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TECHNOLOGY GROUP

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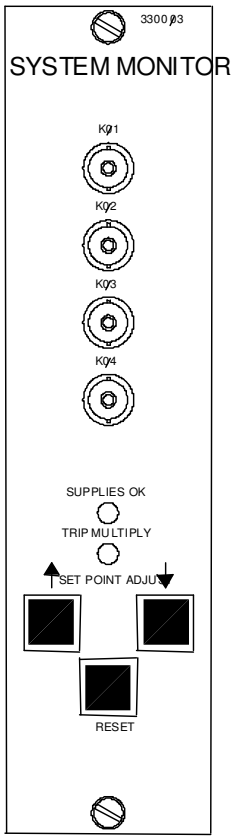
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Find the *GE / Bently Nevada 76683-02 35mm* at our website: *Click HERE*

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

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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.

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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

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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.

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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:

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Supports both a Trend and Fast Trend for all proportional data.

System Ok Relay

One hermetically sealed, normally energized, single-pole double-throw relay is used for annunciation of a NOT OK condition in the monitoring rack and/or a problem with the primary (mains) power to the rack.

Contact Ratings - Standard:

5A at 28 Vdc

5A at 120 Vac, 50/60 Hz

3A at 220 Vac, 50/60 Hz

CSA Approval:

5A at 28 Vdc

5A at 120 Vac, 50/60 Hz

ATEX approval:

5A at 28 Vdc

5A at 30 Vac, 50/60 Hz

Ordering Information

System Monitor

3300/03-AXX-BXX

A: Type

0 1	Standard
0 2	Serial Data Interface
0 3	Dynamic Data Interface and Serial Data Interface

B: Approvals Option

0 0	None
0 1	CSA/NRTL/C
0 2	ATEX self certification

Note: ATEX approval requires the monitor rack be installed in a weatherproof housing.

Upgrade Kit 143121

0 1	Basic to SDI upgrade
0 2	SDI to DDI upgrade
0 3	Basic to DDI upgrade

Accessories

Serial Data Interface Cables

RS232 3300/03 to Allen-Bradley 1770-KF2 Communication Module or Honeywell PLC® Gateway or Data Highway

89968 - AXXXX-BXX-CXX

RS232 3300/03 to Allen-Bradley 1771-KE or 1785-KE Communications Module

89969 - AXXXX-BXX-CXX

RS422 3300/03 to Allen-Bradley 1770 KF2 Communications Module

89970 - AXXXX-BXX-CXX

A: Cable Length

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

B: Assembly Option

0 1	Not Assembled
0 2	Assembled

C: Protection Option

0 0	No Surge Protection
0 1	Surge Protection provided

RS422 3300/03 to 3300/03

47125 - AXXXX-BXX-CXX-DXX

A: Cable Length

0 0 1 0	10 feet (3 metres)
0 0 2 5	25 feet (7.5 metres)
0 0 5 0	50 feet (15 metres)
0 1 0 0	100 feet (30 metres)
0 2 0 0	200 feet (61 metres)
0 2 5 0	250 feet (76 metres)
0 5 0 0	500 feet (152 metres)
1 0 0 0	1000 feet (305 metres)
2 0 0 0	2000 feet (610 metres)*
4 0 0 0	4000 feet (1220 metres)*

* **Note:** Can not be ordered assembled.

B: Assembly Option

0 1	Not Assembled
0 2	Assembled

C: Insulation Option

0 1	PVC Insulated
0 2	Teflon® Insulated

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D: Protection Option

0 0	No Surge Protection
0 1	Surge Protection provided

RS422 3300/03 to 3300/01

(3300/01 electrically closest to host computer)
89966 - AXXXX-BXX-CXX

RS422 3300/01 to 3300/03

(3300/03 electrically closest to host computer)
89967 - AXXXX -BXX-CXX

A: Cable Length

0 0 1 0	10 feet (3 metres)
0 0 2 5	25 feet (7.5 metres)
0 0 5 0	50 feet (15 metres)
0 1 0 0	100 feet (30 metres)
0 2 5 0	250 feet (76 metres)
0 5 0 0	500 feet (152 metres)

B: Assembly Option

0 1	Not Assembled
0 2	Assembled

C: Surface Protection

0 0	No Surge Protection
0 1	Surge Protection Provided

Dynamic Data Interface Cables

3300/03 to Bently Nevada host (DM2000) computer; RS422

{9-pin female to 25-pin female}

132632 - AXXXX -BXX
(PVC Insulation)

132633 - AXXXX -BXX
(Teflon® Insulation)

A: Cable Length

0 0 1 0	10 feet (3 metres)
0 0 2 5	25 feet (7.5 metres)
0 0 5 0	50 feet (15 metres)
0 1 0 0	100 feet (30 metres)
0 2 5 0	250 feet (76 metres)
0 5 0 0	500 feet (152 metres)

B: Assembly Option

0 1	Not Assembled
0 2	Assembled

3300/03 to Bently Nevada host computer (IBM® compatible); RS232

89949 - AXXXX-BXX-CXX

3300/03 to Bently Nevada host computer (Compaq or Intel); RS232

89950 - AXXXX-BXX-CXX

A: Cable Length

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

B: Assembly Option

0 1	Not Assembled
0 2	Assembled

C: Protection Option

0 0	No Surge Protection
0 1	Surge Protection Provided

3300/03 to Bently Nevada host (TDM2) computer; RS422

{9-pin female to 9-pin male}

103629 - AXXXX-BXX-CXX-DXX

A: Cable Length

0 0 1 0	10 feet (3 metres)
0 0 2 5	25 feet (7.5 metres)
0 0 5 0	50 feet (15 metres)
0 1 0 0	100 feet (30 metres)
0 2 5 0	250 feet (76 metres)
0 5 0 0	500 feet (152 metres)

B: Assembly Option

0 1	Not Assembled
0 2	Assembled

C: Insulation Option

0 1	PVC Insulated
0 2	Teflon® Insulated

D: Protection Option

0 0	No Surge Protection
0 1	Surge Protection provided

Surge Protector Kit

(for existing installations, not required when surge protection option is specified with new cables).

109959-AXX

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

A: Surge Protector Kit

0 1	TDM Comm Processor end of cables 81650 and 78205

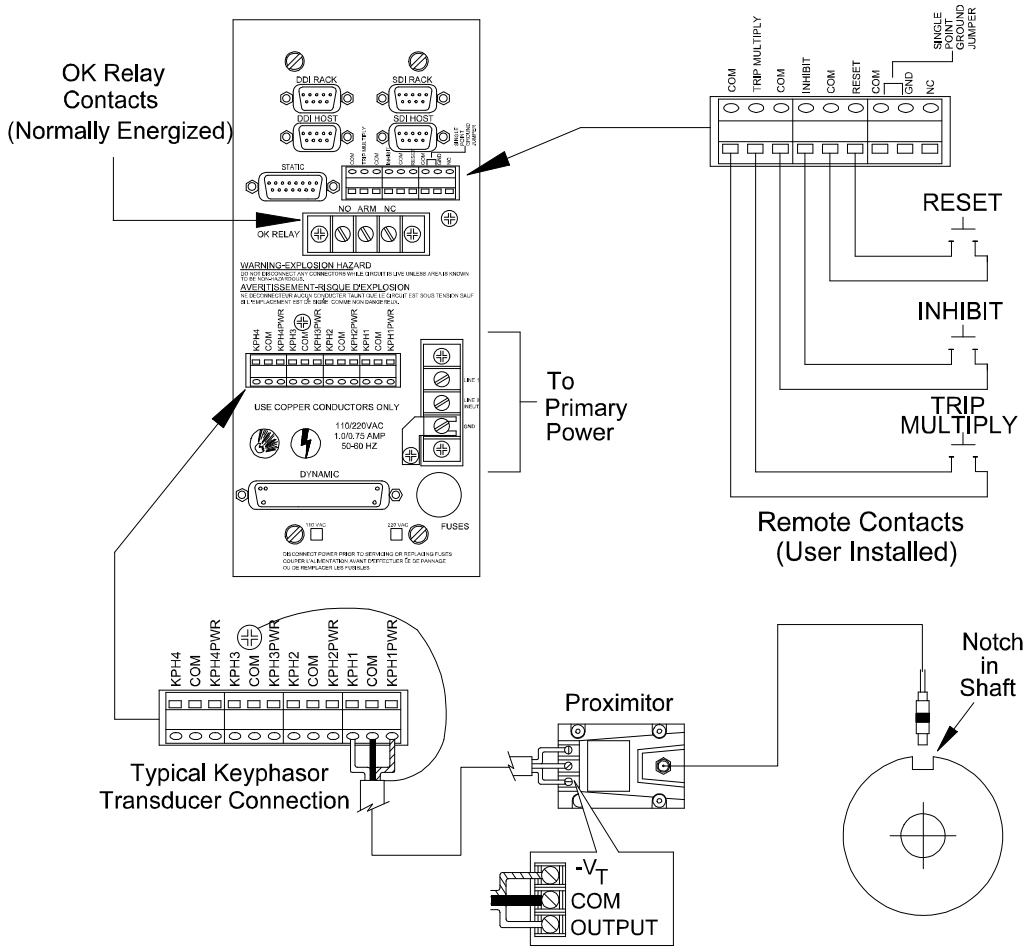
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0 2	Host Computer end of TDM cable 78205; both Host and Comm Processor end of DDI cable 89950; Comm Processor end of DDI cable 89949.
0 3	Host Computer end of TDM cable 81650 and DDI cable 89949.
0 4	Comm Processor end of cable 78206 (TDM Host to First Comm Processor), 103629 (TDM2 Host to first Comm Processor) and 132632 or 132633 (DM2000 Host to First Comm Processor); both ends of cable 47125 (DDM/PDM/ TDM Comm Processor to Comm Processor); 3300/03 rack end of cables 89966, 89967, and 89970.
0 5	Host Computer end of cable 78206 (TDM Host to First Comm Processor).
0 6	Host Computer end of cable 103629 (TDM2 Host to first Comm Processor).
0 7	ost Computer end of cables 132632 and 132633 (DM2000 Host to First Comm Processor)
0 8	llen-Bradley Communications Module end of cable 89969 (3300/03 to Allen-Bradley 1771-KE).
0 9	300/03 rack end of cables 89968 (3300/03 to Allen-Bradley 1770-KF2) and 89969 (3300/03 to Allen-Bradley 1771-KE).1 0 3300/01 rack end of cables 89966 (3300/03 to 3300/01) and, 89967 (3300/03 to 3300/01) and on AB Comm Module end of cable 89970 (3300/03 to Allen-Bradley Comm Module).
1 1	Allen-Bradley Communication Module end of cable 89968 (3300/03 to Allen-Bradley 1770-KF2).

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Field wiring diagrams

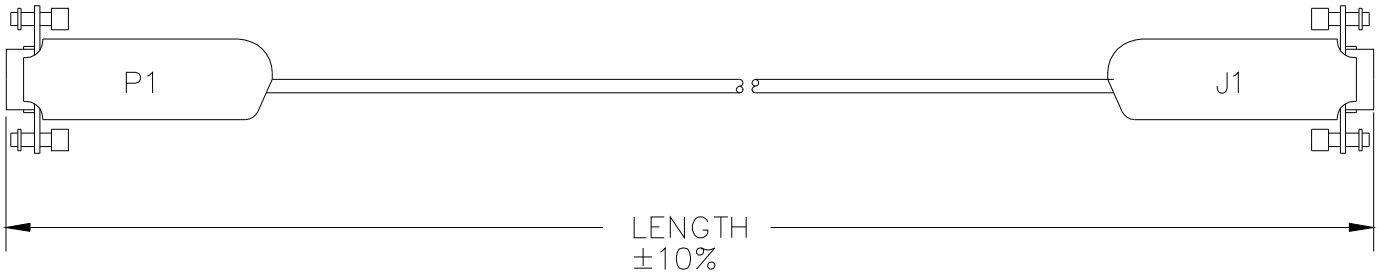
3300/03 System Monitor



Field wiring diagram for 3300/03 System Monitor (ac Power Supply without internal barriers)

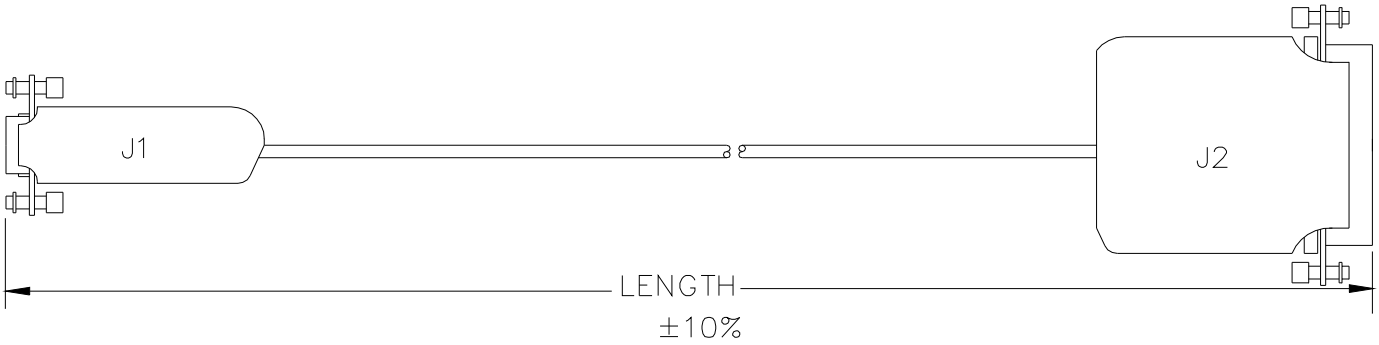
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Cable details



FROM (MALE)	TO (FEMALE)
P1–1	NC
P1–3	J1–3
P1–4	J1–4
P1–5	J1–5
P1–6	J1–6
P1–9	J1–9
SHIELD	J1–1

Figure 1: Part Number 47125
9-pin male Rack RS422 to 9-pin female Rack RS422

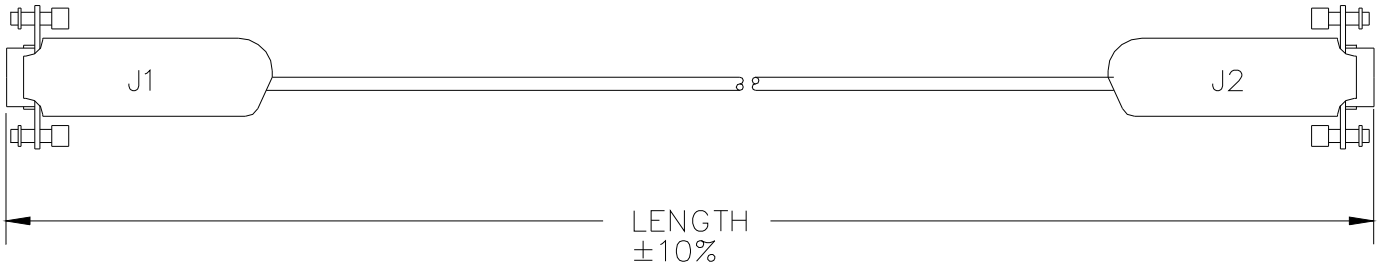


FROM	TO
J1–5	J2–7
J1–3	J2–3
J1–2	J2–2
J1–1	SHIELD
DDI	HOST

Figure 2: Part Number 89949

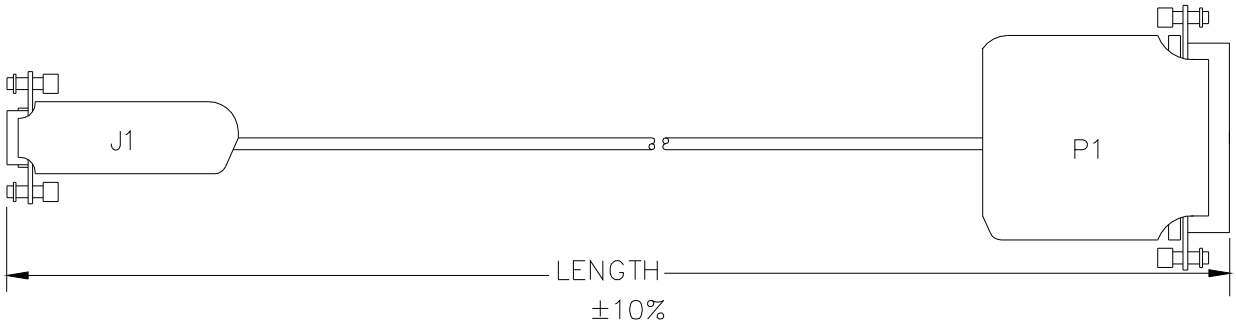
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9-pin female Rack RS232 to 25-pin female Computer RS232



FROM	TO
J1–5	J2–5
J1–2	J2–3
J1–3	J2–2
J1–1	SHIELD
DDI	HOST

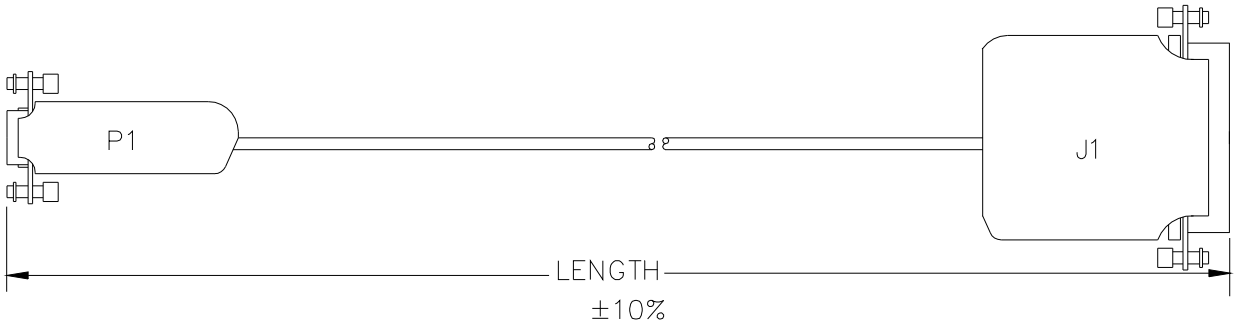
Figure 3: Part Number 89950
9-pin female Rack RS232 to 9-pin female Computer RS232



FROM	TO
J1–1	SHIELD
J1–3	P1–14
J1–4	P1–16
J1–5	P1–7
J1–6	P1–18
J1–9	P1–25
3300/03	3300/01

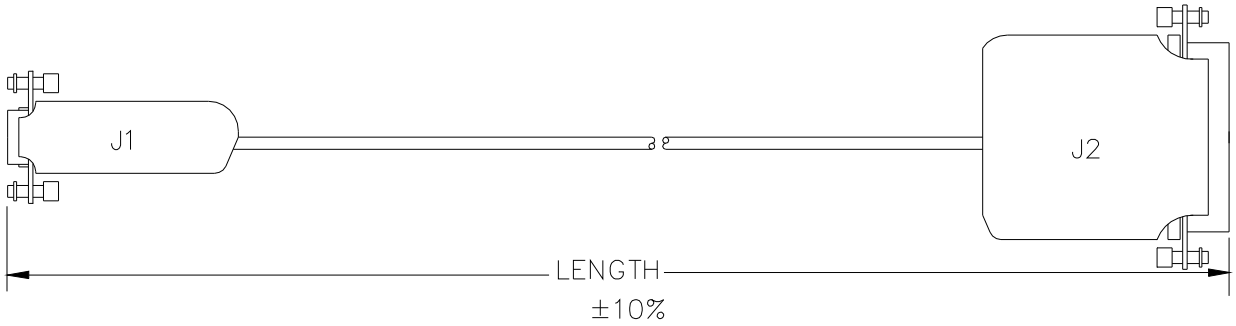
Figure 4: Part Number 89966
9-pin female RS422 Rack cable to 25-pin male RS422 Rack cable

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FROM	TO
P1–1	SHIELD
P1–3	J1–14
P1–4	J1–16
P1–5	J1–7
P1–6	J1–18
P1–9	J1–25
3300/03	3300/01

Figure 5: Part Number 89967
9-pin male RS422 Rack cable to 25-pin female RS422 Rack cable



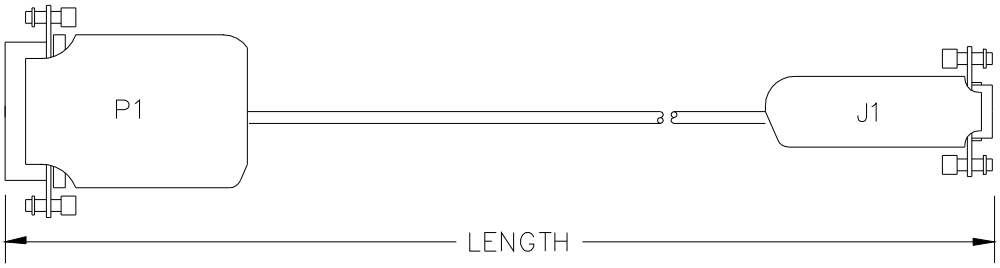
FROM	TO
J1–1	SHIELD
J1–2	J2–2
J1–3	J2–3
J1–4	J2–8
J1–5	J2–7

FROM	TO
J1–6	J2–20
J1–7	J1–8
J1–9	J1–6
J2–4	J2–5
J2–6	J2–8

J1 is 3300/03 System Monitor
J2 is Allen Bradley 1770–KF2 or Honeywell PLC Gateway

Figure 6: Part Number 89968
9-pin female RS232 Rack to 25-pin female RS232 cable

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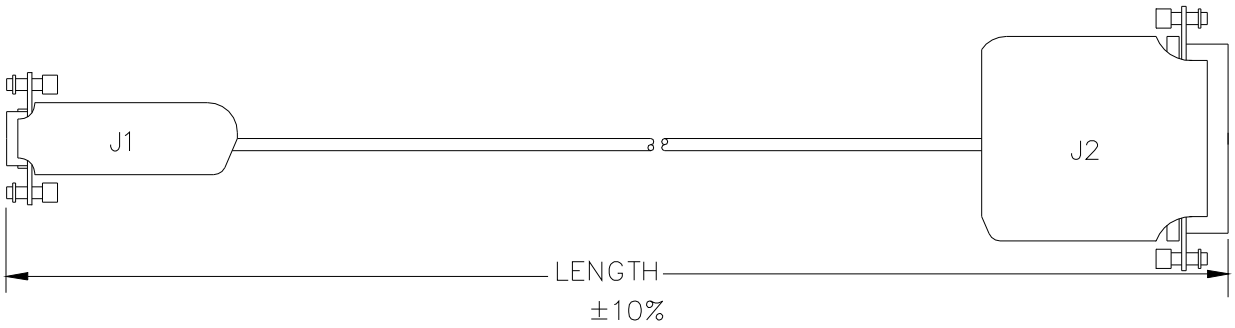
FROM	TO
P1–1	SHIELD
P1–2	J1–2
P1–3	J1–3
P1–4	P1–5
P1–6	J1–4
P1–7	J1–5

FROM	TO
P1–8	P1–6
P1–11	J1–6
P1–13	P1–7
P1–14	P1–13
J1–6	J1–9
J1–7	J1–8

P1 is Allen Bradley 1771–KE or 1785–KE

J1 is 3300/03 System Monitor

Figure 7: Part Number 89969
15-pin male RS232 cable to 9-pin female RS232 Rack cable



FROM	TO
J2–1	SHIELD
J2–4	J2–5
J2–6	J2–8
J2–8	J2–20
J2–7	J1–5

FROM	TO
J2–14	J1–4
J2–16	J1–3
J2–18	J1–9
J2–25	J1–6

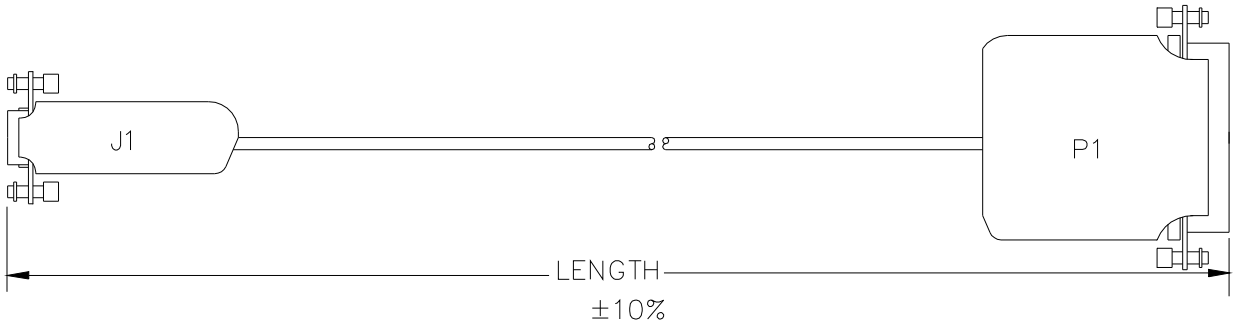
J1 is 3300/03 System Monitor

J2 is Allen Bradley 1770–KF2

Figure 8: Part Number 89970

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9-pin female RS422 Rack to 25-pin female RS422 cable

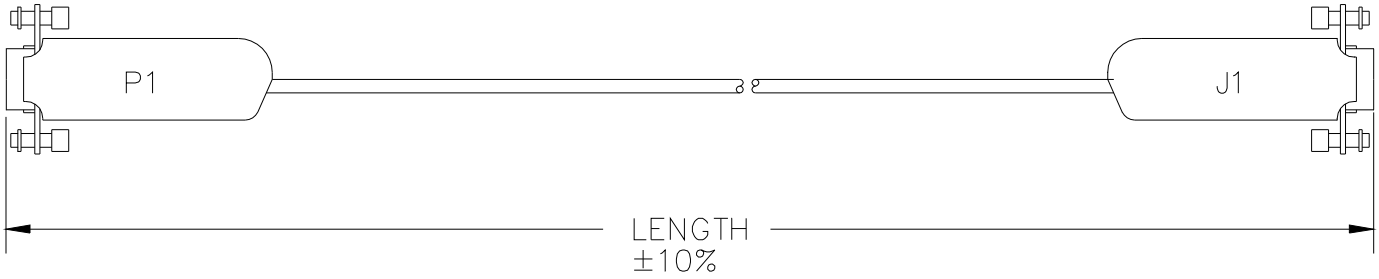


FROM	TO
P1–1	SHIELD
P1–2	J1–3
P1–3	J1–2
P1–4	J1–7
P1–5	J1–8

FROM	TO
P1–6	J1–6
P1–7	J1–5
P1–8	J1–9
P1–20	J1–4

J1 is 3300/03 System Monitor
P1 is Modem

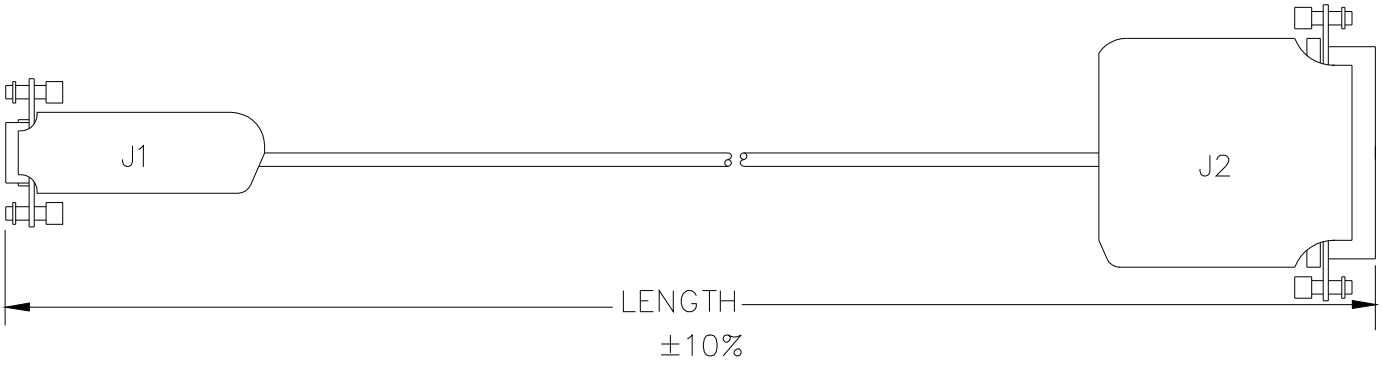
Figure 9: Part Number 100058
25-pin male modem cable to 9-pin female cable



FROM (MALE)	TO (FEMALE)
P1–1	SHIELD
P1–2	J1–4
P1–3	J1–3
P1–6	J1–6
P1–7	J1–9
SHIELD	J1–1

Figure 10: Part Number 103629
9-pin male (P1) RS422 TDM2 Host cable to 9-pin female (J1-3300/03) RS422 Rack cable

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FROM	TO
J1–3	J2–16
J1–4	J2–14
J1–5	J2–7
J1–6	J2–2
J1–9	J2–3

J1 is 3300/03 System Monitor
J2 is RS422 Host Computer

Figure 11: Part Number 132632/132633
9-pin female RS422 Rack cable to 25-pin female RS422 DM2000 Host cable

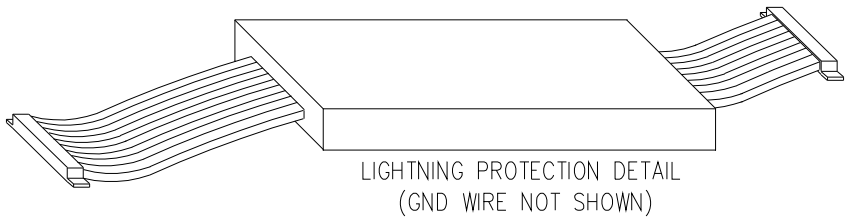


Figure 12: Part Number 109959
Surge Protector

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