

solartronISA

SUBSEA FLOW MEASUREMENT



Measurement | Solutions | Expertize

Flow Measurement Experts

Solartron ISA have produced flow measurement solutions for the oil and gas industry for over 50 years. Operators have utilized our expertise to pioneer the development of flow meters for the subsea environment, supplying the world's first subsea flow meter in 1991. Since early applications in shallow water, meters are now installed globally, including ultra deep water developments.

Solutions Philosophy

Our philosophy is not 'one product fits all' but to uniquely develop production and injection flow measurement products to meet accuracy, reliability and budgetary requirements.

The best results come from understanding your operational needs as the Solartron ISA team works directly with you to provide a customized design specific to your application.

Total Delivery Experience

Solartron ISA's 'Total Delivery Experience' is focused on clients, employees and the environment. Our team ensures a smooth transition through evaluation, project execution and Life of Field Support. Our vertically integrated manufacturing facility ensures consistent quality with the ability to rapidly react to your requirements. The cornerstone of our 'Total Delivery Experience' is as follows:

- **HSE**
- **Quality**
- **Delivery**
- **Communication**
- **Support**

Life of Field Support

Solartron ISA offers life of the well assistance. Our aftermarket programs take care of you 24/7 through customized service agreements.



Wet Gas Measurement

Dualstream meters are specifically designed for multiphase measurement of gas condensate fields. Meters are created to work in complex production conditions including the hydrocarbon phase that detects small changes in water production without the use of radioactive sources. Data is used for flow assurance and well allocation purposes.

A range of meters are available from the original wet gas meter, Dualstream 1, to our latest technology, the Dualstream Elite.



Dualstream Elite – ultra high accuracy subsea wet gas meter

The Dualstream Elite incorporates unique water fraction technology using multi-path microwave sensors that provide high accuracy gas and precise water measurement. Elite can easily be incorporated into any tree design, choke bridge, manifold or jumper. By deploying non-intrusive sensors and fully redundant electronics, the Elite is ideal for long life field developments.

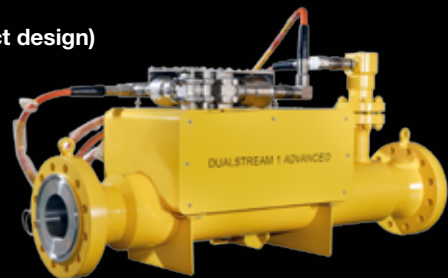
- Real time 3-phase data
- Ultra high accuracy water measurement
- Excellent performance in oil and water continuous flow
- No radioactive source
- Patented non-intrusive probes
- Salinity detection



Dualstream Advanced – smart subsea solutions for high gas volume fraction wells

Dualstream Advanced uses standard subsea sensors together with sophisticated algorithms installed topside to generate accurate multiphase flow data including water rate measurements. By keeping subsea electronics to a minimum, the advanced meters provide a reliable, easy-to-use and economical multiphase flow measurement solution.

- Dualstream 1 Advanced for high gas volume fraction wells (compact design)
- Dualstream 2 Advanced for high liquid applications
- Vertical or horizontal installation
- Minimal power



Dualstream – the original wet gas meter

Lowest cost solution for allocation or monitoring of gas flow on subsea wells used on each flowline in combination with well testing.

Measurement Applications for the Dualstream Range

✓ Improve Production ✓ Reservoir Management ✓ Hydrocarbon Allocation ✓ Hydrate Mitigation

Single Phase Flow Meter

Solartron ISA offers a wide range of metering technologies ensuring the best solution for each application. Customized designs are available to meet demanding installation, measurement or redundancy needs.

Accurate measurements of injected fluids are essential to improve hydrocarbon recovery.

- Water injection
- Gas lift
- Gas injection
- WAG injection
- Chemical injection

Seastream Venturi

- Internationally recognized design to ISO5167-4
- Most robust solution in water and gas applications
- High accuracy and reliability
- Compact design options
- Multiple sensor configurations



Seastream Cone

- Compact design
- High accuracy and reliability
- Low Reynolds numbers
- Multiple sensor configurations

Seastream LoFlo

- Extremely low Reynolds numbers designed for inhibitor injection
- High accuracy and reliability at low flow rates for normal operating conditions
- Generate flow information at high flow rates during start-up when flow lines are flooded with inhibitor
- Multiple sensor configurations

FloCalculator – save cost and leave the flow calculation to the experts

The Seastream FloCalculator is the latest addition to our injection meter range. This tool eliminates the need for integration of a flow algorithm into a MCS.

- Reduced MCS software engineering time
- Reduced uncertainty from flow algorithm integration
- Full calibration curve of discharge coefficient against Reynolds number



Accurate Reliable Data

Solartron ISA provides accurate and reliable flow measurement data to allow operators to optimize hydrocarbon recovery from subsea field developments. We specialize in providing measurement for both production and injection processes used in flow assurance and well allocation accounting.

Flow Assurance Applications

- Water breakthrough
- Hydrate mitigation
- Production optimization
- Well testing
- Chemical injection
- Water/gas injection
- Gas lift

Well Allocation

High accuracy flow rate measurement for royalty allocation

Production tools

Flow rate data is provided for the operator via a rack mounted flow computer or in an industrial PC. Systems can interface directly to the subsea sensors through the MCS for remote diagnostics to retrieve raw data. The flow computer offers customized displays with options for either well testing or allocation reporting.

- Remote diagnostics
- Raw data availability
- Customizable display
- FloCalculator for injection applications

Communication Interfaces

Equipment is designed to interface with all current control system protocols

- IWIS
- SIIS Level II CanOpen
- Modbus
- 4-20mA
- SIIS Level III Ethernet

DUALSTREAM 1 ADVANCED

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AMETEK OIL and GAS

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