

Sun SPOTs

<https://spots.dev.java.net/>

Sun SPOT World Home Page: <http://www.sunspotworld.com/>

SPOTs Discussion Forums: <https://www.sunspotworld.com/forums/>

SPOTs documentation: <http://www.sunspotworld.com/docs/>

<https://www.dev.java.net/servlets/StartPage>

Spots-applications

<https://spots-applications.dev.java.net/>

This is where members of the SPOTs community can share software developed for the Sun SPOT.

Some contributions are listed on the page as Subprojects with links to project pages

See in particular

Sun SPOTs Application Incubator

<https://spots-applications-incubator.dev.java.net/>

For code that you think will be useful to others but isn't quite a project unto itself

Other contributions are or available only as archive files via links in the *Documents & files* area.

Spots-curriculum

<https://spots-curriculum.dev.java.net/>

Links of schools that are participating in their curriculum programs

Some useful teaching materials and examples

NC State (among others) is useful

Spots-hardware

<https://spots-hardware.dev.java.net/>

The top level place for all things SPOT hardware. The subprojects are PC board projects with schematics, bill of materials, design files, mechanical files and printed circuit board files. If this is the first time you are here, I would suggest looking at the spot-ebones project. This contains application notes for how eSPOT add-on boards are made and how to make your own java classes to talk to the boards

Spots-libraries

<https://spots-libraries.dev.java.net/>

This is where the open source development of the libraries used by SPOT applications will take place. This includes the Java ME libraries loaded in the flash memory of each Sun SPOT and the Java SE libraries used by host applications. Subprojects:

- the core libraries
- the network stack
- different SPOT sensorboards
- security

Documentation

<http://www.sunspotworld.com/docs/>

Getting Started with Sun SPOTs

<http://www.sunspotworld.com/GettingStarted/index.html>

Instructions on downloading and using the Sun SPOT Software Developer Kit (Sun SPOT SDK).

General FAQ

<http://www.sunspotworld.com/docs/general-faq.html>

General questions about Sun SPOTs: what are they, how do I order them, what hardware/software do they use, etc.

Troubleshooting FAQ

<http://wiki.java.net/bin/view/Mobileandembedded/SpotsTroubleshootingFAQ>

Tutorial

<http://www.sunspotworld.com/docs/Blue/Tutorial/Tutorial.html>

Sun SPOT Release Notes

<http://www.sunspotworld.com/docs/Blue/ReleaseNotes.html>

Sun SPOT Owner's Manual

<http://www.sunspotworld.com/docs/Blue/SunSPOT-OwnersManual.pdf>

Sun SPOT Developer's Guide

<http://www.sunspotworld.com/docs/Blue/spot-developers-guide.pdf>

Using the SPOT Emulator in SPOTWorld

<http://www.sunspotworld.com/docs/Blue/SunSPOT-Emulator.pdf>

Sun SPOT Library APIs (javadoc)

<http://www.sunspotworld.com/docs/Blue/javadoc/>

Sun SPOT Host Library APIs (hostjavadoc)

<http://www.sunspotworld.com/docs/Blue/hostjavadoc/>

Sun SPOT Theory of Operation

<http://www.sunspotworld.com/docs/Blue/SunSPOT-TheoryOfOperation.pdf>

Using the LIS3L02AQ Accelerometer

<http://www.sunspotworld.com/docs/AppNotes/AccelerometerAppNote.pdf>

The demo sensor board has this to measure the orientation or motion of the SPOT.

Using the AT91 Timer/Counter

<http://www.sunspotworld.com/docs/AppNotes/TimerCounterAppNote.pdf>

The processor board includes two AT91 Timers. This note describes how to use it to measure elapsed time and to perform a periodic task.

Remote Control Camera

<http://www.sunspotworld.com/docs/AppNotes/SunSPOTCamera.pdf>

How to attach Servo Motors to a Sun SPOT to create a remote-controlled pan-and-tilt Web Camera including BaseStation webserver for web-based control.

Before You Begin Tutorials

<http://www.sunspotworld.com/docs/Blue/Tutorial/Tutorial.html>

The Sun SPOT is a Java programmable embedded device
Designed for flexibility

Basic unit includes
an accelerometer,
a temperature sensor,
a light sensor,
a radio transmitter,
8 multicolored LEDs,
2 push-button control switches,
5 digital I/O pins,
6 analog inputs,
4 digital outputs, and
a rechargeable battery

Sun SPOT Software Development Kit (the Sun SPOT SDK)

The Sun SPOT Java Development Kit includes a base station and two Sun SPOT devices equipped with sensor boards and rechargeable batteries.

The Sun SPOT SDK includes an emulator capable of running Sun SPOT applications on your desktop computer inside *virtual SPOTs*. Instead of a physical sensorboard, virtual SPOTs are equipped with a *sensor panel* where you can set any of the potential sensor inputs (including light level, temperature, digital pin inputs, analog input voltages, and accelerometer values). Your application can control the LED color that is displayed in the virtual SPOT image, just as it would control a real SPOT. Using the mouse you can click on the push button switches in the virtual SPOT image to press and release the switches. Receiving and sending by radio is also supported.

Getting Started With Sun SPOTs

<http://www.sunspotworld.com/GettingStarted/>

Sun SPOTs (Sun Small Programmable Object Technology) are small, wireless, battery-powered devices developed at [Sun Labs](#) to explore the next frontier of network computing.

Sun SPOTs are powered by a specially designed small-footprint Java virtual machine, called Squawk, that can host multiple applications concurrently, and requires no underlying operating system. Stackable boards include application-specific sensors and actuators such as accelerometers, light detectors, temperature sensors, LEDs, push buttons and general I/O pins. The devices can be duty cycled to run for months on a single charge of their rechargeable battery.

By supporting application development and debugging via standard IDEs such as NetBeans, our platform opens up the exciting world of embedded programming to a much broader class of developers.

The Sun SPOT Software Development Kit (SDK) includes the necessary documentation, code samples and software to help you develop applications for SPOTs.

The SDK also includes an emulator so users that do not have any Sun SPOT devices can still develop and run applications on virtual SPOTs.

All of the Sun SPOT SDK (and even the hardware) is available as open source from [Java.net](#).

Installation

1. Prerequisites

Once you have the Sun JRE installed, the Sun SPOT Manager Tool, a Java WebStart Application, should be able to install and configure everything else you may need to develop programs for the Sun SPOT.

We have divided this Getting Started Guide into platform-specific sections

Installing the Sun SPOT SDK on Windows XP

2. Installation Using Sun SPOT Manager

The Sun SPOT Manager Tool is a Java WebStart Application, designed to make installing and running the Sun SPOT SDK as easy as possible

1. Navigate to the SPOT Manager web page
<http://www.sunspotworld.com/SPOTManager/>
Click on the image of the Sun SPOT to launch the Sun SPOT Manager application.
Clicking on the icon of the Sun SPOT on this page will download the Sun SPOT Manager Application to your machine and begin the installation process.
2. You will see a series of windows appear as you go through this process:
If your browser does not know how to deal with .jnlp files yet, configure it to open such files with the javaws application.
3. You may be asked to accept the digital certificate of the Sun SPOT Manager Application. This is a trusted certificate, signed by Sun Microsystems, so accepting it permanently is safe
4. You may be prompted to configure a Desktop Shortcut for the Sun SPOT Manager. It is recommended that you do this in order to make using the Sun SPOT Manager easier in the future. Depending on your preferences, the shortcut may be created for you.
5. Once downloaded, the Sun SPOT Configuration Validator will start. This utility will check for any missing required software, and will enable to you install and configure any and all required software. You **must** scroll to the bottom of the window in order to enable the 'Start ...' button. It is even suggested that you read the text in the window as you do so.
6. If you did not install the Sun JDK in the Prerequisite section, The Sun SPOT Manager will offer to install it for you
7. The Sun Java Development Kit installer will be downloaded and executed for you.
Again, you must accept the license agreement in order to proceed
You will be given an opportunity to 'customize' the installation but no customization is required or recommended.
Since you already have a JRE installed it is not necessary to re-install the JRE, though it will cause no harm to do so
8. You will then be given the opportunity to install the latest version of the NetBeans IDE (currently 6.1). While NetBeans is not a requirement for Sun SPOT development, we **highly** recommend installing NetBeans and the Sun SPOT NetBeans modules as we have provided templates for developing Sun SPOT applications (both host-side and SPOT-side applications) using NetBeans.
9. NetBeans is downloaded from the NetBeans Download Center. Once downloaded, the NetBeans installer will begin. This will walk you through the entire process of installing NetBeans.
You must agree to the NetBeans license
You should be able to accept the default values for everything
And click 'Install' to install NetBeans

Once the installation process is completed, simply click "Finish" and the installation procedure for Sun SPOTs SDK will continue

10. Once NetBeans is completely installed, if the Apache Ant Build environment is not already installed on your machine, the Sun SPOT Manager will offer to install it for you. Once again, this is **required** software, and you must either allow the Sun SPOT Manager to install ant, or install ant yourself, before the installation of the Sun SPOT SDK will succeed.

Ant will be downloaded from one of the official Apache mirrors and installed

11. Once the installation of Ant has completed you will be given the opportunity to install the Sun SPOT NetBeans modules. Again, we **strongly** recommend installing the Sun SPOT NetBeans modules as they greatly simplify the development of Sun SPOT Applications

12. Once all the configuration has succeeded you will be able to install the Sun SPOT SDK software itself

You will be presented with the Sun SPOT SDK License Agreement. You **must** accept this license agreement in order to proceed with the installation

Note that, once again, you must scroll to the bottom of the license agreement before you will be able to click the 'Accept' button. Also, you are strongly encouraged to **read** the license agreement before agreeing to it

13. You can simply accept the default values, unless you have reason to want your development environment located somewhere else.

If you have accepted the defaults you may see a warning about spaces in the Path

This was a problem in previous releases of the SDK, but has since been fixed so you do not need to move the SDK and can simply continue.

14. Click the 'Install' button to install the Sun SPOT SDK

Once the Sun SPOT SDK has completed downloading and installing, you should see the following screen which indicates that the process has been successful. Click the 'Done' button to complete the installation process.

15. You should now see the install screen, which has a log of the actions which the installer performed for you.

Click 'OK' to close this window

You can see the specifics of what was done by clicking the "Show Log" button.

Click 'OK' to end the installation.

16. If you installed either the Sun JDK or Ant (or both) you will see the following screen
You **must** reboot in order to complete the installation process

17. Upon logging in again, you should run the Sun SPOT Manager Tool

Once again, you will go through the Configuration Validation process

This time, however, you should see the 'Success' screen indicating that your machine is now capable of running the Sun SPOT SDK.

Clicking 'OK' will take you directly to the main Sun SPOT Manager window

18. You can now work through the Sun SPOT SDK Tutorial. If you have a physical Sun SPOT device, you should plug it in now.

19. The 'New Hardware Wizard' should recognize your Sun SPOT Device and offer to configure the driver for you

The Sun SPOT Driver will not be found on the Microsoft website, so you can say 'no' in the above dialog.

The driver will also not be found in the Windows Update Center, so you can decline searching for it there as well.

20. The Hardware Wizard should now find the proper Sun SPOT Driver already installed

The driver is not digitally signed, but is still safe to install

Finish the driver installation, and then click on the Sun SPOTs Tab.

21. If the Drop-Down Menu does not already list your Sun SPOT Device, click the 'Refresh' Button to show the connected Sun SPOTs

22. Clicking on the "Get Info" button will connect to your physical Sun SPOT Device and display the configuration of the software on it

23. If the Software on your physical Sun SPOT Device does not **exactly** match the software on your Desktop, you will need to upgrade the Sun SPOT Device

Notice that the 'Upgrade' button turns red if you need to upgrade your Sun SPOT Device. Simply click this button to upgrade the software on your physical device.

24. We **strongly** suggest that you work through the tutorial in order to learn more about interacting with your Sun SPOT Devices and the Sun SPOT SDK