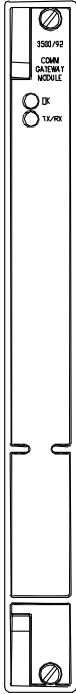


3500/92 Communication Gateway

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. F (03/11)

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.

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.

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.

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.

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

Low Voltage Directives:

**Certificate of
Conformity:
136669**

EN 61010-1

Safety Requirements

Hazardous Area Approvals

North American

Approval Option (01)

Class 1, Div 2
Groups A, B, C, D
T4 @ Ta = -20 °C to +65 °C
(-4 °F to +150 °F)

North American


Approval Option (02)

A/Ex nC[L] IIC
Class 1, Zone 2
Class 1, Div 2, Groups A, B, C, D
T4 @ Ta -20 °C to +65 °C
(-4 °F to +150 °F)

ATEX:

Approval Option (02)

**For Selected Ordering Options
with ATEX/North American
agency approvals:**

 II 3/(3) G

Ex nC[L] IIC
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

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/O
Module
- 04** Ethernet/RS485 Modbus/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/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

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

142809-01

6-port unmanaged 10BASE-FL hub w/ 10BASE-2 (Thinnet) backbone

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

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

Ethernet Transceivers

02200260

15-Pin AUI male to Fiber Optic Cable (10BASE-FL) with ST connection

10 ft - 500 ft. in 10 ft increments only

02200261

15-Pin AUI male to Thinnet (10BASE2)

500 ft. - 6500 ft. in 100 ft increments only

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)

Fiber-optic cable (10BASE-FL)

137451-AXXXX

A: Length (in ft.) up to 6500 ft (2000 m) in length

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

130419-AXXXX-BXX

A: Cable Length

- 0010 10 feet (3 meters)
- 0025 25 feet (7.5 meters)
- 0050 50 feet (15 meters)
- 0100 100 feet (30.5 meters)

B: Assembly Instructions

- 01 Not Assembled
- 02 Assembled

RS232 Cable, Honeywell PLCG to 3500/92

130420 - AXXXX-BXX

Option Descriptions

A: Cable Length

- 0010 10 feet (3 meters)
- 0025 25 feet (7.5 meters)
- 0050 50 feet (15 meters)
- 0100 100 feet (30.5 meters)

B: Assembly Instructions

- 01 Not Assembled
- 02 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 - AXXXX-BXX****A: Cable Length**

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

B: Assembly Instructions

01	Not Assembled
02	Assembled

RS422 PVC Insulated Cable, 3500/92 to 3500/92**129665-AXXXX-BXX****A: Cable Length**

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

B: Assembly Instructions

01	Not Assembled
02	Assembled

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

Option Descriptions**A: Cable Length**

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

B: Assembly Instructions

01	Not Assembled
02	Assembled

131108 - AXXXX-BXX**A: Cable Length**

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

B: Assembly Instructions

01	Not Assembled
02	Assembled

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

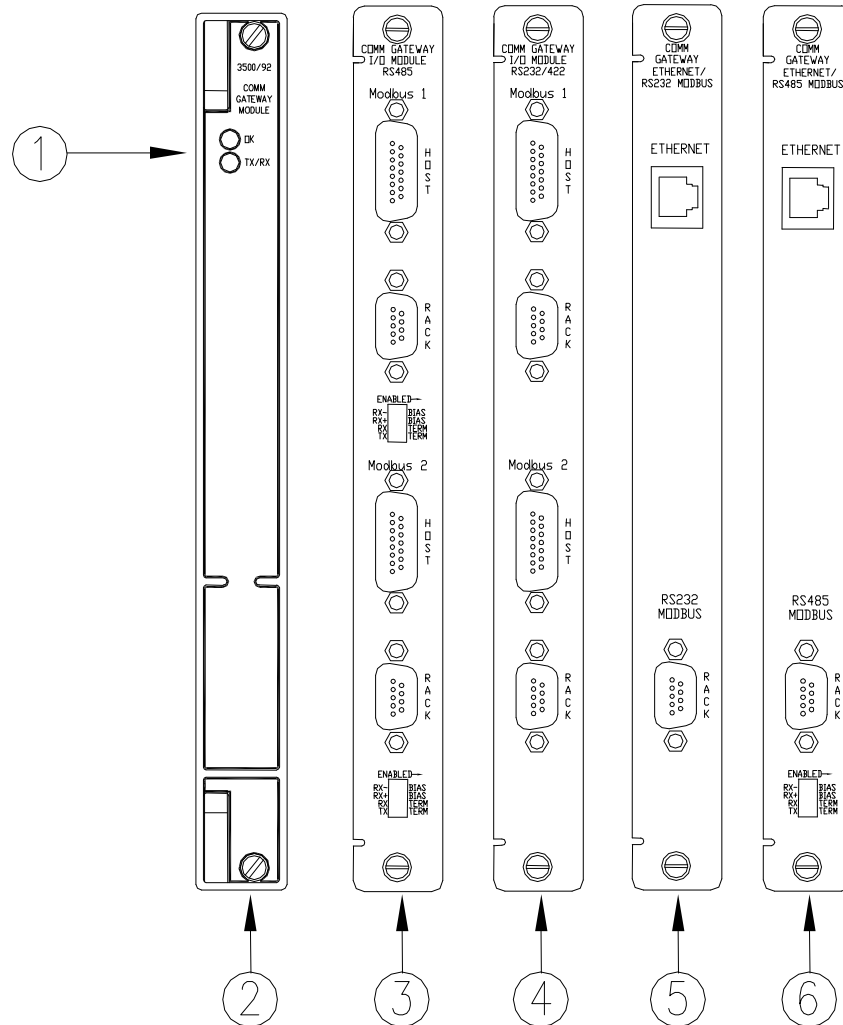
01	Not Assembled
02	Assembled

B: Insulation

01	PVC Insulated
02	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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