



iPERL

Smart Water Measurement



iPERL - foundation of a smart water network

Smart water metering can be one of the first steps on the journey to operating a more sophisticated water distribution network. Sensus iPERL is a proven high-performance solid state smart water meter, which when combined with two-way communications is the foundation of a smart water network.

Using a fixed AMI communications network (such as Sensus FlexNet), iPERL can help identify potential issues in the network enabling you to address them quickly. This saves your business time, money, improves targeting of field crews, and increases customer service levels.

The Sensus smart water network solution is scalable to fit the needs of large and small utilities alike, using technologies that will grow with you into the future and realise short-term payback.



5

Data Fusion and Analysis



4

Data Management and Display



3

Collection and Communication



2

Sensing and Control



1

Physical Layer

With a clear view of your network's performance you are in a stronger position to focus on strategic management (asset management and investment planning) and operational management (repair management, maintenance and customer service) matters. With a holistic view of the business, you are able as a team to focus proactively on business and regulatory objectives, rather than having to react to daily developments.

If your business chooses in the future to move from a walk-by/drive-by solution to full fixed AMI communications, iPERL can adapt seamlessly without any visits to the meter.

At layers 2 and 3 of the Smart Water Network Forum distribution model, iPERL is the foundation of a smart water network.

Tamper proof and fraud resistant

Sensus iPERL meter is tamper proof and resistant to fraud in accordance with European Measuring Instruments Directive (MID), OML, R49 EN14154. Alarms indicating manipulation by magnetic interference can be forwarded with meter reads. If orientation of the meter is switched it will be detected

by empty pipe detection and the volume of water passed in reverse will be stored along with date and time stamps of the period. Sensus' proprietary RF protocol combined with AES 128 encryption ensures that meter data is protected from retrieval by unauthorised people.

Why choose iPERL?



Sensus iPERL offers unrivalled, sustained measurement accuracy over its expected 15 year certified operational life. Unlike other solid state meters, iPERL uses remnant magnetic field technology which provides a constant linear working flow range. This starts at a rate of 1 litre per hour to ensure a greater percentage of customer water consumption is captured, as well as a number of other parameters. As it has no moving parts, it also offers extremely low pressure loss across all meter sizes.

Its patented metrology is unaffected by trapped air, sand or particles within the water, ensuring its accuracy at day one remains the same throughout its life. This prevents unplanned maintenance costs and allows resources to be reallocated to other value-added services. Thanks to its leakage reduction capability, iPERL is the perfect solution for non-revenue water; meaning less energy for pumping and less treatment chemicals get lost in the ground.

iPERL - benefits for your business

Increase customer service and satisfaction

Trials in the industry have shown that customers receiving regular, accurate bills, don't call their suppliers as often to question or dispute bills. This has a direct cost saving and improves customer satisfaction. This enables you to spend more time informing them on ways to reduce their bills and gain rewards, making them even happier customers. Customers are also happy when they don't have to call their provider to supply meter readings manually.

Reduce non-revenue water

High accuracy

iPERL offers unrivalled, linear working flow range for a solid state meter with R800 metrology through all meter sizes. This assures accurate measurements starting with flow rates as low as 1L/hr, iPERL improves the accountability of non-revenue water due to pipe rupture or undetected leakages.

Sustained accuracy

iPERL provides sustained measurement accuracy throughout its expected 15 year service life when installed and operated in accordance with Sensus guidelines. This is because iPERL has an open flow tube design and does not have measurement mechanisms with any moving parts that may deteriorate over time due to poor water quality or contamination.

Reduce maintenance

15 year service life

There's no need for meter re-calibration or replacement during iPERL's expected 15 year operational service, period as the measurement accuracy of the meter is certified for life. iPERL provides significant long-term cost savings and reduces operational costs due to a longer meter replacement cycle.

(Note: Actual battery life is dependent on operating and installation conditions please see the user manual for more information).

Improve operational efficiency and customer service

High granular data

Accurate, high granular data with interval rates as low as one minute resolution data when required. 15 minute interval resolution data enables more accurate usage monitoring and leakage detection and is proven to help improve the accuracy in identifying customer-side leakage issues.

Data capture capabilities

iPERL has an internal memory capacity of 2,880 data points which is equivalent to over one month of 15 minute resolution data.

Alarm functions

The wealth of time-stamped data and alarm functions provided enables the development of services such as leakage detection, tampering, or abnormal usage reporting.

Two-way radio communications

Reduces the time, cost and difficulty in reading meters installed in hard to access locations.

Performance uninterrupted by installation

iPERL does not have any moving parts and can be installed in any orientation. It automatically detects the flow direction and alerts if reverse flow is detected. No upstream or downstream straight pipe lengths are required, providing full flexibility and simplicity in meter installation processes.

Flexible communications solution

Radio capability

iPERL offers the choice of walk-by, drive-by or fixed radio network communications. It has been designed to provide a seamless migration path from AMR to AMI. Sensus can supply mobile meter reading solutions using handheld or vehicle devices (walk-by/drive-by) or fixed network solutions using either SensusRF, a mesh network on public spectrum or Sensus FlexNet™ a fixed AMI communications network used to transfer data over a dedicated, reliable and secure network.

Future proof

iPERL supports both Sensus proprietary radio and open standards based communications. The integration and migration capability of iPERL supports a future proofed AMI strategy and your roadmap towards a smart water network.



The iPERL water management system is a proven and trusted solution

- Over 2 million iPERL meters installed worldwide.
- Offers unparalleled low flow accuracy with high flow durability.
- Captures previously unmeasured low flow and drives additional revenue.
- Is 100% lead-free with no moving parts and maintains accuracy over its expected 15 year certified operational life.
- Increases your returns while maximizing operational efficiency.

iPERL - benefits for your customers

- ✓ Accurate billing giving customers confidence.
- ✓ Ensures higher levels of customer interaction and service, helping them to reduce their consumption and their bills.
- ✓ Customer won't have to supply meter readings manually.
- ✓ You can pro-actively alert customers to potential leaks faster, saving them money and enhancing your reputation as a supplier.

Further benefits of a smart water network for your customers

- ✓ Customers have greater visibility of their water usage and can see usage patterns to allow them to make informed choices.
- ✓ Potential for customers to take advantage of pricing incentives (time of day tariffs).
- ✓ A customer's meter can be read on demand remotely, for example when there is a change of tenant.
- ✓ Customers have more information of how efficient their household is and see the rewards from water saving efforts.



iPERL has a 2,880 point data logging function and can be programmed to provide a wide set of data

- | | | |
|------------------------|-----------------------------|-----------------------------------|
| ■ Meter type | ■ Serial number | ■ Meter reading |
| ■ Alarm information | ■ Reception level | ■ Time stamp |
| ■ Bubble up interval | ■ LAT interval | ■ Current flow rate |
| ■ Backward volume | ■ Units | ■ OMS status and interval |
| ■ Alarm activation | ■ Leakage detection | ■ Broken pipe detection |
| ■ Remaining battery | ■ Max flow rate | ■ Time since min & max flow |
| ■ Leak start & end | ■ Magnet tamper start & end | ■ Empty pipe start & end |
| ■ Backflow start & end | ■ Broken pipe start & end | ■ Time since low battery detected |

Does your business recognise these challenges?

- ≡ Population growth
- ≡ Cost of energy & chemicals
- ≡ Regulatory challenges
- ≡ Aging infrastructure
- ≡ Water scarcity
- ≡ Reduced extraction limits
- ≡ Customer side leakage
- ≡ Environmental change

We know businesses like yours are increasingly under pressure from Governments, regulators and your customers to make the best use of the valuable, limited, natural resource of water. To do this and to enhance customer service and improve network reliability, many are looking for solutions that go well beyond what conventional meter reading products can deliver. You need a solution that protects installed capital investment whilst enabling your business to move forward, delivering additional operational and customer benefits.



We can help you save water and save money

At Sensus we understand the huge environmental, financial and social responsibilities you undertake and know you need a solution you can rely on to deliver:

- ✓ Increased customer service and satisfaction through more accurate bills and no requirement for customer meter readings.
- ✓ Reduction of non-revenue water by detecting flow rates as low as 1l/hr.
- ✓ Improved operational efficiency and reduction in water wastage through more accurate monitoring, enabling faster leak detection.
- ✓ Reduced maintenance costs with iPERL's 15 year battery life - no need for meter re-calibration or replacement.
- ✓ Flexible and future-proof solution designed to work with your current requirements and migrate seamlessly with a smart water network.

If you can't measure, you can't manage

The data captured by a Sensus iPERL smart water meter provides your business with the accurate information to identify and help manage network issues proactively and efficiently. It also helps you address regulatory and environmental challenges whilst improving customer service, security of supply and operational efficiencies.



iPERL can measure and record data at a resolution as low as one minute intervals (selectable and programmed over-the-air) and can store up to a month of 15 minute resolution data. This is just one example of how flexible iPERL is as a meter and how the data it records is invaluable in detecting issues within:

- ✓ The supply network
- ✓ Customer supply pipes (customer side leakage)
- ✓ Plumbing
- ✓ Water theft and other security breaches
- ✓ Reducing non-revenue water

Sensus - a global leader in smart water network technologies

Sensus has been working with water utilities around the world for over 100 years so we understand the industry. Our global customers trust the reliable, quality solutions we deliver for the intelligent use and conservation of energy and water. We work hard to understand your issues and our proven technology helps companies like yours drive operational efficiencies and customer satisfaction.

Sensus currently has:

- ✓ Presence in 42 countries worldwide.
- ✓ Over 80 million metering endpoints worldwide.
- ✓ Over 2 million iPERL water meters installed worldwide.
- ✓ Over 16 million smart endpoints connected to AMI networks in service.
- ✓ Over 400 smart grid projects completed or in-process around the world.



Europe

Sensus UK Systems Ltd
3 Lindenwood Crockford Lane
Chineham Business Park
Basingstoke, RG24 8QY
UK
+44 20 7112 1565
info.gb@sensus.com

Sensus GmbH Ludwigshafen
Industriestraße 16
67063 Ludwigshafen
Germany
+49 621 6904 1000
info.de@sensus.com

Sensus France S.A.S
Zac du Champ Perrier
41 Porte du Grand Lyon, 01700 Neyron
France
+33 4 72 01 85 50
info.fr@sensus.com

Sensus España S. A.
C/ Llacuna n° 166, 1° A y B
08018 Barcelona
Spain
+34 93 460 10 64
info.es@sensus.com

Sensus Italia SRL
Via Valtellina, 33
20092 Cinisello Balsamo
Italy
+39 02 61291861
info.it@sensus.com

Sensus Polska Sp. z o.o.
ul. Mazowiecka 63/65,
PL 87-100, Torun
Poland
+48 56 654 3303
info.pl@sensus.com

Sensus Slovensko a.s.
Nám. Dr. Alberta Schweitzera 194
91601, Stara Tura
Slovakia
+421 32 775 2244
info.sk@sensus.com

Sensus Česká Republika spol. s r.o.
Olšanská 54/3
130 00 Praha 3 – Žižkov
Czech Republic
+420 286 588 995-6
info.cz@sensus.com

Africa

Sensus Algérie SPA
B.P. 02 Route de Batna
El-Eulma- Wilaya de Sétif
Algeria
+213 36 8749 72
info.dz@sensus.com

Sensus Maroc SA
23 Lot Beau fruit II
Zone industrielle, 12013 Ain Atiq
Morocco
+212 538 02 32 50
info.mr@sensus.com

Sensus South Africa Limited
104 Kyalami Boulevard
2128 Rivonia
South Africa
+27 1146 616 80
info.za@sensus.com

Asia

Sensus Asia Pacific
41F/Room G Block 1
Park Central, TKO, NT
Hong Kong
+852 9665 3953
info.ap@sensus.com

Sensus Metering Systems Co., Ltd
Building 78, Fuzhou Airport Industrial Zone
350212
China
+86 591 2863 1389
info.cn@sensus.com

Sensus Japan
12th floor, Yurakucho ITOCIA
2-7-1 Yuraku-cho, Chiyoda-ku
Tokyo 100-0006
Japan
+81 3 6860 4673
info.jp@sensus.com

South America

Sensus Metering Systems do Brasil Ltda
Rua José Grassi, 879
Jardim São Luiz
Americana – SP, 13477-560
Brazil
+55 19 3471 8530
sac.br@sensus.com

Sensus Chile S.A.
Las Araucarias 9041
Casilla 512 V, Quilicura – Santiago
Chile
+ 56 2482 6600
info.cl@sensus.com

Sensus de México, S. de R. L. de C.V.
Av. Ejército Nacional no. 6225 int. 37
Col. del Márqu z, Cd. Juárez, Chihuahua
Mexico
+52 55 2621 2245
info.mx@sensus.com