General technical requirements for private measurement

Version 2.0 (15/06/2020)

This document describes the technical requirements for private measurement devices connected to the Elia grid.

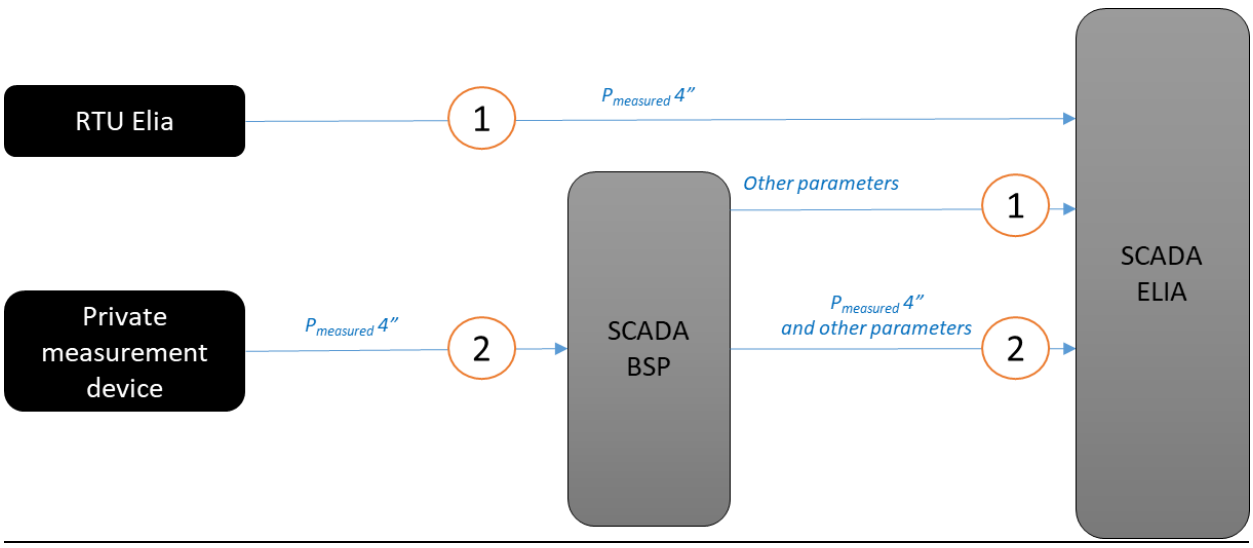
1 Configuration for Delivery Point DP_{SU} (CIPU assets)

In case an RTU owned by Elia is installed on the level of the delivery point, this RTU communicates the instantaneous power measurements directly to the SCADA of Elia. For delivery points, where no RTU owned by Elia is installed, a private measurement device needs to be put in place to provide Elia the instantaneous power measurement every 4" via the SCADA of the BSP to the SCADA of Elia. To ensure a secure communication and a well-functioning of the architecture, minimal technical and regulatory requirements are defined in this document for the private measurement devices. The parameters to be communicated from the BSP to Elia and the communication requirements are described in the T&C BSP aFRR.

The following solutions are possible:

1. Option 1: The use of a RTU owned by Elia that collects the instantaneous power measurement and communicates them in real-time directly to the SCADA of Elia. The RTU of Elia is located at the delivery point.
2. Option 2: The use of a private measurement device that collects the instantaneous power measurement values every 4" and communicates them in real-time directly to the SCADA of the BSP. The SCADA of the BSPs forwards the values to the SCADA of Elia via a communication protocol determined by Elia. The private measurement devices are located at delivery point level.

Schematic view



These solutions apply exclusively to Delivery Points within the electrical facilities of a grid user.

2 Configuration for Delivery Point DP_{PG} (non-CIPU assets)

A private measurement device needs to be put in place to provide to Elia the instantaneous power measurement every 4" via a private gateway and via the real-time communication platform. To ensure a secure communication and a well-functioning of the architecture, minimal technical and regulatory requirements are defined in this document.

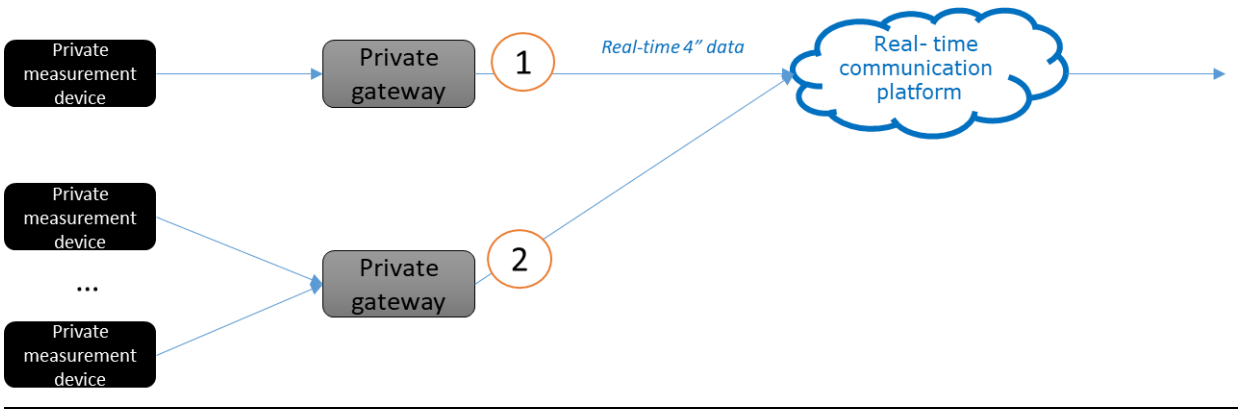
The following solutions are possible:

1. Option 1: The use of a private gateway that collects the instantaneous power measurement values every 4" of a private measurement device and communicates them in real-time directly to the real-time communication platform via a communication protocol determined by Elia. The private measurement device is located at the delivery point. The delivery point can also be defined at the level of the access point.

The gateways have to be installed locally within the premise of the grid user and must have direct connection with the communication platform.

2. Option 2: The use of a private gateway that collects the instantaneous power measurement values every 4" of two or more private measurement devices and communicates them in real-time directly to the real-time communication platform via a communication protocol determined by Elia. The private measurement devices are located at delivery point level. Connection of a private gateway on two or more access points is not allowed. The gateways have to be installed locally within the premise of the grid user and must have direct connection with the communication platform.

Schematic view



These solutions apply exclusively to Delivery Points within the electrical facilities of a grid user.

3 Technical requirements for the private measurement system connected to the federal and local transmission grid

The private measurement system meets the following minimum requirements:

- The accuracy class of the measurement core of the current transformers (CT) should at least be in line with the requirements of the current transformers for the energy measurements as specified in the Technical Regulations for Federal and Local Transmission Grid in force.
- The accuracy class of the measurement core of the voltage transformers (VT) should at least be in line with the requirements of the voltage transformers for the energy measurements as specified in the Technical Regulations for Federal and Local Transmission Grid in force.
- The accuracy class of the private measurement device for the 4" power measurements should be in line with the requirements of the energy measurements as specified in the Technical Regulations for Federal and Local Transmission Grid in force. The accuracy class of 0.2s and the accuracy class of 0.2 may be replaced by an accuracy class of 0.25.
- The private measurement device must have a sampling rate which allows to give a new value exactly each 4". Refresh rate must be $1/2^n$ times the 4" interval (with n = 1,2,3,4,…).
- The data have to be timestamped each 4 seconds.
- The device that is responsible for the time stamping must be time synchronized with an NTP server or an equivalent system. The precision of the timestamp should be at least 20ms.
- Any cable connecting the current or voltage transformers to a measurement device must be as short as possible with a maximum of 50m. The section of the connection wires between the measurement device and the current transformer is ideally minimum 4 mm^2. The section of the connection wires between the measurement device and the voltage transformer is ideally minimum 10 mm^2.
- The connection wires to current and voltage transformers may not be located in the same cable.
- A system of 2 or 3 current / voltage transformers is allowed (method 2 or 3 power meters) but the 3 power meters method is preferred.
- The installation must be grounded correctly.

- Precision control of the private measurement device is mandatory every 5 years following technical specifications of ELIA. A copy of the report has to be transmitted to ELIA.
- Elia has the right to perform an ad-hoc on-site audit at any time.

4 Technical requirements for the private meter system connected to the closed Distribution Grid

The private measurement system meets the following minimum requirements:

- The accuracy class of the measurement core of the current transformers (CT) should at least be in line with the requirements of the current transformers for the energy measurements as specified in the Technical Regulations for Distribution Grid in force.
- The accuracy class of the measurement core of the voltage transformers (VT) should at least be in line with the requirements of the voltage transformers for the energy measurements as specified in the Technical Regulations for Distribution Grid in force.
- The accuracy class of the private meter for the 4" power measurements should be in line with the requirements of the energy measurements as specified in the Technical Regulations for Local Transmission Grid in force. The accuracy class of 0.2s and the accuracy class of 0.2 may be replaced by an accuracy class of 0.25.
- The private measurement device must have a sampling rate which allows to give a new value exactly each 4". Refresh rate must be $1/2^n$ times the 4" interval (with n = 1,2,3,4,…).
- The data have to be timestamped each 4 seconds.
- The device that is responsible for the time stamping must be time synchronized with an NTP server or an equivalent system. The precision of the timestamp should be at least 20ms.
- Any cable connecting the current or voltage transformers to a measurement device must be as short as possible with a maximum of 50m. The section of the connection wires between the measurement device and the current transformer is ideally minimum 4 mm^2. The section of the connection wires between the measurement device and the voltage transformer is ideally minimum 10 mm^2.
- The connection wires to current and voltage transformers may not be located in the same cable.
- A system of 2 or 3 current / voltage transformers is allowed (method 2 or 3 power meters) but the 3 power meters method is preferred.
- The installation must be grounded correctly.
- Precision control of the private meter is mandatory every 5 years following technical specifications of ELIA. A copy of the report has to be transmitted to ELIA.
- Elia has the right to perform an ad-hoc on-site audit at any time.