User manual

STSW-L99DZ200 GUI

Introduction

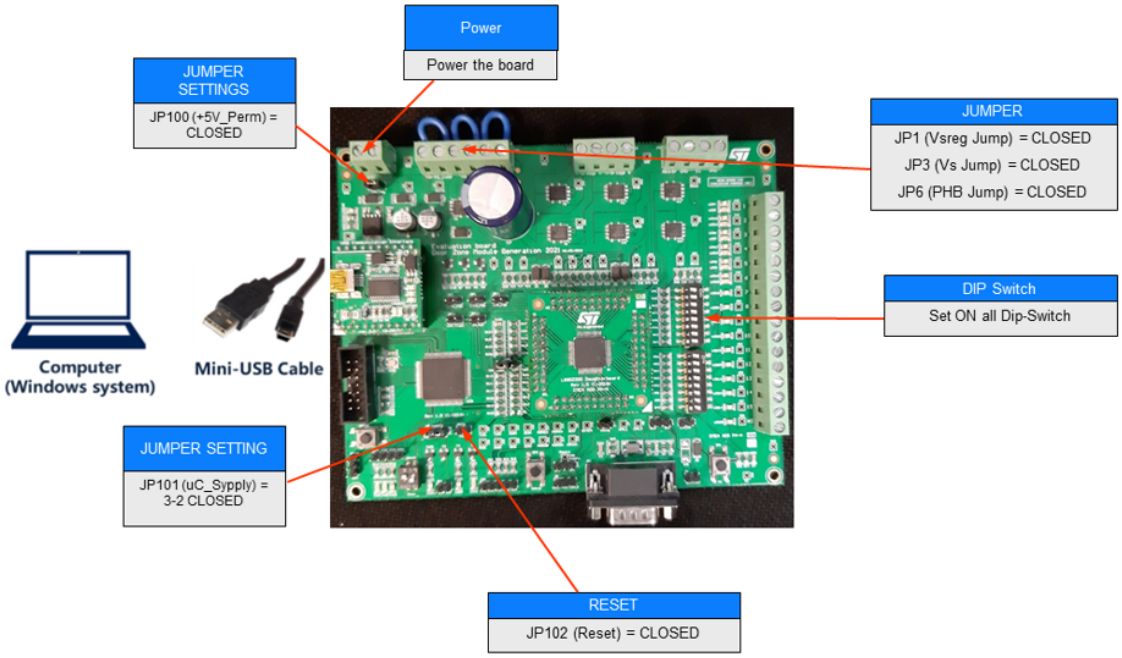
This document describes the STSW-L99DZ200 Graphical User Interface (GUI) dedicated to run the EVAL-L99DZ200.

The EVAL-L99DZ200 evaluation board is designed for automotive door zone application and it consists in a motherboard and a daughter board on which the L99DZ200G device is assembled. Both the boards provide electronic control modules with enhanced power management functionalities including a standby mode. These evaluation boards are designed to drive multiple DC motors. The STSW-L99DZ200 has been developed by using C++ and it works with a motherboard based on SPC582B60 microcontroller programmed with dedicated firmware that drives the L99DZ200G assembled in the daughter board.

1 How to connect the EVAL-L99DZ200

The following figure shows how to connect the EVAL-L99DZ200 and the main HW settings. Refer to the datasheet (see Section 11 Reference documents) for more information on the HW settings of the EVAL-L99DZ200.

Figure 1. Eval-L99DZ200 connection

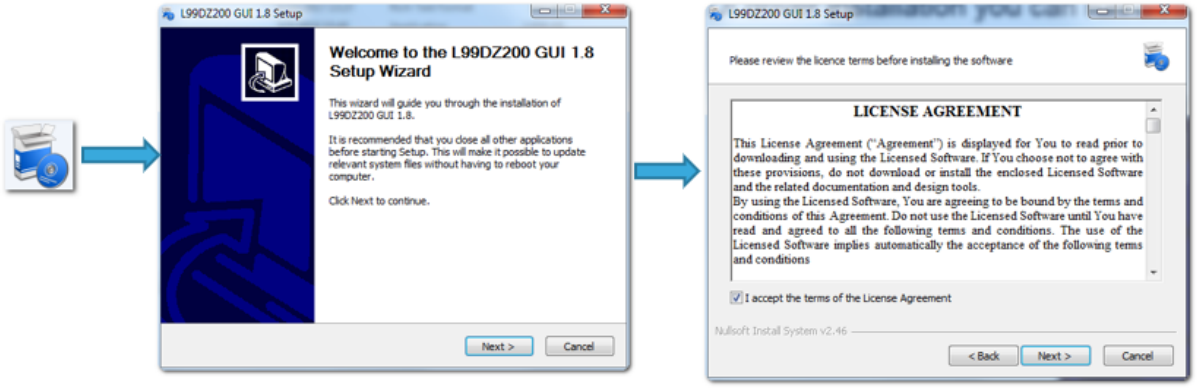


2 STSW-L99DZ200 GUI installation

2.1 STSW-L99DZ200 GUI setup

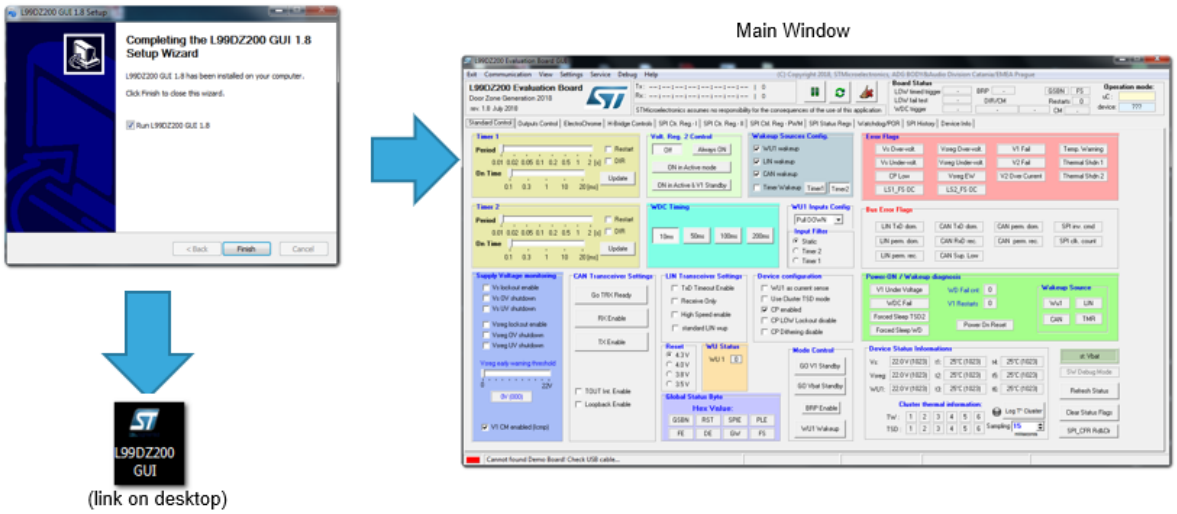
1. Install FDTI drive from supplier website
2. Complete the connection (see the Figure 1. Eval-L99DZ200 connection), then power-on
3. Run **Setup_GUI.exe**

Figure 2. Graphic User Interface setup (1/2)



When GUI installation is finished, GUI icon link is added on your desktop and a main window is showed:

Figure 3. Graphic User Interface setup (2/2)



3 Main window overview

When the EVAL-L99DZ200 is connected and the USB driver is installed, the message **“Board connected and ready ….”** will be displayed on the bottom left part of the main window.

Here below an overview of the main functions of the main window is reported.

Figure 4. Main window overview

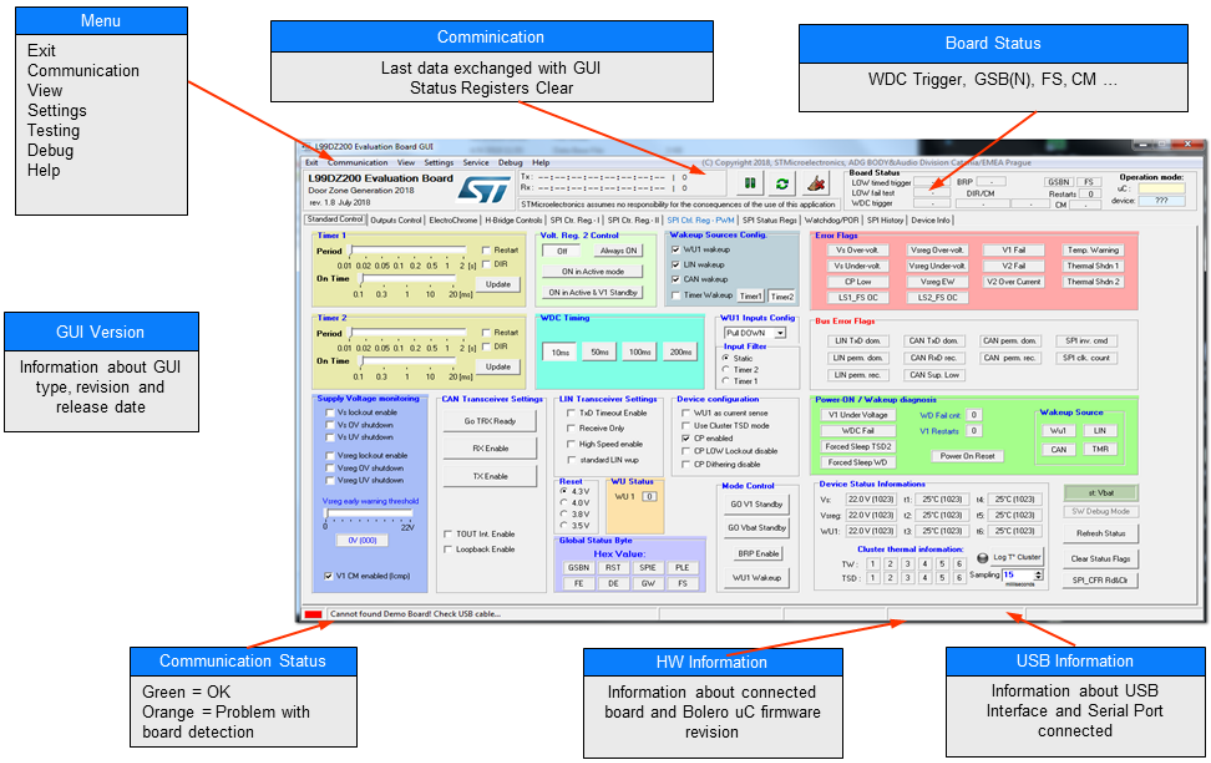
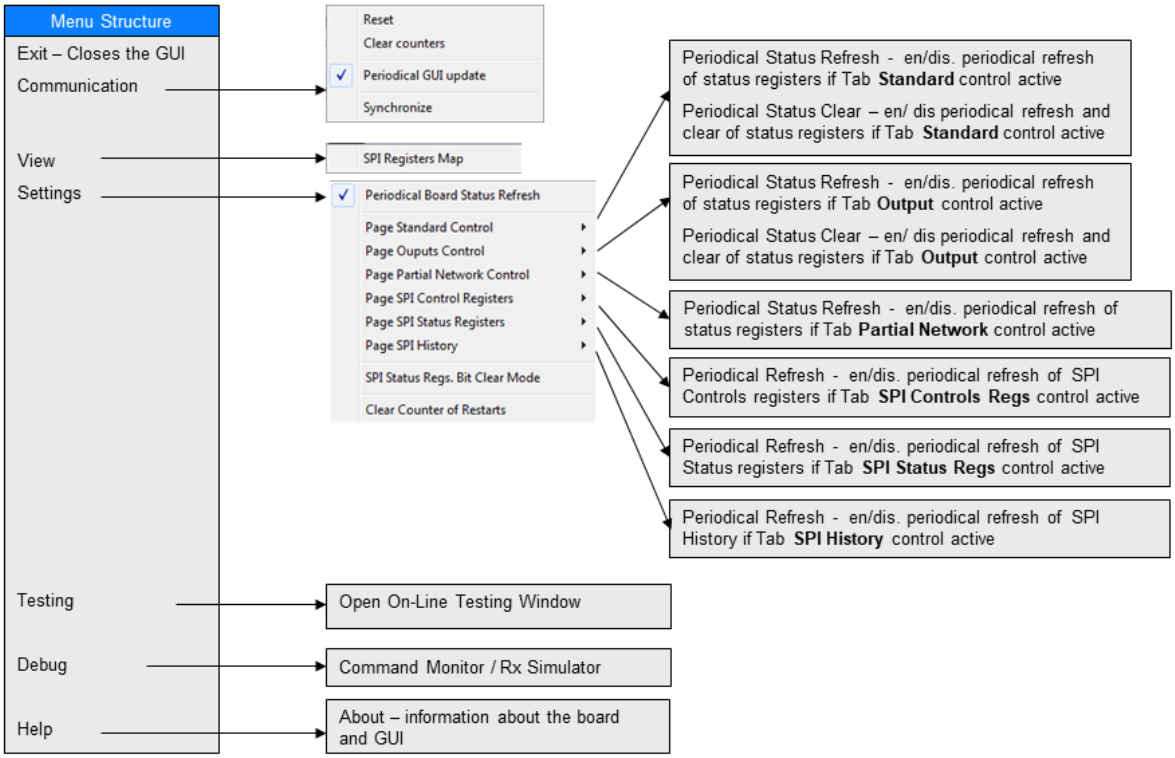


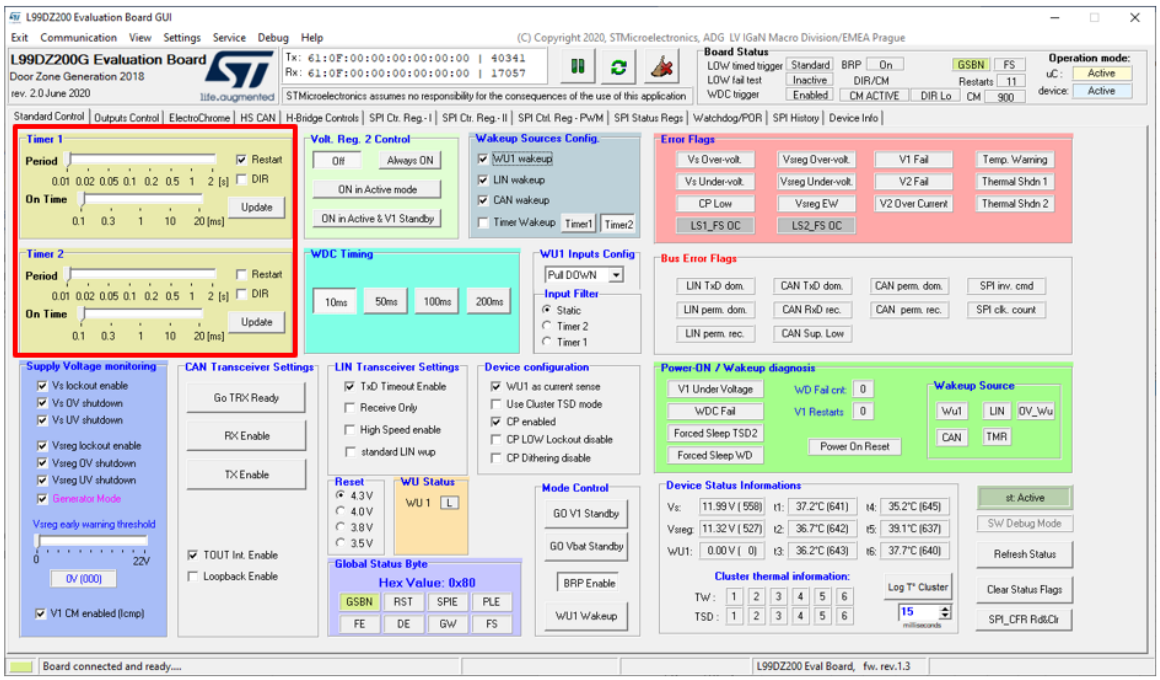
Figure 5. **Main window menu items**



4 Standard control panel

4.1 Timers section

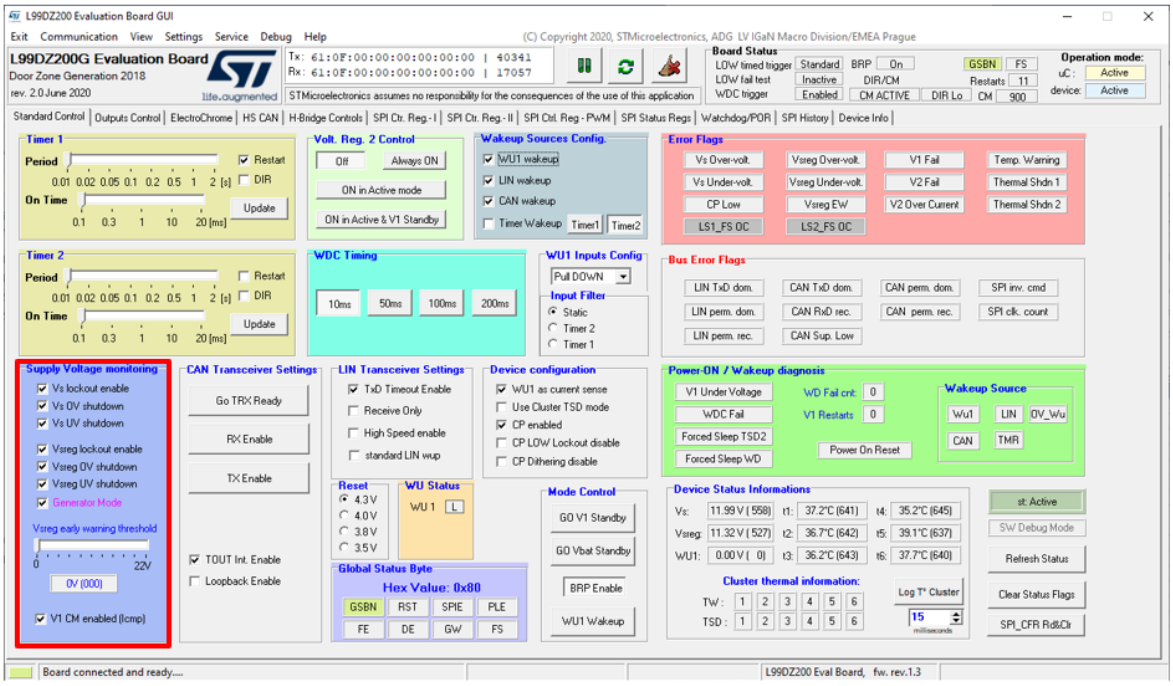
Figure 6. **Standard control window – timers section**



In Figure 6. Standard control window – timers section the section of the GUI related to the configuration of the two timers embedded in L99DZ200G is shown. For each of the two timers, the period (from 0.01 s to 2 s) and the on time (from 0.1 ms to 20 ms) is programmable. The restart flag allows to restart the timer with the defined settings when the SPI CSN goes from low to high (see Section 11 Reference documents). The DIR flag allows to control the timer from DIR input (see the datasheet Section 11 Reference documents). Once the configuration of the timers has been set, the update button allows the MCU to create and transfer to the L99DZ200G the corresponding SPI command.

4.2 Supply voltage monitoring section

Figure 7. **Standard control window – supply voltage monitoring section**



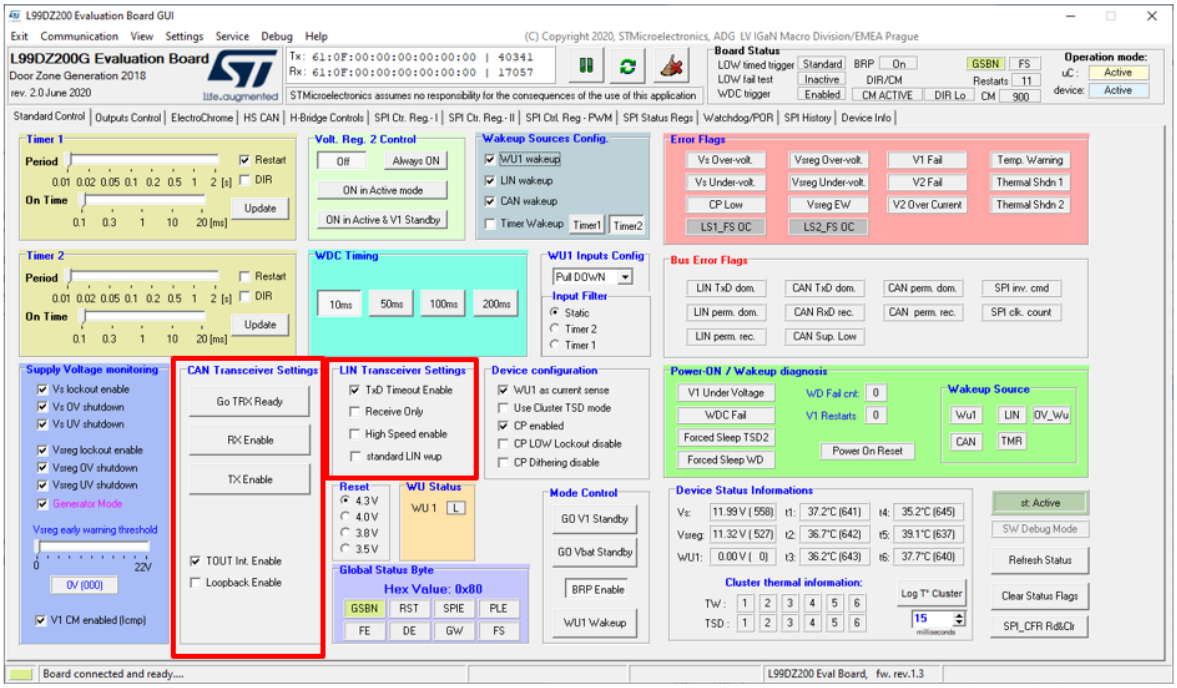
In Figure 7. Standard control window – supply voltage monitoring section the section of the GUI related to the configuration of the **supply voltage monitoring** is shown.

For both V_s and V_{sreg} there are some flags to enable the lockout and the OV/UV shutdown. A flag to configure the **generator mode** (see in the datasheet Section 11 Reference documents) is reported inside this section; the V_{sreg} early warning threshold can be here configured too.

One more flag is dedicated to the enabling of the V1 CM (Icmp); see Figure 6. Standard control window – timers section in its own datasheet (see Section 11 Reference documents).

4.3 CAN and LIN transceivers section

Figure 8. Standard control window – CAN and LIN transceiver sections



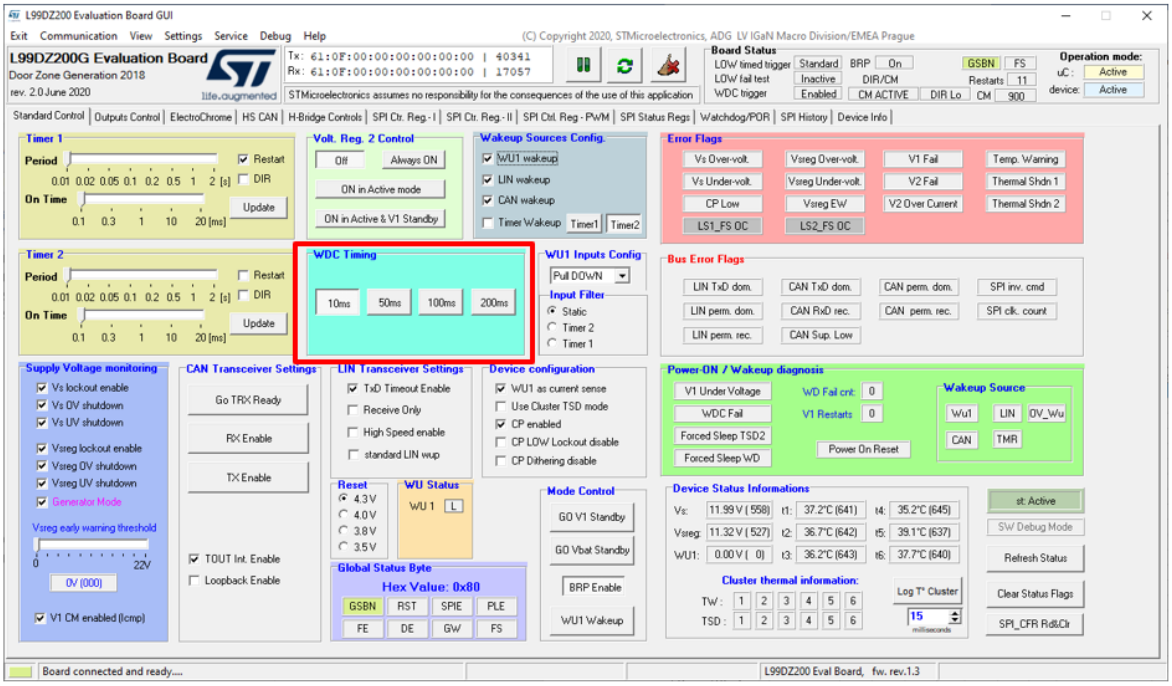
In the figure above the section of the GUI related to the setting of CAN and LIN transceivers is shown.

- **Go TRX Ready** button allows to set the CAN transceiver in TRX READY mode;
- **RX Enable** button allows to enable the CAN receiver;
- **TX Enable** button allows to enable the CAN transmitter;

TOUT Int. Enable flag allows to enable interrupt signal in case of CAN timeout (see CR1, bit 11)
Loopback Enable flag enables the loopback modality of L99DZ200G CAN transceiver (see CR2, bit 5).

4.4 Watchdog timing section

Figure 9. **Standard control window – Watchdog timing sections**

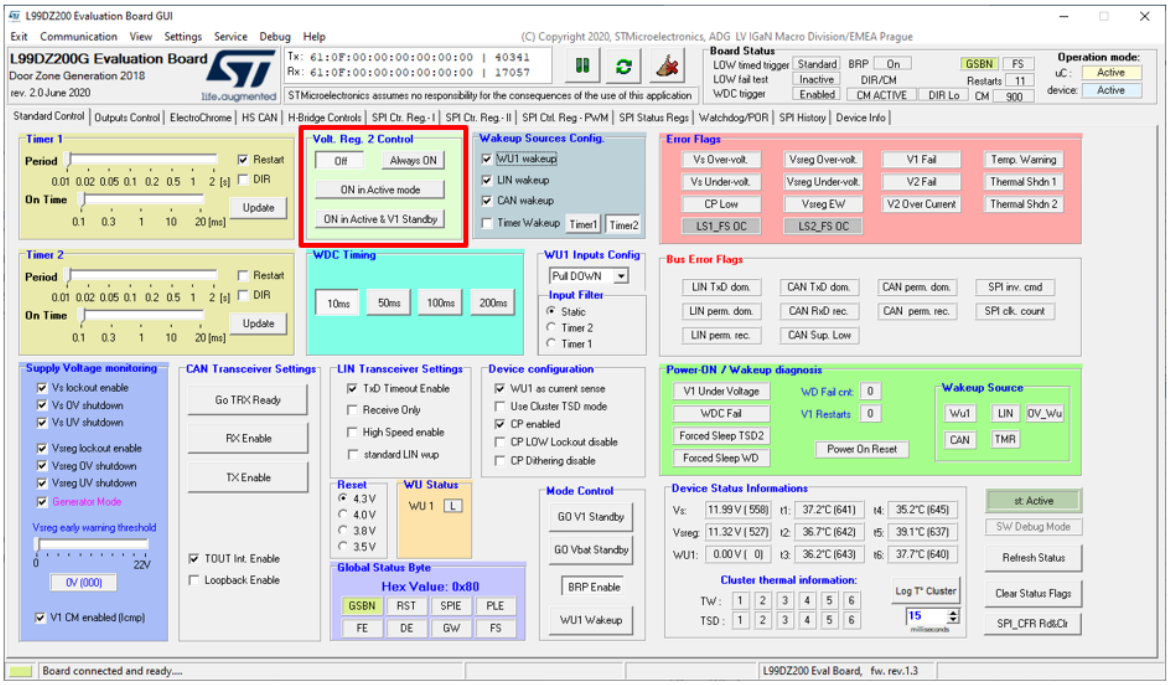


In the figure above the section of the GUI related to the setting of WatchDog timing is reported.
One of the following values can be here set, as defined by the WD_TIME_0/1 bits (CR2, bit 0 and bit 1):

- 10 ms
- 50 ms
- 100 ms
- 200 ms

4.5 Voltage regulator control section

Figure 10. **Standard control window – voltage regulator 2 control section**



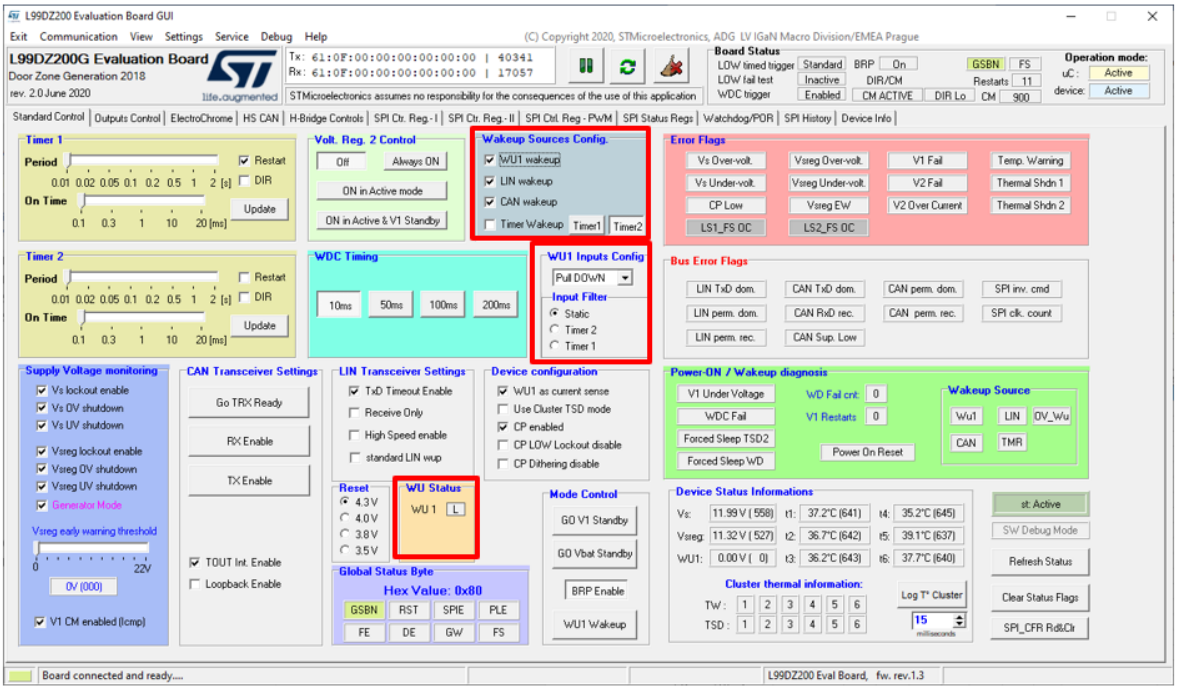
In the figure above the section of the GUI related to the control of the voltage regulator 2 is reported.

The **Off** button allows to switch OFF or switch ON the V2; in case the V2 is ON, one of the following cases can be used by setting the related button (see the datasheet Section 11 Reference documents):

- **Always ON**
- **ON in Active mode**
- **ON in Active & V1 Standby**

4.6 Wakeup section

Figure 11. **Standard control window – wakeup section**



In the figure above the sections of the GUI related to the setting of wake-up are reported.

One of the following values can be here set:

- **WU1 wakeup** flag allows to wake up the L99DZ200G from WU1 pin;
- **LIN wakeup** flag allows to wake up the L99DZ200G from LIN;
- **CAN wakeup** flag allows wake up the L99DZ200G from CAN;
- **Timer wakeup** flag allows wake up the L99DZ200G from **Timer 1** or **Timer 2**.

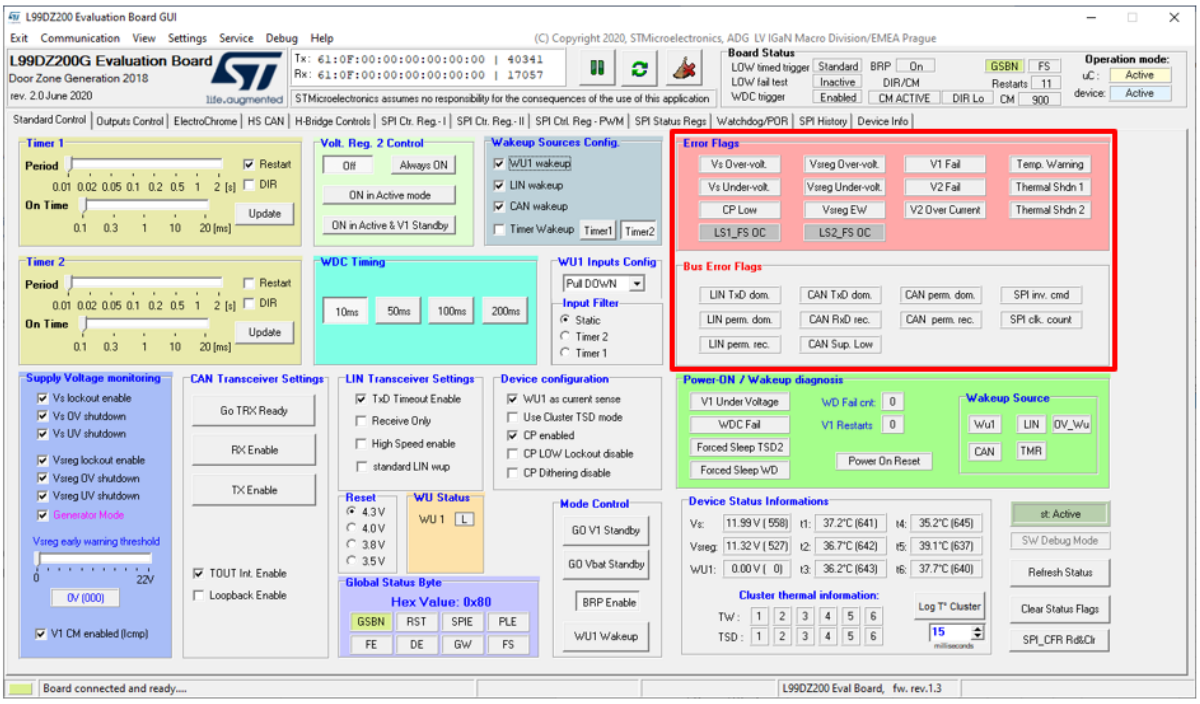
The **WU1 Inputs Config** can be set as **Pull DOWN** or pull up from the related window menu (as specified in CR 1, bit 20 - WU_PU).

The **Input Filter** can be set **Static** or from **Timer 1** or from **Timer 2**, as specified in bit 16, 17 of CR1.

The **WU Status** reports the value of the bit 22 of SR1 (WU_STATE).

4.7 Error flags section

Figure 12. **Standard control window – error flags section**



In the figure above the sections of the GUI related to the errors and bus errors flags are reported.
The following error flags are reported:

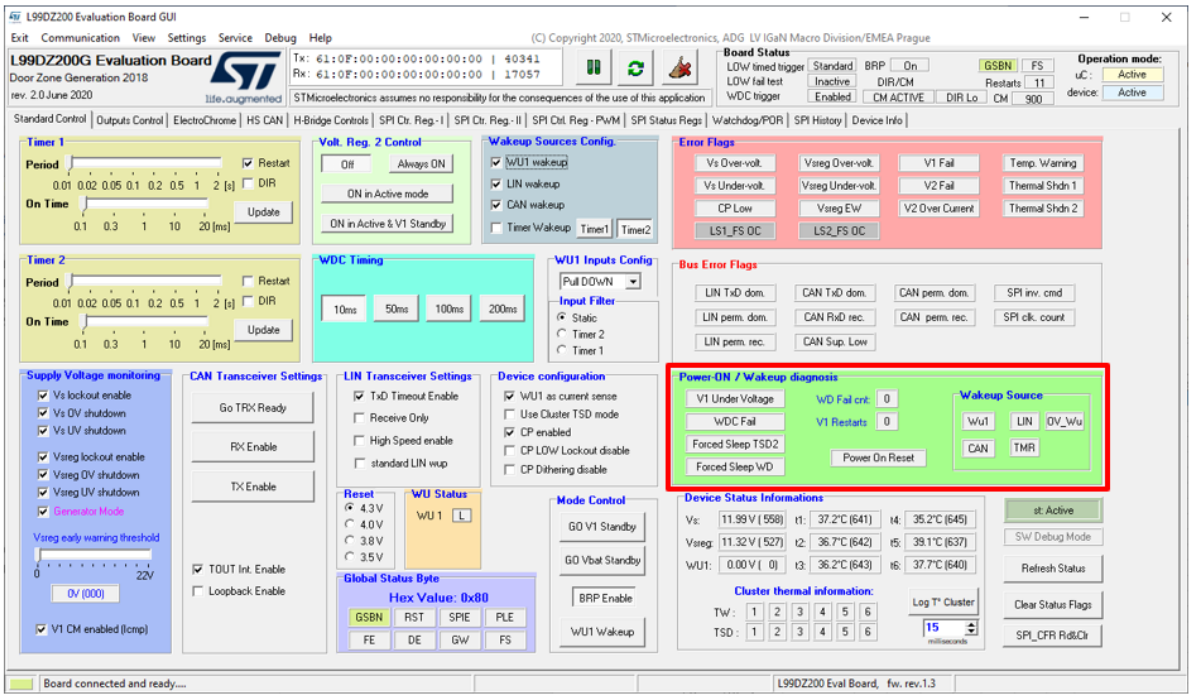
- Vs/Vsreg over voltage / under voltage
- V1/V2 fail
- Temperature warning
- Thermal shutdown 1 and thermal shutdown 2
- CP low
- Vsreg early warning
- V2 overcurrent
- LS1(LS2)_FS overcurrent

The following bus errors flags are reported:

- CAN TxD dominant
- CAN RxD recessive
- CAN permanent dominant
- CAN permanent recessive
- CAN supply low
- LIN TxD dominant
- LIN permanent dominant
- LIN permanent recessive
- SPI invalid command
- SPI clock count

4.8 Power-on / Diagnosis section

Figure 13. **Standard control window – power-on / diagnosis section**



In the figure above the section of the GUI related to the power-on / wakeup diagnosis is reported.

One of the following values can be here observed:

- **V1 Under Voltage**
- **WDC Fail**
- **Forced Sleep TSD2**
- **Forced Sleep WD**

The **WD Fail cnt** indicates number of subsequent watchdog failures (see SR1 from bit 8 to bit 11)

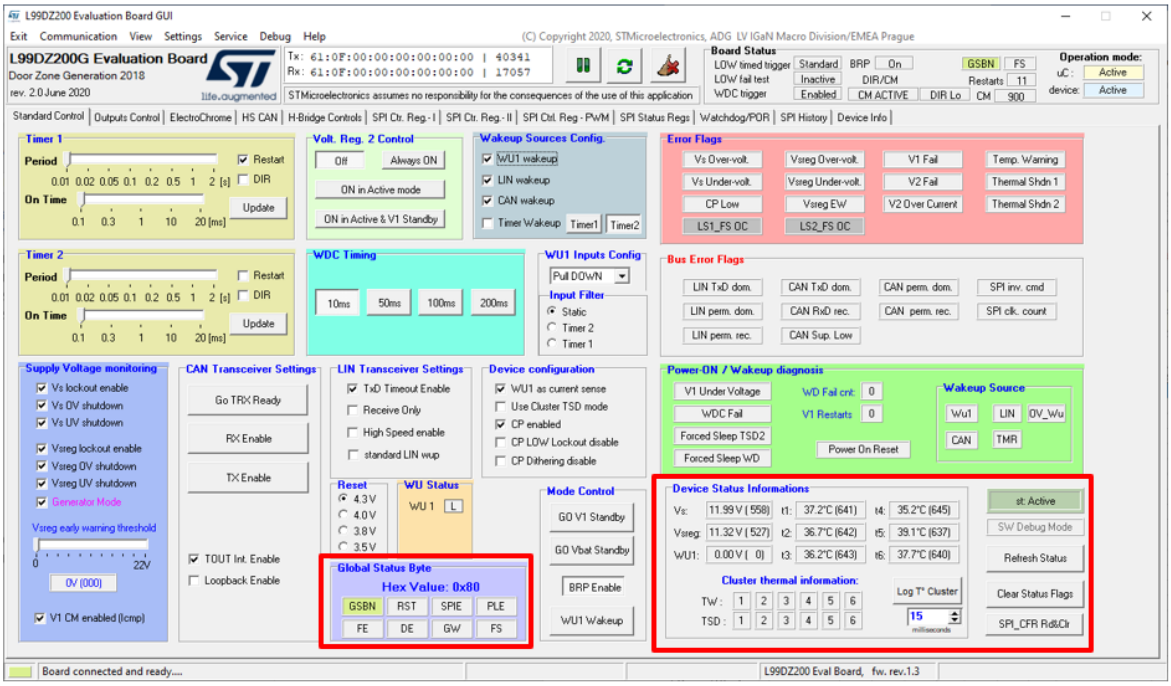
The **V1 Restarts** Indicates the number of TSD2 events which caused a restart of voltage regulator V1 (see SR1 from bit 12 to bit 14).

The **Power-on Reset** indicates when a Power-on reset occurs (see SR1, bit 0);

The **Wakeup Source** reports the source of the wake up (i.e. **Wu1**, **LIN**, **CAN** or **TMR**).

4.9 Device status and global status byte section

Figure 14. **Standard control window – device status and global status byte section**



In the figure above the sections of the GUI related to the device status information and global status byte are reported.

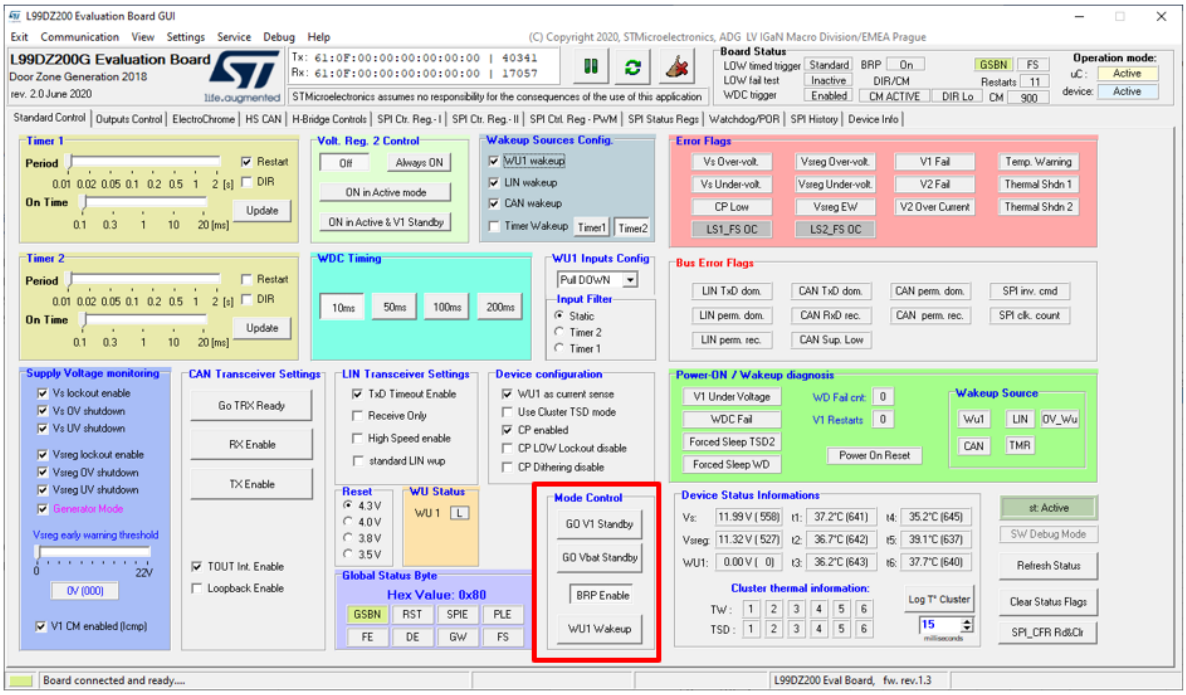
The runtime values for Vs, Vsreg, WU1 and thermal clusters 1-6 are reported.

The thermal cluster information visualize the status (TW or TSD) for each of the 6 thermal clusters; when a given thermal Cluster is in TW, the correspondent flag is orange; when it is in TSD, the correspondent flag becomes red.

V_{bat} value indicates if the L99DZ200G is in V_{bat} standby or V1 standby.

4.10 Mode control section

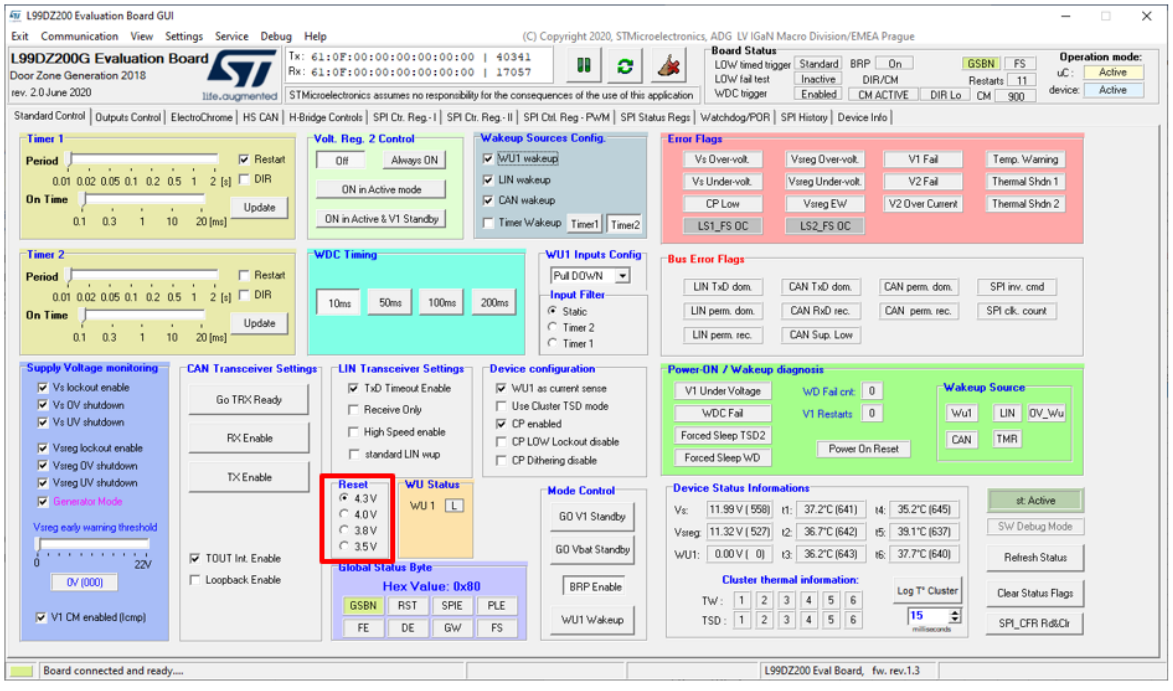
Figure 15. **Standard control window – mode control section**



In the figure above the section of the GUI related to the mode control of the L99DZ200G is reported.

4.11 Reset section

Figure 16. **Standard control window – reset section**



In the figure above the section of the GUI related to the reset of the L99DZ200G is reported.
In this section one of the 4 possible reset thresholds (4.3 V, 4.0 V, 3.8 V and 3.5 V) can be configured.

5 Outputs control panel

Figure 17. **STSW-L99DZ200 outputs control panel**

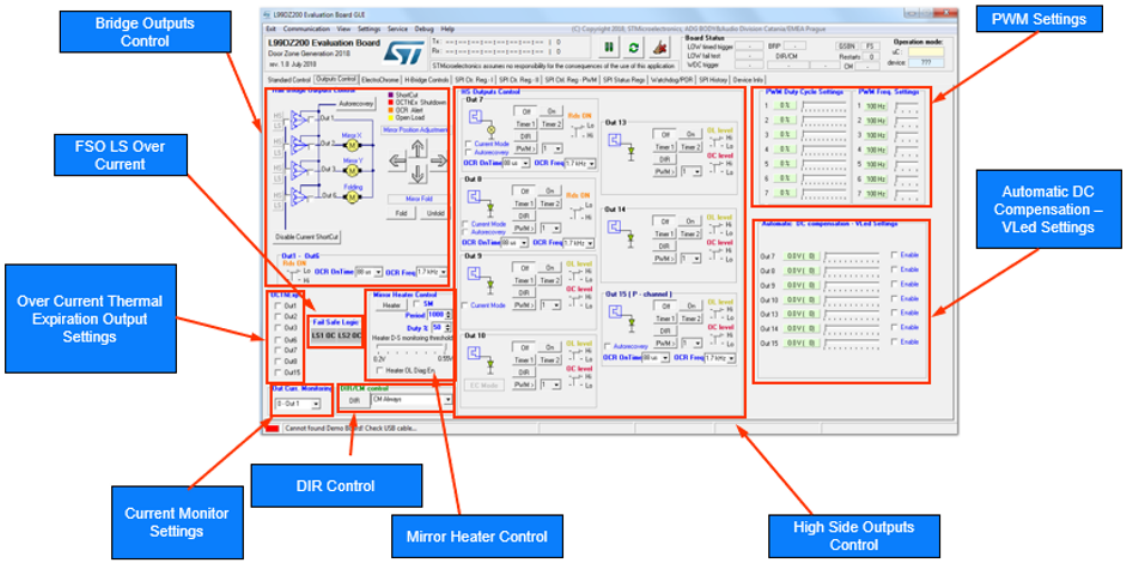


Figure 18. **STSW-L99DZ200 outputs control - half-bridge outputs**

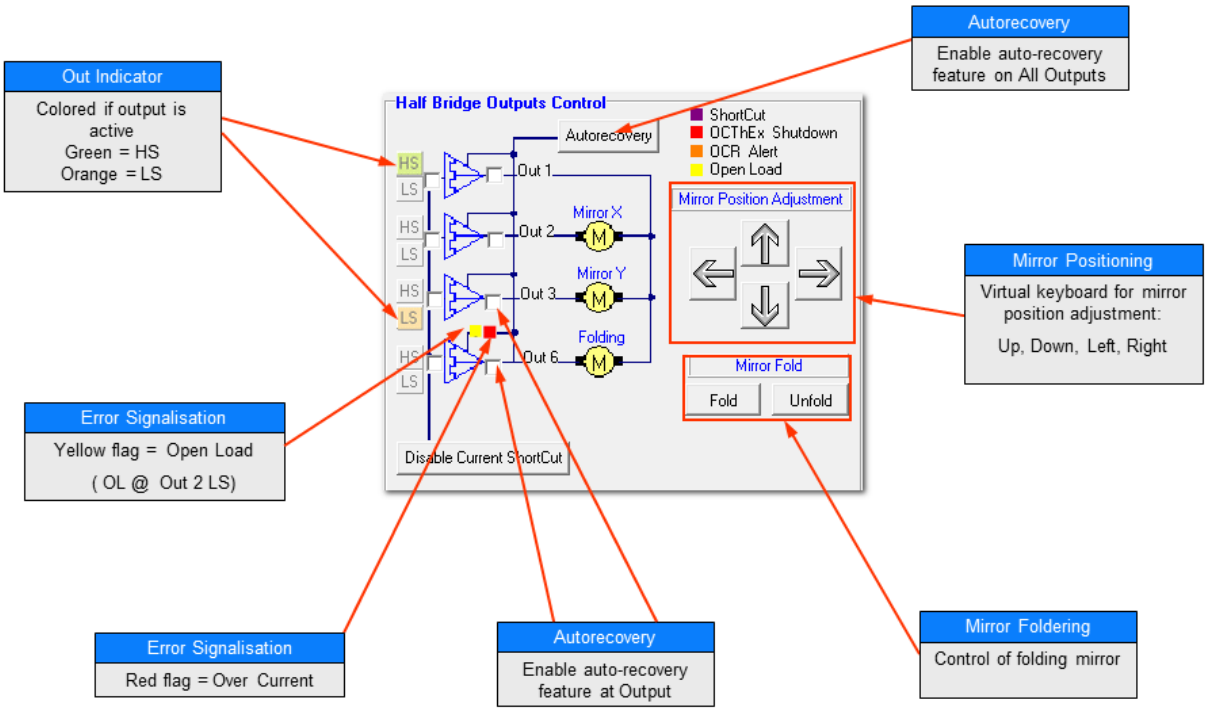


Figure 19. **STSW-L99DZ200 outputs control – high sides**

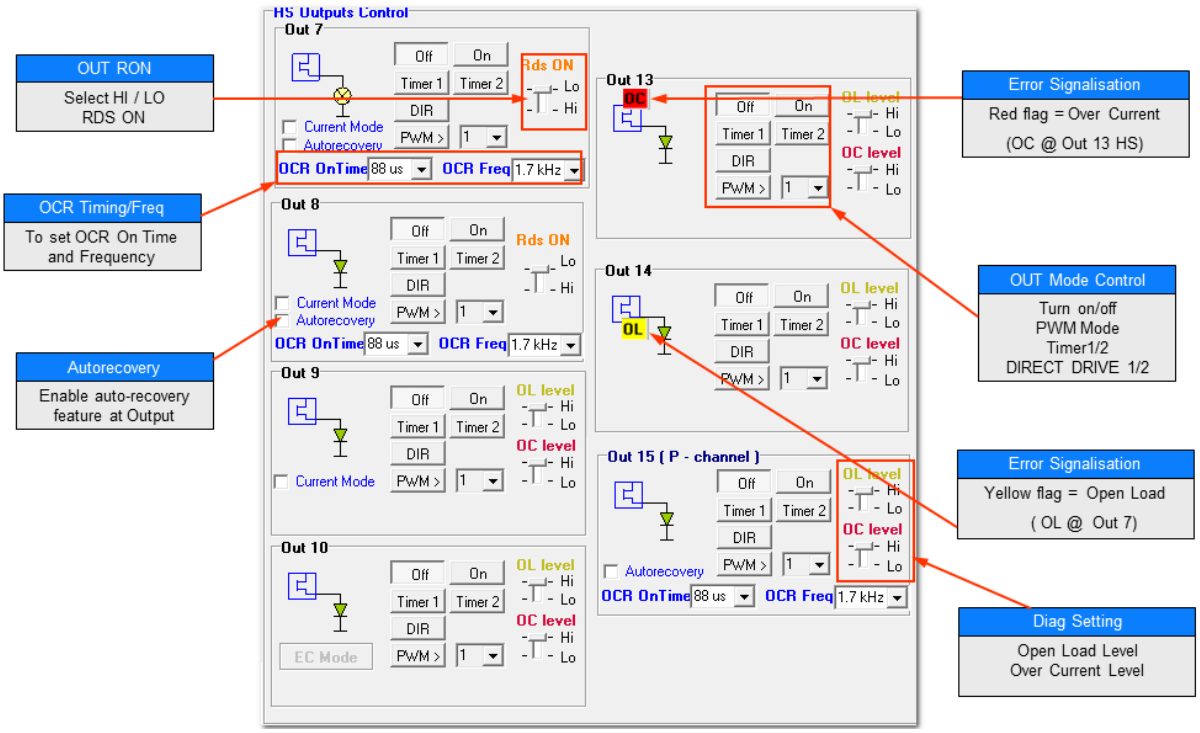
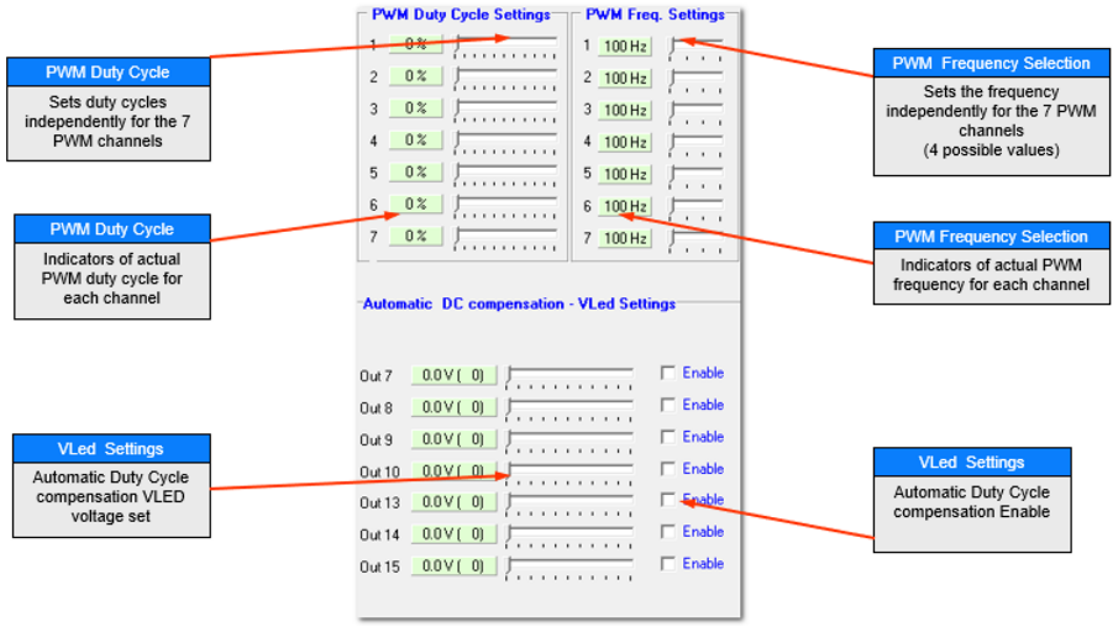
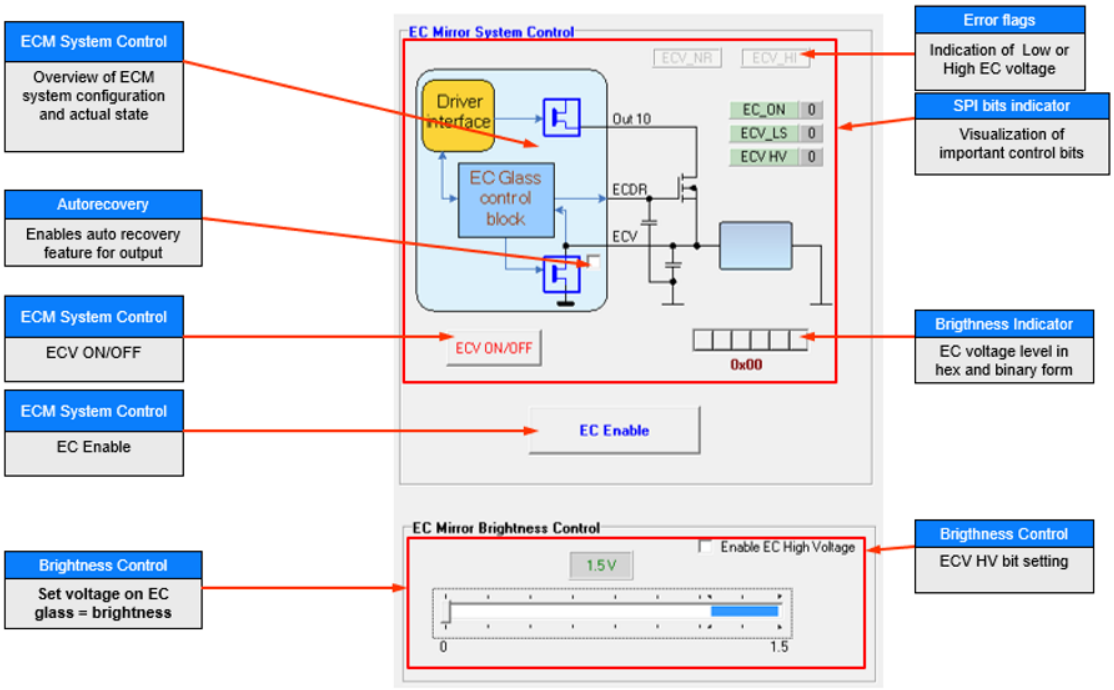


Figure 20. **STSW-L99DZ200 outputs control – PWN configuration / automatic DC compensation**



6 Electro chrome mirror panel

Figure 21. **STSW-L99DZ200 –electro-chrome mirror panel**



7 H-bridges control panel

Figure 22. **STSW-L99DZ200 – power H-bridge A control**

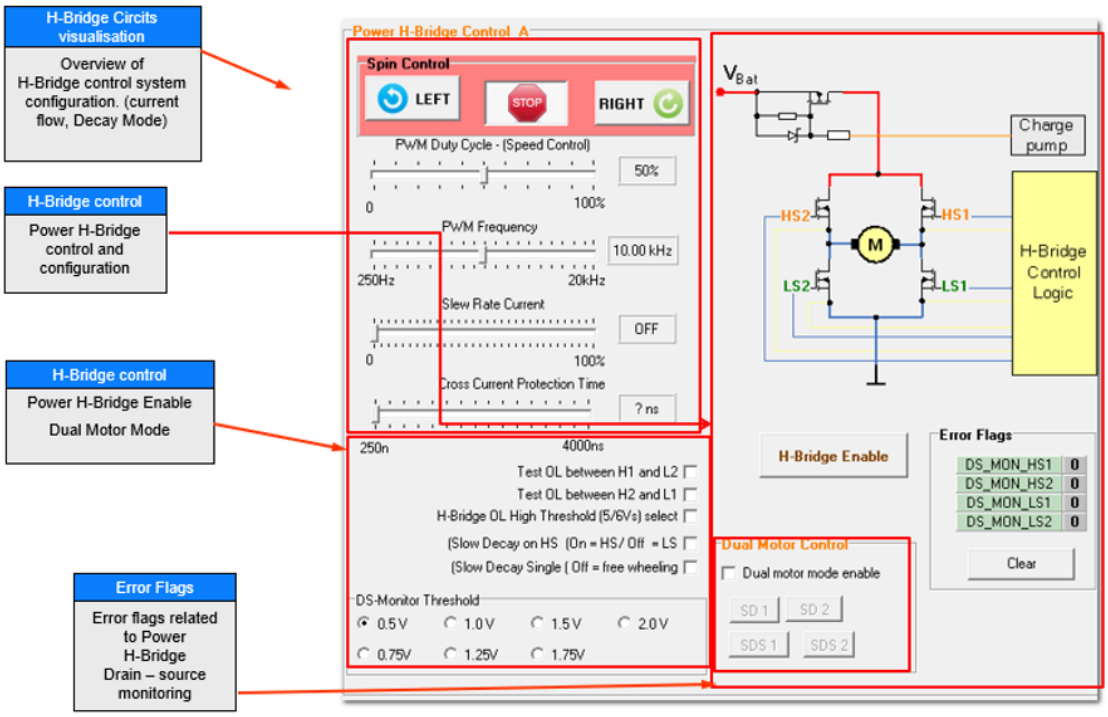


Figure 23. **STSW-L99DZ200 – power H-bridge B control**

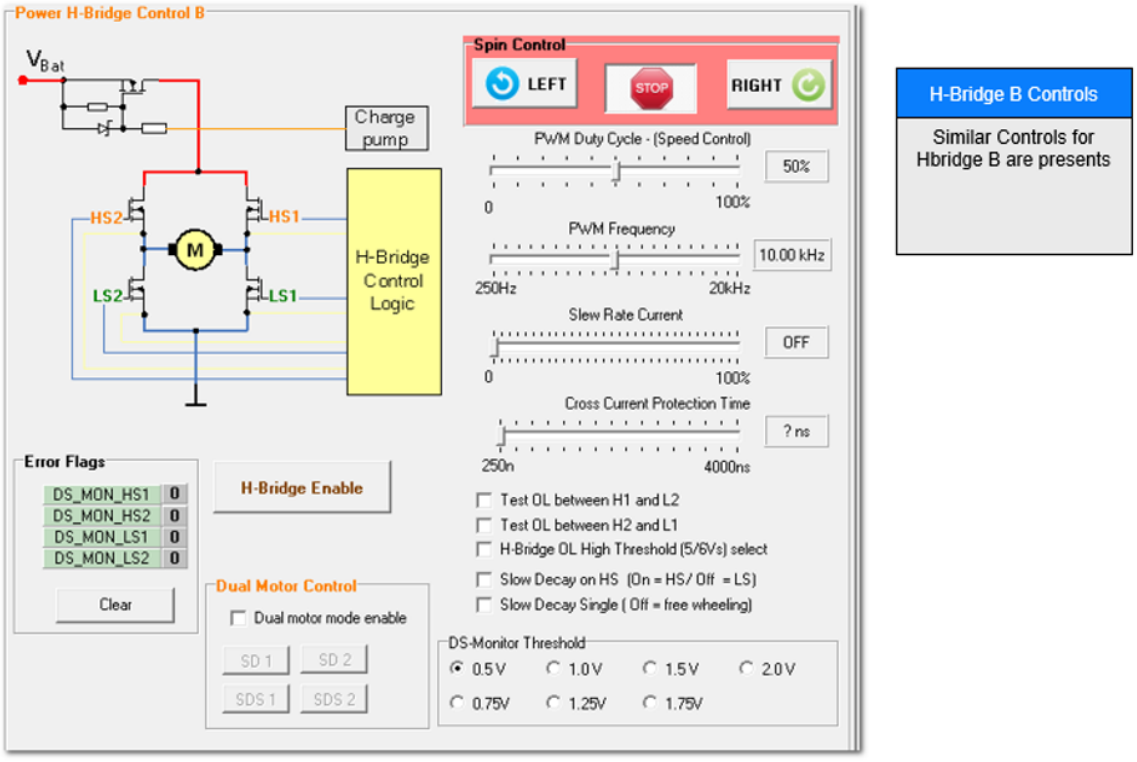
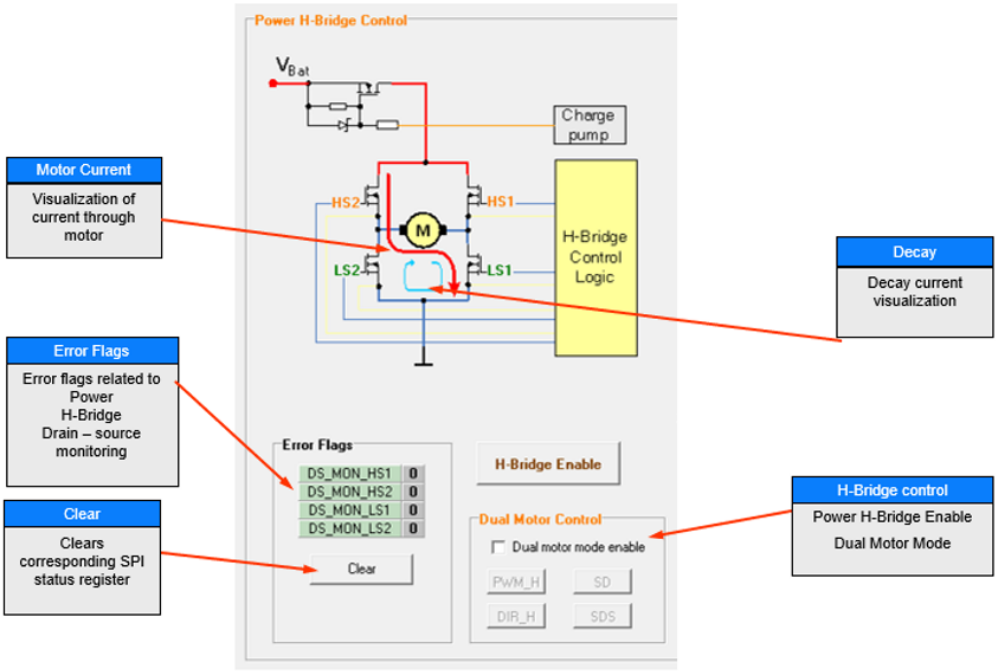
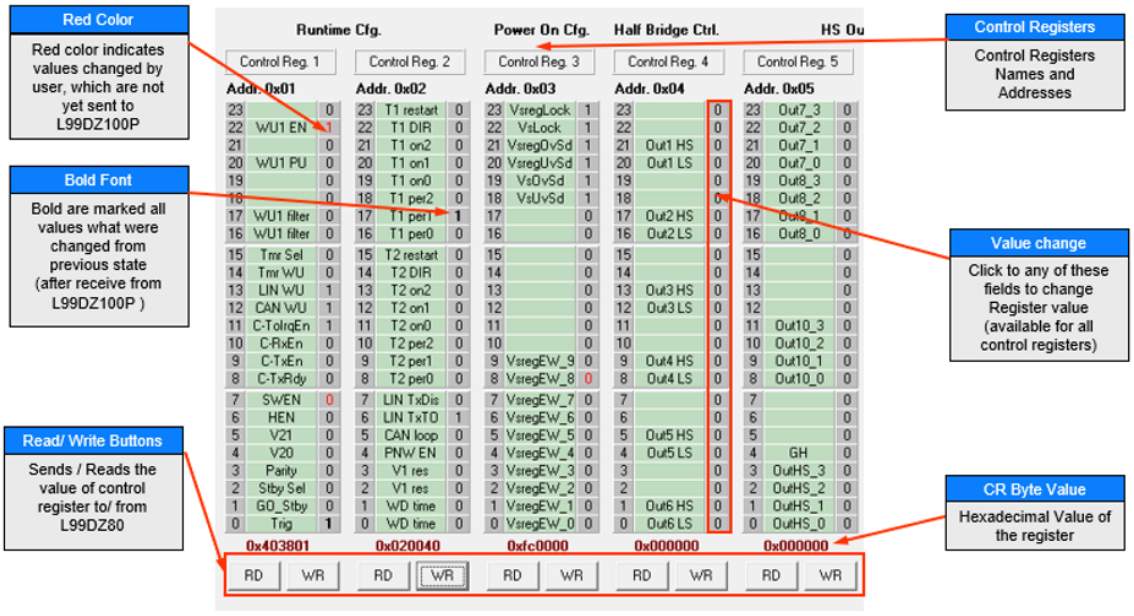


Figure 24. **STSW-L99DZ200 – power H-bridge A/B control**



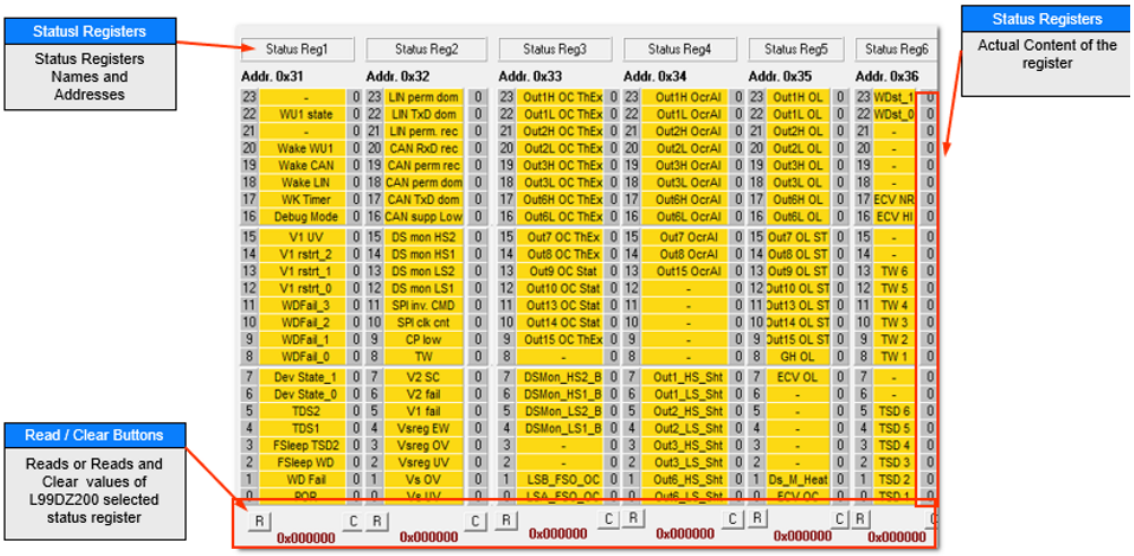
8 SPI control registers panel

Figure 25. **STSW-L99DZ200 – SPI control register example**



9 SPI status registers panel

Figure 26. **STSW-L99DZ200 – SPI status register example**



10 Watchdog/POR settings panel

Figure 27. **STSW-L99DZ200 – watchdog/POR settings**

11 Reference documents

- L99DZ200G datasheet, DS13220.
- EVAL-L99DZ200 Data brief, DB4431.

Revision history

Table 1. **Document revision history**

Date	Version	Changes
16-Jun-2021	1	Initial release.

Contents

List of figures