3500/20 Rack Interface Module

Datasheet

Cordant™

141531 Rev. D



Description

The Rack Interface Module (RIM) is the primary interface to the Bently Nevada™ 3500 rack. It supports a proprietary protocol used to configure the rack and retrieve machinery information. The RIM must be located in slot 1 of the rack (next to the power supplies).

The RIM supports compatible Bently Nevada external communications processors such as TDXnet, TDIX, and DDIX. While the RIM provides certain functions common to the entire rack, the RIM is not part of the critical monitoring path and has no effect on the proper, normal operation of the overall monitoring system. One RIM is required per rack.

For Triple Modular Redundant (TMR) applications, the 3500 System requires a TMR version of the RIM. In addition to all the standard RIM functions, the TMR RIM also performs "monitor channel comparison." The 3500 TMR configuration implements monitor voting using the setup specified in the monitor options. Using this method, the TMR RIM continually compares the outputs from three (3) redundant monitors. If the TMR RIM detects that the information from one of those monitors is no longer within a configured percentof the information of the other two monitors, it will flag that the monitor is in error and place an event in the System Event List.

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Specifications

Inputs

Power Consumption	4.75 watts, typical
Data Front panel	
Standard	RS232 serial communications
Data Rate	38.4 k baud.
I/O modules	
Standards	RS232/RS422 serial communications Internal modem communications
Data Rate	38.4 k baud maximum,serial communications 14.4 k baud, internal modem communications.

Outputs

Front Panel LEDs	
OK LED	Indicates when the RIM is operating properly.
TX/RX LED	Indicates when the RIM is communicating with other modules in the 3500 rack.
TM LED	Indicates when the 3500 rack is in Trip Multiply.
CONFIG OK LED	Indicates that the 3500 rack has a valid configuration.

I/O Module OK Relay	Relay to indicate when the 3500 rack is operating normally or when a fault has been detected within the rack. User can select either an "OPEN" or "CLOSED" contact to annunciate a NOT OK condition. This relay always operates as "Normally Energized".
OK relay	Rated to 5A @ 24 Vdc/ 120 Vac, 120 Watts/600 VA Switched Power.
Normally closed contacts	Arc suppressors are provided.

Controls

Front Panel	
Rack reset button	Clears latched alarms and Timed OK Channel Defeat in the rack. Performs same function as "Rack Reset" contact on I/O module.
Address switch	Used to set the 63 possible rack address.

Configuration Keylock	Used to place 3500 rack in either "RUN" mode or "PROGRAM" mode. RUN mode allows for normal operation of the rack and locks out configuration changes. PROGRAM mode allows for normal operation of the rack and also allows for local or remote rack configuration. The key can be removed from rack in either position, allowing switch to remain in either RUN or PROGRAM positions. Locking switch in the RUN position allows you to restrict unauthorized rack reconfiguration. Locking switch in PROGRAM position allows remote configuration of a rack at any time.
I/O Module System Contacts	
Trip multiply	Used to place 3500 rack in Trip Multiply.
Alarm inhibit	Used to inhibit all alarms in the 3500 rack.
Rack reset	Used to clear latched alarms and Timed OK Channel Defeat.
Maximum Current	<1 mA dc, Dry Contact to Common.
RS232/RS422 Switch (RS232/RS422 I/O module only)	Used to select between RS232 and RS422 for communications with the Bently Nevada host software.

Communications

Front Panel	
Communications	RS232 serial communications only.
Protocol	Bently Nevada proprietary.
Data rate	38.4 k baud maximum (auto baud capable).
Purpose	Permits data collection and 3500 rack configuration.
Cable length	30 metres (100 feet) maximum.
RS232/RS422 I/O Module	
Communications	RS232, RS422, or external modem.
Protocol	Bently Nevada proprietary.
Baud rate	38.4 k baud maximum (auto baud capable).
Purpose	Permits data collection and 3500 rack configuration.
Cable Length	
RS232	30 metres (100 feet) maximum.
RS422	1200 metres (4000 feet) maximum.
Modem	Consult modem manufacturer, typical 3 metres (10 feet).
Modem I/O Module	
Communications	Hayes AT-compatible.
Protocol	Bently Nevada proprietary.
Baud Rate	14.4 k baud maximum.
Purpose	Permits data collection and 3500 rack configuration.
Cable Length	2.1 metres (7 feet) maximum.

Modem	To phone jack.
Rack Connector	
Communications	RS422 only.
Protocol	Bently Nevada proprieatry
Baud Rate	38.4 k baud maximum.
Purpose	Allows multiple 3500 racks to be daisy-chained together for communications with 3500 Host Software.
Cable Length	1200 metres (4000 feet) maximum
Data Manager I/O Module (2 sets of ports)	
Communications	Bently Nevada proprietary
Protocol	Bently Nevada proprietary
Baud Rate	9600 baud fixed
Purpose	Permits static and dynamic data collection by Bently Nevada Transient Data Interface External or Dynamic Data Interface External Communication Processors
Cable Length	3 metres (10 feet) maximum

Environmental Limits

Rack Interface Module and RS232/RS422 I/O	
Operating Temperature	-30°C to +65°C (-22°F to +150°F).
Storage Temperature	-40°C to +85°C (-40°F to +185°F).
Modem I/O Module	
Operating Temperature	0°C to +50°C (+32°F to +122°F).
Storage Temperature	-40°C to +85°C (-40°F to +185°F).
Humidity	95%, non-condensing.

Physical

RIM	
Dimensions (Height x Width x Depth):	241.3 mm x 24.4 mm x 241.8 mm (9.5 in. x 0.96 in. x 9.52 in.).
Weight:	0.91 kg (2.0 lb.).
RS232/RS422 I/O	
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	0.45 kg (1.0 lb.).
Modem I/O	
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	0.45 kg (1.0 lb.).
Data Manager I/O	
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	0.45 kg (1.0 lb.).

Rack Space Requirements

RIM Main Board	1 full-height front slot.
RIM I/O Modules	1 full-height rear slot.
Data Manager I/O Modules	1 full-height rear slot.

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.

3500/20-AA-BB-CC

A: Rack Interface Type	
0 1	Standard RIM (Use for standard monitoring applications)
0 2	TMR RIM (Use only for application that requires a Triple Modular Redundant Configuration)
B: Type of I/O Module	
0 1	I/O module with built-in modem
0 2	I/O module with RS232/RS422 interface
C:Agency Approval Option	
0 0	None
0 1	CSA/NRTL/C

Spares

125744-02	Standard Rack Interface Module
125744-01	TMR Rack Interface Module
135031-01	RIM I/O Module with Modem Interface
125768-01	RIM I/O Module with RS232/RS422 Interface
125760-01	Data Manager I/O Module
04425545	Grounding Wrist Strap (single use)
00801286	Real-Time Clock IC
128755-01	Firmware IC (for PWA 125744-01 Rev P or later, or for PWA 125744-02 Rev N or later)
00580441	Connector Header, Internal Termination, 3-position, Green
00580436	Connector Header, Internal Termination, 6-position, Green
129768	RIM Operation and Maintenance Manual

Cables

02290860	RS232 Modem cable from: 3500 Rack External Modem Host Computer to External Modem
130119-01	Host Computer to RS232/RS422 Converter Cable RS232
129386-01	TDIX - Static Data Cable
129387-01	DDIX - Static Data Cable
02290160	DDIX/TDIX - Dynamic Data Cable
02230411	RS232 to RS422 Converter 110 Vac
02230412	RS232 to RS422 Converter 220 Vac

Host Computer to 3500 Rack Cable, RS232

130118-AAAA-BB

A: Cable Length	
0 0 1 0	10 feet (3 metres)
0 0 2 5	25 feet (7.5 metres)
0 0 5 0	50 feet (15 metres)
0 1 0 0	100 feet (30.5 metres)
B: Assembly Instructions	
0 1	Not Assembled
0 2	Assembled

RS232/RS422 Converter to 3500 Rack Cable, RS422, PVC Insulated

130120-AAAA-BB

A: Cable Length	
0 0 1 0	10 feet (3 metres)
0 0 2 5	25 feet (7.5 metres)
0 0 5 0	50 feet (15 metres)
0 1 0 0	100 feet (30.5 metres)
0 2 5 0	250 feet (76 metres)
0 5 0 0	500 feet (152 metres)
B: Assembly Instructions	
0 1	Not Assembled
0 2	Assembled

RS232/RS422 Converter to 3500 Rack Cable, RS422, Teflon Insulated

131106-AAAA-BB

A: Cable Length	
0 0 1 0	10 feet (3 metres)
0 0 2 5	25 feet (7.5 metres)
0 0 5 0	50 feet (15 metres)
0 1 0 0	100 feet (30.5 metres)
0 2 5 0	250 feet (76 metres)
0 5 0 0	500 feet (152 metres)
B: Assembly Instructions	
0 1	Not Assembled
0 2	Assembled

Host Computer to 3500 Rack Cable, RS422, PVC Insulated

132632-AAAA-BB

A: Cable Length	
0 0 1 0	10 feet (3 metres)
0 0 2 5	25 feet (7.5 metres)
0 0 5 0	50 feet (15 metres)
0 1 0 0	100 feet (30.5 metres)
0 2 5 0	250 feet (76 metres)
0 5 0 0	500 feet (152 metres)
B: Assembly Instructions	
0 1	Not Assembled
0 2	Assembled

Host Computer to 3500 Rack Cable, RS422, Teflon Insulated

132633-AAAA-BB

A: Cable Length	
0 0 1 0	10 feet (3 metres)
0 0 2 5	25 feet (7.5 metres)
0 0 5 0	50 feet (15 metres)
0 1 0 0	100 feet (30.5 metres)
0 2 5 0	250 feet (76 metres)
0 5 0 0	500 feet (152 metres)
B: Assembly Instructions	
0 1	Not Assembled
0 2	Assembled

3500 Rack to 3500 Rack Cable, RS422, PVC Insulated

130122-AAAA-BB

A: Cable Length	
0 0 1 0	10 feet (3 metres)
0 0 2 5	25 feet (7.5 metres)
0 0 5 0	50 feet (15 metres)
0 1 0 0	100 feet (30.5 metres)
0 2 5 0	250 feet (76 metres)
0 5 0 0	500 feet (152 metres)
B: Assembly Instructions	
0 1	Not Assembled
0 2	Assembled

3500 Rack to 3500 Rack Cable, RS422, Teflon Insulated

131107- AAAA-BB

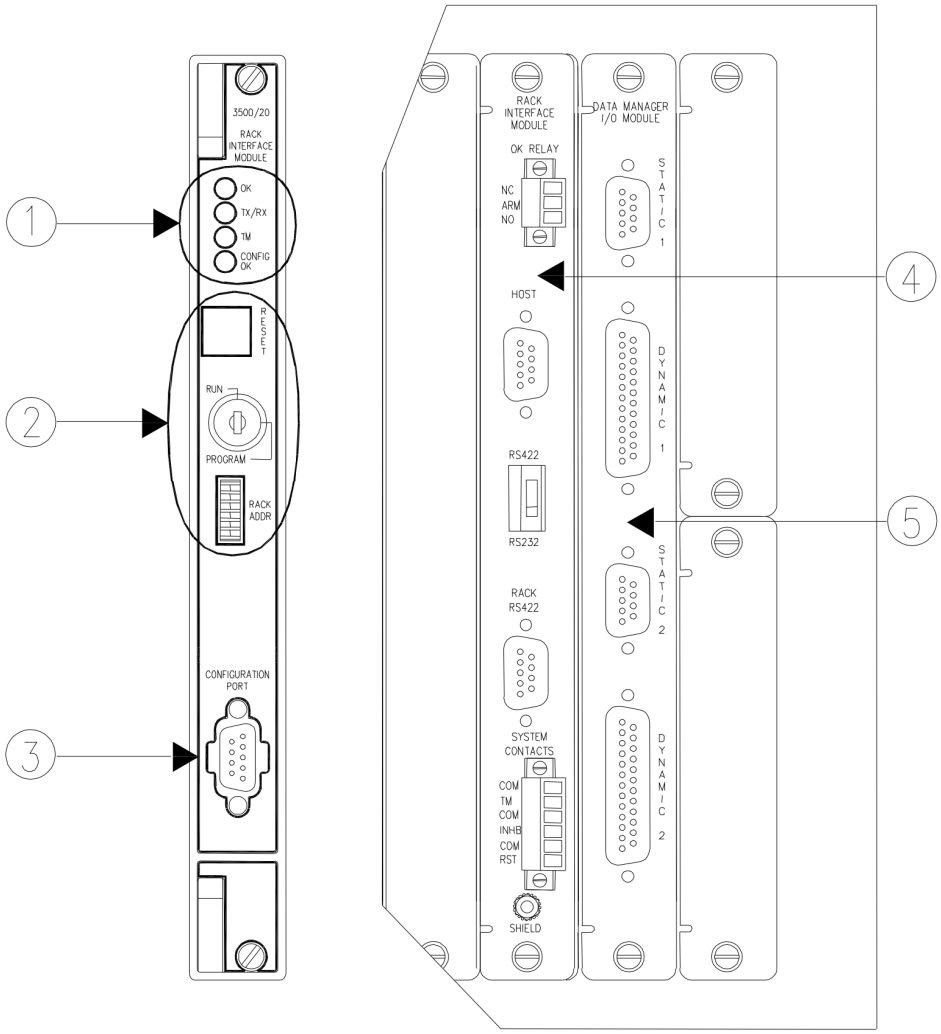
A: Cable Length	
0 0 1 0	10 feet (3 metres)
0 0 2 5	25 feet (7.5 metres)
0 0 5 0	50 feet (15 metres)
0 1 0 0	100 feet (30.5 metres)
0 2 5 0	250 feet (76 metres)
0 5 0 0	500 feet (152 metres)
B: Assembly Instructions	
0 1	Not Assembled
0 2	Assembled

500 Foot (152 metres) Extension Cable, RS422 (Used with Cables 130120, 131106, 130122 and 131107 for lengths greater than 500 feet (152 metres)).

130121 - AA-BB

A: Assembly Instructions	
0 1	Not Assembled
0 2	Assembled
B: Insulation	
0 1	PVC Insulated
0 2	Teflon Insulated

Graphs and Figures



1. LEDs: Indicate the operating status of the module
2. Hardware Switches:
3. Configuration Port: Configure or retrieve machinery data from only this rack using RS-232 protocol.
4. Rack Interface I/O Module: Daisy chain or configure racks using RS-232 and RS-422 protocol
5. Data Manager I/O Module: Connect two Bently Nevada Communication Processors to the 3500 rack.

Figure 1: Front and Rear View of the 3500/20 Rack Interface Module

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