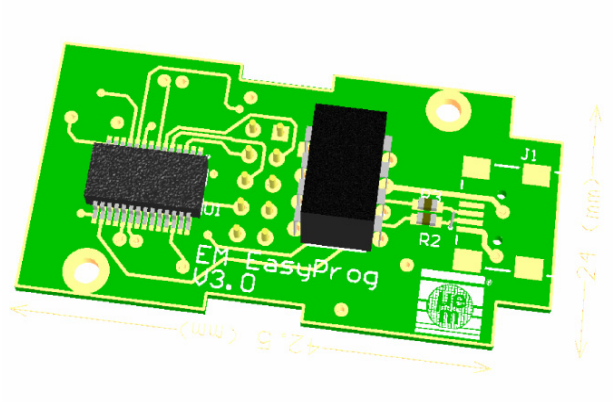
EMPB2 USER MANUAL



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1. GENERAL PRESENTATION

EM Programming Box 2 (EMPB2) is a very compact, easy-to-use and low-cost EM programmer. This programmer is able to program all the standard EM Microcontrollers. EMPB2 support only ISP (In-System-Programming) – no socket provided. EMPB2 is USB powered and does not require any additional power-supply. The Software can be launched with its GU (Graphical User) Interface or through command from dos shell or any other application.

1.1 FEATURES

- ISP programming
- Support all the standard EM Microcontrollers
- EMPB2 software
- USB communication and powered – No additional power-supply needed
- Totally upgradeable by software
- GUI and/or batch

1.2 REQUIREMENTS

- Pentium processor
- 10 MB Free Hard Disk Space
- 64 MB RAM
- USB port (USB 1.1 and USB 2.0 compatible)
- Windows 98 / 98 SE / 2000 / ME / XP

1.3 SOFTWARE

EMPB2 Software can be downloaded: Please visit our website http://www.emmicroelectronic.com { go through Low Power Microcontroller ► MCU Tools ► EMPB2 } or contact EM Microelectronic-Marin.

New devices will be added in the new versions of EMPB2 software. We recommend using the latest release available. No hardware upgrade procedure required (no firmware).

1.4 MICROCONTROLLER DEVICE SUPPORT

4-bit EEPROM	4-bit FLASH	8-bit FLASH
EM6503	EM6580	EM6812-2K
EM6504		EM6812-4K
EM6505		EM6812-8K
EM6517		
EM6520		
EM6521		
EM6522		
EM6540		

Table 1: Microcontroller support

1.5 DELIVERABLES

The EMPB2 toolset consist of:

- USB cable
- ISP cable
- EMPB2 programmer

2. HARDWARE DESCRIPTION

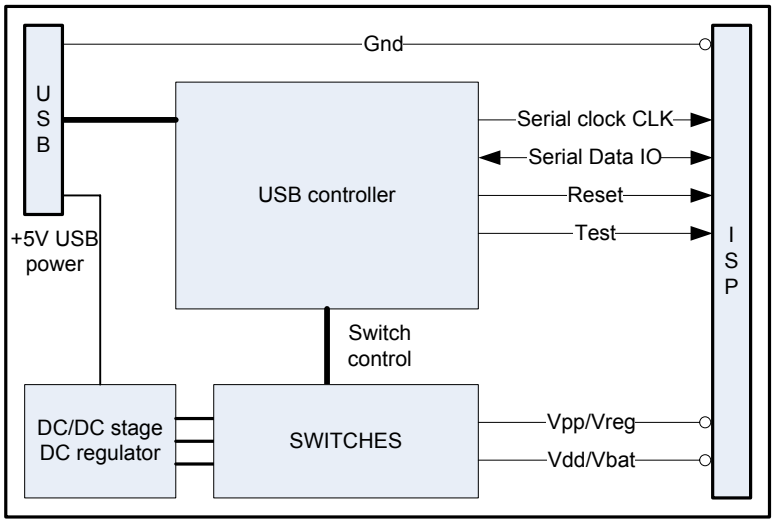


Figure 1 : Hardware

2.1 ISP CONNECTOR

The red mark shows the pin 1 (2.54mm HE10 2x5 pole male).

9	N.C.	Vpp/Vreg	**10**
7	Gnd	Sclk	**8**
5	N.C.	Sdio	**6**
3	Reset	Test	**4**
1	Vdd/Vbat	N.C.	**2**

Table 2 : ISP pinout

The ISP cable has to be connected here

2.2 USB CONNECTOR

It uses a female B-Mini 5 poles SMD connector.
The USB cable must be connected here

2.3 ISP CABLE

The red mark shows the pin 1.
The ISP flex cable is a 1:1 cable. It uses two female connector (2.54mm HE10 2x5 pole female).
ISP cable must be connected between the ISP connector and the application connector, demo board …

2.4 ELECTRICAL CONSIDERATIONS

Since the EMPB2 deliver power during programming, it is understood that the power is limited and it is not possible to deliver an important current. User must not exceed the following limitations:

Parameter	Maximum value	Unit
Vpp/Vreg	10	mA
Vdd/Vbat	10	
Sdio	5	
Sclk	5	
Test	5	
Reset	5	

Table 3 : Maximum DC ratings

Connections to the dedicated programming pins (power and signals) must be done carefully.

- No power-supply from the target board must be applied during the time of the EMPB2 connections. Disconnect the application power-supply before connecting the EMPB2.
- If the application sink a significant part of the maximum rating current (Table 3 : Maximum DC ratings), disconnect the application.
- If communication lines (Sdio, Sclk) are used in the applications as general IOs you must ensure that load on the lines will not be too important. Eventually and if possible, add some serial resistors between the lines and the application and connect directly the programming pins to the communications lines without resistors.

2.5 DEVICE CONNECTIONS

EM6503 - EM6504 - EM6505 - EM6517 - EM6520 - EM6521 - EM6522 - EM6540 required connections:

9		Vreg	**10**
7	Vss	Sclk(Qout)	**8**
5		Sdio(Qin)	**6**
3	Reset	Test	**4**
1	Vdd		**2**

EM6580 required connections:

9		Vpp/Vreg	**10**
7	Vss	Sclk(PA4)	**8**
5		Sdio(PA0)	**6**
3		Test(PA1)	**4**
1	Vdd		**2**

EM6812 required connections:

9		Vpp/Test	**10**
7	Vss	Sclk(PB5)	**8**
5		Sdio(PB7)	**6**
3			**4**
1	Vdd		**2**

2.6 NOTE CONCERNING EM6580

A special option “Disable sector 2 verification” (/N option in command line mode) allows to handle EM6580 without checking the content of sector 2 (refer to EM6580 Datasheet paragraph 15.2 Oscillator Trimming for more information). If this option is not selected (verification enabled means that EMPB2 verify the content of sector 2 which contain trimming values) the content of sector 2 is written and saved in a file located under EMPB2 installation folder (lastsector2.bin).

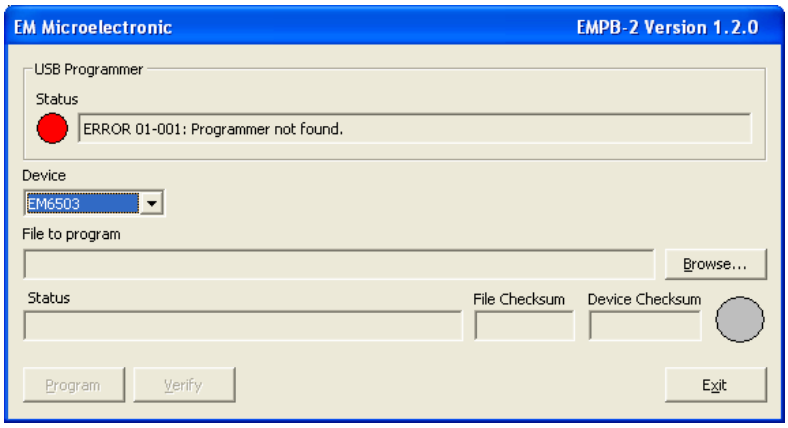
3. SOFTWARE DESCRIPTION

3.1 INSTALLATION PROCEDURE

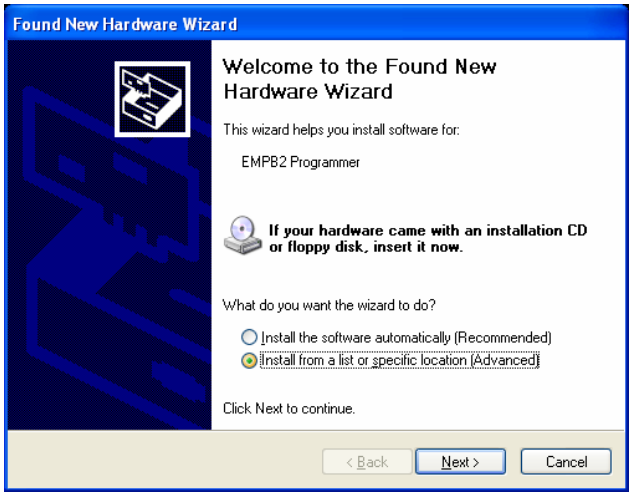
- **Do Not connect the EMPB2**
- Double-click on the executable file EMPBVxxx.exe and follow the steps.

After installation procedure, the USB driver must now be installed.

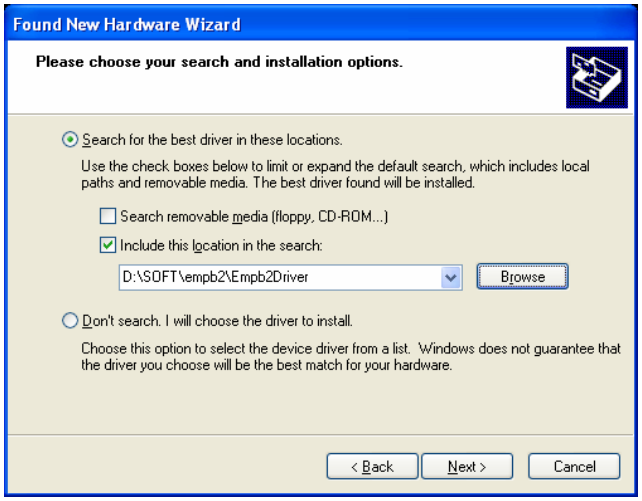
- Open the EMPB2 software (shortcut in your Start menu). The following window appear



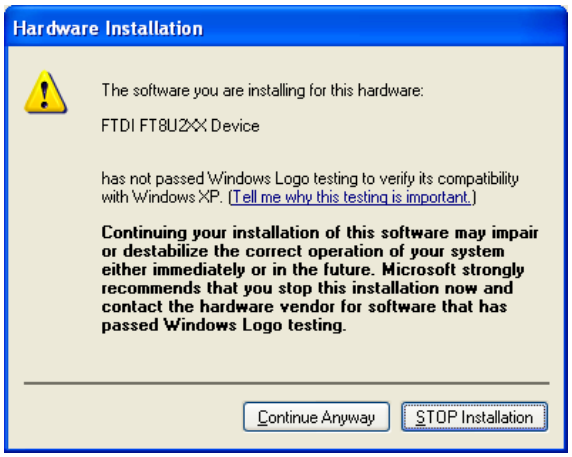
- **Connect EMPB2 to the USB cable and USB cable to your PC**
- New hardware will be detected, then by double-clicking on the New Hardware Found (USB detection tip in your task bar), the following window appear



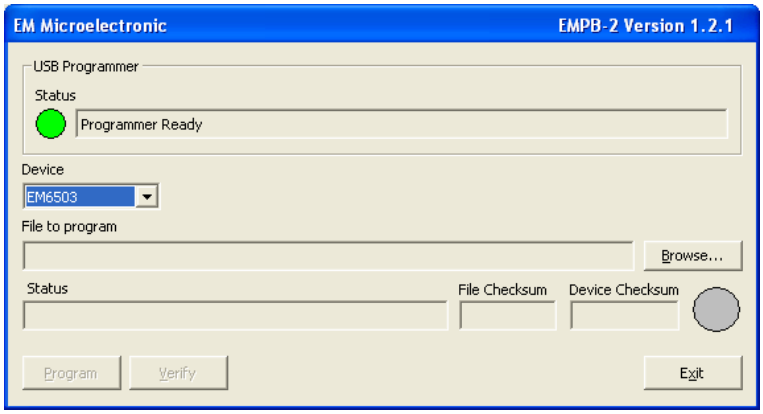
- Check the “Install from a list or specific location” option and click next. The following window appear



- Check the “Include this in the search” option and through the Browse menu go to the root EMPB2 directory and select EMpb2Driver (it contains the .inf file). Click next. The following Window may appear



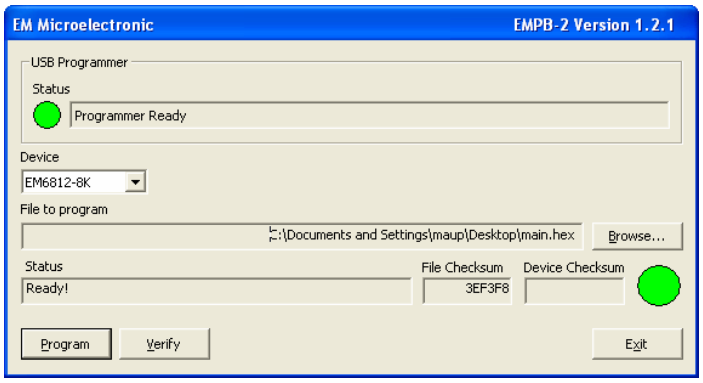
- Click Continue Anyway
- The installation procedure is finished



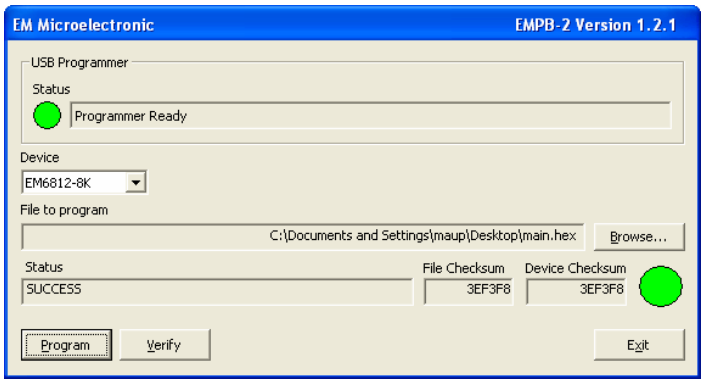
3.2 EMPB2 SOFTWARE - GUI

- The selection of the Device is done through the device combo-box.

- The selection of the programming file is done through the Browse menu. Two formats are supported (pure binary file *.bin or IntelHEX *.hex).
- File Checksum is the checksum evaluated from the programming file.



- Program action will realize the programming and CRC check. Device checksum return the value of the CRC read from the device (File and device checksum must be identical for a successful programming).



- Verify action realize a CRC check

3.3 EMPB2 SOFTWARE – COMMAND LINE

EMPB2 can also be started from command line (DOS or any application). The following command line is described below:

EMPB2 *[/C] [/N] [/?\|/H\|/Help] [/M <MCU Type>] [/F <file to program>]*

/C	Return the CRC as returned value if successful otherwise it return code error Note: If no /C option return value is 0 if successful otherwise it return code error
/N	Don't check sector 2 content if any (EM6580)
/?, /H or /Help	Open a help message box with
/M <MCU name>	The name of the MCU (EM6580, EM6812-2K, …)
/F <Prog. File>	The FULL path of the file to program (including extension .bin or .hex

/S	Start EMPB2 without any Graphical view Note: if no /S only the scroll bar appears

The Returned Code or Errors are given below:

0	Success
-1	Unknown MCU name
-2	BIN/HEX File not found or read error
-3	Read Sector2 failed
-4	Programming failed (sector 1 for EM6580)
-5	Programming sector2 failed
-6	Sector2 verification failed
-7	Read CRC failed
-8	Wrong CRC

4. KNOWN LIMITATION, BUGS, TROUBLESHOOTING