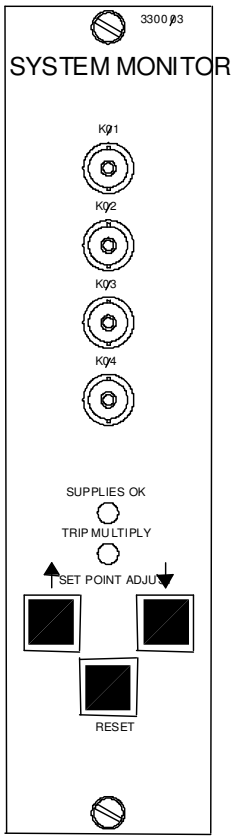
3300/03 System Monitor

Bently Nevada™ Asset Condition Monitoring



Description

The System Monitor performs four important tasks in a 3300 monitor rack, providing:

- Functions common to all monitors in the rack, such as:
  - Alarm setpoint adjustment
  - Keyphasor® power, termination, conditioning, and distribution
  - Alarm acknowledgement

- Connection of all installed monitors to an external communications processor (sold separately) via STATIC and DYNAMIC data ports.
- Optional Serial Data Interface (SDI) for communication of transducer and monitor data to process computers, digital/distributed control systems, programmable controllers, and other control and automation systems.
- Optional Dynamic Data Interface (DDI) for communication of transducer and monitor data to compatible Bently Nevada machinery management software. Depending on the type of data required, this option may eliminate the need for an external communications processor.

⚠ Warning

A transducer field wiring failure, monitor failure, or loss of primary power can cause loss of machinery protection. This could result in property damage and/or bodily injury. Therefore, we strongly recommend connection of an external (operator control panel mounted) annunciator to the OK Relay terminals.

imagination at work

Specifications

Inputs

Power Consumption:

2 watts; 4.6 watts with interface options.

Keyphasor Signal:

Accepts up to four proximity probe Keyphasor signals.

Input impedance:

10 k Ω.

RS422 Communications

Impedance:

4 k Ω.

Threshold:

0.2 V.

Baud Rate:

19.2 k baud maximum for SDI;
38.4 k baud maximum for DDI.

Distance:

1200 metres (4000 feet) maximum.

RS232 Communications

Impedance:

3 k Ω to 7 k Ω.

Input Levels:

High +3 to +25 V;

Low -3 to -25V.

Baud Rate:

19.2 k baud maximum for

SDI and DDI.

Distance:

30 metres (100 feet) maximum.

Keyphasor® Signals

Frequency Range:

60 to 30,000 cpm (rpm).

Duty Cycle:

1% minimum.

Amplitude:

0.5 V peak-to-peak minimum.

dc Signal Range:

0 to -24 V (VT = -24 Vdc);

0 to -18 V (VT = -18 Vdc).

Signal Conditioning

Frequency Range:

Determined by software (user-selectable); 10 kHz maximum.

Accuracy - Dynamic Signal:

± 0.3% of full-scale, typical, at 25°C (77°F);

±0.7% of full-scale, maximum, at 25°C (77°F).

Phase:

±0.2°, typical, at 25°C (77°F);

±1°, maximum, at 25°C (77°F).

Gap:

0.3% of dc Signal Range, typical.

RPM:

±1 rpm, typical.

Outputs

Buffered Keyphasor Outputs:

Four coaxial connectors on front panel.

Output Impedance:

100 Ω.

Keyphasor Transducer Power Supply:

User-programmable for -24 Vdc or -18 Vdc. Voltages are short-circuit protected.

Indicators:

Three LEDs on front panel

Supplies OK:

ON when all system supply voltages are within tolerance. LEDs behind the slide-away front panel indicate the condition of the various monitored supply voltages. The appropriate Supply voltage LED and the SUPPLIES OK LED on the front panel turn OFF if a voltage is out of tolerance.

Trip Multiply:

ON when Trip Multiply function is active.

Data Interface OK:

OFF when either the SDI or the DDI hardware is not functioning properly or is not installed.

RS422 Communications

Levels:

High 2.5 V, minimum;

Low 0.5 V, maximum.

Baud Rate:

19.2 k baud, maximum, for SDI;
38.4 k baud, maximum, for DDI.

Distance:

1200 metres (4000 feet), maximum.

RS232 Communications

Levels:

High +5 V, minimum;

Low -5 V, maximum.

Baud Rate:

19.2 k baud, maximum,

for SDI and DDI.

Distance:

30 metres (100 feet), maximum.

Controls

Front Panel:

Two switches control the Up and Down adjustment of monitor alarm setpoints. A third switch controls the alarm RESET function.

Rear Panel:

Terminals provide connections for Rack Inhibit, Trip Multiply, and Alarm Reset contact closures.

Communications:

RS232 or RS422 communication links. One connection to host computer and one connection for daisy chaining to the next rack.

RS232 Interface:

150 baud to 19.2 k baud; 30 metres (100 feet) maximum.

RS422 Interface:

150 baud to 19.2 k baud for SDI;
150 baud to 38.4 k baud for DDI;
1200 metres (4,000 feet) maximum.

Environmental Limits

Operating Temperature:

0°C to +65°C (+32°F to +150°F).

Storage Temperature:

-40°C to +85°C (-40°F to +185°F).

Relative Humidity:

To 95%, noncondensing.

CE Mark Directives

EMC Directive

Certificate of Conformity:

158710

Low Voltage Directive

Certificate of Conformity:

135300

Hazardous Area Approvals

Approval Option (01)

Class I, Div 2

Groups A, B, C, D

T4 @ Ta = -20 °C to +65 °C

(-4 °F to +150 °F)

Certification Number

CSA 150368-1002151 (LR 26744)

ATEX

Approval Option (02)

For Selected Ordering Options with ATEX/CSA agency approvals:

 II G

EEx nC[L] IIC

T4 @ Ta = -20°C to +60°C

Certification Number

BN26744C-55A

Physical

Rack Space Requirements:

One rack position, installs only in position two (next to the Power Supply).

Weight:

0.9 kg (2.2 lbs.).

Serial Data Interface

Communications Protocol:

Either Modicon Modbus® or Allen-Bradley DF1 protocol (switch selectable); RS422 or RS232 cabling (jumper-selectable). Data available via this interface includes the following on a per channel basis:

Proportional value for each monitored variable (available as current values and a Fast Trend file)

Proportional value for probe gap voltage (for proximity probe channels)

OK status

Alert and Danger alarm status

Bypass status (channel and monitor)

Trip Multiply status (rack)

Monitor alarm setpoints (Modicon Modbus only)

Address Setting:

Eight jumpers on the Serial Data Interface allow setting of up to 256 different addresses.

Baud Rate:

Four jumpers are used to set the desired baud rate for serial communications; 19.2 k baud, maximum.

Message Checking:

One jumper selects between Cyclic Redundancy Check (CRC) and Block Character Checking (BCC) for message validation. Allen-Bradley protocol can use CRC or BCC checking; Modicon Modbus uses only CRC checking.

Parity and Stop Bit Selection:

Two jumpers allow selection of parity and stop bit modes.

BCD Switch:

If set, the data returned in Allen-Bradley protocol is formatted in Binary Coded Decimal.

Data Format:

Up to 12-bit data is supported; depends on monitor type.

Data Accuracy:

Data accuracy is the same as the monitor (no additional losses).

Dynamic Data Interface

Communications Protocol:

Proprietary protocol for communications with compatible Bently Nevada computerized monitoring systems. Connection to computer is via RS422 (or RS232 for rack closest to computer). Data available via this interface includes the following on a per channel basis:

Proportional value for each monitored variable available as current values and a Fast Trend file

Proportional value for probe gap voltage (for proximity probe channels)

OK status

Alert and Danger alarm status

Bypass status (channel and monitor)

Trip Multiply status (rack)

Digitized dynamic waveform (time domain) signals

Address Setting:

Uses the same eight jumpers on the SDI.

Baud Rate:

Jumper-selectable; 38.k baud, maximum.

Data Types:

All 3300 monitor types are supported by DDI. Various types of proportional data are obtained, depending on monitor type, including overall values, individual channel alarm status, channel OK status, probe gap (for proximity probe based monitors), 1X and 2X amplitude and phase (for vector monitors).

Accuracy:

12-bit dynamic data is maintained with no losses. While DDI can support up to 24-bits of resolution on static data, the actual resolution is a function of the monitor type for each channel.

Dynamic Data:

12-bit dynamic data is obtained 2-channels at a time from all 3300 monitors which have dynamic data.

Dynamic Data Sampling - Asynchronous:

Sampling rate is selected at the host computer (Configuration program); maximum rate is 12.8 kHz for maximum frequency display (spectrum) of 5 kHz; resolution 400 lines.

Synchronous:

Sampling rate is fixed and is a function of Keyphasor frequency (shaft rotative speed). Maximum Keyphasor frequency is 30,000 cpm (500 Hz). Dynamic data signal is sampled 32 times per shaft revolution (32X) for 8 revolutions; maximum frequency 12.5X, minimum 0.125X; resolution 100 lines.

Trend Data: