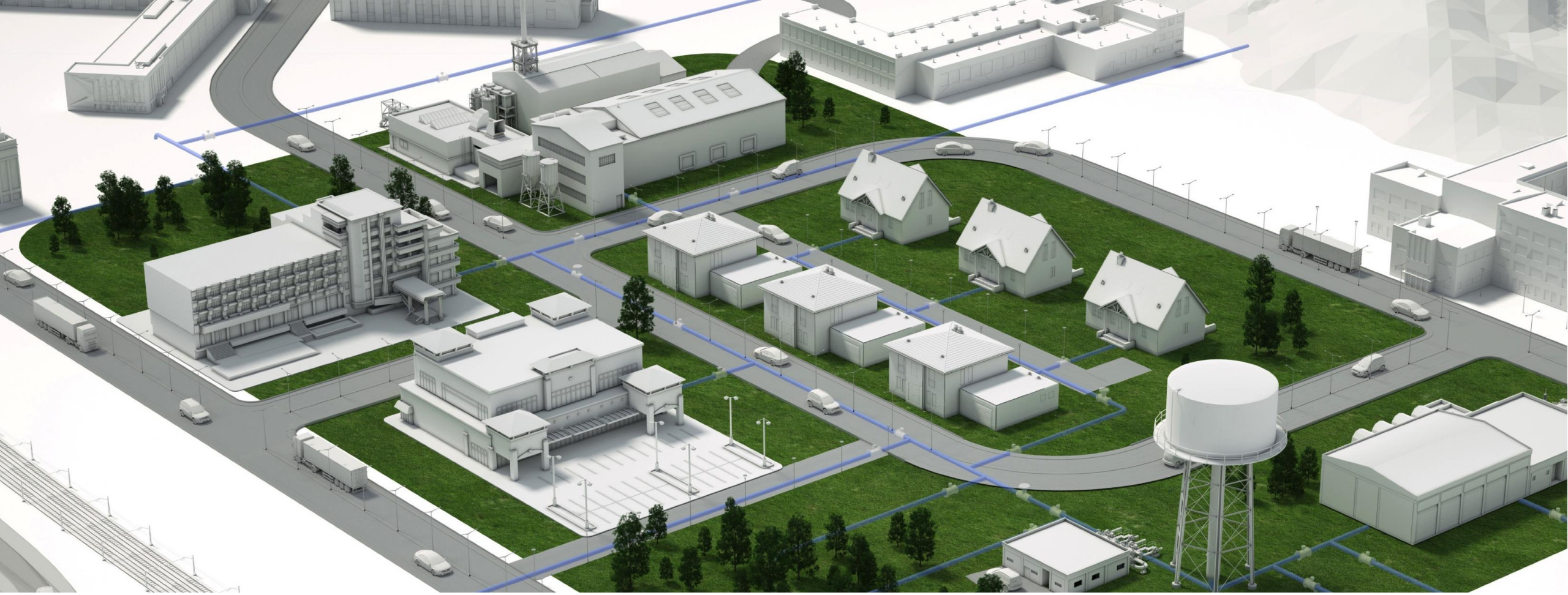


ABB WATER SOLUTION DAY 2022 | AUGUST 30, 2022 | MEASUREMENT & ANALYTICS

A more measured world of water & wastewater

Chris Krincevski, National Sales Manager AU/NZ
Water & Wastewater Industry Sales Manager SAMEA Region

ABB

Speaker Introduction

Chris Krincevski

National Sales Manager AU/NZ & Industry Sales Manager W&WW – SAMEA Hub

Measurement & Analytics

ABB Automation Products

601 Blackburn Road Notting Hill Victoria Australia

Mobile: +61408 293 178

E-Mail: chris.krincevski@au.abb.com

Chris drives the Water & Wastewater business for ABB across the South Asian, Middle East and Africa regions. He is also the National Sales Manager for AU/NZ.

Experience

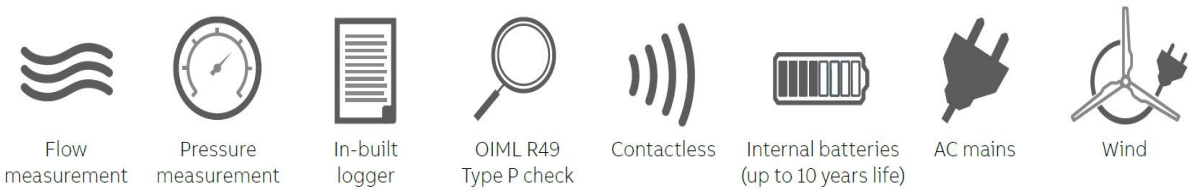
- >22 years overall instrumentation sales experience and >15 years product management experience
- Chris holds an Honors degree in Chemical Engineering from University of Melbourne

ABB...Our History and Portfolio

Aztec · Bailey · BOMEM · Bush Beach Engineering Limited · Fischer & Porter · Hartmann & Braun · K-TEK · Kent · LGR Los Gatos Research · Pressductor® · SENSYCON · Schoppe & Faeser · Spirit · Taylor · TBI-Bailey · TORBAR Flowmeters Ltd · TOTALFLOW Measurement & Control Systems

ABB Elecromagentic Flowmeters

Aquamaster 4, Watermaster, Processmaster



AquaMaster4 – Electromagnetic Flowmeter

For Drinking water network management, abstraction and irrigation

Masters of Flow Measurement

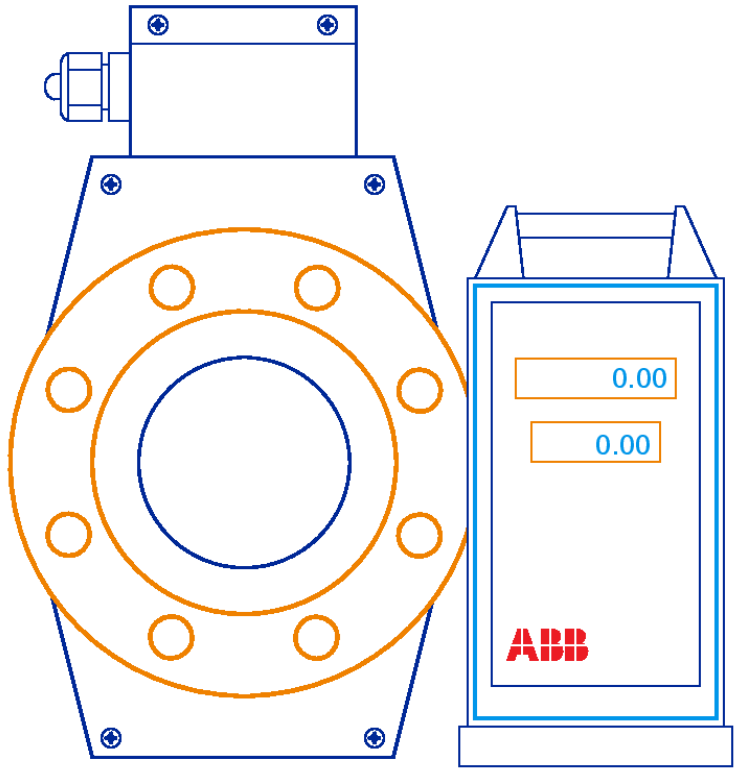
The original brains behind the world's 1st

1988

ABB invented the world's

1st

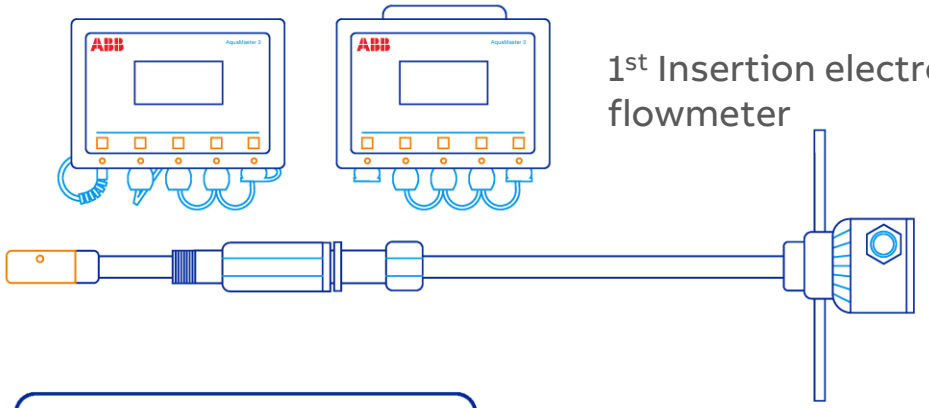
Battery-powered electromagnetic flowmeter for District Metered Area (DMA)



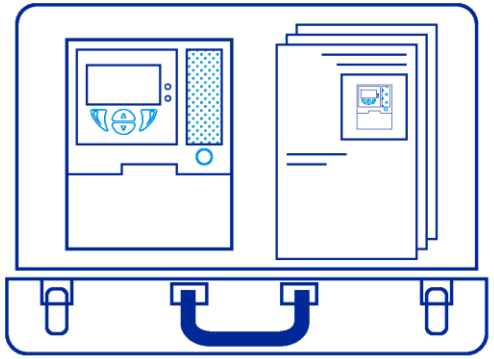
Masters of Flow Measurement

The original brains behind the world's 1st ….continued for decades

1995



1st Insertion electromagnetic flowmeter



1996

1st In-situ electromagnetic flow meter verification system

2000

1st 0 x diameter upstream and 0 x diameter downstream sensor technology

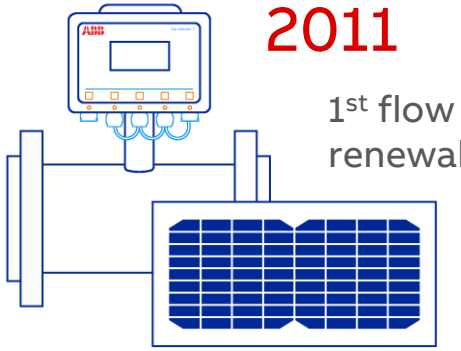
2004

1st 'integrated' GSM communication technology in flow meters

2006

1st self-verifying flow meter

2011



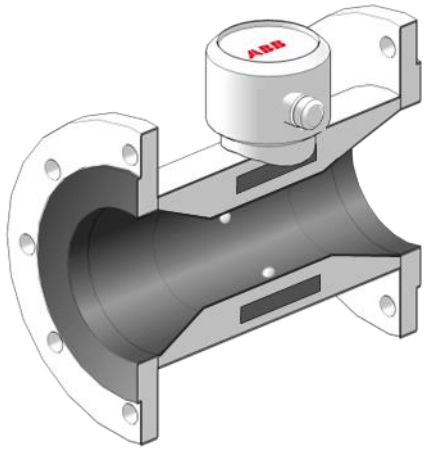
1st flow meter powered with renewable energy

2014

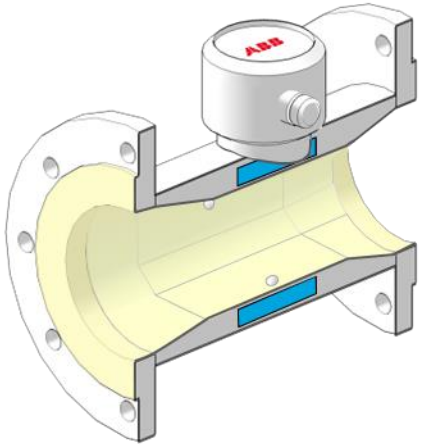
1st Water Industry Telemetry Standards (WITS) integrated flow meter

AquaMaster4 - Increase confidence in your revenue billing meter

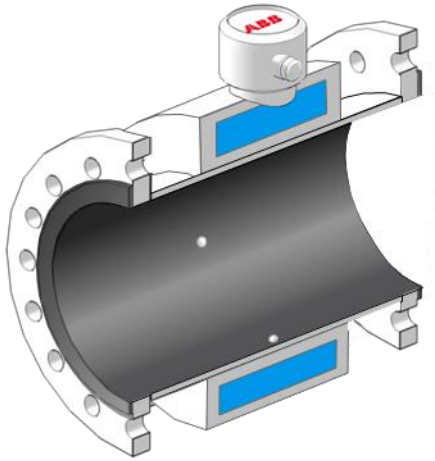
Our breadth for the right application



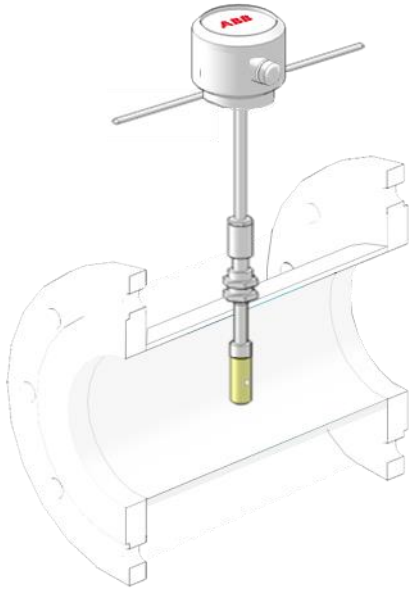
Reduced Bore Sensor
DN40 to 600
Pressure drop typically 0.075 Bar @ 2.5m/s
Inlet 0xDN / Outlet 0xDN



Octagonal Bore Sensor
DN40 to 200
Pressure drop typically 0.016 Bar @ 2.5m/s
Inlet 3xDN / Outlet 0xDN



Full Bore Sensor
DN250 to 2400
Minimum pressure drop
Inlet 3xDN / Outlet 2xDN



Insertion probe Sensor
300 to 1000 mm
Minimum pressure drop
Inlet ≥ 25xDN/Outlet 5xDN

Benefit

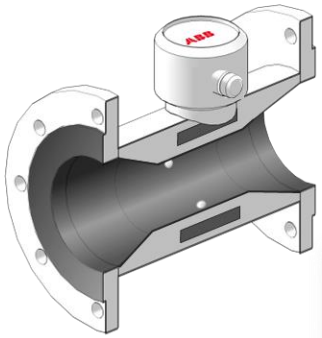
One size doesn’t fit all. Hence we offer the right sensor for the right application

AquaMaster4 - Reduce losses by minimising Non-revenue Water

Values only we offer

Source: Macclesfield Express

- Low flow rate capability with a high turndown range (R) enables minimal night flow rates to be metered accurately using ABB’s Reduced bore (R) sensor
- External pressure transducer with no requirements for any additional transmitter



Benefit

Manage leaks and pressure in your distribution network - reduce waste and prioritise OPEX strategically

NRW applications often require OIML certification

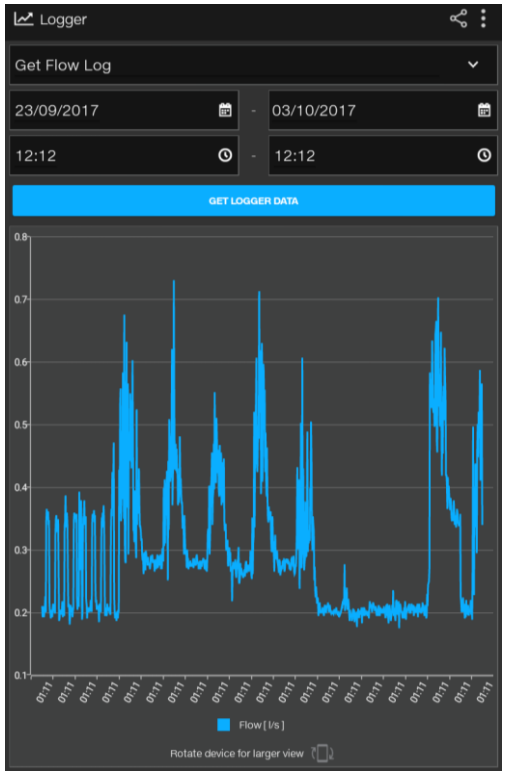
AquaMaster4 - Invest smartly through 'Single box' DMA solution

In-built data logger to allow investigation in detail when needed

Logs three parameters in non-volatile memory – **Flow rate, Pressure, Volume flow** (forward, reverse and net). All records fully retained in the event of power loss. Note: real time clock will need resetting after total power loss.

Internal memory capacity

- Flow & Pressure = 45,871 records or 31 days at 1 minute or 477 days at 15 minutes
- Volume Totals = 3120 records or 8 years at 24 hours fixed
- Data can be requested for any time window
- Oldest data is overwritten once full



Benefit **Reduce CAPEX through a single box solution**

AquaMaster4 - Achieve lowest TOTEX with the use of Velox app

Values only we offer

Increase productivity of your staff and reduce human error with the use of ABB’s Velox app.

Secure | Contactless | Offline | Chart

Benefits

1. **What used to take minutes will take seconds – increase productivity**
2. **What used to require skilled personnel will require less skilled personnel – deal with deskilling**

AquaMaster4 Mobile Comms

AquaMaster4 Premium – A new paradigm in long range flow metering

Standard (FET41x)

Comms over Pulse/Sensus

Measure – Flow

Advanced (FET43x)

Comms over Pulse/Modbus/Sensus

Measure – Flow & pressure

In-built logger

Higher accuracy

Premium (FET45x)

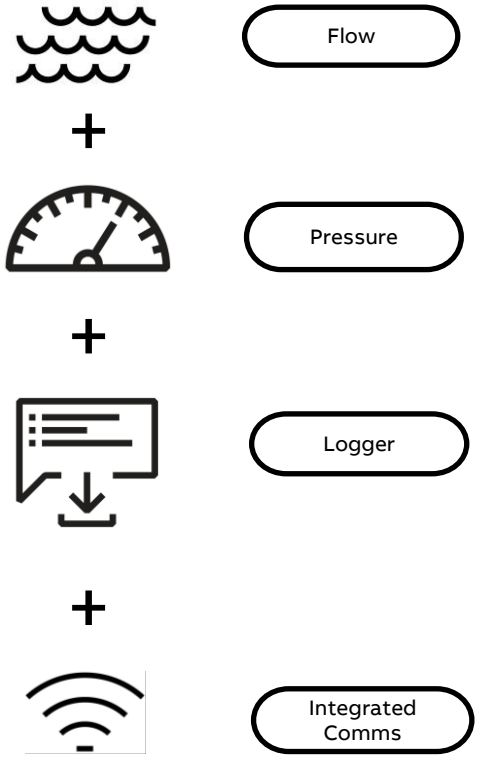
Comms over 4G (FTPS)/NB IoT (LwM2M over CoAP)

Bi – Directional Communication ,

OTA firmware upgrade Audit log

Measure – Flow & pressure

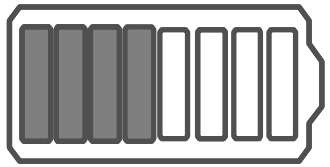
Digital Output – Pulse / Modbus



Single Box Solution

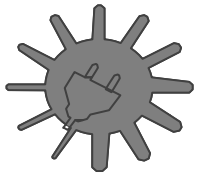
AquaMaster4 - Achieve lowest TOTEX with longer consumables’ life

Reduce OPEX by extending the life of consumables or eliminating the need for one

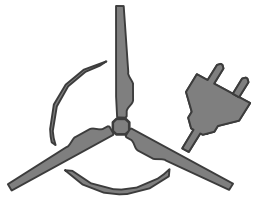


Up to 10 years life from 2 x standard Li batteries

AC Mains



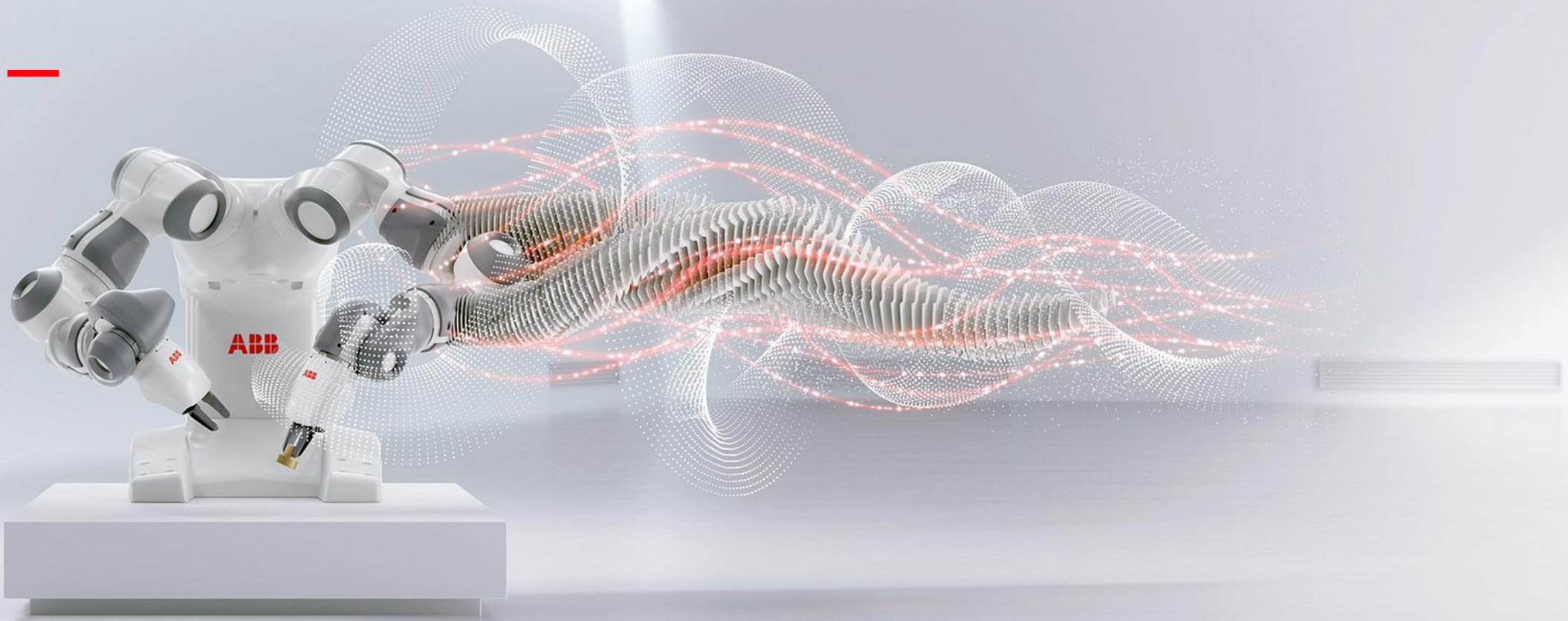
Solar



Wind

- Powered from Industry standard Lithium D Cells (2 off) **up to 10 years life**, batteries are user fitted and replaceable. Each battery can be replaced without loss of logger contents enabling smooth switchover.
- Mains-only option with a built-in rechargeable super capacitor backup power source can operate for **up to 16 days without power** (depending on operating conditions)
- Solar/Wind power option uses a simple DC (6 to 32 V) connection from as small as a 5 W solar panel/wind generator. With a built-in rechargeable super capacitor backup power source can operate for **up to 48 days without power** (depending on operating conditions)

Benefit	**Extend life of consumables without sacrificing performance**

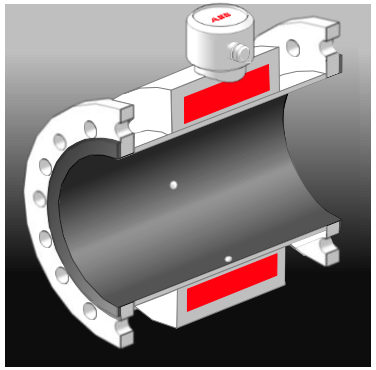


WaterMaster

Sensor Overview

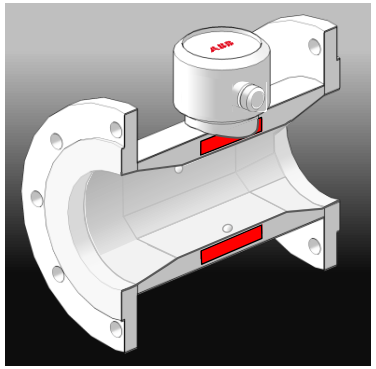
Sensor Overview

Application of Flow Sensor Versions



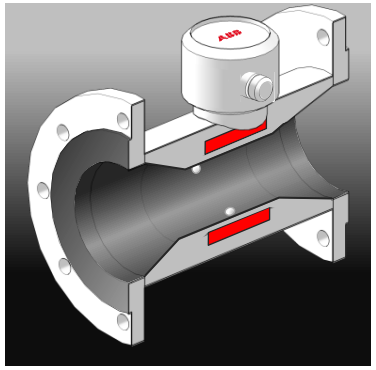
FEW

– Full bore Sensor
  - Maximum Capacity 15 m/s
  - Minimal Pressure Drop
  - Optimal accuracy @ >0.5 m/s
  - Straight pipe, Inlet 3xDN, Outlet 2xDN



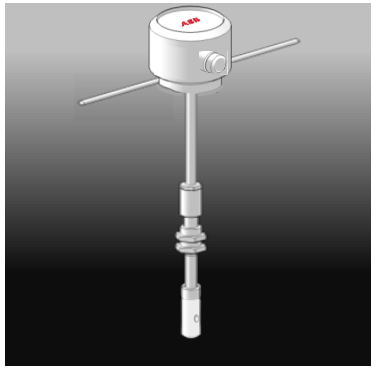
FEV

– High Capacity Reduced Bore Sensor
  - Maximum Capacity ~ 10 m/s
  - Pressure Drop ~ 0.016 Bar @ 2.5 m/s
  - Optimal accuracy @ >0.4 m/s
  - Straight pipe, Inlet 3xDN, Outlet 0xDN



FER

– Reduced Bore Sensor
  - Maximum Capacity ~ 5.5 m/s
  - Pressure Drop ~ 0.075 Bar @ 2.5 m/s
  - Optimal accuracy @ >0.2 m/s
  - Straight pipe, Inlet 0xDN, Outlet 0xDN



FEA

– Insertion Type Sensor
  - Maximum Capacity ~ 5 m/s
  - Low Pressure Drop in most cases
  - Qmin >0.2 m/s
  - Straight pipe, Inlet 25xDN, Outlet 5xDN

WaterMaster Sensor Memory

Power & Flexibility in a Value Added Package

Sensor Memory

- 'Fit & Flow' data storage
- Intelligent sensor
- All data items duplicated in both memory locations
- Self repairing in the rare event of a data corruption
- Total security
- Total integrity
- Option of resin filled sensor terminal box for extra protection

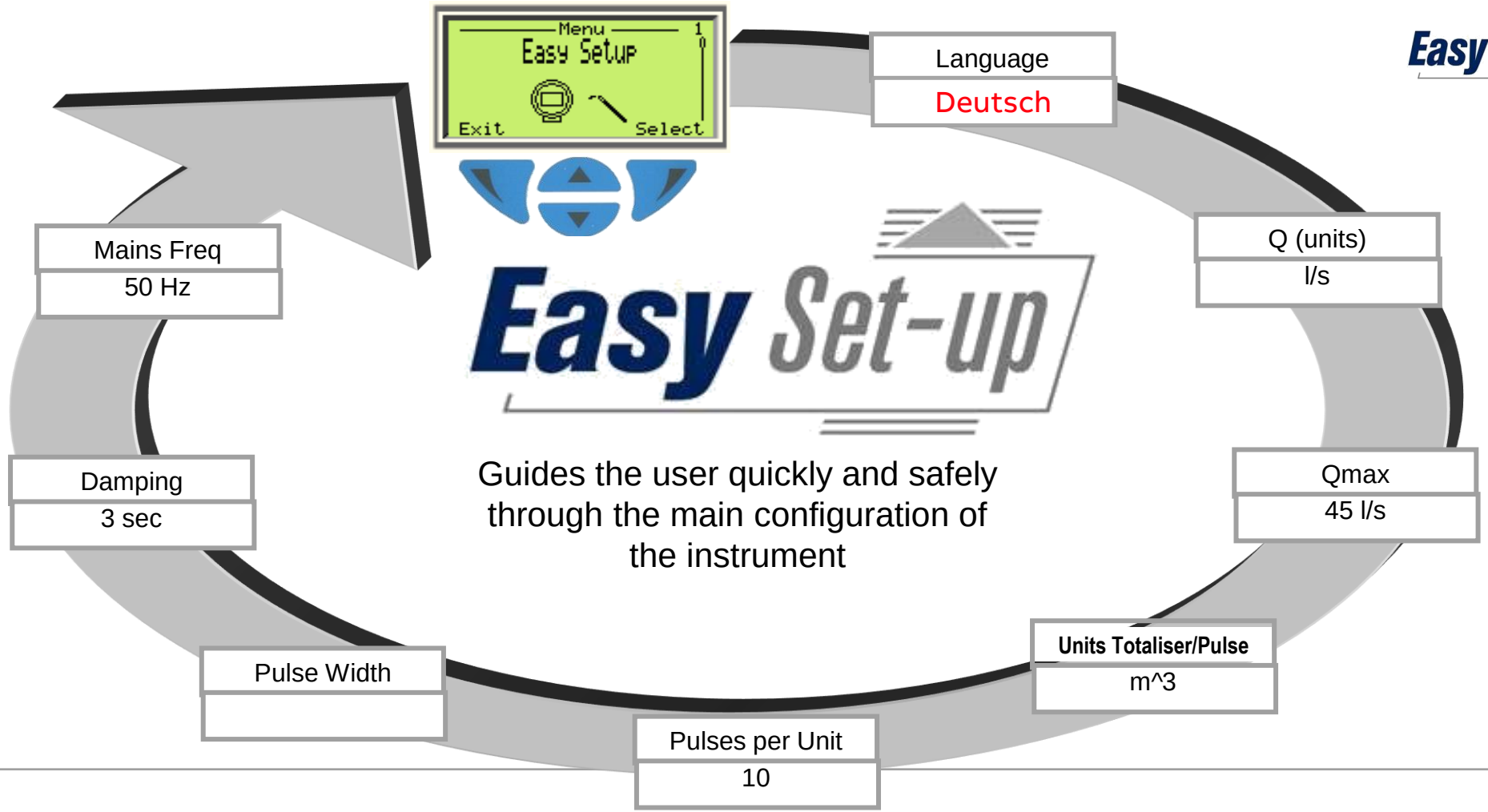
WaterMaster Product Features

Continuously Self Calibrating Electronics

- **Self-calibrating transmitter**
- Highest accuracy
- Calibrates itself every 60 secs
- The World's first EMF to self verify
- Virtually zero drift due to :-
  - Component Aging
  - Temperature Gradient

FEx121 WaterMaster Remote Electronics

Power & Flexibility in a Value Added Package



Process/Hygienic Master 600

Snapshot

WaterMaster

Full,Reduced,Octagonal

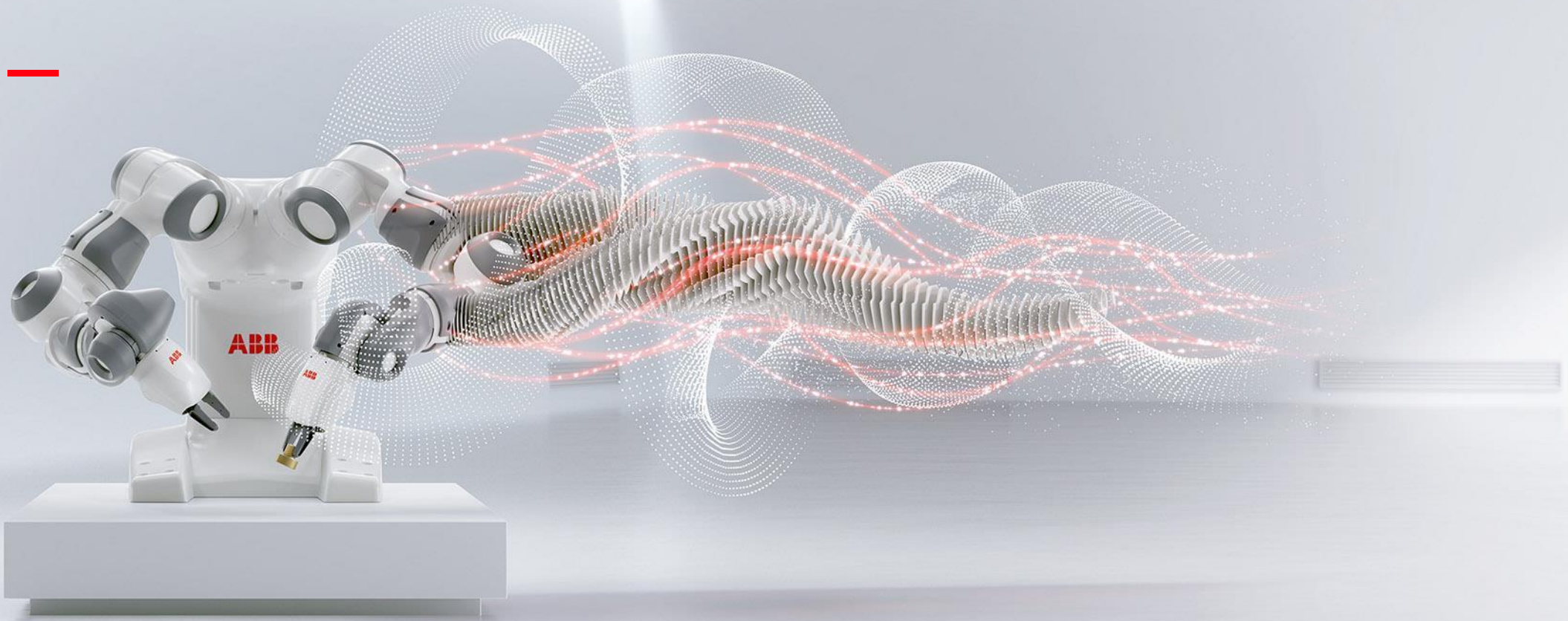
AquaMaster

ProcessMaster

HygienicMaster

FSM4000

Process Master can be used by in chemical dosing applications.



AquaProbe insertion flowmeter

The next level in flowmeter versatility

AquaProbe insertion flowmeter

FEA121 and FEA221

FEA121
AquaProbe FEA100 sensor +
WaterMaster mains transmitter

FEW4XX.A
AquaProbe sensor + AquaMaster
battery transmitter

Features

- Suitable for pipe diameter from 200 to 8000 mm
- Accuracy ±2% (or ±2 mm/sec) of measured velocity
- Volume – refer ISO 7145-1982 (BS 1042 section 2.2) for details
- Bi-directional flow
- IP68/NEMA6P (Indefinite submersion down to 10 m [30 ft.])
- Multiple power options

Benefits

- No moving parts and rugged construction
- Hot tap capability meaning Easy, low cost installation into existing pipelines
- Price virtually independent of pipe size
- Suitable for permanent or temporary installation

AquaProbe insertion flowmeter

Reasons to choose the new AquaProbe with AquaMaster4

- Fit and Flow' design eliminates need to match the probe and transmitter. All calibration factors, site settings, serial numbers and totalizer values are stored in the probe and uploaded to the transmitter during installation
- Easy, low cost installation into existing pipelines without the need for costly and time-consuming installation work required by full bore meters
- Suitable for a wide range of temporary or permanent installations, from long-term leakage monitoring to short term surveys
- Solid state technology without any moving parts, offering low maintenance and high reliability
- Rugged and robust design, providing peace of mind and prolonging product life

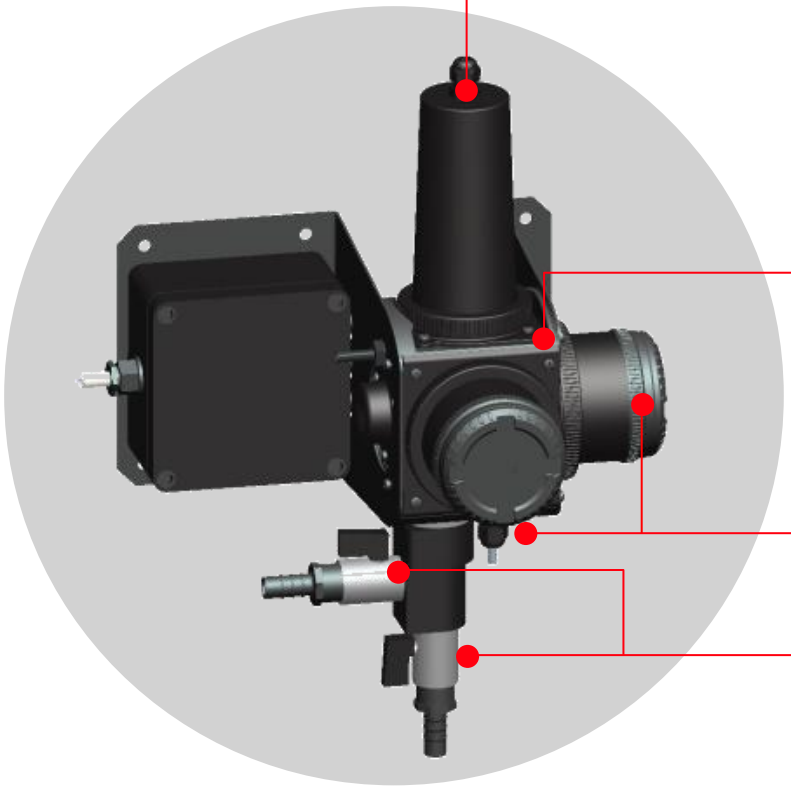
ABB Continuous Water Analysers

4690 Turbidity Systems

Accurate, Reliable Turbidity Measurement

Water quality monitoring

On-line turbidity measurement – ABB 4690



Dry Calibration Standards

Auto-clean system

Low-volume Flow Cell

Emitter & Receiver Assemblies

Integrated Sample Inlet & Drain Valves

Automatic cleaning of optical cell

Reduces maintenance and ensures accuracy

- Optical cell fouling greatly reduces accuracy of turbidity measurement
- ABB's 4690 Sensors feature an Auto-clean system that overcomes the problem of optical cell fouling
- Mechanical wiper assembly physically wipes clean the optical cell at user-programmable intervals
- No need to regularly disassemble the sensor to inspect/ manually clean the photocell window
- Reduces maintenance and lowers cost of ownership whilst ensuring accuracy and reliability

Dry secondary calibration standard

Simplifies routine instrument verification

Optomechanical filter that diverts a fixed quantity of light to the detector corresponding to a known turbidity value

Each standard is factory calibrated and certified against primary formazine standards

Provides a quick and simple verification/calibration procedure that minimizes instrument downtime

Reduces the need for liquid standards and laboratory time taken to prepare such standards – thus reducing cost of ownership/OPEX

Minimises employee's exposure to Formazine which is highly toxic and a suspected carcinogen

Simple to **use**, **repeatable** and **reliable**

Calibration Standards will operate across the specified operating range of the sensor, to suit the application

Insert directly into sensor body during calibration procedure

AW400

Features and benefits

Proven measurement principle based on open cell technology
- Fast response time, able to measure free or total chlorine, chlorine dioxide and ozone

Self cleaning sensor assembly
- Prolongs sensor life and maintains sensitivity

Reagentless operation
- Reduced operating costs with reagentless operation when <pH7.5 or less

Optional reagent feed assembly
- For the measurement of total chlorine or free chlorine in waters with a >pH7.5

Integral pressure regulator
- No additional plumbing required to ensure optimum sample delivery rate and pressure

Multiple sensor input capability
- Reduced installation costs for multiple point monitoring operations

Optional PID control
- Allows direct control of dosing pump

Low maintenance design
- Simple to install, use and maintain

The AW400

Range and application

Chlorine, chlorine dioxide and ozone are powerful oxidants that are used to destroy a wide range of harmful pathogens

Parameter	Range	Applications
Chlorine (Free or Total)	**0.005 … 20 mg/l**	Potable water treatment Municipal wastewater treatment Boiler cooling water Large HVAC systems and holding tanks
Chlorine Dioxide	**0.005 … 20 mg/l**	
Ozone	**0.005 … 20 mg/l**	

Next generation Water Sensors & Analysers

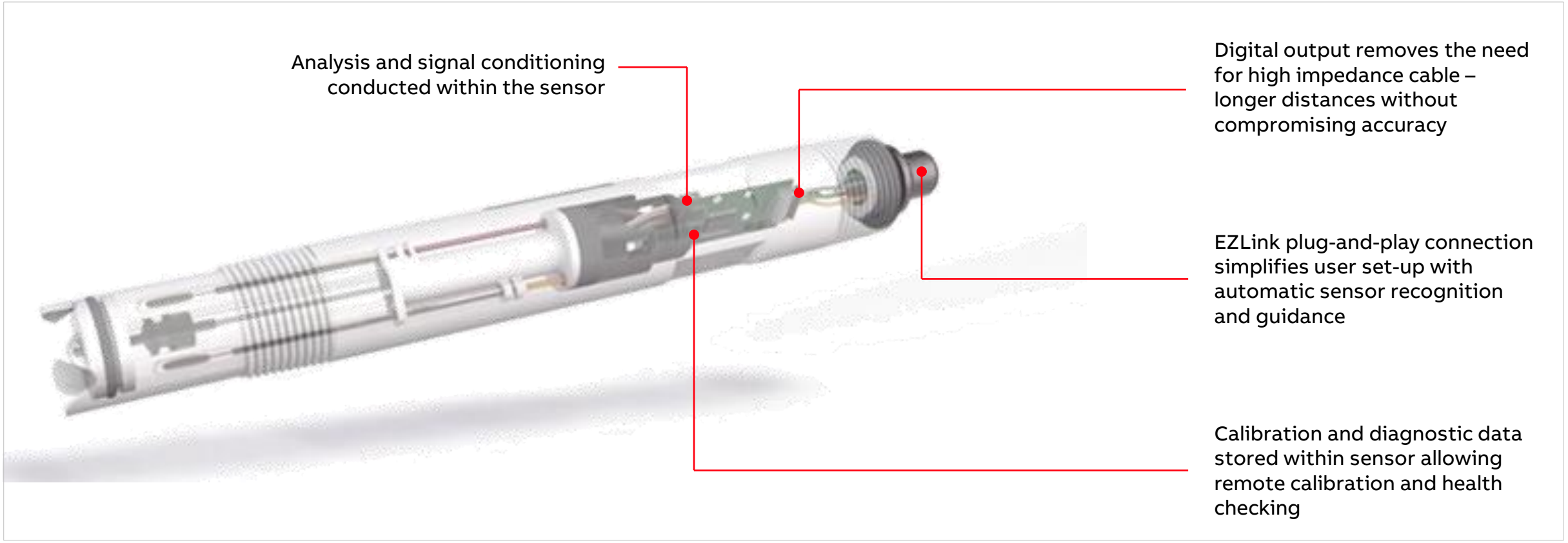
The most versatile pH range that works the way you want to work

Taking water analysis to the next level (pH)

The top-performing products - AX, AP and TB re-designed for the age of digitalization – AWT and APS

A smarter way to measure pH

EZLink digital connectivity



Continuous sensor diagnostics

The pH sensor that tells you when it’s time to change!

Customers dispose of analogue and competitors’ digital probes prematurely to avoid failure during operation – ALL pH probes are ‘consumable’

Electrode lifetime is known to be difficult to predict – sensor failures can occur slowly, such as the gradual poisoning of the reference electrode or sudden as in the case of pH electrode breakage.

Intelligent diagnostics increase operational confidence and maximize electrode service life. Enabling users to reduce Opex without risking process control.

Reference Electrode Monitoring (REM) system provides early warning notification of electrode poisoning.

Perpetual impedance diagnostics detect electrode faults in real-time without the need for a solution earth providing detection of broken glass or out of sample

Extended storage

New storage solution design for long term storage

We understand most customers maintain stock of pH/ ORP sensors in case of unexpected demand. Ensuring peak performance, even after extended storage, is critical in maintaining product availability and keeping your process running.

The new range of pH sensors are stored in a specially formulated solution with added anti-microbial agent keeping the sensor active for up to 2 years when stored as recommended.

Next generation pH range

Simplified electrode selection, maximized electrode performance

100 Series
Entry level electrodes for light duty applications

500 Series
Durable electrodes for harsh processes

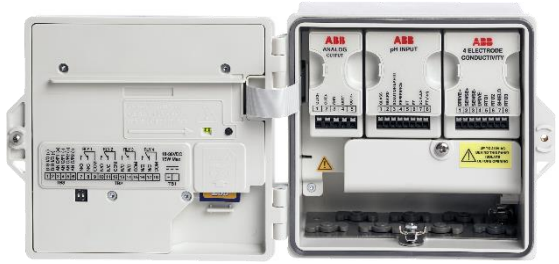
700 Series
Specialist range for target applications

100E	100GP	100ULTRA	500PRO	500X	700ULTRA	700M
pH 0-14 0…60°C/ 32 … 140°F 6 bar 12mm	pH 0-14 0…60°C/ 32 … 140°F 6 bar ¾”	pH 0-14 -5… 100°C/ 32 … 140°F 6 bar ¾”	pH 0-14 -5…105°C/ 23 … 221°F 12 bar ¾” & Hot-Tap	pH 0-14 -5…150°C/ 23 … 302°F 20 bar ¾” & Hot-Tap	pH 0-14 -5… 100°C/ 32 … 140°F Atmospheric 12mm	pH 0-14 0…60°C/ 32 … 140°F 6 bar ¾”
Entry level 12mm economy analog sensor	Cost effective sensor for general purpose applications	Cost effective sensor for low conductivity applications	High performance industrial sensor for harsh applications	Durable industrial sensor for the toughest processes	Flow through sensor for low conductivity applications	Robust and responsive sensor for Marine applications
– Drinking water – Irrigation – Hydroponics – Aquaculture	– Drinking water – Municipal wastewater – Cooling water – Food & bev	– Boiler water – Demin water – Power plants – Steam water analysis – Reverse Osmosis – Condensate/ feedwater	– Wastewater effluents – Scrubbers – Dye baths – Mineral processing – Paper mill	– Pulp & Paper – Oil & Gas – Petrochem	– Boiler water – Demin water – Power plants – Steam water analysis – Reverse Osmosis – Condensate/ feedwater	– Ballast water – Exhaust gas scrubbers

Common accessories

Sensor & communication options – AWT420

Pre-calibrated, simple and quick to install



Communication Modules

Sensor Modules – T1 Module now available for 4690 turbidity

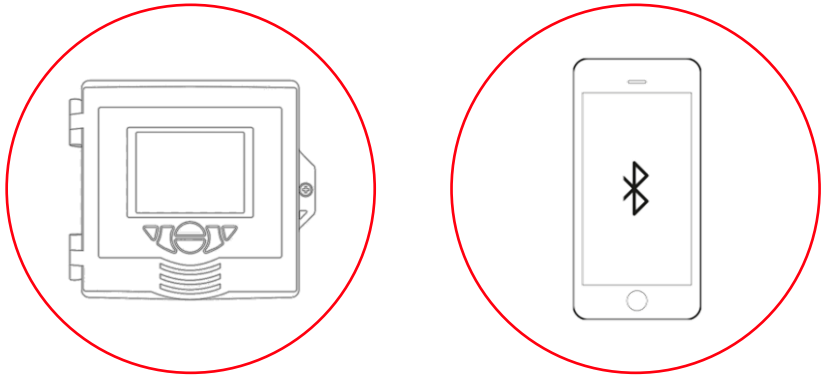
HART®	PROFIBUS® DP	MODBUS	Ethernet	Additional Analog Output	pH/ORP	2-electrode Conductivity	4-electrode Conductivity	EZLink (Safe Area)	Low range Turbidity
Provides seamless integration into your plant control system					Fully compatible with ABB's extensive range of robust sensors				Turbidity

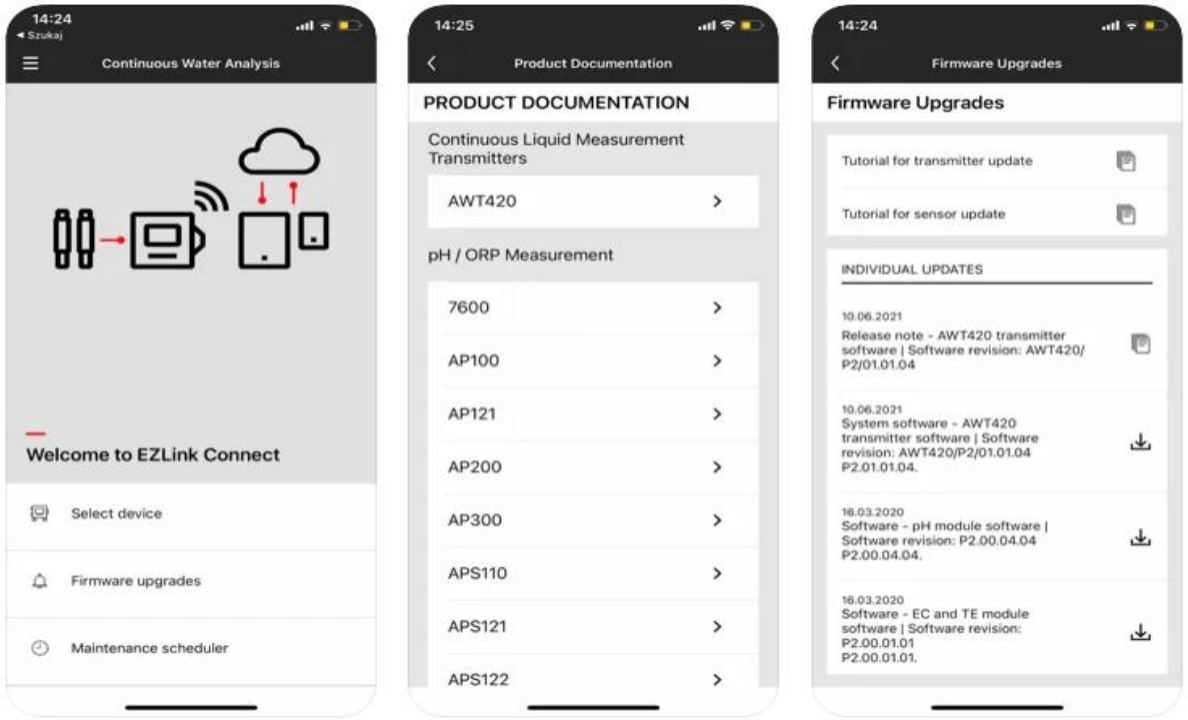
Each module is electrically calibrated at the factory and provided with an individual test certificate

AWT440 also available – 4 x digital sensor inputs

Access support where and when you need it

Connect to any smart device using the EZLink app (AWT420)





ATS430 Smarter, faster and more accurate

Turbidity and Suspended Solids Measurement

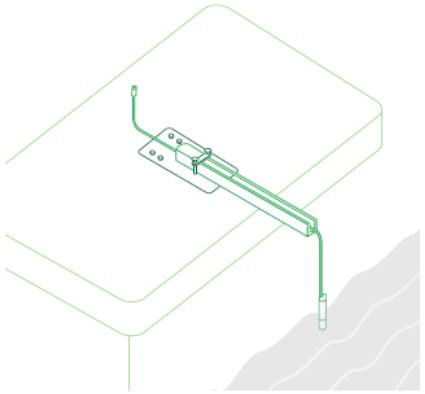
Analysis and signal conditioning is conducted within the robust sensor housing and transmitted digitally to the transmitter

4000 NTU or 100,000 mg/l

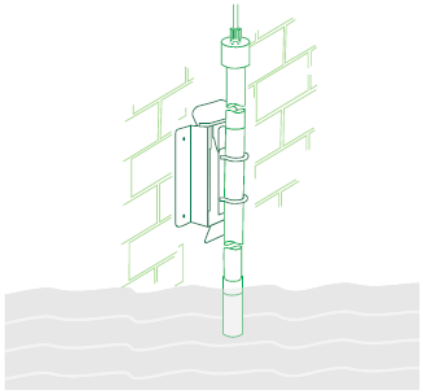
- Plug-and-play digital sensor connection
- Automatic sensor recognition and set-up
- Waste Water TSS
- Enhanced measurement accuracy

ATS430 Options

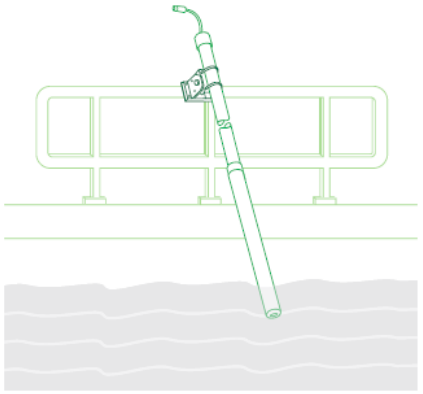
A choice of mounting options



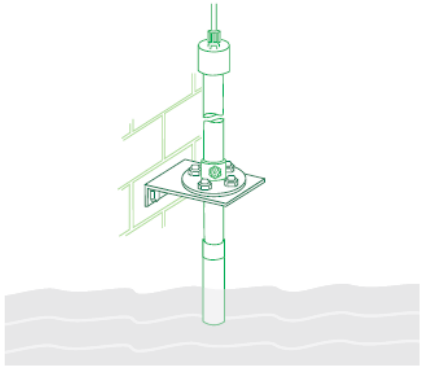
1. Open channel mounting – suitable for floor/ wall (surface) mounting



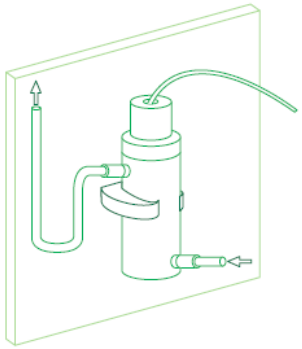
2. Wall mounting – suitable for mounting dip pole



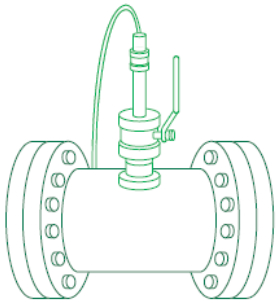
3. Dip pole mounting – suitable for handrail or wall mounting



4. Open tank flanged dip mount



5. Flow cell pipeline mount, suitable for wall / surface mounting



6. In-pipe mounting, suitable for installation in pressurized systems

ATS430 Turbidity - Measurement made easy

Quick, safe and cost-effective verification

Benefits of ABB's sensor verification and calibration kit:

- Simple and fast procedure makes calibration quick and easy, providing minimum analyzer downtime
- Saves time and money by reducing:
  - Consumable chemical standards
  - Time taken to prepare chemical standards
  - Cost of waste disposal
- One or more kits can be used for all ATS430 sensors
- Eliminates employee exposure to harmful formazine

Say goodbye to chemical standards that can be difficult to prepare, costly and hazardous

ABB's sensor verification and calibration kit

ADS430 Dissolved Oxygen - Simply snap on and start measuring

Smart sensor cap

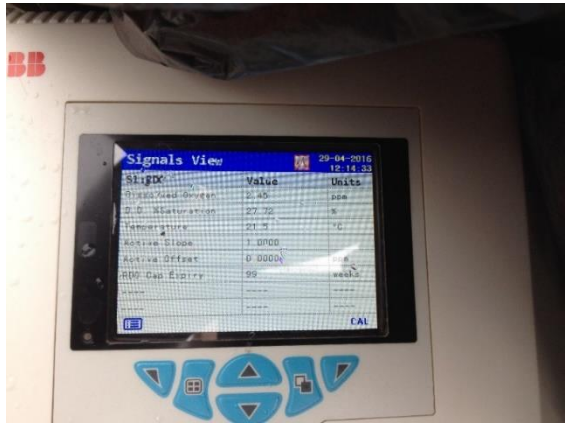
The ADS430 Sensor Cap is pre-loaded with factory calibration coefficients, serial number, lifetime indication and

manufacture date

- Each SmartCap is provided factory calibrated ready for use
- Automatically uploads SmartCap data to ADS430 probe
- Eliminates programming errors
- Eliminates user calibration errors
- Provides up to 24 months continuous use
- Maintenance diagnostics provide advance warning when SmartCap replacement is due

ADS430 Customer Trials

Robust, Accurate and Cost Effective



ADS430 - Versatile installation options for any DO application

Range of sensor mounting kits

The ADS430 sensor is available with a range of mounting options for open tank and channel installations as well as a flow-through system for wall or panel installation

Dip-mount & Floating Ball Assemblies & Kits

Handrail Mounts

Chain Mount System

Flow Cell

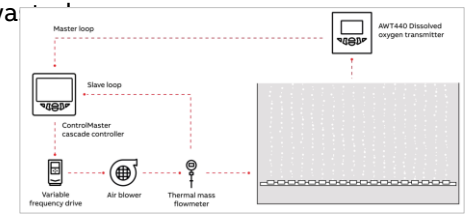
Wastewater treatment plant – Dissolved Oxygen & Thermal Mass

Air measurement with SensyMaster FMT

The application

Dissolved Oxygen (DO) is a key ingredient in the secondary treatment (Biological phase) of wastewater treatment.

- DO is added to the aeration basin to provide **oxygen** to the **microorganisms** so they can convert organic wastes into inorganic byproducts.
- DO concentrations must be **carefully controlled** - too little and the bacteria will die, and the organic waste will not be broken down, too much and energy is wa



- The Energy costs associated with the operation of the aeration process are typically 2/3.

ABB Solution

ABB offers the Dissolved Oxygen System comprising of the **ADS430 Optical DO Probe** and **Multi-Channel Digital Transmitter** (Product: AWT440 & AWT420) to measure the levels of the dissolved oxygen.

The **SensyMaster FMT430** measure the **air flow into the aeration basin**.

FMT430

Optional for analytical

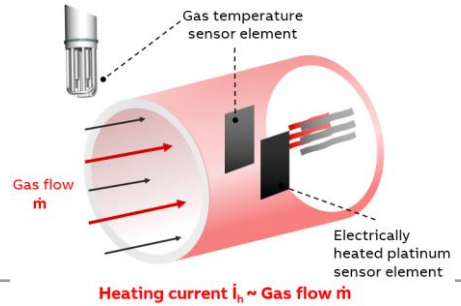
AWT440

ADS430

Advantages of principle

The measuring method of the SensyMaster flowmeter series is based on the hot-film anemometer principle. They offer a high quality and cost-effective solution for precise and dynamic direct mass flow measurements of gases in low and medium pressure conditions.

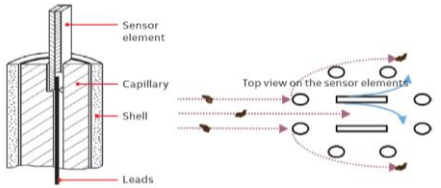
- Direct mass flow measurement → No compensation of temperature and pressure required
- Low pressure drop - No additional energy losses
- Best accuracy and shortest response time - Close control of the process



Thermal sensor elements

SensyMaster provide a sensor element protection frame to conditions the flow for:

- Best response time and repeatability due to thin platinum sensor element
- Self-cleaning effect of the sensor element for longer maintenance cycles
- Long term stability without drift



And mechanical protection to:

- ✓ **Prevent damage by particulate material**
- ✓ **Extend meter lifetime and maintenance cycles**

chris.krincevski@au.abb.com

Did you know…

We make conductivity cells

You will find our sensors being used for:

- High purity water applications
- Potable & Wastewater
- Steam water analysis – AC200
- Industrial applications eg: Pulp & Paper
- Compatible with AWT210 & ATW420
- 2 electrode, 4 electrode and toroidal

Aztec 600 ISE & Colorimetric Analysers

Aztec 600 ISE & Colorimetric range

Measurement throughout drinking water treatment

	Aluminium	Ammonia		Colour	Fluoride	Iron	Manganese		Phosphate
	AW631	AW632	AAM631	AW637	AFM631	AW633	AW634	AW635	AW636
									
	Col	Col	ISE	Col	ISE	Col	Col	Col	Col
Monitoring Point									
Influent	-	-	✓	✓	✓	✓	✓	✓	✓
Aeration	✓	✓	✓	✓	✓	✓	✓	✓	✓
Flocculation water	-	-	-	✓	-	-	-	-	-
Clarified water	✓	-	-	✓	-	✓	-	-	-
1st stage filtrate	✓	-	-	✓	-	✓	-	-	-
2nd stage filtrate or outlet of GAC contactor	✓	-	-	✓	-	✓	-	✓	-
Final Effluent	✓	✓	✓	✓	-	✓	-	✓	✓

ABB Ammonia & Phosphate in Wastewater

Customer installation in Australia

ABB Laser and Ultrasonic Level

MEASUREMENT AND ANALYTICS

Laser level Technology in Water and Wastewater Applications

Level measurement

Water & waste water market trends

Traditional trends

- ❑ **Trend from contact to non-contact**

- ❑ **Non-contact level measurement**
  - Ultrasonic uses sound waves
  - Open-path radar uses radar waves

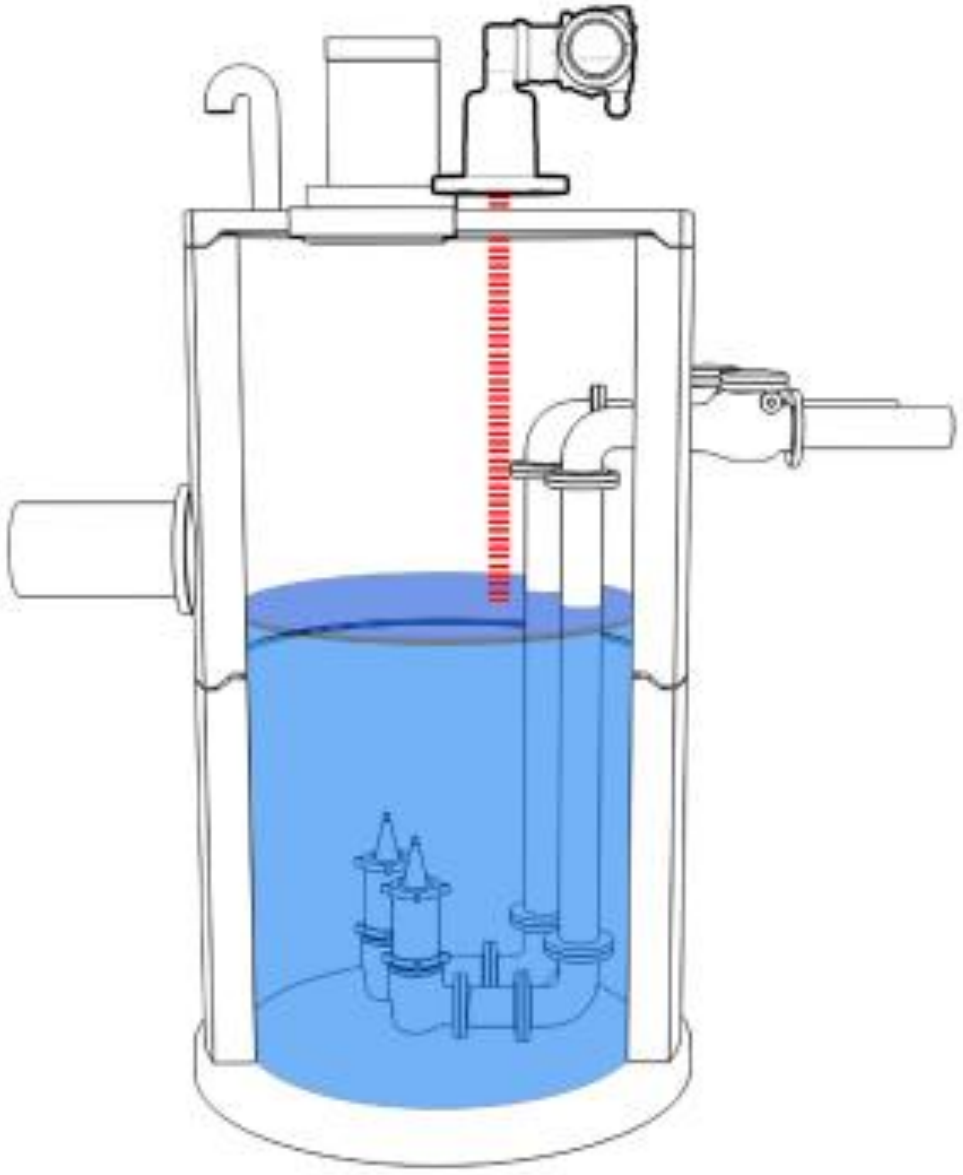
- ❑ **Typical problems**
  - Hard to setup, requires training
  - Costly installation
  - Narrow beam units are costly
  - False echoes lead to unreliable measurement and additional maintenance costs
  - Moisture on the lens

Lasers are changing level measurement

Significant growth in W&WW since LLT100 launch

ABB: The leader in laser level measurement

- ❑ Up to 30 m (100 ft.) for liquid level applications
- ❑ Up to 100 m (330 ft.) for solid level applications
- ❑ Up to 200 m (650 ft.) for positioning applications
- ❑ Operating temperature –40 °C to +60 °C (–40 °F to +140 °F)
- ❑ 4-20 mA current output with HART 7
- ❑ Powered from the 4-20 mA loop
- ❑ Heated Lens
- ❑ Certified for potentially explosive atmospheres (dust and gas atmospheres) ATEX and IEC Ex.
- ❑ Eye safe laser. Class 1.
- ❑ ABB Easy setup HMI. Common configuration. TTG platform.



One easy setup menu will enable setup of 90% applications on one menu.

Mastering tough applications with laser level measurement

Common industrial problems

Lasers can play a key role in providing a complete W&WW solution

- Tough level measurement applications lead to intensive maintenance or loss of uptime
- Many W&WW applications can be done by lower cost devices
- Many applications are challenging and represent significant maintenance costs for the users
- Competitor Ultrasonic replaced by ABB Laser

We are very comparable to the narrow beam Open path Radar products. The best on the market is 3°

Municipal water applications

Deep waste water wet well / sewers

Application

- Deep and narrow well
- Waste water gas affects the reading from some products
- Condensation on fascia ultrasonic – goes full scale
- ATEX/IEC Ex certified

LLT100 Benefits

- Positioned at the top of the wet well allowing easy maintenance.
- Laser technology unaffected by sewer gas
- Heated lens prevents condensation forming
- Dust tubes also help against condensation - +/-5°
- No calibration or maintenance required
- Easy to aim in deep and narrow spaces

The LLT100 can be mounted directly up against the wall. No need for the min 30cm requirements of other non-contact devices.

Ultrasonic Level

LST200 and LST300

HOME » OFFERINGS » MEASUREMENT & ANALYTICS » LEVEL » ULTRASONIC LEVEL TRANSMITTERS AND SWITCHES » LST200

GLOBAL SITE

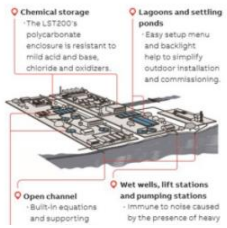
Ultrasonic level transmitter LST200

Level measurement is a key requirement in many industries where accurate data on liquid levels is needed for purposes ranging from managing storage through to reporting. In water and wastewater treatment applications, where dozens of level devices may be used, a product that offers simple commissioning, reliable operation, fast delivery and easy maintenance offers tremendous customer value.

Developed in conjunction with our customers and drawing on ABB's extensive experience in level measurement, the LST200 ultrasonic level transmitter offers a simple, smart and reliable level measurement solution. Featuring a modular design, the LST200 utilizes the latest developments in digital sensing technology, including built-in smart chip and an interface for upgrading with future modern data acquisition methods such as NB-IoT, offering the full benefits of digitalization for improved measurement and sharing of data.

Key features

Typical water and wastewater applications



HOME » OFFERINGS » MEASUREMENT & ANALYTICS » LEVEL » ULTRASONIC LEVEL TRANSMITTERS AND SWITCHES » LST300

Compact ultrasonic level transmitter LST300

The LST300 is a high performance ultrasonic level transmitter that accurately measures level, distance and open channel flow in ranges up to 10m (30ft). It is a non-contact, level measuring instrument designed for use on liquid level in a wide range of applications and industries.

Overview | Data | Fieldbus & HART | Download | Service

LST300 represents the future of level measurement. While using intelligent compact transmitters has always been attractive, certain limitations prevented their use in many applications. LST300 removes those old obstacles. Whether you have the risk of flooding or corrosive materials in the process, LST300 survive these conditions easily. With metal at the top and PVDF at the bottom, LST300 is the first compact ultrasonic to be resistant to corrosion on the entire instrument. Ingress protection approvals up to IP68 (optional) ensure the entire device can survive flooding.

LST300 combines the most advanced functions found on any ultrasonic in any class, in a compact form. Installation becomes easy thanks to the graphic echo display and advanced diagnostics. The false echo filtering algorithm combined with the best-in-class beam angle ensures easy installation in narrow areas with many obstructions. With through the glass technology, you never have to open the cover to configure the instrument. It is hard to believe that all this functionality is available on a device powered by only two-wire loop power.

FEATURES:

- Maintenance free, non-contact continuous level sensor
- 2-wire instrument with HART digital communication
- Up to 10 m measurement range
- Wide temperature range of -40 to 85 °C
- Accuracy of ±2 mm or 0.2 % of full span (the larger one)
- Beam angle as low as 5° with false echo filtering for narrow spaces
- Easy installation with graphic echo display, advanced diagnostic and easy setup menu
- Unique GAP technology ensures the best performance under any condition
- IP66/67 and NEMA 4X (can submerge to 1 m depth for 30 minutes)
- ATEX, IEC & FM Intrinsic safe and non sparking approved

OPTIONS:

— Through the Glass (TTG) buttons, standard push buttons or without HMI interface

— 6 m (20 ft.) or 10 m (32 ft.) measurement range

— FM, ATEX, IECEx or NEPSI approved, intrinsically safe or non-sparking

— Standard, extendable or floor mounted brackets available for easy installation

— Flange mounting options

Laser vs Ultrasonic

What's the difference?

Beam divergence

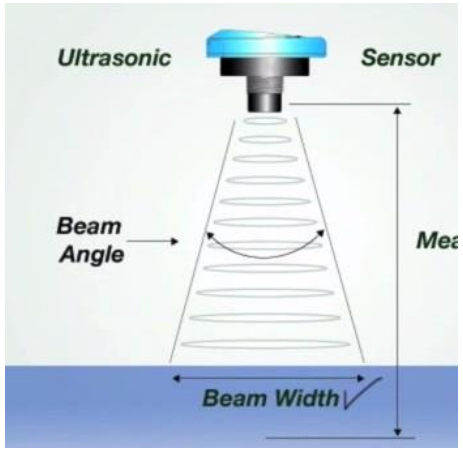
Δ < 0.3°

Beam spot width

Distance	1 m (3 ft)	3 m (10 ft)	5 m (16 ft)	10 m (33 ft)	20 m (66 ft)	30 m (98 ft)
Approx. spot width	0.7 cm (0.3 in)	2.0 cm (0.8 in)	3.3 cm (1.3 in)	6.6 cm (2.6 in)	13.5 cm (5.3 in)	20 cm (7.9 in)

Ultrasonic

- ❑ Wide beam angle (5-12 Deg typically)
- ❑ Wider footprint needed
- ❑ Restricted installation – cannot be mounted close to edge of vessels/pit walls
- ❑ Effected by moisture condensing on the fascia – full scale!
- ❑ Not suitable for wet wells, sewer pits
- ❑ Takes longer to commission
- ❑ Speed of sound
- ❑ Up to 10m for liquids
- ❑ Transducer must be perpendicular to the level



LLT100 Benefits

- ❑ Positioned at the top of the wet well allowing easy maintenance.
- ❑ Narrow footprint
- ❑ **0.3 Deg Beam angle**
- ❑ Laser technology unaffected by sewer gas
- ❑ Heated lens prevents condensation forming
- ❑ Dust tubes also help against condensation - +/-5°
- ❑ No calibration or maintenance required
- ❑ Easy to aim in deep and narrow spaces
- ❑ Verification technology (ABB SRV500)
- ❑ Speed of light
- ❑ Up to 30m for liquids
- ❑ +/-5 Deg to the perpendicular

Example – With beam angle of 5 Deg, Ultrasonic needs 17.2" clearance, laser needs 2.6" for a 10m range

ABB Pressure Transmitters in W&WW

PxS100 – The Essential Pressure Transmitter

The game changer in water & wastewater markets

PxS100 – The Essential Pressure Transmitter

New high visibility HMI with backlit display

ABB 266 Differential Pressure

The new HMI has:

- high visibility thanks to
  - Wide display dimensions (2 inches)
  - Backlight option
- improved touch response for best interaction

Display menu is constructed with intuitive and easy interaction logic similar to the existing ABB navigation standards.

On top, the multiple-teeth HMI board grants full flexibility in setting any position for display readability, with a +180°/-180° rotation available.

PxS100 – The Essential Pressure Transmitter

Flexible process connections: Threaded Adapters Modularity

Double threaded connection

Threaded adapters

Flanged Level

One single sensor can drive up to more than 300 equivalent models combining adapters, turndown and certification options

PxS100 – The Essential Pressure Transmitter

Application examples

Sewerage water

Application conditions

Sewerage water is often viscous or containing suspended objects / particles.

How does PxS100 provide a solution?

PxS100 with front bonded diaphragm is designed not to be blocked or clogged as it might happen with a typical NPT connection.

PxS100 – The Essential Pressure Transmitter

Application examples

Pressure Reducing Valves (PRV)

Application conditions

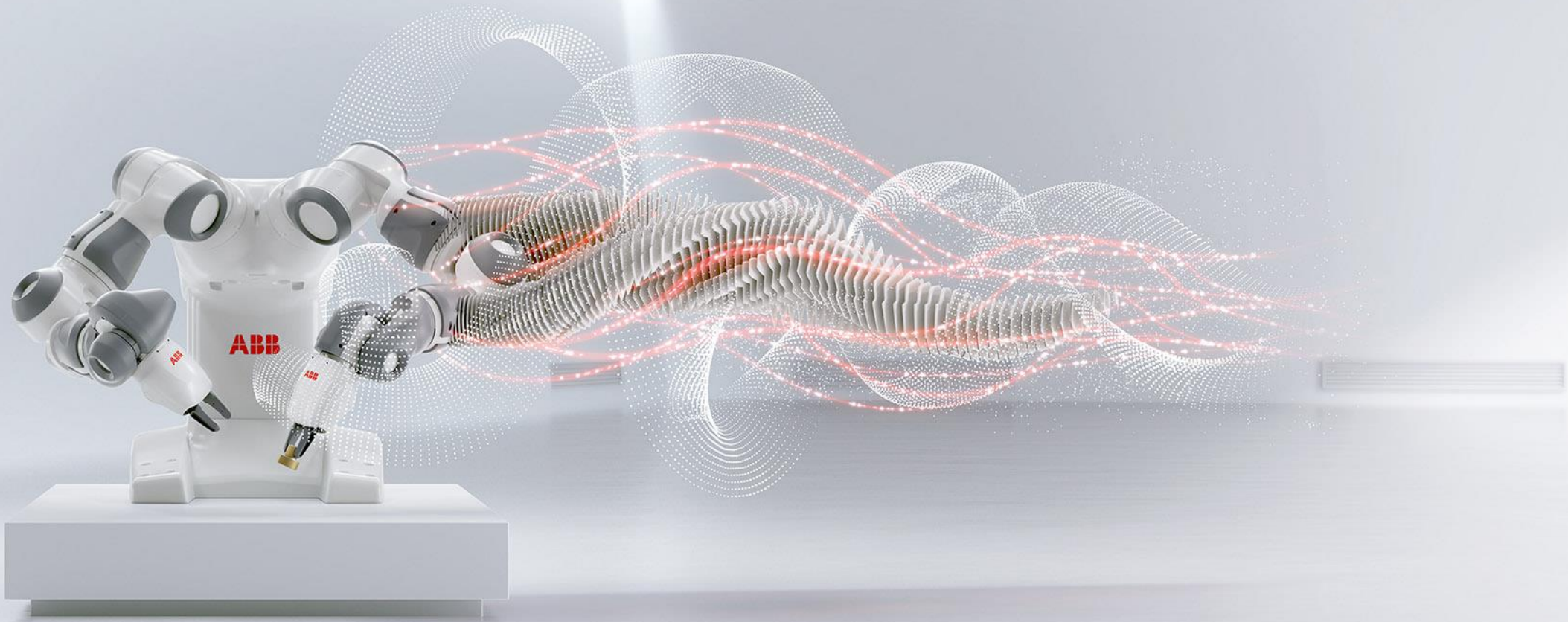
PGS100 gauge model is available with standard process connection to fit such simple installation.

Since sometimes PRVs are installed below ground level, PGS100 delivers IP67 and IP68 to ensure

How does PxS100 provide a solution?

Pressure Reducing Valves (PRV) – a gauge pressure transmitter on each side of the PRV so you can see up and down stream pressures and calculate what the pressure drop is across the valve.

ABB Digital



ABB

How Digitalisation Is Increasing Productivity In Water

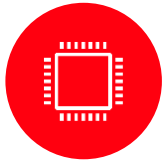
Digitalisation in Water

Digitalisation – It's Power

How do we access it?

What can we do with it?

How do we keep it simple?



Technology – What is digital?

Preventative Maintenance – How does digital technology enable this?

Data driven analysis – a proactive approach

The Promise of Digital Transformation

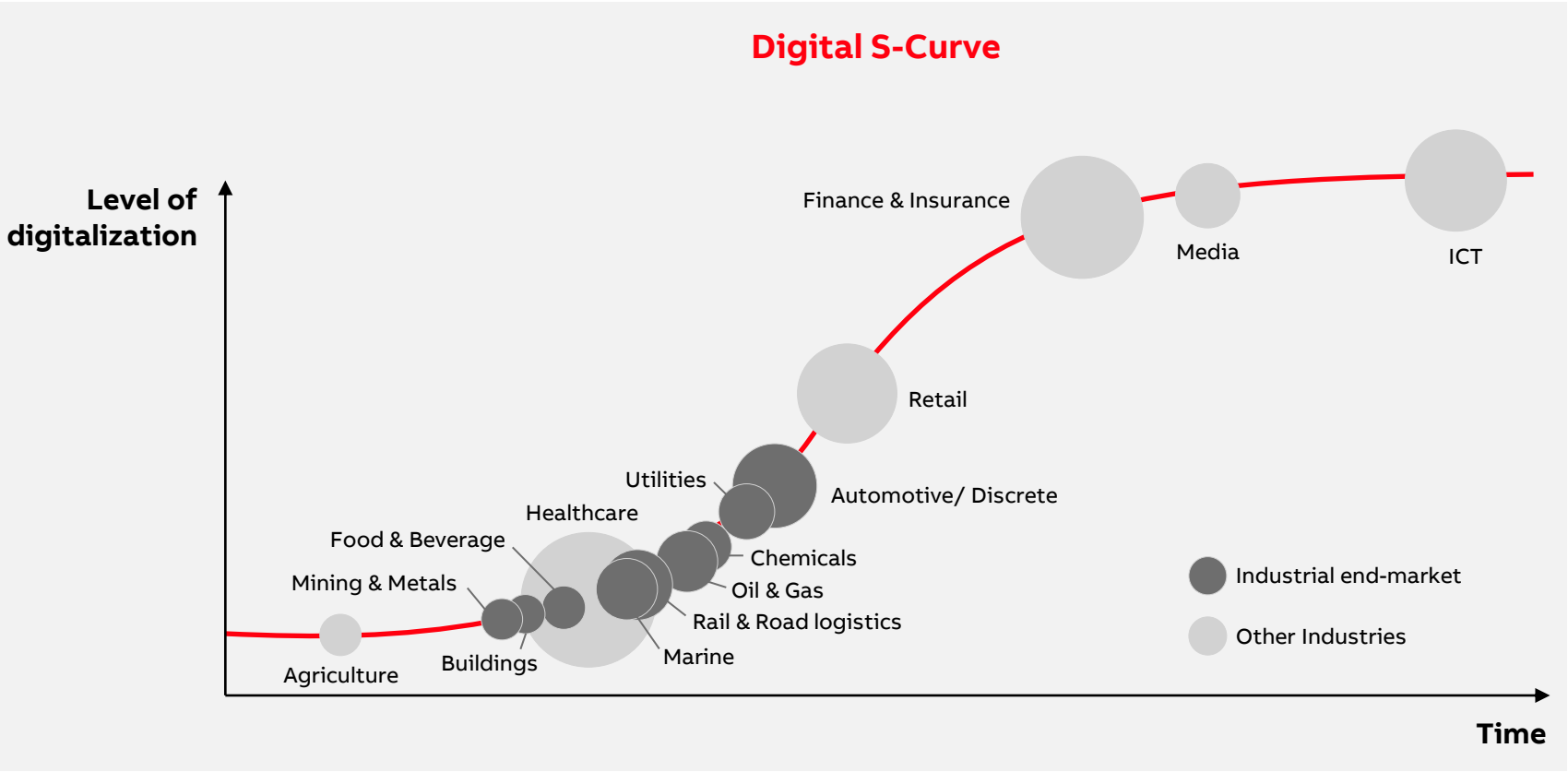
Digital S Curve

Water companies globally are looking to data – more data, more frequently – as a silver bullet to improve efficiency and lower cost

Without being able to convert data into meaningful action, they are simply getting overwhelmed

The water industry is slowly moving up the digital S-curve

However, the unfamiliarity of viable solutions is a significant restraint



Digitalisation in Water

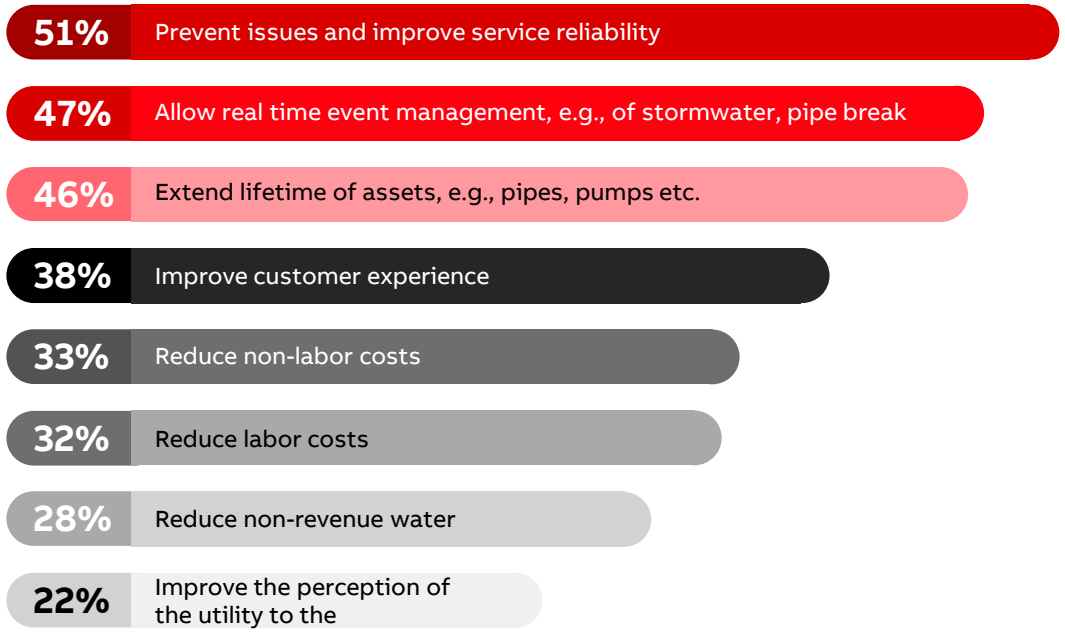
What Are The Benefits of Digitalisation?

51 percent

of water companies stated that:

- Preventing issues Improving service reliability
- Let's look at two examples where Australian water companies have managed to do just that

Benefits of digital solutions to utilities



% among top 3

Industry survey carried out by Amane Advisors
Source: Amane advisors.

Case Study 1

Digitalisation In Continuous Fluoride Measurement

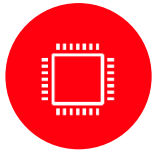
- Melbourne's largest water company using digital technology to manage fluoridation of drinking water better
- Data (mg/L) must be accessible and reported to the local authority
- Traditional measurement technology required a high level of manual intervention, increasing the cost of ownership and waste
- The water company trialled a **Profibus enabled Fluoride Analyser**. This allowed data on sensor diagnostics and alarms to be digitally communicated back to the control room
- The two-way communication enabled technicians to remotely interrogate the instrument as well as to instigate a calibration during the backwash process rather than when the process was online
- This overcame the issue of the fluoride plant being forced "off-line" during the calibration process, ensuring continuous operation

Fluoridation of drinking water is a critical measurement that must be monitored and controlled accurately.

Case Study 1

Digitalisation In Continuous Fluoride Measurement (cont.)

The result was notable uplift in the efficiency (four hours per calibration cycle, typically one calibration per week).

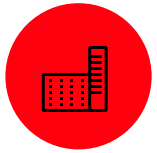


Allowing technicians to focus on core activities.

Site visits became more targeted, taking the guesswork out of which spares/ tools to take.

A predictive maintenance regime for the fleet was employed by logging the spares requirement through asset management.

The self-calibrating sensor further reduced the need for expensive external services, with monthly savings of $1,500 per analyser (with up to 19 analysers on-site).



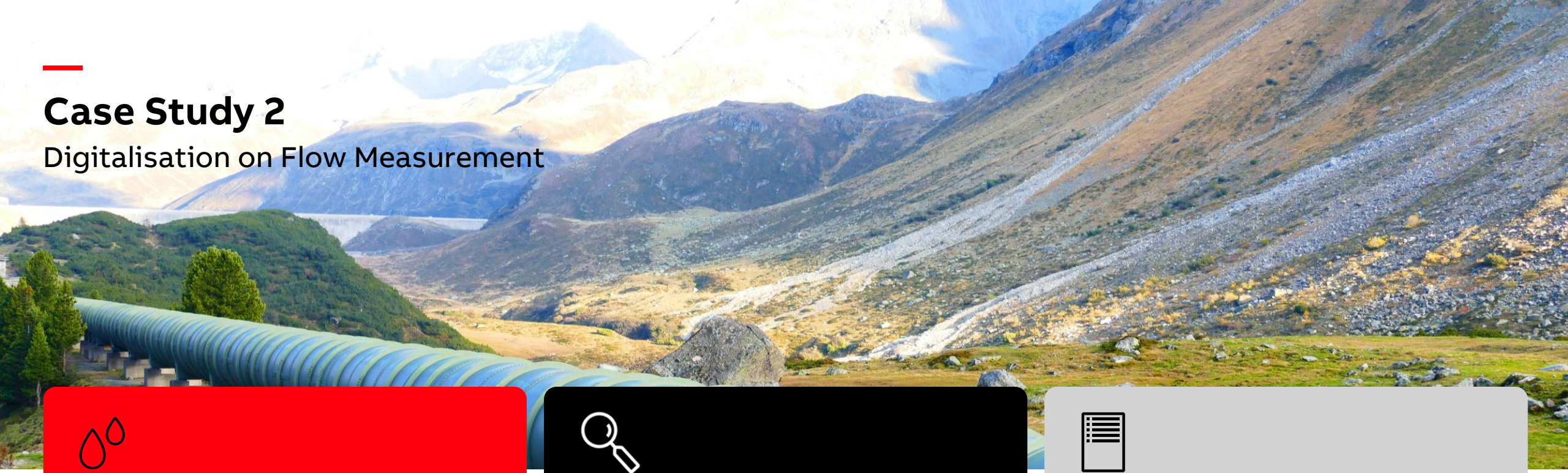
Profibus has become this company's standard communication protocol for subsequent installations.

These outcomes were proven to be sustainable initially over a three-month trial period and in permanent operation thereafter since July 2017.

Data alone was not enough. The real value was extracting actionable insights, which in this instance, facilitated targeted utilisation of resources.

Case Study 2

Digitalisation on Flow Measurement



Water

Water company assets typically have a broad age vintage.

Survey

In a recent ARC Advisory Group survey, 80 percent of all operational losses caused as a result of asset functionality issues were found to be avoidable.

Be In Specification

Being able to confirm that assets such as flowmeters are performing within specification digitally without disrupting the process has enabled a regional water authority in Victoria to get ahead of potential problems.

Case Study 2

Digitalisation on Flow Measurement(cont)

What?

- As verification technology has evolved, so has access to previously hidden data
- Rather than a simple pass/ fail, technicians now have information providing deeper process knowledge and insight into asset health

How?

- The water company uses in-situ verification technology
- By connecting to the meter via simple non-invasive infrared communication and a software package, they perform a full health check
- This is against a known baseline (a fingerprint produced at the factory when the meter is manufactured) and produces a live result on the spot

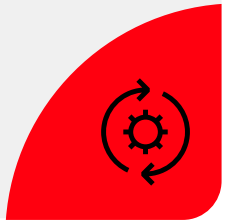
Outcome

- Predictive diagnostics, delivered in a simple, accessible format, have enabled the water company to implement a preventative maintenance regime – extending asset life and more targeted utilisation of resources
- Complete with supporting documentation

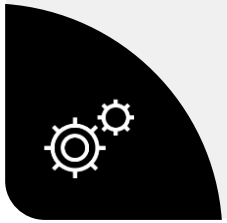
Case Study 2

Digitalisation on Flow Measurement(cont'd)

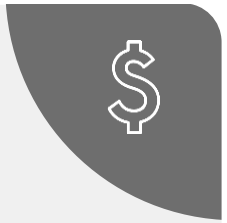
Eliminating guesswork has also eliminated frequent firefighting



The test procedure is simple and automated



It can be carried out by the water company's technicians, eliminating the need for external service support



As the process does not need to be interrupted to perform this digital test, the client can check their assets at regular intervals without the loss of measurement due to downtime

These examples illustrate how digital technology is:

- Driving continuous improvement
- Significantly reducing downtime
- Increasing productivity
- Digital technology like this is being used by more water companies
- By being able to manage their own assets better, water authorities further reduce reliance on expensive third-party service providers. Resulting in significant OPEX savings in the process.


ABB