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.
Specifications

Inputs

Power

Consumption

5.0 watts typical with
Modbus RS232/ 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

\textit{EN50081-2}:

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

\textit{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

\textit{EN 61010-1}

Safety Requirements

Hazardous Area Approvals
North American

\textit{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:

\[ \text{II } 3/(1) \text{ G} \]
Ex nC[io 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:

\[ \text{II } 3/(3) \text{ G} \]
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 Modbus/IO Module
0 4 Ethernet/RS485 Modbus/IO 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 Modbus/IO Module
<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Ethernet Transceivers</th>
<th>Ordering Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>136188-02</td>
<td>Ethernet/RS485 Modbus I/O Module</td>
<td></td>
<td></td>
</tr>
<tr>
<td>139036-01</td>
<td>9-pin D-SUB &quot;Y&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>02230411</td>
<td>RS232 to RS422 Converter 110 Vac.</td>
<td>15-Pin AUI male to Fiber Optic Cable (10BASE-FL) with ST connection</td>
<td></td>
</tr>
<tr>
<td>02230412</td>
<td>RS232 to RS422 Converter 220 Vac.</td>
<td>15-Pin AUI male to Thinnet (10BASE2)</td>
<td></td>
</tr>
<tr>
<td>142808-00</td>
<td>16-port unmanaged 10BASE-T hub w/ no backbone connection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>142808-01</td>
<td>16-port unmanaged 10BASE-T hub w/ 10BASE-2 (Thinnet) backbone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>142808-02</td>
<td>16-port unmanaged 10BASE-T hub w/ Fiber-optic, ST connection backbone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>142808-03</td>
<td>16-port unmanaged 10BASE-T hub w/ 15-pin AUI backbone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>142809-00</td>
<td>6-port unmanaged 10BASE-FL hub w/ no backbone connection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>142809-01</td>
<td>6-port unmanaged 10BASE-FL hub w/ 10BASE-2 (Thinnet) backbone</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Accessories**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Ethernet Transceivers</th>
<th>Ordering Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>02200260</td>
<td>15-Pin AUI male to Fiber Optic Cable (10BASE-FL) with ST connection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>02200261</td>
<td>15-Pin AUI male to Thinnet (10BASE2)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Serial Converters**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Ethernet Transceivers</th>
<th>Ordering Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>02175190</td>
<td>6 ft. Length</td>
<td></td>
<td></td>
</tr>
<tr>
<td>02175191</td>
<td>10 ft. Length</td>
<td></td>
<td></td>
</tr>
<tr>
<td>02175192</td>
<td>25 ft. Length</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Ethernet Hubs**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Ethernet Transceivers</th>
<th>Ordering Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: Length (in ft.) up to 320 ft in length.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 0 6</td>
<td>6 feet (1.8 meters)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 1 0</td>
<td>10 feet (3 meters)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 2 5</td>
<td>25 feet (7.3 meters)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 4 0</td>
<td>40 feet (12 meters)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 5 0</td>
<td>50 feet (15 meters)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 7 5</td>
<td>75 feet (22.5 meters)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 8 5</td>
<td>85 feet (25.5 meters)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 0 0</td>
<td>100 feet (30.5 meters)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 2 0</td>
<td>120 feet (36.6 meters)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 5 0</td>
<td>150 feet (44.8 meters)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 0 0</td>
<td>200 feet (61 meters)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 5 0</td>
<td>250 feet (75 meters)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 2 0</td>
<td>320 feet (98 meters)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

Specifications and Ordering Information
Part Number 141542-01
Rev. G (06/13)
Page 5 of 9
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

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