

LoRa Endpoint counter for reading water and gas meters



Principal characteristics

- LoRaWAN™ Protocol 1.0.3
- Operates in the 863-928 MHz frequency range
- Comes with 8 configurable channels
- Transmission power up to +20 dBm
- Minimum receiving sensitivity of -120 dBm
- Several kilometers of communication distance depending on the region and position in which the device is installed
- Compatible with major network servers: Everynet, ChirpStack, TTN and Khomp
- Waterproof protecting rating
- Long-term operation using two AA batteries (standard transmission time)
- **ABP** or **OTAA** activation
- Accumulation capacity supporting more than 4 billion pulses, exceeds other compatible products on the market
- Beginning with firmware version 2.2.1.0, **3 devices may be monitored** simultaneously using a single ITC 100 SZ
- Integration with [Tago](#) via [ITG gateway](#) with Internal Network Server and through [ChirpStack](#)

Applications

- Counter for water and gas meters using dry contact sensors (reed switch, open collector, relay)
- Detects fraud
- Monitors excessive consumption during dry periods
- Support in detecting leaks
- Reduces service costs through means of automated readings

Overview

The ITC 100 SZ is part of Khomp's line of IoT Endpoints. It is a wireless sensor transmitter that can be used to count events from equipment with a dry contact output (reed switch, open collector or other).

The ITC 100 SZ comes with a LoRa radio and uses the LoRaWAN™ 1.0.3 protocol.

It is possible to "identify fraud" and "verify flow direction" (forward or reverse) whenever the equipment connected to the ITC 100 SZ has specific outputs allowing these functions.

Technical specifications

ITC 100 SZ components

- Internal support for 2 AA batteries
- Internal LED indicating the moment of transmission
- Internal data transmission and factory reset button
- High performance internal antenna
- Tubular terminals for fixing the cables to the internal terminals of the board

LoRa specifications (standard-based)*

- Class A device
- Region: AU915 (915 MHz frequency)
- Activation Method: ABP (Activation by Personalization)
- Standard interval between transmissions: 60 minutes
- Minimum interval between transmissions: 1 minute (beginning with firmware version 2.2.3.0)
- Maximum transmission interval: 1440 minutes (24 hours)
- Data Rate: DR0 (corresponding to SF12)
- Subband: First (915.2-916.6 MHz)
- Firmware versions 2.2.2.0 or higher:
- Adaptive Data Rate (ADR): Switched off by default
- Firmware versions prior to 2.2.2.0:
- Adaptive Data Rate (ADR): Switched on by default
- Message type: Unconfirmed

* The above-mentioned may be configurable.

Physical characteristics

- Dimensions: 99x33x76 mm
- Weight: 436 g
- Operating temperature:
- -10 °C to 70 °C
- Operating Humidity:
- Up to 100% (relative humidity)
- Waterproof protection

Electrical characteristics

- Power Supply: Two AA batteries (use lithium batteries for optimal performance)
- Battery life (values will be updated soon, approximate values are noted below):
- 3 years and 6 months (with transmissions every 24 hours)
- 3 years (with transmissions every 6 hours)
- 1 year and 6 months (with transmissions every hour)
- 1 year (with transmissions every 30 minutes)
- 2 weeks (with transmissions every minute, beginning with firmware version 2.2.3.0)
- Current in Sleep Mode: 6.3 µA
- Transmission current (maximum): 172 mA
- Receiving current (maximum): 24 mA
- Operating voltage between 2 V and 3 V
- Average power: 0.26 w

Equipment with dry contact output compatible with ITC 100 SZ

- The manufacturers LAO, Elster, Saga, Fae, Itron and Diehl (beginning with firmware version 2.2.2.0) produce models compatible with the ITC 100 SZ
- Dry contact outputs for fraud identification / flow direction (normal or reverse) can be connected to the device through connectors on the ITC 100 SZ's board
- Elster hydrometers require Vector VMRS-01 dry contact sensors. LAO, on the other hand, comes with its own sensors

Warranty and certifications

- Total warranty (legal warranty + Khomp warranty): 1 year
 - Legal warranty: 90 days
 - Khomp Warranty: 9 months
- Anatel Certification
- ISO 9001-certified manufacturer



Attention

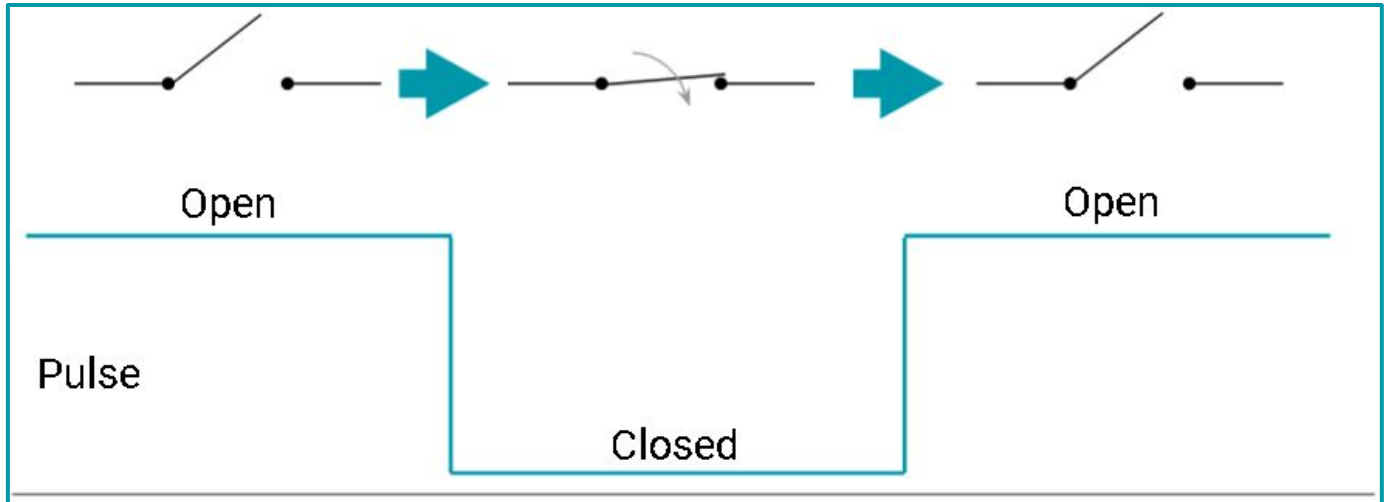
- The Waterproof degree of protection is guaranteed with the passage of cables with a diameter of 3,5 mm to 6,5 mm.
- The use of thinner cables facilitates the entry of water into the product.

Everynet seal of interoperability



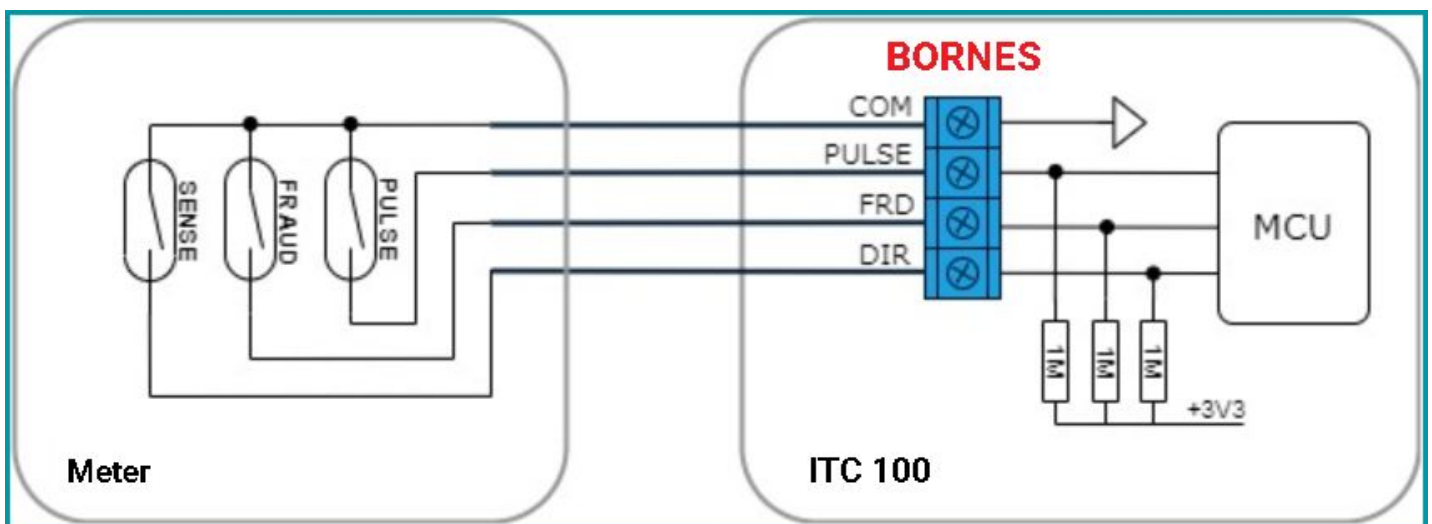
Pulse reading characteristics

The ITC 100 SZ detects pulses on the dry contact sensor. The pulse is verified upon the closing and opening of switches. The dry contact sensor is present in devices such as switches, relays, reed switches, among others.



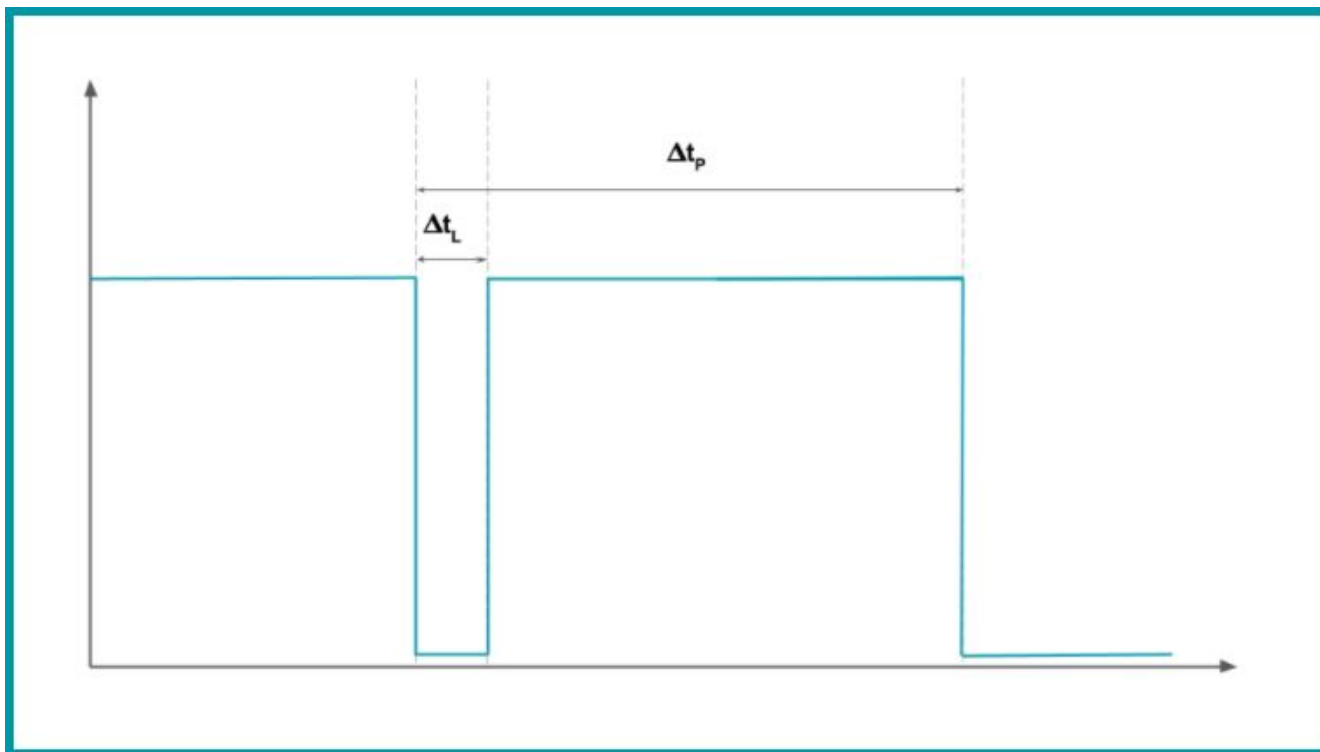
Caption: Example of the type of pulse read by the ITC 100 SZ.

The generated pulse is continuous and verifies that the circuit is closed/open at all times. The ITC 100 SZ does not detect voltage or current. Therefore, voltage or current should not be applied to the ITC 100 SZ's terminals. When connecting a meter (water meter, gas meter, etc.) to the ITC 100 SZ, this pulse will be detected between the COM terminal and any of the other terminals.



Caption: Example of how the ITC 100 SZ carries out the verification of other devices in order to count pulses.

In order for pulses to be recognized by the ITC 100 SZ, minimum intervals of (Δt) are required. These intervals are described below:



Legend:

Δt_p : 100 ms (interval between pulses).

Δt_L : 1 ms (minimum contact time with switch).

Maximum frequency between readings: 10 Hz.

i	Note	Verify the characteristics of the pulse generated by the product in the meter’s manual (water meter, gas meter, etc.). This information is needed to identify whether the meter is compatible with the ITC 100 SZ.
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Compatible hydrometers and gas meters

Hydrometers from the manufacturer **LAO** compatible with the ITC 100 SZ

Models from the manufacturer LAO that are compatible with the ITC 100 SZ are presented in the following table:

Model	Series	Diameter	Maximum reading (m ³)	Counting resolution
Woltman	L	6"	9.999.999	10000 Liters
Woltman	G, J, K	2", 3", 4"	999.999	1000 Liters
Multi-jet	E, F	1(½)", 2"	99.999	1000 Liters
Multi-jet	Y, A, B, C, D	3/4", 1"	9.999	100 Liters
Single-jet	X, Y, A, B	1/2", 3/4"	9.999	100 Liters

Hydrometers from the manufacturer **Itron** compatible with the ITC 100 SZ

Hydrometers from the manufacturer Itron that are compatible with the ITC 100 SZ are presented in the following table:

Model	Type	Diameter	Nominal Flow (Qn)	Maximum reading (m ³)	Counting resolution
Multimag TM II	multi-jet	25, 40, 50 mm	3.5, 5, 10, 15 m ³ /h	–	1 Liter or 10 Liters

Additional information on Itron’s hydrometers are provided by the manufacturer.

Hydrometers from the manufacturer **Elster** compatible with the ITC 100 SZ

Models from the manufacturer Elster that are compatible with the ITC 100 SZ are presented in the following table:

Model	Series	Diameter	Maximum reading (m ³)	Counting resolution
Single-jet	S120	1/2", 3/4"	99.999	1 Liter
Single-jet	S100	1/2", 3/4"	9.999	1 Liter
Multi-jet	M170	1/2", 3/4"	9.999 / 99.999	1 Liter
Multi-jet	MTC	1/2", 3/4", 1", 1(1/2)", 2"	99.999	100 Liters
Multi-jet	M190	1/2", 3/4", 1", 1(1/2)", 2"	99.999	100 Liters
Multi-jet	M172 Industrial	1", 1(1/2)", 2"	99.999 / 999.999	1 to 10 Liters
Multi-jet	MTC Industrial		99.999	100 Liters

Hydrometers from the manufacturer **Saga** compatible with the ITC 100 SZ

Models from the manufacturer Saga that are compatible with the ITC 100 SZ are presented in the following table:

Model	Type	Diameter	Nominal flow (Qn)	Maximum reading (m ³)	Counting resolution
Sagasonic	Ultrasonic	20 mm	1.5 m ³ /h	99999.99	1 Liter
Sagasonic	Ultrasonic	20 mm	2.5 m ³ /h	99999.99	10 Liters
US-5,0	Single-jet	20 mm	2.5 m ³ /h	–	1 Liter

Additional information on Saga's hydrometers are provided by the manufacturer.

Hydrometers from the manufacturer **FAE** compatible with the ITC 100 SZ*

Models from the manufacturer Fae that are compatible with the ITC 100 SZ are presented in the following table:

Model	Type	Diameter	Nominal flow (Qn)	Maximum reading (m ³)	Counting resolution
Fluxus	Ultrasonic	20 mm	1.5 m ³ /h	999999.999	1 Liter

Additional information on Fae's hydrometers are provided by the manufacturer.

*** Observation:** Use the operation mode "digital reflux" available in firmware version 2.2.2.0 or newer when operating with this hydrometer.

Hydrometers from the manufacturer **Diehl** compatible with the ITC 100 SZ*

Model	Type	Diameter	Nominal flow (Qn)	Maximum reading (m ³)	Counting resolution
Hydrus	Ultrassônico	15, 20, 25 mm	1.6, 2.5, 4.0, 6.3, 10, 16, 25 m ³ /h	99999999	1–100 Liters

Additional information on Diehl's hydrometers are provided by the manufacturer.

*** Observation:** Use the operation mode "digital reflux" available in firmware version 2.2.2.0 or newer when operating with this hydrometer.

Gas meters from the manufacturer LAO compatible with the ITC 100 SZ

Models from the manufacturer LAO that are compatible with the ITC 100 SZ are presented in the following table:

Model	Line	Diameter	Maximum reading (m ³)	Counting resolution
G0,6	Residential	1/2", 3/4"	99.999.999	10 Liters
G1	Residential	1/2", 3/4"	99.999.999	10 Liters
G1,6	Residential	1/2", 3/4"	99.999.999	10 Liters
G2,5	Residential	1/2", 3/4", 1", 1(1/2)", 2"	99.999.999	10 Liters
G4	Residential	1/2", 3/4", 1", 1(1/2)", 2"	99.999.999	10 Liters
G6	Commercial	1", 1(1/2)", 2"	99.999.999	10 or 100 Liters
G10, G16	Industrial		99.999.999	10 or 100 Liters

Product images

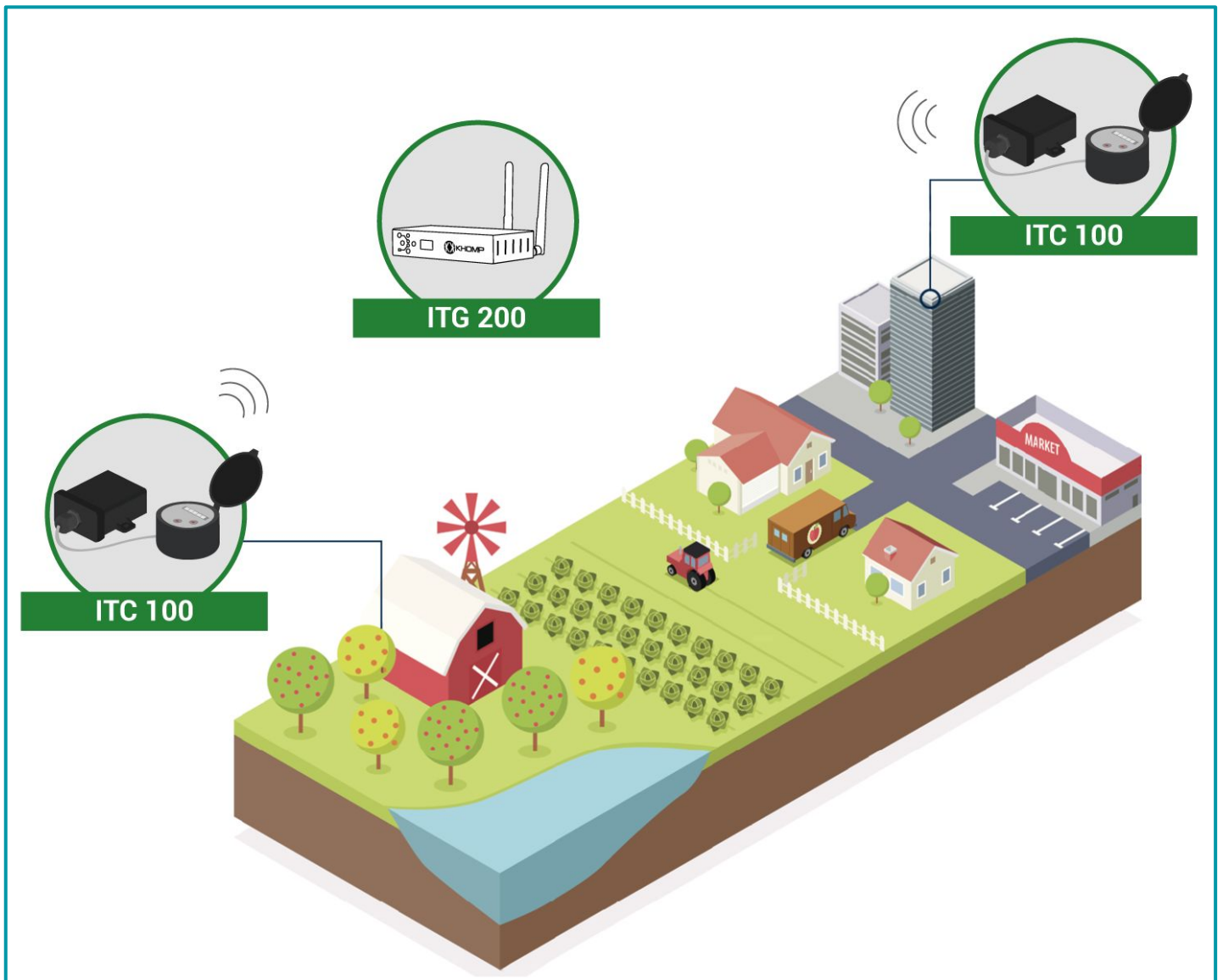


Caption: ITC 100 SZ integrated into hydrometer from the manufacturer LAO.



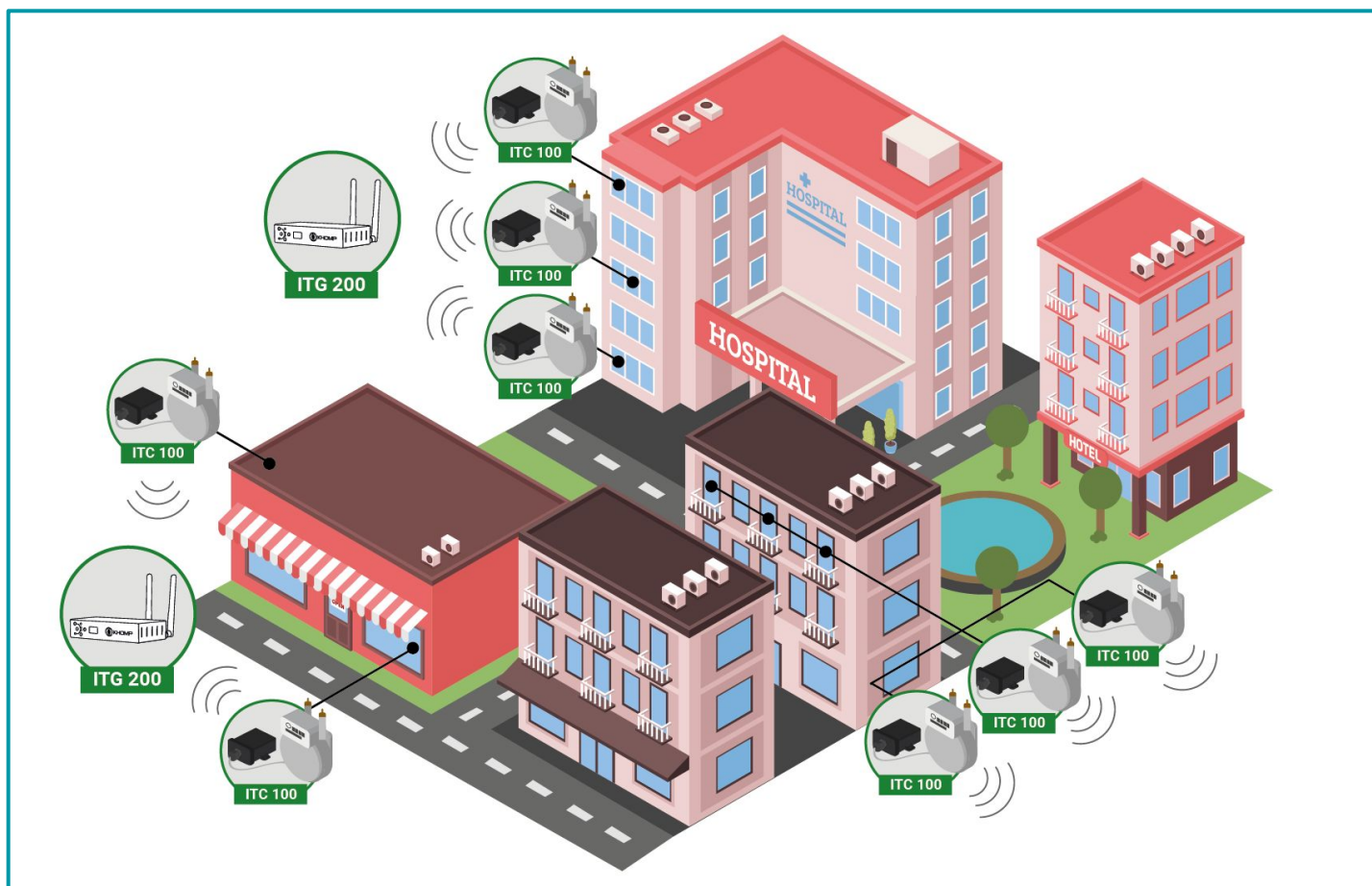
Caption: ITC 100 SZ integrated into gas meter from the manufacturer LAO.

Application model



Caption: ITC 100 SZ monitoring water consumption at a farm and commercial district.

Application model



Caption: ITC 100 SZ monitoring gas consumption at a grocery store, hospital and residential building.

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