

SOS Remote App

User Manual

Version 4.0.2
December 10, 2012

<http://sos.noaa.gov>

Table of Contents

OVERVIEW	3
SYSTEM REQUIREMENTS	3
SOS SOFTWARE VERSION	3
IOS SOFTWARE VERSION	3
WI-FI ACCESS.....	3
<i>Using Existing Wi-Fi Infrastructure</i>	4
<i>Adding a Wi-Fi Router to SOS</i>	4
CONFIGURING THE APP	5
USING THE APP	5
ORIENTATION.....	6
<i>Setting a User Position Offset</i>	7
PLAYBACK	7
ANNOTATION.....	8
<i>Point Mode</i>	8
<i>Draw Mode</i>	8
<i>Drop Icons</i>	9
<i>Using an Icon as a Pointer</i>	9
<i>Other</i>	9
ZOOMING	9
<i>Other</i>	10
DATASETS	10
LAYERS	11
<i>Pre-Programmed Layers</i>	11
<i>Interactive Layers</i>	12
WEB PAGE.....	12
ALIGNMENT	12
<i>Setting a Password</i>	13
AUTO RUN.....	13
TROUBLESHOOTING	13
Wi-Fi	13
CONTACT	13

Overview

The iOS Remote Control App for Science On a Sphere® (SOS) is an alternative to using the Wii controller to control an SOS system. It is a universal app that runs on either the iPhone, iPod Touch, or iPad. It can do everything the Wii does, but in a different fashion. In addition, the SOS Remote app has many features that the Wii does not. For example, the app can display the current playlist, allowing the user to jump from one clip to any another within the playlist. In addition, the app supports features such as annotation, zooming, and layering. Unlike the Wii, which uses Bluetooth as its means of communicating with SOS, the SOS Remote app uses Wi-Fi Internet access.

System Requirements

To be useful, this app requires access to a Science On a Sphere® (SOS) installation. For further information about SOS, see our web site at <http://sos.noaa.gov>. The app does nothing interesting until it is connected to a running SOS system.

SOS Software Version

For full functionality of this app, please update your SOS computer to release version 4.0.6.

For basic functionality of this app (without features such as annotation, zooming, and layering), your SOS computer must run a minimum of SOS version 3.4.2.

iOS Software Version

Your iOS device (iPhone, iPod Touch, or iPad) must be running a minimum of iOS version 5.1.

Wi-Fi Access

The app requires Wi-Fi access to the SOS computer that is being controlled (specifically TCP port 2468). Simultaneous outbound Wi-Fi access from the device to the Internet at large (or at least to the SOS web servers at <http://sos.noaa.gov>) is also desirable for some features of the app, but it is not required for basic remote control of SOS.

There are two basic approaches to getting that Wi-Fi access. The first is to use the existing Wi-Fi infrastructure at your site. The second is to add a Wi-Fi router to your SOS installation. In either case, you will want to consult with your network and security team for advice on the best approach for Wi-Fi connectivity at your site. In extreme cases, Wi-Fi network security policies may entirely preclude the use of the SOS Remote app. A direct connection to a dedicated Wi-Fi router is preferred for performance reasons, since the remote control protocol is “chatty” and sends lots of messages back and forth between the device and the SOS computer.

Using Existing Wi-Fi Infrastructure

If your site has an existing Wi-Fi infrastructure, you may be able (or required by policy) to use it to connect to your SOS system. The details of this will be specific to your site, so you will need to consult with your networking team for the specifics at your site. Many sites have multiple Wi-Fi networks, typically a low-security one for visitors and casual access, and one or more high-security for access to internal computers at the site. You will want to use the one that provides network access to your active SOS computer (TCP port 2468). There will be network passwords and/or VPN instructions that are specific to your site. See your network team for the details.

Adding a Wi-Fi Router to SOS

For the most responsive control of your SOS system by the app, you can connect a Wi-Fi router directly to your SOS computer. Doing this in a secure way requires some network expertise, so be sure to consult with your network team before attempting this. You may need to select a Wi-Fi channel that doesn’t conflict with other Wi-Fi networks, for example. Using the minimum transmitter power that you need is always a good idea. And WPA2 encryption is probably the minimum level of encryption you will want to use. You might want to turn off the beacon identifier for your Wi-Fi router to make it less obvious to casual visitors at your site. You might also consider limiting access to the specific MAC addresses of your portable devices. The details of router configuration are beyond the scope of this document, so consult with your network team when in doubt.

The SOS computer has two network interfaces: one to the external Internet, and one for a private subnet. For maximum functionality, connect the router between the external Internet and the SOS computer. This will allow your remote control

to access both the SOS computer and the Internet at large. The default NAT (Network Address Translation) of the router will allow both the SOS computer and the Wi-Fi devices to share the Internet connection. You may need to change the outward IP address configuration of your SOS system.

As an alternate but less desirable approach, you can connect the router to the private subnet. This provides maximum security in the event your router is compromised, since the private network doesn't allow connecting beyond the SOS computer. The downside is that some features of the app will not be available (for example, thumbnail images for datasets will not be shown). But the basic remote control of the sphere will still work.

Configuring the App

In order to control Science on a Sphere from your iPhone, iPod Touch, or iPad device, you must configure your device to communicate with your SOS computer. To get started, tap on the Settings icon on the homepage of your device, and then tap on SOS Remote located under the Apps category. In the Name or IP field under SOS computer to control, enter the host name or IP address of your SOS computer.

Now, return to the homepage and tap on the SOS Remote app icon to open the application. Tap on the Settings icon located in the tab bar to open the SOS Settings page. The host name or IP address you just entered should appear under the section labeled Connection.

If the Connection switch is set to OFF, tap the ON/OFF slider to the ON position. This should initiate the connection between the device and the SOS computer.

NOTE: If at any point the device is unable to connect to the SOS machine, a red badge with a question mark will automatically appear on top of the Settings tab.

Using the App

Once a connection has been established between your device and the SOS computer, you are now ready to control the SOS display.

Orientation

Tap on the Presentation icon located in the tab bar, and select the Present button at the top of the Presentation page. This will open the SOS Presentation page, which consists of orientation and playback controls.

Before manipulating the orientation of the sphere, first use the User Position slider control to set your desired viewing position relative to the sphere.

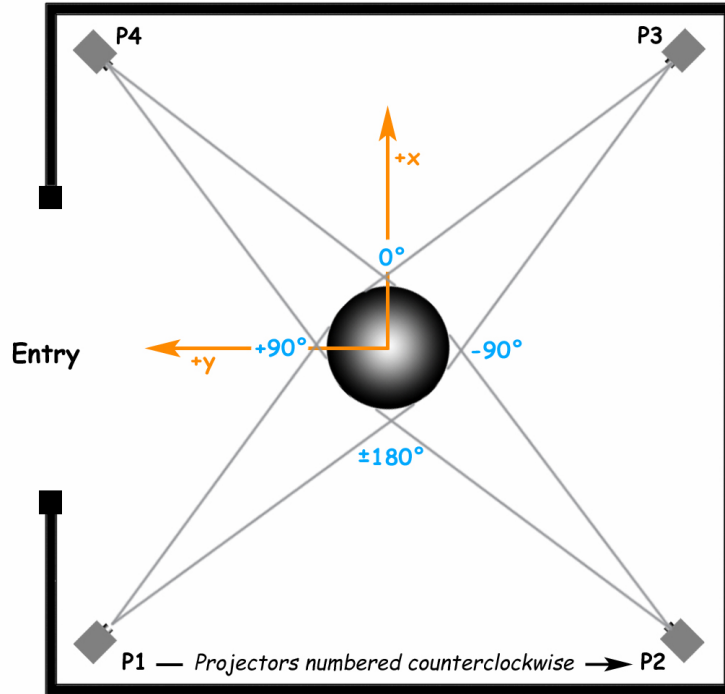
iPhone: Tap on the User Pos icon to access the User Position slider control dialog.

When you tap and hold on the slider circle, a red dot will appear along the equator of the sphere (the default position places the red dot on the positive x-axis of the sphere at the equator, which corresponds to 0 degrees longitude). Move the slider left or right until you see the red dot in front of you or at any other desired location on the sphere. Now, all future orientation adjustments will occur relative to this view position. See diagram below.

To adjust the orientation of the sphere, simply slide one finger over the arrows indicated on the track pad. With the default 0 degree User Position, the up-down arrows tilt the sphere around the y-axis (pitch), the left-right arrows rotate the sphere around the z-axis (yaw), and the two arrows on either end of the track pad tilt the sphere around the x-axis (roll). Again, all rotations are relative to the User Position you selected using the slider control.

To automatically rotate a time-series dataset around the z-axis (the axis that passes through the north and south poles), tap the Z-Rot button. Note that the automatic z-rotation will only be active when a time-series dataset is animating.

To reset the orientation of the sphere back to its default position, tap the Reset button.



Setting a User Position Offset

By default, the User Position slider on the Presentation page is centered at 0 degrees longitude and extends to -180 and +180 degrees along the equator. If a site tends to present datasets to an audience around the +/- 180 degree location, they have to keep moving the slider to the far left and far right as they move from left to right in order to maintain orientation control relative to where they are standing. To make presentation more convenient, you can set an offset position for the slider. From the home page of your device, tap on the Settings icon and select SOS Remote. Then, tap on Default User Position to select the desired offset.

Playback

Tap on the Presentation icon located in the tab bar to open the SOS Presentation page, and make sure the Present button at the top of the Presentation page is selected. To pause or play a dataset, either tap the Pause/Play button, or use a two-finger single tap gesture in the track pad area.

To step forward or backward frame-by-frame, tap the forward and backward buttons, respectively. To fast forward or fast rewind quickly, tap and hold the forward and backward buttons, respectively. Note that tapping the forward or

backward buttons will automatically pause the dataset if it was previously animating.

Use the Frame Slider to quickly scroll through a dataset. If the dataset is animating, the circle on the Frame Slider will automatically progress along the slider. Tapping on the circle at anytime will stop the animation.

iPhone: Tap on the Frame icon to access the Frame Slider dialog.

iPhone: To go to the next or previous clip in the playlist, tap the Next or Prev icons, respectively. Or, you can go to the Datasets tab and select the desired clip.

iPad: The playlist is shown to the left of the Presentation controls. To select a new clip, simply tap on the name of a clip in the list. Or, you can go to the Datasets tab and select the desired clip.

Annotation

Annotation allows pointing and drawing onto the sphere to dynamically highlight areas of interest during a presentation. In addition, icons related to datasets can be dropped onto the sphere. Annotation provides extra visual cues for the audience, and can serve as a helpful storytelling mechanism.

Tap on the Presentation icon located in the tab bar to open the SOS Presentation page, and select the Annotate button at the top of the Presentation page. (Alternatively, if you are on the Present page, you can do a two finger double tap on the trackpad to get to the Annotate page.) A white cursor appears on the sphere. The cursor will be located at either the last set User Position (the red dot) or at the last recorded position of the cursor.

Point Mode

Drag one finger over the trackpad (the pad should be displaying a white cursor) to move the cursor on the sphere.

Draw Mode

First position the white cursor on the sphere. Then, double tap the trackpad (or tap the Draw button) with one finger to get into Draw Mode. A yellow marker will appear on the trackpad and on the sphere. Drag one finger over the trackpad to draw onto the sphere. To draw at another location, you must first get back into Point Mode (by one finger double tapping the trackpad or by tapping the Point button), position the white cursor, and then get back into Draw Mode to draw.

You can select line color and line width by tapping the Lines button to open the Lines dialog.

All drawing can be cleared by tapping the Clear button or by doing a two finger single tap on the trackpad. Note that drawings can be cleared while in Point Mode or Draw Mode.

Drop Icons

Open the Icons dialog by tapping the Icons button. Select an icon from the library. Close the Icons dialog. Position your cursor on the sphere where you would like to drop the icon. Now, tap and hold on the trackpad with one finger to drop an icon onto the sphere. Alternatively, you can tap the “+” button to drop an icon. Use the “-“ button to remove the last added icon. Use the “x” button to clear all icons on the sphere or use a three finger single tap to clear all icons.

The size of the icon can be adjusted by using the slider in the Icons dialog.

Note that icons can be dropped and cleared while in Point Mode or Draw Mode.

Using an Icon as a Pointer

Open the Icons dialog. Select an icon. Then tap the Use Icon button. Close the Icons dialog. The selected icon will now be the cursor that is drawn on the sphere. Similar to a rubber stamp concept, you can drop copies of this icon onto the sphere in the same way detailed in the Drop Icons section above.

Other

The Reset button moves the Point or Draw cursor back to the last set User Position (as set on the Present page). This is useful in case you lose site of the cursor.

Tap the “i” information button to view a quick help guide for Annotation gestures.

When a new clip is selected from the playlist, all drawings and icons are automatically cleared and the Presentation tab is reset to display the Present page.

Zooming

Zooming allows zooming in over a region of the sphere for a closer look at the data. The zooming is done via a virtual magnifying glass that appears on the sphere.

Tap on the Presentation icon located in the tab bar to open the SOS Presentation page, and select the Zoom button at the top of the Presentation page. (Alternatively, if you are on the Present page, you can do a one finger single tap on the trackpad to get to the Zoom page.) A magnifying glass appears on the sphere. The magnifying glass will be located at either the last set User Position (the red dot) or at the last recorded position of the magnifying glass.

Drag one finger over the trackpad to move the magnifying glass on the sphere. Use the two finger pinch-in and pinch-out gestures on the trackpad to increase and decrease, respectively, the scale of the view in the magnifying glass. Use the Window Size slider to change the window size of the magnifying glass.

Other

While on the Zoom page, you can toggle the magnifying glass on or off by selecting the Show or Hide buttons, respectively.

The Reset button moves the magnifying glass back to the last set User Position (as set on the Present page).

Tap the “i” information button to view a quick help guide for Zoom gestures.

When a new clip is selected from the playlist, the magnifying glass is automatically cleared and the Presentation tab is reset to display the Present page.

Datasets

To access the current playlist or the SOS library of datasets, tap on the Dataset icon located in the tab bar.

Tap on the Playlist button to view the current playlist that is loaded on the SOS system. To load a particular dataset from the playlist onto the sphere, simply tap on the name of the dataset.

To load a new playlist from disk onto the SOS system, tap on the Load (iPhone) or Load Playlist (iPad) button. This will display a list of all playlists in the sosrc directory. Select a playlist and it will automatically get loaded onto the system.

To view other datasets in the SOS library, tap on the Library button and then select a library from the list. This will bring up a list of all the datasets in the selected library. To load a dataset from the selected library onto the sphere, simply tap on the name of the dataset. Note that selecting a library category and/or a library dataset does not erase or alter the playlist that was originally loaded onto the system. You can always go back to your particular playlist by tapping the Playlist button.

iPad: When in Presentation mode, you can view the current playlist without having to jump over to the Datasets tab. Note that the datasets shown in the playlist will reflect the datasets that are shown in the Datasets tab. For example, in the Datasets tab, if you have selected the astronomy library, the astronomy playlist will show up in the Playlist section of the Presentation tab. On the other hand, if you have tapped the Playlist button in the Datasets tab, the datasets of the currently loaded playlist will show up in the Playlist section of the Presentation tab.

Layers

Layering allows for multiple geographic layers to be present within a single SOS dataset. Each layer's visual attributes, such as visibility and transparency, can be manipulated. Layering caters to more dynamic presentations and can be used to fluidly demonstrate the relationships between datasets.

Pre-Programmed Layers

In pre-programmed layering, a dataset has already been created to store multiple layers. Select a dataset in the current playlist or in the library. If that dataset has any layers associated with it, a red badge with the number of layers in the dataset will automatically appear on the Layers tab.

Select the Layers tab. A list of all the layers in the dataset will appear, along with an ON/OFF switch for each layer. To display a layer on the sphere, simply toggle the layer's switch to ON. To make a layer invisible on the sphere, simply toggle the layer's switch to OFF. To adjust the transparency of the layer, tap on the layer's name to bring up the Transparency slider for that layer. To delete a layer, select the layer name and tap on the Delete button. (Note that when you reload the dataset, the previously deleted layer will show up again on the layer's list.)

Note: PIPs and Labels show up as separate layers on the Layers tab. However, the red badge does not include these layers in its layer count.

Interactive Layers

In interactive layering, two or more datasets can be combined on the fly during a presentation and then subsequently manipulated as layers. For example, suppose you are displaying the Aerosol Black Carbon and Sulfate dataset (let's call this dataset A) and you would like to overlay the Earth at Night dataset (let's call this dataset B) on top of it in order to show how major sources of pollution generally correspond to areas of high population and high electric use.

To do this using SOS Remote, you tap on dataset A to load it on the sphere, find dataset B either in your playlist or from somewhere in the library, and then press and hold dataset B. Dataset B will show up fully opaque on the sphere. Go to the Layers tab, select dataset B, and adjust its transparency so that dataset A will show through.

Additionally, SOS comes preloaded with a set of overlay datasets, such as Country Borders and Latitude/Longitude Grids, that may be useful during a presentation. To interactively overlay one of these datasets on top of the current dataset, simply tap the Overlays button located on the top right of the Presentation page to open the Overlays dialog. Tap on a dataset in the list and that dataset will automatically get overlaid and will be available for manipulation in the Layers tab.

For each layer that is interactively added/deleted, the number in the red badge that pops up on the Layers tab will get automatically incremented/decremented.

Web Page

To view the specific SOS Data Catalog web page that corresponds to the dataset currently selected in the Playlist, tap on the Web Page icon located in the tab bar. If the dataset's web page cannot be found, the default SOS Data Catalog web page will be displayed.

Alignment

NOTE: Using the alignment controls without understanding how projector alignment works, or accidentally tapping on alignment controls can cause the sphere to become completely unaligned.

To perform alignment of the projectors on the sphere, tap on the Settings icon located in the tab bar and select the Alignment option. The sphere will automatically display a white grid against a red background.

The Alignment interface is divided into three clearly labeled sections (Red Ball, Grid, and Vertex Tweaking) to facilitate greater ease in stepping through the alignment procedure. Please refer to the “Projector Alignment for Science On a Sphere (SOS) Using an iPhone, iPod Touch, or iPad” Manual for complete information on the alignment controls and how to perform projector alignment.

[Setting a Password](#)

Before beginning alignment, you may want to set an alignment password to prevent unintended use of the alignment interface. To do this, tap on the Settings icon located in the tab bar and then select Alignment Password to set a password.

[Auto Run](#)

To run Science on a Sphere in automatic presentation mode, tap on the Settings icon located in the tab bar, and then set the ON/OFF switch in the Auto Run section to ON.

Troubleshooting

[Wi-Fi](#)

If you are experiencing problems with the Wi-Fi connection, try tapping on Settings > Wi-Fi and turn Wi-Fi off and then on again. Then, try to reconnect to the SOS computer via the SOS Settings page as detailed above.

For more tips on troubleshooting Wi-Fi networks and connections with iOS devices, please see: <http://support.apple.com/kb/ts1398>

Contact

Please contact sos.gsd@noaa.gov if you have any questions regarding the SOS Remote App.