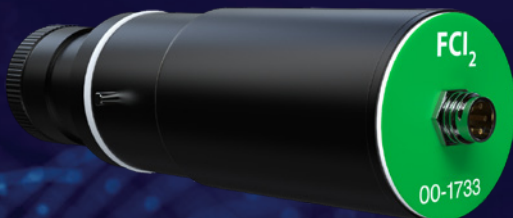




Intelligent,
smart water
quality monitoring
for continuous and
accurate data.



MetriNet with Metasphere RTU

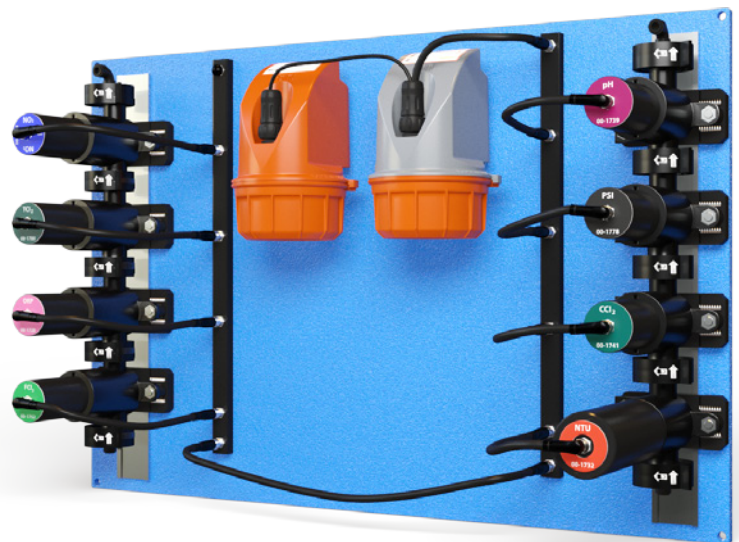


Solutions for a Smarter Future

MetriNet is a pioneering breakthrough in continuous, reliable and accurate water quality monitoring from ATi. Through its smart sensor technology, MetriNet offers a sustainable solution to meet the complex challenges currently facing the water sector. It will ultimately help to drive down complaints, increase water companies' C-MeX scores and result in pro-active network management to safeguard water quality for customer use.

Example shown features eight M-Nodes each measuring a different water quality parameter, using the Metasphere RTU and battery, connected direct to the bus bar.

Note: MetriNet can be mains or battery powered dependent on application and is compatible with any RTU provider.



MetriNet is an ultra low-powered, modular system for monitoring water quality and collecting data for a vast range of applications. This pioneering system utilises all the experience and expertise that ATi has earned over four decades of working closely with water utilities around the world.

The MetriNet system features sensors that have the same accuracy and reproducibility as our well-known and proven Q-Series sensors, combined with ultra-compact, full featured monitors in one small housing unit.

16 parameters, including:

Chlorine, Turbidity, pH, Conductivity, Dissolved Oxygen, Dissolved Ozone, ORP, Pressure, Temperature, Nitrite & Flouride.

As well as general monitoring applications, MetriNet can also be used for:

- Mains Conditioning
- Flow Reversal
- Network Resilience
- Chlorine Decay Modelling
- Leakage
- Flushing
- Legionella
- Renal Dialysis

At the heart of the system are ATi's new industry-leading M-Nodes, a complete sensor and transmitter housed in a miniaturised body.



M-Nodes are complete water quality monitors equivalent to traditional online instruments. The M-Nodes are connected to the water supply using a purpose designed 'click-connect' flow cell arrangement. M-Nodes are connected in series to minimise water usage and can run at pressures up to 6 bar. M-Nodes are ultra low-powered and run autonomously for years at a time on small batteries. Alternatively they can be powered from a local plc or telemetry system.

Flexibility is key with M-Nodes – they can be connected to any data gathering system. The modular nature enables users to assemble a monitoring package that fits individual site requirements. All M-Nodes plug directly into the MetriNet system and are powered directly from the communications bus.



The Metasphere RTU offers great flexibility, unparalleled reliability and scalability for use with countless applications. Designed to save money, time and reduce risk, they are globally operational on NB-IoT/ Cat-M1, 3G and GSM/GPRS networks.

- Powers and controls the M-Node water quality sensors
- Stores water quality data
- Transmits data to a preferred web portal



Key features

- Software configurable I/O; includes support for AI, CI, and DI
- Powers external loop and active voltage sensors
- External serial port for connecting intelligent sensors
- Built in 3G modem with auto switching internal and external antenna
- Lithium battery with an extended life of 5+ years
- IP68 unit enclosure is submersible to 4 metres for 4 days
- Very compact footprint of just 156mm x 110mm x 112mm
- Connects to Medina, DNP3 and WITS DNP3 Masters (e.g. ClearSCADA)
- Modbus master communicating over RS232 and RS485

Specification	
Memory	Stores up to 250 million records
Protocols	Connects to Medina, DNP3 and WITS DNP3 Masters (e.g. ClearSCADA).
Communication	Modbus master communicating over RS232 and RS485
Software	Flexible, software-configurable I/O: AI, CI & DI. Remote configuration & firmware upgrade
IP Rated	IP68 up to 4 metres for 4 days
Power	Lithium battery with an extended life of 5+ years
Dimensions	156mm x 110mm x 112mm
Connection	External serial port for connecting intelligent sensors

MetriNet User Interface



For a complete solution, M-Nodes can also be connected to the MetriNet User Interface (MUI). The MUI connects to up to 8 M-Nodes and connects to the outside world in via any 'ftp' based system – operating as independent modules that can be linked via a communication bus. The MUI also has on board data-logging with vast data storage capabilities. All M-Nodes plug directly into MetriNet systems and are powered directly from the communications bus. M-Nodes may be added or removed as needed and removal of a node will not affect system measurements. Sensor and bus connectors are IP-67 rated for maximum signal protection.

The MetriNet UI also allows setup and calibration of M-Nodes, as well as storing data and transmitting data to either local or remote locations. Electronic assemblies are galvanically isolated from both the power supply and communication link. Data sampling rates are user selectable to minimize power consumption. Data is stored locally in standard .csv file format for easy manipulation with spreadsheet programs. Cellular data transmission may be directed to commercial storage sites or directly to customer site.



MetriNet Benefits

Ability to measure anywhere means closer to customer

Can foresee potential issues by advising early, which avoids complaints and allows you to take mitigating action

Future-proof in terms of communication so it will be useful for a long time

Data value increases as the number of measuring points increase building a better picture of the whole network

Zero and span data stored internally so calibration can be done anywhere

Internal clock records total run time on the sensor

Calibration timer can alert users when calibration is due

Two alarm set points are available

Sensor diagnostics report problems in clear message form

16 character user defined 'Tag' name

MetriNet Features



Designed specifically for applications in water distribution networks, MetriNet allows 'no compromise' continuous measurement of all the main water quality parameters required.

M-Nodes

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Internal clock records total run time on the sensor

Calibration timer can alert users when calibration is due

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Controller

Accepts up to 8 M-Node sensor inputs

Stores data at user defined intervals from 0.1-60 minutes

Stores over 300K values, or 30 days of data for 8 sensors at 1 minute data interval

Options for cellular modem, Wi-Fi, or wired Modbus, Ethernet/IP, or Profibus DP

Internal Micro-SD RAM card provides data backup in the event of communication problems

Addition of a low power solenoid valve allows intermittent sample flow

Sensor diagnostics report problems in clear message form



WRAS Approved for Water Conservation



Regulation standards for potable water necessitates that sensors and flow cells meet a gold-standard of material compliance to ensure the materials used in the sensors do not contaminate the water. WRAS approval is the European hallmark of material quality required by the water sector to ensure this compliance. All potable water sensors need an audit trail to demonstrate that the materials used do not jeopardise water quality by polluting it with the residue left behind. Unlike WRAS approved analytical sensor technology, lower-cost sensors will plasticise the water, leaking chemicals into the source, which inevitably breaches standards by contaminating the water. This means that all water samples taken from the bypass to be tested are put to waste due to contamination from the sensor.

However, with WRAS approved, smart technology, like ATI's MetriNet, the sample can be immediately returned back to the network, resulting in zero wastage, on average saving approximately 288 litres per day per system, which is 102,528 litres per year. There is no cumulative leakage as the sampled water re-joins mains flow, meaning WRAS compliant technology is a reliable and environmentally sustainable method for gathering data, capturing events and understanding why they occurred.



Modular Flow System

MetriNet flow cells are modular, allowing assembly of from 1 to 8 flow chambers. Each chamber holds one M-Node sensor with a simple bayonet connection. A rotating lock-ring clamps flow chambers together for easy assembly. A flow control device is integrated into the outlet fitting of the MetriNet flowcell to control sample flow to 0.2 LPM over 10-100 PSIG (70-700 kPa) inlet pressure range.

The first flow chamber is supplied with a push-to-connect fitting for rigid 1/4" o.d. tubing. An internal mesh screen protects the flow element from particles larger than 100 micron that might enter the system, and is easily removed for inspection and cleaning, if necessary. DIN rail mounting clips attached to each MetriNet flow chamber allow assembled flow systems to be easily rail mounted.



Power Options

Power consumption requirements of traditional water quality monitors prevent their use in locations where AC power is not available. The low power design of the MetriNet system allows these monitors to operate on 12-24 VDC power, as well as battery power, without sacrificing reliability.

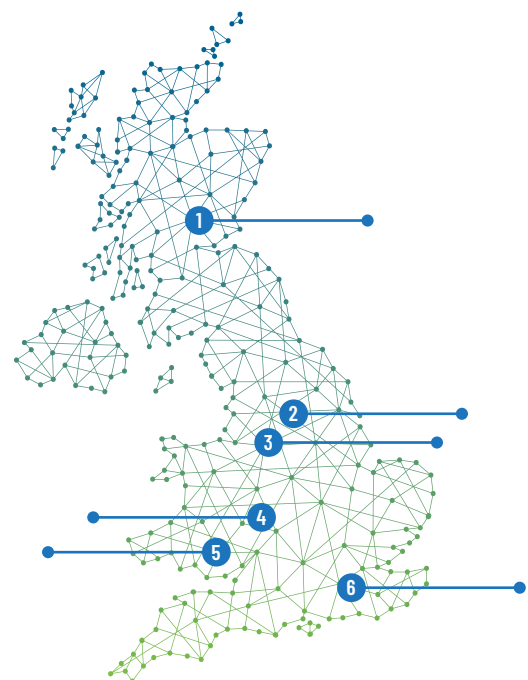
To further improve power consumption, the MetriNet system allows users to operate in either continuous or cycle modes. In full continuous mode, power is constantly applied to M-Nodes and measurements are continuously taken. When operating in cycle mode, the measurement nodes are placed in 'sleep mode' for much of the time. Every 15 minutes, the Nodes are switched to 'full power' for about 15 seconds in order to take a reading and store data. Operation in cycle mode extends battery life considerably.

System Type	Full Power Mode (at 12V)	Low Power Mode
12-24 VDC with modem	43 mA + 3 mA/node	15 mA + 3 mA/node
12-24 VDC without modem	30 mA + 3 mA/node	15 mA + 3 mA/node
12 V battery with modem	26 mA + 3 mA/node	4 mA + 3 mA/node
12 V battery without modem	12 mA + 3 mA/node	4 mA + 3 mA/node

Note: During modem operation, power draw can spike to about 150 mA for the duration of the data transfer. A typical daily data transfer takes about 3 minutes.

Site Location

MetriNet controllers contain a GPS module so that users may automatically identify the exact location of an installation. Using the GPS data, sites can be easily tied to map locations. If a controller is moved to another location, the position change is again updated.



Available M-Nodes

M-Node sensors are available for a variety of water quality parameters. Users simply select the parameters required for a specific location and assemble them into an integrated system.

All Nodes communicate on a common RS-485 sensor bus using Modbus protocol. Each M-Node has an IP-67 M8 water-tight connector for external communication. Power for the M-Node system is also supplied via the RS-485 bus. Nodes may even be used independently by system integrators who wish to communicate directly with the nodes using their own PLC system.



M-Nodes

Part Number	Parameter and Range	Resolution
00-1847	Free Chlorine 0-5.00ppm	0.01ppm
00-1848	Conductivity 0-2000uS	1uS
00-1849	pH 2-12 pH	0.01 pH
00-1850	ORP 0-1000mv	1 mv
00-1851	Dissolved Oxygen 0-20.00ppm	0.01ppm
00-1852	Dissolved Ozone 0-5.00ppm	0.01ppm
00-1853	Turbidity 0-40.00 NTU	0.01 NTU
00-1854	Combined Chlorine 0-5.00ppm	0.01ppm
00-1855	Total Chlorine 0-5.00ppm	0.01ppm
00-1856	Fluoride 0.1-10.00ppm	0.01ppm
00-1857	Chlorine Dioxide 0-2.00ppm	0.01ppm
00-1858	Peracetic Acid 0-200ppm	1ppm
00-1859	Hydrogen Peroxide 0-20.00ppm	0.01ppm
00-1863	4E Conductivity 0-2000mS	1uS
00-1864	Pressure 0-300 PSIG (0-20 Bar)	1 PSI

Flow System Components



Part Number	Description
03-0488	Flow Chamber with Inlet and Fitting
03-0489	Additional Flow Chamber
03-0491	Flow Assembly Outlet with Flow Regulator. 90° Fitting
03-0490	Flow Assembly Outlet w/out Flow Regulator. 90° Fitting
36-0067	Latching Solenoid Valve, 12 VDC
48-0217	DIN Rail for Flowcell Mounting
00-1890	Flowcell Plug
03-0495	4-Node Bus Bar

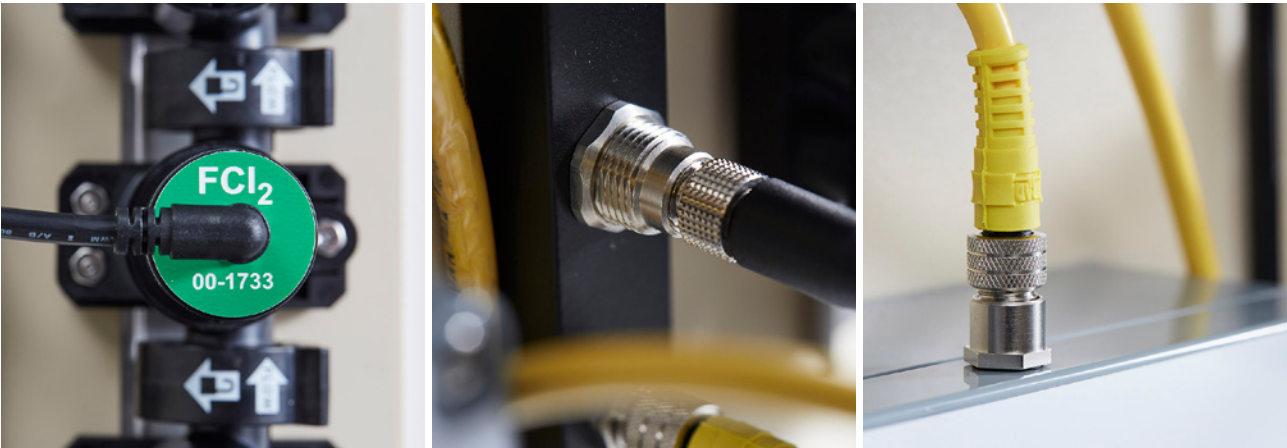
MetriNet Controller

Part Number	Description
00-1795	MetriNet Controller, 12-24 VDC with SD Card
00-1811	MetriNet Controller, 12 V Battery with SD Card
00-1796	MetriNet Controller, 12-24 VDC with SD Card and 3G Modem
00-1812	MetriNet Controller, 12 V Battery with SD Card and 3G Modem
00-1885	MetriNet Controller, 12V Battery with SD Card Modbus Enabled
00-1798	Portable M-Node Calibrator



Please email sales@atiuk.com for further information about other compatible logger options.

Part Number	Cabling
31-0202	Node to Bus Bar Cable 12" (30cm) Sensor to Bus Bar
31-0212	Q52 to Bus Bar Cable 18" (46cm) Controller to Bus Bar
31-0204	Q52 to Bus Bar Cable 155" (4m) Controller to Bus Bar
31-0211	Bus Bar Jumper Cable for 2 bus bar assemblies Bus Bar to Bus Bar
31-0208	Power Supply Interface Cable 12"
Part Number	Panels
03-0515	MetriNet 14"x14" Assembled Panel for up to 4 Nodes (Includes Panel, Bus Bar and DIN Rail)
03-0519	MetriNet 14"x20" Assembled Panel for up to 8 Nodes (Includes Panel, 2x Bus Bars, 2x DIN Rails and bus bar jumper cable)





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