

# Using Wildlife Acoustics SM4 Song Meter, Field Deployment, and Maintenance

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Asi@Connect Projects

Extending Asian Soundscape Monitoring Network and Moving Towards Open Science Platform



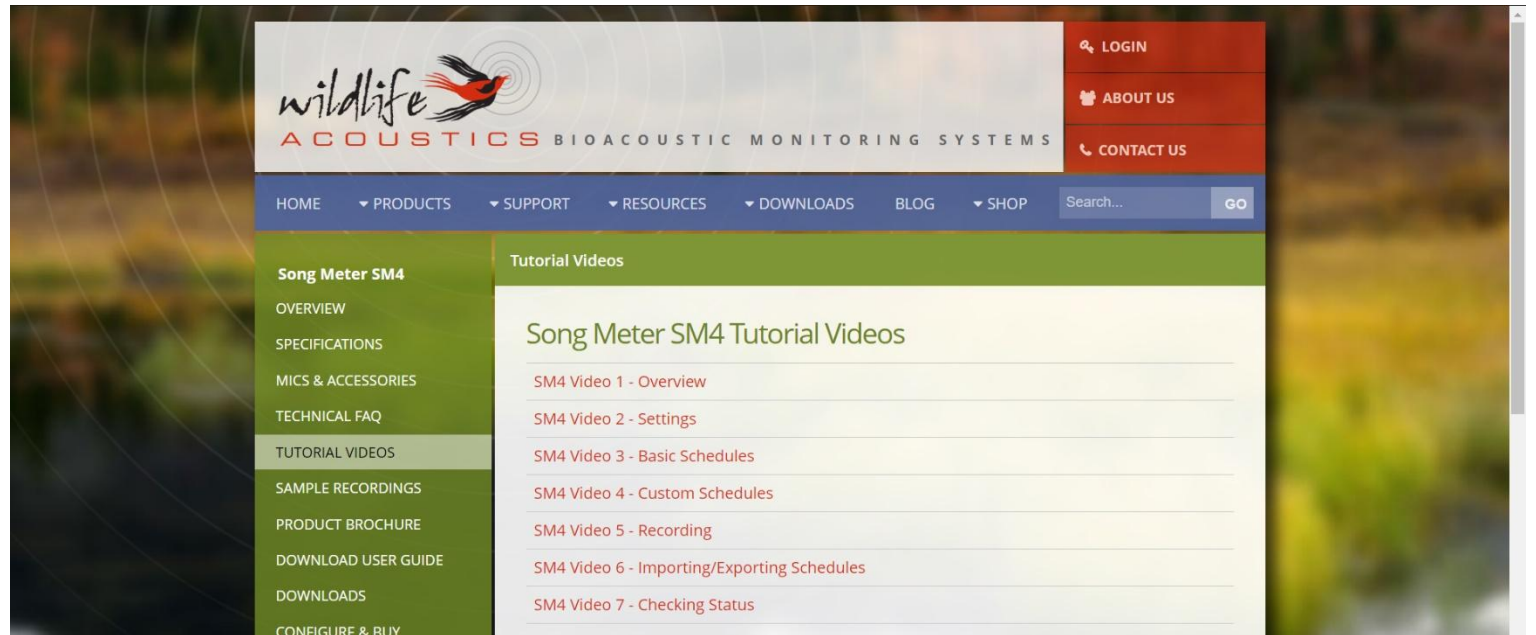


See Page 1 for  
Quick Start Checklist

## Song Meter SM4 BIOACOUSTICS RECORDER

### User Guide

Last updated on January 26, 2018.



# Using Wildlife Acoustics SM4 Song Meter

[User guide](#)

[Tutorial videos](#)

# Using SM4

## 2.2 Visual Tour



# Using SM4

- Use SM4 Configurator to set up settings and schedule
- Power off (slide the switch to **EXT**)
- Install internal batteries
- Insert SD cards
- Power on (slide the switch to **INT**)
- The Menu
- Set date and time
- Import settings and schedule from SD card
- Check status
- Start instant recording and monitor live audio with headphones
- Start and stop schedule recording

# Use SM4 Configurator to set up schedule and settings

- Deployment scenario
- Settings
- Schedule
- Power consumption and SD card usage
- Copy the configuration file to SD card

The screenshot displays the SM4 Configurator software interface, which is used for configuring and scheduling data loggers. The interface is divided into several sections:

- Deployment Scenario:** This section allows users to select a deployment scenario (currently 'SM4'), set the simulation start date and time (2018/05/25 at 16:18:54), and choose the recorder model (SM4, SM4BAT-FS, or SM4BAT-ZC). It also includes options for Slot A and B (both 'Empty'), microphone selection (both 'Internal'), and battery capacity (72 Wh).
- Settings:** This section includes options for Prefix, Timezone (UTC+00), Position (Latitude: 0.00000 N, Longitude: 0.00000 W), Channel (stereo), Gain (Left: 16.00 dB, Right: 16.00 dB), Preamp (Left: 26dB, Right: 26dB), High-pass filter (Left: off, Right: off), Sample Rate (24000 Hz), Max Length (01:00), Delay Start (2000/01/01), and LED status (LED always).
- Schedule:** This section allows users to load a built-in schedule or create a custom one. It includes fields for START and END times and a DUTY setting (always).
- Schedule Grid:** A grid showing the schedule for the period from 2018-May-25 to 2018-May-31. The grid is color-coded to indicate different states: Night (blue), Day (yellow), Recording (black), Flash full (purple), and Battery empty (red).

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Deployment Scenario

SM4  2018/05/29 00:00:00

Slot A: 256GB Slot B: Empty

Mic 0: Internal Mic 1: Internal

Battery (Wh): 72 Wh

NOTE: Remember to select the correct model of SM4 recorder e.g. SM4, SM4BAT-FS, or SM4BAT-ZC

NOTE: Run time estimates assume power-efficient flash cards and high quality batteries at room temperature. Run times can vary significantly (by as much as 50%) otherwise.

Schedule

--- Load built-in schedule ---

START time 00 : 00

DUTY cycle ON 00 : 01 OFF 00 : 09

END time 00 : 00

Settings

Prefix: MMK01 Channel: stereo

Timezone: UTC+08 :00 Gain:Left: 16.00 dB Right: 16.00 dB

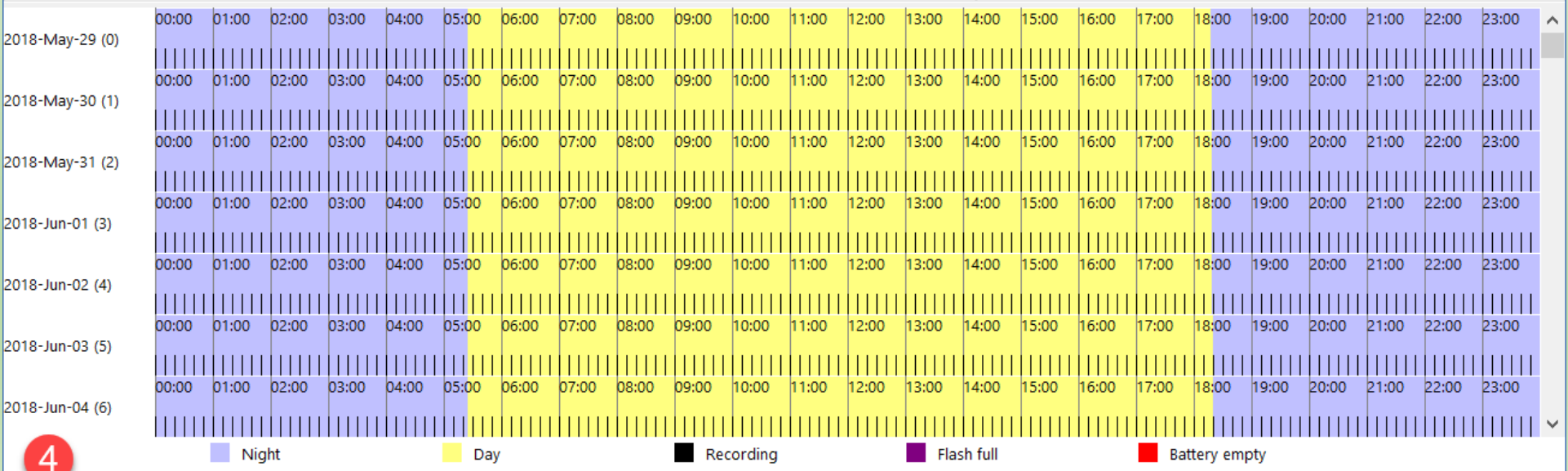
Position: Lat: 14.13825 N Lon: 121.20425 E Preamp:Left: 26dB Right: 26dB

sunrise/sunset High-pass filter:Left: off Right: off

Delay Start (yyyy/mm/dd): 2000/01/01 Sample Rate: 44100 Hz

LED 5 minutes only Max Length (hh:mm): 01:00

Add



2018-May-29 23:10:00 (00:01:00) 0.6Wh A:1.5G(140) B:0.0G(0) [rise 05:26 set 18:19]

# Deployment scenario

- Choose SM4
- Set Slot A: 256GB, Slot B: Empty
- Set Mic 0 & 1: Internal

## Deployment Scenario

SM4 1

Slot A:  2 Slot B:

Mic 0:  3 Mic 1:

Battery (Wh):

NOTE: Remember to select the correct model of SM4 recorder e.g. SM4, SM4BAT-FS, or SM4BAT-ZC

NOTE: Run time estimates assume power-efficient flash cards and high quality batteries at room temperature. Run times can vary significantly (by as much as 50%) otherwise.

# Settings

- Prefix: Organization-Site
- Timezone
- Position
- LED 5 minutes only
- Channel: stereo
- Gain Left & Right: 16 dB
- Preamp Left & Right: 26 dB
- High-pass Left & Right; off
- Sampling rate: 44100 Hz
- Schedule Mode daily
- Do Not Sleep: no

Settings

Prefix: 1 ACB-MMK01

Timezone: 2 UTC+08 :00

Position: Lat: 14.13825 N 3 Lon: 121.20425 E  
sunrise/sunset

Delay Start (yyyy/mm/dd):  2000/01/01

4 LED 5 minutes only

Channel: stereo

Gain: Left: 16.00 dB Right: 16.00 dB

Preamp: Left: 26dB Right: 26dB

High-pass filter: Left: off Right: off

Sample Rate: 44100 Hz

Max Length (hh:mm): 01:00

Settings

Delay Start (yyyy/mm/dd):  2000/01/01

LED 5 minutes only

Battery Cutoff: 0.0 V

Sensitivity: Left: 0.0 dB Right: 0.0 dB

Schedule Mode daily

Do Not Sleep: no

Sample Rate: 44100 Hz

Max Length (hh:mm): 01:00

Compression: none



# Schedule

- START time 00:00
- DUTY cycle ON 00:01 OFF 00:09
- END time 00:00

Schedule

--- Load built-in schedule --- ▾

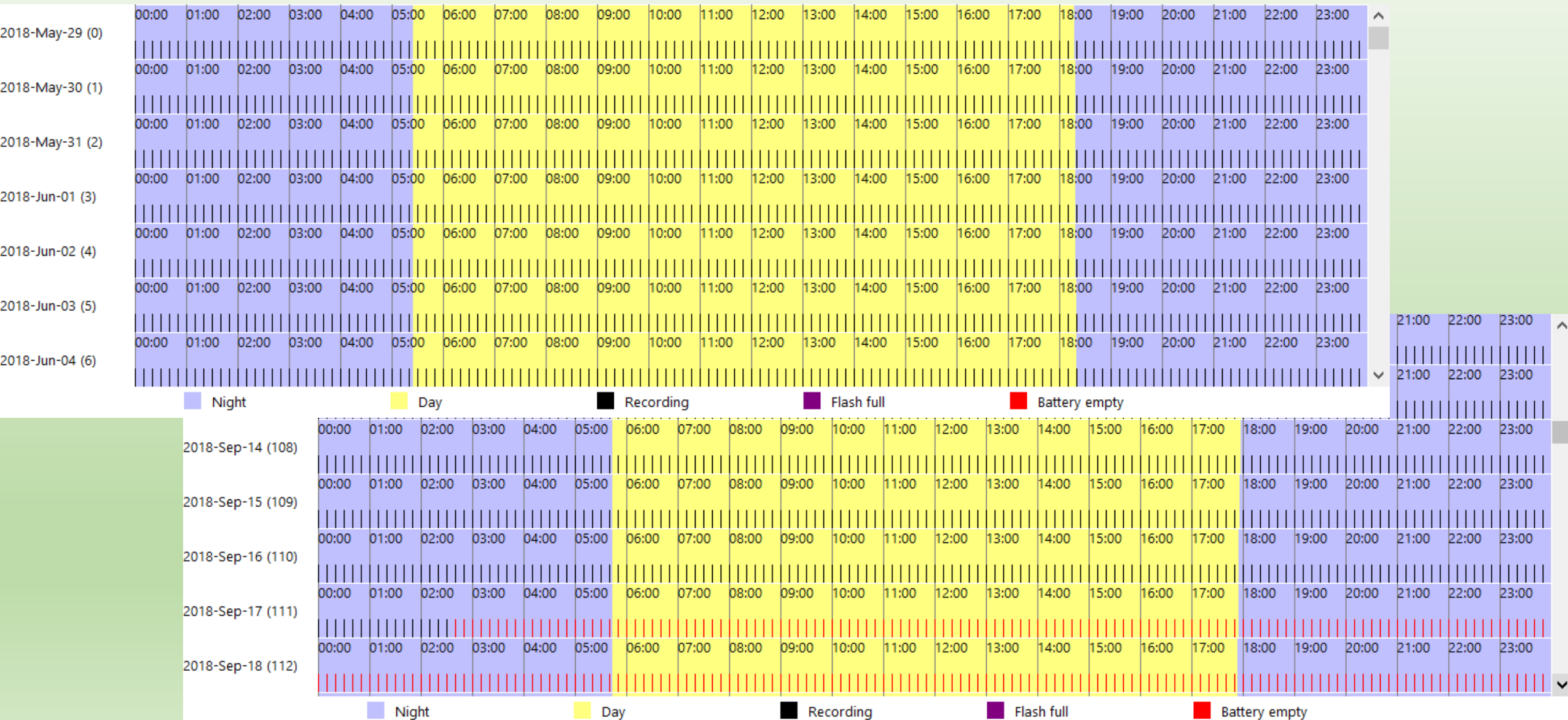
START time ▾ 00 ▾ : 00 ▾

DUTY cycle ▾ ON 00 ▾ : 01 ▾ OFF 00 ▾ : 09 ▾

END time ▾ 00 ▾ : 00 ▾

Add

# Estimated power consumption & SD card usage



# Save configuration file

SM4 Configurator

File Help

- Open... Ctrl-O
- Save... Ctrl-S
- Save with lock/unlock code... Ctrl-Shift-S
- Close Ctrl-W
- Exit Ctrl-Q

00:00:00

NOTE: Remember to select the correct model of SM4 recorder e.g. SM4, SM4BAT-FS, or SM4BAT-ZC

NOTE: Run time estimates assume power-efficient flash cards and high quality batteries at room temperature. Run times can vary significantly (by as much as 50%) otherwise.

Battery (Wh): 72 Wh

Settings

Delay Start (yyyy/mm/dd): 2000/01/01

Sample Rate: 44100 Hz

LED 5 minutes only

Max Length (hh:mm): 01:00

Battery Cutoff: 0.0 V

Compression: none

Sensitivity: Left: 0.0 dB Right: 0.0 dB

Schedule Mode daily

Do Not Sleep: no

Schedule

--- Load built-in schedule ---

START time 00 : 00

DUTY cycle ON 00 : 01 OFF 00 : 09

END time 00 : 00

Add

2018-May-29 (0)

2018-May-30 (1)

2018-May-31 (2)

2018-Jun-01 (3)

2018-Jun-02 (4)

2018-Jun-03 (5)

2018-Jun-04 (6)

2018-Jun-05 (7)

00:00 01:00 02:00 03:00 04:00 05:00 06:00 07:00 08:00 09:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00

Night Day Recording Flash full

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Open...	Ctrl-O
Save...	Ctrl-S
Save with lock/unlock code...	Ctrl-Shift-S
Close	Ctrl-W
Exit	Ctrl-Q

Save .SM4S file

This PC > Desktop >

Organize New folder

Name	Date modified	Type	Size
CC_free_music	12/11/2017 8:48 PM	File folder	
ConservationTools	3/31/2017 11:07 A...	File folder	
DJI	5/9/2018 9:25 PM	File folder	
EU_EN-GB	7/9/2017 9:39 PM	File folder	
JavaScript eBooks	5/11/2018 9:27 PM	File folder	
maxent340	3/25/2017 3:59 PM	File folder	
NewPapers	5/15/2018 7:21 PM	File folder	

1 File name: MMK01.SM4S

Save as type: .SM4S files (\*.SM4S)

2 Save Cancel

# Copy the configuration file to SD card

- Save a custom schedule to the top-level directory (not in a folder) of an SD memory card from the Song Meter SM4 Configurator software.

# Using SM4

- Use SM4 Configurator to set up settings and schedule
- Power off (slide the switch to **EXT**)
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- Insert SD cards
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# The Menu

## Quick Start

Record Always

Record 30on & 30off

Record 50on & 55off

Record Sunrise → Set

Record Dawn & Dusk

## \*Settings

Audio

\*Date and Time

Location

Sunrise/Sunset Type

Delay Start

LED Indicator

Advanced

## \*Schedule

Edit Schedule

\*Import Sched+Setts

Export Sched+Setts

## \*Utilities

Export Diagnostics

Set factory default

Calibrate Mic


\*Format all cards

\*Firmware Update

# Set the Date and Time

- Refer to the User Guide p16
1. Navigate to **Main Menu > Settings > Date and Time**. The date and time appear on one line in the following format:  
**YYYY-MMM-DD HH:MM:SS 2017-Oct-22 20:17:45**
  2. Press **▶ Right** to set the date (year, month, and calendar day). As you adjust the month and day, the corresponding sunrise and sunset times appear (according to the Sunrise/Sunset Type setting) for that date.
  3. Press **▶ Right** to set the time (hours, minutes, and seconds).
  4. To adjust any value, press **▲ Up** or **▼ Down**.
  5. Press **ENTER** when finished.

# Import schedule and settings into SM4

- Refer to User Guide page 44-45
1. Save a custom schedule to the top-level directory (not in a folder) of an SD memory card from the Song Meter SM4 Configurator software, or export a schedule to an SD memory card from another recorder.
  2. Insert the SD memory card in slot A of the recorder.
  3. Navigate to **Main Menu > Schedule > Import Sched+Setts.**
  4. At the **Select Schedule File** prompt, press **▲ Up** or **▼ Down** to select a schedule file on your SD memory card. Press **ENTER**.
  5. If no warnings or errors are found, the following message appears and the imported schedule is now the current schedule: 
  6. Press **◀ Left** to return to the **Schedule** menu. You can now edit or start the schedule.



# Check status

- Perform this procedure to check the status of the recorder and SD memory cards before every deployment.
- Refer to the User Guide p27

# Start instant recording and monitor live audio with headphones

- In addition to running a schedule, you can start an instant recording anytime. Starting an instant recording is like forcing a record *always* schedule for 24 hours. Refer to the User Guide p28-29.
  1. Verify the recorder is turned on and displaying the main menu. If the recorder is sleeping, press and hold **SCHEDULE STOP** to wake it.
  2. Press and hold both the ▲ **Up** and ▼ **Down** keys at the same time.
  3. After a brief **Preparing to record** screen, the recorder immediately starts continuous instant recording.
  4. Press **SCHEDULE STOP** to stop instant recording. After 24 hours, instant recording will automatically stop and the current schedule will begin.

# Start and stop schedule recording

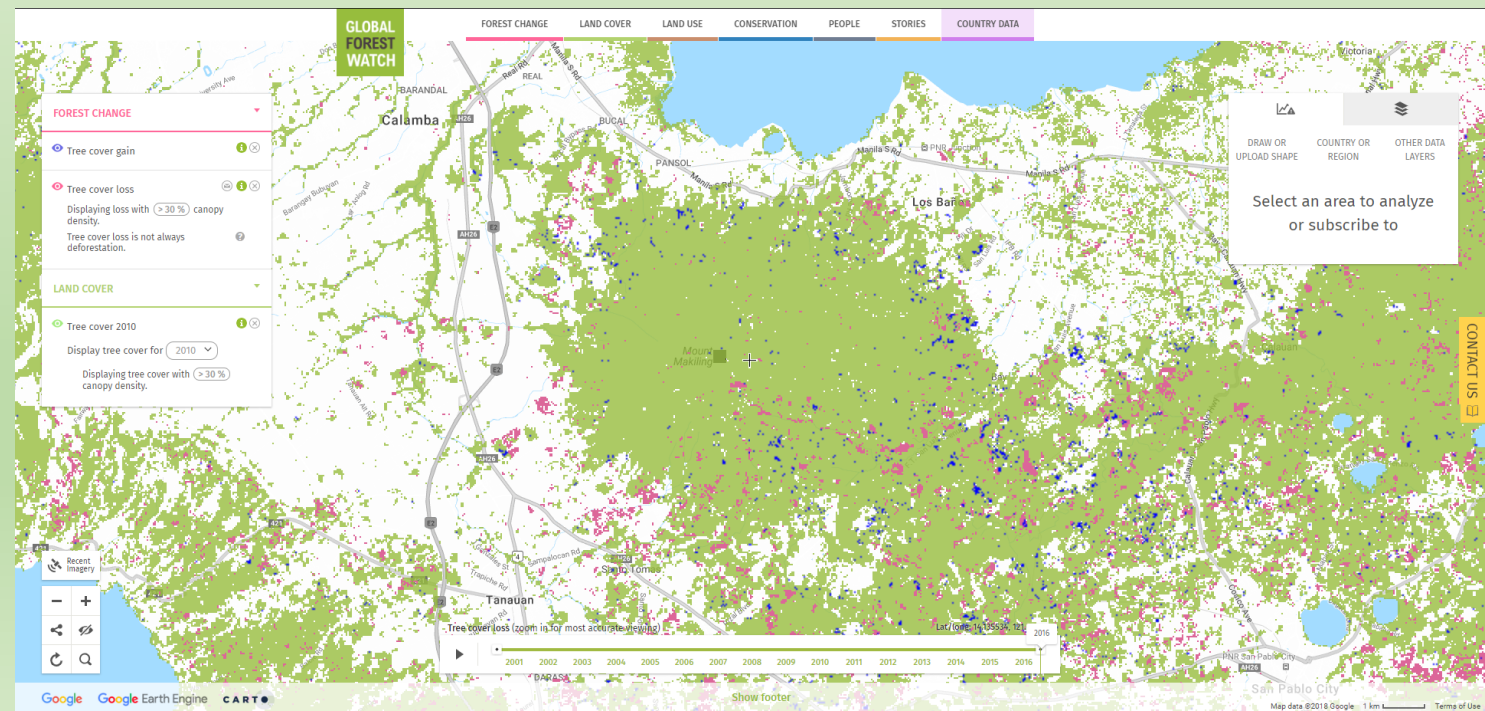
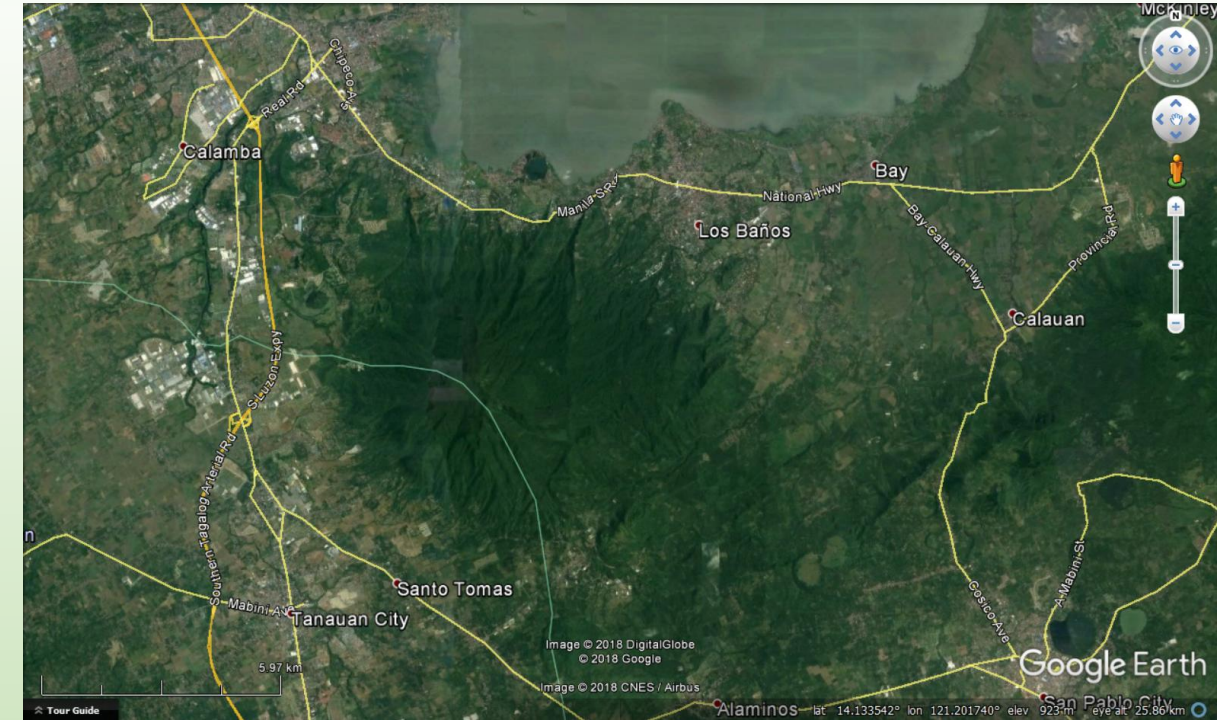
- Start the recording schedule by pressing **Schedule Start**.
- When a schedule is running, or scheduled to run, you have the option to stop it.
  1. Press and hold the **SCHEDULE STOP** button for several seconds.
  2. When you stop a running schedule, the current recording is saved to the SD memory card before it ends.
  3. The recorder automatically attempts to resume the current recording schedule after three (3) minutes of inactivity. When not recording for an extended period of time, power the recorder *off*.



Field Deployment

# Site selection

- Use Google Earth and Global Forest Watch for site evaluation and pre-selection
- Significance / Uniqueness
- Safety
- Accessibility



# Deploying SM4

- Avoiding direct sunlight on SM4 and mount it on a tree trunk with diameter  $\leq$  the width of SM4
- Keep SM4 in horizontal level
- Power on and check settings
- Trigger instant recording to check microphone gain level
- Start recording schedule
- Seal the edge of cover top with 3M waterproof tape

# Site description (metadata)

- Site name/code
- Location: latitude and longitude (WGS84 decimal degree), altitude (meters), horizontal positioning accuracy
- Habitat description (primary or secondary tropical forest, forest edge close to farmland, ...)
- Site photos in N/E/S/W directions

# Field tools for document site metadata

- GPS receiver & field note
- Mobile Apps
  - GPS Status & Toolbox or similar one  
<https://play.google.com/store/apps/details?id=com.eclipsim.gpsstatus2>
  - Google Keep or Google Sheets of metadata template



# Seal the top of cover

- Seal the edge of cover top with 3M tape to enhance water proofing



# Locating your site using GPS Status & Toolbox

- Wait for fixing
- Copy latitude/longitude
- Altitude
- Positioning accuracy within 10 meters



# Taking site photos in N/E/S/W directions

TW\_TFRI\_LHC01\_N



TW\_TFRI\_LHC01\_E



TW\_TFRI\_LHC01\_S



TW\_TFRI\_LHC01\_W



Wildlife Acoustics, Inc.  
www.wildlifeacoustics.com  
Designed and built in USA  
Pat. No. 7,782,195  
Other patents pending  
FCC CE  
wildlife  
ACOUSTICS  
S4A02066

# Song Meter SM4


BIOACOUSTICS RECORDER

2016-Sep-23 12:21:15  
R:1.2.0 Mic0:IN 1:IN  
SDA: 0/128B: 0/128  
Bat: 6.3V Temp:29.50

 CHECK STATUS

 ENTER MENU 



SCHEDULE START 

 SCHEDULE STOP

wildlife  
ACOUSTICS

# Maintenance

# Maintenance

- Revisiting the field site about every three months (no later than 3 months)
  1. Stop schedule
  2. Check the status of SM4
  3. Power off SM4 (slide to **EXT**)
  4. Install fresh and good quality alkaline batteries
  5. Retrieve SD card from slot A and replace with empty one (check SD card unlocked)
  6. \*Replace microphones or windscreens if necessary (refer to User Guide p10-11)
  7. Power on SM4 (slide to **INT**)
  8. Check the status of SM4
  9. Start schedule

# Exercise

- Deploy the SM4 around the campus of Academia Sinica
- Reclaim the SM4

