1 General

1.1 Using this manual

This manual contains information concerning the use of the device.

Read the operating manual completely prior to starting installation and operating the device. Comply with all safety instructions.

This operating manual applies for all variants of the AMS EZ 1000 Converter with a hardware revision listed in Table 1-1 and for AMS Machine Studio 4.x. See type plate for hardware revision.

Table 1-1: Hardware revision of the AMS EZ 1000 Converter variants

Variant	Hardware revision	Serial number	Remarks
EZ1000	≥ 22	≥ P2540xxxxx	
EZ1000-EX	≥ 18	< P2540xxxxx	
EZ1000-SIS	≥ 20	≥ P2540xxxxx	Safety-related
EZ1000-SIS-EX	≥ 18	< P2540xxxxx	

Table 1-2 shows which sensors are supported from which firmware version.

Table 1-2: AMS EZ 1000 Converter firmware versions and supported sensors

Firmware version	Supported sensors
1.0.0 and higher	EZ105x-xx-xx-xxx, EZ108x-xx-xx-xxx, and BN 33010x-xx-xx-yy[1]-xx-xx
1.0.6 and higher	PR 6424/0xx-xx0, PR 6425/010-1x0, and PR 6426/0x0-xx0

1 *yy: 10, 50, or 90*

Include the operating manual when transferring the device to third parties.

Note
When requesting technical support, indicate type and serial number from the type plate.

Table 1-3 shows a list of documents that are referred to in this operating manual.

Table 1-3: Referenced documents

MHM-97879	Operating Manual Machine Studio - General Functions
MHM-97883	Installation Guide AMS EZ 1000 Sensor
MHM-97887	Safety Manual AMS EZ 1000 Converter and Sensor

3 Application and design

3.1 Application

The AMS EZ 1000 Converter is a signal converter for different types of eddy current sensors. The converter is designed for the connection of eddy current sensors of the AMS EZ 1000 Sensor series, the listed types of the PR 642x series, and a selection of third party sensors:

- EZ105x-xx-xx-xxx and EZ108x-xx-xx-xxx
- PR 6424/0xx-xx0, PR 6425/010-1x0, and PR 6426/0x0-xx0
  The sensor adapter EZ1900-003-ADAP-1 is required for the connection of these sensors.
- Bently Nevada™ 3300 XL 8 mm Proximity Probe types:
  - 33010x-xx-xx-10-xx-xx with extension cables 330130-040-xx-xx or 330130-080-xx-xx
  - 33010x-xx-xx-50-xx-xx
  - 33010x-xx-xx-90-xx-xx

  The sensor adapter EZ1900-003-ADAP-2 is required for the connection of 33010x probes.

The AMS EZ 1000 Converter, in combination with eddy current sensors listed above, can be used for static and dynamic distance measurements at a variety of different rotating machinery. This means that slow axial displacements and fast radial vibrations of rotating machines can be measured. By using pulse wheels or key marks stuck on the shaft, the speed of the machine can be measured and key pulses generated.

The AMS EZ 1000 Converter is integrated into AMS Machine Studio which allows an easy on-site calibration of the converter to the sensor. AMS Machine Studio also provides the opportunity of detuning the converter if sensors are fitted closely together or to extend the standard measuring range of several sensors.

Supply circuits for the eddy current sensor and the measuring electronic are contained in the converter. The nominal supply voltage for the converter is -24 V DC, the nominal range of the output signal, proportional to the nominal measuring range of the sensor, is -2 to -18 V.

3.2 Design

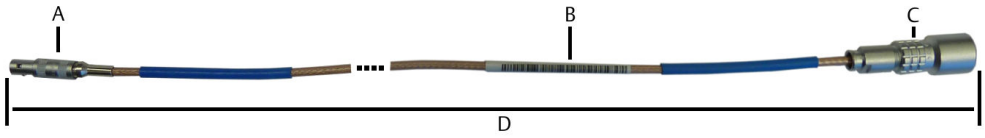
The AMS EZ 1000 Converter is designed for DIN rail mounting within a field housing or cabinet. The connection of converter supply and sensor signal is made by screw terminals. The converter is equipped with a LEMO connector for connection of an eddy current sensor. The USB 2.0 Micro-B socket is the interface for the configuration. Figure 3-1 explains the connections and operating elements.

Sensor connection

The following sensor types can be connected.

- EZ105x-xx-xx-xxx and EZ108x-xx-xx-xxx
- PR 6424/0xx-xx0, PR 6425/010-1x0, and PR 6426/0x0-xx0
  The sensor adapter EZ1900-003-ADAP-1 is required for the connection of these sensors.

Figure 5-14: Sensor adapter EZ1900-003-ADAP-1

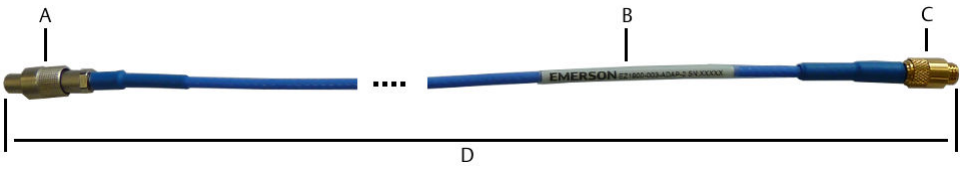


A. Connector to the AMS EZ 1000 Converter (without cap nut)
- *To connect, plug the connector into the sensor socket. The connector locks with an audible click.*
- *To unlock, pull the connector out of the sensor socket.*

B. Label
C. Connector to PR 6424/0xx-xx0, PR 6425/010-1x0, or PR 6426/0x0-xx0
D. Total adapter length: approximately 365 mm

- Bently Nevada 3300 XL 8 mm Proximity Probes 33010x.
  The sensor adapter EZ1900-003-ADAP-2 is required for the connection of 33010x probes.

Figure 5-15: Sensor adapter EZ1900-003-ADAP-2



A. Connector to the AMS EZ 1000 Converter
See Connect and Disconnect for how to use the connector.
B. Label
C. Connector to BN 33010x
D. Total adapter length: approximately 365 mm

The sensor socket of the converter is a mini LEMO socked with an external thread to secure the sensor against unintentional removing.

EZ1900-ADAP-90 adapter for EZ108x-xx-xx-xxx

Use the EZ1900-ADAP-90 adapter, shown in Figure 5-16, to connect an EZ108x-xx-xx-xxx sensor to an AMS EZ 1000 Converter mounted in a housing with limited space in depth. See Figure 5-17 for dimensions.

Connection with EZ1900-ADAP-90

Procedure

1. Plug the sensor connector into the threaded sensor socket of the EZ1900-ADAP-90 adapter. See EZ1900-ADAP-90 adapter for EZ108x-xx-xx-xxx.
2. Gently turn the cap nut of the sensor connector clockwise to secure the sensor.
3. Push the adapter into the sensor socket of the AMS EZ 1000 Converter. See Figure 3-1 for the location of the sensor socket. The adapter locks with an audible click.

Disconnect

Procedure

1. Turn the cap nut of the sensor connector counter clockwise to unfasten the sensor.
2. Unplug the sensor.

   If the sensor is connected with the EZ1900-ADAP-90 adapter, pull the adapter out of the sensor socket. When pulled, the plug is automatically unlocked.

Isolate the adapter connection

If using the EZ1900-003-ADAP-1 or the EZ1900-003-ADAP-2 adapter to connect PR 642x sensors or third party sensors to the AMS EZ 1000 Converter, isolate the connection between the sensor cable and the adapter with the included black shrink sleeve. For installation in a hazardous environmental, also use the included blue shrink sleeve.

Procedure

1. At the open connection, push the shrink sleeve over the connector of the sensor cable so that the sleeve completely covers the sensor cable.

   First the blue shrink sleeve[1] and then the black shrink sleeve.
2. Close the connection.
3. Move the black shrink sleeve over the closed connection. Plug and socket must be completely covered by the shrink sleeve.

   Ensure that the shrink sleeve evenly overlaps plug and socket.
4. Use a hot air gun to evenly shrink the sleeve. The required shrinking temperature is approximately 200°C.
5. Ensure that the shrunken sleeve touches sensor cable, plug, and socket. It is important that the shrink sleeve cannot slip from the connection.
6. Move the blue shrink sleeve evenly over the closed connection already isolated with the black shrink sleeve.[1]
7. Use a hot air gun to evenly shrink the blue sleeve. The required shrinking temperature is approximately 200°C.[1]

1 *Only necessary for installation in a hazardous environmental.*

5.4 Adjustment of measuring chains at the machine

5.4.1 General connection

Prerequisites

- -24 V DC power supply, if the converter is not supplied by a measuring amplifier such as an A6500-UM.
- Voltmeter with an accuracy of 1%.

Procedure

1. Connect the converter supply -24 V DC (+24 V to ⊥ (GND)). See Power supply and output signal connection.
2. Connect the sensor to the sensor socket. See Sensor connection.
3. Measure the output level at pins OUT and ⊥ (GND). See Power supply and output signal connection.

5.4.2 Sensors EZ105x-xx-xx-xxx, EZ108x-xx-xx-xxx, PR 6424/0xx-xx0, and PR 6425/010-1x0

Procedure

1. Loosen the lock nut of the sensor.

   See installation guide of the used sensor for further installation details.

2. Turn the sensor in the holder until the nominal distance between sensor tip and measuring target is reached, and the connected voltmeter indicates the desired point on the characteristic curve.

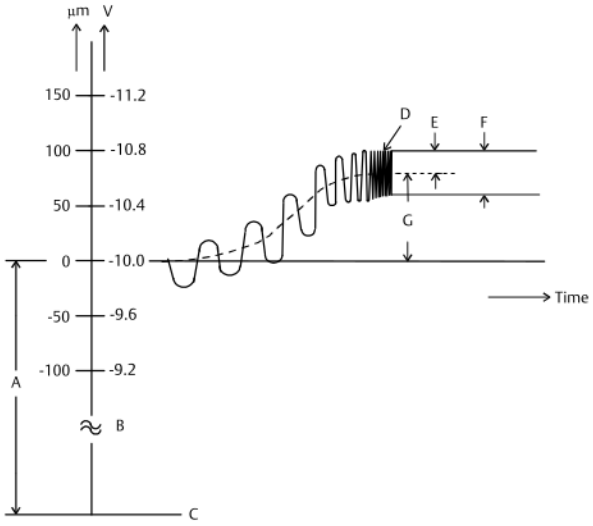
   For sensors with an extension cable, Emerson recommends removing the extension cable to avoid twisting the cable during mounting and turning the sensor. Reconnect the extension cable before measuring the output voltage for the fine adjustment.

   - For measuring shaft vibrations, it is sufficient to adjust the sensor to an output value of -10V ±1 V. See Figure 5-18.
   - For static measurements, a precise adjustment to one output value is required, the sensor is preferably set to one of the three output levels of the converter:
     - For symmetrical displacements around the center point (see Figure 5-19, F) to -10 V ±0.05 V (recommended procedure).
     - For the measuring range minimum (= minimum distance) to -2 V ±0.05 V for single-sided movements to greater distances (Figure 5-19, E).
     - For the measuring range maximum (= maximum distance) to -18 V ±0.05 V for single-sided movements to smaller distances. (Figure 5-19, G).

— Or to any other value within the measuring range when different distances in both directions must be measured.

Note
The position of the machine shaft must be known when adjusting the sensor for static measurement.

Figure 5-18: Characteristic curve - dynamic



A. Nominal distance[3]
B. Voltage range: -2 V to -18 V
C. Sensor tip
D. Shaft vibration signal
E. 0-to-Peak
F. Peak-to-Peak
G. Quasi static displacement