



**ZENNER**

Product information

EDC-  
communication module

LoRaWAN™

Saarbrücken, September 2020



# SPEAKER

Name: Thomas Buchholz  
Position: Product manager system technology  
@ ZENNER: since 01/10/2010  
Qualification: study of energy & environmental technology,  
before ZENNER: working for a metering service company  
& a multi utility company  
Telephone: +49 681/996763 119 or +49 173/9662 863  
E-mail: thomas.buchholz@zenner.com

# AGENDA

- Construction
- Hard facts
- Further development – LoRaWAN™ variant
- Technical specifications
- Content LoRaWAN™ radio telegram
- LoRaWAN™ EDC settings
- Commissioning
- SAP numbers and SAP short text explanation
- Smart Meter functions
- news

# CONSTRUCTION

## EDC radio

- Battery
- ID & bar code
- Antenna
- IR



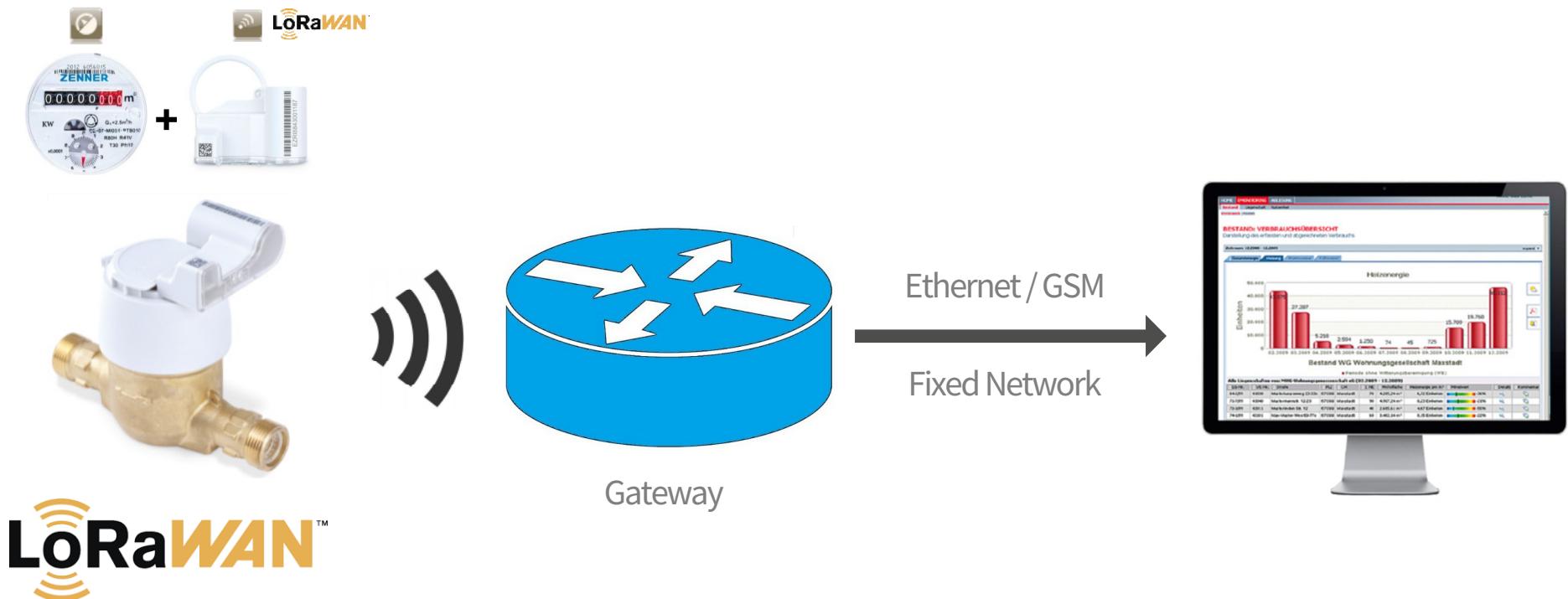
## HARD FACTS

- EDC communication module (Electronic Data Capture module)
- Electronic, non-reactive sampling of all ZENNER water meters equipped with modulator disk
- Secure remote reading (transmission of the roller counter value)
- Integration of water meters into smart metering systems
- Suitable for ZENNER single-jet, multi-jet, ring piston and Woltman meter with modulator disc
- Retrofitting without damaging the seal

**→ Recommendation: Water meter from the factory with mounted EDC module**



## FURTHER DEVELOPMENT → LoRaWAN™



## TECHNICAL DATA

|                                   |   |
|-----------------------------------|---|
| Operating frequency               | 868 MHz   |
| Duration of the send telegram     | Up to 1 second (depending on the spreading factor)                  |
| Transmitting frequency            | daily, monthly on demand, 8 x p.d. with 3 hourly values each (SZ3)  |
| Data transmission method          | LoRaWAN™ class A (bidirectional communication)                      |
| Encryption of the radio protocols | yes   |
| Battery capacity                  | Lithium battery – ca.10 years (depending on transmitting frequency) |
| Transmission power                | 25 mW   |
| Protection class                  | IP 68   |
| Operating temperatur              | -15°C to +55°C  |
| CE conformity                     | according to guideline 2014/53/EU (RED)                             |

## Radio packets in Zenner devices

| packet type | packet name | short description  | remark                     |
|-------------|-------------|--|----------------------------|
| 0x00        | SP0         | current value  |                            |
| 0x01        | SP1         | day value, single channel                                |                            |
| 0x02        | SP2         | monthly value, single channel                            |                            |
| 0x03        | SP3         | monthly and half-monthly value, single channel           |                            |
| 0x04        | SP4         | key date and value at key date, single channel           |                            |
| 0x05        | SP5         | day value, two channels                                  | two-channel version of SP1 |
| 0x06        | SP6         | monthly value, two channels                              | two-channel version of SP2 |
| 0x07        | SP7         | monthly and half-monthly value, two channels             | two-channel version of SP3 |
| 0x08        | SP8         | key date and value at key date, two channels two-channel | two-channel version of SP4 |
| 0x09        | SP9         | time, status, static info                                | depending on subtype       |

SP 5 – 8 entfallen bei EDC

Utility: SP 1 – 2 | Submetering: SP 2 – 4

# LoRaWAN™ RADIO TELEGRAM

| Protocol content  | Interval                | Packet |
|---|-------------------------|--------|
| Serial number (DevEUI of radio hood)  | once at Join            | SP 9.2 |
| Device specific information<br>(Firmware version, LoRaWAN version, device type) | half-yearly             | SP 9.2 |
| Value at key date [01.01.]  | yearly on key date      | SP 4   |
| Status change (manipulation, battery warning, ...)                              | irregular (event based) | AP 1   |

| Scenario 1 (monthly) – battery: 10 years + reserve & 1 year storage                       |                                    |        | Scenario 2 (daily) – battery: 10 years + reserve & 1 year storage |          |        |
|---|------------------------------------|--------|---|----------|--------|
| Protocol content  | Interval                           | Packet | Protocol content  | Interval | Packet |
| Monthly value (pr. month) [liter],<br>status information,<br>current date and time        | after<br>beginning of<br>new month | SP 2   | Daily value<br>(Day before midnight) [liter]                      | daily    | SP 1   |
| Monthly value (pr. month) [liter],<br>monthly mid-value [liter],<br>current date and time | in second half<br>of month         | SP 3   | Status information,<br>current date and time                      | monthly  | SP 9.1 |

SP=synchronous packets=regular | AP=asynchronous packets=irregular

## LoRaWAN™ EDC FACTORY SETTINGS

|                        | <b>Retrofit module</b>   | <b>Module mounted on water meter</b>   |
|------------------------|--|--|
| <b>Delivery status</b> | EDC in delivery mode;<br>sensing deactivated;<br>radio deactivated | coil scanning active;<br>protective film over the IR interface<br>against unintentional activation                         |
| <b>Activation</b>      | only via IR command<br><br>Later implemented: autostart via light  | Activating by strong visible light directed<br>towards the IR diodes (min. 8 seconds);<br>Autostart after 30 Liter of flow |

# COMISSIONING

- Remove protective film at IR interface and activate EDC module with light source (> 8s)
  - default: daily transmission interval
- Device sends a join request to the LNS and waits for join accept
- If no join response is received by the device, an additional request will be sent every minute (max. 5 requests)
- Control light LED (red) indicates the status of the connection process –  
fast flashing: no join accept received / slow flashing: successful connection
- In the case of unsuccessful joining, the device will send a random join request every other day until a successful connection has been made (LED does not indicate later join attempts)

## SAP numbers and SAP short text explanation

- EDC-C LORA 868 DV
  - C = Clip (+ screw)
- EDC-S LORA 868 DV
  - S = Screw (2 pcs.)
- EDC-C LORA 868 F. WP DN150-300 100L DV
  - DV = daily value
- EDC-C LORA 868 F. WP DN50-125 10L DV
  - 868 = 868 MHz (frequency)
- EDC-C LORA 868 F. WS DN50-200 10L DV
  - DN = Nominal Diameter

# Smart Meter features

*since firmware 1.41*

- Self-monitoring
- Manipulation detection
- Detection of incorrect mounting (flow direction detection)
- Detecting leakage
- Detection of meter blocked
- Detection oversized meter
- Detection of undersized meter
- Dismantling the module



## Further developments

- LoRaWAN Certification → already done: <https://lora-alliance.org/showcase/edc>
- Next step: bring this version into production
- wM-Bus version: short before launch: new firmware with improved coil detection, modern LoRa Hardware and different way of calculating the monthly values

Questions?





**ZENNER**

Thank you  
for your attention!