

ADLINK Technical Document

Abstract	How to install Linux drivers for the D2K-DASK/X		
OS	Linux		
Keyword	Linux, D2K-DASK/X		
Related Products	DAQ-2010, DAQe-2010, PXI-2010, DAQ-2016, DAQe-2016, PXI-2016, DAQ-2005, DAQe-2005, PXI-2005, DAQ-2006, DAQe-2006, PXI-2006, PXI-2020, PXI-2022, DAQ-2208, DAQe-2208, PXI-2208, DAQ-2204, DAQe-2204, PXI-2204, DAQ-2205, DAQe-2205, PXI-2205, DAQ-2206, DAQe-2206, PXI-2206, DAQ-2501, DAQe-2501, PXI-2501, DAQ-2502, DAQe-2502, PXI-2502, DAQ-2213, DAQe-2213, DAQ-221, DAQe-2214		
Date	2021-07-16	No.	202110015

- Issue Details:

To build a Linux software application to operate an ADLINK DAQ card (e.g., DAQ-2205), 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 Ubuntu 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.

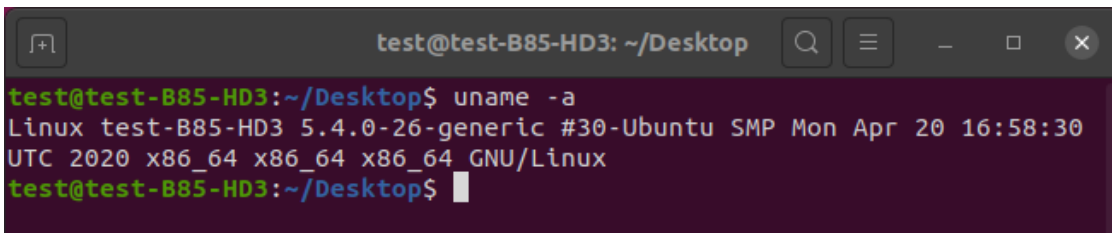


- Solution:

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 “D2K-DASK/X”, and download the driver that corresponds to your OS and kernel version.

Direct link (login required):

https://www.adlinktech.com/Products/Data_Acquisition/SoftwareandDrivers/D2K-DASK_X

Software Download :**DAQ-2000 Series Driver**Linux Ubuntu 

D2K-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](#)
(4.34MB)
Upload: 2021-03-24

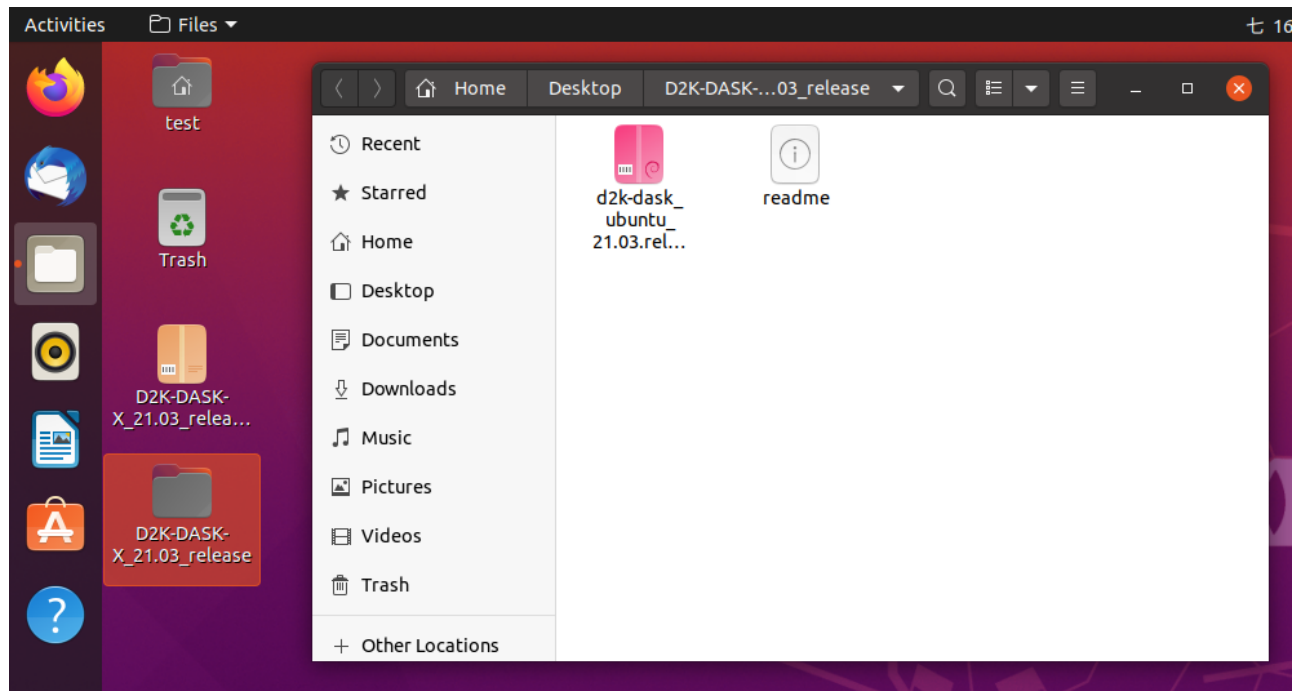


D2K-DASK/X, v20.01 for Ubuntu 16.04 &
16.04.6 i686, Linux Driver and SDK for
ADLINK D2K DAQ Series



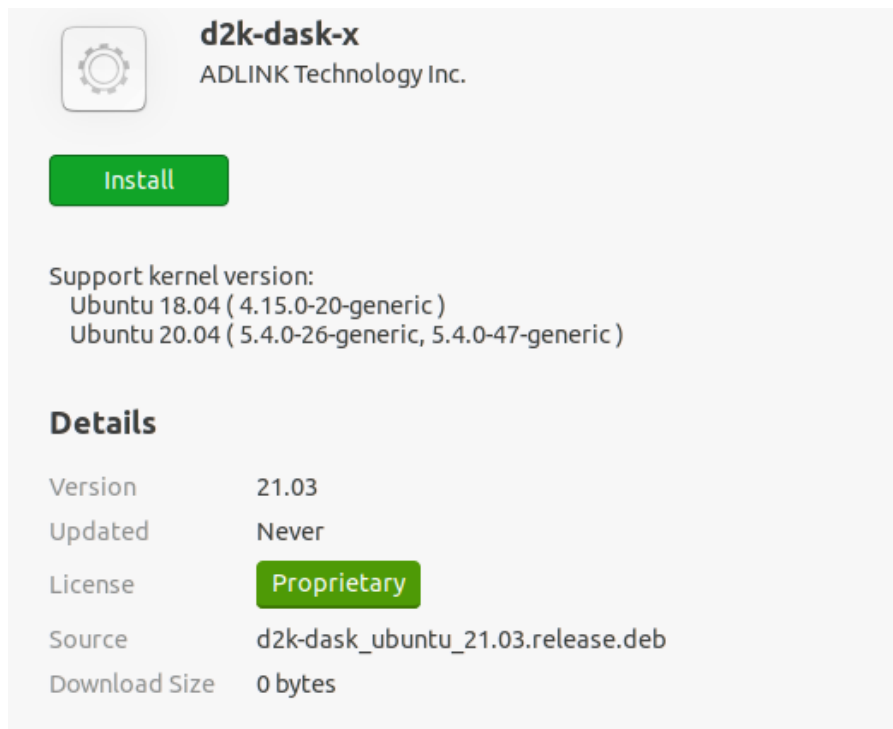
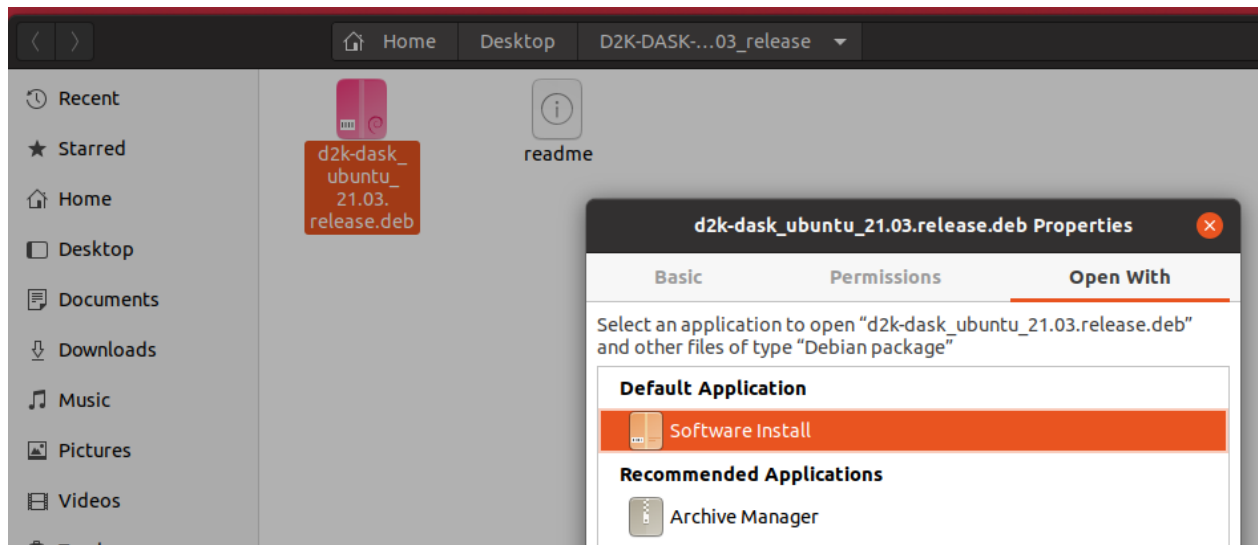
Step 3:

Unpack the .gz file. There are two files in the archive.



Step 4:

Double-click the .deb file and select “Software Install” as the default application if it isn’t already. Follow the steps to install the files and reboot the system.



Step 5:

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

```
test@test-B85-HD3: ~/Desktop

Memory behind bridge: f7c00000-f7cfffff [size=1M]
Prefetchable memory behind bridge: [disabled]
Capabilities: <access denied>
00: 86 80 4e 24 07 00 10 00 41 01 04 06 10 00 01 00
10: 00 00 00 00 00 00 00 00 03 04 04 20 d1 d1 20 22
20: c0 f7 c0 f7 f1 ff 01 00 00 00 00 00 00 00 00 00
30: 00 00 00 00 90 00 00 00 00 00 00 00 0a 01 12 02

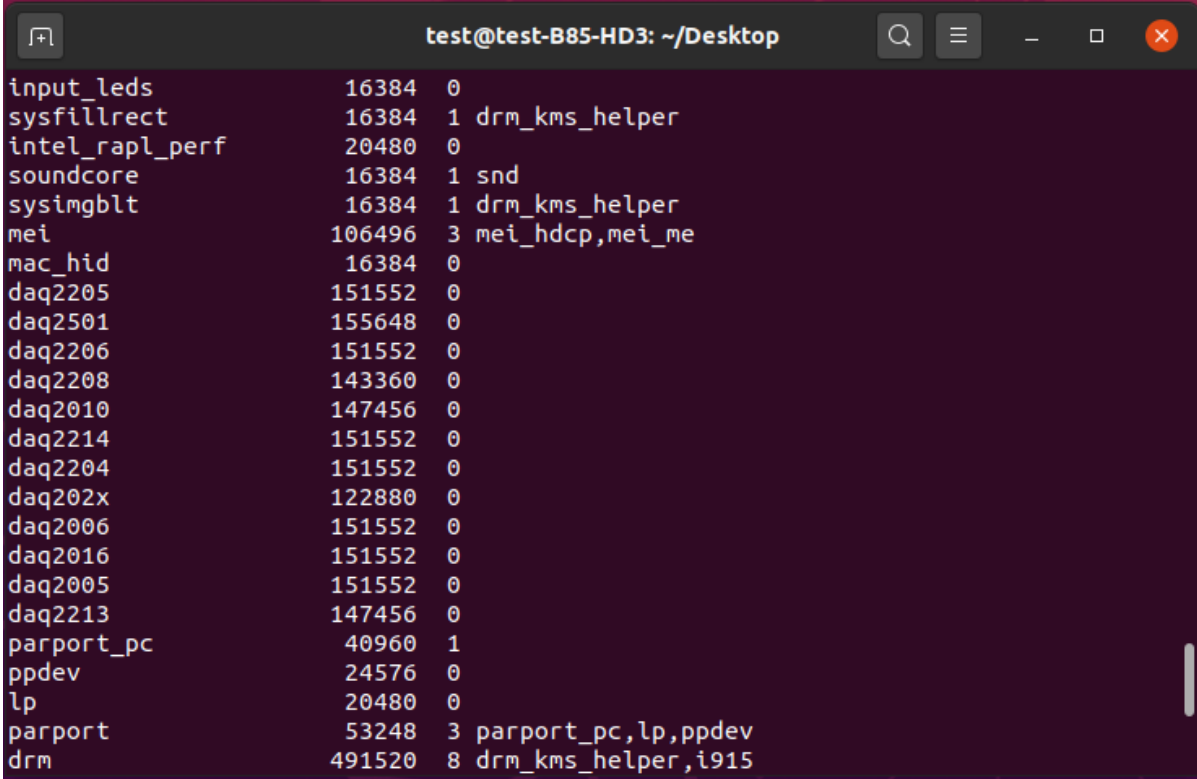
04:00.0 Signal processing controller: Adlink Technology Device a205 (rev 05)
Subsystem: Adlink Technology Device a205
Flags: bus master, 66MHz, medium devsel, latency 32, IRQ 19
Memory at f7c00000 (32-bit, non-prefetchable) [size=512]
I/O ports at d100 [size=256]
I/O ports at d000 [size=256]
I/O ports at 0000
Capabilities: <access denied>
Kernel driver in use: DAQ-2205 Driver
Kernel modules: daq2205
00: 4a 14 05 a2 07 00 b0 02 05 00 80 11 10 20 00 00
10: 00 00 c0 f7 01 d1 00 00 01 d0 00 00 01 00 00 00
20: 00 00 00 00 00 00 00 00 00 00 00 00 4a 14 05 a2
30: 00 00 00 00 40 00 00 00 00 00 00 00 00 01 00 00

test@test-B85-HD3:~/Desktop$
```



Step 6:

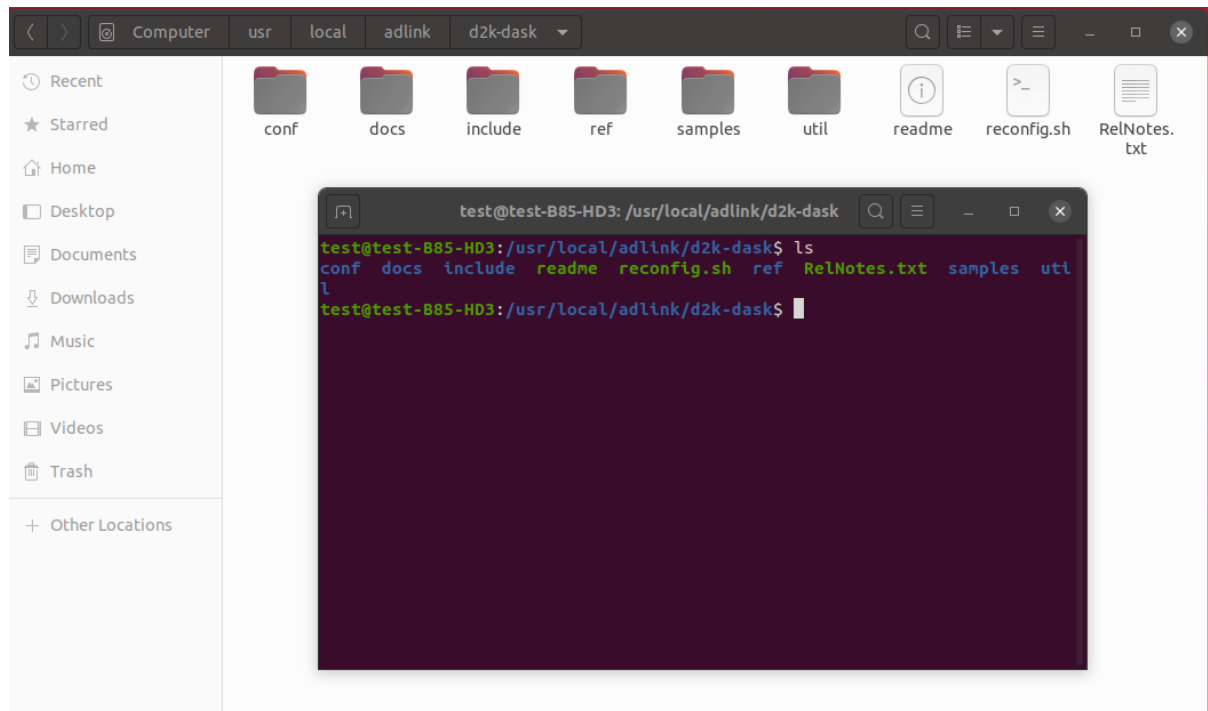
Go to the terminal and type “lsmod” to check the driver service is activated and running in the Linux kernel.



```
test@test-B85-HD3: ~/Desktop
input_leds                16384 0
sysfillrect               16384 1 drm_kms_helper
intel_rapl_perf           20480 0
soundcore                 16384 1 snd
sysimgblt                 16384 1 drm_kms_helper
mei                       106496 3 mei_hdcp,mei_me
mac_hid                   16384 0
daq2205                   151552 0
daq2501                   155648 0
daq2206                   151552 0
daq2208                   143360 0
daq2010                   147456 0
daq2214                   151552 0
daq2204                   151552 0
daq202x                   122880 0
daq2006                   151552 0
daq2016                   151552 0
daq2005                   151552 0
daq2213                   147456 0
parport_pc                40960 1
ppdev                     24576 0
lp                         20480 0
parport                   53248 3 parport_pc,lp,ppdev
drm                       491520 8 drm_kms_helper,i915
```

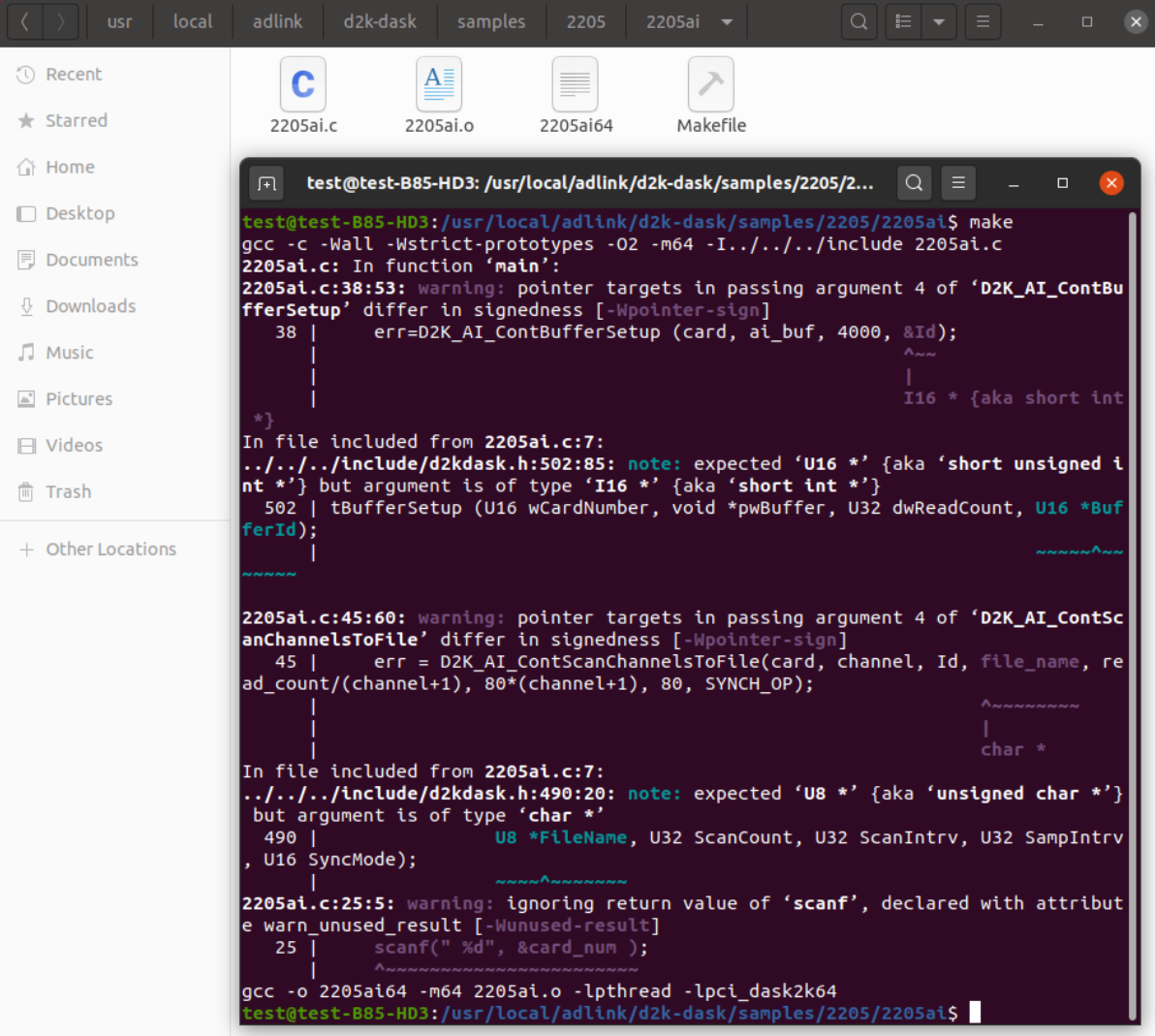
Step 7:

The ADLINK software package deploy files such as documents, utilities, and samples to the following folder: `///usr/local/adlink/d2k-dask/`



Step 8:

Choose a sample program (e.g., `//usr/local/adlink/d2k-dask/samples/2205/2205ai`) . Users can modify the sample program as needed and type “make” to build the executable.



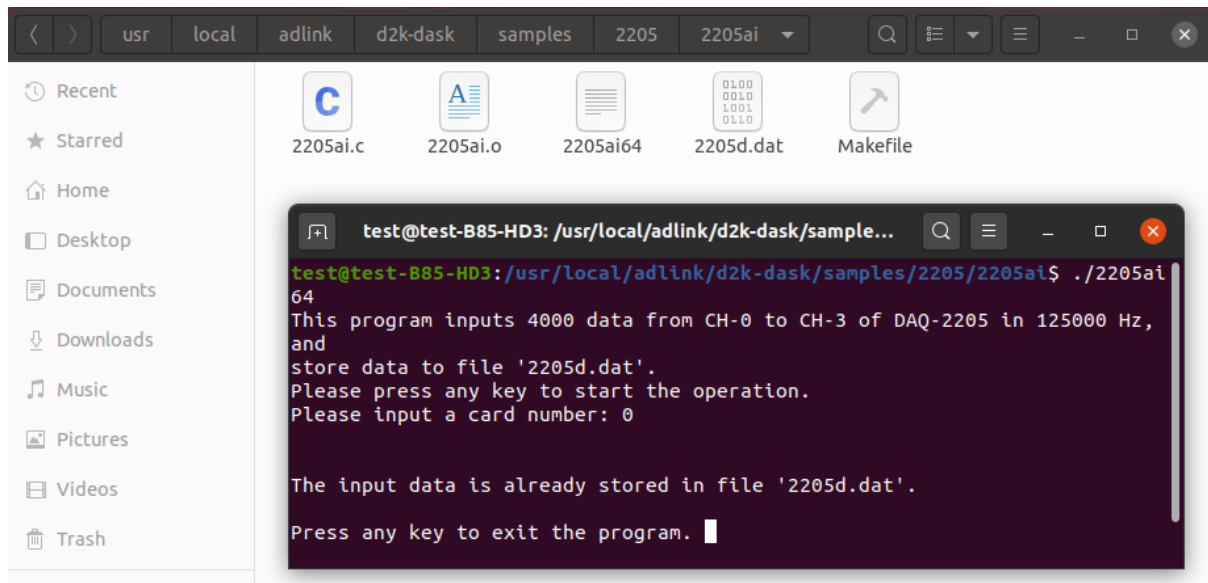
```

test@test-B85-HD3: /usr/local/adlink/d2k-dask/samples/2205/2205ai$ make
gcc -c -Wall -Wstrict-prototypes -O2 -m64 -I../../../../include 2205ai.c
2205ai.c: In function 'main':
2205ai.c:38:53: warning: pointer targets in passing argument 4 of 'D2K_AI_ContBufferSetup' differ in signedness [-Wpointer-sign]
   38 |         err=D2K_AI_ContBufferSetup (card, ai_buf, 4000, &Id);
      |                                           ^~~~~~
      |                                           |
      |                                           I16 * {aka short int *}
In file included from 2205ai.c:7:
../../../../include/d2kdask.h:502:85: note: expected 'U16 *' {aka 'short unsigned int *'} but argument is of type 'I16 *' {aka 'short int *'}
   502 | tBufferSetup (U16 wCardNumber, void *pwBuffer, U32 dwReadCount, U16 *Buf
ferId);
      |
2205ai.c:45:60: warning: pointer targets in passing argument 4 of 'D2K_AI_ContScanChannelsToFile' differ in signedness [-Wpointer-sign]
   45 |         err = D2K_AI_ContScanChannelsToFile(card, channel, Id, file_name, re
ad_count/(channel+1), 80*(channel+1), 80, SYNCH_OP);
      |
In file included from 2205ai.c:7:
../../../../include/d2kdask.h:490:20: note: expected 'U8 *' {aka 'unsigned char *'} but argument is of type 'char *'
   490 |         U8 *FileName, U32 ScanCount, U32 ScanIntrv, U32 SampIntrv
, U16 SyncMode);
      |
2205ai.c:25:5: warning: ignoring return value of 'scanf', declared with attribute warn_unused_result [-Wunused-result]
   25 |         scanf(" %d", &card_num );
      |         ~~~~~^~~~~
gcc -o 2205ai64 -m64 2205ai.o -lpthread -lpci_dask2k64
test@test-B85-HD3: /usr/local/adlink/d2k-dask/samples/2205/2205ai$

```

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.



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”



```
test@test-B85-HD3: /usr/local/adlink/d2k-dask$ ./reconfig.sh
Reset config setting procedure...

Cards is inserted now:
=====
Card    AI      AO      DI      DO      [unit: KB]
daq2205 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

```
test@test-B85-HD3: /usr/local/adlink/d2k-dask

===== Configured Cards =====
Card Type   Cards   Buffer Size [unit: pages(4KB/page)]
           AI      AO      DI      DO      legacy
-----
DAQ2005      1      256     256      0      0      0
DAQ2006      1      256     256      0      0      0
DAQ2010      1      256     256      0      0      0
DAQ2016      1      256     256      0      0      0
DAQ202x      1      256      0      0      0      0
DAQ2204      1      256     256      0      0      0
DAQ2205      1     1024    1024      0      0      0
DAQ2206      1      256     256      0      0      0
DAQ2208      1      256      0      0      0      0
DAQ2213      1      256      0      0      0      0
DAQ2214      1      256     256      0      0      0
DAQ2501      1      256     256      0      0      0
DAQ2502      1     1024     512      0      0      1

=====
(1)DAQ2005 (2)DAQ2006 (3)DAQ2010 (4)DAQ2016 (5)DAQ202x
(6)DAQ2204 (7)DAQ2205 (8)DAQ2206 (9)DAQ2208 (10)DAQ2213
(11)DAQ2214 (12)DAQ2501 (13)DAQ2502
Select the card type for configuration, or '0' to exit:7
```

- c. Select "(1) User Config" for configuration

```
test@test-B85-HD3: /usr/local/adlink/d2k-dask
-----
DAQ2005      1      256      256      0      0      0
DAQ2006      1      256      256      0      0      0
DAQ2010      1      256      256      0      0      0
DAQ2016      1      256      256      0      0      0
DAQ202x      1      256      0      0      0      0
DAQ2204      1      256      256      0      0      0
DAQ2205      1      1024     1024      0      0      0
DAQ2206      1      256      256      0      0      0
DAQ2208      1      256      0      0      0      0
DAQ2213      1      256      0      0      0      0
DAQ2214      1      256      256      0      0      0
DAQ2501      1      256      256      0      0      0
DAQ2502      1      1024     512      0      0      1

=====
(1)DAQ2005 (2)DAQ2006 (3)DAQ2010 (4)DAQ2016 (5)DAQ202x
(6)DAQ2204 (7)DAQ2205 (8)DAQ2206 (9)DAQ2208 (10)DAQ2213
(11)DAQ2214 (12)DAQ2501 (13)DAQ2502
    Select the card type for configuration, or '0' to exit:7

=====
(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, check if the setting is correct.

```

test@test-B85-HD3: /usr/local/adlink/d2k-dask
*****
*****      D2K_DASK LINUX Configuration Utility      *****
*****

Card_Type : DAQ2205

How many DAQ2205 adapters in your machine : 1
Memory pages for AI function ( 1 Mem_Page = 4 KB ) : 512
Memory pages for AO function ( 1 Mem_Page = 4 KB ) : 512
Ignore Board ID : 0

The setting for DAQ2205 :
-----
AI: 512 Pages    AO: 512 Pages    DI: 0 Pages    DO: 0 Pages    for 1 DAQ2205 Ca
rds (legacy=0)

                                are these correct (Y/N) ? Y

```

- e. Reboot the system.

```

test@test-B85-HD3: /usr/local/adlink/d2k-dask
=====
Current Config:
Card      AI      AO      DI      DO      LEGACY [unit: KB]
daq2213   1024    0       0       0       0
daq2208   1024    0       0       0       0
daq2204   1024    1024    0       0       0
daq2005   1024    1024    0       0       0
daq2006   1024    1024    0       0       0
daq2502   4096    2048    0       0       1
daq2501   1024    1024    0       0       0
daq2016   1024    1024    0       0       0
daq202x   1024    0       0       0       0
daq2010   1024    1024    0       0       0
daq2206   1024    1024    0       0       0
daq2205   2048    2048    0       0       0
daq2214   1024    1024    0       0       0
=====
Move Config file...
>>>>> SYSTEM REBOOT REQUIRED <<<<<

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

```