



## Low-Cost Development Tools Guide

For use with Analog and Interface Products, Microcontrollers, Digital Signal Controllers, Memory, KEELoq® and Wireless Products

Microchip offers a wide range of development tools – all designed to help you achieve faster time to market. For a complete listing of Microchip products, users guides, data sheets and technical information, visit our web site at: [www.microchip.com](http://www.microchip.com)

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#### Getting Started

All Products ..... 1

#### Analog and Memory Products

Linear Products ..... 2  
 Interface Products ..... 3  
 Mixed Signal Products ..... 4  
 Power Management Products ..... 5  
 Thermal Management Products ..... 9  
 Blank and Other Eval PCBs .....10  
 Analog Software Tools.....10

#### Wireless Products

Infrared Products (IrDA) .....11  
 Radio Frequency Products (RF).....11

#### PIC® MCU and dsPIC® DSC Products

Standard Demo Boards.....12  
 Communication and Display Products ..15  
 Programmers .....16  
 Software Tools .....16  
 Application Software and Libraries .....17

### GETTING STARTED All Products

#### PIC32 Starter Kit

Part Number: DM320001



The fully integrated PIC32 Starter Kit features simple installation, getting started tutorial and PIC32 Starter Kit board with easy USB connection to your PC. The starter kit includes: MPLAB® IDE and MPLAB C32 C Compiler (Student Edition), PIC32 Starter Kit board with integrated debugger, code examples, full documentation, tutorials and sample projects.

#### Explorer 16 Starter Kit

Part Number: DV164033



A complete set of tools for application development using the PIC24F, PIC24H and dsPIC33F 16-bit families. The kit includes MPLAB ICD 2, Explorer 16 Development Board, 9V universal power supply, serial cable and both a PIC24FJ128GA010 and dsPIC33F256GP710 PIM. Tutorials, user manuals, MPLAB IDE and MPLAB C30 C Compiler (student edition) are included.

#### PICKit™ 2 Starter Kit

Part Number: DV164120



PICKit 2 is small, easy-to-use starter kit that enables users to start writing code and programming with PIC® MCUs. Features full-speed USB support and firmware upgradeability in a low-cost tool. Includes a low pin-count demo board. Upgrade firmware for debugger function.

#### SEEVAL® 32 Serial EEPROM Eval Kit

Part Number: DV243002



An evaluation and programming system supporting all Microchip Serial EEPROMS. Using a ZIF socket, standard DIP packages are directly supported. The SEEVAL 32 kit gives the designer the ability to read, write or erase any byte, page or the entire array, and to display, save or load this data as a file. The SEEVAL 32 kit provides support for Windows® XP, Windows ME, Windows 2000, Windows NT® 4.0 and Windows 95/98.

## ANALOG AND MEMORY PRODUCTS Linear Products

### MCP6XXX Amplifier Eval Board 1



Part Number: MCP6XXEVAL-AMP1

This board is designed to support voltage followers, inverting/non-inverting amplifiers, comparators and differentiators.



### MCP6XXX Amplifier Eval Board 2



Part Number: MCP6XXEVAL-AMP2

This amplifier evaluation board supports inverting/non-inverting summing amplifiers.



### MCP6XXX Amplifier Eval Board 3



Part Number: MCP6XXEVAL-AMP3

This board is designed to support the difference amplifier circuits which are generated by the Minda™ Amplifier Designer.



### MCP6XXX Amplifier Eval Board 4



Part Number: MCP6XXEVAL-AMP4

The MCP6XXX Amplifier Evaluation Board 4 is designed to support the inverting integrator circuit.



Minda™ Amplifier Designer can be used to design, simulate and validate op amp circuits.

### MCP6271 Active Filter Eval Kit



Part Number: MCP6XXDM-FLTR

This kit supports active filters designed by FilterLab® V2.0. These filters are all pole and are built by cascading first and second order sections. The kit includes: one PCB designed to provide mid-supply biasing to the other printed circuit boards, four PCBs that support active filter designs with filter order between  $n = 1$  and 8 (output test point for lab equipment provided) and op amps, zero ohm jumpers, resistors and capacitors that can be used to help build filters.

### MCP6S22 PGA PICtail™ Demo Board



Part Number: MCP6S22DM-PICTL

This board evaluates/demonstrates Microchip's MCP6S21/2/6/8 Programmable Gain Amplifier (PGA) family. Interface this board with the PICkit 1 Flash Starter Kit to demonstrate firmware integration between the PIC MCU and PGA devices, while allowing modification and development of firmware for specific requirements.

### MCP6S2X PGA Eval Board



Part Number: MCP6S2XEV

This board provides a versatile selection of input channels and gains to evaluate device performance and supports multiple input signal sources. Two devices can be cascaded to produce gain to 1024 V/V.

### MCP6SX2 PGA Photodiode PICtail™ Demo Board



Part Number: MCP6SX2DM-PCTLPD

Opens possibilities to process other sensor signals. Increases the number of PIC MCU I/O pins available for other purposes. Features a PNZ334 photo-diode, MCP6001U op amp and MCP6S22 and MCP6S92 Programmable Gain Amplifiers (PGA).

### MCP6SX2 PGA Thermistor PICtail™ Demo Board



Part Number: MCP6SX2DM-PCTLTH

Features MCP6S22 and MCP6S92 PGAs. Helps overcome non-linear response of the on-board NTC thermistor. Opens possibilities of temperature-correcting another sensor, and increasing the number of PIC MCU I/O pins available for other purposes.

### Humidity Sensor PICtail™ Demo Board



Part Number: PIC16F690DM-PCTLHS

This board supports the capacitive humidity sensor application note AN1016. It measures the capacitance of a relative humidity sensor plugged into the board. The on-board microcontroller sends the measured and calculated relative humidity (RH) to a PC for display. The board can also measure small capacitors in different ranges of values using a dual slope integration method.

## Interface Products

### PICKit™ Serial I<sup>2</sup>C™ Demo Board

Part Number: PKSERIAL-I2C1



This board was designed to easily connect to the PICKit Serial Analyzer (DV164122).

The serial analyzer provides the I<sup>2</sup>C master mode serial communications and power for the PICKit Serial I<sup>2</sup>C demo board. The devices on the demo board operate in the I<sup>2</sup>C slave mode and can easily be connected to virtually any demo or development board by connecting the communications lines to connector P1.

### PICKit™ Serial SPI Demo Board

Part Number: PKSERIAL-SPI1



This demo board was designed to easily connect to the PICKit Serial Analyzer

(DV164122). The serial analyzer provides the SPI master mode serial communications and power for the PICKit Serial SPI demo board. The devices on the demo board operate in the SPI slave mode and can easily be connected to virtually any demo or development board by connecting the communications lines to connector P1.

### GPIO Expander Keypad and LCD Demo Board

Part Number: GPIODM-KPLCD



The GPIO Expander Keypad and LCD Demo Board is designed to demonstrate the use of the MCP23S08/17 (SPI interface) and the MCP23008/17 (I<sup>2</sup>C interface) devices in a keypad and LCD example. The MCP23X17 (16-bit) devices interface to a 2x16 LCD module and the MCP23X08 (8-bit) devices interface to a 4x4 keyed matrix.

### MCP212X Developer's Daughter Board

Part Number: MCP212XEV-DB



Evaluates and demonstrates the MCP2122 or MCP2120 IrDA® Standard Encoder/Decoder devices. A header allows the MCP212X daughter board to be easily jumpered into systems for development purposes. This board also interfaces with these new low-cost PIC MCU

demo boards: PICDEM™ HPC Explorer, PICDEM FS USB and PICDEM LCD demo board.

### MCP215X/40 Developer's Daughter Board

Part Number: MCP215X/40EV-DB



Used to evaluate and demonstrate the MCP2150, MCP2155 or the MCP2140 IrDA Standard Protocol Handler with Encoder/Decoder devices. Headers allow the MCP215X/40 Developer's daughter board to be easily jumpered into systems for development

purposes. This board also interfaces with these new low-cost PIC MCU demo boards: PICDEM HPC Explorer, PICDEM FS USB and PICDEM LCD demo board.

### MCP23X08 8-bit GPIO Expander Eval Board

Part Number: MCP23X08EV



Demonstrates simple input/output functionality of the MCP23008 (I<sup>2</sup>C interface) and the MCP23S08 (SPI interface). The system demonstrates the simplicity of monitoring four inputs and applying the level to associated outputs.

### MCP23X17 16-bit GPIO Expander Eval Board

Part Number: MCP23X17EV



This board demonstrates the simple input/output functionality of the MCP23017 (I<sup>2</sup>C interface) and the MCP23S17 (SPI interface).

The system demonstrates the simplicity of monitoring four pins configured as inputs and applying a predetermined pattern on LEDs connected to the remaining 12 pins configured as outputs.

### MCP250XX CAN I/O Expander Developer's Kit

Part Number: DV250501



Supporting CAN V2.0B active with bus rates up to 1 Mb/s, this kit includes everything needed to demonstrate, design, develop and configure a CAN node using the MCP250XX CAN I/O Expander family of products.

### MCP2510/2515 CAN Developer's Kit

Part Number: DV251001



This developer's kit offers a unique combination of a software development tool and a CAN message/communication tool. This kit helps speed up software development and enable introduction of CAN to those who are unfamiliar with the protocol.

### MCP2515 CAN Controller PICtail™ Demo Board

Part Number: MCP2515DM-PCTL



This demo board implements a simple CAN bus using two nodes. One using the MCP2515 stand alone CAN controller and the other using the MCP25020 CAN I/O Expander. Each node utilizes one input (push button) and one

output (LED). The boards demonstrate a simple, inexpensive implementation of a CAN bus.



## Mixed Signal Products

### MCP3421 Battery Fuel Gauge Demo Board



Part Number: MCP3421DM-BFG



This board is used to demonstrate the MCP3421 18-bit delta-sigma ADC for battery fuel gauging applications. It includes two MCP3421 devices, MCP73831 (single cell Li-Ion/Li-Polymer Charger) and PIC18F4550 MCU. The board measures: (1) the battery voltage and (2) the current coming out from the battery in the discharging mode and into the battery in the charging mode using the ADC device (if charging mode is enabled (optional)). It calculates the total fuel used and also remaining fuels.

### MCP2030 Bidirectional Communications Demo Kit



Part Number: MCP2030DM-TPR



This kit demonstrates short range bidirectional communication applications using the features of the MCP2030. The kit consists of two units: a base station unit and a transponder unit. The features and concepts demonstrated by the demo kit can be used for low frequency (LF) sensing and various hands-free access control security applications.

### MCP3421 SOT-23-6 Eval Board



Part Number: MCP3421EV



This eval board is designed to make handling of the MCP3421 in a tiny SOT-23-6 package easier. The board contains only the MCP3421, I<sup>2</sup>C loading resistors, V<sub>DD</sub> decoupling capacitors and corresponding pins of the MCP3421 device, allowing an easy method to connect to the target board for evaluation.

### MCP4725 SOT-23-6 Eval Board



Part Number: MCP4725EV



This board is designed to make handling of the MCP4725 in a tiny SOT-23-6 package easier. The board contains only the MCP4725, I<sup>2</sup>C loading resistors, V<sub>DD</sub> decoupling capacitors and corresponding pins of the MCP4725 device, allowing an easy method to connect to the target board for evaluation.

### MCP3221 12-bit A/D PICtail™ Demo Board



Part Number: MCP3221DM-PCTL

Designed to demonstrate the MCP3221 device using DataView Windows software for a graphical real-time data analysis from the board through USB. This demo board can also be used for firmware development to the MCP3221 device using the PICkit 1 Flash Starter Kit.

### MCP355X Tiny Application Sensor Demo Board



Part Number: MCP355XDM-TAS

This 1" x 1" board is designed to demonstrate the performance of the MCP3550/1/3 devices in a simple low-cost application. The circuit uses a ratiometric sensor configuration and uses the system power supply as the voltage reference.

### MCP355X Sensor Applications Developer's Board



Part Number: MCP355XDV-MS1

This board allows for easy design of high resolution systems such as weigh scale, temperature sensing or other small signal systems requiring precise signal conditioning circuits. The reference design includes LCD display firmware that performs all the necessary functions including ADC sampling, USB communication for PC data analysis, LCD display output, zero cancellation, full scale calibration and units display in gram (g), kilogram (kg) or ADC output units.

### MCP3551 Delta-Sigma ADC Demo Board



Part Number: MCP3551DM-PCTL

Designed to demonstrate the MCP3551 device's 22-bit Delta-Sigma Analog-to-Digital Converter (ADC) performance using DataView software installed on a PC. This demo board can be used with MPLAB ICD 2, PICkit 1 Flash Starter Kit or PICkit 2 for developing demonstration/evaluation firmware.

### MCP3905 Energy Meter Eval Board



Part Number: MCP3905EV

This evaluation board is designed to test out a variety of energy meter designs. On the input side high-voltage line and load AC-plug headers are included, along with mounting holes for shunts, current transformers and screw-type connections for wiring. On the output side a large prototype area is included along with optical isolation and a standard PICtail header for experiments with a variety of PIC MCU-based energy meter designs.

### MCP3905 Energy Meter Reference Design



Part Number: MCP3905RD-PM1

A stand-alone low-cost energy meter that can act as either a stand alone energy meter, or as the analog front end design for LCD MCU-based meters. This design is specified with an energy measurement error of 0.1% typical across 1:500 dynamic range for high accurate energy meter designs and is compliant with EMC requirements per energy metering standards IEC62053 and legacy IEC61036, IEC1046 and IEC687.

### MCP4XXX Digital Potentiometer Daughter Board



Part Number: MCP4XXXDM-DB

This board allows evaluation of the MCP42XXX and MCP402X Digital Potentiometers. The MCP42XXX are dual digital potentiometer devices that have the same characteristics as the single digital potentiometer devices (MCP41XXX).

The MCP402X devices are non-volatile and have similar characteristics to their volatile memory versions (MCP401X). The board supports two MCP42XXX devices to allow the resistor networks to be “stacked” and form a programmable windowed digital potentiometer. The board also has a voltage doubler device (TC1240A), which can be used to show the WiperLock™ Technology feature of the MCP4021.

### MCP402X Non-Volatile Digital Potentiometer Eval Board



Part Number: MCP402XEV

This low-cost board enables user's to exercise all of the features of the MCP401X and MCP402X devices. Kit includes one populated and one unpopulated PCB. The populated board has an MCP4021-103E/SN digital potentiometer

configured as a “windowed” potentiometer using a 2.5 kΩ pull-up and a 2.5 kΩ pull-down resistor. The PCB supports the 8-pin SOIC, SOT-23-6 and SOT-23-5 package variations. The unpopulated PCB allows user's to build the exact combination of components their application requires.

### Mixed-Signal PICtail™ Demo Board



Part Number: MXSIGDM

Quickly and accurately evaluates performance of Microchip DACs, A/D converters, LDOs, VREFs and operational amplifiers. Interfaces

to the PICkit 1 Flash Starter Kit. Can use with a PIC16F767 for stand-alone operation. Supports many Microchip mixed-signal devices (surface mount footprint).

## Power Management Products

### MCP1602 Eval Board



Part Number: MCP1602EV



The MCP1602 eval board demonstrates the features and capabilities of the MCP1602 500 mA PFM/PWM Synchronous buck regulator. The MCP1602 is a step-down (Buck) switching regulator with a power-good monitor to provide a highly integrated solution for systems that require supply voltage between 0.8V to 4.5V from a 2.7V to 5.5V input. The board includes a MCP1602 circuit that has a Shutdown feature and a 4-position dip switch to select between different output voltages.

### MCP1603 Buck Converter Eval Board



Part Number: MCP1603EV



The Buck Converter eval board uses a MCP1603 device in a step-down application. The evaluation board is a fully functional platform to evaluate the MCP1603 buck regulator over its entire input voltage, output voltage and current range.

### MCP1630 Boost Mode LED Driver Demo Board



Part Number: MCP1630DM-LED2



This demo board is a step-up, switch-mode, DC-DC converter used for power LED applications. The demo board provides a 350 mA or 700 mA constant current source with a jumper selection. The input operating voltage range is 9-16VDC and the board can supply up to 30W to a string of power LEDs.

### MCP1630 Low-Cost NiMH Battery Charger Ref Design



Part Number: MCP1630RD-NMC1



This reference design board is pre-programmed to charge 3 NiMH cells. The charge profile and number of batteries can be changed with firmware. The design uses the MCP1630 high-speed analog PWM combined with the PIC microcontroller.

### MCP1630V Bidirectional 4 Cell Li-Ion Charger Ref Design



Part Number: MCP1630RD-DDBK3



This charger reference design demonstrates the use of a bidirectional buck-boost converter to charge multiple series cell Li-Ion batteries with the presence of an input source (boost) and provide a regulated output voltage when the input source is removed (buck), while evaluating the MCP1630V device.

## MCP1631HV Multi-Chemistry Battery Charger Ref Design



**Part Number: MCP1631RD-MCC1**

This reference design is a complete stand-alone constant current battery charger for NiMH, NiCd or constant current/constant voltage for Li-Ion battery packs. When charging NiMH or NiCd batteries, the reference design is capable of charging one, two, three or four batteries connected in series and one or two series batteries for Li-Ion. This board utilizes the MCP1631HV (high-speed PIC MCU PWM TSSOP-20) and PIC16F883 (28-pin SSOP).

## MCP7381X Low Cost Li-Ion Battery Charger Eval Board



**Part Number: MCP7381XEV**

The MCP7381X Charger evaluation board demonstrates the features and abilities of the MCP73811 and MCP73812 simple, miniature single-cell, fully integrated Li-Ion/Li-polymer charge management controllers. The MCP73811/2 are standalone highly integrated linear Li-Ion battery chargers that employ a Constant Current/Constant Voltage (CCCV) charge algorithm for cost sensitive and space limited applications.

## MCP73837/8 AC/USB Dual Input Battery Charger Eval Board



**Part Number: MCP7383XEV-DIBC**

This battery charger evaluation board demonstrates the features and abilities of the MCP73837 and MCP73838 single-chip linear Li-Ion battery charger with autonomous AC adapter or USB port power source selection.

These stand-alone highly integrated linear battery charger management controllers employ a Constant Current/Constant Voltage (CCCV) charge algorithm with selectable preconditioning and charge termination ratio.

## TC110 Boost Converter Demo Board



**Part Number: TC110DM**

The TC110 demo board can charge Li-Ion batteries with single-cell alkaline battery or 2-cell alkaline battery at maximum 500 mA constant current. It is used to evaluate Microchip's TC110 PFM/PWM Step-Up DC/DC Controller. The board also includes a MCP73832 miniature single-cell, fully integrated Li-Ion, Li-Polymer charge management controller.

## MCP1252 Charge Pump Backlight Demo Board



**Part Number: MCP1252DM-BKL**

Demonstrates the use of a charge pump device in an LED application and acts as a platform to evaluate the MCP1252 device in general. Light intensity is controlled uniformly through the use of ballast resistors.

A PIC10F206 MCU provides an enable signal to the MCP1252 and accepts a push-button input that allows the white LEDs to be adjusted to five different light intensities.

## MCP1256/7/8/9 Charge Pump Eval Board



**Part Number: MCP1256/7/8/9EV**

An evaluation and demonstration tool for the MCP1256/7/8/9 regulated 3.3V, low-ripple charge pumps with low-operating current Sleep mode or Bypass mode. The board is set-up to evaluate simple, stand-alone, DC-to-DC conversion. The two evaluation circuits provided, demonstrate the versatility of the MCP1256/7/8/9 family.

## MCP1601 Buck Regulator Eval Board



**Part Number: MCP1601EV**

For both battery-powered and distributed- power applications. Operates over a 2.7V to 5.5V input range while delivering 500 mA of output current.

## MCP1612 Synchronous Buck Regulator Eval Board



**Part Number: MCP1612EV**

Features a 1A 1.4 MHz synchronous buck regulator in two buck converter applications. The applications use the 8-lead MSOP and 8-lead DFN packages respectively. Selectable output voltages and a shutdown terminal are available on each converter.

## MCP1630 Automotive Input Boost Converter Demo Board

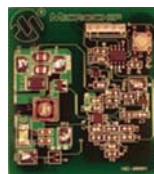


**Part Number: MCP1630DM-DDBS1**

Demonstrates the MCP1630/V high-speed pulse width modulator used for automotive applications. When used with a microcontroller, the MCP1630/V devices control the power system duty cycle to provide regulated output voltage. The programmable PIC12F683 microcontroller is used

to provide oscillator pulses at switching frequency of 500 kHz and set maximum duty cycle. The user may also modify or develop their own firmware routines to further evaluate the MCP1630/V devices in this application.

## MCP1630 Coupled Inductor Boost Demo Board



**Part Number: MCP1630DM-DDBS2**

This board demonstrates Microchip's high-speed Pulse Width Modulator (PWM) used in a coupled inductor design. When used with a programmable PIC12F683 microcontroller, the MCP1630 device controls the power system duty cycle to provide different regulated output voltages from 15V-40V, generates oscillator pulses, reference voltage, output voltage selection and ON/OFF of converter using push button S1. The user can also modify or develop their own firmware routines to further evaluate the MCP1630 device in this application.



### MCP1630 Automotive Input, Tri-Output Converter Demo Board



Part Number: MCP1630DM-DDBK4

Demonstrates a high-speed Pulse Width Modulator (PWM) used for automotive application. When used in conjunction with a microcontroller, the MCP1630 will control the power system duty cycle to provide three regulated output voltages of 3.3V at 1.2A, 1.2V

at 600 mA and 4.7V at 150 mA. The PIC12F683 microcontroller is used to provide reference voltage, ON/OFF of converter using push button SW1 and oscillator pulses at switching frequency of 250 kHz. The MCP1630 generates duty cycle based on various external inputs. External signals include the input oscillator pulses, reference voltage from PIC12F683 device, and the feedback voltage. The user can also modify or develop their own firmware routines to further evaluate the MCP1630 device in this application.

### MCP1630 +12V In Dual-Output Buck Converter Ref Design



Part Number: MCP1630RD-DDBK1

This demo board is a dual-output programmable power supply capable of 20A per output. Both outputs switch at 500 kHz 180° out of phase while powered from a +12V input source. Features include programmable

output voltage, power good output indication, sequencing, overcurrent and overtemperature.

### MCP1630 1A Bias Supply Demo Board



Part Number: MCP1630DM-DDBK1

This demo board is used to evaluate Microchip's MCP1630 used in a SEPIC power converter application. The demo board is capable of providing a regulated output from an input voltage of 9V. The regulated output voltage is selectable at 3.3V or 5V and remains constant for an output load range of 0A to 1A. An LED indicates the presence of output voltage.

### MCP1630 Li-Ion Multi-Bay Battery Charger Ref Design



Part Number: MCP1630RD-LIC1

Used to evaluate the MCP1630 used in a SEPIC power converter application. This charger is capable of charging two single-cell, Li-Ion battery packs in parallel utilizing an input voltage of 10V to 30V (battery packs are not included).

### MCP1630 Low-Cost Li-Ion Battery Charger Ref Design



Part Number: MCP1630RD-LIC2

This board is used to evaluate the MCP1630 device used in a SEPIC power converter applications. The charger is capable of charging a single-cell, Li-Ion battery pack utilizing an input voltage of 6V to 18V (battery packs are not included).

### MCP1630 NiMH Battery Charger Demo Board



Part Number: MCP1630DM-NMC1

This board features a high-speed PWM interface to a PIC16LF818, providing a complete NiMH battery charger with fuel gauge capability. Minimizes external inductor, capacitor cost; performs complex NiMH battery charger timing functions. Protects battery circuit if a fault occurs.

### MCP1650 3W White LED Demo Board



Part Number: MCP1650DM-LED1

Demonstrates the MCP165X Boost Controller product family in a battery-powered white LED application with an input voltage range of 2.0V to 4.5V.

### MCP1650 Multiple White LED Demo Board



Part Number: MCP1650DM-LED2

The MCP1650 Multiple White LED demo board uses the MCP1650 IC to power the nine white LEDs which are connected in series. A PIC10F202 MCU in a SOT-23-6 package is used to provide the PWM signal to the MCP1650. It also accepts a push button input that allows the user to adjust the white LEDs to three different intensities of 100%, 50% and 25%.

### MCP1650 Boost Controller Eval Board



Part Number: MCP1650EV

Demonstrates the MCP165X Boost Controller product family in two high-power, boost-converter applications.

### MCP1650 SEPIC Power Supply Demo Board



Part Number: MCP1650DM-DDSC1

Used to evaluate Microchip's MCP1650 boost controller in a low-power application that requires a regulated output voltage from an input source that can be greater than, less than or equal to the output voltage. As provided, this board generates a 5.0V output from a 3.0V to 7.0V source.

### MCP1726 1A LDO Eval Board



Part Number: MCP1726EV

This board features 1A, Low Quiescent Current LDO Regulator in two circuits. The circuits feature adjustable versions of the MCP1726 in the 8-lead 3x3 DFN and 8-pin SOIC packages respectively. Both circuits have potentiometers to adjust the output voltage of the LDO. Fixed voltage versions of the device can also be evaluated with this board.

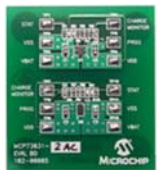
## MCP7382X Li-Ion Battery Charger Eval Board



Part Number: MCP7382XEV

Three circuits utilizing the MCP73826, MCP73827 and MCP73828 devices to demonstrate simple, stand-alone, linear charging of single cell Lithium-Ion/Lithium-Polymer battery packs (the battery packs are not included).

## MCP73831 Eval Kit



Part Number: MCP73831EV

The two evaluation boards provided are set up to evaluate simple, stand-alone, linear charging of single cell Li-Ion/Li-Polymer battery packs (the battery packs are not included). Each board design provides constant current charging followed by constant voltage charging with automatic charge termination. Each board design provides evaluation in two package options: a SOT-23-5 and a 8-lead 2x3 DFN for higher power handling capability.

## MCP73833 Li-Ion Battery Charger Eval Board



Part Number: MCP73833EV

This evaluation and demonstration tool for MCP73833/4 charge management controllers provides two independent circuits (only one is populated) for charging single cell Li-Ion/Li-Polymer battery packs (the battery packs are not included). Each circuit design provides constant current charging followed by constant voltage charging algorithm with automatic charge termination and battery temperature monitoring. The board provides for evaluation of two package options: a MSOP-10 (not populated) and a 10-lead 3x3 DFN for higher power handling capability.

## MCP7384X Li-Ion Battery Charger Eval Board



Part Number: MCP7384XEV

Three circuits use MCP73841, MCP73842 and MCP73843 devices to demonstrate simple, stand-alone, linear charging of single- or dual-cell, Lithium-Ion/Lithium-Polymer battery packs (battery packs are not included).

## MCP73855 Li-Ion Battery Charger Eval Board



Part Number: MCP73855EV

Use to evaluate simple, stand-alone, linear charging of single cell Li-Ion/Li-Polymer battery packs (the battery packs are not included). The board design provides constant current charging followed by constant voltage charging with automatic charge termination.

## MCP7386X Li-Ion Battery Charger Eval Board



Part Number: MCP7386XEV

Use to evaluate simple, stand-alone, linear charging of single/dual cell Lithium-Ion/Lithium-Polymer battery packs (the battery packs are not included). The board design provides constant current charging followed by constant voltage charging with automatic charge termination.

## TC115 PFM/PWM Boost Converter Eval Board



Part Number: TC115EV

A complete, step-up, switch-mode, DC-DC power converter. This board generates a regulated 3.0V output at load currents up to 110 mA. Different output voltages are obtainable by replacing the fixed 3.0V output TC115 with a fixed 3.3V or 5.0V device. Requires the use of an external input voltage source (0.9V –  $V_{out}$ ). The board is provided with an aluminum electrolytic output capacitor with additional surface-mount pads to evaluate tantalum or ceramic capacitors.

## TC1016/17 LDO Linear Regulator Eval Board



Part Number: TC1016/17EV

This evaluation board contains two independent LDO circuits that allow the user to evaluate the TC1016 (80 mA) and TC1017 (50 mA) devices in SC-70-5 and SOT-23-5 packages. The evaluation board is populated with 1.8V and 3.0V TC1017 devices. Any of the available output voltage values of the devices (1.2V to 5.0V) can be used on this board.

## TC1303 DFN Adjustable Output Demo Board



Part Number: TC1303DM-DDBK2

This demo board is used to evaluate the TC1303C device over the input voltage range, output voltage and current range for both the synchronous buck regulator output and the low dropout linear regulator output. Test points are provided to monitor the input voltage, output voltage, shut down control and power good signal.

## TC1303B Demo Board



Part Number: TC1303BDM-DDBK1

The TC1303B Dual-Output Regulator with Power-Good Output Demo Board can be used to evaluate the TC1303B device over the input voltage range and output current range for both the synchronous buck regulator output and the low-dropout linear regulator output. Test points are provided for input power, output loads, shutdown control and power-good monitoring.



## Thermal Management Products

### MCP9800 Temperature Data Logger Demo Board 2



Part Number: MCP9800DM-DL2

This demo board is a PCB assembly that uses a PIC10F202 to read temperature data using I<sup>2</sup>C communication from a MCP9800 temperature sensor, and stores that data, also using I<sup>2</sup>C communication, to a 24LC16B Serial EEPROM. The board can then be placed into a SEEVAL<sup>®</sup> 32 Serial EEPROM evaluation tool where the data can be read and stored into a .hex file, which can be imported and the contents graphed.

### MCP6V01 Thermocouple Auto-Zeroed Ref Design Board



Part Number: MCP6V01RD-TCPL

The MCP6V01 design board demonstrates how to use a difference amplifier system to measure Electromotive Force (EMF) voltage at the cold junction of thermocouple in order to accurately measure temperature of the thermocouple bead. This can be done by using the MCP6V01 auto-zeroed op amp because of its ultra low offset Voltage (Vos) and high Common Mode Rejection Ratio (CMRR).

### MCP9700 Temperature-to-Voltage Converter PICtail™ Demo Board



Part Number: MCP9700DM-PCTL

This board demonstrates how to interface the MCP9700 to a MCU. This can be used by the system designer as an example of how to integrate an analog temperature sensor into systems.

### MCP9800 Temperature Sensor PICtail™ Demo Board



Part Number: MCP9800DM-PCTL

Demonstrates how to interface the MCP9800 to a PIC MCU using the PICkit 1 Flash Starter Kit as a platform. The demo board can also be used as a stand-alone module to quickly add thermal sensing capability to any existing application.

### MCP9800 Temperature Data Logger Demo Board



Part Number: MCP9800DM-DL

Allows users to store up to 128,000 temperature readings from the MCP9800 sensor to the 24LC1025, Microchip's 1024 Kbit EEPROM. A PIC16F684 MCU communicates with the sensor and EEPROM. In addition, the PIC MCU interfaces to a PC using the PICkit 1 Flash Starter Kit and transfers the temperature readings from the EEPROM to the PC. Microsoft Excel<sup>®</sup> can be used to view the data.

### TC72 Digital Temperature Sensor PICtail™ Demo Board



Part Number: TC72DM-PICTL

Connects directly to the PICkit 1 Flash Starter Kit. Highly accurate board features a 10-bit digital sensor with 3-wire SPI interface.

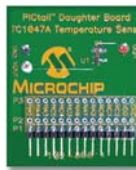
### TC77 Thermal Sensor PICtail™ Demo Board



Part Number: TC77DM-PICTL

System designers can use this design as an example of how to integrate a digital temperature sensor into their systems. Connects directly to the PICkit 1 Flash Starter Kit.

### TC1047A Temperature-to-Voltage Converter PICtail™ Demo Board



Part Number: TC1047ADM-PICTL

Demonstrates how to interface the TC1047A device to a MCU. Connects directly to the PICkit 1 Flash Starter Kit, providing a platform for code development and evaluation. Provides a good example of how to integrate an analog temperature sensor into a system.

### PT100 RTD Eval Board



Part Number: TMPSNS-RTD1

This board demonstrates how to bias a Resistive Temperature Detector (RTD) and accurately measure temperature. Up to two RTDs can be connected. The RTDs are biased using constant current source and the output voltage is scaled using a differential amplifier. The output is then connected to a 12-bit differential Analog-to-Digital Converter (ADC) MCP3301. The ADC outputs serial data to a PIC18F2550 device using a Serial Peripheral Interface (SPI). The data is transmitted to a PC using a USB interface. A Microsoft Excel macro is used as a Graphical User Interface (GUI) to acquire the data. The acquired data is stored in an Excel worksheet and graphed as a real-time stripchart display.

## Blank and Other Eval PCBs

### Electrical Field (E-Field) Eval Board



Part Number: EFIELDEV

The E-Field Eval Board is designed to demonstrate E-field coupling under various conditions on a Printed Circuit Board (PCB). These experiments will help system designers understand the impact PCB layout techniques have on controlling E-field noise in their design.



### Magnetic Field (H-Field) Eval Board



Part Number: HFIELDEV

The H-Field Eval Board (104-00138) is designed to demonstrate H-field coupling under various conditions. These experiments will help system designers understand the impact PCB layout techniques have on controlling noise in their design.



### PSRR and Digital Noise Eval Board



Part Number: INTRFCEV

The PSRR and Digital Noise eval board is designed to explore and quantify the effects of power and digital noise on system performance. These experiments will help system designers understand the impact that power and digital noise can have in their design.



### SOT-23-3 Voltage Supervisor Eval Board



Part Number: VSUPEV

Quickly evaluates operation of voltage supervisors and voltage detectors in the Microchip SOT-23-3 package. Generic board evaluates SOT-23-3 devices (such as LDOs and voltage references). Four blank PCBs are included for testing multiple devices.

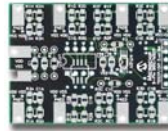
### SOT-23-5/6 Voltage Supervisor Eval Board



Part Number: VSUPEV2

This blank PCB allows quick evaluation of voltage supervisors and voltage detectors in the SOT-23-5 and SOT-23-6 packages. This PCB supports many Microchip devices, including the non-volatile digital potentiometer and PIC10F2XX devices.

### SOIC 8-Lead Eval Board



Part Number: SOIC8EV

A blank PCB to easily evaluate Microchip's 8-pin devices (in SOIC, DIP, MSOP and TSSOP packages). Each device pin is connected to a pull-up resistor, a pull-down resistor, an in-line resistor and a loading capacitor. The PCB pads allow through hole or surface mount connectors to be installed to ease connection to the board. Additional passive component footprints are on the board, to allow simple circuits to be implemented.

### 14-Pin SOIC/TSSOP/DIP Eval Board



Part Number: SOIC14EV

This 14-lead SOIC/TSSOP/DIP evaluation board allows system designers to quickly evaluate the operation of Microchip's devices in either SOIC, DIP or TSSOP packages.

## Analog Software Tools

### Mindi™ Online Simulator Tool **FREE**

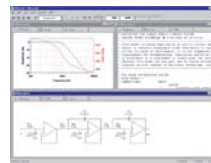


The Mindi™ simulator tool aids in the design of various circuits useful for signal conditioning and power-management applications; specifically, Active Filters, Amplifier Circuits, Battery Chargers and DC-to-DC Converters.

This interactive simulator enables designers to quickly generate circuit diagrams, simulate circuits and specify passive components. Circuits developed using the Mindi simulator tool can be downloaded to a PC or workstation and can often be ported directly into system diagrams. Download the Mindi simulator tool at:

[www.microchip.com/mindi](http://www.microchip.com/mindi)

### FilterLab® Active Filter Design Software **FREE**



The FilterLab Active Filter Software Design tool simplifies active filter design and provides full schematic diagrams of the filter circuit with component values and displays the frequency response. A free download is available at the Microchip web site at:

[www.microchip.com/filterlab](http://www.microchip.com/filterlab)

### SPICE Software Models

Modeling is the heart of any SPICE simulation system and Microchip provides a variety of model libraries. This library and service is an example of Microchip's focus on analog simulation and modeling. For more information, visit the Microchip web site at:

[www.microchip.com](http://www.microchip.com)

## Wireless Products Infrared (IrDA)

### IrDA PICtail™ Plus Daughter Board

Part Number: AC164124



This daughter board is designed to operate in conjunction with the Explorer 16 or other development board. The board has a PICtail Plus connector and uses application note AN1071 “IrDA Standard Stack for Microchip 16-bit MCUs” to create an IrDA-enabled development and evaluation platform. The IrDA stack is written to operate with the IrDA-enabled UARTs on the PIC24F, PIC24H 16-bit controller and dsPIC33 digital signal controllers.

### MCP2140 IrDA® Wireless Temp Demo Board

Part Number: MCP2140DM-TMPSNS



Demonstrates the MCP2140 device in a real-world application. This design is an example of how to integrate an IrDA standard port into a system.

### MCP215X Data Logger Demo Board

Part Number: MCP215XDM



Demonstrates the MCP2150 (or MCP2155) IrDA Standard Protocol Stack Controller device in a real world application. Shows how to integrate an IrDA standard port into an embedded system.

## Wireless Products Radio Frequency (RF)

### PICDEM™ Z Motherboard

Part Number: AC163027-1



The PICDEM Z Motherboard has all of the features necessary to begin developing ZigBee protocol-based applications using the Microchip PIC18 family of microcontrollers.

### PICDEM™ Z MRF24J40 2.4 GHz Daughter Card

Part Number: AC163027-4



The PICDEM Z 2.4 GHz daughter card includes the MRF24J40 transceiver, a PCB antenna and a connector to the PICDEM Z motherboard.

### ZENA™ Network Analyzer

Part Number: DM183023



A wireless network analyzer that graphically displays wireless network traffic following the IEEE 802.15.4 specification on the 2.4 GHz band. Supports both the ZigBee™ and

MiWi™ protocols. In conjunction with the hardware packet sniffer, the software can analyze complete network traffic and graphically display decoded packets, when developing with either the ZigBee or MiWi protocols.

### rfPIC® Development Kit 1

Part Number: DV164102



Provides design engineers with an easy way to evaluate unidirectional remote sense and control wireless links based on the rfPIC12F675 and rFRXD0420/0920 devices. The kit is based on the PICkit 1 Flash Starter

Kit and consists of modular building blocks for different transmitters and receivers that can be utilized for prototype systems or to evaluate different options.

### rfPIC® Development Kit 1 Accessories

rfPIC Transmitter Module (433.92 MHz)

Part Number: AC164101

rfPIC Transmitter Module (315 MHz)

Part Number: AC164102

rfPIC Receiver Module (433.92 MHz)

Part Number: AC164103

rfPIC Receiver Module (315 MHz)

Part Number: AC164104

rfPIC Receiver Module 5 pack (433.92 MHz)

Part Number: AC164105

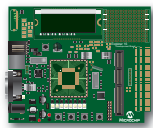
rfPIC Receiver Module 5 pack (315 MHz)

Part Number: AC164106



## PIC® MCU and dsPIC® DSC Standard Demo Boards

### Explorer 16 Development Board



Part Number: **DM240001**

A low-cost modular development system for Microchip's 16- and 32-bit microcontrollers. The board features two interchangeable Plug-In-Modules (PIMs), PIC24FJ128GA010 and dsPIC33F128GP710.

The list below details additional PIMs that work with the Explorer 16 development board or other popular dsPICDEM boards as indicated.

#### Additional Plug-In-Modules (PIMs)

Part Number	Description
MA240011	PIC24FJ128GA010 100P to 100P Plug-In Module
MA240012	PIC24HJ256GP610 100P to 100P Plug-In Module
MA240013	PIC24FJ64GA004 44P to 100P Plug-In Module
MA300014	dsPIC30F6014A 80P Plug-In Module Use with the dsPICDEM 80-pin Starter Dev board (DM300019) and the dsPICDEM GP 1.1 Dev board (DM300014)
MA300015	dsPIC30F6010A 80P Plug-In Module Use with dsPICDEM 80-pin Starter board or dsPICDEM MC1 Motor Control Dev board
MA300016	dsPIC30F2023 80P Plug-In Module Use with dsPICDEM 80-pin Starter board
MA330011	dsPIC33FJ256GP710 100P to 100P Plug-In Module
MA330012	dsPIC33FJ256GP710 100P to 84P Plug-In Module Use with the dsPICDEM 80-pin Starter Dev board
MA330013	dsIC33FJ256MC710 100P to 100P TQFP Plug-In Module
MA330014	dsPIC33FJ12MC202 28P to 100P Plug-in Module
MA330015	dsPIC33FJ12GP202 28P to 100P Plug-in Module
MA330016	dsPIC33FJ32GP204 44P to 100P Plug-in Module
MA330017	dsPIC33FJ32MC204 44P to 100P Plug-in Module

### PIC32 Plug-in Module



Part Number: **MA320001**

Enables development with PIC32 in conjunction with the Explorer 16 Development Board. The PIM features the 72 MHz, 512K Flash, 32K RAM, 100-pin device.



### PICDEM™ HPC Explorer Board



Part Number: **DM183022**

This low-cost demo board is used to evaluate the performance of the PIC18F series. The board features a PIC18F8722 MCU, which is the superset of the entire 64- and 80-pin PIC18FXXX general purpose 5V MCU family. Also, the HPC

Explorer Board can easily be used to evaluate the PIC18 J-series 3V devices with Plug-in Modules (MA180011-MA180020) that will automatically configure the voltage of the HPC Explorer Board to be 3V. A daughter board (mezzanine) is also part of the kit and allows different processors sharing the same pin out to be mounted and tested on the Explorer board.

### MPLAB® ICD 2 Eval Kit



Part Number: **DV164006**

This kit includes the MPLAB ICD 2 Module (DV164005), a PICDEM 2 Plus demonstration board, power supply, serial cable and USB cable.

### Signal Analysis PICtail™ Daughter Board



Part Number: **AC164120**

This board works as an extension to the PICKit 1 Flash Starter Kit. When combined with PICKit 1 firmware version 2.0.0 or later and the signal-analysis PC program, the board performs signal-analysis capabilities such as: real-time strip chart, oscilloscope, Fast Fourier

Transformation (FFT), histogram and programming. The board comes populated with a PIC16F684 and two 25LC640 SPI-compatible serial EEPROM memory devices.

### PICKit™ 2 Debug Express



Part Number: **DV164121**

Allows in-circuit programmer/debugger functions on selected PIC MCUs. This provides the ability to run, examine and modify the program, while the MCU is embedded in the hardware, thereby assisting in debugging the firmware and hardware together. Programs can

be run, stopped and single-stepped. Includes 44-pin demo board. Requires MPLAB IDE version 7.40 or later.

### PICKit™ 2 Low Pin Count Demo Board



Part Number: **DM164120-1**

A small demo board with a PIC16F690 on board and a small prototyping area. Use with the PICKit 2 to program code via a 6-pin ICSP™ header on the board. The kit also includes

two bare PCB boards for those interested in customizing their development.

### PICKit™ 28-pin Demo Board



Part Number: **DM164120-3**

This small demo board comes populated with Microchip's PIC16F888 28-pin microcontroller and includes a generous prototyping area. The kit also includes two bare boards for those interested in customizing their development.

## PICKit™ 44-pin Demo Board



Part Number: DM164120-2

A small demo board with a PIC16F917 MCU on board and a small surface mount prototype area. Use with PICKit 2 to program code via a 6-pin ICSP header on the board. This kit also

includes two bare PCB boards for those interested in customizing their development.

## PICKit™ Serial Analyzer



Part Number: DV164122

A low-cost development kit with an easy-to-use interface. Includes a development board containing Microchip's 28-pin PIC16F886 Flash microcontroller. This MCU contains firmware to emulate several functions typically

found in serial systems. The PICKit Serial Analyzer can be used to exercise these functions and display the data.

## PICDEM™ System Management Kit



Part Number: DM164123

An inexpensive demonstration and training tool that allows communication between a PC and the serial protocol of the system being tested. Integrates the functions of a dedicated Real-Time Clock (RTC), serial EEPROM, thermal

management controller and Analog-to-Digital Converter (ADC) into a single PIC microcontroller. Ideal for designing applications with a variety of integrated peripherals.

## PICDEM™ Low-Power Solutions Demo Board



Part Number: DM163026

This board explores PIC microcontroller nanoWatt features within a functional ultrasonic range-finder application. It features the PIC18F4620 power managed device.

## PICDEM™ MC LV Dev Board



Part Number: DM183021

This board provides a cost-effective method of evaluating and developing sensed or sensorless brushless DC (BLDC) motor control applications. The board supports Microchip's 28-pin, PIC18F microcontrollers and dsPIC30F

Digital Signal Controllers and is capable of controlling motors rated up to 48V and 2.2 amps. This board is designed to work with the 24V BLDC motor (AC300020) and the 24V motor power supply (AC002013) to create a complete 24V BLDC development kit.

## PICDEM™ 2 Plus Demo Board



Part Number: DM163022

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 MPLAB ICE or with MPLAB ICD 2.

## PICDEM™ 4 Demo Board



Part Number: DM163014

A demonstration and evaluation board for the 8-, 14- and 18-pin general purpose products with power-management features. It comes with two pre-programmed Flash-based MCUs, the PIC18F1320 and PIC16F627A, which both feature nanoWatt Technology.

## PICDEM™ Mechatronics Demo Board



Part Number: DM163029

Learn how to use PIC MCUs to enhance or replace a mechanical design. This demo kit takes a hands-on approach to learning about mechatronics. Jumper wires are provided in the kit and allow the user to experiment by connecting the PIC MCU to various components

on the board. These components include sensors, LEDs, human input devices and motor drivers. The board comes with nine example projects and includes firmware, connection diagrams and schematics.

## Speech Playback PICTail™ Plus Daughter Board



Part Number: AC164125

This board is for evaluation and development of speech recording and playback applications using Adaptive Differential Pulse Code Modulation (ADPCM). The daughter board is

designed to interface with both the PICTail interface used on many PIC16 and PIC18 evaluation boards and the PICTail Plus card edge connector used on PIC24 and dsPIC evaluation boards. Reference AN643 for information on implementing an ADPCM solution.

## Prototype PICTail™ Plus Daughter Board



Part Number: AC164126

This board allow designers to easily breadboard their solution for evaluation on the Explorer 16 Eval board using a PIC24 MCU or dsPIC33 DSC. The 8 x 8 cm board provides access to all of the processor pins as well as a generous prototyping

area with a card-edge connection that allows it to be plugged directly into the PICTail Plus expansion socket. Contains three blank Prototype PICTail Plus Daughter Boards.



## Audio PICTail™ Plus Daughter Board



Part Number: AC164129

This PICTail Plus board can be used with the Explorer 16 board and the 16-bit 28-pin starter board. This PICTail plus board will be useful for customers doing voice encoding and decoding using the libraries available thru Microchip, like

the G.711, and doing the decoding either via codec or via the internal PWM module in the dsPIC DSCs. The PICTail even includes 4 Mbits of Flash memory to store compressed audio. (Available Q1/08)



### MPLAB® Starter Kit for dsPIC Speech and Audio Applications



Part Number: DM330011

This board is intended to introduce and demonstrate some of the speech and audio processing capabilities of dsPIC DSC devices.

The kit demonstrates a low-cost yet effective

software technique for processing acceptable voice-quality audio. The PCB also includes a 24-bit audio codec for high-quality audio applications. In addition, the starter kit has on-board in-circuit debug circuitry for developing and debugging audio applications. (Available Q1/08)

### 16-Bit 28-Pin Starter Demo Board Kit



Part Number: DM300027

This starter demo board allows users to easily validate a development tool setup using a 28P DIP dsPIC30F/PIC24F/dsPIC33F device. The demo board has a socketed PIC24FJ64GA002, 28P DIP, USB port, power supply regulator, crystal oscillator,

connectors for MPLAB ICD 2 In-circuit Debugger/Programmer and PICkit 2, single UART communication channel via USB bridge, header for access to all device I/O pins, circuit prototyping area including pads for SOIC and SOT-23 devices.

### dsPICDEM™ DC-DC SMPS Buck Dev Board



Part Number: DM300023

This development board implements a simple DC/DC Switch Mode Power Supply (SMPS) with a dsPIC30F2020 DSC and is a good starting point for designers new to digital loop control design. Key features: dual independent buck

converters, operable in synchronous or asynchronous modes, input voltage range 7-15V (nominal 9V), output voltage programmable: 0 to input voltage minus 1.5V. User can enable a dynamic output load to investigate transient response.

### dsPICDEM™ 80-Pin Starter Development Board



Part Number: DM300019

This board offers an economical way to evaluate both the dsPIC30F and dsPIC33F general purpose and motor control family of devices. An ideal prototyping tool to help quickly develop and validate key design requirements. dsPIC30F6014A and dsPIC33F Plug-In Modules are included.

### dsPICDEM™ 2 Demo Board

Part Number: DM300018



A development and evaluation tool to help create embedded applications using dsPIC30F DSCs. Sockets are provided for 28- and 40-pin devices in the motor control family and 18-, 28- and 40-pin devices in the general purpose and sensor family.

### PIC10F 6L SOT-23 to 8-Pin DIP Adapter Kit

Part Number: AC163021



This is a kit consisting of (5) PIC10F206 SOT-23 devices, (5) pin scramble boards and DIP pins. Once assembled, this makes the SOT-23 look like a standard 8-pin DIP and can be used directly in standard development tool sockets. This kit should be used only for early evaluation.

### KEELoq® Eval Kit II

Part Number: DM303006



This kit demonstrates the capabilities of the code-hopping technology used in security systems such as garage door openers, auto keyless entry, etc. for secure access and/or authentication. It includes a main board and 2 transmitters to demonstrate encoders and decoders. The fully functional kit allows a short learning cycle into the technology.



## Communication and Display Products

### QVGA Graphic PICTail™ Plus



Part Number: AC164127



This daughter board provides a cost-effective method of evaluating and developing QVGA display applications. The board is designed for flexibility and works in conjunction with the Explorer-16 (DM240001) development board. The daughter board is populated with a 2.2" TFT LCD panel with 320x240 (QVGA) resolutions. The panel consists of an 8-bit parallel CPU interface which is supported by the Parallel Master Port (PMP) peripheral of the 16-bit MCU PIC24FJ family.

### PICDEM™ LCD 2 Demo Board

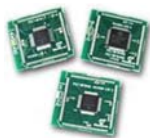


Part Number: DM163030



This board demonstrates the main features of Microchip's 28, 40, 64 and 80-pin LCD Flash PIC microcontrollers including the LCD voltage booster and contrast controller. It is populated with the PIC18F85J90. Other devices are supported via a transition socket and are available separately (MA180019). A sample LCD glass display is included for custom prototyping. The glass features 7-segment displays, wipers, thermometers, star bursts and other common icons.

### PICDEM™ LCD 2 Plug-In Modules



Part Number: MA180019



These plug-in modules allow for easy development of LCD application in conjunction with the PICDEM LCD 2 platform. The modules support the PIC18F8490, PIC16F917 and PIC16F946 LCD microcontrollers.

### PICDEM™ CAN-LIN 2 Demo Board



Part Number: DM163011

PICDEM CAN-LIN 2 supports: 28-pin SDIP PIC18F258 and PIC18F268X devices, 40-pin PDIP PIC18F458 and PIC18F468X devices and 20-pin PDIP PIC16C432 with integrated LIN Bus transceiver.

### PICDEM™ CAN-LIN 3 Demo Board



Part Number: DM163015

PICDEM CAN-LIN 3 supports: 64-pin TQFP PIC18F6680, 80-pin TQFP PIC18F8680 devices, 20-pin SSOP PIC18F1320 and MCP201 LIN Bus transceiver.

### PICDEM™ FS USB Demo/Eval Board



Part Number: DM163025

Demonstrates and evaluates the PIC18F4550 family of Flash MCUs with full-speed USB 2.0 interface. The board contains a PIC18F4550 MCU in a 44-pin TQFP package, representing the superset of the entire family of devices.

### PIC18F87J50 FS USB Plug-In Module



Part Number: MA180021



The PIC18F87J50 full-speed USB Plug-In Module (PIM) is a full speed USB demonstration and development board featuring the PIC18F87J50. The PIM can be operated either stand alone, or while plugged into the HPC Explorer Board (DM183022).

### PICTail™ Daughter Board for SD and MMC Cards



Part Number: AC164122

This PICTail daughter board interfaces with newer development boards that offer the PICTail and PICTail Plus connector interface; such as the PICDEM FS USB development board. This board also interfaces with the Explorer 16 Development Board via the PICTail Plus connector.

### Ethernet PICTail™ Daughter Board



Part Number: AC164121

Provides a cost-effective method of evaluating and developing Ethernet-control applications. This board is populated with a 28-pin Ethernet controller, which interfaces to the RJ-45 female connector. Designed for flexibility, this board can be plugged into the popular PICDEM HPC Explorer Board (DM183022).

### Ethernet PICTail™ Plus Daughter Board



Part Number: AC164123

This board provides a cost-effective method of evaluating and developing Ethernet-control applications. Designed for flexibility, the board can be plugged into Microchip's Explorer 16 Development Board (DM240001). The board is populated with a 28-pin ENC28J60 Ethernet controller, which interfaces to the RJ-45 female connector. When used in conjunction with the Microchip TCP/IP stack, the daughter board allows a developer to connect any Microchip 16-bit product to an Ethernet device.

## Programmers

### MPLAB® ICD 2 Debugger/Programmer



Part Number: DV164005

A low-cost, all-in-one real-time debugger/programmer solution for selected PIC MCUs. Programs can be downloaded, executed in real time and examined in detail using the proprietary debug functions of MPLAB IDE. Watch variables and breakpoints can be set from symbolic labels in C or assembly source code, and single stepping can be done through C source line, assembly code level, or from a mixed C source and generated assembly level listing. MPLAB ICD 2 can also be used as a development programmer for supported devices.

### PICkit™ 2 Microcontroller Programmer



Part Number: PG164120

The PICkit 2 Microcontroller Programmer takes advantage of Microchip's full-speed USB device, significantly speeding up development programming. Included in this package are the PICkit 2 programming software, the MPLAB IDE software, an A to mini-B USB cable and lessons for programming PIC microcontrollers.

### PIC10F2XX Universal Programmer Adapter



Part Number: AC163020

Populates DIP-8 and SOT-23 sockets. 2x3 DFN socket unpopulated.

Part Number: AC163020-2

Populates DIP-8 and 2x3 DFN sockets. SOT-23 socket unpopulated.

The PIC10F2XX Universal Programmer Adapter provides PIC10F socket support for the SOT-23, 2x3 DFN and 8-pin DIP packages. It provides a simple interface to Microchip's low-cost family of programmers including: PICkit 1, PICkit 2, MPLAB ICD 2 and PICSTART® products.

### PIC12F5XX Universal Programmer Adapter



Part Number: AC163022

The PIC12F5XX Universal Programmer Adapter provides PIC12F socket support for the 2x3 DFN and 8-pin DIP packages. It provides a simple interface to Microchip's low-cost family of programmers including: PICkit 1, PICkit2, MPLAB ICD 2 and PICSTART products.

## Software Tools

### MPLAB® IDE **FREE**

Microchip's FREE, integrated toolset for the development of our 8, 16 and 32-bit controllers. MPLAB IDE runs as a 32-bit application on MS Windows, is easy to use and includes a host of free software components for fast application development and debugging. MPLAB IDE also serves as a single, unified graphical user interface for Microchip and third party software/hardware development tools.

### MPLAB® C18 C Compiler

Part Number: SW006011 **(FREE STUDENT EDITION)**

A full-featured ANSI-compliant C compiler for the PIC18F family of 8-bit PIC MCUs. MPLAB C18 is a 32-bit Windows console application as well as a fully integrated component of MPLAB IDE, allowing source level debugging with the MPLAB ICE emulator, the MPLAB ICD 2 debugger and the MPLAB SIM simulator. A full-featured 60-day demo of the MPLAB C18 compiler is available at:

[www.microchip.com](http://www.microchip.com)

### MPLAB® C30 C Compiler

Part Number: SW006012 **(FREE STUDENT EDITION)**

A fully ANSI-compliant C compiler with standard libraries for the PIC24 MCU and dsPIC DSC architectures. Provides efficient software code generation and extensions that allow for excellent support of the hardware, such as interrupts and peripherals. It is fully integrated with the MPLAB IDE for high level, source debugging. MPLAB C30 comes complete with its own assembler, linker and librarian, allowing users to write and link mixed mode C and assembly programs into a single executable file. A full-featured 60-day demo of the MPLAB C30 compiler is available at:

[www.microchip.com](http://www.microchip.com)

### MPLAB® C32 C Compiler

Part Number: SW006015 **(FREE STUDENT EDITION)**



A full-featured ANSI-compliant C compiler for the PIC32 family of 32-bit microcontrollers. MPLAB C32 is fully compatible with Microchip's MPLAB Integrated Development Environment (IDE). Features include: standard, math, memory and data conversion libraries, complete run-time optimized peripheral libraries that are API compatible with C30 libraries, support for mixing 16-bit code (MIPS16e) and 32-bit code in the same project, support for in-line assembly, single and multi-vector interrupt support and generation of relocatable object modules for enhanced code reuse.

### Application Maestro™ Software

A stand-alone module tool to configure and incorporate a range of pre-written firmware modules into PIC MCU applications. Using a graphic interface, select one or more modules, then configure the parameters listed. The Application Maestro software generates code that can be incorporated into the application project, using MPLAB IDE or any compatible development environment.

### MPLAB® Visual Device Initializer **FREE**

MPLAB VDI graphically configures the microprocessor and peripherals, and when complete, generates code usable in assembly language or C programs. MPLAB VDI does extensive error checking on assignments and settings, and generates an error message if there are conflicts on any resources.

Check our web site for additional 3rd Party Tools including PIC16 C Compilers: [www.microchip.com/thirdparty](http://www.microchip.com/thirdparty)

## Application Software and Libraries

	Application Software	Description	Part Number or App Note #	PIC16	PIC18	PIC24F	PIC24H	dsPIC30	dsPIC33	PIC32	EE
Free	Math Library	Standard math and floating point library (ASM, C Wrapper)	Included in Compiler		MPLAB C18	MPLAB C30	MPLAB C30	MPLAB C30	MPLAB C30	MPLAB C32	
Free	Peripheral Library	Peripheral initialization, control and utility routines	Included in Compiler		MPLAB C18	MPLAB C30	MPLAB C30	MPLAB C30	MPLAB C30	MPLAB C32	
Free	dsPIC DSC DSP Library	Essential DSP algorithm suite (Filters, FFT)	SW300022					√	√		
Free	Memory Disk Drive File System Library	Implements all the standard memory disk file system (FAT16) functions: fopen, fread, fwrite, fseek, etc.	AN1045		√	√	√	√	√		
Free	EEPROM Emulation	Use internal program flash to emulate EEPROM with this algorithm	AN1095		√	√	√	√	√		
Free	TCP/IP Library for Ethernet	TCP/IP connectivity and protocol support for Ethernet applications	AN833		√	√	√	√	√	√*	
Free	ZigBee™ Stack	ZigBee is an industry standard 802.15.4 wireless network protocol specifically designed for low data rate sensors and control networks	AN965		√	√	√	√	√		
Free	MiWi™ Stack	MiWi Wireless Networking Protocol is a simple protocol designed for low data rate, short distance, low-cost 802.15.4 networks	AN1066	√	√	√	√	√	√		
Free	IrDA® Stack	IrDA® Standard is a popular, inexpensive method for providing wireless point-to-point communication	AN1071			√	√		√		
Free	Graphics Library (QVGA)	Add easy graphics to your application to improve your user interface	AN1136			√	√		√	√*	
	Symmetric Key Embedded Encryption Library	Security encryption software support for AES, triple-DES, SHA-1, RNG and MD5	SW300050					√	√		
	Triple DES/AES Encryption Libraries	Production license for security encryption software support for AES and Triple-DES	SW300052 / AN1044			√	√	√	√		
	Asymmetric Key Embedded Encryption Library	Security encryption software support for RSA, DSA, Diffie-Hellman, SHA-1, RNG and MD5	SW300055					√	√		
Free Eval	Noise Suppression Library	Function to suppress noise interference in speech signals	SW300040					√	√		
Free Eval	Acoustic Echo Cancellation Library	Function to eliminate echo generated from a speaker to a microphone	SW300060					√	√		
Free Eval	Line Echo Cancellation Library	Function to cancel electrical line echoes caused by 2- or 4-wire conversion hybrids	SW300080					√	√		
Free Eval	Soft Modem Library V.22	V.22bis/V.22 Soft Modem Library	SW300002					√	√		
Free Eval	Soft Modem Library V.32	V.32bis Soft Modem Library	SW300003					√	√		
Free Eval	Speech Recognition Library	Automatic speech recognition system including a PC-based speech training subsystem and a speech recognizer software library (16:1 compression)	SW300010					√	√		
Free Eval	SPEEX Speech Encoding/Decoding Library	Speech library to perform speech compression and decompression supports SPEEX (CELP) companding algorithm	SW300070					√	√		
Free	G.711 Speech Encoding/Decoding Library	APCM speech compression and decompression (2:1 compression)	SW300026			√	√	√	√		
Free Eval	G.726A Speech Encoding/Decoding Library	Speech compression and decompression (8:1 compression)	SW300090					√	√		
	Digital Filter Design Lite	A subset of the functionality in the full version of Digital Filter Design. (Less FIR/IIR taps and MATLAB support)	SW30001-LT					√	√		
Free	Total Endurance™	Microchip's Total Endurance™ Software Disk provides electronic systems designers with unprecedented visibility into Serial EEPROM-based applications.									√

\*Denotes planned capability for future devices.



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