SENSEnuts GUI User Guide

Contents

1. Introduction

SENSEnuts GUI is a program that runs on Windows Operating System. It is used to program the SENSEnuts Radio Modules as well as display the data received from the network made up of sensor motes.

The GUI is a collection of three separate programs, performing a separate function, namely Device Programmer, SenseLive and Print Window. When we start the GUI, the default program that opens is Device Programmer.

Device Programmer, as the name suggests, is a tool to program the SENSEnuts nodes according to the algorithm written in C language using Eclipse IDE. It also enables the user to read the MAC address of the node connected to the system at the USB port.

SenseLive, is a graphical environment that displays the data which it receives from the network. It features two separate sections, one to display the latest data coming from the motes and the other to create a database of all the messages received from all the motes which can be saved and analyzed.

Print Window, allows the motes to display some custom messages on the GUI.

2. Device Programmer

Device programmer is a tool to program the motes. When a code written to implement an algorithm or an application on SENSEnuts platform is compiled, it generates a binary (.bin) file. Device Programmer uses this .bin file to flash the motes. The tool also enables the user to view the MAC address of the device connected with the PC. The options available on the GUI are explained in the next few sections.

2.1 Browse

This button enables the user to locate and select the .bin file to be programmed saved on the hard disk.

2.2 Download

This button initiates the flashing of the mote connected with the computer with the help of USB cable and SENSEnuts Gateway

2.3 Verify

If this checkbox is selected, the tool compares the file flashed on the device and the file present on the hard disk and verifies if the flashing operation went through without any error.

2.4 Re-Verify

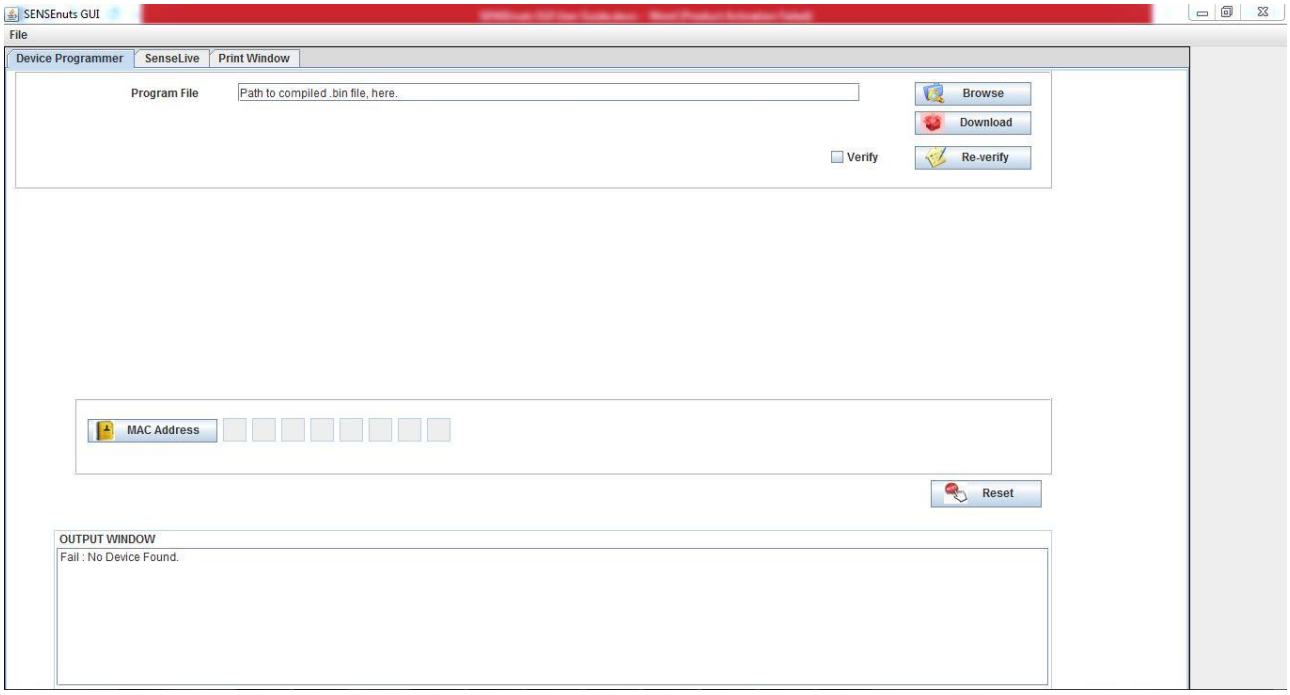
This button allows the user to compare the .bin file already present on the mote and the file selected using “Browse” button. This particular option can be used to check if the mote at hand is programmed according to the algorithm written.

2.5 MAC Address

This option, when clicked, prints the MAC address of the mote attached with the PC with a USB cable and the SENSEnuts Gateway

2.6 Reset

This option resets the Radio Module connected with the system if any point of time, manual reset is required.



Device Programmer

2.7 OUTPUT WINDOW

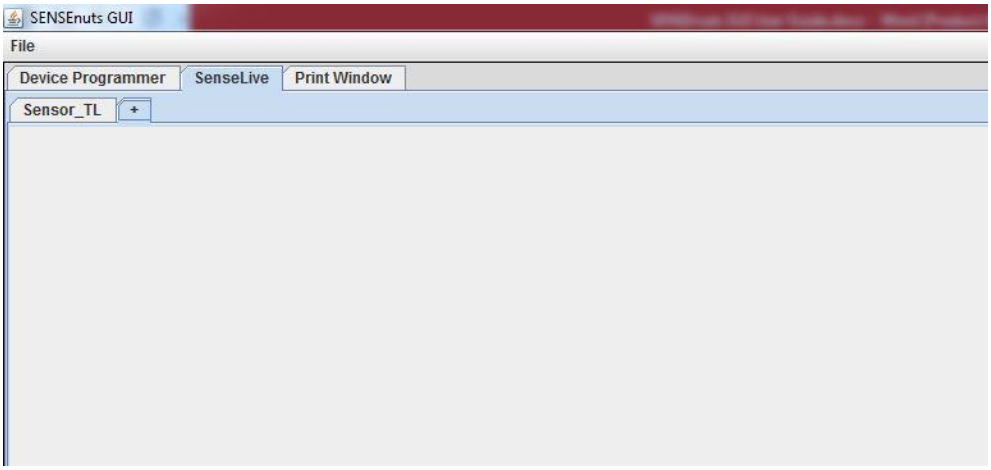
This section is used for debug messages, for example, if the device connected with the system is being detected by the Device Programmer or not.

3. SenseLive

SenseLive is a GUI which displays the data received from the network in an intuitive way. It displays the latest data received from all the motes in the network and creates a database of all the data received from the network. It also allows the user to create a new custom interface to receive the data from a custom sensor which is not a part of the SENSEnuts platform.

3.1 Default Screen

By default, SenseLive opens a blank screen. To view a window for a particular type of sensor module, click on the respective tab. For example, as shown in the figure, click on Sensor_TL to open a window for Sensor TL module.



SenseLive Default Window

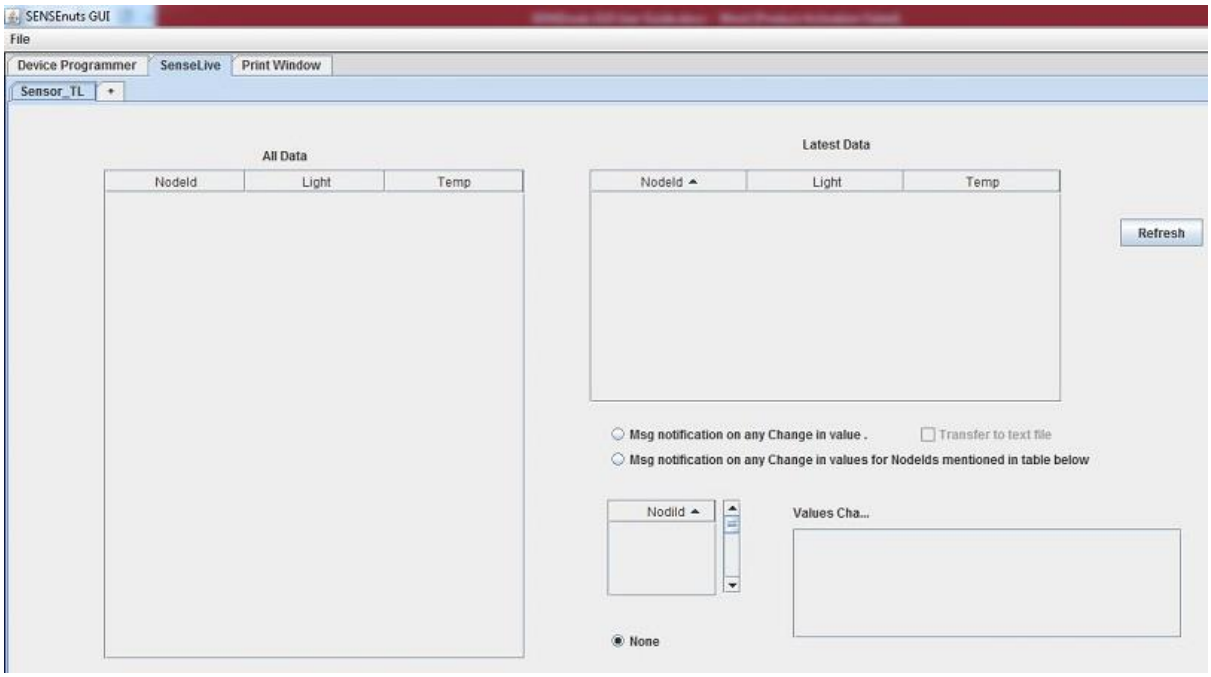
3.2 Sensor_TL

3.2.1 All Data

This section records all of the data received from all the motes in the network. It displays the Node ID, the temperature in “degree Celsius” and the light intensity in “lux”. This part of the window saves the data in SQL format. Hence the data can be analyzed later with the help of SQL queries.

3.2.2 Latest Data

This section displays the latest information received from the motes in the network. The format of the data displayed is same as the “All Data” section but this part does not create a database.



Sensor_TL Window

3.2.3 Refresh

This button clears the “All Data” and “Latest Data” from the GUI. Note that this operation just clears the section and has no effect on the database being created by the “All Data” section.

3.2.4 Msg notification on any Change in value

This is a radio button which when selected prints the value in “Value Change” window on the receipt of a packet from any mote in the network.

3.2.5 Msg notification on any Change in values for Node IDs mentioned in table below

This is again a radio button which when selected prints the value in “Value Change” window whenever there is a packet received from the node mentioned in “NodeID” table.

3.2.6 *None*

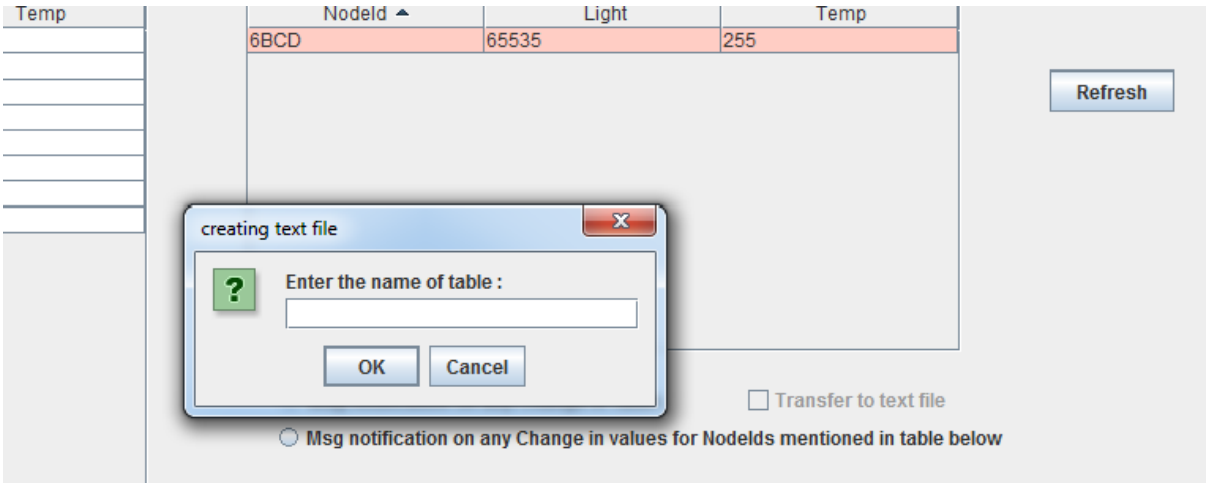
This is a radio button which, when selected, stops printing the messages in the "Value Change" window.

3.2.7 *Transfer to text file*

This is a checkbox option which, when selected transfers the contents of "Value Change" section into a text file.

3.2.8 *Saving the database in text*

When SENSEnuts GUI is closed, it will ask if the "All Data" section has to be saved in a text file. If the user want to save the data in text format, the name of the table has to be entered. After that press "Ok" and then click on "cancel". In case there are multiple tables to be stored, then multiple table names should be entered one by one by clicking on "Ok". For example, if the data of "Sensor_TL" has to be saved in a form of text file, then in the "Enter the name of table" field, "sensor_tl" must be entered.



Exiting SENSEnuts GUI

3.3 Creating a New Table

Sometimes there might be a requirement to create a new table to display some special data, for example, data from a custom sensor which is not a part of SENSEnuts platform. SENSEnuts provides a way in which data from the new sensor can be displayed on the GUI without a need of writing a program to create new custom GUI. Following are the steps to create a new table in SenseLive:

i. Click on "+" adjacent to "Sensor_TL"

ii. Enter the Table Name to give the name to the new table. For example, *my_table*

iii. Choose the number of columns to be present in the table. For example there are two columns in Sensor_TL section (excluding Node ID column which has not to be specified here as well). Let there be two data columns needed from two sensors which has to be displayed on *my_table*, then the number of columns will be two.

iv. Mention the "Message Type" which the table is supposed to receive. It must be same which the mote connected with the PC would define the header of the packet. Let it be 0x60 for *my_table*

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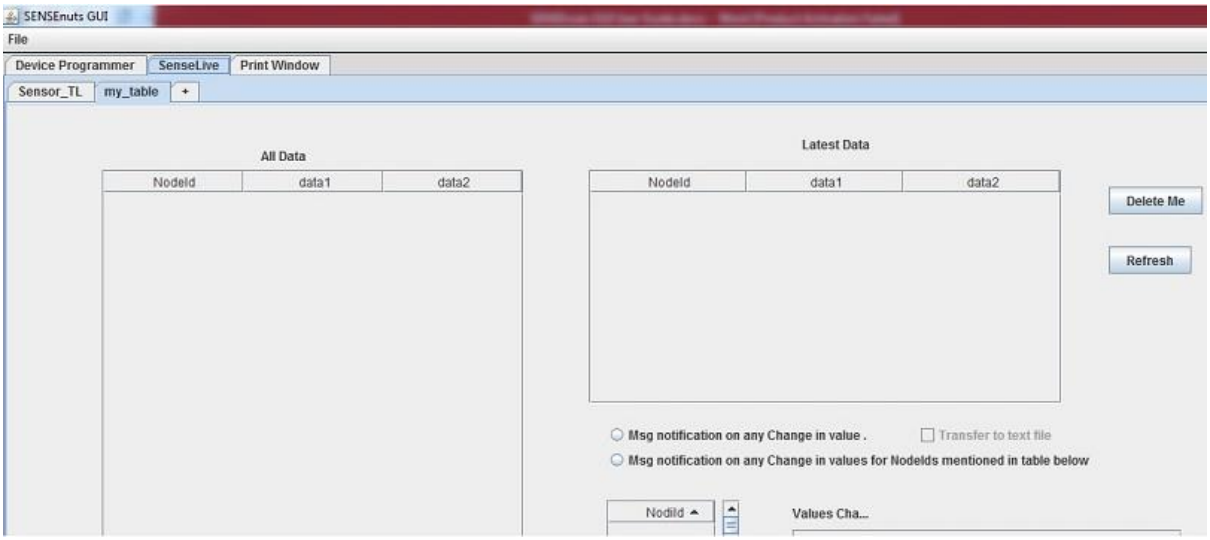
Entering details to create a new table

v. Mention the name of the columns and select the data type that they will receive from the mote. In this example, the columns are named data1 and data2 with corresponding data types as INT and FLOAT. Clicking on "Submit" will create a new tab with the name as specified in "Table Name" entry. In this case, a table with the name *my_table* is created as shown in the image.



4. Print Window

Print Window is the section where the print messages sent by the motes are printed. These can be used for debugging purpose. The options available in the Tool are explained in further sections.

4.1 Text Area

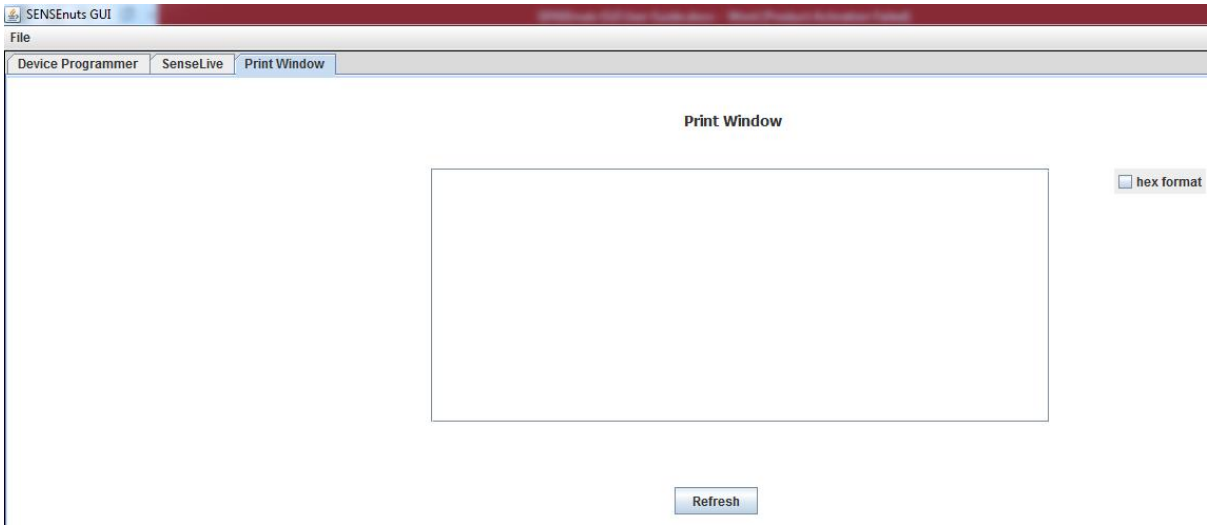
This is the section where the messages are printed.

4.2 Refresh

This will clear all the text in the “Text Area”.

4.3 hex format

This will print the incoming messages in hex format instead of a string.



Print Window

Revision History

Version	Date	Comments
5.0	30.01.2015	Fifth Release

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