SAR ADC Utility User Manual

MICROCHIP TECHNOLOGY INC.

CONTENTS

PURPOSE AND USE OF THE SOFTWARE

The SAR ADC Utility software was designed to support Microchip SAR ADC devices. The following evaluation boards are supported by this software:

- ADM00872
- ADM00873

APPLICATION REQUIREMENTS

The following items are required for the application to run properly:

Supported Operating Systems:	Microsoft Windows OS (XP SP3 or later)
Admin Privileges Required?	For installation only
Other Requirements*:	MCR (MATLAB Compiler Runtime 2013a)

*= All dependencies are checked for during the installation and will be installed if they are needed.

Note: This software works best on monitors with a resolution of at least 1280 x 720 or higher.
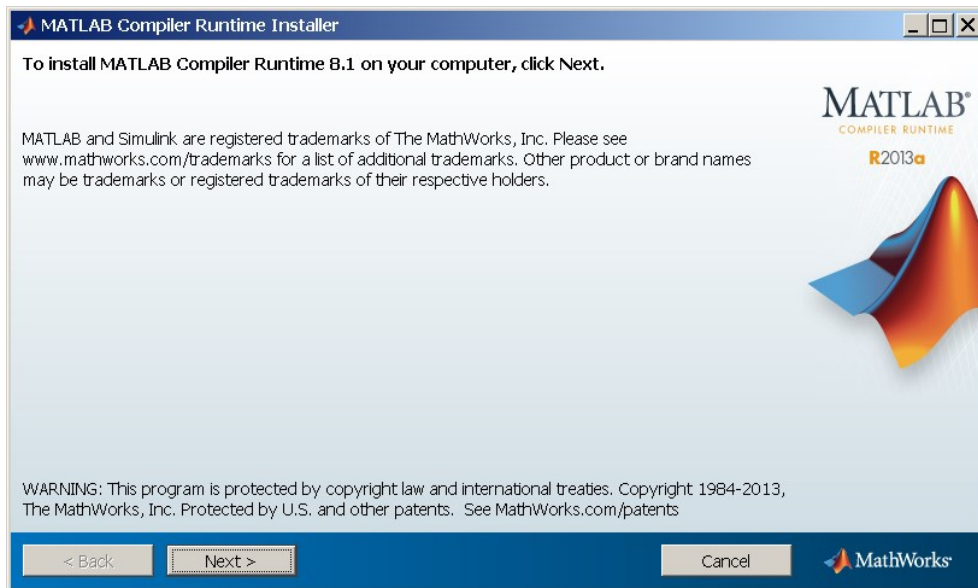
INSTALLING THE SOFTWARE

1. Download the latest version of the software from the Microchip website. The download link can be found on the web page for any of the supported evaluation boards.

2. Once the download finishes, run the installer. You will be prompted to install a MATLAB runtime engine, which will be downloaded after clicking "yes".
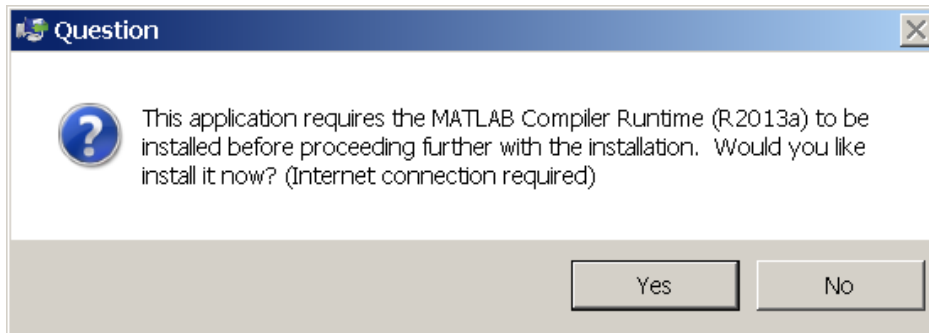
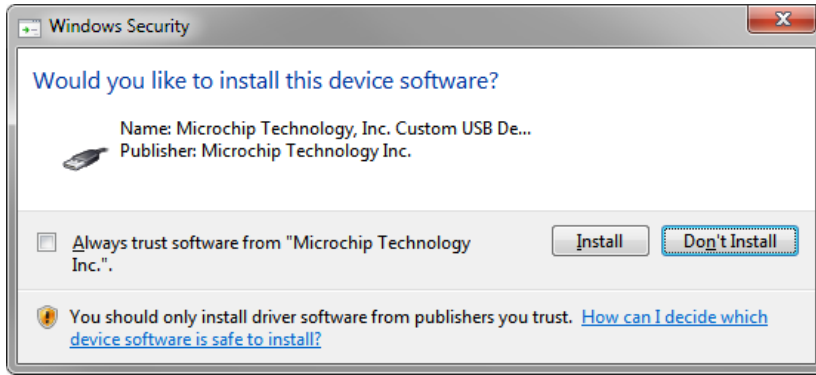*IMPORTANT: This download is large and can take a long time to complete.*

3. Follow the on-screen instructions given by the runtime installer.

4. The Microchip installer will run next. Follow the on-screen instructions.

Permit the driver installation during the install process (**required** for the software to operate properly).

5. Once the installer finishes, you will have a Start menu entry in the Microchip folder labeled "SAR ADC Utility". A desktop shortcut will also be created for convenience.

GETTING STARTED QUICKLY

1. Install the software.

2. Plug the evaluation board into the PC using the appropriate USB cable.

   *PLEASE NOTE: The software will **NOT** run if the board is not connected prior to running the software.*

3. Allow sufficient time for the device to enumerate. On a Windows 7 PC, you should see something similar to the following:
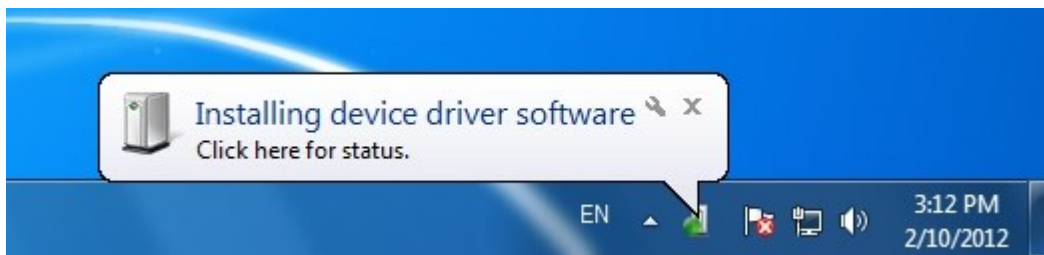

   Figure 1: On a Windows 7 PC, plugging in the device will trigger the operating system to search for and install the driver for the data capture card.

4. Start the application.

5. Customize settings as needed.

6. Click one of the green arrow buttons to start a single or continuous data acquisition sequence.
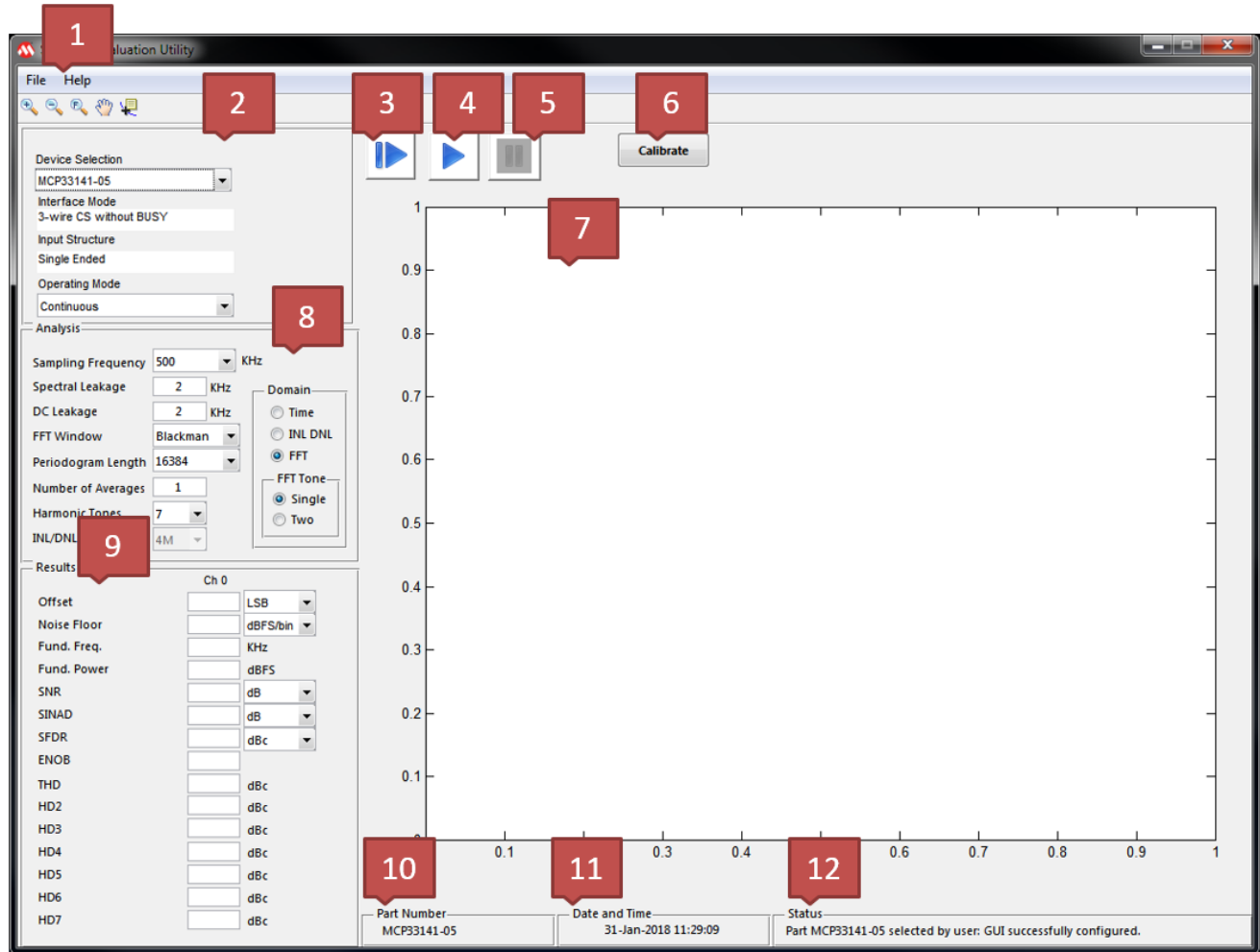
4

APPLICATION LAYOUT AND INTERFACE

Figure 2 Utility in Continuous Mode

Identifier	Item Name	Description
1	Menu Item bar	The menu item categories and subsequent menu items provide convenient options for saving/loading data to/from the application. Additionally software version information can be found here.
2	Device selection and information	The connected device can be changed from here and information about it displayed. The Operating Mode can also be switched between continuous and single-shot.

3	Run single acquisition	Once clicked, the software will collect one data set will from the device.
4	Run continuous acquisition	Once clicked, the software will continuously sample the device for data.
5	Stop acquisition	Press this button to stop the current data acquisition (allowed only when continuous acquisition is taking place).
6	Calibration	This will perform the device calibration. During calibration the button will turn red. A successful calibration will turn it to green, while a failure will be indicated by red.
7	Chart/plotting area	A chart is generated after collecting a data sample from the device. Different charts will be plotted according to the GUI settings, including FFT, INL/DNL, Time Domain.
8	Analysis settings	Analysis configuration can be changed here. These options modify the way the data is analyzed/displayed.
9	Results	The results of all calculations based off the collected data samples will be displayed here.
10	Board Information	Information on currently attached board will be displayed here.
11	Date and time	A date and time for reference (particularly useful when saving data and referring back to it at a later date)
12	Status	This text field will display important status information. Any encountered errors will be listed here along with any other useful information.
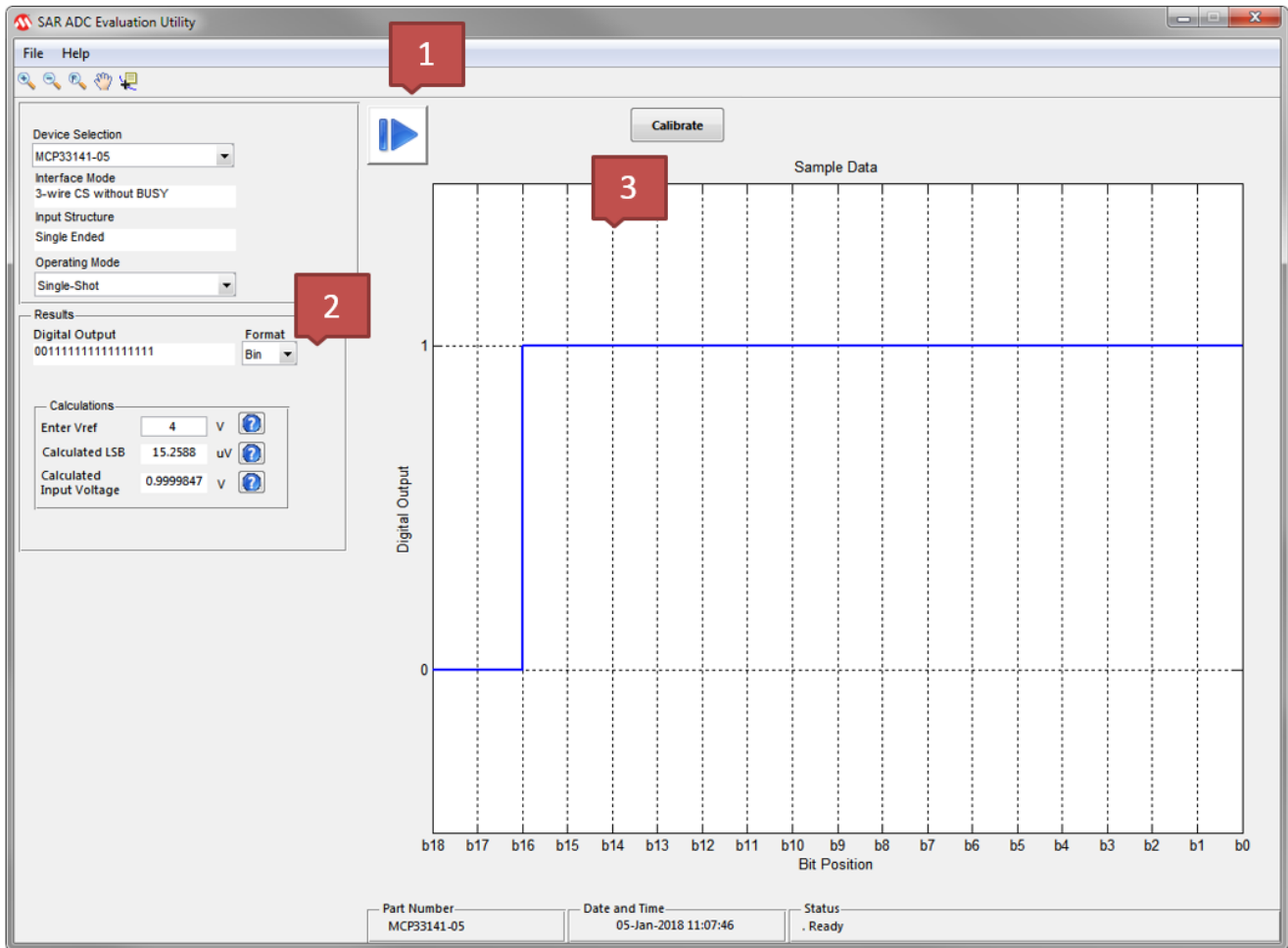
Figure 3 Utility in Single-Shot Mode

| Identifier	Item Name	Description
1	Run single acquisition	Once clicked, the software will collect one data sample will from the device.
2	Results	The sample data is displayed in binary, hex or decimal format. Based on the sample value and Vref the LSB and input voltage are calculated.
3	Chart/plotting area	A chart is generated after collecting a single data sample from the device and the individual bit values are displayed.

DEVICE SELECTION AND INFORMATION

The device selection drop down menu allows control over which device will be used. When the software starts up this field is automatically populated with the detected device. Changing the selection will make the software try to establish a connection with the selected device.

Information such as the interface mode and input structure is also listed here.

APPLICATION OPERATIONS

LOAD FACTORY DEFAULT CONFIGURATION

1. Click on the "File" menu item.

2. Click the "Load Factory Default Configuration" item.
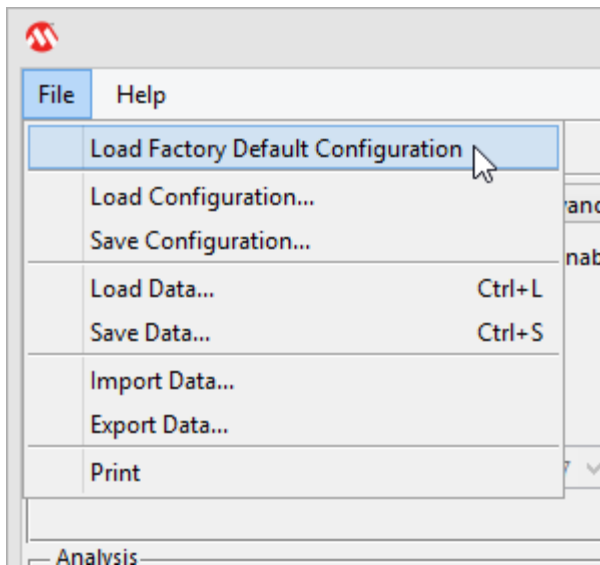
SAVE/LOAD CONFIGURATION SETTINGS

This command will save/load configuration settings, which includes those found in the ADC, I/O, DSP, PLL, and Advanced tabs – no sample data will be saved.

1. Modify configuration settings to the desired values.
   Note: No manual modifications to the registers will be saved.

2. Click on the "File" menu item.

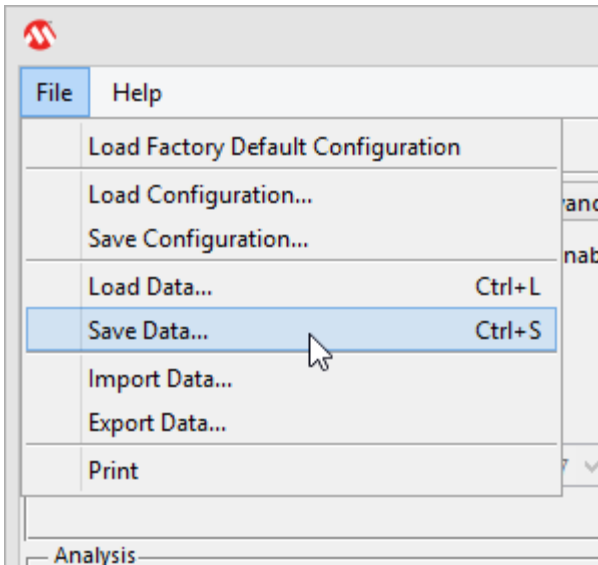3. Click the "Save Configuration" item.
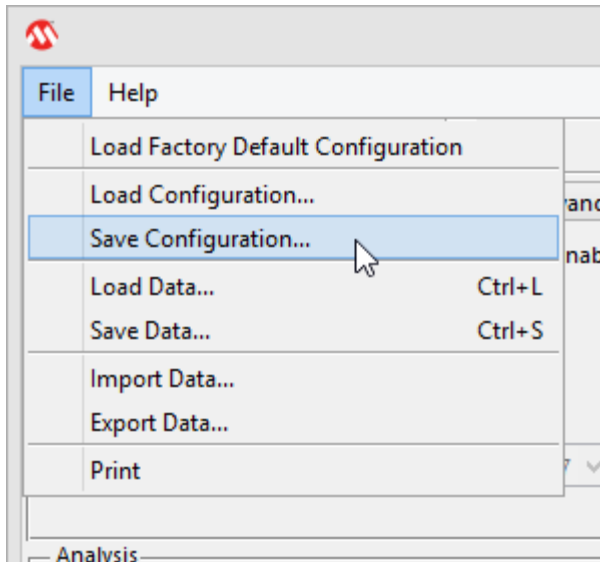
4. Specify the save location using the save dialog.
   Note: The saved file will have a ".cfg" extension

5. Load the same file at a later time by simply selecting the "Load Configuration…" item from the "File" menu and navigating the load file dialog to the same location where the configuration data was originally saved.

SAVE/LOAD DATA

This command will export both the configuration settings and the raw data shown in the chart(s) of the GUI.

1. Click on the "File" menu item.

2. Click the "Save Data…" item.

3. Specify the save location using the save dialog.
   Note: The saved file will have a ".mchp" extension

4. Load the data at a later time by simply selecting the "Load Data…" item from the "File" menu and navigating the load file dialog to the same location where the data file was originally saved.
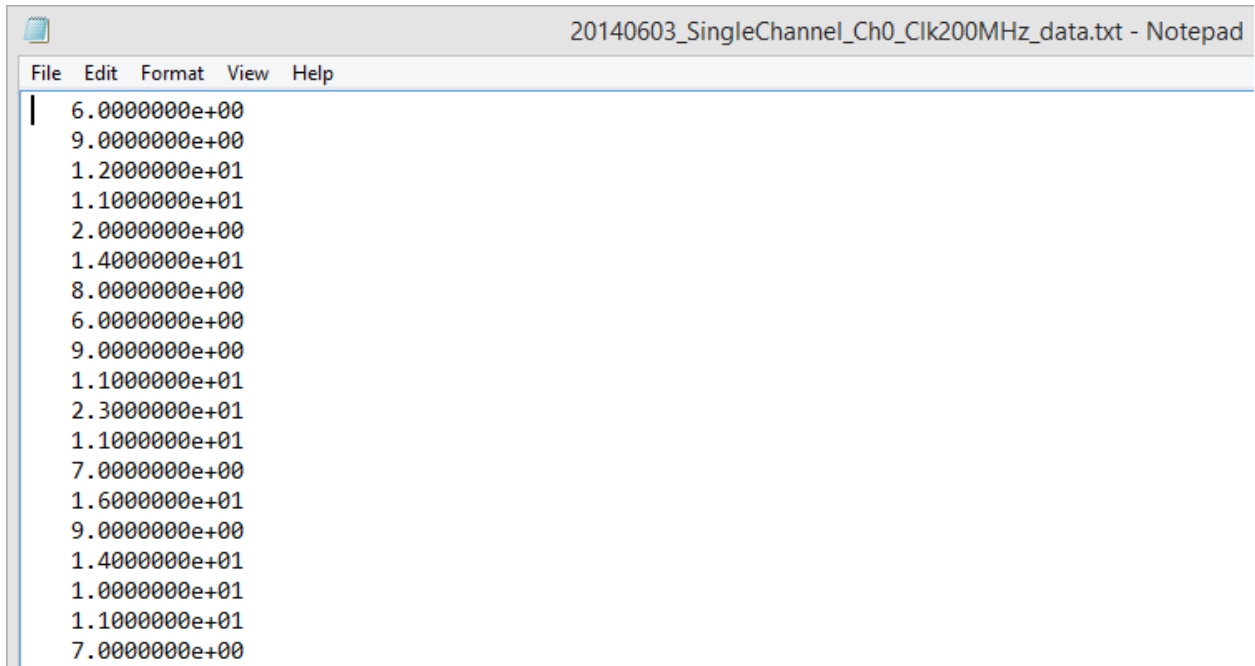
EXPORT/IMPORT DATA

This command will export/import the raw data shown in the chart(s) of the GUI – no configuration data is exported/imported.

1. Click on the "File" menu item.

2. Click the "Export data…" item.
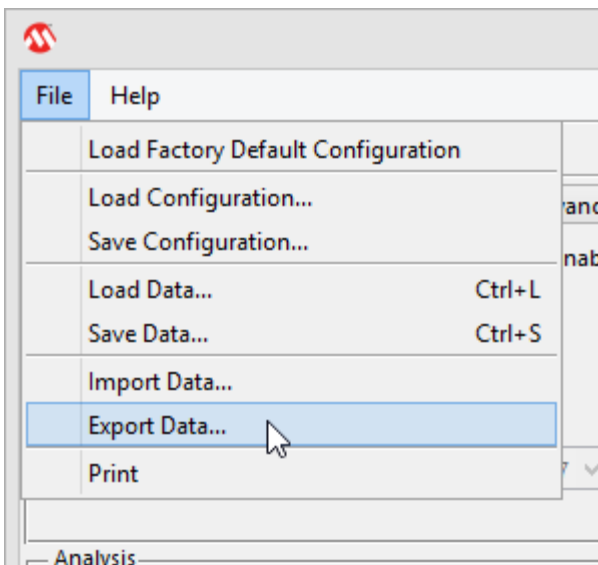
3. Specify the save location using the dialog window.
   Note: The saved file will have a ".txt" extension and look similar to the file screenshot below:

4. The same data can later be imported by simply selecting the "Import Data…" item from the "File" menu and navigating the load file dialog to the same location where the text file was originally saved.

TROUBLESHOOTING

UTILITY NOT RECOGNIZING CONNECTED DEVICE

Try one or all of the following:

- Verify the USB connection is secure.

- Unplug and reconnect the USB connection while waiting a few seconds between each step.

- Verify the device shows in device manager.

OTHER ISSUES

Please contact Microchip Technical Support for other questions/comments regarding this software.

APPENDIX

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