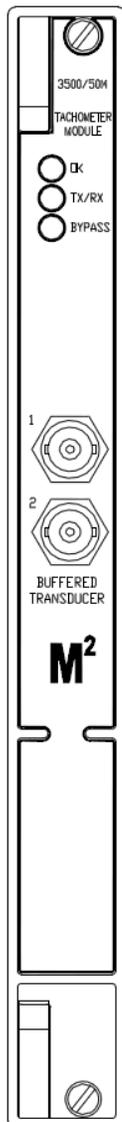# 3500/50M Tachometer Module

Datasheet

Bently Nevada Machinery Condition Monitoring

Description

The 3500/50M Tachometer Module is a 2-channel module that accepts input from proximity probes or magnetic pickups to determine shaft rotative speed, rotor acceleration, or rotor direction. The module compares these measurements against user-programmable alarm setpoints and generates alarms when the setpoints are violated.

The Tachometer Module is programmed using the 3500 Rack Configuration software. The following configuration options are available:

- Speed Monitoring, Setpoint Alarming and Speed Band Alarming
- Speed Monitoring, Setpoint Alarming and Zero Speed Notification
- Speed Monitoring, Setpoint Alarming and Rotor Acceleration Alarming
- Speed Monitoring, Setpoint Alarming and Reverse Rotation Notification

The 3500/50M Tachometer Module can be configured to supply conditioned Keyphasor signals to the backplane of the 3500 rack for use by other monitors. Therefore, you don't need a separate Keyphasor module in the rack.

The 3500/50M Tachometer Module has a peak hold feature that stores the highest speed, the highest reverse speed, or the number of reverse rotations that the machine has reached. You can reset the peak values.

> ✏️ Bently Nevada offers an **Overspeed Protection System** (Product 3701/55).

Specifications

Inputs

Signal	Each 3500/50M Tachometer Module accepts up to two transducer signals from proximity probe transducers or magnetic pickups.
Input signal range	+10.0 V to -24.0 V Signals exceeding this range are limited internally by the module.
Input impedance	20 k Ω (standard) 40 k Ω (TMR) 7.15 k Ω (Internal Barrier)
Power consumption	5.8 watts, typical
Transducers	Accepts 1 to 2 proximity transducer signals Restrictions may apply to magnetic pickups. See on page 2.

Outputs

Front Panel LEDs	
OK LED	Indicates when the 3500/50M Tachometer Module is operating properly.
TX/RX LED	Indicates when the Tachometer Module is communicating with other modules in the 3500 rack.
Bypass LED	Indicates when the Tachometer Module is in Bypass Mode.
Buffered Transducer	
Outputs	The front of each module has one coaxial connector for each channel. Each connector is short circuit and ESD protected. Buffered outputs are available at the I/O

	module via Euro style connectors.
Output Impedance	550 Ω

Transducer Power Supply	24 Vdc, 40 mA maximum per channel
Recorder	+4 to +20 mA Values are proportional to module full-scale range (rpm or rpm/min). Individual recorder values are provided 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
Resolution	0.3662 µA per bit ±0.25% error at room temperature ±0.7% error over temperature range Update rate approximately 100 ms

Signal Conditioning

> 🖊 Specified at +25 ºC (+77 ºF)

Speed Input	The 3500/50M Tachometer Module supports 1 to 255 events per revolution for Rotor Acceleration and Zero Speed channel types. All other channel types support 0.0039 to 255 events per revolution. All channel types support a maximum full scale range of 99,999 rpm and a maximum input frequency of 20 kHz. Minimum input frequency for

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	proximity transducers is 0.0167 Hz (1 rpm for 1 event per revolution). Minimum input frequency for passive magnetic pickups is 3.3 Hz.
RPM Accuracy	Less than 100 rpm = ± 0.1 rpm 100 to 10,000 rpm = ±1 rpm 10,000 to 99,999 rpm = ± 0.01% of true shaft speed
RPM/Min Accuracy	± 20 rpm/min

Transducer Conditioning

Auto Threshold	Use for any input above 0.0167 Hz (1 rpm for 1 event/revolution) Minimum signal amplitude for triggering is 1 volt peak-to-peak.
Manual Threshold	User selectable from +9.5 Vdc to -23.5 Vdc Minimum signal amplitude for triggering is 500 millivolts peak-to-peak
Hysteresis	User selectable from 0.2 to 2.5 volts

Alarms

Alarm Setpoints	Alarm 1 levels (setpoints) can be set for each value measured by the Tachometer. Alarm 2 setpoints can be set for any two of the values measured by the Tachometer. Alarm setpoints are set using software configuration. Alarms are adjustable and can normally be set from 0 to 100% of full scale for each measured value.
Alarm Time Delays	Programmable alarm delays for Alarm 1 and Alarm 2
Alarm 1 Time Delay	From 1 to 60 seconds in 1 second intervals
Alarm 2 Time Delay	From 1 to 60 seconds in 0.1 second intervals

Measured Values

Measured values are speed measurements used to monitor a machine. The 3500/50M Tachometer Module returns the following measured values:

Rotor Speed	Speed[1] Speed Band

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	Peak Speed[2]
Rotor Speed 2	Speed[1] Gap[2] Speed Band Peak Speed[2]
Rotor Acceleration	Rotor Acceleration[1] Speed Peak Speed[2]
Rotor Acceleration 2	Rotor Acceleration[1] Gap[2] Speed Peak Speed[2]
Zero Speed	Zero Speed[1] Speed Peak Speed[2]
Zero Speed 2	Zero Speed[1] Gap[2] Speed Peak Speed[2]
Reverse Rotation	Reverse Speed[1] Reverse Peak Speed Speed (forward) Gap[2] Num Reverse Rotations

[1] The primary value for the channel. This value can be included in contiguous registers in the Communications Gateway Module.

[2] This measured value is for display and setup purposes only. No alarms are provided.

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	0.82 kg (1.8 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 (internal 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 Module	1 full-height front slot
I/O Modules	1 full-height rear slot

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