Lab 0 - Getting Started with the ADALM2000

Note: this simple introductory exercise is required of all students (even those registered for the in-person sections), and you will not be assigned a partner. You must complete these exercises at home, not in the AVW 1356 laboratory.

Objectives

Sign out, and learn how to set up and use the ADALM2000 learning module. Download and install the required driver software on your computer, and connect to the device using the Scopy software. Select and purchase a digital multimeter, for later use in the semester.

Laboratory Equipment

The ADALM2000 is a multi-purpose instrument that allows students to measure and explore simple electronic circuits at home, without requiring access to traditional test and measurement equipment.

Unlike benchtop instruments, the ADALM2000 does not have a display, and it is not controlled using buttons, keys, knobs or switches. It connects to a computer through a standard USB interface, which provides both electrical power to the device, and communication and control. In addition to the USB connection, it has several input/output wires that can be used for building electronic circuits:

- Two analog inputs channels (V1, V2)
- Two programmable voltage supplies (0 to +5V and 0 to –5V)
- 16 programmable digital channels (input/output)
- Two programmable analog output channels

You will also need a laptop or desktop computer, with a functioning, available USB-A port. The ADALM2000 uses open-source software called Scopy for controlling and performing measurements. Versions are available for Windows, MacOS and Linux.

Background

Useful information about the ADALM2000 specifications can be found on the Analog Devices website, and on the ADALM2000 wiki page:

- https://www.analog.com/en/design-center/evaluation-hardware-and-software/evaluation-boards-kits/adalm2000.html
- https://wiki.analog.com/university/tools/m2k/devs/intro

Pre-lab Preparation

While there are no required pre-lab activities for this lab, successful completion of the activities required for this lab is required for all subsequent labs.

Instructions

1. Select & Purchase a DMM

If you do not already have one, select and purchase a digital multimeter. It is not required for this lab, but we will be using it for upcoming asynchronous laboratory activities. Guidelines and requirements for DMM purchase are posted here.

2. Equipment Sign-out and Pick-up

Use the following Google form, provided by the ECE department, to sign up for an ENEE 205 kit:

https://docs.google.com/forms/d/e/1FAIpQLSeJTAino5H7oxV4MZvdHLitgNj18gIN-HKJQgi17mbt_kQ5LA/viewform?vc=0&c=0&w=1&flr=0&gxids=7628

Under Equipment Type, select “ADALM2000 Breadboard and Components Kit”. You must complete this Google form before retrieving components.

All equipment Pick up and Return will be at the ECE Technical Operations Shop (Room#1338 AV Williams) Monday through Friday between the hours of 8:30 AM and 4:30 PM (closed when the University is closed). You are expected to return all equipment by 5/12/2021 (Reading Day for the Spring 2021 Semester)

Pick up your equipment during the week of 1/25/2021 through 1/29/2021.

Important: You are responsible for returning your working ADALM2000 unit, with leads, to the ECE department at the conclusion of the semester. Failure to return the hardware will result in you receiving an incomplete "I" grade for the course.

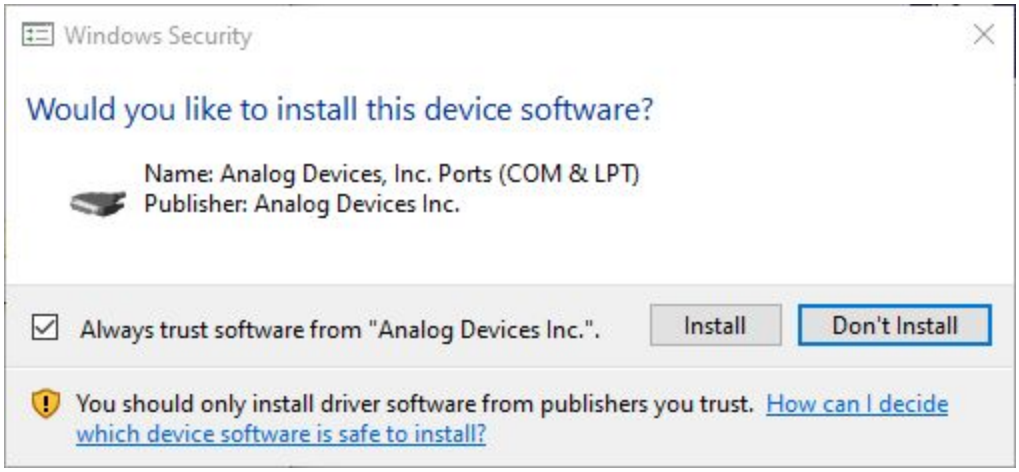
3. Driver Installation

Before you can communicate with the ADALM2000, you must install the drivers so that your computer will recognize the instrument.

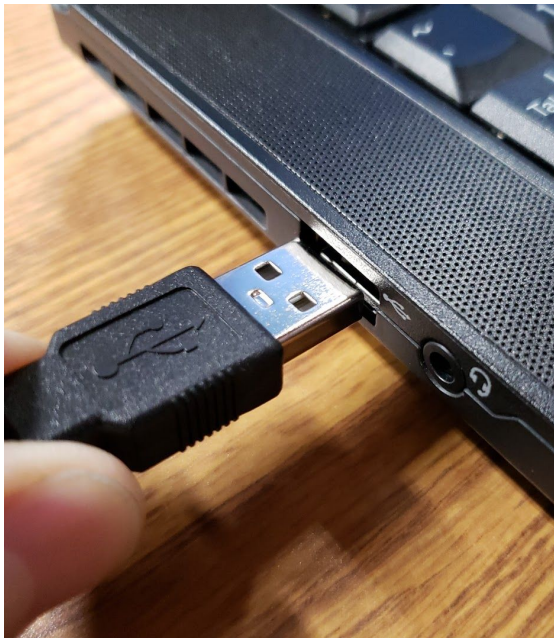
Before plugging in your device, follow the instructions in the ADALM2000 Quick Start Guide, to download and install the appropriate drivers for your computer (Windows, OSX, or Linux).

https://wiki.analog.com/university/tools/m2k/users/quick_start

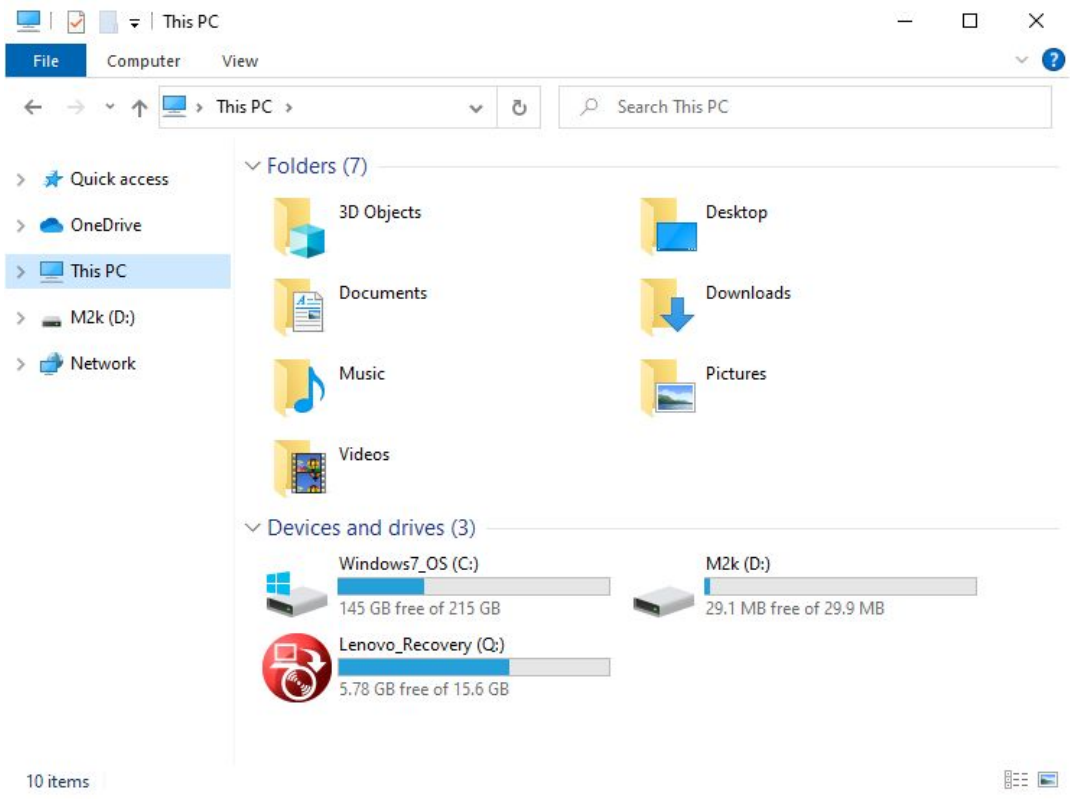
Accept the license agreement, choose an installation folder (or accept the default suggested). You may receive a security warning asking if you trust hardware drivers from "Analog Devices, Inc." -- select OK



After installation, connect your ADALM2000 to one of the available USB ports on your computer, using the micro-USB cable provided:

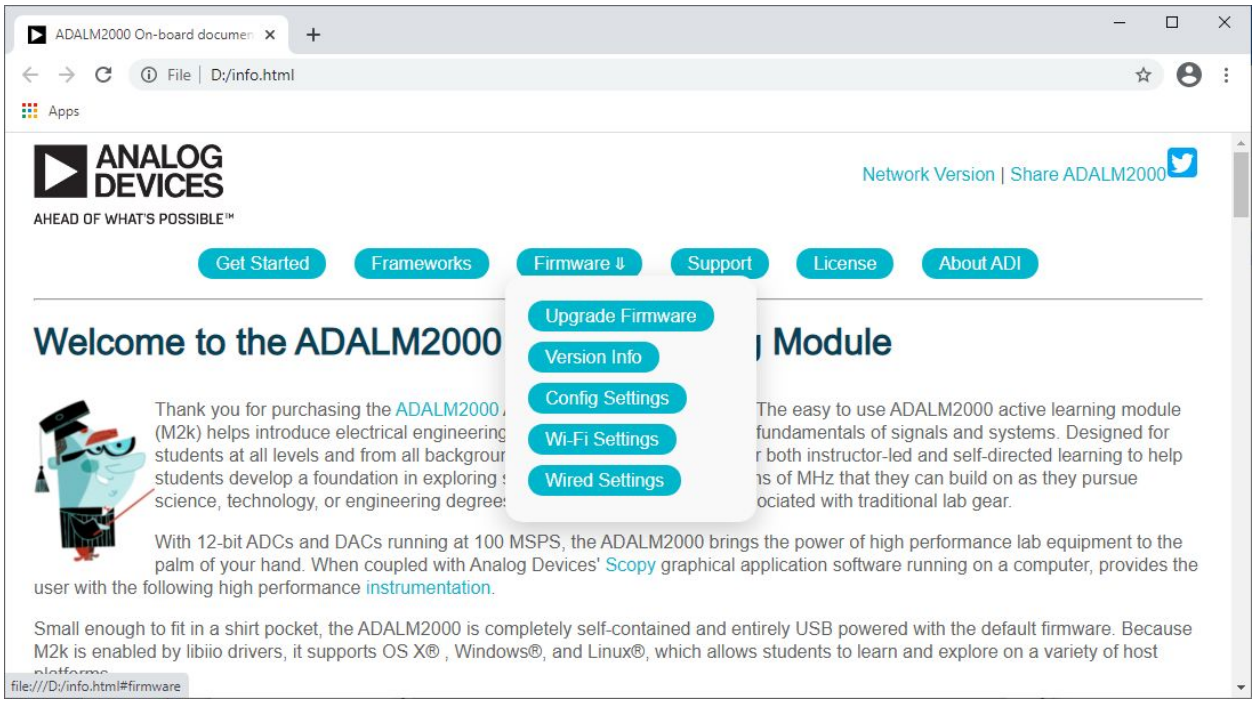


Your computer should recognize the device and show a connected external file storage device called “M2k”:



Within the external storage device “M2k”, open the file called “info.html”, which will show information and documentation about your device. Under the “Firmware” tab, choose “Upgrade

Firmware". If necessary, follow the instructions on screen to download and update your ADALM2000 to the latest firmware version.



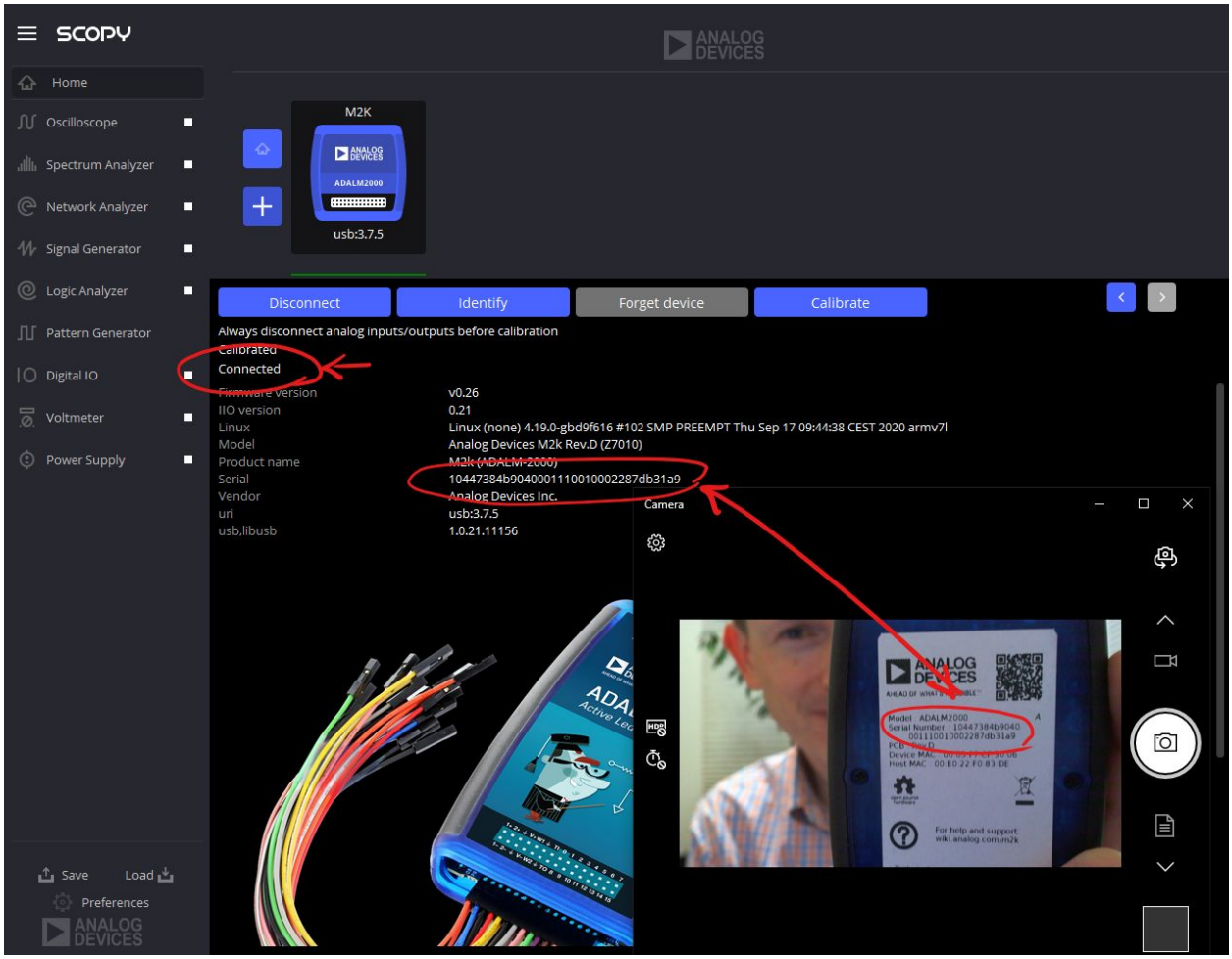
4. Install and Test Scopy

After installing the drivers and updating firmware (if necessary), you are ready to install the Scopy software, which we will use to control and communicate with the ADALM2000.

Download and install the "latest release" version of Scopy for your platform (Windows, OSX, or Linux):

https://wiki.analog.com/university/tools/m2k/scopy

Run Scopy, click on the "Connect". Turn on your webcam, and take a screenshot to show us that you have successfully connected to the ADALM2000 (see below for example). Congratulations!



Post-lab Analysis

You do not need to prepare a formal lab report. Just submit your screenshot to show us that you have completed the required setup and you are ready for the subsequent labs.