ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

Expert team | Trust guarantee | 100% satisfaction

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Find the *GE / Bently Nevada 3500/50M-01* at our website: *Click HERE*

GE Measurement & Control

3500/50M Tachometer Module Product Datasheet

Bently Nevada* Asset 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 3500/50M 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** (part number **141539-01**) for the 3500 System.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

	WARNING
	**PRODUCT MISUSE** **Risk of personal injury or equipment damage.** **3500/50M Tachometer Module:** Do **not** use 3500/50M Tachometer Module independently or as a component of a speed control or an overspeed protection system because it does **not** provide protective redundancy or the response speed needed for reliable operation as a speed control or overspeed protection system. The analog proportional output is suitable for data logging, chart recording, or display purposes only. Speed alert setpoints are suitable for annunciation purposes only. **Magnetic Pickups:** Do not use magnetic pickups for the reverse rotation option or zero speed option. Otherwise, false indications of rotation direction may occur. The transducers do not provide a clean edge for the detection circuit during low speeds.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

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 Warning 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 3500/50M Tachometer Module is communicating with other modules in the 3500 rack.
Bypass LED	Indicates when the 3500/50M 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 °C (+77 °F)

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 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

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

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

Proportional Values

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

Rotor Speed	Speed[1] Speed Band 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 proportional value is for display and setup purposes only. No alarms are provided.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

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

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% Non-condensing

Compliance and Certifications

EMC	**Standards:** EN 61000-6-2 Immunity for Industrial Environments EN 61000-6-4 Emissions for Industrial Environments EN 55011/CISPR 11 ISM Equipment **European Community Directives:** EMC Directive 2004/108/EC
Electrical Safety	**Standards:** EN 6110-1 **European Community Directives:** 2006/95/EC Low Voltage

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Hazardous Area Approvals

For the detailed listing of country and product specific approvals, refer to the **Approvals Quick Reference Guide**, document 108M1756, at **www.GEmeasurement.com**.

CSA/NRTL/C (Approval Option 01)	
When used with I/O module ordering options and internal barriers	Ex nC [ia] IIC Class I, Division 1 AEx nC [ia] IIC Class I, Zone 2/0 Groups A, B, C, D T4 @ Ta = -20 °C to +65 °C (-4 °F to +150 °F) per drawing 138547
When used with I/O module ordering options without internal barriers	Ex nC [L] IIC Class I, Division 2 AEx nC IIC Class I, Division 2 Groups A, B, C, D T4 @ Ta = -20 °C to +65 °C (-4 °F to +150 °F) per drawing 149243
ATEX/IECEx (Approval Option 02)	
For ATEX/IECEx agency approval ordering options with internal barriers	 II 3 (1) G Ex nA nC ic [ia Ga] IIC T4 Gc T4 @ Ta = -20 °C to +65 °C (-4 °F to +150 °F)
For ATEX/IECEx agency approval ordering options without internal barriers	 II 3 G Ex nA nC ic IIC T4 Gc T4 @ Ta = -20 °C to +65 °C (-4 °F to +150 °F)
When used with Internal Barriers I/O Module	See 3500 Internal Barriers product datasheet (Document 141495)

Ordering Considerations

To add the 3500/50M Tachometer Module to an existing 3500 Monitoring System, you must have the following versions of firmware and software:

Firmware and Software	Version
3500/22M Module Firmware	Revision (1.70)
3500/01 Configuration Software	Version 4.20 or later
3500/02 Data Acquisition Software	Version 2.52 or later
3500/03 Display Software	Version 1.52 or later
3500/50M Firmware	Revision 5.30 or later
3500/50M	**Not** compatible with any version of 3500/20

Consider the following guidelines and restrictions before placing an order:

- External Termination Blocks cannot be used with Internal Termination I/O modules.
- When ordering I/O Modules with External Terminations, you must order External Termination Blocks and cables separately.
- Use Bussed External Termination Blocks with TMR I/O modules only.
- Before selecting the Internal Barrier option, see 3500 Internal Barriers product datasheet (document **141495**).

Ordering Information

For the detailed listing of country and product specific approvals, refer to the **Approvals Quick Reference Guide**, document 108M1756, at **www.GEmeasurement.com**.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

3500/50M Tachometer Module 3500/50-AXX-BXX

A: I/O Module Type
- **01** I/O Module with Internal Terminations
- **02** I/O Module with External Terminations
- **04** I/O Module with Internal Barriers and Internal Terminations

B: Agency Approval Option
- **00** None
- **01** CSA/NRTL/C
- **02** ATEX/IECEx/CSA

External Termination (ET) Blocks

Part Number	Description
125808-05	Tachometer ET Block Euro Style connectors
128015-05	Tachometer ET Block Terminal Strip connectors
128702-01	Recorder ET Block Euro Style connectors
128710-01	Recorder ET Block Terminal Strip connectors

Cables

3500 Tachometer Signal to ET Block Cable 135101-AXXXX-BXX

A: Cable Length
- **0005** 5 feet (1.5 metres)
- **0007** 7 feet (2.1 metres)
- **0010** 10 feet (3 metres)
- **0025** 25 feet (7.5 metres)
- **0050** 50 feet (15 metres)
- **0100** 100 feet (30.5 metres)

B: Assembly Instructions
- **01** Not Assembled
- **02** Assembled

3500 Recorder Output to ET Block Cable 129529-AXXXX-BXX

A: Cable Length
- **0005** 5 feet (1.5 metres)
- **0007** 7 feet (2.1 metres)
- **0010** 10 feet (3 metres)
- **0025** 25 feet (7.5 metres)
- **0050** 50 feet (15 metres)
- **0100** 100 feet (30.5 metres)

B: Assembly Instructions
- **01** Not Assembled
- **02** Assembled

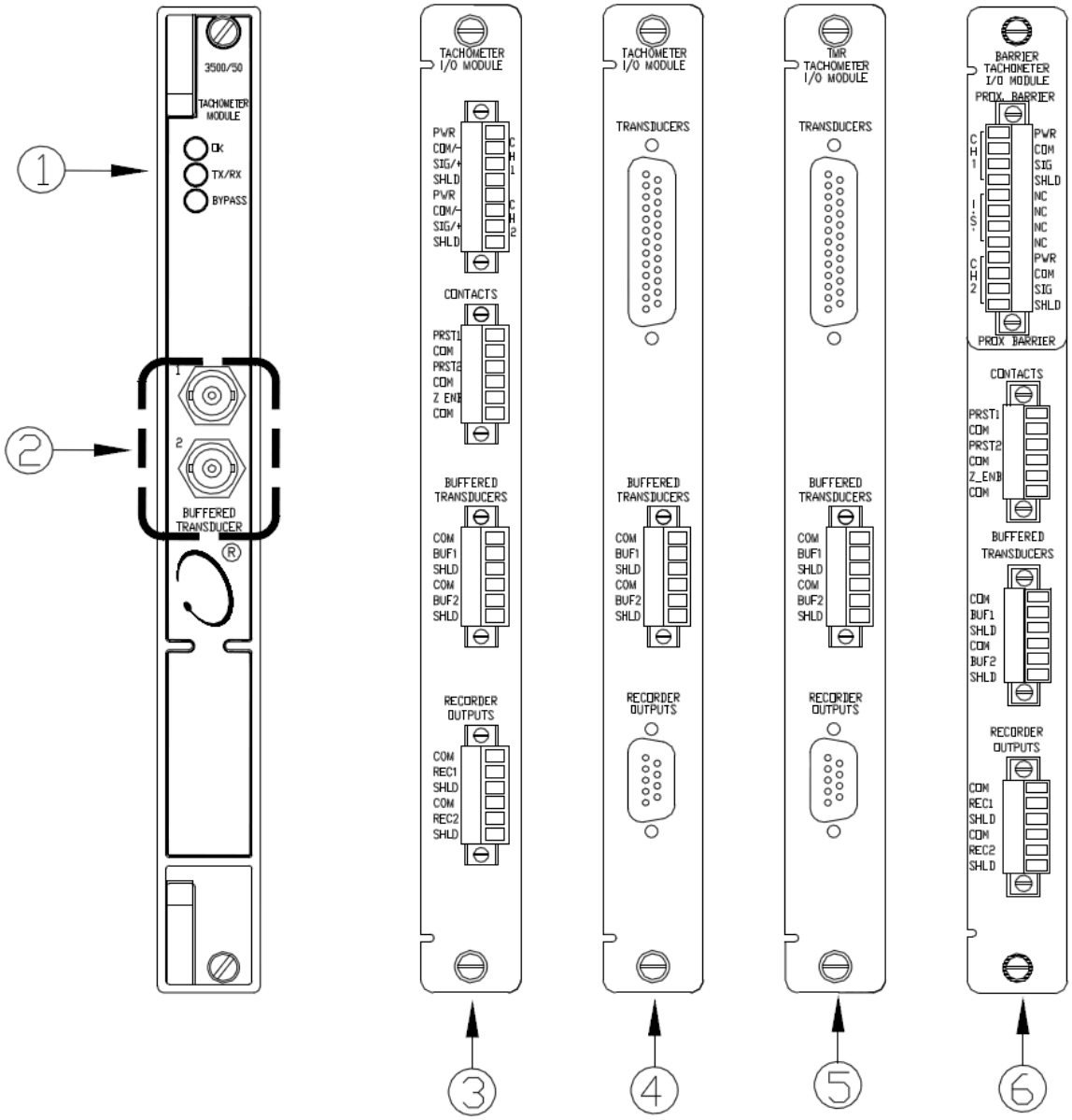
Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Spares

Part Number	Description
288062-02	3500/50M Tachometer Module
133442-01	I/O Module with Internal Terminations
136703-01	Discrete Internal Barrier I/O Module with Internal Terminations
133434-01	I/O Module with External Terminations
133450-01	TMR I/O Module with External Terminations
134938-01	3500/50M Tachometer Manual
04425545	Grounding Wrist Strap Single use only
00580434	Connector Header Internal Termination 8-position| Green
00580436	Connector Header Internal Termination 6-position Green
00502133	Connector Header Internal Termination 12-position Blue

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Graphs and Figures



1: Status LEDs
2: Buffered transducer outputs
3: I/O Module, Internal Terminations
4: I/O Module, External Terminations
5: I/O Module, TMR, External Terminations
6: I/O Module, Internal Barrier, Internal Terminations

Figure 1: Front and rear views of the 3500/50M Tachometer Module

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

© 1999 - 2016 Bently Nevada, Inc. All rights reserved.
* Denotes a trademark of Bently Nevada, Inc., a wholly owned subsidiary of General Electric Company.
The information contained in this document is subject to change without prior notice.
Printed in USA. Uncontrolled when transmitted electronically.
1631 Bently Parkway South, Minden, Nevada USA 89423
Phone: 1-775.782.3611 Fax: 1-775.215.2873
www.GEmeasurement.com

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Artisan Technology Group is an independent supplier of quality pre-owned equipment

Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP