Software User Manual
MLX92232 PTC-04
Version 1.0

Table of Contents

1 Overview

The PTC-04 solution for MLX92232 has the main goal to provide a very general and user friendly software that can be used as an example for mass production.

1.1 Connection

There are two possibilities for connecting the PTC-04 to the computer – through **RS-232** or **USB-cable**. In the first case no extra device driver installation is necessary. In the second case, first time when the PTC-04 is connected with the computer, hardware setup must be performed.

1.2 Reference

AN: PTC-04.pdf
AN: MLX92232 Software Description.pdf
AN: Advanced Calibration options

1.3 Software Installation

It is important that the current user has administrative rights to be able to install the software. When running the installation of the software the following will be installed on the user's computer:

• MPT application (MPTApp.exe) – Melexis Programmable Toolbox application is the main work environment for loading specific user interface modules.

• MLX92232 user interface (UI_092232AAMLX.exe) – MLX92232 PTC-04 specific user interface, which can be executed only by MPT Application.

• MLX92232 PSF (PSF92232AAMLX.exe) – Product Specific Functions library containing several ActiveX objects facilitating the communication with the device.

2 Launching the software

There are two ways to launch the software:

1. Run Melexis Programming Toolbox application (MPT) -> On Workspace panel open UI modules branch -> Double-click on MLX92232 PTC04 to open the user interface. The software is now ready to use.

2. The same can be automatically done by running the specific item on the Start menu: Start->Programs->Melexis->Melexis Programmable Toolbox->MLX92232PTC04 UI.

3 Start up MLX92232 PTC-04

The goal of this section is to give the user a deeper insight in how to program his/her device with help of screenshots and small tutorials.

3.1 General overview

When the MLX92232 PTC-04 software is launched successfully, figure 1 will appear:

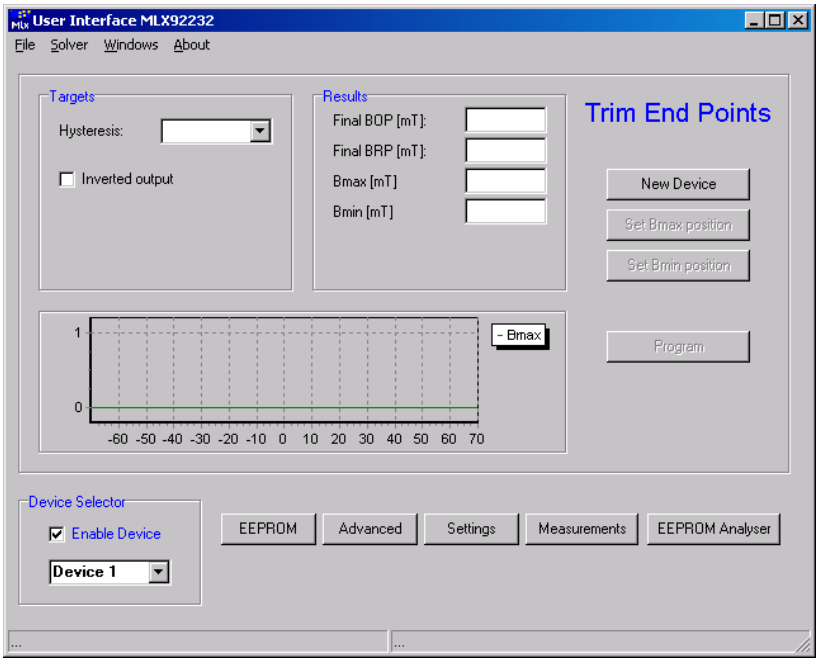


Figure 1

3.2 Solver

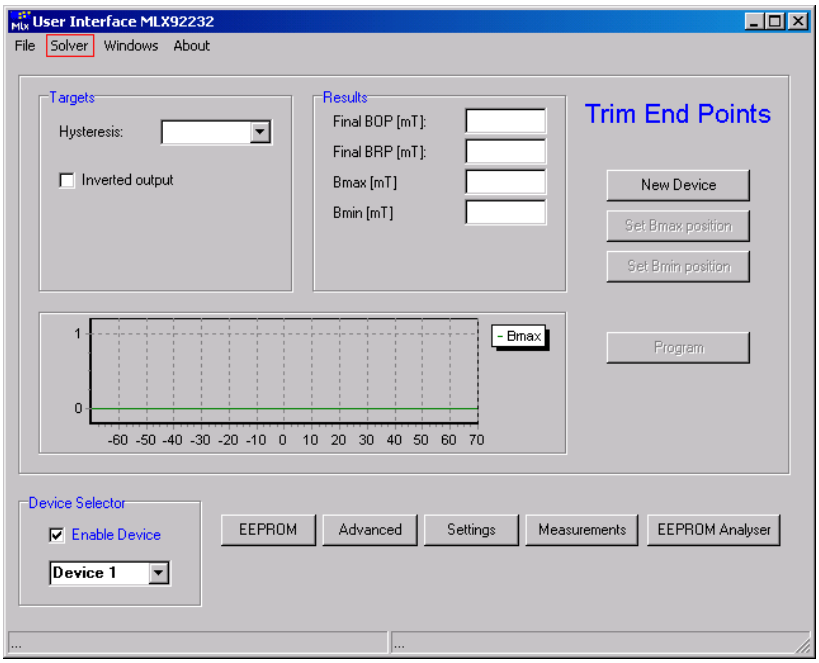


Figure 2 general overview

Clicking on solver will give you 3 different options to choose from; Trim B_{op}, Trim B_{rp} and Trim End Points.

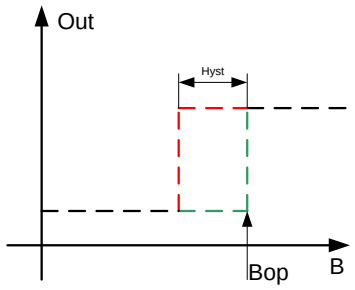
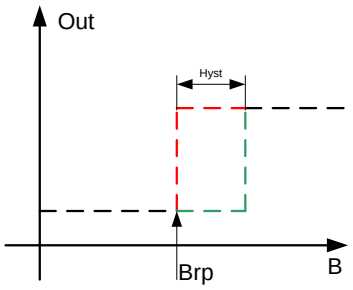
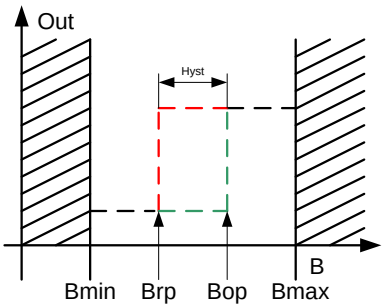
Trim Bop First option	Trim Brp Second option	Trim End points Third option
 **Brp = Bop - Hyst**	 **Bop = Brp + Hyst**	
Inputs: Reverse output, SWITCH, HYST	**Inputs: Reverse output, SWITCH, HYST**	**Inputs: Reverse output, SWITCH, HYST**
• Apply Bop • Brp calculated	• Apply Brp • Bop calculated	• Apply Bmax & Bmin • Bop & Brp calculated
Remark: Bop = Operating point; Brp = Release point and Bop > Brp (absolutely)		

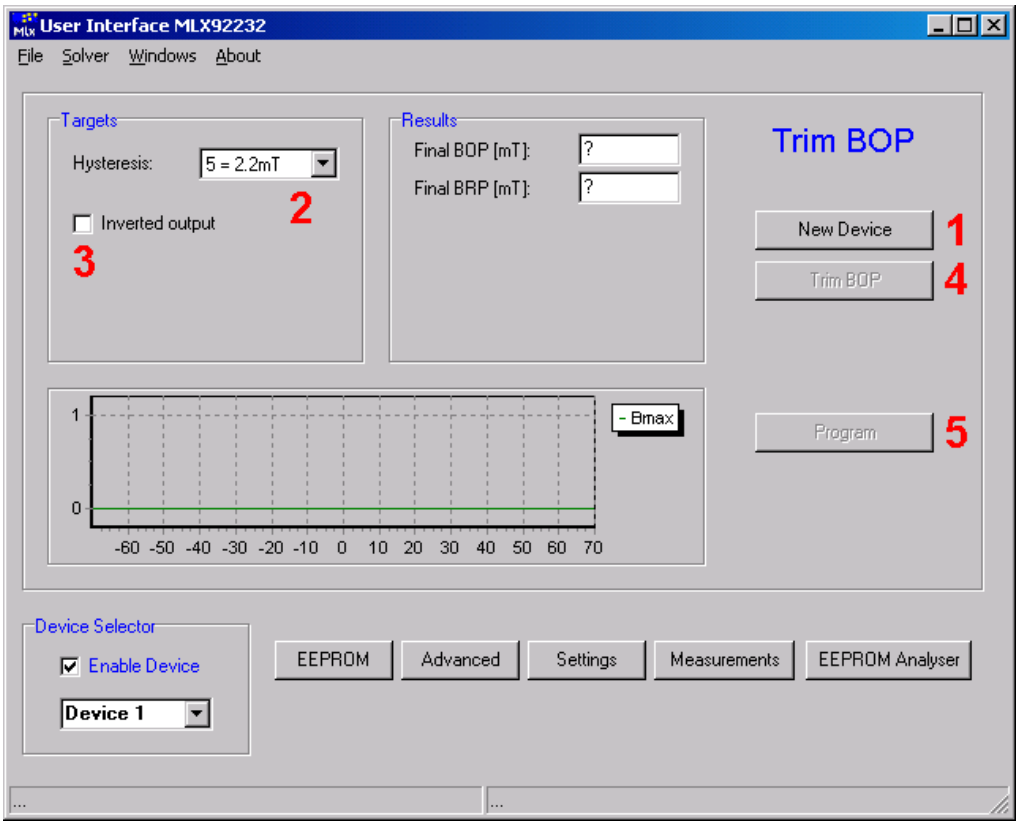
Figure 3 different options

3.2.1 Trim B_{op} (first option)

Procedure:

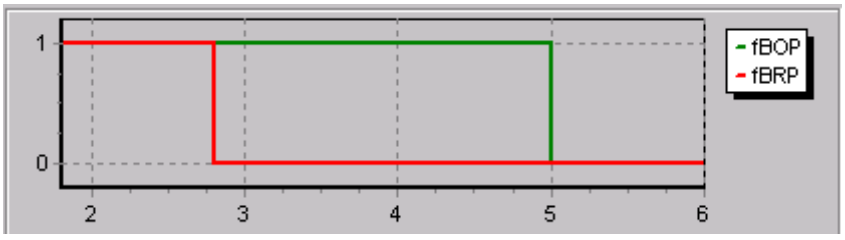
- User applies his/hers desirable B_{op}
- Sets a fixed hysteresis
- B_{rp} is calculated

- Click on 'New Device' in the right hand corner (1)



- Set desired fixed hysteresis (2)
- In case an inverted output is desired, 'inverted output' should be check (3)
- Apply desired B_{op} (4)
- If all settings are done and correct, push the program button (5)

Please note that when the chip is programmed the screen gets updated to give the user maximum insight in his/her settings



In previous example we see that B_{op} is programmed around 5mT which means that B_{rp} is equal to (5mT – 2.2mT) which is 2.8mT as final B_{rp}. *($B_{rp} = B_{op} – hyst$)*

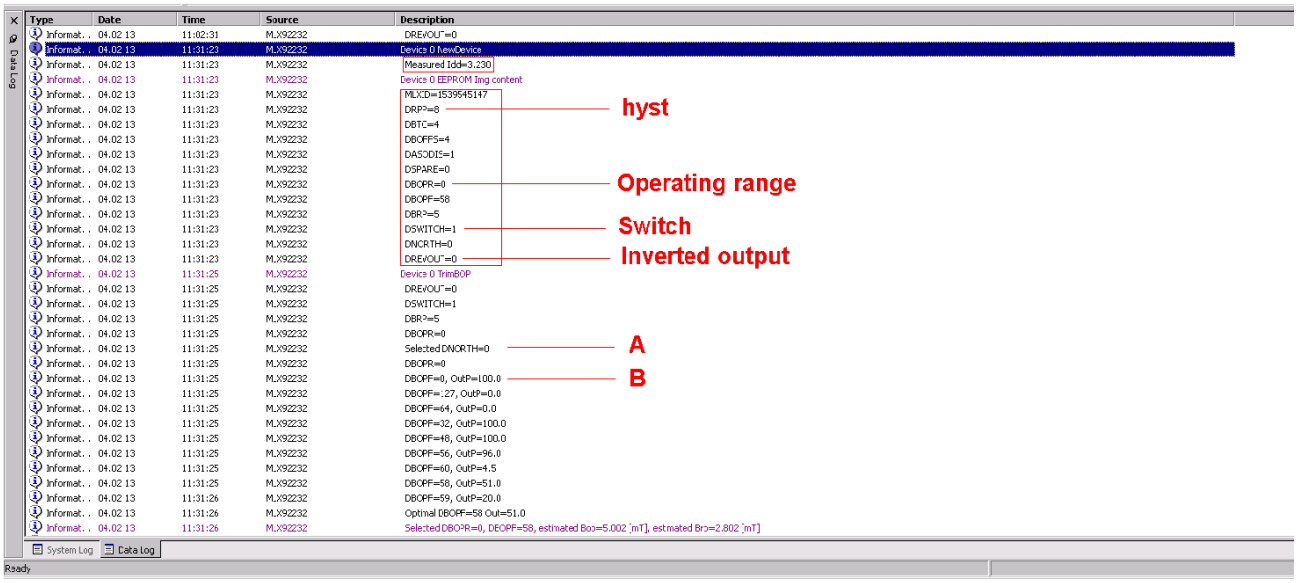


Figure 4

One may open the data log in the MPT (**M**elexis **P**rogrammable **T**oolbox) and find the programming log of the MLX92232.

After clicking “New Device” the source current gets checked as first. If the source current would result in 0mA then it’s probably due to the fact that there isn’t a chip placed inside the socket. If the source current would indicate ±100mA one may think in a way of a short circuit.

In the next step the EEPROM parameters get stored in the local memory of the PC/Laptop.

Further the device gets tested if there is a North or a South field applied. In both cases the most optimal DBOPF is searched for (A & B).

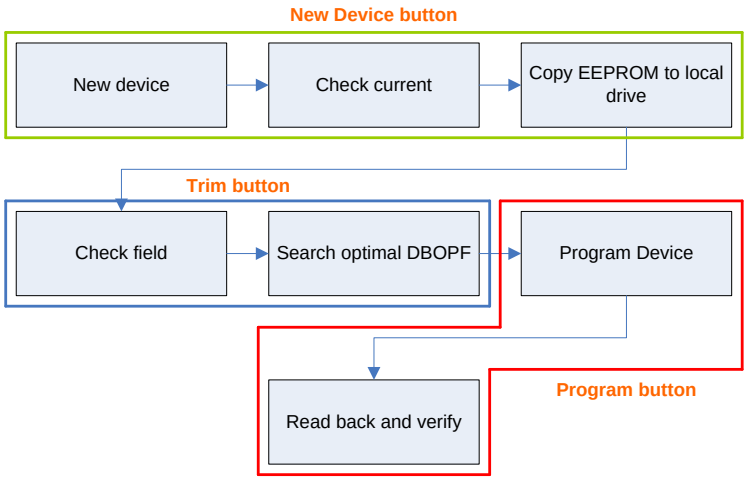
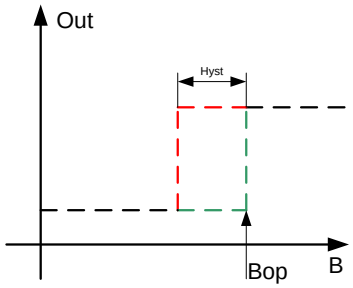
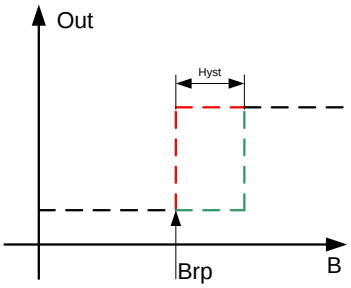
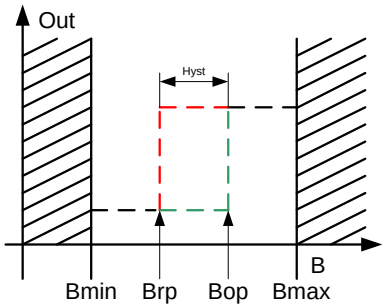


Figure 5

3.2.2 Trim B_{rp} (second option)

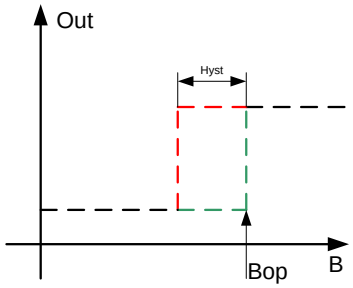
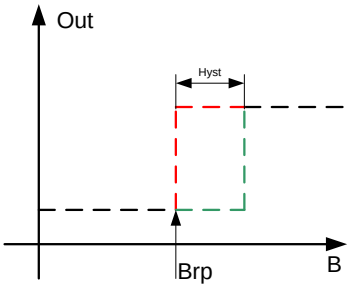
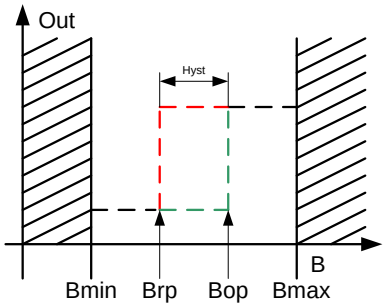
The same analogy as “Trim B_{op}” can be used to explain “Trim B_{rp}”.

The reason for trimming at B_{rp} is for those who want to obtain a higher accuracy at B_{rp}

Trim Bop First option	Trim Brp Second option	Trim End points Third option
 **Brp = Bop - Hyst**	 **Bop = Brp + Hyst**	
Inputs: Reverse output, SWITCH, HYST	**Inputs: Reverse output, SWITCH, HYST**	**Inputs: Reverse output, SWITCH, HYST**
• Apply Bop • Brp calculated	• Apply Brp • Bop calculated	• Apply Bmax & Bmin • Bop & Brp calculated
Remark: Bop = Operating point; Brp = Release point and Bop > Brp (absolutely)		

3.2.3 Trim End Points (third option)

You can think off mechanical endpoint if we speak about Bmin and Bmax in this case.

Trim Bop First option	Trim Brp Second option	Trim End points Third option
 **Brp = Bop - Hyst**	 **Bop = Brp + Hyst**	
Inputs: Reverse output, SWITCH, HYST	**Inputs: Reverse output, SWITCH, HYST**	**Inputs: Reverse output, SWITCH, HYST**
• Apply Bop • Brp calculated	• Apply Brp • Bop calculated	• Apply Bmax & Bmin • Bop & Brp calculated
Remark: Bop = Operating point; Brp = Release point and Bop > Brp (absolutely)		

Procedure:

- User applies desirable Bmax & Bmin
- User chooses fixed hysteresis
- B_{op} & B_{rp} is calculated

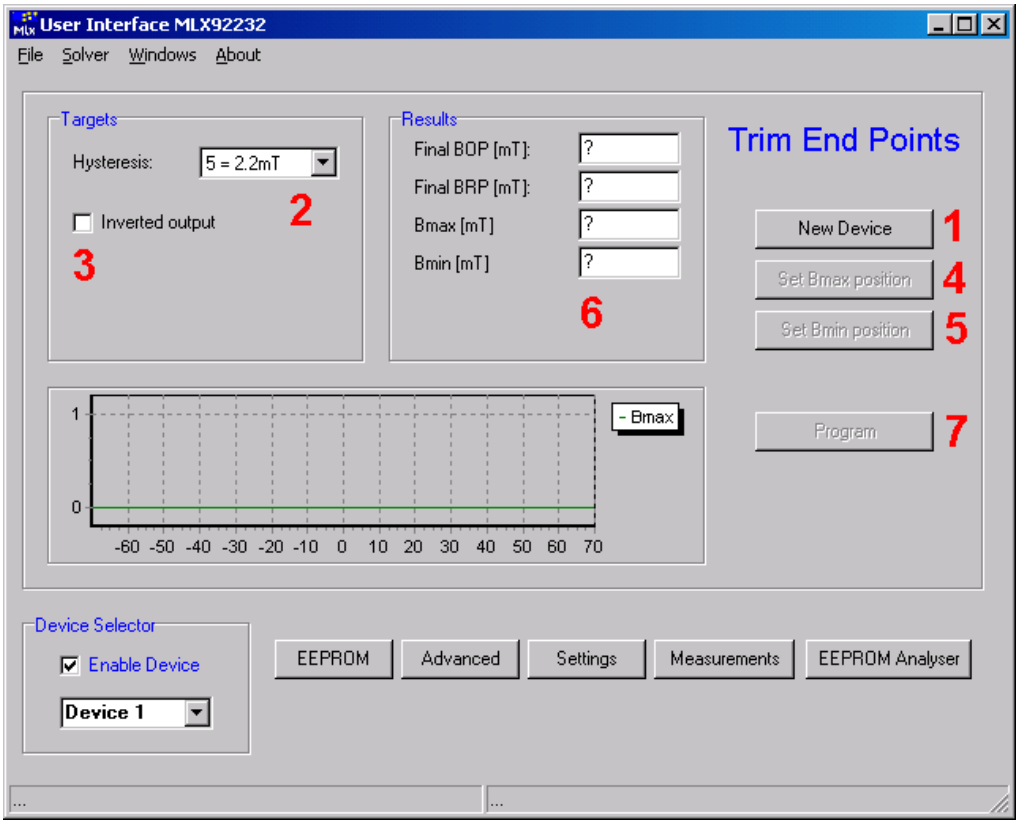


Figure 6

- Click on ‘New Device’ in the right hand corner (1)
- Set fixed hysteresis (2)
- In case of an inverted output is desired, ‘inverted output’ should be checked (3)
- Set Bmax position (4)
- Set Bmin position (5)
- Results are automatically calculated and filled in by the program (6)
- If all settings are done and correct, push the program button (7)

As in this example we programmed Bmax at 6.30mT and a Bmin at -0.20mT. B_{op} and B_{rp} can be calculated using the formula described as in figure 7.

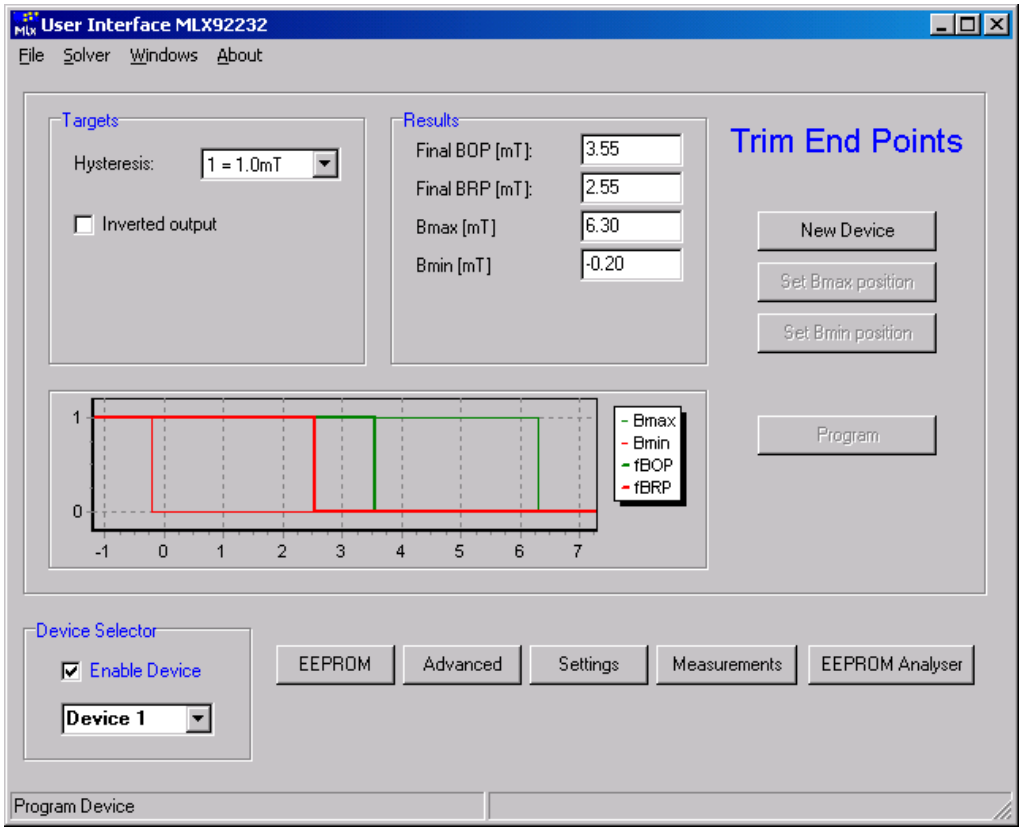
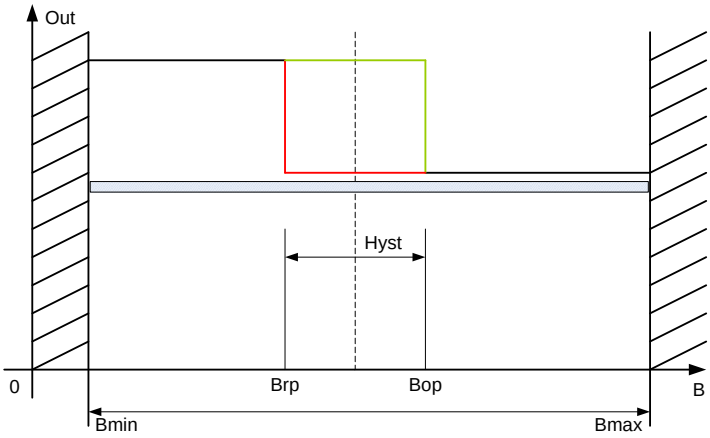


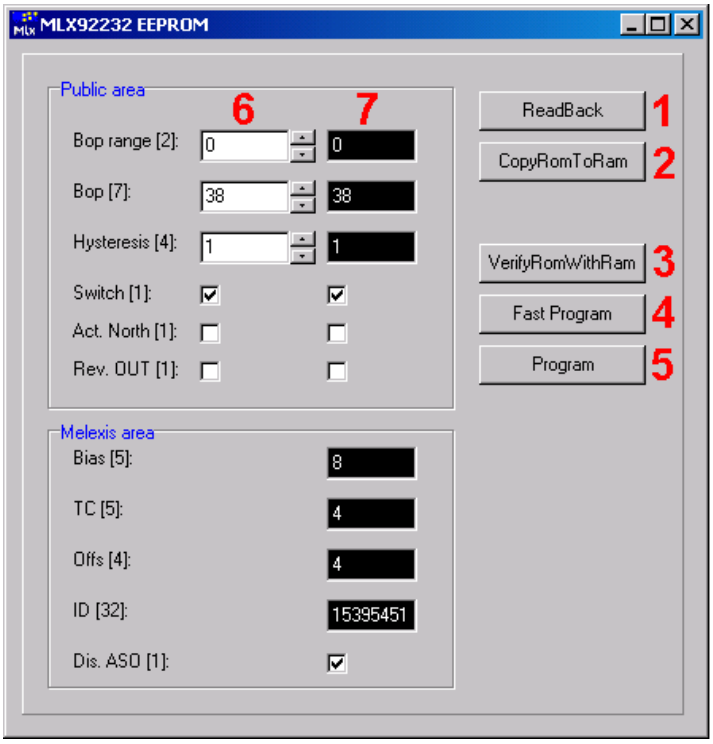
Figure 7



For example:

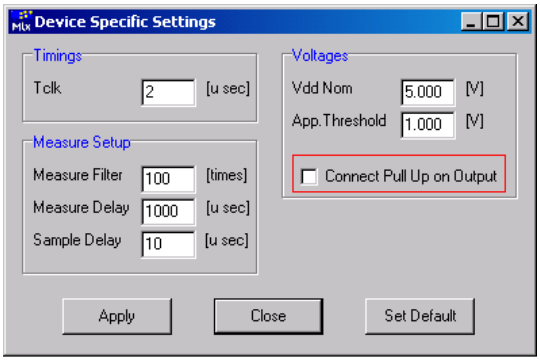
Bmax = 6.30mT, Bmin = -0,20mT, Hyst = 1mT

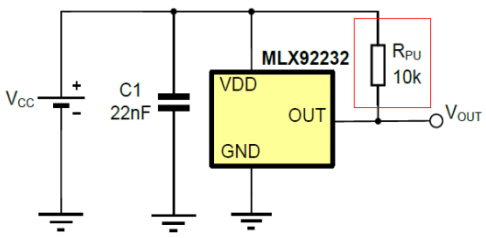
3.3 EEPROM



- Pressing readback will read back the parameters stored inside the chip (1) and will be made visible in (7)
- Pressing CopyRomToRam (2) will copy the Rom-parameters to the Ram-memory (7) so the user will be able to modify them.
- Pressing VeryRomWithRam will check if Rom (7) is equal to Ram (6).
- Pressing fast program will only program the changes that were being made in respect to the last EEPROM content.
- Pressing program will conduct a full programming cycle.

3.4 Settings





In some cases the pull-up from the PTC04 needs to be used if there no pull-up available on the module that the user is intent to use. (Ref pg 8 MLX92232_Preliminary_Datasheet_rev1.pdf)

3.5 Measurement

The chip can be easily tested after programming by clicking the measurement button. Figure 8 will popup.

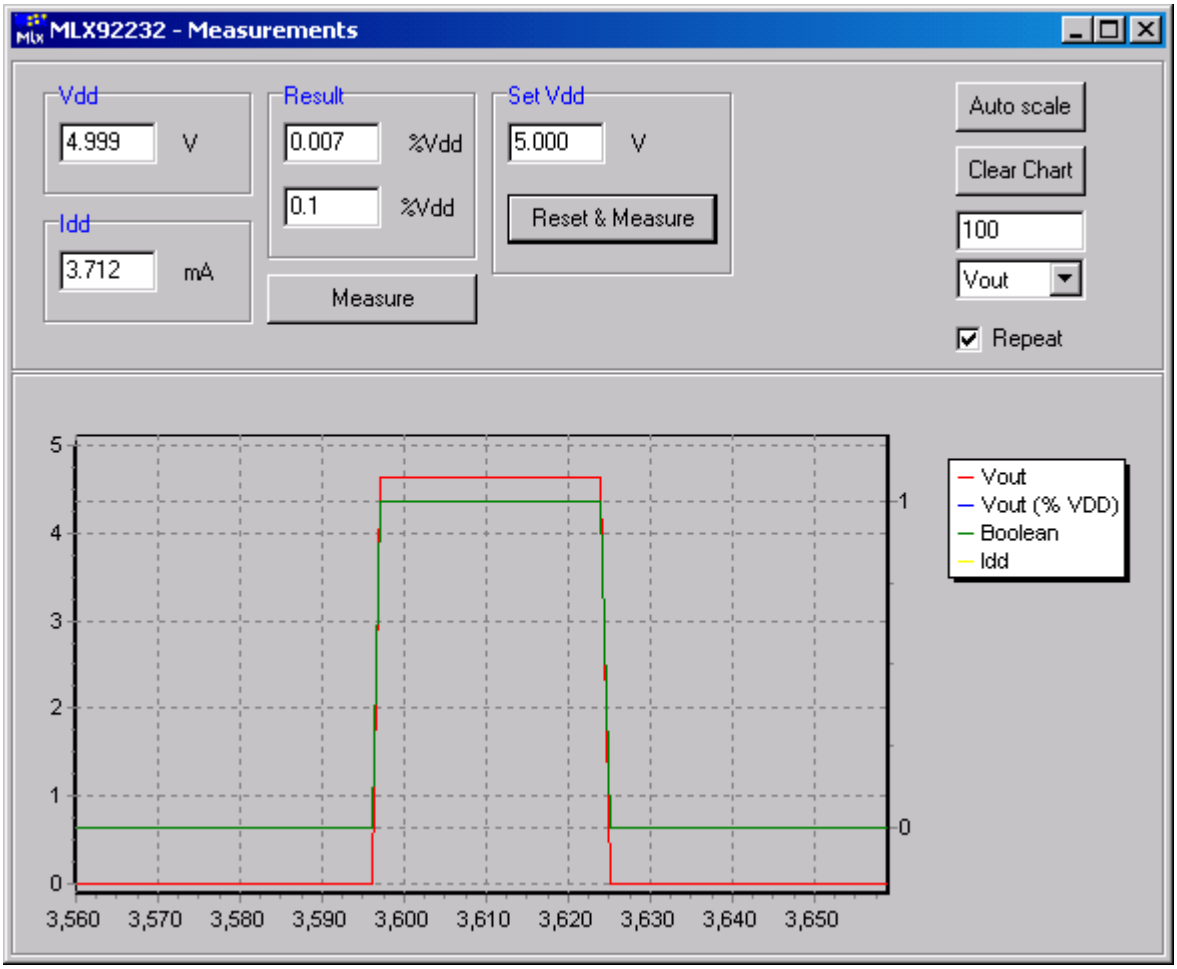


Figure 8 measurements

The best way to test you chip and settings is by measuring it.

The user is able to measure Vout, %VDD, IDD and field just by selecting it in the dropdown menu.

Measuring field can be very helpful in case of if one wants to know where the field of his/her magnets is the highest (see next page)

Figure 9

Field can be measured by first selecting field in the dropdown menu, and checking repeat to true. Then click on Rest & Measure.

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