Wireless M-Bus Gateway V4 with Modbus Add-On

Description

Gateway for remote reading of Modbus values via NB-IoT, LTE-M mobile radio or LoRaWAN to the Internet. Suitable for indoor and weather-protected outdoor installation.

Features

- wM-Bus meter data upload via NB-IoT or LTE-M mobile radio (2FF / Mini SIM card)
- Secure DTLS data transmission (client + server certificates) via mobile radio
- Connection via CoAP and DTLS (NB-IoT, LTE-M) or MQTT (LTE-M) to the Lobaro platform
- Direct connection via MQTT (LTE-M) to third-party systems possible.
- Alternative upload via LoRaWAN 1.0.2 (EU-868)
- Compatible with wireless M-BUS S1, C1/T1 modes (868 MHz) meters
- Compatible with Xylem Sensus RF Bubble Up (868 MHz)
- Compatible with Müller Funk (ME protocol, Walk-By) for µon and µflow skyW-2 and skyE-2

- Internal memory, for over 64.000 telegrams
- Whitlist for up to 2.000 individual meters
- Remote configuration
- Signed firmware updates (FOTA) via mobile radio
- Modbus ASCII / RTU reading

Product Components

> **COMPONENT INFO**
>
> This product is manufactured by Lobaro using the components listed below. Detailed information about the firmware and other components can be found in their respective descriptions. Please use the links provided to access comprehensive product details.

Component	Manual / Description	Additional note
Firmware	app-nrf91-origin	See here for available firmware updates
Housing	LoCube	122 mm (l) x 82mm (w) x 55mm (h)

Product Identification

- Name: **Wireless M-Bus Gateway V4 Modbus**
- Type: **LOB-GW4-MODBUS**
- MPN / Ordering code: `1200526`

Datasheet & Quickstart

> **INFO**
>
> Please contact our sales team.

Product specific details

LED signal patterns

The device has 3 three LEDs (B, G, R = Blue, Green, Red), labeled `Status` on the PCB: 🔵 🟢 🔴.

Patterns during booting/restart

- 🔵 ⚪ 🔴 B and R on: Device is in Bootloader Mode (not actively running, remove config adapter press reset to leave Bootloader Mode).
- 🔵 -> 🟢 -> 🔴 Quick cycle B, G, R for ~0.5s: Device just booted, either after power on, reset b button or software, or after a hard failure.
- ⚪ ⚪ 🔴 R flashes repeatedly on and off in 1s interval: critical failure during boot (failed to start application).

Patterns during normal operation

- 🔵 ⚪ ⚪ B flashes 1s on and 1s off in loop: building LTE connection to mobile provider. Followed by:
  - ⚪ 🟢 ⚪ Short G flash on success.
  - ⚪ ⚪ 🔴 Short R flash after connection failed.
- ⚪ 🟢 ⚪ G flash during installation mode while collecting wireless M-Bus telegrams.

Exceptional patterns

- 🔵 ⚪ 🔴 / 🔵 🟢 ⚪ Quickly changing between R & B and G & B every 5s in a loop: Modem is in connection restriction mode - keep device on power, will fix itself after 30min.

Battery Lifetime Calculator

> **INFO**
>
> Please contact our sales team.

Firmware Updates

The latest firmware can be found here:

- Download latest firmware

> **NOTE**

> A remote firmware update over LoRaWAN is currently not possible.

Configuration

The device is shipped with default configuration parameters. The configuration can be changed via the 6-pin config port using the Lobaro USB Configuration Adapter.

More information about the usage of the configuration tools can be found in our documentation.

> **INFO**
>
> **Remote Configuration** is also supported after initial network connection.

General Parameters

Description	Key	Type	Possible Values	Default
Uplink channel selection	`WAN`	String	`lte` or `lorawan`	`lte`
Days without connectivity until device reset	`LostReboot`	Number	Any, e.g., `3`	`5`

<details>
<summary>Detailed Description</summary>
</details>

Wireless M-Bus Meter Reading

Description	Key	Type	Possible Values	Default
WMBUS Listen Cron [UTC+0]	`listenCron`	String	Any CRON String	`0 0 12 * * *`

Description	Key	Type	Possible Values	Default
WMBUS C1/T1 Listen Duration [s]	`cmodeDurSec`	Number	Number of seconds `0` = Do not collect C1/T1 Max Value=`36000`	`300`
WMBUS S1 Listen Duration [s]	`smodeDurSec`	Number	Number of seconds `0` = Do not collect S1 Max Value=`36000`	`0`
Sensus RF Listen Duration [s]	`xmodeDurSec`	Number	Number of seconds `0` = Do not collect X-Mode Max Value=`36000`	`0`
Müller-Funk Listen Duration [s]	`umodeDurSec`	Number	Number of seconds `0` = Do not collect U-Mode Max Value=`36000`	`0`
WMBUS ID Filter List	`devFilter`	String	List, e.g. `88009035,13456035`	`[not set]`
WMBUS Type Filter List	`typFilter`	String	List, e.g. `08,07`	`[not set]`
WMBUS M-Field Filter List	`mFilter`	String	List, e.g. `DME,ITW,SEN,QDS`	`[not set]`
WMBUS CI-Field Filter List	`ciFilter`	String	List, e.g. `8a,72`	`[not set]`
WMBUS Telegram Upload Limit	`maxTelegrams`	Number	Any number of max. Telegrams `0` = no limit.	`0`

▸ Detailed Description

LTE Connection

Description	Key	Type	Possible Values	Default
LTE Lobaro Platform Host	`Host`	IP / URL	List of various Endpoints	`coaps://platform.lobaro.com`
LTE MCC+MNC Code	`Operator`	Number	e.g. `26201` (Dt. Telekom)	`[not set]`
LTE Band	`Band`	Number	`3` or `8,20` or `3,8,20`	`3,8,20`
LTE APN	`APN`	String	any APN	`*`
LTE SIM Pin	`PIN`	Number	4 digits pin, e.g. `1234`	`[not set]`
LTE NB-IoT on/off	`UseNbiot`	Bool	`true` or `false`	`true`
LTE M1 on/off	`UseLtem`	Bool	`true` or `false`	`true`
LTE DNS Servers used	`DNS`	IP	List of DNS server IPs	`9.9.9.9,1.1.1.1`
Plain UDP Host	`UdpHost`	IP	any, e.g `94.130.20.37`	`[not set]`
Plain UDP Port	`UdpPort`	Number	any, e.g `3333`	`[not set]`

▸ Detailed Description

LoRaWAN Connection

Description	Key	Type	Possible Values	Default
DevEUI	`DevEUI`	byte[8]	any	`Device EUI64`
AppEUI / JoinEUI (1.1)	`AppEUI` / `JoinEUI`	byte[8]	any	`random`
AppKey	`AppKey`	byte[16]	any	`random`
NwkKey (1.1)	`NwkKey`	byte[16]	any	`00000000000000000000000000000`
Days between Timesync	`TimeSync`	Number	any	`3`
Payload Format	`PayloadFormat`	Number	`0`, `1`, `2`	`0`
use OTAA	`OTAA`	Bool	`true` or `false`	`true`
Random TX Delay [s]	`RndDelay`	Number	any	`10`
Spreading Factor	`SF`	Number	7-12	`12`
Transmission Power	`TxPower`	Number	2-14	`14`

Description	Key	Type	Possible Values	Default
Adaptiv Data Rate	`ADR`	Bool	`true` or `false`	`true`
LoRaWAN max. Payload Length	`loraPLMax`	Number	10 to 241	`100`

▸ Detailed Description

Modbus Reading

Description	Key	Type	Possible Values	
Modbus address for internal	`modbusInternalAddress`	Number	0..255	
Number of readouts to be uploaded together (saves energy)	`addonAccumulate`	Number	1-60	
Modbus configuration and list of commands	`modbusCmdConf`	String		`R,9600,8N1:0103000200`
LoRaWAN Payload	`loraFormat`	Number	'1', '4', '5'	

Description	Key	Type	Possible Values	
Format Modbus				
Time to wait (in ms) before executing the commands	`PowerOnDelay`	Number	0-60000	
Number of seconds to power Modbus after gateway 1st power on	`PwrAfterBrownoutDur`	Number	0-3600	

▸ Detailed Description

OneWire Multi-Temperature Sensor Reading

Description	Key	Type	Possible Values	Default
Number of readouts to be uploaded together (saves energy)	`MTempAcc`	Number	1-600	1
List of sensor IDs or `*` for scanning	`MTempIDs`	String		`*`
Include Sensor ID in upload (LoRaWAN)	`MTempSendID`	Bool	`true` or `false`	`false`

▸ Detailed Description

Special

Description	Key	Type	Possible Values	Default
Verbose UART Log	`verbose`	Bool	`true` or `false`	`false`
Addon RAM configuration	`extRam`	String	Lobaro Internal	`[not set]`
Live Mode	`liveMode`	String		`[not set]`
Operation Mode	`opMode`	Number	Lobaro Internal	`1`

▸ Detailed Description

Modbus Config Generator

> **NOTE**
>
> The Modbus request syntax for `modbusCmdConf` complies with the Modbus specification, except that the 16-bit CRC at the end is omitted.
>
> More Info: Modbus Request Syntax.

Bus Configuration

Protocol

Modbus RTU

Baudrate

9600

Data Length

8 bits

Parity

Stop Bits

None | 1 bit

Commands

Server Address	Function	Address	# 16-Bit Register	
0x 01	03 Read Holding Registers	0x 0000	0x 0003	

+ Add command

"modbusCmdConf" Result:

`R,9600,8N1:010300000003`

Estimated memory consumption of all responses:

33 Byte

Maximum number of Modbus responses

To cache the Modbus responses 4096 byte are reserved in the internal RAM. The memory consumption can be calculated with the Modbus Config Generator. This memory consumption multiplied by the accumulation factor `addonAccumulate` must not exceed 4096 byte.

When using LoRaWAN a single response must not exceed the maximum payload size `loraPLMax`.

PLAUSIBILITY CHECKS

When powered up the gateway checks the parameters for plausibility. If invalid parameters or parameter combinations are detected the configuration is not accepted and must be fixed.

Upload Formats LoRaWAN

LoRaWAN Port	Uplink Message
1	Status Message
3-5	Data Packet - Verbose
20	Data Packet - Compact
30, 31	Temperature Measurement Data
200..223	Data Packet - Compact (consecutive)

MORE DETAILS

For a detailed specification of the payload formats, please refer to the LoRaWAN Communication page.

Upload Formats LTE

CoAP Protocol

The protocol details of the CoAP implementation are not publicly disclosed and are intended for use exclusively with the Lobaro IoT Platform. For integration with third-party systems, MQTT is the preferred protocol.

If you require access to this and MQTT is not an option, please contact Lobaro directly.

MQTT Protocol

INFO

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Example JS Parser

INFO

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Declaration of Conformity

	Download CE declaration of conformity

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