InformIT PSG 810 / PSG 830

Wide area measurement
Phasor measurement: A new data acquisition technology

In contrast to conventional control systems, where RTUs are used for the acquisition of RMS values of currents and voltages, the PSG810/PSG830 system acquires GPS-synchronized current, voltage and frequency phasor measurements, which are measured by Phasor Measurement Units (PMUs), from critical locations of the power system. They include both magnitudes and phase angles and they are synchronized with an accuracy of 1 microsecond.

PMU integration in wide area measurement systems

The PSG810/PSG830 acquires phasor data from PMUs located at several nodes and provides it as dynamic information on the power system at locations where it is needed (stations, regional centers, national centers etc.). This allows existing and new PMUs to be integrated into a wide area measurement system.

Dynamic monitoring of critical nodes in power systems

Critical nodes in today’s transmission grids are usually monitored by using static or quasi-dynamic data based on RMS measurements. Phasors measured at the same time instant allow snapshots of the status in the monitored nodes to be made. By comparing the snapshots with each other, not only the steady-state but also the dynamic state of critical nodes in transmission and sub-transmission networks can be observed.

Monitoring of transmission lines and corridors

Transmission lines and corridors between transmission networks need to be carefully monitored since they can form bottlenecks leading to power flow congestion. Dynamic information provided by the PSG810/PSG830 are used by the operator to initiate the necessary measures in due time to keep the power flow at the required level.

Angle and magnitude monitoring

On-line angle and magnitude monitoring is provided by the PSG830 based on voltage and current phasors. Actual angle and magnitude display as well as the comparison of selected power system nodes with any other node that has phasor measurement.

Data analysis

Historical data access is provided for retrieval of phasor data for post-mortem analysis. Navigation facility is implemented easing selection and display of information required.

Now is the time for PSG 810 / PSG 830 — your first step towards the benefits of innovative wide area monitoring, protection and optimization solutions

It forms the basic platform enabling the integration of comprehensive applications provided by ABB as well as in-house and third party applications.

The right time for a dynamic approach to your power system
Take the opportunity to meet a new era of future monitoring, protection and optimization of power systems

Utilize phasor information from new as well as already installed PMUs
Phasor measurement is becoming more and more the ultimate data acquisition technology, which will be used in wide area monitoring, protection and optimization. Power utilities have already started deploying PMUs in their grids mainly for manual data acquisition and treatment. PSG810/PSG830 provide central data acquisition from already installed and planned PMUs enabling utilities to utilize phasor information wherever it is needed.

Dynamic information for maintaining power system security
Present power systems are usually operated based on static or quasi-dynamic information extracted from RMS measurements. Phasor measurements at critical nodes help system operators to create a dynamic view of the power system and initiate the necessary measures in proper time. This increases the efficiency of power system operation and maintains security at the desired level.

Improve power flow in transmission corridors
It has been observed that transmission corridors and intertie-lines can form bottlenecks leading to congestion in daily operation. Precise and dynamic information provided by PSG810/PSG830 helps system operators to recognize these bottlenecks and to re-route power flow via other connections. This improvement in congestion management helps to avoid delays in power delivery and secures revenues.

Power swing detection by on-line angle difference monitoring
Power swings may lead to load shedding and islanding in transmission networks. The on-line angle comparison facility of PSG830 enables operators to recognize power swings at a very early stage and to initiate the necessary counter measures. This helps to avoid unnecessary load shedding and to secure the income of power utilities.

Improved analysis
The historical data package provides facilities for the post-mortem analysis of incidents based on dynamic phasor information. This improves the efficiency of power system analysis and helps to find the real cause of the incident.

First installation of wide area technology
The PSG810/830 forms the first step in wide area measurement, monitoring, protection, and optimization. ABB provides all the necessary equipment, systems, and services from one supplier for creating solutions suitable for the utility’s needs and requirements. This enables utilities to reduce the costs of project evaluation and implementation.

PSG 830 — the new state-of-the-art platform for wide area monitoring, protection and optimization applications
The PSG830 platform is the basis for implementing both ABB and customer specific applications. A comprehensive portfolio of software applications can easily be installed to create the solution required for today’s and for future needs.

Next step // Wide area applications planned in the near future
- Basic monitoring // State calculation and topology monitoring providing total observation of monitored area
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- Control action suggestion // Operator guidance based on stability assessment
- Voltage stability assessment // Voltage stability monitoring including on-line loadability calculation
- Frequency stability assessment // Frequency stability monitoring
- Power oscillation assessment // Power oscillation monitoring
- On-line thermal assessment // Thermal limit calculation based on phasor measurement
- Off-line // Off-line support for system implementation
- Advanced control // Automatic protective and/or optimization actions

Our implementation philosophy enables a utility to start with a small installation and to expand to the ultimate solution — step by step. It helps to drastically decrease the financial and technical risks.
InformIT PSG 810 provides

- Real-time and synchronized phasor data acquisition

The elementary application package which integrates existing as well as new PMUs for wide area measurement and phasor data viewing.

The PSG810 includes:

Connectivity* for phasor data acquisition and viewing
- Phasor acquisition from PMUs using dedicated channels as well as LAN
- IEEE 1344-1995 data format
- Validity check and time alignment of data acquired
- Monitoring of communication links to PMUs
- PMU data viewing

Historical data for post-mortem analysis (option)
- Data storage
- Navigation through historical data
- Trending

*The Connectivity module provides data from IEEE1344-1995 compliant PMUs over an OPC data access standard interface. Supported connections to PMUs are either serial (RS232) or network (Ethernet) links. The OPC specifications 1.0A (custom and automation interfaces) and OPC specification 2.0 are supported.

Take the advantage of our offer to gain experience with a 30-day free trial version of PSG 810. We have prepared a free download of the PSG 810 module “connectivity”.

All you have to do is to contact our wide area team via e-mail: wide.area@ch.abb.com and ask for the URL and a password.

InformIT PSG 830 provides

1. Real-time and synchronized phasor data acquisition

2. A graphic user interface enabling process oriented navigation using single line diagrams, faceplates etc.

3. The basic PSGuard system platform ready for the implementation of additional application software packages

The first step towards wide area monitoring, protection and optimization—based on ABB’s IndustrialIT concept.

The PSG830 includes:

Basic system with Graphic User Interface (GUI)
- IndustrialIT Aspect Integrator Platform enabling integration of SW packages
- OperateIT GUI enabling process oriented navigation through phasor information
- Enabling links to WEB as well as other systems
- Integrated engineering tools

Historical data for post-mortem analysis (option)
- Data storage
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Scope of delivery

Hardware
- PC with pre-installed PSG 830 applications
- Phasor measurement units—e.g. ABB RES 521

Software
- Connectivity
- Basic system
- Historical data (option)

Services
- Basic network analysis
- Customer requirement assessment and system design
- Project management
- Set-up engineering and commissioning
- Training and technical support