sensus

a xylem brand

SensusRF

Licence Free Radio

SensusRF infrastructure

SensusRF is an advanced walk-by / drive-by radio system for retrieving data from meter endpoints and providing it for further processing and analysis, creating information for billing and network management.

SensusRF is an optimised license-free radio communications system for battery powered endpoints. It provides a pathway to move from mobile read to fixed infra-structure for remote reading, without any changes to the endpoints. It is available for operation at 433MHz and 868MHz and is OMS compatible.

SensusRF offers two communication modes:

1. Unidirectional - BUP*

- Fast readout
- Easy to use
- Reliable battery lifetime of device
- Simple ‘sniffing’ for devices in a certain range
- Short and robust telegram (BUP*) with endpoint ID, total consumption, alarm flags
- Auto routing capability in radio network

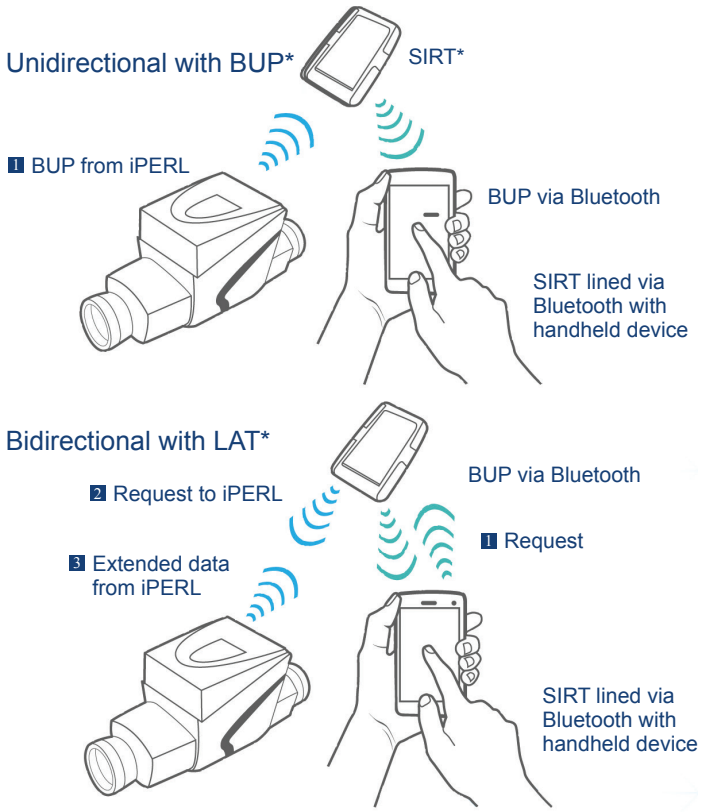
2. Bidirection - LAT*

- Extended data protocol
- Retrieve data on request
- Remote configuration (alarms, alarm resetting etc.)
- Download of data logger values

BUP* Bubble UP Meter Reading Packet Format

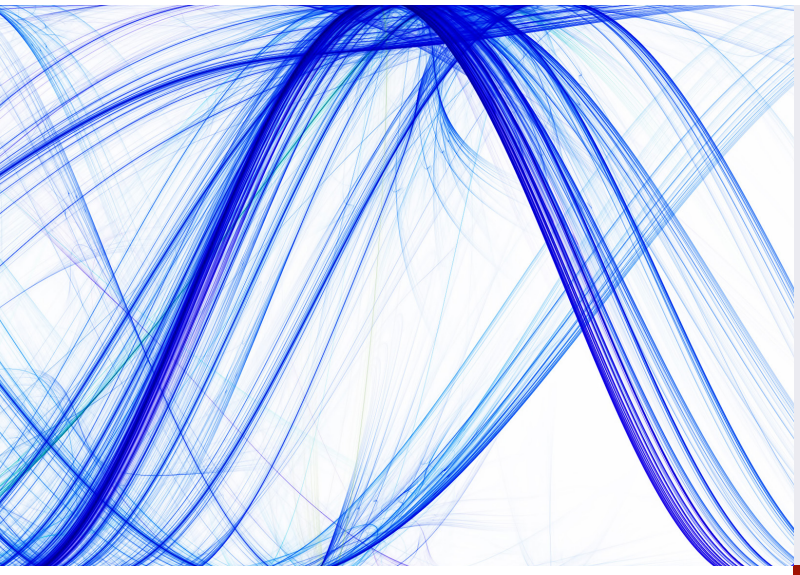
LAT* Listen After Talk

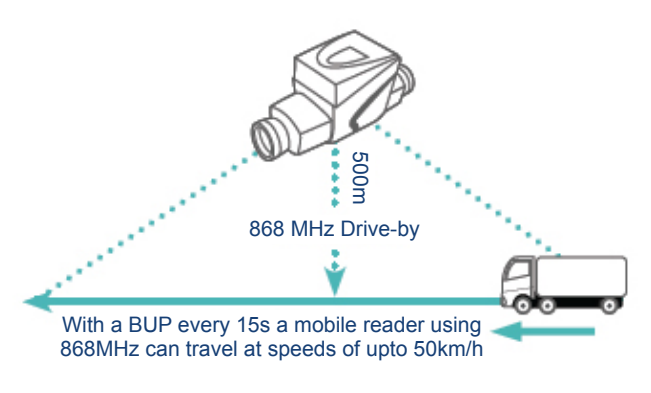
SIRT* Sensus Interface Radio Tool



Mobile read - walk-by or drive-by

- ✓ Unidirectional telegrams
- ✓ Spontaneous reception from all meters within range
- ✓ Bidirectional communication
- ✓ Configuration of the endpoint





Note: all distances for direct line-of-sight

SIRT (Sensus Interface Radio Tool)

SIRT is a radio modem for SensusRF radio connection to a handheld via Bluetooth and using SensusREAD software with the following features:

- ✓ Installation and readout of devices
- ✓ Reception of frequently transmitted radio messages from SensusRF radio endpoints
- ✓ Request additional information from the radio endpoints
- ✓ Change configuration of radio endpoints (alarm, level settings...)

SIRT provides two internal antennas and forwards radio messages from the strongest one received (diversity function). Technical features:

- ✓ IP 53 (water spray protected)
- ✓ Charging via USB from mains or PC instead of power supply
- ✓ External antenna available for drive-by applications
- ✓ Software library available to integrate SIRT into existing systems
- ✓ Data link via Bluetooth or USB

Mobile reading software

SensusREAD is the Sensus software for mobile terminals used to collect data from metering devices. The user can choose between a guided (route) or service readout.

Features include:

- Export of readout data/import of other MDM database
- Readout via radio by single address or broadcast
- Supports also other technologies like Sensus((S))cout

iPERL infrastructure

All iPERL and many future endpoints will have SensusRF technology integrated, giving the advantages of both uni and bi-directional communications as described above.

- Reliable battery lifetime determination
- Automatic endpoint detection via handheld computer or PC
- Short and fast BUP messages so less vulnerable to interference from other devices
- Remote programming
- Applicable for walk-by, drive-by and fixed radio network infrastructure without any configuration or exchange components

iPERL provides information every 15 seconds in a short telegram (BUP):

Fab. No.	24871973	Reception level (RSSI)**	95%
Meter reading	3683	Time stamp**	05.01.2011
Alarm information*	00000000		

* Possible alarms are; tampering with magnet, low battery, broken pipe, leakages, backward flow, empty pipe

** Added by the receiving device

Endpoint dependent protocol – iPERL

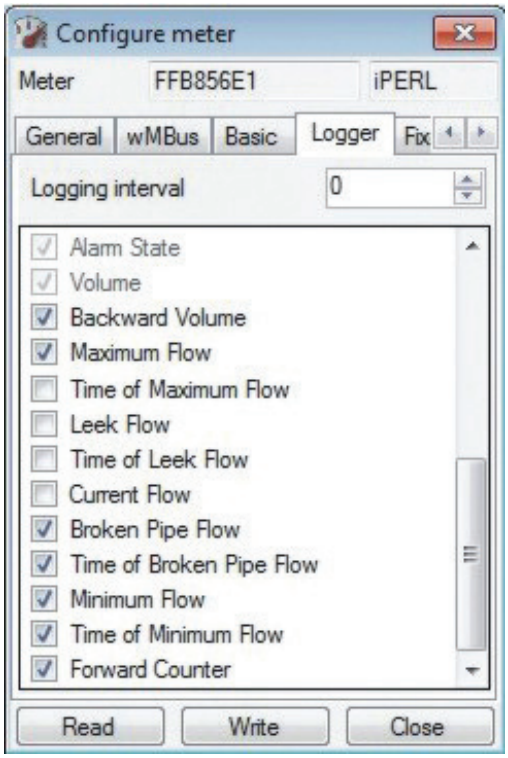
Using SensusRF a range of parameters and additional information can be retrieved from iPERL on request, - see table below:

Meter type	OMS status	Leak start
Fab. No.	OMS interval	Leak end
Meter reading	Alarm activation	Magnet tamper start
Alarm information	Leakage detection	Magnet tamper end
Reception level (RSSI)	Broken pipe detection	Empty pipe start
Time stamp	Remaining battery	Empty pipe end
BUP interval	Max. flow rate	Backflow start
LAT interval	Time since max. flow	Backflow end
Current flow rate	Min. flow rate	Broken pipe start
Backward volume	Time since min. flow	Broken pipe end
Units	Time since low battery detected	Fixed date reading

Data logger and fixed date reading are special telegrams requested by command.

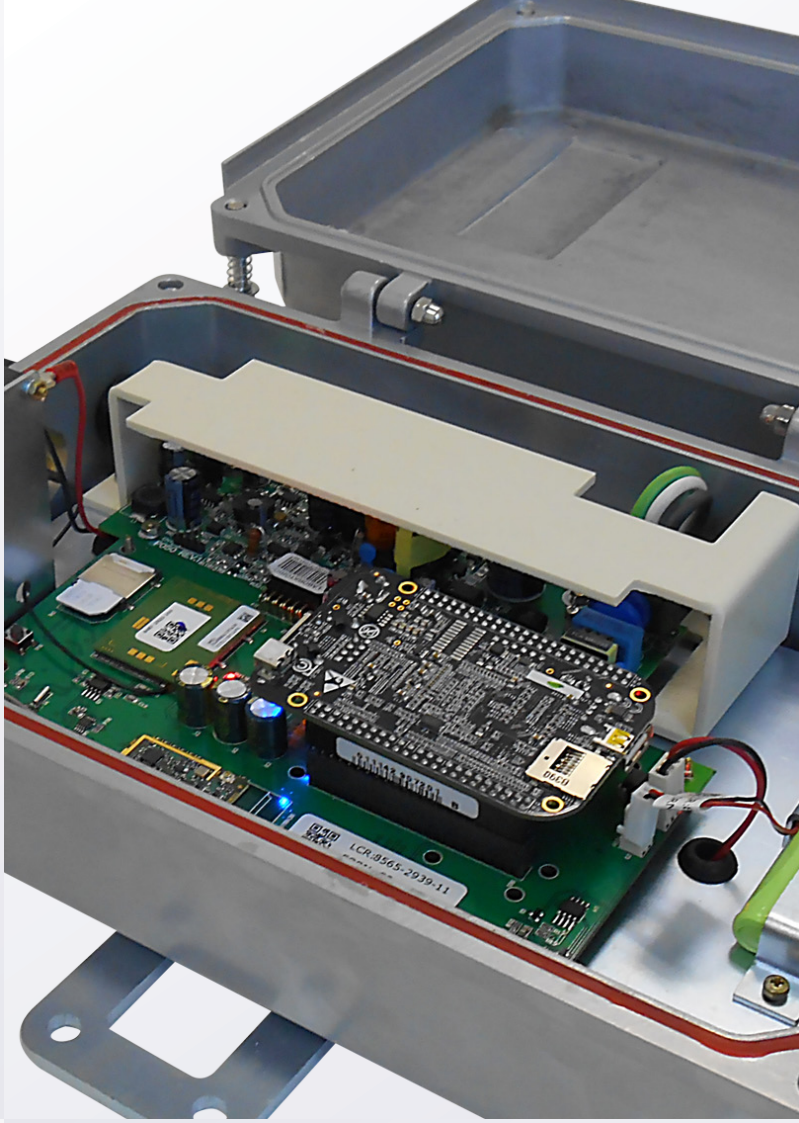
The integrated data-logger can provide from 2 to 13 parameters, with up to 2880 steps within the rotating memory - see table:

The time interval can be selected from one minute up to one day.



SensusRF fixed radio solution

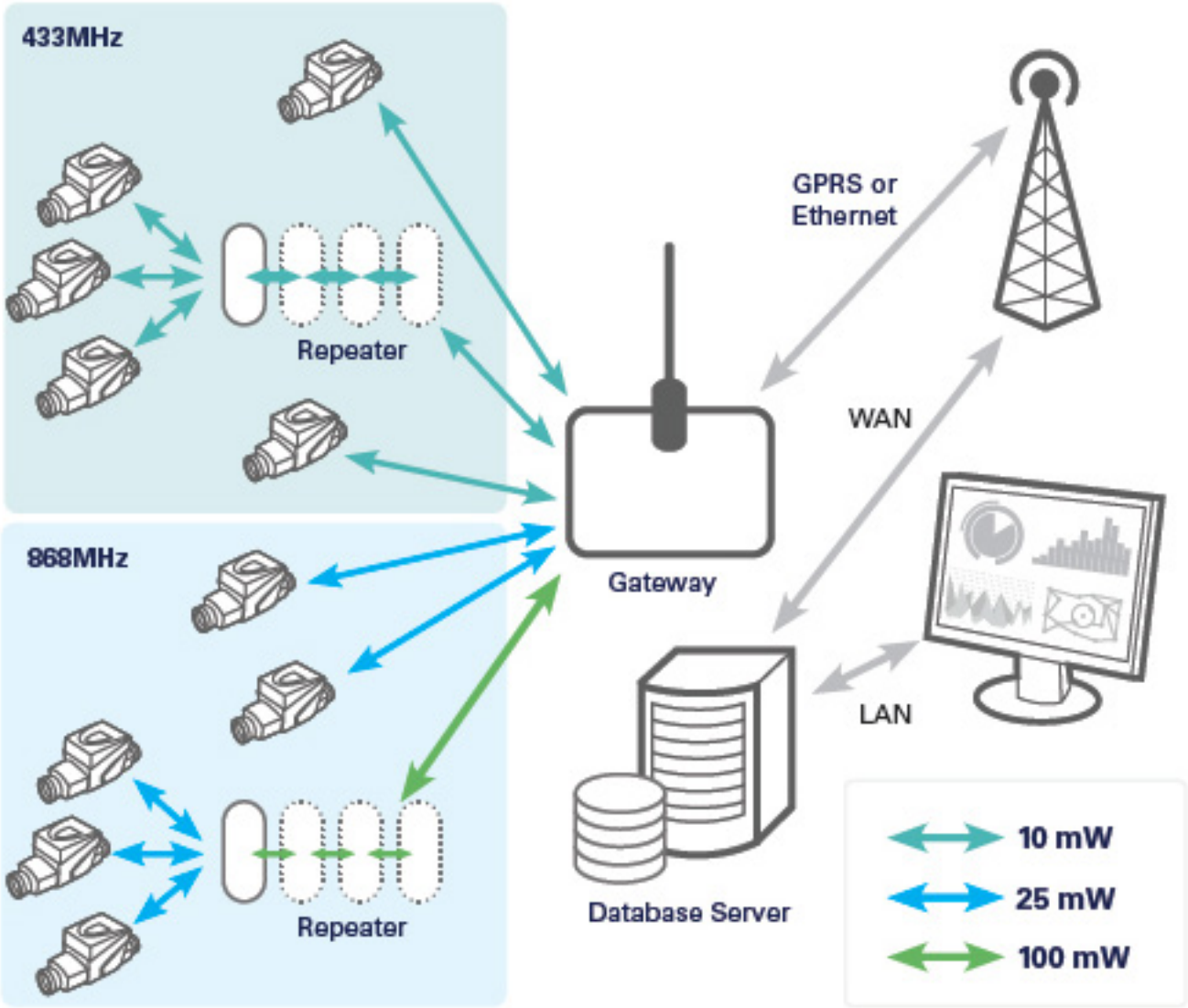
- Auto configuration wizard (gateway sniffing for endpoints and repeaters)
- Integrating repeaters
- Self-healing network (using alternative routes)
- Meter reading transparent and local
- Fast track alarms
- DMA snap shot (snap shot of a water network for evaluation)
- TCP/IP technology for the WAN communication'
- High level data security (encryption end-to-end)
- Enables cloud technologies, FTP and other remote database applications



Network devices - Sensus repeater and gateways

- Gateways can use repeaters to extend the radio range of a network
- Scheduled reading of programmed meters
- Transparent mode
- Remote reading and network maintenance
- Auto routing of a network (repeater and endpoints)
- Auto maintenance in case of endpoints missed
- GPRS and Ethernet connection
- IP65 (wet/humid environment, outdoor usage)
- Mains power supply, solar panel
- Up to 7 repeaters hops in a chain

IPERL fixed radio network - remote access and monitoring



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