WireLess Position Data Transfer Module

FEATURES

- Autonomous (2 years battery life)
- Two independent channels for analog sensors data transfer
- Long range bi-directional communication (2 km)
- 2.4 GHz unlicensed friendly-usage frequency band (private network)
- LoRa gateways compatible
- Custom settable configurations
- Compact and robust for outdoor usage (IP67 sealed and UV resistant)
- Battery levels monitoring
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT

LINKS TO ADDITIONAL RESOURCES

3D Models

Related Documents

QUICK REFERENCE DATA

Sensor type	MtM (1) wireless position data transfer
Output type	Digital output - M8 sealed connectors (analog input)
Market appliance	Industrial
Dimensions	89 mm x 55.5 mm x 21.6 mm

Note

(1) MtM: Machine to Machine

LINKS TO SUITABLE POSITION SENSORS

Analog linear / analog contacting

Analog linear / analog non-contacting

MAIN FUNCTION

The WLMO node helps to remotely monitor and to power supply any connected analog position sensors (either potentiometric and / or contactless technologies). Thanks to the widely used radio LoRa protocol, data of up to two sensors can be wirelessly transmitted to any compatible gateways before further processing by the end application.

The usage of the free friendly usage 2.4 GHz band makes WLMO flexible and improves data transfer speed rate, optimizing the usage of the bandwidth (up to 10 %). The WLMO is used on private LoRa network, needless of license, maintaining a very good distance of broadcasting and low power consumption capabilities.

Parameterization queries can also be sent wirelessly by compatible LoRa gateways for tuning the WLMO.

ORDERING INFORMATION / DESCRIPTION

WLMO	1	L	D	ZXXX
MODEL	NUMBER OF CONNECTED SENSORS	PROTOCOLE	ANTENNA	SPECIAL REQUEST
	1: one sensor connected **2:** two sensors connected	**L:** LoRa	**D:** internal **X:** external	**ZXXX:** special number for customized configuration

SAP PART NUMBERING GUIDELINES

WLMO	2	L	D	ZXXX
MODEL	NUMBER OF CONNECTED SENSORS	PROTOCOLE	ANTENNA TYPE	SPECIAL REQUEST
	Two sensors connected	LoRa	“Custom”	

ACCESSORIES (upon request)

- Connectors / wires harnesses
- Sensors already equipped with connectors / wires harnesses

MAIN CHARACTERISTICS	
Number of input / sensor type	Up to two analog sensors (contacting and / or non-contacting)
Initial activation and pairing	By actuation of the sealed mechanical switch (incl. status colored LED)
Application layer / protocol of communication	LoRa 2.4 GHz (to be interpreted by compatible gateways), no-license private network
Transmission / reception channels, five frequency bands (settable), bandwidth: ± 200 kHz each	CH0 at 2.402 GHz CH1 at 2.426 GHz CH2 at 2.450 GHz CH3 at 2.465 GHz CH4 at 2.480 GHz
Number of measures (NoM) during DFCP (settable)	1 to 10 000 values per sensors
Data frame transmission cycle period (DFCP) (settable)	One frame (1) per sensor is sent periodically at a configured value within the 20 s to 10 000 000 s range (1 s increment)
Power emission	7.08 mW (8.5 dBm)
Spreading factor (SF) (settable)	SF7 to SF12
Receiving sensitivity	-140 dBm
Signal range	2 km (SF12 - open field - no obstacle - perfect orientation of the module / gateway), please refer to technical note www.vishay.com/doc?50094
Stand-by mode	Request over the air (OTA)
Data encryption	AES128, please refer to technical note www.vishay.com/doc?50094
Output data resolution (ADC)	12 bits on 5 V $\rightarrow \frac{\text{theorical electrical angular or linear travel}}{4096}$
Data storage (2 sensors)	Five last values of NoM

Note

(1) The voltage value sent is the average value of the NoM (please refer to technical note www.vishay.com/doc?50094

INITIAL FACTORY SET UP	
Transmission / reception channel	CH0
Spreading factor (SF)	SF7
Number of measures (NoM) during DFCP	60
Data frame transmission cycle period (DFCP)	3600 s

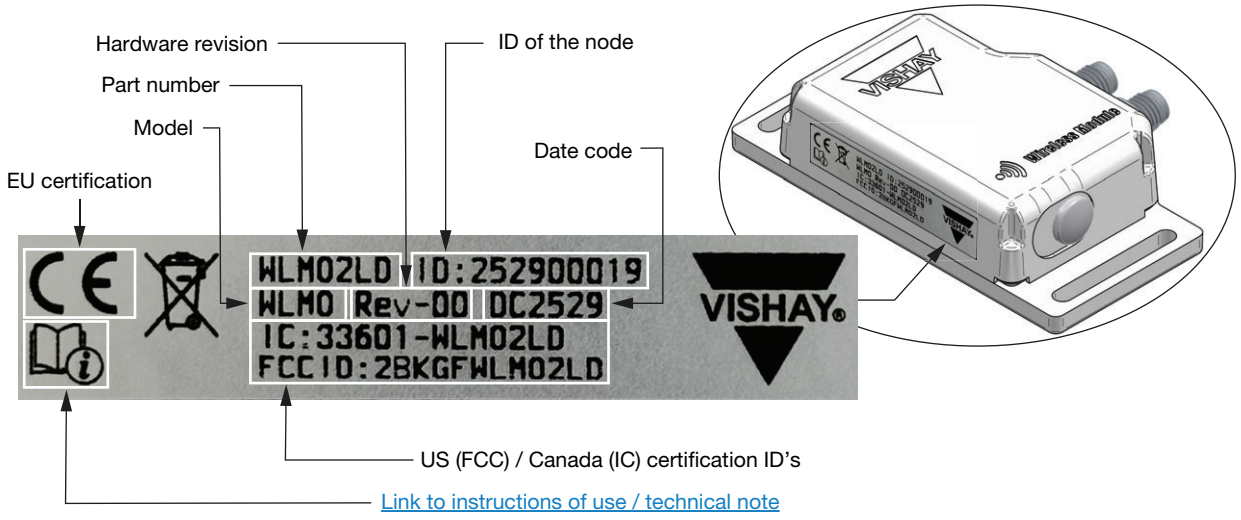
CONNECTION / SUPPLY SPECIFICATIONS	
Maximum voltage supply to sensors	5 V_{DC} per sensor
Interface (to connect sensors)	Two threaded M8x1 sealed connectors - 3 male pins, TE connectivity: T4030014031-000
Recommended cable (max. length)	2 m cables - 3 wires AWG 20 per sensor
Recommended connectors	Matching with TE connectivity: T4030014031-000
Power supply	2 x AAAA 1.5 V - 625 mAh battery (included)
Battery level Information	Available in payload message (data 5)
Battery life (typical)	2 years SF7 - 1 measure/15 minutes - 1 transmission/hour recommended storage conditions

MECHANICAL SPECIFICATIONS	
Recommended fixing hardware (not supplied)	2 x (stainless steel M4 x 12 mm + washer)
Recommended screws tightening torque	30 cNm max.
Weight	60 g
Actuation stroke (activation button)	0.65 mm ± 0.2 mm
Actuation force (activation button)	3.5 N ± 1 N

ENVIRONMENTAL SPECIFICATIONS	
Sealing	IP67
Operating temperature range	-18 °C to +55 °C
Storage temperature range	-18 °C to +55 °C
Shocks (dropping vertical impact)	3 times / 3 axis / 1 m height on hard surface (ISO 2248)
Damp heat	93 % RH - 40 °C - 96 h (NF EN 600 68-2-30)
UV protection	UV resistant materials according to ISO 4892-2
Electrostatic discharges	Contact discharges: ± 4 kV, air discharges: ± 8 kV, EN 61000-4-2
Immunity to power frequency magnetic field	1 A/m, 50 Hz, EN 61000-4-8
Immunity to radiated RF field	3 V/m, 80 MHz to 1 GHz, EN6100-4-3

MATERIALS	
RoHS directive (2011/65/UE)	Compliant
REACH regulation (1907/2006)	Compliant
Housing	PC and ABS (UL94HB)
Actuation button	Silicone
Connectors (contacts)	Nickel plated copper alloy (gold plated copper alloy)
Label	Metalized PE film

IDENTIFICATION LABEL

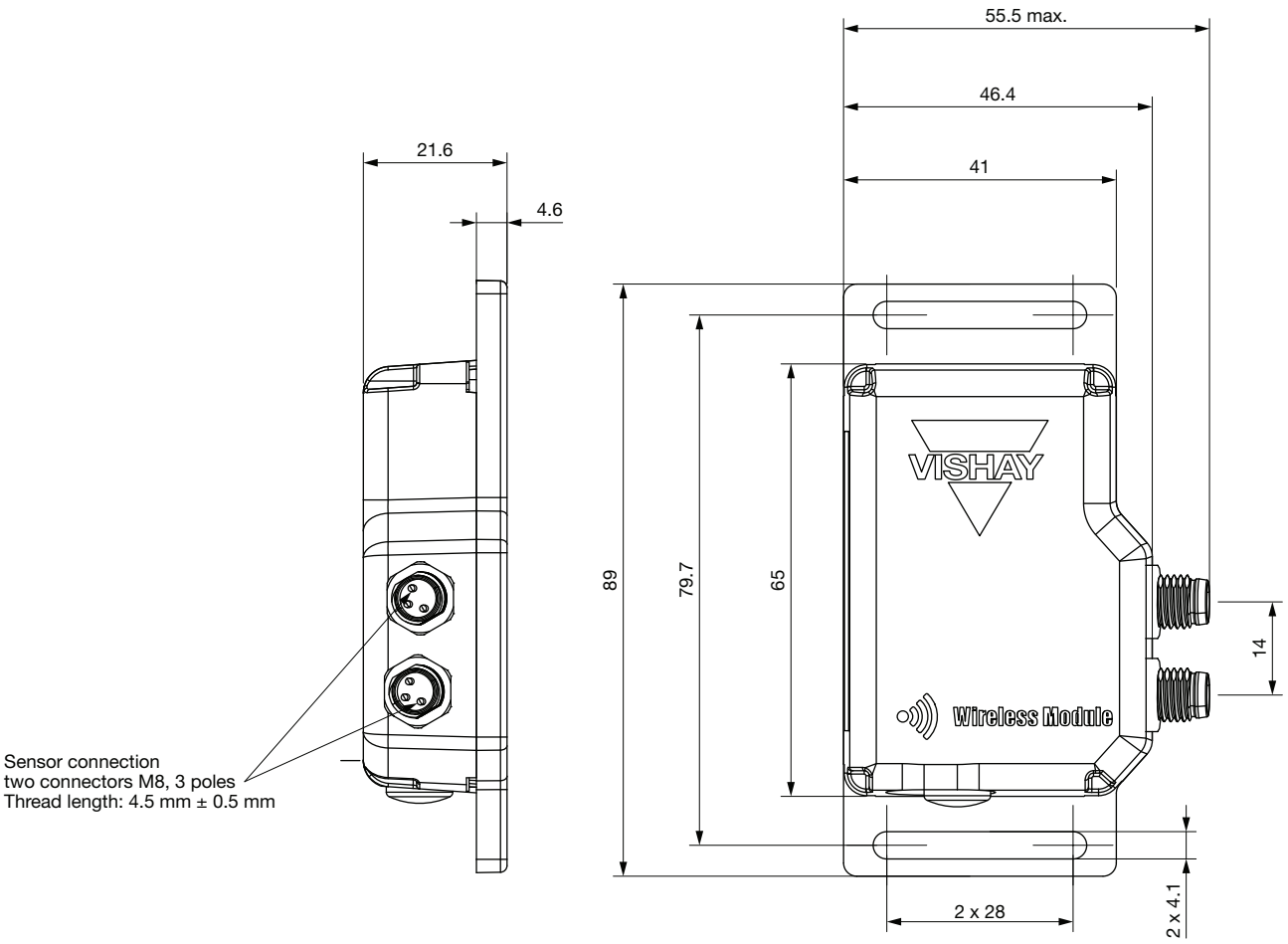


CERTIFICATIONS	
CE conformity	EN 300440: SRD - 1 GHz to 40 GHz harmonized standard CISPR 32: EMC multimedia equip.- emission requirements CISPR 35: EMC multimedia equip.- immunity requirements EN 301489-3: EMC - SRD (9 kHz and 246 GHz) EN 301489-1: EMC common technical requirements CEI 62311: human exposure EMF 0 Hz to 300 GHz
FCC ID (USA)	FCCID: 2BKGFWLMO2LD
IC ID (Canada)	IC: 33601-WLMO2LD
USA and Canada standards	RSS-102 - RF all frequency bands KDB 447498 mobile and portable dev. RF exposure KDB 996369 D04 CEI 62368-1: 2014 audio / video safety requirements CEI 62368-1: 2018 CEI 60950-22 outdoor equipment safety requirements

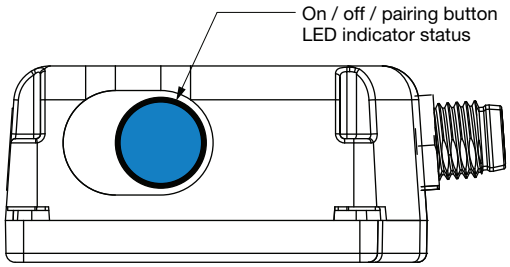
Note

- Nothing stated herein shall be construed as a guarantee of quality or durability

DIMENSIONS in millimeters (general tolerance ± 0.5 mm)

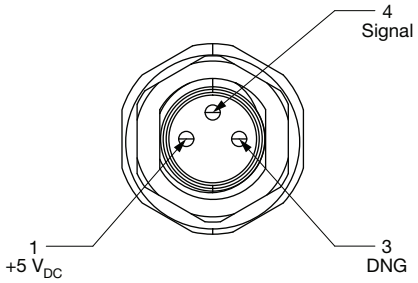


PAIRING



Please refer to technical note www.vishay.com/doc?50094

SENSORS CONNECTION / WIRING



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