

# ELECTRONIC SEAL

Electronic Seal provides information about unauthorized manipulation with an electric meter or with any device that should be sealed. Functionality consists in constant control of the optical fiber which allows detection of loop interruption. In this case, a message about non-technical action is sent immediately. Re-connection of the Electronic Seal is possible only by authorized intervention. Thanks to a built-in accelerometer it sends notification even when you move the device.



## TECHNICAL PARAMETERS

Battery	Li-SOCI2, 3,6 V
Lifespan	7 years
Protection	IP68
ATEX	Class 2 (optional)
Sigfox module	Wisol
Antenna	868 MHz non-directive, Sigfox Class 0
MCU	STM32L0 series
Security	optical fiber loop (loop break detection), fiber bridging detection (detection of attenuation change), vibration and rotation detection (accelerometer), reed contact (technician authorization via server)
UI	Reed contact (magnet), LED



## LOGISTICS IN RETAIL

- Theft prevention
- RTU protection in:  
Warehouse  
On the route



## FACILITY MANAGEMENT

- Theft prevention
- Protection of hydrants
- Prevention  
of unauthorized entrance  
(opening doors, cabinets, etc.)



## ENERGY DISTRIBUTION

- Theft prevention
- Detection of unauthorized  
manipulation or  
circumvention of the meter
- Confirmation of site visits
- Protection of various assets,  
e. substations



## BUSINESS CASE – THEFT PREVENTION

- **Gas distribution company** – monopoly for distribution of gas
- **1,5 milion** metering points
- Over **30 000** conducted site visits to suspected gas theft
- Only **2000** sites were confirmed with theft with cumulated damage **2 193 000 €** plus additional of approximated **1 200 000 €** in site visits
- Assumed energy theft at **3 - 5 % of meters**, meters are visited only once per year
- Average household gas bill: 60 - 100 € / month = 720 € / year
- **Thus big households and SME are more prone to energy theft (120 000 are SME only plus approximate 100 000 big households)**



Yearly confirmed loss	3 393 000 € (1 % theft)
Yet yearly additional estimated loss	4 386 000 € (+2 % theft)
Yearly loss in total	7 779 000 €
<b>Estimated loss in 5 years</b>	<b>27 226 500 €</b>

### Compared to 3 year deployment

Seal Price	50 €
Suspected metering points (50 % of total)	110 000
Installation costs	25 €
SW + Sigfox connectivity	12 € / year
<b>In Total for 5 years</b>	<b>13 353 000 €</b>