



PRO - CTR100 COUNTER INDICATOR

**PRO - CTR100 Setup Manual
(I/R4/R4A/R4S/R4AS)**

CONTENTS

1 - Introduction	1
2 - Specifications	2
3 - Case Diagrams	4
4 - Input Header Configuration	7
5 - Wiring	10
6 - Setup & Calibration	17
7 - Setpoint Setup	38
8 - Setpoint Direct Access	48
9 - Display Shortcuts	49
10 - Reset PIN Numbers	51
11 - Display Brightness	52

APPENDICES

A - Primary & B Input Count Modes	53
B - C Input Count Modes	58
C - Hysteresis Types	60
D - Batching	62

1 INTRODUCTION

The PRO - CTR100 controller is the ideal solution for a variety of counting and rate application requirements.

This controller has been designed for ease of use, with intuitive, scrolling text prompts that guide you step-by-step through the setup process. The front panel includes a 6-digit LED display and five front-panel buttons, for simple operator interface. One of the five buttons is user-programmable, so you can customise it as a shortcut to your most frequently used feature.

The PRO - CTR100 can be customised to include a serial port (RS232/RS485) and an analog output. Up to four relay outputs can also be added.

2 SPECIFICATIONS

Input	0-24V DC, 0-30V AC
Power supply	HV: 85-265V AC/95-370V DC or LV: 15-48V AC/10-72V DC
Security	Setup PIN code protected for security
Excitation	24V DC (50mA max) standard 5V DC (200mA max) optional
Case	48mm x 96mm x 119.5mm (H x W x D) 45.5mm x 92.5mm panel cutout

HEADER SELECTABLE OPTIONS

Input type header

NPN (sink) PNP (source) TTL

Noise filter header

On (20kHz) Off

Excitation voltage header

24V 5V

2.1 Counter

Input frequency	10kHz (Quad x4, A+B, A-B, A/B Ind, Up/Down, RSOFAB, RSOFST) 20kHz (Quad x1, Quad x2) 38kHz (C Count)
Pulse width	Minimum pulse width must be $> 5\mu\text{s}$
Sampling rate	10msec

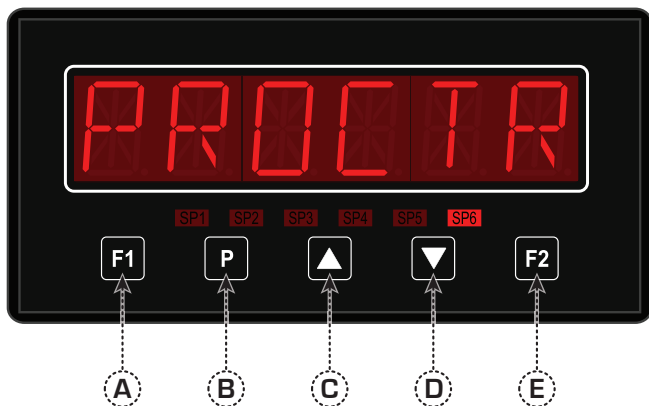
2.2 Rate (Primary signal only)

Input frequency	20kHz max
Pulse width	Minimum pulse width must be $> 5\mu\text{s}$
Sampling rate	100msec
Resolution	0.01Hz
Accuracy	0.005%
Temperature drift	Typically 2ppm/ $^{\circ}\text{C}$

3 CASE DIAGRAMS

The PRO - CTR100 has a 6-digit, 14-segment alphanumeric LED display, five front-panel buttons and six setpoint annunciator LED's.

3.1 Fig 1 - Front view



BUTTON PRESS FUNCTIONS

(A) **Function 1** - This button is used to access the input setup and calibration menu. See Section 6.

(B) **Program** - This button is typically used to save your settings and advance to the next step in the setup process.

The function of a single keypress of this button from the operational display can be user programmed. By default, no function is assigned. See 6.5B to enable this feature.

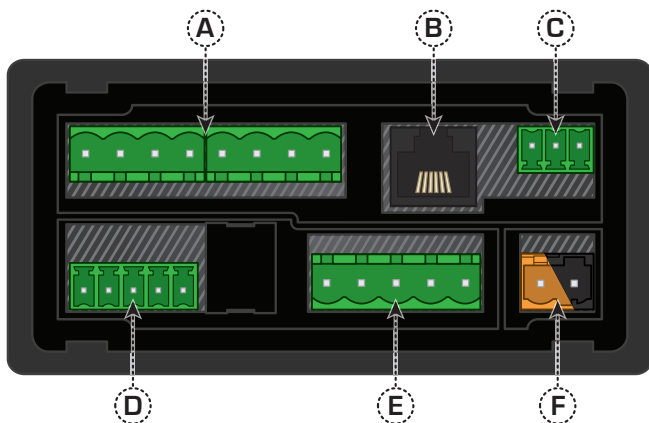
Available functions include resetting of primary, B or C counters (to load value), resetting of batch or batch counter (to zero), or unlatching of all (or individual) setpoints. See the table on p27 for a full list of **(P)** button functions.

(C) **Up** - This button is typically used to scroll through options or increase values in the setup menu.

(D) **Down** - This button is typically used to scroll through options or decrease values in the setup menu.

(E) **Function 2** - This button is used to access the setpoint setup menu (see Section 7) and the setpoint direct access menu (see Section 8).

3.2 Fig 2 - Rear view



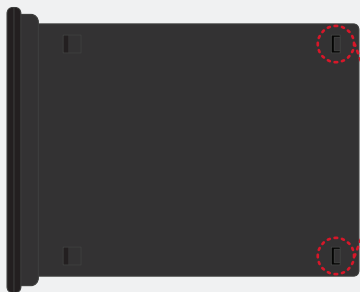
CONNECTOR PINS

- | | |
|---|--|
| <p>(A) 4 x relays -
Wiring: Section 5.4</p> | <p>(D) ISC02 input module -
Header setup: Section 4
Wiring: Section 5.2</p> |
| <p>(B) Serial port -
Wiring: Section 5.5</p> | <p>(E) Function pins -
Wiring: Section 5.6</p> |
| <p>(C) Analog output -
Wiring: Section 5.3</p> | <p>(F) Power supply [HV/LV] -
Wiring: Section 5.1</p> |

4 INPUT HEADER CONFIGURATION

Before you begin:

Before you can begin wiring, the ISCO2 input module must be removed from the meter case so that the headers can be configured for your input type.



Remove the plastic backing plate from the rear of the meter by inserting a screwdriver into these indents

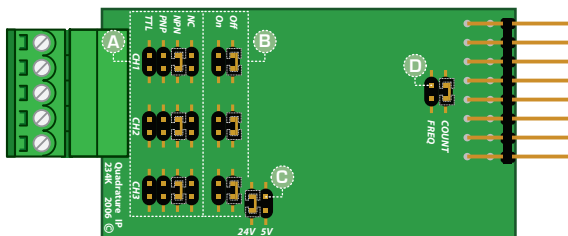
Once the backing plate has been removed, gently slide the input module from the case (see Section 3.2D to identify the input module).

4.1 Position your input headers

The ISCO2 input module has eight headers, some of which may need to be repositioned to suit your application.

Please consult the tables on p.9 for more information on positioning the headers to suit your requirements.

Header D should always be set to COUNTER.



When you have finished, slide the input module back into the case and replace the plastic backing plate.

INPUT TYPE

Ⓐ

For inputs A [CH1], B [CH2] & C [CH3]

NC	Not connected	NPN
PNP		TTL

NOISE FILTERING

Ⓑ

For inputs A [CH1], B [CH2] & C [CH3]

Off	For high-speed encoding	On	1kHz low-pass filter, for noisy signal or mechanical contact
------------	-------------------------	-----------	--

EXCITATION VOLTAGE

Ⓒ

24V	Standard setting	5V	May apply to some encoders
------------	------------------	-----------	----------------------------

MODE

Ⓓ

COUNT	ALWAYS use this setting	FREQ	Not used for PRO - CTR100
--------------	-------------------------	-------------	---------------------------

5

WIRING

Before you begin:

Determine whether your controller is configured for low or high voltage power supply. Make sure to check the label on the unit against the colour of the power connector:

- **Orange** = high voltage
- **Black** = low voltage

5.1 Connect your controller to the power supply

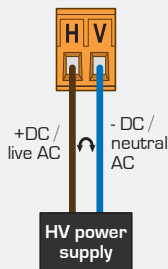
Refer to 3.2F

Wire your controller to your power supply as per the appropriate diagram below.

Remember to switch your power supply off before you begin wiring, and NEVER connect your low voltage controller to mains power.

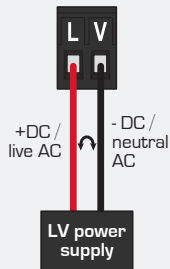
High voltage (HV) -

5-265V AC, 95-370V DC



Low voltage (LV) -

15-48V AC, 10-72V DC



5.2 Wire your ISCO2 analog input module

Refer to 3.2D

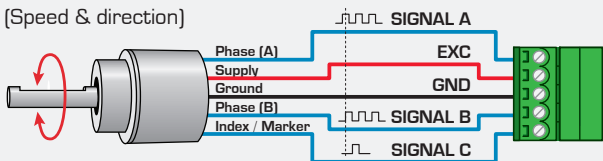
Make sure that you have completed Section 4 before you begin wiring your input module.

Once you have adjusted your header settings as needed (see Section 4) and replaced the plastic backing plate, wire your input module.

The diagram below shows the wiring for a quadrature encoder. For other sensor types, see p13.

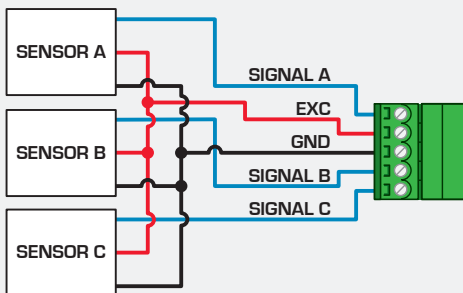
Quadrature Encoder

(Speed & direction)

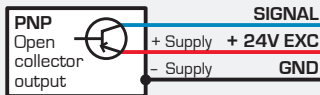
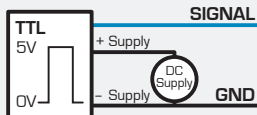
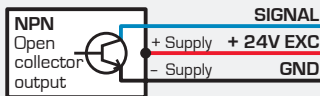


Non-Quadrature Sensor Connections

The following diagram shows how multiple sensors can be connected to your input module.



Any combination of the following sensor types can be used for sensors A, B or C above.



5.3 Wire your analog output (if fitted)

Refer to 3.2C

If your PRO - CTR100 has an analog output fitted, wire it as shown.

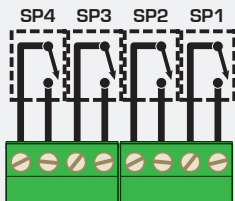
If you do not have an analog output, step 5.3 is skipped.



5.4 Wire your relays (if fitted)

Refer to 3.2A

Wire your relays as shown. PRO - CTR100 relays can be programmed to operate within the total span range of the controller (see 7.2).



If you do not have any relays fitted, 5.4 is skipped.

5.5 Wire your serial port (if fitted)

Refer to 3.2B

If your PRO - CTR100 has a serial port fitted, wire it as per the appropriate diagram.

If you do not have a serial port fitted then step 5.5 is skipped.

RS485

Screw terminal



RS232 RJ11

N/C
GND
+5V DC (option)
RXD
TXD
N/C



5.6 Wire your function pins (if required)

Refer to 3.2E

Connect external switches (as shown on the following page) to enable a function to be executed when its switch is activated.

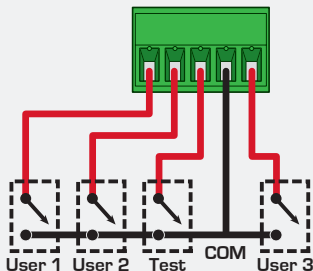
FUNCTION PINS

User 1-3

Activating one of these pins will execute its user-defined function (as specified in 6.5C-E).

Test

Activating this pin will reset the meter.



5.7

Power up your controller

Once you have completed the wiring process it is safe to switch on your power supply. Ensure that your display is functioning before you proceed.

6 SETUP & CALIBRATION

Enter the setup and calibration mode by pressing **F1**.

6.1 Enter PIN

A **__ _ ENTER CAL PIN NUMBER** scrolls across the display and toggles with **0**. Use the **▲** and **▼** buttons to enter your security code (factory default 1). Then press **P**. If the correct PIN is entered then the setup is started at 6.2.

If an incorrect PIN number is entered, **__ _ INCORRECT PIN NUMBER - ACCESS DENIED** scrolls across the display and it returns to the normal operating mode.

You will be given the opportunity to change your PIN number at the end of this section (6.9). If you have forgotten your PIN number, see Section 10.

6.2 Input setup

*There are 3 counter inputs available on the input module - count inputs A, B & C. When the primary counter mode is set to **AB IND** (A & B independent) the A input drives the primary counter and the B input drives the secondary counter.*

In other count modes the A & B inputs are both used to drive the primary counter, so the B counter options are not available. It is therefore advisable to set up the primary count mode first.

A **___ COUNTER SETUP** scrolls across the display and toggles with **SKIP**. Press **[P]** to skip to 6.3, or use the **[▲]** and **[▼]** buttons to select: **PRM CT** (Primary counter), **B INPT** (B Input) or **C INPT** (C Input).




*The secondary counter cannot be independently configured unless the primary count mode is set to **AB IND** (see 6.2B). Attempts to enter secondary (**B INPT**) counter setup when the above condition has not been met will redirect you to the counter setup menu (6.2A) and display the following error message:*

___ NOT AVAILABLE! - CHANGE PRIMARY COUNT MODE

▶▶ More info on count modes ▶▶ See Appendices A-B (p52-58)



If you selected **PRM CT** in 6.2A:

- B** **___ COUNT MODE** scrolls across the display and toggles with the currently selected count mode. Using the  and  buttons, select: **QUAD X1**, **QUAD X2**, **QUAD X4**, **A+B**, **A-B**, **AB IND**, or **UP/DN**. Then press .

See Appendix A [p53] for more information.






If you selected **B INPT** in 6.2A:




- B** Skip this step and continue to 6.2C now.






If you selected **C INPT** in 6.2A:




- B** **___ COUNT MODE** scrolls across the display and toggles with the currently selected count mode. Using the  and  buttons, select: **COUNT**, **RSOFAB** or **RSOFST**. Then press .

See Appendix B [p58] for more information.




C **___ DECIMAL POINT POSITION** scrolls across the display and toggles with the currently selected decimal point position. Using the  and  buttons, select either: **No DP**, **0.1**, **0.12**, **0.123**, **0.1234**, or **0.12345**, and then press .

D **___ PULSES PER UNIT OF MEASUREMENT** scrolls across the display and toggles with the currently selected number of pulses. Use the  and  buttons to adjust your number of pulses, and then press .

*For example, if an encoder outputs 1,500 pulses/metre, set the **PULSES PER UNIT OF MEASUREMENT** to 1,500.*

E **___ ENTER DISPLAY VALUE FOR (X) PULSES** scrolls across the display and toggles with the current display value setting. Adjust this value as required using the  and  buttons, and then press .




For example, if you selected 1,500 pulses in 6.2D, and 1,500 pulses = 1 metre, then enter 1 here. [Enter this value with reference to your decimal point position - the controller will automatically calculate the correct scale factor for you.]

- F** ___ **RESET AT POWER UP** scrolls across the display and toggles with the currently selected setting. Use the  and  buttons to select either **NO**, **ZERO** or **LD VAL** (load value). Then press .

***NO** - The count value will be retained at power up.*


***ZERO** - The count value will be cleared to zero at power up.*

***LD VAL (load value)** - The count value will be set to a user defined load value at power up [see 6.2G].*

- G** ___ **LOAD VALUE** scrolls across the display and toggles with the currently selected load value. Use the  and  buttons to adjust your load value as desired. Then press .

*This value is loaded into the counters at power up when **LD VAL** is selected in 6.2F above. It is also the value used for the C input reset functions **RSOFAB** and **RSOFST** (see Appendix B (p58).)*

- H** ___ **COUNTER SETUP** scrolls across the display and toggles with **SKIP**. You are now back at 6.2A.

To set up another input channel, follow the instructions from 6.2A-G again. If you have finished input setup, press  now to proceed to 6.3.

6.3 Rate display setup




- A** ___ **RATE DISPLAY SETUP** scrolls across the display and toggles with **SKIP**. Press **(P)** to skip to 6.4, or the **(▲)** button and then **(P)** to **ENTER** rate setup.

The rate value is taken from the primary count input (signal A).

- B** _ _ _ **DECIMAL POINT POSITION** scrolls across the display and toggles with the currently selected decimal point position. Using the **(▲)** and **(▼)** buttons, select either: **NO DP**, **0.1**, **0.12**, **0.123**, **0.1234**, or **0.12345**. Then press **(P)**.




- C** ___ **ROUNDING** scrolls across the display and toggles with the currently selected rounding setting. Using the **(▲)** and **(▼)** buttons, select either: **NONE**, **2**, **5** or **10**. Then press **(P)**.

Rounding is quoted in display counts and is not influenced by decimal point position. For example, if your input signal is 5.3, the display will show: 5.3 (for rounding=None), 5.4 (for rounding=2), 5.5 (for rounding=5) or 5.0 (for rounding=10).




- D** ___ TIME PERIOD FOR RATE DISPLAY scrolls across the display and toggles with the currently selected time period. Using the  and  buttons, select: **SECS**, **MINS** or **HOURS**. Then press .

This parameter allows you to view the effective rate over different time periods. For example, if the measurement units are metres, then rate can be viewed in m/sec, m/min or m/hr.

The PRO - CTR100 will automatically calculate the required scaling factors based on the input channel setup, so you must complete Section 6.2 first.

- E** _ _ _ RATE MULTIPLIER scrolls across the display and toggles with the currently selected multiplication factor. Using the  and  buttons, select: **x0.0001**, **x0.001**, **x0.01**, **x0.1**, **x1**, **x10**, **x100**, or **x1000**. Then press .

This option allows the user add a scale factor to the rate display calculation, to display the value in the required units.

- F** _ _ _ LOW CUT scrolls across the display and toggles with the currently selected low cut value. Use the  and  buttons to adjust this value, and then press .

When the rate drops below the low cut value, it displays as zero.

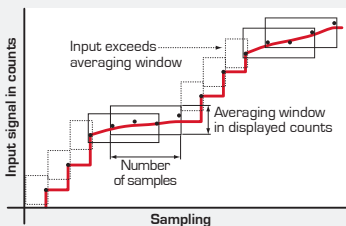
- G** **___ DISPLAY ZERO TIME** scrolls across the display and toggles with the current display zero time. Use the **▲** and **▼** buttons to select either: **0.5SEC** or **100SEC**, and then press **P**.

The display zero time controls how quickly the rate display changes to zero. Select 100 seconds for slow inputs, and 0.5 seconds for faster inputs [more than 2 pulses/second].

Averaging (6.3H-I)




Input signal averaging on the rate guarantees stable measurement.

If the input exceeds the averaging window value it will not average, ensuring fast response.



- H** **___ AVE SAMPLES** scrolls across the display and toggles with the currently selected averaging. Using the **▲** and **▼** buttons, alter the number of rate samples that the controller will average, and then press **P**.

Increasing the number of samples will stabilise measurement, but it will also slow down response rates.

- I **___ AVE WINDOW** scrolls across the display and toggles with the currently selected averaging window value. Using the  and  buttons, alter the rate signal averaging window. Then press .

If your input signal contains large noise spikes, then you can increase the size of averaging window to ensure that these pulses are still averaged. However, increasing the averaging window too far will reduce the ability of the controller to respond quickly to real changes in input signal.

Setting the averaging window to zero will turn off the window mode and give continuous averaging as per the selected averaging samples.

6.4 Display setup

- A **___ DISPLAY SETUP** scrolls across the display and toggles with **SKIP**. Press **[P]** to skip to 6.5, or the **[▲]** button and then **[P]** to **ENTER** display setup.
- B **___ LINE 1 DISPLAY SOURCE** scrolls across the display and toggles with the currently selected display source. Using the **[▲]** and **[▼]** buttons, select: **NONE**, **PRMCTR** (primary counter), **B CNTR**, **C CNTR**, **RATE**, **BATCH** or **BCHCNT** (batch count). Then press **[P]**.

See Appendix D (p62) for more information on batching.

6.5 User programmable input functions

- A** _ _ _ **USER PROGRAMMABLE INPUT FUNCTIONS** scrolls across the display and toggles with **SKIP**. Press **P** to skip to 6.6, or the **▲** button and then **P** to **ENTER** input functions setup.

USER PROGRAMMABLE INPUT FUNCTIONS

NONE	No action
RS PRM	Reset primary count value to load value
RST B	Reset B count value to load value
RST C	Reset C count value to load value
RST BT	Reset batch value to zero
RSTBTC	Reset batch counter value to zero
UNLTCH*	Unlatch all setpoints
UNLT (X)*	Unlatch SP X (1-4)

* When a setpoint is configured for latching mode it will activate as normal and remain activated until it is unlatched either by setpoint logic or manually (as specified in this section). Refer to section 7.2F to configure setpoint latching.

- B** _ _ _ **PROGRAM BUTTON** scrolls across the display and toggles currently selected **P** button function. Use the **▲** and **▼** buttons to select a function from the list, and then press **P** to confirm.




*This specifies the operation to be executed when the **P** button is pressed from the main display. See the table on p27 for function descriptions.*

- C** _ _ _ **USER INPUT 1** scrolls across the display and toggles with the currently selected User 1 pin function. Use the **▲** and **▼** buttons to select a function from the list, and then press **P** to confirm.

This specifies the operation to be executed when the User 1 input pin at the rear of the meter is connected to the common pin. Refer to Section 5.6 and the table on p27.

- D** _ _ _ **USER INPUT 2** scrolls across the display and toggles with the currently selected User 2 pin function. Use the **▲** and **▼** buttons to select a function from the list, and then press **P** to confirm.

This specifies the operation to be executed when the User 2 input pin at the rear of the meter is connected to the common pin. Refer to Section 5.6 and the table on p27.

- E** **___ USER INPUT 3** scrolls across the display and toggles with the currently selected User 3 pin function. Use the  and  buttons to select a function from the list, and then press  to confirm.

This specifies the operation to be executed when the User 3 input pin at the rear of the meter is connected to the common pin. Refer to Section 5.6 and the table on p27.

6.6**Analog output setup (I/R4/R4S users skip this step)**

Please note that I/R4/R4S models do not have this option installed - these instructions are only relevant to R4A/R4AS users.

A ___ **ANALOG OUTPUT SETUP** scrolls across the display and toggles with **SKIP**. Press **(P)** to skip to 6.7, or the **(▲)** button and then **(P)** to **ENTER** analog output setup.




B _ _ _ **DATA SOURCE FOR ANALOG OUTPUT** scrolls across the display and toggles with the current selection. Using the **(▲)** and **(▼)** buttons, choose from: **NONE**, **PRMCTR** (primary counter), **B CNTR**, **C CNTR**, **RATE**, **BATCH** or **BCHCNT** (batch count). Press **(P)**.

See Appendix D (p62) for more information on batching.

C _ _ _ **LOW SCALE VALUE FOR ANALOG OUTPUT** scrolls across the display and toggles with the currently selected low scale value. Use the **(▲)** and **(▼)** buttons to set the low scale value. Then press **(P)**.


This sets the display value for cal low (as at 6.6F).

D _ _ _ **HIGH SCALE VALUE FOR ANALOG OUTPUT**



scrolls across the display and toggles with the currently selected high scale value. Use the  and  buttons to set the high scale value. Then press .

This sets the display value for cal high (as at 6.6F).

E _ _ _ **CALIBRATE ANALOG OUTPUT?**

scrolls across the display and toggles with **SKIP**. If you do not wish to calibrate your analog output, press  now.

If you would like to calibrate your analog output:

Set the analog output board header in the correct position (see Section 4) and connect a mA or volt meter across the analog output connector (see 5.3). Press the  button to select **ENTER** and then  to enter calibration mode.






If you selected SKIP in 6.6E:




F Skip the rest of this section and continue to 6.7.



If you selected ENTER in 6.6E:

F ___ **CAL LOW ANALOG OUTPUT** scrolls across the display and toggles with a calibration number. Using the  and  buttons, calibrate your low analog output as required. Then press .

The display value is shown in internal units [mA].

___ **CAL HIGH ANALOG OUTPUT** scrolls across the display and toggles with a calibration number. Using the  and  buttons, calibrate your high analog output as required. Then press .

The display value is shown in internal units [mA].

6.7 Serial setup (I/R4/R4A users skip this step)

Please note that I/R4/R4A models do not have an active serial port - these instructions are only relevant to R4S/R4AS users. Configuring an active serial port on your PRO - CTR (as specified below) will allow you to connect your controller to a PC or another device.

A _ _ _ **SERIAL SETUP** scrolls across the display and toggles with **SKIP**. Press **[P]** to skip to 6.8, or the **[▲]** button and then **[P]** to **ENTER** serial port setup.

B _ _ _ **SERIAL MODE** scrolls across the display and toggles with the currently selected serial mode. Using the **[▲]** and **[▼]** buttons, select either: **ASCII**, **MODBUS** (RTU) or **RNGR A** (Ranger A). Then press **[P]**.

*Texmate **ASCII** is a simple protocol that allows connection to various Texmate PC configuration tools.*

***MODBUS** is an industry standard RTU slave mode that allows connection to a wide range of devices, such as PC's or PLC's.*

***RNGR A** is a continuous output, used to drive remote displays and other instruments in the Rinstrum™ range. (Ranger is a trade name belonging to Rinstrum Pty Ltd.)*






If you selected **ASCII** or **MODBUS** in 6.7B:




C Skip this step and continue to 6.7D now.









If you selected **RNGR A** in 6.7B:

C **___ SERIAL DATA SOURCE** scrolls across the display and toggles with the current Ranger A serial data source. Use the  and  buttons to select: **PRMCTR** (primary counter), **BCNTR**, **CNTR**, **RATE**, **BATCH** or **BCHCNT** (batch count). Then press .

See Appendix D (p62) for more information on batching.

D **___ BAUD RATE** scrolls across the display and toggles with the current selection. Using the  and  buttons, select either: **1200**, **2400**, **4800**, **9600**, **19200**, **38400**, **57600** or **115200**. Press .

E **___ PARITY** scrolls across the display and toggles with the current selection. Use the  and  buttons to select: **NONE**, **ODD** or **EVEN**. Then press .

- F **___ SERIAL ADDRESS** scrolls across the display and toggles with the current selection. Use the  and  buttons to alter the serial address. Then press .

The serial address parameter is used to identify a particular device when it is used with other devices in a system. (It applies particularly to Modbus mode when used on a RS485 network.)

The serial address of the controller must be set to match the serial address defined in the master device.

▶▶ More info on registers ▶▶

See tables (below, p36)

RANGER A - This allows the controller to drive a remote display from the Rinstrum range. The following shows the output string format when Ranger A output is selected:

<Start> <Sign> <Output Value> <Status> <End>

<i>STRING CHARACTER(S)</i>	
<Start>	STX character (ASCII 02)
<Sign>	Output value sign (space for + and dash for -)
<Output Value>	Seven character ASCII string containing the current output value and decimal point. <i>(If there is no decimal point, then the first character is a space. Leading zero blanking applies.)</i>
<Status>	Single character output value status: U=Under, O=Over, E=Error
<End>	ETX character (ASCII 03)

MODBUS REGISTERS - These are all holding registers and should be accessed via function codes 3 and 6.

Register addresses are displayed in the Modicon™ addressing format. i.e. Register 65=40065 (subtract 1 for direct addressing).

<i>8-BIT UNSIGNED</i>	
48207	Baudrate
48211	Serial address
48215	Serial mode

<i>24-BIT SIGNED (2x16-bit)</i>	
42509	Load value (Primary)
42511	Load value (B counter)
42513	Load value (C counter)

<i>16-BIT UNSIGNED</i>	
44181	SP 1 hysteresis
44197	SP 1 make delay
44213	SP 1 break delay
44182	SP 2 hysteresis
44198	SP 2 make delay
44214	SP 2 break delay
44183	SP 3 hysteresis
44199	SP 3 make delay
44215	SP 3 break delay
44184	SP 4 hysteresis
44200	SP 4 make delay
44216	SP 4 break delay
45173	Batch count increment

<i>32-BIT SIGNED (2x16-bit)</i>	
40007	Batch result
40009	Rate
40013	Primary counter
40015	B counter
40011	C counter
40037	Batch tare
40039	Batch count
40057	Peak
40059	Valley
40111	Setpoint 1
40113	Setpoint 2
40115	Setpoint 3
40117	Setpoint 4
40239	Alarm status

6.8 Edit calibration PIN

- A** **___ EDIT CAL PIN NUMBER** scrolls across the display and toggles with **SKIP**. Press **[P]** to skip and return to the operational display, or the **[▲]** button and then **[P]** to **ENTER**.
- B** **___ ENTER NEW CAL PIN NUMBER** scrolls across the display and toggles with the current PIN (default 1). Using the **[▲]** and **[▼]** buttons, enter your new calibration PIN number. Then press **[P]** to exit and return to the operational display.

7 SETPOINT SETUP

Enter the setpoint setup mode by pressing and holding the **F2** button for 3 seconds.

7.1 Enter setpoint PIN

A **___ ENTER SP PIN NUMBER** scrolls across the display and toggles with **0**. Use the **▲** and **▼** buttons to enter your security code (factory default 1). Then press **P**. If the correct PIN is entered then the setup is started at 7.2.

If an incorrect PIN number is entered, **___ INCORRECT PIN NUMBER - ACCESS DENIED** scrolls across the display and it returns to the normal operating mode.

You will be given the opportunity to change your PIN number at the end of this section (7.3). If you have forgotten your PIN number, see section 10.

7.2 Edit setpoints

- A** ___ **EDIT SETPOINT** scrolls across the display and toggles with **SKIP**. Press **P** to skip to 7.3, or use the **▲** and **▼** buttons to select a setpoint to edit: **SP 1**, **SP 2**, **SP 3** or **SP 4**. Then press **P**.
- B** ___ **SP VALUE** scrolls across the display and toggles with the last setpoint value entered. Using the **▲** and **▼** buttons, adjust the display value at which the setpoint will activate. Then press **P**.
- C** ___ **SP ACTIVATION** scrolls across the display and toggles with the last selected setpoint activation. Using the **▲** and **▼** buttons, select the relay activation to operate **ABOVE** or **BELOW** the setpoint value, and then press **P**.

*Select **ABOVE** for the relay to turn on above the setpoint value and off below it. Select **BELOW** for the relay to turn on below the setpoint value and off above it.*






If you selected **SP 1** or **SP 3** in 7.2A:

- D** Skip this step and continue to 7.2E now.



If you selected **SP 2** or **SP 4** in 7.2A:

- D** **TRACK SP1** scrolls across the display and toggles with the current selection. Using the  and  buttons, select **OFF** or **ON**, and press .




*If you choose **ON**, the selected setpoint will track the setpoint value of SP 1, with the setpoint value of the tracking setpoint becoming an offset value.*

OFF 




Go to 7.2E

ON 

Go to 7.2F

- E** **SETPOINT SOURCE** scrolls across the display and toggles with the current selection. Use the  and  buttons to select: **PRMCTR**, **B CNTR**, **C CNTR**, **RATE**, **BATCH** or **BCHCNT** (batch count). Press .




See Appendix D (p62) for more information on batching.

- F** ___ **SETPOINT TYPE** scrolls across the display and toggles with the last selected setpoint type. Using the  and  buttons, choose from: **NORMAL**, **TIMED** or **LATCHD** (latched). Then press .




When a setpoint is configured for latching mode it will activate as normal and remain activated until it is unlatched either by setpoint logic or manually (see Section 6.5).



If you selected NORMAL in 7.2F:

- G** ___ **HYSTERESIS TYPE** scrolls across the display and toggles with the last selected hysteresis type. Using the  and  buttons, select either **ALARM** or **CNTRL** (Control). Then press .

See Appendix C (p60) for information on hysteresis types.




- ___ **HYSTERESIS VALUE** scrolls across the display and toggles with the last selection. Adjust using the  and  buttons if required, and then press .

The hysteresis value defines the separation band between setpoint activation and deactivation. Hysteresis will operate as per the specified type setting (see above).



If you selected **TIMED** or **LATCHD** in 7.2F:




G Skip this step and continue to 7.2H now.

H **__ _ MAKE DELAY** scrolls across the display and toggles with the last selected make delay value. Adjust the make delay value if required using the  and  buttons, and then press .

This value is displayed in seconds with a 0.1 second resolution, and is the time delay before the relay energises.



If you selected **NORMAL** in 7.2F:

I **__ _ BREAK DELAY** scrolls across the display and toggles with the last selected break delay value. Adjust the break delay value if required using the  and  buttons, and then press .

This value is displayed in seconds with a 0.1 second resolution, and is the time delay before the relay de-energises.

! If you selected **TIMED** in 7.2F:

- I** **___ ON TIME** scrolls across the display and toggles with the last selected value. Edit this value using the **▲** and **▼** buttons if required. Then press **P**.

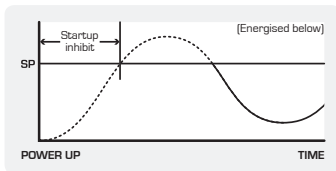
This value is displayed in seconds with a 0.1 second resolution and is the time the relay remains energised.




! If you selected **LATCHD** in 7.2F:

- I** Skip this step and continue to 7.2J now.

- J** **___ STARTUP INHIBIT** scrolls across the display and toggles with the current setting. Using the **▲** and **▼** buttons, select either **NO** or **YES**. Then press **P**.

*This option can be used with setpoints which may be active initially at power up. Setting this option to **YES** will cause a relay to remain off (de-energised) at power up until it has first reached its inactive state. It will then function normally.*






- K **___ RESET ACTION** scrolls across the display and toggles with the current selection. Using the  and  buttons, choose: **NONE**, **RS PRM** (reset primary count), **RST B** (reset B count), **RST C** (reset C count), **RST BT** (reset batch value), **RSTBTC** (reset batch count) or **UNLTCH** (unlatch all setpoints). Press .

See Appendix D (p62) for more information on batching.



If you selected NONE, RS PRM, RST B, RST C or RSTBTC in 7.2K:




- L **___ RESET VALUE** scrolls across the display and toggles with the current reset value. Use the  and  buttons to edit this value, and then press .

*The reset value is the value which will be loaded into the destination register selected by **RESET ACTION** (7.2K) when the selected **RESET EDGE** (7.2M) occurs.*






If you selected RST BT or UNLTCH in 7.2K:

- L Skip this step and continue to 7.2M now.

M _ _ _ **RESET EDGE** scrolls across the display and toggles with the current setting. Using the  and  buttons, choose from: **NONE**, **MAKE** (make edge - relay energises), **BREAK** (break edge - relay de-energises) or **BOTH** (make and break edges). Then press .



If you selected SP 1 in 7.2A:




N _ _ _ **BATCH COUNT MODIFIER** scrolls across the display and toggles with the current batch count modifier value. Use the  and  buttons to adjust this value if desired, and then press .


*A **positive** number will cause the batch count register to be incremented by that amount each time the selected reset edge is triggered. Likewise, a **negative** number will cause the batch count register to be decremented. Setting this value to **zero** will effectively disable this feature.*




If you selected SP 2 - 4 in 7.2A:

N Skip this step and continue to 7.20 now.

- O** **___ USER ACCESS?** scrolls across the display and toggles with the last selected direct access setting. Using the  and  buttons, select either **OFF** or **ON**. Then press .

When enabled, this option allows the setpoint value to be edited directly after pressing the  button, without needing to enter a PIN number or go through all of the other options. Each setpoint can individually have this option enabled or disabled.

- P** **___ EDIT SETPOINT** scrolls across the display and toggles with **SKIP**. You are now back at 7.2A.

To edit another setpoint, follow the instructions from 7.2A-P. If you do not wish to edit another setpoint, press  now to proceed to 7.3.

7.3 Edit setpoint PIN

- A** ___ **EDIT SP PIN NUMBER** scrolls across the display and toggles with **SKIP**. Press **P** to skip and return to the operational display, or the **▲** button and then **P** to **ENTER**.
- B** ___ **ENTER NEW SP PIN NUMBER** scrolls across the display and toggles with the current PIN (default 1). Using the **▲** and **▼** buttons, enter your new setpoint entry PIN number. Then press **P** to **EXIT** and return to the operational display.

8 SETPOINT DIRECT ACCESS

If neither of the setpoints have their direct access option enabled then this feature will be disabled and the **F2** button will not respond to a short button press. (See 7.20.)





8.1 Setpoint direct access

- A** Begin by pressing the **F2** button for less than 3 seconds. The setpoint name (**SP 1**, **SP 2**, **SP 3** or **SP 4**) will appear on the display and toggle with the current setpoint value. Using the **▲** and **▼** buttons, adjust the selected value. Then press **P** to accept the new setpoint value.
- B** If any other setpoints have the direct access option enabled then the same process is repeated for the next setpoint. Pressing **P** for the last enabled setpoint will exit and return to the operational display.

9 DISPLAY SHORTCUTS

Use these shortcuts for quick viewing of specified parameters from the operational display.

9.1 View

- A** Begin by pressing the  button for half a second. **RATE** will appear on the display and toggle with the current rate value.
- B** Use the  and  buttons to view the values shown below. Press  to return to the operational display.






RATE
PRMCNT (primary counter)
PEAK (rate peak)



C CNT (C counter)
B CNT (B counter)
VALLEY (rate valley)

9.2




Reset

- A** To reset either **PEAK** or **VALLEY**, press both the  and  buttons together while the required parameter is being displayed (as in 9.1). Press  to return to the operational display.

10 RESET PIN NUMBERS

If you have forgotten your PIN number, follow the procedure below to reset the calibration and setpoint entry PIN numbers to their factory default of 1.

10.1 Reset PIN numbers

- A** Press ,  and  at the same time. (This key combination can be difficult to execute and you may need several tries to get it right.)
- B** When successful, a factory identification text will scroll across the display, followed by: **_ _ _ ALL PIN NUMBERS RESET TO 1.**
- C** Reset the calibration PIN numbers if required by following the instructions in Sections 6.8 and 7.3.

11 DISPLAY BRIGHTNESS

Follow the instructions below to adjust the brightness of your LED display.

11.1 Adjust display brightness

- A** Press the **(P)** and **(▲)** buttons together from the operational display. **BRI** appears on the display and toggles with the current brightness setting.
- B** Use the **(▲)** and **(▼)** buttons to adjust the brightness of the LED backlight as required, and then press **(P)**. The display returns to normal operating mode.

A

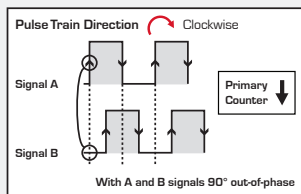
APPENDIX A

Primary & B Input Count Modes

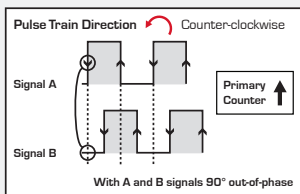
This section outlines the count modes available on the A and B counters. See Appendix B (p58) for C input count modes. Refer to Section 6.2B (p19) to configure your PRO-CTR100 controller for your required count mode.

QUAD x 1

This is the most commonly used counter function, and is shown for a shaft encoder in this example. Depending on the direction of rotation, the A signal either leads or lags the B signal.

**Primary counter decrements:**

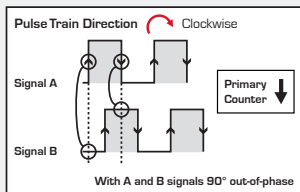
- on a **rising** edge A signal when B is **low**

**Primary counter increments:**

- on a **falling** edge A signal when B is **low**

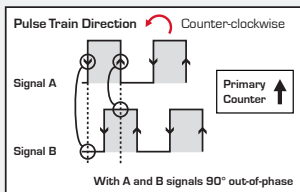
QUAD x 2

In this mode, the angular/linear resolution of the x 1 mode is increased by 2. Depending on the direction of rotation, the A signal leads or lags the B signal. This example is for a shaft encoder.



Primary counter decrements:

- on a **rising** edge A signal when B is **low**
- on a **falling** edge A signal when B is **high**



Primary counter increments:

- on a **rising** edge A signal when B is **high**
- on a **falling** edge A signal when B is **low**

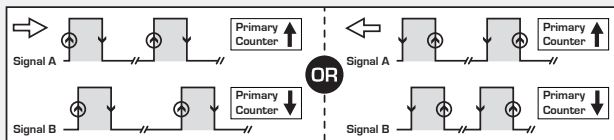
QUAD x 4

In this mode, the angular/linear resolution of the x 1 mode is increased by 4. Depending on the direction of rotation, the A signal leads or lags the B signal. This example is for a shaft encoder.

▶▶ Continues ▶▶

A - B

In this mode the A and B signals are linked in a phase relationship. Signal A increments the primary counter on every rising edge, while signal B decrements the primary counter on every rising edge.



Primary counter increments:

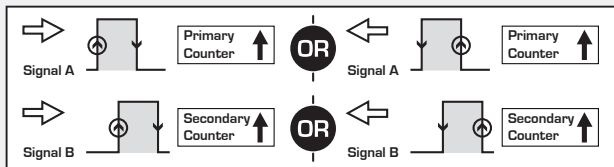
- on a rising edge A signal

And decrements:

- on a rising edge B signal

A & B INDEPENDENT

In this mode there is no fixed relationship between signals A and B. Signal A increments the primary counter on every rising edge, and signal B increments the secondary counter on every rising edge.



Primary counter increments:

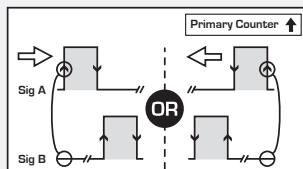
- on a rising edge A signal

Secondary counter increments:

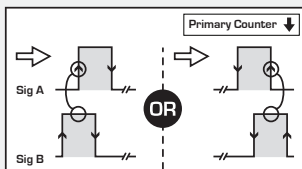
- on a rising edge B signal

UP / DOWN

In this mode the A and B signals are linked in a phase relationship. Signal A increments the primary counter on every rising edge when signal B is low. Signal A also decrements the primary counter on every rising edge when signal B is high.



Primary counter increments:
 - on a **rising** edge A signal
 when B is low



Primary counter decrements:
 - on a **rising** edge A signal
 when B is high

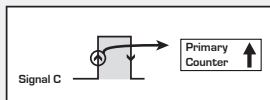
B

APPENDIX B
C Input Count Modes

This section outlines the count modes available on the C counter. See Appendix A (p53) for primary and B input count modes. Refer to Section 6.2B (p19) to configure your PRO - CTR100 controller for your required count mode.

COUNT

In this mode the **primary** counter **increments** on a **rising** edge C signal only. This is particularly useful for multi-input systems.



RSOFAB

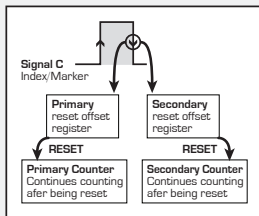
(Reset to offset A, B mode)

In this mode the **primary** and **secondary** counters are reset to the values stored in the meter's reset offset registers, and they continue counting after being reset. This is useful for setting a position to a known reference position.

▶▶ Continues ▶▶

On a **falling edge** C signal:

- **Primary** counter is reset to value stored in **primary reset offset register**
- **Secondary** counter is reset to value stored in **secondary reset offset register**
- **Both counters** continue to count after being reset



RSOFST

(Reset to offset and start A, B mode)

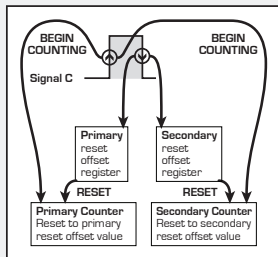
In this mode the **primary** and **secondary** counters are reset to the values stored in the meter's reset offset registers, and they continue counting after being reset.

On a **rising edge** C signal:

- **Both counters** begin counting

On a **falling edge** C signal:

- **Primary** counter is reset to value stored in **primary reset offset register**
- **Secondary** counter is reset to value stored in **secondary reset offset register**
- Both counters continue to count after being reset



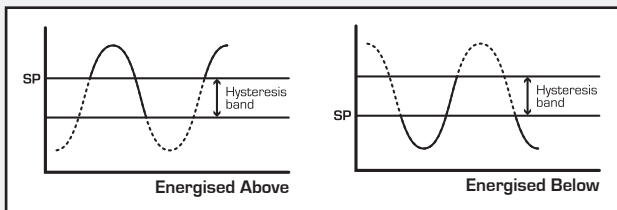
C

APPENDIX C
Hysteresis Types

This section outlines the hysteresis types available for **NORMAL** setpoints (i.e. not timed or latched setpoints). See 7.2G to configure your hysteresis type.

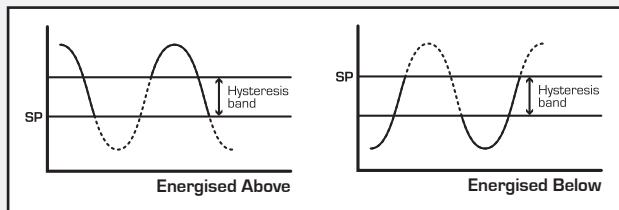
ALARM

The **setpoint value** controls the point at which the setpoint will activate, and the **hysteresis value** controls the point at which the setpoint will deactivate.



CNTRL**(Control)**

The **setpoint value** controls the point at which the setpoint will deactivate, and the **hysteresis value** controls the point at which the setpoint will reactivate.



D

APPENDIX D
Batching


Batching - This function is used to maintain the total count as well as the current batch value.

$$\text{Batch Value} = \text{Primary Count} - \text{Batch Tare}$$

The **Batch Tare** value is reset to the **Primary Count** value via the setpoint reset function **RST BT**, which can be executed by setpoint logic (see 7.2K) or manually by activating an appropriately configured user input pin (see Section 6.5).

Batch Tare is a hidden register used only for this calculation.

The controller also includes a batch counter function associated with **SP 1**. The **BATCH COUNT MODIFIER** value (see 7.2N) is added to the **Batch Count** register each time **SP 1** activates, allowing the user to count how many completed batches have been processed.



Copyright © 2009 Texmate NZ Ltd.
10B Vega Place, Mairangi Bay
North Shore City 0632, New Zealand

Ph: +64 (9) 835-1550
Fax: +64 (9) 835-1250
Email: info@texmate.co.nz
Web: www.texmate.co.nz



PRO - CTR100

**DOCUMENT REVISION CODE:
PRO-CTR100-MAN-09-V.01**