Radio system RF

Internet variants

Range of application

Radio-system RF is an advanced Walk-by/Drive-by or a fixed wireless radio system for wireless remote reading via license-free radio frequency 868 MHz. With radio system RF, measured values can be read from meters with radio system RF or wM bus. With this radio communication system there is the possibility of measurement management for further process and analysis as well as the ability to create data that is transferred to the billing-system.

Suitable applications are for reading limited-access gauges, for example, in a water-filled well. Can also be used for individual measurement in terraced areas or areas with large geographical spread.

The system is flexible and can easily be expanded and supplemented with more transmitters/gauges.

Using Android based mobile application DIAVAZO, route planning, addressing of gauges, transfers to existing billing system, etc. are performed.

The advantages of radio-based remote reading:
Improves the readout/reading:
- Unbroken data chain from meter to debit system
- Reduces the risk of error debts
- Easier to read more often which increases consumption / leakage

Saves times:
- With wireless reading, limited access meters can be read easily and easily (eg well meters) - do not need to drain the meter well and do not climb it to read the meter.
- Wireless reading meter where only authorized personnel have access, pharmaceutical companies etc. - Saves portkeepers, codes, courses etc.

Simplifies measurement:
- Sit in the car and read
- Read multiple meters from a reading point
- Transfer and configure measurement values digitally via the software to the debit system, which provides increased data security
- Complete easily with more meters or transmitters - no wiring or conjugation changes.

Improves the working environment:
- Avoid workplace accidents
- Release climbing into the well

AT 7275MEI-RF

AT 7275HRI-RF

AMA-text
8 meter-systems, measurement value transmission via radio communication
Meter reading radio system AT 7087 .... type RF

Function and design

The system consists of the following components:
- Meter
- Radio transmittor (retrofitted or integrated in meters)
- Collection-equipment including software according to one of the following options:
- SIRT, software and android mobile or reading disc
- Gateway, repeaters and software

Meter's that are used in the RF radio system shall be equipped with an integrated electronic register or alternatively equipped with an HRI-trick or open-collector pulse output or radio-transmitter reed.
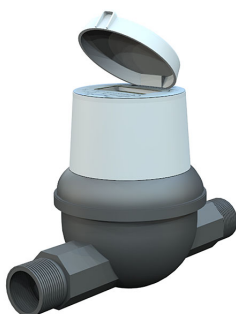
Examples of meters with integrated electronic register are AT 7450, AT 7440.

AT 7275RF, AT 7275HRI-RF and 7275MEI-RF are transmitters that enable HRI-triggers or alternate open-collector or reed pulse outputs to be integrated and communicated with RF radio system. These can be used in both mobile and fixed radio networks.

The transmitters can be configured with the radio modem AT 7087SIRT together with DIAVASO (mobile application).

Radio-system RF offers two communication routes, single and bi-directional communication. The one-way communication is called BUP (Bubble UP meter Reading Packet Format).
- BUP provides fast reading, easy use and reading, finds meters within a certain range and small short telegrams with information about measurement ID, accumulated consumption, alarm flags and the possibility of automated route reading on a radio network.
- The two-way radio communication is called LAT (List After Talk), and LAT receives extended radio telegrams with more consumer values, can request measurement data from measurement points, remote configuration of alarm and alarm reset, and ability to download data logger statistics.

AT 7450

AT 7440

Transmitting data

Available data from sender	
AT 7275RF, AT 7275HRI-RF	Measurement ID, Measurement Index, Alarm, Fixed Measurement Reading, Data Logger
	Alarm (leakage, cable break*, backflow*, pipe break, internal error, low battery-life)
Integrated e-register, ex AT 7450	
Measurement information	Measure ID, Signal Level, Time Stamp, Measurement Type, Data Logger Settings
Flow and volume data	Measurement Index, Momentary Flow, Min/Max Flow, Backflow
Alarm information	Alarm flags, Alarm activation, Leak start / stop, Sabotage start / stop,
	Backflow start/stop, Pause break, Remaining battery life, Time ago, battery level alarm was started
Additional data	2880 data points in data logger information, measurement read date
Radio status	BUP-interval, LAT-interval, OMS-status, OMS-interval
*If the meter's protocol allows this information	

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Technical data

Technical specifications	7275RF	7275HRI-RF, 7275MEI-RF
Power supply	Lithium battery (15 year battery-life)	Lithium battery (15 years battery-life)
Radio specifications		
Radio band	868 (433)MHz	868 (433)MHz
Radio effect	25 (10) mW	25 (10) mW
Radio protocol	Sensus RF radio protocol two way direction, wM-Bus OMS one way direction	Sensus RF radio protocol two way protocol, wM-Bus OMS one way direction
Pulse interface		
Minimum pulse length	32 ms	32 ms
Max pulse-rate	60 ms	60 ms
Max pulse frequens	10 Hz	10 Hz
Detection open	(0...0.7) V	(0...0.7) V
Detection closed	(2.0...2.5) V	(2.0...2.5) V
Max cable capacity	10 nF	10 nF
Internal resistance	10 kOhm	10 kOhm
Internal voltage	2,5 V	2,5 V
Environment		
Protection class	IP68	IP68
Storage temperature	min -20grC/max +70grC	
Performance temperature	min -20grC/max +60grC	
Measurement and weight		
Dimension, mm.	45 x 115 x 40	45 x 115 x 40
Weight, kg.	0,230	0,230
Encapsulation	ABS	ABS
Color	Grey	Grey

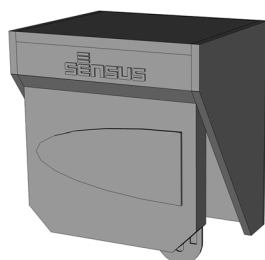### Gateway and repeater

RF Gateway AT 7087RF-GW is a gateway designed for fixed radio networks with the function of receiving measured values in periodic intervals or on call from meters supporting radio protocol RF and repeater AT 7087RF-REP. Measurement values are transmitted via GPRS or Etherent communication to servers or e-mail.

Repeater AT 7087RF-REP has the function of amplifying the radio signal. AT 7087REP-RF communicates via a two way communication and can be used in both fixed- and Walk-by/Drive-by radio systen. The repeater can communicate with meter supporting RF radio, other repeater AT 7087RF-REP, AT 7087SIRT and gateway AT 7087RF-GW.

Attach to a post or a wall with screws on the rear of the bracket. Orientation as shown.

AT 7087RF-GW

AT 7087RF-REP

Transmitting data

AT 7087RF-GW, AT 7087REP-RF	
Radio signal range between measurement point and gateway	Free area ≤ 500m
	Within settlement ≤ 300m
	Difficult environment ≤ 100m
Radio signal range between gateway and repeater, and repeater to repeater	Up to 1000m
Radio signal range between measurement point and repeater	Free area ≤ 500m
	Within settlement ≤ 200m
	Difficult environment ≤ 100m
Number of repeaters in sequence	Max 7 repeat in succession. Maximum number of meters per repeater is 298 pcs.
All transmitters can also be used for broadcasting up to 100m each (max 3 consecutive)	

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Technical data

	7087RF-GW	7087RF-REP
Power supply	65...285 VAC, Internal NIMH backup battery with power failure max 1 hour. Option 12-24 VDC for solar panels, consumption 8,2 W	Lithium battery 12 years battery-life
Radio specifications		
Radio band	868 (433) MHz	868 (433) MHz
Radio effect	Measuring to gateway 25 mW, Repeater to Gateway 100 mW	Meter for repeater 25 mW, Repeater to Repeater/SIRT up to 100 mW, Repeater to Gateway up to 100 mW.
Number of measurement points	Up to 1000 measurement Points (512 KB flash, 128 KBRam)	Up to 298 measuring point
Radio protocol Transmission	Sensus RF radio protocol two way communication	Sensus RF radio protocol 4 times per day (default), Alarms are transmitted directly (max 20 min.) Reading on request directly(1 ggr/day)
Standards, approvals	CE Anatel, RoHs approved R&TTE directive 99/5/EC	CE Radio frequency: EN 300-220-3/-1 EMC: EN 301-489-/-3 V1.4.1
Configuration interface		
Readout	GSM/GPRS and Ethernet	
Configuration interface	GPRS and Ethernet remote, USB locally	
AMR intergration	Irislite- built in SMTP and FTP service CAS Iris communications server CAS Hemera^{TM} Plattform - SmartWater^{TM} module	
Environment		
Protection class	IP65	IP68
Storage temperature	min -20grC/max +70grC	min -20grC/max +60grC
Performance temperature	min -20grC/max +70grC	min -20grC/max +60grC
Environment	Avoid direct sunlight when installing outdoors, Avoid cold, dirty and humid environment	Avoid direct sunlight when installing outdoors, Avoid cold, dirty and humid environment
Measurement and weight		
Dimension, mm.	306 x 222 x 113	145 x 80 x 80
Weight, kg.		0,540
Encapsulation	Aluminum alloy, UV resistance	ABS
Color	Grey	Grey

AT 7087SIRT

SIRT (sensus interface radio tool) radio modem

AT 7087SIRT is a handheld radio modem for connection to radio system RF, measurement data is transmitted via Bluetooth to an Andriod mobile or reading disc. The AT 7087SIRT has two internal antennas for increased range, with the ability to complement an external antenna for drive-by applications. With the DI-AVASO software, the system can offer the following features;

• Installation and reading of measurement points
• Radio receivers for measuring points and repeaters
• Configuration changes of measurement points such as alarm limits

Is uses to read meter through preprogrammed route or via route planning mode. Route planning mode means reading all the meters within the range of the radio modem to build up its route. The building of the route with input and/or import of customer data is then done in DIAVASO mobile application.

SIRT

SIRT Radiomodem	
Performance	Collection of measurement values. SIRT connects to existing android mobile or readpad via Bluetooth or via USB to PC. Used to go around and collect measurement values.
Software	Mobile application DIAVASO or PC software SensusREAD.
Transmission power	25 mW on license-free frequency 868 MHz
Weight	295 g
Operating temperature	-18°/+60°C (Storage -20°/+60°C)
Data transfer	USB-connection
Dimensions	95 x 145 x 35mm

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Technical data

	AT 7087SIRT
Power supply	Rechargeable Lithium Ion battery via supplied cable to PC or 230V. Usually 12 hours. Operating time at full charge
Modulation	2-GFSK, 2-FSK for wMBUS T1
USB	Version 2.0
Bluetooth	Class II Interface
Radio specification	
Radio band	868 (433)MHz
Radio effect	25 mW for measurement point, 1 mW to enable the radio communication measurement point after installation
Radio protocol	Sensus RF radio protocol, wM-Bus T1
Enviroment	
Protection class	IP53
Storage temperature	min -20 grC/max +60 grC
Performance temperature	min --18g rC/max +60 grC
Charge battery	min 0 grC/max +40 grC
Measurement and weight	
Dimension, mm.	95 x 145 x 35
Weight, kg.	0,295
Encapsulation	ABS
Color	Grey

DIAVASO mobile application

DIAVASO is a mobile application with several underlying applications for remote reading of metrics via Android-based mobile or tablet. The DIAVASO application consists of various individual applications, RF Finder, Collection Station, Collection Mobile Configuration & Service and Data Logger. These can be used individually or in combination, depending on your system requirements for remote reading (AMR) or for small scale fixed networks (AMI).

Mobile applications are compatible with most Android-based smartphones and tablet and communicate with the SIRT radio modem. DIAVASO is compatible with all meter and repaters communicating via RF radio system.

The applications are designed to be used for installation of measurement points, remote reading, maintenance and configuration of gauge and repeaters, and handling of reading routes. The Collection Mobile application can also communicate with web server to handle workflow for metering, reporting and data exchange with billing systems.

DIAVASO mobile applications - comparative properties

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	Collection mobile (CM)	Collection Station (CS)	Configuration and Service	RF Finder (RF)
	Read-through and workflow control to Walk-by/Drive-by	*For easy drive-city and smaller fixed networks*	*Read and configure tools for installers and service technicians*	*Locate, read and "health test" your meter*
Installation				
Walk-by	x		x	
Drive-by	x	x		
Fixed small-scale radio network		x	x	
DATA AVAILABILITY				
BUP data (meter-ID, measurement value, alarm, radio signal quality)	x	x	x	x
Fast mode (BUP data)	x	x		
Semi data (Full Data Mode)	x		x	x
Reading at the specified date	x		x	
Loggers	x		x	
METER READING				
Find meters and repeaters within reach			x	x
Measurement reading on request	x		x	x
Reading a specific route	x	x		
Scheduled reading (fixed radio network)		x		
Send measurement data to server	x	x	x	x
EVENTS				
Overview	x	x	x	x
Sending notification	x	x	x	x
Analysis	x		x	
Reset and change of parameters			x	
RADIO				
See signal strength	x	x	x	x
Adjust radio link			x	
Configure gauge, radio and user			x	
Reports and adm. dashboard	x			
Map view	x			

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	Collection mobile (CM)	Collection Station (CS)	Configuration and Service	RF Finder (RF)
	Read-through and workflow control to Walk-by/Drive-by	*For easy drive-city and smaller fixed networks*	*Read and configure tools for installers and service technicians*	*Locate, read and "health test" your meter*
Photo feature	x		x	

Technical data DIAVASO applications

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| Applica-tion name	Requirement
RF Finder Configu-ration and service Data Log-ger	- Android version 4.2 (Jelly Bean) or higher - Android device with screen size of at least 4 ", blue screen function and network connection - Available FTP server and SIRT radio modem
Collec-tion Sta-tion	- Android version 4.2 (Jelly Bean) or higher - Android device with bluetooth, WiFi or mobile network access. - Battery driver for the Android device and SIRT radio modem (for stationary mode). - SIRT radio modem - Available FTP (SFTP, FTPS) server (To be able to get configuration from and to send collected measurement data to). - Available SMTP server (if email is required) - Android-device with SIM-kort (If SMS is required or if the mobile network will be used as the only option for uploading/downloading files from/to FTP).
Collec-tion Mo-bile	- Android version 4.2 (Jelly Bean) or higher. - Android device with screen size of at least 4 "and Bluetooth function. - Network access to CM (Collection Mobile) - SIRT radio modem - Web server access **Export and Reporting:** File format for exporting files: CSV File format for file reporting: PDF Reporting: All route reports, single read report, alarm **CM server requirements** Operation system: Windows (Windows 7 or higher, Windows Server 2008 R2 or higher), Linux (Kernel måust be at least 3.10) Ram-memory: At least 3GB with 5GB of available disk space. **Installation requirements:** - Adiminator (Windows) or Root (Linux/Unix) permissions on the device in question. - Valid certificate for the domain that will be used to run Sensus server web application. The certificate must be stored in a following format; JKS, PKCS11 or PKCS12. Owned ceremonies come running out to work proper-ly. The certificate must be signed by a public certificate authority. - JRE 7 or higher should be installed on the device for which it is intended. **Hosting Service:** CM Server can be hosted by Sensus Data Center.

Drive-by/Walk-by application

In a system consisting of many meter where all or part of the them are geographically collected. Meters are read with integrated electronic register or transmitted with RF radio communication to the SIRT radio modem. The software defines which meters are included in each reading point. You can build the system in any way.

- Radio modem that can easily be mounted in the car holder. With the help of an external roof rack, the range increases and the meter can be read from a long distance and can be left in the car while reading.

- The radio modem is connected to an existing laptop that is included in the car or via bluetooth connectivity to Android based mobile application.
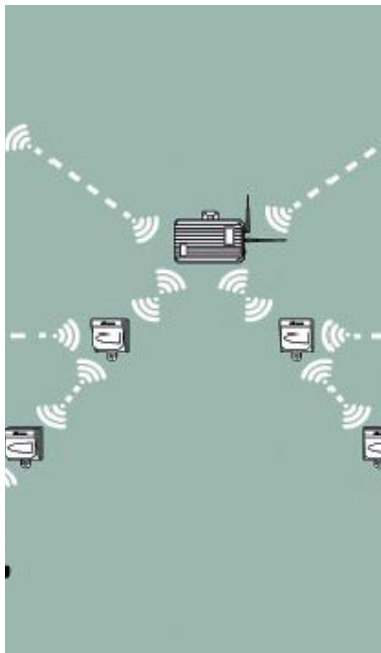
Fixed radio network

In a system consisting of a maximum of 1000 meters, all meters are automatically read to a collection device, a so-called gateway. The gateway then sends the signal via the GPRS network and an existing FTP server to your network server. The system is built with radio repeaters AT 7087REP-RF, which receives the measurement values from the meters and relays to the AT 7087GW-RF collection unit or another radio amplifier. Using an Excel-based program, the measured values are automatically recorded with a preset time interval. The server is automatically notified when alarms, such as cable breaks and low battery levels.
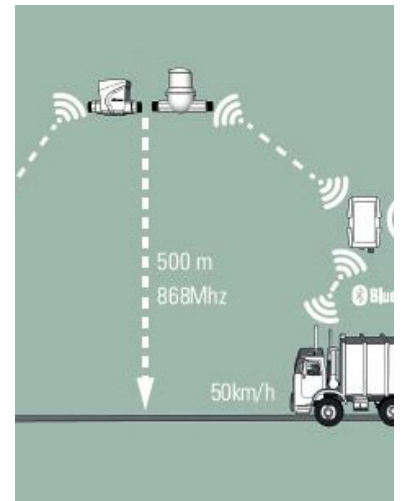
RF dive city radio application

How to order

RF Fixed radio network

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Art. no	Description	
AT 7450	Meter	Static cold water meter that has extremely high measurement accuracy with integrated electronic register and radio
AT 7440	Meter	Cold-water meter with integrated electronic register and radio
AT 7275HRI-RF	Transmitter	Type HRI for the wing wheel and ring piston gauge AT 7050B7420A/7430. Cable length 2,5 m
AT 7275RF	Transmitter	For pulse output meters type AT 7080/7085, 7029. Cable length 2,5 m.
AT 7275MEI-RF	Transmitter	Type HRI for mainstream meter type AT 7110A, AT 7170. DN 50-300. Cable length 2,5 m.
AT 7299IP68KAB	Coupling	IP68-rated cable connection for extension of transmission cable.
AT 7087RF-REP	Repeater	Radio amplifier for long distance data transmission
AT 7087SIRT	Radiomodem	Handheld Radio Modem for reading and configuring measurement points
AT 7087RF-GW	Gateway	Collection unit of measurement values in fixed radio networks. Transfer of measurement value to mail or web server via GSM/GPRS or TCP/IP
AT 7087FINDER-RF	Application	Android-based mobile application for detection of measurement points
AT 7087CS-RF	Application	Android-based mobile mobilization Collection Mobile for drive-by or small fixed-line networks
AT 7087CMS-RF	Application	Android-based mobile mobilization Collection Mobile for drive-by or small fixed-line networks
AT 7087CMM-RF	Application	Android-based mobile mobilization Collection Mobile for drive-by or small fixed-line networks
AT 7087CMH-RF	Application	Android-based mobile mobilization Collection Mobile for drive-by or small fixed-line networks
AT 7087CMU-RF	Application	Android-based mobile mobilization Collection Mobile for drive-by or small fixed-line networks
AT 7087CONFIG-RF	Application	Android-based mobile appillation for reading measurement values and setup tools for installers and service technicians för installatörer och servicetekniker

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Art. no	Description	
AT 7087DL-RF	Application	Android-based mobile application with data logger function and to send measurement values to FTP server
AT 7087-CMS-RF	Hosting	On request