

Operation

General

The PTX800D is a scalable pulse counter/rate indicator for digital pulse signals. It will display either the rate or total according to setup. The other value is displayed when you hold down the **TOTAL/RATE** key.

For more complex applications, the PTX800D can be supplied with two alarm channels and/or an analogue retransmit output.

Alarm conditions are indicated by the LEDs above buttons marked **AL1** (for alarm channel one) and **AL2** (for alarm channel two).

Manually clearing tripped alarms

The alarm channels can be set for automatic or manual reset. For manual reset, the LED will flash when an alarm trips. These alarms will only clear if you have acknowledged the alarm and the trip condition has cleared. Press **AL1** or **AL2** to acknowledge the alarm.

Viewing the alarm setpoints

Press the **AL1** or **AL2** at any time to display the setpoint for that channel. The value will be shown for 5s. If the alarms are disabled, pressing the key will have no effect.

Changing the alarm setpoints

Press **PGM** while the setpoint is on display (see above), you will be able to change the value using the **▲** and **▼** keys. To save the changes, press **PGM**. Note: you can disable this feature during setup for greater security.

Checking the Rate/Total

You can set up the PTX800D to show either total or rate. If the total is normally on display, you can check the rate by holding down the **TOTAL/RATE** key.

Resetting the total

If you press the **RESET** key, the PTX800D will set the total to zero and clear any total alarms (you can disable this feature during setup for greater security). There is also an external reset input that you can use to clear the total remotely.

Reviewing the setup options

To review the setup (in read only mode) press the **PGM** key. The PTX800D will show the software version number. Press the **▼** key to see the next setting. The information in review mode is shown in the same order as setup mode (some irrelevant items will be skipped). There is a 10s timeout during review mode or you can press **PGM** again to return the display to normal operation.

You can review the setup while the instrument is in service - the unit will continue to operate normally. Setup mode

Changing the setup options

You should only use setup mode if you have to change a setting or calibrate the outputs. The setup mode stops all operation. As soon as you have setup the last parameter, the unit behaves as if it has been switched on with the new settings. This does not mean that the total is reset - you must do this yourself if necessary.

If you want to abandon all the changes you have made, simply remove the security link (or remove the power) before the **5RUE** message is shown.

To change the instrument setup:

1. Connect the security link (short pins 8 & 12).
2. Press the **PGM** key.

The setup sequence is shown in the table on page two.

Setup options

General

There are four basic areas of the instrument operation that must be setup on a fully configured PTX800D. They are:

- Pulse/frequency inputs;
- Display and keypad operation;
- Alarms one and two (optional); and
- Analogue outputs (optional).

You can disable the alarms and/or analogue outputs if you do not need them (so that their settings are skipped).

Software version

The information in this guide refers to versions 1.00 to 1.09.

Model

PTX series instruments all look identical from the front so this identifies the instrument type.

Input signal type

Sets the input trigger and reset levels to suit the pulse source. The table below gives the threshold values.

For contact closure inputs, the software incorporates debouncing (minimum pulse width 20mS/maximum frequency 10Hz).

Input type	Low voltage inputs		High voltage inputs		Description
	Trigger	Reset	Trigger	Reset	
L R E	50mV	-50mV	200mV	-400mV	Low level AC signals
H R E	2.5V	-2.5V	14V	-10V	High level AC signals
L d E	3.5V	0.5V	20V	-2V	Low level DC signals
H d E	6V	3V	35V	10V	High level DC signals
E o n	6V	3V	35V	10V	Contact closure

Pulse rate

Set the pulse rate to low if the maximum input frequency is below 1kHz. Otherwise it should be set to high.

Pulse scaling factor

Sets the number of pulses received for a unit change in the total. So, if you have a flowmeter that gives four pulses per litre, you can show the total in litres by setting the pulse scaling factor to four, or in kilolitres by setting the pulse scaling factor to four thousand. You can not set it to more than 10 000 display digits (i.e., ignoring the decimal point).

Total decimal point

The total decimal point position sets the number of decimal places for the total display. Totals are displayed using the full eight digits.

Rate decimal point

Sets the number of decimal places for the rate display. Rates are displayed as five digit numbers.

Rate scaling factor

The rate scaling factor sets the ratio between the total display and the rate display. It must be a power of ten (i.e., 1000,100, ..., 0.01, or 0.001).

Number of samples

The PTX800D calculates the rate every 260mS. The analogue output and display are then updated from the average over the programmed number of samples. For example, if you set the number of samples to 10, the analogue output and rate display will be updated every 2.6s.

Rate timebase

The rate timebase setting sets the timebase for the rate display. It can be set to hours, minutes or seconds.

Show rate or total

Use the display rate/total setting to choose the measurement that will normally be on display.

Enable Reset key

The front panel reset key can be used to reset the total. You can disable this feature (for added security) using this setting.

Alarms disable/enable

If you do not need alarms, you can disable them. This simplifies the setup process, as all of the parameters related to the alarm operation are skipped.

Alarm type

Each alarm channel can monitor the total or the rate. Total alarms operate when the setpoint is exceeded. A 'total' alarm trip condition clears when the total is reset.

Setpoint

The setpoint is the display value at which an alarm activates. It can be changed during normal operation if the setpoint security option is off.

Alarm action

High alarms are active above the setpoint and low alarms are active below the setpoint. Total alarms are always 'high' type, so this setting is not shown.

Deadband

This parameter sets the "hysteresis" for an alarm channel; the alarm will clear above or below the setpoint to prevent chatter when the rate level passes the setpoint. The minimum deadband is one display count. Total alarms do not need a deadband setting.

Alarm output energisation options

There are many applications where it is important to raise an alarm if the instrument power supply is cut off. Normally energised coil operation allows for this application.

Alarm timer delays

Sets the minimum time that an alarm condition must be present to be recognised.

Setpoint security

You can change the setpoints from the front panel. If you want to disable this feature, switch on the setpoint security.

Alarm reset sequence

Alarms normally reset automatically when a trip condition has passed. Manual reset requires the operator to press the appropriate key before the alarm will clear. The alarm status LED flashes until the alarm is acknowledged and then remains on until the trip condition is gone.

Total or rate output and range

To set up the analogue outputs you must first choose if the output is going to be proportional to the rate or the total. After that you can set up the portion of the rate/total range that you want to retransmit.

Analogue output format

These setup parameters let the PTX800D show the output range correctly during review mode and prompt for the correct values during calibration. They have no effect on the operation of the instrument. If you change them you must be prepared to calibrate the outputs.

Output Action

Direct action results in the normal, proportional output. Reverse action gives an output that is inverted with respect to the rate, so a rate of zero gives a full scale output and vice versa.

Display Intensity

There are fourteen different levels.

Setup Sequence

Setting	Display	Description	▼	▲	PGM
S/W Version	uEr 101	S/W Version 1.01	-	-	Next
Model	PuL5E	Pulse counter: PTX800D	-	-	Next
Inputs					
Input type	iPz	Introduces the input type	-	-	Next
	LOdC	Low level DC	Toggle	Accept	
	Hi dC	High level DC			
	LOrC	Low level AC			
	Hi rC	High level AC			
Con	Contact closure (debounced)				
Input pulse rate	FrEQz LO FrEQz Hi	Low frequency input (below 1kHz) High frequency input (from 1 to 10kHz)	Toggle	Accept	
Pulse scaling factor	PuL5E dPz 12345	Pulse scaling factor decimal point Demo display for decimal point selection	-	-	Next Accept
	PuL5E SFz 1230	Introduces the pulse scaling factor e.g., 1.230 Pulse = 1 Unit change in total	Dec	Inc	Next Accept
Total and rate display settings and scaling					
Total decimal point	toE dPz 12345	Introduces total decimal point Demo, e.g., total shown to one decimal place	-	-	Next Accept
Rate decimal point	toE dPz 12345	Introduces rate decimal point Demo, e.g., rate shown to 3 decimal places	-	-	Next Accept
Rate scaling factor	rREz SFz 1000	Introduces rate scaling factor e.g., 1000 rate units = 1 total unit	-	-	Next Accept
Rate timebase	rRE SEc rRE min rRE Hr	Rate is in units per second Rate is in units per minute Rate is in units per hour	Toggle	Accept	
Number of samples	SrRPz 10	Introduces the number of samples used for rate, e.g., 10	-	-	Next Accept
Show rate or total	d,5-rRE d,5-toE	Display normally shows the rate Display normally shows the total	Toggle	Accept	
Reset key enable					
Reset Total Key Enable	En rESy En rESn	RESET key resets count RESET key ignored	Toggle	Accept	
Alarm enable					
Alarms 1 & 2 Select	A12y A12n	Enable Disable (Select this option for PMX420)	Toggle	Accept	
Alarm channel one settings					
Coil energisation	A1norE A1norD	Normally energised Normally de-energised	Toggle	Accept	
Alarm one type	A1z-rRE A1z-toE	Channel one monitors total Channel one monitors rate	Toggle	Accept	
Alarm one action	A1z-LO A1z-Hi	Low type (active below setpoint) High type (active above setpoint)	Toggle	Accept	
Setpoint value	SEt Pt1z 5000	Setpoint value e.g., 50.00%	-	-	Next Accept
Deadband value	dbRnd1z 001	Deadband value e.g., 0.01%	-	-	Next Accept
Timer delay	dELAY1z 20	Timer delay (set to 0s to disable) e.g., 20s	-	-	Next Accept
Alarm channel two settings					
As above	As channel one (except uses A2norE, A2z-rRE,..., dELAY2z)				
General alarm settings					
Setpoint security	SECurE y SECurE n	Setpoints fixed at setup Can change setpoints	Toggle	Accept	
Alarm reset sequence	rESAutO rESOpER	Automatic reset Manual reset	Toggle	Accept	
Analogue output settings (not shown unless outputs are fitted)					
Rate or total output	Outz-rRE Outz-toE	Analogue output proportional to rate Analogue output proportional to total	Toggle	Accept	
Rate range rerepresented	rRE LOz 000	Introduces the rate low value e.g., 0.00	-	-	Next Accept
	rRE Hi z 10000	Introduces the rate high value e.g., 100.00	-	-	Next Accept
Total range rerepresented	toE LOz 000	Introduces the rate low value e.g., 0.00	-	-	Next Accept
	toE Hi z 10000	Introduces the rate high value e.g., 100.00	-	-	Next Accept
Output type	Outz-Cur Outz-Volt	Current (mA) output Voltage (V) output	Toggle	Accept	
Output range	Out LOz 400	Introduces output low value Value, e.g., 4.00mA	-	-	Next Accept
	Out Hi z 2000	Introduces output high value Value, e.g., 20.00mA	-	-	Next Accept
Output Action	Out d,r Out rEv	Direct (proportional) output Reversed (inverted) output	Toggle	Accept	
Calibration options					
Calibrate Output?	CRLOut n CRLOut y	Skip output calibration Calibrate outputs	Toggle	Accept	
Display Intensity	IntEn5 z 23456789	Introduces the display intensity Demo display for adjustment	-	-	Next Accept
Save values	SrUE	Instrument is saving the changes to the setup and returning to normal operation			

Installation

General

You should check your requirements against the model number before installation. The sensor supply voltage is 12Vdc unless otherwise specified (/FPS option).

Input connections

The input circuit has programmable trigger levels according to the 'Input type' setting.

For NAMUR sensors, 3-wire NPN sensors, 3-wire PNP sensors, NPN open collector (O/C) outputs and PNP open collector (O/C) outputs set the input type to "High Level DC" (*H i d C*).

For voltfree contact inputs use 'Contact closure' (*C a n*). The minimum contact closure time is 20mS and the maximum frequency is 10Hz.

For voltage pulses (including TTL/CMOS logic) select a suitable input type using the trigger/reset voltage table.

Input voltages over 45Vdc

If the input voltage is above 45Vdc connect the internal high voltage select jumper before applying the signal.

Noise

Make sure that you use shielded cable for low level signals and ground the shield at the sensor end. If possible, amplify the signal at the sensor - most low level sensors have an amplifier module available. This is especially important for long runs and high frequency signals.

Digital pulse output

The basic model PTX800D has a retransmit pulse output, which gives a single pulse every time the total increases by one unit. The pulse width is a constant 32msec and the minimum off time is 32 msec. The output is an isolated, NPN, open collector transistor type and can switch a maximum of 50Vdc or a current up to 200 mA.

Reset pulse input

Accepts a volt-free contact closure, or a shorting link, between pins 7 and 12. The contact must be closed for at least 100 mS.

Alarm channels one and two (optional)

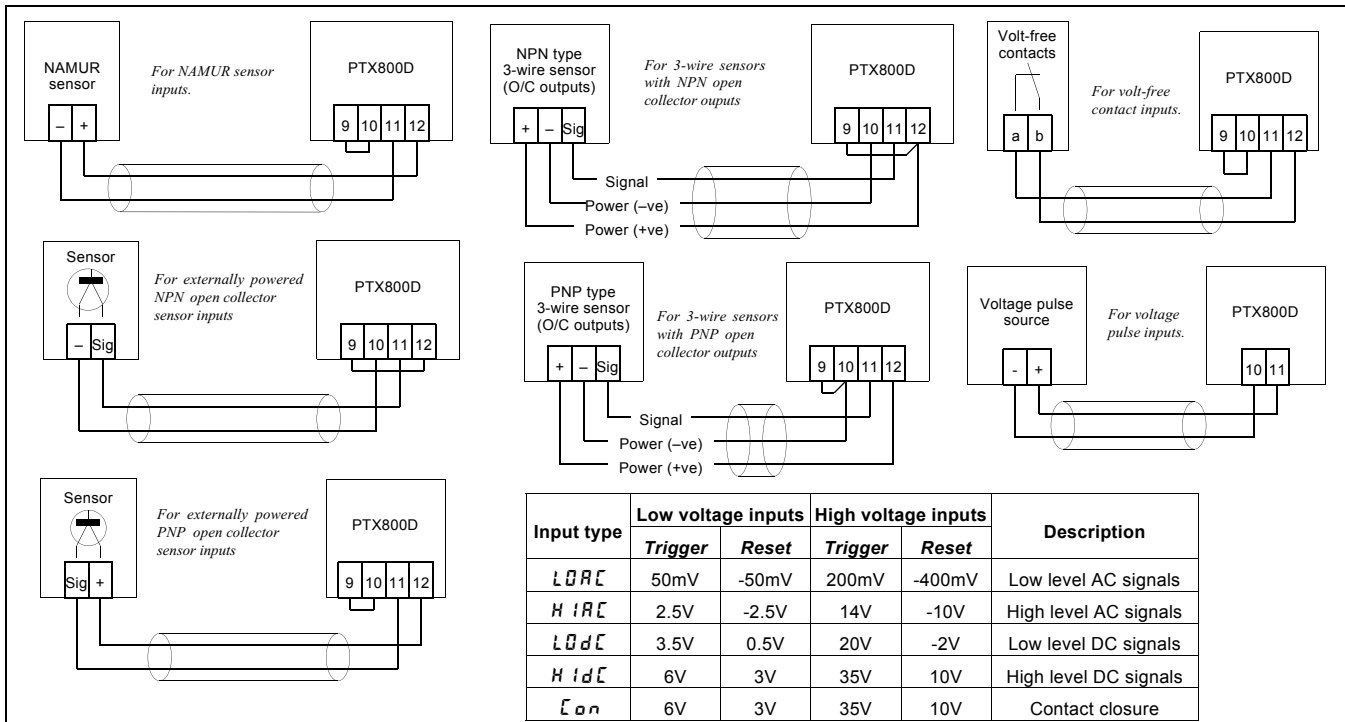
Alarm channels one and two have SPDT relay contact outputs. The rated current decreases for inductive loads so using suppressor capacitors is recommended. This will also reduce the general level of electrical noise.

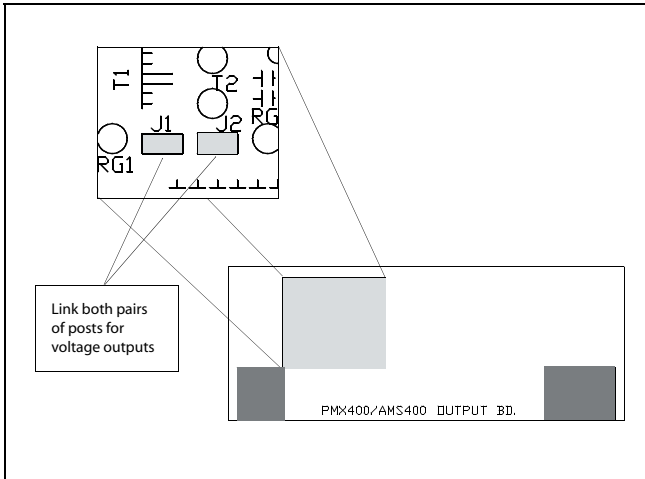
Connections

Pin	Signal	
1	Neutral / - ve	Power supply
2	Live / + ve	
3	Signal +ve	Analogue output (optional)
4	Signal -ve	
5	0V	Pulse output
6	Pulse	
7	Reset count	Short to 12 to reset
8	Security	Short to 12 for setup mode
9	Pull Up/Down	Inputs
10	Input - ve / 0V	
11	Input +ve	
12	+12Vdc (out)	
13	Normally Closed	Alarm one (optional)
14	Common	
15	Normally Open	
16	Normally Closed	Alarm two (optional)
17	Common	
18	Normally Open	

Analogue output (optional)

The analogue output provides you with a current or voltage based signal that is proportional to the rate or total. For rate outputs, the average value is the same as the rate, although the instantaneous value may differ slightly for rapidly changing signals.





PTX800D analogue output board showing output type jumper locations.

Output calibration

General

The PTX800D analogue outputs are calibrated for a specific output range and type. If you have changed the output range or type you must follow the procedure given below.

Allow the instrument 15 minutes of powered operation (to reach a stable temperature) before calibrating the output.

Equipment requirements

- An accurate digital multimeter (accurate to 0.05mV and ±0.1µA)

Terminal Connections for output calibration

Calibration Stage	Signal type	Terminal
Analogue Current Output	mA output +ve	3
	mA output -ve	4
Analogue Voltage Output	V output +ve	3
	V output -ve	4

Procedure

Note: the procedure below shows calibration for the commonly used 4-20mA format. If you have set the outputs to any other format, the unit will prompt you with the output high and low values you have chosen.

When the display shows	Action/Description
	Put the instrument in setup mode and scroll through the main menu
<code>CRLOUT n</code>	Press ▲ or ▼
<code>CRLOUT y</code>	Press PGM to select output calibration
<code>OUT LO =</code>	Connect the multimeter to measure the output level, then press PGM
<code>4.00</code>	Press PGM
	Measure the output signal
	Adjust the output (using the ▲ or ▼ keys) until the output is at the value shown When you are happy that the output is correct, press PGM
<code>OUT HI =</code>	Press PGM
<code>20.00</code>	Press PGM
	Measure the output signal
	Adjust the output (using the ▲ or ▼ keys) until the output is at the value shown When you are happy that the output is correct, press PGM
<code>SAVE</code>	Continue with the setup sequence.

Note: Do not remove the power while the save message is on display.

Modifications

Analogue output type

The analogue output type (current/voltage) is set by internal push fit jumper. To change the output type:

Change the output type push fit jumper:

1. Gently remove the backplate (it is held in place by four lugs).
2. Slide the electronics from the housing.
3. Change the jumper location to the required setting (see diagram above).
4. Look inside the housing and note that there are connectors that mate with the display board.
5. Slide the electronics gently back into the case. Carefully moving the board until the keypad connectors engage with the display board.
6. Replace the backplate.

Change the output type in the software:

1. Power up the instrument and start the setup routine.
2. While the software version number is flashing, remove the security link and press **PGM**.
3. The display will show `ROUT = y`. Press **PGM**.
4. The display will show `ROUT=volt` or `ROUT=cur`. Select using up or down key.
5. Replace the security link and press **PGM**.

Change the output range settings:

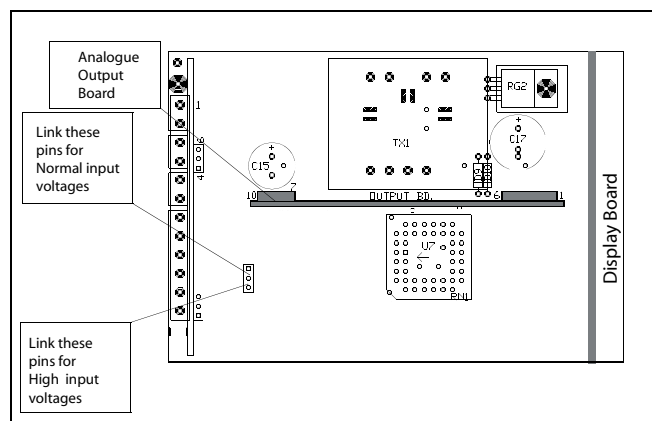
6. Scroll through the setup and change the output type and range settings - you will be required to calibrate the outputs.

Calibrate the output:

7. Calibrate the outputs to the new output range and type.

High/Low voltage input selection

1. Gently remove the backplate (it is held in place by four lugs).
2. Slide the electronics from the housing.
3. Change the High/Low voltage jumper to the required setting (see diagram right).
4. Look inside the housing and note that there are connectors that mate with the display board.
5. Slide the electronics gently back into the case. Carefully moving the board until the keypad connectors engage with the display board.
6. Replace the backplate.



PTX800D main board showing the location of the high voltage input select jumper and the analogue output board.