

## **Introduction**

The present document describes the Graphical User Interface (GUI) that allows to initialize and control the EVAL-L9945 evaluation board by changing parameters through the SPI protocol, manage the parallel input with PWM or GPIO and enable the device.

The L9945 GUI has been developed using Labview and it uses, as microcontroller interface, the SPC563M-DISP Discovery+ evaluation board.

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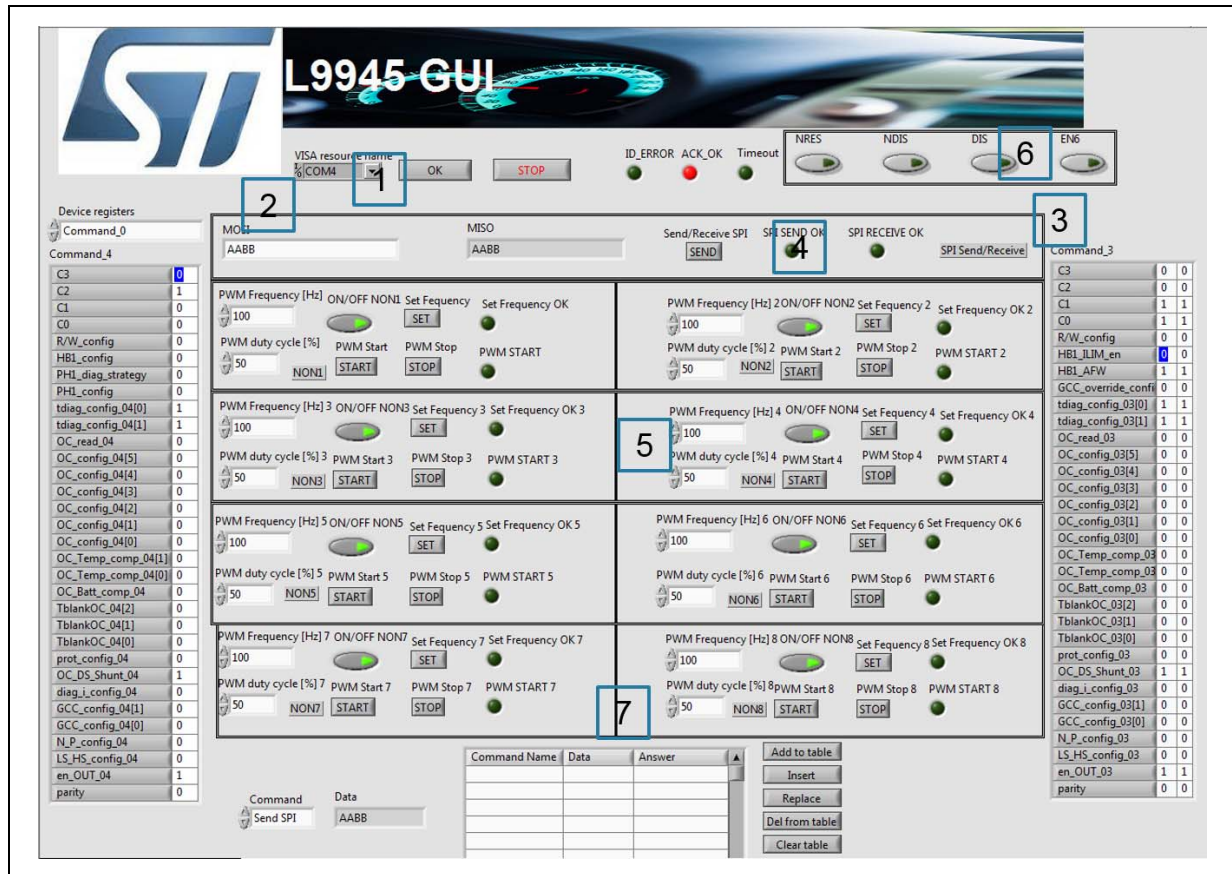
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# 1 Graphical User Interface description

The L9945 GUI is made up by seven fields:

Figure 1. GUI interface description



1. **Com Port Setup:** through this menu you select the microcontroller com port.
2. **MOSI:** through this menu you can select the specific device register and setup its required value.
3. **MISO:** through this menu you can read the SDO register of the device.
4. **SPI Send/Receive:** pushing the [SEND] button, it is possible:
  - Sending the SPI command configured in the MOSI menu (menu 2)
  - Sending an SPI command manually written in the MOSI field
  - Reading the device answer MISO. The two LED, SPI SEND OK and SPI RECEIVE OK are used to give feedback on the SPI communication (Green led means communication is OK)
5. **PWM/GPIO control of parallel command:** through this menu it is possible setup the Frequency and the Duty cycle of eight PWMs (NON1...NON8). By pushing the [START] button, the PWMs start, by pushing the [STOP] button the PWMs are stopped. Before sending a PWM, the selected Frequency must be confirmed by pushing the

[SET] button. Pushing the ON/OFF button it is possible to control manually the state of parallel output.

6. **NRES, NDIS, DIS and EN6 GPIO control:** with these buttons it is possible to control the status of the related signal. In order to let L9945 properly work NRES should be asserted, NDIS should be asserted, DIS should be un-asserted and EN6 asserted if you need to use OUT6 output.
7. **Table:** this table can be used to schedule a set of command to be sent to L9945 in terms of: SPI read/write. It's possible to setup up to 100 lines of command, save it and reload. The command will be discharged to the  $\mu$ C and executed in real time, after the execution the results will be sent back to GUI.

## 2 Running procedure

The Start sequence is the following:

1. Configuring the COM port
2. Pressing "OK"
3. Disabling the Communication Check (CC) using the following SPI configuration:  
A2AAAAD4 that corresponds to Command10 with n\_config\_cc=1 and config\_CC=0  
and other bit at the default state.

### 3      **Labview driver installation guide**

The L9945 GUI can be used standalone without a Labview license, but installing the free Runtime Engine for Labview 2016, following the below link:

<http://www.ni.com/download/labview-run-time-engine-2016/6066/en/>

and the VISA Runtime 16, following the below link:

<http://www.ni.com/download/ni-visa-run-16.0/6184/en/>

## 4 How to load general purpose FW on SPC56M-Discovery

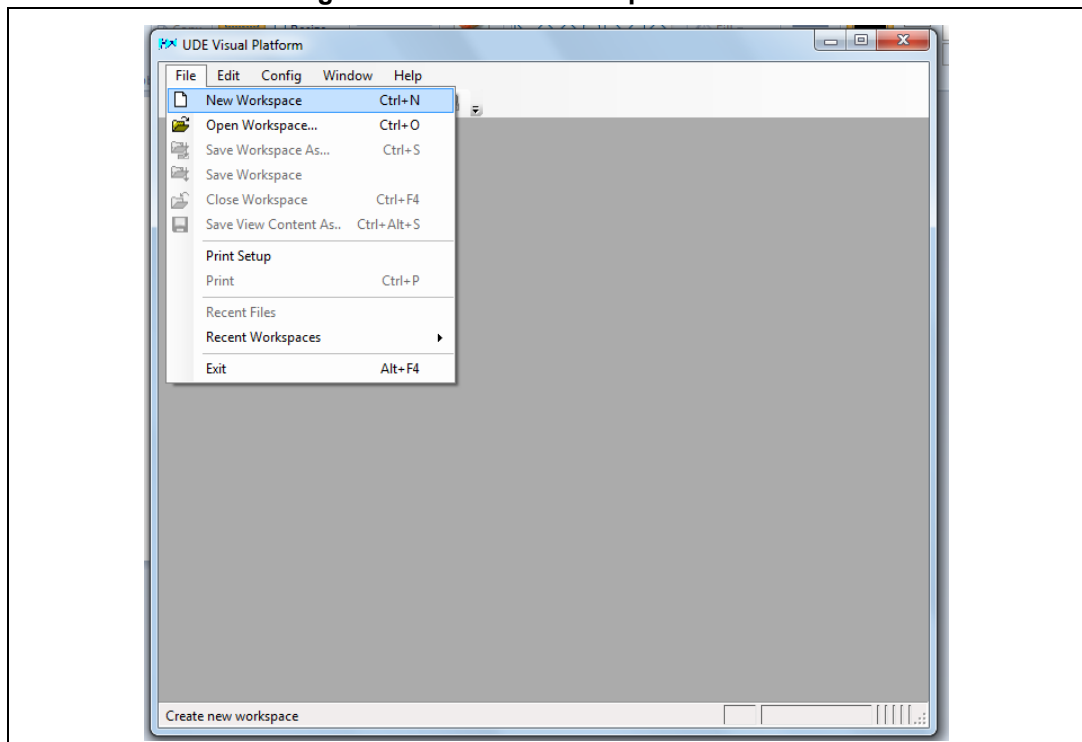
To use the L9945 GUI the discovery board SPC56M-Discovery+ must be programmed with the dedicated Firmware (L9945\_GUIV1.0.elf). This is the procedure to program the SPC56M-Discovery+ using the ST toolchain based on SPC5-UDEDEBG

1. Start UDE Visual Platform 4.0.



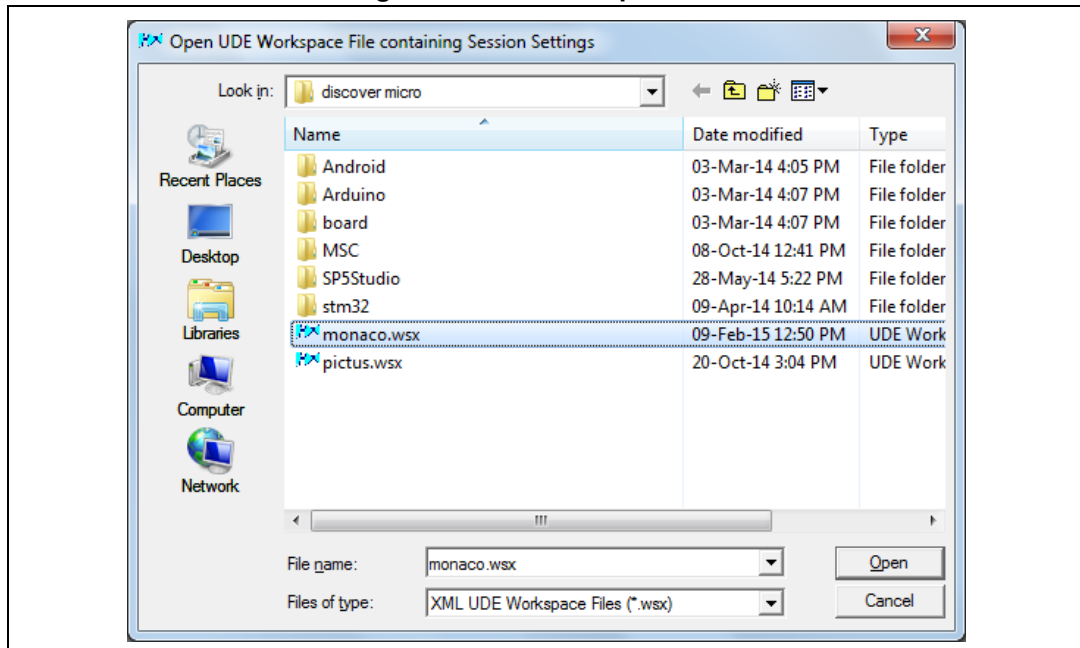
2. If not yet done, create a New Workspace for SPC56M. Click File>New Workspace.

**Figure 2. UDE: New Workspace creation**

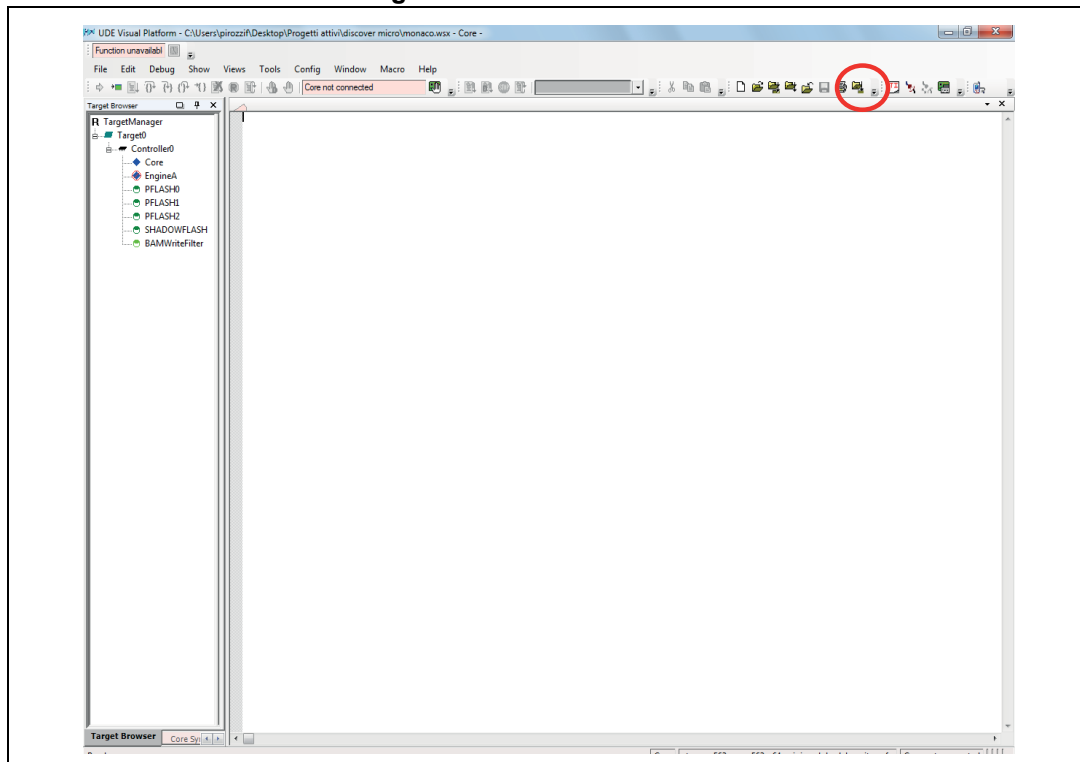


3. Name the new Workspace i.e. *Monaco* and select OPEN.



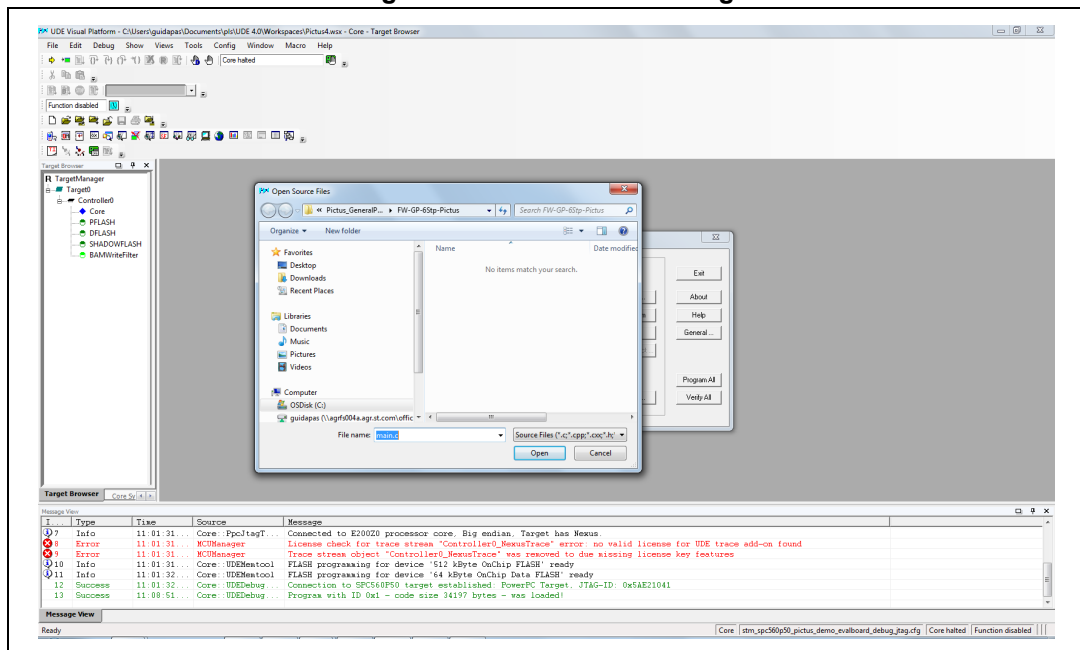
**Figure 3. UDE: workspace load**

4. UDE Visual Platform 4.0 will be refreshed and new functionalities will appear, then click on “Load Program” (or File/LoadProgramm).

**Figure 4. UDE: main window**

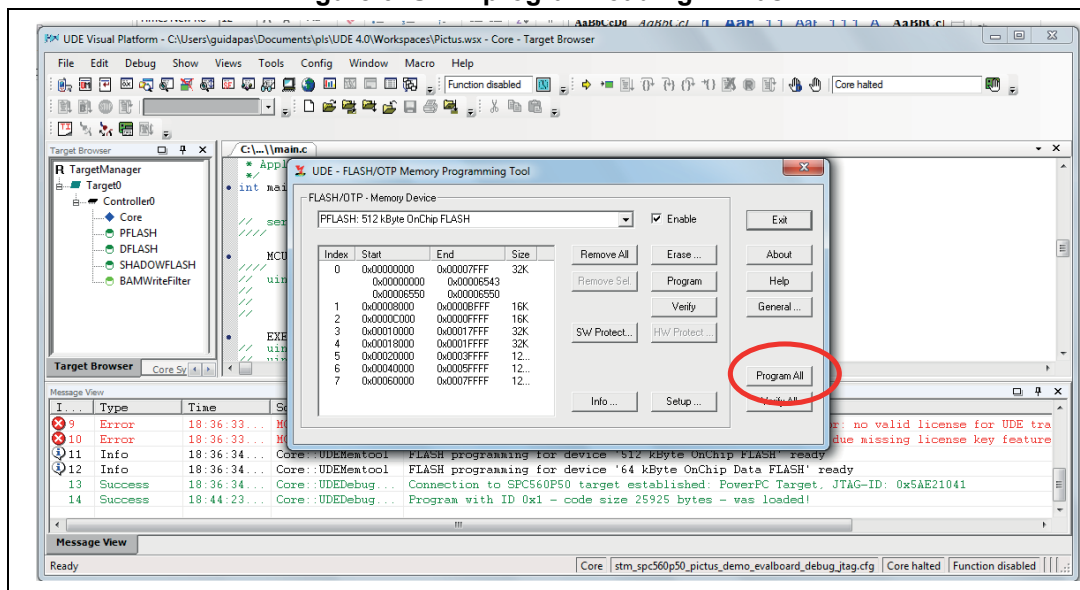
5. Browse the file “L9945\_GUIV1.0.elf “ and click “Open”.
6. In the next windows click on “Cancel”.

Figure 5. UDE: .elf file loading



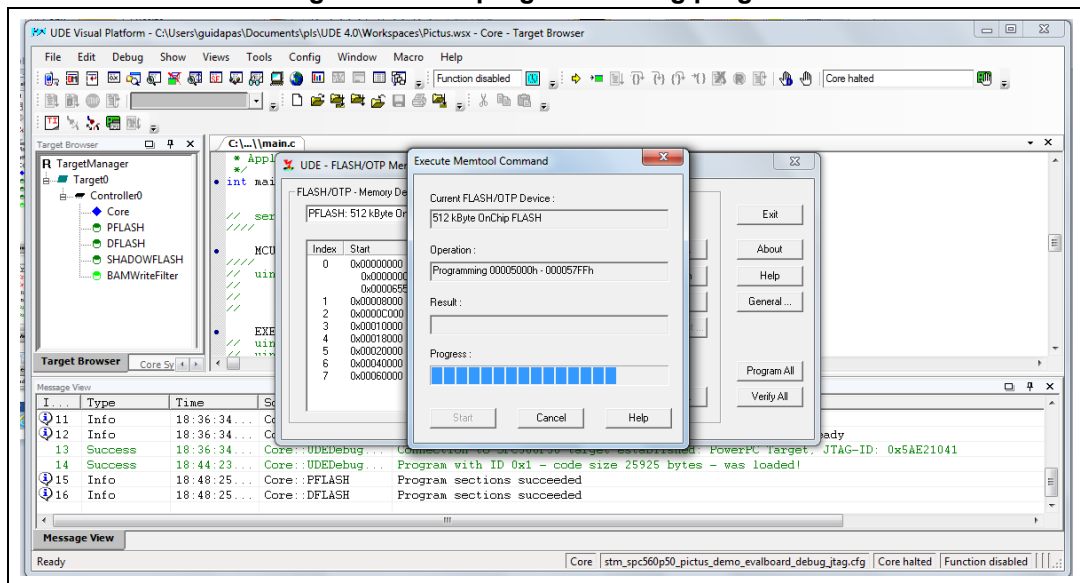
7. Then click on "Program All".

Figure 6. UDE: program loading in Flash



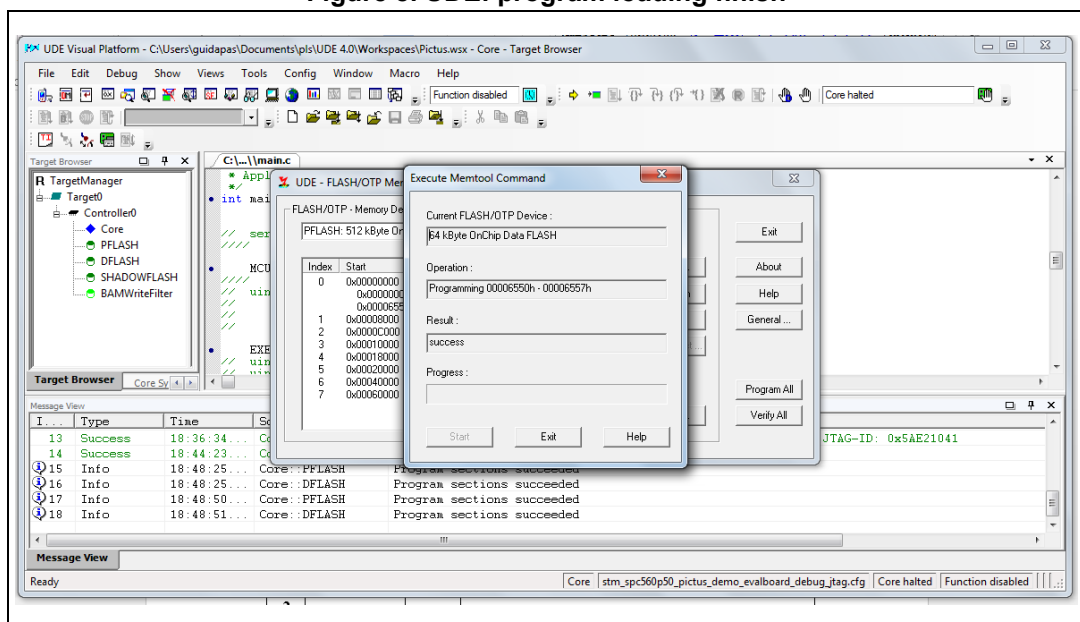
8. The UDE Visual Platform 4.0. will start to load the program.

Figure 7. UDE: program loading progress



9. When the procedure is terminated click on “Exit” on all windows.

Figure 8. UDE: program loading finish



10. When the procedure is terminated click on “Exit” on all windows and close UDE Visual Platform 4.0. The SPC56M-Discovery is ready to be used with the Graphical User Interface (GUI) for L9945.
11. In order to connect to microcontroller board an RS232 cable is needed. In case your PC has not COM port an adapter (i.e. USB-RS232) is needed. For the correct installation please refer to the documentation of the adapter. The cable has to be connected to the COM0 port of SPC56M-Discovery.

## 5 Revision history

Table 1. Document revision history

Date	Revision	Changes
02-Oct-2017	1	Initial release.

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