

**Workshop: Discover How to Retrofit Commercial Buildings in the UK for Better Energy Performance with LoRaWAN** 

10/12/2025







































# **Agenda**



- Welcome & Introductions: MClimate, Alliot, and Actility
- The Value of Retrofitting Non-residential Buildings
- Why smart retrofits are key to energy efficiency and compliance (Alliot) Achieving Energy Efficiency Beyond Just Monitoring with MClimate Smart Devices
- Practical use cases and proven results from the field with ROI in 1-2 heating seasons (MClimate)
- ThingPark Enterprise All-in-One (TAO)
- How to seamlessly connect LoRaWAN sensors to any building system (Actility)
- Use Case Example What could work for you to implement in your next project (Alliot)
- Live Q&A Session







# **Introducing the Speakers**





Violeta Mitsova
CSO and Co-Founder
at MClimate



Trudi Roberts
Customer Project Manager
at Alliot Technologies ltd.



Lode Van Halewyck
Senior Technical
Consultant at Actility



## **Partners**

















































































# Retrofitting





Fit and forget with long battery life



Super simple, no special qualifications required for installing



Battery powered sensors – no cabling required



Fast deployments

# **Energy Efficiency**



- Monitor Energy Consumption
- Cut energy waste
- Automate tasks via BMS
- Build schedules within an existing BMS







#### **Retrofitting Commercial Buildings with MClimate Smart Solutions**

Leverage the right smart technology to measure and advance your buildings' performance.



#### **IoT Energy and Air Quality Managements Retrofit**

#### With 16ASPM and/or 16ADS you:

- Monitor power consumption of big electrical appliances or lights
- Control electrical appliances remotely and set schedules, ensuring energy efficiency.
- Reduce electricity consumption and energy costs

#### With Vicki Smart Radiator Thermostat you:

- Control remotely your radiators and activate child lock
- Control heating system based on opened/closed windows
- Set hourly, daily and weekly automatic schedules
- Achieve 15-35% energy consumption savings (kWh)

#### With CO2 Sensor you:

- Monitor real-time CO<sub>2</sub> levels and implement demanddriven ventilation.
- Track and show temperature, humidity, and light levels.

#### With Fan Coil Thermostat you:

- Control remotely or manually 2- and 4-pipe Fan Coil Units, accommodating 3-speed or FCM fans
- Show current temperature, target temperature and humidity levels
- Realize up to 30% initial savings

#### **With Wireless Thermostat you:**

- Control all Vicki TRVs from one place in bigger spaces
- Monitor temperature, humidity and LUX levels and make the necessary adjustments.
- Motion detection
- Set it up once and forget about it entirely maintenance-free.



**Connected to any BMS, SaaS or** 

**MClimate Enterprise** 

www.mclimate.eu

#### MClimate Smart Devices for Climate & Energy Control









#### **Vicki Smart Radiator Thermostat LoRaWAN®**





10+ years battery life.



Heating accounts for over 60% of a

building energy use and 35% of CO2

emissions. Vicki allows you to easily

retrofit 90% of the radiators, allowing

monitoring, control and optimisation

of your energy usage generating up

to 35% bill and 45% overall savings.





#### **Fan Coil Thermostat LoRaWAN®**













The Fan Coil Thermostat (FCT) is LoRaWAN device for 2- and 4-pipe Fan Coil Units, accommodating 3-speed or ECM fans. Ideal for building retrofitting, it enhances energy efficiency and reduces heating/cooling expenses significantly. With its 4.2" e-ink fast refresh display it allows the end-users to change the target temperature and see current indoor conditions.

#### **Wireless Thermostat LoRaWAN®**







entirely powered by solar

energy, using an organic solar

panel. It features a 2.9" e-ink

screen, sensors for movement

change the target temperature

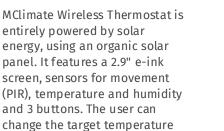
and 3 buttons. The user can

and track current indoor

conditions.







#### **Melissa Smart AC Controller LoRaWAN®**











With Melissa AC Controller LoRaWAN you can control your air conditioner from your smartphone and fully optimize your comfort. This smart device can save you up to 25% on your A/C's energy consumption and maintain the perfect temperature for you at all times.



#### **MClimate Smart Devices for Climate & Energy Control**

HT + PIR lite

**LoRaWAN®** 









#### HT LoRaWAN®







Aimed to provide an accurate and

commercial, public indoor

in larger rooms for most

comfortable environment.

timely information for office, home.

temperature and humidity with 10+

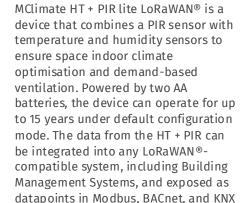
batteries. Easily paired with Vicki to

vears battery life with AA Lithium

offer external control of radiators







systems through a dedicated gateway.

# MClimate 16A Switch & Power Meter LoRaWAN®







The MClimate 16ASPM LoRaWAN® is a

enabling you to automate, track, and

N, N, Lout, and it works in a way that

With an overheating protection

rapid building retrofitting.

connects and disconnects Lout from L.

mechanism, FUOTA (Firmware Upgrades

Over The Air), and operation in LoRaWAN

Class C, the MClimate 16ASPM is ideal for

compact 16A relay and electricity meter.

The device is small enough to fit behind

most wall switches and power equipment,

control your electrical appliances. This is

possible as the device has 4 terminals L,











Climate

# Switch LoRaWAN®

The MClimate 16A Dry Switch LoRaWAN® is a miniature device that features a dry 16A relay. The device is small enough to fit behind most wall switches and power equipment, enabling you to automate, track, and control your electrical appliances. The device has 4 terminals L, N, I, O, connecting and disconnecting I from O. The 16ADS features an overheating protection mechanism, operates in LoRaWAN Class C, and supports FUOTA.

#### www.mclimate.eu

#### **MClimate Smart Devices for Air Quality Monitoring**









#### **MClimate CO2 Sensor** & Notifier LoRaWAN®





A 3-in-1 sensor with



temperature humidity, and CO2

readings. Measures exact CO2

levels with a configurable

if the CO2 level is below a

levels based on NDIR actual CO2

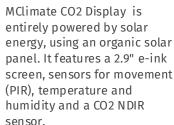
buzzer and LED to notify tenants

predefined threshold ensuring

health and safe environment.







#### **MClimate CO2 Display** LoRaWAN®













#### MClimate CO2 Display lite CO2 + PIR lite **LoRaWAN®**





special gateway.













**LoRaWAN®** 





Just like the MClimate CO2 Display, the lite version is equipped with temperature and humidity sensor, LUX sensor and NDIR CO2 sensor. Featuring smaller 1.54" e-ink screen the device is showing the current levels of CO2 as well as historical trends. The data from the CO<sub>2</sub> Display lite can be used in any LoRaWAN® compatible system, incl. Building Management Systems to control demand-based ventilation. Sensor information can be exposed as datapoints in Modbus, BACnet and KNX systems through the use of a

The MClimate CO2 + PIR lite LoRaWAN® combines an NDIR CO<sub>2</sub> sensor, a PIR sensor, and temperature and humidity sensors to deliver comprehensive monitoring and optimization of indoor climate conditions. Powered by two AA batteries, the device can operate for up to 15 years under default configuration mode. The data from the CO2 + PIR can be integrated into any LoRaWAN®compatible system, including Building Management Systems, and exposed as datapoints in Modbus, BACnet, and KNX systems through a dedicated gateway. Climate

#### **MClimate Smart Devices for Automation & Water Control**









# **Multipurpose Button LoRaWAN®**





presses the button.



a simple device with versatile and

with a temp. sensor and 3 types of

configurable use for many client

The Multipurpose Button LoRaWAN® is

applications. Featuring a single button

clicks, only your imagination limits all

possible actions when the customer





The Open/Close Sensor
LoRaWAN® detects the event
of opening or closing
windows, doors, cabinets
and more. It features long
battery life, LED, temp.
sensor and a button. The
device sends an uplink for
every event and keeps an
internal counter of the total
number of events.

#### Open/Close Sensor LoRaWAN®













Identify floods or leakage as soon as they happen with our small yet powerful battery-operated LoRaWAN sensor. It will notify you through an app or IoT desktop solution when a leak is detected, so you can take things into control and save you money and effort in the long run.

# Flood Sensor LoRaWAN® LoRa























Floods and leaks rarely happen, but when they do, it can cost a fortune to fix the damage. Pair T-Valve with our flood sensor to have total leak detection, flood prevention for a total peace of mind. 3/4" and 1" version; 10+ years battery; 2 temperature digital sensors and soon flow meter.



#### **Driving Success in Commercial Properties with Smart LoRaWAN Solutions**

#### **Proven Solution**

Pioneered in 2018 as the first LoRaWAN TRV, now perfected after 7+ years of development.



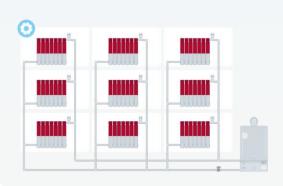
#### **LoRaWAN®** Certified

Vicki is the first LoRaWAN® certified Smart Radiator Thermostat and has been deployed since 2019.



#### Certified for Automatic Hydraulic Balancing

TÜV Rheinland confirms that the Vicki LoRaWAN® Smart Radiator Thermostat is capable of performing automatic adaptive hydraulic balancing on an unbalanced heating system.



#### **Future-Proofed**

The only smart TRV with Firmware Updates Over The Air (FUOTA).



#### **FCC & CE Certified**

Vicki meets the highest standards for safety and compliance, ensuring smooth operation and reliable performance.



#### **EU-Made**



With a fault rate of less than 1% in the last 2 years, designed to the highest quality and regulatory standards.

#### 30k+ monthly

Vickies sold and installed since launch.



#### Measuring success: Expected POC Outcomes and Financial Impact

- Achieve 15-35% energy consumption savings (kWh)
- Control heating system based on opened/closed windows
- Reduce energy waste based on occupancy of the room
- Set hourly, daily and weekly automatic schedules of the heating/cooling system
- Easy remote management of the devices

- Measure, analyze, and optimize in real-time and historical building data and sustainability reports
- Retrofit without major renovations or high costs
- (\$) Quick ROI 12-18 Months
- Improve CO2 (eqCO2) savings to up to 20%
- Improve occupants comfort and create healthy indoor environment

M Climate

www.mclimate.eu

#### **Recent Smart Buildings Use Cases – UK**

































#### Recent Smart Buildings Use Cases – EU and the UK



Hotels (50,000+ Vicki) **SaaS provider** 



Residential (1,500+ Vicki /15000+ HT) IoT Solutions Provider



Museum/ Public Site (750+ Vicki /350+ WT) BMS Integrator



Student Housing (10k+ Vicki) SaaS Provider



Offices (1,500+ Vicki) **German JV and Utility** 



Dutch Schools (500+ Vicki) SaaS and Energy Advisor



Paris Schools (10k+ Vicki) **Government + Siemens** 



Business Center (1,500+ Flood Sensors) IoT Integrator



Offices (500+ Vicki) IoT Integrator



Office (4,000+ Vicki) **BMS Integrator** 



Hotels (1,000+ Vicki) **Hotel operator** 



Industrial Site Offices (500+ Vicki) Industrial Corporate



School Buildings (3000+ CO2) IoT Integrator Installation



Police Station (1,000+ Vicki) Energy Efficiency Provider



Museum/ Public Site (750+ Vicki /350+ WT) BMS Integrator



9 Schools (1,000+ Vicki) IoT Solutions Provider



Belgian University (423 Vicki) **Vrije University** 



Bulgarian Bank Office (300+ HT, CO2, Open/Close) Banking Corporate



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### **Measuring success: Detailed Example Walk Though**

Number of buildings	1 1	number of gatewa	ys can be higher de	pending on existing infrastructure		
Number of radiators	100	100				
Illustrative Set Up Costs in GBP (excl VAT)	No. devices	Unit Price	Total Price	Comments		
One off set up costs						
Hardware (Wattsense gateway with LNS)	1	1 000	1 000	can range		
Hardware (Vicki TRV LoRaWAN)	100	65	6 500	volume discounted		
Total one off set up cost			7 500	one off		
Existing property management installation			-			
Total investment cost			7 500			

Energy consumption (1000 sqm building)	Building 1		
Office building size (sqm)	1 000		
Average heating requirement per building per month (based on sqm/hour)	160	Between 150-180 kWh/m² for UK non-residential (	office buildings
Use pattern calculation per year based on:			
Working hours (heating and/or cooling)	9		_
Work days (5 per week) - assuming 6 months per year	124	<mark>-</mark>	<b>Energy savin</b>
Energy use per year (kWh)	178 560		Per building
Yearly consumption (kWh)			
of which heating	95%	usual split for office	<b>Project savin</b>
of which water	5%	usuut spiit joi ojjice	Investment r
Price per kWh (GBP) - day energy price	0,250	UK range 0.25-0.29	Savings (GBP
Price for heating of building (GBP)	42 408		Cash flow im
Price for water heating of building (GBP)	2 232		
Total average yearly bill (GBP)	44 640	-	<b>Project savin</b>

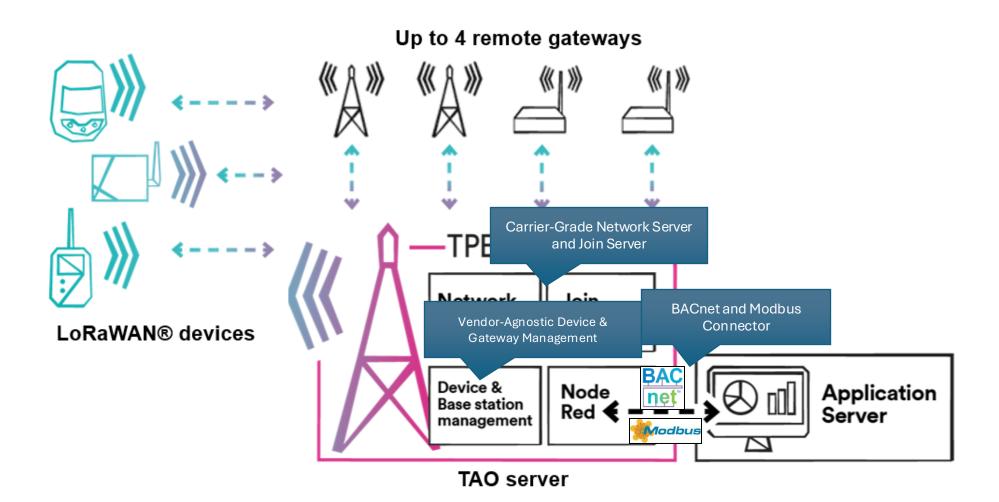
Energy savings (Yearly)	Low	Medium	High
Per building	15%	25%	35%
Project savings - LOW	Year 1		
Investment requirement (GBP)	-7 500		
Savings (GBP)	6 696		
Cash flow impact (GBP)	-804		
•			
Project savings - MEDIUM	Year 1		
Investment requirement (GBP)	-7 500		
Savings (GBP)	11 160		
Cash flow impact (GBP)	3 660		
•			
Project savings - HIGH	Year 1		
Investment requirement (GBP)	-7 500	(88) (811	
Cash flow impact (GBP)	15 624	(M) Clima	te

8 124

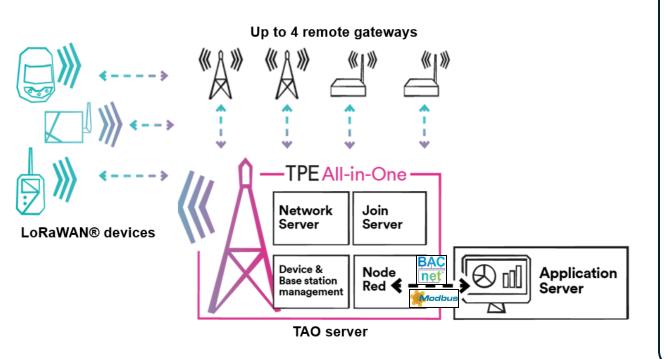
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# ThingPark Enterprise All-in-One (TAO)

## ThingPark Enterprise All-in-One



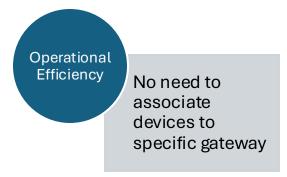
## ThingPark Enterprise – Unique Value



#### **Unique Value**

- Managed Catalogue of Device
   Drivers
- Available on several gateway brands and models
- Support of up to 4 remote gateways
- Providing off-the-shelf connectors for BACnet & Modbus
- Seamless Migration path to TPE Full solution

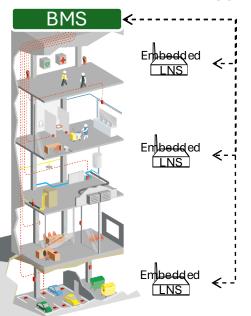
## The Value of Macro-Diversity in TAO





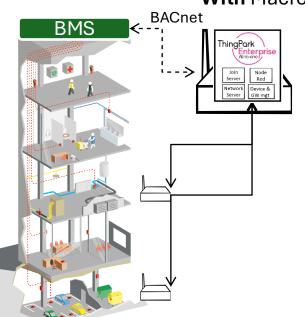


#### Without Macro-diversity



- Devices have to be associated to a specific Gateway
- The battery-lifetime of devices will not be optimized
- Every gateway has to be integrated to the BMS
- A gateway is a Single Point of Failure (SPOF)

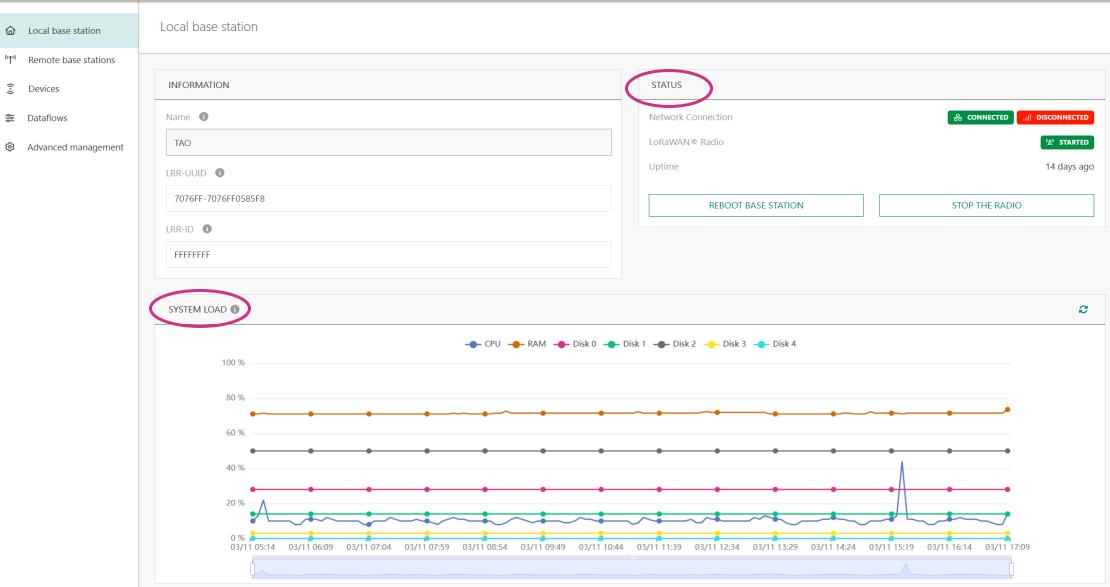
#### With Macro-diversity

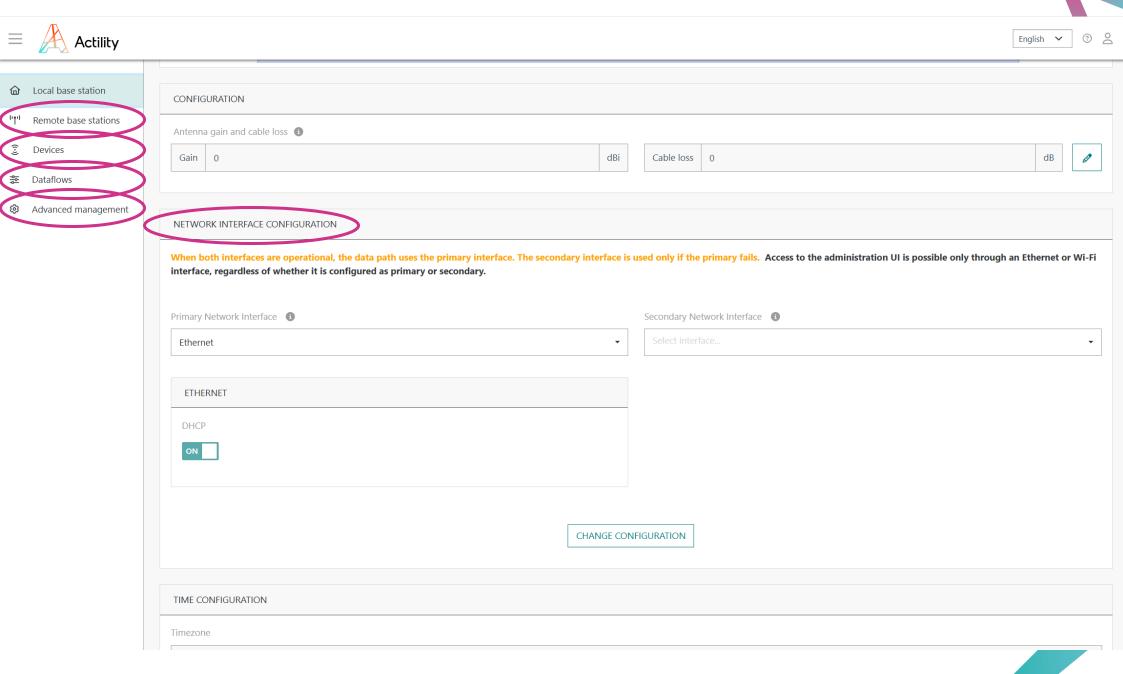


- Centralized device provisioning
- Optimized battery life-time of devices.
- Only 1 integration to the BMS (TAO Master)
- No SPOF. Backup-Restore of the TAO master gateway.













English 🗸

**1** ■

♠ Local base station

((†)) Remote base stations

② Devices

**≇** Dataflows

Advanced management

Devices	+ ADD A DEVICE	IMPORT DEVICES

**1-9 of 9** Search by name or DevEUI... Q

	Name 💠	DevEUI	DevAddr	Last Uplink	FCntUp	SNR 🔷	SF 🔷	
	600-021	77-77-77-77-77-77		Never				•••
N i	600-052	66-66-66-66-66-66		Never				•••
1.	600-065	88-88-88-88-88-88		Never				•••
1111	MCS	44-44-44-44-44-44		Never				•••
6	Mclimate - VICKI	70-B3-D5-2D-D3-02-01-38	03-1E-E7-83	2025-11-24 17:48:18	28	9 dB	SF7	•••
<b>.</b>	Watteco - smartwire class C	70-B3-D5-E7-5E-03-18-2D	03-E1-1B-05	2025-11-24 17:49:18	8,852	0.5 dB	SF7	• • •
•	aedenis	99-99-99-99-99-99		Never				• • •

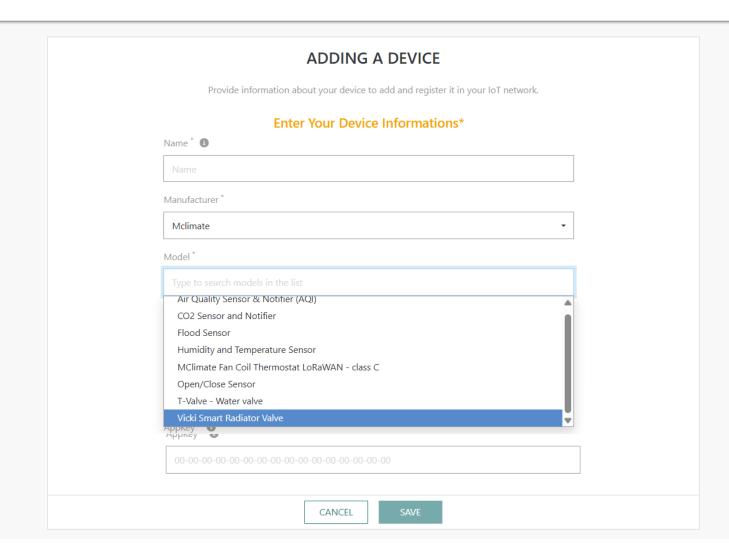


- Local base station

  ('T') Remote base stations

  Devices
- Advanced management

Dataflows





English 🗸



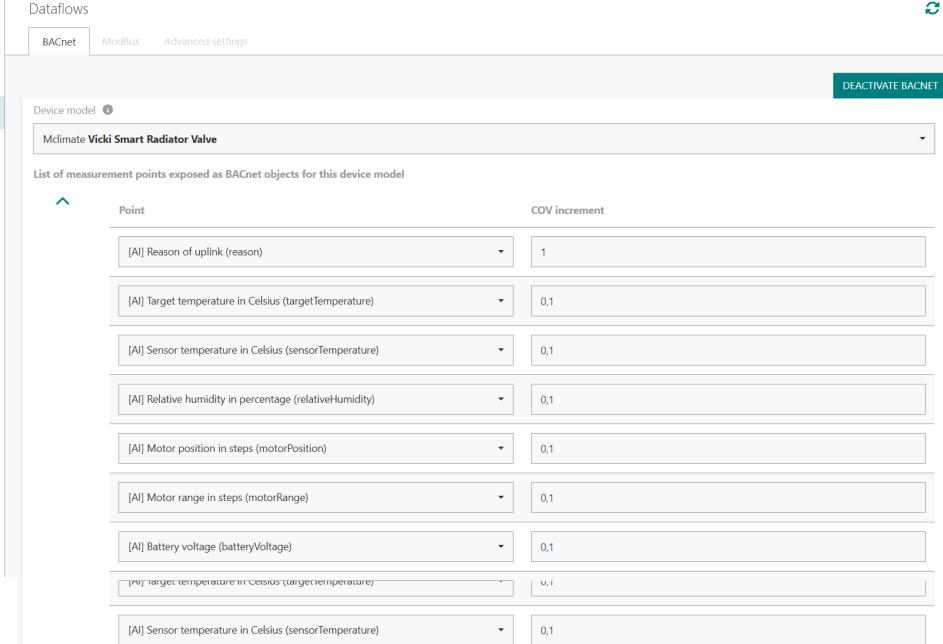
♠ Local base station

Provide the stations in the stations in the stations in the state of t

Devices

**≋** Dataflows

Advanced management



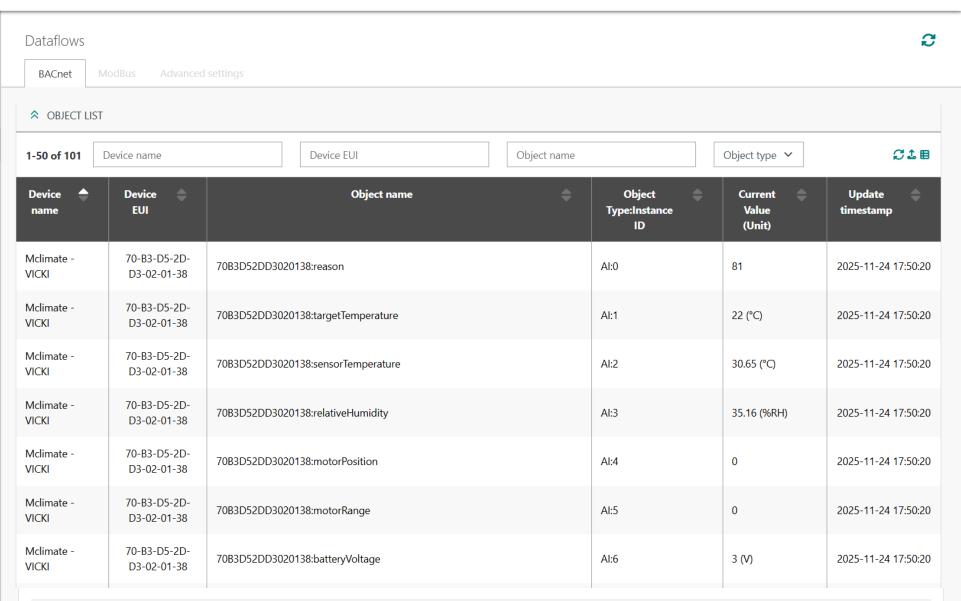




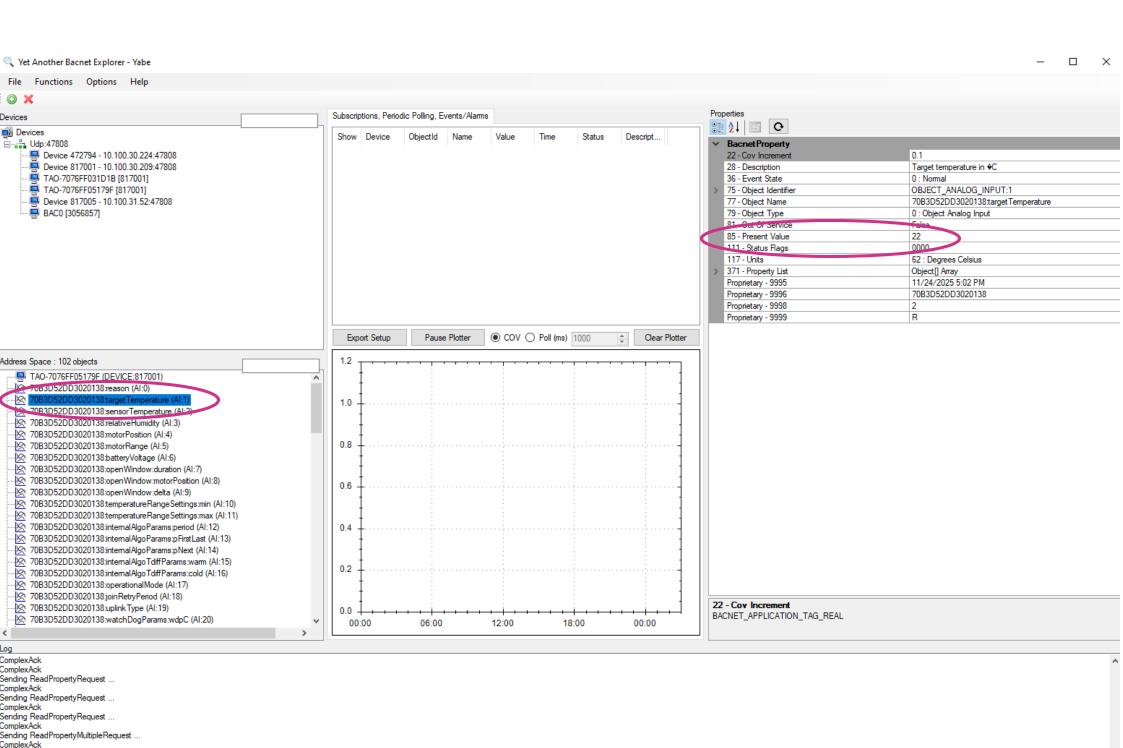
English 🗸

- Local base station

  ('†') Remote base stations
- ② Devices
- **≋** Dataflows
- Advanced management







Sending ReadPropertyMultipleRequest ...

ComplexAck



② 💍

English	~	

Local	base	station

Remote base stations

② Devices

**ॐ** Dataflows

Advanced management

*	UL/DL	FCnt	Timestamp	Content	FPort	SNR	ESP	SF	Channel
~	Ø	24	2025-11-25 09:13:56	DATA	2	8.75 dB	-51.74 dBm	SF7	868.1 MHz Lc1
~	O	23	2025-11-25 09:11:53	DATA	2	10.75 dB	-61.95 dBm	SF7	867.9 MHz LC8
~	Ø	22	2025-11-25 09:09:51	DATA	2	9.75 dB	-57.64 dBm	SF7	868.5 MHz LC3
^	<b>(a)</b>	3	2025-11-25 09:09:45	DATA	1			SF9	868.3 MHz Lc2

PHYPayload A083E71E0300030001366315C085FD

Message Type Confirmed Data Down

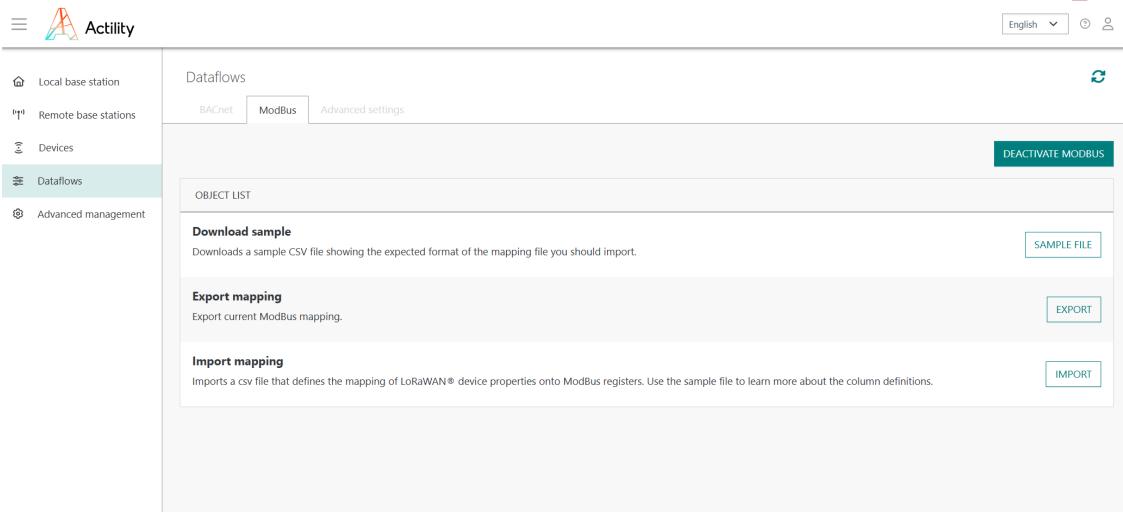
FRMPayload 0E17

PACKETS HISTORY

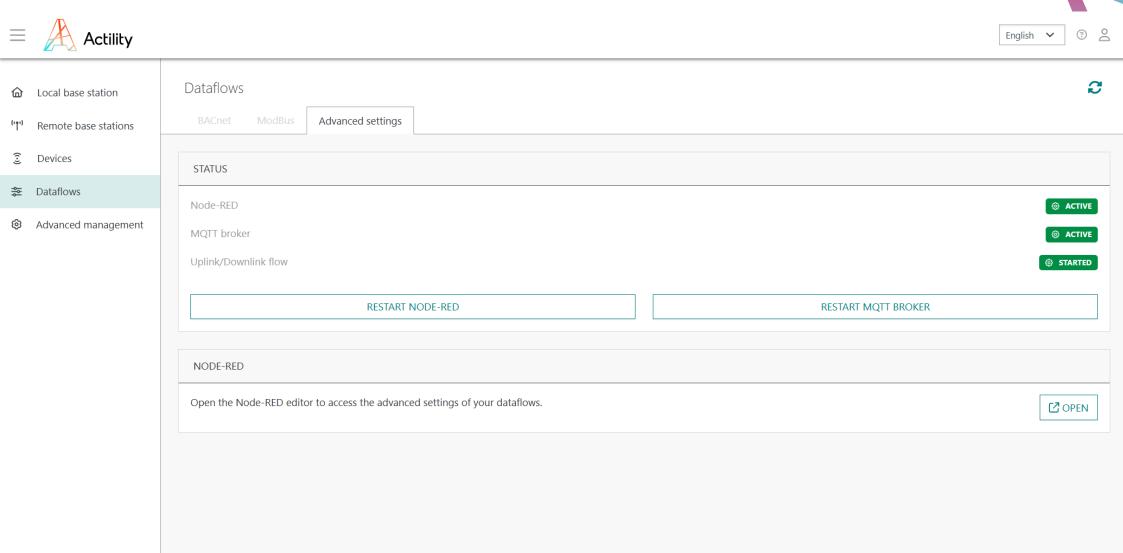
DevAddr 📵 03-1E-E7-83

**Delivery Status** Sent Base stations 🕕 TAO

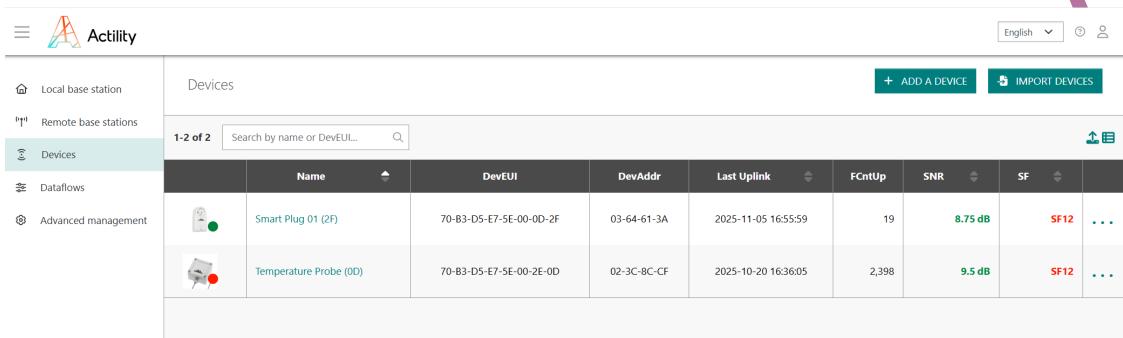
~	•	21	2025-11-25 09:09:43	DATA	2	7 dB	-57.99 dBm	SF7	868.3 MHz Lc2
~	•	20	2025-11-25 09:07:41	DATA	2	10 dB	-56.01 dBm	SF7	867.1 MHz LC4
~	•	19	2025-11-25 09:05:39	DATA	2	9.5 dB	-54.06 dBm	SF7	867.1 MHz LC4









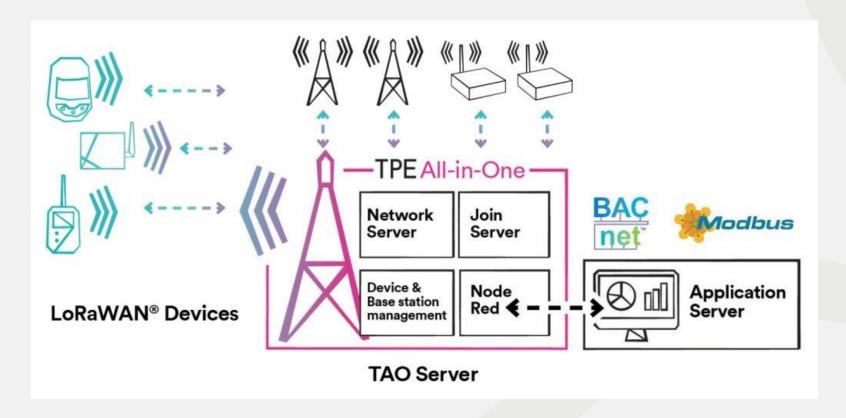




# **BMS**



- Addition of the TAO (ThingPark All-in-One) licence to LoRaWAN gateway enables data to be converted from LoRaWAN into other protocols (i.e. Bacnet objects) which can then be discovered within the existing BMS
- Automations & scheduling can be set within the BMS
- Set timings for heating/AC schedules
- If this, then that rules such as "meeting room occupied, switch on lights & heating"



**Q&A?** 

Alliot Technologies
<a href="mailto:co.uk">contact@alliot.co.uk</a>
<a href="mailto:+441484599544">+441484599544</a>
<a href="https://www.alliot.co.uk">https://www.alliot.co.uk</a>