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IEEE Guide for Phasor Data Concentrator Requirements for Power System Protection, Control, and Monitoring

IEEE Power and Energy Society

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Power System Relaying Committee

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IEEE Guide for Phasor Data Concentrator Requirements for Power System Protection, Control, and Monitoring

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Power System Relaying Committee
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Abstract: The functional, performance, and testing guidelines for a phasor data concentrator are described in this guide. Supporting information is also provided.

Keywords: data concentrator (DC), GPS synchronization, IEEE C37.244™, phasor, phasor data concentrator (PDC), phasor measurement, phasor measurement unit (PMU), synchrophasor

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Introduction

This introduction is not part of IEEE Std C37.244-2013, IEEE Guide for Phasor Data Concentrator Requirements for Power System Protection, Control, and Monitoring.

A phasor data concentrator (PDC) is a function that combines synchrophasor data from more than one source for further processing. Originally the PDC purpose was to combine synchrophasor measurements from many phasor measurement units (PMUs) into a single time synchronized data stream. Since the PDC was the only common element in communications with all measurement units, its function included monitoring the overall measurement system. As measurement systems and the deployment of applications have increased in size, the functions of the PDC have expanded to include more data handling, processing and storage. At the same time, the rapid growth in technology is enabling the development of integrated features for power systems applications. This guide provides definitions of the terminology, functional descriptions, and what could be expected from a PDC. It is arranged with clauses describing the functions and requirements in order for the user to identify the features desired for the respective applications. This guide is communication protocol independent in terms of applications, and will also serve the industry with common interpretation of terms for function standardization and data protocol implementation agreements. Clause 7 offers practical methods for testing PDC functions, including example setups for data transport in a production-type environment, in line with related IEC and IEEE standards.

This guide defines numerous functions that may be included in a PDC. Which ones are included depend on the application and use of the PDC, as well as agreements between the PDC manufacturer and customer. The functions presented in this guide may not be available; and it is anticipated that other functions which have not been included here may exist and others may be developed in the future.

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1. Overview

This clause describes the scope, purpose, and the limitation of applicability of the IEEE Guide for Phasor Data Concentrator Requirements for Power System Protection, Control, and Monitoring, hereafter referred to as "this guide."

1.1 Scope

This guide describes performance, functional, and communication needs of phasor data concentrators (PDCs) for power system protection, control, and monitoring applications. The guide covers synchrophasor system needs and testing procedures for PDCs. It includes functional requirements for associated interfaces with phasor measurement units (PMUs) to a PDC and PDC systems. In particular, it includes requirements for synchronization, synchrophasor data processing, and real-time access.