



USB I&P Box User Manual

USB Interface & Programming Box

Evaluation Programmer for SPI & I2C Interface

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Revision History

Revision	Date	Owner	Description
1.0	21.01.2014	AZEN	Initial revision
1.1	06.08.2014	RPH	Minor changes
1.2	06.10.2014	AZEN	Updated Compatible Products
1.3	12.12.2014	AZEN	Add Section 4
1.4	09.09.2015	AZEN	Add AS5047P/AS5147P/AS5247

1 General Description

This Manual explains how to use the USB I&P Box.

The USB I&P Box is a Programming-Tool for Magnetic Position Sensors with I2C or SPI Interface. After connecting a Magnetic Position Sensor to I&P Box you can open the GUI on your computer and start programming.

For programming a Magnetic Position Sensor the sensor should be mounted on a PCB to get connected with all the necessary pins of the sensor.

For Position Sensors, ams provides Adapterboards where an easy access from the Sensor to the USB I&P Box is possible (not in the Tool-Kit included)



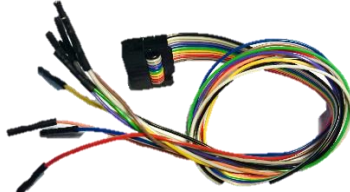


Figure 1:
USB I&P Box



2 Hardware

2.1 Kit Content

Table 1:
USB I&P Box Kit content

Part	Description	Picture
USB I&P Box	USB Interface & Programming Box	
USB cable	To connect the USB I&P box to a computer	
10-way cable	To connect the USB I&P Box to a compatible sensor on an existing board	
Quick Start Guide	First steps introduction	
USB flash drive	Contains the USB I&P Box Software and manuals. To get latest SW / FW and Manuals please refer to http://ams.com/eng/Support/Demoboards/Accessories/Evaluation-Tool/USB-I-P-Box	

2.2 Compatible Products

Table 2:
Compatible Products

Product	Description	Adapterboard available
AS5047D	14-bit On-Axis Magnetic Rotary Position Sensor	yes
AS5047P	14-bit On-Axis Magnetic Rotary Position Sensor	yes
AS5048A	14-bit Angular Position Sensor with SPI Interface	yes

Product	Description	Adapterboard available
AS5048B	14-bit Angular Position Sensor with I2C Interface	yes
AS5050A	Low Power 10-Bit Magnetic Position Sensor	yes
AS5055A	Low Power 12-Bit Magnetic Position Sensor	yes
AS5147	14-bit On-Axis Magnetic Rotary Position Sensor	yes
AS5147P	14-bit On-Axis Magnetic Rotary Position Sensor	yes
AS5247	14-bit Dual-Die Magnetic Rotary Position Sensor	yes
AS5510	Linear Hall Sensor with I ² C Output	yes
AS5600	12-bit Programmable Contactless Potentiometer	yes
AS5601	12-bit Programmable Contactless Encoder	yes

2.3 Pin-out

The pin-out of the USB I&P box is shown below in Table 3

Table 3:
USB I&P Box Pin-out and wire description

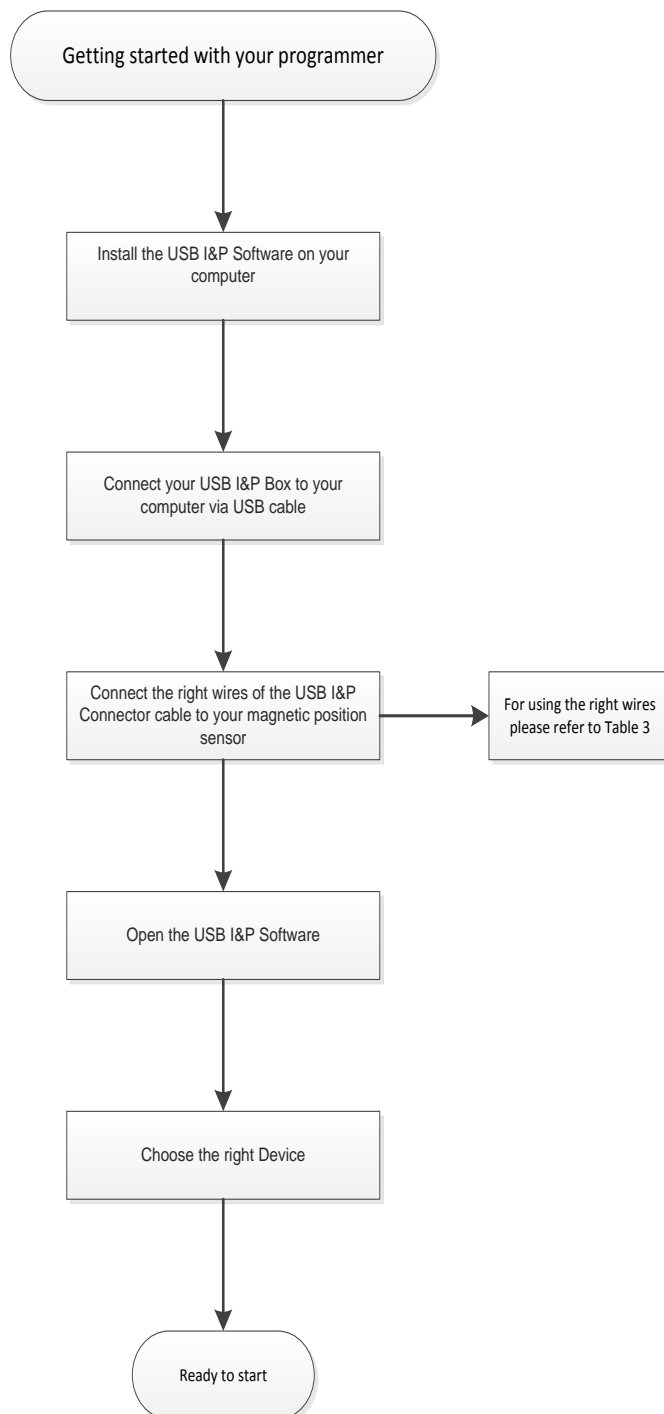
Pin #	Color	Definition	SPI Mode
1	Brown	5V Supply	Not used
2	Red	3.3V Supply	Positive power supply
3	Orange	SPI-CS(0)	SPI-CS(0)
4	Yellow	I2C-SCL	Not used
5	Green	SPI-CLK	SPI-CLK
6	Blue	I2C-SDA	Not used
7	Purple	SPI-MOSI	SPI-MOSI
8	Grey	SPI-CS(1)	Optional (dual die version)
9	White	SPI-MISO	SPI-MISO
10	Black	GND	GND

Note: The interface voltage of the USB I&P Box is 3,3V. Use the 3,3V mode when connecting to a position sensor board.

3 First steps with the USB I&P Box

The first steps to get started with the USB I&P Box are described below in Figure 2.

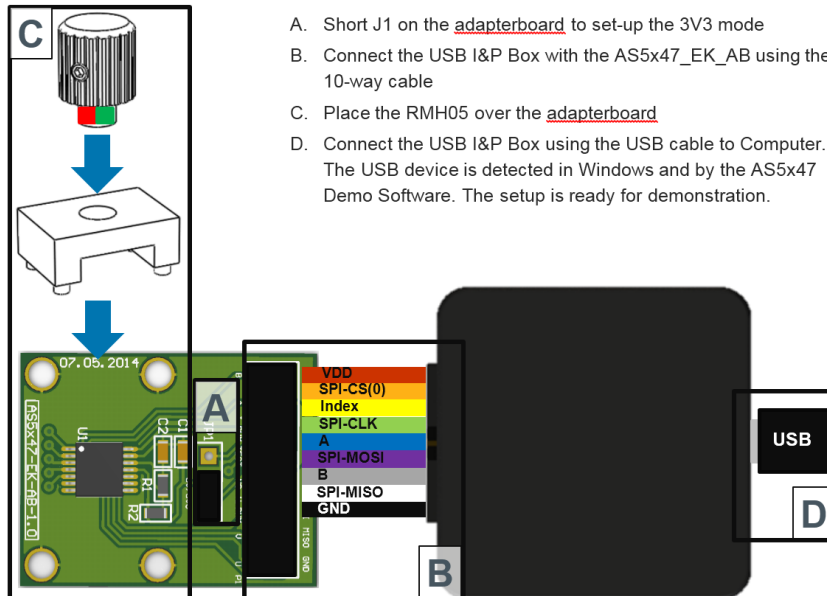
Figure 2:
First steps with the USB I&P Box



4 Connection from compatible Adapterboard to USB I&P Box

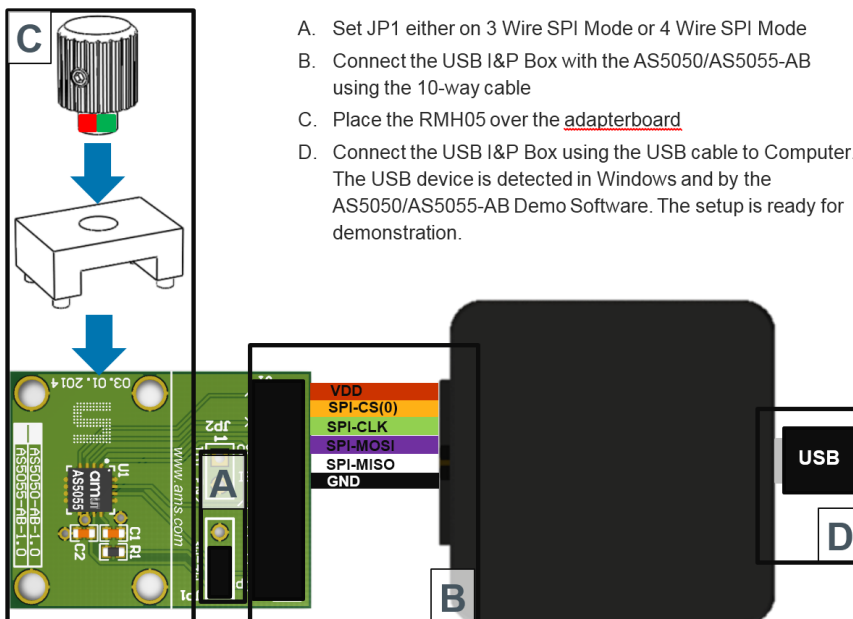
4.1 AS5047D/AS5147/AS5047P/AS5147P

Figure 3:
How to connect an AS5047D/AS5147/AS5047P/AS5147P adapterboard to the USB I&P Box



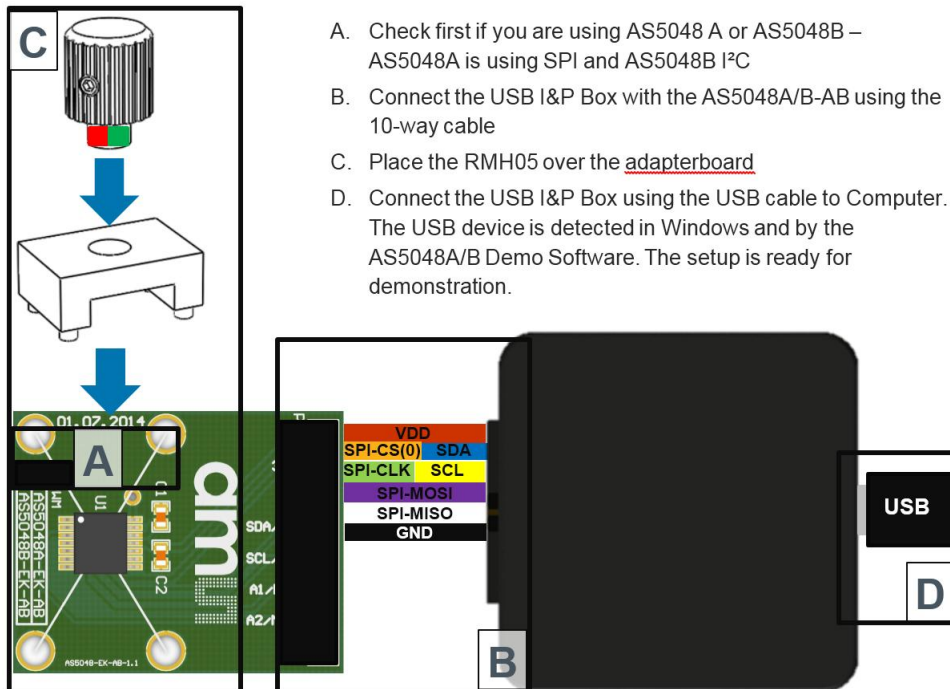
4.2 AS5050A/AS5055A

Figure 4:
How to connect an AS5050A/AS5055A adapterboard to the USB I&P Box



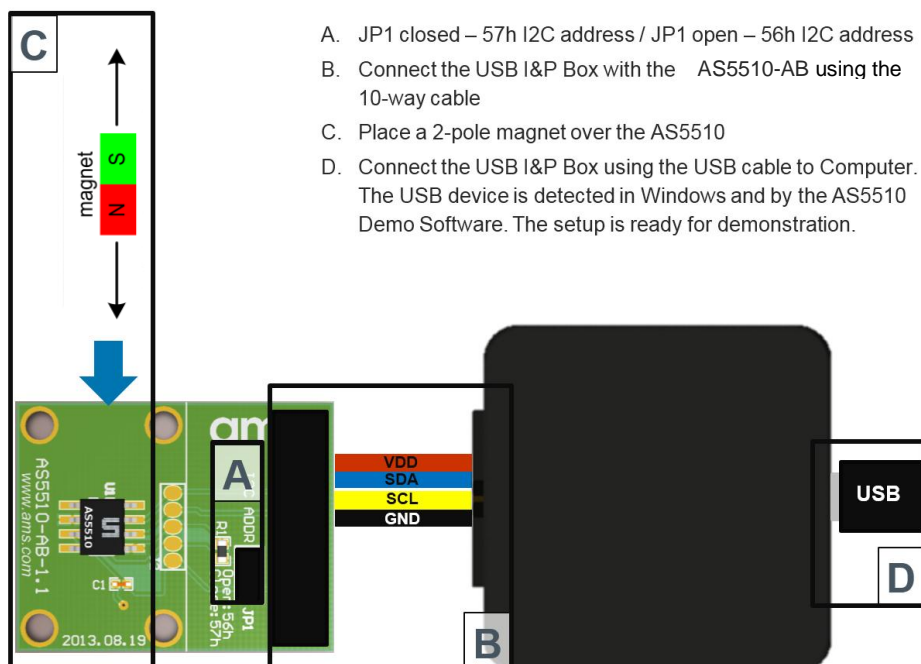
4.3 AS5048A/AS5048B

Figure 5:
How to connect an AS5048A/AS5048B adapterboard to the USB I&P Box



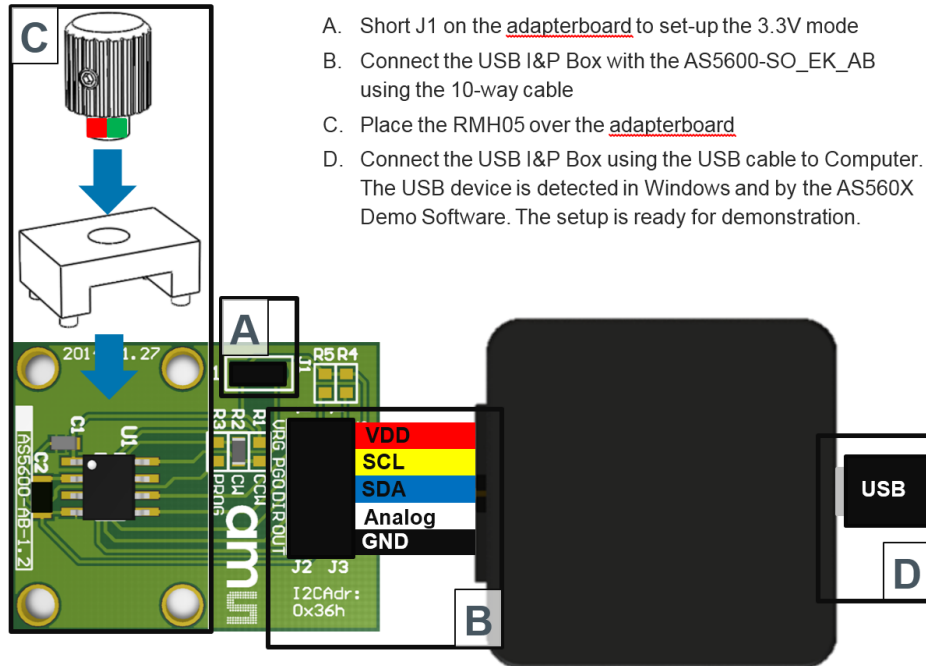
4.4 AS5510

Figure 6:
How to connect an AS5510 adapterboard to the USB I&P Box



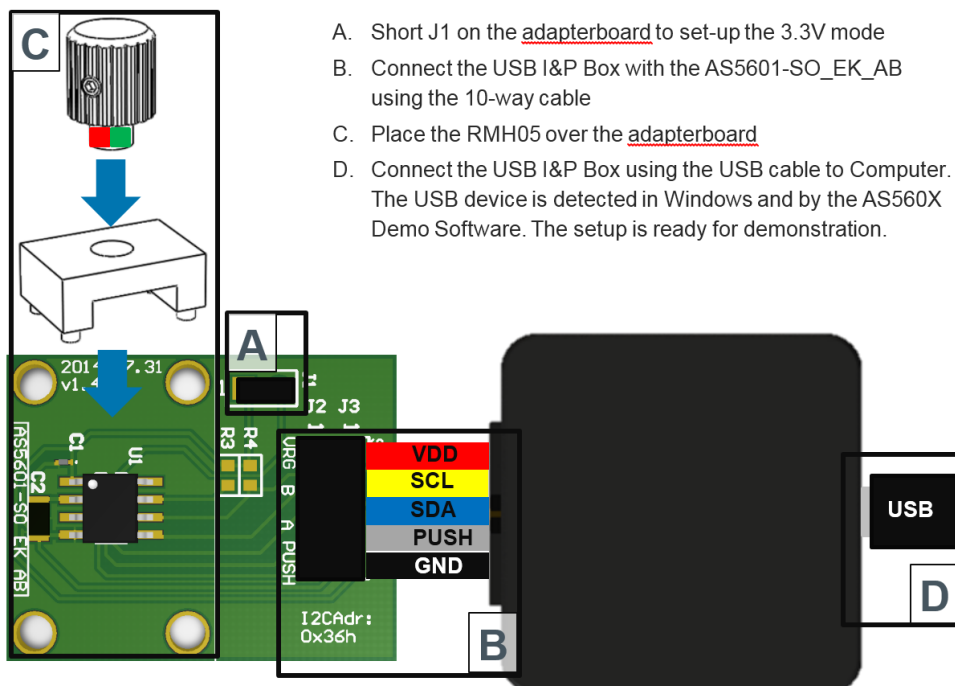
4.5 AS5600

Figure 7:
How to connect an AS5600 adapterboard to the USB I&P Box



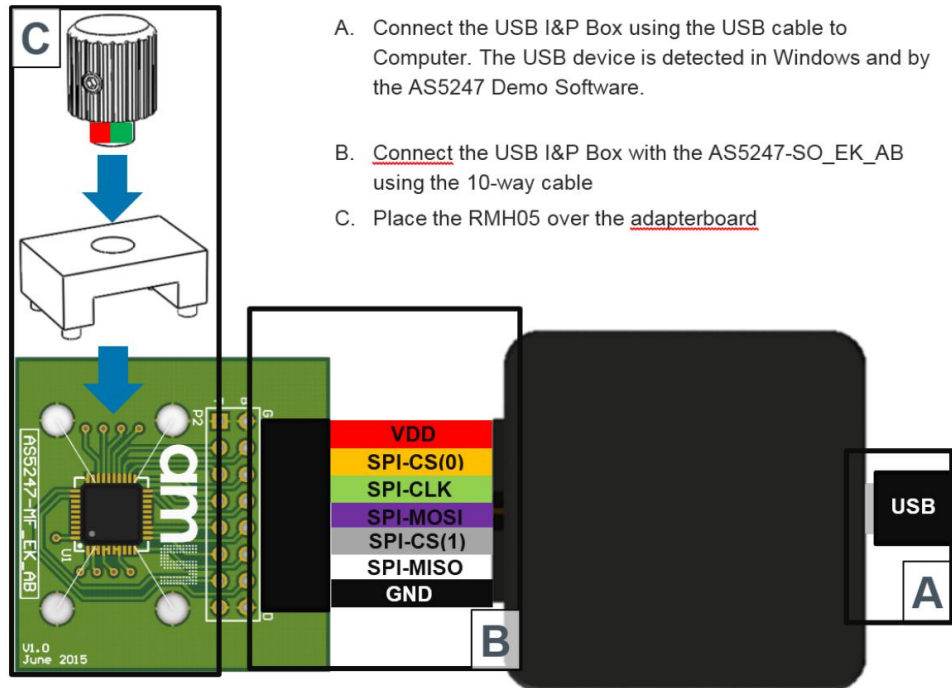
4.6 AS5601

Figure 8:
How to connect an AS5601 adapterboard to the USB I&P Box



4.7 AS5247

Figure 9:
How to connect an AS5247 adapterboard to the USB I&P Box



5 Software

5.1 GUI Overview

Also included in your USB I&P Tool is a USB stick with the software.

The software is needed for programming the Magnetic Position Sensor on your computer.

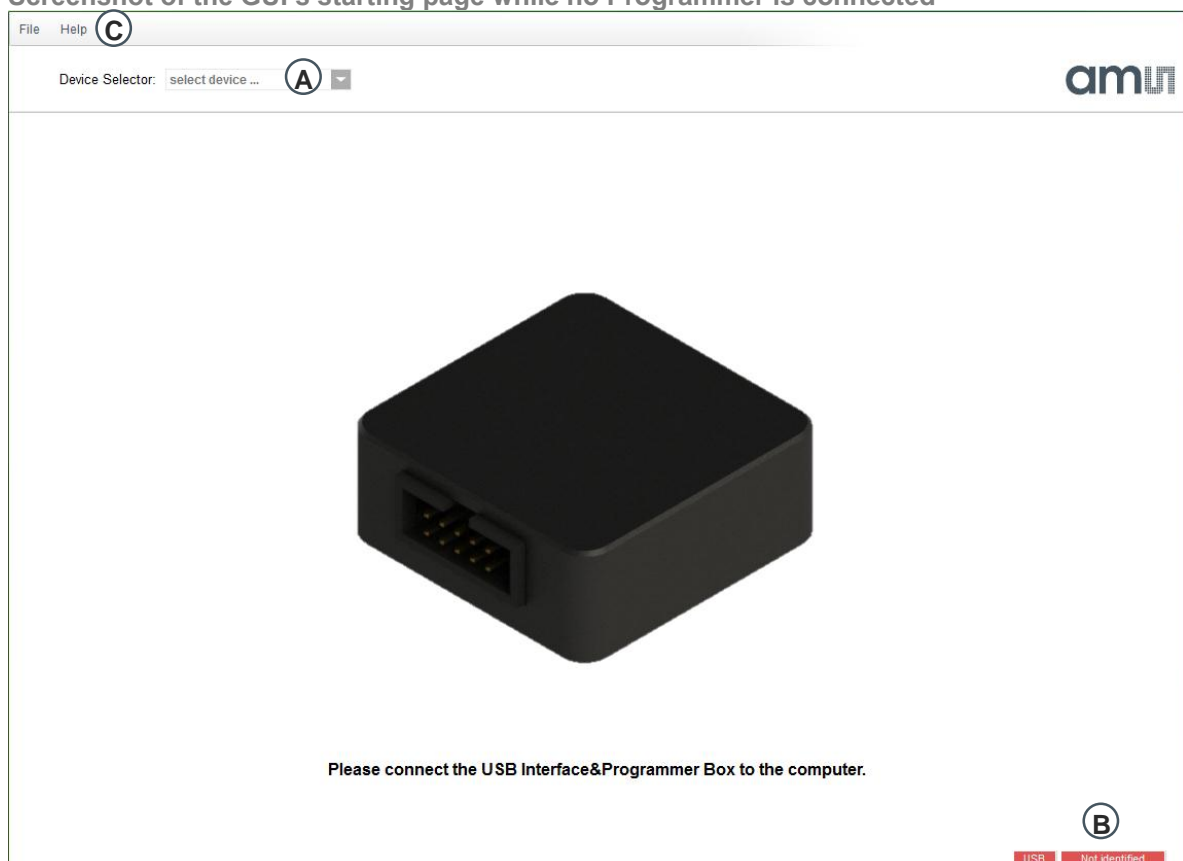
When you copied the software from the USB stick to your computer please click on it and follow the instructions of the Install Wizard through the installing procedure.

The software is compatible for Windows XP and newer versions.

In **Figure 10**: you can have a look at the starting page after finishing the installing and no device connected.

Figure 11 shows the GUI while a Programmer Box connected

Figure 10:
Screenshot of the GUI's starting page while no Programmer is connected

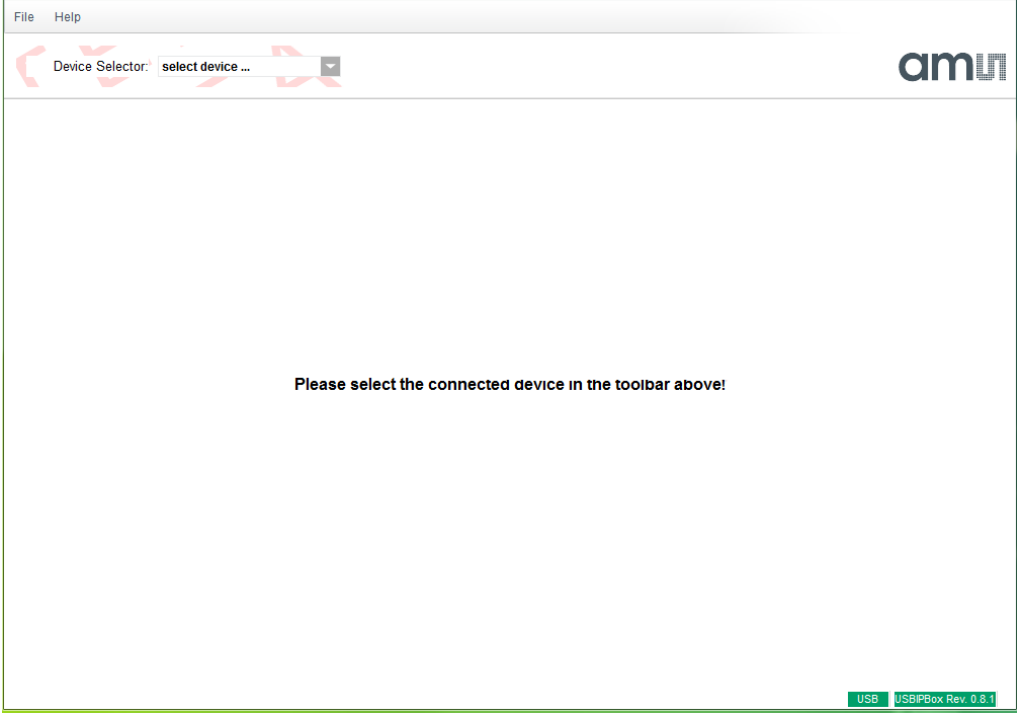


A: Select the Device (only possible when a I&P Box is detected)

B: Check if the Programmer will be detected (or there is no bootloader on the I&P Box)

C: For firmware updates click on Help and Firmware Update, for further Information about this topic refer to 5.2

Figure 11:
Screenshot of the GUI's starting page while Programmer connected



5.2 Firmware Update

- Connect your I&P Box to your Computer and open the Software
- Click on Help and Firmware Update
- Search your computer for the new firmware file and click at it
- After that the firmware installs by itself and the update is successful

6 Ordering Information

Table 4:
Ordering Information

Ordering Code	Description
USB I&P Box	USB Interface & Programming box for I2C/SPI

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Contact Information

Headquarters

ams AG
Tobelbader Strasse 30
8141 Unterpremstaetten
Austria
T. +43 (0) 3136 500 0
For Sales Offices, Distributors and Representatives, please visit:
<http://www.ams.com/contact>