PD6820 Explosion-Proof Loop-Powered Rate/Totalizer

Instruction Manual

- Fully-Approved Explosion-Proof Loop-Powered Rate/Totalizer
- 4-20 mA Input with ±0.03% Accuracy
- 3.0 Volt Drop (6.0 Volt Drop with Backlight)
- Easy Field Scaling in Engineering Units without Applying an Input
- 0.7" (17.8 mm) 5 Digits Main Display for Rate
- 0.4" (10.2 mm) 7 Alphanumeric Characters Secondary Display for Total, Tag, or Units
- Simultaneous 5-Digit Rate and 7-Digit Total Display
- Rate in Units per Second, Minute, Hour, or Day
- Display Open Channel Flow with Programmable Exponent Feature
- Open Collector Pulse or Alarm Output
- Display Mountable at 0°, 90°, 180°, & 270°
- SafeTouch Through-Glass Button Programming
- HART® Protocol Transparent
- Loop or External DC-Powered Backlight Standard
- Operating Temperature Range: -40 to 75°C (-40 to 167°F)
- Installation Temperature Range: -55 to 75°C (-67 to 167°F)
- CSA Certified as Explosion-Proof / Dust-Ignition-Proof / Flame-Proof
- ATEX and IECEx Certified as Explosion-Proof
- Conformal Coated PCBs for Dust and Humidity Protection
- Password Protection for Programming Only
- 32-Point Linearization, Square Root Extraction and Programable Exponent Function
- Wide Viewing Angle
- Built-In Flange for Wall or Pipe Mounting
- Explosion-Proof, IP68, NEMA 4X Die-Cast Aluminum & Stainless Steel Enclosures
- Two 3/4" NPT or M20 Conduit Openings
- 2" U-Bolt Kit Available
- 3-Year Warranty

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Disclaimer

The information contained in this document is subject to change without notice. Precision Digital Corporation makes no representations or warranties with respect to the contents hereof; and specifically disclaims any implied warranties of merchantability or fitness for a particular purpose.

⚠ CAUTION

- Read complete instructions prior to installation and operation of the meter.

⚠ WARNINGS

- Risk of electric shock or personal injury.
- This product is not recommended for life support applications or applications where malfunctioning could result in personal injury or property loss. Anyone using this product for such applications does so at his/her own risk. Precision Digital Corporation shall not be held liable for damages resulting from such improper use.
- Failure to follow installation guidelines could result in death or serious injury. Make sure only qualified personnel perform the installation.
- Never remove the meter cover in explosive environments when the circuit is live.
- Cover must be fully engaged to meet flame-proof/explosion-proof requirements.

⚠ WARNING
Cancer and Reproductive Harm - www.P65Warnings.ca.gov

Limited Warranty

Precision Digital Corporation warrants this product against defects in material or workmanship for the specified period under “Specifications” from the date of shipment from the factory. Precision Digital’s liability under this limited warranty shall not exceed the purchase value, repair, or replacement of the defective unit. See Warranty Information and Terms & Conditions on www.predig.com for complete details.

Introduction

The PD6820 is a rugged, full-featured, explosion-proof loop-powered flow rate/totalizer ideal for demanding applications in hazardous areas or in the harshest environmental conditions. The product is CSA Certified as Explosion-Proof, Dust-Ignition-Proof, and Flame-Proof, and ATEX & IECEx Certified as Explosion-Proof. It is available in either an aluminum or stainless steel enclosure with ¾" or M20 conduit connections. It will operate down to -40°C and is approved for installation in areas where the temperature gets as cold as -55°C, however, the display will cease functioning.

The meter derives all of its power from the 4-20 mA loop thus making installation a simple matter of wiring the instrument into the existing loop. No external power is required. Programming is performed using the four SafeTouch through-glass buttons and can be done without removing the cover. In addition, the meter can be scaled with or without a calibration signal.

The backlit LCD display consists of two lines. The top line of the display has five full digits and can display flow rate or total. The bottom line has seven alphanumeric characters and can display flow rate, total, grand total, a tag, or engineering units. The backlight makes the display visible under any lighting condition and can be powered from either the 4-20 mA loop or from a separate DC power supply. A pulse output is available that can be used to send a pulse to an external device for every user-specified amount of volume totalized.

Ordering Information

Aluminum Enclosure

Model	Description
PD6820-0K1	Explosion-Proof Loop-Powered Rate/Totalizer with Backlight and Two 3/4" Conduit Openings
PD6820-0K1-M20	Explosion-Proof Loop-Powered Rate/Totalizer with Backlight and Two M20 Conduit Openings

Stainless Steel Enclosure

Model	Description
PD6820-0K1-SS	Explosion-Proof Loop-Powered Rate/Totalizer with Backlight and Two 3/4" Conduit Openings
PD6820-0K1-SS-M20	Explosion-Proof Loop-Powered Rate/Totalizer with Backlight and Two M20 Conduit Openings

Accessories

Model	Description
PDAPLUG75	3/4" NPT 316 Stainless Steel Conduit Plug with Approvals
PDAPLUGM20	M20 316 Stainless Steel Conduit Plug with Approvals
PDAREDUCER-75M-M20F	M-3/4" NPT to F-M20 Reducer with Approvals
PDAREDUCER-75M-50F	M-3/4" NPT to F-1/2" NPT Reducer with Approvals
PD9501	Multi-Function Calibrator
PD9502	Low-Cost Signal Generator
PDA1001	USB Power Bank
PDA1002	6" DIN Rail Mounting Kit
PDA1024-01	24 VDC Power Supply for DIN Rail
PDA-SSTAG	Custom Stainless Steel Tag (see website for convenient ordering form)
PDA6846-SS	Stainless Steel 2" U-Bolt Kit. All Material: Stainless Steel; (1) U-Bolt for 2" Pipe with (2 each) Washers, Lock Washers, and Nuts

Note: Unless otherwise specified, the above accessories do not carry hazardous area approvals and are thus not suitable for location in hazardous areas.

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Physical Features

The ProtEX-RTA PD6820-0K1 comes with two ¾" NPT conduit openings and the PD6820-0K1-M20 comes with two M20 conduit openings.

Great for Cold Temperatures

The ProtEX-RTA PD6820 will operate over a temperature range of -40 to 75°C (-40 to 167°F). Below -40°C, the display will cease functioning, however, the instrument is approved to be installed in locations where the temperature goes down to -55°C.

Wide Viewing Angle

The window and display module have been optimized to provide a wide viewing angle of approximately ±40°; nearly twice that of the competition.

Easy Pipe Mounting

The ProtEX-RTA comes with a built-in mounting flange. This allows for easy mounting to walls or pipes using the PDA6846-SS Stainless Steel 2" U-Bolt Kit. A slot on the back of the enclosure makes it easy to center the unit on a pipe.

Rotatable Display Module

The display module can be rotated in 90° increments providing added mounting flexibility. Plus the various conduit connections allow a variety of installation options.

Tamper-Proof Capability

The instrument can be made tamper-proof by inserting a wire through the built-in loop on the base of the enclosure and a hole in the lid of the enclosure and securing this wire with a lead seal.

Stainless Steel Tag Attaching Loop

The enclosure is equipped with a loop at the top to easily attach a PDA-SSTAG stainless steel tag.

Accessories

PDA1024-01 24 VDC Power Supply

The PDA1024-01 is a DIN rail mounted 1.5 A, 24 VDC power supply that can be used to power the 4-20 mA transmitter.

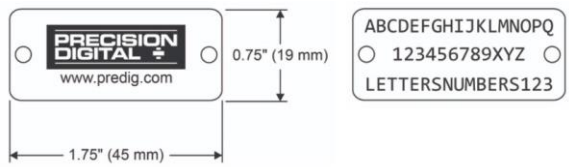
PDA6846-SS 2" U-Bolt Kit

The PDA6846-SS U-Bolt Kit provides a convenient way to mount the PD6820 to 1.5" or 2" pipes.

PDA-SSTAG Stainless Steel Tag

The PDA-SSTAG is a laser etched stainless steel tag that can be customized with three lines of text. Each tag comes with a stainless steel wire and lead seal for easy mounting wherever you need.

Dimensions



Specifications

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

General

Display	Five digits (-9999 to 99999)	0.70" (17.8 mm) high, 7-segment, automatic lead zero blanking		
	Seven characters	0.4" (10.2 mm) high, 14-segment		
	Symbols	High & Low Alarm, Password Lock		
Display Orientation	Display may be mounted at 90° increments up to 270° from default orientation.			
Display Assignment	Upper display is assigned to rate and lower display may be assigned to total, tag name/ engineering units, or to alternate between them.			
Display Update Rate	Ambient > -25°C: 2 Updates/Second Ambient < -25°C: 1 Update/5 Seconds			
Backlight	White; Loop-powered or externally powered. Backlight can be enabled or disabled via alternative wiring of terminal block. Loop-powered backlight brightness will increase as the input signal current increases. Externally powered backlight has consistent brightness.			
Externally Powered Backlight	*Voltage Range: 9-36 VDC*			
	Supply V	9 VDC	12 VDC	24 VDC 36 VDC
	Max Pwr	0.2 W	0.25 W	0.5 W 0.75 W
Display Overrange	Display flashes 99999			
Display Underrange	Display flashes -9999			
Programming Method	Four SafeTouch through-glass buttons when cover is installed. Four internal pushbuttons when cover is removed.			
Noise Filter	Programmable LO, no Ed, HI, or OFF			
Recalibration	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 turned off.			
Advanced Function	Linear, square root, or programmable exponent			
Password	Programmable password restricts modification of programmed settings.			
Non-Volatile Memory	All programmed settings are stored in non-volatile memory for a minimum of ten years if power is lost.			
Normal Mode Rejection	64 dB at 50/60 Hz			
Environmental	Operating temperature range: -40 to 75°C (-40 to 167°F) Storage temperature range: -55 to 75°C (-67 to 167°F) Installation temperature range: -55 to 75°C (-67 to 167°F) (The display ceases to function below -40°C) Relative humidity: 0 to 90% non-condensing Printed circuit boards are conformally coated			
Connections	Screw terminals accept 12 to 22 AWG wire			
Mounting	May be mounted directly to conduit. Built-in flange for wall mounting or NPS 1½" to 2½" or DN 40 to 65 mm pipe mounting. See *Dimensions* on page *13*.			
Overall Dimensions	5.65" x 5.25" x 4.86" (W x H x D) (144 mm x 133 mm x 124 mm)			
Weight	5.00 lbs (80 oz, 2.27 kg)			
Warranty	3 years parts and labor. See Warranty Information and Terms & Conditions on www.predig.com for complete details.			

Input

Input	4-20 mA	
Accuracy	±0.03% of calibrated span ±1 count, square root & programmable exponent accuracy range: 10-100% of calibrated span.	
Temperature Drift	50 PPM/°C from -40 to 75°C ambient	
Maximum Voltage Drop & Equivalent Resistance	**Without Backlight or with Externally Powered Backlight**	**With Loop-Powered Backlight**
	3.0 VDC @ 20 mA	6.0 VDC @ 20mA
	150 Ω @ 20 mA	300 Ω @ 20 mA
Multi-Point Linearization	2 to 32 points	
Signal Input Conditioning	Linear, square root, programmable exponent	
Programmable Exponent	User selectable from 1.0001 to 2.9999 for open channel flow.	
Low Flow Cutoff	0-99999 (0 disables cutoff function) Point below at which display always shows zero.	
Decimal Point	User selectable decimal point	
Minimum Span	Input 1 & Input 2: 0.10 mA	
Calibration Range	An *Error* message will appear if input 1 and input 2 signals are too close together.	
	Input Range	**Minimum Span Input 1 & Input 2**
	4-20 mA	0.10 mA
Input Overload	Over current protection to 2 A max.	
HART Transparency	The meter 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 meter is not affected if a HART communicator is connected to the loop. The meter does not display secondary HART variables.	

Rate/Totalizer

Rate Display	0 to 99,999 leading zero blanking
Total Display	0 to 9,999,999 leading zero blanking
Total Decimal Point	Up to six decimal places or none: d.dddddd, d.ddddd, d.dddd, d.ddd, d.dd, d.d, or ddddddd
Lower Display Configuration	Can be programmed to display total, tag name/engineering units, or to alternate between them.
Totalizer	Calculates total based on rate, time base of second, minute, hour, or day, and field programmable multiplier; stored in non-volatile memory upon power loss.
Totalizer Reset	Via front panel SafeTouch button, time delay, external contact closure, or protected
Total Conversion Factor	0.000001 to 9,999,999
Totalizer Rollover	Display rolls over when display exceeds 9,999,999. Relay status reflects the displayed value.
Total Reset Delay	Programmable from 0 to 99,999 seconds

Open Collector Output

Rating	Isolated open collector, sinking NPN 30 VDC @ 150 mA max.
Alarm Output	Assign to rate for high or low alarm trip point. Assign to total for total alarm trip point.
Deadband	0-100% FS, user selectable
Acknowledge	Front panel ACK button resets output and screen indication.
Pulse Output Scaler (Count)	The pulse output scaler (count) is programmable from 0.0001 to 99999. One pulse is generated for every total increment selected (e.g. A pulse scaler value of 100 will generate one pulse every time the total is incremented by 100 units). If the pulse output exceeds the programmed output frequency, pulses are accumulated as pending and are not lost. Pulses will continue to output until the buffer is emptied or the total is reset from the front panel.
Pulse Output Frequency	Programmable frequency: 2, 4, 8, 16, 32, 64, 128 Hz. Minimum pulse width: 3.9 ms @ 128 Hz Maximum pulse width: 250 ms @ 2 Hz Factory default pulse width: 31 ms @ 16 Hz

Enclosure

Material	AL Models: ASTM A413 LM6 die-cast aluminum, copper-free, enamel coated SS Models: ASTM A743 CF8M investment-cast 316 stainless steel
Gasket	Fluoroelastomer
Rating	NEMA 4X, IP68 Explosion-proof
Color	AL: Blue SS: Silver
Window	Borosilicate glass
Conduits	PD6820-0K1: Two 3/4" NPT PD6820-0K1-M20: Two M20 PD6820-0K1-SS: Two 3/4" NPT PD6820-0K1-SS-M20: Two M20
Flange	Built-in flange for wall and pipe mounting
Tamper-Proof Seal	Cover may be secured with tamper-proof seal
Instrument Tag Loop	Built-in loop for securing stainless steel tag
ATEX & IECEx	Flame-proof protection Ⓔx II 2 G D Ex db IIC Gb Ex tb IIIC Db IP66/IP68 Tamb: -55°C to +85°C Certificate No.: Sira 19ATEX1252U Certificate No.: IECEx SIR 19.0075U
CSA	Class I, Division 1, Groups A, B, C, D Class II, Division 1, Group E, F, G; Class III Ex db IIC Gb Ex tb IIIC Db Class I, Zone 1, AEx db IIC Gb; Zone 21, AEx tb IIIC Db IP66/IP68/TYPE 4X Tamb: -55°C to +85°C Certificate number: CSA 19.80011200U
UL	Class I, Division 1, Groups A, B, C and D Class II, Division 1, Groups E, F and G Class III; Class I, Zone 1, AEx db IIC Gb Zone 21, AEx tb IIIC Ex db IIC Gb Ex tb IIIC Db IP66/IP68/TYPE 4X Tamb: -55°C to +85°C Certificate Number: E518920

Note: The above approvals are for the enclosure only. See *Product Ratings and Approvals* on page *11* for approvals on the entire instrument.

General Compliance Information

Electromagnetic Compatibility

EMC Emissions	• CFR 47 FCC Part 15 Subpart B Class A emissions requirements (USA) • ICES-003 Information Technology emissions requirements (Canada) • AS/NZS CISPR 11 Group 1 Class A ISM emissions requirements (Australia/New Zealand) • EN 55011 Group 1 Class A ISM emissions requirements (EU) • EN 61000-6-4 Emissions requirements for Heavy Industrial Environments - Generic
EMC Emissions and Immunity	EN 61326-1 EMC requirements for Electrical equipment for measurement, control, and laboratory use – industrial use

Product Ratings and Approvals

CSA	Explosion-proof for use in: Class I, Division 1, Groups B, C and D Dust-ignition-proof for use in: Class II/III, Division 1, Groups E, F and G; T6 Flame-proof for use in: Zone 1, Ex d IIC T6 Ta = -55 to 75°C Enclosure: Type 4X & IP66/IP68 Certificate number: CSA 11 2325749
ATEX	Explosion-proof for use in: Ⓔx II 2 G D Ex db IIC T6 Gb Ex tb IIIC T85°C Db IP68 Ta = -55 to 75°C Certificate number: Sira 10ATEX1116X
IECEx	Explosion-proof for use in: Ex db IIC T6 Gb Ex tb IIIC T85°C Db IP68 Ta = -55 to 75°C Certificate number: IECEx SIR 10.0056X

ATEX/IECEx Specific Conditions of Use

1. The equipment label and epoxy coating may generate an ignition-capable level of electrostatic charges under certain extreme conditions. The user should ensure that the equipment is not installed in a location where it may be subjected to external conditions (such as high-pressure steam) which might cause a buildup of electrostatic charges on non-conducting surfaces. Additionally, cleaning of the equipment should be done only with a damp cloth.
2. Flameproof joints are not intended to be repaired.
3. All entry closure devices shall be suitably certified as “Ex d”, “Ex t” and “IP66/68” as applicable. Suitable thread sealing compound (non-setting, non-insulating, non-corrosive, not solvent based, suitable for the ambient rating) must be used at the NPT conduit entries to achieve the IPx8 rating while maintaining the Ex protection concept.

Year of Construction

This information is contained within the serial number with the first four digits representing the year and month in the YYMM format.

For European Community:

The PD68XX Series must be installed in accordance with the ATEX directive 2014/34/EU, the product certificate Sira 10ATEX1116X, and the product manual.

EU Declaration of Conformity

For shipments to the EU and UK, a Declaration of Conformity was printed and included with the product. For reference, a Declaration of Conformity is also available on our website www.predig.com/docs.

Safety Information

⚠ CAUTION

- Read complete instructions prior to installation and operation of the annunciator.

⚠ WARNINGS

- Risk of electric shock or personal injury.
- Hazardous voltages exist within enclosure.
- Installation and service should be performed only by trained service personnel.
- Service requiring replacement of internal components must be performed at the factory.
- In hazardous areas, conduit and conduit/stopping plugs require the application of non-setting (solvent free) thread sealant. It is critical that all relevant hazardous area guidelines be followed for the installation or replacement of conduit or plugs.

Installation

For Installation in USA: The PD68XX Series must be installed in accordance with the National Electrical Code (NEC) NFPA 70.

For Installation in Canada: The PD68XX Series must be installed in accordance with the Canadian Electrical Code CSA 22.1. All input circuits must be derived from a CSA approved Class 2 source.

For European Community: The PD68XX Series must be installed in accordance with the ATEX directive 2014/34/EU and the product certificate Sira 10ATEX1116X.

⚠ WARNINGS

- Disconnect from supply before opening enclosure.
- Keep cover tight while circuits are live.
- Conduit seals must be installed within 18" (450 mm) of the enclosure.
- Use suitably certified and dimensioned cable entry device and/or plug.
- Cable must be suitable for 90°C.

All controls and wiring connections are located on the display module that is accessed by removing the enclosure cover. The controls can be accessed without removing the display module. The wiring connections can be accessed by removing the display module which is secured to the enclosure by two captive screws.

Unpacking

Remove the meter from box. Inspect the packaging and contents for damage. Report damages, if any, to the carrier.

If any part is missing or the meter malfunctions, please contact your supplier or the factory for assistance.

Cover Jam Screw

The cover jam screw should be properly installed once the meter has been wired and tested in a safe environment. The cover jam screw is intended to prevent the removal of the meter cover in a hazardous environment without the use of tools. Using a M2 hex wrench, turn the screw clockwise until the screw contacts the meter. Turn the screw an additional 1/4 to 1/2 turn to secure the cover.

⚠ CAUTION

- Excess torque may damage the threads, screw head, or wrench.

Mounting

The PD68XX Series includes a built-in mounting flange that may be used for pipe mounting or wall mounting. Alternatively, the unit may be supported by the conduit using the conduit holes provided.

Refer to *Figure 1* and *Figure 2*.

⚠ WARNING

- Do not attempt to loosen or remove flange bolts while the meter is in service.

Dimensions

All units: inches (mm)

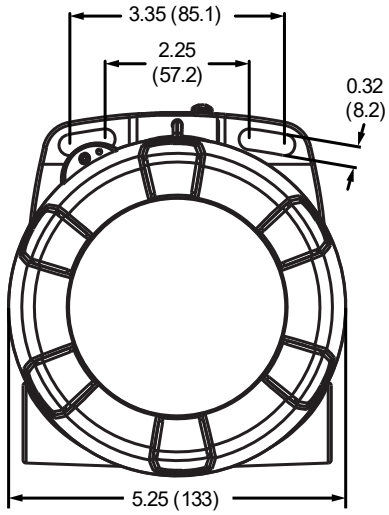


Figure 1. Enclosure Dimensions - Front View

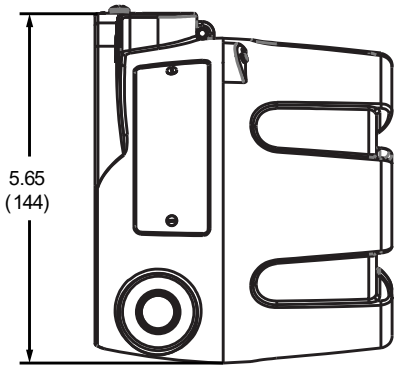


Figure 2. Enclosure Dimensions - Side View

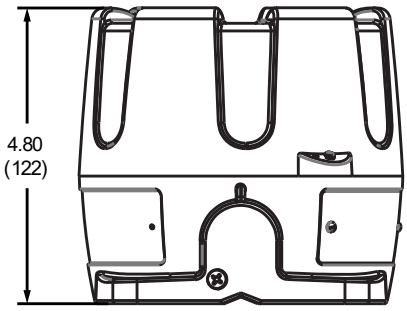


Figure 3. Enclosure Dimensions - Top View

Connections

To access the connectors, remove the enclosure cover and unscrew the two captive screws that fasten the display module. Disconnect the ribbon cable and remove the display module. Signal connections are made to a four-terminal connector in the base of the enclosure. Grounding connections are made to the two ground screws provided on the base – one internal and one external.

SIGNAL +	4-20 mA signal input positive terminal connection
SIGNAL -	4-20 mA signal return/negative terminal connection when not using loop powered backlight.
BACKLIGHT +	+9-36 VDC when powering backlight from external supply.
BACKLIGHT -	4-20 mA signal return/negative terminal when using the installed loop powered backlight or ground/negative when powering backlight from external supply.
OUTPUT+	NPN open collector output positive.
OUTPUT-	NPN open collector output negative.
RESET +	Contact closure alarm acknowledge pull up to 3 VDC.
RESET-	Contact closure alarm acknowledge ground/negative.

Refer to *Figure 4* for terminal positions.

WARNINGS

- Observe all safety regulations. Electrical wiring should be performed in accordance with all agency requirements and applicable national, state, and local codes to prevent damage to the meter and ensure personnel safety.
- Static electricity can damage sensitive components.
- Observe safe handling precautions for static-sensitive components.
- Use proper grounding procedures/codes.
- If the meter is installed in a high voltage environment and a fault or installation error occurs, high voltage may be present on any lead or terminal.

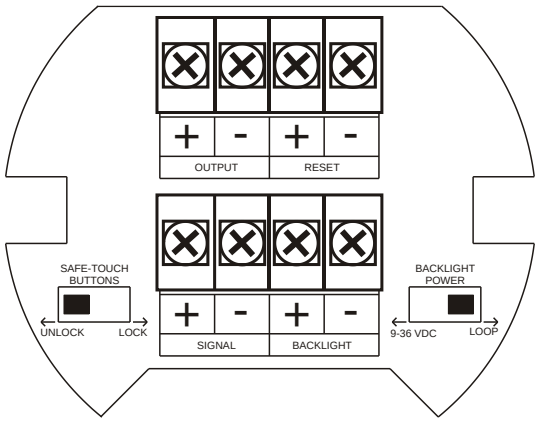


Figure 4. Connector Board

Wiring Diagrams

Signal connections are made to a four-terminal connector mounted in the base of the enclosure per *Figure 4. Connector Board*. The enclosure also provides one internal and one external earth grounding screw.

For installations that don't use the backlight, the maximum voltage drop is 3 V and connections are made per *Figure 5.*

For installations that use the backlight powered from the meter, the maximum voltage drop is 6 V and connections are made per *Figure 6*.

For installations that use the backlight powered from an external source, the maximum voltage drop is 3 V and connections are made per *Figure 7*.

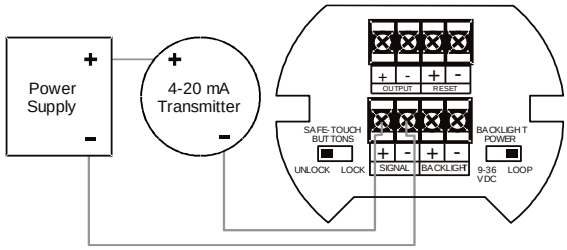


Figure 5. Connections without Backlight

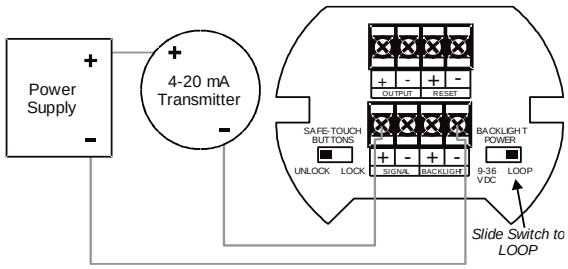


Figure 6. Connections with Loop-Powered Backlight

Loop-powered backlight brightness will increase as the input signal current increases. If constant backlight brightness is desired, the backlight should be powered by an external source.

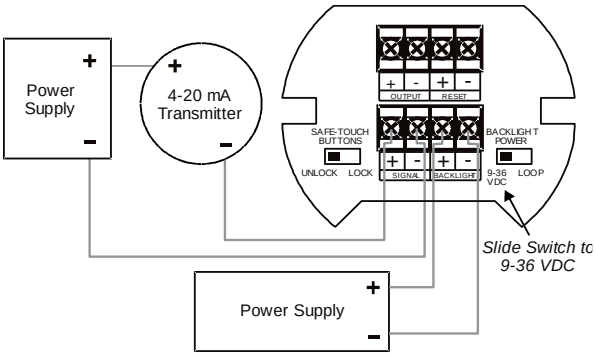


Figure 7. Connections with Externally-Powered Backlight

It is possible to use the same transmitter (signal loop) power supply for the externally powered backlight. The backlight circuit will draw 25 mA in addition to the loop circuit.

External Reset Connection

External reset connections are made to two terminals labeled RESET. Connect to a contact closure source such as a relay or a pushbutton as shown in *Figure 8*.

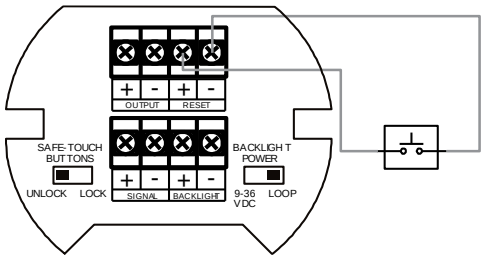


Figure 8. Reset Connections

Open Collector Output Connections

Output connections are made to two terminals labeled OUTPUT. Connect to an input device such as alarm indicator or pulse counter as shown in *Figure 9* or drive a relay as shown in *Figure 10*.

To avoid damaging the PD6820's amplifying components, use care not to wire incorrectly or exceed output ratings. A diode, such as 1N4000 series, will provide protection from relay transients.

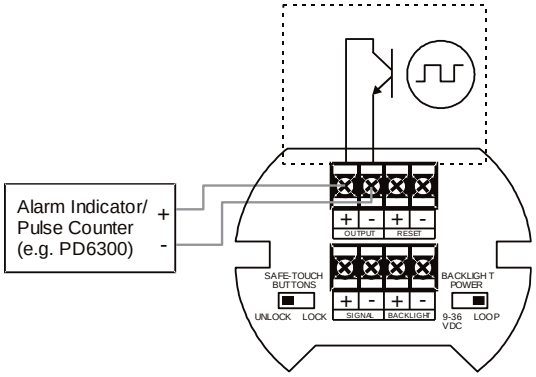


Figure 9. Connection to Device with Internal Pull-Up

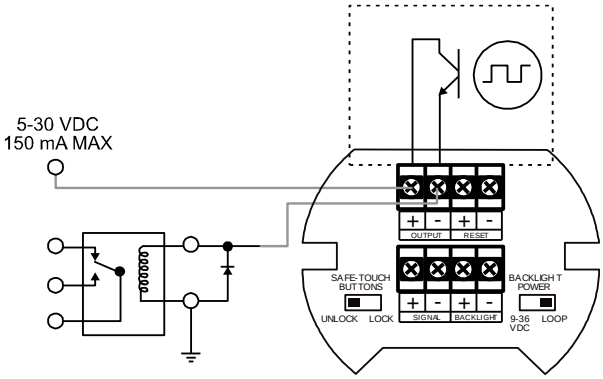


Figure 10. Output Connections

Setup and Programming

There is **no need to recalibrate** the meter for milliamps when first received from the factory.

The meter is ***factory calibrated*** for milliamps prior to shipment. The calibration equipment is traceable to NIST standards.

Overview

Setup and programming is done through the infrared through-glass SafeTouch buttons or using the mechanical buttons when uncovered. There are two slide switches located on the connector board. One is used to select backlight power and the other is to lock or unlock the SafeTouch Buttons.

After all connections have been completed and verified, connect the ribbon cable to the display module, fasten the display module to the base, install enclosure cover, and then apply power.

SafeTouch Buttons

The PD6820 is equipped with four sensors that operate as through-glass buttons so that it can be programmed and operated without removing the cover (and exposing the electronics) in a hazardous area. These buttons can be disabled for security by selecting the LOCK setting on the switch located on the connector board in the base of the enclosure. To actuate a button, press one finger to the glass directly over the marked button area. When the cover is removed, the four mechanical buttons located next to the sensors are used. The sensors are disabled when a mechanical button is pressed and will automatically be re-enabled after 60 seconds of inactivity.

The SafeTouch buttons are designed to filter normal levels of ambient interference and to protect against false triggering, however, it is recommended that the SafeTouch buttons be disabled (slide switch to LOCK) if there is an infrared interference source in line-of-sight to the display.

SafeTouch Button Tips and Troubleshooting

The SafeTouch buttons are designed to filter normal levels of ambient interference and to protect against false triggering, however, it is recommended that the SafeTouch buttons be disabled (slide switch to LOCK) if there is an infrared interference source in line-of-sight to the display.

SafeTouch Button Tips:

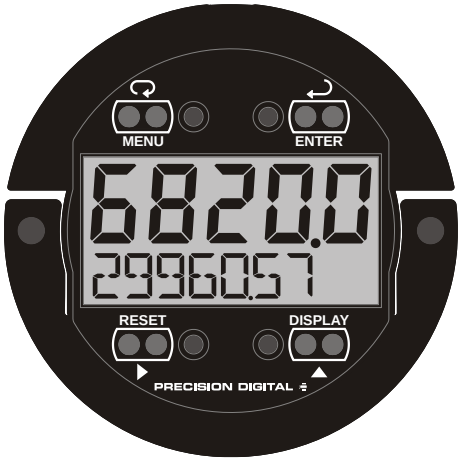
- To remove cover with power applied (safe area only), or to clean the window, select SERVICE in the main menu before opening the cover. This will temporarily disable the SafeTouch buttons for 60 seconds to prevent inadvertent use. Use the mechanical buttons while the meter is open.
- To the extent possible, install the display facing away from sunlight, windows, reflective objects and any sources of infrared interference.
- Keep the glass window clean.
- Tighten the cover securely.
- Use a password to prevent tampering.

  After all connections have been completed and verified, apply power to the loop.

⚠ IMPORTANT

- SafeTouch buttons will not work if two or more buttons are detected as being pressed simultaneously. As a result, be careful to avoid triggering multiple buttons or reaching across one button location to press another.

Buttons and Display



Button Symbol	Description
MENU	**Menu**
RESET	**Right arrow/ Reset**
DISPLAY	**Up arrow/ Display**
ENTER	**Enter**

Symbol	Status
HI	High Alarm Set
LO	Low Alarm Set
SET	Total Alarm Set
🔒	Password Enabled

Menu Button

- Press the **Menu** button to enter or exit the Programming Mode at any time.
- Press and hold the **Menu** button for five seconds to access the *Advanced* features of the meter.

Right / Reset Button

- Press the **Right** arrow button to move to the next digit or decimal position during programming.

Up / Display Button

- Press the **Up** arrow button to scroll through the menus, decimal point, or to increment the value of a digit.

Enter Button

- Press the **Enter** button to access a menu or to accept a setting.

The meter displays various functions and messages during setup, programming, and operation. The following table shows the main menu functions and messages in the order they appear in the menu.

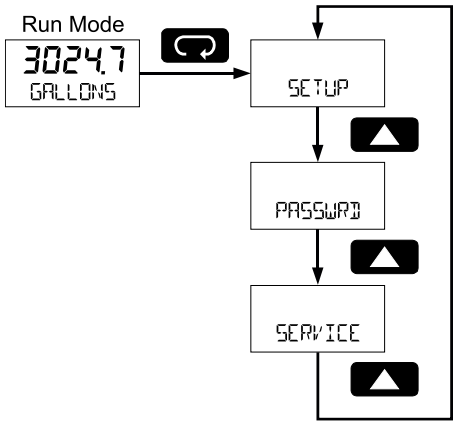
Main Menu Display Functions & Messages

The meter displays various functions and messages during setup, programming, and operation. The table in the right column shows the main menu functions and messages in the order they appear in the menu.

Main Menu

The main menu consists of the most commonly used functions: *Setup, Password,* and *Service*.

Press **MENU** button to enter Programming Mode then press the **Up Arrow** button to scroll through the main menu.



- Press **MENU**, at any time, to exit and return to Run Mode. Changes made to settings prior to pressing **Enter** are not saved.
- Changes to the settings are saved to memory only after pressing **Enter**.
- The display moves to the next menu every time a setting is accepted by pressing **Enter**.

Display	Parameter	Action/Setting
SETUP	*Setup*	Enter *Setup* menu
dEC.Pt	*Decimal point*	Enter *Decimal Point* menu
rAtE	*Rate decimal*	Set rate display decimal point
totAL	*Total decimal*	Set total display decimal point
Prog	*Program*	Enter the *Program* menu
SCALE	*Scale*	Enter the *Scale* menu
CAL	*Calibrate*	Enter the *Calibrate* menu
InPt 1	*Input 1*	Calibrate input 1 signal or program input 1 value
dSPL 1	*Display 1*	Program display 1 value
InPt2	*Input 2*	Calibrate input 2 signal or program input 2 value
dSPL2	*Display 2*	Program display 2 value
SPAn Error	*Span Error*	Error, calibration not successful, check signal
tbASE	*Time Base*	Enter the *Time Base* menu
SEc	*Second*	Units per *second*
1 in	*Minute*	Units per *minute*
hour	*Hour*	Units per *hour*
dAY	*Day*	Units per *day*
totCF	*Conversion Factor*	Enter the *Conversion Factor* menu
t rSt	*Total Reset*	Enter the *Total Reset* menu
Auto	*Automatic*	*Automatic* Total Reset
T DELAY	*Time Delay*	Automatic Reset *Time Delay*
1An	*Manual*	*Manual* Total Reset
EnAbL	*Enable*	*Enable* Manual reset
dSAbL	*Disable*	*Disable* Manual reset
tAG	*Tag/Units*	Enter the Tag/Units Menu
On	*Tag On*	Enable Tag/Units
OFF	*Tag Off*	Disable Tag/Units
toGLE	*Tag Toggle*	Toggle Tag and Total
PASSWRD	*Password*	Enter the *Password* menu
UNLOCKD	*Unlocked*	Program password to lock meter
LOCKED	*Locked*	Enter password to unlock meter
99999 -99999	*Flashing display*	Overrange condition Underrange condition
SERVICE	*Service*	Select before removing/installing cover for service or to clean the glass window

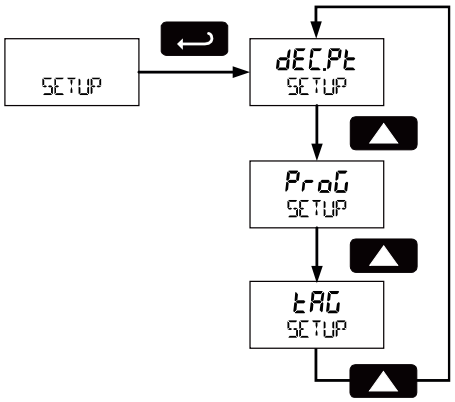
Setting Up the Meter (SETUP)

The *Setup* menu is used to select:

1. Rate and total decimal point position
2. Program menu
3. Rate and total tag display
4. Time base
5. Total conversion factor
6. Manual or automatic total reset function

Press the **Enter** button to access any menu or press **Up** arrow button to scroll through choices.

Press the **Menu** button to exit at any time.



Setting Numeric Values

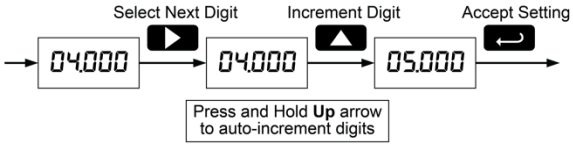
The numeric values are set using the **Right** and **Up** arrow buttons.

Press **Right** arrow to select next digit and **Up** arrow to increment digit.

The digit being changed blinks.

Press the **Enter** button, at any time, to accept a setting or **MENU** button to exit without saving changes.

The decimal point is set using the **Right** or **Up** arrow button in the *Setup-decimal point* menu.

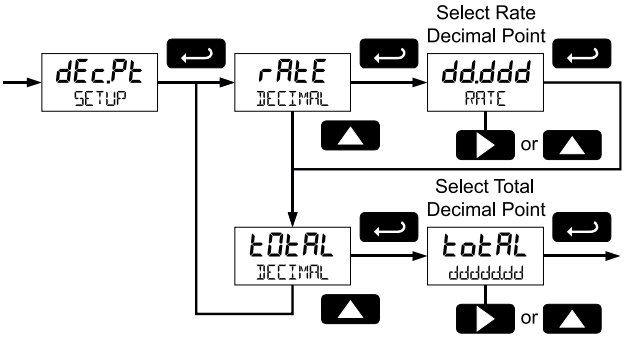


Setting the Decimal Point (dEc.Pt)

Rate decimal point may be set with up to four decimal places or with no decimal point at all. Total decimal point may be set with up to six decimal places or with no decimal point at all. Rate decimal and total decimal are programmed individually.

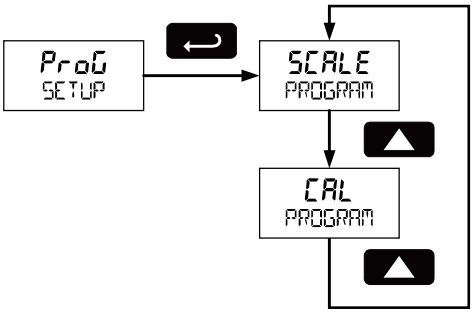
Pressing the **Right** arrow moves the decimal point one place to the right until no decimal point is displayed.

Pressing the **Up** arrow moves the decimal point one place to the left.

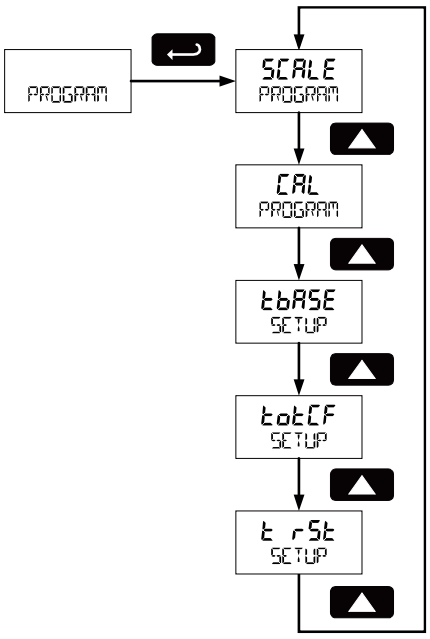


Programming the Meter (ProG)

The meter may either be scaled (SCALE) without applying an input or calibrated (CAL) by applying an input. The meter comes factory calibrated to NIST standards, so for initial setup, it is recommended to use the (SCALE) function. The Program menu contains the Scale (SCALE) and the Calibrate (CAL) menus. Process inputs may be scaled or calibrated to any display within the range of the meter.



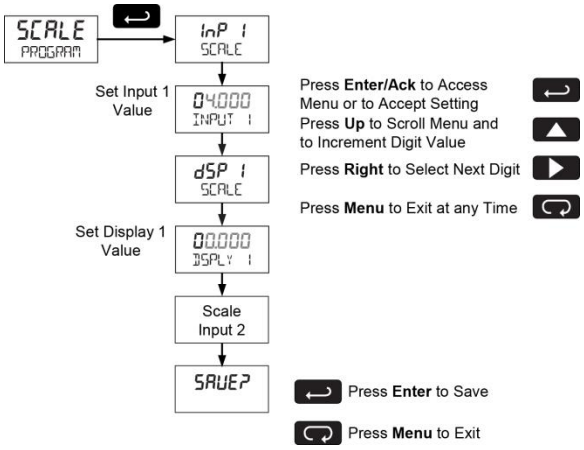
Note: *The Scale and Calibrate functions are exclusive of each other. The meter uses the last function programmed. Only one of these methods can be employed at a time. The Scale and Calibrate functions can use up to 32 points (default is 2). The number of points should be set in the Advanced Features menu under the Multi-Point Linearization (LnEAr) menu selection prior to scaling and calibration of the meter, see Advanced Features Menu, page 24.*



Scaling the Meter (SCALE)

The 4-20 mA input can be scaled to display the process in engineering units.

A signal source is not needed to scale the meter; simply program the inputs and corresponding display values.



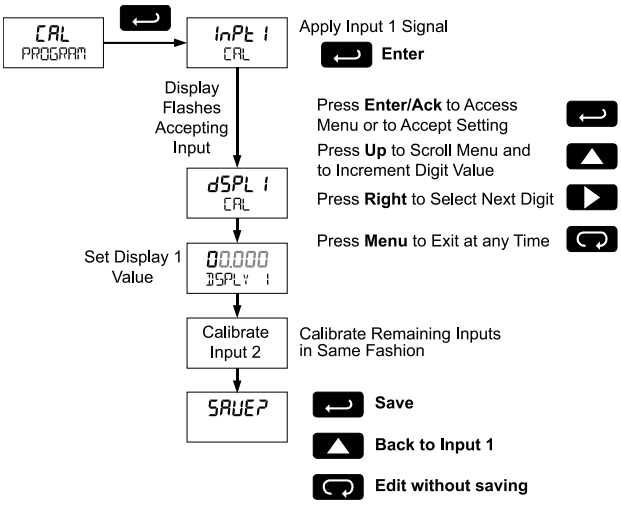
For instructions on how to program numeric values see *Setting Numeric Values*, page *19*.

Calibrating the Meter (CAL)

To scale the meter without a signal source refer to *Scaling the Meter* (SCALE) on page *20*.

The meter can be calibrated to display the process in engineering units by applying the appropriate input signal and following the calibration procedure.

The use of a calibrated signal source is strongly recommended.



1. Press the **Up** arrow button to scroll to the *Calibration* menu (CAL) and press **Enter**.
2. The meter displays InPt 1. Apply a known signal and press **Enter**.
   The display will flash while accepting the signal.
3. After the signal is accepted, the meter displays dSPL 1 Press **Enter**.
   Enter a corresponding display value for the signal input, and press **Enter** to accept.
4. The meter displays InPt2. Apply a known signal and press **Enter**.
   The display will flash while accepting the signal.
5. After the signal is accepted, the meter displays dSPL2. Press **Enter**.
   Enter a corresponding display value for the signal input and press **Enter** to accept.

After completing calibration the SAVE? display will need to be acknowledged using the Enter key before calibration will take effect.

Minimum Input Span

The minimum input span is the minimum difference between input 1 and input 2 signals required to complete the calibration or scaling of the meter. The minimum span is 0.10 mA.

If the minimum span is not maintained, the meter reverts to input 2, allowing the appropriate input signals to be applied.

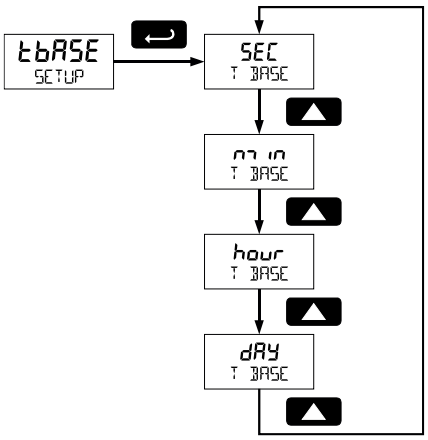
Re-Calibrating the Internal Calibration Reference (ICAL)

The *Internal Calibration* (ICAL) menu, located in the *Advanced* features menu, is used to recalibrate the internal calibration reference. Recalibration is recommended at least every twelve months. Refer to *Internal Calibration* (ICAL) on page *28* for instructions.

Setting the Time Base (t.bASE)

The meter calculates total based on rate and a time base of units per second, minute, hour, or day.

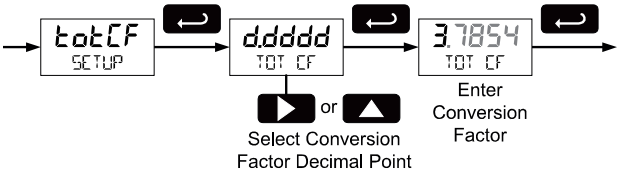
Press the **Enter** button, at any time, to accept a setting or **Menu** button to exit without saving changes.



Setting the Total Conversion Factor (totCF)

Total Conversion Factor is used to convert to a different unit of total display. For example, to display rate in gallons and total in liters, enter a conversion factor of 3.7854. When rate and total units are the same, the Conversion Factor should be 1.0000.

Press the **Enter** button, at any time, to accept a setting or **Menu** button to exit without saving changes.



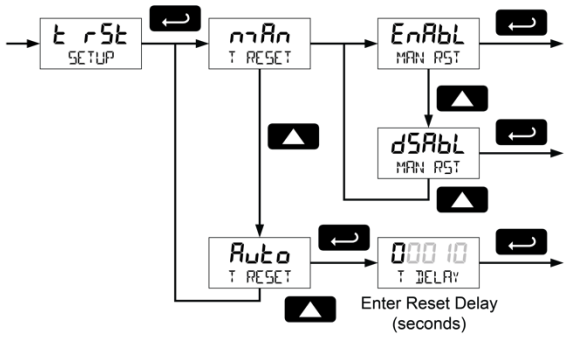
Manual or Automatic Total Reset Function (t rSt)

The meter may be programmed to reset the total either manually using the **Reset** button or automatically. Manual reset button may be disabled to avoid inadvertent total reset.

The automatic reset is based on the set point programmed in the *Advanced* menu: OUTPUT → ALrn → totAL. Once the set point is reached, the meter waits for a programmed amount of time (t dLY) and then resets the total to zero.

- To enable total reset by **Reset** button, choose rMn → EnAbL.
- To disable total reset by **Reset** button, choose rMn → dSAbL.
- To reset total upon total alarm set point, choose Auto, enter a time delay (t dLY), and proceed to programming the set point, see *Alarm Output* (ALrn) on page *25*.

Press the **Enter** button, at any time, to accept a setting or **Menu** button to exit without saving changes.



Setting the Tag Display (tAG)

The meter can be set to display a combination of seven alphanumeric characters for engineering units (e.g. GALLONS) or for identification (e.g. TANK 3).

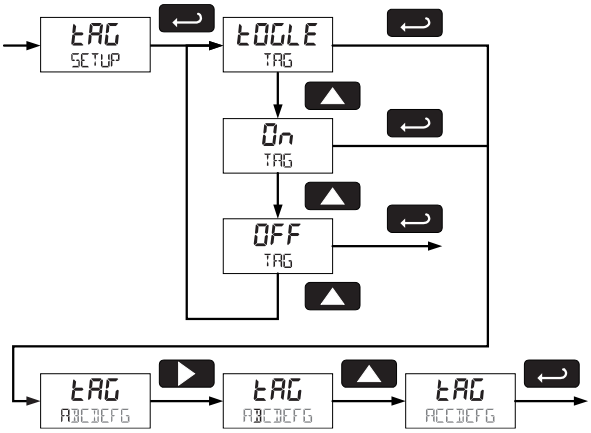
Press **Right** arrow to select next unit and **Up** arrow to increment unit.

- To automatically cycle the lower display between total reading for ten seconds and tag for two seconds, choose tOGLE.
- To disable the tag display and show only total reading uninterrupted on the lower display, choose OFF.
- To show tag only on the lower display choose On. Totalizing continues in the background, but it is not shown while On is selected.

Selecting On or toGLE prompts for entry of the tag.

The unit being changed blinks.

Press the **Enter** button, at any time, to accept a setting or **Menu** button to exit without saving changes.



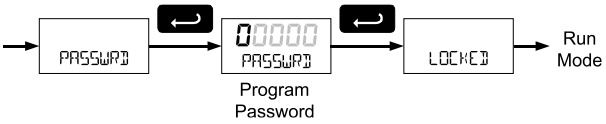
Setting Up the Password (PASSWRD)

The *Password* menu is used to program a five-digit password to prevent unauthorized changes to the programmed parameter settings. The lock symbol is displayed to indicate that settings are protected.

Locking the Meter

Enter the *Password* menu and program a five-digit password.

For instructions on how to program numeric values see *Setting Numeric Values*, page *19*.



Record the password for future reference. If appropriate, it may be recorded in the space provided.

Model:	
Serial Number:	
Password:	__ __ __ __ __

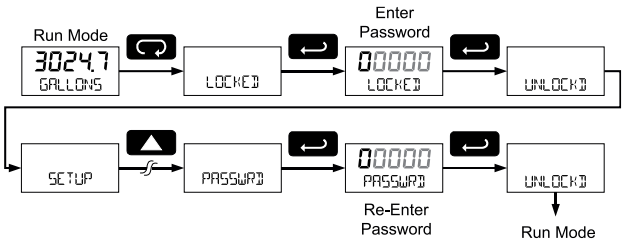
Additional parameters, not needed for most applications, are programmed with the *Advanced* features menu, see *Advanced Features Menu* on page *24*.

Making Changes to a Password Protected Meter

If the meter is password protected, the meter will display the message LOCKED when the Menu button is pressed. Press the Enter button while the message is being displayed and enter the correct password to gain access to the menu. After exiting the programming mode, the meter returns to its password protected condition.

Disabling Password Protection

To disable the password protection, access the *Password* menu and enter the correct password twice, as shown below. The meter is now unprotected until a new password is entered.



If the correct six-digit password is entered, the meter displays the message UNLOCKD (*unlocked*) and the protection is disabled until a new password is programmed.

If the password entered is incorrect, the meter displays the message LOCKED for about two seconds, and then it returns to Run Mode. To try again, press Enter while the *Locked* message is displayed.

Did you forget the password?

The password may be disabled by entering a master password. If you are authorized to make changes, enter the master password 50865 to unlock the meter.

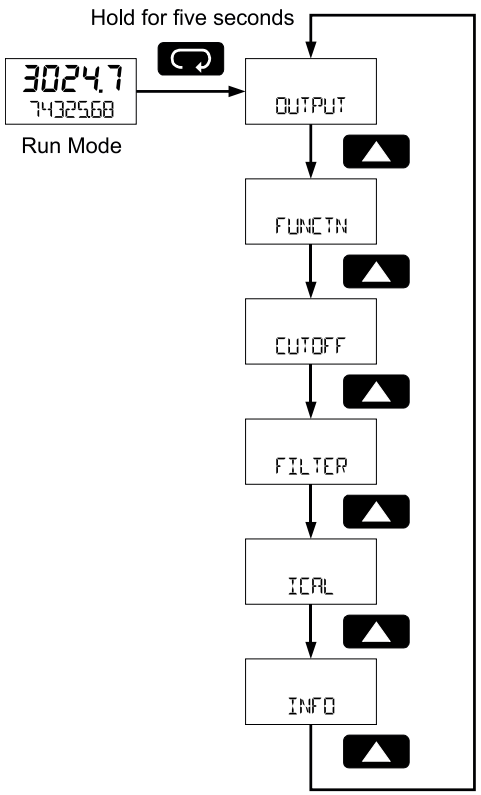
Service Feature (SERVICE)

Select SERVICE from the main menu to temporarily disable the SafeTouch buttons to prevent inadvertent use. Buttons will automatically resume operation after 60 seconds. The display blinks the message SERVICE during this period. This should be used when cleaning the window and when installing or removing the cover while power is applied (in a safe area only).

The service menu is not shown when the SafeTouch buttons are disabled using the slide switch located on the connector board.

Advanced Features Menu

To simplify the setup process, functions not needed for most applications are located in the *Advanced* features menu. Press and hold the **MENU** button for five seconds to access the *Advanced* features menu. Press the **Enter** button to access any menu or press **Up** arrow button to scroll through choices. Press the **Menu** button to exit at any time.



Advanced Features Menu & Display Messages

The following table shows the *Advanced* features menu functions and messages in the order they appear in the menu.

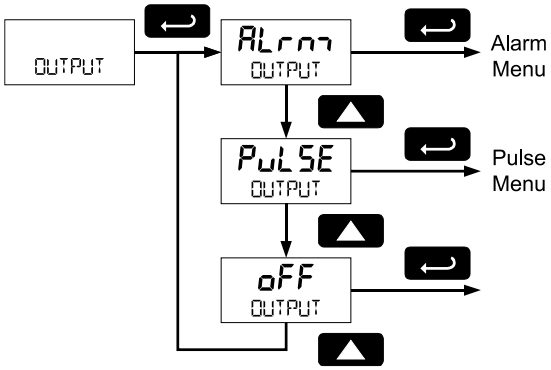
Display	Parameter	Action/Setting
OUTPUT	*Output*	Enter output menu
OFF	*Off*	Disable output
ALrn	*Alarm Output*	Enter alarm output menu
rAtE	*Rate Alarm*	Assign alarm output to rate
totAL	*Total*	Assign alarm output to total
SEt	*Set Point*	Program set point
rESEt	*Reset Point*	Program reset point
PuLSE	*Pulse Output*	Program pulse output Scaler (Count)
MAX HZ	*Frequency*	Program pulse output maximum frequency
Funct	*Function*	Enter advanced function menu
LnEAr	*Linear*	Set linear scaling
SQuAr	*Square Root*	Set square root extraction
ProG.E	*Programmable Exponent*	Set programmable exponent
CUTOFF	*Low-Flow Cutoff*	Set low-flow cutoff
FILTER	*Filter*	Set noise filter
OFF	*Filter Off*	Disable noise filter
LO	*Filter Low*	Set noise filter to low setting
mEd	*Filter Medium*	Set noise filter to medium setting
HI	*Filter High*	Set noise filter to high setting
ICAL	*Internal Calibration*	Enter internal reference calibration
INFO	*Meter Information*	Show software number and version, or reset to factory defaults
SFt	*Software*	Software number
UEr	*Software Version*	Software version
rESEt DFALTSP	*Reset Defaults*	Restore factory default parameter settings

For instructions on how to program numeric values see *Setting Numeric Values, page 19.*

Alarm & Pulse Output (OUTPUT)

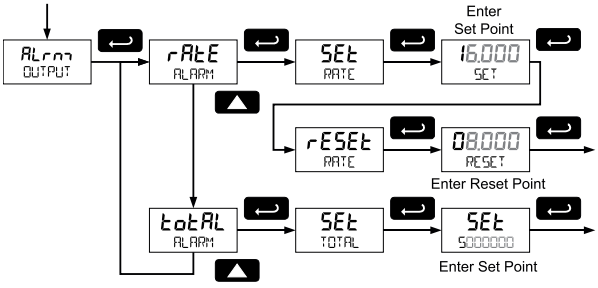
The PD6820 is equipped with an NPN open collector output that may be set up for high or low rate alarm trip point, total alarm trip point, or pulse output based on K-factor. The pulse output frequency may be programmed for 2, 4, 8, 16, 32, 64, or 128 Hz.

The output may be disabled by selecting oFF. When alarm indication is enabled, the HI and LO symbols are used accompanied by a flashing display. The alarm status will show on the display even if the output is not wired.



Alarm Output (ALrm1)

- **Rate high alarm trip point:** program set point above reset point.
- **Rate low alarm trip point:** program set point below reset point.
- Rate alarm deadband is determined by the difference between set and reset points. Minimum deadband is one display count. If set and reset points are programmed the same, output will reset one count below set point.
- **Total alarm trip point:** program total set point. Alarm reset is triggered by total reset (There is no reset parameter entered for total). If automatic total reset is enabled, this setting will be the trigger point for the timer. *It is not necessary to have the output wired for automatic reset function to work.*

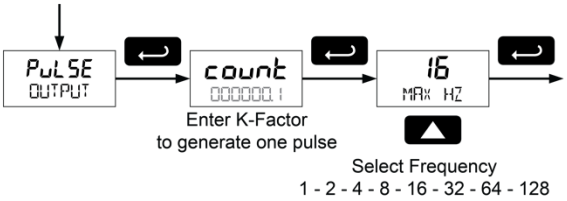


To acknowledge an alarm, press the **Enter** button once for acknowledge prompt and a second time to confirm.

Pulse Output Scaler (count)

The pulse output scaler (count) corresponds to the total units (e.g. gallons) needed to generate one pulse. For example, if the pulse output scaler (count) value is set to 10; one pulse is generated for every 10 counts incremented on the display.

If the pulse output exceeds the programmed output frequency, pulses are accumulated as pending. Pulses will continue to output until the buffer is emptied or the total is reset from the front panel.



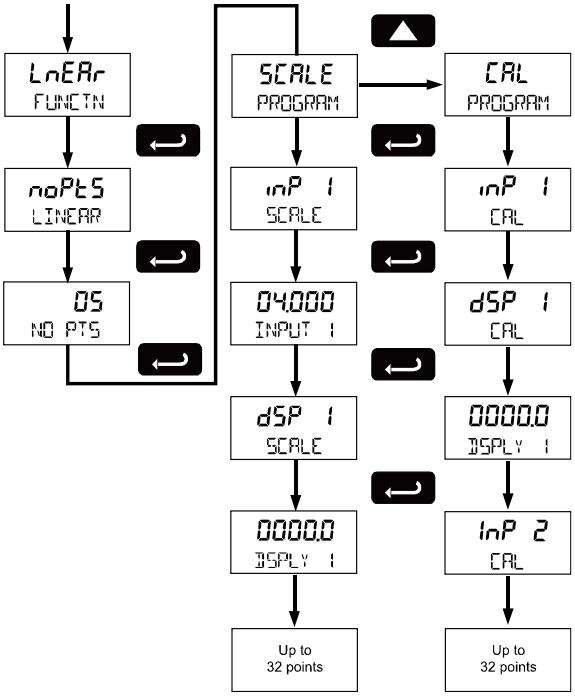
Advanced Function Selection (FUNCTN)

The *Advanced Function* menu is used to select the advanced function to be applied to the input: linear, square root, programmable exponent, or round horizontal tank volume calculation. The multi-point linearization is part of the linear function selection.

Meters are set up at the factory for linear function with 2-point linearization. The linear function provides a display that is linear with respect to the input signal.

Multi-Point Linearization (LnEAr)

Up to 32 linearization points can be selected under the *Linear* function. The multi-point linearization can be used to linearize the display for non-linear signals such as those from level transmitters used to measure volume in odd-shaped tanks or to convert level to flow using weirs and flumes that require a complex exponent. These points are established via direct entry (SCALE) or with a live calibration signal source (CAL).



Multi-Point Scaling (SCALE)

The multi-point scaling is entered after selecting the number of points (noPtS). The input signal levels (inP 1-32) for up to 32 points, along with the corresponding meter reading (dSP 1-32) should be entered for each linearization point.

Multi-Point Calibration (CAL)

The meter can be calibrated using a current source instead of using input scaling. This process will override previously programmed scaling points. Apply a live signal using a known accurate signal source (inP 1-32) and then enter the corresponding meter reading (d iSP 1-32) for that input signal level.

The use of a calibrated signal source is strongly recommended.

Important Navigation Note

After entering the last display value, the linearization entries must be saved (SAVE?) before they are put into effect. However, you may move past this selection using the Up arrow key if you need to go back and correct and earlier entry. Once confident in the entries, you must navigate back to the Save menu screen (SAVE?) and press the Enter key to save the changes.

Square Root Linearization (SQUAr)

The square root function can be used to linearize the signal from a differential pressure transmitter and display flow rate in engineering units.

PD6820 Displaying Flow Rate by Extracting Square Root from DP Transmitter Signal.

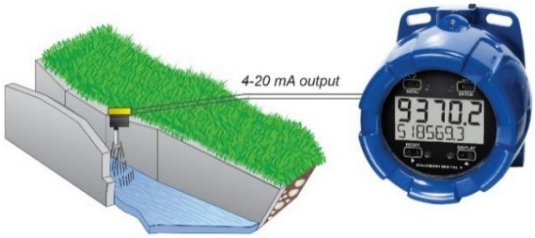
Low-Flow Cutoff (CUTOFF)

The low-flow cutoff feature allows the meter to be programmed so that the often-unsteady output from a differential pressure transmitter, at low flow rates, always displays zero on the meter. The default cutoff is zero to prevent negative readings, but this may be overridden to allow them.

The cutoff value may be programmed from -0 to 99999. Below the cutoff value, the meter will display zero. Selecting either square root or programmable exponent will set the cutoff value to 0. Program the cutoff value to 0 to disable.

Programmable Exponent Linearization (PrOG.E)

The programmable exponent can be used to linearize the signal from level transmitters in open-channel flow applications using weirs and flumes.



The PD6820, in combination with an ultrasonic level transmitter, makes for an economical way to measure and display open channel flow rate and total in most weirs and flumes. A guide such as the ISCO Open Channel Flow Measurement Handbook can provide the user with all the information needed: the exponent used in the flow equation for the desired flow units and the flow rate for any given head height.

For example, to display the open channel flow rate from a 3" Parshall flume, the ISCO handbook advises the exponent is 1.547 and at the maximum head height of 3.0 feet, the flow rate is 3.508 MGD.

3" Parshall Flume Discharge Table

Formula:	CFS	$= 0.9920\ H^{1.547}$
	GPM	$= 445.2\ H^{1.547}$
	MGD	$= 0.6411\ H^{1.547}$
Where:	H	= Head in feet

Table 12-3

Head (Feet)	CFS	GPM	MGD
3.00	5.428	2436	3.508

ISCO Open Channel Flow Measurement Handbook, 3rd edition

With this information the PD6820 should be programmed in the following fashion. This setup assumes the level transmitter is programmed to output 20 mA at the maximum head height of 1.10 feet; but any mA value at a head height with a known flow rate may be used.

Function	Desired	Programming
Open Channel Flow	3" Parshall flume	Set Programmable Exponent to 1.547
Flow Rate	Millions of Gallons per Day (MGD)	Set 4 mA = 0 20 mA = 3.508 Time base = Day
Total	Millions of Gallons	Set Totalizer Conversion Factor = 1 (password protect “total” to avoid accidental reset)
Non-Resettable Grand Total	Program meter so grand total can never be reset	Set non-resettable grand total password
Display	Display Flow Rate, Total, and Grand Total	Set upper display for Grand Total and lower display to toggle between rate and total.

Input Signal Filter (FILTER)

The noise filter is available for unusually noisy signals that cause an unstable process variable display. The noise filter averages the input signal over a certain period. The filter level can be set to low (LO), medium (mEd), high (HI), or off (OFF). The higher the filter setting, the longer the averaging time and so the longer the display may take to find its final value. The filter contains a noise filter bypass feature so that while small variations in the signal will be filtered out, large, abrupt changes to the input signal are displayed immediately.

Internal Calibration (ICAL)

There is **no need to recalibrate** the meter for milliamps when first received from the factory.

The meter is ***factory calibrated*** for milliamps prior to shipment. The calibration equipment is traceable to NIST standards.

The internal calibration allows the user to scale the meter without applying a signal. The use of a calibrated signal source is necessary to perform the internal calibration of the meter. Check calibration of the meter at least every 12 months.

Notes: The signal source must have a full-scale accuracy of 0.002% or better between 4 and 20 mA in order to maintain the specified accuracy of the meter.
Allow the meter to warm up for at least 15 minutes before performing the internal calibration procedure.

The *Internal calibration* menu is part of the *Advanced* features menu.
Press and hold the **MENU** button for 5 seconds to enter the *Advanced* features menu. Press the **Up** arrow button to scroll to the *Internal Calibration* menu (ICAL) and press **Enter**.
The meter displays 4.000 mA. Apply a 4.000 mA signal and press **Enter**. The display flashes for a moment while the meter is accepting the signal.
After the signal is accepted, the meter displays 20.000 mA. Apply a 20.000 mA signal and press **Enter**. The display flashes for a moment while the meter is accepting the signal.

Error Message (SPAn ERROR)

An error message indicates that the calibration process was not successful. After the error message is displayed, the meter will revert to input 2 calibration settings. The error message might be caused by inadvertently leaving the signal at the previous level or not maintaining the minimum span. Press the Menu button to cancel the current calibration process if necessary.

Information (INFO)

The *Internal calibration* menu is part of the *Advanced* features menu. It shows software identification number and version number. To determine the software version of a meter:
Go to the *Information* menu (INFO) and press **Enter** button.
Continue pressing **Enter** to scroll through the software release number and software version.
Following the information display, the meter will exit the *Advanced* features menu and return to run mode.

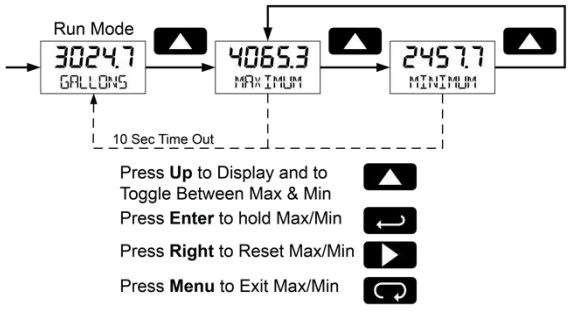
Operation

Front Panel Buttons Operation

Button Symbol	Description
MENU	Press to enter or exit Programming Mode or exit Max/Min readings
RESET	Press to reset Max/Min readings
DISPLAY	Press to display Max/Min readings alternately
ENTER	Press to display Max or Min reading indefinitely while displaying Max or Min

Maximum & Minimum Readings (MAXIMUM & MINIMUM)

The maximum and minimum (peak & valley) readings reached by the process are stored in the meter since the last reset or power-up. The meter shows MAXIMUM or MINIMUM to differentiate between run mode and max/min display. Press **Enter** to remain in Max/Min display mode. If **Enter** is not pressed, the Max/Min display readings will time out after ten seconds. The meter will return to display the actual reading.



Reset Meter to Factory Defaults

When the parameters have been changed in a way that is difficult to determine what's happening, it might be better to start the setup process from the factory defaults.

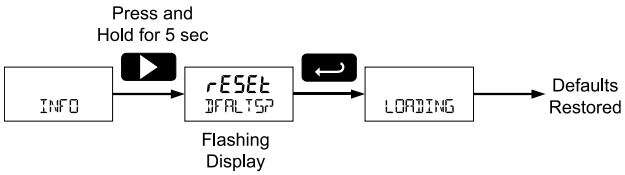
Instructions to load factory defaults:

Enter the *Advanced* features menu.

Press and hold **Reset** button when INFO is shown.

Press **Enter** when rESEt DFALTSP prompt is shown

Note: If **Enter** is not pressed within three seconds, the prompt will stop flashing return to showing INFO.



Factory Defaults & User Settings

The following table shows the factory setting for most of the programmable parameters on the meter. Next to the factory setting, the user may record the new setting for the particular application.

Model: _____

S/N: _____

Date: _____

Parameter	Display	Default Setting	User Setting
Programming	PROGRAM	Scale	
Input 1	InPt 1	4.000 mA	
Display 1	dSPL 1	4.000	
Input 2	InPt2	20.00 mA	
Display 2	dSPL2	20.000	
Decimal point rate	dd.ddd	3 places	
Decimal point total	ddddddd.dd	2 places	
Tag	tAG	Off	
Time Base	tbASE	Minute	
Conversion Factor	totCF	1.0000	
Total Reset Function	t rSt	Manual - Enabled	
Password	PASSWRD	00000 (unlocked)	
Programming	PROGRAM	Scale	
Advanced Features			
Output	OUTPUT	Off	
Function	FUNCTN	Linear	
Cutoff	CUTOFF	0 (disabled)	
Filter	FILTER	Low	

Troubleshooting

Due to the many features and functions of the meter, it's possible that the setup of the meter does not agree with what an operator expects to see. If the meter is not working as expected, refer to the *Diagnostics* menu and consult the recommendations described below.

Troubleshooting Tips

Symptom	Check/Action
No display or faint display	Check input signal connections. Perform hard reset by shorting S+ and S- terminals.
Rate display unsteady	Increase filter setting in *Advanced* menu.
Meter displays error message during calibration (SPAn ERROR)	Check signal connections. Verify minimum input span requirements.
Meter flashes 99999 or -9999	Check input signal is within scaled range of 99999 and -9999.
Display stuck displaying MAXIMUM or MINIMUM	Press **Menu** to exit Max/Min display readings.
Display response is too slow	Check filter setting to see if it can be lowered to LO or OFF.
If the display locks up or the meter does not respond at all	Perform hard reset by shorting S+ and S- terminals.
Backlight does not appear.	Backlight is intended for viewing assistance in dim lighting conditions. It may not be noticeable under good lighting conditions. Check connections are as shown in *Figure 6. Connections with Loop-Powered Backlight* or *Figure 7. Connections with Externally-Powered Backlight* on page *15*.
SafeTouch buttons do not respond	Service menu was selected, or mechanical button was pushed. The SafeTouch buttons will be re-enabled automatically **60 seconds** after the last button push. If slide switch on connector board is in Lock position, switch to Unlock. Sunlight can interfere with the sensors. It is recommended to shield the window from sunlight while operating the buttons by standing so as to block direct sunlight.
Other symptoms not described above	Call Technical Support for assistance.

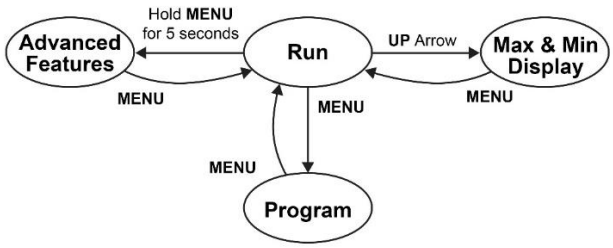
Quick User Interface Reference

Pushbutton	Function
MENU	Go to programming mode or leave programming. Hold for 5 seconds to enter *Advanced Features* menu directly.
RIGHT Arrow	Move to next digit. Go to previous menu or alphanumeric character selection. Reset max or min while displayed.
UP Arrow	Move to next selection or increment digit. Cycle through maximum, minimum, and mA display mode.
ENTER	Accept selection/value and move to next selection. Acknowledge alarms.

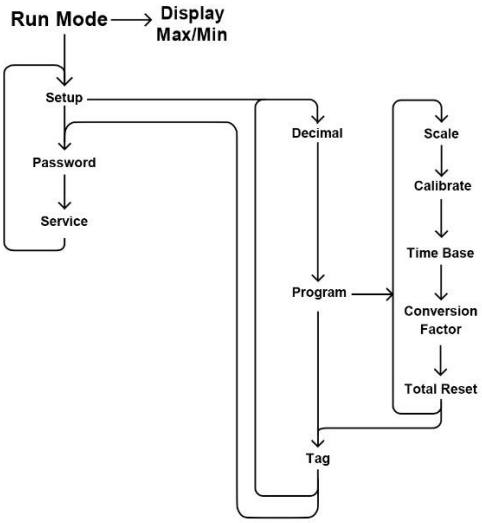
Max/Min Mode
While in Run Mode, pressing **Up** Arrow will initiate MAX/MIN Mode. **Up** Arrow toggles between MAX & MIN displays, and **Right** Arrow resets the MAX/MIN to the current value. Press **Menu** or wait 10 seconds to return to Run Mode. Pressing **Enter/Ack** will disable the 10 second timeout and continuously display Max or Min.

To enter the Advanced Features Menu, hold the **Menu** button for 5 seconds.

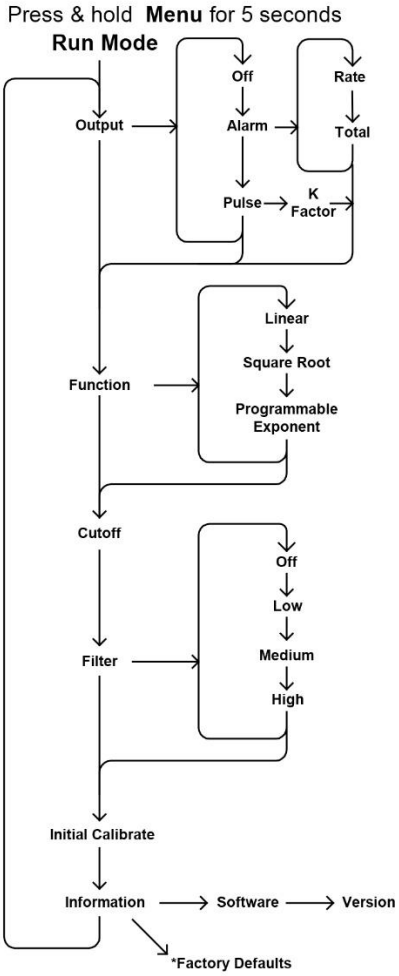
Operation Modes



Main Menu



Advanced Menu



*Access by holding **Right/Reset** for 3 seconds

Contact Precision Digital

Technical Support

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Email: support@predig.com

Sales Support

Call: (800) 343-1001 or (508) 655-7300

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Place Orders

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