

## How to Run the Vaunix LDA SDK Example Program

10/11/22

For an introduction to using the Apple macOS programs used in this explanation you can read the material provided by Apple.

Finder User Guide

<https://support.apple.com/guide/mac-help/finder-mchlp2605/mac>

How to go to a specific folder using Finder:

<https://support.apple.com/guide/mac-help/go-directly-to-a-specific-folder-on-mac-mchlp1236/mac>

Terminal User Guide

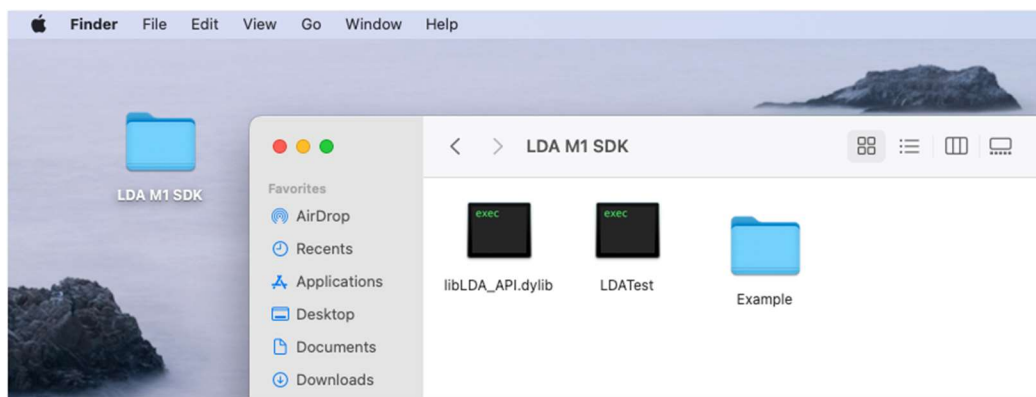
<https://support.apple.com/guide/terminal/welcome/mac>

More information on running command line programs using Terminal:

<https://support.apple.com/guide/terminal/execute-commands-and-run-tools-apdb66b5242-0d18-49fc-9c47-a2498b7c91d5/mac>

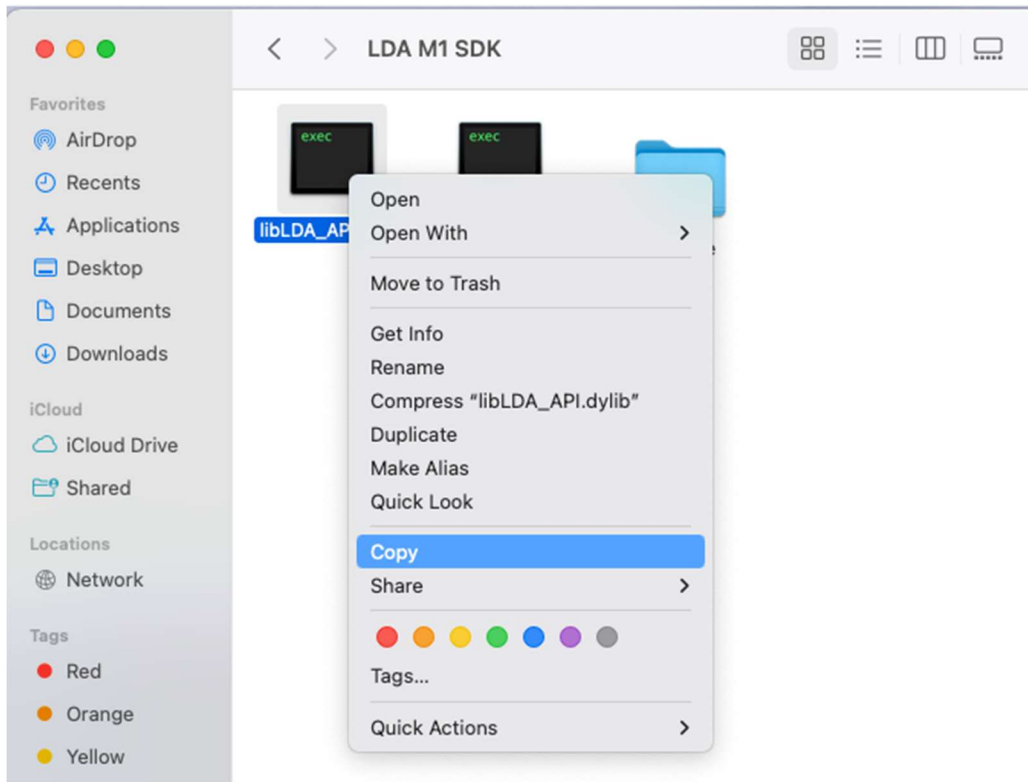
This example of how to use the Vaunix LDA SDK example program on macOS is not the only sequence of steps that you can use but shows one sequence of steps you can use.

- 1) Copy the LDA M1 SDK to your desktop using Finder.



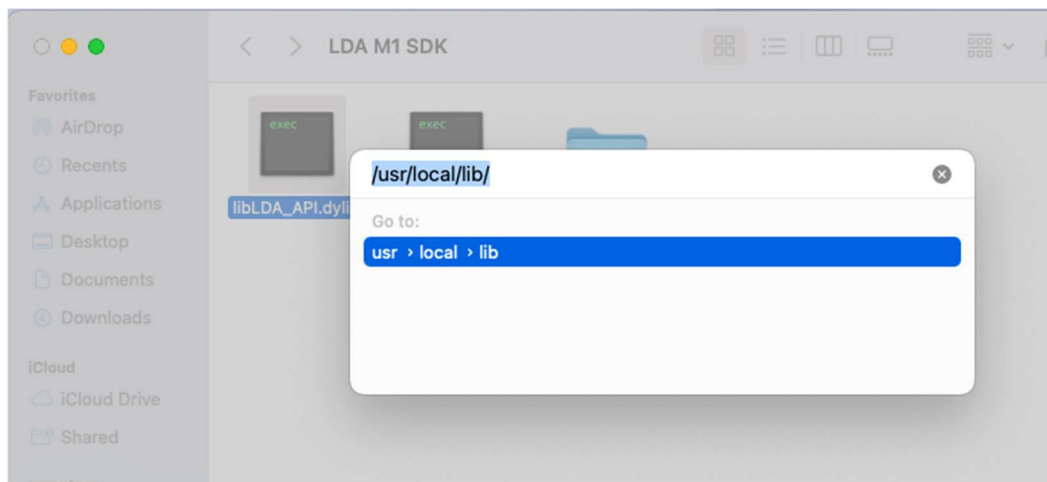
You can see the contents of the LDA M1 SDK folder. The libLDA+API.dylib contains the API functions you can use to control your LDA device. The LDATest program is a ready to run version of the example program included in the Example folder.

- 2) Copy the libLDA\_API.dylib file to the /usr/local/lib folder on your system. Some systems already have the /usr/local/lib folder present, on other systems you will need to create the /usr/local/lib folder if it is not present. If you need to create the folder use Finder to make a new folder named lib that is located in the /usr/local folder. You may need to enter your password to enable creation of the folder.

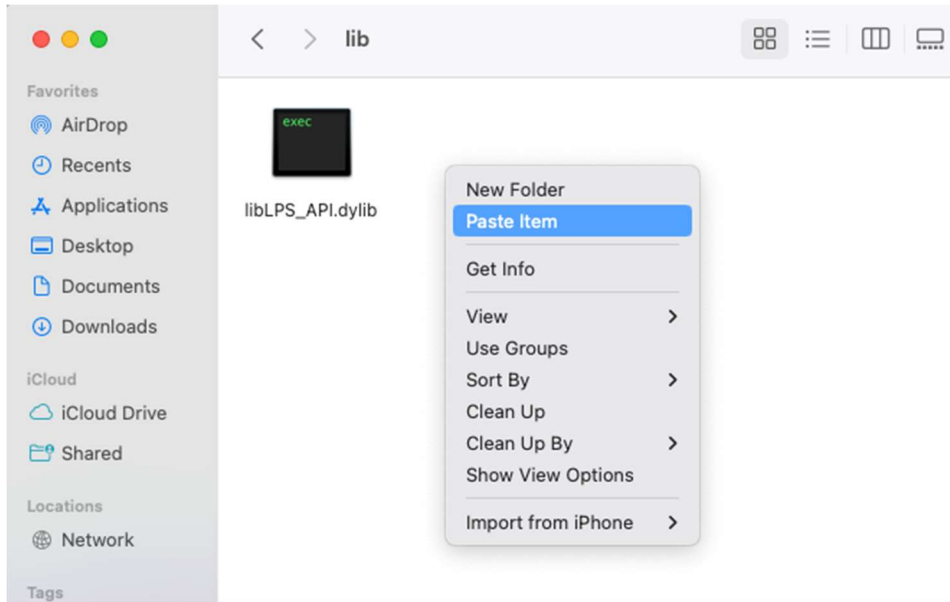


Select the libLDA\_API.dylib file and copy it.

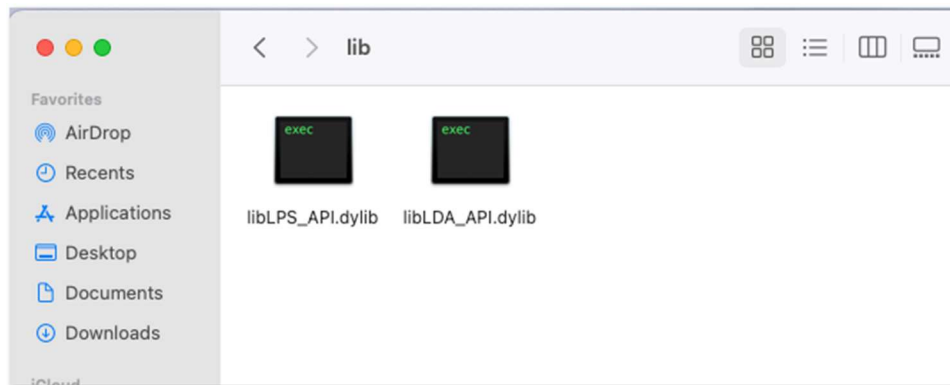
In Finder go to the /usr/local/lib folder. Choose Go > Go to Folder in Finder and then enter the path name. If the path name does not exist, use Folder to create the lib folder.



Paste the libLDA\_API.dylib file into the /usr/local/lib folder.



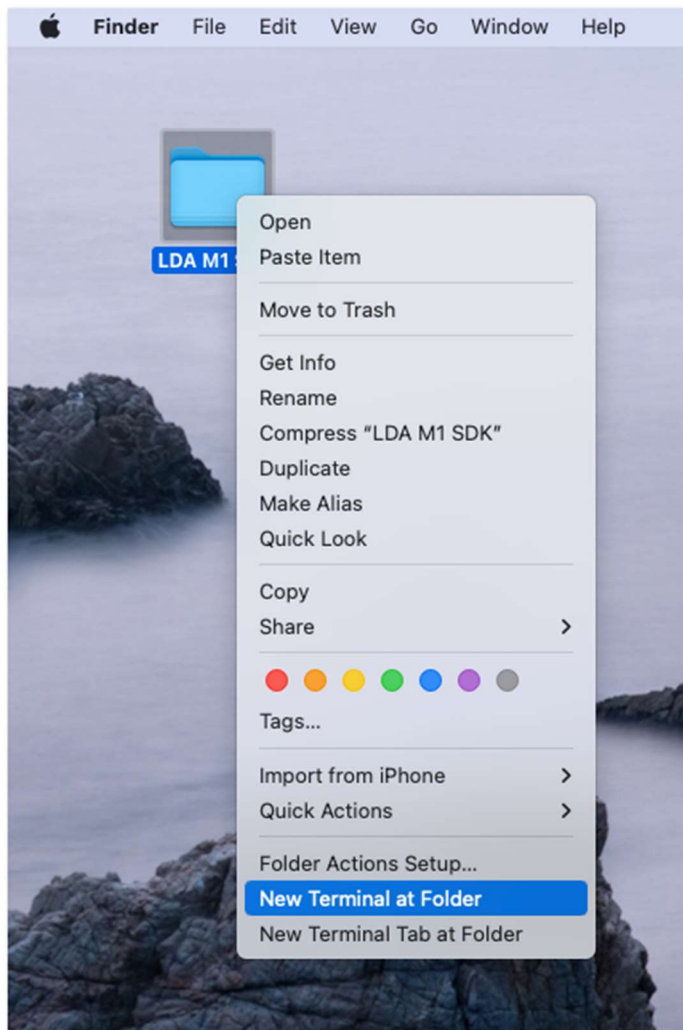
On this system the Vaunix Phase Shifter library was already present.



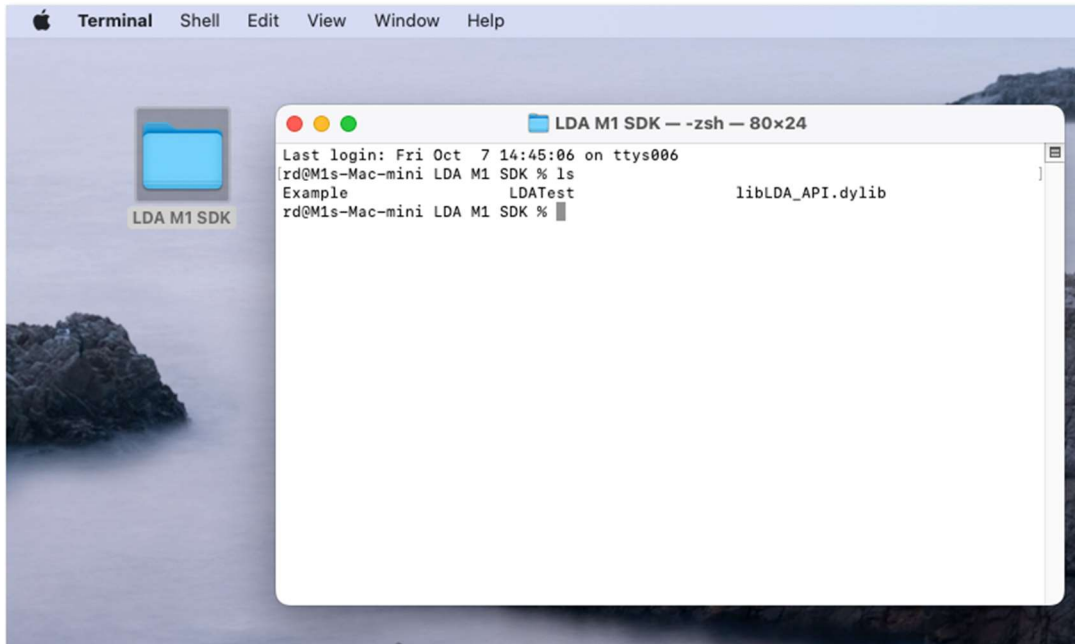
After the libLDA\_API.dylib file has been copied to the /usr/local/lib folder you are ready to run the example program.

On some systems which have enhanced security settings you may need to adjust the permissions related to the library so that you can execute it. If you encounter this situation the simplest strategy will be to contact your IT department help desk for assistance.

3) Open a Terminal window at the LDA M1 SDK folder.

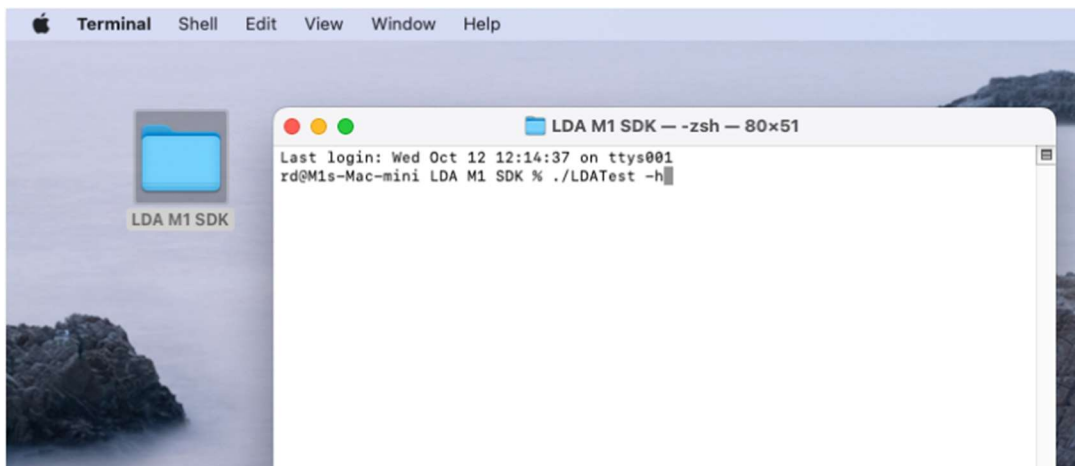


The Terminal window will show the LDA M1 SDK folder contents if you enter the ls command.

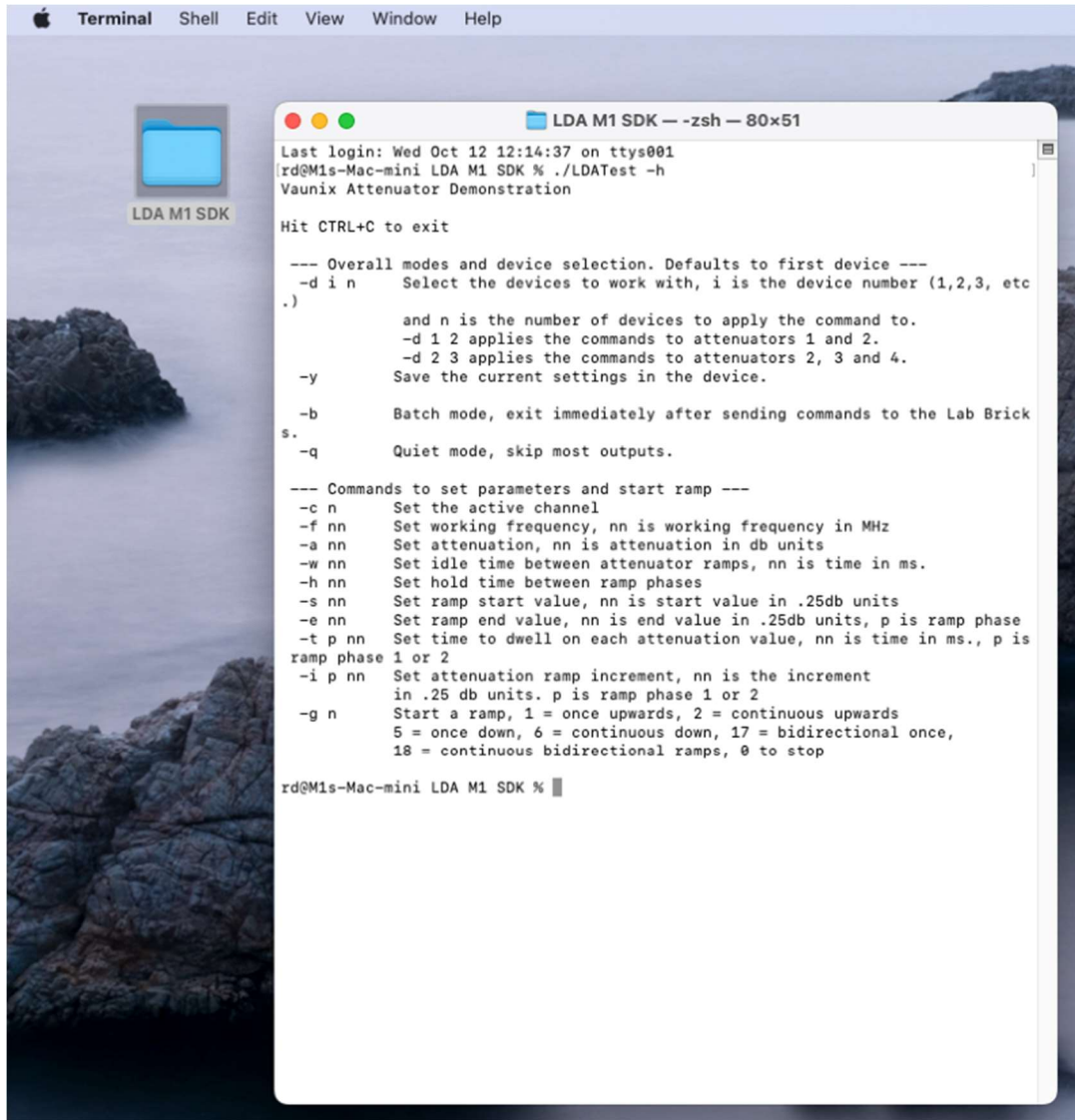


You may want to expand the Terminal window to make it easier to see the example program's output without scrolling.

- 4) Type the path to the LDATest program, which is `./LDATest`. Enter the command line arguments after the name of the program. You can use the `-h` command line argument to see a list of available command line arguments.



Press the Enter key to run the LDATest program.



```
Terminal  Shell  Edit  View  Window  Help

LDA M1 SDK

LDA M1 SDK - zsh - 80x51
Last login: Wed Oct 12 12:14:37 on ttys001
rd@M1s-Mac-mini LDA M1 SDK % ./LDATest -h
Vaunix Attenuator Demonstration

Hit CTRL+C to exit

--- Overall modes and device selection. Defaults to first device ---
-d i n    Select the devices to work with, i is the device number (1,2,3, etc
.)
          and n is the number of devices to apply the command to.
          -d 1 2 applies the commands to attenuators 1 and 2.
          -d 2 3 applies the commands to attenuators 2, 3 and 4.
-y        Save the current settings in the device.

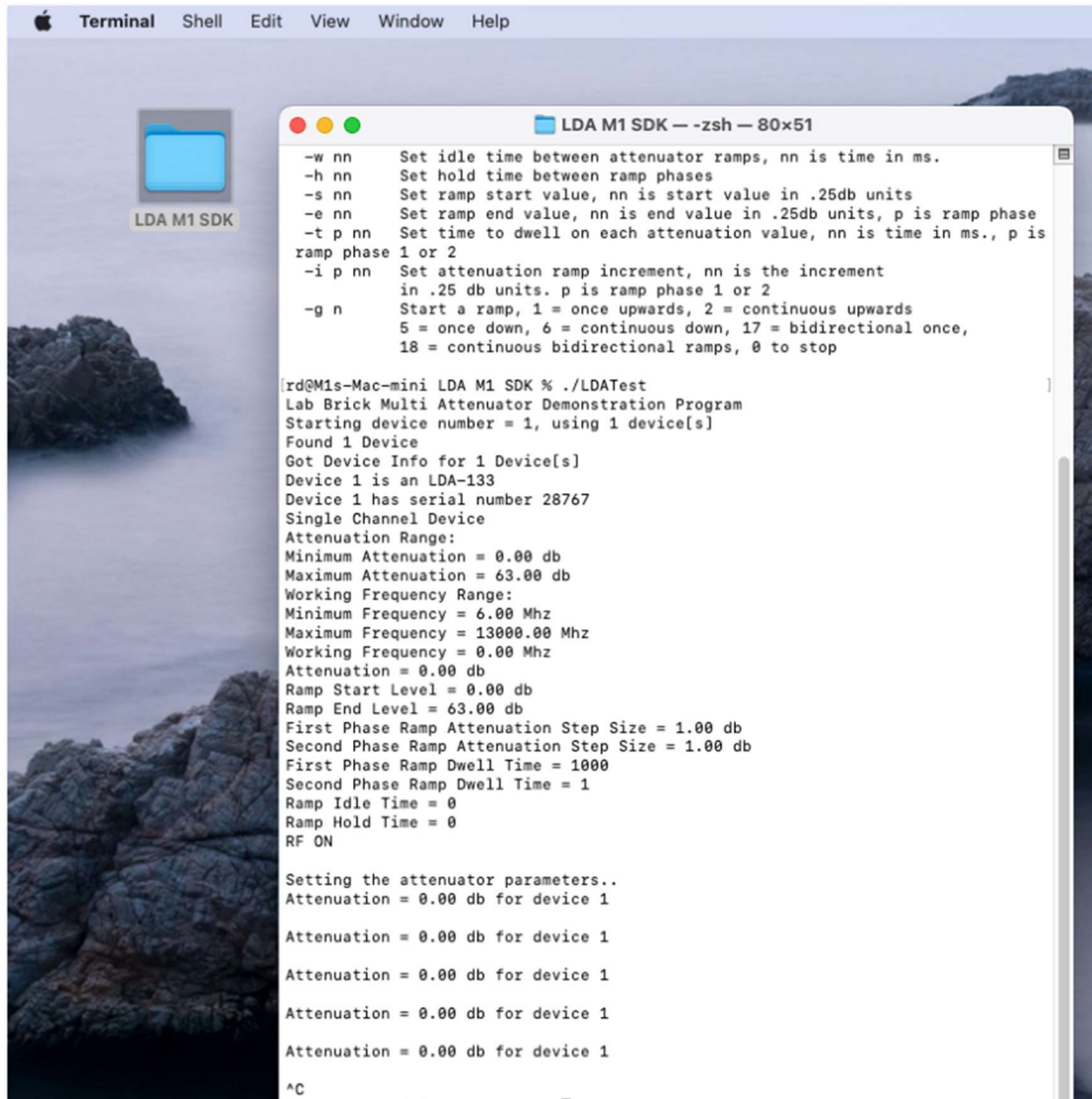
-b        Batch mode, exit immediately after sending commands to the Lab Brick
s.
-q        Quiet mode, skip most outputs.

--- Commands to set parameters and start ramp ---
-c n      Set the active channel
-f nn     Set working frequency, nn is working frequency in MHz
-a nn     Set attenuation, nn is attenuation in db units
-w nn     Set idle time between attenuator ramps, nn is time in ms.
-h nn     Set hold time between ramp phases
-s nn     Set ramp start value, nn is start value in .25db units
-e nn     Set ramp end value, nn is end value in .25db units, p is ramp phase
-t p nn   Set time to dwell on each attenuation value, nn is time in ms., p is
ramp phase 1 or 2
-i p nn   Set attenuation ramp increment, nn is the increment
in .25 db units. p is ramp phase 1 or 2
-g n      Start a ramp, 1 = once upwards, 2 = continuous upwards
          5 = once down, 6 = continuous down, 17 = bidirectional once,
          18 = continuous bidirectional ramps, 0 to stop

rd@M1s-Mac-mini LDA M1 SDK %
```

- 5) Running the LDATest program with no options will show the settings of the attached attenuators. In this case an LDA-133 attenuator is being used. Because there is not an active

ramp or profile the attenuation does not change. A Control-C was pressed to exit from the LDATest program.



The screenshot shows a macOS desktop with a Terminal window titled "LDA M1 SDK --zsh-- 80x51". The window displays the output of the LDATest program. The output includes a list of command-line options (-w, -h, -s, -e, -t, -i, -g) and their descriptions. Below this, the program reports the device information for an LDA-133, including its serial number (28767) and various attenuation and frequency parameters. The program then sets the attenuation to 0.00 db for device 1 and displays this value five times. The output ends with a Control-C (^C) character.

```
Terminal Shell Edit View Window Help

LDA M1 SDK

LDA M1 SDK --zsh-- 80x51

-w nn      Set idle time between attenuator ramps, nn is time in ms.
-h nn      Set hold time between ramp phases
-s nn      Set ramp start value, nn is start value in .25db units
-e nn      Set ramp end value, nn is end value in .25db units, p is ramp phase
-t p nn    Set time to dwell on each attenuation value, nn is time in ms., p is
ramp phase 1 or 2
-i p nn    Set attenuation ramp increment, nn is the increment
           in .25 db units. p is ramp phase 1 or 2
-g n       Start a ramp, 1 = once upwards, 2 = continuous upwards
           5 = once down, 6 = continuous down, 17 = bidirectional once,
           18 = continuous bidirectional ramps, 0 to stop

[rd@M1s-Mac-mini LDA M1 SDK % ./LDATest
Lab Brick Multi Attenuator Demonstration Program
Starting device number = 1, using 1 device[s]
Found 1 Device
Got Device Info for 1 Device[s]
Device 1 is an LDA-133
Device 1 has serial number 28767
Single Channel Device
Attenuation Range:
Minimum Attenuation = 0.00 db
Maximum Attenuation = 63.00 db
Working Frequency Range:
Minimum Frequency = 6.00 Mhz
Maximum Frequency = 13000.00 Mhz
Working Frequency = 0.00 Mhz
Attenuation = 0.00 db
Ramp Start Level = 0.00 db
Ramp End Level = 63.00 db
First Phase Ramp Attenuation Step Size = 1.00 db
Second Phase Ramp Attenuation Step Size = 1.00 db
First Phase Ramp Dwell Time = 1000
Second Phase Ramp Dwell Time = 1
Ramp Idle Time = 0
Ramp Hold Time = 0
RF ON

Setting the attenuator parameters..
Attenuation = 0.00 db for device 1

Attenuation = 0.00 db for device 1

Attenuation = 0.00 db for device 1

Attenuation = 0.00 db for device 1

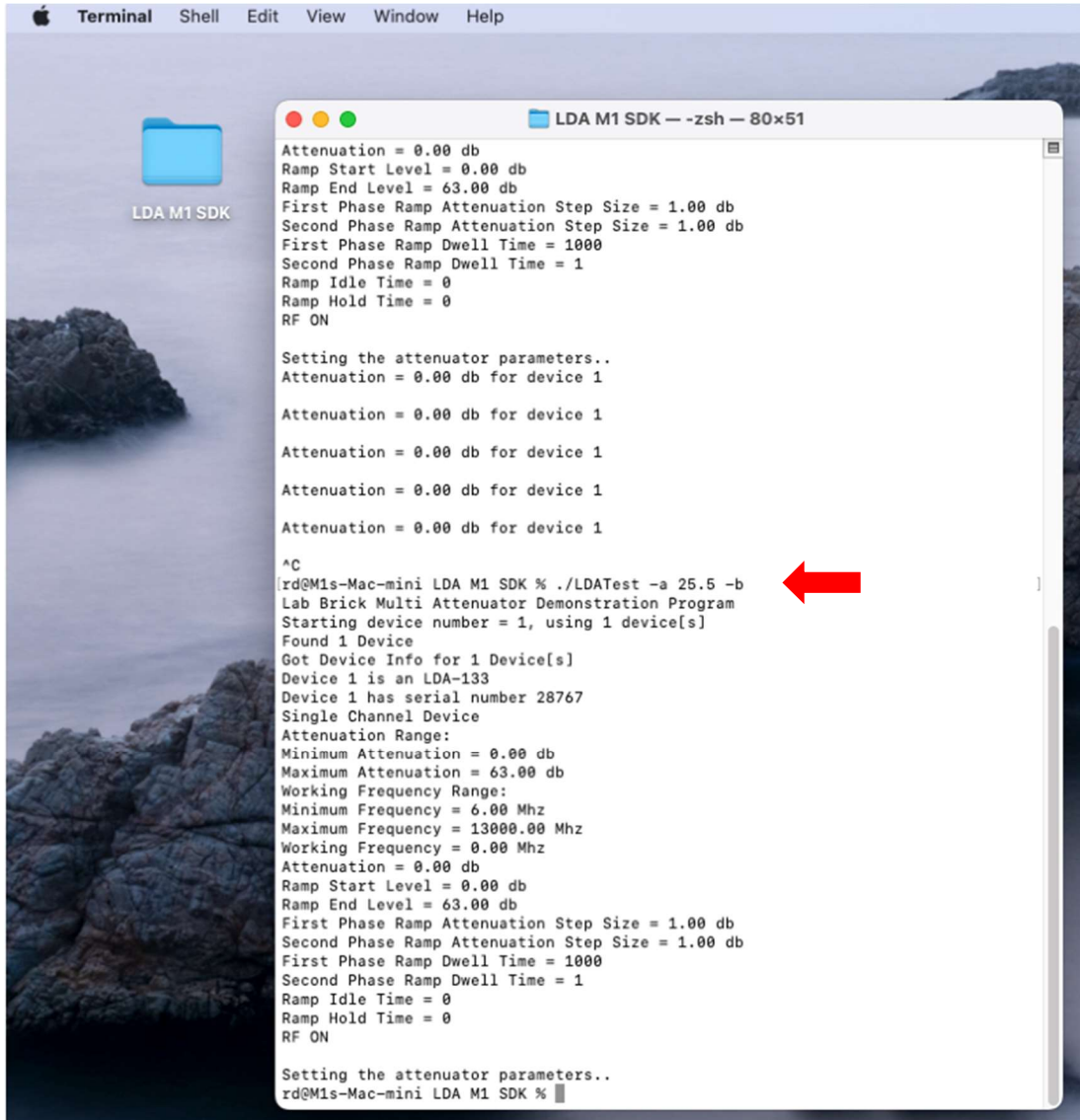
Attenuation = 0.00 db for device 1

^C
```

- 6) In the examples shown here the attenuation is set to 25.5 db on an LDA-133 attenuator. The -b option allows you to have the example program exit immediately after setting the attenuator parameters, the -q option reduces the amount of information displayed. If you enter neither



option the example program will display the attenuation value repeatedly. You can press Control-C to exit from the program.



```
Terminal  Shell  Edit  View  Window  Help

LDA M1 SDK

LDA M1 SDK - zsh - 80x51
Attenuation = 0.00 db
Ramp Start Level = 0.00 db
Ramp End Level = 63.00 db
First Phase Ramp Attenuation Step Size = 1.00 db
Second Phase Ramp Attenuation Step Size = 1.00 db
First Phase Ramp Dwell Time = 1000
Second Phase Ramp Dwell Time = 1
Ramp Idle Time = 0
Ramp Hold Time = 0
RF ON

Setting the attenuator parameters..
Attenuation = 0.00 db for device 1

Attenuation = 0.00 db for device 1

Attenuation = 0.00 db for device 1

Attenuation = 0.00 db for device 1

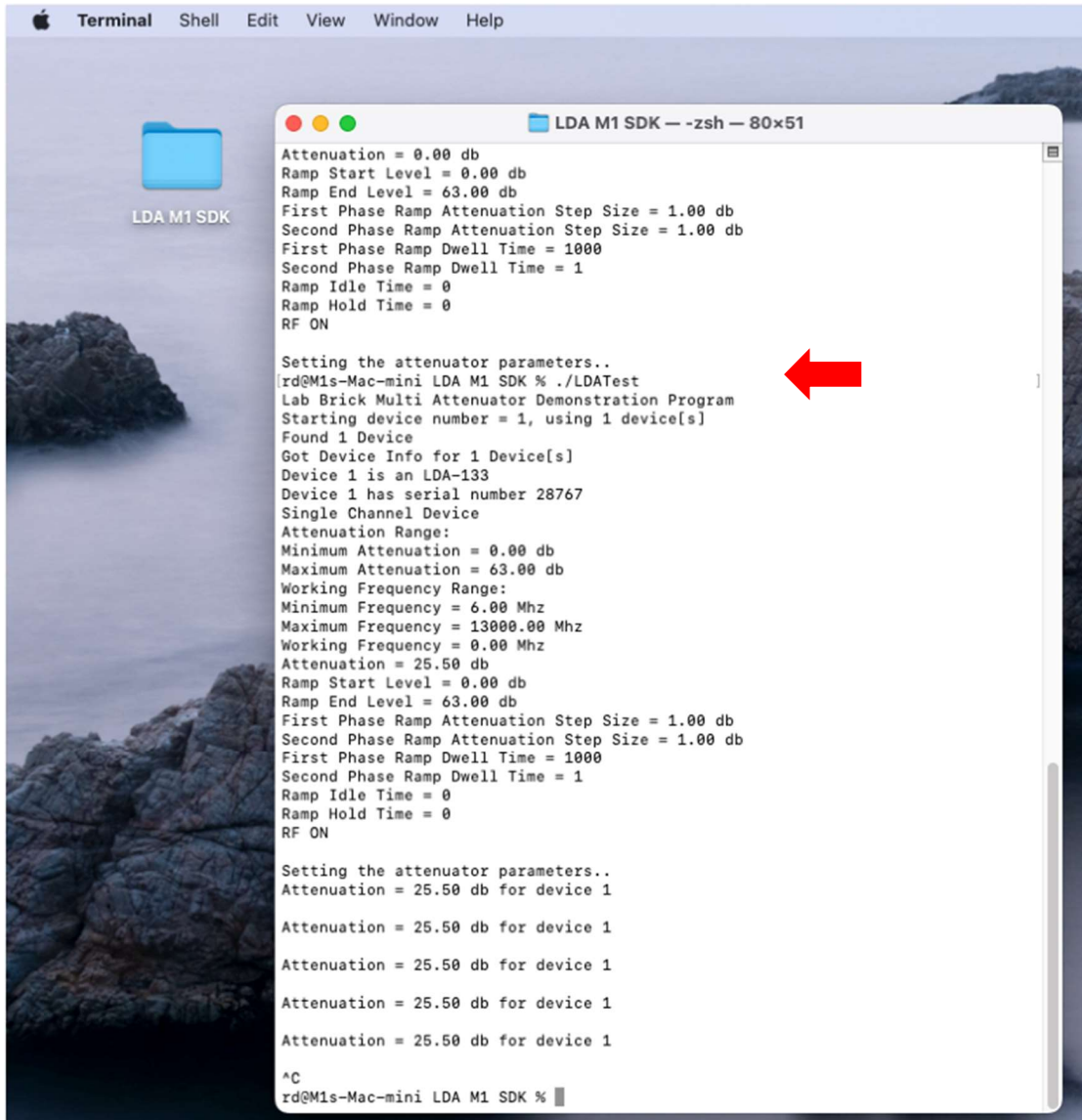
^C
rd@M1s-Mac-mini LDA M1 SDK % ./LDATest -a 25.5 -b
Lab Brick Multi Attenuator Demonstration Program
Starting device number = 1, using 1 device[s]
Found 1 Device
Got Device Info for 1 Device[s]
Device 1 is an LDA-133
Device 1 has serial number 28767
Single Channel Device
Attenuation Range:
Minimum Attenuation = 0.00 db
Maximum Attenuation = 63.00 db
Working Frequency Range:
Minimum Frequency = 6.00 Mhz
Maximum Frequency = 13000.00 Mhz
Working Frequency = 0.00 Mhz
Attenuation = 0.00 db
Ramp Start Level = 0.00 db
Ramp End Level = 63.00 db
First Phase Ramp Attenuation Step Size = 1.00 db
Second Phase Ramp Attenuation Step Size = 1.00 db
First Phase Ramp Dwell Time = 1000
Second Phase Ramp Dwell Time = 1
Ramp Idle Time = 0
Ramp Hold Time = 0
RF ON

Setting the attenuator parameters..
rd@M1s-Mac-mini LDA M1 SDK %
```

The command line option -a will set the attenuation. In this case 25.5 db was chosen.



The LDA device's settings can be displayed by running the LDATest program with no command line options.



```
Attenuation = 0.00 db
Ramp Start Level = 0.00 db
Ramp End Level = 63.00 db
First Phase Ramp Attenuation Step Size = 1.00 db
Second Phase Ramp Attenuation Step Size = 1.00 db
First Phase Ramp Dwell Time = 1000
Second Phase Ramp Dwell Time = 1
Ramp Idle Time = 0
Ramp Hold Time = 0
RF ON

Setting the attenuator parameters..
rd@M1s-Mac-mini LDA M1 SDK % ./LDATest
Lab Brick Multi Attenuator Demonstration Program
Starting device number = 1, using 1 device[s]
Found 1 Device
Got Device Info for 1 Device[s]
Device 1 is an LDA-133
Device 1 has serial number 28767
Single Channel Device
Attenuation Range:
Minimum Attenuation = 0.00 db
Maximum Attenuation = 63.00 db
Working Frequency Range:
Minimum Frequency = 6.00 Mhz
Maximum Frequency = 13000.00 Mhz
Working Frequency = 0.00 Mhz
Attenuation = 25.50 db
Ramp Start Level = 0.00 db
Ramp End Level = 63.00 db
First Phase Ramp Attenuation Step Size = 1.00 db
Second Phase Ramp Attenuation Step Size = 1.00 db
First Phase Ramp Dwell Time = 1000
Second Phase Ramp Dwell Time = 1
Ramp Idle Time = 0
Ramp Hold Time = 0
RF ON

Setting the attenuator parameters..
Attenuation = 25.50 db for device 1

Attenuation = 25.50 db for device 1
Attenuation = 25.50 db for device 1
Attenuation = 25.50 db for device 1
Attenuation = 25.50 db for device 1

^C
rd@M1s-Mac-mini LDA M1 SDK %
```