

# 350V Retro-Fit Multifunction Meters



- **Standard DIN Formats**
- **Installation Aids 'Right First Time'**
- **Supplied as a Retro-fit Kit with Split CTs**
- **Isolated Pulse Output**
- **True rms measurement to the 30<sup>th</sup> harmonic**  
*Individual harmonics to the 15<sup>th</sup> via MODBUS*
- **Accuracy better than Class 1**
- **RS485 MODBUS RTU<sup>®</sup> Option**
- **Designed & Made in the UK with a 5 year Warranty**

**Rail350V** and **Cube350V** – a range of meters specifically designed for retro-fit applications. They are supplied complete with specially designed openable current sensors. Easy to fit, and with added measurements to ensure ‘*Right First Time*’ installation.

### Easy to Commission — *Right First Time*

**Wiring:** With kW & PF displayed at the touch of a button, installations can be quickly and simply tested – connections confirmed & the load measured.

**Pulse Output:** With a **Pulse Test** facility, pulses can be generated – without any load present – to test all downstream equipment.

### Easy to Use

Complex menus structures are eliminated by limiting the displayed parameters to key values. Links allow the display to be further simplified by disabling the per-phase kW and/or PF readings. All system parameters are however available via MODBUS. With a bold custom LCD display, the Meters can be read from any angle, with the necessary legends simplifying reading. The programmable isolated pulse outputs provide an interface to a data collection system or BEMs.

### Multi-Parameter

Displayed	Phases	Additionally available via MODBUS	Phases
Volts, LN & LL	1, 2, 3	Pk Volts LN	1, 2, 3
Amps	1, 2, 3	Pk Amps	1, 2, 3
PF	1, 2, 3 & $\Sigma$	Neutral Current	$\Sigma$
kW	1, 2, 3 & $\Sigma$	kVA & kvar	1, 2, 3 & $\Sigma$
kWh & kvarh	$\Sigma$	kVAh	$\Sigma$
Frequency		kW, kVA & kvar Demand	$\Sigma$
Hours Run (on Load)	$\Sigma$	Pk kW, kVA & kvar Demand	$\Sigma$
<b>True rms measurement of Volts &amp; Amps – and true Power Measurement – to the 30<sup>th</sup> harmonic at 50Hz.</b>		Amp Demand & Peak	1, 2, 3
		%THD Volts & Amps	1, 2, 3
		V & I Harmonics 2 <sup>nd</sup> – 15 <sup>th</sup>	1, 2, 3

### Current Ranges

FS Amps	Current Range	CT Type	Max Cable <i>j</i>
5 Amp	50mA — 6 Amp	SCL8	8mm
50 Amp	250mA — 60 Amp	SCL16	15mm
100 Amp	500mA — 120 Amp	SCL16	15mm
150Amp	1 Amp — 175 Amp	SCT19	19 x 19mm
400 Amp	4 Amp — 450 Amp	SCT32	32 x 32mm

Other current ranges may be available to order.

### Easy to Configure

**Rail350** Meters are configured from the front panel to suit installations, with decimal point and legend being automatically set to provide optimum resolution.

### Fully Supported

Comprehensive operating instructions - supplied with every Meter – provide full information on installation. These include connection schematics and configuration details for virtually all CT ratios. Full technical support is readily available from your local Distributor or from Technical Sales at ND Metering Solutions.

### Universality of Connections

For maximum convenience all these Meters can be powered from the measurement voltage. Where supplies may be subject to unusually wide variations, the Meters may be powered from a separate auxiliary supply. Standard Meters are suitable for both 3 wire and 4 wire 3 $\phi$  unbalanced loads.

### Accurate Real World Measurement

A precision measurement system maintains full accuracy up to the 30<sup>th</sup> harmonic (at 50Hz) in the presence of harmonics and randomly and/or periodically interrupted waveforms - as commonly found on modern electronically controlled loads.

### RS485 MODBUS<sup>®</sup> Communications

A high speed internal RS485 MODBUS<sup>®</sup> communications option allows readings to be read remotely and provides the extra information required for system management.

## OUTLINE SPECIFICATION

INPUTS		
<b>System Voltage</b> $U_n$	3 Phase 3 or 4 Wire Unbalanced Load 400/230V. 3 Phase 3 or 4 Wire 110/63V & 208/120V optional. Others to order.	
<b>Current</b> $I_n$	Special to suit CTs. $I_n$ = CT nominal FS Amps	
<b>Measurement Range</b>	<b>Voltage</b> 50% to 120% <b>Current</b> 0.5% to 120%	
<b>Frequency Range</b>	<b>Fundamental</b> 45 to 65Hz <b>Harmonics</b> Up to 30 <sup>th</sup> harmonic at 50Hz Individual to the 15 <sup>th</sup>	
<b>Burden</b>	<b>Voltage</b> <0.1VA per phase <b>Current</b> To suit CT used	
<b>Overload</b>	<b>Voltage</b> x4 for 1 hour <b>Current</b> As per CT specification	
DISPLAY		
<b>Type</b>	Custom, Supertwist, LCD	
<b>Data Retention</b>	10 years min. Stores kWh & Meter set-up	
<b>Format</b>	8 x 6.66mm high digits with DPs & 3.2mm legends	
<b>Scaling</b>	Direct reading. User programmable CT & VT CT Primary programmable from 10A to 25kA VT primary programmable from 11V to 440kV	
<b>Legends</b>	Wh, kWh, MWh etc. depending on user settings	
AUXILIARY SUPPLY		
<b>Standard Options</b>	230V 50/60 Hz $\pm$ 15% 110V 50/60 Hz $\pm$ 15% 24Vdc, 48Vdc or 110Vdc	
<b>Load</b>	2VA max.	
<b>Overload</b>	x1.2 continuous	
ACCURACY		
	All errors $\pm$ 1 digit. Accuracies specified equivalent to Meter being used with Class 1 CTs	
<b>kWh</b>	Equivalent to Class 1 per EN 62053-21 & BS 8431	
<b>Kvarh</b>	Equivalent to Class 2 per EN 62053-23 & BS 8431	
<b>kW &amp; kVA</b>	Equivalent to Class 0.25 IEC 60688	
<b>kvar</b>	Equivalent to Class 0.5 IEC 60688	
<b>Amps &amp; Volts</b>	Equivalent to Class 0.1 IEC 60688 (0.01 $I_n$ – 1.2 $I_n$ or 0.1 $U_n$ – 1.2 $U_n$ )	
<b>PF</b>	Equivalent to $\pm$ 0.2° (0.05 $I_n$ – 1.2 $I_n$ and 0.2 $U_n$ – 1.2 $U_n$ )	
<b>Neutral Current</b>	Equivalent to Class 0.5 IEC 60688 (0.05 $I_n$ – 1.2 $I_n$ )	
PULSE OUTPUTS		
<b>Function</b>	1 Pulse per unit of energy	
<b>Scaling</b>	Settable between 1 & 1000 counts of kWh register	
<b>Pulse Period</b>	0.1 sec. default; Settable between 0.1 and 20 sec	
<b>Rise &amp; Fall Time</b>	< 2.0ms	
<b>Type</b>	N/O Volt free contact. Optically isolated BiFET	
<b>Contacts</b>	100mA ac/dc max., 100V ac/dc max.	
<b>Isolation</b>	2.5kV 50Hz 1 minute	
MODBUS <sup>®</sup> Serial Comms		
	Optional	
<b>Bus Type</b>	RS485 2 wire + 0v. ½ Duplex, ¼ unit load	
<b>Protocol</b>	MODBUS <sup>®</sup> RTU with 16 bit CRC	
<b>Baud Rate</b>	4800, 9600 or 19,2000 User settable	
<b>Address</b>	1 – 247 User settable	
<b>Latency</b>	Reply within 250ms max.	
<b>Command Rate</b>	New command within 5ms of previous one	
GENERAL		
<b>Temperature</b>	Operating -10°C to +65°C Storage -25°C to +70°C	
<b>Humidity</b>	< 75% non-condensing	
MECHANICAL		
	<b>Meter Panel</b>	<b>DIN Rail</b>
<b>Environment</b>	IP54 (Option of IP65)	IP22 (IP65 in external case)
<b>Enclosure</b>	DIN 43700 96 x 96	DIN 42880 6 Modules
<b>Material</b>	Mables UL94-V-O. Self extinguishing	Noryl UL94-V-O. Self extinguishing
<b>Dimensions</b>	96 x 96 mm x 83.5mm 72mm behind panel	106mm x 90mm x 58mm
<b>Weight</b>	~ 250 gms	~ 325 gms
<b>Terminals</b>	Rising Cage. 4mm <sup>2</sup> (12 AWG) cable max.	
SAFETY		
<b>Conforms to</b>	EN 61010-1 Installation Category III	