DEEPDOWN

Operations manual

Analyzer

DEEPDOWN

Caution!

This analyzer has bugs. Although we haven't found them all yet, they are there. It is certain that there are things that this analyzer does, that we either didn't think about, or planned for it to do something different. Never risk your blend on only one source of information. Always check the blend using a different analyzer.

This analyzer will fail. It is not *whether* it will fail but *when* it will fail. Do not depend on it. Always have a plan on how to handle failures. Automatic systems are no substitute for knowledge and training. No technology will create the perfect blend. Knowledge, skill, and practiced procedures are your best defense (Except for getting your mixes elsewhere, of course).

This analyzer has no brain. Use your own!

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Introduction

This analyzer is capable of measuring the following gasses:

- Oxygen, using any electrochemical oxygen cell with a range in 10mV - 60mV
- Helium, using a Winsen MD62 sensor
- Carbon monoxide, using an electrochemical Winsen ZE-07CO or ZE-15CO sensor

The oxygen and carbon monoxide sensors have a limited lifespan. If the oxygen cell voltage drops below 9mV, a warning will be displayed when turning on the analyzer. The CO sensor should be replaced after 2 years. The helium sensor measures the thermal conductivity of the gas.

The analyzer contains bugs. Once we have found them, fixes are released in firmware updates. To update the firmware, a WiFi connection to the internet is required.

Battery

The analyzer runs on a single lithium-ion battery type 18650. Please use a safe and reliable battery with a capacity of 3000mAh or higher and a discharge current of at least 2A. Both protected and unprotected batteries can be used.

The analyzer has a built-in charging circuit for the battery through the USB port. Use an adapter capable of delivering a charging current of 1A. **Never charge the battery unattended!**

Turning on

Touch the glass with two fingers just below the screen. The buttons are capacitive touch based, no pressure is required to operate them.

Operation

After switching on, the analyzer calibrates the sensors in air. The helium sensor requires several minutes to warm up, once the temperature is above 30 degrees Celsius, it is ready for analysis.

To analyze a mix, connect a flow limiter to the tank and insert the hose into the analyzer. A flow of ~4 liters per minute is enough for analysis.

Touching the right button will change the MOD displayed, from 1.0 to 1.6 in steps of 0.1 per touch.

Menu

Touching the left button will display the menu. Use the right button to select a menu.

Main menu

- **Turn off** – touching the right button will turn the analyzer in standby mode.
- **Menu** – touch the right button for various settings (see next section).
- **Info** – touch the right button for version information. The voltages of all sensors are shown on this screen as well.
- **Switch display** – touching the right button will display the oxygen percentage in a larger font. This option is shown when the helium sensor is disabled.

After selecting Menu, the function of the left and right touch buttons is displayed in each menu screen.

Calibration menu

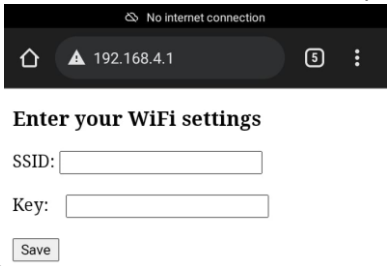
- **Calibrate Air** – use this option to calibrate the sensors using a flow of normal air. The oxygen sensor will calibrate at 20.9% in air.
- **Calibrate 100% oxygen** – periodically calibrate the oxygen sensor using pure oxygen. Use a flow of 100% oxygen. Touch the *Save* button when the displayed voltage stabilizes.
- **Calibrate 100% helium** - periodically calibrate the helium sensor using pure helium. Use a flow of 100% helium. Touch the *Save* button when the displayed voltage stabilizes.
- **Calibrate helium sensor** – after the sensor is above 30 degrees Celsius, turn the screw on the potentiometer until the displayed voltage is 0.0mV. Calibrating the helium sensor is required before calibrating the sensor with 100% helium.

Settings

- **He sensor** – set the helium sensor [**on** | **off**]. When set to off, the helium sensor is no longer powered to extend battery life.
- **CO sensor** - set the carbon monoxide sensor [**on** | **off**]. If no CO sensor is present, a hyphen (-) is shown.
- **Units** – set the units to be displayed in [**metric** | **imperial**].
- Brightness - set the screen brightness to [**low** | **medium** | **high**].
- Standby - set the standby time to [**off** | **15min** | **30min**].

Firmware

- **Network:** - this setting is used to connect the analyzer to your own WiFi network.
    - When selected, the analyzer will create a wireless network ***analyzer*** to which you can connect (with a computer or smartphone) using password ***12345678***. Once connected, point your browser to http://192.168.4.1
    - On the webpage, enter the SSID (or network name) and key (or password) of your own wireless network and press **Save** when done. The analyzer will save the network settings and restart.



- **License** – if no license has been stored in the analyzer, use this option to retrieve a license. This menu option is not shown for licensed analyzers. This option will use your wireless internet connection set in the first option.
- **Language** - sets the language. Current available languages: DE – German, EN – English, FR – French, IT – Italian, NL – Dutch.
- **Upgrade firmware** – this option will check for a new firmware version and if available, automatically download and install the new version. This option will use your wireless internet connection set in the first option. **Important:** when upgrading the firmware, connect the analyzer to a charger. If the battery level is too low, the analyzer will restart when connecting to your wireless network and no upgrade is performed.