

### Display Screens

Each screen is displayed by pressing its appropriate button, (I for Current, V/Hz for Voltage and Frequency, P for Power and E for Energy). Further presses of a screen's button will scroll through the available measurements associated with that button. Each button's state is stored in memory.

Line Currents	Phase Voltages	Power W/VAr/VA	Import kW.h
Ad, Max Ad Neutral I	Line Voltages	Wd, Max Wd Avg P.F.	Export kW.h
Line THD %	Frequency	-Wd, Max -Wd Avg P.F.	Import kVA.h
	Line THD %	VAd Max VAd Avg P.F.	Export kVA.h
		Line Power	kVA.h
		Line VAR	A.h
		Line VA	

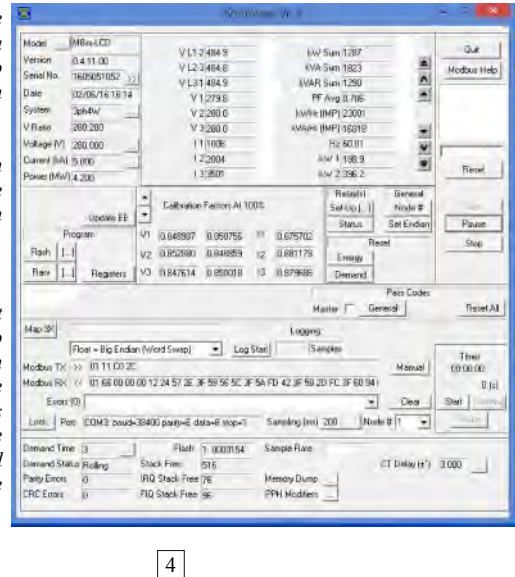
3ph 4 wire only

The LCD back-light brightness is adjusted by holding down the two centre buttons. The LCD's back-light colour can be changed by holding the 'I' and 'P' buttons down for 6-8 seconds.

Set-points can be programmed via a Modbus network to monitor certain system parameters.

The back-light can be set to change colour when an exception occurs.

Software: The RS485 port enables the unit to communicate with devices using the popular Modbus protocol. Software can be provided for use with the RS485 port



### Settings Menu

The main menu is entered by holding buttons 'I' and 'E' down for approximately 5 seconds. The main menu and all sub-menus are scrolled through using the 'E' button. Any selection is made using the 'I' button.

If no buttons are pressed for 6 minutes the unit will exit the Settings Menu.

The Settings Menu structure is defined below:

SUPPLY [SUPP]	COMMS [485]	DEMAND [dt]	ENERGY [ENGY]
System Current	Address	Reset	Adjust Pulses (W.h)
Primary Voltage	Baud Rate	Demand Time	Adjust Pulses (Var.h)
Secondary Voltage	Stop Bits	Cancel	Adjust Pulses (VA.h)
System Type	Parity	Confirm	Adjust Pulses (A.h)
Cancel	Endian		Reset
Confirm	Lock		Cancel
	Cancel		Confirm
	Confirm		

RELAY [RLAY]	CODE [CODE]	EEPROM [STOR]	END [END]
Relay Type	Edit	Cancel	...
Pulse Length	Set	Confirm	
Pulses per Hour	Cancel		
Cancel	Confirm		
Confirm			

**Supply [SUPP]**

The VT ratio and the system current are entered using this sub-menu. The secondary voltage (meter input) is optimised at 280V L-N. Decimal point positioning and exponent selection is used in this section

**SYSTEM CURRENT [SYSI]****PRIMARY VOLTAGE [UPRI]****SECONDARY VOLTAGE [USEC]****SYSTEM TYPE [TYPE]**

The system's type is selected from the list on the right:

- Un-Balanced Load
- [1P2] 1 phase 2 wire
- [3P3] 3 phase 3 wire
- [3P4] 3 phase 4 wire

**Comms [485]**

Network settings can be detected and the unit configured automatically. If manual configuration is preferred, the meter can be set up as follows:

**ADDRESS [ADDR]****BAUD RATE [BAUD]**

The unit's baud rate, number of stop bits and parity can be selected from the lists on the right:

- [ 4.8] 4800 baud
- [ 9.6] 9600 baud
- [19.2] 19200 baud
- [38.4] 38400 baud
- [57.6] 57600 baud

**STOP BITS [STOP]**

Floating point numbers can be transmitted in Big Endian or Little Endian BYTE order and can be selected using the ENDIAN item. (word-swap option selectable for both)

- [0] no stop bits
- [1] 1 stop bit
- [2] 2 stop bits

**PARITY [PAR]****ENDIAN [ENDI]**

Locking prevents the unit hunting for a valid network if communication errors are occurring and can be set using the LOCK item.

- [N] no parity bit
- [O] odd parity bit
- [E] even parity bit

**LOCK [LOC]**

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**Demand [dt]**

The unit integrates all Current, Power and VA measurements within a variable time-length, sliding window.

**RESET [RSET]**

The reset option will reset all demand and maximum demand measurements.

**DEMAND TIME [DTSI]**

The demand time (window) can be set to a value of between 3 and 60 minutes inclusive.

**Energy [ENGY]**

There are six energy accumulators in the unit; import and export power, import and export VAR, VA and current. Modifications to the pulses per hour rate can be done through this sub-menu.

**ADJUST PULSES [ADJ] (W.h)****ADJUST PULSES [ADJ] (Var.h)****ADJUST PULSES [ADJ] (V.A.h)****ADJUST PULSES [ADJ] (A.h)****RESET [RSET]**

Adjust pulses (W, VAR, VA and A) allows the selection of a DIVISOR from the list on the right: Caution: Changing the divisor and confirming the selection will reset ALL energy readings

- 1000
- 100
- 10
- 1
- 0.1
- 0.01
- 0.001

The reset option resets ALL energy readings.

**Relay [RLAY]**

The solid-state relay can be programmed to operate as an import/export W.h, import/export VAR.h, VA.h or A.h type. The relay's parameters can be set up in this sub-menu.

**RELAY TYPE [TYPE]****PULSE LENGTH [PULS LNTH]**

The pulse length of the relay(s) can be set from the list on the right (0-200ms). PPH are modified using the decimal point positioning method.

**PULSES per HOUR [PPH]**

- OFF
- 40
- 60
- 80
- 100
- 120
- 140
- 160
- 180
- 200

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**Code [CODE]**

The Pass Code is used to help prevent unauthorised tampering with the unit's settings.

**EDIT PASS CODE [EDIT]**

The Pass Code can be changed using the EDIT facility in the sub-menu.

**SET PASS CODE [SET]**

It is activated using the SET option.

**EEPROM [STOR]**

The EEPROM sub-menu allows the user to save all settings into the unit's non-volatile memory. It is recommended that this option is used whenever settings have been updated. However, the unit will save all settings on a power down or brown out condition.

**END [END]**

This selection leaves the main menu and resumes displaying measurements.

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**CANCEL [CNCL]**

At the end of most sub-menus is the option to cancel any changes made in that sub-menu.

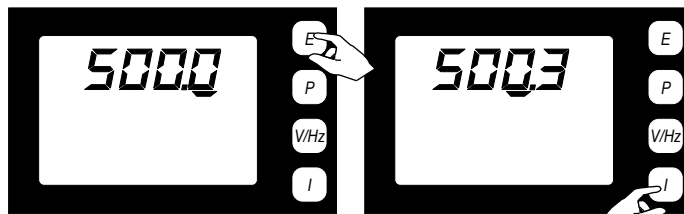
**CONFIRM [CONF]**

Confirmation is required before any changes are implemented. The changes are effective as soon as they are confirmed.

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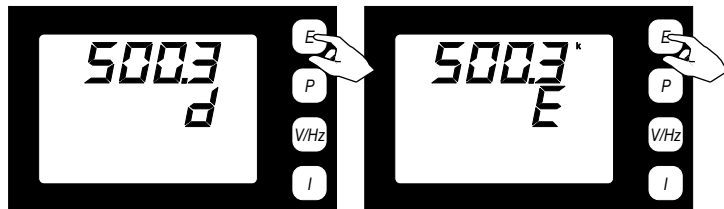
**Entering Data**

When required, numbers can be entered into the unit in the following way:



To increment a column - press 'E'

To confirm or move - press 'I'



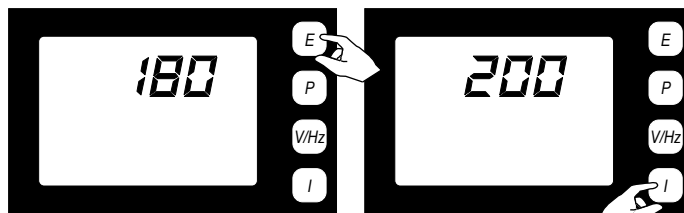
Select decimal point position with 'E'

Select exponent with 'E'

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**Lists**

When only fixed data can be entered, selection is made from a list:



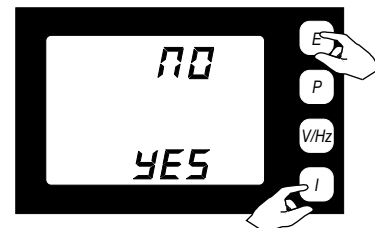
To scroll through a list - press 'E'

To select the displayed item - press 'I'

When a decision has to be made the Yes - No screen is displayed

**Entering Data - Summary**

Pressing the 'I' button accepts the currently selected item and moves on to the next. Pressing the 'E' button either changes the item's option or increments a column. Other menu items that may be displayed are all treated in the same manner.



press 'I' for Yes press 'E' for No

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**Input (accuracy range)**

Un 28V to 330V L-N (48V to 570V L-L)  
 Burden < 0.5VA  
 In (5A specified) 0.5A to 6A via CT  
 In (1A specified) 0.1A to 1.2A via CT  
 Burden < 0.5VA  
 Frequency 45Hz to 65Hz  
 Secondary of CTs must be connected to earth

**Input (working range)**

Voltage and Current 1.7% - 100%

**Overload**

800V L-L indefinitely, In x 10 for 1 sec

**Accuracy (8.4% - 100% of range)**

Voltage 0.5% +/- 2 digits  
 Current 0.5% +/- 2 digits  
 Power (W, VAR, VA) 1.0% +/- 2 digits  
 Power Factor 1% of range  
 Frequency 0.1 Hz  
 Energy IEC 1036 Class I

**Auxiliary Voltage**

100V to 440V ac (45Hz to 65Hz)

100V to 420V dc

Burden: < 10VA

**Display**

Digits 3 lines 9999  
 Digit size 7mm 7 segment  
 Update time 1 second

**Relay**

Solid-State 1-Form-A  
 Switching 100Vpk @ 120mA  
 On Resistance < 8Ω

**Insulation**

Installation Category III (480V ph/ph)

Degree of Pollution 2

Rated Impulse Voltage IEC 60947-1-V

imp 4kV

Class II

Electrical Security IEC 61010-1

**Electromagnetic Compatibility****Immunity:**

ESD IEC 61000-4-2-Level III

Radiated IEC 61000-4-3-Level III

Fast Transient IEC 61000-4-4-Level III

Impulse Waves IEC 61000-4-5-Level III

Conducted IEC 61000-4-6-Level III

Voltage Dips/ Short Interruptions IEC 61000-4-11-Level II

**Emissions:**

Conducted and Radiated CISPR11-Class A

**Environment**

Working Temperature -20 to 70 deg C

Storage Temperature -30 to 80 deg C

Relative Humidity 0-95% non condensing

30G in 2 planes

**Shock****Enclosure**

Panel mounting Rail mounted

IP Rating - Front IP52 / Nema

IP Rating - Case IP30 / Nema

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