
EMPB85XX CONFIGURATION TOOL KIT USER GUIDE

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1 INTRODUCTION

The EM85xx naming shall be used in this document as a generic part number name for EM85xx devices.

The EMPB85xx naming shall be used in this document as a generic part number name for EM85xx configuration tool.

The EMPB85xx is a small form factor configuration tool to configure the nonvolatile EEPROM on the EM85xx devices.

The EMPB85xx configuration tool provides a set of useful functions to configure, read and check the content of the EM85xx 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
- | I2C communication to support EM85xx devices
- | +3.3V target voltage power
- | USB Micro-B socket

Software

- | EMPB85xx executable
- | Several options and parameters (command line mode)
- | Includes the parser for EM85xxCFG files (configuration file format for EM85xx)
- | FTDI D2XX drivers included

3 OVERVIEW

The EMPB85xx Configuration tool includes:

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



Figure 3-1 EMPB85xx 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 EM85xx devices through EMPB85xx configuration tool is based on the following connection schematic

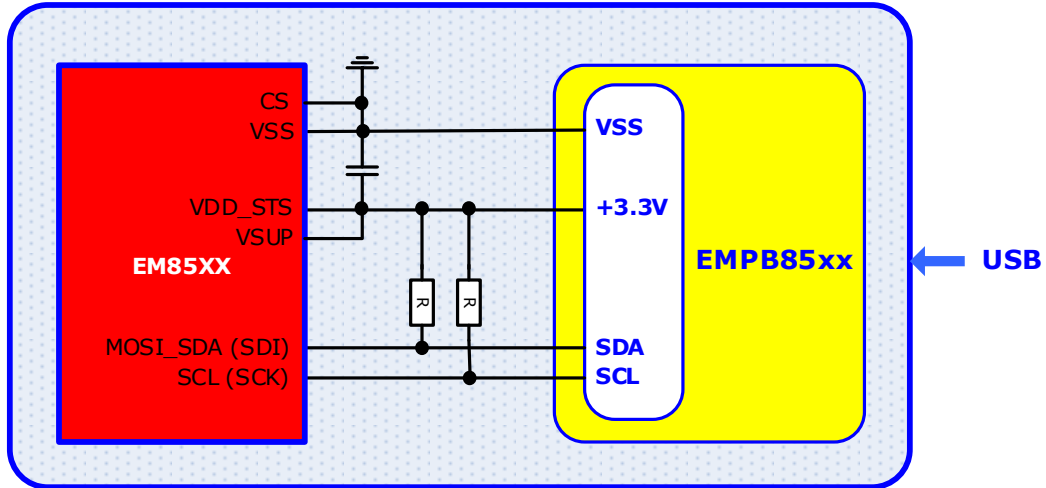


Figure 3-2 EMPB85xx Connection Schematic

4 EMPB85XX CONFIGURATION AND CONNECTION

4.1 PRELIMINARY DESCRIPTION

The EMPB85xx directly plugs into the user's USB port and provides connections to directly connect your EM85xx target device.

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

See Figure 4-1: EMPB85xx Board Description and Configuration (Top View) and Figure 4-2: EMPB85xx Board Description and Configuration (Bottom View).

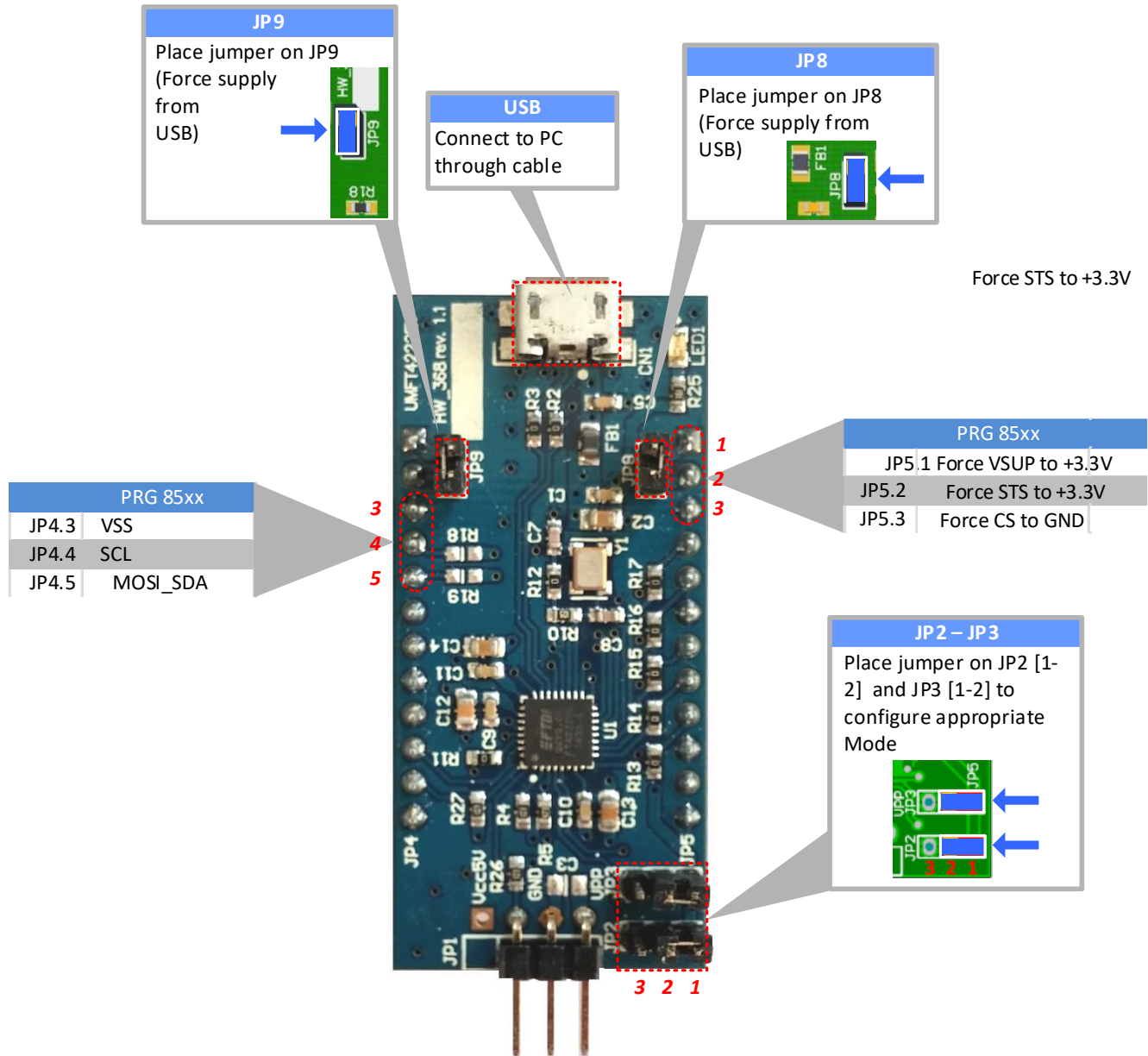


Figure 4-1: EMPB85xx Board Description and Configuration (Top View)

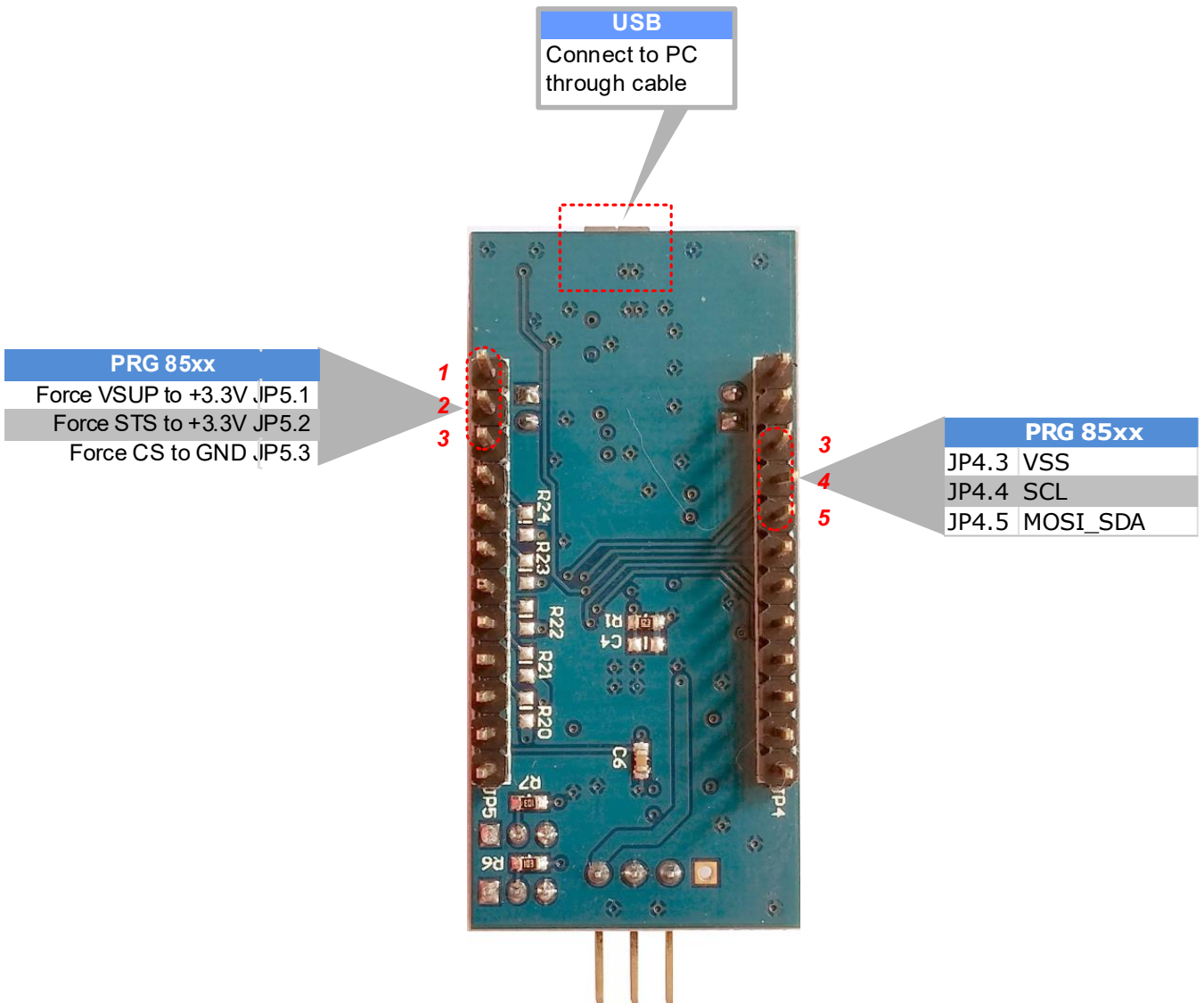


Figure 4-2: EMPB85xx Board Description and Configuration (Bottom View)

4.2 EMPB85XX CONNECTIONS TO EM85XX 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

The **mandatory connections** are listed above:

- | +3.3V output of the EMPB85xx supply the line VDD_STS and VSUP of the EM85xx device.
- | Ground VSS must be connected to CS and VSS of the EM85xx
- | MOSI_SDA (SDI) line of the EM85xx must be connected to the I2C data SDA of the EMPB85xx
- | SCL (SCK) line of the EM85xx must be connected to the I2C clock SCK of the EMPB85xx

See Figure 4-3: EMPB85xx Connections to Target (example shown with EMEVB85xx Evaluation Board).

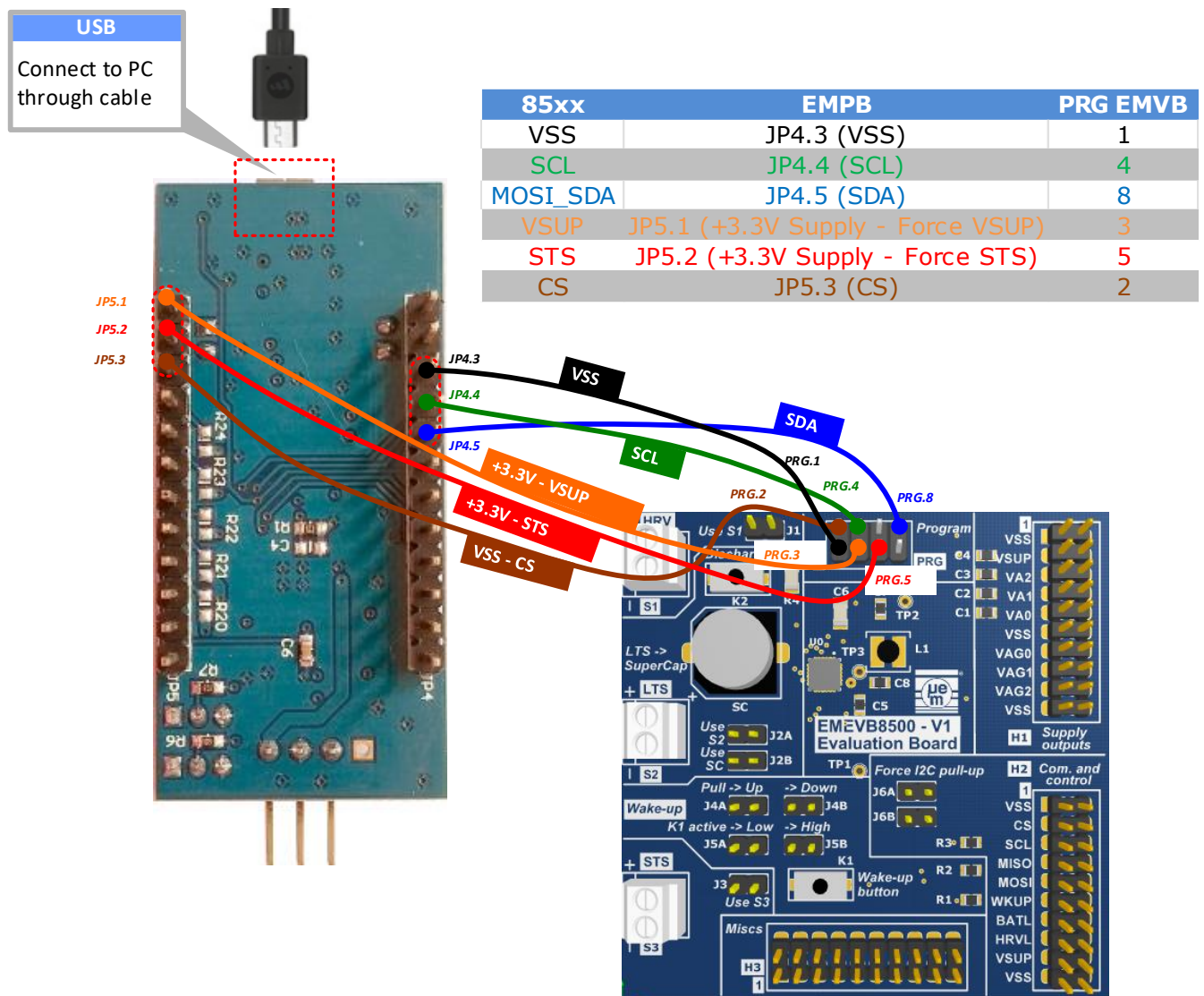


Figure 4-3: EMPB85xx Connections to Target (example shown with EMEVB85xx Evaluation Board)

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 EMPB85xx is disconnected from USB
- | Step 2: connect jumper wires between EMPB85xx and your target
- | Step 3: connect EMPB85xx to USB

To **disconnect** your hardware:

- | Step 1: disconnect EMPB85xx from the USB
- | Step 2: disconnect jumper wires between EMPB85xx and your target

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

➡ I2C pull-ups

- | 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.

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

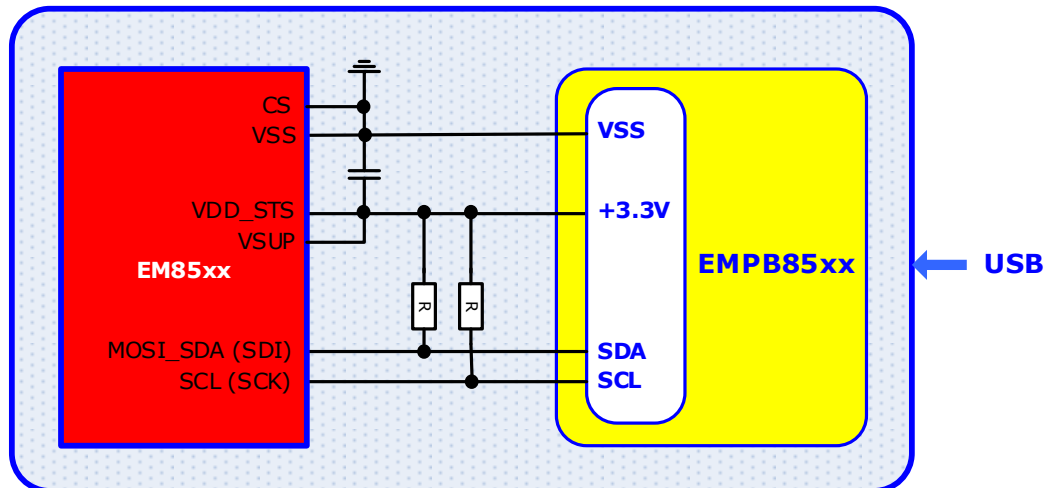


Figure 4-4: I2C Pull-ups resistors – General Target System

When using the EMEVB85xx Evaluation Board as your EM85xx target board, pull-ups resistors are available when connecting jumpers J6A and J6B as shown below.

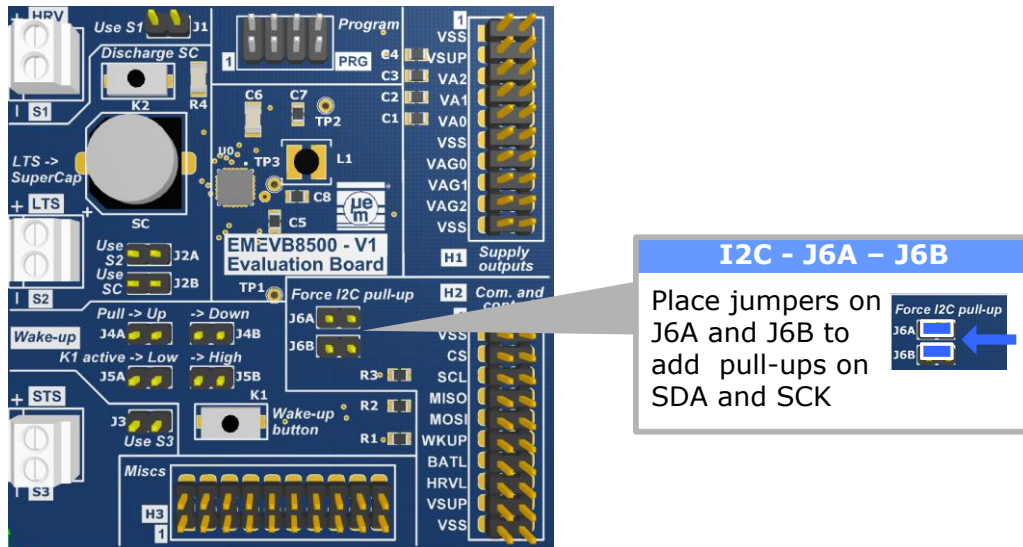


Figure 4-5: I2C Pull-ups Resistors on EMEVB85xx

➡ **CS Line**

- | Ensure that the CS pin of the EM85xx 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 EMEVB85xx Evaluation Board as your EM85xx target board, CS can be forced to VSS as shown (brown wire) in *Figure 4-3: EMPB85xx Connections to Target (example shown with EMEVB85xx Evaluation Board)*.

➡ **STS and VSUP**

- | Ensure that both pins VSUP and STS are forced to the programming voltage. STS provides the supply of EM85xx. 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 EM85xx is set to a different voltage.

When using the EMEVB85xx Evaluation Board as your EM85xx target board, STS and VSUP can be forced to +3.3V as shown (red wire) in *Figure 4-3: EMPB85xx Connections to Target (example shown with EMEVB85xx Evaluation Board)*.

4.2.3 Connection line summary

The EMPB85xx lines used during configuration are listed below

		I/O TYPE		DESCRIPTION	
LOCATION	PIN NAME	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 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:

- | **Help function:**
Provides details about command line usage and available options
- | **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)
- | **Dump Menu**
Reads (dumps) the complete EM85xx EEPROM.
- | **Configuration Menus**
Loads the file EM85xxCFG or a single byte into the EM85xx EEPROM (different options are offered).
- | **CRC Menus**
These functions will manage and check the Hardware CRC (based on the EM85xx EEPROM content) and Software CRC (based on the EM85xxCFG file) on a defined range of addresses.

Note EM85xxCFG file:

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

5.1 EMPB85XX SOFTWARE INSTALLATION

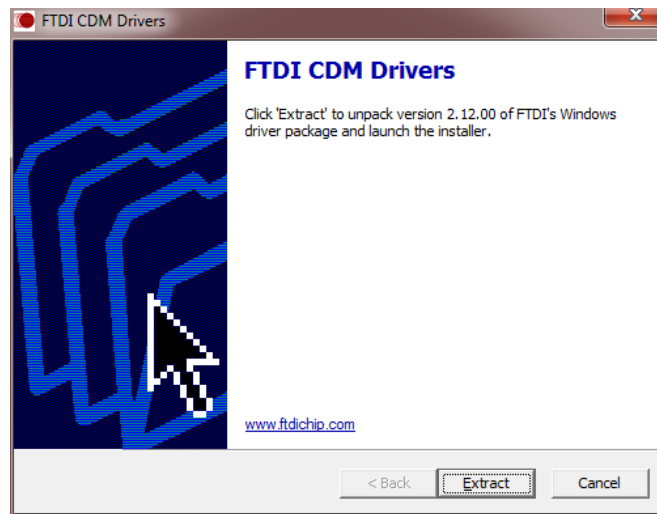
Download and install the setup file **SetupEMPB85xx.exe**.

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

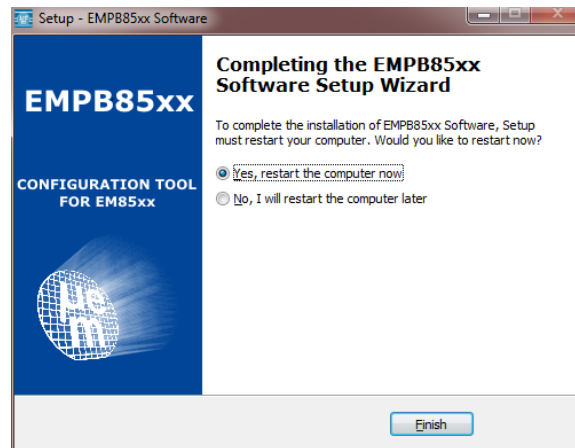
Do not plug in the hardware.



- | 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
- | “EMEB85xx User Manual”.
Provides access to the Evaluation Board manual documentation
- | “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)

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