The **DLMS UA Remote Sensor Generic Companion Profile (RSE GCP)** introduces a robust and scalable framework for the integration of metrologically relevant sensors within smart metering infrastructures. This profile establishes a **physical and logical architecture** detailing interactions **between verified sensors, metrologically approved Mother Units (MU), and Head-End Systems (HES)**.

By adopting the DLMS RSE GCP, stakeholders across the energy ecosystem can **streamline sensor integration, enhance operational transparency, and support advanced metering capabilities** in alignment with national and international standards.

RSE (Remote Sensor) GCP Overview

The RSE GCP defines the data and command transfer framework between Mother Units (MU) and one or more remote metrological sensors (SC), including gas volume, temperature, pressure, and other critical sensors. This enables energy providers to construct modular, adaptive metering architectures where sensors operate as independently verified components contributing to legally recognized billing outcomes.

Addressing Industry Challenges with RSE GCP

The integration of standalone sensors into smart metering systems presents challenges in calibration, communication, and compliance. The RSE GCP directly addresses these issues by standardizing data exchange between verified sensors and metrologically approved Mother Units. It also supports secure credential management and authenticated communication using DLMS/COSEM. Additionally, the platform enables a modular approach to hardware deployment and maintenance, reducing costs and improving system longevity. Most importantly, it ensures that metrological data from remote sensors can be legally recognized.

KEY BENEFITS

Standardized Sensor Integration: Establishes a unified communication and control model for all supported metrological sensor types.

Legally Recognized Measurements: Enables secure transmission of metrological data from sensors to Mother Units for compliant billing and audit.

Secure Communication Protocols: Leverages DLMS/COSEM with encryption and authentication for trustworthy, tamper-resistant data exchange.

Operational Flexibility: Supports dynamic processes such as sensor installation, commissioning, calibration, replacement, and credential refresh.

Support for Unreliable Networks: Includes mechanisms to ensure data consistency and integrity even in low-connectivity environments.

Energy-Efficient Sensor Support: Optimized for battery-powered sensors, allowing extended deployment in remote or hard-to-access locations.

Highlighting the Main Use Cases

1 Sensor Installation

Physical installation of a sensor including introducing it to a network containing an MU

2 Sensor Commissioning

Performing the actions needed to move the sensor from the installed state to the BaU state., This may include Security Credential exchange, verification of metrological suitability, information regarding naming and addressing of peers on a network, and mutual authentication.

3 Sensor Types

Description of Sensor types that are covered by the Use Cases, and the constraints and limitations that may apply. NOTE that this may migrate into an architectural or scope element in future editions

4 Sensor Metrological Reading

Data transfer from the Sensor (SC) to the MU in the BaU condition. Data is Metrological. Data Transfer will be initiated from the Sensor (SC) in most cases, but may be initiated from the MU where the SC is not battery powered.

5 Sensor Non-Metrological Reading

Transfer of data from the Sensor that is not metrologically relevant. This can be values, logs, events and alarms. Transmission of this data will usually be initiated from the Sensor, but may be initiated from the MU if the SC is not battery powered

6 Credential Refresh

Replacement of security credentials on the SC and MU

7 Sensor Calibration

Verification and adjustment of sensors by suitably authorized persons.

8 Sensor Exchange

Replacement of a faulty sensor with a known good sensor

9 Sensor Clock Update

Where a Sensor has an RTC, verification that it is within necessary tolerance and update as needed.

10 Disturbances to BAU

The Use Case covers external events, included detected interference with the sensor itself and interruptions to the communications flow from the SC to the MU.