

AMS Asset Monitor – VI Voltage CHARM Sensor Compatibility

With release of FW 2.0.x in June 2021, we also support the new VI Voltage CHARM for dynamic vibration measurements with AMS Asset Monitor. This whitepaper will focus on the supported sensors compatible with the Voltage CHARM, and how to decide the best sensor for new installations.

By design, the VI Voltage CHARM is a single channel measuring module for the connection of dynamic voltage input signals in a range of $\pm 24V$ where the VI Voltage CHARM converts the analog measuring data provided by the connected signal source into a digital signal.

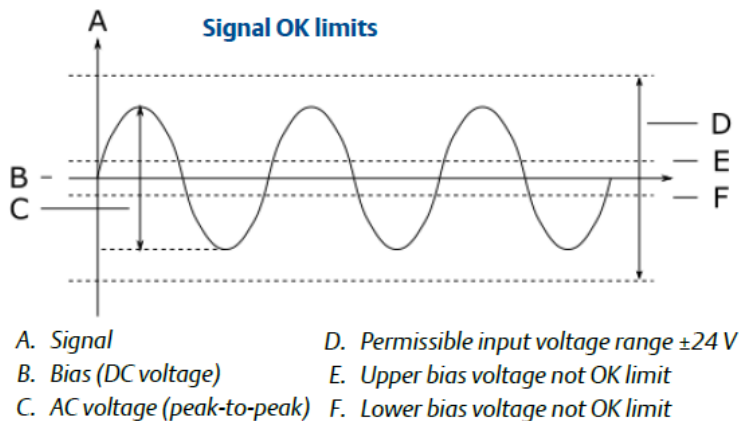
Based on this the Voltage CHARM supports eddy current measurement chains, electrodynamic vibration sensors and other sensors or transmitters that provide voltage vibration waveform signals in range as specified for the Voltage CHARM.

Each sensor configuration will require different input ranges and other associated parameters. Understanding the sensor specifications will aid in identifying the compatibility of the sensor to the AMS Asset Monitor. This document will provide the details necessary for this determination.

Checking for compatibility should include the comparison of the technical details of the sensor or transmitter, based on the product data sheet, with the published information regarding the types of signal sources (sensor or transmitter) supported by the AMS Asset Monitor. Additional signal sources may be tested as future needs dictate. This testing may find that the signal source performs the vibration measurement functionality with no exceptions, or in some cases exceptions may be noted.

General limitations and ranges of the AMS Asset Monitor Volt CHARM will be provided in this document. This information is provided for the purpose of comparison and compatibility verification to select a compatible and supported sensor.

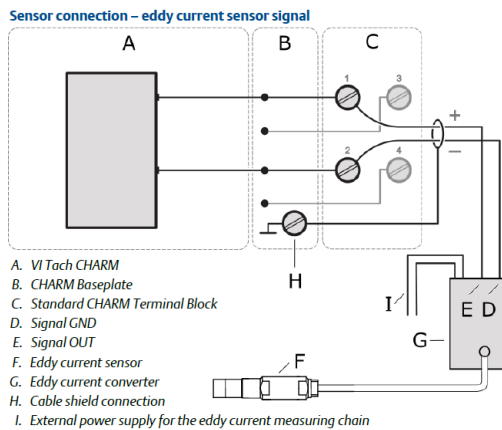
Channel OK recognition (in general):



The Signal OK limits result from the configuration of the upper- / lower bias voltage (DC bias range) for the CHARM which results from the sensor or transmitter type connected to the Voltage CHARM. The upper- / lower bias voltage (DC bias range) is freely configurable for all supported types of signal sources in range $-24V \dots +24V$.

1st: Using Eddy Current Measurement Chains

For checking the AMS Asset Monitor – Voltage CHARM connectivity and compatibility to any eddy current measurement chain, like AMS EZ 1000 or 3rd party sensors, use the table below to compare the sensor data provided from the datasheet as accurate as possible. Also, consider the use case and application from the signal perspective and ensure that the ranges provided by the sensor meet the measurement requirements especially where those differ from the AMS Asset Monitor Voltage CHARM specification.



Details

Measurement type: Displacement

Unit: μm

Evaluation: Displacement P-P

Sensitivity: 8.00 mV/ μm

Evaluation filter: 10 - 3000 Hz

DC bias range: -12.00 V, -8.00 V

Measurement range (\pm): 2000.00 μm

Display

Display range: 0.00 μm , 2000.00 μm

Apply the connections to the eddy current converter as shown above and make sure the converter power is supplied externally (typically -24Vdc @ 35mA).

From the picture above you can find a typical configuration example of the VI Voltage CHARM for an eddy current measurement chain with 8mm Sensor being connected.

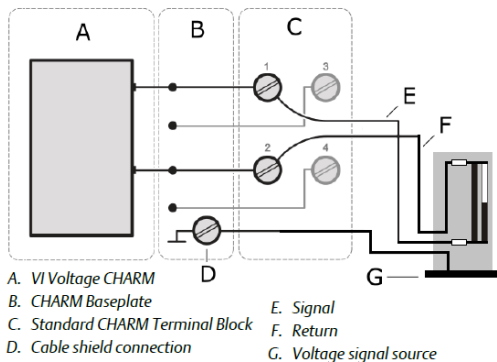
Vibration Measurement with Eddy current measurement chain	Sensor Data	OK (Y/N)	Note
Sensor Voltage Supply	Must be external, Not provided by AMS Asset Monitor – Tach CHARM		Sensor supply (typically -24Vdc) must be provided externally
Sensor Current supply (max)	Ext. power supply must be provided		External sensor supply must meet the max. converter current
Signal voltage range (nominal)	+24 V ... -24 V (typically -2 V ... -18 V)		Check if the Sensor voltage is within +/-24V range
CHARM Input Frequency Range	1 Hz ... 3 kHz		Check that if converter frequency is $\geq 3\text{kHz}$

If the eddy current measurement chain specifications match up with the ranges of the AMS Asset Monitor Voltage CHARM, the expectation is that the sensor is compatible; however, keep in mind that we do not provide a guarantee that a 3rd party sensor is compatible without officially testing the sensor.

2nd: Using Electrodynamic (aka. Seismic) Velocity Sensors

For checking the AMS Asset Monitor – Voltage CHARM connectivity and compatibility to any seismic sensor, like Emerson’s PR 9268 or 3rd party sensors, use the table below to compare the sensor data provided from the datasheet as accurate as possible. Also, consider the use case and application from the signal perspective and ensure that the ranges provided by the sensor meet the measurement requirements especially where those are less than the AMS Asset Monitor Voltage CHARM specification.

NOTE: For seismic sensors, no separate COK (Channel OK) recognition is applied by the CHARM for reason that the signal provided by the sensor is around 0V without DC (bias) offset thus make sure you have set the DC bias range accordingly.



Details

Measurement type: Velocity

Unit: mm/s

Evaluation: Velocity P-P

Sensitivity: 22.00 mV/mm/s

Evaluation filter: 10 - 3000 Hz

DC bias range: -5.00 V to 5.00 V

Measurement range (±): 250.00 mm/s

Display

Display range: 0.00 mm/s to 250.00 mm/s

Apply the connections to the seismic (electro-dynamic) sensor as shown above. Electrodynamic Sensors do not require external power supply.

From picture above you can find a typical configuration example of the VI Voltage CHARM for a Seismic (Electrodynamic) Velocity Sensor being connected.

NOTE: If using the Voltage CHARM with seismic sensors, the sensor must be installed within its nominal position for reason that the Voltage CHARM does not supply lowering or lifting currents to the sensor.

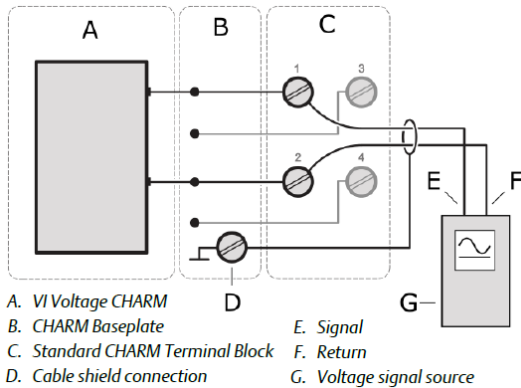
Vibration measurement with Seismic (Electrodynamic) Sensors		Sensor Data	OK (Y/N)	Note
Sensor Voltage Supply	Seismic sensors do not require external power supply			No Power supply from CHARM
Sensor Current supply (max)	n. a.			No Power supply from CHARM
Signal voltage range (nominal)	-24 V ... +24 V			Check if the Sensor voltage is within range
CHARM Input Frequency Range	1 Hz ... 3 kHz			Check that the Sensor frequency is ≥ 3kHz

If the sensor specifications match up with the ranges of the AMS Asset Monitor Voltage CHARM, the expectation is that the sensor is compatible; however, keep in mind that we do not provide a guarantee that a 3rd party sensor is compatible without officially testing the sensor.

3rd: Using general voltage sensors/transmitters

For checking the AMS Asset Monitor – Voltage CHARM connectivity and compatibility to any signal source (sensor or transmitter) just providing a vibration proportional waveform (voltage) signal, use the table below to compare the sensor/transmitter data provided from the datasheet as accurate as possible.

Also, consider the use case and application from the signal perspective and ensure that the ranges provided by the signal source meet the measurement requirements especially where those are less than the AMS Asset Monitor Voltage CHARM specification.



Details

Measurement type: Voltage

Unit: V

Evaluation: Voltage P-P

Sensitivity: 1000.00 mV/V

Evaluation filter: 10 - 3000 Hz

DC bias range: -5.00 V to 5.00 V

Measurement range (±): 20.00 V

Display

Display range: 0.00 V to 20.00 V

Apply the connections to the signal source as shown above. If the sensor/transmitter requires external power supply, this needs to be provided externally.

From the picture above you can find a typical configuration example of the VI Voltage CHARM for of a voltage sensor/transmitter being connected.

Vibration Measurement with Voltage Sensor/Transmitter		Sensor Data	OK (Y/N)	Note
Signal source Voltage Supply	Must be external (if required), Not provided by Voltage CHARM			No Power supply option from CHARM
Signal source Current Supply	n. a.			No Power supply option from CHARM
Signal voltage range (nominal)	-24 V ... +24 V			Check if the sensor/transmitter voltage is within range
CHARM Input Frequency Range	1 Hz ... 3 kHz			Check that sensor/transmitter frequency ≥ 3kHz

If the sensor specifications match up with the ranges of the AMS Asset Monitor Tach CHARM, the expectation is that the sensor/transmitter is compatible; however, keep in mind that we do not provide a guarantee that a 3rd party sensor/transmitter is compatible without officially testing it.

Technical Support

Emerson provides a variety of ways to reach your Product Support team to get the answers you need when you need them:

Phone Toll free 800.833.8314 (U.S. and Canada)
+1 512 832 3774 (Latin America)
+ 63 2702 1111 (Asia Pacific, Europe, and Middle East)

Email Guardian.GSC@Emerson.com

Web <http://www.emerson.com/en-us/contact-us>

To search for documentation, visit <http://www.emerson.com>

To view toll free numbers for specific countries, visit <http://www.emersonprocess.com/technicalsupport>

The Emerson logo is a trademark and service mark of Emerson Electric Co. The AMS logo is a mark of one of the Emerson family of companies. All other marks are the property of their respective owners.

The contents of this publication are presented for informational purposes only, and while diligent efforts were made to ensure their accuracy, they are not to be construed as warranties or guarantees, express or implied, regarding the products or services described herein or their use or applicability. All sales are governed by our terms and conditions, which are available on request. We reserve the right to modify or improve the designs or specifications of our products at any time without notice.

Contact Us
🌐 www.emerson.com/contactus

