

Software User Manual MLX92232 PTC-04 Version 1.0



Table of Contents

3
3
3
3
4
4
5
6
8
9
12
12
13



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 <u>administrative rights</u> 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:

Targets Hysteresis:	Results Final BOP (mT): Final BRP (mT):	Trim End Points
Inverted output	Bmax [mT]	New Device
	Bmin [mT]	Set Bmax position
		Set Bmin position
-60 -50 -40 -30 -20 -10 0	10 20 30 40 50 60 70	- i isgisini
rice Selector	M Advanced Settings	Measurements EEPROM Analyse

Figure 1



3.2 Solver

His User Interface MLX92232 File Solver Windows About	Results	Trim End Points
Hysteresis:	Final BRP (mT): Bmax (mT) Bmin (mT)	New Device
		Set Bmax position
1 -60 -50 -40 -30 -20 -10 0	- Br 10 20 30 40 50 60 70	Program
Device Selector Enable Device Device 1	Advanced Settings	Measurements EEPROM Analyser

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.



Figure 3 different options



3.2.1 Trim B_{op} (first option)

Procedure:

- User applies his/hers desirable Bop
- Sets a fixed hysteresis
- B_{rp} is calculated
- Click on 'New Device' in the right hand corner (1)

Hysteresis: 5 = 2.2mT	Final BOP (mT): ? Final BBP (mT): ?	Trim BOP
Inverted output 2		New Device
3		Trim BOP 🖌
-60 -50 -40 -30 -20 -10 0	10 20 30 40 50 60 70	
evice Selector	I Advanced Settings Meas	urements EEPROM Analyse

- 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} . ($B_{rp} = B_{op} - hyst$)

×	Туре	Date	Time	Source	Description	
0	informat	. 04.02.13	11:02:31	M.X92232	DREVOUT=0	
6	🔍 Informat	. 04.02.13	11:31:23	M.X92232	Device 0 NewDevice	
ata	informat	. 04.02.13	11:31:23	M.X92232	Measured Idd=3.230	
5	🤑 informat	. 04.02.13	11:31:23	M.X92232	Device 0 EEPROM Img content	
	🤑 informat	. 04.02.13	11:31:23	M.X92232	MLX:D=1539545147	
1	🤑 informat	. 04.02.13	11:31:23	M.X92232	DRP>=8	— hyst
1	🤑 informat	. 04.02.13	11:31:23	M.X92232	DBTC=4	-
1	🤑 informat	. 04.02 13	11:31:23	M.X92232	DBOFF5=4	
1	informat	. 04.02 13	11:31:23	M.X92232	DA50DIS=1	
1	informat	. 04.02 13	11:31:23	M.X92232	DSPARE=0	
1	informat	. 04.02 13	11:31:23	M.X92232	DBCPR=0	— Operating range
1	informat	. 04.02 13	11:31:23	M.X92232	DBOPF=58	
1	informat	. 04.02 13	11:31:23	M.X92232	DBR ⁵ =5	Outline h
5	🎝 Informat	. 04.02 13	11:31:23	M.X92232	DSWITCH=1	
5	Informat	. 04.02 13	11:31:23	M.X92232	DNCRTH=0	Invested automatic
5	Informat	. 04.02.13	11:31:23	M.X92232	DRE/OUT=0	— Inverted output
5	🥹 Informat	. 04.02.13	11:31:25	M.X92232	Device 0 TrimBOP	
5	🎝 Informat	. 04.02.13	11:31:25	M.X92232	DRE/OUT=0	
5	🎝 Informat	. 04.02.13	11:31:25	M.X92232	DSWITCH=1	
5	🍨 Informat	. 04.02.13	11:31:25	M.X92232	DBR ⁹ =5	
1	Informat	. 04.02 13	11:31:25	M.X92232	DBOPR=0	•
9	Informat	. 04.02.13	11:31:25	M.X92232	Selected DNORTH=0	— A
1	🍨 Informat	. 04.02.13	11:31:25	M.X92232	DBOPR=0	-
1	informat	. 04.02 13	11:31:25	M.X92232	DBOPF=0, OutP=100.0	— B
5	🍨 Informat	. 04.02.13	11:31:25	M.X92232	DBOPF=:27, OutP=0.0	
	🍨 Informat	. 04.02.13	11:31:25	M.X92232	DBOPF=64, OutP=0.0	
	🥹 informat	. 04.02.13	11:31:25	M.X92232	DBOPF=32, OutP=100.0	
	🥹 informat	. 04.02.13	11:31:25	M.X92232	DBCPF=48, OutP=100.0	
	🥹 informat	. 04.02.13	11:31:25	M.X92232	DBOPF=56, OutP=96.0	
	🥹 informat	. 04.02.13	11:31:25	M.X92232	DBOPF=60, OutP=4.5	
	🍨 informat	. 04.02 13	11:31:25	M.X92232	DBOPF=58, OutP=51.0	
	🍨 Informat	. 04.02 13	11:31:26	M.X92232	DBOPF=59, OutP=20.0	
	Niformat	. 04.02 13	11:31:26	M.X92232	Optimal DBOPF=58 Out=51.0	
	∛ Informat	. 04.02.13	11:31:26	M.X92232	Selected DBOPR=0, DEOPF=58, estimated B	Boo=5.002 [mT], estmated Bro=2.802 [mT]
	😑 System Log	og 📃 Data Log				

Figure 4

One may open the data log in the MPT (\underline{M} elexis \underline{P} rogrammable \underline{T} colbox) 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 $\pm 100mA$ 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).





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}





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	Trim Brp	Trim End points	
First option	Second option	Third option	
Out	Out	Out Hyst Bmin Brp Bop Bmax	
Inputs: Reverse output, SWITCH, HYST	Inputs: Reverse output, SWITCH, HYST	Inputs: Reverse output, SWITCH, HYST	
Apply BopBrp calculated	Apply BrpBop 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

Mix User Interface MLX92232 File Solver Windows About		
Targets Hysteresis: 5 = 2.2mT ▼	Results Final BOP [mT]: ?	Trim End Points
Inverted output	Bmax [mT] ?	New Device 1
3	Bmin (mT) ?	Set Bmax position 4
	6	Set Bmin position 5
	- Bmax	Program 7
Device Selector Enable Device Device 1	Advanced Settings Mea	surements EEPROM Analyser

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.

Fargets Hysteresis: 1 = 1.0mT ▼ 「Inverted output	Results 3.55 Tri Final BRP (mT): 2.55 2.55 Bmax (mT) 6.30 2.50 Bmin (mT) -0.20 0.20	Im End Points New Device Set Bmax position Set Bmin position
-1 0 1 2 3	- Bmax - Bmin - fBOP - fBRP	Program
e Selector Enable Device EEPROF	1 Advanced Settings Measuremer	nts EEPROM Analyser
evice 1		
Device	Figure 7	
n Device	Figure 7	
Device 1	Figure 7	



3.3 EEPROM

MLX92232 EEPRO	IM		
Public area	6	7	ReadBack 1
Bop range [2]:			
Bop [7]:	38	38	
Hysteresis [4]:	1	1	VerifvBomWithBam
Switch [1]:	v		
Act. North [1]:			Fast Program 4
Rev. OUT [1]:			Program 5
Melexis area			
Bias [5]:		8	
TC [5]:		4	
Offs [4]:		4	
ID [32]:		15395451	
Dis. ASO [1]:		V	

- 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.

MLX92232 - Measu	urements	<u>-</u> D×
Vdd 4.999 ∨ Idd 3.712 mA	Result Set Vdd 0.007 %Vdd 0.1 %Vdd Measure	Auto scale Clear Chart 100 Vout 💌 Repeat
5 4 3		- Vout - Vout (% VDD) - Boolean - Idd
	0 3590 3600 3610 3620 3620 2640	-0

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.





For the latest version of this document, go to our website at www.melexis.com

Or for additional information contact Melexis Directly

ISO/TS 16949 and ISO14001 Certified