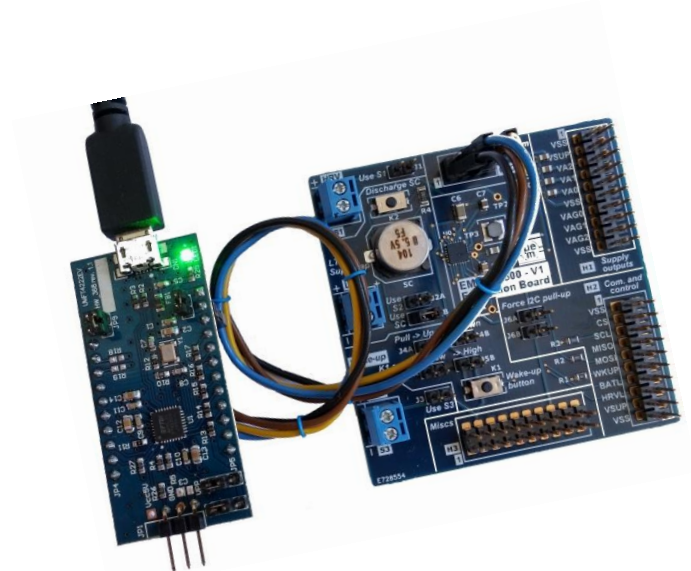




EMPB85XX CONFIGURATION TOOL USER MANUAL



Description

The EMPB85xx is a tiny configuration tool which allows the configuration of the nonvolatile EEPROM of 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.

Main features

Hardware

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

1. OVERVIEW

The EMPB85xx Configuration tool consists of:

- The configuration tool board
- The USB cable (USB A plug to USB Micro-B plug)
- The jumper wires (6 wires)

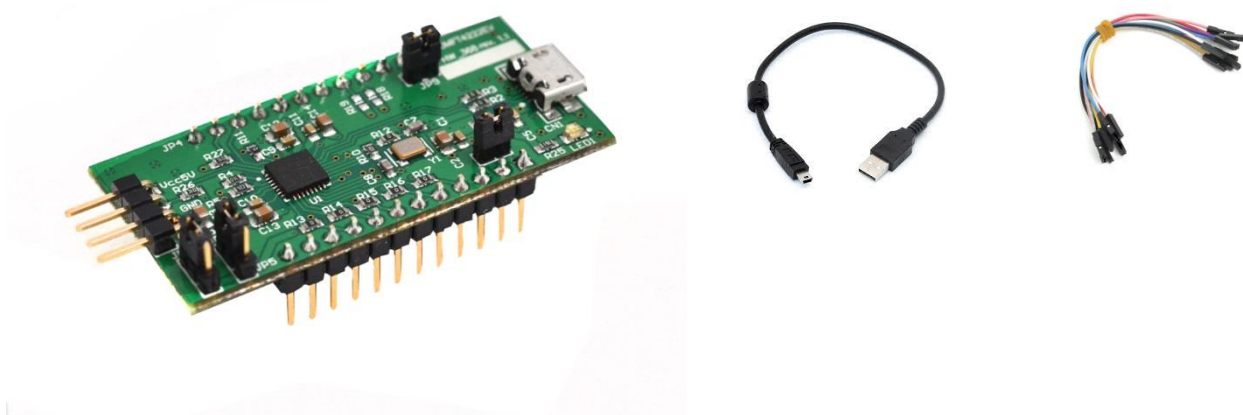


Figure 1-1 EMPB8500 out of the box (Configuration Tool board – USB cable and Jumper wires)

The configuration tool board hardware of the EMPB85xx configuration tool 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 scheme

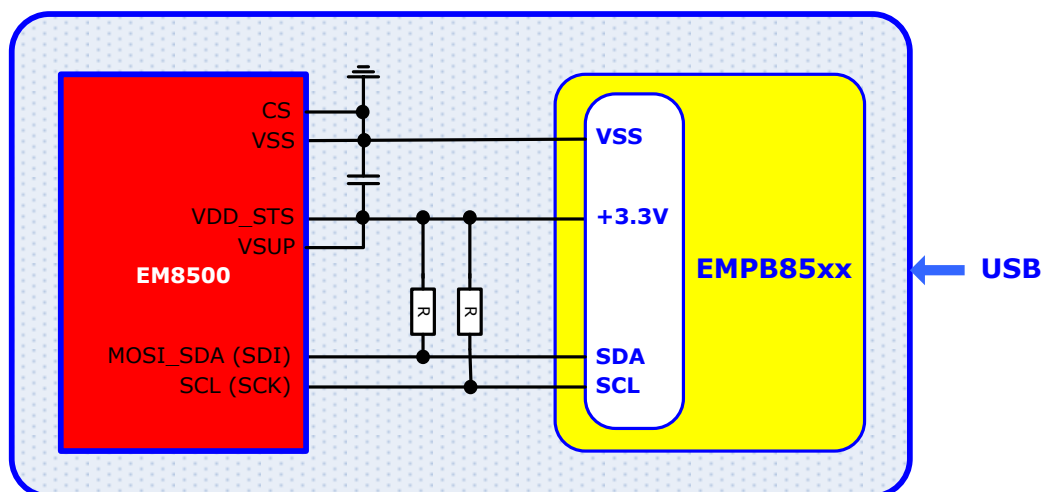


Figure 1-2 EMPB8500 connection scheme

2. EMPB8500 CONFIGURATION AND CONNECTION

2.1. PRELIMINARY DESCRIPTION

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

Make sure that the jumper JP2, JP3, JP8 and JP9 are correctly set - see Figure 2-1: EMPB8500 board description and configuration (Top View) and Figure 2-2: EMPB8500 board description and configuration (Bottom View).

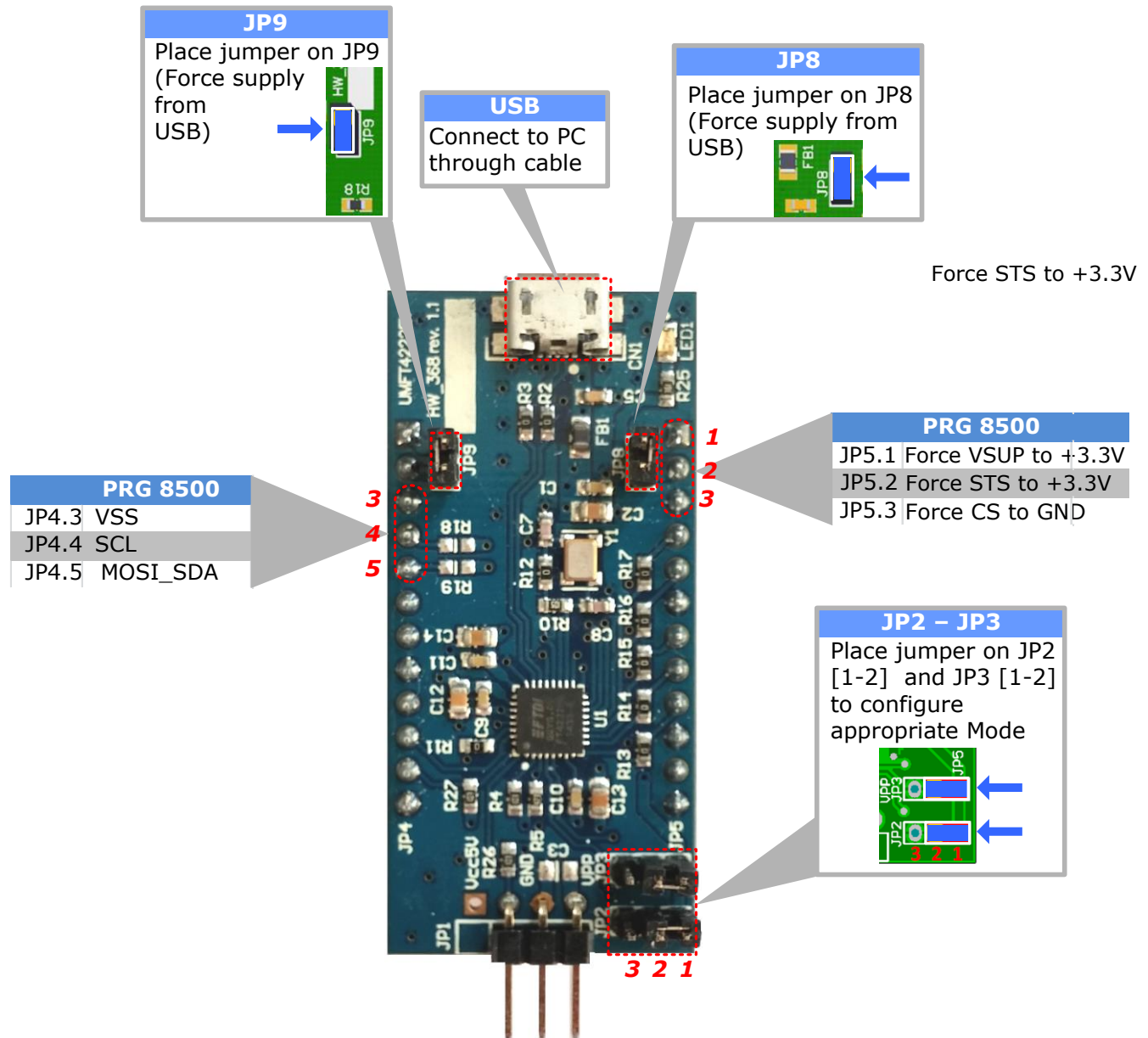


Figure 2-1: EMPB8500 board description and configuration (Top View)

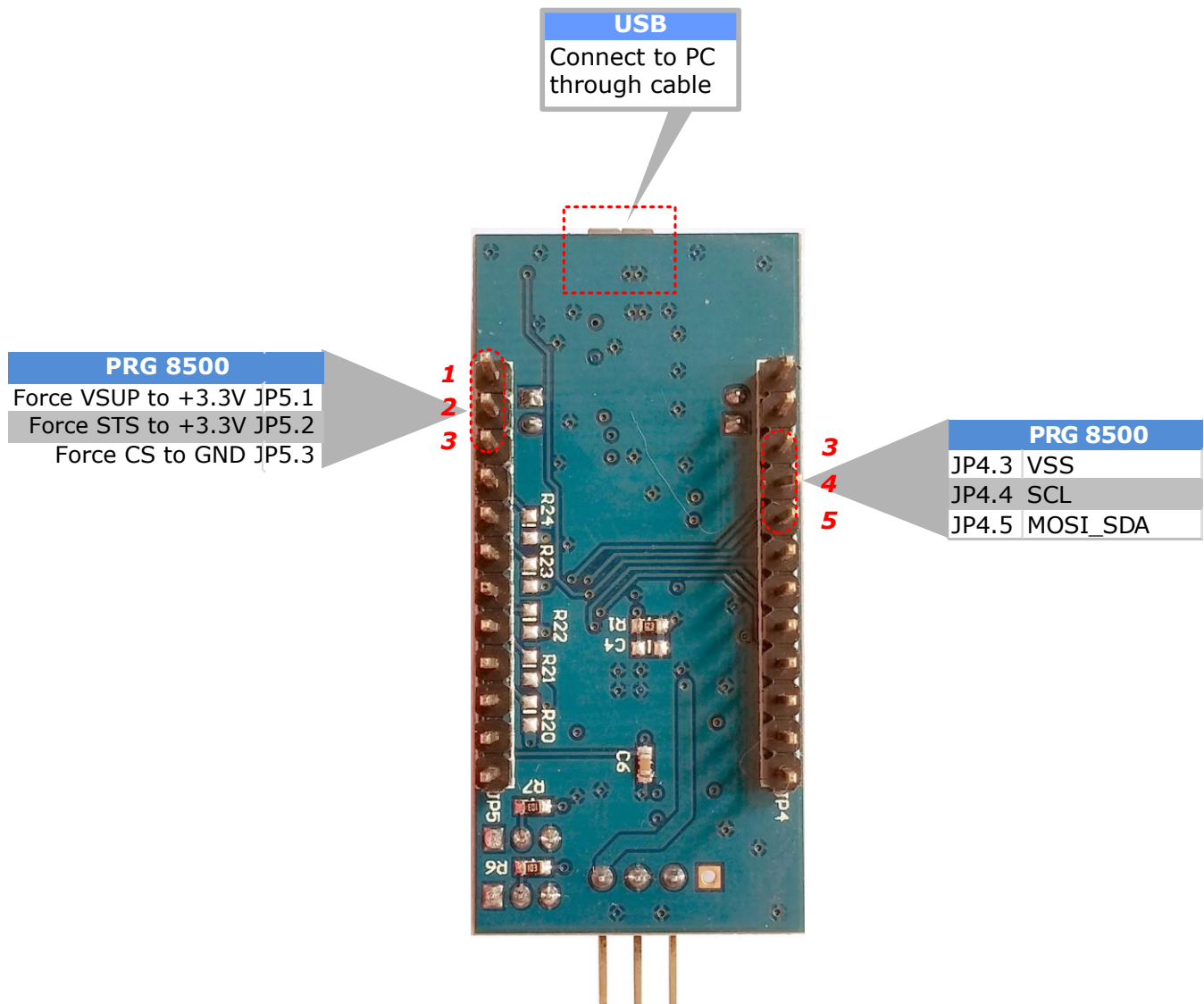


Figure 2-2: EMPB8500 board description and configuration (Bottom View)

2.2. EMPB85XX CONNECTIONS TO EM8500 TARGET

Additionally 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.

2.2.1. MANDATORY CONNECTIONS

The **mandatory connections** are listed above:

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

See Figure 2-3: EMPB8500 connections to target (example with EMEVB8500 evaluation board).

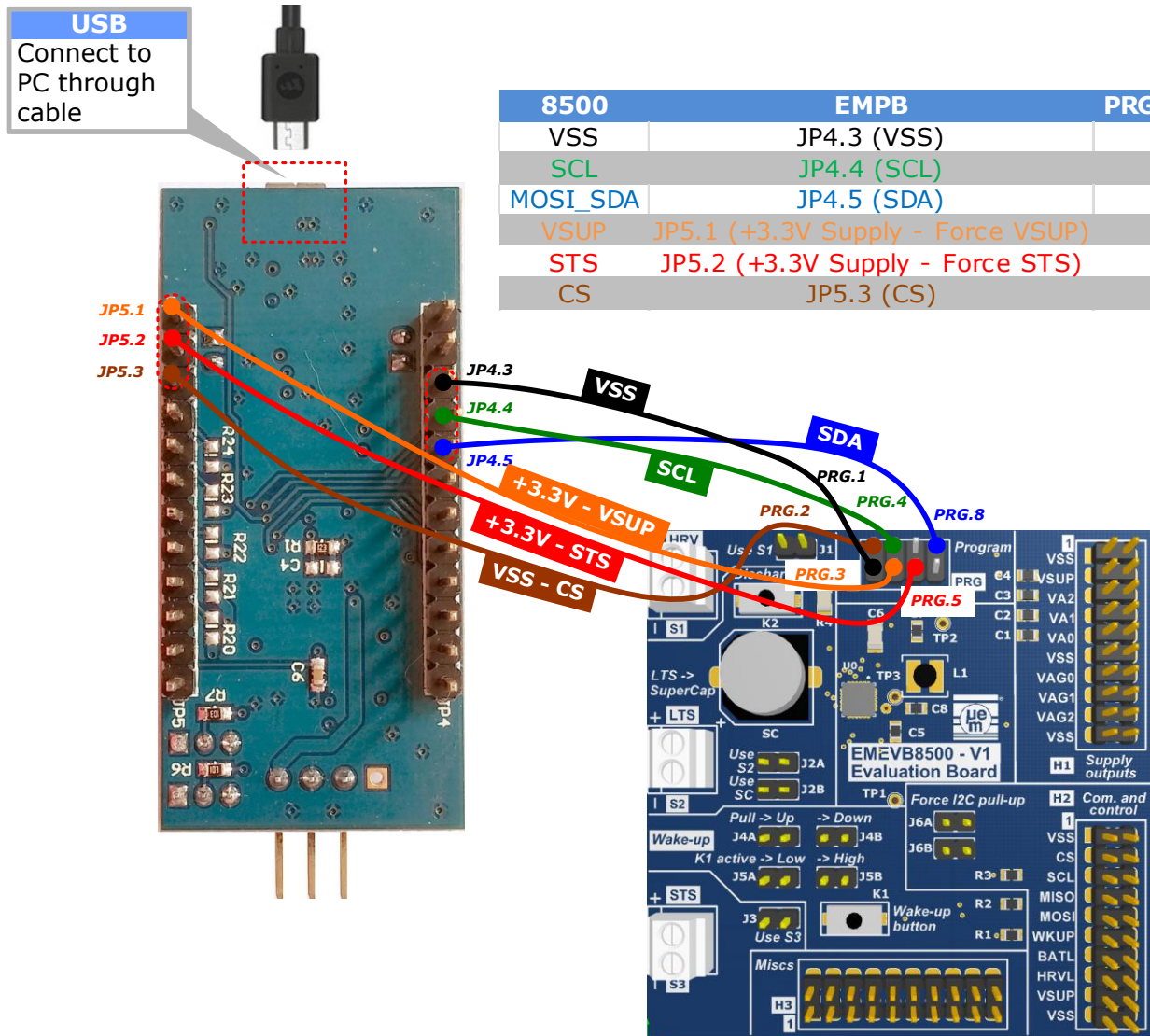


Figure 2-3: EMPB8500 connections to target (example with EMEVB8500 evaluation board)

2.2.2. CONNECTIONS COMMENTS

Connection order

To **prevent** some potential **dysfunctional behaviour** the following rules should always **be respected**

To **connect** your hardware:

- Firstly, make sure the EMPB8500 is not connected to USB
- Secondly, connect the jumper wires between EMPB8500 and your target
- Then connect the EMPB8500 to USB

To **disconnect** your hardware:

- Firstly, disconnect the EMPB8500 from the USB
- Secondly, disconnect the jumper wires between EMPB8500 and your target

Some **additional connections** might be required depending on the hardware target used.

I2C pull-ups

- The I2C lines from EMPB85xx have no pull-ups resistors. In case your target hardware does not provide pull-ups resistors, some pull-up resistors must be placed on SDA and SCL and connected to VSUP domain. Typically some resistor values from 1Kohm to 22Kohm might be used.
See Figure 2-4: I2C Pull-ups resistors.

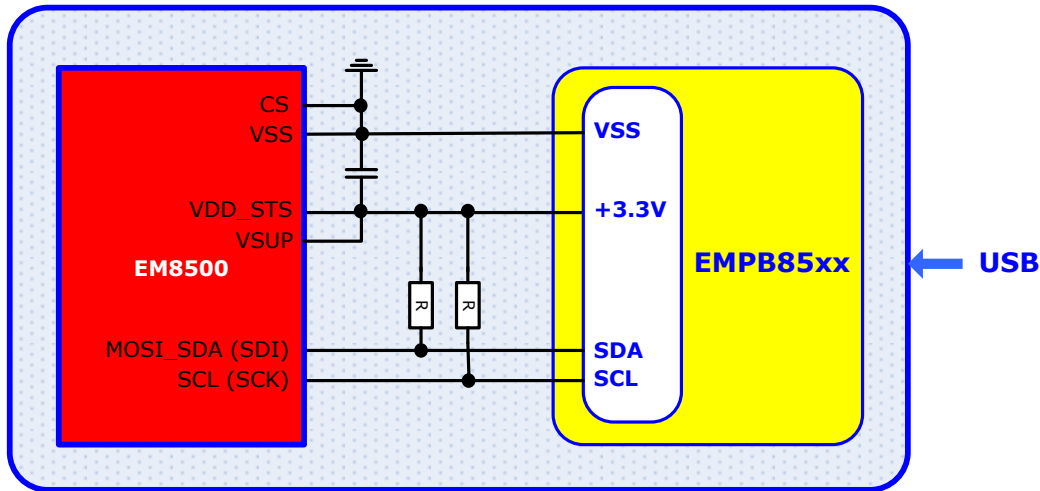


Figure 2-4: I2C Pull-ups resistors – General target system

If you are using the EMEVB8500 Evaluation Board as your EM8500 target board, you can its pull-ups resistors thanks to the jumpers J6A and J6B as shown below.

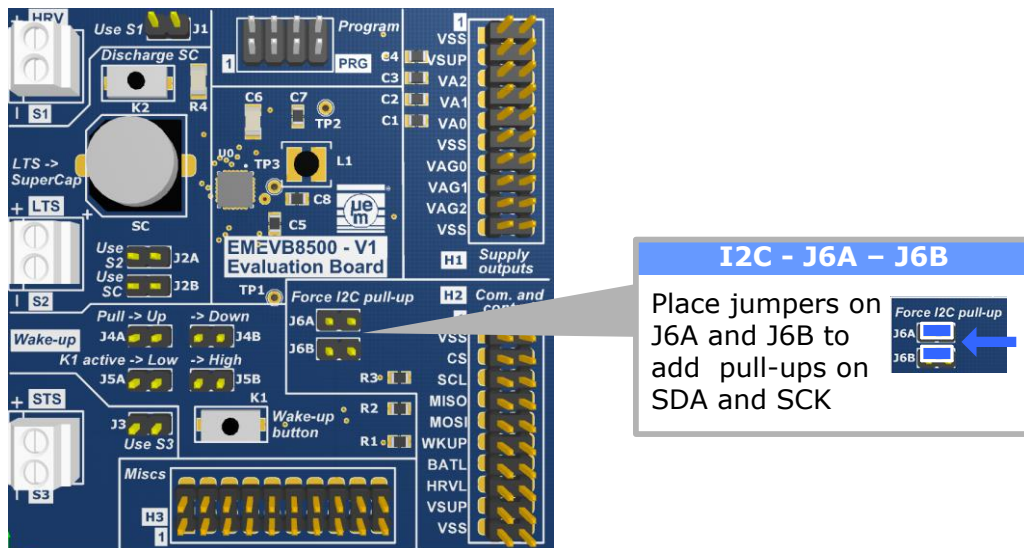


Figure 2-5: I2C Pull-ups resistors on EMEVB8500

CS line

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

If you are using the EMEVB8500 Evaluation Board as your EM8500 target board, you can force CS to VSS as shown (brown wire) on Figure 2-3: EMPB8500 connections to target (example with EMEVB8500 evaluation board).



➔ STS and VSUP

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

If you are using the EMEVB8500 Evaluation Board as your EM8500 target board, you can force STS to +3.3V as shown (red wire) on Figure 2-3: EMPB8500 connections to target (example with EMEVB8500 evaluation board).

If you are using the EMEVB8500 Evaluation Board as your EM8500 target board, you can force VSUP to +3.3V as shown (orange wire) on Figure 2-3: EMPB8500 connections to target (example with EMEVB8500 evaluation board).

2.2.3. CONNECTION LINE SUMMARY

The EMPB85xx lines used during configuration are listed below

LOCATION	PIN NAME	I/O TYPE		DESCRIPTION
		DIRECTION ^(*)	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 2-1 PRG Pin-out description

3. 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:

- Help function:

This function gives details about command line usage and available options

- Test menu

This function check 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)

- Dump Menu

This function read (dump) the complete EEPROM memory of the EM8500

- Configuration Menus

This function will load the file EM8500CFG or a single byte into the EEPROM memory of the EM8500 (different options are offered).

- CRC Menus

These functions will manage and check the Hardware CRC (based on the EEPROM content of the EM8500) 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 will check and detect eventual syntax / format definitions. Output messages will be displayed.
- The tool features an exception verification. The tool will check and detect eventual uncorrect configurations values. Output messages will be displayed.

3.1. EMPB85XX SOFTWARE INSTALLATION

Download and install the setup file **SetupEMPB85xx.exe**.

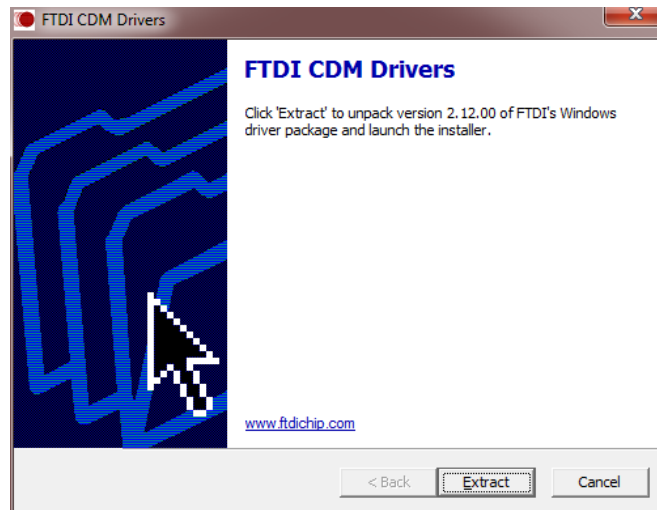
Step 1: Double-click **SetupEMPB85xx.exe**

Do not plug in the hardware.

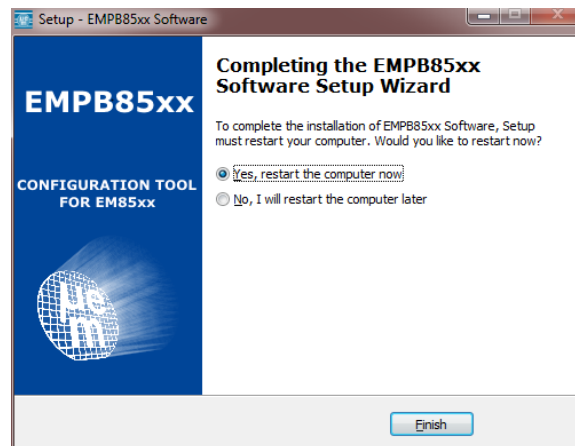


Step 2: Click Next and answer to the messages displayed (License agreement, Destination folder, Start Menu)

Step 3: Ftdi cdm Drivers installation will automatically follow. Click Extract and answer to the messages displayed (License agreement)



Final Step: Installation is completed but your computer need reboot



You can now plug your hardware (respect the connection order)



3.2. EMPB85XX START MENU SHORTCUT

A shortcut “EM Microelectronic” ➔ “EMPB85xx Configuration Tool” has been added in your Start Menu.

The created shortcuts are:

- “EMPB85xx Command Line and console”.

This shortcut displays the command line usage and options available with the executable console EMPB85xx. A console is ready to be used.

- “EMPB85xx User Manual”.

This shortcut gives access to the current manual documentation

- “EMEB85xx User Manual”.

This shortcut gives access to the Evaluation Board manual documentation

- “Uninstall EMPB85xx Software”

This shortcut launches the uninstallation of the configuration tool software.

- “Install FTDI USB Driver”

This shortcut launches the FTDI driver installation (it is already part of the main installation)



3.1. USING EMPB85XX SOFTWARE

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

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

By using the shortcut EMPB85xx Command Line and console, the console will be opened automatically and started at the location of the EMPB85xx executable (installation folder). In such case the user has no need to explicitly use the installation path in its command in order for the EMPB85xx executable to be found.

Also, different possibilities are offered to start the console.

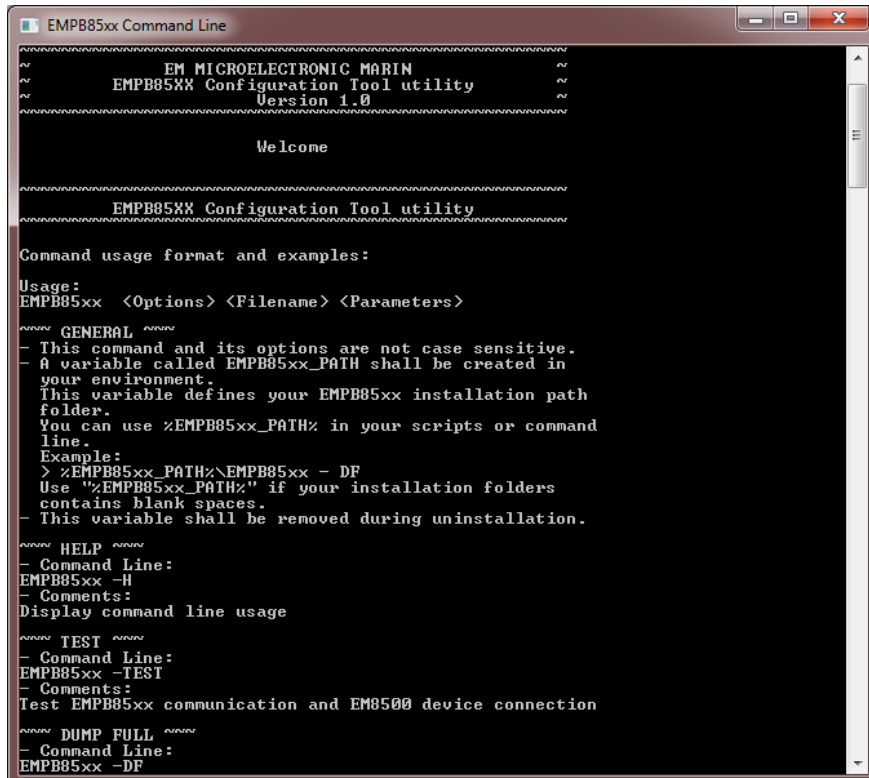
- Open the Command Prompt window by clicking the **Start** button , clicking **All Programs**, clicking **Accessories**, and then clicking **Command Prompt**.
- Or, Click the **Start** button . In the **Search** box, type **Command Prompt** or **cmd**, and then, in the list of results, double-click **Command 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
Version 1.0
~ ~ ~ ~ ~

Welcome

~ ~ ~ ~ ~
EMPB85XX Configuration Tool utility
~ ~ ~ ~ ~

Command usage format and examples:
Usage:
EMPB85xx <Options> <Filename> <Parameters>

~ ~ ~ ~ ~ GENERAL ~ ~ ~ ~ ~
- This command and its options are not case sensitive.
- A variable called EMPB85xx_PATH shall be created in
  your environment.
  This variable defines your EMPB85xx installation path
  folder.
  You can use %EMPB85xx_PATH% in your scripts or command
  line.
Example:
> %EMPB85xx_PATH%\EMPB85xx - DF
Use "%EMPB85xx_PATH%" if your installation folders
contains blank spaces.
- This variable shall be removed during uninstallation.

~ ~ ~ ~ ~ HELP ~ ~ ~ ~ ~
- Command Line:
EMPB85xx -H
- Comments:
Display command line usage

~ ~ ~ ~ ~ TEST ~ ~ ~ ~ ~
- Command Line:
EMPB85xx -TEST
- Comments:
Test EMPB85xx communication and EM8500 device connection

~ ~ ~ ~ ~ DUMP FULL ~ ~ ~ ~ ~
- Command Line:
EMPB85xx -DF
```

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 check communication (configuration tool connection and EM8500 connection) use the command **EMPB85xx -TEST**



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