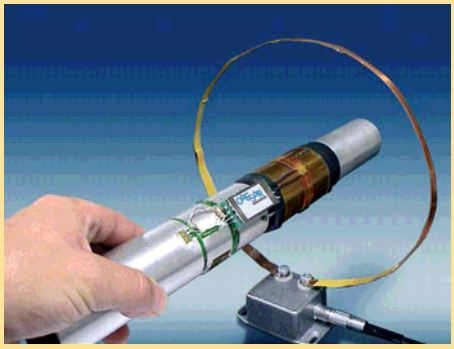
J1 • Single-Channel Advanced Telemetry System

Contactless measurement from rotating machinery with minimum effort – the new J1

The installation of a telemetry system could not be simpler: the new J1.



*The 1-Channel Telemetry System **J1** enables stable and reliable measurement of Torque, Strain, Temperature, Voltage, Pressure, and ICP® sensor signals up to 2.5 kHz.*

With maximum reliability, long-term stability and the lowest time investment: The new J1 Shaft Telemetry System.

Wireless transmission of sensor data from rotating objects is now generally accepted by mechanical engineers as a standard method for measurement applications in research, testing and vehicle development. For such tasks the new single-channel telemetry system J1, with the revolutionary IPT (Intelligent Power Transmission) from CAESAR DataSystems, offers even more compelling reasons for using this technique.

Engineers demand that shaft telemetry systems have the highest possible signal integrity, are easy to install and reliable in operation. With the J1 system and IPT technology, this becomes a reality. Power transmission is now substantially improved giving a longer range (70mm) than previously possible.

The flexible ring of the stator type JX-SR-70 can be individually adapted to accommodate very large deflections of a shaft or axle (up to 700mm) and supply uninterrupted power to the rotor electronics.

Small and lightweight rotor electronics installed directly on the item under test, provide power to the sensor, acquire the measurement data and transmit it wirelessly to the stator antenna. The stator can transmit power to the rotor electronics allowing continuous operation without batteries. Remote shunt calibration for strain based applications is also supported. The receiving control unit provides signals for recording, monitoring or analysis.

The key to quick success: The new J1 with IPT (Intelligent Power Transmission)

IPT supervises and regulates the power transmission to the rotor electronics on the shaft. Aging and temperature dependent fluctuations of the operating point of the stator unit are determined by the control unit and automatically readjusted or balanced.

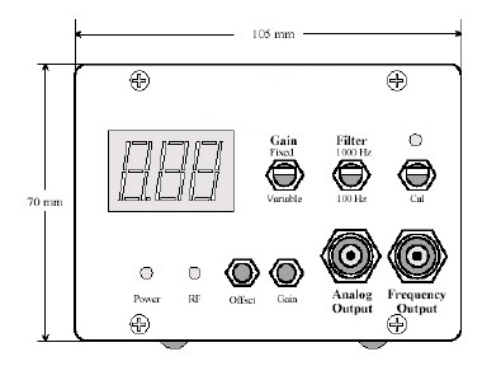
Remarkably the new J1 permits the mounting of the stator and the receiving antenna directly adjacent to substantial metallic surfaces without loss of range or performance.

A range of accessories and options for rotors, stators and control units, including a low profile, low weight, flexible rotor, and a CANbus interface, ensure most demanding measurement applications can be met.

Easy configuration, assembly and installation, and the flexibility of using inductive or battery power for the rotor electronics, makes the J1 a genuine multi-talent for rotary applications.

Technical Data - J1 Telemetry

J1-CE Control Unit



Signal bandwidth	dc -100 Hz/1 kHz switchable (-3 dB) (optional: dc - 2.5 kHz (-3 dB))
Carrier frequency	10.7 MHz (Standard) (optional: 13.56/ 19.66 / 24 / 30 MHz)
Frequency output	10 kHz / ±5 kHz
Output voltage	±10 V
CAN Bus output	Option
Noise	< 3.5 mV rms
Dynamic range	60 dB (1 kHz bandwidth)
Offset range (adjustable)	±1 V
Gain range (adjustable)	0.5 to 2.0 x output voltage
Power supply	9 to 36 Vdc (4 A max.)
Power	35 VA (max.)
Display	3 ½-digit (7-Segment LED)
Strain gauge shunt calibration	Remote, using front panel switch
Weight	1.0 kg
Size (excl. connectors)	170 x 105 x 70 mm (l x b x h)
Protection class	IP 40
Part Number – Control Unit Carrier frequency Signal bandwidth 2.5 kHz (opt.) CAN Bus output	**J1-CE-xx-y-z** **xx**: 13, 19, 24, 30 (option) **y**: F (option) **z**: C (option)

J1-RE Multi-Rotor Electronics with Signal Conditioning for Strain Gage, Thermocouple (Type K) or DC Voltage Measurements

Signal Conditioning	**Strain gage ≥ 350 Ohm**
Accuracy	0.2%
Gain	1 to 20,000 (freely adjustable)
Sensor voltage supply	+5 V
Offset Temperature drift	0.0025% / °C
Gain -Temperature drift	25 ppm / °C
Shunt calibration	Remote, using front panel switch on Control Unit
Signal Conditioning	**Thermocouple Type K (NiCrNi)**
Cold junction compensation	Integrated
Measurement range	-200°C to +1000°C
Input impedance	390 kOhm
Signal Conditioning	**AC / DC Voltage**
Measurement range	0 to ±5 V
Input impedance	10 kOhm

Signal bandwidth (frequency range – 3dB)	dc to 1kHz (Standard) (optional: 2.5 kHz)
Carrier frequency	10.7 MHz (Standard) optional: 19.66 / 24 / 30 MHz
Signal range (V/F converter)	10 kHz ±5 kHz
Operating temperature	-15°C to +75°C
Housing material	Aluminum
Weight	Approx. 15 g
Size (incl. solder pads)	42 x 25 x 7 mm (l x b x h)
Connections	Solder pads
Protection class	IP 67 (application dependant)
Part No. – Multi-Rotor Electronics Carrier frequency Signal bandwidth 2.5 kHz	**J1-RE-xx-y** **xx**: 19, 24, 30 (option) **y**: F (option)

Technical Data - J1 Telemetry

J1-RD Micro-Rotor Electronics with Signal Conditioning for Strain Gage Only

J1-RD

J1-RD-Flex
Shown shaft mounted

Signal Conditioning	**Strain gage ≥ 350 Ohm**
Accuracy	0.2%
Gain	1 to 20,000 (freely adjustable)
Sensor voltage supply	+5 V
Offset-Temperature drift	0.0025% / °C
Gain-Temperature drift	25 ppm / °C
Shunt Calibration	Remote, using front panel switch on Control Unit

Signal bandwidth (frequency range -3dB)	dc to 1kHz (Standard) (optional: 2.5 kHz)
Carrier frequency	10.7 MHz (Standard) optional: 13.56/ 19.66 / 24 / 30 MHz
Signal range (V/F converter)	10 kHz ±5 kHz
Operating temperature	-15°C to +75°C (Standard) optional: -40°C to +125°C
Housing material	Aluminum; optional without housing (plastic coating)
Weight	Approx. 12 g (Standard) Optional: approx. 6 g (plastic coated without housing)
Size (incl. solder pads)	45 x 18 x 7 mm (l x b x h)
Connections	Solder pads
Protection class	IP 67 (application dependant)
Part No. – Micro Rotor Electronics Carrier frequency Signal bandwidth 2.5 kHz Operating temp. -40°C to 125°C Weight 6 g (Plastic coating)	**J1-RD-xx-y-z-g** **xx**: 13, 19, 24, 30 (option) **y**: F (option) **z**: T (option) **g** : K (option)

J1-RI Micro-Rotor Electronics with Signal Conditioning for ICP®-Sensors Only

Signal Conditioning	**ICP®**
Power supply	≥7 V (using battery supply)

Signal bandwidth (frequency range -3 dB)	2 Hz to 1kHz (Standard) (optional: 2.5 kHz)
Carrier frequency	10.7 MHz (Standard) optional: 19.66 / 24 / 30 MHz
Signal range (V/F converter)	10 kHz ±5 kHz
Operating temperature	-15°C to +75°C (Standard) optional: -40°C to +125°C
Housing material	Aluminum; optional without housing (plastic coating)
Weight	Approx. 9 g (Standard) Optional: approx. 6 g (plastic coated without housing)
Size (incl. solder pads)	45 x 18 x 7 mm (l x b x h)
Connections	Solder pads
Protection class	IP 67 (application dependant)
Part No. – Micro Rotor Electronics Carrier frequency Signal bandwidth 2.5 kHz Op. temperature -40°C to 125°C Weight 6 g (Plastic coating)	**J1-RI-xx-y-z-g** **xx**: 19, 24, 30 (option) **y**: F (option) **z**: T (option) **g** : K (option)

Technical Data - J1 Telemetry

JX-SR-70 Wideband Ring Stator

Transmission range	< 70 mm
Carrier frequency	10.7 to 30 MHz (wideband)
Cable length (to the control unit)	5 m (Standard) optional: 10 / 30 m
Weight	Approx. 200 g
Size (incl. connector)	61 x 50.5 x 33 mm (l x b x h)
Protection class	IP 40 (Standard) Optional: IP 67
Part Number - Ring Stator Cable length Waterproof	**JX-SR-70-xx-y** **xx**: 10, 30 (option) **y**: W (option)

JX-SE-60 Wideband Inductive Stator

Transmission range	< 60 mm
Carrier frequency	10.7 to 30 MHz (wideband)
Cable length (to the control unit)	3 m (Standard) optional: 5 / 10 / 30 m
Weight	Approx. 500 g
Size	70 x 44 x 49 mm (l x b x h)
Protection class	IP 40 (Standard) optional: IP 67
Part Number - Inductive Stator Cable length Waterproof	**JX-SE-60-xx-y** **xx**: 05, 10, 30 (option) **y**: W (option)

JX-SE-40 Wideband Inductive Stator

Transmission range	< 40 mm
Carrier frequency	10.7 to 30 MHz (wideband)
Cable length (to the control unit)	3 m (Standard) optional: 5 / 10 / 30 m
Weight	Approx. 130 g
Size (incl. connector)	74 x 31 x 25 mm (l x b x h)
Protection class	IP 40 (Standard) optional: IP 67
Part Number - Inductive Stator Cable length Waterproof	**JX-SE-40-xx-y** **xx**: 05, 10, 30 (option) **y**: W (option)

JX-SE-40S Wideband Inductive Stator

Transmission range	< 40 mm
Carrier frequency	10.7 to 30 MHz (wideband)
Cable length (to the control unit)	3 m (Standard) optional: 5 / 10 / 30 m
Weight	Approx. 140 g
Size	50 x 50 x 25 mm (l x b x h)
Protection class	IP 40 (Standard) optional: IP 67
Part Number - Inductive Stator Cable length Waterproof	**JX-SE-40S-xx-y** **xx**: 05, 10, 30 (option) **y**: W (option)

Technical Data - J1 Telemetry

JX-SB-01 Wideband Battery Stator

Transmission range	< 80 mm
Carrier frequency	10.7 to 30 MHz (wideband)
Cable length (to the control unit)	5 m (Standard) optional: 5 / 10 / 30 m
Weight	Approx. 50 g
Size (incl. connector)	25 x 25 x 15 mm (l x b x h)
Protection class	IP 40 (Standard) optional: IP 67
Part Number - Battery Stator Cable length Waterproof	**JX-SB-01-xx-y** **xx**: 05, 10, 30 (option) **y**: W (option)

J1-RD-Flex Rotor Electronics

With a maximum overall height of less than 5 mm., the rotor electronics unit is extremely flat. Mounted on a flexible, foil substrate its space-saving design enables it be easily applied to rotating shafts or similar machine parts. The low-profile J1-RD Flex is also ideally suited for applications involving high rotational speeds.

Sensor input	Strain gage ≥120 Ω to 1 kΩ
Signal bandwidth	dc to 1 kHz
Shunt calibration	Remote, using front panel switch on Control Unit
Dimensions (l x b x h)	102 x 17 x 4.2 mm (incl. pads)
Weight	3.2 g
Part Number – Rotor Electronics Carrier frequency Signal bandwidth 2.5 kHz Operating temp. -40°C to 125°C	**J1-RD-FLEX-xx-y-z** **xx**: 10, 19, 24, 30 (option) **y**: F (option) **z**: T (option)

Complete System

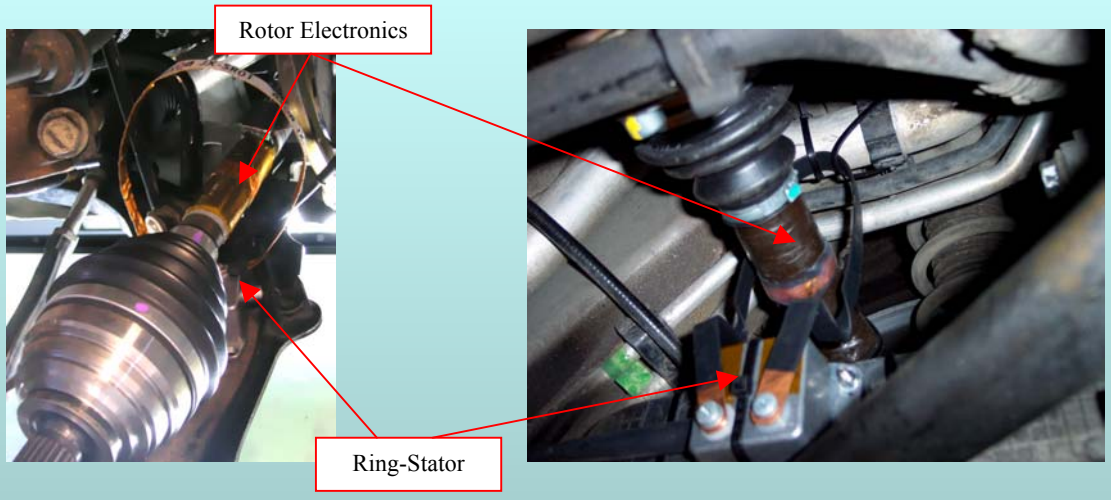
Part number 1-Channel Telemetry system complete (consisting of the following individual components): **x = D: - J1-RD-10**: Micro-Rotor Electronics 10.7 MHz with signal conditioning for strain gage; Bandwidth 1 kHz; Temperature range -15°C to +75°C OR **x = E: - J1-RE-10**: Multi- Rotor Electronics 10.7 MHz with signal conditioning for strain gage, Thermocouple (Type K) or DC voltage measurements; Bandwidth 1 kHz; Temperature range -15°C to +75°C OR **x = I: - J1-RI-10**: Micro- Rotor Electronics 10.7 MHz with signal conditioning for ICP®-Sensors; Bandwidth 1 kHz; Temperature range -15°C to +75°C **- JX-SR-70**: Wideband Ring Stator for 0 to 70 mm Distance incl. 5 m cable length; Inductive power supply for Rotor Electronics; Temperature range –15°C to+75°C; Metal housing **- J1-CE10:** Control unit 10.7 MHz. Desktop version with Frequency and Voltage output, Shunt calibration and Display; Output filter 100 and 1,000 Hz; Power supply +9 to +36 Vdc **- JX-EK01**: Assembly material consisting of insulating tape, 2-Component cement, 2 x 1 m Mu-Metal (77 mm wide), 1 m Copper band, Wire, High temperature tape	**J1-SY-Rx-10** **x:** D, E, I

Accessories

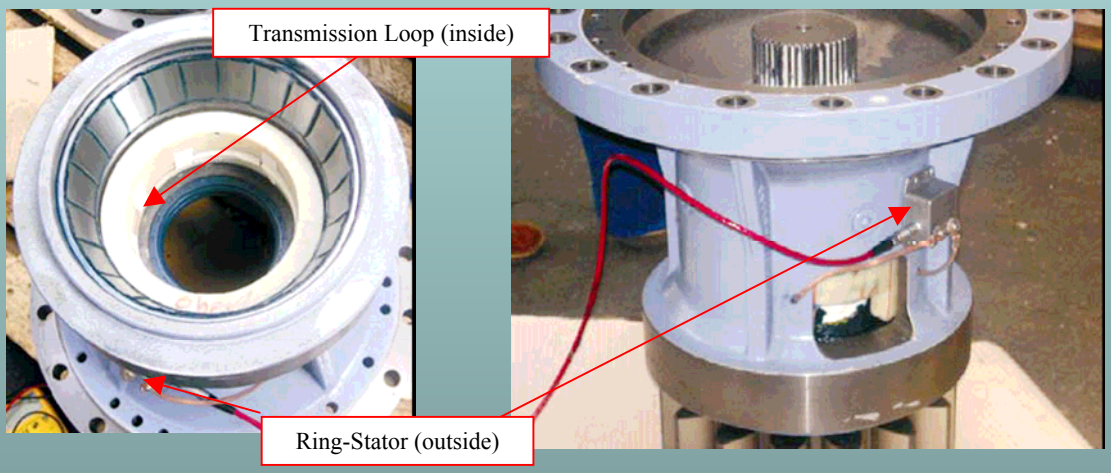
Power supply 110/230 Vac 60 W for Control Unit	**JX-EP60**
Assembly material consisting of insulating tape, 2-Component cement, 2 x 1 m Mu-Metal (77 mm wide), 1 m Copper band, Wire, High temperature tape	**JX-EK01**
1 m Mu-Metal (77 mm wide), self adhesive	**JX-EM07**
1 m Mu-Metal (155 mm wide), self adhesive	**JX-EM15**
1 m Copper band, self adhesive	**JX-EC01**
1 Roll High temperature tape, 19mm wide	**JX-EH01**
Preparation of a drive shaft for measurement of torque consisting of: strain gage application, assembly of the telemetry, calibration to 10 kNm, incl. documentation	**J1-AK01**
Local support for start-up/maintenance of the telemetry system	**J1-SUP**

Application Examples - J1 Telemetry

Contactless measurement of torque on vehicle driveshafts with large suspension travel



Contactless measurement of torque in a planetary gear of a wind-powered device



Contactless torque and speed measurement on a drive shaft

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