Branch-specific solutions

Wind Power SCADA (WPS)

Based on atvise® scada, with "Wind Power SCADA" (WPS) Bachmann makes a SCADA system available for the wind power industry. WPS enables a comprehensive, and at the same time, detailed view of the entire wind farm and of an individual wind turbine.

State-of-the-art technologies

As is the case with atvise® scada, pure web technology that offers absolute consistency on all levels for the user, is implemented for WPS. Thanks to this technology visualization can be operated on any PC, tablet, or smart phone. Through use of scalable vector graphics (SVG) an ergonomically favorable solution is provided for each device level (control center/park/individual wind turbine).

Item	Item No.
WPS SDK License	00027931-00
WPS RT	00026989-63
WPS AMT	00026989-70

Wind Power SCADA (WPS)

Process integration / communication	
Protocols	OPC Unified Architecture (UA) data access IEC 61400-25
Physical connection	Ethernet
Parallel operation	Yes, multiple clients in different technology (PC, tablet, mobile phone)
Project planning	
Development environment	atvise® builder
Functionalities	
Language switchover	Yes
Data historization	Yes, recorded on M1 controller and SCADA server
Alarm/event log	Yes, recorded on M1 controller and SCADA server
Trending (event-trigger)	Yes, recorded on M1 controller and SCADA server
Wind rose	Yes
User administration	Yes, consistent synchronized administration on SCADA and M1 controller
Access security	User-specific access monitoring and logging/archiving of the accesses
Export function	Yes, Excel, CSV, PDF, and clipboard
Online live trend	Yes
Reporting	Yes
Visualization	
Browser	HTML5 visualization (Chrome/Firefox/IE/Safari) with SVG graphics (Scalable Vector Graphics)

bachmann.

Communication standards

WPS implements communication standards, such as OPC UA (Unified Architecture) and IEC 61400-25. The OPC UA interface integrates convenient live process data and alarms and it can be used for historization. Use of data structures in accordance with IEC 61400-25 standardizes the process values.

Scalability

WPS maps all relevant plant levels: From the global view of the region, to the wind farm, and the individual turbine. Specific information is displayed for each level, which provides the user with an overview at any time. If detailed information is required, the user can quickly and easily go to the respective level.

The number of levels can be freely configured, so that smaller units, as well as large wind farms, can be created in a manner that is clearly organized and easy to understand. An overview table provides a fast survey of the entire number of turbines, the queued alarms, the produced power, and total energy generated.

The visualization has a "split screen" mode that makes it possible to see up to four different views of different levels at one time. The settings for the logged in user are stored and are available automatically at next log-in.
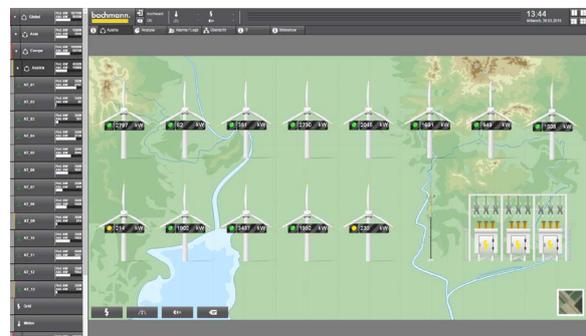WPS has a presentation mode. Presentation mode automatically changes screens of the WPS that can freely configured at a specific time interval.

SCADA functions

WPS makes functionalities available that are already familiar from atvise® scada, such as alarm handling, data historization, trending, user administration, and support of multiple languages. User administration is transparent and easy to operate for the user. One login procedure on the WPS suffices to access an individual turbine. For this the familiar security standards of the M1 controller, for which Bachmann is well-known, are used in the transmission (SSL) and user administration (groups/level) to prevent unauthorized access.
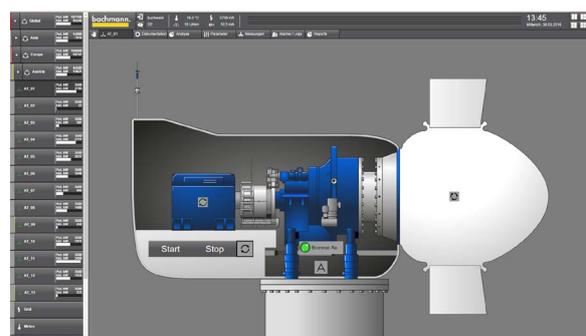

WPS – global view

WPS – wind farm view "graphic"

WPS – wind farm view "GeoMap"

WPS – turbine detail

System Overview • Bachmann electronic GmbH • 11/2019 • Specification subject to change – the product's characteristics are exclusively governed by the data of the respective user manual.

bachmann.

Branch-specific solutions

An additional active state function ensures that multiple users do not have concurrent write access to the system. Active state can be requested via WPS and the actual access status is presented in a clear and understandable manner.

Data history, alarms/events and trending are recorded by the M1 controller and consistently relayed to WPS so that a comprehensive analysis (power curve/wind rose/filters) is ensured there. If the connection to the SCADA server is interrupted, no data is lost, because it is first stored on the M1 controller. For the further connection the data is synchronized with the SCADA server and historized on the turbine with the time stamp of its occurrence.

On the data level, the WPS system is subject to the Bachmann Product „Wind Turbine Template" (WTT), which provides the functions cited above.

WPS offers extensive possibilities for analysis of the recorded data (sorting/filter functions), among other things, via elements such as power curve, wind rose or event-triggered snapshots. An online trend component enables read-out and comparison of live process data as a trend diagram or table. The values can be presented in a manner that extends beyond the wind turbine or the wind farm; the values can also be historized. The configuration can be executed online in WPS at any time. As a start aid, the most prevalent process values of a wind turbine are pre-configured and can be reached via a selection box.
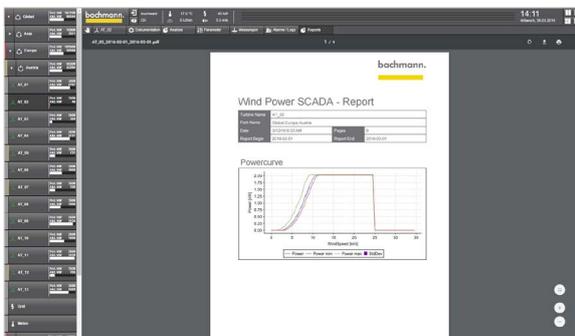
In addition, WPS offers a service logbook where freely entered text can be stored. It is also possible to store these texts directly when acknowledging an alarm that has occurred. All entries can also be edited retroactively and likewise they can be historized.
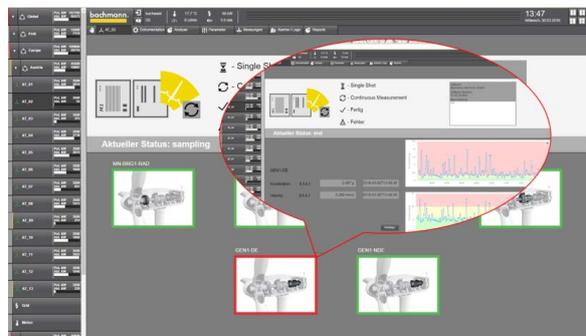
Integrated reporting
WPS offers the possibility of creating reports. These can be created manually for a selected period of time in WPS, as well as generated automatically with a prescribed time interval. The reports are stored on the server as PDF files and they can be displayed, fully integrated, via the WPS interface. The report content includes the power curve, wind distribution, and wind data, as well as availability and produced energy. An alarm table with all errors that occurred in the time frame, as well as an analysis of alarms relative to frequency and duration of the single alarms, is also included. The service logbook is also a component of the report. The report templates can be individually adapted via a selection of components.

Condition monitoring in accordance with ISO VDI 3834
The integration of Bachmann CMS is implemented in WPS in accordance with ISO VDI 3834. An overview page alerts the user when a lasting exceeding of the characteristic ISO values has occurred. In addition, with one click a trend can be opened that displays the last measured values recorded. In addition to the experienced CMS Remote Service, this component is a helpful indication for the user.

WPS – report view

WPS – CMS in accordance with ISO VDI 3834

System Overview • Bachmann electronic GmbH • 11/2019 • Specification subject to change – the product's characteristics are exclusively governed by the data of the respective user manual.

bachmann.

Project planning

WPS project planning is done via the tool atvise® builder. The object structure, created in accordance with IEC 61400-25, offers the user the simple possibility of configuring the necessary elements. As is the case for atvise® scada, the data points are pulled up for linking by browsing an OPC UA data source in the atvise® builder. The scripting functionality, as well as other advantages of the atvise® builder can likewise be used for WPS project planning. In this regard, an extensive library provides a wide variety of pre-fabricated, wind-specific components.

„Responsive web design" ensures that the WPS project must only be created once. Adaptation to the resolution on the tablet or smart phone occurs automatically.

WPS – split screen "4x"

Connection to external systems

Via the standardized OPC UA interface it is possible to integrate external controller systems that are based on the IEC 61400-25 data model, directly into the WPS.

External systems that does not support the standards cited above can be integrated via a gateway (Bachmann controller) that contains the basis for the WPS functions.

This is where the standardized fieldbus protocols of the M1 controller (PROFINET/PROFIBUS/CANBus/DNP3 etc.), as well as energy protocols (IEC 60870-103/-104/IEC 61850 in each case as client and server) are available; on the basis of these protocols the process data of the wind power plant can then be decoupled. Customer-specific, proprietary solutions can also be implemented on the gateway in order to use WPS in full scope.

WPS – tablet view/smart phone view, wind farm

Features

- Branch-specific SCADA system
- Use of standard communication protocols OPC UA and IEC 61400-25
- High scalability, open system
- Live process data on all visualization levels
- Automatic adaptation of the graphic resolution for PC, tablet, or smart phone
- Easy visualization on all mobile operating devices
- Uniform user administration for SCADA and turbine

- Active state / access control
- Split screen mode
- Online/offline trending
- Online language switchover
- Alarm and data historization
- Availability calculation in accordance with IEC 61400-26-1/-3
- Service logbook
- CMS ISO VDI 3834 integration
- Reporting

System Overview • Bachmann electronic GmbH • 11/2019 • Specification subject to change – the product's characteristics are exclusively governed by the data of the respective user manual.

bachmann.