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Timing Synchronization Framework for Wide Area Measurement System in Smart Grid Computing

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Abstract

The exceptionally designed correspondence is currently on-request in the force business mainly for the control, estimation, and checking frameworks in electrical substations that are profoundly essential to have high accessibility, precise, and continuous observing frameworks. The conventional substations are equipped with Programmable Logic Controllers (PLCs) with the Supervisory Control and Data Acquisition (SCADA) frameworks. These PLCs operate the smart grid substations' data as a communication channel by covering a regulated carrier frequency of the overhead transmission lines. Existing PLCs with SCADA and Phasor Measurement Unit (PMU) with the IEEE C37.118 based WAM framework faces synchronization difficulties in estimating real-Time phasors and controlling of Wide Area Measurement System (WAMS) in the smart grid network. Along these lines, this article aims to build up a precise synchronization framework for two-way correspondence in the smart grid network. The key objective is to relieve the stage counterbalanced and mitigate delay errors to monitor the grids through PMUs based WAMS continuously. The simulation result suggests that the proposed framework archives better precision than the existing IEEE C37.118. © 2020 IEEE.

Author Keywords

Phasor Measurement Unit words; Secured message; Timing Synchronization; Wide Area Measurement

Index Keywords

Computation theory, Data acquisition, Electric power transmission networks, Geodesy, Optical instruments, Phasor measurement units, Programmable logic controllers, Smart power grids, Surveying, Synchronization, Timing circuits, Wide area networks; Carrier frequency, Electrical substations, Overhead transmission lines, Precise synchronizations, Smart grid networks, Supervisory control and data acquisition, Timing synchronization, Wide- area measurement systems (WAMS); Grid computing

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