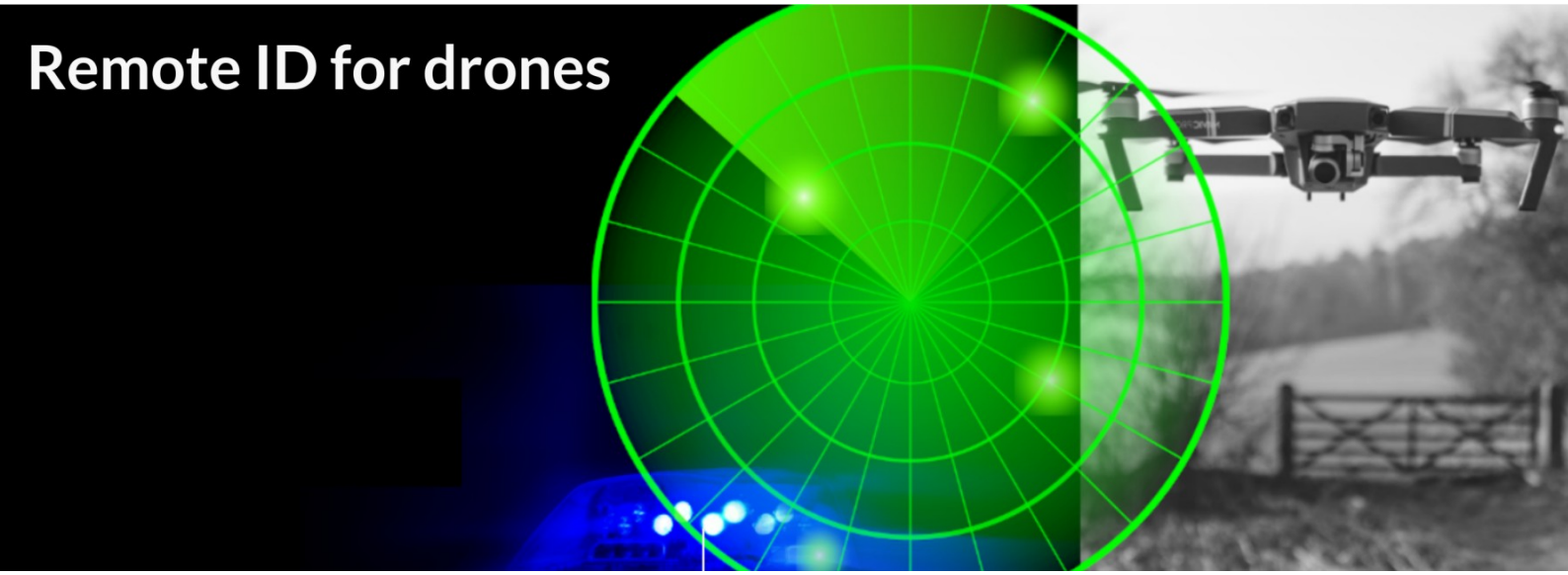
DroneScout Dashboard - Manual

June 2025 - version 1.2



The latest version of this manual is located here:
https://download.bluemark.io/ds_dashboard.pdf

Intended audience: end users, system integrators

Disclaimer: we are not responsible or liable for errors or incomplete information in this document.

Version history

version	date	description
1.0	January 2025	● Initial release
1.1	April 2025	● updated information with latest dashboard version (sound alarms)
1.2	June 2025	● update manual with latest features such brand/model identification, setting system time without internet

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1 INTRODUCTION

DroneScout Dashboard is a dashboard that runs on a DroneScout receiver (ds230/ds240). It displays detected *RemoteID* drones/add-ons and also aircraft (*ADS-B*, *UAT*, *ADSL*), if the appropriate add-on has been installed.

1.1 Audience

This document is intended for users or system integrators that want to use the *DroneScout Dashboard option* with DroneScout receivers.

1.2 Architecture

DroneScout Dashboard using the following architecture/components:

- local MQTT broker that runs on the DroneScout receiver
  - is accessible at port 1883 for other applications, default, no SSL, no username/password
- compressed SQLite database that is located (in `/data/`)
- local webserver using JavaScript/PHP
  - port 80 is used for displaying the dashboard. You can map this to a different port if you use it behind a router/NAT
  - port 3000 is used to provide the datafeed
- a local MQTT subscriber application that provides a data feed to the webserver

DroneScout Dashboard requires that the sensor has correct time (using a NTP client or use a GNSS receiver (LTE add-on) as internet source.)

2 INSTALLATION

DroneScout Dashboard is installed on the sensor when this option is selected when buying a DroneScout receiver. At the moment, DroneScout Dashboard only works for ARM64 platforms (ds230/ds240) and need a license to unlock the functionality. Normal users can skip this chapter.

If you want to install DroneScout Dashboard, pleases execute this command in a SSH terminal connected to the DroneScout receiver:

```
curl https://download.bluemark.io/dronescout/dashboard/install.sh | bash
```

Reboot afterwards. Note this will overwrite/clear the database.

DroneScout Dashboard only works if there is a valid license file: `/root/.ssh/portal.license`

If this file is missing or lost, please contact us (Chapter 5). (In such case the status icon is blue.)

2.1 Upgrade

DroneScout Dashboard can be updated to the latest version using the web interface (Chapter 3). It is also possible to upgrade by executing this command in a SSH terminal:

```
/root/upgrade_dashboard.sh
```

2.2 Offline-maps

DroneScout Dashboard allows offline map tiles based on OpenStreetMap (OSM). BlueMark can provide offline map tiles. Contact us for more information. The generic procedure to generate offline OSM map tiles and use them with DroneScout Dashboard is described below.

generating OSM tiles
See this link to generate OSM tiles for your area:
https://www.gibbard.me/openstreetmap/

using OSM tiles
Once the tiles are generated, you can:

- (easiest solution): prepare a micro SD-card, format it as EXT4. Then make a folder called `tiles` and copy the generated tiles inside this folder. Unmount and insert it in the micro SD card slot of the ds230/ds240 sensor. After a reboot, DroneScout Dashboard should recognized the tiles.
- Create a file that contains a ext2/ext4 file system: https://www.baeldung.com/linux/filesystem-in-a-file Mount it and copy the tile data into the folder tiles. Unmount. Copy the file to the sensor folder `/data` and name it `tiles` on the DroneScout Receiver. After a reboot, DroneScout Dashboard should recognized the tiles.

2.3 Use the LTE add-on (GNSS receiver) as time source

In case you don't want to connect the DroneScout receiver to internet, you can use the LTE add-on as time source. Together with offline maps, it allows you to use the DroneScout receiver fully offline.

There are two options

- (preferred) set the setting *set_system_time* to 1 in dronescout.conf See the DroneScout sensor manual for more information (https://download.bluemark.io/ds230.pdf, Section 1.13 System time).
- set up Chrony to use the LTE modem as time source. See below.

Chrony

See this link: https://gpsd.gitlab.io/gpsd/gpsd-time-service-howto.html#_feeding_chrony_from_gpsd

DroneScout receivers use Chrony as NTP client. Furthermore the LTE add-on (Quectel EG-25G/EC-25) provide NMEA output on port /dev/ttyUSB1. This can be verified by executing this command:

```
cat /dev/ttyUSB1
```

Example output:

*$GPGSV,4,1,13,04,03,298,19,16,40,296,24,18,63,150,26,23,04,146,20*72*
*$GPGSV,4,2,13,25,10,130,22,27,11,260,26,28,21,203,25,31,36,224,29*7B*
*$GPGSV,4,3,13,05,23,056,,09,03,324,,20,08,026,,26,68,270,*75*
*$GPGSV,4,4,13,29,43,073,*43*
*$GPGGA,153605.0,5214.176601,N,00650.973998,E,1,04,3.3,28.6,M,47.0,M,,*60*
*$GPVTG,317.9,T,317.9,M,0.0,N,0.0,K,A*23*
*$GPRMC,153605.0,A,5214.176601,N,00650.973998,E,0.0,317.9,130605,0.0,E,A*0F*
*$GPGSA,A,2,18,25,28,31,,,,,,,,3.4,3.3,1.0*33*

The GPGSV messages indicate to which satellites the GNSS receiver has a lock. If the GNSS receiver has not a lock due to poor reception (like indoors), the output may look like this:

*$GPGGA,,,,,,0,,,,,,,,*66*
*$GPRMC,,V,,,,,,,,,,N*53*
*$GPGSV,3,1,11,18,43,168,23,26,50,291,25,28,41,215,28,29,63,067,22*7B*
*$GPGSV,3,2,11,31,50,250,19,04,10,316,,05,18,078,,09,04,343,*7B*
*$GPGSV,3,3,11,11,01,032,,16,20,293,,20,16,042,*47*
*$GPVTG,,T,,M,,N,,K,N*2C*
*$GPGSA,A,1,,,,,,,,,,,,,,*1E*
*$GPGGA,,,,,,0,,,,,,,,*66*
*$GPRMC,,V,,,,,,,,,,N*53*

Here satellites are detected, but there is not a GPS fix yet.

The LTE add-on (Quectel EG-25G/EC-25) does not provide a PPS device. It means that you don't need skip the configuration of it (as described in above link.)

3 USING DRONESCOUT DASHBOARD

Connect to the DroneScout Dashboard by entering the IP address of the DroneScout receiver. Enter in the browser: http://<IP address sensor>

The following screen appears:

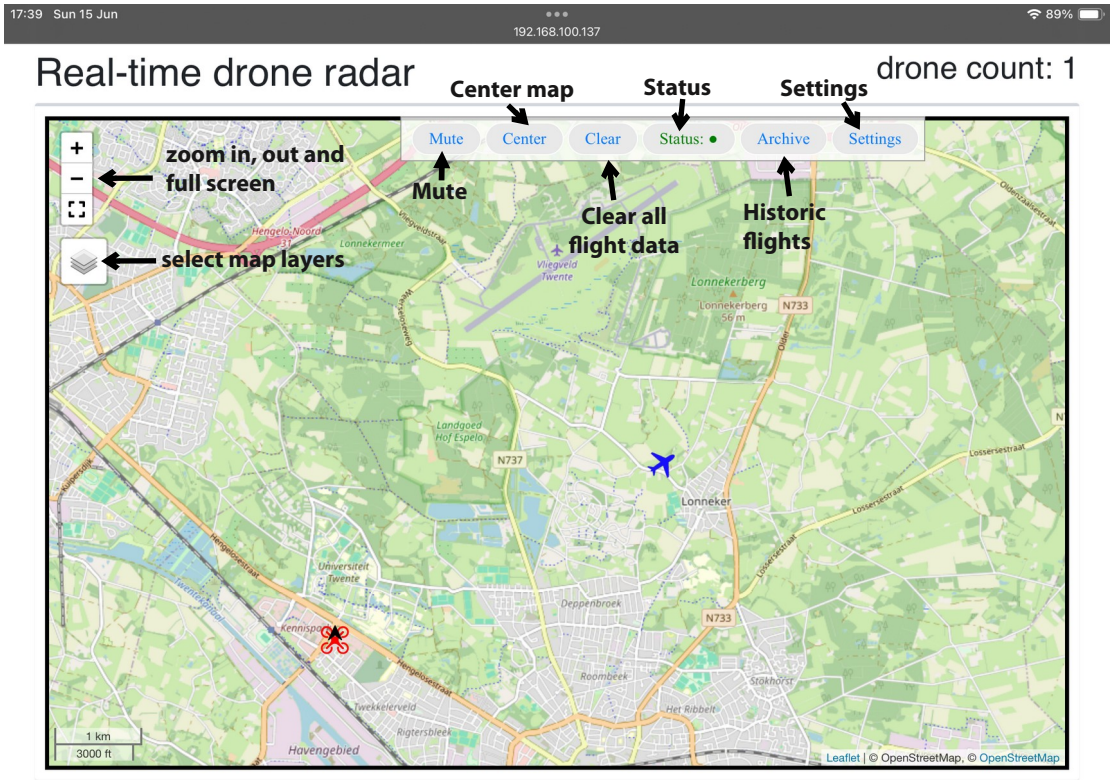

Figure 1 - DroneScout Dashboard

- Detected UAVs (drones) with RemoteID are displayed as a *red multirotor icon* . The black arrow indicates the direction of the drone.
- Detected aircraft (ADS-B, UAT or ADS-L) are displayed as a *blue airplane icon*
- Icons on the left side of the map
  - + symbol - zoom in
  - - symbol - zoom out
  - ⛶ full screen mode
  - select the map layer. The map layer is based on OpenStreetMap (OSM). It is possible to install offline OSM tiles. See section 2.2.
- On top there is a map menu
  - *Mute* - If the text is red, all sound alarms are muted. Otherwise, you will hear sound alarms (if enabled)
  - *Center* - if pressed it will center around the sensor(s) locations. Sensor location is based on the GPS location (if the LTE option is installed) or the browser geolocation (= IP address) as fallback solution. If RemoteID signals are detected, it will center the map around these.
  - *Clear* - if pressed it will clear all flight track and symbols from the map. This is useful to clear historic tracks.

- *Status* - the color will signal the health of the system. *Green* = okay, *Yellow* = warning, *Red* = error, *Blue* = license error. The status is determined by looking at the sensor health, but also available disk space. More details are shown when you click on the *Status*. If the Status is Blue, the dashboard does not have a valid license. Please contact us to get a license.
- *Archive* - select a date to look at historic flight, display or export (xlsx) them.
- *Settings* - if pressed a settings menu will popup up.

3.1 Historic flights

Historic flights can be accessed by pressing the Archive button. The Archive menu is shown in Figure 2. Select a date to view the historic flights during the day. There is also a time out setting. A drone/UAV can have multiple flights during the day. In order to separate flights, one can use the time out setting. A value of 900 means that if a drone/UAV is not seen for 900 seconds (15 minutes), new detections will be considered as a *new flight*. Next to each flight, two icons are shown:

 - if clicked, it will show the historic flight track. This includes the start, end and pilot location.

 - if clicked, it will export the flight track to an xlsx file.

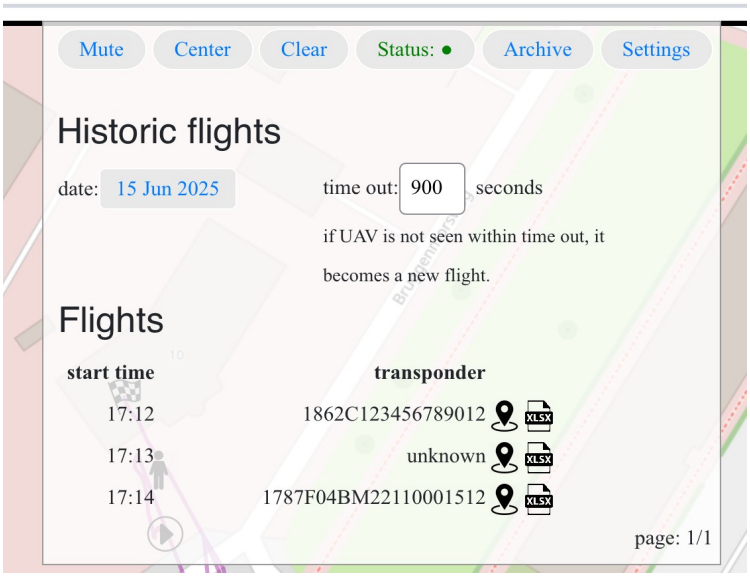

Figure 2 - Archive menu

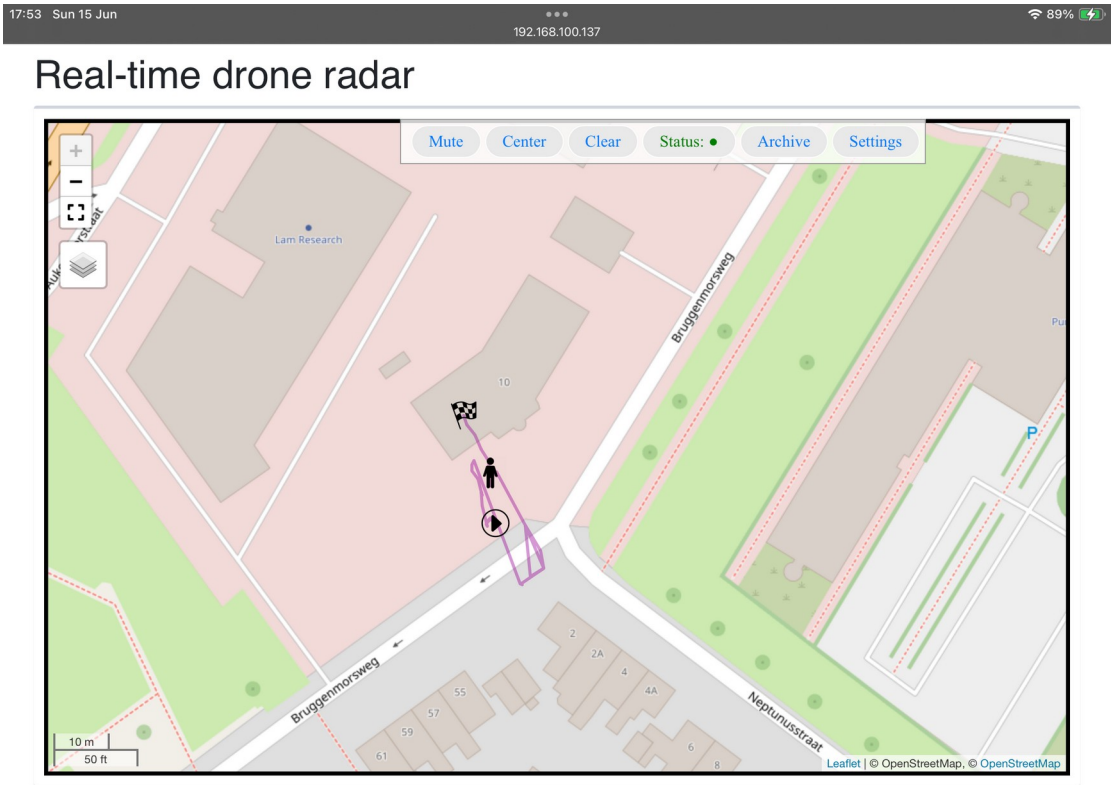

Figure 3 – Historic flight

3.2 Settings

The settings menu is shown in Figure 4.

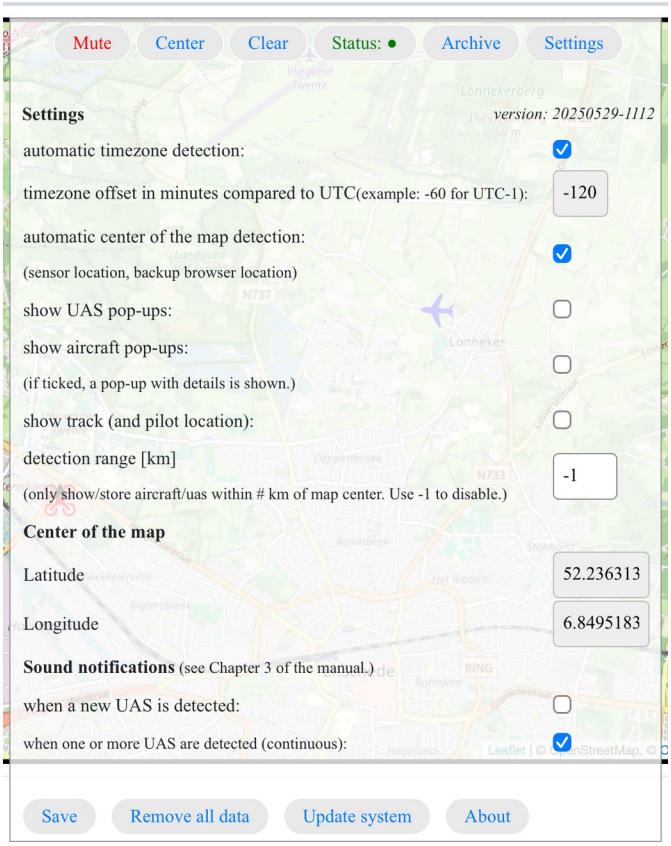

Figure 4 - Settings menu

- timezone. In the default configuration, the sensor will detect the time zone offset (compared to UTC) using the browser. Untick *automatic timezone detection* and enter manually a *timezone offset in minutes* instead. Most users don't need to change the default behavior (automatic detection).

- Center of the map. In default settings, the map is automatically centered. It uses the location reported by the sensor (if the LTE add-on has been installed). Otherwise, it will use the geolocation reported by the browser (based on the IP address). Untick *automatic center of map detection* to disable. Enter manual latitude/longitude information in the *Center of the map* section.
- show UAS pop-ups (default enabled). If enabled, a popup is shown above the drone/UAV with additional information like Serial Number, altitude etc.
- show aircraft pop-ups (default disabled). If enabled, a popup is shown above the aircraft with additional information like ICAO number, altitude etc.
- detection range. Enter a maximum range in km. Only drones/aircraft within this maximum are shown. Use -1 to disable.
- Sound notifications. If the setting *when a new UAS is detected* is ticked, an alarm is played for ~ 10 seconds. If the setting *when one or more UAS are detected (continuous)* is ticked, the alarm will play as long as one or more UAS are detected. See also the section sound notifications.
- On the bottom of the settings menu there are several buttons
  - Save - when pressed it will save the settings. After a few seconds the portal is refreshed and the new settings have been applied.
  - Remove all data - clear/wipe the database
  - Update the system - update to the latest version
  - About - provides a popup with more information about DroneScout Dashboard

Sound notifications
Web browsers don't allow to play audio by default, if there has been **no user interaction**. To solve this, a) click on a button or icon to generate a user interaction. b) please configure the browser to allow (audio) autoplay for the portal website.

More information:

- Firefox: https://support.mozilla.org/en-US/kb/block-autoplay
- Chrome: https://support.google.com/chrome/answer/114662?hl=en&co=GENIE.Platform%3DDesktop Click on the not secure (warning) icon in the address bar for site settings
- Safari: https://help.mixlr.com/en/articles/1665450-enabling-auto-play-in-safari

4 TROUBLE SHOOTING/FAQ

New settings are not applied.
After saving new settings, the portal site should refresh after a few seconds. If not, please try again to save the settings.

The center of the map is incorrect.
Make sure the LTE add-on is installed and the GNSS receiver has a GPS fix. See Section 2.3. If you use a VPN, the geolocation reported by the browser is based on the VPN location instead. The browser returns not always the correct location. In that case enter manual lat/lon values for the center of the map.

Which TCP ports does DroneScout Dashboard use?
DroneScout Dashboard uses port *80* to display the dashboard and port *3000* for the datafeed. You can use DroneScout Dashboard behind a router/NAT. Port *80* can be mapped to a different port, the datafeed port (*3000*) cannot.

The system does not detect any drone or aircraft.
Make sure the status is green. If it is not, the sensor has issues. If the problem persists, please reboot the system. Also check that the detection range setting (Figure 3), Make sure that it is set -1 (= maximum detection range). In some case the database may be corrupted, try "Remove all data". In this case all previous data will be removed!

Can I use another application to read the sensor data?
The broker is accessible at port 1883 (plain (no SSL), no username/password. This means that you can run both DroneScout Dashboard and run a 3rd party application to read data from the sensor.

Can I connect other DroneScout sensors to the Dashboard?
DroneScout Dashboard is designed to run on a sensor. You could point other DroneScout sensors to the broker of the sensor with the Dashboard option. In that case the DroneScout Dashboard will show the information of both sensors.

The sound alarms don't seem to work.
See section 3.2 of this manual to enable auto play of audio files for the portal website.

The brand and model of detected drones are unknown.
See section *RID* on page 30 of the manual (https://download.bluemark.io/ds230.pdf). Make sure the section rid in dronescout.conf has the field extra set to 1.

I want to change the MQTT Mosquitto settings.
DroneScout Dashboard uses a stand-alone version of the MQTT mosquitto broker. If you want to use your own broker or mosquitto settings, follow these steps in an SSH terminal:

```
#disable standalone broker uses by DroneScout Dashboard
overlayroot-chroot
mv /root/broker /root/broker.backup
exit
```

Install the Mosquitto broker as described in the section "MQTT broker on the DroneScout receiver" in the manual (https://download.bluemark.io/ds230.pdf) on page 35. Change the system Mosquitto file `/etc/mosquitto/mosquitto.conf` accordingly.

Where can I find the version history?
The version history can be found at:

https://download.bluemark.io/dronescout/dashboard/history.txt

5 MORE INFORMATION

If you need more information, please contact us at info@bluemark.io or by phone: +31 53 711 2104.

All contact information can be found at the *DroneScout* contact page:
https://dronescout.co/contact/