



# **Integrated Programming Environment (IPE) User's Guide**

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## Preface

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### NOTICE TO CUSTOMERS

All documentation becomes dated, and this manual is no exception. Microchip tools and documentation are constantly evolving to meet customer needs, so some actual dialogs and/or tool descriptions may differ from those in this document. Please refer to our web site ([www.microchip.com](http://www.microchip.com)) to obtain the latest documentation available.

Documents are identified with a “DS” number. This number is located on the bottom of each page, in front of the page number. The numbering convention for the DS number is “DSXXXXXXXXA”, where “XXXXXXXX” is the document number and “A” is the revision level of the document.

For the most up-to-date information on development tools, see the MPLAB® X IDE online help. Select the Help menu, and then Topics to open a list of available online help files.

## INTRODUCTION

This chapter contains general information that will be useful to know before using the Integrated Programming Environment. Items discussed in this chapter include:

- Document Layout
- Recommended Reading

## DOCUMENT LAYOUT

This document describes how to use the Integrated Programming Environment as a programming tool to program devices. The document is organized as follows:

- **Chapter 1. IPE Application Overview** – Defines the Integrated Programming Environment, provides software installation requirements and upgrade procedures, lists the supported tools, and provides a feature matrix.
- **Chapter 2. General Setup** – Discusses launching and setting up the application and provides Advanced Mode login and options information.
- **Chapter 3. IPE Reference** – Provides reference information for the menu items.

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## CONVENTIONS USED IN THIS GUIDE

This manual uses the following documentation conventions:

### DOCUMENTATION CONVENTIONS

Description	Represents	Examples
<b>Arial font:</b>		
Italic characters	Referenced books	<i>MPLAB X IDE User's Guide</i>
	Emphasized text	...is the <i>only</i> compiler...
Initial caps	A window	the Output window
	A dialog	the Settings dialog
	A menu selection	select Enable Programmer
Quotes	A field name in a window or dialog	"Save project before build"
Underlined, italic text with right angle bracket	A menu path	<u><i>File&gt;Save</i></u>
Bold characters	A dialog button	Click <b>OK</b>
	A tab	Click the <b>Power</b> tab
N'Rnnnn	A number in verilog format, where N is the total number of digits, R is the radix and n is a digit.	4'b0010, 2'hF1
Text in angle brackets < >	A key on the keyboard	Press <Enter>, <F1>
<b>Courier New font:</b>		
Plain Courier New	Sample source code	#define START
	Filenames	autoexec.bat
	File paths	c:\mcc18\h
	Keywords	_asm, _endasm, static
	Command-line options	-Opa+, -Opa-
	Bit values	0, 1
	Constants	0xFF, 'A'
Italic Courier New	A variable argument	<i>file.o</i> , where <i>file</i> can be any valid filename
Square brackets [ ]	Optional arguments	mcc18 [options] <i>file</i> [options]
Curly brackets and pipe character: {   }	Choice of mutually exclusive arguments; an OR selection	errorlevel {0 1}
Ellipses...	Replaces repeated text	var_name [, var_name...]
	Represents code supplied by user	void main (void) { ... }

## RECOMMENDED READING

This user's guide describes how to use Integrated Programming Environment. Other useful documents are listed below. The following Microchip documents are available and recommended as supplemental reference resources.

### **Processor Extension Pak and Header Specification (DS51292)**

This booklet describes how to install and use headers. Headers are used to better debug selected devices using special -ICE device versions, without the loss of pins or resources. See also the Header online help file.

### **Transition Socket Specification (DS51194)**

Consult this document for information on transition sockets available for use with headers.

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## **Chapter 1. IPE Application Overview**

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### **1.1 INTEGRATED PROGRAMMING ENVIRONMENT DEFINED**

The Integrated Programming Environment (IPE) is a software application that provides a simple interface to quickly access key programmer features. IPE provides a secure programming environment for production programming.

The IPE uses the MDB (Microchip Debugger) Core and MPLAB® X IDE framework to provide all the programming capabilities for all Microchip programmers.

### **1.2 SOFTWARE INSTALLATION REQUIREMENTS**

The IPE uses the MPLAB X IDE framework; MDB database, and hardware tool interfaces; and respective drivers to provide programming capabilities to the end user.

The following software must be installed on your PC to use the IPE application:

- MPLAB X IDE v1.85 or greater.
- The MPLAB X IPE application (installed automatically with MPLAB X IDE).

See the IPE Release Notes for up-to-date version compatibility information.

Once you've installed the software, the IPE application can be accessed through the MPLAB X IPE icon on your desktop or startup menu. The IPE must be run as administrator for all features to be fully functional.

### **1.3 PROGRAMMING TOOLS SUPPORTED**

The following programming tools work with the IPE:

- MPLAB ICD 3 In-Circuit Debugger - recommended for production programming
- MPLAB PICKit™ 3 Debugger/Programmer - for development programming only
- MPLAB PM3 Programmer - recommended for production programming
- MPLAB REAL ICE™ Emulator - recommended for production programming

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## 1.4 INTEGRATED PROGRAMMING ENVIRONMENT APPLICATION MODES

### 1.4.1 Modes

The Integrated Programming Environment application operates in two modes:

1. Production Mode – in which you can perform all the production programming operations. By default, the IPE is in this mode when it is launched. Instructions to set the operations for the Production Mode are supplied in **Section 2.5.6 “Production Mode”** of this document.
2. Advanced Mode – a feature-rich GUI interface in which you can view and change the settings for programming operations, and set up secure environments for production programming. To enable Advanced Mode, see **Section 2.3 “Setting Up the Programmer”**.

### 1.4.2 Feature Matrix

The following matrix shows the default features that are accessible in Production mode.

However, in Advanced mode, the default behavior of Production mode can be changed, and features can be added or removed as per the authorized personnel's discretion. (Note: For all features to be fully functional, run the IPE as administrator.)

**TABLE 1-1: FEATURE MATRIX**

Feature	Description	Production Mode Defaults
Import Hex file	loads the Hex file	On
Import Environment	loads the Environment file	Off
Import SQTP file	loads the pre-built SQTP file	Off
Export Hex file	saves the all memory contents into a hex file	Off
Program	connects to hardware tool and performs program operation	On
Erase	erases the device	On
Verify	verifies the device against the memory contents of IPE	On
Blank Check	checks that the device is blank	On
Read	reads the device and fills the read content in memory	On
<b>Memory View</b>		
Program Memory	displays the program memory contents	Off
Auxiliary Memory	displays the auxiliary memory contents	Off
Config Memory	displays the configuration memory contents	Off
Flash Data	displays the Flash data memory contents	Off
User IDs	displays the User ID memory contents	Off
EEPROM	displays the data memory contents	Off
<b>Memory Edit</b>		
Program Memory	program memory contents can be edited	Off
Auxiliary Memory	auxiliary memory contents can be edited	Off

**TABLE 1-1: FEATURE MATRIX (CONTINUED)**

<b>Feature</b>	<b>Description</b>	<b>Production Mode Defaults</b>
Flash Data Memory	Flash data memory contents can be edited	Off
Config Memory	configuration memory contents can be edited	Off
EEPROM	data memory contents can be edited	Off
User IDs	User ID memory contents can be edited	Off
Save Environment	creates or overwrites the environment	Off
View Memory Settings	views the memory ranges	On
Edit Memory Settings	changes the memory ranges	Off
View Voltage Settings	views the voltage values	On
Edit Voltage Settings	changes the voltage values	Off
Create SQTP	generates the SQTP file	Off
Manual Download Firmware	to select and download the firmware into the Hardware tool	On
Auto Download Firmware	when a tool is connected, the latest firmware (available in the system) will be downloaded	On
Erase All Before Program	erases the device before programming	Off

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## Chapter 2. General Setup

### 2.1 INTRODUCTION

Getting started using the Integrated Programming Environment is discussed.

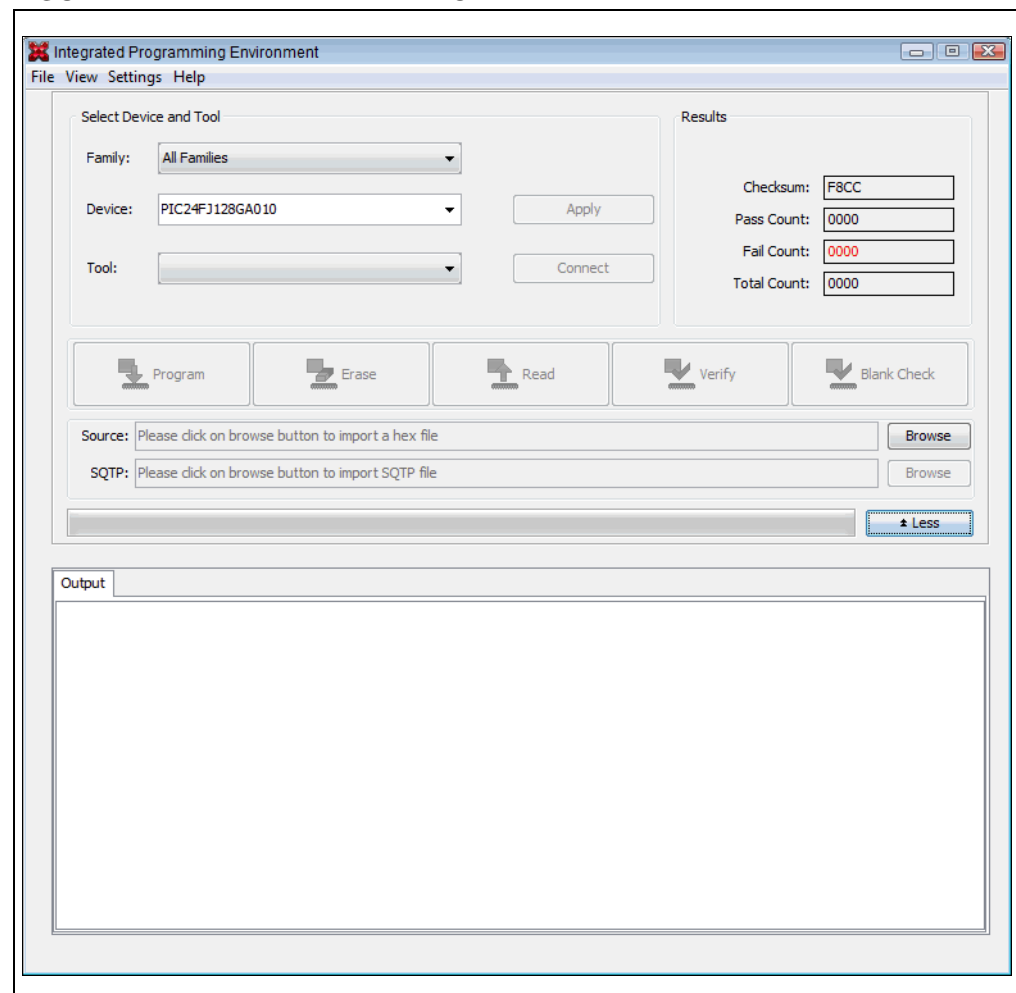
- Launching the IPE Application
- Setting Up the Programmer
- Advanced Mode Login
- Advanced Mode Options

### 2.2 LAUNCHING THE IPE APPLICATION

#### 2.2.1 Launching the IPE

After installing the MPLAB X IDE software, double-click on the MPLAB X IPE application icon found on the desktop. The IPE main window opens.

**FIGURE 2-1: IPE MAIN WINDOW**



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## 2.2.2 Multiple Instances of IPE

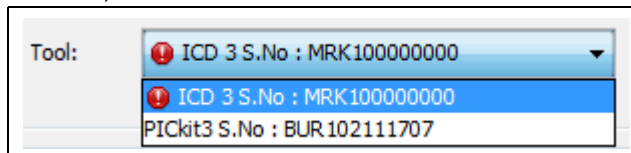
If you need to have multiple instances of the IPE available, refer to the MPLAB X IDE help. Open MPLAB X IDE, go to [Help>Tool Help Contents>MPLAB X IDE Help](#) and navigate to the “Before You Begin” section, then “Launch Multiple Instances of the IDE.” Follow the instruction and apply to the IPE.

## 2.3 SETTING UP THE PROGRAMMER

For programming devices, you can use any of the supported tools (see **Section 1.3 “Programming Tools Supported”**). Refer to the online help of the selected tool (i.e., MPLAB ICD 3, PICkit 3, etc.) for information on programming a device.

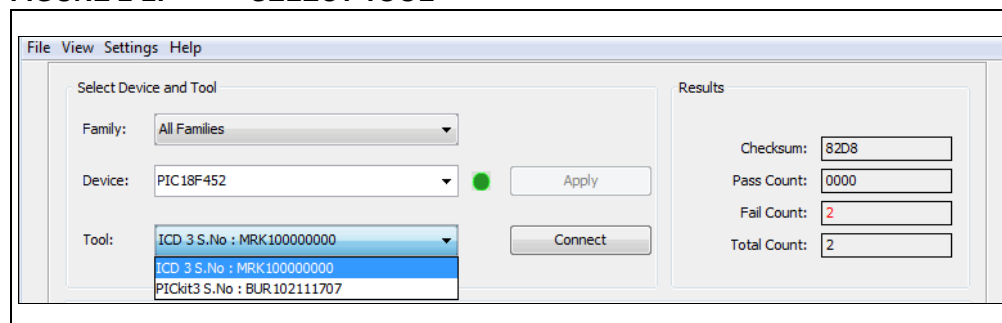
1. Using the Family drop-down menu, select the family of the device you wish to program and use the Device drop-down menu to select the device. Or, use the Device drop-down menu to directly select the device.
2. Click **Apply** to configure the IPE to the current device (e.g., Memory View, checksum).
3. Connect the development tool to the PC. Attach the appropriate target board, device, and power. Refer to the tool's online help for additional instructions and information on connecting to target boards, etc.
4. Use the Tool drop-down menu to select the tool you want to use. If more than one development tool is connected to the PC, select the one you wish to use (see the figure below).

**Note:** An exclamation point before the tool name (as shown below) indicates that the USB drivers need to be updated. This will not occur with the PICkit 3. However, the USB drivers may need to be updated for the MPLAB ICD 3, MPLAB PM3, and REAL ICE.



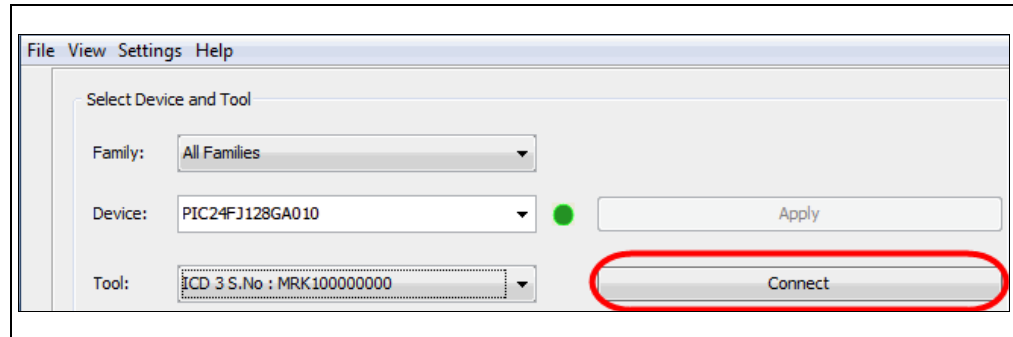
For information on installing the correct USB drivers for Microsoft Windows®, launch MPLAB X IDE and click on the **MPLAB IDE v8 Users - IMPORTANT** link, which is located on the Start Page of the Learn & Discover tab. Follow the instructions to install the driver; then, return to the IPE.

**FIGURE 2-2: SELECT TOOL**



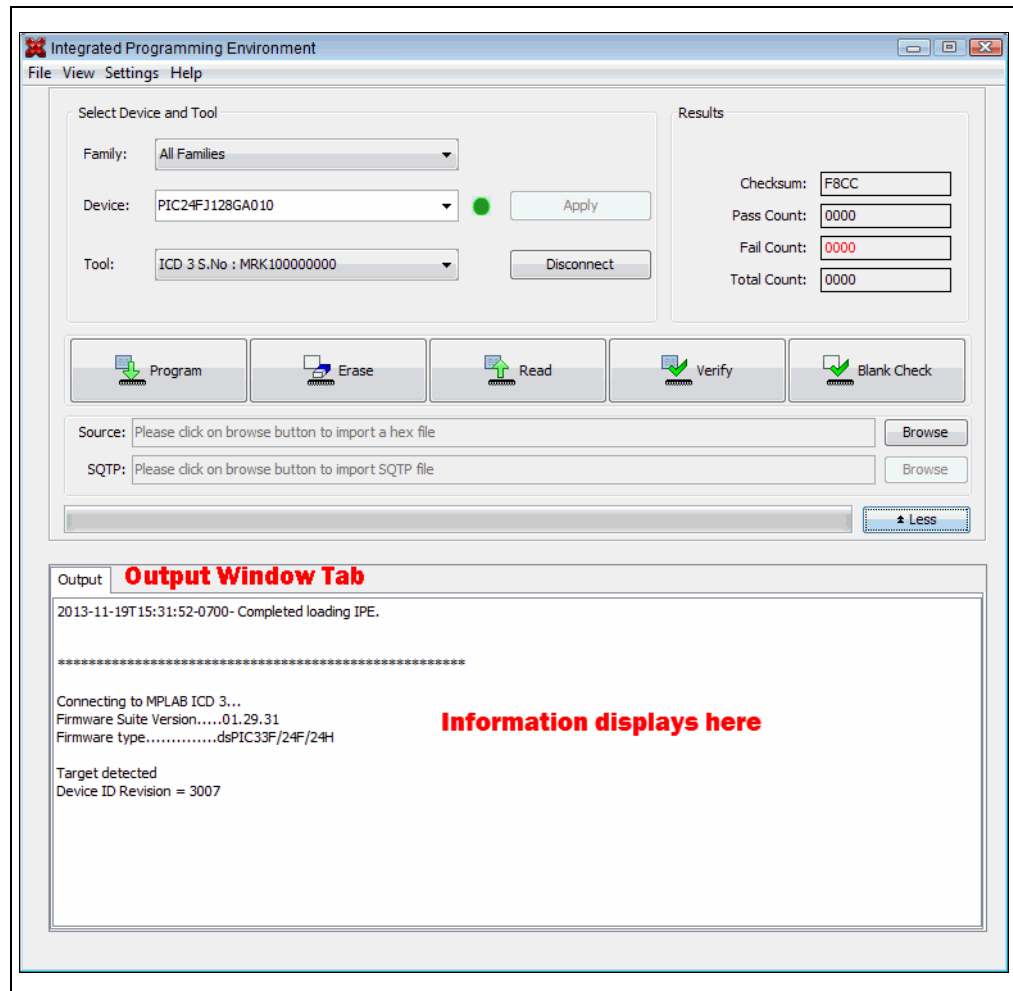
- Click on the **Connect** button (next to the Tool name) to establish a connection between the IPE and the tool.

**FIGURE 2-3: CONNECTING THE TOOL**



- When the tool is connected, any messages or errors related to this tool will be displayed in the Output window.

**FIGURE 2-4: OUTPUT WINDOW**



- After the tool is successfully connected, proceed to **Chapter 3. "IPE Reference"** to program the device with the IPE.

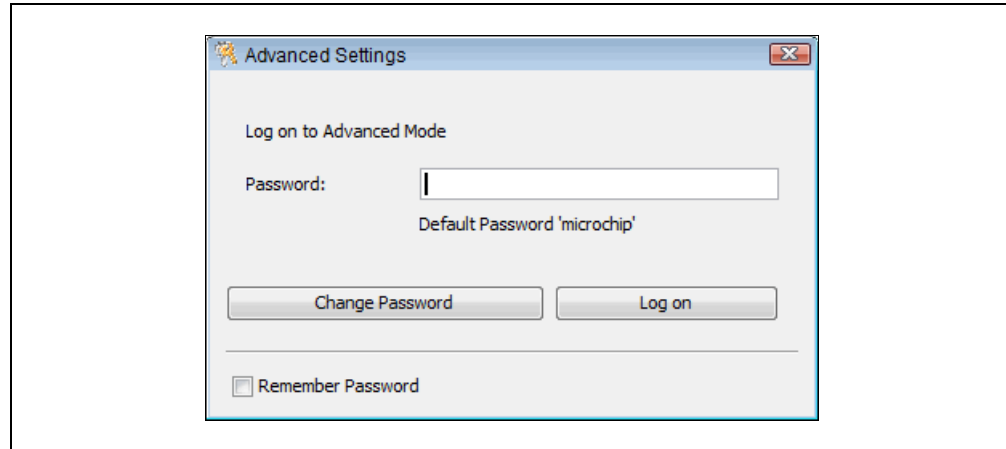
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## 2.4 ADVANCED MODE LOGIN

Typically, someone has been authorized to establish the settings that production will use for the device and tool. To input those settings, log in to the Advanced mode.

1. Select Settings>Advanced Mode to open the Advanced Mode login dialog. The password is case sensitive. Type in the default password `microchip` and click **Log on**.

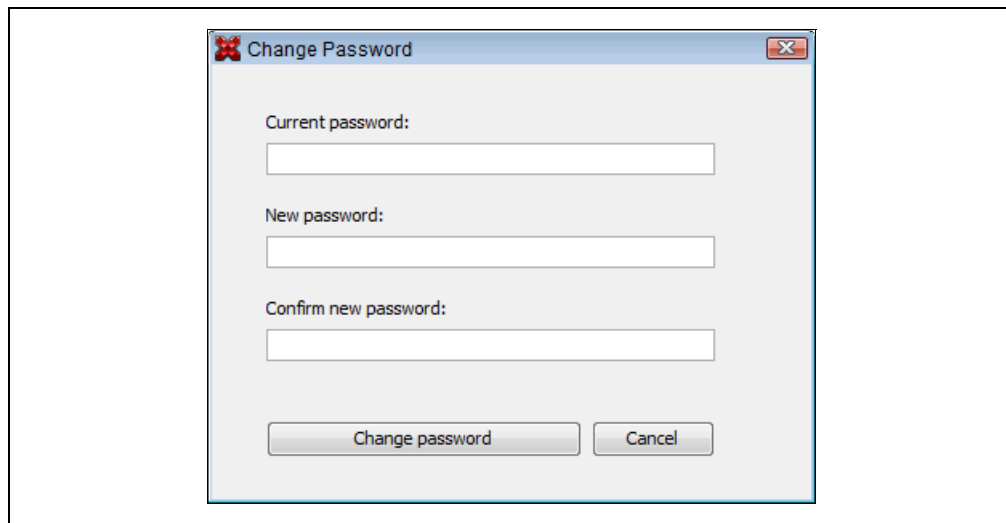
**FIGURE 2-5: ADVANCED MODE LOGIN**



To change the password after the initial log on, click on **Change Password**.

If you forget the new password, you must uninstall the IPE, delete the `ipe.key` file (located in the IPE install directory) to remove any settings made previously in IPE, then reinstall the IPE to begin with the default password `microchip`.

**FIGURE 2-6: CHANGE PASSWORD DIALOG**





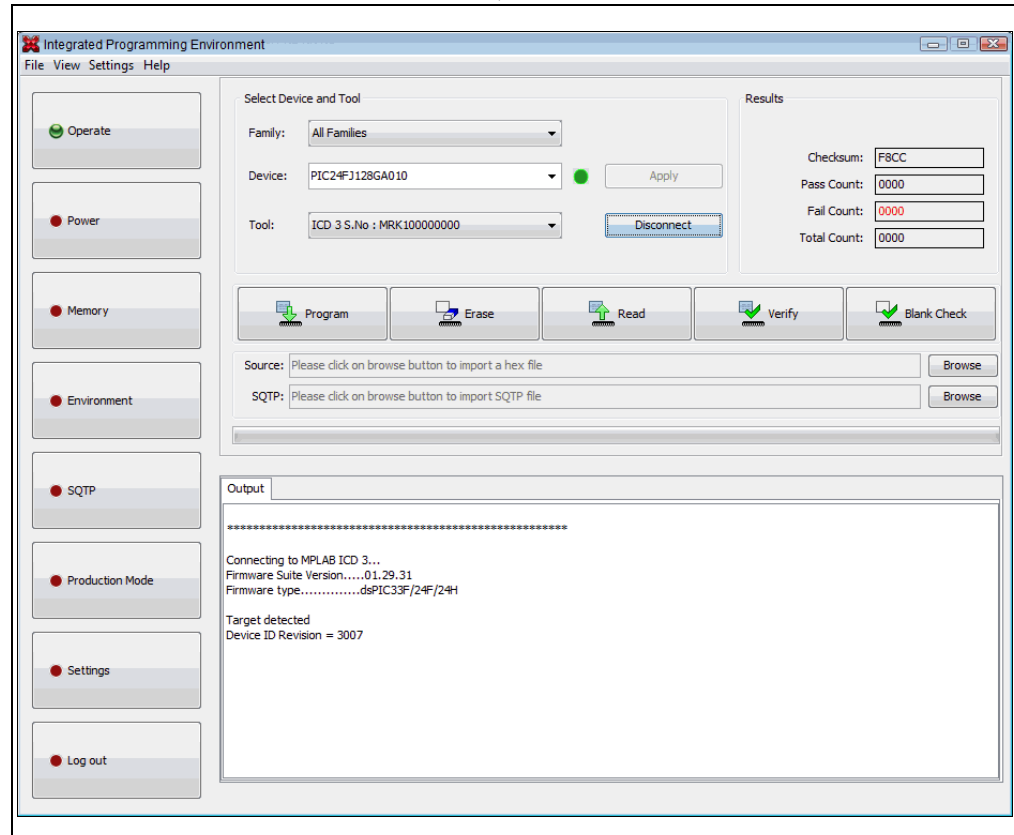
## 2.5 ADVANCED MODE OPTIONS

Advanced mode settings must be set by someone authorized to do so. Some settings that are selected in these dialogs will allow a production specialist to view and control certain options from the Settings Menu.

### 2.5.1 Operate

After validating the password to log in to the Advanced Mode, the dialog opens in the Operate option view. This display is similar to the main display, with the addition of option buttons located along the left side of the window.

**FIGURE 2-7: ADVANCED MODE, OPERATE DIALOG**



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## 2.5.2 Power

The Power option is only available when a tool is connected. From the Advanced Mode dialog, click on **Power** to display the available settings.

**TABLE 2-1: POWER SETTINGS**

Setting	Description
<b>Voltage Settings:</b> Voltages settings will vary for different device families. All of the settings and parameters are similar to MPLAB X IDE.	
VDD	This voltage is used by the programmer to verify memory. The value should be the maximum voltage for the designated circuit. The default is the device's maximum voltage value.
VPP	This is the voltage used to bring the device into a programming mode. Although this is dependent on the device's programming specification, it may be changed.
VDD Nom	The default value depends on the device. For example, PIC32 has 3.3V as default VDD Nom.
VDD APP	This is the voltage used by the programmer to verify Flash memory. The default is the device's nominal voltage value.
Reset Voltages	returns voltages to their default settings
<b>ICSP Options:</b>	
Low voltage program	The tool allows low voltage programming (LVP) with certain PICXXFXXX Flash devices. The Flash device selected must be capable of low voltage and programming must be performed in ICSP mode.
Power Target Circuit from tool	This setting enables the connected tool to power the target.
High Voltage on MCLR	This setting enables high voltage to be used on a Master Clear Reset (MCLR).

## 2.5.3 Memory

From the Advanced Mode dialog, click on **Memory** to display the available settings. You can control the memory address and other parameters related to a programming operation. Some of the options in this window are also available on the main screen, for viewing and to provide easy access to these settings.

**TABLE 2-2: MEMORY SETTINGS**

Setting	Description
<b>Program Memory</b> - define the addresses to be used for range programming of the program memory.	
Start Address:	the starting address in Hex of the program space that will be programmed
End Address:	the ending address in Hex of the program space that will be programmed
Preserve EEPROM*	When the check box is selected, the device will not be programmed with any new data that is present in the memory (shown in the EEPROM window). The data in the EEPROM memory area on the device will not be erased.
Preserve Program Memory Range*	When the check box is selected, the program memory range specified in the following Program Memory (Start and End Address) fields will not be programmed with any new data.
<b>Program Memory</b> - define the range of program memory addresses to be preserved. The Preserve Program Memory Range check box must be selected to activate these fields.	
Preserve Start Address*	the starting address in Hex of the program space that will be preserved
Preserve End Address*	the ending address in Hex of the program space that will be preserved
Reset Addresses	returns addresses to default settings
Allow Tool to select memories and ranges	When the check box is selected, the programmer tool sets the memory types and ranges. If selected, the Program Memory fields are disabled.
<b>Manual select:</b>	
• Program Memory	allows the tool to program program memory
• Auxiliary Memory	allows the tool to program auxiliary memory
• Calibration Memory	allows the tool to program configuration memory
• Boot Flash	allows the tool to program Boot Flash
• User IDs	allows the tool to program User IDs
• EEPROM	allows the tool to program EEPROM
• Flash Data	allows the tool to program Flash data

\* If you wish to use any of the Preserve Memory options, first ensure that your code is **not** code-protected. For memory to be preserved, the programmer reads the section it needs to save, performs a bulk erase of the device, reprograms the device and then rewrites the area that is preserved with what was saved. Therefore, this area cannot be code protected.

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## 2.5.4 Environment

Environments allow you to save specific tool settings, so that all of the same settings can be reloaded again in a different programming session. Environments are supported, under all tools, as either .pen files or .pm3 files.

From the Advanced Mode dialog, click on **Environment** to display the available settings.

**TABLE 2-3: ENVIRONMENT SETTINGS**

Setting	Description
Environment Name	the environment name you specify
.pm3 file	for MPLAB PM3, select this type of file
.pen file	for MPLAB ICD 3, PICKit 3 and REAL ICE tools, select this type of file
Description	the description you use for the environment
SQTP File	the SQTP file name used in the environment
Misc Files	other files used in the environment, e.g., data sheets, instructions, etc. Multiple files can be selected.
Properties	Click this button to display the properties of the SD card in the MPLAB PM3.
Format	Click this button to format the SD card in the MPLAB PM3, erasing all of the contents.
Delete	opens the Delete Environment window
Copy	opens a dialog to select source and destination for copying environment
View	opens the View Environment window
Save to PM3 SD Card	saves the file to a MPLAB PM3 SD card destination
Save to PC	saves file to a destination on the PC

## 2.5.5 SQTP

SQTP (serial quick turn programming) is used to program a unique serial number into each device. This number can be used as an entry code, password or ID number.

From the Advanced Mode dialog, click on **SQTP** to display the available settings.

**TABLE 2-4: SQTP SETTINGS**

Setting	Description
<b>Generation Method:</b>	
Random	Select this option to generate unique, random numbers for each part. Also enter the start address, number of bytes and number of parts in the corresponding fields.
Pseudo Random Seed Value (Hex):	Select this option to generate a pseudo-random set of non-repeating numbers based on the Hex value you enter in the Seed Value field. Also enter the start address, number of bytes and number of parts in the corresponding fields.
Sequential Start Value (Hex): Increment (Hex):	Select this option to generate sequential numbers based on the starting value specified and incrementing each number by the amount specified. Also enter the start address, number of bytes and number of parts in the corresponding fields.
Start Address (Hex)	Enter the starting address (in hex) for the serial number.
Number of bytes (Dec)	Enter the size of the serial number (in decimal). Make sure a large enough serial number is specified for the number of parts planned to program using this file.
Number or parts (Dec)	Enter the number of parts to be programmed using this file.
Generate	Click <b>Generate</b> to create the SQTP (.num) file.
<b>Location:</b>	
Program Memory	Select this option to load the SQTP number in program memory.
EEPROM	Select this option to load the SQTP number in EEPROM.
<b>Access Method:</b>	
RETLW	Select this option to use a series of RETLW (Return Literal W) instructions with the serial number bytes as the literal data.
Raw Data	Select this option to use the raw data.
Format for PSV	If the Raw Data option is selected, selecting Format for PSV formats SQTP data to make it compatible with PSV (Program Space Visibility).

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## 2.5.6 Production Mode

From the Advanced Mode dialog, click on **Production Mode** to display the available Production Mode Settings.

The Production Mode Settings dialog enables authorized personnel to select the options that are available during production programming. The options that are selected in the Production Mode Settings determine which menu items will be available under the File, View and Settings menus in Production Mode.

Select the appropriate settings for your production programming project by checking or unchecking the settings. Selecting a check box in the Production Mode Settings dialog causes a check mark to display in front of that option under the IPE Settings menu.

A check mark indicates that an option has been set in the Advanced Mode. If the item is available and has a check mark, then the production specialist can control this item by toggling it on or off.

**TABLE 2-5: PRODUCTION MODE SETTINGS**

Setting	Description
<b>Production Mode Settings</b>	
Allow Export Hex	enables a production specialist to export Hex files If checked, this option displays under the <i>File&gt;Export</i> menu.
Allow Import Hex file	enables a production specialist to import Hex files. If checked, this option displays under the <i>File&gt;Import</i> menu.
Allow Import Environment	enables a production specialist to import environments. If checked, this option displays under the <i>File&gt;Import</i> menu.
Allow Import SQTP file	enables a production specialist to import SQTP files. If checked, this option displays under the <i>File&gt;Import</i> menu.
Generate Reports	enables reports to be generated. If Generate Reports is checked, click on <b>Browse</b> to set the location where the reports will be placed.
Limit the Program Count to	If selected, this option limits the pass, fail and total counts to the value that is entered into the associated field. This actually halts further programming operations from occurring. To clear the counts on the main window, click <b>Reset Counters</b> .
Allow "Verify Device ID before Program" under the Settings menu	activates this option in the Settings menu and enables a production specialist to control this option This setting is valid only for tools that are capable of performing this function, e.g., MPLAB PM3.
Allow "Auto Download Firmware" under the Settings menu	If selected, this option displays in the Settings menu and can be controlled by a production specialist. If it is not selected, the IPE automatically downloads the latest firmware for the tool, if needed.
Allow "Erase All before Program" under the Settings menu	If selected, this option displays in the Settings menu and can be controlled by a production specialist. If it is not selected, the production specialist cannot control this option from the Settings menu.

**TABLE 2-5: PRODUCTION MODE SETTINGS (CONTINUED)**

Allow “Communication” under the Settings menu	If selected, this option displays in the Settings menu and can be controlled by a production specialist.
Remove Read button from main window	If this option is selected, the Read button is removed from the main window.
Audible notification on successful program completion	If selected, this option generates a sound when programming successfully completes.
Allow memory editing and filling	enables memory editing and filling of memory. If enabled, this option is accessed in Production Mode from the <i>View&gt;Fill Memory</i> option.
<b>Allow Memory View</b>	
Program Memory	If this option is selected, program memory can be displayed in the Memory View pane on the main window.
Auxiliary Memory	If this option is selected, auxiliary memory can be displayed in the Memory View pane on the main window.
Config Memory	If this option is selected, configuration memory can be displayed in the Memory View pane on the main window.
Flash Data	If this option is selected, Flash memory can be displayed in the Memory View pane on the main window.
User IDs	If this option is selected, user IDs can be displayed in the Memory View pane on the main window. This is only applicable if user IDs are supported by the tool.
EEPROM	If this option is selected, EEPROM memory can be displayed in the Memory View pane on the main window.

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## 2.5.7 Settings

From the Advanced Mode dialog, click on **Settings** to display the available options (Figure 2-8).

**FIGURE 2-8: GENERAL SETTINGS OPTIONS**

**TABLE 2-6: GENERAL SETTINGS**

Settings	Description
PICkit 3 programming speed	Use the slider to adjust the programming speed (see Figure 2-9). This option can be used to help troubleshoot problems by slowing the speed down to allow sufficient time for signal levels. The PICkit 3 slider will slow down ICSP programming which may help communication problems brought upon by heavy loading on the ICSP lines. Microchip recommends that these lines are clear of any components. The programming speed control may help to program boards that already have existing components on these lines.



**TABLE 2-6: GENERAL SETTINGS (CONTINUED)**

Settings	Description
PICkit 3 Programmer To Go	Opens the PICkit 3 <b>Programmer To Go</b> dialog (see Figure 2-10) showing the settings that will be applied the next time the Programmer-To-Go feature is used. Enter an Image Name that will be used for the image on the PICkit 3. Click <b>Programmer To Go</b> to activate. Refer to the PICkit 3 In-Circuit Debugger/Programmer User's Guide, DS52116, for information on the Programmer-To-Go feature. This feature may not be supported on all devices.
Secure Segments	
Segments to Program	Available for only devices with CodeGuard, e.g., dsPIC33FJ12GP202, etc. Supported by REAL ICE, MPLAB ICD 3 and PICkit 3. Select the segments to program: <ul style="list-style-type: none"> <li>• Full Chip Programming</li> <li>• Boot, Secure and General Segments</li> <li>• Secure and General Segments</li> <li>• General Segment Only</li> </ul>
SQTP	
Disable operations if SQTP values are exhausted	Selecting the check box prohibits further programming if all SQTP values from the specified .num file have been exhausted.
Program Method	This option allows you to choose the test mode entry method for devices. This feature is supported by the tools which can power the target (except for PM3). This setting refers to the order in which the VPP and VDD voltages will be applied when programming/reading the target device.
Apply VPP before VDD (Recommended)	This is the default setting.
Apply VDD before VPP	Caution is recommended when using this setting as it may have adverse side effects. This options is available only when powering the device from the debug tool.
Diagnostics	
Logging Level	Set the message logging level. <b>OFF:</b> No logging <b>SEVERE:</b> Log severe (error) messages only. <b>WARNING:</b> Log warning messages only. <b>INFO:</b> Log informational messages only. <b>CONFIG:</b> Log configuration information only. <b>FINE:</b> Log some module to module communication. <b>FINER:</b> Log more module to module communication. <b>FINEST:</b> Log all module to module communication.
Log File	Path and name of log file.

FIGURE 2-9: PICKIT 3 SETTINGS OPTIONS

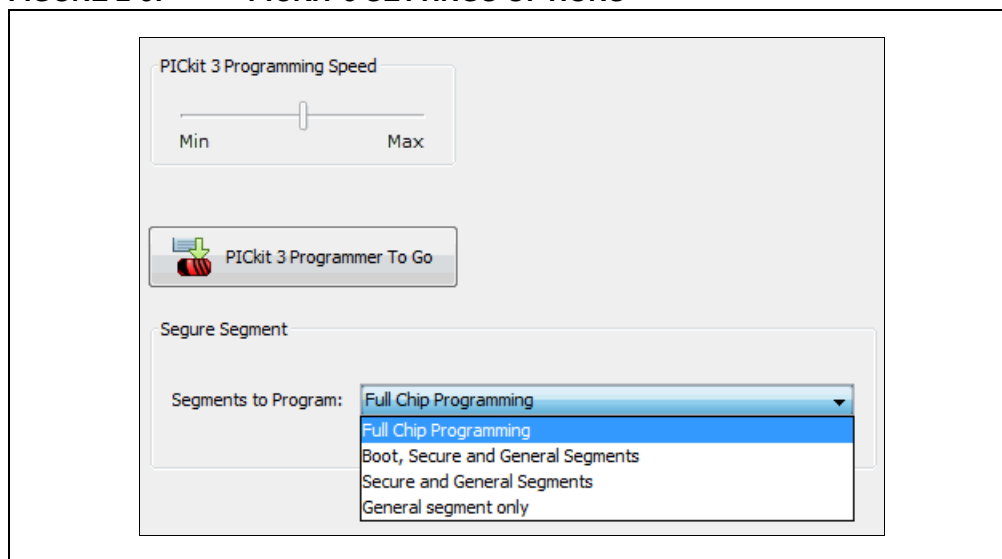
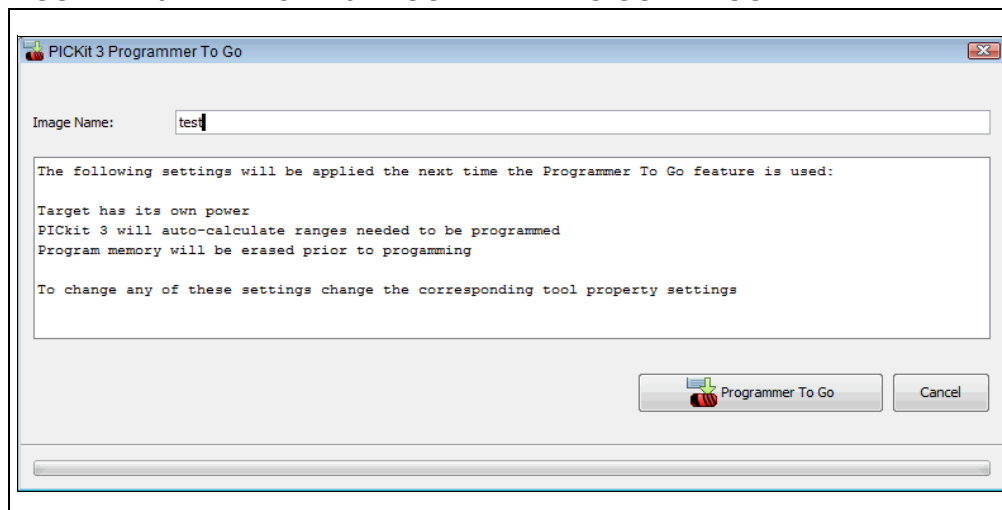


FIGURE 2-10: PICKIT 3 PROGRAMMER TO GO DIALOG



## 2.5.8 Log out

After the settings are selected, click **Log out** to save your settings, exit the Advanced Mode, and return to the main window.

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## **Chapter 3. IPE Reference**

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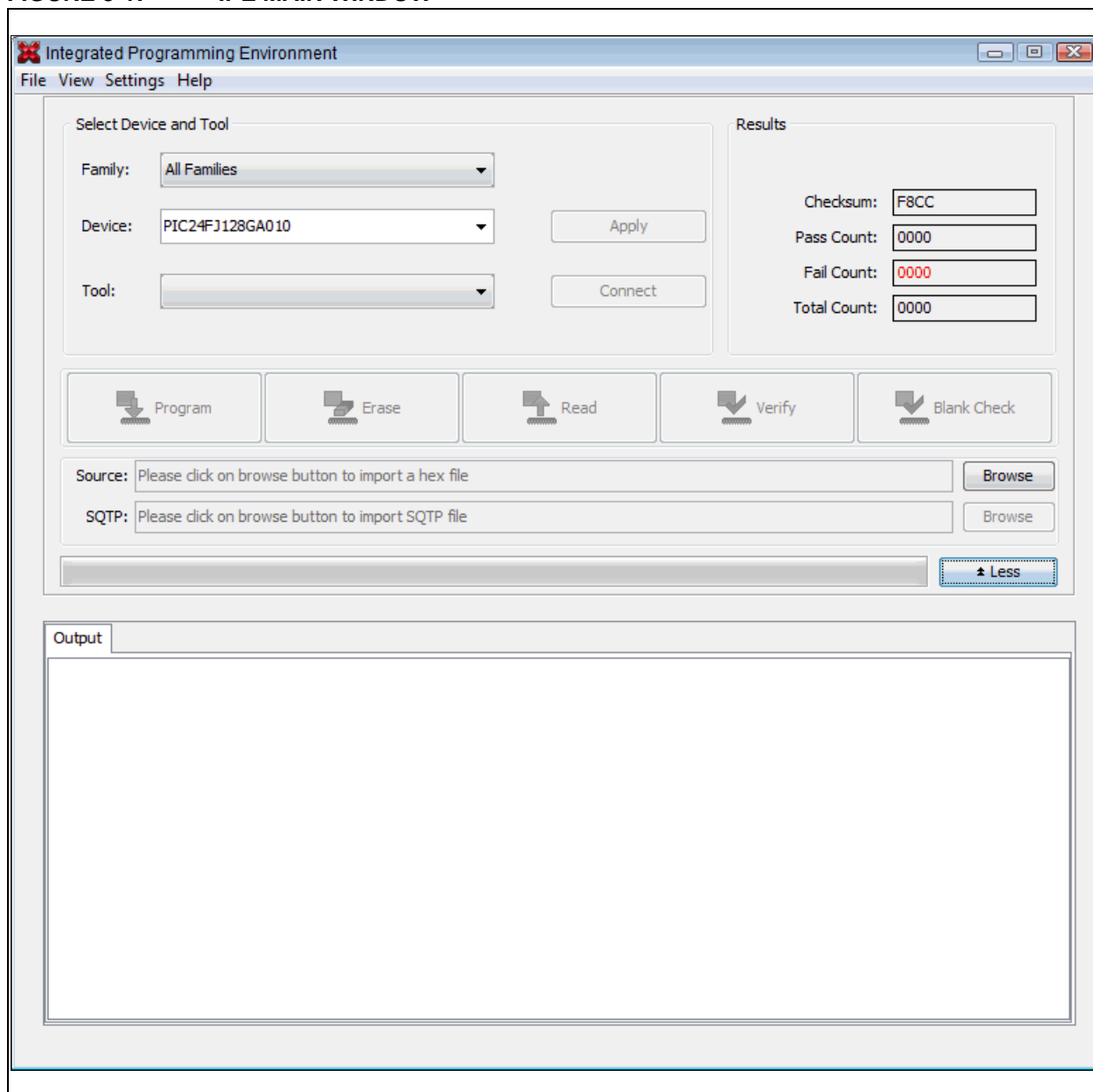
### **3.1 IPE MAIN WINDOW**

The following figure shows the main window of the Integrated Programming Environment. The IPE main menu contains the following menus with commands:

- File Menu
- View Menu
- Settings Menu
- Help Menu

# Integrated Programming Environment User's Guide

FIGURE 3-1: IPE MAIN WINDOW



**TABLE 3-1: IPE MAIN WINDOW FIELDS**

Item	Description
<b>Select Device and Tool:</b>	
• Family	filters devices by family
• Device	specifies the device; click <b>Apply</b> to select
• Tool	specified the tool; click <b>Connect</b> or <b>Disconnect</b> as appropriate
<b>Results:</b>	
• Checksum	checksum value for the device with current memory contents
• Pass Count	details the programming operations that passed
• Fail Count	details the programming operations that failed
• Total Count	the total amount of programming operations
<b>Command Buttons:</b>	
• Program (Alt+F5)	programs the device
• Erase(Alt+F6)	erases the device
• Read(Alt+F7)	reads the device
• Verify(Alt+F8)	performs a verify operation on the device
• Blank Check(Alt+F9)	checks whether the device is blank
<b>Other:</b>	
Source	the hex file location— <b>Browse</b> to locate the file
SQTP	the SQTP file location— <b>Browse</b> to locate the file
More/Less	display more or less information
Output Tab	display of output data. Right-click in the Output window to split the view and show the tools
Tool Tab	display of specific tool data, i.e., PM3, ICD 3, PICkit 3 If a tool is connected, right-click in the Output area and select <i>Split View</i> to display the tool tab.
Memory View	displays only if the <i>View&gt;Show Memory</i> is selected This option displays memory addresses, device ID, configuration memory, etc.

## 3.2 FILE MENU

The File Menu provides three options: Import, Export, Exit.

### 3.2.1 File>Import

The Import menu item allows you to import files into the IPE:

1. File->Import->Hex – select to import the hexadecimal file (\*.hex).
2. File->Import->Environment – select to import the environment (\*.pen or .pm3 file).
3. File->Import->SQTP – select to load the SQTP file (\*.num file).

### 3.2.2 File>Export

The Export menu item allows you to export data from IPE to storage media. By default, these options are not available in Production Mode. However, in Advanced Mode, an authorized user can change the default states of this feature for the Production Mode.

File->Export->Hex – this option allows you to export all the memory contents into Intel® Hex file format.

### 3.2.3 File>Exit

This option closes the IPE application.

## 3.3 VIEW MENU

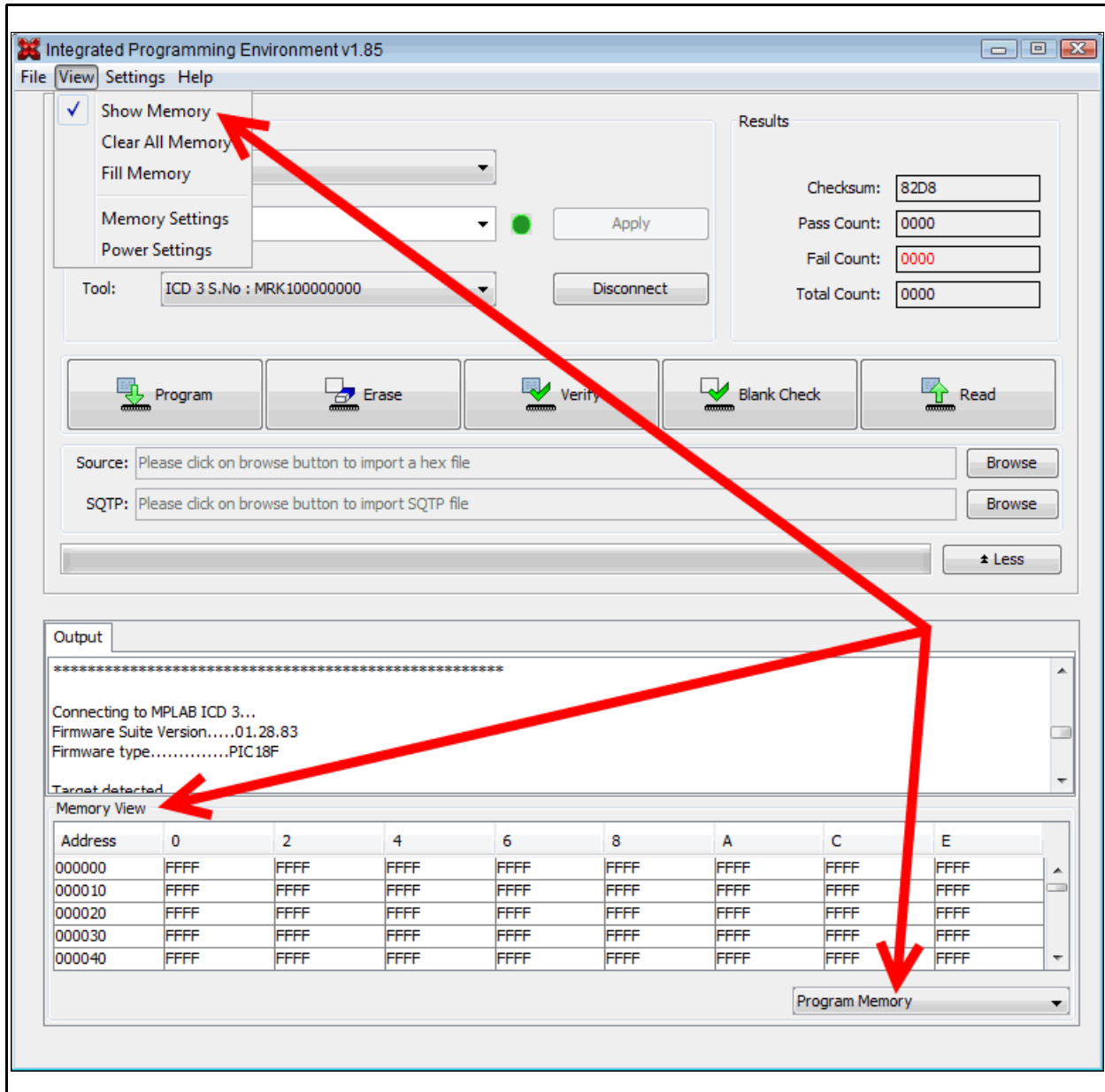
The View menu options are described below:

- Show Memory
- Clear All Memory
- Fill Memory
- Memory Settings
- Power Settings

### 3.3.1 Show Memory

The specific kinds of memory that are shown are determined by Advanced or Production Mode settings. This option toggles between showing and not showing the memory. A check mark before the option indicates it is enabled (showing) in the Memory View pane located near the bottom of the window; unchecked indicates that the memory is not showing.

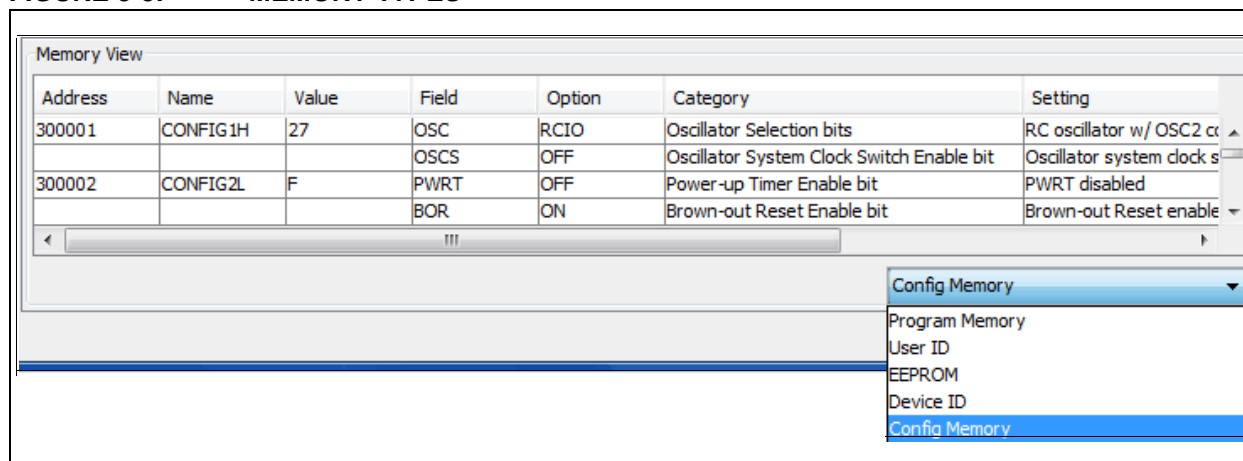
FIGURE 3-2: MEMORY VIEW PANE



The viewable memory types are determined by the Production settings that are set in the Advanced Mode.

# Integrated Programming Environment User's Guide

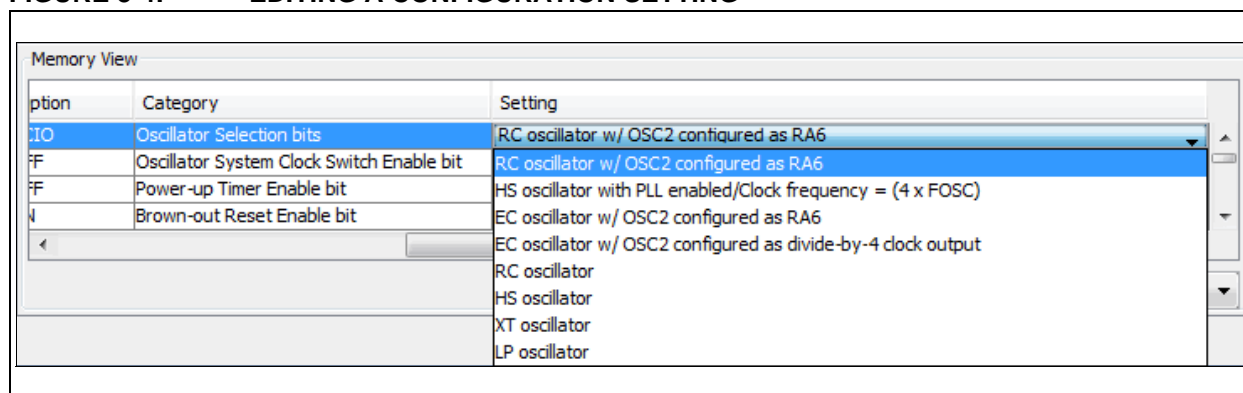
**FIGURE 3-3: MEMORY TYPES**



If enabled, the configuration settings can be edited. Select Config Memory from the drop-down list in Memory View. Use the scroll bar to view the Setting column. Click the setting you want to edit and a list displays that shows the options that are available for that setting. Click on your selection.

This is shown in the following figure.

**FIGURE 3-4: EDITING A CONFIGURATION SETTING**





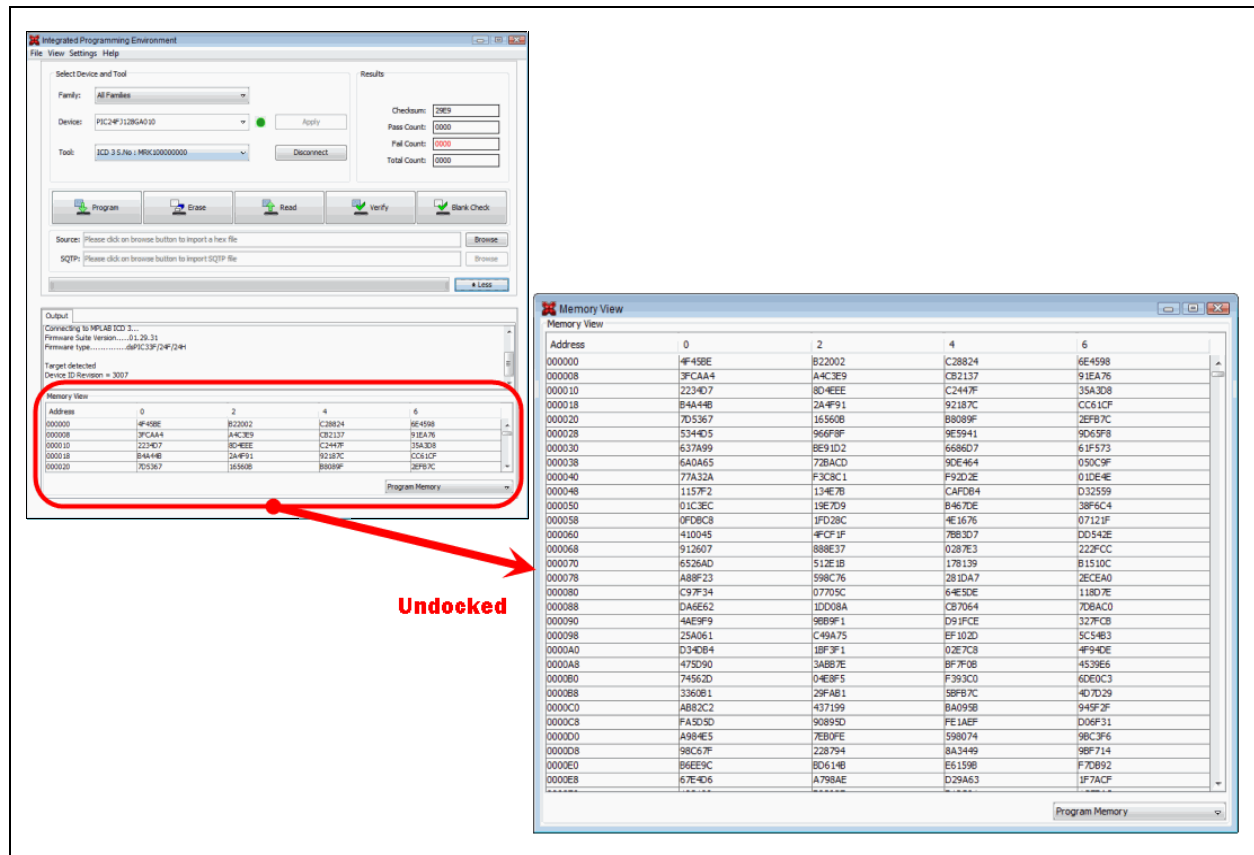
## 3.3.1.1 RIGHT-CLICK MENU OPTIONS

**Undock/Dock** – when viewing the memory window, a right-click menu is available with options to undock/dock, fill memory and print.

The memory window can be undocked to view a larger area in a separate window. Right-click on any value in the Memory View and select *Undock* (see Figure 3-5).

To return the undocked window to the IPE window, either close the memory window or right-click and select *Dock*.

**FIGURE 3-5: UNDOCKED MEMORY VIEW**



**Fill Memory** – you can also access this dialog by right-clicking on any value in the Memory View window and select *Fill Memory*.

**Print** – to print the memory window, right-click on any value in the Memory View window and select Print.

Note: this command will print the entire contents of the memory. So, if you have a large device, such as a PIC32, the printout will probably be quite large. You might consider printing to a file, rather than to a printer, in some cases.

## 3.3.2 Clear All Memory

Clears all of the memory views.

### 3.3.3 Fill Memory

If enabled in Advanced Mode, the Fill Memory option is available in Production Mode under the View menu.

FIGURE 3-6: FILL MEMORY DIALOG

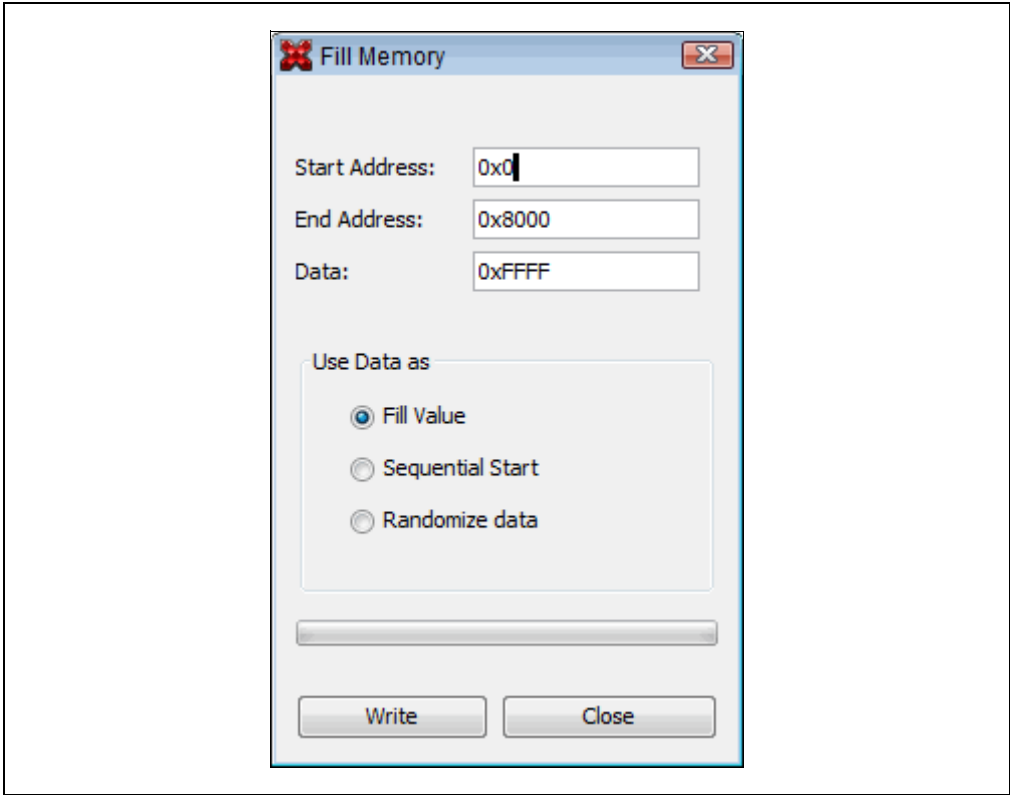


TABLE 3-2: FILL MENU OPTIONS

Setting	Description
Start Address	start address of the fill operation
End Address	end address of the fill operation
Data	the value used for the fill operation
Use Data as	Fill Value – fills each address with the Data value Sequence Start – fills each address with incrementing Data value Randomize – fills each address with a random value
Write	writes addresses to the memory view
Close	exits the dialog

### 3.3.4 Memory Settings

Displays the current memory settings. The Memory Settings are view-only and cannot be changed from this window.

### 3.3.5 Power Settings

Displays the current power settings.

## 3.4 SETTINGS MENU

The Settings menu provides access to the Advanced Mode. Select *Settings>Advanced Mode* to display the login dialog. Once the login is validated, additional settings can be set by an authorized personnel.

Refer to “**Setting Up the Programmer**” and “**Advanced Mode Options**”.

### 3.4.1 Understanding the Settings Display

Menu options are shown as active or unavailable (grayed out).

Menu items that are active and have a check mark indicate that the Production can control these settings.

Menu options that are unavailable and have a check mark indicate that these options have been set in Advanced Mode, but that production personnel cannot control these settings.

Menu items that are active and do not have a check mark indicate that the authorized personnel can access them.

Menu options that are not enabled for the Production mode are shown as grayed menu items.

**TABLE 3-3: SETTINGS MENU OPTIONS**

Setting	Description
Advanced Mode	This option opens the Advanced Mode login dialog. Refer to “ <b>Setting Up the Programmer</b> ” and “ <b>Advanced Mode Options</b> ” for more information.
Verify Device ID Before Program	This option is only appropriate when using devices that have device IDs.
Erase All Before Program	This option is used to control whether or not the contents of the device will be erased before it is programmed. It is not applicable to One-Time-Programmable (OTP). When the “Erase All Before Program” option is enabled (check box is checked), the device will be erased before it is programmed. If it is disabled (unchecked), the device will not be erased before it is programmed.
Auto Download Firmware*	If this option is selected, the application verifies the firmware is the latest available; and, if needed, downloads the newer firmware automatically.
Manual Download Firmware*	This option enables manual download of firmware.
Hold on Reset	prevents the code from running after programming
Release from Reset	removes the Reset and allows the code to run
Communication	This option enables communication to be set for COM or USB ports.

\* The download of firmware will not occur until the connect/disconnect button is clicked or a programming operation is performed.

## 3.5 HELP MENU

The Help menu provides access to the online user's guide and information about the program.



# INTEGRATED PROGRAMMING ENVIRONMENT USER'S GUIDE

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## Support

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### INTRODUCTION

Please refer to the items discussed here for support issues.

- Warranty Registration
- The Microchip Web Site
- myMicrochip Personalized Notification Service
- Customer Support

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# Integrated Programming Environment User's Guide

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When you are selecting your preferences, choosing “Development Systems” will populate the list with available development tools. The main categories of tools are listed below:

- **Compilers** – The latest information on Microchip C compilers, assemblers, linkers and other language tools. These include all MPLAB C compilers; all MPLAB assemblers (including MPASM™ assembler); all MPLAB linkers (including MPLINK™ object linker); and all MPLAB librarians (including MPLIB™ object librarian).
- **Emulators** – The latest information on Microchip in-circuit emulators. These include the MPLAB REAL ICE in-circuit emulators
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- **MPLAB X IDE** – The latest information on Microchip MPLAB X IDE, the Windows® Integrated Development Environment for development systems tools.
- **Programmers** – The latest information on Microchip programmers. These include the device (production) programmers MPLAB REAL ICE in-circuit emulator, MPLAB ICD 3 in-circuit debugger, MPLAB PM3, and PICKit 3 development (nonproduction) programmer.
- **Starter/Demo Boards** – These include MPLAB Starter Kit boards, PICDEM demo boards, and various other evaluation boards.

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- Technical Support

Customers should contact their distributor, representative or field application engineer (FAE) for support. Local sales offices are also available to help customers. A listing of sales offices and locations is included in the back of this document. See our web site for a complete, up-to-date listing of sales offices.

Technical support is available through the web site at <http://support.microchip.com>.

Documentation errors or comments may be emailed to [docerrors@microchip.com](mailto:docerrors@microchip.com).

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