Version 2 PICmicro microcontroller development board

The World's most advanced solution for learning and programming PICmicro microcontrollers
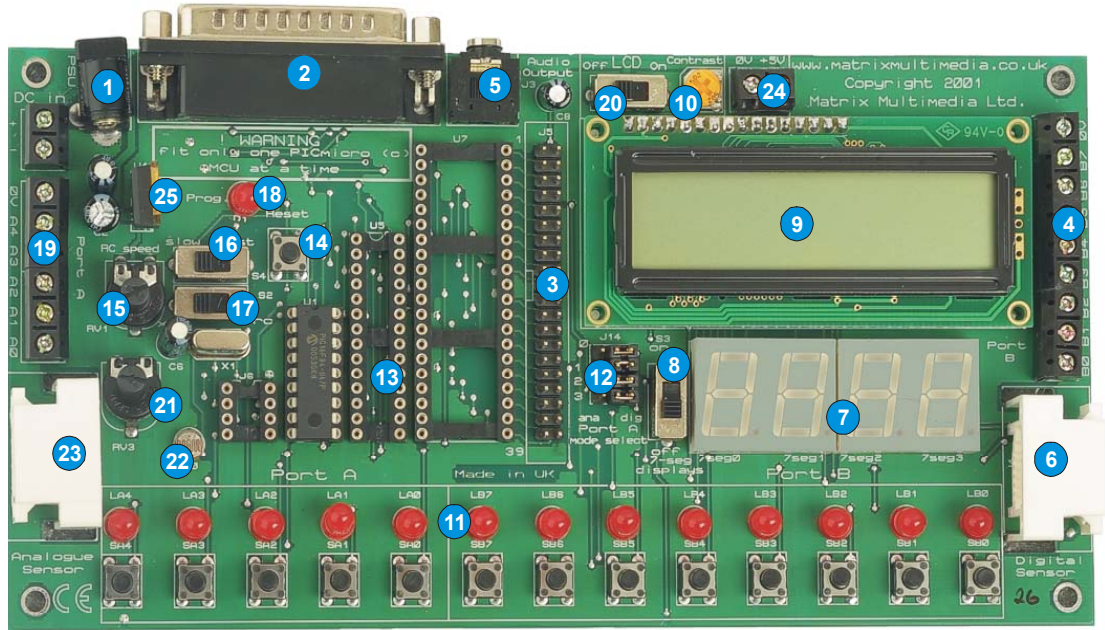

PPP programming utility

Sampler CD ROM

1 Power connector - unregulated 12V supply via PSU jack (positive outer) or 2 terminal screw connector
2 25 way D-type - connects board to PC parallel port via standard 25 way cable
3 Expansion bus - 40 way expansion bus suitable for IDC cable connection
4 Port B I/O - connections for all port B PICmicro I/O
5 Audio output - connects via coupling capacitor to port A0 for simple tone generation
6 Digital external sensor - connects to selected Port A pins for use with Vernier motion/distance detector and light gate
7 Quad 7-segment display - dual 7- seg. displays in 2 banks
8 7-segment display switch - switches power to 7-segment displays.
9 LCD display - 2 line 16 character quasi-intelligent alphanumeric display which is programmed via 4 serial pins on port B of the PICmicro
10 LCD contrast potentiometer - controls contrast on LCD display
11 Port A/B switches and indicators - Individual switches connect +5V to port A/B inputs. Indicators show status when I/O pins are configured as outputs
12 Port A analogue/digital selection jumpers.
13 PICmicro turned pin DIL sockets - DIL sockets for 8, 18, 28 and 40 pin PICmicros - caution: fit only one PICmicro at one time. PIC16F84 fitted as standard. Note that if you are frequently changing the PICmicro device you are using it would be wise to fit additional turned pin sockets / a ZIF socket to the board to preserve the life of your sockets and your PICmicros.
14 Reset switch - resets PICmicro MCU
15 RC clock speed potentiometer - varies clock speed when RC switch is selected
16 RC clock speed switch - controls clock speed (fast or slow) when RC switch is selected
17 Clock crystal / RC switch - controls whether the board runs off a 3.2768MHz crystal or from an on-board RC circuit.
18 Program indicator light - indicates when PICmicro is being programmed.
19 Port A I/O - connections for all port A PICmicro input and outputs
20 LCD display switch - switches power to LCD display.
21 Potentiometer - part of the sensors system - simulates a varying analogue voltage on port A1 for testing code during program development.
22 Light sensor - part of sensors system - on-board light sensor
23 External analogue sensor - allows connection of one of a range of analogue sensors from temperature sensors to heart rate monitors.
24 5V output connector
25 5V regulator.

This flexible development board allows you to learn both how to program PICmicro microcontrollers as well as program a range of 8, 18, 28, and 40 pin devices. All programming software is included in the PPP utility.

- Makes it easier to teach and learn PICmicro programming
- Designed for educational use
- 3 CD ROM based resources in assembly, C, and flow chart programming are available – cut down versions included on sampler CD ROM
- Free download software, PPP, provides seamless send and verify functions

Makes it easier to develop PICmicro projects
- Supports low cost Flash-programmable PICmicro devices
- Fully featured displays - 13 individual LEDs, quad 7-segment display and LCD display
- Supports PICmicro microcontrollers with A/D converters
- On-board sensors
- A comprehensive range of external analogue and digital sensors are available for project work
- Fully protected expansion bus for project work

You can plug in a range of additional sensors into the board like this motion sensor
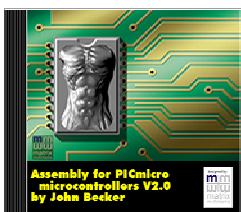
Three CD ROMs with tutorials and software are available:

C for PICmicro microcontrollers V2.0

Flowcode for PICmicro microcontrollers

Assembly for PICmicro microcontrollers V2.0

General description

The PICmicro development board is designed primarily for learning how to program PICmicro applications. It also allows a wide range of PICmicro microcontrollers to be programmed and the 'seamless' nature of the programming software supplied with the product (the PICmicro Parallel Programmer or simply 'PPP') makes it suitable for the development of a range of PICmicro projects.

The board is optimised for use with a PIC16F84 from Arizona Microchip which has a number of features:

- Crystal or RC operation
- 2 ports: Port A - 5 pins and Port B - 8 pins. i.e.: 13 programmable pins which can all be used as inputs and outputs.
- Flash programmable - up to 1,000,000 programming cycles

Whilst the 16F84 has no analogue capability and is not the most functional PICmicro available it has been selected as the standard device shipped with this this development board for a number of reasons:

- It is a low cost device - suitable for project work in schools
- It has been widely used in third party projects and there is a wide body of code available for it
- It has a relatively simple internal topology
- It is electrically re-programmable

A full list of other PICmicros that the board can support is listed below.

The board has been designed to allow those with little or no experience of embedded microcontroller programming to be able to produce highly functional designs in as short a time as possible. With this in mind we have included switches on each input/output pin, a quad 7-segment display, a 2 line 16 character alphanumeric display, a choice of crystal or RC oscillator, simple on-board analogue sensor (light) and sensor simulator (potentiometer) and the ability to interface the board to a host of external sensors including motion, temperature, pH. humidity etc.

Full tutorials in programming the PIC16F84 in both assembly code and in C are available. These sets of tutorials are available on CD ROM and require no other software - all compilers and development environments are included on the CDs themselves. A sampler CD ROM is included with the board that allows you to create and download code using Assembly language, C language or Flowcharts. Each program is a cut down version of the appropriate CD but they all allow you to get started with your chosen programming language.

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Alex animated head can be programmed using the development board and the actuators panel

The Version 2 development board is shipped with a simple test routine for the PIC16F84. The factory test routine is carried out using a larger device - the PIC16F870. This test routine is much more comprehensive and incorporates assembly code that tests the on-board displays, the A/D converter, the sensor inputs, all switches and LEDs etc.

The factory test routine can be downloaded from the downloads section of our web site.

The PICmicro Parallel Programmer [PPP] allows an assembled program to be sent to virtually any PICmicro microcontroller on the PICmicro development board. Both raw OBJ files generated by TASM, and ASCII-encoded HEX files generated by MPASM can be sent using PPP. PPP uses a simple user interface which is explained in the accompanying help file. PPP is supplied free with the development board. Features include:

- Operates with the latest parallel port standards
- HEX and OBJ file compatible
- Range of Xtal and RC operation modes
- Reads content of any non-protected PICmicro
- Confirms each byte of code sent
- Bit selection on configuration word available for advanced users

Minimum requirements

Pentium 100MHz, Parallel printer port, 1 Megabyte of hard drive space, 16Megabytes of RAM, Windows 95/98/ME/NT/2000/XP
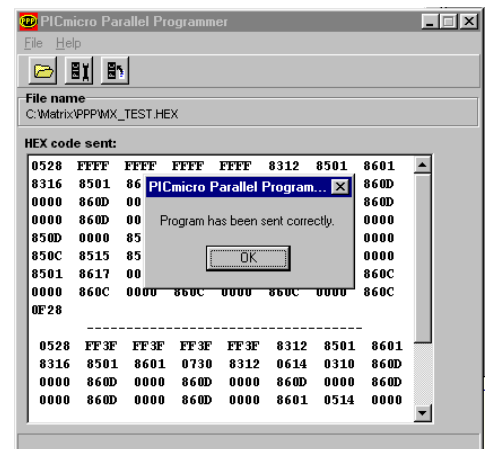
Supported devices

Currently PPP and the development board support the following devices:

PIC12C671, PIC12C672, PIC12CE673, PIC12CE674, PIC16C61, PIC16CR83, 16F83, PIC16CR84, 16F84, 16F84A, PIC16C620, PIC16C620A, PIC16CR620A, PIC16C621, PIC16C621A, PIC16C622, PIC16C622A, PIC16CE623, PIC16CE624, PIC16CE625, PIC16C627, PIC16C628, PIC16C710, PIC16C711, PIC16C71, PIC16C712, PIC16C716, PIC16C62, PIC16C62A, PIC16C62B, PIC16CR62, PIC16C63, PIC16CR63, PIC16C63A, PIC16C66, PIC16C72, PIC16C72A, PIC16CR72, PIC16C73, PIC16C73A, PIC16C73B, PIC16C76, PIC16C745, PIC16C773, 16F870, 16F872, 16F873, 16F876, PIC16C64, PIC16CR64, PIC16C64A, PIC16C65, PIC16C65A, PIC16C65B, PIC16CR65, PIC16C67, PIC16C74, PIC16C74A, PIC16C74B, PIC16C77, PIC16C765, PIC16C774, PIC 16F871, PIC16F874, PIC16F877
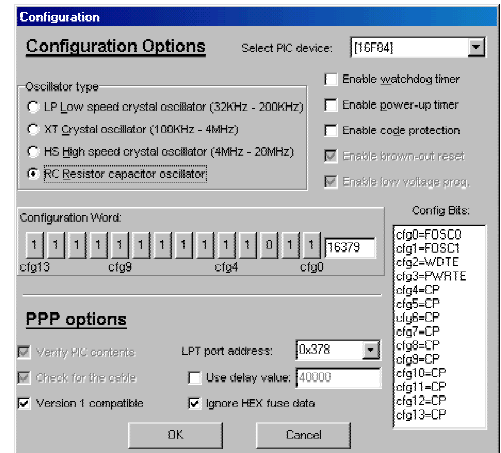
PPP configuration screen

PPP programming screen