

Device presentation for the customer

wM-Bus concentrator

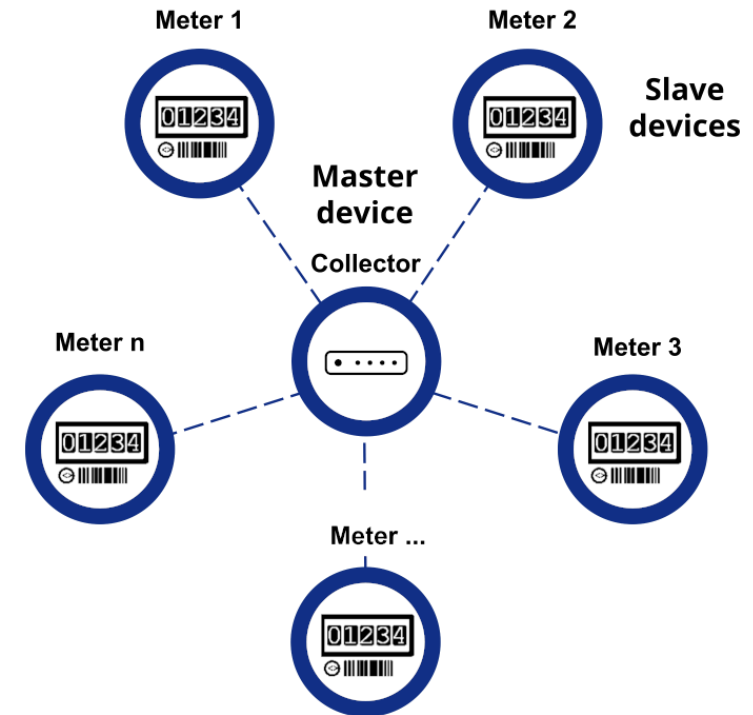
What is Wireless M-Bus (wM-Bus)?

Wireless M-Bus (wM-Bus) is the radio variant of the Meter-Bus standard used for remote reading of utility meters such as water, heat, and gas meters. Instead of using wired connections, meters periodically transmit data wirelessly, typically in the sub-GHz band (868 MHz, 433 MHz or 168 MHz). A gateway or concentrator listens to these transmissions and forwards the data to higher-level systems.

wM-Bus is widely used in retrofit scenarios where replacing meters is not feasible or economically justified. It plays a key role in regulatory compliance projects, especially those driven by the European Energy Efficiency Directive (EED) but it is also widely used in water utility segment.

wM-Bus is often referred to as a “Drive-by” or “Walk-by” solution.

- Wireless standard for remote meter reading. Typically OMS – Open Metering Standard
- Commonly used with **water and heat meters**
- Supports **multiple devices**
- Operates in modes such as T1, C1, and S1
- Meters transmit data, gateway acts as receiver
- Meter typically sends data every 20 seconds - 2 minutes



Master (ACRIOS converter) is NOT asking for the data. Slave (meter) sends data periodically every X seconds, master opens the receiving window to receive the data from meters around it.

Where is wM-Bus used?

Wireless M-Bus is typically used in environments where meters are physically distributed, difficult to access, or located in places where installing communication cabling would be costly or impractical. It is widely deployed both in utility infrastructure and in residential or mixed-use buildings.

For water utilities, meters are often installed outdoors, underground, or in pits, making manual readings expensive and inefficient. In residential buildings, meters are distributed across basements, risers, and apartments, where wireless communication significantly simplifies installation and operation.

- **Water utilities** - large meter fleets, outdoor and underground installations
- **Apartment buildings** and multi-unit residential properties
- Heat metering in residential and mixed-use buildings
- Retrofit projects with existing OMS certified meters
- Installations requiring long lifetime and minimal maintenance



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When to use ACRIOS?

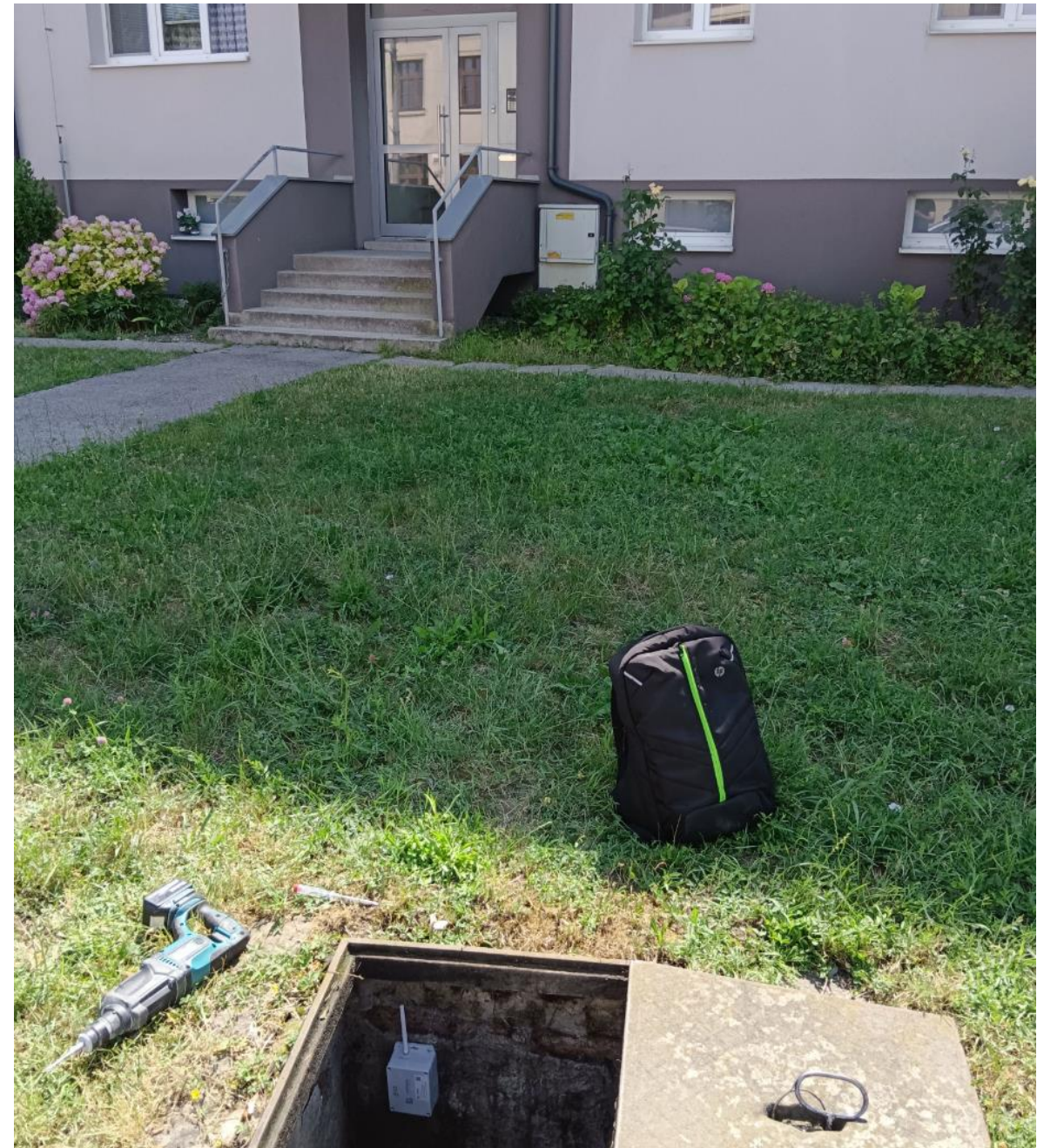
ACRIOS wM-Bus to NB-IoT concentrators are designed for long-term infrastructure projects where reliability, scalability and predictable operational costs are critical. This applies especially to water utilities and building administrators managing large numbers of meters.

The ideal project would require long battery life, IP67 coverage and open hardware that can be integrated into existing systems without having to pay for any extra software.

- **EED and EPBD** compliance projects
- If there are meters with **proprietary protocols**
- Keeping existing wM-Bus meters in place
- Meters already communicate via wM-Bus
- Readings are collected periodically, not in real time
- Nationwide coverage via NB-IoT
- Low-maintenance operation with 10+ year lifetime
- Remote configuration and firmware updates



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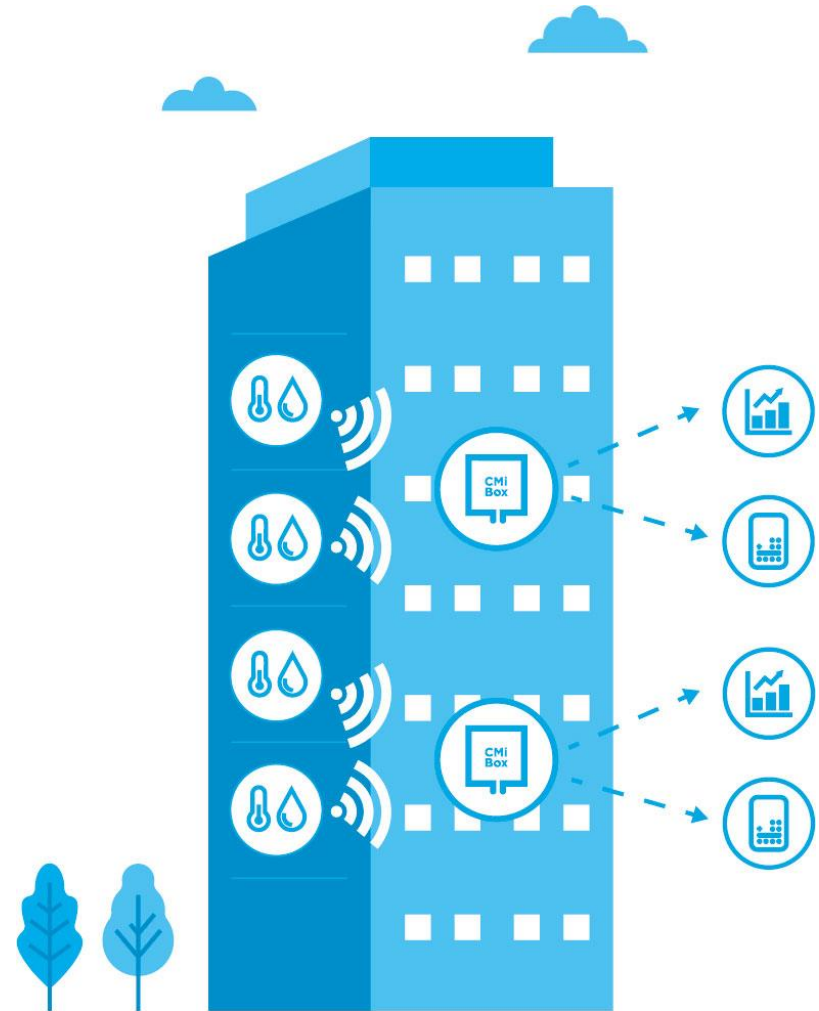


When **not** to use ACRIOS?

Although ACR-CV covers a wide range of real-world metering scenarios, it is not intended to be a universal IoT gateway. Its design is intentionally focused on battery-powered, interval-based data collection, optimized for reliability and long service life rather than maximum flexibility.

Projects that require continuous data transmission, real-time monitoring, or permanent power availability may be better served by a different class of devices. Similarly, if meters already provide direct cellular connectivity, adding a concentrator layer may be unnecessary.

- When meters already provide direct cellular connectivity
- Applications requiring continuous, real-time data flow
- Installations with permanent power and always-on connectivity
- Scenarios where an existing infrastructure already fully meets requirements



To make is simple – ACRIOS converter is not typically used for the installations with more than 3 meters

What makes wM-Bus complicated for IoT world

Wireless M-Bus simplifies installation by eliminating cabling, but it introduces challenges that must be handled carefully in real deployments.

Radio propagation and installation environment

Basements, underground pits, reinforced concrete and metal structures significantly affect radio reception and reliability.

Protocol fragmentation

Even within wM-Bus, real deployments include OMS as well as proprietary vendor-specific formats.

Large-scale meter management

Utility and building deployments often involve hundreds of meters, requiring discovery, filtering, and duplicate handling.

Battery versus coverage trade-off

Longer listening windows improve reception but increase power consumption.

Operational lifecycle

Water utilities and building operators expect devices to operate reliably for 10–15 years with minimal field intervention.



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wM-Bus to NB-IoT

The ACRIOS wM-Bus to NB-IoT concentrator acts as a bridge between existing wireless meters and modern cellular networks. It enables utilities and building administrators to centralize meter data without replacing meters or deploying private communication infrastructure.

The device is designed for long-term, low-maintenance operation, particularly in environments where access is limited and operational continuity is critical.



With NB-IoT, you have also possibility to use MQTT protocol with downlink configuration capabilities.

Wide protocol compatibility

Supports wM-Bus OMS and selected proprietary protocols, allowing mixed meter fleets.

Most used proprietary protocols are Sensus BUP (Xylem), Metra and Radian (Sontex, Itron)

Remote updates and power flexibility

The converter supports **FUOTA (Firmware Update Over The Air)** via NB-IoT, ensuring devices can be maintained remotely without site visits.

High reception sensitivity

Optimized for multi-floor buildings and challenging installations.

We can typically cover 4 floors no matter the material of a building.

Flexible integration and SIM options

Data can be delivered via **MQTT or UDP**, making integration with cloud platforms straightforward. The device supports both **3FF plastic SIMs and soldered chip SIMs**, giving flexibility for different project requirements.

Typical deployment examples

Water utility

Outdoor or pit-installed water meters distributed across a wide area. Gateways are installed in weather-resistant locations and forward data via NB-IoT to a centralized backend.

Apartment building

80–150 water meters located in basements and risers. One or two gateways cover the entire building.

Residential block

Heat and water meters across 4–6 floors with mixed vendors, typically one gateway per entrance.



Major changes as of January 2026

Thanks to your feedback, we've been able to introduce a number of improvements, both small and significant, that we see as a major step forward for our devices. The upgrades don't just enhance technical capabilities, they focus above all on user experience, because every project starts with a successful proof-of-concept installation. Below you'll find the changes that are already implemented in the products available to you today.

New model with both antennas internal

New device under ordering code "ACR-CV-102NI-WI-D" has both antennas internal and single D-cell battery.

Device is suitable for a water utility deployments, where cost needs to be reduced and there is a need for a higher IP coverage.

This device can be currently pre-ordered and will be available by March 2026.

Accurate battery estimates

To further improve reliability, we have implemented a coulomb counter for battery monitoring. Instead of relying only on theoretical lifetime estimates, the device now measures the actual energy consumed over time. This provides precise information about the remaining battery capacity and makes it possible to predict lifetime much more accurately. For you, this means better planning of maintenance, fewer surprises in the field, and overall lower total cost of ownership.

MQTT support in NB-IoT converters

With MQTT support, our NB-IoT converters integrate directly into IoT platforms. Each unit* comes ready to work out of the box using a broadcast address for one connected meter, and further setup- such as selecting meters, choosing data points, or adjusting intervals - can be done remotely.

**MQTT configuration has to be uploaded*



Device configuration

ACR-CV is designed with one clear operational goal: **install fast, configure remotely, and avoid site revisits**.

The device can be physically installed in under **10 minutes**, and all functional configuration is performed remotely after installation using NB-IoT downlinks.

This approach dramatically reduces installation time, simplifies logistics, and minimizes the need for skilled technicians on site. Installers only focus on mounting and powering the device, while all technical setup is handled centrally.

On a next slides, you can see our backend and frontend application that is **OPTIONAL**. We use these tools to manage 100 000+ connected meters across 2 000 concentrators.



On a next slides, you can see our backend and frontend application that is **optional**. We use these tools to manage 100 000+ connected meters across 2 000 concentrators.



Only hardware or vendor platform

We can provide you with either only a hardware, ready to be integrated or we can also provide you with a frontend and backend tools. These tools can be used to manage devices and setup data export to your application or server.

Remote downlink control

Device support **downlink configuration**, so parameters can be changed without site visits.

NB-IoT via MQTT

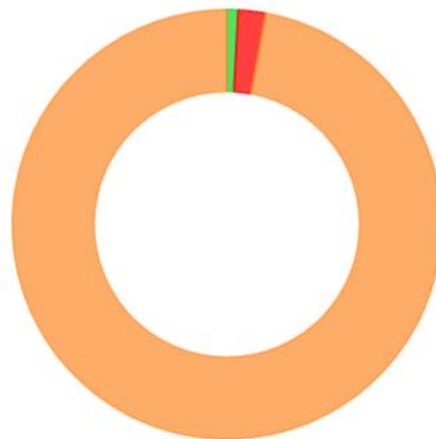
Configuration can be managed directly via **MQTT**, making integration with IoT platforms straightforward.

Out-of-the-box operation

Each device is delivered ready to use: by default, it sends heartbeat every 12 hours, waiting for the first configuration command.

Statistics

Asset composition at a glance



Groups · 878 Units · 2,141 Meters · 101,358

GROUPS
878

UNITS
2,141

METERS
101,358

Edit of group "17.Listopadu 18"

+ Add new units

+ Add new meters

Identification

17listopadu_18

Name

17.Listopadu 18

Profile

INPO Havířov  

 **2**
Show units in group 

 **136**
Show meters in group 

 **Show meters allocation in group** 

ACRIOS SYSTEM							
English A admin							
Meters allocation in group "17.Listopadu 18" Download CSV 136 records...							
☐	Radio number	Scan status ↓	Unit	Manufacturer ID	Mode	RSSI	Time
☐	1124F334	Not scanned					Never
☐	1124F1A6	Not scanned					Never
☐	1124F221	Scanned	901280031172767	0x0614	M	-56	22.12.2025 21:47:19
☐	1124F21E	Scanned	901280031172767	0x0614	M	-57	22.12.2025 23:38:55
☐	1124F21C	Scanned	901280031172767	0x0614	M	-48	23.12.2025 00:06:51
☐	1124F219	Scanned	901280031172767	0x0614	M	-53	22.12.2025 21:20:37
☐	1124F217	Scanned	901280031172767	0x0614	M	-58	23.12.2025 00:06:51
☐	1124F215	Scanned	901280031172767	0x0614	M	-53	22.12.2025 21:24:34
☐	1124F214	Scanned	901280031172767	0x0614	M	-51	22.12.2025 21:24:34
☐	1124F212	Scanned	901280031172767	0x0614	M	-60	22.12.2025 23:38:55
☐	1124F211	Scanned	901280031172767	0x0614	M	-56	22.12.2025 22:30:21
☐	1124F208	Scanned	901280031172767	0x0614	M	-56	22.12.2025 21:27:24
☐	1124F207	Scanned	901280031172767	0x0614	M	-56	22.12.2025 21:58:53

WMBus Backend API

1.0.0

OAS3

[/openapi.json](#)

Authorize



Others

**POST** **/token** Login For Access Token**POST** **/upload** Upload Data

Firmware

**GET** **/fws** List Users Firmware Files**POST** **/fw/add** Add Firmware File For User**POST** **/fw/{identification}/remove** Remove Firmware File For User**POST** **/fw/{identification}/metadata** Update Firmware File Metadata**GET** **/fw/{identification}/file** Read Firmware File For User**POST** **/fw/{identification}/file** Update Firmware File**GET** **/fw/{identification}** Read Firmware File Info**GET** **/fw/{identification}/units** List Units With Firmware**GET** **/fw/{identification}/chatscript** Read Firmware Chatscript For User

Lua

**GET** **/luas** List Users Lua Files**POST** **/lua/add** Add Lua File For User**POST** **/lua/{identification}/remove** Remove Lua File For User

What we typically test within a PoC

Test is typically carried out with a device that has our SIM card. Not because we would like to sell connectivity, but because it is the fastest way forward for the test purpose and neither us or customer has to spend time on integration. For the test, we would typically use our backend + frontend where we can show data and range.

Meter detection and signal reception

Verifying that the concentrator correctly detects nearby wM-Bus meters of various manufacturers.

We also test how many floors can one concentrator cover, giving us a good input for further business case calculation.

Range and signal reliability are key focus areas.

NB-IoT Communication

Verifying stable and consistent data uploads via the internal NB-IoT modem. Network registration and error recovery mechanisms are monitored.

Remote Configuration & Scan

Testing includes triggering remote scans via backend and validating scan results. We also verify scheduled reading, ID filtering, and error reporting over NB-IoT.

Installation Process Validation

We verify that the device can be shipped with the battery connected, allowing for true plug-and-play deployment — requiring only physical mounting on site, with all setup done remotely (zero on-site configuration).



ACRIOS wM-Bus converters

Typical customer scenarios

The meter transmits several telegrams, but you need only one specific type.

Meters send multiple frame types such as status, history, or alarms, while you only need one particular data telegram. The rest make integration complex and overload the system.

Our solution

We filter telegrams by type, CI field, DIF/VIF, or content, and transmit only the one you actually need.

This makes integration easier and keeps data clean and accurate.



ACRIOS wM-Bus converters

Typical customer scenarios

The installation includes meters with wM-Bus OMS and proprietary protocols.

Mixed environments combining OMS and proprietary protocols like Sontex Supercom, Apator Metra, or Sensus BUP cannot be handled by standard converters and usually require multiple systems.

Our solution

We support both OMS and specific proprietary protocols, allowing various meters to be read by a single device.

No need to replace meters or combine multiple systems.



ACRIOS wM-Bus converters

Typical customer scenarios

Each manufacturer provides readings only for its own meters, resulting in vendor lock-in.

When you have meters from several vendors, each offers its own closed system. The result is duplicated platforms, exports, and higher costs.

Our solution

Our converter is fully open and sends data directly to your system.

No closed cloud, no license packages tied to a specific brand.



ACRIOS wM-Bus converters

Typical customer scenarios

You prefer a battery-powered system to avoid electrical inspection and approval in the building.

Network-powered systems require electrical installation, inspection, and often the owner's approval, which slows down projects and increases costs.

Our solution

Our unit is fully battery-powered using dual D-Cell batteries with over 10 years of lifetime.

Installation is cable-free, requires no inspection, and involves no building modifications.



ACRIOS wM-Bus converters

Typical customer scenarios

Meters are replaced mid-lifecycle and everything would need to be reconfigured on site.

After several years, meters are exchanged, and standard systems require manual pairing and configuration on site, increasing error risk and cost.

Our solution

We support remote configuration and meter re-pairing over NB-IoT.

Replacements can be done without technician visits or on-site adjustments.



ACRIOS wM-Bus converters

Typical customer scenarios

You need to deliver remote readings, for example to comply with EED, but do not want to build your own system.

Building managers and energy specialists are required to ensure remote readings and reporting, but developing an in-house system is expensive and time-consuming.

Our solution

We primarily provide open hardware for direct integration but can also supply the backend.

Data are transmitted in open formats such as JSON, CSV, or API, so you can start immediately without developing your own platform.



Why work with ACRIOS – Our Unique Value Proposition

Partnering with ACRIOS means more than just selling devices. We actively help you reduce installation complexity, speed up project rollouts, and deliver tailored solutions to your customers. Our goal is to make cooperation easy and valuable for both you and your clients.

Preloaded configurations

We can upload customer-specific configurations already during manufacturing, so devices arrive ready to use with no extra setup required on site.

SIM card handling

We can insert and activate SIM cards directly for our customers. This saves time in the field and ensures every unit is fully prepared before delivery.

Extended feature support

Our team can provide special features on request, such as implementation of a new proprietary protocol, giving your customers more flexibility and future-proofing.

Made in the EU

All devices are developed and manufactured in Europe, ensuring high quality, short lead times, and compliance with EU standards.



Resources

Below you can find a link to all mentioned resources within this presentation.

Frontend and backend

<https://frontend.wmbus.acrios.com/>

<https://backend.wmbus.acrios.com/docs>

Technical documentation

<https://wiki.acrios.com/>

MQTT documentation

<https://wiki.acrios.com/manuals/Wireless%20M-Bus%20to%20NB-IoT%20-%20MQTT/>



Thank you!

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