

MORAN SMART METER - USER TECHNICAL MANUAL

Model: Moran Prepaid Ultrasonic Water Meter

Sizes: DN15 & DN20 and **Flow Rate (Q3):** 4 m³/h (DN20) ,2.5 m³/h (DN15)

Communication: GPRS

Power Source: ER26500C 3.6 V Lithium Battery

Material: Brass Pipe

Recharge Type: Units-based (Not Token)

Operating Pressure: ≤ 16 bar (16 MAP)

Temperature Rating: ≤ 50 °C (T50)

1. Introduction

The **Moran Smart Ultrasonic Prepaid Water Meter** is designed to accurately measure and manage domestic and commercial water consumption using advanced **ultrasonic sensing** and **GPRS-based communication**.

It operates on **low power**, includes **valve control**, and enables **remote monitoring** and **prepaid water management** via units (not tokens).

This manual provides all the technical details, installation steps, communication setup, safety measures, and operational guidance to ensure reliable and accurate performance.

2. Product Features

- Ultrasonic flow measurement - no moving parts, ensuring long service life.
- Prepaid system using units, allowing remote top-ups and balance checks.
- Integrated valve control - automatically shuts off when balance is zero or tampering is detected.
- GPRS communication for two-way data transfer between meter and server.
- Internal **ER26500C 3.6 V** battery for long-term operation (up to 6 years).
- Tamper detection integrated.
- IP68 waterproof design suitable for buried or wet environments.
- Plastic housing for mechanical strength and corrosion resistance.

3. Installation Requirements

3.1 Site Preparation

- Select a clean, dry, and accessible location for easy maintenance.
- Keep the meter away from **direct sunlight**, vibration, and strong magnetic fields.
- Ensure the pipeline is flushed clean to remove debris, air, or sand before installation.
- Install the meter horizontally with the arrow on the body pointing in the direction of flow.
- Maintain at least **10×DN**(10 times the pipe's diameter) straight pipe length before and **5×DN** (5 times the pipe's diameter) after the meter for accurate low measurement.
- Ensure that the pipe is **completely filled with water** before operation , air bubbles will cause incorrect readings or no readings at all.
- For vertical installations, ensure upward water flow to keep the pipe full.
- Do not install near bends, elbows, valves, or pumps that cause turbulence.

3.2 Plumbing Connection

- Use brass pipes or equivalent metallic fittings matching the **DN15** or **DN20** meter threads.
- Apply sealing compound to ensure tight sealing.
- Avoid overtightening to prevent damage to meter threads.
- Install isolation valves on both sides for future servicing.
- Install air release valves if the system tends to trap air.
- Always ensure the flow direction arrow on the meter matches the pipe's water flow.

3.3 Electrical & Communication Setup

- The meter is powered by an **ER26500C 3.6 V lithium battery** - do not connect external power.
- Communication Activation:
 - Touch and hold the spring terminal for 5 seconds.
 - Wait for the word “connect...” and then “send...” to display on the screen - this confirms the module is initializing.
- Confirm there is strong network coverage in the area.
- The system automatically connects to the server and transmits meter data upon initialization.
- If communication fails, retry activation or check network signal quality.

3.4 Environmental & Mounting Requirements

- Ambient temperature: **0 °C – +50 °C**.
- Maximum pressure: **16 bar (16 MAP)**.
- Protection level: **IP68** (not fully waterproof).
- Mount the meter securely to avoid vibration or movement.
- Avoid installing the meter where it could be flooded or frozen.

4. Pre-Operation Procedure

1. Ensure all fittings are tight and there are no leaks.
2. Fill the pipe fully with water before powering or activating the meter.
3. Check for air pockets - purge any trapped air through an air valve.
4. Confirm that initial readings are stable when no flow is present.
5. Activate the GPRS module using the spring terminal method.
6. Ensure the meter reports correctly to the utility management platform before sealing.

5. Operation and Use

5.1 Normal Operation

- Once installed and activated, the meter begins measuring water flow automatically.
- Data is stored internally and periodically sent to the central server.
- The display shows:
 - Remaining balance (in units)
 - Total volume consumed
 - Valve status (Open/Closed)
 - Signal strength
 - Temper status

5.2 Recharging

- Recharges are performed **through units**, not tokens.
- Users can purchase units via mobile app, web portal, or utility office.
- The top-up is automatically synchronized through the GPRS network to the meter or one can activate it by activating the meter communication to the network instantly through touch sensor.
- When balance runs low, a warning appears on the user application; if it reaches zero, the **valve closes automatically**.

5.3 Communication Behavior

- The meter communicates with the central system periodically or when triggered by events (low balance, tamper alert) or when spring is touched for 5 seconds. Note that any operation commands from the Application , the meter responds immediately if it activates the communication process, either automatically depending on periodically set time or manually through the touch sensor.

6. Maintenance and Safety

- **Do not open or tamper** with the meter body , it will exempt you from service by closing the valve and notifying the central owner.
- Ensure seals are intact before commissioning.
- Periodically inspect for leaks, corrosion, or mechanical damage.
- Replace the **battery (ER26500C)** only by authorized service personnel using anti-static tools.
- Clean the meter and surrounding area with a **dry cloth** , never use water jets.
- Maintain GPRS connectivity by ensuring good network coverage.
- During any electrical work near the meter, disconnect it from the communication network.

7. Troubleshooting

Issue	Possible Cause	Solution
No usage readings	Air in pipe / empty pipe	Ensure water is full pipe before operation
No communication	Poor GPRS network signal	Check signal, or retry activation
Valve not responding	Low battery	Replace battery or contact service
Reading fluctuates	Bubbles or unstable flow	Purge air and stabilize flow
Unit not updating	Communication delay	Wait for the next sync cycle or restart GPRS or activate it manually through the touch sensor.
No sensor touch	Touch sensor locked by user App for specific meter id	Use an application to remove the lock, this will cost you waiting time, when the meter activates communication automatically.

8. Important Installation Warnings

- Always ensure the pipe is full of water before operation.
- Do not install upside down or at an angle.
- Do not install immediately after pumps or valves without a straight pipe section.
- Avoid air pockets and high points in the pipeline.
- Handle meter carefully; ultrasonic sensors are sensitive to shock.
- Ensure grounding of any metal pipes in lightning-prone areas.
- Avoid installing the meter in a place where it can be exposed to **direct sunlight**, as it may damage the battery and reduce the system's internal performance.

9. Technical Specifications

Parameter	Specification
Nominal Diameter	DN15 / DN20
Communication	GPRS
Power	3.6 V Lithium (ER26500C)
Measuring Principle	Ultrasonic transit-time
Operating Pressure	≤ 16 bar
Water Temperature	≤ 50 °C
Protection Level	IP68
Recharge Mode	Units-based
Accuracy Class	± 2 % (Q3–Q4), ± 5 % (Q1–Q2)
Housing Material	Plastic
Valve Type	Motorized Shut-off
Display	LCD
Activation	Touch spring for 5 s

10. Commissioning Checklist

- ☑ Verify water pipe is full
- ☑ Verify flow direction matches arrow
- ☑ Confirm no air bubbles or leaks
- ☑ Activate network by(hold spring for 5 s)
- ☑ Seal meter and record serial number
- ☑ Register device in central management system

11. Warranty and Support

- The meter is covered by a **2-year manufacturing warranty** against defects in materials and workmanship.
- Warranty void if tamper seals are broken, housing is opened, or improper installation is detected.
- For maintenance, calibration, or firmware updates, contact **Moran Technical Support**.

Moran Smart Meter - Technical Team

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