DISPLAX

DISPLAX SKIN ULTRA

USER GUIDE

LARGE MULTITOUCH PROJECTED CAPACITIVE

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SAFETY INSTRUCTIONS

The product contains electronics, which are electrically sensitive. Please take necessary precautions when using such devices.

DO NOT TOUCH THE UPPER OR LOWER FACES OF THE TOUCH CONTROLLER. FINGERS AND TOOLS CONTAIN STATIC ELECTRICITY, WHICH MAY DAMAGE THE TOUCH CONTROLLER. HOLD BY THE OUTER EDGES AND AWAY FROM ANY ELECTRONIC COMPONENTS.

- Select a suitable workspace.
- Avoid carpets in cool, dry areas.
- When you work on a carpet where static electricity is likely to be generated, make sure to take anti-static measures beforehand.
- Do not wear wool or synthetic cloth to work with the Touch Controller.
- Wear anti-static shoes to work with the controller.
- Take off any jewels (a ring, bracelet, or wrist watch) before working with the controller.
- Hold any component by its edge to avoid touching any terminals or parts.
- To store or carry any component, place it in an anti-static bag.
- Do not disassemble parts other than those specified in the procedure.
- Take care when connecting or disconnecting cables. A damaged cable can cause a short in the electrical circuit.
- When installing a Flexible Flat Cable, route the cable so it is not pinched by other components and is out of the path of the system unit cover.
- Prevent damage to the connectors by aligning connector pins before you connect the Flexible Flat Cable. Misaligned connector pins can cause mechanical damage to system components.
- When disconnecting a Flexible Flat Cable, always pull the strain-relief loop first before remove the Flexible Flat Cable.

ABOUT SKIN ULTRA

PRE INSTALLATION

Please check the packing list that was sent to you together with your Skin Ultra unit(s) and make sure that you received all the components.

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

'Displax Connect', the Control Panel where Skin Ultra 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 Ultra, the settings are stored in the Touch Controller, so you can switch to a PC with another Operating System. See Spec File for 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 Ultra to work properly.

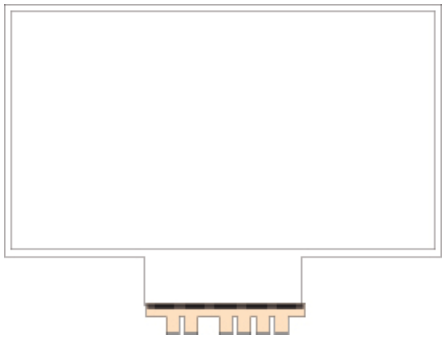
Avoid using frontal USB ports on desktop PCs. Traditionally these ports don't comply with USB standards and may not provide enough power for Skin Ultra to run properly.

TOUCH SENSOR

The Touch Sensor is available in 4 different versions:

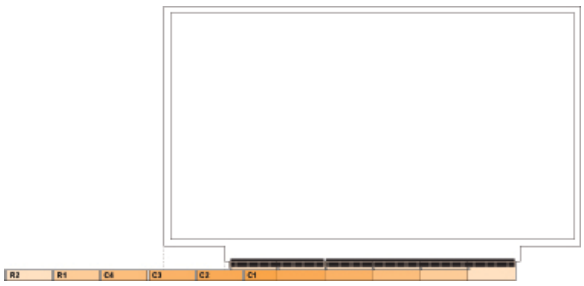
- Bottom tail short connectors
- Side tail short connectors
- Bottom tail long connectors
- Double tail long connectors

Each is composed of a transparent polymer film with a conductive grid and 1 polyester film Flexible Flat Cable (FFC).

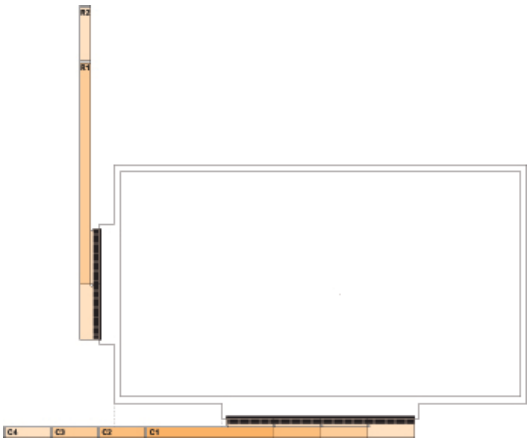


1. Skin Ultra – bottom tail short connectors

2. Skin Ultra – side tail short connectors



3. Skin Ultra – bottom tail long connectors



4. Skin Ultra – double tail long connectors

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

http://displax.com/downloads/FAQ/DisplaxSkinUltraStandardDrawings.php

TOUCH CONTROLLER

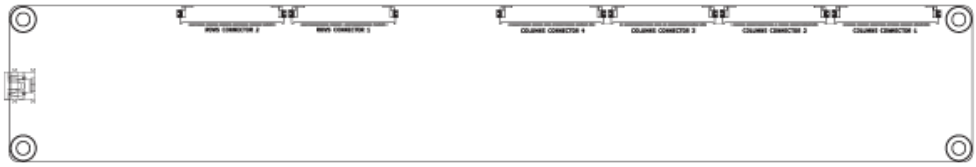
There are two different Touch Controllers available for Skin Ultra. One has 6 connectors on the same side. The other has 4 connectors on one side and 2 on the other.

The Touch Controller *6x0 connectors* is a fiberglass board of 277 x 45 x 9,5mm.

The screw holes are M3 or M3.5.

This Touch Controller can be used with the following Touch Sensors:

- Bottom tail short connectors
- Side tail short connectors
- Bottom tail long connectors
- Double tail long connectors

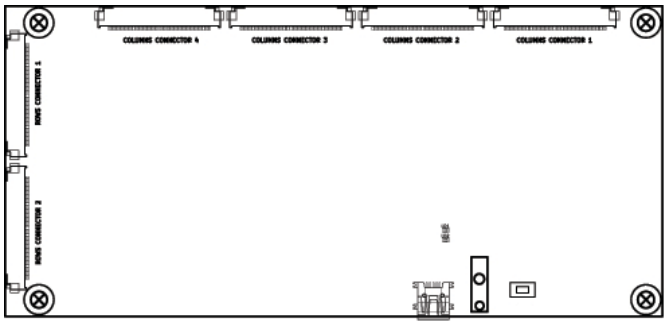


The Touch Controller *4x2 connectors* is a fiberglass board of 160 x 75 x 8mm.

The screw holes are M3 or M3.5.

This Touch Controller can be used with the following Touch Sensors:

- Bottom tail long connectors
- Double tail long connectors



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

LAMINATION GUIDE

OVERVIEW

Before you start the installation of the sensor, make sure you have the following tools available:

- Solution of 10% good quality detergent (dishwashing) in distilled or bottled water
- Liquid sprayer/atomizer
- Soft cleaning lint free cloth
- Squeegee
- Sticky tape (masking tape)

The sensor comes with the permanent adhesive applied to one surface which is exposed when the protection film is removed. This protection film that you need to remove is marked with a sticker.

The Touch Sensor is applied to the substrate using a solution of 10% detergent in water. It usually takes at least 24 hours for the water used in the installation process to sufficiently evaporate and the adhesive to bond to the substrate. The installation for sizes over 40'' requires at least two persons.

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.

A soft cloth should be used if the Touch Sensor requires cleaning. Clean from the center of the foil out to the edges of the Touch Sensor.

Once the Touch Sensor is dry, you can attach the Touch Controller.

If water bubbles remain under the sensor, do not be tempted to pierce the sensor to remove them. These bubbles should evaporate over time.

It is important to ensure that no particles of dust remain under the film. It is possible, immediately after lamination and prior the touch sensor starts to dry, to carefully lift the sensor to remove any particles and carefully reapply using water and the squeegee.

INSTALLATION PROCEDURE

Dirt and other contaminants allow pockets of air that undermine the necessary seal for a good installation. Thoroughly clean the substrate, making sure it is free of dust, oils or grease:

a. Use the alcohol to clean the substrate just before lamination to clean oils and grease;

b. Use the detergent solution and the squeegee to clean the substrate;

Decide on the correct position of the Touch Sensor before starting the lamination process, and place sticky tape to mark the touch screen boundaries.

Apply the non adhesive side of the Touch Sensor to an adjacent window or other suitable surface. Spray the substrate with water, making sure the Touch Sensor is held against the surface.

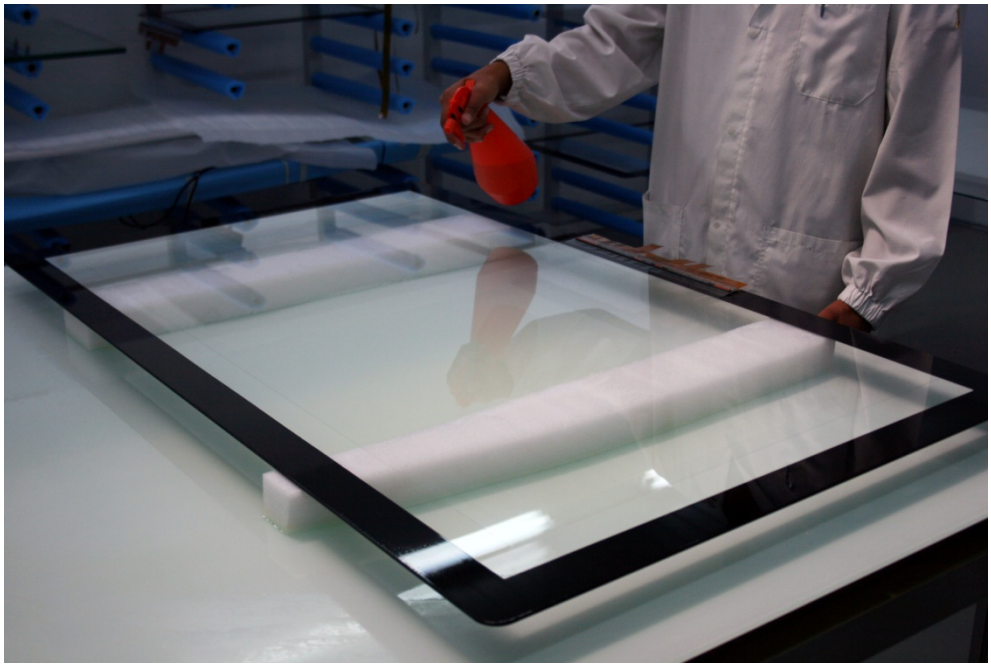
Wet your fingers and carefully release the protection film from the Touch Sensor's adhesive side.

If you have to place the Touch Sensor in the same place where you will perform the final lamination, clean this area before you perform the lamination of the Touch Sensor.

While you remove the protection film, spray the adhesive surface with the detergent solution. It is important to pull back the protection film close to the Touch Sensor and make sure it doesn't lift off the substrate.

Align the Touch Sensor at the top of the substrate, and then slowly lower the Touch Sensor on to the substrate.

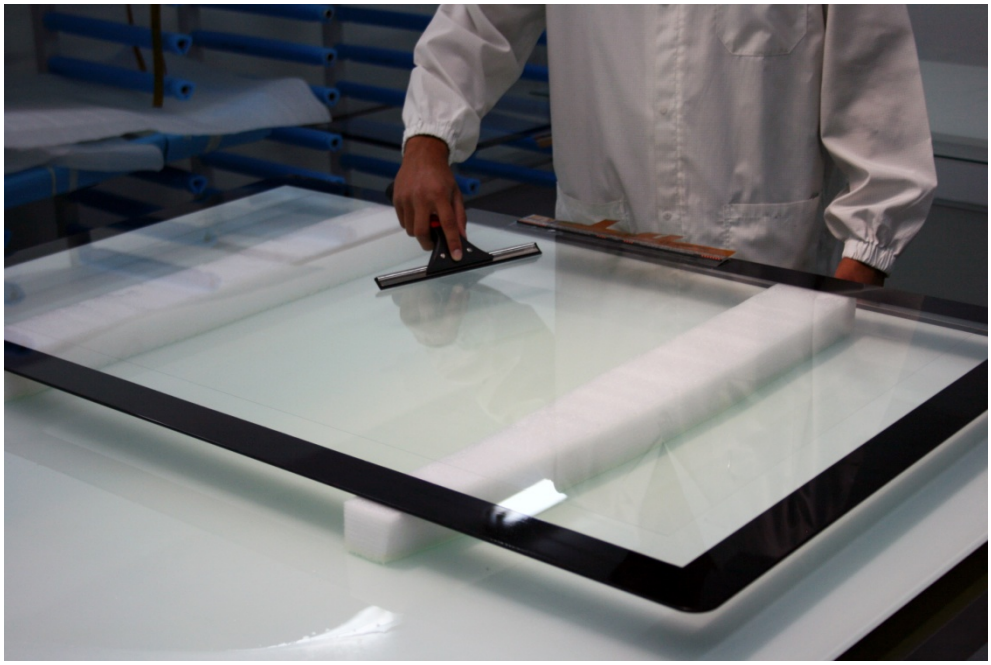
Apply the Touch Sensor with adhesive to the substrate, and apply a fine mist of detergent solution.



Use the squeegee to laminate the adhesive to the substrate, ensuring no particles or dirt is underneath.

1. Gently squeegee the water out, ensuring the Touch Sensor is correctly positioned and without any dirt or particles;

2. When you are sure the lamination process is clean, without any dirt or particles, you should repeat the process applying a fine mist of detergent solution, but now you can apply more pressure to the squeegee to remove the water and make the lamination permanent.



Once the Touch Sensor is in place, carefully dry the surface and the area around it and leave to dry for some time.

If water bubbles remain under the sensor, do not be tempted to pierce to the sensor to remove them. These bubbles should evaporate over time.

Once the Touch Sensor is dry, you can attach the Touch Controller. Bear in mind that you should only connect the Touch Controller to the PC once you installed the 'Displax Connect' software. For more details, please refer to the 'Displax Connect' chapter.

INTEGRATION GUIDE

TOUCH PERFORMANCE VARIABLES

There are several factors that influence the touch performance of your setup. It is important to know them and to understand how they affect it, when making your integration.

- **Glass thickness:** a thicker glass requires more GAIN than a thinner glass. The glass should be as thin as possible, as long as it fulfills safety and legal requirements.
- **LCD:** some displays emit more electro-magnetic noise than others and that radiation is detected by the Touch Sensor. When selecting the LCD make sure to test it to ensure correct functioning.
- **Sensor size:** the sensor acts as an antenna that captures electromagnetic radiation, so the bigger the sensor, the bigger the antenna is.
- **Environment:** the level of electro-magnetic noise varies from place to place. Sites with large machinery, for instance, traditionally have a higher level of noise.

Air gap

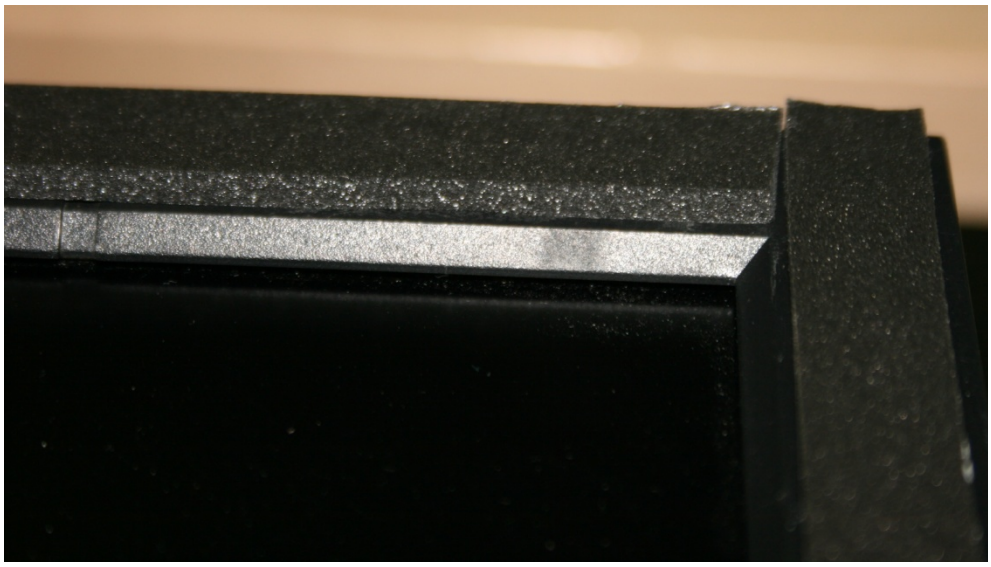
When creating a structure for your touch display, it is important to try to control as much as you can these variables. Ideally the LCD panel and the Touch Sensor should be as close as possible, to minimize the parallax effect. This is possible; however, it is influenced by the aforementioned variables. Adjusting the distance between the LCD panel and the Touch Sensor is a good way to counterbalance the negative effect of these variables. A bigger air gap makes the Touch Sensor less sensitive to the noise from the LCD. Having a structure with the possibility to adjust the distance between the LCD and the Touch Sensor gives more flexibility to make adjustments and ensure the best touch performance.

INTEGRATING THE TOUCH SENSOR

This chapter assumes you already have the Touch Sensor laminated on glass, and you will integrate that in your structure. For more information on how to laminate, please refer to the lamination chapter.

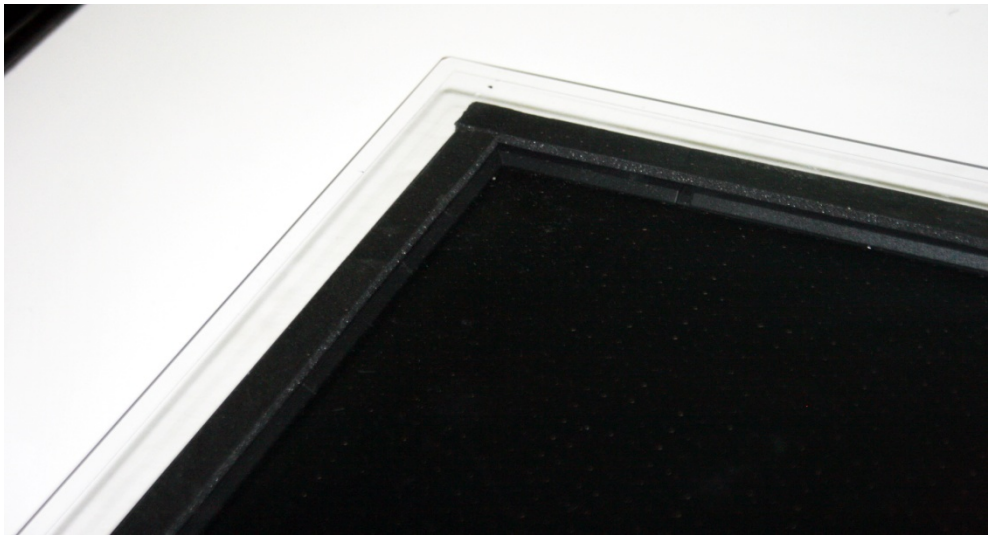
Ensure the side of the glass with the Touch Sensor will be facing the LCD panel.

Air gap: our recommended method to create an air gap between the LCD and the glass is using 3M VHB tape. Make sure it is non sulphurous and maintains its adhesion properties at any temperature that may be experienced during the normal use of the LCD.



TIP: the backlight of the LCD is usually the noisiest part of the display. Traditionally, this component is placed in one of the sides of the displays. If your Skin Ultra is a side tail version, the sensor side where the Touch Controller attaches should be on the same side of the backlight because the signal is stronger here, thus minimizing the impact of the noise from the backlight. Test the sensor in both positions to be sure you use in the most favorable conditions. Contact your LCD manufacturer for more information regarding the backlight location.

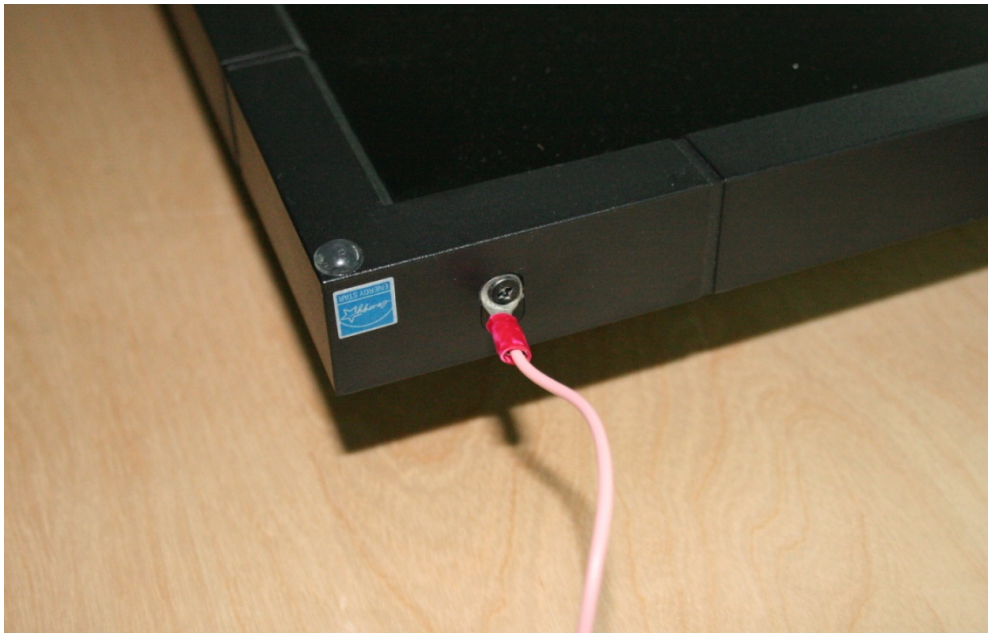
Make sure the glass is clean on both sides. To clean the glass end use a glass cleaning solution. To clean the sensor end use the same solution recommended for lamination (10% good quality detergent in distilled or bottled water). In both cases use a soft lint free cloth.



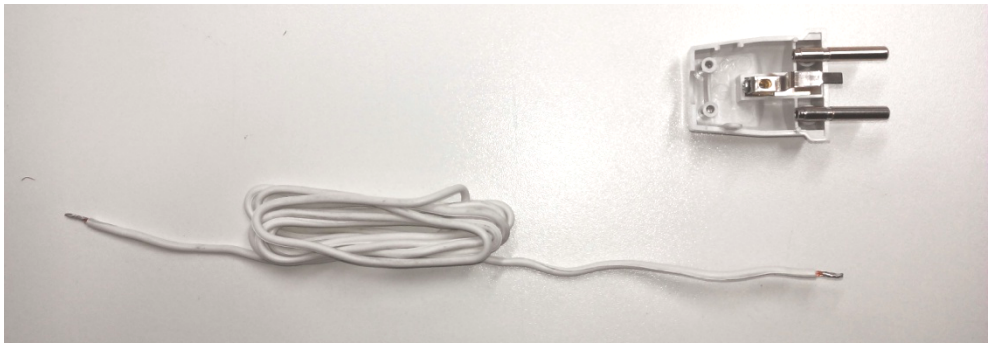
INTEGRATING THE TOUCH CONTROLLER

Define the position of the Touch Controller:

- Make sure the Flexible Flat Cables reach comfortably the Touch Controller.
- Make sure there is a good access to the USB cable in that location.
- Grounding the Touch Controller is required. Search for grounding options in the LCD chassis when defining the position of the Touch Controller because grounding to the LCD chassis should be your first option.



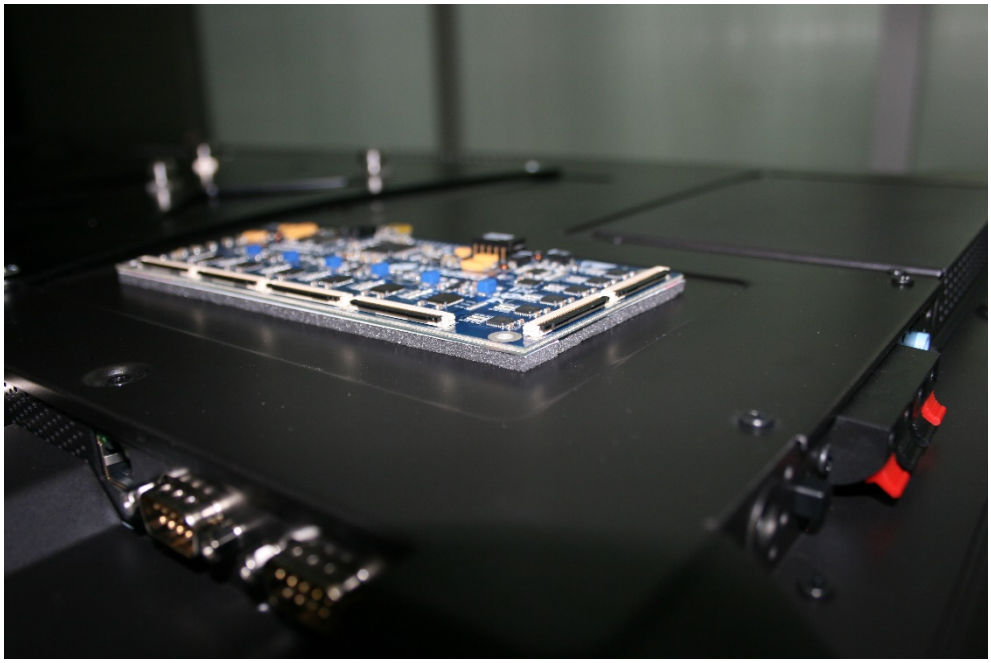
- Sometimes the LCD only has plastic casing and grounding to the LCD chassis is not an option. Other times the LCD electricity plug doesn't ground. In these cases, use the power socket to ground the Touch Controller. Make sure there is a good access to the ground cable.



TIP: Avoid, when possible, placing the Touch Controller near the LCD power source.

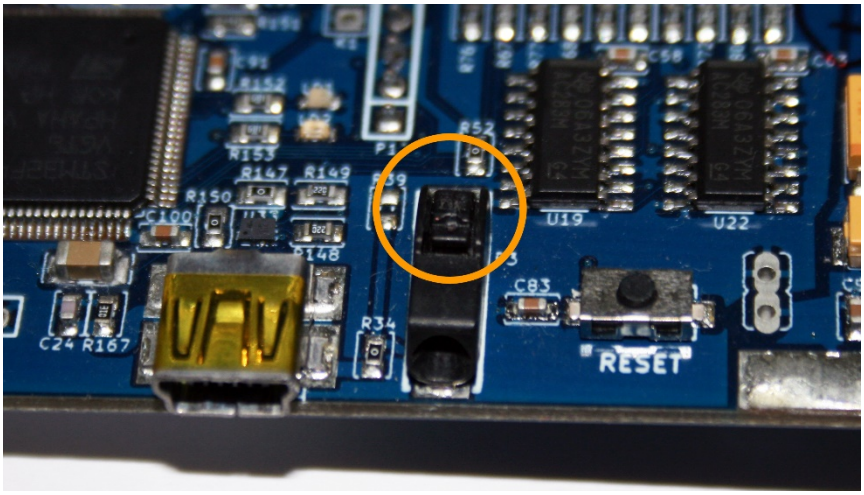
Attach the Touch Controller to the back of the LCD:

- The Touch Controller cannot be directly placed on metal.
- Use 3M VHB to attach the Touch Controller to the back of the LCD.
- It's possible to use screws to attach the Touch Controller to the LCD. This procedure grounds the Touch Controller. The LCD still needs to be grounded.
- Make sure to have a minimum distance of 3mm from the Touch Controller to the LCD, to ensure that the electro-magnetic noise from the LCD doesn't affect it.



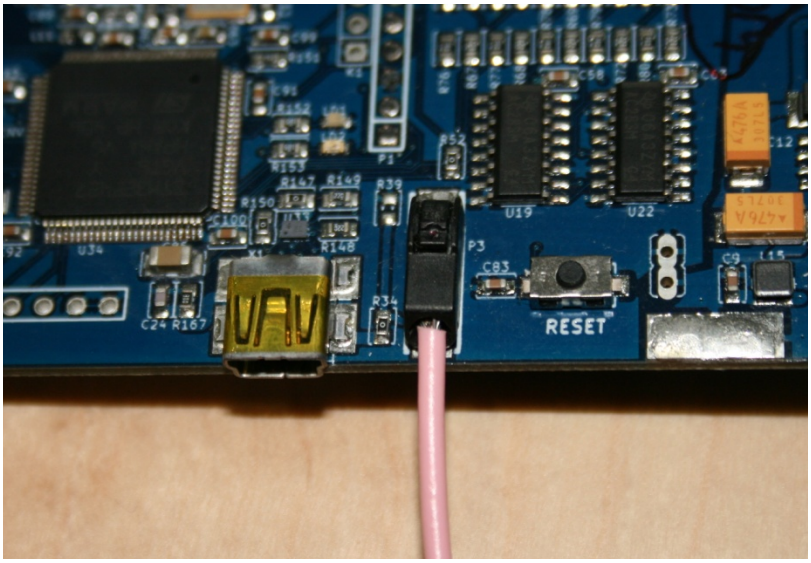
Connect all the cables to the Touch Controller:

- Connect the ground cable to the Touch Controller and do the grounding to the LCD chassis or to the power socket. With a tip of a pen or with a paper clip unlock (orange circle) the ground cable connector and at the same time insert the ground cable. Make sure it stays securely fixed.

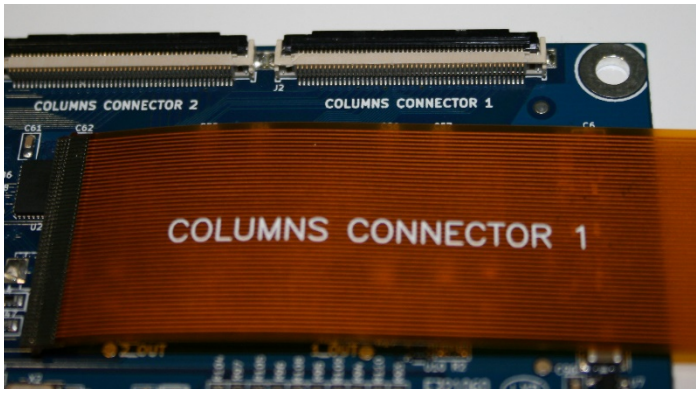


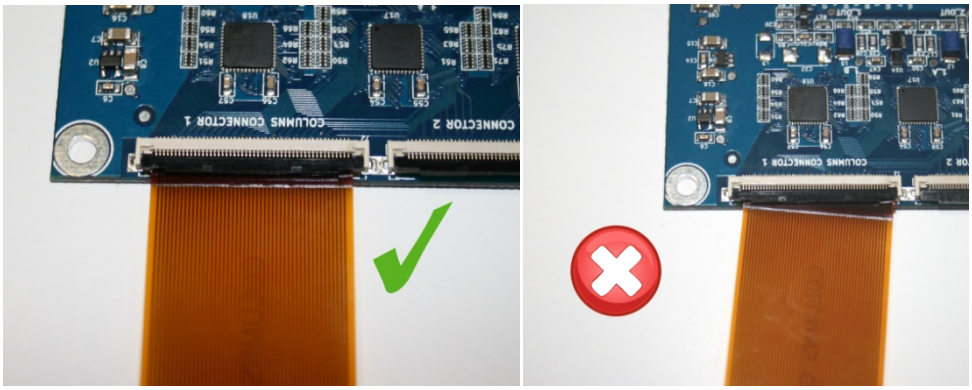
- Connect the other end of the ground cable to either the LCD chassis or to the power socket.

Note: Starting on July, 2015, the Touch Controller no longer includes a physical reset button. To execute the reset function, please refer to 'Displax Connect' chapter.



- Connect the Flexible Flat Cables. The metal side of the Flexible Flat Cables must be facing the metal side of the clamps on the Touch Controller. Also make sure the metal connectors on the Flexible Flat Cables are clean and free from dust before connecting them.
- Short connectors version: there is only one position where the connectors of the Touch Sensor align with all the clamps of the Touch Controller
- Long connectors version: the connectors of the Touch Sensor are numbered to match the clamps of the Touch Controller, as seen in the image





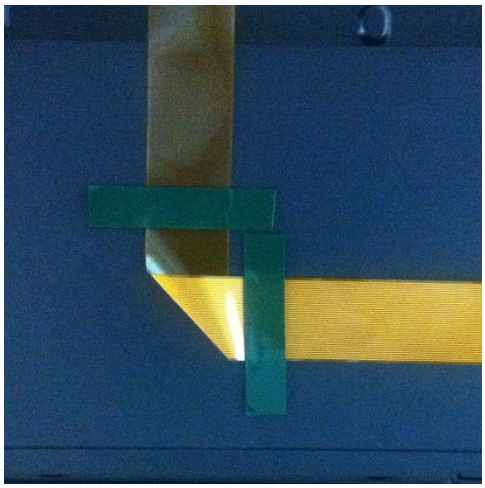
ROUTING THE FLEXIBLE FLAT CABLES

The Flexible Flat Cables are a delicate component of Skin Ultra. You need to handle them carefully to avoid damaging your unit.

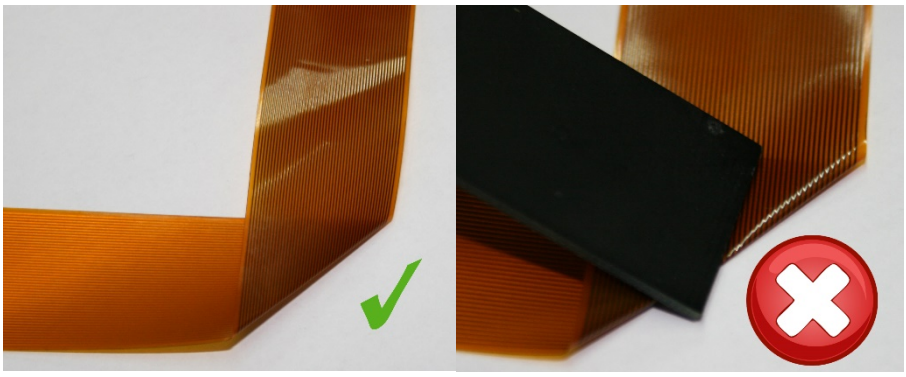
This chapter focus on the long connectors version of the Touch Sensor since there's no need to route the Flexible Flat Cables in the short connectors version.

Here is what you can do to route them in your integration:

- You should avoid having loose Flexible Flat Cables inside your structure.
- The cables can be taped to the back of the LCD, even if it is metal based. To do so use 3M 1350 tape or similar. Please ensure that the tape maintains its adhesion properties at any temperature that it may be experienced to during the normal use of the LCD.



- Bending the Flexible Flat Cables at the sensor end is possible. However, it should be done carefully to avoid straining.



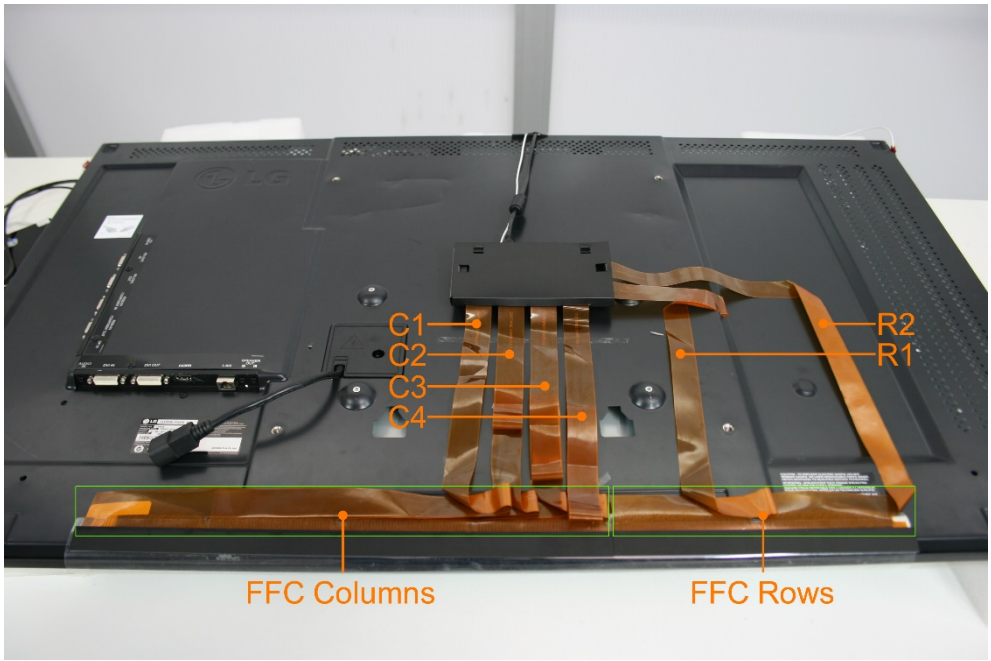
- You can gently crease the cables to route them inside your structure. This is a sensitive operation. To crease, gently apply pressure with finger tips only. The Flexible Flat Cables can be creased several times but always in different locations. You can't un-crease and re-crease in the same location as this might result in permanent damage. You must always crease the minimum number of times possible.

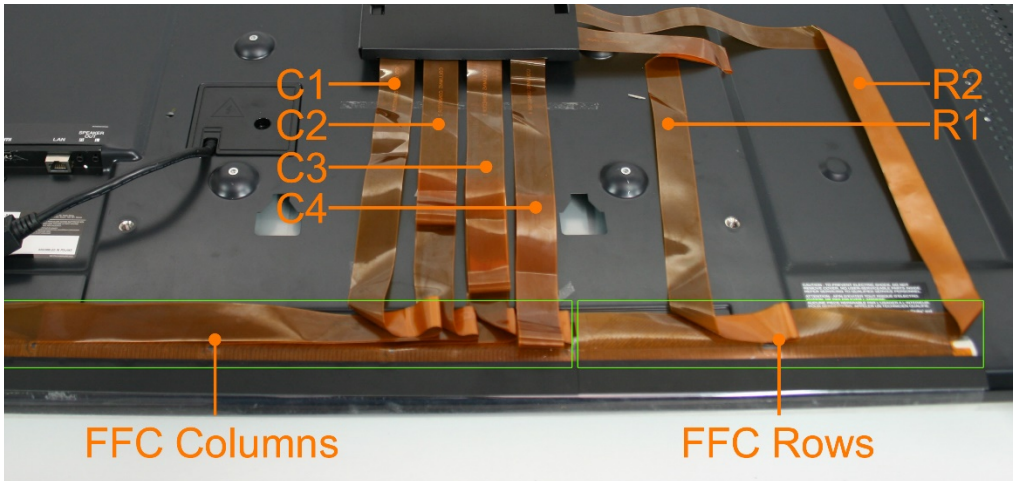
- You can crease at any point of the Flexible Flat Cable.
- The Flexible Flat Cables from rows can be doubled back, lined up and cross over each other.
- The Flexible Flat Cables from columns can be doubled back, lined up and cross over each other.
- The Flexible Flat Cables from rows must not be mixed with Flexible Flat Cables from columns. This will cause interference and degrade the touch sensor performance.

With the double tail version of Skin Ultra, the routing of the cables is straightforward and the FFC from rows usually don't touch the FFC from columns.

The bottom tail version of Skin Ultra's Touch Sensor was designed to make for an easier integration because the FFC are only in one side. However, you should be careful and avoid FFC from rows touching FFC from columns.

Typical integration setup:





C1 – Columns Connector 1

C2 – Columns Connector 2

C3 – Columns Connector 3

C4 – Columns Connector 4

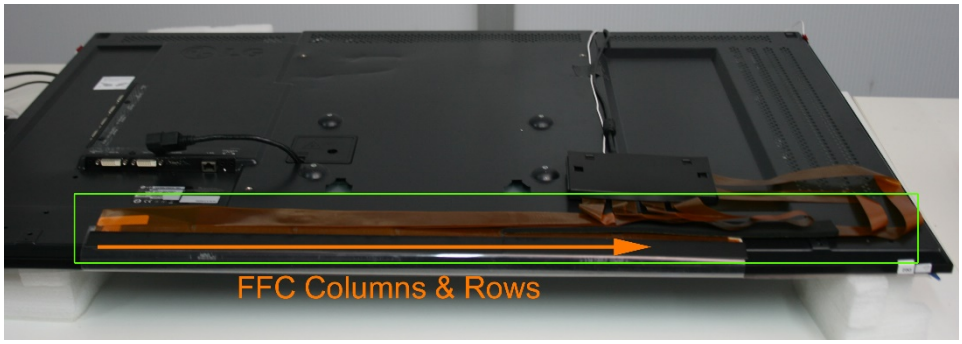
R1 – Rows Connector 1

R2 – Rows Connector 2

Notice that the FFC from rows and the FFC from columns are clearly separated to avoid crosstalk.

Alternative integration setup:

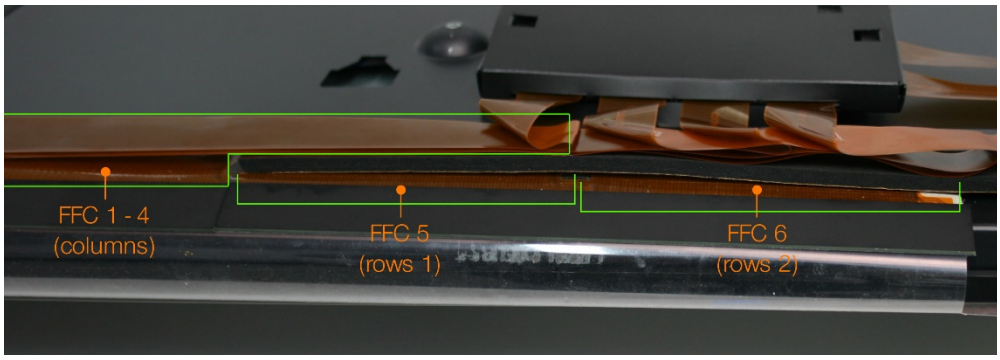
In some cases, the recommended integration setup is not possible. In these cases, there is an alternative setup.



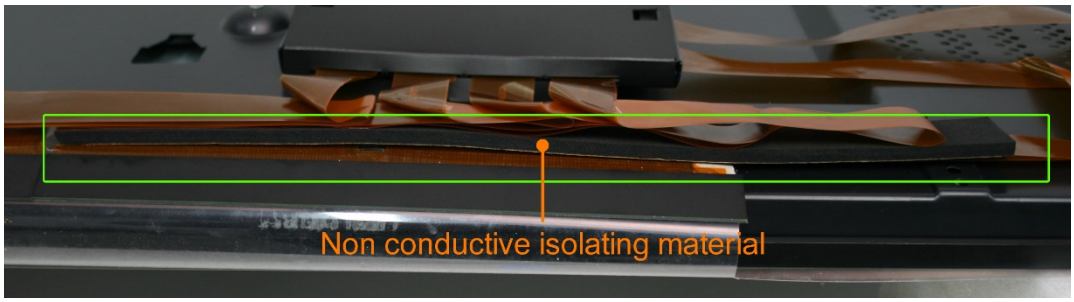
You can see in this bottom tail Touch Sensor integration that all the FFC (both rows and columns) are routed in the same direction.

The first FFC to the left is the Columns Connector 1, and that FFC stays on top of all others. The last FFC, on the right, is the Rows Connector 2. It stays below all the other FFC. This means that the 4th FFC (Columns Connector 4) is on top of the 5th FFC (Rows Connector 1). As explained before, FFC from rows cannot be in contact with FFC from columns.

Notice the foam between the 4th and the 5th FFC.



When the FFC from columns have to be lined up on the FFC from rows, it is required to ensure spacing as big as possible to isolate them. In this example we use non conductive 5mm foam. Make sure the material you use is non conductive, thick enough to isolate the noise and it withholds the temperature inside the structure. The way to know if the material is isolating the noise is through the "Skin Ultra Connect" software. Please refer to that chapter on this User Guide for more information.

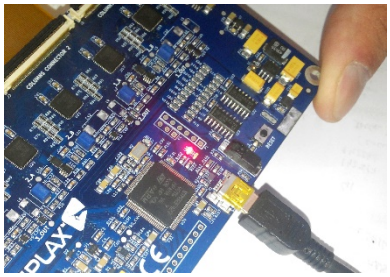


CONNECTING SKIN ULTRA

Download 'Displax Connect', the software required to configure Skin Ultra https://support.displax.com/pages/skinultra

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' currently runs on Windows (7 or higher), OS X (Yosemite and El Capitan) & Ubuntu (14.04 LTS). You need to configure your Skin Ultra 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, as long as it is supported by Skin Ultra. This is possible because the configuration settings are stored in the Touch Controller.

To see the list of all supported OS, please consult the product's 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 1.8.0 or higher.

MINIMUM REQUIREMENTS

Minimum requirements to run the 'Displax Connect':

RAM: 2 GB

CPU speed: 1.33 GHz

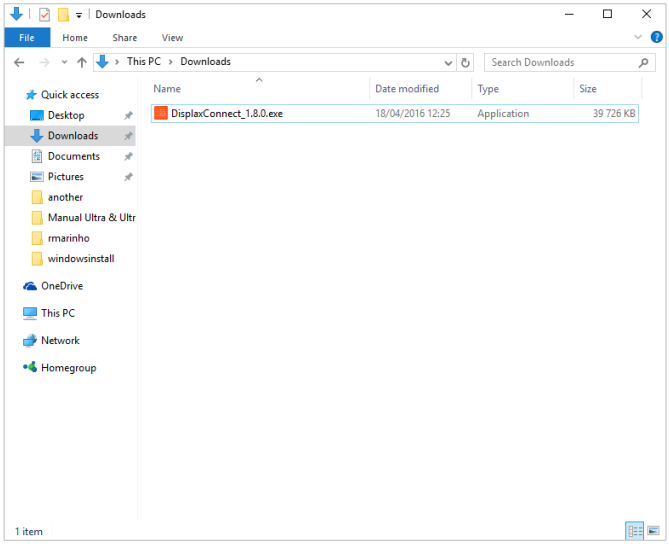
Graphic card supporting: Open GL 2.0

Minimum free disk space: 300MB

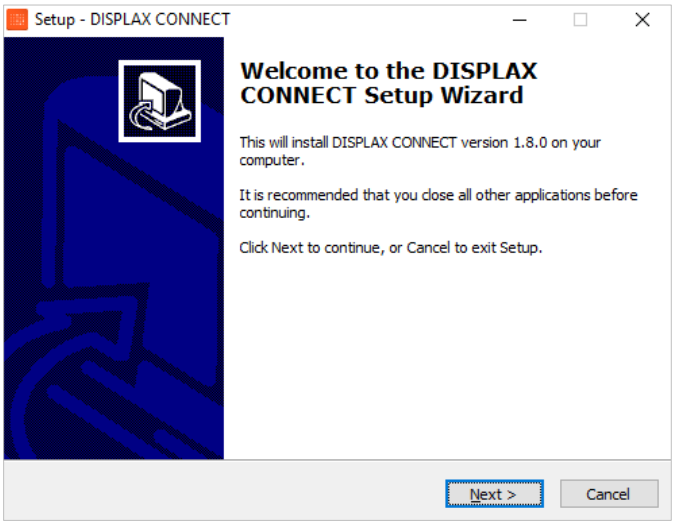
HOW TO INSTALL: WINDOWS 7 OR HIGHER

You should connect the Touch Controller to the PC, after the 'Displax Connect' installation process is successfully concluded.

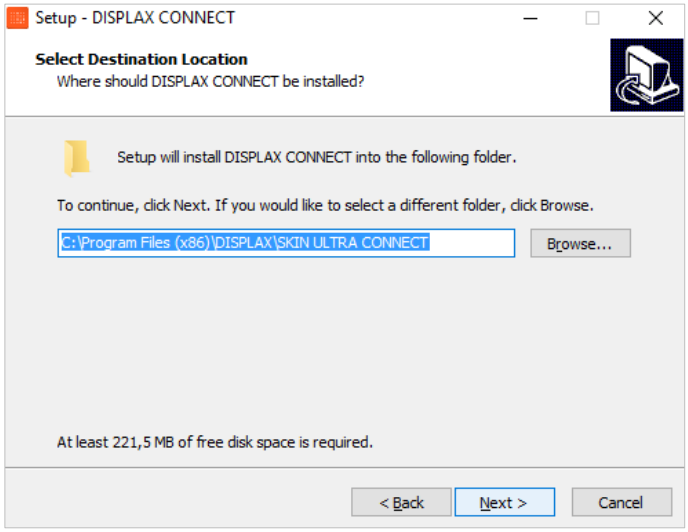
Double Click on the '.exe' file downloaded from the DISPLAX support website to start the installation process.



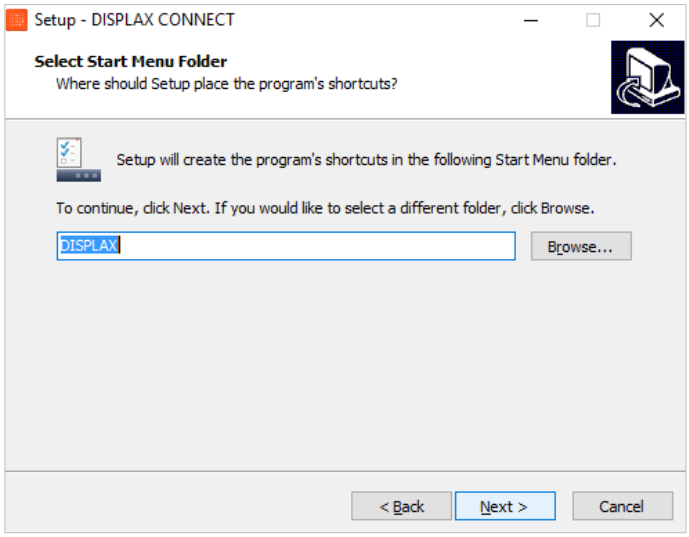
Having doubled clicked the '.exe' file the installation setup window will be displayed. Click 'Next' to start the installation process.



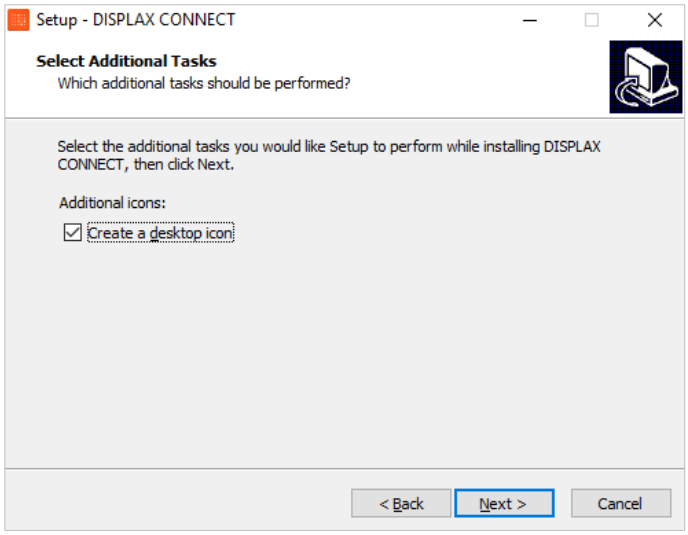
Select the desired folder for the installation, by default, the 64bits version is installed on the 'Program Files (x86)', the 32 bits version is installed on the 'Program Files' folder.



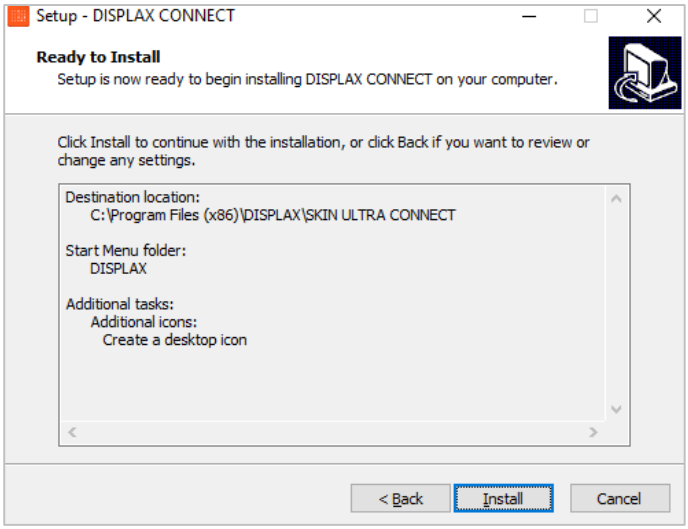
Afterwards, select where the shortcuts should be, click in 'Next' to maintain the default.



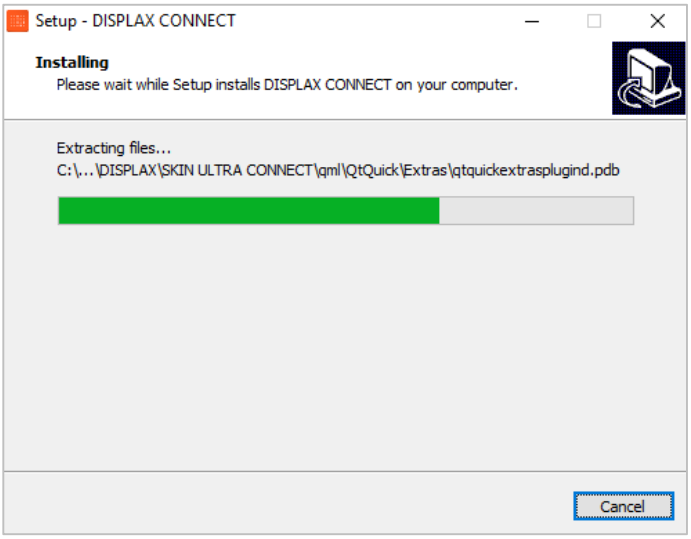
By default a desktop shortcut will be created.



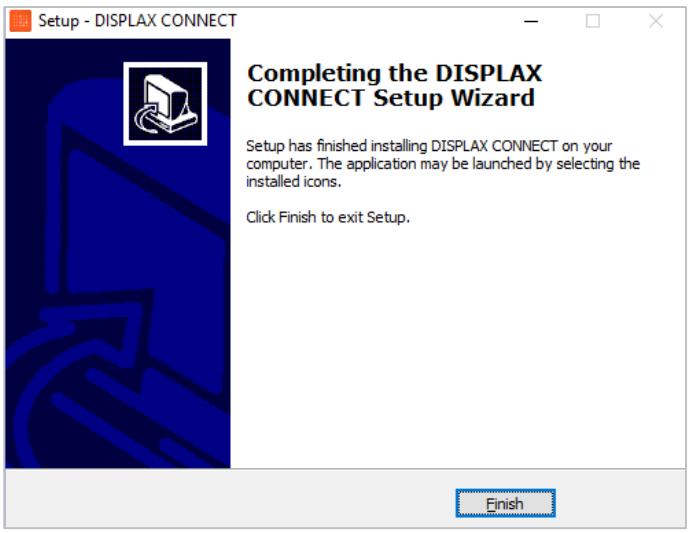
After selecting all content to install and folders to save the files, click in 'Install' to start the 'Displax Connect' installation.



The following image shows the installation in progress.

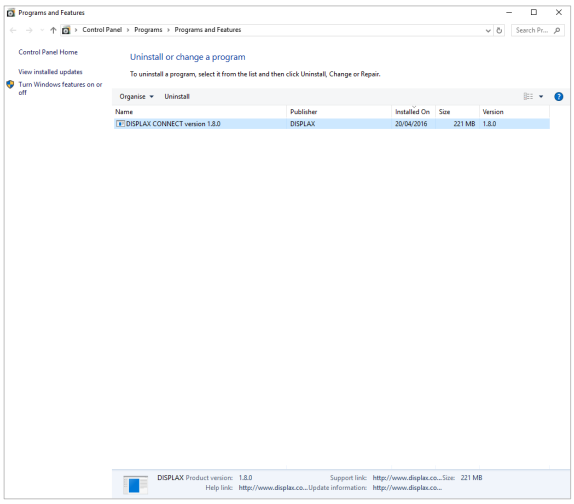


'Finish' to exit the setup.

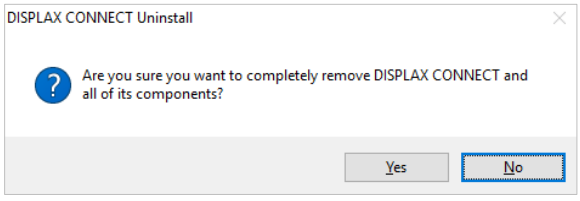


HOW TO UNINSTALL: WINDOWS 7 OR HIGHER

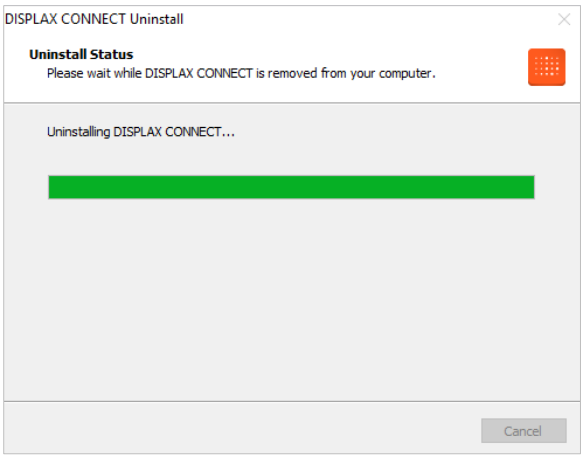
To uninstall 'Displax Connect' go to: 'Control panel'; 'All control panel items'; 'Programs and Features', and select the 'Displax Connect' application and make a left click, then select uninstall.



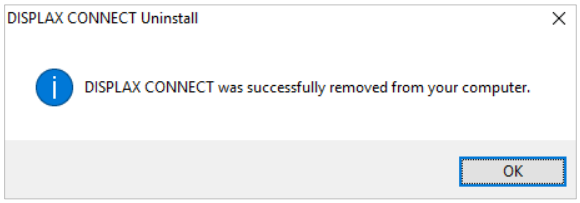
A message box will be displayed where you can confirm if you want to proceed with the uninstallation process. Click 'Yes' to uninstall.



The uninstallation process will start.

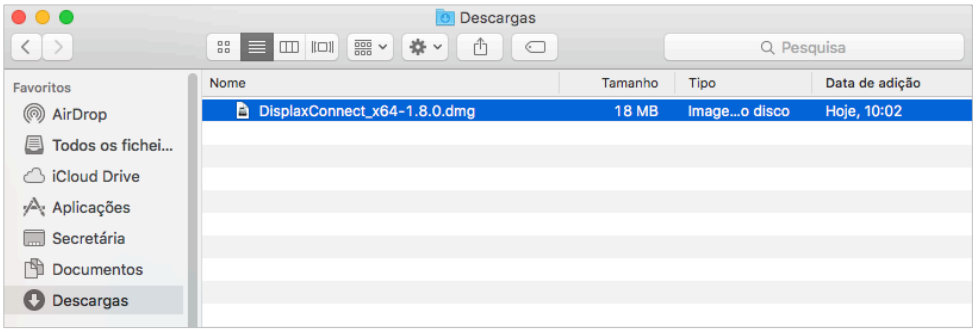


When the uninstallation process is concluded a report message will be shown.

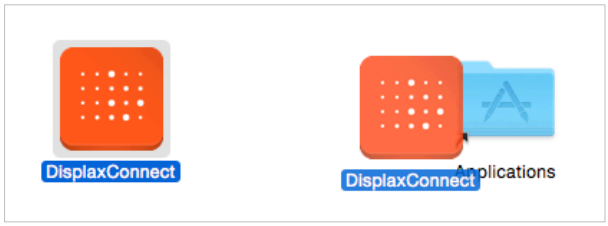


HOW TO INSTALL: MAC OS X

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 doesn't 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 with 'Skin Ultra'.

Note: If you have a previous version of Control Panel called 'Skin Ultra Connect' it should be manually removed **Before** installing the 'Displax Connect' newest version, 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.

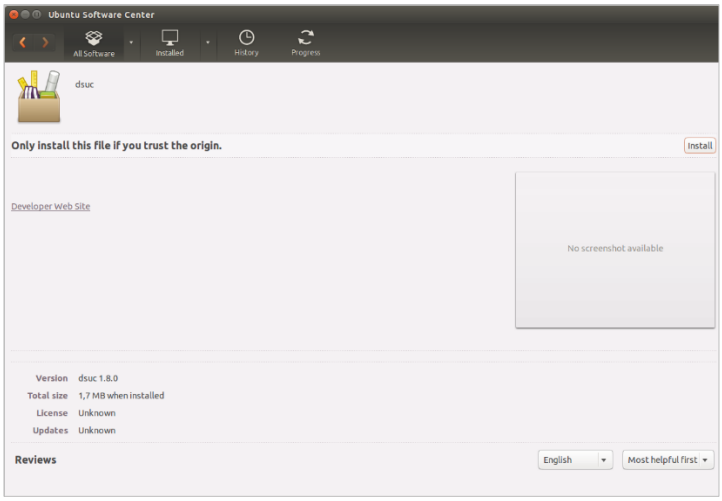
Select the 'DisplaxConnect' icon and drag it to the trash icon to uninstall it.

Before uninstalling TUIO it has to be stopped on the TUIO tab. Otherwise it will continue running.

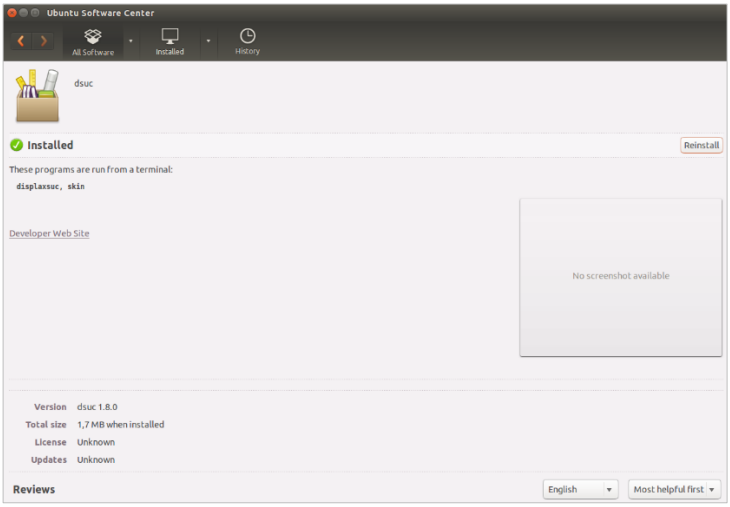
HOW TO INSTALL: UBUNTU

Double click the '.deb' file.

A new window (Ubuntu Software center) will be displayed, click on the 'Install' button to start the installation process (the user password is required for the installation).

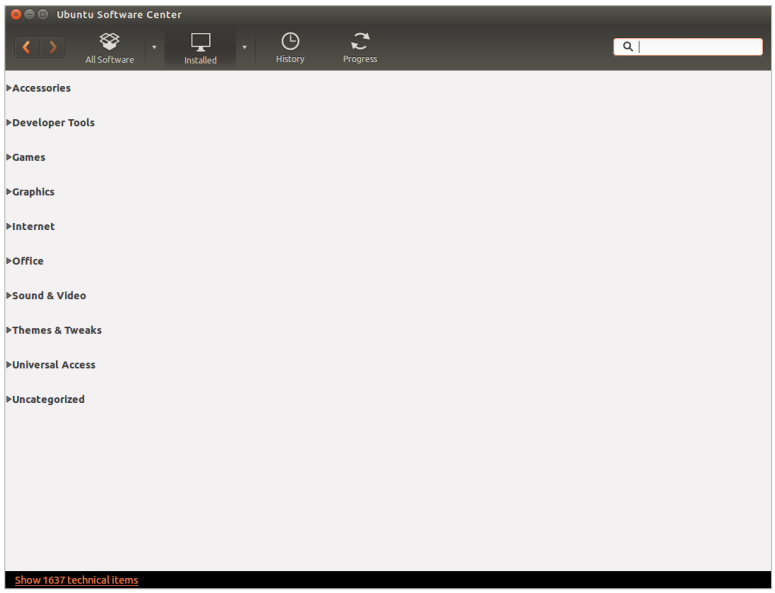


If the installation was successful, the label 'Installed' will be displayed.

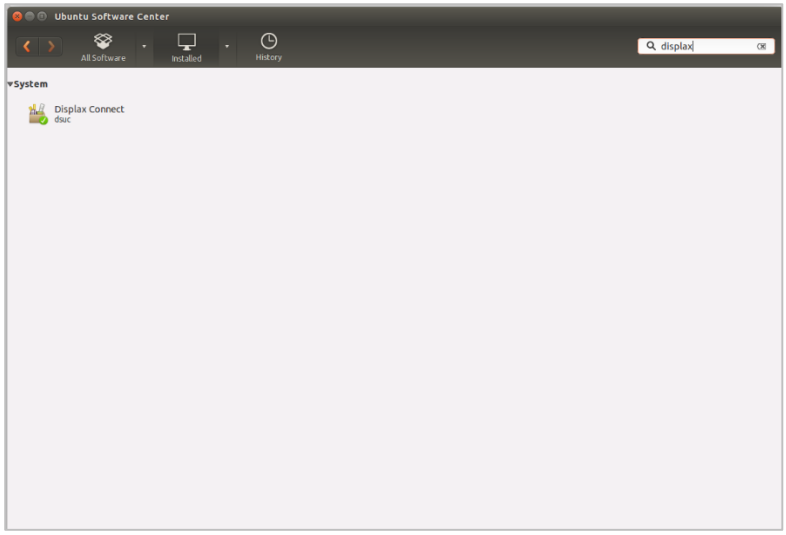


HOW TO UNINSTALL: UBUNTU

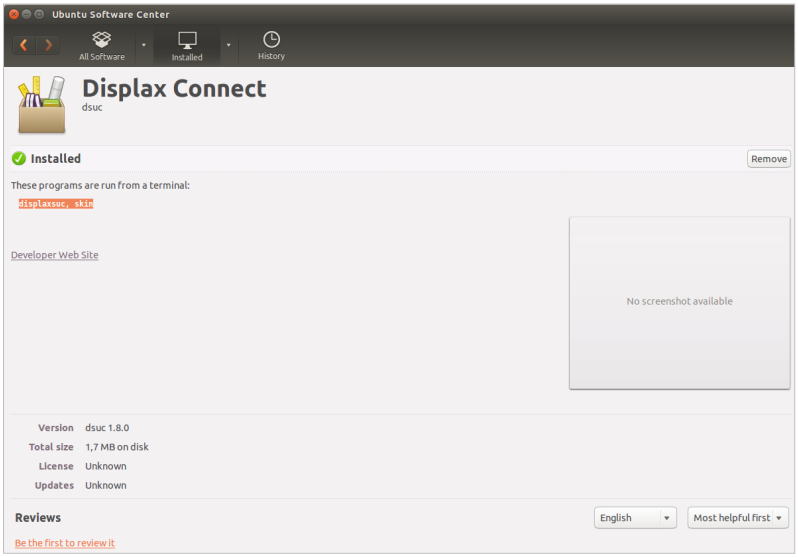
To uninstall ‘DisplaxConnect’ open the 'Ubuntu Software Center' and click on ‘Show technical items’ at the bottom of the window.



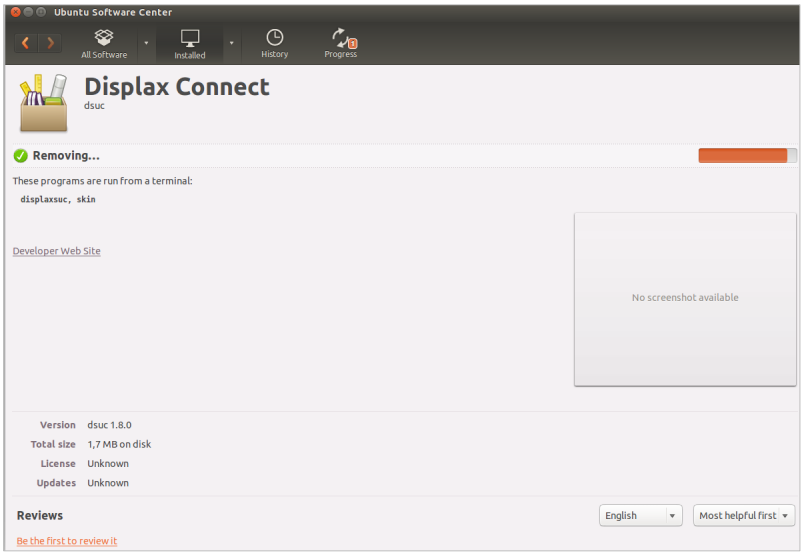
Then on the search tab write ‘DisplaxConnect’, the application will be shown. Click on it and you will be redirected to the application window.



Click on the 'Remove' button.

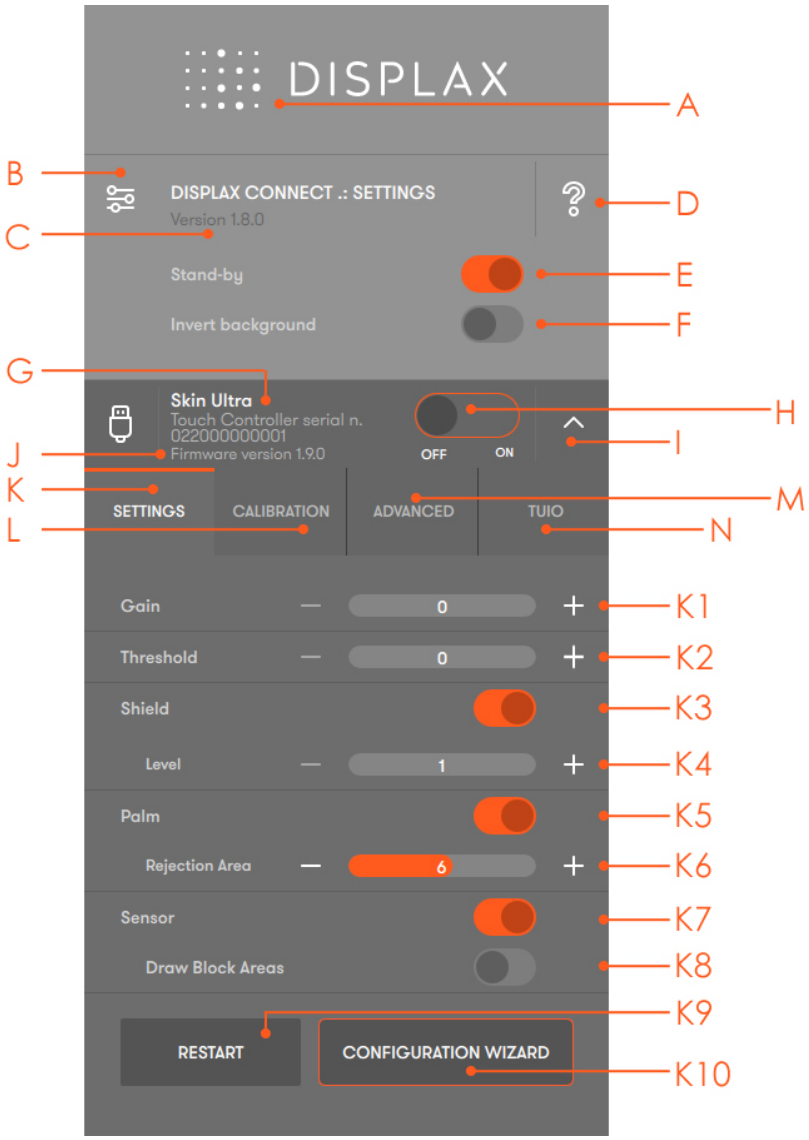


The uninstallation process will be started.



HOW TO USE 'DISPLAX CONNECT'

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



A. Displax Connect: drag floating menu.

B. Hide and show 'Displax Connect' settings.

C. Displax Connect version.

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

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. Skin Ultra serial number.

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

ON: Operating system will receive touch events from Skin Ultra.

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

STAND-BY: Operating system will temporarily not receive touch events from Skin Ultra. 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.

I. Hide/show Touch Controller settings.

J. Touch Controller firmware version.

K. Settings tab: 'Displax Connect' configuration settings.

K1. Gain: adjusts the signal strength injected by the Touch Controller on the Touch Sensor. Gain values range between 0 and 7.

K2. 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).

K3. Shield: electromagnetic shielding that reduce noise that may exist between the Skin Ultra and the LCD.

K4. 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.

K5. Palm: allows the rejection of areas with dimensions larger than a finger, such as a hand or an arm.

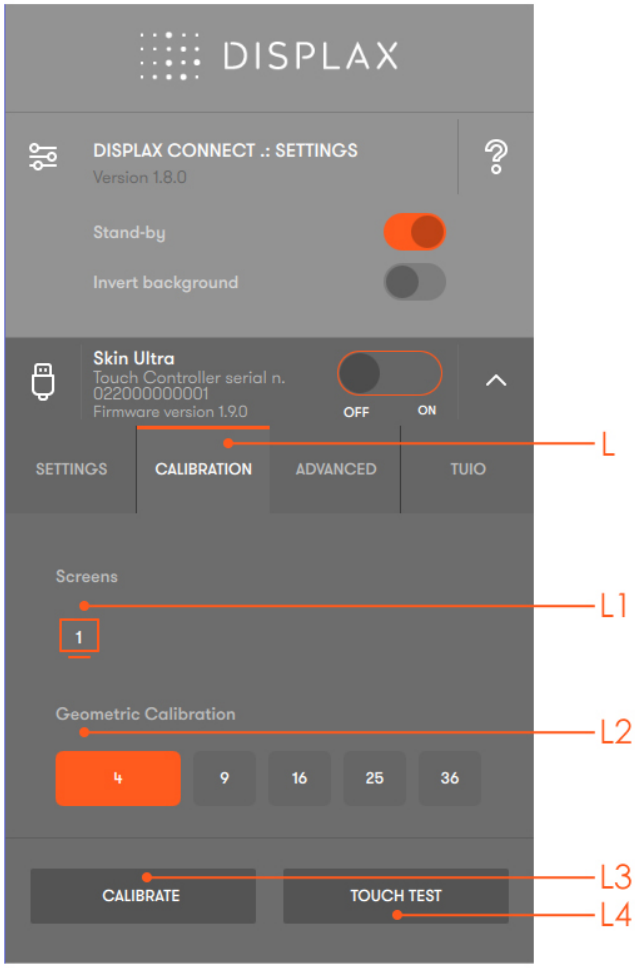
K6. Rejection area: allows the rejection of touches from a hand, arm or other object placed over the touch sensor.

K7. 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.

K8. Draw block areas: allows disabling the touch on specific Touch Sensor active areas, where you don't want touch being processed.

K9. Restart Touch Controller: if for some reason it is necessary to restart the Touch Controller.

K10. 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.



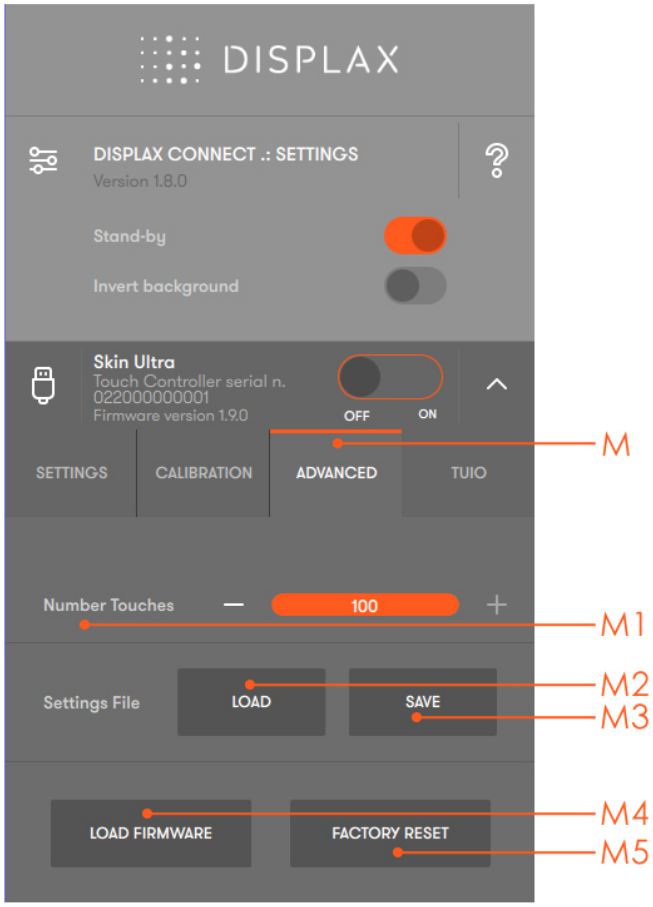
L. Calibration tab: calibration process to match the physical touch with the Operating System digital coordinates.

L1. Screens: select the display where you want to perform the geometric calibration.

L2. Calibration points: Number of points used to perform the geometric calibration. Four points is the recommended standard calibration. Other types of calibration are available for more complex setups. Please see the advanced calibration chapter.

L3. Calibrate: Button to start the geometric calibration.

L4. Touch Test: Touch Test app.



M. Advanced tab: advanced configuration tools.

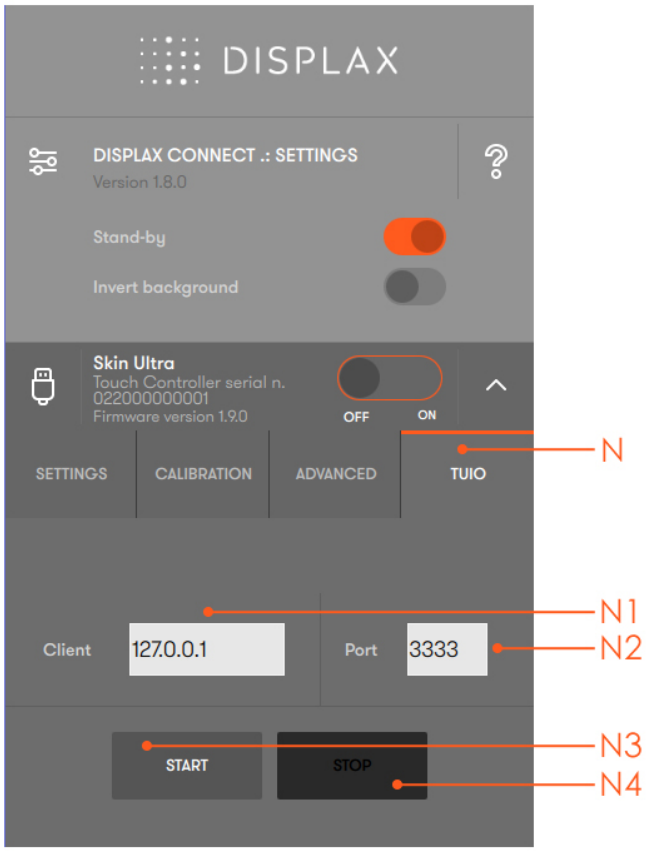
M1. Number of touches: limits the number of touches reported by the Touch Controller (always between 1 to 100 touches). This feature is available depending on the version of the Touch Controller and firmware you are using.

M2. Load settings file: allows loading previously saved configuration files. The user has to wait 10 seconds after changing settings, before changing to other settings, in order to correctly save them into the controller.

M3. 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.

M4. Load firmware: allows to load a firmware file to the Touch Controller.

M5. Factory reset: sets the Touch Controller to its default settings.



N. TUIO tab: touches transmission protocol.

N1. Client: introduce the client IP.

N2. Port: introduce the client port number.

N3. Start: starts sending TUIO events from the chosen device to the defined client.

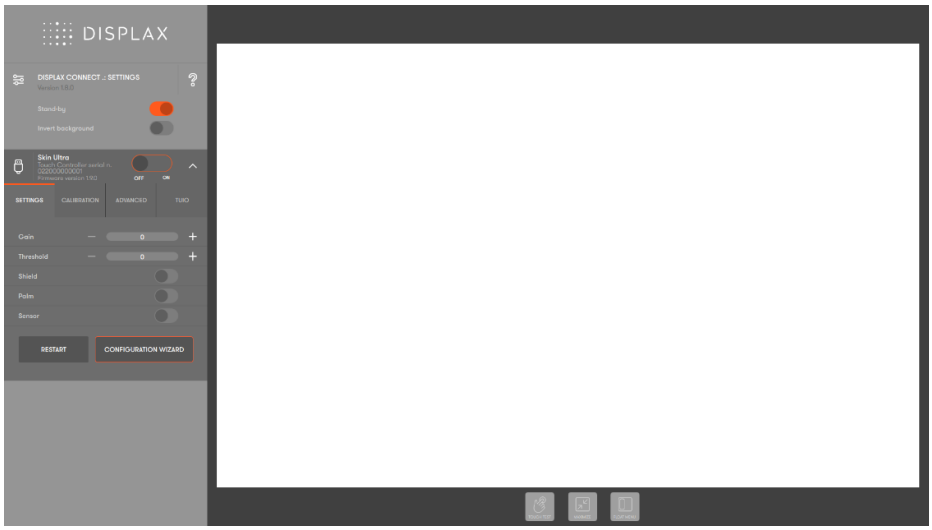
N4. Stop: stops sending TUIO events from the chosen device to the defined client.

O. Touch Test: Touch Test app.

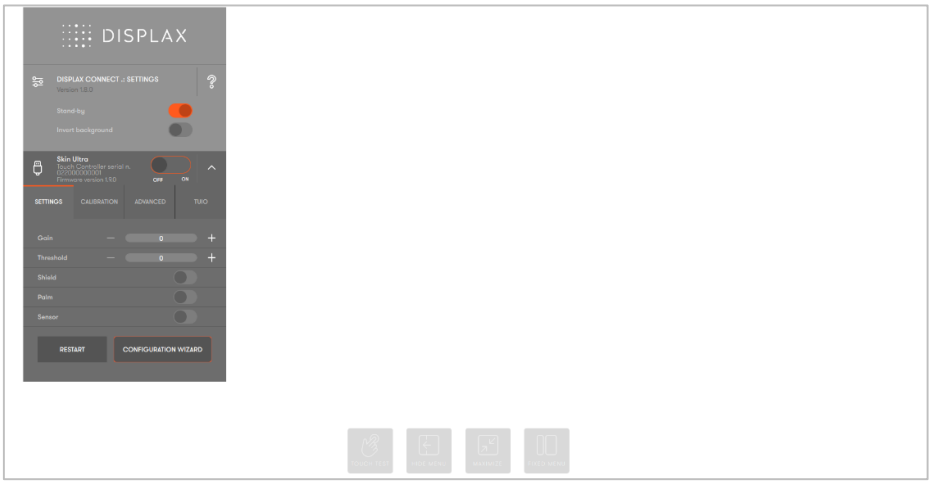
P. Hide Menu: Hides 'Displax Connect'.

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

R. Fixed and Float menu: Transition between the fixed and the floating 'Displax Connect' view.



Fixed view



Float view

KEYBOARD SHORTCUTS

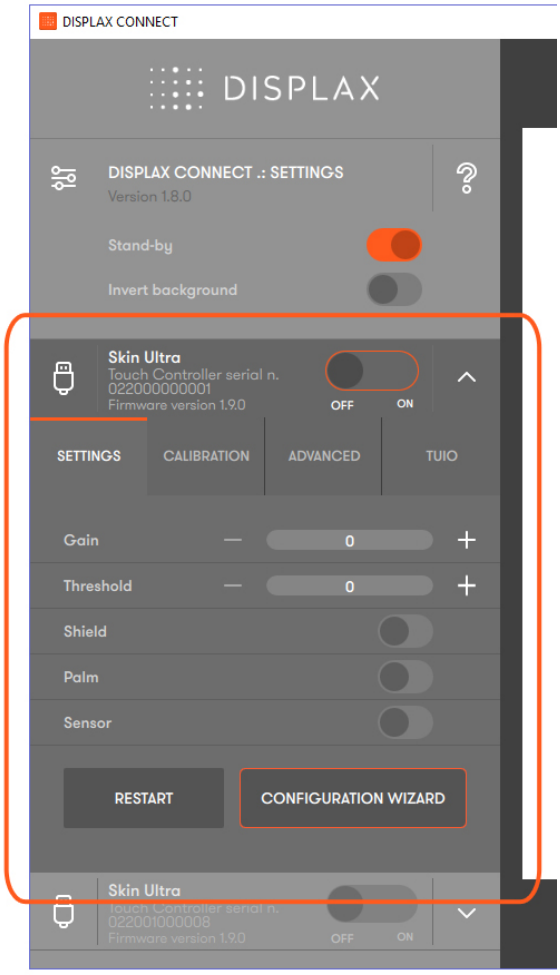
The keyboard shortcuts are presented in the help icon.

	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

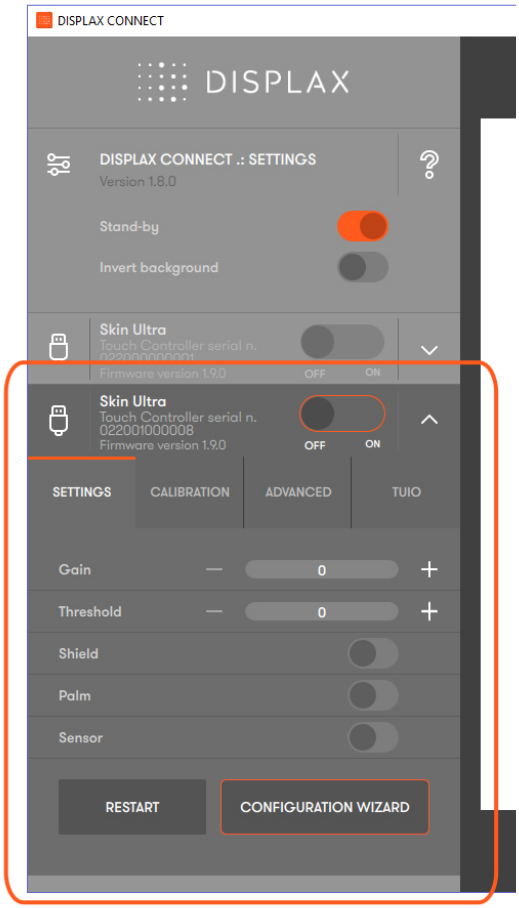
MULTIPLE DEVICES

Two or more units of Skin Ultra 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 the USB standards and supply enough energy to power Skin Ultra.

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



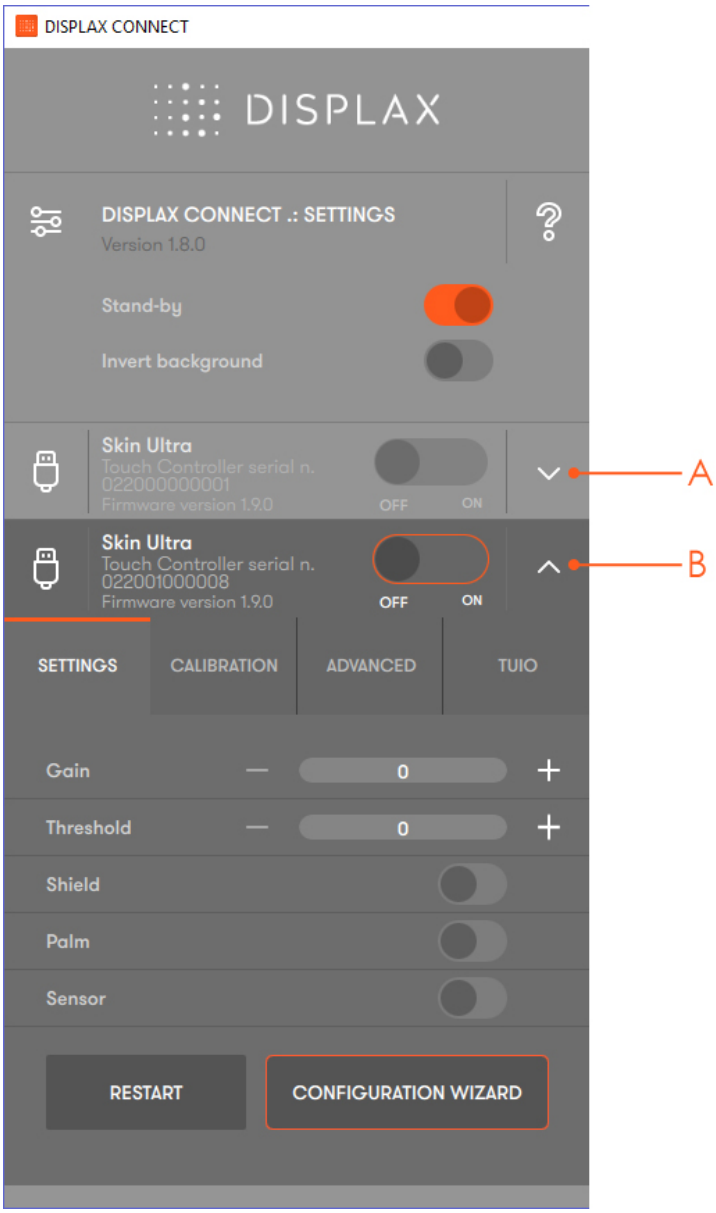
Two Skin Ultra connected:
Skin Ultra serial number: 022000000001 expanded



Two Skin Ultra connected:
Skin Ultra serial number: 022001000008 expanded

You can identify each unit by the serial number (shown on the screen and written in the Touch Controller). 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

To configure 'Displax connect' you have two possibilities, by running the 'Configuration Wizard' or by manually adjusting the Gain, Threshold and Shield level.

We recommend using the 'Configuration Wizard'. This feature is available depending on the version of the Touch Controller and firmware you are using.

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

CONFIGURATION WIZARD

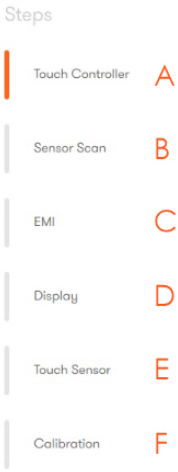
The 'Configuration Wizard' was developed to analyse and to configure the Touch Sensor and the Touch Controller parameters. It helps you to achieve a configuration based on objective data and not on subjective user input. It can always be reviewed by the user.

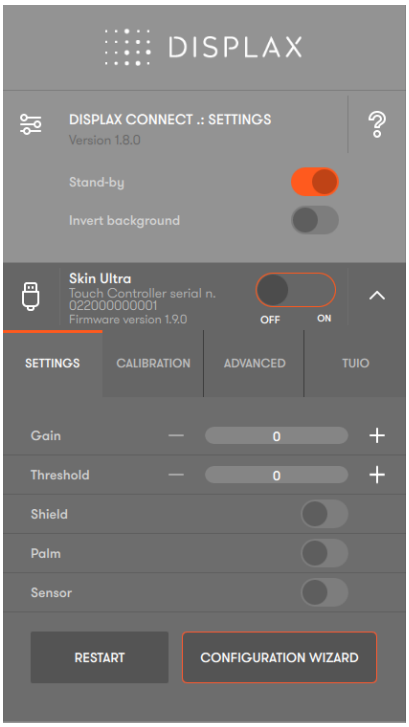
The 'Configuration Wizard' currently is only recommended for a regular setup, one LCD and one Skin Touch Sensor.

This process is run in six steps:

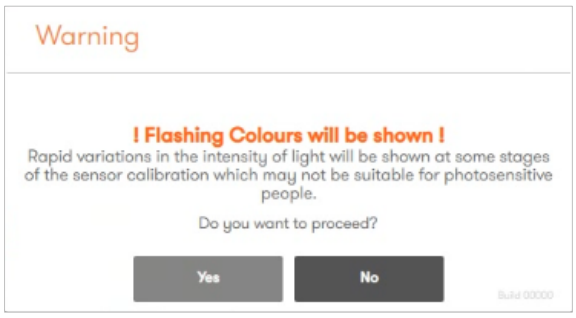
A. Touch Controller: verifies sensor signal, sensor matrix and identifies the Displax product;
B. Sensor Scan: verifies the sensor integrity and checks if the FFCs are properly connected;
C. EMI: checks the electromagnetic interference level that may exist between the LCD and the sensor active area;
D. Display: variations in the intensity of light are displayed to analyse the electromagnetic interferences and find an appropriate shielding level;
E. Touch Sensor: establishes a relation between the analysed data and the touch contact, in order to select the best Gain, Threshold and Shielding level.
F. Calibration: calibration process to match the physical touch with the Operating System digital coordinates.

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





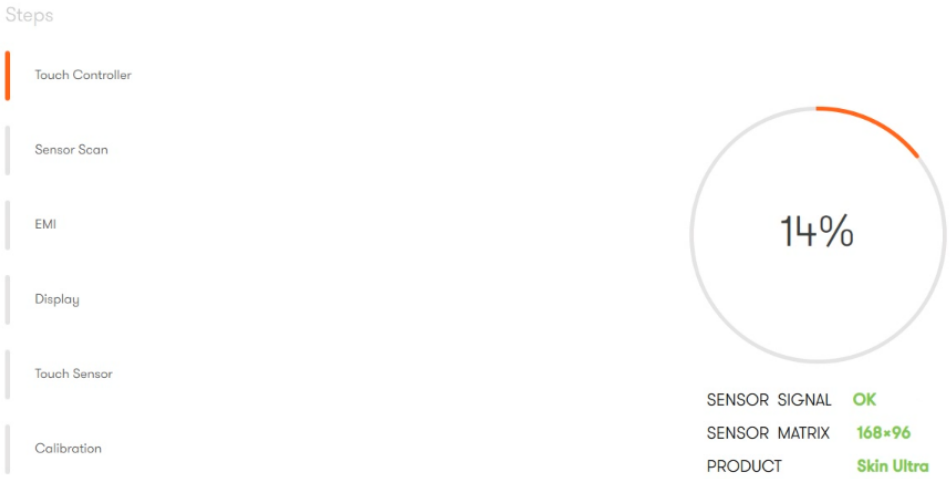
A warning message will be presented.



By clicking 'Yes' the 'Configuration Wizard' will be started, following 6 configuration steps:

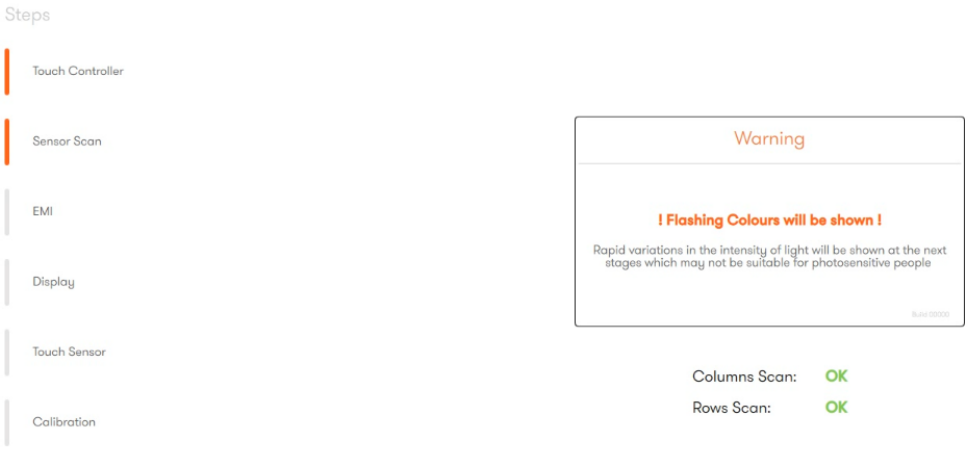
1st step: 'Touch Controller'

a) verifies if the sensor signal is ok;
b) detects the sensor matrix presenting the number of sensing rows and columns;
c) identifies the Displax product.

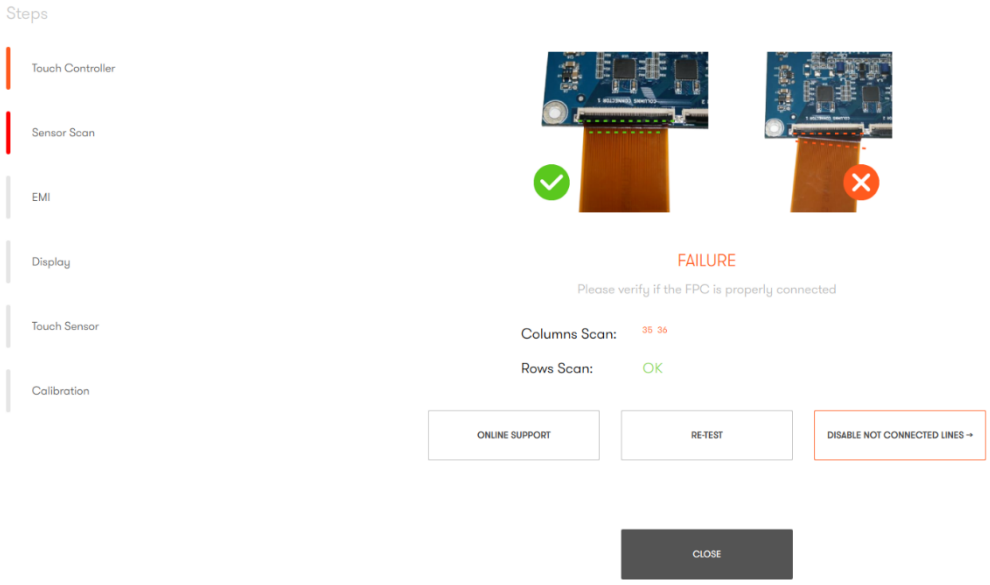


2nd step: Sensor Scan

Verifies the sensor integrity to identify if all columns and rows are OK, and checks if the FFCs are properly connected.



If any unconnected column or row has been detected, their identification number will be presented, and you can disable them (see the section 'Enable and disable rows and columns').



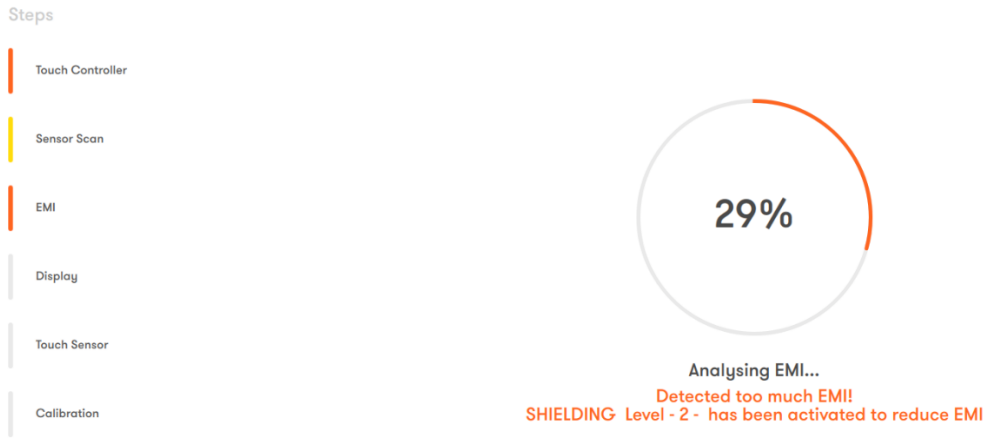
At the end of this 2nd step a warning message similar to the one presented when clicking the 'Configuration Wizard' button will be displayed, to alert the user that flashing colours will be shown in the next steps.

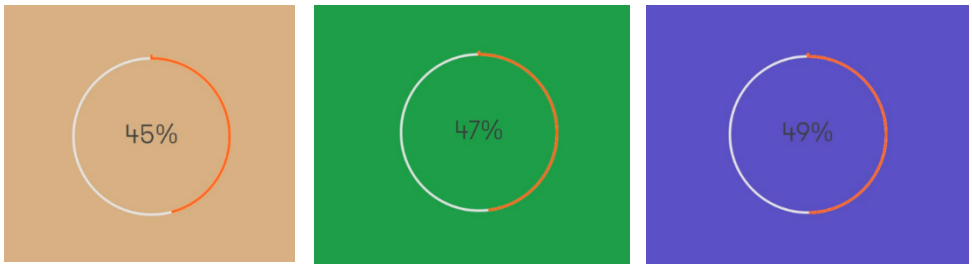
3rd step: EMI

Checks the electromagnetic interference level that may exist between the LCD and the sensor active area.

4th step: Display

Variations in the intensity of light are displayed to analyse the electromagnetic interferences and find an appropriate Shielding level.



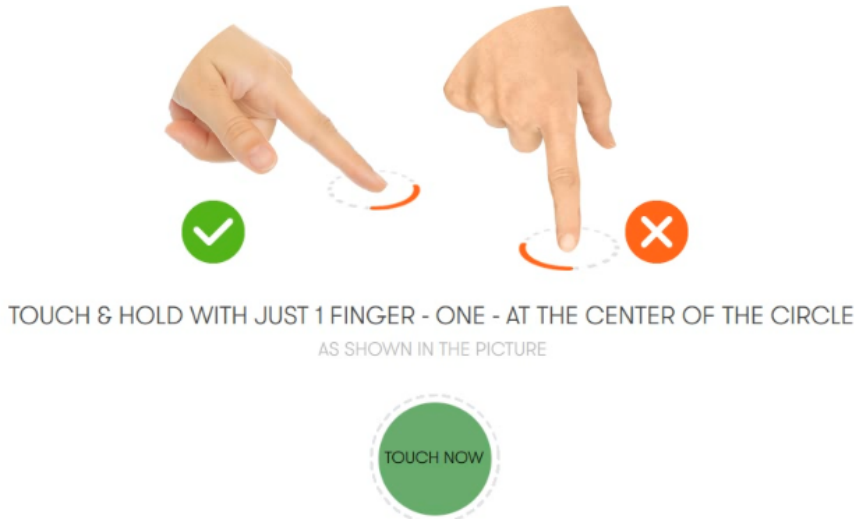


Flashing colors

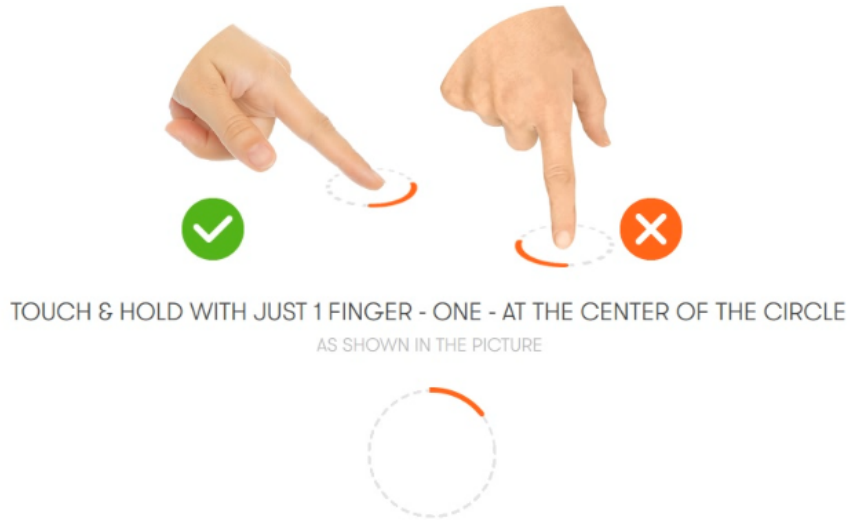
5th step: Touch Sensor

The Touch Sensor analyses the contact area and establishes a relation between itself and the EMI to configure the appropriate Gain, Threshold and Shielding level.

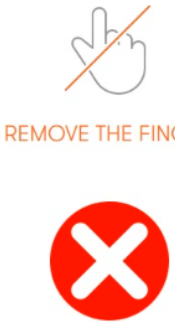
The user is required to touch and hold with just one finger at the center of a circle.



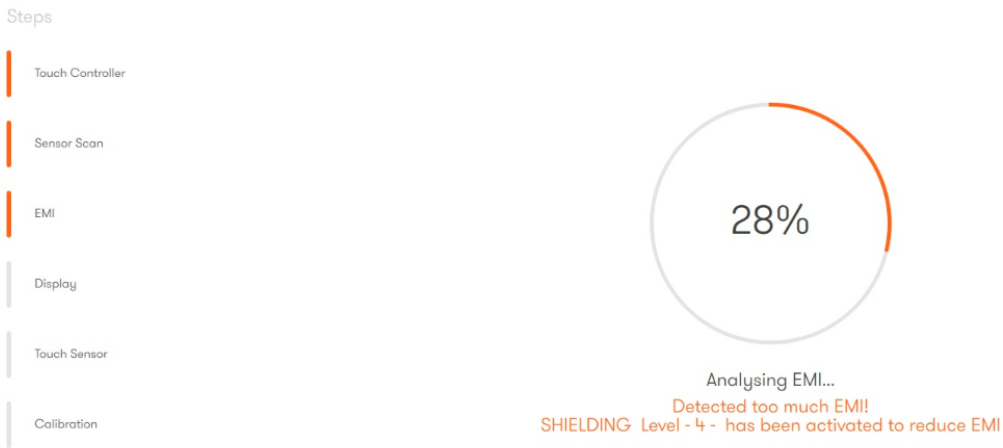
By touching the circle center the active sensor area will be analysed.



The user will be required several times to touch and remove the finger from the circle center.



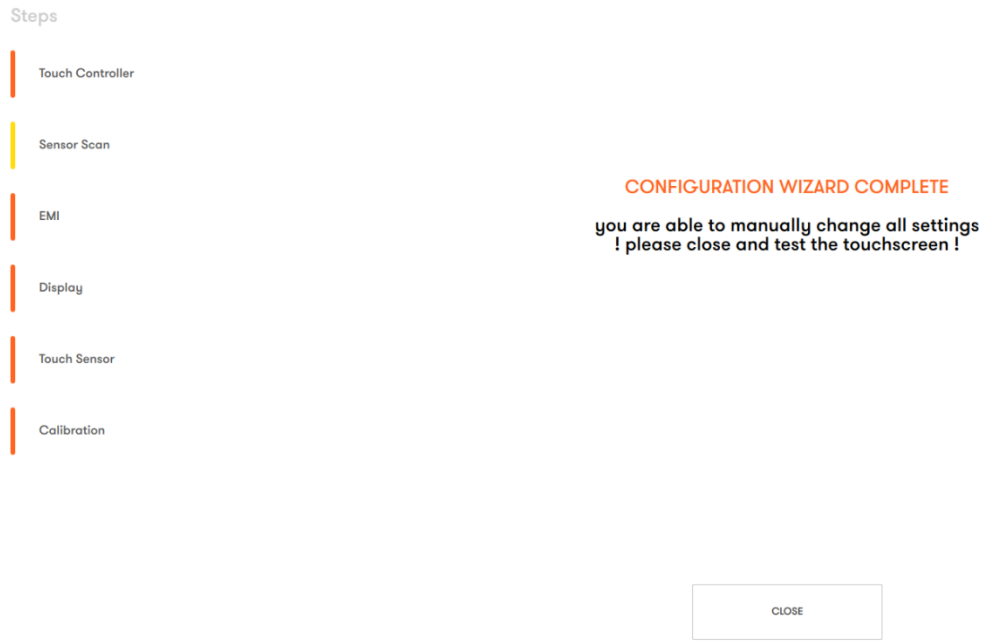
If too much EMI is detected the Shielding level will be incremented and the process will repeat itself.



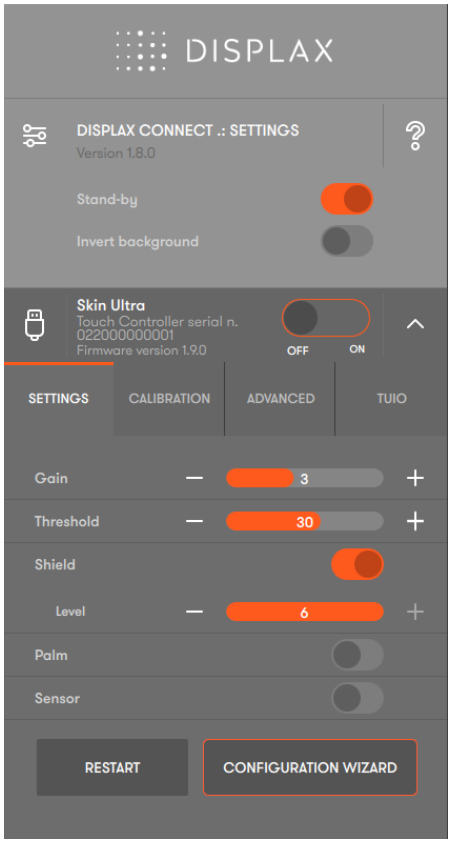
6th step: Calibration

The calibration is run to match the physical touch with the Operating System digital coordinates. When the calibration starts a message is displayed asking the user to touch on the displayed target until it disappears, and to repeat this process for the remaining points.

After successfully running the calibration the 'Configuration Wizard' will be complete, and you should press click on the 'Close' button.



If all previous steps were successful, the Touch Controller will now have defined settings and the setup should now be tested.

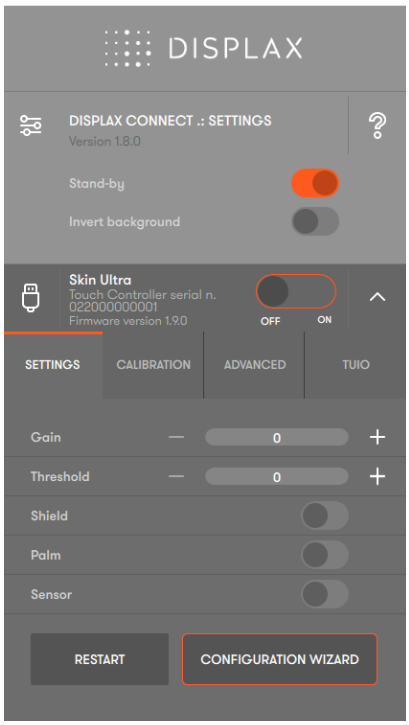


In all cases, if you want to readjust the Gain, Threshold or Shielding level, you can do it manually.

If the 'Configuration wizard fails, you should repeat it again. If the problem persists, check the Displax Support page https://support.displax.com/

MANUAL CONFIGURATION

The first time you connect Skin Ultra to a PC, the Gain and Threshold values have to be adjusted.



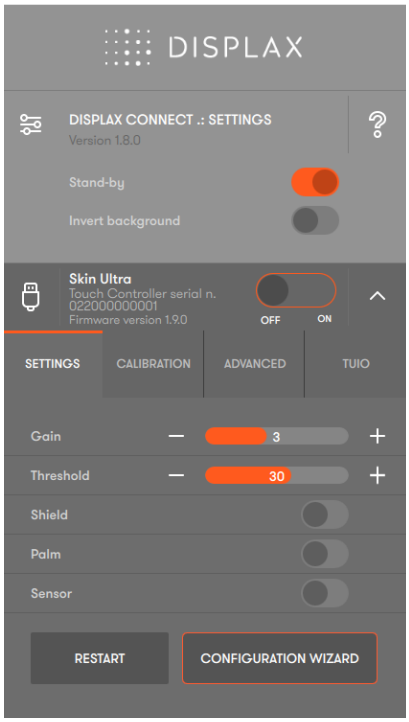
Set **Gain** to the lowest value of its range and wait 2 seconds.

Note: Every time the **Gain** value is changed you need to wait 2 seconds before you can touch the screen (a 'do not touch' image will flash during 2 seconds).

Touch while increasing **Threshold** until touch is detected.

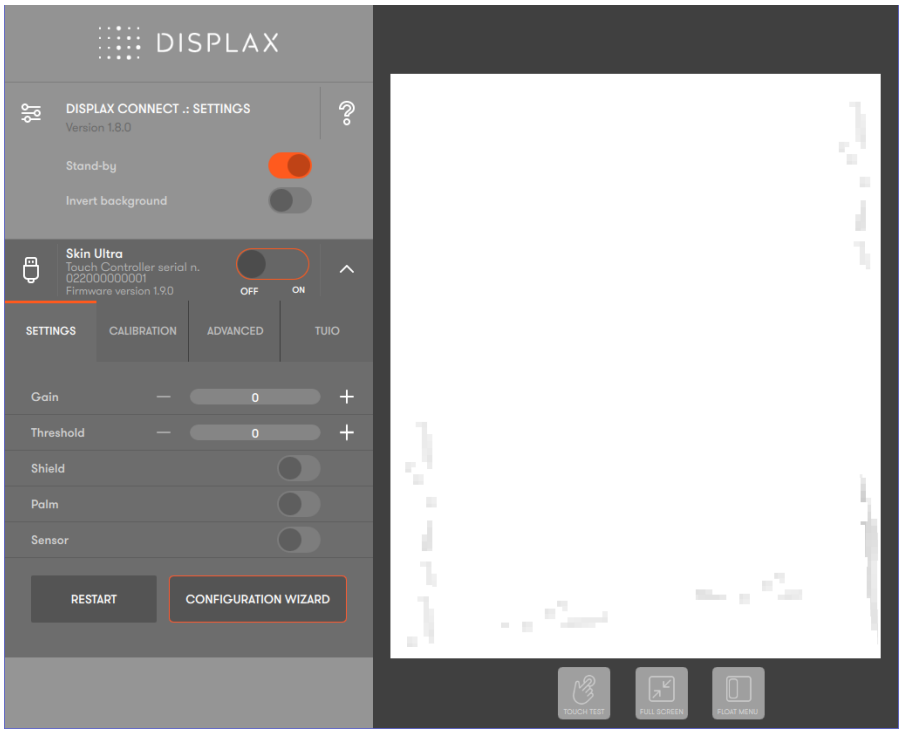
Drag the touch and continue to increase **Threshold** until drag is continuous. Make sure drag is continuous in the whole Touch Sensor, by testing thoroughly both the center of the Touch Sensor and the borders. When the drag color changes it means that drag is lost.

If **Threshold** reached the maximum value, and a good touch experience hasn't been achieved yet, increase the **Gain** one point, set **Threshold** to its minimum value and repeat from the step '*Touch the sensor while increasing **Threshold** until touch is detected*'.



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

We can say that we have electromagnetic interferences when we have visible gray dots along the Touch Sensor boarders or spread over the Touch Sensor active area.



As you increase the Shielding level, you are reducing the electromagnetic interferences. The gray dots tend to disappear with increases in the shielding level. 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 Skin Ultra supports more.

WHAT IS CONSIDERED A GOOD TOUCH

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

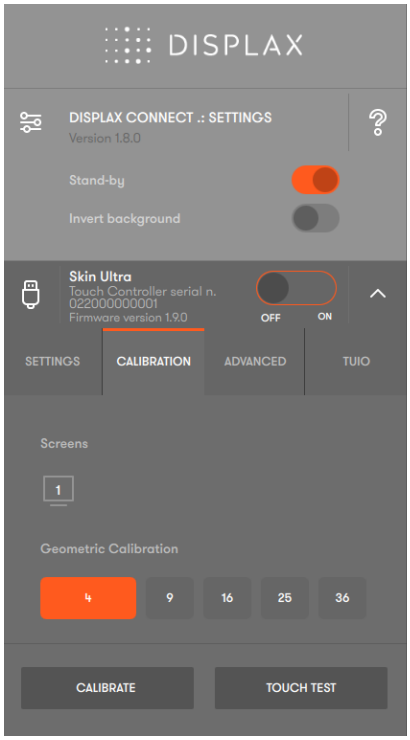
Having continuous drag with 2 or more fingers, i.e. without losing touch detection, with fingers 90° relative to display and making minimal finger pressure. Test across the whole display area, both center and borders.

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.

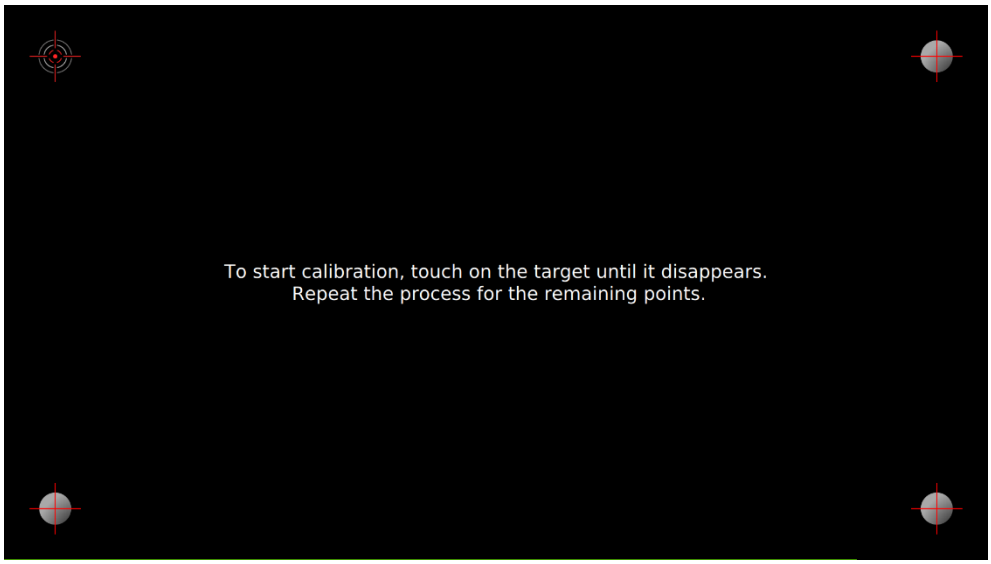
GEOMETRIC CALIBRATION

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

When the sensor is associated with **one LCD you should use 4 calibration points**.



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*'.

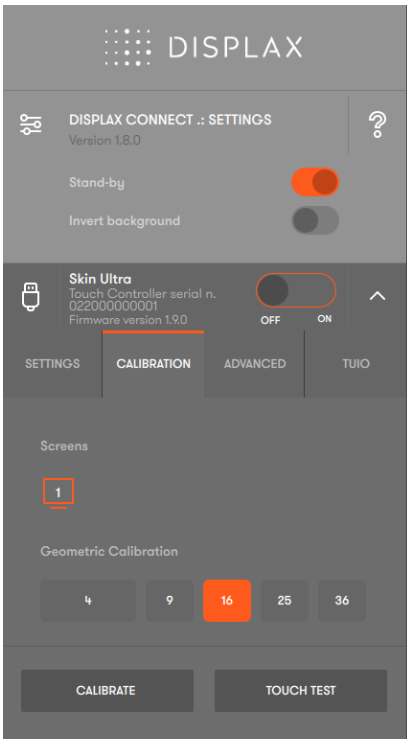


ADVANCED GEOMETRIC CALIBRATION

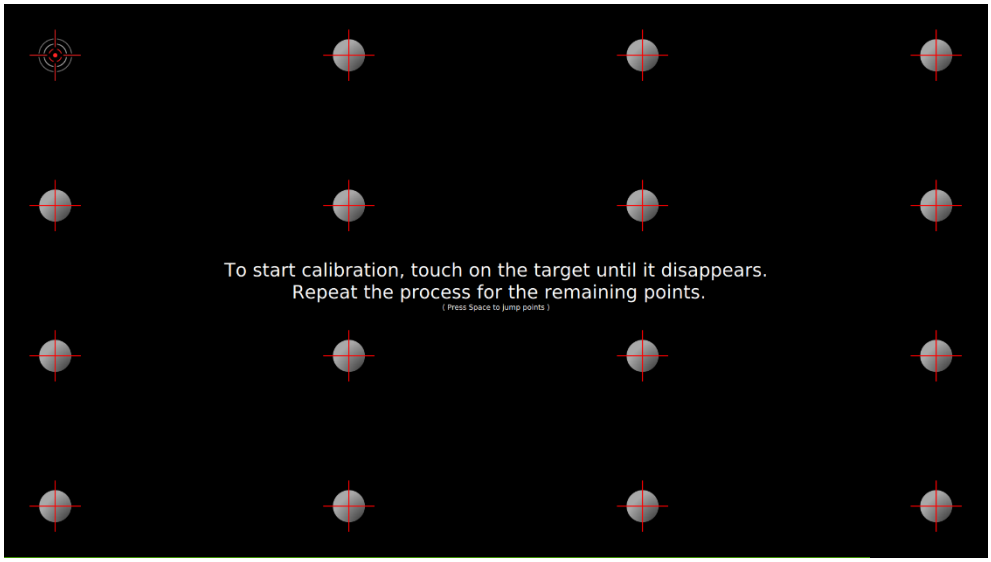
When a **single sensor is used on top of two or more LCDs**, to overcome the bezel between the LCDs you may have to use more than 4 calibration points.

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

When you select the number of points they will be shown on all the 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 access 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.



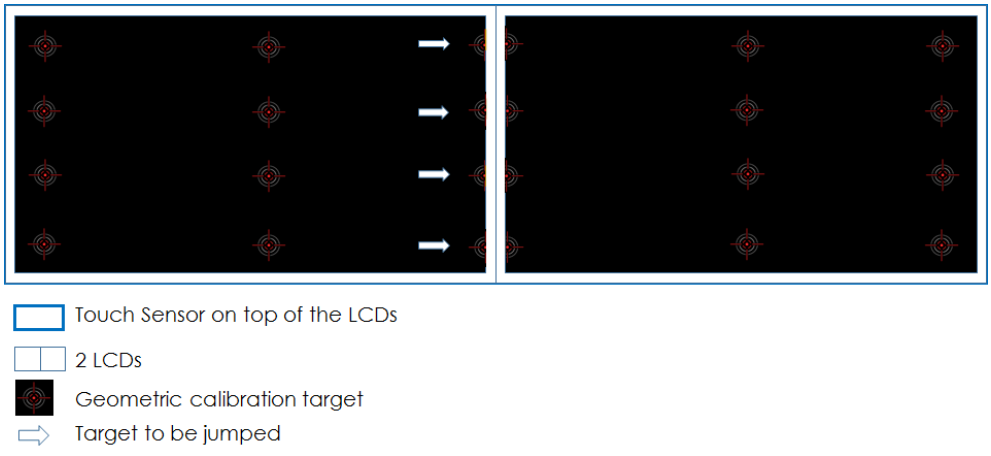
After selecting the number of calibration points a black screen with the chosen calibration points will be displayed and an instruction will be presented '*To start calibration, touch on the target until it disappears. Repeat the process for the remaining points*'.



If some calibration targets are shown split between two or more LCDs, those calibration targets must be jumped (Pict.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.

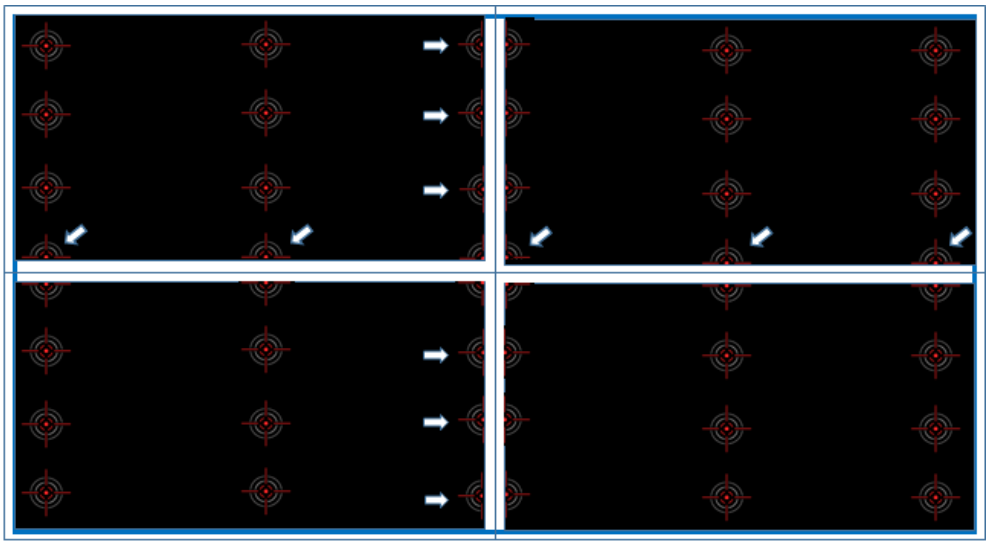
Example 1 – one Touch Sensor on top of 2 LCDs

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



Example 2 – one Touch Sensor on top of 4 LCDs

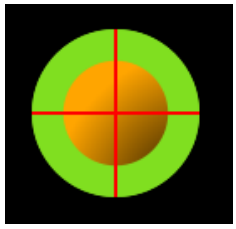
In this scenario we may have calibration points split between four LCDs on a vertical and also on an horizontal axis formed by the LCDs bezel.



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

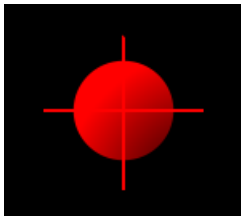
Make sure you are touching on the target center.

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

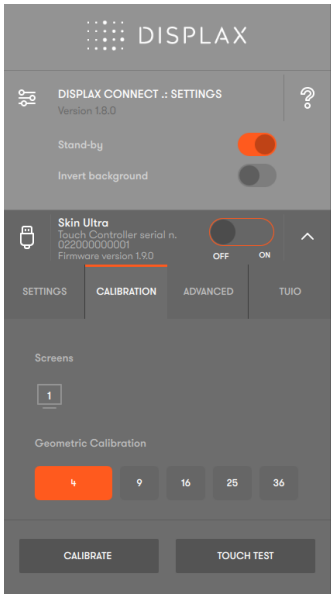
The geometric calibration will be successful if all the presented targets have disappeared (Pict.3). If one of the calibration points fails, after about 2 seconds, the point will be once again available for calibration.

ADVANCED CALIBRATION – DRAG MODE

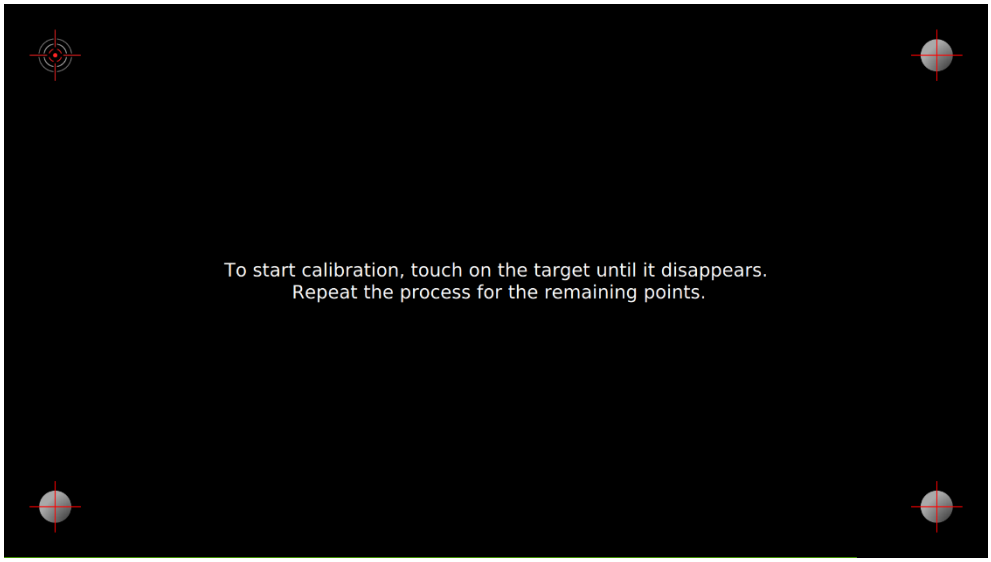
The drag mode of advanced calibration is used when the active Touch Sensor area is smaller than the LCD.

The 'Displax Connect' control panel will be displayed on the entire LCD screen, but as the Touch Sensor is smaller than the LCD you have to define the area that is being covered by the Touch Sensor.

To start the calibration process of custom areas, first you have to select 4 calibration points, as you should do on a regular calibration process.



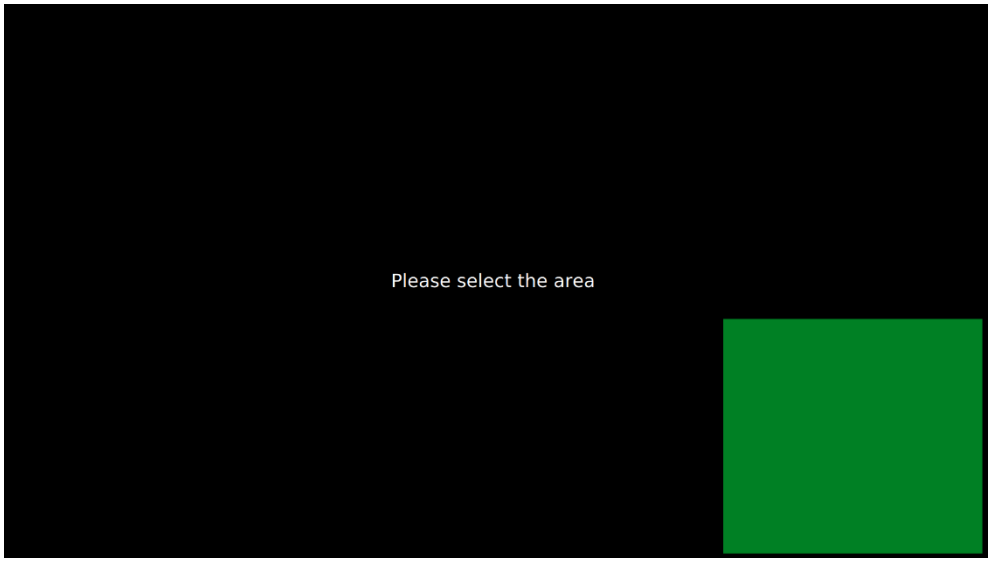
When the 4 calibration points are shown, you have to click on the letter 'A'.



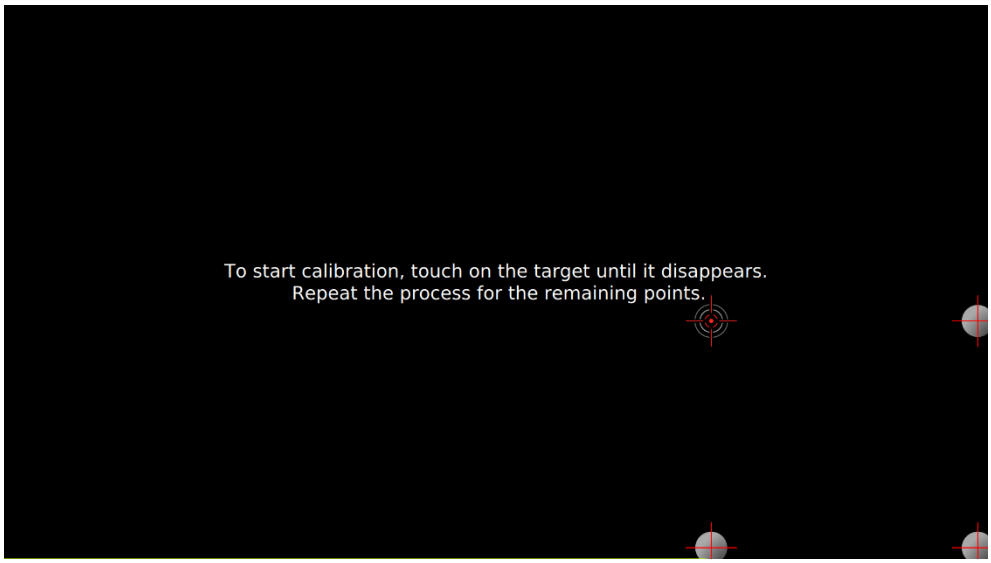
By clicking on the letter 'A' a message will be displayed '*Please select the area*'.

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*'.



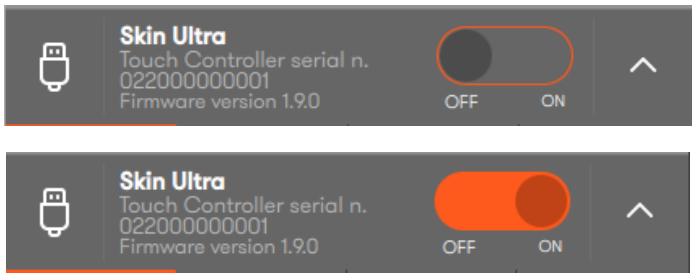
By touching the displayed targets, you will be defining the Touch Sensor active area.

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

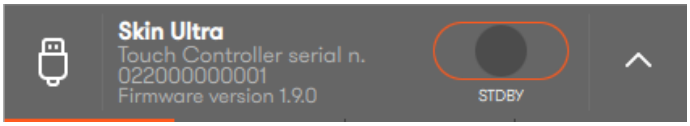
This message can be displayed if you draw a very small area, in that case a red rectangle will be displayed which will be immediately followed by the above error message.

TOUCH INJECTION STATUS

If this is the first time configuring this 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 we 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 If 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 are done adjusting the Touch Controller settings 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.

TOUCH TEST

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

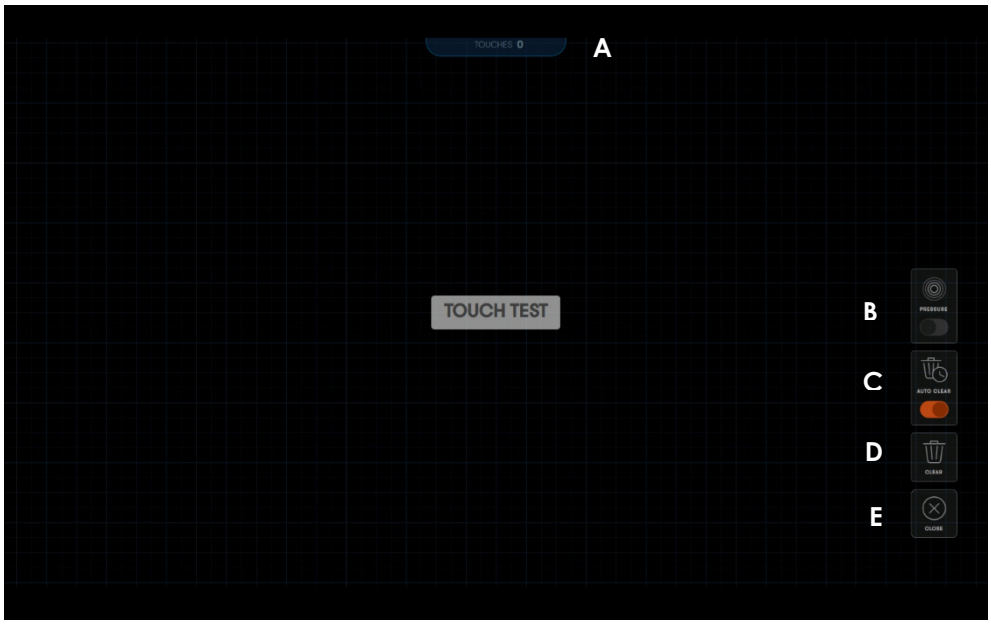
Depending on the specifications of the PC you are running, there are some features that may not be presented, namely:

- Pressure report
- Velocity report
- Touch coordinates
- Number of touches: limited to 20 touches

Bear in mind that on OS X it will only work with a single touch due to OS limitation.

To enter the Touch Test, click on the test button or hit letter 'C'.

A black screen with a rectilinear grid will be displayed.

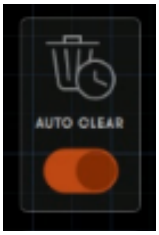


On the Touch Test layout, you will find the label 'Touches' on the upper center of the screen and four touch buttons on the right side of the screen.

The upper label reports the number of touches on the active sensor area.

The buttons on the right side of the screen allow us to activate or deactivate the 'Pressure' and the 'Auto Clear' buttons, and also to clear the screen or close the Touch Test.

B Activate/deactivate pressure report



C Activate/deactivate auto clear – clears the drawn touches

D Erases the drawn touches

E Closes the Touch Test

A. Touches: number of touches being reported;

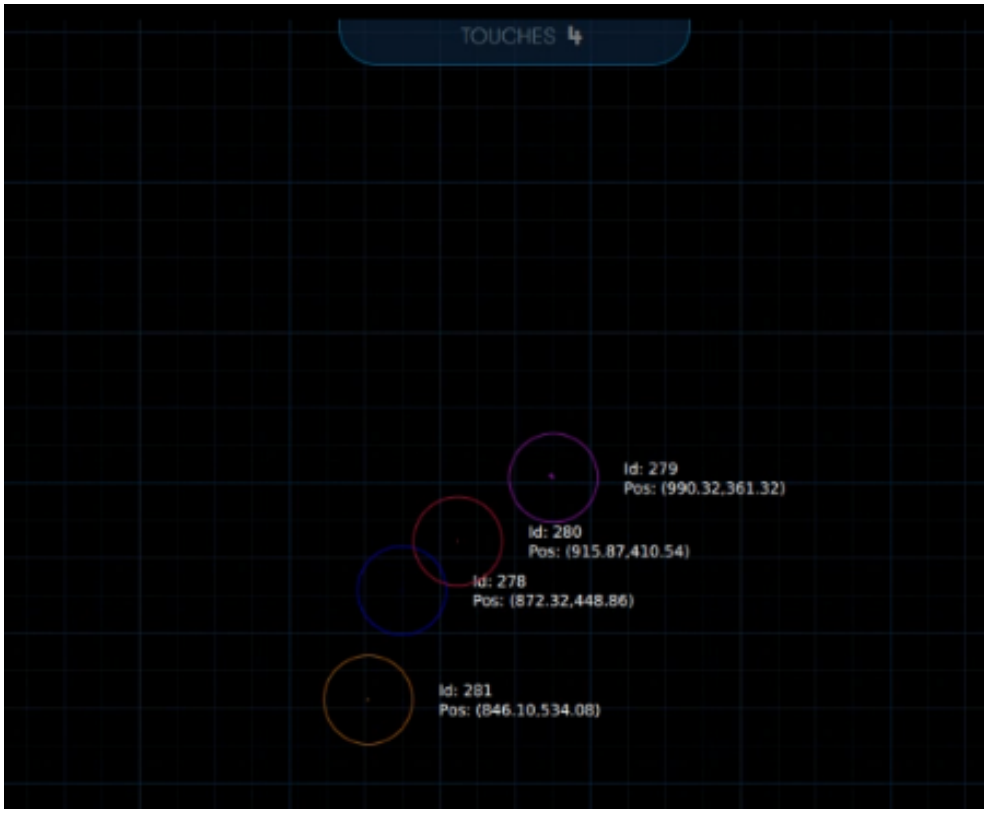
B. Pressure: activates or deactivates the touch pressure report. Bear in mind that you are only activating / deactivating the visualization of the pressure value. The pressure information is always sent to the operating system, when native multitouch support exists;

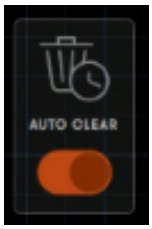
C. Auto-clear: if activated the drawn touches will be cleared in about 3 seconds, making the Touch Test screen clean of all previous touches. If deactivated the drawn touches will remain on the displayed screen until you touch the button 'Clear'.

D. Clear: clears the screen by deleting all the drawn lines;

E. Close: closes the Touch Test.

When touching the Touch Sensor area, touches will be observed with their respective coordinates and the number of touches are presented on the Display upper center.

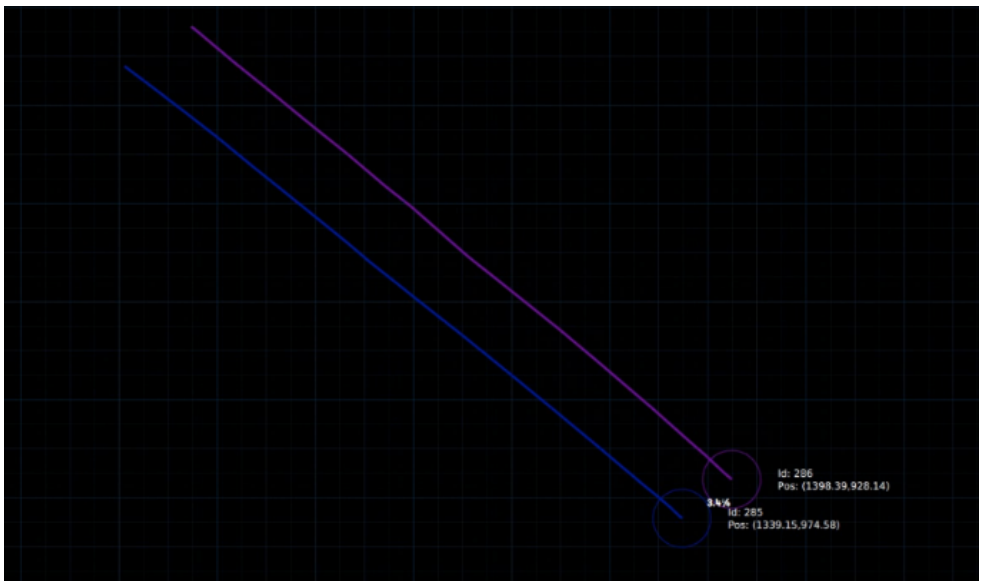


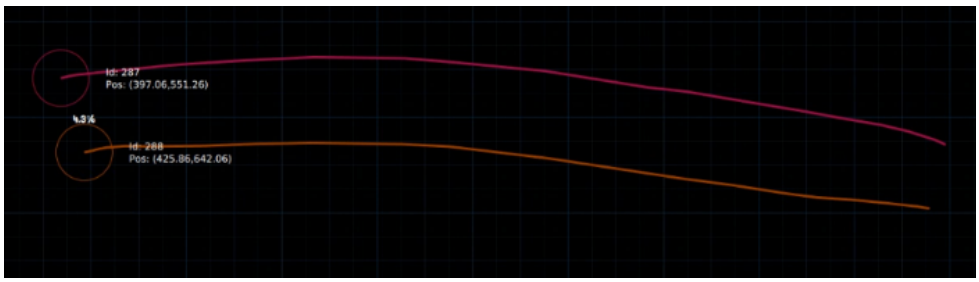


After about 3 seconds the screen will be cleared if the 'Auto clear' button is set.

The 'Auto clear' is set as a default, if you want to disable 'Auto clear', you just have to touch on the its button.

On the Touch Test you can draw anything you want on any direction.

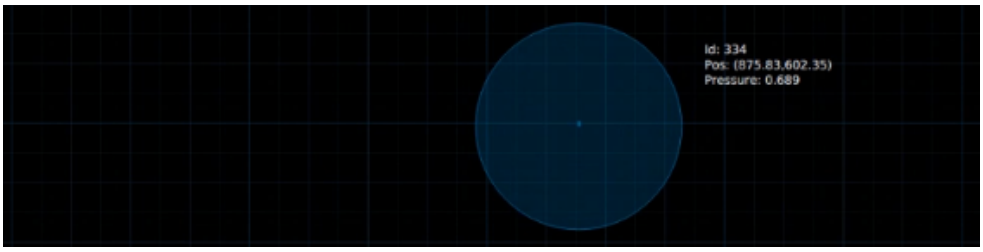




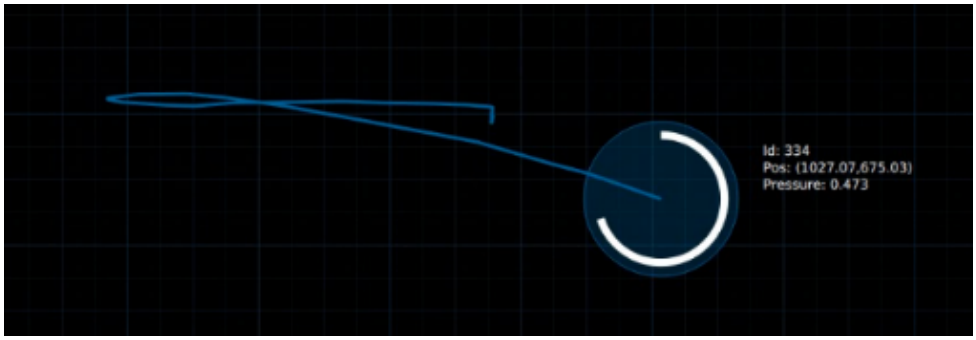
To test the fingers pressure you have to activate the 'Pressure' button.

Having the pressure button active, the pressure will be reported.

The larger the circle area representing the touch, the bigger the pressure.

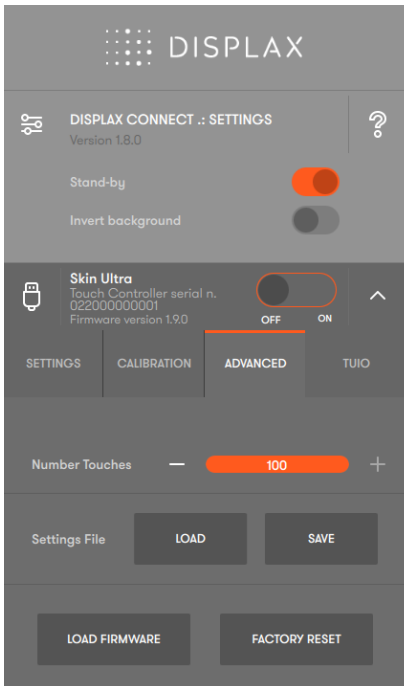


The touch velocity is also displayed while you move the fingers on the Touch Sensor active area. The velocity is shown as a white circular representation. The higher the speed the greater the white circle will be.



NUMBER OF TOUCHES

Limits the number of touches reported by the Touch Controller to a specified number (always between 1 to 100 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 Skin Ultra as being available, even when a lower number of touches has been defined in this feature.

PALM AND ARM DETECTION

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.

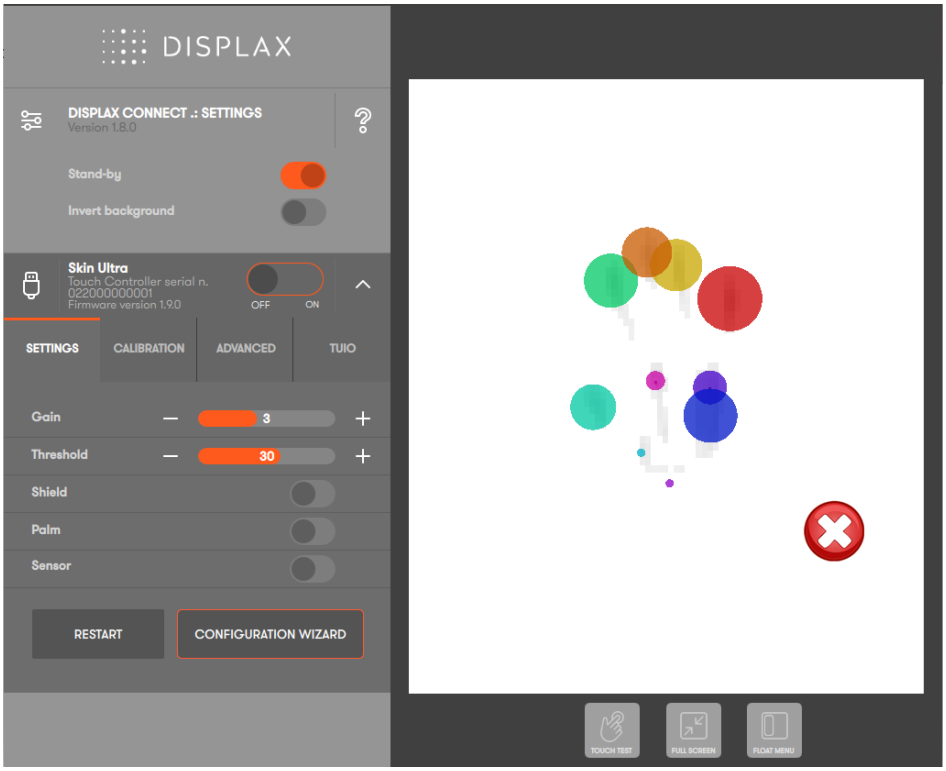
To support the user when configuring the palm rejection area, here we present, as a suggestion, values to configure Skin Ultra to reject an adult palm for Touch Sensors with different dimensions.

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

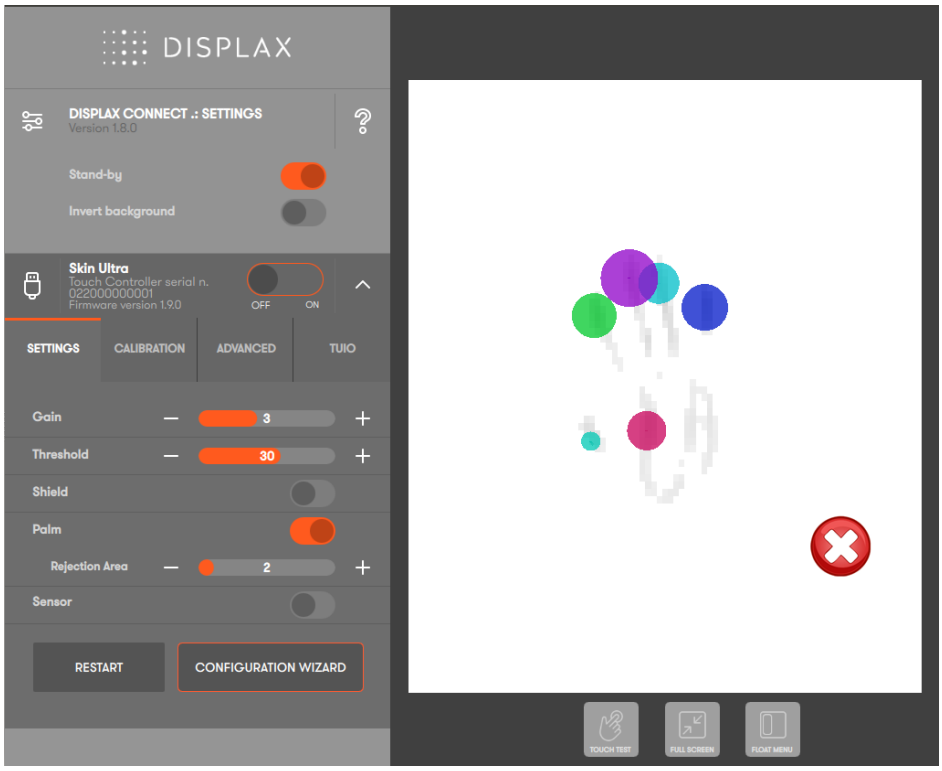
A sequence of images is presented to illustrate palm and arm rejection examples:

PALM

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



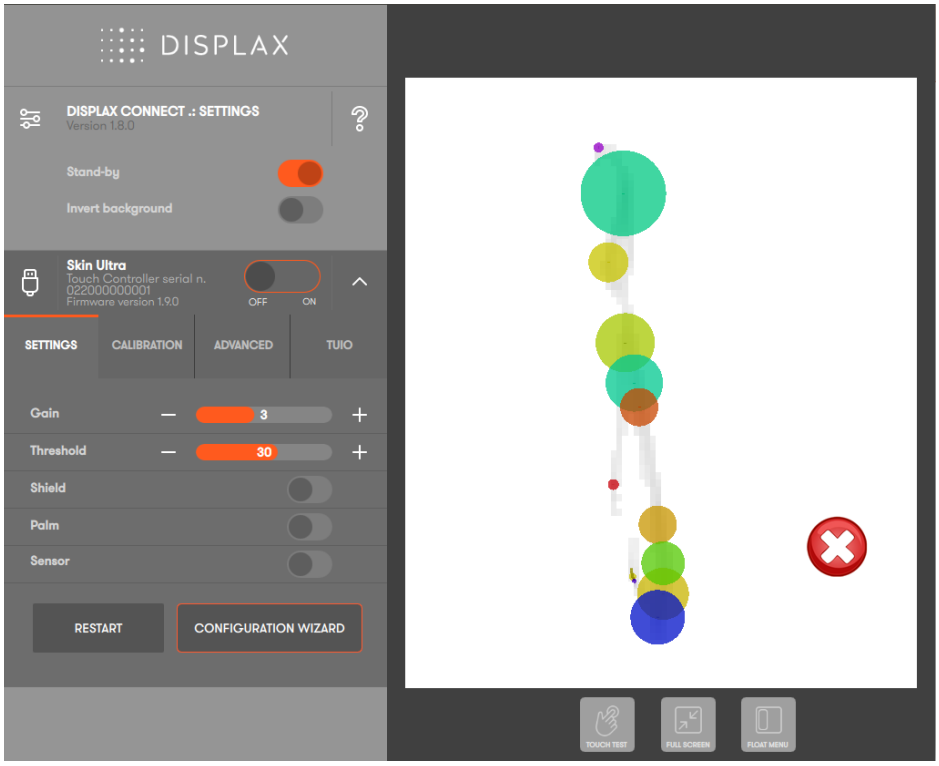
Palm rejection is activated; however, touches are still being recognized since the rejection area isn't properly adjusted to the Touch Sensor size. An increase or decrease of the palm rejection area is required.



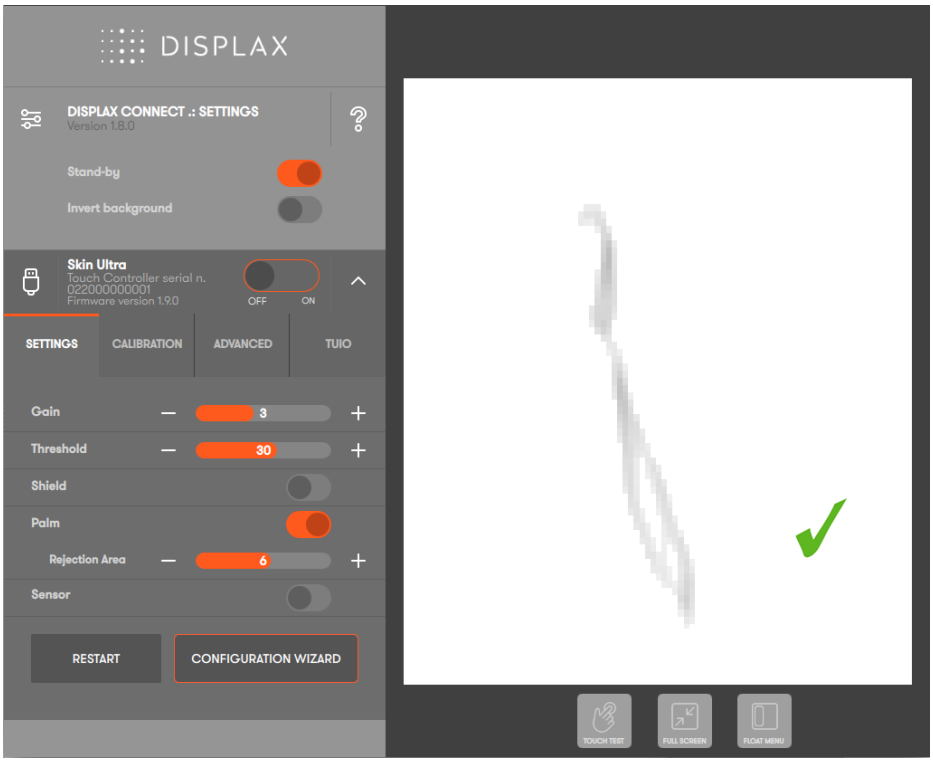
Palm rejection is activated with an adequate value for the Touch Sensor dimension. On the following image you can see the contours of a hand but no touch is recognized.

ARM

Palm rejection is not activated and on the display multiple touches are being recognized as a result of placing an arm on top of the Touch Sensor.



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



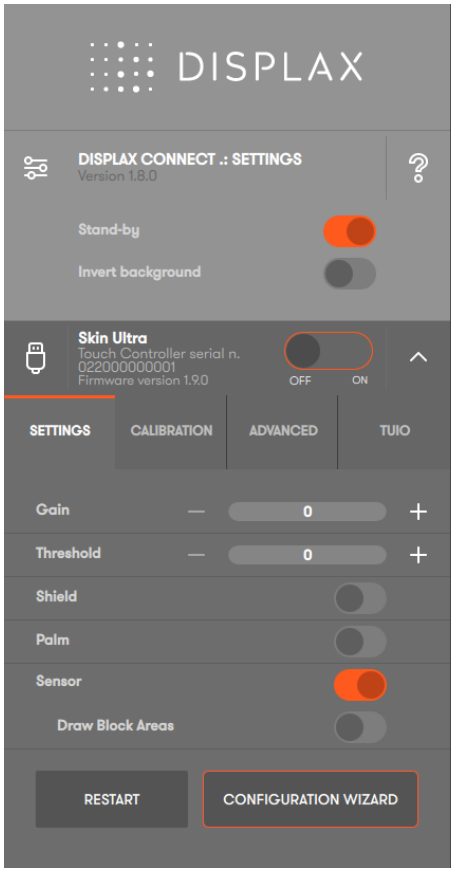
SENSOR

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

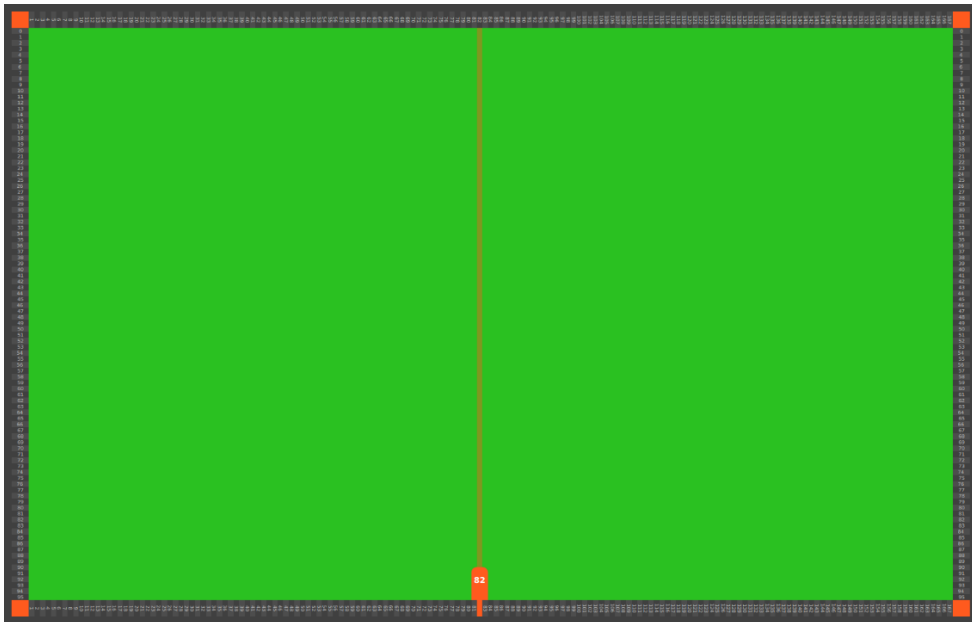
1. Enable and disable rows and columns
2. Draw block areas

1. Enable and disable rows and columns

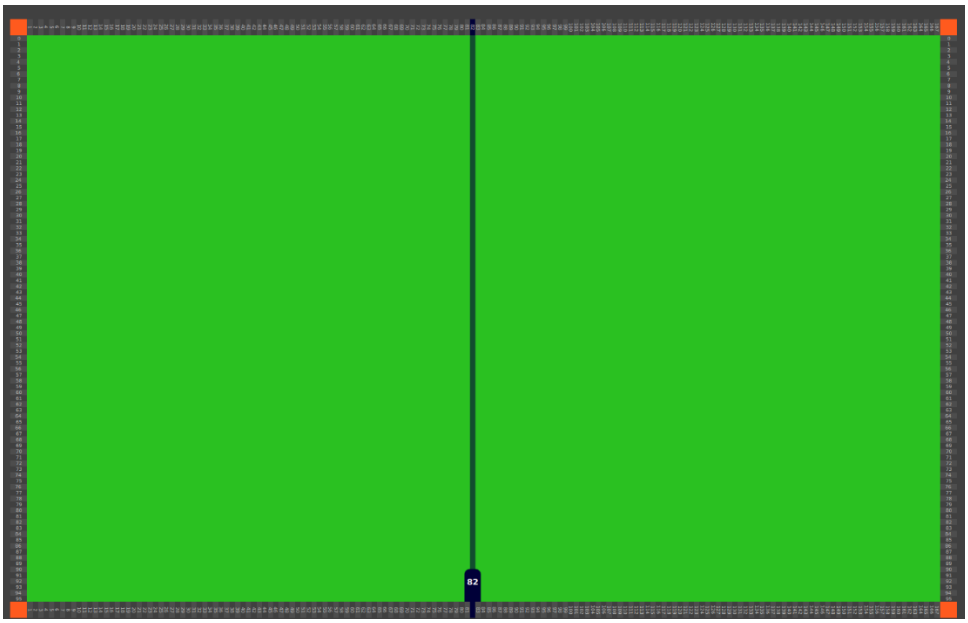
By clicking 'Sensor' button you will be activating the possibility of enabling and disabling rows and columns.



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.



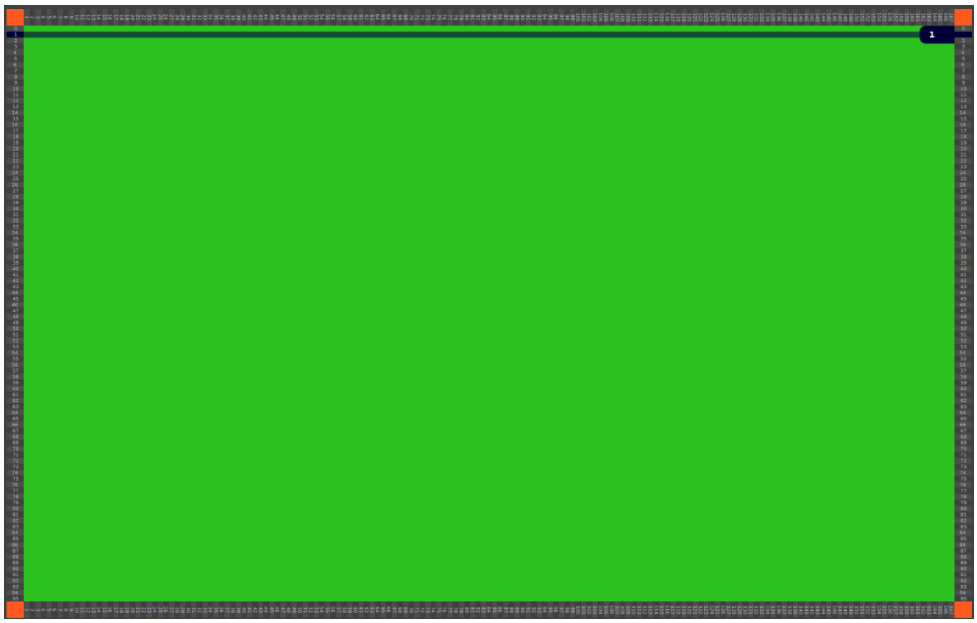
As you move the cursor near the sensor view borders the rows and columns number are zoomed in to allow clicking on them to enable or disable a specific row or column.



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

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

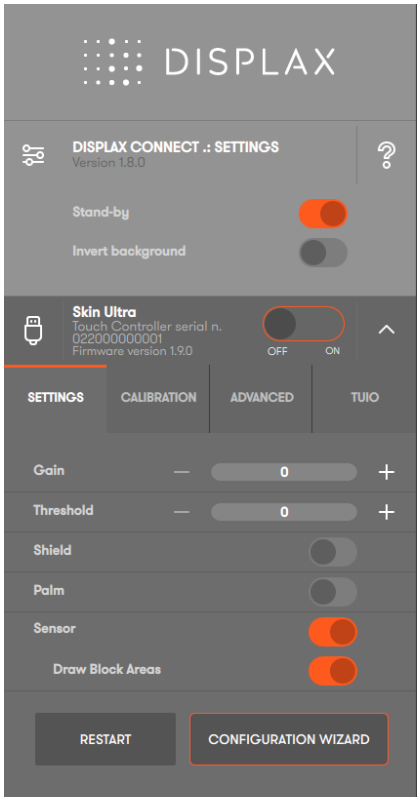
The same procedure is used to disable rows as shown on the following image.



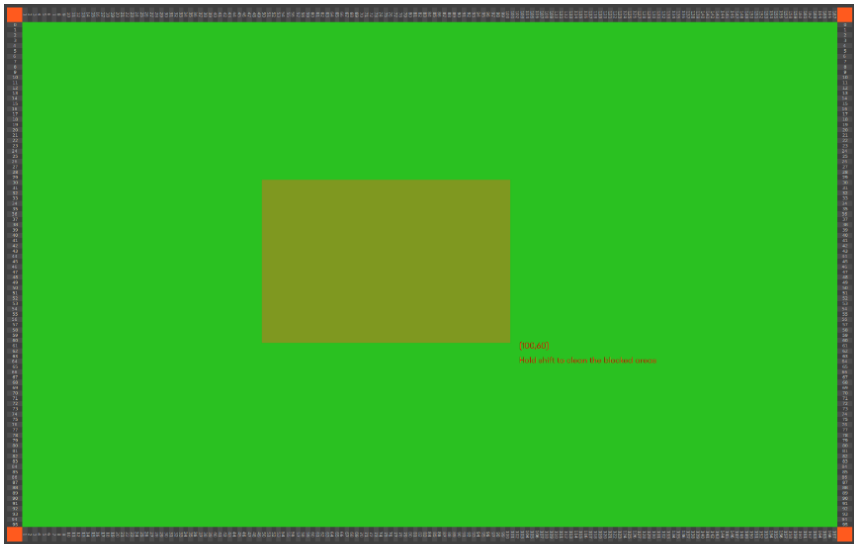
2. Draw block areas

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

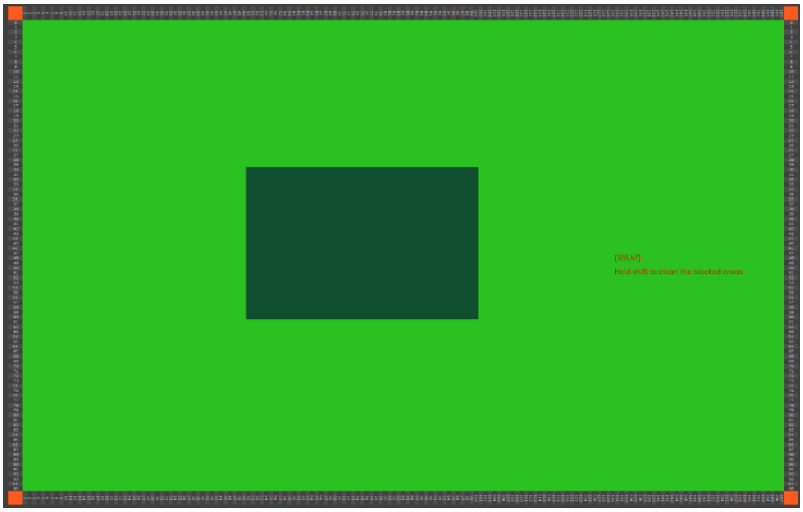
To activate the 'Draw Block Areas' you have to activate the 'Sensor' button, and then activate the 'Draw Block Areas'. The Skin Ultra Touch Controller should be set to OFF.



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

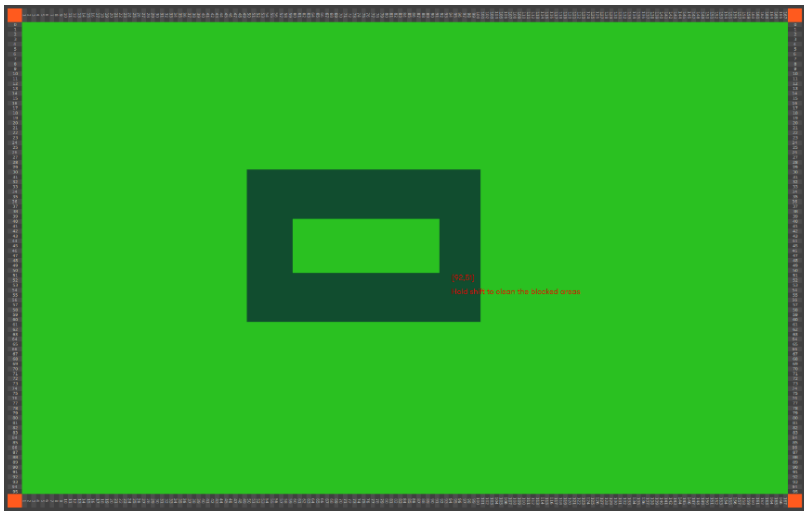


When you stop pressing the left click the area to be blocked will be defined.

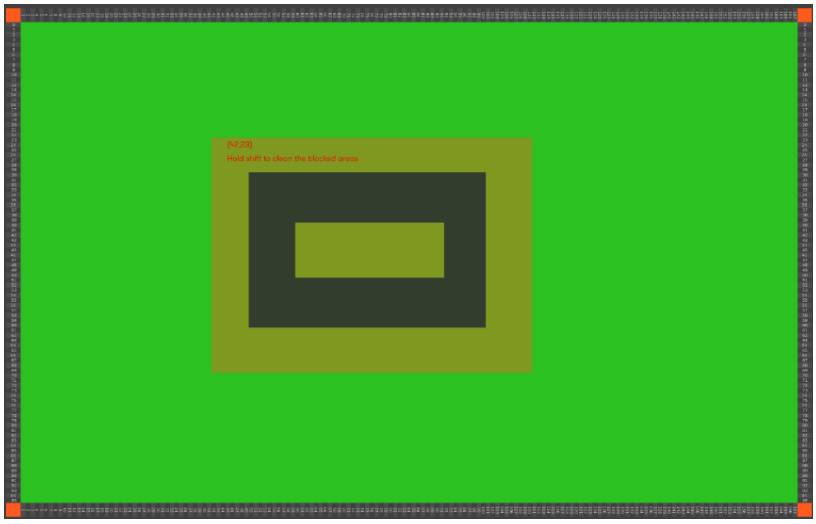


To reactivate the blocked area, you must hold shift and you have to select the blocked area by clicking on the mouse left button.

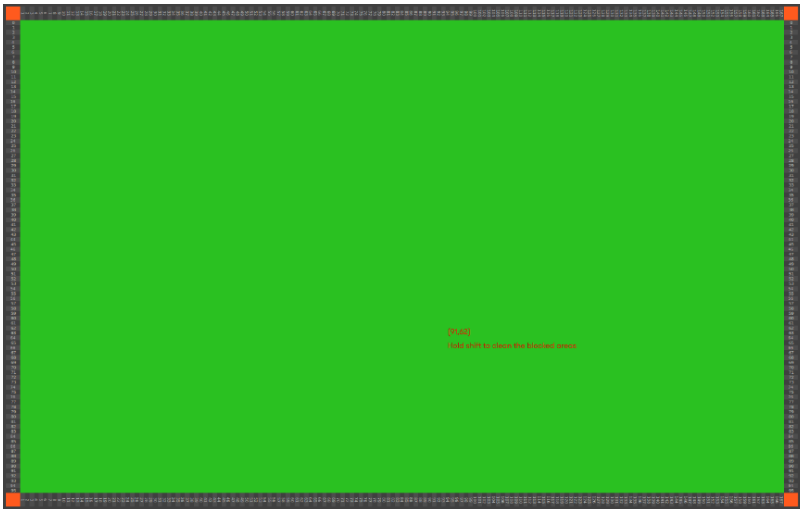
If for example you want to inscribe an active area inside an inactive area you can do it. You just have to hold shift and select the area to be reactivated.



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



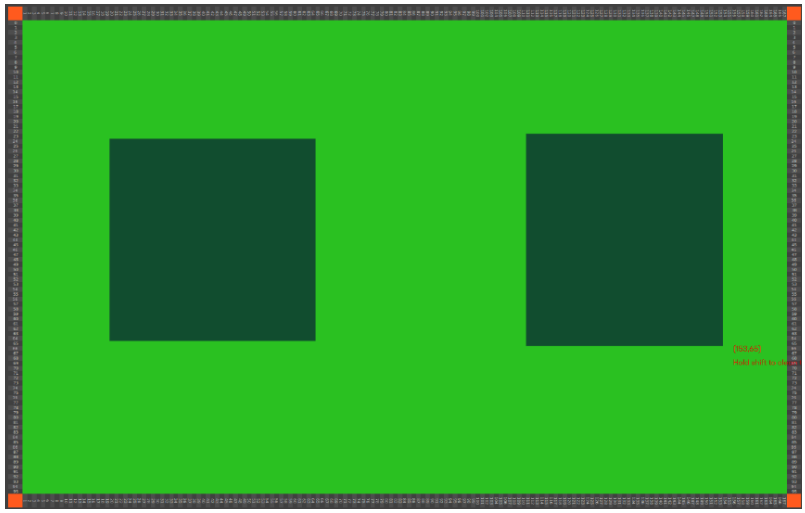
By holding shift and selecting the blocked areas, you are able to reactivate the entire Touch Sensor.



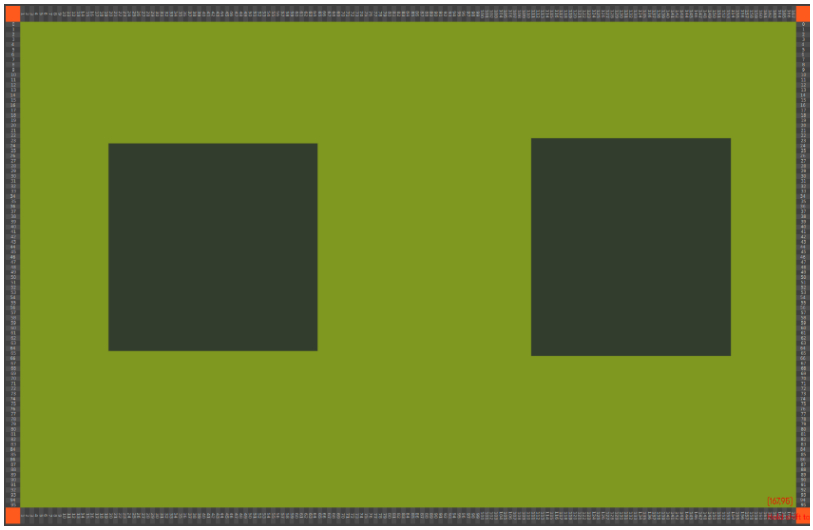
If you want, for example, to maintain active only two specific Touch Sensor areas, you may start by drawing those areas as inactive areas and them you

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 on the next two steps:

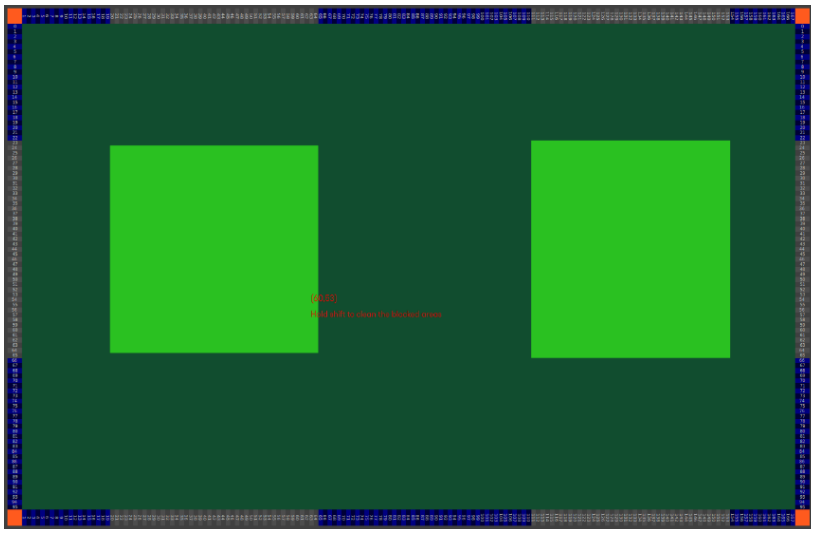
1st step: select the areas to be blocked



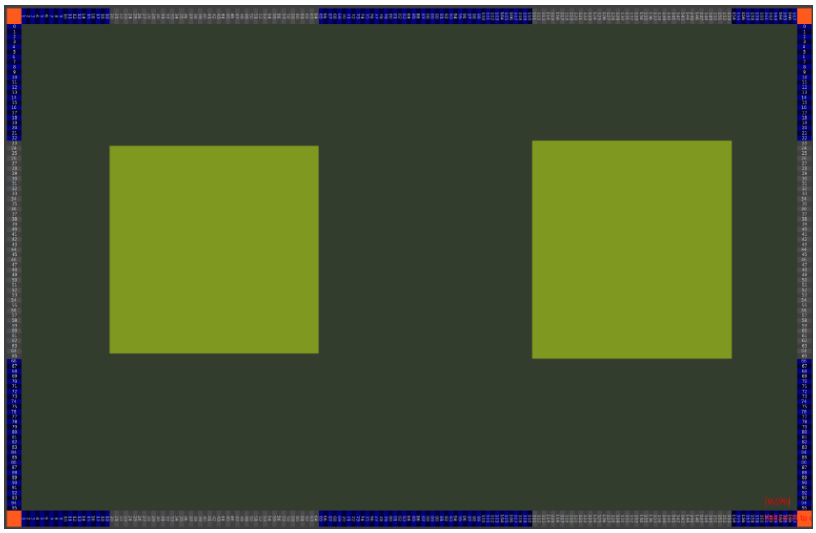
2nd step: Select the entire active Touch Sensor area



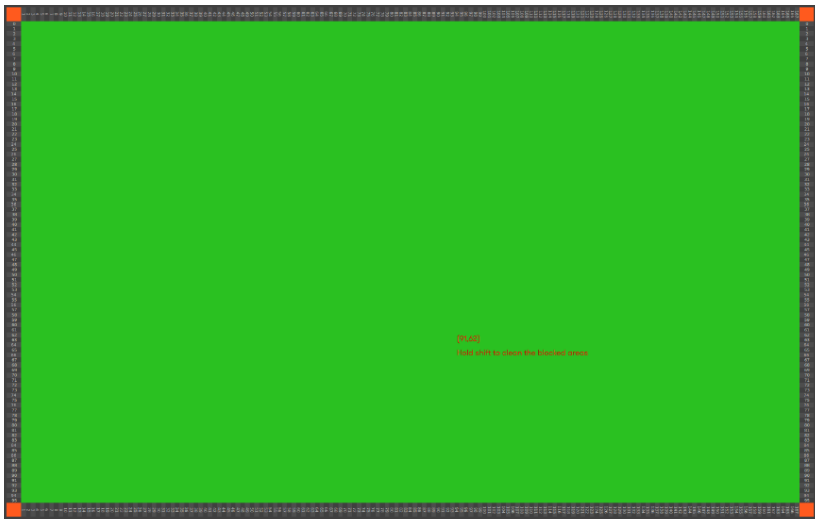
By selecting the entire Touch Sensor area, the central blocked areas will be reactivated and the area surrounding them will be blocked.



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
- Disabled columns, rows or cells
- Number of touches
- Geometric Calibration

When you LOAD the file into a new setup (PC + display + Skin Ultra), '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

NOTES:

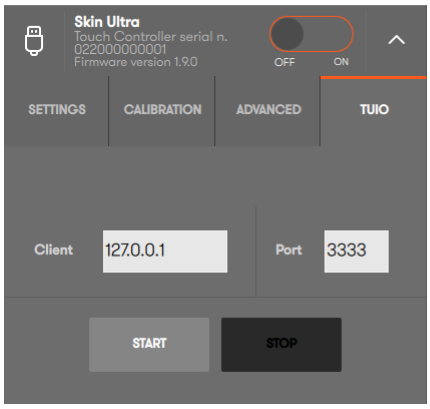
Windows: If the devices are disconnected or have been restarted you must restart TUIO.

OS X: On 'Displax Connect' 1.8.0 version, TUIO supports touch injection ON and OFF. If the touch injection is ON, 100 touches will be recognized. If the touch injection is OFF, only 20 touches will be recognized.

Configuring:

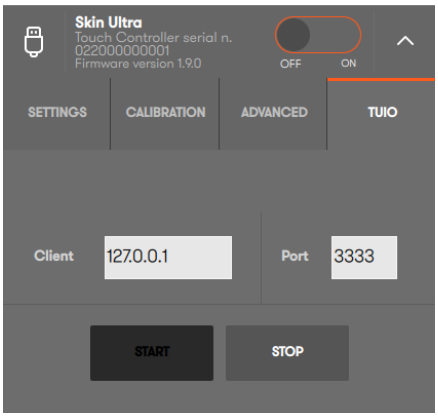
TUIO should be configured after configuring all touch settings.

Having configured all previous settings as wanted, go to the TUIO Tab.



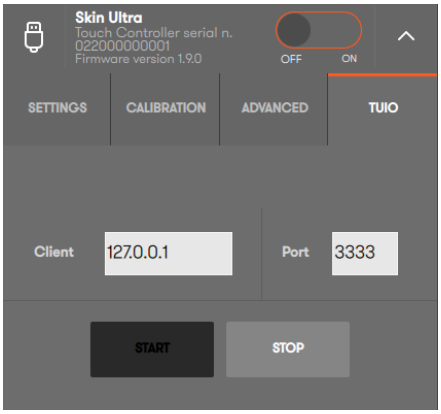
In 'Client' define the IP of the PC that will receive TUIO events. Next, define, the port that will be receiving this events.

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



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 process go to the TUIO tab and click on the 'Stop' button. The TUIO process should now be stopped.



It's recommended to stop sending TUIO events before uninstalling 'Displax Connect'.

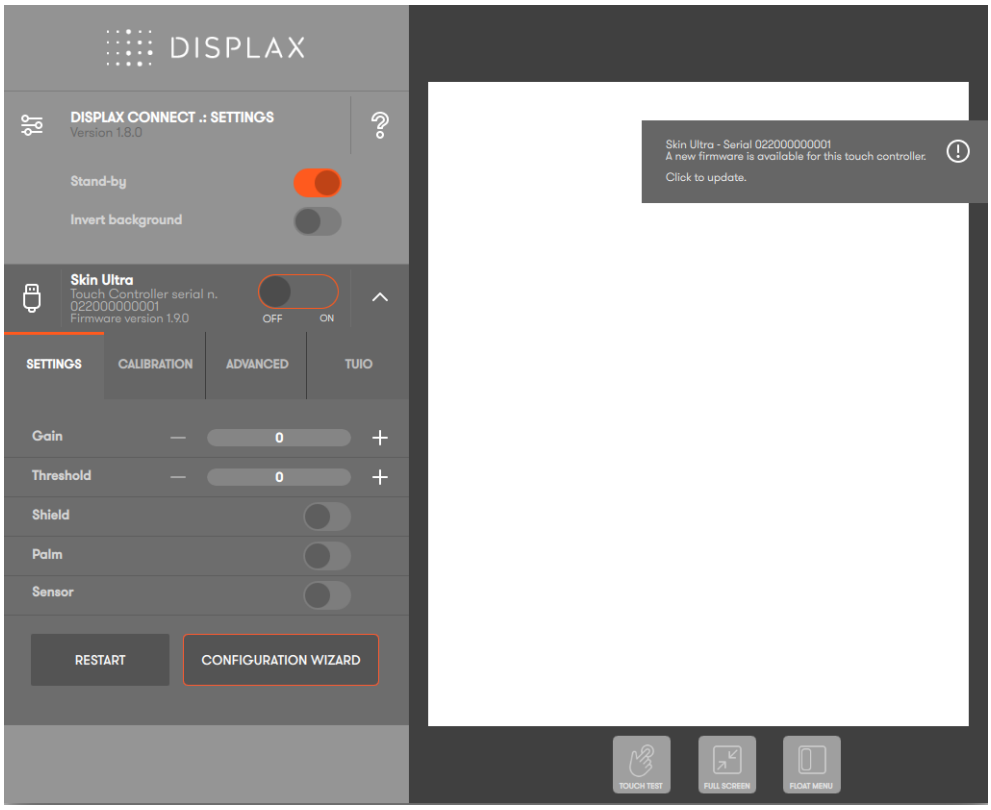
TOUCH CONTROLLER FIRMWARE UPDATE

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

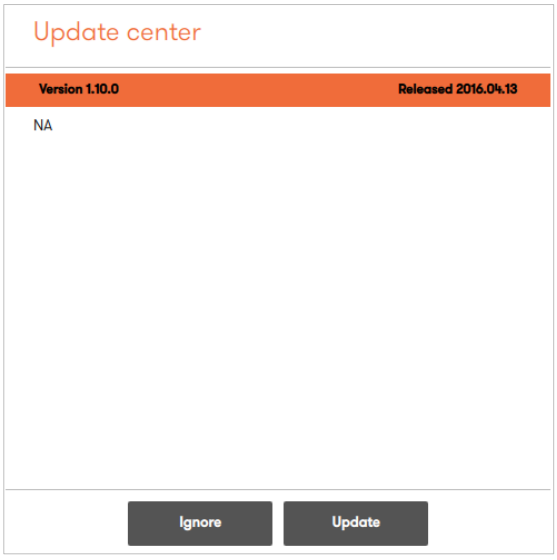
This feature is available for Windows 8 (or higher), OS X (Yosemite) & Ubuntu (14.04 LTS).

If a new firmware version is available, the user will receive a notification of a 'new firmware'.

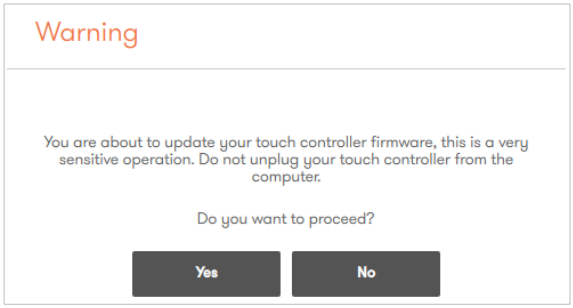
This notification will be shown on the right side of the control panel.



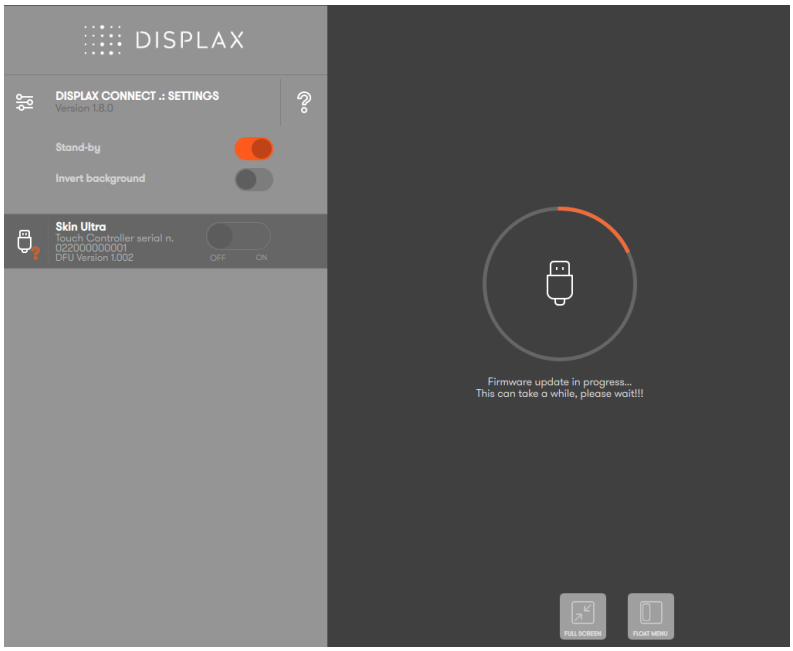
If you click on the update notification, a window with a description of the updates will be displayed.



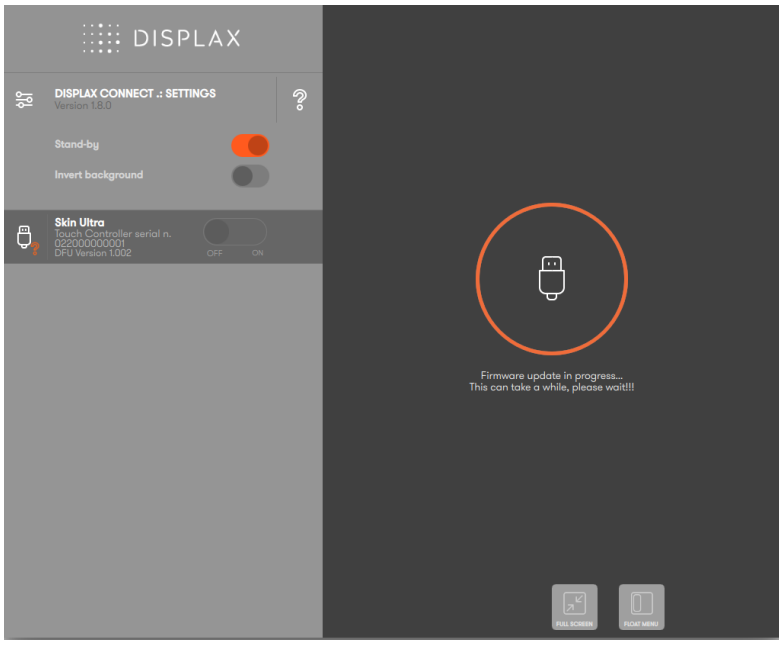
A warning message will pop-up.



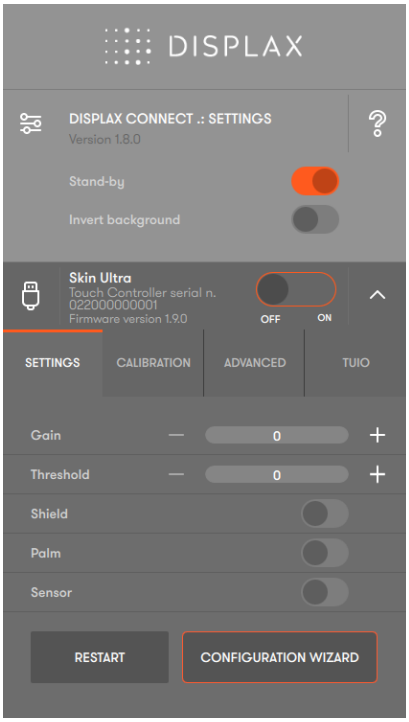
The update will be initiated as follows.



First the Touch Controller restarts. 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.

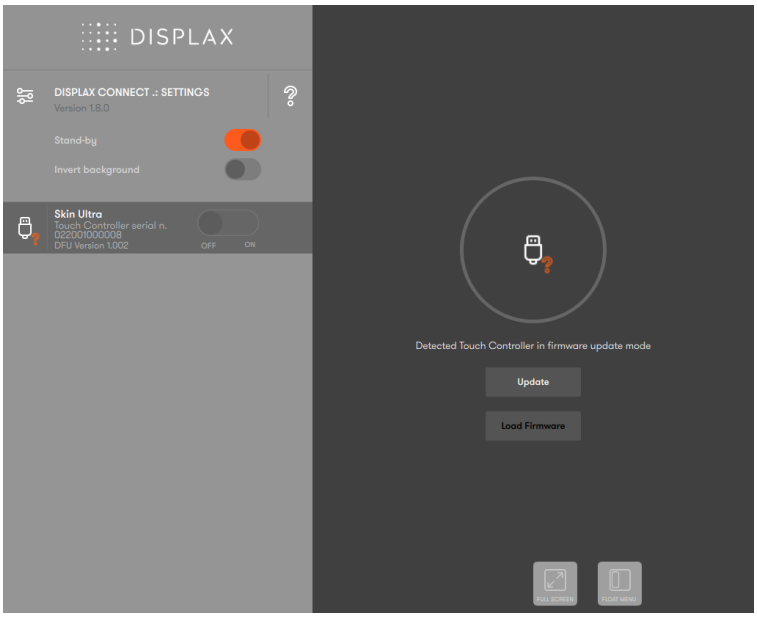


After concluding the Touch Controller Firmware update, you will be redirected to the 'Displax Connect' interface.



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

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



LOAD TOUCH CONTROLLER FIRMWARE

We use this feature when there's no internet access onsite. If you have internet access you don't need to use this feature.

This feature is used only if a Touch Controller Firmware file is available and can only be used on OS X (Yosemite), Ubuntu (14.04. LTS) and Windows 8 or higher versions.

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.

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

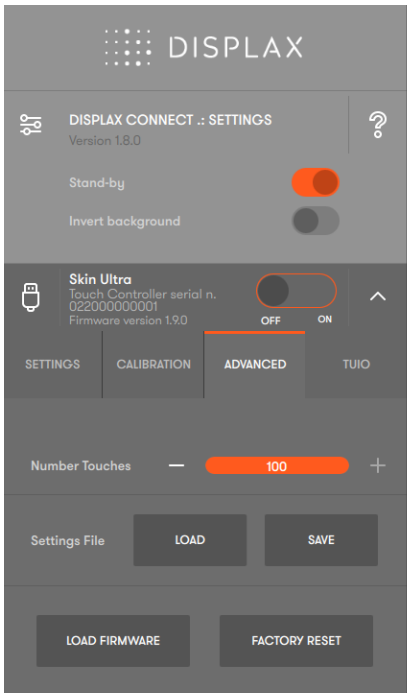


Fig.1

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

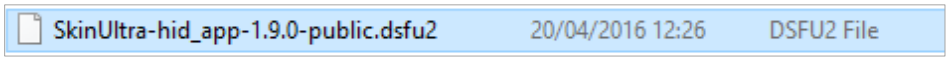


Fig.2

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

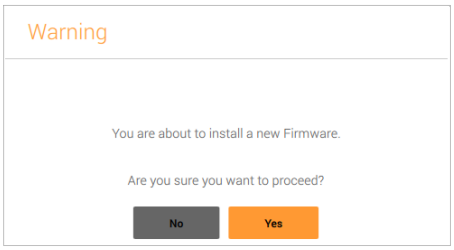


Fig.3

The firmware installation process will initiate.

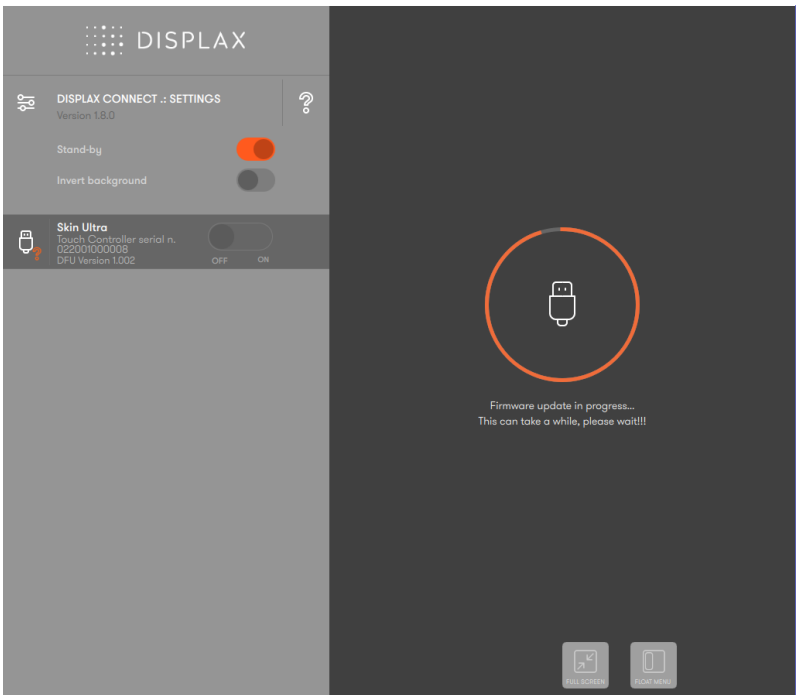


Fig.4

After the firmware upload, you will be redirected to the 'Displax Connect' interface (Fig.5).

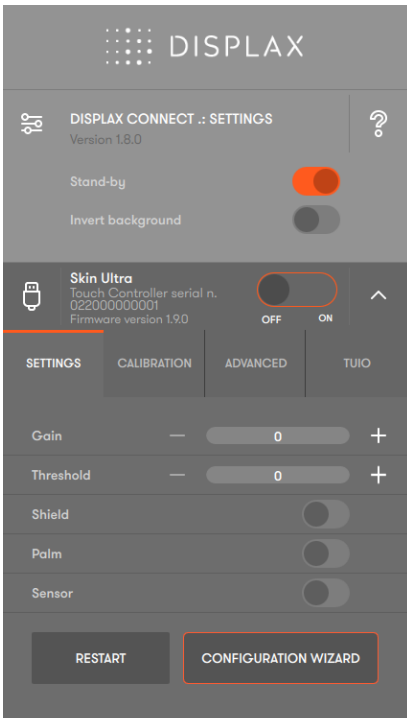


Fig.5

If, when loading the firmware, the process freezes (Fig.4), taking more than 3 minutes to conclude, or if it displays the Fig.6 background, you should close the 'Displax Connect' control panel and also disconnect the Touch Controller USB cable.

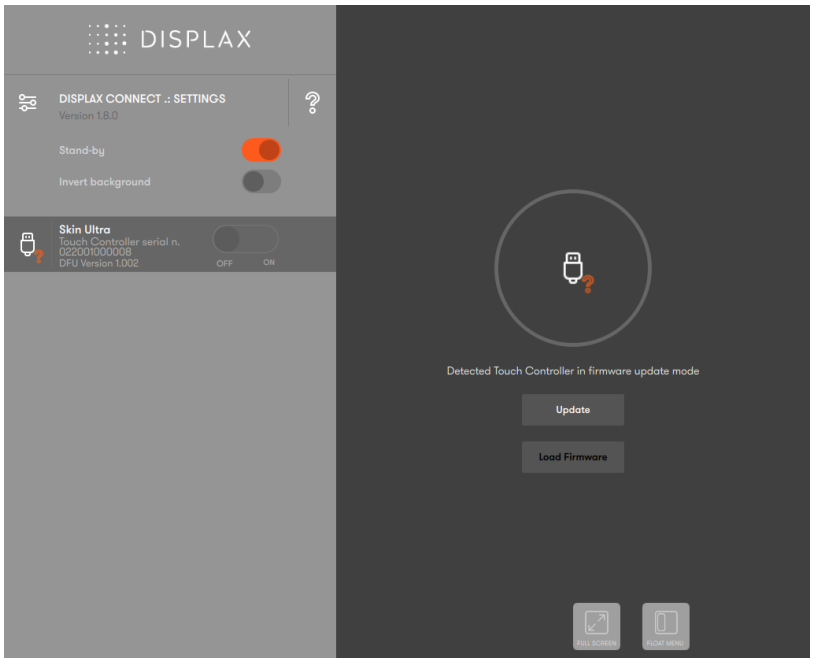
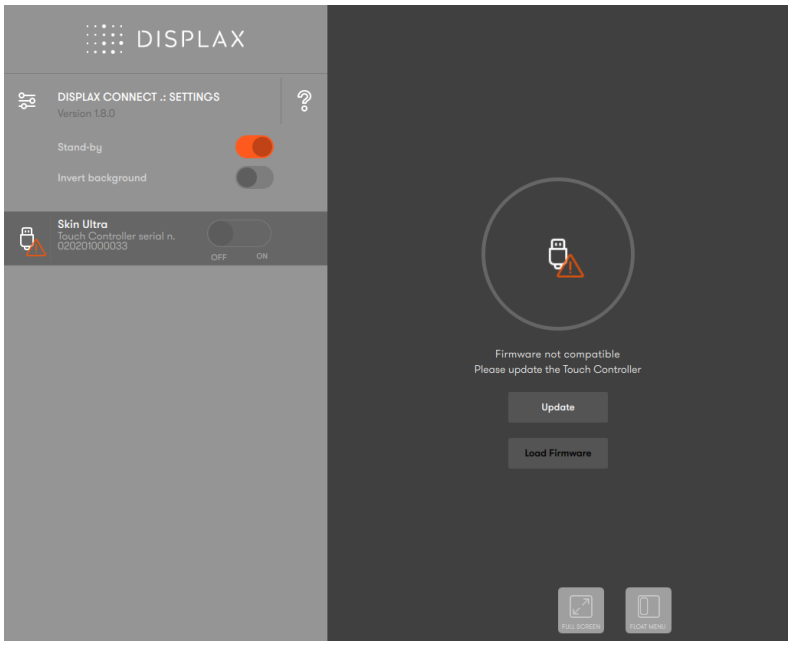


Fig.6

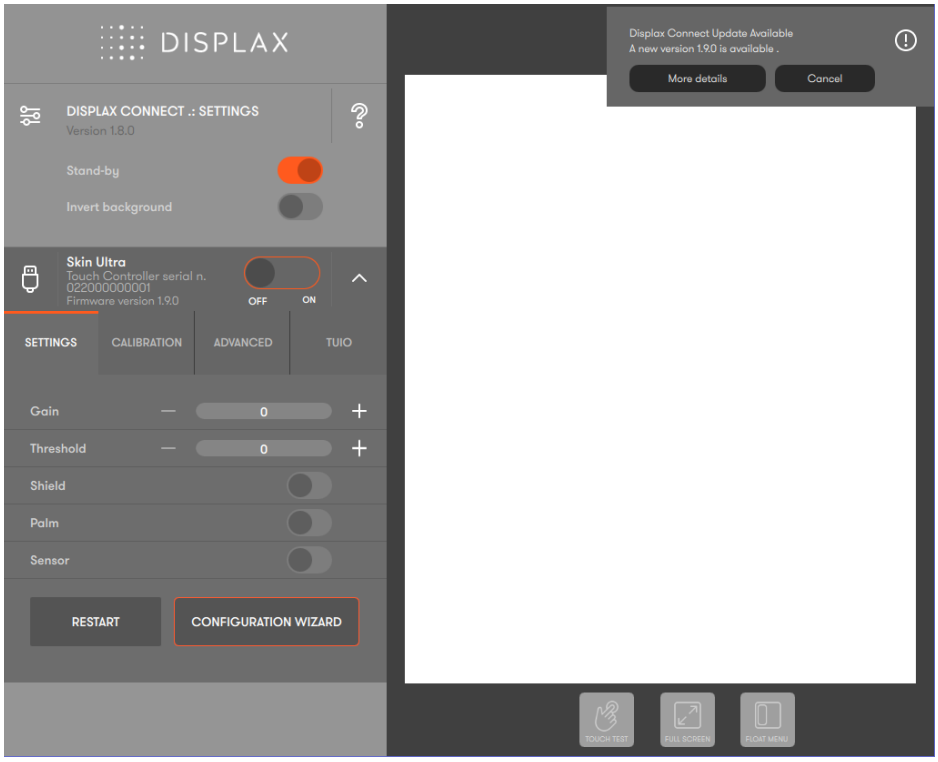
Afterwards you should reconnect the Touch Controller USB cable and reopen 'Displax Connect'. Then, restart the 'Load firmware' process Fig.6. When you click 'Load Firmware' you will restart the firmware upload, and should follow the steps presented on Fig.2 and Fig.3. After clicking 'Yes' on the Fig.3 warning message, the Firmware will be uploaded to the Touch Controller.

Note: The following image will be displayed if you have installed SUC versions 1.1.0 or below. 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.

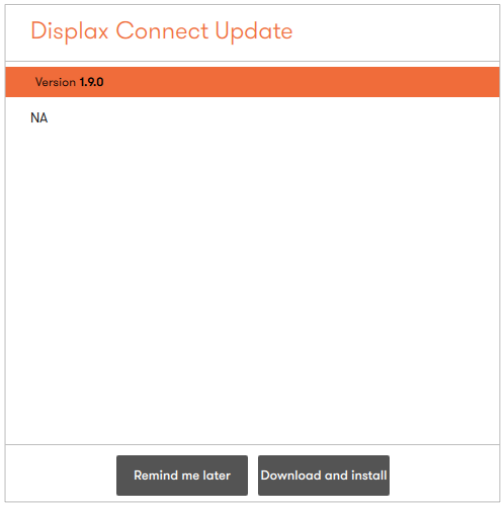


DISPLAX CONNECT UPDATE

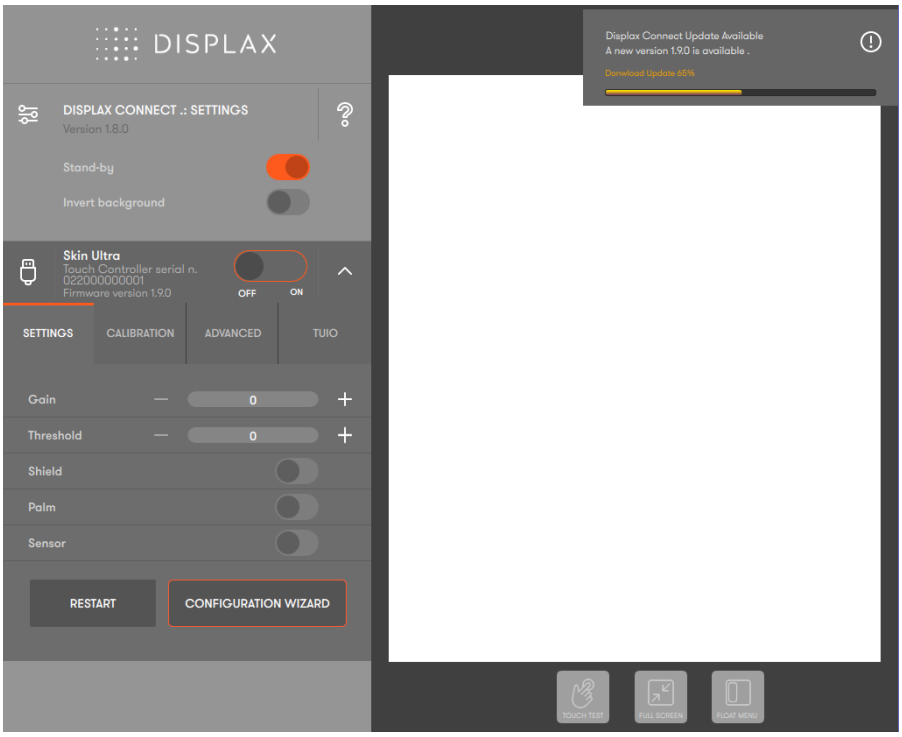
If your computer is connected to the internet, when you open 'Displax Connect' it will always verify if there's available a new version (feature also present in SUC versions 1.4.0 or higher). If there's a new 'Displax Connect' version, a notification will be presented on the Control Panel upper right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



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'.



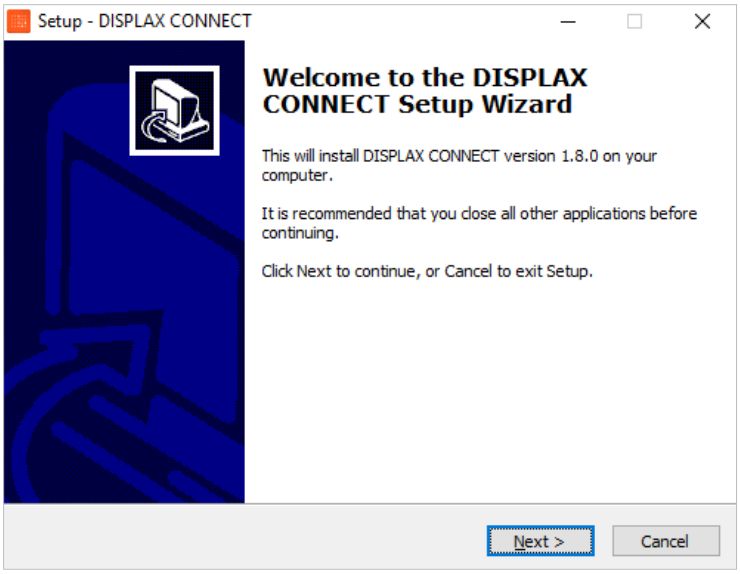
If you want to update, click on 'Download and install'. You should not interrupt this process until it is concluded.



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 Ultra Connect' 1.3.0 or lower, 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 Windows tool to remove programs.

Install the new version.

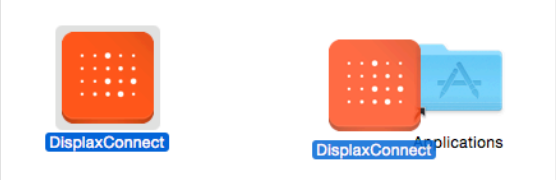
Displax Support website: https://support.displax.com/

OS X (Yosemite)

NOTE FOR OS X USERS: If you have a Skin Ultra Connect (SUC) 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.

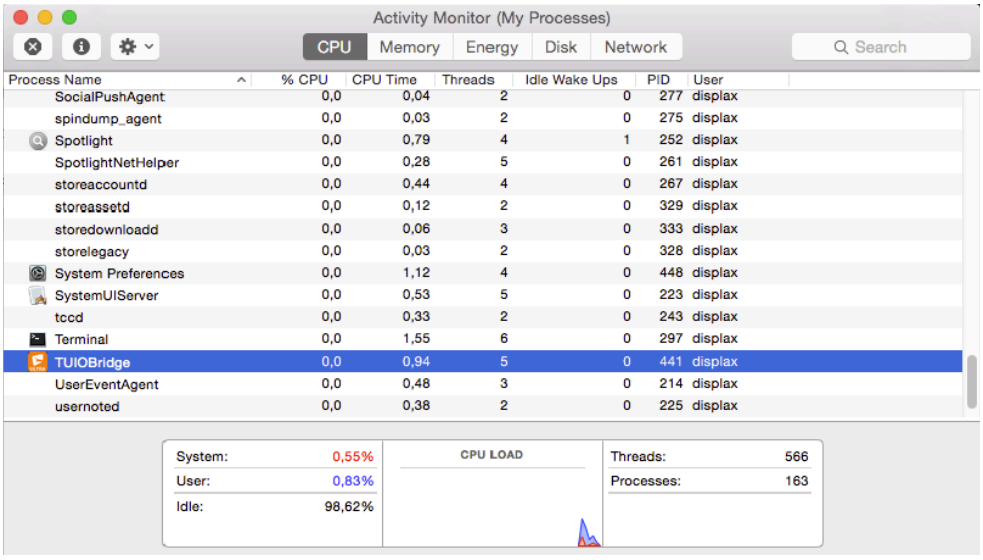
If you have a connected Touch Controller and an installed 'TUIOBridge.app' for 'TUIO', this app should be stopped before opening 'Displax Connect'.

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

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

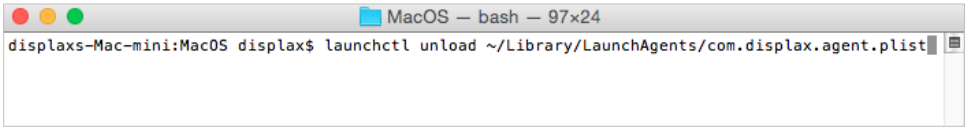
2nd Check if the 'TUIOBridge.app' is running on the 'Activity Monitor'.

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



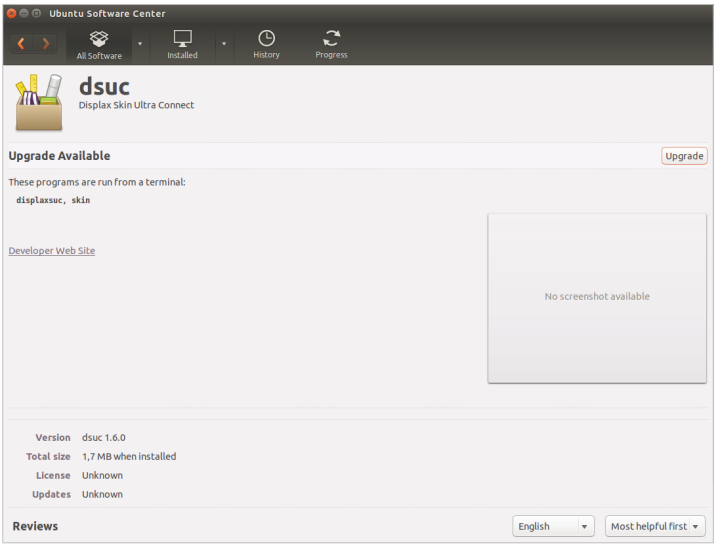
3rd If the 'TUIOBridge.app' is running on the 'Activity Monitor' stop its running process. This can be done by running on 'Terminal' the following command:

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



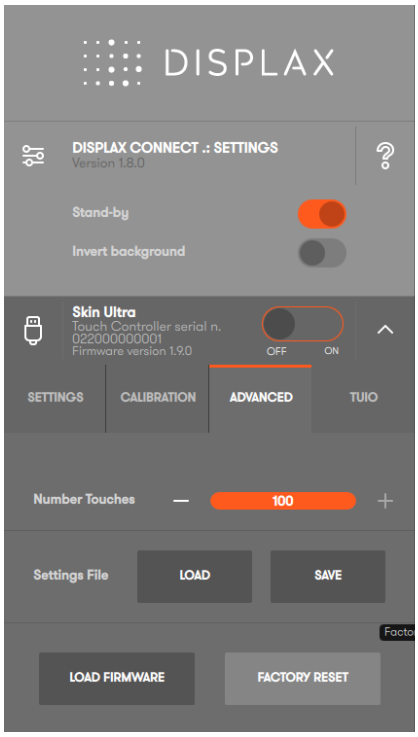
UBUNTU

A new 'Ubuntu Software center' window opens.



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

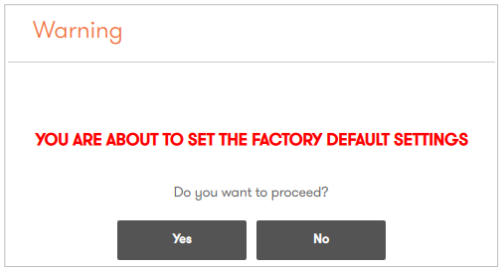
FACTORY RESET



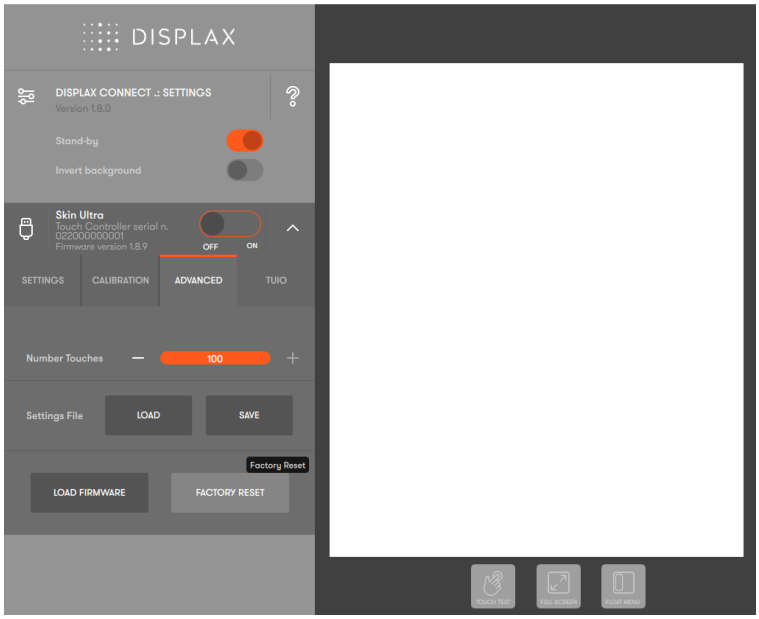
Sets the Touch Controller to its default settings;

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

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

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

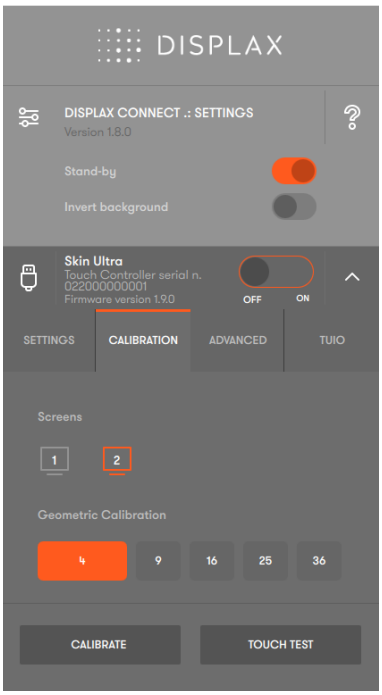
Android:

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

MULTI MONITOR CALIBRATION

Two or more units of Skin Ultra 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 Ultra units.

On 'Calibration' tab, in the 'Screens' section, select the number of Skin Ultra units connected to the PC.



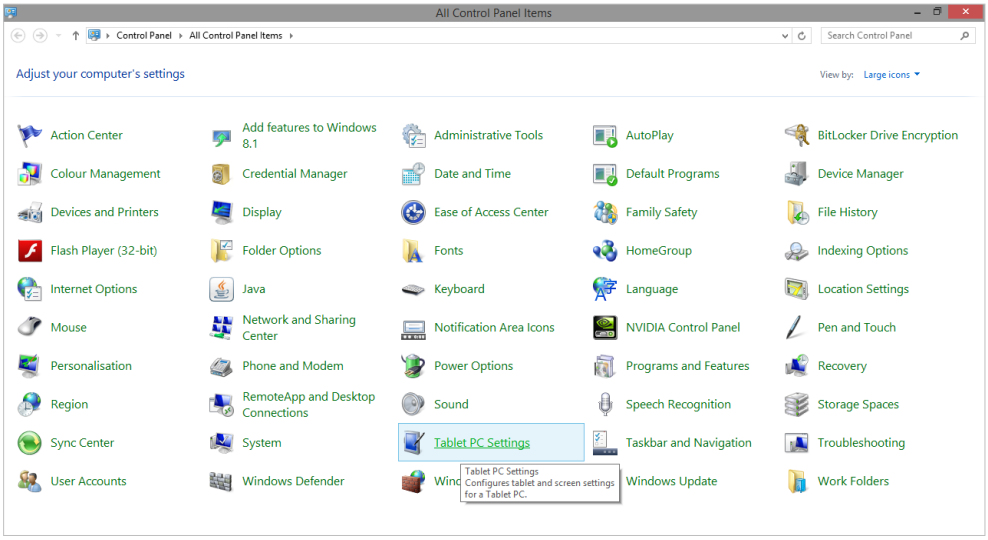
During the geometric calibration all monitors should have the same orientation. Afterwards, you may use monitors in a different orientation, for example, on a vertical orientation.

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)

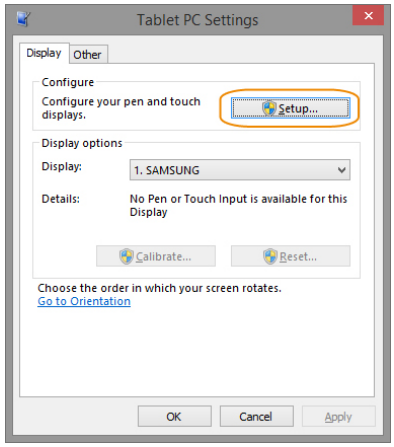
The calibration process of setups with multiple displays can differ depending on a number of factors, such as the display mode, graphics card, operating system, amongst others. If you have a setup with multiple displays and are experiencing difficulties with the calibration process, please contact us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

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

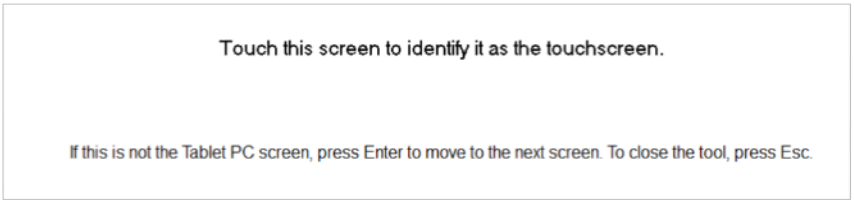
Go to the Windows Control Panel and open 'Tablet Settings'.



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 of the displays has touch (in case only one does) or which display is controlled by which touch device (in case all displays have Skin Ultra).

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 have to 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) doesn't 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 Ultra works in Linux if all of 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) & Ubuntu (14.04 LTS) and once you're 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 Skin Ultra in the Linux PC.

CHROME OS

Skin Ultra runs 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) & Ubuntu (14.04 LTS) and once you're 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 Skin Ultra in the Chrome OS PC.

ANDROID

Skin Ultra 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) & Ubuntu (14.04 LTS) and once you're 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 Skin Ultra 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 don't support multitouch. Skin Ultra emulates a mouse, letting you operate the touchscreen as if it were 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) & Ubuntu (14.04 LTS) and once you're 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 Skin Ultra in the new PC / Media Player.

WARRANTY

DISPLAX provides quality products. DISPLAX warrants to the original end user 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 Ultra has 1 year warranty under normal use from date of invoice of the product.

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
- Damage caused by use of the product outside the permitted or intended uses 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 is return to base only, and 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.