LoRa Manhole Sensor

MTC-XX-MH01

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

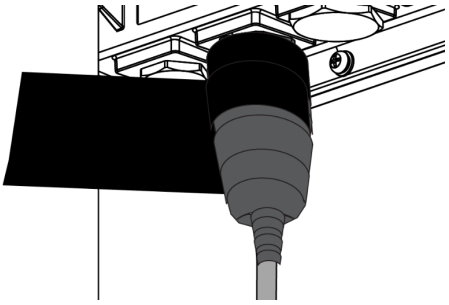
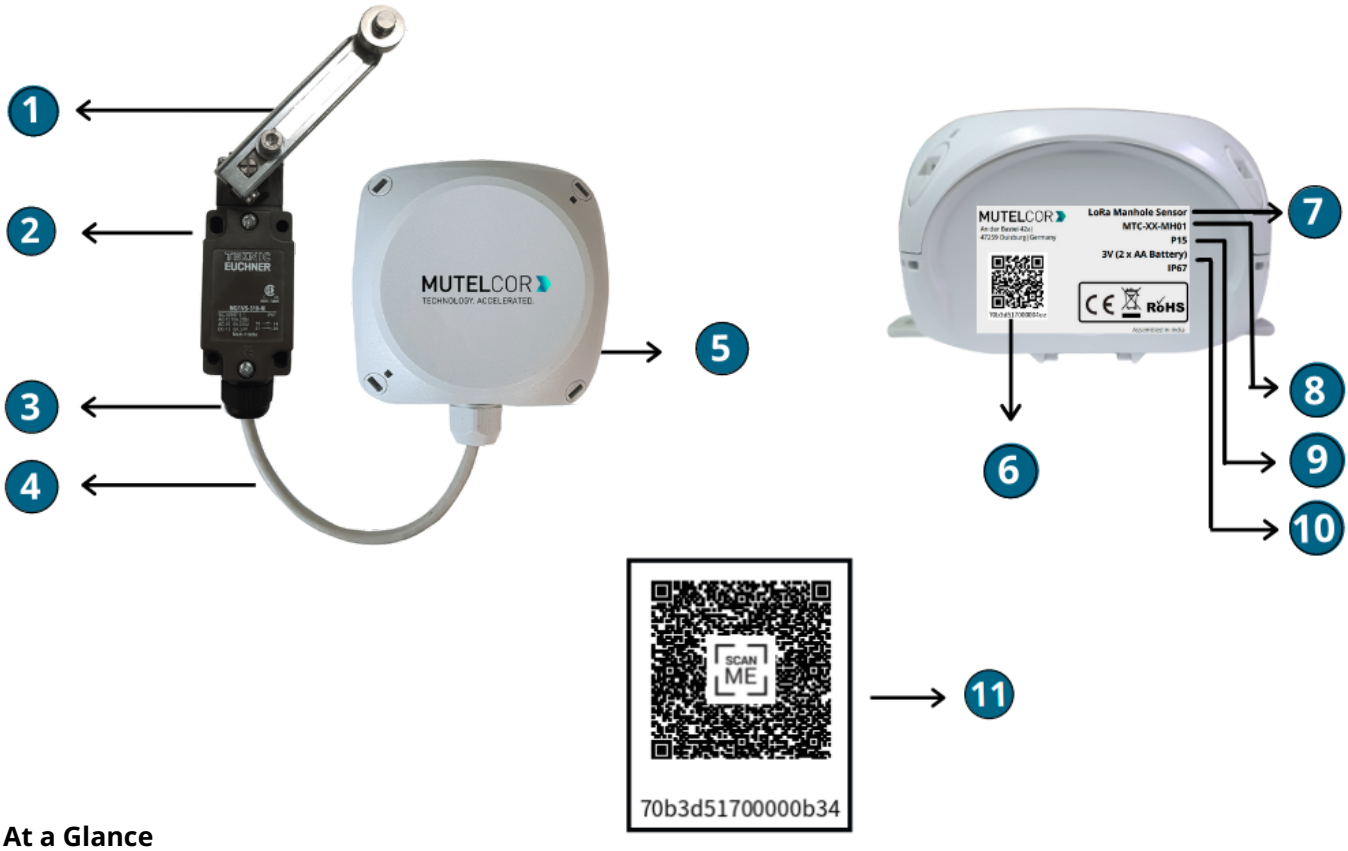


Fig. 3.1
(Wrapping with Waterproof Tape)

4. Product Description



At a Glance

No.	Description		No.	Description
1	Lever operating head		7	Model Name
2	Limit switch		8	Module ID
3	Cable gland		9	Voltage
4	Connecting cable		10	Ingress Protection
5	PCB Enclosure		11	Device info Access Sticker (optional)
6	DevEUI with QR code			

5. Opening and Closing the Device

	• 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, inserting or replacing the batteries, opening of the device is needed as described below:.

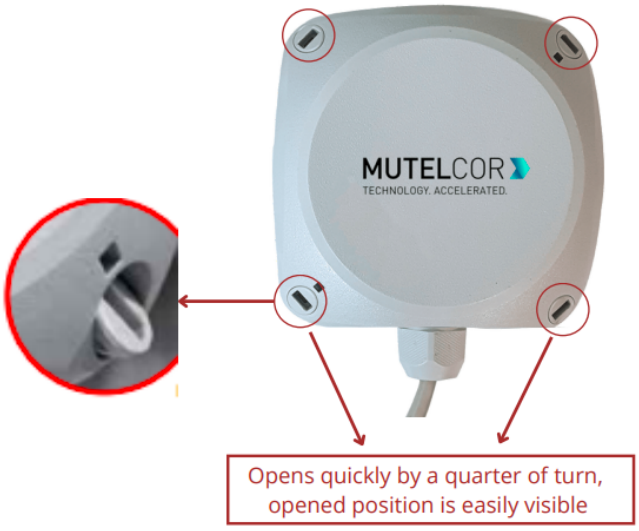


Fig 5.1

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
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

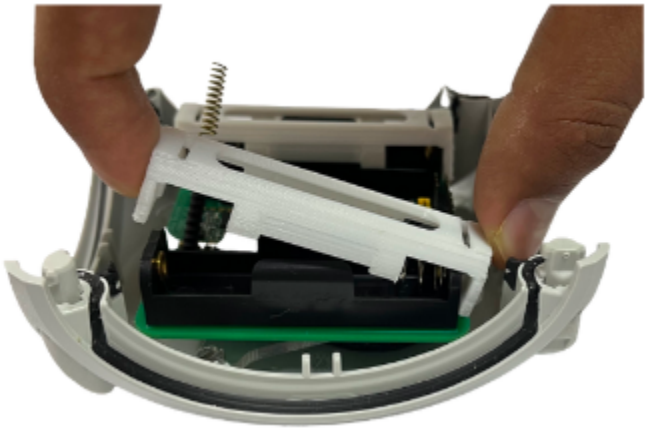


Fig 6.1

Fig 6.2

The insertion or replacement of the batteries will trigger the device to register to the LoRaWAN network. Upon successful registration the device will trigger 3 short beeps (chirps) in rapid succession. 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 9 “Resetting the Device”

7. Activation of the Device

	• LoRa Manhole 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 • Default condition of the Manhole sensor is open state

The device will automatically try to register on a LoRaWAN network upon activation. Upon successful registration to the network, the device will trigger 3 short beeps (chirps) in rapid succession. This implies that the device is activated in a LoRa network and will send heartbeats and alarms via LoRa.

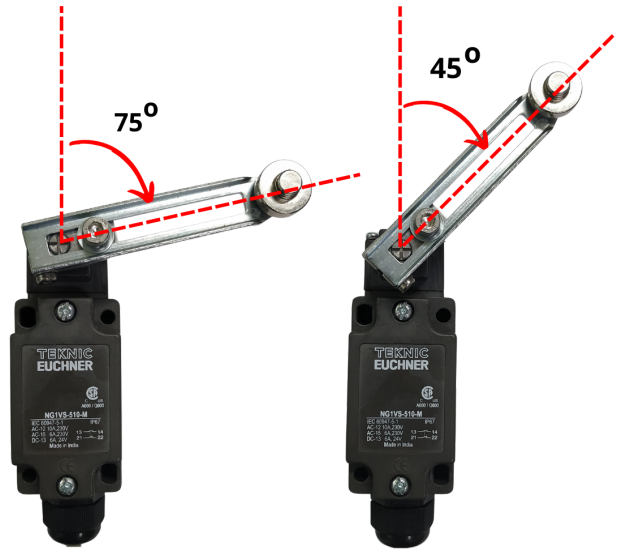


Fig 7.1

Every time the Manhole is closed or opened (ref Fig 7.1), following happens by default:

- When Manhole is closed the buzzer sounds for 30 seconds.
- When Manhole is opened the buzzer will give 3 short beeps. The sound toggles every 0.25 seconds.
- 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. Mounting

⚠	Manhole Sensor Device should be mounted on the wall inside the Manhole

Mounting Option

(With individual mounting clips)

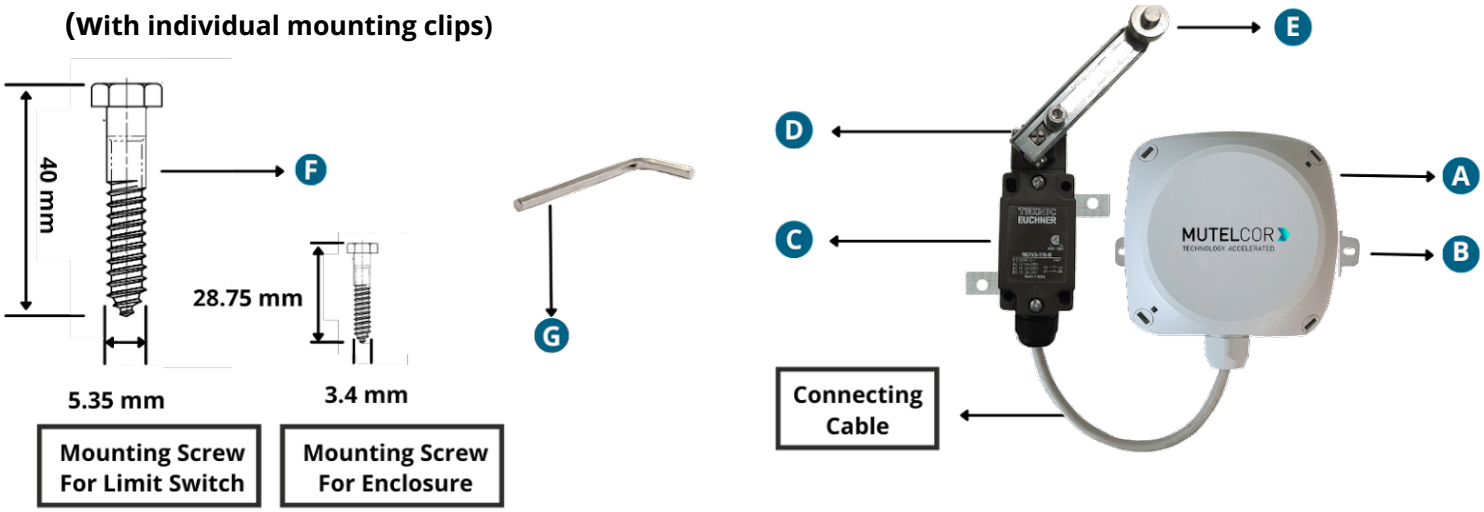


Fig 8.1

To ensure best product performance, instructions are as follow:

- Should be mounted inside the Manhole below the Manhole cover
- Wall surface should be strong enough to hold the Manhole sensor device

Mounting of PCB Enclosure, Limit Switch and adjustment of Lever height

1. Mount PCB enclosure (**A**) on the wall inside the Manhole at suitable position by using the two screws (Available) (**F**)
2. Mount Limit switch (**C**) on the wall inside the Manhole using two screws (Available) (**F**) at a position so that head of the lever (**E**) touches bottom surface of the Manhole lid/cover, adjusting the lever height by loosening/tightening the screw (**D**) with the help of Allen Key (size= 4mm, Available) (**G**)

Notes:

- PCB Enclosure (**A**) and Limit Switch (**C**) are provided with prefixed mounting clips (**B**)
- The height of the Lever of Limit switch can be adjusted from 35 mm to 83 mm
- The hole size on the mounting clip is 6mm

9. Resetting of the Device

	• Open the PCB 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. Ensure 2 AA-Alkaline Batteries are inserted in the battery holders
3. On the PCB, observe carefully a small reset button as shown in fig 9.1
4. Press (do not hold) the button shortly for a second

The reset will trigger the device to re-register to a LoRaWAN network. Upon successful registration the device will trigger 3 short beeps (chirps) in rapid succession. This implies that the device is activated in a LoRa network and will send heartbeats and alarms via LoRa.

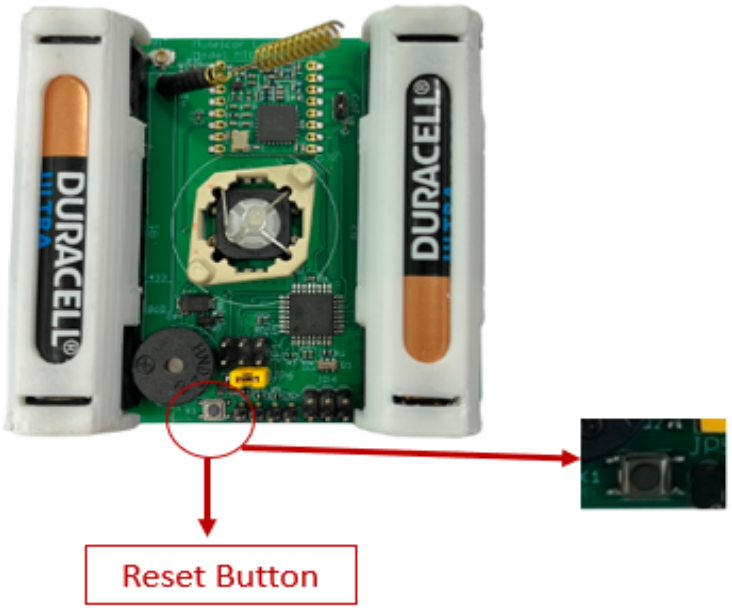


Fig 9.1

10. Technical Specifications

Model Name	LoRa Manhole Sensor		**Enclosure Dimension**	104 x 104 x 70 mm
Module ID	P16		**Cable length:**	500 mm
Model No	MTC-XX-MH01		**Battery life**	5 Years
LoRaWAN Version	MAC V1.0.3		**Limit switch Dimension:**	192 x 104 x 70 mm
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
Net Weight	659g		**Ingress Protection**	IP67

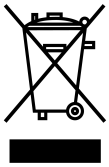
11. Declaration of Conformity

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

12. 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**

13. Product complies and Directives

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

14. Warranty

Contact your reseller for 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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We stay at your disposal for any help on your project requirements

Mutelcor GmbH Team