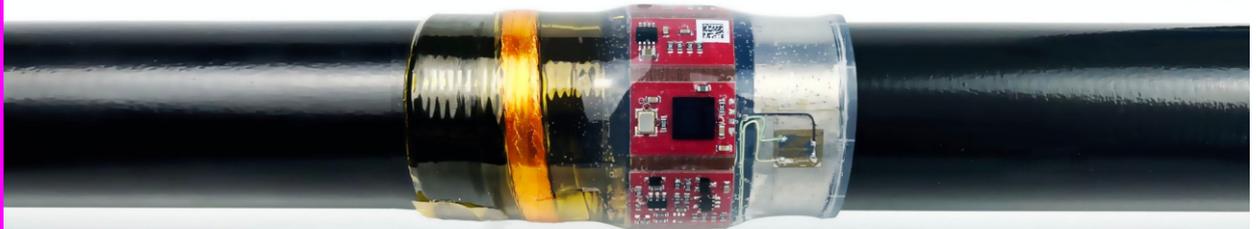




- robust
- reliable
- operating temperatures up to +140°C
- inductive power supply
- high measurement accuracy
- easy installation

- Strain gauge-based measurements for:
- drive shafts
 - propeller shafts
 - torque flanges
 - rotating gearbox components
 - and many more

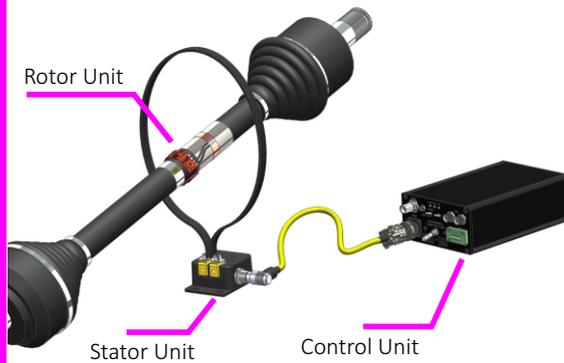


TELEMETRY SYSTEM

for strain gauge measurements on rotating components

Telemetry System AXON J1DB

Function



The AXON J1DB telemetry system enables fully contactless transmission of strain gauge signals from rotating components. Advanced digital signal processing ensures highly accurate, low-noise and interference-resistant acquisition of torque and force values, even under harsh operating conditions such as vibration, temperature fluctuations or electromagnetic interference. A dedicated transmission channel continuously monitors the inductively supplied voltage directly on the measuring shaft during operation. Based on this real-time feedback, the system autonomously regulates the inductive power transfer and maintains a stable, optimally adjusted supply voltage at all times, ensuring reliable sensor performance without manual intervention. In addition, the quality of the received digital data stream is indicated via an RSSI output. All parameters critical to safe and dependable operation – from power supply status to transmission integrity – can therefore be continuously monitored and evaluated in real time, providing maximum transparency and operational reliability.



Rotor Unit:

The Rotor Unit forms the core of signal processing on the rotating shaft. It supplies the sensor with precise excitation voltage, acquires and digitizes the strain gauge signals directly on the shaft and transmits the measurement data digitally and contactlessly to the Stator Unit. Its compact size and multiple design variants allow reliable integration even in highly confined installation spaces.



Control Unit:

The Control Unit provides central system control and data processing. It regulates the inductive power supply of the Rotor Unit and outputs the measured shaft data in both digital and analog form.

Inductive power transfer and RF data reception are continuously monitored and dynamically adjusted during operation. This ensures a stable energy supply and permanently reliable, interference-resistant data transmission – even during long-term operation under demanding conditions.



Stator Unit:

The Stator Unit generates the dynamic inductive field required for contactless power transfer to the Rotor Unit while simultaneously receiving the transmitted measurement data. The contactless coupling between rotor and stator antenna enables transmission distances of up to 80 mm. This allows reliable compensation of substantial axial and radial relative movements between rotor and stator. The result is maximum flexibility for integration into test benches and vehicle platforms, ensuring stable energy and data transmission even in complex installation scenarios.

Telemetry System AXON J1DB

designed for
e-Mobility
und Anwendungen mit hoher
elektromagnetischer Belastung

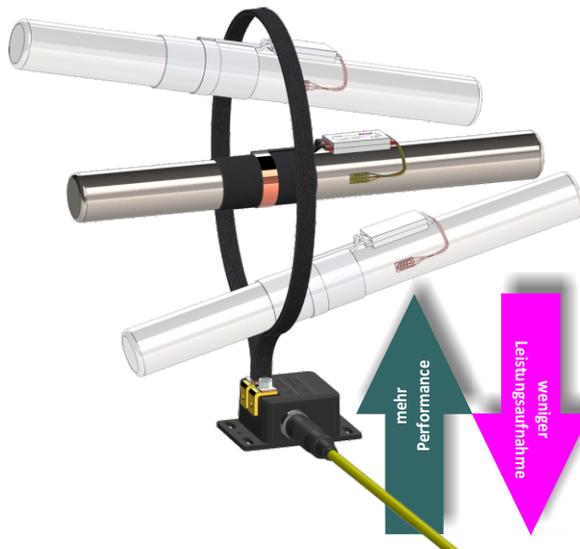
Anti-EMC: Noise Cancelling for Reliable Measurements

The integrated Anti-EMC technology actively suppresses electromagnetic interference affecting the received data stream.

In environments with electric drives, inverters or high switching currents, unwanted emissions can significantly impair signal quality. The Anti-EMC function continuously detects and compensates for these disturbances, ensuring stable and interference-resistant data transmission. As the system operates automatically in the background, no additional user interaction is required, providing dependable measurement results in e-mobility applications and advanced test bench setups.



Performance



Inductive Power Supply 4.0

The inductively transmitted power supply of the Rotor Unit is continuously monitored and actively controlled during operation to ensure optimal performance at all times.

IPT – Intelligent Power Transmission – dynamically adjusts the transmitted energy: power is increased instantly when required and reduced wherever possible. In a wide range of applications, this intelligent regulation decreases the overall power consumption of the telemetry system by up to 60% while simultaneously enhancing system stability. Reliable transmission is maintained even on shafts with significant deflection and relative movement. Stable inductive coupling is ensured under challenging installation scenarios, including confined spaces such as gearboxes, guaranteeing uninterrupted energy supply and dependable data transmission.

The Ideal System for Torque Measurements

The J1DB telemetry system provides a reliable foundation for professional torque measuring shafts that deliver permanently stable and highly accurate measurement data, even under extreme operating requirements.

Whether in demanding vehicle development programs or in long-term test bench operation, AXON telemetry systems ensure reproducible results, maximum operational reliability and high measurement accuracy across a wide range of applications. At the same time, installation and commissioning remain straightforward. Antenna geometry and size can be flexibly adapted to suit the specific installation environment.



Telemetry System AXON J1DB

Complete Telemetry Data Access via CAN

In addition to the measurement data transmitted via a dedicated CAN ID at baud rates of up to 1 Mbit/s, the system provides further measurement-critical information within a separate status ID for comprehensive system monitoring and signal evaluation:

- Transmission status (stable data transmission yes/no)
- Rotor Vs (available supply voltage on the Rotor Unit)
- Temperature of the Rotor Unit
- Temperature of the Control Unit
- Device name (freely configurable)
- Serial number of the Control Unit
- Serial number of the transmitting Rotor Unit
- Calibration factor for torque output in Nm
- Offset correction
- Sampling rate of the measurement channel

For maximum flexibility and straightforward integration, key operating parameters are also available as analog voltage outputs:

- Measurement signal
- Rotor Vs (quality of inductive power supply)
- RSSI (reception quality of the digital data transmission)

All configuration settings defined in the software can be conveniently exported as a .dbc file and seamlessly integrated into existing CAN architectures.

AXON
systems

CANConfig V1.9



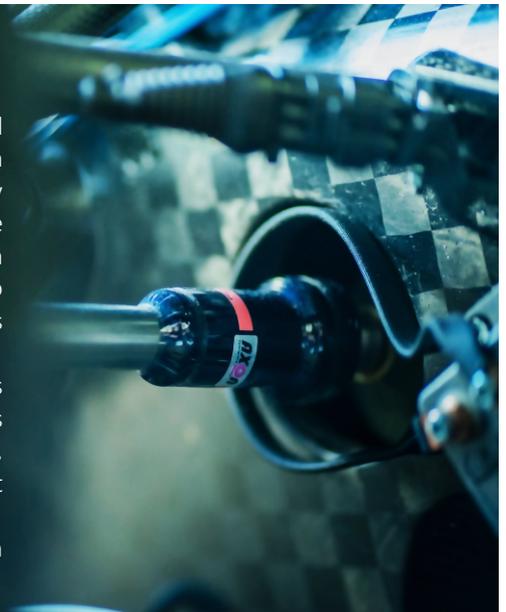
Connectivity

Plug & Play Torque Measuring Shafts for Demanding Applications

Based on the AXON J1DB telemetry system, we design and manufacture fully customized torque measuring shafts – from engineering and strain gauge application to calibration and delivery as a ready-to-use solution. Following a detailed analysis of the installation environment, including CAD alignment, the system components are professionally integrated and precisely adapted to the specific application. **ATP – a multi-layer sealing concept** ensures excellent mechanical and thermal durability.

The compact and space-efficient telemetry integration allows installation even in highly confined spaces. Every measuring shaft is calibrated on our in-house test benches. The result is a robust, maintenance-free Plug & Play solution for vehicle development, test bench operation and long-term industrial use.

Precise, dependable and perfectly matched to specific application requirements.



Telemetry System AXON J1DB

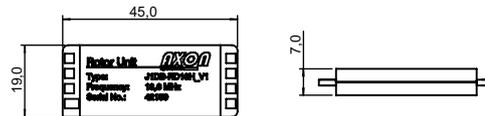
Rotor Units

General Technical Data

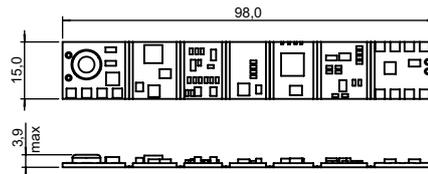
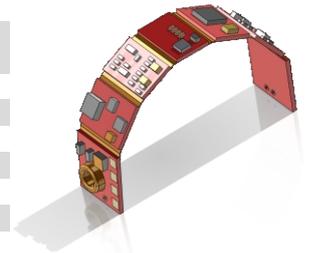
Signal conditioning	1 channel full-bridge strain gauge	Temperature range Option T	-40°C +125°C
Power supply	Inductive or battery-powered	Temperature range Option H	-40°C +140°C
Transmission	PCM (digital) 16 Bit	Measurement accuracy	± 0.2% FS
Sampling rate	5.2 kSa/s	Zero drift	0.007% FS/°C
Measurement range	0.1 - 500 mV/V adjustable	Gain drift	0.007% FS/°C
Carrier frequency (standard)	13.6 MHz		
Carrier frequencies (optional)	11.6 MHz, 12.6 MHz, 14.6 MHz, 15.6 MHz		

Designs / Versions

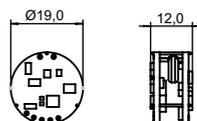
Type	J1DB-RD13T	J1DB-RD13H
Housing	Aluminium	
Connections	Solder pads	
Dimensions	45 x 19 x 7 mm	
Operating temperature range	-40°C +125°C	-40°C +140°C
Weight	10 g	
Degree of protection	IP68 with appropriate covering of solder contacts	



Type	J1DB-RF13T	J1DB-RF13H
Housing	Without housing; flexible PCB	
Connections	Solder pads	
Dimensions	98 x 15 x 3.9 mm	
Operating temperature range	-40°C +125°C	-40°C +140°C
Minimum bending radius	14 mm	
Weight	4.5 g	
Degree of protection	IP10, electronics coated; protection / encapsulation after application	



Type	J1DB-RR13TL	J1DB-RR13HL
Housing	Without housing; cylindrical design	
Connections	Solder pads	
Dimensions	Ø19 mm x 12 mm	
Operating temperature range	-40°C +125°C	-40°C +140°C
Weight	3.5 g	
Degree of protection	IP10, electronics coated; protection / encapsulation after application	



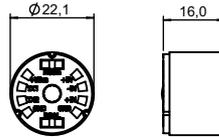
Technical Data

Telemetry System AXON J1DB

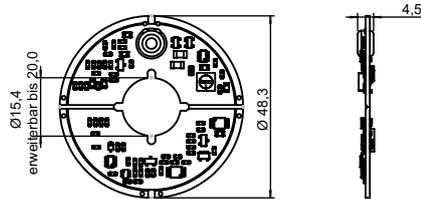
Rotor Units

Designs / Versions

Type	J1DB-RR13T	J1DB-RR13H
Housing	Carbon; cylindrical design	
Connections	Solder pads	
Dimensions	Ø22.1 mm x 16.0 mm	
Operating temperature range	-40°C +125°C	-40°C +140°C
Weight	10.4 g	
Degree of protection	IP68 with appropriate covering of solder contacts	



Type	J1DB-RQ13T	J1DB-RQ13H
Housing	Without housing; flat, circular design, separable at predefined cut edges	
Connections	Solder pads	
Dimensions	Ø48.3 mm x 4.5 mm, inner bore 15.4 mm, expandable up to 20.0 mm	
Operating temperature range	-40°C +125°C	-40°C +140°C
Weight	7 g	
Degree of protection	IP10, electronics coated; protection / encapsulation after application	



Telemetry System AXON J1DB

Stator Units JXD-SRxx- Ring Stators with Wideband Reception

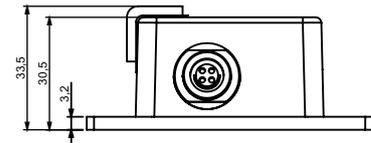
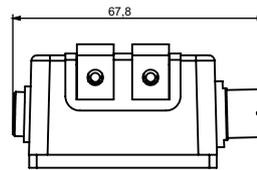
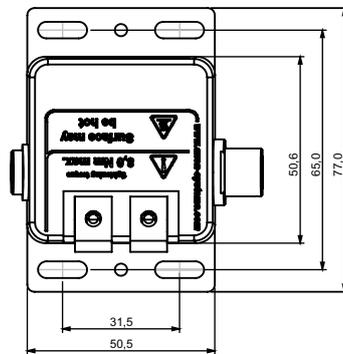
General Technical Data

Transmission type	Ring stator with conductor loop (transmission coil)
Transmission coil	Copper stator antenna $\varnothing > 4$ mm Optional: copper stator antenna JX-EC02 Optional: EMC stator antenna JX-ECE02
Transmission coil connection	Screw terminals with connection option on top and front
Cable length Stator – Control Unit	5 m, optional 7 m, 8 m, 10 m, 15 m, 20 m, 30 m, 50 m
Reception frequency range	Wideband (10 – 30 MHz)
Degree of protection	IP 68

Designs / Versions

Type	JXD-SR80TE	JXD-SR80HE
Housing	Aluminum, powder-coated	
Dimensions	68 x 53 mm (base plate 77 x 33.5 mm)	
Operating temperature range	-40°C +125°C	-40°C +140°C
Transmission coil diameter	\varnothing 60 500 mm	
Anti-EMC	Integrated	
Weight	232 g	
Degree of protection	IP68	

Type	JXD-SR80TEL	JXD-SR80HEL
Housing	Aluminium, pulverbeschichtet	
Dimensions	68 x 53 mm (base plate 77 x 33.5 mm)	
Operating temperature range	-40°C +125°C	-40°C +140°C
Transmission coil diameter	\varnothing 300 2,000 mm	
Anti-EMC	Integrated	
Weight	232 g	
Degree of protection	IP68	

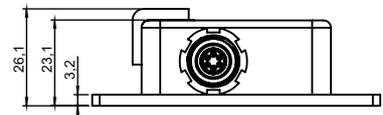
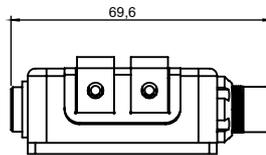
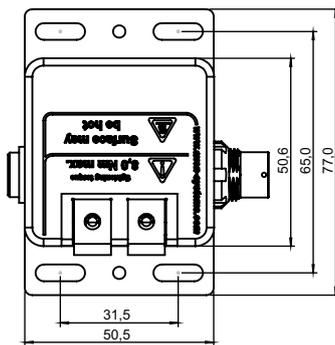


Technical Data

Telemetry System AXON J1DB

Stator Units JXD-SRxx- Ring Stators with Wideband Reception

Typ	JXD-SR80TM	JXD-SR80HM
Housing	Aluminum, powder-coated	
Dimensions	68 x 53 mm (base plate 77 x 33.5 mm)	
Operating temperature range	-40°C +125°C	-40°C +140°C
Transmission coil diameter	Ø 40 300 mm	
Anti-EMC	Integrated	
Weight	232 g	
Degree of protection	IP68	



Technical Data

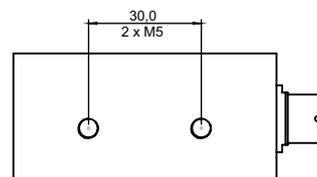
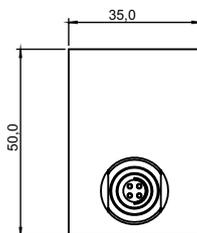
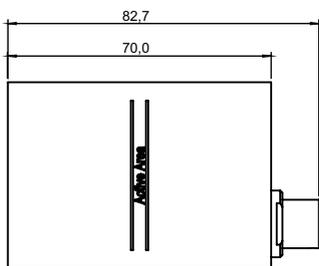
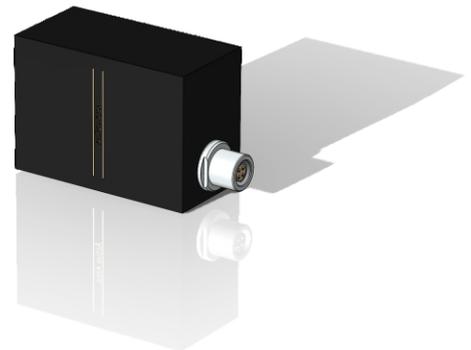
Stator Units JXD-SExx- Inductive Pick Up with Wideband Reception

General Technical Data

Transmission type	Inductive stator as pick-up
Cable length Stator – Control Unit	5 m, optional 7 m, 8 m, 10 m, 15 m, 20 m, 30 m, 50 m
Reception frequency	Wideband
Degree of protection	IP 68

Designs / Versions

Type	JXD-SE60TE
Housing	Plastic, black
Dimensions	82.7 x 50 x 35 mm
Operating temperature range	-40°C +125°C
Distance stator – shaft	0 – 60 mm (free field)
Weight	220 g
Degree of protection	IP68



Telemetry System AXON J1DB

Control Unit

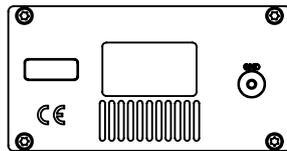
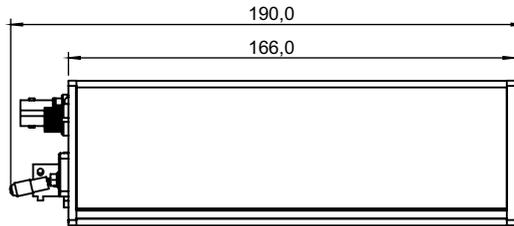
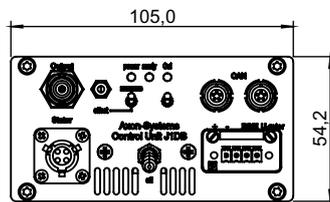
Type	J1DB-CC13
Dimensions	190 x 105 x 54 mm (incl. connectors)
Weight	740 g
Supply voltage	9 – 36 VDC
Power consumption	Typical: 12 W, max. 35 W
Signal bandwidth	1000 Hz (-3dB)
Signal output Rotor Vs ⁽¹⁾	0 - 10 V, scaling 3:1
RSSI output ⁽²⁾	0 - 4.5 V
Baud rate	125, 250, 500 and 1000 kBaud/s selectable
CAN channel sampling rate	50 - 1550 Hz
Analog signal outputs	SG measurement signal, Rotor Vs ⁽¹⁾ , RSSI ⁽²⁾
CAN interface connector	LEMO FGG.0B.305
CAN bus signal output	Measurement data (selectable V or Nm), Rotor Vs ¹ , ready status, Control Unit serial number, Rotor Unit serial number, Offset correction, device name, channel sampling rate, Rotor Unit temperature, Control Unit temperature
Analog offset adjustment	±0.5 V, via potentiometer
Analog measurement signal output	BNC, ±10V
Carrier frequency (standard)	13.6 MHz
Carrier frequencies (optional)	11.6 MHz, 12.6 MHz, 14.6 MHz, 15.6 MHz
Analog signal delay	1.3ms
Wireless shunt calibration	Shunt Cal push-button on the Control Unit or CAN command
Degree of protection	IP40
Operating temperature range	-20°C ... +75°C
Overvoltage protection	Integrated
Reverse polarity protection	Integrated
Conformity	CE

(1) Supply voltage Rotor Unit

(2) Receive Signal Strength Indicator



Technical Data



*Engineering
Trust
in
Motion*

AXON Systems GmbH stands for telemetry solutions engineered with passion, precision and a deep understanding of real-world measurement challenges. Founded in Germany and driven by engineering excellence for more than two decades, AXON develops high-end telemetry systems for strain gauge, torque and temperature measurements on rotating components – wherever accuracy, robustness and reliability truly matter.

Our systems are designed to perform under the harshest conditions: high temperatures, limited installation space, strong electromagnetic interference and demanding test environments. Whether in vehicle testing, e-mobility applications, test benches or industrial R&D, AXON telemetry solutions deliver stable, trustworthy measurement data when conventional approaches reach their limits.

Development, production, calibration and application engineering are combined under one roof. This allows us to create not only technically advanced products, but also application-specific solutions tailored precisely to our customers' needs – including fully customized mechanical integrations for contactless temperature measurement. AXON systems are trusted worldwide by automotive manufacturers, suppliers and research institutions. We follow uncompromising quality standards and continuously strengthen our processes, including information security, to ensure long-term reliability and confidence.

Behind every system stands a dedicated team. For technical support and application assistance, our engineers are directly reachable via support@axon-systems.com – personal, fast and free of charge.

