

Solution: CAN/FD Repeater Standard

Country: India

Sector: Wind turbines



## CAN/FD Repeater Standard eliminates electromagnetic interference (EMI)

### Background

Wind turbines are one of the most important advances in renewable energy and the fight against climate change, but electrical disturbances affecting internal data communication in wind turbines are a significant technical challenge that can lead to downtime. One of the biggest wind turbine manufacturers in India uses the CAN/FD Repeater Standard from Ixxat for reliable communication in its products, making EMI faults and undesirable ground potential differences that can cause system downtime a thing of the past.

### The challenge: EMI faults and ground potential differences

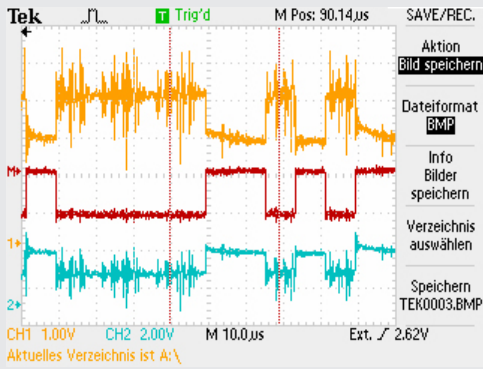
In the customer's wind turbines, numerous sensors are built into the rotor blades. They generate position signals, which are transmitted to a central control unit in the stator where they are processed so that information can be transmitted to the motors that control rotor movement. This communication is implemented in a star topology with a CAN network. The turbines face two technical challenges in their CAN data communication. The frequency converters control the speed of the generators, but they are also sources of electromagnetic interference. The induced voltage peaks on the CAN

transmission lines caused signal faults so severe that an unambiguous identification of dominant or recessive data bits on the CAN bus was impossible. This often led to communication errors and sensor data loss.

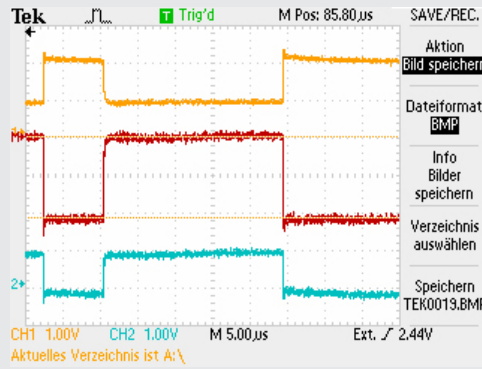
A further complication was caused regularly by the moving slip rings. The slip rings transfer signals between fixed and rotating parts, causing electrostatic charges that generate different capacitive loads. The resulting potential differences resulted in communication failures that disabled entire wind turbines, leading to expensive and time-consuming field servicing for the customer.

### CUSTOMER BENEFITS

- ✓ Improved signal quality for reliable data transmission, even with disturbing effects of EMI
- ✓ Avoiding expensive field work to troubleshoot and fix problems
- ✓ Protection of electrical components with high galvanic isolation (5 kV)



CAN signal without repeater



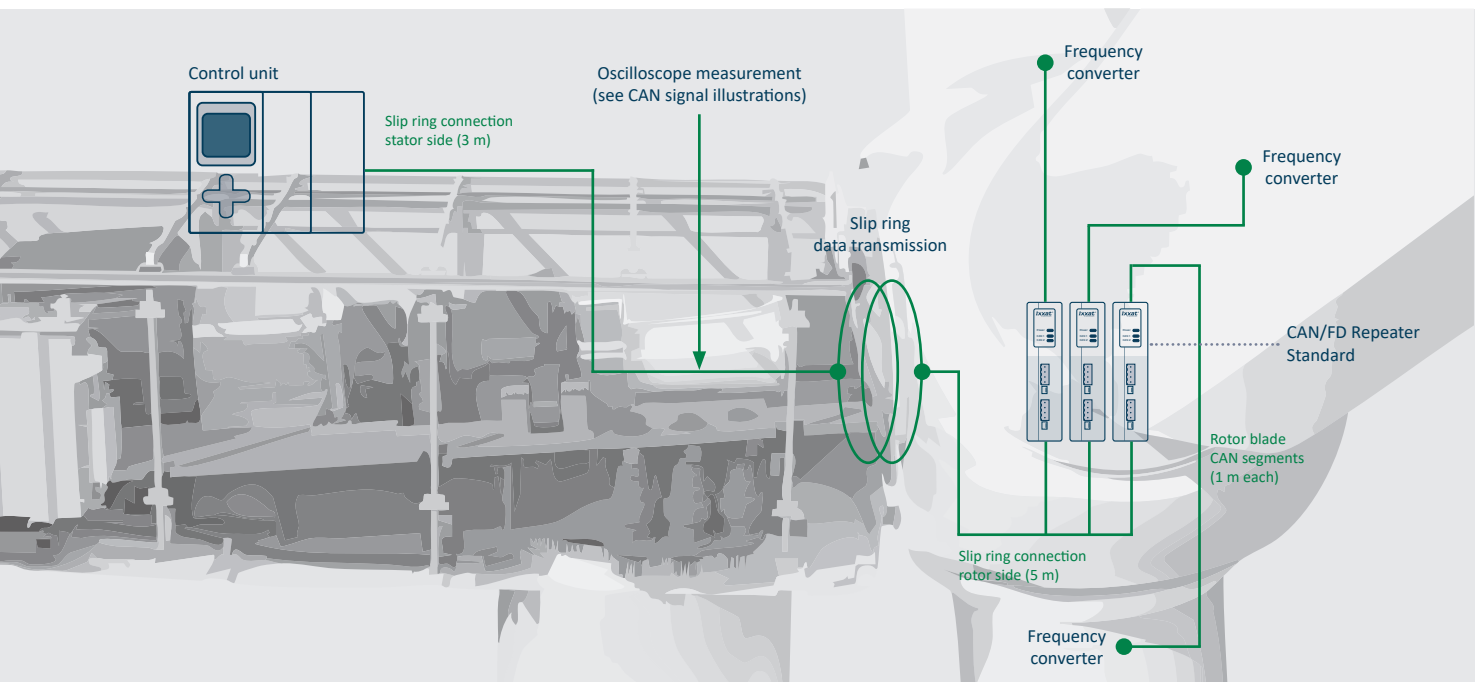
CAN signal with repeater

## The solution: CAN repeater ensures clear communication

To meet these challenges, the customer chose the CAN/FD Repeater Standard. Installed between the sensors in the rotor and the CAN controller in the stator, it filters out electromagnetic interference and amplifies the CAN signals. The repeater's main task is to effectively eliminate voltage peaks on the CAN bus that are caused by the frequency converters, thus ensuring clear transmission of the signals. In addition, galvanic isolation up to 5 kV ensures that differences in ground potential between rotating and stationary components do not have a negative impact on signal integrity. Not only does this solution improve the communication between the sensors and the control units, but it also means expensive on-site troubleshooting visits can be avoided.

## The product: The CAN/FD Repeater Standard

The Ixxat CAN/FD Repeater Standard was developed for CAN-based industrial communications networks and is the ideal solution for optimizing network topologies and improving signal quality. It has two CAN/FD channels and features high galvanic isolation of up to 5 kV between the CAN channels and the power supply. Its terminating resistors can be set externally with DIP switches, making configuration simple, and push-in connection makes tool-free installation easy. Its compact design is ideal for DIN rail mounting and cramped control cabinets, with clear labeling and LED indicators for easy operation.



For more information, see  
<https://www.hms-networks.com/ixxat>