TECHNICAL FILE			
Product	RF Cyble		
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1. PRESENTATION

The Cyble RF is a compact radio module designed for reading water meters.

The Cyble RF 433 MHz complies with current radio frequency regulations in France and meets the requirements of market players (local authorities, service companies, private distributors) who wish to develop radio frequency remote reading of water meters to improve their productivity and offer new services to their customers.

INSTALLATION FLEXIBILITY

The Cyble RF is placed directly on the meter. The concept of a **compact radio module makes installation easier** because it avoids any wiring and wall mounting.

The Cyble RF is **compatible with the entire range of Actaris water meters** pre-equipped with the target needle (from DN 15 to DN 500).

The Cyble RF can be delivered from the factory, already installed on the meter and programmed to **save time during commissioning.** Commissioning is then limited to installation on the pipe.

The Cyble RF, alone, can be fitted to meters already installed **without requiring any change, removal or unsealing of the meter.**

The Cyble RF can be read by any **RADIAN** type radio equipment : portable drive-by or fixed network data entry terminal.

RELIABILITY

The Cyble RF remotely transmits the current volume index in **full accordance** with the mechanical index of the water meter. The Cyble technology, on which the Cyble RF is based, eliminates any parasitic pulse, counts water regardless of the flow direction and takes into account any water returns. The Cyble technology, patented by Actaris, has proven its reliability since 1996, on several million meters

The target, made of a non-magnetic material and present as standard on the totalizer of the entire range of Actaris water meters, as well as the Cyble RF detection system are **insensitive to attempts at fraud** by magnet.

Encapsulating the electronics in a waterproof resin protects the Cyble RF from the prolonged effects of **water immersion** (IP68).

The Cyble RF's housing is designed to be **shock and UV resistant.**

The Cyble RF has a typical **lifespan** of **15 years** under standard use.

The Cyble RF has been designed to withstand **residential, commercial and industrial** environments . It can be installed both in a face and in a technical duct.

MULTIFUNCTIONS

The target technology has made it possible to integrate numerous intelligent functions which constitute as much added value compared to a summary index reading: - monthly readings of the water meter index
over 13 months, - detection and history of leaks over 13 months, - detection,
history over 13 months and quantification of reverse flows in
the pipeline, - indication of end of battery life, - detection of temporary or permanent fraud attempts, - alarms, etc.

These functions allow the Cyble RF to meet the needs of: - billing or distribution, -
control and maintenance of the meter
fleet and the installation.

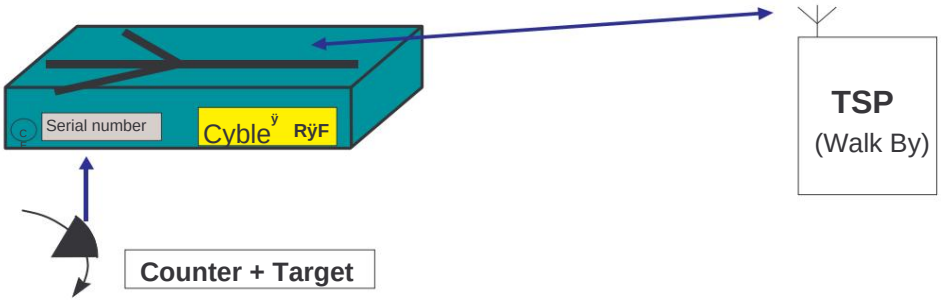
2. TECHNICAL CHARACTERISTICS

2.1INTRODUCTION

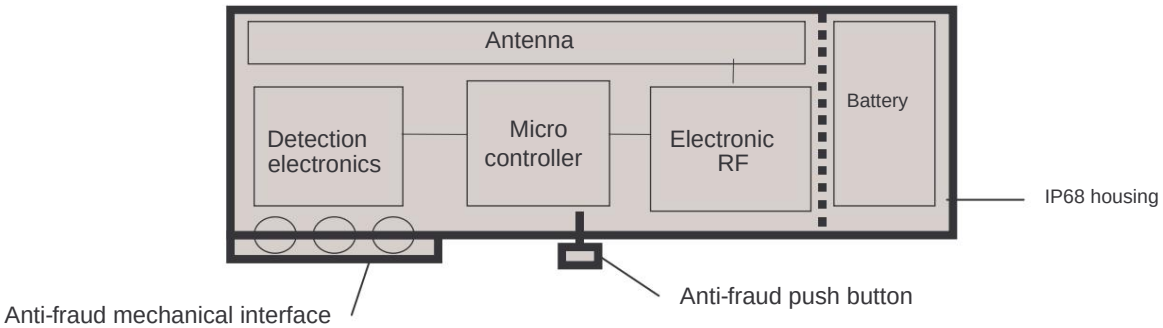
The Cyble RF is a radio interface for Actaris water meters pre-equipped with a target.
It is an intelligent interface that counts the target revolutions (one revolution corresponds to an increment on the last roller of the totalizer and therefore to the pulse weight of the counter) and provides indexes, flags (event indicators), alarms and information processed by radio link via any RADIAN compatible equipment.

Radio transmission between the Cyble RF and radio equipment above has the features the following:
- Frequency modulation (FSK)
- 433.82 MHz -
2 channels

Block diagram of the overall system



Cyble schematic diagram RF



2.2 FEATURES

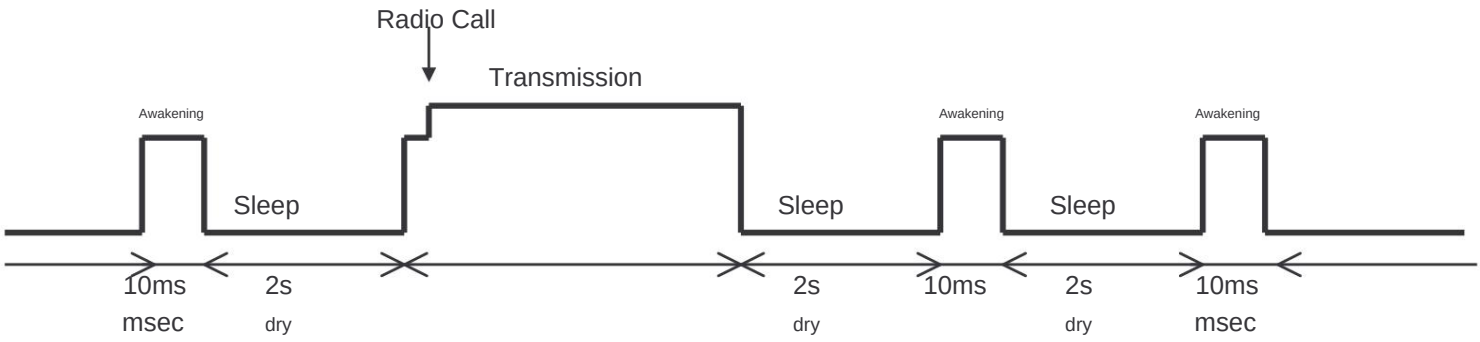
Until now, a meter was only able to provide an index, limiting its information role to the strict minimum necessary.

A meter equipped with the Cyble ÿ RF allows you to achieve much more than just a index reading:

- Current volume register
- Fixed-date index readings with 13-month storage
- Fraud detection by tearing/lifting
- Battery end of life indication
- Leak detection
- Return count detection
- Water return register
- Alarms (battery/lifting/detection error)
- Date and time
- …

Detailed description of features

FEATURES	DESCRIPTION
Encryption	Data encapsulation in a frame according to the RADIAN protocol In order to reduce
Radio standby mode	battery consumption, the product is woken up every 2 sec. Wake-up is only possible from Monday to Saturday. The daily listening window is programmable: - module delivered alone: default value from 0:00 to 24:00. To be reprogrammed. Recommended range: 12:00 per day. - module delivered on meter: default value from 6:00 to 6:00 p.m.



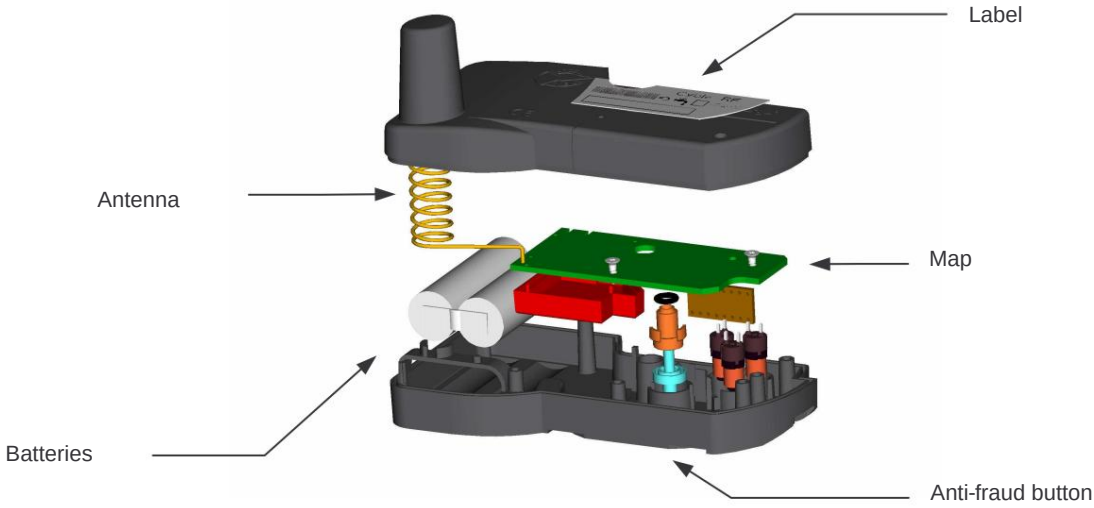
Filtering of spurious impulses Cyble technology	ÿ does not, by design, allow parasitic pulses by bouncing or vibration, unlike REED technology.
End of life indication	An alarm indicates the battery life status. This alarm is triggered 1 year before the minimum theoretical end of life (12 years) of the battery. A counter also indicates the remaining battery life, expressed in months.
Current index	The initialization or resetting of the index is possible on site. The index provided by the Cyble RF takes into account any water returns, and is therefore in line with the mechanical index of the totalizer. The index is provided on 8 digits (99999999). The index changes from 00000000 to 99999999 when decremented.
Date and time	Date and time are available and take into account leap years until 2100. Date and time can be set on site.
Monthly archiving of indexes	The current index is automatically archived on the last day of the month - every month - and kept in memory for 13 consecutive rolling months.
Leak detection	A leak detection threshold is available and can be configured on site or in the factory. It generates a daily flag (=event indicator) (at midnight) when Qmoy > threshold during the entire past day. In addition, the number of days per month during which a leak above the threshold was detected is stored. A history over 13 consecutive rolling months is kept in memory.
Reverse flow	The cumulative volume index in case of reverse flow is available, from the first target needle turn (=pulse weight). This index can be reset during an on-site intervention. In addition, if a reverse flow greater than 10 target needle turns is detected at least once in the month, a monthly alarm is triggered. This information is archived over 13 consecutive rolling months.
Fraud detection	Any attempt at uprising or withdrawal, temporary or permanent, of the Cyble RF module is detected (fraud check every 1 sec) and triggers an alarm (temporary fraud/permanent fraud). This alarm can be reset during an on-site intervention. The geometry of the mechanical interface between the Cyble RF and the totalizer prohibits any attempt to insert a foreign body.
Alarms	Available alarms: - battery life less than 1 year - attempted fraud (temporary or permanent) - transmission problem between the meter and the RF module - reverse flow - leaks

Note: The functions relating to under-volume counts (= consumption too low), excessive volumes (= consumption too high) and counting interruptions (= zero consumption) are integrated into the Actaris embedded reading software supplied with the Actaris portable data entry terminals. These functions are part of the “Consumption control” automatically implemented during reading.

2.3 APPEARANCE

- Max. height on the meter: 50 mm (antenna included)
- Serial number of the meter readable without dismantling the Cyble module - Totalizer index readable without dismantling the Cyble module - Antenna integrated into the housing - Color: black

- Marking: - RF cyble, year and month of manufacture, serial number. This last information is also recorded in the form of a bar code.
- Radio certification: number of the approved laboratory which carried out the tests: 0536.
- ACTARIS, Access Cyble , CE and RF logos



2.4 RADIO FREQUENCY INTERFACE

RADIAN communication protocol Communication
frequency: 433.82 MHz (offset from the 433.92 MHz frequency, the most used in the territory in the 433 band)

Modulation type: FSK (frequency modulation digital)
Transmission type: 2 channels
Transmitted power: Erp ÿ 10 mW
Optimal performance: -
Maximum theoretical range: 600m in open field - Minimum theoretical collection time: < 3 sec/interrogation Operation in any position.

2.5 PROGRAMMING

The Cyble[ÿ] RF is field configurable.

The following parameters are programmable, either at installation start-up (commissioning) or during on-site intervention:

- **Initial index of the associated water meter**
- **Date and Time**
- **Pulse weight of the associated water meter**
- Serial number of the associated water meter
- Resetting histories
- Reset alarms
- Leakage threshold if desired

The parameters indicated in bold must be configured for radio frequency reading.

2.6 MECHANICAL INTERFACE

The Cyble[ÿ] RF is compatible with ACTARIS totalizers of the TVM, TSN and TS type. The corresponding counters are: NARVAL, AQUADIS, AQUADIS+, TD8, FLODIS, FLOSTAR M, IRRIMAG, WOLTEX M, WOLTMAG M, ISOFLO.

The Cyble[ÿ] RF is fixed to the meter using a screw. Max tightening torque: 1.2 Nm Flat-type screwdriver.

2.7 ENVIRONMENTAL CONSTRAINTS

Temperature

Accidental and transport: - 20°C
in peaks (< 24 hours / year) + 70°C in
peaks (< 24 hours / year)

Continuous operation (including storage): -10°C to +55°C

Temperature	% of time 5 20
-10°C	
0°C	45
20°C	25
40°C	5
55°C	

IP protection rating IP68:

non-interchangeable battery.
The Cyble ÿ RF is functional even when submerged in a manhole.

Shock protection

Falls onto concrete from a height of 1 m, on each of the 3 axes, 2 faces/axes, with no impact on the functionality and integrity of the Cyble ÿ RF.

Vibes

3 g in the main resonance frequencies/directions (up to 5), for 1 minute, frequency range 0 to 300 Hz, without impact on the functionality and integrity of the Cyble ÿ RF.

2.8 LIFESPAN

15 years typical (including storage).
Minimum lifetime: 12 years minimum. (lifetime
calculated on the basis of one interrogation per day max, with temperature profile described in point 1.2.7. and radio alarm range of 12 hours per day from Monday to Saturday).

2.9 CONFORMITIES

Authorization for use in France issued by the notified body EMITECH and identified under no. 0536.

Standards specified by R&TTE Directive 1999/5/EC:
EN 300-220-3 (Radio)
EN 301-489-3 (EMC)
EN 60950-1:2001 (protection of the health and safety of persons)

Compliance testing to the above standards available upon request.