

EVAL-L9942 Graphical User Interface

Introduction

This document describes the Graphical User Interface (GUI) to initiate and control the EVAL-L9942 (Stepper Motor Driver application boards for L9942). The GUI allows to modify the parameters through the SPI protocol, to manage the enable, DIR pins and generate the pulse signal.



Figure 1. EVAL-L9942: Graphical User Interface (GUI)

The L9942 GUI has been developed by using Labview[®] and it must be used with the EVAL-L9942 evaluation board in conjunction to the SPC56P-Discovery evaluation board SPC560P-DISP.

Contents

1	Graphical User Interface description4
2	Running procedure
	2.1 Running procedure using PWM
	2.2 Running procedure using step clock
3	SPC560P-DISP and EVAL-L9942 connection
4	SPC560P-DISP jumper configuration
5	SPC56P-Discovery USB drivers installation guide
6	Labview driver installation guide 14
7	How to load the FW on SPC56P-DISP
Appendix	A Document reference 19
Revision	history



List of figures

EVAL-L9942: Graphical User Interface (GUI)1
GUI, fields description
SPC560P-DISP
SPC560P-DISP – 4 x 36 Connector, pin "A-17"
SPC560P-DISP – 4 x 36 Connector, pins connected to EVAL-L9942
EVAL-L9942 and SPC560P-DISP9
EVAL-L9942 and SPC560P-DISP plugged9
InstallPIsUsbJtagDriver.bat11
SPC560P-DISP – USB port
Device Manager
Computer management
PLS USB JTAG Adapter for SPCxxx A & B 12
PLS USB JTAG adapter property 13
COM port
New Workspace for SPC56P-DISP (part 1) 15
New Workspace for SPC56P-DISP (part 2) 15
STM Pictus Evaluation Board with SPC560P50 (SPC5 UDE/STK)16
UDE Visual Platform 4.0 (part 1) 16
UDE Visual Platform 4.0 (part 2) 17
UDE Visual Platform 4.0 (part 3) 17
UDE Visual Platform 4.0 (part 4)



1 Graphical User Interface description

The L9942 GUI includes eight fields:

9942-v1.1.0.vi Edit Operate Tools Window Ŷ ٠ _9942 GUI GUI Help 2 HW Help REG_ 3 SPI Send/Receive 4 MISC d/Receive SPI SPI SEND OK SPI RECEIVE OK SEND CLR CLR TSD PWM UV HSB2 HSB1 PWM Freq Set Frequency O 10 SET LSB2 LSB1 HSA2 HSA2 **PWM START** 3 50 START GPIO EN ON/OFF EN write Ok end Pul-10 10 10 OK 0 6 ID ERROR ACK OK Timeout SPC56P-Discovery GUI v1.1.0

Figure 2. GUI, fields description

- 1. Com Port Setup: this menu allows to select the COM port.
- 2. **SDI:** through this menu it is possible to select the specific device register and program the bits
- 3. **SDO:** through this menu it is possible to read the device SDO register.
- 4. SPI Send/Receive: in this area, pushing the [SEND] button, it is possible to send the SPI command configured in the SDI menu(menu #2) or directly send an SPI command manually and then send the command programmed in the MOSI field. In the same menu it is possible to read the SPI message from the device (MISO). The two LEDs, SPI SEND OK and SPI RECEIVE OK show the status of the SPI communication. If the LED is turned ON the communication is established and the data is transferred properly.
- 5. **PWM:** through this menu it is possible to enable the PWM generator. The PWM frequency as well as the duty cycle is programmable.
- 6. **GPIO:** through this menu it is possible to manage the **Pulse Generator** setting the number of pulses, the Ton and Toff. After pushing the [OK] button, the configured number of pulses is generated. In this menu it is possible to Enable /Disable the device.
- 7. HELP: through this menu it is possible to download the GUI, the HW help and the



L9942 datasheet.

8. **CLOSE:** push this button to stop the execution of the GUI.



2 Running procedure

2.1 Running procedure using PWM

Here below there is a list of commands the user must follow to drive the EVAL-L9942 using the GUI and PWM generator:

- 1. Configure the COM port
- 2. Press "OK"
- 3. To enable the Device (EN), press the "EN ON/OFF" button in field #6. If the communication has been established, and the command have been sent properly, the led "SEND ENABLE OK" is turned ON (red). The led D1, on the EVAL-L9942, is turned ON as well.
- 4. Write the desired value of the SPI in the field #2
- 5. Press "SEND" in the field #4. If the communication has been established, and the command has been sent properly, the LED "SPI SEND OK" is turned ON (red color). The led "SPI RECEIVE OK" is turned ON if the answer from the device has been properly received.
- 6. In field #3 it is possible to read the answer from the device in bit format; in field #4 SDI and SDO data are shown (expressed in hex).
- 7. In field #6, set the Pulse Number the Ton [us] and Toff [us].
- 8. In field #6 press "OK" [Send Pulse], if the set values are correct and comply with the characteristics of the motor it will start for the set pulses.
- 9. When the set number of Pulse are completed, the motor stop.
- 10. The button "STOP" on the top side of the GUI stops the execution of Labview program
- 11. Press [x] on the right top side to close the window.
- Note: To use the Step Generator a bridge between A21 and A22 must be made (for reference see EVAL-L9942 HW Manual see Section Appendix A: Document reference)

2.2 Running procedure using step clock

Here below there is a list of commands the user must follow to drive the EVAL-L9942 using the GUI and Step Clock generator:

- 1. Configure the COM port
- 2. Press "OK"
- 3. To enable the Device (EN), press the "EN ON/OFF" button in field #6. If the communication has been established, and the command have been sent properly, the led "SEND ENABLE OK" is turned ON (red). The led D1, on the EVAL-L9942, is turned ON as well.
- 4. Write the desired value of the SPI in the field #2
- 5. Press "SEND" in the field #4. If the communication has been established, and the command has been sent properly, the LED "SPI SEND OK" is turned ON (red color). The led "SPI RECEIVE OK" is turned ON if the answer from the device has been properly received.
- 6. In field #3 it is possible to read the answer from the device in bit format; in field #4 SDI



and SDO data are shown (expressed in hex).

- 7. In field #6, set the Pulse Number the Ton [us] and Toff [us].
- 8. In field #6 press "OK" [Send Pulse], if the set values are correct and comply with the characteristics of the motor it will start for the set pulses.
- 9. When the set number of Pulse are completed, the motor stop.
- 10. The button "STOP" on the top side of the GUI stops the execution of Labview program
- 11. Press [x] on the right top side to close the window.
- Note: To use the Step Generator a bridge between A21 and A22 must be made (for reference see EVAL-L9942 HW Manual see Section Appendix A: Document reference)



SPC560P-DISP board has a connector 4 x 37 pin 100 mils where the EVAL-L9942 must be plugged. The user must pay attention to plug the EVAL-L9942 in the right position; *Figure 4:* SPC560P-DISP – 4 x 36 Connector, pin "A-17" and *Figure 5:* SPC560P-DISP – 4 x 36 Connector, pins connected to EVAL-L9942 show how to identify the pins.



Figure 3. SPC560P-DISP

Figure 4. SPC560P-DISP – 4 x 36 Connector, pin "A-17"



Figure 5. SPC560P-DISP – 4 x 36 Connector, pins connected to EVAL-L9942





DocID028317 Rev 2



Figure 6. EVAL-L9942 and SPC560P-DISP

Figure 7. EVAL-L9942 and SPC560P-DISP plugged





4 SPC560P-DISP jumper configuration

The following jumper setup for SPC560P-DISP are recommended when using the EVAL-L9942 evaluation board with EVAL-L9942 Graphical User Interface:

Jumper name	Туре	Configuration
JP3	-	OPEN
JP4	-	UART=MCU LIN0
JP5	-	UART=MCU LIN0
JP7	-	A
JP8	-	A
JP9	-	A
JP10	-	ON
JP11	-	Master (Verso C42)
JP12	-	5 V or 3,3 V depending on the V_{CC} used for L9942
JP13	-	OPEN
JP14	-	OPEN
JP15	-	L
JP16	-	L
JP17	-	L
JP18	-	OPEN
JP19	-	ON
JP20	-	ON
JP21	-	ON
JP22	-	OPEN
JP23	-	OPEN
JP24	-	5 V or 3,3 V depending on the V_{CC} used for L9942
JP25	-	OPEN
JP26	-	OPEN

Table 1. SPC560P-DISP jumper configuration



5 SPC56P-Discovery USB drivers installation guide

If the USB drivers are already installed, it is suggested to uninstall them and then follow the instructions reported below.

The USB connection provides the operating voltage to supply the board (no external PSU to supply the SPC560P-DISP is needed).

1. Disconnect the USB from SPC56P-DISP board and then open the folder "JtagUsbDriver".



2. Right click on "InstallPIsUsbJtagDriver.bat" and then select "Run as administrator"



Figure 8. InstallPIsUsbJtagDriver.bat

3. Once the installation is completed, connect the USB cable to the SPC56P-DISP board: the USB drivers are installed.



Figure 9. SPC560P-DISP – USB port

4. From "Start" Menu, right click on "Computer" and select "Manage".



	gano non 2000 managon
Proty year Proty yea	B B B B B B B D D D
	GAPG0709151217RI

Figure 10 Device Manager

5. Once the computer management popup appears, select Device Manager from the System Tools menu.



Figure 11. Computer management

6. Expand the item Universal Serial Bus controllers: the item "PLS USB JTAG Adapter for SPC5xxx A" and "PLS USB JTAG Adapter for SPC5xxx B" appears.



Figure 12. PLS USB JTAG Adapter for SPCxxx A & B

To enable the COM port, right click on "PLS USB JTAG Adapter for SPC5xxx B" (only 7. this post) and then click on "Properties". A new window pops up: select the tab



"Advanced" then flag the "LOAD VCP" (Virtual COM Port) box. This item should be already flagged, leave it as it is.

	USB ITAG Adapter for SPCSxxx B Properties	
	eneral Advanced Dever Details	
	PLS USB JTAG Adapter for SPC5000 B	
	Configuration	
×	Use these settings to override normal device behaviour.	
inu da		
	5 - Selective Suppend	

40 DI CLICD ITAC .

- 8. Click OK button to continue.
- 9. Disconnect the USB cable from the SPC56P-DISP and reconnect it.
- 10. A COM port is detected and a new driver automatically installed. From the Device Manager window check the new COM port available.



Figure 14. COM port

- 11. The COM port is now available on the SPC56P-DISP and the USB on the board can be used for serial communication with the PC.
- Note: Once the USB cable is connected, either at points 3 or 9 of the procedure above, should Windows not automatically install the drivers, the manual installation is still possible using the path "...\JtagUsbDriver\driver".



6 Labview driver installation guide

The L9942 GUI can be used Stand Alone, without a Labview license, by installing the free Runtime Engine for Labview 2013 and the VISA Runtime 5.4.



7 How to load the FW on SPC56P-DISP

In order to use the L9942 GUI the SPC560P-DISP must be programmed with a dedicated Firmware (named "GP-Pictus.elf").

- 1. Start UDE Visual Platform 4.0x.
- 2. Create a new Workspace for SPC56P-DISP. Click File>New Workspace



3. Name the new Workspace i.e. Pictus then select OPEN



4. Select "STM Pictus Evaluation Board with SPC560P50 (SPC5 UDE/STK)" then click OK



_			-
WM UDE Visua	al Platform		
File Edit	Config Window Help		-
1 : 🗅 🗃 🖗			
	Select Target Configuration		
	Last Used Browse		
	Folder to browse :		
	C:\Users\guidapas\Documents\pls\UDE 4.0\Targets\	▼	
	Additional Filter: Chinese Boards	▼	
	Files in folder :	Show descriptions	
	STM Bolero Demo Evaluation Board with SPC560B40 (SPC5 UDE.	/STK)	
	STM Bolero Demo Evaluation Board with SPC560860 (SPC5 UDE) STM Monaco Demo Evaluation Board with SPC563M64 (SPC5 UD	/STK) DE/STK)	
	STM Pictus Demo Evaluation Board with SPC560P50 (SPC5 UDE) STM Pictus Demo Evaluation Board with SPC56AP60 Dual Core ((SPC5 UDE/STK)	
	STM Pictus Demo Evaluation Board with SPC56AP60, Single Core	(SPC5 UDE/STK)	
	Default New Copy Edit	Remove	
		·	
	ок	Cancel Help	
		GAPG07091	51347BI
		0/11 00/09/1	

Figure 17. STM Pictus Evaluation Board with SPC560P50 (SPC5 UDE/STK)

5. UDE Visual Platform 4.0 is refreshed and new functionalities available.



		803
: 🕪 🔟 🕂 🖂 ญ (st w sta co sta to the the state of the stat	
: I I I 🖤 II 📗		
i 🛄 🐜 🗞 🐻 🎰	-	
Target Browser 0	9 4 × C:\\main.c	
R TargetManager		
e- Target0	SPCS HAL - Copyright (C) 2013 STRICTORIECTTONICS	
e	Licensed under the Apache License, Version 2.0 (the "License");	
- Core	you may not use this file except in compliance with the License.	
- PFLASH	You may obtain a copy of the License at	
DELASH	http://www.apache.org/licenses/LICENSE-2.0	
- SHADOV	The set of the second s	
C RANAWA	distributed under the Tissues is distributed on a "AC IC" DISTS	
	Primpr III ulaticuted under the ficence is distributed on all NO IO DNOID.	
	Without VAREANTIES OR CONDITIONS OF ANY KIND, either express or inplied.	
	TITHOUT VARANTIES OR CONDITIONS OF ANY KIND, either express or inplied. See the License for the specific language governing permissions and	
	<pre>uinter uinter a second and a second a secon</pre>	
	UTHOUT WERANTIES OF CANDITORS OF APP KIND, either express or inplied. See the License for the specific language governing persissions and limitations under the License.	
	<pre>unre utilities on constraints of ANY KIND _ either express or inplact. See the license for the specific language governing permissions and limitations under the license /* Inclusion of the main header files of all the inported components in the under constraint of in the sublicities utilities that is component in the sublicent of the sublicities of all the incorted components in the sublicent constraint of the sublicent of</pre>	
Target Browser	TITHOUT VAREAUTIES OF CONDITIONS OF ANY KIND, wither express or inplied. See the licenses for the specific language governing persissions and limitations under the License. Inclusion of the main header files of all the imported components in the mesy that	
Target Browser Co	information of the name beder files of all the inported components in the monor of the name beder files of all the inported components in the	
Target Browser Co	Time Source Message	<u> </u>
Target Browser Co Message View I Type Q 8 Info	Without VaRANTIES CR CONDITIONS OF ANY KIND. either express or inplied. See the License for the specific language governing permissions and limitations under the License. * Inclusion of the nain header files of all the inported components in the massive state of the specific limit to the speci	- ?
Target Browser Ca Message Vew I Type 38 Info 39 Error	Inclusion of the main bester files of all the imported components in the mersynthe Time Source Message Message Message Listing Concerted to E20020 processor core. Big endian, Target has Mesus 18 36:33 KCUManager License check for trace stream "Controller", Message error: so valid	C P
Target Browser Q Message View I Type Q 8 Info Q 9 Error 210 Error	Time Source Message 18 36:33 Come: PpollagT Comescience for chapter of the state of the component of the optimized of the component of the state of	□ ₹ license for UDE tr license key featur
Target Browser C	Time Source Message 7 ine Source Message 18 36:33 Core: PpollagT Connected to E20020 processor core. Big endian. Target has Mesus. 18 36:33 KCUManager Trace streak offs trace streak offs. Controller0_MesuFace" earow to waiting the start of the provided to E20020 processor core. Big endian. Target has Mesus. 18 36:33 KCUManager Trace streak offs trace streak offs. Controller0_MesuFace" earow to de missing 18 36:33 KCUManager Trace streak offs trace streak offs. Controller0_MesuFace" earow to de missing	icense for UDE tr license key featur
Target Browser G Message View I Type Ø 8 Info Ø 9 Error Ø 10 Error Ø 11 Info Ø 12 Info	Time Villed VaRANTIES CR CONDITIONS OF ANY KIND. either express or includ. See the License for the specific language governing permissions and limitations under the License. Inclusion of the nain header files of all the inported components in the Under Grant the License. Inclusion of the nain header files of all the inported components in the Under Grant the License. Image: All the state of the state of the state of the state of the state of the	C) ? license for VDE tr license key featur
Target Browser Q Message Vew I I Type Q.8 Info 9 Error Q10 Error Q11 Info 13 Succese	wine WinNorth VARANTIES CR CONDITIONS OF ANY KIND. wither expression inplued. See the Licenses for the specific language governing permissions and limitations under the License. * * * Inclusion of the main header files of all the imported components in the order constilled in the application mission m	E P license for UDE tr license key featur AE21041
Target Browser Target Browser Thesage Ver Thesage Ver	Willing	icense for UDE tr license key featur AE21041
Target Browser Message Verr	Without VaRANTIES CR CONDITIONS OF ANY KIND. wither sources of inplied. See the License for the specific language governing permissions and limitations under the License. Inclusion of the nain header files of all the inported components in the	License for UDE tr License key featur AE21041
Target Browser Co Measge Ver M. T. Type 0.0 Error 0.10 Error 0.11 Info 1.3 Success 4 Hessage Ver Ready	Inclusion of the nain beader files of all the inported components in the model of the nain beader files of all the inported components in the model of the nain beader files of all the inported components in the model of the nain beader files of all the inported components in the model of the nain beader files of all the inported components in the model of the nain beader files of all the inported components in the model of the nain beader files of all the inported components in the model of the nain beader files of all the inported components in the model of the nain beader files of all the inported components in the model of the nain beader files of all the inported components in the model of the nain beader files of all the inported components in the model of the nain beader files of all the inported components in the model of the nain beader files of all the inported components in the model of the nain beader files of all the inported components in the model of the nain beader files of all the inported components in the model of the nain beader files of all the inported components in the model of the nain beader files of the inported components in the model of the nain beader files of the inported components in the inported component in the inported component in the inported components in the inported component in the inported component in the inported components in the inported components in the inported components in the inported component in t	License for UDE tr License key featur AE21041

6. Click on "Load Program", browse to find the file "GP-Pictus.elf ", click "Open" and in the next windows click on the button "Program All"





Figure 19. UDE Visual Platform 4.0 (part 2)

7. The procedure starts and its status is shown in a new window.

Figure 20. UDE Visual Platform 4.0 (part 3)



8. When the procedure is terminated click on "Exit" on all windows. The program procedure is finished and the SPC56P-DISP is ready to be used with the Graphical User Interface (GUI) for L9942.





Figure 21. UDE Visual Platform 4.0 (part 4)



Appendix A Document reference

- EVAL-L9942 (UM1707, DocID025691)



Revision history

Date	Revision	Changes
24-Sep-2015	1	Initial release.
		Updated Figure 1: EVAL-L9942: Graphical User Interface (GUI) and Figure 2: GUI, fields description.
11-May-2016	2	Added Section 2.1: Running procedure using PWM and Section 2.2: Running procedure using step clock. Added Section 4: SPC560P-DISP jumper configuration.

Table 2. Document revision history



IMPORTANT NOTICE - PLEASE READ CAREFULLY

STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST's terms and conditions of sale in place at the time of order acknowledgement.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of Purchasers' products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2016 STMicroelectronics - All rights reserved



DocID028317 Rev 2