Climate

LoRaWAN

Vicki LoRaWAN

Multi-room heating control directly
from your smartphone.

Our Mission

At MClimate we believe in a consumer-led shift to a low carbon and sustainable future. Energy consumption control and automation is not the privilege of a few, but rather the right and social responsibility of us all. Our mission is to provide digital, connected, smart and energy efficient automation products and services, which improve everyone's carbon footprint, reduce utility bills and enhance comfort.

Why Vicki LoRaWAN?

Using LoRaWAN is offering superior range (8km in urban areas and 15km in suburban area), long battery life (10+ years), simple public or private infrastructure, reliability, security and lower investment requirement upfront and over time making this an affordable and sustainable solution suitable for any budget. Our device is currently used by utilities, telecoms, building management and energy efficiency companies for managing institutional projects due to its extremely low maintenance costs and huge energy savings benefits of up to 30%.

Who is the solution for?

Vicki LoRaWAN is the go to solution for smart buildings and energy management – it offers improved energy efficiency with energy savings between 15-30% compared to standard TRV and easier utility bills management for large projects. Our smart radiator valve is specifically designed for managing multiple rooms and units across floors in multiple residential housing units, office and public sector buildings such as care homes and schools.

Benefits at a glance

Long operational range

The wider the coverage, the better and cheaper the IoT infrastructure. With LoRaWAN, the range is nearly 8 km in urban settings and 15 km in suburban areas.

Long battery life of up to 10 years

Specifically designed to dramatically reduce the power consumption and extend the battery life, LoRaWAN based data transmission and reception requires low current (less than 30 mA).

Bidirectional communication

Wide variety of uses cases requiring uplinks and downlinks. Sending data and receiving information in return, LoRaWAN devices can deliver status messages even to remote locations.

Open source standart

The LoRaWAN standard is based on an open protocol approach managed by the LoRa Alliance which supervises the development of the standard and ensures interoperability.

Indoor penetration

The LoRa waves can pass through obstacles and allow deep indoor penetration and adds the ability to reach sensors monitoring water or gas meters located underground.

Low capex and opex

The LoRaWAN open standard combined with cost-free operation frequencies and low-cost base stations allows operators to roll out networks quickly and with minimum investment.

Scalability

Wireless, easy to set up and able to support thousands of connected end-devices and millions of messages transmitted. Its fast deployment allows for large scale projects to come to live quicker and cheaper.

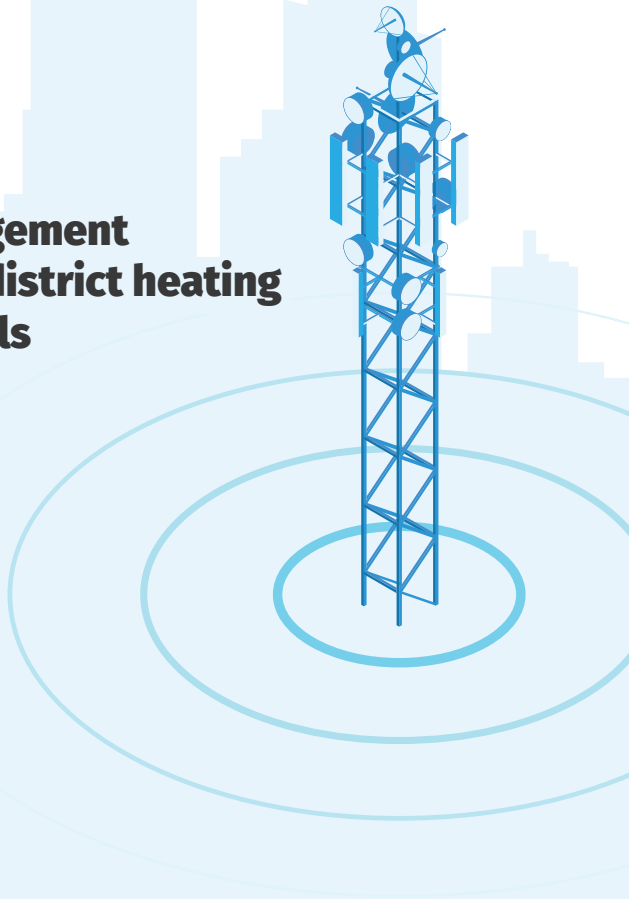
High Security

LoRaWAN security design adheres to state-of-the-art principles: use of standard, well-vetted algorithms, and end-to-end security ensuring mutual authentication, integrity protection and confidentiality.

LoRaWAN

Selected case study:

Nordics Telecom Solution for Building Management Optimising a residential housing units with district heating in Finland and managing individual utility bills



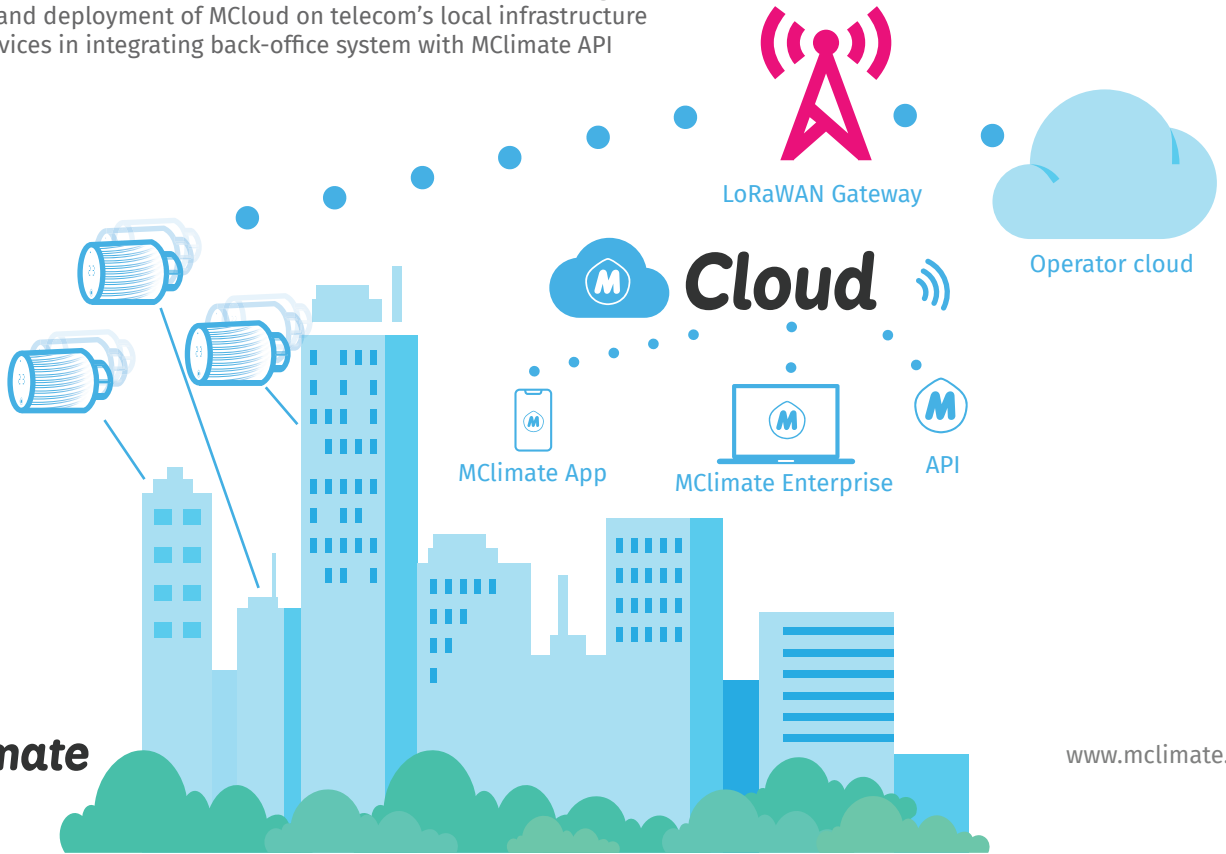
The problem

The smart energy management is taking shape and with the help of Vicki LoRaWAN we are aiming high to resolve the issues with traditional short-range connectivity solutions such as WiFi controlled valves in multiple storey buildings. We aim not only to deliver saving and comfort to the end consumers but to help us all meet our climate change commitments by ensuring our energy use is more flexible and efficient and each individual's consumption easily controlled and monitored.

In 2019 we were approached by a leading telecom from the Nordics as a technological partner in a new venture they were developing – offering heat optimization to residential buildings using common areas and individual room control smart radiator thermostats aiming to optimize the overall heat cost and CO2 impact of the buildings by 15-30%

Project and device requirements

- A battery-powered wireless device that can be deployed in a building and have seamless communication throughout floors
- Ability for the tenants to control the target temperature from the radiator thermostat and an application on their phones
- Ability for the building management company to set up schedules for common parts / monitor individula tenants consumption
- A technology offering highest data security and protection
- White label device of the radiator thermostat with customised design
- API control and deployment of MCloud on telecom's local infrastructure
- Support services in integrating back-office system with MClimate API



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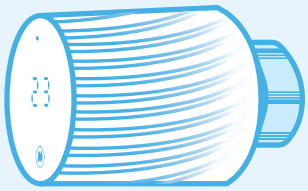
www.mclimate.eu

The solution

MClimate worked closely with the telecom to configure a complete and affordable IoT white label solution by developing a custom gateway according to telecom's requirements as well residential connectivity requirement by using MClimate's high-performance custom LoRa communication module. Within only 2 months from the project start, MClimate and the client started deploying the solution in numerous Finnish buildings before the heating season in 2019. MClimate's team continuously supported the telecom with valuable know-how about the residential heating patterns on the tenants throughtout the year and it is now estimated that the first year alone generated energy savings of 15-30% and the devices installed paid for themselves in the first year of use.

The end solution benefits included:



12,000+

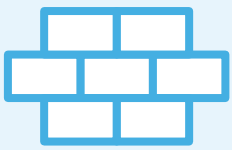
MClimate smart white-label thermostats produced and delivered to FinnishCo

60+ Buldings

Growing installations to date – many completed pre 1st heating season (2019)

EUR 45-60k

Average annual building heating bill before MClimate depending on size

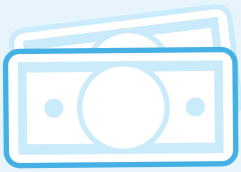


Any age of buildings

Retrofits buildings of any age of construction; current sample from 1920-1975

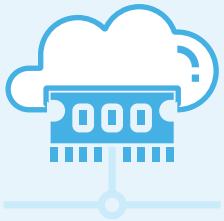
15-33% savings

Savings generated in 2019 depending on the set up agreed or modified by users



High RoI

Over EUR 500,000k saved in 2019; user investment paying for itself within 12-18 months



Low upfront capex

Economically viable business model for end clients allowing for quick rollout

CO2 Reduction

Reducing yearly Co2 emissions in a block of 30 apartments by 7 cars

High security

User information data security guaranteed by a Security Mark issued by Traficom

Vicki
by MClimate

LoRaWAN

7,8 cm

5,4 cm

5 cm

Description

Vicki is a a smart thermostatic radiator valve (TRV) retrofitting radiators with thermostatic valve and allowing for temperature control and monitoring from distance. Manual target temperature selection is possibly by rotating the outer ring of the device. The target temperature is displayed on the device.

Product features

- Manual adjustment of temperature 2-digits
- display
- Automatic temperature control algorithm
- Automatic temperature control algorithm with external temperature reading
- Manual valve openness control
- Open window detection
- Child lock

Applications

- Smart Buildings
- Smart home
- Residential buildings
- Commercial buildings
- Energy optimization
- Environment monitoring

Device specifications

Mechanical specifications

WEIGHT	107gr
DIMENSIONS	54x78x50mm
ENCLOSURE	PC reinforced with Glass Fibers, Anodised copper (metal nut)

Operating conditions

TEMPERATURE	-20-60°C
HUMIDITY	0-80% RH (non-condensing)

Power supply

BATTERY TYPE	2xAA
OPERATING VOLTAGE	3VDC
EXPECTED BATTERY LIFE	Up to 10 years (depending on configuration and environment)

Vicki by MClimate

LoRaWAN

Radio/Wireless

WIRELESS TECHNOLOGY	LoRaWAN® 1.0.3
WIRELESS SECURITY	LoRaWAN® End-to-End encryption (AES-CTR)
LORAWAN DEVICE TYPE	Class A End-device
SUPPORTED LORAWAN FEATURES	OTAA, ADR, Adaptive Channels setup
SUPPORTED LORAWAN REGIONS	EU863 – 870; Other LoRaWAN regional settings available upon request
LINK BUDGET	130dB
RF TRANSMIT POWER	14dB

Compatibility

DEFAULT RADIATOR VALVE FITTING	M30x1.5
AVAILABLE ADAPTORS	RA, RAV, RAVL, ORAS, Oventrop, Other types of adapters available upon request

Conformity

CE	Health: EN 62479:2010	
	2014/35/EU Low Voltage Directive	EN 60950-1:2006/ A11:2009 / A1:2010 / A12:2011 / A2:2013
	2014/30/EU EMC Directive	EN 301489-1 V2.1.1; EN 301489-3 V2.1.1
	Radio Equipment Directive (RED)	EN 300220-1 V3.1.1; EN 300220-2 V3.1.1

Communication protocol

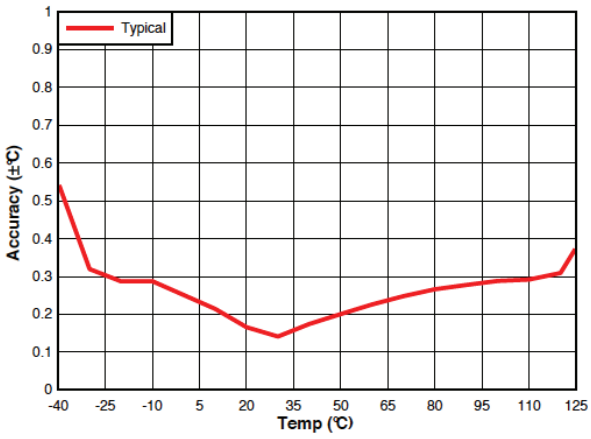
KEEPALIVE	BYTE INDEX	VALUE NAME	DATA SIZE	NOTES
	0	Command type	1	Command type - Keepalive
	1	Target temperature	1	0x05 <= XX <= 0x1E
	2	Measured temperature	1	
	3	Measured relative humidity	1	
	4-6	Motor range and position	3	Valve actuating motor maximum range (steps) and current position
	7	Battery voltage; Status bits	1	Battery voltage; Status bits for: detected open window; Motor consumption status; Temperature and Humidity sensor check
	8	Child lock status	1	Read child lock (enabled/disabled)

UPLINK/DOWNLINK AVAILABLE REQUESTS	Read/Write Keepalive period Recalibrate motor Read device hardware & firmware version Read/Write Motor position Read/Write Target temperature Enable/Disable open window detection and set parameters Enable/Disable Child lock Force close the valve Read/Write Target temperature range Read/Write Internal temperature control algorithm parameters Read/Write Join-request retry period Read/Write confirmed/unconfirmed uplink configuration Read/Write Device operation mode (Online automatic control/Online manual control/Online automatic control with external temperature sensor reading) Write External temperature sensor reading

Sensors

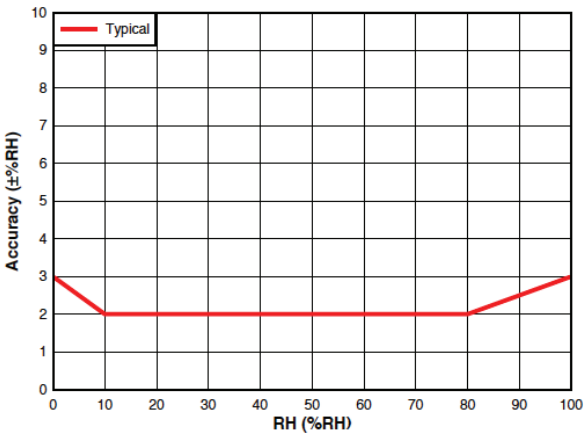
Temperature

RESOLUTION	0,1°C
ACCURACY	±0,2°C



Humidity

RESOLUTION	0.1%RH
ACCURACY	2%RH



Actuator

PUSH FORCE	70N
WITHSTAND PRESSURE AT SPINDLE	150N (min)
WITHSTAND DRAG AT SPINDLE	40N (min)
WITHSTAND PRESSURE AT ACTUATOR	300N (min)
STROKE/STEP	0,00208mm/step