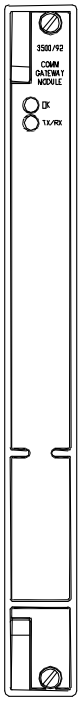
3500/92 Communication Gateway

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

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)

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

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

- **0 1** ModbusRS232/RS422 I/O Module
- **0 2** ModbusRS485 I/O Module
- **0 3** Ethernet/RS232 ModbusI/O Module
- **0 4** Ethernet/RS485 ModbusI/O Module

B: Memory Type

- **0 1** Low Memory

C: Agency Approval Option

- **0 0** None
- **0 1** CSA/NRTL/C
- **0 2** 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 ModbusI/O Module

136188-02

Ethernet/RS485 ModbusI/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.

- **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)

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

Fiber-optic cable (10BASE-FL)

137451-AXXXX

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

10 ft - 500 ft. in 10 ft increments only

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

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

RS232 Cable, Honeywell PLCG to 3500/92

130420 - AXXXX-BXX

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

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

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-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)
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 - AXXXX-BXX

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)
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 - 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)
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 - 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

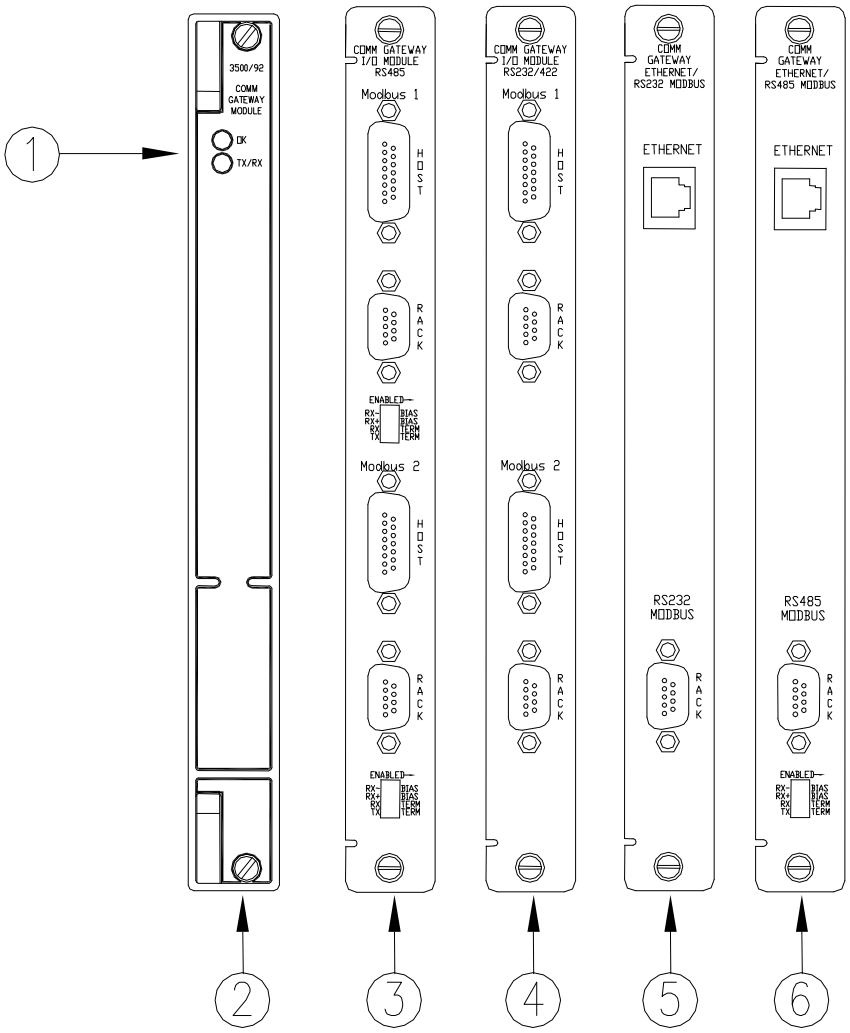
0 1	Not Assembled
0 2	Assembled

B: Insulation

0 1	PVC Insulated
0 2	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

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