HiLoader

User Guide

Issue 04

Date 2015-04-30

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About This Document

Purpose

This document describes how to use the loader package tool HiLoader.

Related Versions

The following table lists the product versions related to this document.

Product Name	Version
Hi3716C	V2*XX*
Hi3719C	V1*XX*
Hi3718C	V1*XX*
Hi3719M	V1*XX*
Hi3718M	V1*XX*
Hi3716M	V4XX
Hi3716M	V31X
Hi3796M	V1XX
Hi3798M	V1XX
Hi3110E	V5XX
Hi3798C	V2XX

Intended Audience

This document is intended for:

- Technical support engineers
- Software R&D engineers

Change History

Changes between document issues are cumulative. Therefore, the latest document issue contains all changes made in previous issues.

Issue 04 (2015-04-30)

This issue is the fourth official release, which incorporates the following changes:

Hi3798C V200, Hi3716M V420, and Hi3716M V410 are supported.

Issue 03 (2015-03-10)

This issue is the third official release, which incorporates the following changes:

Hi3110E V500 is supported.

Issue 02 (2015-01-15)

This issue is the second official release, which incorporates the following changes:

Chapter 2 GUI and Function Description

Sections 2.2.2 and 2.2.3 are added.

Issue 01 (2014-10-31)

This issue is the first official release, which incorporates the following changes:

Hi3716M V310, Hi3796M V100, and Hi3798M V100 are supported.

Issue 00B01 (2013-12-16)

This issue is the first draft release.

Contents

Figures

1 Overview

The HiLoader is a loader packaging tool provided by HiSilicon. It is used to package original images as an upgrade file complying with either of the following protocols:

- HiSilicon protocol (including the HISI OTA and HISI FILE protocols)
- System Software Updates (SSU) protocol

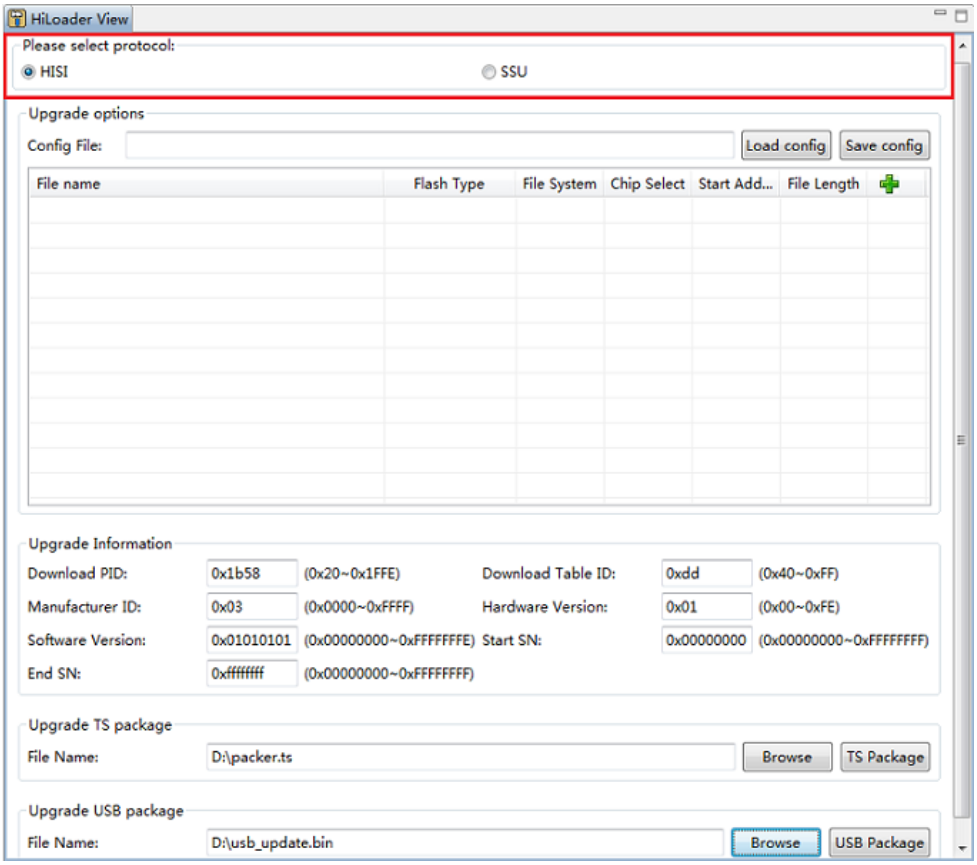
2 GUI and Function Description

2.1 Packaging Images as an Upgrade File Complying with the HiSilicon Protocol

Perform the following steps:

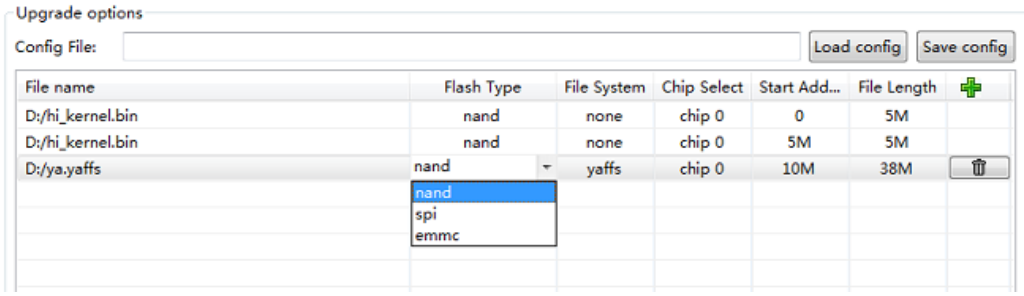
Step 1 Start the HiLoader, select **HISI** on the main GUI, as shown in Figure 2-1.

Figure 2-1 HISI protocol packaging



Step 2 Click in the upgrade file option group to add a partition row. You can select the component type, component CS (four CSs are supported), specify whether the file system is required, select the file system type, and change the start address of the partition, the partition size, and the partition image. You can also add partition rows in batches by loading the configuration file. To delete a partition row, click . See Figure 2-2.

Figure 2-2 Upgrade file list



- **File name**: name of the image corresponding to the partition
- **Flash Type**: type of the component where the partition is located. The value can be **nand** (corresponding to the NAND flash), **spi** (corresponding to the SPI flash), and **emmc** (corresponding to the eMMC flash).
- **File System**: file system of the partition. You can select **none**, **yaffs**, or **ubi** for the NAND/SPI flash, **none** or **ext3/4** for the eMMC flash, and **none** for the boot and kernel partitions.
- **Chip Select**: ID of the chip to be selected among chips of the same type
- **Start Address**: start address of the partition in the component
- **File Length**: length of the partition

Step 3 Add other upgrade files by repeating step 2.

Step 4 Configure file parameters in the **Upgrade Information** area, as shown in Figure 2-3.

Figure 2-3 Upgrade information

- Download PID: upgrade stream PID, 16-bit width (0x20–0x1FFE).
- Download Table ID: table ID of the download sequence, 8-bit width (0x40–0xFF).
- Manufacturer ID: code of the manufacturer (0x0000–0xFFFF)
- Hardware Version: version of the hardware suited for the downloaded software, 8-bit width (0x00–0xFE).
- Software Version: version of the downloaded software, 32-bit width (0x00000000–0xFFFFFFFE).

- Start SN: start SN of the STB whose software needs to be upgraded, 32-bit width (0x00000000–0xFFFFFFFF)
- End SN: end SN of the STB whose software needs to be upgraded, 32-bit width (0x00000000–0xFFFFFFFF)

Step 5 Click **Browse** in the target upgrade file generation area, specify the name and path for the upgrade file to be generated, and then click the corresponding package button.

The HiSilicon protocol supports the following package modes:

- TS package: Click **TS Package** to generate the upgrade file complying with the HISI OTA protocol.
- USB package: Click **USB Package** to generate the upgrade file complying with the HISI FILE protocol.

CAUTION

Only the HISI protocol supports the USB upgrade. The HiLoader uses the HISI protocol forcibly for the USB upgrade.

See Figure 2-4.

Figure 2-4 Generating the upgrade file

----End

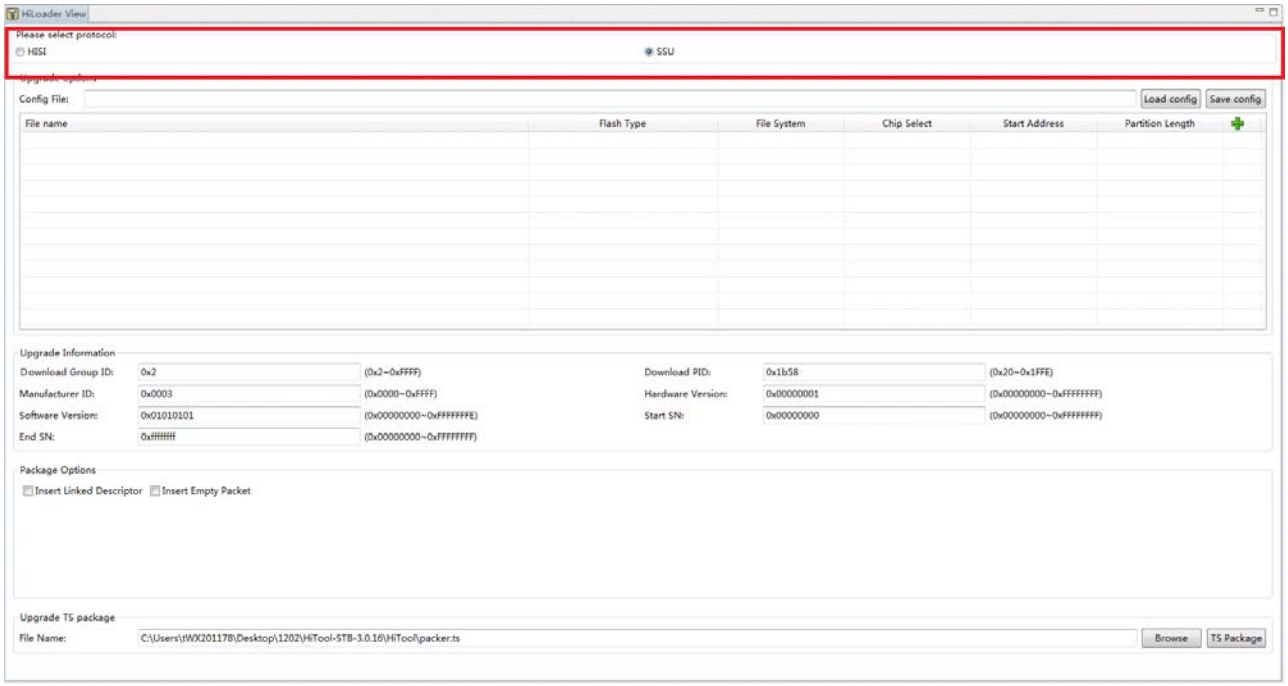
2.2 Packaging Images as an Upgrade File Complying with the SSU Protocol

2.2.1 Packaging Images as an Upgrade File Complying with the SSU Protocol (with Nothing Inserted)

Perform the following steps:

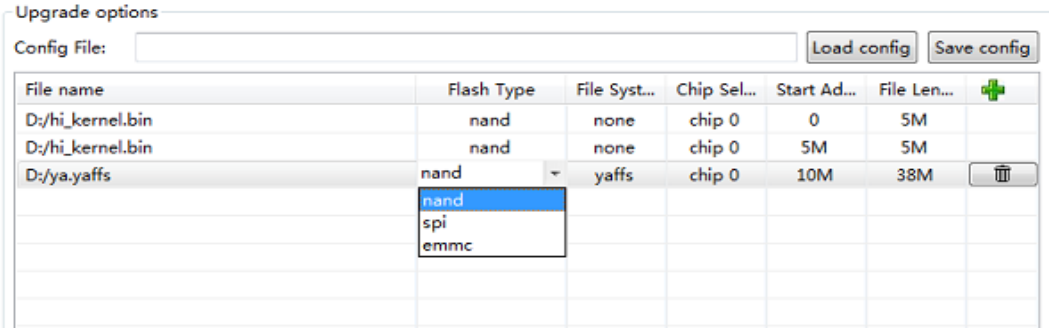
Step 1 Start the HiLoader, select **SSU** on the main GUI, as shown in Figure 2-5.

Figure 2-5 SSU protocol packaging



Step 2 Click  in the upgrade file option group to add a partition row. You can select the component type, component CS (only one CS is supported), specify whether the file system is required, select the file system type, and change the start address of the partition, the partition size, and the partition image. You can also add partition rows in batches by loading the configuration file. To delete a partition row, click  . See Figure 2-6.

Figure 2-6 Upgrade file list



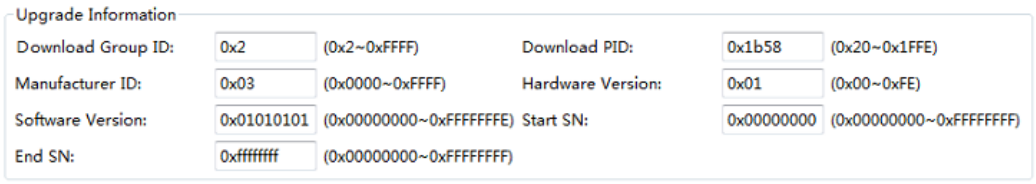
- **File name**: name of the image corresponding to the partition
- **Flash Type**: type of the component where the partition is located. The value can be nand (corresponding to the NAND flash), spi (corresponding to the SPI flash), and emmc (corresponding to the eMMC flash).
- **File System**: file system of the partition. You can select none, yaffs, or ubi for the NAND/SPI flash, none or ext3/4 for the eMMC flash, and none for the boot and kernel partitions.
- **Chip Select**: ID of the chip to be selected among chips of the same type

- **Start Address**: start address of the partition in the component
- **File Length**: length of the partition

Step 3 Add other upgrade files by repeating step 2.

Step 4 Configure file parameters in the **Upgrade Information** area, as shown in Figure 2-7.

Figure 2-7 Upgrade information



- **Download Group ID**: code of the group, 16-bit width (0x20–0xFFFF)
- **Download PID**: upgrade stream PID, 16-bit width (0x20–0x1FFE)
- **Manufacturer ID**: code of the manufacturer (0x0000–0xFFFF)
- **Hardware Version**: version of the hardware suited for the downloaded software, 8-bit width (0x00–0xFE)
- **Software Version**: version of the downloaded software, 32-bit width (0x00000000–0xFFFFFFFE)
- **Start SN**: start SN of the STB whose software needs to be upgraded, 32-bit width (0x00000000–0xFFFFFFFF)
- **End SN**: end SN of the STB whose software needs to be upgraded, 32-bit width (0x00000000–0xFFFFFFFF)

Step 5 Click **Browse** in the target upgrade file generation area, specify the name and path for the upgrade file to be generated, and then click **TS Package** to generate the upgrade file complying with the SSU protocol. See Figure 2-8.

Figure 2-8 Generating the upgrade file

----End

2.2.2 Inserting Resource Linked Descriptors

Perform the following steps:

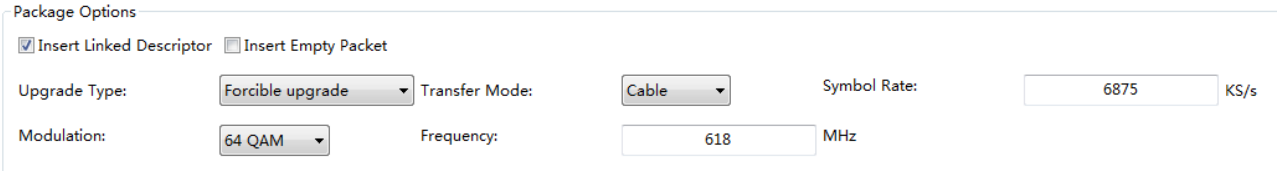
Step 1 Perform steps 1 to 4 in section 2.2.1 "Packaging Images as an Upgrade File Complying with the SSU Protocol (with Nothing Inserted)."

Step 2 Select **Insert Linked Descriptor**.

Step 3 Select a transfer mode.

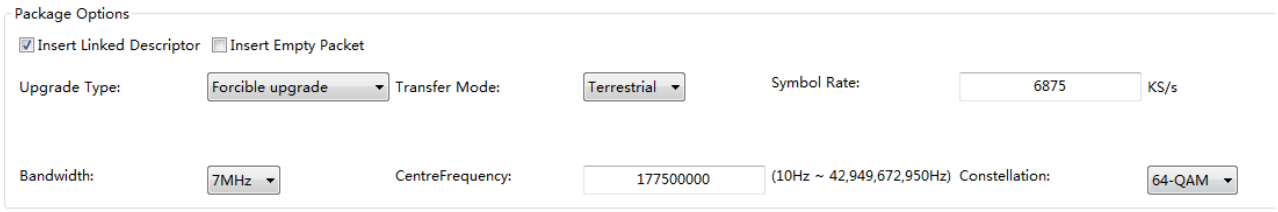
- If you select **Cable** from the **Transfer Mode** drop-down list, configure the parameters in the **Package Options** pane shown in Figure 2-9.
  - Upgrade Type: Undefined, Forcible upgrade, or Non-forcible upgrade
  - Symbol Rate: 1000–99999 KS/s
  - Modulation: Undefined, 16 QAM, 32 QAM, 64 QAM, 128 QAM, or 256 QAM
  - Frequency: 1–9999 MHz

Figure 2-9 Setting Transfer Mode to Cable



- If you select **Terrestrial** from the **Transfer Mode** drop-down list, configure the parameters in the **Package Options** pane shown in Figure 2-10.
  - Bandwidth: 6 MHz, 7 MHz, or 8 MHz
  - Center Frequency: 10 Hz (0x00000001)–42,949,672,950 Hz (0xFFFFFFFF) (32-bit width)
  - Constellation: QPSK, 16-QAM, or 64-QAM

Figure 2-10 Setting Transfer Mode to Terrestrial



Step 4 Click **Browse** in the target upgrade file generation area, specify the name and path for the upgrade file to be generated, and then click **TS Package** to generate the upgrade file complying with the SSU protocol. See Figure 2-11.

Figure 2-11 Generating the upgrade file

----End

2.2.3 Inserting Empty Packets

Perform the following steps:

Step 1 Perform steps 1 to 4 in section 2.2.1 "Packaging Images as an Upgrade File Complying with the SSU Protocol (with Nothing Inserted)."

Step 2 Configure the file parameters in the **Package Options** pane, as shown in Figure 2-12.

Figure 2-12 Configuring the file parameters

- Symbol Rate: 1000−99999 KS/s, 28-bit width
- Valid Symbol Rate: 1000−99999 KS/s, 28-bit width

Step 3 Click **Browse** in the target upgrade file generation area, specify the name and path for the upgrade file to be generated, and then click **TS Package** to generate the upgrade file complying with the SSU protocol. See Figure 2-13.

Figure 2-13 Generating the upgrade file

CAUTION

If the network packet loss rate is high, inserting empty packets reduces the loss of valid data.

----End

3 Notes

Note the following when you use the HiLoader:

- When adding a partition, note that:
  - The unit K or M (not case-sensitive) must be attached when the partition length is entered.
  - The entered partition length must be greater than the length of the selected file.
  - The addresses occupied by partitions cannot overlap.
- If an error occurs when you use the HiLoader, save the screenshot that shows the symptom, and deliver the screenshot along with the issue to facilitate problem location.
- Wait patiently during the TS packaging process. Packaging TSs may take a long time because there are many partitions or the partition files are large.
- If the partition file exceeds a specific size (490 MB in the HISI protocol and 250 MB in the SSU protocol), the tool automatically divides the partition into small partition files. This is because certain field length is limited in the protocol.
- For the eMMC EXT4 file system, the tool supports files in the sparse or non-sparse formats, and it identifies the format automatically based on the file header.
- If the HISI protocol is used, you can view the NAND CS in the displayed information during boot. For example, Nand (Hardware):
  - Block: 128 KB
  - Page: 2 KB
  - OOB: 64 B
  - ECC: 4 bits
  - Chip: 128 MB*1

  ***1** indicates CS0. For details about the CS of other components, consult the hardware development personnel.

A Glossary

E

eMMC	embedded multimedia card	The standard specifications of an embedded memory include an MMC interface, a flash memory, and a master controller, all in a small ball grid array (BGA) package. The eMMC is fast and upgradable.

H

HISI OTA		A protocol defined by HiSilicon. This protocol applies to OTA upgrade.
HISI FILE		A protocol defined by HiSilicon. This protocol is also called USB/IP protocol and applies to USB and IP upgrade.

N

NAND		The NAND flash is a better storage solution than the hard disk drive.

S

SPI	serial peripheral interface	Synchronous serial communication mode
SSU	system software updates	A system software upgrade service protocol defined based on the European digital video broadcast (DVB) standard. This protocol applies to OTA upgrade.