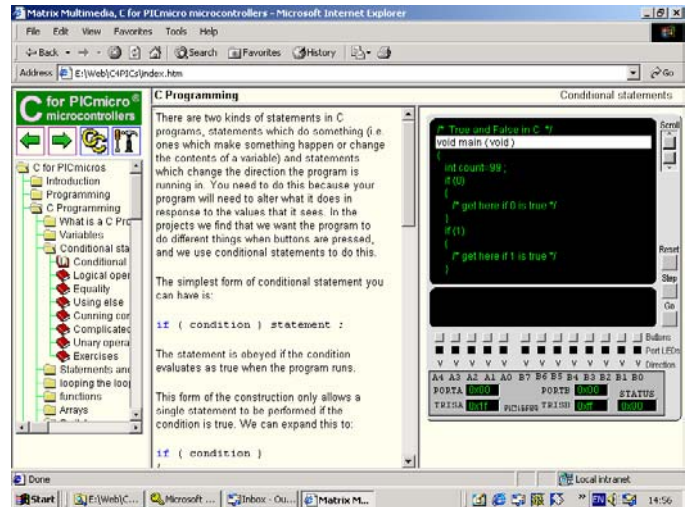
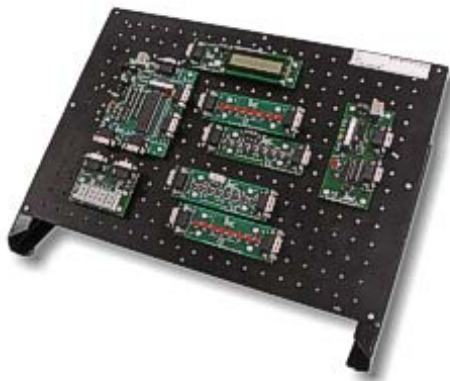


The C for PICmicro® microcontrollers CD ROM is designed for students and professionals who need to learn how to program embedded microcontrollers in C. The CD contains a course as well as all the software tools needed to create Hex code for a wide range of PICmicro devices - including SourceBoost, a full C compiler and an Integrated Development Environment (IDE).

Although the course focuses on the use of the PICmicro microcontrollers this CD ROM will provide a good grounding in C programming for any microcontroller. The C compiler on this product is not licensed for industrial use.



Screen image shows Virtual C PICmicro

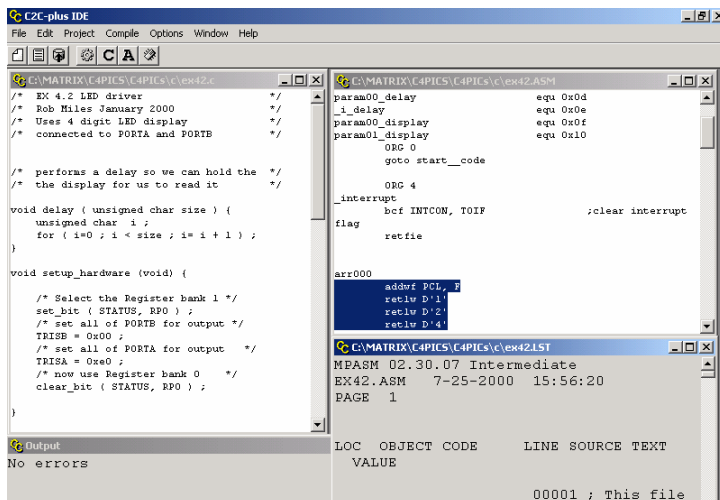


C for PICmicro microcontrollers can be used with E-Blocks

- Complete course in C as well as C programming for PICmicro microcontrollers
- Highly interactive course
- Virtual C PICmicro improves understanding
- Includes a C compiler for a wide range of PICmicro devices
- Includes full Integrated Development Environment
- Includes MPLAB software
- Compatible with most PICmicro programmers

What's new in version 3?

- This second version differs from version 2.0 in three significant ways:
- The C compiler for V3.0 covers an even greater range of PICmicro devices than in V2.0 - see table below.
 - V3.0 includes a tutorial on working with Analogue inputs.
 - V3.0 includes the updated and improved SourceBoost IDE – successor to C2C IDE.
 - Includes PPP V3
 - Includes support for E-Blocks



Screen image shows IDE and C compiler

The following pages give further information:

A complete solution for learning and teaching C programming for PICmicro microcontrollers



See our web site for a range of sensors that work with this product.

“I was very impressed with the Assembly for PICmicros CD ROM (AKA PICtutor) and have no hesitation in recommending it as a powerful method of delivering the PIC programming element of the A level electronics course. C for PICmicro MCUs is the perfect companion.”

John Verrill
Electronics teacher & examiner
Whitby Community College,
UK

The contents of the course on the CD ROM are as follows:

Introduction

About the course, Navigation, What is a PICmicro?, the Virtual C PICmicro, MPLAB, C2C IDE

Programming

Conventional programs, Embedded programs, High and low level, Low level PICmicro, Getting you programs into a compiler, writing our programs.

What is a C program?

Introduction, Comments, The main function header, The main function body, The end of the line, Exercises,

Variables

Introduction, Types, Floating point, Characters, Integers, Choosing variables, Identifiers, Declarative Multiple declarations, Initialization, Names, Assigning statements, Expressions, Operators and Operands, Constant operands, Operators and divide, Working on bits, Shifting bits, Shortcut operators, Unary operators, Casting Exercises

Conditional Statements

Introduction, Logical operators, Equality, Using else, Cunning conditions, Complicated conditions, Unary operators in conditions, Exercises.

Statements and Blocks

Introduction, Blocks in Blocks, Global and local variables, Local variable scope, Global variables, Global and local in C2C, Exercises.

Looping the loop

Introduction, While loop, Counting with the while loop, The for loop, Breaking out of loops, Continuing loops, Exercises.

Functions

Introduction, When to use a function, Functions which return values, Functions which accept parameters, Functions which return values, More than one parameter, Exercises.

Arrays

Introduction, The need for arrays, Declaring an array, elements in an array, Sorting array elements, the next dimension, Exercises.

Switches

Introduction, The switch condition, Switches and breaks, Exercises.

Pointers

Introduction, Arrays and pointers, Declaring a pointer, Using a pointer, Comparing a pointer, Null pointers, Functions and pointers, Finding out the size, Strings, Exercises.

Structures

Introduction, Creating structures, How structures work, Pointers in structures, Structures in structures, Exercises.

The pre-processor

Introduction, The #include directive, magic numbers and #define, Conditional compilation, Exercises

Software engineering in C

Introduction, Deciding on specification, Deciding how to test, creating the functions, Using the functions, Making a project, External data, And finally...

PICmicro reference

Introduction, Bits and bytes, Hex and decimal, Ready reckoner, Exercises, The PIC microcontroller PICmicro range, Architecture, Programming the PICmicro, The workign register, File registers, Bank selection, Special function registers, PORTA and PORTB, TRISA and TRISB, Interrupts, Timer, Watchdog, Sleep, EEPROM memory, Development board, Exercises.

Compiling and running programs

Introduction, Compiling your program, assembling your program, downloading your program, C2C functions, C2C project files.

Labs

Lab 1 - Flashing lights, Lab 2 - Switches and torches, Lab 3 Sound software, Lab 4 - LEDs and clocks, Lab 5 - LCDs and libraries, Lab 6 - Mystic LCD, Lab 7 - PICing a lock, Lab 8 - reaction timer, Lab 9 - Inspecting your Morse. Lab 10 – Analogue fun, Resource Lab index, Code toolbox, LCD reference.

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Alex animated head can be programmed from C for PICmicros using the Actuators training panel

This product is shipped with the SourceBoost C2C C compiler. The specification of this is as follows:

The C2C compiler is a general purpose compiler-cum-IDE. It supports the following functions:

Supported features:

- 8-bit and 16-bit variables
- Pointers
- Built in variables
- Arrays
- Arithmetic expressions
- Functions and built in functions
- Interrupts
- Standard C commands
- Libraries and include files supported
- Multiple data types

Built in functions:

clear_wdt, enable_interrupt, disable_interrupt, set_mode, set_option, set_tris_a, set_tris_b, set_tris_c, output_port_a, output_port_b, output_port_c, output_high_port_a, output_high_port_b, output_high_port_c, output_low_port_a, output_low_port_b, output_low_port_c, input_port_a, input_port_b, input_port_c, input_pin_port_a, input_pin_port_b, input_pin_port_c, sleep, nop, set_bit, clear_bit, putchar, getchar, delay_s, delay_ms, delay_us, char_to_bcd, bcd_to_char

Standard C commands:

- if, else, while, for, return, break, continue, extern, switch, case, default;
- goto and labels;
- char, short, int, long, void;
- ~, ++, --, +, -, <, <=, >, >=, ==, !=, =, !, &, |, ^, &=, |=, ^=, &&, ||, *, /, %, <<, >>, <<=, >>=;
- one-dimensional arrays; · const char pointers; · const variables and arrays;
- functions with no/one/many parameters and void/char return type; built-in assembler;
- #include
- #define, #undef
- #ifdef, #ifndef, #else, #endif

Data types

Decimal, Octal, Hexadecimal, Binary, ASCII

The following devices are supported:

IC12c508, PIC12c508a, PIC12c509, PIC12c509a, PIC12ce518, PIC12ce519, PIC12cr509a, PIC12c671, PIC12c672, PIC12ce673, PIC12ce674, PIC12f629, PIC12f675, PIC16c505, PIC16c52, PIC16c54, PIC16c55, PIC16c56, PIC16c57, PIC16c58, PIC16c61, PIC16c62, PIC16c62a, PIC16c62b, PIC16c63, PIC16c63a, PIC16c64, PIC16c64a, PIC16c65, PIC16c65a, PIC16c65b, PIC16c66, PIC16c67, PIC16c62, PIC16c620a, PIC16c621, PIC16c621a, PIC16c622, PIC16c622a, PIC16c641, PIC16c642, PIC16c661, PIC16c662, PIC16c71, PIC16c72, PIC16c72a, PIC16c73, PIC16c73a, PIC16c73b, PIC16c74, PIC16c74a, PIC16c74b, PIC16c76, PIC16c77, PIC16c710, PIC16c711, PIC16c712, PIC16c715, PIC16c716, PIC16c717, PIC16c745, PIC16c765, PIC16c770, PIC16c771, PIC16c773, PIC16c774, PIC16c84, PIC16c923, PIC16c924, PIC16ce623, PIC16ce624, PIC16ce625, PIC16cr54, PIC16cr56, PIC16cr57, PIC16cr58, PIC16cr62, PIC16cr63, PIC16cr64, PIC16cr65, PIC16cr620a, PIC16cr72, PIC16cr83, PIC16cr84, PIC16f627, PIC16f627a, PIC16f628, PIC16f628a, PIC16f648a, PIC16f630, PIC16f676, PIC16f72, PIC16f73, PIC16f74, PIC16f76, PIC16f77, PIC16f737, PIC16f747, PIC16f767, PIC16f777, PIC16f83, PIC16f84, PIC16f84a, PIC16f87, PIC16f88, PIC16f818, PIC16f819, PIC16f870, PIC16f871, PIC16f872, PIC16f873, PIC16f873a, PIC16f874, PIC16f874a, PIC16f876, PIC16f876a, PIC16f877, PIC16f877a

Reviews

This CD-ROM allows the user to fully explore the world of programming using C language. The beauty of this product is that it encourages the user to follow a simple series of instructions which form a complete course in C programming. This area of control applications can be thought of as a potentially difficult subject to be involved with and certainly an area that could hold some reservation from a teaching point of view. Teaching Year 9 pupils and above who are interested in this area of computer control is so much easier when excellent graphics can support the lesson. Pupils today expect to see and use quality media and this is certainly an excellent product. There is a good range of practical examples included for the student to work through. They can see what is happening at each stage of the program and would certainly feel supported by these examples as they write their own.

It would certainly be of value to purchase the optional development boards which have been developed for student use. These boards are available as a standard or a deluxe version but you should know that only the deluxe version is available to educational institutions and would form part of a package with an institutional licence. The deluxe board includes a quad 7-segment display, a quasi-intelligent dual line 16 character alphanumeric LCD display, and a plug top power supply. It is well worth visiting the web site for the company at www.matrixmultimedia.co.uk. The site contains information about this product and the range of similar electronic products made by Matrix Multimedia.

The PICmicro CD-ROM provides the user with all the required information to program the PIC16F84 microcontroller. It enables control and programming of switches into a sequence, for example, or the use of other input devices. Some projects that would interest students include the use of sound by using an electronic organ example and making an electronic reaction timer for the more competitive element! Throughout the descriptions used by Rob Miles in the supporting text, he has really tried to make the stuff interesting. Of necessity, some of the language used is a bit 'techi', but Rob has a writing style which is almost conversational and one which I feel most readers would enjoy.

From a teaching point of view I would recommend the purchase of this product as a stand-alone application. In this way, a few pupils could work with a tutor and make some real progress. I feel that this would offer greater progression than perhaps running it as a networked version to a larger group. If a school had access to a video projector then the needs of a larger group could be more effectively met and the program would have some real impact. There is a lot of potential in this product and I am sure that the project boards, running from the printer port of a PC, would really make the product come alive for the users. All in all, I would heartily endorse this product and have enjoyed my time with it.

Reviewed by David Foster, Head of Technology Faculty, Tibshelf School, Alfreton, UK.