Bently Nevada 133442-01

Tachometer I/O Module



Bently Nevada 133442-01 is the standard internal-termination I/O module for a compatible 3500/50M tachometer monitoring assembly. It provides the rear interface for proximity-probe or magnetic-pickup signals used by the front monitor to determine shaft speed, acceleration or direction. Depending on configuration, the complete assembly can support speed alarms, zero-speed notification, reverse-rotation indication and conditioned Keyphasor signals. The 133442-01 is the field-interface component rather than the processing monitor, and its standard internal-termination design distinguishes it from the external-termination and internal-barrier I/O options.

Technical Specifications

Product Identity	
Part number	133442-01
Component	Tachometer I/O with internal terminations
I/O dimensions (H x W x D)	241.3 x 24.4 x 99.1 mm
Rack space	One full-height rear slot
Functional Configuration	
Documented family	3500/50M
I/O version	Standard non-barrier
Buffered I/O outputs	Euro-style connectors
Host software	3500 Rack Configuration Software; check current monitor/TDI requirements
Application exclusion	Not a speed-control or overspeed-protection system
Performance & Power	
Standard input impedance	20 kOhm
Published tachometer input range	+10.0 to -24.0 V
Environment	
Hazardous-location ambient limit	3500/50M non-barrier configuration: T4, –20 to +65 °C under the applicable marking and drawing 149243 or 149244

Selected original manufacturer material follows on pages 3–8.

Compatibility & Selection Guide

System compatibility. The associated 3500/50M monitor is configured with 3500 Rack Configuration Software for supported speed-related measurements. Its functions and restrictions depend on the transducer and configuration; magnetic pickups must not be used for reverse-rotation or zero-speed options. The current 3500/50M is not compatible with any version of 3500/20, so retaining the correct host environment matters when selecting 133442-01.

Wiring & Installation Reference

Sensor and function matching

1. Check the transducer Confirm the transducer type and the applicable signal range.

2. Review the configured function Preserve the manufacturer restrictions for zero speed, reverse rotation and recorder use.

Rear I/O and host compatibility

1. Match the I/O spare Confirm 133442-01 and distinguish the external and internal-barrier variants.

2. Check the host environment For a 3500/50M installation, verify TDI firmware and configuration/software requirements from the ordering table.

Installation precautions

Do not use the tachometer assembly for speed control or overspeed protection. Its analog proportional output is for logging, chart recording or display, and speed alerts are for annunciation only.

View tachometer I/O layout (PDF) — page 8 · View mounting reference (PDF) — page 8

WARNING

PRODUCT MISUSE

Risk of personal injury or equipment damage.

Do **not** use the 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.

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

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

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 (108M1756)*.

For additional technical documentation, please log in to bntechsupport.com and access the Bently Nevada Media Library.

3500/50M Tachometer Module 3500/50-AA-BB

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: Hazardous Area Approval Option	
00	None
01	cNRTLus (Class 1, Division 2)
02	ATEX/IECEx/CSA (Class 1, Zone 2)

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-AAAA-BB

A: I/O Cable Length	
0005	5 feet (1.5 metres)
0007	7 feet (2.1 metres)
0010	10 feet (3.0 metres)
0025	25 feet (7.6 metres)
0050	50 feet (15.2 metres)
0100	100 feet (30.5 metres)
B: Assembly Instructions	
01	Not Assembled
02	Assembled

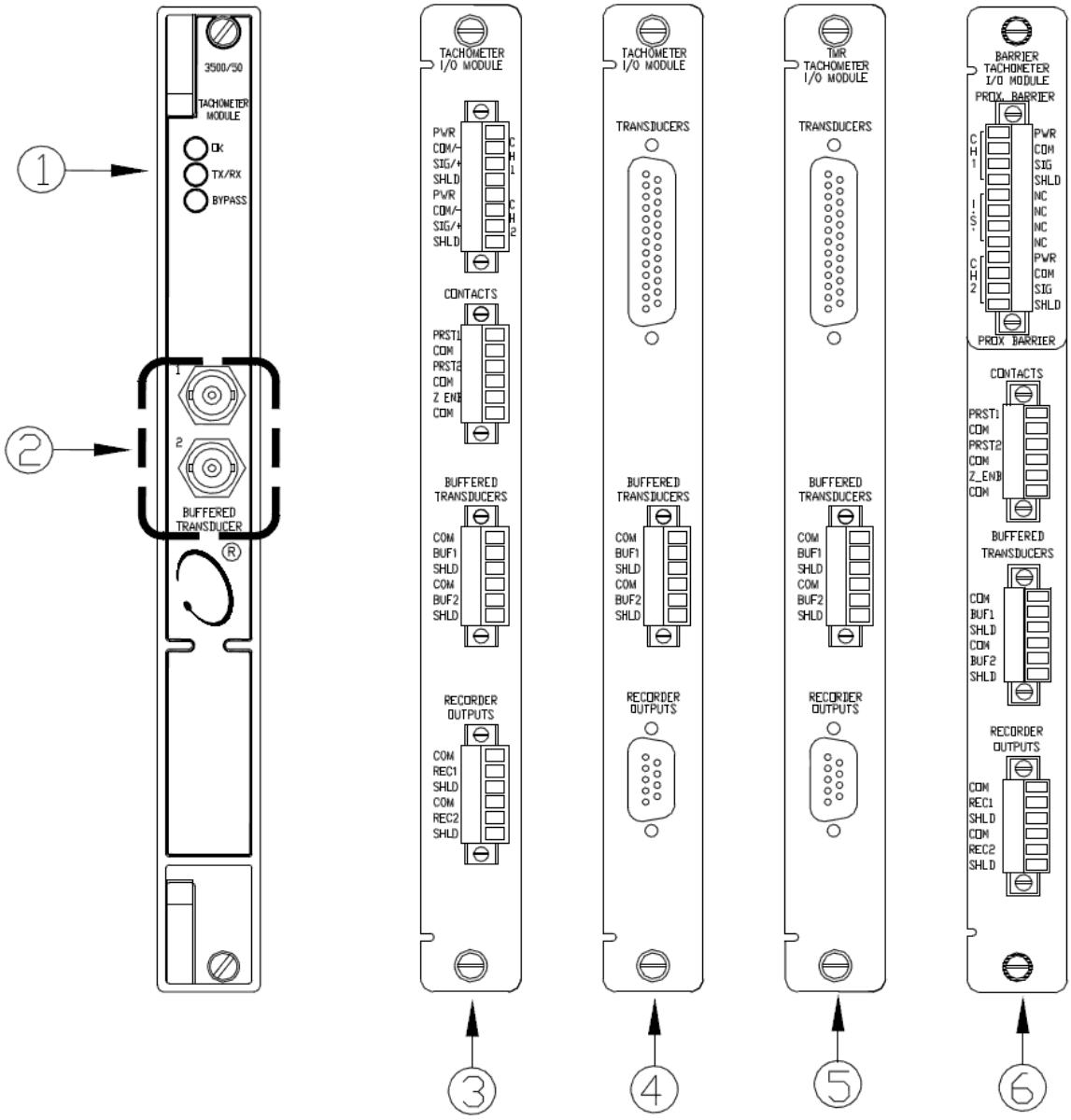
3500 Recorder Output to ET Block Cable 129529-AAAA-BB

A: I/O Cable Length	
0005	5 feet (1.5 metres)
0007	7 feet (2.1 metres)
0010	10 feet (3.0 metres)
0025	25 feet (7.6 metres)
0050	50 feet (15.2 metres)
0100	100 feet (30.5 metres)
B: Assembly Instructions	
01	Not Assembled
02	Assembled

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	3500/50M Tachometer User Guide
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
166M2390	Connector Header Push-in-Spring Type (Alternative for PN 00580436)
166M2389	Connector Header Push-in-Spring Type (Alternative for PN 00580434)

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