Electricity Meter.

Datasheet

Available from:
CONCEPT13.CO.UK
(+44) 0333 335 0345

LoRa Alliance® Member

Application.

- The iQ Electricity Meter measures AC flowing through the devices connected to the electricity grid.
- The iQ EM4301 can be connected directly to a three phase electricity grid with a maximum load of 100A, the iQ EM4301-CT is our current transformer model.
- The iQ EM4301-CT can be equipped with up to 3 current transformers. The measurement range of the current depends on your local requirements. The available options include current transformers with the following limits: 100A, 160 A, 200 A, 400 A, 600 A, 800 A, and 1000A.
  The current clamps need to be ordered based on your requirements.
- The iQ EM4301-CT can optionally be equipped with voltage transformers.
- The iQ Electricity Meter has a pulse output and Modbus RTU communication available.
- Accurate mapping and logging of various energy parameters and energy consumption in both directions.
- The LoRaWAN® module with a very long data transmission range allows the device to be used virtually anywhere.

Components.

- The device is equipped with a LCD screen and touchbuttons for operating and reading the consumption information and configuring parameters.
- The device consists out of a Microcontroller with LoRaWAN® and Bluetooth Low Energy communication modules.
- The device is adapted for installation in power panels or automation cabinets on standard TS35 DIN Rails.
- The device has a direct measuring circuit for 1 or 3 phase systems, the CT model has indirect measurement circuits for 1 or 3 phase systems.
- The device is equipped with the possibility to inverse the current direction running through the current transformers.

Device Operation.

- The iQ Electricity Meter requires an operational LoRaWAN® network to transmit data, however it can operate as a stand-alone device as well.
- The device is powered by the power wires it's connected to, the CT model requires an auxiliary 230V power supply.
- Once connected the meter will measure the following parameters Current, Voltage, Frequency.
- Active Power, Power Factor, Active Energy and store the maximum demand values.
- Configuration of the device is done using the touchbuttons, mobile app or LoRaWAN down-links.
- The log interval and parameters to be stored are adjustable from 5-60 minutes, the device will store the measured values in the internal storage of the device.
- The iQ Electricity Meter transmits data over more then 2 km in an open space with a medium density of buildings.
- It's recommended to add the device to the Yobi Hub, which allows detailed and easy monitoring of the data transmitted by the device.

Advantages.

- Because of it's ability to operate stand alone or over the LoRaWAN network you save on cabling costs.
- Conversion of existing installations is not required because of the LoRaWAN module.
- The meter is manufactured by qualified engineers and CE certified.
- The device synchronizes time over the LoRaWAN network ensuring that the time is always accurate.
- The device can transmit measurement data over up to 10 ports, where each port can contain 10 parameters. Each port can have it's own transmission interval; meaning you can send up to 100 registers with different intervals.
- Measurement logging interval is always synchronized to a whole hour, thus if you set a interval of 5 minutes it will log the parameters at 00, 05, 10, 15, etc. minutes after the hour.
- The data transmission is pseudo-random to avoid radio collisions.
- The device can be used on Private or Public Networks and works with the majority of the network servers and visualization platforms.

Mounting Advice.

The device contains a radio antenna, it's recommended to observe the environment when mounting the device to avoid problems due to for instance EMC.

The installation and assembly of electrical equipment should only be performed by authorized personnel.

The product should only be used for the intended application. Unauthorised modifications are prohibited! The product must not be used in relation with any equipment that in case of a failure may threaten, directly or indirectly, human health or life or result in danger to human beings, animals or assets.

Ensure all power is disconnected before installing.

Do not connect to live/operating equipment.

CAUTION! Risk of electric shock due to live components within the enclosure.

Please comply with:

- Local laws, health & safety regulations, technical standards and regulations
- Condition of the device at the time of installation, to ensure safe installation
- This data sheet and installation manual

Technical Details.

Electrical Characteristics.

Type of measurement		RMS including harmonics on AC systems, supporting 1P2W, 3P3W, 3P4W.	
Measurement accuracy	Voltage, Current	Class 0.5, according to IEC 61557-12	
	Active Power	Class 1/0.5, according to IEC 61557-12	
	Reactive Power	Class 2, according to IEC 61557-12	
	Apparent Power	Class 1, according to IEC 61557-12	
	Active energy	Class 1 / 0.5S, according to IEC 62053-22, IEC 61557-12	
	Reactive energy	Class 2, according to IEC 62053-23, IEC 61557-12	
	Power factor	Class 1, according to IEC 61557-12	
	Frequency	Class 0.2, according to IEC 61557-12	
Data update rate		1 second	
		iQ EM4301	**iQ EM4301-CT**
Input Voltage	Rate voltage (Un)	230Vac (L-N) / 400Vac (L-L)	
	Direct Connection	Measured range : 85 to 270Vac (L-N) / 85 to 400Vac (L-L)	
	Impedance	45 to 65 Hz	
	PT Primary	-	30 to 500000V
	Impedance	-	1MΩ
Input Current	Frequency Range	45 to 65 Hz	
	Overload Capacity	2*Un for 1 second	
	CT2 (Secondary)	-	1A or 5A
	CT1 (Primary)	-	1 to 9999A
	Measured Range	0.005 to 100A, basic current (Ib) is 5A	0.003 to 6A, basic current (Ib) is 5A
	Overload capacity	30*Imax for 0.01 second	120A for 0.5 seconds
Realtime clock accuracy	0.5 s/d		

Mechanical Characteristics.

IP Degree of Protection (IEC 60529)	Designed to IP51 front display, IP30 meter body
Dimensions (WxHxD)	36 x 100 x 65 mm
Materials	UL 94 V-0

Environmental Characteristics.

Operating temperature	-25 to +55°C
Storage temperature	-40 to +80°C
Humidity	<99% Rv, non condensing
Pollution degree	2
Altitude	Up to 2000m
Vibration	10Hz to 150Hz, according to IEC 60068-2-6

Electromagnetic Characteristics.

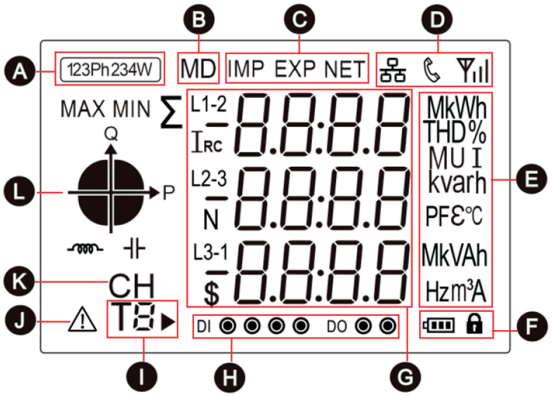
Electrostatic Discharge	Level 4, according to IEC 61000-4-2[1]
Immunity to Radiated Field	Level 3, according to IEC 61000-4-3[1]
Immunity to Electrical Fast Transients	Level 4, according to IEC 61000-4-4[1]
Immunity to Surges	Level 4, according to IEC 61000-4-5[1]
Immunity to Conducted Disturbances	Level 3, according to IEC 61000-4-6[1]
Immunity to Magnetic Fields	IEC 61000-4-8[1]
Immunity to Voltage Dips	IEC 61000-4-11[1]
Radiated Emissions	Class B, according to EN55011
Conducted Emissions	Class B, according to EN55011
Harmonics	IEC 61000-3-2[1]

[1]The laboratorium test is carried out according to the grade requirements of industrial grade products in IEC61326-1

Safety.

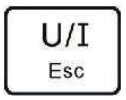
Measurement Category	CAT III, according to IEC 61010-1
Overvoltage Category	CAT III, according to IEC 61010-1
Insulation	AC Voltage Test : 4kV for 1 minute Impulse Voltage Test : 6kV - 1.2/50μS
Protective Class	CAT II, according to IEC 61010-1

Display.

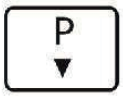


A - MThe power grid type icon represents the current measurement type of the meter.
B - Maximum demand icon.
C - Direction icon for import and export energy.
D - A status indicator icon for the meter.
E - An icon of a unit of measurement data.
F - Battery status Icon and lock icon, displays the battery status and dicates that the device is locked.
G - Measured values.
H - An icon of digital I/O status for the meter.
I - Multi tariff icon indicating the tariff segment to which the current energy.
J - Warning Status icon.
K - Channel indicator icon for multiple measurement channels.
L - Quadrant indicator icon indicating the quadrant of the current load.

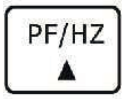
Buttons.



Escape

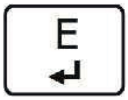


Down



Up

In the setting screen or auxiliary screen: scroll down to display the page or the decreasing number.



Enter

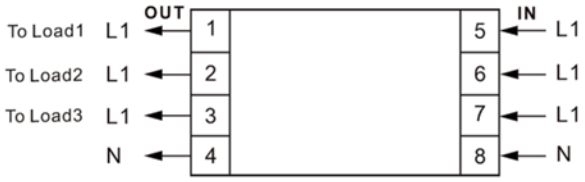
In the setting screen: right move the setting cursor.

Wiring Direct Connected.

3P4W

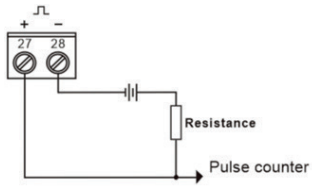
3P3W

1P2W



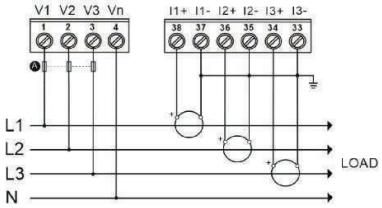
2P3W

Pulse output wiring

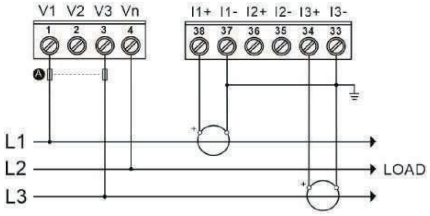


Wiring Indirect Connected.

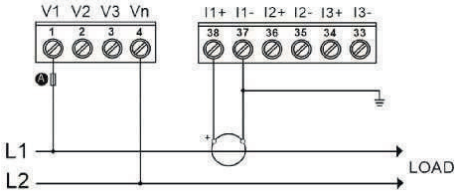
3P4W



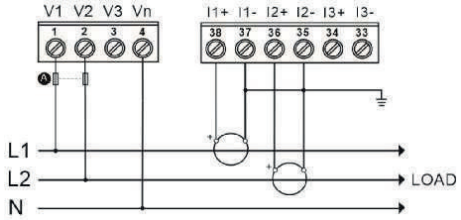
3P3W



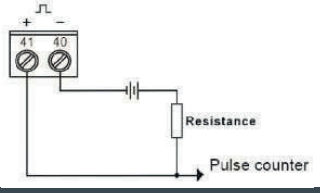
1P2W



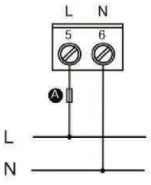
2P3W



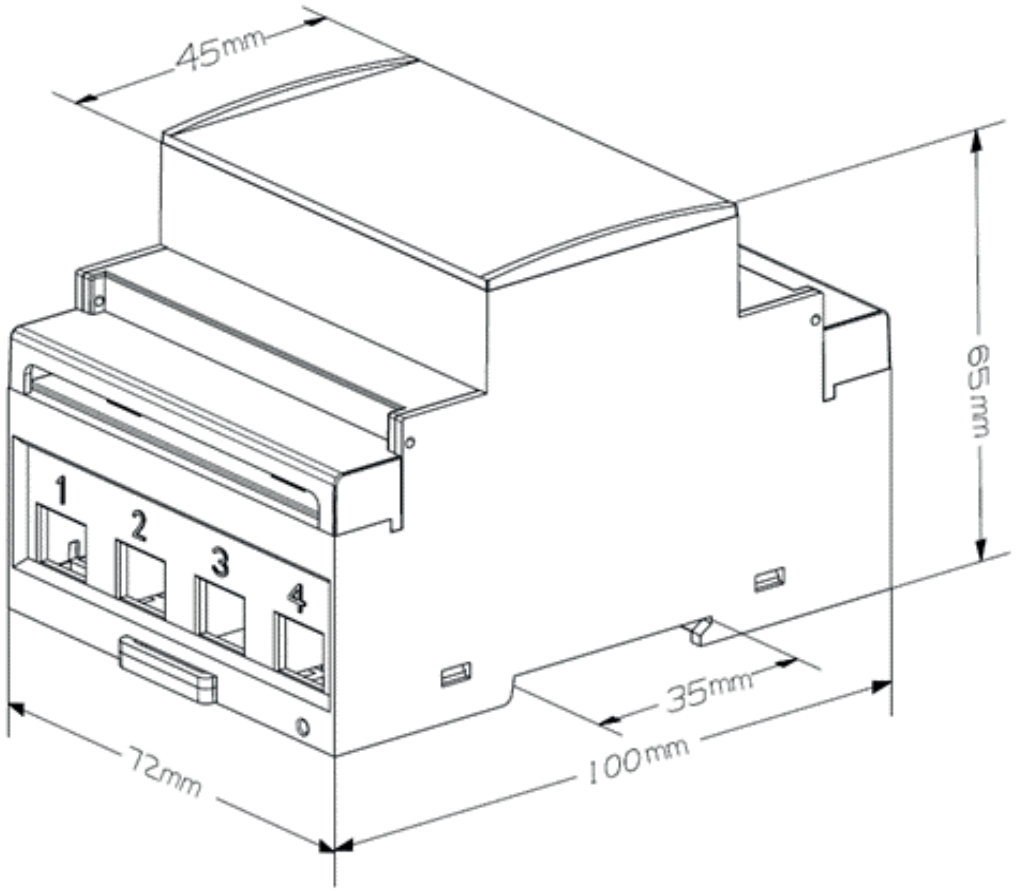
Pulse output wiring



Auxiliary power



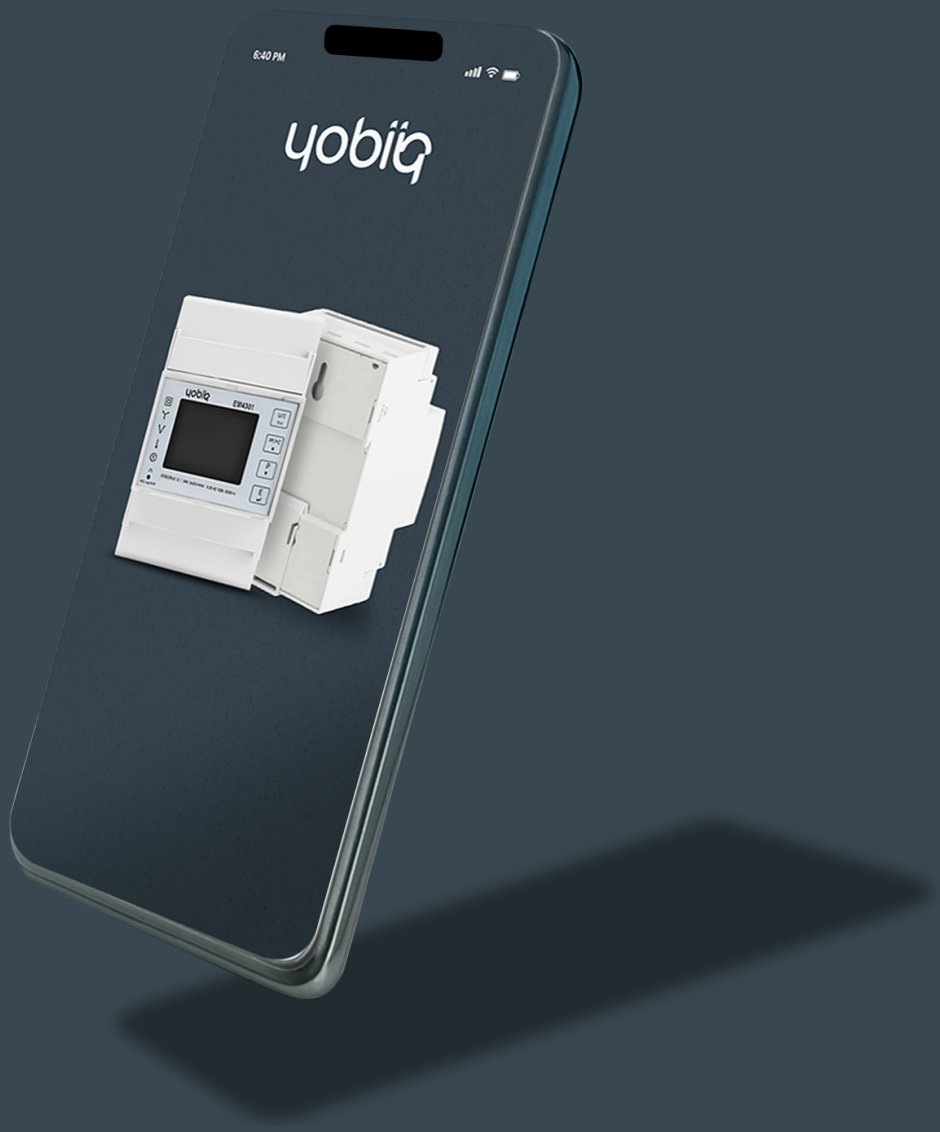
Dimensions.



Order Information.

iQ EM2101 - LoRaWAN 868 (EU)	1002011
iQ EM4301-CT - LoRaWAN 868 (EU)	1002010

yobiq
EM4301
U/I
Esc
PF/HZ
P
E
400 imp/kWh



Our mission is to make all environments smarter.

The best way to predict the smart future is to create it. That's what we do every day. Locating and building solutions for you, your business, and your smart objectives. We provide cutting-edge IoT hardware and software to connect, monitor, and optimize your environment seamlessly. Discover our range of products designed to enhance efficiency, security, and productivity across various industries.

Available from:
CONCEPT13.CO.UK
(+44) 0333 335 0345