HCM4

Thermal Energy
Calculating Meter Systems For
'The Digital Age'

INSTALLATION INSTRUCTIONS

HCM4002 - Thermal Energy Calculating Meter - 230 volts

2 Pulsed Inputs & 2 Pulsed Output Version
(Heating or Chilled Circuit Energy Calculation kWh/mWh + Warm Water or Potable Water Usage m3)

Calculates The Energy Used In Heating or Cooling Systems
KWh & Monetary Read Outs (£ $ ₦)
Digital High Accuracy Sensors
Strap On Pockets Option
'On Site' Programming Facility
Manufactured to ISOEN 1434 Parts 1 to 6

Qualified for Energy Technology List
Authorised User No. 00475

Certificate No. 2030

Order Code(s)
hcm4002 (Standard Version) With Monetary Value & Re Settable
hcm4002hp As above but High Precision Version

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The HCM4 consists of 3 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 .

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

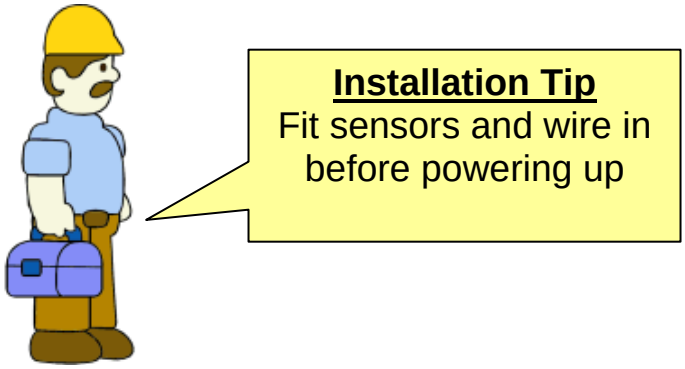
Wiring

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

Wiring Terminal List

1 = Power In (+) -Either Mains 230v (110v USA) or 24v
2 = Power In (-) - Either Mains 230v (110v USA) or 24v

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 = CAT Terminal (+) –Building Alarm Terminal (where fitted) www.hcm4.com/cat.htm
14 = CAT Terminal (-) – Building Alarm Terminal (where fitted) www.hcm4.com/cat.htm
15 = Pulsed Output 2 (+)
16 = Pulsed Output 2 (-)
17 = Flow Meter 2 (+)
18 = Flow Meter 2 (-)
19 = Sensor Cold -- Brown
20 = Sensor Cold – Green
21 = Sensor Cold -- Blue



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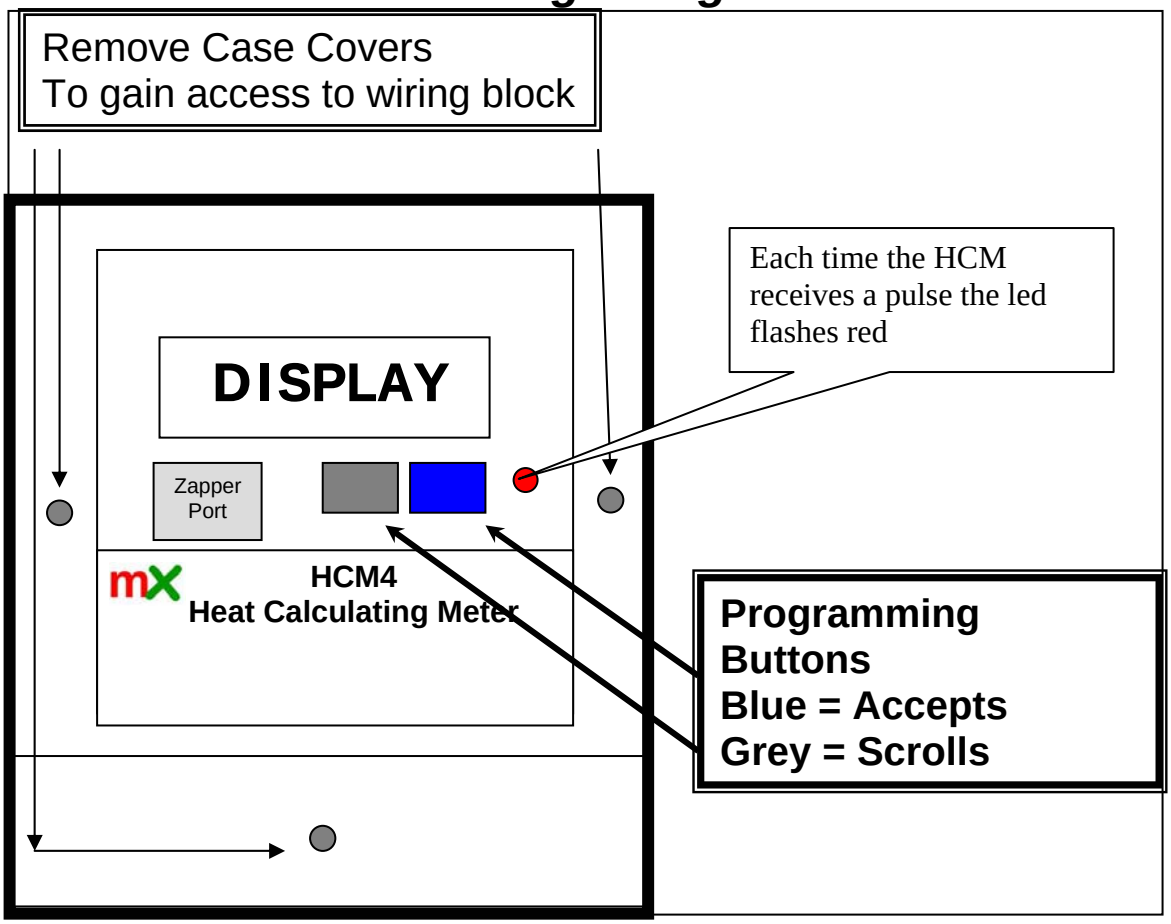

Installation

Remove HCM4 cover and install all wiring leaving the **connection of either mains supply 230v or 24v until last**
Wiring standards must conform to IEE regulations
It is recommended to use shielded cable manufactured to BS4360 Class 5 or VDE0295 Class 5
Hot flow meters should be 'FULLY' insulated with either Thermal Jackets or wrapped in insulation

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
The **Red Coloured Sensor**, should always be located in the hottest pipe
Heating Circuit = Flow Chilled Circuit = Return

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

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Pipework Recommendation

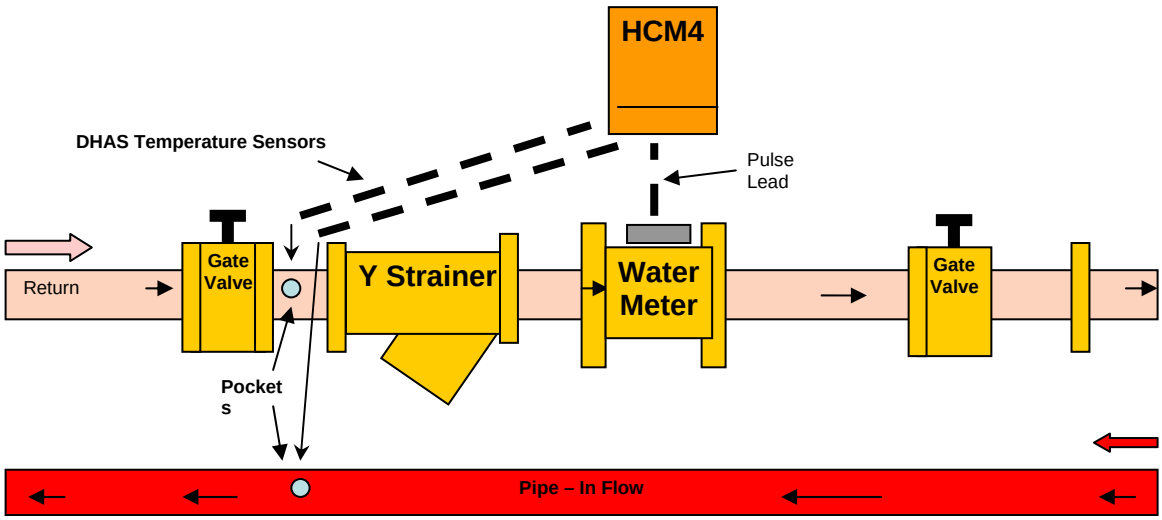
It is strongly recommended that the pipe work is correctly protected with the following valves :- Gate Valves (x2) Strainer (x1
Should these not be fitted, the company takes the option to invalidate any guarantee(s)

Heat Calculating Meter

HCM4

Pipe Work and Valve Layout
Hot or Chilled Water Circuit

'How it all fits'



DHAS Sensors (Digital High Accuracy Sensors)

DHAS Sensors are highly accurate, calibrated temperature sensors, they are designed to fit into pockets which onwardly fit into the pipe work. The sensors have individual serial numbers located on the sealing tags, 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
C – They can be added too up to 10 metres long. (For length's 10+ up to 200 metres use LD version) www.hcm4.com/LD

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

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NEGATIVE DELTA T The sensors are likely too be the wrong way r

Installation Tip
Buttons
Left/Grey = Scroll
Right /Blue =

Programming Heat Calculator
At Boot up - Sequence

Matrix Metering
HCM4002 Version No 2.0

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

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)

2nd Screen Set (Billing Preference) 2/a

Resetable Energy

Billing in KWh's

If this option chosen

Resetable Money

Billing in Monetary Value

See Page 9 For full explanation

Screen 2/b

Cost 000.p KWh

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

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5th Screen (Pulse value from Water Meter (No 1) -- HEATING OR COOLING

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)

6th Screen (Pulse value from Water Meter (No 2) -- HAND WASH or DRINKING WATER

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)

END OF PROGRAMMING
THE HCM4 NOW AUTOMATICALLY SCROLLS THROUGH THE SETTINGS

7th 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

8th Screen

Hold to Save ..

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

Last screen

Saved

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At this point all the settings are saved

Operational Data

Default Screen

See Page 9
For full explanation

RM £ 050.25	RE 45697.1 KWh
Resetable Money	Resetable Energy KWh/MWh

Total Energy

TE 0000000.0 KWh

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

Instantaneous Energy

IE 23 KW

The amount of energy being consumed in the circuit NOW

Temperature Flow

tf 78.8C

Temperature in the flow pipe

Temperature Return

tr 78.8C

Temperature in the return pipe

Flow Meter 1
(Heating/Chilled)

F1 354.87 m3/h

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

Flow Meter 2
(Warm/Drinking Water)

F2 154.87 m3

Total flow in metres cubed 1 m3 = 1000 litres

To Change Settings

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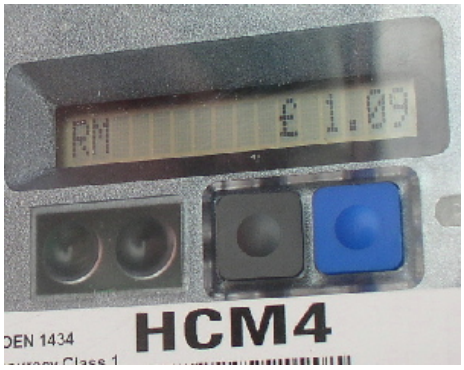
Once passed screen set no 7 – the only way to access the settings is with a Zapper Unit Reference **www.hcm4.com/zapper.htm**

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 50 msecs
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) Resetable 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 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 resetable
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 incorrectly wired – re check the wiring

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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 HCM4 versions available

CAT Terminals (Calculator Alarm Terminal)

Offers the option of providing a error alarm to a Building Management System
How it works -- The BMS despatches a voltage (max 30 volts) to CAT Terminal 1 (wiring terminal 13)
In the event of an error occurring a voltage would be returned to the BMS on CAT Terminal 2 (wiring terminal 14)
In operation CAT Terminal 2 would have zero volts – In error mode CAT Terminal 2 would have a voltage

High Precision
Where high accuracy is required the HP version uses higher quality materials to be able to be calibrated to 0.02% accuracy

LD (Long Distance) Temperature Sensors
Temperature sensors that can measure accurately for distances from 10 metres up to 200 metres

NEED REMOTE READINGS ACCESS TO METERS!!!

Remote Counter Unit
PROVIDES EASY ACCESS TO READING FOR ALL TYPES OF UTILITY METERS – Electricity – Gas - Heat & Water etc

- ✓ 1 & 6 way versions
- ✓ Easy programming – (two buttons on front)
- ✓ kWh/m3h or Monetary Read Outs (£ $ H)
- ✓ Manufactured to ISOEN 8859-2
- ✓ Simple User Friendly Readout
- ✓ 230/24 volts
- ✓ Pulse Output (with grab circuit)
- ✓ Zero Display Option (Resetable Display)
- ✓ 230v or 24v

Reference www.meters.co.uk/rcu.htm

meters uk Ltd Whitegate, White Lund Trading Estate, Lancaster,

Qualified for Energy Technology List
Authorised User No. 00475

URS UKAS QUALITY MANAGEMENT 043-A
Certificate No. 2030

www.hcm4.com

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