Digital Indicator Solutions

NOSHOK

Attachable Loop-Powered
Compact Loop-Powered
Compact Smart System
Smart System "Intelligent"
Dual Display

Options & Accessories

At NOSHOK, we pride ourselves on being innovators in the industry by continually offering the latest technology and measurement solutions, and providing the best customer support in the marketplace.

Established in 1967, NOSHOK was one of the first companies to offer liquid filled pressure gauges. We also took a bold step by backing our quality gauges with an extended 3-year warranty. That unwavering standard of quality has endured for over 50 years, and as we have expanded our product offering we continue to provide industry-leading warranties. NOSHOK also leads the industry as one of the first companies to offer corrosion-resistant zinc nickel plating standard on our carbon steel valves.

We have the capacity to put together special requirements which are so often hard to find. If you do not find what you need in this catalog, chances are we can still put a solution together.

NOSHOK is committed to providing excellence on every level. Thank you for choosing NOSHOK products.

Jeff N. Scott
President

NOSHOK Corporate Headquarters
Your Single Source Instrumentation Company

NOSHOK is a member and actively supports:

FCI Fluid Controls Institute, Inc. Technical Resources for Instrumentation and Fluid Control

THE FPDA MOTION & CONTROL NETWORK

ASME SETTING THE STANDARD

ASSOCIATION FOR HIGH TECHNOLOGY DISTRIBUTION AHTD

NOSHOK is an ISO 9001:2015 registered company.

WARRANTY INFORMATION

NOSHOK's **One Year Warranty** applies to our 1800 Series Digital Indicators. NOSHOK's **Two Year Warranty** applies to our 1900, 1950, 2000/2100 and 2200 Series Digital Indicators and accessories. ***NOSHOK guarantees all products*** to be free from defects in material and workmanship, to remain within catalogued accuracy specifications, and to operate within the catalogued performance specifications. These products must be operated within the catalogued environmental and application parameters. Determination of failure will be made by NOSHOK, Inc.'s equipment and personnel or a certified test facility specializing in this type of evaluation.

T A B L E O F C O N T E N T S

DIGITAL INDICATORS

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Compact Loop-Powered:
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Compact Smart System:
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Smart System "Intelligent":
2000/2100 SERIES 10-11

Dual Display:
2200 SERIES 12-13

OPTIONS & ACCESSORIES

Backlight & display, power supplies, enclosures, option cards, AC to DC Retrofit 14-15

Wiring Diagrams 16

In keeping with and for purpose of product and/or manufacturing process improvements, NOSHOK, Inc. reserves the right to make design changes without prior notice.

Attachable Loop-Powered

Unit with relay option.

1800 SERIES

- High accuracy 4 mA to 20 mA loop-powered indicators for NOSHOK 300, 600, 615, 616 and 800 Series transmitters
- Can be fitted to NOSHOK pressure transmitters utilizing a 4 mA to 20 mA output signal and the Hirschmann (DIN 43650A) connector
- Easily inserted between the transmitter body and the connector
- Programmable to display a range of -1999 to 9999; may be tilted for better viewing
- User selectable digital filtering improves readability in rapidly varying pressure applications
- All parameters are stored in non-volatile memory so that reprogramming is not necessary in the event of a power failure

APPLICATIONS

- Hydraulic and pneumatic systems
- Pumps and compressors
- Test equipment and systems
- Industrial machinery and machine tools
- HVAC systems
- Power generation
- Water and wastewater
- Stamping and forming presses

SPECIFICATIONS

Input signals	4 mA to 20 mA (optional 0 Vdc to 10 Vdc)	
Process display	4 digit, 0.4" liquid crystal display (-1999 to 9999)	
Key pad	3 programmable function keys for relay option only	
Power requirement	Loop powered by sensors excitation	
	Power consumption	40 mA max.
	Voltage drop	≤3 Vdc (1800) ≤5.5 Vdc (1800-1)
Electrical connection	Hirschmann, DIN EN 175301 803 form A	
Memory	EEPROM	
Accuracy	<0.2% of full scale, ±1 digit	
Humidity	<90%, non-condensing	
Update rate	200 msec	
Temperature ranges	Operating	32 °F to 122 °F (0 °C to 50 °C)
	Effect	≤ 0.1% of full scale/18 °F (10 °C)
	Storage	-22 °F to 176 °F (-30 °C to 80 °C)
Electromagnetic rating	CE compliant to EMC norm EN 61326-1 RFI, EMI and ESD protection	
Environmental rating	NEMA 4, 4X, IP65 (front of display only)	
Filtering	0.2 seconds to 1.5 seconds, selectable	
Relay option	1 transistor, n-switching	
Linearization	2 point	
Weight	3 oz.	

To install, remove the DIN 43650A plug and insert indicator on top of transducer and reinstall the plug. This indicator can be used with NOSHOK and some competitive transmitters with 2-wire 4 mA to 20 mA output. Hirschmann connector with the same pin configuration. (Pin 1 + supply, pin 2 + output)

Shown with 800 Series Temperature Transmitter

Shown with 300 Series Pressure Transmitter

ORDERING INFORMATION				
SERIES	**1800**			
OPTIONS	**0**	No options	**1**	With relay

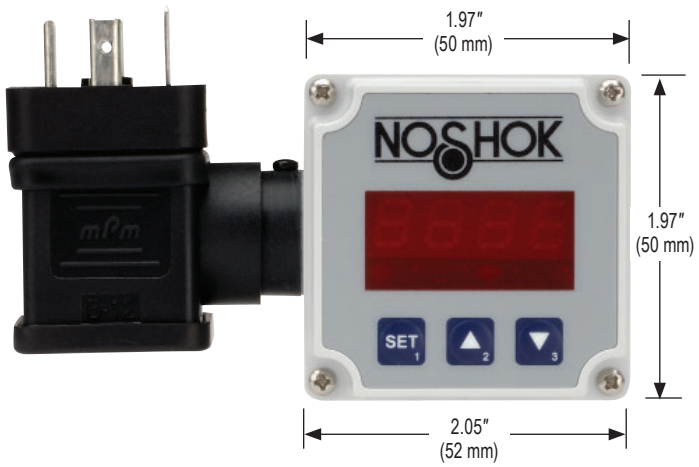
Please consult your local NOSHOK Distributor or NOSHOK, Inc. for availability and delivery information.

Note: Indicate display range on order eg. 0-1,000 for 4 mA to 20 mA

EXAMPLE

1800 – 1

Series .....1800 Series
Option.....With relay



Compact Loop-Powered

1900 SERIES

- Provides compact digital display of any desired unit of pressure, temperature, level, force, or flow measurement
- Dual range 4 mA to 20 mA or 10 mA to 50 mA
- 3-1/2 digit, 0.6" high display with a span range of 0 to 1999
- Positive image reflective LCD is standard; red or yellow/green back-lit versions optional
- Span and zero offset capabilities
- Negative pressure and overpressure indication
- Selectable decimal point position
- Compact, lightweight, impact-resistant NEMA 4X, IP65 housing with sealed front bezel
- Fits DIN standard cut-out 2.68" (68 mm) x 1.30" (33 mm)
- CE compliant to suppress RFI, EMI, and ESD

APPLICATIONS

Suitable for a wide variety of applications requiring pressure, flow, level, force and temperature measurement, including:

- Process indication
- On/off pump controls
- Compressor controls
- Safety or shutdown alarms

Note: See page 14-15 for more information on backlights & displays. See page 16 for 1900C wiring diagram, including the backlight feature.

SPECIFICATIONS

Input signals	4 mA to 20 mA	
Process display	3½ digit, 0.6" liquid crystal display (-1999 to 1999)	
Power requirement	**1900C-1/1900C-2**	Loop powered by sensors excitation
	Power consumption	160 Ω max. @ 20 mA 65 Ω max. @ 50 mA
	Voltage drop	3.2 Vdc
	1900C-3/1900C-4	Main display loop powered by sensors excitation w/ PS3 power supply for back light (85-250 VAC required)
	Power consumption	160 Ω max .@ 20 mA 65 Ω max. @ 50 mA
	Voltage drop	4 Vdc
Electrical connection	Screw terminals at back of case	
Memory	EEPROM	
Accuracy	±(0.1% + 1 digit)	
Humidity	85% max., non-condensing	
Vibration	5-500 Hz, 5g	
Shock	30 g	
Normal rejection mode	60 dB 50/60 Hz	
Altitude	Up to 2,000 meters	
Update rate	400 msec	
Temperature ranges	Operating	32 °F to 140 °F (0 °C to 60 °C)
	Effect	100 ppm/°C
	Storage	-40 °F to 176 °F (-40 °C to 80 °C)
Electromagnetic rating	CE compliant to EMC norm EN 61326-1	
	RFI, EMI and ESD protection	
Environmental rating	NEMA 4X, IP65 (front of display only)	
Linearization	2 point	
Weight	3.3 oz.	

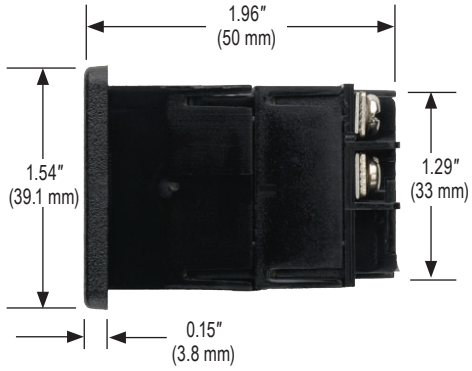
ORDERING INFORMATION				
SERIES	**1900**			
INPUT SIGNALS	**C**	Current		
INDICATIONS	**1**	Positive image reflective LCD	**3**	Yellow/green backlight transflective LCD with backlight power supply
	2	Positive image reflective LCD backlight	**4**	Red backlight transflective LCD with backlight power supply

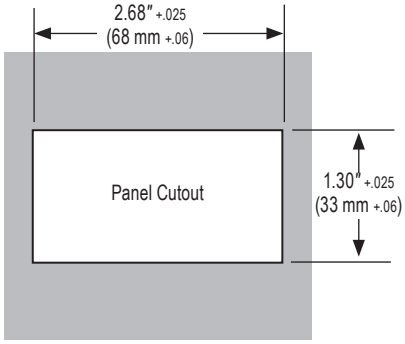
Please consult your local NOSHOK Distributor or NOSHOK, Inc. for availability and delivery information.

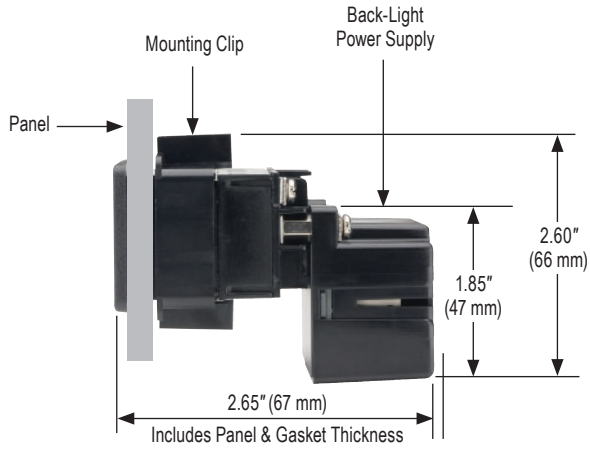
EXAMPLE **1900C – 4**

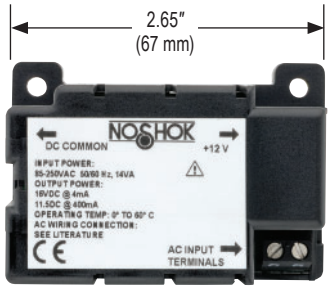
Series .....1900 Series
Input signal .....Current
Option.....Red backlight LCD

OPTIONAL POWER SUPPLIES		
MODEL	**INPUT**	**OUTPUT**
PS1	**115 Vac**	**12 Vdc**
PS2	**115 Vac**	**24 Vdc**









1900C-3/1900C-4: Loop Powered Display with backlight power supply

Compact Smart System

1950 SERIES

- Offers all the features of a full size panel meter in a compact digital display for pressure, flow, level, force, and temperature measurement
- 5 digit, 0.48" LCD display with a span range of -9999 to 99999
- Reflective LCD display; or green backlighting optional
- Display is fully expandable to accommodate applications requiring relays, dual sinking outputs, and serial communications by RS232 or RS485
- Fully scalable & field upgradable
- Simple programming through front panel
- Compact, lightweight, impact-resistant NEMA 4X, IP65 housing with sealed front bezel
- CE compliant to suppress RFI, EMI, and ESD
- Relay, communications and dual sinking output option cards available

APPLICATIONS

Suitable for a wide variety of applications requiring pressure, flow, level, force and temperature measurement, including:

- Process indication
- On/off pump controls
- Compressor controls
- Safety or shutdown alarms

Note: See page 14-15 for more information on power supplies, enclosures, and option cards.

SPECIFICATIONS

Input signals	4 mA to 20 mA, 0 Vdc to 10 Vdc (optional RTD and Thermocouple)	
Process display	5 digit, 0.48" liquid crystal display	
Key pad	2 programmable function keys	
Power requirement	9 Vdc to 28 Vdc	
	Power consumption	10 mA typical, 95 mA with max. display intensity
Electrical connection	Screw terminals at back of case	
Memory	EEPROM	
Accuracy	<0.1% of full scale	
Humidity	<85%, non-condensing	
Vibration	5-500 Hz, 5g	
Shock	30 g	
Normal rejection mode	60 dB 50/60 Hz	
Altitude	Up to 2,000 meters	
Update rate	500 msec	
Temperature ranges	Operating	-31 °F to 167 °F (-35 °C to 75 °C)
	Effect	≤ 0.1% of full scale /18 °F (10 °C)
	Storage	-31 °F to 185 °F (-35 °C to 85 °C)
Electromagnetic rating	CE compliant to EMC norm EN 61326-1	
	RFI, EMI and ESD protection	
Environmental rating	NEMA 4X, IP65 (front of display only)	
Filtering	0.25 seconds to 1 second, selectable	
Min/Max reading	Captures and stores min/max measurement	
User inputs	1 programmable, 28 Vdc max. continuous	
Linearization	2 point	
Weight	3 oz.	
Option cards	Serial communication (RS232 or RS485)	
	Analog output (0-20 mA, 4-20 mA or 0-10 Vdc)	
	Single or Dual Relay (NPN or PNP type)	
	USB programming	

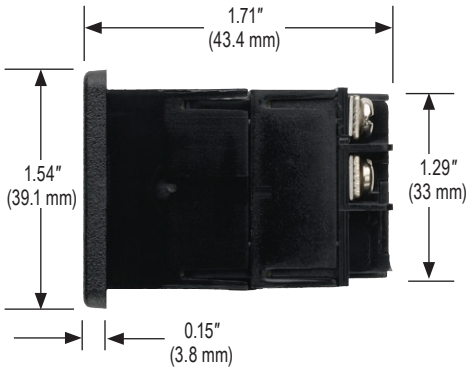
ORDERING INFORMATION						
SERIES	**1950**					
INPUT SIGNALS	**C**	Current	**V**	Voltage	**R**	Resistance
DISPLAYS	**1**	Reflective	**2**	Backlight		
OPTION CARDS	**0**	None	**2**	Dual sinking open collector	**7**	RS485 comm
	1	Single relay	**6**	RS232 comm		
OPTIONAL ENCLOSURES	**ENC1**	Black painted steel	**ENC2**	Off-white fiberglass		

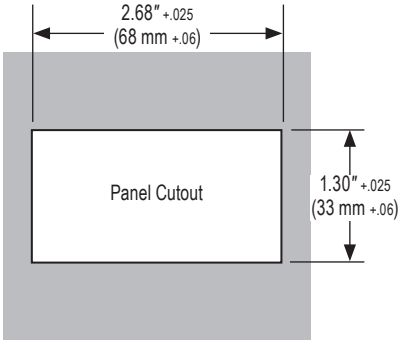
Please consult your local NOSHOK Distributor or NOSHOK, Inc. for availability and delivery information.

EXAMPLE

1950C – 1 – 1 – ENC1

Series ..... 1950 Series
Input signal ..... Current
Display ..... Reflective
Option card ..... Single relay
Option ..... Black painted steel enclosure





Smart System "Intelligent"

2000/2100 SERIES

- Accepts a variety of standard process signals and precisely scales them into any desired unit of measurement
- Single input or dual input
- Employs advanced technology for stable, drift-free readout
- Field upgradable with plug-in option cards; including 4 set point alarms, analog output and serial communication
- 16 point scaling for non-linear processes
- Max. and min. value display
- Easy menu-driven programming
- NEMA 4X/IP65 sealed front bezel
- Optional PC software available for configuration
- AC or DC input power
- Signal totalizer for batch weighing or other timed input processes
- Programmable signal response time
- Standard DIN panel cutout
- CE compliant to suppress RFI, EMI, and ESD

APPLICATIONS

- Process indication
- On/off pump controls
- Compressor controls
- Safety or shutdown alarms
- Local indication with signal
- Retransmission to computer control system

Note: See page 14-15 for more information on enclosures and option cards.

SPECIFICATIONS

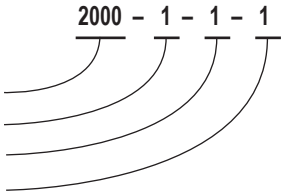
Input signals	4 mA to 20 mA, 0 Vdc to 10 Vdc (optional RTD and Thermocouple)	
Sensor excitation	Built-in 24 Vdc	
Process display	5 digit, 0.56" Red LED	
Key pad	3 programmable function keys, 5 total	
Power requirement	AC version	85 Vac to 250 Vac, 50/60 Hz, 15 VA
	DC version	11 Vdc to 36 Vdc, 11 W
Electrical connection	Screw terminals at back of case	
Memory	EEPROM	
Accuracy	<0.03% of full scale	64 °F to 82 °F (18 °C to 50 °C)
	<0.12% of full scale	32 °F to 122 °F (0 °C to 50 °C)
Humidity	<85%, non-condensing	
Vibration	5-150 Hz, 2 g	
Shock	25 g	
Normal rejection mode	60 dB 50/60 Hz	
Altitude	Up to 2,000 meters	
Update rate	200 msec	
Temperature ranges	Operating	32 °F to 122 °F (0 °C to 50 °C)
	Effect	≤ 0.1% of full scale/18 °F (10 °C)
	Storage	-40 °F to 140 °F (-40 °C to 60 °C)
Electromagnetic rating	CE compliant to EMC norm EN 61326-1 RFI, EMI and ESD protection	
Environmental rating	NEMA 4X, IP65 (front of display only)	
Filtering	0 seconds to 25 second, selectable	
Min/Max reading	Captures and stores min/max measurement	
User inputs	3 programmable, 30 Vdc max. continuous	
Totalizer	Time base	Second, minute, hour or day
	Batch	Can accumulate from user input
Linearization	2 to 16 points, selectable	
Weight	10.4 oz.	
Option cards	Serial communication (RS232 or RS485) DeviceNet communication MODBUS communication (RS485 RTU and ASCII MODBUS) Profibus communication Analog output (0-20 mA, 4-20 mA or 0-10 Vdc) Dual or Quad Relay (NPN or PNP type) USB programming	

ORDERING INFORMATION										
SERIES	**2000** (Single input)				**2100** (Dual input)					
INPUT SIGNALS	**1** 4 mA to 20 mA		**2** 0 Vdc to 5 Vdc		**4** 1 Vdc to 6 Vdc		**5** 0 Vdc to 10 Vdc		**6** 1 Vdc to 11 Vdc	
POWER REQUIREMENTS	**1** 115/230 Vac		**3** 11 Vdc to 36 Vdc							
OPTION CARDS	**0** No option card				**3** Quad NPN-OC option card		**6** RS 232-C Serial communications option card			
	1 Dual relay option card				**4** Quad PNP-OC option card		**7** RS 485 Serial communications option card			
	2 Quad relay option card				**5** Analog output option card					
OPTIONAL ENCLOSURES	**ENC1** Black painted steel									

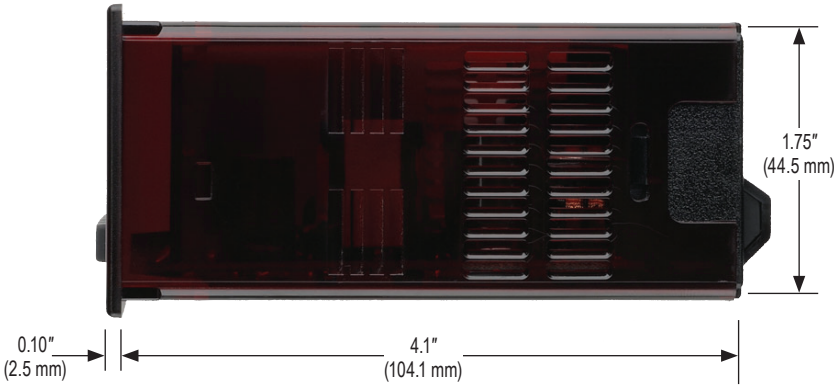
Please consult your local NOSHOK Distributor or NOSHOK, Inc. for availability and delivery information.

EXAMPLE

Series .....2000 Series
Input signal ..... 4 mA to 20 mA
Option card ..... 115/230 Vac
Option.....Dual relay option card



OPTIONAL ACCESSORIES
RS232C Mating connector
RS485 Mating connector
2000-50000 NEMA 4 enclosure



Dual Display

2200 SERIES

- Accepts a wide variety of input signals including thermocouples or RTDs, current, voltage, resistance and process signals
- Dual display with tri-color and variable intensity digits
- Universal AC/DC power input and 24 Vdc sensor excitation
- Built-in USB port for configuring with a computer
- Meter update rate up to 160/second
- Plug-in option cards available for field upgrading
- Interface software available on request

APPLICATIONS

- Pump control and monitoring
- Liquid level measurement
- Heating and cooling
- Force measurement
- Cycle counting
- Flow rate measurement

Note: See page 14-15 for more information on enclosures and option cards.

SPECIFICATIONS

Input signals	4 mA to 20 mA, 0 Vdc to 10 Vdc (optional RTD and thermocouple)	
Sensor excitation	Built-in 24 Vdc	
Process display	Upper	6 digit, 0.71", tri-color LED (red, green, orange)
	Lower	9 digit, 0.35", green LED
Key pad	2 programmable function keys, 4 total	
Power requirement	AC input	40 Vac to 250 Vac, 50/60 Hz, 20 VA
	DC input	21.6 Vdc to 250 Vdc, 8 W
Electrical connection	Screw terminals at back of case Built-in USB port for configuring with a computer	
Memory	FRAM	
Accuracy	<0.03% of full scale	64 °F to 82 °F (18 °C to 28 °C)
	<0.12% of full scale	32 °F to 122 °F (0 °C to 50 °C)
Humidity	<85%, non-condensing	
Vibration	5-150 Hz, 2 g	
Shock	25 g	
Normal rejection mode	60 dB 50/60 Hz	
Altitude	Up to 2,000 meters	
Update rate	160/sec	
Temperature ranges	Operating	32 °F to 122 °F (0 °C to 50 °C)
	Effect	≤ 0.1% of full scale/18 °F (10 °C)
	Storage	-40 °F to 140 °F (-40 °C to 60 °C)
Electromagnetic rating	CE compliant to EMC norm EN 61326-1 RFI, EMI and ESD protection	
Environmental rating	NEMA 4X, IP65 (front of display only)	
Filtering	0 seconds to 25 seconds, selectable	
Min/Max reading	Captures and stores min/max measurement	
User inputs	2 programmable, 30 Vdc max. continuous	
Totalizer	Time base	Second, minute, hour or day
	Batch	Can accumulate from user input
Linearization	2 to 16 points, selectable	
Weight	8 oz.	
Option cards	Serial communication (RS232 or RS485) DeviceNet communication MODBUS communication (RS485 RTU and ASCII MODBUS) Profibus communication Analog output (0-20 mA, 4-20 mA or 0-10 Vdc) Dual or Quad Relay (NPN or PNP type) USB programming	

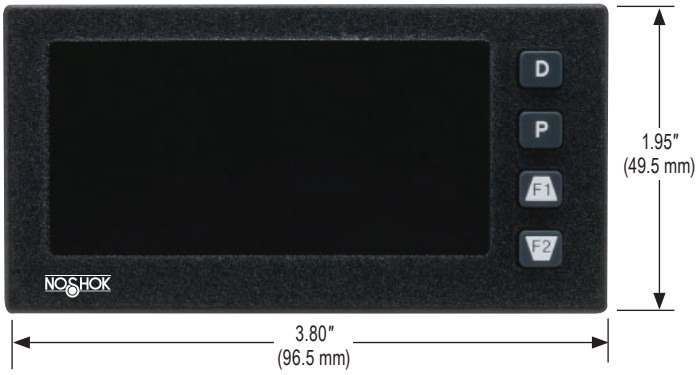
ORDERING INFORMATION					
SERIES	**2200**				
INPUT SIGNALS	**1**	4 mA to 20 mA	**6**	1 Vdc to 11 Vdc	**E** Thermocouple Type E
	2	0 Vdc to 5 Vdc	**J**	Thermocouple Type J	**PT1** RTD PT100
	4	1 Vdc to 6 Vdc	**K**	Thermocouple Type K	
	5	0 Vdc to 10 Vdc	**T**	Thermocouple Type T	
POWER REQUIREMENTS	**4**	40 Vac to 250 Vac/21.6 Vdc to 250 Vdc			
OPTION CARDS	**0**	No option card	**3**	Quad NPN-OC option card	**6** RS 232-C Serial communications option card
	1	Dual relay option card	**4**	Quad PNP-OC option card	**7** RS 485 Serial communications option card
	2	Quad relay option card	**5**	Analog output option card	
OPTIONAL ENCLOSURES	**ENC1**	Black painted steel			

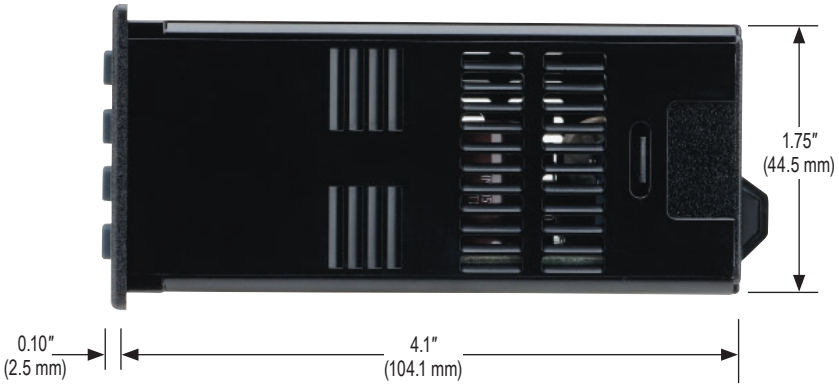
Please consult your local NOSHOK Distributor or NOSHOK, Inc. for availability and delivery information.

EXAMPLE

2200 – PT1 – 4 – 1 – ENC

Series .....2200 Series
Input signal .....RTD PT100
Power requirement..... 40 Vac to 250 Vac/21.6 Vdc to 250 Vdc
Option card .....Dual relay option card
Option.....NEMA 4 Enclosure





Options & Accessories

BACKLIGHT & DISPLAY

- Available for 1900 Series
- Green backlight and red backlight versions available
- Display options shown to the right

Green backlight version
1900C-3

Red backlight version
1900C-4

1900C-3/1900C-4: Loop-powered display with backlight power supply

1900C-1/1900C-2: Loop-powered

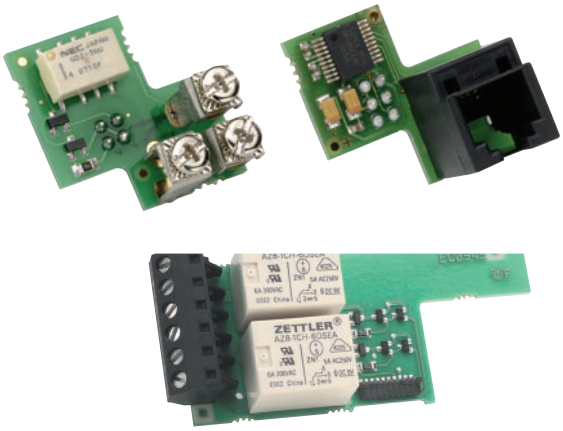
ENCLOSURES

- Black painted steel enclosures are available for the 1950, 2000/2100 and 2200 series. Off-white fiberglass enclosures are available for the 1950 Series.
- NEMA 4X/IP65 enclosures (sealed bezel only) standard on 1950 & 2000/2100 Series

OPTION CARDS

- Plug-in cards are available options for the 1950 Series, that provide alarm and setpoint relay outputs, analog and digital outputs, including RS 232-C and RS 485 functions.
- RS232 Comm, single relay, RS485 comm, dual sinking open collector option cards available for 1950 Series
- Dual relay, quad relay, quad NPN-OC, quad PNP-OC, analog output, RS232-C serial communications and RS 485 serial communications options cards available for 2000/2100 Series

OPTION CARDS	
Relay option card	Type: single FORM-C relay Isolation to sensor & user input commons: 1400 Vrms for 1 min. Working voltage: 150 Vrms Contact rating: 1 amp @ 30 Vdc resistive; 0.3 amp @ 125 Vac resistive Life expectancy: 100,000 minimum operations Response time: Turn on time: 4 msec max. Turn off time: 4 msec max.
Communications option card	RS485 multi-point balanced interface (non-isolated) Baud rate: 300 to 38.4k Data Format: 7/8 bits; odd, even, or no parity Bus address: 0 to 99; max 32 meters per line Transmit delay: Selectable RS232 half duplex (non-isolated) Baud rate: 300 to 38.4k Data format: 7/8 bits; odd, even, or no parity
Dual sinking output option card	Non-isolated switched DC, N channel open drain MOSFET Current rating: 100 mA max. VDS ON: 0.7 V @ 100 mA VDS MAX: 30 Vdc Offstate leakage current: 0.5 mA max.
Dual relay option card	Two FORM-C relays. Rating: One relay energized; 5 amps @ 120/240 Vac115/230 Vac or 28 Vdc (resistive load), 1/8 HP @ 120 Vac, inductive load. Total current not to exceed 5 amps with both relays energized
Quad relay option card	Four FORM-A relays. Rating: One relay energized; 3 amps @ 240 Vac or 30 Vdc (resistive load), 1/10 HP @ 120 Vac, inductive load. Total current not to exceed 4 amps with all four relays energized
Analog output option card	0 mA to 20 mA, 4 mA to 20 mA or 0 Vdc to 10 Vdc retransmitted signal
Quad NPN-OC option card	4 isolated open collector sinking transistors, 100 mA at maximum 30 Vdc
Quad PNP-OC option card	4 isolated open collector sourcing transistors, 24 Vdc with 30 mA total maximum
Communication option cards	RS232C or RS485

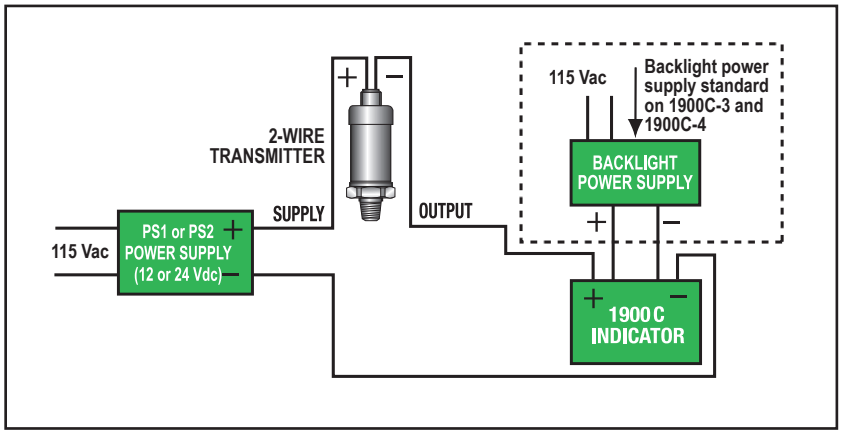


Typical plug-in option card with on board terminals

AC TO DC RETROFIT PACKAGE

- Easily integrates with non-metallic seal and transmitter/switch assemblies to operate with 110/240 VAC systems
- Solid state relay - 10A at 250 VAC
- DIN rail mountable with NEMA 4X enclosure

1900 SERIES WIRING DIAGRAM



Typical wiring for the 1900C including the optional backlight feature. .

NOTES

NOTES

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