



reliability, proactivity,  
**control**





Whether monitoring an individual turbine or controlling an entire wind park, owners need to access the right information to instantly respond to any issues and maximize generation.

Often located in remote locations, wind turbines are frequently left unattended, facing harsh environmental conditions such as high wind speeds, storms, snow, ice, and severe heat. Due to these highly variable and dynamic operating conditions, significant mechanical stress is often placed on the turbine and its components. Maintenance is key to providing a safe, cost-effective and reliable power output with acceptable equipment lifetime.

To reduce costly component failures, wind park owners and operators need to be able to monitor each individual turbine and all of its subsystems while also retaining a bird's eye view of the entire wind park. They must have the ability to coordinate each turbine and know which are operating at capacity and which require attention. They need to be capable of collecting, coordinating, and visualizing turbine and total park performance data.

In a constantly challenging and changing environment, wind park owners and operators need reliable proactive asset management and real-time control to maximize power output and minimize O&M costs.

### Information is power.

Our Supervisory Control and Data Acquisition (wtSCADA), Condition Monitoring System (wtCMS) and Wind Park Controller (wtWPC) solutions work harmoniously together to allow for total monitoring and control of wind turbine and wind park operations.

AMSC's wtSCADA, wtCMS and wtWPC reduce O&M costs, minimize wind park downtime, and proactively work to enhance the life of wind turbines and park assets.

For individual turbines, the best approach to reducing O&M expenses and ensuring high performance is to use a proactive preventative maintenance approach.

### Adding value across all conditions.



Our wtSCADA, wtCMS and wtWPC software solutions provide a total solution for complete monitoring and control of wind turbine and wind park operations. Ensuring wind park owners have the data to make informed, proactive decisions.

Consider the following solutions:

#### wtSCADA Supervisory Control and Data Acquisition

The acquisition and storage of real-time data and historic data can now be executed by a single system – wtSCADA solution.

Each user has direct communication with the server without need of a direct connection with the programmable logic controllers (PLC) of any individual wind turbine.

This decentralization of data communication means the PLC has more capacity to concentrate on the wind turbine operation.

In order to accommodate for commissioning and troubleshooting work, the included wtCommissioner solution supports the field service team. It offers a bundle of tools directly connecting to the PLC before wind park network infrastructure is operational.

Additionally, wtSCADA solution comes with wtDataCenter system included, offering long-term evaluations of recorded operational data. Statistics about availability and states, production, the turbines' power curves and more are available via numerous interfaces and export functions.

The wtSCADA software solution enables comprehensive remote control of various wind park assets.

#### wtCMS Condition Monitoring System

Our wtCMS tool enables wind park operators to employ a fully condition-based proactive maintenance strategy. The wtCMS system helps to run Wind Energy Converters (WECs) for as long as possible, reducing downtime and repairs.

The wtCMS system provides the operator with virtually real-time information regarding the condition of selected sub-systems and components.

We fully integrate the wtCMS system capabilities into the wind turbine control system. Essential information about turbine operation modes is provided directly to the main controller. No additional sensors are required, resulting in a reduced total number of components and increased reliability in comparison to similar, non-integrated monitoring systems.

#### wtWPC Wind Park Controller

Our wtWPC product manages the behavior of multiple WECs, uniting them into a self-contained power plant and offering a single, defined interface to the utility grid.

The wtWPC controller measures voltages and currents at the point of interconnection (POI) for the wind park. Following the incoming data (power measurements & WEC states), the power demands to each individual turbine are derived. Based on these demands, each turbine's workpoint is calculated and forwarded to each turbine's internal control system.

Using the wtWPC controller, wind parks can meet even very complex grid connection standards, thus lowering the overall grid connection costs, enhancing the ability to stay online, and therefore generating more power over time. It is a necessity for connecting larger wind parks to modern utilities.

## Software solutions field of function

#### wtSCADA Solution

- Central point of communication and configuration for the entire wind park
- User management functions
- Optimized data acquisition (collection of more data from more turbines)
- Fully configurable data retrieval, allowing for more scalability
- Configurable data storage mechanism
- Configurable alarms and notifications
- Sophisticated look and feel of the user interface
- Possibilities for customizations
- Better integration of the reporting and analyzing tool wtDataCenter solution
- wtDataCenter system enables long-term evaluations through access to evaluation reports via Web Browser and easy export functionality to MS Excel
- Interface available to connect with other systems
- Integration with the wind park controller
- Comes with wtCommissioner software, the commissioning and troubleshooting tool that enables direct connection to the PLC without a server

#### wtCMS Solution

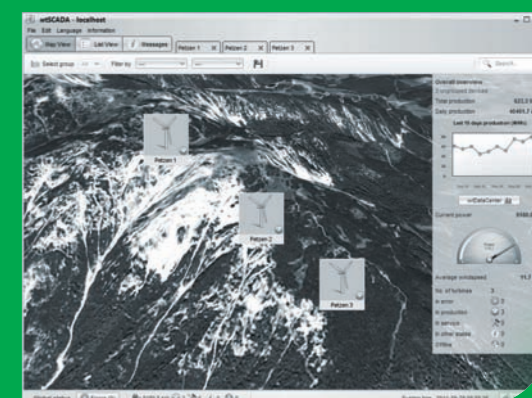
- Fits any AMSC turbine design
- Ability for local and remote access
- Real-time information for preventative maintenance

#### wtWPC Solution

- Fits all AMSC solutions turbine designs
- Active and reactive power control
- Allows start and stop of the whole wind park
- Accepts externally set workpoints
- Calculation of workpoints from voltage and current measurements at POI



- Enhance wind park energy output by increasing uptime
- Reduce unnecessary downtimes and repairs
- Leverage a single, defined interface to the utility grid
- Minimize O&M costs



wtSCADA Overview Map

# Wind Turbine Software Solutions

## About AMSC's Windtec Solutions™

AMSC's Windtec Solutions enable manufacturers to launch best-in-class wind turbines quickly, effectively and profitably. We provide conceptual and detailed designs for complete wind turbines and advanced drivetrain systems. In addition, we provide a broad range of volume manufacturing support services, including supply chain development, localization and employee training. Our offerings also include advanced wind turbine electrical control systems that ensure highly reliable and efficient power flows. Whether you are a new entrant or a proven wind turbine manufacturer, our commitment is to provide you with the solution that delivers competitive advantage, lowers the cost of energy and enhances your return on investment.

**We can do all of this for you; we are the partner you can turn to.**

## About AMSC®

AMSC (NASDAQ: AMSC) generates the ideas, technologies and solutions that meet the world's demand for smarter, cleaner ... better energy. Through its Windtec Solutions, AMSC enables manufacturers to launch best-in-class wind turbines quickly, effectively and profitably. Through its Gridtec Solutions, AMSC provides the engineering planning services and advanced grid systems that optimize network reliability, efficiency and performance. The company's solutions are now powering gigawatts of renewable energy globally and enhancing the performance and reliability of power networks in more than a dozen countries. Founded in 1987, AMSC is headquartered near Boston, Massachusetts with operations in Asia, Australia, Europe and North America.



## Talk to us about

- Solving your most complex power challenges
- Enhancing competitive advantage
- Improving your system's performance, reliability and profitability

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Whether you wish to make new advances in renewable technology, optimize power generation or delivery, or simply gain a better understanding of the issues you face, please get in touch. We're here to help.



smarter, cleaner  
... better energy

