SAILORGUARD

Anchor Guard

Installation and setup guide

DEVICE WI-FI NETWORK (FACTORY DEFAULT)

ESP32-DASH

WI-FI PASSWORD (FACTORY DEFAULT)

esp32pass

WEB INTERFACE ADDRESS

http://192.168.4.1

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Overview

SailorGuard Anchor Guard counts the chain paid out by your windlass and sends the data to the boat's **Signal K** server. The **SailorGuard** app on your phone or tablet shows how much chain is out, beeps when you pass the lengths you have set, and lets you raise, lower and stop the windlass remotely.

The device is configured through its web interface, which opens in any browser on a phone, tablet or computer.

> **The steps at a glance**
> Wire the board to the battery, the windlass relay and the chain sensor → join the `ESP32-DASH` Wi-Fi → open `http://192.168.4.1` → connect the device to the boat's Wi-Fi → connect to the Signal K server and approve the device → install the SailorGuard app → set up chain calibration and alerts.

1. What you need

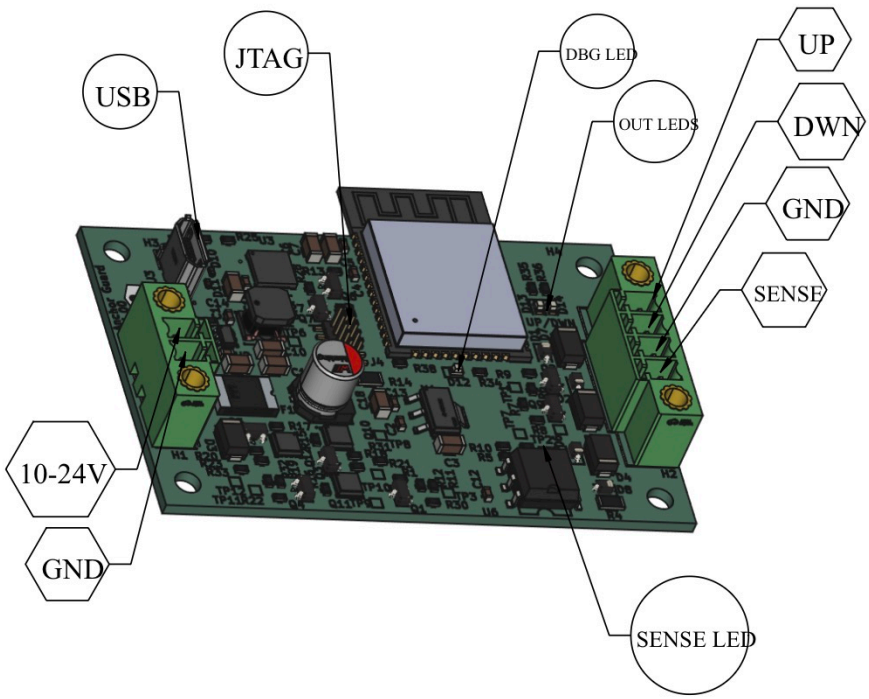
- The Anchor Guard device, installed and powered.
- A phone, tablet or laptop with Wi-Fi and a browser (Chrome, Safari, Edge, Firefox).
- The name (SSID) and password of the boat's Wi-Fi.
- A Signal K server on the same network: the **SailorGuard Gateway** or the official Signal K server (e.g. OpenPlotter, Raspberry Pi, Victron Cerbo GX). With the official server you need access to its admin panel to approve the device.
- The **SailorGuard** app for iPhone or iPad (iOS / iPadOS 16.4 or later), free on the App Store.

> **No Signal K?**
> Chain counting works without a Signal K server. The beeps, however, are played by the SailorGuard app, not by the device. To get the beeps, see the chain length on your phone and control the windlass remotely, you need Signal K and the app.

2. Wiring

Before you start

Switch off the windlass main isolator and disconnect the power. If you are not familiar with marine electrics, have the installation done by a marine electrician.



Board terminals and LEDs

Terminals

TERMINAL	CONNECTS TO
10-24V	Battery positive (+), through a fuse.
GND (left)	Battery negative (−), common ground with the windlass.
UP	The **UP** coil terminal on the windlass relay (contactor), where the wire from the existing UP switch already lands.
DWN	The **DOWN** coil terminal on the windlass relay, where the wire from the existing DOWN switch already lands.
GND (right)	One wire of the chain sensor.
SENSE	The other wire of the chain sensor.
USB / JTAG	Service only. Not needed for installation.

> **How the UP / DWN outputs work**
>
> The outputs supply +V to the relay coil, exactly like the existing switches. The switches stay connected and keep working as before. The board detects when they are pressed, so the counter knows whether the chain is going up or down. Power the board at the same voltage as the relay coils (12 V or 24 V).

Indicator LEDs

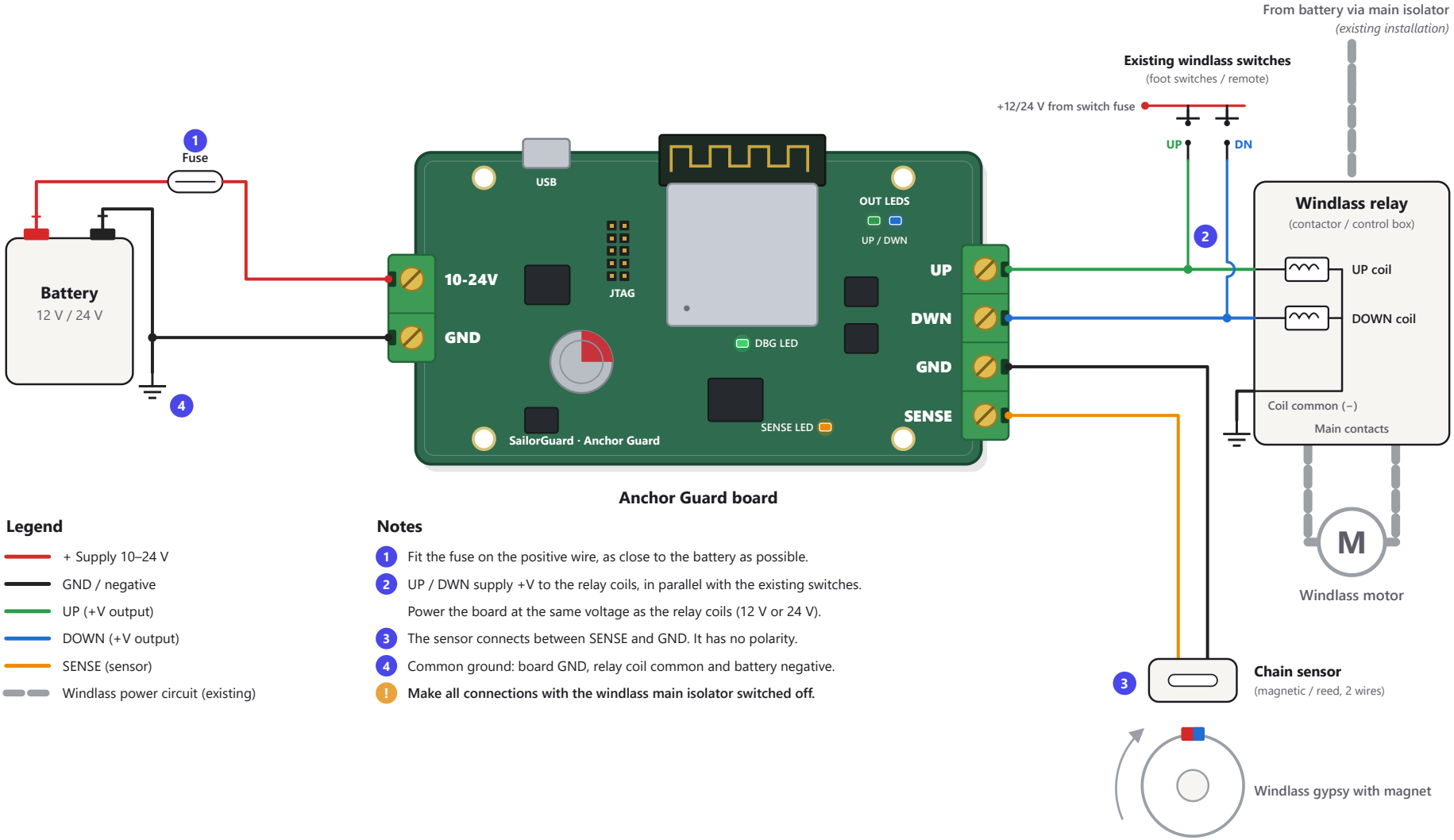
LED	WHAT IT SHOWS
DBG LED	On while the board is driving the windlass (command from the app).
OUT LEDS (UP / DWN)	On when the UP or DWN line is live, whether driven by the board or by the existing switches.
SENSE LED	On when the magnet passes the chain sensor.

Installation steps

1. Switch off the windlass main isolator.
2. Mount the board in a dry, protected place, using the four corner holes.
3. Fit the magnet on the gypsy and the sensor opposite it, so the magnet passes within a few millimetres on every turn. Connect the two sensor wires to **SENSE** and **GND**.
4. Connect **UP** and **DWN** to the relay coil terminals, in parallel with the wires from the existing switches.
5. Connect the power last: **10-24V** to positive through a fuse and **GND** to negative.
6. Switch the isolator on and check:
    - Pressing the existing UP or DOWN switch runs the windlass as usual and lights the matching **OUT LED**.
    - As the gypsy turns, the **SENSE LED** flashes once per turn.

The full wiring diagram is on the next page.

Anchor Guard · Wiring diagram



Anchor Guard board

Legend

- + Supply 10–24 V
- GND / negative
- UP (+V output)
- DOWN (+V output)
- SENSE (sensor)
- Windlass power circuit (existing)

Notes

1. Fit the fuse on the positive wire, as close to the battery as possible.
2. UP / DWN supply +V to the relay coils, in parallel with the existing switches. Power the board at the same voltage as the relay coils (12 V or 24 V).
3. The sensor connects between SENSE and GND. It has no polarity.
4. Common ground: board GND, relay coil common and battery negative.

! **Make all connections with the windlass main isolator switched off.**

3. First connection to the device

The device creates its own Wi-Fi network (Access Point). This network **always stays on**, even after the device joins the boat's Wi-Fi, so you can always reach the settings, even if the boat's network changes.

1 Join the device's network

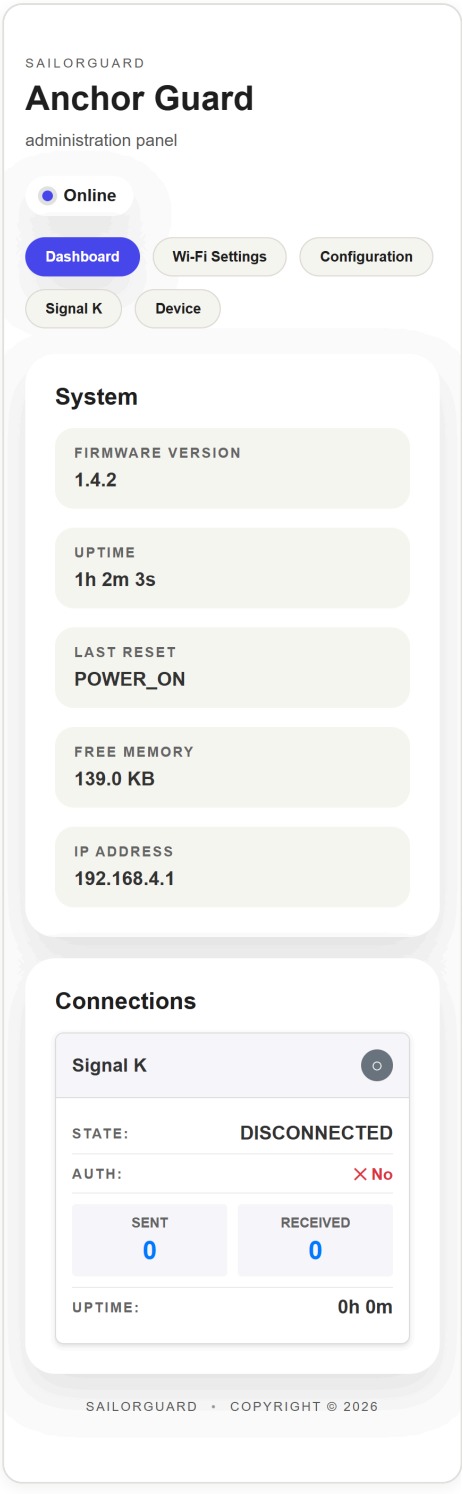
Power on the device and wait about 20 seconds. The network `ESP32-DASH` will appear in your phone's Wi-Fi settings. Connect with the password `esp32pass`.

> **"No Internet connection" message**
> If your phone shows this message, tap *"Stay connected"* or *"Use without Internet"*. This is normal, because the device does not provide Internet access.

2 Open the web interface

Open your browser and type `http://192.168.4.1`. You will see the **Anchor Guard – administration panel** with the menu at the top:

- **Dashboard**: device and connection status
- **Wi-Fi Settings**: network connection
- **Configuration**: windlass, chain and alert settings
- **Signal K**: connection to the Signal K server
- **Device**: firmware, updates, restart



The Dashboard on first connection

4. Connecting to the boat's Wi-Fi

To talk to the Signal K server and download updates, the device must join the boat's Wi-Fi.

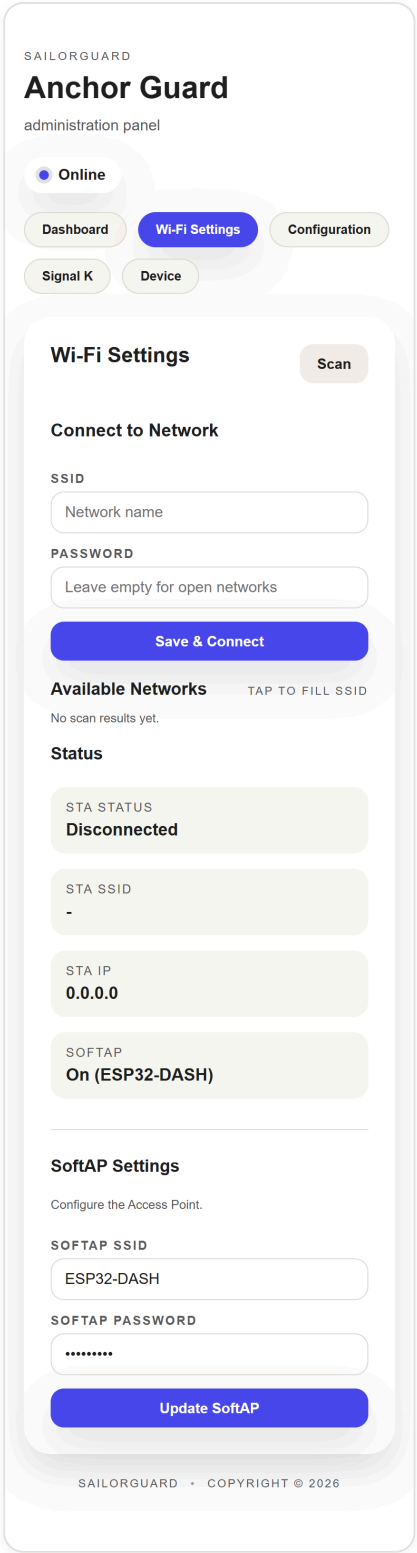
1 Open “Wi-Fi Settings”

Tap `Wi-Fi Settings` in the menu. At the bottom, under **Status**, you will see `STA Status: Disconnected`, because the device has not joined a network yet.

2 Scan for networks

Tap `Scan` at the top right. The scan takes about 5 seconds. The networks found appear under **Available Networks**, together with their signal strength (RSSI).

> **Signal strength**
>
> The closer the RSSI is to 0, the better the signal. Values from −30 to −67 dBm are very good. Below −80 dBm the connection may be unstable.



The Wi-Fi Settings page

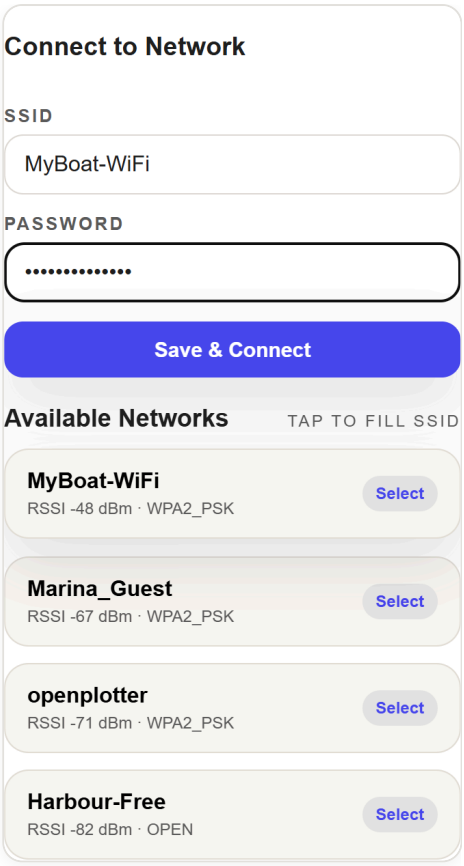
3 Select the network and enter the password

Tap `Select` next to the boat's network. Its name fills in the `SSID` field automatically. Type the network password in the `Password` field. Leave it empty for open networks.

If your network is hidden, type its name in the `SSID` field yourself.

4 Tap “Save & Connect”

The message *“Saved. Connecting...”* appears. The settings are stored permanently **only if the connection succeeds**. If the password is wrong, the device keeps using its previous setting.



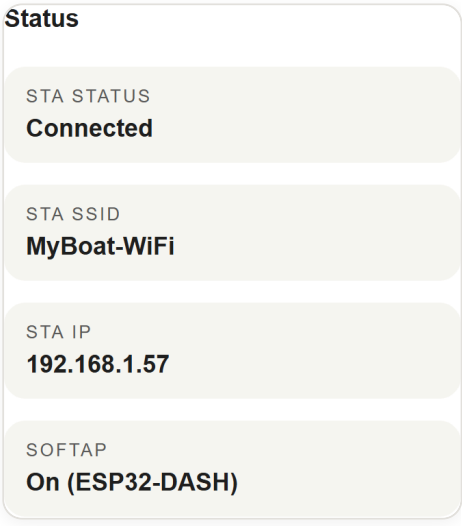
Selecting a network and entering the password

5 Check the connection

After a few seconds the **Status** section shows:

- `STA Status: Connected`
- `STA SSID`: the boat's network
- `STA IP`: the device's address on the boat's network (e.g. `192.168.1.57`)

> **Write down the STA IP address**
> With this address you can open the web interface from any device on the boat's Wi-Fi (e.g. `http://192.168.1.57`), without joining `ESP32-DASH`. If your router supports it, give the device a fixed IP (DHCP reservation).



The device has joined the boat's Wi-Fi

5. Changing the device network password

Strongly recommended

The factory password `esp32pass` is the same on every device. Change it so that nobody else in the marina can open your windlass settings.

1 Find “SoftAP Settings”

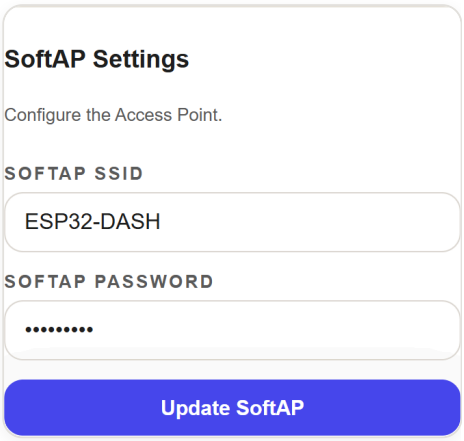
On the `Wi-Fi Settings` page, scroll down to **SoftAP Settings**.

2 Set a name and password

- `SoftAP SSID`: the name of the device's network (up to 32 characters), e.g. `MyBoat-Anchor`.
- `SoftAP Password`: a new password of **at least 8 characters**.

3 Tap “Update SoftAP”

You will see *“SoftAP settings updated successfully”*. If you are connected through `ESP32-DASH`, the connection will drop. Reconnect to the new network with the new password.



Device network settings

Keep the password somewhere safe

If you forget it, you can always get in through the boat's Wi-Fi (STA IP address, see chapter 4).

6. Connecting to Signal K and the SailorGuard app

The device must already be on the boat's Wi-Fi (chapter 4), on the same network as the Signal K server.

1 Open the “Signal K” page

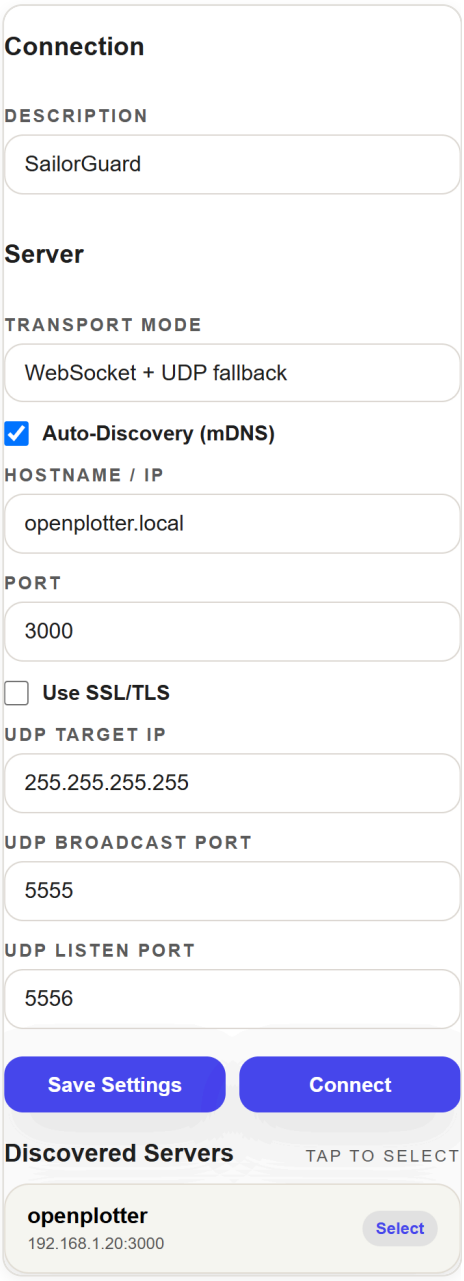
Tap **Signal K** in the menu. The **Status** section at the top shows the connection state (initially **DISCONNECTED**).

2 Find the server automatically

Make sure **Auto-Discovery (mDNS)** is ticked and tap **Discover**. After about 3 seconds, the servers found appear under **Discovered Servers**.

Tap **Select** next to your server. The **Hostname / IP** and **Port** fields fill in automatically.

> **No server found?**
> Fill in the fields yourself: **Hostname / IP** (e.g. `192.168.1.20` or `openplotter.local`) and **Port** (usually `3000`, or `3443` with SSL).



Server found and selected

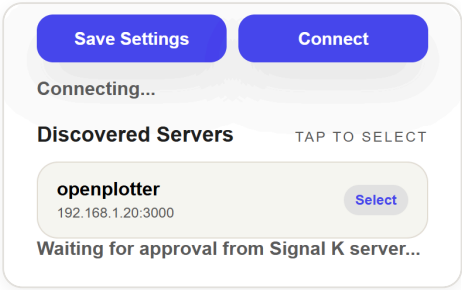
3 Check the remaining settings

FIELD	RECOMMENDED VALUE	DESCRIPTION
Description	`SailorGuard`	The name the device appears under on the Signal K server.
Transport Mode	`WebSocket + UDP fallback`	*WebSocket only*: WebSocket only. *UDP only*: UDP only. *WebSocket + UDP fallback*: WebSocket, with UDP when WebSocket is not available. Keep the recommended value unless you know you need something else.

Use SSL/TLS	`off`	Tick only if your server uses HTTPS.
UDP Target IP	`255.255.255.255`	UDP destination. The default sends to the whole network (broadcast).
UDP Broadcast / Listen Port	`5555` / `5556`	UDP ports. Change them only if you also changed them on the server.

4 Save and connect

Tap `Save Settings`, then `Connect`. The device sends an access request to the server and the message *"Waiting for approval from Signal K server..."* appears (state `AUTH_PENDING`).



Waiting for approval from the server

5 Approve the device

On the official Signal K server:

1. Open the Signal K server admin panel (e.g. `http://openplotter.local:3000`) and log in as administrator.
2. Go to **Security** → **Access Requests**.
3. You will see a request from the *SailorGuard* device.
4. Under **Permissions** choose **Read/Write** and set **Authentication Timeout** to **NEVER**, so the token does not expire.
5. Click **Approve**.

> **Read/Write is required**
> With Read-only permission, the device cannot send chain readings or receive commands.

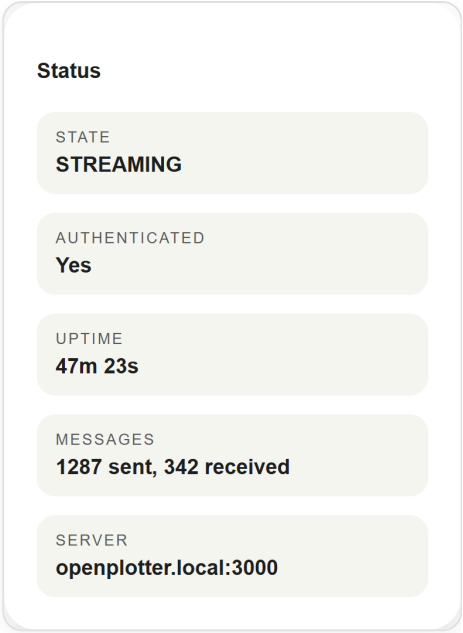
In SailorGuard: SailorGuard has its own approval process for adding the device. Approve the Anchor Guard device from the SailorGuard app, following its instructions (step 8).

6 Confirm the connection

After approval, the **Status** section shows:

- `State: STREAMING`: the connection is working and data is being sent.
- `Authenticated: Yes`
- `Messages`: the message counters keep increasing.

The device stores the token and reconnects automatically every time it starts. You don't need to repeat this.



Successful connection

If you need to approve again

If you change server or delete the device on the server, tap `Clear Token` in the **Authentication** section and then `Connect`. The approval process starts over.

Connection states

STATE	MEANING
DISCONNECTED	Not connected. Check the settings and tap `Connect`.
DISCOVERING	The device is looking for a server on the network.
CONNECTING	Connecting to the server.
AUTH_PENDING	Waiting for your approval on the Signal K server or in SailorGuard (step 5).
CONNECTED	Connected, data stream is starting.
STREAMING	Everything is working normally.
ERROR	An error occurred. See the message on the Dashboard and chapter 10.

Installing the SailorGuard app

7 Download the app

Scan the QR code with your iPhone or iPad camera, or search for **“SailorGuard”** on the App Store. The app is free and requires iOS / iPadOS 16.4 or later.

More information: `www.sailorguard.com/sailorguard-app`



SailorGuard on the App Store

8 Connect the app to your boat

Open the app and follow its instructions to pair it with your boat. To add the Anchor Guard, approve the device through the SailorGuard approval process.

- **With the SailorGuard Gateway:** the app connects directly to the Gateway.
- **With the official Signal K server:** first install the `signalk-sailorguard` plugin on the server (Signal K admin → **Appstore**) so the app can connect.

The app works on the boat's Wi-Fi and remotely, over a secure cloud connection.

> **In the app you will find**
> Live chain length, the chain counter beeps, and buttons to raise, lower and stop the windlass.

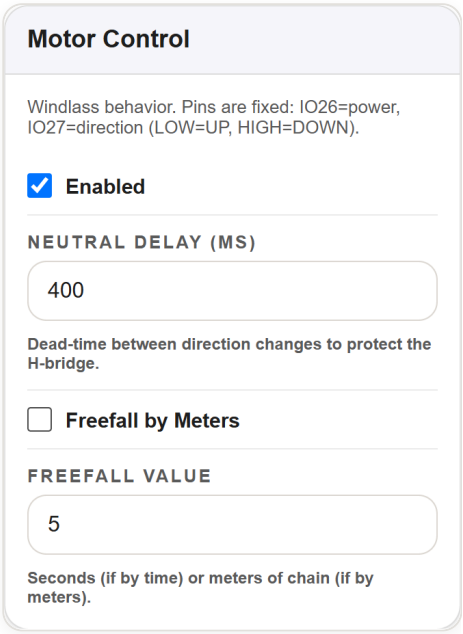
7. Configuring Anchor Guard

Tap `Configuration` in the menu. The settings are grouped into four sections. When you are done, tap `Save Configuration` at the bottom of the page. The message *"Configuration saved"* appears.

> **Decimal numbers**
> In number fields you can type decimals with a point or a comma (e.g. `0.33` or `0,33`).

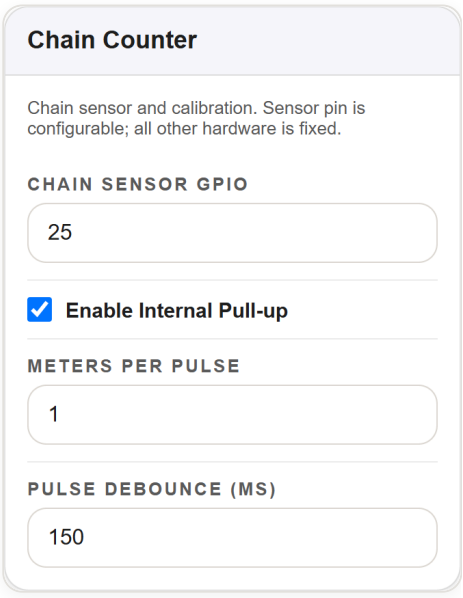
7.1 Motor Control

SETTING	DEFAULT	DESCRIPTION
Enabled	on	Lets the device control the windlass.
Neutral Delay (ms)	`400`	Safety pause when the direction changes (up/down), to protect the motor and relays. Do not set it below 300 ms.
Freefall by Meters	`off`	When ticked, the "freefall" command pays out a set number of **meters** of chain. Otherwise it runs for a set number of **seconds**.
Freefall Value	5	Seconds or meters, depending on the previous setting (0.5 to 200).



7.2 Chain Counter

SETTING	DEFAULT	DESCRIPTION
Chain Sensor GPIO	25	The pin the chain sensor is wired to. **Do not change it** unless technical support asks you to.
Enable Internal Pull-up	on	Leave on for most sensors (magnetic / reed switch).
Meters per Pulse	1	**The main calibration:** how many meters of chain go out per sensor pulse, i.e. per turn of the gypsy.
Pulse Debounce (ms)	`150`	Filters false sensor pulses. Increase it if the counter shows more chain than is actually out.



How to find “Meters per Pulse”

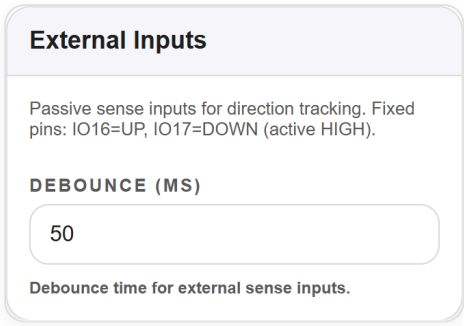
1. Mark the chain where it enters the gypsy.
2. Pay out chain for exactly 10 turns of the gypsy (10 pulses).
3. Measure how much chain went out with a tape, e.g. 3.3 m.
4. Divide by the number of turns: 3.3 ÷ 10 = **0.33**. This is the value for the field.

For even better accuracy, measure over more turns (e.g. 20).

7.3 External Inputs

The device also “sees” the windlass's existing buttons and switches (e.g. foot switches or a remote). This way the counter knows whether the chain is going up or down, even when the windlass is operated from them.

SETTING	DEFAULT	DESCRIPTION
Debounce (ms)	`50`	Noise filtering on the switch inputs (10 to 1000 ms).

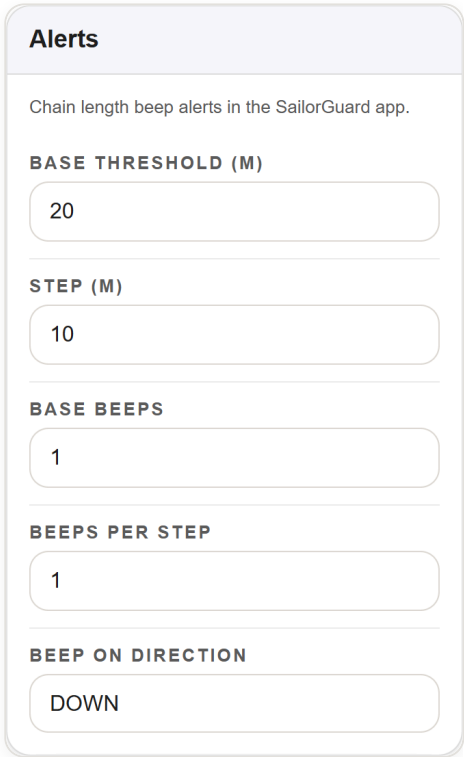


7.4 Alerts: audible chain alerts

When the chain reaches certain lengths, the device sends an alert through Signal K and the **SailorGuard app** beeps on your phone or tablet. Each further step adds more beeps, so you know how much chain is out without looking at a screen.

The device itself has no speaker. To hear the beeps, the app must be connected and your phone's sound must be on.

SETTING	DEFAULT	DESCRIPTION
Base Threshold (m)	`20`	The length at which the first alert sounds.
Step (m)	`10`	How many meters after the first threshold each new alert sounds.
Base Beeps	`1`	Number of beeps at the first threshold.
Beeps per Step	`1`	Beeps added at each further step.
Beep On Direction	`DOWN`	When the beeps sound: *DOWN* while anchoring, *UP* while weighing anchor, *BOTH* in both cases.



Example with the default values

At 20 m the app plays 1 beep, at 30 m 2 beeps, at 40 m 3 beeps, at 50 m 4 beeps, and so on.

Save

Tap **Save Configuration**. Changes take effect immediately and are kept after a power loss.



8. Dashboard: checking status

The `Dashboard` is the home page and refreshes automatically every 2 seconds.

System

- `Firmware Version`: the device software version.
- `Uptime`: time since the last start.
- `Last Reset`: the reason for the last start. `POWER_ON` means a normal power-up. If you often see `BROWNOUT`, the supply voltage is dropping (check wiring and battery).
- `Free Memory`: free memory, useful for technical support.
- `IP Address`: the device's address on the network.

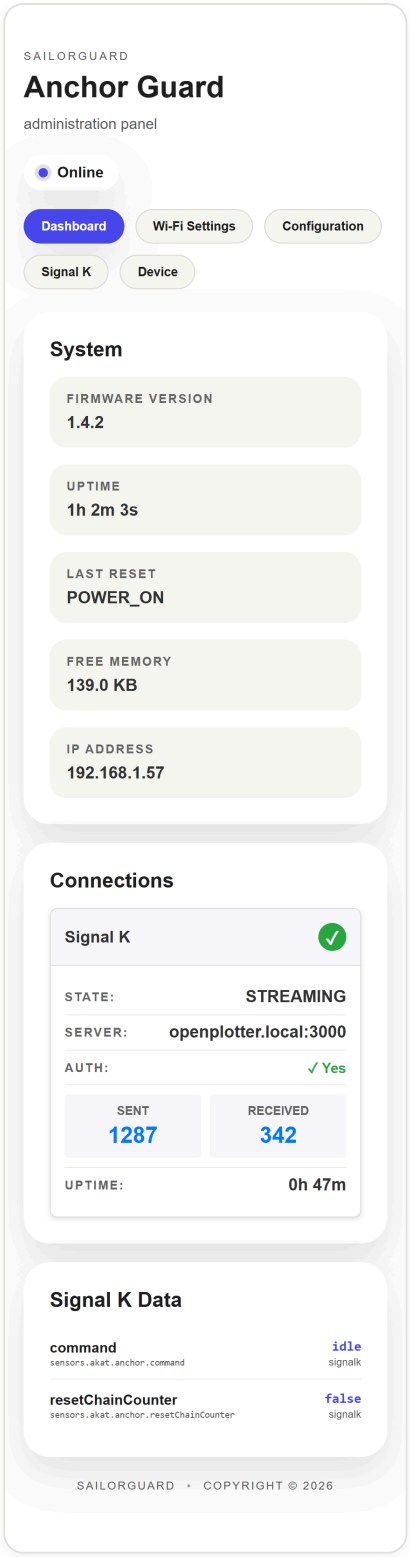
Connections

The **Signal K** card shows the connection state by color:

- **Green** ✓: STREAMING, everything is working
- **Blue**: CONNECTED
- **Yellow**: connecting or waiting for approval
- **Red** ✕: error
- **Grey**: not connected

Signal K Data

Shows the latest commands the device received from the Signal K server.



The Dashboard with an active connection

9. Firmware updates and restart

1 Open the “Device” page

The **Device Information** section shows the current firmware version.

2 Check for updates

Tap `Check for Updates`. The device needs Internet access through the boat's Wi-Fi for this.

- *“Firmware is up to date”*: you have the latest version.
- *“Update available: x.y.z”*: a newer version is available.

3 Install the update

Tap `Update Firmware + UI` and confirm. A progress bar shows the progress. The device restarts by itself. The process takes 1 to 3 minutes.

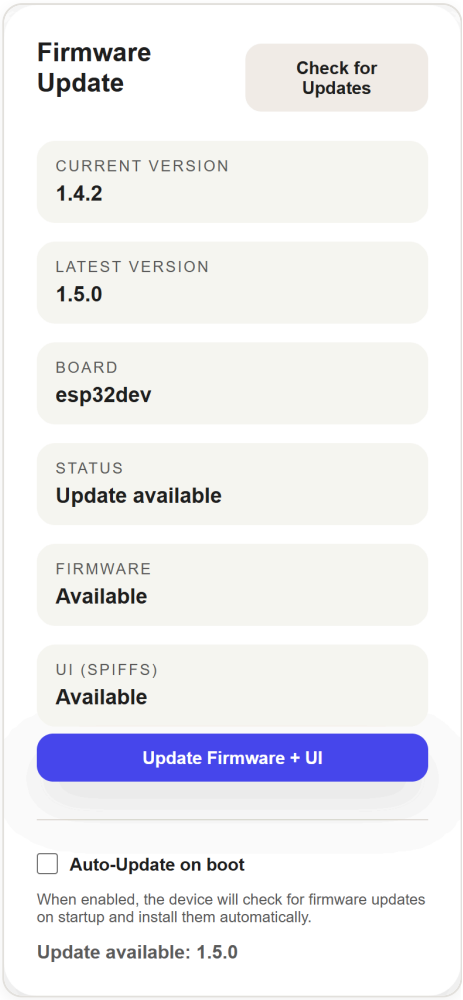
> **During the update**
> Do not cut the power, do not use the windlass and do not close the page until the message *“OTA finished”* appears. Do not update while at anchor in difficult conditions.

Automatic updates

If you tick `Auto-Update on boot`, the device checks for updates every time it starts and installs them automatically.

Restart

In the **System** section, the `Reboot Device` button restarts the device. Your settings are kept.



Update available

10. Troubleshooting

PROBLEM	SOLUTION
I can't see the `ESP32-DASH` network	Wait 20 to 30 seconds after power-up. Check the power supply. If you renamed the network (chapter 5), look for the new name.
`192.168.4.1` does not open	Make sure you are connected to the device's network. Temporarily turn off your phone's mobile data. Type the address with `http://` in front (not https).
The device won't join the boat's Wi-Fi	Check the password (it is case-sensitive). The device supports **2.4 GHz** networks only, not 5 GHz. If the signal is weak (RSSI below −80), move closer to the router or use a repeater.
Discover does not find a Signal K server	Check that the server is running and on the same network. Some routers block mDNS. In that case, type the server's IP address yourself.
Stuck on `AUTH_PENDING`	Approve the request in Signal K admin → Security → Access Requests and in the SailorGuard app (chapter 6, steps 5 and 8).
It was connected, now it shows an error	The device may have been deleted on the server, or its token may have expired. Tap **Clear Token** → **Connect** and approve again.
The counter shows the wrong length	Redo the **Meters per Pulse** calibration (chapter 7.2). If it counts double pulses, increase **Pulse Debounce**. Check the gap between the magnet and the sensor.
No beeps on the phone	The beeps are played by the SailorGuard app, not by the device. Check that the app is open and connected, that the phone is not on silent, and that the device shows **STREAMING** on the Signal K page. Also check **Base Threshold** and **Beep On Direction** (chapter 7.4). For example, with *DOWN* there are no beeps while weighing anchor.
Last Reset often shows `BROWNOUT`	The supply voltage is dropping (usually when the windlass starts). Check the cable size and the power connections.

11. Appendix: Signal K paths

For advanced users who want to build their own displays (e.g. KIP, WilhelmSK, Node-RED).

Data sent by the device

PATH	TYPE	DESCRIPTION
`sensors.akat.anchor.chainOut`	number (m)	Meters of chain out
`sensors.akat.anchor.chainPulses`	integer	Total sensor pulses
`sensors.akat.anchor.state`	text	Current windlass state
`sensors.akat.anchor.enabled`	true/false	Whether control is enabled
`sensors.akat.anchor.externalControl.active`	true/false	Operated from an external switch
`sensors.akat.anchor.externalControl.source`	text	External control source
`sensors.akat.anchor.alert.buzzerEvent`	text (JSON)	Beep alert for the app (number of beeps, threshold, time)
`sensors.akat.anchor.alert.lastThreshold`	number (m)	Threshold of the last alert
`sensors.akat.anchor.alert.lastBeeps`	integer	Number of beeps of the last alert
`sensors.akat.anchor.alert.firedAt`	text	Time of the last alert

Commands accepted by the device

PATH	VALUE	ACTION
`sensors.akat.anchor.command`	`"running_down"`	Lower chain
	`"running_up"`	Raise chain
	`"freefall"`	Lower for a set time/length, based on Freefall Value
	`"idle"`	Stop the windlass
	`"reset_counter"`	Reset the chain counter
`sensors.akat.anchor.resetChainCounter`	`true`	Reset the chain counter

> **Safety**
> Operate the windlass remotely only when you can see the bow and nobody is near the chain.