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MICROCHIP 50003215A Compiler Advisor in MPLAB X IDE User Guide

Compiler Advisor in MPLAB X IDE
User's Guide

Contents

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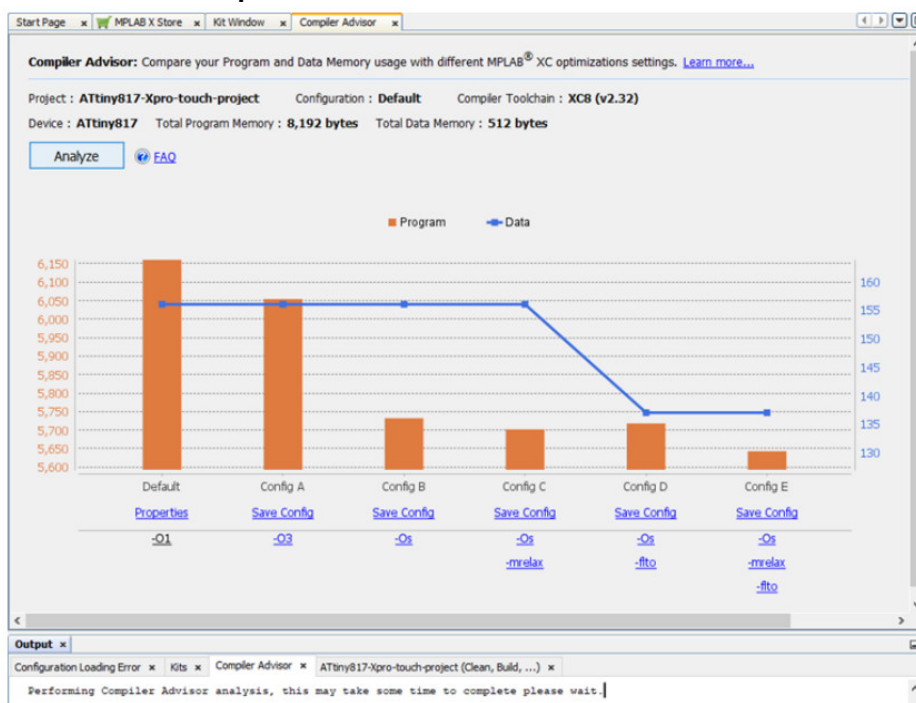For the most up-to-date information, find help for your tool at **onlinedocs.microchip.com/**.

Compiler Advisor

Note: This content is also in the "MPLAB X IDE User's Guide" (DS-50002027).

Compiler Advisor displays a graphical comparison of sets, with carefully selected available compiler optimizations using project code.

Figure 1-1. Compiler Advisor Example

This MPLAB X IDE plug-in can be useful in:

- Providing information on available compiler optimizations for each compiler type (XC8, XC16, XC32).
- Demonstrating the advantages each optimization provides for a project in an easy-to-read, graphical form for program and data memory size.
- Saving desired configurations.
- Providing links to optimization definitions for each configuration.

Compiler Support

Supported compiler versions:

- MPLAB XC8 v2.30 and later
- MPLAB XC16 v1.26 and later
- MPLAB XC32 v3.01 and later

No license is required for use. However, the number of optimizations for a free compiler will be less than for a licensed compiler.

MPLAB X IDE and Device Support

All devices supported in MPLAB X IDE will be supported in Compiler Advisor. Updated Device Family Packs (DFPs) will add device support.

1.1 Perform Project Analysis

To use the Compiler Advisor to analyze your project for different combinations of optimizations, follow the procedures in the following sections.

1.1.1 Select Project for Analysis

In MPLAB X IDE, open a project and in the Projects window either click on the project name to make it active or right click on the project name and select "Set as Main Project."
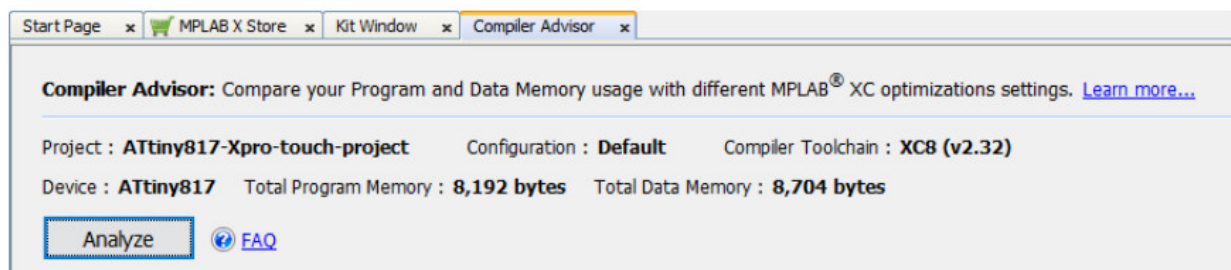
The project code, configuration, compiler and device will be used for the analysis. Therefore ensure that the compiler and device pack versions are supported as specified in 1. Compiler Advisor.

Note: You will be warned in Compiler Advisor before analysis if the compiler and device pack versions are not correct.

1.1.2 Open Compiler Advisor

Open the Compiler Advisor. Select Analysis>Compiler Advisor either by right clicking on the project or by using the Tools menu. Information about the selected project will be loaded into the Compiler Advisor and displayed at the top of the window (see figure below). Additionally, there are links to learn more about the Compiler Advisor or view Frequently Asked Questions.

**Figure 1-2. Compiler Advisor with Project Information**

Verify that the project name, project configuration, compiler toolchain and device are correct for analysis. If you do not have a supported compiler or device pack version selected for your project, a note will be displayed. For example, a note about unsupported compiler versions will have links to help you (see figure below):

- Click "install" to open the MPLAB XC C Compiler webpage where you can download or purchase an updated compiler version.

- Click "Scan for Build Tools" to open the Tools>Options>Embedded>Build Tools tab where you can scan your system for existing compiler versions.

- Click "switch" to open project properties for compiler version selection.

Once you have completed any needed update, the Compiler Advisor will detect the change and request that you click Reload. Clicking this button will update the project information.

Figure 1-3. Note on Unsupported Compiler Version
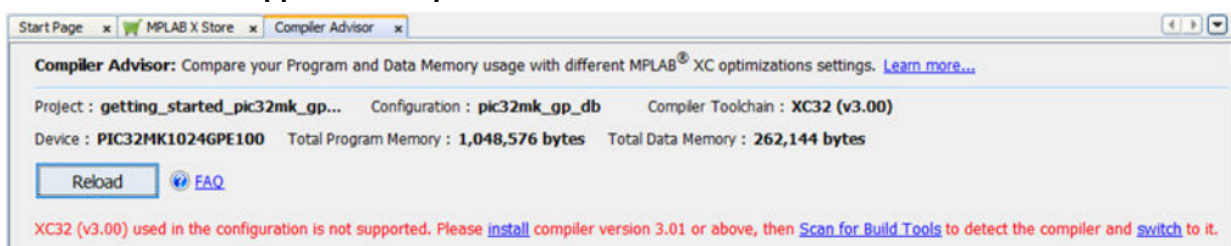
If you make other changes to the project, such as changing the configuration, you will also need to Reload.

1.1.3 Analyze the Project

Once any project modifications are complete and loaded into the Compiler Advisor, click Analyze. The Compiler Advisor will build the project code several times using different sets of optimizations.

Note: Depending on code size, this may take some time.

When the analysis is complete, a graph will appear showing program and data memory used for each of the different configurations (see figures below). For a compiler in Free mode, the last column will show a PRO

compiler comparison. To buy a PRO license, click the "Buy License" link to go to the MPLAB XC Compiler webpage to select the type of PRO license to buy.

The analysis information is saved in the project folder.

For details on the chart, see 1.2 Understand Analysis Results in Chart.
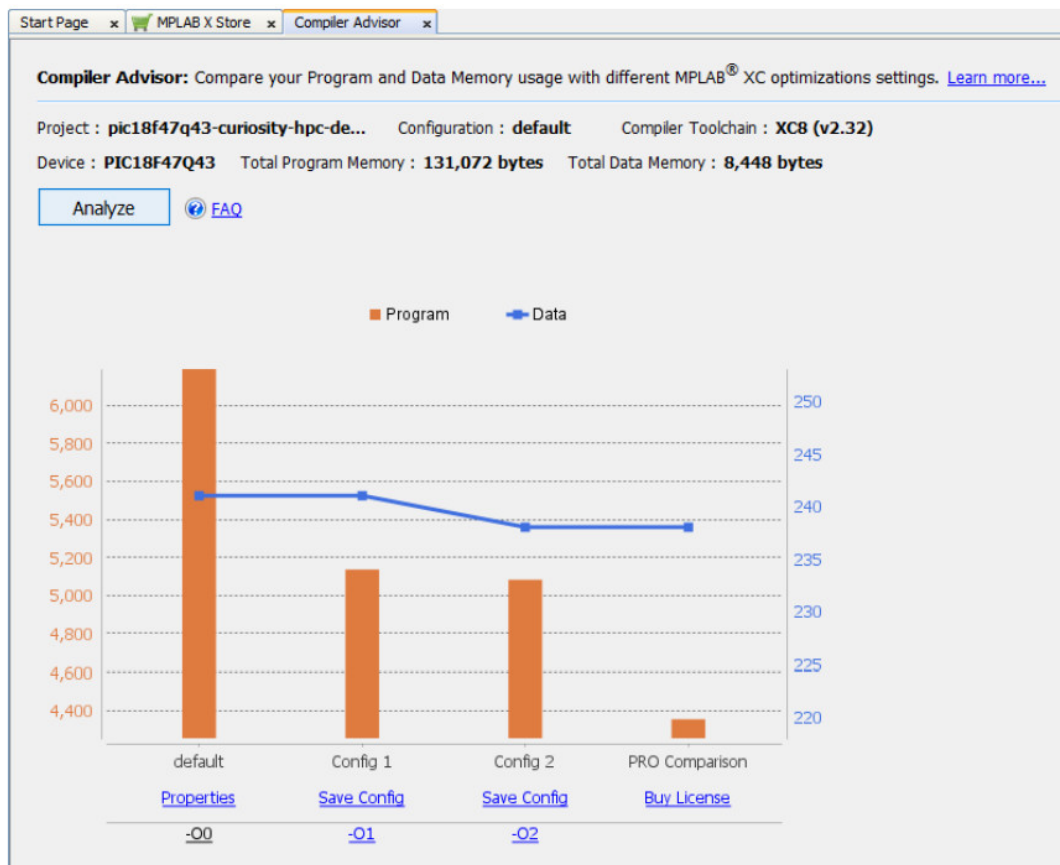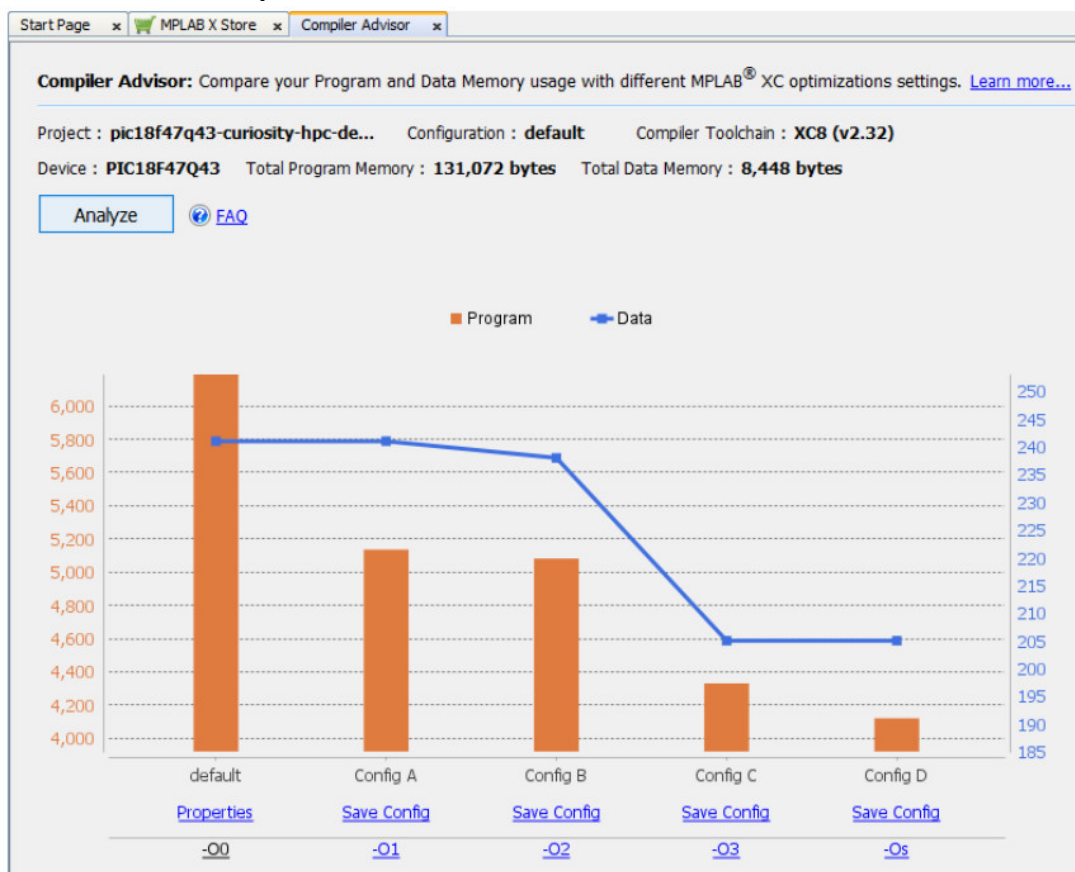
Figure 1-4. Free License Example
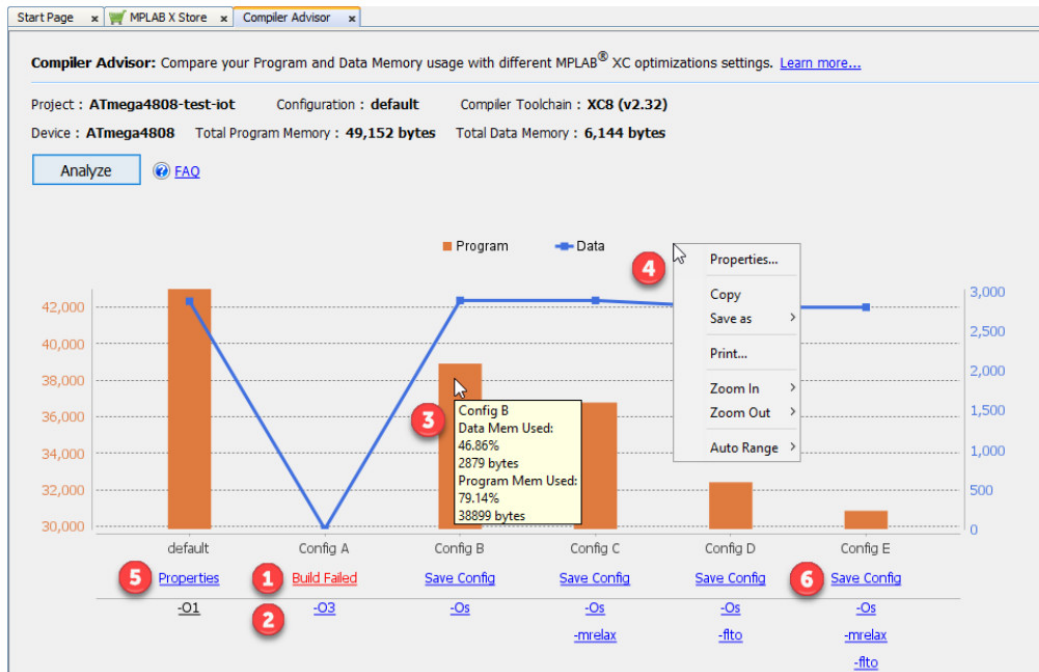

Figure 1-5. PRO License Example

1.2 Understand Analysis Results in Chart

The chart generated after analysis has several features explained in the following sections. Use these features to determine if another configuration is right for your application.

Figure 1-6. Annotated Chart Features

1.2.1 Find Build Failures

When a build fails due to certain optimization selections, you can click on Build Failed to go to where the error(s) are in the Output window.

Figure 1-7. Build Failed Link
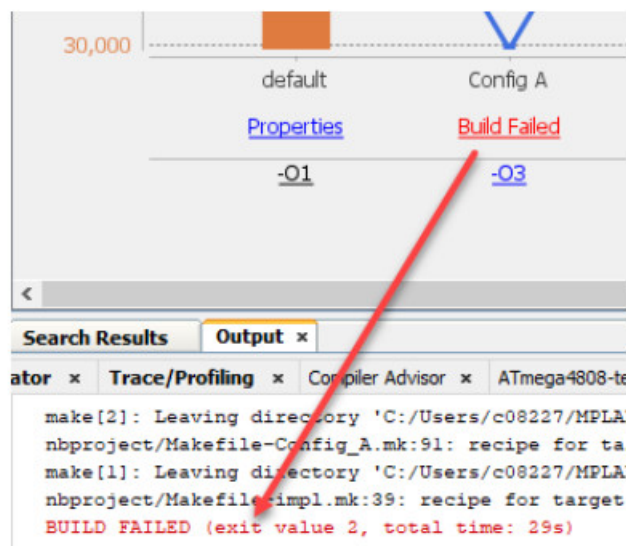
1.2.2 View Configuration Optimizations

Click the link of an optimization (e.g., -Os) used in a configuration to get more information. The link will take you to a description of the optimization in the compiler online documentation.

Figure 1-8. Click to See Optimization Description

1.2.3 View Configuration Data

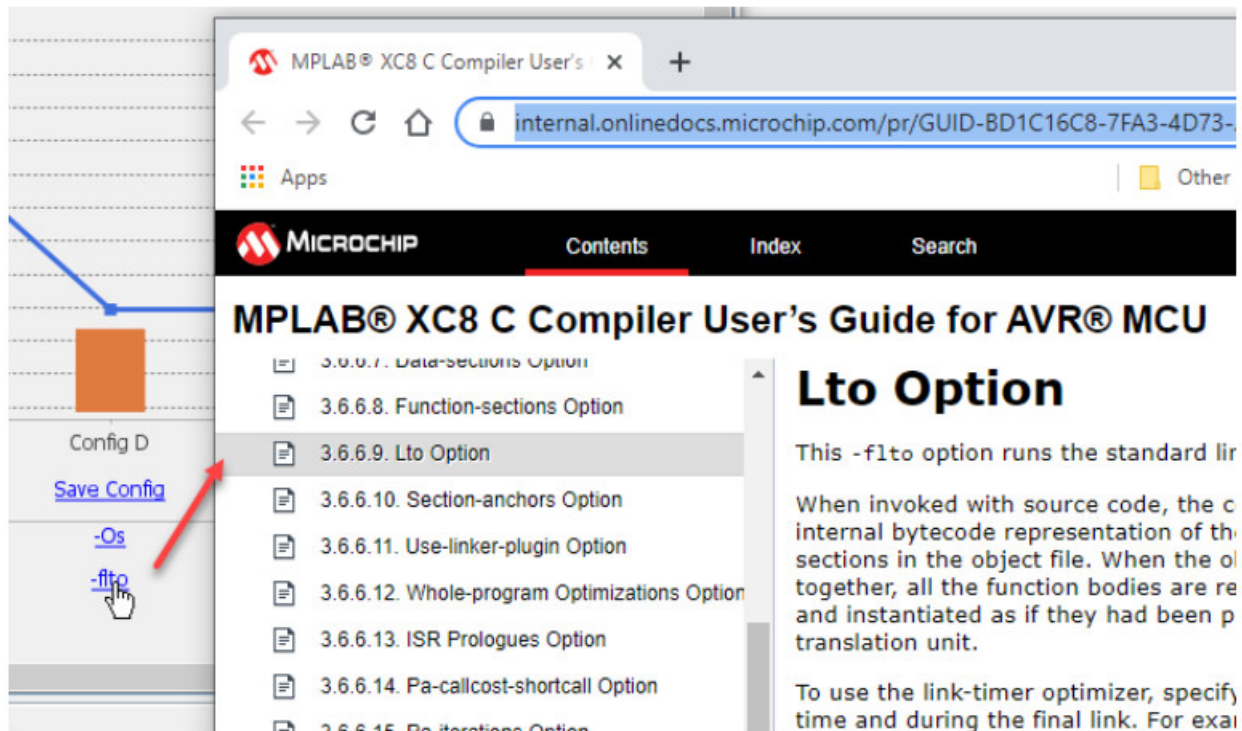To see the percentage and bytes of program and data memory used for each build configuration, mouseover a program memory bar for MCUs (see figure) and a data memory point for MPUs.

Figure 1-9. MCU Mouseover for Tooltip
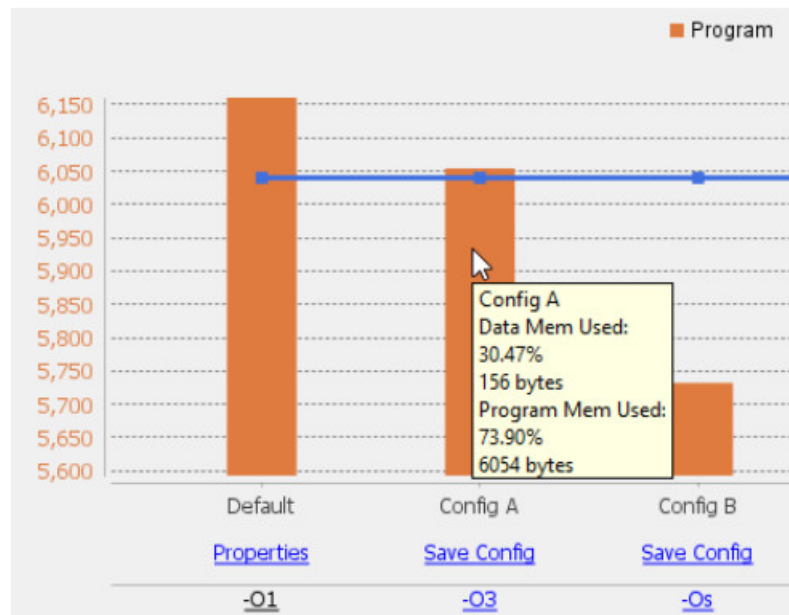
1.2.4 Use Context Menu Functions

Right click on the chart to pop up the context menu with items listed in the table below.

Table 1-1. Compiler Analysis Context Menu

| Menu Item	Description
Properties	Open the Chart Properties dialog. Add a title, format the plot or select other drawing options.
Copy	Copy an image of the chart to the clipboard. You may need to alter the Properties.
Save As	Save the chart as an image. You may need to alter the Properties.
Print	Print an image of the chart. You may need to alter the Properties.
Zoom In/Zoom Out continued	Zoom in or zoom out on the selected chart axes.
Auto Range	Automatically adjust the range of the selected axes for the data in the chart.

1.2.5 View Initial Configuration

To view the initial project configuration used, click on "Properties" to open the Project Properties window.
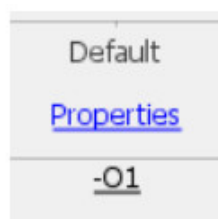
1.2.6 Save Configuration to Project

Click on the "Save Config" link under a configuration (e.g., Config E) that you want to add to your project. This will open the Save Configuration to Project dialog (see figure below). If you want this to be the active configuration in the project, check the checkbox. Then click OK.

Figure 1-10. Save Configuration to Project
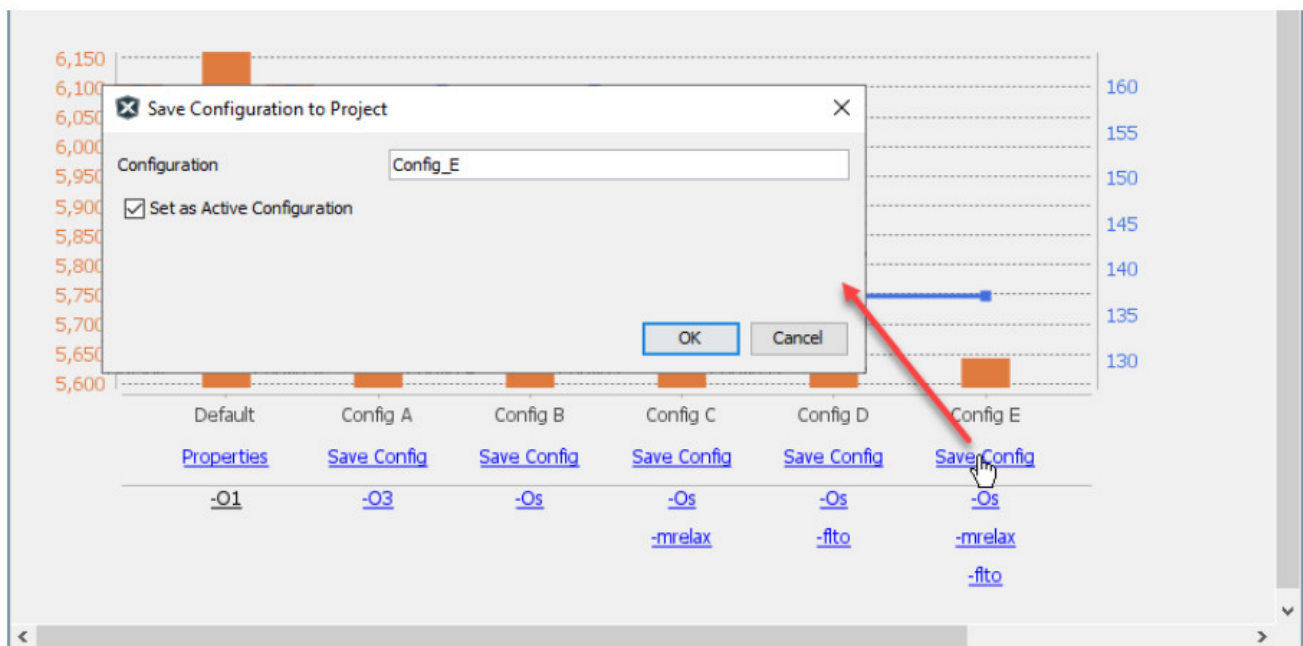
To open the Project Properties to see the added configuration, click the link in the Output window.

Figure 1-11. Open Project Properties from Output Window
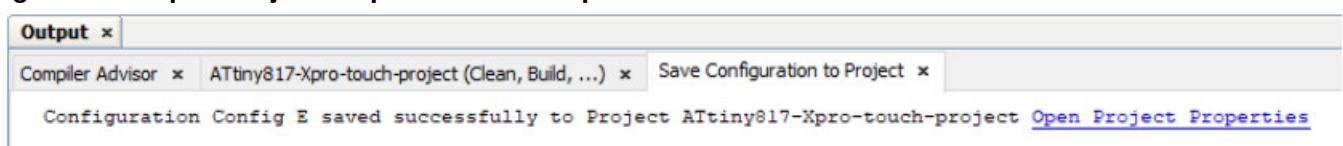
The configuration is now added to the project. If the configuration was made active, it will also appear in the toolbar drop-down list.

Figure 1-12. Configuration Saved to Project

Note: Because the configuration has been added to the project, the Compiler Advisor will notice a change to the project properties and change Analyze to Reload.

1.3 Understand MPU Charts

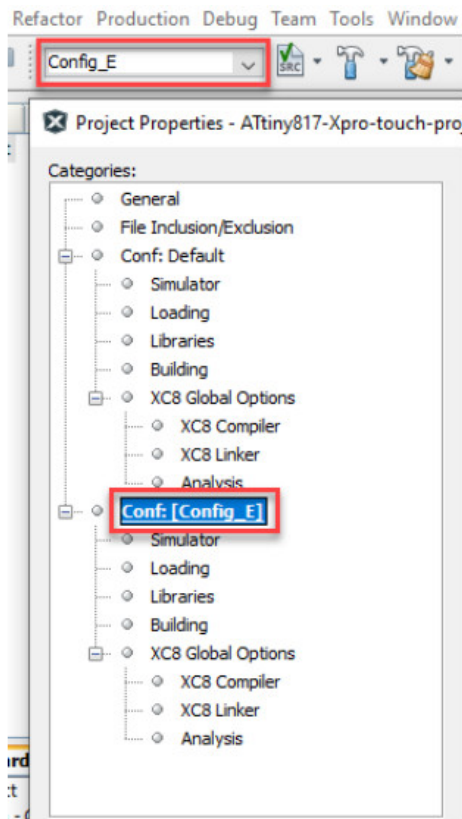The procedure to perform project analysis and the features of the resulting analysis chart are similar to those mentioned previously for MCU devices. Differences for MPU charts are:

- MPU devices will only display information as data due to a combined program/data memory compiler output file.

- Data for each configuration may be seen by mousing over a data memory point.

Figure 1-13. MPU Chart from Analysis
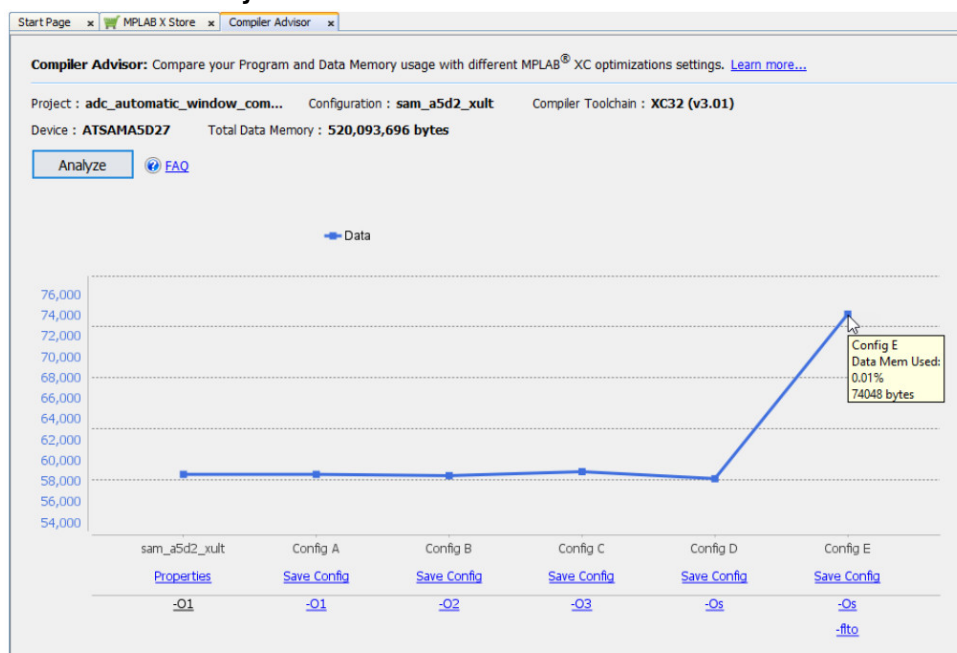
1.4 Analyze Another Project

If you decide to analyze another project, select that project by making it active or main (see 1.1.1 Select Project for Analysis). Then reopen the Compiler Advisor (see 1.1.2 Open Compiler Advisor). A dialog will ask if you want to change from the existing project to the new project (see figure below). If you select Yes, then the Compiler Advisor

window will be updated with the details of selected project.

The Microchip Website

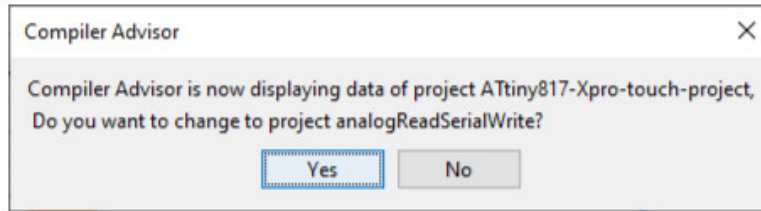Microchip provides online support via our website at **www.microchip.com/**. This website is used to make files and information easily available to customers. Some of the content available includes:

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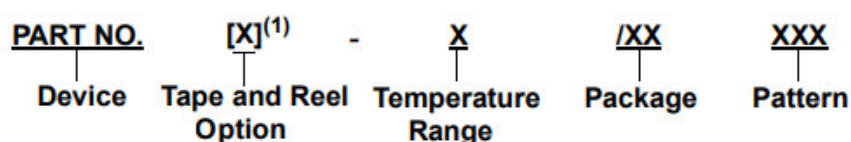
Device:	PIC16F18313, PIC16LF18313, PIC16F18323, PIC16LF18323	
Tape and Reel Option:	Blank	= Standard packaging (tube or tray)
	T	= Tape and Reel(1)
Temperature Range:	I	= -40°C to +85°C (Industrial)
	E	= -40°C to +125°C (Extended)
Package:(2)	JQ	= UQFN
	P	= PDIP
	ST	= TSSOP
	SL	= SOIC-14
	SN	= SOIC-8
	RF	= UDFN
Pattern:	QTP, SQTP, Code or Special Requirements (blank otherwise)	

Examples:

- PIC16LF18313- I/P Industrial temperature, PDIP package
- PIC16F18313- E/SS Extended temperature, SSOP package

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