

IoT Sensor Node with Bluetooth

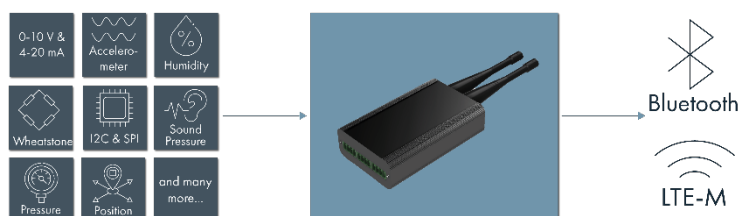
Features

- IoT sensor node with LTE-M / NB-IoT and Bluetooth
- 2 channels for strain gauge full bridges
- Integrated 3-axis accelerometer + gyroscope
- Integrated environmental temperature + humidity sensors
- Integrated data logger
- GNSS localization
- Logs data directly to App or into internal memory
- Customizable to customers needs



Applications

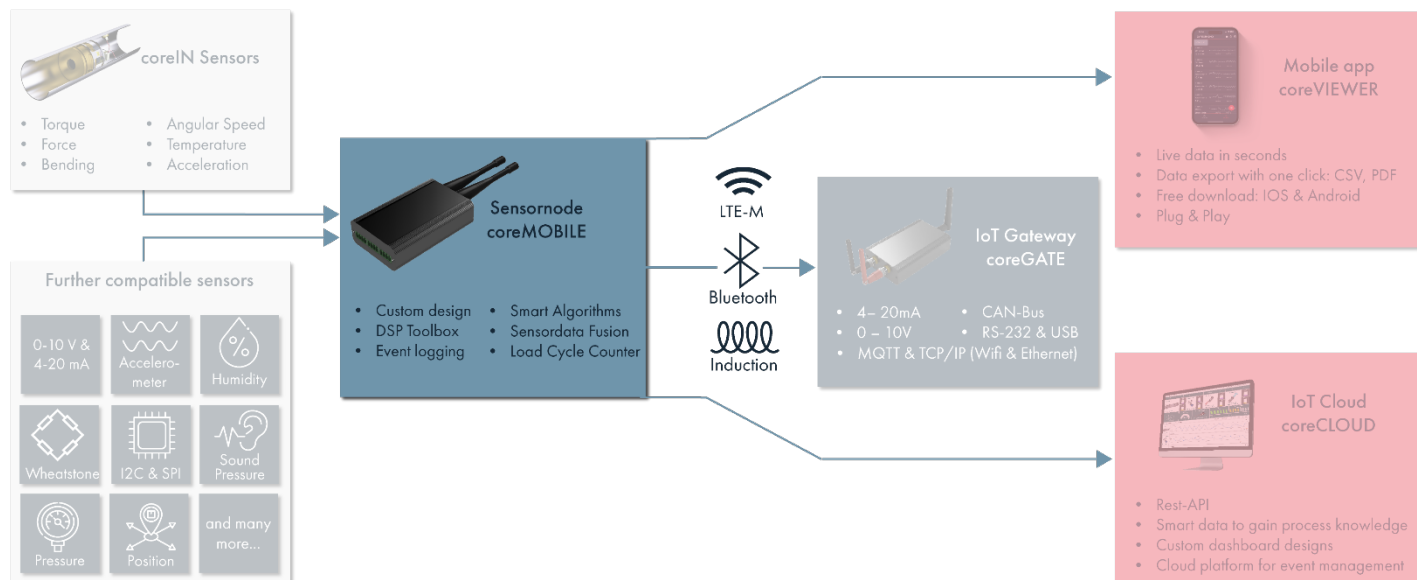
- Test & Measurement
- Predictive Maintenance
- Industrial machine surveillance
- Telemetry for Off-Site asset health monitoring
- Construction surveillance



Description

coreMOBILE is a versatile IoT sensor node for remote monitoring of strain gauge bridges. Equipped with dual-band cellular and Bluetooth connectivity for reliable and flexible data transmission. The compact sensor node has two channels for strain gauge full bridges, ideal for measuring physical quantities like force, torque or pressure. In addition, coreMOBILE has a 3-axis accelerometer, gyroscope, and ambient temperature and humidity sensors to provide comprehensive environmental data. The built-in data logger allows for on-device storage, while GNSS positioning allows for location tracking. coreMOBILE seamlessly transmits data to mobile applications or cloud platforms for real-time monitoring and analysis.

core sensing ecosystem



Technical specifications

The following data applies to firmware versions 5.1051 (BLE) and 3.301 (LTE-M).

Strain Gauge Amplifier ¹		
Number of Full Bridges	2	
Sensitivity (typ.)	0.1 ...3	mV/V
Bridge Excitation ²	3.3	V
DMS Resistance	120 ...5k	Ω
Resolution	24	Bit
Sampling rate (max.)	500	SPS

¹ Only in battery mode

² ratiometric

Rotational speed sensor		
Number of axes ¹	1	
Resolution	16	Bit
Measurement range	-660 ...660	rpm
Measurement uncertainty ²	0.5	%
Sampling rate (max.)	500	SPS

¹ Additional axes available upon request

² Relative to nominal value of 660 rpm

Acceleration Sensor		
Number of axes	3	
Resolution	16	Bit
Measurement range	-30 ...30	g
Measurement Uncertainty	0.5	%
Sampling rate (max.)	500	SPS

Internal Temperature Sensor ¹		
Accuracy	0.2	K
Resolution	14	Bit
Measurement range	0 ...60	°C
Sampling rate	0.2	SPS

Internal Humidity Sensor ¹		
Deviation (typ.) ²	2	%
Resolution	14	Bit
Measurement range of relative humidity	20 ...60	%
Sampling rate	0.2	SPS

¹ Upon request

² Temperature range 0-60°C

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Data Transmission		
Frequency band	2.45	GHz
Bluetooth Version	Bluetooth Low Energy 4.2	
Transmission rate	1...500	Hz
Transmit power (max.)	4	dBm
Received Signal Strength	-95 ...-4	dBm
Range (max.)	20	m

LTE-M Data Transmission		
Cloud transmission rate (max.)	1	Hz
Signal strength	-100 ...-44	dBm

LTE-M Network Coverage	Zuordnung
Belgium	EU
Denmark	EU
Germany	EU
Finland	EU
France	EU
Latvia	EU
Luxembourg	EU
Malta	EU
Netherlands	EU
Austria	EU
Sweden	EU
Slovenia	EU
Spain	EU
Switzerland	EFTA

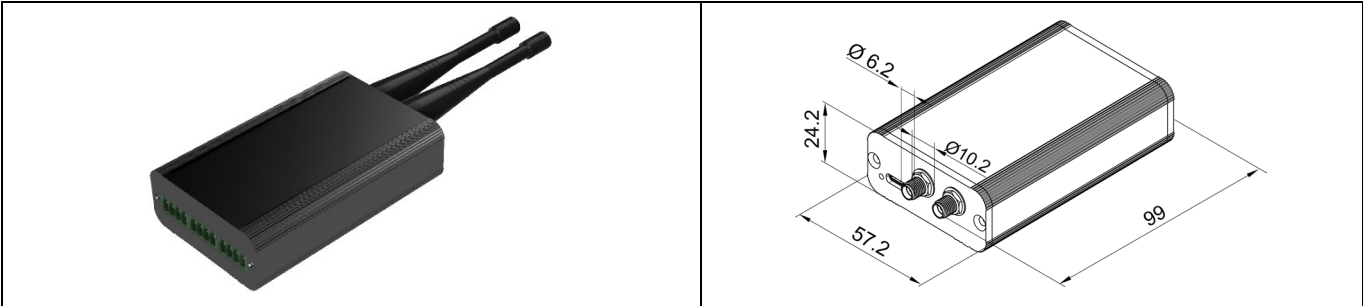
Power Supply		
Energy storage	Li-Ion battery	
Capacity	2350	mAh
Battery voltage (nominal)	3.7	V
Charging voltage via USB-C port	5	V
Power consumption (typ.)	22	mA
Operating time (typ.) ¹	106	h

¹ Not connected to coreVIEWER, medium intervals in cloud

Operation		
Temperature range	0 ...60	°C
ESD	4	kV
Weight	190	g
Relative centrifugal acceleration	30	g

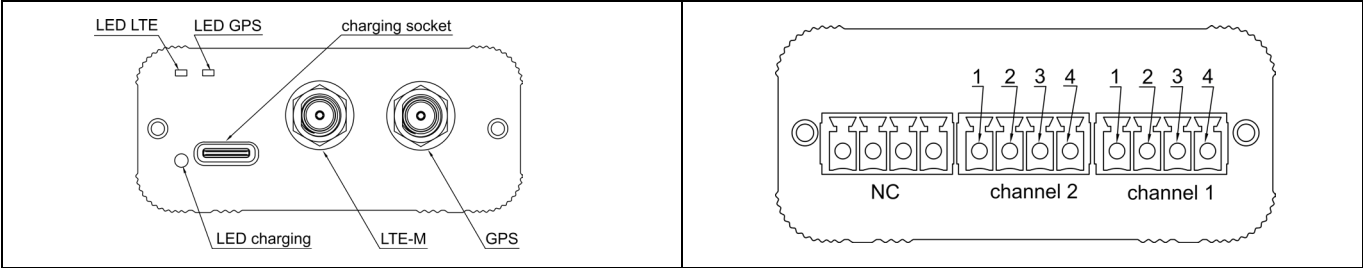
IoT Sensor Node with Bluetooth

coreMOBILE



Left: coreMOBILE as a sensor node including antennas, Li-Ion battery in a housing ready for experiments and measurements.
Right: Dimensions in mm

Connections coreMOBILE



Left: Front view with USB-C port and antenna connectors (Type: SMA female),
Right: Rear view with pin configuration including 1) AVDD, 2) Ain+, 3) Ain-, 4) GND (Type: Molex 39502-1004); NC: not connected

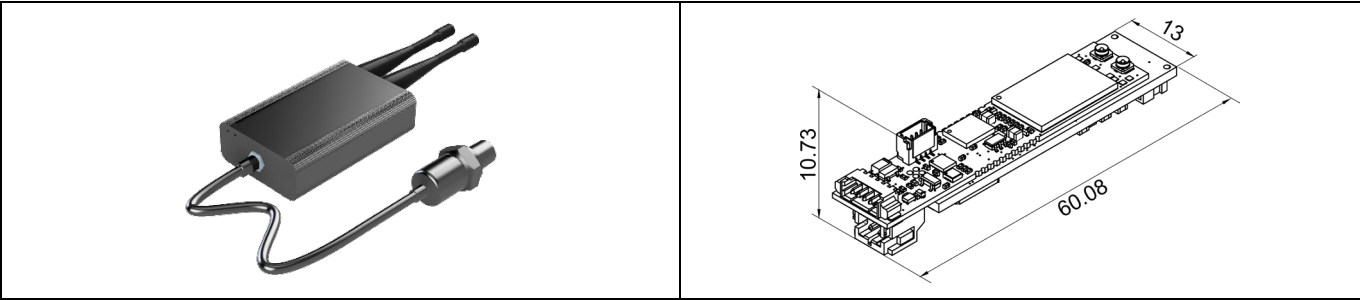
Included accessories coreMOBILE

Quantity	Article	Type
1	Charging cable	USB-C to USB-C
3	Connectors	Molex 39500-0004
1	BLE antenna	TE Connectivity, SMA male, 2.4GHz
1	LTE-M antenna	ANT-LTE-MON-SMA-E

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Other designs

Other designs of the coreMOBILE are available upon request. These include an OEM version and an I2C version. The coreMOBILE I2C comes standard with an external pressure and temperature sensor connected via I2C. The OEM version comes complete with battery, cables and/or connectors.



Examples of other forms of design

Change log

Versions	Change	Release
Version 0.0	Initial release	27.06.2024