



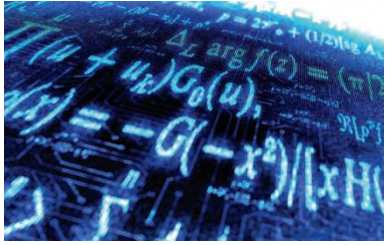
ENG63 GridSens – Sensor network metrology for the determination of electrical grid characteristics

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Introduction

- Distribution grids growing in **complexity** due to **distributed renewable generation**
- **Greater observation** and control are needed
- Greater reliance on transfer of large volumes of measurement data leading to **security threats**
- **Standardisation** – homogeneous approach, incorporate security for measurement networks, interoperability
- Understanding the grid with **minimal instrumentation**
- **Evolving grids poorly understood** – missing topology data, unknown impedances
- **Updating and reinforcement** – requires greater knowledge of grid structure and behaviour

Objectives



Sensor network metrology algorithms to process data from grid monitoring systems developed and applied to real electrical grids (**WP1, WP2**)

To determine uncertain distribution network topologies and line impedances and verify existing grid models using on-site measurements and state estimation techniques (**WP1, WP2, WP3**)



To investigate the use of Phasor Measurement Units (PMUs) for power flow calculation and state estimation in distribution grids (**WP3**)



Objectives



To apply Smart Meter data to network state estimation. Aggregation of low accuracy Smart Meter data to provide an of understanding of The distribution grid state **(WP3)**

To implement and validate a secured standardised distributed measurement system and address the impact of security measures on the metrological requirements and uncertainties **(WP4)**

