TYPE: IC 200-IM-R

INSTALLATION MANUAL

INTRODUCING THE OFGEM APPROVED IC 200-IM-R

The IC 200-IM-R is a new product from Autometers Systems and has been specifically designed for switchboard manufacturers. The meter has been designed and built to comply to strict regulations concerning OFGEM approval for revenue collection and also with the requirements of panel manufacturers around the world.

'specialist designers and suppliers of electronic power meters'

'fully compatible with the Horizon system'

AUTOMETERS SYSTEMS

LOCATION

The IC 200-IM-R meter should be installed in a dry and, dirt free environment away from heat sources and very high electric fields. Temperatures should not exceed 70 C or fall below -20 C. The meter has been designed to be installed in an enclosure or switchboard cabinet.

Check Contents

Package should contain the following:

1. **Meter**
2. **Two terminal covers**
3. **Plastic bag containing:** **Qty 6 - M8 screws** **Qty 2 - M4 screws** **Qty 2 - M4 locking nuts** **Qty 6 - M8 washers** **Qty 2 - M4 washers**

INSTALLATION

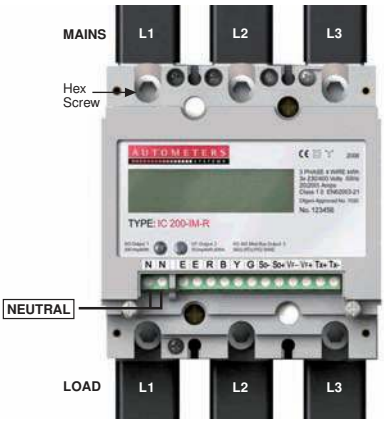
1. Position the IC 200-IM-R meter ensuring that all cables can reach the terminals, secure the meter to the back plate by using the two M4 long screws, star washers and locking nuts provided.
2. Present the current carrying conductors to the large terminals to the top and bottom (L1, L2, L3) of the meter, ensure they are not pulling and that the Copper bar/lugs used sits freely and comfortable in position. Using the M8 Hex screws and washers provided secure firmly to the terminals. *See Diagram 1.*
3. Fit and secure the large terminal covers.
4. Connect the Neutral conductor to the Neutral terminal ensuring that the cable passes under the cable clamp, secure cable by tightening the clamp.
5. If using a remote display pass the cable under the fixing clamp and secure, connect the wires into correct terminals. *See Diagram 2.*
6. Place the terminal cover over the terminals and secure.

The terminal covers can be individually sealed to stop unauthorised tampering.

CONNECTION - WIRING INFORMATION

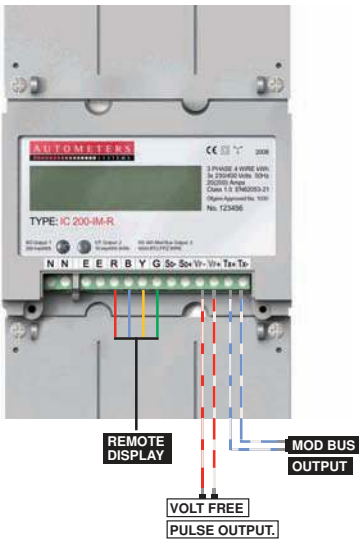
Power supply - The IC 200-IM-R is a 3 phase 4 wire kWh meter and is powered by 230 volt 50 Hz.The meter will work with any single phase connected (L1, L2 L3) and Neutral.

Diagram 1.



Current Carrying Conductors

Diagram 2.



Wiring

The main current carrying conductors are rated at 200 Amps and are connected by using lugs or pre drilled copper bar to terminals L1, L2 and L3 which can also be identified by the large M8 Hex fixing screws at the top and bottom of the meter. *(See diagram 1)*

The Neutral and communication connections are made to the green terminals on the front of the meter. *(See diagram 2)*

The neutral terminal is not a current carrying conductor and therefore can be wired in a smaller cable, Autometers recommend a flexible multi stranded cable with a current rating of 5 amp. For the communication and pulse outputs there are a number of cables available, Autometers recommend a twisted shielded cable Belden 9841.

It is imperative that all cables, Lugs and copper bars are securely tightened in the correct terminals.

POWER ON

When the meter has been installed and fully wired and power has been applied to the meter, the display will go through a set routine.

Power On

The display will scroll through three registers; this will last for 5 minutes.

1. **kWh register with 2 decimal places (kWh symbol will flash)**
2. **Serial number**
3. **Modbus address**

After 5 minutes the display will change and show the kWh register with two decimal places, this is for testing.

After another 5 minutes the register will go into default. The kWh register will now show 7 digits with one decimal, L1, L2, L3 and kWh on the display.

L1, L2, L3 are voltage indicators and will illuminate when voltage is present on that particular phase.

1. kWh register

2. Serial number

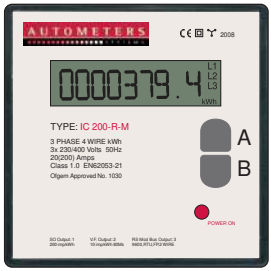
3. Modbus address

PROGRAMMING THE MODBUS REMOTE DISPLAY

On meters where Modbus is a requirement you will need to program the Modbus address into the meter, it is extremely important that you do not duplicate meters with the same Modbus address as this will cause errors in the readings.

The meter can not be programmed without the IC 200-R-M remote display, this is easily recognized as it has two buttons on the front of the display marked **"A"** and **"B".**

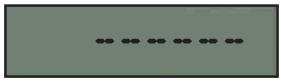
Important
Each display will automatically lock to the base unit when programmed and can not be moved to another meter base. The Remote display will only program one meter.



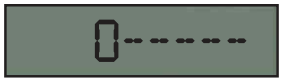
When the meter has gone through the set up routine as listed above **"Power On"** it will now enter a new routine to lock and programme the Modbus address.

The display will change to six, flashing **"-"** *(See diagram "A")*

Diagram "A".



1) When you press **"A"** for the first time, the first **"-"** on your left will change to **"0"**. Pressing **"A"** again will increment the number.



If the number is correct press button **"B"** this will lock the number and also move the cursor to the next **"-"** in line to the right.

Repeat until all six numbers match the serial number as printed on the meter base. When all six digits have been entered the digits will flash Press button **"B"** twice this will lock the serial number into the meter.

a) The duration for pressing **A** is more than 5 seconds, it will automatically cancel the operation.

b) The duration for pressing **B** is more than 5 seconds; it will automatically cancel the operation.

This will revert you back to the beginning.

A white label is provided on the back of the display case to print the serial number and the Modbus address when programmed. Please ensure you complete this as it might be important for future reference.

SETTING THE MODBUS ADDRESS

2. When **STEP 1** has been completed the display will show and flash three **"-"**
   This is for entering and setting the Modbus address into the meter.
   When you press **"A"** for the first time the first **"-"** on your left will change to **"0"**.
   Pressing **"A"** again will increment the number.
   If the number is correct press button "B" this will lock the number and also move the cursor to the next **"-"** in line to the right.
   Repeat until all the 3 numbers have been entered. (Max number possible 127)
   When all 3 digits have been entered the 3 numbers will flash
   Press button **"B" twice** this will lock the Modbus address into the meter.

(Max number 127)

a) The duration for pressing **A** is more than 5 seconds, it will automatically cancel the operation.
b) The duration for pressing **B** is more than 5 seconds; it will automatically cancel the operation.

This will send you back to the beginning of programming the Modbus address. *(Section 2)*

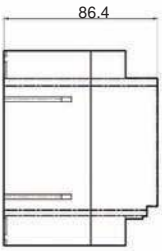
When you have completed both the serial number and the Modbus address the meter will default for 10 seconds to display kWh, serial number and Modbus address.

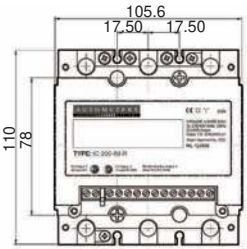
After 10 seconds the meter will revert to 6 digits and two decimals for 5 minutes after 5 minutes will change to **(7+1)** digits.

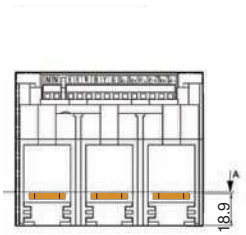
IMPORTANT
To change the Modbus address at any time press and hold down both "A" and "B" together for 5 seconds...this will take you to above number 2 to allow you to change the Modbus address.

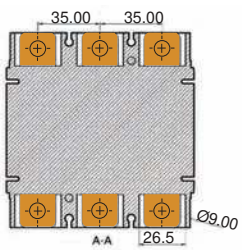
Fault code:
001- Indicates that the display is connected to the wrong meter base.
002- Indicates the communication has not been established with the meter.

METER DIMENSIONS









REMOTE DISPLAYS

The IC 200-IM-R can have an option of two remote displays.

a. The standard remote display IC 200-R which just mirrors the base unit.

b. The Modbus remote display IC 200-R-M which mirrors the base unit but also has the facility to program the Modbus address. *See page 4 to program the address.*

The displays both come with a 2 metre length of screened cable attached leaving one end with extended wires to make the connections to the meter. These wires are colour coded and must be inserted into the correct terminals. *See Diagram 3.*

The screening on this cable is not connected.

Modbus Connection

The IC 200-R-M has another type of cable which needs to be connected this is usually a twisted pair screen shielded cable (Belden 9841) it is imperative that the outer screen is carried through the cables as a continuous loop as this protects the transmission of data through the conductors.

a. Make sure when connecting the Modbus cables that you have stripped back the cable plastic outer sheath leaving the copper braid bare and long enough to fit under the metal clamp. Screw the clamp firmly down ensuring you have gripped the copper braid of both cables. *See Diagram 4.*

b. As an alternative way to connect the Modbus cable, you can form the copper braid into a wire and connect into one of the "E" terminals. Both of these wires must be connected into the same "E" terminal. *See Diagram 5.*

Diagram 3.

Diagram 4.

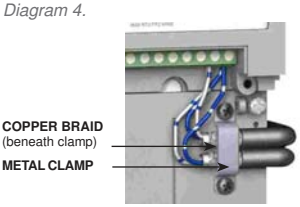
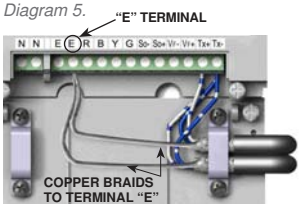


Diagram 5.



PERFORMANCE AND DATA

Measurements

The IC 200-IM-R is a direct connected 200 amp meter designed to measure kWh in a 3 phase 4 wire system.

Technical Data

Accuracy class	1 (EN 62053-21)
Basic current Ib	20A
Max. Current Imax	200A
Starting Current	0.004Ib
Rated Voltage	3x230/400 V
Operating Temperature Range	-25°C…+60°C
Storage Temperature	-35°C…+75°C
Current circuit burden	<0.5 VA
Voltage circuit burden	<2 W/10 VA
Impulse Voltage	6 kV, 1.2/50µs
Short-Circuit Current	30 Imax

Technical Data

EMC:
High Frequency Disturbances (IEC 1000-4-4)

Pulse outputs:
SO (IEC 62054-21) 200imp/kWh
Volt free 100ms 10imp/kWh

Current Terminals:
Copper with 9mm through hole suitable for lug connectins only.
M8 threaded screw for clamping lug to terminal.

Neutral and communication terminals:
Rated voltage AC300V, rated current 16A, wire size 26-14AWG.

Enclosure:
Self extinghuishiung uv stabalised polycarbonate.

Communication Output

RS 485 Modbus.

Baud Rate:	9600
Wire Mode:	2 Wires
Modbus Type:	RTU
Parity:	Even
Data Format:	Floating Point
F.P.Format:	High Word First.

DEDICATED CUSTOMER SERVICE

Customer care is the cornerstone of the company's success. A positive service policy is observed throughout every specialists area of operation.

The personal involvement of all the directors at every level. a highly trained and motivated staff, fully computerized systems and in depth stockholding combine to provide a level of service which has earned the appreciation of customers across the spectrum of the UK and overseas markets. Computerized distribution systems are geared to a consistent 24 hour dispatch of products, with 20 minutes dispatch being possible in response to urgent demand for small orders.

PRODUCT RANGE

Metering and monitoring equipment ranges from single phase and polyphase kWh electromechanical meters to a sophisticated range of fully programmable information centres. Also available are electronic Meters, Panel meters, and Data logging meters.

A full data monitoring and billing system is now available From Autometers Systems Ltd allowing 24 hour information via the Web.

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