

3500/42M Proximator Seismic Monitor

Datasheet

Cordant™

143694 Rev. AE

Description

The Bently Nevada™ 3500/42M Proximator Seismic Monitor:

- Protects machinery by continuously comparing monitored parameters against configured alarm setpoints to drive alarms.
- Communicates essential machine information to both operations and maintenance personnel.

The 3500/42M Proximator Seismic Monitor is a four-channel monitor that accepts input from proximity and seismic transducers. It conditions the signal to provide vibration and position measurements and compares the conditioned signals with user-programmable alarms.

You can program each channel using the 3500 Rack Configuration Software to monitor and report:

- | | | |
|--------------------|------------------------------|-------------------|
| - Radial vibration | - REBAM | - Thrust position |
| - Acceleration | - Differential expansion | - Shaft absolute |
| - Eccentricity | - Circular acceptance region | - Velocity |



The monitor channels are programmed in pairs and can perform up to two of the listed functions at a time. For example, Channels 1 and 2 can perform one function while channels 3 and 4 perform another or the same function.

Each channel, depending on configuration, typically conditions its input signal to generate various parameters called **static values**. You can configure **alert setpoints** for each active static value and danger setpoints for any two of the active static values.



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Specifications

Inputs

Signal	Accepts from 1 to 4 proximity, velocity or acceleration transducer signals
Power consumption	7.7 watts, typical

Input Impedance

Standard I/O	10 kΩ (Proximitors and acceleration inputs)
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Sensitivity

Radial Vibration	3.94 mV/μm (100 mV/mil) or 7.87 mV/μm (200 mV/mil)
Thrust	3.94 mV/μm (100 mV/mil) or 7.87 mV/μm (200 mV/mil)
Eccentricity	3.94 mV/μm (100 mV/mil) or 7.87 mV/μm (200 mV/mil)
Differential Expansion	0.394 mV/μm (10 mV/mil) or 0.787 mV/μm (20 mV/mil)
REBAM	40 mV/μm (1000 mV/mil) or 80 mV/μm (2000 mV/mil)
Acceleration & Acceleration ²	10 mV/ (m/s ²) (100 mV/g)
Velocity & Velocity ²	20 mV/ (mm/s) pk (500 mV/ (in/s) pk) or 5.8 mV/ (mm/s) pk (145 mV/ (in/s) pk) or 4 mV/ (mm/s) pk (100 mV/ (in/s) pk)
Shaft Absolute, Radial Vibration	3.94 mV/μm (100 mV/mil) or 7.87 mV/μm (200 mV/mil)
Shaft absolute, Direct	3.94 mV/μm (100 mV/mil) or 7.87 mV/μm (200 mV/mil)

Shaft absolute, Velocity	20 mV/ (mm/s) pk (500 mV/ (in/s) pk) or 5.8 mV/ (mm/s) pk (145 mV/ (in/s) pk) or 4 mV/ (mm/s) pk (100 mV/ (in/s) pk)
Circular Acceptance Region	See Radial Vibration on page 4.

Outputs

Front Panel LEDs	
OK LED	Indicates when the 3500/42M Proximitor Seismic Monitor is operating properly.
TX/RX LED	Indicates when the 3500/42M Proximitor Seismic Monitor is communicating with other modules in the 3500 rack.
Bypass LED	Indicates when the 3500/42M Proximitor Seismic Monitor is in Bypass Mode.
Buffered Transducer Outputs	The front of each monitor has one coaxial connector for each channel. Each connector is short-circuit protected.
Output Impedance	550 Ω
Transducer Power Supply	-24 Vdc
Recorder	+4 to +20 mA Values are proportional to monitor full-scale. The monitor provides individual recorder values for each channel. Monitor operation is unaffected by short circuits on recorder outputs.
Voltage Compliance (current output)	0 to +12 Vdc range across load Load resistance is 0 to 600 Ω .

Front Panel LEDs	
Resolution	0.3662 μ A per bit $\pm 0.25\%$ error at room temperature $\pm 0.7\%$ error over temperature range Update rate approximately 100 ms or less
Shaft Absolute Buffered Outputs	The Shaft Absolute I/O modules have one output for each channel group. Each output is short-circuit protected.
Shaft Absolute Output Impedance	300 Ω
Output supply parameters	See Output Supply Parameters on page 14..

Filter Tracking / Stepping (Requires a valid speed signal)

Switch from nominal to higher filter set	Current shaft speed $\geq 1.1 \times$ (nominal shaft speed)
Switch from higher to nominal filter set	Current shaft speed $\leq 1.05 \times$ (Nominal Shaft Speed)
Shaft speed error condition	Nominal filter set used

Environmental Limits

Operating Temperature	When used with Internal/External Termination I/O Module: -30°C to +65°C (-22°F to +150°F) When used with Internal Barrier I/O Module (Internal Termination): 0°C to +65°C (32°F to +150°F)
Storage Temperature	-40°C to +85°C (-40°F to +185°F).
Humidity	95%, noncondensing

Physical

Monitor Module (Main Board)

Dimensions (Height x Width x Depth)	241.3 mm x 24.4 mm x 241.8 mm (9.50 in x 0.96 in x 9.52 in)
Weight	0.91 kg (2.0 lb)

I/O Modules (non-barrier)

Dimensions (Height x Width x Depth)	241.3 mm x 24.4 mm x 99.1 mm (9.50 in x 0.96 in x 3.90 in)
Weight	0.20 kg (0.44 lb)

I/O Modules (barrier)

Dimensions (Height x Width x Depth)	241.3 mm x 24.4 mm x 163.1 mm (9.50 in x 0.96 in x 6.42 in)
Weight	0.46 kg (1.01 lb)

Rack Space Requirements

Monitor	1 full-height front slot
I/O Modules	1 full-height rear slot

Barrier Parameters

The following parameters apply to CSA-NRTL/C and ATEX approvals.

Proximito Barrier

Circuit Parameters	V _{max} (PWR) = 26.80 V (SIG) = 14.05 V I _{max} (PWR) = 112.8 mA (SIG) = 2.82 mA R _{min} (PWR) = 237.6 Ω (SIG) = 4985 Ω
Channel Parameters (entity)	V _{max} = 28.0 V I _{max} = 115.62 mA R _{min} (PWR) = 237.6 Ω (SIG) = 4985 Ω

Seismic Barrier

Circuit Parameters	V _{max} (PWR) = 27.25 V I _{max} (PWR) = 91.8 mA R _{min} (PWR) = 297 Ω
Channel Parameters (entity)	V _{max} = 27.25 V I _{max} = 91.8 mA R _{min} (PWR) = 297 Ω

B: Assembly Instructions

01 Not Assembled

02 Assembled

Spares

176449-02	3500/42M Proximator Seismic Monitor
128229-01	Prox/Seismic I/O Module with internal terminations
128240-01	Prox/Seismic I/O Module with external terminations
00530843	3500/42M Prox/Seismic I/O Module four-pin connector shunt
143489	3500/42M Monitor User Guide
135489-01	I/O Module with Internal Barriers (internal terminations, 4 x Prox/Accel)
135489-02	I/O Module with Internal Barriers (internal terminations, 2 x Prox/Accel and 2 x Velomitor)
135489-03	I/O Module with Internal Barriers (internal terminations, 4 x Velomitor)
138708-01	Shaft Absolute I/O Module with internal terminations
138700-01	Shaft Absolute I/O Modules with external terminations
00517018	3500/42M Shaft Absolute I/O Module 8-pin connector shunt

140471-01	Prox/Velom I/O Module with internal terminations
140482-01	Prox/Velom I/O Module with External Terminations
00561941	3500/42M Prox/Velom I/O Module 10-pin connector shunt
00580434	Internal I/O Module connector header, Euro style, 8-pin Used on I/O modules 128229-01 and 138708-01
00580432	Internal I/O Module connector header, Euro style, 10-pin Used on I/O modules 128229-01 and 138708-01
00502133	Internal I/O Module connector header, Euro style, 12-pin
166M2389	Connector header Push-in-Spring Type (Alternative for PN 00580434)
166M2388	Connector header Push-in-Spring Type (Alternative for PN 00580432)



For spare front and rear cover plates, please see 3500/05 System Rack datasheet (document 141525)

Firmware & Software Requirements

3500/42M Proximator Seismic Monitor	3500/01 software, version 2.50 or later
	3500/02 software, version 2.20 or later
	3500/03 software, version 1.21 or later
Internal Barrier I/O Modules	See the 3500 Internal Barrier datasheet (part number 141495-01)
Shaft Absolute	3500/42M Module Firmware, revision B
	3500/01 Software, version 2.61
	DM2000 Software, version 3.10
REBAM	The 3500 Proximator / Seismic Monitor, version M
	3500/40M Module Firmware – Revision 2.1
	3500/01 Software, version 3.30
	3500/02 Software, version 2.40
	3500/03 Software, version 1.40
	DM2000 Software, version 3.40
Acceleration II, Velocity II, Circular Acceptance Region	The 3500 Proximator Monitor, version M
	3500/42M Module Firmware, revision 2.10
	3500/01 Software, version 3.20
	DM2000 Software, version 3.30
	The 3500 Proximator Monitor, version M

I/O Module Types

AA Ordering Option	I/O Part Number	I/O Description	Transducer Type
01	128229-01	Prox/Seismic I/O Module with internal terminations	Seismoprobe Prox/Accel and Velomitor are supported but are not recommended.
02	128240-01	Prox/Seismic I/O Module with external terminations	Seismoprobe Prox/Accel and Velomitor are supported but are not recommended.
04	135489-01	I/O Module with internal Barriers, internal terminations, 4 x Prox/Accel	Prox/Accel on channels 1 through 4
05	135489-02	I/O Module with internal barriers, internal terminations, 2 x Prox/Accel and 2 x Velomitor	Prox/Accel on channels 1 and 2 Velomitor on channels 3 and 4
06	135489-03	I/O Module with internal barriers, internal terminations, 4 x Velomitor	Velomitor on channels 1 through 4
07	138708-01	Shaft Absolute I/O Module with internal terminations	Prox/Accel or Velomitor or Seismoprobe
08	138700-01	Shaft Absolute I/O Modules with external terminations	Prox/Accel or Velomitor or Seismoprobe
09	140471-01	Prox/Velom I/O Module with internal terminations	Prox/Accel, Velomitor or HTVS
10	140482-01	Prox/Velom I/O Module with external terminations	Prox/Accel, Velomitor or HTVS



External termination blocks cannot be used with Internal Termination I/O Modules. When ordering I/O modules with external terminations, order the external termination blocks and cable separately for each I/O module.

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