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CAMBIA

Bently Nevada 133323-01 DATASHEET

CAMBIA AUTOMATION LIMITED

3500/92 Communication Gateway

Datasheet

Bently Nevada Machinery Condition Monitoring

Description

The 3500/92 Communication Gateway module provides extensive communication capabilities of all rack monitored values and statuses for integration with process control and other automation systems using both Ethernet TCP/IP and serial (RS232/RS422/RS485) communications capabilities. It also permits Ethernet communications with 3500 Rack Configuration Software and Data Acquisition Software.

Supported protocols include:

- Modicon Modbus protocol (via serial communications)
- Modbus/TCP protocol (a variant of serial Modbus used for TCP/IP Ethernet communications)
- Proprietary Bently Nevada protocol (for communication with 3500 Rack Configuration and Data Acquisition Software packages)

The Ethernet connection to the 3500/92 is an RJ45 connection for 10BASE-T star configuration Ethernet networks.

The 3500/92 supports the communication interfaces, communication protocols, and other features from the original 3500/90 with the exception of the primary value Modbus registers. The 3500/92 now has a Configurable Modbus Register Utility, which can provide the same functionality originally addressed by the primary value Modbus registers.

Specifications

Inputs

Power Consumption	5.0 watts typical with ModbusRS232/ RS422 I/O Module 5.6 watts typical with Modbus RS485 I/O Module
Data Types	Collects data from other modules in the rack, such as current measured values with time stamp, module statuses, and current alarm statuses, via a high speed internal network. Exact data types returned depend on module type and channel configuration. Update Time: The data collection rate depends on rack configuration but will not exceed 1 second for all modules in the 3500 rack.

Outputs

OK LED:	Indicates when the 3500/92 is operating properly.
TX/RX LED:	Indicates when the 3500/92 is communicating with other modules in the 3500 rack.

Protocols

BNC Host Protocol	Communication with 3500 Configuration Software and 3500 Data Acquisition and Display Software over Ethernet TCP/IP.
Modbus	Based on AEG Modicon PI-MBUS-300 Reference Manual. Uses Remote Terminal Unit (RTU) transmission mode.
Ethernet	
Communication Link	Ethernet, 10Mbps, and conforms to IEEE802.3
Protocol	Ethernet TCP/IP frame and Modbus/TCP
Connection	RJ-45 (telephone jack style) for 10BASE-T Ethernet cabling

Environmental Limits

Main and I/O Module	
Operating Temperature:	-30 °C to +65 °C (-22 °F to +149 °F)
Storage Temperature:	-40 °C to +85 °C (-40 °F to +185 °F)
Humidity:	95%, non-condensing

Physical

Main Board	
Dimensions (Height x Width x Depth):	241 mm x 24.4 mm x 242 mm (9.50 in x 0.96 in x 9.52 in)
Weight:	0.82 kg (1.8 lb.)
I/O Modules	
Dimensions (Height x Width x Depth):	241 mm x 24.4 mm x 99.1 mm (9.50 in x 0.96 in x 3.90 in)
Weight	0.44 kg (0.96 lb.)

Rack Space Requirements

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

Compliance and Certifications

FCC

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

EMC

European Community Directive:

EMC Directive 2014/30/EU

Standards:

EN 61000-6-2 Immunity for Industrial Environments

EN 61000-6-4 Emissions for Industrial Environments

Electrical Safety

European Community Directive:

LV Directive 2014/35/EU

Standards:

EN 61010-1

RoHS

European Community Directive:

RoHS Directive 2011/65/EU

Maritime

ABS - Marine and Offshore Applications

DNV GL Rules for Classification – Ships, Offshore Units, and High Speed and Light Craft

Hazardous Area Approvals

For the detailed listing of country and product specific approvals, refer to the *Approvals Quick Reference Guide* (108M1756) available from **www.Bently.com**.

CSA/NRTL/C

Class I, Zone 2: AEx/Ex nA nC ic IIC T4 Gc;
Class I, Zone 2: AEx/Ex ec nC ic IIC T4 Gc;
Class I, Division 2, Groups A, B, C, and D;

T4 @ Ta= -20˚C to +65˚C (-4˚F to +149˚F)
When installed per drawing 149243 or 149244.

ATEX/IECEx

Ex II 3 G
Ex nA nC ic IIC T4 Gc
Ex ec nC ic IIC T4/T5 Gc

T4 @ Ta= -20˚C to +65˚C (-4˚F to +149˚F)
When installed per drawing 149243 or 149244.

Ordering Information

For the detailed listing of country and product specific approvals, refer to the *Approvals Quick Reference Guide* (108M1756) available from **www.Bently.com**.

The 3500/92 Communication Gateway

3500/92-AA-BB-CC

A: I/O Module Type	
01	ModbusRS232/RS422 I/O Module
02	ModbusRS485 I/O Module
03	Ethernet/RS232 Modbus I/O Module
04	Ethernet/RS485 Modbus I/O Module
B: Memory Type	
01	Low Memory
C: Agency Approval Option	
00	None
01	CSA/NRTL/C
02	CSA/ATEX/IECEx

Additional Options

Firmware	
126M4118-01	Firmware Upgrade Kit Older Communication Gateway modules will require a Firmware Upgrade to communication with a new I/O Module. See 3500/92 manual for detailed information.

Spares

04425545	Grounding Wrist Strap (single use)
137495-01	Firmware IC (Odd bank)
137494-01	Firmware IC (Even bank)
136180-01	3500/92 Communication Gateway Module.
125736-01	ModbusRS232/RS422 I/O Module.
133323-01	ModbusRS485 I/O Module.
136188-01	Ethernet/RS232 ModbusI/O Module[1]
136188-02	Ethernet/RS485 ModbusI/O Module[1]
Bently_Manuals	International Technical Documentation DVD

[1] These spares include the Firmware Upgrade Kit (126M4118-01).

Accessories

139036-01	9-pin D-SUB "Y"
Serial Converters	
02230411	RS232 to RS422 Converter - 110 Vac.
02230412	RS232 to RS422 Converter - 220 Vac.
Ethernet Hubs	
142808-00	16-port unmanaged 10BASE-T hub w/ no backbone connection
142808-01	16-port unmanaged 10BASE-T hub w/ 10BASE-2 (Thinnet) backbone
142808-02	16-port unmanaged 10BASE-T hub w/ Fiber-optic ST connection backbone
142808-03	16-port unmanaged 10BASE-T hub w/ 15-pin AUI backbone
142809-00	6-port unmanaged 10BASE-FL hub w/ no backbone connection
142809-01	6-port unmanaged 10BASE-FL hub w/ 10BASE-2 (Thinnet) backbone
Ethernet Transceivers	
02200260	15-Pin AUI male to Fiber Optic Cable (10BASE-FL) with ST connection
02200261	15-Pin AUI male to Thinnet (10BASE2)
Ethernet Cabling - Standard 10 BASE-T Shielded Category 5 Cable with RJ-45 connectors	
02175190	6 ft. Length
02175191	10 ft. Length
02175192	25 ft. Length

Standard 10BASE-T Shielded Category 5 Cable with RJ-45 connectors

138131-AAA

A: Length (in ft.) up to 320 ft in length.	
0 0 6	6 feet (1.8 meters)
0 1 0	10 feet (3 meters)
0 2 5	25 feet (7.3 meters)
0 4 0	40 feet (12 meters)
0 5 0	50 feet (15 meters)
0 7 5	75 feet (22.5 meters)
0 8 5	85 feet (25.5 meters)
1 0 0	100 feet (30.5 meters)
1 2 0	120 feet (36.6 meters)

1 5 0	150 feet (44.8 meters)
2 0 0	200 feet (61 meters)
2 5 0	250 feet (75 meters)
3 2 0	320 feet (98 meters)
For specific cable lengths,please order through Bently Nevada Custom Products.	
30 ft. - 100 ft. in 5ft. increments only	
100ft. - 320 ft. in 10ft. increments only	

Serial Cabling (RS232): RS232 Cable, Host to 3500/92

130419-AAAA-BB

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

RS232 Cable, Honeywell PLCG to 3500/92

130420 - AAAA-BB

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

130119-01 RS232 Cable, Host Computer to RS232/RS422 Converter

Serial Cabling (RS422/RS485):

RS422 Cables can be used for rack-to-rack connections when using ModbusRS485 I/O Modules. The final rack-to-host connection is application specific and may require a custom cable.

RS422 PVC Insulated Cable, RS232/RS422 Converter to 3500/92

130530 - AAAA-BB

A: Cable Length	
0 0 1 0	10 feet (3 meters)
0 0 2 5	25 feet (7.5 meters)
0 0 5 0	50 feet (15 meters)
0 1 0 0	100 feet (30.5 meters)
0 2 5 0	250 feet (75 meters)
0 5 0 0	500 feet (150 meters)
B: Assembly Instructions	
0 1	Not Assembled
0 2	Assembled

RS422 PVC Insulated Cable, 3500/92 to 3500/92

129665-AAAA-BB

A: Cable Length	
0 0 1 0	10 feet (3 meters)
0 0 2 5	25 feet (7.5 meters)
0 0 5 0	50 feet (15 meters)
0 1 0 0	100 feet (30.5 meters)
0 2 5 0	250 feet (75 meters)
0 5 0 0	500 feet (150 meters)
B: Assembly Instructions	
0 1	Not Assembled
0 2	Assembled

RS422 Teflon Insulated Cable, RS232/RS422 Converter to 3500/92

131109 - AAAA-BB

A: Cable Length	
0 0 1 0	10 feet (3 meters)
0 0 2 5	25 feet (7.5 meters)
0 0 5 0	50 feet (15 meters)
0 1 0 0	100 feet (30.5 meters)
0 2 5 0	250 feet (75 meters)
0 5 0 0	500 feet (150 meters)
B: Assembly Instructions	
0 1	Not Assembled
0 2	Assembled

131108 - AAAA-BB

A: Cable Length	
0 0 1 0	10 feet (3 meters)
0 0 2 5	25 feet (7.5 meters)
0 0 5 0	50 feet (15 meters)
0 1 0 0	100 feet (30.5 meters)
0 2 5 0	250 feet (75 meters)
0 5 0 0	500 feet (150 meters)
B: Assembly Instructions	
0 1	Not Assembled
0 2	Assembled

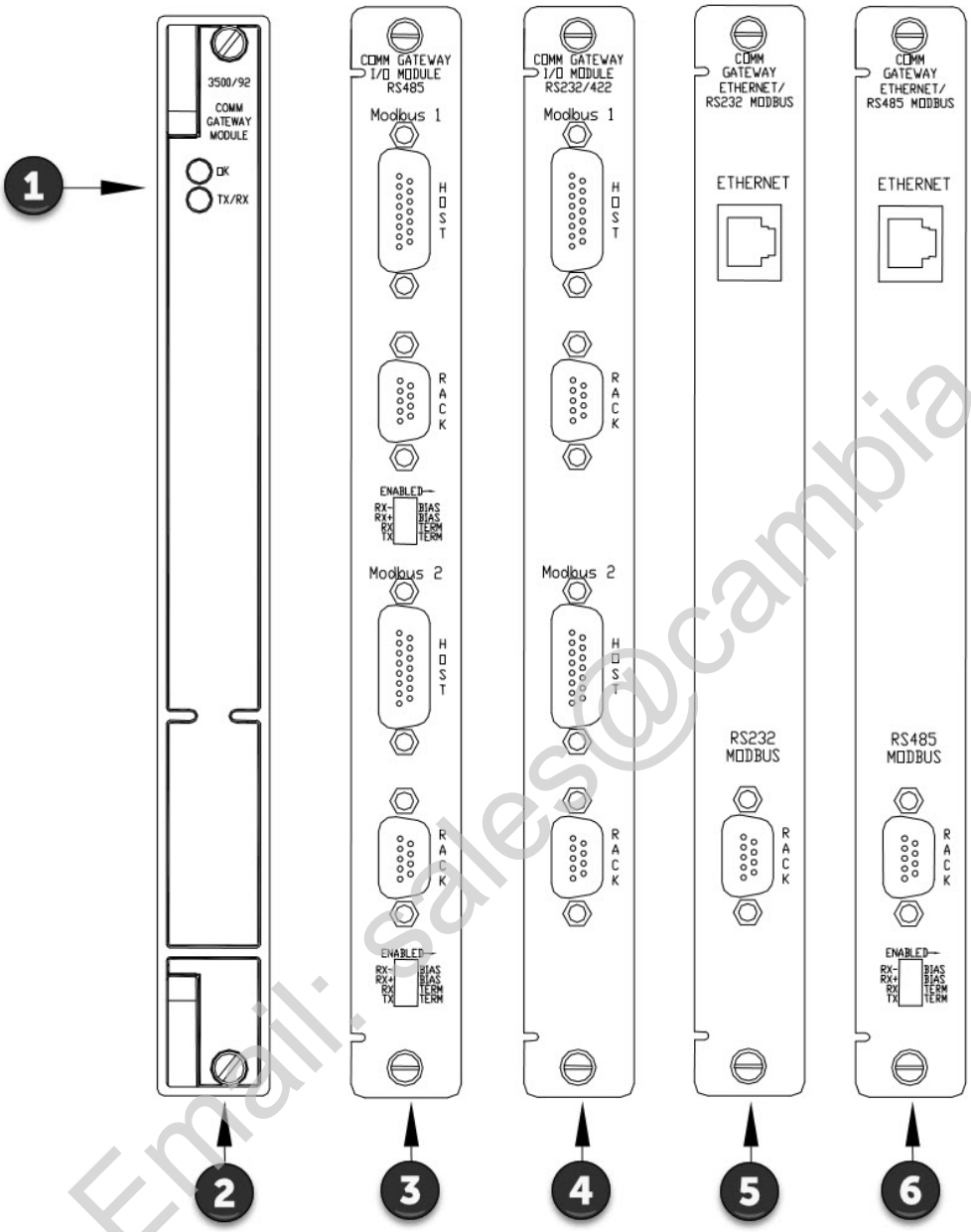
RS422/RS485 Extension Cable

130531 - AA - BB

Used with Cables 130530, 129665, 131109, and 131108 for lengths greater than 500 feet (152 meters).	
Standard length is 500 feet (152 meters).	
A: Assembly Instructions	
0 1	Not Assembled
0 2	Assembled
B: Insulation	
0 1	PVC Insulated
0 2	Teflon® Insulated

The total RS485 cable run can be up to 4000 feet (1220 meters). The total RS422 cable run can be up to 4000 feet (1220 meters) between each rack

Graphs and Figures



1. Status LEDs
2. Comm Gateway Module
3. RS485 I/O Module
4. RS232/422 I/O Module
5. Ethernet/RS232 I/O Module
6. Ethernet/RS485 I/O Module

Figure 1: Front and Rear Views of the 3500/92 Communication Gateway