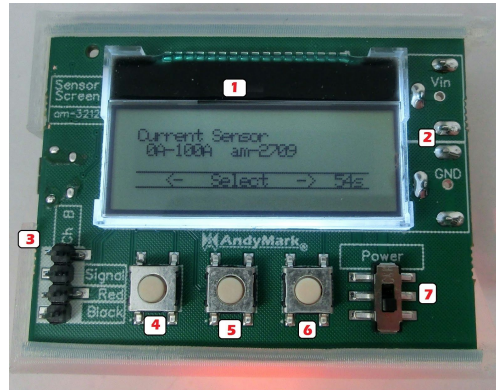# Sensor Screen User Guide

January 10, 2016
v1.0

Top View of the Sensor Screen

1. The Screen

The Screen is used to display the information from the sensors. It has a white LED backlight and four rows of text. Typically the top row features the Name of the sensor and the current mode that the data is being displayed. Some sensors, like Current Sensor and Potentiometer, can be put into *ADC* mode. Please see *ADC Mode* for more information.

2. The Power Plugs

The Power Plugs connect the voltage source to the Sensor Screen. The nominal voltage is 9v.

3. The Sensor Port

The Sensor Port allows Digital and Analog sensors to be wired to it.

- **Ch B**: Channel B on encoders.
- **Signal**: Input or output pin for the sensor. If it is an analog sensor, wire the signal output to The Signal pin on the Sensor Screen. If using an encoder, wire Channel A to this pin.
- **Red**: 5v @ ~150 mA and can be used as another digital or analog IO.
- **Black**: Ground.

4. Previous / Back Button

The Previous / Back Button has multiple functions. When in the main menu (where you see the title of each sensor), you can navigate the list of sensors. When you have selected a sensor, this button allows you to go back to the main menu. This button also can be used in conjunction with the Select button to call the SD update. Please view *SD Card Upgrading Procedure* section for more information.

5. Select / Clear Button

The Select / Clear Button has multiple functions. When in the main menu (where you see the title of each sensor), use this button to select the sensor. Data will start to show up on the screen. When you have selected a sensor, this button allows you to clear the averages and other data on the screen. This button also can be used in conjunction with the Previous button to call the SD update. Please view *SD Card Upgrading Procedure* section for more information.

6. Next / Mode Button

The Next / Mode Button has multiple functions. When in the main menu (where you see the title of each sensor), you can navigate the list of sensors. When you have selected a sensor, this button turns on the alternate mode for the sensor if the sensor has it (ie. Analog sensors show Scaled and ADC.

7. The Power Switch

The Power Switch is used to turn the device on and off. Pull the switch away from The Screen (1.) to turn the device on.

Bottom View of the Sensor Screen
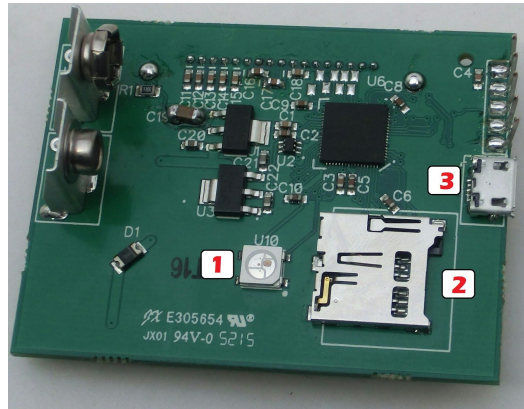
1. The LED
The LED is used to display visual feedback from the sensors. The brightness is scaled with Analog inputs. The color changes for each sensor menu. The *Flashlight* menu option turn the LED full white and can be dimmed if a potentiometer is wired the the Sensor Port. Using the Next / Mode button, the LED is toggled on/off when in this menu option.

2. The SD Card Slot
The SD Card Slot is a push in push out style connector. This means to plug an SD card in, push the SD card into the connector. To unplug the SD card, push the SD card in first and then the card should slide out. It is possible to force pull the card out but this will lead to damaging the card holder over time. When putting an SD card into the slot, make sure the contacts (the shiny metal parts) are towards the Sensor Screen.

3. The USB Port
The USB Port allows for UART communications of sensor data to a computer. A driver is needed and located at http://www.andymark.com/Electronic-p/am-3212.htm?TECH. When you first connect the Sensor Screen to a computer, Windows should fail to find a driver. You need to Click Start -> Right Click on Computer -> Click Manage -> Click Device Manager-> Right Click on UART under Unknown Devices -> Click Update Driver -> Browse Computer -> Select the folder with the Driver (.inf) you downloaded -> Click Next. If everything is installed correctly, in a few minutes a new COM port should show up. Using something like putty.exe, you can select this COM port, a baud rate, and few the data from the Sensor Screen. This data can also be read by any program that can read serial data on the computer to make a Graphing program to graph the data from your test.

The data format is shown below(Comma Separated Variables) :

　　　menu number, 12Mhz clock time stamp, data (ADC mode)

　　　2,10234844, 255

SD Upgrading Procedure:
- Download the latest CYA (image file) from http://www.andymark.com/Electronic-p/am-3212.htm?TECH
    - AM3212.CYA (spelling is crucial)
- Transfer *AM3212.CYA* to the SD card
- Safely eject the SD card from computer
- Shut off the Sensor Screen
- Push in SD card, contacts towards the board
    - Should hear a *click-click* sound
- Start the Bootloader
    - Through the Main Menu
        - Turn on the Sensor Screen
        - Navigate left until "UPDATE FIRMWARE"
        - Click Select
    - Through Alternate
        - Hold Previous and Select button
        - Turn on device
        - Release once *Flashing* is on screen
- Sensor Screen should boot if update successful
- Possible Errors
    - SD ERR
        - The Sensor Screen can't read the SD card or the filename is wrong.
        - Make sure the SD card in installed correctly\