

# Mercury 6-5 M Pulse Reader User Guide

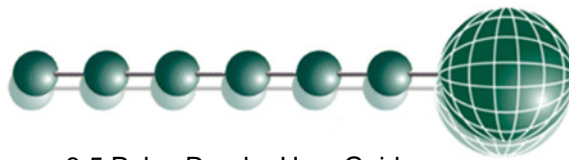


**For Product: -**

**PR0318**



Ensure that all power is switched off before installing or maintaining this product



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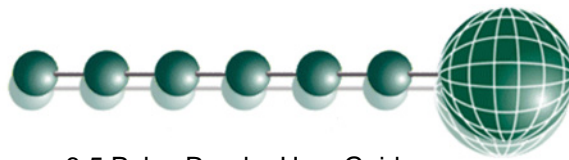
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## The Mercury Range

### Description

The Mercury Pulse Reader has 6 independent inputs that can be configured for pulse counting from the pulse relay of most utility meters. The input is activated by the use of a 0 volt return through the normally open and common contacts of the relay inside the utility meter.

In addition to the 6 inputs, the 5 on board relays can be used remotely by "The Data Builder".

The Pulse Reader will accumulate pulses on a per channel basis to give a running total. It also has time slots on a per channel basis that counts the number of pulses during the time interval. These time slots are: -

1 hour	Updates every hour on the hour
12 hours	Updates at mid-day and mid-night
24 hours	Updates at mid-night

Note that the Pulse Reader is unit-less; item aliasing can be used on the Data Manager/Director to indicate units. Also due to the potential size of the numbers, there is a x1 field and a x1000 field.

### Configuration

The Pulse Reader is delivered pre-configured with all 6 channels "off"

### Networks

The controllers are capable of connecting to either a TCP/IP local area network or a RS485 network or controlling in standalone mode with no network output.

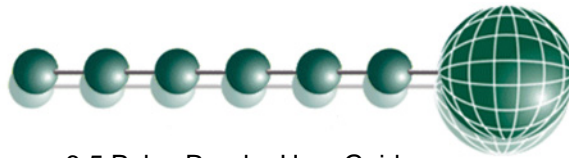
To connect to a network you must add the correct communications module.

- 485 Legacy module (Part No PR0026)
- IP Futura module (Part No PR0016)

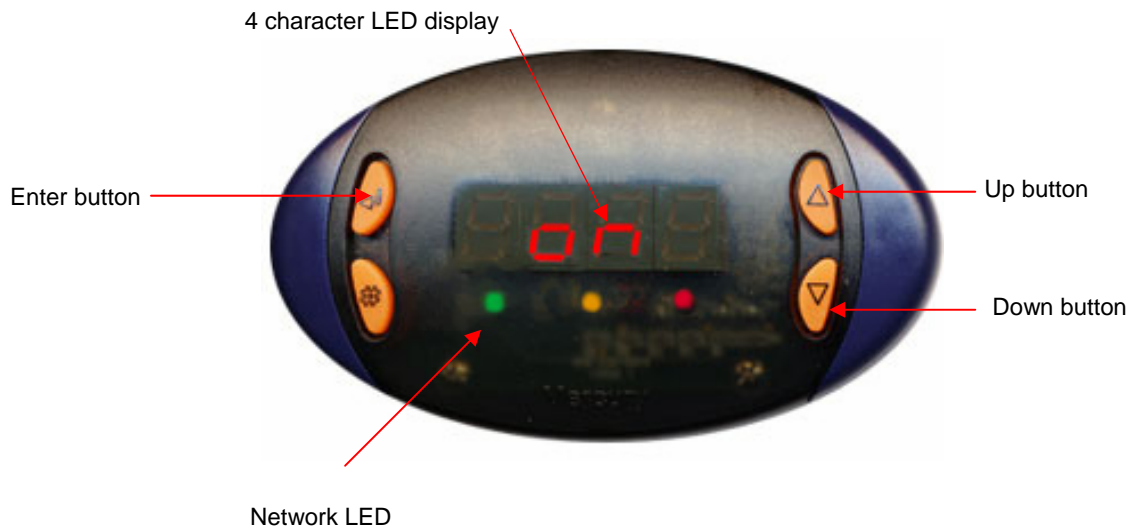
Connecting to either of these communication modules will automatically be detected on power up and this will affect the set up screens made available to you.



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## Front Panel Features



### Display:

4 character red LED display, used to display temperature and status messages.

### Enter Button:

Button used to enter values front the menu system.

### Up Button:

Button used to scroll up through the menu items

### Down Button:

Button used to scroll down through the menu items

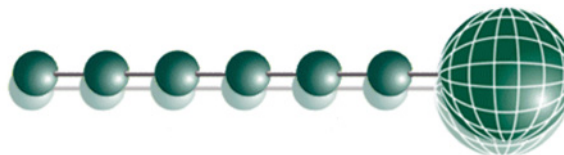
### Network LED:

Green LED used to indicate network Status:

- Off No network attached
- Flashing Attempting to Log on to network
- Steady On-line

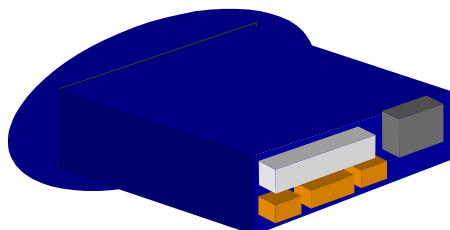


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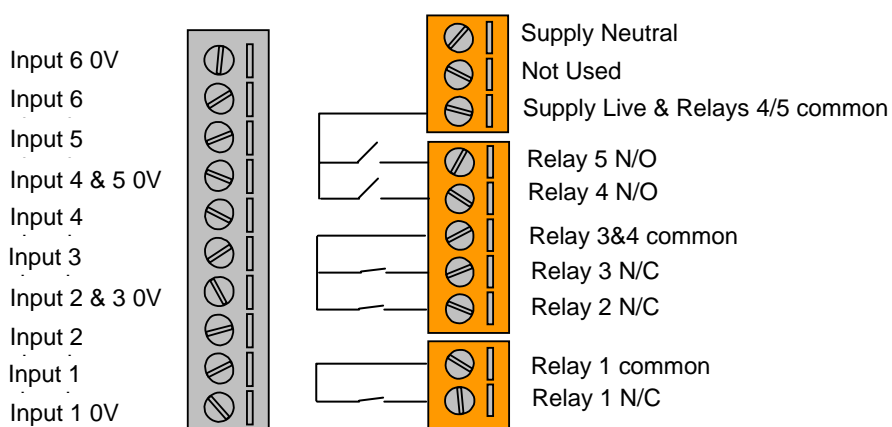


## Connections

All connections are made to the back of the controller. The diagram below shows the connection detail. Inputs and outputs are assigned according to the chosen configuration. See [Specification](#) for further details on connections.



Comms connector



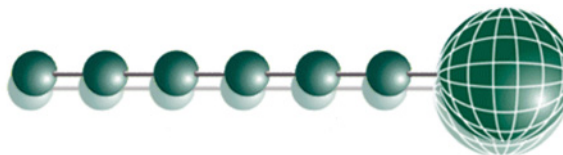
**Do not connect an earth.**

### Input/Output Allocation Table:

Pulse Reader	Description	Alarm Action
Input 1	Channel 1 ( 0 volt return)	Yes
Input 2	Channel 2 ( 0 volt return)	Yes
Input 3	Channel 3 ( 0 volt return)	Yes
Input 4	Channel 4 ( 0 volt return)	Yes
Input 5	Channel 5 ( 0 volt return)	Yes
Input 6	Channel 6 ( 0 volt return)	Yes
Relay 1	N/C	N/A
Relay 2	N/C	N/A
Relay 3	N/C	N/A
Relay 4	N/O	N/A
Relay 5	N/O	N/A



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## Setting up the controller

Access to the controller can be achieved several ways

- Through the front mounted buttons
- Direct access by PC or palm top into the rear comms port. This requires a software package available on the RDM website
- Through legacy front end panels on 485 networks
- Through the RDM Data Director or Data Manager

## Setup Mode

### Setup through front buttons



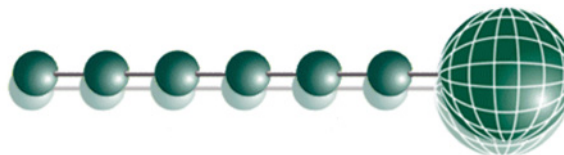
To enter setup mode, hold the Enter and Down buttons together for approximately 3 seconds until the message “Ent” appears on the display. Now press the Enter button again to enter the function menu. IO will be displayed. Scroll up or down to go through the list.

### Setup Function Menu

Display	Option	Explained in Paragraph
IO	View Inputs / Outputs and States	<a href="#">Input / output table</a>
PArA	Set/View Parameters	<a href="#">Set view parameters</a>
rtc	Set/view Clock (rtc = Real Time Clock)	<a href="#">Real Time Clock</a>
nEt	Set/view network configuration	<a href="#">Network Configuration</a>
SoFt	View software version	
Clr	Clear Channels	<a href="#">Clear Channels</a>
ESC	Exit Setup mode	



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## Recommended set-up method

If you are not connecting to a network and want to set up the controller through the buttons we recommend you use the following order from the function menu.

### rtc.

Real time clock (This will automatically synchronise on network systems)

- a. Use the up or down buttons to scroll through the display until the display reads “rtc”
- b. Press enter. The display will show “t-1”. press enter again
- c. Scroll hours up or down (0 – 23) press enter
- d. Use up button to select “t-2”, press enter
- e. Scroll minutes up or down (0 – 59) press enter
- f. Repeat for t-3 (seconds 0 – 59)
- g. Repeat for t-4 (Days up to 31)
- h. Repeat for t-5 (months up to 12)
- i. Repeat for t-6 (Year up to 99)
- j. Use up button to display “ESC”, press enter to display “rtc”

Time clock is now set

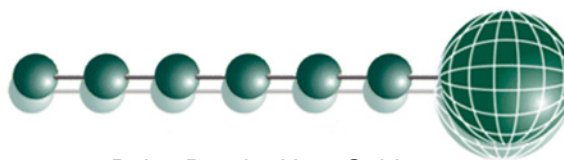
### PArA.

Set/view parameters (This can be achieved at the network front end)

- a. From the function menu scroll to select PArA
- b. Pressing Enter while PArA is displayed will enter the parameter menu. The first parameter option will be displayed as P-01. Pressing the Up or Down button will present the other parameter options P-02, P-03 etc. See the parameter list below to find what parameter number corresponds to which actual parameter. Pressing the Enter button will show the current value of the selected parameter. Press Up or Down to modify the value and press Enter again to save the value. The parameter list number will be displayed again. Two other options are present in the parameter menu – dFLt and ESC. Selecting ESC will exit setup mode. Selecting dFLt will reset all parameters back to the default values for the current type of controller.



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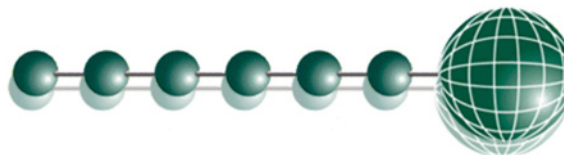


**Parameter Table:**

Number	Parameter	Range	Step	Value
P-01	Channel 1 set	0 - 6	1	0 = off (default) 1 = 1 pulse/100Units 2 = 1 pulse/10Units 3 = 1 pulse/Unit 4 = 10 pulse/Unit 5 = 100 pulse/Unit 6 = 1000 pulse/Unit
P-02	Ch1 1 Hour (x1000 Counter) alarm level	0 - 9999	1	0 (default)
P-03	Ch1 1 Hour (Units Counter) alarm level	0 - 999.9	0.1	0.0 (default)
P-04	Ch1 12 Hour (x1000 Counter) alarm level	0 - 9999	1	0 (default)
P-05	Ch1 12 Hour (Units Counter) alarm level	0 - 999.9	0.1	0.0 (default)
P-06	Ch1 24 Hour (x1000 Counter) alarm level	0 - 9999	1	0 (default)
P-07	Ch1 24 Hour (Units Counter) alarm level	0 - 999.9	0.1	0.0 (default)
P-11	Channel 2 set	0 - 6	1	0 = off (default) 1 = 1 pulse/100Units 2 = 1 pulse/10Units 3 = 1 pulse/Unit 4 = 10 pulse/Unit 5 = 100 pulse/Unit 6 = 1000 pulse/Unit
P-12	Ch2 1 Hour (x1000 Counter) alarm level	0 - 9999	1	0 (default)
P-13	Ch2 1 Hour (Units Counter) alarm level	0 - 999.9	0.1	0.0 (default)
P-14	Ch2 12 Hour (x1000 Counter) alarm level	0 - 9999	1	0 (default)
P-15	Ch2 12 Hour (Units Counter) alarm level	0 - 999.9	0.1	0.0 (default)
P-16	Ch2 24 Hour (x1000 Counter) alarm level	0 - 9999	1	0 (default)
P-17	Ch2 24 Hour (Units Counter) alarm level	0 - 999.9	0.1	0.0 (default)
P-21	Channel 3 set	0 - 6	1	0 = off (default) 1 = 1 pulse/100Units 2 = 1 pulse/10Units 3 = 1 pulse/Unit 4 = 10 pulse/Unit 5 = 100 pulse/Unit 6 = 1000 pulse/Unit
P-22	Ch3 1 Hour (x1000 Counter) alarm level	0 - 9999	1	0 (default)
P-23	Ch3 1 Hour (Units Counter) alarm level	0 - 999.9	0.1	0.0 (default)
P-24	Ch3 12 Hour (x1000 Counter) alarm level	0 - 9999	1	0 (default)
P-25	Ch3 12 Hour (Units Counter) alarm level	0 - 999.9	0.1	0.0 (default)
P-26	Ch3 24 Hour (x1000 Counter) alarm level	0 - 9999	1	0 (default)
P-27	Ch3 24 Hour (Units Counter) alarm level	0 - 999.9	0.1	0.0 (default)
P-31	Channel 4 set	0 - 6	1	0 = off (default) 1 = 1 pulse/100Units 2 = 1 pulse/10Units 3 = 1 pulse/Unit 4 = 10 pulse/Unit 5 = 100 pulse/Unit 6 = 1000 pulse/Unit
P-32	Ch4 1 Hour (x1000 Counter) alarm level	0 - 9999	1	0 (default)
P-33	Ch4 1 Hour (Units Counter) alarm level	0 - 999.9	0.1	0.0 (default)
P-34	Ch4 12 Hour (x1000 Counter) alarm level	0 - 9999	1	0 (default)



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P-35	Ch4 12 Hour (Units Counter) alarm level	0 - 999.9	0.1	0.0 (default)
P-36	Ch4 24 Hour (x1000 Counter) alarm level	0 - 9999	1	0 (default)
P-37	Ch4 24 Hour (Units Counter) alarm level	0 - 999.9	0.1	0.0 (default)
P-41	Channel 5 set	0 - 6	1	0 = off (default) 1 = 1 pulse/100Units 2 = 1 pulse/10Units 3 = 1 pulse/Unit 4 = 10 pulse/Unit 5 = 100 pulse/Unit 6 = 1000 pulse/Unit
P-42	Ch5 1 Hour (x1000 Counter) alarm level	0 - 9999	1	0 (default)
P-43	Ch5 1 Hour (Units Counter) alarm level	0 - 999.9	0.1	0.0 (default)
P-44	Ch5 12 Hour (x1000 Counter) alarm level	0 - 9999	1	0 (default)
P-45	Ch5 12 Hour (Units Counter) alarm level	0 - 999.9	0.1	0.0 (default)
P-46	Ch5 24 Hour (x1000 Counter) alarm level	0 - 9999	1	0 (default)
P-47	Ch5 24 Hour (Units Counter) alarm level	0 - 999.9	0.1	0.0 (default)
P-51	Channel 6 set	0 - 6	1	0 = off (default) 1 = 1 pulse/100Units 2 = 1 pulse/10Units 3 = 1 pulse/Unit 4 = 10 pulse/Unit 5 = 100 pulse/Unit 6 = 1000 pulse/Unit
P-52	Ch6 1 Hour (x1000 Counter) alarm level	0 - 9999	1	0 (default)
P-53	Ch6 1 Hour (Units Counter) alarm level	0 - 999.9	0.1	0.0 (default)
P-54	Ch6 12 Hour (x1000 Counter) alarm level	0 - 9999	1	0 (default)
P-55	Ch6 12 Hour (Units Counter) alarm level	0 - 999.9	0.1	0.0 (default)
P-56	Ch6 24 Hour (x1000 Counter) alarm level	0 - 9999	1	0 (default)
P-57	Ch6 24 Hour (Units Counter) alarm level	0 - 999.9	0.1	0.0 (default)

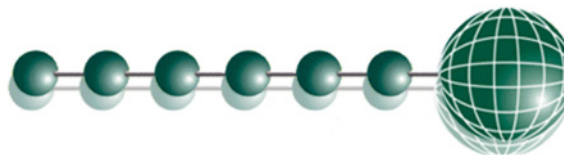
**Note:** Owing to the potentially very large numbers involved with pulse reading, each channel is split into 2 counters: - a units counter which will count up to 999.9 and then start back at 000.0, and an “x1000” counter which increments every time the units counter reaches 999.9.

Example: - (pulses set to give 1 pulse/unit)

A pulse count of 160,675 pulses would give a reading of 675.0 in the units counter and 160 in the “x1000” counter.



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## Network Configuration

The final section to setup is the network address. In all instances, this must be done before the controller is plugged into the site network. The controllers have an auto-initialise function, which will automatically log the device onto the site network. If the wrong address has been entered onto the network, you will have to reset the controller address by setting the address to 00-0, and then re-enter the correct address. (You may have to deregister the wrong address from the home system as well).

To set the controller onto a network you must first connect the controller to a communications module. This is either a: -

- 485 Legacy, or
- IP Futura

### 485 Legacy module

In a legacy system, the only option is Genus compatible.

Connecting a 485 legacy module to the controller will govern which set up screens are made available.

Display	Option
485t	485 Network Type
485A	485 Address/Name
gAdd	Show underlying network address assigned to controller
rLog	Re-log the controller back onto the network
CLrA	Clear the address/name from the controller
ESC	Exit network menu. <b>N.B.</b> this option <b>must</b> be selected to save any changes made in this menu

#### 485t

This option shows a value representing the network type. The possible values are:

Value	Network Type
1	Genus compatible (all versions)
2	Not available

#### 485A

This option shows a value that represents the name of the controller in a Genus compatible network.

The value shown is of the form 05-6. This means the controller would log onto a Genus compatible network using the name 'RC05-6'. Use the up/down keys to select the desired address.

#### gAdd

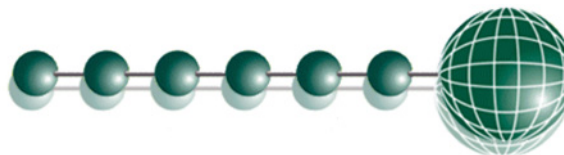
This option displays (in hexadecimal format) the underlying network address (given address) assigned to the controller when it was logged onto the network.

#### rLog

This option allows the controller to be logged back onto the network with its current name. The 'rLog' message will flash for confirmation. Press the Enter button to execute the command, Up or Down buttons to cancel.



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## Fast Network Address Reset

### ClrA

This option will clear out the network address and name in the controller. The 'ClrA' message will flash for confirmation. Press the Enter button to execute the command, Up or Down buttons to cancel.

To enter this mode, hold the Enter, Up and Down buttons together for approximately 3 seconds until the message CLrA appears on the display. CLrA is the first option in the menu consisting of the following options:

Display	Option
CLrA	Clear the address/name from the controller
ESC	Exit Setup mode

Pressing the Enter button to select the CLrA option will cause the 'CLrA' message to flash for confirmation, if the network type is set to Genus compatible. Press the Enter button to execute the command, Up or Down buttons to cancel. If the network type is not set to Genus compatible then the CLrA message will not flash and the ESC option can be used to exit the menu.

### IP Futura module

In an IP system there are two options

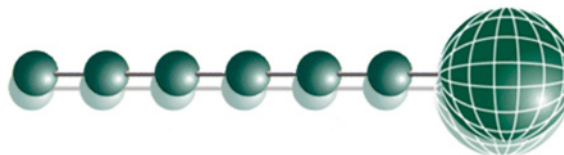
- IP-L
- IP-r

IP-L allows you to fix an IP address into the controller, which you would use when you are connecting the controllers onto a customer's local area network. This would allow the customer to view each controller using Internet Explorer

IP-r allows you to give each controller on the system a unique number. This number is then allocated a dynamic IP address by the system DHCP server (such as the RDM Data Director)



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### IP-L

To configure the communication module for IP-L, set all three rotary switches to zero. The module should then be connected to the controller.

1. nEt. From the function menu you can now select nEt
  - Press enter and the display will show "IP-L", press enter
  - You can now set the address using the table below

Display	Option
IP-1	IP Address byte 1
IP-2	IP Address byte 2
IP-3	IP Address byte 3
IP-4	IP Address byte 4
nL	Network Mask Length
gt-1	Gateway Address byte 1
gt-2	Gateway Address byte 2
gt-3	Gateway Address byte 3
gt-4	Gateway Address byte 4
ESC	Exit network menu. <b>N.B.</b> this option <b>must</b> be selected to save any changes made in this menu

### IP-r

To configure the communication module for IP-r, set the three rotary switches to give each controller a unique identifier. The module should then be connected to the controller and the network.

2. nEt. From the function menu you can now select nEt
  - Press enter and the display will show "IP-r", press enter
  - You can now view only the address given by the DHCP server

To ease setup, a single network mask length value is used. If the address has been specified with a network mask value in dotted IP format e.g. 255.255.255.0 then the table below gives the conversion:

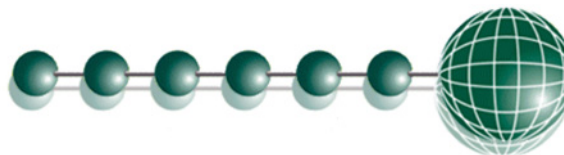
Mask	Length	Mask	Length	Mask	Length
		255.255.254.0	23	255.254.0.0	15
255.255.255.252	30	255.255.252.0	22	255.252.0.0	14
255.255.255.248	29	255.255.248.0	21	255.248.0.0	13
255.255.255.240	28	255.255.240.0	20	255.240.0.0	12
255.255.255.224	27	255.255.224.0	19	255.224.0.0	11
255.255.255.192	26	255.255.192.0	18	255.192.0.0	10
255.255.255.128	25	255.255.128.0	17	255.128.0.0	09
255.255.255.0	24	255.255.0.0	16	255.0.0.0	08

### Clear Channels

Channels can be reset to zero by using the clear channel option. Press enter at the "Clr" screen, then select Clr-1 through to Clr-6, then press enter to clear the channel.



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## Viewing

Apart from setting up the controller, you can also view the status of the inputs and outputs.

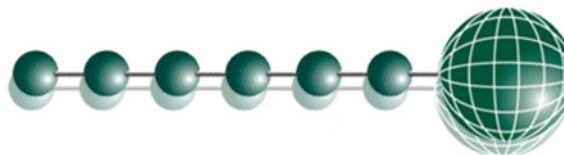
1. IO. View Inputs / Outputs and States
  - a. From the function menu, select "IO", press enter
  - b. You can now scroll through the IO tables as set out below.

### Input/Output table

Number	IO
I-01	Channel 1 x 1000 Units
I-02	Channel 1 x Units
I-03	Channel 2 x 1000 Units
I-04	Channel 2 x Units
I-05	Channel 3 x 1000 Units
I-06	Channel 3 x Units
I-07	Channel 4 x 1000 Units
I-08	Channel 4 x Units
I-09	Channel 5 x 1000 Units
I-10	Channel 5 x Units
I-11	Channel 6 x 1000 Units
I-12	Channel 6 x Units
I-21	Channel 1 1Hour x1000 Units
I-22	Channel 1 1Hour units
I-23	Channel 1 12Hour x1000 Units
I-24	Channel 1 12Hour units
I-25	Channel 1 24Hour x1000 Units
I-26	Channel 1 24Hour units
I-31	Channel 2 1Hour x1000 Units
I-32	Channel 2 1Hour units
I-33	Channel 2 12Hour x1000 Units
I-34	Channel 2 12Hour units
I-35	Channel 2 24Hour x1000 Units
I-36	Channel 2 24Hour units
I-41	Channel 3 1Hour x1000 Units
I-42	Channel 3 1Hour units
I-43	Channel 3 12Hour x1000 Units
I-44	Channel 3 12Hour units
I-45	Channel 3 24Hour x1000 Units
I-46	Channel 3 24Hour units
I-51	Channel 4 1Hour x1000 Units
I-52	Channel 4 1Hour units
I-53	Channel 4 12Hour x1000 Units
I-54	Channel 4 12Hour units
I-55	Channel 4 24Hour x1000 Units
I-56	Channel 4 24Hour units
I-61	Channel 5 1Hour x1000 Units
I-62	Channel 5 1Hour units
I-63	Channel 5 12Hour x1000 Units
I-64	Channel 5 12Hour units



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I-65	Channel 5 24Hour x1000 Units
I-66	Channel 5 24Hour units
I-71	Channel 6 1Hour x1000 Units
I-72	Channel 6 1Hour units
I-73	Channel 6 12Hour x1000 Units
I-74	Channel 6 12Hour units
I-75	Channel 6 24Hour x1000 Units
I-76	Channel 6 24Hour units
O-21	Relay 1 state, 0 = off, 1 = on
O-22	Relay 2 state, 0 = off, 1 = on
O-23	Relay 3 state, 0 = off, 1 = on
O-24	Relay 4 state, 0 = off, 1 = on
O-25	Relay 5 state, 0 = off, 1 = on

### Alarm Messages

Alarms are indicated by the red LED only, no screen messages are displayed.

### Network Alarms

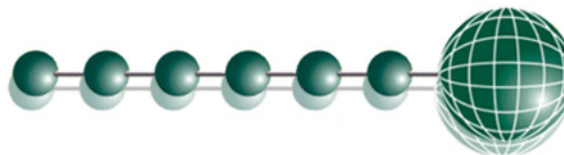
Alarm message	Type (index Number)
Channel 1 1 Hour Count	21
Channel 1 12 Hour Count	22
Channel 1 24 Hour Count	23
Channel 2 1 Hour Count	21
Channel 2 12 Hour Count	22
Channel 2 24 Hour Count	23
Channel 3 1 Hour Count	21
Channel 3 12 Hour Count	22
Channel 3 24 Hour Count	23
Channel 4 1 Hour Count	21
Channel 4 12 Hour Count	22
Channel 4 24 Hour Count	23
Channel 5 1 Hour Count	21
Channel 5 12 Hour Count	22
Channel 5 24 Hour Count	23
Channel 6 1 Hour Count	21
Channel 6 12 Hour Count	22
Channel 6 24 Hour Count	23

### Operation

Connect a 0v line from the reader through the powermeters voltfree pulse relay back to the desired input. Set the channel parameter to correspond with the meters pulse information. The reader will accumulate the pulse information from the meter. To view the counts, use the appropriate IO function, or view the data at the system front-end. Note that due to the potentially very large size of counts from readers, the total count is split into 2 fields: - units and x1000 units. Example: 66,967 counts will have: - 967 in the units field and 66 in the x1000 field.



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## Specification

### Power requirements:

Supply Voltage Range:	100 - 240 Vac $\pm$ 10%
Supply Frequency:	50 - 60 Hz
Maximum supply current:	5.2 Amps (when relays 4 and 5 are fully loaded)
Typical supply current:	<1 Amp
Operating temperature range:	+5°C to +50°C
Operating Humidity:	80% maximum
Storage temperature range:	-20°C to +65°C
Environmental:	Indoor use at altitudes up to 2000m, Pollution Degree 1, Installation Category II. Voltage fluctuations not to exceed $\pm$ 10% of nominal voltage
Size:	110mm (W) x 60mm (H) x 100mm (D)
Weight:	150 Grams
Safety:	EN61010
EMC:	EN61326; 1997 +Amdt. A1; 1998
Ventilation:	There is no requirement for forced cooling ventilation
Class 2 Insulation:	<b>No</b> protective Earth is required and <b>none</b> should be fitted.
The host equipment must provide	a suitable external over-current protection device such as: -
Fuse:	6.3A 240 Vac Antisurge (T) HRC conforming to IEC 60127
Or MCB:	6A, 240 VAC Type C conforming to BS EN 60898

The host equipment must provide adequate protection against contact to hazardous live parts.

### Relays

Max current relay 1:	6A (non inductive)	
Max Voltage relay 1:	260Vac (external supply)	
Exclusive common		
Max current relay 2:	4A (non inductive)	Relays 2 and 3 share a common supply line and the loads can have a combined total of 8A. Relay 2 or 3 can switch a maximum of 6A provided the other is at 2A or lower.
Max Voltage relay 2:	260Vac (external supply)	
Shared common with relay 3		
Max current relay 3:	4A (non inductive)	
Max Voltage relay 3:	260Vac (external supply)	
Shared common with relay 2		
Max current relay 4:	3A (non inductive)	
Max Voltage relay 4:	260Vac (Internal supply)	
Common connected to Input "live"		
Max current relay 5:	3A (non inductive)	
Max Voltage relay 5:	260Vac (Internal supply)	
Common connected to Input "live"		

For compliance with the LVD, relays 2 and 3 common must be at the same potential as the supply voltage.



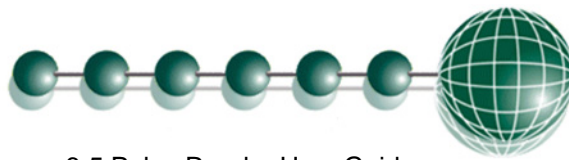
### Warning:

Relays 4 and 5 outputs have hazardous voltages (Supply input voltage potential).

### Inputs:



Ensure that all power is switched off before installing or maintaining this product



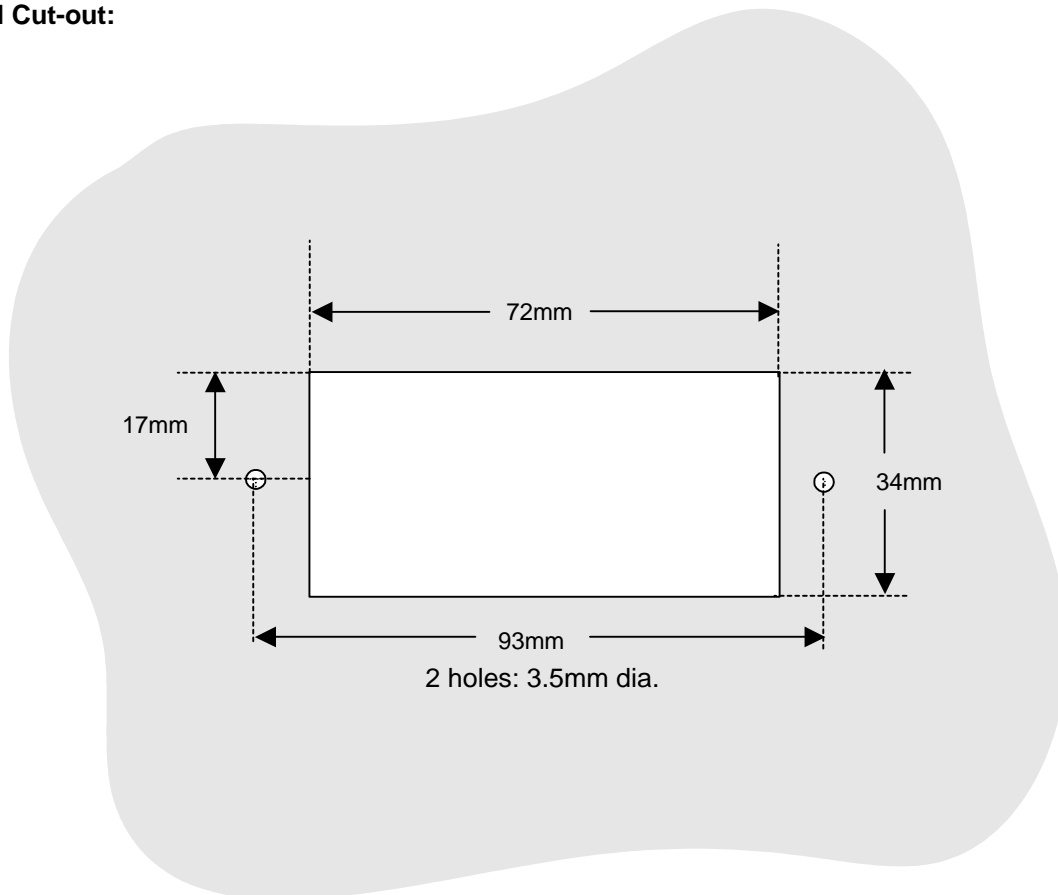
Input resistance: 3.01K Ohms  
Input type: 0 Volt return  
Comms: RS232 with flow control

### Reader Specification

Pulse High Duration: 100ms minimum  
Pulse Low Duration: 100ms minimum  
1 hour store maximum: 3276 counts  
12 hour store maximum: 3276 counts  
24 hour store maximum: 3276 counts  
Main accumulator maximum: 9,999,999.9 counts  
Pulse Voltage: 0v return from reader

### Installation:

#### Panel Cut-out:



#### Fixing:

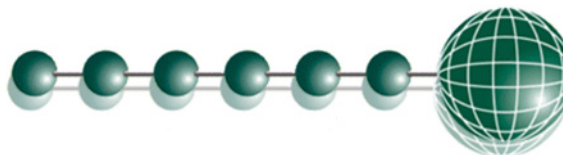
The controller can be fixed either by 2 X M3 screws from the rear or by the plastic retaining device (PR0329), obtainable from RDM.

#### Clearances:

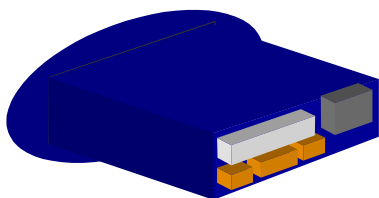
The controller must have 5mm clearance above the top and below bottom, and 25mm clearance from the sides. Clearance at the rear is dependant on the wiring. There is no requirement for forced cooling ventilation



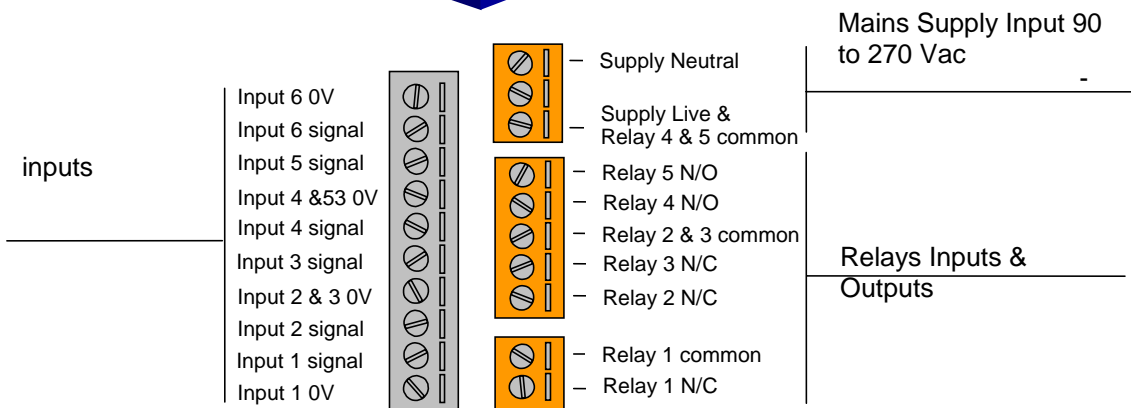
Ensure that all power is switched off before installing or maintaining this product



**Wiring:**



Communications socket



Relay 4 and 5 N/O are fed from the supply input

**Note:**

Suitable mechanical restraints on the wiring to the controller may be required; dependant on cable types, to prevent undue stress or distortion on the controller connectors.

**Fuse:**

The host equipment must provide a suitable external over-current protection device such as: -

- Fuse: 6.3A 240 Vac Antisurge (T) HRC conforming to IEC 60127
- Or MCB: 6A, 240 VAC Type C conforming to BS EN 60898

**Cleaning:**

Do not wet the controller when cleaning. Clean the front by wiping with slightly dampened lint free cloth.

**Please note:** The specifications of the product detailed on this set up guide may change without notice. RDM Ltd shall not be liable for errors or for incidental or consequential damages, directly or indirectly, in connection with the furnishing, performance or misuse of this product or document.



Ensure that all power is switched off before installing or maintaining this product