MUTELCOR ⟩

LoRa Multi-Function Device
MTC-XX-MF01

Quick Start Guide

Thank you for choosing Mutelcor GmbH.
We are proud to be part of your project.

1. Need Help?

For any other query related to our product, please contact the local distributor or Mutelcor at
support@mutelcor.com

2. Manufacturer

Mutelcor GmbH: An der Bastei 42a, 47259 Duisburg, Germany

Office: +49 203 72996070, Fax: +49 203 72996071, Web: www.mutelcor.com

3. Safety

Read the instructions carefully before device installation, operation and maintenance.

1	For enhanced water protection, the device is delivered with an additional layer of waterproof tape of gland (see Fig. 3.1)
2	Maintenance and repair must be carried out by qualified personnel authorized by reseller
3	Keep the device away from any hot surface
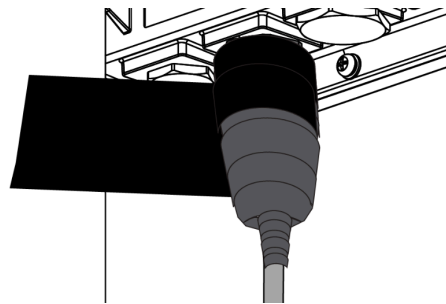
Fig. 3.1
(Wrapping with Waterproof Tape)

4. Product Description
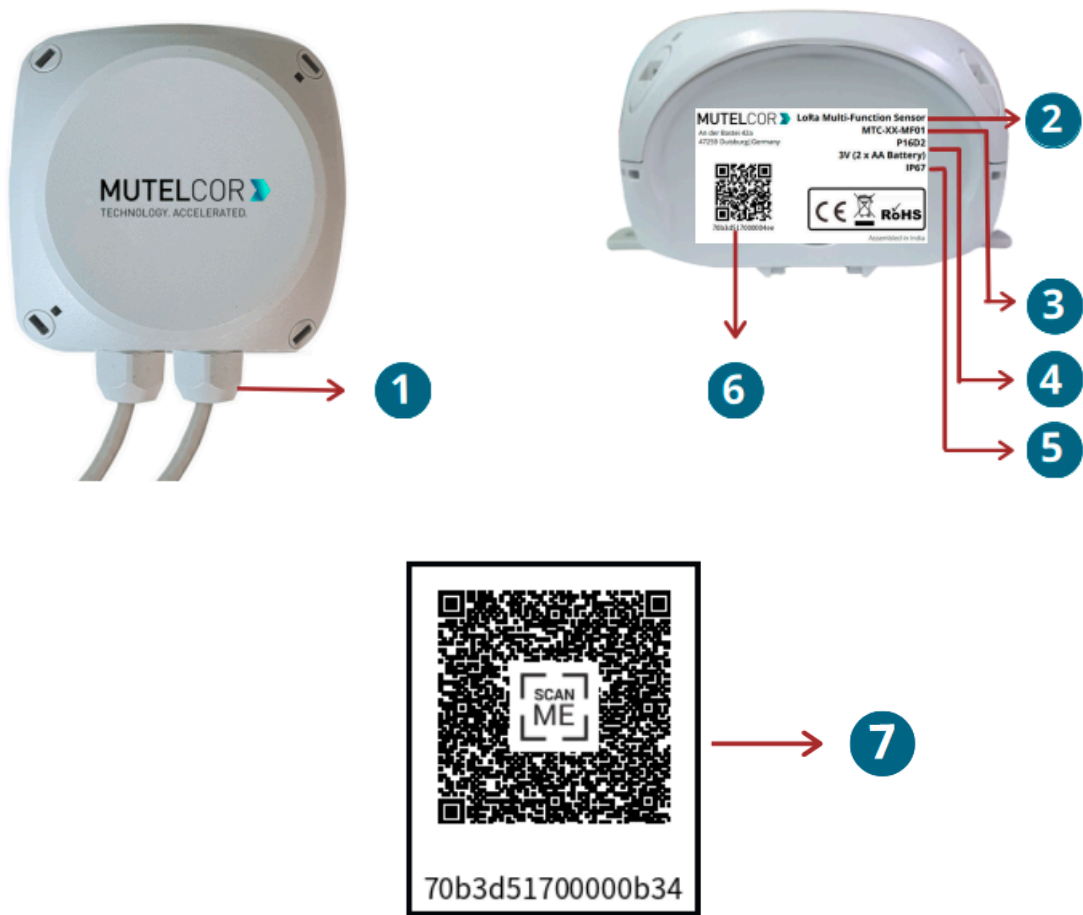
At a Glance

No.	Description		No.	Description
1	Switch Input Glands		5	Ingress Protection
2	Model Name		6	DevEUI with QR code
3	Module ID		7	Device info Access Sticker (optional)
4	Voltage			

5. Opening and Closing the Device

(i)	• Always wear gloves or keep your hands dry while handling the PCB • Do not touch the circuitry part of the PCB with bare hands

For reset or replacing the batteries, opening of the enclosure is needed.

Opens quickly by quarter of turn, opened position is easily visible
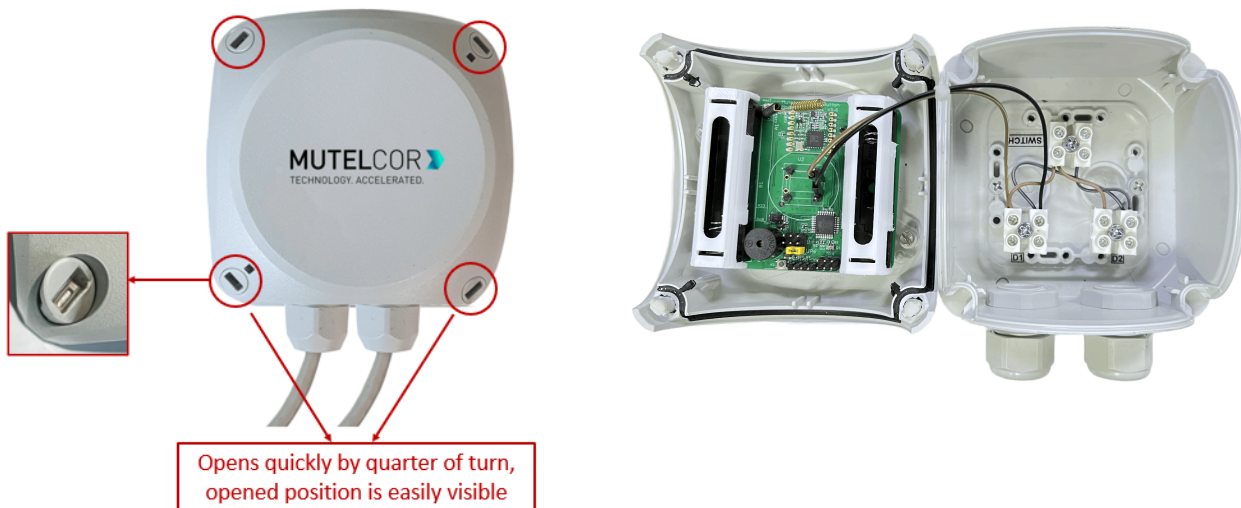
Fig 5.1

For opening the PCB Enclosure, follow the following steps:

1. Unscrew the four screws (by a quarter of turn) on the top front sides of the PCB Enclosure.
2. Gently separate the top and bottom cases.
3. After insertion, replacement or reset, close the top and bottom of the enclosure together and tighten all the four screws by quarter of turn.

6. Insertion & Replacing the Batteries

ⓘ	• Open the device for replacing the batteries • Always wear gloves or keep your hands dry while handling the PCB • Do not touch the circuitry part of the PCB with bare hands • Do not use sharp objects to Insert/remove the batteries

For inserting and replacing the batteries, please follow the steps described below:

1. Open the PCB Enclosure as mentioned in section 5 'Opening and closing the device'.
2. To insert the batteries, **lift two white battery caps** as shown in fig 6.1
3. When replacing the batteries: Hold the PCB and carefully remove the batteries from the holders
4. Insert 2 new AA-Alkaline good quality batteries and make sure the positive (+) and negative (-) ends of batteries are facing in the correct direction
5. Cover the battery holders along with inserted batteries using **two white battery caps** as shown in fig 6.2
6. Once the batteries are inserted, follow the instructions in section 5 "Opening and Closing the Device" to close the PCB Enclosure

Fig 6.1

Fig 6.2

The insertion or replacement of the batteries will trigger the device to register to the LoRaWAN network. To verify the device joined successfully, please check on your LoRa Network Server. This implies that the device is activated in a LoRa network successfully and will send heartbeats and alarms via LoRa.

Note: If rejoining of the device fails, one can manually reset the device as described in section 10 "Resetting the Device"

7. Activation of the Device

	• LoRa Multi-Function Sensor must be provisioned in the LoRa network before activation, as otherwise it will continuously send join requests towards the network, which may result in quicker battery discharge • Device can be installed in outdoor environment

The device will automatically try to register on a LoRaWAN network upon activation. To verify the device joined successfully, please check on your LoRa Network Server. This implies that the device is activated in a LoRa network and will send heartbeats and alarms via LoRa.

Every time a connected switch changes it's status, the following happens by default:
- The buzzer gives a short chirping sound
- Alarm message sent via LoRa is repeated two extra times. Each repeat is sent after 10 seconds on a different frequency and with an increased frame counter

For all details on the payload sent on LoRa, changing values via OTAA, provisioning of the device in a LoRa network, please contact the local distributor or Mutelcor GmbH at support@mutelcor.com

Note: If the buzzer in the device continuously beeps in every 8-second interval, then there is a software error. When this happens the device must be returned for repair. Please immediately contact your reseller or Mutelcor GmbH at support@mutelcor.com

QR code sticker: All devices are QR-Ready. If requested, we can activate this feature to allow reading the current battery status by simply scanning a QR code. Please contact us for activation of this service. Please contact the local distributor or Mutelcor GmbH at support@mutelcor.com

8. Connecting external Switches to the Device

Connecting Bottom enclosure plate
for external Connection

Fig 8.1

External Switch Input Connection

Fig 8.2

D1 : Switch Input 1 (Polled at a configurable interval)
D2 : Switch input 2 (Polled at a configurable interval)
SWITCH : Switch Input (Continuously monitored without a delay)

Digital Input Cable entry via integrated switch input gland in enclosure walls.

Terminal Connector

Digital Input
Terminal Connection
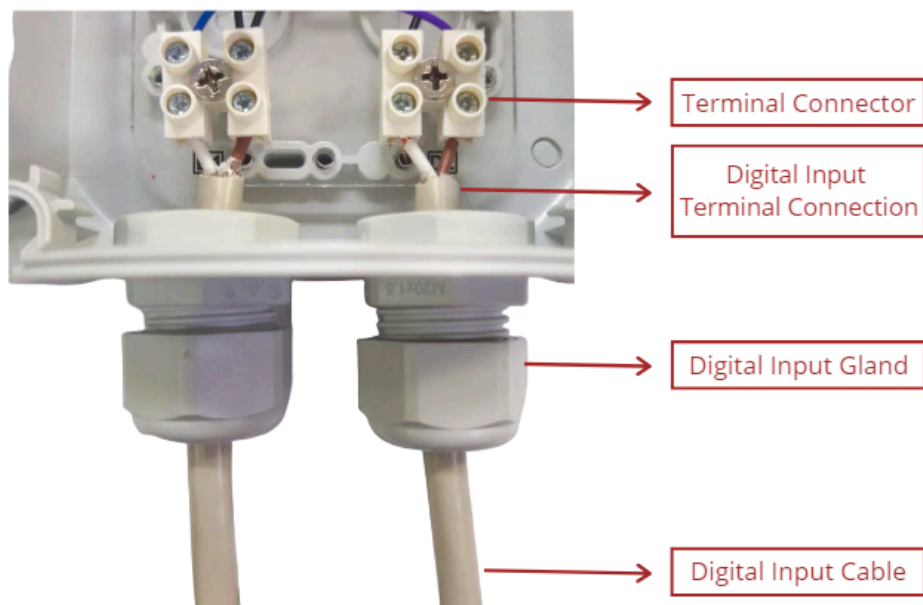
Digital Input Gland

Digital Input Cable

Fig 8.3

Terminal Connections: Terminals shall be able to accommodate two or more conductors of the same or different nominal cross-section or combinations. Terminals shall be able to accommodate rigid and / or flexible unprepared conductors.

Fig 8.4

All terminals are equipped with two clamping units per pole and allow the connection of various conductor cross sections and as well different conductor types with ease.

There is the possibility to add up to 3 different switches to the device. There are 3 different connectors on the inside of the device (see Fig. 8.1 and 8.2):

1) Switch: Any switch connected to this pin will immediately trigger a LoRa message on a status change. As soon as the value provided by the sensor changes from 0 to 1 or back, immediately a LoRa message indicating this change will be sent.

Switch Input 1 and Switch Input 2: Those pins are measured at a configurable interval via OTA. The default interval is 8 seconds. Whenever a status change is detected, a LoRa message indicating this change will be sent.

9. Mounting

⚠️	Multi-Function Device can be mounted on the wall

External brackets for fastening are always included. Oblong holes provide easy mounting and adjustment.

External Bracket

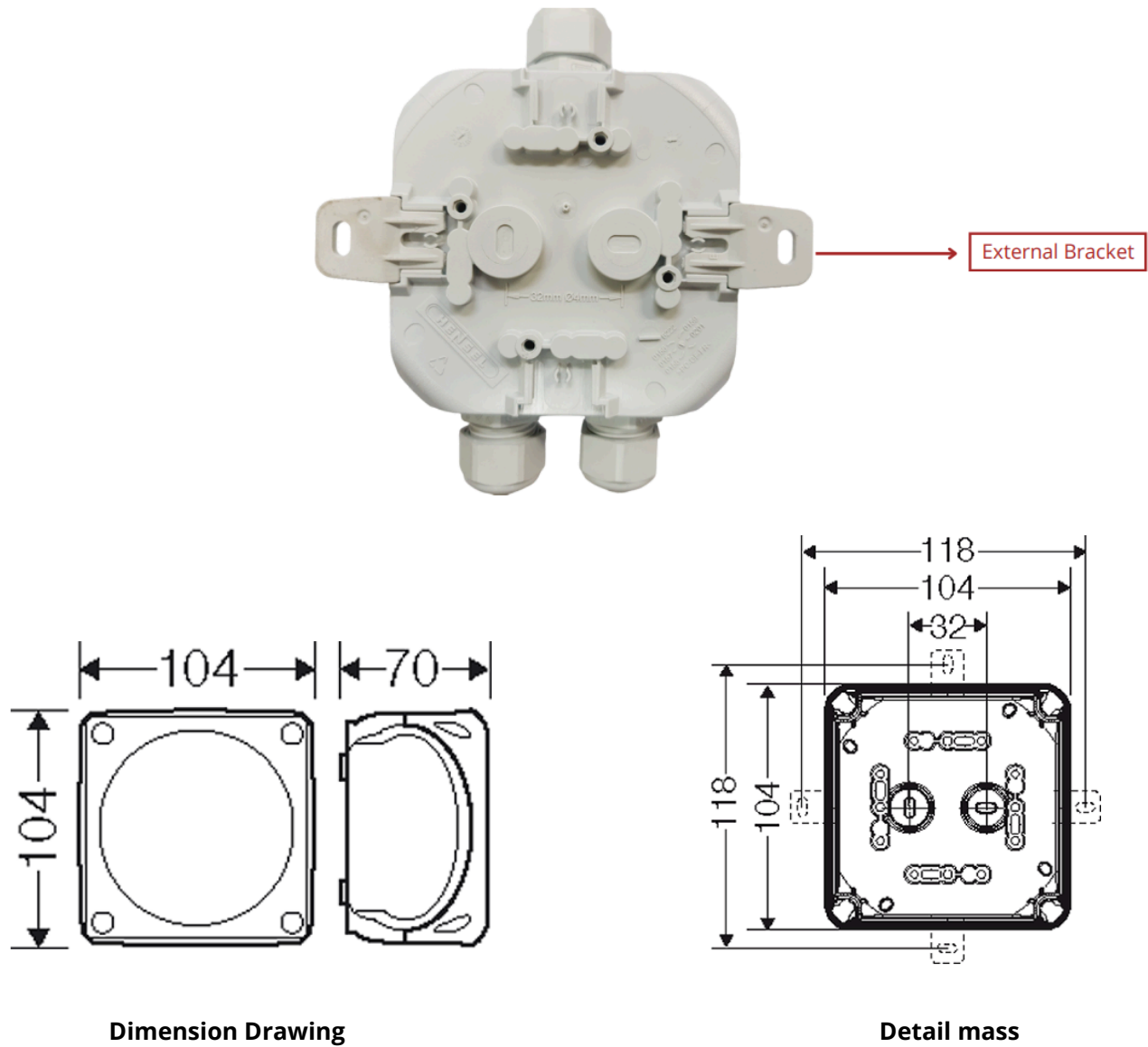**Dimension Drawing**

Detail mass
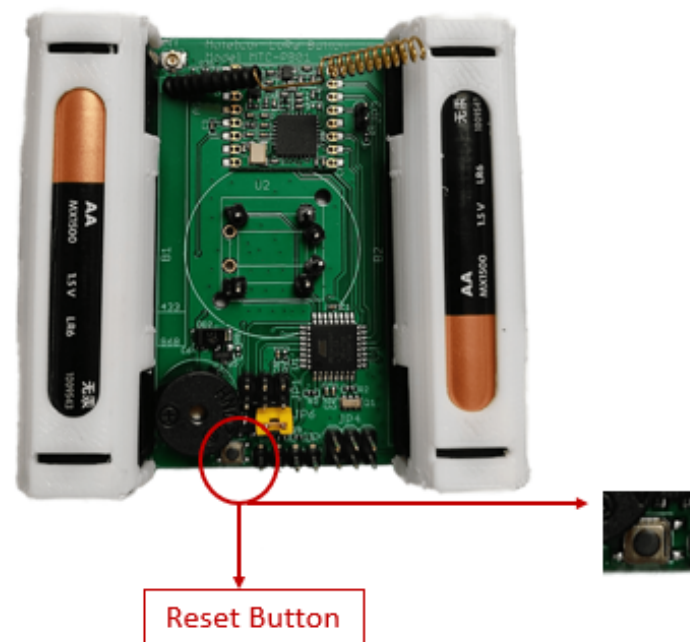
Fig 9.1

10. Resetting the Device

	● Open the Enclosure for resetting PCB ● Always wear gloves or keep your hands dry while handling the PCB ● Do not touch the circuitry part of the PCB with bare hands ● Do not use sharp objects to press the reset button

Resetting the device may be needed, in case re-register the device into the LoRa network.
For resetting please follow the steps described below.

1. Open the PCB Enclosure (for details, refer to section 5 "Opening and Closing the Device")
2. Position and hold the PCB as shown in fig 10.1.
3. Ensure 2 AA-Alkaline Batteries are inserted in the battery holders.
4. On the PCB, observe carefully a small reset button as shown in fig 10.1
5. Press (do not hold) the button shortly for a second

The reset will trigger the device to re-register to a LoRaWAN network. To verify the device joined successfully, please check on your LoRa Network Server. This implies that the device is activated in a LoRa network and will send heartbeats and alarms via LoRa.

Reset Button

Fig 10.1

11. Technical Specifications

Model Name	LoRa Multi-Function Device		Enclosure Dimension	104 x 104 x 70 mm
Module ID	P16D2		Net Weight	350 g
Model No	MTC-XX-MF01		Battery life	5 Years
LoRaWAN Version	MAC V1.0.3		Ingress Protection	IP68
Model No. (XX) LoRa Frequency	EU: EU 863-870 IN: IN865-867 US: US 902-928 AU: AU915-928 AS: AS923-1 KR: KR920-923 IL: AS923-4 OTAA and ADR supported		Voltage	3V (2 x AA-Alkaline Battery)
Transmission Power	Max 25mW (14 dBm)		Operating Temperature	-18°C to +55°C

12. Declaration of Conformity

Hereby, Mutelcor GmbH, declares that the Product is in conformity with the essential requirements of Article 3.1 (a) the protection of the health, 3.1 (b) an adequate level of electromagnetic compatibility and 3.2 effective use of the spectrum of 2014/53/EU

The CE mark appears due to the issued declaration of conformity under responsibility of Mutelcor GmbH as manufacturer, who declares that the used radio equipment is in compliance with relevant EC Directives. For any further information, please contact Mutelcor GmbH at support@mutelcor.com

In Europe, the Sensor also complies with EN62479 and ERC requirements regarding duty cycle and maximum EIRP

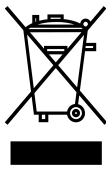## 13. Product complies and Directives

RoHS   C E   ETA   **Equipment Type Approval (INDIA)**
Issue by Wireless Planning and Coordination (WPC)
DEPARTMENT OF TELECOMMUNICATIONS

14. Disposal / Recycling

	• Do not dispose of the product with household waste. For proper disposal, contact a waste disposal company • Discharge batteries store in a plastic or cardboard container that doesn't conduct electricity in case there is a spark • Search the area for recycling centers that accept single-use batteries using Earth911's Recycling Search. • **WEEE-Reg.-Nr.: DE 71445608**

15. Warranty

Contact your reseller for warranty

WARRANTY	LoRa Manhole Sensor is not warranted by Mutelcor GmbH in case the enclosure is modified, broken, painted, branded out, outlined for any reason

The forgoing is buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Mutelcor GmbH be liable for any consequential, special or incidental damages.

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