OneView® SCADA

More than a SCADA system
OneView® SCADA
Simple, flexible, independent

OneView® SCADA, the all-in-one OEM independent solution for wind farm management, combines wind farms and wide-ranging functionality into optimized performance and maximum profit. With OneView® SCADA you get access to all required functionality in one simple and user-friendly system.

OneView® SCADA is continuously updated and developed to add value to your business. Through advanced surveillance and predicting tools, it allows you to optimize performance and reduce downtime and maintenance costs. The built-in alarms and events with automatic notification vouch for safe and reliable operation at all times.

With the OneView® SCADA you get much more than a standard SCADA system:

**MONITOR**

The monitoring functionalities of the OneView® SCADA provide a complete and streamlined overview of all your assets - no matter the different data models and interface technologies. The OneView® SCADA can present a combination of live, statistical and static information. Generate live information based on conditions you define as KPI’s and virtual events. Plan ahead or mark incidents using Tickets that injects directly into the daily monitoring operation and asset history.
Customized to match your requirements

If your needs are driven by legal or local requirements and the ability to monitor and control the WTG’s production and performance the OneView® SCADA system is your best choice.

No matter the brand, model, protocol or controller, we capture and display data for easy and reliable operation. OneView® SCADA enables flexible integration, customized configuration, remote control of assets, track of performance, transparency across wind turbines and sites and cost efficient administration.

The unique flexibility of OneView® SCADA means that the solution can work directly or indirectly on the controller, the turbine, the substation, on park level or work as a 2nd level to one or several OEM SCADA solutions.

Attributes

With OneView® SCADA you get the following attributes:
- Supports multiple interfaces, + 25 drivers/protocols
- Open interface for integration with other systems
- Powerful expression tool for creating virtual data
- Set multiple calculation rules for availability
- Data streamlining
- Normalized data models, IEC61400-25-2
- Alarm & events categorization
- TLS/SSL secured communication
- Multiuser concept with full permission handling
- Automated notification & reporting

Benefits

Some of the many benefits you get from OneView® SCADA:
- Easy to deploy
- OEM independent
- Ownership of system and data
- Custom configuration of the system to meet your specific requirements
- Running on own hardware or a hosted solution
- Easy to add additional turbines or assets
- Easy to access and use – from PC, tablet and mobile
- Cost efficient solution and administration
- Hotline user support and a 24/7/365 Service Level Agreement option

REPORT

Evaluate the performance of your assets in regards to production and budget, lost production assigned to different categories and multiple types of availability. The availability can be calculated both as energy based and time based, technical and operational. Use the reports interactively in the front-end web application or automate the generation and dispatch of reports with the Task Handler module.

ANALYZE

Access all the streamlined historical and statistical information stored in the OneView® SCADA database and compare across all assets. Plot the historical data on an x-y chart time based or one/multiple data as a function of another data item. Also create virtual historical data based on other historical data using the expression tool. For frequent use create pre-sets containing the set of data channels to analyze. All data can be exported to csv files for further analysis in e.g. excel or to pdf files “as is”.

CUSTOMIZE

The OneView® SCADA is modular – select functionality modules needed at one time and add more and new modules later. The configuration module itself gives access to a vast amount of customization tools. For instance you will be able to set up your own data model, access the data streamlining tools, and create new virtual data, e.g. your own KPI’s - live and/or historical. Furthermore you gain access to the user group permission handling tool, end user visualization tool and the localization tool to translate all strings to any language.
The need for replacing and updating the SCADA system for a wind power plant will occur several times during the lifetime of the wind power plant. OneView® SCADA is a SCADA solution that is uniform across the fleet and a system that can be fully administrated and managed by the wind power plant owner.

The system can fully replace the OEM’s SCADA or any other existing level 1 SCADA system. It can act as a unified level 2 SCADA system across a fleet of various turbine brands and various level 1 systems. And it can also act as a level 3 solution connecting to various level 2 systems adding functionality to those systems.

When acting as a level 1 system, the OneView® SCADA connects directly to the turbine controller/PLC, collects the data and controls the turbine. In addition it provides full and unlimited control to the turbine data and allows the data to be calculated and displayed according to customer requirements.

OneView® SCADA can be implemented fully independently on individual sites or can be tied together with an overall system with access to multiple wind power plants, i.e. a level 2 system. All data will then seamlessly be synchronized between the wind power plant(s) and the overall system ensuring that all data are safe and backed up at all times.

An integrated part of the OneView® SCADA solution for individual sites is the ability to regulate the power output from the wind power plant. The regulation is carried out using the OneView® Energy Control Unit (ECU) which enables advanced regulation of the power output from the wind power plant and can be tailored exactly to the requirements on each individual site.

All modules and features in OneView® SCADA are available both for level 1 (connected directly to the turbine controller on site), level 2 (connected to several wind power plants and/or level 1 SCADA systems) and level 3 (connected to several level 2 systems) allowing for the same functions and interfaces across all operator interfaces.
Design and Architecture

OneView® SCADA consists of three main parts; a central service, a database and a web based client layer. All three parts can be distributed across multiple hardware platforms.

The main responsibility of the OneView® SCADA southbound interfaces is to support the old proprietary and the new open communication standard interfaces. This allows OneView® SCADA to access the raw data. This raw data needs to be interpreted and there might be special rules related to collect historical data and sending commands. This knowledge is located in the layer called Logical Drivers. The drivers is agreed on a project to project basis and are not part of the standard system.

The next layer of the OneView® SCADA Server is the normalization layer. Here all data is streamlined to the configured normalized data model described in the IEC 61400-25 standard for wind turbine generators.

All normalized data tags, northbound data tags, can be used inside the OneView® SCADA Web Based applications running on the IIS web server. The same tags can be made available via SOAP XML, ODBC or OPC DA, but this is not part of the standard system.
Standard Module Overview
OneView® SCADA Modules

- OneView® SCADA Unit Monitor
- OneView® SCADA Park Monitor
- OneView® SCADA Map Monitor
- OneView® SCADA Reports
- OneView® SCADA Alarm & Events
- OneView® SCADA Data Plotter
- OneView® SCADA Production
- OneView® SCADA Task Handler
The Unit Monitor module features streaming of live data for all units connected to the OneView® SCADA system, thus enabling the user to gain an overview of key data with the glance of an eye.

Data is presented and structured in a hybrid tree-list-view control that allows expand and collapse of all levels.

With the levels collapsed, aggregated information about the units in this structure is presented.

Expanding to the next level will cause the information for each unit to be presented or revealing the next aggregated level. This is configured individually to match the preferred structure. It is even possible to create several views divided into tabs with separate presentation structures assigned, and the views can be restricted to a user group.

The presenting methods inside the cells include progress bars, direction indicators, state icons, textual strings or list views for monitoring live alarms and events. The data to present is configured to match the needs of the individual customer based on the available information provided by the unit.

**Features**
- Live data presentation for actual status
- Normalized data for comparison across manufacturer platforms
- Hybrid tree-list-view for easy navigation
- Customizable to match the users individual needs
- Various presenting methods for instant overview
- Multiple views with access control
Park Monitor
OneView® SCADA

The Park Monitor module offers access to historical production data and production budgets for the selected units. The comparison of production data and production budgets are presented in a graphical chart. The module also presents live Alarms and Events together with a summation of production data from the selected units.

It is possible to create several views, which again can be restricted to a user group and divided into tabs. The tabs are divided into three overviews named Asset Overview, Production Overview and Live State Overview.

The Asset Overview enables the Park Selection in which the units can be selected. The overview also presents aggregated key data from the units, such as Active Power and Errors. The key data can be individually configured for each view configured in the module. The Live State Overview displays all active alarms and events from the selected units. The Production Overview is presented as a chart where the production data and budgets are displayed and comparable.

The data is displayed into the chart with corresponding y-axes and automatic scaling. The columns in the chart are based on monthly production data and budgets.

Features
- Live Alarm and Events presentation for actual status
- Chart presentation for instant overview
- Normalized data for comparison across manufacturer platforms
- Customizable to match the users individual needs
- Multiple views with access control
Unit Monitor
OneView® SCADA

The Map Monitor module offers an overview of assets based on the geographical location of the units using a map of the world and icons illustrating the operational status of the unit. The interactive map enables the user to navigate between units and to access key data of each unit.

It is possible to create several views of maps with individually configured number of units. The views are restricted to user groups. The views are divided into levels. The "Top-Level" is a view of all the units configured for the particular view and is shown in accordance with the hierarchical structure configured for the module "Unit Monitor".

From here, it is possible to go further through the sub-levels, either by choosing from the "Map and site list" at the upper left corner or by clicking the interactive map icon.

At the lower left corner, the aggregated key data for the chosen sub-level is presented. It is possible to see key data for each unit by placing the pointer over the unit icon (do not click the icon). A new window will appear and by clicking the info icon in this window, it is becomes possible to access a more detailed list of unit data.

**Features**
- Geographical map with status icons for instant overview
- Interactive functionality for getting detailed information
- Customizable to match the user's individual needs
- Multiple views with access control
Reports
OneView® SCADA

The Report module contains a range of standard reports providing an overview of the unit’s performance, event statistics or other points of interest. The data is presented as charts or tables depending on the type of report.

Basic standard reports

OneView® Monthly Statistics
Production in relation to average wind speed

OneView® Daily Statistics
Production in relation to average wind speed and the availability values or capacity factor

OneView® Wind Rose
Wind direction, wind speed and production at various wind directions

Optional standard reports

OneView® Production Overview (Budget)
Production versus budget figures

OneView® Lost Production
Actual production versus theoretical production

OneView® Park Availability
Technical, energy and real availability

OneView® Management Overview
Keypoint indicators divided into calendar years and split into budget and actual values

OneView® Production Overview
Active and reactive power production

OneView® Power Curve
Produced Power in relation to Wind Speed per unit

OneView® Event Statistics
The events of a chosen duration

OneView® Pie Divider
Spread of configured data input

OneView® Master Report
One report containing the following reports merged into one:
- Management Overview
- Production Overview (Budget)
- Park Availability
- Monthly Statistics
- Power Curve
- Wind Rose
Alarm & Events
OneView® SCADA

The Alarm & Events module gives access to the historical alarms and events collected for a unit. It is possible to select multiple units and filter for specific events or views using a great variety of filters.

The OneView® Alarm & Events module consists of two main panels: "Loaded alarms" and "Settings".

The "Loaded alarms" panel presents a short detailed description of the loaded alarm and/or events. In the "Settings" panel, the user can select the units and time period to load from the OneView® SCADA database. This, in conjunction with the filtering options, enables the user to target specific alarms and/or events.

Furthermore, it is possible to configure what columns to present in the "Loaded alarms" panel and thereby customize it to the user’s exact need.

Features
- Historical Alarm & Events presentation for actual status
- Filtering options for targeting specific alarms and/or events
- Customizable to match the user’s individual needs
The Data Plotter module is part of a bigger module called “Analyze”. This part is designed for analyzing the historical data stored in the OneView® SCADA database by plotting selected data of selected duration in relation to time or data. This provides the user with an easy overview of the selected data.

After having selected the units for an analysis, it is possible to choose from all available historical data tags of all types and resolutions. This provides a very high degree of flexibility as 10 min data, 15 min data, daily or monthly data is available for combined plotting on the charting area.

Depending on selected data, units and time period or function, the data is plotted onto the chart with automatic scaling and explanatory legend. It is also possible to change the view settings to control the legend, unit time offsets and accuracy of the data. It is also possible to export data for processing or illustration purposes.

Features

- Analyze data across manufacturer platforms
- Access to all available historical data tags of all types and resolutions
- Combined plotting offers a high degree of flexibility
- Export data
The OneView® Production Module offers full access to all production data in the OneView® SCADA database. Data can be retrieved and plotted over time or as function of other data. As all data is normalized, it is possible to compare data between all units of same or different type and across unit manufacturers.

After having selected the units to analyze, it is possible to choose from a series of inputs and presenting methods such as lines, bars side-by-side and more. This provides a very high degree of flexibility as 10 min data, daily, weekly or monthly data is available for combined plotting on the charting area.

Depending on selected data, units and time period or function, the data is plotted onto the chart with automatic scaling and explanatory legend. It is even possible to change the view settings to control the legend, unit time offsets and accuracy of the data.

The data is also presented in a table for detailed analysis. Furthermore, the data can be exported for processing or illustration purposes.

**Features**
- Compare data across manufacturer platforms
- Combined plotting offers a high degree of flexibility
- Export data for processing or illustrations
The Task Handler module, accessed via the “Configure” tab, makes it possible to configure tasks triggered by events or time. The tasks then execute a predefined action such as sending a report via e-mail, or exporting historical data to a file.

The time based trigger can be configured as Daily, Weekly or Monthly. The event based trigger can make use of the events defined in the Event sets. Several events can be configured as triggers with additional expressions to specify the exact criteria for executing the action in the task.

The list of possible actions includes Clock-Sync, E-mail, SMS, Report via E-mail, Report to File, Report to FTP, Export historical data to File, Export historical data to FTP, Generate configured Power Curve for report.

**Features**
- Automated notification for easy access to status
- Time or event based with additional criteria for precise task execution
- Varied selection of actions ensuring flexibility
Optional Module Overview
OneView® SCADA Modules

- OneView® SCADA Page Creator
- OneView® SCADA Virtual Events
- OneView® SCADA Applications
- OneView® SCADA System Set-up
- OneView® SCADA Tickets
- OneView® SCADA Predictor
- OneView® SCADA Energy Control Unit
By using the Page Creator module in the OneView® SCADA System it is possible to create single line diagrams, visualize SCADA data on turbine level and much more.

The Page Creator module in the OneView® SCADA system – makes it possible to customize end user front ends. The creation of pages is made easy by using widgets for the pages, linking them to the powerful streamlined data model of the OneView® SCADA system. The customized front ends are easily deployed and immediately available for the end users.

The configuration starts from a canvas on which widgets can be placed and customized using the widget properties. Some widgets are static and others can be used with any data from the OneView® SCADA system. It is possible to select a group of units that is part of the OneView® SCADA data model to bring context to the pages.
Virtual Events
OneView® SCADA

The Virtual Events module covers events defined by the user, but Virtual Events can be handled in the same way as events from units or the OneView® SCADA system. The module enables consequently supervision and various ways of analyzing events targeted the exact needs of the customer.

Features

- Creation of events based on Boolean expressions that are freely definable
- Supervision and analyzing of events targeting the exact needs of the customer
- Virtual Events is treated equally to a unit event

The Virtual Events module is automatically set and reset based on Boolean expressions that are freely definable. It is possible to use the same expression or two different expressions to set and reset the virtual event. When the event is set it becomes a “live” event. When the event expression evaluates to false the live event goes away and the event is saved to the unit event log with set and reset time for use in statistics, availability calculations and lost production. The virtual event is treated equally to a unit event and hence simply complements the knowledge of the units.
Applications
OneView® SCADA

The Applications module enables the user to make changes to the visual parts of the OneView® SCADA system i.e. the front-end web clients, as well as administration of culture and languages available to the front-end and back-end users.

Features
- Customization of views addressing the need of the individual user group
- Flexible language configuration for easy adaptation
- Mobile presentation for access to data on the fly

The Application module is divided into three areas called WebClient, Mobile and Server. It is by way of the WebClient that the presentation of the monitoring views like "Map Monitor" showing the location of wind turbines on a map is set up. The "Mobile" part is the circumstances relating to the presentation on mobile phones whereas the "Server" part is the administration of the culture and languages.
System Set-up
OneView® SCADA

The OneView® SCADA system Set-up is configured through its main web based GUI accessed via the “Configure” tab. The system is very flexible and the configuration possibilities match the flexibility. The structure of the System Set-up makes it easier for skilled personnel to make a complete configuration of the system.

For security reasons, only users with a correct level of permission can enter the “Configure” tab. And to save changes, a “lock” must be requested. When a user has the lock, other users are blocked from saving changes.

The general configuration possibilities will be listed with short descriptions in the following:

Parks & Units
Defining the structure and the individual units.

Data Interfaces
Configuring drivers needed to communicate with a certain communication interface.

Mapping Tags
Defining the unique set of Data Tags available in the SCADA system.

Features

• Restricted access for security reasons
• Configurable through a web based GUI
• The many configuration possibilities make the system very flexible

Mapping Sets
Transforming the OEM data model into the streamlined OneView® SCADA Data Model.

Event Categories
Streamlining and/or categorizing Alarms & Events.

Event Sets
Defining the relationship between Event Identifiers, Descriptions, Types and more.

Tickets
Configuration of events that can complement the other types of events per unit.

Property Models
A Property Model can hold as many properties with values as needed.

Property Definitions
Pre-defined properties and custom properties to be used in Property Models.

User Groups
Defining Rights and Permissions.

Users
Defining all user accounts with attributes.

Reports
Configuring which data tags should be used to deliver the required report data.

Budgets
Budget Values per unit per month.

Power Curves
Manually entered reference power.
The Tickets module in the OneView® SCADA system allows you to plan ahead, accumulate knowledge and track the energy of all your assets.

With the ticket module you can create and edit events for all units which will feed in to the existing pool of events coming from the unit itself. Events of all types can be assigned according to defined categories following among others the IEC 61400-26-1 standard or any other category scheme.

Core functionalities of the OneView® SCADA system Ticket module

Plan ahead

An important functionality of the Ticket module is the possibility to integrate a plan into the OneView® SCADA system. This could be cases such as planned service or maintenance, or simple site visits. A user can then create a ticket that starts when the activity is planned and stops when the activity ends. The ticket will then be visible in the Ticket calendar and in the Alarm & Event log thus giving the possibility to share the plans with other users and technicians to avoid confusion and frustrations.

Accumulate knowledge

Another important functionality of the OneView® SCADA system Ticket module is the possibility to accumulate knowledge, meaning that the work performed and the lessons learned can be defined to be stored in a Ticket. If a unit stops working, some of the resulting events will be caused by the “first error” or “root cause” error. A skilled technician can identify the root cause by investigating the historical event log of the unit, but very often the technician cannot share this knowledge. Tickets gather the knowledge for sharing purposes and easier future tracking of errors.
Features

- Planned tasks can be entered directly into the OneView® SCADA system.
- Accumulate knowledge on work performed and lessons learned.
- Knowledge "action matrix" for quantifying and making statistics to guide in problem solving.
- Overrule, explain and re-categorize downtime of the turbines for availability statistics.

Flexible storage

Also the Ticket module of the OneView® SCADA system offers a flexible way of storing gathered knowledge relating to specific events in the event log of each unit for easier root cause analysis by other technicians. It is therefore possible to create a knowledge "action matrix" defined according to internal requirements, - consequently without extraneous restrictions, in the OneView® SCADA system and hereafter make the knowledge available for all historical events. This can be used for quantifying the knowledge and make statistics to help guide others in solving problems and/or in various instances of decision making.

Track the energy

To track the energy produced and how much energy is lost when units are stopped due to an error or planned stop is also a vital functionality of the OneView® SCADA Systems Ticket module. The unit event log will answer much of this but not all and it may perhaps not be in accordance with special contractual agreements.

As Tickets are unit events, but solely created and maintained by users of the OneView® SCADA system, they can be used to overrule, explain and re-categorize downtime of units. This is especially useful when combining Tickets with the use of the report "Lost Production - Advanced". This report calculates three types of availability and the overall lost production on an event level per unit. With the tickets as additional input, this report will be an accurate tool for tracking the energy.
One of the key elements in obtaining the highest possible return on investment of renewable assets is to secure maximum availability at the lowest possible costs. The OneView® SCADA Predictor module contributes significantly to this challenge by using historical SCADA data both intelligently and systematically. This will make it possible for the operator to focus attention and resources towards e.g. wind turbines that are underperforming or towards wind turbines that show critical values on important maintenance indicators.

How it works

The Predictor module enables an easy method of conducting comparative analysis of single metrics under specific circumstances. This can be used for predicting maintenance issues. An example could be the turbine gearbox oil temperature data sampled from a group of turbines of same model and type under heavy loading conditions for a specific period. Data are then used for a comparison of each turbine against the group’s average in order to identify turbines where the gearbox oil temperature is significantly higher than the average. In this case an outlier would indicate a possible maintenance issue and thereby make preventive maintenance possible and avoid breakdown.

Another use of the Predictor module is to compare the turbine power production data samples from a group of similar turbines but from different manufacturers for a particular period of time and under equal conditions. This will identify the turbines and brands that out- or underperform when comparing to the other turbines in the sample. It is valuable information for the dialogue between the OEM’s and the service providers in relation to optimizing power production but also upon making business cases for future investments in new turbines.

The OneView® SCADA Predictor module makes it possible to set-up multiple analyses and store them for either manual execution or automatic execution.

Manual execution

When using the manual execution, a user can set up different types of analyses manually by selecting different data tags for analysis, setting the filtering and threshold conditions and then select the group units and single units for comparison with the group. In this way different methodologies can be tested and the results verified before setting up an automatic execution of a period analysis on a larger scale.
Automatic execution

Once the analysis has been verified, the settings can be saved as a preset. The preset analysis can then be re-used when creating a task in the OneView® SCADA Task Handler module and in this way run the analysis automatically and periodically. The result of the analysis will be stored for the purpose of making trends and further analysis.

Once a Predictor task runs automatically, it can create internal Predictor events for turbines or units if the analysis reveals a deviation from the initially selected threshold levels. A number of events can be created for different threshold levels. An outlier will result in an active event in the OneView® SCADA system and the event can be monitored – in the same way as other live alarms and events from the turbine.

Features

- Comparative analysis
- Manual execution
- Automatic execution
- Prediction of preventive maintenance
- Power production analysis for optimization

Benefits

- Focus attention and resources on critical turbines and issues
- Preventive maintenance and reduced service costs
- Optimize availability and power production
The OneView® Energy Control Unit (ECU) is SCADA International’s advanced Power Regulation Unit. The OneView® ECU controls the power output at the “Point of Common Coupling” (PCC) of either one or more energy producing units or e.g. compensation equipment units. An energy unit is e.g. a wind park, a capacitor bank, a single turbine, a wave power plant, solar panels etc.

Meeting grid code requirements

The OneView® ECU makes sure that energy units meet the grid code requirements (ref local utility companies) and that all data are logged. The commanding signals of the energy units (sub-units) are calculated on the basis of the regulation algorithm, the received energy set points and the actual measurements at the “PCC”. These regulation methods are supported by:

- Active and reactive power control
- Active power ramping
- Frequency control
- Cos phi control
- Voltage control

Besides the standard control algorithms, site specific controls can be implemented to meet any requirements, such as control of substation equipment, event triggered controls (shadow, noise, wind speed etc.) or handle the controls according to different time schedules.

Mixed park regulation

The OneView® ECU is specifically designed to meet the challenges of mixed park regulations where different OEM Wind Farms are designed to be the “only one” receiving the wind farm set points. Curtailment can be distributed equally between sub windfarms MW-vice or divided depending on sub farm size. Reactive power set points can be distributed to sub windfarms based on possible capacitive/inductive capability of each sub windfarm. The reactive power regulation can run both Q-ref mode or Cos phi mode.

Stand-alone or OneView® SCADA integrated

The OneView® ECU may be used as the power regulation module of a OneView® SCADA solution or the OneView® ECU could be equipped with a local or a remote light version of the OneView® SCADA system for live data monitoring and reporting:

- Active and reactive power report
- Cos phi report
- Lost production report

The OneView® ECU can also be used as a stand-alone solution where the numerous types of data are accessible on an open communication interface are therefore could be incorporated into any SCADA system.
Features

- Communicating directly with the power plant
- Commanding signals of the energy units (sub-units) are calculated on the basis of the regulation algorithm, the received energy set points and the actual measurements at the “PCC”
- Supports several regulation methods
- Consists of a basis OneView® ECU Solution with optional add-ons: OPC interface, Modbus interface, Power meter, UPS back up, OneView® ECU Outdoor Solution and more
- GL certified

Benefits

- Ability to monitor and control wind farms and power plants
- Fulfils requirements from utility (grid code requirements)
- Brings production portfolio assets together in one control unit
- Stand-alone solution or OneView® SCADA integrated
- Optimizes power production and earnings
Optional Services Overview

OneView® SCAD

- OneView® SCADA Service Level Agreement
  - Extended
  - Premium
- OneView® SCADA Hosting
System Set-up

OneView® SCADA

Competent and fast response
For years SCADA International has assisted customers in protecting their investment by providing valuable and advantageous Service Agreements.

We take pride in offering premium Service Level Agreements based on proactivity – combining scheduled remote maintenance, SW/HW health checks and delivering automatic alarms and status reports.

SCADA International enables customers, in due time, to react to minor issues that could potentially lead to dangerous damages or even breakdowns.

Our competent team of experts are naturally available for solving any challenges during normal working hours. However, customers with a Service Level Agreement will have an additional access to our world-wide hotline support 24/7/365.

<table>
<thead>
<tr>
<th>SERVICE LEVEL AGREEMENT OVERVIEW</th>
<th>BASIC</th>
<th>EXTENDED</th>
<th>PREMIUM</th>
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<tbody>
<tr>
<td>Basic hotline user support on the use of the system for trained personnel*</td>
<td>Yes</td>
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<td>Hotline access</td>
<td>Normal working hours</td>
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<td>Alarm &amp; Events reporting</td>
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<td>Manned System Monitoring</td>
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<td>Yes</td>
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<tr>
<td>Packages of support and maintenance hours at reduced rates</td>
<td>No</td>
<td>Yes</td>
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<tr>
<td>Prioritized response time for service request</td>
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<td>Within 1 working day</td>
<td>Within 1 working hour</td>
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<td>Prioritized on-site work</td>
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<td>Within 7 days upon accepted offer</td>
<td>Within “24” hours upon accepted offer</td>
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<tr>
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<tr>
<td>Monthly status report with recommendations for proactive measures</td>
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</tr>
<tr>
<td>Recommended spare parts always on stock**</td>
<td>No</td>
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</tbody>
</table>

* Included in annual OneView® SCADA license fee – no hourly charges.
** Based on the monthly status reports and customer specific agreement, recommended spare parts will always be on stock to secure a high service level at any time.
Benefits
- Manned System Monitoring – normal working hours
- Alarm & Events reporting – 24/7/365
- Hotline Access – 24/7/365
- Prioritized response time for service request – within 1 working day
- Prioritized on-site work – within 1 working week
- Packages of support & maintenance hours at reduced rates

Prioritized response time for service request
Whenever a request is raised for service, the work will be initiated within one (1) working day.

Prioritized on-site work
With our Extended Priority Service Level Agreement we will be on site within one working week (7 days) to begin troubleshooting and repair.

Manned System Monitoring
To monitor and proactively take necessary steps in order to avoid downtime of your SCADA solution extensive system knowledge is required. Our service team monitors your system during normal working hours.

Alarm & Events reporting
24/7/365 all relevant alarm and events, concerning the OneView® SCADA system itself, servers and network, will be reported automatically to an appointed recipient(s) by e-mail or SMS.

Hotline Access
In case of an emergency you can rely on calling our Hotline service 24/7/365 and request for assistance.

The Hotline support is your uninterrupted emergency connection to SCADA Internationals qualified team of technicians and specialists. We deliver OneView® SCADA user support, guidance to technical problems with the system and communication issues with assets, product configuration guidance, system status inquiries, spare-part ordering, warranty claims and planning of trouble shooting and repair tasks.

Before initiating a support and maintenance task you will get a qualified estimate of the total hours and cost. Should the cost exceed our estimate you will be advised before we continue the work. It is possible to buy packages of support and maintenance hours at reduced rate.
Premium Priority Service Level Agreement

With the Premium Priority Service Level Agreement you have all the advantages of the Extended Priority Service Level Agreement and more. With a Premium Priority Service Level Agreement a number of additional advantages are added in order to secure the value of your investment: Prioritized hotline, presence on site within 24 hours, monthly status reports with proactive recommendations and much more.

Benefits
• Manned System Monitoring – normal working hours
• Alarm & Events reporting – 24/7/365
• Hotline Access – 24/7/365
• Prioritized response time for service request – within 1 hour
• Prioritized on-site work – within “24” hours
• Prioritized e-mail & Hotline number
• Monthly status report with recommendations for proactive measures
• Packages of support & maintenance hours at reduced rates
• Recommended spare parts always on stock

Prioritized response time for service request
Your request for service will begin within one work hour after you have accepted the service offer.

Prioritized on-site work
As a Premium customer you can expect us to be on site within 24 hours after having accepted an offer for on site assistance. The response time usually depends on travel time and availability of transportation ticket.

Prioritized E-mail & Hotline number
To secure easy and prompt access we deliver a prioritized e-mail and hotline number for customers with a Premium Priority Service Level Agreement.

Monthly status reports and recommendations
By the end of every month a report will be made containing HW and SW status, data availability, system and application logs, internet connection status and performance as well as recommended SW and HW updates.

Recommended spare parts
Based on the monthly status report and a customer specific agreement any recommended spare parts will always be on stock to secure a high service level at any time.
We offer a hosting solution where your data and software are stored in a safe environment – a dedicated and shared solution using virtual servers on dedicated hardware.

Our hosting solutions are being delivered from a modern hosting center. The hosting center complies with all industrial standards and is yearly revised by the revision standard ISAE3402 Type 2 and is, among other things, secured with:

- Access control
- Video surveillance
- Temperature surveillance, water and moisture detectors
- Fire, smoke and gas alerts
- Fire extinguishing with Inergen
- Complete redundancy on cooling, power, internet lines and firewall

OneView® Hosting comes with a redundant firewall and a redundant internet connection as well as a guaranteed service level of 99.8% up-time.

If you decide to use an external hosting partner, SCADA International has a strong setup. We take our starting point in your current and future needs and construct a scalable solution that can be adjusted whenever there is need for it.

**Operation**

The operations department is manned 24 hours a day with experienced staff to take care of the following tasks:

**Surveillance**

- Surveillance of hardware faults
- Surveillance of system parameters, logs and services
- Resource management
- Examination and escalation of events

**Patch management**

- Installation of patches and updates
- Patching and updates are carried out in predefined maintenance windows

**OS operation**

- Surveillance of services, logs and parameters for the individual servers
- Fault finding on OS level
- System work influencing the operation is carried out in predefined maintenance windows

**Application operation**

- Surveillance of applications
- Update and patching of applications in predefined maintenance windows
Backup and restoring
The backup and restoring standards are as specified in the following.

Database backup

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete backup</td>
<td>Weekly</td>
</tr>
<tr>
<td>Transaction log backup</td>
<td>Every 2 hours</td>
</tr>
<tr>
<td>Retention period</td>
<td>30 days</td>
</tr>
</tbody>
</table>

Other file based backup

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete backup</td>
<td>One time (first backup)</td>
</tr>
<tr>
<td>Incremental</td>
<td>Daily</td>
</tr>
<tr>
<td>Retention period</td>
<td>30 days for active files</td>
</tr>
<tr>
<td></td>
<td>180 days on non-active files (deleted)</td>
</tr>
</tbody>
</table>

Restoring reaction time
If a restoring is needed, it will be executed according to the accepted offer.

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>SERVICE LEVEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency</td>
<td>In less than one hour</td>
</tr>
<tr>
<td>Database restoring</td>
<td>In less than four hours</td>
</tr>
<tr>
<td>File restoring</td>
<td>In less than eight hours</td>
</tr>
</tbody>
</table>

Hosting packages
Our Hosting solutions are scalable – i.e. you start buying the hosting packages that suit your current needs and can adjust the packages whenever there is need for it.

<table>
<thead>
<tr>
<th>HOSTING PACKAGES</th>
<th>NUMBER OF USERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Server for 1-25 turbines</td>
<td>Up to 5 users</td>
</tr>
<tr>
<td>Server for 26-50 turbines</td>
<td>Up to 5 users</td>
</tr>
<tr>
<td>Server for 51-100 turbines</td>
<td>Up to 10 users</td>
</tr>
<tr>
<td>Server for 101-250 turbines</td>
<td>Up to 15 users</td>
</tr>
<tr>
<td>Server for 251-500 turbines</td>
<td>Up to 20 users</td>
</tr>
<tr>
<td>Server for more than 500 turbines</td>
<td>Up to 25 users</td>
</tr>
</tbody>
</table>

The price consists of a setup price per server and the price for the actual server(s) chosen.

When buying the hosting service for OneView® SCADA, it is a prerequisite that all turbines on the same server use the same OneView® SCADA solution. But it is possible on the same server to distinguish between different users and what they are able to see and do in the chosen OneView® SCADA solution.
Since its foundation in 2006, SCADA International has grown to be a leading solution provider within the global renewable energy industry. With an extensive track record and deep roots in the Danish wind heritage our services span the entire value chain including SCADA Hardware Solutions, Software Solutions, Installation & Commissioning, Consulting and Value Adding Services.

Headquartered in Denmark, SCADA International employs close to 100 wind and SCADA specialists at offices in Germany, Poland, Ukraine, United Kingdom and USA. The company is certified according to ISO 9001, ISO 14001 and OHSAS 18001.

An increasing number of companies in the renewable sector in Europe and North America choose SCADA International as their partner when it comes to SCADA systems and SCADA installation, surveillance, support and maintenance.

When choosing SCADA International you get solutions that are:

- Made for renewables
- Customized
- Scalable
- Open
- Reliable
- And support your business model

Company references

- Afaplan
- Aidosz Nova Energia
- Centrica Renewables
- DONG Energy
- E.ON
- EDF Energies Nouvelles
- Enel
- Energia Renewables
- Eneria
- ESB International
- Eurowind Energy
- GE Wind Energy
- Nexus Energie
- Nordex
- Ostwind
- PGE Energia Natury
- RegEnPro
- ScottishPower
- SEMCO Maritime
- Senvion
- Siemens
- STEAG New Energies
- Suzlon Energy
- TransAlta Corporation
- Vestas
- VATTENFALL
- WKN AG

www.scada-international.com