

ADLINK Technical Document

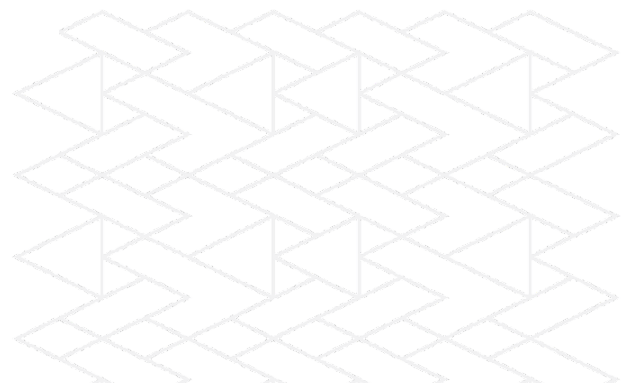
Abstract	How to install Linux drivers for the UD-DASK/X		
OS	Linux		
Keyword	Linux, UD-DASK/X		
Related Products	USB-1210, USB-1901, USB-1902, USB-1903, USB-2405, USB-2401, USB-7230, USB-7250		
Date	2021/08/05	No.	202110002

- Issue Details:

To build a Linux software application to operate an ADLINK USB DAQ card (e.g. USB-1902), download the Linux drivers and install them. The steps for downloading and installing the Linux drivers are detailed in this document.

- More information:

ADLINK provides pre-built driver binaries for Ubuntu LTS Linux kernels. These binaries are regularly updated and officially supported to work with specific Linux kernels indicated in this document and on the ADLINK website. If you want to use another Linux OS or Linux Kernel, you need to sign the NDA to get the driver source code and build the Linux driver by yourself.

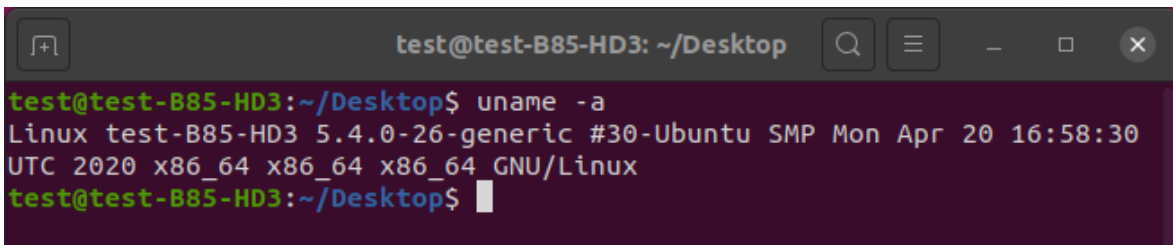


- Solution:

Step 1:

Find out the system kernel version. Go to the terminal and type “uname -a”.

NOTE: ADLINK only supports Linux Kernel version 4.15.0-20-generic, 5.4.0-26-generic, and 5.4.0-47-generic.



```
test@test-B85-HD3: ~/Desktop
test@test-B85-HD3:~/Desktop$ uname -a
Linux test-B85-HD3 5.4.0-26-generic #30-Ubuntu SMP Mon Apr 20 16:58:30
UTC 2020 x86_64 x86_64 x86_64 GNU/Linux
test@test-B85-HD3:~/Desktop$
```

Step 2:

Go to the official ADLINK website, search for “UD-DASK/X”, and download the driver corresponding to your OS and kernel version.

Direct link (login required):

https://www.adlinktech.com/Products/Data_Acquisition/SoftwareandDrivers/UD-DASK_X

Software Download :

USB-1901/1902/1903 Driver

Linux Ubuntu



UD-DASK/X, v21.03 for Ubuntu 18.04 & 20.04 (4.15.0-20-generic, 5.4.0-26-generic, 5.4.0-47-generic)

(1.06MB)

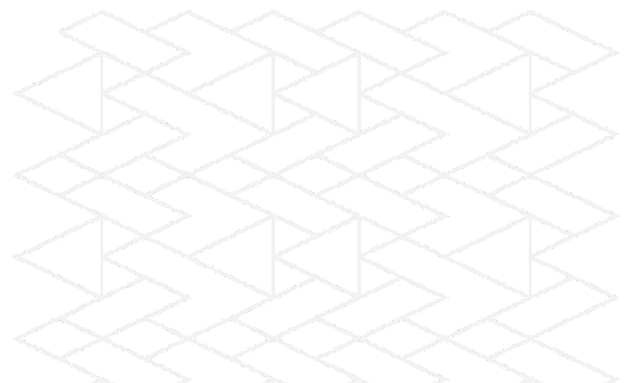
Upload: 2021-03-24



UD-DASK/X, v1.01 for Ubuntu 14.04.3 x86_64, Linux Driver and SDK for ADLINK USB DAQ Series

(1.40MB)

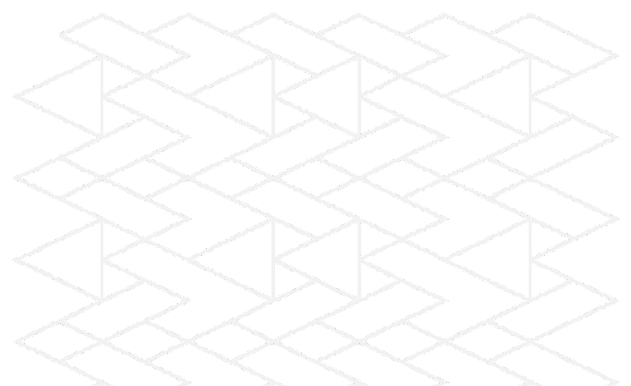
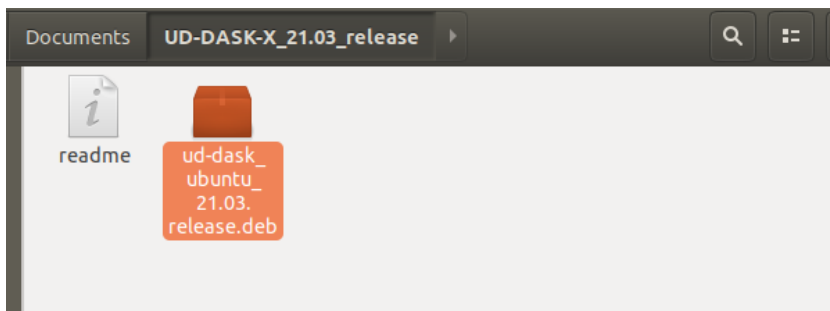
Upload: 2018-02-05



Step 3:

Go to the terminal and type “tar zxvf UD-DASK-xxxxxx.tar.gz” to unpack the .gz file. There are two files in the target folder.

```
ist@ist-MXC2300: ~/Documents
File Edit View Search Terminal Help
ist@ist-MXC2300:~/Documents$ tar zxvf UD-DASK-X_21.03_release.tar.gz
UD-DASK-X_21.03_release/
UD-DASK-X_21.03_release/readme
UD-DASK-X_21.03_release/ud-dask_ubuntu_21.03.release.deb
ist@ist-MXC2300:~/Documents$
```



Step 4:

Go to the terminal and type “sudo dpkg -i ud-dask_XXXXXX.deb” to install the driver.

```
ist@ist-MXC2300: ~/Documents/UD-DASK-X_21.03_release
File Edit View Search Terminal Help

ist@ist-MXC2300:~/Documents/UD-DASK-X_21.03_release$ sudo dpkg -i ud-dask_ubuntu
_21.03.release.deb
(Reading database ... 131810 files and directories currently installed.)
Preparing to unpack ud-dask_ubuntu_21.03.release.deb ...
Unpacking ud-dask-x (21.03) over (21.03) ...
Remove config file...

Remove driver files...

Remove library files...

Remove adlink udev permission files...

Setting up ud-dask-x (21.03) ...
Current kernel version: 4.15.0-20-generic
Copy default config file...
>>>> Copy Successfully <<<<<

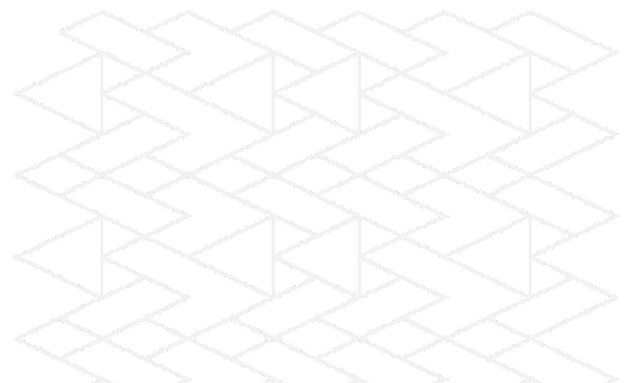
Copy driver files...
>>>> Copy Successfully <<<<<

Copy firmware files...
>>>> Copy Successfully <<<<<

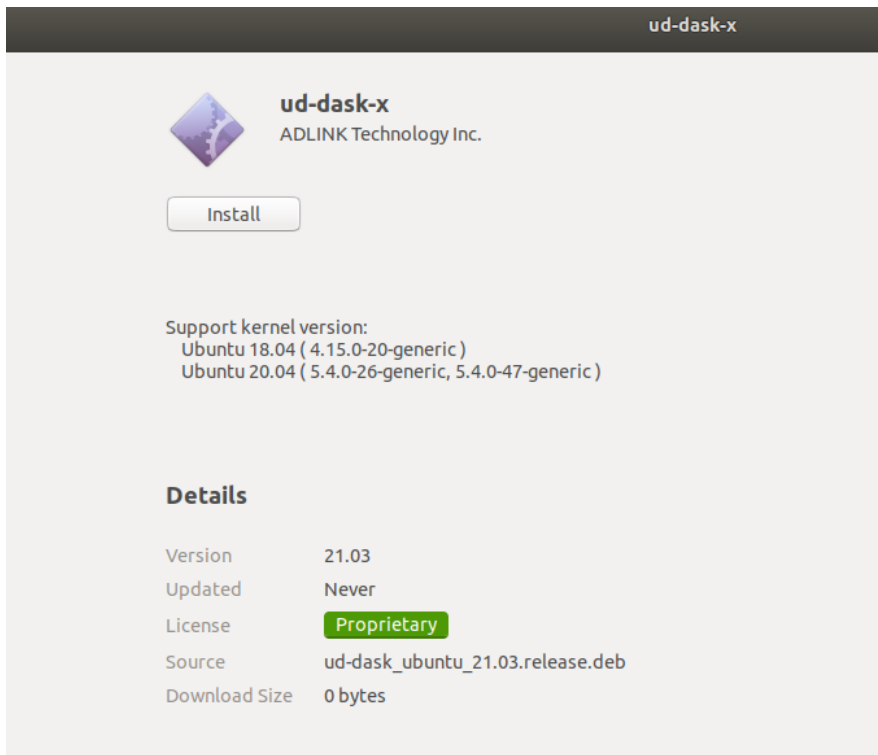
Copy library files...
>>>> Copy Successfully <<<<<

Copy adlink udev permission files...
>>>> Copy Successfully <<<<<

ist@ist-MXC2300:~/Documents/UD-DASK-X_21.03_release$
```



Alternatively, double-click the .deb file in the graphical user interface. Reboot when done.



Step 5:

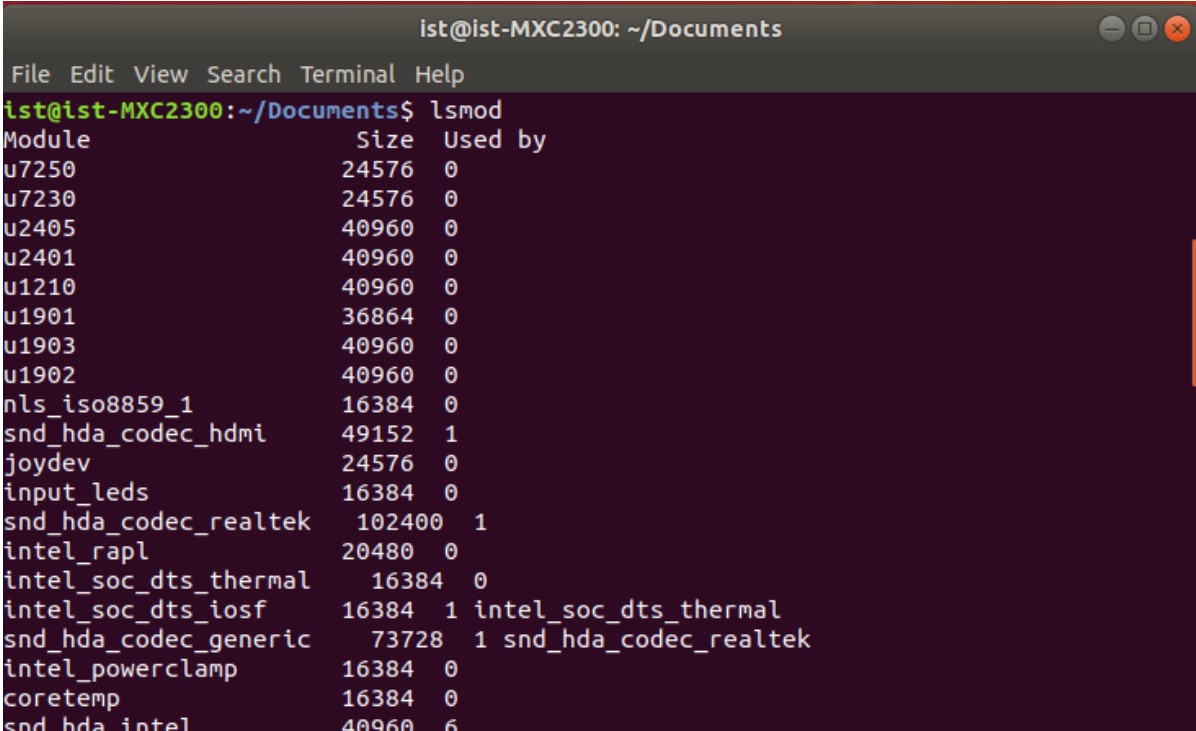
After reboot, go to the terminal and type “lsusb” to check if the system detected and allocated resources for ADLINK devices.

```
ist@ist-MXC2300: ~/Documents
File Edit View Search Terminal Help
ist@ist-MXC2300:~/Documents$ lsusb
Bus 002 Device 001: ID 1d6b:0003 Linux Foundation 3.0 root hub
Bus 001 Device 013: ID 0000:3825
Bus 001 Device 010: ID 0781:558b SanDisk Corp.
Bus 001 Device 014: ID 0c45:7603 Microdia
Bus 001 Device 003: ID 0424:2514 Standard Microsystems Corp. USB 2.0 Hub
Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
ist@ist-MXC2300:~/Documents$
```



Step 6:

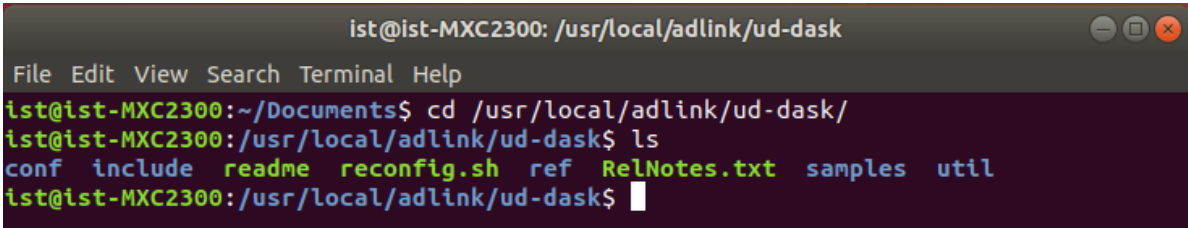
Go to the terminal and type “lsmod” to check the driver service is activated and running in the Linux kernel.



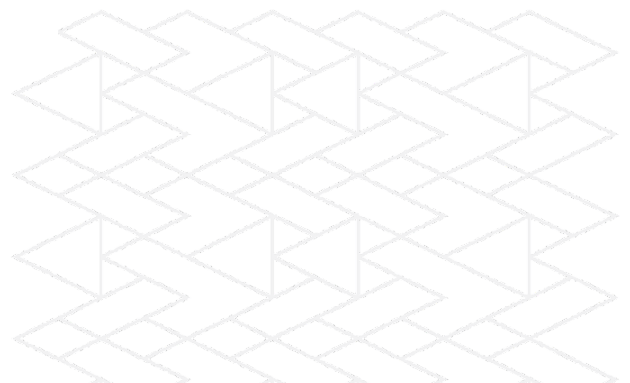
```
ist@ist-MXC2300: ~/Documents
File Edit View Search Terminal Help
ist@ist-MXC2300:~/Documents$ lsmod
Module                Size  Used by
u7250                  24576  0
u7230                  24576  0
u2405                  40960  0
u2401                  40960  0
u1210                  40960  0
u1901                  36864  0
u1903                  40960  0
u1902                  40960  0
nls_iso8859_1          16384  0
snd_hda_codec_hdmi    49152  1
joydev                 24576  0
input_leds             16384  0
snd_hda_codec_realtek 102400  1
intel_rapl             20480  0
intel_soc_dts_thermal  16384  0
intel_soc_dts_iosf    16384  1 intel_soc_dts_thermal
snd_hda_codec_generic 73728  1 snd_hda_codec_realtek
intel_powerclamp       16384  0
coretemp               16384  0
snd_hda_intel          40960  6
```

Step 7:

The ADLINK software package deploys files such as documents, utilities, and samples to the following folder: `//usr/local/adlink/ud-dask/`



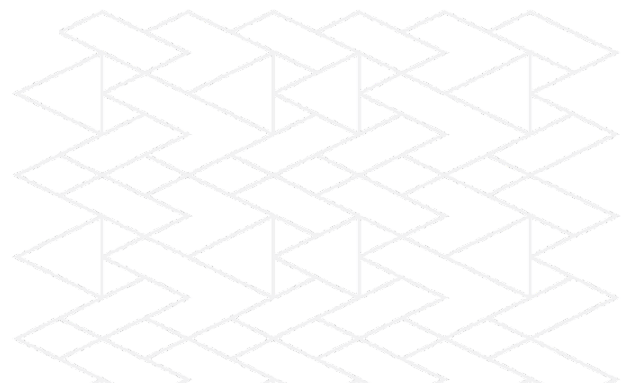
```
ist@ist-MXC2300: /usr/local/adlink/ud-dask
File Edit View Search Terminal Help
ist@ist-MXC2300:~/Documents$ cd /usr/local/adlink/ud-dask/
ist@ist-MXC2300:/usr/local/adlink/ud-dask$ ls
conf  include  readme  reconfig.sh  ref  RelNotes.txt  samples  util
ist@ist-MXC2300:/usr/local/adlink/ud-dask$
```



Step 8:

Choose a sample program (e.g., `//usr/local/adlink/ud-dask/samples/190x/c190x_AI_DBF`).. Users can modify the sample program as needed and type “make” to build the executable.

```
ist@ist-MXC2300: /usr/local/adlink/ud-dask/samples/190x/c190x_AI_DBF
File Edit View Search Terminal Help
ist@ist-MXC2300:/usr/local/adlink/ud-dask$ ls
conf include readme reconfig.sh ref RelNotes.txt samples util
ist@ist-MXC2300:/usr/local/adlink/ud-dask$ cd samples/
ist@ist-MXC2300:/usr/local/adlink/ud-dask/samples$ cd 190x/
ist@ist-MXC2300:/usr/local/adlink/ud-dask/samples/190x$ ls
c190x_AI_DBF          c190x_AI_Polling
c190x_AI_DMA         c190x_AO_DBF
c190x_AI_DMA_DelayTrigger  c190x_AO_DMA
c190x_AI_DMA_ExtA    c190x_AO_DMA_ExtD
c190x_AI_DMA_ExtConvSrc  c190x_AO_DMA_ReTrigger
c190x_AI_DMA_ExtD    c190x_AO_Polling
c190x_AI_DMA_GatedTrigger  c190x_AO_WaveRepeat
c190x_AI_DMA_InfiniteReTrigger  c190x_DIO_Polling
c190x_AI_DMA_ReTrigger  c190x_GPTC
c190x_AI_DMA_Sync    Makefile
ist@ist-MXC2300:/usr/local/adlink/ud-dask/samples/190x$ cd c190x_AI_DBF
ist@ist-MXC2300:/usr/local/adlink/ud-dask/samples/190x/c190x_AI_DBF$ ls
190xai.c Makefile
ist@ist-MXC2300:/usr/local/adlink/ud-dask/samples/190x/c190x_AI_DBF$ make
```



Step 9:

Launch the executable and check the output. The image below shows a successful execution of the ADLINK DAQ and the acquired data output to a .dat file.

```
ist@ist-MXC2300: /usr/local/adlink/ud-dask/samples/190x/c190x_AI_DBF
File Edit View Search Terminal Help
gcc -c -Wall -Wstrict-prototypes -O2 -m64 -I../../../../include 190xai.c
gcc -c -Wall -Wstrict-prototypes -O2 -m64 -I../../../../include ../../conio/conio.c
gcc -o 190xai 190xai.o conio.o -lusb_dask64
ist@ist-MXC2300:/usr/local/adlink/ud-dask/samples/190x/c190x_AI_DBF$ ./190xai
This sample performs infinite AI acquisition from AI Channel 0
at 50000.000 Hz sampling rate by Double buffer mode.

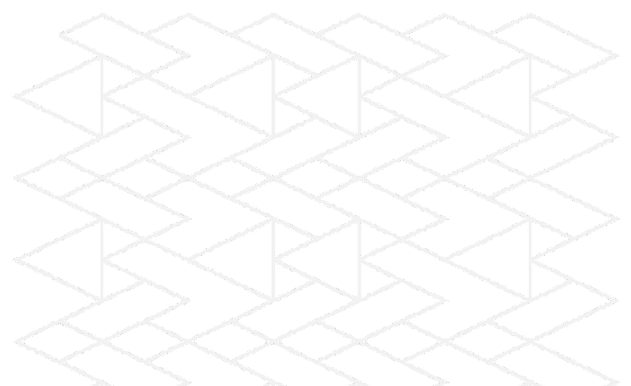
Card Type? (1) USB-1902   (2) USB-1903   (3) USB-1901: 2
Card Number? 0

AI Infinite Acquisition is started...

Buffer0 Half Ready...
Write 10240 samples of Buffer0 to ai_data.dat file...
Press Enter to stop...

Buffer1 Half Ready...
Write 10240 samples of Buffer1 to ai_data.dat file...
Press Enter to stop...

Buffer0 Half Ready...
Write 10240 samples of Buffer0 to ai_data.dat file...
Press Enter to stop...
```



Step 10:

If necessary, adjust the data acquisition settings (default: 1 MB, 256 pages). To adjust the settings, go to the terminal and type `./reconfig.sh`. Refer to the following images for further details.

- a. Choose "(1) Change to user settings".

```
ist@ist-MXC2300: /usr/local/adlink/ud-dask
File Edit View Search Terminal Help
ist@ist-MXC2300:/usr/local/adlink/ud-dask$ ./reconfig.sh
Reset config setting procedure...

Cards is inserted now:
=====
Card   AI      AO      DI      DO      [unit: KB]
u1903  1024    1024    0        0
=====

Please choose the flow:
(1) Change to User settings (2) Restore original factory settings
1
```

- b. Select the card type for configuration.

```
ist@ist-MXC2300: /usr/local/adlink/ud-dask
File Edit View Search Terminal Help
===== Configured Cards =====
Card Type  Cards  Buffer Size [unit: pages(4KB/page)]
          AI      AO      DI      DO
-----
USB1902    1      256    256     0      0
USB1903    1      256    256     0      0
USB1901    1      256     0      0      0
USB2405    1      256     0      0      0
USB2401    1      256     0      0      0
USB7230    1       0      0      0      0
USB7250    1       0      0      0      0
USB1210    1      256     0      0      0
=====
(1)USB1902 (2)USB1903 (3)USB1901 (4)USB2405 (5)USB2401
(6)USB7230 (7)USB7250 (8)USB1210
Select the card type for configuration, or '0' to exit:2
```

- c. Select “(1) User Config” for configuration.

```

ist@ist-MXC2300: /usr/local/adlink/ud-dask
File Edit View Search Terminal Help
===== Configured Cards =====
Card Type   Cards   Buffer Size [unit: pages(4KB/page)]
           AI      AO      DI      DO
-----
USB1902     1       256    256     0       0
USB1903     1       256    256     0       0
USB1901     1       256     0       0       0
USB2405     1       256     0       0       0
USB2401     1       256     0       0       0
USB7230     1         0     0       0       0
USB7250     1         0     0       0       0
USB1210     1       256     0       0       0

=====
(1)USB1902 (2)USB1903 (3)USB1901 (4)USB2405 (5)USB2401
(6)USB7230 (7)USB7250 (8)USB1210
Select the card type for configuration, or '0' to exit:2

=====
(1)User Config (2)Reset to Default
Select the config type for configuration, or '0' to exit:1

```

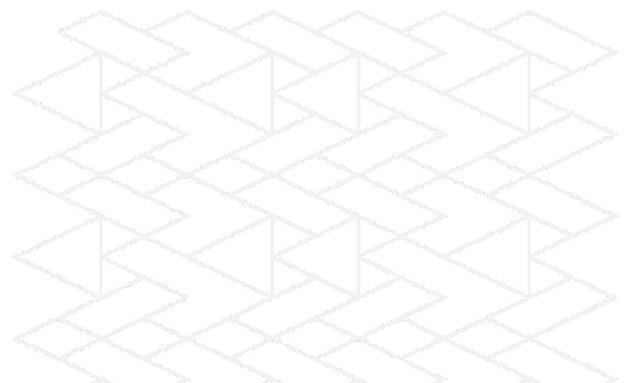
- d. Enter memory pages for AI/AO for your device. After that, you need to check if the setting is correct.

```

ist@ist-MXC2300: /usr/local/adlink/ud-dask
File Edit View Search Terminal Help
*****
*****  USB_DASK LINUX Configuration Utility  *****
*****
Card_Type : USB1903

How many USB1903 adapters in your machine : 1
Memory pages for AI function ( should be < 1024 pages, 1 Mem_Page = 4 KB ) : 51
2
Memory pages for AO function ( should be < 1024 pages, 1 Mem_Page = 4 KB ) : 51
2

```



- e. Check the result of configuration and exit the utility.

```
ist@ist-MXC2300: /usr/local/adlink/ud-dask
File Edit View Search Terminal Help
*****
*****          USB_DASK LINUX Configuration Utility          *****
*****
Card_Type : USB1903

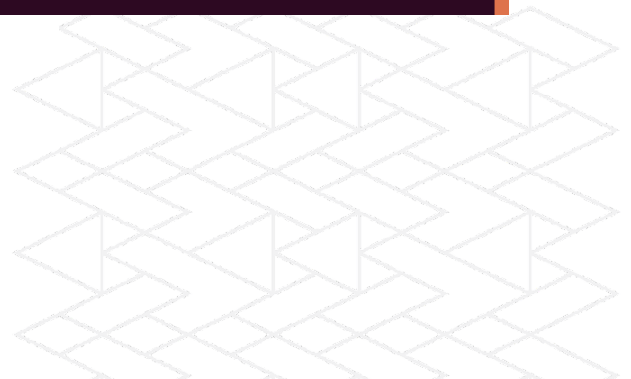
How many USB1903 adapters in your machine : 1
Memory pages for AI function ( should be < 1024 pages, 1 Mem_Page = 4 KB ) : 51
2
Memory pages for AO function ( should be < 1024 pages, 1 Mem_Page = 4 KB ) : 51
2

The setting for USB1903 :
-----
AI: 512 Pages   AO: 512 Pages   DI: 0 Pages   DO: 0 Pages   for 1 USB1903 Ca
rds

                                are these correct (Y/N) ? y
```

```
ist@ist-MXC2300: /usr/local/adlink/ud-dask
File Edit View Search Terminal Help
===== Configured Cards =====
Card Type   Cards   Buffer Size [unit: pages(4KB/page)]
           AI      AO      DI      DO
-----
USB1902     1       256    256     0       0
USB1903     1       512    512     0       0
USB1901     1       256     0       0       0
USB2405     1       256     0       0       0
USB2401     1       256     0       0       0
USB7230     1        0       0       0       0
USB7250     1        0       0       0       0
USB1210     1       256     0       0       0

=====
(1)USB1902 (2)USB1903 (3)USB1901 (4)USB2405 (5)USB2401
(6)USB7230 (7)USB7250 (8)USB1210
Select the card type for configuration, or '0' to exit:0
```



- f. Reboot the system.

```
The memory size you configure for your USB-DASK adapters is 2304 Mem_Pages.
[sudo] password for ist:

The SMP information is got from /proc/sys/kernel/version !

=====
Current Config:
Card  AI    AO    DI    DO    [unit: KB]
u1901 1024   0     0     0
u1210 1024   0     0     0
u2405 1024   0     0     0
u7230  0      0     0     0
u1902 1024   1024  0     0
u7250  0      0     0     0
u2401 2048   0     0     0
u1903 1024   1024  0     0

=====
Move Config file...
>>>> SYSTEM REBOOT REQUIRED <<<<<

Do you want to reboot now? (Y/N)
y
```

