



# APM Power Meter

## User Guide



**CAUTION: Risk of Danger**

Read complete instructions prior to installation and operation of the unit



**CAUTION: Risk of electric shock**

**Before installation please read the safety warnings section**



# Safety



**WARNING: INSTALLATION AND MAINTENANCE MUST BE CARRIED OUT BY SUITABLY QUALIFIED AND COMPETENT PERSONEL ONLY. HAZARDOUS VOLTAGES MAY BE PRESENT ON THE CONNECTION TERMINALS.**



## INSTALLATION

- Install this product in accordance with local regulations, codes and instructions.
- All AC supply wiring must be rated for the voltages and currents that they will conduct
- All fuses must be 0.5A Type F with a breaking capacity of 35A or greater and rated for the max voltage that may be applied.
- All conductors carrying hazardous voltage must have external switching or disconnect mechanisms fitted that provide at least 3 mm of contact separation in all poles.
- Signal cables connected to this device must not exceed 30 metres long.
- If signal cables are routed outside the building, install extra surge-protection devices.
- Current input: All circuits connected to these connectors must be limited-energy and insulated by double/reinforced insulation from mains voltages according to IEC 61010-1:2010



**Failure to install or operate the unit in accordance with the above requirements may impair the electrical safety of the unit. Voltage measurements: An external UL recognized or listed overcurrent protection device (fuse or circuit breaker) must be fitted in-line with the voltage lead. Recommended fuse: 0.5A Type F with a breaking capacity of 35A or greater. Fuse voltage rating must be greater than the maximum voltage that will be applied to the meter.**



## MAINTENANCE

- Before cleaning, inspection or maintenance, isolate all power sources to the unit.
- There are no user-serviceable parts inside this unit. Never open the case.
- Inspect all external wiring connections at regular intervals. Replace any damaged wiring and tighten any loose connections.
- To clean the unit, use a dry cloth to wipe the casing.

## INTENDED USE

The APM has been specifically designed for engineers requiring an effective way to monitor and display data. The APM accepts a range of electrical inputs and displays the data on its integrated multi-format display. The APM has been designed for installation into electrical cabinets or display panels. The APM should not be used in safety critical applications.

# Specification

Item	Spec/Range
Power supply input:	100-240VAC +/- 10% 50-60Hz 3W MAX
Network	1P2W or 1P3W

Measurement Inputs:	Quantity	Spec
Voltage	2	10 – 264VAC 50 – 60Hz
Current	2	0 – 5A (via CT)

Functions:	Measurement	Range	Accuracy
Voltage (V)	Instantaneous and MAX	10 – 264VAC	1%
Current (I)	Instantaneous and MAX	0 – 1000AAC	1% Using external 5A CT
Reactive Power (VAr)	Instantaneous and MAX		1%
Active Power (W)	Instantaneous and MAX		1%
Apparent Power (VA)	Instantaneous and MAX		1%
Active Energy (kWh)	Total demand And Sub-total demand		1%
Frequency (Hz)	Instantaneous and MAX	45 – 65 Hz	0.01Hz
Power factor (PF)	Instantaneous and MAX	0 – 1	1%
THD Voltage		0 – 400%	5%
THD Current		0 – 400%	5%

Alarms	Quantity	Spec/Range
User configurable alarms	2	Selectable:- Display Text, Backlight , Digital output Either momentary or latched

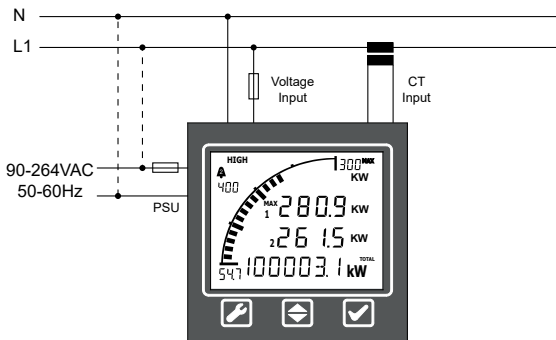
Outputs:	Quantity	Measurement	Spec/Range	Accuracy	Comment
Analogue	1		4 - 20mA	1%	any parameter except kWh
Digital	2		Optocoupler – 8 to 30VDC	Open collector 30V/15mA max	
Pulsed output			IEC 62053-31 Class A 8 - 30 VDC		User configurable pulse weight and length. Configurable to output either kWh, kVah, kVArh

Control Inputs:	Quantity	Spec/Range	Comment
RESET	1	Active Low	User configurable to reset max values, totals and/or alarms
LOCK	1	Active Low	Disable front buttons
Front buttons	3		

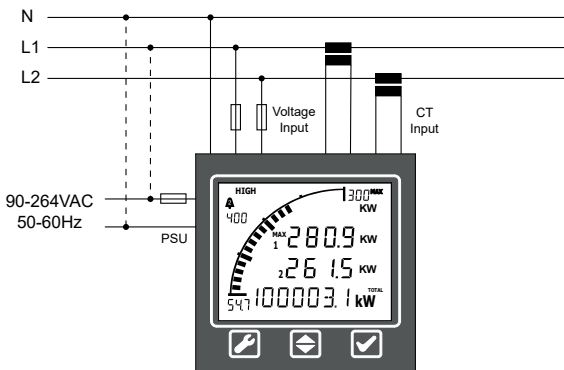
Environmental	Spec/Range	Comment
Storage	-40 to +70°C	
Operating	-10 to +60°C	
IP rating (from the front)	IP65 / NEMA 12 and NEMA 4	Using supplied gasket
Certification	CE, RoHS	
Degree of pollution	2	
Installation category (Overvoltage category)	II	

# Installation

The APM Power Meter has been designed to work with both single phase 2 wire (1P2W) and single phase 3 wire (1P3W) networks. The meter can be powered from either the measured voltage, or from an independent mains supply. All connections to the power supply and voltage measuring connections should be fused.



*Single Phase 2-Wire Installation*



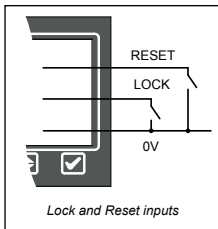
*Single Phase 3-Wire Installation (Split Phase)*

# Control Inputs

The **LOCK** input can disable all front panel buttons preventing operators from entering programming mode, changing the displayed parameters or resetting the kWh totals.

The **RESET** input needs to be enabled and configured in the software application (see page 10). The reset input can be configured to reset the following:

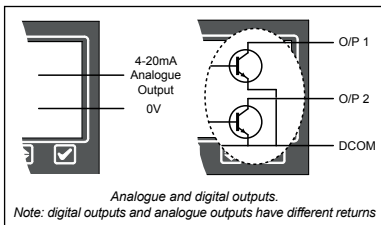
- Total kWh
- Subtotal kWh
- Max values
- Alarm outputs
- Peak hold



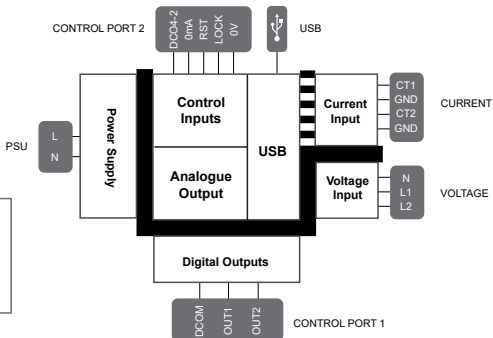
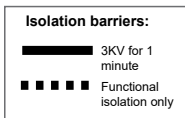
# Outputs

2x digital open collector, and 1x 4-20mA analogue.

The outputs are configured in the software application, and the analogue output can be assigned to any of the measured parameters, giving a proportional signal with adjustable response time. The digital outputs can be used with the alarm/setpoint features, and digital output 1 can also be configured as a pulsed output for energy monitoring applications.

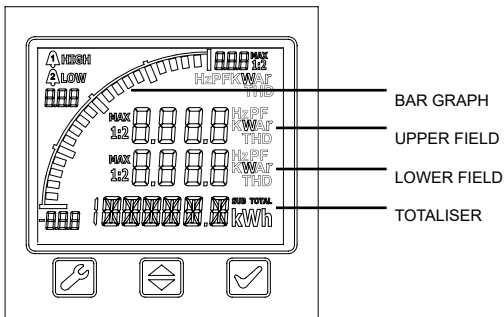


# Isolation



# APM Power Meter – Front Panel Programming

The Power Meter has 4 display areas, and 3 buttons:




Enters programming mode, and cycles between display areas.




In normal operation pressing this button will toggle between Max and Instantaneous values on the display. In programming mode changes the displayed parameter or value in the selected display area or option.





Confirms the parameter for the selected display area and moves on to the next.

Press and hold  for 3 seconds (3...2...1...) to enter programming mode. The annunciators for the totaliser display area will start to flash.


Pressing  will cycle through the available parameters that can be displayed in this area:

TOTAL kWh → SUB TOTAL kWh → OFF

Press  to confirm the selection and move on to the next display area. If you do not want to change the displayed parameter, press  to move to the next area.

The display areas are selected in the following order:

Totaliser  → Lower Field  → Upper Field  → Bar Graph

To exit programming mode and return to normal operation, cycle through the display areas until EXIT flashes in the Totaliser display. Press  to exit.



# Display Areas & Available Parameters

Totaliser Display:

TOTAL SUB TOTAL  
**kWh kWh OFF**

Lower Field, Upper Field & Bar Graph:

Active Power (W)	<b>W</b>
Apparent Power (VA)	<b>WA</b>
Current (A)	<b>A</b>
Frequency (Hz)	<b>Hz</b>
Power Factor (PF)	<b>PF</b>
Reactive Power (VAr)	<b>VAr</b>
THD Current (A THD)	$\overset{A}{\text{THD}}$
THD Voltage (V THD)	$\overset{V}{\text{THD}}$
Voltage (V)	<b>V</b>
Off	

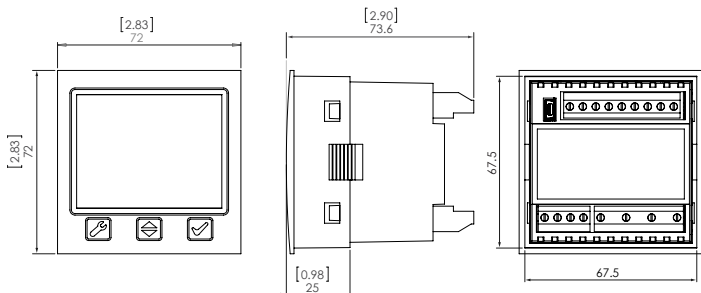
## Mechanical

Size of the cutout in the panel:

68 x 68mm (2.68in) +0.7 - 0mm (0.02in)

Max panel thickness:

11.0mm (0.43in)



**Connection Type:** Screw Terminals

**Wire gauge:** 0.8mm<sup>2</sup> - 3.3mm<sup>2</sup> (18AWG to 12AWG)

**Weight:** 205 grams

# Configuration Software

The Power Meter configuration software is required to setup the meter for use, along with a mini USB cable for connection to a PC.

*Note: the configuration software is for Windows operating systems only.  
The software can also be downloaded at <http://truapm.com/products/power-meter/>*

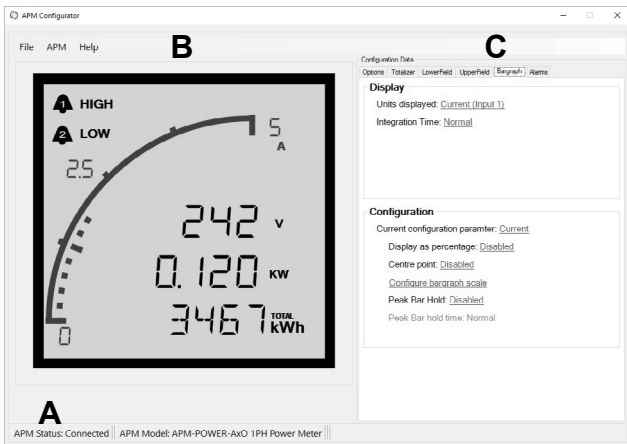
The software application allows users to configure all features & functions of the meter, from the backlight colour to alarm set points and more.

The connection status of the meter is shown in the bottom left of the application window (A). When a meter is connected the software will automatically read the settings from the meter and update the software with the current configuration.

Live values are shown on the virtual APM display (B), and clicking on any of the display areas will open the corresponding tab on the right (C) for easy configuration.

Changes made in the software take immediate effect on the meter, and configurations can be saved/opened on the PC if multiple meters are to be configured.

Firstly the electrical network configuration and CT ratio need to be set to ensure accurate measurement of the electrical parameters. This can be found in the Options tab.



Power Meter configuration software



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