Pipeline ADC Utility User Manual

MICROCHIP TECHNOLOGY INC.

CONTENTS

PURPOSE AND USE OF THE SOFTWARE

The Pipeline ADC Utility software was designed to support Microchip pipelined ADC devices. This tool can be used during evaluation, development, and/or production. The following evaluation boards are supported by this software:

- ADM00436
- ADM00437
- ADM00438
- ADM00459
- ADM00505
- ADM00506

Note: This software communicates with the MCP37XXX device on the evaluation board through the MCP37XXX Data Capture Card (ADM00506).

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".
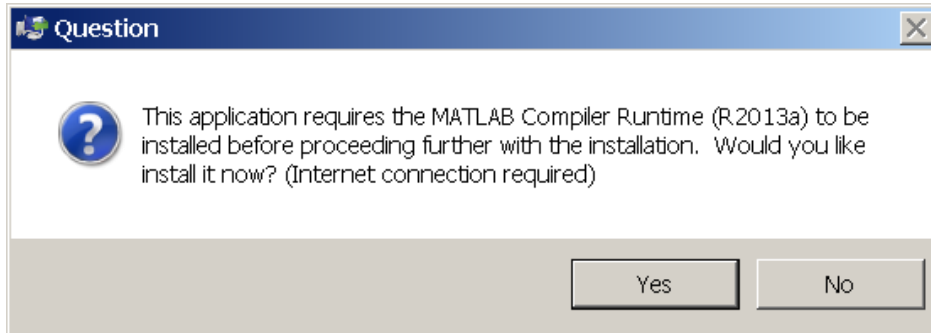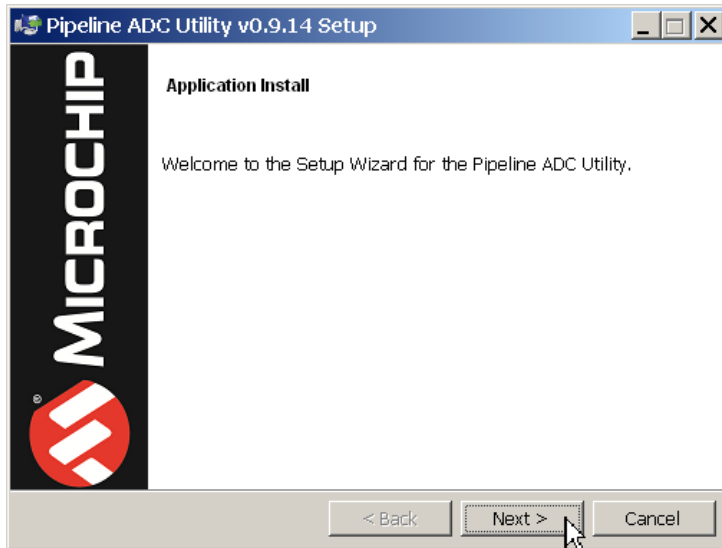

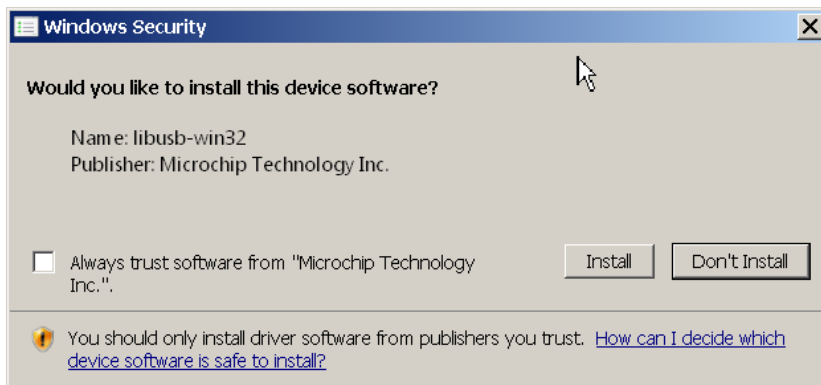*IMPORTANT: This download is large and can take a long time to complete.*

3. Follow the on-screen instructions given by the runtime installer.
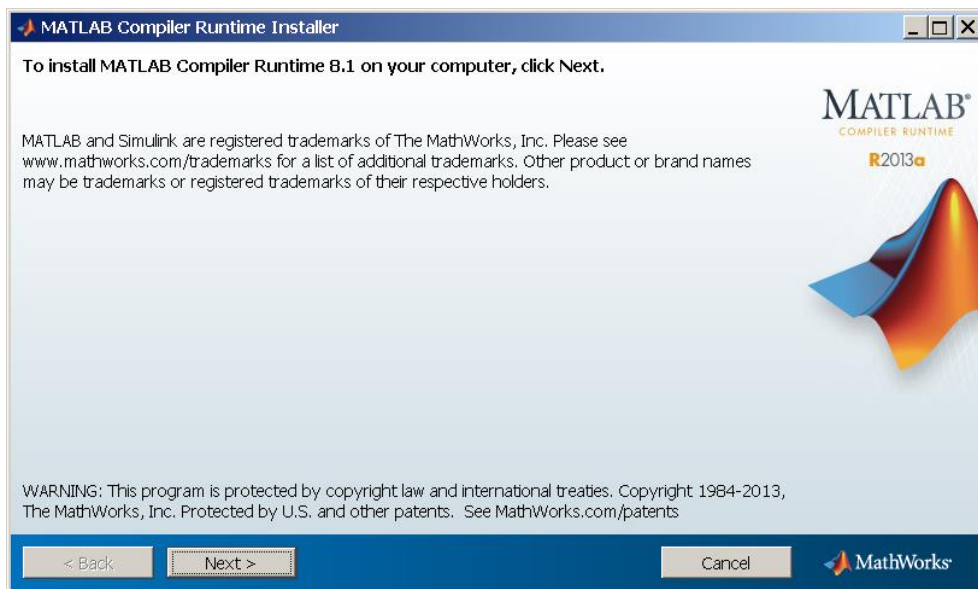
4. The Microchip installer will run next. Follow the on-screen instructions.

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

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

GETTING STARTED QUICKLY

1. Install the software.

2. Plug the data capture card 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:

4

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.
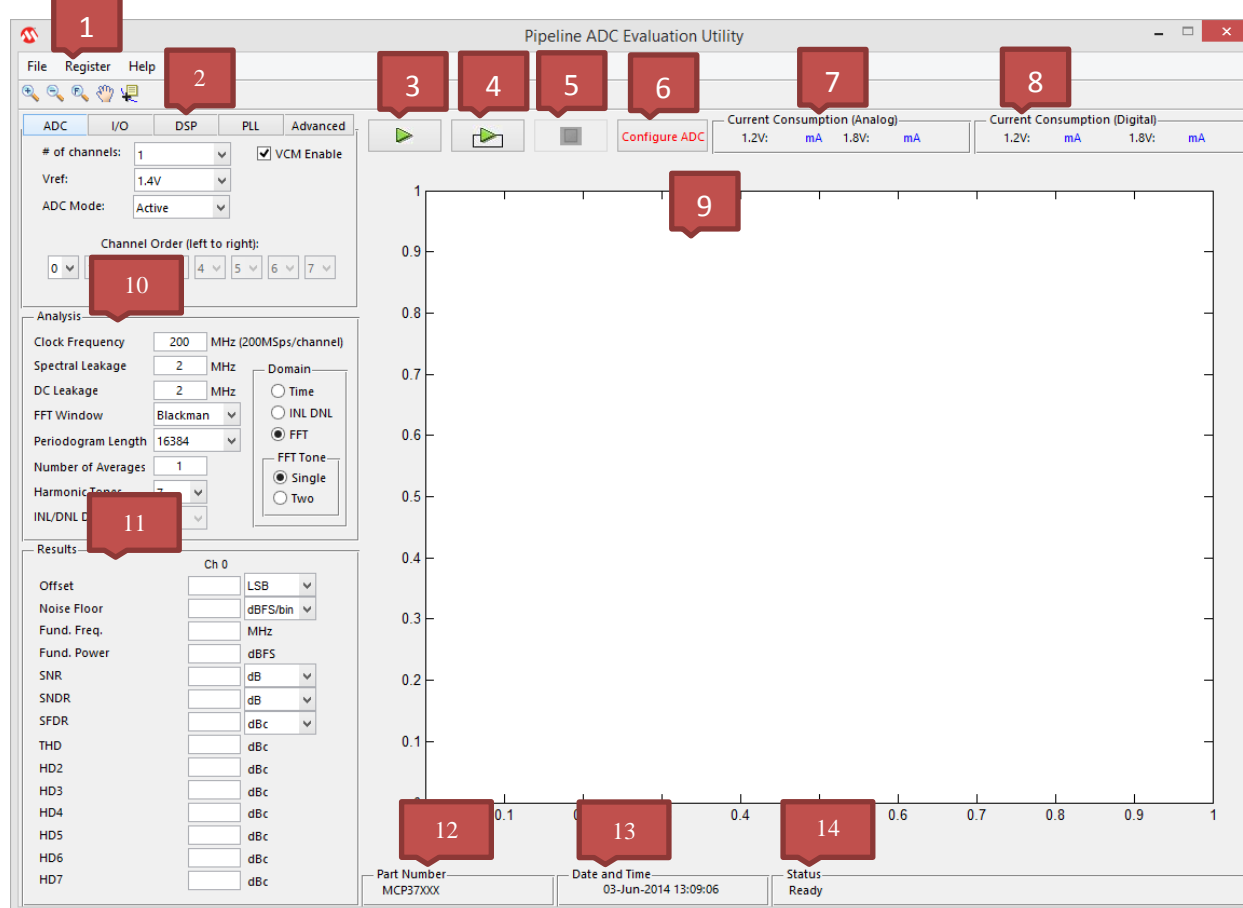
APPLICATION LAYOUT AND INTERFACE

Figure 2

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, register access and software version information can be found here.
2	Tab control for various device configuration options	Various device settings are broken up into different categories. Use the tab control to switch between these different categories and make the desired configuration customizations.
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	Configure device	This button will send the configuration settings to the device. *This operation can take up to 30 seconds to complete, depending on the configuration options selected.*
7	Current consumption (analog)	Current consumption of the analog 1.8V (I/O) and analog 1.2V (core) power domains.
8	Current consumption (digital)	Current consumption of the digital 1.8V (I/O) and digital 1.2V (core) power domains.
9	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.
10	Analysis settings	Analysis configuration can be changed here. These options modify the way the data is analyzed/displayed.
11	Results	The results of all calculations based off the collected data samples will be displayed here.
12	Board Information	Information on currently attached board will be displayed here.
13	Date and time	A date and time for reference (particularly useful when saving data and referring back to it at a later date)
14	Status	This text field will display important status information. Any encountered errors will be listed here along with any other useful information.

APPLICATION SETTINGS

DEVICE SETTINGS

ADC: Key ADC setting parameters are found in the first tab.

ADC	I/O	DSP	PLL	Advanced

# of channels: `1` ▾   ☑ VCM Enable

Vref: `1.4V` ▾

ADC Mode: `Active` ▾

Channel Order (left to right):

`0` ▾ `1` ▾ `2` ▾ `3` ▾ `4` ▾ `5` ▾ `6` ▾ `7` ▾

I/O: Settings that pertain to the device Input/Output are found in the second tab.

ADC	I/O	DSP	PLL	Advanced
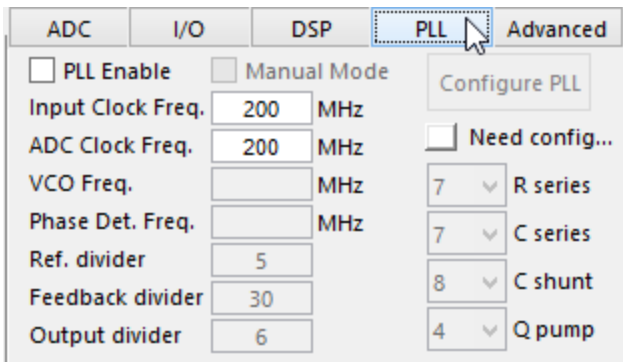
☐ Enable Word Clock and OVR   ☐ Randomizer

— Digital Output —

Number of Bits:

Mode: `LVDS_EvenFirst` ▾   `16` ▾ Bits

Format: `2sComplement` ▾

Clock Phase: `270` ▾

DSP: Settings that pertain to the digital signal processing (DSP) are found in the third tab. Enabling either the DDC or NSR will result in more options being displayed for these functions.
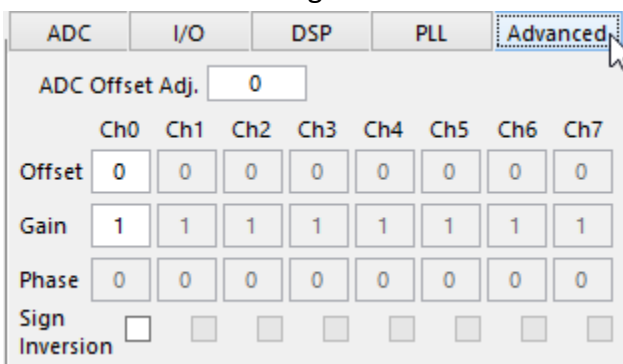
ADC	I/O	DSP	PLL	Advanced

Decimator: `1` ▾

☐ DDC Enable NSR: `off` ▾

PLL: Settings that pertain to the PLL are found in the fourth tab.

Advanced: Other settings fall into an "advanced" category and are found in the fifth tab.

ANALYSIS SETTINGS

You may use this software, and any derivatives created by any person or entity on your behalf, exclusively with Microchip's products. Microchip and its licensors retain all ownership and intellectual property rights in the accompanying software and in all derivatives hereto.

1. This software and any accompanying information is for suggestion only. It does not modify Microchip's standard warranty for its products. You agree that you are solely responsible for testing the software and determining its suitability.

## MANUAL REGISTER MANIPULATION

If custom register manipulation is desired, use the manual register access window to do so. Please note that <u>making changes in this manner is NOT recommended for most users</u>.

***** NOTE: INCORRECT CHANGES CAN RESULT IN INSTABILITY - USE WITH CAUTION *****

1. Click on "Register" file menu and select "Manual register access…"
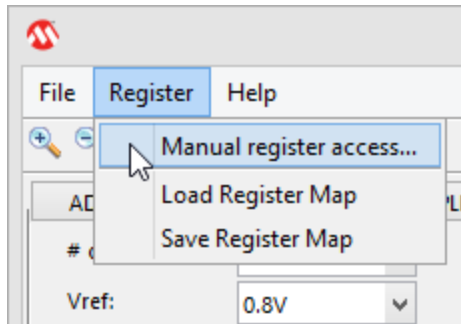
2. A window similar to the following will be shown:
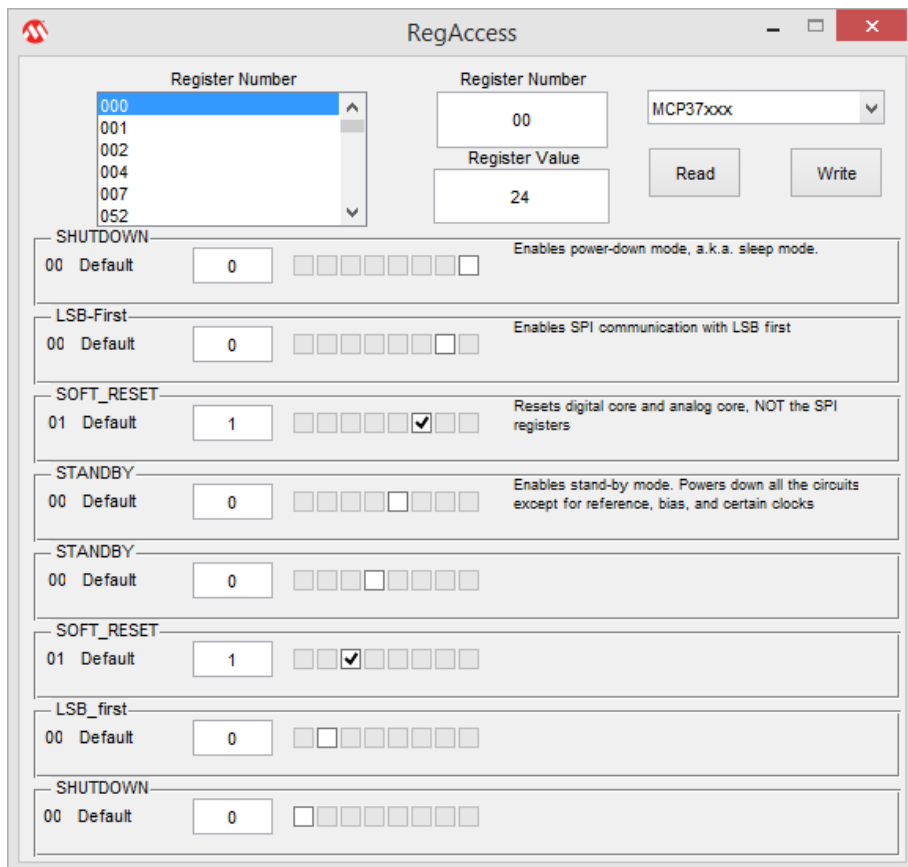
3. Select the desired register number from the selection box in the upper left area of the window.

4. Click the "Read" button in the upper right area of the window to ensure the proper register data is loaded.

5. *Modify the register selected through clicking the check boxes and/or changing the numeric value of the register.*
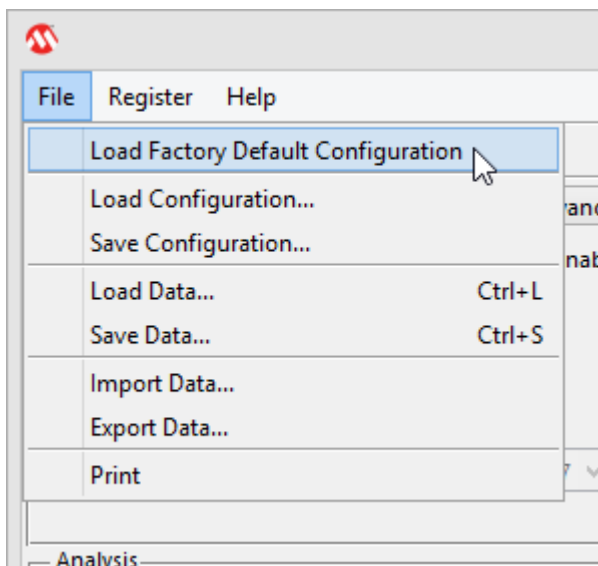   *Note: Any changes should be highlighted by the color RED*

6. Write the new value to the device by clicking the "Write" button in the upper right area of the window.

APPLICATION OPERATIONS

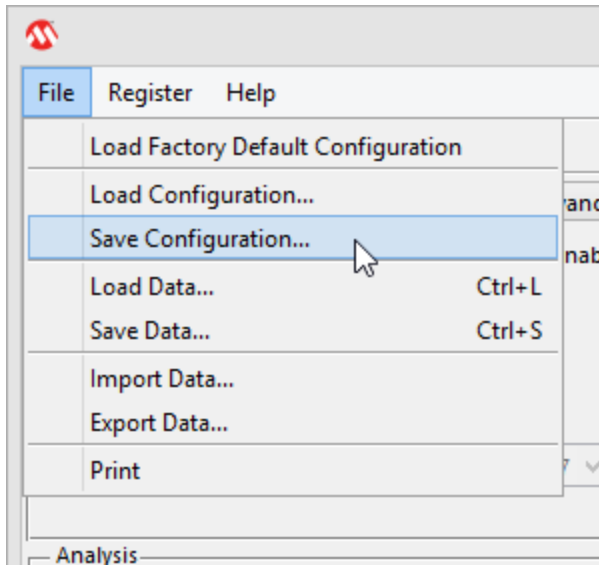### LOAD FACTORY DEFAULT CONFIGURATION

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.

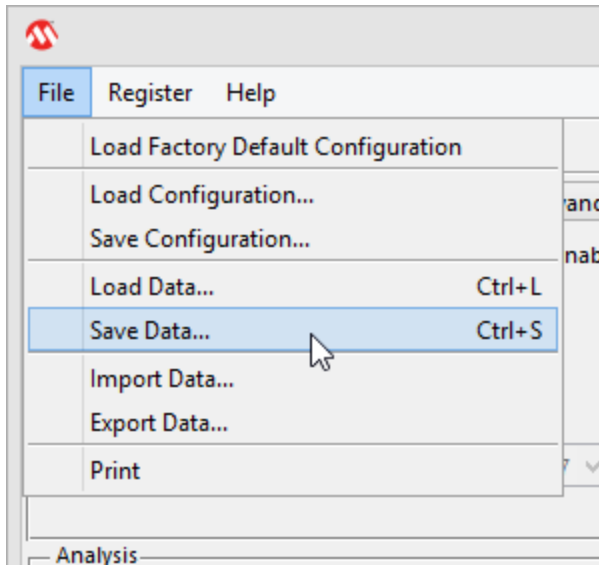3. Click the "Save Configuration" item.

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.
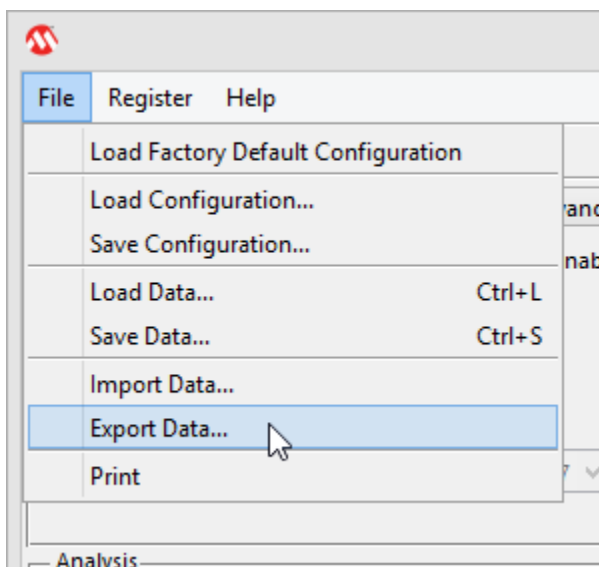
2. Click the "Save Data…" item.

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.
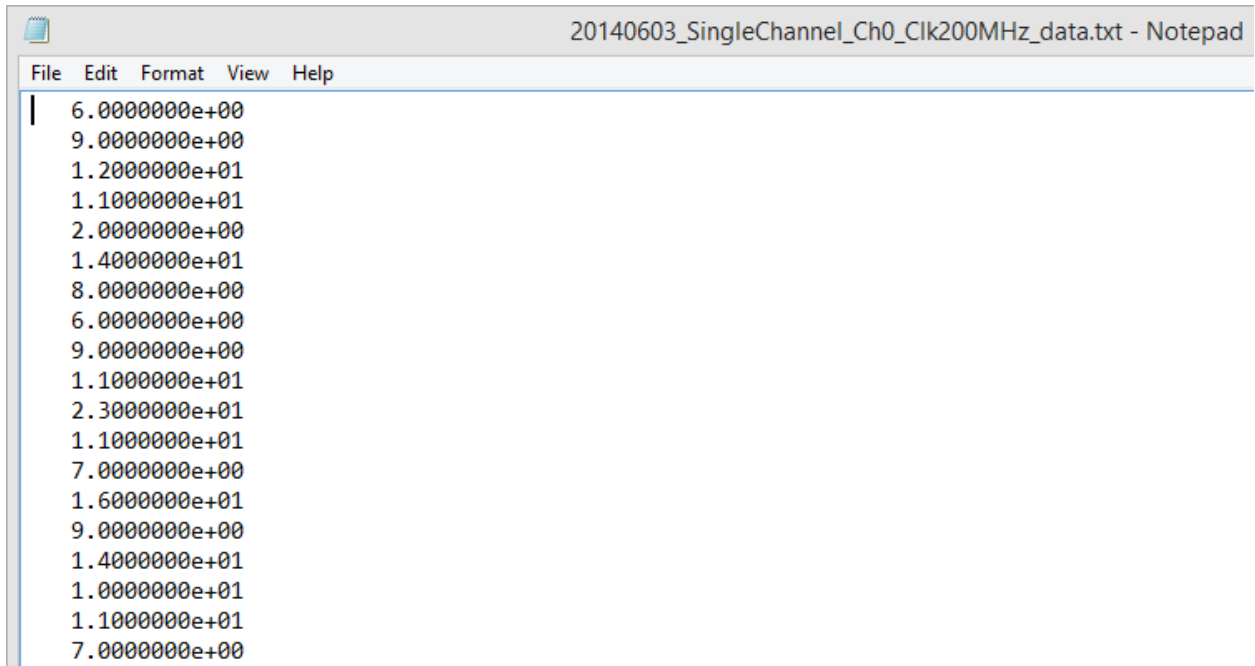
EXPORT/IMPORT DATA

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:
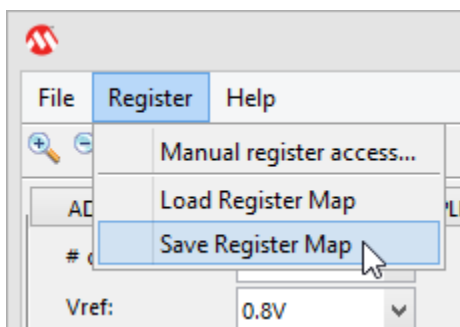

4. The same data can later be imported by simply selecting the "Import Data…" item from the "File" menu and navigating the load file dialog to the same location where the text file was originally saved.

SAVE/LOAD REGISTER MAP

This command will save/load the entire register map to/from a file. Any manual changes to the device registers will be saved with this command.

1. Click on the "Register" menu item.

2. Click the "Save Register map" item.

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

4. Load the saved register map at a later time by simply selecting the "Load Register Map" item from the same "Register" menu and navigating the load file dialog to the same location where the map 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. You should see an entry like the following:
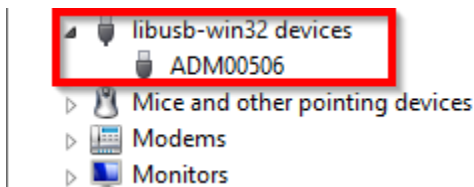
OTHER ISSUES

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

APPENDIX

MICROCHIP SOFTWARE NOTICE AND DISCLAIMER

You may use this software, and any derivatives created by any person or entity by or on your behalf, exclusively with Microchip's products. Microchip and its licensors retain all ownership and intellectual property rights in the accompanying software and in all derivatives hereto.

This software and any accompanying information is for suggestion only. It does not modify Microchip's standard warranty for its products. You agree that you are solely responsible for testing the software and determining its suitability. Microchip has no obligation to modify, test, certify, or support the software.

THIS SOFTWARE IS SUPPLIED BY MICROCHIP "AS IS". NO WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING, BUT NOT LIMITED TO, IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY, AND FITNESS FOR A PARTICULAR PURPOSE APPLY TO THIS SOFTWARE, ITS

INTERACTION WITH MICROCHIP'S PRODUCTS, COMBINATION WITH ANY OTHER PRODUCTS, OR USE IN ANY APPLICATION.

IN NO EVENT, WILL MICROCHIP BE LIABLE, WHETHER IN CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE OR BREACH OF STATUTORY DUTY), STRICT LIABILITY, INDEMNITY, CONTRIBUTION, OR OTHERWISE, FOR ANY INDIRECT, SPECIAL, PUNITIVE, EXEMPLARY, INCIDENTAL OR CONSEQUENTIAL LOSS, DAMAGE, FOR COST OR EXPENSE OF ANY KIND WHATSOEVER RELATED TO THE SOFTWARE, HOWSOEVER CAUSED, EVEN IF MICROCHIP HAS BEEN ADVISED OF THE POSSIBILITY OR THE DAMAGES ARE FORESEEABLE. TO THE FULLEST EXTENT ALLOWABLE BY LAW, MICROCHIP'S TOTAL LIABILITY ON ALL CLAIMS IN ANY WAY RELATED TO THIS SOFTWARE WILL NOT EXCEED THE AMOUNT OF FEES, IF ANY, THAT YOU HAVE PAID DIRECTLY TO MICROCHIP FOR THIS SOFTWARE.

MICROCHIP PROVIDES THIS SOFTWARE CONDITIONALLY UPON YOUR ACCEPTANCE OF THESE TERMS.

COPYRIGHT AND VERSION INFORMATION

© 2014 Microchip Technology Inc.

Last updated: 06/6/2014