



# USB to SPI Converter

## User Manual

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## Revision History

Date	Revision	Change(s)
13/12/2013	1.0	Initial Release (Dec. 2013)
07/04/2017	1.1	change to new AMAC document layout

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## **Terms, Definitions, and Abbreviations**

GND	–	Ground
MISO	–	Master In / Slave Out
MOSI	–	Master Out / Slave In
SCK	–	SPI-Clock Output
SEN	–	Chip Select
SPI	–	Serial Peripheral Interface
USB	–	Universal Serial Bus
VDD	–	Power Supply (depends on the configuration)

# 1 Overview

The „USB to SPI Converter“ unit is used as a stand alone USB interface and power supply for any SPI device such as microcontrollers, sensors or integrated circuits. It is also suitable for interfacing AMAC GmbH integrated circuits, demoboards and user boards.

With the USB to SPI Converter software tools it is also possible to apply a stabilized 5.0 volt or 3.3 Volt power supply to the interface and drive SPI device up to 400mA directly from USB port.

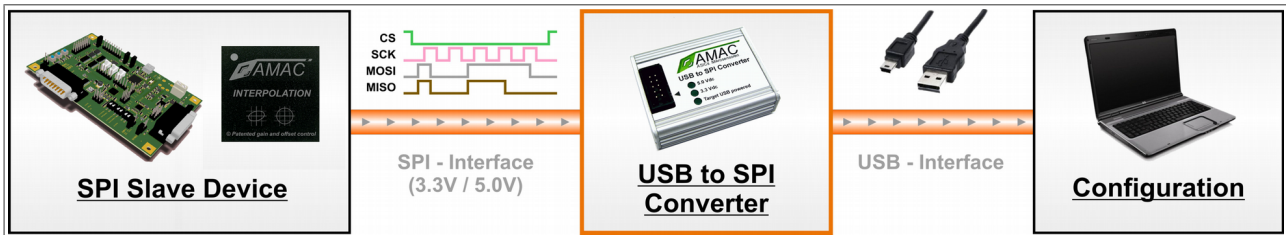


Figure 1: Block Diagram

# 2 USB to SPI Connector Pin Assignment

Table 1: USB to SPI Converter, Connector pin assignment

Pin	Function	Description	Cable Color
1	CS	Chip Select	green
2	GND	GND, 0V	white
3	MOSI	Master Output, Slave Input	gray
4	GND	GND, 0V	white
5	MISO	Master Input, Slave Output	brown
6	GND	GND, 0V	white
7	SCK	Clock	pink
8	GND	GND, 0V	white
9	VDD	3.3V / 5V / High Impedance (depends on the configuration)	blue
10	VDD	3.3V / 5V / High Impedance (depends on the configuration)	blue

The USB to SPI Converter uses three LED’s to indicate different SPI interface modes. D1 shows a 5V driven SPI interface while D2 indicates a 3.3V SPI interface. If D3 is on, the selected voltage level is also applied to the VDD pins of the SPI interface connector (pin 9 and 10). In this case the target can be powered by the USB to SPI Converter directly.

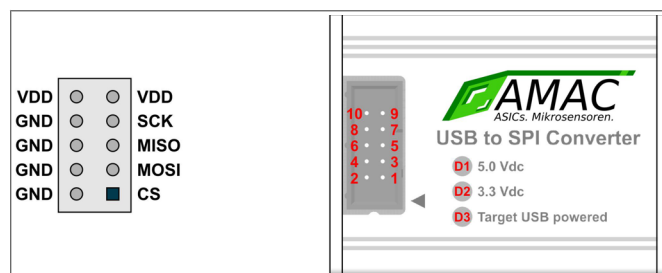


Figure 2: USB to SPI Converter, Connector and LED’s

### 3 Technical Specifications

Table 2: Technical specifications

Symbol	Parameter	Unit
$V_{in}$	Operating voltage	USB Supply Voltage +2.5V ... +5.5V
$V_{out}$	Output voltage	3.3V / 5V / High Impedance (depends on the configuration)
$I_{out}$	Maximum output current	400 mA
$\Delta\vartheta$	Temperature range	- 20 °C ... +55 °C
$L_{Max}$	Maximum cable length to the slave device (SPI)	0.5 m
$F_{CLK}$	Maximum SPI clock frequency	30 MHz (depending on output load capacitance and cable length)
$V_{IH}$	Minimum HIGH-level input voltage	2.0 V
$V_{IL}$	Maximum LOW-level input voltage	0.8 V

