

Cambia

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2018

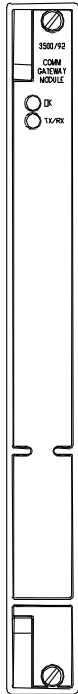
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Bently Nevada  
3500/92 125736-01

Datasheet

# 3500/92 Communication Gateway

Bently Nevada\* Asset 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.



imagination at work

Specifications and Ordering Information  
Part Number 141542-01  
Rev. G (06/13)

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## 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 proportional 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.

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### Outputs

#### Front Panel LEDs

##### 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.

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### 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. Modbus is a registered trademark of Modicon, Inc.

#### 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.

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### Environmental Limits

#### Main Module

##### Operating Temperature:

-30 °C to +65 °C  
(-22 °F to +150 °F).

##### Storage Temperature:

-40 °C to +85 °C  
(-40 °F to +185 °F).

##### Humidity:

95%, non-condensing.

#### I/O Module

##### Operating Temperature:

0 °C to +65 °C  
(+32 °F to +150 °F).

##### Storage Temperature:

-40 °C to +85 °C  
(-40 °F to +185 °F).

**Humidity:**

95%, noncondensing.

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**CE Mark Directives**

**EMC Directives:**

**Certificate of  
Conformity:  
134036**

**EN50081-2:**

Radiated Emissions  
EN 55011, Class A  
Conducted Emissions  
EN 55011, Class A

**EN50082-2:**

Electrostatic Discharge  
EN 61000-4-2, Criteria B  
Radiated Susceptibility  
ENV 50140, Criteria A  
Conducted Susceptibility  
ENV 50141, Criteria A  
Electrical Fast Transient  
EN 61000-4-4, Criteria B  
Surge Capability  
EN 61000-4-5, Criteria B  
Magnetic Field  
EN 61000-4-8, Criteria A  
Power Supply Dip  
EN 61000-4-11, Criteria B  
Radio Telephone  
ENV 50204, Criteria B

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**Low Voltage Directives:**

**Certificate of  
Conformity:  
136669**

**EN 61010-1**

Safety Requirements

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**Hazardous Area Approvals**

**North American**

**Approval Option (01)**

When used with I/O module ordering  
options with internal barriers:

Ex nC [ia] IIC: Class I, Div 1

AEx nC [ia] IIC: Class 1, Zone 2/0

Groups A, B, C, D

T4 @ Ta = -20 °C to +65 °C

(-4 °F to +150 °F)

per drawing 138547

When used with I/O module ordering  
options without internal barriers:

Ex nC [L] IIC: Class I, Div 2

AEx nC IIC: Class 1, Div 2

Groups A, B, C, D

T4 @ Ta = -20 °C to +65 °C

(-4 °F to +150 °F)


per drawing 149243

## ATEX:

### Approval Option (02)

#### For Selected Ordering Options with ATEX/CSA agency approvals:

For ATEX agency approval ordering options with internal barriers:


 II 3/(1) G

Ex nC[ia Ga] IIC T4 Gc

T4 @ Ta = -20°C to +65°C

(-4°F to +150°F)

For ATEX agency approval ordering options without internal barriers:

 II 3/(3) G

Ex nC[nL Gc] IIC T4 Gc

T4 @ Ta = -20°C to +65°C

(-4°F to +150°F)

For further certification and approvals information please visit the following website:

[www.ge-mcs.com/bently](http://www.ge-mcs.com/bently)

## 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.

## Ordering Information The 3500/92 Communication Gateway

### 3500/92-AXX-BXX-CXX

#### 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

## Spares

### 138629-01

3500/92 Manual

### 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 Modbus/I/O Module

136188-02  
Ethernet/RS485 Modbus/O  
Module

**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-AXXX

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

- 006 6 feet (1.8 meters)
- 010 10 feet (3 meters)
- 025 25 feet (7.3 meters)
- 040 40 feet (12 meters)
- 050 50 feet (15 meters)
- 075 75 feet (22.5 meters)
- 085 85 feet (25.5 meters)
- 100 100 feet (30.5 meters)
- 120 120 feet (36.6 meters)
- 150 150 feet (44.8 meters)
- 200 200 feet (61 meters)
- 250 250 feet (75 meters)
- 320 320 feet (98 meters)

**Note:** Standard lengths for 10BASE-T  
cabling are shown above. Specific lengths  
can be ordered through Custom Products  
and are available as shown below.

30 ft. - 100 ft. in 5ft. increments  
only

100ft. - 320 ft. in 10ft. increments  
only

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**Fiber-optic cable (10BASE-FL)****137451-AXXXX****A:** Length (in ft.) up to 6500 ft (2000 m) in length10 ft - 500 ft. in 10 ft  
increments only500 ft. - 6500 ft. in 100 ft  
increments only

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**Serial Cabling (RS232): RS232 Cable, Host to 3500/92****130419-AXXXX-BXX****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

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**RS232 Cable, Honeywell PLCG to 3500/92****130420 - AXXXX-BXX**

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**Option Descriptions****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

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**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.

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**RS422 PVC Insulated Cable, RS232/RS422 Converter to 3500/92****130530 - AXXXX-BXX****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-AXXXX-BXX****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

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**RS422 Teflon Insulated Cable, RS232/RS422 Converter to 3500/92****131109 - AXXXX-BXX**

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**Option Descriptions****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 - AXXXX-BXX****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

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**RS422/RS485 Extension Cable****130531 - AXX - BXX**

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

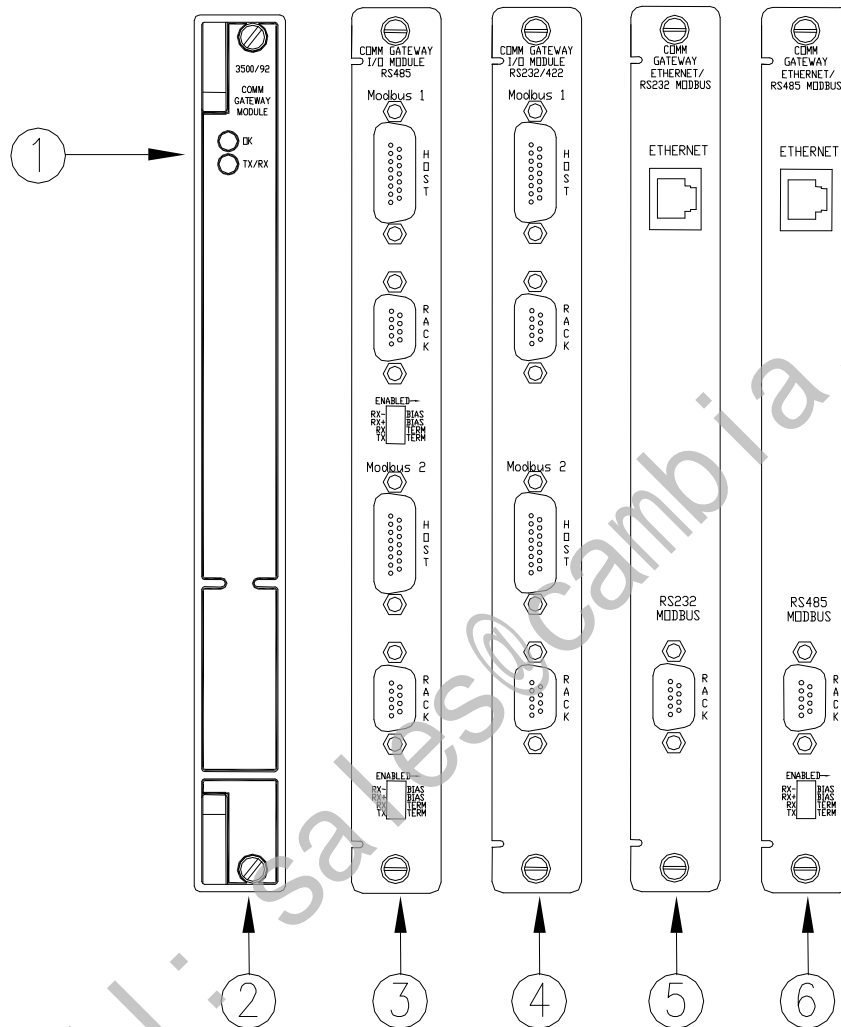
**B: Insulation**

<b>01</b>	PVC Insulated
<b>02</b>	Teflon® Insulated

**Note:** 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 Communication Gateway

\* Denotes a trademark of Bently Nevada, Inc., a wholly owned subsidiary of General Electric Company.  
Modbus is a trademark of Modbus-IDA.  
Modicon is a trademark of Schneider Electric.  
Teflon is a registered trademark of DuPont.

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