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Modules

Linux Host Tools User Guide

RC71xx

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Revision History

Revision number	Release date	Changes
1	September 2024	Creation

Contents

1: Introduction

This document provides instructions for effective use of the RC71xx (RC7110, RC7120) module's host tools on Linux platforms.

The RC71xx module includes the following tools:

- SFTL — Linux firmware download tool via a USB port or UART port.
- RC71x0-Logger Tool — Capture RC71x0 log via a USB port.
- RCX71xx RAM dump tool — Collect RAM dump via a UART port.

2: Firmware Download (SFTL)

2.1 SFTL Introduction

On Linux host platforms, the SFTL application (Software Flash Tool for Linux) is used to download firmware to RC71xx modules.

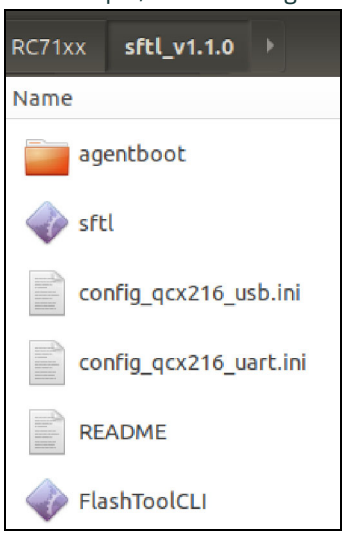
- SFTL specifically designed for RC71xx modules.
- SFTL supports firmware download via USB and UART interfaces.
- Current Linux support: x86, x64, arm, mips platforms

2.2 Firmware Download Procedure

Note: The procedure described below uses sftl_v1.1.0 examples, and an RC71xx module installed in an HL78xx-RC-WP Development Kit.

Use the following procedure on a Linux host platform to download firmware to an RC71xx module:

1. Use a working folder to hold the SFTL application and the firmware that will be downloaded:
   a. If necessary, download the latest version of the SFTL package from source.sierrawireless.com.
   b. Copy all files from the SFTL folder to the working folder.
      For example, the following is a partial list of files in the sftl_v1.1.0 folder:



2. Make sure the target device is connected to the host platform via the USB interface or a UART interface. (e.g., via the Development Kit's MAIN (USB), UART1 or UART2 connector)

3. In a host platform terminal, prepare (but do not execute) the sftl firmware download command using the following format:

```
# sudo ./sftl [-f <1st image file> <1nd image file > …] [-d device name]
[-usb] [-h]
```

where:

- -f: Specify a single image file or multiple image files to download
- -d: Specify a USB or UART download port
- -usb: Set this option to downloading via USB.
  To download via UART (the default interface), do not set this option.
- -h: Display usage options

For example:

- Example 1: Prepare to download one firmware image via the USB interface:

```
# sudo ./sftl -f 01.02.03.02.sop -d /dev/ttyACM0 -usb
```

- Example 2: Prepare to download one firmware image via the UART interface:

```
# sudo ./ sftl -f 01.02.03.02.sop -d /dev/ttyS0
```

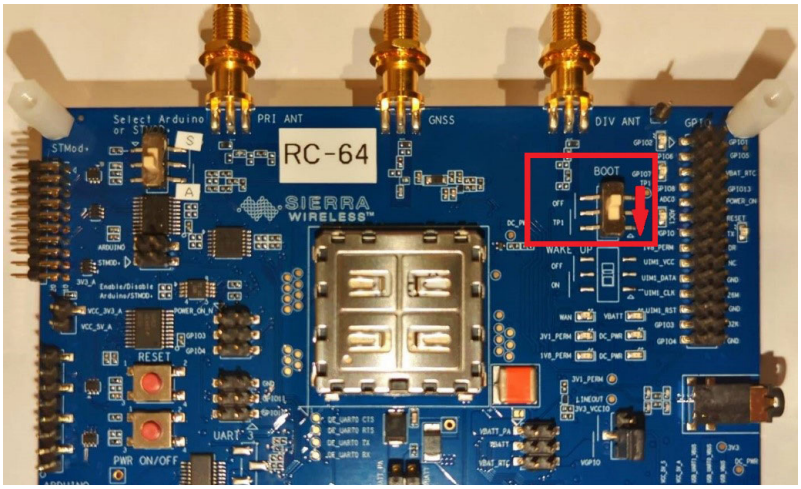
- Example 3: Prepare to download multiple firmware images via the USB interface:

```
# sudo ./sftl -f 01.02.03.02.fwi generic_000.001_001.mcf -d /dev/ttyACM0
-usb
```

- Example 4: Prepare to download multiple firmware images via the UART interface:

```
# sudo ./sftl -f 01.02.03.02.fwi generic_000.001_001.mcf -d /dev/ttyS0
```

4. Prepare the target device (e.g., the Development Kit) and start the firmware download:
   a. On the host platform, open another terminal and go to /dev/
   b. On the Development Kit, toggle the BOOT switch to the TP1 position (i.e., assert the RC71xx's TP1 pin):



   c. Power on or reset the RC71xx module, and watch the /dev/ folder on the host platform to see the download port appear (e.g., /dev/ttyS0 for a UART port).
   d. As soon as the download port appears, execute the sftl command that was prepared in Step 3.

Note: The download port exists for only 10 seconds—the sftl command must be executed while the port exists. If the download is not started in time, the module will boot to application mode. If this happens, go back to Step 3 to try again.

e. Wait for the download to start — the download progress appears in the terminal.

For example, when the download is performed over the UART interface:

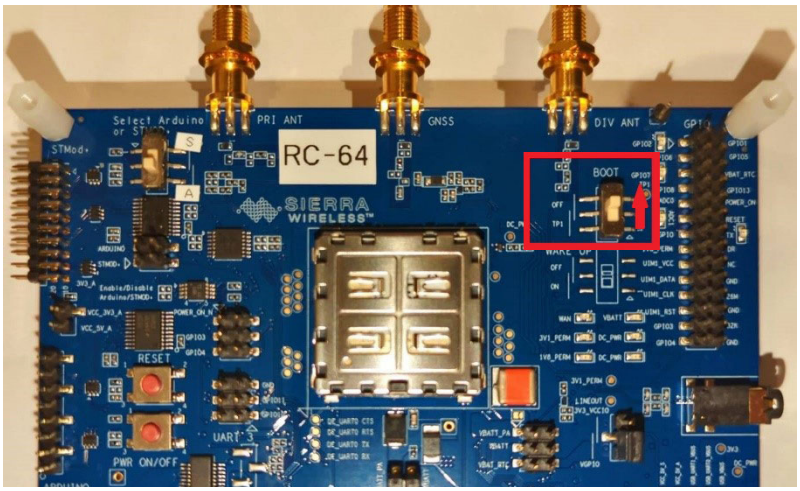
```
# sudo ./ sftl -f 01.02.03.02.sop -d /dev/ttyS0

sftl v1.1.0

cfg file: config_qcx216_uart.ini
Current version: 01.02.03.01

Downloading... ← Downloading in progress
```

f. On the Development Kit, toggle the BOOT switch to the OFF position (i.e., de-assert the TP1 pin) — this enables the module to boot normally (in application mode) when the firmware download completes.



g. Wait for the download to complete:

```
# sudo ./ sftl -f 01.02.03.02.sop -d /dev/ttyS0

sftl v1.1.0

cfg file: config_qcx216_uart.ini
Current version: 01.02.03.01

Downloading.............................. ← Downloading in progress

Module boot up completed, Elapsed time: 01m:38s ← Download completed successfully
Revision: 01.02.03.02 ← New firmware version that has been installed

Exit download process ← Download process exits automatically
#
```

3: RC71x0-logger Tool

3.1 RC71x0 Introduction

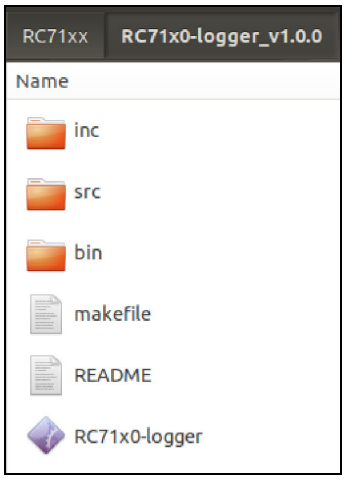
On Linux host platforms, the RC71x0-logger tool is used to capture modem logs for RC71xx modules.

(RC71x0-logger is specifically designed for RC71xx modules.)

3.2 Using RC71x0-logger

To use RC71x0-logger to capture modem logs:

1. Use a working folder to hold the tool:
   a. If necessary, download the latest version of the RC71x0-logger package from source.sierrawireless.com.
   b. Copy all files from the RC71x0-logger folder to the working folder.
   For example, the following is a partial list of files in the RC71x0-logger_v1.0.0 folder:



2. In a host platform terminal, enter the RC71x0-logger command to begin collecting modem logs, using the following format:

```
# sudo ./ RC71x0-logger [-p <modem port>] [-b <baud rate>] [-o
<output file name>] [-mf < log segment size] [-h]
```

where:

- -p: Specify the modem port.
- -b: Set the baud rate to synchronize the communication with device. Default is 921600.
- -o: Set the output file name for the modem logs. Default file name is "dm_log.bin".
- -mf: Set the desired size for splitting the log file. Default size is 500M bytes.
- -h: Display usage options.

For example:

- Example 1: Record the log via the modem port using default file name and file size:

```
# sudo ./ RC71x0-logger -p /dev/ttyACM1 -b 921600
```

- Example 2: Record the log via the modem port using a specified file name and default file size:

```
# sudo ./ RC71x0-logger -p /dev/ttyACM1 -b 921600 -o my_log.mbn
```

- Example 3: Record the log via the modem port using default file name, with a maximum log file size of 100 MB for log splitting:

```
# sudo ./ RC71x0-logger -p /dev/ttyACM1 -b 921600 -mf 100
```

After executing the command, RC71x0-logger begins recording the log. For example, to record logs using log splitting:

```
# sudo ./ RC71x0-logger -p /dev/ttyACM1 -b 921600 -mf 100

RC71x0-logger v1.0.0
Set baudRate: 921600

Log file:dm_log.bin
Log recording... ← Log recording in progress

Press any key to stop.
```

3. When ready to stop logging, press any key to stop the process.

If the log file size exceeds the specified log splitting (segmentation) size, the log will be divided and stored into separate files. For example:

```
# sudo ./ RC71x0-logger -p /dev/ttyACM1 -b 921600 -mf 100

RC71x0-logger v1.0.0
Set baudRate: 921600

Log file:dm_log.bin
Log recording...

Press any key to stop.
log.bin -> log_00.bin ← Log file size is >100M bytes, so the file is split into segments.
log.bin -> log_01.bin
log.bin -> log_02.bin

Total log size 33668K bytes
```

4: RAM Dump Tool

4.1 RAM Dump Tool Introduction

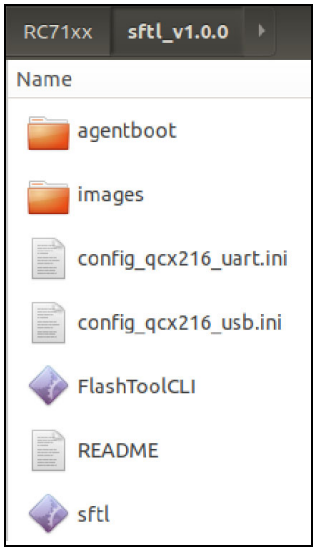
On Linux host platforms, the SFTL tool includes a RAM dump tool option ("-dump") that extracts (dumps) logs from the RC71xx module's RAM via the UART interface.

4.2 Using the RAM Dump Tool

Use the following procedure on a Linux host platform to dump memory logs from an RC71xx module to the host platform:

1. Use a working folder to hold the SFTL application:
   a. If necessary, download the latest version of the SFTL package from source.sierrawireless.com.
   b. Copy all files from the SFTL folder to the working folder.

      For example, the following is a partial list of files in the sftl_v1.1.0 folder:



2. Make sure the target device is connected to the host platform via a UART interface. (e.g., via the Development Kit's UART1 or UART2 connector)
3. In a host platform terminal, start the RAM (memory logs) dump using the following format:

```
# sudo ./sftl  [-d <device name>] [-o <output file name>] [-dump]
```

   where:
   - -d: Specify a UART download port
   - -o: Set the output file name for the memory logs. Default file name is "ramdump.bin".
   - -dump: Set this option to enable the download tool's RAM dump feature.

   For example:
   - Example 1: Dump RAM data (memory logs) to via the UART interface, using the default output file name:

```
# sudo ./sftl -d /dev/ttyS0 -dump
```

   - Example 2: Dump RAM data (memory logs) to a specified output file, via the UART interface:

```
# sudo ./sftl -d /dev/ttyS0 -dump -o my_ramdump.bin
```

4. Wait for the RAM dump to complete:

```
# sudo ./sftl -d /dev/ttyS0 -dump -o my_ramdump.bin

sftl v1.1.0

cfg file: config_qcx216_uart.ini ← RAM dump initiated on specified download port
Current version: 01.02.03.02

RAM dumping.............................. ← RAM dump in progress

RAM dump file: ramdup.bin ← RAM dump stored to specified output file
Dump completed, Elapsed time: 00m:44s ← RAM dump completed successfully

Exit download process. ← RAM dump process exits automatically
```

5. View the RAM dump (memory logs) file in the working folder: