



JAQUET's complete speed measurement chain for wind turbines advanced reliability, safety, performance & availability .

SPEED OF ROTORS
SPEED FOR PITCH CONTROL
SPEED FOR TURBINE START UP
SPEED FOR HYDRAULIC BRAKES
SPEED OF GENERATOR
SPEED OF GEAR TRANSMISSION
OVERSPEED PROTECTION

STANDARD OR CUSTOMIZED SOLUTIONS:

- SPEED SENSORS
- POLE BANDS, POLE WHEELS AND RINGS
- OVERSPEED PROTECTION SYSTEMS
- SAFETY SYSTEMS
- COMPLETE MEASUREMENT CHAIN

Handling rotational speed - detecting, measuring, monitoring and processing speed in demanding ambient conditions - is the core business of JAQUET TECHNOLOGY GROUP.

From hydro-electric power stations in the Pyrenees to hundreds of wind turbines on the Dutch plains and nuclear powered submarines at the bottom of the Atlantic ocean, you'll find JAQUET equipment measuring, controlling and protecting rotating machines. So you can be safe in the knowledge that we understand your world and how to protect it.

The quality of the measurement and protection chain is determined by its weakest link. Type tested and qualified, designed to meet the specific ambient conditions and norms & standards of wind turbines, JAQUET products provide optimized performance, availability with safety.

JAQUET offers the complete measurement and protection chain:

- non- contact speed sensors with multiple output signals - one sensor provides 4 or more signals for speed, direction, monitoring and diagnostic information
- pole wheels, pole bands and rings - optimized for wind turbine use
- overspeed protection systems

Drawing on our tried and tested experience, we can be sure to give you an immediate suggestion that matches your individual requirements. We take pride in providing you with an efficient solution which also helps reduce your total costs.

JAQUET target design - pole bands, wheels and rings

A reliable speed measurement chain and protection system begins with an ideal target design. JAQUET's unique portfolio and long experience in providing pole wheels, pole bands and pole rings to various applications guarantees a solid accuracy of the measurements.

- Robust wind turbine specific designs optimized for large shaft geometrics
- A careful optimization with speed sensors allows higher radial tolerances, flexibility with a sensing distance (air gap) and contributes to a robust signal quality.
- Perfected mechanical design with corrosion resistant materials ensure easy and safe mounting and a solid long term performance over wide temperature range.

Let us help you select or customize a target design which meets your individual requirements. Or we can consult you with the mechanics and performance requirements to optimize the functionality of your existing target.

JAQUET's robust speed sensor concept for wind turbines: speed, direction, monitoring & diagnostic functions in one customizable speed sensor.

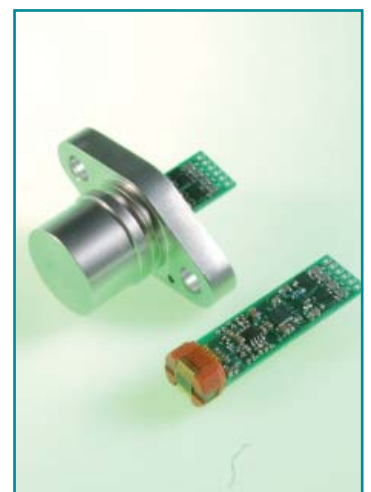
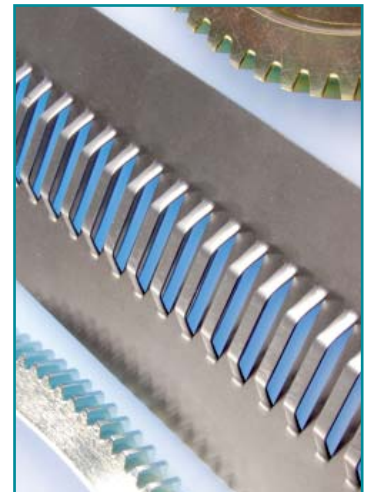
JAQUET's wind turbine Hall effect speed sensor line offers a reliable alternative to encoders, proximity switches or VR sensor based speed measurement solutions. The speed sensor line is robust (no mechanical contact) and flexible with customizable functionalities and output interfaces .

- Customizable multiple output signals - 4 or more output signals in one sensor
 - Speed and direction - including zero speed and creep detection information
 - Diagnostics and monitoring - for example sensor health, transmission status, power status, signal quality, air gap optimization, redundant phase shift and duty cycle analysis - depending on your wishes and requirements.
 - Robust design meeting IEC norms and standards for wind turbines incl. vibration, humidity, temperature changes, EMC and lightning protection.
 - Applicable for use in SIL 2 environments
 - Flexible and customizable hermetically sealed housing options - easy and safe mounting
 - Customizable cable and/or connector options
 - Generous air gap range - specifically optimized for JAQUET pole band and pole wheel designs
- Consult us on what you need and we'll assist you in creating the optimum design and functionality.

Basic technical data

Technology	Hall effect - DC / static
Supply voltage	5 - 24 V
Signal output	Single ended or differential signal options, customizable outputs / interface
Frequency range	0 Hz - 20 kHz
Operating temperature	-40 C° - +125 C°
Housing sizes	10 mm and larger

For more and detailed information please see Wind Turbine Speed Sensor Operating Instructions.



Overspeed protection and safety systems

Where the protection of your valuable investment is concerned compromise is out - real-time speed measurement is essential to continuous monitoring, protection and optimization of the wind turbine performance.

JAQUET has a long tradition of being the leading supplier of overspeed protection systems and instruments. (In fact JAQUET invented the hand held tachometer and pioneered the first digital tachometer and overspeed protection systems for turbines.) Today JAQUET provides an extensive range of products for overspeed protection and speed measurement. Availability and Safety are the key words describing our overspeed protection solutions. Every shutdown costs money - but safety comes first. Whether the system is single channel or in complex 2 out of 3 voting logic, we promise you fastest reaction time, maximum security and optimum availability.

1-2 channel overspeed protection systems

JAQUET T400 series

Single channel tachometers, with or without display; frequency to analog converter & speed switch in one; Relay and open collector frequency output.

JAQUET DualTach T500

DualTach tachometer with 2 frequency & 2 binary inputs; 2 analog, 4 relay and 2 open collector outputs; for complex measurement, control and protection.



Dual channel multifunction tachometer and overspeed protection system

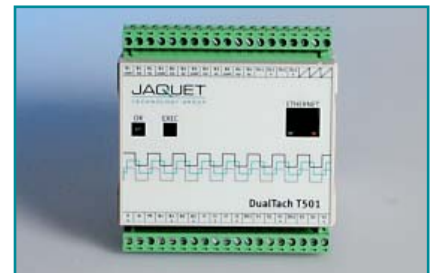
JAQUET MultiTasker T600

MultiTasker with 2 frequency, 1 analogue & 2 binary inputs; 2 analogue, 4 relay and 2 open collector outputs; CAN bus and Ethernet interfaces; event recorder and trip data-logger; for complex measurement, control, protection and communication.

The T500 and T600 series take tachometers to a higher level. Both feature a System Limit capability that allows the logical combination of input parameters to form an alarm or trip command.

JAQUET Display D211

5 digit display option for T600. Either direct cable connection of 1 display or connection of 1...7 displays via Bluetooth® master module and Bluetooth® enabled displays.



SIL 2 multifunction safety and overspeed protection system

JAQUET SafetyTachT700

This single redundant channel tachometer complies with the EN 61508 SIL2 requirements. The unit provides safe in- and outputs such as 1 frequency, 1 analogue, 2 digital inputs and 2 relay, 1 analogue, 4 digital outputs. For complex measurement, control and protection the T700 features 8 System Limit parameters and 2 limit parameter sets. Further the T700 offers a comprehensive sensor diagnostic, an event recorder and a trip data logger. The product will be available for serial production in January 2011.



JAUQUET TECHNOLOGY GROUP offers the world's most versatile and advanced range of solutions for the detection, measurement, diagnosis and management of rotational speed.

Our industry and application specific expertise ensures that you will achieve an optimum solution. Completely matched to your individual requirements, meeting key industrial standards and certifications, our products help boost the performance of your machinery while reducing cost of ownership.



TYPICAL INDUSTRIES SERVED

- Automotive and truck
- Aerospace
- Diesel and gas engines
- Hydraulics
- Railway
- Turbines and compressors
- Wind turbines
- Turbochargers
- Industrial machinery



PRODUCTS – SPEED SENSORS

- Various technologies - standard, custom and OEM models
- For demanding applications, e.g. 300,000 rpm, temperature up to 320 °C / 600 °F, high vibration, shock to 200 g, etc.
- GreenLine speed sensors for general applications
- Ex models for hazardous areas
- Pole bands and target wheels available where needed



PRODUCTS – SYSTEMS

- Multi-channel overspeed protection systems
- 1–2 channel measurement, protection and control modules
- Engine diagnostic systems
- Redundant speed measurement and indication



SPECIAL PROJECT EXAMPLES

- An automotive linear movement sensor
- Integrated power and torque measurement for display and gearbox control
- Naval spec. turbine protection for nuclear submarines
- Speed measurement in turreted, tracked vehicles



QUALITY MANAGEMENT AND STANDARDS

- Quality management: TS 16949 & ISO 9001, ZELM ATEX 1020, KWU, EN/AS/JISQ 9100
- Sensors: GL, KWU, TÜV, ATEX, EN 50155, NF F 16-101 102, ABS, EMC
- Systems: IEC 61508 SIL 2 and SIL 3, API 670, GL, TÜV, KWU, EX
- Environmental: RoHS - EU directive 2002/95/EC, WEEE - EU directive 2002/96/EC



JAUQUET – YOUR PARTNER

- Efficient and professional service - JAUQUET TECHNOLOGY GROUP is headquartered in Basel, Switzerland and has subsidiaries in Belgium, China, Germany, the Netherlands, United Kingdom and United States along with a worldwide distributor and end-user service network.
- Flexible production quantities; from 1 to millions per project
- Reduction of total costs by intelligent and cost-effective solutions
- Fast turn around time