DISPLAX

SKIN FIT

USER GUIDE

LARGE MULTITOUCH PROJECTED CAPACITIVE

DOCUMENT REVISION HISTORY AND APPROVAL

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PRODUCT COMPLIANCE

DISPLAX is a certified company under the ISO 9001 standard which establishes the requirements for a quality management system, meaning that our R&D, production, support, sales and marketing processes are organized around quality management practices to guarantee the effectiveness of our work and the satisfaction of our clients.

Our products are compliant with RoHS - Restriction of Hazardous Substances, meaning that they do not contain substances which might put at peril the product users, they are also compliant with the Electromagnetic Compatibility Directive 2014/30/EU, meaning that they can be integrated with other electronic components without provoking interferences over the regular functionality of other components or parts.

All our products have the CE certification mark, which can be ascribed to our products since they are compliant with RoHS and with the Electromagnetic Compatibility Directive 2014/30/EU, and they are developed, manufactured and supported under a certified quality system.

FCC COMPLIANCE – WARNING

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) this device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

ABOUT SKIN FIT

PRE-INSTALLATION

Please check the packing list that was sent to you together with your Skin Fit unit(s) and make sure that you received all the components, namely: Touch Sensor; Touch Controller; Ground cable; USB cable and the Packing list.

Always be very careful when handling Skin Fit, as the Touch Sensor is fragile.

'DISPLAX Connect', the Control Panel where Skin Fit is configured, runs on Windows (7 or higher versions), OS X (Yosemite and El Capitan) and Ubuntu (14.04. LTS) and requires the graphic card to support Open GL 2 or higher. After configuring Skin Fit, the settings are stored in the Touch Controller, so you can switch to a PC with another Operating System. See the Spec File for the list of supported OS.

If you are using a laptop, make sure to plug the power adapter. Running with a laptop using only the battery has shown that it does not always provide enough power to the USB port for Skin Fit to work properly.

Avoid using frontal USB ports on desktop PCs. Traditionally these ports do not comply with USB standards and may not provide enough power for Skin Fit to run properly.

SKIN FIT SPECIFICATIONS

Skin Fit outlook:

a) High speed
b) Versatile and adaptable product
c) Wide range of glass thickness
d) Features XTR-Shield™ Plus, the most advanced generation of DISPLAX's proprietary noise filtering technology

Benefits:

a) Superb touch experience
b) Wide variety of application and use
c) Versatility and ease of integration
d) Highly customizable

Key features:

a) Flexible projected capacitive sensor
b) 40 simultaneous touches
c) 5 milliseconds response time
d) Works up to 15 mm glass thickness
e) HID (Human Interface Device) – works with a wide range of Operating Systems
f) XTR-Shield™ Plus – Most advanced noise filtering technology

Specifications:

GENERAL	
Detection method	Projected Capacitive Technology
Input method	Finger and gloved finger
Number of simultaneous touches	40
Sensor thickness	100 micron transparent polymer
Noise Shielding	DISPLAX XTR-Shield™ Plus, a proprietary noise filtering technology
Sizes	20'' to 105''
Aspect ratio	16:9, 4:3, custom formats
Controller	Printed circuit board with mini USB connector
Adhesive	Permanent, removable
Substrate	Float Glass, Gorilla Glass
Interface	HID
OS with multitouch	Windows 10, 8, 7*, Ubuntu 12.04, Linux**, Android**, Chrome OS ***
OS with single touch	Mac OS X Yosemite (multitouch support through TUIO bridge)
OS with mouse emulation	Spinetix Media Player HMP 200, Samsung SSP D Series
Data connectivity	USB 2.0
Touch accuracy	0,53% of sensor diagonal
Sensor weight	260 g
Controller weight	42 g
USB cable length	2 m

*Home Premium SP1; Professional SP1; Ultimate x64 SP1
** Depending on kernel and multitouch support.
*** 39.0.2171.85(64-bit)

PERFORMANCE	
Substrate thickness	Up to 15 mm
Touch response	5 milliseconds
Finger separation	2,64% of sensor diagonal
Calibration	Available using control panel: no drift

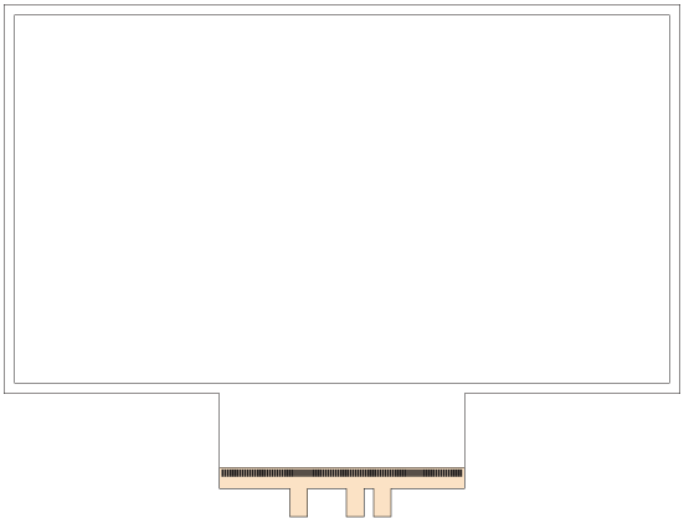
POWER CONSUMPTION	
Average power consumption (P)	USB powered @ 5 V Operation consumption: 250 mA

RELIABILITY	
Operating temperature range	-20 °C to 70 °C
Storage temperature range	-40 °C to 135 °C
Operating humidity range	0% to 96%
Storage humidity range	0% to 100%, except controller

Touch Sensor life time expectancy	Unlimited
Touch Controller life time expectancy	1 million hours
Warranty	2 years

TOUCH SENSOR

The Touch Sensor is composed of a transparent polymer film with a conductive grid and 1 polyester film Flexible Flat Cable.



Skin Fit – Touch Sensor, bottom tail version

Skin Fit – Touch Sensor, side tail version

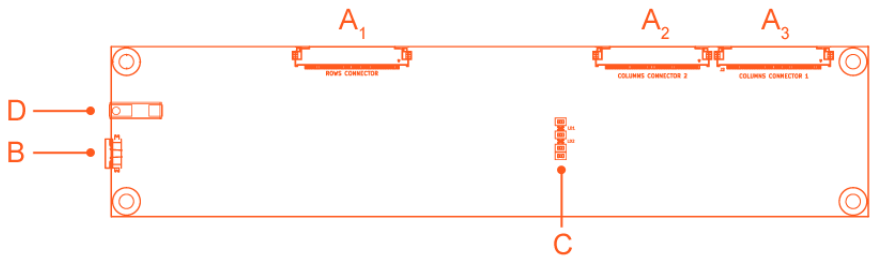
For more information, refer to DISPLAX Skin Fit Standard Drawings document, available for download in the following link:

http://login.displax.com/?op=20&id_item=4906&id_file=0

TOUCH CONTROLLER

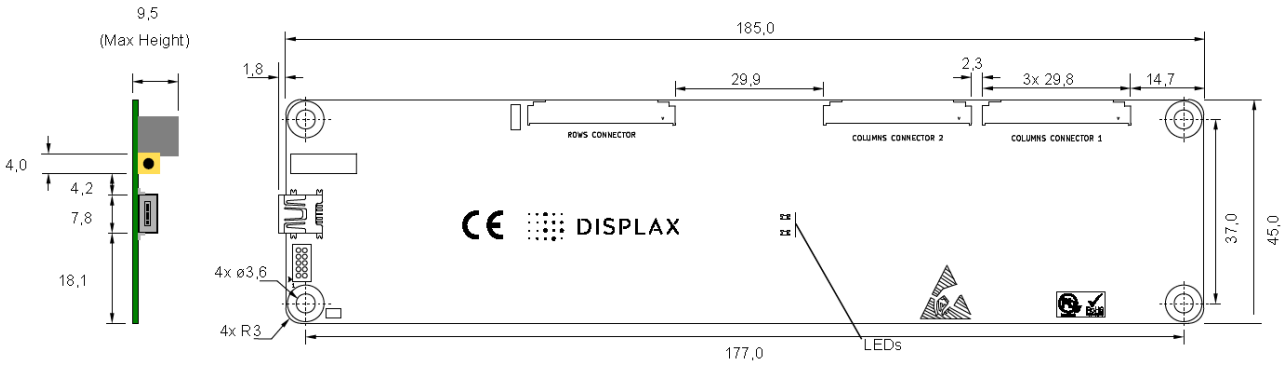
The Touch Controller is a fiberglass board of 185 x 45 x 9,5mm.

The screw holes are M3 or M3.5.



A1 / A2 / A3– Flexible Flat Cable (FFC) Connector
B – Mini USB Port
C – LEDs
D – Ground cable port

Touch Controller dimensions:

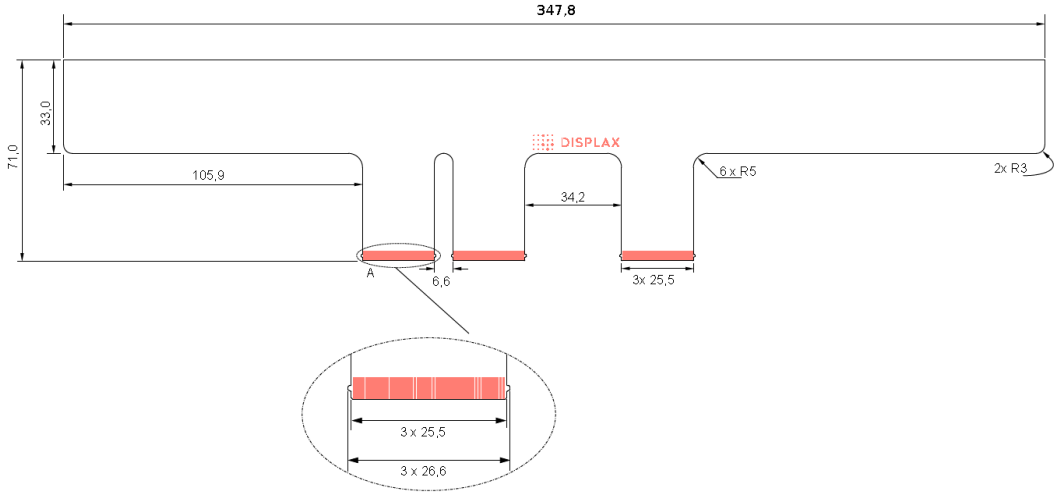


Touch Controller led status

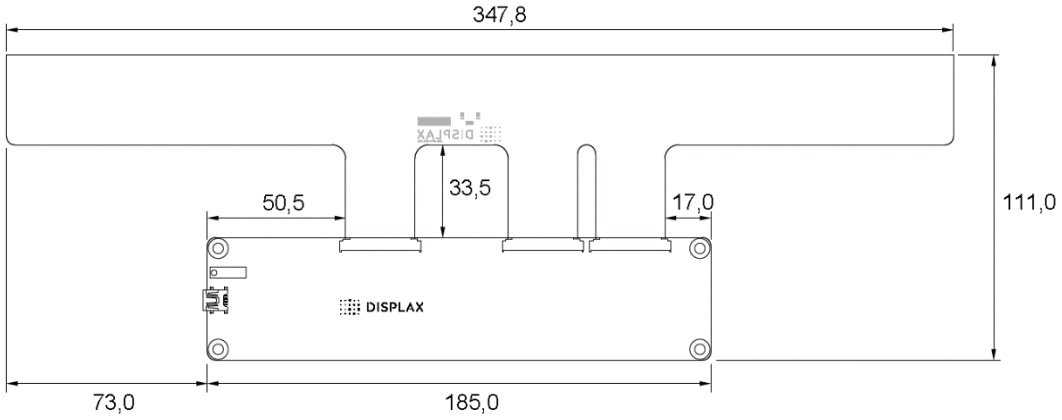
Led status	Normal Operation (HID)	Device Firmware Update
Red led	Fast blinking	On
Orange led	On with touch Off without touch	Slow blinking

FLEXIBLE FLAT CABLE (FFC)

FFC dimensions:



INTEGRATION BETWEEN THE TOUCH CONTROLLER AND THE FLEXIBLE FLAT CABLE (FFC)



UNPACK THE PRODUCT

OVERVIEW

This section provides a step by step guide on how to unpack the Skin product, before its lamination.
Watch the unpacking video:
https://www.youtube.com/watch?v=ePth5KP0L8k

Note: Your product may present a different design from the one presented in this user guide and instruction video.

RESOURCES NEEDED

A cutter and a clean plain table.

WORK PROCEDURE

1. Open the tube from the top side with the help of a cutter (Fig.1).

Fig.1

2. The touch sensor is wrapped around an inner tube inside the main tube. Remove all the items inside the inner tube:

1. Touch controller(s);
2. USB and Ground cables;
3. Packing list.

3. Remove the inner tube (Fig.2):

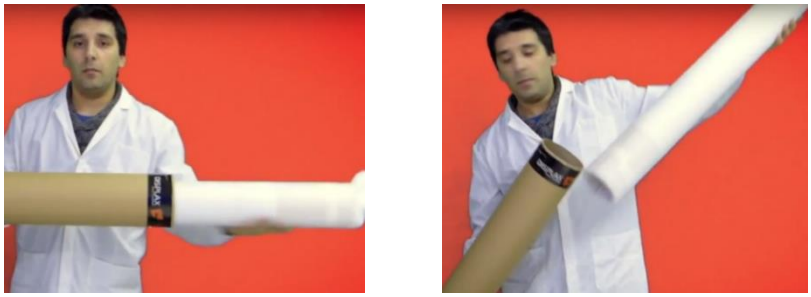


Fig.2

4. Unroll the Touch Sensor on top of a flat clean table (Fig. 3).

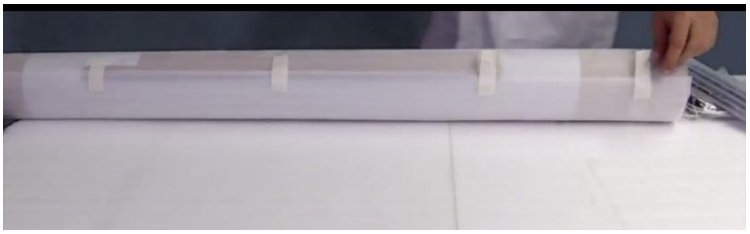


Fig. 3

a) Detach all the stickers to remove the foam layer (Fig.4);
b) Unroll the touch sensor over the table (Fig.5);

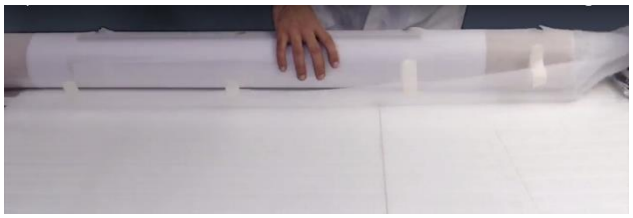


Fig.4

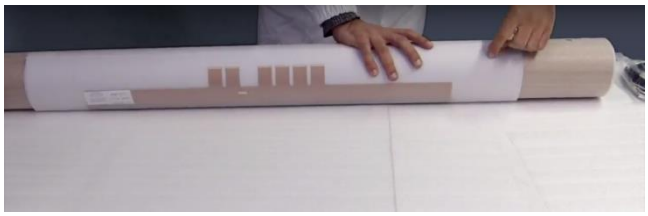


Fig.5

c) Detach the remaining stickers (Fig.6);
d) Free the unrolled touch sensor from the foam and other protection layers (Fig.7).

Fig.6

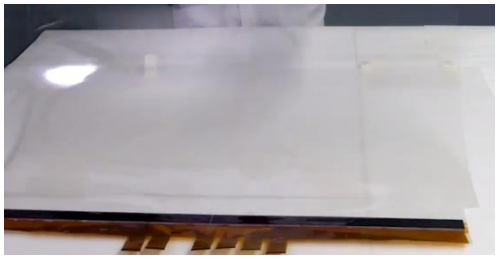


Fig.7

LAMINATION

OVERVIEW

The Touch Sensor must be laminated on a non-conductive substrate, such as glass, acrylic plate, corian, wood, mirror or other material, or surface where we want to process multitouch recognition events.
The Touch Sensor of Skin Ultra has a permanent adhesive, which means that after its lamination you cannot remove it and reuse it.
The Touch Sensor of Skin Fit and Skin Dualtouch is available in two versions: permanent and removable.
The permanent version after lamination cannot be removed and reused.
The permanent version is the most common Touch Sensor version.
The removable version can be removed from the substrate where it has been laminated and reapplied to a different substrate, as long as you remove it gently and carefully to avoid damaging the Touch Sensor grid.
This section describes how to laminate the permanent and removable Touch Sensor versions.
For the permanent version, a video has been created to enhance our understanding of this procedure.
URL: https://www.youtube.com/watch?v=X4u-SKIjR9g

PERMANENT VERSION

OBJECTIVE

To laminate the Touch Sensor on a non-conductive substrate.
This description has been illustrated using 'Glass' but other non-conductive substrates can be used.

PEOPLE REQUIRED

One person is required to perform the lamination on glass if the sensor has less than 32 inches.
It is advisable involving a second person to support the lamination activities, especially for Touch Sensors exceeding 32 inches. In this case, both persons will pick up the Touch Sensor, one on each side, to avoid creasing and tearing the sensor grid.

RESOURCES NEEDED

Before starting the Touch Sensor lamination, make sure you have the following tools and equipment:

- Soft cleaning lint free cloths;
- Ethylic alcohol;
- Dishwashing detergent with a neutral pH;
- Distilled or bottled water;
- Liquid sprayer, containing a solution with distilled or bottled water and about 10% of the dishwashing detergent with a neutral pH, hereafter referred as soapy water;

- Squeegee;
- X-acto or blade.
- Scratch free surface to laminate the Touch Sensor on glass.

INSTALLATION PROCEDURE

The Touch Sensor must be handled carefully to avoid creasing or tearing. Rippling may occur during delivery, but this will disappear during the lamination process.

Always lay the Touch Sensor on a soft scratch free surface.

After unpacking the Touch Sensor, laminate it on a non-conductive substrate. In here, the lamination process is illustrated using 'Glass'.

To laminate the Touch Sensor, please refer to the following steps:

1. Clean the glass

Dirt and other contaminants allow pockets of air that undermine the necessary seal for a good installation. Thoroughly clean the glass, with a lint free cloth and ethylic alcohol, making sure it is free of dust, oils or grease (Fig.1).

Fig.1

After cleaning the glass spray it with the mentioned solution containing distilled or bottled water and about 10% of the dishwashing detergent with a neutral pH (Fig.2).

Fig.2

Use a squeegee to remove the water (Fig.3),
Be sure that the glass is completely clean.

Fig.3

2. Peel off the Touch Sensor protection layer.
To peel off the Touch Sensor protection layer, you can either use:

a) a lamination wall, or
b) a clean and scratches free table.

In this work instruction a lamination wall has been used (Fig.4).

When using a table, the process is exactly the same but the operations are executed in the horizontal position.

3. Wet the lamination wall with soapy water in order to adhere the Touch Sensor to the wall (Fig.4)

Fig.4

Fig.5

4. Pick the Touch Sensor and stick it to the lamination wall with the protection layer facing the user view (Fig.6 and 7). This layer is the one which has a sticker "QA APPROVED" (Fig.5), signaling the layer to be removed;

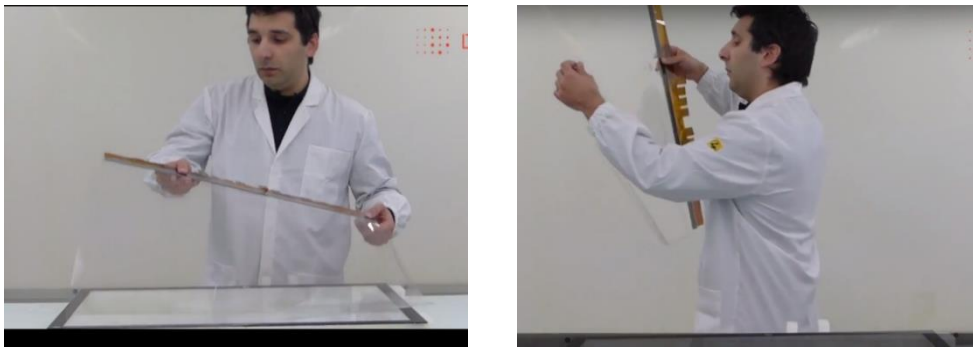


Fig.6

Fig.7

5. Apply soapy water to the Touch Sensor to ensure its adherence to the lamination wall (Fig.8).

Fig.8

6. With a squeegee, remove some of the soapy water, to secure the sensor on the lamination wall (Fig.9).

Fig.9

7. With the help of the "Quality approved" sticker remove the Touch Sensor protection layer (Fig.10).
The "Quality approved" sticker is placed over one edge of the protection layer and will help us lift and pell-off this protection cover.

Fig.10 With the help of the "Quality approved" sticker peel the Touch Sensor protection layer

8. Pell-off the Touch Sensor protection layer while continuously spraying soapy water and pulling-off the protection layer.
To perform this task, wet your fingers (Fig.11) and carefully release the protection layer from the user side.
While you remove the protection layer, spray the adhesive surface with the soapy water solution (Fig. 12, 13 and 14). It is important to pull back the liner close to the Touch Sensor.

Fig.11 Be sure that your fingers are wet

Fig.12 Start peeling off the protection layer by pulling the sticky tape together with the protection layer

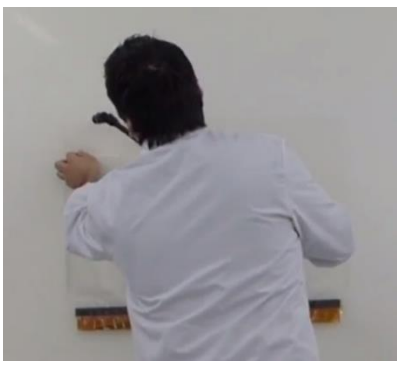


Fig.13 Gently pull the sensor protection layer while applying soapy water to the Touch Sensor glue side

Fig.14 Pull the protection layer and apply soapy water until removing it completely.

9. Spray soapy water over the Touch Sensor glue area after removing its protection (Fig.15)

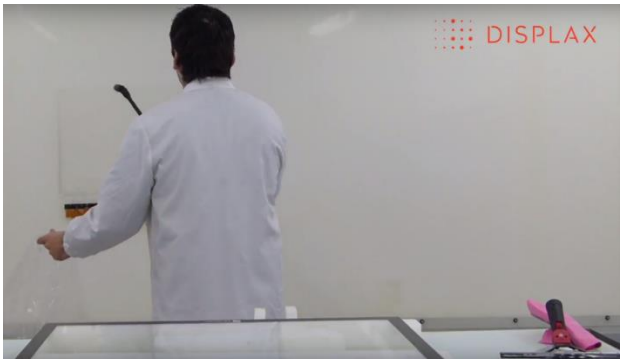


Fig.15

10. Spray soapy water over the glass where the Touch Sensor lamination will be performed (Fig.16)

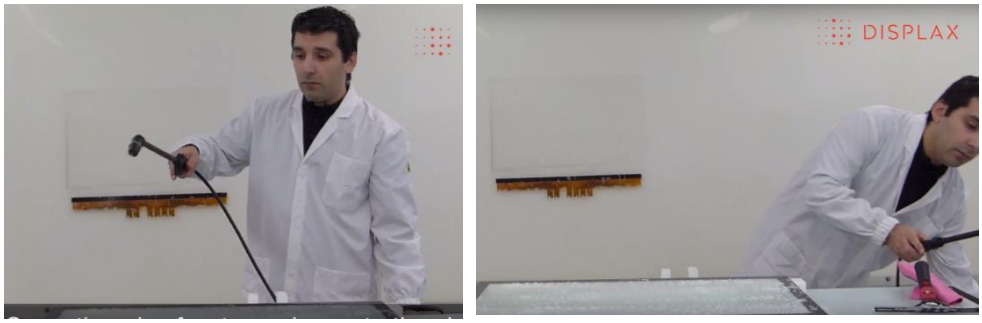


Fig.16

11. Clean the glass using a squeegee
Be sure that the glass is completely clean (Fig.17)

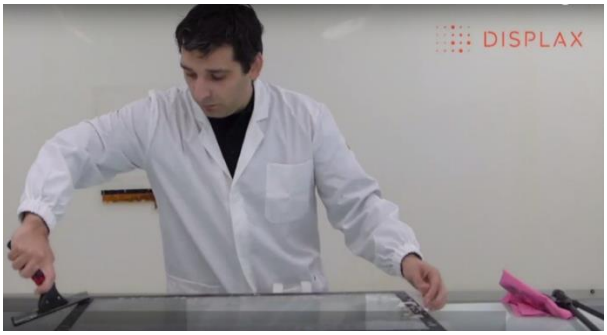


Fig.17

12. Before starting the Touch Sensor lamination spray the glass with soapy water (Fig.18)

Fig.18

13. Carefully and gently detach the Touch Sensor from the lamination wall (Fig.19)
If the Touch sensor has more than 32'' two people may be required to avoid creasing and tearing the sensor grid.

Fig.19

14. Position the Touch Sensor and apply its glue side on top of the wet glass (Fig.20)

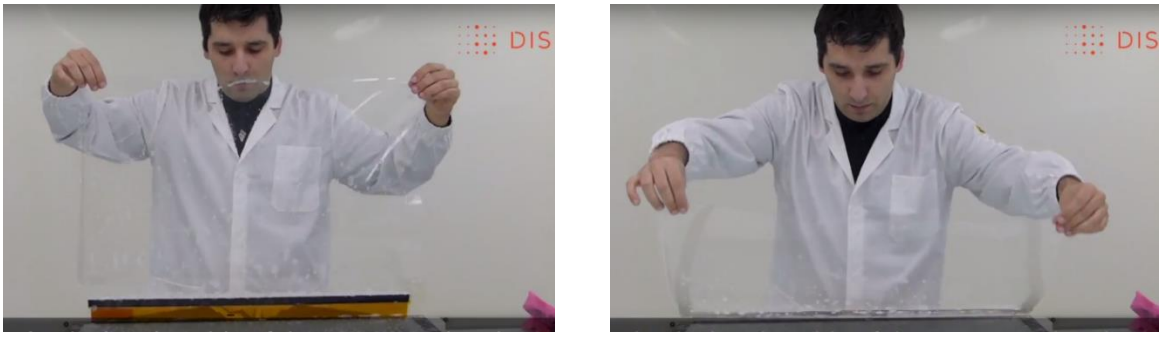


Fig.20

15. Gently and carefully align the Touch Sensor to the glass surface (Fig.21)

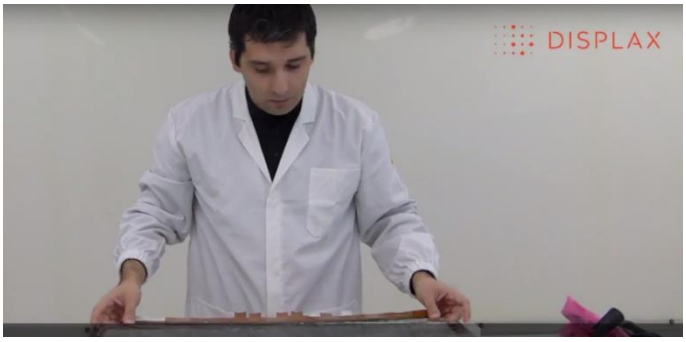


Fig.21

16. Spray the touch sensor on glass with soapy water (Fig.22)

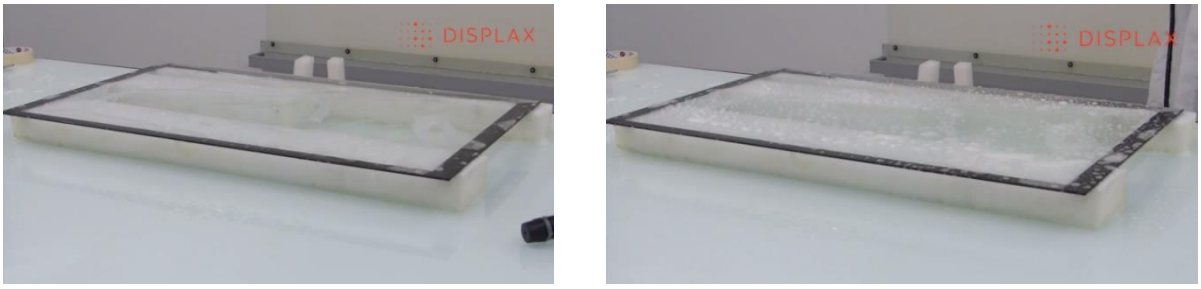


Fig.22

17. Use the squeegee to laminate the Touch Sensor to the glass by lightly and gently removing the soapy water, ensuring the Touch Sensor is correctly positioned and without any dirt or particles (Fig.23)

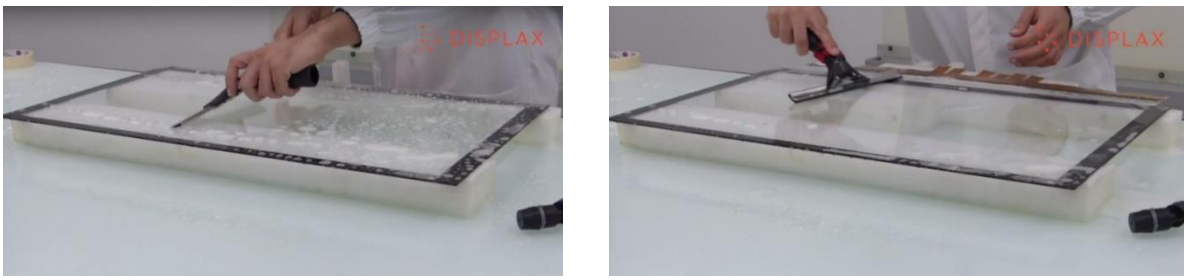


Fig.23

19. Verify and gently adjust the margins of the Touch Sensor to the Glass active area (Fig.24). The active area is the one in which we want to process touch signals.

Fig.24

20. Again, for a 2nd time, spray the Touch Sensor on glass with soapy water (Fig.25)
We should repeat the lamination process by applying once again soapy water to the Touch Sensor on glass, but now we can apply more pressure to the squeegee to remove the water and to ensure a more permanent lamination.

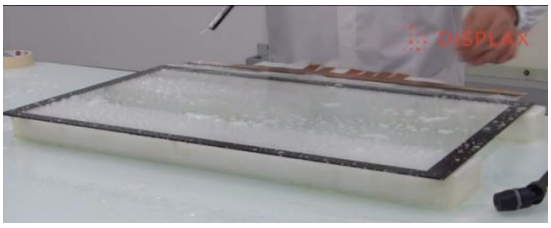


Fig.25

21. Gently but with more pressure remove the soapy water with the squeegee, to ensure a more consistent adhesion between the Touch Sensor and the glass (Fig.26)

Fig.26

22. Again, for a 3rd time, spray the Touch Sensor on glass with soapy water (Fig.27)

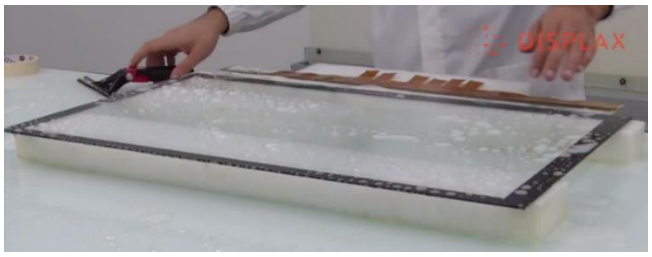


Fig.27

23. With a little more pressure remove the soapy water with the squeegee to ensure a permanent adhesion between the glass and the Touch Sensor (Fig.28)

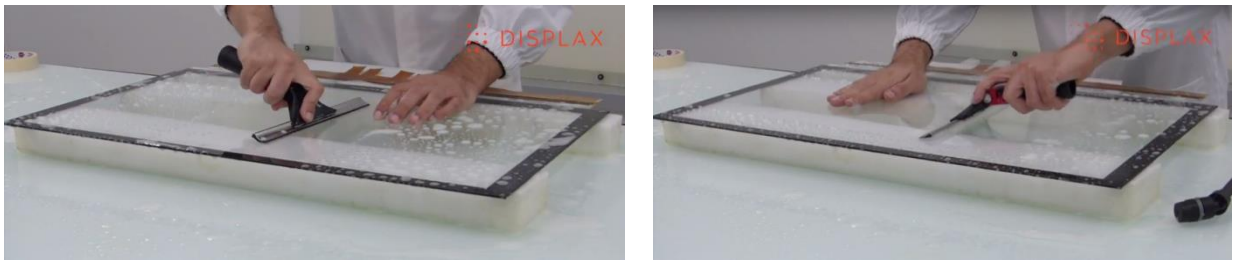


Fig.28

24. If needed, repeat the process one last time: apply the soapy water and remove it with the squeegee (Fig.29)

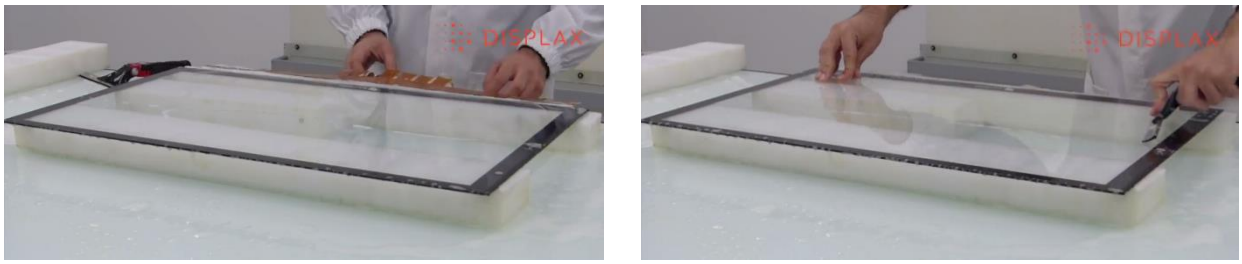


Fig.29

25. After the lamination process you can gently pass a clean lint free cloth all over the laminated product to remove remaining water (Fig.30)

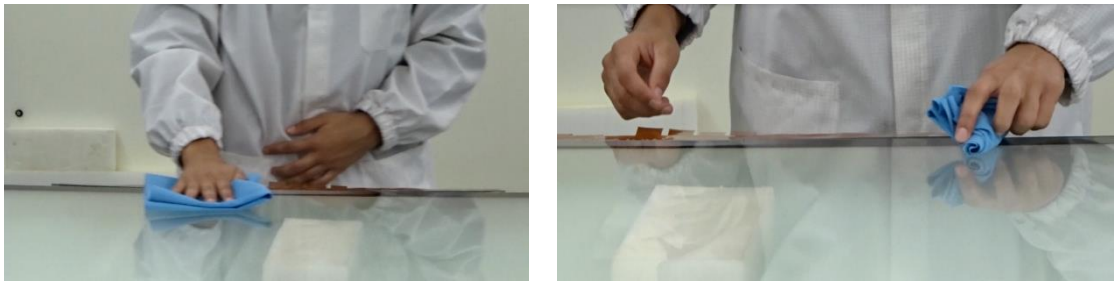


Fig.30

26. Leave the Touch Sensor laminated on glass drying for 24 hours (Fig.31)
If water bubbles remain between the Touch Sensor and the glass, do not be tempted to force them out. These bubbles should evaporate during the 24 hours drying period.

If feasible the drying area should have air conditioning to control and monitor the air heat and humidification levels:

a) The temperature of the air should be between 20 and 25 °C;
b) The humidity level should be between 30% and 45%;
c) The drying time should be of 24 hours.

The drying area should have a structure to place the Touch Sensor on glass. This structure, should have a foam covering or coating the areas where the glass will be in contact with the support structure parts. Fig.31 depicts this condition, we can see a foam covering the areas in contact with the glass and/or Touch Sensor.

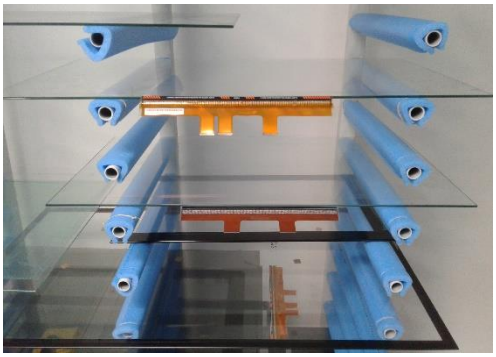


Fig.31

Once the Touch Sensor is dry you can connect it to the Touch Controller.

LAMINATION QUALITY BEFORE DRYING

1. Misalignment between the glass and the laminated Touch Sensor
Edge and squareness misalignment between the glass and the Touch Sensor are permissible but we recommend that they do not exceed a tolerance interval between 1 and 2 mm for Touch Sensors between 20 and 50 inches and between 1 and 4 mm for Touch Sensors between 51and 105 inches. A posteriori, this misalignment can be compensated by running the Touch Controller software on which we can define the Active Touch Sensor area to perform the Touch Sensor geometrical calibration.

2. Overall lamination quality
Bubbles are permissible as long as they are deemed to disappear per evaporation after the drying period.
Bubbles, coiled hair and lint, blemishes, contaminations and scratches are not permissible.
Scratches on the Touch Sensor active area (which will be visible to the user) may be permissible if they are very thin, no more than 5 millimetres long and with a thickness of about 15 microns, unless the client defines other quality requirements.

AFTER DRYING

Bubbles, coiled hair and lint, blemishes, contaminations and scratches are permissible if they will be covered by the LCD or other display borders.
Scratches on the Touch Sensor visible area may be permissible if they are very thin, making them imperceptible among the Touch Sensor grid, and they do not exceed three occurrences, unless the client defines other quality requirements.

CLEANING THE LAMINATED TOUCH SENSOR BEFORE INTEGRATION

Clean the laminated product comprising the Glass and the Touch Sensor before its integration on a LCD or other Display.
Carefully clean the glass, and gently clean the Touch Sensor making sure no finger print, dirt or other contaminant are left.
Use a soft cleaning lint free cloth previously wet with soapy water, and clean both sides.
Proceed with a visual inspection to ensure that no finger print, dirt or other contaminant is left.
The glass with the Touch Sensor shall be inspected and verified on both sides at a close distance of about one foot with good quality ambient light.

REMOVABLE VERSION

The removable version does not have a protective layer to be removed exposing the glue like on the permanent version.

In the removable version, the Touch Sensor must be laminated over a backing adhesive provided with the Skin Fit or Skin Dualtouch product.

This backing adhesive, named "cling", is a transparent polymer, which must be applied over a determined substrate, like glass. In this description, we refer to 'glass', but other non-conductive substrates can also be used.

Clean the glass, proceeding in the same way as described in step 1of the permanent version, to ensure the glass is duly clean without any dirt, lint, finger-tip or other contaminant, then you should decide on the correct position to place the "Cling" over the glass.

To ensure the "Cling" adhesion to the glass spray soapy water all over the glass where you want to laminate the "Cling".

The "cling" is provided with a white protective substrate, which must be removed (Fig.1). The exposed area must be placed facing the glass, previously wet with soapy water, where we want to laminate the Touch Sensor (Fig.2).

Fig.1 Carefully remove the white protection

Fig.2 Place the "Cling" against the glass, previously wet with soapy water, where we want to laminate the Touch Sensor

Having the "Cling" over the glass, apply soapy water all over the "Cling" and use a squeegee to clean and to laminate the "Cling" onto the glass, repeat this process of applying soapy water and removing it with the squeegee for another two times, making more pressure at each time to ensure the adhesion of the "Cling" onto the glass. (Fig.3).

Fig.3 Apply soapy-water over the "Cling" to clean it and also to ensure its adherence to the glass

The "Cling" by now should be laminated and free of any particles, finger-tips, lint or other contaminant, and should be without any crease or bubble.

Having the "Cling" laminated onto the glass, we can now laminate the Touch Sensor onto the "Cling".

Carefully and gently clean the Touch Sensor using a soft cleaning lint free cloth previously wet with soapy water, then proceed with a visual inspection to ensure that no finger print, dirt or other contaminant is present.

To laminate the Touch Sensor over the "Cling" the steps are similar to the ones described in the permanent version (see steps 15 to 26 of the permanent lamination), those steps consist on:

1. Applying soapy water over the "Cling" on glass;
2. Positioning and placing the Touch Sensor over the "Cling" on glass;

3. Aligning the Touch Sensor active area with the area of the "Cling" on glass;
4. Applying soapy water over the Touch Sensor;
5. Removing the soapy water with a squeegee to ensure the progressive adhesion between the Touch Sensor and the "Cling" on glass;
6. Repeating for another two times the previous step, of applying soapy water and removing it with the squeegee, but when doing it for a second and third time more pressure should be applied at each term, to ensure the Touch Sensor adhesion onto the "Cling" laminated on glass;
7. Carefully drying the laminated Touch Sensor surface and the area around it;
8. Letting the laminated product to dry for a 24-hour period.

Once the Touch Sensor is dry you can connect it to the Touch Controller.

The same lamination quality parameters are applied to the permanent and to the removable versions, see the above sections "Lamination quality" and "Cleaning the laminated Touch Sensor before its integration on an LCD".

To reuse the "Cling" and the "Touch Sensor" in another surface, they both must be removed and handled gently and carefully.

Start by removing the Touch Sensor by lifting its edges and progressively lifting the whole Touch Sensor.

After removing the Touch Sensor, remove the "Cling" from the glass by lifting its edges and progressively detaching it from the glass.

Both the "Touch Sensor" and the "Cling" after its removal must be handled carefully and gently to be reused in another substrate. We recommend placing each component, the "Cling" and the "Touch Sensor" on individual vegetable paper covered with foam.

To reuse the product components, please refer to the above described procedure, but this time you will not have to remove the "Cling" white protection substrate since it has already been removed in the first application.

We do not recommend removing the cling more than two times, although a third time might be possible depending on different handling, substrates, and operational and environmental conditions. If the cling gets damaged, you should replace the cling for a new one.

PRODUCT SERIAL NUMBER

The Touch Sensor serial number is placed on the left side of the FFCs.

The Touch Controller serial number is placed on its back.

The product package also has the same serial number.

INTEGRATION GUIDE

A video has been created to support the integration process:
URL: https://academy.displax.com/knowledgebase/integration/
Your product may present a different design from the one presented in this user guide and instruction video.

Note:
This guide assumes you already have the Touch Sensor laminated on glass. For more information on how to laminate, please refer to the lamination guide.

MOUNTING THE GLASS WITH THE TOUCH SENSOR ON A DISPLAY

Clean the LCD and the glass on which the Touch Sensor has been laminated. Use a soft wet lint free cloth with dishwasher detergent to clean the glass. The same solution can be used to clean the Touch Sensor, which should be cleaned with care to avoid damaging the sensor electrodes, the flat flexible cable and its solder joints.

To mount the glass with the Touch Sensor on the LCD apply foam gasket or a double sided bonding tape (Fig.2) around the perimeter of the LCD to ensure an air gap between the LCD and the Touch Sensor. An air gap is advisable to reduce electromagnetic interferences from the LCD panel. The air gap may vary between 1 to 10 mm, a bigger air gap makes the Touch Sensor less sensitive to electromagnetic interferences. We recommend using an air gap of at least 2 mm.

The foam gasket or double sided bounding tape should be non-sulphurous and must maintain its adhesion properties at any temperature that the LCD may be experiencing in normal use.

Fig.1

Having applied the foam gasket, place the laminated Touch Sensor over the LCD panel with the Touch Sensor facing the LCD (Fig.2 and 3).

Fig.2

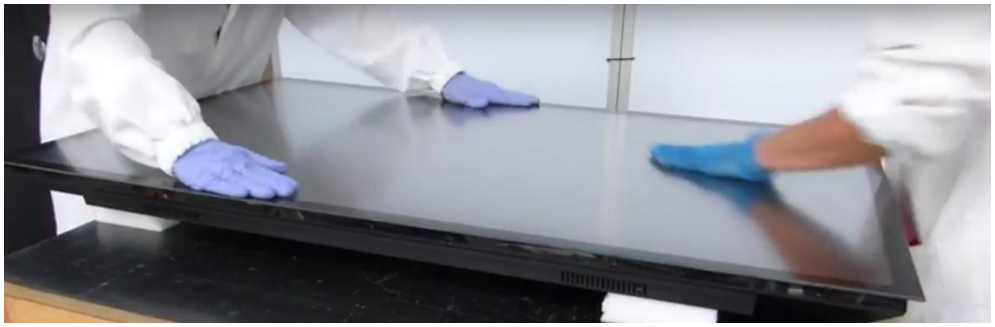


Fig.3

When positioning the laminated Touch Sensor over the LCD, carefully align the active area of the LCD with the active area of the Touch Sensor laminated on glass, also take into consideration the position of the flexible cables to ensure the best alignment for mounting the PCB controller on the back of the LCD.

Likewise, take into account that the backlight of the LCD is usually the noisiest part. Traditionally, this component is placed in one of the sides of the display. If your Touch Sensor is a side tail version, the sensor side where the PCB Controller attaches should be on the same side of the LCD backlight since the signal is stronger here, thus minimizing the impact of the noise from the backlight. Contact your LCD manufacturer for more information regarding the backlight location.

INTEGRATING THE TOUCH CONTROLLER

To open the Touch Controller protection air bag, pierce the bag, using a blade to release its air to make it easier to remove it in safety (Fig.4 and 5).

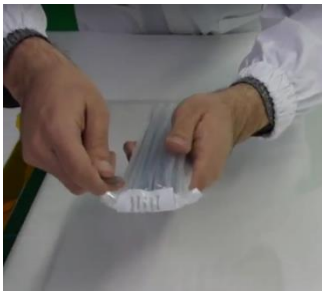


Fig.4

Fig.5

Define the position to secure the Touch Controller to the LCD (Fig.6).

Fig.6

When defining the Touch Controller position:

a) Make sure the flexible cable reaches comfortably the Touch Controller (PCB);
b) Make sure there is a good access to the USB cable in that location;
c) Identify a grounding option for the Touch Controller;
d) Avoid, when possible, placing the Touch Controller near the LCD power source.

Touch Controller integration - attach the Touch Controller to the back of the LCD:

a) The Touch Controller cannot be directly placed on metal;
b) Use foam gasket or a double sided bonding tape to attach the Touch Controller to the back of the LCD (Fig.7). The gasket must maintain its adhesion properties at any temperature that the LCD may be experiencing in normal use.

Fig.7

c) Make sure to have a minimum distance of 3 mm from the Touch Controller to the LCD, to ensure that the electromagnetic noise from the LCD doesn't affect it. This distance can be created either by placing a gasket under the Touch Controller, as previously described, or by using

metal standoffs connected to the LCD chassis above which the Touch Controller can be placed and attached using screws threaded into the metal standoffs. This procedure grounds the Touch Controller.

d) Ground the Touch Controller, either by using screws threaded into the LCD metal chassis or by using the low impedance grounding cable supplied with the Skin product which must be connected to the Touch Controller socket (Fig.8 and 9) and to a metal part of the LCD chassis (Fig.10). To connect the ground cable to the Touch Controller insert its ending tip into the socket, and make sure it does stay securely fixed. Later if you want to remove the ground cable from its socket use a tip of a pen or a paper clip to unlock the ground cable connector (Fig.8 and 9).

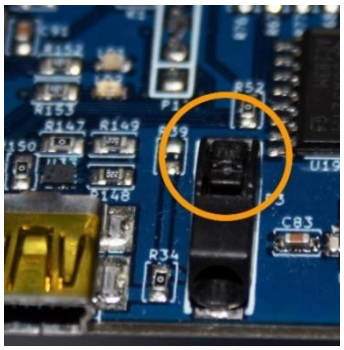


Fig.8

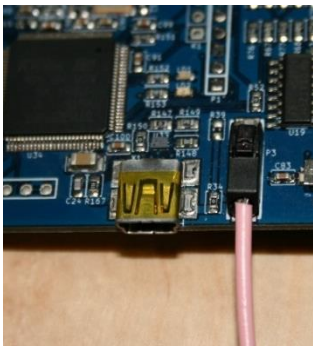


Fig.9


Fig.10

e) In some applications the LCD may only have a plastic casing and grounding to the LCD chassis is not an option. Other times the LCD electricity plug doesn't ground. In these cases, use the power socket to ground the Touch Controller. Make sure there is a good access to the ground cable (Fig.11 and 12).

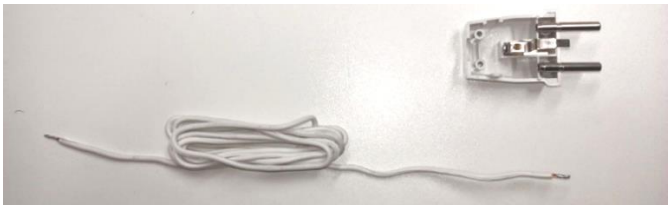


Fig.11


Fig.12

INTEGRATION EXEMPLIFICATION:

Secure the Touch sensor flexible cable to the LCD rear side using a double sided bonding tape (Fig.13 and 14).

Fig.13

Fig.14

Ensure that the flexible cable endings are clean, free of any particle or lint and properly connect them to the Touch Controller sockets (Fig.15 and 16) – if needed you can use alcohol and a lint free clouding to clean the flexible cable endings.

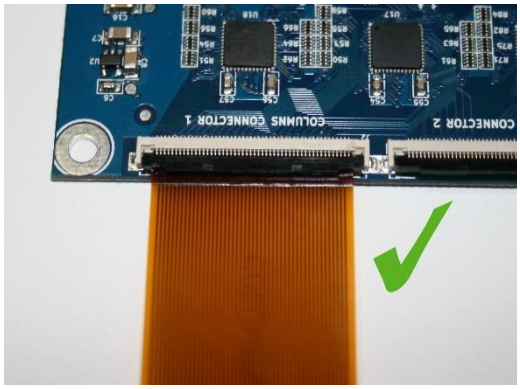


Fig.15

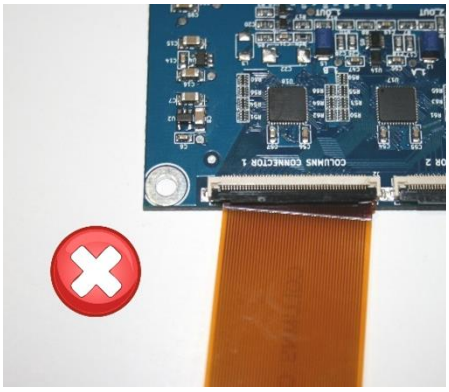


Fig.16

Apply a standoff support, or a double side bonding tape, with a minimum height of 3 mm, to bond the Touch Controller to the LCD rear (Fig.17).

Fig.17

Ground the Touch Controller to the LCD using the low impedance grounding cable, supplied with the skin product.

Connect the ground cable to the Touch Controller and to the LCD chassis (Fig.18).

Fig.18

To connect the low impedance ground cable to the LCD chassis, find a suitable grounding option. A screw bonded to the metallic LCD chassis can be an option (Fig.19 and 20). In Fig.20 the ground cable has been attached to the screw near the LCD VGA entrance grounding the Touch Controller.

Fig.19

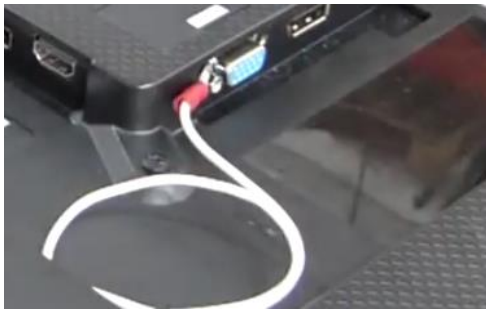


Fig.20

It is advisable adding cable clips to secure the grounding cable, and to secure the USB cable connecting the Touch Controller to the PC (Fig.21 and 22).

Fig.21

Fig.22

Alternative integration methods can be implemented and all the devices may be included inside the LCD depending on the LCD design and internal spacing, and also on the size of the PC in use. Embedding cases attached to the LCD may also be used to protect or incase the setup devices.

CONNECTING THE SKIN TOUCH CONTROLLER

Download 'DISPLAX Connect', the software required to configure the Skin product https://academy.displax.com/downloads/

Install 'DISPLAX Connect' and then run the software.

After running the software, connect the USB cable to the Touch Controller and to the PC.

Note: 'DISPLAX Connect' should be closed before disconnecting the Touch Controller board.

If the Touch Controller board is removed before closing 'DISPLAX Connect', its settings may not be properly recorded, causing a reset to re-establish the factory settings.

DISPLAX CONNECT

OVERVIEW

'DISPLAX Connect' is the control panel software developed for Displax products allowing full control of touch detection.

'DISPLAX Connect' runs on Windows (7 or higher), OS X (Yosemite and El Capitan) and Ubuntu (14.04 LTS). You need to configure your Skin unit using one of these Operating Systems.

Once you are satisfied with the touch configuration, you can switch to a PC with a different OS, if it is supported by the Skin Touch Controller. This is possible since the configuration settings are stored in the Touch Controller.

To see the list of all supported OS, please consult the product Spec File.

To configure 'DISPLAX Connect', it is required to have a keyboard and a mouse.

The following instructions refer to the 'DISPLAX Connect' versions 1.9.0 or higher, for Skin Ultra, Skin Fit and Skin Dualtouch.

MINIMUM REQUIREMENTS

Minimum requirements to run 'DISPLAX Connect' are:

RAM: 2 GB

CPU speed: 1.33 GHz

Graphic card supporting: Open GL 2.0

Minimum free disk space: 300MB

Supported OS: Windows (7 or higher); OS X (Yosemite and El Capitan); Ubuntu (14.04 LTS)

Note:

If you are using a laptop, make sure to plug the power adapter. Running with a laptop using only the battery has shown that it does not always provide enough power to the USB port for the Touch Controller to work properly.

Avoid using frontal USB ports on desktop PCs. Traditionally these ports do not comply with USB standards and may not provide enough power for the Skin product to run properly.

DISPLAX CONNECT DOWNLOAD

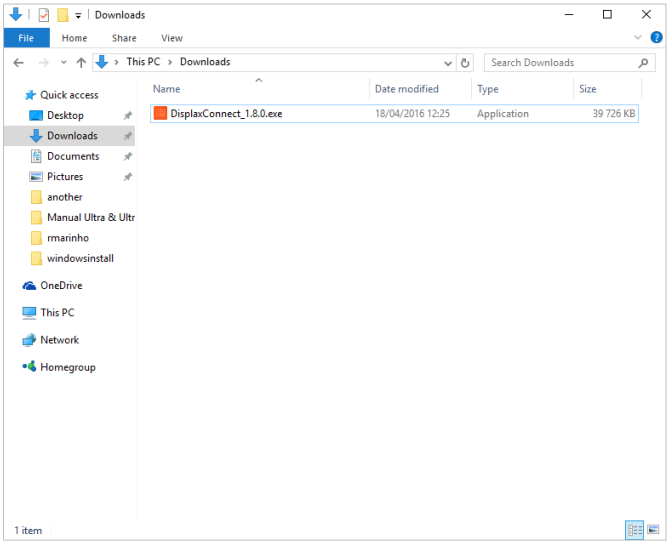
Download and install the DISPLAX Connect software:
https://academy.displax.com/downloads/

HOW TO INSTALL: WINDOWS 7 OR HIGHER

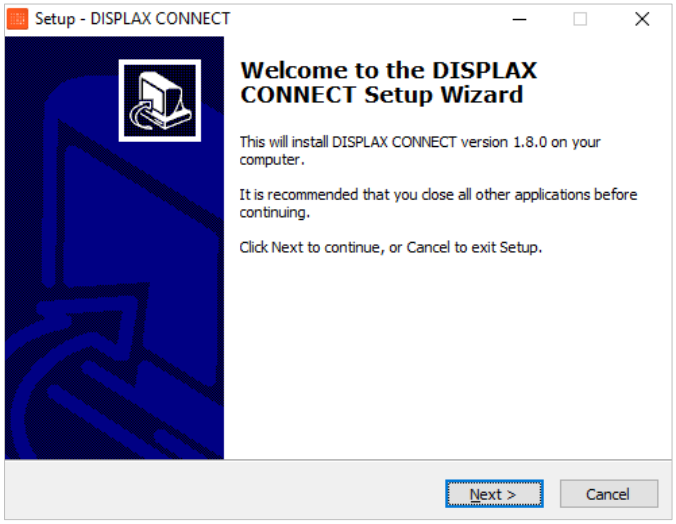
Note: Run the 'Displax Connect' installation steps and after the installation connect the Touch Controller to a PC.

Installation process:

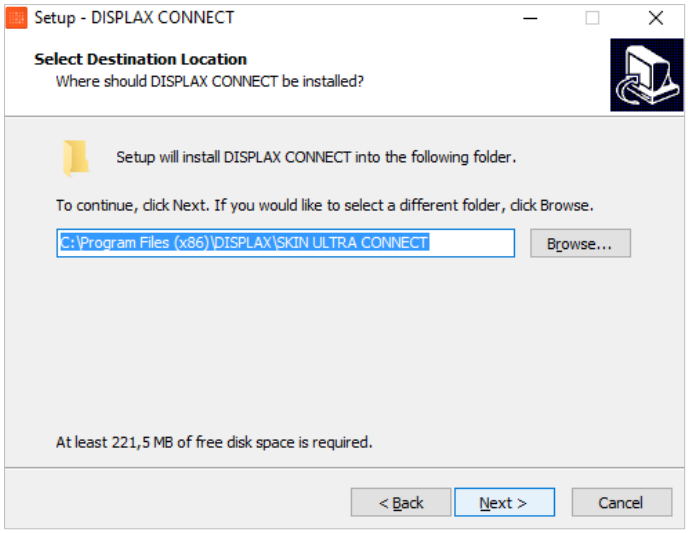
To run 'Displax Connect' double Click the '.exe' file to start the installation process.



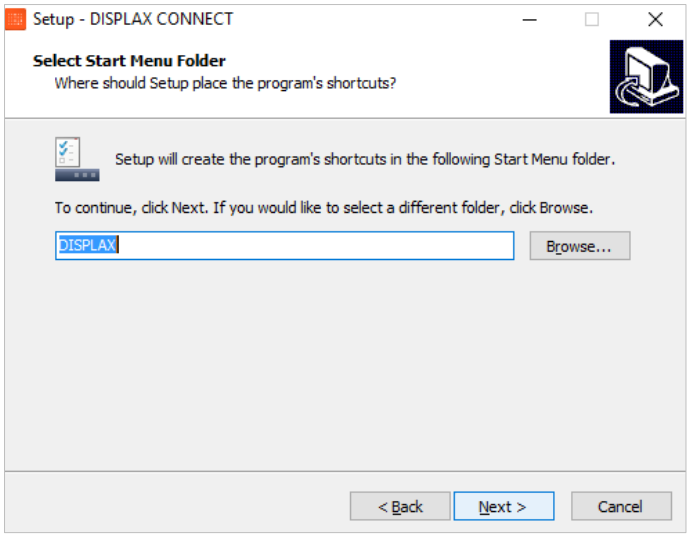
An installation window will be displayed.
Click 'Next' to start the installation process.



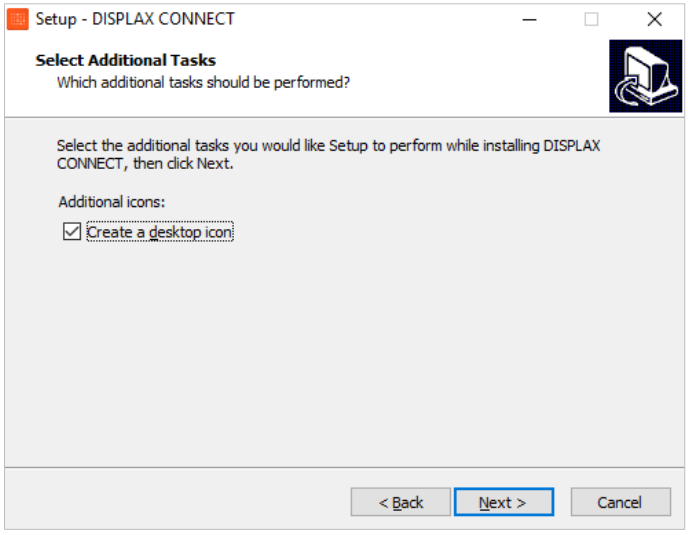
Select the desired folder for the installation, by default, the 64bits version is installed on the folder 'Program Files (x86)', the 32 bits version is installed on the folder 'Program Files'.



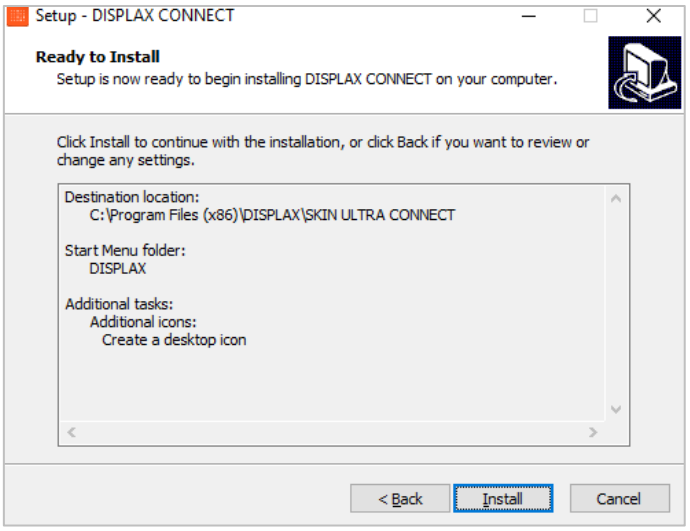
Afterwards, select where the shortcuts should be, click 'Next' to keep the default.



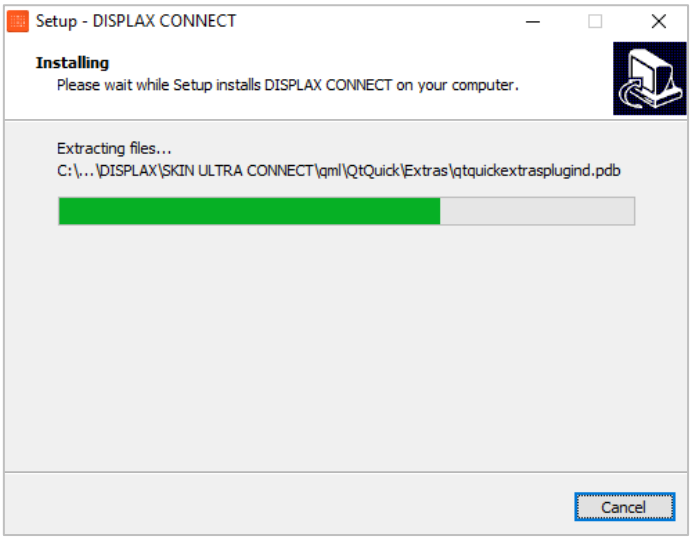
By default, a desktop shortcut will be created.



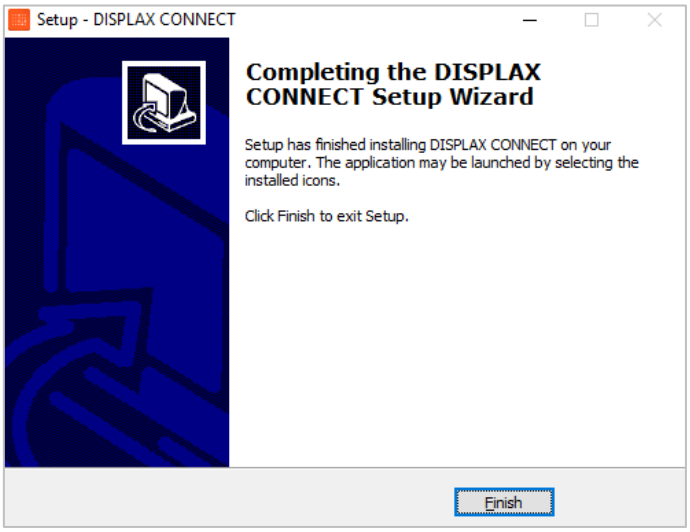
After selecting all content to be installed and the folders to save the files, click 'Install' to start the 'DISPLAX Connect' installation.



The following image shows the installation in progress.

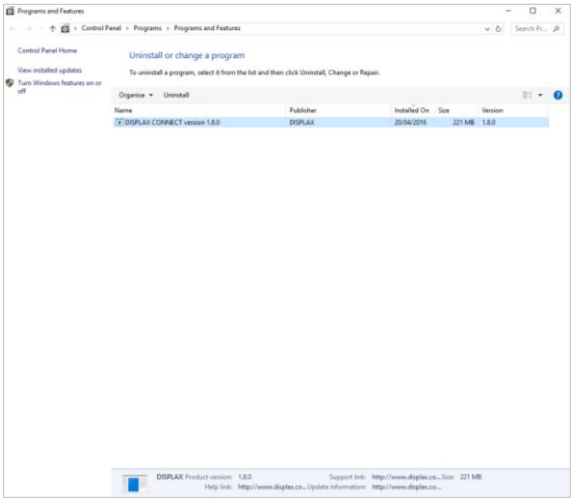


'Finish' to exit the setup.

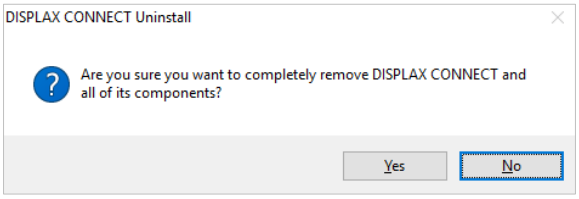


HOW TO UNINSTALL: WINDOWS 7 OR HIGHER

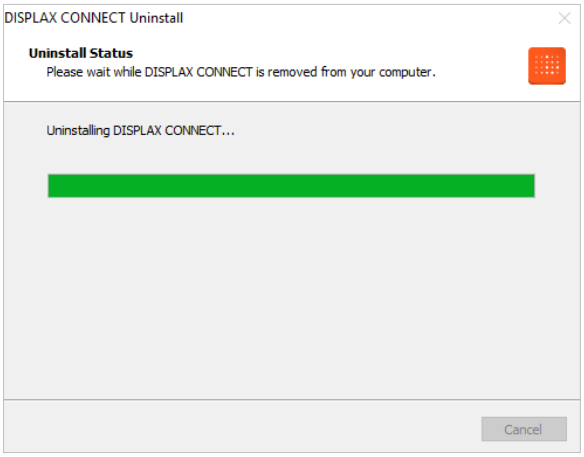
To uninstall 'DISPLAX Connect' go to: 'Control panel'; 'All control panel items'; 'Programs and Features', and select the 'DISPLAX Connect' application, then make a left click and select uninstall.



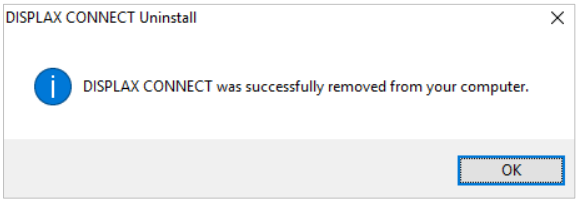
A message box will be displayed where you can confirm if you want to proceed. Click 'Yes' to uninstall.



The uninstallation process will start.

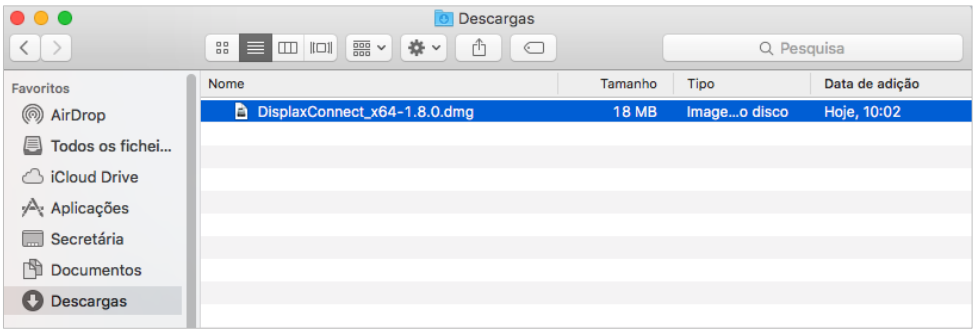


When the uninstallation process is concluded, a report message will be shown.

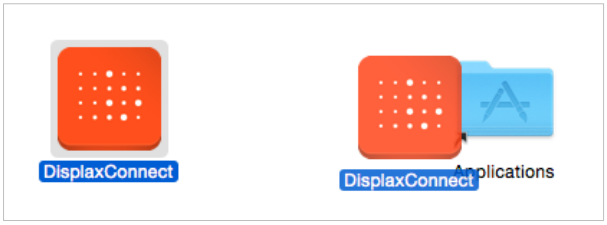


HOW TO INSTALL: MAC OS X

Search for '.dmg' file. Double click the file to mount it.



The '.dmg' content will be displayed, now drag 'DisplaxConnect' to 'Applications' folder, as shown on the following image.



The OS X installation process is concluded.

Your setup is now working with native single touch, since Mac OS Operating System does not support multitouch. To use multitouch on Mac OS, you will need to use TUIO. Please refer to the TUIO protocol chapter for more information on how to use TUIO.

Note: If you have a previous version of Control Panel called 'Skin Ultra Connect' it should be manually removed before installing the newest version of 'DISPLAX Connect', as shown in the instructions bellow.

HOW TO UNINSTALL: MAC OS X

To uninstall 'DISPLAX Connect' go to 'Applications' folder and select the 'DisplaxConnect' application.

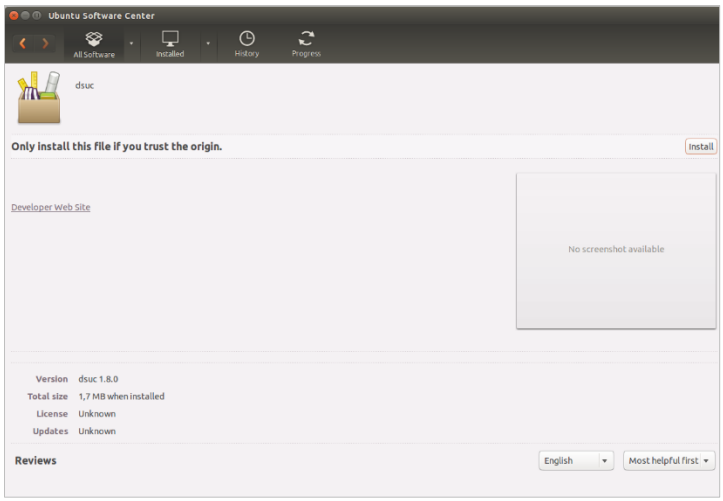
Select the 'DisplaxConnect' icon and drag it to the trash icon to uninstall it.

Before uninstalling TUIO, it must be stopped on the TUIO tab. Otherwise, it will continue running.

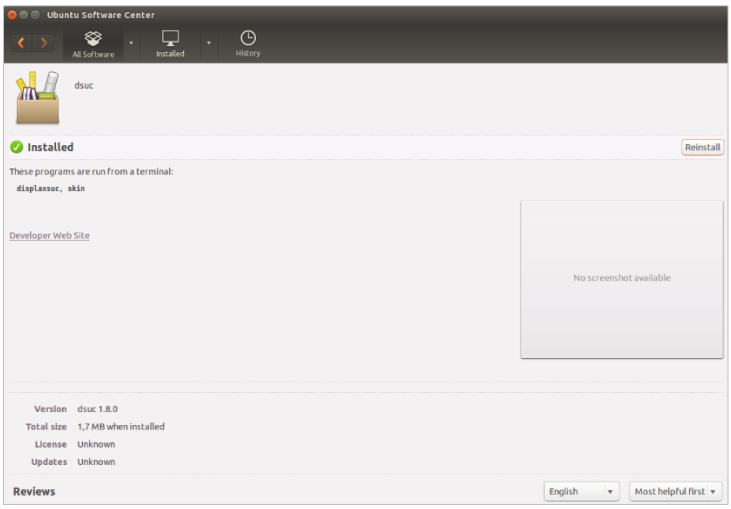
HOW TO INSTALL: UBUNTU

Double click the '.deb' file.

A new window (Ubuntu Software centre) will be displayed, click 'Install' to start the installation process (an user password is required to proceed with the installation).

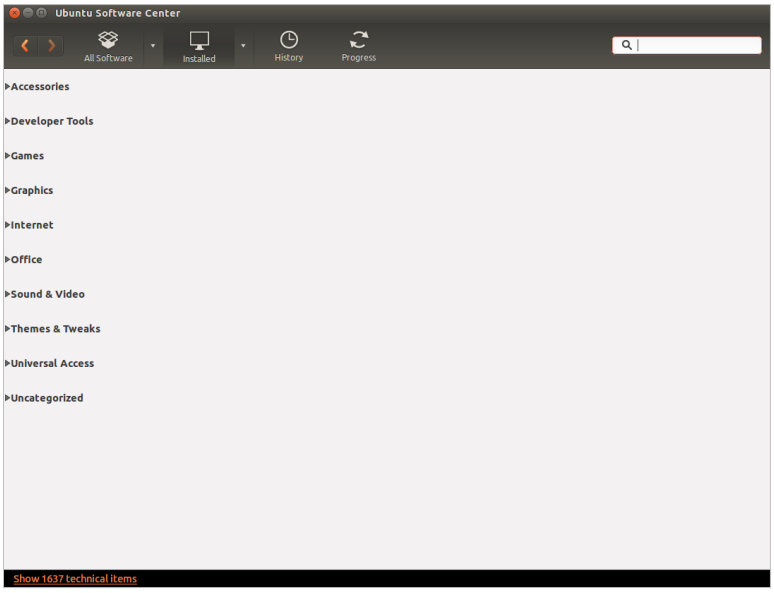


If the installation was successful, the label 'Installed' will be displayed.

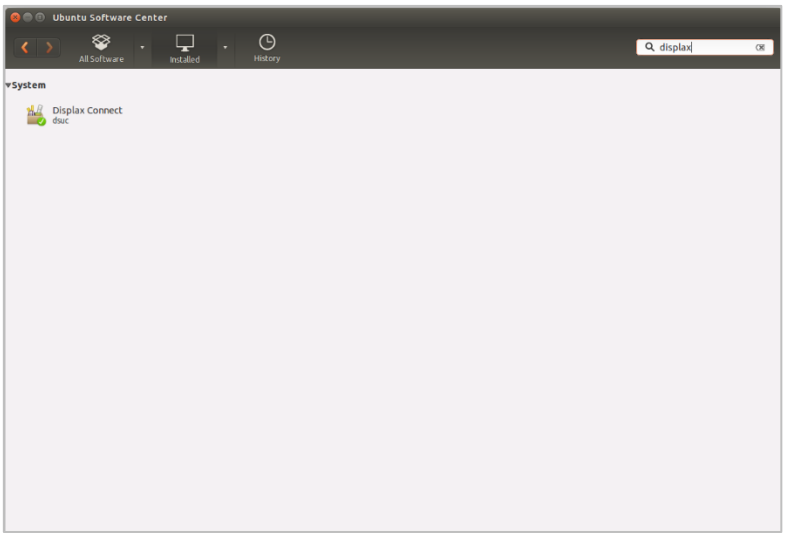


HOW TO UNINSTALL: UBUNTU

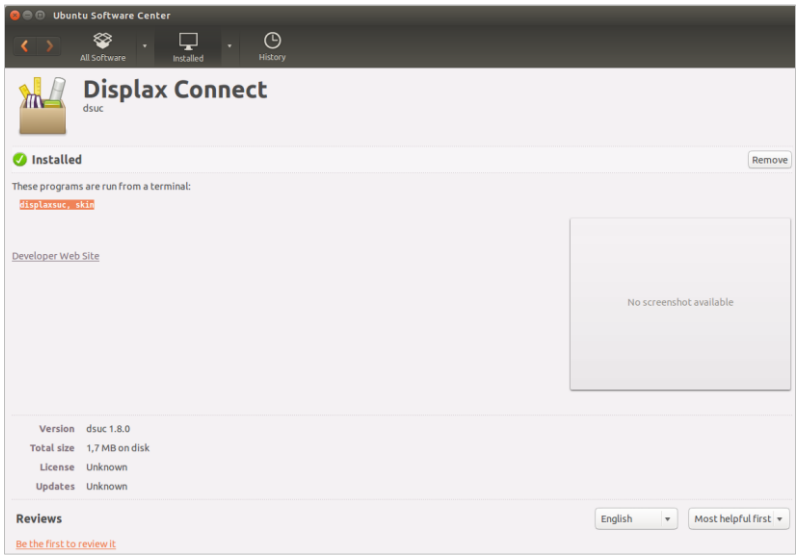
To uninstall ‘DisplaxConnect’ open the 'Ubuntu Software Center' and click on ‘Show technical items’ at the bottom of the window.



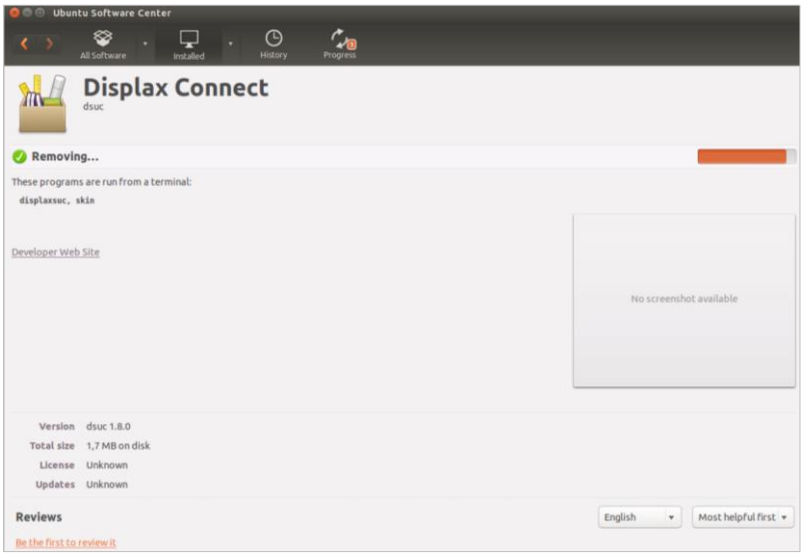
In the search tab write ‘DisplaxConnect’, the application will be shown. Click on it and you will be redirected to the application window.



Click 'Remove'.



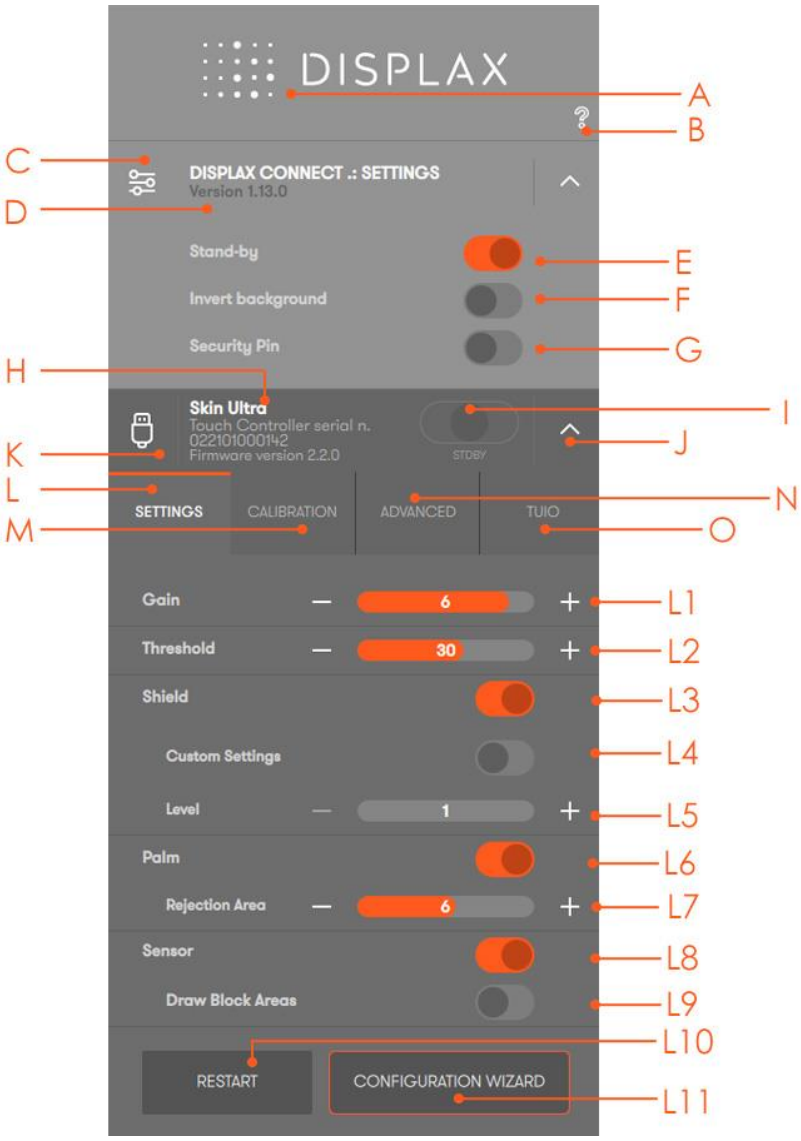
The uninstallation process will start.



HOW TO USE 'DISPLAX CONNECT'

The features A to G provide information relative to 'DISPLAX Connect' Control Panel. The remaining letters from H provide information relative to settings or information stored in the Touch Controller.

The specifications herein presented may not all be available in your control panel, they are dependent on the product you have purchased. Skin Ultra contains all the Displax Connect features, whenever a feature is not available in other Displax products, an advertising note is given.



Control Panel features

A. Displax Connect: drag floating menu.

B. Help menu: shortcut keys and help per feature.

C. Hide and show 'DISPLAX Connect' settings.

D. DISPLAX Connect version.

E. Stand by: the touch is temporally disable when opening the control panel. This way, if you want to adjust some setting you will be able to do it. When you close 'DISPLAX Connect' the touch injection will be automatically re-enabled and the STAND-BY status will change to ON. This stand-by status is only active when 'DISPLAX Connect' is open.

F. Invert background: alternate between a white and a black background.

G. Security Pin: a security pin to protect the configured settings.

Touch Controller features

H. Skin product serial number.

I. Touch Injection Status: touch injection to the Operating System. This has 3 modes:

   ON: Operating system will receive touch events from the Skin product.

   OFF: Operating system will not receive touch events from the Skin product.

   STAND-BY: Operating system will temporarily not receive touch events from the Skin product. This way, if you want to adjust some setting you will be able to do it. When you close 'DISPLAX Connect' the touch injection will be automatically re-enabled and the STAND-BY status will change to ON. This stand-by status is only active when 'DISPLAX Connect' is open.

J. Hide/show Touch Controller settings.

K. Touch Controller firmware version.

L. Settings tab: 'DISPLAX Connect' configuration settings.

   L1. Gain: adjusts the signal strength injected by the Touch Controller on the Touch Sensor - thicker glasses and bigger Touch Sensors may require a stronger signal (higher GAIN values). Gain values range between 0 and 7.

   L2. Threshold: adjusts the threshold level of what is considered a touch. Values vary between 0 and 50 starting on firmware version 1.5.0. (0 to 15 on firmware version equal or previous to 1.4.0).

   L3. Shield: electromagnetic shielding reduces noises that may exist between the Skin product and the LCD.

   L4 and L5. Shielding level: adjusts the level of shielding. Ranges between 1 and 6, with 6 being the strongest shielding level. The shielding level should be maintained as low as possible.

   L6. Palm: allows the rejection of areas with dimensions larger than a finger, such as a hand or an arm. (Feature not available in Skin Dualtouch).

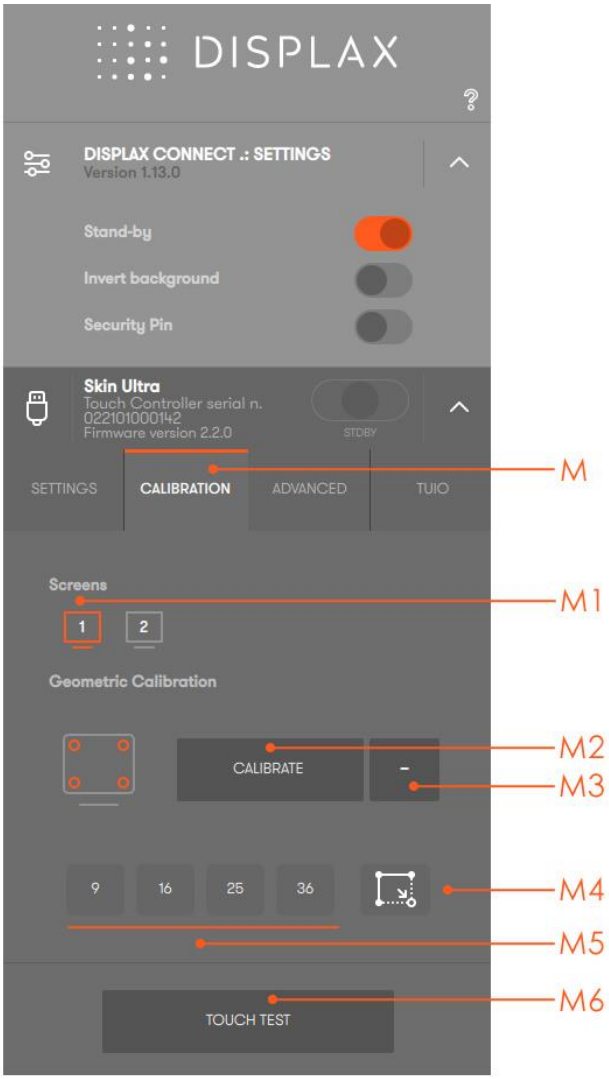
   L7. Rejection area: allows the rejection of touches from a hand, arm or other object placed over the touch sensor. (Feature not available in Skin Dualtouch).

L8. Sensor: checks the Touch Sensor electrical conditions on rows and on columns to visualize electromagnetic interferences and permits to enable and disable rows and columns, and to draw block areas.

L9. Draw block areas: allows disabling the touch on specific Touch Sensor active areas, where you do not want touch being processed.

L10. Restart Touch Controller: if for some reason it is necessary, restart the Touch Controller.

L11. Configuration wizard: this is an assisted process to configure the current setup. This feature is available depending on the version of the Touch Controller and firmware you are using. This feature is explained with more detail in the Configuration Wizard chapter. (Feature not available in Skin Dualtouch and Skin Sense).



M. Calibration tab: calibration process to match the physical touch with the Operating System digital coordinates.

M1. Screens: select the display where you want to perform the geometric calibration.

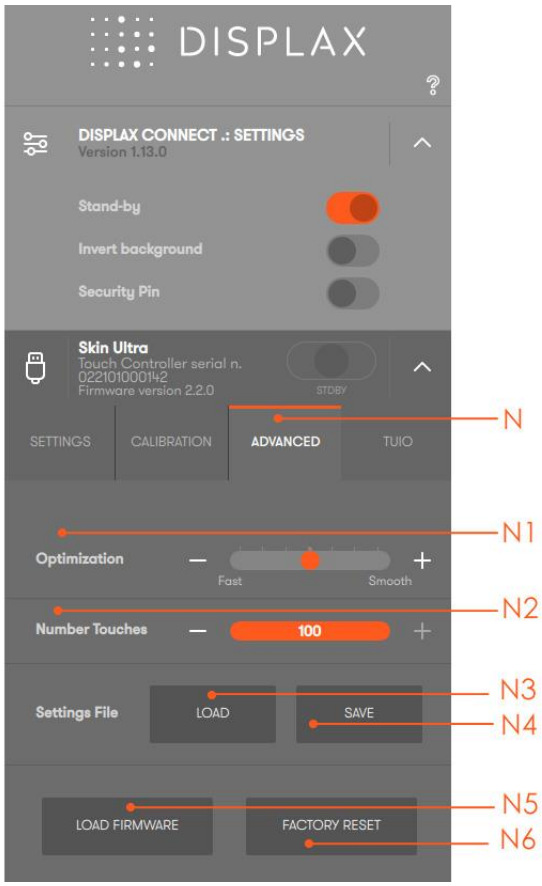
M2. Calibrate: Click the button to start the geometric calibration.

M3. + Advanced geometric calibration.

M4. Calibration points: Number of points used to perform the geometric calibration. Please refer to the advanced calibration chapter.

M5. Drag mode: Calibration of Touch sensor smaller than the LCD. Please refer to the advanced calibration chapter.

M6. Touch Test: Touch Test app.



N. Advanced tab: advanced configuration tools.

N1. Optimization: establishes a reason between Touch speed and Touch precision.

N2. Number of touches: limits the number of touches reported by the Touch Controller (Skin Ultra: between 1 to 100 touches; Skin Fit: 1 to 40 touches; Skin Dualtouch: 1 to 2 touches). This feature is available depending on the Touch Controller version and firmware you are using.

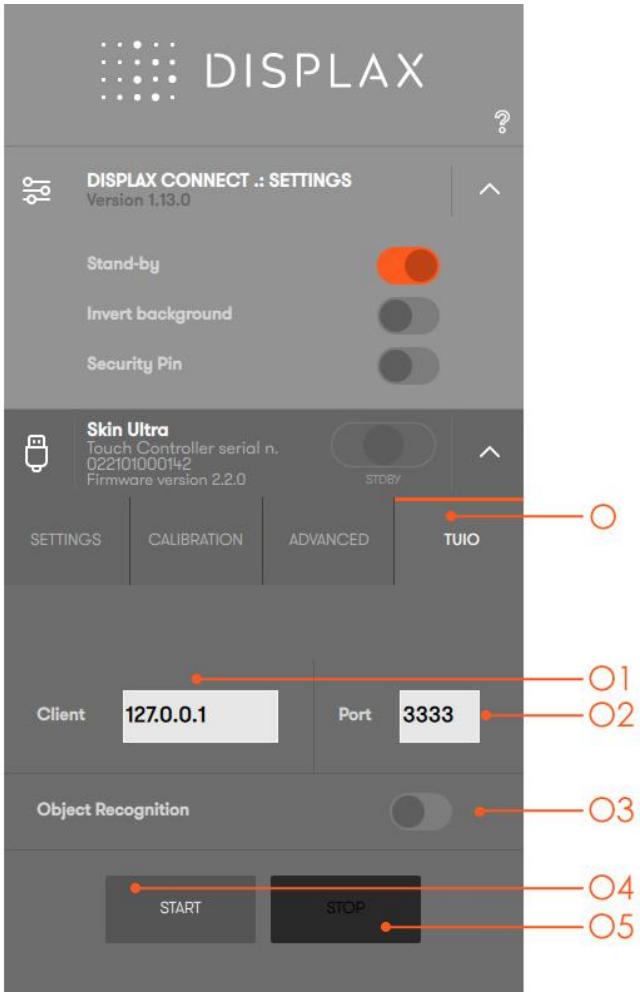
N3. Load settings file: allows loading previously saved configuration files. The user must wait 10 seconds after changing settings, before changing to other settings, in order to correctly save them into the controller.

N4. Save current settings to file: Allows saving the current settings to be used in other configurations. This feature should be used with equivalent setups, i.e. same LCD, glass thickness and size, sensor size and air gap.

Note that there may be other sources of electromagnetic interferences on each setup, and the settings may have to be adjusted.

N5. Load firmware: allows to load a firmware file to the Touch Controller.

N6. Factory reset: sets the Touch Controller to its default settings.



O. TUIO tab: touches transmission protocol.

O1. Client: introduce the client IP.

O2. Port: introduce the client port number.

O3. Object recognition: activate or deactivate the object recognition feature. (Feature not available in Skin FIT, Skin Dualtouch and Skin Sense).

O4. Start: starts sending TUIO events from the chosen device to the defined client.

O5. Stop: stops sending TUIO events from the chosen device to the defined client.

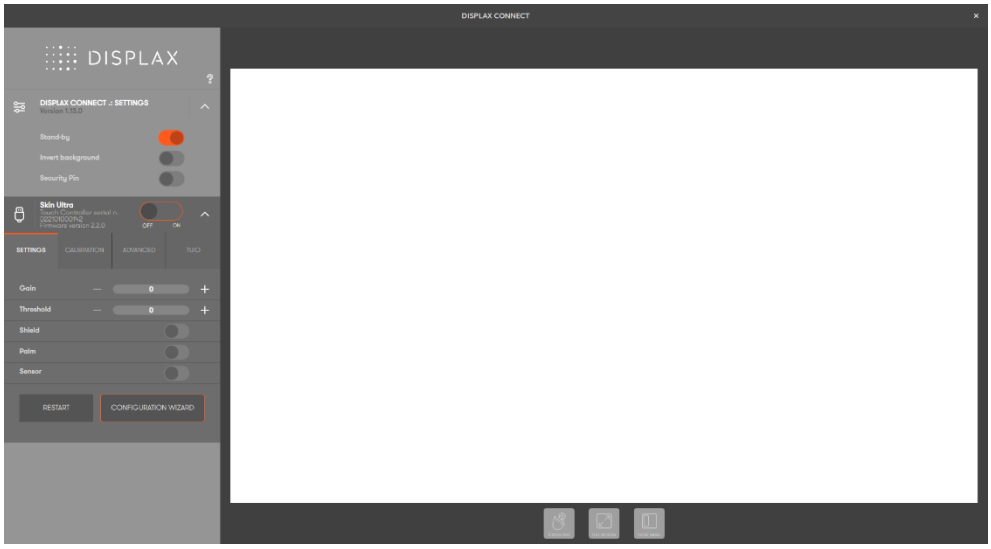
P Q R S

P. Touch Test: Touch Test app.

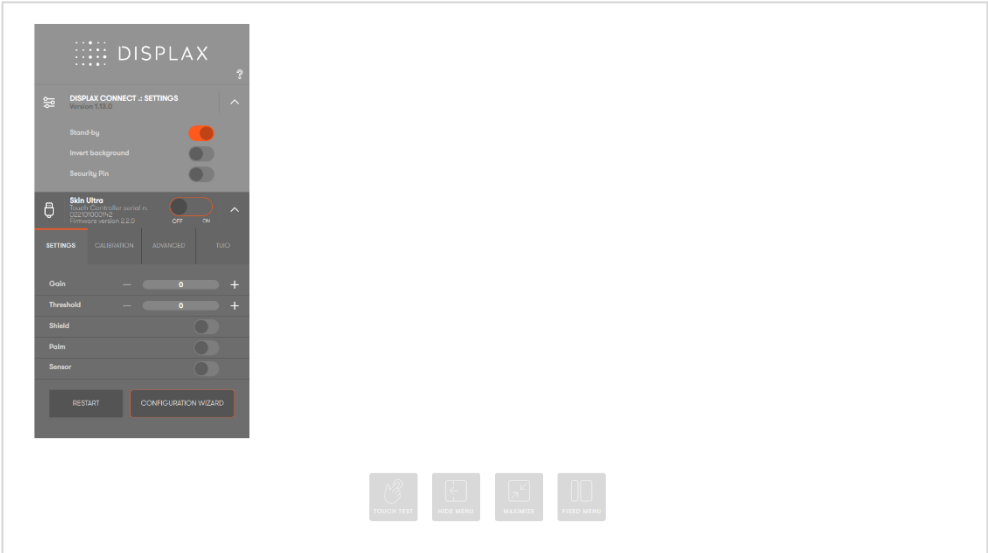
Q. Hide Menu: Hides 'DISPLAX Connect'.

R. Maximize/Full screen: Changes between maximized and full screen view.

S. Fixed and Float menu: Transition between the fixed and the floating 'DISPLAX Connect' view.



Fixed view



Float view

KEYBOARD SHORTCUTS

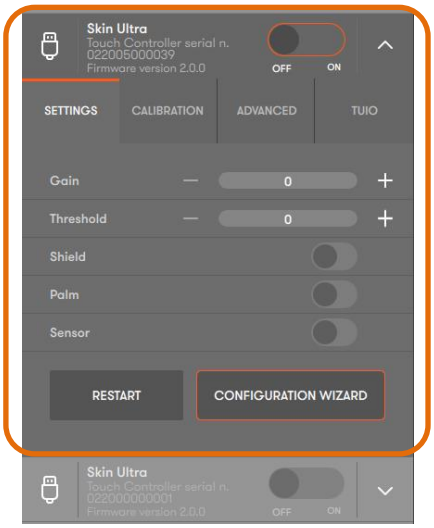
The keyboard shortcuts are presented in the help icon. 

	SHORTCUT KEY	
ACTION	**WINDOWS**	**OS X**
Help Show/Hide	F1	F1
FullScreen	F11	Alt+F11
Show/Hide Displax Connect settings	Home	Home
Toggle STDBY	Alt+S	Alt+S
Temporarily invert background color	Alt+B	Alt+B
Next Touch Controller	Tab	Tab
Change tab	Alt+,	Alt+,
Show/Hide Touch Controller settings	S	S
Enable/Disable touch	E	E
Calibration	Keys [1..n] (screen number)	Keys [1..n] (screen number)
Restart Touch Controller	R	R
Increase Gain	PageUp	PageUp
Decrease Gain	PageDown	PageDown
Increase Threshold	+	+
Decrease Threshold	-	-
Enable/Disable Sensor	T	T
Enable/Disable Palm	P	P
Increase Palm area	Ctrl+P	Cmd+P
Decrease Palm area	Ctrl+O	Cmd+O
Enable/Disable Shield	X	X
Increase Shield	Ctrl+X	Cmd+X
Decrease Shield	Ctrl+Z	Cmd+Z
Load settings	Ctrl+L	Cmd+L
Save settings	Ctrl+S	Cmd+S
Firmware update	U	U
Load Firmware file	W	W
Touch Test	C	C
Exit	Ctrl+Q	Cmd+Q

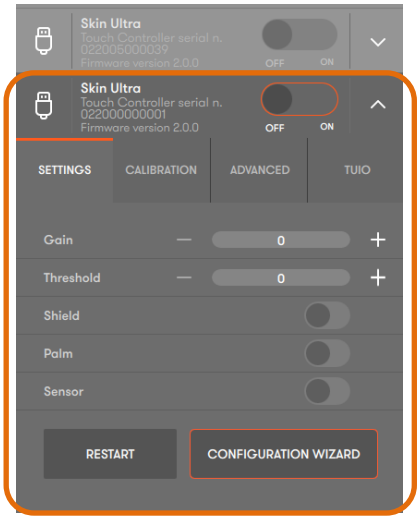
MULTIPLE DEVICES

Two or more units of a specific Skin product can be connected to the same PC. The number of units you can connect is limited by the number of USB connections you have on your PC. Make sure the USB ports used are compliant with USB standards and supply enough energy to power your Skin product.

If you have two units of your Skin product connected to the same PC, 'DISPLAX Connect' will display two menus, one for each unit.



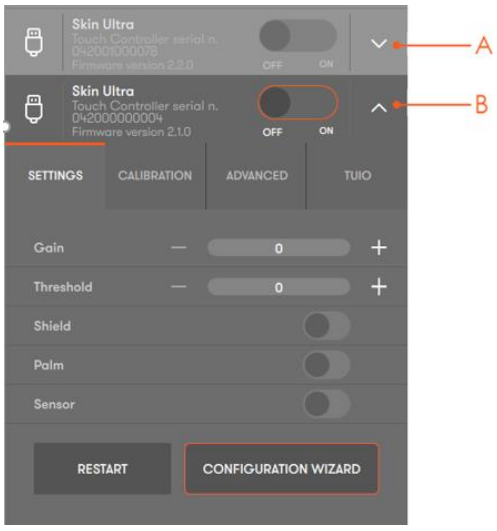
Two Skin Ultra connected
Skin Ultra serial number:
022005000039 expanded



Two Skin Ultra connected
Skin Ultra serial number:
022000000001 expanded

You can identify each unit by its serial number (in the screen and in the Touch Controller label). If physical access to the Touch Controller is not possible, an alternative method to identify it, is by unplugging one of the PC USB cables.

'DISPLAX Connect' will order the devices by order of connection.



A. First Touch Controller to be connected
B. Second Touch Controller to be connected

HOW TO CONFIGURE

Skin Ultra, and Skin Fit can be configured either using the 'Configuration wizard' or the 'Manual configuration'.

Skin Dualtouch can only be configured manually – If you have a Skin Dualtouch go to the section 'Manual configuration'.

If you have a Skin Ultra or Skin Fit product we recommend using the 'Configuration Wizard'.

Having run the 'Configuration Wizard', if you want to, you can manually change the defined Gain and Threshold values, and you can also adjust the Shielding level.

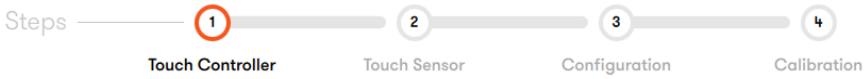
CONFIGURATION WIZARD

The 'Configuration Wizard' was developed to analyze and to configure the Touch Sensor and the Touch Controller parameters.

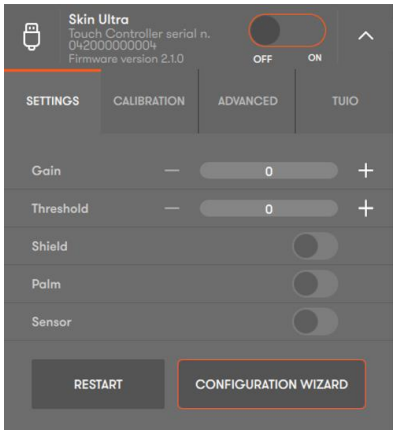
Currently the 'Configuration Wizard' is only recommended for a regular setup, one LCD and one Skin Touch Sensor.

This process runs in four steps:

1. Touch Controller: verifies the sensor integrity and checks if the FFCs are properly connected;
2. Touch Sensor: verifies the integrity of the sensor electrodes and displays information regarding any vertical or horizontal electrode which might be defective;
3. Configuration: checks the electromagnetic interference level that may exist between the LCD and the sensor active area, and establishes a relation between the analyzed data and the touch contact, to select the best Gain, Threshold and Shielding level;
4. Calibration: calibration process to match the physical touch with the Operating System digital coordinates.



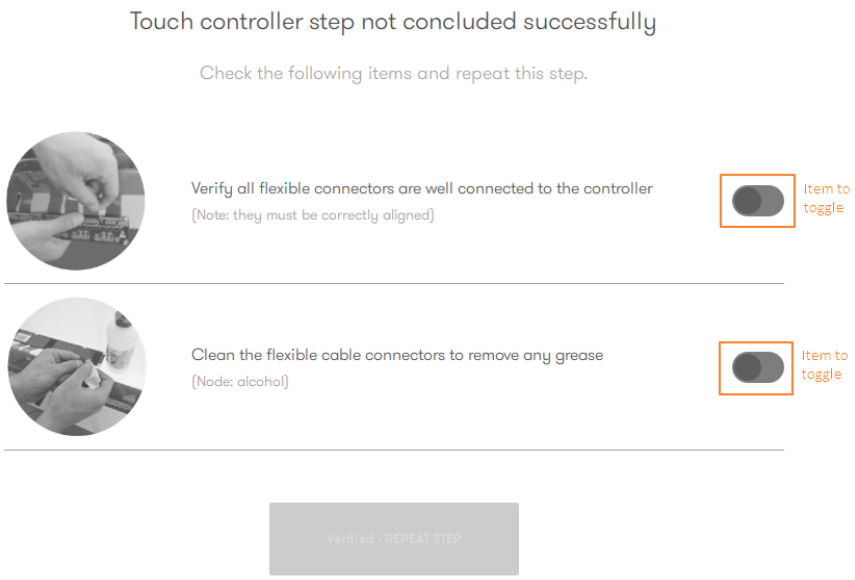
To run the 'Configuration Wizard' click on the button with its name.



1. TOUCH CONTROLLER

Verifies which controller is being used and if the Flexible Flat Cables (FFCs) are properly connected to the Touch Controller.

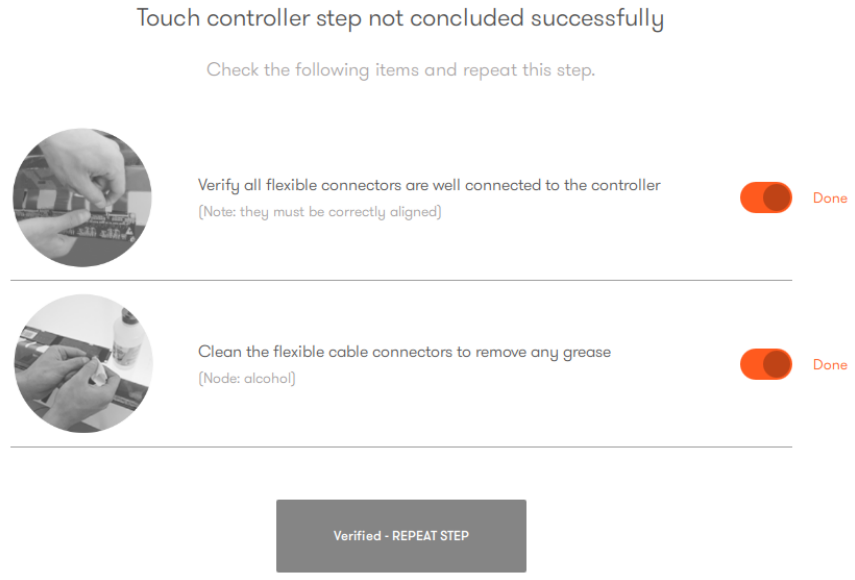
The Touch Controller step will fail either if the FFCs are not properly connected or if they are not aligned. If so, the following screen will be displayed.



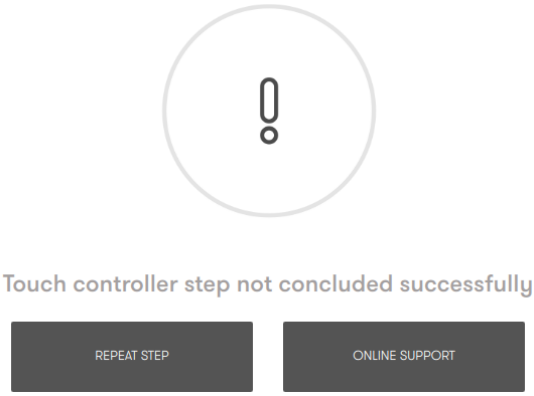
To proceed, you must toggle two items, each one referring to a specific action:

1. Verifying, and if needed, reconnecting the FFCs to ensure they are well connected and aligned to the touch controller;
2. Cleaning the FFC connectors to remove any grease.

Having toggled the two items, their state will be altered to "Done" and the "Verified – REPEAT STEP" button will be enabled, allowing to proceed to the next step of the configuration wizard.



If the process fails for a second time, then the following screen will be displayed, but this time the action tips will not be presented anymore.

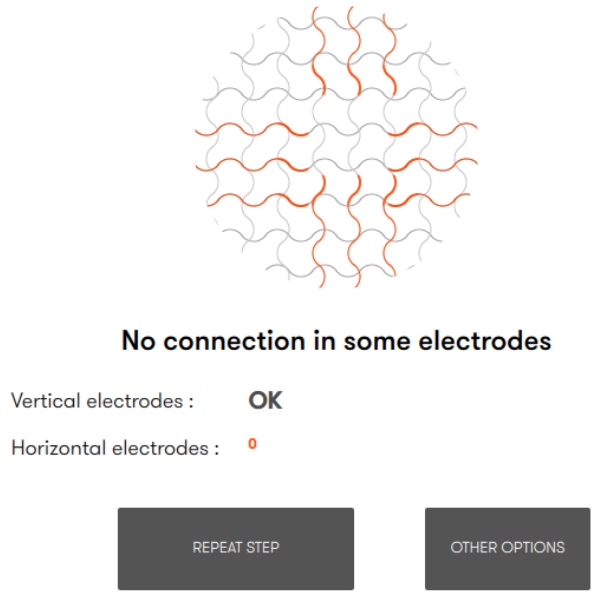


You can either, repeat the step or click 'online support', or you can cancel the Configuration Wizard process, and configure the touch parameters manually.

2. TOUCH SENSOR

Tests the integrity of the sensor electrodes and displays information regarding any vertical or horizontal electrode which might be defective.

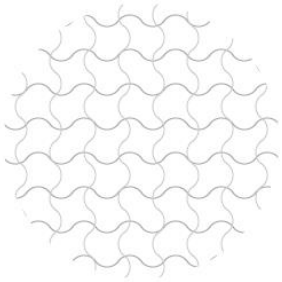
If any horizontal or vertical electrode is defective the following screen will be displayed.

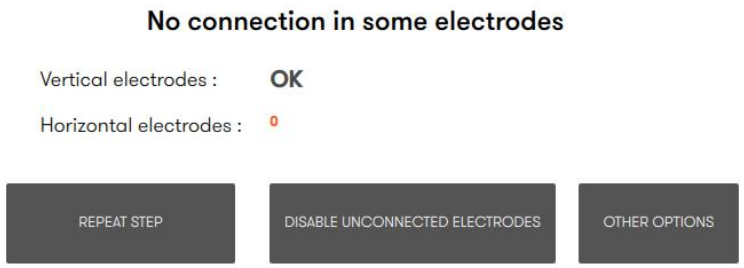


It is recommended to click "Repeat Step" for optimal test results.

After repeating the step if it continues to fail it is advisable to click in "Other options".

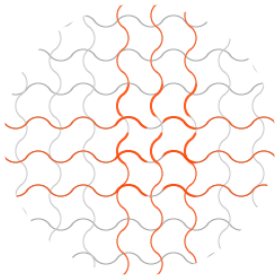
After clicking "Other options" the following screen will be displayed.

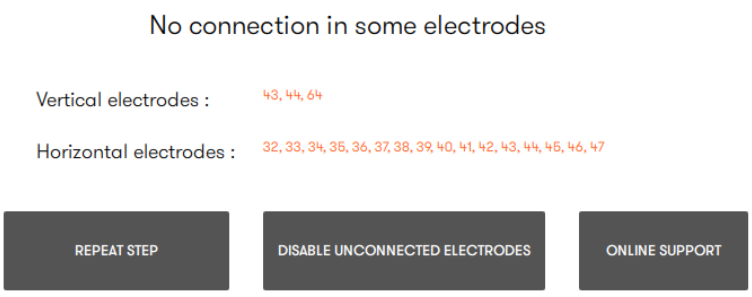




It is advisable to click "Disable unconnected electrodes" to disable those electrodes to allow the user to continue with the Configuration Wizard procedure.

In alternative, you can click "Other options". If you do so the "Online Support" button will be displayed.





If you click "Online support" you will be redirected to a specific support page explaining why this screen is being displayed and recommended procedures are proposed.

If everything is ok, the Configuration Wizard will proceed.

3. CONFIGURATION

Checks the electromagnetic interference (EMI) level between the LCD and the sensor active area, and establishes a relation between the processed data and the touch contact, to configure the touch recognition parameters: Gain, Threshold and Shielding level.

While the process is analysing the EMI level the user can not touch the sensor.

After analysing the EMI level one of two alternatives may be displayed depending on the results obtained in the previous configuration step, the "Touch Sensor" step – if defective electrodes have been found in the draggable area.

The two alternatives are: "Touch and hold" and "Touch and drag".

3.1. TOUCH AND HOLD

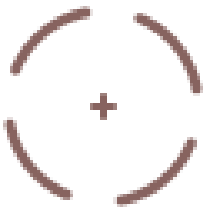
After analysing the sensor EMI level the user will be asked to touch the sensor in order to gather data to configure the touch parameters according to the touch input and EMI level.

An animation, on how to touch the sensor will be shown for ten seconds, to instruct the user on how to proceed.

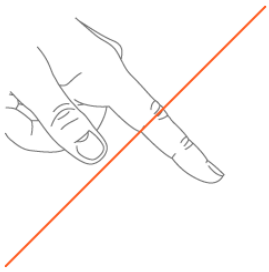
Touch to initiate and hold with 1 finger at the center of the target

(Note: This step assumes a suitable air gap and insignificant EMI - Noise in the sensor)

After showing the animation, a target will be displayed on screen, you must touch the target centre and hold for a while.



After a while a "Stop touching" message will be prompted, you must stop touching the sensor.



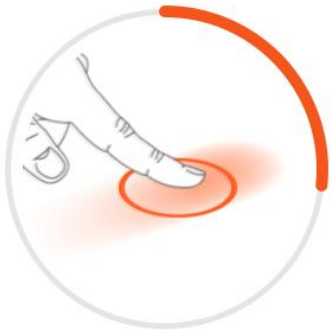
Stop touching

For data comparison, the target to be touched, may be displayed several times – there can be several iterations depending on the EMI levels gathered.

3.2. TOUCH AND DRAG

After analysing the sensor EMI level the user will be asked to touch the sensor in order to gather data to configure the touch parameters according to the touch input and EMI level.

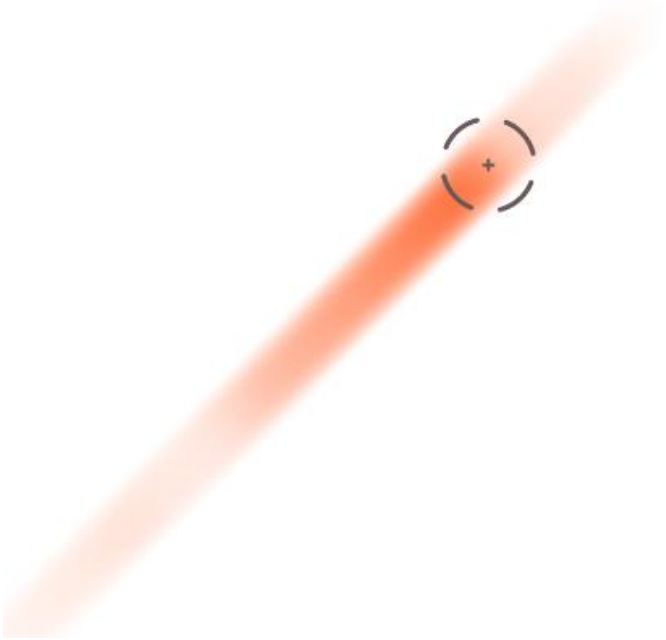
Before the user starts touching and dragging, an animation will be shown for ten seconds, to instruct the user on how to proceed.



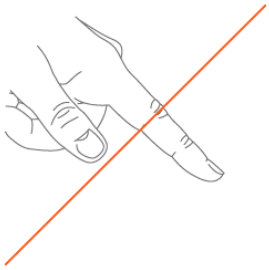
Touch to initiate and follow the target with your finger

(Note: This step assumes a suitable air gap and insignificant EMI - Noise in the sensor)

After the animation, a target will be displayed on screen, you must touch the target centre and you must keep your finger inside the centre while the circle is moving.



After a while a "Stop touching" message will be prompted, you must stop touching the sensor.

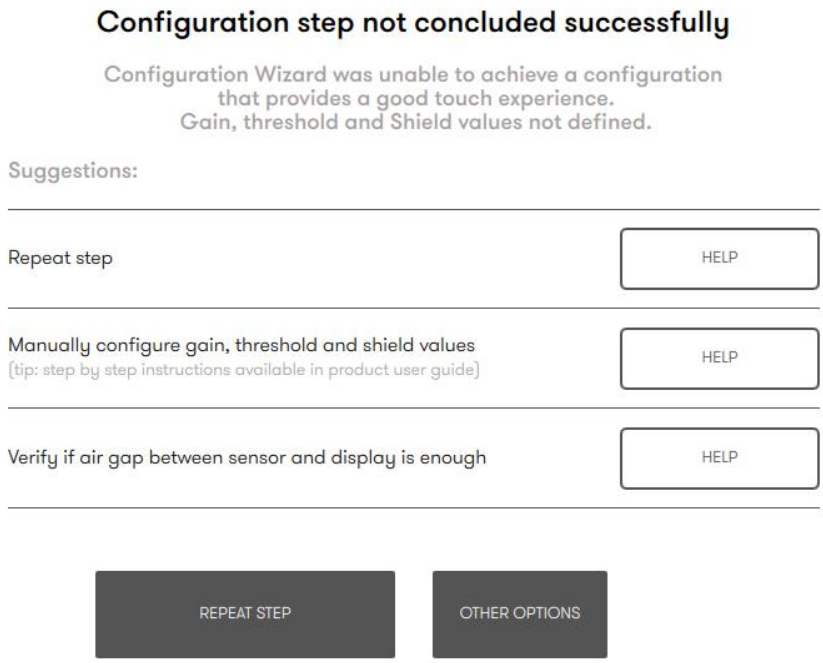


Stop touching

For data comparison, the target to be touched and dragged, may be displayed several times – there can be several iterations depending on the EMI levels gathered.

If the "Configuration" fails (or is cancelled) then the following screen will be displayed.

This screen lists some tips with help links and two buttons "Repeat step" and "Other options" by clicking this last button the "Online support" button will be displayed.



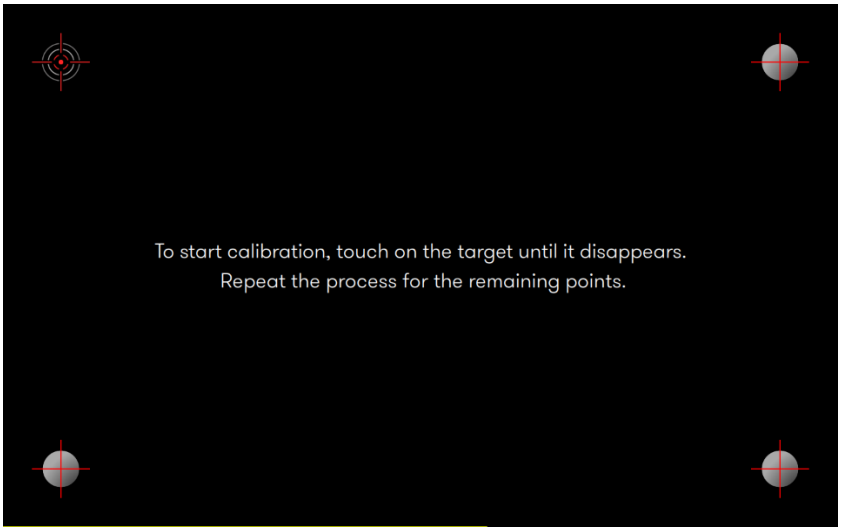
If the "Configuration" step is successful the "Calibration" step will be initiated.

4. CALIBRATION

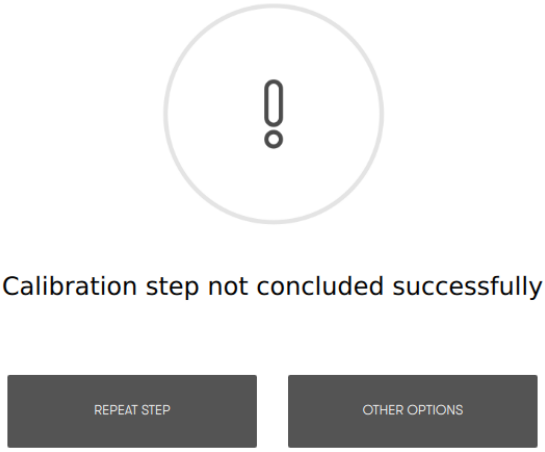
The calibration step matches the physical touch with the Operating System digital coordinates.

An animation, on how to perform the calibration will be shown for ten seconds, to instruct the user on how to proceed.

Then a message will be displayed asking to touch on a target until it disappears, and to repeat this process for the remaining targets.



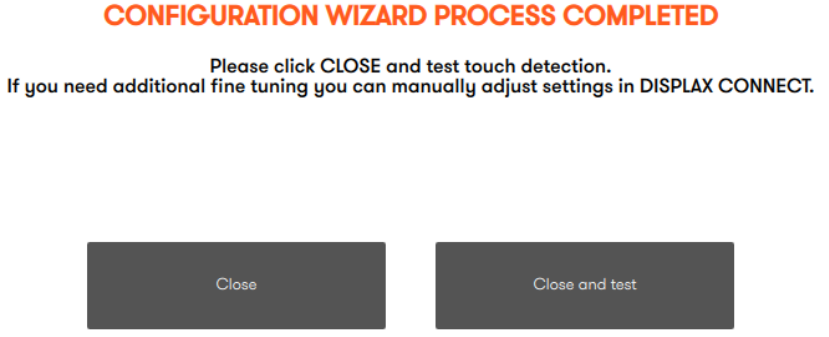
If the geometric calibration fails, the following screen will be displayed.



The user can either repeat the calibration or click on "Other options" to access the "Online Support" button.

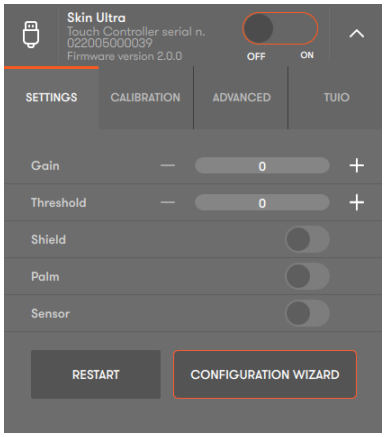
FINAL

After successfully running all the Configuration Wizard steps the process will be complete and you must click on either "Close" which closes the Configuration Wizard and redirects to the Displax Connect menu, or you can click on "Close and test" which exits the Configuration Wizard and redirects the user to the "Touch test" application.



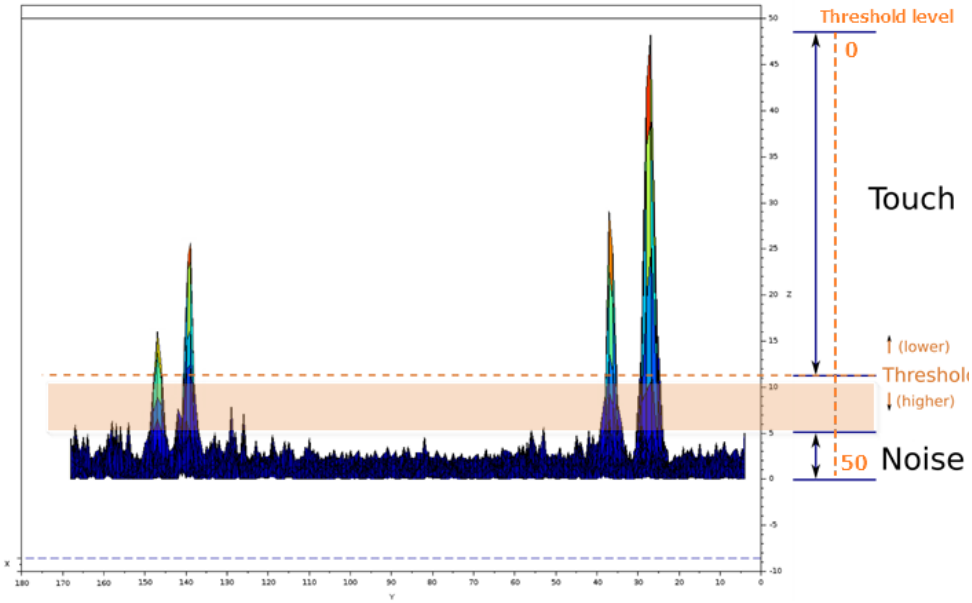
MANUAL CONFIGURATION

The first time you connect your Skin product to a PC, the Gain and Threshold values must be adjusted.



Gain: The Gain adjusts the signal strength injected by the Touch Controller on the Touch Sensor. Thicker glasses and bigger Touch Sensors may require a strong signal (higher Gain values). Gain values range between 0 and 7.

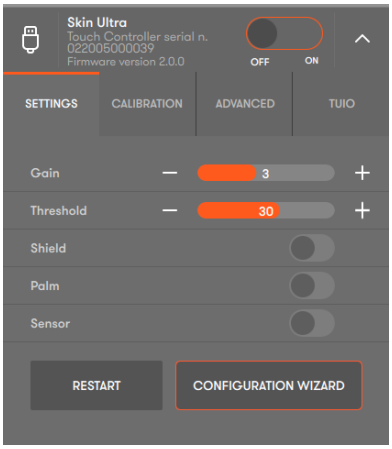
Threshold: When you touch the sensor with a finger or conductive object, an electromagnetic interference is generated. The threshold level, which you have set, defines the interference level which is deemed to be considered a touch event. Higher levels of threshold allow the recognition of more sensitive electromagnetic interferences, meaning that small peaks of interferences can generate a touch. The threshold values vary between 0 and 50 starting on firmware version 1.5.0. (firmware versions equal or previous to 1.4.0 the threshold varies between 0 to 15).



Threshold: defines the level of electromagnetic interference which is considered a touch. This electromagnetic interference can be provoked by a finger, conductive object, the LCD or the surrounding environment. The higher the threshold the higher will be the electromagnetic interferences being processed as an actual touch event.

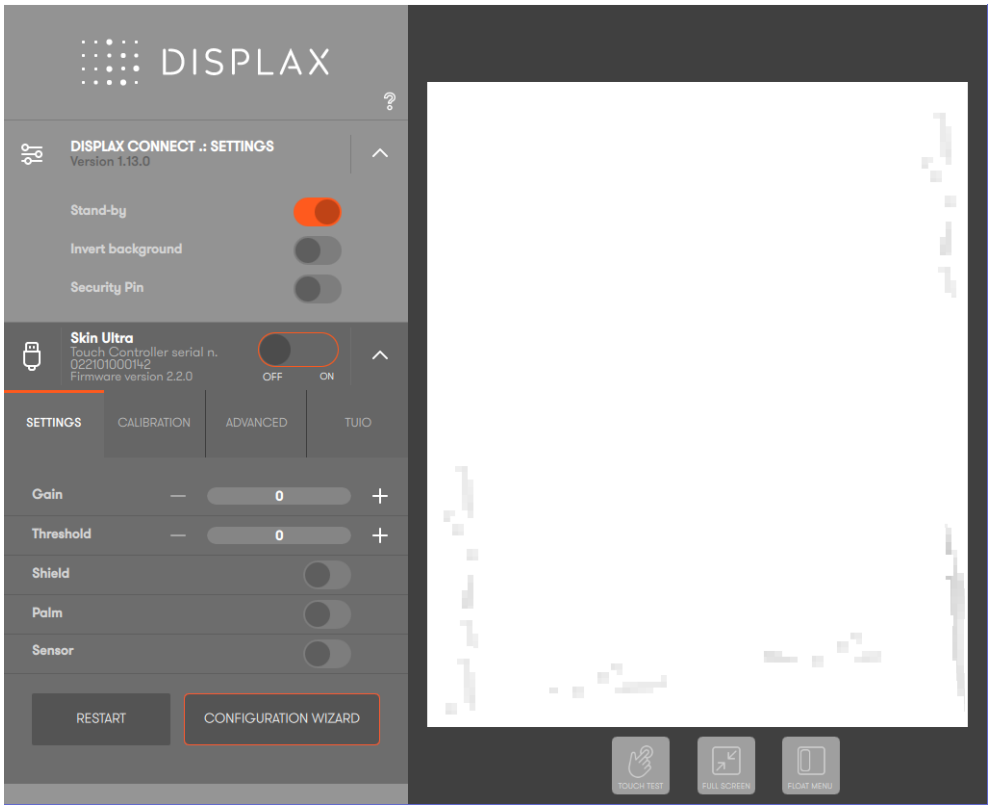
Set Gain and Threshold:

1. The Gain is dependent on the glass thickness, sensor size and energy power, the ticker the glass the higher should the gain be. Start by keeping the Gain to a minimum value and then increase the threshold value until you have a good touch experience. If a good touch experience has not been achieved by increasing the threshold you can now increase the Gain.
   Note: Every time the Gain value is changed you need to wait 2 seconds before you can touch the screen (a 'do not touch' message will flash for 2 seconds).
2. Touch while increasing the Threshold until touch is detected.
3. Drag the touch and continue to increase Threshold until the drag is continuous. Make sure the drag is continuous in the whole Sensor, by testing thoroughly both the center of the Sensor and the borders. When the drag colour changes, it means that drag has been lost.
4. If the Threshold reached its maximum value, and a good touch experience hasn't been achieved, increase the Gain one point, and set the Threshold to its minimum value, then repeat the process, from step 2. '*Touch the sensor while increasing Threshold until touch is detected*'.
5. Keep repeating the steps 2 and 3 until you reach a good touch performance.



If you are experiencing difficulties achieving a good touch experience due to high electromagnetic interference levels, activate the 'Shield' button.

There are electromagnetic interferences when visible grey dots are seen along the Touch Sensor borders or spread over the Touch Sensor active area.



As you increase the Shielding level, you are reducing the electromagnetic interferences. The grey dots tend to disappear if the shielding level is augmented. As a consequence, the touch recognition may be deteriorated. However, increasing the Shielding level may be required to avoid false touches.

'DISPLAX Connect' limits the visualization to 20 simultaneous touches, even though your Skin product might support more.

WHAT IS CONSIDERED A GOOD TOUCH

Having continuous drag, i.e. without losing touch detection, with one finger 90° relative to the display and making minimal finger pressure. Test across the whole display area, both center and borders.

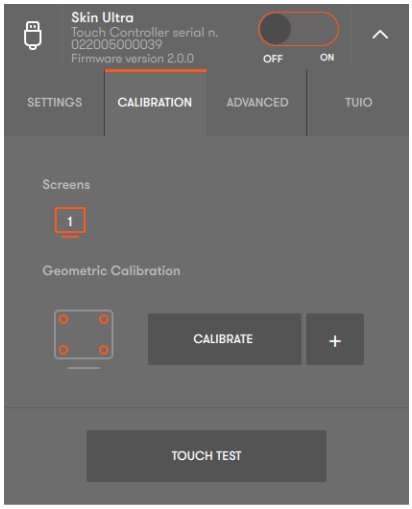
Having continuous drag with 2 or more fingers, i.e. without losing touch detection, with fingers 90° relative to the display and making minimal finger pressure. Test across the whole display area, both center and borders.

Drag with each hand from opposite sides of the display, touching with 4 fingers in each hand, to the other side of the display (left hand drag from left to right; right hand drag from right to left), without losing touch.

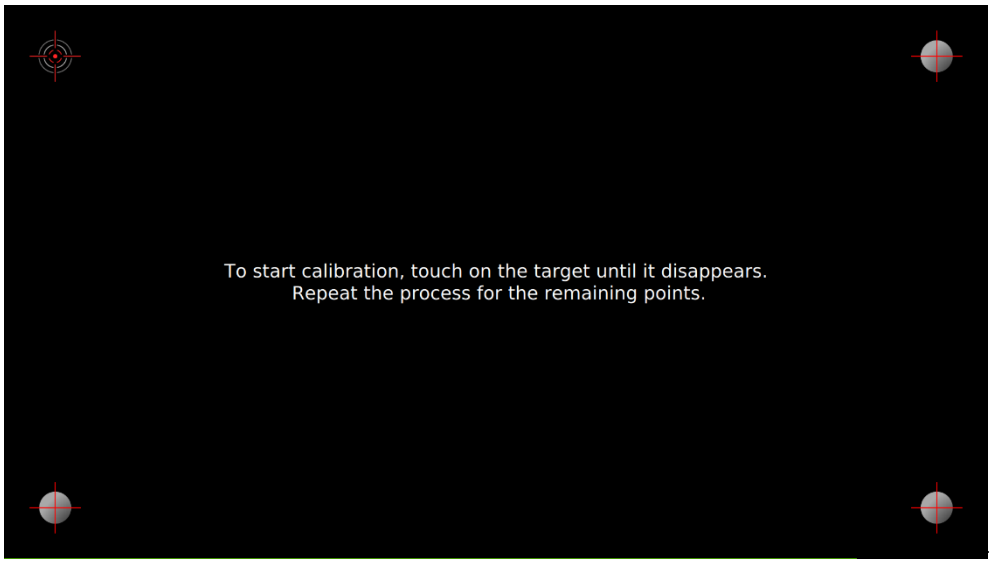
GEOMETRIC CALIBRATION

Once you have a good touch detection, start the Geometric Calibration and make sure you are as accurate as possible during this process.

Click 'Calibrate' if the Touch Sensor is only associated with one LCD. If the Touch Sensor is placed over more than one LCD, please refer to the advanced calibration.



A black screen with four calibration points will be displayed and an instruction will be presented '*To start calibration, touch on the target until it disappears. Repeat the process for the remaining points*'.

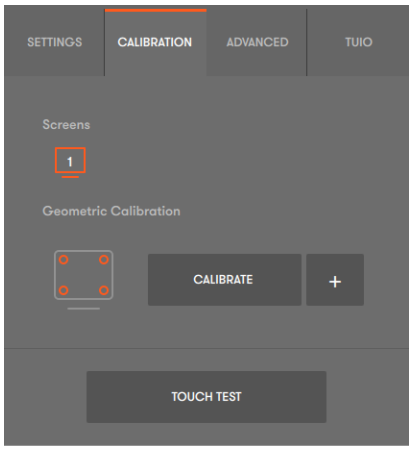


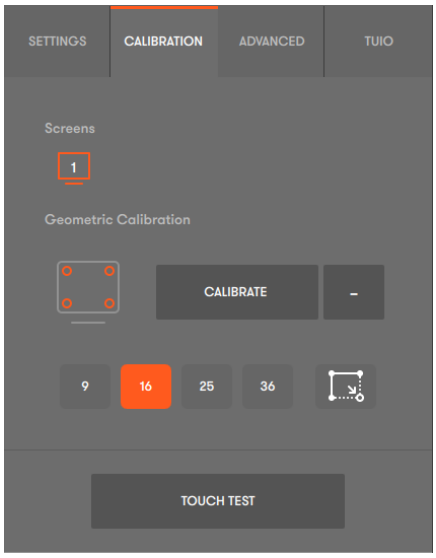
ADVANCED GEOMETRIC CALIBRATION

When a single sensor is used on top of two or more LCDs, to overcome the bezel between the LCDs you may have to use more than 4 calibration points.

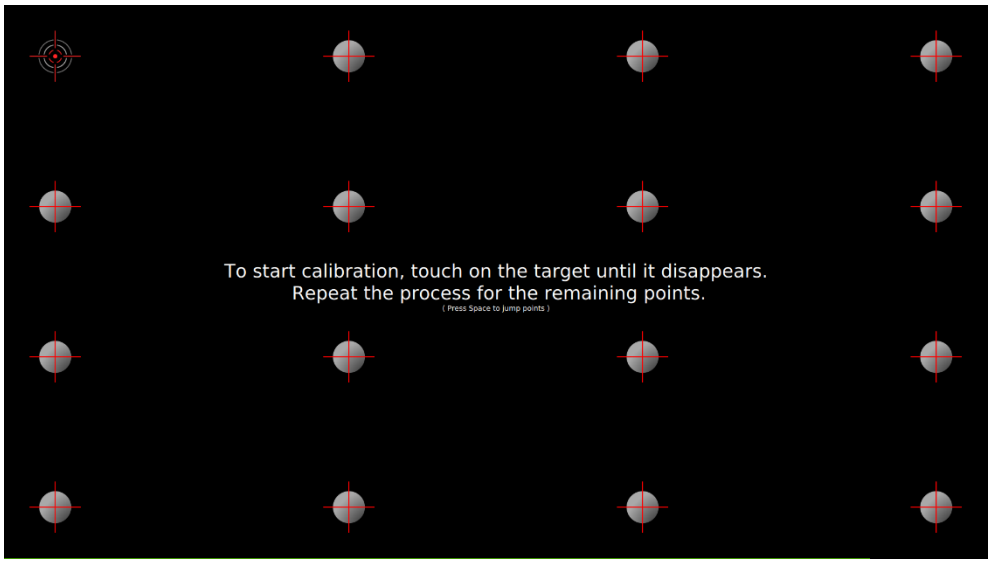
You can use 9, 16, 25 or 36 calibration points.

To open the 'Advanced geometric calibration' click on the '+' button.





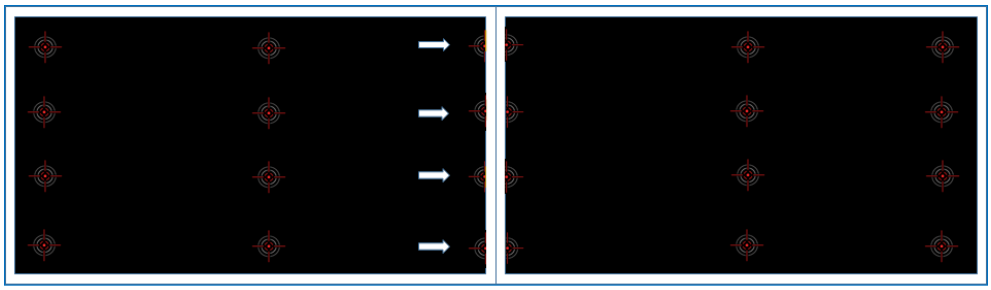
You can now select the number of calibration points.
When you select the number of calibration points, they will be shown on all LCDs in use. The optimal calibration is the one in which the points on the different LCDs are positioned almost in the same relative position on the different LCDs. The user should assess which combination of points (9, 16, 25 or 36) offers a closer equidistance of points between the two or more LCDs to obtain an optimal sensor calibration.
After selecting the number of calibration points a black screen with the chosen calibration points will be displayed and an instruction will be presented '*To start calibration, touch on the target until it disappears. Repeat the process for the remaining points*'.



If some calibration targets are shown split between two or more LCDs, those calibration targets must be jumped (see example 1 and 2). Perform calibration point by point as normal, and when you arrive to a split calibration point press space to jump it. Then you can calibrate that point and continue with the calibration. Perform this action every time a calibration point is split between 2 displays.

Example 1 – one Touch Sensor on top of 2 LCDs

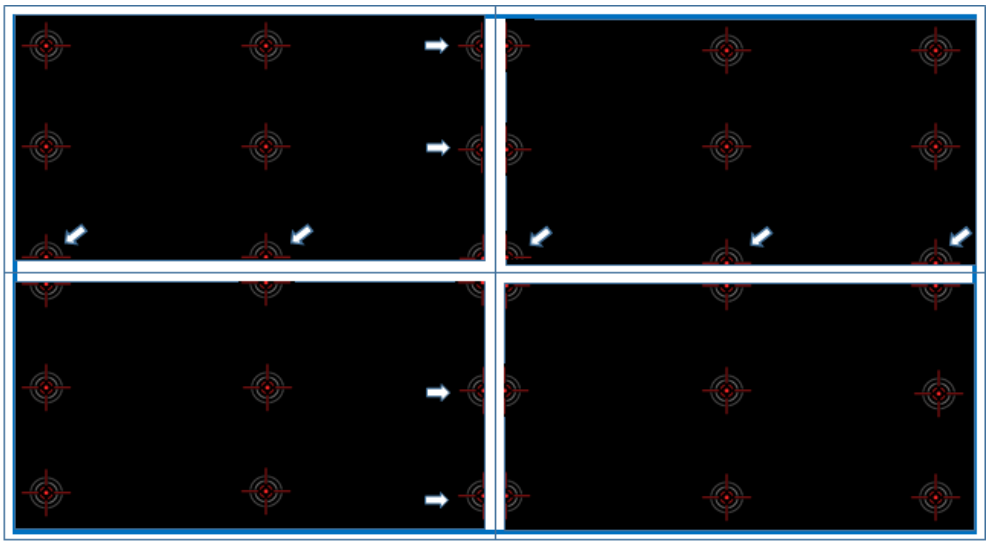
In this scenario, we may have calibration points split between the bezel of two LCDs.



Touch Sensor on top of the LCDs
2 LCDs
Geometric calibration target
Target to be jumped

Example 2 – one Touch Sensor on top of 4 LCDs

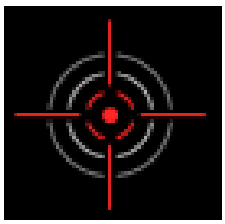
In this scenario, we may have calibration points split between four LCDs on a vertical and also on a horizontal axis formed by the LCDs bezel.



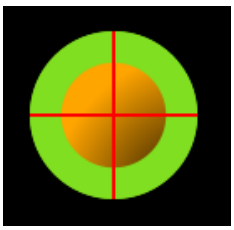
Touch sensor on top of the LCDs (1 unit)
LCD (4 units)
Geometric calibration target
Target to be jumped

After touching all the calibration targets the Skin product will be ready to be used.

Make sure you are touching on the target center.

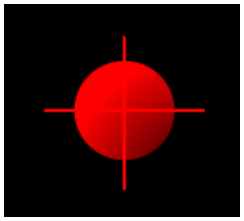


Pict.1. Geometric calibration target which has to be touched



Pict.2. Geometric calibration point that has been jumped

Pict.3. Geometric calibration correctly achieved – the point disappears



Pict.4. Geometric calibration point not achieved

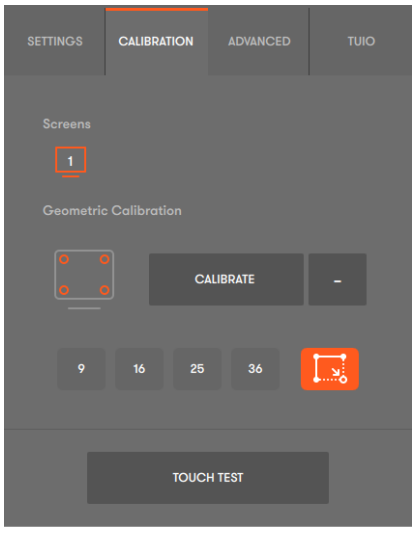
The geometric calibration will be successful if all the presented targets have disappeared (Pict.3). If one of the calibration points fails, after about 2 seconds, the point will be once again available for calibration.

ADVANCED CALIBRATION – DRAG MODE

The 'Advanced calibration' drag mode is used when the active Touch Sensor area is smaller than the LCD.

The 'DISPLAX Connect' control panel will be displayed on the entire LCD screen, but since the Touch Sensor is smaller than the LCD you must define the area which is being covered by the Touch Sensor.

To start the calibration process of custom areas, click on the 'Drag mode' button, the one containing a squared drawing and an arrow.

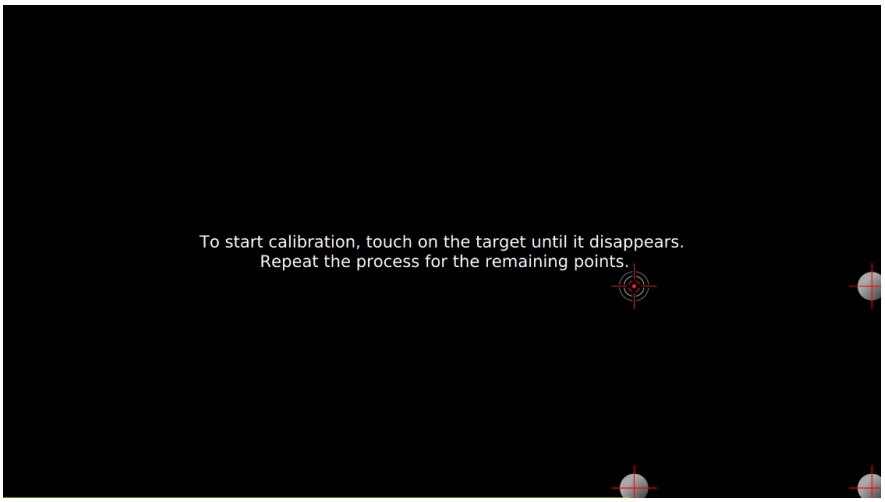


Immediately after clicking on the 'Drag mode' button a message will be displayed '*Please select the area*'.

To select the area, click on the left button of the mouse at one of the Touch Sensor active upper corners, and then move the cursor on the diagonal towards the opposite lower corner of the Touch Sensor active grid. When you start selecting the area, you will notice a transition from a red area into a green area. A red area means that the area is too small for calibration.

When the selected area is enough to be calibrated, the selected area turns green.

After lifting the finger from the left mouse button, an instruction message and four calibration points will be displayed – '*To start calibration, touch on the target until it disappears. Repeat the process for the remaining points*'.



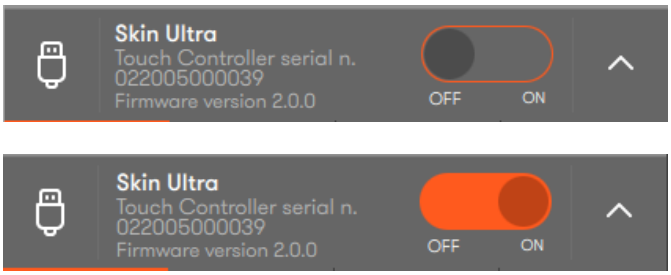
By touching the displayed targets, you will be defining the Touch Sensor active area.

Note: When selecting a calibration area, an error message may be displayed '*The selected area is invalid, please select again*'.

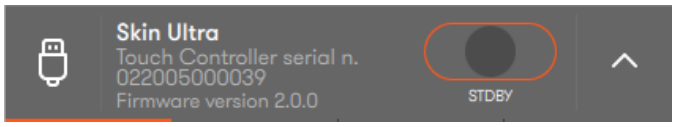
This message can be displayed if you draw a very small area, in that case a red rectangle will be displayed which will be immediately followed by the above error message.

TOUCH INJECTION STATUS

If this is the first time configuring the Touch Controller, before closing 'DISPLAX Connect' make sure that the Touch Injection status is set to ON (as it is set to OFF from factory), otherwise the touch controller won't be processing the touch signals after closing the 'DISPLAX Connect'.



If the touch injection was set into 'ON' in the first configuration before closing the Touch Controller, then when you re-open 'DISPLAX Connect', the Touch injection status will be set into STAND-BY. In this case, you can leave it in that position, as touch injection is automatically enabled (set to ON) when you close 'DISPLAX Connect'.

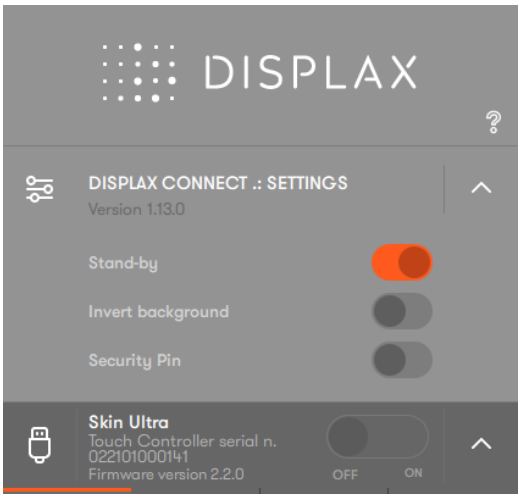


Please note that 'DISPLAX Connect' should only be open when configuration changes are being made. When you conclude the Touch Controller settings adjustment, you must close it. Leaving it open decreases the touch speed.

All settings are stored on the Touch Controller, so once configured for a particular LCD/glass/air gap combination you can change the computer without affecting the touch setup.

SECURITY PIN

Displax Connect allows you to introduce a pin to protect the configured settings.



To introduce a security pin activate the 'Security Pin' button and introduce four digits.

After closing Displax Connect the Security Pin will be saved.

When you re-open Displax Connect the Security Pin will be requested.

You can disable the Security Pin at any time after unlocking Displax Connect by toggling off the 'Security Pin'.

If you forget the Security Pin, it must be reset, using the command line launching Displax Connect from the folder where it is installed using one of the following arguments:

a) Windows: "displax-connect.exe --resetpin"
b) Ubuntu: "./displaxdc --resetpin"
c) OSx:"./DisplaxConnect --resetpin"

This way Displax Connect will be launched with the Security Pin disabled.

TOUCH TEST

This feature provides more data than other mechanisms of test and it is conveniently integrated with the DISPLAX Connect software.

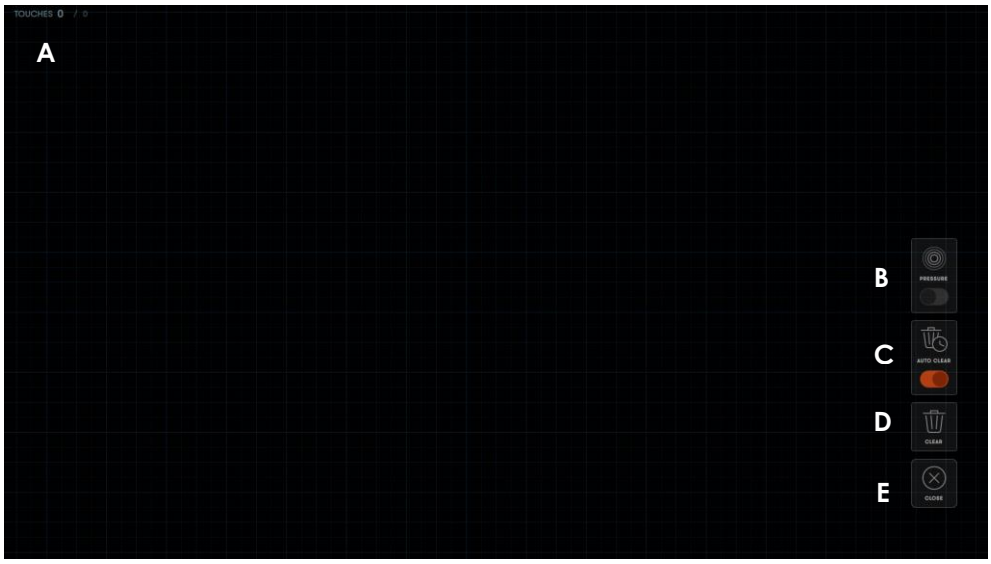
Depending on the PC specifications and the Skin product that you have, there are some features that may not be presented, namely:

- Pressure report (Feature not available in Skin Fit, Skin Dualtouch and Skin Sense);
- Touch coordinates;
- Number of touches (Skin Ultra and Skin Sense: up to 100 touches; Skin Fit: up to 40 touches; Skin Dualtouch: up to two touches);
- Multiple devices input.

Notice that OS X will only work with a single touch due to OS limitation.

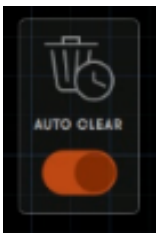
To access this feature, click on the 'Touch test' button, or hit the keyboard key 'C'.

A black screen with a rectilinear grid will be displayed.

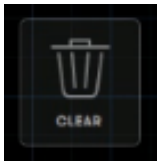


A

B Activate/deactivate pressure report



C Activate/deactivate auto clear – clears the drawn touches



D Erases the drawn touches

E Closes Touch Test

A. Touches: number of touches being reported, i.e. "Touches 2 / 24", means that 2 touches are currently being recognized, from a total of 24 touches already reported since the last "Auto clear";

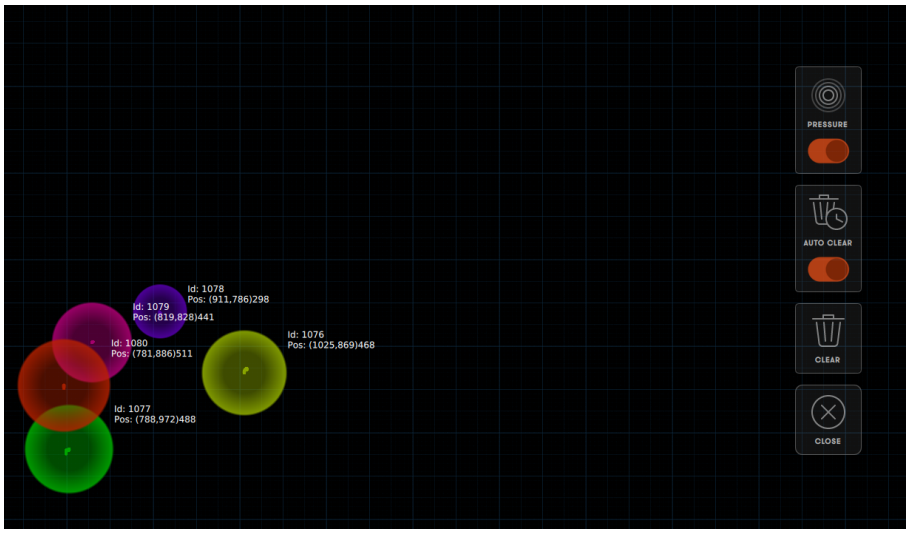
C. Pressure (only available in Skin Ultra): activates or deactivates the touch pressure representation. Pressure units are dependent on the OS:
   - 'Windows' represents pressure between 0~1024;
   - 'Linux' represents pressure 0~1;
   - 'Mac OS' pressure is not represented.

C. Auto-clear: if activated the drawn touches will be cleared in about 5 seconds since the last touch recognition, making the Touch Test screen clear of all previous touches and the touch counter is reset. If deactivated, the drawn touches will remain on the displayed screen until you touch the button 'Clear';

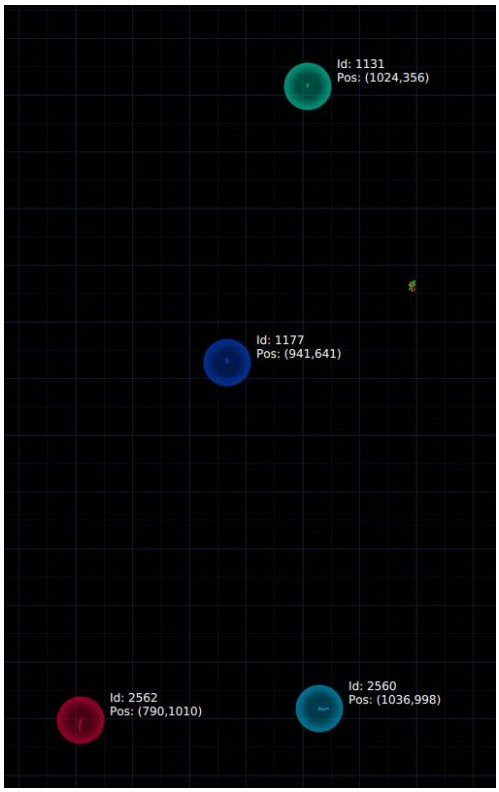
D. Clear: clears the screen by deleting all the drawn lines and resets the touch counter;

E. Close: closes the Touch Test.

When touching the Touch Sensor area, the first five touches will be represented with their respective identification, coordinates and pressure if enabled (Pressure is only reported in Skin Ultra).



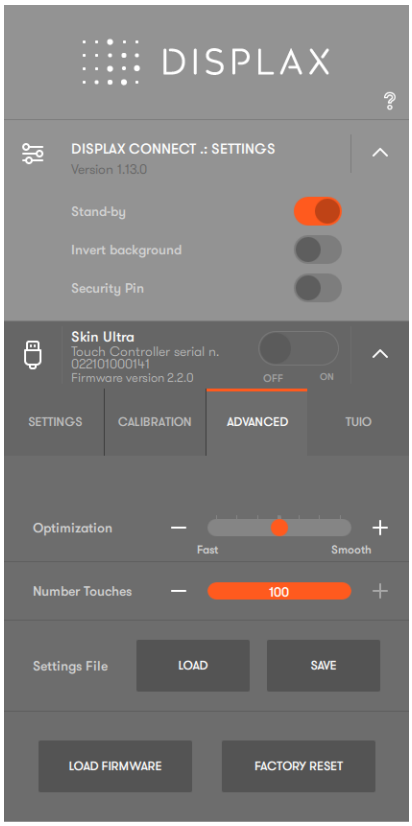
Touch test version 1.13 onwards accepts multiple devices input, distinguishing device inputs with the ID first two digits (in the below example, the first device has ID 11 and the second device has ID 25), the remaining digits refer to the touch ID identification number (the number of devices input is conditioned by the type of product. Skin Dualtouch can only report two devices, since it is limited to report two touches.



Note:
1 - MAC OS pressure is not supported and only the mouse is recognised.
2 – If the touch injection is disabled, when using multiple devices at the same time one of the devices will not have touch, the touch should be enabled in all devices first and then you can enter in touch test.
3 - When opening the Touch Test application if multiple touches have been detected, possibly due to high levels of electromagnetic interferences, a warning message will be displayed. (This does not apply to Skin Dualtouch which only reports two simultaneous touches).

NUMBER OF TOUCHES

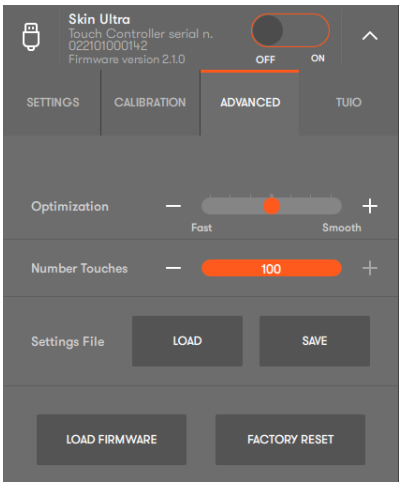
Limits the number of touches reported by the Touch Controller to a specified number (Skin Ultra: up to 100 touches; Skin Fit: up to 40 touches; Skin Dualtouch: up to 2 touches). This feature is available depending on the version of the Touch Controller and firmware you are using.



Note: some operating systems may still incorrectly report the maximum number of touch points supported by the Skin product, when in fact a lower number of touches has been defined in this feature.

OPTIMIZATION

The 'Optimization' is a bilateral parameter establishing a reason between Touch speed and Touch smoothness. Factory setting is halfway between Touch speed and Touch smoothness in Skin Ultra and Skin Fit, in Skin Dualtouch factory settings slightly favour touch speed. You can change this default value to optimize the Touch experience in accordance to the desired usage.



If you want more Touch smoothness, you can increase it by clicking on the '+' button. This may be useful for drawing or writing.

If you want more Touch speed, you can decrease smoothness to gain speed by clicking on the '-' button. This may be useful for non-precision activities, like touching and manipulating buttons and images.

You should always try to establish an adequate compromise between precision and speed in accordance to the application content and user experience you want to provide.

PALM AND ARM DETECTION

(Feature not available in Skin Dualtouch)

Allows the rejection of areas with dimensions larger than a finger, such as a hand or an arm. The rejection area can be configured and is conditioned by the Touch Sensor size.

For the same hand, a smaller Touch Sensor should have a greater palm rejection area since the touch is going to cover more cells. On a bigger Touch Sensor, the hand touch will cover less cells. In this case, the rejection area should be smaller.

To support the user when configuring the palm rejection area, here is presented as a suggestion, values to configure the Skin product to reject an adult palm for Touch Sensors with different dimensions.

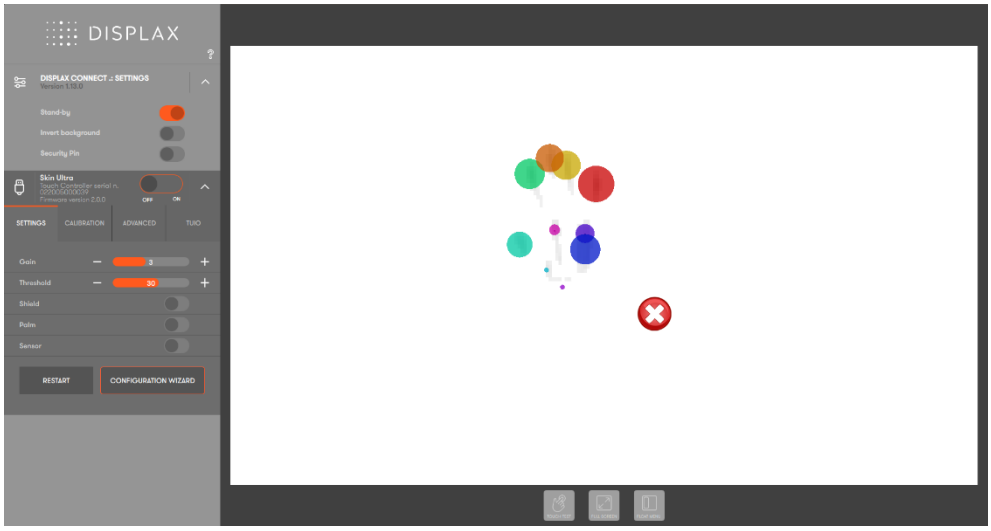
Touch sensor dimension	Rejection area reference
30'' to 41''	8
42'' to 49''	7
50'' to 64''	6
65'' to 75''	5
>75''	4

A sequence of images is presented to illustrate palm and arm rejection examples.

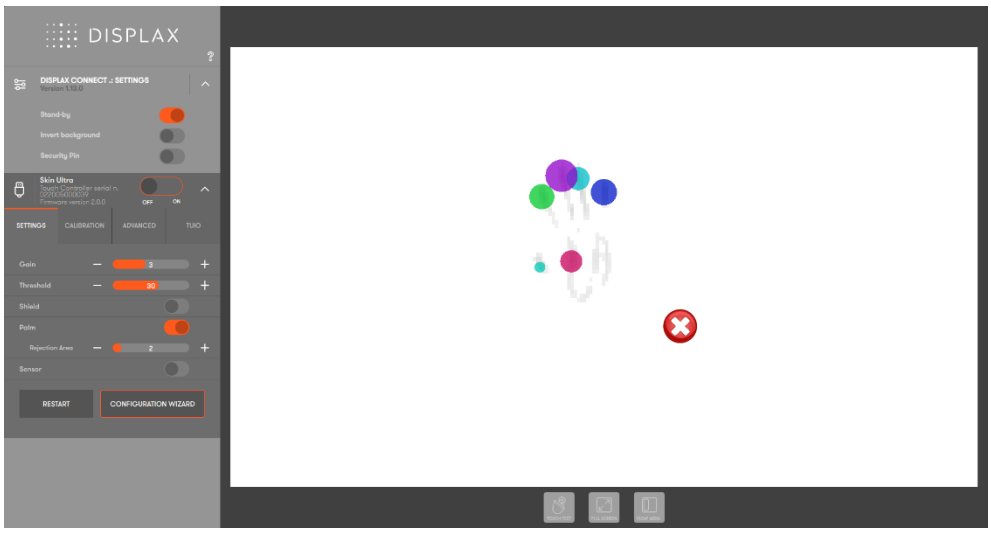
Note: touches representation, in palm and arm rejection, may differ slightly depending on the product you have purchased.

PALM

Palm rejection is not activated, as a result multiple touches are being recognized.



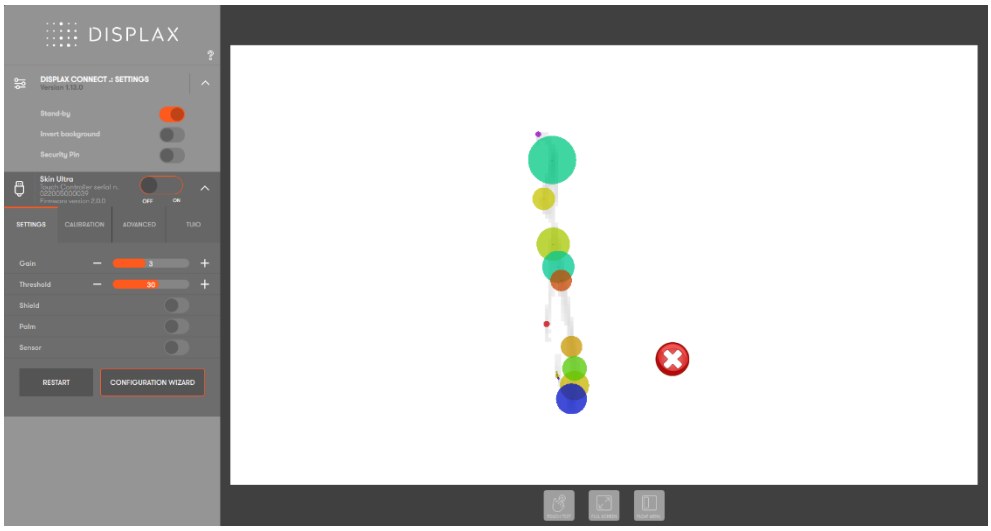
Palm rejection is activated, however, touches are still being recognized since the rejection area is not properly adjusted to the Touch Sensor size. An increase or decrease of the palm rejection area is required.



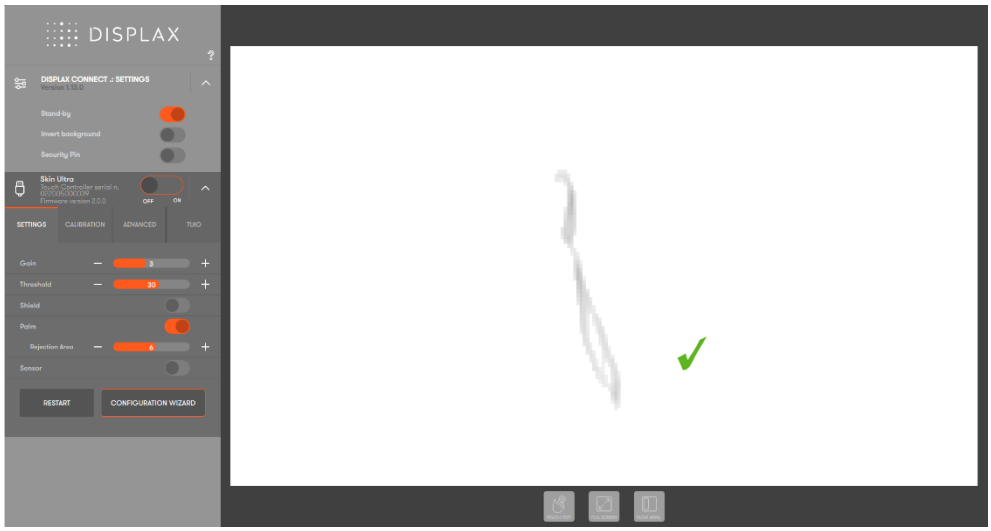
Palm rejection is activated with an adequate value for the Touch Sensor dimension. In the following image, you can see the contours of a hand but no touch is being recognized.

ARM

Palm rejection is not active: an arm is placed on top of the Touch Sensor and the display is reporting multiple touches.



If Palm rejection is activated, with a certain rejection area adequate to the touch sensor dimension, we can see the contours of an arm but no touch is being recognized.



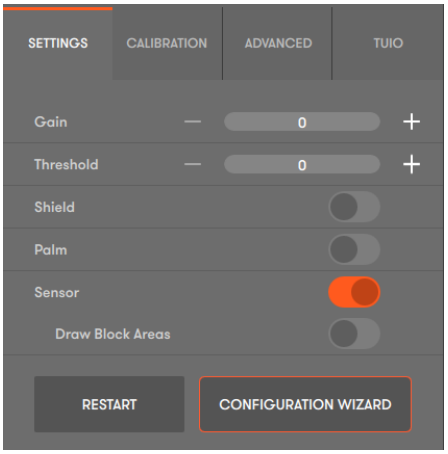
SENSOR

Checks the Touch Sensor electrical conditions on rows and on columns to visualize electromagnetic interferences and permits to:

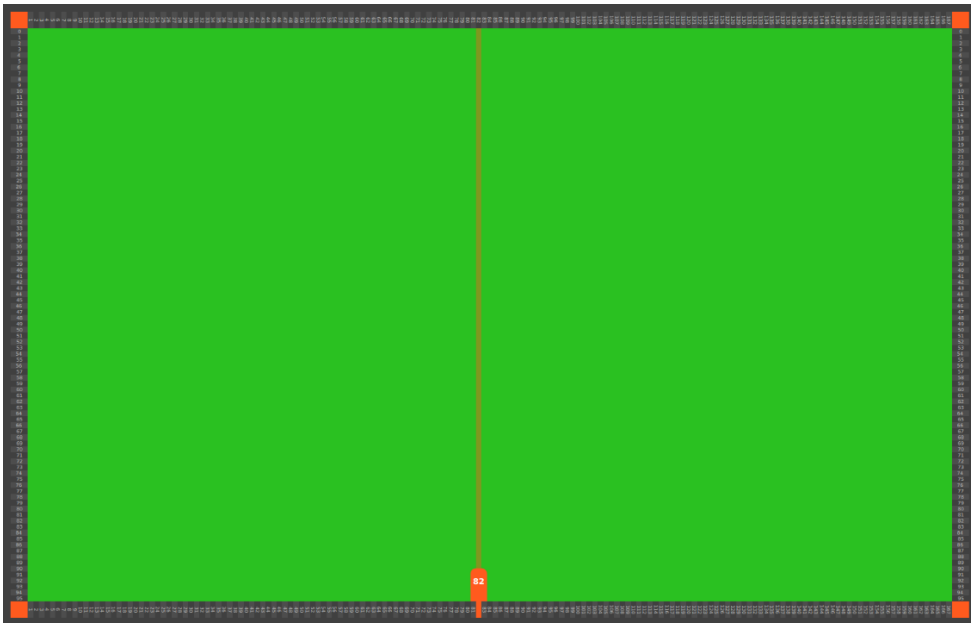
1. Enable and disable rows and columns;
2. Draw block áreas.

1. ENABLE AND DISABLE ROWS AND COLUMNS

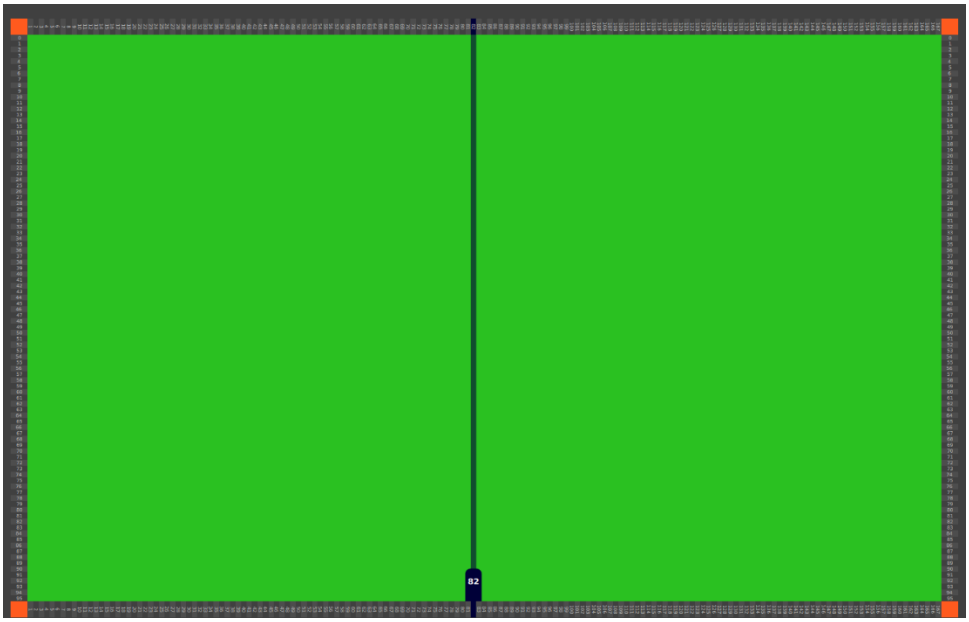
By clicking in the 'Sensor' button you will be activating the possibility of enabling and disabling rows and columns.



Now, the sensor view will allow you to click on the rows and columns to deactivate or activate them, by moving the cursor near its borders.



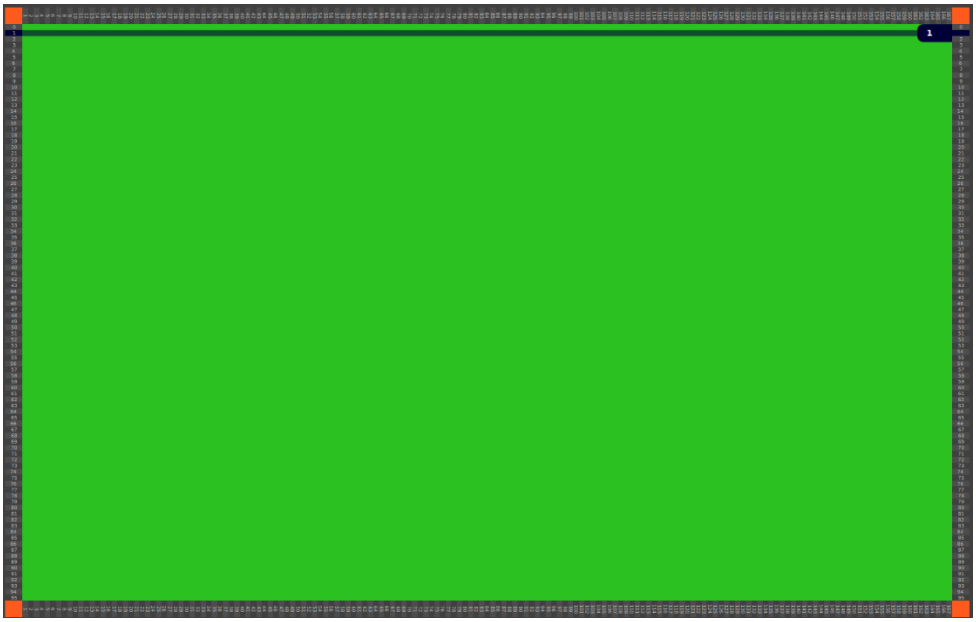
As you move the cursor near the sensor view borders, the rows and columns number are zoomed in to allow clicking on them to enable or disable a specific row or column.



On the previous image, the column '82' is disabled.

When the column is disabled, it turns into dark green.

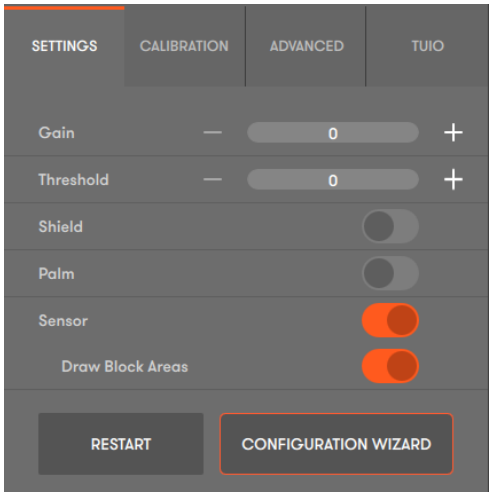
The same procedure is used to disable rows as shown on the following image.



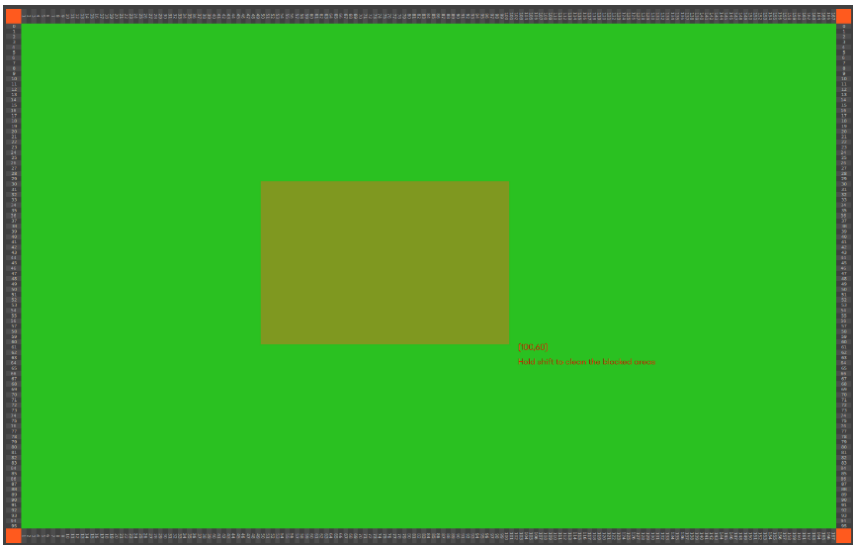
2. DRAW BLOCK AREAS

The draw block areas feature is intended to disable the touch on specific Touch sensor areas, where you do not want to process touch signals.

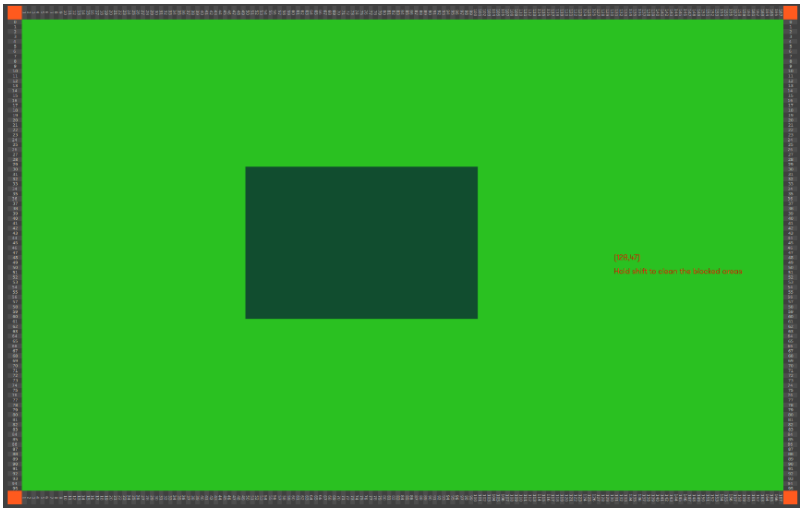
To activate the 'Draw Block Areas' you must activate the 'Sensor' button, and then activate the 'Draw Block Areas'. The Skin Touch Controller should be set to OFF.



To select the area to be blocked, you must make a left click and by maintaining it pressured you can draw the area you want to block.

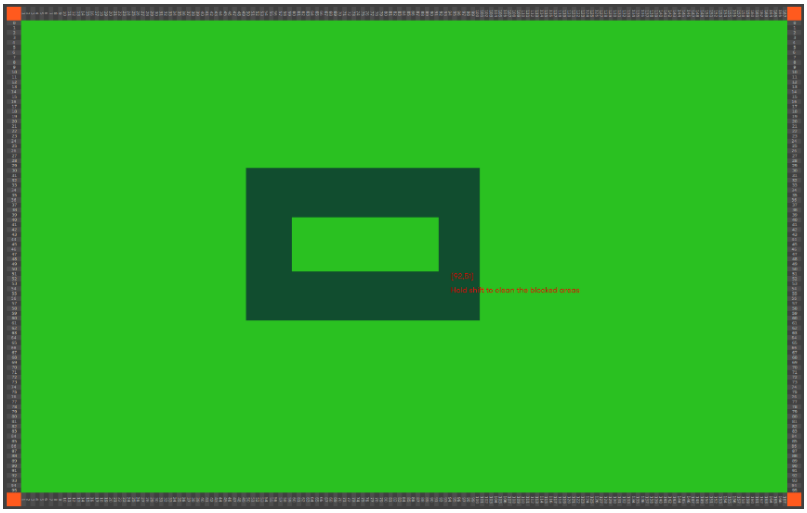


When you stop pressing the left click, the area to be blocked, will be defined.

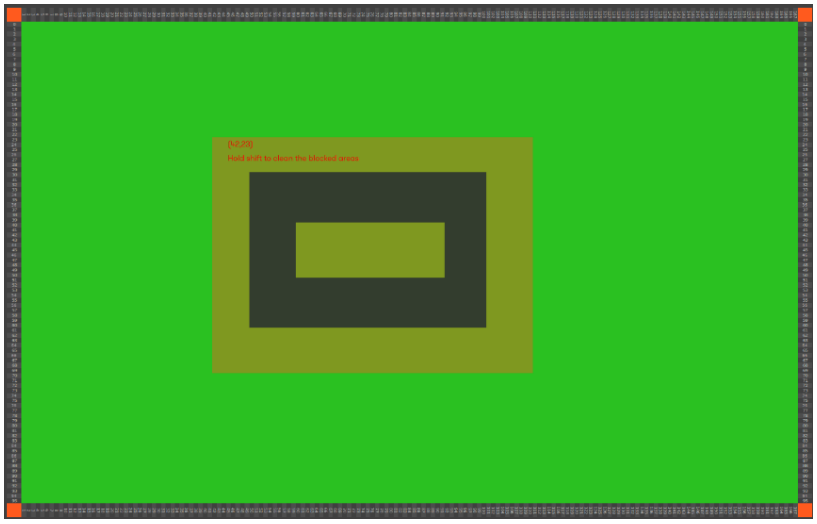


To reactivate the blocked area, you must hold shift and you have to select the blocked area by clicking on the mouse left button.

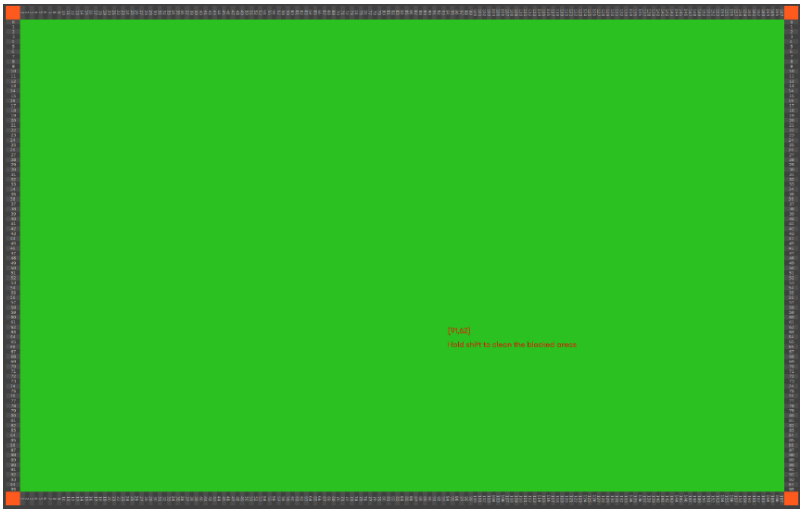
If for example you want to inscribe an active area inside an inactive area you can do it by holding shift and selecting the area to be reactivated.



If you want to unblock a specific area or if you want to unblock all the blocked areas, you must hold shift and reselect those areas.

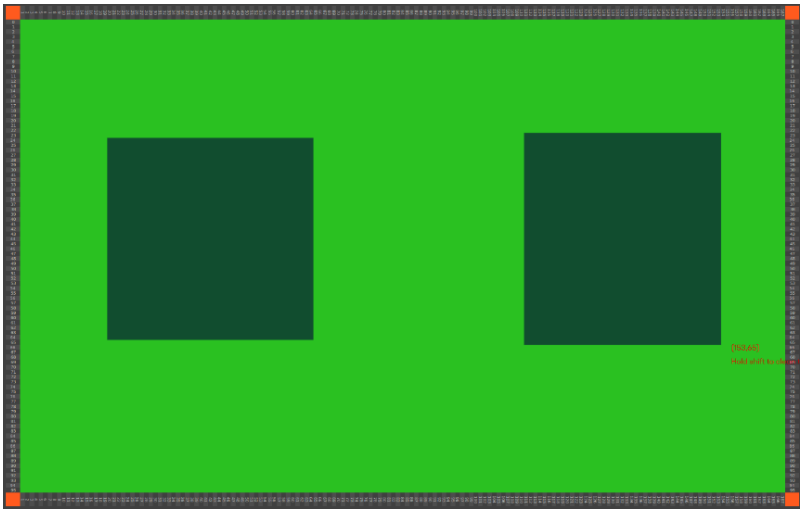


By holding shift and selecting the blocked areas, you can reactivate the entire Touch Sensor.

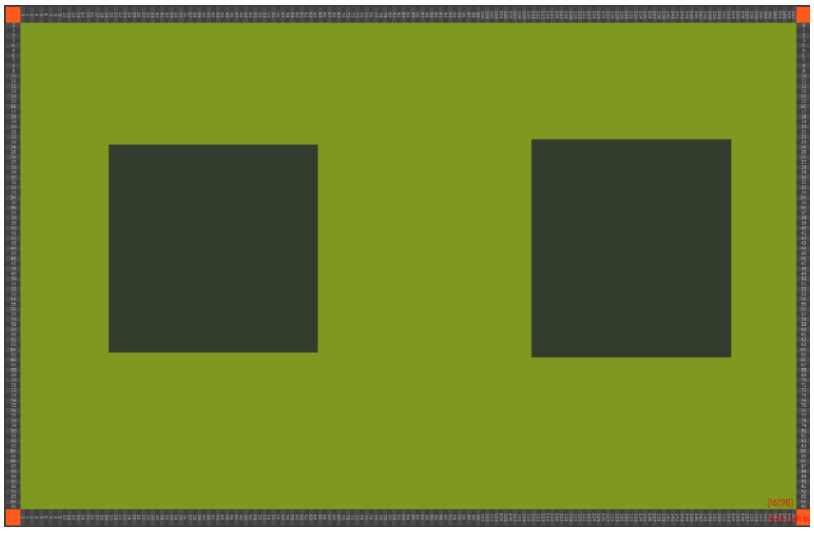


If you want, for example, to maintain active only two specific Touch Sensor areas, you may start by drawing those areas as inactive areas, and then you can draw another area covering those two central areas, and as a result, those areas will be activated and the area surrounding them will be inactivated, as described in the next two steps:

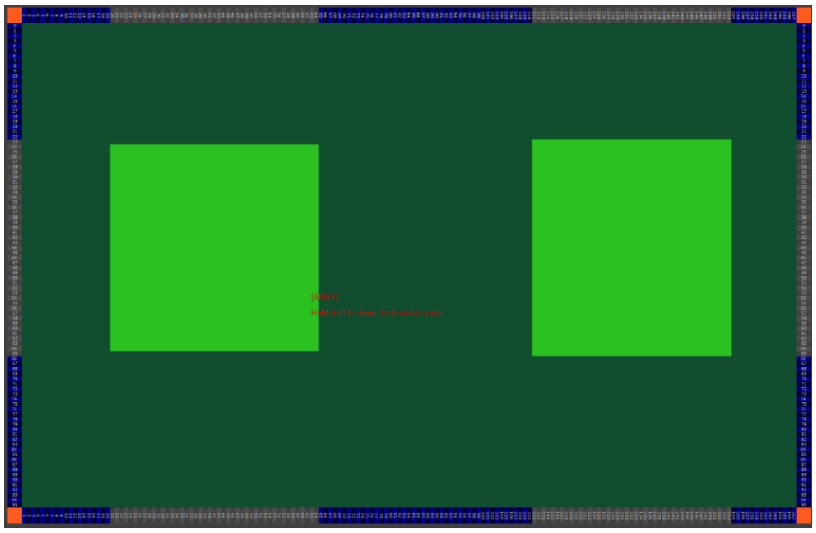
1st step: select the areas to be blocked



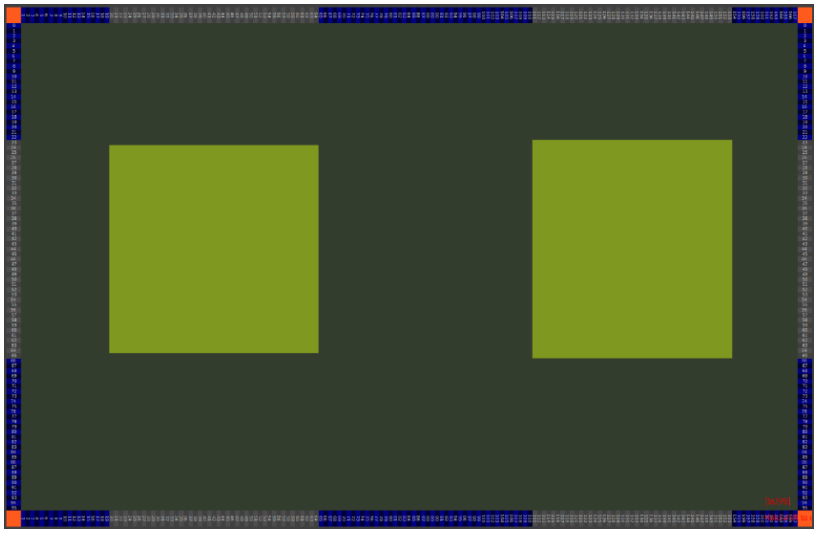
2nd step: Select the entire active Touch Sensor area



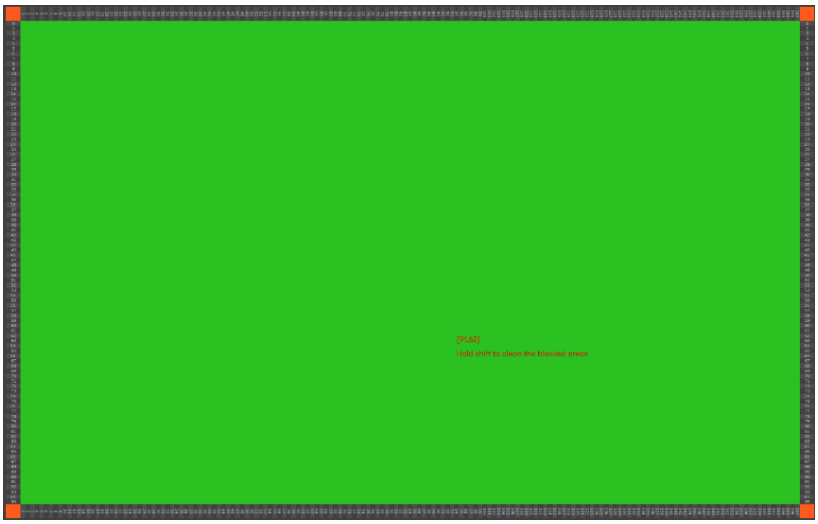
By selecting the entire Touch Sensor area, the central blocked areas will be reactivated and the area surrounding them will be blocked.



If you want to reactivate all the blocked areas, you have to hold shift and select the entire Touch Sensor area.



By holding shift and selecting the entire Touch Sensor area, all of them will be reactivated.



LOAD & SAVE TOUCH CONTROLLER SETTINGS

This feature can be used when you have multiple units of an identical setup because it saves time configuring 'DISPLAX Connect'. Another use case would be to save a file with the optimal configuration so that it is fast to restore in case someone changes the configuration parameters. You can SAVE the settings from your current setup into a file. This will save the values of the following parameters:

- Touch status (enabled/disabled)
- Gain (values 0 - 7)
- Threshold (Values vary between 0 and 50 starting on firmware version 1.5.0, and between 0 and 15 on firmware versions equal or previous to 1.4.0).
- Shield level
- Palm detection status and palm rejection area values (Feature not available in Skin Dualtouch)
- Disabled columns, rows or cells
- Number of touches
- Geometric Calibration

When you LOAD the file into a new setup (PC + display + Skin product, either Skin Ultra, Skin Fit or Skin Dualtouch), 'DISPLAX Connect' will assume the values of the previous setup. It is recommended reviewing the touch performance of every setup to verify if additional configuration adjustments are required.

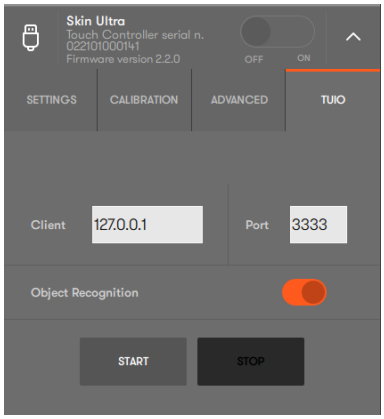
Bear in mind that this feature should be used with equivalent setups, i.e. same LCD, glass thickness and size, sensor size and air gap.

It is recommended, shortly after loading the settings file, to restart the Touch Controller.

TUIO

TUIO should be configured after configuring all touch settings.

Having configured all previous settings go to the TUIO Tab.



In 'Client' define the IP of the PC which is going to receive TUIO events. Next, define, the port that will be receiving these events.

Click 'Start' and test if the host PC is receiving the TUIO events. If not, check if the firewall is blocking them.

If TUIO events are being received in the Client PC, you can now close 'DISPLAX Connect', TUIO is now a Daemon (for windows)/Agent (OS X) process (it runs on the background).

To stop TUIO, go to the TUIO tab and click 'Stop'. TUIO should now be stopped.

It is recommended to stop sending TUIO events before uninstalling 'DISPLAX Connect'.

NOTES:

OS X: From 'Displax Connect' 1.9.0 version onwards, if touch injection is ON, 100 touches for the Skin Ultra and 40 touches for Skin Fit will be recognized through TUIO. If touch injection is OFF, only 20 touches will be recognized. Skin Dualtouch either way recognizes two touches.

Windows and Linux: Does not matter the touch injection status, only 20 touches will be recognized through TUIO, either in Skin Ultra or Skin Fit. Skin Dualtouch either way recognizes two touches.

Windows: Once the Board is reset or unplugged, you should restart TUIO, otherwise TUIO events will stop being sent to the host. But if you shut down or restart the computer, TUIO will automatically restart and there is no need to perform this step.

OBJECT RECOGNITION

Feature only available for Skin Ultra.

GENERAL DESCRIPTION

Skin Ultra supports the use of objects which can be placed on top of the sensor along with regular touches from fingers.

Object recognition is supported for Skin Ultra sensor sizes up to 55 inches. For larger sizes it is also possible to process object recognition events but the size of the predefined objects must be redefined accordingly.

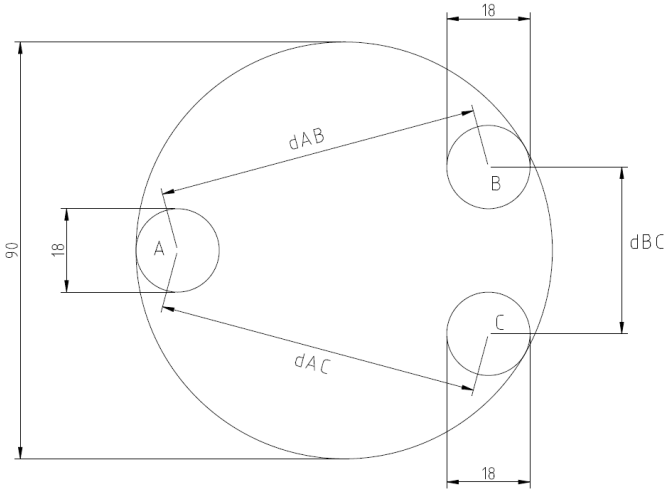
Currently, 6 different object types, also referred to as tags, are supported.

The tags are objects with conductive contacts arranged in pre-determined configurations. The tags have a circular shape, but it is possible to have different tag designs and shapes, but the relations between the contact points must be maintained.

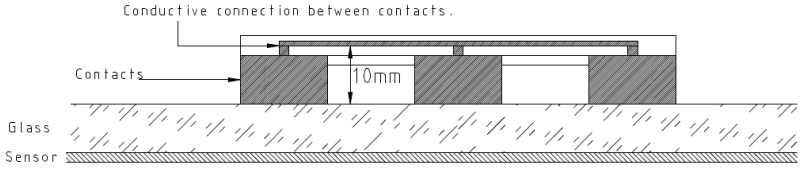
The tags designed for Skin Ultra are guaranteed to work in all sensor sizes, for the Ultra product, up to 55 inches. For larger sensors the tag dimensions must be scaled up accordingly.

From the 6 skin Ultra tags, 4 of them have 3 conductive contacts, and 2 of them have 4 conductive contacts, when all the 6 tags are placed over the Skin Ultra sensor, 20 touch points will be recognized.

The following representation presents the top view of an object tag, displaying contacts as points A, B and C.



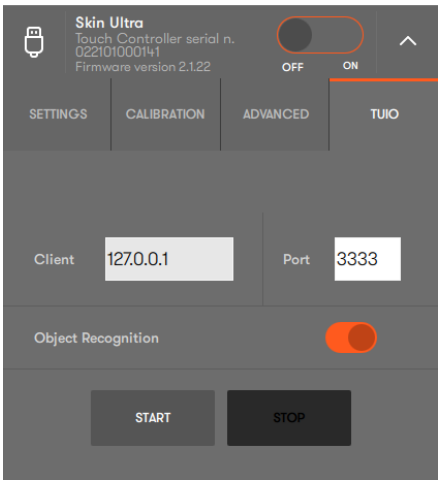
The object tag conductive contacts touch the glass which has underneath a laminated Touch Sensor, the following representation illustrates this setup, where the tag conductive contacts are touching the glass and those touches are being processed by the Skin Ultra Touch Sensor and Touch Controller.



USAGE

The data generated by the recognition of touches and objects is available through a TUIO client which implements the specification v2.0 (see http://www.tuio.org/?tuio20, for details on the protocol).

To start TUIO go to the TUIO tab, and in 'Client' define the IP of the PC that will receive TUIO events. Next, define the port that will be receiving these events. Then click 'Start' and test if the host PC is receiving TUIO events. If not, check if the firewall is blocking them.



Description of the parameters passed to 'skin' executable:

- Client / Port: specify IP address and port of client, if necessary, multiple addresses can be specified;
- DC Object recognition button: enable or disable object recognition, if the parameter is specified as '1' the object recognition is enabled, if not specified or set as '0', all touch events will be reported as finger touches.

Notice that the application which uses object recognition should not accept HID touch events, and should only process TUIO events.

Clients are advised to:

- Disable injection of touches in the operating system, or,
- If HID touch injection is active, disable the touch feedback on the operating system, or conflicting information will be shown in the application because one touch is being received by TUIO (Tag center) and 3/4 touches from HID simultaneously.

LIMITATIONS

The implementation of the TUIO client protocol, has a limitation in the number of reported touches. No matter what operating system is being used, only 20 touches will be recognized and reported via TUIO, no matter the status of touch injection in the operating system. See https://academy.displax.com/knowledgebase/tuio-2/ for more information.

Since the object recognition works with the TUIO protocol, the number of tags used is limited to the number of available touches.

TUIO MESSAGE STRUCTURE

The communication protocol is implemented using TUIO specification v2.0, see http://www.tuio.org/?tuio20 for details on global operation and message structures.

The data specifically concerning the objects and touches uses a 'PTR' component message formatted as:

/tuio2/ptr s_id tu_id c_id x_pos y_pos angle shear radius press

Message components:

- **s_id** [int32]: Session ID, identification of touch, see details ahead in 'Object ID' section;
- **tu_id** [int32]: Type/User ID (Not used: sent as '0');
- **c_id** [int32]: Component ID (Not used: sent as '0');
- **x_pos** [float]: Point coordinate X axis;
- **y_pos** [float]: Point coordinate Y axis;
- **angle** [float]: Rotation angle relative to the horizontal surface plane (0 – 2π);
- **shear** [float]: Shear angle (Not used: value sent '0');
- **radius** [float]: Radius of influence, normalized relatively to the frame height and encoded in the range [0..1]. If the touch is a finger touch, radius is '0';
- **press** [float]: Pressure of touch, normalized in the range [0..1].

OBJECT ID

In total there are 6 different tags specified, 4 tags with 3 points and 2 tags with 4 points. The tag ID is formed as a 32bit integer with the following format:

XX YY ZZZ

where:

- XX: Type of touch:
  - 00: None/Invalid;
  - 01: Finger touch;
  - 02: Object tag (3 points);
  - 03: Object tag (4 points).
- YY: Sub type, for each type of touch there is an associated sub type.
  - Finger touch – 00: None/Invalid; 01: Finger;
  - Object tag (3 points) – 00: None/Invalid; [01..04]: Tag number;
  - Object tag (4 points) – 00: None/Invalid; [01..02]: Tag number;
- ZZZ: ID, incremental value that identifies the object/touch [001..999]. Some examples:

Type of object	Object ID (Session ID in TUIO)
Finger touch	0101264
Object tag (3 points) type 4	0204561
Object tag (4 points) type 1	0301127

Table 1: Some examples of 'Object ID' according to the type of object being detected in the sensor.

The 6 TAGs which can be provided with Skin Ultra have the following ID:

4 Tags with 3 conductive contacts	2 tags with 4 conductive contacts
Tag 1: 0201 + 3 digits sequential number	Tag 5: 0301 + 3 digits sequential number
Tag 2: 0202 + 3 digits sequential number	Tag 6: 0302 + 3 digits sequential number
Tag 3: 0203 + 3 digits sequential number	
Tag 4: 0204 + 3 digits sequential number	

Tags representation in Displax Connect

SOFTWARE DEVELOPMENT FOR OR

When developing software for object recognition, take into account the above information regarding the TUIO message structure and the Object ID, knowing that the communication protocol is implemented using TUIO 2.0 specification.

NOTES

a) When using object recognition, it is not recommended having the touch injection enabled in the Operating System because it will reproduce simultaneously contact points from the tag and other touches, so only TUIO should be enabled to differentiate touches from contact points);
b) Object recognition should be enabled before starting TUIO;
c) Things that can affect OR: Glass thickness; sensor cell area; electromagnetic interferences; contacts or tags close to each other; signal Strength.

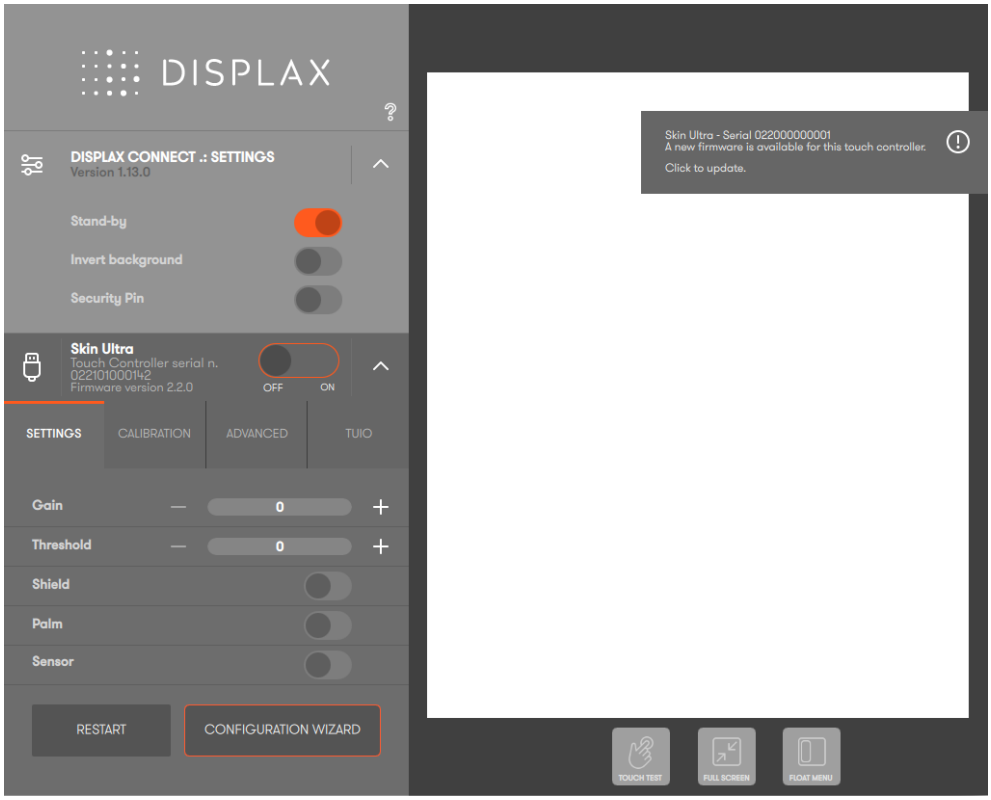
TOUCH CONTROLLER FIRMWARE UPDATE

New versions of the Touch Controller Firmware may be available in time.

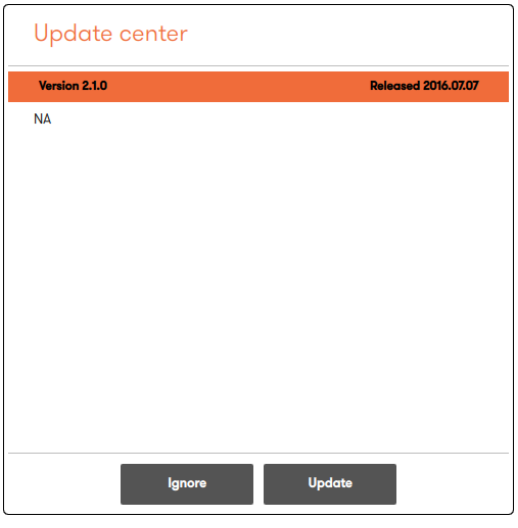
This feature is available for Windows 8 (or higher), OS X (Yosemite), and Ubuntu (14.04 LTS).

If a new firmware version is available you will receive a notification.

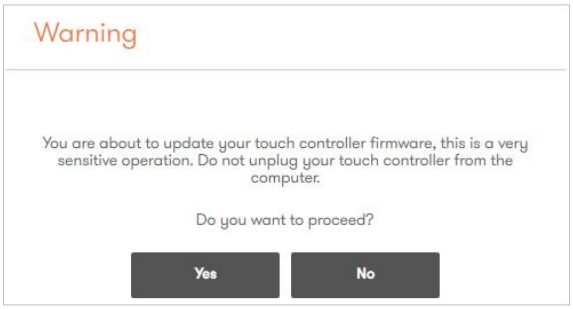
This notification will be presented in the right side of the control panel.



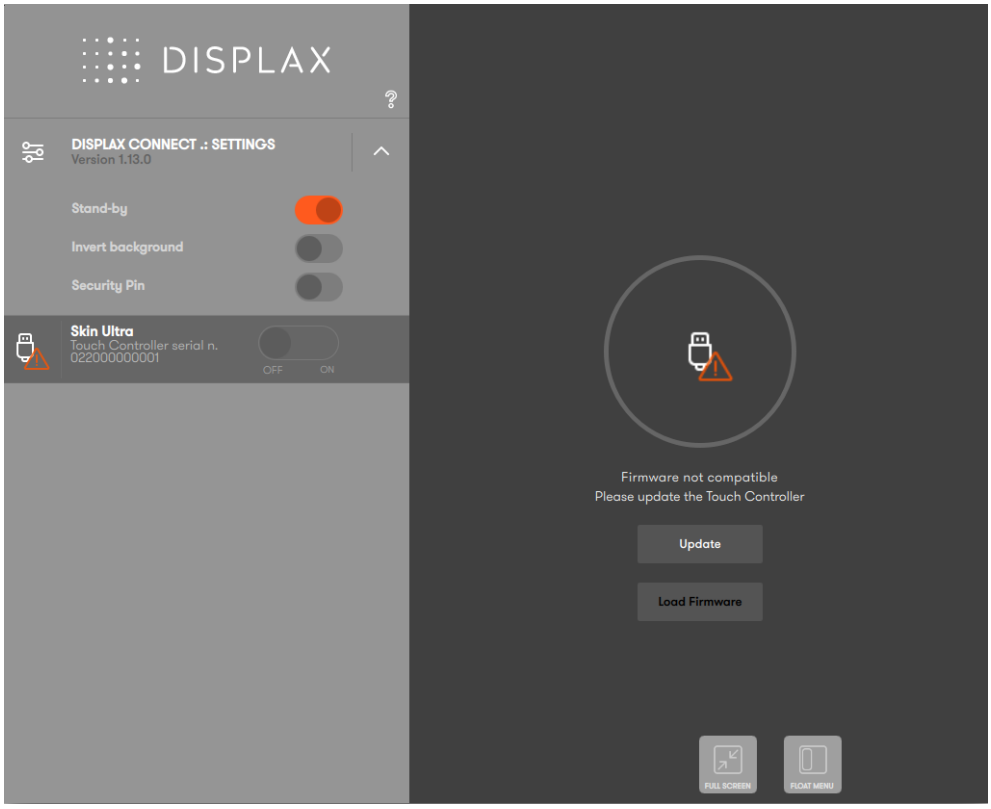
If you click the notification, a window with a description of the updates will be displayed, click 'ignore' or 'update'.



If you clicked in 'update' a warning message will pop-up.

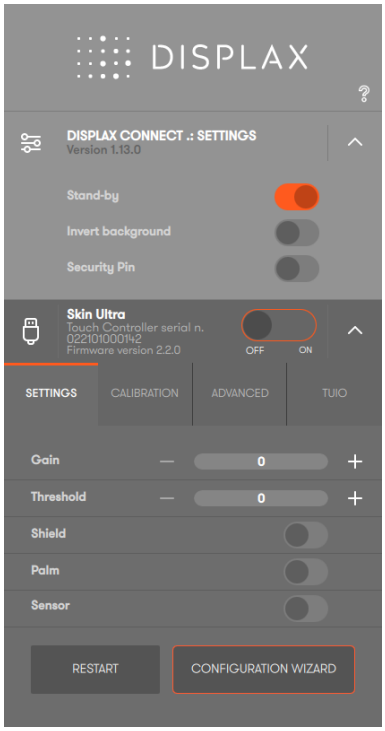


Click 'Yes' to start the update.



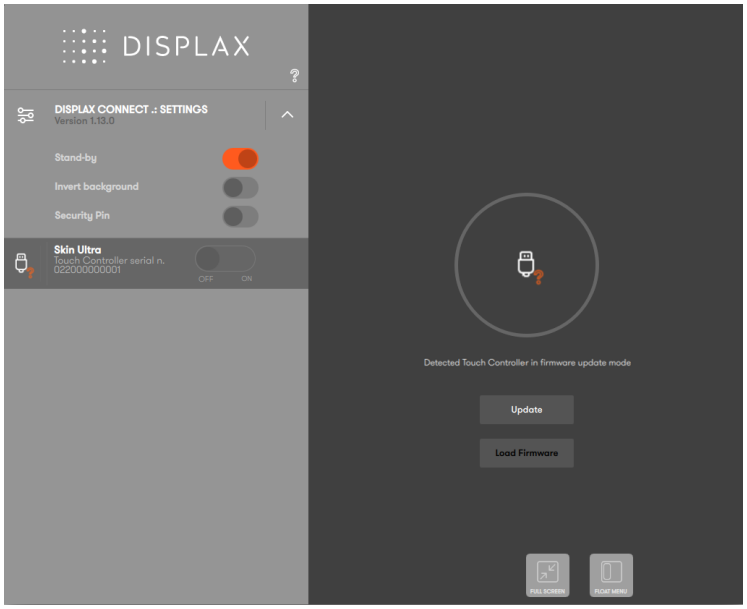
The Touch Controller will restart, then the firmware update process will start, and it will take, depending on the PC and internet connection, between one to five minutes until it is complete.

After concluding the Touch Controller Firmware update, you will be redirected to the 'DISPLAX Connect' interface.



If the Touch Controller firmware update is taking more than five minutes to proceed, it might mean that something went wrong due to incorrect cables connection, internet connection failure or other problem. In this case, you must close the control panel and disconnect the Touch Controller USB cable. Then, you must reconnect the Touch Controller USB cable and restart the Touch Controller firmware update process from the beginning as described in this section.

If for some reason the touch controller firmware update crashes, the following image will be presented. If it is presented, you should click 'Update' to move this process forward.



LOAD TOUCH CONTROLLER FIRMWARE

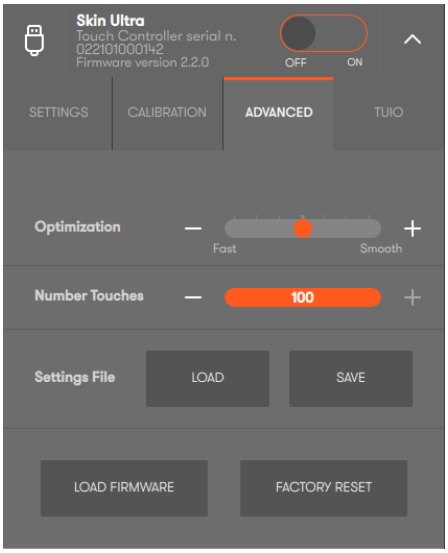
This feature was conceived to be used when there is no internet access onsite. If you have internet access you do not need to use this feature.

This feature can only be used with an available Touch Controller Firmware file either using OS X (Yosemite), Ubuntu (14.04. LTS) or Windows 8 (or higher version).

Use only files provided by DISPLAX otherwise you will lose warranty and you may damage the Touch Controller.

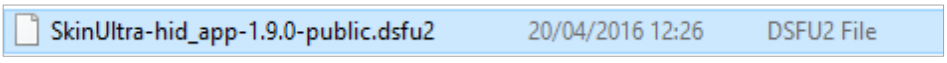
While performing the upload, assure that you do not remove the USB cable and do not perform any other action while the firmware is being uploaded into the Touch Controller.

Click in 'Load firmware' to upload the Touch Controller firmware file.

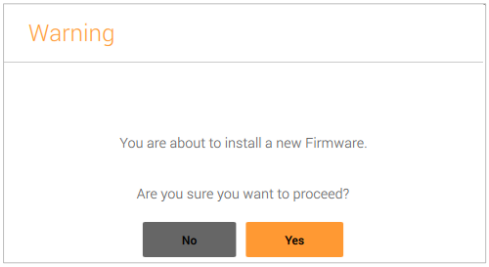


Browse for the folder where the Firmware file is stored (file with '.dsfu' or '.dsfu2' extension).

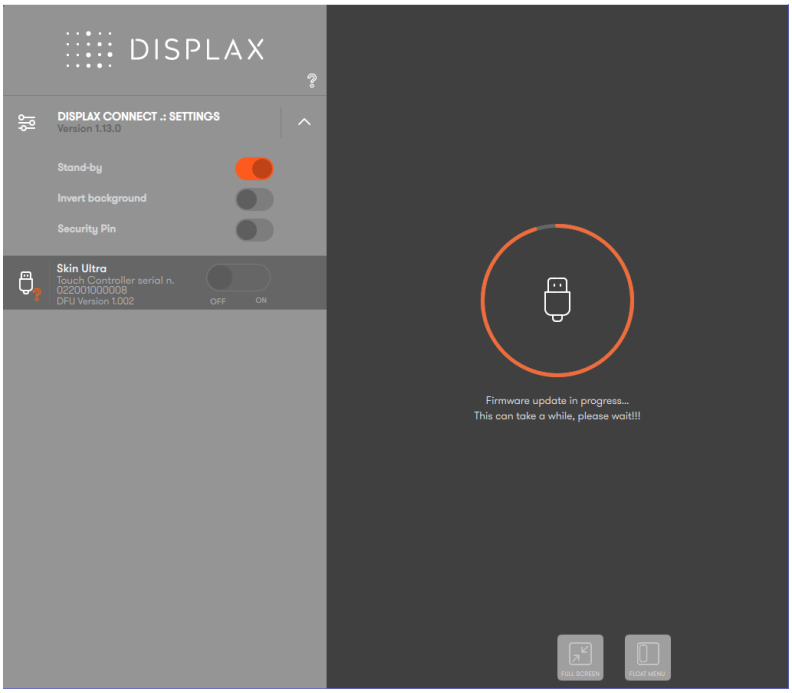
Example:



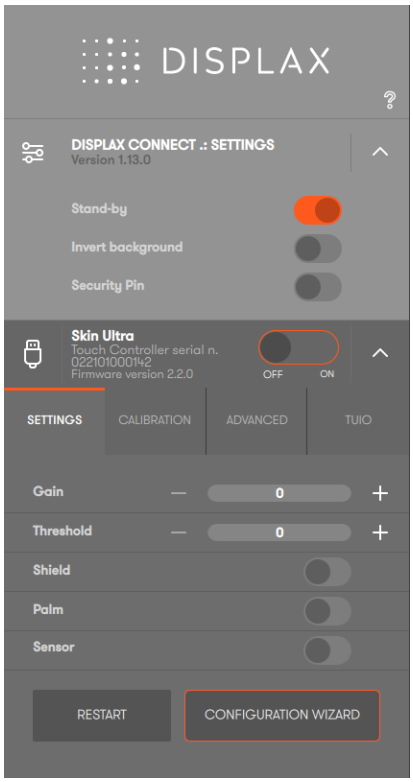
After selecting the firmware file, a warning message will be displayed. Select 'Yes' to upload the firmware.



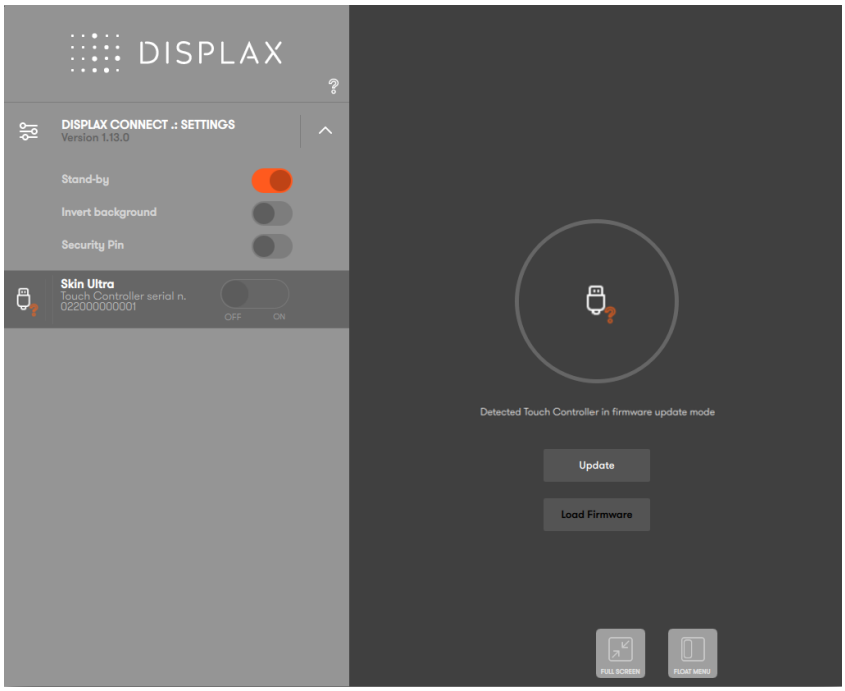
The firmware installation process will be started.



After the firmware is uploaded you will be redirected to the 'DISPLAX Connect' interface.



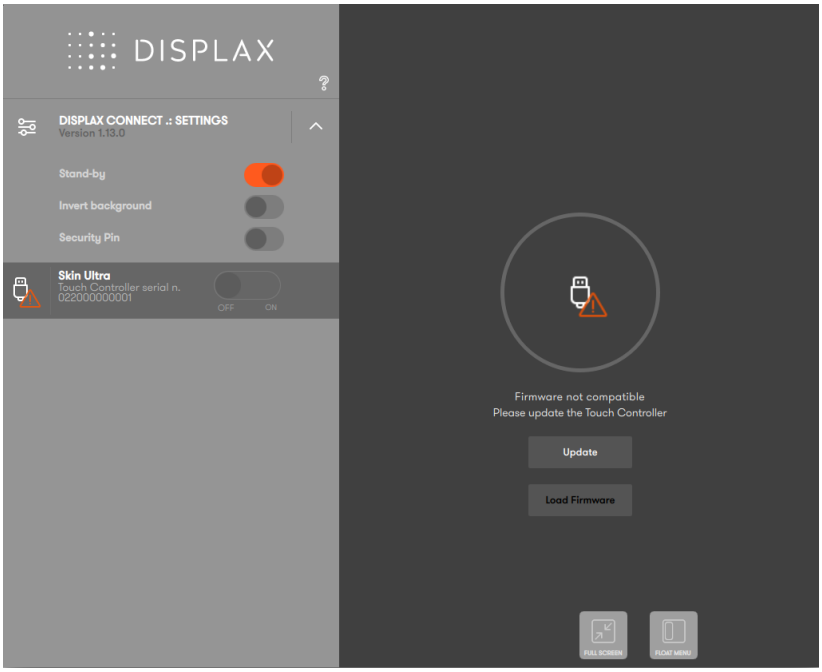
If, when loading the firmware, the process freezes, taking more than 3 minutes to conclude, or if the following image is displayed, you should close the 'DISPLAX Connect' control panel and disconnect the Touch Controller USB cable.



Afterwards you should reconnect the Touch Controller USB cable and reopen 'DISPLAX Connect'. Then, restart by clicking in 'Load firmware'.

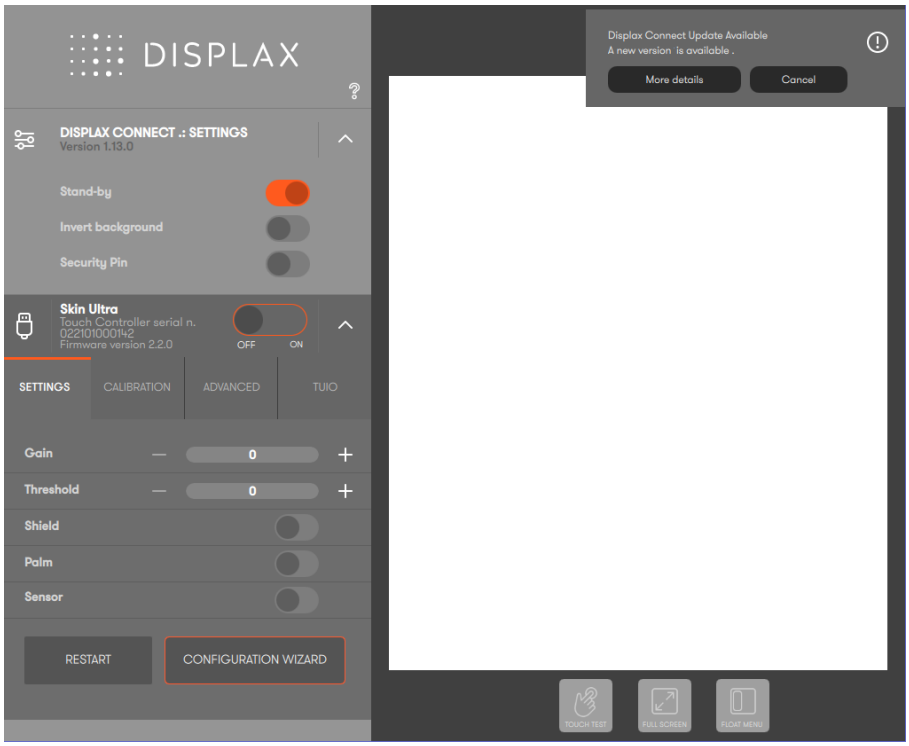
When you click 'Load Firmware' you will restart the firmware upload. After clicking 'Yes' the Firmware will be uploaded to the Touch Controller.

Note: If you have installed SUC versions 1.1.0 or below, the following image will be displayed. If this is the case, you should click on 'Load firmware' to start loading the touch controller firmware. If for some reason the loading process is not starting, you should restart the touch controller, and proceed with the loading process.

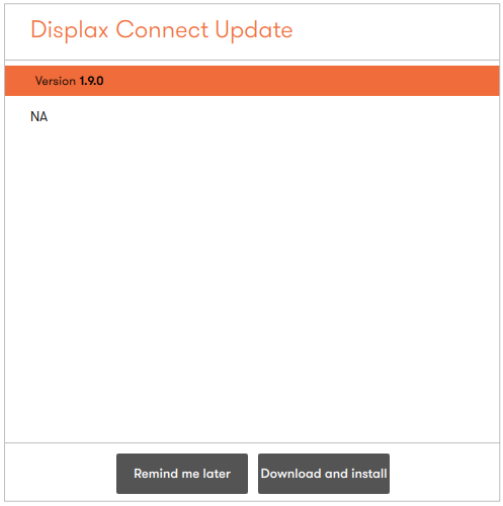


DISPLAX CONNECT UPDATE

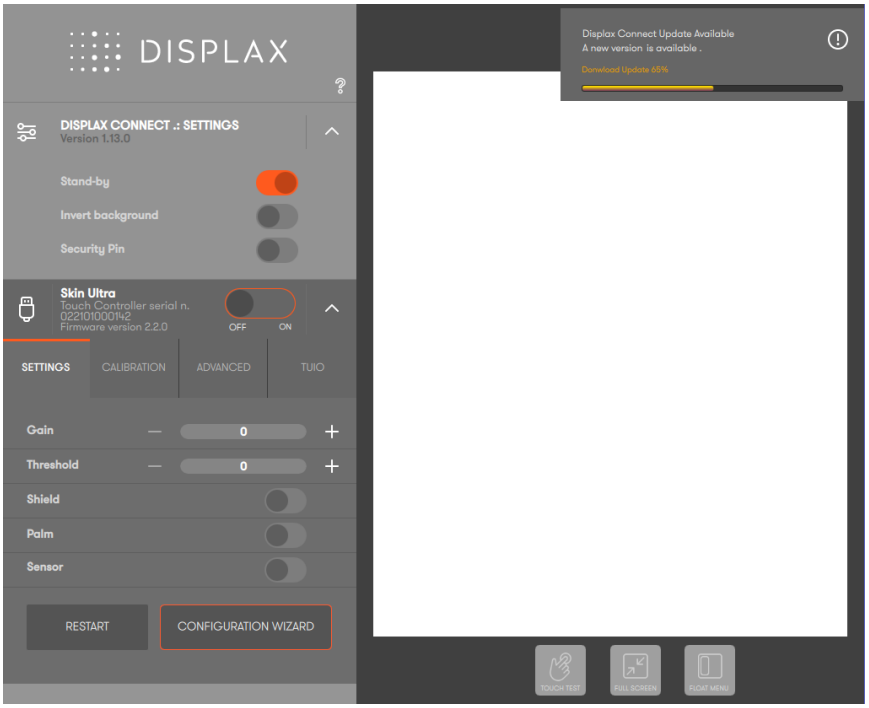
If your computer is connected to the internet, when you open 'DISPLAX Connect' it will always verify whether there is a new version available (feature also present in SUC versions 1.4.0 or higher). If there is a new version of 'DISPLAX Connect', a notification will appear on the upper right corner of the Control Panel.



When clicking in 'More details' a new window with the 'change log' will pop-up with two options: 'Remind me later' and 'Download and install'.



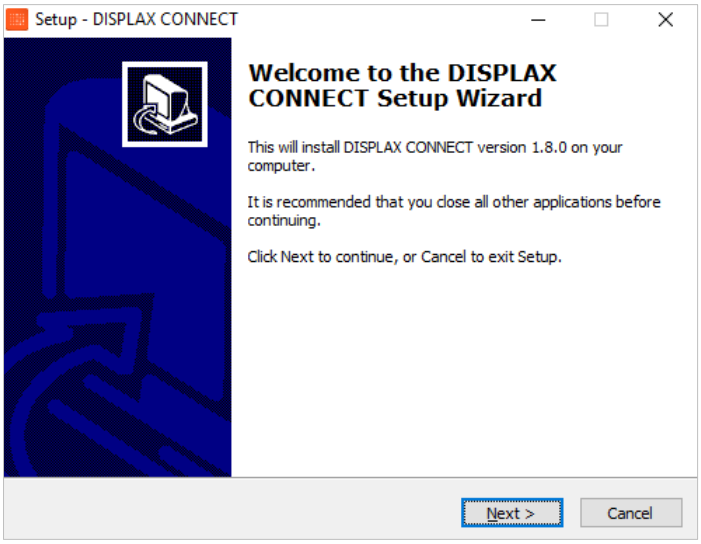
If you want to update, click 'Download and install'. You should not interrupt this process until it is concluded.



After downloading the update file, depending on the operating system you are using, the installation process may differ:

Windows 7 or higher version

By clicking on the 'DISPLAX Connect' update file, the installation setup will be initiated and you just have to follow the installation procedure.



If you have installed 'Skin Connect' 1.3.0 or other previous version, you will need to manually download and install a newer version.

Visit our support website to download the latest version of 'DISPLAX Connect'.

Uninstall the current version, using the Windows tool for programmes removal.

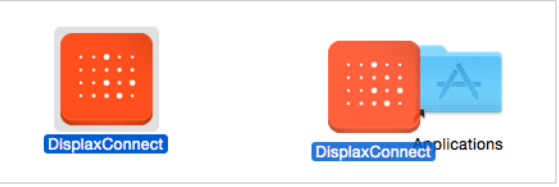
Install the newest version at the DISPLAX Support website: https://support.displax.com/

OS X (Yosemite)

NOTE FOR OS X USERS: If you have a Skin Connect version installed on OS X, please uninstall that previous version, to install 'DISPLAX Connect'.

Updating the 'DISPLAX Connect' on OS X:

A new window with the newest 'DISPLAX Connect' version is displayed. Follow the installation process for MAC OS X as previously described and replace the application on the 'Applications' folder.



Drag the 'DisplaxConnect' icon to the application folder.

Replace the existent 'DisplaxConnect' application.

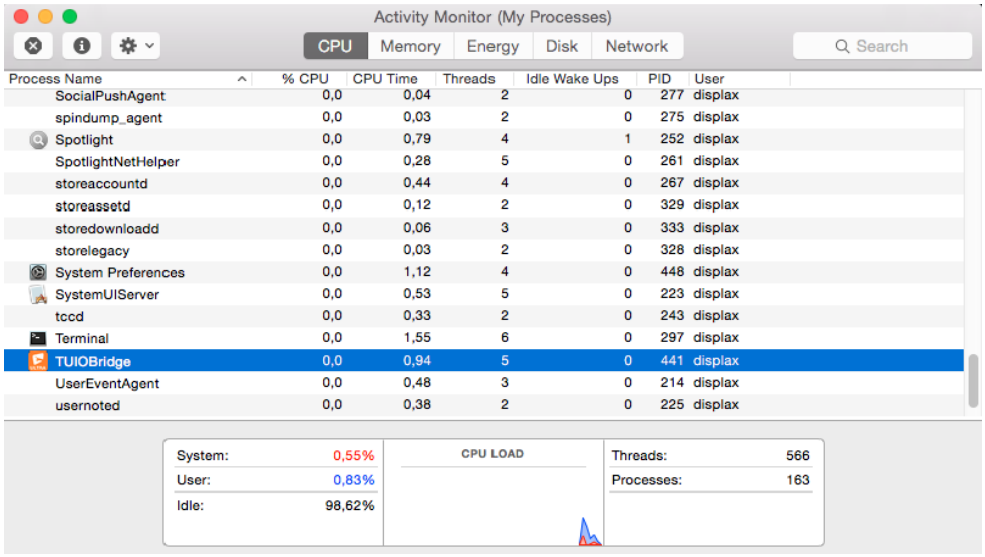
If you have a connected Touch Controller and an installed 'TUIOBridge.app' for 'TUIO', this app should be stopped before opening 'DISPLAX Connect'.

To stop 'TUIOBridge.app' you should follow three steps:

1. Open 'Terminal' and 'Activity Monitor';

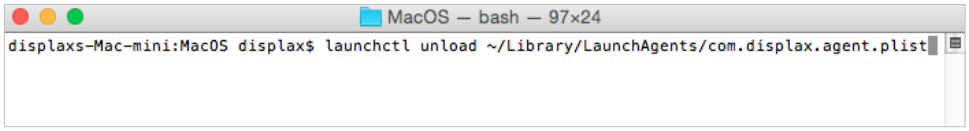
2. Check if the 'TUIOBridge.app' is running on the 'Activity Monitor'.

To open the 'Terminal' and 'Activity monitor' go to: 'Applications'->'Utilities';



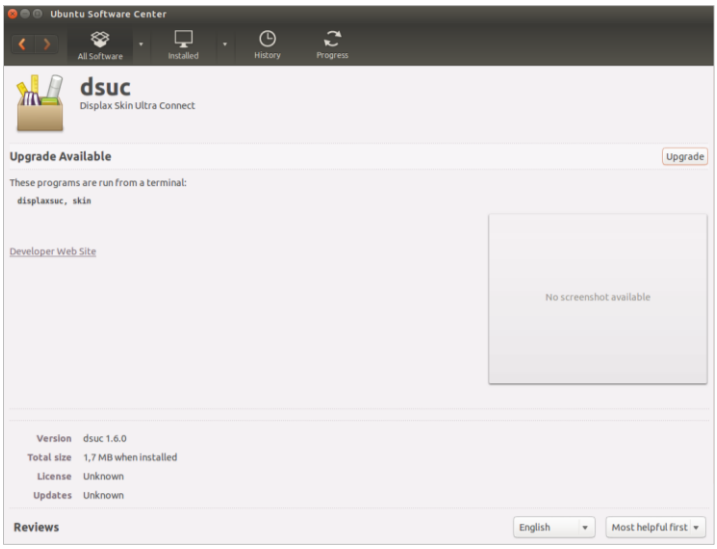
3. If the 'TUIOBridge.app' is running on the 'Activity Monitor' stop its running process. This can be done by running on 'Terminal' the following command:

'launchctl unload ~/Library/LaunchAgents/com.displax.agent.plist'



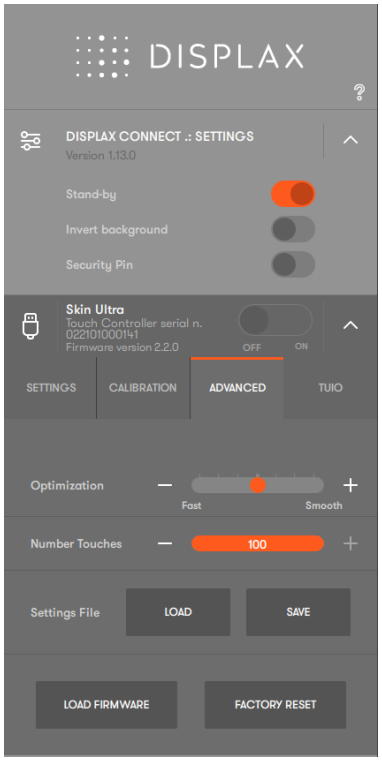
UBUNTU

A new 'Ubuntu Software center' window opens.



Click on the 'Upgrade' button to install the new 'DISPLAX Connect' version.

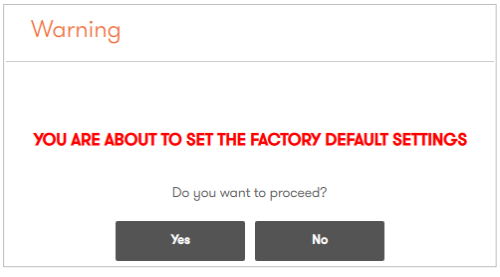
FACTORY RESET



Sets the Touch Controller to its default settings.

To re-establish the factory default settings, select the 'Advanced' tab. In this tab, click 'Factory reset'.

A warning message will be displayed '*You are about to set the factory default settings*'.



By clicking 'Yes' the Touch Controller is restarted, and the factory default settings are reestablished.

PRESSURE DETECTION

Feature only available in Skin Ultra.

Skin Ultra is an HID Multitouch compliant product. This means that Skin Ultra follows the USB Multitouch standard when sending touch events information to the Operating System. Information about pressure is one of the parameters that Skin Ultra sends to the Operating System, and that is why you can detect pressure when using Skin Ultra.

Therefore, to use the touch pressure information in your software application, you should develop the application following the instructions of the Operating System where the application will run.

The Operating System must have native multitouch support.

For more information about each Operating System, please visit:

Windows:

https://msdn.microsoft.com/en-us/library/windows/desktop/dd371581(v=vs.85).aspx

Linux:

https://www.kernel.org/doc/Documentation/input/multi-touch-protocol.txt

Mac OS X:

It is possible to develop software applications with pressure detection on Mac OS X, but it requires the use of IOKit. This is a low-level programming that requires a high level of expertise.

https://developer.apple.com/library/mac/documentation/DeviceDrivers/Conceptual/IOKitFundamentals/Introduction/Introduction.html

Chrome OS:

Chrome OS is a Linux running a Chrome browser.

To develop native Linux applications, follow the Linux link. Chrome OS applications follow the W3C standard, that currently does not support pressure

https://dvcs.w3.org/hg/webevents/raw-file/tip/touchevents.html

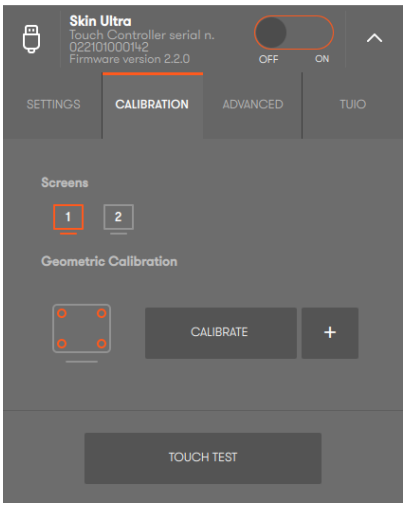
Android:

http://developer.android.com/reference/android/view/MotionEvent.html

MULTI MONITOR CALIBRATION

Two or more units of Skin product can be connected to the same PC. The number of units that can be connected is limited by the number of USB connections you have on the PC in use. Make sure that the USB ports used are compliant with the USB standards and supply enough energy to power the Skin product units.

In the 'Calibration' tab, 'Screens' section, select the number of Skin product units connected to the PC.



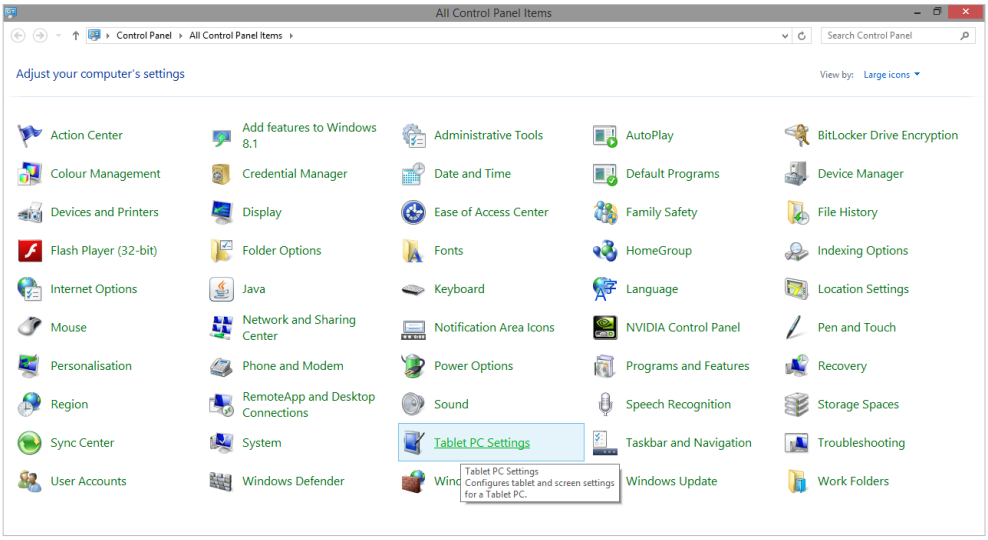
During the geometric calibration, all monitors should have the same orientation. Afterwards, you may use monitors in a different orientation, for example, on a vertical orientation.

Number of displays connected	Display Mode (Mirrored or Extended	Number of Sensors connected	Native support in OS (OS X Yosemite, Windows >=7, Ubuntu 14.04)
1	N/A	1	All
2	Mirrored	1	All
2	Mirrored	2	All
2	Extended	1	Windows (>=7)
2	Extended	2	Windows (>=7)

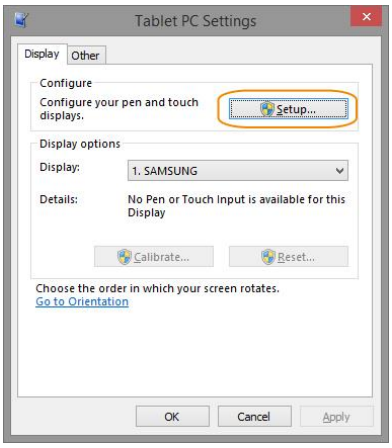
The calibration process of setups with multiple displays can differ depending on a number of factors, such as the display mode, graphics card, operating system, amongst others. If you have a setup with multiple displays and you are experiencing difficulties with the calibration process, please contact us for detailed information.

Windows natively supports the use of multiple displays with touch, and the assignment of touch inputs to each of them.

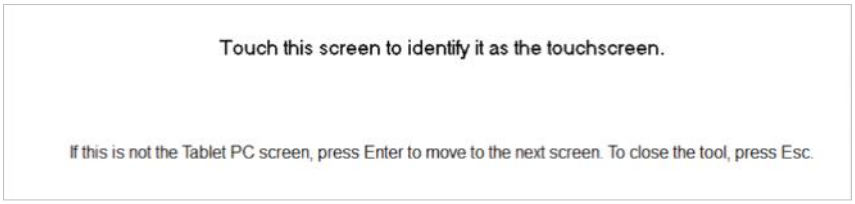
Go to the Windows Control Panel and open 'Tablet Settings'.



In 'Configure your pen and touch displays' click 'Setup'.



In one of the displays, the following message will be presented.



Follow the instructions.

Now Windows knows which display has touch (in case only one does) or which display is controlled by which touch device (in case all displays have either one of the following products Skin Ultra, Skin Fit or Skin Dualtouch).

Open 'DISPLAX Connect' and calibrate – to perform the geometric calibration refer to the section '*How to configure Displax Connect*'.

If all displays have touch, calibrate all. If only one display has touch, there is no way of knowing if it is display number 1 or number 2, and so on. You must click on each of them to detect which ones are the displays without touch, cancel the calibration on those displays without touch and click on the one with touch.

Bear in mind that the number assigned by Windows to each display (1, 2, 3 and so on) does not necessarily match the numbers assigned by 'DISPLAX Connect' to each display.

This feature is currently available for Windows 7 and higher versions.

HOW TO USE WITH OTHER OPERATING SYSTEMS

GENERIC LINUX

Skin products work in Linux if all the following requirements are met:

- Kernel version 3.8 or higher
- Xorg version 1.8 or higher
- Kernel is compiled with HID multitouch support

You need to configure your setup running 'DISPLAX Connect' on a Windows (7 or higher), OS X (Yosemite), and Ubuntu (14.04 LTS). Once you are satisfied with the configuration, switch to a PC with Linux. The configuration settings are stored in the Touch Controller so there is no need to re-configure the Skin product in the Linux PC.

CHROME OS

Skin products run in Chrome OS 38.0.2125.119 (64 bit) or higher. You need to configure your setup running 'DISPLAX Connect' on a Windows (7 or higher), OS X (Yosemite), and Ubuntu (14.04 LTS). Once you are satisfied with the configuration, switch to a PC with Chrome OS. The configuration settings are stored in the Touch Controller, so there is no need to re-configure your Skin product in the Chrome OS PC.

ANDROID

Your Skin product will work out of the box in Android, If all the following requirements are met:

- Kernel version greater or equal to 3.10
- Kernel compiled with HID multitouch support

You need to configure your setup running 'DISPLAX Connect' on a Windows (7 or higher), OS X (Yosemite), and Ubuntu (14.04 LTS). Once you are satisfied with the configuration, switch to an Android PC. The configuration settings are stored in the Touch Controller so there is no need to re-configure your Skin product in an Android PC.

Note: if you are using a Display orientation different from landscape, the geometric calibration should be performed in a Windows Operating System.

MOUSE EMULATION

Some Operating Systems do not support multitouch. Skin products emulate a mouse, letting you operate the touchscreen as if it was a single touch device. You need to configure your setup running 'DISPLAX Connect' on a Windows (7 or higher), OS X (Yosemite and El Capitan), and Ubuntu (14.04 LTS). Once you are satisfied with the configuration, switch to the PC or Media Player of your choice. The configuration settings are stored in the Touch Controller, so there is no need to re-configure your Skin product in the new PC / Media Player.

WARRANTY

DISPLAX provides quality products. DISPLAX warrants to the original end user and customer of its products that they are free from defects in material and workmanship. In the event of experiencing problems with any of our product, please follow these guidelines.

DISPLAX Skin products have 2 years warranty under normal use, which starts counting from the product's invoice date. During the warranty period, DISPLAX will repair or replace defective parts that are returned to our head-quarters, in Braga, Portugal, Europe.

Replacement parts are warranted for the remainder of the warranty period. All parts that are exchanged under this warranty become the property of DISPLAX.

This limited warranty does not cover any damage to this product that results from:

- Improper installation
- Accident
- Abuse
- Misuse
- Natural disaster
- Insufficient or excessive electrical supply
- Abnormal mechanical or environmental conditions

This limited warranty also does not apply to any product on which the original configuration has been:

- Altered
- Obliterated or removed
- Incorrect handling
- Non-Cautions Packaging (difficult to understand)
- Damage caused by the use of the product outside the permitted or intended usage described in the product specifications

Damage caused by service (including upgrades and expansions) performed by anyone who is not a representative of DISPLAX or by anyone unauthorized by DISPLAX is not covered.

For any warranty claim, the Buyer must provide DISPLAX with:

- Applicable model and serial numbers, the date of purchase, and the nature of the problem.

DISPLAX, in its discretion, may also require that the Buyer return the product being covered under warranty.

The warranty covers only the returned items to the base, and it does not include:

- On-site repair charges such as labor
- Travel
- Shipping
- Other expenses associated with the repair or installation of replacement parts.

Shipping Charges: When applicable, DISPLAX will pay all shipping charges to send the repaired, replaced or exchanged product to the original shipment point.