

# 3500/92 Communication Gateway

## Datasheet

### Bently Nevada Machinery Condition Monitoring

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#### 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](http://www.Bently.com).

### CSA/NRTL/C

Class I, Zone 2: AEx/Ex nA nC ic IIC T4 Gc;

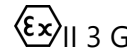
Class I, Zone 2: AEx/Ex ec nC ic IIC T4 Gc;

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



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](http://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 <sub>1</sub>
136188-02	Ethernet/RS485 ModbusI/O Module <sub>1</sub>
Bently_Manuals	International Technical Documentation DVD

<sub>1</sub> These spares include the Firmware Upgrade Kit

(126M4118-01).

## Accessories

139036-01	9-pin D-SUB "Y"
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### 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)

<b>1 5 0</b>	150 feet (44.8 meters)
<b>2 0 0</b>	200 feet (61 meters)
<b>2 5 0</b>	250 feet (75 meters)
<b>3 2 0</b>	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

<b>0 0 1 0</b>	10 feet (3 meters)
<b>0 0 2 5</b>	25 feet (7.5 meters)
<b>0 0 5 0</b>	50 feet (15 meters)
<b>0 1 0 0</b>	100 feet (30.5 meters)

##### B: Assembly Instructions

<b>0 1</b>	Not Assembled
<b>0 2</b>	Assembled

### RS232 Cable, Honeywell PLCG to 3500/92

#### 130420 - AAAA-BB

##### A: Cable Length

<b>0 0 1 0</b>	10 feet (3 meters)
<b>0 0 2 5</b>	25 feet (7.5 meters)
<b>0 0 5 0</b>	50 feet (15 meters)
<b>0 1 0 0</b>	100 feet (30.5 meters)

##### B: Assembly Instructions

<b>0 1</b>	Not Assembled
<b>0 2</b>	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

<b>0 0 1 0</b>	10 feet (3 meters)
<b>0 0 2 5</b>	25 feet (7.5 meters)
<b>0 0 5 0</b>	50 feet (15 meters)
<b>0 1 0 0</b>	100 feet (30.5 meters)
<b>0 2 5 0</b>	250 feet (75 meters)
<b>0 5 0 0</b>	500 feet (150 meters)

##### B: Assembly Instructions

<b>0 1</b>	Not Assembled
<b>0 2</b>	Assembled

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

#### 129665-AAAA-BB

##### A: Cable Length

<b>0 0 1 0</b>	10 feet (3 meters)
<b>0 0 2 5</b>	25 feet (7.5 meters)
<b>0 0 5 0</b>	50 feet (15 meters)
<b>0 1 0 0</b>	100 feet (30.5 meters)
<b>0 2 5 0</b>	250 feet (75 meters)
<b>0 5 0 0</b>	500 feet (150 meters)

##### B: Assembly Instructions

<b>0 1</b>	Not Assembled
<b>0 2</b>	Assembled

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

### 131109 - AAAA-BB

<b>A: Cable Length</b>	
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>B: Assembly Instructions</b>	
0 1	Not Assembled
0 2	Assembled

### 131108 - AAAA-BB

<b>A: Cable Length</b>	
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>B: Assembly Instructions</b>	
0 1	Not Assembled
0 2	Assembled


## RS422/RS485 Extension Cable

### 130531 - AA - BB

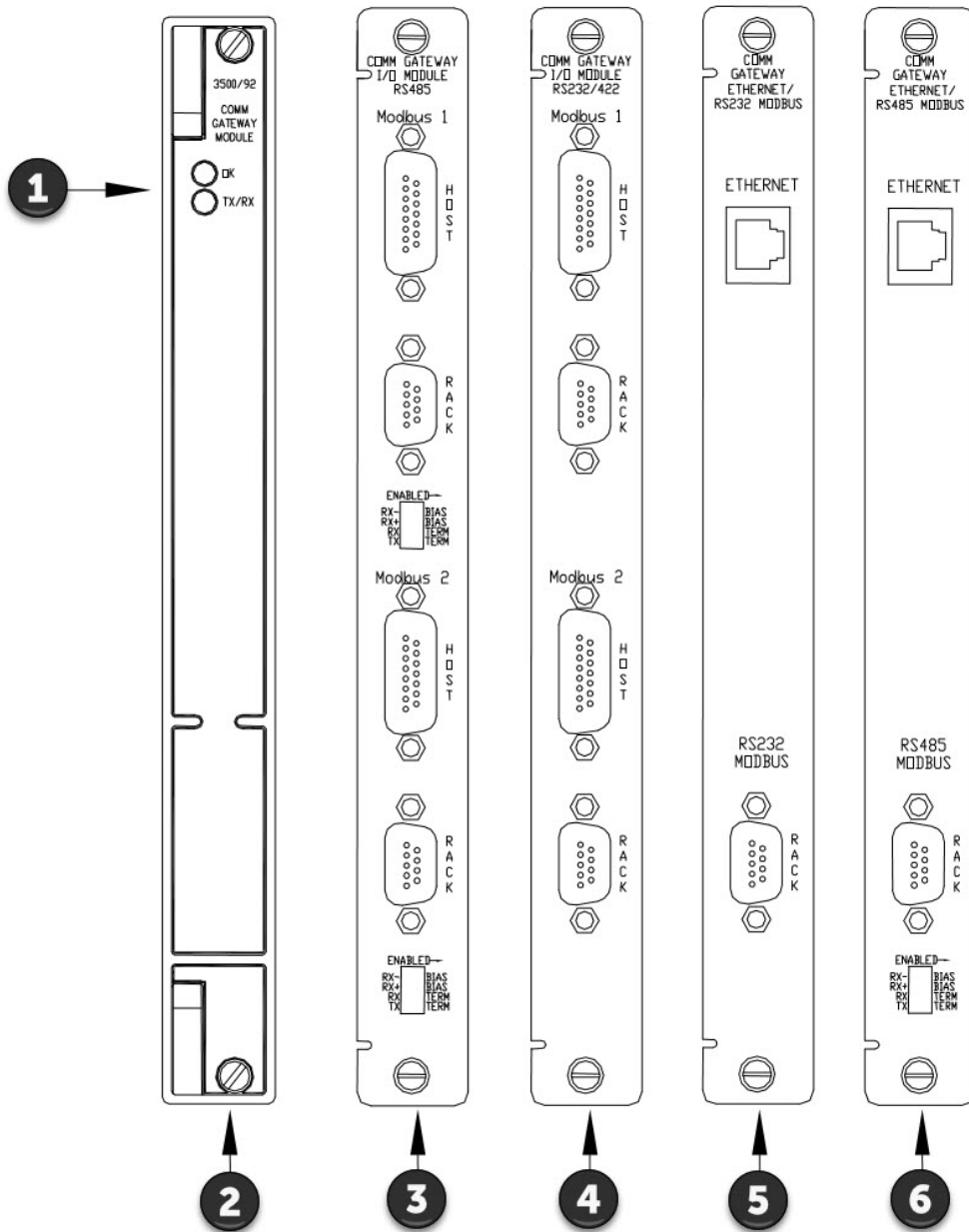
Used with Cables 130530, 129665, 131109, and 131108 for lengths greater than 500 feet (152 meters).

Standard length is 500 feet (152 meters).

<b>A: Assembly Instructions</b>	
0 1	Not Assembled
0 2	Assembled
<b>B: Insulation</b>	
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**

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1631 Bently Parkway South, Minden, Nevada USA 89423

Phone: 1.775.782.3611 [Bently.com](http://Bently.com)

