



**IDS-30 “next generation”
ICE DETECTION SYSTEM for wind power industry**

History - Sommer

sommer was founded in 1987 and provides more than 30 years experience in development and production of high quality and **innovative measurement equipment** for hydrology and meteorology.

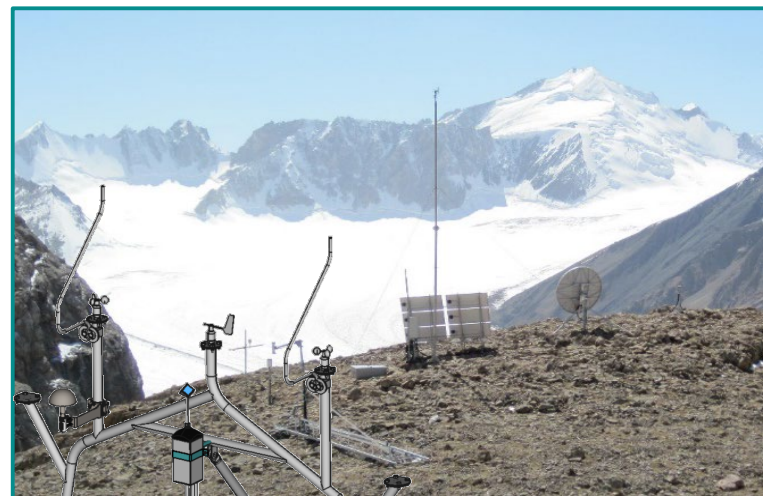
sommer is active internationally with distributors in **more than 60 countries** worldwide.

30 years ago SOMMER kick-started the development of its first **snow measurement and analysis systems**.

By using its world-leading technology and experience in snow analysis to develop a **unique ice detection system**.



SOMMER Headquarters

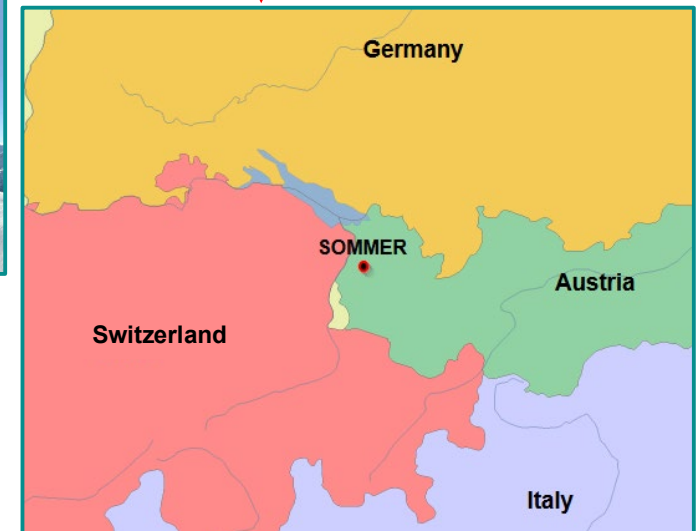


SOMMER Snow Ice application

Information - Sommer

sommer headquarter is located in western **Austria, the heart of Europe**, in the border region of Austria, Germany and Switzerland.

The location in the European Alps provides the possibly to study the **effects of ICE in our daily life**.



SOMMER headquarters in western Austria



sommer is a **family owned company** with excellent reputation. Customer focus, reliability, excellent service and high-end products are our commitment to you.

Introduction

Main **problems** with icing in the Wind power industry:

- ✓ Shutdown of turbines
- ✓ Loss of power production
- ✓ Loss of aerodynamics
- ✓ Vibrations
- ✓ Increased maintenance
- ✓ Danger of ice-throw



Icing related shutdowns cause **more loss of energy production** than shutdowns in warm locations.



Introduction

Why is a **reliable and accurate** ice detection system important?

- ✓ Prevent or reduce shutdowns
- ✓ Switch on blade-heating only when necessary
- ✓ Avoid damage caused by vibrations
- ✓ Protect people
- ✓ Save money

The **unique Technology** of the IDS-20 can detect **92%*** of all icing events.



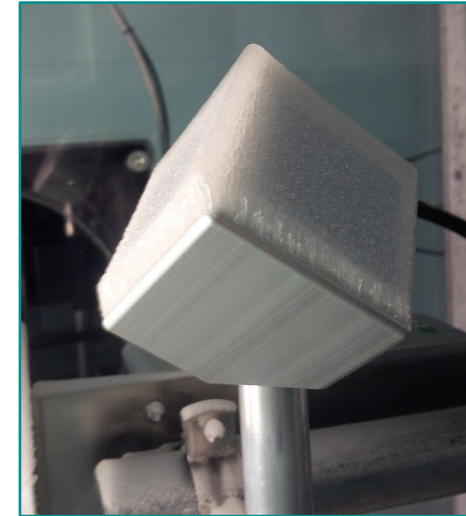
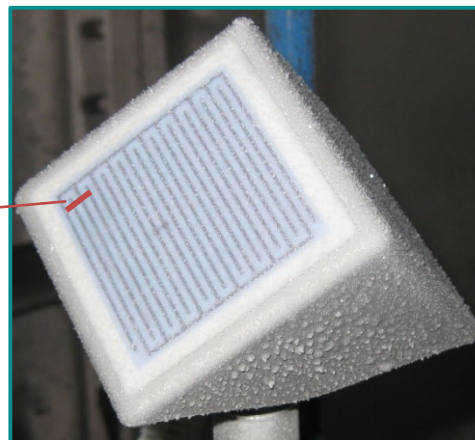
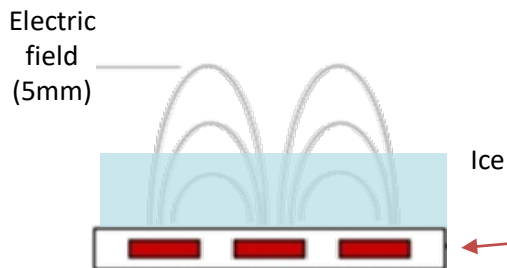
(*Value reached in internal field tests)

Ice detection system

There are different technologies on the market, **most of them do not detect ICE** directly. They only detect the effects that ICE has.

The Sommer IDS technology is unique and can **detect ICE in before it can cause problems** with the highest reliability on the market.

Due to the complex impedance measurement technology, the **IDS sensor detects only ICE** and will not be influenced by anything else.



Ice detection system -types



Detect already
0,1mm of ICE

IDS-30 – CUBE:

- detect ICE **very early**
- Output **the complete ICEING event** (ICEING event = ICE is growing)
- Perfect for **blade heating control**

Application:

Sensor will detect ICE so early that blade heating can be switch on **before the ICE can influence the operation.**

Life time of the turbine and the blades will be increased.



Ice detection system - types



Measures ICE thickness
from 1 -80mm

IDS-30 – ROD:

- Will measure the **ICE thickness** of the **total ice**
- Gives you the information **how much ice** is on the turbine.
- Output when the ICE is **melting**
- Perfect for turbine **without heating**

Application:

Sensor will output the **total amount of ICE** on the NOT heated turbine parts. The sensor will also output when the **ICE is melting**. The melting information is important to restart the turbine as fast as possible after a ICE shutdown.





IDS-30 – ALL in ONE:

- Will **detect ICE early** and measures **total ICE thickness** as well as the **ICE melting**
- Gives you **all ICE related information** you need. ICE, ICING event, ICE thickness and ICE is melting
- Perfect for **ICE studies** or collect more information
- Perfect to get **all site information**

Total solution

Ice detection system - interfaces

- ✓ Very easy system integration
 - SDI-12
 - RS-485 ASCII-Protocol
 - RS-485 MODBUS (RTU)
 - 3 Relay outputs (Configurable)
 - **Cube:** ice is growing, Self check
 - **Rod:** Ice exceed threshold, ice is melting, Self check
 - **All in one:** ice is growing, Ice exceed threshold, ice is melting, Self check
- ✓ Additional PLC integration (optional)
 - CANopen, PROFIBUS, PROFINET, EtherCAT
 - via converter
- ✓ SOMMER data logger connection (optional)
 - CSV-file transfer via mobile internet or satellite
 - Periodic image transfer from on-site camera
 - Remote access to sensor and data logger
 - Remote access via Android app
 - SOMMER MDS Cloud



ANDROID

Ice detection system



Ice detection system – Advantages

Advantages of IDS-30:

- ✓ The IDS-30 will detect more than **92% of all icing events**.
- ✓ Real-time measurement and discrimination **of ice and water** as well as **transformation from water to ice**
- ✓ Very easy interpretation of measurements with **simple relay functions**
- ✓ **Easy integration** into control systems and retrofit of older systems
- ✓ **Short, optimized** heating cycles
- ✓ Actual **ice thickness**
- ✓ **Not affected** by ambient interferences
- ✓ Detection of **extremely thin ice layers** for early warning

The IDS-30 is the only ice detection system that can reliably **distinguish between water and ice.**



Ice detection system – Advantages

Advantages of IDS-30 - rod:

- ✓ Information about the **total ice load**.
- ✓ **Ice thickness** from 1mm to 80mm
- ✓ Ice **Melting**
- ✓ **Velocity of ICE melt**, to predict how long it will take till the ice has melted.

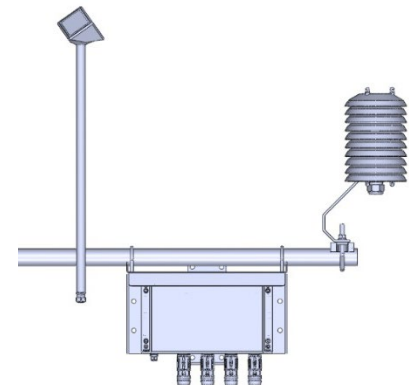
With the **ICE melting information** inspections can be planed more precisely and to **keep turbine shutdowns as short as possible**.



Example:

Icing events on wind turbine over a period of 2 month

- ✓ thin to medium ice layers
- ✓ IDS-20 Cube 5 sensor
- ✓ Measuring range: 0.1 ... 5 mm
- ✓ Heating cycles



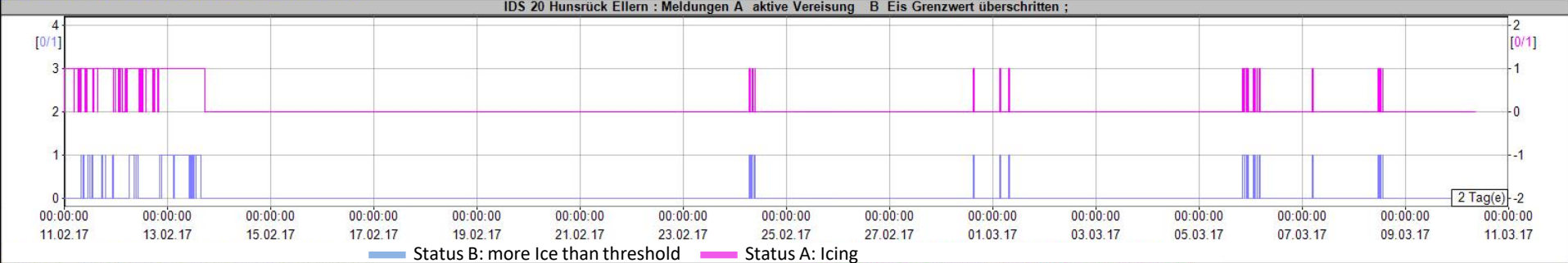
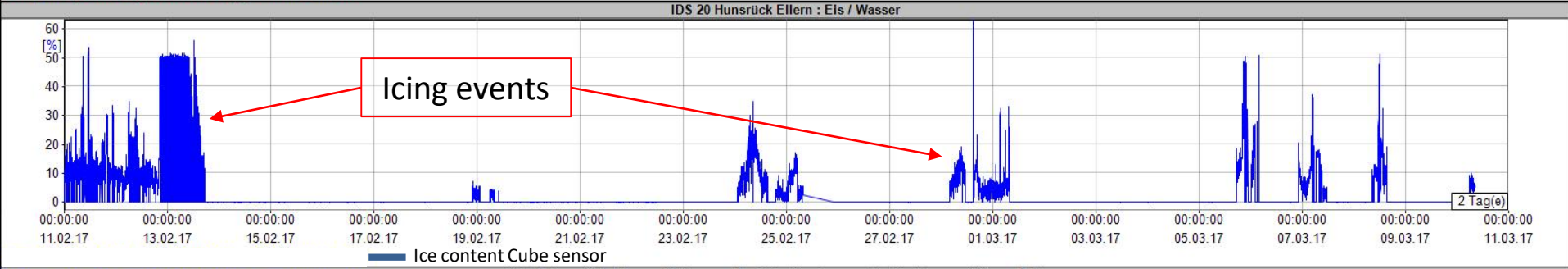
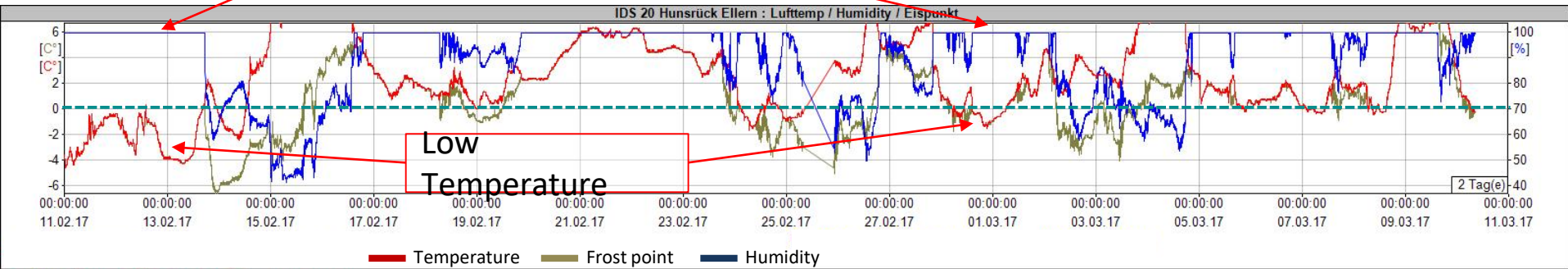
Application - Hunsrück Ellern (Germany)

Icing events during 11. February – 11. March 2017

Humidity 100%

Low Temperature

Icing events



Any Questions?



Thank you for your attention!