BECOM
it's possible.

Melexis EVK75123

Application Note 1: Hidden Functions

Version 4

BECOM Systems GmbH

Gutheil-Schoder-Gasse 17

1230 Wien

AUSTRIA

office.systems@becom-group.com

http://systems.becom-group.com

Melexis EVK75123 – Application Note 1: Hidden Functions

Template No.: 900-519 Rev A

Publication date: March 25, 2019

Subject to change without notice. Errors excepted.

Table of Contents

The information herein is given to describe certain components and shall not be considered as a guarantee of characteristics.

Terms of delivery and rights of technical change reserved.

We hereby disclaim any warranties, including but not limited to warranties of non-infringement, regarding circuits, descriptions and charts stated herein.

BECOM Systems makes and you receive no warranties or conditions, express, implied, statutory or in any communication with you. BECOM Systems specifically disclaims any implied warranty of merchantability or fitness for a particular purpose.

BECOM Systems takes no liability for any damages and errors causing of the usage of this board. The user of this board is responsible by himself for the functionality of his application. He is allowed to use the board only if he has the qualification. More information is found in the General Terms and Conditions (AGB).

Information

For further information on technology, delivery terms and conditions and prices please contact BECOM Systems
www.becom-group.com

1 General Information

This guide applies to the Melexis EVK75123 evaluation kit.

It contains a short description of firmware functionality that is not communicated to customers in the Software User Manual because of its confidentiality.

This document applies to firmware version 0.6.2.

1.1 Symbols Used

This guide makes use of a few symbols and conventions:

Warning

Indicates a situation which, if not avoided, could result in minor or moderate injury and/or property damage or damage to the device.

Caution

Indicates a situation which, if not avoided, may result in minor damage to the device, in malfunction of the device or in data loss.

Note

Notes provide information on special issues related to the device or provide information that will make operation of the device easier.

Procedures

A procedure always starts with a headline

1. The number indicates the step number of a certain procedure you are expected to follow.
   Steps are numbered sequentially.

This sign ➤ indicates an expected result of your action.

References

This symbol  indicates a cross reference to a different chapter of this manual or to an external document.

2 Feature Description

2.1 MLX Unlock Command

In order to send the "MLX Unlock" command to the ToF companion chip via I2C, write the following Control Interface registers:

1) Register ***CmdEnablePasswd*** 0x0022: Write value 0xFE41
2) Register ***CmdExec*** 0x0033: Write value 0x544E

If at any later time, but before the next reboot/power cycle, a "Save Registers" command is issued to the evaluation kit (see the Software User Manual), both blocks of the Tof companion chip, lower and upper, will be saved to its NVRAM.

2.2 Changing the MIXH voltage via register

In order to configure the MIXH voltage for the ToF sensor, one must write a value in 1/10 volts into register ***MixhVoltage*** (0x00FC).

This setting is password protected, so one has to write password **0xEB47** into register ***CmdEnablePassword*** (0x0022) beforehand. The password is automatically cleared from this register on a write to register 0x00FC.

2.3 ToF Companion Chip Initialization – Customer registers only

In order to initialize the ToF companion chip to reasonable values (so that the user gets the "It-works-out-of-the-box" experience), there is a hidden command that

1) Initializes the Tof companion chip with Melexis-provided default values. (Those values that actually switch off all MIX and LED modulation signals)
2) Initializes the ToF companion chip with an "overlay" that configures some default values so that the chip is operating on next start. This is provided by Bluetechnix.

In order to start the initialization, write the following Control Interface registers:

1) Register ***CmdEnablePasswd*** 0x0022: Write value 0xFE41
2) Register ***CmdExec*** 0x0033: Write value 0xA2FE

Note that the initialized values will be saved to the CUST area of the NVRAM of the ToF companion chip immediately. It is recommended to reboot the evaluation kit immediately after.

2.4 ToF Companion Chip Initialization – Both customer+MLX registers

Caution

As this procedure writes ALL companion chip registers, it should not be used on chips that were calibrated previously.

In order to initialize the ToF companion chip to reasonable values (so that the user gets the "It-works-out-of-the-box" experience), there is a hidden command that

3) Initializes the Tof companion chip with Melexis-provided default values. (Those values that actually switch off all MIX and LED modulation signals)
4) Initializes the ToF companion chip with an "overlay" that configures some default values so that the chip is operating on next start. This is provided by Bluetechnix.

In order to start the initialization, write the following Control Interface registers:

3) Register ***CmdEnablePasswd*** 0x0022: Write value 0xFE41
4) Register ***CmdExec*** 0x0033: Write value 0x1F26

Note that the initialized values will be saved to NVRAM of ToF companion chip immediately. It is recommended to reboot the evaluation kit immediately after.

2.5 Illumination Configuration (for Production)

There are two illumination boards for the EVK75123 hardware: One with Laser illumination (manufactured for Melexis) and one with LED illumination (manufactured originally for BHTC).

Since these two boards can't be distinguished in software, but need different configuration of the DACs for setting the illumination output power, a new register was added to the firmware: ***IlluminationType*** (0x0157).

So here is what to do during production:

1) Laser illumination: Do nothing.
2) LED illumination:
    a. Write register ***IlluminationType*** to value 0x1.
    b. Save this as Factory Default.
    c. Mount the illumination AFTERWARDS.

2.6 Saving registers as Factory Default

In order to save the register map as factory default please execute the following steps:

1) Register ***CmdEnablePasswd*** 0x0022: Write value 0x9C65

2) Register ***CmdExec*** 0x0033: Write value 0x19D6

3 Hidden Register Description

Addr (hex)	Register Name	Default Value (hex)	R/W	Description
0157	IlluminationType	0000	R/W	Type of illumination. Bit 0 used for EVK75123: 0...Laser Illumination (for MLX); 1...LED illumination (for BHTC) This bit is hidden, only used in our production. This register must be saved into factory regmap.

4 Document Revision History

Version	Date	Document Revision
1	2016 08 12	Initial version of the document
2	2016 09 01	Added chapter 2.2 on MIXH voltage configuration, since it is password-protected in f/w version 0.5.0
3	2016 11 09	Added chapter 2.3
4	2017 01 19	Added chapter 2.6
5	2019 05 25	Updated document template

Table 1: Document revision history

A List of Figures and Tables

Figures

No table of figures entries found.

Tables