

PD9000 ConsoliDator+

Multivariable Controller



ConsoliDator+



PD9000 Installed in a PDA2909 Enclosure



Panel Mount

MULTI-CHANNEL CONTROLLER

- NEMA 4X Panel Mount Multi-Channel Controller
- Convenient Display, Control, & Alarm of Multiple 4-20 mA & Pulse Inputs
- Numeric & Bargraph Color Display (320 x 240 px) 5.7" (145 mm)
- Sunlight Readable Display, White Backlight
- Isolated 24 VDC Transmitter Supplies 200 mA / Analog Input; 1,600 mA Max
- 99 Channels, 32 Totalizers, 32 Timers, & 199 Modbus Slave Inputs
- 64 High & Low Alarms, Combine Multiple Alarms Into Logic AND & OR Alarms
- Simulation & Manual Control Modes for Testing Setup
- Modular Design for Input & Output Flexibility
- Up to (28) 4-20 mA Isolated Inputs or Pulse Inputs
- Up to (25) 10 Amp Form C Relays (With Eight Analog or Pulse Inputs)
- Up to (25) Isolated 4-20 mA Outputs (With Eight Analog or Pulse Inputs)
- Operating Temperature Range: -40 to 60°C (-40 to 140°F)
- Pulse, Analog, & Modbus Input Flow Rate / Total / Grand Total Capability
- 50-Point Linearization, Square Root, and Exponent for Open Channel Flow
- Round Horizontal Tank Volume Calculation; Just Enter Diameter & Length
- Multi-Pump Alternation Control or Simple On / Off Control
- Programmable Displays, Function Keys & Digital Inputs
- Math Functions: Sum, Diff, Average, Multiply, Divide, % Efficiency, & More
- Direct Modbus PV Inputs - Slave Mode
- Customize Modbus Outputs to Read Multiple Registers in One Block
- RS-485 Serial Communication with Modbus RTU
- Field Selectable Input Power: 85-264 VAC or 24 VDC
- (20) Screens with up to Eight PVs Each
- Automatic or Manual Scanning
- ConsoliDator+ Configuration Software
- NEMA 4 Field Mount Enclosure Accessory
- Light / Horn & Control Station Accessory for Remote Operation
- 3-Year Warranty

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DIGITAL** ÷

PRECISION DIGITAL CORPORATION

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PD9000 Multi-Channel Controller

OVERVIEW

The ConsoliDator+ is a multi-channel controller that is both easy to use and satisfies a wide variety of process display, alarm and control applications. It accepts 4-20 mA inputs, flow meter pulse inputs, digital inputs, and Modbus RTU inputs and displays them both in numeric and bargraph format on a large, 5.7" color display. It can be equipped with multiple relays with user-definable actions, 4-20 mA outputs, digital outputs, Modbus RTU, and Ethernet Modbus TCP/IP protocol communication capabilities. Additionally, the controller is equipped with up to 32 timers that can be used to control many processes or events.

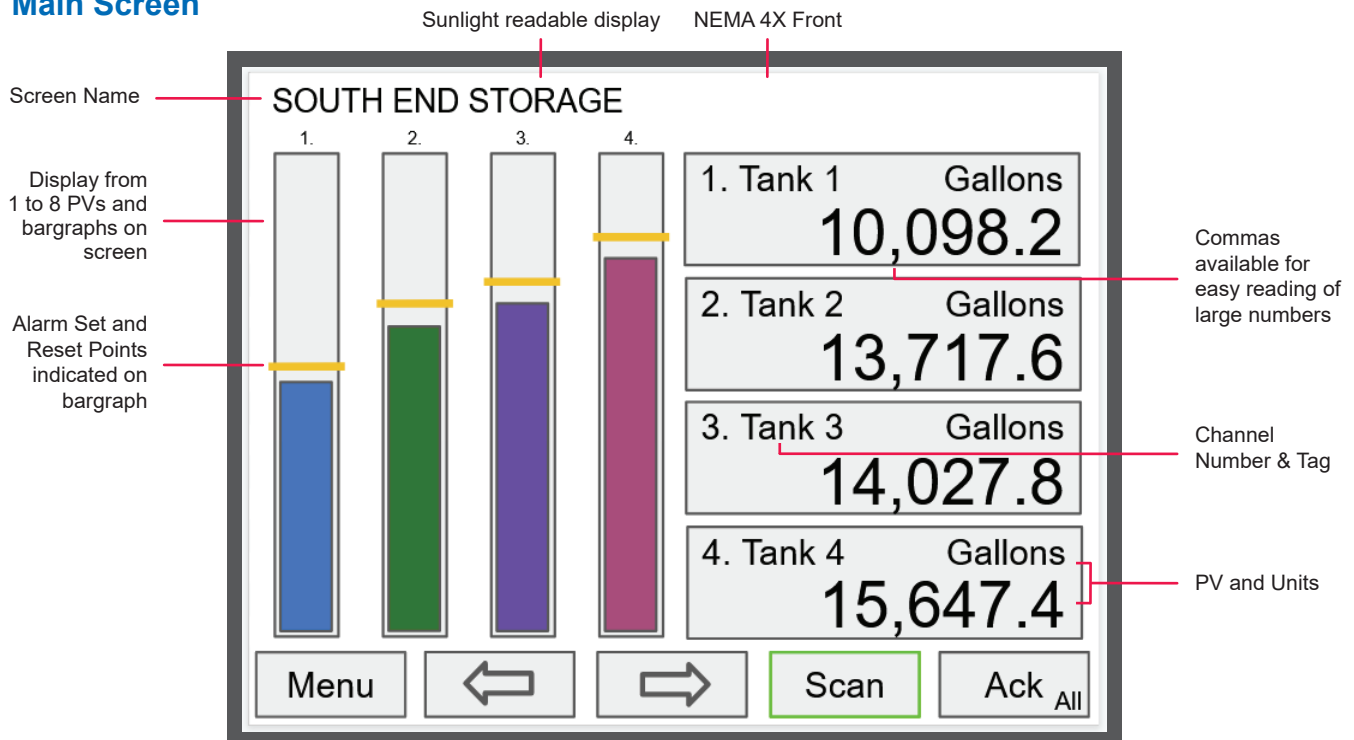
The ConsoliDator+ takes full advantage of its color display by allowing the user to customize screen colors for bargraphs, alarm conditions, and input channels.

All this functionality is easily programmed using free software or via the front panel pushbuttons. Choose the model that best suits your application, from monitoring only to fully loaded controllers with an extensive combination of inputs, outputs and communication protocols. The standard product offering is listed in the ordering guide and other models are available for special order.

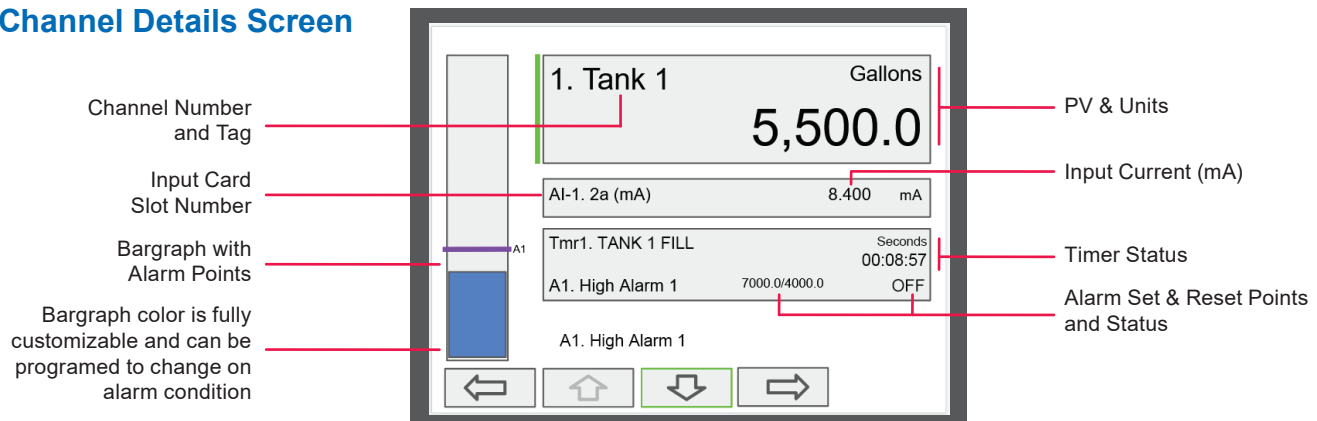
SCREENS

The ConsoliDator+ can be programmed to display the data on up to 20 different screens in a variety of formats and colors, with and without bargraphs. The following screens show a typical main screen and channel details screen:

Main Screen



Channel Details Screen



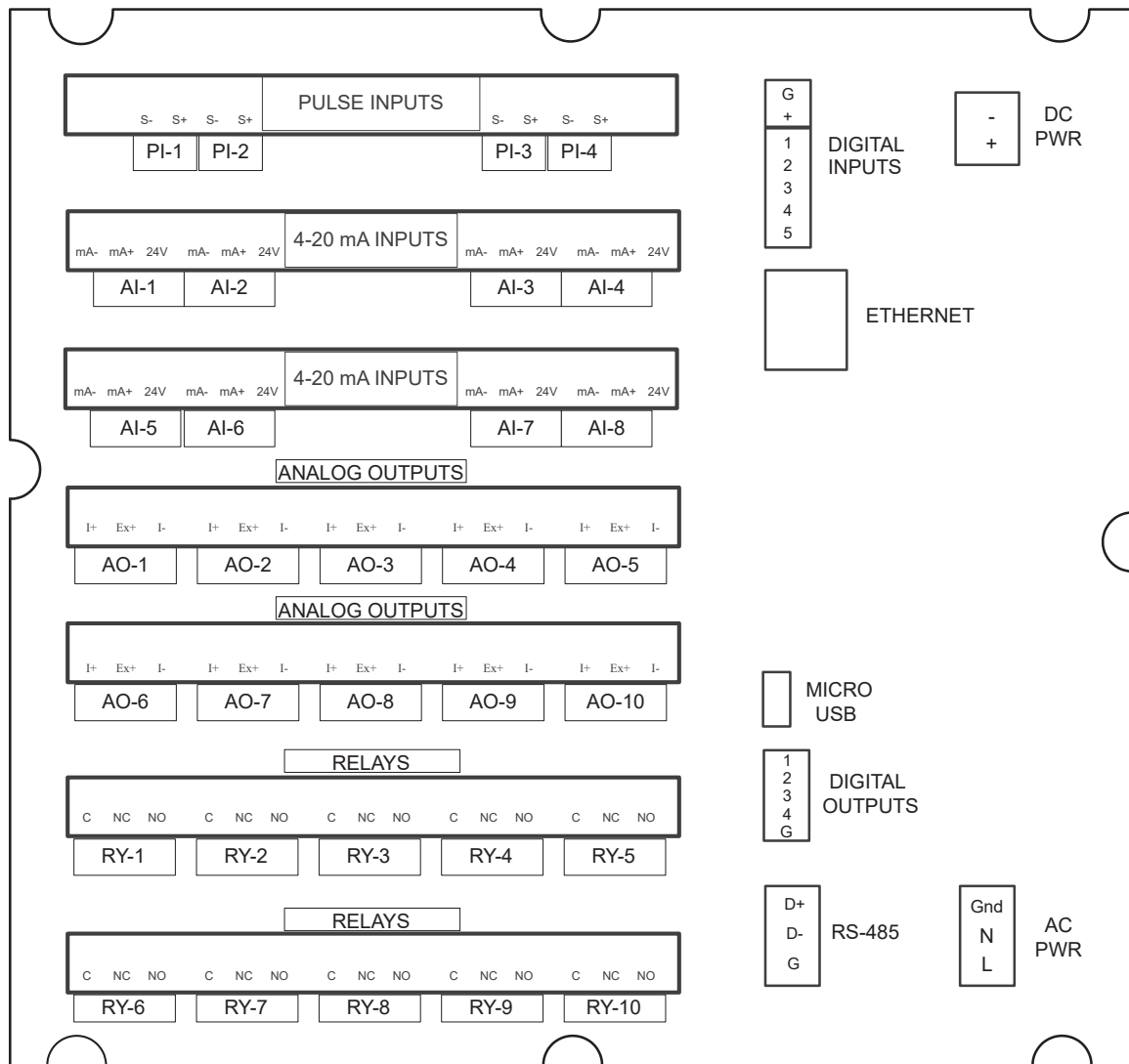
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INPUTS & OUTPUTS

The back panel is labeled with the I/O boards that were installed at the factory. The removable connectors are labeled with the connection signal for each terminal. The following diagram shows what the back of the model PD9000-GP-4PI-8AI-10AO-10RY looks like. This model accepts (4) pulse and (8) analog inputs and has (10) 4-20 mA outputs and (10) relays. (5) digital inputs, (4) digital outputs, RS-485 serial capability and USB connections are standard on all ConsoliDator+ models. Ethernet is an option.

If all Input / Output slots are used exclusively for one function, the ConsoliDator+ can accept up to (28) isolated 4-20 mA inputs, (28) pulse inputs, (25) isolated 4-20 mA outputs, and (25) relays. If used as a Modbus slave only: (35) 4-20 mA outputs, (30) relays.

All units can be powered from AC or DC; both power connections can be used at the same time. The DC power supply can serve as backup power if the voltage is 24 V or less, otherwise the controller will run on DC power.



Notes:

1. Each 4-20 mA input has its own isolated 24 VDC power supply to power the transmitter.
2. Each 4-20 mA output has its own isolated 24 VDC power supply to power the output loop.
3. Each relay is Form C and rated at 10 A.
4. Input / output connections are made to removable screw connectors.
5. Every ConsoliDator+ has five digital inputs (additional digital inputs can be obtained by using the Pulse Inputs).
6. Every ConsoliDator+ has four digital outputs.
7. Every ConsoliDator+ has RS-485 with Modbus.
8. All ConsoliDator+ models can be powered from either AC or DC Power.
9. Ethernet with Modbus TCP is an option.
10. Micro USB is used for programming the ConsoliDator+.

SETTING CHANNEL PARAMETERS

What makes the ConsoliDator+ easy to program is its intuitive setup screens. As shown in the first image below, the setup screen allows you to see all the relevant information you need when creating or editing a channel - all on one screen! When creating a new channel, the channel number is auto-generated for you. All you have to do is populate the appropriate fields such as the channel tag name, function, input, and units. Scaling the inputs and outputs, selecting number of decimals, and turning the bargraph on/off and inputting its values are also programmed from this screen. Multiple colors can also be selected for the text, background and bargraphs to customize the look of the display screens. During programming, the soft keys will change based on the screen in place. For instance, pressing the edit key will bring up the letters/numbers key pad and appropriate navigation keys will appear (Shown in the bottom image). See the PD9000 manual for details on setup and programming.

Auto-Generated Channel #: User-editable to re-order channels

Channel Tag: User editable

Color Pattern Select: Select color for text, background, and bargraph

Function: Applied to input source

Input: Source for channel

Units: Engineering / time or none

Decimals: Number of decimals for PV

Scale: Enter input and output values

Cutoff: PV goes to zero below the cutoff value

Display Bargraph: Display on screen

Bargraph Scale: Set the 0 and 100% values

Soft Keys: Change based on the screen in place

Channel 13: Flow #30, Function: Scale Linear 2-Pt, Input: AI-1. 2a (mA), Units: Gallons/min, Decimals: 0, Scale: Input (mA) 1. 4.000, 2. 20.000, Output (Gallons/min) 0, 30000, Cutoff: 0 Gallons, Colors 1, Bargraph, 0%: 0, 100%: 30000

Numbers Key Pad Button: pressing this will bring up the numbers key pad

Text / Numbers Input Field

Letter and Numbers Key Pad: Used to input text and numbers in text fields

Text Field Editing Buttons

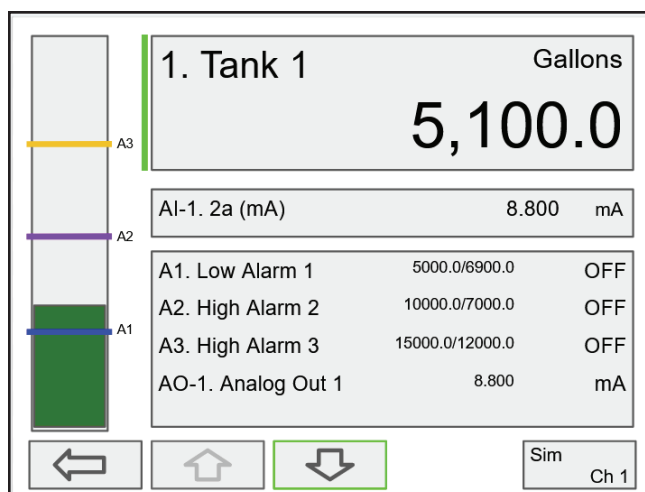
Soft Keys: Change based on the screen in place

Channel 1: Rate #1, Source: 2b (mA), Units: GAL/r, Decimals: 2, Scale: Input 1. 0.0, 2. 10000.0, Output 0.00, 10000.0, Cutoff, Colors 1, Bargraph, 0.0, 10000.0

INDIVIDUAL CHANNEL VIEW

To view the details of any channel, press Menu and then press View – Channel. Select the channel of interest. Navigate through the different items using the navigation keys. A green bar indicates the selected item, press the R-key to step into and see more details about the inputs and outputs related to the channel in view.

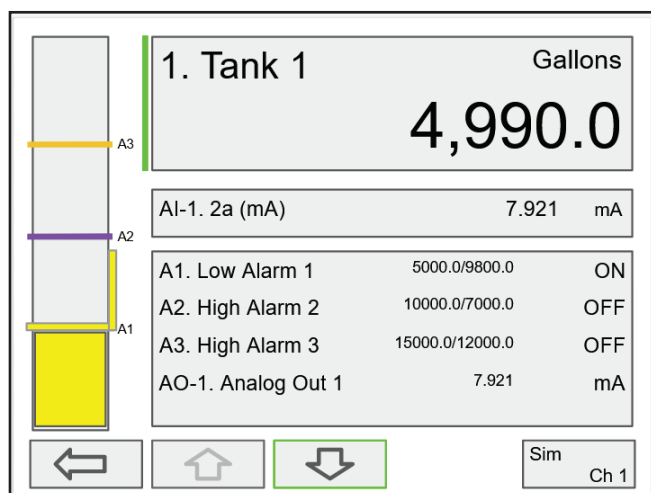
In the following examples, the screens show all the parameters associated with Channel 1 including analog input, slot number and its current value, setpoints and status of alarms, and analog output and its mA value. The bargraphs in each of these screens examples represent the current value in gallon units.



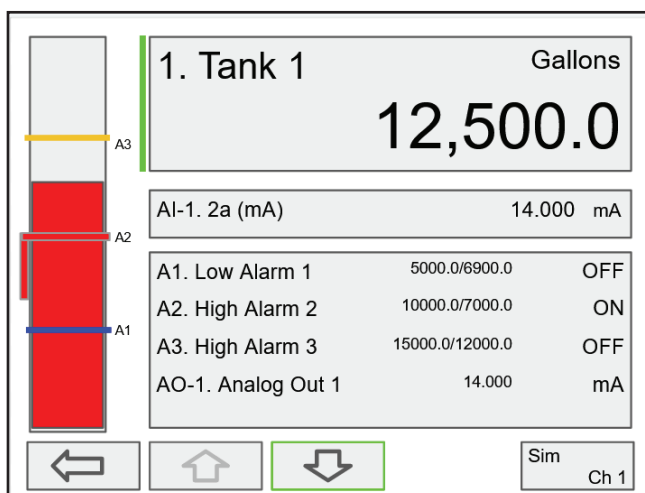
Alarm set points are indicated by horizontal lines.

Low & High Alarm Indication

If applicable, alarms may be acknowledged, and totals may be reset from the channel view screens. The alarm set points are indicated by a line at the corresponding value on the bargraph. Color selection for alarm conditions can be done in the Setup – Alarm menu or in the System – Display menu.



Active Low Alarm: Indicated by horizontal and vertical lines. The top of the vertical line is the reset point of the low alarm. The low alarm is indicated on the right side of the bargraph.



Active High Alarm: Indicated by horizontal and vertical lines. The bottom of the vertical line is the reset point of the high alarm. The high alarm is indicated on the left side of the bargraph.

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FREE CONSOLIDATOR+ CONFIGURATION SOFTWARE



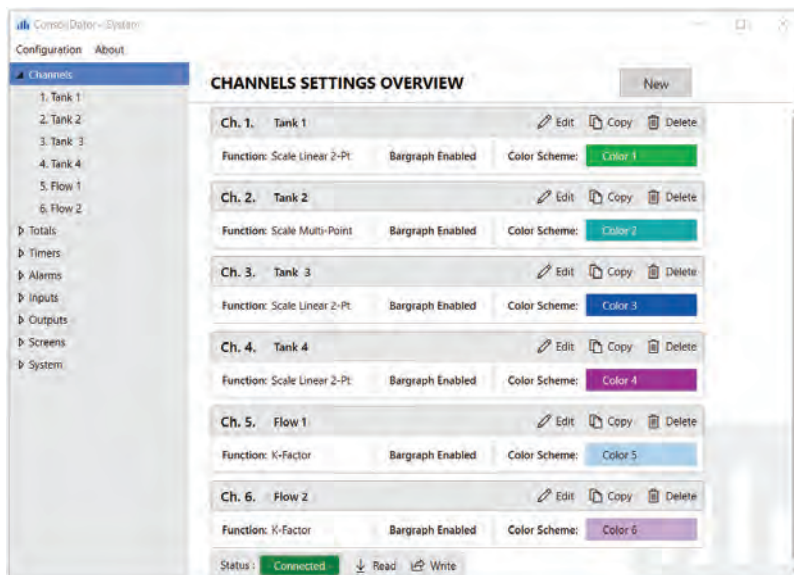
The easiest and quickest way to program your ConsoliDator+ multivariable controller is to use the FREE ConsoliDator+ configuration software.

The ConsoliDator+ configuration software is intuitive, and most customers can get their controller programmed as they like without even looking in the manual.

Once your controller is programmed the way you want it, you can wire it up for your application per the instructions in this manual and install it. If you find that you need to adjust the programming after the controller is installed, you can use the front panel soft keys and the instructions in the manual to do so.

Channel Settings

- Enter Display Tag Name for Channel
- Select a Function
- Select Input
- Select Units
- Select Decimal Position
- Select Color Scheme for Text, Background, and Bargraph
- Check Box to Display Bargraph
- Enter Scaling for Bargraph



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Totals Settings

- Enter Display Tag Name for Total
- Select Input
- Enter Units
- Enter K-Factor Value
- Set Decimal Point
- Check Box for Countdown, Allow Negative, Preset Value and Enter Value, Roll-Over and Enter Value, and Non-Resettable
- Select a Color Scheme for Text, Background, and Bargraph
- Check Box to Display Bargraph
- Enter Scaling for Bargraph

The screenshot shows the 'Configuration' tab of the ConsoleData+ System. The left sidebar lists various channels and totals. 'Total 2' is selected. The main panel shows settings for 'Total 2':

- Display Tag:** T2 - Total 2
- Color Scheme:** Color 6
- Input:** PI-2, Flowmeter 2
- Units:** Gallons
- K-Factor:** 1.0 Pulses/Gallons
- Decimals:** 0
- Count Down:** ☐
- Allow Negative:** ☐
- Preset Value:** 0.0 Gallons
- Roll-Over:** ☒ 10000000.0 Gallons
- Non-Resettable:** ☐
- Bargraph:** ☒ 0% to 100% (100000000)

Buttons at the bottom include 'New', 'Copy', and 'Delete'. The status bar shows 'Connected'.

Timers Settings

- Enter Display Tag Name for Timer
- Select Input
- Select Power Up Option
- Select Error Option
- Select Reset Option and Enter Value
- Select Start Option and Enter Value
- Select Stop Option and Enter Value
- Set Decimal Point
- Select Color Scheme for Text, Background, and Bargraph
- Check Box to Display Bargraph
- Set Scaling for Bargraph

The screenshot shows the 'Configuration' tab of the ConsoleData+ System. The left sidebar lists various channels and timers. 'Timer 1' is selected. The main panel shows settings for 'Timer 1':

- Display Tag:** Tmr1 - Tank 1 Fill
- Color Scheme:** Color 1
- Input:** 1. Tank 1
- Power Up:** Reset & Start
- Error:** Stop & Reset
- Reset:** Falling 0.000 Gallons
- Start:** Rising 0.100 Gallons
- Stop:** Rising
- Decimals:** 0
- Count Down:** ☐ 00:01:00
- Bargraph:** ☐ 0% to 100% (00:01:00)

A 'Select Source' dialog box is open, showing a list of inputs. The status bar shows 'Connected'.

Alarm Settings

- Enter Display Tag Name for Alarm
- Select Alarm Type
- Select Input
- Enter Set and Reset Points
- Select Color Scheme for Text, Background, and Bargraph
- Check Box to turn On/Off Sound Horn, Alert!, Automatic, or Ack Anytime
- Select Break: Alarm Off, Alarm On, Stay As Is
- Enter Value for On Delay and Off Delay
- Enter Name for Alarm Color Profile
- Check Box for Alarm to Flash

The screenshot shows the 'Configuration' tab of the ConsoleData+ System. The left sidebar lists various channels and alarms. 'Alarm 1' is selected. The main panel shows settings for 'Alarm 1':

- Display Tag:** A1 - High Alarm 1
- Color Scheme:** A Color 1
- Type:** Single Source
- Input:** Select Alarm Color
- Set Pt:** (blank)
- Reset:** (blank)
- Sound Horn:** ☒
- Alert!:** ☒
- Alarm Colors:** A Color 1, A Color 2, A Color 3, A Color 4, A Color 5, A Color 6, A Color 7
- Text:** ☐ Flash
- Background:** ☐ Flash
- Bargraph:** ☐ Flash

Buttons at the bottom include 'New', 'Delete', 'Select', and 'Cancel'. The status bar shows 'Connected'.

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Inputs Settings

- Enter Display Tag Name for Input Channel
- Select Filter Time
- Enter Bypass Value
- Check Box for Glitch Filter
- Check Box for Break Below and Set mA Value
- Check Box to Disable Input Channel

The screenshot shows the '2a: mA Input' configuration window. The left sidebar lists various channels, with 'AI-1, Level Sensor 1' selected. The main area contains the following settings:

- Display Tag:** AI-1, Level Sensor 1
- Filter:** WIN 4 sec
- Bypass:** 0.5 Percent of Full Scale
- ☐ **Glitch Filter**
- ☒ **Break Below:** 0.010 mA
- ☐ **Disable Input Channel**

Buttons at the bottom include 'Status: Connected', 'Read', and 'Write'.

Outputs Settings

- Enter Display Tag Name for Output Channel
- Select Input Source
- Check Box for Fail-Safe

The screenshot shows the '6e: Relay Output' configuration window. The left sidebar lists various outputs, with 'RY-5, Horn Alarm 1-4' selected. The main area contains the following settings:

- Display Tag:** RY-5, Horn Alarm 1-4
- Input:** Horn
- ☐ **Fail-Safe**

A 'Select Source' dialog box is open, showing a list of sources with 'Horn' selected. Buttons at the bottom include 'Status: Connected', 'Read', and 'Write'.

Screens Settings

- Enter Title Name for Screen
- Check Box to Show Title
- Check Box to Show Channel Number
- Check Box to Display Bargraph and/or Bargraph Only
- Check Box to Auto Scan
- Check Box for Dwell Time and Enter Dwell Time

The screenshot shows the 'Screen 4' configuration window. The left sidebar lists various screens, with '4, Alarms 1-8' selected. The main area contains the following settings:

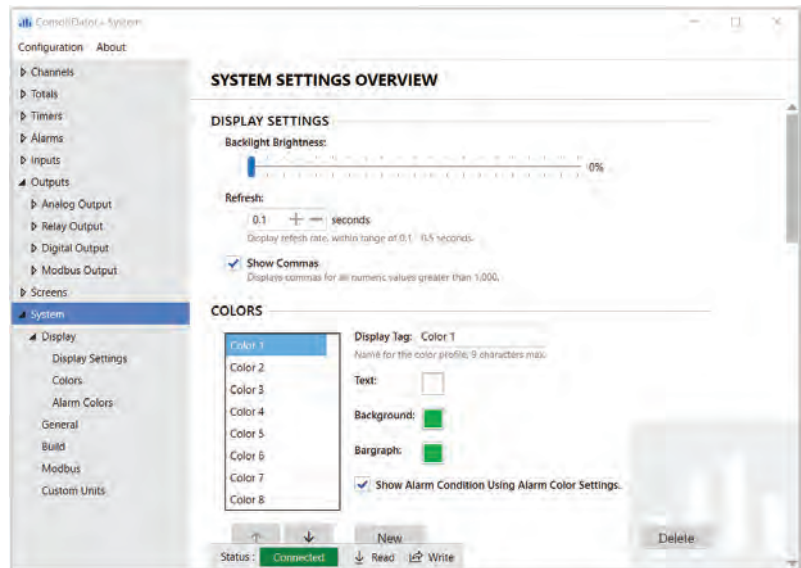
- Title:** 4, Alarms 1-8
- ☒ **Show Title**
- ☒ **Show Channel #**
- ☐ **Show Bargraphs**
- ☒ **Auto Scan**
- ☒ **Dwell Time** (Seconds: 3)

Buttons at the bottom include 'Status: Connected', 'Read', and 'Write'.

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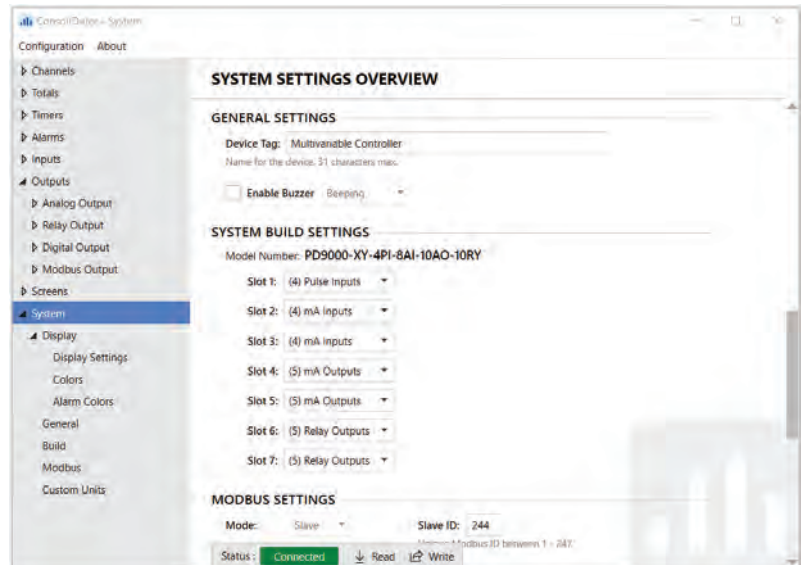
System Display Settings

- Set Backlight Brightness
- Enter Display Refresh Rate
- Check Box to Show Commas
- Select Color Scheme for Text, Background, and Bargraph
- Check Box to Show Alarm Condition Using Alarm Color Settings



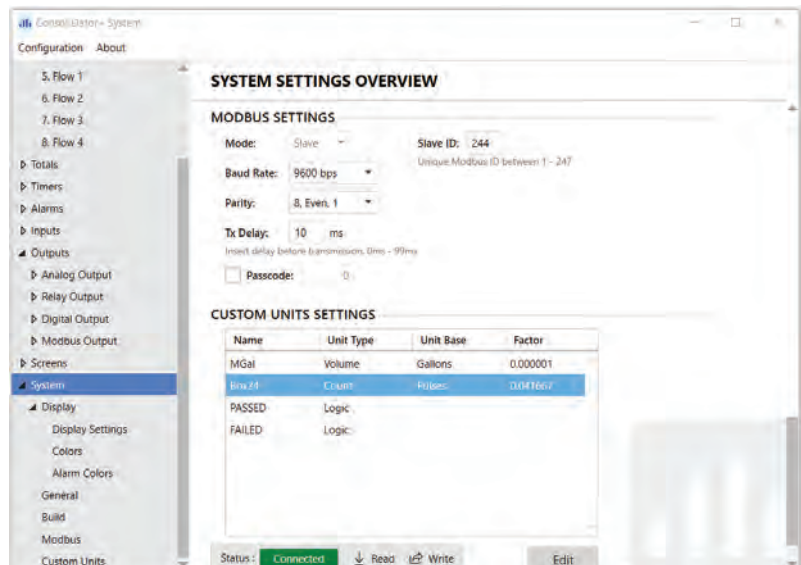
System General/Build Settings

- Enter Device Tag Name
- Check Box for Enable Buzzer and Select Buzzer Sound
- Shows Model Number, Input/Output Cards Installed, and Slot Number



Modbus Settings

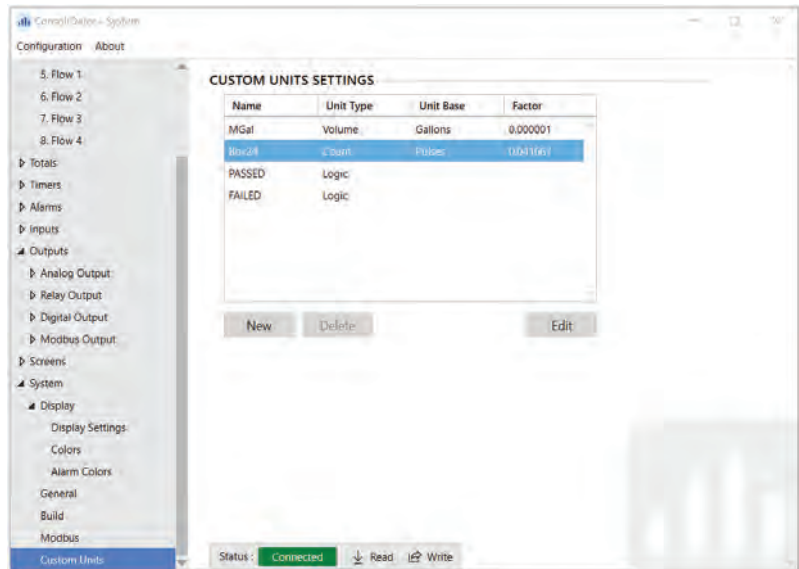
- Select Modbus Mode
- Enter Slave ID
- Select Baud Rate
- Select Parity
- Select Tx Delay Value in ms
- Select and Enter Passcode



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Custom Units Settings

- View or Add Custom Units
- Enter a Label for Unit
- Select a Unit Type
- Select Unit Base
- Enter a Value for Factor



CONNECTIONS

Power connections are made to one of the power terminal connectors. All units are capable of being powered either by AC or by DC for the ranges specified.

90-264 VAC Power

- Use three-terminal power connector as shown in Figure 1.
- Unit is protected internally with 1.25 A auto-resettable fuse. 2 A max, slow blow, 250 V min UL Recognized external fuse recommended.

24 VDC Power $\pm 10\%$

- Use two-terminal power connector as shown in Figure 1.
- Unit is protected internally with 3.7 A auto-resettable fuse. 4 A max, slow blow, 50 V min UL Recognized external fuse recommended.

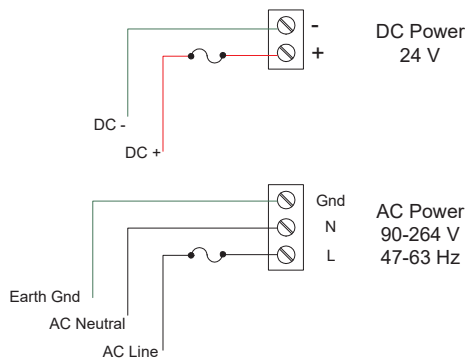


Figure 1. Power Connections

Note:

The controller may be powered by AC voltage with the 24 VDC power connection used as backup power.

Isolated Input Signal Connections

Isolated input signal connections are made to removable screw terminal connectors, which are labeled individually on the back panel of the controller. The back panel shows the type of input card installed in each slot (The top slot is #1 and the bottom is #7). Individual inputs are referenced as PI-1 to PI-4 for pulse inputs and AI-1 to AI-4, AI-5 to AI-8, etc for analog inputs.

4-20 mA Analog Input Connections

Analog 4-20 Input connections are made to screw terminal connectors (two inputs per connector). The following figures show examples for typical applications. Each of the 4-20 mA inputs may be connected in any of the modes shown below.

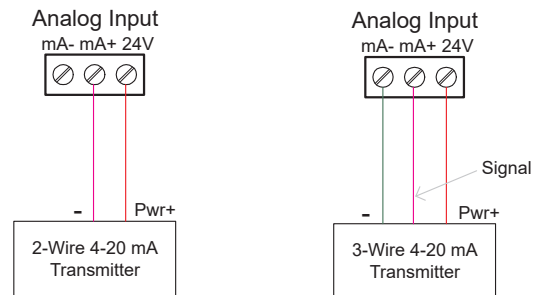


Figure 2. Transmitters Powered by ConsoliDator+'s Isolated 24 VDC Power Supply

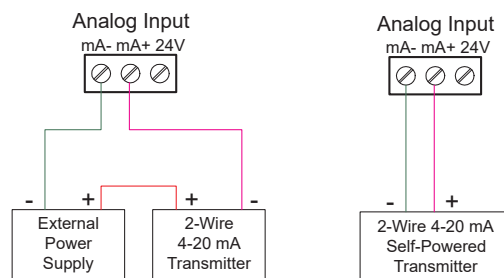


Figure 3. Transmitter Powered by External Supply or Self-Powered

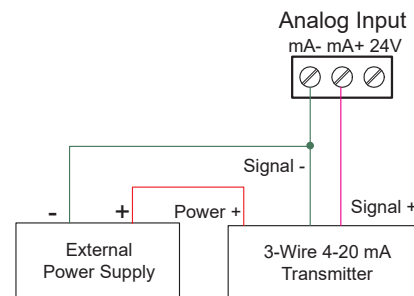


Figure 4. Three-Wire Transmitters Powered Externally

Flow Meter Pulse Input Connections

Flow Meter Pulse Inputs are wired to four-terminal connectors (two inputs per connector). A square waveform is used in the illustration, but the input is capable of reading many other types of signals within the voltage and frequency ranges specified.

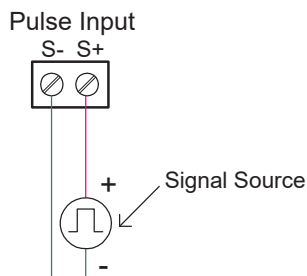


Figure 5. Flow Meter Pulse Input Connections

Digital Input Connections

Inputs are wired between terminals 1-5 of the digital input connector and the G terminal of the 2-position connector above the digital inputs. Normally open switch contacts may be used as shown in Figure 6. The diagram also shows a Digital Input using an NPN open collector transistor output from a live signal. Logic LO or switch closure appearing across the terminals is interpreted as ON. When using an open collector transistor, a logic HI at the base (marked "B" in Figure 6) will be interpreted as ON. The 2-position connector has a +5 V terminal that may be used to provide excitation to some sensors requiring more than the pull-up provided on each digital input terminal.

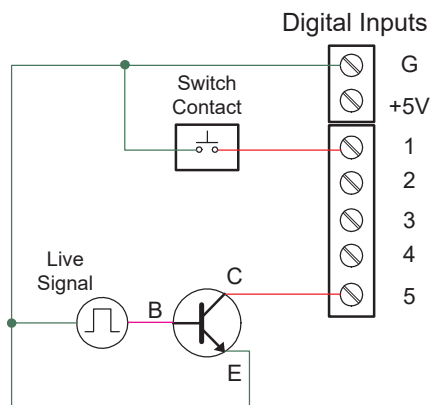


Figure 6. Digital Input from Switch Closure and Live Signal

Analog Output Connections

The following figures show examples for isolated 4-20 mA transmitter output connections. Terminal connectors are labeled individually. The analog outputs are isolated from each other and from the inputs. They are powered internally to provide an active 4-20 mA output loop. The outputs may be powered externally by connecting the positive voltage to the Ex+ terminal.

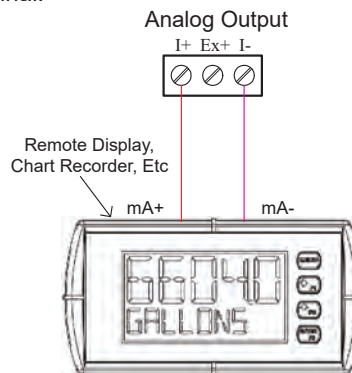


Figure 7. Active 4-20 mA Output Powered by ConsoliDator+

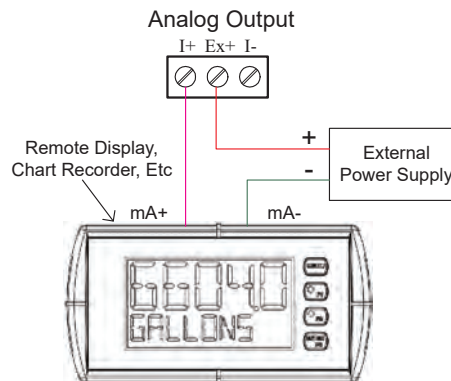


Figure 8. Passive 4-20 mA Output Powered by External Supply

Note: Analog inputs and outputs are isolated from each other.

Digital Output Connections

The digital outputs may be used to drive digital inputs, alarm annunciators, or other devices such as solid state relays that can be driven with low voltage signals.

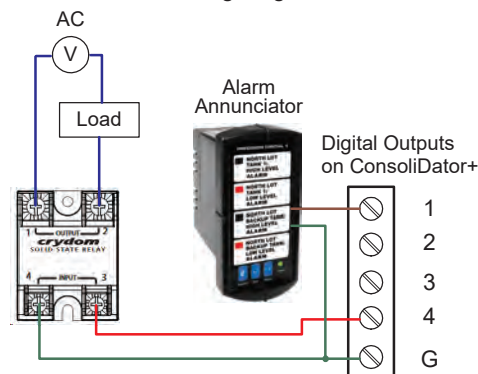


Figure 9. Digital Outputs Driving 5V Solid State Relay and Alarm Annunciator

Relay Connections

Relay connections are made to three-terminal connectors labeled individually. There are five relays per card.

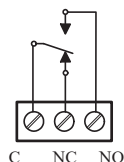


Figure 10. Relay Connections

Switching Inductive Loads

The ConsoliDator+ has internal circuitry to protect the relays from inductive loads, however, the use of suppressors (snubbers) is strongly recommended when switching inductive loads to prevent disrupting the microprocessor's operation. The suppressors also prolong the life of the relay contacts. Suppression can be obtained with resistor-capacitor (RC) networks assembled by the user or purchased as complete assemblies. Refer to the following circuits for RC network assembly and installation.

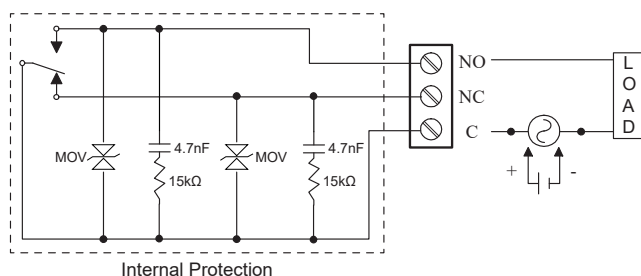


Figure 11. AC and DC Internal Inductive Load Protection

For additional external protection choose R and C as follows:

R: 0.5 to 1 Ω for each volt across the contacts
C: 0.5 to 1 μ F for each amp through closed contacts

Notes:

1. Use capacitors rated for 250 VAC.
2. RC networks may affect load release time of solenoid loads. Check to confirm proper operation.
3. Install the RC network at the instrument's relay screw terminals. An RC network may also be installed across the load. Experiment for best results.

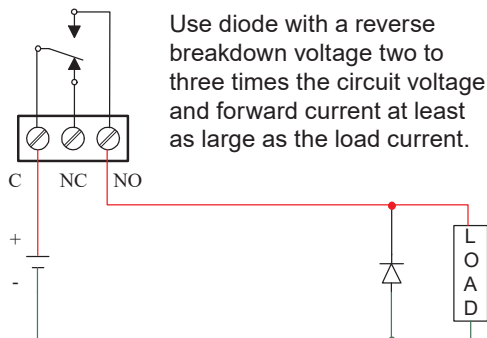


Figure 12. Low Voltage DC Loads Protection

RC Networks Available from Precision Digital

RC networks are available from Precision Digital and should be applied to each relay contact switching an inductive load. Part number: PDX6901.

Serial Communication Connections

The RS-485 port for serial communication (using Modbus protocol) has three terminals labeled D+, D-, and G. It is strongly recommended to use three-wire shielded cable and to always connect the ground terminal to the other equipment's ground to avoid differential voltage between the systems. Distances up to 4000 feet can be reached with RS-485. Up to 32 Modbus devices may be connected to a single RS-485 bus.

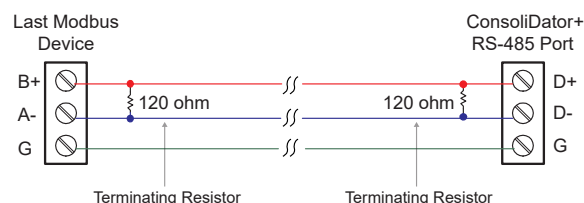


Figure 13. Serial Connections

Ethernet Option

The Ethernet port is available on the RJ45 connector. This allows the ConsoliDator+ to connect to a local area network. The Ethernet port option is configured using the Lantronix DeviceInstaller software, available for download from the Lantronix's Website at www.lantronix.com/products/xport. See the PD9000 ConsoliDator+ manual for ethernet port setup details.

External Keypad Connections

Normally open pushbuttons may be wired to the digital inputs connector for use when the front panel of the controller is not accessible. The external keys may be assigned to replicate the Menu and F1-F4 function keys.

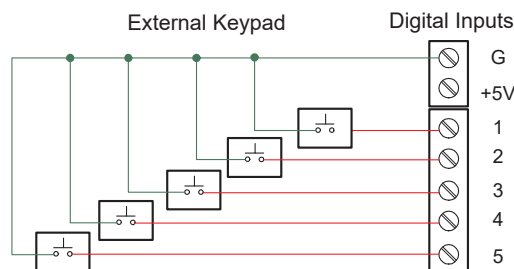


Figure 14. External Keypad Connections

PD9000 Multi-Channel Controller

SPECIFICATIONS

Except where noted all specifications apply to operation at 25°C (77°F)

General

Display: Color; QVGA (320x240 px), 5.7" (145 mm) diagonally, white backlight Bargraph: Twenty divisions Numerical: Up to 15 digits (±999,999,999,999,999) Feet & Inches Format: 99,999' 11.9"

Screen Bargraph: Enable/disable: Channels, totals, timers Bargraph scale: 0 – 100%, independent of channel scale. Twenty divisions: 5% each. Screen: Select to show bargraph or not.

Color Selection: 65 colors selection, Customize bargraph, panel background, and text for normal and alarm conditions.

Decimal Point: 0 to 15 decimal places, user selectable

Engineering Units: User selectable units or custom units Time, Distance, Volume, Pressure, Weight, Temperature, Current, Voltage, Percent, Amps, Volts, Counts, Logic, and Custom, Any unit/unit of time or other units

Units Conversion: Units' conversion is supported for channels, totals, timers, and any function using those parameters. Channel scaling must be in the intended base units (e.g. Gallons/min)

Display Update Rate: User selectable: 0.1 to 0.5 sec (10 updates/sec to 2 updates/sec)

Programming Method: Front panel buttons, external buttons, or ConsoliDator+ Software

Number of Alarms: Up to 64 high or low Automatic (non-latching) or latching On & Off time delays. May be assigned to one or more relays. Note: Alarms are independent from relays.

Alarm Types: Single Source: One input

Multi-Source: Two or more inputs

Interval: Enter time interval and On Time

Day & Time: Select day of the week & time

Alarm OR: Any active input alarm triggers the OR alarm

Alarm AND: All alarms must be active to trigger the AND alarm

Alarm Ack & Reset: Automatic only (Non-latching)

Automatic and manual

Manual only (Latching)

Manual with Ack only after alarm is cleared (Latching with Clear)

Alarm Indication: 1. Bargraph, panel, and text can be set up to change color on alarm

2. Enable internal buzzer

3. Assign external relay to drive a horn

Internal Buzzer: 60 dBA @ 24 inches (61 cm) Enable/disable in System – General menu. Associated with alarm Horn setting

External Horn (Sold separately): Assign any relay to the Horn function to activate an external horn when alarm condition is detected.

Live Channel Calibration: Live calibration of channels is independent of the input calibration used for scaling.

Input & Output Cards: Max Number of I/O Cards: 7

Analog Inputs: 4/card, Pulse Inputs: 4/card, Analog Outputs: 5/card, Relays: 5/card

Number of Screens: Up to 20 screens with 1 to 8 PVs or items per screen. Enable or disable screen title, channel #, and bargraph Automatic or manual scanning Scan time: 1 to >1000 sec, independent for each screen. F1-F4 keys are assigned per screen

Function Keys: User programmable (See defaults below)

F1 = Previous ← F2 = Next → F3 = Scan/Stop F4 = Ack

Number of Channels: Up to 99 channels

Input Source: 4-20 mA, Pulse, Digital, Modbus, another Channel, Total, Timer, Alarm, Date & Time, mA Output, Relay Output, Digital Output, or Modbus Output

Password: Programmable password restricts modification of programmed settings. View and Setup menus are password protected, function keys and digital inputs are not protected.

Simulation Mode: Inputs, channels, totals, timers, and alarms can be simulated from the View menu or from a function key.

Simulation mode is not saved on power down. Alert! message is provided for simulated items.

Manual Control: Analog outputs and relays can be controlled manually from the View menu or from a function key.

Manual control mode is not saved on power down. Alert! message is provided for outputs in manual control.

Note: If it is necessary to turn relays off and maintain the condition through power cycle, configure the relays to Always Off.

Non-Volatile Memory: Settings stored for a minimum of 10 years.

Power (User Selectable Based on Wiring): Three-terminal connector (L, N, GND), AC: 80-264 VAC, 47 to 63 Hz, 60 W max DC: 113-370 VDC, 60 W max (L, N)

Two-terminal connector (G, 24V) DC: 24 VDC ±10%, 60 W max

Backup Power Supply: If AC and DC power are connected, the 24 VDC can be used as backup power in case of AC power failure.

Note: DC supply must be 24 V or less; otherwise the system runs on DC power.

Fuse: Unit is protected internally with auto-resettable fuse.

AC: 1.25 A max, DC: 3.7 A max

External Fuse: Recommended external fuse slow-blow

120 VAC: 2.0 A, 240 VAC: 1.0 A, 24 VDC: 4 A

Isolation & Grounding: 1500 V Analog inputs/outputs-to-power line, 500 V Analog input-to-input, input-to-output, analog output-to-output

All analog inputs and analog outputs are isolated from each other.

Note: DC Power is not isolated. DC- is connected to Earth Ground. Digital I/O, USB, and Ethernet are grounded.

Environmental: Operating temperature range: -40 to 60°C (-40 to 140°F)

Storage temperature range: -40 to 60°C (-40 to 140°F)

Relative humidity: 0 to 90% non-condensing

*All functions operate down to -40°C (-40°F.) If the LCD response is slower, increase the display refresh setting.

Internal Fan: Automatic temperature-controlled fan turns on if the inside temperature reaches 50°C and increases the speed as the temperature rises to 60°C.

Internal Heater: Automatic temperature-controlled heater located behind the LCD turns on at 0°C, delivering the minimum power. If the temperature drops below -10°C, the heater delivers its maximum power.

Connections: Removable screw terminal blocks Inputs/Outputs: 12 to 24 AWG wire, Digital I/O: 16 to 30 AWG, RS-485: 12 to 24 AWG wire RJ45 Ethernet connection, USB ports: Micro-USB (Device), cable included.

Tightening Torque: Screw terminal connectors: 5 lb-in (0.56 Nm)

Digital I/O terminals: 2.5 lb-in (0.28 Nm)

Enclosure: Enclosure Body: Thermoplastic Polyester,

Color: Gray,

Display Window: Clear Polycarbonate, GE LEXAN HP12W

Front Panel Keys: Silicone rubber

Mounting: Panel-mounting frame and twelve screws (provided)

Cutout: 10.0" x 10.0" ±0.05" (254 mm x 254 mm ±1.3 mm) (H x W)

Panel thickness: 0.07" – 0.35" (1.8 mm – 8.9 mm)

Clearance behind panel: 6" (152 mm)

Overall Dimensions: 10.85" x 10.85" x 4.87" (276 mm x 276 mm x 124 mm) (H x W x D)

Weight: Ex: PD9000-XY-4PI-8AI-10AO-10RY

7.4 lb (3.4 kg) approx.

Warranty: 3 years parts and labor.

PD9000 Multi-Channel Controller

Totalizer

Number of Totalizers: Up to 32 totalizers, 15 digits with comma separator

Totalizer Inputs: Calculates total based on selected rate channel, pulse input, digital input, or triggered event for non-rate channels. Total is stored in non-volatile memory if power is lost.

Maximum Total: 18 digits, 999,999,999,999,999,999

Rate Channel Input: 4-20 mA input, Pulse input, Modbus input

Rate & Total Decimal Point: Independent and user selectable from 0 to 15 places

Totalizer Reset: Via front panel keys or digital inputs

Non-Resettable Total: Total may be setup to be non-resettable to prevent unintentional reset. This can be changed in the Setup Totals menu.

Total Units Conversion : Input: Rate channel

Total units may be different than rate units. Use the custom units to convert to any unit (e.g. Gallons to MGal: Factor = 0.000001)

Pulse Input K-Factor: K-Factor = pulses/units of measure
Calculates total directly from pulse input or from rate channel
Decimals: 0 to 15

Count Down: Total may be setup to count down

Preset Value: Enter the preset value to count up or down
Reset total sets total to the preset value; to reset to zero uncheck the Preset box.

Roll-Over: Enter the value for total to roll-over to 0

Example: Roll-Over = 1,000,000

Total goes to 0 after 1 million

Negative Total: Allow total value to count below 0 for bi-directional flow based on rate channel

Total Bargraph: Bargraph may be scaled to represent the expected maximum total.

Function Keys: Screen Setup: Assign F1-F4 to Reset Total, Enter Total, Add To, or Remove From total

Real Time Clock

Date Format: Month, day, year (e.g. July 16, 2020)

Time Format: 24 hour; 00: Midnight hh:mm:ss

Battery: 3 V, P/N: CR2032 included

Display Date & Time: Displayed on the top line of Setup and View menus, including day of the week.

Screens: Date & Time can be added to any screen.

Channels: Date & Time can be the input to a channel.

Display Format: yyyy/mm/dd hh:mm:ss

Channel & Math Functions

Scale Functions	K-Factor	Converts number of pulses to volume or other units
	Scale Factor	Apply multiplier to a channel
	Scale Linear 2-Pt	Scale a channel
	Scale Multi-Point	Multi-point scaling of a channel
	Scale Square Root	Apply square root to a channel – Differential Pressure from two channels
	Scale Exponent	Apply exponent for weirs and flumes open channel flow calculation
	Round Horizontal Tank	Calculate volume in round horizontal tank with flat ends
	Units Conversion	Convert standard units to custom units

Math Functions	Constant	Assign fixed value
	Summation	Add two or more channels
	Difference	Subtract any two channels
	Abs Difference	Difference always positive
	Absolute Value	Convert channel value to positive
	Average	Find the average of channels
	Weighted Average	Assign % weight to two or more channels
	Multiply	Multiply two channels
	Divide	Divide two channels
	% Efficiency	Calculate input to output efficiency $((A-B)/A)*100\%$

List of Engineering Units

None: No units

Time: seconds, minutes, hours, days & /sec, /min, /hr, /day

Distance: (Height): cm, m, Inch, Feet, Ft-In, Yard, km, miles, custom

Volume: Gallons, GAL, L, IGAL, M3, BBL, BUSH, cuYD, cuFt, cuIn, LiBBL, BBBL, HECtL, quarts, pints, fl oz, mL, DT, M/T, custom

Pressure: psi, Pa, bar, hPa, kPa, MPa, GPa, inH2O, cmH2O, inHg, mmHg, atm, kg/cm2, kg/m2, mbar, Mbar, Torr, mTorr, custom

Weight: grams, Oz, Lb, lb, g, kg, ounces, tons, tonnes, custom

Temperature: C, F, K, Ra

Percent: %, PCT, Percent, custom

Amps: mA, Amps, custom

Volts: V, mV, Volts, custom

Counts: Pulses, Cycles, Counts, custom

Logic: ON, OFF, OPEN, CLOSED, YES, NO, START, RUNNING, STOP, STOPPED, PUMP ON, PUMP OFF, OK, OKAY, ERROR, WARNING, custom

Custom: Enter unit's name, type, base unit, and factor.

Additional Functions	Compare	
	Greatest	Greatest value in a group of channels
	Least	Smallest value in a group of channels
	Measure	
	Tare	Calculate net value when Tare function is applied via function key
	Maximum	Maximum value reached by the process
	Minimum	Minimum value reached by the process
	Percent (Bargraph)	% bargraph of any: 4-20 mA input, channel, total, timer, or mA output
	Duration	Keep track of time a condition has been present (e.g. high alarm active)
	Rate of Change	Calculates how fast a process is changing /sec, /min, /hr, /day
	Filter	
	Window Average	Enter time to calculate the average
	IIR (First Order)	Infinite Impulse Response (slow)
	Cutoff	PV = 0 below cutoff Flip Side: 0 above (-)
	Limits	Sets PV's upper & lower limits.
	Control	
	Sampler	Uses channel to trigger relay sample and select sampling time (e.g. Turn relay on for 30 sec every time total increases by 1,000 Gallons)
	On-Off Control	Set on & off control based on process value
	Select A or B	Switch between 2 inputs
	Schedule	Daily or weekly event
	Relays	
	Cycle Count	Number of relay cycles since last reset
	Runtime	Relay runtime (ON) hh:mm:ss
	Modbus	
	Time Since Read	This is the time since a Modbus master device read a register
	Time Since Write	This is the time since a Modbus master device wrote a register

PD9000 Multi-Channel Controller

4-20 mA Analog Inputs

Number of Inputs: (4) Analog inputs/card

(28) Analog inputs max, no other I/O

Typical Input: 4-20 mA

Input Range: 0-24 mA

Accuracy: $\pm 0.03\%$ of full scale ± 1 count

4-20 mA Display Value: Up to six full digits

(Recommended) $\pm 999,999$

More digits may be used, but the stability will be affected. Increase the filter value and lower the display update rate to get a more stable reading.

Transmitter Power Supply: Isolated 24 VDC @ 200 mA/input

Max current: 1,600 mA (All inputs), (8) Analog Input @ 200 mA max

(28) Analog Input @ 20 mA max

Available on AC or DC powered units

Temperature Drift: Better than: 20 ppm/ $^{\circ}\text{C}$ from -40 to 60°C ambient

Filter: Window: 0.5, 1, 2, 4, 8 sec, IIR: 16, 32 sec

Glitch Filter: Discards a single sample caused by high frequency noise

Filter Bypass: 0 to 100 % of full scale Filter is ignored, if the signal change is greater than bypass value

Channel Input Scale Function: Linear 2-Point, Multi-Point (up to 50 points) Square Root, Programmable Exponent, Scale Factor, Round Horizontal Tank (Volume), None (mA Input Reading)

Channel Input Live Calibration: Each channel may be calibrated using live calibration signal from a sensor or a calibrator.

Input Protection: Each 4-20 mA input is protected by an auto-resettable fuse, 30 VDC max. The fuse resets automatically after the fault condition is removed.

Input Impedance: 125 Ω Typical Including auto-resettable fuse

Hart Transparency: The controller does not interfere with existing HART communications; it displays the 4-20 mA primary variable and it allows the HART communications to pass through without interruption. The controller is not affected if a HART communicator is connected to the loop. The controller does not display secondary HART variables.

Isolation: 1500 V: Input-to-power line

500 V: Input-to-input, input-to-output

All analog inputs and analog outputs are isolated from each other.

Normal Mode Rejection: 100 dB at 50/60 Hz

Common Mode Rejection: 90 dB at 50/60 Hz

Pulse Inputs

Number of Inputs: (4) Pulse inputs/card,

(28) Pulse inputs max, no other I/O

Input Type: Active Square Wave, NPN, PNP, Reed Switch, Coil (Magnetic Pickup)

Normal threshold: 1.2 V (0.8 to 3.0 V)

High threshold: 2.5 V (2.0 V to 6.0 V)

Coil threshold: 20 mV (Low) or 100 mV (High)

Signal Level: Active Square Wave: 0 to 30 V max

Typical: 0 to 5 V

Coil: 20 mVp-p to 30 Vp-p (Magnetic Pickup)

Input Impedance: Active, NPN, Reed: 10 k Ω pull-up to 5 V

PNP: 10 k Ω pull-down to (S-)

Coil: >2 k Ω (20 mV sensitivity), >10 k Ω (100 mV sensitivity)

Isolation: Pulse inputs are not isolated, (S-) terminal is connected to system GND

Input Protection: ± 36 V, non-isolated

Frequency Response & Signal Level:

Active Square Wave 5 V: 0 to 100 kHz

Coil (Magnetic Pickup): 0 to 50 kHz

Frequency – Signal level (Coil: 20 mV)

20 mVp-p – 100 Hz

100 mVp-p – 10 kHz

Frequency – Signal level (Coil: 100 mV)

100 mVp-p – 90 Hz

500 mVp-p – 5 kHz

20 Vp-p – 50 kHz

Minimum Frequency: 250 μHz with High Gate = 4,000 sec

Low Gate: 1 to 99 sec

High Gate: 2 to 4,000 sec (Must be higher than low gate)

Accuracy: ± 1 count for K-Factor > 1 or 30 ppm

K-Factor: Programmable pulses/unit of measure with up to 15 decimal resolution

Scale Pulse Input: Linear 2-Point

Multi-Point Scaling: 2 to 50 points

Live Calibration: Pulse input channel may be calibrated using live calibration signal from a sensor.

Modbus Inputs

Number of Inputs: 199 Modbus RTU

Scale MB Input: Modbus input may be used as the input for creating channels and totals, the same way 4-20 mA inputs are used.

Data Type: Bit-Logic

Signed/Unsigned: 16 (Short), 32 (Long), 64 (Long-Long)

Float 32

Float 64 (Double)

Decimal Point: User selectable

Comm Break & Timeout: Specify what value to hold on comm. break and how long to wait for new data before reporting a break condition.

Input Action: Specify what should happen when new data is written to the input register (e.g. add value to total).

Digital Inputs & Outputs

Digital Inputs: 5 Inputs, non-isolated, 30 VDC max

Standard feature on all ConsoliDator+ models

Low: 0 to 1.2 V

High: 2.8 to 30.0 V

Internal pull-up: 5 k Ω to 5 V

Max pulse frequency: 1 kHz @ 5 Vp-p

+5 V terminal: Internal pull-up 100 Ω

Note: Pulse inputs may be used as digital inputs

Types of Digital Inputs: Normally open switch: External excitation not required (Current: 1 mA)

Open collector transistor: 4.1 V open circuit voltage

Logic level: 0 to 30 V

Digital Outputs: 4 Outputs

Standard feature on all ConsoliDator+ models

Low: 0 V (no load), 1.5 V max @ 10 mA sink (External pull-up)

High: 5.0 V (no load), 3.5 V @ 10 mA load

Maximum current: 30 mA Output impedance: 100 Ω

Output protection: 150 mA auto-resettable fuse

Max frequency: 5 Hz

Input/Output Protection: ± 36 V, non-isolated

PD9000 Multi-Channel Controller

Relays

Number of Relays: (5) Relays/card, (30) Relays max with (4) analog or (4) pulse inputs, no other I/O

Rating: SPDT (Form C)

Resistive load: Rated 10 A @ 120/240 VAC or 8 A @ 30 VDC

Inductive load: NO contacts: 1/3 HP, 120 VAC; 30,000 cycles

NC contacts: 1/8 HP, 120 VAC; 50,000 cycles

Minimum load: 100 mA @ 5 VDC

Isolation: 1500 VAC, 50/60 Hz for 1 min between coil and contacts

Deadband: 0-100% of full scale, user selectable

Electrical Noise Suppression: TVS diodes & snubbers on all contacts. Recommended additional external snubber: 0.01 μ F/470 Ω , 250 VAC (Order: PDX6901)

Assignment & Operation: Any relay may be assigned to any alarm, channel, total, timer, digital input, Modbus input, pump alternation, horn, always on, or always off. Multiple relays may be assigned to the same alarm or channel. All relays are programmed independently.

High & Low Alarm: Defined by set and reset points in the Alarm menu

High or Low Alarm: Assign relay to any alarm or channel for on/off relay control Note: Automatic reset only for channel

Multi-Source High or Low Alarm: Assign relay to multi-source alarm to indicate common high or low condition.

Pulse Action: Set any relay for pulsing on/off timed relay control.

Programmable pulse width (on/off time) and on/off delay.

Sampling: Relay must be assigned to channel setup for Sampler function with user-defined total increment and sampling time.

Pump Alternation: Any relay may be setup to alternate with any relay in the group. Multiple alternation groups may be setup.

Acknowledge: Front panel Ack key or digital input acknowledges alarms; relays associated with acknowledged alarm are turned off. Acknowledge all or any alarm.

Alarm Relay: Assign any relay to be driven by any alarm; acknowledging the alarm turns off the relay (non-fail-safe mode).

Time Delay: Programmable on/off delays, 0.0 to 999.9 sec Independent for each relay.

Auto Initialization: When power is applied to the controller, relays will reflect the state of the input to the controller.

Fail-Safe Operation: 1The relay coil is energized when the process variable is within safe limits and the relay coil is de-energized when the alarm condition exists.

4-20 mA Transmitter Outputs

Number of Analog Outputs: (5) Analog outputs/card, (35) Analog outputs max with no other I/O cards (Seven I/O slots)

Output Range: 4.00 to 20.00 mA, nominal

Calibration: Factory calibrated for 4-20 mA

Scaling Range: Any process range

Reverse scaling allowed

Assignment & Operation: Assign to any analog or pulse input, digital input, Modbus input, channel, total, timer, alarm, or fixed value (none).

Note: Multiple 4-20 mA outputs can be assigned to the same input.

Accuracy: $\pm 0.03\%$ F.S. ± 0.005 mA

Temperature Drift: 20 ppm/ $^{\circ}$ C from -40 to 60 $^{\circ}$ C ambient. (Output & Input drifts are separate)

Output Loop Power: Powered by controller or externally by 12 to 32 VDC

Output Loop Resistance: Powered by controller: 10 to 600 Ω

External 12 VDC: 10 to 200 Ω

External 24 VDC: 10 to 600 Ω

External 32 VDC: 10 to 1000 Ω

Isolation: 1500 V: Output-to-power line

500 V: Output-to-output, output-to-input

All analog inputs and analog outputs are isolated from each other.

Timers

Number of Timers: Up to 32

Time Format: hh:mm:ss with 0 decimals selected

Seconds with 1 or more decimals

Automatic Actions: Power Up: Timer action on power up

Error: Action when an error is detected

Reset: Event causes the timer to reset

Start: Event triggers the timer to start

Stop: Event causes the timer to stop

Start / Stop Reset: The function keys and digital inputs can be used to start, stop, and reset the timers, regardless of the automatic actions selected.

Assignment & Operation: Timers can be triggered, stop, and reset, by rising or falling signals from 4 20 mA input, pulse, digital, Modbus input, channel, total, other timers, alarm, mA output, relay, or Modbus output.

Count Down Timer: Select count down and enter starting time

Timer Alarm: Timer can be used to trigger alarms

Bargraph: Select bargraph during setup and scale the bargraph for 0 – 100% target time

Timer Control: Access timer control via the View Timer menu or assign a function key to timer control in the Screens menu

Timer & Relay: Timer can be assigned to drive relays based on selected set and reset points

Modbus® Serial Communications

Compatibility: RS-485 (EIA-485)

Protocol: Modbus RTU

Device Address: 1 to 247

Transmit Delay: 0 to 99 ms

Baud Rate: 1,200 to 115,200 bps

Data: 8 bit (1 start bit, 1 stop bit)

Parity: Even, Odd, None with 1 stop bit, or None with 2 stop bits

Ethernet Communications

Device: Lantronix Xport-05

Protocol: Modbus TCP/IP (Default), Modbus UDP/IP, Modbus RTU Over TCP/IP, Modbus RTU Over UDP/IP

Port Settings (Do Not Change):

Protocol: RS-232

Baud Rate: 9600

Data Bits: 8

Flow Control: None

Parity: None, Stop Bits: 1

Network Stack: IPv4

Ethernet MAC/PHY: 10/100 Mbps

Additional Specifications: Refer to the Lantronix Webpage

<https://www.lantronix.com/products/xport>

Ethernet Port Configuration: Download the Lantronix

DeviceIntaller software to configure the Ethernet port

<https://www.lantronix.com/products/xport>

ConsoliDator+ Software

System Requirements: Windows® 7, 10

Compatibility: One software version for all models

Connection: Micro-USB

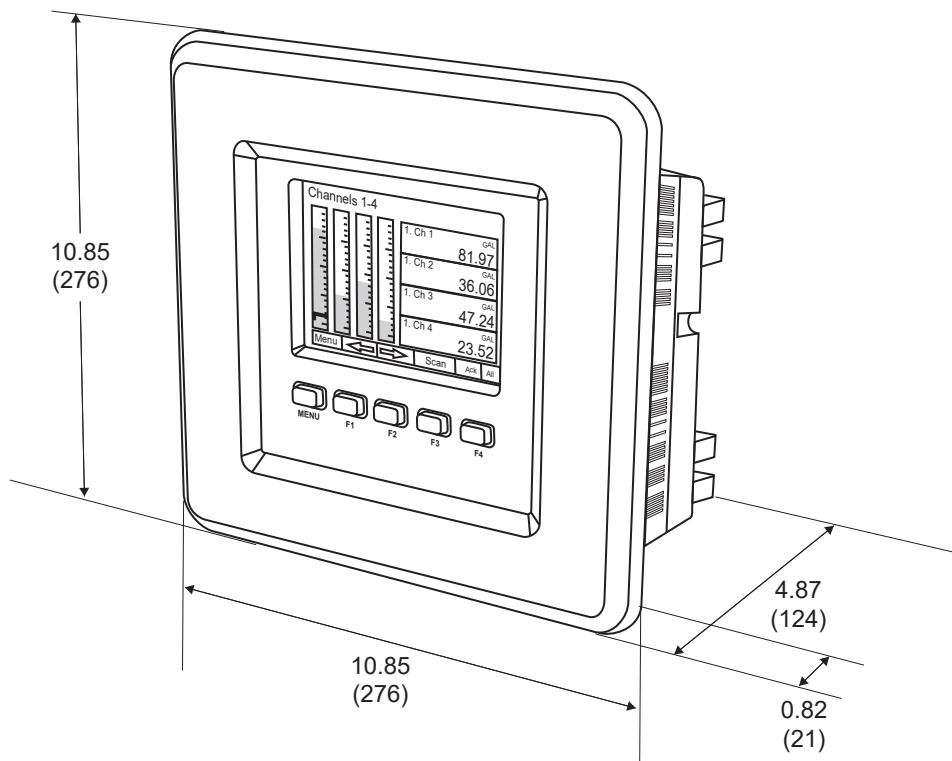
Configuration: Configure inputs and outputs, channels, totals, timers, alarms, etc. Configure bargraph and panel colors for normal operation, and colors for alarm indication. Save controller settings file on PC for programming other controllers or to restore settings.

PD9000 Multi-Channel Controller

DIMENSIONS

Overall Dimensions

Units: Inches (mm)



Panel Mount Controller



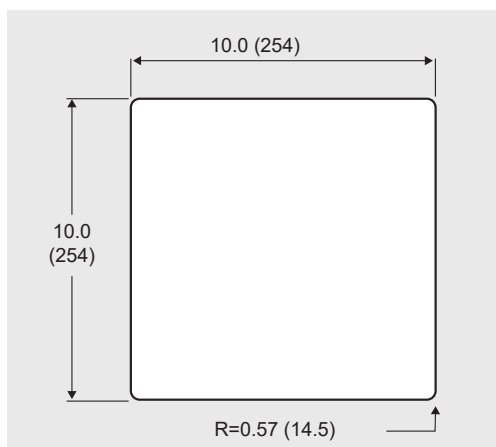
Download free 3-D CAD files of these instruments to simplify your drawings!

PD9000 Multi-Channel Controller

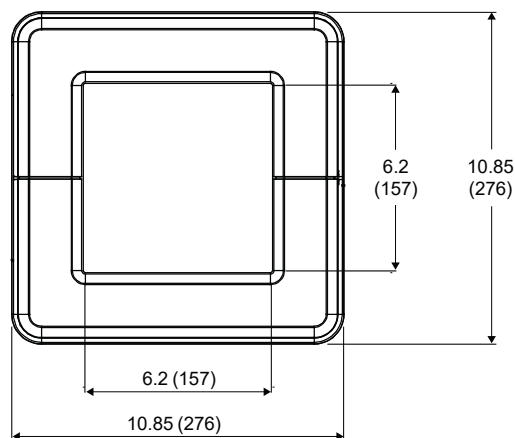
Panel Mounting

- Prepare panel cutout per the dimensions provided
- Locate the panel mounting bracket and screws
- Inspect the controller to assure the gasket is securely in place
- Insert controller in the panel cutout, the latches on the top and bottom should hold it in place
- Insert the panel mounting bracket from the back of the panel, observe the orientation of the piece marked TOP
- Install the 12 screws provided

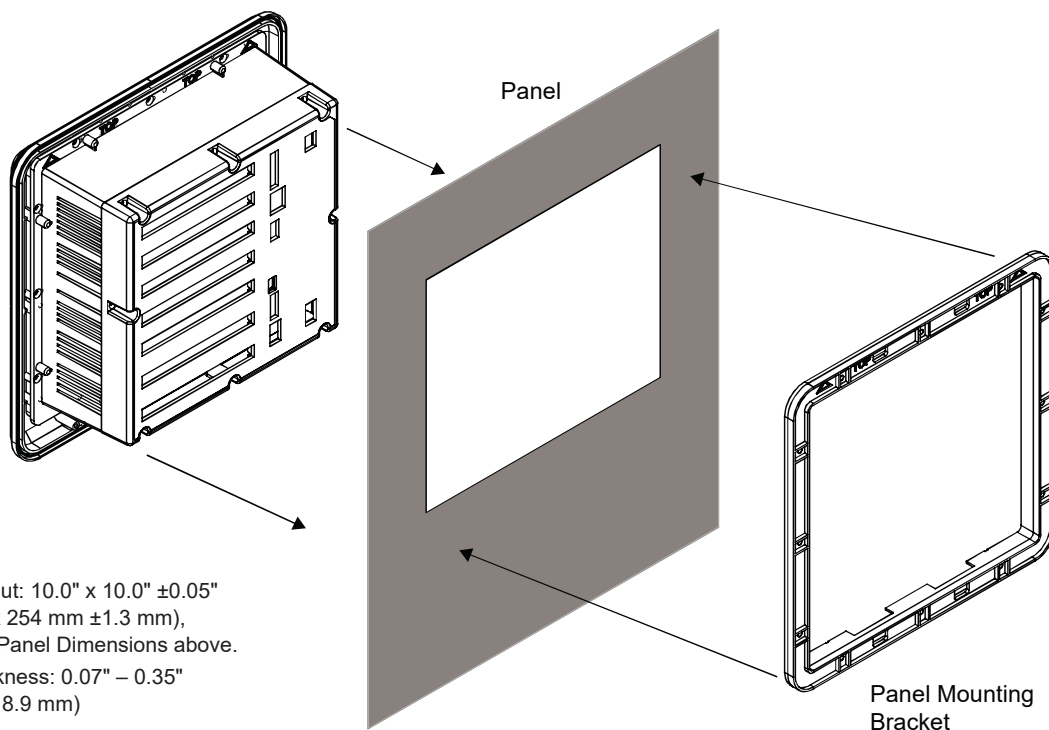
Units: Inches (mm)



Panel Cutout Dimensions



Front Panel Dimensions



Notes:

1. Panel cutout: 10.0" x 10.0" ± 0.05 " (254 mm x 254 mm ± 1.3 mm), see Front Panel Dimensions above.
2. Panel thickness: 0.07" – 0.35" (1.8 mm – 8.9 mm)
3. Clearance: Allow 6" (152 mm) behind panel

Panel Mount Installation

PD9000 Multi-Channel Controller

ACCESSORIES

PDA2909 NEMA 4 Steel Enclosure for One ConsoliDator+

The PDA2909 steel NEMA 4 enclosure provides a convenient way to mount the PD9000 ConsoliDator+ to walls and other vertical structures. This enclosure comes pre-cut with one cutout to mount the PD9000 in. The ConsoliDator+ is mounted in the door of the enclosure thus allowing for programming and operation of the device. No additional mounting hardware other than screws to mount to the wall is needed. The door is hinged and secured with latches. The enclosure and ConsoliDator+ are ordered and packaged separately.



PDA2909 with ConsoliDator+ Installed



PDA2909 Opened with ConsoliDator+ Installed

Features

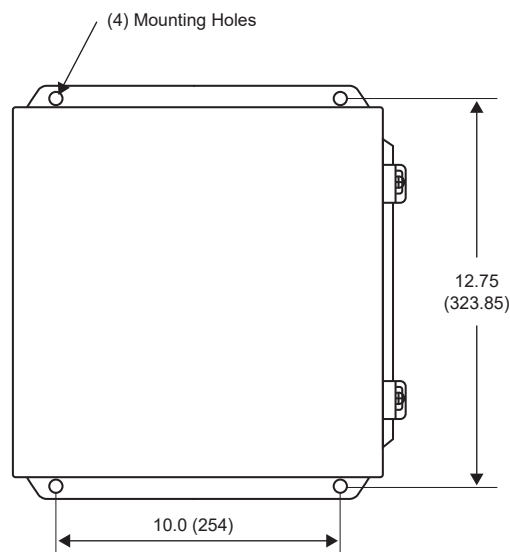
- House One ConsoliDator+ Multi-Variable Controller
- 14-Gauge Steel
- Comes Pre-Cut with One Cutout
- NEMA 4, 12 and 13
- Cover Secured with Screwed Latches
- Hinged Door
- ConsoliDator+ Mounted in Cover
- Mounting Holes Integral to Enclosure
- UL Listed, CSA Certified

Visit predig.com/PDA2909 for more details

Wall Mounting Dimensions:

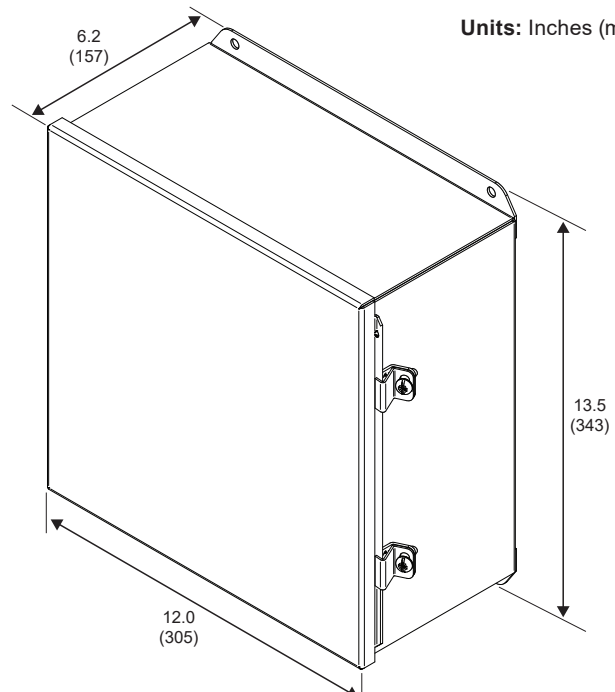
The PDA2909 enclosure includes integral mounting flanges at the top and bottom of the enclosure that can be used to mount the enclosures to a wall.

Units: Inches (mm)



PDA2909 Overall Dimensions:

Units: Inches (mm)



PD9000 Multi-Channel Controller

PDA9000SH Sun Hood



PDA9000SH Installed on PD9000 ConsoliDator+ mounted in PDA2909 enclosure
(ConsoliDator+ and enclosure sold separately)

The PDA9000SH ConsoliDator+ Sun Hood provides shade for the ConsoliDator+ when it is mounted in direct sunlight. It is adhered to the ConsoliDator+ enclosure with industrial grade double-sided tape (provided).

PDA-LH Light / Horn



PDA-LH Installed on a PDA2909 NEMA 4 enclosure that contains the PD9000 ConsoliDator+
(ConsoliDator+ and enclosure sold separately)

Precision Digital offers three different light configurations in its line of Light / Horn devices that are designed to be mounted in the PDA2909 enclosure with the ConsoliDator+.

The first option is a factory ordered Light / Horn with a color of either red, green, yellow, blue, or white. The second option is a Light / Horn the user determines the light color (red, green, yellow, blue or white) by connecting the appropriate wire. The third option is a Light / Horn with red, yellow, and green layers the user can turn on independently.

The light on the Light / Horn can be wired to flash (not available on PDA-LH5C) or stay steady on and the horn is rated at 85 dB.

The light and horn can be controlled independently of each other via separate relays on the ConsoliDator+; and since the controller's relays can be reset in a variety of ways, there are several ways the Light / Horn can operate. For instance, the horn can be programmed to silence at any time via the soft keys on the front of the ConsoliDator+, and reset the light automatically when the alarm clears.

PD9000 Multi-Channel Controller

ORDERING INFORMATION

General Purpose Panel Mount Models				
Model	Pulse Inputs	4-20 mA Inputs	4-20 mA Outputs	Relays
PD9000-GP-4AI	0	4	0	0
PD9000-GP-4AI-10RY	0	4	0	10
PD9000-GP-4AI-5AO-10RY	0	4	5	10
PD9000-GP-4AI-20RY	0	4	0	20
PD9000-GP-4AI-5AO-20RY	0	4	5	20
PD9000-GP-8AI	0	8	0	0
PD9000-GP-8AI-10RY	0	8	0	10
PD9000-GP-8AI-10AO-10RY	0	8	10	10
PD9000-GP-8AI-20RY	0	8	0	20
PD9000-GP-8AI-25RY	0	8	0	25
PD9000-GP-12AI	0	12	0	0
PD9000-GP-12AI-20RY	0	12	0	20
PD9000-GP-12AI-10AO-10RY	0	12	10	10
PD9000-GP-16AI	0	16	0	0
PD9000-GP-16AI-15RY	0	16	0	15
PD9000-GP-16AI-15AO	0	16	15	0
PD9000-GP-20AI	0	20	0	0
PD9000-GP-20AI-10RY	0	20	0	10
PD9000-GP-20AI-10AO	0	20	10	0
PD9000-GP-24AI	0	24	0	0
PD9000-GP-24AI-5RY	0	24	0	5
PD9000-GP-24AI-5AO	0	24	5	0
PD9000-GP-28AI	0	28	0	0
PD9000-GP-4PI	4	0	0	0
PD9000-GP-4PI-5AO	4	0	5	0
PD9000-GP-4PI-5AO-10RY	4	0	5	10
PD9000-GP-4PI-4AI-5AO	4	4	5	0
PD9000-GP-4PI-4AI-5AO-10RY	4	4	5	10
PD9000-GP-4PI-8AI-10AO-10RY	4	8	10	10
PD9000-GP-8PI	8	0	0	0
PD9000-GP-8PI-10AO	8	0	10	0
PD9000-GP-8PI-10AO-10RY	8	0	10	10
PD9000-GP-8PI-8AI-10AO-5RY	8	8	10	5

G = General Purpose
P = Panel-Mount
AI = Analog Input
PI = Pulse Input

AO = Analog Output
RY = Relay
E = Ethernet (Add "-E" at the end of the model number)
Example: PD9000-GP-4PI-8AI-10AO-10RY-E

Other models are available upon request.

PD9000 Multi-Channel Controller

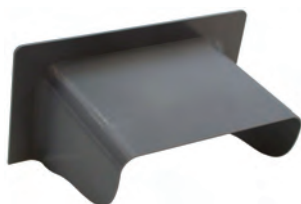
Input / Output Cards	
Model	Description
PDA9000-C4AI	(4) Isolated 4-20 mA Inputs Card for ConsoliDator+
PDA9000-C4PI	(4) Pulse Inputs Card for ConsoliDator+
PDA9000-C5AO	(5) Isolated 4-20 mA Outputs Card for ConsoliDator+
PDA9000-C5RY	(5) Relays Card for ConsoliDator+

Setup & Calibration Services	
Part Number	Description
PDN-CALCON+12	ConsoliDator+ Calibration and Certificate for up to 12 inputs and outputs
PDN-CALCON+24	ConsoliDator+ Calibration and Certificate for up to 24 inputs and outputs
PDN-CALCON+36	ConsoliDator+ Calibration and Certificate for up to 36 inputs and outputs
PDN-CALCON+12-DATA	ConsoliDator+ Calibration and Certificate with data for up to 12 inputs and outputs
PDN-CALCON+24-DATA	ConsoliDator+ Calibration and Certificate with data for up to 24 inputs and outputs
PDN-CALCON+36-DATA	ConsoliDator+ Calibration and Certificate with data for up to 36 inputs and outputs
PDN-CSETCON+	Custom Setup for ConsoliDator+

Accessories



NEMA 4 Steel Enclosure	
Model	Description
PDA2909	NEMA 4 Steel Enclosure for One ConsoliDator+



PDA9000SH Sun Hood	
Model	Description
PDA9000SH	ConsoliDator+ Sun Hood



Light / Horn Accessories	
Model	Description
PDA-LHR	Red Light / Horn
PDA-LHG	Green Light / Horn
PDA-LHY	Yellow Light / Horn
PDA-LHB	Blue Light / Horn
PDA-LHW	White Light / Horn
PDA-LH5C	Light / Horn with User Choice of Red, Green, Yellow, Blue or White Light
PDA-LH3LC-RYG	Light / Horn with Red, Yellow, Green Light Layers

PD9000 Multi-Channel Controller



PDA2360 Control Stations

Model	Description
PDA2360-E	Emergency Stop Button
PDA2361-A	1 Black Ack Button
PDA2361-Q	1 Black Silence Button



Signal Splitter & Conditioner Accessories

Model	Description
PD659-1MA-1MA	Signal Isolator with One 4-20 mA Input and One 4-20 mA Output
PD659-1MA-2MA	Signal Splitter with One 4-20 mA Input and Two 4-20 mA Outputs
PD659-1V-1MA	Signal Conditioner with One 0-10 VDC Input and One 4-20 mA Output
PD659-1MA-1V	Signal Conditioner with One 4-20 mA Input and One 0-10 VDC Output



PDA1024-01 Power Supply

Model	Description
PDA1024-01	24 VDC Power Supply for DIN Rail



Split Core AC Current Transducer

Model	Description
PDA6420	Split Core AC Current Transducer. Input: 30/60/120 AAC; Output 4-20 mA



PDA2360 Control Stations

Model	Description
PDA-BUTTON1B	NEMA 4X Black Reset Button
PDA-BUTTON1G	NEMA 4X Green Reset Button
PDA-BUTTON1R	NEMA 4X Red Reset Button



Panel Mount Buzzer and Light

Model	Description
PDA1000	Panel Mount Buzzer and Light



Snubber 0.01μF/470Ω Flexible Leads

Model	Description
PDX6901	Snubber 0.01μF/470Ω Flexible Leads



Low-Cost Signal Generator

Model	Description
PD9502	4-20 mA or 0-10 VDC, Low-Cost Signal Generator