

INS-Extender®

The LoRa extender designed by Ineo-Sense allows the collection of sensors that are out of public LoRaWAN networks coverage, thanks to its ability to operate communications in point-to-point in Clover-Net® mode.

When Ineo-Sense devices cannot perform a JOIN successfully during their installation, they have the possibility to transmit their data to a INS-Extender® that can be connected to the public network. Thus it acts as a repeater to the LoRaWAN network. The architecture is represented by the opposite figure.



Thanks to Clover-Net® power-consumption optimization, it can run on a simple battery. For intensive usage, it can either embed a second battery or have external power supply (with battery backup).

Seamless Integration

INS-Extender® transmits repeated information in the same way in order to respect payload decoding known on application server side. It just sends its payload through a dedicated service LoRaWAN port and adds an end device identifier. Thus, extracting the data associated to the sender permits to decode the data in the same way as if it was received directly.

Downlink capable

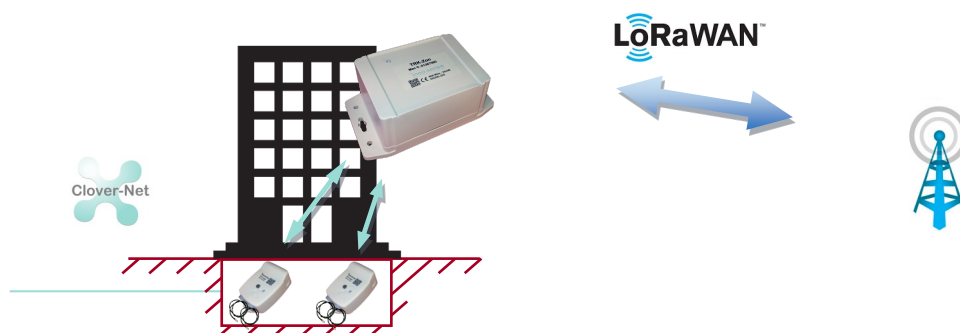
INS-Extender® embeds a device management system to allow the messages to go down to the sensors. This management therefore allows the use of downlink messages transparently with respect to the exploitation of the endpoints. This can be implemented to a single sensor up to 10 different sensors using the extender.

Repeat several devices

Capable of immediate message forward, this INS-Extender® is able to buffer the data. Indeed, when the data volume is limited, INS-Extender® can concatenate data coming from several end devices before sending it in a single message. Normal data and urgency data attributes allow to manage the sending behavior to get the best benefit of saving energy while providing the best service.

One LoRaWAN connection

Clover-Net® protocol is used between the end devices and INS-Extender®. Only this last one uses LoRaWAN connectivity to communicate with the remote infrastructure. In other words, a single LoRaWAN subscription allows to collect several end devices.



Main features

- 1 bicolor LED
- Health report periodic message
- Clover-Net to LoRaWAN forwarder
- Allows downlink redirections
- Auto end device affiliation
- Immediate data forwarding
- Data concatenation capability
- No applicative data modification
- Able to tag data as 'urgent' to force sending
- Power loss detection (according to option)

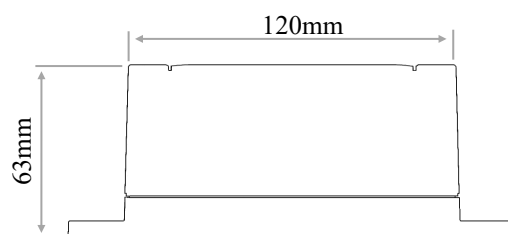
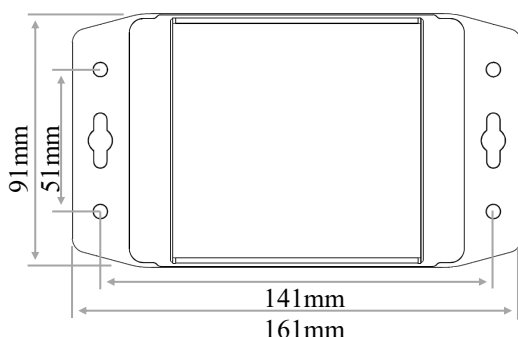
Options

- A second battery capacity
- External power supply (with battery backup)
Service not stopped
- Scheduled data collection mechanism

Mecanical & protection characteristics

- Tamper detection
- IP66 protection
- Flammability UL 94 HB
- Operating temperature: -20 to +70°C

Dimensions



Order references

Order #	Description
INS-EXT-ST-X89-001	868MHz, 1 battery
INS-EXT-ST-X89-002	868MHz, 2 batteries
INS-EXT-PS-X89-001	868MHz, external power supply and battery backup
INS-EXT-HB-XXX-003	868MHz, autonomous scheduled data collection

Others on demand



Clover-Net generic features

- Transmission range up to 5,000m line of sight, up 500m indoor.
- Real-time 2-way communications: Scheduled transmission, automatic alarms and on-demand reading.
- Robust against physical and electronic interferences.
- Fast event reactivity, huge coexistence ability.
- Low cost for mass deployment
- Auto RTC propagation
- Native triband compatibility (433, 868 and 915Mhz)
- CE & EN 300-220 & FCC 15-247 compliant
- LoRaWAN compatible
- Uses Multi-channel frequencies to avoid collision.
- Dedicated alarm frequency channel.
- Data Encryption by AES 128 with dynamic key mixt
- Includes Full networks services (Broadcast, Repeater, Mesh, ...)

Ineo-sense

125 Rue de L'hostellerie,
Immeuble ELLIPSIS, Niv 4 Porte 12
30 900 Nîmes — France

Phone : +33 466 276 495
Web : www.ineo-sense.com
contact@ineo-sense.com

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