



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 (depending on the model) and displays the data on its integrated multi-format display. The APM has been designed for installation into electrical cabinets or display panels. Output models include two independent outputs that can be configured by the user to be either digital set-point outputs or 4-20mA monitor outputs.

# APM

- Voltmeter
- Ammeter
- Frequency Meter



### CAUTION: Risk of Danger

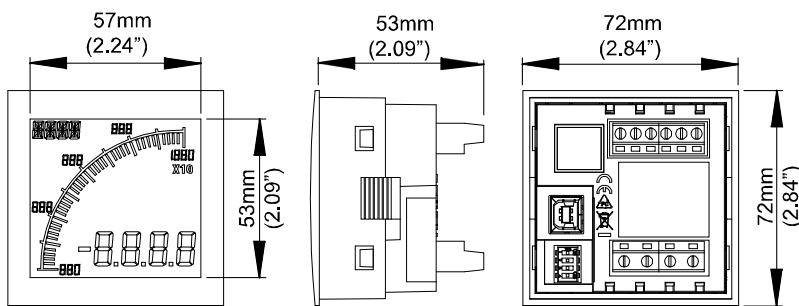
Read complete instructions prior to installation and operation of the unit



### CAUTION: Risk of electric shock

Before installation, read the Safety Warnings overleaf.

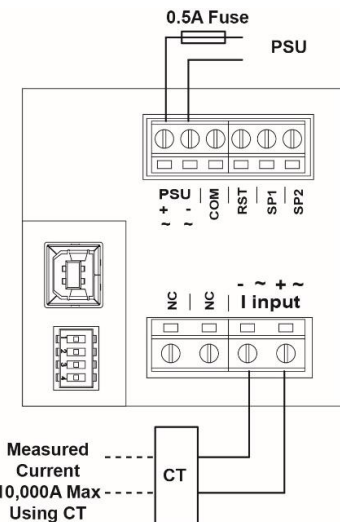
## Size



68 x 68mm (2.68in) +0.7 -0mm  
Size of the cutout in the panel:

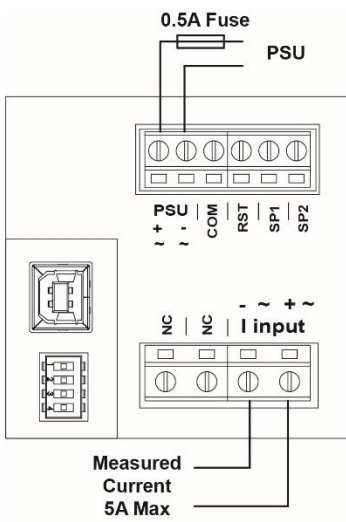
## Ammeter Configuration

### AMMETER USING CURRENT TRANSFORMER



Measured Current  
10,000A Max  
Using CT

### AMMETER DIRECT



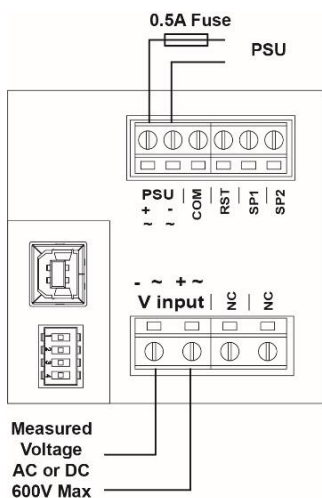
Measured Current  
5A Max

Item	Sw Pos	Measured Value	Bar Graph Min	Bar Graph Max	Display Value Format	Display Value Max	
1	0000	Custom (Defined in Software Application)					
2	1000	Auto Ranging					
3	0100	4 A	0	4	###	5.00	
4	1100	5 A	0	5	###	5.00	
5	0010	10 A	0	10	###	10.00	
6	1010	20 A	0	20	###	20.00	
7	0110	40 A	0	40	###	40.0	
8	1110	50 A	0	50	###	50.0	
9	0001	60 A	0	60	###	60.0	
10	1001	80 A	0	80	###	80.0	
11	0101	100 A	0	100	###	100.0	
12	1101	200 A	0	200	###	200.0	
13	0011	400 A	0	400	###	400.0	
14	1011	600 A	0	600	###	600	
15	0111	800 A	0	800	###	800	
16	1111	1000 A	0	1000	###	1000	

■ =Using external 5A secondary current transformer

Operating specification		
	VALUE	UNIT
<b>INPUT</b>		
Input range (direct connection)	0-5 A	I AC/DC
Input range (via current transformer)	0-10,000 A	I AC
Min CT Power Rating (Burden)	1	VA
Input Current Frequency	DC and 30-400	Hz
Max Continuous Working Voltage (Current input to ground)	60 / 30	VDC / VAC
Isolation	2.1KVAC for 1 min	
Input Impedance	2	mΩ
Accuracy	1	%
Resolution	2.4	mA
Sample rate	62	KHz
Display modes	Avg DC or RMS	

## Voltmeter Configuration



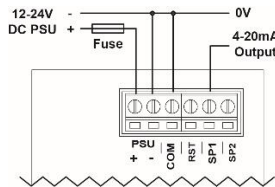
Measured Voltage  
AC or DC  
600V Max

Item	Sw Pos	Measured Value	Bar Graph Min	Bar Graph Max	Display Value Format	Display Value Max	
1	0000	Custom (Defined in Software Application)					
2	1000	Auto Ranging					
3	0100	12 V	0	20	###	99.99	
4	1100	12 V	10	14	###	99.99	
5	0010	24 V	0	40	###	99.99	
6	1010	24 V	15	35	###	99.99	
7	0110	48 V	0	60	###	999.9	
8	1110	48 V	40	60	###	999.9	
9	0001	100 V	0	100	###	999.9	
10	1001	110 V	0	160	###	999.9	
11	0101	110 V	90	130	###	999.9	
12	1101	230 V	0	300	###	999.9	
13	0011	230 V	210	250	###	999.9	
14	1011	415 V	0	500	####	9999	
15	0111	415 V	350	450	####	9999	
16	1111	600 V	0	600	####	9999	

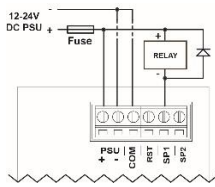
Operating specification		
	VALUE	UNIT
<b>INPUT</b>		
Input Voltage Range (DC)	0-600	V DC
Input Voltage Range (AC)	0-600	V AC RMS
Input Voltage Frequency	DC and 30-400	Hz
Isolation	None	-
Measurement Category	CATII	-
Max overvoltage rating	800	V
Impedance	1.5	MΩ
Accuracy	1%	%
Sample rate	62	KHz
Display modes	Average DC or RMS	-

## Outputs When Powering APM from DC Supply

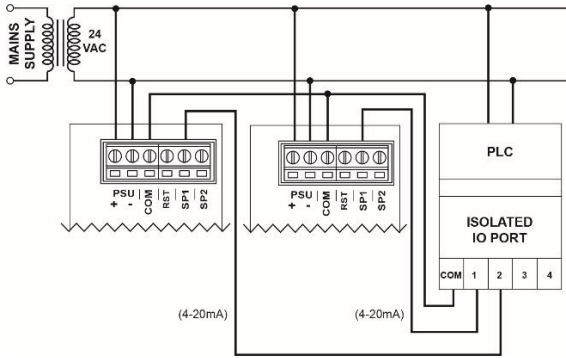
4-20 mA analogue output using setpoint 1.



Using a diode-protected relay on setpoint 1.



## Outputs When Powering APM from AC Supply

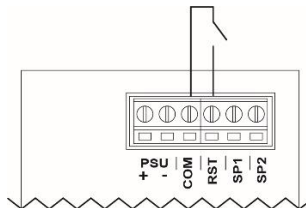


When powering from an AC supply only connect isolated devices or other APMs to the COM terminal

(in this application SP1 was configured as an analogue output using the APM Configurator)

## Reset

Use the Reset input with the peak hold function



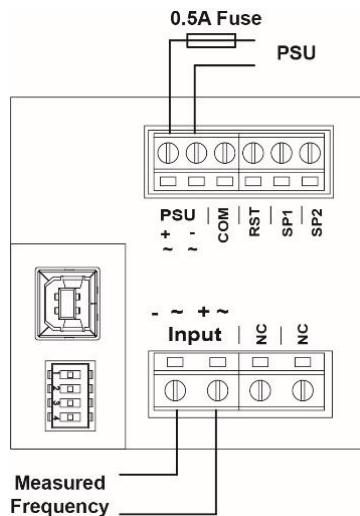
## Frequency Meter Configuration

Item	Sw Pos	Measure d	Bar Graph	Display Value
	1234	Value	Min Max	Format Max
1	0000	Custom (Defined in Software Application)		
2	1000	Auto Ranging		
3	0100	50 Hz	40 60	###.## 99.99
4	1100	50 Hz	48 52	###.## 99.99
5	0010	55 Hz	45 65	###.## 99.99
6	1010	60 Hz	50 70	###.## 99.99
7	0110	60 Hz	58 62	###.## 99.9
8	1110	400 Hz	350 450	####.## 999.9
9	0001	400 Hz	390 410	####.## 999.9
10	1001	100 Hz	0 100	####.## 999.9
11	0101	200 Hz	0 200	####.## 999.9
12	1101	300 Hz	0 300	####.## 999.9
13	0011	400 Hz	0 400	####.## 999.9
14	1011	500 Hz	0 500	###.## 999
15	0111	300 Hz	0 600	###.## 999
16	1111	400 Hz	0 1000	####.## 1000

Use the DIP switch to set the Frequency Meter bar graph range and target values. The digital readout will still show the actual measured frequency even if the bar graph is out of range.

### Operating specification

	VALUE	UNIT
<b>INPUT</b>		
Input range	2-400	Hz
Impedance	1.5	MΩ
Accuracy at 25°C	0.5	%
Resolution	0.1	Hz
Sample rate	62	KHz
Measurement mode	frequency	
Measurement Category	CATII	
Signal Level – Min	10	V
– Max	600	V



## Specification

	VALUE
<b>Environment</b>	
Temperature - operating	-10 to +60 deg C
Temperature - storage	-40 to +70 deg C
Altitude	2000 metres
Relative Humidity (non-condensing) - Continuous	0 - 85 %
Relative Humidity (non-condensing) - Intermittent	0 - 95 %
Overvoltage category (IEC664)	II
Pollution Degree (IEC664)	2
IP rating (from the front)	IP65
NEMA Rating (from the front)	Type 4 & Type 12
Vibration	
Shock	
<b>Power supply</b>	
Input	12-24V AC/DC +/-10%
Max Power	1.6W
Supply Frequency	DC and 50-400Hz
Isolation	None
<b>Display</b>	
Number of digits	4
Digit height	12 mm
Number of bar-graph segments	40
Number of starburst message characters	4
Backlight colours	Red, Green, White
LCD	Positive or negative
Digit update frequency	0.08 - 21 sec
Bar-graph update frequency	0.08 - 21 sec
Viewing angle	+/-70° Horizontal +/-70° Vertical
<b>Open Collector Sinking Outputs</b>	
Max voltage (open collector outputs)	34 VDC
Max current (open collector outputs)	500 mA
<b>Analogue Output</b>	
Output	4-20 mA
Accuracy	0.50 %
Resolution	0.02 mA
<b>Connections</b>	
Type	Screw Terminals
Wire type	Solid or Stranded
Min. cable temperature rating	65 deg C (149F)
Wire strip length	6.5mm to 7mm (0.26" to 0.28")
Wire gauge	0.8mm <sup>2</sup> - 3.3mm <sup>2</sup> (18AWG to 12AWG)
Torque	0.5-0.6Nm (4.42-5.31 lbf-in)
<b>In the Box</b>	
	APM
	Getting started & safety guide
	Gasket
	Retaining clip
<b>Dimensions &amp; Weight:</b>	
Panel Cut-out: 68 x 68 mm (2.68 in) +0.7 -0 mm (0.02 in). Max. panel thickness: 10 mm.	
Dimensions: Depth behind panel inside front: 55mm (2.17in) incl. external connections. Weight: 180 grams	

## Safety Warnings



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



### INSTALLATION

- Install this product in accordance with local regulations, codes and instructions.
- An external fuse must be fitted in-line with the PSU. Recommended fuse: 0.5A/250V with a breaking capacity of 35A or greater.
- 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.
- Power supply, current input, USB and all outputs: Observe maximum allowable voltages. 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.
- Take great care connecting the supply. If you connect power to the wrong terminals, it may destroy the unit.