printed in a single operation.

2.3.2 Output Mapping -> DC Output IOC-4C still active.

The concept of an IOC-4C was never realized however the MPS software had accommodations for this board type. In particular, the DC outputs showed outputs 5 to 8. All references to DC outputs 5 thorugh 8 and to IOC-4C have been removed.

2.3.3 Basic Function changes for MPC boards

The following is the new Basic Function for the MPC4 Alarm Logical Configuration. The main window displays the Logical Function selection and a lower notebook allows the various alarms to be chosen. The main window Summary box displays the current logical function in a shorthand text.

2.3.4 Prevent inadvertent shutdown or stop of data recording.

Customer feedback requested that when the user is performing operations that will shutdown data recording that a warning should be displayed indicating that recording will be discontinued. The user is now warned when he/she attempts to stop data recording and must confirm that this is desired.

2.3.5 Discrete Output Selection Tags Updates

The Output selection tags are now updated to reflect any implied output names based on processing with respect to the Discrete Output Window.

2.3.6 Implementation of a new card “MPC1”

An OEM request to implement a new card type dedicated for the combustion chamber and having specific filtering characteristic, has been realized.

2.3.7 Introduction of licensing of MPC1 capability

Logic was added to recognize the licensing key that the MPS KeyGen program produces to allow MPC1 licensing. If this licensing key is present then the MPS1 & 2 will execute as it did in previous MPS builds. The following minimal logic changes based on when the licensing key is not present or MPC1 is not licensed were implemented:

If the user attempts to add a new card only the MPC4 and AMC8 choices will be presented.

Dragging an MPC1 board to the rack level will cause an invalid drag/drop display message.

These two minor changes will prevent an unlicensed user from ever adding an MPC1 board to a database. If the user is unlicensed for MPC1 capabilities but the current database was created on a system that was licensed then the user will be able to edit the existing MPC1 boards but not copy them to a different slot.

2.3.8 KeyGen update to incorporate MPC1 option as code

Additional KeyGen options impact MPS code.

2.4 VM600 MPSx software release 2.2 build 000

2.4.1 Introduction of 1U Rack

A new rack, 1U, has been defined and implemented. The 1U rack is a 2-slot cage. The first slot is optionally populated with an RLC on the back-side bus with no front-side board allowed. The second slot can be populated with either an MPC4 or AMC8 with the associated IOC on the backside. If an RLC is present then this RLC will be treated as being on OCBus. The boards found in the second slot may have a slot assignment of 3 through 14. All communications to boards found on a 1U rack is performed through serial I/O.

A new implementation of serial I/O COM port assignment was implemented so that multiple serial I/O assignments, one per boards, can be made. Prior to this change, only a single serial I/O connection could be made.

All MPS communications can now be made via a CPUM or the serial connection of the board. Prior to this change, data recording and bar/strip charts could only be performed if a CPUM was present.

2.4.2 Languages – Cleanup of German and French strings

A major improvement has been made on the quality of translation in all 3 available languages.

2.5 VM600 MPSx software release 2.3 build 000

2.5.1 Setup change to split Documentation library from MPS software

In order to facilitate transfer of the MPS software through slow connections it was decided to split the documentation (TechPubs Library) from the setup.exe (now down to 10 MB). The new setup_techpub.exe is automatically launched in the MPS setup when the related checkbox is ticked (default setting). An error message occurs when this setup_techpub.exe has not been copied or cannot be found in any of the following directories:

- the directory in which the main "setup.exe" is located (root of CD-ROM)

- the subdirectory "Documentation" of the directory in which the main "setup.exe" is located

(CD-ROM:\Documentation)

- the current temp folder, into which the setup has extracted the installation files.

This also fixes the problem of empty pointers where the MPS SW installation used to put nonoperational shortcuts to open the documentation.

2.5.2 Languages – Cleanup of German and French strings

Continuous effort has been put into cleaning up the translation, especially terms concerning the 1U rack.

2.5.3 MPS - extend + update catalogue of VM sensors

When adding Measurement channels the user now sees new sensor types.

In order to comply with the recent implemented conditioners philosophy, which allows to freely the chose the desired sensitivity, care should be take when a sensor family “CA xxx” and a Conditioner “IPC*” are selected from the lists. In this particular case the parameters “Signal Sensitivity” and “Signal Dynamic (x)” are voluntary set to zero and shall be manually entered.

2.5.4 Extension of the MPC1 filters settings to other GTs

The software allows multiple GT types for MPC1 boards. On the previous version only the GT13E2 filters settings was supported, from version 2.3.00 both GT8 and GT11 filters settings has been added.

2.5.5 Use same RS232 serial port for several boards

The same COM port number could be allocated to several cards, to facilitate production process.

2.5.6 Add the Serial I/O tool bar button to the AMC card window

To be consistent with the MPC-4 cards a tool bar button was added for the AMC card.

2.6 VM600 MPSx software release 2.4 build 000

2.6.1 Channel Inhibit implementation

Each measurement and speed channel can be inhibited in order to allow the replacement of a defective sensor (Communications → To MPC → Channel Inhibits). Any status linked to the inhibited sensor is set to the normal state to not affect the behavior of the system.

The Channel Inhibit status can be included to a Basic Function to reflect the status of system.

The Channel Inhibit status (Channel Inhibited / Activated) is display in the list of events and the values of the output windows are grayed out if the channel is inhibited.

The Channel Inhibit function needs the latest firmware version of the CPU-M, MPC-4 and AMC-8. Older version of the boards can be used in the same rack, but the function is not accessible for the old boards and the status on MPS software show all channels of old board as Activated.

2.6.2 Update the catalogue of MSS sensors

The catalogue of MSS sensors has been extended. The additional Wilcoxon's sensors 786A, 797L to 793L and 799LF are available from the measurement channels dropdown menu under the category "AC".

2.7 VM600 MPSx software release 2.5 build 000

2.7.1 Dual Mathematical Function (DMF) processing

Dual Mathematical Function (DMF) processing has been added as a processing function for the dual-processing channels of an MPC4 card, that is, for operation with Channel 1 & 2 and Channel 3 & 4.

The Dual Mathematical Function (DMF) processing supports the following mathematical operations:

RMS Sum Performs the RMS addition of two single-processing input channels:
(Channel 1 + Channel 2) or (Channel 3 + Channel 4).
Note: This operation requires that both input channels are configured with an RMS rectifier.

RMS Subtraction Performs the RMS subtraction of two single-processing input channels:
(Channel 1 − Channel 2) or (Channel 3 − Channel 4).
Note: This operation requires that both input channels are configured with an RMS rectifier.

SUM Performs the addition of two single-processing input channels:
(Channel 1 + Channel 2) or (Channel 3 + Channel 4)
Note: This operation requires that both input channels are configured with an RMS rectifier.

SUBTRACTION Performs the subtraction of two single-processing input channels:
(Channel 1 − Channel 2) or (Channel 3 − Channel 4).
Note: This operation requires that both input channels are configured with the same rectifier.

X & Y MIN Returns the smaller value from two single-processing input channels:
(Channel 1 & Channel 2) or (Channel 3 & Channel 4).
Note: This operation requires that both input channels are configured with the same rectifier.

X & Y MAX Returns the larger value from two single-processing input channels:
(Channel 1 & Channel 2) or (Channel 3 & Channel 4).
Note: This operation requires that both input channels are configured with the same rectifier.

In order to use Dual Mathematical Function (DMF) processing with two single-processing input channels, both single-processing input channels (Channel 1 & 2 or Channel 3 & 4) must be configured with the same single-channel processing function (for example, Broad Band Absolute Bearing Vibration (BBAB)) and with rectifiers from the same rectifier group (for example, AVG, RMS or True).

Note: The Dual Mathematical Function (DMF) processing function must be set to “No Processing” in order to change the processing function for the associated single-processing channels.

2.7.2 SENSOR OK and SENSOR FAIL events

A new class of events, SENSOR events, has been added to the VM600 MPS software:

A **SENSOR OK** event is generated when the DC voltage of a sensor goes inside the OK levels configured for the sensor.

A **SENSOR FAIL** event is generated when the DC voltage of a sensor goes outside the OK levels configured for the sensor.

Note: The OK levels are defined using the **Upper OK Level** and the **Lower OK Level** for an input channel in the **Architectural View**.

Sensor events (like ALARM and DIAG events) are displayed on the **Event Info** tab of the **Logical View** for the database that the sensor is attached to.

Note: Events (Architectural View) are only available with the MPS2 software (not with MPS1).

2.7.3 Confirmation required before a configuration is sent to a card or rack

In order to avoid sending a configuration to a card or rack by accident, a message has been added that will prompt the user for confirmation before a configuration is sent to a card or rack, overwriting the existing configuration.

After clicking a **Send Configuration** command, a “Do you really want to send the configuration?” message is displayed and the user must click **Yes** before the configuration is sent to the card or rack.

2.7.4 Copy operations for MPC4 card configurations

When configuring MPC4 cards, copy operations are now supported that allow the Inputs or Processings and Alarms already configured for an MPC4 card to be re-used elsewhere on the same MPC4 card. Using the copy operations for MPC4 card configurations helps to make the management of VM600 MPS software configurations easier. For example, the Inputs, Processing (and Alarms) could be configured for one channel of an MPC4 card and then re-used for the other channels of the card.

The **Copy Inputs** command is available for operation with the Inputs of an MPC card (Measurement channels 1 to 4 and Speed Channels 1 to 2).

The **Copy Processings and Alarms** command is available for operation with the Processing of an MPC card (Processing channels 1 to 4, Dual Processing channel 1 & 2 and Dual Processing channel 3 & 4) including any alarms configured for the processing channel.

To use the copy operation commands, either:

Click on an MPC4 card level node in the configuration tree to select it, then use the **File > Copy Inputs** and **File > Copy Processings and Alarms** menu commands.

Right-click on an MPC4 card level node in the configuration tree, then click **File > Copy Inputs** or the **File > Copy Processings and Alarms**.

Note: The copy operations for MPC4 card configurations are limited to the same MPC4 card (not between different MPC4 cards) and work on a channel basis, that is, the configuration of a single input channel can be copied to another (single) input channel.

2.7.5 Configuration tree expansion restrictions

The behaviour of the configuration trees when switching between the Logical View (Databases, Stations, Machines and Sensors) and the Architectural View (Databases, Racks and Card) in the MPS2 software has been changed.

Now, when switching between the Logical View and the Architectural View, the configuration trees displayed in these views expand and display only the nodes immediately under the database level:

After switching to the Logical View, only Databases and Stations are displayed.
Station level nodes must be manually expanded to see more detailed information in this configuration tree.

After switching to the Architectural View, only Databases and Racks are displayed.
Rack level nodes must be manually expanded to see more detailed information in this configuration tree.

(Previously, when switching between the Logical View and the Architectural View, the configuration trees expanded completely and displayed all available nodes. However, this behaviour made it difficult to find individual nodes in a configuration tree , particularly for larger configurations.)

2.7.6 Sensor Information Editor

The Sensor Information Editor is a new program that allows the user to customize and manage the information in the sensor list file that is copied to the computer as part of the VM600 MPS software installation process.

The sensor list file includes detailed information on the measurement chains (sensors/signal conditioners) for the different sensor systems that are available from Meggitt Sensing Systems, that is, information such as Sensor Family, Sensor Type, Conditioner, Transmission Mode and Signal Sensitivity. When the VM600 MPS software (MPS1 or MPS2) is being used to configure the input channels for an MPC4 machinery protection card, it uses the information in the sensor list file to populate the drop-down list boxes and text boxes of the VM600 MPS software user interface when input channels (Measurement Channels and Speed Channels) are being configured.

More specifically, the Sensor Information Editor allows sensors/signal conditioners be edited, added or removed. Using the Sensor Information Editor helps to make the management of VM600 MPS software configurations easier.

The Sensor Information Editor is started from the VM600 MPS software: click **Database > Sensor Information Editor** to start the Sensor Information Editor.

When the Sensor Information Editor is running, click **Help** or press the **F1** key to display the associated help text.

Note: To start the Sensor Information Editor, a Database must be selected in the configuration tree of the VM600 MPS software user interface and the User Level must be Super (**Privileges > Super**).

2.8 VM600 MPSx software release 2.6 build 000

2.8.1 Improved support for the safety (SIL) version of the MPC4 card

The MPC4 machinery protection card is available in different versions, including a standard version, a separate circuits version and a safety (SIL) version. Refer to the *VM600 machinery protection system (MPS) hardware manual* for additional information.

NOTE:	The safety version of the MPC4 card (MPC4 SIL) does not have a VME bus interface so it cannot communicate with a CPUM or any other cards in a VM600 rack. Accordingly, the MPC4 SIL card can only be configured via the RS-232 connector on its front panel.

Although earlier versions of the VM600 MPSx software supported the safety (SIL) version of the MPC4 card, several new features have been added to VM600 MPSx version 2.6 in order to make it easier to work with MPC4 SIL cards:

Previously, the MPSx software referred to all versions of the MPC4 card as **MPC4**. Now, the MPSx software makes a distinction between safety MPC4 cards and other MPC4 cards by referring to the standard version and the separate circuits version of the MPC4 card as an **MPC4** and referring to the safety version of the MPC4 card as an **MPC4 SIL**.

Consequently, when adding an MPC4 card to a VM600 rack configuration, the user can select either:

- **MPC4** – to add a standard or a separate circuits MPC4 card.
- **MPC4 SIL** – to add a safety MPC4 card.

This distinction continues in the configuration tree structure, where MPC4 cards are listed as either **MPC4** or **MPC4 SIL**. Also, when an MPC4 card is selected in the configuration tree structure, the image of the card displayed in the main window of the VM600 MPSx software is different for **MPC4** and **MPC4 SIL** cards.

It is important to note that the configuration for a standard or a separate circuits MPC4 card (**MPC4**) in the VM600 MPSx software cannot be sent to a safety MPC4 card (**MPC4 SIL**) in a VM600 rack, and the configuration for a safety MPC4 card (**MPC4 SIL**) cannot be sent to a standard or a separate circuits MPC4 card (**MPC4**). Similarly, the configuration for a standard or a separate circuits MPC4 card (**MPC4**) in a VM600 rack cannot be read to a safety MPC4 card (**MPC4 SIL**) in the VM600 MPSx software, and the configuration for a safety MPC4 card (**MPC4 SIL**) cannot be read to a standard or a separate circuits MPC4 card (**MPC4**). However, it is possible to convert an **MPC4** card configuration in the VM600 MPSx software to an **MPC4 SIL** card configuration, or vice versa, as explained below.

To facilitate working with **MPC4** and **MPC4 SIL** cards, the VM600 MPSx software also now includes additional commands:

- **Check MPC4 SIL Configuration**.
- **MPC4 <–> MPC4 SIL Conversion**.

The **Check MPC4 SIL Configuration** command is available from the shortcut menu that is displayed when an **MPC4 SIL** card in the configuration tree structure is right-clicked. It is used to run an automatic consistency check on the configuration for the safety MPC card (**MPC4 SIL**) and ensure that it meets the requirements for use in a safety-related system. For example, alarms must be configured as latching, and output relays must be configured as normally energised (NE), that is, de-energised to trip. Refer to the *VM600 functional safety manual* for additional information.

NOTE: As all of the features supported by a safety MPC4 card (**MPC4 SIL**) are also supported by a standard or separate circuits MPC4 card (**MPC4**), no configuration information is lost when converting from an **MPC4 SIL** to a **MPC4**.

However, not all of the features supported by a standard or separate circuits MPC4 card (**MPC4**) are supported by a safety MPC4 card (**MPC4 SIL**). For example, the **MPC4 SIL** card does not support the Narrow Band (Tracking Vibration and S_{max} processing functions and it does not support danger bypass (DB) and trip multiply (TM) functions.

While the consistency check (**Check MPC4 SIL Configuration** command) automatically checks the configuration of an individual safety MPC4 card (**MPC4 SIL**) and ensures that it meets the requirements for use in a safety-related system, a further manual check of the complete VM600 system configuration is required by the user in order to identify and avoid possible conflicts from additional cards in the VM600 rack. For example, due to VM600 Raw Bus and/or OC Bus issues. Refer to the *VM600 functional safety manual* for additional information.

The **MPC4 <–> MPC4 SIL Conversion** command is available from the shortcut menu that is displayed when an **MPC4** or **MPC4 SIL** card in the configuration tree structure is right-clicked. It is used to automatically convert the configuration for a standard or separate circuits MPC4 card (**MPC4**) to a configuration for a safety MPC4 card (**MPC4 SIL**) or to convert the configuration for a safety MPC4 card (**MPC4 SIL**) to a configuration for a standard or separate circuits MPC4 card (**MPC4**).

NOTE: As all of the features supported by a safety MPC4 card (**MPC4 SIL**) are also supported by a standard or separate circuits MPC4 card (**MPC4**), no configuration information is lost when converting from an **MPC4 SIL** to a **MPC4**.

However, not all of the features supported by a standard or separate circuits MPC4 card (**MPC4**) are supported by a safety MPC4 card (**MPC4 SIL**), so some configuration information can be lost when converting from an **MPC4** to a **MPC4 SIL**, depending on the configuration. For example, the **MPC4 SIL** card does not support the Narrow Band (Tracking Vibration and S_{max} processing functions, and it does not support danger bypass (DB) and trip multiply (TM) functions.

Refer to the *VM600 functional safety manual* for additional information.

As a safety MPC4 card (**MPC4 SIL**) does not have a VME bus interface, it cannot communicate with a CPUM card (or any other cards) in a VM600 rack. Accordingly, an MPC4 SIL card can only be configured via a direct connection to the RS-232 connector in its front panel (even for a “networked” VM600 rack).

So when a user sends a configuration to a VM600 rack that contains safety MPC4 cards (**MPC4 SIL**s), a message box is displayed to remind the user that an RS-232 connection is required to configure **MPC4 SIL** cards. Similarly, this is also done when a user reads a configuration from a VM600 rack that contains **MPC4 SIL** cards.

For additional information refer to the MPC4 SIL topic in the VM600 MPSx software version 2.6 help (click **Help > Contents** or press the **F1** key, and navigate to MPC4 SIL), the *VM600 machinery protection system (MPS) hardware manual* and the *VM600 functional safety manual*.

Finally, it is worth noting that VM600 MPSx version 2.6 uses a text file in the background to help it make a distinction between the different versions of MPC4 card. The text file (*sil_info.txt*) contains all of the hardware and software ordering numbers (PNRs) for safety MPC4 cards (**MPC4 SIL**s), which allows the VM600 MPSx software to correctly identify MPC4 cards in a VM600 rack.

2.9 VM600 MPSx software release 2.7 build 000

2.9.1 VM600 MPS rack (CPUM) security

New VM600 MPS rack (CPUM) security features have been implemented that allow a VM600 MPS containing a CPUM card to limit the functionality of the MPS that are available via the CPUM to Ethernet-based connections, such as the VM600 MPSx software, the CPUM Configurator software or Modbus TCP.

These new CPUM security features are in addition to the VM600 MPSx software's existing system of privileges (user access rights) that control and limit the functionality of the software available to different levels of user.

NOTE:	VM600 MPSx software version 2.7 or later and a networked VM600 rack containing a CPUM card running firmware version 077 or later are required in order to use VM600 MPS rack (CPUM) security.

By default, the CPUM security features are disabled in order to ensure compatibility with currently deployed systems (CPUM cards running firmware version 076 or earlier).

NOTE:	The passwords and settings for CPUM security are stored on the CPUM card.

The use of CPUM security features is recommended in order to help prevent accidental or unauthorised access to a VM600 MPS configuration and other machinery protection system functionality, thereby reducing the possibility of interference in the operation of the protection system and the machinery being monitored.

For example, in a typical machinery monitoring application in a modern power-generating station, the VM600 MPS is installed close to the machinery being monitored, which is installed in the highest-security zone of the plant. Such security zones are usually restricted and protected areas with physical barriers, specific access requirements and surveillance equipment. Accordingly, only approved and cleared personnel have the physical access to a VM600 MPS in a power station that is required in order to change the CPUM access setting (CPUM access lock), one of the new CPUM security features.

The CPUM access lock prevents remote access to a VM600 MPS, effectively acting as a hardware lock, and it is not possible to "unlock" a CPUM/VM600 remotely.

NOTE:	As the CPUM access setting for a CPUM card is configured using the keys on the front panel of the card, physical access to the CPUM card (VM600 rack) is required.

The CPUM security features consist of two levels of protection integrated in the CPUM card: CPUM access lock and MPS password validation.

CPUM Access Lock is a CPUM access setting that can be thought of as a “hardware” security feature that limits Ethernet-based connections to a VM600 MPS to “read only” operations.

- When CPUM access is blocked, the MPS operations that are available are limited to read only operations.
  That is, communications with the VM600 rack via Ethernet is read only, such that it is possible to read outputs from the MPS but it is not possible to change (commit) the configuration of a VM600 rack or to interfere in the operation of the MPS.
- When CPUM access is allowed, the MPS operations that are available depend on the MPS password validation (see below).

Physical access to the VM600 rack is required in order to change the CPUM Access Lock.

MPS Password Validation can be thought of as a “software” security feature that limits Ethernet-based connections to a VM600 MPS to “read only” operations plus a permitted subset of “write” operations.

- When MPS password validation is enabled, the MPS operations that are available are limited to read only operations and certain specific write operations (“read + restricted write”), that is, write operations which require additional authentication before being run. For example, VM600 MPS commands such as alarm reset (AR) or changing a fieldbus configuration. While the read only operations run as usual, the write operations require that the correct CPUM password is entered by the user before they are run.
- When MPS password validation is disabled, all VM600 MPS operations are available.

The VM600 MPSx software and CPUM access (**CPUM Access Lock: Unlocked**) are required in order to change the MPS Password Validation.

Basically, the use of CPUM access lock protects the VM600 MPS configuration and prevents all sensitive VM600 MPS operations from being run (that is, “read only” – the highest level of security). Like CPUM access lock, the use of MPS password validation protects the configuration of the MPC4 cards and AMC8 cards in the VM600 rack but MPS password validation also allows certain VM600 MPS operations to be run (that is, “read + restricted write” – a reduced level of security). See the table on the following page for further information on the operations permitted when CPUM security features are used.

NOTE:	The CPUM access lock is a stronger protection mechanism than MPS password validation and is used to implement the highest level of VM600 MPS rack security (that is, with the fewest VM600 MPS operations available to the user).

The VM600 MPS operations affected by the CPUM security features are shown in the table below.

VM600 MPS operation (protected by CPUM security features)	CPUM security feature	
	CPUM Access Lock	MPS Password Validation
Committing a VM600 MPS configuration	Not available	Password protected
Running MPS commands via VM600 MPSx software: • Alarms reset (AR) • Channel inhibit (sensor bypass) • Danger bypass (DB) • Trip multiply (TM) • Clear status latch	Not available	Password protected
Running MPS commands via Modbus: • Alarms reset (AR) • Channel inhibit (sensor bypass) • Danger bypass (DB) • Trip multiply (TM) • Clear status latch	Not available	Available
Changing a VM600 MPS fieldbus configuration (such as Modbus)	Not available	Available
Accessing a CPUM using an Ethernet-based connection such as CPUM Configurator, FTP or Telnet	Not available	Available
Displaying VM600 MPS measurement outputs such as the outputs windows and plots (historical or live data)	Available	Available
Operation of a VM600 CMS condition monitoring system using cards such as the CMC16/IOC16T in the same VM600 rack	Available	Available
Operation of a VibroSight condition monitoring system using cards such as the XMx16/XIO16T in the same VM600 rack	Available	Available
MPS Password Validation security feature	Not available	Available
CPUM Access Lock security feature	Available	Available
Level of security	Highest	Reduced

Notes

When CPUM access is blocked (**CPUM Access Lock: Locked**), a VM600 MPS is limited to “read only” operations as shown in the **CPUM Access Lock** column above.

When CPUM access is allowed (**CPUM Access Lock: Unlocked**), MPS Password Validation can be enabled (**MPS Password Validation: Enabled**) and a VM600 MPS is limited to “read + restricted write” operations as shown in the **MPS Password Validation** column above. However, while the read only operations run as usual, the write operations require that the correct CPUM password is entered by the user before they are run.

When CPUM access is allowed (**CPUM Access Lock: Unlocked**) and MPS Password Validation is disabled (**MPS Password Validation: Disabled**), a VM600 MPS can perform all operations (“read + write”). With these settings, no VM600 MPS rack (CPUM) security is used, which is equivalent to using a VM600 system with VM600 MPSx software version 2.6 or earlier and CPUM firmware version 076 or earlier.

The relationship between CPUM access lock, MPS password validation and access rights is shown in the table below.

CPUM Access Lock	MPS Password Validation	Access rights	Notes
Locked	---	Read only	Highest level of security
Unlocked	Enabled with password not entered correctly	Read only	Reduced level of security
Unlocked	Enabled with password entered correctly	Read + restricted write	
Unlocked	Disabled	Read + write	Lowest level of security. This is equivalent to using a VM600 system with VM600 MPSx software version 2.6 or earlier and CPUM firmware version 076 or earlier.

Displaying CPUM security settings

The VM600 MPSx software can be used to communicate with the CPUM card in order to read and display the current state of the CPUM security settings.

NOTE: The VM600 MPSx software privilege level must be at **Master** or **Super** in order to access the **CPUM Security** command.

To read the CPUM security settings:

1. Click on a rack level node in the configuration tree to select it, then use the **Communications > CPUM security** menu command.
   Alternatively, right-click on a rack level node in the configuration tree, then click **CPUM security**.
2. In the **CPUM Security** window that appears, under **Rack Selection**, in the **Hostname** field, enter either the IP address of the rack (CPUM card) in dot-decimal notation or a predefined host name. Then click the **Read Security Settings** button.
   The **CPUM Security** window updates and displays, under **CPUM Security Settings**, the status of the CPUM access (**CPUM Access Lock**) and the status of the MPS password validation (**MPS Password Validation**).
   The “session” information (**Session Information**) shows if the VM600 MPSx software is logged on to the CPUM card, which happens either automatically upon entering the correct CPUM password when running a VM600 MPS command or manually by using the **Log On To CPUM card** button.

NOTE:	The fields under **CPUM Security Settings** are unavailable (greyed out) until the **Read Security Settings** button is used to establish communications with the CPUM card. If the CPUM security settings change, for example, using the keys on the front panel of the card, then the **Read Security Settings** button must be used to read the security settings from the card (as the **CPUM Security** window does not update automatically).

Allowing or blocking access to the CPUM

CPUM access is allowed by default so that the CPUM card and VM600 rack can communicate with the VM600 MPSx software and compatibility with earlier versions of CPUM firmware is maintained.

To block access to a CPUM card (and limit the VM600 MPS to “read only” operations):

- When CPUM access is allowed, simultaneously pressing the OUT−, SLOT− and SLOT+ keys on the front panel of the CPUM card will block access to the card, that is, the **CPUM Access Lock** setting toggles from **Unlocked** to **Locked**.

  To indicate that the CPUM card is locked, the DIAG LED on the front panel of the CPUM card slowly blinks green (approximately once per second).

To allow access to a CPUM card:

- When CPUM access is blocked, simultaneously pressing the OUT−, SLOT− and SLOT+ keys on the front panel of the CPUM card will allow access to the card, that is, the **CPUM Access Lock** setting toggles from **Locked** to **Unlocked**.

  To indicate that the CPUM card is unlocked, the DIAG LED on the front panel of the CPUM card shows green (continuously).

In addition, after changing the CPUM access setting, the **CPUM Security** window in the VM600 MPSx software can be used to display (refresh) the CPUM security settings (by running the **Read Security Settings** command).

Enabling and disabling MPS password validation on a CPUM

MPS password validation on a CPUM card is disabled by default so that the CPUM card can communicate with the VM600 MPSx software and compatibility with earlier versions of CPUM firmware is maintained.

NOTE:	CPUM access must be allowed (**CPUM Access Lock**: **Unlocked**) in order to work with MPS password validation.

To enable password validation on a CPUM card (and limit the VM600 MPS to “read + restricted write” operations):

1. Click on a rack level node in the configuration tree to select it, then use the **Communications > CPUM security** menu command.

   Alternatively, right-click on a rack level node in the configuration tree, then click **CPUM security**.

2. In the **CPUM Security** window that appears, under **CPUM Security Settings**, for the **MPS Password Validation** field, click the **Enable** option.

3. In the **Set CPUM Password** window that appears, enter the new password and enter the new password again to confirm it, then click **OK**.

MPS password validation is enabled and the **CPUM Security** window updates.

To disable password validation on a CPUM card:

1. In the **CPUM Security** window, under CPUM **Security Settings**, for the **MPS Password Validation** field, click the **Disable** option.

2. In the **Enter CPUM Password** window that appears, enter the password, then click **OK**.

MPS password validation is disabled and the **CPUM Security** window updates.

Changing the password on the CPUM

To change the password used by a CPUM card for authentication:

1. In the **CPUM Security** window, under CPUM **Security Settings**, for the **CPUM Password Validation** field, click the **Change CPUM Password** button.

2. In the **Change CPUM Password** window that appears, enter the old password and the new password, and enter the new password again to confirm it, then click **OK**.

The CPUM password is set, MPS password validation is enabled, and the **CPUM Security** window updates.

NOTE:	CPUM access must be allowed (**CPUM Access Lock**: **Unlocked**) in order to work with MPS password validation.

Logging on and off a CPUM

When MPS password validation on the CPUM card is used, whenever the VM600 MPSx software is asked to perform a restricted operation such as alarm reset (AR), the software will prompt the user for the CPUM password before continuing.

If the correct CPUM password is used, then the VM600 MPSx software will automatically log on to the CPUM card and perform the requested operation. When the software logs on to the CPUM card in this

way, it will remain logged on to the CPUM card in a “session” until the **CPUM Security** window is used to log off from the CPUM card or the software is closed (exited).

In a session, it is not necessary re-enter the CPUM password every time a restricted operation is requested. However, such sessions also have a timeout of 10 minutes, so if no restricted command (that is, a command normally requiring a password) is run during a 10 minute period, then the session automatically logs off.

However, if an incorrect CPUM password is used, then VM600 MPSx software will not log on to the CPUM card and the requested operation is not performed.

To manually log on to a CPUM card:

1. In the **CPUM Security** window, under **CPUM Security Settings**, for the **Session Information** field, click the **Log On To CPUM card** button.
2. In the **CPUM Login** window that appears, enter the password, then click **OK**.

The VM600 MPSx software is logged on to the CPUM card and the **CPUM Security** window updates.

To log off from a CPUM card:

1. In the **CPUM Security** window, under CPUM **Security Settings**, for the **Session Information** field, click the **Log Off From CPUM card** button.

The VM600 MPSx software is logged off from the CPUM card and the **CPUM Security** window updates.

If the CPUM security settings change, for example, using the keys on the front panel of the card, or the VM600 MPSx software is closed (exited), any open sessions with a CPUM card are automatically closed (logged off).

Resetting the CPUM security settings

If necessary, the CPUM security settings can be reset to their default values of:

- **CPUM Access Lock: Unlocked**
- **MPS Password Validation: Disabled**.

When the CPUM security settings are reset, any open sessions with the CPUM card are automatically closed:

- **Session Information: Logged off**.

NOTE:	Physical access to CPUM card (VM600 rack) is required in order to reset the CPUM security settings to their default values.

To reset the CPUM security settings:

- Simultaneously press and hold the OUT−, SLOT− and SLOT+ keys on the front panel of the CPUM card for five seconds.

  To indicate that the CPUM card is reset, the DIAG LED on the front panel of the CPUM card quickly blinks green (approximately twice per second) for five seconds. Then, the DIAG LED resumes normal operation (continuous green when the CPUM is running correctly and off when the CPUM is starting).

In addition, after resetting the CPUM security settings, the **CPUM Security** window in the VM600 MPSx software can be used to display (refresh) the CPUM security settings (by running the **Read Security Settings** command).

2.9.2 CPUM Configurator software

CPUM Configurator is now included with VM600 MPSx software version 2.7 or later and is copied to the computer as part of the VM600 MPSx software installation process.

NOTE:	CPUM Configurator is a program that communicates with a CPUM card in a VM600 rack over an Ethernet (TCP/IP) link. Basically, it provides a graphical user interface for a Telnet session between a CPUM Configurator (Telnet client) and a CPUM card (Telnet server), and is used primarily for configuring and managing CPUM cards / VM600 racks Refer to the *VM600 networking manual* for further information on the CPUM Configurator software.

Previously, CPUM Configurator was only available from Meggitt Sensing Systems customer support (see 7.1 Contacting us).

2.10 VM600 MPSx software release 2.7 build 010

There are no new features in VM600 MPS 2.7 build 010 as this version was released to solve specific existing problems and bugs. See 3.11 VM600 MPSx software release 2.7 build 010.

2.11 VM600 MPSx software release 2.7 build 011

2.11.1 Sensor Information Editor file updates

The underlying sensor list files (“sens_vm.txt” and “sens_vm_factory.txt”) used by the Sensor Information Editor of the VM600 MPS software were updated to use more up-to-date sensor information.

For example, the default OK Levels used to check for problems with the front-end of measurement chains were updated for some sensors, some obsolete sensors and measurement chains were removed, and the GSI 127 galvanic separation unit is now included.

See also 3.12.2 Sensor Information Editor stops responding after adding a new sensor.

2.12 VM600 MPSx software release 2.7 build 012

2.12.1 CPUM Configurator software

The CPUM Configurator software included with the VM600 MPSx software was updated to support a number of improvements.

NOTE:	CPUM Configurator is a software tool included with VM600 MPSx software version 2.7 or later and is copied to the computer as part of the VM600 MPSx software installation process. It can also be obtained from Meggitt Sensing Systems customer support. CPUM Configurator is used primarily for configuring CPUM cards and managing VM600 racks over Ethernet links. Refer to the *VM600 networking manual* for further information on the CPUM Configurator software.

Configuration of a CPUM card’s default gateway

When used with a CPUM card running firmware version 076 or later, the latest version of the CPUM Configurator software now allows the default gateway of the CPUM card to be easily configured.

Start **CPUM Configurator**, click **Configure IP** and use the **CPUM TCP-IP Configuration** window that appears to enter the required IP address in the **Default gateway** control. (The Default gateway control is unavailable (greyed out) for CPUM cards running firmware version 075 or earlier.)

When **OK** is clicked to confirm any changes, then CPUM Configurator adds the *`gateway = xxx.xxx.xxx.xxx`* line, with the IP address of the gateway in dot-decimal notation, to the `net.cfg` file, updating it on the CPUM card.

NOTE:	In order for any changes to the `net.cfg` file to take effect, the CPUM card must be restarted.

To remove the default gateway of the CPUM card, use the **CPUM TCP-IP Configuration** window to delete (clear) the IP address from the **Default gateway** control. When **OK** is clicked to confirm any changes, then CPUM Configurator removes any existing *`gateway = xxx.xxx.xxx.xxx`* line from the `net.cfg` file, updating it on the CPUM card.

Previously, the default gateway for a CPUM card could only be configured by manually editing one of its configuration files, for example, the `net.cfg` file for CPUM cards running firmware version 076 or later and the `sysinit` file for CPUM cards running firmware version 075. Refer to the *VM600 networking manual* for further information.

CPUM Configurator Connection check status

The relationship between the **IP Address** and the **Connection check status** controls displayed by the CPUM Configurator software was changed so that the Connection check status now only changes to Unknown when the IP Address has actually changed.

Previously, the Connection check status changed to Unknown whenever the IP Address was edited, even if it had not actually been changed.

CPUM Configurator feedback

When using the CPUM Configurator software, feedback such as status information and results of operations performed by CPUM Configurator is given using individual dialog boxes and/or in the **Action status** output text box.

The latest version of the CPUM Configurator software now provides additional information about a CPUM card, including:

- The version of firmware running on the card.
- The version of the card:
    - Later versions of the CPUM card (PNR 200-595-076-HHh or later) fitted with the PFM-541I or equivalent CPU module.
    - Earlier versions of the CPUM card (PNR 200-595-075-HHh or earlier) fitted with the MSM586EN or equivalent CPU module.
- The type of configuration running on the card, such as a standard configuration or a “known” user configuration.

See also 3.13 VM600 MPSx software release 2.7 build 012.

2.13 VM600 MPSx software release 2.7 build 020

There are no new features in VM600 MPS 2.7 build 020 as this version was released to solve specific existing problems and bugs. See 3.14 VM600 MPSx software release 2.7 build 020.

2.14 VM600 MPSx software release 2.7 build 030

2.14.1 VM600 MPSx installer

The VM600 MPSx installer software has been updated to support more installation options.

More specifically, the VM600 MPSx installer can now optionally install the following software:

- Sample Configuration
  (Example VM600 MPSx software database.)
- CPUM Configurator
  (Software for configuring CPUM cards and managing VM600 racks over Ethernet links.)
- IRC4 Configurator
  (Software for configuring IRC4 cards.)

NOTE:	Previously, the IRC4 Configurator software was distributed separately.

To optionally install the Sample configuration, CPUM Configurator software or IRC4 Configurator software:

1. Run the VM600 MPSx installer software (`setup.exe`).
2. When prompted to select the **Setup type**, select the **Custom** option then click **Next**.
3. When prompted to **Select features**, select the check box for the required options (and clear the check box for the options not required):
   - **IRC4 Configurator**
   - **Sample Configuration**
   - **CPUM Configurator**.
4. Then click **Next** and continue with the installation as usual.

2.14.2 Support for measurement chains with a negative sensitivity by VM600 AMC8 cards

For VM600 AMC8 cards, the configuration of single-channel processing has been updated to support negative sensitivities in order to support even more measurement chains.

NOTE:	The VM600 AMC8 card has always supported negative sensitivities but earlier versions of the VM600 MPSx software could not be used to configure this feature.

More specifically, when configuring single-channels using linear compensation (**Sensor compensation type: Linear**), a negative value can now be used for the compensation sensitivity value (**Sensitivity (deg C/…)**, under **Linear compensation**).

2.14.3 Support for the new IPC707 signal conditioner

The IPC707 signal conditioner from Meggitt's Vibro-Meter® product line converts the charge-based signal from piezoelectric sensors, such as CAxxx piezoelectric accelerometers and CPxxx piezoelectric pressure sensors, into a current or a voltage signal suitable for input to a machinery monitoring system. It is a versatile and highly-configurable device that supports optional diagnostic circuitry that automatically detects and remotely indicates problems with the measurement chain.

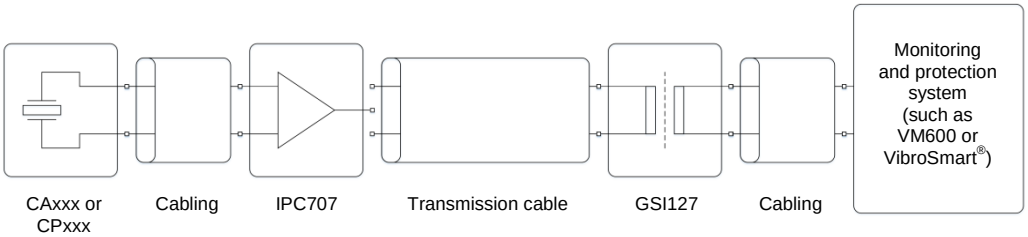
NOTE:	The IPC707 signal conditioner is suitable for safety-critical applications as it was developed in accordance with the IEC 61508 "functional safety" and ISO 13849-1 "safety of machinery" standards. The IPC707 combines enhanced reliability and significant risk reduction, to help ensure increased system availability.

The IPC707 signal conditioner will become available in the summer of 2018. It is compatible with different piezoelectric materials and will replace the different versions of the IPC704 signal conditioner (PNR 244-704-000-xxx). That is, as production of the IPC707 increases, production of the IPC704 will decrease until will the IPC707 ultimately replaces the IPC704.

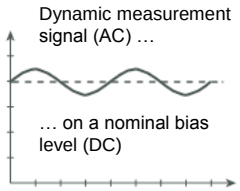
How it works

As shown in the measurement chain and output signal drawings below, the output signal from an IPC707 consists of a dynamic measurement signal (AC) sitting on a bias level (DC). For an IPC707 with diagnostics, the nominal value of the bias level (DC) is updated to indicate the integrity of the measurement chain and the validity of its measurements:

Typical CAxxx or CPxxx and IPC707 measurement chain



IPC707 output signal



For an IPC707 with diagnostics, as shown in the output bias level table below, the bias level (DC) uses different nominal values to indicate the status (health) of the measurement chain:

IPC707 output – nominal value of the bias level (DC)			
13 mA_{DC} or 8 V_{DC}	11 mA_{DC} or 6 V_{DC}	10 mA_{DC} or 5 V_{DC}	<8 mA_{DC} or <3 V_{DC}
Normal operation – the dynamic pressure signal (AC) can be trusted	Problem with the sensor and/or cabling	Problem with the signal conditioner	Other problem with the measurement chain or power supply

To configure a dynamic measurement channel of an MPC4 or MPC4SIL card for operation with an IPC707 signal conditioner:

1. In the configuration tree structure of the Architectural view (left), under the database, rack, card and inputs, select the measurement channels node level.
2. In the main working window (right), select the measurement channel to configure by clicking the appropriate tab at the top of the window (Channels 1 to 4).
3. Configure the type of front-end equipment (measurement chain) used by selecting the **Sensor family**, **Sensor type** and **Conditioner type** as usual.

   When **Sensor type** is configured as **CAxxx** or **CPxxx**, the **Conditioner type** can be configured as one of the **IPC …** options.
4. For a measurement chain using an IPC707 signal conditioner, ensure that the **Signal sensitivity by calculation (IPC707)** check box is selected.
   Note that the **Sensor sensitivity**, **Transfer function** and **IPC707 with diagnostics** controls are available for use, while the **Signal sensitivity** control is not available (greyed out).

NOTE: For a measurement chain using an IPC704 signal conditioner, the **Signal sensitivity by calculation (IPC707)** check box is not selected (the default). Note that the **Signal sensitivity** control is available for use, while the **Sensor sensitivity**, **Transfer function** and **IPC707 with diagnostics** controls are not available (greyed out).

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5. For the IPC707 signal conditioner, enter the values for the **Sensor sensitivity** and the **Transfer function**.

   For example: **… pC/g** and **… µA/pC** or **… mV/pC** for a CAxxx piezoelectric accelerometer; **… pC/mbar** and **… µA/pC** or **… mV/pC** for a CPxxx piezoelectric pressure sensor.

6. For an IPC707 signal conditioner with diagnostics, if the **IPC707 with diagnostics** check box is selected, the OK levels (**Upper OK level** and **Lower OK level**) are automatically configured to use values corresponding to the 'normal operation' of the IPC707 (that is, OK levels centred around the nominal value of 13 mA_{DC} or 8 V_{DC}).

NOTE: The OK levels are used to monitor the incoming signal for problems arising in the front end of the measuring chain. These problems can be due to, for example, a defective sensor or signal conditioner, a faulty transmission line (open or short circuit).

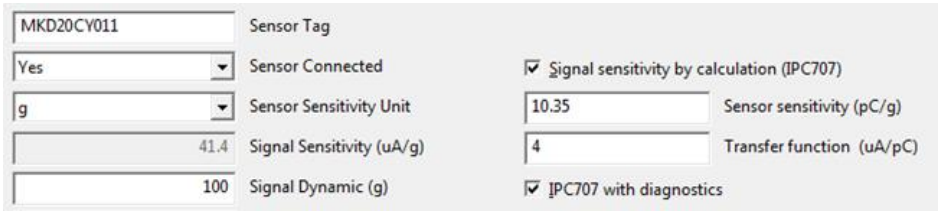
The OK levels are set by default when one of the sensors and from Meggitt's Vibro-Meter® product line is selected.

7. The remainder of the card is configured as usual.
8. The configuration is sent (downloaded) to the card as usual.

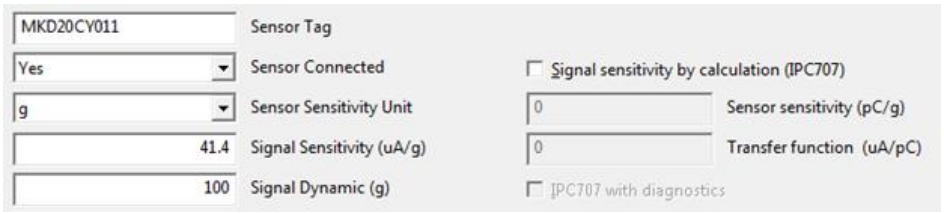
Once configured in this way, if a measurement chain using an IPC707 signal conditioner with diagnostics develops a problem, it will be automatically detected and reported by the VM600-based monitoring and protection system.

For reasons of backwards compatibility, when a card configuration using an IPC707 signal conditioner is read (uploaded) from an MPC4 or MPC4SIL card, the IPC707-related controls are not completed. (Basically, the IPC707-related controls are additional information which is not stored on the cards.)

Example configuration with IPC707 signal conditioner sent to card:



Example configuration subsequently read back from card:



From the screen shots above, it can be seen that the VM600 MPSx software uses the IPC707-related controls (**Sensor sensitivity** and **Transfer function**) to calculate an MPC4 or MPC4SIL card value (**Signal sensitivity**) that is used by the card.

2.15 VM600 MPSx software release 2.7 build 036

2.15.1 S_{max} processing changes for VM600 MPC4 cards

For VM600 MPC4 cards, the S_{max} processing (SMAX) has been updated to support two rectifiers, that is, **Rectifier function: True peak** or **Scaled true peak-to-peak**.

For earlier versions of VM600 MPSx software (release 2.7 build 020 or earlier), S_{max} processing supported both a True peak rectifier and a True peak-to-peak rectifier.

For the previous version of VM600 MPSx software (release 2.7 build 030), S_{max} processing supported a True peak rectifier only.

For the latest version of VM600 MPSx software (release 2.7 build 036), S_{max} processing now supports both a **True peak** rectifier and a **Scaled true peak-to-peak** rectifier.
(The latest **Scaled true peak-to-peak** rectifier actually performs exactly the same processing as the earlier True peak-to-peak rectifier, but it is now more appropriately named to indicate that it is in fact a calculated ('scaled') value as opposed to a directly measured value.)

2.15.2 VM600 CPUx card terminology

The VM600 MPSx software can be used with different versions of VM600 CPUx cards, namely:

- CPUM modular CPU card and optional IOCN input/output card.
  This is the original CPU card.
- CPUR / IOCR rack controller and communications interface card pair.
  This is the first version of the CPUR / IOCR card pair, which supports redundant operation when two functionally equivalent CPUR / IOCR card pairs are installed in the same VM600 rack.
- CPUR2 / IOCR2 rack controller and communications interface card pair.
  This is the second version of the CPUR / IOCR card pair, which supports PROFIBUS DP fieldbus communications.

Accordingly, the VM600 MPSx software has been updated to use more correct and consistent *VM600 CPUx* card terminology as follows:

- **CPUx** is now used to refer to CPUM, CPUR and CPUR2 cards.
- **CPUM** is used to refer to CPUM (and IOCN) cards only, if required.
- **CPUR** is used to refer to CPUR (and IOCR) cards only, if required.
- **CPUR2** is used to refer to CPUR2 (and IOCR2) cards only, if required.
- **IOCx** is used to refer to IOCN, IOCR and IOCR2 cards.
- And so on.

For example, in the user interface of the VM600 MPSx software:

- **CPUx card in rack** refers to all VM600 CPUx cards and replaces **CPU present**.
- **Rack security (CPUx card)** refers to all VM600 CPUx cards and replaces **CPUM security**.
- **CPUx card security settings** refers to all VM600 CPUx cards and replaces **CPUM security settings**.

Previously, the VM600 MPSx software used *VM600 CPUM* card terminology to refer to CPUM, CPUR and CPUR2 cards (simply because only the CPUM card was available when the VM600 MPSx software was originally developed; the CPUR and CPUR2 cards are much more recent.)

2.15.3 Sensor catalogue updates

The underlying sensor catalogue (list) used by the VM600 MPSx software when configuring MPC4 card inputs (measurement channels and speed channels) has been updated with changes for specific sensors as, shown in the table below:

Sensor	Parameter	New value	Old value (for reference only)
SE120	Signal transmission mode	Voltage	Current
CV210 with IVC632 [I]	Upper OK level	−6000 (µA)	−7000 (µA)
	Lower OK level	−18000 (µA)	−17000 (µA)
CV210 with IVC632 [V]	Upper OK level	−2100 (mV)	−2500 (mV)
	Lower OK level	−12900 (mV)	−12500 (mV)
VE210 [I]	Upper OK level	−6000 (µA)	−7000 (µA)
	Lower OK level	−18000 (µA)	−17000 (µA)
VE210 [V]	Upper OK level	−2100 (mV)	−2500 (mV)
	Lower OK level	−12900 (mV)	−12500 (mV)
TQ4xx (2 mm) with IQS450 [I]	Signal transmission mode	Current (fixed)	Current (by default but could be changed)
TQ4xx (2 mm) with IQS450 [V]	Signal transmission mode	Voltage (fixed)	Voltage (by default but could be changed)

2.15.4 MPC4 card measurement channel user interface

When an MPC4 card measurement channel is configured for operation with any specific sensor from the underlying sensor catalogue – apart from **Generic** – the Signal transmission mode is automatically configured as Current or Voltage, as appropriate for the sensor, and cannot be changed (that is, the Signal transmission mode control becomes unavailable (greyed out)).

When an MPC4 card measurement channel is configured for operation with a user defined sensor sensitivity unit (**Sensor sensitivity unit: User defined**), the additionally required **User defined unit label** control is now displayed on the bottom left of the measurement channel tab (user interface).

Previously, the **User defined unit label** control was displayed on the centre right of the measurement channel tab. See also 3.16.1 Problems configuring IPC707 signal conditioners.

2.15.5 Displaying or hiding specific measurements when displaying VM600 MPS2 software charts from a Windows command prompt

When displaying VM600 MPS2 software charts from a Windows command prompt, it is now possible to display or hide specific measurements (sensor tags) using command-line options, as follows:

- `-o`
  The `-o` command-line option is used to display only the specified measurements in the chart.
- `-h`
  The `-h` command-line option is used to hide the specified measurements from the chart, displaying all others.

Examples

To display a bar chart including all available measurements (attached sensor tags), enter the following command at a Windows command prompt:

```
"C:\Program Files (x86)\VM600_MPS\Bin\BarChart.exe" "-all" "-len"
 "-pC:\Program Files (x86)\VM600_MPS\Configuration" "-dSample Database"
 "-sStation 1" "-mMachine 1"
```

Where

`-all` specifies that all available measurements (attached sensor tags) should be displayed. If `-all` is not used, then a measurement point selection window is displayed in order to manually select the measurements to be included in the chart.

`-l` specifies the language to use for the user interface of the chart, as follows: `-len` for English, `-lfr` for French, and `-lde` for German.

`-p` specifies the path to the database, that is, where the `*.db` folder is located.

`-d` specifies the name of the database, that is, the file name of the `*.db` folder.

`-s` specifies the name of the station in the database (from the logical view of the database).

`-m` specifies the name of the machine in the station in the database (from the logical view of the database).

`-o` specifies the measurements to be included in the chart (all others are not displayed).

`-h` specifies the measurements not to be included in the chart (all others are displayed).

NOTE:	In order to use the `-o` or `-h` command-line options, the `-all` command-line option must also be used. If `-all` is not used with `-o` or `-h`, a measurement point selection window is displayed and the `-o` or `-h` options are effectively bypassed/ignored.

To display a bar chart including only the specified measurements V1V, V2V and V3V, enter the following command at a Windows command prompt:

```
"C:\Program Files (x86)\VM600_MPS\Bin\BarChart.exe" "-all" "-o V1V V2V V3V"
 "-len" "-pC:\Program Files (x86)\VM600_MPS\Configuration"
 "-dSample Database" "-sStation 1" "-mMachine 1"
```

To display a bar chart including all available measurements except for the specified measurements V1V, V2V and V3V, enter the following command at a Windows command prompt:

```
"C:\Program Files (x86)\VM600_MPS\Bin\BarChart.exe" "-all" "-h V1V V2V V3V"
 "-len" "-pC:\Program Files (x86)\VM600_MPS\Configuration"
 "-dSample Database" "-sStation 1" "-mMachine 1"
```

The *-o* and *-h* command-line options can be used with all VM600 MPS2 software charts. For example:

- Bar charts

```
"C:\Program Files (x86)\VM600_MPS\Bin\BarChart.exe" "-tbar" "-all" …
```

NOTE:	By default, running the `BarChart.exe` command at a Windows command prompt will display a bar chart, which is equivalent to running the `BarChart.exe` command with the `-tbar` command-line option. To display a trend chart, run the `BarChart.exe` command with the `-tstrip` command-line option.

- Strip charts

```
"C:\Program Files (x86)\VM600_MPS\Bin\BarChart.exe" "-tstrip" "-all" …
```

- Trend charts

```
"C:\Program Files (x86)\VM600_MPS\Bin\TrendChart.exe" "-ttrend" "-all" …
```

- Trend charts (averages).

```
"C:\Program Files (x86)\VM600_MPS\Bin\TrendChart.exe" "-tavg" "-all" …
```

3 Solved problems / bug fixes

3.1 VM600 MPSx software release 2.0 build 008

3.1.1 OC Bus relays were not correctly mapping

The user could correctly map the OCBus relays 1 through 4 but the NE/NDE settings for these relays were not being saved correctly. This problem has been fixed.

3.1.2 Prevents DB Manager from renaming or deleting current database

The MPS Configuration code has been modified to allow the DB Manager to now rename or delete the currently opened database. Previously, a file was being held open by the MPS software and this was preventing the DBManager from perform the rename or delete operation

3.2 VM600 MPSx software release 2.0 build 009

3.2.1 Fix database data deletion problem.

Fixed a problem when attempting to delete data from the database. If the user specified the time field as opposed to deleting all data the user specified time was being used incorrectly. Daylight savings time wasn't being accounted for properly potentially causing the user entered date to be off by an hour.

3.2.2 Page selection problem

When the user selects a tabbed page in the window for Machines and Stations the MPS retains the last page selected. Selecting another Station or Machine should cause the same tabbed page to be selected. For example, selecting the Timing Info page for Machine 1 and then selecting Machine 2 in the tree-list should cause the Timing Info page for Machine 2 to be displayed. This logic was not always working properly but this has been corrected.

3.2.3 Impossible to create a new database if it is the first one.

Prior to this release it was impossible to create a new database if it was the very first one. The user now has a menu item that allows him to create a new database.

3.2.4 Incorrect initialization of AMC8 remote channel source field

When an AMC8 board was added to a rack's configuration the AMC8's card level remote channel source slot number was being initialized incorrectly to zero. This slot number information was in error and must be a value between 3 and 14. This error would be automatically corrected when the Card Level tree item was selected. A "Save Changes?" message would appear the first time the user selected a new AMC8's card level tree item and then selected a different tree item not on the current slot.

3.2.5 Changing databases problem fixed with Event Log

Fixed a problem that occurs when the user is currently recording data for an initial database and then selects a different database for viewing. Any events intended for the initial database were being sent to the second database's event log.

3.2.6 Data recording problem with powered off Racks fixed

Fixed a problem which occurred when the user started data recording while the rack was powered off. Powering up the rack did not cause data recording to begin. In this instance data recording was required to be stopped and then restarted before communications would be established.

3.2.7 Renaming or deletion of the currently opened database.

The code has been modified to allow the DB Manager to now rename or delete the currently opened database. Previously, a file was being held open by the MPS software and this was preventing the DBManager from perform the rename or delete operation.

3.3 VM600 MPSx software release 2.0 build 010

3.3.1 Correctly implemented privilege change operations

The privilege change operations was not correctly handle, from Super to non-Super and back to Super level. The screen objects generally remains enabled when they shouldn't be.

3.3.2 Privilege Change Updates

Additional items falling under the privilege change item. In particular, if the user was at Super level, made changes either to the Database or Rack Window, dropped privilege level to Read, and then selected another tree item they would be presented with the “Save Changes?” dialog - even though they were non-privileged.

3.4 VM600 MPSx software release 2.1 build 001

3.4.1 Window size/position logic problem fixed

A minor problem with the window size and position logic when the window is closed was fixed. If the user had the window minimized when they closed MPS the screen sizes may have been incorrectly saved.

3.4.2 MPC1 Implementation caused some MPC4 display errors

There were some minor problems with the MPC4 displays which were introduced when the MPC1 board implementation was made. In particular, for old configurations, the MPC4 Basic Logical Alarm and the MPC4 Input channel displays where incorrect. These problems were resolved.

3.4.3 Display Plot Button was not operational for AMC8 channels

The “Display Plot” found on the non-linear compensation window for AMC8 channels was, in certain instances, becoming enabled. Unfortunately, there was no logic behind this button. It was there for future work. This button is now ALWAYS invisible so that the user is never presented this option.

3.4.4 Problem with Basic Logical Functions with MPC

A problem was uncovered in the implementation of the MPC1 logical functions for discrete outputs. In "discrete outputs, relay mapping", anytime one attempted to map a relay with a "basic function", the MPS would display: "Measurement channel 3", regardless of which basic function was selected and if the basic function was actually configured. This problem was corrected.

3.4.5 Re-implement card-level drag & drop

The ability to drag & drop at the card level and at the AMC8 point level had been unintentionally removed in an earlier release on the MPS software. This capability has been added back in.

3.4.6 Problem when accessing old database with AMC8 cards

The AMC8 boards were not being displayed properly if the database had been last written using earlier versions of the MPS. This has been corrected.

3.4.7 MPS Sample Database has been updated

Several problems in the sample database released with the MPS distribution were made. These problems dealt which inconsistencies in the data files for the various machines. A consistency check has been added which checks to improve the database backward compatibility.

3.4.8 RS Processed Output 2 sometimes was not properly displayed

When the user changed processing from PS to RS the “Processed Output 2” tag wasn’t properly being changed to display the text string “Gap”. This has been corrected.

3.4.9 Speed channels incorrectly allowed Tacho Ratio editing

The Speed Channels incorrectly allowed the editing of the Tacho Ratio field for privileged users. This field is correctly no longer editable for all users.

3.4.10 Narrow Band Tracking Problem

On the MPC 4 card of the VM 600, in the window “narrow band (tracking) vibration function configuration register” the value of the “tracking speed upper / lower limit” is not the same when we configure it as when we read the configuration from the card. After investigation, we found that the value of the “tracking speed” become wrong when it exceed the half of the real full scale value. This bug appears when we read the configuration of the card. This bug is independent of the “harmonic to process” value we set up. It happens either with frequency or with RPM measurement. This problem was corrected and was due to the function processing the configuration read back interpreting the NB function registers as signed values. This problem, while not reported, also existed for the NBFS processing function.

3.4.11 Dynamic alarm level setting

The MPS software no longer recalculates alarm level settings based on changes being made the current full scale value.

3.4.12 Ping problem related to “Power Users” identified

“Power Users” under Windows® XP have most privileges that the Administrator has. One notable exception is that “Power Users” can’t perform raw socket I/O. The MPS uses raw socket I/O to perform “pings” to the attached racks. Without being able to ping the responsiveness in detecting a down rack is greatly impaired. Microsoft, in their infinite wisdom allows the follow Registry change to re-enable raw socket I/O for “Power Users”:

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Tcpip\Parameters]

"AllowUserRawAccess"=dword:00000001

3.5 VM600 MPSx software release 2.2 build 000

3.5.1 Fixed crashing problem when recording stopped

When data recording was stopped, under certain conditions the MPS would crash. This mainly had to do with shutting down in an orderly manner the data acquisition threads. Also, if the user had switched between numerous databases while collection was occurring then the stopping of recording could have caused an event log synchronization problem.

3.5.2 Jumper matrix shows wrong jumper to set

A problem concerning the jumper matrix for IOC4 boards incorrectly displayed, under certain conditions, has been corrected. The problem occurred because during certain conditions the line attributions weren't being properly updated when the user changed the configuration. This problem, while not reported, also existed for IOC8 displays.

3.5.3 MPS with no databases problem

Under certain conditions one was able to have the database tree items but the "Logical" and "Architectural" buttons were disabled. In other instances there could be no databases in the tree but the "Logical" and "Architectural" buttons were enabled. These problem were corrected.

3.5.4 Rack level inconsistency when sending a configuration

Master Level users may now send the complete rack configurations configuration in one shot.

3.5.5 Machine data collection -> Max Data

Under certain conditions, a machine's max data points value, entered by the user could cause some overflow problems in the displays. This has been fixed. Additionally, this field has now been moved to the timing page.

3.6 VM600 MPSx software release 2.2 build 005

3.6.1 MPS SW forgets user-defined passwords

Sufficiently privileged users can change the MPS passwords for the various privilege levels. The problem was that the MPS was retaining these changed passwords for the current session but for subsequent sessions the MPS reverted to using the default passwords. This problem has been fixed.

3.6.2 No IOC and RLC-16 jumpers Matrix diagrams when no printer is installed

The IOC-4 and RLC-16 jumpers matrix windows wouldn't display if the system the MPS was being executed on didn't have any defined printers. The problem occurred because the MPS logic was attempting to use the default printer's sizes to scale the displays, in a WYSIWYG fashion. Unfortunately, if there weren't any printers, the displays are scaled into oblivion. The logic now scales the windows to an 8.5 by 11.0 inch page if no printers are available. This works for both the letter-size and A4-size users.

3.7 VM600 MPSx software release 2.3 build 000

3.7.1 Default rectifier time for true-peak and true-peak-to-peak

The default rectifier times for the true-peak and true-peak-to-peak rectifiers were change from 0.0 seconds to 4.7 seconds.

3.7.2 MPC1 Service filter containing wrong LP filters parameter

For the GT-13E2 the LP filter parameter (10 kHz) related to the processing Dynamic Pulsation “service band”, was corrected to 1000 Hz. A consistency check allows the user to fix old configurations which contain the incorrect value.

3.7.3 Several serial I/O problems were addressed

Some minor RS-232 bugs when swapping a single RS-232 cable between multiple boards were uncovered and addressed. These changes improve the reliability of communications. Also the application used to crash when at the rack level, the “None” option was selected from the choices for Serial I/O and when in the selection-process the same serial I/O channel was re-selected instead of another channel.

The ability to see the serial port mappings is based on whether any COM port mappings are present. If such mappings exist, the user can see them. Only in the case where the CPU present is ticked and there are no serial ports mappings will the ability to change/view serial port mappings be disabled at the board level. At the rack level, serial port mappings will always be allowed.

3.7.4 AMC8 linear compensation coefficient page editable after privilege change

Changing privilege level from Read level to Super level, while positioned in the “non-linear compensation” page of the AMC windows, was allowing all of the filter coefficients to be editable, even for pre-defined sensor types. This error was corrected.

3.7.5 Analog resolution point problem – value retained at deletion

When deleting a machine with an attached point having an associated analogue resolution value, this value is retained in the “rack file”. Subsequently, adding this point to a different machine caused the point to have its analogue resolution value restored from the retained value and not set to the default value.

3.7.6 NB Tracking Limits displaying as negative values

A display problem occurred when a configuration was read from the MPC4 board, using a version of MPS which pre-dated MPS 2.0.027. This problem has been fixed.

3.7.7 Jumper setting – missing RAW_H on “IOC Jumper Matrix”

Another old problem (dating back to MPS 2.0.007) solved was the view of the "IOC Jumper Matrix" being incorrect for some configurations (a problem with the "blank" Raw Signals/Raw Bus attribution).

Also a display issue, happening when there are no more rawbus lines available to be mapped, was resolved. The only option at that point is to remove an attribution, so the display logic was changed to perform this way.

3.7.8 Processing configuration parameters change when enabling “super” level

When changing privilege levels while positioned in a processing window, the processing parameters were reverting to the default parameters. This old bug has now been corrected.

3.7.9 MPC1 Speed Functions “un-set” automatically

Under certain conditions, the “MPC1/Alarm Configuration/Basic Function x/Speed Channel” would lose the fact that it had been selected. This problem has been fixed.

3.7.10 Update MPC output-window with configuration changes

Every time the opened window detects a change from MPC not running to MPC running the configuration of that card will be re-read. In earlier MPS versions changes in the configuration (as for example of the FSD) were not seen and thus values might have been displayed wrongly.

To restrict traffic to the necessary, the configuration is not verified permanently or on a clocked schedule but triggered by the change from MPC not running back to MPC running, which occurs after the changed configuration has been sent and put to work on the card displayed in this window.

3.8 VM600 MPSx software release 2.5 build 000

3.8.1 Configuration check for Absolute Shaft Vibration (AS) processing

Absolute Shaft Vibration (AS) processing is a dual-channel processing function and requires that one single-channel input is configured for Broad Band Absolute Bearing Vibration (BBAB) processing and one single-channel input is configured for Relative Shaft Vibration (RS) processing.

Absolute Shaft Vibration (AS) processing also requires that the constituent single processing channels (BBAB and RS) use the same cut-off frequencies for their low-pass filters.

When Absolute Shaft Vibration (AS) processing is configured for the dual-processing channels of an MPC4 card (that is, for operation with Channel 1 & 2 or Channel 3 & 4), the VM600 MPS software will check to ensure that the associated single-channels are correctly configured and will display an appropriate message to the user if they are not.

3.8.2 Broad Band Absolute Bearing Vibration (BBAB) rectifiers

Previously, N/A was incorrectly listed as an available rectifier function for Broad Band Absolute Bearing Vibration (BBAB) processing so this N/A option has now been removed.

3.8.3 Bar Chart plot improvements

The Bar Chart available in the VM600 MPS software for the display of live data has been improved as follows.

In the Bar Chart plot window:

The measurement (processed output) displayed is limited to two significant figures after the decimal mark.

The alarm limits displayed are limited to two significant figures after the decimal mark.

A zero reference indicator (**0**) has been added for the dynamic measurement channels and is displayed on the right of the Bar Chart plot window (like the **D+**, **A+**, **A−** and **D−** alarm limit labels). Note: The zero reference indicator is calculated from the values entered for the alarm limits.

3.8.4 Translation-related improvements

The quality of the translation of some French and German language text strings in the user interface were improved as a result of user feedback.

On the Function tab of a dual-channel processing node in an Architectural View configuration tree: “Keine Konfiguration nötig” has replaced “Kein” as the German translation of “No configuration required”.

In general, the use of Yes and No in English for buttons in dialog boxes when French or German has been selected as the language of the VM600 MPS software user interface is normal system behaviour when English has been selected as the language of the operating system (Windows® 7 and XP) for the computer running the VM600 MPS software.

On the Timing Info tab of a Machine level node in a Logical View configuration tree:
“Nombre maximum de points” is used as the French translation of “Max Data Points”.
“Max Datenpunkte” is used as the German translation of “Max Data Points”.

In the Bar Chart plot options window:
“Grenzwert Labels anzeigen”, used as the German translation of “Show Limit Labels”, is now displayed in a wider text box so that the full text string can be seen. (Previously, only “Grenzwert Labels anz” was displayed.)

In the Strip Chart plot data summary window:
“Résumé des données” is used as the French translation of “Data Summary”.
“Daten Zusammenfassung” is used as the German translation of “Data Summary”.

On the Timing Info tab of a Machine level node in a Logical View configuration tree, the “Approximate Maximum File Size” text string now uses the file size units (MB, GB and TB) correctly in all languages. (Previously, the units were displayed twice in English and French, and in both English and French for the French language translation.)

In certain locations of the German version of the user interface, the English “No” was incorrectly translated as “Neine” and has now been changed to “Nein”.

3.8.5 Inconsistency between the summary sheet and the dumped configuration for an MPC4 card

For an MPC4 card, the summary sheet file (*.txt) and the configuration dumped to file (*.csv) were inconsistent in their treatment of the Proximity Probe Initial Gap parameter.

For example, these files showed −5 mm, rather than the −6 mm configured in the VM600 MPS software.

This behaviour was due to an incorrect truncation that has been corrected.

3.8.6 MPS2 software can stop responding when recording data

Under certain circumstances, the MPS2 software can stop responding (“crash”) when recording (acquiring and storing) data, particularly when the user switches from the Logical View to the Architectural View.

For example, the MPS2 software stops responding and a “this program needs to close” message is displayed.

In order to correct this, the behaviour of the MPS2 software has been modified so that the Architectural View is disabled during recording and re-enabled when recording is stopped.

(In fact, the user level “super” falls back to “user” during recording so it was not possible to change the Architectural view configuration anyway).

3.8.7 Rack names with non-alphanumeric characters

When a new rack was created in a configuration and the name (Tag) contained non-alphanumeric characters, the VM600 MPS software did not handle this gracefully.

For example:

- A rack Tag containing a (forward) slash "/" resulted in the VM600 MPS software displaying an error message and stopping responding.
- A rack Tag containing a colon ":" was apparently accepted but resulted in the VM600 MPS software not saving the rack. That is, when the configuration was re-opened, the rack was not there.

In order to correct this, the behaviour of the MPS2 software has been modified so that it consistently accepts all alphanumeric characters and symbols in a rack name (Tag) *except* for the following symbols: > < / \ | ? * and “.

If an unaccepted symbol is used in a rack’s Tag, the rack is not saved and a message is displayed to inform the user.

3.8.8 The summary sheet does not contain all of the MPCC information for an MPC4 card

The summary sheet file (*.txt) did not contain all of the information entered for an MPC4 card (by selecting the card and using the **File > MPCC – General Information** menu command).

This has now been corrected and all of the MPCC information is now included at the start of the summary sheet file.

Note: MPCC refers to the MPCC software, a precursor to the VM600 MPS software that was designed for the configuration of MPC4 cards in stand-alone racks (where each card was configured individually via the RS-232 connector on its front panel).

3.8.9 Extra numbers appearing in the German version of the dumped configuration for an MPC4 card

When using the VM600 MPS software with the German user interface, the configuration dumped to file (*.csv) for an MPC4 card contained extra numbers in the “VERARBEITUNG - VERARBEITETE AUSGÄNGE“ section.

For example, as shown in red below:

VERARBEITUNG - VERARBEITETE AUSGÄNGE

Kanal,Kanal 1/Ausgang 1,Kanal 2/Augang **49202162**,Kanal 3/Ausgang 1,Kanal 4/Ausgang **49202196**

Ausgang belegt,Ja,Ja,Ja,Ja

...

Interne Verarbeitungsgrenze,30,30,30,15

Kanal,Kanal 1/Ausgang 2,Kanal 2/Augang **49202179**,Kanal 3/Ausgang 2,Kanal 4/Ausgang **49202213**

Ausgang belegt,Neine,Neine,Neine,Neine

This behaviour was due to an incorrect handling of the text string used to generate the dumped configuration which has now been corrected.

In addition, the incorrect translation “Augang” has now been changed to “Ausgang”.

3.9 VM600 MPSx software release 2.6 build 000

3.9.1 S_{max} processing mode check for Absolute Shaft Vibration (AS) processing

S_{max} is a dual-channel processing function which requires that the engineering unit and rectifier function of the S_{max} output are the same as the engineering units and rectifier functions of the relative shaft vibration processing functions (single-channels) that are used as its inputs.

However, when working at the Super privilege level with full access rights, it was possible for the S_{max} processing function's engineering units and rectifier functions to be changed to be different from those used by the input processing functions (relative shaft vibration). Further, it was possible to send such an incorrect configuration to a VM600 rack.

In order to correct this, the behaviour of the MPSx software has been modified so that it now uses the engineering units and rectifier functions used by the input processing functions (relative shaft vibration) by default. It also performs a consistency check of S_{max} processing functions in order to ensure that they are correctly configured and any issues are displayed to the user using informative message boxes. In addition, it is no longer possible to send a configuration with an incorrectly configured S_{max} processing function to a VM600 rack.

3.9.2 Sending a configuration to a VM600 rack

A configuration can be sent to a VM600 rack at one of two levels:

- Card level – by selecting a card (AMC8 or MPC4) in the configuration tree then using the **Communications > To AMC > Send Configuration** or **Communications > To MPC > Send Configuration** menu bar command as appropriate.
- Rack level – by selecting a rack in the configuration tree then using the **Communications > Send Configuration** menu bar command.

When sending a configuration to a VM600 rack, the MPSx software prompts the user for confirmation with a message box before continuing with the download. So when sending a configuration to a VM600 rack at the rack level, the MPSx software prompted the user for confirmation for each card (AMC8 or MPC4) in the rack.

The behaviour of the MPSx software has been modified so that it now prompts the user for confirmation only once, for both rack level and card level downloads.

3.9.3 Incorrect Alarm levels for Narrow Band (Vibration) processing function

Under certain circumstances, the Alarm levels configured for the Amplitude outputs of a Narrow Band (Vibration) processing function were effectively ignored and lower levels were used so that the alarm outputs were effectively saturated.

When an alarm is configured for the output of a processing function, the VM600 MPSx software calculates the maximum value of the alarm and compares it to the full scale deflection (FSD) for the channel. If the calculated maximum value of the alarm is less than the FSD value, then the calculated maximum value of the alarm is used as the maximum value of the alarm, and if the calculated maximum value of the alarm is greater than the FSD value, then the FSD is used as the maximum

value of the alarm. However, depending on the configuration of a Narrow Band (Vibration) processing function, the calculated maximum value of the alarm could be incorrect and the incorrectly calculated maximum value of the alarm was used rather than the FSD, resulting in saturated Alarm levels for the Amplitude outputs.

The incorrect calculation was due to an incorrect conversion factor (in RPM but should have been in Hz) that has been corrected.

3.9.4 Sensor Information Editor causing the VM600 MPSx software to stop responding

The Sensor Information Editor could cause the VM600 MPSx software to stop responding, depending on the contents of the underlying sensor list file.

This behaviour was due to the underlying file parser used by the Sensor Information Editor, which has now been improved to be more tolerant of incorrectly defined sensors in the text file (*sens_info.txt*) used in the background.

3.9.5 Unable to send a configuration containing Absolute Shaft Vibration (AS) processing to a VM600 rack

It was not possible to send a configuration containing Absolute Shaft Vibration (AS) processing to a VM600 rack if the engineering units configured for the constituent single-processing channel outputs (BBAB and RS) and the engineering unit configured for the dual-channel AS output required that integration was performed between an input and the output.

This behaviour was due to improvements to the consistency check (in VM600 MPS version 2.5) which had inadvertently removed the “permissions” that are necessary for the required integration to be performed.

3.10 VM600 MPSx software release 2.6 build 001

3.10.1 MPC Outputs window not displaying information from an MPC4 SIL card

When reading the outputs from an MPC4 SIL card, via the RS-232 connector on its front panel, the MPC Outputs window does not display any information from the MPC4 SIL card and displays the error message “No possible to import configuration from MPC4 SIL on standard MPC4 configuration”.

This behaviour of the VM600 MPS software has been improved so that MPC4 SIL cards are now handled correctly by the MPC Outputs window.

See also 2.8.1 Improved support for the safety (SIL) version of the MPC4 card.

3.11 VM600 MPSx software release 2.7 build 010

3.11.1 Communication problems on the second Ethernet interface of a CPUM card

NOTE: Although originally documented in the VM600 MPS 2.7 build 010 release notes, this bug fix was actually included in the VM600 MPS 2.7 build 012 software.

See 3.13.1 Communication problems on the second Ethernet interface of a CPUM card.

3.11.2 MPC4 SIL card support for functionality that is only valid for non-safety-relevant signals

The VM600 MPSx software makes a distinction between the safety version of the MPC4 card (**MPC4 SIL**) and the standard and the separate circuits versions of the MPC4 card (**MPC4**).

NOTE: The MPC4 SIL card does not have a VME bus interface so it cannot communicate with a CPUM or any other cards in a VM600 rack. Accordingly, the MPC4 SIL can only be configured via the RS-232 connector on its front panel (even for a "networked" VM600 rack). Further, the MPC4 SIL does not provide all the signal processing capabilities of the other versions of the card.
Refer to the *VM600 machinery protection system (MPS) hardware manual* and the *VM600 functional safety manual* for additional information.

When a VM600 rack (system) is used as part of a safety-related system (SRS), certain configuration restrictions must be applied to MPC4 SIL cards in order to be SIL compliant. For example, only certain processing functions are permitted, alarms must be configured as latching, and output relays must be configured as normally energised (NE), that is, de-energised to trip (as described in the *VM600 functional safety manual*).

As a consequence, the VM600 MPSx software only allowed an MPC4 SIL card configuration that contained functionality that was valid for safety relevant signals (that is, processing permitted by SIL) to be send to the card.

However, the VM600 MPSx software now allows an MPC4 SIL card configuration that contains functionality that is not valid for safety relevant signals to be sent to the card. For example, this allows "spare" channels of an MPC4 SIL card to be used with non-safety-relevant signals using non-safety-compliant processing as part of a non-safety-related system.

NOTE: When a user sends a configuration to an MPC4 SIL card that that contains functionality that is only valid for non-safety relevant signals, the VM600 MPSx software will display a message to remind the user that "One or more channels of the MPC4 SIL card in slot *n* will use functionality that is only valid for non-safety-relevant signals" and prompt the user before continuing.

3.12 VM600 MPSx software release 2.7 build 011

3.12.1 Unable to send a configuration containing Dual Mathematical Function (DMF) processing to an MPC4 card

It was not possible to send a configuration containing Dual Mathematical Function (DMF) processing to an MPC4 card (VM600 rack) if the input measurement channels, the single-processing channels outputs and the dual-processing channel DMF output were not all configured to use the same engineering unit.

This behaviour of the VM600 MPS software has been improved by removing the engineering unit restriction on the dual-processing channel DMF output. For example, this allows a configuration with integration of the output signal to be used.

3.12.2 Sensor Information Editor stops responding after adding a new sensor

The Sensor Information Editor of the VM600 MPS software could stop running (“crash”) when a new sensor (measurement chain) using the same name as an existing sensor was added to the Sensor List.

The behaviour of the Sensor Information Editor has been improved to better manage the handling of measurement chain names (**Sensor Family Sensor Type / Conditioner**) used in the underlying software and displayed in the Sensor List.

It is still possible to add a new sensor (measurement chain) that uses the same name as an existing one as this is necessary to support similar measurement chains using the same sensor but different signal conditioners.

See also 2.11.1 Sensor Information Editor file updates.

3.13 VM600 MPSx software release 2.7 build 012

3.13.1 Communication problems on the second Ethernet interface of a CPUM card

NOTE: Although originally documented in the VM600 MPS 2.7 build 010 release notes, this bug fix was actually included in the VM600 MPS 2.7 build 012 software.

See 3.11.1 Communication problems on the second Ethernet interface of a CPUM card.

In 2015, the VM600 CPUM card was updated to use a new PC/104 CPU module (PFM-541I or equivalent) that supports two Ethernet interfaces.

NOTE: Two different versions of the CPUM card are currently in use:

- Later versions of the CPUM card (PNR 200-595-076-HHh or later) fitted with the PFM-541I or equivalent CPU module – that supports two Ethernet interfaces by default.
- Earlier versions of the CPUM card (PNR 200-595-075-HHh or earlier) fitted with the MSM586EN or equivalent CPU module – that support one Ethernet interface by default and require an additional Ethernet controller module (MSME104 or equivalent) to be fitted in order to be Ethernet redundant.

The two Ethernet interfaces supported by later versions of the CPUM card have 10/100BASE-TX network interfaces and support data transfer rates up to 100 Mbps (earlier versions of the CPUM card have 10BASE-T interfaces and support data transfer rates up to 10 Mbps).

Depending on the network configuration, the quality of network components such as switches and cable lengths, the second Ethernet interface of the later versions of the CPUM card can experience communications problems when it is autoconfigured for operation at 100 Mbps.

NOTE: The second Ethernet interface (ETH1) is available via the '**2**' connector (8P8C (RJ45)) on the IOCN card's front panel, if used.

As a result, it is necessary to ensure that the second Ethernet interface of later versions of the CPUM card use a maximum data transfer rate of 10 Mbps in order to ensure reliable communications under all circumstances.

To force the second Ethernet interface of later versions of the CPUM card to use a maximum data transfer rate of 10 Mbps, the `net.cfg` configuration file on the card must be updated as follows.

Example existing `net.cfg` file:

```
#main network connection
net0_ipaddr = 10.10.56.56
net0_netmask = 0xFFFF0000
net0_force10Mb = 0
#redundant network connection
net1_ipaddr = 10.10.56.156
net1_netmask = 0xFFFFFF80
```

Example updated `net.cfg` file:

```
#main network connection
net0_ipaddr = 10.10.56.56
net0_netmask = 0xFFFF0000
net0_force10Mb = 0
#redundant network connection
net1_ipaddr = 10.10.56.156
net1_netmask = 0xFFFFFF80
net1_force10Mb = 1
```

When used with a CPUM card running firmware version 076 or later, the latest version of the CPUM Configurator software now ensures that the `net.cfg` file always includes the *`net1_force10Mb = 1`* line for the second Ethernet interface of a CPUM card.

NOTE:	CPUM Configurator is a software tool included with VM600 MPSx software version 2.7 or later and is copied to the computer as part of the VM600 MPSx software installation process. It can also be obtained from Meggitt Sensing Systems customer support. CPUM Configurator is used primarily for configuring CPUM cards and managing VM600 racks over Ethernet links. Refer to the *VM600 networking manual* for further information on the CPUM Configurator software.

When used with a CPUM card running firmware version 076 or later, CPUM Configurator can now be used to configure the default gateway for the CPUM card.

When the **CPUM Configurator** software is started, it automatically reads the contents of the `net.cfg` file on the CPUM card.

If CPUM Configurator does not detect the *`net1_force10Mb = 1`* line that forces the second Ethernet interface of a CPUM card to operate at 10 Mbps, it displays a message warning the user about potential “second ethernet adaptor connectivity issues” and prompts the user to “fix the problem”.

If **Yes** is clicked to confirm the fix, then CPUM Configurator adds the *`net1_force10Mb = 1`* line to the `net.cfg` file, updating it on the CPUM card, thereby ensuring that the second Ethernet interface is configured for operation at 10 Mbps.

NOTE:	In order for any changes to the `net.cfg` file to take effect, the CPUM card must be restarted.

3.13.2 Sensor Information Editor file updates

The underlying sensor list files (“sens_vm.txt” and “sens_vm_factory.txt”) used by the Sensor Information Editor of the VM600 MPS software were updated to correct the following error:

The `ADC TQ 4xx (4mm) / IQS 450 [U]` entry in the Sensor List had the Signal Transmission Mode incorrectly entered as **Current**. This has now been corrected to **Voltage**.

3.14 VM600 MPSx software release 2.7 build 020

3.14.1 Measurement channel alarm delays for MPC4 and AMC8 cards

For MPC4 and AMC8 card measurement channels, the behaviour of the **Delay (s)** boxes used to enter the value of the delay required before an alarm is generated for a processed output has been changed so that:

- Only non-negative values in the range 0 to 3276.7 are now accepted.
  (Previously, values in the range −3276.8 to 3276.7 were accepted.)
- **Delay (s)** box behaviour is more consistent between the MPC4 and AMC8 cards.

NOTE:	Although measurement channel alarm delays in the range 0 to 3276.7 are accepted by the VM600 MPSx build 020 software, only values in the range 0 to 60.0 should be used: • The range of alarm delay values supported by the measurement channels of an MPC4 card is 0 to 60.0 seconds with a resolution of 0.1 second (100 milliseconds). • The range of alarm delay values supported by the measurement channels of an AMC8 card is 0 to 60.0 seconds with a resolution of 0.1 second (100 milliseconds). • Correct operation cannot be guaranteed if a value outside the supported range of alarm delay values is configured.

3.14.2 Problem adding an MPC1 card to a rack

When trying to add an MPC1 machinery pulsation card to a VM600 rack (in the configuration tree structure), the MPSx software displays a window with a message such as "…assertion error D:\Projects\MPS Software\Src\cpuwin.cpp: 732" and then the MPSx software stops responding ("crashes").

This behaviour was due to one of the default measurement chains used by the MPC1 card no longer existing in the underlying sensor list files ("sens_vm.txt" and "sens_vm_factory.txt") due to a recent update to these files.

This has been corrected so that the MPSx software now uses the equivalent updated measurement chain, that is, the `CP xxx / IPC[I] + GSI 127` entry in the Sensor List of the Sensor Information Editor.

3.15 VM600 MPSx software release 2.7 build 030

3.15.1 Invalid sensor fail events in databases

Sensor fail events (SENSOR FAIL) were being incorrectly recorded to databases.

Such sensor fail events were characterised by being random and invalid, as the sensors were known to be operating correctly (that is, the sensor OK levels were correct).

This behaviour was due to the VM600 MPSx software using an incorrect flag (bit).

3.15.2 Multi-channel output values for VM600 AMC8 cards incorrectly displayed as zero in Trend charts

For VM600 AMC8 cards configured with multi-channel processing (MIN, MAX; AVG or DIFF), the multi-channel output was always displayed with a value of zero (0) in the VM600 MPSx software's Trend charts used for the display of historical data.

This behaviour was due to the VM600 MPSx software using an incorrect index which accessed an incorrect (empty) data structure.

3.15.3 Beta firmware versions for VM600 CPUM cards displayed incorrectly by CPUM configurator

For VM600 CPUM cards running 'beta' (unofficially released) versions of firmware, the firmware version information displayed by the CPUM Configurator software was incorrect.

For example, beta firmware versions were previously typically displayed as:

```
CPUM FW version is '098' for unknown hardware
```

Beta firmware versions are now typically displayed as:

```
CPUM FW version is 'SVN3098' for MSM586-based hardware
```

3.15.4 S_{max} processing changes for VM600 MPC4 cards

For VM600 MPC4 cards, the S_{max} processing (SMAX) has been updated to support a single rectifier only, that is, **Rectifier function: True peak**.

Previously, the S_{max} processing supported both a true peak rectifier and a true peak-to-peak rectifier.

Note: The true peak-to-peak rectifier function was removed because MPC4 cards calculate S_{max} in accordance with ISO 7919-1 method C to provide a $S_{max(pk)}$ value (not a peak-to-peak value). Accordingly, the true peak-to-peak rectifier is neither required nor used.

3.16 VM600 MPSx software release 2.7 build 036

3.16.1 Problems configuring IPC707 signal conditioners

When configuring MPC4 card measurement channels for operation with a measurement chain using an IPC707 signal conditioner:

- There were problems regarding the OK levels (**Upper OK level** and **Lower OK level**):
  - OK levels were not always saved.
  - Incorrect OK levels could be displayed.
- There was a problem when the **Sensor sensitivity unit** was configured as **User defined**, whereby the additionally required **User defined unit label** control was displayed on top of the **Signal sensitivity by calculation (IPC707)** controls, making it difficult to understand and use the controls to configure the measurement channel.

In addition, for an IPC707 signal conditioner with integration (**Conditioner: IPC Integ. [I]** or **IPC Integ. [U]**), the units displayed for the **Transfer function (…)** of the IPC707 were not correct. For example, **µA/pC** was displayed instead of **µA/pCs** and **mV/pC** was displayed instead of **mV/pCs**.

3.16.2 Overwriting of OK levels for certain sensors

When configuring MPC4 card measurement channels for operation with a measurement chain using certain sensors, the OK levels (**Upper OK level** and **Lower OK level**) were automatically overwritten with the default values from the underlying sensor catalogue (list) used by the VM600 MPSx software whenever the configuration was opened and the measurement channels were displayed.

The sensors affected were:

- CAxxx
- CE134
- CE281
- CE311
- CE680
- SE120
- CV210
- CV21x
- CPxxx
- PV102
- VE210 [I]
- VE210 [U]
- AE119.

Note: Sensors not included/listed in the underlying sensor catalogue were not affected by this issue.

3.16.3 Incorrect OK levels for certain sensors

When configuring MPC4 card measurement channels for operation with a measurement chain using certain sensors, the default OK levels (**Upper OK level** and **Lower OK level**) from the underlying sensor catalogue (list) used by the VM600 MPSx software when configuring inputs were incorrect.

The sensors affected were:

- CE680 (voltage signal transmission mode)
- SE120 (current signal transmission mode)
- CV21x (voltage signal transmission mode)
- PV102 (voltage signal transmission mode)
- VE210 (current and voltage signal transmission modes)
- AE119 (current signal transmission mode).

4 Known problems

4.1 Database Manager may not display buttons properly on Windows NT4

On a Windows® NT4 workstation having a screen resolution of 1280x1024 pixels, the Database Manager may not display buttons properly. This problem is under investigation and has not been fixed yet.

5 Compatibility

5.1 Software

5.1.1 VM600 MPSx software

VM600 MPSx software version 2.7 build 036 is an update/maintenance level release in the 2.x build xxx series and replaces VM600 MPSx software version 2.7 build 030.

The VM600 MPSx software version 2.7 build 036 is compatible and fully operational with the currently deployed versions of MPC4 cards, AMC8 cards and CPUM cards. See section 5.2 Hardware.

NOTE:	Concurrent installation of several different versions of VM600 MPS1 or MPS2 software is not tolerated, in order to avoid compatibility issues with diverging versions accessing the same databases.

VM600 MPSx software version 2.7 runs on any Microsoft® Windows® operating system (Windows Server 2003, Windows NT, Windows 2000, Windows XP, Windows Vista, Windows 7) and does not have special computer hardware requirements, other than communication gateways such as Ethernet and COM ports must be available and working.

5.1.2 VM600 MPSx databases

VM600 MPSx software version 2.7 is fully backwards-compatible with databases that were created and operated with earlier versions of the VM600 MPSx Software.

NOTE:	However, once opened with VM600 MPSx software version 2.7, a database may not remain compatible with previous versions of the VM600 MPSx software as some details in the internal database structure are adapted to the latest standard when running VM600 MPSx software version 2.7 (for example, to include new system features).

5.2 Hardware

5.2.1 VM600 card hardware

There is no hardware update for the MPC4, AMC8 and CPUM cards used with VM600 MPSx software version 2.7 build 036, which remains compatible with currently deployed versions of these cards (card part numbers):

- MPC4 card version: 200-510-SSS-1/2/3Hh.
- AMC8 card version: 200-550-SSS-1/2Hh.
- CPUM card version: 200-595-SSS-1/3/42h.

5.2.2 VM600 card firmware

There is no firmware (embedded software) update for the MPC4 cards corresponding to VM600 MPSx software version 2.7 build 036. The latest firmware for MPC4 cards is:

- MPC4 firmware version: 200-510-901-076
    - Standard version of the MPC4 card (PNR: 200-510-076-1Hh)
    - Lacquered version of the MPC4 card (PNR: 200-510-076-1HhL)
    - Separate circuits version of the MPC4 card (PNR: 200-510-071-2Hh).
- MPC4 SIL firmware version: 200-510-901-077
    - MPC4 SIL card (PNR: 200-510-077-312).

No firmware upgrades are required for earlier versions of the MPC4 card firmware.

NOTE:	The safety versions of the MPC4 cards (MPC4 SIL) must continue to use their existing firmware, as a firmware upgrade would void their SIL certification.

There is no firmware (embedded software) update for the AMC8 cards corresponding to VM600 MPSx software version 2.7 build 036. The latest firmware for AMC8 cards is:

- AMC8 firmware version: 200-550-901-005
    - Standard version of the AMC8 card (PNR: 200-550-005-1Hh)
    - Separate circuits version of the AMC8 card (PNR: 200-550-005-2Hh).

No firmware upgrades are required for earlier versions of the AMC8 card firmware.

NOTE:	Particular features of the VM600 MPSx software that rely on AMC8 / IOC8T cards may not be available with VM600 racks that don't include AMC8 cards.

There is no firmware (embedded software) update for the CPUM cards corresponding to VM600 MPSx software version 2.7 build 036. The latest firmware for CPUM cards is 200-595-901-079, as used by the following products:

- Standard Ethernet redundant version of the CPUM card – dual Ethernet interfaces (PNR: 200-595-079-331)
- Lacquered Ethernet redundant version of the CPUM card – dual Ethernet interfaces (PNR: 200-595-079-331L)
- Separate circuits Ethernet redundant version of the CPUM card – dual Ethernet interfaces (PNR: 200-595-079-341)
- Standard serial redundant version of the CPUM card – dual Ethernet and dual serial interfaces (PNR: 200-595-079-531)

- CPUM upgrade kit for a CPUM card fitted with the PFM-541I or equivalent CPU module (PNR: 200-595-079-941)
- CPUM upgrade kit for a CPUM card fitted with the MSM586EN or equivalent CPU module (PNR: 200-595-079-901)
- CompactFlash memory card containing firmware for a CPUM card fitted with the PFM-541I or equivalent CPU module (PNR: 200-595-400-079)
- CompactFlash memory card containing firmware for a CPUM card fitted with the MSM586EN or equivalent CPU module (PNR: 200-595-300-079).

No firmware upgrades are required for earlier versions of the CPUM card firmware.

NOTE:	While some of the functionality of VM600 MPSx software version 2.7 requires the latest version of the CPUM card, the VM600 MPSx software continues to work with earlier versions of the CPUM as far as the functionality allows.

Table 1 shows the compatibility between VM600 MPSx software and MPC4 / MPC4 SIL card firmware.

Table 2 shows the compatibility between VM600 MPSx software and AMC8 card firmware.

Table 3 shows the compatibility between VM600 MPSx software and CPUM card firmware.

NOTE:	It is strongly recommended to use the most recent version of the VM600 card firmware that is compatible with the version of VM600 MPSx software being used.

Table 1: VM600 MPSx software and MPC4 / MPC4 SIL card firmware compatibility

MPSx software		**MPC4 card**	**MPC4 SIL card**	**Comments**
Software version (CD PNR) See note 1	**Year**	**Firmware version** (Card PNR) See note 2	**Firmware version** (Card PNR) See note 2	
2.0 (209-500-x00-020)	2004	070 or later (200-510-070-xHh)	Not applicable: no SIL certification before 2009	
2.1 (209-500-x00-021)	April 2007	071 or later (200-510-071-xHh)		Added support for VM600 MPC1 card
2.2 (209-500-x00-022)	July 2007			Added support for VM600 slimline (ABE056) rack
2.3 (209-500-x00-023)	2008			
2.4 (209-500-x00-024)	2011	073 or later (200-510-073-xHh)	071 (200-510-071-113, "standard" MPC4 card in 2009 and 200-510-071-311, "safety" MPC4 SIL card from 2010)	Added (individual) channel inhibit function. Note: Channel inhibit function is not supported by the MPC4 SIL card.
2.5 (209-500-x00-025)	2013	075 or later (200-510-075-xHh)		Added dual mathematical function (DMF) processing. Note: DMF processing is not supported by the MPC4 SIL card (firmware version 071).
2.6 (209-500-x00-026)	2014	076 or later (200-510-076-xHh)	077 (200-510-077-312)	Improved support for the MPC4 SIL card. Note: DMF processing is now supported by MPC4 SIL card (firmware version 077).
2.7 (209-500-x00-027)	2015 to 2018			Added VM600 MPS rack (CPUM) security features (requires CPUM firmware version 077 or later) and the CPUM Configurator software is now included by default

Notes for Table 1

1. In the part number for the MPSx software (PNR 209-500-x00-SSS), "x00" represents the specific software package (that is, "100" for MPS1 and "200" for MPS2) and "SSS" represents the software version.

2. In the part number for the MPC4 and MPC4 SIL cards (PNR 200-510-SSS-xHh), "SSS" represents the firmware version and "xHh" represents the hardware version. In the "xHh" part, "x" identifies the version of the card ('standard', 'separate circuits' or 'safety' (SIL)), "H" identifies major modifications that can affect product interchangeability and "h" identifies minor modifications that have no effect on interchangeability.

Table 2: VM600 MPSx software and AMC8 card firmware compatibility

MPSx software		**AMC8 card**	**Comments**
Software version (CD PNR) See note 1	**Year**	**Firmware version** (Card PNR) See note 2	
2.0 (209-500-x00-020)	2004	003 or later (200-550-003-xHh)	
2.1 (209-500-x00-021)	April 2007		
2.2 (209-500-x00-022)	July 2007		Added support for VM600 slimline (ABE056) rack
2.3 (209-500-x00-023)	2008		
2.4 (209-500-x00-024)	2011	005 or later (200-550-005-xHh)	Added (individual) channel inhibit function
2.5 (209-500-x00-025)	2013		
2.6 (209-500-x00-026)	2014		
2.7 (209-500-x00-027)	2015 to 2018		Added VM600 MPS rack (CPUM) security features (requires CPUM firmware version 077 or later) and the CPUM Configurator software is now included by default

Notes for Table 2

1. In the part number for the MPSx software (PNR 209-500-x00-SSS), “x00” represents the specific software package (that is, “100” for MPS1 and “200” for MPS2) and “SSS” represents the software version.

2. In the part number for the AMC8 card (PNR 200-550-SSS-xHh), “SSS” represents the firmware version and “xHh” represents the hardware version, where “x” identifies the version of the card (‘standard’ or ‘separate circuits’), “H” identifies major modifications that can affect product interchangeability and “h” identifies minor modifications that have no effect on interchangeability.

Table 3: VM600 MPSx software and CPUM card firmware compatibility

MPSx software		CPUM card	Comments
Software version (CD PNR) See note 1	**Year**	**Firmware version** (Card PNR) See note 2	
2.0 (209-500-x00-020)	2004	041 or later (200-595-041-HHh)	
2.1 (209-500-x00-021)	April 2007	See note 3	Added support for VM600 MPC1 card
2.2 (209-500-x00-022)	July 2007		Added support for VM600 slimline (ABE056) rack
2.3 (209-500-x00-023)	2008		
2.4 (209-500-x00-024)	2011		Added (individual) channel inhibit function. Note: Channel inhibit function is supported by the MPC4 and AMC8 cards.
2.5 (209-500-x00-025)	2013		Added dual mathematical function (DMF) processing
2.6 (209-500-x00-026)	2014		Improved support for the MPC4 SIL card
2.7 (209-500-x00-027)	2015 to 2018	079 or later (200-595-079-HHh)	Added VM600 MPS rack (CPUM) security features (requires CPUM firmware version 077 or later) and the CPUM Configurator software is now included by default

Notes for Table 3

1. In the part number for the MPSx software (PNR 209-500-x00-SSS), “x00” represents the specific software package (that is, “100” for MPS1 and “200” for MPS2) and “SSS” represents the software version.

2. In the part number for the CPUM card (PNR 200-595-SSS-HHh), “SSS” represents the firmware version and “HHh” represents the hardware version. In the “HHh” part, “HH” identifies the version of the card (such as the number of communications interfaces) and major modifications that can affect product interchangeability and “h” identifies minor modifications that have no effect on interchangeability.

3. Different versions of the CPUM card using different CPU modules, different types of memory and different versions of firmware have been released:

- Earlier versions of the CPUM card (PNR 200-595-041-HHh or later) were fitted with the MSM486 or equivalent CPU module and used DiskOnChip DIP memory.
- Versions of the CPUM card (PNR 200-595-060-HHh or later) were fitted with the MSM586EN or equivalent CPU module and used DiskOnChip DIP memory.
- Versions of the CPUM card (PNR 200-595-066-HHh or later) were fitted with the MSM586EN or equivalent CPU module and used CompactFlash memory.
- Latest versions of the CPUM card (PNR 200-595-076-HHh or later) are fitted with the PFM-541I or equivalent CPU module and use CompactFlash memory.

NOTE: Due to changes to the underlying CPUM carrier board, the later versions of the CPUM card are not compatible with earlier versions. For example, the PFM-541I CPU module can only be used with the latest versions of the CPUM card.

6 Upgrade procedure

This section describes the procedure for upgrading a VM600 MPSx software system from a previous version. Perform the steps in the given sequence in order to complete a system upgrade.

Refer to the following manuals for further information:

- *VM600 MPS1 software for machinery protection systems software manual*.
- *VM600 networking manual*.
- *Firmware (embedded software) upgrades for cards in a VM600 rack manual*.

6.1 Upgrading the VM600 MPSx software

To upgrade the VM600 MPSx Software:

- Stop the recording (acquiring and storing) of data on a running machinery protection system (MPS) system and exit (close) the VM600 MPSx software.
- Make backup copies of any important (required) data such as configurations and databases.
- Remove the currently installed version of VM600 MPSx software by double-clicking the setup.exe file on the VM600 MPSx software CD.
  The installation wizard will detect any existing version of VM600 MPSx software. When prompted, click the **Remove** button and follow the instructions to remove the existing version.
- Install the latest version of VM600 MPSx software by double-clicking the setup.exe file on the VM600 MPSx software CD again, following the instructions and accepting the default installation options.

NOTE:	It is highly recommended to install the new version of VM600 MPSx software at the same location in the file system as the previous version. Navigate to the appropriate folder when prompted by the installation wizard, as necessary.

NOTE:	Concurrent installation of several different versions of MPS1 or MPS2 is not tolerated, in order to avoid compatibility issues with diverging versions accessing the same databases.

7 Customer support

7.1 Contacting us

Meggitt Sensing Systems worldwide customer support network offers a range of support including Technical support and Sales and repairs support. For customer support, please contact your local Meggitt Sensing Systems representative. Alternatively, contact our main office:

Meggitt SA
Customer support department
Route de Moncor 4
PO Box 1616
1701 Fribourg
Switzerland

Telephone: +41 (0) 26 407 11 11
Email: energysupport@ch.meggitt.com
Website: www.meggittsensing.com/energy

7.2 Technical support

Meggitt Sensing Systems' technical support team provide both pre-sales and post-sales technical support, including:

- General advice
- Technical advice
- Troubleshooting
- Site visits.

7.3 Sales and repairs support

Meggitt Sensing Systems' sales team provide both pre-sales and post-sales support, including advice on:

- New products
- Spare parts
- Repairs.