

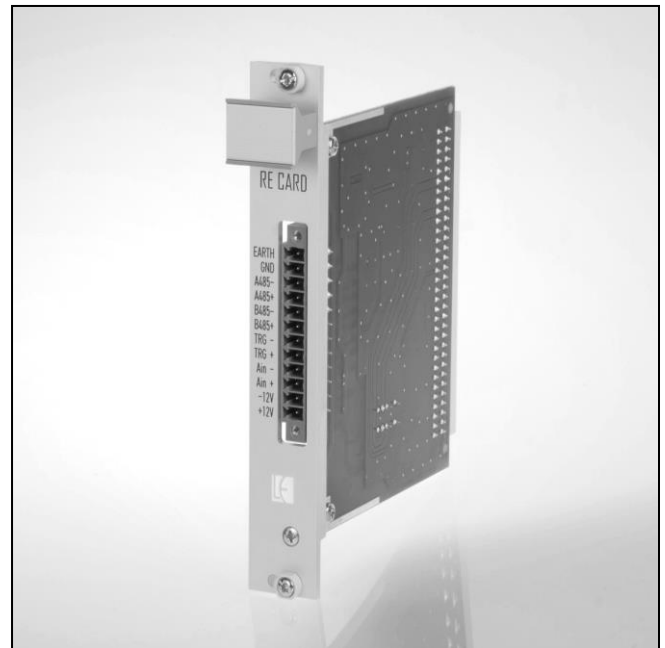
General Description

The VMS-1401 Rear-end module is the component to be used for signal fitting and easy installation of the system in rack case. It consists of signal condition circuits, protection circuits and power load switch and provides panel to connect the analog, digital, RS-485 signals from the rear side of the rack. It further contains one RS485 to LVDS converter so the digital signal from amplifier (VMS-1501) can be fed to the Controller VMS-1201 directly without need of Front-end Card VMS-1301 interaction.

VMS-1401 is compatible with all VMS-1XXX series platform.

Applications and Benefits

- Single connector for wiring to VMS-1502 amplifier
- Provides switched power supply +12/-12 V rails when channel is powered
- Protect against over-voltage bursts
- Converts input RS-485 digital trigger into LVDS voltage for direct processing



VMS-1401 – Rear-End module

Parameters

Parameter	Value		
	Minimum	Typical	Maximum
Mounting	3U card with DIN41612 connector		
Width	4 HP		
Number of analog input channels	1		
Number of digital input channels (RS-485)	1		
Number of digital outputs (RS-485)	2		
Ambient temperature	-40 °C		85 °C
Analog signal voltage	-10 V		10 V
Digital signal speed		50 Mbit/s	
Modbus RTU baud rates	9600	19200	115200
Power supply consumption at +5 V supply	5 mA (off)	30 mA	
Power supply consumption at +12/-12 V supply	0 mA		



Pinout Table

PIN	Type	Description
EARTH	Power Supply Pin	Pin for cable shielding or chassis connection.
GND	Power Supply Pin	Power ground common for +12 V, -12V, and other signals.
A485-	Digital differential bus	Standard RS485 digital bus, negative polarity.
A485+	Digital differential bus	Standard RS485 digital bus, positive polarity. The pair of A485+ and A485- signals form the system RS485-A bus that is used for a Modbus-RTU communication with remote modules of the VMS system, for instance RTD module VMS-1502.
B485-	Digital differential bus	Standard RS485 digital bus, negative polarity.
B485+	Digital differential bus	Standard RS485 digital bus, positive polarity. The pair of B485+ and B485- signals form the system RS485-B bus that is used for Phase Marker synchronization both inside and outside of the VMS system
TRG-	Digital differential input	Digital differential input for digital pulse at RS485 voltage levels, negative polarity.
TRG+	Digital differential input	Digital differential input for digital pulse at RS485 voltage levels, positive polarity. The pair of TRG- and TGR+ signals serve as input for already triggered signal, e.g., generated by amplifier VMS-1501.
Ain-	Analog differential input	Analog differential input for raw analog signal, negative polarity. The voltage range is +/-10V.
Ain+	Analog differential input	Analog differential input for raw analog signal, positive polarity. The voltage range is +/-10V. The pair of Ain+ and Ain- signals contains differential analog signal from the sensor that is sampled by the VMS-1301 frontend card.
-12V	Power Supply Pin	Power supply output pin -12V.
+12V	Power Supply Pin	Power supply output pin +12V. Both power rails +12V, -12V are switched on only when the respective VMS channel is powered on.

VMS Platform Overview

The VMS-1401 is a rear-end, analog and digital signal entry point of the VMS platform as highlighted below. This figure represents example of VMS installation based on VMS-1001.

At the very beginning of measuring chain, there is an inductive sensor VMS-1902 that measures response of passing-by blade and returns a voltage signal. This signal is amplified and conditioned by VMS-1501 amplifier and lead to the VMS-1401 rear-end entry point in form of both differential analog and digital (threshold) signals. Note that other sensors (such as eddy current PR6423, magnetic speed sensor PR9376, or isolator P27000) can be used for measurement if they are connected through VMS-1501 amplifier. Inside the VMS-1001 chassis, these signals are connected through VMS-1101 backplane into VMS-1301 front-end card for analog-to-digital conversion and/or digital signal capture.

The set of VMS-1902 (or other sensor), VMS-1501, VMS-1401, and VMS-1301 compose a single measurement channel. The chassis VMS-1001 supports up to 16 independent channels, chassis VMS-1002 supports up to 4 channels.

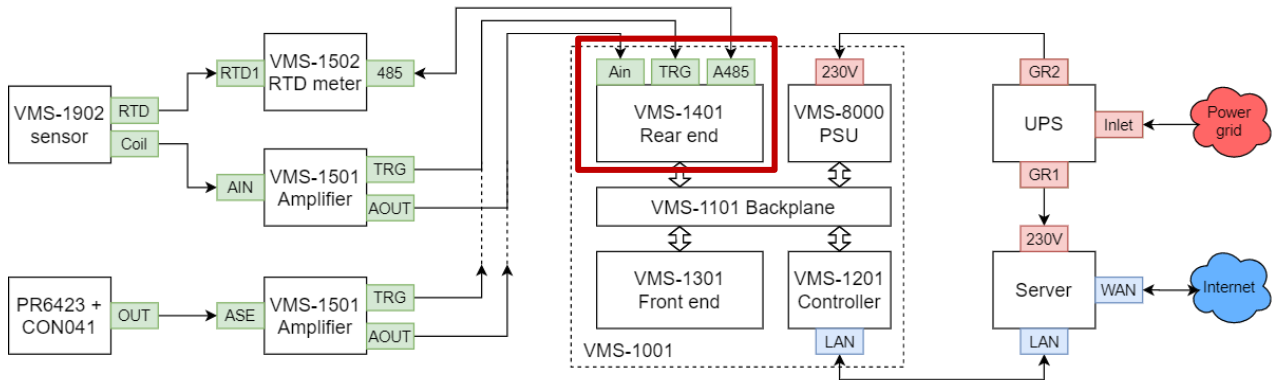
If the sensor contains RTD temperature detector (PT100 or PT1000), RTD meter VMS-1502 can be used. The VMS-1502 measures 6 RTD sensors at the time, so 6 measurement channels share a single device. It communicates directly with VMS-1201 controller that supports up to 3 RTD meters.

The result of analog conversion and triggering (or capture of digital signal) inside the VMS-1301 is then sent to the VMS-1201 controller by means of LVDS (low-voltage differential signaling) time mark. The VMS-1201 controller gathers time marks from all channels and creates time mark data package upon phase marker arrival. The data package is then sent to the Server for processing and vibration analysis. Server also runs software for complete VMS platform configuration and monitoring.

It is a good practice to have the whole platform connected to an Uninterruptable Power Supply as a sudden power shortage may disrupt consistency of the software.



Rear-End Module



Norm compliance

This product was developed and manufactured with the compliance of following European norms (EN):

- EN 61000-4
- EN 55032
- EN 50581:2013



Document revisions

Revision number	Date	Remarks
Rev 01.0	06/2017	Document release
Rev 02.0	09/2020	Add block diagram and description. New parameters table.