SNOWFORCE 3 USER MANAUAL

Kitronyx

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Snowforce 3

Revision History

January 2019 First Publication for Snowforce 3

December 2019 Add Command line

Table of Contents

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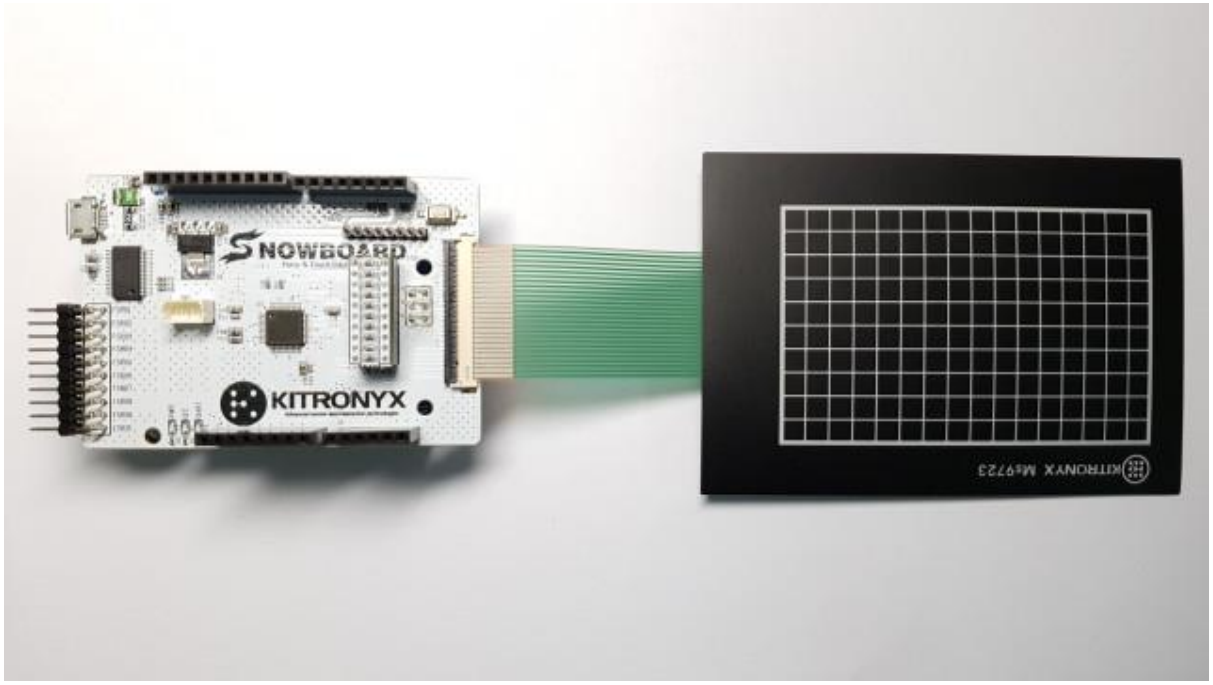
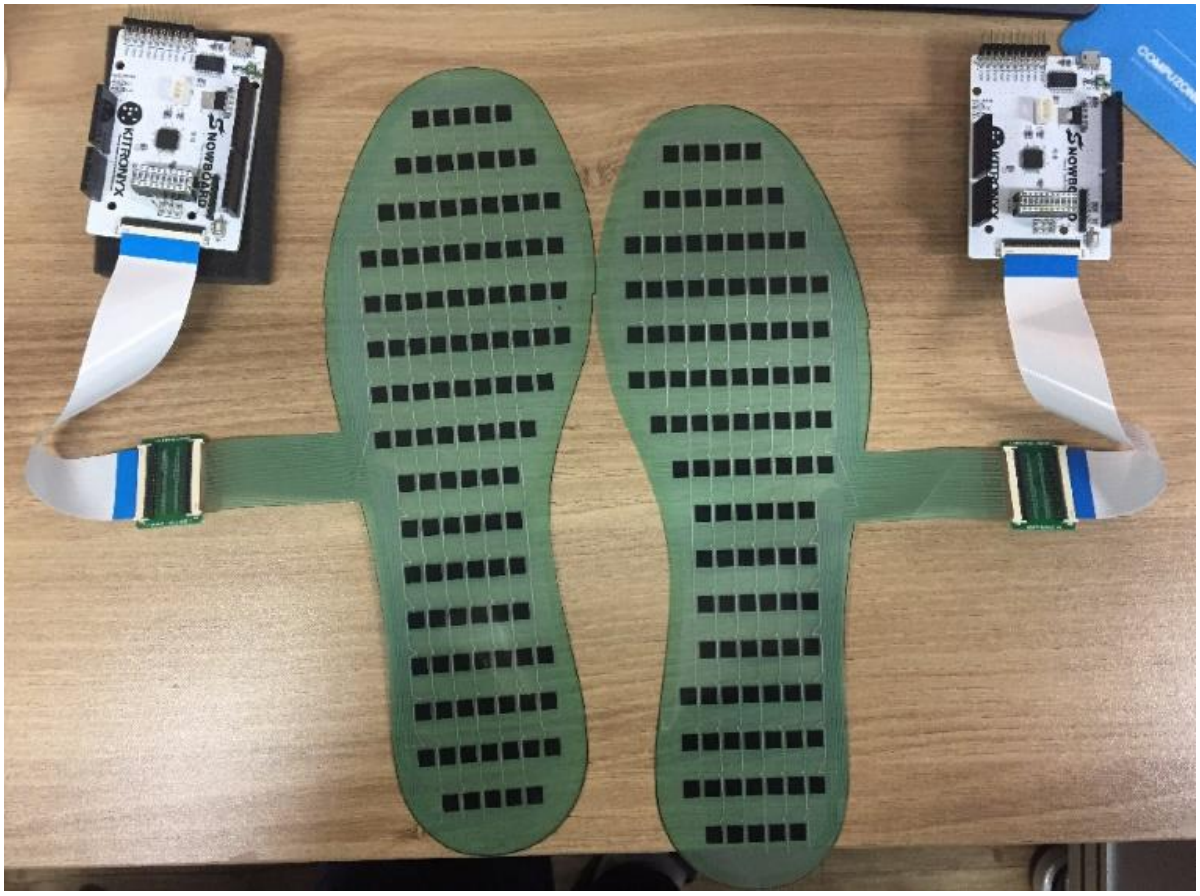
1 Quick Start

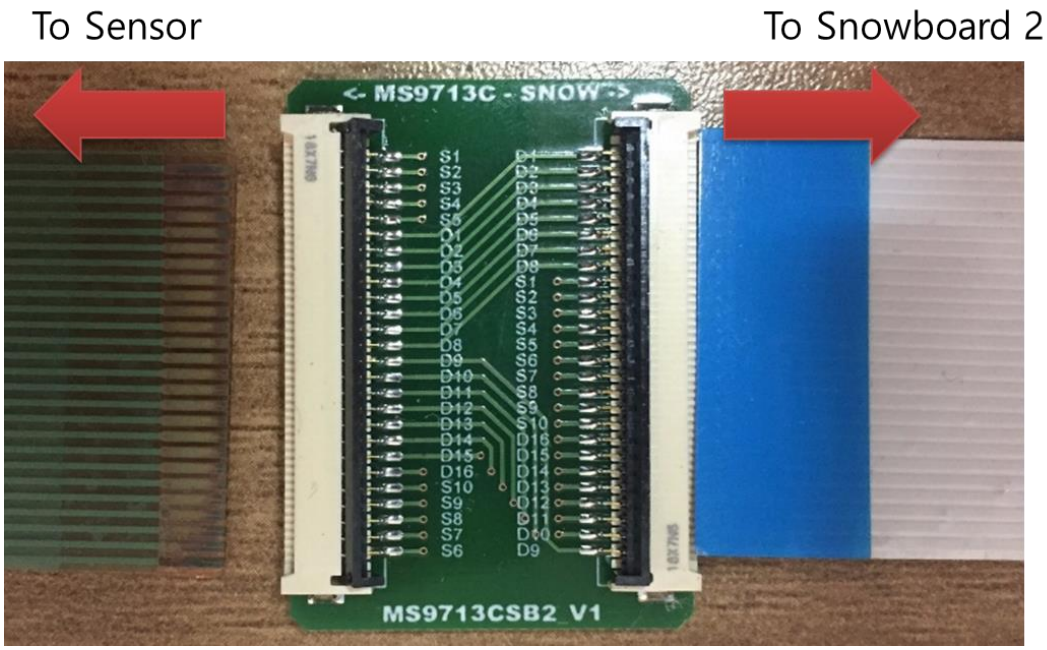
Connect device and sensor as shown below. This photo shows Snowboard 2 and MS9723.



Connection diagram for MS9713 insole pressure mapping sensors are as follow.



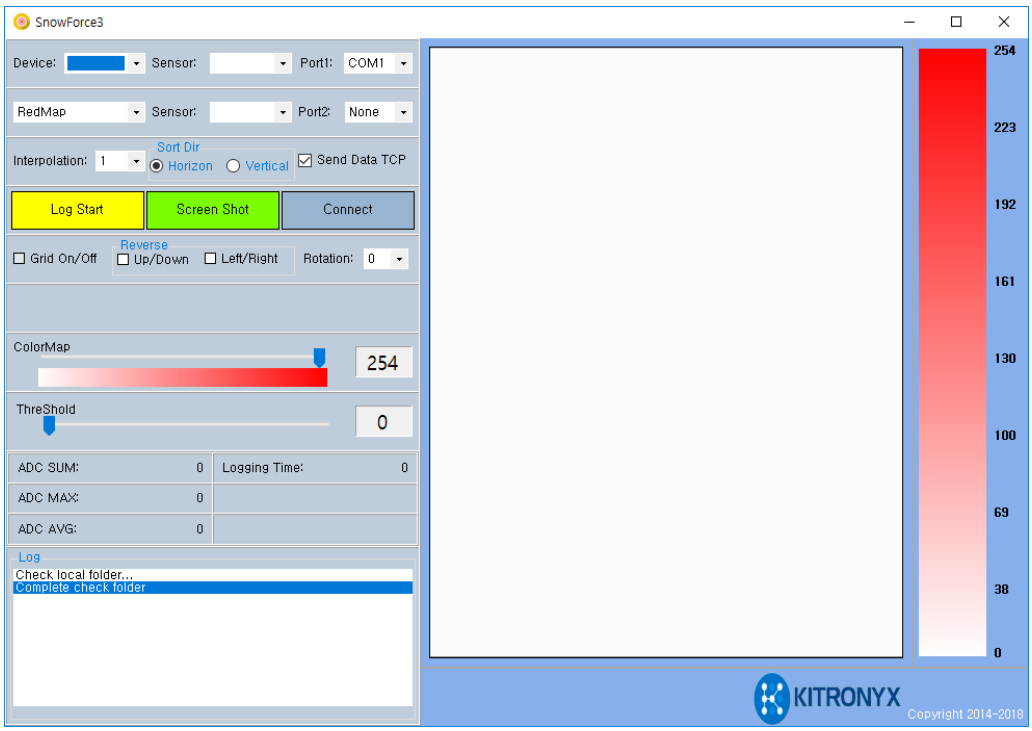
MS9713CSB2 is required to bridge MS9713 sensor and Snowboard 2.



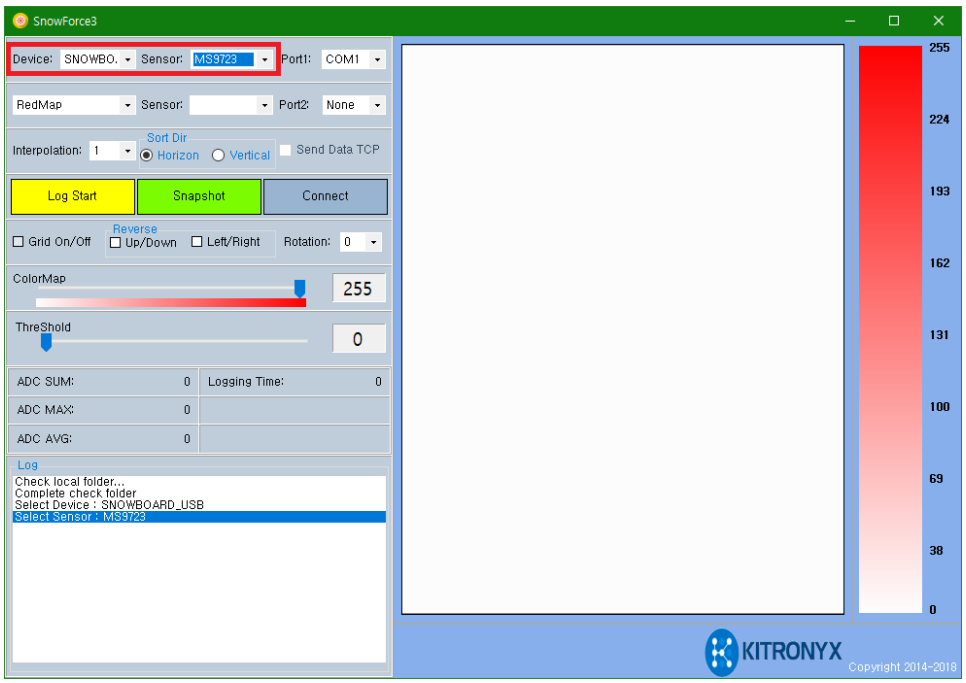
Connect Snowboard 2 to PC using USB Micro Cable.

Double click snowforce3-yyyy.mm.dd.msi to install Snowforce 3.

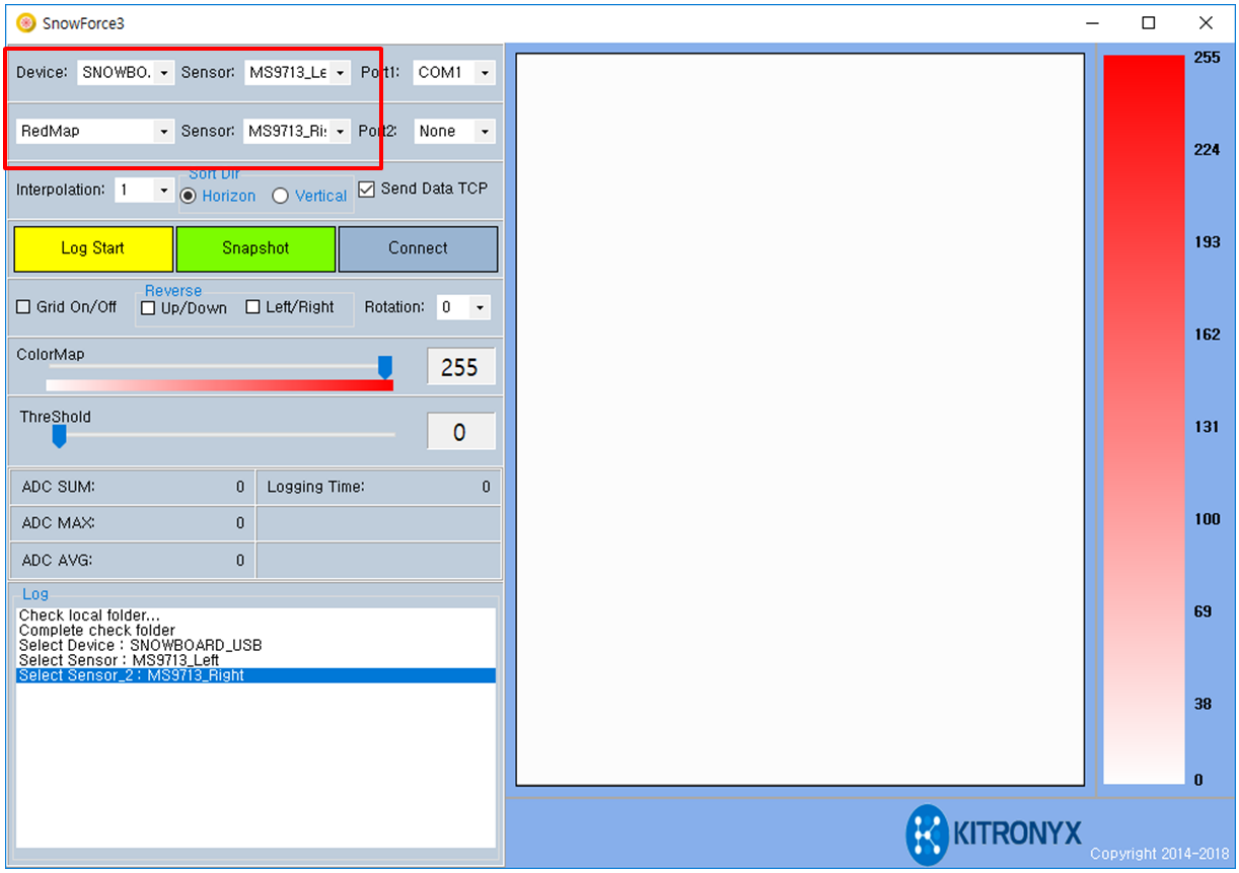
After installation, click Start – Kitronyx – Snowforce 3 to launch Snowforce 3.



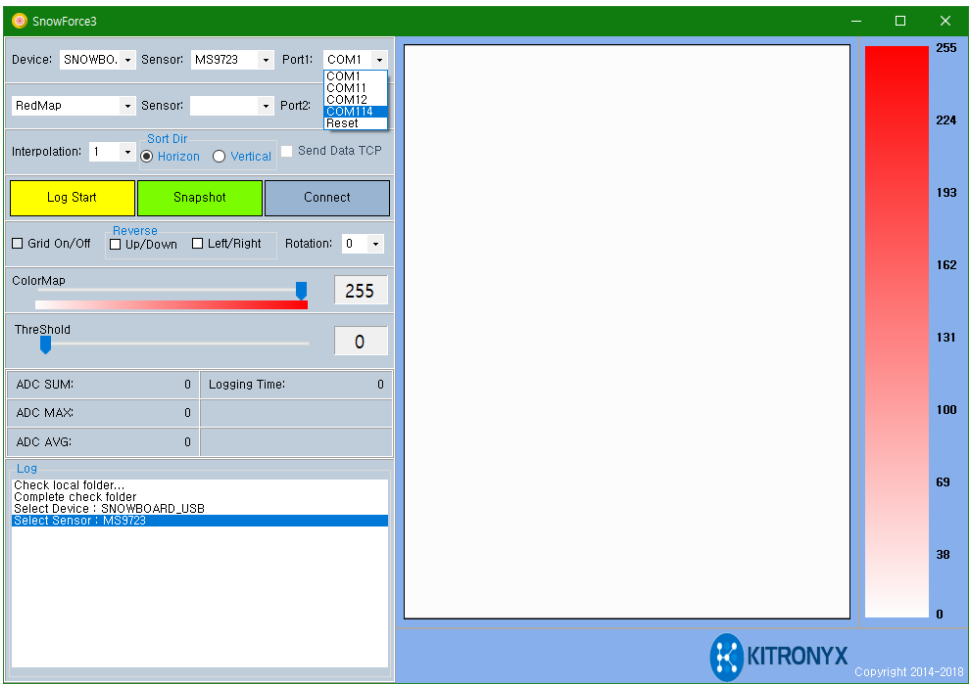
Choose appropriate device and sensor



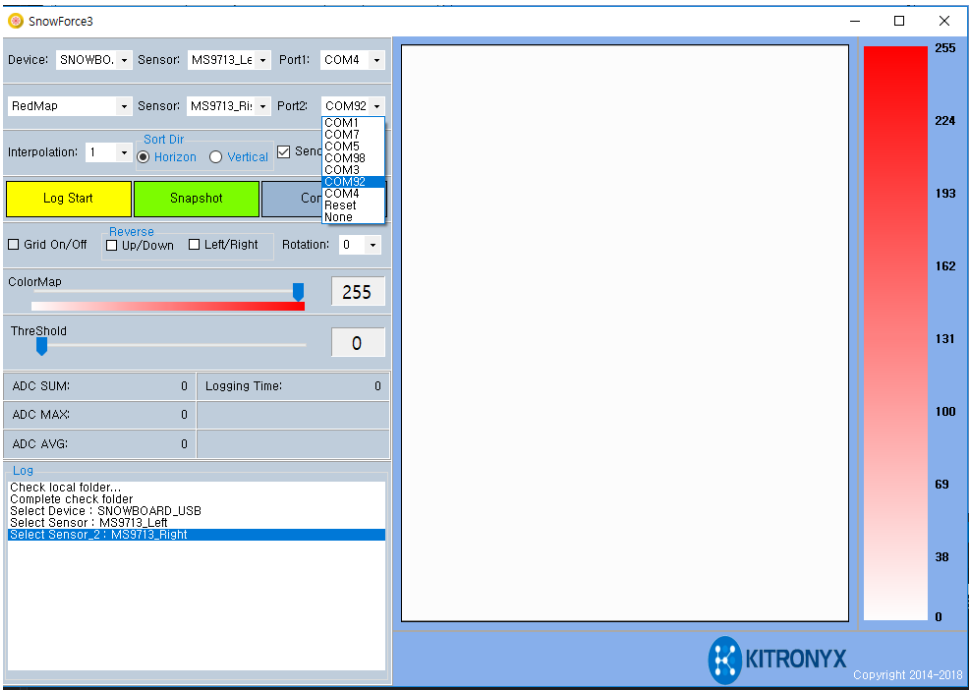
For MS9713 pressure sensing insole, Device is set as Snowboard 2 and Sensors are MS9713_LEFT and MS9713_RIGHT



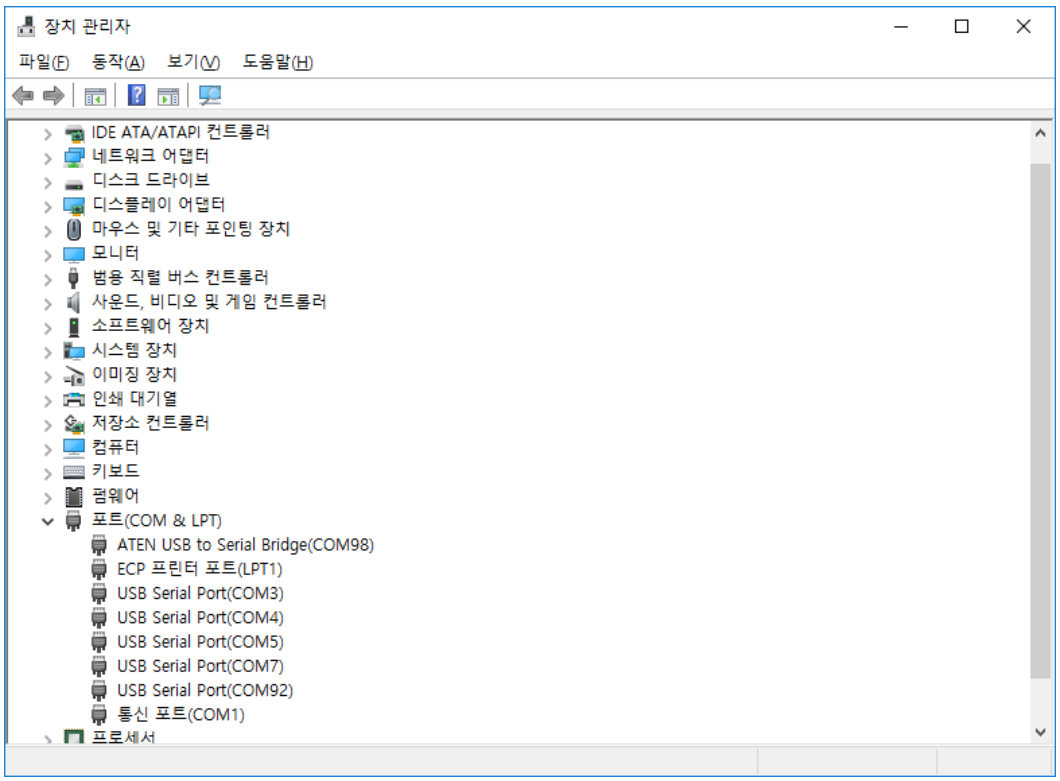
Choose port that is connected with your device.



If you are using MS9713 pressure sensing insole, you have to select port for Port2 combo box.



If you are not sure which port to choose, check control panel – device manager.



Click connect to visualize 2D pressure map data in real time.

2 Overview

2.1 Introduction

Snowforce 3 is a visualization software to visualize 2D force map data, data logging and analysis. The software is specially designed to work with Kitronyx data acquisition devices.

2.1.1 Features

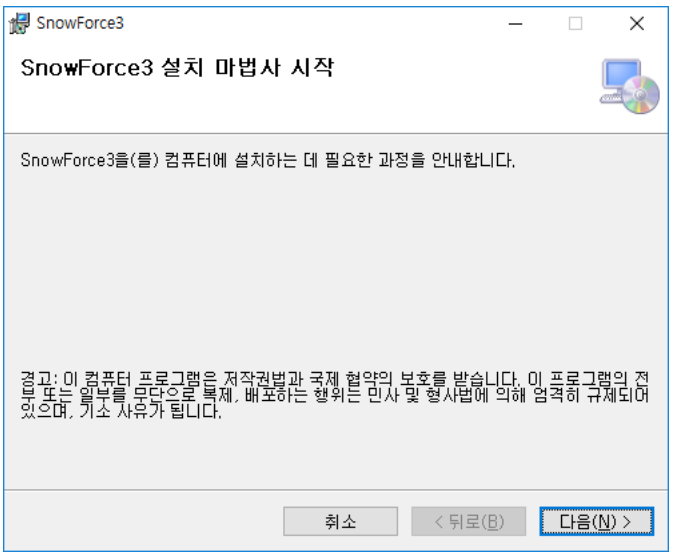
- Real time data monitoring
- Real time statistical analysis
- Data logging
- Data capture
- Support two devices simultaneously
- 2D data visualization
  - Rotation (90, 180, 270 degrees)
  - Flip (X and/or Y axes)
  - Support two color map (heat map and red map) for effective visualization 2D force map image
- Data management

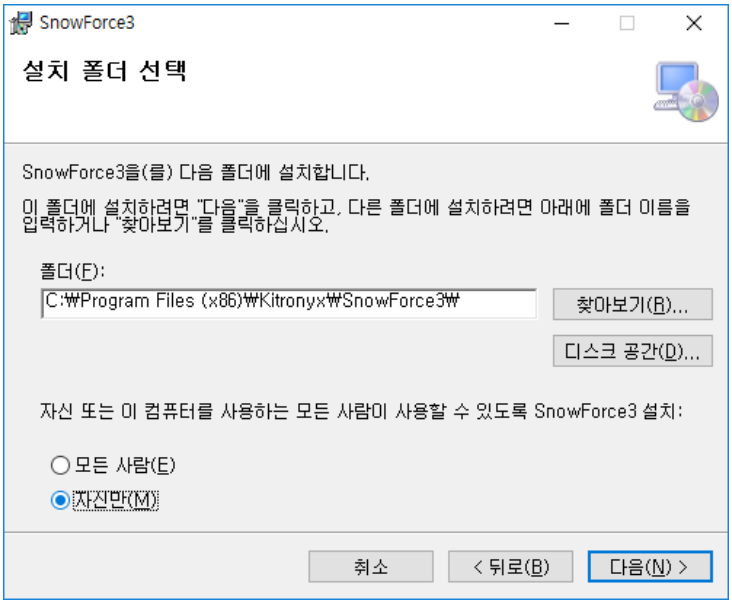
2.1.2 Recommended Environment

- OS: Windows 7, 8, and 10
- CPU: Intel Pentium Dual Core or higher
- RAM: 4GB
- HDD: 10GB
- VGA: 1920 x 1080(FHD) resolution

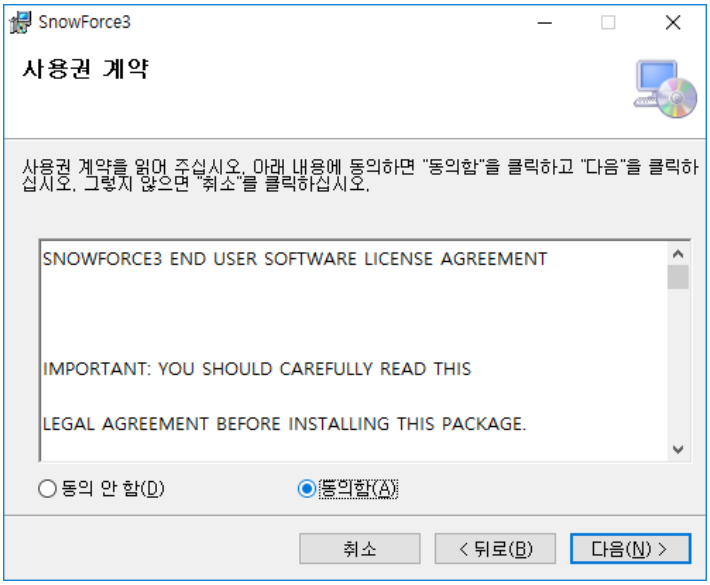
2.2 Installation of Snowforce 3

Double click installation file (snowforce3-yyyy.mm.dd.msi) and click Next button.





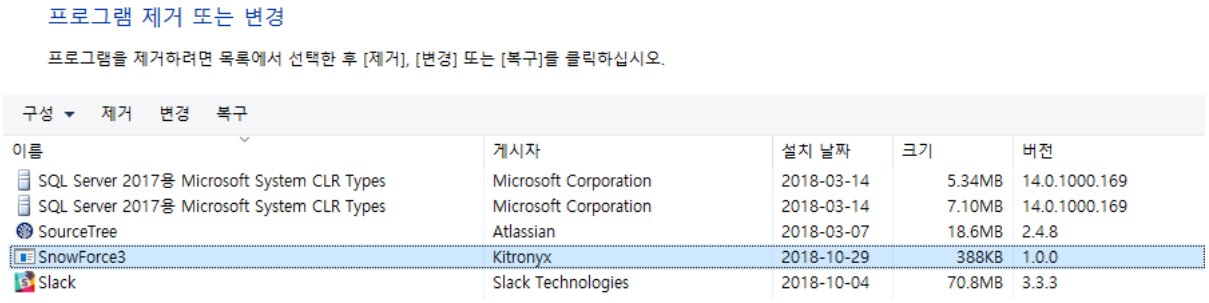
Confirm License Agreement and click Next.



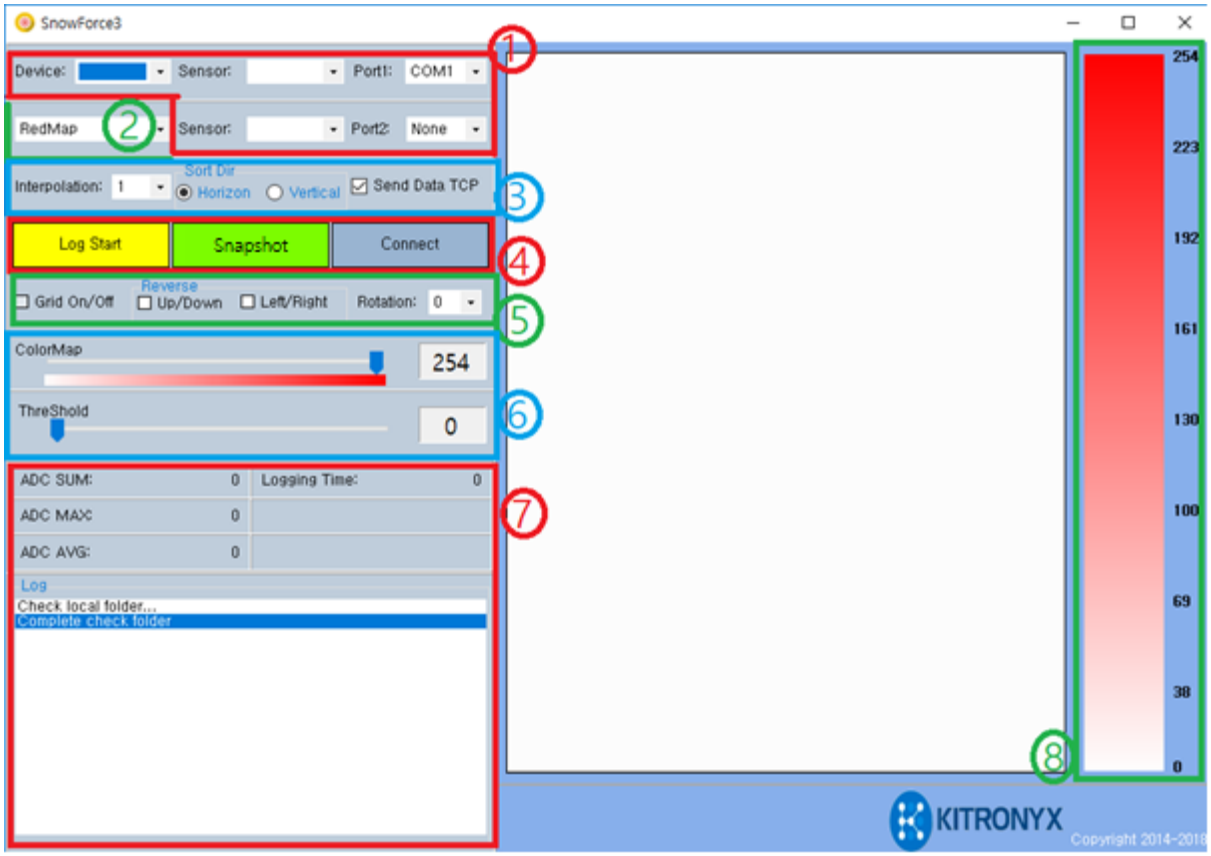
Installation will proceed. After installation, you can launch Snowforce 3 by double clicking Snowforce 3 icon in your desktop or from Start menu.

2.3 Uninstall

Open the Control Panel or press the Windows key, type Control Panel, and then press Enter.
Double-click Add or Remove Programs, Uninstall a program, or Programs and Features depending on your version of Windows.
In the new window, select Snowforce 3 and click the Change, Remove, or Uninstall button.



3 Snowforce 3 Details



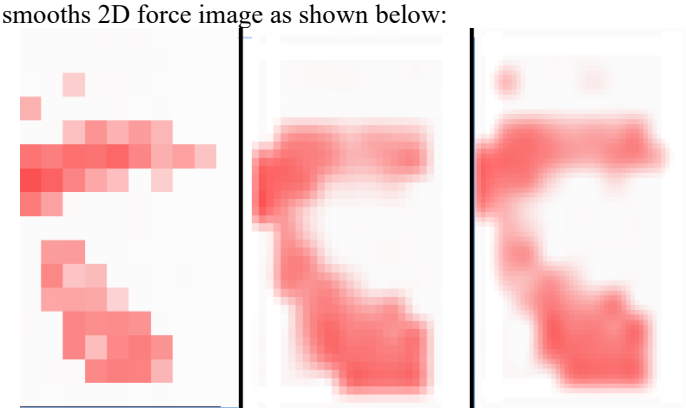
(1) Configure device, sensor and port
(2) Colormap

- Red Map

- Heat Map

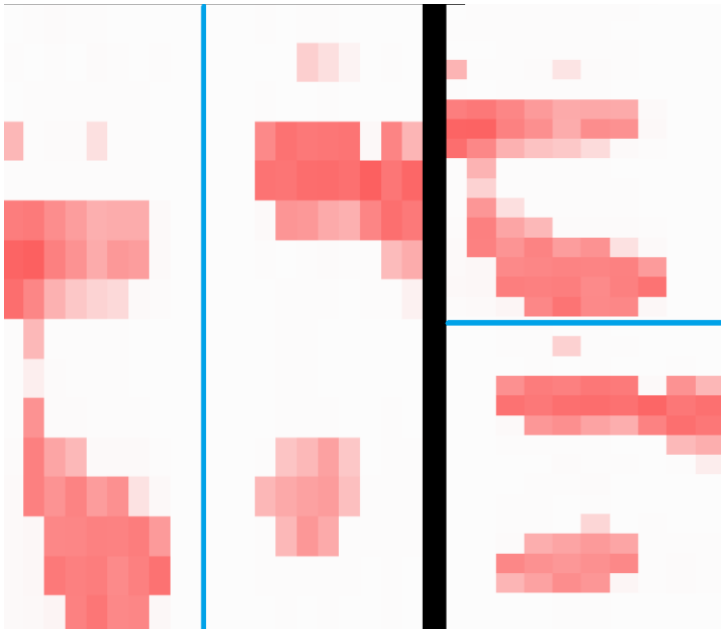
(3) Interpolation, alignment of dual devices, TCP/IP

- Interpolation smooths 2D force image as shown below:



ex) Interpolation 1 -> 3 -> 5

- Sort Dir indicates how to organize two force images from two devices.



ex) Horizon / Vertical

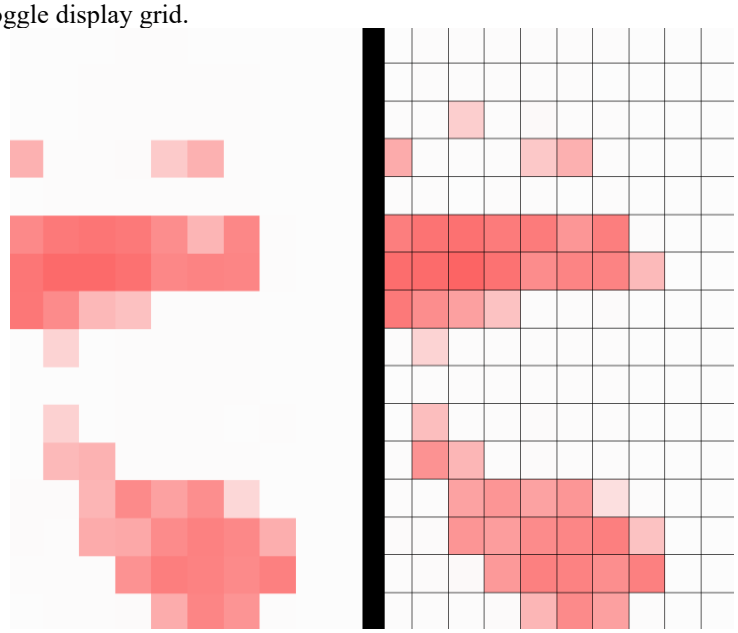
- Send Data TCP: 2D force map can be transferred to other software via TCP/IP. Checking this option will continuously send 2D force data over Ethernet.

(4) Logging

- Log Start: Measurement data is saved as CSV format in real time.
- Snapshot: Capture current measurement.
- Connect: Star measurement. Click again to stop measurement.

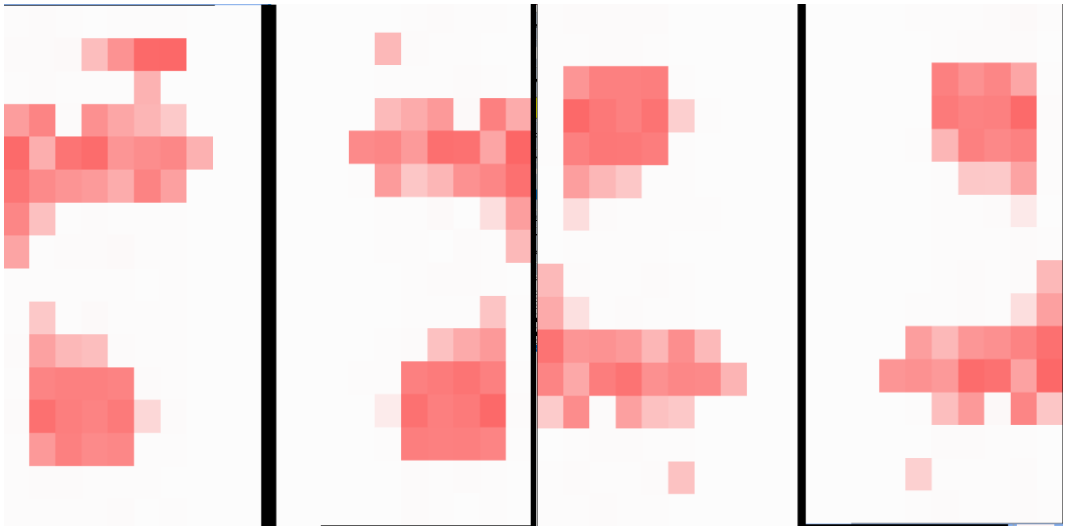
(5) Grid, Flip, and Rotation

- Grid On/Off: Toggle display grid.

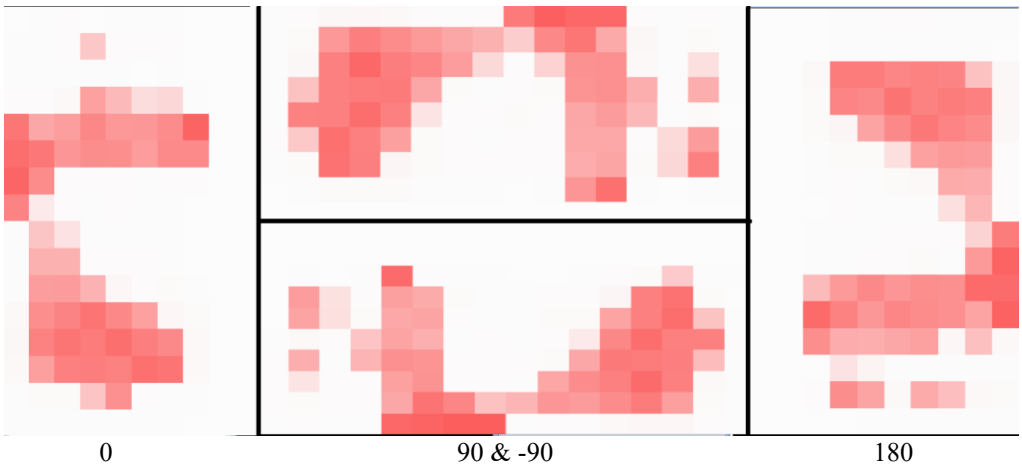


Grid Off / On

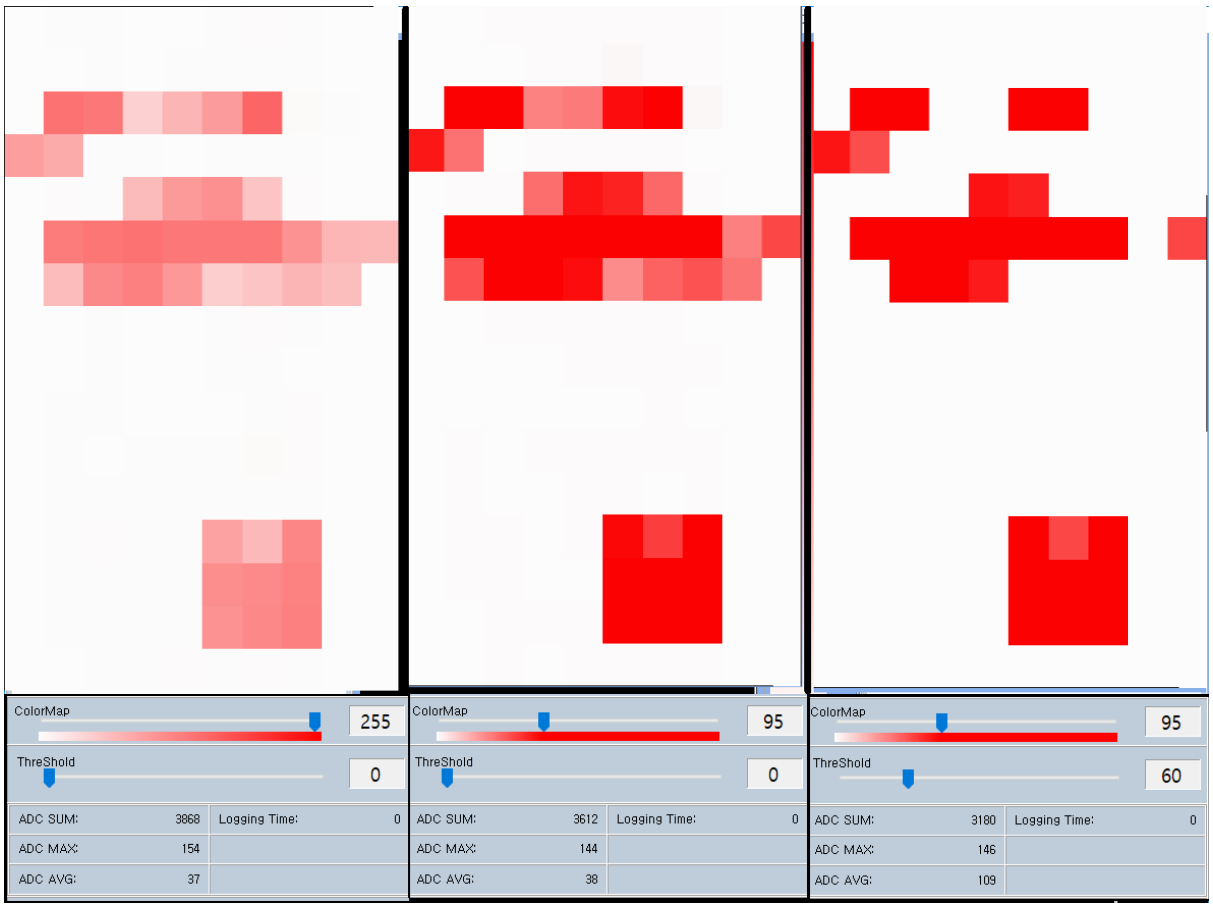
- Up/Down, Left/Right: Vertical and Horizontal flip



Rotation: Rotate image.



(6) Color Map, Threshold
- ColorMap: Controls intensity of force image
- Threshold: removes values smaller than the indicated threshold value (even in logged data).



Color Map: 255
Threshold: 0

Color Map: 95
Threshold: 0

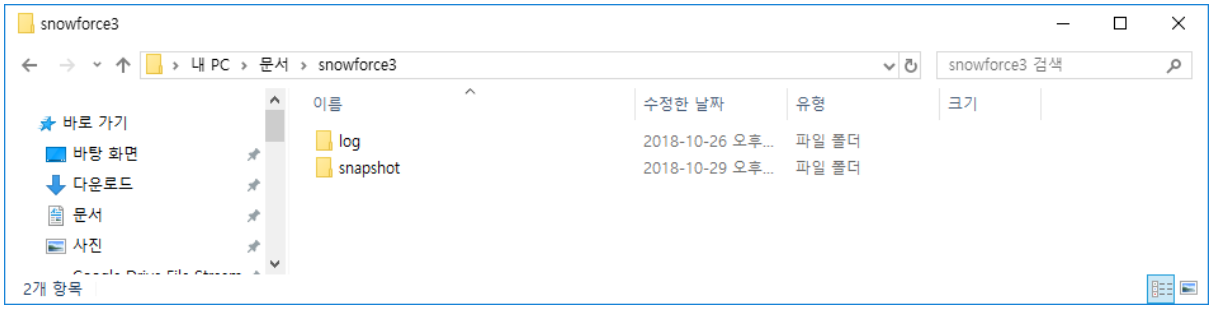
Color Map: 95
Threshold: 60

(7) Statistics
(8) Vertical color map indicates relationship between image intensity and a measurement value.

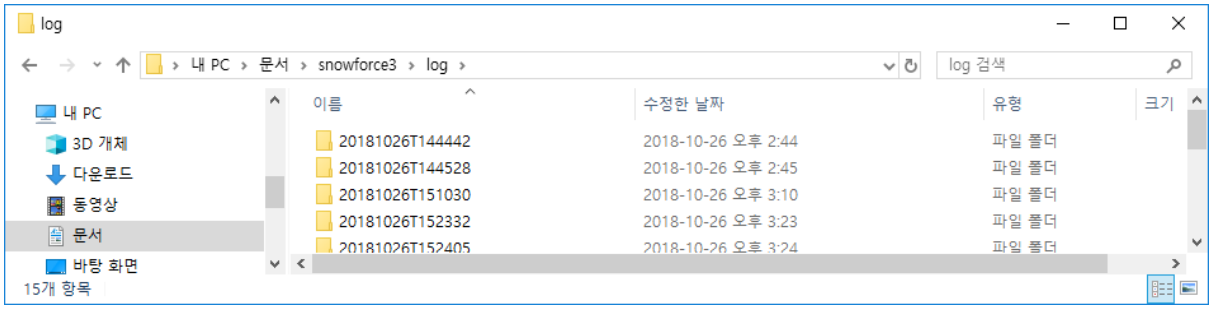
4 Advanced

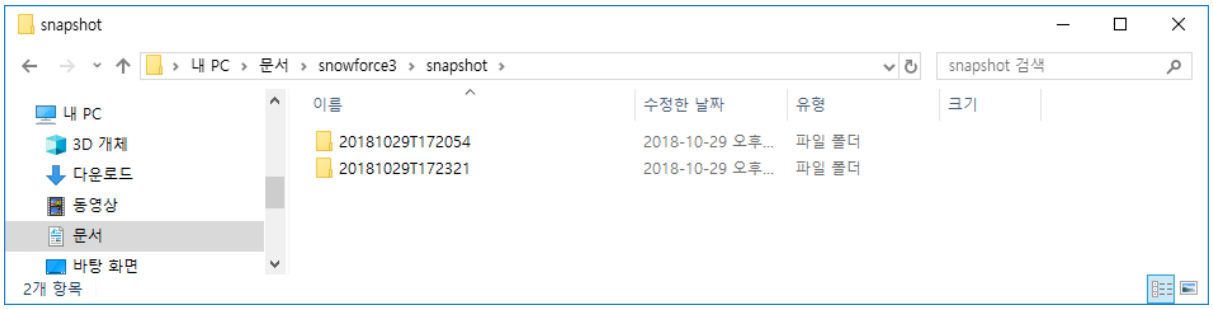
4.1 Snowforce 3 data folder

All data is saved under My Documents – snowforce3 – log and snapshot.



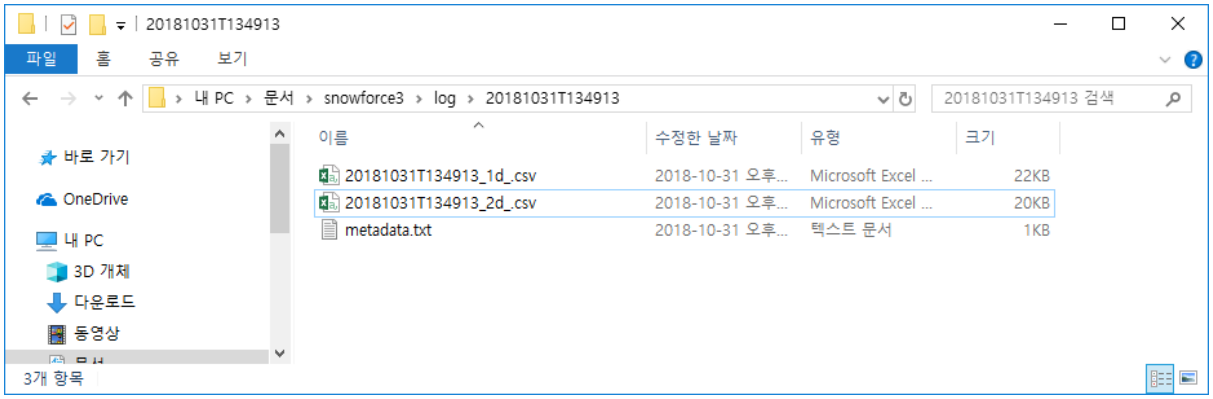
Folders are named after the measured date and time with format of yyyymmddThhMMss.





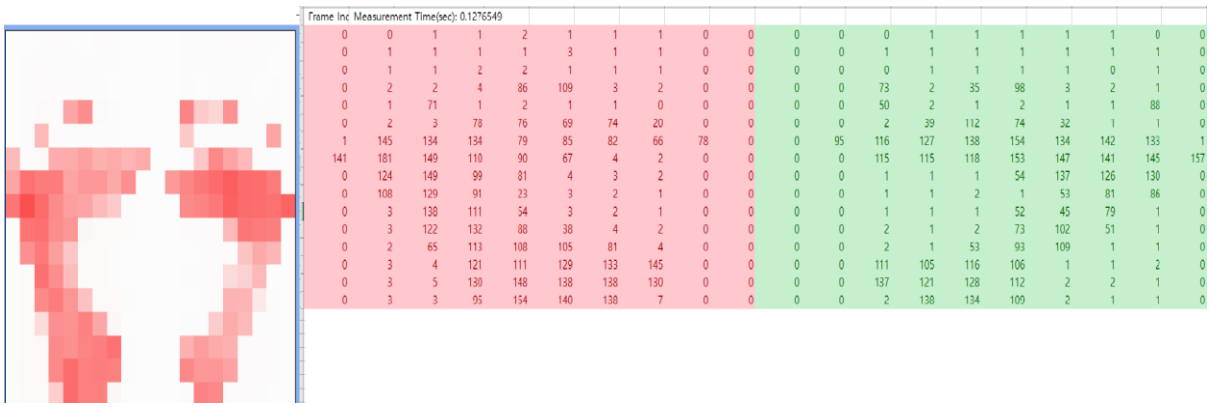
4.2 Log

Log data contains real time measurements. File format follows CSV.

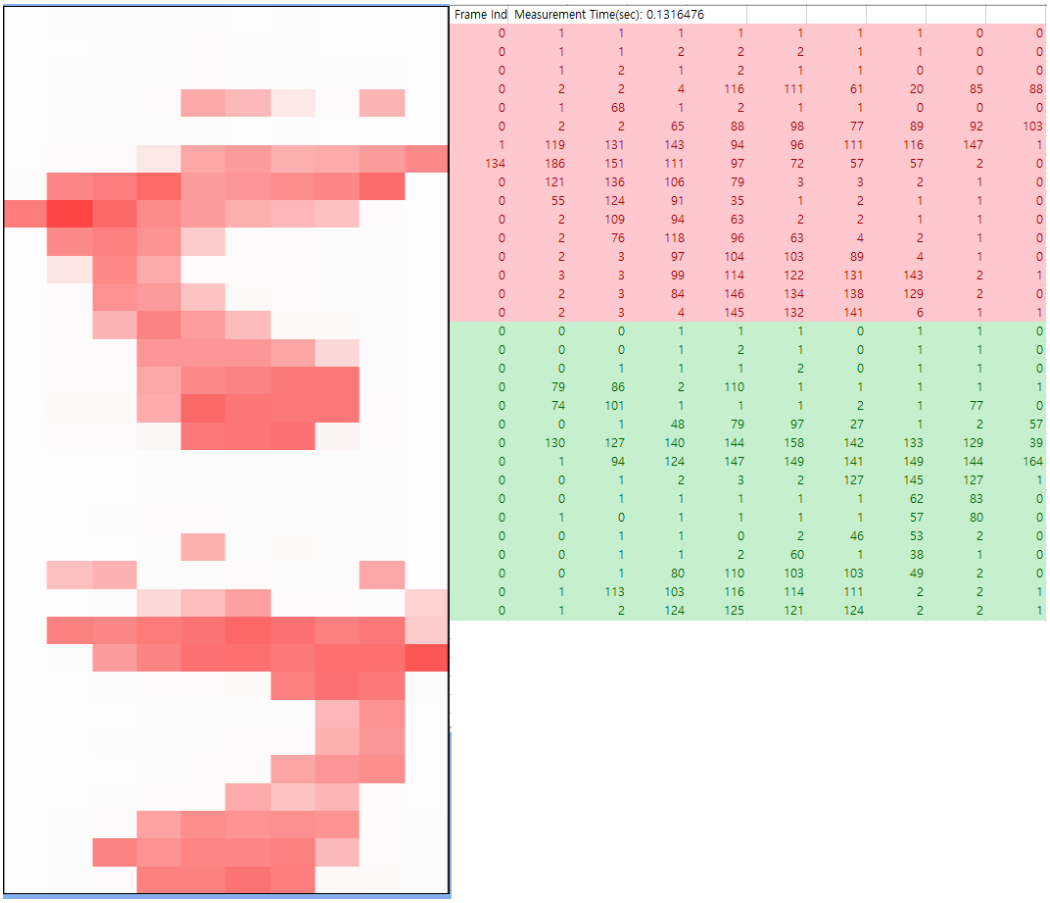


In the log folder, you will see *1d.csv and *2d.csv. These two files contain the same information with different views. In *1d.csv, a single force image is represented as a single row, which will be helpful for data analysis. *2d.csv contains 2D force images as matrices to enhance human readability.

For dual devices such as MS9713 pressure sensing insole, left half and right half matrices of log correspond to left and right devices.



If soft option is vertical, upper half and lower half matrices of log correspond to left and right devices.

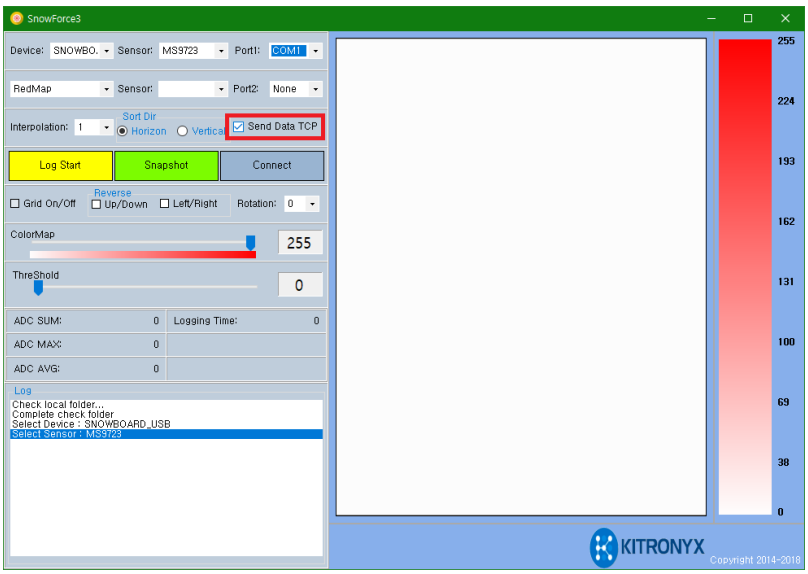


Frame Ind	Measurement Time(sec): 0.1316476								
0	1	1	1	1	1	1	1	0	0
0	1	1	2	2	2	1	1	0	0
0	1	2	1	2	1	1	0	0	0
0	2	2	4	116	111	61	20	85	88
0	1	68	1	2	1	1	0	0	0
0	2	2	65	88	98	77	89	92	103
1	119	131	143	94	96	111	116	147	1
134	186	151	111	97	72	57	57	2	0
0	121	136	106	79	3	3	2	1	0
0	55	124	91	35	1	2	1	1	0
0	2	109	94	63	2	2	1	1	0
0	2	76	118	96	63	4	2	1	0
0	2	3	97	104	103	89	4	1	0
0	3	3	99	114	122	131	143	2	1
0	2	3	84	146	134	138	129	2	0
0	2	3	4	145	132	141	6	1	1
0	0	0	1	1	1	0	1	1	0
0	0	0	1	2	1	0	1	1	0
0	0	1	1	1	2	0	1	1	0
0	79	86	2	110	1	1	1	1	1
0	74	101	1	1	1	2	1	77	0
0	0	1	48	79	97	27	1	2	57
0	130	127	140	144	158	142	133	129	39
0	1	94	124	147	149	141	149	144	164
0	0	1	2	3	2	127	145	127	1
0	0	1	1	1	1	1	62	83	0
0	1	0	1	1	1	1	57	80	0
0	0	1	1	0	2	46	53	2	0
0	0	1	1	2	60	1	38	1	0
0	0	1	80	110	103	103	49	2	0
0	1	113	103	116	114	111	2	2	1
0	1	2	124	125	121	124	2	2	1

4.3 Snowforce 3 API

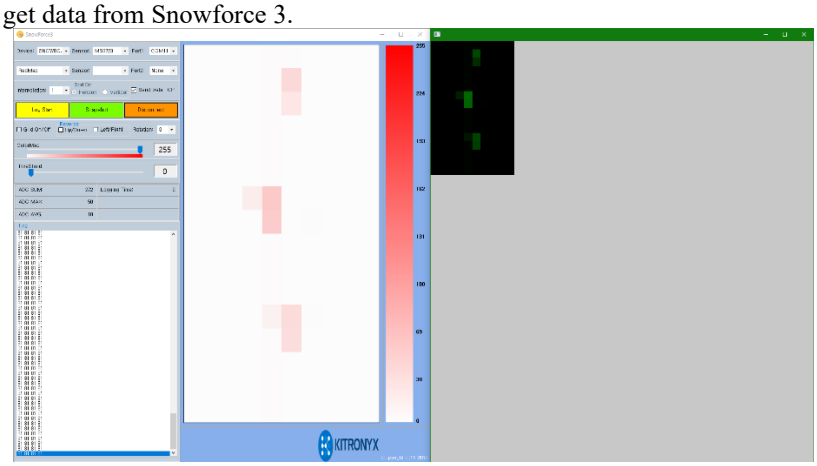
Snowforce 3 can send measurement data over Ethernet so that a user can easily use force data in his project. Kitronyx API supports C/C++, Python, and processing (Java).
For more details, visit https://github.com/kitronyx

Check Snowforce 3 Send Data TCP.



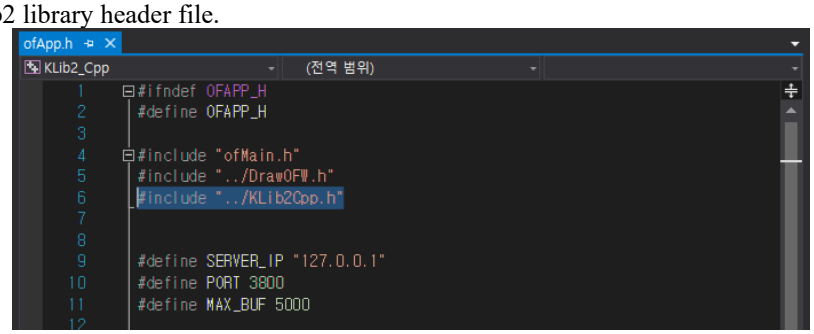
The figure below illustrates an external application that visualizes force data of Snowboard 2. In this demo, the

external application get data from Snowforce 3.

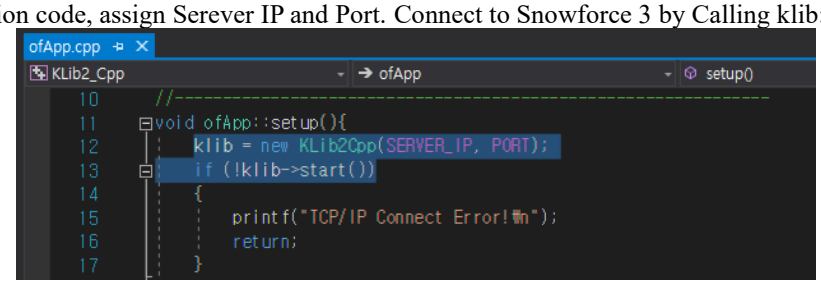


4.3.1 C++ (with OpenFrameWorks)

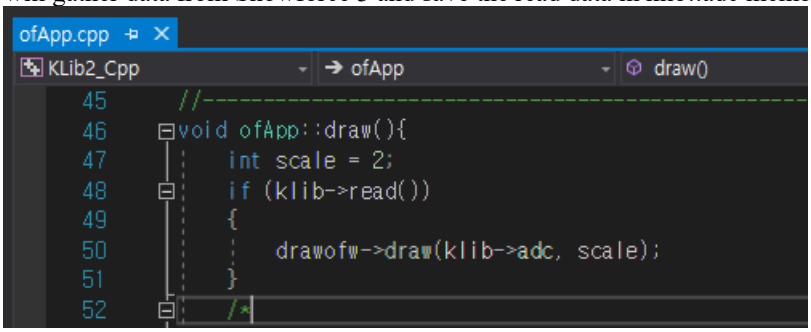
1) Include KLib2 library header file.



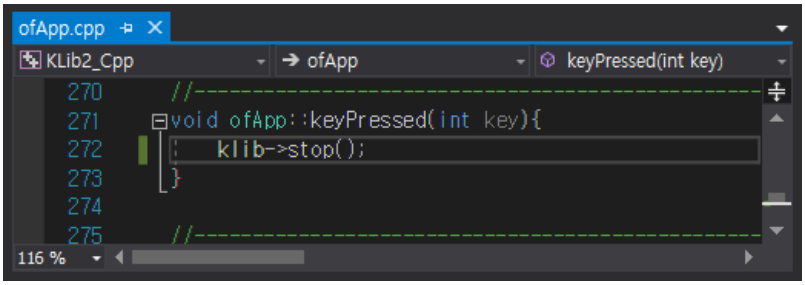
2) In initialization code, assign Serever IP and Port. Connect to Snowforce 3 by Calling klib::start().



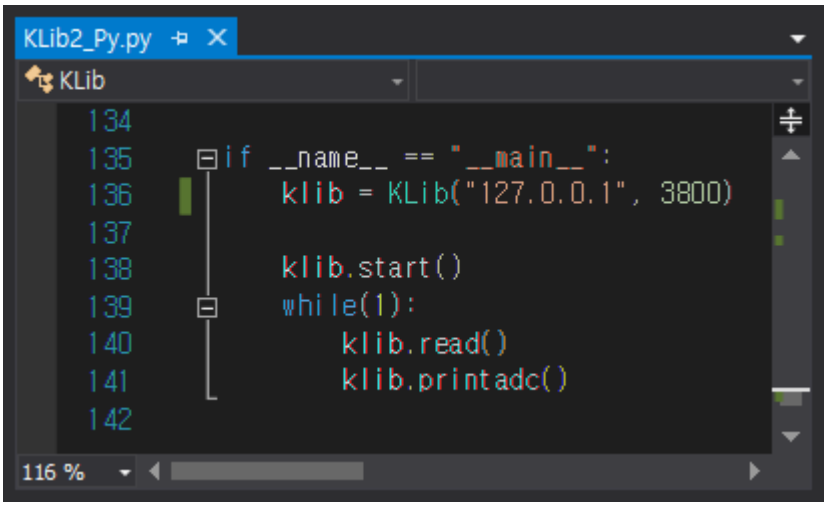
3) klib::read() will gather data from Snowforce 3 and save the read data in klib::adc member variable.



4) klib::stop() terminates connection.

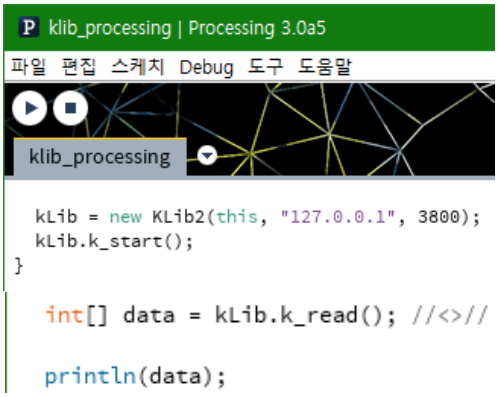


4.3.2 Python



1. Setup Server IP (local host) and port (3800).
2. Call start() to connect your application to Snowforce 3.
3. Call read() to get data from Snowforce 3. The read data is stored in adc member variable.
4. Call stop() to terminate connection.

4.3.3 Processing (Java)



1. Initialize Klib2 class instance with Server IP (local host) and port (3800)
2. Call start() to connect your application to Snowforce 3.
3. Call read() to get data from Snowforce 3. The read data is stored in adc member variable.
4. Call stop() to terminate connection.

4.3.4 Packet Structure

Packet Size: 5,000 bytes
Communication: TCP/IP (port 3000)
Endian: Big Endian

Item	Index	Bytes	Type	Description
STARTBYTE	0	4	Byte	0x7E7E7E7E
COUNT	4	4	Unsigned Int	Frame count is incremented by 1 and reset to zero if count is larger than 4,294,967,294 (2^32-1)
DEVICE	8	24	String	Device Name
SENSOR1	32	24	String	Sensor 1 Name
SENSOR2	56	24	String	Sensor 2 Name
NUM_DEVICE	80	4	Unsigned Int	Number of Attached Devices
ROW	84	4	Unsigned Int	Number of Row
COL	88	4	Unsigned Int	Number of Column
TEMP1	92	8	Byte	Reserved
ADC	100	4800	Byte	ADC values
TEMP2	4900	96	Byte	Reserved
ENDBYTE	4996	4	Byte	0x81818181
Sum Total	-	5000	-	-

4.4 Command Line

ex) Device MC1600 => set device to MC1600
Device Sensor => Error (None target)

target	command line	information	example
Device	**Device**	Device name	Device MC1600
Sensor01	**Sensor** **Sensor01** **Sensor1**	First Sensor	Sensor MS9705 Sensor01 MS9723 Sensor1 MS9705
Sensor02	**Sensor2** **Sensor02**	Second Sensor	Sensor2 MS9705 Sensor02 MS9723
Port01	**Port** **Port1** **Port01**	First port Ther port number must be connected	Port COM87 Port1 COM 9 Port01 COM13
Port02	**Port2** **Port02**	Second port	Port2 COM 11 Port02 COM15
Interpolation	**Interpolation** **Inter**	Interpolation value	Interpolation 1 Inter 4
Send Data TCP	**TCP**	TCP data export value	TCP
Connect	**Connect** **C**	Connect device	Connect C
Minimize	**Minimize** **M**	minimize tray	Minimize M
ColorMap	**ColorMap** **color**	color type	ColorMap HeatMap Color RedMap