
EVAL-L99PM62-72 Evaluation Board

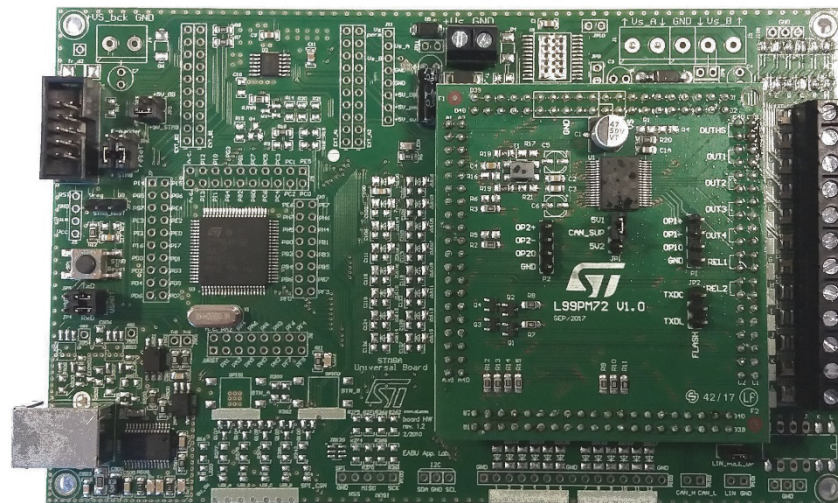
Introduction

The EVAL-L99PM62-72 offers a smart power management with LIN and HS CAN transceivers suitable for ECU power supply and system communication for automotive application.

1 EVAL-L99PM62-72 board

The EVAL-L99PM62-72 evaluation board (see [Figure 1](#)) features the L99PM62GXP and L99PM72GXP PM. Typical applications are BCM, Powertrain, HVAC control module, Door Zone, Seat positioning, Electric park brake, Window lift, Led light control, Sun roof module, Gear box and more. This evaluation board consists of a motherboard (STM8 Universal Board) and two daughterboards. The motherboard, based on STM8 microcontroller, provides the logic section for monitoring and driving the L99PM62GXP or L99PM72GXP assembled in two different daughterboards. With the aim of simplifying board usage and settings, ST provides dedicated and user-friendly software including a Graphic User Interface (GUI). The GUI allows setting L99PM62GXP and L99PM72GXP parameters (HS and LS configuration, LIN and HS CAN transceiver, timer and watchdog etc.), while showing real time device information by SPI register.

Figure 1. EVAL-L99PM62-72



2 Hardware description and setup

This section provides a description of the main components of this evaluation kit, giving instruction for a quick setup of the PM system.

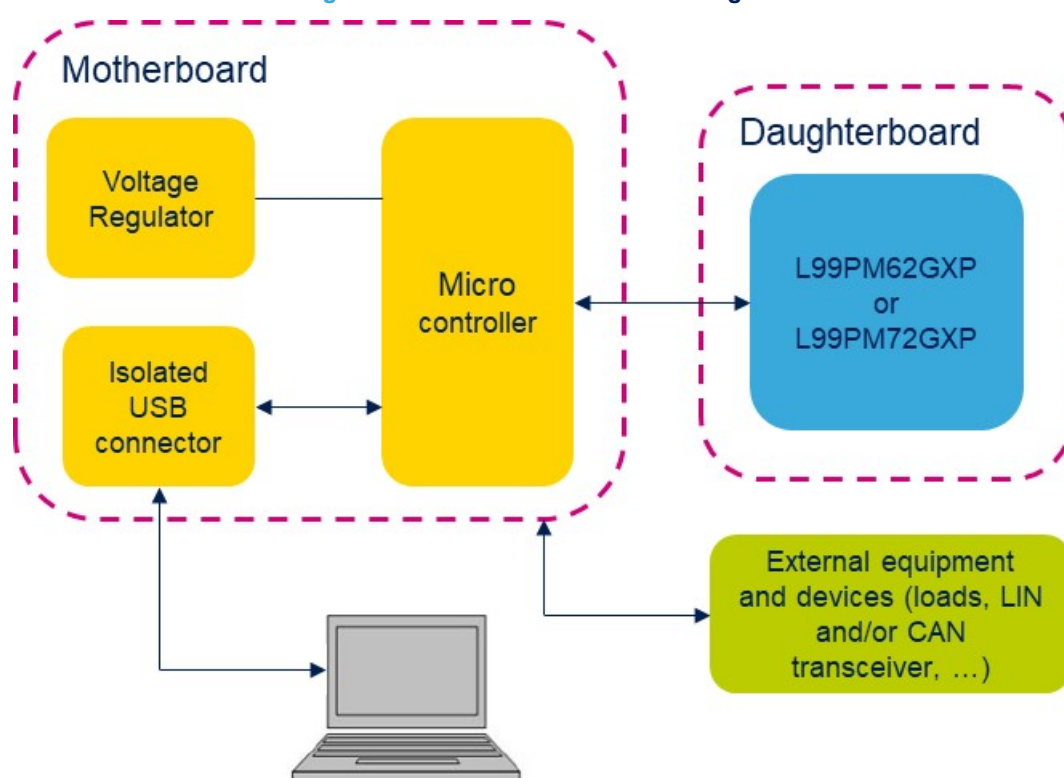
2.1 Components description

The evaluation kit consists of three main components:

- One motherboard based on STM8A microcontroller, interfacing host PC with PM. The communication with the PC is established through isolated USB.
- Two daughterboards assembling L99PM62GXP or L99PM72GXP.

The daughterboard with L99PM62GXP and the motherboard, are provided already properly plugged.

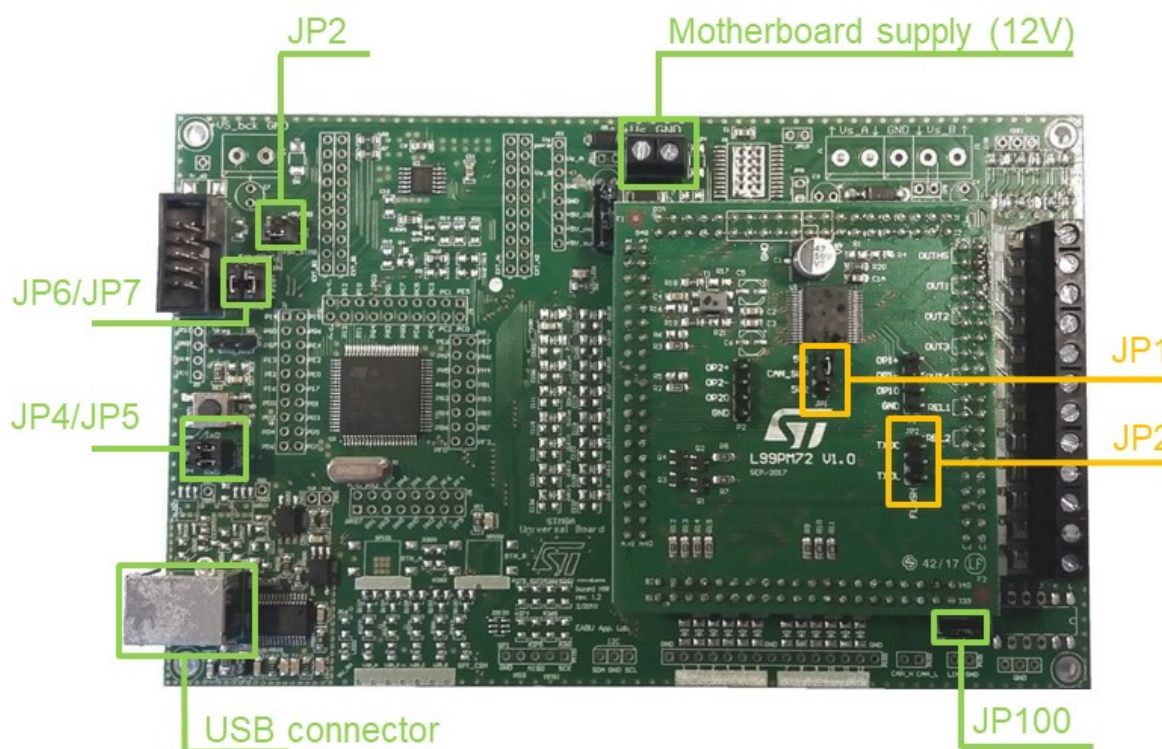
Figure 2. EVAL-L99PM62-72 block diagram



2.2 Board connection and setup

Figure 3 shows the placement of the connectors to be used for supplying the evaluation board, connecting the external equipment and devices for the PM parameters and performance evaluation and connecting with a host PC through USB cable.

Figure 3. EVAL-L99PM62-72 connection



Jumpers are already set in their default position.

Table 1. EVAL-L99PM62-72 jumper configuration

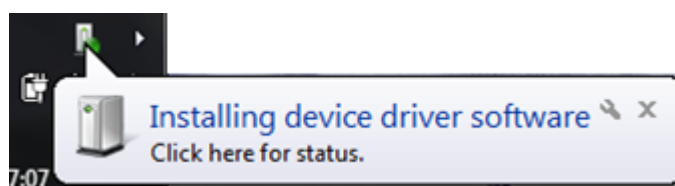
Jumpeer	Description	Default position
Daughterboard		
JP1	Select CAN supply source	5V1
JP2	Select FLASH mode (CAN, LIN)	Not present
Motherboard		
JP2	+ 5 V_DB	Not Present
	+ 5 V_STM8	Present
JP4	RxD	USART
JP5	TxD	USART
JP6	Reset	STM8
JP7	Swim	STM8
JP100	LIN_PULL_UP	Present

3 Software installation

3.1 USB driver installation

When USB cable is plugged, operating system will inform about automatic driver installation (see Figure 4):

Figure 4. Device driver installing

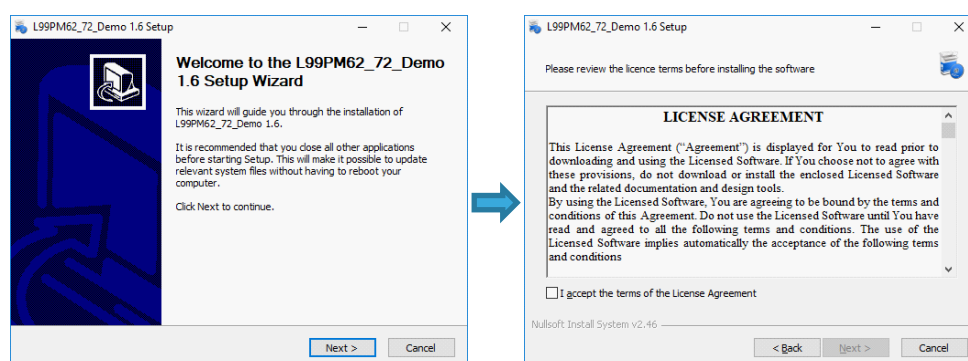


The board embeds an FTDI communication chip already programmed to communicate with PC through USB cable.

3.2 Graphical User Interface installation

Launch Setup.exe and then accept the License Agreement to keep on the installation (see Figure 5).

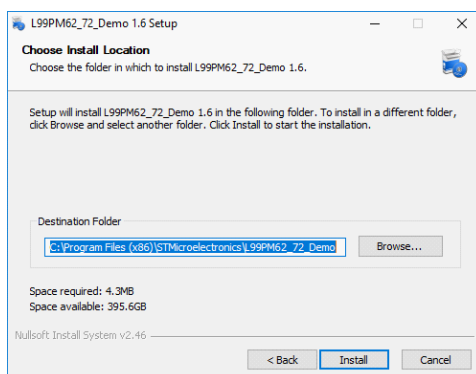
Figure 5. GUI installation (step 1/3)



During installation process, will be indicated by the wizard the destination folder (see Figure 6).

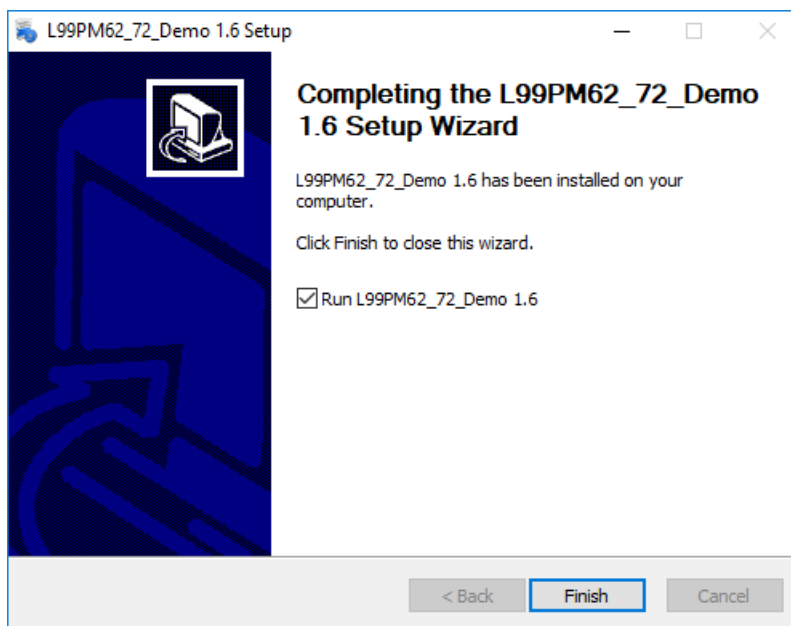
Default folder is `C:\Program Files(x86)\STMicroelectronics\L99PM62_72_Demo`, but the user can link to another path name and folder.

Figure 6. GUI installation (step 2/3)



When the installation is completed (see Figure 7), the software can be launched by clicking on the icon **L99PM62 Evaluation Board GUI**.

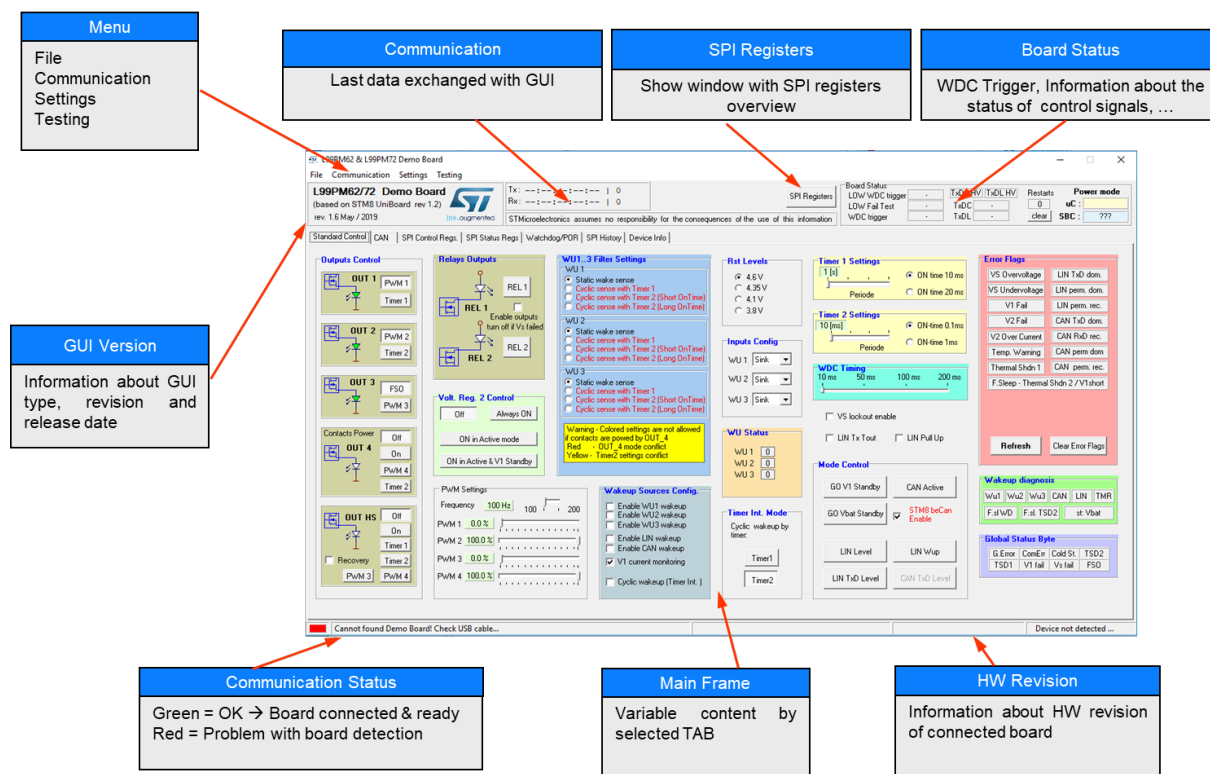
Figure 7. GUI installation (step 3/3)



3.3 EVAL-L99PM62-72 Graphical User Interface

Launching the installed GUI, a configurable Main window starts (see Figure 8).

Figure 8. Main window



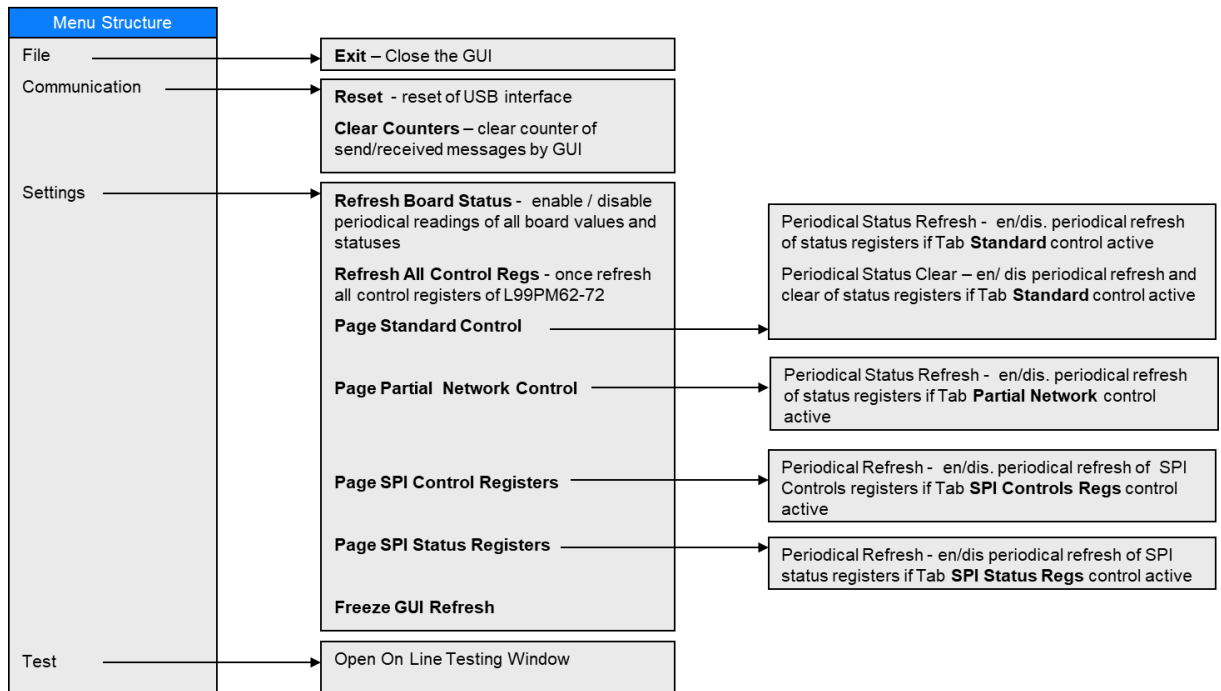
EVAL-L99PM62-72 GUI main window is composed of a menu and different windows/TAB that allow to execute the device management command easily.

3.3.1

Menu

The Menu structure is showed in Figure 9.

Figure 9. Main window - Menu items



In the Menu there are the following items:

File

The File item contains Exit item that allows to close the application.

Communication

The Communication item contains:

- Reset: allow to reset the USB interface
- Clear Counters: allow to clear counter of sent/received message exchanged with GUI

Settings

The Settings item contains:

- *Refresh Board Status* used to enable / disable periodical readings of all board values and statuses
- *Refresh All Control Regs* - once used to refresh all control registers of L99PM62-72
- *Page Standard Control* used to enable or disable periodical refresh only or refresh and clear of status registers if Tab Standard control is active
- *Page Partial Network Control* used to enable or disable periodical refresh of status registers if Tab Partial Network control is active
- *Page SPI Control Registers* used to enable or disable periodical refresh of status registers if Tab SPI Control Regs control is active
- *Page SPI Status Registers* used to enable or disable periodical refresh of status registers if Tab SPI Status Regs control is active
- *Freeze GUI Refresh* used to freeze any refresh

Test (ONLY FOR INTERNAL USE)

Open an ON-line testing command window that allow definition of a custom test sequence (see Figure 10).

Important: *It is only used for internal debugging, please do not take into account during GUI usage.*

Figure 10. ON Line commander window

Test sequence list
Command window where the user can define a custom test sequence

GUI-Board communication messages
List of all messages exchanged between GUI & Board during their communication

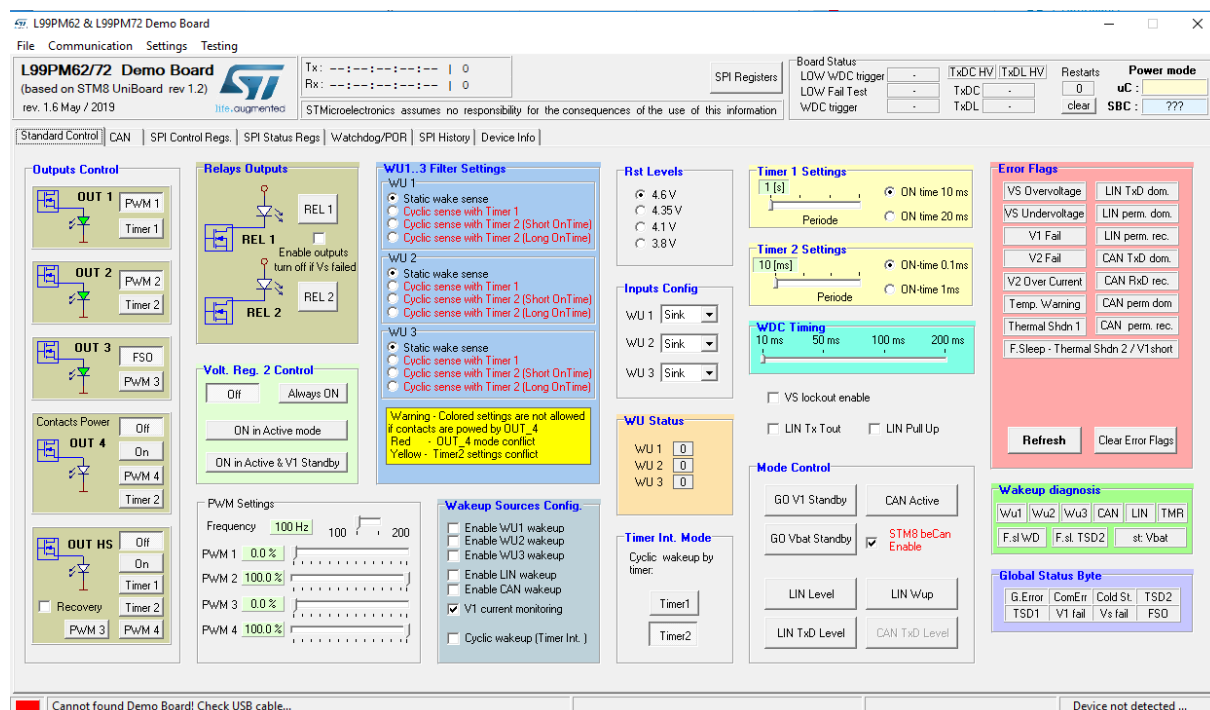
GUI board data
List of data exchanged between GUI and Board during test execution defined into command sequence window

3.3.2

Standard control

This section allows the user to select several controls related to the general configuration of the device (see Figure 11).

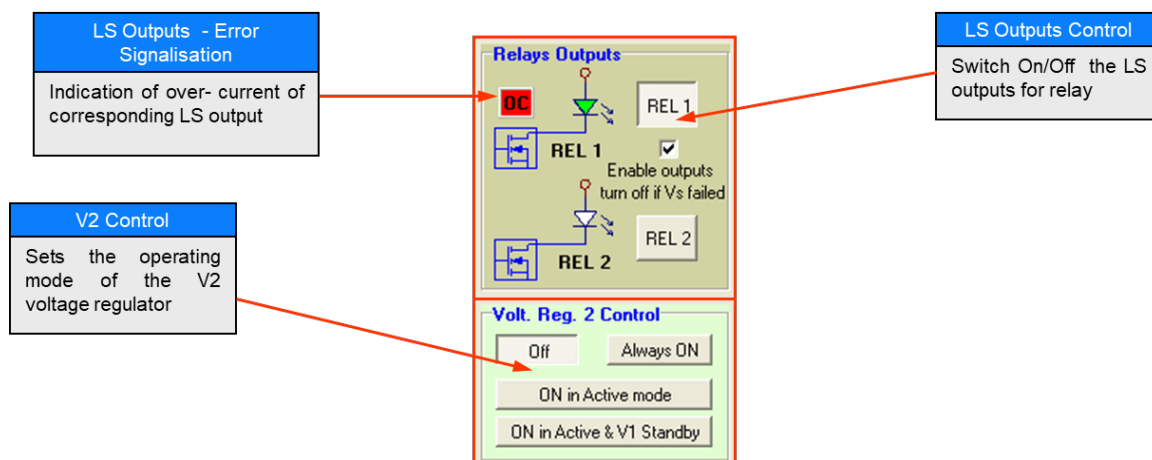
Figure 11. Standard control



It contains controls for:

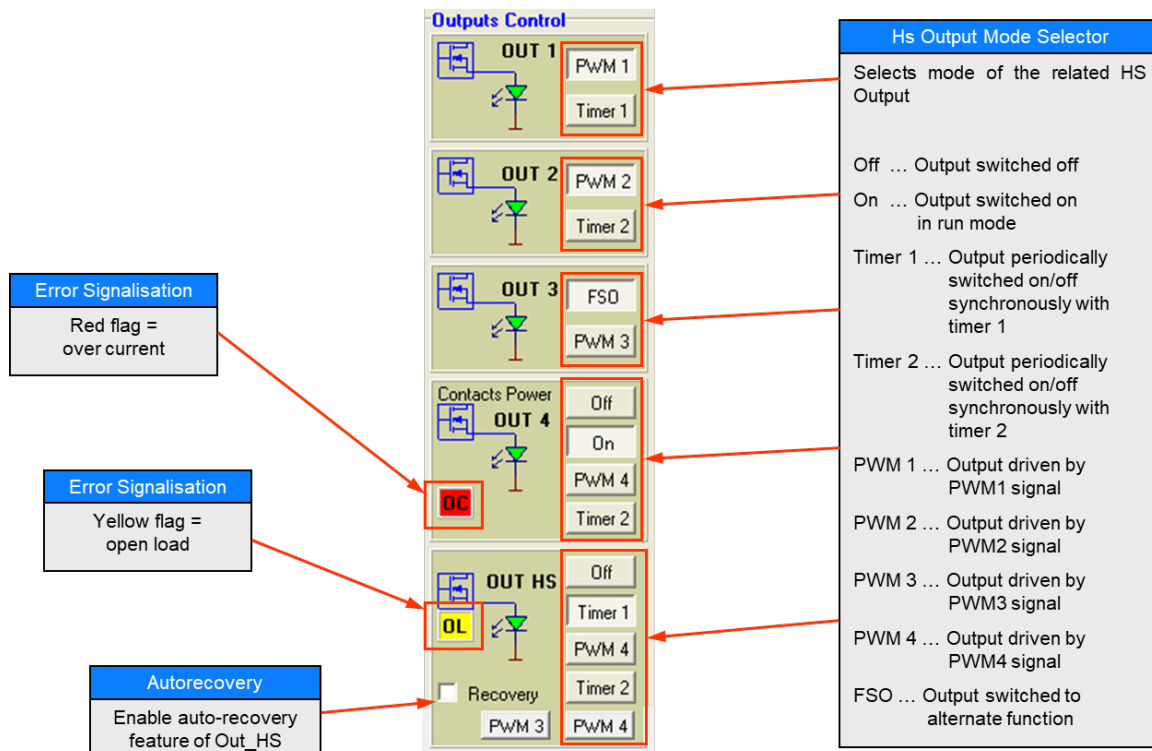
- LS Outputs Control:** allows the user to handle the Low Side output and monitoring of possible error (see Figure 12).
- V2 Settings:** allow the user to set the operating mode of voltage regulator V2 (see Figure 12).

Figure 12. Standard control - LS outputs and V2 configuration



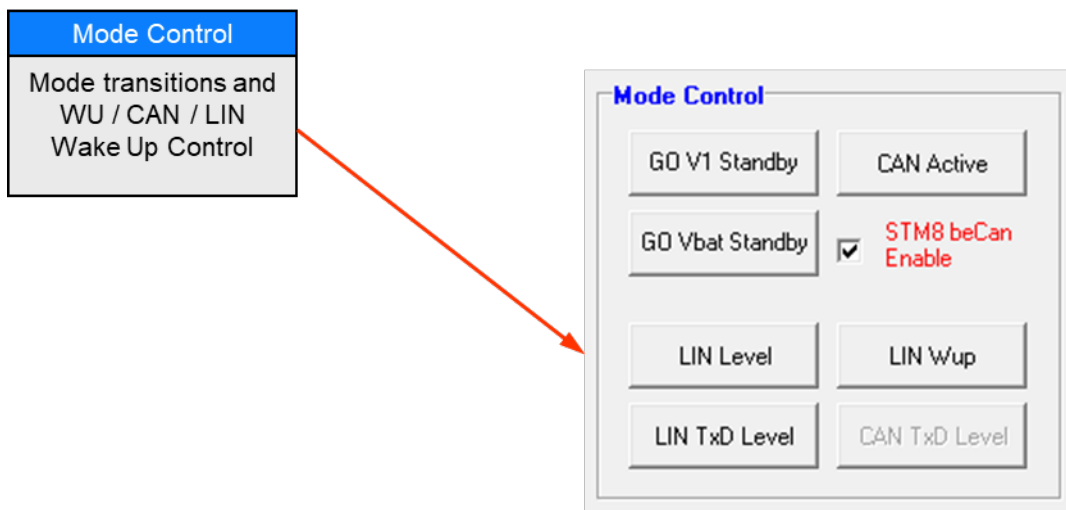
- **HS Outputs Control:** allows the user to select the operating mode of the related HS Output and monitoring of possible errors (see Figure 13).

Figure 13. Standard control - HS outputs control



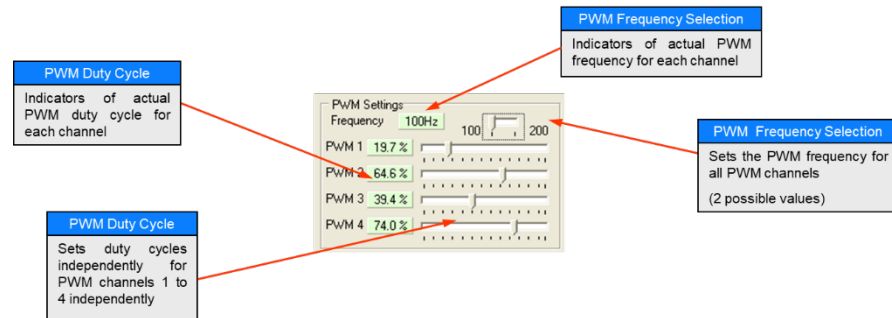
- **Mode Control:** allows the user to handle the device operating modes (see Figure 14).

Figure 14. Standard control - Mode control



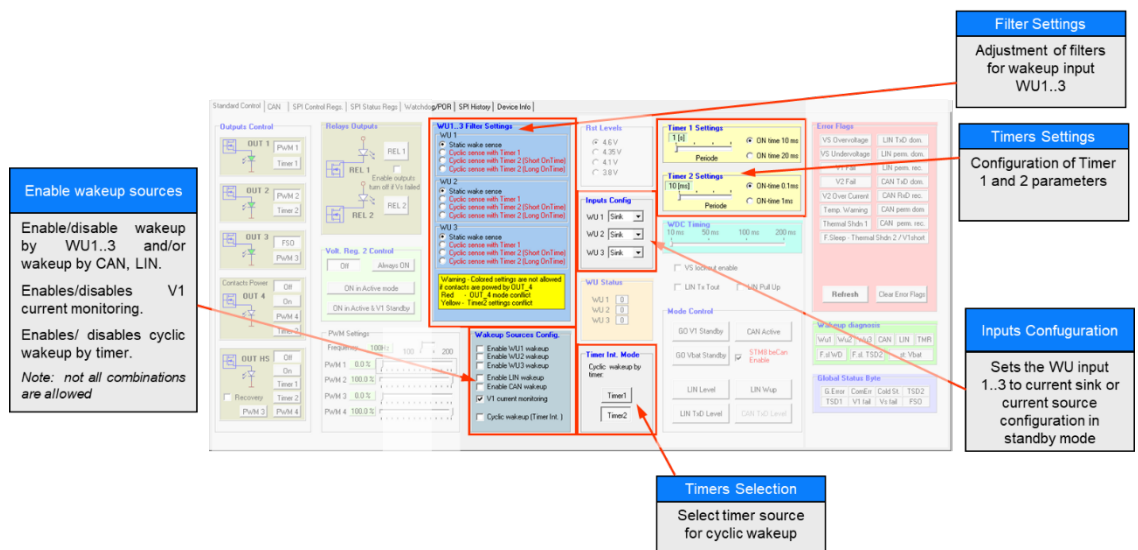
- **PWM Settings:** allow the user to set the PWM frequency for all PWM channels (2 possible values are selectable), (see Figure 15).

Figure 15. Standard control - PWM configuration



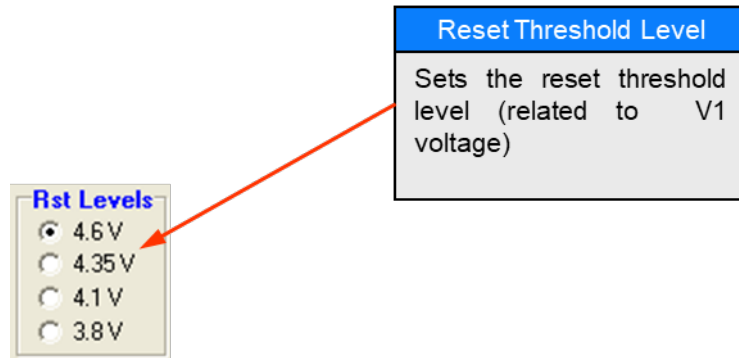
- **Device diagnosis:** allows the user to (see Figure 16):
 - enable/disable wake up sources
 - adjustment of filters for wake up input
 - set timer 1 and timer 2
 - set the wake up input in standby mode
 - select timer source for cyclic wake up

Figure 16. Standard control - Device diagnosis



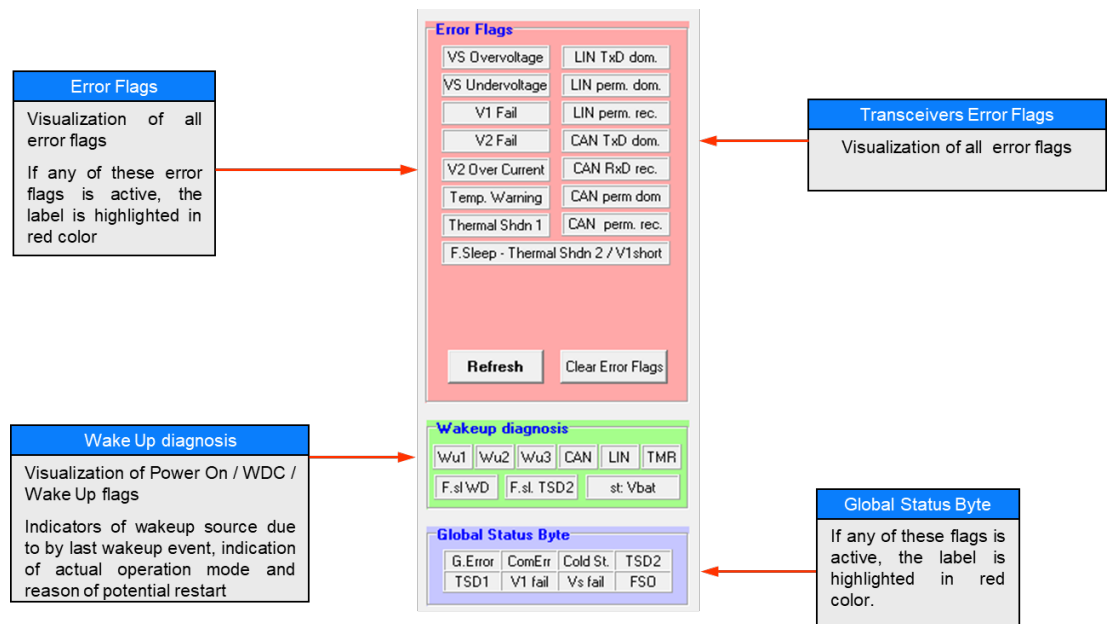
- **Diagnosis function:**
 - **Reset level signal:** allows the user to set the reset threshold level related to V1 voltage (see Figure 17).

Figure 17. Standard control - Reset threshold



- **Error and wake up source monitoring:** allow the user to monitor all error flags related to the regulators or transceiver and also to monitor wake up source due to by last wake up event, actual operating mode and reason of potential restart (see Figure 18).

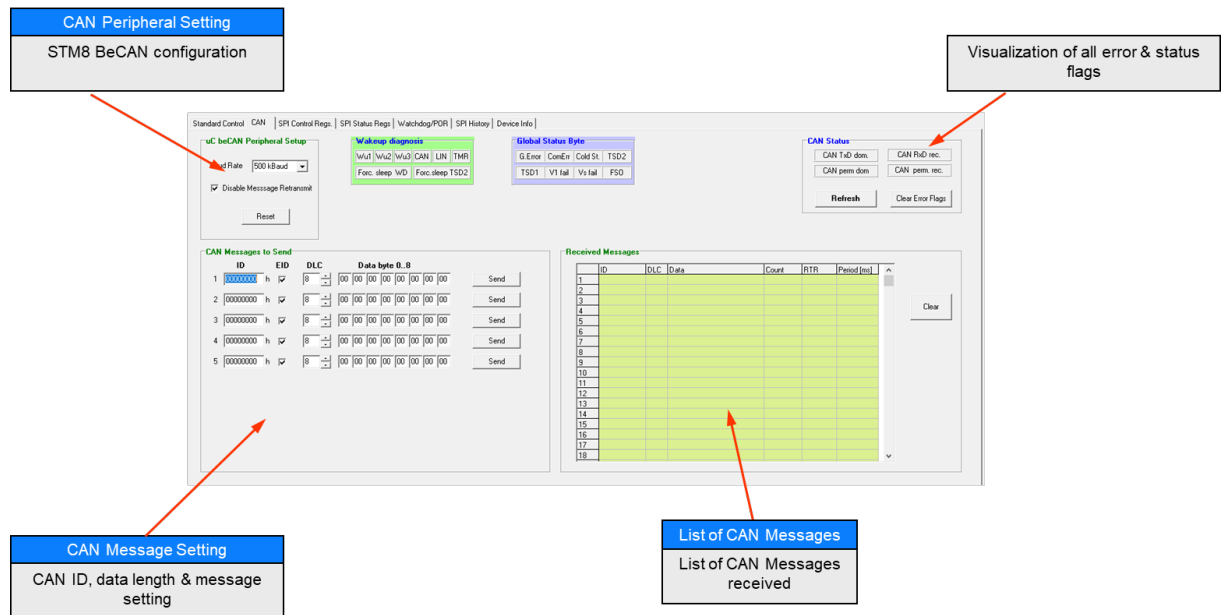
Figure 18. Standard control - error and wake up source monitoring



3.3.3 Partial Networking (only for L99PM72GXP)

The Partial Networking TAB allow the user to define specific CAN messages that can be send to the device from the microcontroller and to monitor CAN messages received back by the device thanks to a list used to store them. It is also possible set CAN Baudrate and monitor all possible error and status flags by usage of a diagnosis feedback (see Figure 19).

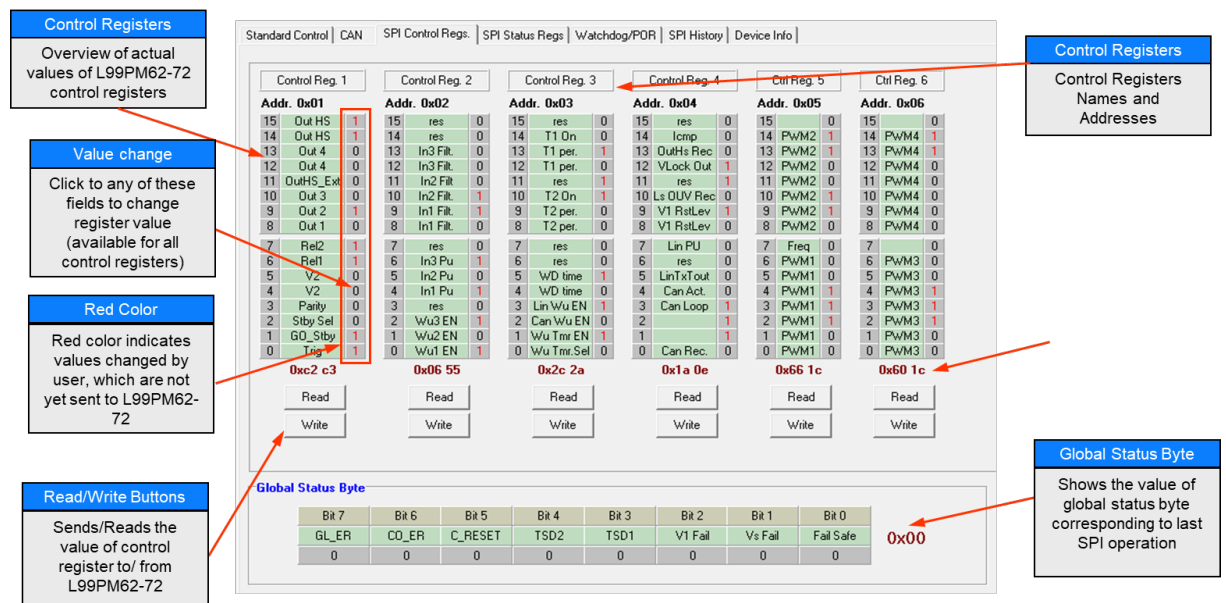
Figure 19. Partial Networking



3.3.4 SPI Control register

The SPI control register allows the user to initialize/setting the device as for its use case, programming internal control register values via SPI (see Figure 20).

Figure 20. SPI Control register



3.3.5

SPI Status register

The SPI status register allows the user to monitor the device operating mode raising possible error by setting of specific bit inside status register. The TAB embeds also the overview of actual value configuration register (see Figure 21).

Figure 21. SPI Status register

The screenshot shows the 'SPI Status Regs' tab in the GUI. It displays three status registers (0x11, 0x12, 0x13) and a global status byte. Annotations point to various components:

- Status Registers Names and Addresses:** Points to the header of the status register tables.
- Status Registers Overview of actual values of L99PM62-72 status registers:** Points to the data rows of the status registers.
- Read / Clear Buttons:** Points to the 'Read' and 'Read & Clear' buttons for each status register.
- Configuration Register Overview of actual value of L99PM62-72 Configuration register:** Points to the 'Config Reg.' table on the right.
- Global Status Byte:** Points to the 'Global Status Byte' table at the bottom.
- Global Status Byte Shows the value of global status byte corresponding to last SPI operation:** Points to the '0x00' value in the global status byte.

3.3.6

SPI History

The SPI History TAB allows the user to list the history of SPI communication between board and device. Clicking on any line allow to get detailed view of selected SPI command on right side register (see Figure 22).

Figure 22. SPI History

The screenshot shows the 'SPI History' tab in the GUI. It displays a list of SPI communication history and a detailed view of the selected SPI command. Annotations point to various components:

- List of SPI History List of History of SPI communication between board and L99PM62-72:** Points to the list of SPI communication history.
- Send Settings Detailed view of selected SPI command in list window:** Points to the 'Control Register' table on the right.
- List window command Do the List window clearing or floating:** Points to the 'Clear List' button.

3.3.7

SPI Register map overview

The SPI register button on Main window allows the user the direct access to the SPI register map overview in order to see all SPI registers value in binary and hexadecimal format (see Figure 23).

Figure 23. SPI Register map overview

SPI Registers

Click on this button shows floating pop-up window with SPI registers overview

SPI Registers Overview

Adr:	Register Name	Value (binary)	Value (hexadecimal)
0x3F	CFR	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0x -- --
0x2A	Test	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0x -- --
0x23	PN	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0x -- --
0x22	Dbg	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0x -- --
0x20	SR 5	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0x -- --
0x14	SR 4	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0x -- --
0x13	SR 3	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0x -- --
0x12	SR 2	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0x -- --
0x11	SR 1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0x -- --
0x10	CR 16	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0x -- --
0x0F	CR 15	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0x -- --
0x0E	CR 14	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0x -- --
0x0D	CR 13	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0x -- --
0x0C	CR 12	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0x -- --
0x0B	CR 11	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0x -- --
0x0A	CR 10	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0x -- --
0x09	CR 9	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0x -- --
0x08	CR 8	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0x -- --
0x07	CR 7	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0x -- --
0x06	CR 6	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0x00 00
0x05	CR 5	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0x00 00
0x04	CR 4	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0x00 00
0x03	CR 3	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0x00 00
0x02	CR 2	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0x00 00
0x01	CR 1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0x00 00

Registers Addresses

Registers Names

Registers Values (binary)

Registers Values (hexadecimal)

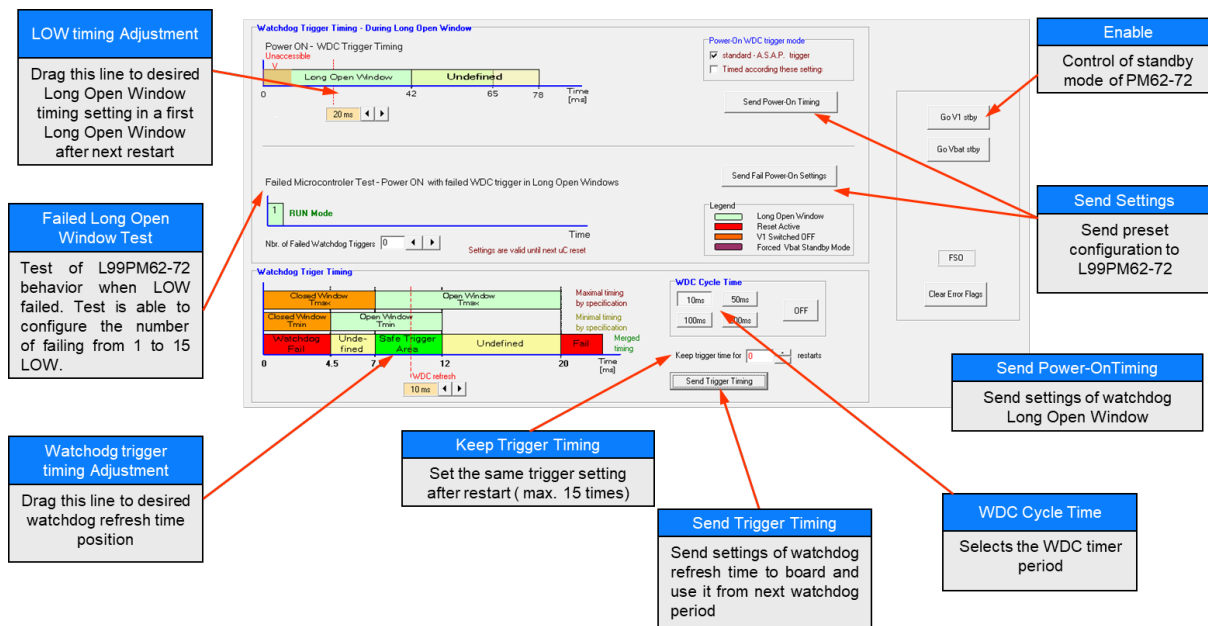
3.3.8 Watchdog/POR settings

The watchdog/POR settings TAB allows the user to test the internal watchdog as:

- Long Open Window timing test after reset
- Watchdog trigger timing test within the safe trigger area
- Long Open Window failing test

It also allows setting of refresh timing during normal operation (see Figure 24).

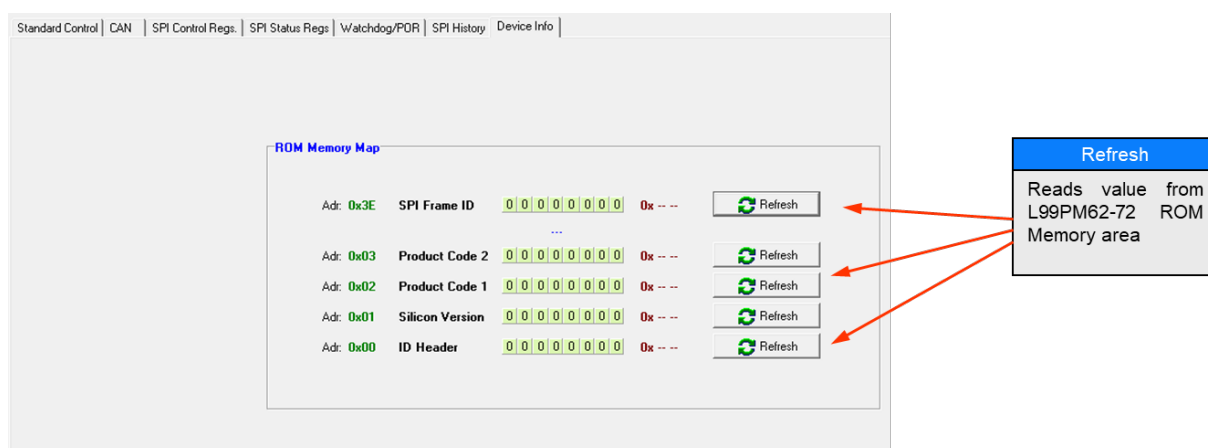
Figure 24. Watchdog/POR settings



3.3.9 Device info

The Device Info TAB allows the user to read device information values from ROM memory area (see Figure 25).

Figure 25. Device info



Revision history

Table 2. Document revision history

Date	Version	Changes
17-Jan-2020	1	Initial release.
14-Feb-2020	2	Typos.

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