HCM4

Thermal Energy
Calculating Meter Systems For
'The Digital Age'

M-Bus

HCM4006 - Thermal Energy Calculating Meter - 230volts
With Pulsed Output

Calculates The Energy Used In Heating or Cooling Systems
KWh & Monetary Read Outs   (£ $ E)
Digital High Accuracy Sensors
Strap On Pockets
'On Site' Programming Facility
Manufactured to ISOEN 1434 Parts 1 to 6
Conforms to the Measuring Instruments Directive (MID) 2004)

Support British Manufacturing
This product has been designed and is totally manufactured in the UK

CE

He read the Instructions

He DIDN'T   !!!!

www.meters.co.uk

INSTALLATION INSTRUCTIONS

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The HCM4 consists of 4 component parts

1 – The HCM4 Energy Calculating Meter
2 – A Set (of two) Digital High Accuracy Digital DHAS sensors
3 – A Set (of two) 'Strap On' Pockets – The temperature sensor bulbs can be strapped directly onto the pipe work .
4 – Flow Meter and Thermal Jacket

Mounting

The HCM4 is designed for wall mounting, a screw case hanging position is located at the top centre of the case with two wall fixing positions located under the terminal cover

Wiring

Wiring block list -- terminals are marked on the pcb –
Remove Meter front cover to expose wiring block

Wiring Terminal List

1 = Power In (+) - 230v
2 = Power In (-) - 230v

3 = Sensor Hot -- Brown
4 = Sensor Hot -- Green
5= Sensor Hot -- Blue
6 = Flow Meter 1 (+) (The red led on front of case flashes when it receives a pulse from the flow meter)
7 = Flow Meter 1 (-)
8 = Pulsed Output 1   (+)
9 = Pulsed Output 1   (-)
10 = Analog Output (4 -20 mA) 1 Active (where fitted)
11 = Analog Output (4 - 20 mA) 2 (where fitted)
12 = Analog Output (4 - 20 mA Passive (where fitted)
13 =
14 =
16 = Pulsed Output 2 (-) -- (where fitted)
17 = Flow Meter 2 (+) -- (where fitted)
18 = Flow Meter 2 (-) -- (where fitted)
19 = Sensor Cold -- Brown
20 = Sensor Cold – Green
21 = Sensor Cold -- Blue

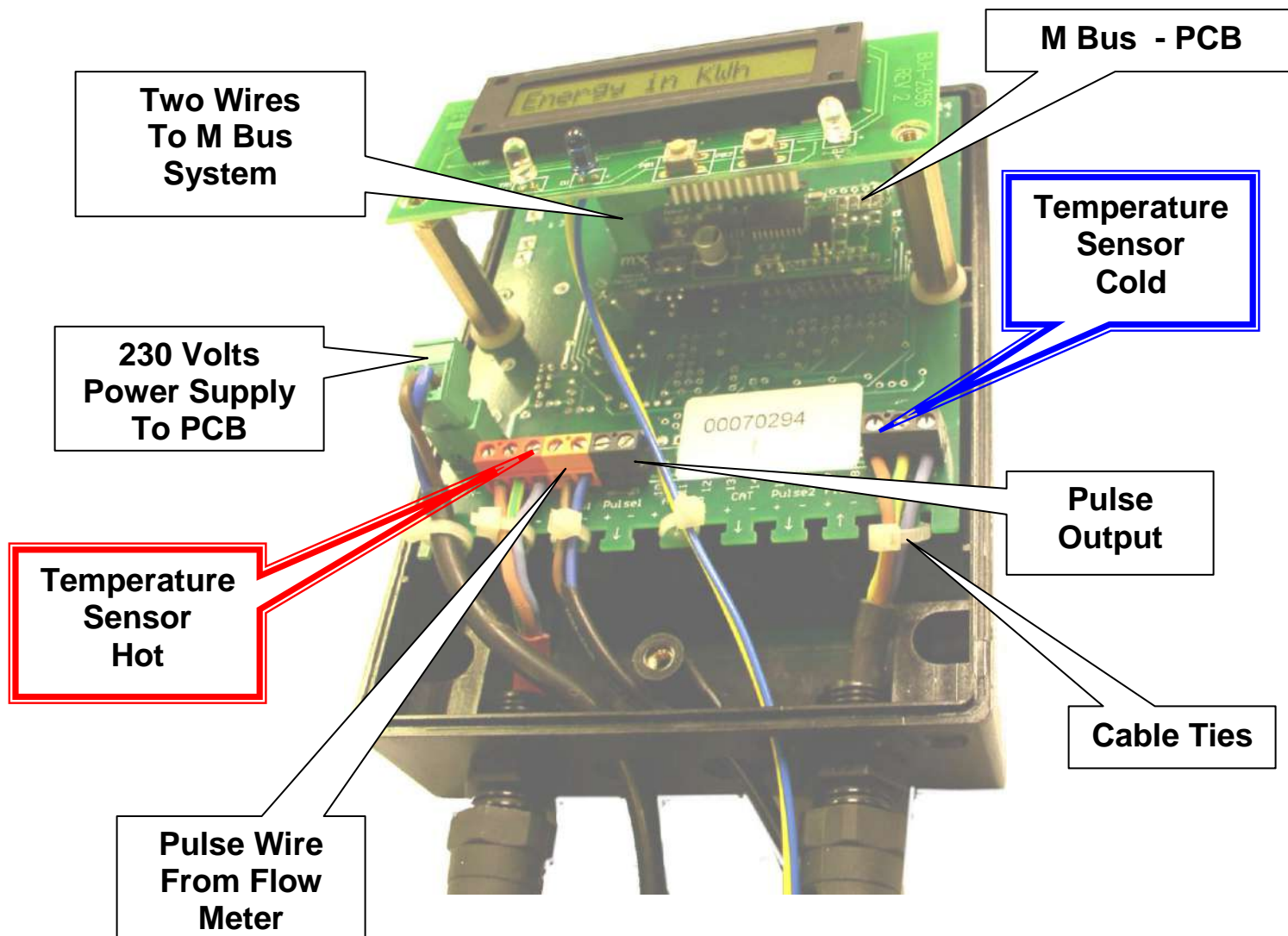> **Installation Tip**
> Fit sensors and wire in before powering up

Separate PCB For Mbus – Two Wires

M Bus Set Up
Primary Addressing
Baud Rate 300
Meter ID – On Front Label
M Bus - Status 0 = Normal
M Bus – Status 1 = Fault

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HCM4006 – Wiring (M Bus)

M Bus - PCB

Two Wires To M Bus System

Temperature Sensor Cold

230 Volts Power Supply To PCB

Temperature Sensor Hot

Pulse Output

Cable Ties

Pulse Wire From Flow Meter
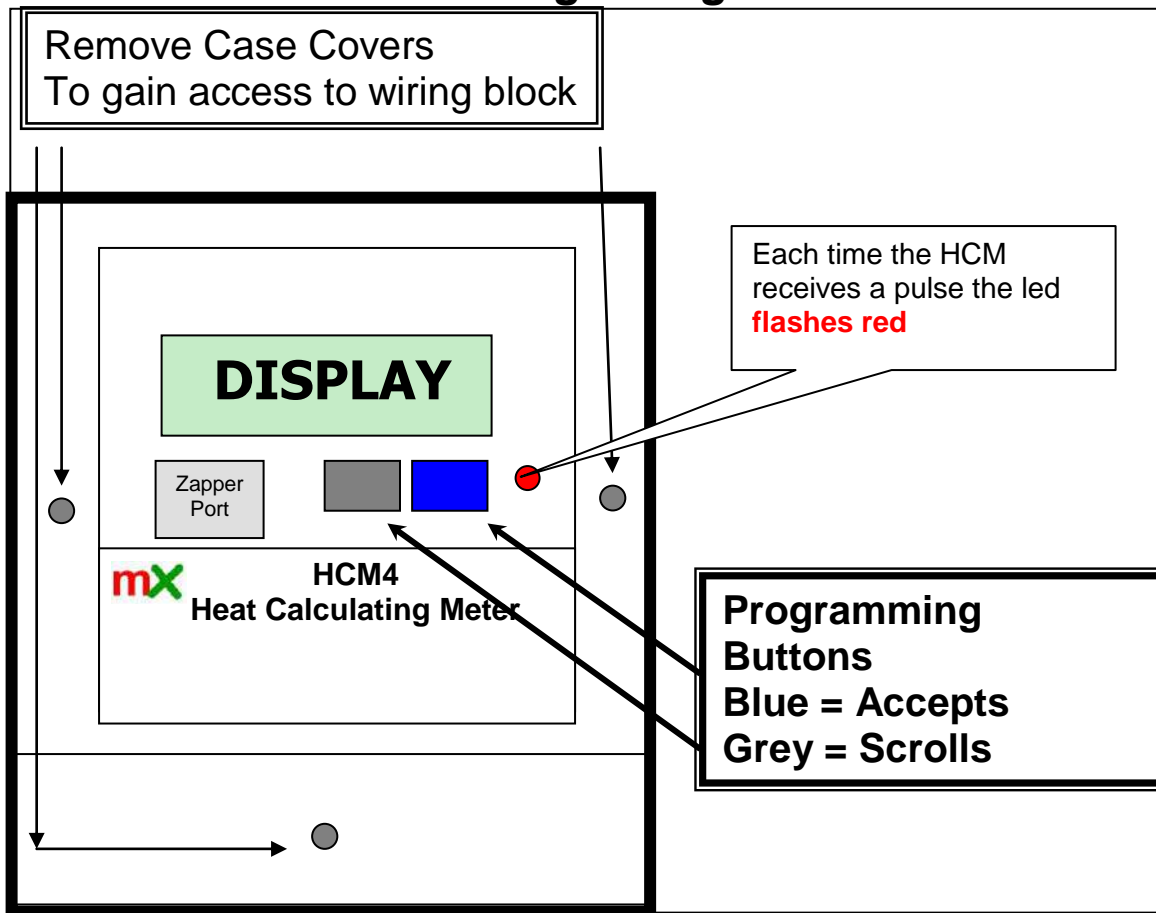
Suggested Wiring - Mbus
All electrical Installation's must conform to BS7671 IEE Wiring Regulations
Below Ground - Armoured - Basec Approved - Low Voltage Armoured 2 Core - XLPE Insulated to BS 6724
Above Ground - Low Resistance Speaker Cable Two Core Conductor 0.75mm (Not Sheathed)

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Remove Case Covers
To gain access to wiring block

Each time the HCM
receives a pulse the led
flashes red

DISPLAY

Zapper
Port

mX
HCM4
Heat Calculating Meter

**Programming
Buttons
Blue = Accepts
Grey = Scrolls**

Installation
Remove HCM4 cover and install all wiring leaving the **connection of either mains supply 230v or 24v**
Wiring standards must conform to IEE regulations
It is recommended to use shielded cable manufactured to BS4360 Class 5   or VDE0295 Class 5
It is recommended that the flow meter when in a heating circuit is fully insulated with a Thermal Jacket

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DHAS Sensors (Digital High Accuracy Sensors)
Are highly accurate, temperature thermometers, they are calibrated to an accuracy of 1.0% and a calibration certificate is included with each sensor set. DHAS are highly efficient and flexible.
The **Red Coloured Sensor bulb** , should always be located in the hottest pipe
Heating Circuit = Flow   Chilled Circuit = Return

The **Black Coloured Sensor bulb** , should always be located in the coolest pipe
Heating Circuit = Return   Chilled Circuit = Flow

DHAS Sensors (Digital High Accuracy Sensors)
DHAS Sensors are highly accurate, calibrated temperature sensors, there unique design ensures they can be easily strapped onto the pipe work. The sensors have individual serial numbers located on the cable, and a calibration certificate is supplied with each set. Unlike other similar products DHAS sensors are both flexible and reliable. And are extremely installer friendly
A – They do not have to be a matched pair
B – They can be cut in length without effecting calibration

LD (Long Distance) Temperature Sensors
All versions of HCM's, owing to there digital design,have the unique ability to be able to read data securely with 100% accuracy over long distances, Temperature sensors that can measure accurately for distances up to 200 metres.
Sensors can be purchased in the following sizes –
Order Code 404020   5metres   Order Code 404030 10 metres
Order Code 404040   50 metres   Order Code 404050 100 metres
Order Code 404060   150 metres   Order Code   404070   200 metres
(other sizes by request)

Programming Heat Calculator
At Boot up - Sequence

Matrix Metering
HCM4006 Version No 2.8

Boot Up –
Is split into 4 sections each section scroll (Left/Grey Button) and Accept with (Right/Blue Button)

> **Installation Tip**
> **Buttons**
> **Left/Grey = Scroll**
> **Right /Blue = Accept**

1ˢᵗ Screen Set   (Setting of Energy Unit)

Energy in KW/KWh	**Energy in MW/MWh**

Total Billing Counter either Kilowatt hours (standard) or Megawatt Hours (commercial)

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2ⁿᵈ Screen Set (Billing Preference) 2/a

Resetable Energy

Billing in KWh's

If this option chosen

Resetable Money

Billing in Monetary Value

Screen 2/b

Cost 000.p KWh

See Page 8 For full explanation

3rd Screen Set   (What type of system is it)

Heating System	Cooling System

Heating/Central Heating/Hot Water   Cooling/Chilled/Air Conditioning

4th Screen Set   (Where is the flow meter located)

Meter in Return	Meter in Flow

Where is the flow/water meter located – Return pipe (standard) or Flow pipe

5ᵗʰ Screen Set (Pulse value from Water Meter)

F1 0001 L/pulse	F1 0100 L/pulse

Pulse value selectable 1,10,100,1000 litres per pulse
Example F10 = 10 litres of water per pulse
(The pulse value is always located on the meter)

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END OF PROGRAMMING
THE HCM4 NOW AUTOMATICALLY SCROLLS
THROUGH THE SETTINGS

Really Important

6th Screen Set

Reject Settings	Accept Settings

THIS STAGE IS VERY IMPORTANT

If during the auto scroll you are unsure of the setting – press Reject Settings and start again

Should you be sure the settings are correct - press Accept Setting

7th Screen Set

> **Hold to Save ..**

You will need to hold the Blue/Right button down firmly for 10secs – the buzzer will sound continuously

Last screen

> **Saved**

At this point all the settings are saved

Operational Data

Default Screen

See Page 8
For full explanation

RM £ 050.25	RE 45697.1 KWh

Resettable Money   Resettable Energy KWh/MWh

Total

> TE   0000000.0 KWh

Total consumption in KWh's (or MWh'S)   Nine digits + One 1/10 (NOT reset table)

Instantaneous Energy

> IE   23 KW

The amount of energy being consumed in the circuit NOW

Temperature Flow

> tf   78.8C

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Temperature in the flow pipe

Temperature Return

tr	**78.8C**

Temperature in the return pipe

Flow

F1	**354.87 m3/h**

Total flow in metres cubed per hour   1 m3h =   3.6 litres

To Change Settings

Once passed screen set no 7 – the only way to access the settings is with a Zapper Unit
Reference **www.hcm4.com/zapper.htm**

Outward Pulse Data – Open Collector
Maximum Operating Voltage 45vdc
Clamp circuit interjection 65vdc
500watt Power Dissipation Limit - Max Current 10amp
Reverse Connection Protection 6vdc
Pulse Width 200 ms
DC Forward Current 0.6v
Rise And Fall Max 18 micro Secs
Isolation Résistance 5 x 10/10 ohms
Isolation Voltage 5 kV
Collector Remitter Saturation Voltage 0.4volts
Operating temperature range -55c to 130c

Outward Pulse Value

10 pulses per KWh (if set for KWh's)
OR
10 pulses per MWh (if set for MWh's)

EXPLANATIONS & FAQ's

(Ref 2nd Screen Setting) Reset able Energy (A) or Monetary Value (B)
This offers the option of either having the default screen showing as :-
A   Energy   -- Shown as KWh (standard applications) or
**   MWh (Commercial Applications)**
B   Monetary Value -- Shows the value as real money !!!

Q1 -- Can I reset the screens
A1 -- Yes with a IT – Reset Zapper unit
Q2 --   Do I lose all the data at reset
A2 --   No the system integrity is kept,the 2nd screen in operation retains the total usage
            since start and is not resettable

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Q3 -- What security of settings are there
A3 -- Once the settings have been saved (9th Screen) they cannot be tampered with
Q4 -- How can I change the settings and monetary values
A4 -- Security is important for this reason we have developed a zapper unit
   The zapper **www.hcm4.com/zapper.htm** unit will open the software for settings
    and monetary value resetting. The company registers each zapper unit sold
Q5 -- What is shown on the screen when in operation
A5 -- The current total which can be reset – either KWh's or Monetary value

Q6 –   I am trying to set up a HCM and I keep getting '**POWER FAILURE**'. on the display .
A6 --   The sensors are either incorrectly wired – re check the wiring – or damaged- replace.
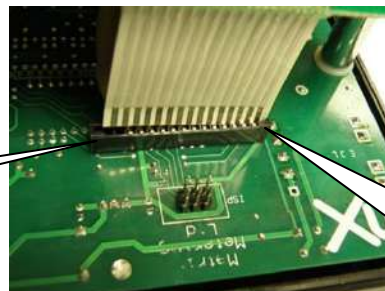
Power Failure
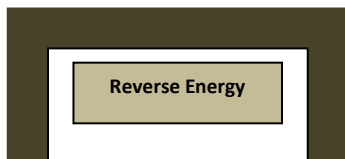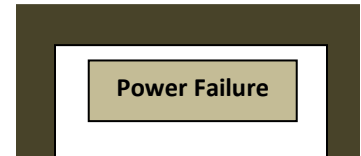
Reverse Energy

Q7 – **Reverse Energy** is on the display ?
A7 – This appears when there isn't a 1c difference between flow & return pipe temperatures.

Display – Dim or Showing Blocks Only = Display Dislodged
 Pull display out of its socket and replace carefully

Display Socket

Metal Strips in ribbon cable and pins in socket need to be in line

Cable requires to be mounted to the left of the socket

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Error Codes
> Act as a 'Que' in the software to inform of potential problems. When an 'ERROR' occurs the HCM4's buzzer operates.

ERROR 1   No sensors connected or shorted to 5volts
ERROR 2   Data shorted to O volts
ERROR 3   Data transmission error
ERROR 4   Only 1 sensor connected
ERROR 5   Not a pair (either 2 hot or two cold connected)
FREEZING   Temperature in pipes or below 1c NEGATIVE DELTA T   The sensors are likely too be the wrong way round

Guarantee

All products are guaranteed on a return to base basis only, for a period of 12 months from dispatch date. No compensation can be offered, relating to consequential loss.
Where HCM4 Calculators are installed, not using Meters UK water/flow meters
This could alter the known operational criteria, and effect the product integrity. The company reserve the rights to refuse claims where deemed correct.
This product is sold subject to the company Despatch, Guarantee & Returns Policy only
www.meters.co.uk/policy.htm

Other M Bus Devices

M-Bus

Shara 100
M Bus Converter -
Converts Pulsed Outputs Into M Bus
Electricity – Gas – Water Meters

M Bus Masters
Available In
 10 Ports
 32 Ports
 64 Ports
 128 Ports
 250 Ports

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