NIT 21LV

LoRa IoT endpoint for measuring vibration in electrical machines

Main characteristics

- DC frequency response with low noise, high stability and sensitivity
- Sending statistics in the time domain
- Sending indirect temperature and humidity measurements for reference use
- Parameterization and device update via Bluetooth Low Energy (BLE)
- Self-referencing for greater data accuracy
- LED indicator and multifunctional internal button
- Integration with Tago via ITG gateway with Internal Network Server and through ChirpStack

Applications

- Industries
- Agribusiness
- Smartcity
- Health
- Corporations

Overview

Khomp presents the NIT 21LV endpoint to the market. Developed for measuring vibration in electrical machines. This endpoint can help with predictive machine maintenance by communicating via the LoRaWAN protocol. The NIT 21LV offers "5 vibration measurements".

1. "*RMS*" measurements (vibration statistics in m/s², with data from all 3 axes).
2. "*Kurtosis*" measurements (factor, with data from the 3 axes).
3. "*Peak-to-peak*" measurements (vibration statistics in m/s², with data from all 3 axes).
4. "*Crest factor*" measurements (vibration statistics in dB, with data from all 3 axes).
5. "*Vibration velocity*" measurements (in mm/s, with data for all 3 axes, in accordance with ISO 10816-3).

In addition to these indications, the NIT 21LV checks "temperature" and "humidity" indirectly (data used for reference purposes only).

The system has "2 modes for reading data":

- **Periodic Mode**: Sensor data is sent every pre-configured period of time.
- **Threshold Mode**: It works with two configurable real-time vibration detection events: factor and limit. The events are triggered when the peak-to-peak measurement exceeds in percentage (factor) or acceleration in g (limit) the peak-to-peak measured in the product's parameterization period. The modes can be activated or deactivated by the user, in addition to various other settings.

All the sensors in this IoT endpoint make it possible to increase the service life of the electrical machine in which it is installed. This equipment makes it possible to establish test criteria to ensure correct installation and to warn of potential repairs. It also makes it possible to ascertain the condition and performance of the associated equipment, improving the data to conduct prior maintenance at the right time (i.e. before the equipment presents any kind of problem).

Model

Khomp offers the endpoint for measuring vibration in electrical machines in the following model:

Model	Description
NIT 21LV	LoRaWAN Endpoint Transmitter for Machine Vibration Measurement.

Technical specifications

Network
- LoRaWAN:
  - TS001-1.0.4 LoRaWAN L2 1.0.4 Specification
  - RP2-1.0.3 LoRaWAN Regional Parameters
- LoRaWAN Class: A
- Activation method: OTAA
- Region: AU915(standard)/LA915/US915 (configurable)
- Data Rate: DR3 SF9BW125 (standard)
- Adaptive Data Rate: On (configurable)
- Maximum potential: +22 dBm
- Message type: Not confirmed (standard and configurable)
- Interval between transmissions configurable (standard 5 minutes)
- Compatible with ATC LoraWAN Public Network and Private Networks
- Antenna integrated to the case
- Sensitivity: starting at -137 dBm
- Frequency range: 902 MHz up to 928 MHz

Sensor reading period
- Every 5 minutes (factory setting)
- Minimum period: 30 seconds
- Maximum period: 18 hours

Electrical characteristics
- Powered by two AA (3V3) Alkaline or Lithium batteries
- Battery-operated voltage level: 2.0 A to 3.0 V
- Energy consumption:
  - Durability of 1 and a half years with transmissions every 30 minutes with the threshold mode being activated 4 times a day
  - Durability of 1 year with transmissions every 5 minutes
  - Durability of 11 months with transmissions every 5 minutes with the threshold mode being activated 4 times a day
  - Durability of 4 months with transmissions every 30 seconds
  - Durability of 3 months with transmissions every 30 seconds with the threshold mode being activated 4 times a day

BLE (Bluetooth Low Energy)
- Version: 5.1
- Frequency: 2,400–2,483.5 MHz
- Power: 0 (zero) dBm
- Maximum distance (approximate): 10 meters

Khonnectable App
- Operating system: Android and iOS

Vibration sensor
- Reading of over 10000 vibration points
- Reading of RMS, peak-to-peak, crest factor and kurtosis of triaxial accelerations
- RMS triaxial velocity reading
- DC response frequency of 0–6 kHz
- Low noise
- High stability and sensitivity
- Parameterization of filters when reading statistics and velocity
- Auto-referencing according to the angle at which the endpoint is installed

Temperature and on boarding humidity sensor
- Checks indirect room temperature in the -10 ºC to +85 ºC range
- Checks indirect room humidity in the 0 to 100% range (without condensation)
- Temperature reading error of up to ± 2.5 ºC
- Humidity reading error of approximately 7%

***** *The endpoint must be stored in the box it came in so as not to impair the operation of the temperature and humidity sensors.*

Products with compatible versions
- ITG 200/201 LoRa: v2.6.2.3 or higher

Physical/Environmental
- Internal antenna
- Case is smaller, more resistant to high temperature, trepidation, dust and humidity (waterproof)
- Case with M6 perforation
- Smart RGB LED with warning function for installation, communication and operating conditions
  - Send message
  - Self-referencing
  - Factory reset
- Multifunctional internal button
- Product dimensions (WxHxL): 102x88x36 mm
- Packaging dimensions (WxHxL): 187x113x72 mm
- Gross weight: 220 g
- Net weight: 110 g
- Attachment: Screw and magnet (accessory sold separately)

Accessories*
- Magnet fixing kit (length x width)
  - 43 mm x 5 mm
- Sheet metal fixing kit
  - 35 mm x 35 mm

Warranties and certifications
- Total warranty (legal + Khomp warranty): 1 year
  - Legal warranty: 90 days
  - Khomp warranty: 9 months
- ISO 9001 certified industry

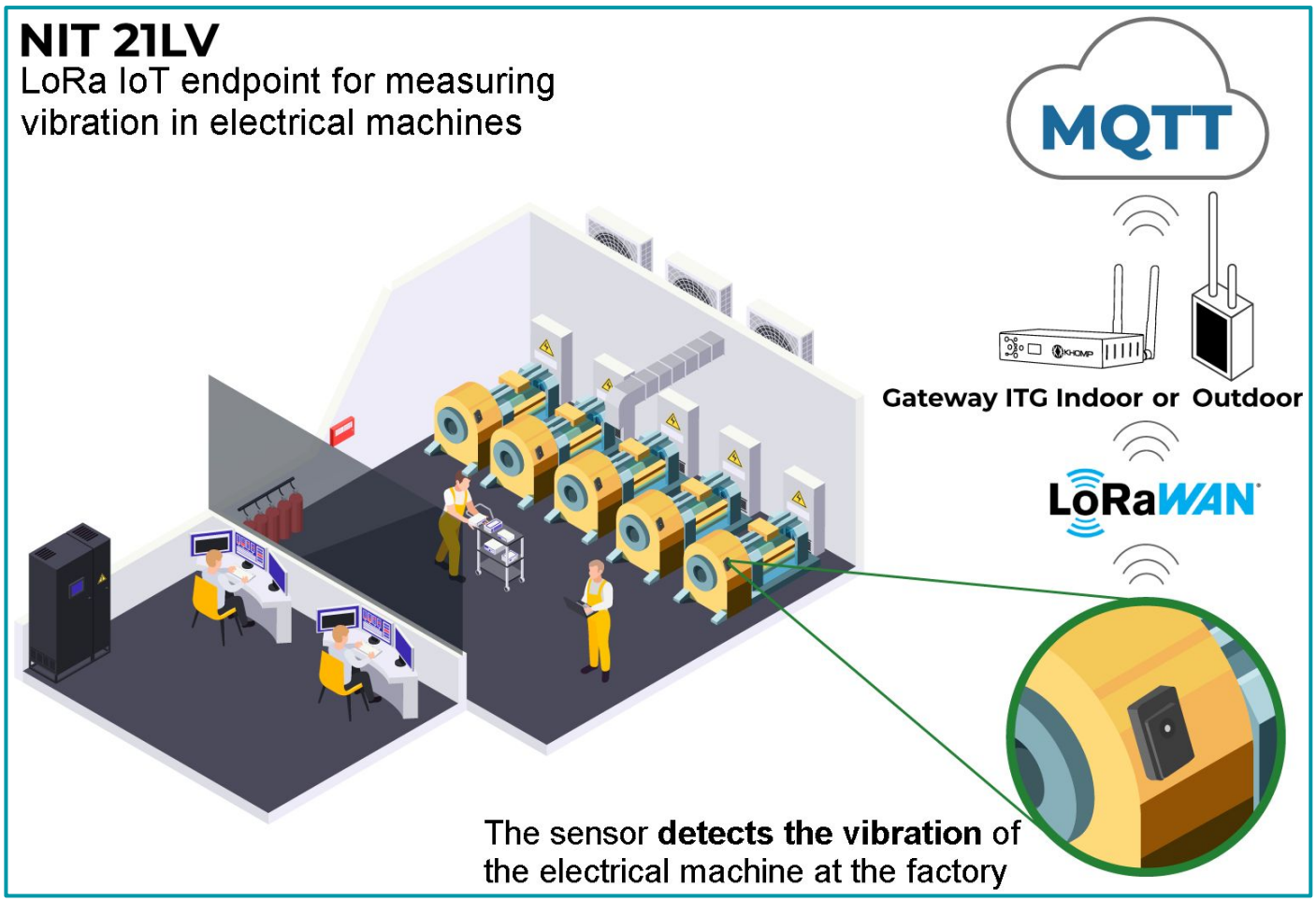
***** Additional items increase the price of the product.

Product images

Caption: *Image of the front of the NIT 21LV.*

Caption: *Image of the back of the NIT 21LV with two optional ways of attaching the product (with a magnet or metal sheet, respectively).*

Application model



Caption: *NIT 21LV by measuring the vibration level and checking the temperature/humidity. This monitoring is essential for preventive maintenance of the electrical machine, providing a longer service life for the industrial machinery.*

- This equipment is not entitled to protection against harmful interference and may not cause interference in duly authorized systems.
- This product is not suitable for use in domestic environments, as it may cause electromagnetic interference, forcing the user to take measures to minimize such interference.

KHOMP
Rua Joe Collaço, 253 - Florianópolis, SC
+55 (48) 3722.2900
comercial@khomp.com