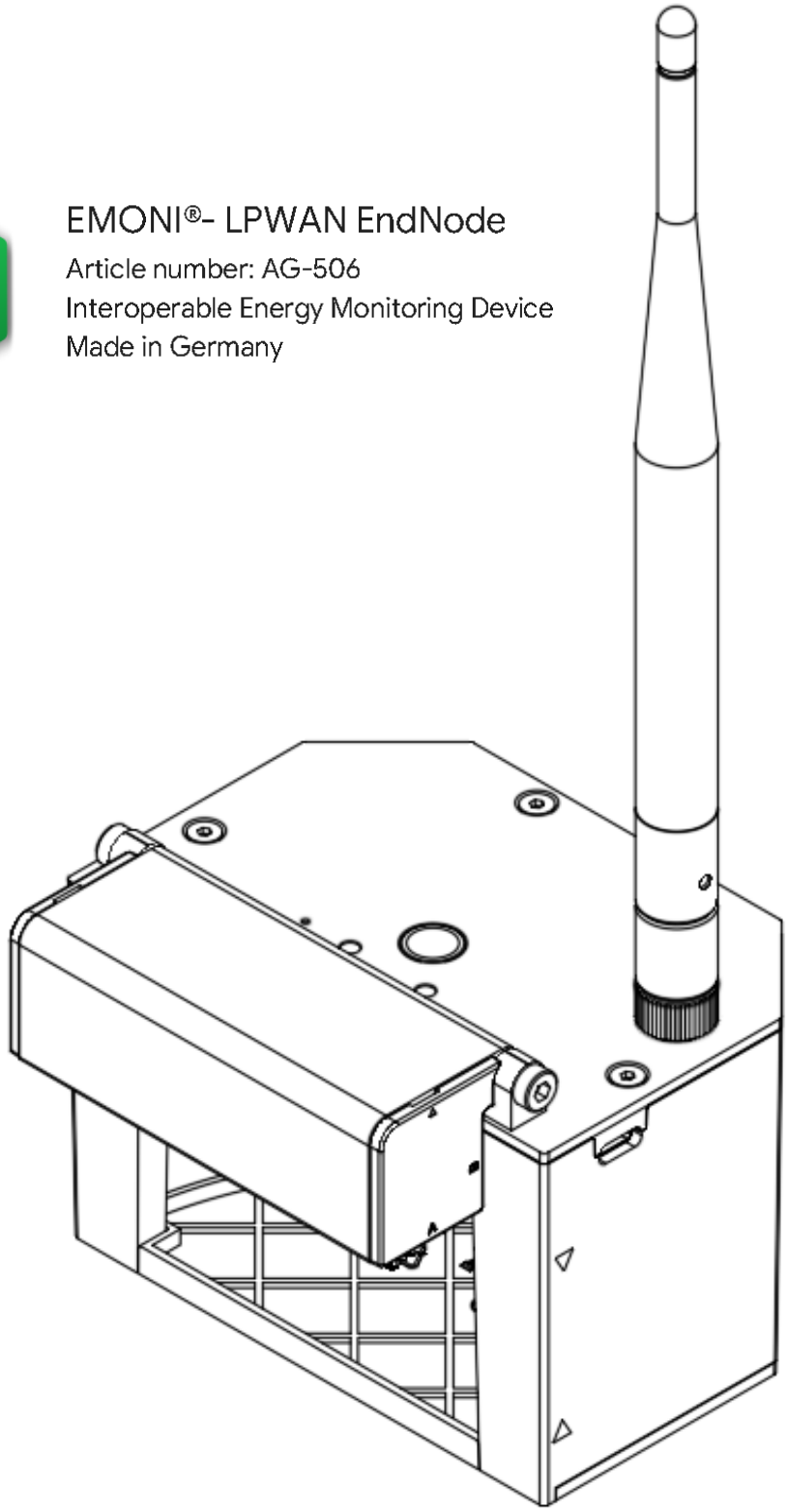
EMONI®- LPWAN EndNode

Article number: AG-506

Interoperable Energy Monitoring Device

Made in Germany



EMONI – Calibration Guide

This guide shows how to calibrate an EMONI meter reader with its built-in calibration menu: how to open the menu, how to go through the calibration steps, and how to draw the reading area around the meter digits.

The most important part of the calibration is the reading area. The device only looks inside the area you draw, so a careless area is the most common cause of wrong readings. Read "Drawing the Reading Area" before your first calibration. Examples for each meter type are shown in "Settings for Each Meter Type" and in "Correct and Wrong Examples".

Symbols and Signal Words Used



WARNING
Ignoring this deletes data or the calibration.



CAUTION
Ignoring this leads to wrong meter readings.



NOTE
Additional information that makes the task easier.

Buttons and fields are written in **bold** exactly as they are labelled in the menu, for example **Einrichtung**. The menu is in German; the English meaning follows in brackets the first time a label appears.

Before You Start

Allow about ten minutes per meter. The calibration menu closes automatically ten minutes after it opens; the remaining time is shown at the top of every screen.

1.1 What you need

- 1.1.1 A smartphone, tablet or laptop with Wi-Fi.
- 1.1.2 The current meter reading, written down, to check the result.
- 1.1.3 The rating plate values of the meter:
  - 1.1.3.1 Water and gas: the maximum flow *Qmax* in m^3/h.
  - 1.1.3.2 Electricity with a rotating disc (Ferraris): revolutions per kWh, maximum current, single- or three-phase.
  - 1.1.3.3 Electricity with a digital display: maximum current, single- or three-phase.
- 1.1.4 A soft cloth for the meter window and a wet wipe for the mounting bracket.

1.2 Check the installation

1.2.1 The device sits straight over the meter, with the camera looking at the digits head-on and centered.

1.2.2 All digits, including the decimal digits, are within the camera view.

1.2.3 The meter window is clean and dry, without condensation or stickers over the digits.

1.2.4 No sunlight or lamp light reflects on the window. The device has its own light.

1.2.5 The holder is tight. If the device moves after calibration, the digits leave the reading area and the device must be calibrated again.

1.2.6 Digital meters: the display is switched on and shows the meter reading.

Opening the Calibration Menu

The calibration menu runs on the device itself. It opens only after you connect to the device Wi-Fi and log in (section 2.2). There is no automatic pop-up page.

2.1 Switch on the device Wi-Fi

Your device is ...	What to do	The lights show ...
new, or has been reset	Insert the batteries. The device starts its Wi-Fi for calibration.	Red and green fade together.
already calibrated	A new calibration needs a device reset: hold the button for 3 seconds. The device deletes its calibration, restarts and starts its Wi-Fi for calibration.	Red and green blink fast, then fade together after the restart.



WARNING

Holding the button for 3 seconds resets the device to its factory settings and deletes the calibration, the meter type and the stored Wi-Fi settings. Do this only when the meter is to be calibrated again.

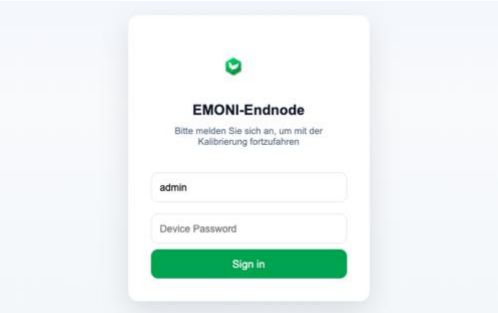
2.2 Connect and log in

2.2.1 Open the Wi-Fi settings and connect to the network EMONI-XXXX, where XXXX are four characters unique to the device, for example EMONI-812D. The Wi-Fi password for all devices is “ENNY!LORA”.

2.2.2 Open a browser and go to http://10.10.10.1. The menu does not open by itself.

2.2.3 Log in with the user name admin. The password is the last 8 characters of the device AppKey, in lowercase letters (capitals are accepted too). The AppKey is sent to the customer separately by email. Example: for the AppKey ...3F9A0C7E the password is 3f9a0c7e.

2.2.4 After 5 wrong passwords in a row, every login is refused for 60 seconds and the login page shows **Zu viele Fehlversuche. Bitte warten Sie eine Minute.** (*too many failed attempts, please wait a minute*). A browser that is already logged in keeps working.



Login page
Enter the device password and tap **Sign in.**

Figure 1: The login page of the calibration menu.

NOTE
The device network has no internet. Many phones leave such a network after a short time and switch back to mobile data or a known Wi-Fi, which makes the menu seem frozen. Switch off mobile data and stay within a few metres of the device while you calibrate.

2.3 Find your way around

Symbol	At the top of the screen	What it does
	Battery	Battery level of the device.
	LoRaWAN	Network connection of the device; the small dot shows whether it has joined.
	Connected devices	How many phones or laptops are connected. Only one should be connected while you calibrate.
	Home	Cancels the calibration and returns to the start page.
	Dark / light	Switches between dark and light display (shown as a sun in the light display).
	Help	Shows help for the current screen.
	Menu	Device information and the LoRaWAN keys.
	Restart	Restarts the device. The calibration session ends.
	Verbleibend	Time left before the menu closes. Amber below 3 minutes, red below 1.
1 Bereich 2 Vorkalibrierung	Step bar	Shows where you are: **Bereich**, **Vorkalibrierung**, **Tuner**, **Vorschau**, **Bestätigen**, **Fertig**. Tap a finished step to go back to it.

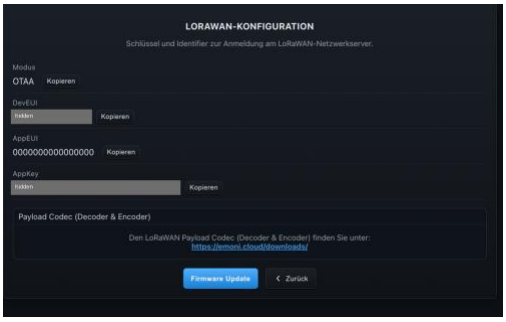
2.4 Start page, LoRaWAN keys and firmware update

2.4.1 **Einrichtung** (*setup*) starts the calibration.

2.4.2 **LoRaWAN OTAA Keys** shows the operating mode, the DevEUI and the AppEUI, and a link to the payload codec. The AppKey is not shown in the menu. The device keys are sent to the customer separately by email; the last 8 characters of the AppKey are also the login password.

2.4.3 **Firmware Update** is needed only in rare cases. The device then connects to a Wi-Fi

network with internet access, which you select on the next page, and downloads the new firmware. Firmware updates over LoRaWAN (FUOTA, sent as small delta updates) are also supported on a self-hosted The Things Stack or ChirpStack network server, not on public TTN.



LoRaWAN page

Mode and device keys with **Kopieren** (*copy*) buttons, the payload codec link and the **Firmware Update** button. Device keys are hidden in this guide.

Figure 2: The LoRaWAN page.

Calibrating Step by Step

Tap **Einrichtung** (*setup*) on the start page. The wizard leads you through five steps.

3.1 Step 1: Select the area (Bereich auswählen)

3.1.1 Choose the meter in **Gerätetyp** (*device type*); see the table below.

3.1.2 If the picture is upside down, tap the **180°** button on the upper right corner.

3.1.3 Draw the frame tightly around the digits. How to draw it correctly is explained in "Drawing the Reading Area" after this section.

3.1.4 Tap **Bereich bestätigen** (*confirm area*). To start again, tap **Zurücksetzen** (*reset*).

Choose …	for a meter that shows …	See
Wasser	water consumption on turning number drums	5.1, Examples 2–4
Wasser (Digital)	water consumption on a digital LCD	5.4, Examples 17–18
Gas	gas consumption on turning number drums	5.2, Examples 5–12
Strom	electricity on number drums, with a rotating disc (Ferraris meter)	5.3, Examples 13–16
Strom (Digital)	electricity on a digital LCD	5.5, Examples 25–26



Step 1

Wasser selected, frame drawn around the five drums. **Bereich bestätigen** becomes active once a frame is drawn.

Figure 3: Step 1 on an analog water meter.



180° button

In the top right corner of the picture (**Bild um 180 Grad drehen**). Tap it when the digits are upside down, before drawing the frame.

Figure 4: The 180° button in Step 1.

3.2 Step 2: Pre-calibration (Vorkalibrierung)

3.2.1 Check the cropped preview first (see "Drawing the Reading Area", "Check the cropped preview").

3.2.2 Set **Gesamtziffern** (*total digits*) to the number of digits on the meter, including the red decimal digits.

3.2.3 Set **Ziffern vor dem Komma** (*digits before the comma*) to the number of digits in front of the decimal point.

3.2.4 Mark the digits:

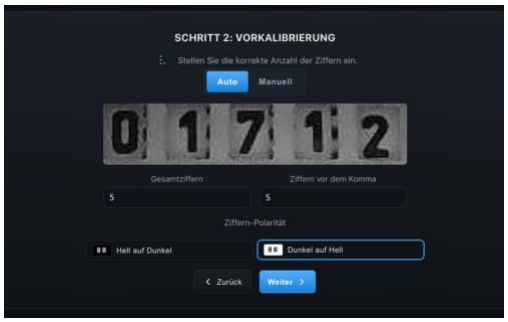
- 3.2.4.1 Gas and Ferraris electricity: nothing to do; the device finds the digits itself.
- 3.2.4.2 Analog water: leave **Auto** selected, or choose **Manuell** and draw one box on the first digit per drum.
- 3.2.4.3 Digital water and electricity: draw one box per digit.

3.2.5 **IMPORTANT**: Analog water only: choose the **Ziffern-Polarität** (*digit colour*): **Dunkel auf Hell** (*dark on light*) for black digits on white drums, **Hell auf Dunkel** (*light on dark*) for white digits on black drums.

3.2.6 Tap **Weiter** (*next*).

Preset	Wasser	Gas	Strom	Wasser (Digital)	Strom (Digital)
Total digits	9	8	7	9	7
Before the comma	6	5	6	6	6

The presets match the most common meters. Always count the digits on your meter and correct them if they differ.



Dunkel auf Hell

Black digits on white drums. 5 total digits, 5 before the comma.

Figure 5: Step 2 on an analog water meter with black digits.

3.3 Step 3: Tuner

The tuner is skipped. It is only needed in extreme cases when the digits are not recognized in Step 4; see "Annex A – The Tuner".

3.4 Step 4: Digit preview (Vorschau der Ziffern)

The device now reads the meter several times. Each digit is shown as a small picture with the number recognized for it; an **X** means that digit could not be read yet. This usually takes less than 5 seconds.

3.4.1 When all digits are read reliably, the wizard moves on to Step 5 by itself.

3.4.2 If digits stay at X or show the wrong number, tap **Zurück** and draw the area or the boxes tighter. This solves most problems.

3.4.3 If **Die Erkennung dauert länger als gewöhnlich** (*recognition is taking longer than usual*) appears, go back and draw the area again.

3.4.4 If a tighter area does not help, tap **Tuner (optional)**.

3.5 Step 5: Confirm the result (Ergebnisse bestätigen)

3.5.1 Compare **Zählerstand** (*meter reading*) digit by digit with the meter. Tap the camera symbol for a new reading. The value cannot be typed in; if it is wrong, tap **Neu kalibrieren** (*calibrate again*). The last digit after the comma sits on a constantly rolling drum and is usually skipped, so it may differ from the meter. This is not an error (Example 1).



✓ **Correct: rolling last digit skipped**

The meter shows 37657,615, the device reads 37657,610. Only the last digit after the comma differs: it sits on a rolling drum and is skipped. This is expected, and the reading can be saved.

Example 1: Gas meter G6: Step 5 reading with the rolling last digit skipped.

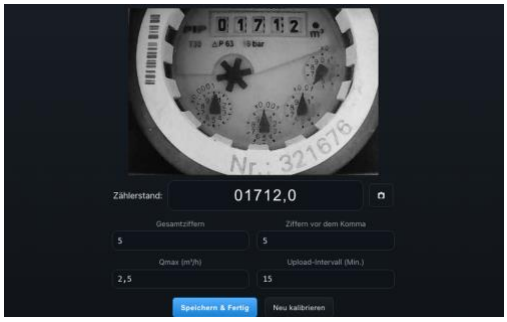
3.5.2 Check **Gesamtziffern** and **Ziffern vor dem Komma** once more.

3.5.3 Enter the rating plate values (see "Settings for Each Meter Type").

3.5.4 Set **Upload-Intervall (Min.)** (*upload interval in minutes*): how often the device reads the meter and sends the value. 1 to 4320 minutes, default 180 minutes. A longer interval saves battery. The interval can also be changed later remotely, with a LoRaWAN downlink.

3.5.5 Tap **Speichern & Fertig** (*save and finish*).

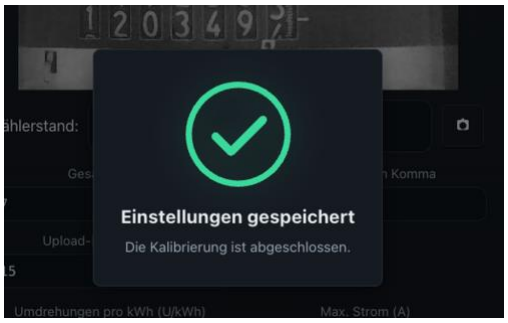
A green tick and **Einstellungen gespeichert** (*settings saved*) confirm the calibration. The device restarts after about five seconds and begins its normal work; the phone loses the connection to the device.



Step 5

The recognized reading 01712,0 matches the meter. Qmax and the upload interval are filled in; **Speichern & Fertig** saves.

Figure 6: Step 5 on an analog water meter.



Calibration saved

The green tick, **Einstellungen gespeichert** (*settings saved*) and **Die Kalibrierung ist abgeschlossen** (*the calibration is complete*) confirm that the calibration is stored.

Figure 7: Confirmation after **Speichern & Fertig**.

Drawing the Reading Area

The reading area, also called the region of interest (ROI), tells the device where the digits are. Everything inside the area is examined; everything outside is ignored. It is drawn in two stages:

Step 1 – the frame: one rectangle around the whole row of digits.

Step 2 – the digits: the device finds the single digits itself, or you draw one box around each digit (in case of meters with an LCD).

EMONI reads only the counter digits (the odometer: number drums or LCD digits). Analog pointer dials are not read. On water meters the pointer readings are skipped, so the pointers stay outside the frame.

CAUTION

Draw the area as tight as possible. Every millimetre of meter face, frame, label or screw inside the area is something the device can mistake for a digit or a part of one. A tight area is the most effective thing you can do for correct readings.

4.1 Who draws the digit boxes

On meters with number drums the device **finds the single digits automatically**: you only draw the Step 1 frame. On meters with a **digital 7-segment display** you draw **one box per digit by hand** in Step 2. You do this only once, during calibration; the boxes are saved and used for every reading afterwards.

Meter type	Display	Digit boxes in Step 2
Wasser, Gas, Strom	Number drums	Automatic. Nothing to draw.
Wasser (Digital), Strom (Digital)	7-segment LCD	Drawn by hand, one box per digit, once.

Analog water meters also offer **Manuell** as an option for unusual counters; normally leave them on **Auto**.

4.2 Rules for every meter

4.2.1 Include **every** counter digit, also the red decimal digits. Pointer dials are not included.

4.2.2 Do not cut off any major part of a digit. For a tight fit the frame may cut slightly through the top and bottom edges of the digits, but not more. For example, a '2' cut off too much

at the bottom can be read as a '7'.

4.2.3 Leave out everything that is not a digit: the unit (m³, kWh), printed labels, the window frame, screws, pointers and symbols.

4.2.4 Keep the frame straight around the row. If the picture is upside down, turn it with the **180°** button first, then draw.

4.2.5 Keep the digits inside the blue field on the screen; this is where the camera sees best. The frame does not have to fill the blue field.

4.3 Meters with number drums

4.3.1 Draw the Step 1 frame along the edges of the drum window, just around the row of drums. See Examples 19–21.

4.3.2 Analog water, gas and Ferraris meters: in Step 2 the device finds the drums itself (**Auto**).

4.3.3 A turning drum shows two half numbers. That is normal. Make sure the frame covers the drum window so both halves are inside.

4.4 Check the cropped preview

After **Bereich bestätigen** the menu moves on to Step 2 and shows only the part of the picture inside the frame: the **cropped preview**. This is exactly what the device will read from now on. Check it before you continue (Examples 22–24):

4.4.1 Every digit is complete: no major part is cut off at the top, bottom, left or right.

4.4.2 The last digit, including a turning decimal drum, is inside.

4.4.3 Nothing but digits is visible: no window border, label, unit, pointer or screw.

4.4.4 The digits fill most of the preview.

If one point is not met, tap **Zurück** (*back*) and draw the frame again.

4.5 Meters with a digital display

4.5.1 Step 1: frame the row of digits only. Leave out the unit, the register code (such as 1.8.0), arrows, battery and other symbols, and the edge of the display. See Example 25.

4.5.2 Check the cropped preview as for drum meters: the digit row only, every segment complete.

4.5.3 Step 2: set **Gesamtziffern** to the number of digits, tap **Gleichmäßig verteilen** (*distribute evenly*) and adjust the boxes so each covers exactly one digit. Double-tap the top edge of a box to align all the boxes at same height, or a side edge to give them the same spacing.

4.5.4 The digit boxes are **saved exactly as drawn**. The device reads each digit by checking which of its seven segments are dark, so position and size matter. See Examples 26–29.

4.6 Rules for digit boxes on a digital display

	Rule
✓	All boxes have the **same size**: the size of a complete **8**.
✓	A box over a **1** is as wide as the others. A 1 sits at the right edge of its box.
✓	Each box covers the top and bottom segment completely, with a very small margin.
✓	Boxes sit side by side without overlapping.
×	No box shrunk around the strokes of a 1: it is then read as a different digit.
×	No box that cuts off the left or right segments: a 0 is then read as a 7 or a 3.
×	No box over the decimal point, the unit or a symbol. The decimal point is not a digit.

NOTE
Draw the first box around a digit that shows an 8, or around the widest digit, and use it as the pattern for all other boxes.

Settings for Each Meter Type

5.1 Water meter with number drums (Wasser)

5.1.1 Frame only the counter drums. The small red pointer dials are not read and stay outside.

5.1.2 Choose the digit polarity in Step 2, this is very important.

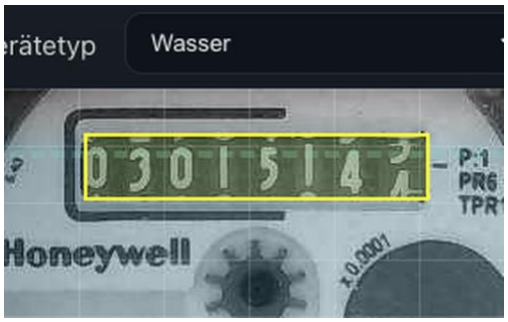
5.1.3 Step 5: enter **Qmax (m³/h)** from the rating plate (the largest flow value, often marked Q4). Preset 6 m³/h.



✓ **Correct**

The frame encloses only the five drums **0 1 7 1 2**. The pointer dials and the "m³" label are outside.

Example 2: Analog water meter: Step 1 frame drawn correctly.



✓ **Correct**

Tight around all eight digits, including the turning last drum. The marks P:1, PR6 and TPR11 on the right stay outside.

Example 3: Honeywell water meter: Step 1 frame drawn correctly.

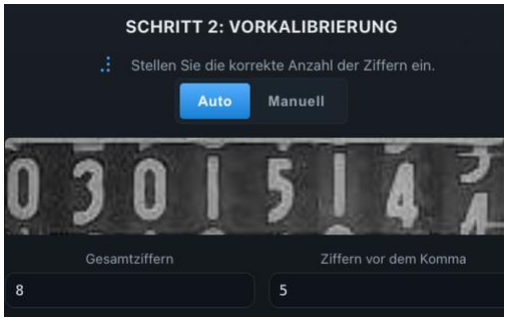


× **Too loose**

The frame takes in the whole counter window and its border, and touches the "Honeywell" print and the marks on the right.

Example 4: Honeywell water meter: Step 1 frame too loose.

5.1.4 Cropped preview at the start of Step 2



✓ **Correct cropped preview**

Only the eight digits are visible, each complete from top to bottom. The turning last drum is inside.

Example 22: Cropped preview at the start of Step 2 after a correct frame.

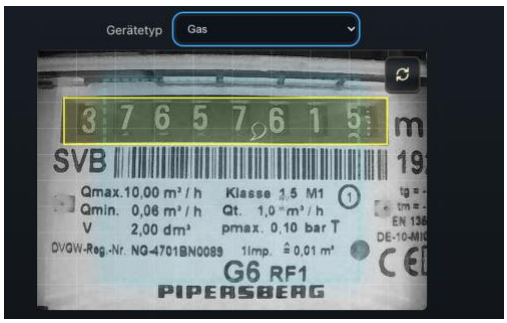
5.2 Gas meter (Gas)

5.2.1 Frame all black and red drums together. Leave the "m³" label, printed labels and the test dial outside.

5.2.2 Step 5: enter **Qmax (m³/h)**. A G4 meter has 6 m³/h, a G6 meter 10 m³/h.

NOTE

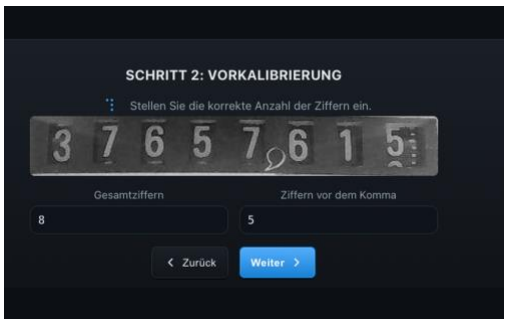
The last red drum tums continuously and is usually skipped. A last digit that differs from the meter in Step 5 is therefore not an error (Example 1).



✓ **Correct**

The frame runs along the drum row and holds all eight digits, the last drum included. The "m³" label, the SVB print and the rating plate below stay outside.

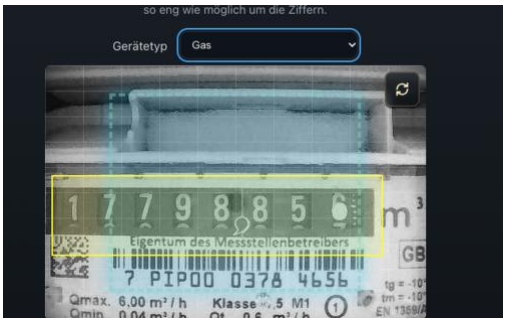
Example 5: Gas meter G6: Step 1 frame drawn correctly.



✓ **Correct cropped preview**

Only the eight drums are visible, each complete. 8 digits in total, 5 before the comma.

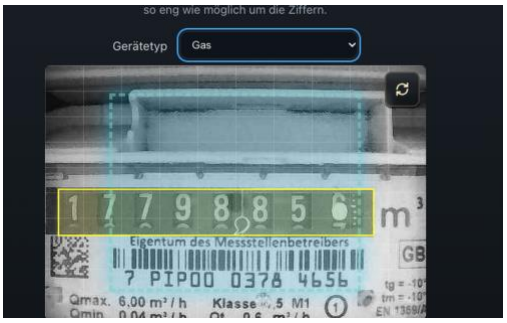
Example 6: Gas meter G6: cropped preview in Step 2.



× Too loose

The frame reaches down into the printed label "Eigentum des Messstellenbetreibers". Its letters sit right under the digits and can be read as parts of them.

Example 8: Gas meter with a printed label: Step 1 frame too loose.



✓ Correct

The frame ends at the lower edge of the drums. The label, the "m³" and the barcode are outside.

Example 9: Gas meter with a printed label: Step 1 frame drawn correctly.



✓ Correct cropped preview

Eight complete digits, no text. 8 digits in total, 5 before the comma.

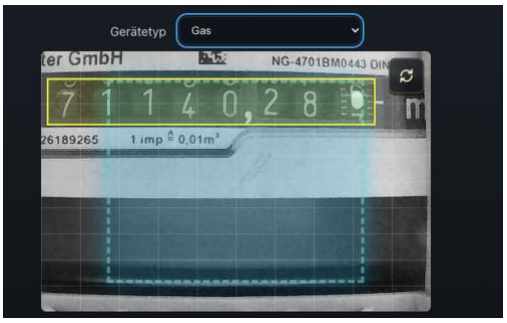
Example 10: Gas meter with a printed label: cropped preview in Step 2.



✓ Correct reading

The device reads 17798,856, the same as the meter. This reading can be saved.

Example 11: Gas meter with a printed label: Step 5 reading.



✓ **Correct**

Tight around all digits before and after the printed comma, including the last drum on the right. The "m³" and the print above stay outside.

Example 12: Gas meter with a printed comma: Step 1 frame drawn correctly.

5.3 Electricity meter with rotating disc/ferraris (Strom)

5.3.1 Frame only the number drums. The rotating disc and its red mark stay outside.

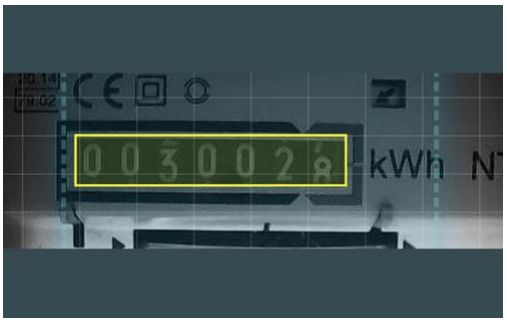
5.3.2 Step 5: enter from the rating plate:

5.3.2.1 **Umdrehungen pro kWh (U/kWh)** (*revolutions per kWh*), for example "375 U/kWh". Preset 375.

5.3.2.2 **Max. Strom (A)** (*maximum current*): the number in brackets, for example 60 in "10(60) A". Preset 60.

5.3.2.3 **Spannung** (*voltage*): **230 V (Wechselstrom)** for single-phase or **3×230/400 V (Drehstrom)** for three-phase.

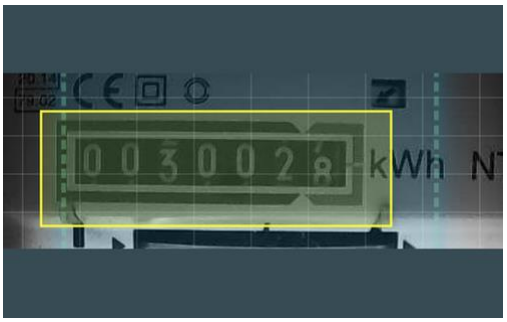
5.3.3 **Max. Leistung (kW)** (*maximum power*) is calculated automatically.



✓ **Correct**

The frame runs along the drums. All seven digits, including the decimal digit, are inside. Unit, tariff mark (NT) and the window edge stay outside.

Example 13: Ferraris meter reading 003002,8 kWh: Step 1 frame drawn correctly.



× **Too loose**

The frame takes in the whole counter window, its border and the start of "kWh". These edges can be read as digits.

Example 14: Ferraris meter reading 003002,8 kWh: Step 1 frame too loose.



✓ **Correct**

Only the drum row is framed, including the turning last drum. "kWh" and the meter face stay outside, although they are inside the blue field.

Example 15: Ferraris meter: Step 1 frame drawn correctly.



✓ **Correct cropped preview**

Seven complete drums. 7 digits in total, 6 before the comma.

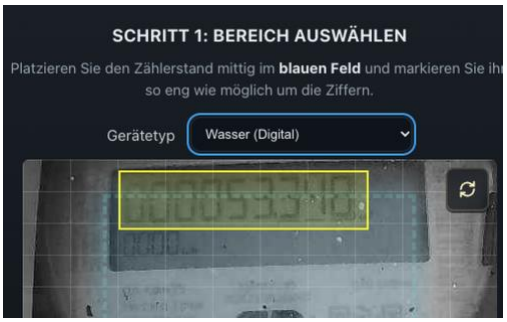
Example 16: Ferraris meter: cropped preview in Step 2.

5.4 Digital water meter (Wasser (Digital))

5.4.1 Wake the display if needed. It must show the total volume, not the flow or a test screen.

5.4.2 Draw the frame and the digit boxes as in "Drawing the Reading Area".

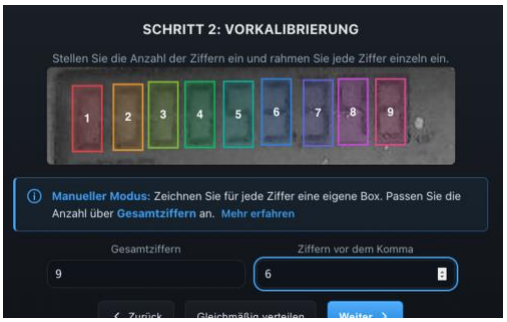
5.4.3 Step 5: enter **Qmax (m³/h)** as for a water meter with drums.



✓ **Correct**

Only the main digit row is framed; the smaller line below it stays outside.

Example 17: Digital water meter: Step 1 frame drawn correctly.



✓ **Manual boxes**

Nine digits in manual mode. Each numbered box belongs to one digit position, counted from the left.

Example 18: Digital water meter: one box per digit in Step 2.

5.5 Digital electricity meter (Strom (Digital))

5.5.1 The display must show the consumption register (1.8.0) in kWh. If it changes between several values, check in Step 4 that the reading stays stable.

5.5.2 Draw the frame and the digit boxes as in "Drawing the Reading Area"; leave the register code and the unit outside. See Example 25 and Examples 26–29.

5.5.3 Step 5: enter **Max. Strom (A)** and **Spannung**.

Troubleshooting

Problem	What to do
Picture stops, **Vorschau pausiert**	Weak connection or the user was logged out. Refresh and log in again.
Menu does not respond	The phone has left the device network.
Zu viele Fehlversuche on the login page	Five wrong passwords in a row. Wait one minute, then log in with the last 8 characters of the AppKey.
Bereich bestätigen is grey	Choose the meter type first, then draw the frame.
Digits stay at X	Draw the frame or boxes tighter ("Drawing the Reading Area").
Digital meter: a 1 is read as 8 or 0	The box over the 1 is not positioned correctly (Example 27).
Digital meter: a 0 is read as 7 or 3	The box cuts off a segment (Example 28).
Last digit after the comma differs	Expected: the rolling last digit is skipped (Example 1).
Wrong digit count or comma in Step 5	Correct **Gesamtziffern** and **Ziffern vor dem Komma**.
Reading in Step 5 is wrong	Do not save. Tap **Neu kalibrieren** and redraw the area.
Time has run out	The device has gone to sleep. Take the batteries out and put them back in; a device that is not calibrated yet starts its Wi-Fi again. Then repeat.

Correct and Wrong Examples

Drawn examples of correct and wrong frames, cropped previews and digit boxes, referenced from "Drawing the Reading Area". Blue rectangles mark correct, red rectangles wrong frames. Real meters are shown in "Settings for Each Meter Type".

5.6 Drum counters: Step 1 frame



✓ **Correct**

The frame runs along the drum window. All eight drums are inside, nothing else.

Example 19: Drum counter: Step 1 frame drawn correctly.



× Too loose

The window frame, the unit and the screw are inside the area and can be mistaken for digits.

Example 20: Drum counter: Step 1 frame too loose.



× Too tight

Far too much is cut off at the top and bottom, and the last drum is missing.

Example 21: Drum counter: Step 1 frame too tight.



× Digits cut off

Large parts of the digits are missing and the last drum is outside. The frame was drawn too tight.

Example 23: Cropped preview after a frame that was too tight.

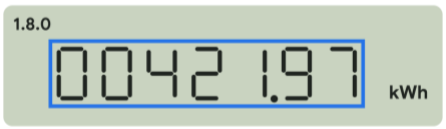


× Too much around the digits

Window border, unit and screw are in the preview, and the digits are small. The frame was drawn too loose.

Example 24: Cropped preview after a frame that was too loose.

5.7 Digital displays: Step 1 frame



✓ Correct

Only the row of digits is framed.

Example 25: Digital display: Step 1 frame drawn correctly.

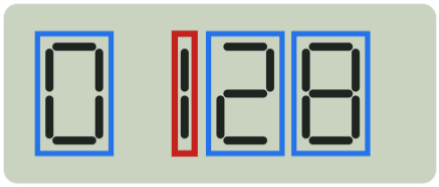
5.8 Digital displays: digit boxes in Step 2



✓ Correct

Four equal boxes, each the size of a full digit. The 1 sits at the right edge of its box.

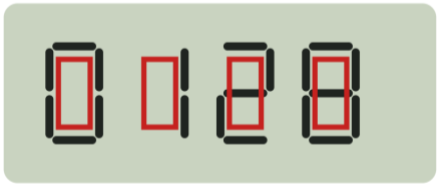
Example 26: Digital display: digit boxes drawn correctly.



× Box drawn around the 1

The 1 fills its narrow box and is read as an 8 or a 0.

Example 27: Digital display: box shrunk around a 1.



× Boxes too small

The outer segments are cut off: a 0 is read as a 7 or a 3.

Example 28: Digital display: digit boxes too small.



× Boxes shifted

Each box catches part of the next digit.

Example 29: Digital display: digit boxes shifted.

Annex A – The Tuner

The tuner changes how the picture is converted to black and white before the digits are read. The presets suit almost every meter, so only use it when Step 4 does not succeed with a tight area. It shows the original picture (**Quellbereich**) and the converted picture (**Binarisierte Vorschau**); in the converted picture the digits must be **white on black**, complete and separate from each other.

Setting	Use it when …
Hell auf Dunkel / Dunkel auf Hell	the digits appear black: switch the polarity.
Erosion (verdünnen) (*thin*)	digits are too thick or touch each other.
Dilatation (verdicken) (*thicken*)	digits are broken or segments are missing.
Blockgröße, C-Offset	under **Mehr erfahren**; for specialists only.

Using the tuner

1. Change one setting in small steps.
2. Tap **Bild aktualisieren** (*refresh image*) to see the effect.
3. When the digits look right, tap **Übernehmen & weiter** (*apply and continue*). **Schließen** (*close*) leaves without saving.

Annex B – Menu Words

Menu (German)	Meaning
Einrichtung	Setup
Gerätetyp	Meter type
Wasser, Gas, Strom	Water, gas, electricity
Bereich auswählen, Bereich bestätigen	Select area, confirm area
Zurücksetzen	Reset
Vorkalibrierung	Pre-calibration
Gesamtziffern	Total digits
Ziffern vor dem Komma	Digits before the comma
Auto, Manuell	Automatic, manual
Gleichmäßig verteilen	Distribute evenly
Ziffern-Polarität	Digit colour
Hell auf Dunkel, Dunkel auf Hell	Light on dark, dark on light
Weiter, Zurück	Next, back
Vorschau der Ziffern	Digit preview
Ergebnisse bestätigen	Confirm results
Zählerstand	Meter reading
Upload-Intervall (Min.)	Upload interval in minutes
Umdrehungen pro kWh	Revolutions per kWh
Max. Strom, Spannung, Max. Leistung	Maximum current, voltage, maximum power
Speichern & Fertig	Save and finish
Neu kalibrieren	Calibrate again

Menu (German)	Meaning
Bild aktualisieren	Refresh image
Ubernehmen & weiter	Apply and continue
Schließen	Close
Verbleibend	Time remaining

Manufacturer Information

ISIS IC GmbH
Handelsweg 2
46485 Wesel
Germany

Email: info@emoni.cloud
Web: https://emoni.cloud/

