

EMPB85XX CONFIGURATION TOOL KIT USER GUIDE

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1 INTRODUCTION

The EMPB85xx is a small form factor configuration tool to configure the nonvolatile EEPROM on the EM8500 family devices.

The EMPB85xx configuration tool provides a set of useful functions to configure, read and check the content of the EM8500 EEPROM.

The EMPB85xx consist of a compact PCB, configuration wires and a dedicated EMPB85xx Software executable file (including required drivers).

The EMPB85xx is based on the UMFT4222EV development module from FTDI chip.

2 MAIN FEATURES

Hardware

- Small PCB size (0.8" wide 24 pin DIP socket)
- USB 2.0 compliant
- USB powered
- I I2C communication to support EM8500 family devices
- +3.3V target voltage power
- I USB Micro-B socket

Software

- EMPB85xx executable
- Several options and parameters (command line mode)
- Includes the parser for EM8500CFG files (configuration file format for EM8500)
- FTDI D2XX drivers included

3 OVERVIEW

The EMPB85xx Configuration tool includes:

- Configuration tool board
- USB cable (USB A plug to USB Micro-B plug)
- I Jumper wires (6 wires)



Figure 3-1 EMPB8500 out of the box (Configuration Tool board – USB cable and Jumper wires)



The configuration tool board hardware is based on the development module UMFT4222EV featuring the FTDI's FT4222H Hi-Speed USB2.0 to QuadSPI/I2C bridge.

The configuration of the EM8500 family devices through EMPB85xx configuration tool is based on the following connection schematic



Figure 3-2 EMPB8500 Connection Schematic

420005-A01, 3.0



4 EMPB8500 CONFIGURATION AND CONNECTION

4.1 PRELIMINARY DESCRIPTION

The EMPB85xx directly plugs into the user's USB port and provides connections to directly connect your EM8500 target devices.

Ensure that jumpers JP2, JP3, JP8 and JP9 are correctly set.

See Figure 4-1: EMPB8500 Board Description and Configuration (Top View) and Figure 4-2: EMPB8500 Board Description and Configuration (Bottom View).



Figure 4-1: EMPB8500 Board Description and Configuration (Top View)

420005-A01, 3.0

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Figure 4-2: EMPB8500 Board Description and Configuration (Bottom View)



4.2 EMPB85XX CONNECTIONS TO EM8500 TARGET

In addition to the jumpers, connect the six jumper wires (2x Supply, 2x ground, I2C bus) from your configuration tool board to your own target board or EM evaluation board.

4.2.1 Mandatory connections

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The mandatory connections are listed above:

- +3.3V output of the EMPB85xx supply the line VDD_STS and VSUP of the EM8500 device.
- Ground VSS must be connected to CS and VSS of the EM8500
- MOSI_SDA (SDI) line of the EM8500 must be connected to the I2C data SDA of the EMPB85xx
- SCL (SCK) line of the EM8500 must be connected to the I2C clock SCK of the EMPB85xx

See Figure 4-3: EMPB8500 Connections to Target (example shown with EMEVB8500 Evaluation Board).



Figure 4-3: EMPB8500 Connections to Target (example shown with EMEVB8500 Evaluation Board)



4.2.2 Connections COMMENTS

Connection Sequence

To prevent some non-functional behaviour the following rules should always be applied To connect your hardware:

- Step 1: ensure that the EMPB8500 is disconnected from USB
 - Step 2: connect jumper wires between EMPB8500 and your target
 - Step 3: connect EMPB8500 to USB

To disconnect your hardware:

See Figure 4-4: I2C Pull-ups resistors.

- Step 1: disconnect EMPB8500 from the USB
- Step 2: disconnect jumper wires between EMPB8500 and your target

Additional connections might be required depending on the hardware target used.

I2C pull-ups

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The I2C lines from EMPB85xx are not equipped with pull-ups resistors. In case your target hardware does not provide pull-ups resistors, pull-up resistors must be placed on SDA and SCL and connected to VSUP domain. Typical resistor values from 1Kohm to 22Kohm can be used.



Figure 4-4: I2C Pull-ups resistors – General Target System

When using the EMEVB8500 Evaluation Board as your EM8500 target board, pull-ups resistors are available when connecting jumpers J6A and J6B as shown below.



Figure 4-5: I2C Pull-ups Resistors on EMEVB8500

CS Line

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- Ensure that the CS pin of the EM8500 is kept low during operations. This pin select SPI or I2C communication mode and must be tied to low level either through pull-down resistor or a direct connection to ground.
- CS floating may result in an unsuccessful configuration.
- CS tied to a high level will result in an unsuccessful configuration.

When using the EMEVB8500 Evaluation Board as your EM8500 target board, CS can be forced to VSS as shown (brown wire) in *Figure 4-3: EMPB8500 Connections to Target (example shown with EMEVB8500 Evaluation Board)*.

STS and VSUP

Ensure that both pins VSUP and STS are forced to the programming voltage. STS provides the supply of EM8500. Forcing VSUP to the programming voltage ensures that the communication lines SDA and SCK work in this voltage domain even if the VSUP LDO of the EM8500 is set to a different voltage.

When using the EMEVB8500 Evaluation Board as your EM8500 target board, STS and VSUP can be forced to +3.3V as shown (red wire) in *Figure 4-3: EMPB8500 Connections to Target (example shown with EMEVB8500 Evaluation Board)*.

4.2.3 Connection line summary

The EMPB85xx lines used during configuration are listed below

		VO TYPE		DESCRIPTION
LOCATION	PIN NAME		SUPPLY	
JP4.3	VSS	Supply		System ground connection
JP4.4	SCL(SCK)	Output – Open Drain	+3.3V	I2C clock connection
JP4.5	SDA	I/O – Open Drain	+3.3V	I2C data connection
JP5.1	+3.3V - VSUP	Supply	+3.3V	Supply connection to force VSUP
JP5.2	+3.3V - STS	Supply	+3.3V	Supply connection to force STS
JP5.3	VSS - CS	Supply		System ground connection to force CS low

Table 4-1 PRG Pin-out Description



5 EMPB85XX SOFTWARE

The EMPB85xx configuration tool is driven by the software EMPB85xx which gives access to the utility software tool. It covers the following functionalities:

- I Help function:
 - Provides details about command line usage and available options
- I Test menu

Checks the communication from the PC to the configuration tool and from the configuration tool to your EM8500 target (discovery mode of your device over I2C)

I Dump Menu

Reads (dumps) the complete EM8500 EEPROM.

Configuration Menus

Loads the file EM8500CFG or a single byte into the EM8500 EEPROM (different options are offered).

I CRC Menus

These functions will manage and check the Hardware CRC (based on the EM8500 EEProm content) and Software CRC (based on the EM8500CFG file) on a defined range of addresses.

Note EM8500CFG file:

- The tool features a syntax / format verification. The tool checks and detects eventual syntax / format definitions. Output messages are displayed.
- 1 The tool performs exception verification. The tool checks and detects eventual incorrect configurations values. Output messages are displayed.

5.1 EMPB85XX SOFTWARE INSTALLATION

Download and install the setup file SetupEMPB85xx.exe.

Step 1: Double-click **SetupEMPB85xx.exe**

Do not plug in the hardware.



- Step 2: Click Next and answer the query boxes (License agreement, Destination folder, Start Menu)
- Step 3: FTDI CDM driver installation follows automatically. Click **Extract** and answer the query boxes (License agreement)





Step 4: Installation is completed and your computer needs rebooting



Step 5: You can now plug your hardware (ensure proper sequence of connections)



5.2 EMPB85XX START MENU SHORTCUT

A shortcut "EM Microelectronic" -> "EMPB85xx Configuration Tool" has been added to your Start Menu.

The shortcuts are:

- EMPB85xx Command Line and console".
 - Displays the command line usage and options available with the executable console EMPB85xx. A console is ready to be used.
- "EMPB85xx User Manual".
 Provides access to the current manual documentation
- "EMEVB85xx User Manual".
 Provides access to the Evaluation Board manual documentation
- I "Uninstall EMPB85xx Software"
 - Launches the uninstallation of the configuration tool software.
- "Install FTDI USB Driver"
 Launches FTDI driver installation (it is already part of the main installation)



5.3 USING EMPB85XX SOFTWARE

The executable EMPB85xx must be launched from a console (cmd.exe). There is no Graphical User Interface.

The executable can also be used from another tool (command line)

When executing the shortcut EMPB85xx Command Line and console, the console is opened automatically and started at the location of the EMPB85xx executable (installation folder). In such case the user does not need to explicitly use the installation path in its command for the EMPB85xx executable to be found.

Different options are offered to start the console.

- Open the Command Prompt window by clicking the Start button (2), clicking All Programs, clicking Accessories, and then clicking Command Prompt.
- I Or, Click the Start button . In the Search box, type Command Prompt or cmd, and then, in the list of results, double-click Command Prompt.

Once the console started, the command (and options) EMPB85xx can be run.

Use the variable EMPB85xx_PATH to retrieve the location of the executable file or use CD (Change Directory)

Example:

Type in the console "%EMPB85xx_PATH%"\EMPB85xx.exe -H to get access to the command line information.

EMPB85xx Command Line	×
	_
~ EM MICROELECTRONIC MARIN ~	^
EMPB85XX Configuration Tool utility ~	
	-
Welcome	=
EMPB85XX Configuration Tool utility	
command usage format and examples.	
Usage:	
EMPB85xx <options> <filename> <parameters></parameters></filename></options>	
OWN GENERAL WWW	
This command and its options are not case sensitive.	
- A variable called EMPB85xx_PATH shall be created in	
your environment.	
folder	
You can use "EMPB85xx_PATH" in your scripts or command	
line.	
Example:	
/ ALTIFBO3XX_FHINA LETFBO3XX - DF	
contains blank spaces.	
- This variable shall be removed during uninstallation.	
NON HELD NON	
- Command Line:	
EMPB85xx -H	
- Comments:	
Display command line usage	
NON TEST NON	
- Command Line:	
EMPB85xx, -TEST	
- Comments: Test FMPR85xx communication and FM8500 deuice connection	
1030 LH1B03XX COMMUNICATION AND LH0500 GEVICE CONNECTION	
NOW DUMP FULL NOW	
- Command Line:	-
Enrbesxx -Dr	*

For command line details and options, refer to the command line information (type the command **EMPB85xx** or **EMPB85xx** –**H** or use the shortcut "EMPB85xx Info Command Line".

For testing the configuration tool or checking communication (configuration tool connection and EM8500 connection) use the command EMPB85xx -TEST



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