Odin1 Firmware Update Tool User Guide

After the upgrade, **be sure to check the official GitHub repository for `ros_driver` updates** to avoid runtime problems caused by a mismatch between the ROS driver and the firmware.

`https://github.com/manifoldsdk/odin_ros_driver`

Tool v0.5.0 Usage

v0.14.0 Update: The `update.sh` one-click flashing script is now available. If the scripted upgrade fails, follow the manual upgrade instructions below.

代码块

```
./update.sh
[update] Detected architecture: x86_64 -> using amd64 update tool
[update] Update pack:
/home/xiao/work/1_odin1/firmware/make_ota/0.14.0_release/odin1_firmware_update_
0.14.0.tar.gz

[update] Before updating: stop the ros driver and reboot the device. Do NOT
cut power during the update.

[update] ================================================
[update] Starting firmware update with tool 0.5.0 ...
[update] ================================================
odin 1 firmware_update_tool 0.5.0
temp folder ./odin1_fw_update_temp/ created.
You entered:
/home/xiao/work/1_odin1/firmware/make_ota/0.14.0_release/odin1_firmware_update_
0.14.0.tar.gz
config.yaml
Daemon_process_0.4.9.bin
db.bin
feat.yml
lyd_soc_app_0.4.9.bin
update_0.14.0.bin
wating for device attach...
```

```
device attach success.
get device version success!
device soc app version: 0.14.1
device daemon version: 0.6.1
device install version: 0.13.0
device mcu version: 1.5.2
device kernel version: 5.10.209
device start upgrade procedure success.
device version is 0.14.1, skip intermidiate stage.
transfering new module 1, this one will take longer
file transfer progress:  0.00%.
file transfer progress:  5.75%.
file transfer progress:  11.51%.
file transfer progress:  17.26%.
file transfer progress:  23.02%.
file transfer progress:  28.77%.
file transfer progress:  34.53%.
file transfer progress:  40.28%.
file transfer progress:  46.04%.
file transfer progress:  51.79%.
file transfer progress:  57.55%.
file transfer progress:  63.30%.
file transfer progress:  69.06%.
file transfer progress:  74.81%.
file transfer progress:  80.57%.
file transfer progress:  86.32%.
file transfer progress:  92.07%.
file transfer progress:  97.83%.
transfer new module 1 success.
transfering extra file db.bin -> /userdata/slam/db.bin
transfer extra file db.bin success.
transfering extra file feat.yml -> /userdata/slam/feat.yml
transfer extra file feat.yml success.
device commit upgrade procedure...
device commit upgrade procedure success.
prepare for firmware flashing...
now flashing...
device rebooted && reconnected in 27 seconds.
get device version success!
new firmware version:
device soc app version: 0.14.0
device daemon version: 0.6.1
device install version: 0.13.0
device mcu version: 1.5.2
device kernel version: 5.10.209
firmware update success, now exit.
[update] Update succeeded (tool 0.5.0).
```

```
67  [update] Power the device off completely, then power it on again, and use the
    latest odin_ros_driver.
```

Precautions

A change introduced in Odin1 firmware **v0.13.0** makes it incompatible with earlier update tools.

- If the currently running firmware is **v0.12.4 or earlier**, use **update tool v0.4.9**.
- If the currently running firmware is **v0.13.0 or later**, use **update tool v0.5.0**.

If the wrong tool is selected, the following message is displayed:

代码块

```
1   odin 1 firmware_update_tool 0.4.9
2   temp folder ./odin1_fw_update_temp/ created.
3   You entered: odin1_firmware_update_0.13.1.tar.gz
4   config.yaml
5   Daemon_process_0.4.9.bin
6   db.bin
7   feat.yml
8   lyd_soc_app_0.4.9.bin
9   update_0.13.1.bin
10  wating for device attach...
11  device attach success.
12  get device version success!
13  device soc app version: 0.13.1
14  device daemon version: 0.6.1
15  device install version: 0.12.1
16  device mcu version: 1.5.2
17  device kernel version: 5.10.209
18  detected firmware version 0.13.1, this tool (0.4.9) does not support firmware
    0.12.5 and later. please use firmware update tool 0.5.0.
```

Usage Instructions

1. Extract `odin1_firmware_update_pack_0.13.1_20260709.zip` to obtain the following upgrade files.

代码块

```
Update tool v0.4.9
odin1_firmware_update_tool_0.4.9_aarch64
odin1_firmware_update_tool_0.4.9_amd64

Update tool v0.5.0
odin1_firmware_update_tool_0.5.0_aarch64
odin1_firmware_update_tool_0.5.0_amd64

Update pack
odin1_firmware_update_0.13.1.tar.gz
```

2. Select the tool that matches the host architecture. The example below uses an x86 host to upgrade from **v0.12.0** to **v0.13.1**.

代码块

```
odin 1 firmware_update_tool 0.4.9
temp folder ./odin1_fw_update_temp/ created.
You entered: odin1_firmware_update_0.13.1.tar.gz
config.yaml
Daemon_process_0.4.9.bin
db.bin
feat.yml
lyd_soc_app_0.4.9.bin
update_0.13.1.bin
wating for device attach...
device attach success.
get device version success!
device soc app version: 0.12.0
device daemon version: 0.6.1
device install version: 0.12.0
device mcu version: 1.5.2
device kernel version: 4.10.0
device start upgrade procedure success.
device version is 0.12.0, skip intermidiate stage.
transfering new module 1, this one will take longer
file transfer progress:  0.00%.
```

```
file transfer progress:  5.70%.
file transfer progress:  11.40%.
file transfer progress:  17.09%.
file transfer progress:  22.79%.
file transfer progress:  28.49%.
file transfer progress:  34.19%.
file transfer progress:  39.88%.
file transfer progress:  45.58%.
file transfer progress:  51.28%.
file transfer progress:  56.98%.
file transfer progress:  62.67%.
file transfer progress:  68.37%.
file transfer progress:  74.07%.
file transfer progress:  79.77%.
file transfer progress:  85.46%.
file transfer progress:  91.16%.
file transfer progress:  96.86%.
transfer new module 1 success.
transfering extra file db.bin -> /userdata/slam/db.bin
transfer extra file db.bin success.
transfering extra file feat.yml -> /userdata/slam/feat.yml
transfer extra file feat.yml success.
device commit upgrade procedure...
device commit upgrade procedure success.
prepare for firmware flashing...
now flashing...
device rebooted && reconnected in 32 seconds.
get device version success!
new firmware version:
device soc app version: 0.13.1
device daemon version: 0.6.1
device install version: 0.12.1
device mcu version: 1.5.2
device kernel version: 5.10.209
firmware update success, now exit.
```

Tool v0.4.x (using v0.4.2 as an example)

Use firmware from the same update package; this example uses`odin1_firmware_update_0.7.0.tar.gz`

1. Library dependencies
   a. `yaml-cpp`
   b. `openssl`

2. Ensure the **ROS driver is NOT running**.

3. Ensure the device is correctly connected to the host and **powered on**.

1. `lsusb` should list device **2207:0019**.

2. Run `lsusb -d 2207:0019 -v | grep bcdUSB` and verify that the connection speed is at least **3.0**.

1. If the actual speed is 2.0, replace the USB cable or port and restart the device.

4. Download the update tool and grant execute permission.

- **Currently, updates are supported only on x86 / x64 hosts.**

1. Select the tool that matches the OS version:
   a. `odin1_firmware_update_tool_0.4.2_x86_x64_20.04`
   b. `odin1_firmware_update_tool_0.4.2_x86_x64_22.04`
2. The following example uses the Ubuntu 22.04 build.

```
代码块
1   chmod +x odin1_firmware_update_tool_0.4.2_x86_x64_22.04
```

5. Download the update pack
   a. Example: `odin1_firmware_update_0.7.0.tar.gz`
6. Run the update tool:

```
代码块
1   ./odin1_firmware_update_tool_0.4.2_x86_x64_22.04 <update_pack_file_path>
```

1. It is recommended to place the tool and update pack in the same directory:

```
-parent
    -odin1_firmware_update_tool_0.4.2_x86_x64_22.04
    -odin1_firmware_update_0.7.0.tar.gz
```

2. Execute the command:

```
./odin1_firmware_update_tool_0.4.2_x86_x64_22.04
odin1_firmware_update_0.7.0.tar.gz
```

3. The tool will upgrade the device.

1. **The device will reboot several times during the upgrade. Keep the power supply and USB connection stable.**
2. After the upgrade completes, it is recommended to power-cycle the device.
3. This tool version automatically adapts to devices running **v0.3.0–v0.5.0**. Example output:

```
./output/odin1_firmware_update_tool_0.4.2/odin1_firmware_update_tool_0.4.2
odin1_firmware_update_0.7.0.tar.gz
odin 1 firmware_update_tool 0.4.2
temp folder ./odin1_fw_update_temp/ created.
You entered: odin1_firmware_update_0.7.0.tar.gz
config.yaml
Daemon_process_0.4.9.bin
lyd_soc_app_0.4.9.bin
update_0.7.0.bin
wating for device attach...
device attach success.
//////////////////////////
# Failed to read the current device version
```

```
<ERROR><firmware_update_tool.cpp:get_device_version:334>: get device version fail.
get device version fail. assume device version older than 0.4.0.
device start upgrade procedure success.
# Device version is older than 0.5.0; transfer the intermediate module
device version older than 0.5.0, apply intermidiate stage.
transfering new module 1
transfer new module 1 success.
transfering new module 2
transfer new module 2 success.
device 1st stage commit success.
waiting for device to reboot...
device now rebooting...
device attach success.
device start 2nd stage upgrade procedure success.
////////////////////////////
# Successfully read the current device version
get device version success!
device soc app version: 0.5.0
device daemon version: 0.5.0
device install version: 0.5.0
device mcu version: 1.4.9
device kernel version: 4.6.0
device start upgrade procedure success.
# Device is 0.5.0 or later; skip intermediate stage and proceed with the formal upgrade
device version is 0.5.0, skip intermidiate stage.
////////////////////////////
transfering new module 3, this one will take longer
file transfer progress:  0.00%.
file transfer progress:  5.55%.
file transfer progress:  11.11%.
file transfer progress:  16.66%.
file transfer progress:  22.22%.
file transfer progress:  27.77%.
file transfer progress:  33.33%.
file transfer progress:  38.88%.
file transfer progress:  44.44%.
file transfer progress:  49.99%.
file transfer progress:  55.55%.
file transfer progress:  61.10%.
file transfer progress:  66.66%.
file transfer progress:  72.21%.
file transfer progress:  77.76%.
file transfer progress:  83.32%.
file transfer progress:  88.87%.
file transfer progress:  94.43%.
```

```
file transfer progress:  99.98%.
transfer new module 3 success.
device commit upgrade procedure...
device commit upgrade procedure success.
# Prepare for firmware flashing
prepare for firmware flashing...
# Flash firmware
now flashing...
# Firmware flashing completed; device is rebooting and reconnecting
device rebooted && reconnected in 34 seconds.
get device version success!
# Device version after the update
new firmware version:
device soc app version: 0.7.0
device daemon version: 0.6.0
device install version: 0.7.0
device mcu version: 1.5.1
device kernel version: 4.7.0
# This update succeeded
firmware update success, now exit.
```

4. Troubleshooting

1. If the following error appears:

代码块

```
[2026:01:18:21:14:45][ERROR][lib_usb.cpp:xfer_async_send:498]: submit 0
transfer fail LIBUSB_ERROR_NO_DEVICE.
```

This error occurs because the device automatically reboots while the image is being flashed, temporarily interrupting communication between the driver and the device. Transfers that have already been submitted but not yet delivered produce this error. As long as the device reconnects successfully at the end and the new version is printed, the upgrade succeeded and the error has no adverse effect.

2. If the following error appears:

代码块

```
device version older than 0.5.0, apply intermidiate stage.
transfering new module 1
transfer new module 1 success.
transfering new module 2
<ERROR><protocol.cpp:send_file_handler:897>: file chunk transfer fail. please retry
<ERROR><firmware_update_tool.cpp:upgrade_module:286>: transfer new module fail. please retry.
transfer new module 2 fail. please retry. current progress was not commited on device, no change made.
```

Please collect the complete update tool log and contact official support for the corresponding patch tool. After applying the patch, retry the upgrade.