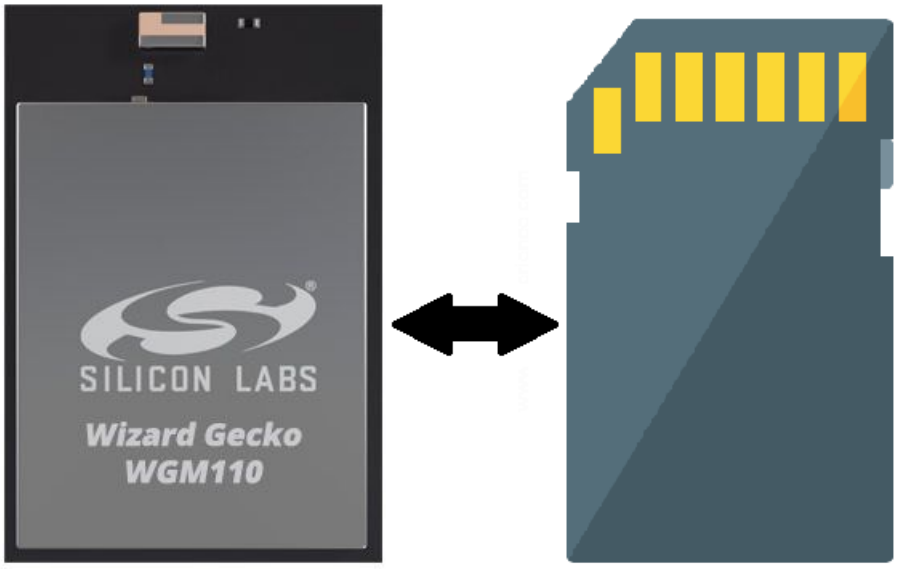
AN1078: SD Card Example

This application note demonstrates how files can be uploaded, indexed, accessed, retrieved, and deleted to/from an SD card which is connected to a module via a web page based user interface.

KEY POINTS

- Discusses file manager example project, configuration, and BGScript
- Shows how to access the file manager via a browser
- Shows how to access the file manager with REST API commands



1. File Manager Project

The `filemgr` example project included in the latest official version of the WGM110 SDK (version 1.1.0) demonstrates how files can be uploaded, indexed, accessed, retrieved, and deleted to/from an SD card which is connected to a module via a web page based user interface. The project includes:

- BGScript source files: *main.bgs* and *api.bgs*
- Html file: *index.html*
- Style sheet for the html file: *style.css*
- Project configuration file: *project.xml*
- Image files: *background.jpg, loader.gif* and *siliconlabs.png*

The html page, in conjunction with the style sheet and the image files, makes up the web page that provides the user interface, allowing for files to be uploaded, indexed, accessed, retrieved, or deleted to/from the SD card connected to the SD card hardware interface on the WGM110 module (USART1 LOC1 in the case of this example project). The BGScript file, *main.bgs*, implements the application logic involved with the operation of the WGM110 hardware.

1.1 Project Configuration

The project configuration includes four elements: `<scripting>`, `<hardware>`, `<image>` and `<files>`. The `<scripting>` element is used to specify the main BGScript file to use for the project. In this example the *main.bgs* will include another script file, *api.bgs*, with the `import` directive.

```
<?xml version="1.0" encoding="UTF-8"?>
<project>
    <scripting>
        <script in="main.bgs"/>
    </scripting>
    <hardware>
        <uart channel="0" baud="115200" api="true" handshake="false"/>
        <kit vcom="true"/>
        <sdhc enable="1" usart="1" usart_loc="1" cs_port="3" cs_pin="7"/>
    </hardware>
    <image out="filemgr.bin" out_hex="filemgr.hex"/>
    <files>
        <file path="index.html"/>
        <file path="style.css"/>
        <file path="siliconlabs.png"/>
        <file path="loader.gif"/>
        <file path="background.jpg"/>
    </files>
</project>
```

Table 1.1. Project Elements

Element	Description
`<scripting>`	Defines the main BGScript file to use in this project.
`<hardware>`	Defines the hardware configuration of the WGM110.
`<sdhc>`	Configures the SD card interface. In order to use the SD Card interface on the WSTK, the `<sdhc>` settings shown above must be used.
`<uart>`	Configures the UART interface which allows using BGTool to read out the command responses and events as the BGScript application is executing.
`<files>`	Defines the HTML, CSS and image files in Flash to be used by the embedded HTTP server.

1.2 BGScript Application

The BGScript source file, *main.bgs*, is responsible for the application logic primarily concerned with the hardware operation of the WGM110 and importing the REST API functionality from the *api.bgs* file. Specifically, *main.bgs* is responsible for turning on the Wi-Fi and setting the operating mode to Access Point when the module boots, then starting Access Point mode and adding HTTP server accessible URL paths to the SD card and module's Flash. The `https_add_path` API method is used to add new URL paths to resources accessible by the HTTP sever. Such resources can be any of the following: the module's Flash, the SD card, or the API.

For a more detailed description of the HTTP server please refer to "AN967: Wizard Gecko WSTK Demo Walkthrough", section 1.2.5 HTTP Server.

2. Accessing the SD Card Content

2.1 Accessing the File Manager with a Browser

The html source file, *index.html*, implements the web based interface allowing files to be uploaded, indexed, accessed, retrieved, or deleted to/from the SD card connected to the WGM110 module.

After associating the remote device with the module's Access Point called "WGM110 Example", browse to http://192.168.1.1/ using any common web browser like Chrome, Firefox or Internet Explorer.

The files currently stored on the SD card will be listed on the body of the page. New files, located on the device accessing the page, may be uploaded to the SD Card using the "Upload" button. Existing files on the SD Card can be deleted using the "Delete" button. New directory can be created by using the "Create Directory" button. Files listed under the index can be selected and viewed within the browser if they are of a format the browser being used can interpret such as html files.

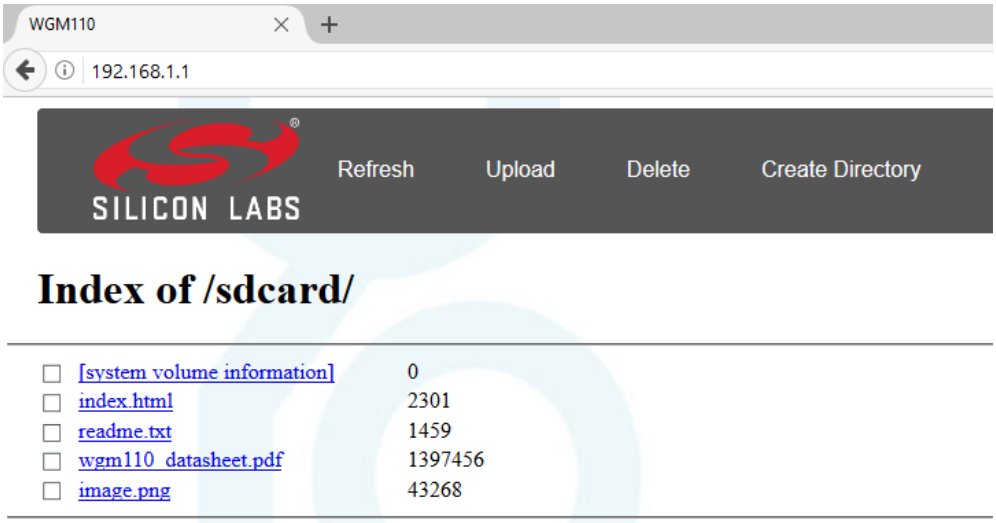


Figure 2.1. Index of /sdcard/

2.2 Accessing the File Manager with REST API Commands

The web page is powered by Javascript code which exposes the HTTP server's built-in functionality meant to manipulate the files in the SD card filesystem. The below operations are available, assuming the usage of `call https_add_path(2, 7, "/sdcard")` in the script. This command will route all resource requests which start with "/sdcard" to the SD Card, and those requests and responses will be automatically handled by the HTTP Server.

Read a file called "123.txt", which exists in the root directory of the SD Card:

```
GET /sdcard/123.txt
```

Write a file called "123.txt" into the root directory of the SD Card

```
PUT /sdcard/123.txt
```

Read the content of the directory `/mydir`:

```
GET /sdcard/mydir?dir
```

Delete a file called "123.txt" which exists in the root directory of the SD Card:

```
DELETE /sdcard/123.txt
```

Create new directory called 123 in the root directory of the SD Card:

```
POST /sdcard/123
```

Any of the above HTTP requests could be also issued for example by the "curl" program in a Linux system, like in the following example:

```
curl -v -X GET http://192.168.1.1/sdcard/123.txt
```

3. Contact Information

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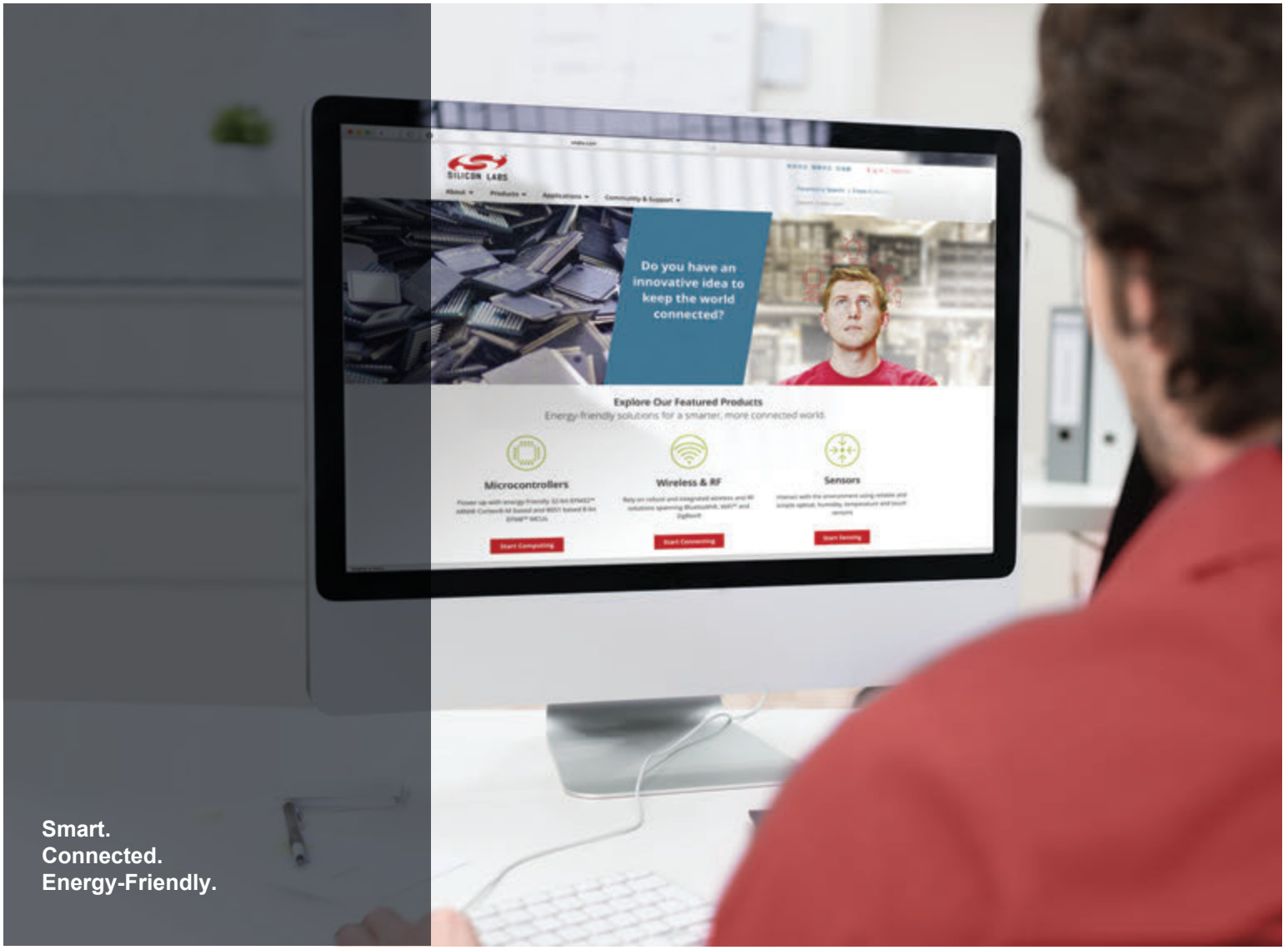

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