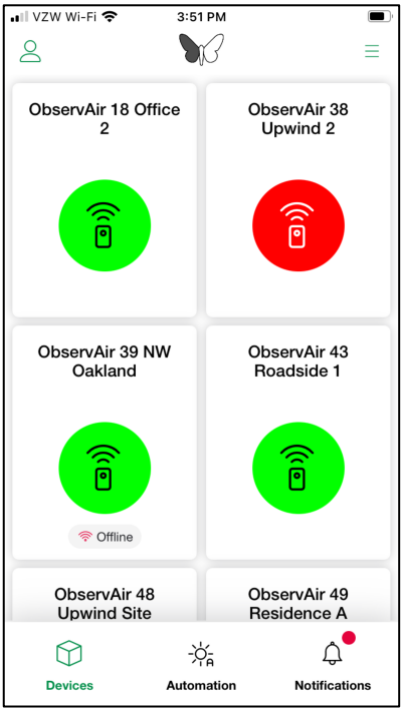
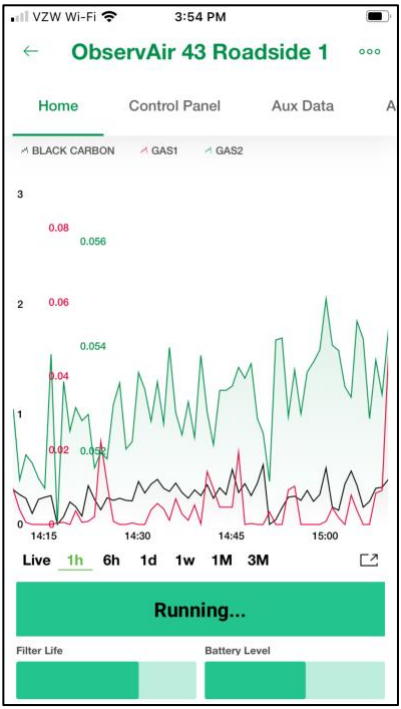
ObservAir®

Cloud Dashboard Manual

Distributed Sensing Technologies





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1. Introduction

ObservAir® Cloud Dashboard enables networked interfacing with ObservAir® instruments via smartphone app (iOS/Android) and desktop browsers. The dashboard can be used to remotely monitor and download data, adjust instrument settings, and facilitate easy deployment of sensor networks. To access the web browser based dashboard, navigate to https://dstech.blynk.cc.

2. Getting Started

The ObservAir® instrument firmware must be version 2.6 at minimum to enable the ObservAir® Cloud Dashboard. Firmware version can be checked from either the settings file in the SD card, or through the ObservAir® desktop software. Firmware can be updated via the ObservAir® desktop software. To begin setup, an account must be created from the ObservAir® phone app. The instrument will then need to be provisioned in order to provide it with network credentials, and link the device with an account.

2.1. Download the App

The app can be downloaded from the Apple App Store, and from the Google Play Store. Search for ObservAir® Dashboard.

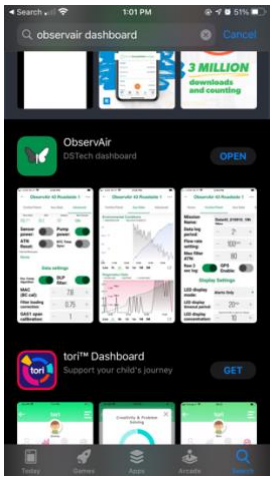

Figure 1. ObservAir® app available in App Store

2.2. Creating ObservAir® Cloud Dashboard account

An invite needs to be provided by DST to create your account. Please contact DST for an invite link. After following the invite instructions, open the ObservAir® app and follow the prompts to finish setting up your account and log in. An account can also be set up via the web browser dashboard at https://dstech.blynk.cc.

Figure 2. Sign up or log into account

2.3. Add Instrument to Account

Provisioning an instrument sets the instrument's WiFi credentials and links the sensor to your account. Please make sure that the instrument's firmware is updated to at least version 2.6 before provisioning. Consult the ObservAir® desktop software manual for instructions on updating firmware.

2.3.1. Setting Instrument to Provisioning Mode

With the instrument fully on (LED breathing, and button responsive), press and hold the LED button until the LED flashes blue twice. The instrument will restart into provisioning mode. When in provisioning mode, the LED will blink blue to indicate that it is ready to be provisioned. Consult the

ObservAir® manual for more detailed instructions on initiating provisioning mode.

2.3.2. Provisioning Instrument from Phone App.

From the ObservAir® smartphone app, select “Add new device” and select the option to “Connect to WiFi.” Make sure that the instrument is in provisioning mode and blinking blue before proceeding and pressing ready. After scanning available networks, the app will automatically find your instrument, and prompt you to join the instrument’s network “DSTech OA SN.”

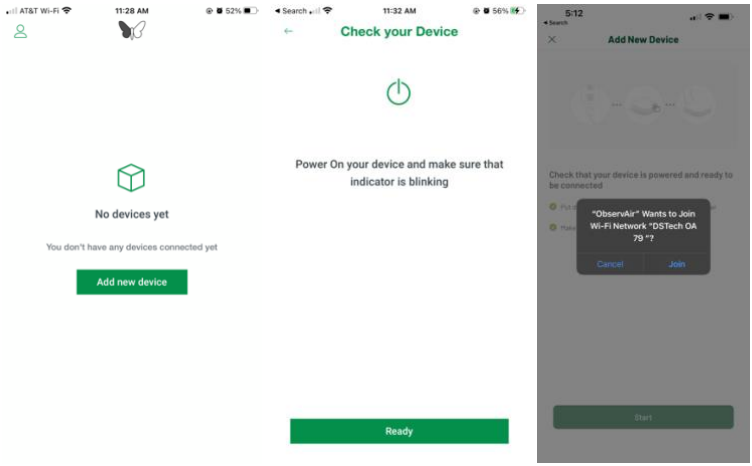

Figure 3. Adding device - Initiate provisioning

Select “Join,” and follow the on-screen setup prompts to configure the instrument’s WiFi credentials, name, and time zone. During setup, the instrument will restart and may take several minutes before it comes online. After completing the provisioning process, select “Exit to app.” The instrument will be displayed as a tile in the Devices section of the ObservAir® app Home page.

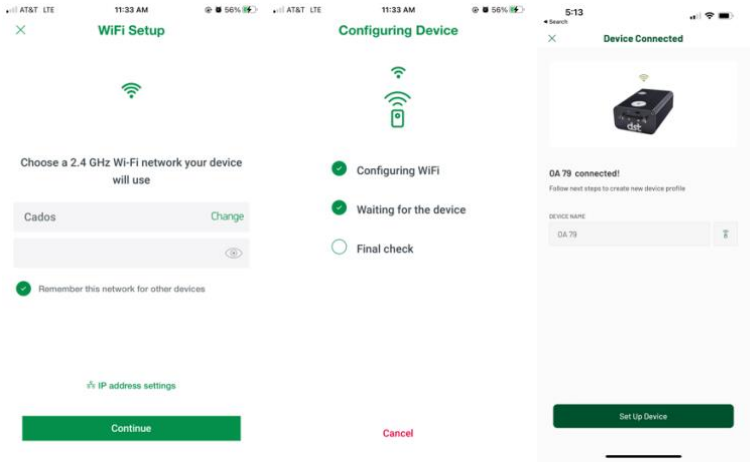

Figure 4. Adding Device - Setup

2.4. ObservAir® App Interface Overview

The ObservAir® app consists of three main sections: the Home page, the Instrument Dashboard, and the Instrument Information Menu. The Home page provides an overview of instruments in the fleet, as well as fleet notifications. The Instrument dashboard is accessed by selecting a sensor from the home page, and provides instrument specific data visualization and instrument controls. The Instrument information menu is accessed from the instrument dashboard, and contains metadata of the instrument as well as an instrument timeline of warnings, errors, and events.

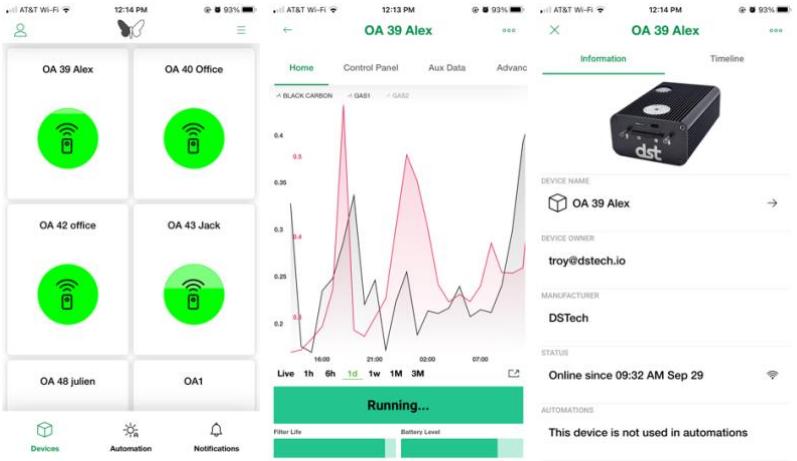

Figure 5. Home Page, Instrument Dashboard, and Information Menu

3. Home Page

The Home page provides a convenient interface to manage your sensor fleet. Fleet devices and notifications views can be accessed at the bottom of the page. New devices can be added from the menu (≡) at the top right. Account information can be accessed from profile icon at the top left.

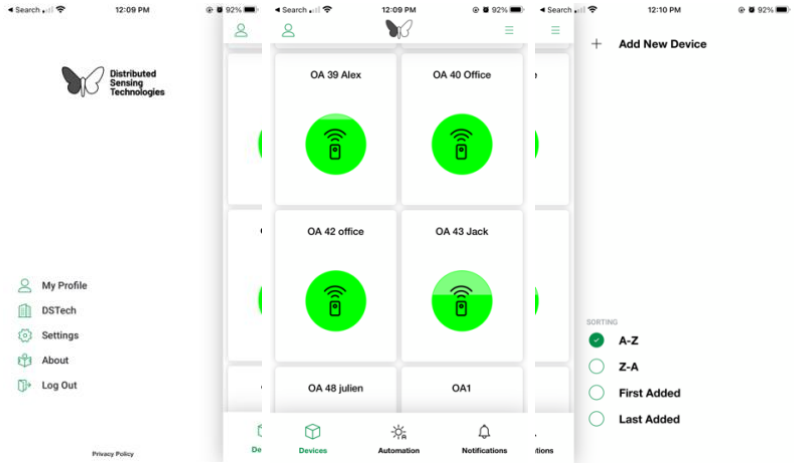

Figure 6. Home page view: Profile, Devices, and Add New Device panes

3.1. Devices

The Devices view (Figure 6.b) displays all of your instruments as tiles with icons indicating the instrument's operational status by color and filter life by fill level. From here you can select a specific instrument to access its instrument dashboard. This view provides a broad overview of your fleet and enables easy management of networked deployments.

3.2. Notifications

The Notifications view of the home page provides fleetwide notifications in one convenient location. Notifications of instrument warnings, errors, and maintenance events assist in network management by quickly alerting a system operator of instruments needing attention. Selecting an event pulls up the instrument's timeline. Timeline events can also be set to trigger phone notifications via the settings section of the home page.

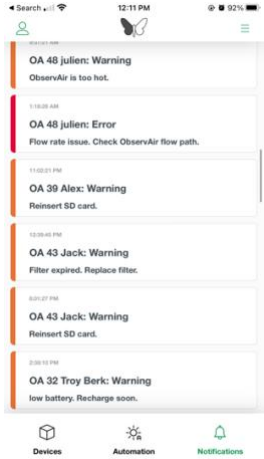

Figure 7. Notifications view

4. Instrument Dashboard

The Instrument Dashboard consists of 4 interactive tabs: Home, Control Panel, Aux Data, and Data Settings. The Instrument information menu can be accessed by pressing the three dots (⁰⁰⁰) in the top right corner

4.1. Home

The Home view displays instrument pollutant time series, sensor status, filter life, and battery level.

4.1.1. Pollutant Time Series Plot

The time series plot has options to view data on different time bases. "Live" displays 10 second data. "1h" and "6h" display 1 minute data. "1d" displays 1 hour data. "1w", "1M", and "3M" display 1 day data.

Instruments with multiple gasses display their timeseries in the main plot as well, legendized as "Black Carbon," "Brown Carbon," "GAS1," and "GAS2." Gas species pollutant names can be looked up in the information tab of the instrument's information menu. For viewing convenience, series visibility can be toggled by pressing the series name in the legend.

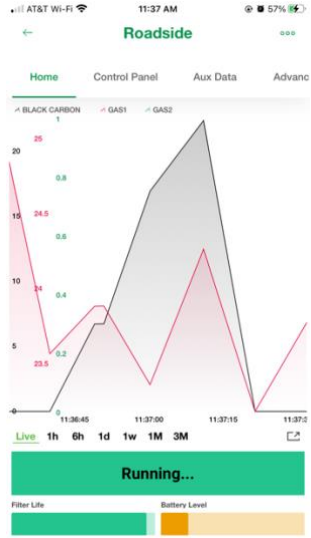

Figure 8. Home view

4.1.2. Home Status Bar

The status bar displays the instrument's operational status, as well as any warnings or errors that may be active. The color of the status bar illuminates red indicating an error or instrument off, yellow indicating warning, and green indicating normal operation.

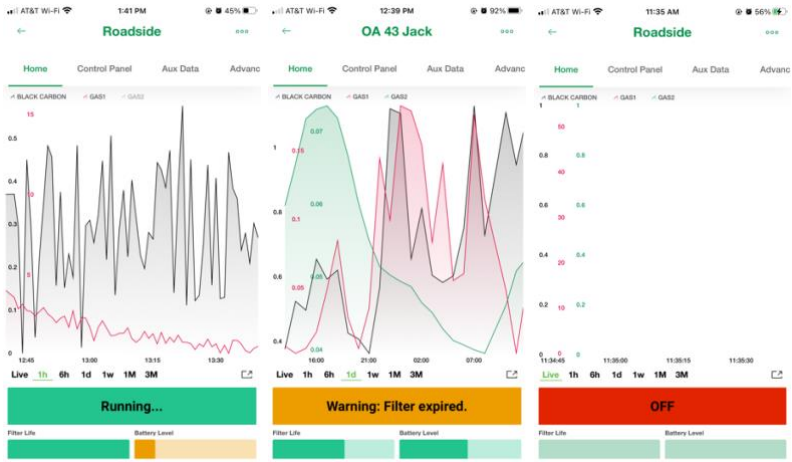

Figure 9. Status bar indicators

4.2. Control Panel

The instrument's settings can be configured from the Control Panel. The battery voltage, attenuation value, current flow rate, and battery charger status are displayed at the top and updated every minute.

Internal messages are displayed when fields are toggled to confirm actions

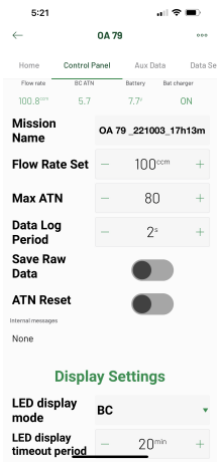

Figure 10. Control Panel

4.2.1. Basic Controls

4.2.1.1. Mission Name

The "Mission Name" sets the name of the data folder/files being written to on the internal SD card. This provides a convenient way to keep track of deployments. By default, the "mission name" is set to the device name with the timestamp of the start time appended to it. The "mission name" resets when the instrument is restarted.

4.2.1.2. Data Log Period Setting

"Data log period" sets the block average to apply to the data saved on the instrument's internal SD card. The minimum value is 2 seconds. Note: the instrument always measures at 2 seconds, and provides block average data for convenience only.

4.2.1.3. Flow Rate Setting

"Flow rate setting" sets the instrument's flow rate. Adjust the flow rate up or down to select a suitable signal to filter life ratio for your application. Guidance in selecting an appropriate flow rate can be found in the ObservAir® instrument manual.

4.2.1.4. Max Filter Attenuation Setting

"Max ATN" sets the attenuation value at which an ATN warning is triggered. When triggered, the LED on the instrument begins to display a

warning to alert the operator to change the instrument filter. This also sets the value in which the ObservAir® Cloud Dashboard sends an alert notification to your phone, if enabled.

4.2.1.5. Save Raw Data Setting

"Save Raw Data" toggles the logging of raw data to the instrument SD card when a data log period greater than 2 is selected. This allows the convenience of retrieving block averaged data from the SD card, while also retaining the raw 2 second data in case more resolved data is needed.

4.2.1.6. ATN Reset

The "ATN Reset" toggle initiates an attenuation reset. The instrument should detect when a filter has been replaced, and initiate an attenuation reset automatically. However, if it doesn't, it can be done manually here.

4.2.2. Display Settings

The Instrument features an interactive LED button and a buzzer to aid in operating the instrument, provide feedback, and indicate active errors.

4.2.2.1. LED Display Mode

The LED display mode can be set to turn off the LED entirely, display alerts only, or display a visual representation of pollutant concentrations.

4.2.2.2. LED Display Timeout Period

When the "LED mode" is set to display pollutant concentrations, the "LED display timeout period" can be set to automatically turn off the LED after a timeout period (in minutes) to conserve battery power and make the instrument more discrete. Setting the timeout period to 0 prevents the LED from turning off. The instrument LED displays a representation of the pollutant concentration as a color in a green to red gradient.

4.2.2.3. LED Display Concentration

When the LED display mode is set to a pollutant, the LED breathes with a color representing the pollutant concentration as a color in a green to red gradient. The "LED display concentration" adjusts the upper range of the gradient scale that displays red.

4.2.2.4. Buzzer

The buzzer provides feedback when operating the button of the instrument. The volume of the buzzer can be adjusted via the slider.

4.2.3. Advanced Settings

4.2.3.1. Pause Switch

The “Pause Switch” toggle controls the operational status of the instrument. Turning the sensor power off turns off the pump and puts the instrument into idle mode. This is useful to conserve battery, selectively monitor an event, or stop the instrument from logging erroneous data if a critical error has occurred.

4.2.3.2. Time Sync

The “Time Sync” toggle initiates syncing the instrument’s clock with internet web server time. This is useful if the clock has fallen out of sync.

4.2.3.3. GPS Enable

Instruments with GPS can enable/disable GPS logging from here

4.2.3.4. Meta Sync

Metadata is the information in the sensor Information Tab (accessible from the 3 dots (⋮) at the top right). Certain fields of the metadata such as device name, firmware version, and time zone can be edited from the app, but must be pushed to the instrument manually by pressing the “Meta Sync” button.

4.3. AUX Data

The AUX Data tab displays plots of auxiliary instrument measurements such as sensor (internal) temperature and relative humidity, Ambient (external) temperature and humidity, filter attenuation, battery voltage, and flow rate. Series visibility can be toggled by selecting the series name in the legend. Data ;can be viewed in several different time-bases by selecting the time-base at the bottom of the charts.

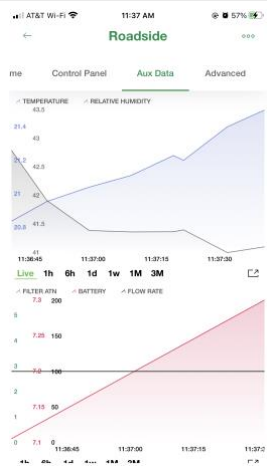

Figure 11. Aux Data

4.4. Data Settings

The Data Settings tab provides toggles and fields to adjust calibration factors.

Calculation factors should only be altered from default values by qualified operators who are familiar with these settings. More detailed information can be found regarding these settings in the ObservAir® instrument manual.

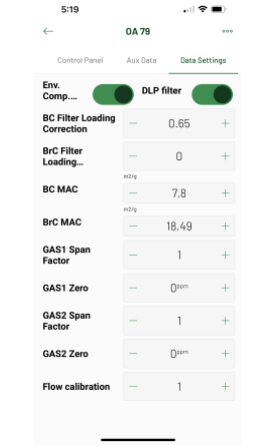

Figure 12. Data Settings

4.4.1. Environmental Compensation

Enables the DST patented environmental compensation algorithm to correct for perturbations in temperature and relative humidity. Default is on

4.4.2. Digital Low Pass Filter

The DLP filter minimizes high frequency noise for higher accuracy at the 2 second level. Default is on.

5. Instrument Information Menu

The Instrument information menu is accessible from the instrument dashboard by selecting the three dots at the top. From here you can access and edit the instrument's metadata (information), and timeline.

5.1. Metadata (Information Tab)

Metadata stores non-measured information about the instrument. The instrument serial number, firmware version, and type of active gas cells are recorded here. Device name and time zone are modifiable, however changes need to be manually synced through the "Meta Sync" toggle in the Advanced Tab of the Instrument Dashboard to take place.

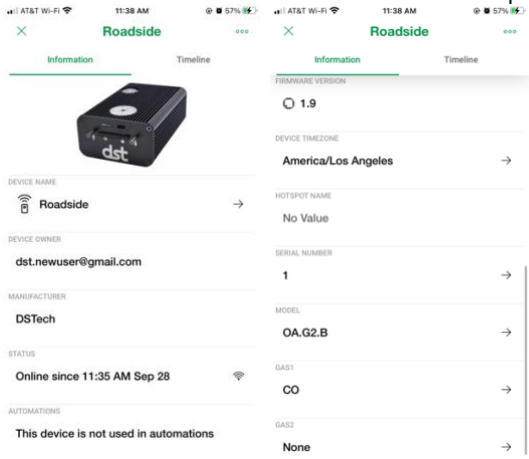

Figure 13. Instrument Information

5.2. Timeline

The instrument Timeline is useful for auditing events. Errors, warnings, and changes to instrument settings are recorded here. Operators can resolve issues, and make comments on events by sliding left on an event.

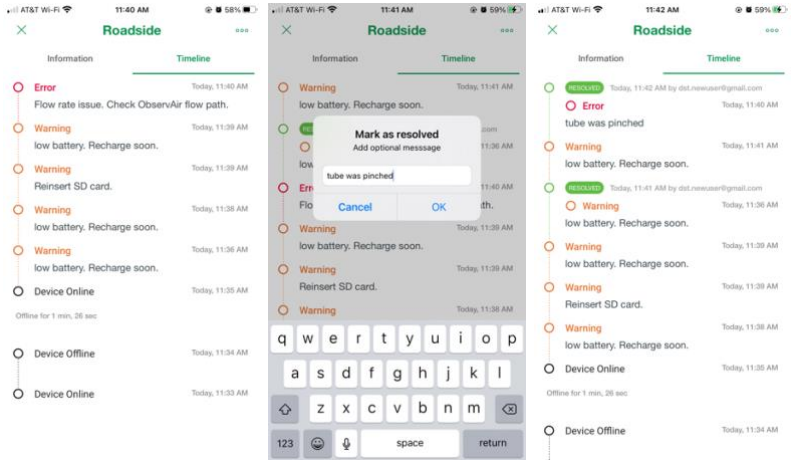

Figure 14. Instrument Timeline