

INTRODUCING: Microchip's CCP/ECCP/PWM Solutions

Feature Description:

A Capture/Compare/PWM (CCP) module works in association with timers (a 16-bit timer and an 8-bit timer) to automate several essential timing functions including a 16-bit precision period measurement (Capture), a 16-bit precision pulse generation (Compare), and a periodic pulse generation with 10-bit precision duty cycle control (PWM).

The Enhanced/Capture/Compare/PWM (ECCP) module extends the PWM functionality to include the ability to control 4

output signals optimally sequenced to operate dual MOSFET and quad H Bridge MOSFET driver circuits common in motor control, inverters and other power electronic applications.

A Digital-to-Analog conversion can be obtained by using the PWM capability in conjunction with a simple external low pass filter.

Differentiating Features

Features	Benefits	Results
High resolution PWM	Avoids annoying noise generation	Quiet motor control applications
Accurate dead band control (ECCP)	Optimized performance when using low cost MOSFET power devices	Safer operation; reduced development cost
Fault Detect inputs (ECCP) for Motor Control Applications	Protection and automatic shutdown when an over-current condition is detected	Reduced components = reduced cost
Double buffered duty cycle control	Problem-free output when duty cycle values are changed mid-period (asynchronous)	Superior performance
Flexible Pre and Post Scaling mechanism	Allows for optimal clock selection and base period generation	Greater flexibility
Selectable interrupt decimation	Low CPU overhead	Greater flexibility

Problem/Solution – Questions to ask your customers

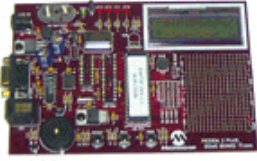
Problem/Question	Solution
Do you need 10-bit D/A conversion?	The CCP can be used in PWM mode with a low pass filter
Does your application require power supply switching control?	The CCP/ECCP can drive a buck/boost circuit
Do you want to utilize a MOSFET totem pole configuration drive?	Use an ECCP for accurate dead band control
Do you need an H-Bridge configuration drive?	Use ECCP quadruple Complementary outputs
Does your application use high resolution pulse length measurement?	Use CCP/ECCP 16-bit Capture mode
Do you need high resolution pulse generation?	Use CCP/ECCP 16-bit Compare mode
Do you need PWM generation with period length not (power of 2) multiple of clock frequency?	CCP/ECCP's associated 8-bit timer pre/post scaler and a Period Register can be used to generate multiple clocks

Target Applications

Industrial	Consumer	Medical	Automotive	Appliance
Motor Control	Motor Control	D/A Conversion	Motor Control	Motor Control
D/A Conversion	Uninterruptible Power Supplies	Stepper Motor Micro-stepping	D/A Conversion	Light Dimming
Pulse Measurement	Power Supplies	Power Supplies	Fan Control	Heater Control
Power Supplies	Voice/Sound/Alarms			Fan Control
Stepper Motor Micro-stepping				
Fan Control				

Selected Development Tools

PICDEM 2 Plus



The PICDEM 2 Plus is a simple board that demonstrates the capabilities of the 18-, 28- and 40-pin PIC16XXXX and PIC18XXXX devices. It can be used stand-alone with a programmed part, with an in-circuit emulator (e.g., MPLAB[®] ICE) or with an in-circuit debugger, MPLAB ICD 2.

Features

- An active program loaded on the installed PIC18F452
- 2x16 LCD
- A PIC16F877 with its own demonstration program
- Generous prototyping area
- 2 x 16 LCD display
- Piezo sounder driven by PWM signal
- Active RS-232 port
- On-board temperature sensor
- 4 LEDs, 2 push button switches and master reset
- Sample PIC18F452 and PIC16F877 Flash microcontrollers
- MPLAB[®] ICD 2 connector
- Source code for all programs
- Works off of a 9V battery or DC power pack

List of Products

Many PIC[®] microcontrollers in the PIC16 and PIC18 families offer these peripherals.

Microchip also offers a stand-alone PWM controller, the MCP1630.

Visit www.microchip.com/can for up-to-date information on all products and resources.

Resources

Design Center: www.microchip.com/motor

Motor Control Solutions Brochure (DS00896)

PICmicro[®] microcontroller CCP and ECCP Tips 'n Tricks (DS41214)

PICmicro[®] microcontroller Comparator Tips 'n Tricks (DS41215)

PICmicro[®] microcontroller DC Motor Tips 'n Tricks (DS41233)

Application Notes:

- AN538 Using PWM to Generate Analog Output
- AN539 Frequency and Resolution Options for PWM Outputs
- AN545 Using the Capture Module
- AN564 Using the PWM
- AN594 Using the CCP Modules
- AN600 Air Flow Control Using Fuzzy Logic
- AN655 /A Conversion Using PWM and R-2R Ladders to Generate Sine and DTMF Waveforms
- AN701 Switch Mode Battery Eliminator Based on a PIC16C72A
- AN786 Considerations for Driving Power MOSFETs in High-Current, Switch Mode Regulators
- AN899 Brushless DC Motor Control Using PIC18FXX31
- AN900 Controlling 3-Phase AC Induction Motors Using the PIC18FXX31
- AN970 Using the PIC18F2431 for Sensorless BLDC Motor Control

Web Seminars – Archived:

- AC Induction Motor Control using the PIC18FXX31
- Brushless DC Motor Control using the PIC18FXX31

Demonstration Boards:

- PICDEM[™] 2 Plus (DM163022)
- PICkit[™] 1 (DV164101)
- PICDEM MC Development Board (DM183011)
- PICDEM MC LV Development Board (DM183021)
- Free Motor Control Graphical User Interface (MC-GUI) found on the Motor Control Design Center



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