

UM2296 User manual

EVAL-L9945 Graphical User Interface

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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1 Graphical User Interface description

The L9945 GUI is made up by seven fields:

3 MISO SPI RECEIVE OK Send/Receive SPI AABB AABB SPI Send/Recei PWM Frequency [Hz] ON/OFF NON1 Set Fequency ncy [Hz] 2 ON/OFF NON2 Set Fequency 2 Set Frequency OK 2 PWM Fr 2 100 100 SET PWM duty cycle [%] PWM Start PWM duty cycle [%] 2 pWM Start 2 PWM Stop PWM Stop 2 PWM START PWM START 2 50 NON1 START STOP 50 NON2 START STOP PWM Frequency [Hz] 3 ON/OFF NON3 Set Fed WM Frequency [Hz] 4 ON/OFF NON4 Set Fequency 4 Set Frequency OK 4 tdiag_config_04[1] OC_read_04 ag_config_03[1] _read_03 100 SET SET C_config_04[5] C_config_04[4] C_config_04[3] PWM duty cycle [%] 3 PWM Start 3 WM duty cycle [%] 4 PWM Start 4 PWM Stop 3 PWM START 3 PWM START 4 STOP STOP NON3 START NON4 START PWM Frequency [Hz] 6 ON/OFF NON6 Set Fequency 6 Set Frequency OK 6 PWM Frequency [Hz] 5 ON/OFF NON5 Set Fequency 5 Set Frequency OK 5 SET SET PWM duty cycle [%] 5 pWM Start 5 PWM duty cycle [%] 6 pWM Start 6 PWM Stop 5 PWM START 5 Temp_comp_04[0] PWM Stop 6 PWM START 6 50 NON5 START STOP NON6 START STOP PWM Frequency [Hz] 7 ON/OFF NON7 Set Fequency 7 Set Frequency OK 7 PWM Frequency [Hz] 8 ON/OFF NON8 Set Fequency 8 Set Frequency OK 8 rot_config_04 SET 100 PWM duty cycle [%] 7 pwm Start 7 PWM duty cycle [%] 8pWM Start 8 PWM Stop 8 PWM START 8 50 NON7 START STOP 50 NON8 START STOP LS_HS_config_03 en_OUT_03 Command Name Data Send SPI AABB

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

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- [SET] button. Pushing the ON/OFF button it is possible to control manually the state of parallel output.
- 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 μ C and executed in real time, after the execution the results will be sent back to GUI.



Running procedure UM2296

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: A2AAAD4 that corresponds to Command10with 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.

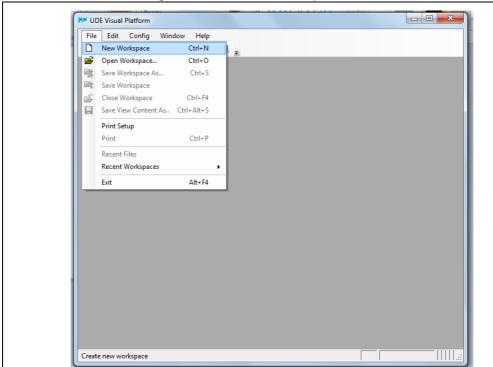


Figure 2. UDE: New Workspace creation

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



M Open UDE Workspace File containing Session Settings Look in: discover micro ← <a>E <a>E</ Name Date modified Android 03-Mar-14 4:05 PM File folder cent Places Arduino 03-Mar-14 4:07 PM File folder board 03-Mar-14 4:07 PM File folder MSC 08-Oct-14 12:41 PM File folder SP5Studio 28-May-14 5:22 PM File folder 09-Apr-14 10:14 AM File folder stm32 monaco.wsx 09-Feb-15 12:50 PM UDE Work pictus.wsx 20-Oct-14 3:04 PM UDE Work Computer <u>O</u>pen File name: monaco.wsx XML UDE Workspace Files (*.wsx) Files of type: ▾

Figure 3. UDE: workspace load

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

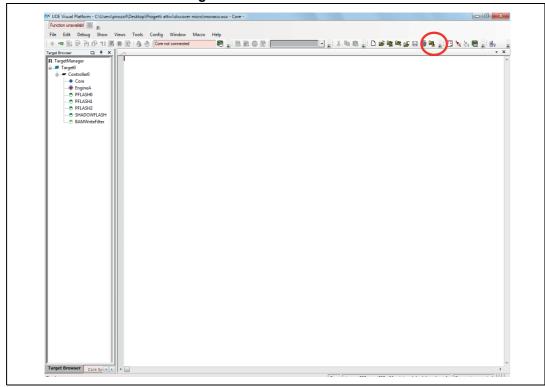


Figure 4. UDE: main window

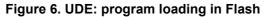
- 5. Browse the file "L9945_GUIV1.0.elf" and click "Open".
- 6. In the next windows click on "Cancel".

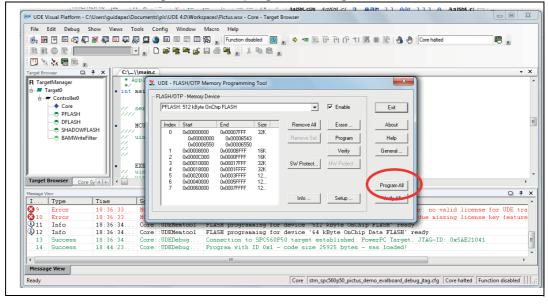


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Figure 5. UDE: .elf file loading

7. Then click on "Program All".





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



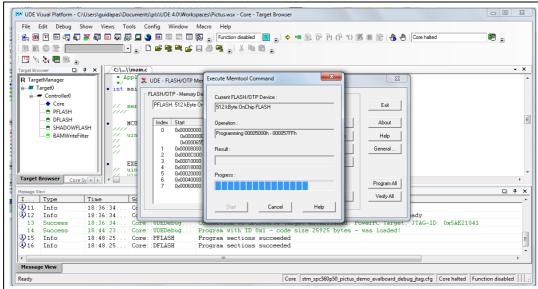


Figure 7. UDE: program loading progress

When the procedure is terminated click on "Exit" on all windows.

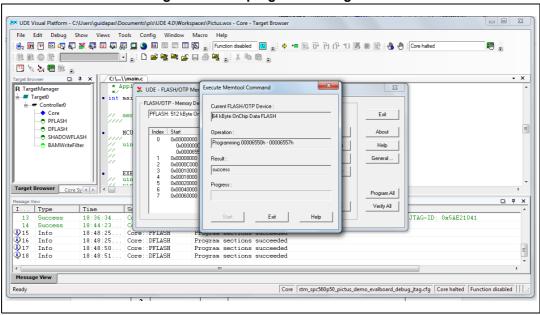


Figure 8. UDE: program loading finish

- 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.



Revision history UM2296

5 Revision history

Table 1. Document revision history

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

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