Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

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Microchip Development Systems Ordering Guide

June 2005

Note the following details of the code protection feature on Microchip devices:

- Microchip products meet the specification contained in their particular Microchip Data Sheet.
- Microchip believes that its family of products is one of the most secure families of its kind on the market today, when used in the intended manner and under normal conditions.
- There are dishonest and possibly illegal methods used to breach the code protection feature. All of these methods, to our knowledge, require using the Microchip products in a manner outside the operating specifications contained in Microchip's Data Sheets. Most likely, the person doing so is engaged in theft of intellectual property.
- Microchip is willing to work with the customer who is concerned about the integrity of their code.
- Neither Microchip nor any other semiconductor manufacturer can guarantee the security of their code. Code protection does not mean that we are guaranteeing the product as "unbreakable."

Code protection is constantly evolving. We at Microchip are committed to continuously improving the code protection features of our products. Attempts to break Microchip's code protection feature may be a violation of the Digital Millennium Copyright Act. If such acts allow unauthorized access to your software or other copyrighted work, you may have a right to sue for relief under that Act.

Trademarks

Printed on recycled paper.

QUALITY MANAGEMENT SYSTEM
CERTIFIED BY DNV
ISO/TS 16949:2002

Microchip received ISO/TS-16949:2002 quality system certification for its worldwide headquarters, design and wafer fabrication facilities in Chandler and Tempe, Arizona and Mountain View, California in October 2003. The Company's quality system processes and procedures are for its PICmicro® 8-bit MCUs, KEELOQ® code hopping devices, Serial EEPROMs, microperipherals, nonvolatile memory and analog products. In addition, Microchip's quality system for the design and manufacture of development systems is ISO 9001:2000 certified.

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Development Systems Ordering Guide

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INTRODUCTION

This section contains the following major topics:

About Microchip Development Tools

With more than 300,000 development tools installed worldwide, Microchip is well known for the seamless integration of their tools with the intuitive MPLAB® Integrated Development Environment (IDE), for the breadth of products that cover all stages of the product development cycle, and for the highest level of support and service. Microchip's development tools provide faster time to market and lower total system cost for engineers, clearly offering a competitive advantage to using Microchip silicon solutions.

This ordering guide covers several new development tools, including the PICkit™ 2 Flash Starter Kit, the PICDEM™ Z 2.4GHz Demonstration Kit, the PICDEM Full-Speed USB Demonstration Board and the PICDEM HPC Explorer Board. For more detailed and current information, please visit Microchip's web site at www.microchip.com.

Microchip Technology Service and Support

Quality

Microchip Development Systems is continuously improving design and manufacturing processes to ensure high quality products.

Warranty

Development system products are warranted against defects for one (1) year (90 days for products that we normally sell for $500 or less (USD), excluding promotional pricing).

Upgrades

Software upgrades are available free-of-charge from the Microchip web site (www.microchip.com). Hardware enhancements are also available free-of-charge or at a nominal fee. Contact your local distributor for more information.

Service

Prompt system service is essential as customers depend on our systems to design and program PICmicro® Microcontrollers and dsPIC® Digital Signal Controllers (DSC). Defective components are typically replaced within 48 hours. Microchip's Service Center in Tempe, Arizona serves customers in the US and Canada. Our European Service Center in Dublin provides service to customers in Europe, the Middle East and Africa. The Far East sales offices provide these services directly.

Microchip Internet Connections

On-Line Support

Microchip provides many avenues of on-line support on the Microchip web site at:

www.microchip.com

Users may download files for the latest development tools, data sheets, application notes, user's manuals, articles and sample programs. Microchip-specific business information is also available, including contact information for all Microchip sales offices and distributors.

The MPLAB® Integrated Development Environment (IDE) software can be downloaded free-of-charge. MPLAB IDE includes a project manager, assembler/linker and simulator debugger for embedded system development. Additional tools are available for purchase for device programming, in-circuit debugging, and C compiling. MPLAB IDE is the development environment for most of the Microchip development tools listed in this guide.

Development tools, Microchip PICmicro® MCU devices, dsPIC® DSC devices, Analog/Interface and Memory devices are available on the web site for purchase with a credit card and delivery in the U.S., Canada or Europe.

The following are some of the many services available on the web site:

- Latest data sheets, application notes and user manuals
- Device errata
- Technical support section with FAQs
- Device programming specifications
- Latest file updates for demonstration and evaluation kits
- Design tips
- Subscription to Microchip Change Notification service for silicon and development tools
- Microchip consultant program member listing
- Third party tools contacts
- Web seminars
- Listing of field seminars and upcoming events
- Conferences for products, development systems, technical information and more
- University Corner
- Latest Microchip press releases
- Job postings
- Links to other useful web sites related to Microchip products

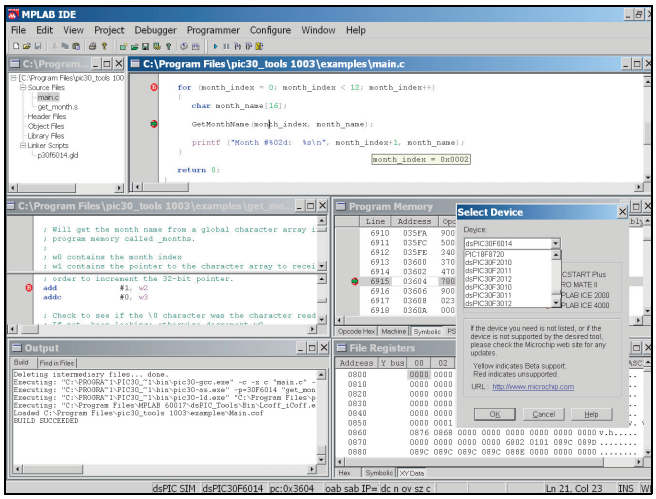
NOTES:

SOFTWARE

This section contains the following major topics:

Development Systems Ordering Guide

MPLAB® Integrated Development Environment (IDE)



MPLAB IDE gives PICmicro® MCU and dsPIC® DSC users the flexibility to edit, compile and debug from a single user interface.

MPLAB IDE gives PICmicro® MCU and dsPIC® DSC users the flexibility to edit, compile and debug from a single user interface. MPLAB Integrated Development Environment (IDE) is a development platform for the Microchip Technology PICmicro microcontroller (MCU) and dsPIC Digital Signal Controller (DSC) families. Designed for use with the Microsoft Windows® operating environment, MPLAB IDE offers an easy-to-use common user interface for the Microchip development tools suite.

MPLAB IDE includes the following components:

- MPASM™ Assembler
- MPLAB ASM30 Assembler for dsPIC30F
- MPSIM™ Software Simulator
- MPLINK™ Linker
- MPLAB LINK30 Linker for dsPIC30F
- Source-Level Debugger
- On-line Help
- Project and Set-up Wizards
- Project Manager
- Visual Device Initializer (see page 7)
- Programmer's Editor
- Drivers for hardware tools (as listed in the Tools Supported section)
- Integration with Source Code Control

The MPLAB IDE desktop provides the development environment and tools for developing and debugging applications as a project, providing a common user interface for different development and debugging modes.

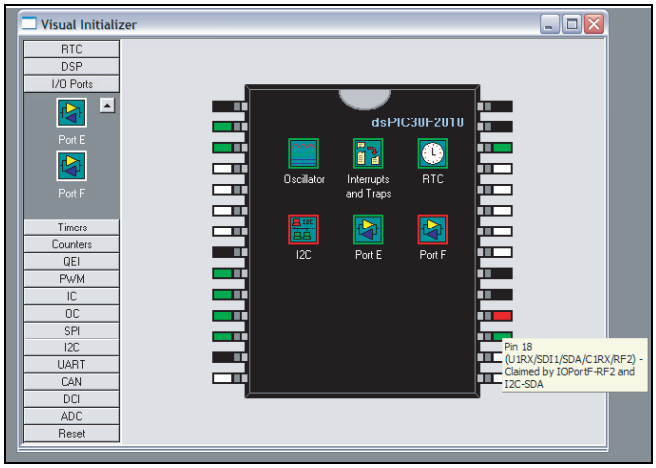
Features

- Full featured, color-coded text editor
- Easy-to-use project manager with visual display
- Source-level debugging
- Enhanced source level debugging for 'C' structures, automatic variables, etc.
- Customizable toolbar and key mapping
- Dynamic status bar displays processor condition at a glance
- Context sensitive, interactive on-line help
- Integrated MPLAB SIM instruction simulator
- Stand-alone user interface for MPLAB PM3 and PRO MATE® II device programmers
- User interface for MPLAB ICE 2000 or MPLAB ICE 4000 In-Circuit Emulator
- User interface for MPLAB ICD 2 In-Circuit Debugger

Ordering Information:

SW007002	MPLAB® IDE (Free download: www.microchip.com)
DS51046	"*MPLAB® IDE Integrated Development Environment Product Overview*" (Available at: www.microchip.com)

MPLAB® IDE Visual Device Initializer Software



Microchip's MPLAB IDE Visual Device Initializer allows users to configure Microchip microcontrollers graphically, and when configuration is complete, a mouse click generates code usable in Assembly or 'C' programs.

MPLAB IDE Visual Device Initializer does extensive error checking on assignments and conflicts on pins, memories and interrupts, as well as a selection of operating conditions. The generated code files are seamlessly integrated with the rest of the application code through the MPLAB IDE project manager.

The detailed reports on resource assignment and configuration simplify project documentation.

Features

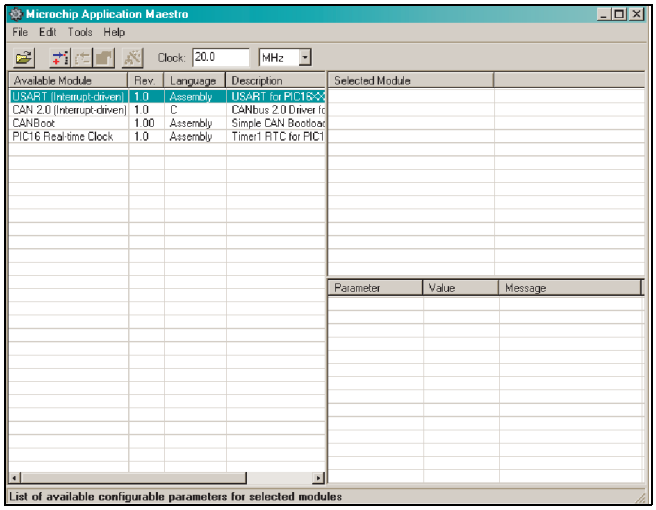
- Drag-and-drop feature selection
- One-click configuration
- Extensive error checking
- Generates initialization code
- Integrates seamlessly in the MPLAB IDE project manager
- Printed reports ease project documentation requirements

Ordering Information:

Free download: www.microchip.com (included with MPLAB IDE download)

DS51443 *"MPLAB IDE Visual Device Initializer Product Overview"* (Available at: www.microchip.com)

Application Maestro™ Software



The Microchip Application Maestro Software is a stand-alone software tool that allows users to configure and incorporate a range of pre-written firmware modules into their applications. Its heart is a collection of modules developed by Microchip Technology for use with its PICmicro® microcontrollers. Starting from a graphic interface, the user selects one or more available modules, then configures the parameters for each. When this is complete, the Application Maestro Software then generates code, that can be incorporated into the user's application project, using MPLAB® IDE or any compatible development environment.

It is important to note that the Application Maestro Software is not a plug-in or add-on to the MPLAB IDE line of development tools; it is a separate item in its own right. Application Maestro Software also differs from other librarian systems, such as MPLIB™ Library, because it does more than archive and manage related files for a single software project. Instead, it manages a library of ready-to-configure modules that the user customizes to their needs, and creates the necessary files for inclusion in the user's projects on demand.

Ordering Information:

Free download: www.microchip.com (now included with MPLAB IDE download)

MPLAB® C18 C Compiler

The MPLAB C18 is a full-featured ANSI-compliant C compiler for the Microchip Technology PIC18CXXX family of PICmicro® MCUs. MPLAB C18 is fully compatible with Microchip's MPLAB IDE, allowing source level debugging with both the MPLAB ICE and the MPLAB SIM Simulator. MPLAB C18 provides a convenient, project-oriented development environment that reduces development time.

MPLAB C18 allows code for the PIC18CXXX family to be written in the high-level 'C' language, using powerful PICmicro MCU libraries, enabling the developer to devote more time to the application and less time to the details of the processor.

MPLAB C18 was designed explicitly for the PIC18CXXX family and allows the use of a software stack for maximum RAM reusability.

MPLAB C18 provides user-configurable interrupt support for saving and restoring context during interrupt handling. Libraries are provided for multiple memory models. Libraries, precompiled objects and linker scripts can be included in MPLAB C18 projects, along with 'C' and Assembly source files, for use with MPLAB C18 make and build functions.

The MPLAB C18 ANSI-compliant C compiler comes complete with the MPLAB IDE. The IDE allows you to move quickly between different development and debugging modes. For example, you can quickly advance from software debugging with the MPLAB SIM Simulator to hardware debugging with MPLAB ICE.

MPLAB C18 has implemented extensions to the 'C' language to provide specific support for Microchip's PICmicro MCU environment.

MPLAB C18 will run on any 486 or better PC, as a native 32-bit Windows® 95 or Windows NT® executable.

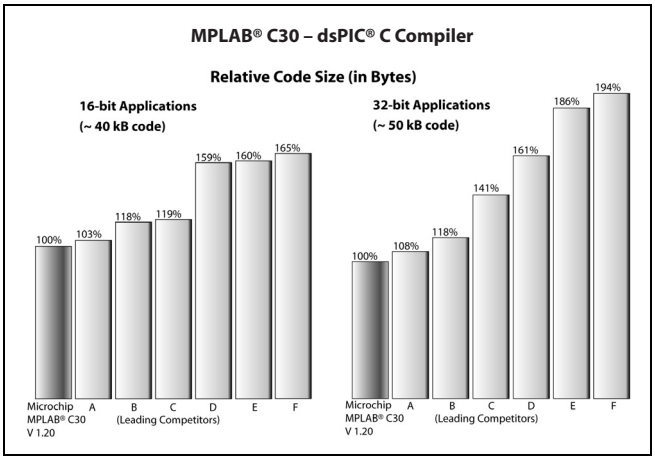
MPLAB C18 C Compiler Contents
• MPLAB® C18 C Compiler Software • MPLAB® IDE Software and Documentation CD • *"MPLAB® C18 C Compiler User's Guide"* and *"MPLAB® C18 C Compiler Librarie*s*"* and *"MPLAB® C18 C Compiler Getting Started"* Manuals

Ordering Information:

SW006011 MPLAB® C18 C Compiler

A 60-day full-featured demo/student edition is available from the Microchip web site at www.microchip.com.

MPLAB® C30 C Compiler



The MPLAB C30 C Compiler is a fully ANSI-compliant product with standard libraries for the dsPIC® DSC architecture. It is highly optimizing and takes advantage of many dsPIC DSC architecture-specific features to provide efficient software code generation. MPLAB C30 also provides 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. These allow the user to write Mixed mode C and Assembly programs and link the resulting object files into a single executable file.

MPLAB C30 is distributed with a complete ANSI 'C' standard library. The library includes functions for string manipulation, dynamic memory allocation, data conversion, timekeeping and math functions (trigonometric, exponential and hyperbolic). The standard I/O functions for file handling are also included, and, as distributed, they support full access to the host file system using the command-line simulator.

The compiler supports both large and small code and data models. The small code model takes advantage of a more efficient form of `CALL` instructions, while the small data model supports the use of compact instructions for accessing data in SFR space.

MPLAB C30 includes a powerful command-line driver program. Using the driver program, application programs can be compiled, assembled and linked in a single step.

MPLAB C30 comes complete with its own assembler, linker and librarian. These tools allow the user to write Mixed mode C and Assembly programs and link the resulting object files into a single executable file.

MPLAB C30 C Compiler Contents

- MPLAB® C30 C Compiler Software
- MPLAB® IDE Software and Documentation CD
- *"MPLAB® C30 C Compiler User's Guide"* (on CD) and Complete Documentation
- *"MPLAB® ASM30, MPLAB® LINK30 and Utilities User's Guide"*
- *"dsPIC® DSC Language Tools Getting Started" and "dsPIC® DSC Language Tool Library"* Manuals

Ordering Information:

SW006012 MPLAB® C30 C Compiler

A 60-day full-featured demo is available from the Microchip web site at www.microchip.com.

DS51432 *"MPLAB® C30 C Compiler Product Overview"* (Available at: www.microchip.com)

dsPIC30F DSP Library

The dsPIC30F DSP Library provides a set of speed-optimized functions for the most common digital signal processing applications. The DSP Library provides significant performance savings over equivalent functions coded in 'C' and allows developers to dramatically shorten their development time.

The DSP Library is written predominantly in Assembly language and makes extensive use of the dsPIC30F DSC instruction set and hardware resources, including X and Y memory addressing, modulo addressing, bit-reversed addressing, 9.31 saturation and REPEAT and DO loops. It provides functions for vector, matrix, filtering, transform and window operations.

Features

- 49 total functions
- Full compliance with the Microchip dsPIC30F C30 Compiler, Assembler and Linker
- Simple user interface – just one library file and one header file
- Functions are both 'C' and Assembly callable
- FIR filtering functions include support for Lattice, Decimating, Interpolating and LMS filters
- IIR filtering functions include support for Canonic, Transposed Canonic and Lattice filters
- FIR and IIR functions may be used with the filter files generated by the dsPIC® DSC Digital Filter Design Tool
- Transform functions include support for in-place and out-of-place DCT, FFT and IFFT transforms
- Window functions include support for Bartlett, Blackman, Hamming, Hanning and Kaiser windows
- Support for Program Space Visibility
- Complete function profile information, including register usage, cycle count and function size information

Function Execution Times Table

Function	Cycle Count Equation	Conditions	Number of Cycles*	Execution Time @ 30 MIPS
Complex FFT**	—	N = 64	3739	124.6 µs
Complex FFT**	—	N =1 28	8485	282.8 µs
Complex FFT**	—	N = 256	19055	635.2 µs
Block FIR	53 + N(4 + M)	N = 32, M = 32	1205	40.2 µs
Block FIR Lattice	41 + N(4 + 7M)	N = 32, M = 32	7337	244.6 µs
Block IIR Canonic	36 + N(8 + 7S)	N = 32, S = 4	1188	39.6 µs
Block IIR Lattice	46 + N(16 + 7M)	N = 32, M = 8	2350	78.3 µs
Matrix Add	20 + 3(C * R)	C = 8, R = 8	212	7.1 µs
Matrix Transpose	16 + C(6 + 3(R – 1))	C = 8, R = 8	232	7.7 µs
Vector Dot Product	17 + 3N	N = 32	113	3.8 µs
Vector Max	19 + 7(N – 2)	N = 32	229	7.6 µs
Vector Multiply	17 + 4N	N = 32	145	4.8 µs
Vector Power	16 + 2N	N = 32	80	2.7 µs

Legend: C = # columns, N = # samples, M = # taps, S = # sections, R = # rows

* 1 Cycle = 33 nanoseconds @ 30 MIPS.

** Complex FFT routine inherently prevents overflow.

Ordering Information:

SW300022 dsPIC30F DSP Library (Free download: www.microchip.com)

DS51443 *"dsPIC30F DSP Library Product Overview"* (Available at: www.microchip.com)

dsPIC30F Math Library

The dsPIC30F Math Library is the compiled version of the math library that is distributed with the highly optimized, ANSI-compliant dsPIC30F MPLAB® C30 C Compiler (SW006012). It contains advanced single and double-precision, floating-point arithmetic and trigonometric functions from the standard 'C' header file `<math.h>`. The library delivers small program code size and data size, reduced cycles and high accuracy.

Features

- The math library is callable from either MPLAB C30 or dsPIC30F Assembly language.
- The functions are IEEE-754 compliant, with signed zero, signed infinity, NaN (Not a Number) and denormal support and operate in the "Round-to-Nearest" mode.
- Compatible with MPLAB ASM30 and MPLAB LINK30, which are available at no charge from Microchip's web site.
- Total library memory usage(1,2):
  - Code size: 5250 bytes
  - Data size: 4 bytes

dsPIC® DSC Math Library Function and Performance

Function Group	Function	Performance (Cycles)(1,2,3,4)
Basic Floating Point	Addition	122
	Subtraction	124
	Multiplication	109
	Division	361
	Remainder	385
Trigonometric and Hyperbolic	acos	478
	asic	363
	atan	696
	atan2	3206
	cos	3249
	sin	2238
	tan	2460
	cosh	1049
	sinh	525
	tanh	338
Logarithmic and Exponential	exp	530
	frexp	39
	ldexp	44
	log	2889
	log10	3007
Power Functions	pow	2134
	sqrt	493
Rounding Functions	ceil	94
	floor	51
Absolute Value Function	fabs	6
Modular Arithmetic Functions	modf	151
	fmod	129

Note 1: Results are based on using the dsPIC30F MPLAB® C30 Compiler (SW006012) version 1.20.

2: Maximum "Memory Usage" when all functions in the library are loaded. Most applications will use less.

3: All performance statistics represented here are for 32-bit IEEE754 floating-point input and output data types.

4: Performance (in instruction cycles) listed here represent an average number of instruction cycles required to perform the floating-point operation.

Ordering Information:

SW300020 dsPIC30F Math Library (Free download: www.microchip.com)

DS51443 *"dsPIC30F Math Library Product Overview"* (Available at: www.microchip.com)

dsPIC30F Peripheral Library

The dsPIC30F Peripheral Library provides a set of functions for setting up and controlling the operation of all the peripheral modules available in the dsPIC30F devices, as well as functions for interfacing with an external LCD. The Peripheral Library serves as a convenient layer of abstraction over the specific details of the peripherals and their associated control and status registers.

The dsPIC30F Peripheral Library supports the following hardware peripheral modules:

- Timers
- Input Capture
- Output Compare
- Quadrature Encoder Interface (QEI)
- Motor Control PWM
- I/O Ports and External Interrupts
- Reset
- UART
- SPI™
- I^2C™
- Data Converter Interface (DCI)
- 10-Bit A/D Converter
- 12-Bit A/D Converter
- CAN

Functions for controlling an external LCD through configurable I/O port pins are also provided

Features

- For each individual device from the dsPIC30F family, there is a file that includes functions corresponding to peripherals present in that particular device.
- 'C' include files enable the user to take advantage of predefined constants for passing parameters to various library functions. There is an include file for each peripheral module.
- Since the functions are in the form of precompiled libraries, they may be called from a user application program written in either MPLAB® C30 or dsPIC30F Assembly language.
- 'C' source code is also included so users can customize the functions to suit specific application requirements.
- Predefined constants in 'C' include files eliminate the need to refer to details and structure of Special Function Registers, while initializing peripherals or checking status bits.

Resource Requirements

Program Memory

The Peripheral Library functions have been optimized for reduced program memory usage. Since the functions are in the form of libraries, the actual program memory requirements depend on the functions being called by the application, as well as on the specific dsPIC30F device being used.

Data Memory

The vast majority of the functions do not use RAM at all. Each of the remaining functions uses less than 10 bytes of RAM.

Ordering Information:

SW300021	dsPIC30F Peripheral Library (Free download: www.microchip.com)
DS51443	*"dsPIC30F Peripheral Library Product Overview"* (Available at: www.microchip.com)

dsPIC30F Soft Modem Library

The Microchip Soft Modem Library is composed of ITU-T compliant algorithms for V.21, V.22, V.22bis, V.23, V.32 and V.32bis modem recommendations. Bell standard 103 is also included in this library.

V.21, V.23 and Bell 103 are Frequency Shift Keying (FSK) modems. V.32, V.32bis and V.22bis are Quadrature Amplitude Modulated (QAM) modems. V.22 is a Quadrature Phase Shift Keyed (QPSK) modem. V.21, V.22, V.22bis, V.32 and V.32bis are all 2-wire, full-duplex modems. V.23 is a full-duplex modem when it operates with a 75 bps backwards channel.

V.22bis includes fallback to V.22, V.23 and V.21 standards. V.32bis optionally falls back to V.22bis, V.22, V.23 and V.21 standards.

Features

The data modem library is provided in two basic software packages:

- V.22bis/V.22, which is offered free with full source code
- V.32bis/V.32, which is offered in a tiered pricing structure with full source code

The library currently supports single-channel data pump implementations.

Both libraries are supported with fallback data pump modulations down to V.21. Each data modem library is provided with a respective library archive containing all the data pump object code modules required to link to the user's application. Hardware component drivers, such as UART and Data Converter Interface for DAA/AFE I/O, are provided in Assembly source code for linking with the user's application.

ITU-T Recommendation V.42 is provided with each library. V.42 contains a High-Level Data Link Control (HDLC) protocol, referred to as Link Access Procedure for Modems (LAPM) and defines error correcting protocols for modems.

All data pump modulations are developed in ASM30 Assembly code, yielding optimal code size and execution time. The AT, V.42 and Data Pump APIs are based on C30 C language.

Electronic documentation accompanies the modem library to help you become familiar with and implement the library functions. A comprehensive *"Soft Modem User's Guide"* describes the required APIs for the AT, V.42 and data pump layers.

Ordering Information:

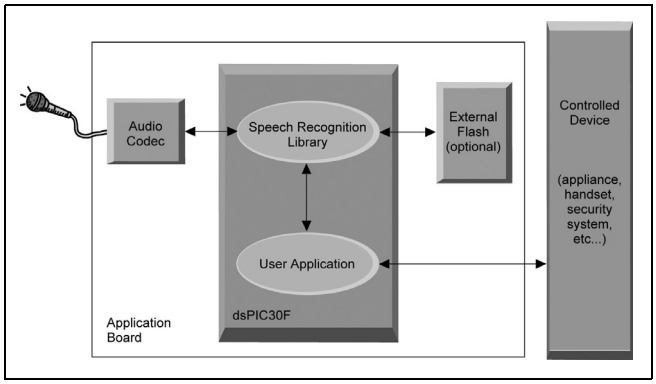
SW300003-EVAL	dsPIC30F V.32bis Soft Modem Library Software License (Evaluation Copy)
SW300002	dsPIC30F V.22bis Soft Modem Library (Free download: www.microchip.com)
SW300003	dsPIC30F V.32bis Soft Modem Library Software License (Up to 5K units)
SW300004	dsPIC30F V.32bis Soft Modem Library Software License (5K to 25K units)
SW300005	dsPIC30F V.32bis Soft Modem Library Software License (25K to 100K units)
DS70126	*"dsPIC30F Soft Modem Library Product Overview"* (Available at: www.microchip.com)

dsPIC30F Speech Recognition Library

The dsPIC30F Speech Recognition Library provides voice control of embedded applications that require an alternative user interface. With a vocabulary of up to 100 words, the Speech Recognition Library allows users to control their applications vocally. The Speech Recognition Library is an ideal front-end for hands-free products, such as modern appliances, security panels and cell phones. The Speech Recognition Library has very modest memory and processing requirements.

Features

- Speaker-independent recognition of isolated words
- Hidden Markov Model-based recognition system
- Recognition time < 500 msec
- Master library of 100 common words
- Windows® operating system-based utility allows you to create a custom library from the master library
- Additional words can be added to the master library (fee-based)
- No speaker training is required
- US English language support
- Data tables can be stored in external memory
- Optional keyword activation and silence detection
- Optional system self-test using a predefined keyword
- Flexible API
- Full compliance with Microchip MPLAB® C30 language tools
- *"dsPIC30F Speech Recognition Library User's Guide"*



The Speech Recognition Library provides isolated, speaker-independent word recognition of US English. It allows the user to control an application through a set of fixed, voice commands.

The library has already been pretrained by a demographic cross-section of male and female US English speakers. Conveniently, no training is required for end users of the product.

The library samples speech data from a voice codec connected to the dsPIC30F device's Data Converter Interface. The data is processed a frame at a time, and when a word ending is detected, the received word is identified using Hidden Markov Model processing. After the library identifies the word, your application may then take some predefined action.

The Speech Recognition algorithm is written in Assembly language to optimize performance and minimize RAM usage. A well-defined API makes it easy to integrate the Speech Recognition Library with your application. Library functions let your application easily disable and enable speech recognition. The library lets your other system processing operations take place without disrupting speech recognition.

Ordering Information:

SW300010-EVAL	dsPIC30F Speech Recognition Library Software License (Evaluation Copy)
SW300010	dsPIC30F Speech Recognition Library Software License (Up to 5K units)
SW300011	dsPIC30F Speech Recognition Library Software License (5K to 25K units)
SW300012	dsPIC30F Speech Recognition Library Software License (25K to 100K units)
AC300031	Accessory Kit (includes: microphone, headset and 6.144 MHz clock oscillator)
DS51465	*"dsPIC30F Speech Recognition Library Product Overview"* (Available at: www.microchip.com)

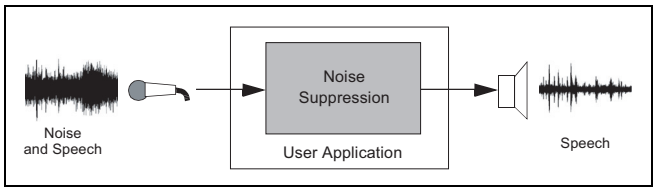
dsPIC30F Noise Suppression Library

The dsPIC30F Noise Suppression Library provides a function to suppress the effect of noise interference with a speech signal. This function is useful for microphone-based applications, which have a potential for incoming speech corruption by ambient noise captured by the microphone. It is especially suitable for systems in which an acoustically isolated noise reference is not available, such as:

- Hands-free Cell Phone Kits
- Speakerphones
- Intercoms
- Teleconferencing Systems
- Headsets
- As a front-end to a Speech Recognition system (e.g., SW300010)
- Any microphone-based application that needs to eliminate undesired noise

Features

- Only 2 user functions ("`NoiseSuppressionInit`" and "`NoiseSuppression`"), both of which can be called from either a 'C' or Assembly application program
- Full compliance with the Microchip dsPIC30F C30 Compiler, Assembler and Linker
- Simple user interface – just one library file and one header file



- Highly optimized Assembly code, utilizing DSC instructions and advanced addressing modes
- Audio Bandwidth: 0-4 kHz at 8 kHz sampling rate
- 10-20 dB noise reduction, depending on the type of noise:
  - Several speech recordings corrupted by Babble, Car Cabin, White and Narrowband Noise included for library evaluation
- Source code is provided with the library
- *"dsPIC30F Noise Suppression Library User's Guide"* is provided to help the user understand and use the library
- Demo application source code is provided with the library
- Accessory Kit available for purchase includes: an audio cable, headset, oscillators, microphone, speaker, DB9 M/F RS-232 cable, DB9M-DB9M null modem adapter and can be used for library evaluation

Contact Microchip sales for FREE evaluation samples.

Ordering Information:

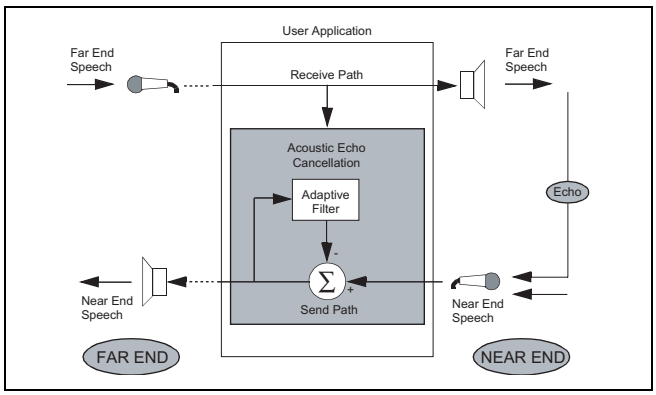
SW300040-EVAL	dsPIC30F Noise Suppression Library Software License (Evaluation Copy)
SW300040-5K	dsPIC30F Noise Suppression Library Software License (Up to 5K units)
SW300040-25K	dsPIC30F Noise Suppression Library Software License (5K to 25K units)
SW300040-100K	dsPIC30F Noise Suppression Library Software License (25K to 100K units)
AC300030	Accessory Kit (includes: audio cable, headset, oscillators, microphone, speaker, M/F RS-232 cable, DB9M-DB9M Null Modem Adapter)
DS70124	*"dsPIC30F Noise Suppression Library Product Overview"* (Available at: www.microchip.com)

dsPIC30F Acoustic Echo Cancellation Library

The dsPIC30F Acoustic Echo Cancellation (AEC) Library provides a function to eliminate echoes generated in the acoustic path between a speaker and a microphone. This function is useful for speech and telephony applications in which a speaker and a microphone are located in close proximity to each other and therefore, susceptible to signals propagating from the speaker to the microphone resulting in a perceptible and distracting echo effect at the far end. It is especially suitable for these applications:

- Hands-free Cell Phone Kits
- Speakerphones
- Intercoms
- Teleconferencing Systems

For hands-free phones intended to be used in compact environments, such as a car, this library is fully compliant with the G.167 standard for acoustic echo cancellation.



Features

- Only 2 user functions ("`AcousticEchoCancellerInit`" and "`AcousticEchoCanceller`"), both of which can be called from either a 'C' or Assembly application program
- Full compliance with the Microchip dsPIC30F C30 C Compiler, Assembler and Linker simple user interface – just one library file and one header file
- Highly optimized Assembly code, utilizing DSC instructions and advanced addressing modes
- Echo cancellation for 16, 32 or 64 ms echo delays or 'tail lengths' (configurable)
- Fully tested for compliance with G.167 specifications for in-car applications
- Audio Bandwidth: 0-4 kHz at 8 kHz sampling rate
- Convergence Rate: Up to 43 dB/sec., typically > 30 dB/sec.
- Echo Cancellation: Up to 50 dB, typically > 40 dB
- Can be used together with the Noise Suppression (NS) Library, since the same processing block size (10 ms) is used
- *"dsPIC30F Acoustic Echo Cancellation Library User's Guide"* is provided to help the user understand and use the library
- Demo application source code is provided with the library. Accessory kit available for purchase includes: an audio cable, headset, oscillators, microphone, speaker, DB9 M/F RS-232 cable and DB9M-DB9M Null Modem Adapter and can be used for library evaluation
- Contact Microchip sales for FREE evaluation samples

Ordering Information:

SW300060-EVAL	dsPIC30F Acoustic Echo Cancellation Library Software License (Evaluation Copy)
SW300060-5K	dsPIC30F Acoustic Echo Cancellation Library Software License (Up to 5K units)
SW300060-25K	dsPIC30F Acoustic Echo Cancellation Library Software License (5K to 25K units)
SW300060-100K	dsPIC30F Acoustic Echo Cancellation Library Software License (25K to 100K units)
AC300030	Accessory Kit (includes: audio cable, headset, oscillators, microphone, speaker, M/F RS-232 cable, DB9M-DB9M Null Modem Adapter)
DS70123	*"dsPIC30F Acoustic Echo Cancellation Library Product Overview"* (Available at: www.microchip.com)

dsPIC® DSC Symmetric Key Embedded Encryption Library

Microchip offers a reliable security solution for embedded applications built on the dsPIC30F platform. This solution is provided by means of two libraries – Symmetric Key and Asymmetric Key Embedded Encryption Libraries. The Symmetric Key Library features the following:

- Hash Functions:
  - SHA-1 Secure Hash Standard
  - MD5 Message Digest
- Symmetric Key Encryption/Decryption Functions:
  - Advanced Encryption Standard (AES)
  - Triple Data Encryption Algorithm (Triple-DES)
- Random Number Generator Functions:
  - Deterministic Random Bit Generator ANSI X9.82

Features

- C-callable library functions developed in MPLAB® ASM30
- Assembly language
- Optimized for speed, code size and RAM usage:
  - RAM usage below 60 bytes
- Library functions extensively tested for adherence to applicable standards
- Symmetric Key Encryption/Decryption functions support multiple modes of operation:
  - Electronic Code Book (ECB) mode
  - Cipher Block Chaining with Message Authentication (CBC-MAC) mode
  - Counter (CTR) mode
  - Combined CBC-MAC and Counter (CCM) mode
- A comprehensive *"dsPIC30F Embedded Encryption Libraries User's Guide"* describing the required APIs for the library functions
- Several examples of use are provided for each library function

Ordering Information:

SW300050-EVAL	dsPIC® DSC Symmetric Key Embedded Encryption Library Software License (Evaluation Copy)
SW300050-5K	dsPIC® DSC Symmetric Key Embedded Encryption Library Software License (Up to 5K units)
SW300050-25K	dsPIC® DSC Symmetric Key Embedded Encryption Library Software License (5K to 25K units)
SW300050-100K	dsPIC® DSC Symmetric Key Embedded Encryption Library Software License (25K to 100K units)
DS70128	*"dsPIC® DSC Symmetric Key Embedded Encryption Library Product Overview"* (Available at: www.microchip.com)

dsPIC® DSC Asymmetric Key Embedded Encryption Library

Microchip offers a reliable security solution for embedded applications built on the dsPIC30F platform. This solution is provided by means of two libraries – Symmetric Key and Asymmetric Key Embedded Encryption Libraries. The Asymmetric Key Library implements the following:

- Public Key Encryption/Decryption Functions:
  - RSA (1024 and 2048-bit)
- Key Agreement Protocol:
  - Diffie-Hellman (1024 and 2048-bit)
- Signing and Verification:
  - DSA (1024-bit)
  - RSA (1024 and 2048-bit)
- Hash and Message Digest Functions:
  - SHA-1, MD5
- Random Number Generator (RNG):
  - ANSI X9.82

Features

- C-callable library functions developed in MPLAB ASM30 Assembly language
- Optimized for speed, code size and RAM usage:
  - RAM usage below 100 bytes
- Library functions extensively tested for adherence to applicable standards
- A comprehensive *"dsPIC30F Embedded Encryption Libraries User's Guide"* describing the required APIs for the library functions
- Several examples of use provided for each library function

Typical Applications

The algorithms supported by this library have emerged as the defacto standard for many large scale, secured applications, like web access, e-mail, secure XML transactions and Virtual Private Networks (VPN). These algorithms are also recommended by most Internet Engineering Task Force (IETF) Standards, Federal Information Processing Standards (FIPS) and IPSec Standards. Some typical applications for this library include:

- Mobile and wireless devices, PDAs
- Secure banking
- Secure web transactions:
  - Secure Socket Layer (SSL)
  - Transport Layer Security (TLS)
  - Secure Multi-purpose Internet Mail Extensions (S/MIME)
  - ZigBee™ technology and other monitoring and control applications
- Smart card readers
- Friend/foe identification
- Peripherals interoperating with TCG and NGSCB personal computers

The Trusted Computing Group (TCG) and related Microsoft® Next Generation Secure Computing Base (NGSCB) both specify RSA and Triple-DES. AES, Triple DES and other symmetric solutions are featured in the dsPIC30F Symmetric Key Embedded Encryption Library (SW300050).

Ordering Information:

SW300055-EVAL	dsPIC® DSC Asymmetric Key Embedded Encryption Library Software License (Evaluation Copy)
SW300055-5K	dsPIC® DSC Asymmetric Key Embedded Encryption Library Software License (Up to 5K units)
SW300055-25K	dsPIC® DSC Asymmetric Key Embedded Encryption Library Software License (5K to 25K units)
SW300055-100K	dsPIC® DSC Asymmetric Key Embedded Encryption Library Software License (25K to 100K units)
DS70127	*"dsPIC® DSC Asymmetric Key Embedded Encryption Library Product Overview"* (Available at: www.microchip.com)