



User Guide

Configuration Device for MIU

Version 2.1



Revision History

Version	Date	Remarks
1.0	23 May 2024	Initial Revision.
2.0	23 Sep 2024	Steps by Steps Manual
2.1	26 Sep 2024	Added in the section on changing of passwords

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1 HANDHELD DEVICE FOR MIU

During the initial installation of ST Engineering Meter Interface Unit (MIU) onto an inductive mechanical water meter, it is necessary to configure the MIU to match the water meter it is measuring. The handheld device serves this purpose by communicating with the MIU through its Infrared port to configure the MIU to start its water data consumption that is in line with the water meter reading on its mechanical dial, calibrating the liter per pulse of the water meter that is 10L or 1L per pulse, performing other functions such as setting the number of times the data uplink by the MIU, alarms threshold setting etc.

In a nutshell, the handheld device serves three objectives:

- 1) To configure the MIU
- 2) To read information from the MIU
- 3) To activate the MIU to uplink to the backend

The basic process for the configuration of the MIU is to get ready the MIU to start its communication with its targeted backend is as below.

- 1) Power on the handheld device.
 - Go to *section 1.1 Power on the handheld Device*
- 2) Wake-up the MIU through the magnet.
 - Go to *section 1.2 Waking up the MIU*
- 3) Set or check that the IP address of the backend the MIU is to be connected to, and the APN of the SIM card are correct.
 - Go to *section 1.3 Set the IP Address and APN, and*
 - Go to *section 1.4 Check IP Address and APN*
- 4) Using the handheld device to report to the backend the IP address and APN set for the MIU.
 - Go to *section 1.12 Manual Reporting*
- 5) Set the water meter size, e.g., DN15, DN20 etc.
 - Go to *section 1.6 Set the Caliber (Size of the water meter)*
- 6) Set the liter per pulse as in accordance with the water meter the MIU is attached to. Some water meter is 10L per pulse and some is 1L per pulse.
 - Go to *section 1.7 Set the Flow Units (Lite per Pulse of the Water Meter)*
- 7) Set the number of digits as shown on the water meter. Some water meters come with 5 integers and 3 decimal numbers, and some comes with 4 integers and 2 decimal numbers etc.
 - Go to *section 1.8 Set the Digits (Integer Digits of the Water Meter)*
- 8) Set the period (e.g., 15min, 30min etc.) for the MIU to log the water consumption data.
 - Go to *section 1.10 Set MIU Data Logging Period*
- 9) Set the communication protocol (TCP or UDP)

- Go to *section 1.5 Set UDP or TCP*
- 10) Set the number of data reporting time per day by the MIU.
 - Go to *section 1.11 Set MIU Data Reporting Time per Day*
- 11) Before turning on the water to flow through the water meter, set the initial reading as shown on the water meter mechanical dial reading, into the MIU. This will allow the MIU to start the water consumption data collection from this initial reading.
 - Go to *section 1.9 Set the Initial Flow Reading*
- 12) Using the handheld device to send the initial reading to the backend.
 - Go to *section 1.12 Manual Reporting*

Steps 1) to 12) will match the MIU with the water meter it is clip-on, establish the network setup and sync with the backend it is to send the data to.

Others functions of handheld device

- 13) The handheld device allows the configuration of the MIU alarms thresholds as below:
 - Battery low voltage alarm
 - Go to *section 2.1.3 Battery Low Voltage Alarm*
 - Overflow alarm
 - Go to *section 2.1.1 Overflow Alarm*
 - Reverse flow alarm
 - Go to *section 2.1.2 Reverse flow Alarm*
 - High temperature alarm
 - Go to *section 2.1.4 High Temperature Alarm*
- 14) The handheld device allows uplink on-demand commands to the backend it is connected to.
- 15) Change password of the handheld device
 - Go to *section Changing password of the Handheld*
- 16) Read and Change MIU parameters
 - FW version
 - Go to *section 2.3.3 FW Version /MIU Real Time*
 - MIU UID
 - Go to *section 2.3.1 MIU UID / Water meter UID*
 - Meter UID
 - Go to *section 2.3.1 MIU UID / Water meter UID*
 - IMEI/IMSI/ICCID (sim card related info)
 - Go to *section 2.3.2 IMEI /IMSI/ICCID*
 - Real-time Time
 - Go to *section 2.3.3 FW Version /MIU Real Time*
 - Cumulative flow, Overflow, reverse flow, Real-time flow, **Collection time.**

- Go to section 2.4.1 *Cumulative flow/In flow/Reverse flow/Real time/Real time flow*

1.1 POWER ON THE HANDHELD DEVICE



Figure 1: Install the battery to the Handheld Device

Figure 1 shows how the battery is installed in the handheld device.



Figure 2: Power on the Handheld Device

In Figure 2 , Press and hold the power button for 3-5sec to display the program interface. Click on the right click and go to “Programs” (程序) and click “Confirm” (确认).



Figure 3: To start Handheld Device Usage

Then shown the display in Figure 3, click on “confirm” (确认) to start assessing the handheld functionality



Figure 4: Setting the DN Size

Set the DN size as shown in Figure 4. After keying in the DN size, press the FUNC key (功) at the lower left corner of the handheld device. This is to confirm the DN setting.

1.2 WAKING UP THE MIU



Figure 5: To wake up the MIU with a magnet



Figure 6: Location of the magnet on MIU

As shown in Figure 6, point the small red magnet at the transparent window and wait for the internal blue light to light on. If the blue light is blinking, it indicates that the MIU is reporting or connecting to the network. **During this time, do not perform any operations.**



Figure 7: Configuring the MIU with the Handheld Device

When the blue light indicator is light on permanently, point the handheld device as shown in Figure 7 near or at the transparent window to perform the desired operation.

Once the handheld device is ready to configure the MIU or read the MIU or activate the MIU to uplink to backend, always bring the handheld device as shown in Figure 7 near to the transparent window. Press the appropriate command on the handheld device (when the blue light has stopped blinking) to carry out the desired operation.

1.3 SET THE IP ADDRESS AND APN



Figure 8: Changing IP Address

Figure 8 shows the steps to change the IP address of the MIU. After successfully changing the IP address, verify it is correct by reading the IP port again.



Figure 9: Changing of APN

Figure 9 shows the steps to set the APN. When entering a new APN, note that it switches by the number of times press. For example, the number key 7, the first press is the number 7, the second press is +, the third press is A, the fourth press is B; It's the same with all the other keys.

1.4 CHECK IP ADDRESS AND APN



Figure 10: Verifying IP address and APN set

Figure 10 shows the steps to verify the IP address and APN set in the MIU

1.5 SET UDP OR TCP

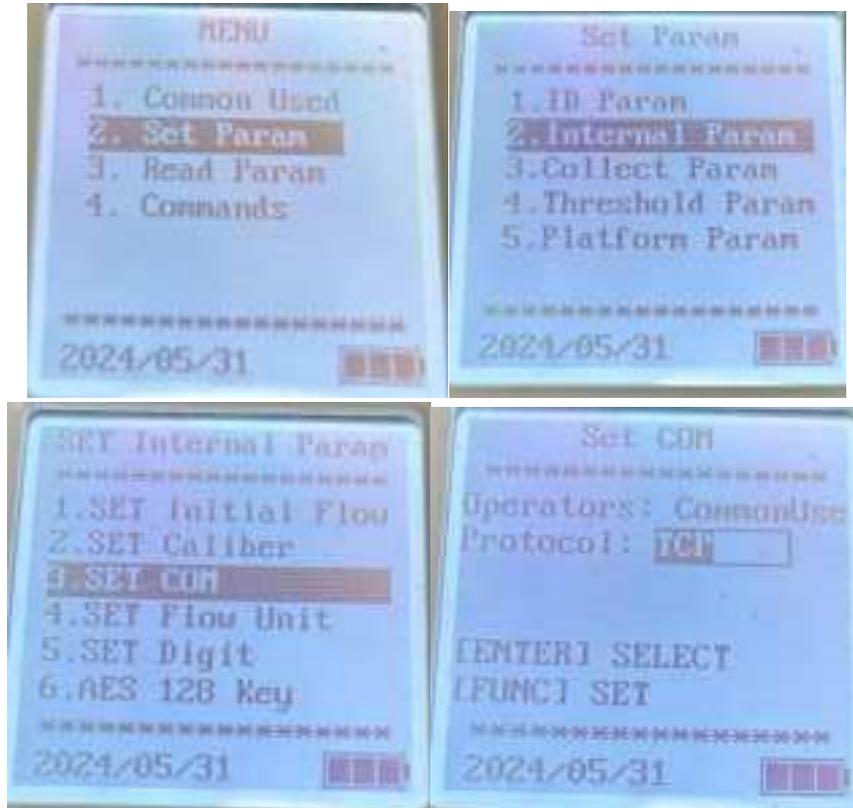


Figure 11: Setting the Communication Protocols (TCP or UDP)

Figure 11 shows the steps to choose the communication protocols whether to be TCP or UDP for NB-IoT MIU.

1.6 SET THE CALIBER (SIZE OF THE WATER METER)

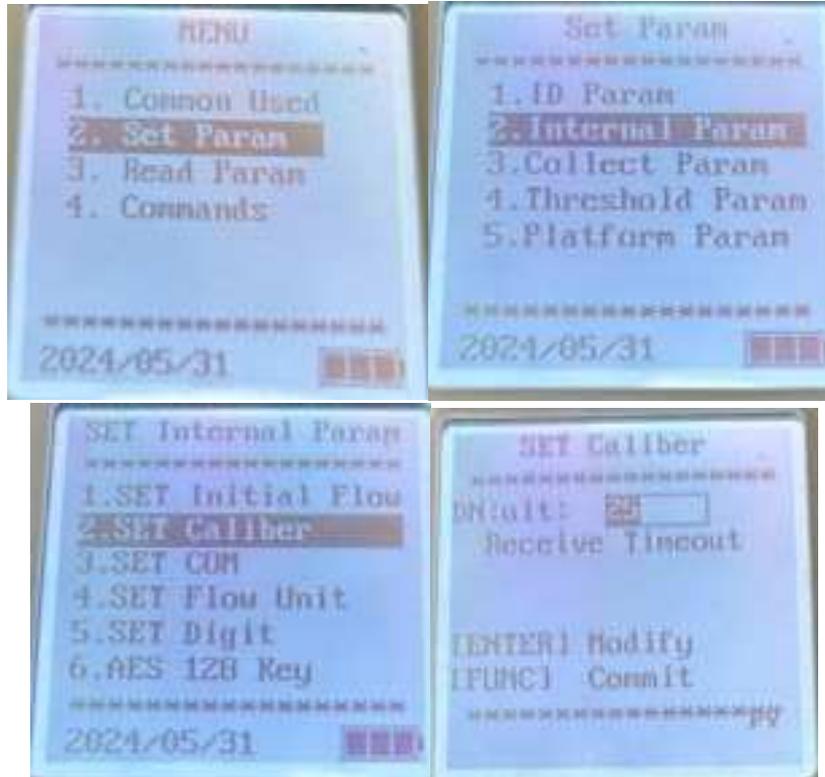


Figure 12: Setting the Water Meter Size (DN)

Figure 12 shows the steps to set the size of the water meter (DN). This setting is to ensure the thresholds set for the backflow and overflow are accurately monitored.

1.7 SET THE FLOW UNITS (LITE PER PULSE OF THE WATER METER)

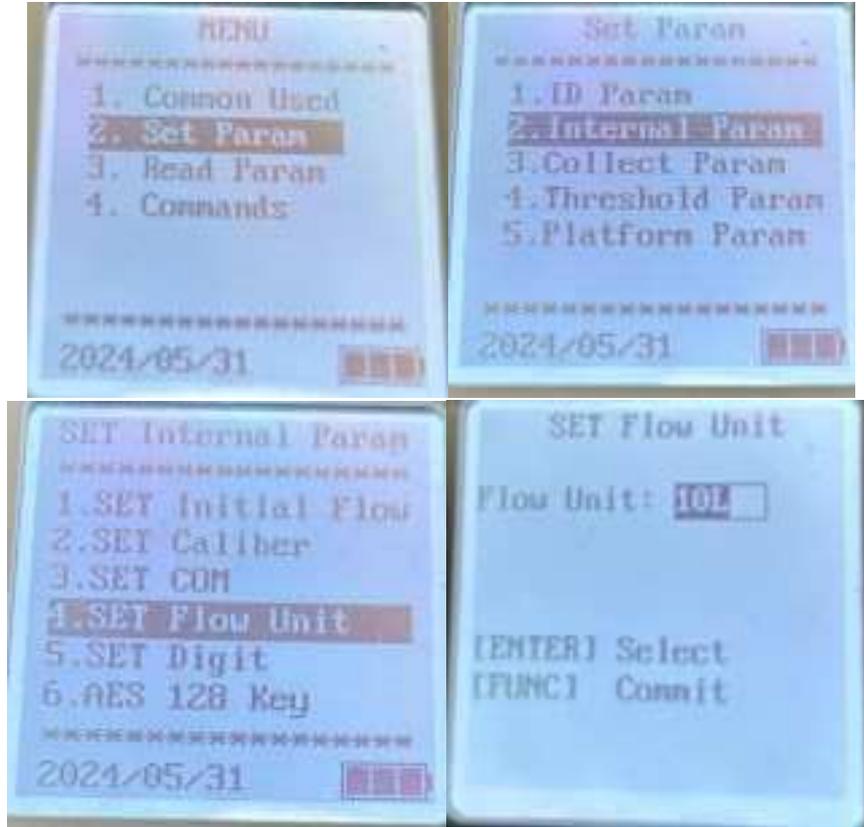


Figure 13: Setting the MIU Flow Units

Figure 13 shows the steps to set the flow units such as it is 1L per pulse or 10L per pulse.

1.8 SET THE DIGITS (INTEGER DIGITS OF THE WATER METER)



Figure 14: Setting the Water Meter Digit

Figure 14 shows the steps to set the number of digits the water meter.

1.9 SET THE INITIAL FLOW READING



Figure 15: Setting the Initial Flow Reading of the Water Meter

The water meter typically does not start with digits on its dial from all “0”. Therefore, it is necessary to set the correct digits on the water meter dial into the MIU and send it to the backend. This is so that the backend will start at the correct collection of the water consumption data. Figure 15 shows the steps to record the initial flow reading of the water meter.

Note that due to the translation from Chinese to English, there is an error in the translation and display. The “(L)” should be “(T)”.

1.10 SET MIU DATA LOGGING PERIOD



Figure 16: Setting the MIU data sampling interval

Figure 16 shows the steps to use the handheld device to set MIU data sampling interval such as every half an hour or every one hour.

1.11 SET MIU DATA REPORTING TIME PER DAY



Figure 17: To set the MIU data reporting interval

Figure 17 shows the steps to set the daily data reporting interval into the MIU, such as every 8 hourly or 12 hourly, the MIU will send the collected data to the backend.

1.12 MANUAL REPORTING

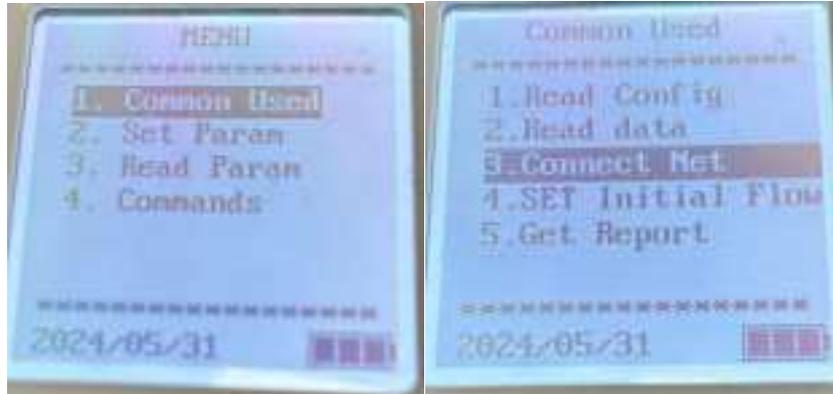


Figure 18: To request MIU to report manually

Figure 18 shows the steps to send the configuration and collected information set in the handheld device to the backend.

2 OTHER FUNCTIONS OF HANDHELD DEVICE

2.1 SET ALARM THRESHOLDS

This section shows the steps of using the handheld device to configure the different alarms threshold setting to the MIU.

2.1.1 Overflow Alarm



Figure 19: To set Overflow Alarm

Figure 19 shows the steps to set the threshold level for Overflow alarm.

2.1.2 Reverse flow Alarm



Figure 20: To set Reverse Flow alarm

Figure 20 shows the steps to set the threshold level for Reverse Flow alarm.

2.1.3 Battery Low Voltage Alarm



Figure 21: To set Low Voltage alarm

Figure 21 shows the steps to set the Low Voltage alarm.

2.1.4 High Temperature Alarm

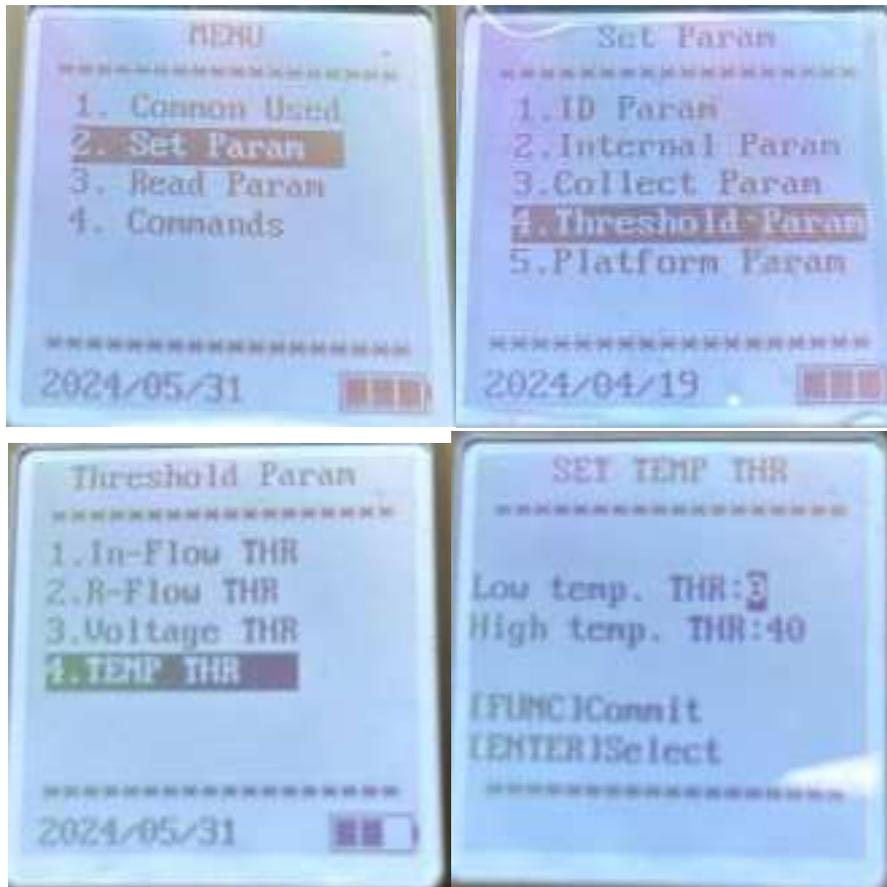


Figure 22: To set High Temperature Alarm

Figure 22 shows the steps to set High Temperature alarm.

2.2 SET UPLINK TIME

2.2.1 Set MIU Reporting Start Time

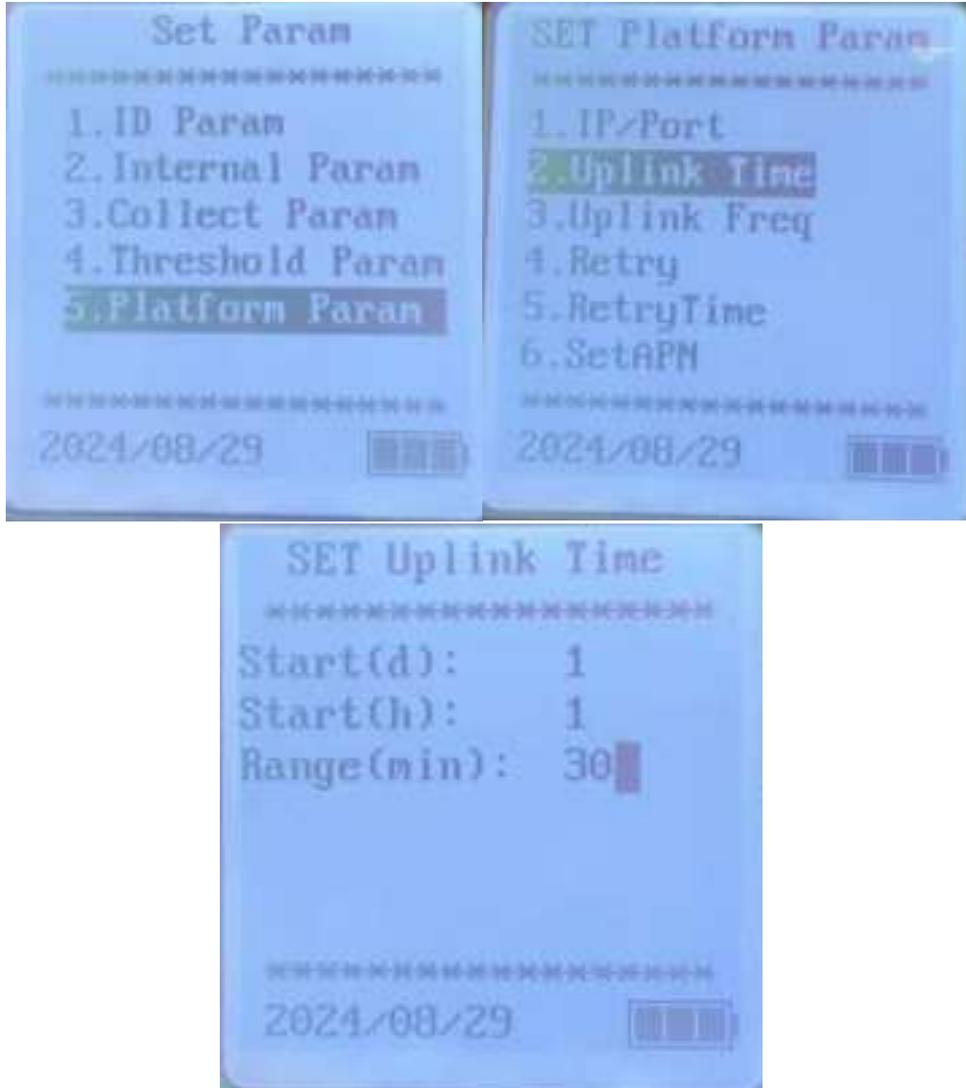


Figure 23: To set MIU Uplink Time

Reporting Start Day(d): The day of the month when reporting begins.

Reporting Start Time(h): The hour of the day (0-24 hours, on the hour) when reporting begins. For example, set to 8 for reports to start at 8 AM, or set to 24 for reports to be sent at midnight the next day.

Reporting Discretion Time (min): The random interval (in minutes) within which the device will report, with a minimum setting of 30 minutes. This prevents network congestion if multiple MIUs report simultaneously.

2.3 READ MIU INFORMATION

2.3.1 MIU UID / Water meter UID



Figure 24: Reading MIU UID/Water Meter UID

Device ID (Device Unique Code) is set at factory. It started with “9039xxxxxxxx” and is a code used internally during production and testing.

MIU UID is the User define ID and it starts with “250xxxxxxxx”. This is also the serial number printed on the casing of the MIU.

Meter ID is the UID of the water meter UID.

2.3.2 IMEI /IMSI/ICCID

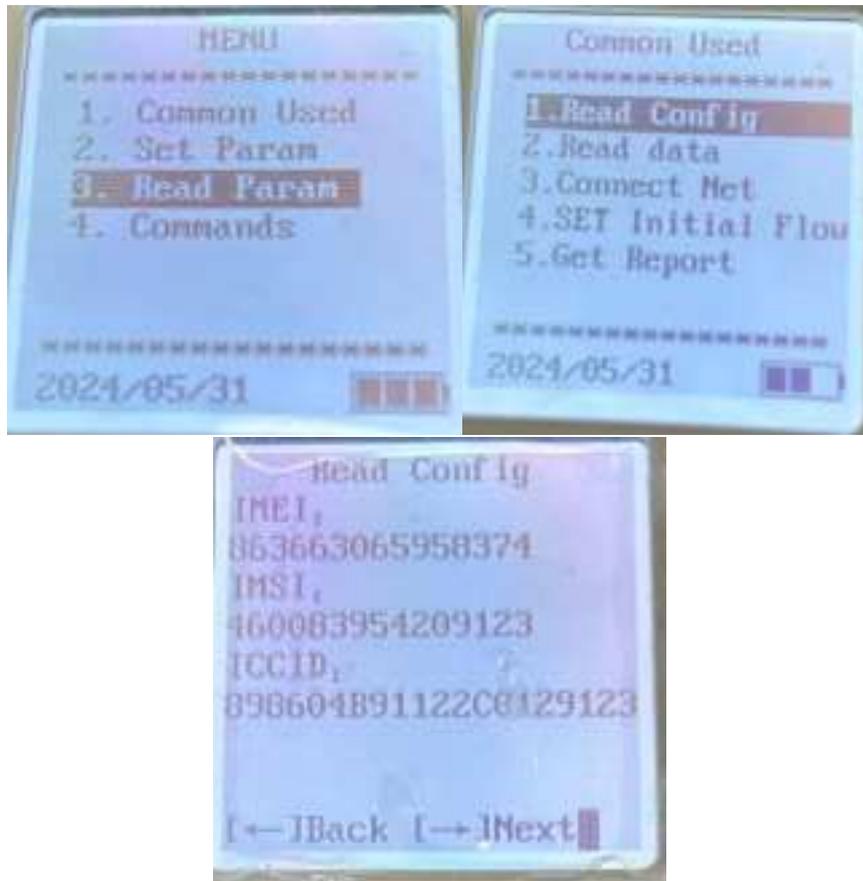


Figure 25: Reading the IMEI/IMSI/ICCID

Figure 25 shows the steps to extract the IMEI/IMSI/ICCID numbers from the MIU. These are SIM card related information.

2.3.3 FW Version /MIU Real Time

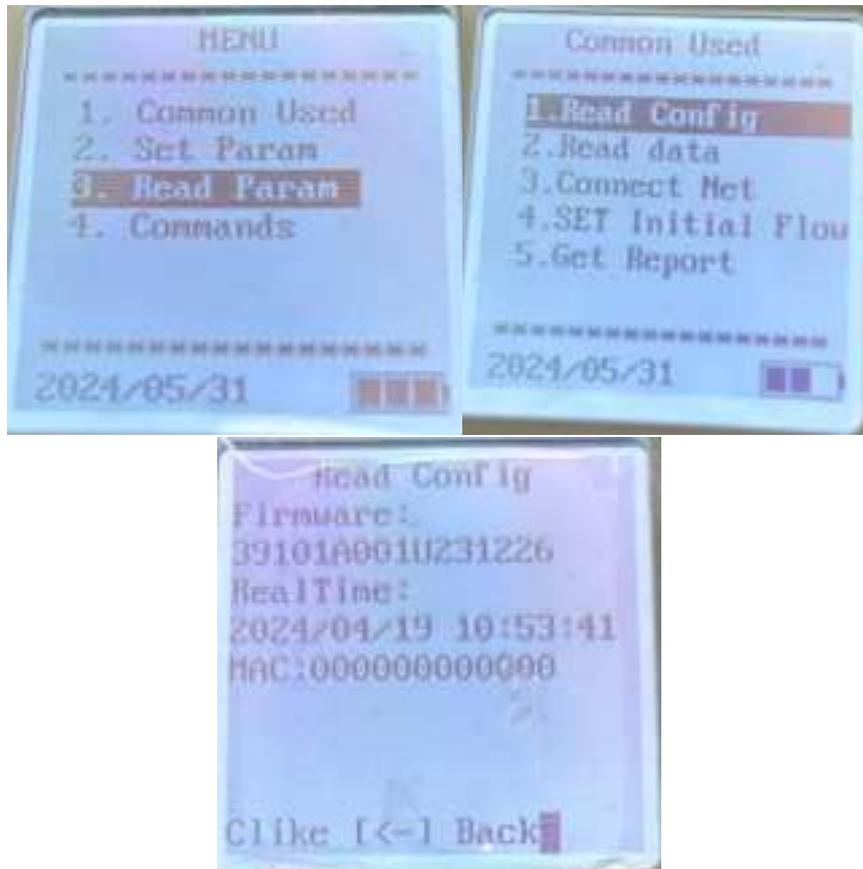


Figure 26: Reading the MIU FW version/Real time

2.4 READ MIU DATA

2.4.1 Cumulative flow/In flow/Reverse flow/Real time/ Real time flow



Figure 27: Reading MIU Data

Figure 27 shows where you can read the water data such as:

- Cumulative flow
- Overflow
- Reverse flow
- Real time
- Real time flow

2.4.2 Battery Voltage



Figure 28: Reading of Battery Voltage

Figure 28 shows the section to read the MIU's battery voltage using the handheld device.

2.5 READ DEVICE CONFIGURED PARAMETERS

2.5.1 Low Voltage Alarm threshold



Figure 29: Read Low Voltage Alarm threshold

The MIU Low Voltage Alarm threshold can be read from the MIU using the handheld device as shown in Figure 29.

2.5.2 Data Sampling interval / Initial Reading/ Caliber / Flow Units

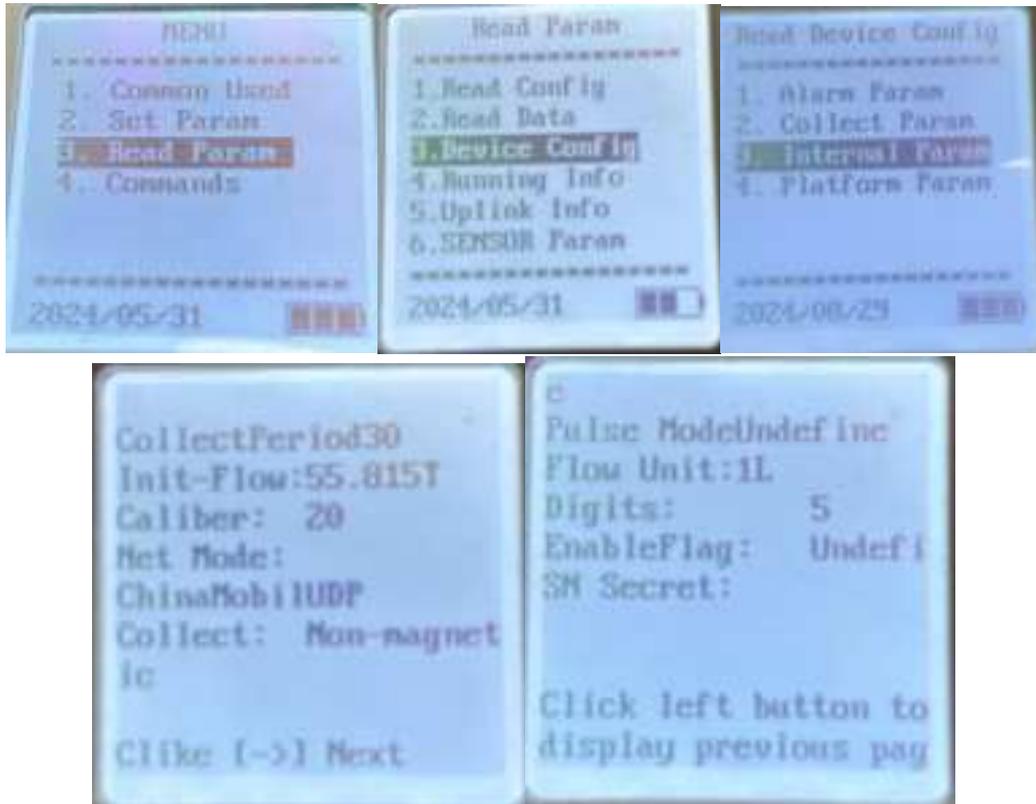


Figure 30: To read MIU configured Parameters_1

Figure 30 shows the steps to go to the page of the handheld device where you can read the following configured parameters:

- Data Sampling Interval
- Initial reading of water meter
- Size (DN) of water meter
- The Flow Units (1L or 10L)

2.5.3 Read IP Address/ Uplink frequency/ Retry time/ APN



Figure 31: To read MIU configured Parameters_2

Figure 31 shows the steps to go to the page of the handheld device where you can read the following configured parameters:

- IP Address
- Uplink Frequency
- Retry Time
- APN

2.6 READ MIU OPERATING INFORMATION

2.6.1 Reset Counts / AT Commands Failed Counts / SIM Error Counts

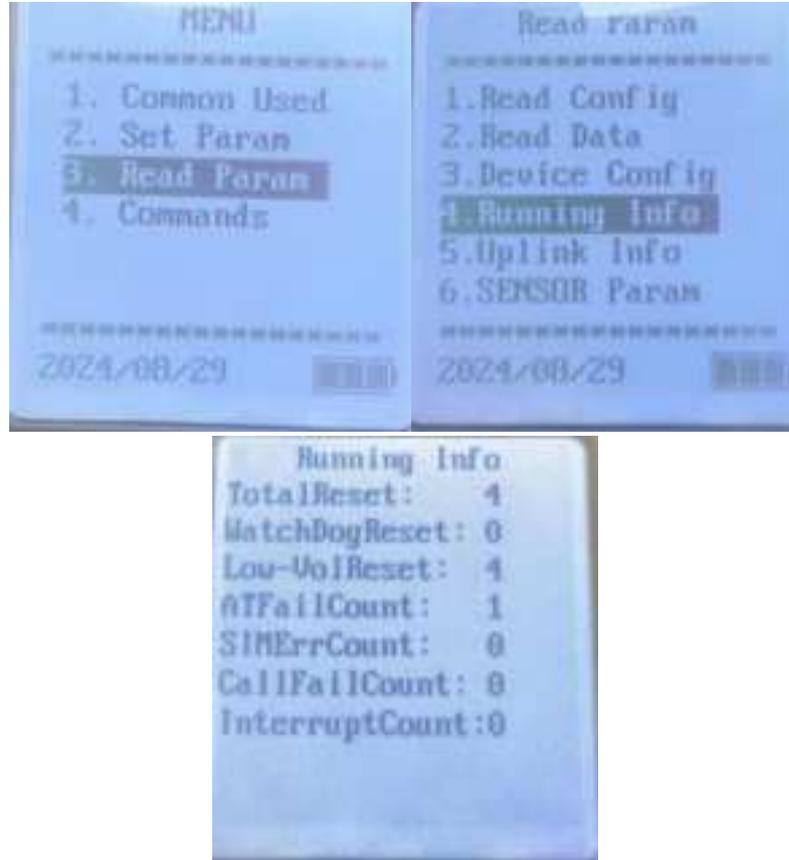


Figure 32: To read MIU Operating Information

Figure 32 shows the steps to go to the page of the handheld device where you can read the following MIU operating information:

- Reset Counts
- AT Commands Failed Counts
- SIM Error Counts

2.7 READ MIU UPLINK INFORMATION

2.7.1 ConnSuccCount / ConnFailCount / LastFaultTime



Figure 33: To read MIU Uplink Information

Figure 33 shows the steps to go to the page of the handheld device where you can read the following MIU Uplink information:

- ConnSuccCount (Number of cumulative successful reports)
- ConnFailCount (Number of cumulative failed reports)
- LastFaultTime (Time of the last reported failure)

2.7.2 CSQ Error / Step Error

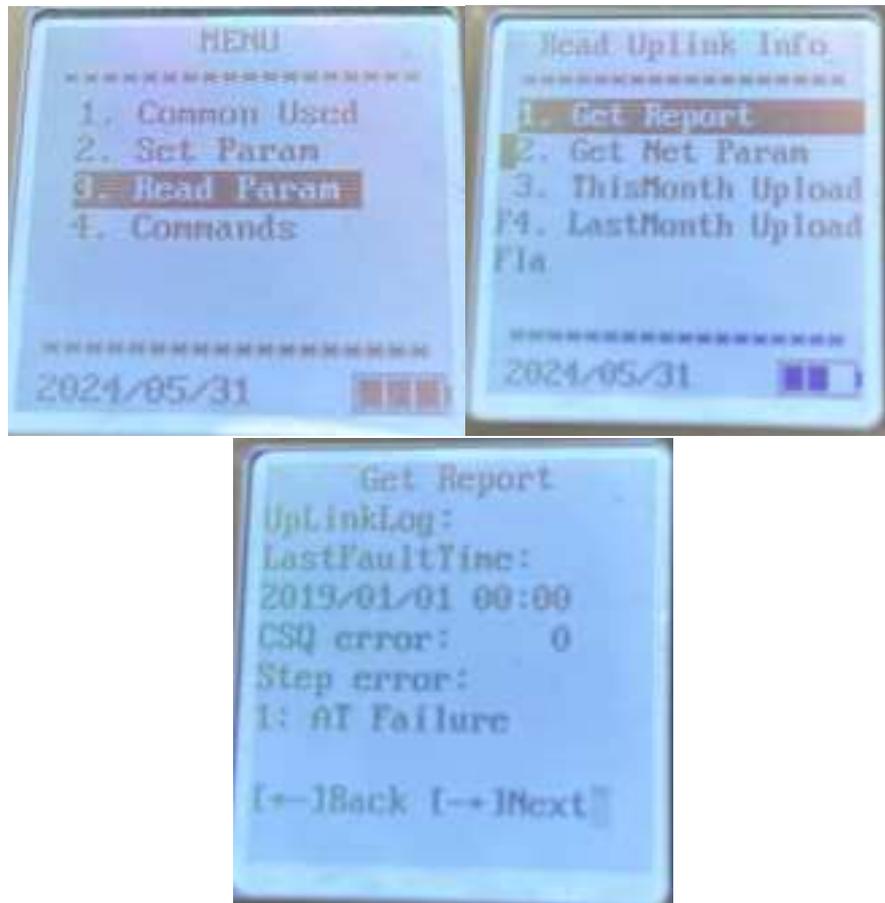


Figure 34: CSQ Error/Step Error

The "Step error" has to be interpreted in conjunction with the "ConnFailCount" and "LastFaultTime":

- If the "LastFaultTime" updates to the current time, it indicates a failure occurred this time, and the "ConnFailCount" will increase.
- If the "LastFaultTime" remains the same as before, it indicates there was no network registration failure this time.
- An increase in "ConnFailCount" suggests that a response was not received. Therefore, as long as the error time hasn't updated, it means the device has successfully connected to the network.

Step Error = 8 means MIU failed to connect with the Base station.

2.7.3 CSQ/RSRP/SNR/ECL/Cell ID

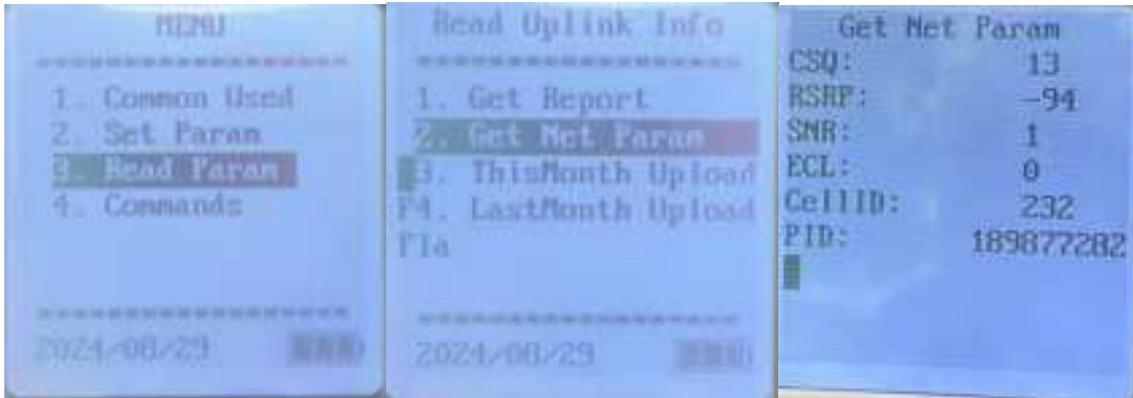


Figure 35: To read Uplink Cellular Signals Parameters

1. **CSQ** (Carrier to Signal Quality): Range from 0 to 31, the larger the signal, the better. If CSQ value is greater than 5, it can work normally; If CSQ value is less than 5, it cannot work normally. If 99 appears, it means the channel is invalid.
2. **RSRP** (Reference Signal Received Power): Range from -110 to -44, refers to the path loss strength of the channel, the larger the value is the better.
3. **SNR** (Signal-to-noise ratio): Range from -20 to +30, the ratio of signal strength to interference signal, the larger is the better.
4. **Signal coverage level**: (ECL value from 0 to 2, 0 is excellent, 1 means extended coverage, 2 means extreme coverage).

2.8 CHANGING PASSWORD OF THE HANDHELD

Figure 36 shows the steps to change the password of the handheld device. The default password of the handheld is 62544089.

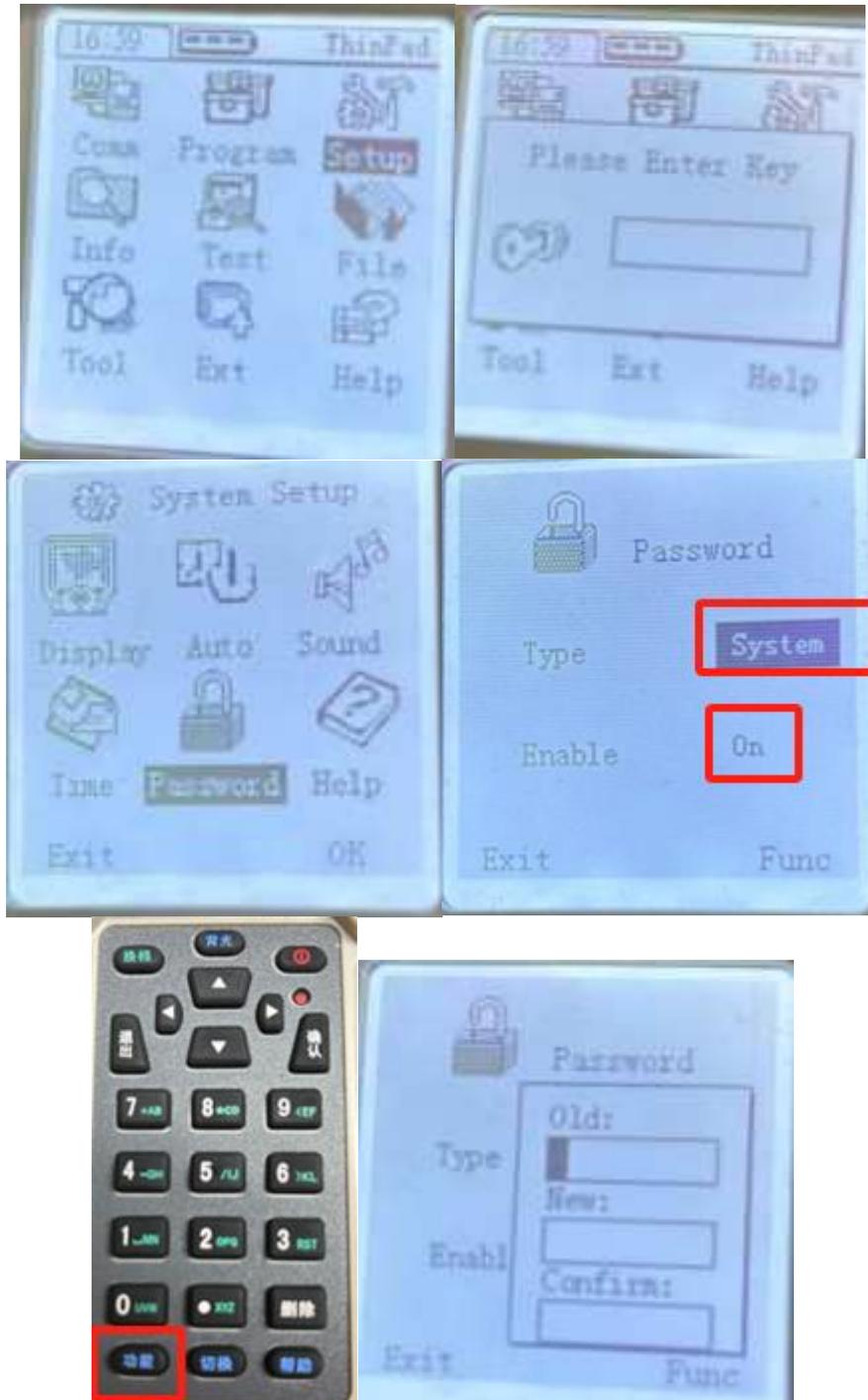


Figure 36: Changing password of the handheld