3500/23E Transient Data Interface

Bently Nevada* Asset Condition Monitoring

Description

The 3500/23E Transient Data Interface (TDI) is the interface between the 3500 ENCORE monitoring system and GE's System 1* condition monitoring and diagnostic software. The TDI combines the capability of a System Monitor with the data collection capability of a communication processor.

The TDI operates in the System Monitor slot of a 3500 ENCORE rack in conjunction with the vibration monitors (3500/42E) to continuously collect steady state and transient waveform data and pass this data through an Ethernet link to the host software. Static data capture is standard with the TDI, however using an optional Channel Enabling Disk will allow the TDI to capture dynamic or transient data as well. The TDI features improvements in several areas over previous communication processors and incorporates the Communication Processor function within the 3500 ENCORE rack.

The TDI module provides extensive communication capabilities of all rack monitored values and statuses for integration with process control and other automation systems using serial (RS232/RS422/RS485) communications capabilities.

Every 3500 ENCORE rack requires one TDI, which always occupies Slot 1 (next to the power supplies).

imagination at work

Specifications

Inputs

Power Consumption

TBD

Data

Front panel:

Ethernet:

2 Ports: 10Base-T or 100Base-TX Ethernet, autosensing

Rear I/O:

Serial Communication

115.2 kbaud maximum RS232 or RS422 serial communications

1200 baud minimum rate supported.

Ethernet

10Base-T Ethernet, autosensing

Outputs

Front Panel LEDs

Rack OK LED:

Indicates when the 3500 ENCORE System is operating properly

TDI OK LED:

Indicates when the 3500/23E is operating properly

TM LED:

Indicates when the 3500 ENCORE System is in Trip Multiply mode.

CONFIG OK LED:

Indicates that the 3500 ENCORE System has a valid configuration.

I/O Module OK Relay:

Relay to indicate when the 3500 ENCORE System is operating normally or when a fault has been detected within the rack. User can select either an "OPEN" or "CLOSED" contact to annunciate a NOT OK condition. This relay always operates as "Normally Energized".

OK Relay:

Specifications in 3300/12 or 3300/14 data sheet

Controls

Front Panel

Rack reset button:

Clears latched alarms and Timed OK Channel Defeat in the rack.

Performs same function as "Rack Reset" contact on I/O module.

Display Control switches:**

Used to control all of the displays of the monitors in the rack.

Home:

Used to return all of the monitor displays to their primary screen.

Page Up:

Moves all displays to their next screen.

Page Down:

Moves all displays to their previous screen.

**Note: The Display Control switches are provided to support a future enhancement to the 3500/23E.

View Set Points Tag Names:

Used to change the displays to show the setpoints and tag names for the channels being monitored.

Configuration Keylock:

Used to place 3500 ENCORE System in either "RUN" mode or

"PROGRAM" mode. RUN mode allows for normal operation of the rack and locks out configuration changes. PROGAM mode allows for normal operation of the rack and also allows for local or remote rack configuration. The key can be removed from the rack in either position, allowing the switch to remain in either the RUN or PROGRAM position. Locking the switch in the RUN position allows you to restrict unauthorized rack reconfiguration. Locking the switch in PROGRAM position allows remote reconfiguration of a rack at any time.

I/O Module System Contacts

Trip Multiply:

Description:

Used to place 3500 rack in Trip Multiply.

Maximum Current:

<1 mAdc, Dry Contact to Common

Alarm Inhibit:

Description:

Used to inhibit all alarms in the 3500 rack.

Maximum Current:

<1 mAdc, Dry Contact to Common

Rack Reset:

Description:

Used to clear latched alarms and Timed OK Channel Defeat.

Maximum Current:

<1 mAdc, Dry Contact to Common

Data Collection

Keyphasor* Inputs:

- Supports the four 3500 system Keyphasor signals.
- Supports multiple events per revolution speed inputs up to 20 kHz.

Startup / Coastdown Data

- Data collected from speed and time intervals.
- Increasing and decreasing speed interval independently programmable.
- Initiation of transient data collection based on detecting the machine speed within one of two programmable windows.
- The number of transient events that can be collected is only limited by the available memory in the module.

Alarm Data Collection

- Pre- and post-alarm data.
- 1 second of static values collected for 10 minutes before the event and 1 minute after the event.
- 100 ms static values collected for 20 seconds before the event and 10 seconds after the event.
- 2.5 minutes of waveform data at 10-second intervals before the alarm and 1 minute collected at 10-second intervals after the alarm.

Static Values Data

- TDI will collect the static values including the values measured by the monitors.

- TDI provides four nX static values for each point. Amplitude and phase are returned for each of the values.

Waveform Sampling

- Collection of waveforms for 48 channels.
- DC-coupled waveforms.
- Simultaneous Synchronous and Asynchronous data sampled during all operational modes
- User-configurable Synchronous waveform sampling rates:

  - 1024 samples/rev for 2 revolutions,

  - 512 samples/rev for 4 revolutions,

  - 256 samples/rev for 8 revolutions,

  - 128 samples/rev for 16 revolutions,

  - 64 samples/rev for 32 revolutions,

  - 32 samples/rev for 64 revolutions, and

  - 16 samples/rev for 128 revolutions.

- Asynchronous data sampled to support an 800-line spectrum at the following frequency spans:

  - 10 Hz,

  - 20 Hz,

  - 50 Hz,

  - 100 Hz,

  - 200 Hz,

  - 500 Hz,

  - 1000 Hz,

  - 2000 Hz,

  - 5000 Hz,

  - 10 kHz,

  - 20 kHz, and

  - 30 kHz.

- Asynchronous data is anti-alias filtered.
- Channel Pairs for providing Orbit or synchronous full spectrum presentations can be split among multiple monitors. For asynchronous full spectrums the channels must be within a monitor channel pair (30 kHz frequency span data will not be phase correlated between channel pairs).

Communications

Protocols

BN Host Protocol:

Communication with 3500 Configuration Software

BN TDI Protocol:

Communication with GE's System 1* Asset Management and Data Collection Software.

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.

Front Panel

Communications:

Ethernet, 10Base-T and 100Base-TX. Conforms to IEEE802.3.

Protocol Supported:

BN Host Protocol and BN TDI Protocol using Ethernet TCP/IP.

Connection:

2 ports: RJ-45 (telephone jack style) for 10Base-T/100Base-TX Ethernet cabling.

Cable Length:

100 metres (328 feet) maximum.

Rear Panel

TDI Host Connector

Communications:

Ethernet, 10Base-T

Protocol Supported:

BN Host Protocol and BN TDI Protocol using Ethernet TCP/IP.

Connection:

9 Pin DSub

Cable Length:

100 metres (328 feet) maximum.

SDI Host RS-232

Communications:

RS232

Protocol Supported:

BN Host Protocol, Modbus®.

Baud Rate:

115.2 kbaud maximum

Cable Length:

30 metres (100 feet) maximum

Connector:

9-pin DSUB

SDI Host RS-422 & SDI Rack

Communications:

RS422 & RS485

Protocol Supported:

Modbus®.

Baud Rate:

115.2 kbaud maximum

Cable Length:

1220 metres (4000 feet) maximum

Connector:

9-pin DSUB

Environmental Limits

Operating Temperature:

0 °C to +65 °C (-22 °F to +149 °F)

For operation above +55°C the unit requires a minimum 0f 300ft/min of moving air across the rack.

Storage Temperature:

-40 °C to +85 °C (-40 °F to +185 °F)

Humidity:

95%, non-condensing

Battery Life

Powered TDI:

38 years @ 50°C (122 °F)

Un-powered TDI:

12 years @ 50°C (122 °F)

CE Mark Directives

EMD Directive

Certificate of Conformity

287885

EN61000-6-4

Radiated Emissions

EN 55011, Class A

Conducted Emissions

EN55011, Class A

EN 61000-6-2

Electrostatic Discharge

EN 61000-4-2, Criteria B

Radiated Susceptibility

EN 61000-4-3, Criteria A

Conducted Susceptibility

EN 61000-4-6, 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

CE Mark Low Voltage Directives

Certificate of Conformity

287885

EN 61010-1

Safety Requirements

Hazardous Area Approvals

North American

Approval Option (01)

Class 1, Div 2

Groups A, B, C, D

T4A @ Ta = -20°C to +60°C

(-4 °F to +140 °F)

T4 @ Ta = -20 °C to +65 °C

(-4 °F to +150 °F)

Note: When installed as a retrofit monitor for a 3300 System, hazardous area approval is valid only if the existing 3300 System has the same type of approval.

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

www.ge-mcs.com/bently

Physical

TDI Module

Dimensions (Height x Width x Depth)

228mm (8.97 in) x 50mm (1.98 in) x 289mm (11.39 in)

Weight

1.45kg (3.2 lb)

Rack Space Requirements

TDI Module

1 full-height front slot.

Ordering Information

Transient Data Interface

3500/23E-AXX-BXX

A: I/O Module Type

0 0 none, uses currently installed 3300 PIM.

B: Agency Approval Option

0 0 None

0 1 CSA/NRTL/C (Class 1, Div 2)

Note: For installation as a retrofit monitor for a 3300 System, Agency Approval Option B01 should be ordered only if the existing 3300 System has the same type of approvals. Installation of a retrofit monitor in a system without approvals will invalidate the approvals of the monitor.

Spares

285690-01

3500/23E TDI

287545-01

3500/23E Monitor Manual

Ethernet Cables

Standard 10 Base-T/100 Base-TX Shielded Category 5 Cable with RJ-45 connectors (solid conductor)

138131-AXXX

A: Cable Length:

0 0 6	6 feet (1.8 m)
0 1 0	10 feet (3.0 m)
0 2 5	25 feet (7.6 m)
0 4 0	40 feet (12.2 m)
0 5 0	50 feet (15.2 m)
0 7 5	75 feet (22.9 m)
0 8 5	85 feet (25.9 m)
1 0 0	100 feet (30.5 m)
1 2 0	120 feet (36.6 m)
1 5 0	150 feet (45.7 m)
2 0 0	200 feet (61.0 m)
2 5 0	250 feet (76.2 m)
3 2 0	320 feet (97.5 m)

Ethernet 9 Pin Dsub to RJ-45

167887-AXXX-BXX

A: Cable Length

0 0 3	3 feet (1 metres)
0 1 0	6 feet (2 metres)
0 1 0	10 feet (3 metres)
0 2 5	25 feet (7.5 metres)
0 5 0	50 feet (15 metres)
1 0 0	100 feet (30 metres)
2 5 0	250 feet (76 metres)
3 2 0	320 feet (100 metres)

B: Assembly Option

0 1	PVC Insulated – Non Plenum
0 2	PVC Insulated – Plenum

Ethernet 9 Pin Dsub to RJ-45 Crossover

167974-AXXX-BXX

A: Cable Length

0 0 3	3 feet (1 metres)
0 1 0	6 feet (2 metres)
0 1 0	10 feet (3 metres)
0 2 5	25 feet (7.5 metres)
0 5 0	50 feet (15 metres)
1 0 0	100 feet (30 metres)
2 5 0	250 feet (76 metres)
3 2 0	320 feet (100 metres)

B: Assembly Option

0 1	PVC Insulated – Non Plenum
0 2	PVC Insulated – Plenum

Serial Data Interface Cables

RS232 Cable, Honeywell PLCG to 3500/23E

89968 - AXXXX-BXX-CXX

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

C: Protection Option

0 1	No Surge Protection
0 2	Surge Protection Provided

RS422 Cable, 3500/23E to 3500/23E

47125-AXXXX-BXX-CXX-DXX

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 meters)
0 2 0 0	200 feet (61 meters)
0 2 5 0	250 feet (75 meters)
0 5 0 0	500 feet (150 meters)
1 0 0 0	1000 feet (305 meters)
2 0 0 0	2000 feet (610 meters)*
4 0 0 0	4000 feet (1220 meters)*

*Note: Cannot be ordered assembled.

B: Assembly Instructions

0 1	Not Assembled
0 2	Assembled

C: Insulation Option

0 1	PVC Insulated
0 2	Teflon® Insulated

D: Protection Option

0 1	No Surge Protection
0 2	Surge Protection Provided

Surge Protector Kit

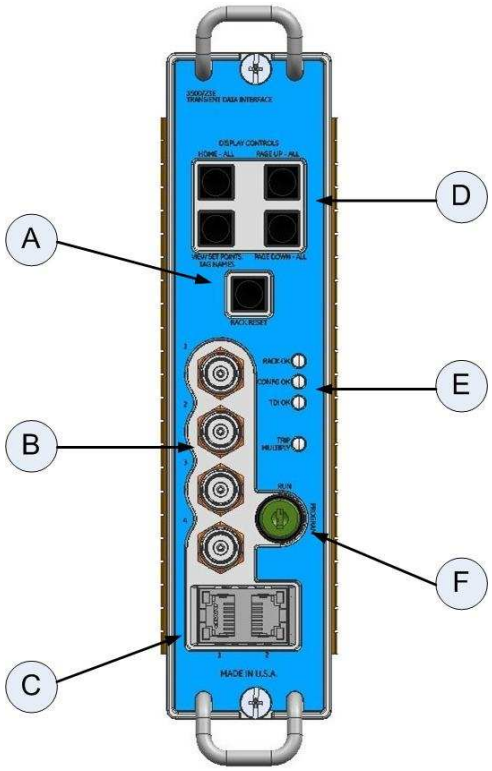
109959-AXX

(Note: Each communication cable requires one device at each end of the cable).

A: Surge Protector Kit

0 4	For Cable 47125
0 9	For Cable 89968

Graphs and Figures



A. Reset Switch
B. Buffered Transducer Outputs
C. Ethernet Ports
D. Display Control Switches
E. Status LEDs
F. Keylock (Program / Run)

Figure 1: Front view of the Proximitor*/Seismic Monitor

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