



## Tutorial 3:

# PMUs for Distribution Grids: a Comprehensive Guide for Distribution System Operators

### Background

Distribution grid monitoring, control and optimization is typically achieved via complex control room solutions such as Advanced Distribution Management System (ADMS). Such systems, in order to properly function, typically require the availability of high-quality grid measurements, which are typically scarce at the distribution level.

To increase the amount and quality of the data managed and processed by ADMS and improve their performance, Distribution Phasor Measurement Unit (D-PMU) seem an extremely viable technology, on one hand for their inherently higher data quality, on the other hand for their capability to server multiple use cases simultaneously.

### Aim of the tutorial

As the D-PMU technology becomes more mature and adopted, this tutorial aims at providing an in-depth analysis of Distribution PMU technology and explaining how it can help Distribution System operators to accelerate the grid digitalization process.

### Contents (preliminary)

The tutorial is structured as follows:

- **D-PMU basics:** Basic concepts about D-PMU technology and main differences from conventional transmission PMUs.
- **PMU Standards:** review of PMU Standard history and focus on currently active PMU Standards
- **D-PMU enabling technologies:** analysis of D-PMU enabling technologies, including sensing, communication and time synchronization technologies
- **D-PMU use cases:** review of distribution PMU use-cases and their integration with existing control room solutions.
- **D-PMU system architectures:** review of possible architecture of D-PMU systems able to address different use cases.
- **D-PMU user experience:** return of experience from 1-2 DSOs who decided to invest in the D-PMU technology.
- **The future of D-PMU technology:** overview of major technology trends which are expected to facilitate the adoption of D-PMUs.

### Expected benefits

Participants will gain an understanding of the D-PMU technology and its application to monitoring, protection and control of modern power distribution systems, with reference to real applications.

### **Who should attend**

- Distribution System operators or Private grid/microgrid operators
- Companies/industries interested to develop a D-PMU product portfolio
- Regulators
- Academics interested in real applications of PMU technology at the distribution level.

### **Support material**

A copy of all the presentation material used in the tutorial will be supplied to delegates (electronic version).

### **About the presenters**

Presenter information will be confirmed shortly.