

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Selected official pages for procurement and maintenance review

PRODUCT BRAND

Bently Nevada

PRODUCT MODEL

86517-01-01-01-02

86517-01-01-01-02 - Accelerometer signal interface module
Selected manufacturer pages; verify exact configuration.

OFFICIAL SOURCE

Operation manual 88301-01 Rev. H

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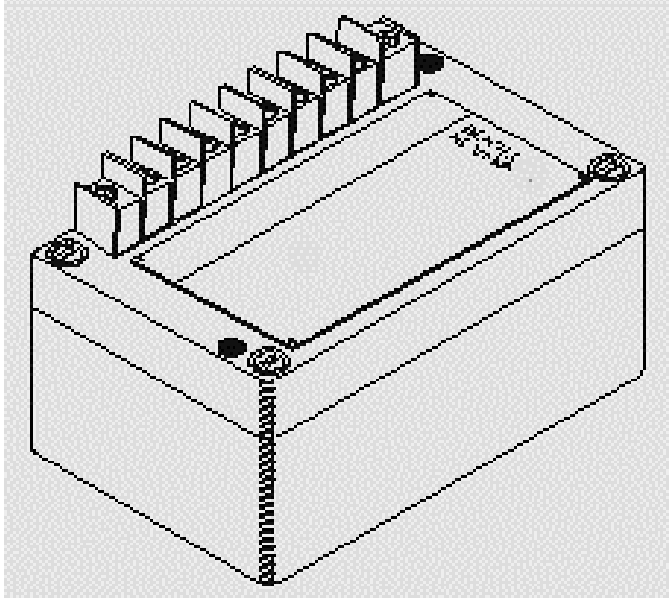
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Amikon Limited prepared this independent reference package. Selected manufacturer pages follow with their original content and pagination visible.

Operation Manual

Bently Nevada™ Asset Condition Monitoring



Accelerometer Interface Module

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Bently Nevada, Keyphasor, Proximitor

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Additional Information

Notice:

This manual does not contain all the information required to operate and maintain the product. Refer to the following manuals for other required information.

3300 System Overview (Part Number 80171-01)

3300 System Installation Instructions (Part Number 80172-01)

3300 System Troubleshooting (Part Number 80173-01)

**3300/95 Filter Module/Vibration Monitor Operation Manual
(Part Number 88060-01)**

**3300/17 Aeroderivative Gas Turbine Vibration Monitor Operation
(Part Number 88061-01)**

**3300/17 Aeroderivative Gas Turbine Vibration Monitor Maintenance
(Part Number 88062-01)**

3300/15 Dual Vibration Monitor Maintenance (Part Number 80177-01)

3300/25 Dual Acceleration Monitor Maintenance (Part Number 80181-01)

Rolls Royce RB211 and Avon Vibration Monitoring (Part Number AN051)

**General Electric LM 1600 Gas Generator and Gas Turbine Vibration
Monitoring (Part Number AN052)**

**General Electric LM 2500 Gas Generator and Gas Turbine Vibration
Monitoring (Part Number AN053)**

**General Electric LM 5000 Gas Generator and Gas Turbine Vibration
Monitoring (Part Number AN054)**

**General Electric LM 6000 Gas Turbine Vibration Monitoring
(Part Number AN055)**

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1. INTRODUCTION

The 86517 Accelerometer Interface Module is a component in accelerometer- based transducer systems commonly used for vibration monitoring of aeroderivative gas generators and gas turbines. The interface module is designed for use with the Bently Nevada 3300 series 3300/95 Filter Module/Vibration Monitor and can also be used with specially modified 3300 monitors such as the 3300/15 and 3300/25.

Section 1 describes the transducer system and its individual components and explains some of the features of the system.

Section 2 gives typical receiving, inspecting, and installation instructions and field wiring and hazardous area installation instructions.

Section 3 shows how to recalibrate the charge amplifier and verify the velocity signal output. This section also contains troubleshooting information.

Section 4 provides ordering information and Section 5 describes the ordering options for the accelerometer interface module.

Specifications are provided in Section 6.

The appendix contains drawings of the interface module, extension cables, and a weatherproof housing. Also included are installation drawings for Canadian Standards Association Class 1, Division 1, and CENELEC (SIRA) Zone 1, Group IIB hazardous environments.

2. SYSTEM OVERVIEW

The accelerometer-based transducer system consists of a high temperature charge-coupled accelerometer; rugged, low-noise, high temperature extension cable(s); and the accelerometer interface module as shown below.

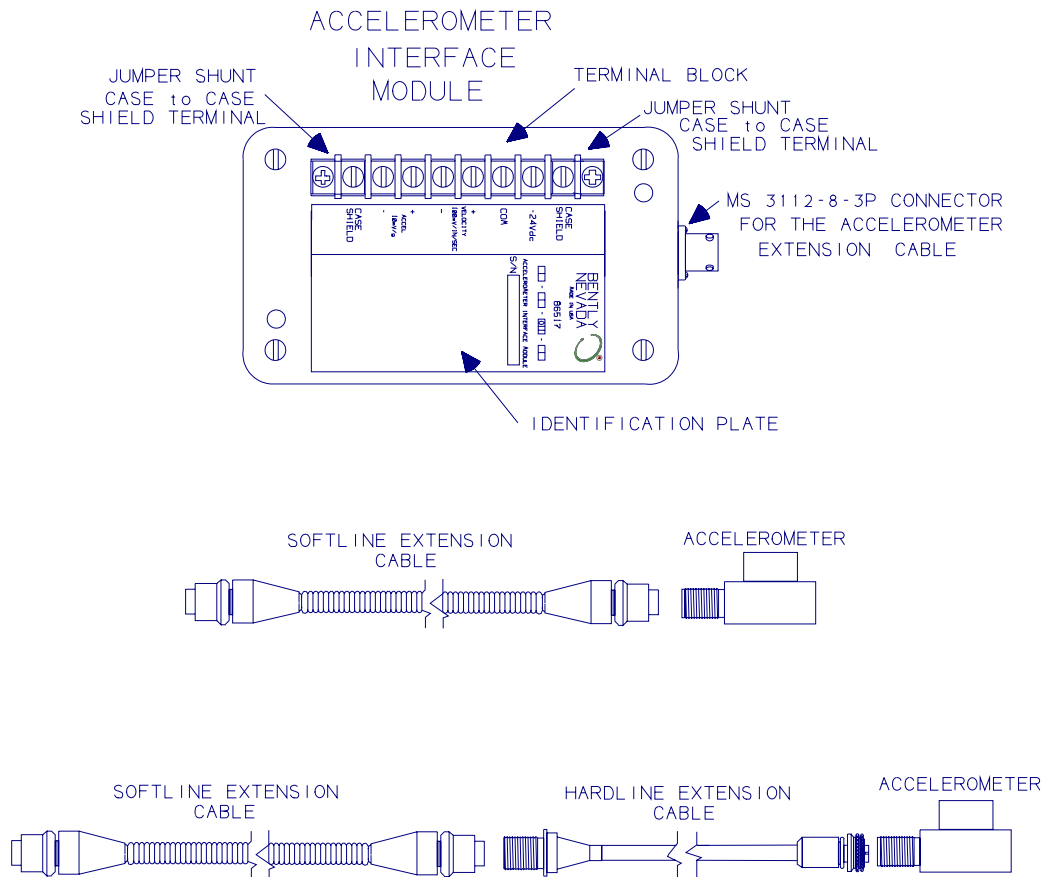


Figure 1.1 Transducer System

2.1 Accelerometer Interface Module

A functional block diagram of the interface module is shown below:

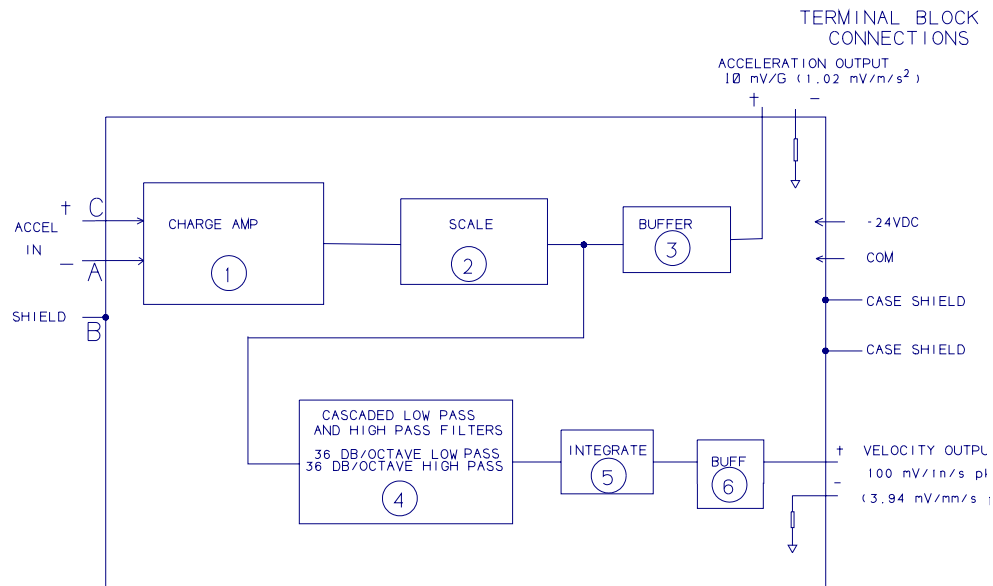


Figure 1.2 Interface Module Block Diagram

The accelerometer interface module performs the following functions:

1. Converts a charge input from the accelerometer to a voltage acceleration signal.
2. Scales the voltage signal to 10 mV/g peak ($1.02 \text{ mV/m/s}^2 \text{ pk}$).
3. Buffers the acceleration signal so that it can be connected to instrumentation over long cable lengths.
4. Bandpass filters the acceleration signal using a 12th order filter with corner frequencies determined by option BB.
5. Integrates the filtered acceleration signal to a velocity signal with a sensitivity of 100 mV/in/s pk (3.94 mV/mm/s pk).
6. Buffers the velocity signal so that it can be connected to monitoring instruments over long cable lengths. The velocity signal is typically used to monitor machines.

The differential charge output of the accelerometer enters the interface module through pins C and A of the three-pin locking connector while pin B connects to the extension cable inner shield and to the interface module case. The charge amplifier converts the differential charge input to a low impedance voltage signal and the subsequent scaling stage adjusts the sensitivity to 10 mV/g pk (1.02 mV/m/s² pk). The frequency response of the charge amplifier/scaling stage combination has an overall bandpass transfer characteristic. See Section 6 for specifications. The interface module can be ordered to operate with accelerometers having charge sensitivities of 50 pC/g or 100 pC/g. This option is not field programmable.

The interface module filters are cascaded 6th order low pass and 6th order high pass filters with a Butterworth response. Filter corner frequencies are determined at ordering and are not field programmable. The corner frequencies are normally chosen to pass the vibration component at the rotative speed of each rotor while excluding higher and lower frequency signals which may be due to blade passings or structural resonances. The standard corner frequency options conform to requirements for General Electric LM 2500, LM 5000, LM 1600, and LM 6000 series aeroderivative gas turbines. Contact your Bently Nevada representative for nonstandard corner frequencies. If you elect to use corner frequencies not recommended by the engine manufacturer consideration should be given to the fact that the acceleration signal will contain structural and/or structural-borne noise that is not related to rotor vibration. Most common machine malfunctions originate on the rotor and can be detected as a change in rotor vibration. Choose corner frequencies carefully.

Both the acceleration and velocity signal outputs can be wired as either single-ended outputs or as balanced two-wire outputs. In the single-ended configuration, only the **+ ACCEL** or **+ VELOCITY** terminal is wired to the monitoring or measuring instrumentation. In the balanced two-wire mode the **+ VELOCITY** and **- VELOCITY** outputs create a differential output and the **+ ACCEL** and **- ACCEL** outputs create a differential output. Inside the interface module the (-) terminals are connected to signal common through an impedance which matches the output impedance of its mate. The **+VELOCITY** and **+ACCEL** outputs are biased at -10 Vdc nominal.

2.2 Extension Cable

The extension cable connects the accelerometer and the interface module and may consist of a single softline cable or two cables where the cable on the accelerometer side is a hardline, mineral-insulated cable rated for higher temperatures. The extension cables must be constructed with special low noise characteristics and resist high temperatures and corrosive environments. The low noise construction is a conductive treatment on the surface between the center conductors and the dielectric and between the dielectric and the inner shield. This treatment minimizes the charge induced between the surfaces by motion or vibration of the cable. This phenomenon is called triboelectric noise and can be particularly troublesome in charge amplifier systems. The total pole-to-pole

capacitance of the accelerometer plus the distributed cable capacitance should not exceed 8300 picofarads. Cable drawings and schematics are in the appendix.

2.3 Accelerometer

For aeroderivative gas turbines, the accelerometers are typically provided with the engine either by the manufacturer or the packager and must be qualified by the engine manufacturer. Accelerometers of this type are typically constructed with a piezoelectric crystal isolated from the accelerometer case so that the accelerometer output is differential. Accelerometers used with the 86517 interface module must have a sensitivity of 50 picocoulombes per g or 100 picocoulombes per g, and the necessary connector.

Bently Nevada offers a 50 pC/g charge coupled accelerometer (part number 45357-01) that can be used with this system. This accelerometer has a typical pole-to-pole capacitance of 1000 picofarads.

3. INSTALLATION

3.1 Receiving, Inspecting, and Handling

Carefully remove the interface module, extension cable and accelerometer (if applicable) from their shipping containers and inspect them for shipping damage. If you remove the lid, be careful not to lose the two mounting screws located in the base of the interface module enclosure. If shipping damage is apparent, file a claim with the carrier, and submit a copy to Bently Nevada Corporation. Include part numbers and serial numbers on all correspondence. If no damage is apparent and the equipment is not going to be used immediately, return the equipment to the shipping containers, and reseal until ready for use. Store the equipment in an environment free from potentially damaging conditions such as high temperature, excessive humidity, or a corrosive atmosphere. See Section 6 for environmental specifications.

3.2 Installation

Installation consists of mounting the interface module in a housing and connecting the field wiring and the extension cable to the accelerometer. In most cases the accelerometer will already be mounted on the engine.

Interface Module

Mount the interface module in an enclosure that protects it from mechanical damage, contamination, the weather, and which isolates the interface module. Bently Nevada part number 80808-01 and -02 are stainless steel weatherproof housings with a built-in insulated mounting plate. Housing drawings are in the appendix. For installations in hazardous areas requiring agency approvals, the housing must be approved by the local inspection authority. For notes on installation in hazardous environments rated Class 1, Division 1 by CSA, or Zone 1, IIB by CENELEC (European standards) see drawings 141243 or 141110 in the appendix.

Figure 2.1 illustrates the basic mounting configuration; it is imperative that the enclosure and interface module be installed in a HORIZONTAL position, as shown. Mount the interface module by using the two mounting bolts located at diagonal corners of the interface module. The bolts can be accessed with the lid in place by removing the two plastic caps on the lid as shown in Figure 2.1. Make sure the lid is tightly closed. Locate the interface module outside the turbine enclosure or at the coolest location in the turbine enclosure. The recommended mounting location for the interface module is on a structure where vibration components between 20 Hz and 400 Hz do not exceed 0.1 g-pk in any of three orthogonal directions.

Connect the extension cable tightly to the accelerometer and safety wire the connector. A major cause of nuisance alarms is a loose connection to the accelerometer. Route the extension cable away from the turbine, and in the case of steam injection turbines, away from any steam manifolds. Secure the extension cable at frequent intervals to prevent excessive vibration. Cable vibration can induce charge on the conductors which appear as noise to the input of the charge amplifier.

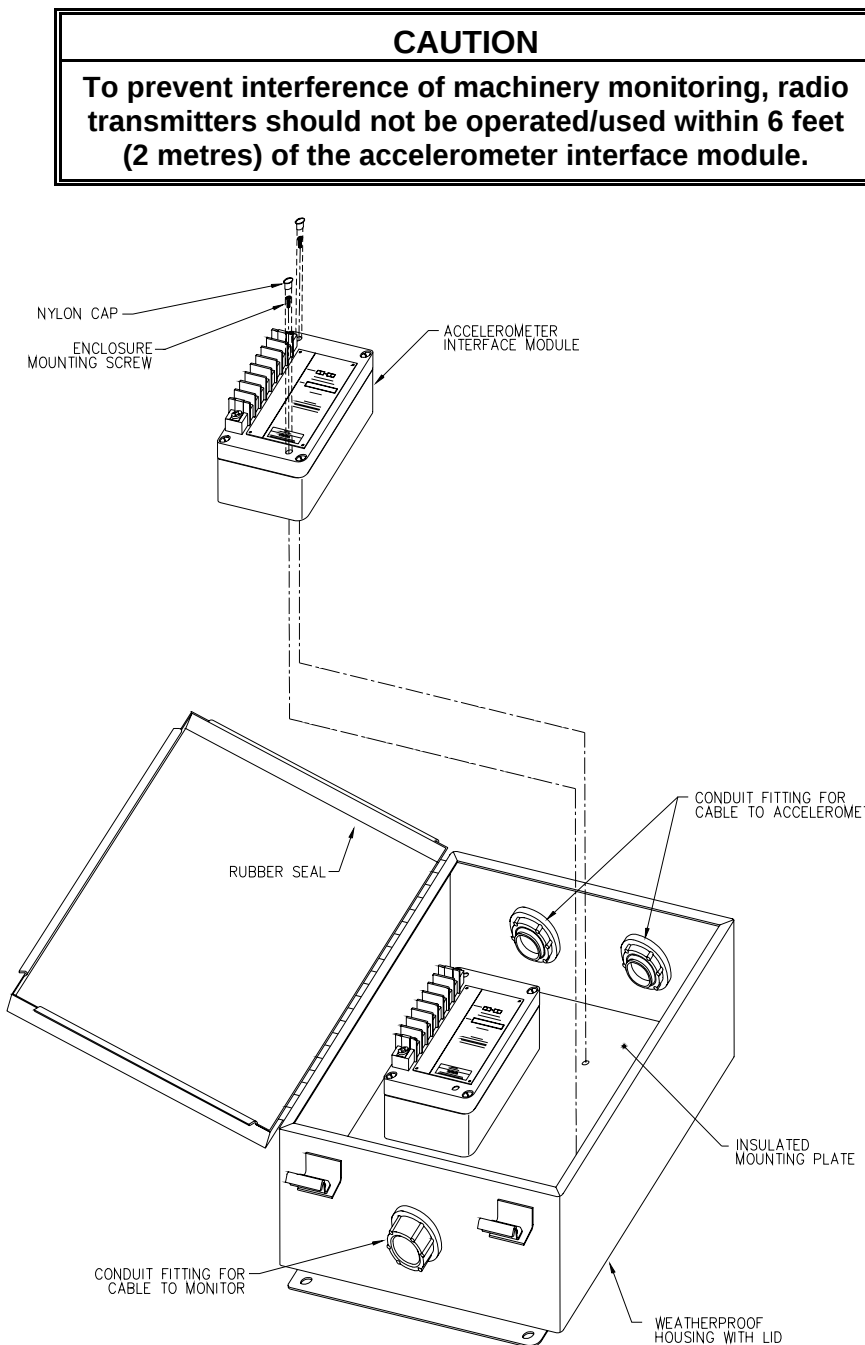


Figure 2.1 Typical Installation

Accelerometer

If you are installing the Bently Nevada accelerometer (P/N 45357-01) then follow these directions:

Contact the turbine manufacturer or your original equipment manufacturer (OEM) for instructions on mounting the accelerometer. The correct mounting location and mounting structures, such as brackets and fasteners, are critical to the performance of the transducer system.

The accelerometer can be mounted in any orientation as long as its sensitive axis (indicated by arrow on side of accelerometer) is 90 degrees to the axis of the rotor. Four mounting holes should be drilled for 1/4 inch (6 mm) bolts at the corners of a 1.188 inch (30.18 mm) square. The mounting holes should be perpendicular to the mounting surface and the mounting surface must be flat and smooth. The mounting structure must also be rigid and have no mechanical resonances within the frequency range of interest.

Connect and safety wire the extension cable to the accelerometer.

Hazardous Area Considerations

The accelerometer interface module agency approvals are "entity" approvals. This means that each component, or entity, of the transducer system must be certified for the overall system to meet certification requirements. When specifying an agency certified system you should verify that both the interface module and accelerometer have the appropriate hazardous area certification. The Bently Nevada accelerometer, part number 45357-01, is certified for use in Class I, Divisions 1 and 2 by the Canadian Standards Association.

When installing a CENELEC approved system you must attach a system cable tag to the interface module field wire, refer to Drawing 141110 in the appendix. The tag is shipped in a plastic bag attached to the interface module. Attach the tag to the power field wire near the safety barrier using the adhesive backing. Protect the label using the piece of transparent heat shrink tubing supplied with the tag.

3.3 Field Wiring

You must supply the field wiring from the interface module to the monitor unless you specifically request that Bently Nevada Corporation provide it. The 86517 interface module is intended to be used with the 3300/95 Filter Module/Vibration Monitor but may also be connected to certain specially modified 3300 series monitors such as the 3300/15 and 3300/25. Figure 2.2 shows the wiring connections to a 3300/95 monitor without barriers and Figure 2.3 shows the wiring connections to a 3300/15 (or equivalent) without barriers. Figures 2.4 and 2.5 show connections for Division 1/Zone 1 installations when external safety barriers are used.

Refer to drawing 141243 (see appendix) for field wiring connections to 3300 series monitors with internal safety barriers. Notes are referenced in each of the wiring diagrams which address grounding and shielding and making recommendations.

Drawings 141243 and 141110 in the appendix are agency approval drawings showing installation and wiring for Division 1 and Zone 1 hazardous areas. Note that to meet the requirements of the Zone 1, IIB approval from SIRA certification services a tag should be attached to the power/common/signal cable at the safety barrier. When the interface module is ordered with the CENELEC Zone 1 approval the unit is shipped with the tag attached to the ground strap on the terminal block. The tag is mylar with an adhesive back and can be attached directly to the cable. Protect the tag with the piece of clear heat shrink tubing provided with the tag.

In all installations isolate the interface module case.

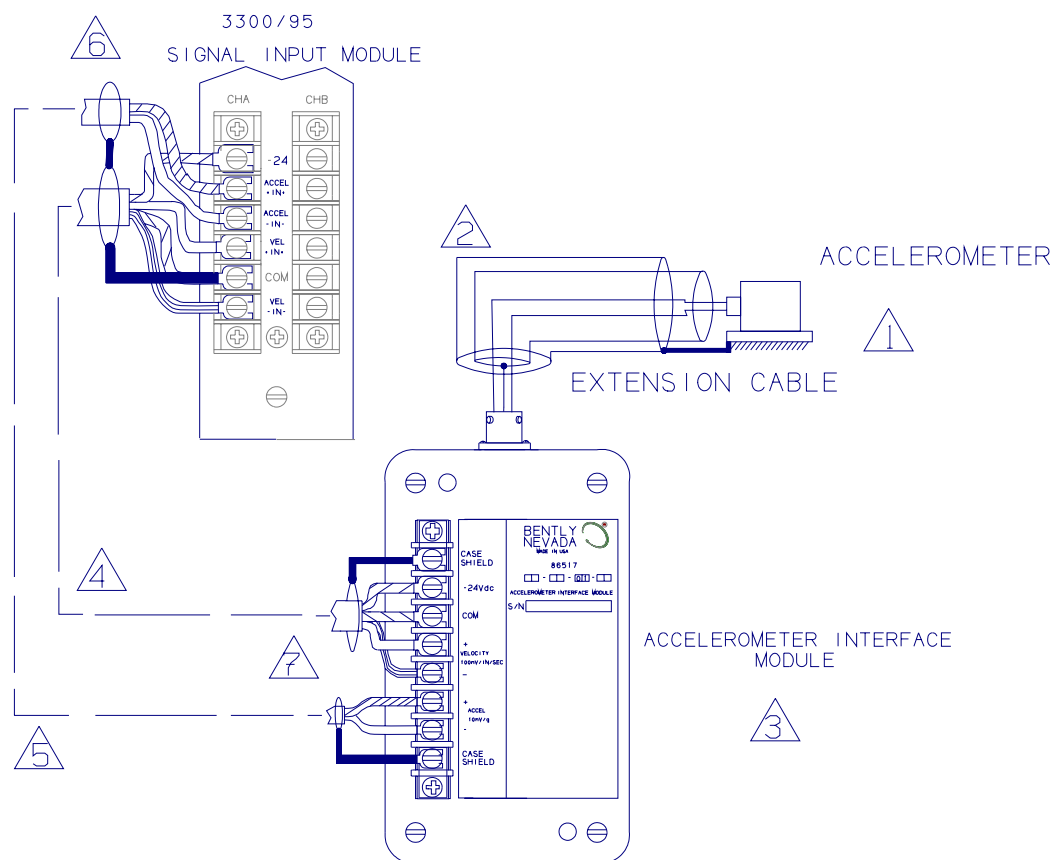


Figure 2.2 Field Wiring to 3300/95 Monitor without Barriers
(Notes on following page)

Notes for Figure 2.2

1 The accelerometer case is connected to the machine earth and the differential signal output is isolated. The accelerometer case connects to the extension cable shield through the cable connector for the hardline cable and connects to the outer shield for the softline cable.

3 The interface module case must be isolated. Bently Nevada housing, part number 80808-01 or -02, contains a mounting plate which provides isolation.

Wiring Recommendations:

2 Accelerometer to interface: Use extension cable, Bently Nevada part numbers 45358-07 and -09, or 83387-xxx, or equivalent.

4 Interface module to monitor; Power, Common, +Velocity, and -Velocity wiring recommendation: two twisted pairs of stranded 18 to 22 AWG wire with insulating sheath and 100% shield coverage. 1000 feet (305 metres) maximum. Use Bently Nevada part number 02101200 or equivalent.

5 Interface module to monitor +/- Accel wiring recommendation: stranded twisted pair, 18 to 22 AWG, insulating sheath and 100% shield coverage. 1000 feet (305 metres) maximum.

Shielding:

6 Shields terminate at signal common at the monitor. The jumper between signal common and 3300 rack chassis should be installed on the Power Input Module at the rear of the 3300 rack. See the 3300 System Installation Instructions, (document part number 80172-01).

7 At the interface module the shields connect to the terminals marked CASE SHIELD. Note that a jumper shunt is installed between the terminal block mounting screw and the CASE SHIELD terminal.

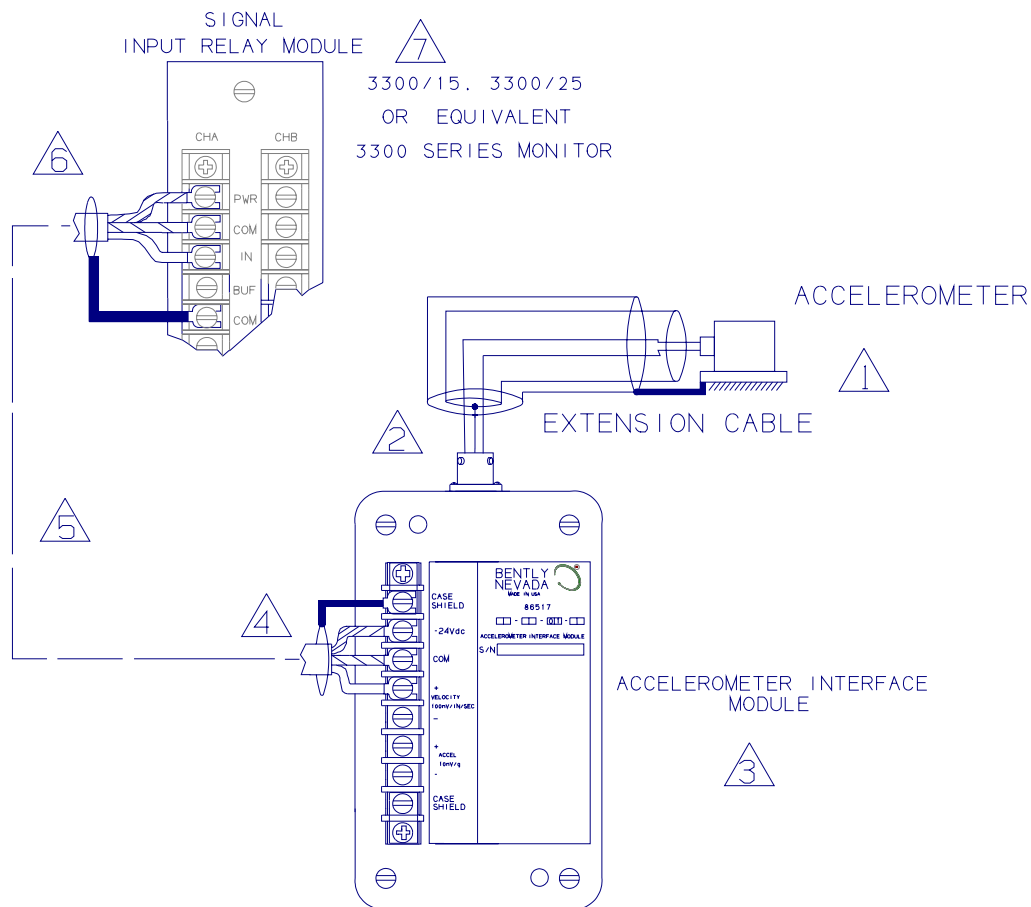


Figure 2.3 Field Wiring to 3300 Monitor without Barriers
(Notes on following page)

Notes for Figure 2.3

1 The accelerometer case is connected to the machine earth and the differential signal output is isolated. The accelerometer case connects to the extension cable shield through the cable connector for the hardline cable and connects to the outer shield for the softline cable.

3 The interface module case must be isolated. Bently Nevada housing, part number 80808-01, or -02, contains a mounting plate which provides isolation.

Wiring Recommendations:

2 Accelerometer to interface: Use extension cable, Bently Nevada part numbers 45358-07 and -09, or 83387-xxx, or equivalent.

5 Interface module to monitor Power, Common, and +Velocity wiring recommendation: 18 to 22 AWG stranded, three conductor wire with insulating sheath and 100% shield coverage. 1000 feet (305 metres) maximum. 18 AWG Belden 83336 or 22 AWG Belden 83334 can be used.

Shielding:

4 At the interface module the shield connects to the terminal marked CASE SHIELD. Note that a jumper shunt is installed between the terminal block mounting screw and the CASE SHIELD terminal.

6 The shield terminates at signal common at the monitor. The jumper between signal common and 3300 rack chassis should be installed on the Power Input Module at the rear of the 3300 rack. See the 3300 System Installation Instructions, (document part number 80172-01).

7 3300 series monitors other than the 3300/95 must be modified before connection to the interface module. Contact your Bently Nevada representative. Other connections are possible. For example the acceleration signal could be connected to a monitor for some special applications.

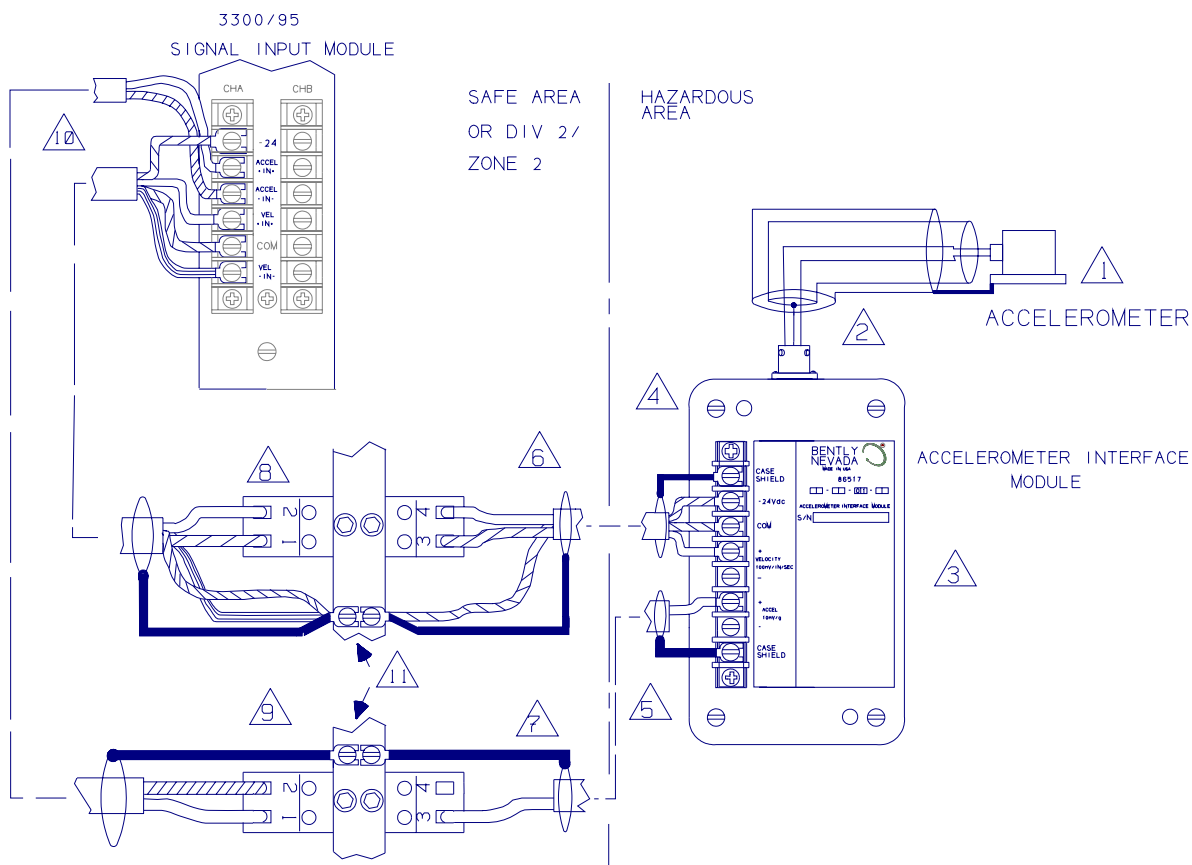


Figure 2.4 Field Wiring Interface Module to 3300/95 Monitor with Barriers
(Notes on following page)

Notes for Figure 2.4

1 The accelerometer case is connected to the machine earth and the differential signal output is isolated. The installer must ensure that the accelerometer mounting structure has the same ground potential as barrier ground. Total earth loop impedance should be less than 1 ohm. The accelerometer case connects to the extension cable shield through the cable connector for the hardline cable and to the inner shield for the softline connector.

3 The interface module case must be isolated. The interface module must be installed in a housing which meets approval agency requirements for the installation site.

Wiring Recommendations:

2 Accelerometer to interface: Use extension cable, Bently Nevada part numbers 45358-07 and -09, or 83387-xxx, or equivalent.

4 Interface module to monitor, Power, Common, and Velocity signal wiring recommendation: two twisted pairs of stranded 18 to 22 AWG wire with insulating sheath and 100% shield coverage. Connect the -Velocity wire from the monitor to barrier ground but not to the interface module. The shield connects to the CASE SHIELD terminal at the interface module. The maximum length is 800 feet (244 metres) between the interface module and the barrier and 1000 feet (305 metres) between the interface module and the monitor. Use Bently Nevada part number 02101200 or equivalent.

5 Interface module to monitor, acceleration signal wiring recommendation: Single twisted pair, stranded 18 to 22 AWG with insulating sheath and 100% shield coverage. Connect the -Accel wire from the monitor to barrier ground, (connection is made inside the barrier), but not to the interface module. The shield connects to the CASE SHIELD terminal at the interface module. The maximum length is 800 feet (244 metres) between the interface module and the barrier and 1000 feet (305 metres) between the interface module and the monitor.

Shielding:

6 Shield connects to barrier ground.

7 Shield connects to barrier ground.

10 Shields float at monitor. -Velocity and -Accel must connect from monitor to barrier ground.

Safety Barriers:

8 MTL 796(-) barrier is recommended for power and velocity signal. Power:
 $V_{\max} =$

-26 V , $R_{\min} = 300 \text{ ohms}$. Velocity: $V_{\max} = -20 \text{ V}$, $R_{\min} = 390 \text{ ohms}$.

9 MTL 728(-) barrier is recommended for acceleration signal. Power: $V_{max} = -28$ V, $R_{min} = 300$ ohms.

11 Barrier ground is the single point earth ground.

NOTE: When external barriers are used the jumper between signal common and rack chassis on the 3300 Power Input Module at the rear of the 3300 rack must be removed. See the 3300 System Installation Instructions, (document part number 80172-01

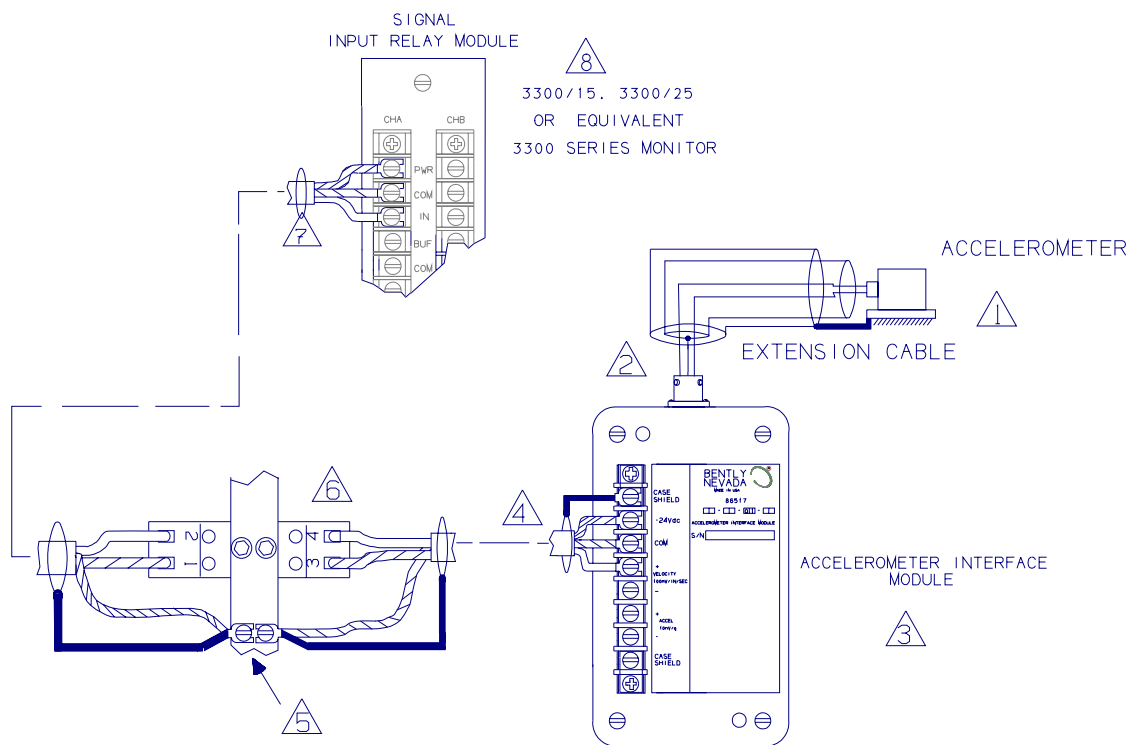


Figure 2.5 Field Wiring Interface Module to 3300 Monitor with External Barriers

(Notes on the following page)

Notes for Figure 2.5

- 1 The accelerometer case is connected to the machine earth and the differential signal output is isolated. The installer must ensure that the accelerometer mounting structure has the same ground potential as barrier ground. Total earth loop impedance should be less than 1 ohm. The accelerometer case connects to the extension cable shield through the cable connector for the hardline cable and to the inner shield for the softline connector.
- 3 The interface module case must be isolated. The interface module must be installed in a housing which meets approval agency requirements for the installation site.

Wiring Recommendations:

- 2 Accelerometer to interface: Use extension cable, Bently Nevada part numbers 45358-07 and -09, or 83387-xxx, or equivalent.
- 4 Interface module to monitor Power, Common, and Velocity signal wiring recommendation: 18 to 22 AWG stranded, three conductor wire with insulating sheath and 100% shield coverage. The -Velocity output at the interface module is not connected. The maximum cable length between the monitor and the interface module is 1000 feet (305 metres) and the maximum length between the interface module and the barrier is 800 feet (244 metres). 18 AWG Belden 83336 or 22 AWG Belden 83334 can be used.

Shielding:

- 5 Barrier ground is the single point earth ground. The shields should be earthed only at this point.
- 7 Shield floats at the monitor and is earthed at barrier ground.

Safety Barriers:

- 6 MTL 796(-) barrier recommended for power and velocity signal. Power: $V_{\max} = -26 \text{ V}$, $R_{\min} = 300 \text{ ohms}$. Velocity: $V_{\max} = -20 \text{ V}$, $R_{\min} = 390 \text{ ohms}$.
- 8 3300 series monitors other than the 3300/95 must be modified before connection to the interface module. Contact your Bently Nevada representative. Other connections are possible. For example the acceleration signal could be connected to a monitor for some special applications.

NOTE: When you use external barriers, remove the jumper between signal common and rack chassis on the 3300 Power Input Module at the rear of the 3300 rack. See the 3300 System Installation Instructions, (document number 80172-01).

5. ORDERING INFORMATION

Accelerometer Interface Module

86517 – AXX – BXX – CXX – DXX

A Transducer Charge Input Sensitivity Option

- 01 50 pC/g
- 02 100 pC/g

B Filter Corner Frequency Option

- 01 25 Hz high pass corner, 350 Hz low pass corner
- 02 100 Hz high pass corner, 560 Hz
low pass corner
- 03 40 Hz high pass corner, 300 Hz
low pass corner

C DC Signal Bias Voltage

- 01 -10 Vdc, No other option available

D Agency Approval

- 00 Not Required
- 01 Canadian Standards Association
- 02 CENELEC (SIRA)

Extension Cable

Softline Cable

- 45358 - 07 7 Metre
- 45358 - 09 9 Metre

Hardline Cable

- 83387 - 054 54 inch
- 065 65 inch
- 096 96 inch
- 100 100 inch
- 132 132 inch

Accelerometer

- 45357 - 01 50 pC/g Accelerometer.

Weatherproof Housing*

80808 - 01 Housing for two interface modules.

80808 - 02 Housing for four interface modules.

* Housings come with 3/4 inch conduit hubs. Conduit and fittings as necessary will need to be procured separately.

Accessories

0.01 microfarad capacitor: BNC P/N 00448308

Connector for connection of unterminated extension cables to interface module. (Requires potting). BNC P/N 00591075.

Recommended Spare Parts

One spare interface module, extension cable, and accelerometer should be kept on hand. If five or more transducer systems are installed then one spare of each part is suggested in a ratio of one spare to five installed units.

6. INTERFACE MODULE OPTIONS

Option AA, Transducer Charge Input Sensitivity

This option sets the charge sensitivity of the charge amplifier at 50 pC/g or 100 pC/g. If soldered link W1 on the charge amplifier PWA (printed wiring assembly) is not installed then the 50 pC/g option is selected, when W1 is installed then the 100 pC/g option is selected. Calibration and velocity path verification is required if the option is changed.

Option BB, Filter Corner Frequency

This option determines the filter corner frequencies and cannot be changed without changing components on the Filter PWA.

Option CC, DC Signal Bias Voltage

Only Option CC = 01 is available. This sets the dc bias voltage at -10 Vdc. Soldered link W2 on the Filter PWA is not installed.

Option DD, Agency Approval

The 86517 interface module is certified for use in certain hazardous areas. Safety barriers are required for installations in Class I, Division 1 or Zone 1 environments. Contact Bently Nevada Corporation for more information on using the interface module in hazardous areas.

7. SPECIFICATIONS

The following specifications apply with a -24 Vdc supply voltage, 100 KΩ load, at 77° F (25° C) unless otherwise specified.

7.1 Accelerometer Interface Module

POWER

Supply Voltage:	-23 Vdc to -26 Vdc
Current Draw:	22 mA maximum

INPUT

Acceleration:	Differential input from a piezoelectric accelerometer with a sensitivity of 50 pC/g pk or 100 pC/g pk. Accelerometer pole to pole capacitance plus extension cable capacitance should not exceed 8300 picofarads.
Overload:	50,000 pC peak for accelerometers with 50 pC/g pk sensitivity, and 100,000 pC peak for accelerometers with 100 pC/g pk sensitivity.

ACCELERATION OUTPUT

Sensitivity:	10 mV/g pk (1.02 mV/m/s ² pk) balanced output, 50 ohm nominal output impedance.
Dynamic Range:	750 gs (7350 m/s ²) without barriers typical. 500 gs (4902 m/s ²) with barriers typical.
Frequency Response:	The low frequency response is controlled by the charge amplifier. The -3 dB corner is at 4.7 Hz. The high frequency response is controlled by the combination of the accelerometer and extension cable capacitance, the charge amplifier/scaling stage, and the load capacitance on the acceleration output buffer. For an accelerometer capacitance of 1000 pF and a cable capacitance of 1000 pF the upper -3 dB frequency is approximately 5000 Hz.

VELOCITY OUTPUT

Sensitivity:	100 mV/in/s pk (3.93 mV/mm/s pk), balanced output. Output impedance 100 ohms nominal.
Dynamic Range:	20 in/s pk (508 mm/s pk) 25 Hz to 1000 Hz.
Frequency Response:	Dependent on filters. See filter specifications.

7.2 Accelerometer Interface Module

VELOCITY OUTPUT

Accuracy:	±5.0% of calculated velocity from an ideal input in the passband of the bandpass filter at 77° F (25° C)
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FILTERS

High and low pass corner frequencies are ordered as pairs, the following pairs can be ordered:

High Pass Corner	Low Pass Corner
25 Hz	350 Hz
40 Hz	300 Hz
100 Hz	560 Hz

The high and low pass filters are 6th order with -36 dB/octave rolloff and have a butterworth response. Attenuation at the corner frequency is -3 dB ±0.5 dB.

ENVIRONMENTAL

Operating Temperature:	+32° F to +158° F (0° C to 70° C)
Storage Temperature:	-40° F to +185° F (-40° C to +85° C)
Humidity:	0 to 95%, noncondensing

MECHANICAL

Accelerometer Input Connector:	MS-3112-8-3P
Power/Output Connector:	8 lug terminal block
Dimensions:	
Height:	3.00 inches, (76.2 mm)
Width:	3.25 inches, (82.6 mm)
Length:	5.50 inches, (139.7 mm)

Mounting:	Two 0.16 inch diameter 8 - 32 allen head bolts located at opposite diagonal corners of a 4.45 inch by 2.05 inch (113 mm by 52 mm) rectangle . The interface module must be isolated from ground.
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7.3 Extension Cable

SOFTLINE CABLE

Accelerometer Mating Connector:

Mates to MS 3100R-10SL-4P receptacle and has a Viton insert.

Interface Module Mating Connector:

Mates to MS 3112-8-3P

Cable:

Twisted shielded pair with low noise construction. Protected by convoluted teflon tubing overall and the rear of the connectors are potted.

Operating Temperatures:

Cable -65° F to +400° F (-54° C to +204° C)

Accelerometer mating connector -65° F to +392° F (-54° C to +200° C)

Interface module mating connector -50° F to +200° F (-45° C to +93° C)

HARDLINE CABLE

Accelerometer Mating Connector:

Mates to MS 3100R-10SL-4P receptacle and has a Viton insert.

Disconnect Interface Mating Connector:

Mates to MS 3106-10SL-4S

Cable:

Twisted shielded pair with mineral insulation and protected by a stainless steel overbraid.

Operating Temperatures:

Cable -65° F to +1200° F (-54° C to +649° C)

Accelerometer mating connector -65° F to +800° F (-54° C to +427° C)

Disconnect interface mating connector -65° F to +800° F (-54° C to +427°C)

7.4 Accelerometer, P/N 45357-01

Sensitivity: 50 pC/g $\pm$ 5%

Mounting: 4 holes at the corners of a square with 1.188 inch (30.17 mm) sides. Suitable for mounting with 0.25 inch or 6 mm bolts.

Connector: MS3100R-10SL-4P

Weight: 15 Ounces (425 grams) nominal

8. APPENDIX

Drawings

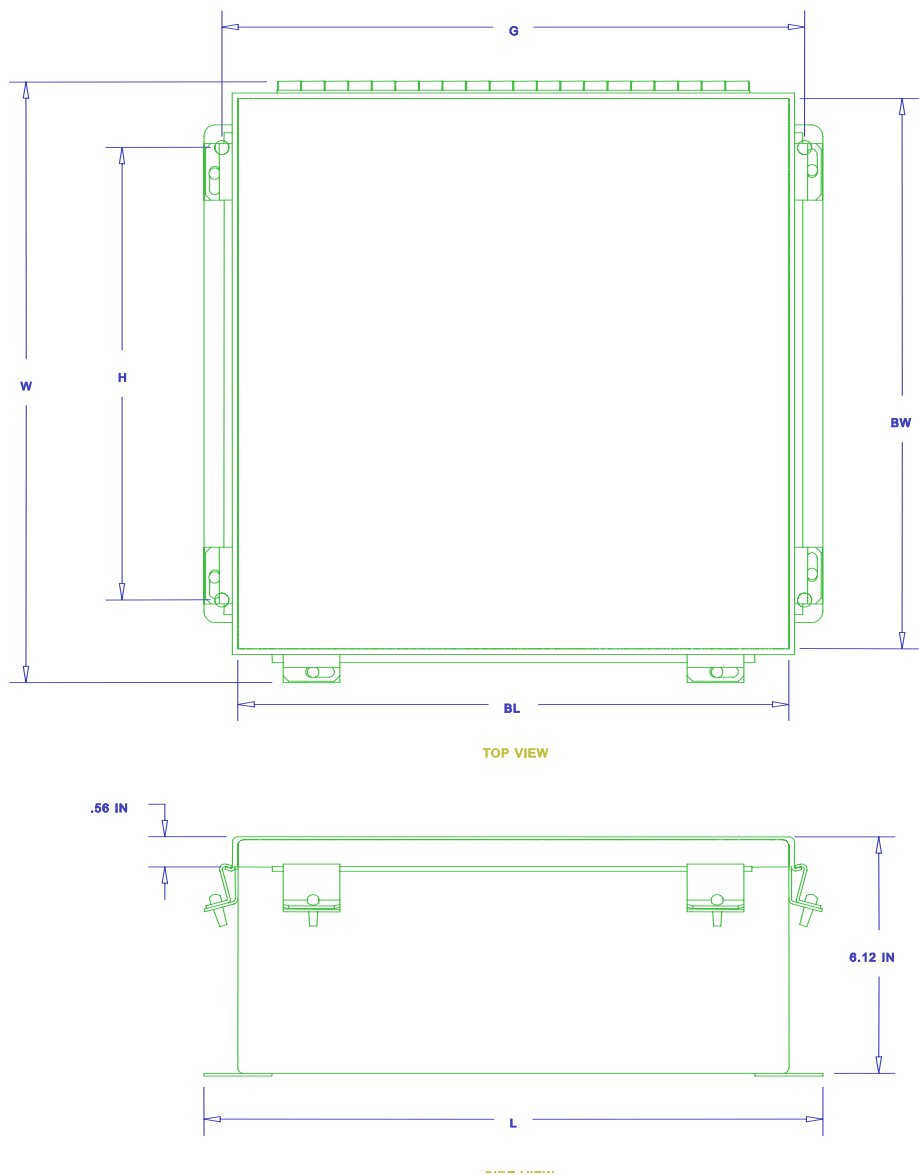


Figure A-1 80808 Weatherproof Housing

Description	Overall Base	Overall	Mounting
	BL x BW	L x W	G x H
Small SST Enclosure	12.00 in x 12.00 in (304.8mm x 304.8mm)	13.50 in x 12.94 in (342.9mm x 328.7mm)	12.75 in x 10.00 in (323.8mm x 254mm)
Large SST Enclosure	18.00 in x 18.00 in (457.2mm x 457.2mm)	19.50 in x 18.94 in (495.3mm x 481.1mm)	18.75 in x 16.00 in (476.2mm x 406.4mm)

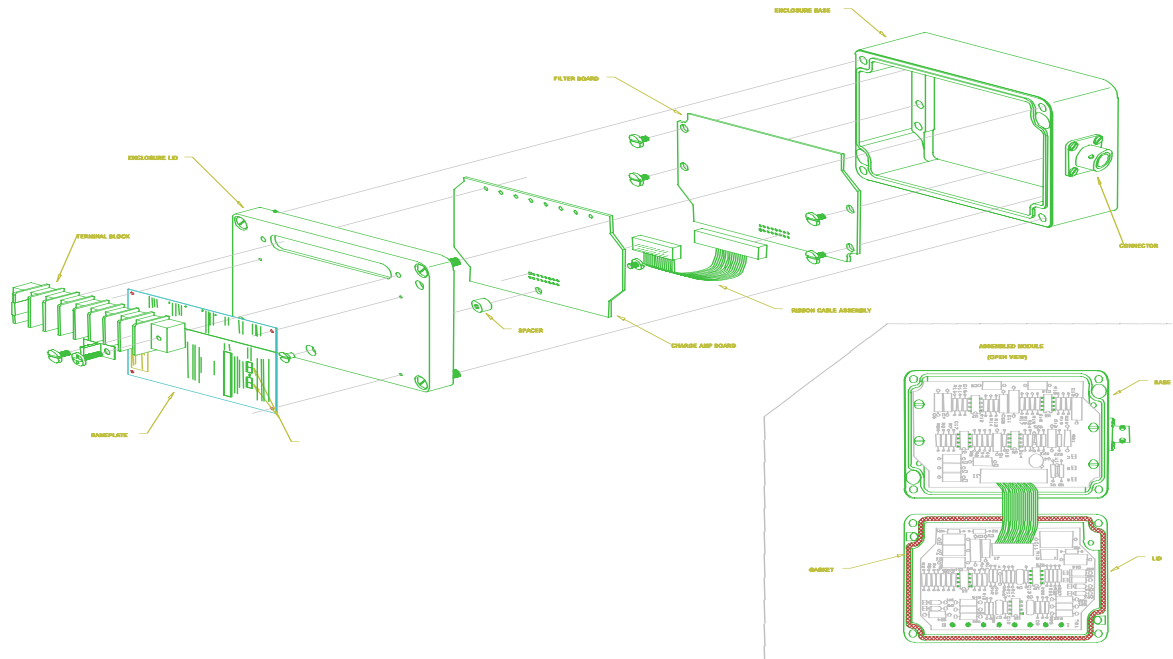


Figure A-2 Interfaule Assembly