

# 3500/92 Communication Gateway

## Datasheet

Cordant™

141542 Rev. N



## Description

The Bently Nevada™ 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	<p>5.0 Watts typical with ModbusRS232/ RS422 I/O Module</p> <p>5.6 Watts typical with Modbus RS485 I/O Module</p>
Data Types	<p>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.</p> <p>Exact data types returned depend on module type and channel configuration.</p> <p>Update Time: The data collection rate depends on rack configuration but will not exceed 1 second for all modules in the 3500 rack.</p>

### 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.
<b>Ethernet</b>	
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

<b>Main and I/O Module</b>	
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

DNV GL rules for classification – Ships, offshore units, and high speed and light craft

ABS Rules for Condition of Classification, Part 1

- Steel Vessels Rules
- Offshore Units and Structures

## Hazardous Area Approvals



For the detailed listing of country and product-specific approvals, refer to the [Approvals Quick Reference Guide \(108M1756\)](#).

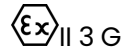
For additional technical documentation, please log in to [bntechsupport.com](http://bntechsupport.com) and access the Bently Nevada Media Library.

### cNRTLus

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 nA nC ic IIC T4 Gc  
Ex ec nC ic IIC T4 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 \(108M1756\)](#).

For additional technical documentation, please log in to [bntechsupport.com](http://bntechsupport.com) and access the Bently Nevada Media Library.

## 3500/92 Communication Gateway 3500/92-AA-BB-CC

### A: I/O Module Type

<b>01</b>	ModbusRS232/RS422 I/O Module
<b>02</b>	ModbusRS485 I/O Module
<b>03</b>	Ethernet/RS232 Modbus I/O Module
<b>04</b>	Ethernet/RS485 Modbus I/O Module

### B: Memory Type


<b>01</b>	Low Memory
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### C: Agency Approval Option

<b>00</b>	None
<b>01</b>	CSA/NRTL/C
<b>02</b>	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.

## Cables

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

#### 138131-AAA

#### A: Length (in ft.) up to 320 ft in length.

<b>0 0 6</b>	6 feet (1.8 meters)
<b>0 1 0</b>	10 feet (3 meters)
<b>0 2 5</b>	25 feet (7.3 meters)
<b>0 4 0</b>	40 feet (12 meters)
<b>0 5 0</b>	50 feet (15 meters)
<b>0 7 5</b>	75 feet (22.5 meters)
<b>0 8 5</b>	85 feet (25.5 meters)
<b>1 0 0</b>	100 feet (30.5 meters)
<b>1 2 0</b>	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. is ordered in 5ft. increments only. 100 ft. - 320 ft. is ordered 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>0010</b>	10 feet (3 meters)
<b>0025</b>	25 feet (7.5 meters)
<b>0050</b>	50 feet (15 meters)
<b>0100</b>	100 feet (30.5 meters)

##### B: Assembly Instructions

<b>01</b>	Not Assembled
<b>02</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>0010</b>	10 feet (3 meters)
<b>0025</b>	25 feet (7.5 meters)
<b>0050</b>	50 feet (15 meters)
<b>0100</b>	100 feet (30.5 meters)
<b>0250</b>	250 feet (75 meters)
<b>0500</b>	500 feet (150 meters)

##### B: Assembly Instructions

<b>01</b>	Not Assembled
<b>02</b>	Assembled

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

#### 129665-AAAA-BB

##### A: Cable Length

<b>0010</b>	10 feet (3 meters)
<b>0025</b>	25 feet (7.5 meters)

<b>0050</b>	50 feet (15 meters)
<b>0100</b>	100 feet (30.5 meters)
<b>0250</b>	250 feet (75 meters)
<b>0500</b>	500 feet (150 meters)

**B: Assembly Instructions**

<b>01</b>	Not Assembled
<b>02</b>	Assembled

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

**131109-AAAA-BB**

**A: Cable Length**

<b>0010</b>	10 feet (3 meters)
<b>0025</b>	25 feet (7.5 meters)
<b>0050</b>	50 feet (15 meters)
<b>0100</b>	100 feet (30.5 meters)
<b>0250</b>	250 feet (75 meters)
<b>0500</b>	500 feet (150 meters)

**B: Assembly Instructions**

<b>01</b>	Not Assembled
<b>02</b>	Assembled

**131108-AAAA-BB**

**A: Cable Length**

<b>0010</b>	10 feet (3 meters)
<b>0025</b>	25 feet (7.5 meters)
<b>0050</b>	50 feet (15 meters)
<b>0100</b>	100 feet (30.5 meters)
<b>0250</b>	250 feet (75 meters)

<b>0500</b>	500 feet (150 meters)
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**B: Assembly Instructions**

<b>01</b>	Not Assembled
<b>02</b>	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**

<b>01</b>	Not Assembled
<b>02</b>	Assembled

**B: Insulation**

<b>01</b>	PVC Insulated
<b>02</b>	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.

## Spares

Part Number	Description
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	Modbus RS232/RS422 I/O Module.
133323-01	Modbus RS485 I/O Module.
136188-01	Ethernet/RS232 Modbus I/O Module*
136188-02	Ethernet/RS485 Modbus I/O Module*
Bently_ Manuals	International Technical Documentation DVD



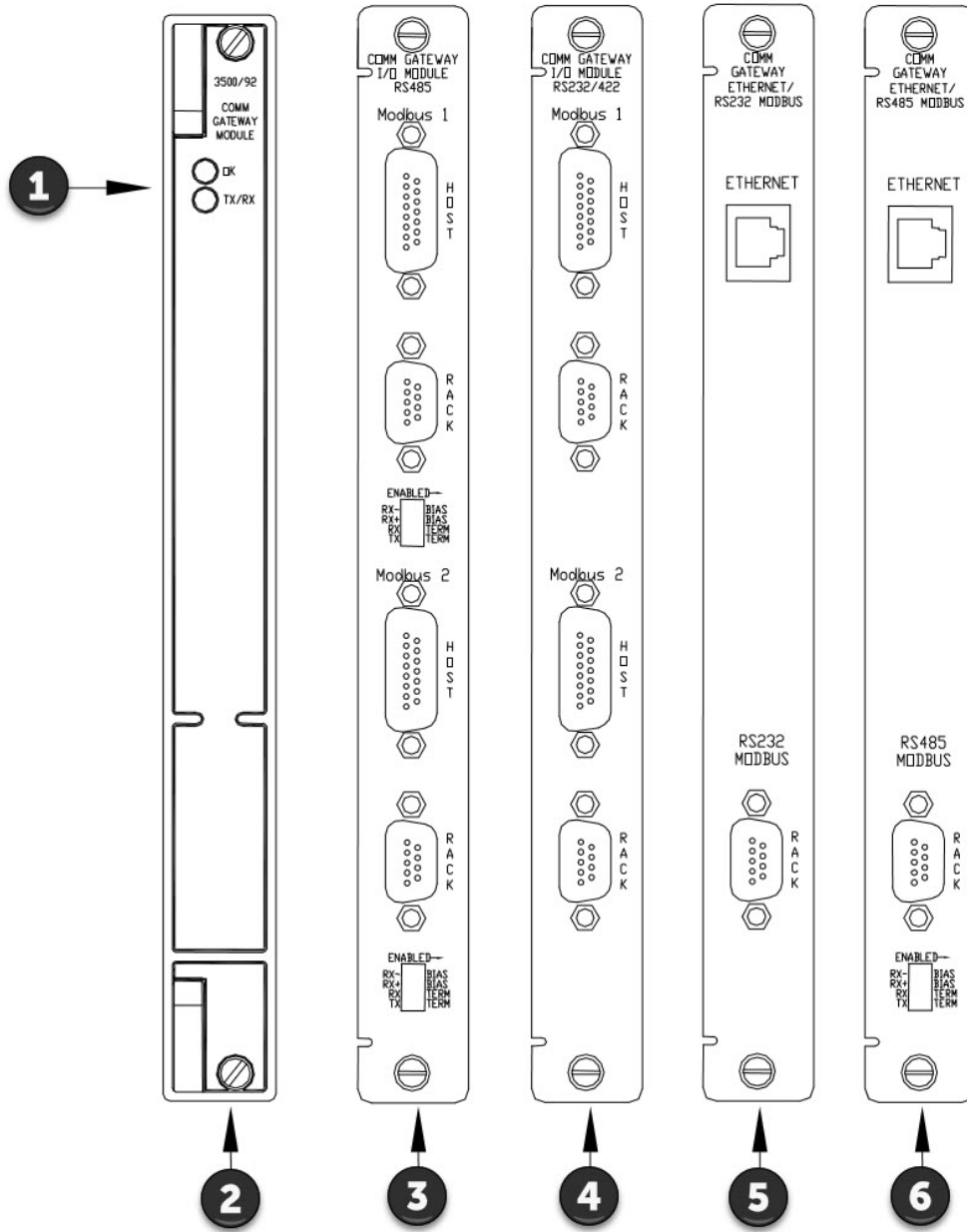
\* These spares include the Firmware Upgrade Kit (126M4118-01).

## Accessories

Part Number	Description
139036-01	9-pin D-SUB "Y"
<b>Serial Converters</b>	
02230411	RS232 to RS422 Converter - 110 Vac.
02230412	RS232 to RS422 Converter - 220 Vac.
<b>Ethernet Hubs</b>	
165M2516	24-port 100/1000 SFP BE based switch

Part Number	Description
<b>Ethernet Transceivers</b>	
02200260	15-Pin AUI male to Fiber Optic Cable (10BASE-FL) with ST connection
02200261	15-Pin AUI male to Thinnet (10BASE2)
<b>Ethernet Cabling - Standard 10 BASE-T Shielded , Category 5 Cable with RJ-45 Connectors</b>	
02175190	6 ft. length
02175191	10 ft. length
02175192	25 ft. length

## 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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Bently Nevada, a Baker Hughes Company  
1631 Bently Parkway South, Minden, Nevada USA 89423  
<https://bntechsupport.com>