LoRa Climate Weather Station

Main features

- Digital connection with LoRa Endpoint (NIT 2xLI)
- Contains 2 digital inputs and 1 power output for Weather Sensors and the Barometer
- Contains 1 analog input for the solar radiation sensor (Pyranometer)
- The Rain Gauge sensor sends accumulated rainfall data
- The Anemometer sensor sends wind speed and direction
- The Thermo-hygrometer sensor sends ambient temperature and humidity
- The Pyranometer sensor sends the level of solar radiation incident on the location
- The Barometer sensor sends atmospheric pressure
- Sensor to ascertain UV and Lux index

Applications

- Solution for integrators with specific needs for reading climate sensor data for environmental monitoring
- Data integration for monitoring the following physical and climatic parameters:
  - Average wind speed
  - Wind gust
  - Wind direction
  - Accumulated rainfall
  - Temperature
  - Relative humidity
  - Luminosity
  - UV index
  - Solar radiation
  - Atmospheric pressure

Overview

The LoRa Climate Weather Station integrates interfaces for weather sensors, enabling the connection of devices with wireless communication.

The solution is comprised of a central processing module, responsible for reading, decoding, and forwarding information collected from the sensors to the LoRa Endpoint (NIT 2xLI, responsible for transmitting the data on the wireless network).

The agribusiness and smart city verticals are the markets most geared towards this product.

The system is the result of identifying the needs of clients and partners who need to monitor the types of quantities in this project.

Model

Khomp offers the following "LoRa Climate Weather Station":

Model	Description
LoRa Climate Weather Station	Contains 2 digital inputs and 1 analog input for the solar radiation sensor (Pyranometer). It has 1 power output for the weather sensors and the barometer.

Technical specifications

Components
- IoT EndPoint (NIT 2xLI)
- Modular Weather Extension (EM W104)
- 680–2700 MHz omni-directional outdoor antenna
- Weather Sensors
- Barometer sensor
- Magnetic contact sensor
- PWM charge controller
- 10W photovoltaic panel
- Solar panel fixing bracket
- Cabinet
- 2 Metal brackets for fixing the cabinet
- 2 Metal clamps for fixing the cabinet
- Battery fixing kit

Photovoltaic panel
- 3.2 mm tempered glass, high transmissivity and low iron
- Panel with 36 polycrystalline silicon photovoltaic cells
- Waterproof protection rating (protected against dust and water jets)
- Module weight: 1.34 kg
- Dimensions: 245 x 375 x 25 mm
- Cable length: 1.5 m

PWM Charge Controller
- Model ECP 1024
- INMETRO 007859/2019 Certificate
- Battery Type (Stationary): Sealed Lead Acid Battery
- Overvoltage Protection
- USB Output Power Only, 5 V, 1 A
- Operating Temperature -10 °C to +55 °C

Power supply in the LoRa kit
- Powered by the LoRa Endpoint through the 10W Solar Photovoltaic Panel and the XB 1270 battery

Physical/Environmental
- Outdoor installation
- Product dimensions:
  - Without antenna: 348x314x160 mm
  - With antenna: 348x534x160 mm
  - Packaging dimensions: 364x364x170 mm
- Gross weight: 3.35 kg
- Net weight: 3.15 kg
- Operating temperature: -10 °C to +60 °C
- Operating humidity: 0–90% (non-condensing)

Outdoor case
- IK10 protection rating
- Waterproof
- Dimensions: 348x314x160 mm
- Weight: 2850 g

Antenna
- Frequency: 680–2700 Mhz
- Gain: 4 dBi
- Impedance: 50 Ohms
- Maximum power: 50 W
- Polarization: vertical
- VSWR: 1.5:1
- Dimensions: 220x25 mm
- Weight: 113 g

Cabinet fixing bracket
- Material: Carbon steel
- Weight: 628 g
- Dimensions: 250x70x45 mm

Photovoltaic panel support
- Material: Carbon steel
- Weight: 628 g
- Dimensions: 250x70x45 mm

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

Attention

- The battery is an optional item.
- The customer/integrator can request the battery at the time of purchase.
- **We do not recommend using the Weather Station V2 without the battery!**

Climate Sensor Specifications

Physical/Environmental
- Dimensions: 135x97x26 mm
- Weight: 805 g
- Operating temperature: -40 to +60 ºC
- Operating humidity: 10–90% (non-condensing)

Rain gauge
- Records the accumulated rainfall level (in millimeters)
- Has a bird protection grid
- Rainfall level accuracy:
  - Less than 15 mm: ± 1 mm
  - From 15 mm to 6553.5 mm: ± 7%

Wind speed and direction sensor
- Records wind speed (average and gust) and angular direction
- Wind direction: 0–359°
- Wind direction accuracy: 45° (8 points)
- Wind speed: 0–180 km/h (0–50 m/s)
- Wind speed accuracy:
  - 2–0 m/s (± 3 m/s)
  - 10–56 m/s (± 10%)

Temperature and humidity sensor
- Records temperature and humidity at the operating location
- Humidity range: 10–99% (1% resolution)
- Humidity level accuracy: ±5%
- Temperature range: -40°C to +60°C
- Temperature accuracy: ±1°C

Illumination sensor
- Resolution: 1 lux
- Units of measurement: lux
- Range: 0–128000 lux
- Accuracy: ± 15%

Ultraviolet sensor
- UVB and UVA, index scale accuracy: ± 1 level

Everynet Interoperability Seal

Battery specifications

- Model: XB 1270
- Dimensions: 151x100x65 mm
- Weight: 2.0 kg (tolerance of ± 4%)
- Operating temperature:
  - Discharge: -20 °C to +60 °C
  - Charge: 0 °C to +50 °C
  - Storage: -20 °C to +60 °C
- Number of cells: 6
- Total battery voltage: 12 V
- Capacity: 7.0 Ah @ 20h up to 1.75 V (final voltage) per cell at +25 °C
- Maximum discharge current: 70 A (5 seconds)
- Internal resistance ≅ 30 mΩ
- Float recharge voltage: 13.6 VDC to 13.8 VDC
- Recommended maximum recharge current: 2.1 A
- Service cyclic and equalization: 14.4 VDC to 15 VDC
- Considering the use of the system with a transmission every 5 minutes (default configuration) and being powered only by the battery, the approximate estimated operating time of the equipment is:
  - LoRa Weather Station → 9 months

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- **We do not recommend using the Weather Station V2 without the battery!**

LoRa Endpoint Specifications (NIT 2xLI)

LoRa

- LoRaWAN 1.0.4 protocol
- Authentication mode: ABP or OTAA
- LoRaWAN Class: A or Class C
- Frequency range: 860–930 MHz*****
- Channels: 8 (configurable)
- Power: up to +20 dBm
- Antenna gain: 5 dBi and V.S.W.R: ≤1.5
- Sensitivity: from -137 dBm
- Communication distance: A few km depending on the installation area
- Compatible with the ATC Public Network, LoraWAN and Private Networks

***** *The 868 MHz band is for sale in the European Union. The 915 MHz band is for the USA and Brazil.*

Monitoring period

- Sensors: Minimum period of 30 seconds and maximum of 24 hours (1440 minutes)

Communication

- Communication via LoRaWAN™ 1.0.4 protocol

Other product images

Caption: *Image of the V2 LoRa Weather Station installed on the pole with the case open for observation.*

1. *Modular Climate Extension (EM W104).*
2. *LoRa Endpoint (NIT 2xLI).*
3. *Magnetic contact sensor (inside and on the case lid).*
4. *Battery.*
5. *Three cable glands and a ventilation valve.*
6. *PWM charge controller.*
7. *Barometer.*
8. *Harness with connector plug to integrate the Climate Sensors and the Barometer.*
9. *Pole and base for mounting the Climate Sensors on the pole.*
10. *Climate Sensors.*
11. *Anti-Nest Spike.*
12. *Outdoor antenna.*
13. *10W photovoltaic solar panel.*

Note: *The equipment is installed on a metal pole (3/4" to 1.1/4" pipe).*

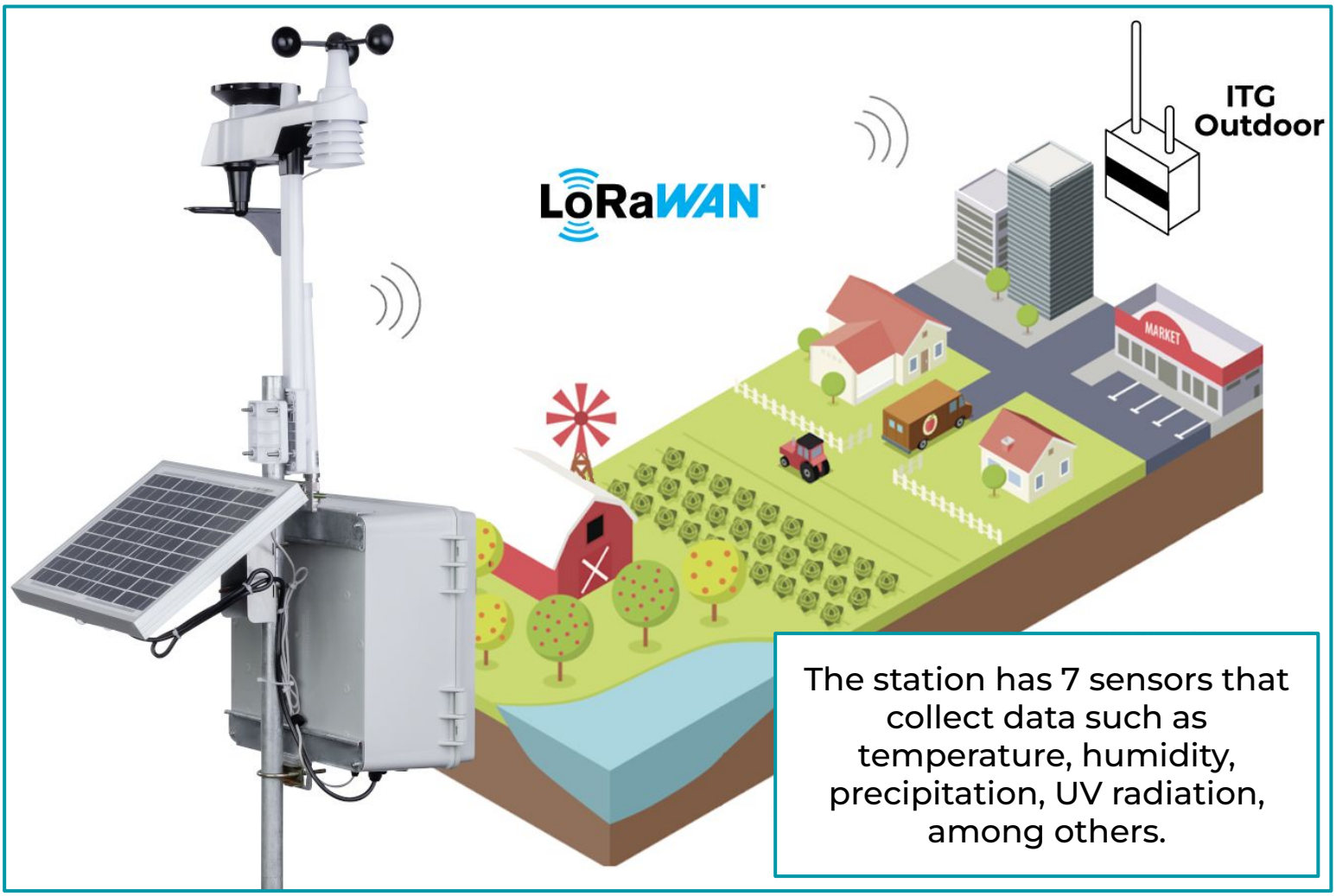
Other product images

Caption: *Weather Station sending farm weather data for monitoring on ITG gateway.*

Other product images

Caption: *Weather Station sending city weather data for monitoring on ITG gateway.*

Application model



Caption: *Image of Weather Station application sending weather data to the farm for monitoring.*

Note	• The V2 Weather Station is only responsible for collecting data from climate sensors and transmitting it (via LoRa Endpoint, in this example). • The analysis and development of the application to which the equipment will be subjected is the sole responsibility of the customer/integrator.

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