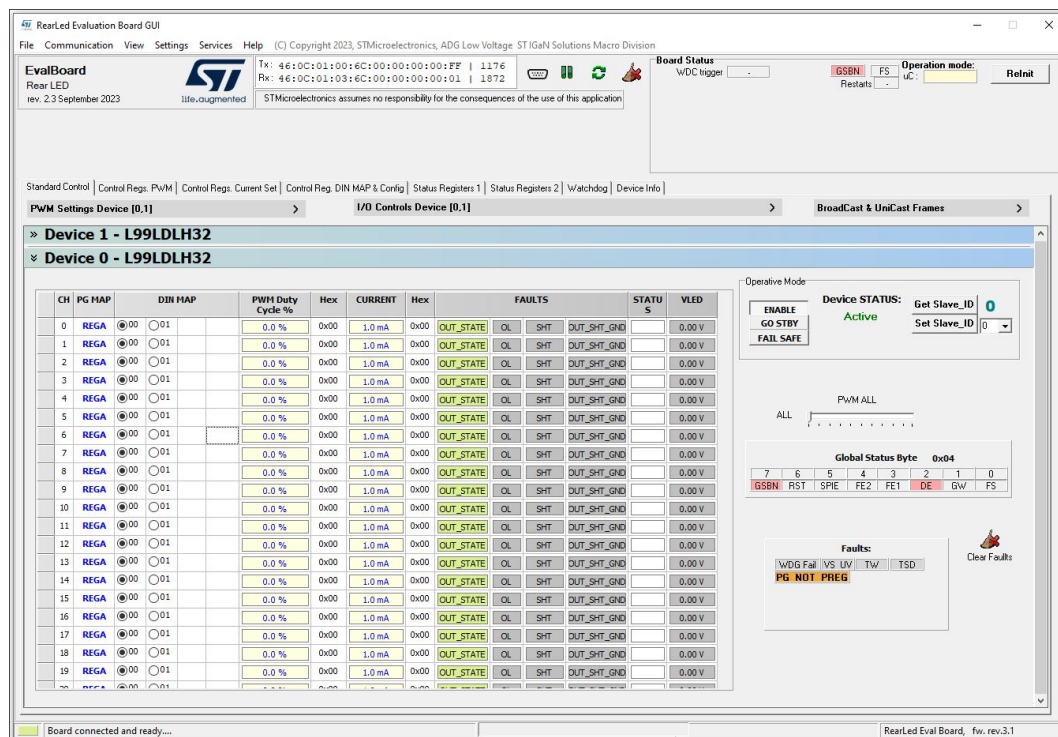


Graphical user interface (GUI) for EV-L99LDLH32GEN

Introduction

The STSW-EVLDLH32GEN is the graphical user interface (GUI) dedicated to set and control the L99LDLH32 device assembled in the corresponding evaluation board EV-L99LDLH32GEN. The STSW-EVLDLH32GEN has been developed by using Visual Studio/C sharp and it works with the board EVAL-SPC582B programmed with a dedicated firmware.

Figure 1. STSW-EVLDLH32GEN graphical user interface



1 Get software

Search on www.st.com, STSW-EVLDLH32GEN and in the “Tools & Software” section. To get the software (GUI + Firmware) follow the procedure below.

2 Software installation

2.1 Firmware

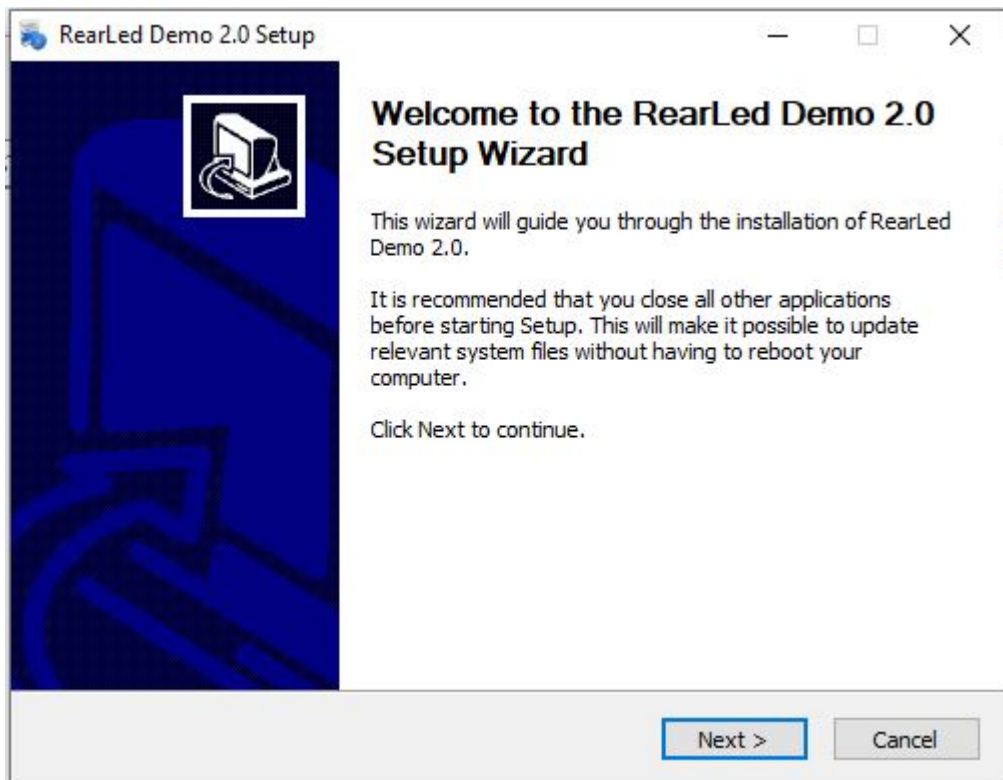
The board EVAL-SPC582B is programmed with a specific firmware.

2.2 GUI installation

The GUI installation has the following steps:

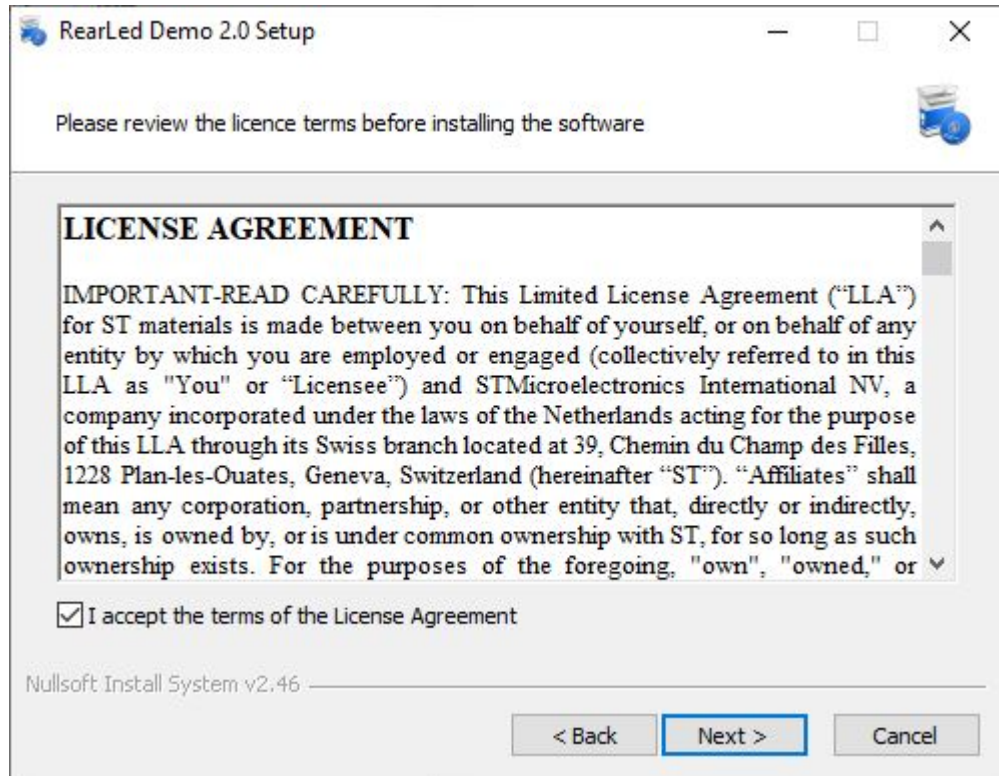
- Launch SetupRearLed.exe

Figure 2. Setup wizard



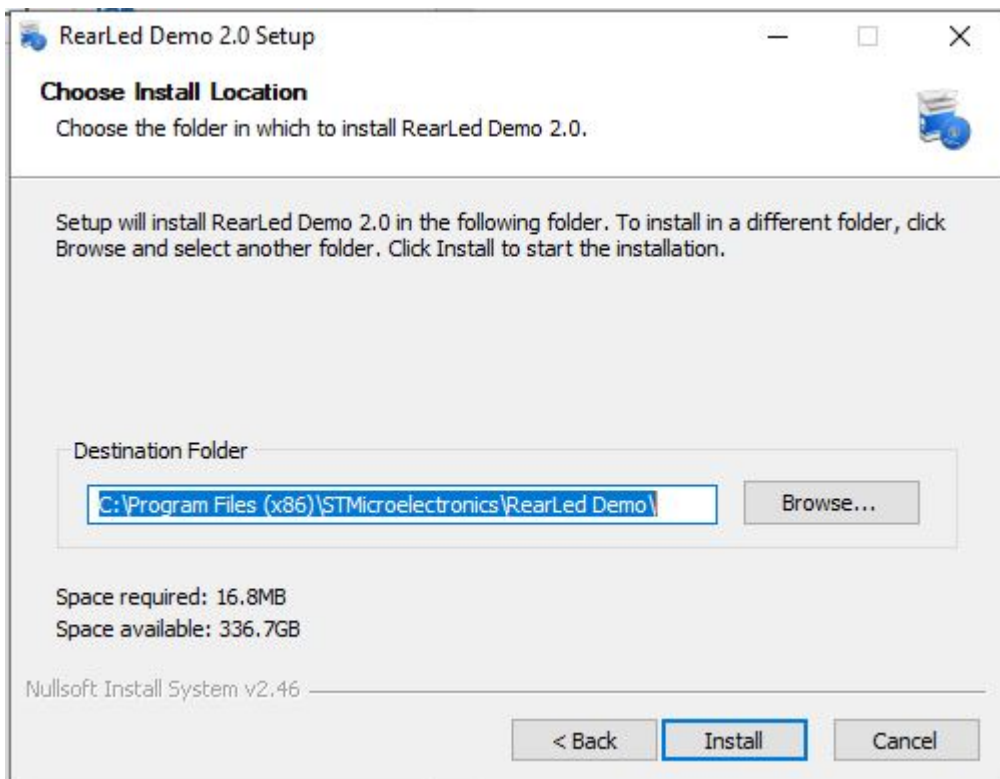
- Following step by step the wizard you are able to install the GUI RearLed. To continue the installation you have to accept the terms of the license agreement:

Figure 3. License agreement



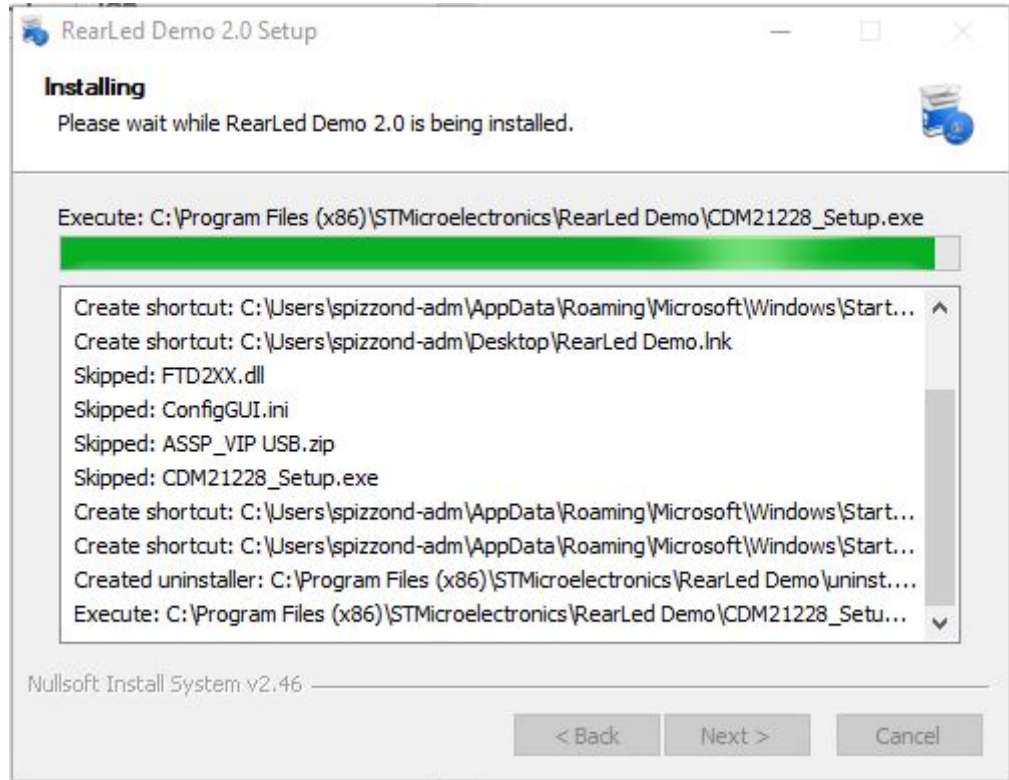
- Next you have to choose the installation folder:

Figure 4. Installation folder setup



- The installation continues till the end:

Figure 5. Copying files



- Before ending the installation, it is proposed to install FTDI drivers. Skip this step if you want to install them at a different time (drivers could be obtained from the [ftdichip website](http://ftdichip.com)) or if they are already installed.

Figure 6. FTDI installation (1/4)

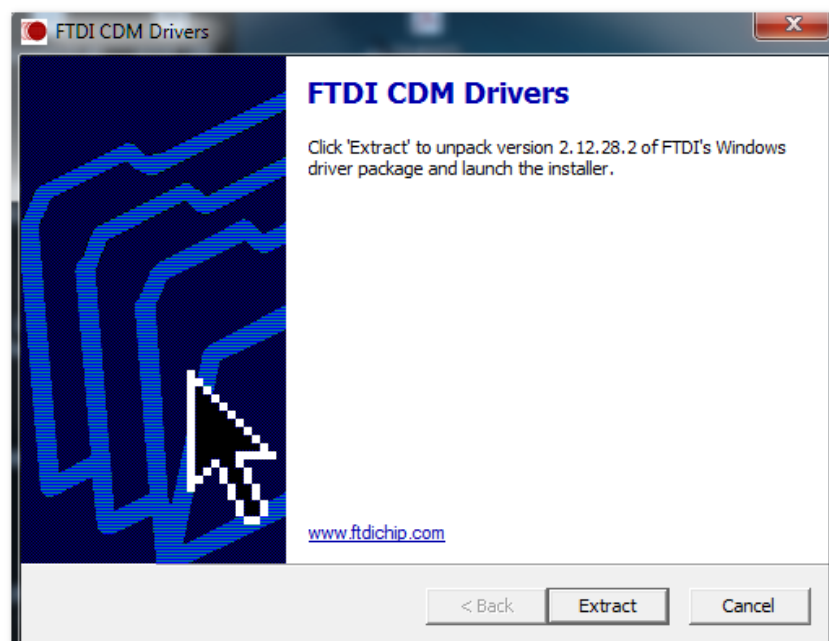


Figure 7. FTDI installation (2/4)

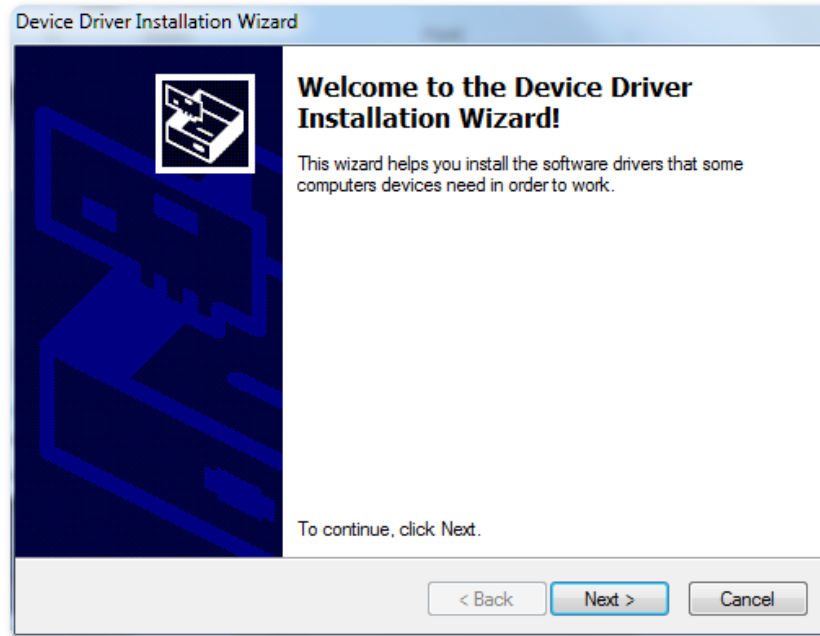
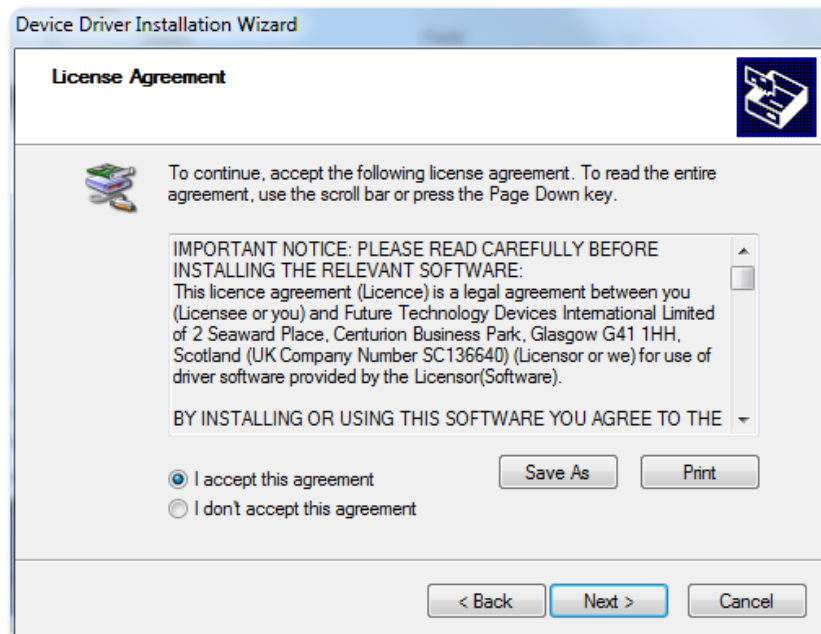
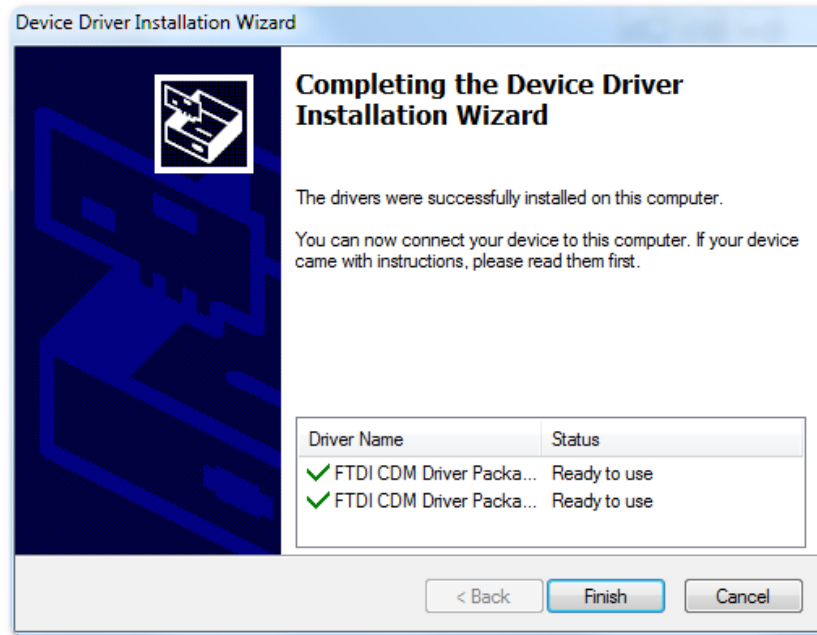


Figure 8. FTDI installation (3/4)



- To complete the FTDI installation the following dialog box is shown to confirm that the drivers were successfully installed.

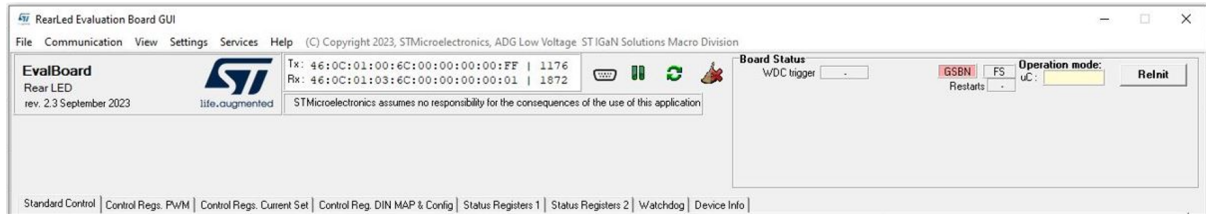
Figure 9. FTDI installation (4/4)



3 GUI description

The main form contains four tabs for device control.

Figure 10. Tabs for device control



It is also embedded the communication traffic monitor, showing communicated data between GUI and MCU.

3.1 Main menu

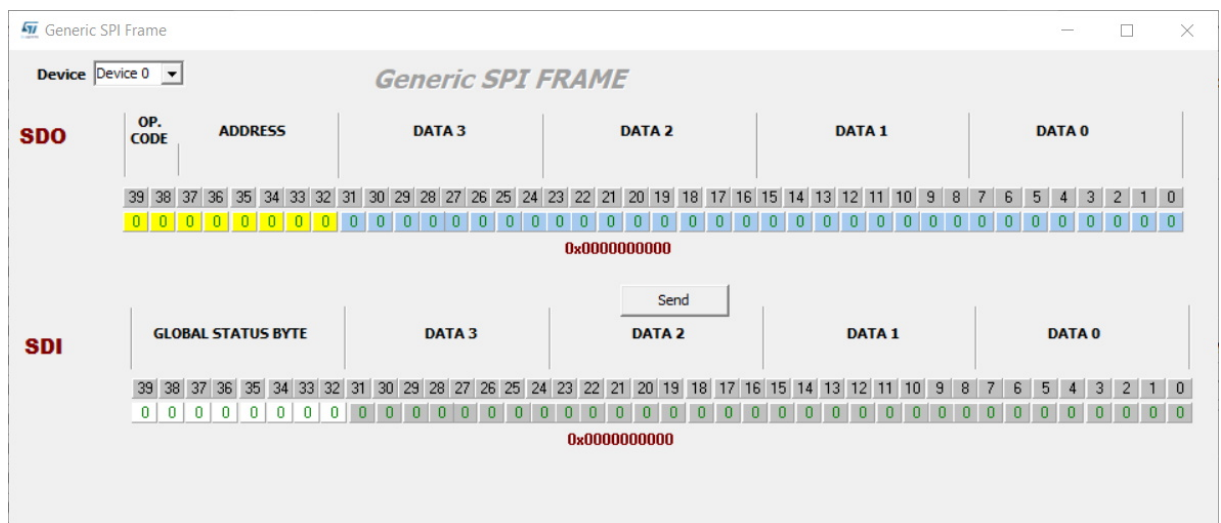
Figure 11. Main menu



It contains the following actions:

- Possibility to choose the communication interface
- View: SPI registers overview
- Settings: allow to configure periodical refresh of registers
- Service: generic SPI frame allows to send a customizable SPI frame to a specific device selected through a combo box

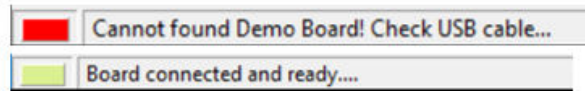
Figure 12. Generic SPI frame



3.2 Status strip

The icons show the interface status between FTDI and GUI.

Figure 13. Status strip

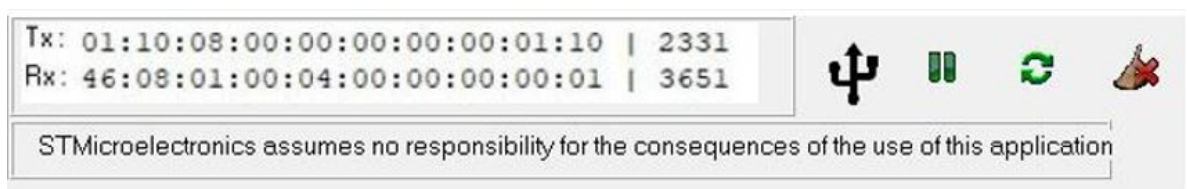







- board not connected
- normal application operation (communication between MCU and GUI correctly established)

3.3 Device diagnostic/communication

It shows SPI traffic detail (Tx and Rx).

Figure 14. Diagnostic/communication panel

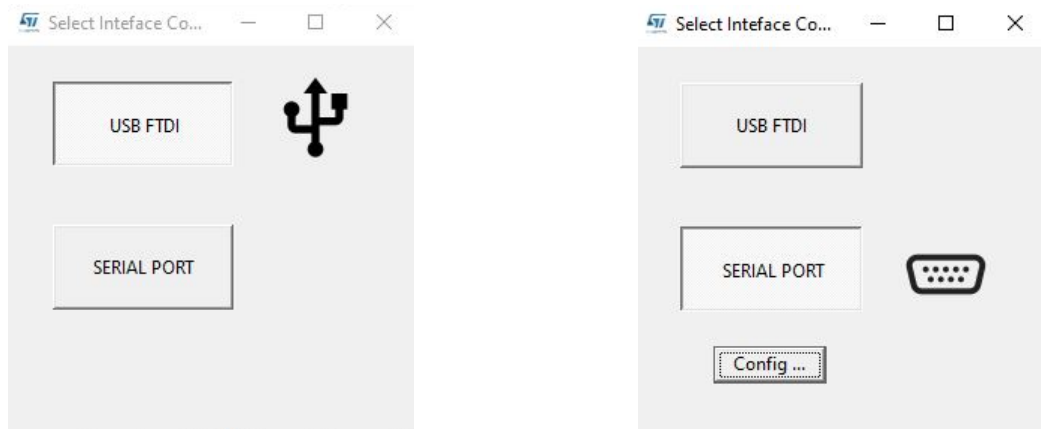


	Communication interface selection
	
	Enable/Disable periodical reading of status registers and GSB
	Refresh all registers (both control and status)
	Clear all status registers

Board status section shows the status of the device pin HWLO and DIAG.

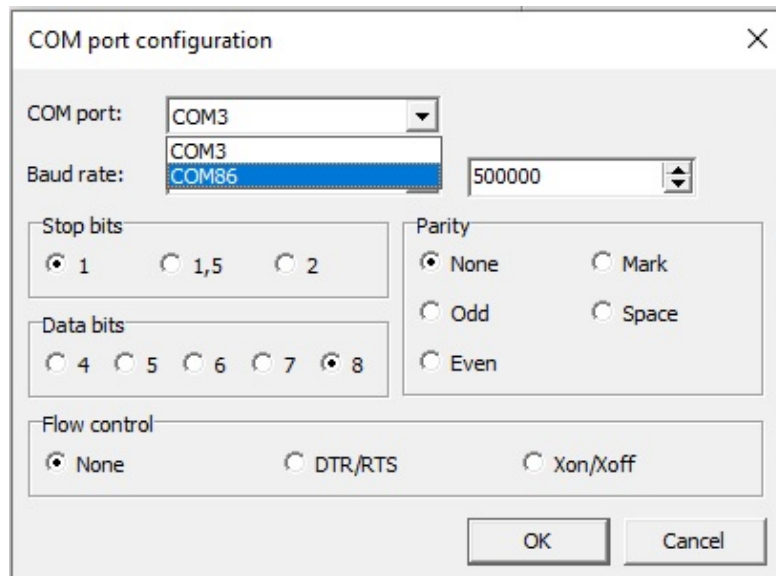
If you choose one of the two communication buttons, described before, an pop-up menu appears where you can choose the FTDI or the serial port communication.

Figure 15. Interface configuration



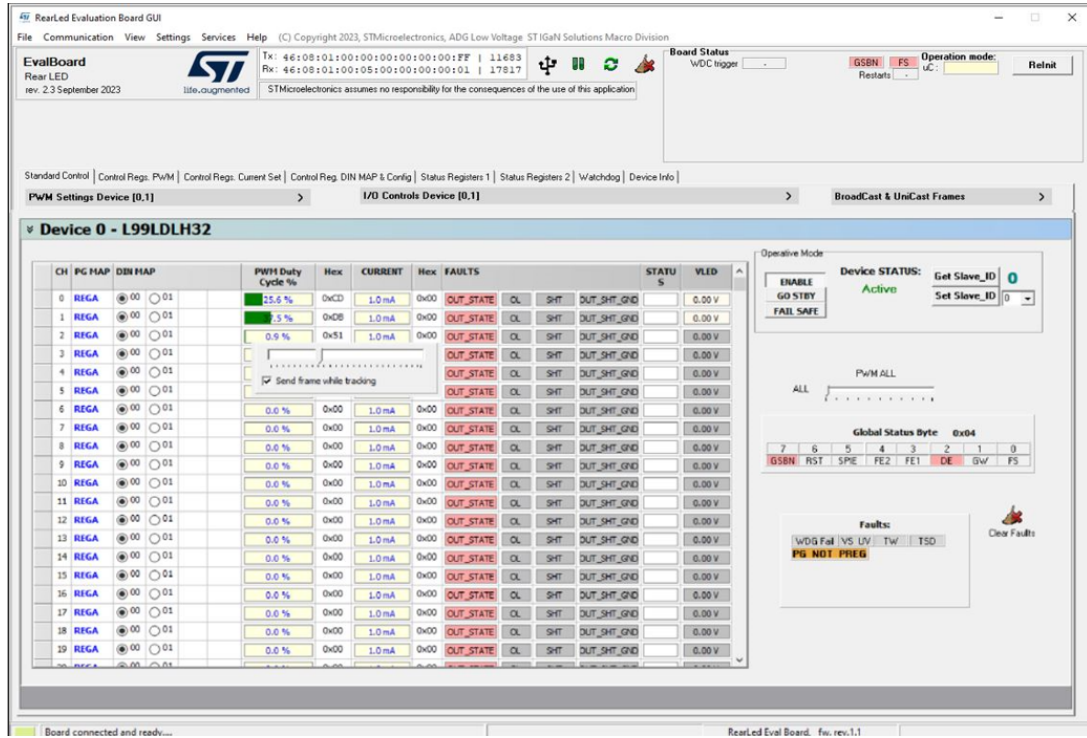
By choosing the serial port option, another pop-up appears to configure the com port. Closing all the pop-up the connection starts automatically.

Figure 16. Com port configuration



3.4 Standard control

Figure 17. Standard control



This main tab shows the main device features, giving the possibility to apply different device modes, enable HS gate, execute self-test, set different thresholds and select diagnostic data to be periodically read and displayed or stopped.

3.4.1 Device control panel

Figure 18. Device control panel

Device 0 - L99LDLH32													
CH	PG MAP	DIN MAP		PWM Duty Cycle %	Hex	CURRENT	Hex	FAULTS				STATUS	VLED
0	REGA	<input checked="" type="radio"/> 00	<input type="radio"/> 01	0.0 %	0x00	5.0 mA	0x49	OUT_STATE	OL	SHT	DUT_SHT_GND	<input type="checkbox"/>	0.00 V
1	REGA	<input checked="" type="radio"/> 00	<input type="radio"/> 01	0.0 %	0x00	5.0 mA	0x49	OUT_STATE	OL	SHT	DUT_SHT_GND	<input type="checkbox"/>	0.00 V
2	REGA	<input checked="" type="radio"/> 00	<input type="radio"/> 01	0.0 %	0x00	5.0 mA	0x49	OUT_STATE	OL	SHT	DUT_SHT_GND	<input type="checkbox"/>	0.00 V
3	REGA	<input checked="" type="radio"/> 00	<input type="radio"/> 01	0.0 %	0x00	5.0 mA	0x49	OUT_STATE	OL	SHT	DUT_SHT_GND	<input type="checkbox"/>	0.00 V
4	REGA	<input checked="" type="radio"/> 00	<input type="radio"/> 01	0.0 %	0x00	5.0 mA	0x49	OUT_STATE	OL	SHT	DUT_SHT_GND	<input type="checkbox"/>	0.00 V
5	REGA	<input checked="" type="radio"/> 00	<input type="radio"/> 01	0.0 %	0x00	5.0 mA	0x49	OUT_STATE	OL	SHT	DUT_SHT_GND	<input type="checkbox"/>	0.00 V
6	REGA	<input checked="" type="radio"/> 00	<input type="radio"/> 01	0.0 %	0x00	5.0 mA	0x49	OUT_STATE	OL	SHT	DUT_SHT_GND	<input type="checkbox"/>	0.00 V
7	REGA	<input checked="" type="radio"/> 00	<input type="radio"/> 01	0.0 %	0x00	5.0 mA	0x49	OUT_STATE	OL	SHT	DUT_SHT_GND	<input type="checkbox"/>	0.00 V
8	REGA	<input checked="" type="radio"/> 00	<input type="radio"/> 01	0.0 %	0x00	5.0 mA	0x49	OUT_STATE	OL	SHT	DUT_SHT_GND	<input type="checkbox"/>	0.00 V
9	REGA	<input checked="" type="radio"/> 00	<input type="radio"/> 01	0.0 %	0x00	5.0 mA	0x49	OUT_STATE	OL	SHT	DUT_SHT_GND	<input type="checkbox"/>	0.00 V
10	REGA	<input checked="" type="radio"/> 00	<input type="radio"/> 01	0.0 %	0x00	5.0 mA	0x49	OUT_STATE	OL	SHT	DUT_SHT_GND	<input type="checkbox"/>	0.00 V
11	REGA	<input checked="" type="radio"/> 00	<input type="radio"/> 01	0.0 %	0x00	5.0 mA	0x49	OUT_STATE	OL	SHT	DUT_SHT_GND	<input type="checkbox"/>	0.00 V
12	REGA	<input checked="" type="radio"/> 00	<input type="radio"/> 01	0.0 %	0x00	5.0 mA	0x49	OUT_STATE	OL	SHT	DUT_SHT_GND	<input type="checkbox"/>	0.00 V
13	REGA	<input checked="" type="radio"/> 00	<input type="radio"/> 01	0.0 %	0x00	5.0 mA	0x49	OUT_STATE	OL	SHT	DUT_SHT_GND	<input type="checkbox"/>	0.00 V
14	REGA	<input checked="" type="radio"/> 00	<input type="radio"/> 01	0.0 %	0x00	5.0 mA	0x49	OUT_STATE	OL	SHT	DUT_SHT_GND	<input type="checkbox"/>	0.00 V
15	REGA	<input checked="" type="radio"/> 00	<input type="radio"/> 01	0.0 %	0x00	5.0 mA	0x49	OUT_STATE	OL	SHT	DUT_SHT_GND	<input type="checkbox"/>	0.00 V
16	REGA	<input checked="" type="radio"/> 00	<input type="radio"/> 01	0.0 %	0x00	5.0 mA	0x49	OUT_STATE	OL	SHT	DUT_SHT_GND	<input type="checkbox"/>	0.00 V
17	REGA	<input checked="" type="radio"/> 00	<input type="radio"/> 01	0.0 %	0x00	5.0 mA	0x49	OUT_STATE	OL	SHT	DUT_SHT_GND	<input type="checkbox"/>	0.00 V
18	REGA	<input checked="" type="radio"/> 00	<input type="radio"/> 01	0.0 %	0x00	5.0 mA	0x49	OUT_STATE	OL	SHT	DUT_SHT_GND	<input type="checkbox"/>	0.00 V
19	REGA	<input checked="" type="radio"/> 00	<input type="radio"/> 01	0.0 %	0x00	5.0 mA	0x49	OUT_STATE	OL	SHT	DUT_SHT_GND	<input type="checkbox"/>	0.00 V

This table reports all the channels of the selected device. For each channel you can set:

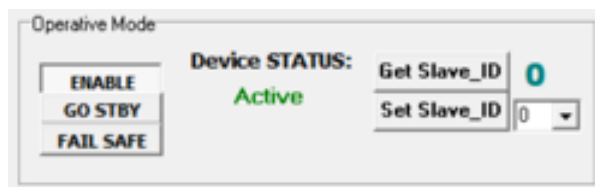
- DIN MAP
- Duty cycle
- Current

There is also diagnostic info:

- OL (Open load)
- SHT (Short to GND)
- SHT_VPRE (Short to VPre)
- VLED (V indication)

3.4.2 Operative mode

Figure 19. Operative mode



To change device status use buttons ENABLE, GO STBY and FAIL SAFE. The device ID is managed using the buttons Get or Set Slave_ID.

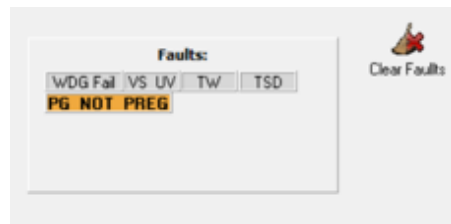
3.4.3 Global status byte

Here is reported the GSB value of the device:

Figure 20. Global status byte

Global Status Byte 0x04							
7	6	5	4	3	2	1	0
GSBN	RST	SPIE	FE2	FE1	DE	Gw	FS

Figure 21. Faults



Here are reported the device warnings/errors:

- WDG fail (watchdog error)
- VS UV (undervoltage)
- TW (thermal warning)
- TSD (thermal shutdown)
- PG_NOT PREG (power not good for pre-regulator)

3.4.4 Add/Remove device form

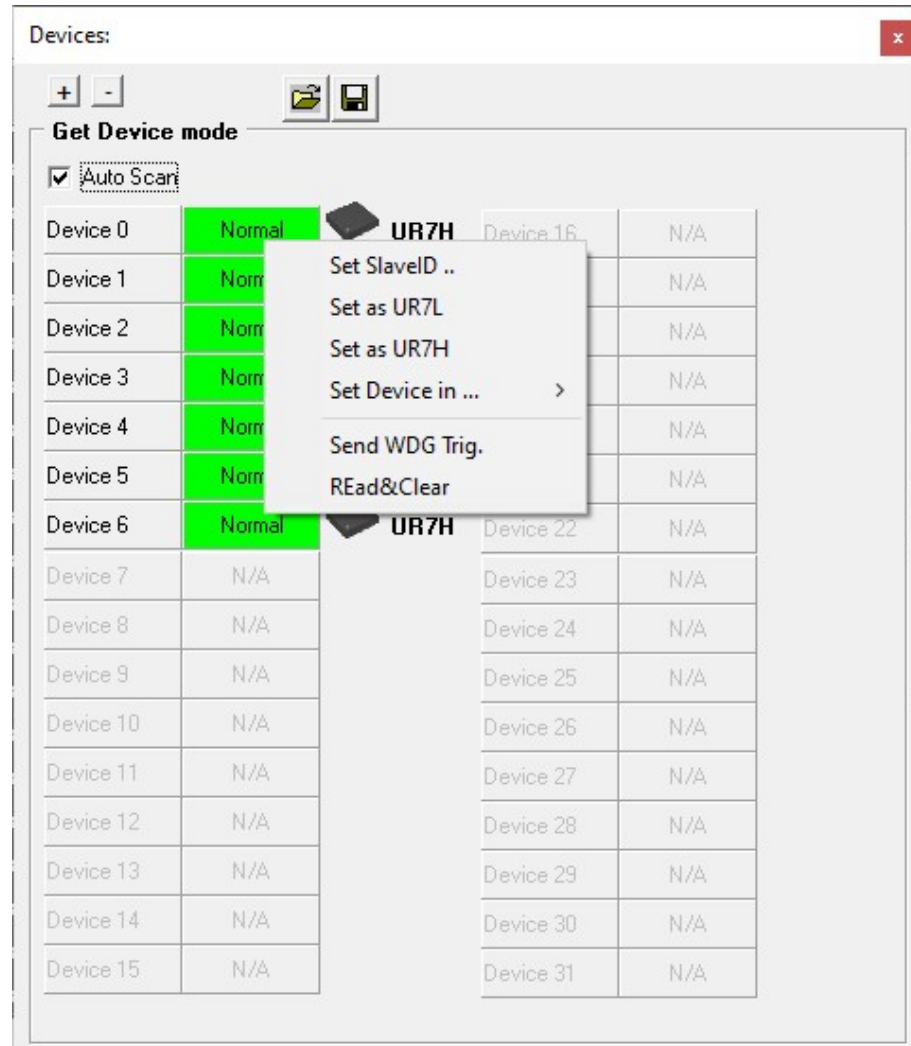
Figure 22. Add/Remove device form



- A new device can be added (+) or removed (-)
- Device status monitored until this checkbox "Autoscan" is checked
- Device status can be in 3 states:
 1. Green (normal mode)
 2. Red (failsafe mode)
 3. Yellow (standby mode)

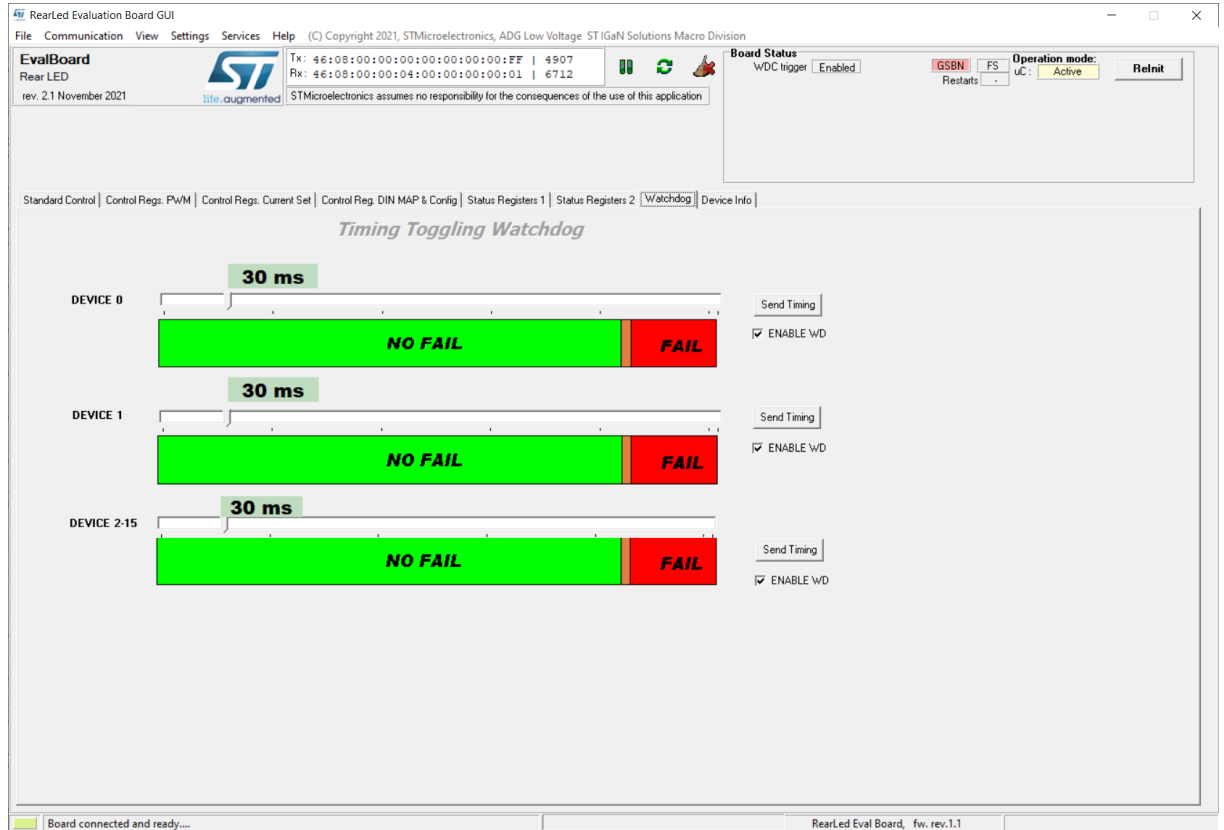
- For each device it can be set (by right click):
 1. Device ID
 2. Type
 3. Set device in normal, failsafe or standby mode
 4. Send watchdog trigger
 5. Read&Clear command

Figure 23. Device setting



3.5 Watchdog

Figure 24. Watchdog



Period for watchdog (WD) serving is adjustable by item “WDG TIME”.

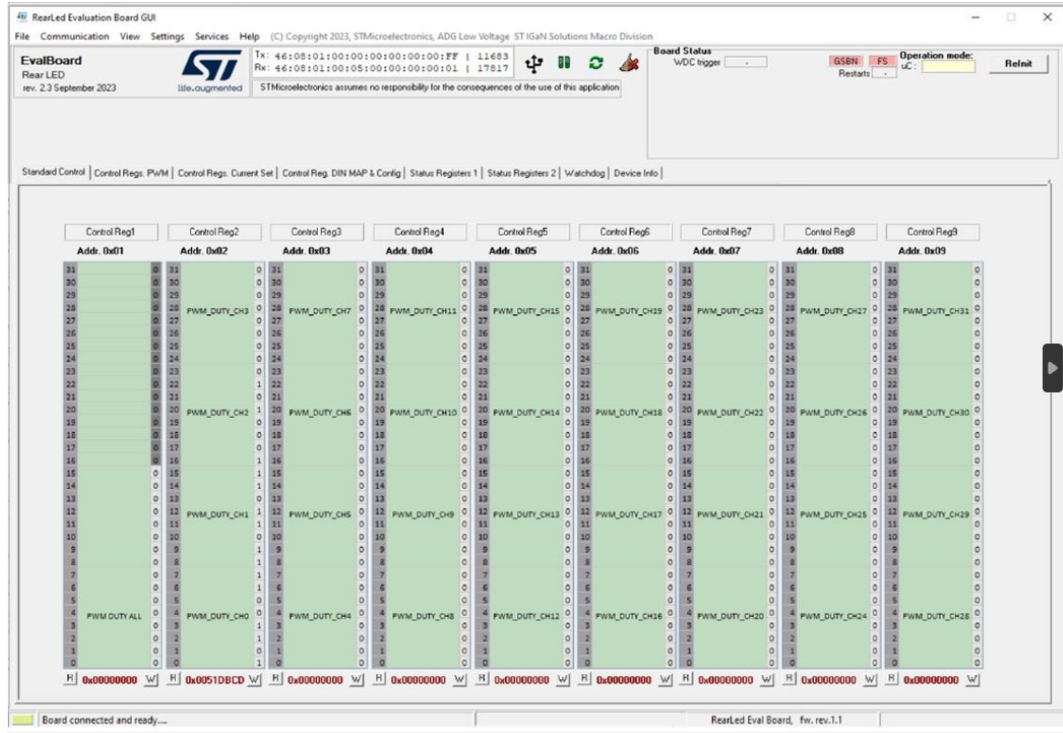
WD serving is applied by refreshing the WD_TRIG bit in one of the control registers.

Enabled WD—enable/disable WD serving by refreshing the WD_TRIG bit

There is also the possibility to set the WD refresh time sent by MCU through a dedicated bar and button (“Send Timing”). This allows the testing of device WD timeout failure.

3.6 Control register page

Figure 25. Control register page



This page displays the control registers for each device selected in the following combo box Device 0. It is possible for each column to change the values and read or write new values by clicking the related buttons

R or W.

3.7 Status register page

Figure 26. Status register page

Device **L99LDLH32**

Standard Control | Control Regs: PWM | Control Regs: Current Set | Control Reg: DIN MAP & Config | Status Registers 1 | Status Registers 2 | Watchdog | Device Info

Burst Read

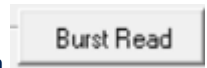
OUT_STATUS	SHT	OL	OUTSHT_VPRE	VLEDON_RFR	STATUS 1	STATUS 2	STATUS 3	FTP_STATUS_1	FTP_STATUS_2
Addr: 0x27	Addr: 0x28	Addr: 0x29	Addr: 0x2A	Addr: 0x2B	Addr: 0x2C	Addr: 0x2D	Addr: 0x2E	Addr: 0x2F	Addr: 0x30
31 OUT_STATUS_CH31	31 SHT_CH31	31 OL_CH31	31 SHT_VPRE_CH31	31 VLEDON_RFR_CH31	0	31	0	31	0
30 OUT_STATUS_CH30	30 SHT_CH30	30 OL_CH30	30 SHT_VPRE_CH30	30 VLEDON_RFR_CH30	0	30	0	30	0
29 OUT_STATUS_CH29	29 SHT_CH29	29 OL_CH29	29 SHT_VPRE_CH29	29 VLEDON_RFR_CH29	0	29	0	29	0
28 OUT_STATUS_CH28	28 SHT_CH28	28 OL_CH28	28 SHT_VPRE_CH28	28 VLEDON_RFR_CH28	0	28	0	28	0
27 OUT_STATUS_CH27	27 SHT_CH27	27 OL_CH27	27 SHT_VPRE_CH27	27 VLEDON_RFR_CH27	0	27	0	27	0
26 OUT_STATUS_CH26	26 SHT_CH26	26 OL_CH26	26 SHT_VPRE_CH26	26 VLEDON_RFR_CH26	0	26	0	26	0
25 OUT_STATUS_CH25	25 SHT_CH25	25 OL_CH25	25 SHT_VPRE_CH25	25 VLEDON_RFR_CH25	0	25	0	25	0
24 OUT_STATUS_CH24	24 SHT_CH24	24 OL_CH24	24 SHT_VPRE_CH24	24 VLEDON_RFR_CH24	0	24	0	24	0
23 OUT_STATUS_CH23	23 SHT_CH23	23 OL_CH23	23 SHT_VPRE_CH23	23 VLEDON_RFR_CH23	0	23	0	23	0
22 OUT_STATUS_CH22	22 SHT_CH22	22 OL_CH22	22 SHT_VPRE_CH22	22 VLEDON_RFR_CH22	0	22	0	22	0
21 OUT_STATUS_CH21	21 SHT_CH21	21 OL_CH21	21 SHT_VPRE_CH21	21 VLEDON_RFR_CH21	0	21	0	21	0
20 OUT_STATUS_CH20	20 SHT_CH20	20 OL_CH20	20 SHT_VPRE_CH20	20 VLEDON_RFR_CH20	0	20	0	20	0
19 OUT_STATUS_CH19	19 SHT_CH19	19 OL_CH19	19 SHT_VPRE_CH19	19 VLEDON_RFR_CH19	0	19	0	19	0
18 OUT_STATUS_CH18	18 SHT_CH18	18 OL_CH18	18 SHT_VPRE_CH18	18 VLEDON_RFR_CH18	0	18	0	18	0
17 OUT_STATUS_CH17	17 SHT_CH17	17 OL_CH17	17 SHT_VPRE_CH17	17 VLEDON_RFR_CH17	0	17	0	17	0
16 OUT_STATUS_CH16	16 SHT_CH16	16 OL_CH16	16 SHT_VPRE_CH16	16 VLEDON_RFR_CH16	0	16	0	16	0
15 OUT_STATUS_CH15	15 SHT_CH15	15 OL_CH15	15 SHT_VPRE_CH15	15 VLEDON_RFR_CH15	0	15	0	15	0
14 OUT_STATUS_CH14	14 SHT_CH14	14 OL_CH14	14 SHT_VPRE_CH14	14 VLEDON_RFR_CH14	0	14	0	14	0
13 OUT_STATUS_CH13	13 SHT_CH13	13 OL_CH13	13 SHT_VPRE_CH13	13 VLEDON_RFR_CH13	0	13	0	13	0
12 OUT_STATUS_CH12	12 SHT_CH12	12 OL_CH12	12 SHT_VPRE_CH12	12 VLEDON_RFR_CH12	0	12	0	12	0
11 OUT_STATUS_CH11	11 SHT_CH11	11 OL_CH11	11 SHT_VPRE_CH11	11 VLEDON_RFR_CH11	0	11	0	11	0
10 OUT_STATUS_CH10	10 SHT_CH10	10 OL_CH10	10 SHT_VPRE_CH10	10 VLEDON_RFR_CH10	0	10	0	10	0
9 OUT_STATUS_CH9	9 SHT_CH9	9 OL_CH9	9 SHT_VPRE_CH9	9 VLEDON_RFR_CH9	0	9	0	9	0
8 OUT_STATUS_CH8	8 SHT_CH8	8 OL_CH8	8 SHT_VPRE_CH8	8 VLEDON_RFR_CH8	0	8	0	8	0
7 OUT_STATUS_CH7	7 SHT_CH7	7 OL_CH7	7 SHT_VPRE_CH7	7 VLEDON_RFR_CH7	0	7	0	7	0
6 OUT_STATUS_CH6	6 SHT_CH6	6 OL_CH6	6 SHT_VPRE_CH6	6 VLEDON_RFR_CH6	0	6	0	6	0
5 OUT_STATUS_CH5	5 SHT_CH5	5 OL_CH5	5 SHT_VPRE_CH5	5 VLEDON_RFR_CH5	0	5	0	5	0
4 OUT_STATUS_CH4	4 SHT_CH4	4 OL_CH4	4 SHT_VPRE_CH4	4 VLEDON_RFR_CH4	0	4	0	4	0
3 OUT_STATUS_CH3	3 SHT_CH3	3 OL_CH3	3 SHT_VPRE_CH3	3 VLEDON_RFR_CH3	0	3	0	3	0
2 OUT_STATUS_CH2	2 SHT_CH2	2 OL_CH2	2 SHT_VPRE_CH2	2 VLEDON_RFR_CH2	0	2	0	2	0
1 OUT_STATUS_CH1	1 SHT_CH1	1 OL_CH1	1 SHT_VPRE_CH1	1 VLEDON_RFR_CH1	0	1	0	1	0
0 OUT_STATUS_CH0	0 SHT_CH0	0 OL_CH0	0 SHT_VPRE_CH0	0 VLEDON_RFR_CH0	0	0	0	0	0

0xFFFFFFFF C 0x00000000 C 0x00000000 C R 0x00000000 C 0x00000000 0x00000000 0x00000421 C 0x00000000 R 0x00000000 R

This page displays the status registers for each device that you have selected in the following combo box



It is possible to read 4 status registers at the same time by clicking "Burst Read" button



it is possible to read or clear some registers by clicking the related buttons

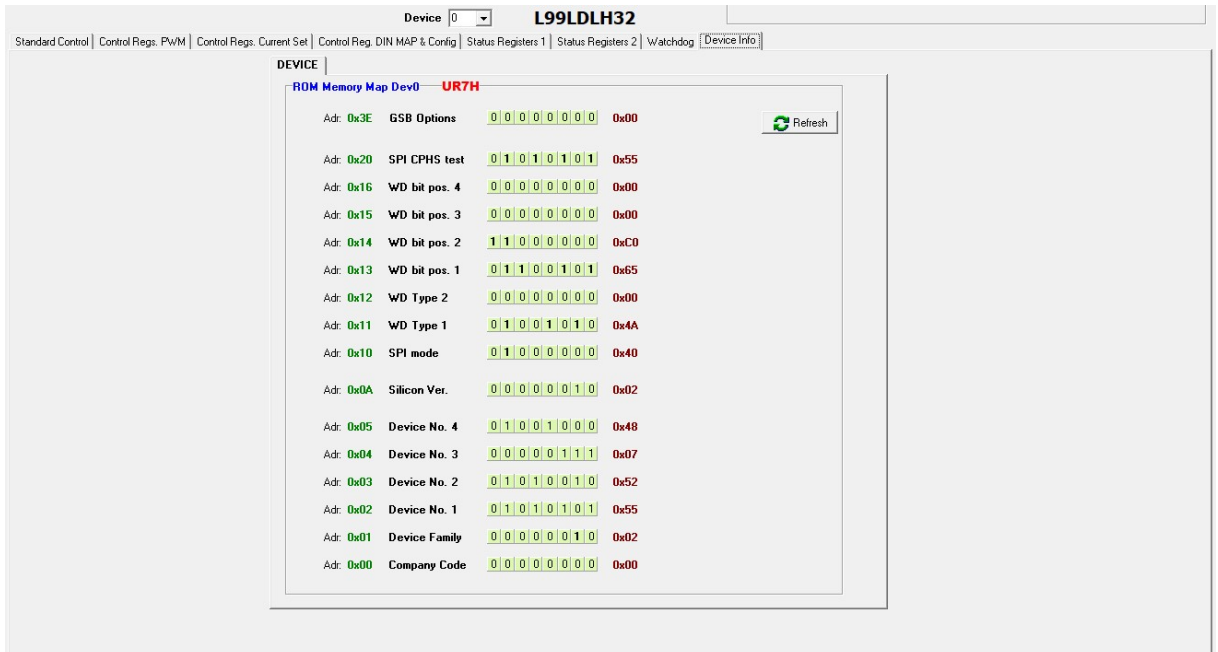


3.8 Device info

The form below shows the device ROM and can be refreshed with the dedicated button, and details about all the devices info stored in ROM:

- UR7H for L99LDLH32
- UR7L for L99LDLL16

Figure 27. ROM memory map



3.9 Broadcast

The user can send a broadcast CAN frame to devices connected to the same chain setting current or duty cycle through the below dialog box.

Figure 28. Broadcast CAN frame

The screenshot shows a window titled "UniCast Frames" with a close button in the top right corner. The main title "UniCast Frames" is centered at the top. Below the title is a dropdown menu labeled "Device index 0".

The interface is divided into three main sections:

- Single Read / Single Read_Clear / Single Write:** A yellow background section. It contains three buttons: "Single Read", "Single Read_Clear", and "Single Write". To the right of these buttons are input fields for TX-Addr, TX-D3, TX-D2, TX-D1, and TX-D0. The "Single Read" section has values: TX-Addr: 11 h, TX-D3: 22 h, TX-D2: 33 h, TX-D1: 44 h, TX-D0: 55 h. Below these are input fields for RX-GSB, RX-D3, RX-D2, RX-D1, and RX-D0, all currently empty.
- Burst Write:** A green background section. It contains a button labeled "3 x Write". To the right are three rows of TX-Addr, TX-D3, TX-D2, TX-D1, and TX-D0 input fields. The values are: Row 1: 01 h, 02 h, 03 h, 04 h, 05 h; Row 2: 11 h, 12 h, 13 h, 14 h, 15 h; Row 3: 21 h, 22 h, 23 h, 24 h, 25 h. Below these is an input field for RX-GSB, currently empty.
- Burst Read:** A blue background section. It contains a button labeled "Read". Above the button is the text "Addr 1Fh, 23h, 27h, 2Ch". To the right are input fields for TX-Addr, TX-D3, TX-D2, TX-D1, and TX-D0. The values are: TX-Addr: 1F h, TX-D3: 00 h, TX-D2: 00 h, TX-D1: 00 h, TX-D0: 00 h. Below these is a text area labeled "Received data (16 bytes)" with a long input field and a small "h" at the end.

3.10 FTP programming dialog

The user can access the Non-volatile Memory (NVM) section of the selected device through the below dialog box. The user can read or write one or more memory sectors modifying single or multiple bytes.

Figure 29. FTP programming dialog

The screenshot shows the 'FrmFTPFrame' dialog box. At the top, it displays 'Device index 0'. Below this, there are controls for 'Key write, Key status (addr. 1Eh)'. The 'CAN_FTP_CTM (apply 5V on CS pin or set CS_EN bit)' checkbox is checked, and 'CS ENABLE' is unchecked. The 'Key write' field contains '0000DCBA h' and the 'Key status' field contains '00000001 h'. A legend indicates: '00000000h => Key not accepted', '00000010h => CTM Key accepted', and '00000002h => ST Key accepted'. The 'FTP data Map - Read all' section has 'FTP Read All' selected. It shows a grid of data bytes from 00h to 0fh. The 'Write' section has 'Write' selected and shows a grid of data bytes from DATA BYTE 15 to DATA BYTE 0. At the bottom, a row of RX-B registers (RX-B15 to RX-B0) is shown with values of 00.

Revision history

Table 1. Document revision history

Date	Revision	Changes
16-Sep-2022	1	Initial release.
25-Jun-2024	2	Updated Figure 1. STSW-EVLDLH32GEN graphical user interface, Figure 10. Tabs for device control, Section 3.1: Main menu, Section 3.3: Device diagnostic/communication, Figure 17. Standard control and Figure 25. Control register page.

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