Metron4

Connecting Sensors to the Cloud

Connecting Sensors to the Internet of Things

- ● **KNOWLEDGE**
  - ○ **User Interfaces**
  - ○ **Platform**
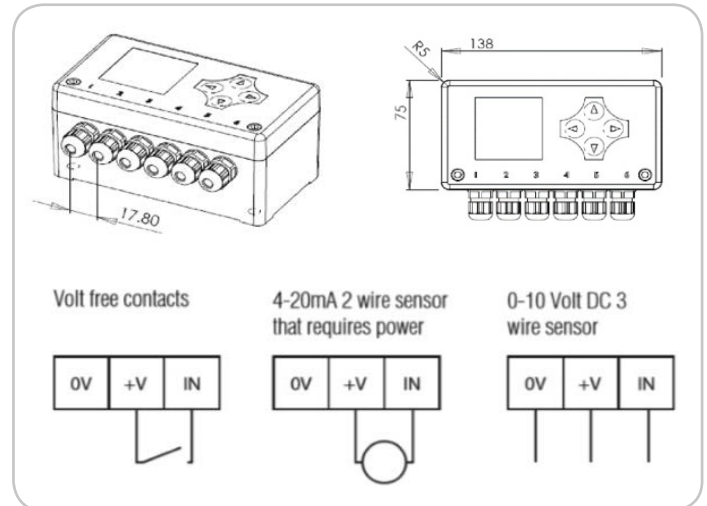 - ○ **Communications**
  - ○ **Gateways**
- ● **SENSORS**

Temperature
Level
Pressure
Flow
Vibration
Flow
Wind speed
Wind direction
Humidity
CO_2
Distance
Hours run
Fault
Intruder
Collision
State
Weight
pH
Conductivity
Salinity
TOC

Getting to Know...

The Metron4 makes remote monitoring simple and affordable, interfacing with sensors, taking periodic readings and transmitting them over the mobile phone networks.

- Compatible with 1000s of sensors
- Remotely programmable
- Self-contained, weatherproof
- Proven and reliable

Volt free contacts | 4-20mA 2 wire sensor that requires power | 0-10 Volt DC 3 wire sensor

Technical Specifications	
Parameter	**Details**
Inputs	4 (4 – 20 mA, 0 – 10 V DC sensors or volt free contacts). Expansion cards: 5 channel pulse (volt free, 10 Hz max.) & RS232 / R S485 (contact Powelectrics regarding protocols).
Outputs	Optional 2 relay outputs controlled either remotely or when threshold breached.
Communications	GSM (4G (CatM1 / NB1) with 2G fallback – worldwide frequencies).
Data Logging	80 per channel, (first in first out).
Power Supply	Battery, 6-24Vdc. solar and mains options.
Sensor Excitation	Will provide power to sensors (5 V or 21.6 V, 31 mA max.) for a programmable length of time.
Environmental	IP67, -20 to +65°C.
Programming	Normally remotely from MetronVIEW or locally via USB (Windows software free of charge from Powelectrics. Mini USB not provided by Powelectrics).

Configurable Parameters	**System**	**Inputs**
	Wake up interval (min: 1 min, max: 24 hr)	Type (analogue or digital)
	Transmit interval (min: 1 min, max: 24 hr)	Tag name
	Modem state (including idle, transmit on power up, pollable)	Units of measure
		Zero & span (scaling) and linearisation
	Antenna selection (internal or external)	Alarm thresholds (10 high (rising) and 10 low (falling))
	Synchronisation time	Call out delay
	Transmission window	Sensor excitation time and settling voltage upon waking the device, touch left button for immediate reading
Display	The built-in back lit 40x40mm LCD display acts as a local gauge to help test the device and ensure it is communicating well. It is also used to check sensors and wiring. Can be used as a local display to show measured values on wake up.	

Metron4/SSM runs from an **internal battery.**

Battery life depends on regime. The Metron4 is designed to maximise battery life. More frequent readings, weak signal and cold temperatures will shorten battery life. Battery duration also dependent on the type of sensor used. Typical life is **4 years** if powering a 2 wire, 4-20 mA sensor for 2 seconds and transmitting once per day. Only use Powelectrics approved batteries.

Metron4/S runs on **6-24Vdc.** Allow 0.5 A. Ensure supply is well regulated.

For mains power 110/230 Vac, options are:

/MPSU Mains (110 / 230 Vac) power supply with backup battery and regulator, housed in a weatherproof enclosure and a Metron4 fixed on base plate (185 x 371 mm). Provides 6 Vdc to Metron4

UPS 12 V Uninterruptable power supply is a separate box (262 × 188 mm). Mains 110 / 230 Vac in 12 Vdc maintained output via battery backup. Battery can typically support 50 transmissions. IP54 protection rating. Run cable from UPS 12 V to Metron4.

Metron4/S/SOL SYS runs from a **10 Watt solar power** and lead acid battery via an intelligent charge regulator.

Intelligent solar regulator maximises battery life and solar charging potential and includes pre charge conditioning if battery is in poor condition. There is also temperature com pensation, meaning charge rate is adjusted according to battery temperature, maximizing battery life.

Solar capability depends on orientation, sight of sun and location (ie the further from the equator the less power from the sun). In England, 10 minute transmissions possible, in Scotland need a 2nd solar cell to achieve this.

Dimensions
185 × 337 mm base plate

Metron4/S/...ATEX for use in explosive atmospheres. For 110/230 Vac power supply.

The Metron4 is housed in a panel with the barriers. This panel needs to be in the safe area and suitable sensors fitted in the field.

Enclosure
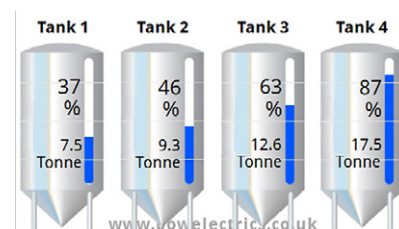400 × 300 mm wall mount panel with hinged door.

ATEX Barrier(s)
Includes up to 4 ATEX barries, such as MTL 554

Sensor Cabling
Consider inductance and capacitance of cable as well as characteristics of sensor. For SPS Ex (from Powelectrics) with LAPP12420 cable max. = 754m.

MetronAS (Augmented Solution)

This augmented solution offers a sophisticated interface on site, with high resolution, colour display of actual process (eg tank levels & graphics). It is used where more complex calculations and commands are needed on site. MetronAS offers instant response to programmable inputs/events, triggering immediate alarms and beacons Contact Powelectrics to discover more about MetronAS and bespoke, application specific solutions.

Tank 1	Tank 2	Tank 3	Tank 4
37 %	46 %	63 %	87 %
7.5 Tonne	9.3 Tonne	12.6 Tonne	17.5 Tonne

www.powelectrics.co.uk

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Metron4 Optional Additions

EXPANSION CARDS

The Metron4 can have expansion cards fitted such as a 5 channel pulse counting card, providing a system that has 4 analogue inputs and 5 pulse inputs in total. Pulse inputs can be used for a variety of applications, including flow and electricity meter reading.

The expansion cards fit neatly inside the Metron4 and present the terminals for easy connection of the pulse signals. The pulses need to be slower than 10 Hz (10 pulses per second) and must be volt free contacts.

The count can be configured to either reset when successfully transmitted to the server, or rollover (can count to 4,294,967,295).

1
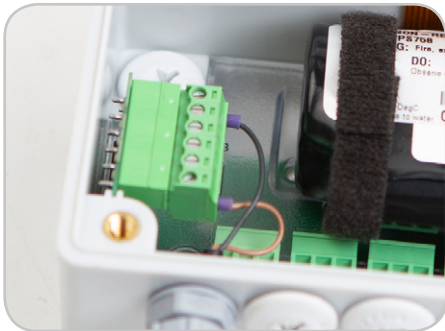
Insert card into Ex socket.

2

Wire in to green connector plug and tighten screw.

3

Insert connector into plug in terminal connector

You will see the corresponding LED quickly flash when a pulse is seen, if fitted correctly. Also available: serial port RS232 & RS485. (Contact Powelectrics regarding protocols)

EXTERNAL ANTENNA

The Metron4 has an integral antenna and has been designed to achieve optimal signal strength to the mobile phone networks. However, consider connecting an external antenna too, if mounting in an area of poor signal strength improve the signal or inside a metal enclosure.

The SMA connector present on the board usually requires a mating connector that is too large to fit through the standard M12 cable glands that are supplied.

A fitting kit is provided but if sourcing own antenna, an M12 – M16 cable gland adapter will be required. Also consider the need to bore out centre to get the connector through.
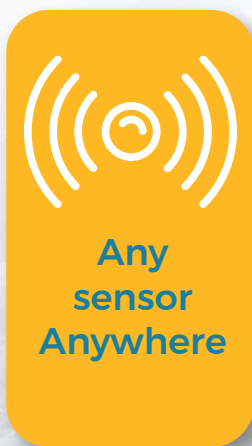
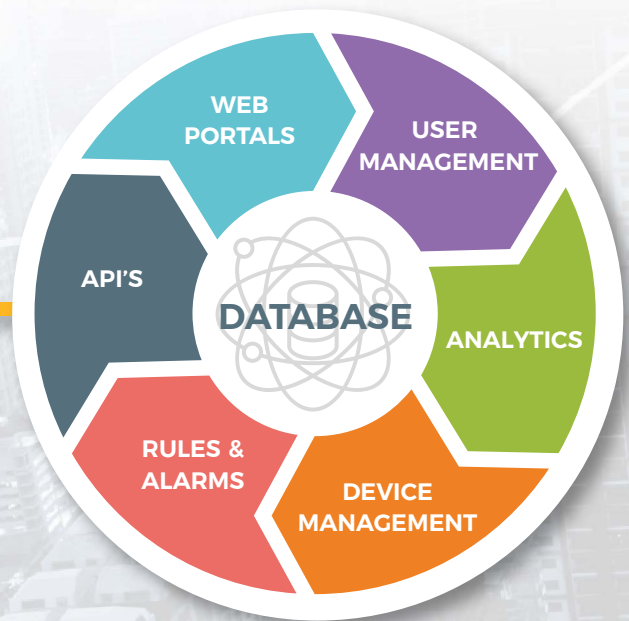Select external antenna via menu or set in the configuration.

MetronView

Metron VIEW
Connecting Sensors to the Cloud

Any sensor Anywhere

Metrons
Devices that send the readings from the remote locations

WEB PORTALS

USER MANAGEMENT

API'S

DATABASE

ANALYTICS

RULES & ALARMS

DEVICE MANAGEMENT

- Hosted software platform
- Receives data from the Metron4 and other remote IoT devices
- Allows for viewing of data via internet connected devices in any browser
- Remote Metron configuration
- Alarms sent by email
- Pull data via API
- Safe and secure

GSM sigfox LoRa WiFi NB-IoT M-Bus wireless

Metron4 Quick Start Guide

HOW METRON4 WORKS

Unit asleep; screen and GSM off

Wake up interval – powers the sensors and takes readings

Transmit interval (or upon alarm) it powers up the GSM engine

Readings & alarms are sent via GSM

The system is usually set up so unit powers down between readings.

The real time clock counts time and wakes the device up depending on how it is programmed.

10 high and 10 low alarm thresholds for each of the 4 channels – if threshold is breached then Metron4 transmits immediately. The unit can log 80 readings per channel.

METRON4 QUICK INSTALL GUIDE

1. Unpack & Open Up the Metron4

Place the unit on a flat surface and loosen the 2 nylon screws in the bottom corners to open. Allen key required.

Open the Metron. The interior will vary depending on unit. The image shows the /SSM model with a battery.

Ensure the SIM card is installed. Plug in the power source.

2. Mount the Metron4

Use the 2 mounting holes used to fasten the Metron4 down to a baseplate, wall or other surface.

The unit needs a mobile phone signal to operate, so try to avoid mounting inside metal cabinets or underground. The unit is weatherproof, but ensure:

- All cable glands and breather glands on the unit have an 'O' ring fitted and are sufficiently tightened.
- If no cable is going through the gland, that blanking plugs are fitted. Blanking plugs also need fitting over the fixings inside the device.
- Both screws on the top are tightened, but not over tightened.
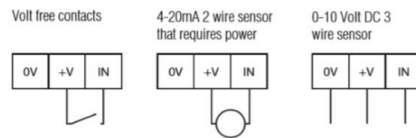- The seal around the lid is correctly in place.

3. Connect the Sensors

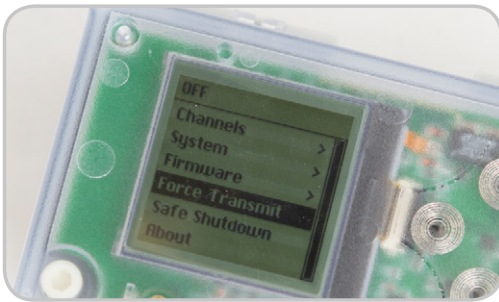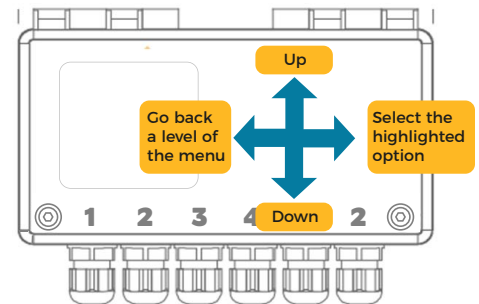Run the sensor's cable through the gland.

Unplug the green connector and wire in as required

Plug the connector into the correct input channel and tighten the gland. Ensure cable is through the gland.

4. Navigate the Metron4

Press any button to wake up the Metron4 and enter PIN (default = 1234). Press right after 4th digit to enter.

Force transmit. Move down to Force Transmit, and right to select. Watch the progress bar and wait for the unit to transmit. Once complete, the data will be available for viewing on MetronView. The unit will countdown for 40 seconds then enter Run Mode. The screen will turn off
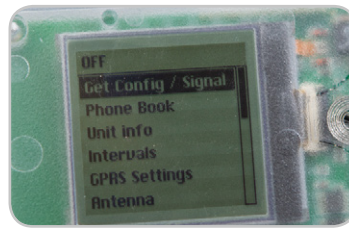
Check signal. Enter PIN, select System, select Get Config / Signal. Signal is scaled between 0 -31 (31 = best) and at least 10 recommended for GSM connection.
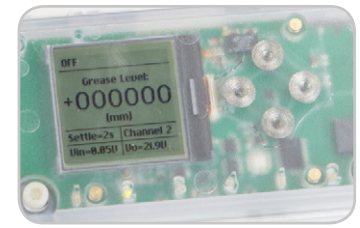
Immediate reading. Touch device to wake and left for live reading. Keep pressing left to swap between channels and read different sensors.

5. View Data

Login details will normally be sent by email. If not, contact Powelectrics support. Once logged in, a summary of your units will be visible. Click on view to the left of the device's name to see the historical data. Powelectrics support can change the name of units and inputs if required.

6. Programming

Units can be remotely programmed from MetronView. It is possible to change how often readings are taken & sent, alter scaling and alarm thresholds for each of the input channels and much more (see Configurable Parameters earlier). To make changes please contact Powelectrics support. The configuration will be held on the server and be downloaded to the device when it next communicates, and then use the new settings in the future. Select 'Force transmit' rather than waiting for the next time the device transmits in order to reconfigure sooner.

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connected sensors

Connecting assets to the cloud is now essential for businesses to remain competitive.

Powelectrics' innovative Metron4 IoT telemetry device (or sensor gateway) makes remote monitoring simple.

Metron4 gets sensor data reliably and affordably into the cloud via 4G (2G backup).

- 4 analogue inputs,
- Expansion cards for pulse counting, options for RS232, RS485 and CANBUS
- Compact IP67 enclosure
- Solar, battery and external power options
- Operational temperatures -25 to +65°C

Compatible with thousands of sensors, Metron4 is ideal in a vast range of global environments and applications.

In conjunction with our MetronView cloud, Metron4 helps customers improve margin, achieve competitive advantage and develop new revenue streams.

Monitor. Control. Maintain. Alert.

Remote Condition Monitoring

Lower Operational & Maintenance Costs

Extend Asset Life

Improve Safety

Enhance Sales Propositions

Introduce New Revenue Streams

Improve Service Levels

Metron4
Connecting Sensors to the Cloud

Powelectrics Limited. 12 Ninian Park, Tamworth, Staffordshire. B77 5ES

sales@powelectrics.co.uk | +44(0) 1827 310 666 | www.powelectrics.co.uk