

# PIC-MT-USB development board

## Users Manual



All boards produced by Olimex are ROHS compliant

Rev. A, November 2007

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## **INTRODUCTION:**

**PIC-MT-USB** is small development board for 40 pin PIC microcontroller. With its LCD, two buttons, USB, ICSP and extension connector for some of the microcontroller's pins this board is suitable for different embedded systems applications.

## **BOARD FEATURES:**

- ICSP/ICD connector for programming with PIC-MCP-USB, PIC-MCP or PIC-PG1, PIC-PG2, PIC-PG3, PIC-PG4 and debugging with PIC-ICD2, PIC-ICD2-POCKET, PIC-ICD2-TINY or is PIC16F87X microcontroller is used PIC-ICD1
- DIL-40 for PIC microcontroller
- LCD 16x2 alphanumeric display with backlight
- 2 Buttons
- bi-color LED
- Power supply taken from USB port
- Virtual USB-RS232 port
- 20 Mhz crystal
- Extension headers for PIC unused ports
- Four mounting holes
- FR-4, 1.5 mm (0,062"), green soldermask, white silkscreen component print
- Dimensions 95x36 mm (3,7x1,4")

## **ELECTROSTATIC WARNING:**

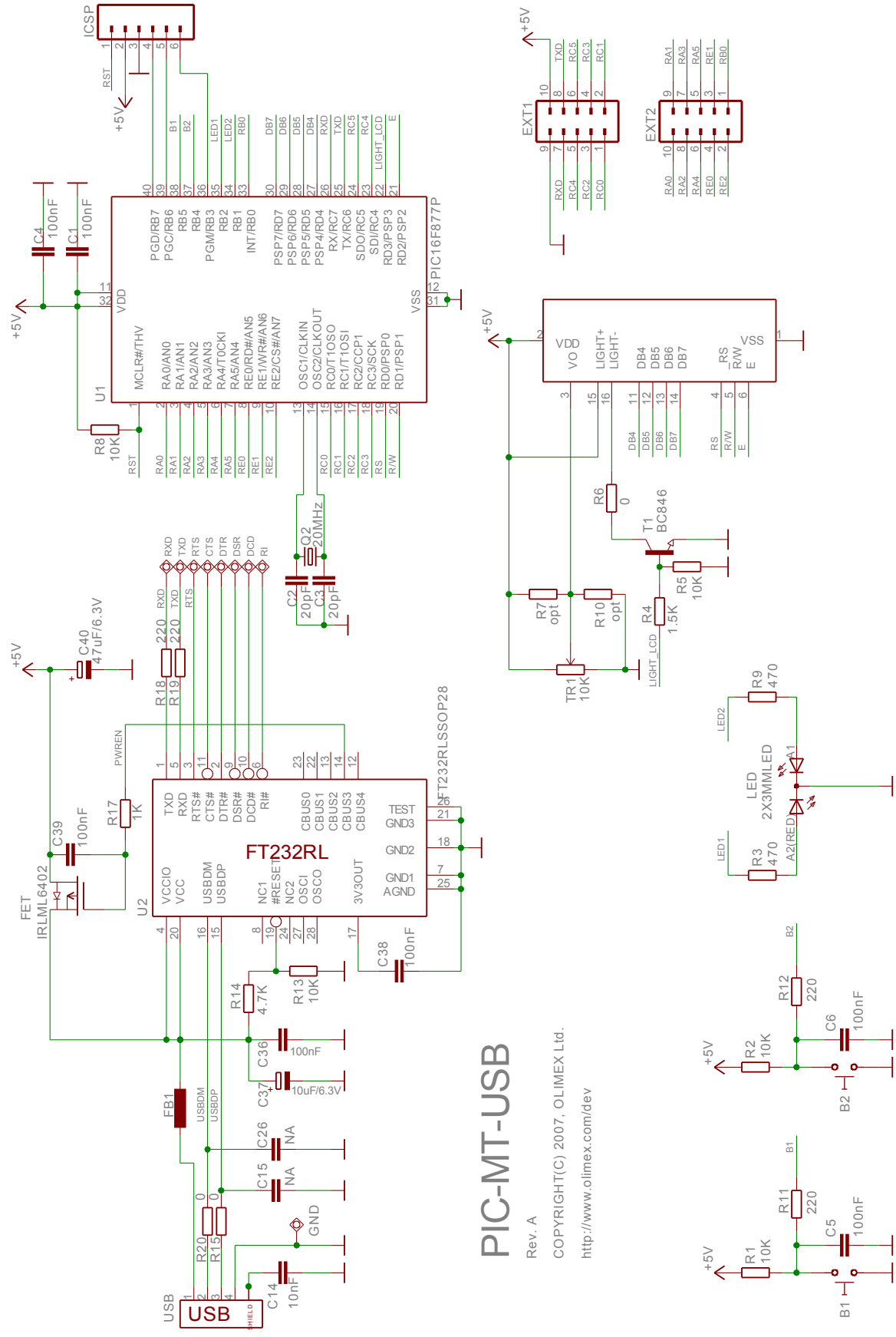
The PIC-MT-USB board is shipped in protective anti-static packaging. The board must not be subject to high electrostatic potentials. General practice for working with static sensitive devices should be applied when working with this board.

## **BOARD USE REQUIREMENTS:**

**Cables:** Depends on the used programming/debugging tool. It could be 1.8 meter USB A-B cable to connect [PIC-ICD2-POCKET](#), [PIC-ICD2](#), [PIC-MCP-USB](#) to USB host on PC or RS232 cable in case of [PIC-ICD2-TINY](#), [PIC-MCP](#) or other programming/debugging tools.

**Hardware:** Programmer/Debugger – some of Olimex programmers are applicable, for example **PIC-ICD2**, **PIC-ICD2-POCKET**, **PIC-ICD2-TINY**, **PIC-MCP**, **PIC-MCP-USB** or other compatible programming/debugging tool.

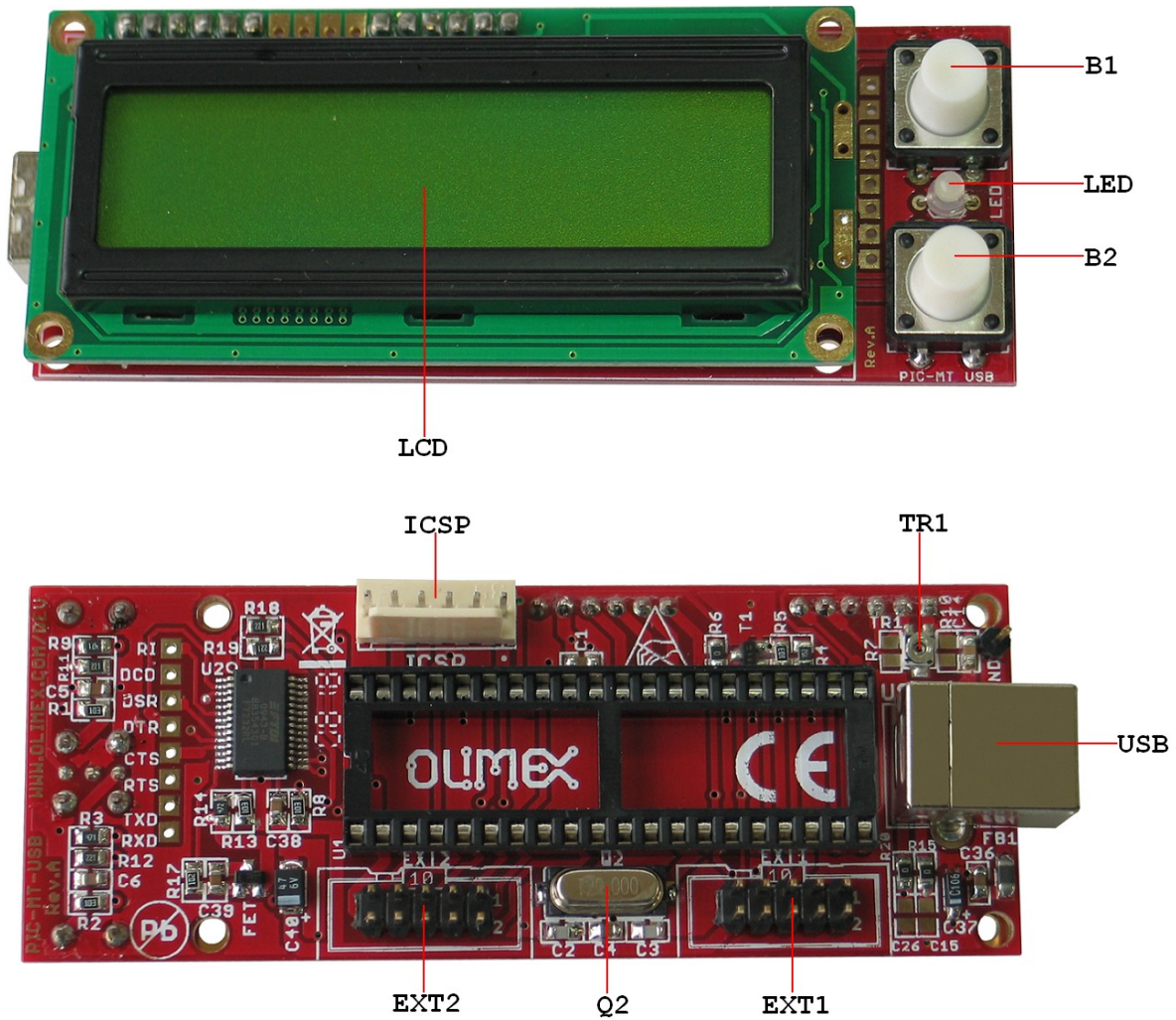
**SCHEMATIC:**



**PIC-MT-USB**

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## BOARD LAYOUT:



## POWER CIRCUIT:

PIC-MT-USB can take power +5V from USB.

## RESET CIRCUIT:

PIC-MT-USB reset circuit includes R8 (10k) pull-up, ICSP pin 1, U1 - pin 1 (MCLR#).

## CLOCK CIRCUIT:

Quartz crystal Q2 (20 MHz) is connected to U1 pin 13 (OSC1/CLKIN) and pin 14 (OSC2/CLKOUT).

## JUMPER DESCRIPTION:

- There are no jumpers on this board.

## INPUT/OUTPUT:

**User button** with name **B1**, connected to U1 - pin 38 (RB5).

**User button** with name **B2**, connected to U1 - pin 37 (RB4).

**LCD 16x2 display** with **BACKLIGHT**, connected as follows: RS - to U1 - pin 19 (RD0); R/W - to U1 - pin 20 (RD1); E - to U1 - pin 21 (RD2), DB4 - to U1 - pin 27 (RD4), DB5 - to U1 - pin 28 (RD5), DB6 - to U1 - pin 29 (RD6), DB7 to U1 - pin 30 (RD7).

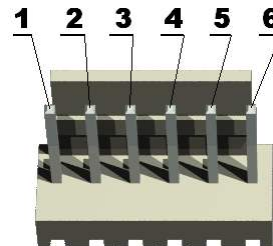
**Potentiometer** with name **TR1** for setting LCD contrast voltage.

**Bi-colour status Led** with name **LED** connected to U1 - pin 35 (red) and to U1 - pin 34 (green).

## EXTERNAL CONNECTORS DESCRIPTION:

### ICSP:

Pin #	Signal Name
1	RST
2	+5V
3	GND
4	U1 - pin 40 (RB7)
5	U1 - pin 39 (RB6)
6	U1 - pin 36 (RB3)



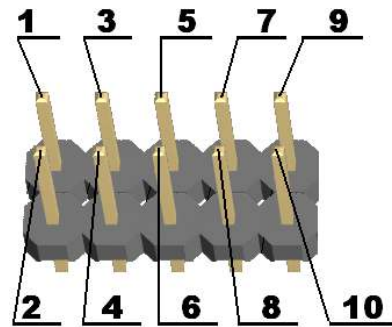
### USB:

Pin #	Signal Name
1	USB_PWR
2	USBDM
3	USBDP
4	GND



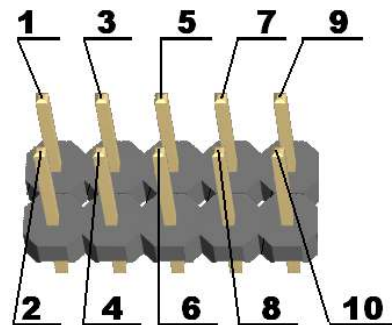
## EXT1:

Pin #	Signal Name
1	RC0
2	RC1
3	RC2
4	RC3
5	RC4
6	RC5
7	RXD
8	TXD
9	GND
10	+5V

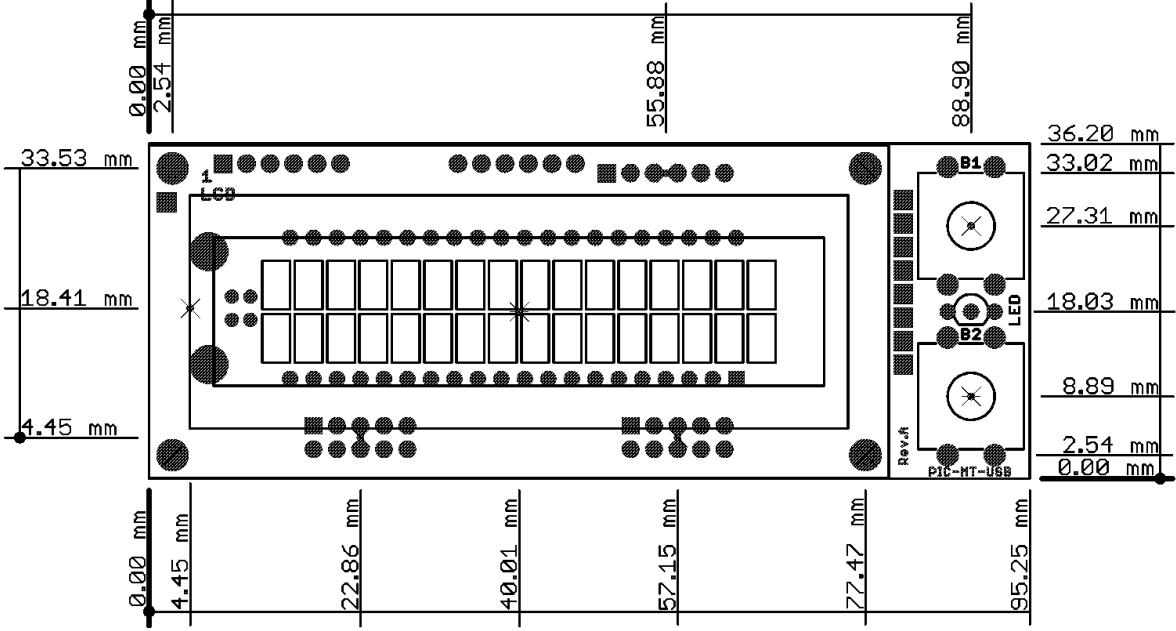


## EXT2:

Pin #	Signal Name
1	RB0
2	RE2
3	RE1
4	RE0
5	RA5
6	RA4
7	RA3
8	RA2
9	RA1
10	RA0



**MECHANICAL DIMENSIONS:**





## **AVAILABLE DEMO SOFTWARE:**

- Blinking LED for PIC16F877 demo code ([C source](#) and [HEX](#))
- Button read for PIC16F877 demo code ([C source](#) and [HEX](#))
- RS232 send / receive for PIC16F877 demo code ([C source](#) and [HEX](#))
- LCD display write for PIC16F877 demo code ([C source](#) and [HEX](#))

## **ORDER CODE:**

**PIC-MT-USB** - completely assembled and tested.

How to order?

You can order to us directly or by any of our distributors.

Check our web [www.olimex.com/dev](http://www.olimex.com/dev) for more info.

## **Revision history:**

Rev. A - create November 2007

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