



JN51xx Flash Programmer User Guide

JN-UG-3007

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About this Manual

This User Guide describes how to use the JN51xx Flash Programmer application for loading binary code into the Flash memory of a board, module or dongle based on the JN51xx device.

Organisation

This manual consists of four chapters and three appendices, as follows:

- Chapter 1 introduces the JN51xx Flash Programmer application.
 - Chapter 2 describes how to use the GUI version of the Flash Programmer.
 - Chapter 3 describes how to use the CLI version of the Flash Programmer.
 - Chapter 4 outlines a two-stage process for downloading binary code to Flash memory devices not directly supported by the JN51xx Flash Programmer.
 - The appendices provide procedures for connecting a PC to a JN51xx board and procedures for downloading binary code when using a USB dongle.
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Conventions

Files, folders, functions and parameter types are represented in **bold** type.

Function parameters are represented in *italics* type.

Code fragments are represented in the `Courier` typeface.

Acronyms and Abbreviations

CLI	Command Line Interface
GUI	Graphical User Interface
IEEE	Institute of Electrical and Electronic Engineers

Related Documents

JN-AN-1038	Custom Flash Programmer Application Note
JN-AN-1066	Obtaining and Installing MAC Addresses and ZigBee Licenses
JN-UG-3064	SDK Installation and User Guide

Trademarks

All trademarks are the property of their respective owners.

1 Introduction

The JN51xx Flash Programmer application can be used to download binary code to the SPI bus connected Flash memory chip on a JN51xx module or dongle, or to the on-chip Flash memory of a JN516x microcontroller.



Note: The JN51xx Flash Programmer can also be used to download binary code to other types of Flash chip as part of a two-stage process that involves first downloading a custom Flash programmer to RAM on the JN51xx – refer to Chapter 4.

The JN51xx Flash Programmer application is installed as part of the Software Developer's Kit (SDK) Toolchain, available from www.nxp.com/jennic/support.



Note: The version of the JN51xx Flash Programmer shown in the screenshots of this manual (which includes provision for using a USB dongle) is later than the version included in the Toolchain.

The JN51xx Flash Programmer is available through a GUI (Graphical User Interface) or a CLI (Command Line Interface). In this manual, these interfaces are described separately in Chapter 2 and Chapter 3 respectively.



Note: When downloading a binary file to Flash memory (by means of the Flash Programmer GUI or CLI), you must use the JN51xx UART0 serial interface.

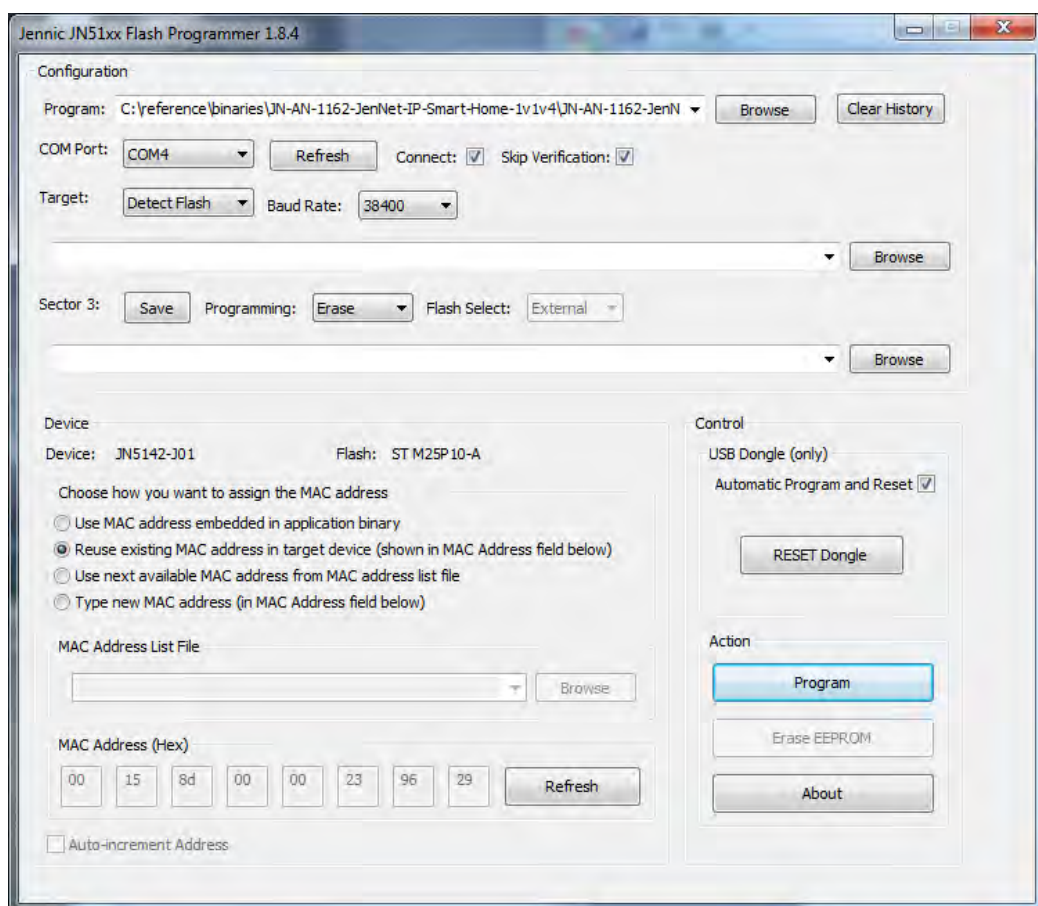
2 Using the Flash Programmer GUI

This chapter describes how to use the JN51xx Flash Programmer application through its GUI (Graphical User Interface), as follows:

- How to download binary code to Flash memory – see Section 2.1
- How to set the IEEE/MAC address for a device – see Section 2.2
- How to connect to a device and how to release a serial port to be used by other programs – see Section 2.3
- How to preserve Sector 3 data that already exists in the Flash memory – see Section 2.4
- How to skip the default verification process during Flash programming – see Section 2.5

2.1 Downloading Binary Code

The JN51xx Flash Programmer presents the following GUI in order to allow .bin file programming:



User Interface

To use the GUI to download a **.bin** file to a board or module, follow the procedure given below.



Important: If you are using a USB dongle, as detailed in the Reference Design JN-RD-6021 or JN-RD-6023, you must follow the relevant download procedure in Appendix C instead of the procedure below.

- Step 1** Connect your PC to the target board using a USB-to-serial cable from a JN51xx evaluation kit. **Make sure you connect the black wire of the cable to Pin 1 of the on-board UART0 serial connector.** At this point, you may be prompted to install the driver for the cable – if this is the case, refer to Appendix A.
- Step 2** Run the Flash programmer application by following the Windows Start menu path:
Start > All Programs > Jennic > Jennic Flash Programmer
- Step 3** In the **COM Port** field of the interface, select the PC serial communications port for the board connection – to identify the relevant port, refer to Appendix B.
- Step 4** Reset the device and put it into programming mode.
For boards/modules from the kits JN5139-EK000, JN5139-EK010 and JN5148-EK010:
- Press and hold down the Programming button on the board/module.
 - Press and then release the Reset button on the board/module.
 - Release the Programming button.
- For boards/modules from the JenNet-IP EK040 kit, enable the automatic reset and programming mode signals for the target device. To do this, in the **USB Dongle** area of the interface, ensure that the checkbox **Automatic Program and Reset** is ticked (if this box is not ticked, the target JN51xx device will not enter programming mode and the download will fail).
- Step 5** In the Flash programmer interface, use the **Browse** button in the **Program File** area to find and select the binary file to download.
Alternatively, the application remembers previously downloaded files and these can be selected from the drop-down list (see highlighted part of the above screenshot).
- Step 6** Select the baud rate for the download using the **Baud Rate** drop-down list.
- Step 7** In the **Flash Select** drop-down list, select:
- „Internal“ if the target Flash memory is on the JN51xx chip (e.g. for JN516x)
 - „External“ if the target Flash memory is not on the JN51xx chip
- Step 8** Check that the MAC address shown is correct for the device. If it is correct, click the **Reuse existing MAC Address** radio button. If it is not correct, or if the MAC address is shown as all zeros, follow the procedure in Section 2.2.



Note: Click the **Refresh** button to re-read the existing MAC address from the device.

Step 9 Once the file and baud rate have been selected and the correct MAC address is displayed, click the **Program** button to start the download.

The progress of the download can be viewed in the progress box that is displayed while the Flash memory is being programmed:

When the download has finished, the result will be shown as successful or having errors. If there are errors, try the download again.



Note: A binary file for a device with a small Flash memory (e.g. JN5161) may be programmed into a device with a larger Flash memory (e.g. JN5168) for development purposes. In this case, the Flash programmer will notify the user with the message *'The firmware file was built for another processor version and might not run on the connected device. Are you sure you want to continue'*. Select **Yes** and continue to programme the device.

Step 10 Once the download has successfully completed:

- a) Disconnect the serial cable or release the serial port - refer to Section 2.2.2.
- b) Reset the board or module.

The downloaded code will automatically run.

2.2 Setting the IEEE/MAC Address for a Device

The IEEE/MAC address is normally programmed into a network device during manufacture, in a range allocated to the manufacturer by the IEEE.



Note: All JN51xx modules are programmed with a MAC address during manufacture.

If the Flash Programmer screen shows a valid MAC address then there should be no reason to change it. However, the following circumstances will necessitate entering a new MAC address:

- The MAC address was not programmed during manufacture, as is the case for chips to be used in custom modules.
- The MAC address was wiped during a previous programming operation.

In each case, the displayed address will be 0xFFFFFFFFFFFFFFFF. The MAC address for a JN51xx module can normally be found in the documentation supplied with the device. For JN51xx chips and JN51xx modules with no/lost MAC addresses, the addresses must be obtained for the devices as described in the Application Note JN-AN-1066.



Note: Always ensure that the MAC address specified is unique.

2.2.1 MAC Address Programming Procedure

To specify the MAC address to be programmed into the device:

Step 1 Click the **Refresh** button to read the existing MAC address from the device.

Step 2 Assign a MAC address using one of the following options in the interface:

- **Use application supplied MAC address:** The MAC address embedded in the application binary will be used. [Not available for JN516x]
- **Reuse existing MAC address:** The existing MAC address of the target device (shown in the **MAC Address** field) will be used.
- **Use MAC Address list file:** The next available MAC address in the licence file (specified in the **Licence file** field) will be used – refer to Section 2.2.2. [Not available for JN516x]
- **Type new MAC address:** A new MAC address can be typed into the **MAC Address** field. A factory programmed MAC address may be overwritten with another MAC address using this option – for JN516x, see the Caution below.

! **Caution:** For a JN516x device, entering a new MAC address is a 'one-time programmable' option and care should be taken to ensure that the MAC address specified is correct before programming, as it cannot be modified after programming.

Step 3 Continue with the download operation in Section 2.1.

2.2.2 MAC Address List File

For a set of supported devices (excluding JN516x), a file containing a list of MAC addresses can be used to programme the devices in a sequence. This programming option can be selected as described in Section 2.2.1. The Flash programmer takes the next unused MAC address in the list.

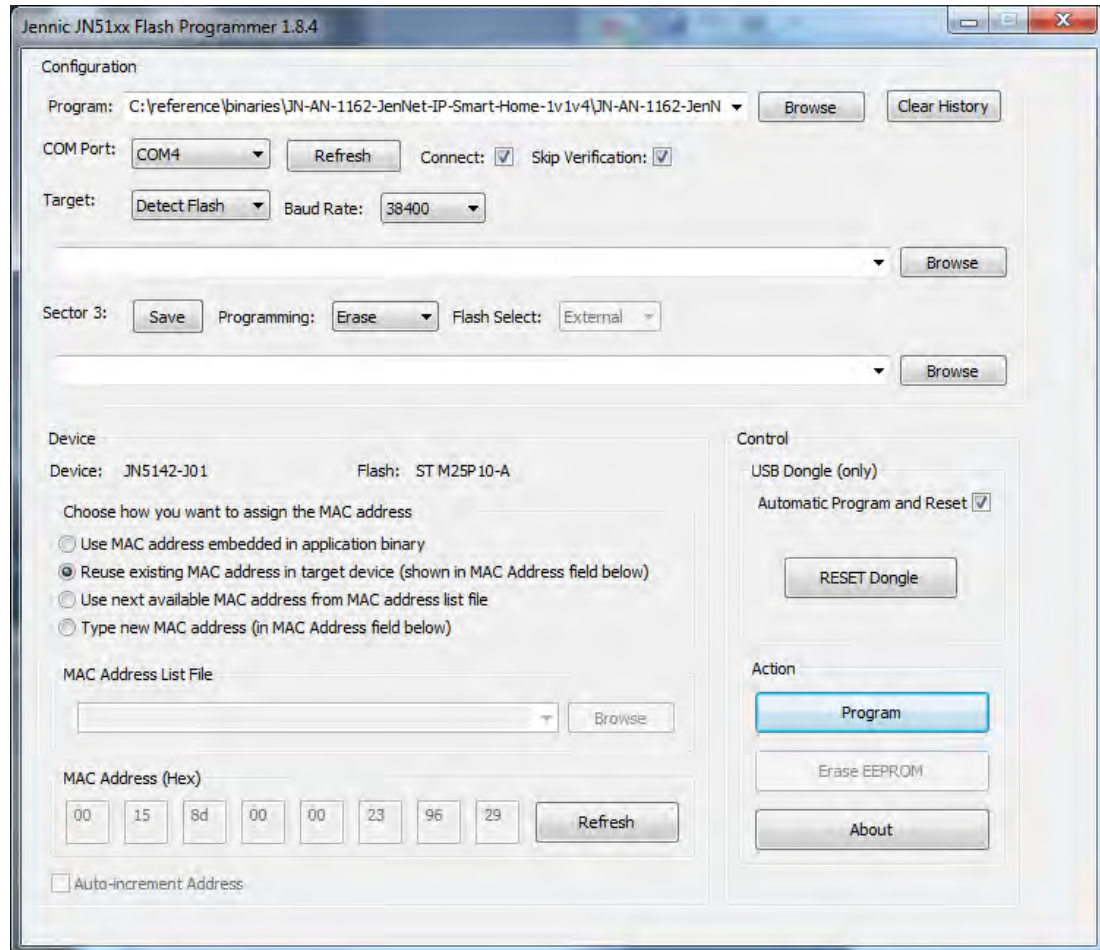
The MAC address list must be created in a text file (.txt) with the following format:

```
# MAC address list
0, 0x00158d000005844b, 0xffffffffffffffffffffffffffffffff
0, 0x00158d000005844c, 0xffffffffffffffffffffffffffffffff
```

- Field 1 - Flag that identifies if this entry has been used (0 indicates unused, 1 indicates used). Once the Flash programmer has used a MAC address from the list, it changes this field from 0 to 1.
- Field 2 - 64-bit MAC address as an ASCII hex number.
- Field 3 - 128-bit ZigBee licence key as an ASCII hex number (this field is unused and should be left as shown above).

2.3 Connecting to a Device and Releasing the Serial Port

The **Connect** checkbox in the Flash programmer's dialogue box (illustrated below) is used to connect to a device on the selected serial port. If you want the Flash programmer to release this serial port, you must de-select the **Connect** checkbox. You can then use the serial port for other programs, such as a terminal program to communicate with the firmware you have programmed into the device.



Connecting to a Device

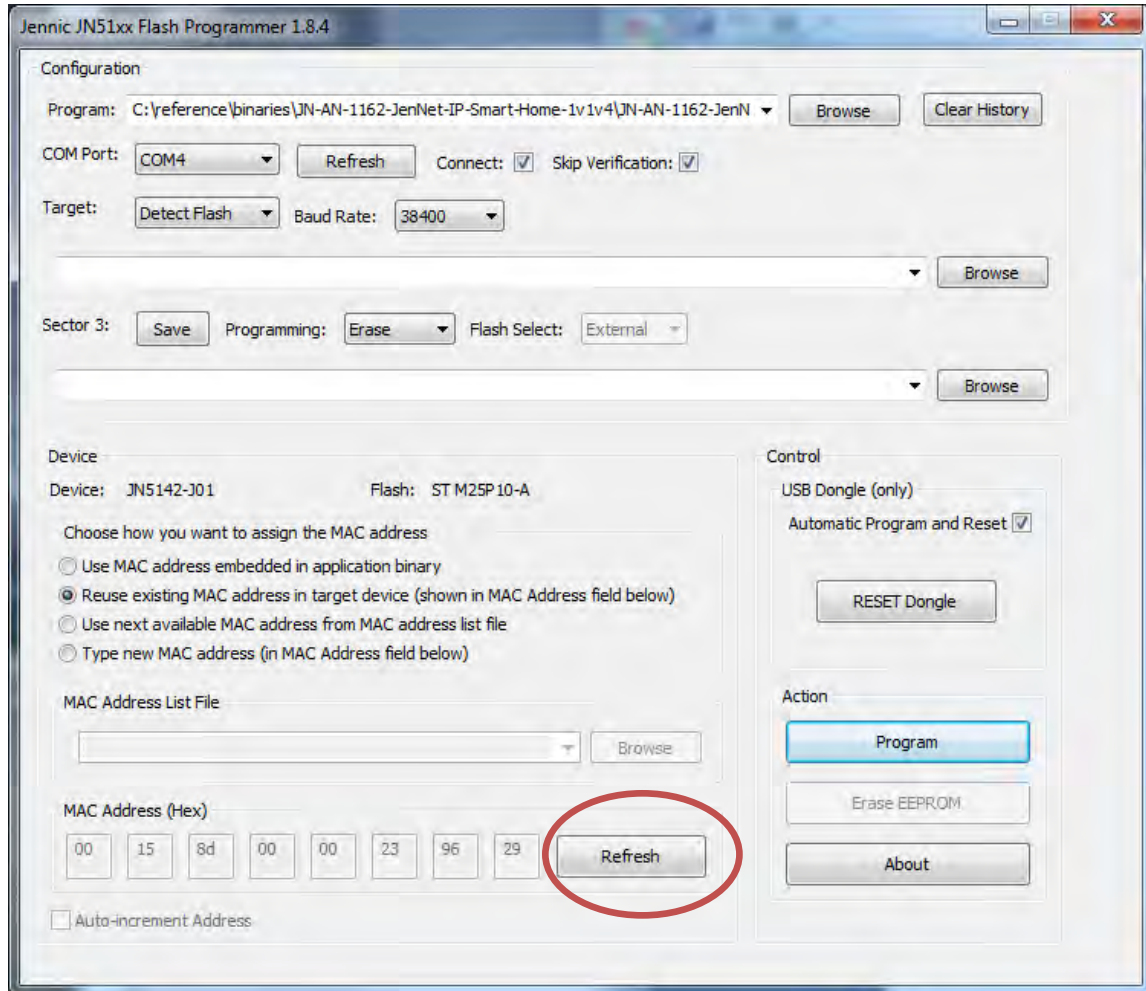
If you need to reprogram the Flash device, you must re-select the **Connect** checkbox and power-cycle the board/module. The Flash programmer will open the serial port again and attempt to detect whether a device is connected to the port.

If the Flash programmer cannot detect a device on the serial port, it will display a warning and remind you to power-cycle the device to force it back into programming mode. The device type will be shown – for example:

JN5168, BL 0x00080006 Flash: Internal Flash (256K)

After a power-cycle of the device, you can verify the connectivity by pressing the **Refresh** button, illustrated below. The Flash programmer will then detect the JN51xx device, the Flash device type and the MAC address of the JN51xx, and display this information in the **Device** field of the dialogue box.

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Refresh Button

2.4 Application Data in Sector 3

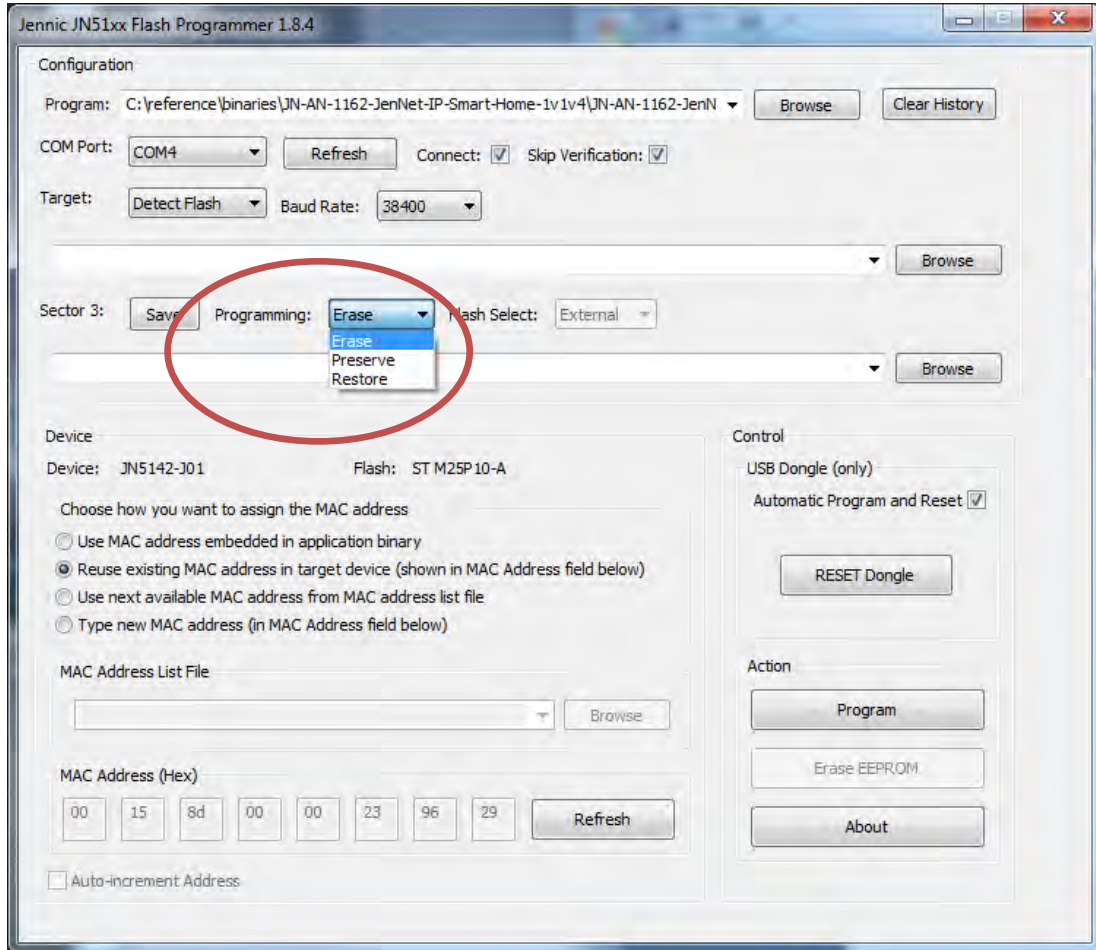
The Flash device used in JN51xx modules has a capacity of 128 Kbytes, but only 96 Kbytes of this are used for code. This leaves 32 Kbytes (in Sector 3) available for use by the application for data storage.



Note: When using a JN5148 module, Sector 3 will become Sector 6 due to the Flash memory page-size used.

2.4.1 Preserving the Contents of Sector 3

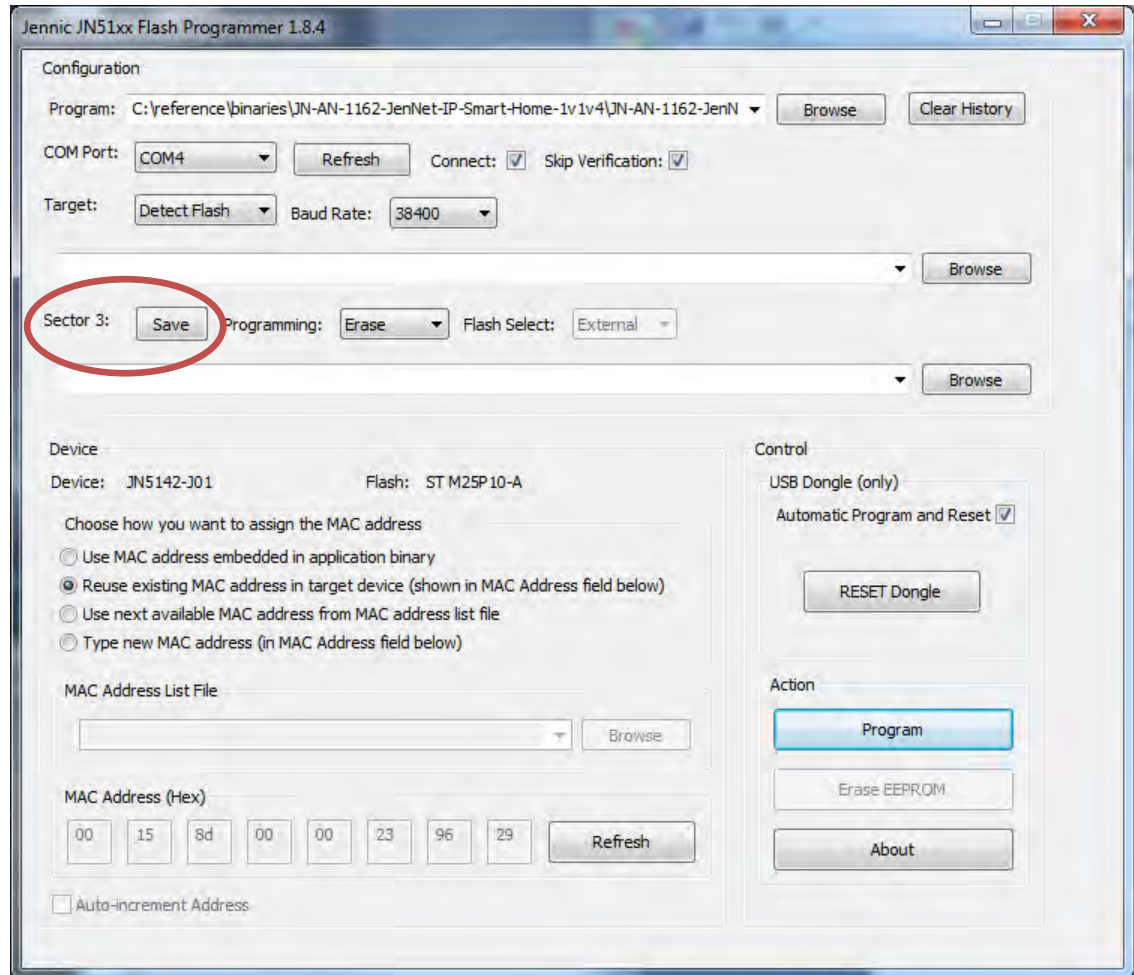
By default, the Flash programmer will erase the entire contents of Flash memory when a new program is programmed into the device. If your application uses Sector 3 of the Flash memory for non-volatile storage of data, you should select the **Preserve** option in the Sector 3 **Programming** drop-down list, illustrated below. When this option is selected, the Flash programmer will back up Sector 3 before erasing the contents of Flash and will restore the data once the application has been programmed into Flash.



Programming Options

2.4.2 Saving the Contents of Sector 3

You can save the contents of Sector 3 to a file for back-up purposes. To do this, click on the Sector 3 **Save** button, illustrated below.

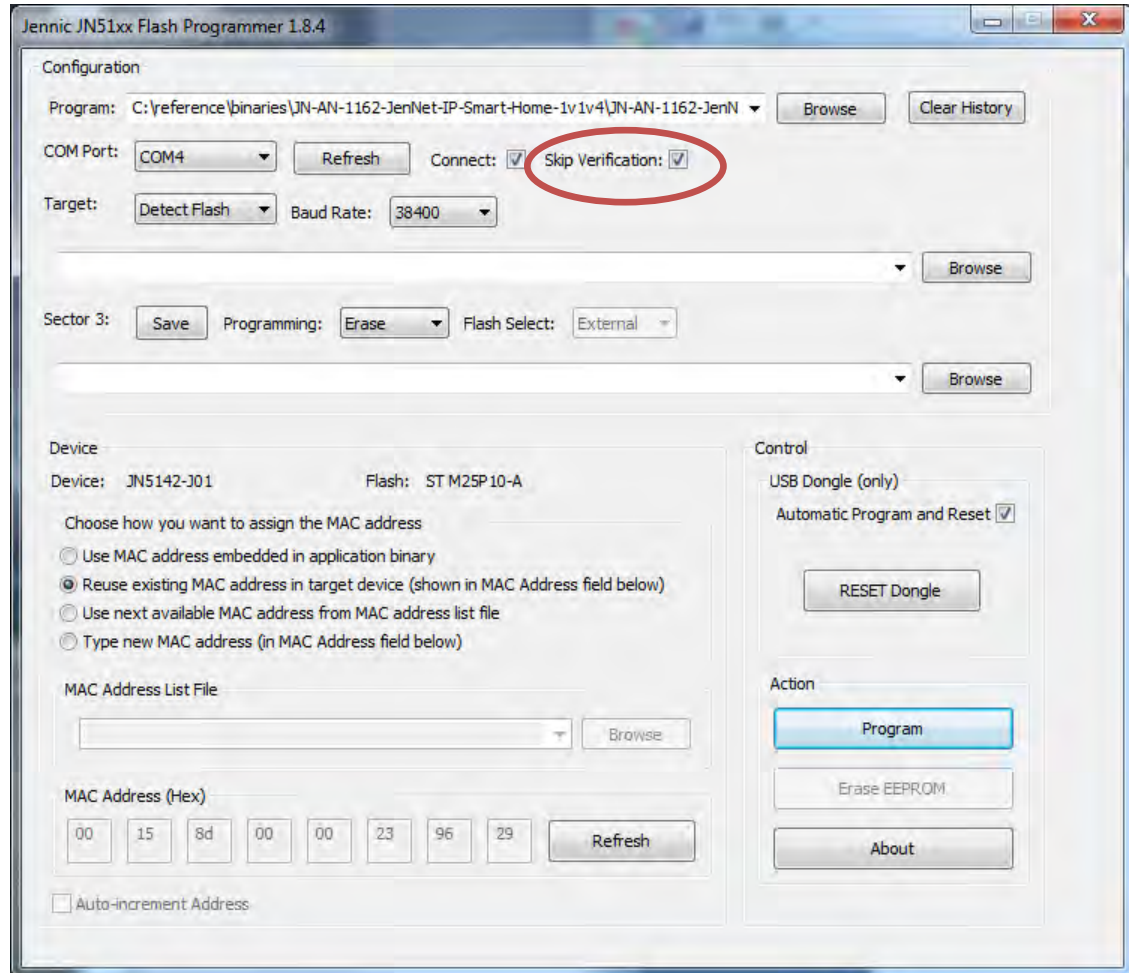


Save Button

You can later restore your saved application data into Sector 3 by selecting the **Restore** option in the Sector 3 **Programming** drop-down list and then browsing for the back-up file.

2.5 Skipping Verification

The default operation of the Flash programmer compares the contents of the Flash memory with the original file after the Flash has been programmed. However, to speed up the programming operation, you can choose to skip this verification step. To do this, select the **Skip Verification** checkbox, illustrated below.



Skip Verification Option

! **Caution:** *Skipping the verification process is only intended for R&D purposes. You should not skip verification in production environments.*

3 Using the Flash Programmer CLI

This chapter describes how to use the JN51xx Flash Programmer application through its CLI (Command Line Interface). You can use this interface instead of the GUI version (described in Chapter 2), if you wish.



Note 1: Refer to the information on the GUI version in Chapter 2 for details of options such as data encryption, preserving sector 3 and skipping verification.



Note 2: For a JN516x device, the internal Flash memory is programmed by default when using the CLI version of the Flash programmer.



Note 3: If you are using a USB dongle, as detailed in the Reference Design JN-RD-6021 or JN-RD-6023, you must use the GUI version of the Flash programmer and follow the relevant download procedure in Appendix C.

3.1 Downloading Binary Code

To use the CLI to download a **.bin** file to a board or module, the procedure is as follows:

- Step 1** Connect your PC to the target board using a USB-to-serial cable from a JN51xx evaluation kit. **Make sure you connect the black wire of the cable to Pin 1 of the on-board UART0 serial connector.** At this point, you may be prompted to install the driver for the cable – if this is the case, refer to Appendix A.
- Step 2** Determine which serial communications port your PC has allocated to the board connection - to identify the relevant port, refer to Appendix B.
- Step 3** On your PC, open a command window by following the Windows Start menu path:
Start > All Programs > Jennic > Jennic Bash Shell
- Step 4** In the command window, navigate to the Flash Programmer directory:
`/cygdrive/c/Jennic/cygwin/jennic/flashprogrammer/`
- Step 5** Run the Flash programmer to download your binary file to Flash memory by entering the following at the command prompt:
`./FlashCLI.exe <command options> -f <path to .bin file>`
where **<command options>** can be one or more of the options specified in Section 3.2 and should include `-c <comport>`.
- Step 6** If prompted to do so, reset the target device and put it into programming mode. To do this on boards/modules from kits JN5139-EK000, JN5139-EK010 and JN5148-EK010:
- a)** Press and hold down the Programming button on the board/module.
 - b)** Press and then release the Reset button on the board/module.
 - c)** Release the Programming button.
- Step 7** Once the download has successfully completed:
- a)** Disconnect the serial cable.
 - b)** Reset the board or module.

The downloaded code will automatically run.

3.2 CLI Options

The table below lists and describes the command options that can be specified with the `./FlashCLI.exe` command (see Section 3.1).

Command Option	Alternative Option	Description
	<code>--version</code>	Show Flash Programmer version number and exit
<code>-a <USB dongle></code>	<code>--AutomaticPandR</code>	Specifies that a USB dongle is being used (enables automatic reset and programming mode signals for the target device) – see Appendix C
<code>-B <baud rate></code>	<code>--BaudRate=<baud rate></code>	Specifies baud rate for transfer - must be less than 1000000 bps (default is 38400)
<code>-c <comport></code>	<code>--ComPort=<comport></code>	Specifies serial communications port to use (default is 1)
<code>-f <binary file></code>	<code>--FlashFile=<binary file></code>	Specifies binary file to be programmed into Flash memory (or into RAM – see below)
<code>-h</code>	<code>--help</code>	Display list of command options and exit
<code>-k <pass-key></code>	<code>--Passkey=<pass-key></code>	Specifies device security pass-key for transfer
<code>-l <list file></code>	<code>--ListFile=<list file></code>	Allocate MAC address from specified address list and programme into Flash memory
<code>-m <MACaddr></code>	<code>--MACAddress=<MACaddr></code>	Specifies MAC address to programme into Flash memory - address in hex format XX:XX:XX:XX:XX:XX:XX:XX
<code>-p</code>	<code>--Preserve sector 3</code>	Specifies that Sector 3 of Flash memory must be preserved
<code>-R</code>	<code>--RAM</code>	Load binary file into RAM (instead of Flash memory) and execute
<code>-s</code>	<code>--SkipVerification</code>	Skip verification of Flash memory contents after programming
<code>-w</code>	<code>--NoWait</code>	Do not prompt the user to put device into programming mode

Examples

If you want to load the file **router.bin** via serial port 5 and skip verification, enter:

```
./FlashCLI.exe -c 5 -s -f router.bin
```

If you want to load the file **enddevice.bin** via serial port 1 at baud rate 19200 bps without waiting for the user to put the target device into programming mode, enter:

```
./FlashCLI.exe -B 19200 -w -f enddevice.bin
```

4 Custom Flash Programming

The JN51xx Flash Programmer enables you to reprogram the SPI-bus connected ST M25P10 Flash chip on the JN51xx module. If required, the ST Flash chip can be replaced by other SPI-bus enabled Flash chip types, but the Flash programming routines built into the JN51xx ROM do not support programming of all types of Flash chip.

There are often small variations in the ways different Flash chip manufacturers implement Flash programming algorithms in their chips, but most implement Flash reading in the same way. The ROM boot loader is therefore likely to be able to read from any SPI-enabled Flash chip, and thus boot a program from it, but might not be able to reprogram the chip.

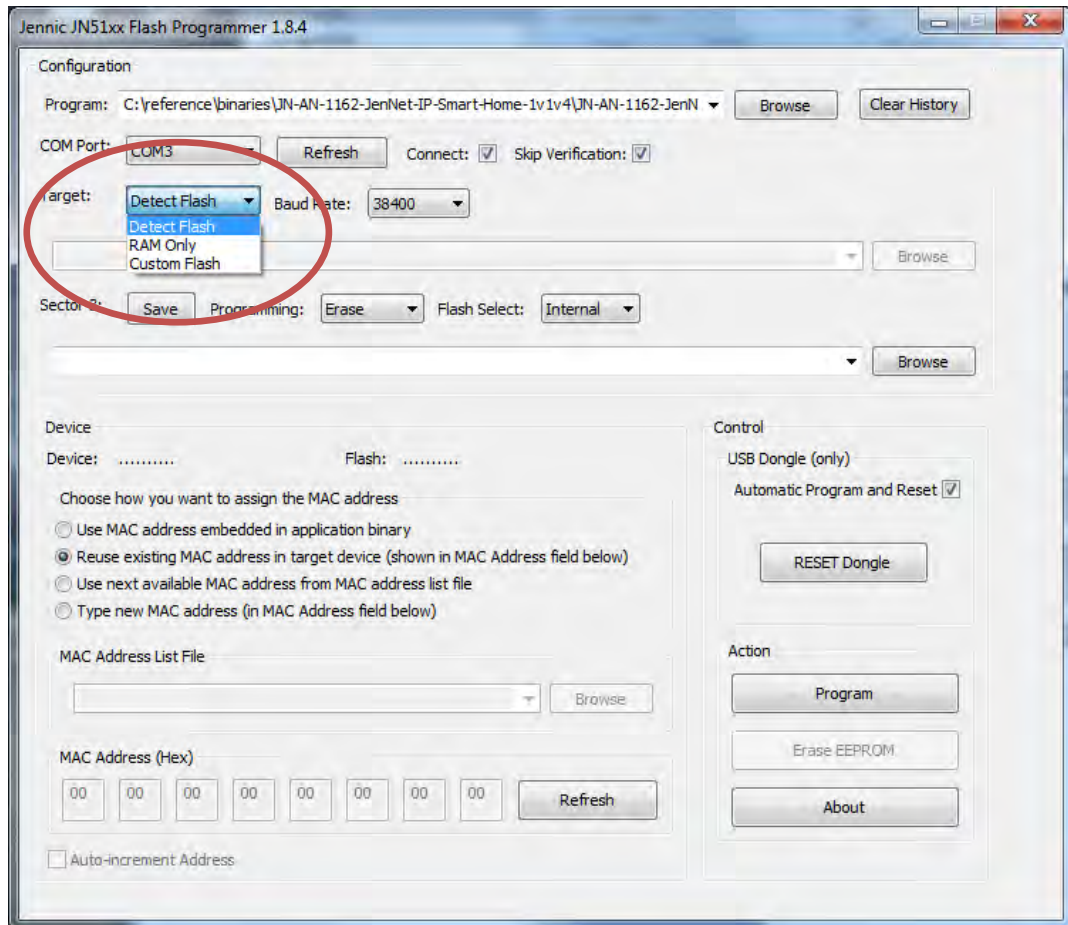
To handle the programming of different types of Flash chip, the JN51xx supports a two-stage approach in which a custom-made Flash chip programming firmware image can be uploaded to RAM and then used to program the attached Flash chip. Please refer to the Application Note *Custom Flash Programmer (JN-AN-1038)* for details of how to implement a custom Flash programmer firmware image for your Flash chip.

Once you have a custom Flash programmer image, you can program your SPI-bus connected Flash chip as described below.

Step 1 In the **Program File** field of the JN51xx Flash Programmer interface, browse for the application (.bin) file to be downloaded to Flash memory.

Alternatively, the application remembers previously downloaded files and these can be selected from the drop-down list.

Step 2 In the **Target** drop-down list, select the **Custom Flash** option, as illustrated below.

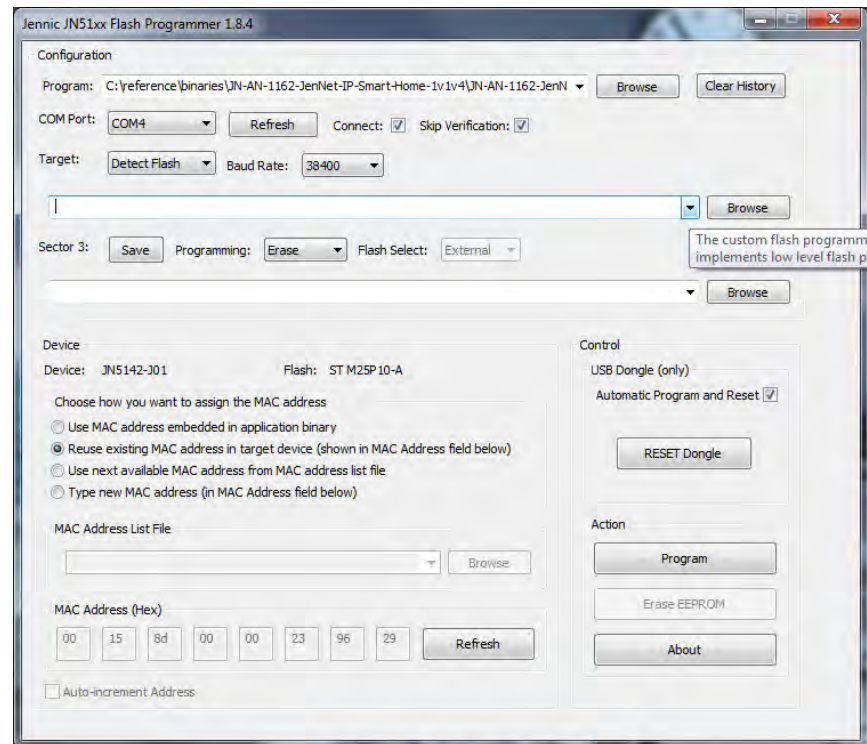


Target Options

The „hidden“ field under the **Target** list now becomes visible and accessible.

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Step 3 In this new field, browse to find and select your custom Flash programmer firmware image (see below).



Custom Programming File Browser



Note 1: The following message appears when the mouse hovers over the new **Browse** field: *The custom flash programmer firmware that implements low level flash programming commands.*



Note 2: Even when using this procedure just to upload a custom Flash programmer to RAM, an application binary file must be specified in the **Program File** field.

Step 4 Click on the **Program** button.

The JN51xx Flash Programmer now uploads the custom Flash programmer to RAM.

Once the upload has finished, the custom Flash programmer automatically programs your application into the Flash chip.

Appendices

A Installing the USB-to-Serial Cable Driver

The USB-to-serial cable supplied with JN51xx evaluation kits allows a PC USB port to be used as a serial communications port and requires an FTDI driver. This driver is provided in the SDK Toolchain (JN-SW-4031 or JN-SW-4041) and must be installed on your PC the first time you use the supplied cable. This installation is described below (although you may not need this procedure if Windows automatically finds the required driver on the Internet).

1. When you plug the USB-to-serial cable into a USB port of your PC, check whether **Found new hardware wizard for TTL232r-3v3** is displayed.

If this appears, you must install the driver by following the rest of this procedure. Otherwise, the driver is already installed.

2. Fill in the screen **Install from a specific location**, as follows:
 - a) Select the radio button **Search for the best driver in these locations**.
 - b) Tick the checkbox **Include this location in the search**.
 - c) Using the **Browse** button, navigate to the directory **FTDI_drivers**, either in the installed SDK on your PC.

For example, if the SDK has been installed on drive **C** of your PC, the required path will be **C:\Jennic\drivers\FTDI_drivers** for a toolchain installed from JN-SW-4031 or **C:\Jennic\Tools\Drivers\FTDI_drivers** for a toolchain installed from JN-SW-4041.

- d) Click **OK**.

The wizard will automatically fill in the details in the drop-down search box.

3. In the **Found new hardware wizard** screen, click **Next**.
4. Wait for the wizard as it searches for and installs the new driver. On completion, it will display the message "Completing the Found new hardware wizard". Click **Finish** to complete.

In some cases, you may need to repeat the procedure from Step 2, depending on your hardware configuration.

Finally, the **Found new hardware** bubble will indicate that the hardware is installed and ready for use.



Note: Alternatively, you can obtain the relevant driver for your operating system from the FTDI web page www.ftdichip.com/FTDrivers.htm. Go to the VCP drivers, download the required driver to your desktop and double-click on its icon to install.

B Identifying PC Communications Port Used

In order to use the Flash programmer, you need to find out which serial communications port your PC has allocated to the connection with the board - this is described below.

1. In the Windows Start menu, follow the menu path:

Start>Control Panel>System

This displays the **System Properties** screen.

2. In the **System Properties** screen:

- a) Select the **Hardware** tab.

- b) Click the **Device Manager** button

This displays the **Device Manager** screen.

3. In the **Device Manager** screen:

- a) Look for the **Ports** folder in the list of devices and unfold it.

- b) Identify the port which is connected to the board (it will be labelled „USB Serial Port“) and make a note of it (e.g. COM1).

C Downloading Binary Code to a carrier board or USB Dongle

This appendix describes how to download a binary file from a PC to the Flash memory associated with a JN51xx device in the following situations:

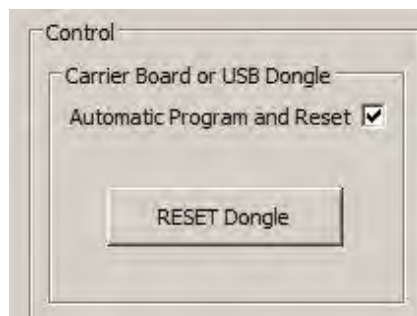
- When using a carrier board DR1174
- When using the USB Programming Dongle (detailed in the Reference Design JN-RD-6021) to connect the PC to a custom JN51xx board via an on-board 6-pin connector wired to UART0
- When using an IEEE 802.15.4 USB Dongle (detailed in the Reference Design JN-RD-6023) which contains a JN5148 or JN5168 device and Flash memory device

The download procedures for the above cases are provided below and each replaces the procedure given in Section 2.1. The above boards each contain an onboard FTDI device for USB-to-Serial connection and include additional functionality to enable the JN51xx device to be put into programming mode and to be reset under control of the flash programmer.

Using the DR1174 carrier board

To use the JN51xx Flash Programmer GUI to download a **.bin** file to the DR1174 carrier board, follow the procedure below.

- Step 1** Connect a USB mini-B cable from a USB port of your PC to the USB connector on the carrier board
- Step 2** Run the Flash programmer application by following the Windows Start menu path:
Start > All Programs > Jennic > Jennic Flash Programmer
- Step 3** In the **COM Port** field of the interface, select the PC serial communications port for the board connection – to identify the relevant port, refer to Appendix B.
- Step 4** Enable the automatic reset and programming mode signals for the target device. To do this, in the **Carrier board or USB Dongle** area of the interface, ensure that the checkbox **Automatic Program and Reset** is ticked (if this box is not ticked, the target JN51xx device will not enter programming mode and the download will fail).



- Step 5** Use the **Browse** button in the **Program File** area to find and select the binary file to download.

Alternatively, the application remembers previously downloaded files and these can be selected from the drop-down list.

- Step 6** Select the baud rate for the download using the **Baud Rate** drop-down list.
- Step 7** Check that the MAC address shown is correct for the device. If it is correct, click the **Reuse existing MAC Address** radio button. If it is not correct, or if the MAC address is shown as all zeros, follow the procedure in Section 2.2.



Note: Click the **Refresh** button to re-read the existing MAC address from the device.

- Step 8** Once the file and baud rate have been selected and the correct MAC address is displayed, click the **Program** button to start the download.
- Before the binary file is downloaded, the Flash programmer automatically places the target JN51xx device into programming mode. The download is then started and its progress is displayed in the progress box that now appears. On completion of the download, the JN51xx device is reset and the downloaded code automatically runs.

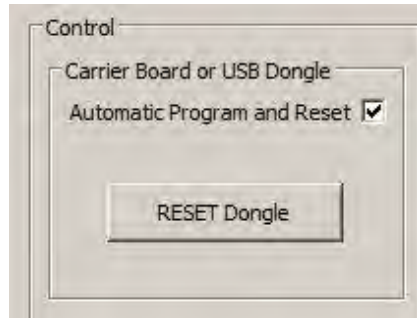


Note: The **RESET Dongle** button in the **Carrier Board or USB Dongle** area of the interface can be subsequently used to reset the target device from the PC.

Using the USB Programming Dongle for a custom JN51xx board

To use the JN51xx Flash Programmer GUI to download a **.bin** file to a board via the USB Programming Dongle, follow the procedure below.

- Step 1** Plug the dongle into a USB port of your PC and then use a suitable serial cable (e.g. a ribbon cable) to connect the dongle to the target board. **Make sure you connect pin 1 of the J8 connector on the dongle to pin 1 of the relevant 6-pin connector on the board.**
- Step 2** Run the Flash programmer application by following the Windows Start menu path:
Start > All Programs > Jennic > Jennic Flash Programmer
- Step 3** In the **COM Port** field of the interface, select the PC serial communications port for the board connection – to identify the relevant port, refer to Appendix B.
- Step 4** Enable the automatic reset and programming mode signals for the target device. To do this, in the **Carrier Board or USB Dongle** area of the interface, ensure that the checkbox **Automatic Program and Reset** is ticked (if this box is not ticked, the target JN51xx device will not enter programming mode and the download will fail).



Step 5 Use the **Browse** button in the **Program File** area to find and select the binary file to download.

Alternatively, the application remembers previously downloaded files and these can be selected from the drop-down list.

Step 6 Select the baud rate for the download using the **Baud Rate** drop-down list.

Step 7 Check that the MAC address shown is correct for the device. If it is correct, click the **Reuse existing MAC Address** radio button. If it is not correct, or if the MAC address is shown as all zeros, follow the procedure in Section 2.2.



Note: Click the **Refresh** button to re-read the existing MAC address from the device.

Step 8 Once the file and baud rate have been selected and the correct MAC address is displayed, click the **Program** button to start the download.

Before the binary file is downloaded, the Flash programmer automatically places the target JN51xx device into programming mode. The download is then started and its progress is displayed in the progress box that now appears. On completion of the download, the JN51xx device is reset and the downloaded code automatically runs.

The serial cable can now be disconnected, if required (see note below).



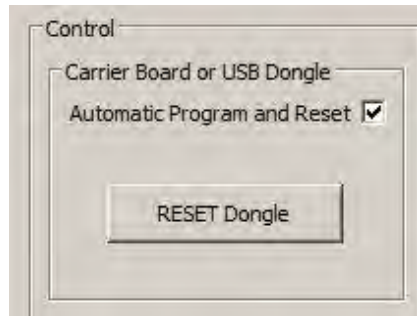
Note: The **RESET Dongle** button in the **Carrier Board or USB Dongle** area of the interface can be subsequently used to remotely reset the target device from the PC, provided that the device remains connected to the PC via the serial cable and dongle.

Using the IEEE 802.15.4 USB Dongle

To use the JN51xx Flash Programmer GUI to download a **.bin** file to the IEEE 802.15.4 USB Dongle, follow the procedure below.

Step 9 Plug the dongle into a USB port of your PC.

- Step 10** Run the Flash programmer application by following the Windows Start menu path:
Start > All Programs > Jennic > Jennic Flash Programmer
- Step 11** In the **COM Port** field of the interface, select the PC serial communications port for the board connection – to identify the relevant port, refer to Appendix B.
- Step 12** Enable the automatic reset and programming mode signals for the target device. To do this, in the **USB Dongle** area of the interface, ensure that the checkbox **Automatic Program and Reset** is ticked (if this box is not ticked, the target JN51xx device will not enter programming mode and the download will fail).



- Step 13** Use the **Browse** button in the **Program File** area to find and select the binary file to download.
Alternatively, the application remembers previously downloaded files and these can be selected from the drop-down list.
- Step 14** Select the baud rate for the download using the **Baud Rate** drop-down list.
- Step 15** Check that the MAC address shown is correct for the device. If it is correct, click the **Reuse existing MAC Address** radio button. If it is not correct, or if the MAC address is shown as all zeros, follow the procedure in Section 2.2.



Note: Click the **Refresh** button to re-read the existing MAC address from the device.

- Step 16** Once the file and baud rate have been selected and the correct MAC address is displayed, click the **Program** button to start the download.
Before the binary file is downloaded, the Flash programmer automatically places the target JN51xx device into programming mode. The download is then started and its progress is displayed in the progress box that now appears. On completion of the download, the JN51xx device is reset and the downloaded code automatically runs.



Note: The **RESET Dongle** button in the **Carrier board or USB Dongle** area of the interface can be subsequently used to reset the target device from the PC.

**JN51xx Flash Programmer
User Guide**

Revision History

Version	Date	Description
1.0	15-Nov-2005	First issue
1.1	21-Nov-2005	Updated Formatting
1.2	29-Nov-2005	Added Module Programming information
1.3	21-Dec-2005	Changed Programming Instructions
1.4	20-Jan-2006	New screenshots
1.5	15-May-2006	New screenshots for reduced functions
1.6	24-Oct-2006	New screenshots for custom Flash programming and skipping verification. Manual reformatted and name changed.
1.7	10-Jan-2007	Added Section 2.2 and updated screenshots for version 1.5 of the Flash programmer
1.8	04-Apr-2007	Updated Sections 2.1 and 2.2 for JN513x chip series
1.9	05-June-2007	Installation from JN-SW-4007 removed. New Sector 3 functionality added.
1.10	29-Feb-2008	Updated for new SDK installer (JN-SW-4031). Added appendices on connecting to a board.
1.11	05-June-2008	Added information on encryption pass-key and updated screenshots
1.12	03-Sept-2008	Custom Flash programming procedure improved
1.13	29-June-2009	Added support for JN5148 device. Modified chapter on GUI version to add baud rate and MAC address options. Added chapter on CLI version, plus other minor modifications made.
1.14	19-Feb-2010	Added more options for specifying MAC address
1.15	26-Mar-2010	Added download procedures for USB dongles
2.0	15-Oct-2010	Template revised, screenshots updated and USB dongle CLI option added
2.1	23-Nov-2012	Updated for JN516x chip series
2.2	11-Dec-2012	Added Carrier board programming

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