

Black Rail SongMeter 2+ (ARU) programming

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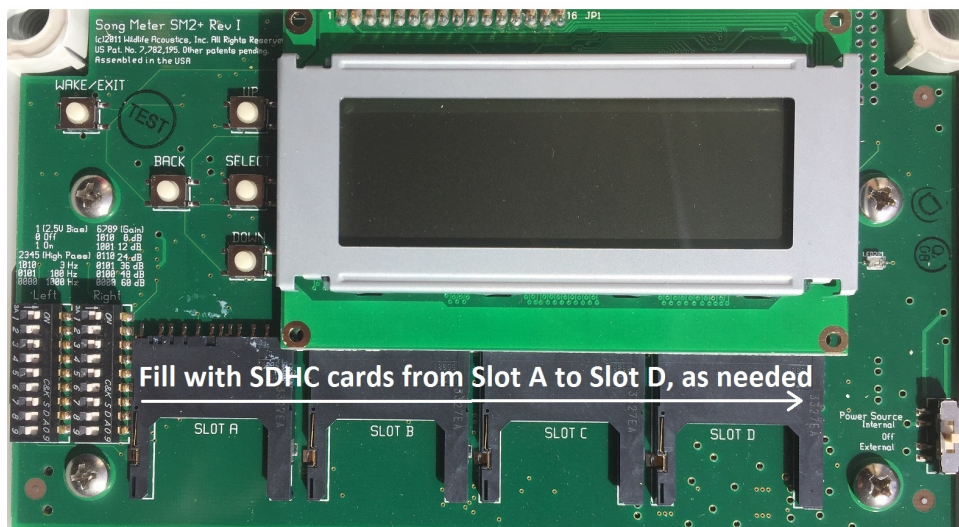
1. Remove front panel from SongMeter (ARU)

2. Check/install batteries

- a. 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.

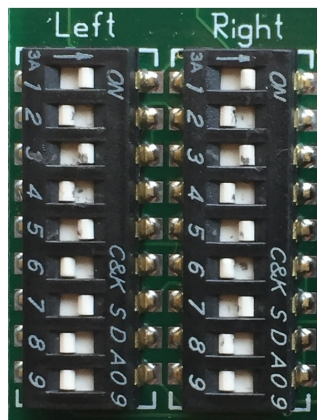
3. Install flash cards

- a. 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.
- b. Make sure SD cards are fully inserted and secure in their Slot. They can occasionally appear installed but not be fully inserted.



4. Check bias and gain jumper settings

- a. Ensure bias and gain jumpers (left side of the control panel) match the following figure on both left and right channels. For users with newer SongMeter ARUs, these settings do the following:
 1. Set a 180Hz two-pole high-pass filter. On SongMeter 3 and 4, the nearest equivalent is 220Hz.
 2. Set the microphone pre-amplifier gain to +48dB. See the SongMeter 3 or 4 manual regarding matching this setting with those units.



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 16 April, 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 If the firmware is out of date, download [the current version](#).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 **SELECTing** each line and navigating through the options, one of which is **<Delete>** to remove a line:

- 01 AT SSET - 00:30:00
- 02 DO
- 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](#).