

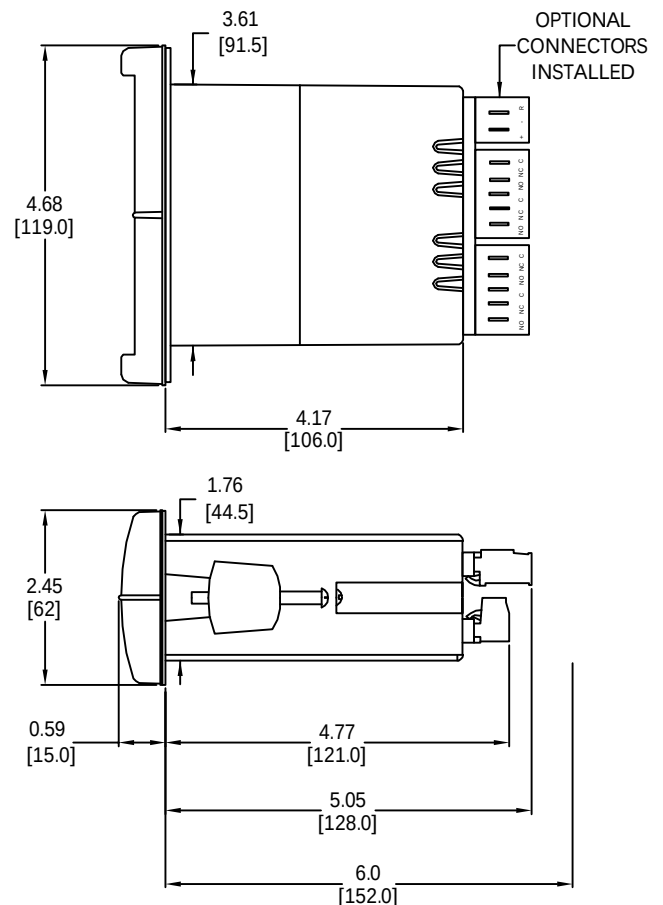
The G4610 is a full-featured multipurpose, easy-to-use digital strain gauge & load cell meter ideal for weight and force measurement applications.



FEATURES

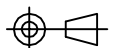
- 15, 30, 150, 300 mV Unipolar Input Ranges.
- ± 15 , ± 25 , ± 150 , ± 250 mV Bipolar Input Ranges.
- Selectable 5 or 10 VDC Sensor Excitation.
- Supports up to twelve (12) 350 Ω Load Cells (Minimum Load Resistance of 28 Ω).
- Capture or Programmable Tare Feature.
- Auto-Zero Feature Eliminates Zero Drift.
- Ratiometric Operation.
- Max/Min or Peak/Valley Hold Feature.
- Large Dual-Line 6-Digit Display, 0.60" & 0.46".
- Dual-Scale Feature – Single Input.
- Rounding Function 1, 2, 5, 10, 20, 50, or 100.
- Programmable Display & Function Keys.
- 32-Point Linearization.
- NEMA 4X, IP65 Front.
- Input Power Options Include 85-265 VAC or 12/24 VDC.
- 2 or 4 Relays + Isolated 4-20 mA Output Options.
- External 4-Relay & Digital I/O Expansion Modules.
- USB, RS-232, & RS-485 Serial Communication Options.
- Modbus® RTU Communication Protocol Standard
- Configure, Monitor, and Datalog from a PC with Free MeterView® Pro Software.

OUTLINE DIMENSIONS



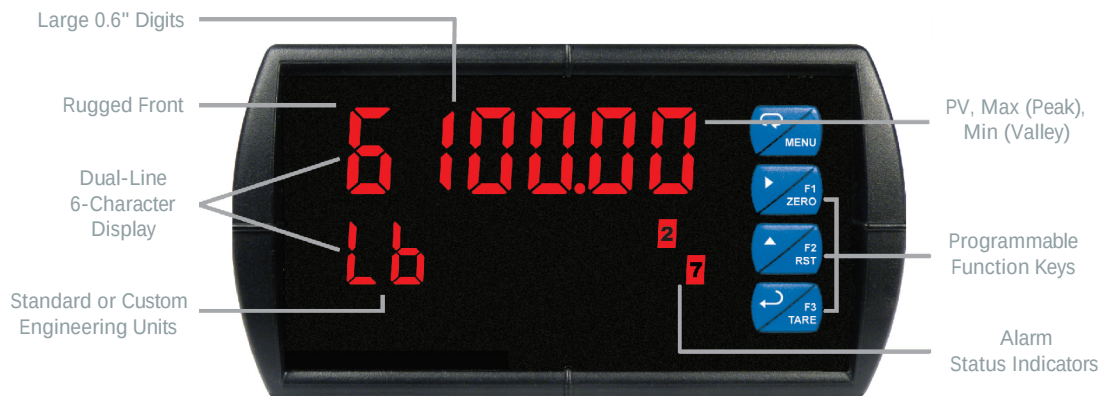
Notes:

1. Panel cutout required: 1.772" x 3.622" (45 mm x 92 mm)
2. Panel thickness: 0.040 - 0.250" (1.0 mm - 6.4 mm)
3. Mounting brackets lock in place for easy mounting
4. Clearance: Allow 6" (152 mm) behind the panel



Strain Gauge, Load Cell & mV Meter

G4610



KEY FEATURES

Precise, Accurate, and More Informative

The large 0.6" upper display provides a highly accurate and precise 6-digit view of the process measurement. Its 24-bit A/D is accurate to $\pm 0.03\%$ of calibrated span ± 1 count.

Configurable

The upper display can be programmed to indicate PV, maximum (peak), minimum (valley), alternating maximum/minimum, one of eight alarm set points, or Modbus input. The lower display can also be configured to display engineering units, set points, user defined legends, or simply turned off.

Function Keys

There are three function keys available to the user. These keys can be programmed to trigger certain events (e.g. tare the display, reset the tared display, zero the displayed value, acknowledge alarm states, etc.), provide direct menu access points, and more.

Rugged

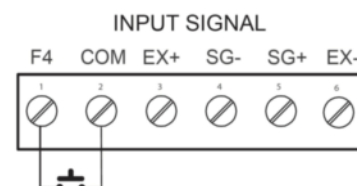
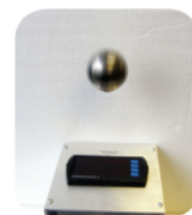
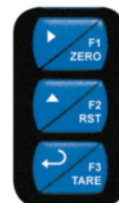
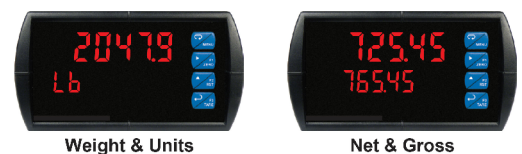
A unique front panel design makes the G4610 nearly impenetrable in typical applications. Here, the G4610 easily survives a direct hit on the display from a heavy 2" solid stainless steel ball dropped from a height of eight feet.

Optional SunBright Display Models

The G4610's SunBright display models have an extraordinarily bright LED display. They are perfect for applications where the meter is in direct sunlight or in applications where visibility may be impaired by smoke, fog, dust, or distance. Option is available on all G4610 models.

On-Board Digital Input

The G4610 includes a digital input as a standard feature. This digital input can operate with the tare, reset tare, or interlock relays feature, force relays on from a signal from a PLC or relay on other equipment, and much more. This is ideal for installations where the meter is inaccessible behind a cover, or where an additional function key is needed for customized operation.



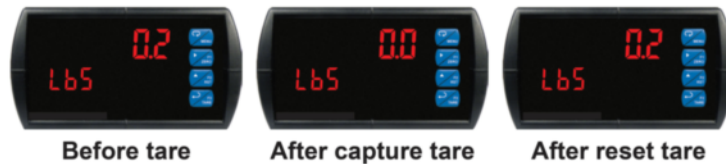
Strain Gauge, Load Cell & mV Meter G4610

Zero the Meter

The zero function zeroes out the display. In the case where there has been drift in the strain gauge output over time, zero is used to eliminate this drift and provide a true zero reading. For example, if an empty scale were to display a value other than zero, the zero function would tell the meter to show zero regardless of the current input signal.

Capture Tare

The tare function also zeroes out the display. In the case of scale weight, tare is used to eliminate container weight and provide net weight readings. If the tare value is a known constant, such as a container weight, this may be programmed in manually. The captured tare may be reset manually with any function key or digital input.



Automatic Unit Conversion

In addition to entering a custom unit or tag, pre-defined engineering units may be selected: lb, kg, ounce, gram, ton (short), tonne (metric ton). Automatic unit conversions are done when switching between pre-defined units, without the need for additional scaling. The meter converts the reading according to the unit selected (e.g. 100.00 lb = 45.36 kg = 45359.2 g = 1600 oz).

Auto-Zero

The auto-zero feature corrects for drift that can occur over time that causes the input signal to slowly change. The meter will continue to read zero despite slow and small changes to the input signal around zero. The auto-zero sensitivity is set by the user as a percent of full scale.

Rounding

The rounding feature is used to give the user a steadier display with fluctuating signals. It causes the display to round to the nearest value according to the rounding value selected (1, 2, 5, 10, 20, 50, or 100). For example, with a rounding value of 10, and an input of 12346, the display would indicate 12350.

Shunt Calibration Check

The G4610 is equipped with a means of simulating strain in a strain gauge bridge circuit, via an included shunt resistor in the meter. This technique can be used as a means of verifying the meter setup and output behavior by simulating a physical input. With no load connected, the enabling of the shunt resistor will simulate a 70% full scale load in the case of a 350Ω Strain Bridge.

Ratiometric Compensation

This feature compensates for changes in the strain gauge input signal that are due to variations in the internal or external excitation voltage. The compensation is effective for up to $\pm 5\%$ variation in the excitation power supply.

Dual-Scale Display Feature

The G4610 has a rather unique, and very flexible dual-scale capability; a second scaled display can represent the measured input in a different form (i.e. gallons & height). This is of particular value in level applications. Please see the examples shown below. Both displays are independently scaled and are based on the 4-20 mA input signal. Beyond level, this function has been used for pressure & force, weight & piece count, feet & meters, and more.



Advanced Linearization Capability

The includes a 32-point linearizer. In non-linear level applications (i.e. some pumping or lift stations), it can easily compensate for submerged equipment or plumbing that displace usable volume. A second independent 8-point linearizer is available for a second scaled display (PV2) when the dual scale feature is enabled. The free MeterView Pro PC-based software greatly simplifies the construction of the linearization tables. The software can save this data to the meter and/or PC.

Group Four Transducers

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Strain Gauge, Load Cell & mV Meter

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DIGITAL COMMUNICATIONS

Modbus® RTU Serial Communications

With the purchase of a serial communication adapter, The G4610 meter can communicate with any Modbus Master device using the ever-popular Modbus communications protocol that is included in every G4610 meter. This greatly increases the flexibility of the meter. Modbus provides much more capability than read PV and write set points. Below are some examples of other things that can be done with The G4610's Modbus communications.

- Send a 6-character message to the lower display upon an event
- Convert a digital value to a 4-20 mA signal
- Remote user control (i.e. change set points, acknowledge alarms)
- Input a Modbus digital PV (in place of analog input)
- Remote override of any, or all, relays and analog outputs



Modbus PV Input



Remote Message

Meter Copy

The Copy feature is used to copy (or clone) all the settings from one G4610 to other G4610 meters in about 20 seconds! The Copy function is a standard feature on all meters. It does not require a communications adapter, only an optional cable assembly, P/N PDA1200. See part numbers section for complete details.



FIELD EXPANSION MODULES

Add functionality to the G4610 in the field with easy-to-install external expansion modules. Add USB, RS-232, or RS-485 communications, I/O modules (up to 2), and 4-relay expansion module. The menu items for these modules do not appear until the module is connected, simplifying the basic menu. See part numbers section for details.



METERVIEW® PRO SOFTWARE

Configure, monitor, and datalog a G4610 strain gauge meter from a PC using MeterView Pro Software.

OUTPUTS

Relay Outputs

The G4610 has up to four 3 A Form C relays (SPDT) with multiple power loss fail-safe options. Relays can be configured for proper protective action upon input loop break. Relay ON and OFF delay times are user adjustable. Up to eight front panel indicators show alarm and/or relay state. All relays can be configured for 0-100% deadband.

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Relay Operation/Configuration

There are powerful relay functions that can be configured in the G4610 strain gauge meter, including:

- Automatic reset only (non-latching)
- Automatic + manual reset at any time (non-latching)
- Latching (manual reset only)
- Latching with clear (manual reset only after alarm condition has cleared)
- Pump alternation control (automatic reset only)
- Sampling (activated for a user-specified time)
- User selectable fail-safe operation
- Relay action for loss (break) of 4-20 mA input signal
- Time delay (on and off), independent for each relay
- Manual control mode
- Interlock relay mode

Analog Output

The isolated analog retransmission signal can be configured to represent the process variable (PV), maximum (peak) value, minimum (valley) value, the value for any of the eight relay set points, or Modbus input. While the output is nominally 4-20 mA, the signal will accurately accommodate under- and over-ranges from 1 to 23 mA.

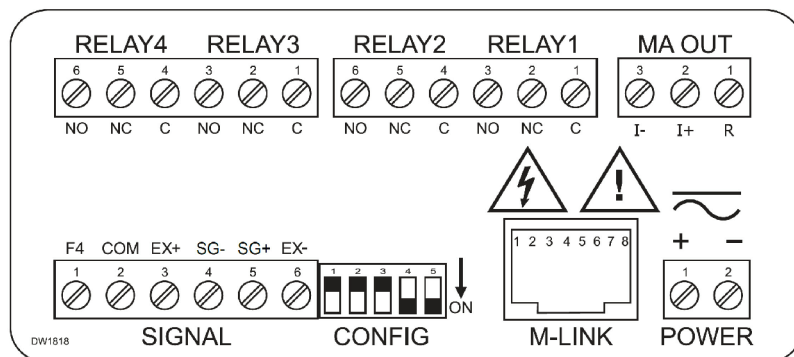
Manual Output Control

Take control of any output with this feature. All relays can be forced ON or OFF, and the 4-20 mA output signal can be set to any value within its range. When the relays and 4-20 mA output are controlled manually, an LED labeled "M" is turned on and the associated Alarm LEDs (1-8) flash every 10 seconds indicating that the meter is in manual control mode.

Isolated Transmitter Power Supplies

A powerful isolated power supply is a standard feature on the G4610 meter. It can be configured for 5, 10 (default), or 24 V (not to be used with strain gauge or load cell) by means of a simple internal jumper (see manual). An additional power supply (24 V @ 40 mA) is standard with the 4-20 mA output option.

CONNECTIONS



Strain Gauge, Load Cell & mV Meter

G4610

SPECIFICATIONS

Model	G4610
General	
Display	Upper display: 0.60" (15 mm) high. Lower display: 0.46" (12 mm) high. Both are 6 digits (-99999 to 999999), red LEDs.
Display Intensity	Eight intensity levels
Display Update Rate	5/second (200 ms)
Overrange	Display flashes 999999
Underrange	Display flashes -99999
Display Assignment	The displays may be assigned to PV1, PV2, PCT, max & min, set points, PV & units, units (lower display only), net & gross weight, Modbus input, and display millivolts.
Units	lb, kg, ounce, gram, ton, metric ton (tonne), custom units.
Front Panel	NEMA 4X, IP65
Programming Methods	Four front panel buttons, digital inputs, PC and MeterView Pro software, Modbus registers, or cloning using Copy function.
F4 Digital Input Contacts	3.3 VDC on contact. Connect normally open contacts across F4 to COM.
F4 Digital Input Logic Levels	Logic High: 3 to 5 VDC, Logic Low: 0 to 1.25 VDC
Noise filter	Programmable from 2 to 199 (0 will disable filter)
Filter Bypass	Programmable from 0.1 to 99.9% of calibrated span
Rounding	Select 1, 2, 5, 10, 20, 50, or 100 (e.g. rounding = 10, value = 123.45, display = 123.50).
Recalibration	All ranges are calibrated at the factory. Recalibration is recommended at least every 12 months.
Max/Min Display	Max/min readings reached by the process are stored until reset by the user or until power to the meter is cycled.
Password	Three programmable passwords restrict modification of programmed settings.
Non-Volatile Memory	All programmed settings are stored in nonvolatile memory for a minimum of ten years if power is lost.
Power Options	85-265 VAC 50/60 Hz, 90-265 VDC, 20 W max, or jumper selectable 12/24 VDC $\pm 10\%$, 15 W max.
Fuse	Required external fuse: UL Recognized, 5 A max, slow blow; up to 6 meters may share one 5 A fuse.
Isolated Transmitter Power Supply	Terminals P+ & P-: 10 VDC or 5 VDC $\pm 10\%$.12/24 VDC powered models selectable for 24 (should not be used for strain gauge/load cell), 10, or 5 VDC supply (internal jumper J4). (G4610): 85-265 VAC models rated @ 200 mA max, 12/24 VDC powered models rated @ 100 mA max, @ 50 mA max for 5 or 10 VDC supply. Note: Do not use 24 VDC to power strain gauge bridge
Normal Mode Rejection	Greater than 60 dB at 50/60 Hz
Isolation	4 kV input/output-to-power line. 500 V input-to-output (powered by external supply).
Overvoltage Category	Installation Overvoltage Category II: Local level with smaller transient overvoltages than Installation Overvoltage Category III.
Environmental	PROVU Series (G4610): Operating temperature range: -40 to 65°C Storage temperature range: -40 to 85°C Relative humidity: 0 to 90% non-condensing
Connections	Removable screw terminal blocks accept 12 to 22 AWG wire, RJ45 for external relays, digital I/O, and serial communication adapters.
Enclosure	1/8 DIN, high impact plastic, UL 94V-0, color: black
Mounting	1/8 DIN panel cutout required: 3.622" x 1.772" (92 mm x 45 mm). Two panel mounting bracket assemblies are provided.
Tightening Torque	Screw terminal connectors: 5 lb-in (0.56 Nm)
Dimensions	4.68" x 2.45" x 5.64" (119 mm x 62 mm x 143 mm) (W x H x D)
Weight	9.5 oz (269 g)
Warranty	3 years

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Strain Gauge, Load Cell & mV Meter

G4610

SPECIFICATIONS

Strain Gauge Input		
Inputs	Field selectable: 0-15, 0-30, 0-150, 0-300 mV, ±15, ±25, ±150, ±250 mV, or Modbus PV (Slave)	
Accuracy	±0.03% of calibrated span ±1 count	
Minimum Load Resistance	28 Ω @ 5 V or 10 V	
Maximum Excitation Current	350 mA @ 5 V or 10 V	
Temperature Drift	0.002% of calibrated span/°C max from 0 to 65°C ambient, 0.005% of calibrated span/°C max from -30 to 0°C ambient	
Function	Linear with multi-point linearization	
Low-Flow Cutoff	0-999999 (0 disables cutoff function)	
Decimal Point	Up to five decimal places or none: d.ddddd, dd.dddd, ddd.ddd, dddd.dd, ddddd.d, or ddddddd.	
Calibration Range	Input Range	Minimum Span Input 1 & Input 2
	15 mV	0.2 mV
	25 mV, 30 mV	0.4 mV
	150 mV	2.0 mV
	250 mV, 300 mV	4.0 mV
An Error message will appear if the input 1 and input 2 signals are too close together.		
Input Impedance	Voltage ranges: greater than 1 M Ω.	
Relays		
Rating	2 or 4 SPDT (Form C) internal and/or 4 SPST (Form A) external; rated 3 A @ 30 VDC and 125/250 VAC resistive load; 1/14 HP (~ 50 watts) @ 125/250 VAC for inductive loads.	
Noise Suppression	Noise suppression is recommended for each relay contact switching inductive loads.	
Deadband	0-100% of span, user programmable	
High or Low Alarm	User may program any alarm for high or low trip point. Unused alarm LEDs and relays may be disabled (turned off).	
Relay Operation	automatic (non-latching), latching (requires manual acknowledge), sampling (based on time), pump alternation control (2 to 8 relays), Off (disable unused relays and enable interlock feature, manual on/off control mode).	
Relay Reset	User selectable via front panel buttons or digital inputs. 1. Automatic reset only (non-latching), when input passes the reset point. 2. Automatic + manual reset at any time (non-latching). 3. Manual reset only, at any time (latching). 4. Manual reset only after alarm condition has cleared (latching). Note: Front panel button or digital input may be assigned to acknowledge relays programmed for manual reset.	
Time Delay	0 to 999.9 seconds, on & off relay time delays. Programmable and independent for each relay.	
Fail-Safe Operation	Programmable and independent for each relay. Note: Relay coil is energized in non-alarm condition. In case of power failure, relay will go to alarm state.	
Auto Initialization	When power is applied to the meter, relays will reflect the state of the input to the meter.	
Serial Communications		
Protocol	Modbus® RTU	
Slave ID	1 - 247 (Meter address)	
Baud Rate	300 - 19,200 bps	
Transmit Time Delay	Programmable between 0 and 199 ms or transmitter always on for RS-422 communication	
Data	8 bit (1 start bit, 1 or 2 stop bits)	
Parity	Even, odd, or none with 1 or 2 stop bits	
Byte-to-Byte Timeout	0.01 - 2.54 seconds	
Turn Around Delay	Less than 2 ms (fixed)	

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Strain Gauge, Load Cell & mV Meter

G4610

SPECIFICATIONS

Isolated 4-20 mA Transmitter Output				
Output Source	Process variable (PV), max, min, set points 1-8, manual control setting, or Modbus input			
Scaling Range	1.000 to 23.000 mA for any display range			
Calibration	Factory calibrated: 0.00 to 100.0 = 4-20 mA output			
Analog Output Programming	1.000 mA minimum and 23.000 mA maximum for all parameters: Overrange, underrange, max, min, and break			
Accuracy	± 0.1% of span ± 0.004 mA			
Temperature Drift	0.4 µA/°C max from 0 to 65°C ambient, 0.8 µA/°C max from -40 to 0°C ambient Note: Analog output drift is separate from input drift.			
Isolated Transmitter Power Supply	Terminals I+ & R: 24 VDC ± 10% . May be used to power the 4-20 mA output or other devices (except load cell/strain gauge). (G4610): All models rated @ 40 mA max.			
External Loop Power Supply	35 VDC maximum			
Output Loop Resistance	Power supply	Minimum	Maximum	
	24 VDC	10 Ω	700 Ω	
	35 VDC (external)	100 Ω	1200 Ω	
Digital I/O Expansion Module				
Channels	4 digital inputs & 4 digital outputs per module			
System	Up to 2 modules for a total of 8 inputs & 8 outputs			
Digital Input Logic	High: 3 to 5 VDC Low: 0 to 1.25 VDC			
Digital Output Logic	High: 3.1 to 3.3 VDC Low: 0 to 0.4 VDC			
Source Current	10 mA maximum			
Sink Current	1.5 mA minimum			
+5 V Terminal	To be used as pull-up for digital inputs only.			
4-Relay Expansion Module				
Relays	Four Form A (SPST) rated 3 A @ 30 VDC and 125/250 VAC resistive load; 1/14 HP (≈ 50 watts) @ 125/250 VAC for inductive loads.			

Except where noted all specifications apply to operation at +25°C.

PART NUMBERS

Standard Models		SunBright Display Models		Options Installed
85-265 VAC Model	12/24 VDC Model	85-265 VAC Model	12/24 VDC Model	
G4610-6R0	G4610-7R0	G4610-6H0	G4610-7H0	None
G4610-6R2	G4610-7R2	G4610-6H2	G4610-7H2	2 Relays
G4610-6R3	G4610-7R3	G4610-6H3	G4610-7H3	4-20 mA Output
G4610-6R4	G4610-7R4	G4610-6H4	G4610-7H4	4 Relays
G4610-6R5	G4610-7R5	G4610-6H5	G4610-7H5	2 Relays & 4-20 mA Output
G4610-6R7	G4610-7R7	G4610-6H7	G4610-7H7	4 Relays & 4-20 mA Output

ACCESSORIES

Model	Description
PDA1002	DIN Rail Mounting Kit for Two Expansion Modules
PDA1004	4-Relay Expansion Module
PDA1044	4 Digital Inputs & 4 Digital Outputs Module
PDA1200	Meter Copy Cable
PDA1232	RS-232 Serial Adapter
PDA1485	RS-422/485 Serial Adapter

Model	Description
PDA7485-I	RS-232 to RS-422/485 Isolated Converter
PDA7485-N	RS-232 to RS-422/485 Non-Isolated Converter
PDA8008	USB Serial Adapter
PDA8232-N	USB to RS-232 Non-Isolated Converter
PDA8485-I	USB to RS-422/485 Isolated Converter
PDA8485-N	USB to RS-422/485 Non-Isolated Converter
PDX6901	Suppressor (snubber): 0.01 $\mu\text{F}/470 \Omega$, 250 VAC

Dimensions and specifications subject to change without notice



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