

# Firmware & Changelog (LOB-GW-DINRAIL-HYB-MODBUS)

## Firmware Downloads

Firmware	Comment
<ul style="list-style-type: none"><li>#8000171 (Hybrid Modbus Gateway V2 (Battery))</li></ul>	
<a href="#">app-hybrid-modbus-TZ2-0.10.2+battery-mcuboot-slot0-boot.hex</a>	current version for <b>battery</b> powered variant
<a href="#">app-hybrid-modbus-TZ2-0.10.2+battery-mcuboot-slot1.hex</a>	for remote update via the Lobar Platform only
<ul style="list-style-type: none"><li>#8000166 - Hybrid Modbus Gateway (ext. Power, 230V)</li><li>#8000159 - Hybrid Modbus Gateway (ext. Power, Din-Rail)</li></ul>	
<a href="#">app-hybrid-modbus-TZ2-0.10.2+dinrail-mcuboot-slot0-boot.hex</a>	current version for <b>externally</b> powered variants
<a href="#">app-hybrid-modbus-TZ2-0.10.2+dinrail-mcuboot-slot1.hex</a>	for remote update via the Lobar Platform only
<a href="#">app-boot-nrf9160-sec-TZ2-1.8.2-mcuboot-slot1.hex</a>	Secure Firmware for remote update only

## Changelog

app-hybrid-modbus – Modbus over various WAN technologies.

This changelog's format is based on [Keep a Changelog](#), and this project adheres to [Semantic Versioning](#).

### Planned features

- Execute Modbus Commands per LTE-Downlink
- Modbus TCP (DIN-rail only).
- "auto" wan feature.
- Enhanced dialog mode.

### 0.10.2 - 2023-10-13

#### Fixed

- Fix a problem with using wireless M-Bus together with Ethernet

#### Added

- Add special command for reading Volltel Modbus pressure + temperature probe.

### 0.10.1 - 2023-09-05 (I2C only)

#### Changed

- Give feedback on pressure probe on "Firmware" tab in Lobar Config Tool.
- Print raw pressure in Log and "Firmware" tab, to enable calibrating pressure probes.
- Change default LoRaWAN upload format to include raw pressure and devices temperature and voltage.

### 0.10.0 - 2023-08-31 (I2C only)

#### Added

- Firmware supports alternative I2C-Board, that can be used to connect pressure probes by Volltel or Keller (no support for Modbus on that board).
- (I2C only) add support for Volltel and Keller I2C pressure probes.

## 0.9.3 - 2023-08-08

### Fix

- Fix a crashing Bug in dialog mode.

## 0.9.2 - 2023-08-08

### Fix

- Fix a crashing Bug that could trigger when using LoRaWAN Mode C.
- Fix a problem with using wireless M-Bus together with LoRaWAN (not yet)

### Changed

- Change internal handling of serial peripherals.

### Added

- Add basic support for secondary addresses in wired M-Bus.

## 0.9.1 - 2023-06-13

### Fixed

- Fix a situation that could lead to broken sockets and hence failing uplinks when using LTE with long modbus readouts.
- Battery variant: Fix a 22  $\mu$ A leakage current in idle mode when SD is not present and  $\sim 400$   $\mu$ A when it is present (leakages were introduced in 0.9.0).

### Added

- Introduce config parameter `advanced` for developer options.

## 0.9.0 - 2023-06-06

### Added

- Upload of wired MBus and wireless MBus via LoRaWAN.
- LoRaWAN port 102: wMBus telegrams with meta info, sliced if too long (same format as on port 102 in wMBus Gateway).
- LoRaWAN port 110: upload of discovered wired MBus slaves after boot, when scanning is used (\* in mBusCmd).
- LoRaWAN port 112: wired MBus telegrams with meta info, sliced if too long.
- Use of SD-Card, when one is inserted: save all collected data in CSV-files (experimental, format may change).

### Fixed

- Report correct reboot reason via LTE upload.
- Fix assert when running into LoRaWAN duty cycle with retransmission pending (just drop retransmission instead).

### Changed

- Require boot firmware v1.8.2.
- Update to use new nrf modem lib v2.2.1.
- More information in scheduler logging (show execution IDs).
- Change Upload-Queue size to 1 when using LoRaWAN, so that when uplink is blocked by duty cycle, reading of data is blocked - so that uploaded data is recent, when operating on duty cycle limit.
- Add voltage, temperature, and connection information to status message.
- Change status cron to `HH H(0-5)/6 * * *`, so that multiple devices will distribute status messages over the day, to keep platform from being overloaded.
- Limit maximal wMBus collection duration to 15 minutes.

## 0.8.5 - 2023-01-12

### Changed

- Changed LED pattern on battery version. First 15 minutes, the LED will signal sensor/uplink state every 2 seconds. After 15 minutes, it will only blink once every minute (to save battery power).

## Fixed

- Optimise RF-Switch control to reduce power consumption on sleep without losing connection quality during communication.
- Fix upload of Sensus-RF (X-Mode) and Müller Funk (U-Mode) telegrams.
- (battery only): remove high power consumption after collecting wMBus-telegrams.

## 0.8.3 - 2022-12-14

## Fixed

- Fix handling of large batch uploads of wMBus-Telegrams via LTE (batches are now split into multiple uplinks correctly).

## 0.8.2 - 2022-12-12

## Fixed

- Fix LTE-connection issues that could lead to bad reception (DIN-Rail only).

## 0.8.1 - 2022-12-02

## Added

- Add internal testing-registers 8192-9215 (0x2000-0x23ff) with uint16 numbers 0-1023.

## 0.8.0 - 2022-11-28

## Added

- LAN connection to backend (DIN-rail only). Set WAN to ethernet.

## Fixed

- Do not execute same command twice on App level if received a second time.
- (LoRaWAN) responses to DL-Modbus-Commands (via port 4) are now responded to on port 4, as intended.

## 0.7.3 - 2022-10-07

## Fixed

- Fix broken upload that happened when wired MBus discovery was used and no device was found.
- Fix antenna configuration that was broken on some older hardware revisions (DIN-rail only).

## 0.7.2 - 2022-09-28

## Changed

- Change time sync requests on startup, to better cope with network servers that cannot handle time sync requests well. If time sync on initial status message fails, retries on port 0. Gives up after 3 retries.

## 0.7.1 - 2022-09-27

## Fixed

- Fix handling of wMBus telegrams with App-Level ID/Manufacturer.
- Fix handling of Sensus-RF IDs.
- Fix filtering of Sensus-RF (X-Mode) and Mueller-RF (U-Mode) telegrams.
- Fix handling of Qundis IDs on DifVif level.

## 0.7.0 - 2022-09-08

## Added

- Support collection and upload of wMBus telegrams.

## Changed

- Update nordic modem lib to v2.1.3
- Enhanced uplink retries and dial-up logic.
- Use high precision clock when communicating via Modbus. This will make communication consistently work with devices that communicate far outside the proclaimed Baud rate.
- Use language standards C17 and C++20.

## 0.6.1 - 2022-08-22

## Fixed

- Execute confirmation of Firmware and Config change in all configurations.

## 0.6.0 - 2022-08-18

## Changed

- **breaking**: Changed LTE-Uplink format for supporting batch uploads. Individual readouts for all supported data uplink types (`modbus`, `mbus`, `wmbus`) are groups in a cbor-array, that is sent under the key `batch`.
- Change LTE dial-up logic and uplink logic, to work better with Firmware concept.

## Added

- Retries (potentially with reconnect) for each Uplink on upload failure.
- Retry/reconnect during FW update, when connection breaks.
- Multiple config-parameters added, that will be used for wireless M-Bus support (wMBus mode is still WIP and experimental - parameter names might change in the future).

## Fixed

- Adopt remote config when using LoRaWAN.
- Check for Duty-Cycle for each individual Uplink before uploading for remote command responses (did lead to reboots in certain situations).

## 0.5.1 - 2022-05-06

## Changed

- Adjust to changes in Modem driver.
- Adjust to new modem firmware version.

## Fixed

- Fix Modbus with UART 7E1 (was not working in previous version).

## 0.5.0 - 2022-04-19 prerelease

## Added

- Support wired MBus readout (REQ\_UD2) via RS-485 (needs adapter hardware).
- New Config Parameter `MbusCmd`.
- Autodetect feature for discovering wired MBus-Slaves.
- New uplink types `mbus` and `mbus-scan`.
- Caching of Operator/Band LTE parameters after first connection (if not set explicitly).
- Autodetect APN when using special value `*` for APN config parameter (currently working for 1nce cards only).

## Changed

- LTE Modbus uplinks are now identified in envelope by `"q": "modbus"` (was: no `"q"` entry).

## 0.4.0 - 2022-03-17

### Changed

- Change LTE upload format to put Modbus Commands/Responses of a single entry in the same uplink as array (up to 10kB).

## 0.3.1 - 2022-03-16

### Changed

- Increase size usable for config (allow for much bigger config/longer modbus commands).
- Verify on boot that secure firmware is of sufficient version.

## 0.3.0 - 2022-03-11

### Added

- DNS and DTLS support for NB-IoT/LTE-M.
- Revert temporary config (from remote command), if backend cannot be reached.
- Revert temporary firmware (from remote update), if backend cannot be reached.
- Add virtual internal modbus device to bridge, that can be addressed to read internal values (current time, internal modem temperature, current voltage) on address 0xfa=250 (configurable).
- New config parameter `InternalAddress`.
- Add Lost Reboot feature for LoRaWAN that resets device if LoRaWAN is network connection is lost.
- New config parameter `LostReboot`.
- (battery only) Add config parameter `ExternalAntenna` to support use of external antenna.
- Feedback for power on self test of modbus commands.

### Changed

- (battery only) Adjust power-off-setting for new add-on to avoid leakage.
- Config parameter `Host` now supports optional protocol prefixes `coap://` and `coaps://`.
- Set default host configuration to `coaps://platform.lobaro.com`.
- Add voltage and temperature to LoRaWAN status message.

## 0.2.1 - 2022-02-14

### Added

- Support for LoRaWAN Class C.
- New Config Parameter `OpMode` for selecting Class A or Class C operation mode for LoRaWAN.
- Add Lost-Network feature for LTE.

### Fixed

- Removed double status message uplink on boot for LoRaWAN.

## 0.2.0

### Added

- Support for battery powered hardware variant, using mikrobus-rs485-var nrf-addon-rs485-VBat-rev1.
- (Battery only) Add config parameter `PowerOnDelay` for letting attached slaves power up.

## 0.1.5

### Added

- Allow 8E1 in UART config.

## 0.1.4 - pre-release 2021-11-23

### Added

- Add additional compact LoRaWAN payload formats known from the LoRaWAN Bridge device.
- Add config parameters `PLFmt`, `PLMax`, `PLId` for controlling the LoRaWAN payload format.

## Fixed

- A timing issue could lead to the dialog mode not working properly.

## 0.1.3 - pre-release 2021-11-17

### Added

- Interactive Dialog Mode for testing setups.
- LED feedback about state of Modbus and WAN connections.
- Execute Modbus Commands remotely via LoRaWAN Downlink.

## 0.1.2 - pre-release 2021-11-15

- This is a pre-release! It is neither complete nor fully tested!

### Added

- Support for NB-IoT, LTE-M, and LoRaWAN.
- Downlinks for remote config (all WAN technologies) and firmware updates (NB-IoT and LTE-M only)

## Dependencies

- Boot Firmware  $\geq 1.7.1$
- Modem Firmware  $\geq 1.2.0$

## 0.1.0 - 2021-07-02

### Added

- Start new app for Hybrid NB-IoT/LoRaWAN Modbus Gateway.