SCADA webMI

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 RT	00026989-63
WPS SDK USB Small	00027931-11
WPS AMT Small	00026989-72
WPS SDK USB Medium	00027931-12
WPS AMT Medium	00026989-71
WPS SDK USB Large	00027931-30
WPS AMT Large	00026989-70

Wind Power SCADA (WPS)	
Process integration / communication	
Protocols	OPC Unified Architecture (UA) data access and alarms and conditions (AC) IEC 61400-25
Physical connection	Ethernet
Parallel operation	Yes, multiple clients in different technology (PC, tablet, mobile phone)
Project planning	
Development environment	atvise® builder, WTT configurator (SolutionCenter Plugin)
Functionalities	
Language switchover	Yes
Data historization	Data recorded on M1 controller (WTT) and historized in a database on SCADA server
Alarm/event log	Recorded on M1 controller and SCADA server
Trending (event-trigger)	Data recorded on M1 controller (WTT) and historized in a database on SCADA server
Wind rose /Powercurve	Yes
Dashboards/Widgets	Customer specific configuration of overview pages (dashboards) with turbine and park data
User administration	Consistent synchronized administration on SCADA and M1 controller
Access security	User-specific access monitoring and logging/archiving of the accesses to M1 controller
Export function	Excel, CSV, PDF, and clipboard
Online live trend	For each turbine and also park-wide
Reporting	Customer specific configurable reports (adhoc and planned), manageable directly in WPS
Visualization	
Browser	HTML5 visualization (Chrome/Firefox/IE/Safari) with SVG graphics (Scalable Vector Graphics)

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 and with this, offers a simple and clear solution.

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. Many already implemented monitoring views are showing the most important values of turbines, parks and the whole fleet.

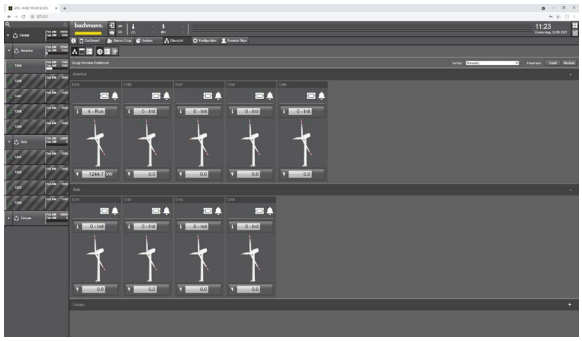
Dashboards and widgets

In the area of selection and presentation of data, the users of SCADA systems pursue different interests. For example, it is important for the service to have an eye on the status of the system and alarms/events and for the operator essentially the production data and the yield count.
In WPS, all process data of a system can be freely configured by the user on widgets (display containers). These self-compiled data ads are then freely placed on a dashboard page. These settings are saved to the logged-in user and reloaded the next time they log in. Thus, each user can design his individual views in the WPS according to his interests and use cases.

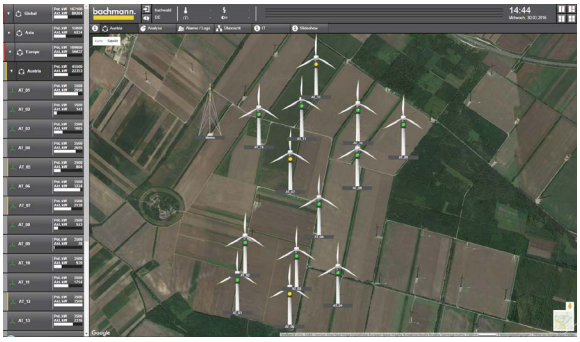
SCADA functions

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.

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 and the logged- in user is presented in a clear and understandable manner.

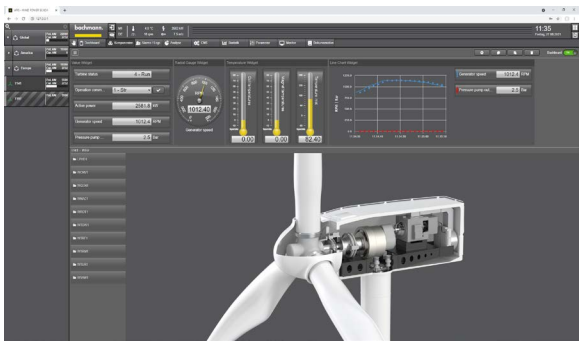


▲ WPS – wind farm view „graphic“



▲ WPS – wind farm view „GeoMap“

▲ WPS – dashboard view



▲ WPS – turbine detail

Data history, alarms/events and trending are recorded by the M1 controller and consistently relayed to WPS so that a comprehensive analysis of average values and also raw data 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 on the M1 controller.

WPS offers extensive possibilities for analysis of the recorded data (graphical and table views), 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.

Integrated reporting

WPS offers the possibility of creating reports. These are managed via the dashboard configurations.
On the one hand, the user can create an ad hoc report from the currently active dashboard, or store an automatic report for a previous period of time via a configuration menu.
The content of the report includes the content of the dashboard stored in the configuration. This also responds to customer-specific requirements when creating reports in WPS.

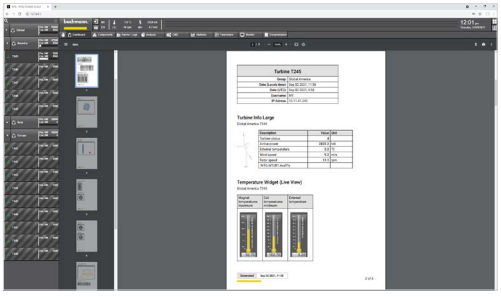
Condition monitoring in accordance with ISO VDI 3834 and ticket system

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, a trend is opened that displays the last measured values recorded. Furthermore to the experienced CMS Remote Service, this component is a helpful indication for the user.
Apart from the ISO View, the user is informed in the WPS if there are CMS tickets for the system (from the weblog). These tickets are displayed in tabular form and when a ticket is selected, preconfigured data from the turbine from the database is automatically displayed in a diagram. This data configuration can be easily extended by the user.

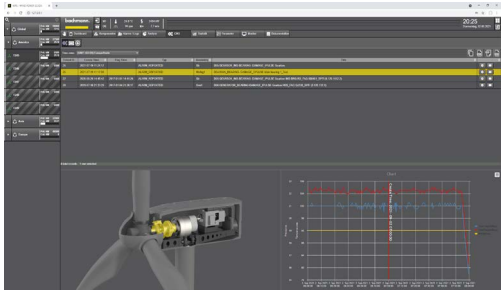
Project configuration

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 – CMS in accordance with ISO VDI 3834



▲ WPS – report view



▲ WPS – CMS ticket system

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.

If there is a need to decouple the historical data of the WPS into a higher-level system, this can also be done directly with access to the database. By default, WPS uses a free SQL database (mariaDB) with a simple table structure that can be accessed using common DB clients and implementations.

▲ WPS – user specific views

▲ 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
- Dashboards and Widgets
- Online/offline trending
- Online language switchover
- Alarm and data historization via external database
- Availability calculation in accordance with IEC 61400-26-1/-3
- Service logbook
- CMS ISO VDI 3834 integration
- Connection to CMS ticket system
- Customizable Reporting