

LoRaWAN™ CELS'O SENSOR



The CELS'O sensor measures the temperature of sensitive products in order to control and respect the cold chain in the food and transport sectors. It transmits the measurements via a public or private LoRaWAN™ radio frequency network. As an option, the CELS'O sensor is available in two versions with the remote temperature sensor on cables of different lengths.

APPLICATIONS

- Supervision of the ambient temperature in refrigerated and climatic chambers in the food, transport and food processing sectors.
- Applications: freezer, refrigerator, refrigerated vehicle, refrigerated container
- Sharing information via the Cloud

BENEFITS & FEATURES

- LoRaWAN™, Class A
- Easy to install and use
- >7 years of autonomy based on 4 measurements per hour and 1 transmission per hour
- Historicization (storage) of 30 days of temperatures measured every 60 minutes.
- Temperature measurement
 - ✓ Range: -30°C / +35°C
 - ✓ Accuracy: +/-0.5°C
 - ✓ Resolution: +/- 0.1°C
- Differential data compression
- IP66

CERTIFICATION

- RoHS, CE

The CELS'O sensor measures the temperature of boxes in refrigeration and air conditioning systems. The data transmission on public or private LoRaWAN™ network is done periodically and also when temperature thresholds are exceeded.

Installation and commissioning is quick and easy.

The sensor is equipped with :

- an ILS switch for activating and deactivating the sensor
- Indicators (LEDs) for monitoring configuration and association on the network



Temperature data can be stored in local memory and compressed before being transmitted to the LoRaWAN™ network. This reporting technique considerably reduces the amount of data transmitted, which increases the autonomy of the sensor and reduces subscription costs.

The memory capacity of the CELS'O sensor allows 30 days of measurements to be stored locally on the basis of one measurement per hour. On receipt of a request from the server, the history is traced back.

Powered by a 3.6V battery, the autonomy of the sensor is more than 7 years (data compression mode) for a configuration carrying out 4 measurements per hour and one transmission per hour.

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nke Watteco is a leading European designer and manufacturer of intelligent radio frequency sensors and actuators as well as multi-protocol remote sensing and data collection solutions.

nke Watteco is a member of the LoRa® Alliance

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TECHNICAL SPECIFICATIONS

RADIO FREQUENCY	
Frequency (MHz)	EU: 863-870
Transmitted power (dBm)	+14
Sensitivity (dBm)	-140
Embedded software	
Protocol	LoRaWAN™, Class A
Measuring cycles	15mn by default reconfigurable from the remote server
Transmission cycles	60mn by default reconfigurable from the remote server
Time stamping of measurements	The remote server can reconstruct the timestamp of each measurement.
Historical measurement history	30-day storage of temperatures measured every 60 minutes. The temperature is stored at $\pm 1^{\circ}\text{C}$.
Data compression	yes (differential coding) or no
Method of activation	Activation by Personalization (ABP) Over-The-Air Activation (OTAA)
Data Encryption	AES128
Battery voltage transmission	Every 7 days by default reconfigurable from the remote server
TEMPERATURE MEASUREMENT ON-BOARD SENSOR	
Measuring range ($^{\circ}\text{C}$)	$-30^{\circ}\text{C} / +35^{\circ}\text{C}$
Accuracy ($^{\circ}\text{C}$)	$\pm 1^{\circ}\text{C}$ in the range $-30^{\circ}\text{C} / +9^{\circ}\text{C}$ $\pm 0.5^{\circ}\text{C}$ in the range $+9^{\circ}\text{C}$ to $+35^{\circ}\text{C}$ $\pm 1^{\circ}\text{C}$ in the range $> +36^{\circ}\text{C}$
Resolution ($^{\circ}\text{C}$)	$\pm 0,1^{\circ}\text{C}$
POWER SUPPLY	
Voltage	3.6V / 3600mAh per Li-SOCI2 lithium battery
Autonomy in a range of $+10^{\circ}\text{C}$ to $+25^{\circ}\text{C}$	> 7 years.
INTERFACE	
LED indicator	Configuration and association on the network
magnetic switch	Reset, ON/OFF
NFC tag / QR code	Product number, serial number, batch number
Remote temperature sensor (optional)	On cable length 14 or 500cm
ALARMS	
Temperature	Immediate transmission on variation of $\pm 5^{\circ}\text{C}$ between measurements (default) Transmission on high and low threshold (disabled by default)
BOX	
Dimension (mm)	100x100xep.25
Installation	Fixed by double-sided adhesive tape or screw (not supplied)
IP Class	IP66
Fire Resistance	UL94-V0HB flame retardant treated housing
ENVIRONMENT	
Operating temperature ($^{\circ}\text{C}$)	Range -40°C temporarily to $+40^{\circ}\text{C}$
Storage (temperature / humidity)	Range $+10^{\circ}\text{C}$ to $+30^{\circ}\text{C}$ / range $+20\%rH$ to $+60\%rH$
STANDARDS & REGULATIONS	
EN, 61000-4-2 EN 300-220-1 V2-4-1, EN 301 489 V1-6-1 CE, RoHS	



PRODUCT REFERENCES

REFERENCE	DESCRIPTION
50-70-049	LoRaWAN™ CELS'O SENSOR, EMBEDDED PROBE
50-70-096	LoRaWAN™ CELS'O SENSOR, 14 CM REMOTE PROBE
50-70-097	LoRaWAN™ CELS'O SENSOR, REMOTE PROBE 5M FLAT CABLE