

Black Rail SongMeter 2+ (ARU) programming

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27 March, 2019

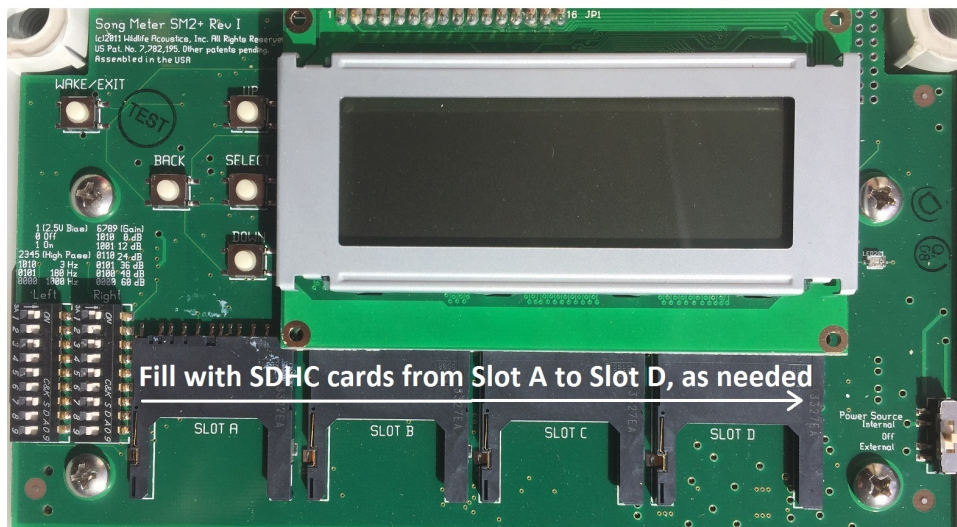
1. Remove front panel from SongMeter (ARU)

2. Check/install batteries

- The main power supply is 4 “D”-sized high-capacity rechargeable NiMH batteries. Make sure these are fully charged. The internal clock runs on 2 “AA” alkaline batteries. Replace (or at least check the voltage levels of) these prior to first deployment each year.

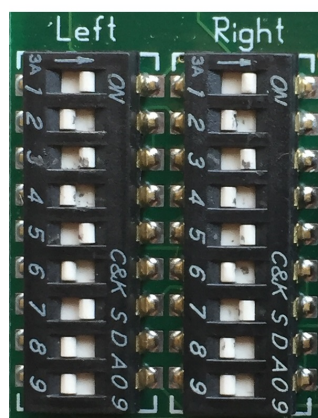
3. Install flash cards

- Insert 1 - 4 SDHC cards (16 or 32 GB; Class 10), filling from Slot A - D as needed. We have not had good luck using SDXC cards with this unit, though the SongMeter manual suggests it is possible to use them after reformatting the cards to a FAT32 file system. Use at your own risk.



4. Check bias and gain jumper settings

- Ensure bias and gain jumpers (left side of the control panel) match the following figure on both left and right channels.



5. Power on ARU

- a. Flip Power Source switch to **Internal** (right side of control panel).

6. Ensure up-to-date firmware version

- a. As of 27 March, 2019, this is **R3.3.9** for the Song Meter SM2+. It will display on the second line of the LCD screen. For example:

```
2019-Jan-29 13:54:00  
Song Meter II R3.3.9
```

- b. If the firmware is current, proceed to the next step. If the firmware is out of date, download [the current version](#).
- c. Power down the ARU by flipping the **Power Source** switch to **Off**.
- d. Copy the **CURRENT_FIRMWARE.SM2** file to the top level directory of any capacity SD card.
- e. Safely eject this SD card, then insert into Slot A of the SM2+.
- f. While pressing and holding the **UP** button, power on the ARU by moving the **Power Source** switch to **Internal**.
- g. Continue holding the **UP** button until you see the message “Song Meter II Boot”.
- h. Using the **UP/DOWN** buttons if necessary, navigate to the **CURRENT_FIRMWARE** desired firmware file and press **SELECT**. You should see the following messages on the LCD screen:

```
Upgrading.....  
Upgrading Complete! Press Reset to Boot
```

- i. There is no **Reset** button on the SM2+, so flip the **Power Source** switch to **Off** and then **Internal** to reboot with the new firmware.
- j. Success will be indicated as in Step a.

7. Set date/time, if necessary

- a. Visit time.gov to get official US time.
- b. Press **SELECT** button and navigate to **Settings** with the **DOWN** button. With **Settings** highlighted, press **SELECT** again.
- c. Highlight **Time and date** and press **SELECT**
- d. Highlight the current date and time and press **SELECT**
- e. Work through the year, month, day, hour, minutes, and seconds settings sequentially, pressing **SELECT** after each component is set.
- f. The date/time will be set when you press **SELECT** after setting the seconds component.

8. Set sunrise/sunset reference

- a. Navigate (using **UP/DOWN** buttons) to **Solar**, press **SELECT**, and press **UP** button until **Sunrise/set** is indicated. Press **SELECT**.
- b. Press **BACK** button to return to **Settings** menu.

9. Set location prefix and coordinates of ARU

- a. Navigate to **Location** and press **SELECT**
- b. Press **SELECT** and modify the location prefix.

- c. Set the location prefix using the following convention: <ARU ID>-<survey point ID>.
 - For example, the prefix for audio collected on Cedar Island NWR at point CDR4H with SongMeter IM06 would be IM06-CDR4H. Only 12 alphanumeric spaces are available, so abbreviating long, historical location names may be necessary (e.g., PTAILLIE114 becomes PT114).
- d. If the location prefix is less than 12 alphanumeric characters, enter a trailing blank space and press **SELECT** to finish the location prefix.
- e. Navigate to **Latitude** and press **SELECT**. Set the latitude of the location of ARU deployment.
- f. Navigate to **Longitude** and press **SELECT**. Set the longitude of the location of ARU deployment.
- g. Navigate to **Timezone** and press **SELECT**. Set the timezone of your location relevant to UTC. All of our ARUs will operate under Eastern Daylight Time, which is UTC - 4:00.

10. Confirm audio settings

- a. Navigate to **Audio** and press **SELECT**.
- b. Set **Sample rate** to 22050.
- c. Set **Channels** to **Stereo**.
- d. Set **File Format** to **WAV**.
- e. Set both **Gain Left** and **Gain Right** to + 0.0 dB.
- f. Navigate to **Advanced Settings** and press **SELECT**.
- g. Set both **Dig HPF Left** and **Dig HPF Right** to 459. They will display **fs/48** after setting.
- h. Ensure the following settings are **Off**: **Dig LPF Left**, **Dig LPF Right**, **Trg Lvl Left**, and **Trg Lvl Right**.
- i. Ensure **Bits** setting is 16. The other **Trg** setting options are irrelevant provided other settings are as specified above.
- j. Press **BACK** 3X to return to the ARU Main Menu.

11. Confirm ARU recording program

- a. Navigate to **Schedule** and press **SELECT**. This will move the cursor to the right to choose between **advanced** and **daily** schedules.
- b. Navigate to **advanced** schedule and press **SELECT**.
- c. Confirm the following program and, if necessary, change it by **SELECT**ing each line and navigating through the options, one of which is **<Delete>** to remove a line:
 - 01 AT SSET - 00:30:00
 - 02 D0
 - 03 RECORD 02:00:00
 - 04 GOTO LINE 02 00X
- d. Press **BACK** until you arrive at the ARU Main Menu.

12. Power down the ARU

- a. Flip **Power Source** switch to **Off**.

13. Replace front panel on SongMeter (ARU)

- a. The SongMeter (ARU) is now ready for [deployment](#).