

Crystal-PO2™ *Monitor I*

GUIDE
-PRELIMINARY-
8/18/2016a

Overview:

The Xtal-PO2 Oxygen Monitor is designed to be a very basic and easy to use instrument for your rebreather. It has very few operations or pieces of information other than the PPO2 read out of oxygen from 1, 2, or 3 sensor cells while in Dive Mode and the ability to calibrate the sensors while in Surface Mode. There is only 1 diving screen which will display the individual output of each cell along with the battery level.

That's it! This is not a diving computer, it has no other purpose other than to read oxygen levels. It will run on either 4 AAA batteries or 1 9volt battery. The battery type can be selected in the setup menu but that only affects the battery level display. Otherwise it is a "don't care".

There are 2 operational modes available to you when you turn it on. Surface Mode and Dive Mode. Dive Mode only allows you to see the oxygen level display. Surface Mode allows you to calibrate, change settings, and run diagnostics.

NOTE: Once in the dive mode, you must completely turn the display off and restart it in order to access the Surface Mode. This is purposeful in order to prevent any possibility of accessing calibration while diving.

Basics:

Turning On: 5 to 10 taps on the cable side

Turning Off:

- Dive Mode: 3 taps on the cable side (followed by 2 taps outside, then cable side)
- Surface Mode: Rotate (outside taps) through to the OFF screen and select.

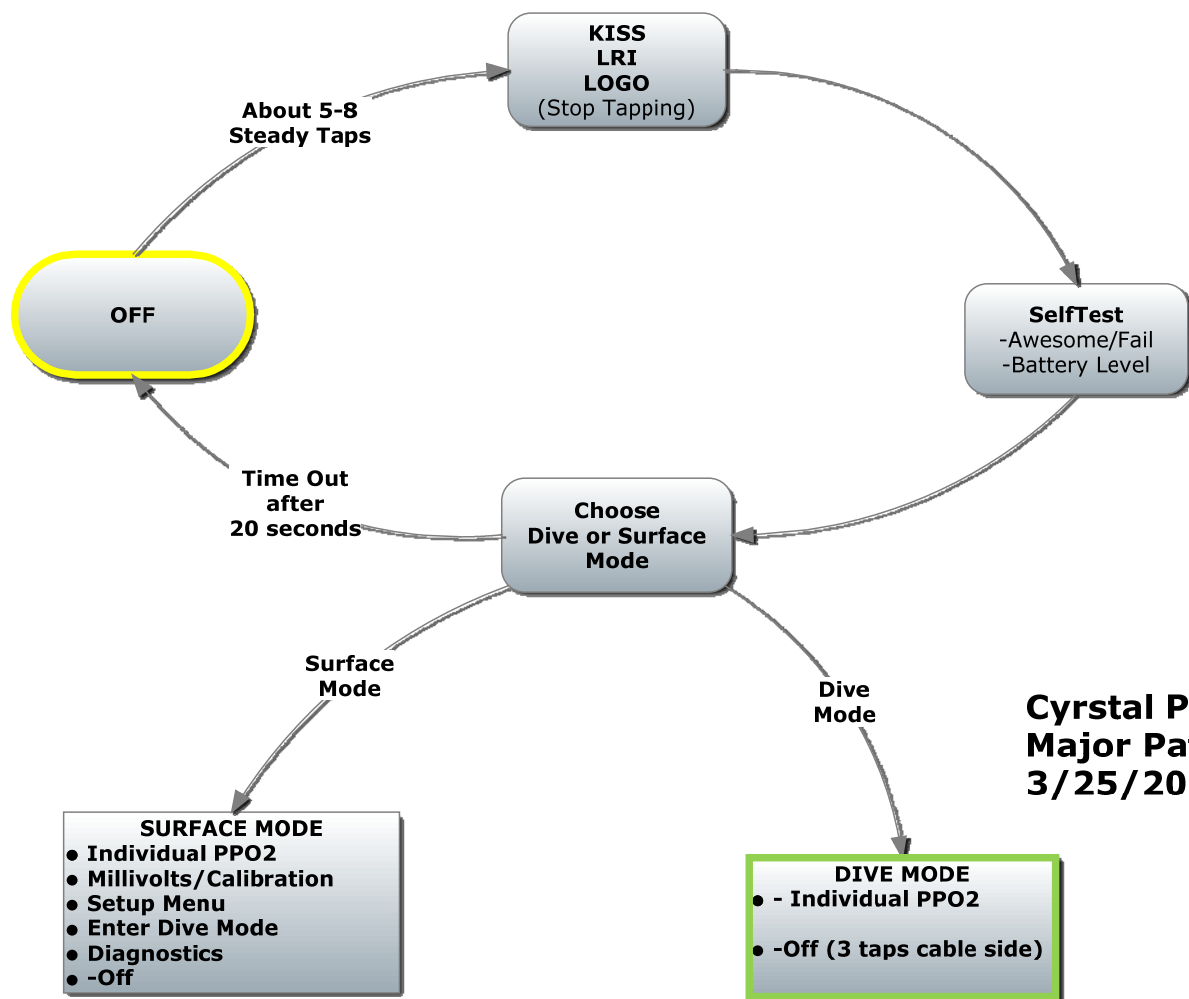
Calibration:

- Select Surface Mode, rotate to Millivolt Screen.
- Flush with either air or oxygen, 2 cable side taps to initiate
- 1 pt calibration: Automatic detection of either air or oxygen
- 2 pt calibration: Do a successive flush with opposite gas and recalibrate.
 - o 2pt calibration is automatic
 - o Sensor Linearity is displayed
- Adjustments (Humidity, Altitude): Manual in Setup Mode

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**Cyrstal PO2
Major Paths
3/25/2018**

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- PPO2
- Off
-

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Screens:

- PPO2
- Millivolt
- Setup Menu
- Exit to Dive Mode
- Diagnostics
- Off

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DISPLAY WARNING

Never risk your life on only one source of information. Use a second computer or tables. If you choose to make riskier dives, obtain the proper training and work up to them slowly to gain experience.

All display systems 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 keep you alive. Knowledge, skill, and practiced procedures are your best defense. (Except for not doing the dive, of course.)

Batteries: The system will run off of anything between 3.2 and 11 volts. Normally used batteries are 4 AAA/AA batteries or a single 9 volt battery. NOTE: 9 volt batteries are intended as a short term solution only and will have a limited use span of approximately 6-10 hours depending on light levels (and associated backlight power requirements. Battery life may be extended by using lowest power level setting for the backlight. Batteries removal during extended times of non-use (several months) will extend battery life.

Setup Menu Selections:

- Return To Surface Mode PPO2
- Number of Sensors
- Humidity
- Altitude
- Calibration Gas %O2
- Dead Sensor mv Level
- Pressure Units (ATA/Bar)
- Instructions
- Version Level

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- Support Information
- Battery Type (4xAAA or AA, or 9v battery)
- Bluetooth (not yet enabled)
- Cable Side setting (shows which side the cable is mounted on)
- Pod Side (Left or Right side mounting)
- HUD (On/Off) (HUD Version Only)
- SetPoint Levels Enabled (Controller or HUD version only)
- Solenoid On/Off (Controller Version Only)
- Tap Level Sensitivity (Hard/Soft/Low)
- BackLight Level
- Solenoid Timing (Controller Version Only)

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Initiation

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Initiation

-Logo -

Cable

Outside



=>Logo lasts for approximately 5 seconds. Stop Wakeup Taps at this time.

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Initiation

-Self Test -

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=>Displays Diagnostic Results. "Awesome" if no issues. Specific Error messages displayed as detected.

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Initiation

-Select -

Cable

Outside



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Initiation

--Select -

Cable

Outside



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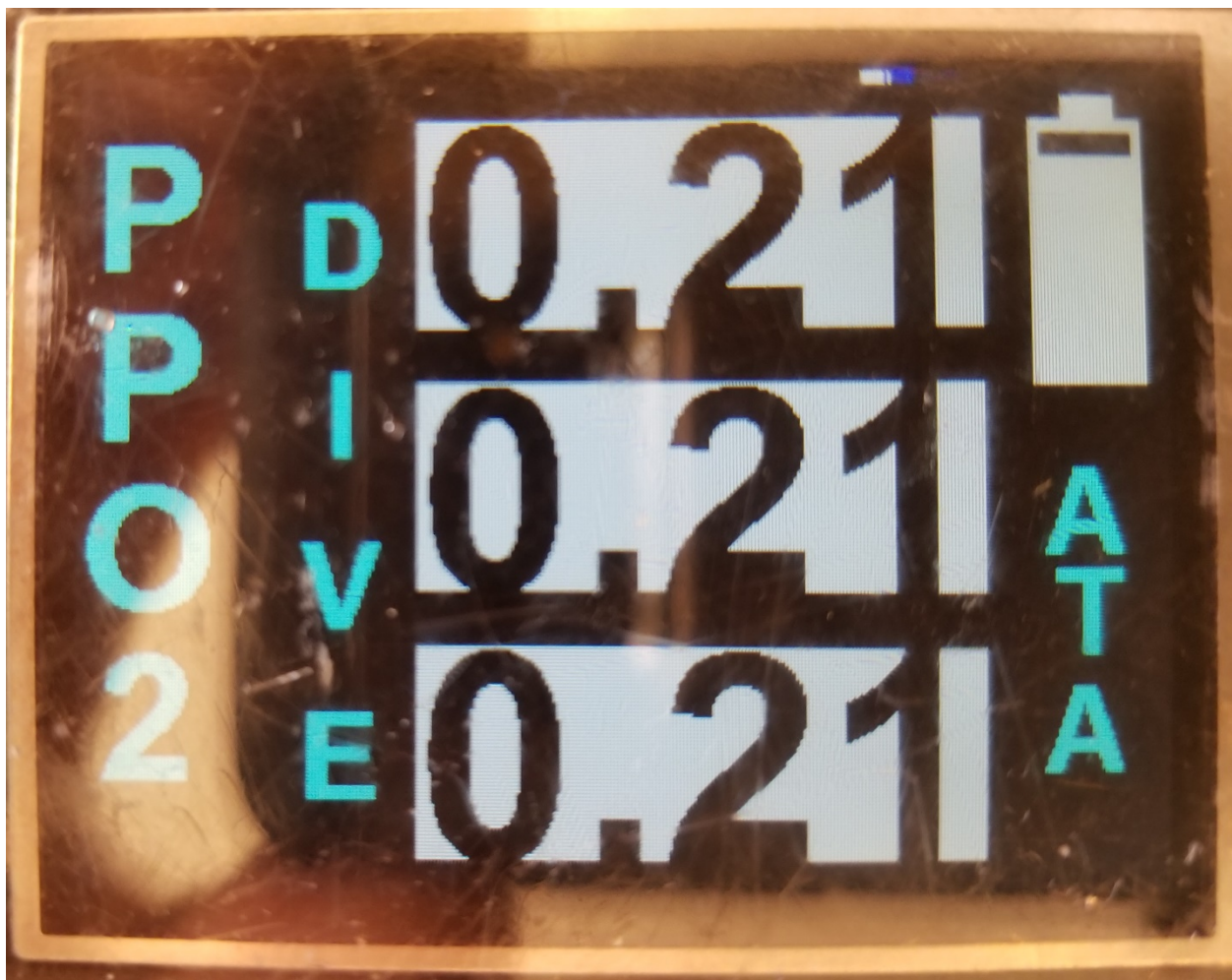
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Dive Mode

-Startup Screen -

Cable

Outside



=>This is the startup screen for Dive Mode. It persists for 20 seconds to inform that PPO2 based in either Bar or ATA units is being displayed in Dive Mode. Ongoing display will remove the extraneous information leaving only PPO2 and Battery Level information.

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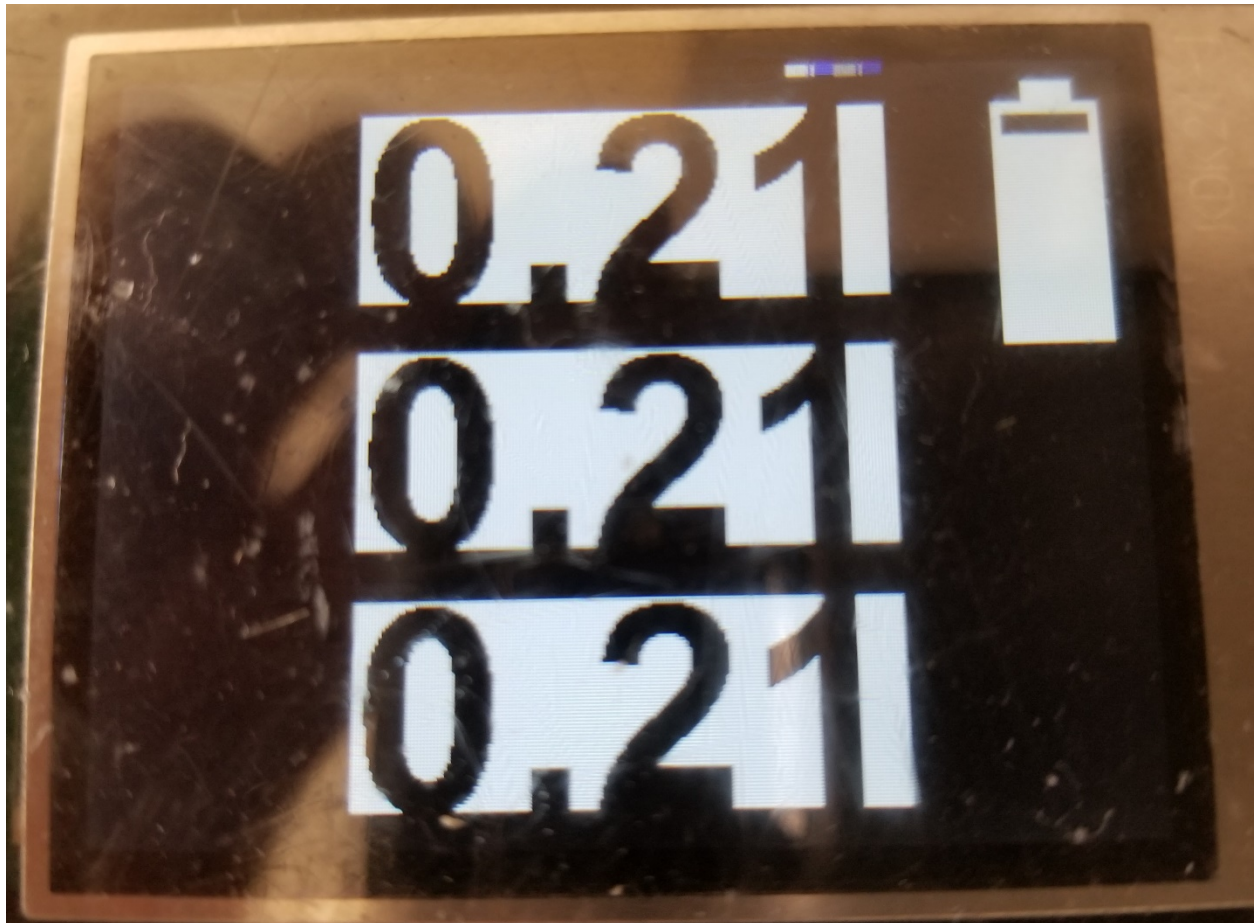
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Dive Mode

-PPO2 –

Cable

Outside



- ⇒ 3 Taps on cable side to turn off (followed by 2 taps on outside, and 2 more cable side taps
- ⇒ System Diagnosis is ongoing. Any errors detected will be displayed on bottom line as needed.

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Dive Mode

-Off 1-

Cable

Outside



- ⇒ Second Stage Off Screen: 2 taps “TT” on outside to turn off
- ⇒ Ignore and let screen timeout (about 5 seconds) to revert to PPO2 display

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Dive Mode

-Off 2-

Cable

Outside



- ⇒ Third Stage Off Screen: 2 taps “TT” on cable side to complete the turn off
- ⇒ Ignore and let screen timeout (about 5 seconds) to revert to PPO2 display

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Surface Mode

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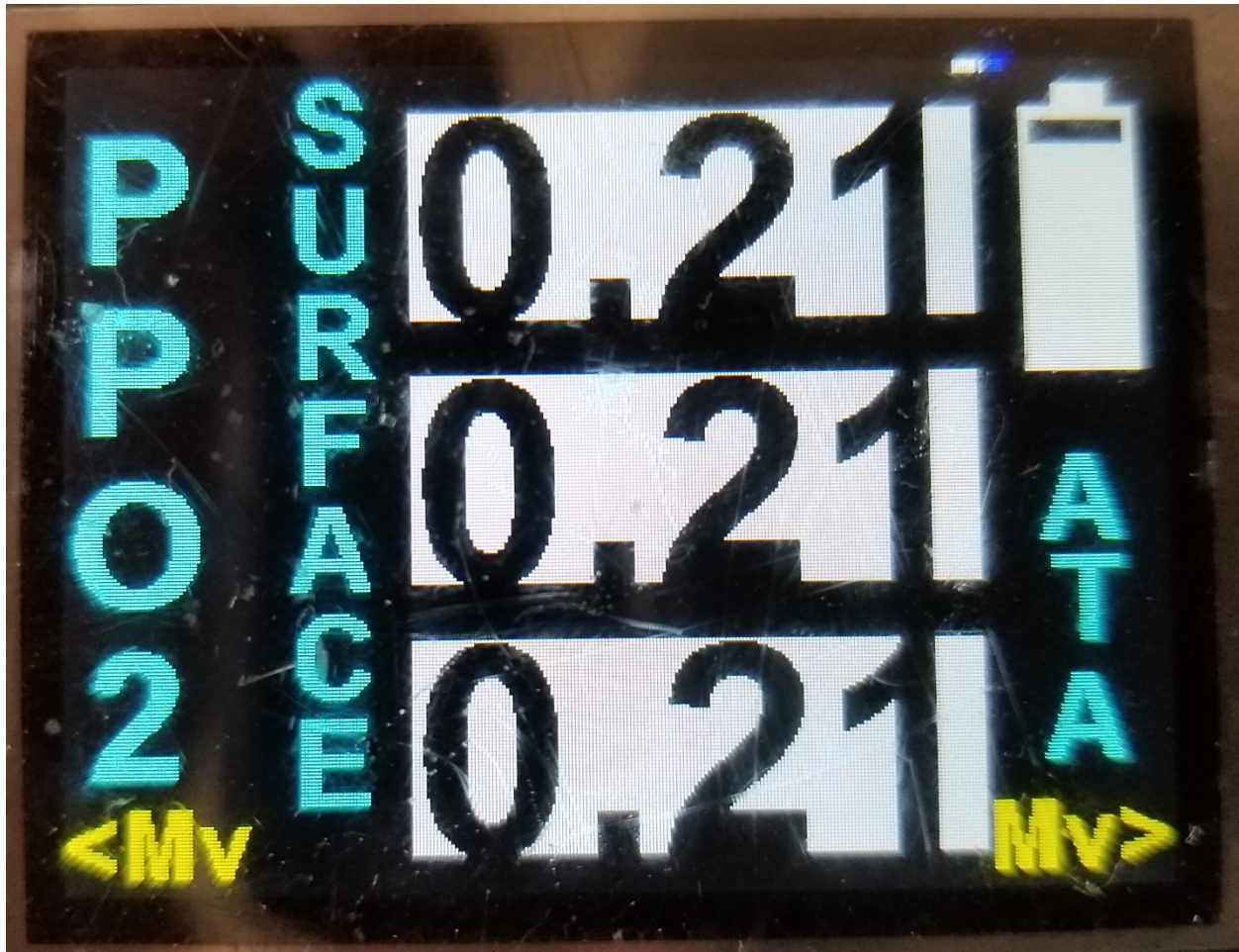
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Surface Mode

-PPO2 -

Cable

Outside



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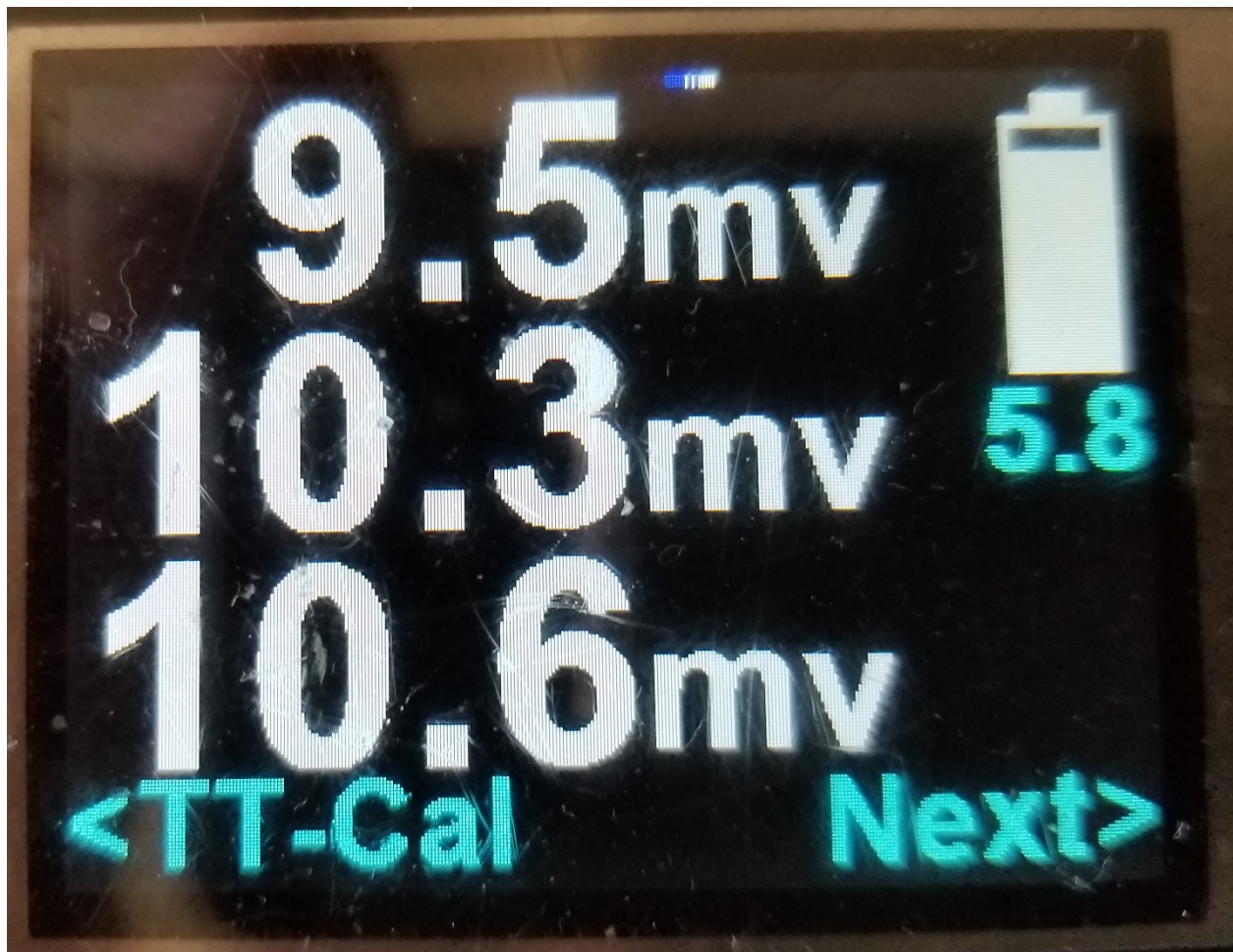
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Surface Mode

-MilliVolt -

Cable

Outside



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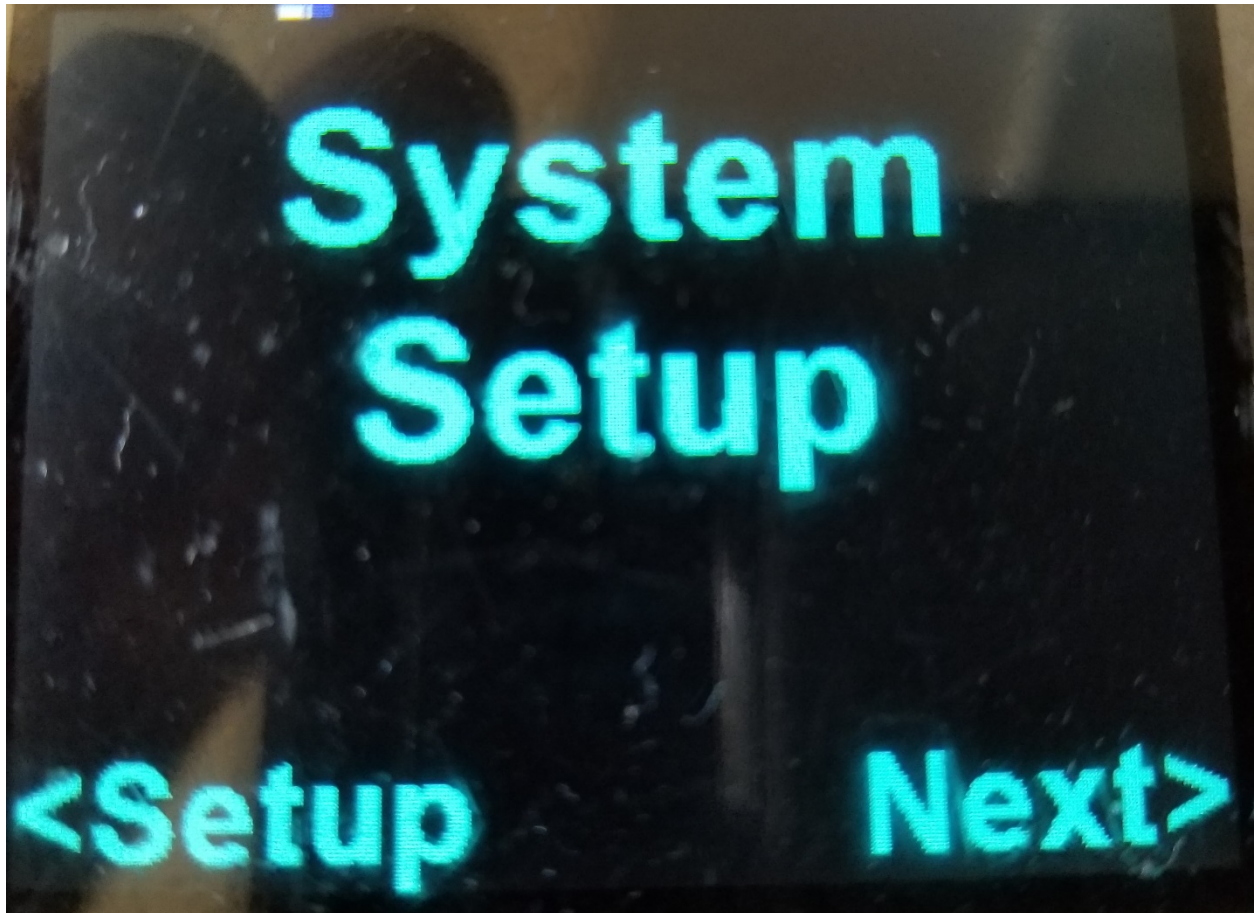
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Surface Mode

-Setup Selection -

Cable

Outside



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Surface Mode

-Dive Mode Selection -

Cable

Outside



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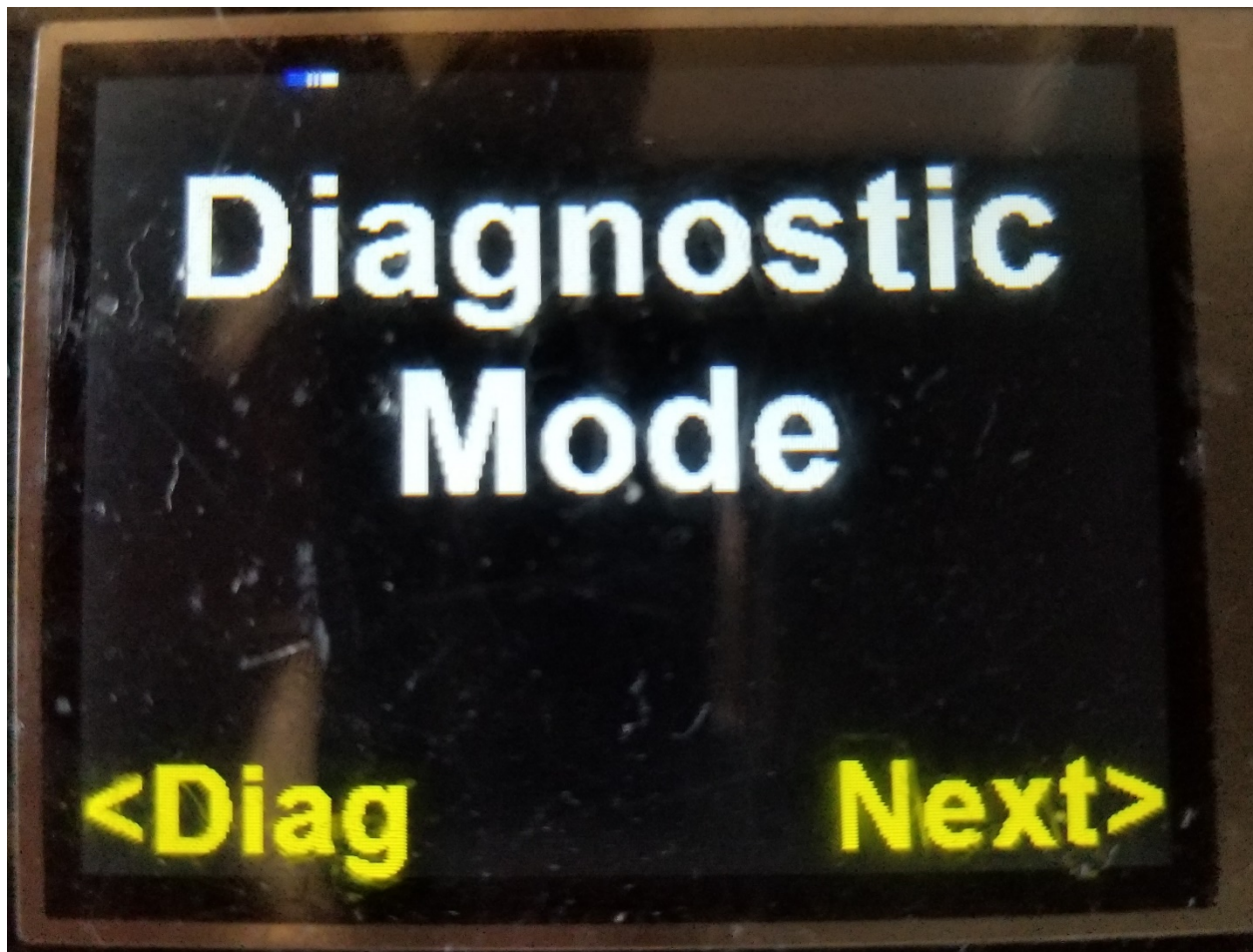
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Surface Mode

-Diagnostic Selection -

Cable

Outside



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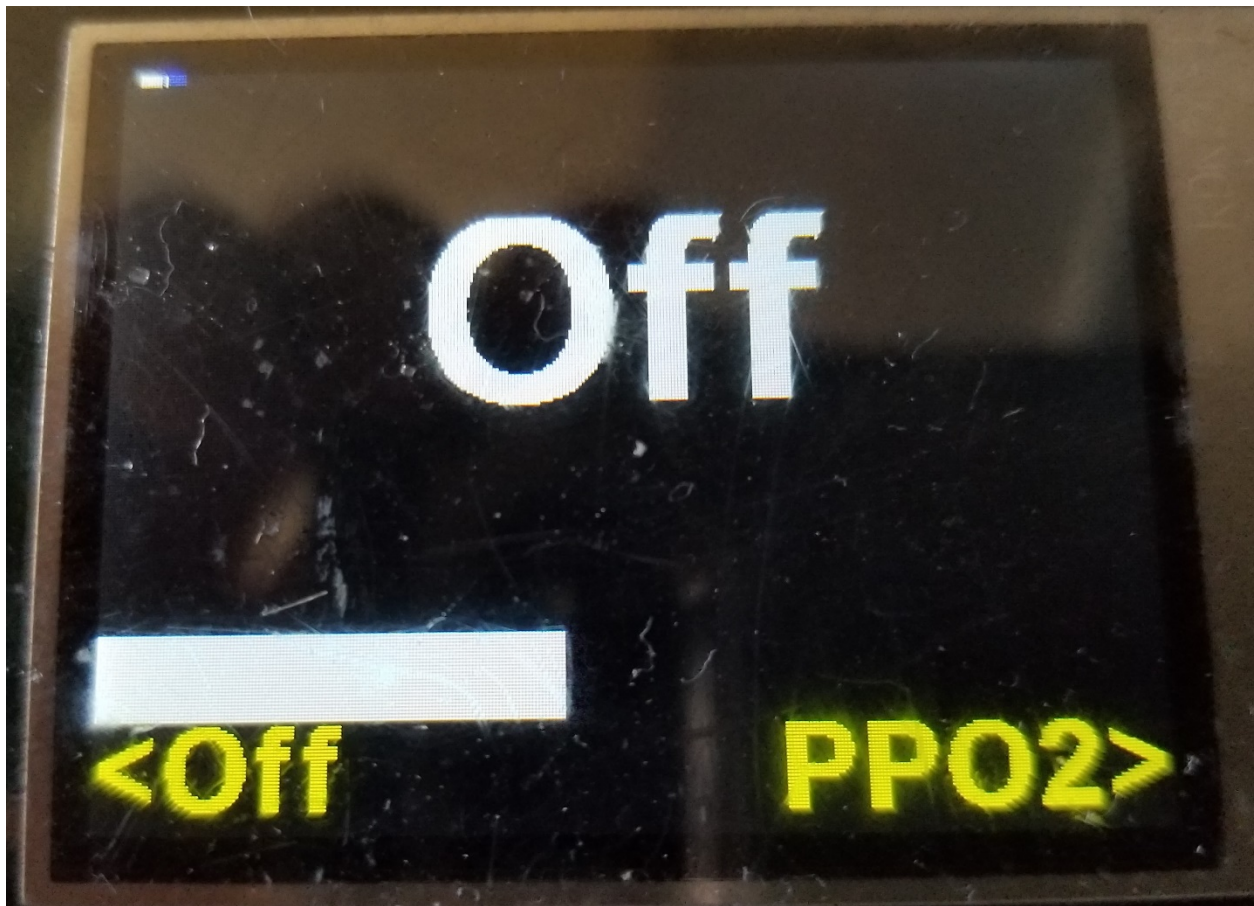
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Surface Mode

-Off Selection -

Cable

Outside



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Calibration

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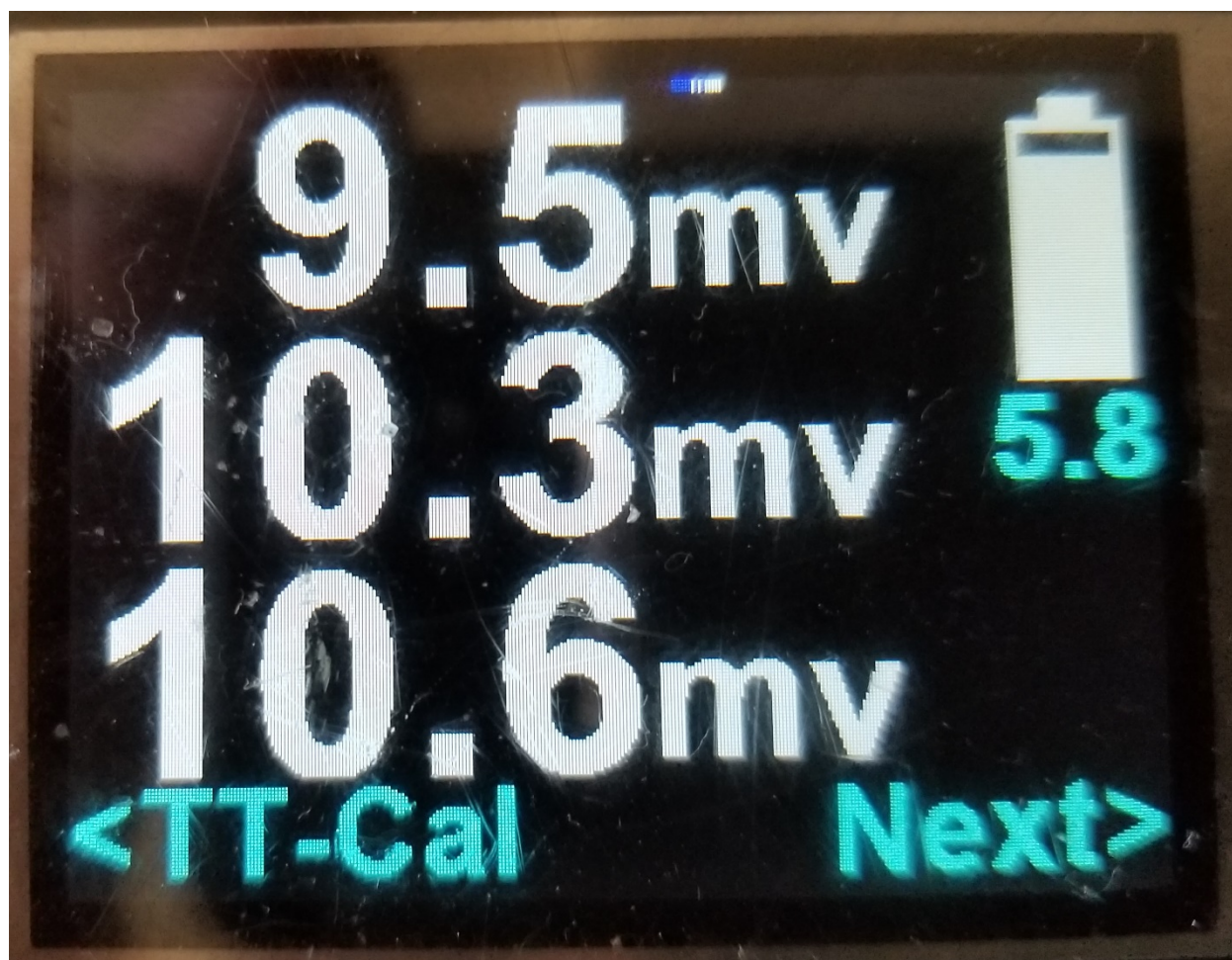
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Surface Mode: Calibration

-Millivolt Screen -

Cable

Outside



- ⇒ Double Tap on Cable Side to select Calibration
- ⇒ Air and Oxygen calibration levels are automatically detected
- ⇒ Altitude and Humidity (for air calibration only) are set in the Setup Menu selections. Sensor Output levels in air at sea level is automatically reported for reference if calibration is occurs in non-standard conditions.
- ⇒ Optional 2 point calibration is automatically applied if the opposite point is calibration in same surface mode. Sensor Linearity is automatically displayed in the event of 2pt calibration.

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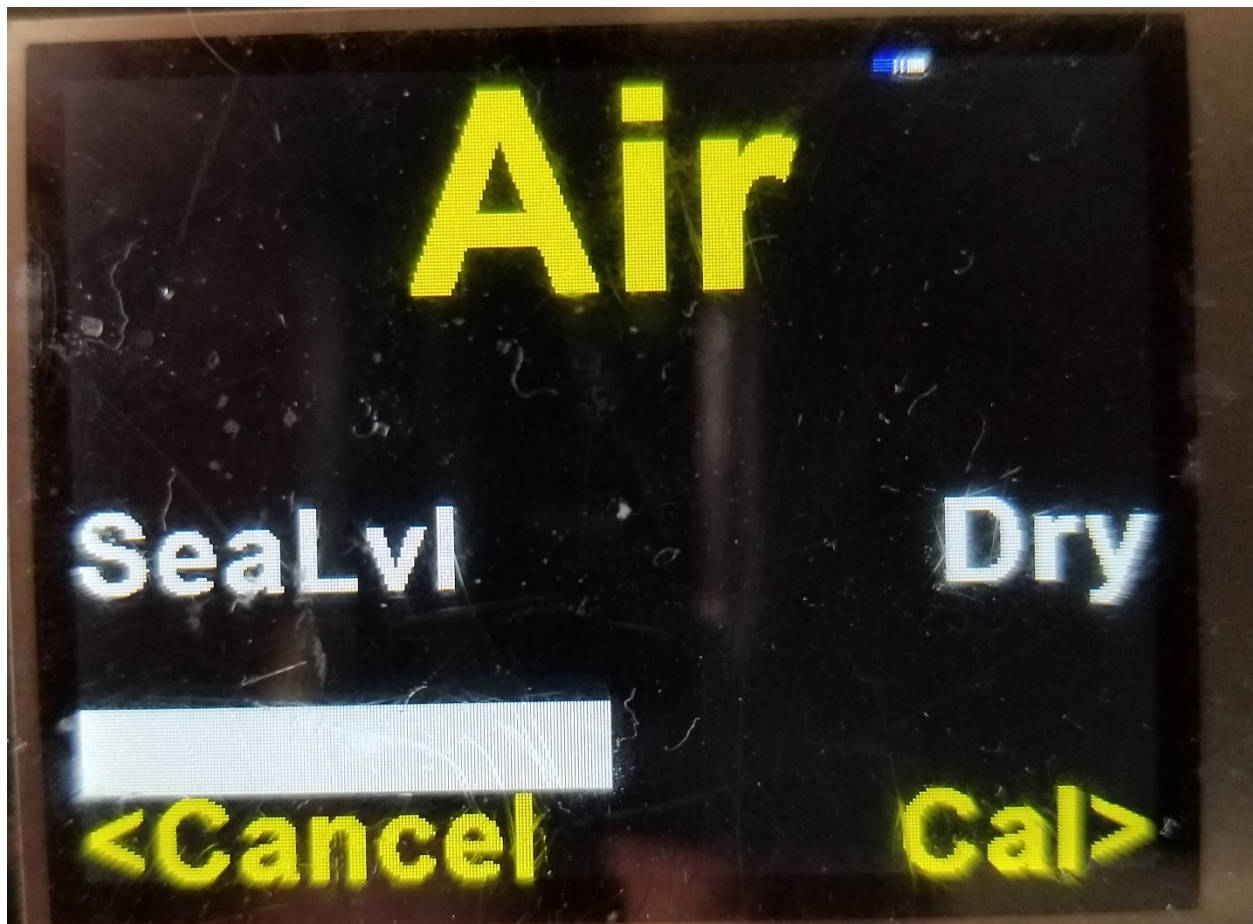
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Surface Mode: Calibration

-Calibration Confirm Screen –

Cable

Outside



- ⇒ Outside Tap to confirm Calibration
- ⇒ Altitude and Humidity settings (manually set in Setup Menu) are displayed
- ⇒ NOTE: Humidity level is only applied to an air level calibration

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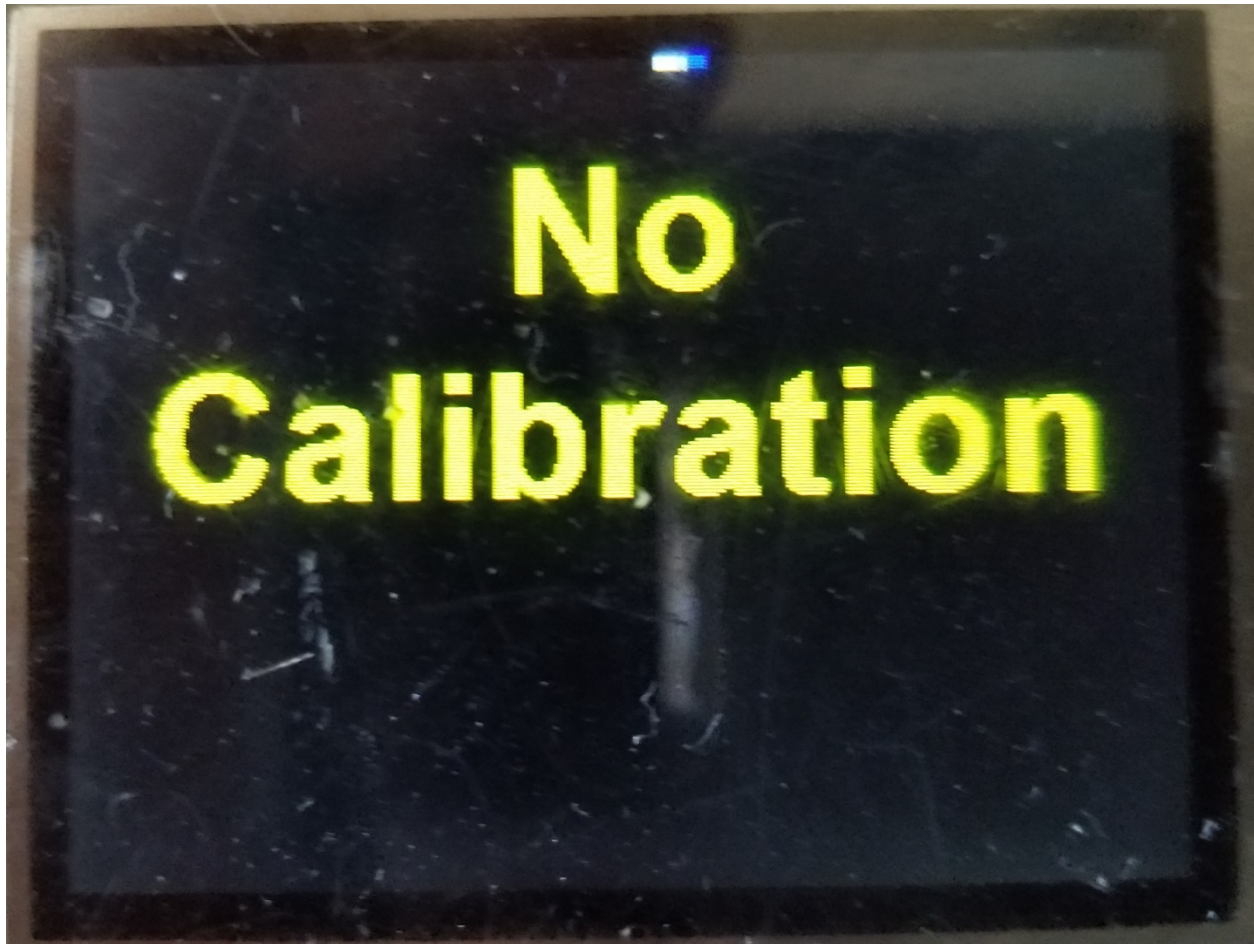
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Surface Mode: Calibration

-Calibration Fail Screen –

Cable

Outside



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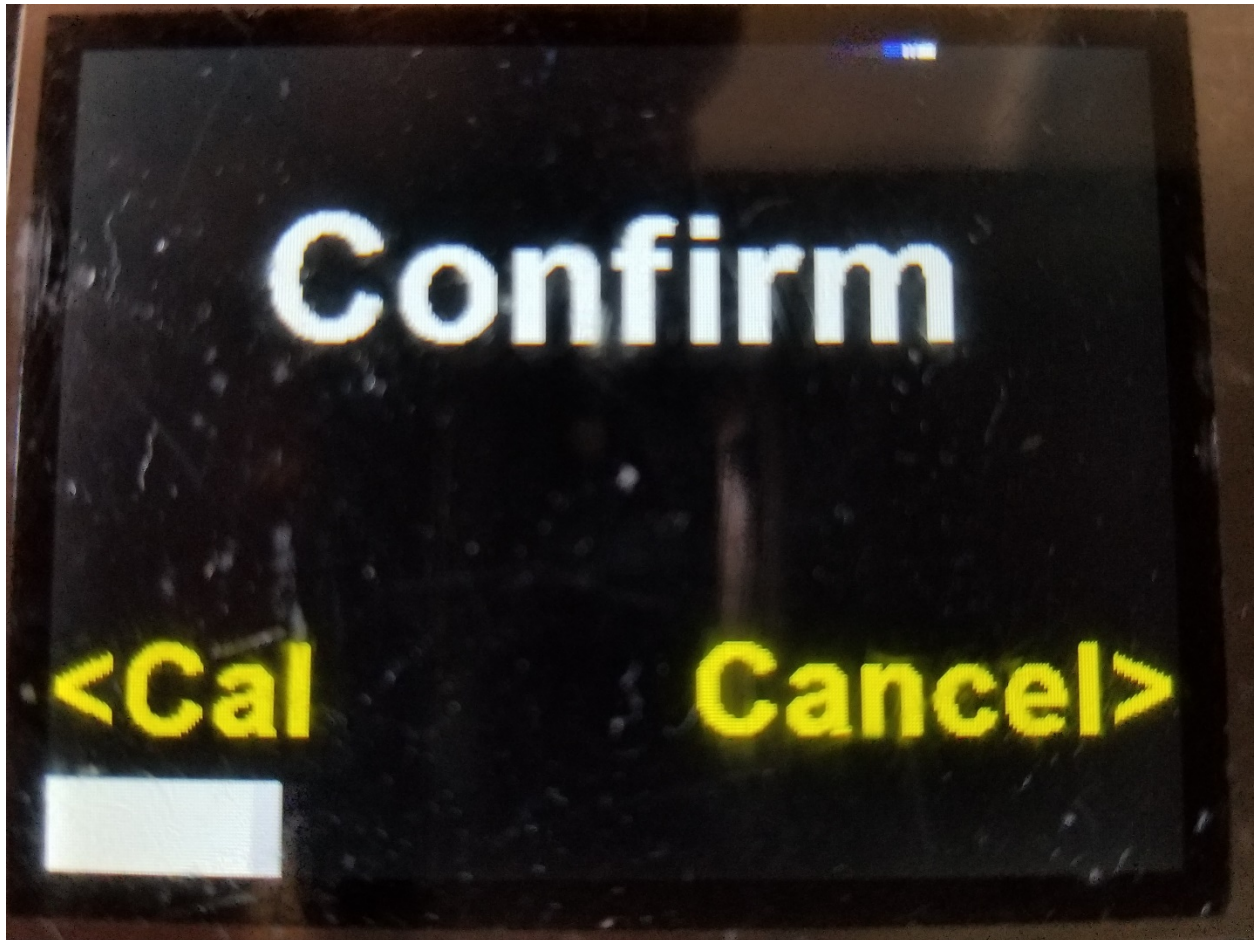
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Surface Mode: Calibration

-Calibration Confirm Screen –

Cable

Outside



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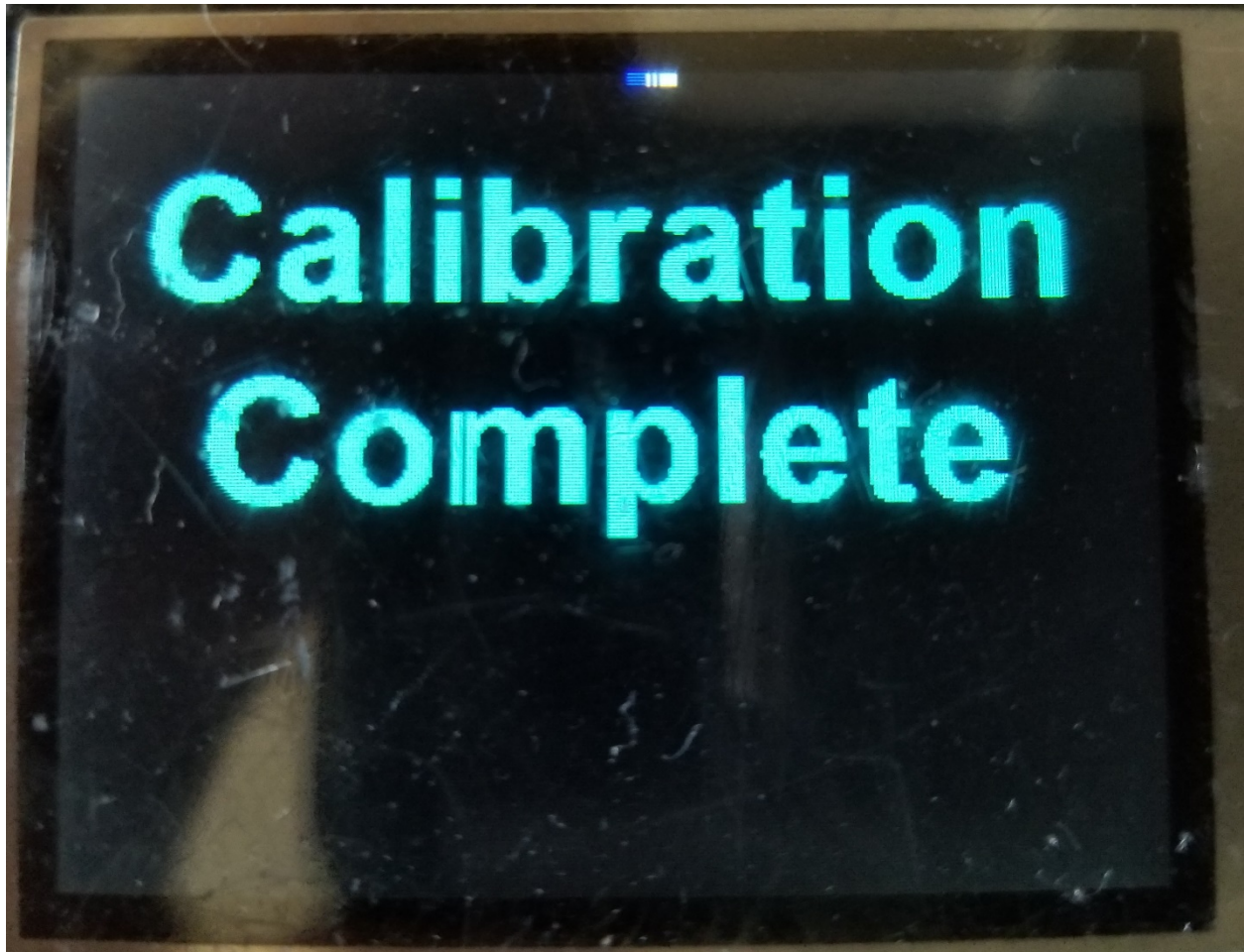
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Surface Mode: Calibration

-Calibration Complete Screen –

Cable

Outside



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Setup Mode

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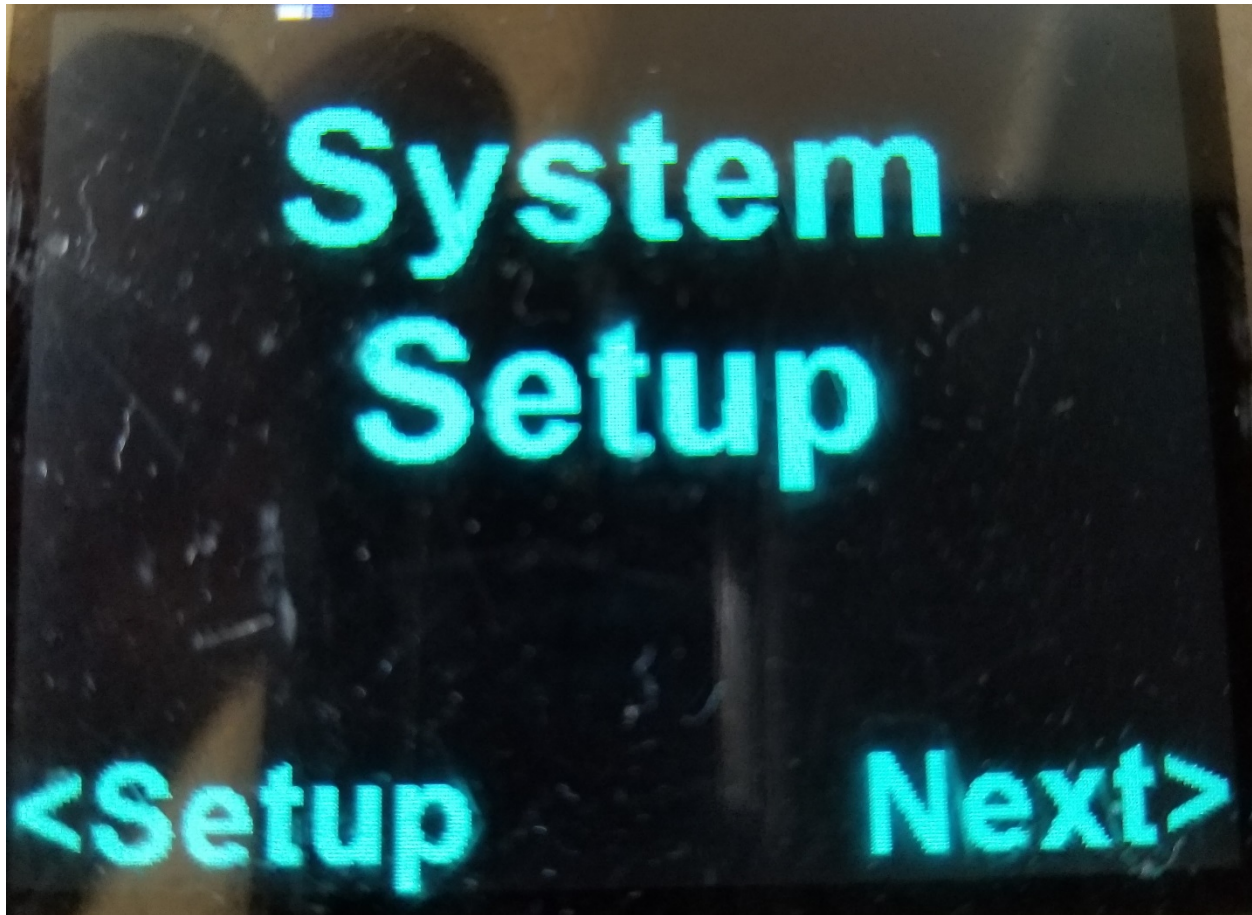
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Surface Mode: Setup

-Setup Menu Selection Screen –

Cable

Outside



⇒ Cable Side tap to select System Setup Menu

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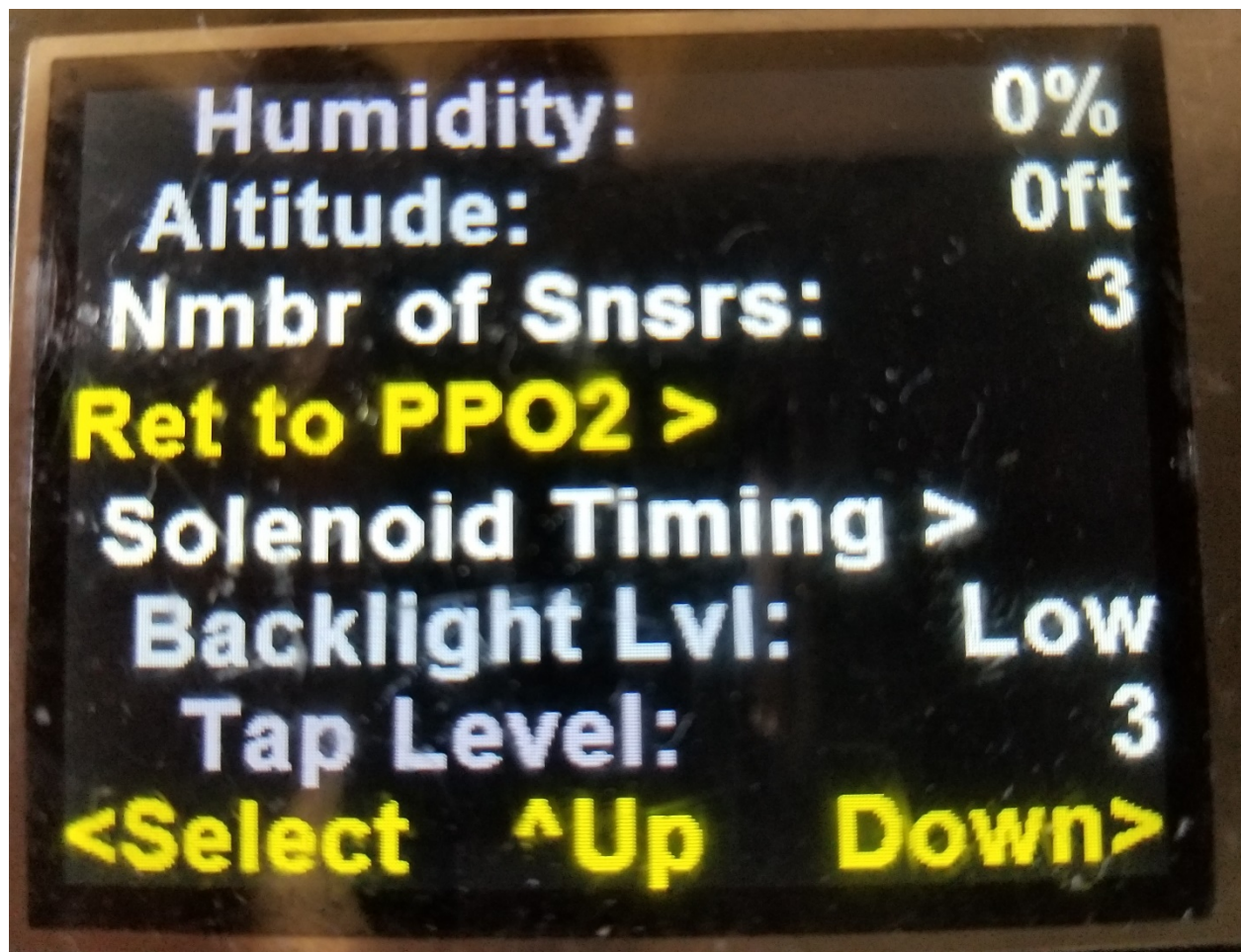
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Surface Mode: Setup

-Setup Menu Selection Screen –

Cable

Outside



⇒ Setup Menu options

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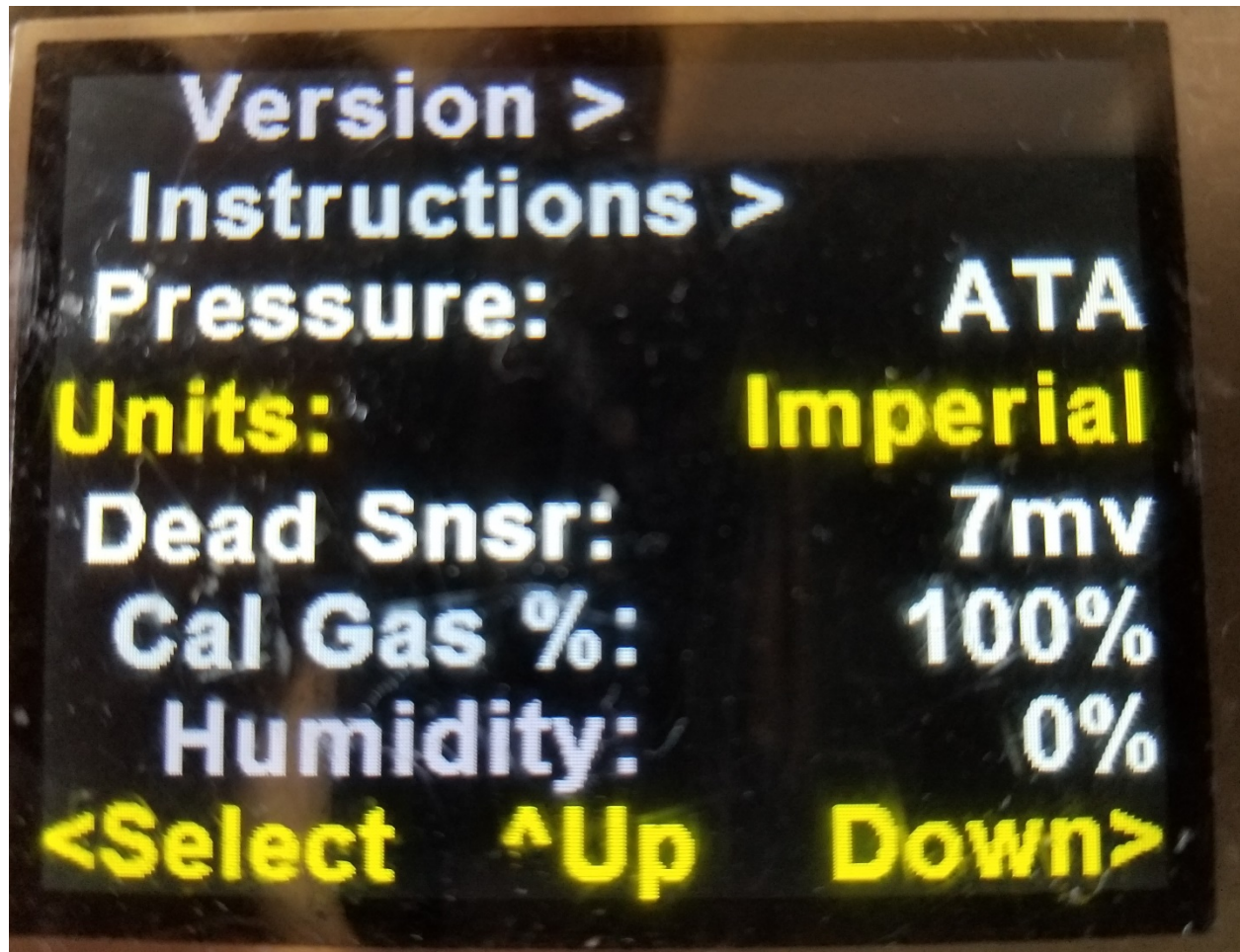
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Surface Mode: Setup

-Setup Menu Selection Screen –

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⇒ Setup Menu options

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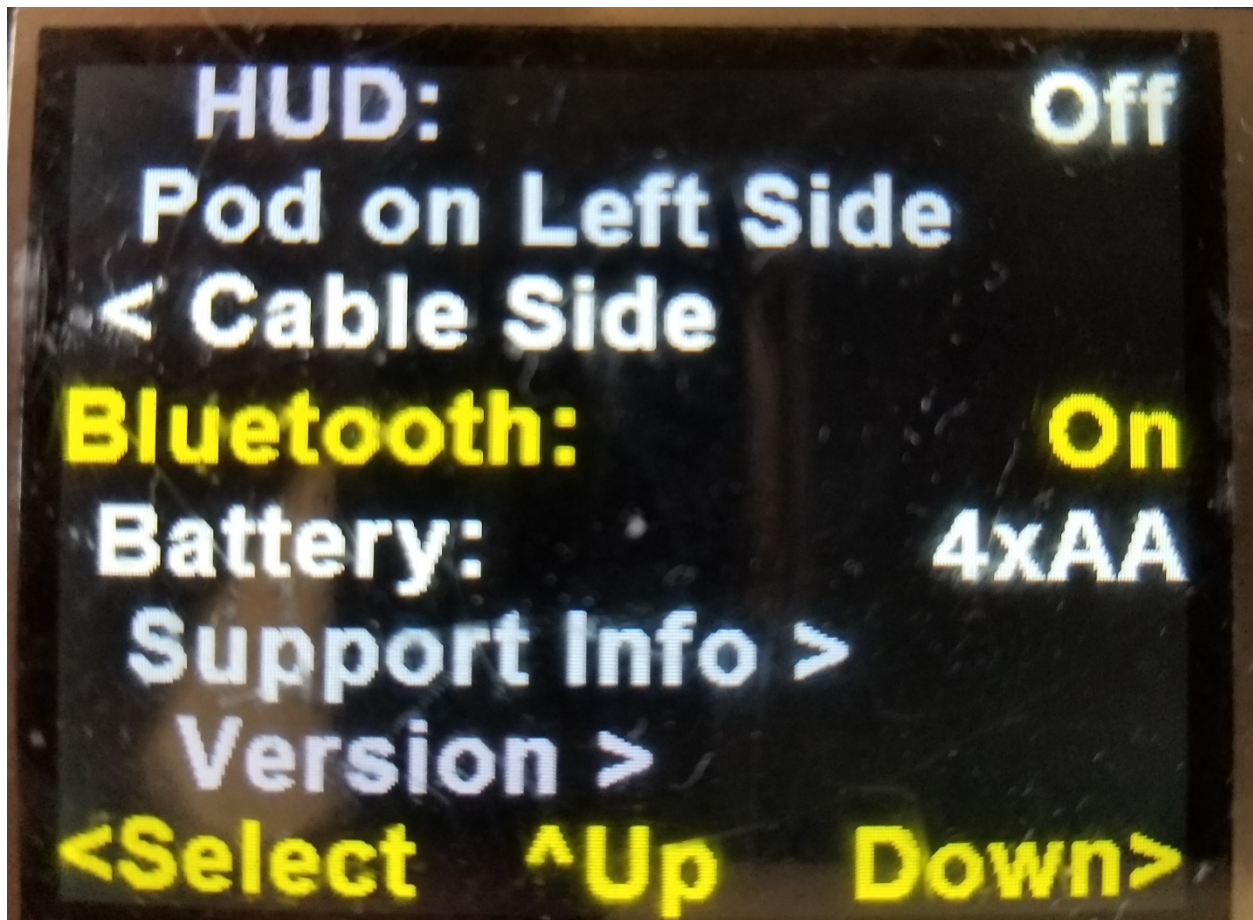
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Surface Mode: Setup

-Setup Menu Selection Screen –

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⇒ Setup Menu options

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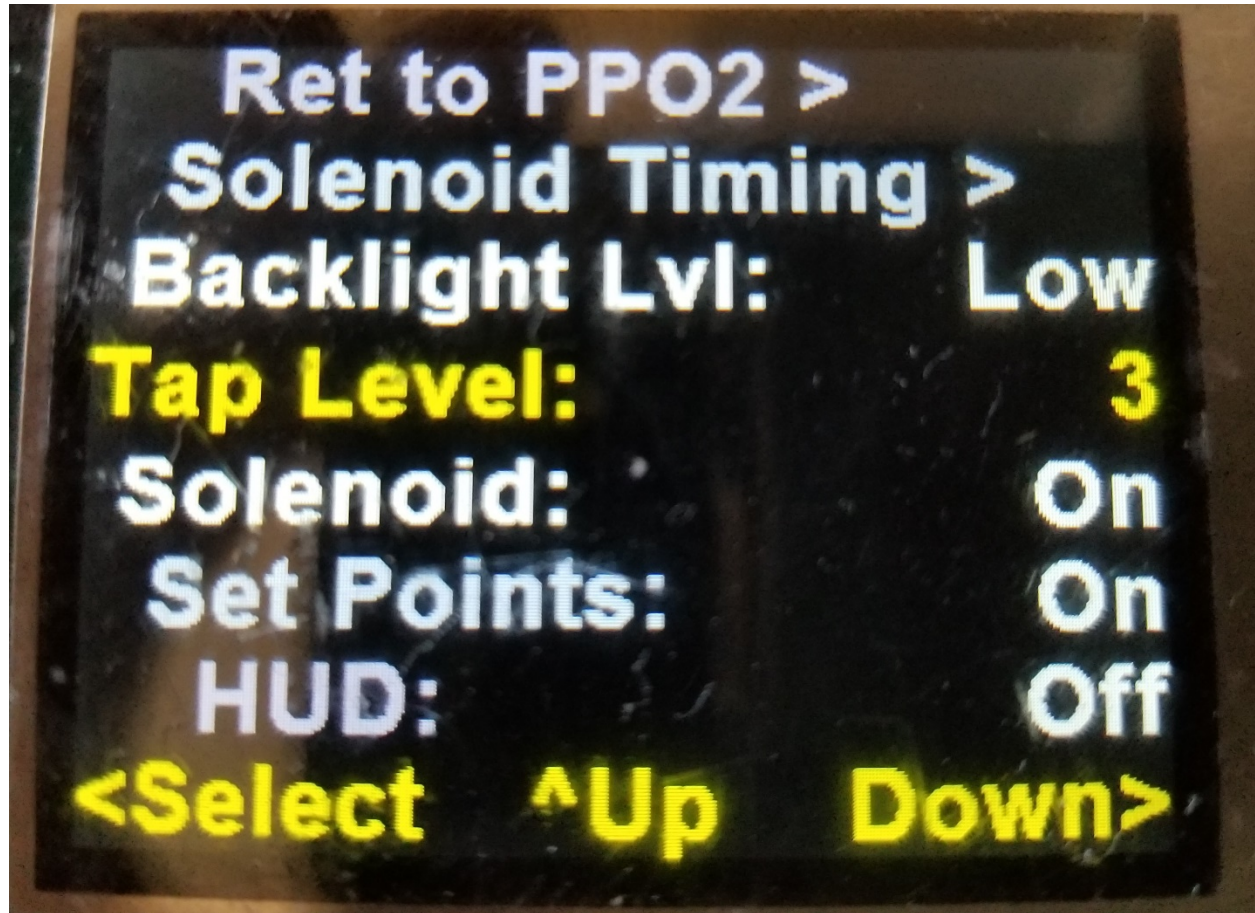
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Surface Mode: Setup

-Setup Menu Selection Screen –

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⇒ Setup Menu options

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Diagnostic Mode

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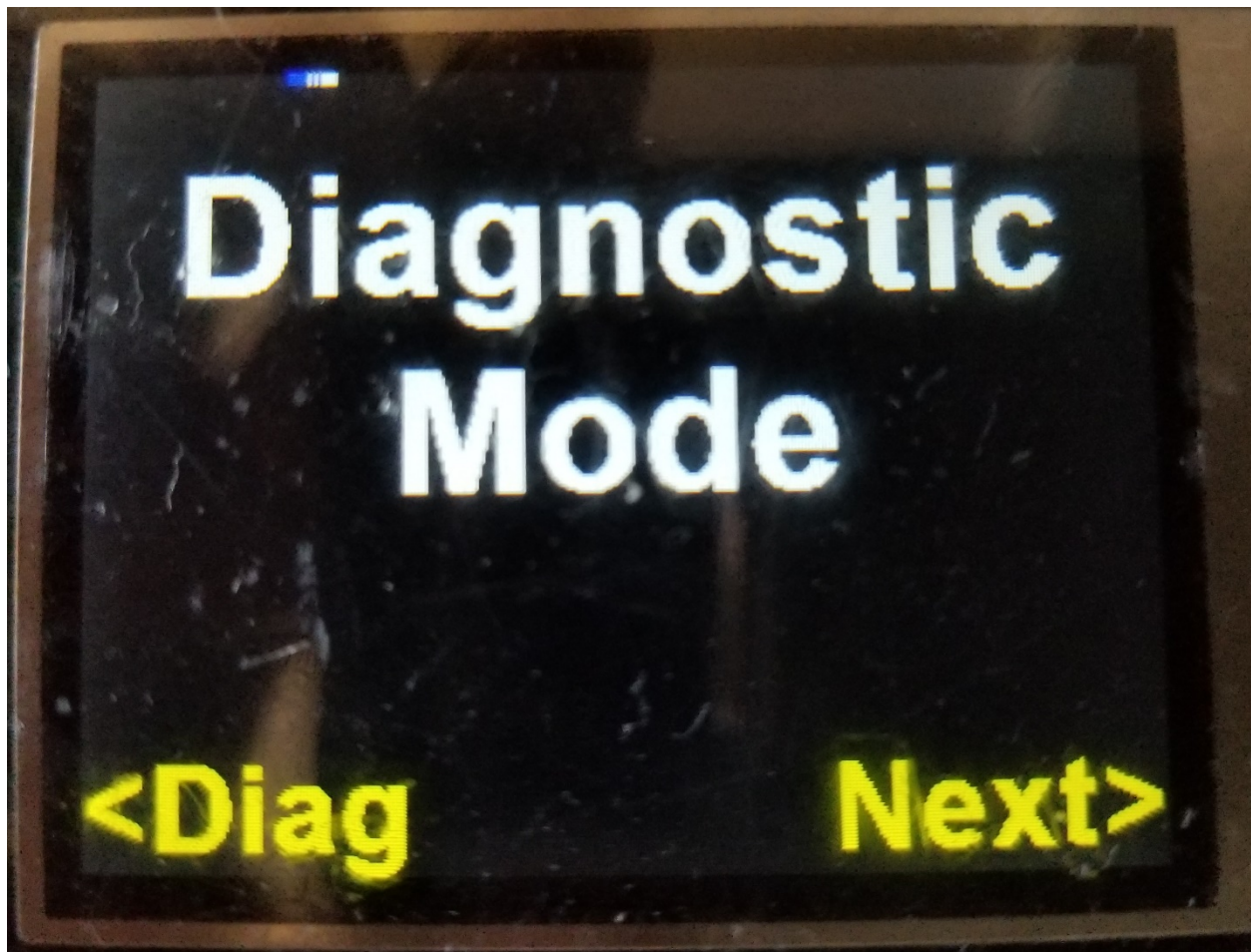
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Surface Mode: Diagnostic

-Diagnostic Selection Screen –

Cable

Outside



⇒ A Cable Side tap will select Diagnostic Mode

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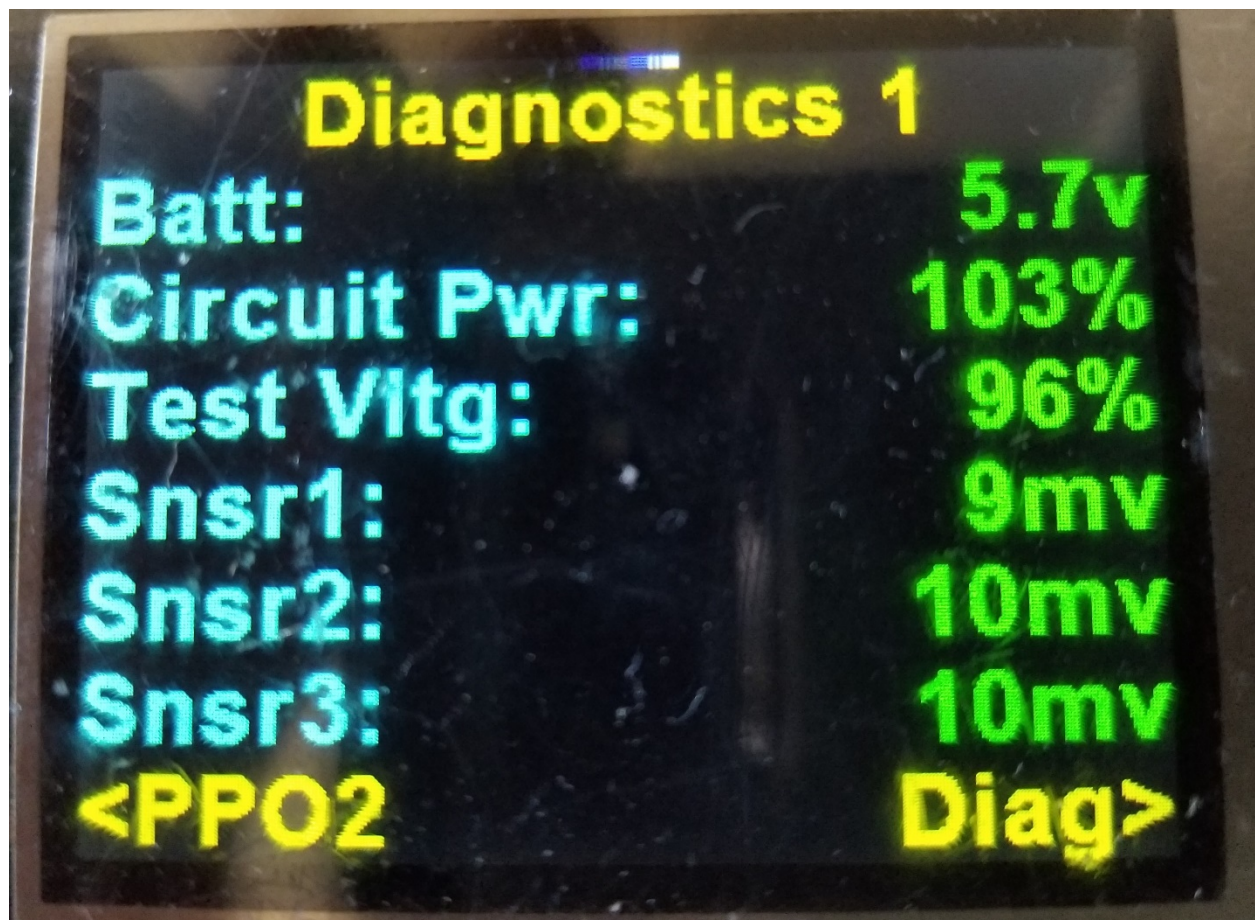
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Surface Mode: Diagnostic

-Screen 1-

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⇒ Shows all current voltage level measurements

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Surface Mode: Diagnostic

-Screen 2-

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⇒ Shows current Light Level

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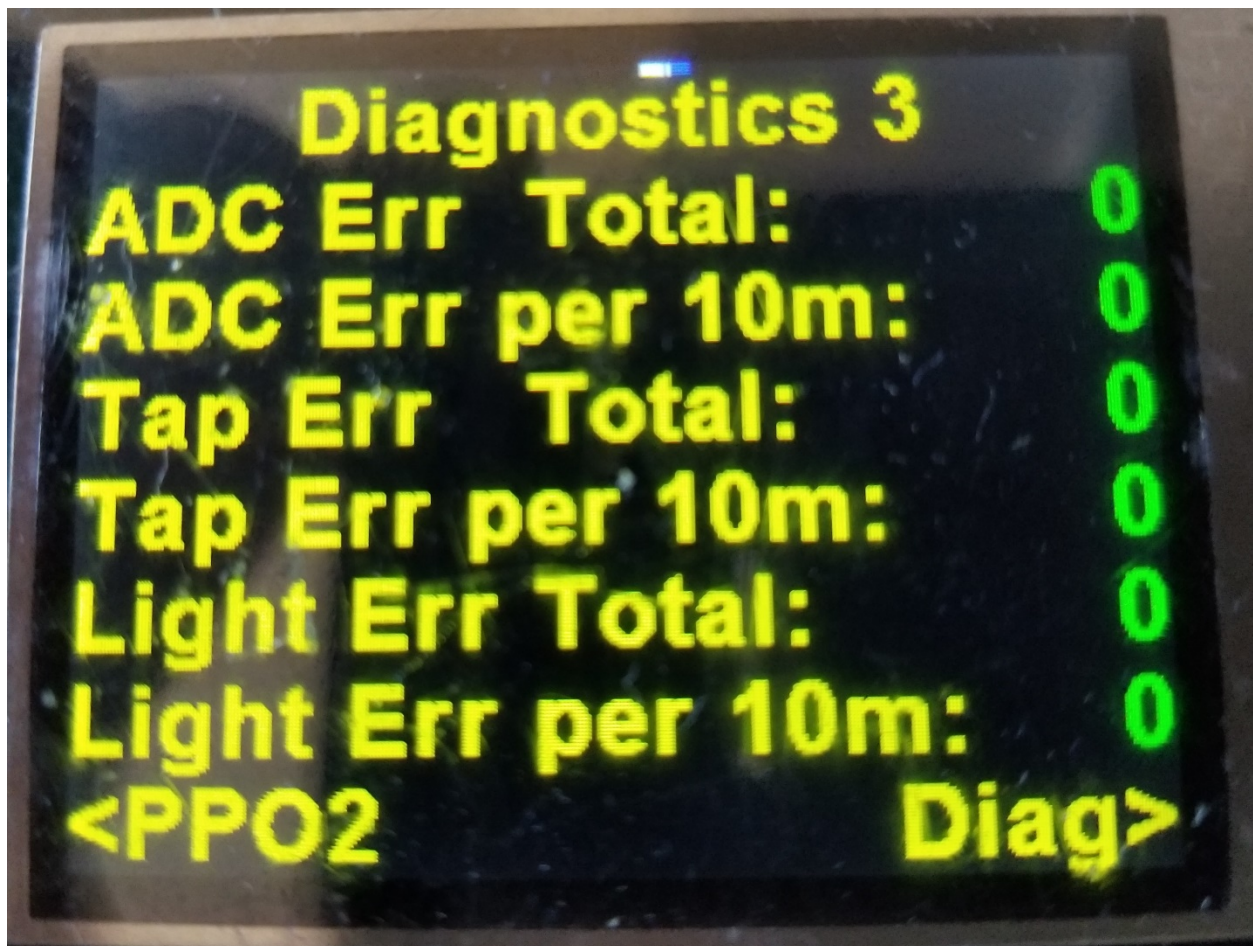
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Surface Mode: Diagnostic

-Screen 3-

Cable

Outside



- ⇒ Shows total errors for indicated circuits this Power On cycle
- ⇒ Shows errors that have occurred within the last 10 minutes

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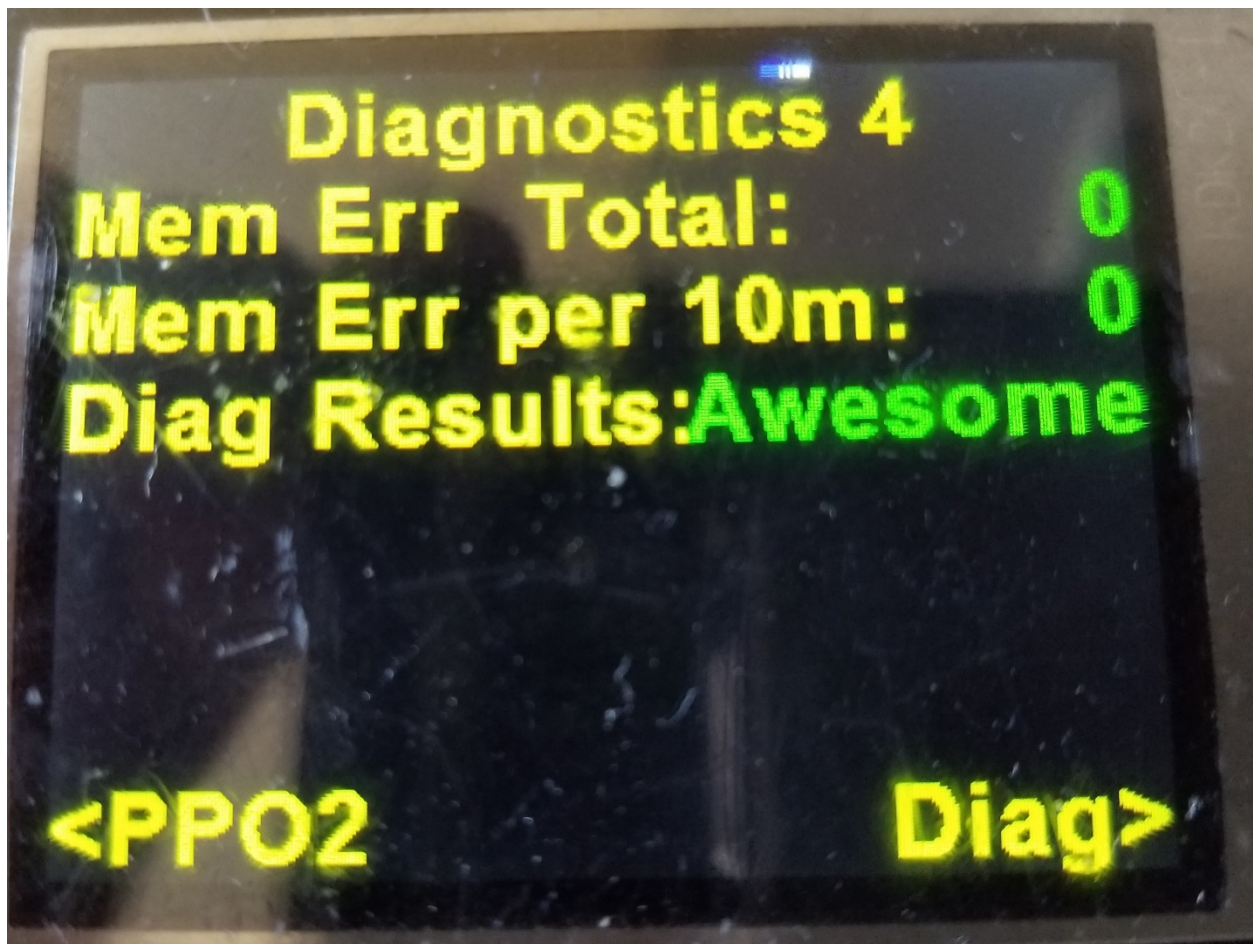
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Surface Mode: Diagnostic

-Screen 4-

Cable

Outside



- ⇒ total memory errors this on cycle and for the last 10 minutes
- ⇒ Overall Diagnostic Results

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Surface Mode: Diagnostic

-Screen 5 through 10-

Successive Diagnostic screens display solid Red, Green, Blue, White, Black, and Backlight Off screens in order to evaluate all pixel points.