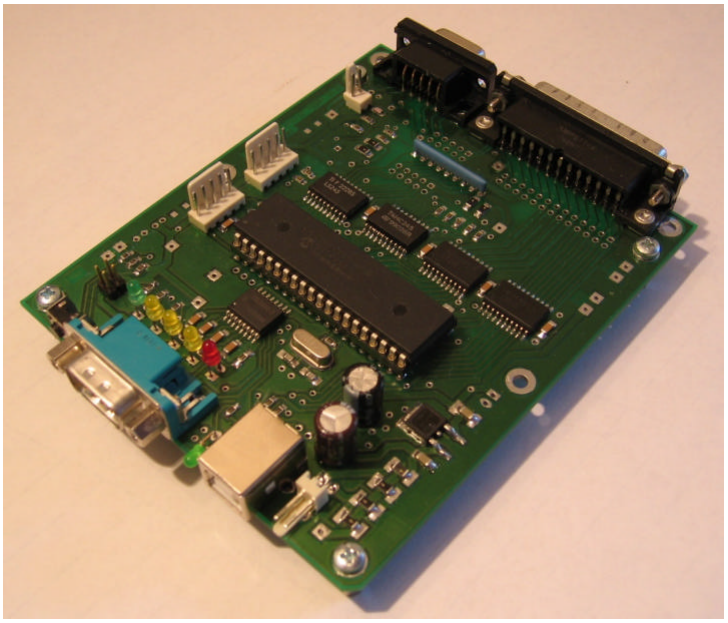
TN002

AKKON USB CONTROLLER BOARD

USB Microcontroller board with the PIC18F4550™*

Datasheet



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Attachments: no attachments

Table of versions

Version	Date	Remarks
1.0	18.10.2005	First version
	1	

*PIC18F4550 is a trademark of the microchip corporation (www.microchip.com).

1 Introduction

The AKKON USB controller board is an electronic development board with the PIC18F4550 micro controller, with USB support, power supply and IO drivers. The board is designed as a development kit for starting up working with PIC microcontrollers and for fast development of new devices.

1.1 Why for starting up?

The board can be assembled with low requirements on the assembly tools. Starters have well documented hardware and some small software examples available.

1.2 Why for fast development?

Common used hardware configuration is available on board. A lot of applications can be realized with no further hardware. Assembling of the hardware in two types of housings is very easy.

1.3 Other documents

TN003 Technical note about how to built the PIC USB Controller board (German language)

2 Features of the AKKON USB CONTROLLER BOARD

- micro controller operating with 48MHz internal clock
- 2 Kb RAM
- Quartz crystal oscillator circuit 20MHz
- DIL40 microcontroller socket
- free assembler available
- different commercial C compilers available
- USB bus 1.1 and 2.0 compatible
- in circuit serial programming interface (ICSP)
- USB interface
- I2C interface
- RS232 interface (Rx and Tx)
- Power supply
- Reset button
- two general purpose push buttons
- digital outputs amplified by 74HCT245 drivers
- digital inputs amplified by 74HCT245 drivers
- PWM-output
- output pin RD0 to RD3 with status LED
- eight mounting holes with 3.2mm
- easy firmware update over USB bootloader
- easy installation in housing

- extensions: 120mm x 100mm

Information about the PIC18F4550 controller can be found on www.microchip.com e.g. the data sheet DS39632B.

Please read the warranty conditions at the end of the document.

3 Details about the featuers

3.1 Supported devices

The AKKON USB controller board is primarily designed for the PIC18F4550 USB Controller. Other controllers as the pin compatible PIC16F877, PIC18F452, PIC18F458 can also be used with related hardware assembling.

3.2 Power supply

Power supply is supported on board but can also provided directly from external power supply.

3.3 Oscillator

Standard assembly is a 20MHz oscillator, 1M parallel resistor, two 27pF ceramic capacitors combination. The internal clock is multiplied by PLL to 48MHz. Beyond that the board can be assembled with different oscillator configurations (see the microchip datasheet). Clock rates can be defined by the configuration bits of the microcontroller.

3.4 ICSP interface

The in circuit serial programming interface (ICSP interface) is connected with connector J4.. The pin assignment is shown in figure z. As a ICSP-programmer, e.g. the PBRENNER of sprut (www.sprut.de) PIC programmer or a lot of other PIC programmers can be used.

3.5 RS232 interface

The RS232 interface can be reached over Connector J2. For RS232 communication the Rx and Tx signals are available. For mobile the devices the RS232 connector can be configured by hardware jumpers to provided supply voltage on two pins. With that feature, a second device can communicate with the AKKON USB controller board over RS232 and no further power supply for the second device is needed.

3.6 Status LEDs

The AKKON USB board can be equipped with six Leds. Led 1 shows the state of the power supply, Led 2, 3, 4 and 5 indicate the state on the digital outputs RD0, RD1, RD2 and RD3. Finally Led 6 indicates if a USB Host is connected to the AKKON USB Controller board.

3.7 Reset button

A hardware reset can be performed by using the Reset button. This button can either be equipped on board or on connector JP12.

3.8 Firmware update button

The firmware update button (S2) is placed on front of the AKKON USB controller board. By holding the firmware update button and pressing the reset button, the AKKON USB controller can enter the boot mode. If no bootloader software is needed the button can be used as general purpose button.

3.9 General purpose button

The general purpose button S32 can be equipped on board or connected on connector J6, J7, or J10.

3.10 Digital input with input protection

If I2C-bus is not required Pin RB0 and RB1 can operate as digital input or output. Beyond that PIN RB0 is can be assembled with two diodes and a resistor to protect the input against over- and under voltage.

3.11 Frequency input with input protection

The AKKON USB controller board is equipped with a frequency input with over and under voltage protection. The input is connected to the Pin RC0 of the PIC18F4550 to clock TIMER 1.

3.12 Digital inputs and outputs

The AKKON USB controller board has 17 digital outputs that are buffered with 74HCT245 or 74LS245 drivers. Alternatively IC4 can be switched by hardware configuration to input mode. In this case 11 digital outputs are available. The board also has 8 digital inputs with pullup resistor. This allows an easy connection e.g. of eight switches. All digital inputs and outputs can either be connected by the connectors J10 or by two D-SUB connectors (female).

3.13 USB Bus

The AKKON USB controller board is equipped with a USB 1.1 and USB 2.0 compatible interface. In addition to the USB connector on board the USB can also be connected on the four pads directly behind connector J5 If the AKKON USB controller board is equipped with the PIC16F877, PIC18F452 or PIC18F458, pin 23 and pin 24 can be used as general purpose IOs or for SPI bus. Pin 18 (RC3) can also be used as digital IO. Please not, compatibility with PIC16F877, PIC18F452 or PIC18F458 has not been tested yet.

3.14 Bootloader

New firmware can be uploaded to the AKKON USB controller board. One USB bootloader can be downloaded for free on the microchip web page. In addition the controller. A modified version of the microchip USB bootloader can be found on our web page.

4 Related files

Description	Type	format	Remarks
Schematics and mounting plan	design	pdf	

5 Disclaimer

5.1 Limited Warranty and Disclaimer of Warranty

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