GN412x EEPROM Utility User Manual

1. Overview

This document describes the operation of the GN412x EEPROM Utility software, and how it can be used to modify the contents of an EEPROM on boards such as the GN4124 Gullwing RDK board or GN4121 Gullwing-x1 RDK board. It requires the use of the Gennum USB Dongle. The driver for the Gennum USB Dongle is required. This driver must be installed upon attaching the device to the PC for the first time. The driver INF file is located under the "Util" subdirectory of the installed program location. Please refer to the GN412x Gullwing RDK User Guide document for steps to install this driver. (There are two User Guides: GN4124 Gullwing RDK User Guide, Document ID: 50932, and GN4121 Gullwing-xl RDK User Guide, Document ID: 52162.)

Revision History

Version	ECR	Date	Changes and/or Modifications
1.1.1	151921	May 2009	Added new documents.
1.1	151755	April 2009	Renamed document; formerly called: Gennum EEPROM Utility User Guide. Changed the list of 2. Related Documentation.
1.0	150692	October 2008	Creation of document.

Contents

2. Related Documentation

Industry Standards:

http://www.pcisig.com/home

- The I^2C-bus Specification, Philips Semiconductors, Version 2.1, January 2000

Gennum's Documentation:

- GN4124 x4 Lane PCI Express to Local Bus Bridge Data Sheet, Document ID: 48407
- GN4121 x1 Lane PCI Express to Local Bus Bridge Data Sheet, Document ID: 51539
- GN412x PCI Express Family Reference Manual, Document ID: 52624
- GN4124 Gullwing RDK User Guide, Document ID: 50932
- GN4121 Gullwing-x1 RDK User Guide, Document ID: 52162
- GN412x RDK Software Design Guide, Document ID: 51859
- GN412x Diagnostic Utility (GenDiag) User Manual, Document ID: 51406
- GN412x I^2C Utility User Manual, Document ID: 51402

3. How to Run the Program

Before starting the program, please attach the Gennum USB Dongle to one of the PC's USB port. Install the Gennum USB Dongle, as stated in GN412x Gullwing RDK User Guide.

The EEPROM utility has two modes of operation:

- Normal Mode
- I^2C Slave Boot Mode

In the normal mode, all operations are performed directly to the EEPROM on the GN4124 Gullwing RDK or GN4121 Gullwing-x1 board.

In the I^2C slave boot mode, it will only perform register writes to the PCI express bridge device to complete chip configuration prior to the bus enumeration process. This operation mode requires the PCI express bridge device to be setup in the local processor initialization mode. Please refer to the GN412x Gullwing RDK User Guide for detail instructions on setting up the correct initialization mode.

Running the Program

Go to the Start Menu, ***GN412x RDK▶Utilities▶EEPROM Utility*** or ***GN412x RDK▶Utilities▶EEPROM Utility (I2C Slave Boot)***, depending on the desired mode of operation.

3.1 Normal Mode

When the program starts, it will first read the content of the EEPROM and cache it in the memory. Once the reading is completed successfully, the main menu will be shown.

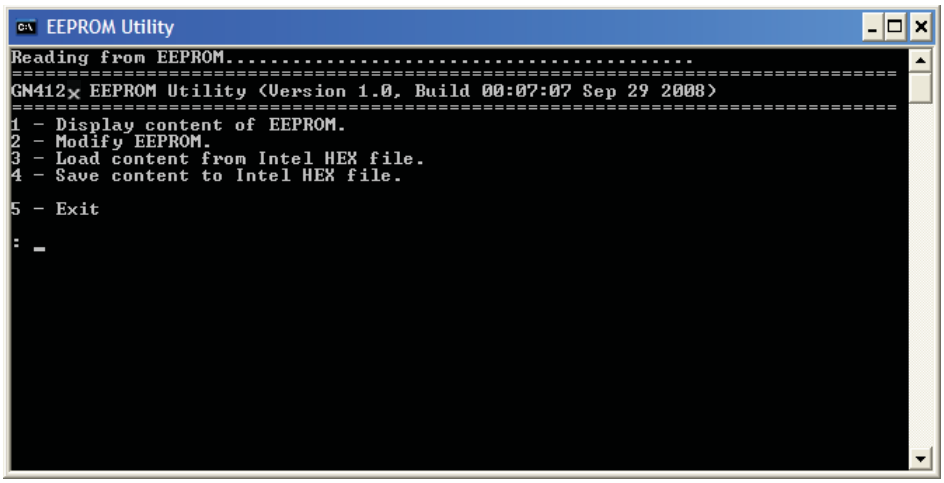

Figure 3-1: Main menu in normal mode

Type in a number and press Enter to perform the specific operation.

3.1.1 Normal Mode Operations

Following is a brief description of each of the operations.

1. Display content of EEPROM

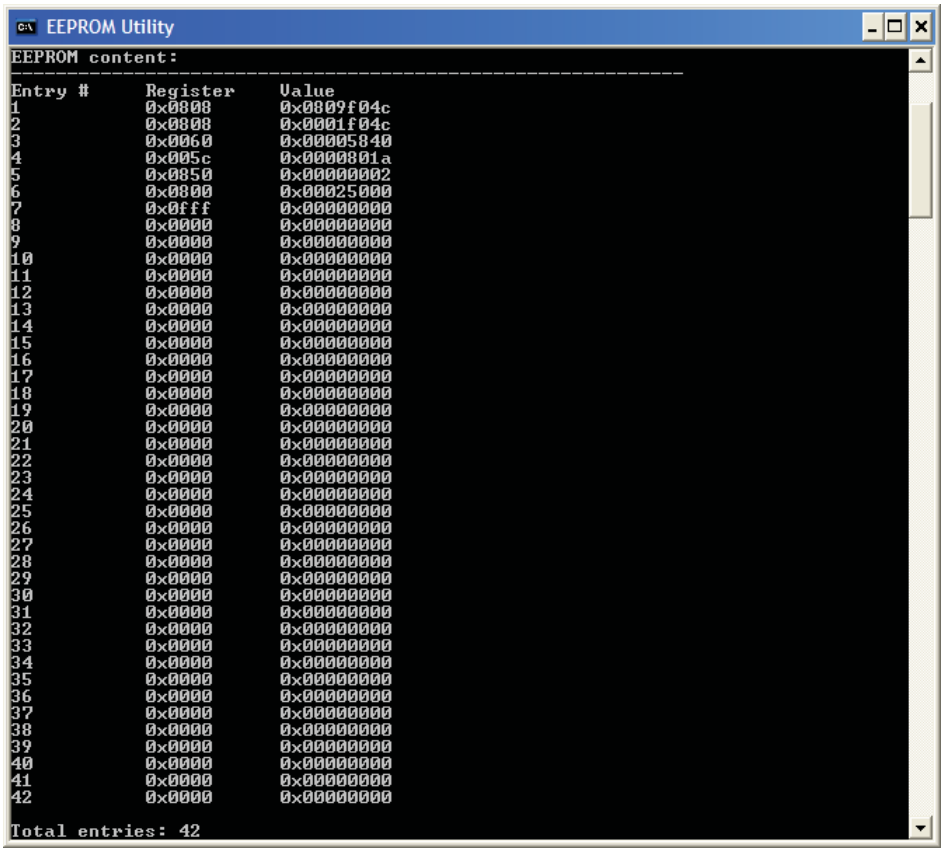

Figure 3-2: Display content of EEPROM screen

Display the content of the EEPROM in the cache memory. Any write updates to the EEPROM content will cause the cache to be refreshed automatically. The EEPROM is divided into multiple consecutive data entries. Each entry consists of the 16 bits register and the 32 bits value. Number displays in the ***Register*** and ***Value*** columns are display in big-endian byte ordering. Entries in EEPROM will be read consecutively starting from the first entry during the bridge device initialization.

Please note that the highest 4 bits of the ***Register*** column are purposely masked out for the display. The physical content of the EEPROM will have those 4 bits set to HIGH automatically during write update as required by the bridge device.

Please refer to the GN412x PCI Express Family Reference Manual for description of the EEPROM content structure.

2. Modify EEPROM.

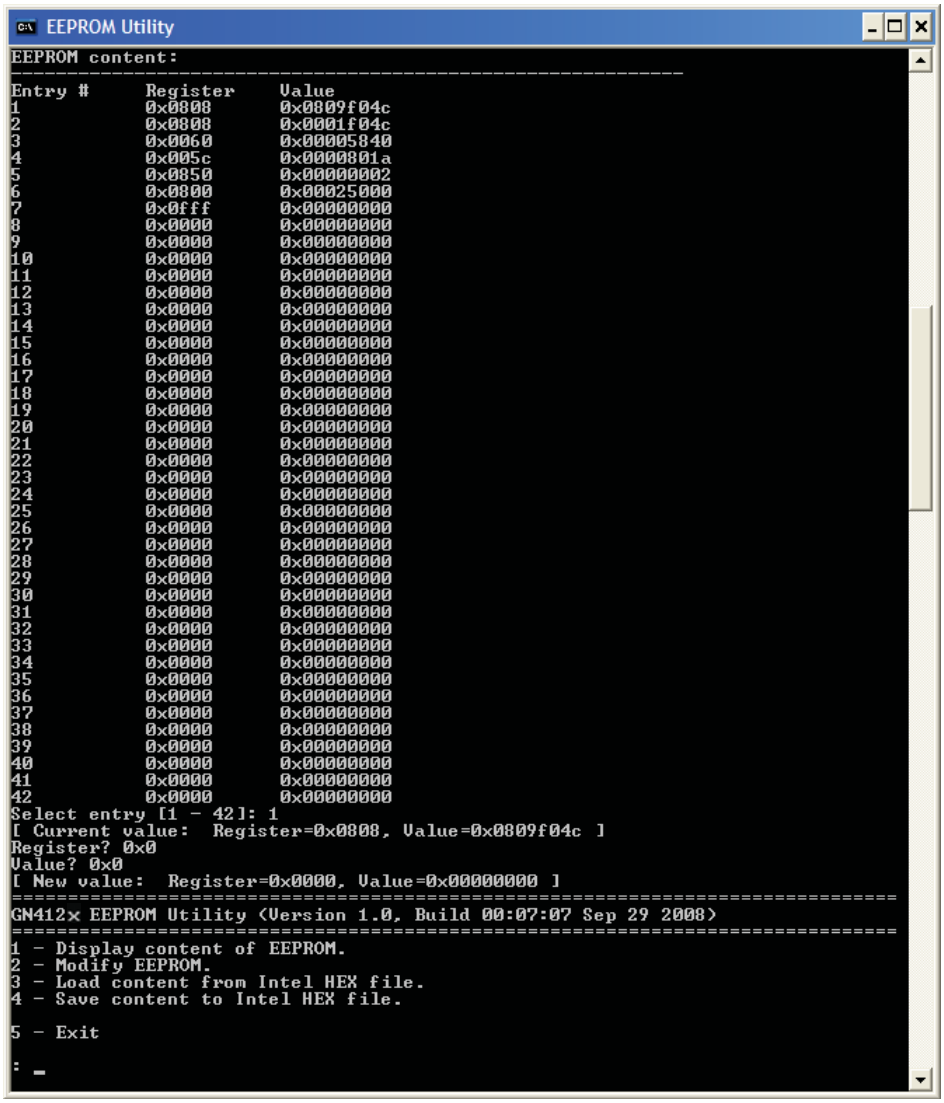

Figure 3-3: Modify EEPROM screen

Select the entry for modification. The current register and value will be printed on screen. Enter the desired 16 bits register and 32 bits value in hexadecimal. Please note that the highest 4 bits of the 16 bits register number entered will be ignored, since those bits are automatically set to HIGH during the write update.

Please refer to the GN412x PCI Express Family Reference Manual for description of the EEPROM content structure.

3. Load content from Intel HEX file.

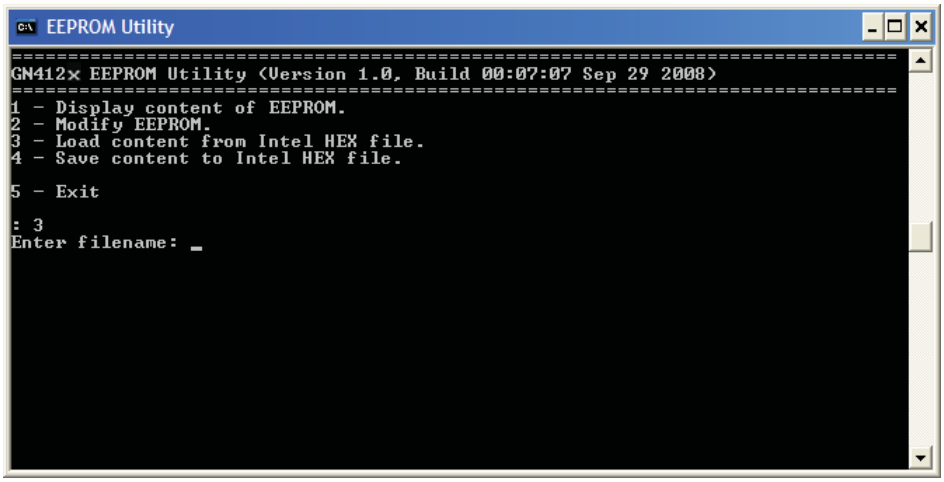

Figure 3-4: Load content from Intel HEX file screen

Enter the complete file name with the full system path. File name without a full system path is assumed to be located in the default search path, which is the directory where the application is installed and stored in. Cache memory is refreshed once the EEPROM is updated successfully.

4. Save content to Intel HEX file.

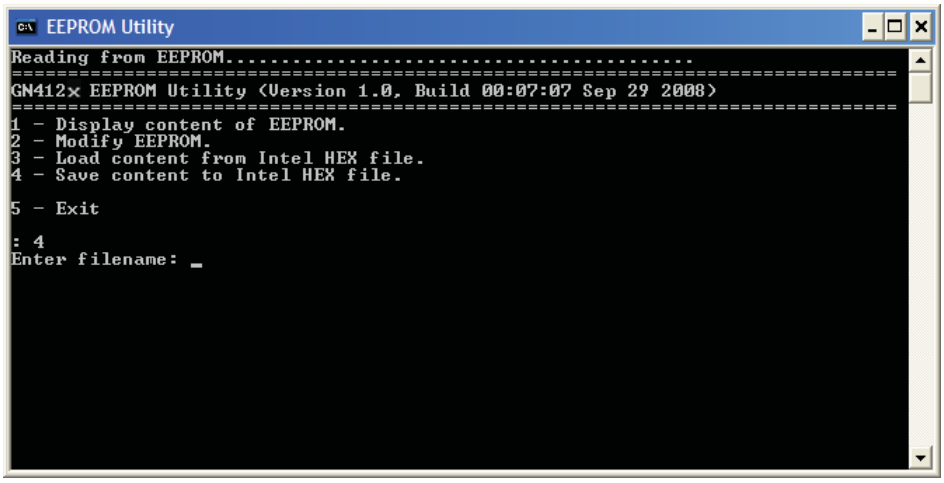

Figure 3-5: Save content to Intel HEX file screen

Enter the complete file name with the full system path. File name without a full system path is assumed to be located in the default search path, which is the directory where the application is installed and stored in. The content of the EEPROM will exported into the specified HEX file.

The exported HEX file can be used by a stand alone programming device to replicate the EEPROM settings.

5. Exit.

Exit the application. It is safe to remove the Gennum USB Dongle, once the application is ended.

3.2 I²C Slave Boot Mode

In the I²C slave boot mode only option 1 and 3 is available.

1. Display content of EEPROM.

   Display the content of the cache memory. The difference between I²C slave boot mode and its normal mode counterpart is that I²C slave boot mode displays what values have been written, when loading from the HEX file.

3. Load content from Intel HEX file.

   Load data content from the HEX file. The difference between I²C slave boot mode and its normal mode counterpart is that the write update are performed directly to the bridge device via I²C.

3.2.1 Example of I²C Slave Boot Mode

Here is a typical usage scenario of the EEPROM utility in the I²C slave boot mode. This will demonstrate the local processor initialization method for the bridge device using two PCs (a target and a controller).

1. Power down the target PC with the GN4124 Gullwing RDK board installed.
2. Complete the Gennum USB Dongle connection between the target PC and the controller PC.

   Refer to the GN412x Gullwing RDK User Guide for detailed instructions.

3. On the controller PC, start the EEPROM utility in I²C slave boot mode.
4. Select option 3 from the main menu.
5. Enter the HEX file name.

   Once the file is loaded successfully, the program will halt.

6. Power up the target PC.
7. Shortly after the power up, press any key on the controller PC to start the download process.

   Timing of the programming is critical, as there is only a limited amount of time before the BIOS begins the PCI enumeration process. Failure to program the PCI Express bridge device in time may cause the target PC to be unable to boot up properly, in which case, the user will need to power down the target PC, and restart the process from step 4.

Once the download process completes successfully and the BIOS is able to complete the device enumeration process, the target PC will boot normally, and the bridge device will be found by the operating system.

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DOCUMENT IDENTIFICATION
USER MANUAL

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CAUTION

ELECTROSTATIC SENSITIVE DEVICES

DO NOT OPEN PACKAGES OR HANDLE EXCEPT AT A STATIC-FREE WORKSTATION

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