

Cube 350

Multifunction Meter



- ***DIN 96x96 Standard Format***
- ***Phase Indicator Lights IEC 60439***
- ***True rms measurement to the 30th harmonic
Individual harmonics to the 15th via MODBUS***
- ***Installation Aids – ‘Right First Time’***
- ***Accuracy better than Class 1***
- ***Isolated Pulse Output***
- ***RS485 MODBUS[®]***
- ***IP54 Protection Category***
- ***Designed & Made in the UK with a 5 year Warranty***

Cube350 – a DIN 96x96 panel mounting Electronic Multifunction Meter, with Phase Indicator Lights for compliance with IEC 60439. Easy to install and convenient to use. Equally suitable for both 3 wire and 4 wire 3f unbalanced loads, these Meters have been designed to measure accurately irrespective of the type of load – ideal for a motor or heater, or for a modern electronically controlled load.

MultiParameter

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 & Σ	Neutral Current	Σ
kW	1, 2, 3 & Σ	kVA & kvar	1, 2, 3 & Σ
kWh & kvarh	Σ	kVAh	Σ
Frequency		kW, kVA & kvar Demand	Σ
Hours Run (on Load)	Σ	Pk kW, kVA & kvar Demand	Σ
True rms measurement of Volts & Amps – and true Power Measurement – to the 30th harmonic at 50Hz.		Amp Demand & Peak	1, 2, 3
		%THD Volts & Amps	1, 2, 3
		V & I Harmonics 2 nd – 15 th	1, 2, 3

Safe to Use

With fully isolated current inputs, installation safety is assured. This allows the **Cube350** to be directly connected under certain conditions and provides versatility of connection. Installation in conjunction with other instrumentation can be carried out safely without affecting accuracy and CTs can be earthed if required.

Easy to Install

The **Cube350** is fitted with large Rising Cage terminals – allowing connection to a wide range of cables from 0.25mm² to 4.0mm²

Easy to Configure

Cube350 Meters are configured from the front panel to suit installations using Current and/or Voltage Transformers, with decimal point and legend being automatically set to provide optimum resolution.

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 **Cube350** 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.

Fully Supported

Comprehensive operating instructions - supplied with every **Cube350** - include 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 **Cube350** 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 3f unbalanced loads.

Accurate Real World Measurement

A precision measurement system maintains full accuracy up to the 30th 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[®] Communications

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

OUTLINE SPECIFICATION

INPUTS	
System	3 Phase 3 or 4 Wire Unbalanced Load
Voltage U_n	400/230V. 3 Phase 3 or 4 Wire 110/63V & 208/120V optional. Others to order.
Current I_n	5A from external CTs. 1A optional. Fully isolated
Measurement	Voltage 50% to 120%
Range	Current 0.2% to 120%
Frequency	Fundamental 45 to 65Hz
Range	Harmonics Up to 30 th harmonic at 50Hz Individual to the 15 th
Burden	Voltage <0.1VA per phase
	Current <0.1VA per phase
Overload	Voltage x4 for 1 hour
	Current x40 for 0.5 second max
DISPLAY	
Type	Custom, Supertwist, LCD
Data Retention	10 years min. Stores kWh & Meter set-up
Format	8 x 6.66mm high digits with DPs & 3.2mm legends
Scaling	Direct reading. User programmable CT & VT CT Primary programmable from 10A to 25kA VT primary programmable from 11V to 55kV
Legends	Wh, kWh, MWh etc. depending on user settings
AUXILIARY SUPPLY	
Standard	230V 50/60 Hz \pm 15%
Options	110V 50/60 Hz \pm 15%
Load	2VA max.
Overload	x1.2 continuous
ACCURACY	
	All errors \pm 1 digit
kWh	Better than Class 1 per EN 62053-21 & BS 8431
Kvarh	Better than Class 2 per EN 62053-23 & BS 8431
kW & kVA	Better than Class 0.25 IEC 60688
kvar	Better than Class 0.5 IEC 60688
Amps & Volts	Class 0.1 IEC 60688 (0.01I _n – 1.2I _n or 0.1U _n – 1.2U _n)
PF	\pm 0.2° (0.05I _n – 1.2I _n and 0.2U _n – 1.2U _n)
Neutral Current	Class 0.5 IEC 60688 (0.05I _n – 1.2I _n)
PULSE OUTPUTS	
Function	1 Pulse per unit of energy
Scaling	Settable between 1 & 1000 counts of kWh register
Pulse Period	0.1 sec. default; Settable between 0.1 and 20 sec
Rise & Fall Time	< 2.0ms
Type	N/O Volt free contact. Optically isolated BiFET
Contacts	100mA ac/dc max., 100V ac/dc max.
Isolation	2.5kV 50Hz 1 minute
MODBUS[®] Serial Comms	
Bus Type	RS485 2 wire + 0v. ½ Duplex, ¼ unit load
Protocol	MODBUS [®] RTU with 16 bit CRC
Baud Rate	4800, 9600 or 19,2000 User settable
Address	1 – 247 User settable
Latency	Reply within 250ms max.
Command Rate	New command within 5ms of previous one
GENERAL	
Temperature	Operating -10°C to +65°C Storage -25°C to +70°C
Humidity	< 75% non-condensing
Environment	IP54 standard, IP65 optional
MECHANICAL	
Terminals	Rising Cage. 4mm ² (12 AWG) cable max.
Enclosure Material	DIN 43700 96 x 96 Mablex [®] with fire protection to UL94-V-O. Self extinguishing
Dimensions	96 x 96 mm x 83.5 mm (72 mm behind panel)
Weight	~ 250 gms
SAFETY	
Conforms to	EN 61010-1 Installation Category III

Northern Design (Electronics) Ltd
228 Bolton Road
Bradford BD3 0QW, England
Tel: +44 (0) 1274 750 620
Fax: +44 (0) 1274 721 074
E-mail: sales@ndmeter.co.uk
www.ndmeter.co.uk