This C compiler, is fully optimised for use with PIC microcontrollers. Built in functions make coding the software very easy. Based on original K&R, the integrated C development environment gives developers a fast method to produce efficient code from an easily maintainable high level language.

**CAPABILITIES**

- Arrays up to 5 subscripts
- Structures and Unions may be nested.
- Custom bit fields (1-8 bits) within structures.
- ENUMerated types,
- CONStant variables, arrays and strings.
- Full function parameter support (any number).
- Some support for C++ reference parameters.

- Integrates with MPLAB and other simulators/emulators for source level debugging.
- Standard Hex file and debug files ensure compatibility with all programmers.
- Formatted Printf allows easy formatting and display in Hex or decimal.
- Efficient function implementation allows call trees deeper than the hardware stack.
- Access to hardware from easy to use C functions, Timers, A/D, E2, SSP, PSP, I2C & more.
- 1,8, and 16 bit types.
- Assembly code may be inserted anywhere in source and may reference C variables.
- Automatic linking handles multiple code pages.
- Inline procedures supported; Linker automatically determines optimum architecture or it can be manually specified.
- Compiler directives determine if tri-state registers are refreshed on every I/O
- Constants (including strings and arrays) are saved in program memory.
- Standard one bit type (Short Int) permits the compiler to generate efficient Bit oriented code.
- #BIT and #BYTE allow C variables to be placed at absolute addresses to map register to C variables.
- Reference parameters may be used to improve code readability and inline procedure efficiency.
- Both an Integrated editor/compiler and a cmd line compiler.
- Special windows show the RAM memory map, C/Assembly listing and the calling tree.
- Interrupt procedures supported on PCM. The compiler generates all startup and cleanup code as well as identifying the correct interrupt procedure to be called.
- Updates via modem for 30 days included.

**STANDARD C FUNCTIONS:**

- IF, ELSE, WHILE, DO, SWITCH, CASE, FOR, RETURN, GOTO, BREAK, CONTINUE

- !, ~, ++, --, *, /, %, +, -, <<, >>, <, <=, >, >=, ==, !=, &^, |, &&, ||, ?:: =, +=, -=, *=, /=, %=, »>>, »>>=, »<<=, &^=, ^=, |=

- TYPEDEF, STATIC, AUTO, CONST, ENUM, STRUCT, UNION
PIC C Compiler

Description
This integrated C development environment gives developers the capability to quickly produce very efficient code from an easily maintainable high level language. The compiler includes built in functions to access the PIC hardware such as READ_ADC to read a value from the A/D converter. Discrete I/O is handled by describing the port characteristics in a PRAGMA. Functions such as INPUT and OUTPUT_HIGH will properly maintain the tri-state registers. Variables including structures may be directly mapped to memory such as I/O ports to best represent the hardware structure in C. The microcontroller clock speed may be specified in a PRAGMA to permit built in functions to delay for a given number of microseconds or milliseconds. Serial I/O functions allow standard functions such as GETC and PRINTF to be used for RS-232 like I/O. The hardware serial transceiver is used for applicable parts when possible. For all other cases a software serial transceiver is generated by the compiler. The standard C operators and the special built in functions are optimised to produce very efficient code for the bit and I/O functions. Functions may be implemented inline or separate. Function parameters are passed in reusable registers. Inline functions with reference parameters are implemented efficiently with no memory overhead. During the linking process the program structure including the call tree is analysed. Functions that call one another frequently are grouped together in the same page. Calls across pages are handled automatically by the tool transparent to the user. Functions may be implemented inline or separate. RAM is allocated efficiently by using the call tree to determine how locations can be re-used. Constant strings and tables are saved in the device ROM. The output hex and debug files are selectable and compatible with popular emulators & programmers including MPLAB for source level debugging. The Professional Package (PCW) provides both compilers in a powerful Windows environment.

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<th>CCS-PCM</th>
<th>CCS-PCW</th>
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<td>12 bit PICs (PIC12C50X &amp; 16C5X)</td>
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Part Numbering and Pricing

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<td>PCM Compiler for PIC16C61-84</td>
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# PIC C Compiler

## Built In Functions

### DELAYS
- DELAY_US
- DELAY_MS
- DELAY_CYCLES

### RS232 I/O
- GETCH
- PUTCHAR
- KBHIT
- ETS
- PUTS
- PRINTF
- GETCHAR
- PUTC

### I2C I/O
- I2C_START
- I2C_STOP
- I2C_WRITE
- I2C_READ
- I2C_POLL

### DISCRETE I/O
- OUTPUT_HIGH
- OUTPUT_FLOAT
- OUTPUT_BIT
- INPUT
- SET_UART_SPEED
- SET_TRIS_x
- OUTPUT_LOW
- PORT_B_PULLUPS

### BIT MANIPULATIONS
- SHIFT_LEFT
- SHIFT_RIGHT
- ROTATE_LEFT
- ROTATE_RIGHT
- BIT_SET
- BIT_CLEAR
- BIT_TEST
- SWAP

### STANDARD C
- MEMCOPY
- MEMSET
- STRCPY
- ISALNUM
- ISALPHA
- ISDIGIT
- ISLOWER
- ISUPPER
- ISSPACE
- ISXDIGIT
- TOUPPER
- TOLOWER
- READ_BANK
- WRITE_BANK
- SETUP_LCD
- LCD_LOAD

### STR
- CHAR STRCAT
- CHAR STRCHR
- CHAR STRCHR

### STRRCHR
- INT STRRCHR

### STRCHR
- CHAR * STRCHR

### STRNCPY
- INT STRNCPY

### STRLEN
- INT STRLEN

### STRCMP
- INT STRCMP

### STRICMP
- INT STRICMP

### STRCSPN
- CHAR * STRCSPN

### STRSPN
- INT STRSPN

### STRCHR
- INT STRCHR

### STRCHR
- CHAR * STRCHR

### STANDARD C
- #PRAGMA
- #DEFINE
- #UNDEF
- #INCLUDE
- #IF
- #IFDEF
- #ELSE
- #ENDIF
- #ERROR
- #NOLIST
- #LIST

### DEVICE SPECIFICATION
- #DEVICE
- #FUSES
- #ID

### FUNCTION QUALIFIER
- #INLINE
- #SEPARATE
- #INT_xxx
- #INT_GLOBAL
- #INT_DEFAULT

### BUILT-IN LIBRARIES
- #USE
- #USE STANDARD_IO
- #USE FAST_IO
- #USE FIXED_IO
- #USE DELAY
- #USE RS232
- #USE I2C
- #MEMORY CONTROL
- #BIT
- #BYTE
- #ASM
- #ENDASM
- #ROM
- #ZERO_RAM
- #RESERVE

### COMPILER CONTROL
- #CASE
- #PRIORITY
- #OPT
- PRE_DEFINED_IDENTIFIER
  - __PCB__
  - __PCM__
  - __DEVICE__
  - __DATE__
  - __PSP__

### TIMERS/COUNTERS
- SETUP_COUNTERS
- GET_RTCC
  - GET_TIMER0
  - GET_TIMER1
  - GET_TIMER2
  - SET_RTCC
  - SET_TIMER0
  - SET_TIMER1
  - SET_TIMER2
  - SETUP_TIMER1
  - SETUP_TIMER2
  - RESTART_WDT
  - CCP
  - SETUP_CCP1
  - SETUP_CCP2
  - SETUP_PWM_DUTY
  - SETUP_COMPARATOR
  - VREF
  - SETUP_VREF
  - INTERNAL_EEPROM
  - READ_EEPROM
  - WRITE_EEPROM
  - A/D INPUT
  - SETUP_PORT_A
  - SETUP_ADC
  - SET_ADC_CHANNEL
  - READ_ADC

### PROCESSOR CONTROL
- ENABLE_INTERRUPTS
- DISABLE_INTERRUPTS
- EXT_INT_EDGE
- PSP_PARALLEL_I/O
- PSP_OUTPUT_FULL
- PSP_INPUT_FULL
- PSP_OVERFLOW
- SETUP_PSP
- SPI 2 WIRE I/O
- SETUP_SPI
- SPI_DATA_IS_IN
- SPI_WRITE
- SPI_READ
- PROCESSOR_CONTROL
- SLEEP
- RESTART_CAUSE
Example Program

```c
// This program interfaces to a stepper motor.  The program will use the RS-232 interface to either control the motor with an analog input, a switch input or by RS-232 command.  

#include <16C71.H>
#define FOUR_PHASE TRUE

byte const POSITIONS[4] = {0b0101, 0b1001, 0b0110};
#else
byte const POSITIONS[8] = {0b0101, 0b0001, 0b1001, 0b1000, 0b1010, 0b0010, 0b0110, 0b0100};
#endif

drive_stepper(byte speed, char dir, byte steps) {
    static byte stepper_state = 0;
    byte i;
    for(i=0;i<80)
        drive_stepper(128-(value-128), 'F', 8);
    delay_ms(100);
}

use_switch(byte speed, char dir) {
    byte steps;
    printf("Steps per press: ");
    steps = gethex();
    while(true) {
        while(input(pin_13)) ;
        drive_stepper(speed,dir,steps);
        while(!input(pin_13)) ;
    }
}

delay_ms(100);

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