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1. *Scope*

The following document describes the use of the file loader FL10801. The file loader is intended for use as a programming tool for a single MLX10801 IC as well as an in-circuit-programmer for a completely assembled module.

2. *Usage*

The tool has been developed for engineering reasons in order to modify the pretrimmed Melexis standard parameter set. It is not intended to be used as a production programming solution.

2.1. *Programming procedure for a single chip*

- 1) Insure that the power supply switch (S1) of the FL10801 is in off state (refer chapter 3.4.1 for additional information).
- 2) Plug the FL10801 with a standard LPT cable (connected to J2) to a LPT port of a PC.
- 3) Connect the power supply of the FL10801 (J1).
- 4) Switch on the power supply.
- 5) Start the FL10801 software on a Win95/98/XP PC. The software may also run under WinNT/2000, however Melexis does not guarantee that.
- 6) Configure the software as described in section 4.
- 7) Insert a MLX10801 in the empty socket of the FL10801 (U200).
- 8) Select/edit a MLX10801 parameter set out of the FL10801 file loader software package.
- 9) Modify the parameter set to the requirements of the application.
- 10) Program the modified parameter set.
- 11) Remove the MLX10801 IC from the socket of the FL10801.
- 12) Check out the programmed IC in the application.
- 13) Repeat steps 7)...12) again to refine the parameter set if necessary.

2.2. *Programming procedure for a module connected to the FL10801 (e.g. the EVB10801)*

- 1) Execute step 1)...3) from section 2.1 above.
- 2) Connect a module via J3 of the FL10801 according to section 3.4.2.
- 3) Switch on the power supply.
- 4) Start the FL10801 software on a Win95/98/XP PC. The software may also run under WinNT/2000, however Melexis does not guarantee that.
- 5) Configure the software as described in section 4.
- 6) Select a MLX10801 parameter set.
- 7) Modify the pretrimmed parameter set to the requirements of the application.
- 8) Program the modified parameter set into the connected module.
- 9) Check out the connected module (LED current, light output etc.).
- 10) Repeat steps 7)...9) again to refine the parameter set.

3. Hardware Kit

3.1. Revision

The documentation is valid for the hardware revision FL10801 rev. 2.0.

3.2. Schematics

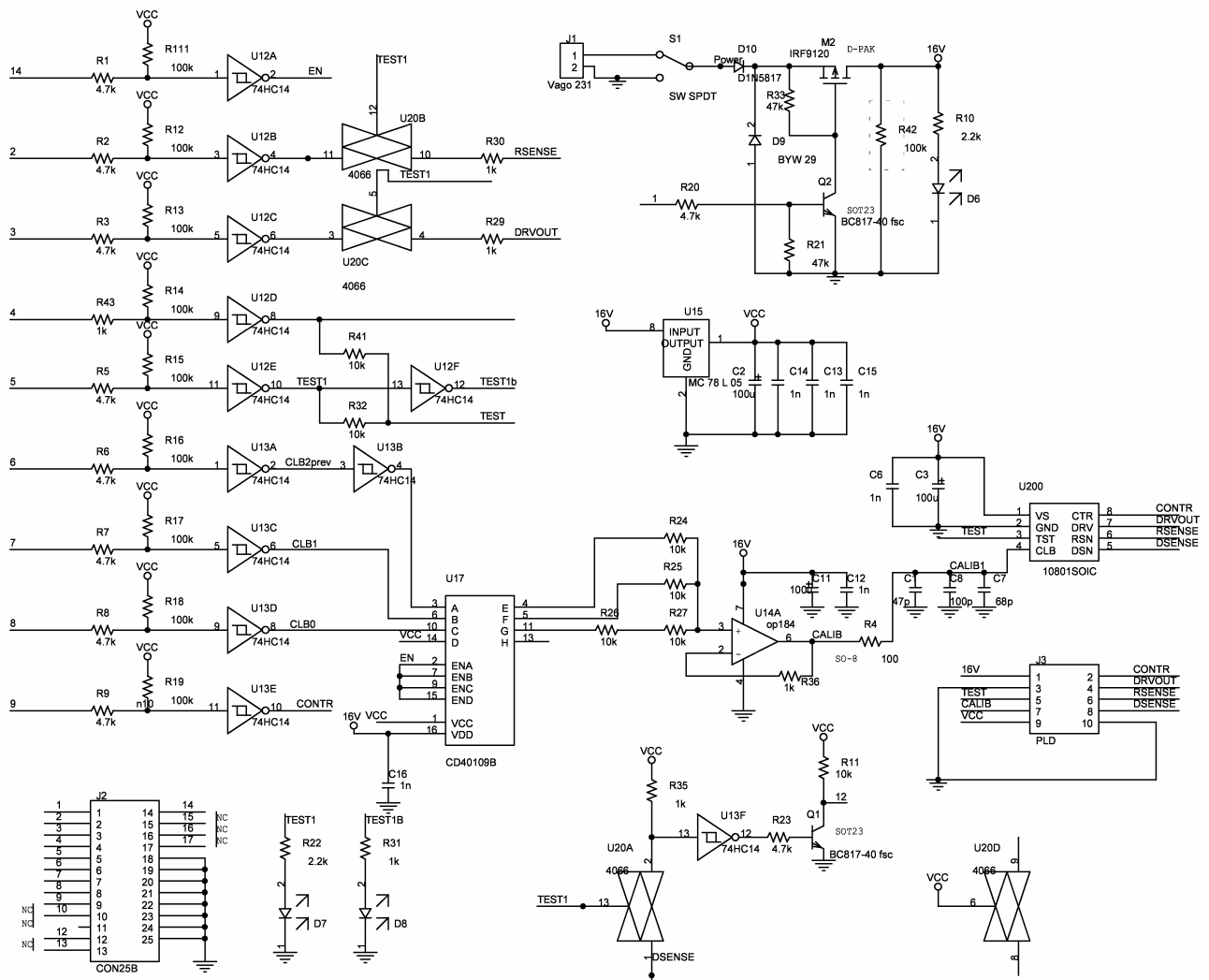


Figure 1: FL10801 Schematics

3.3. PCB of the FL10801

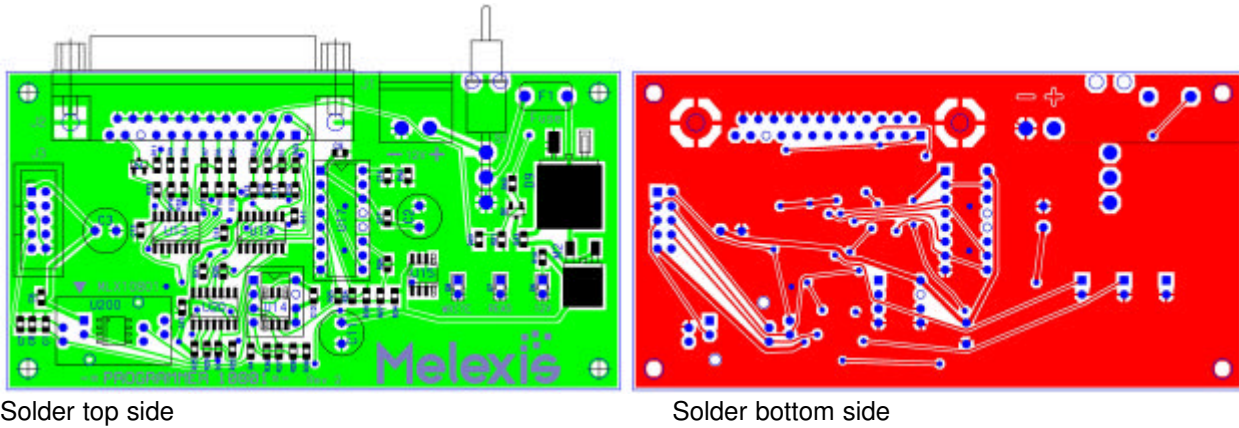


Figure 2: FL10801 PCB Layout

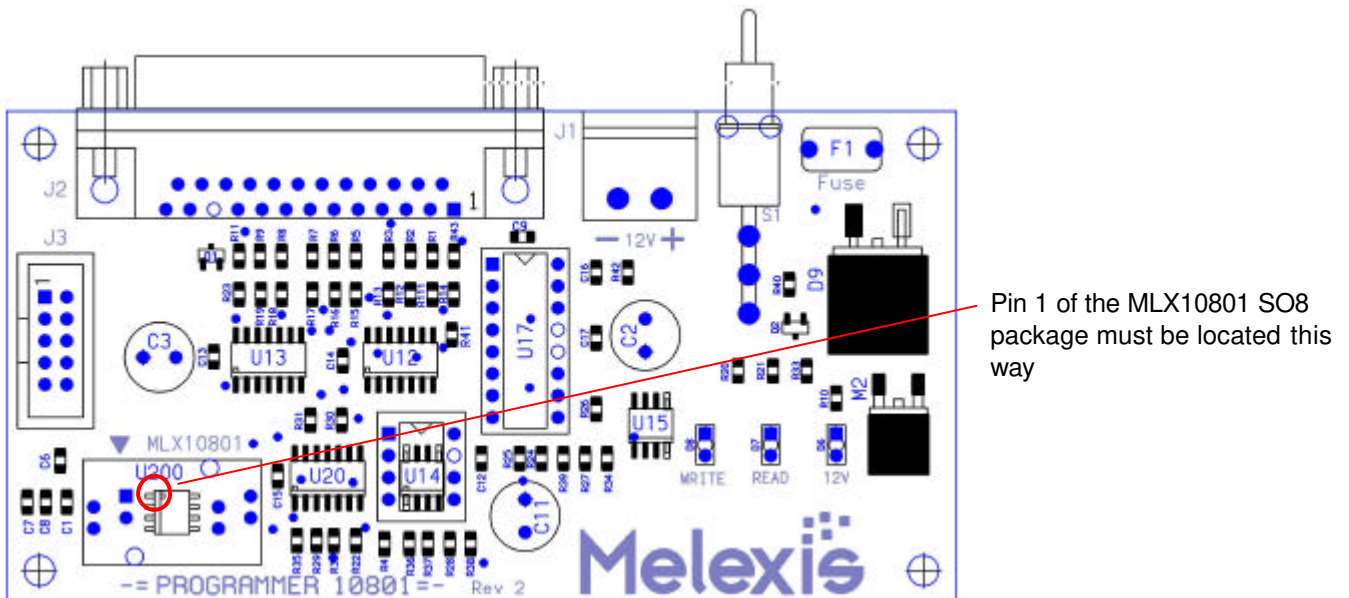


Figure 3: FL10801 PCB component view

File loader FL10801

Power LED driver for automotive applications
Power saving low side coil driver
Electronic fuse

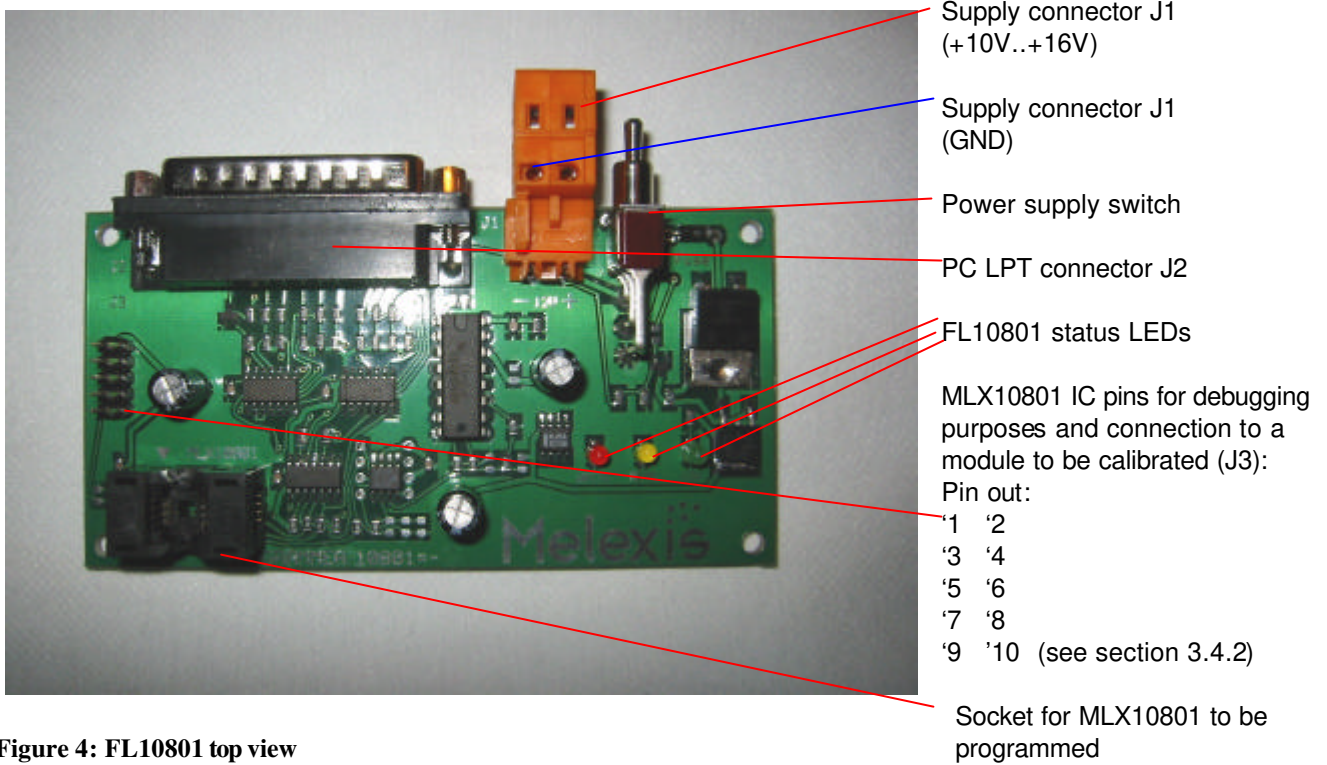


Figure 4: FL10801 top view



Figure 5: FL10801 connected to Melexis evaluation board EVB10801

3.4. Additional description

3.4.1. FL10801 supply

Power supply range: +10...+16V DC.

The FL10801 is reverse polarity protected. The power supply is switched on/off as shown in the following diagram:

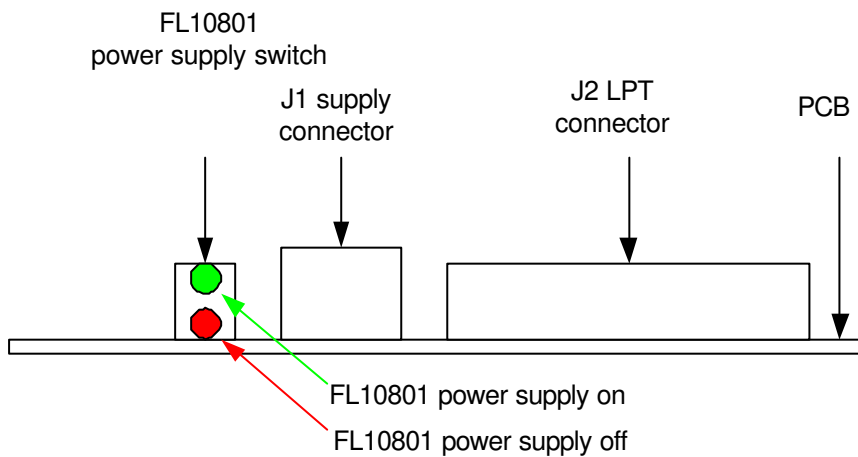


Figure 6: Location of the FL10801 connectors and the power supply switch

Note: The LPT cable between J2 and the PC is a standard 1:1 cable (male/female connector).

The user has to connect the power supply lines to the matching connector of J1 which is supplied with the FL10801. This is achieved the following way:

Insert stripped ends of the supply leads into the round holes of the connector.
On top of the connector there are 2 other holes where the metallic wire holder can be seen.
Press the wire holder down with a screwdriver or the like and insert the wires into J1.
Release the wire holders to fix the connection.

3.4.2. Pin out of connector J3:

(Refer to chapter 3.3, component view, for the pin order)

Nr.	Pin	Nr	Pin
1	FL10801 supply	2	IC pin CONTR
3	FL10801 GND	4	IC pin DRVOUT
5	IC pin TEST	6	IC pin RSENSE
7	IC pin CALIB	8	IC pin DSENSE
9	VCC (5V supply)	10	IC pin GND

In case a module is connected to J3, the following connections are necessary:

J3 pin Nr.	FL10801 signal connected to the module	Signal of the module connected to J3 of the FL10801
1	FL10801 supply	Module pin VBAT
1	FL10801 supply	Module pin CONTROL
3	FL10801 GND	Module pin GND
7	IC pin CALIB	Calibration point CALIB

3.4.3. LED status indication

LED	Meaning	LED on
Green	MLX10801 IC supply	FL10801 power supply on and fileloader software started (standby)
Yellow	Read indicator	Read operation in progress (function is not available for the customer)
Red	Write indicator	Write operation in progress

4. Software Kit

4.1. Revision

This documentation is valid for the software versions 3.x.

4.2. Content of the Setup Program

Installation program:	FL10801_setup.exe	(This executable will install all below mentioned files in a specified directory.)
Main program:	MLX10801.exe	
Help file:	readme.txt	
Config file:	holds LPT port address and default parameter file	
Example trim files:	EVA10801_100u_0.47R_100mA.LED EVA10801_100u_0.47R_200mA.LED EVA10801_100u_0.47R_350mA.LED	(Sets an application with L=100μH and R _{shunt} =0.47R to a LED current of about 100mA, 200mA or 350mA)
	EVA10801_220u_0.47R_100mA.LED EVA10801_220u_0.47R_200mA.LED EVA10801_220u_0.47R_350mA.LED	(Sets an application with L=220μH and R _{shunt} =0.47R to a LED current of about 100mA, 200mA or 350mA)
	EVA10801_470u_1R_100mA.LED EVA10801_470u_1R_200mA.LED EVA10801_470u_1R_350mA.LED	(Sets an application with L=470μH and R _{shunt} =1R to a LED current of about 100mA, 200mA or 350mA)

4.3. The Main Window

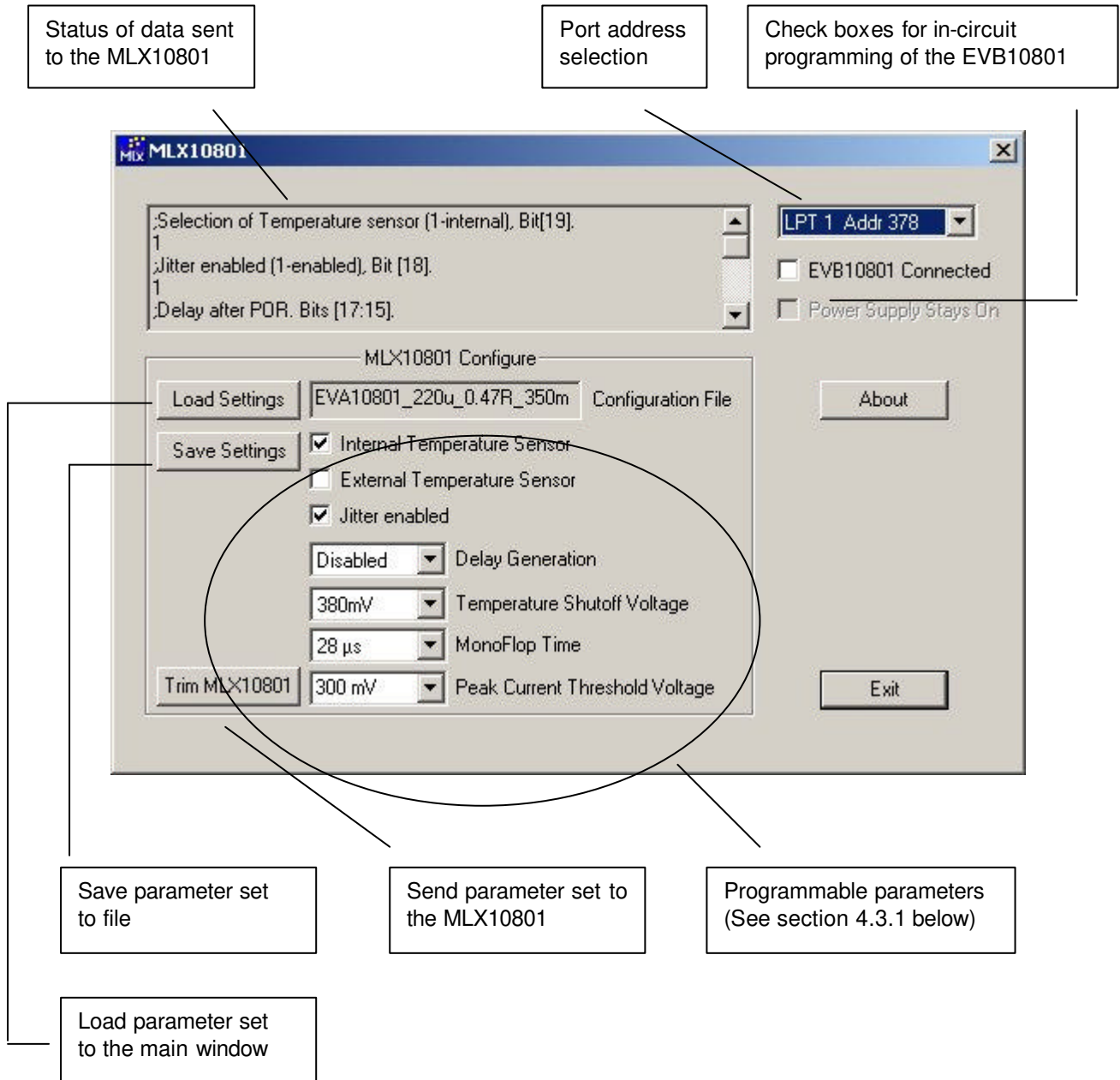


Figure 7: FL10801 software main window

4.3.1. Programmable Parameters

Parameter	Range / Status	Remarks
Internal/External Temperature Sensor	Internal / External	Selection of the internal or external temperature sensor
Jitter enabled	Enabled / Disabled	Jitter mode can be enabled or disabled
Delay Generation	1 ms-63ms / disabled	<u>Only used in coil driver mode</u> , defines the start up delay in order to pull relays, microvalves etc. stays otherwise disabled
Temperature Shutoff Voltage	300mV-600mV / disabled	Temperature switch off point, can be disabled if no temperature switch off is desired
MonoFlop Time	1 μ s-63 μ s (*) / disabled	Selection of the drivers OFF time, coil discharging (passive) state. Disabled only in electronic fuse mode
Peak Current Threshold Voltage	90-540mV	Defines maximum load current, driver switches OFF when threshold voltage is reached

(*) If jitter mode is enabled, monoflop time is not selectable with a stepwise of 1 μ s. As a result of jitter mode, an average monoflop time arises for each time segment. Only these average times (5 μ s, 12 μ s, 20 μ s, ... etc.) are therefore selectable and thus, displayed in the MonoFlop time panel.

For details about this parameter, see section 14.2 in the datasheet for the MLX10801.

4.4. The Software Usage

Before any programming can be executed, the file loader board FL10801 must be powered and switched on as described under 3.4.

4.4.1. Programming a single MLX10801 with the FL10801

- 1) Select the LPT port to which the FL10801 is connected. By default this is LPT1. The chosen port will be displayed in the related panel.
- 2) Press the “Load Settings” button to select a parameter set file that should be written to the IC. In the example below this is EVA10801_220u_0.47R_200mA.LED. Open the selected file. The name of the selected file is displayed in the “Configuration File” panel. All individual parameters of this file are shown in the related panels and check boxes.
- 3) Trim the IC with the selected *.LED file by pressing the “Trim MLX10801” button. This will upload the displayed parameters to the IC.

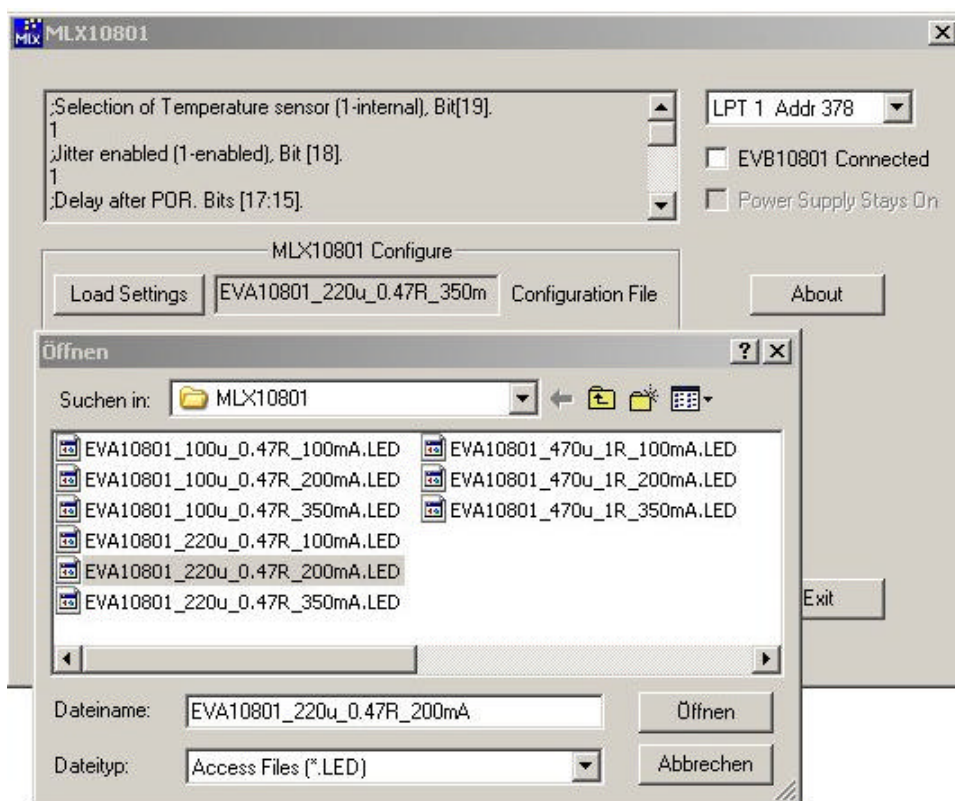


Figure 8: Opening a MLX10801 parameter set file

4.4.2. Programming a module connected to the FL10801

This option can be used for in-circuit-programming of the MLX10801 in an assembled module (e.g. the Melexis evaluation board EVB10801). Only the module pins VS, GND and CALIB need to be available. These lines must be connected to their respective counterparts on the FL10801 via the J3 connector. Connect VS, GND and CALIB of the assembled module to J3 of the FL10801.
(See section 3.4.2 for the pin out of J3)

Note: Make sure that the MLX10801 socket of the FL10801 is empty if a module is connected to the FL10801!

During programming the module is **ONLY** driven by the supply of the FL10801. Therefore it is necessary to remove/switch off the supply of the module.

- 1) Select the LPT port to which the FL10801 is connected. By default this is LPT1. The chosen port is displayed in the related panel.
- 2) Press the "Load Settings" button to select a parameter set file that should be written to the IC. In the example given above this is *EVA10801_220u_0.47R_200mA.LED*. Open the selected file. The name of the selected file is displayed in the "Configuration File" panel. All individual parameters of this file are shown in the related panels and check boxes.
- 3) Click the check box "EVB10801 connected" in the upper right corner. After that, the check box "Power Supply Stays On" becomes active and can be set. If set, the FL10801 supply remains ON after the programming cycle. Thus, the result of a programming can be easily observed.
- 4) Trim the IC with the selected *.LED file by pressing the "Trim MLX10801" button.
- 5) If necessary, re-trim the IC by making changes to the displayed parameters and upload the changes to the chip by pressing the "Trim MLX10801". Repeat until the optimal parameters are found.

File loader FL10801

Power LED driver for automotive applications
Power saving low side coil driver
Electronic fuse

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