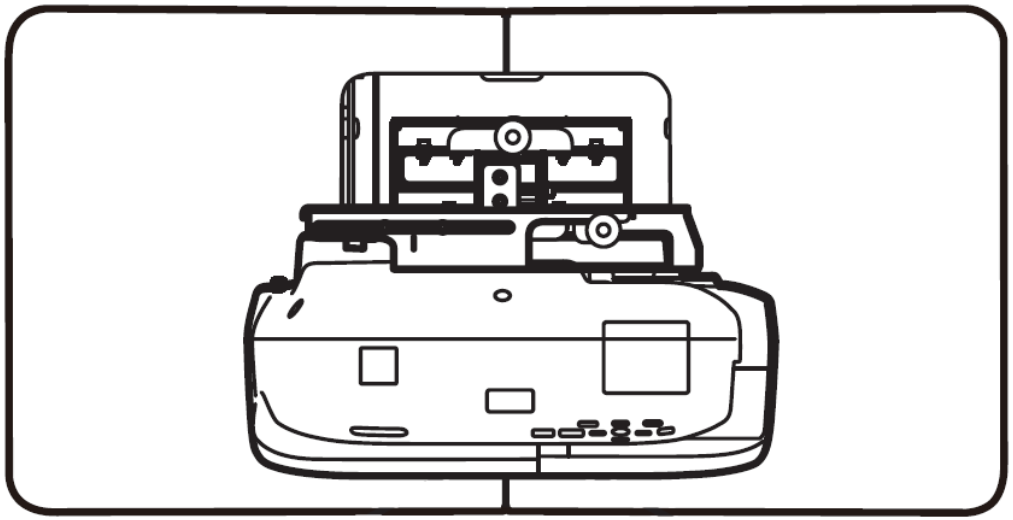
EPSON Finger Touch Unit

(addendum to the installation manual)

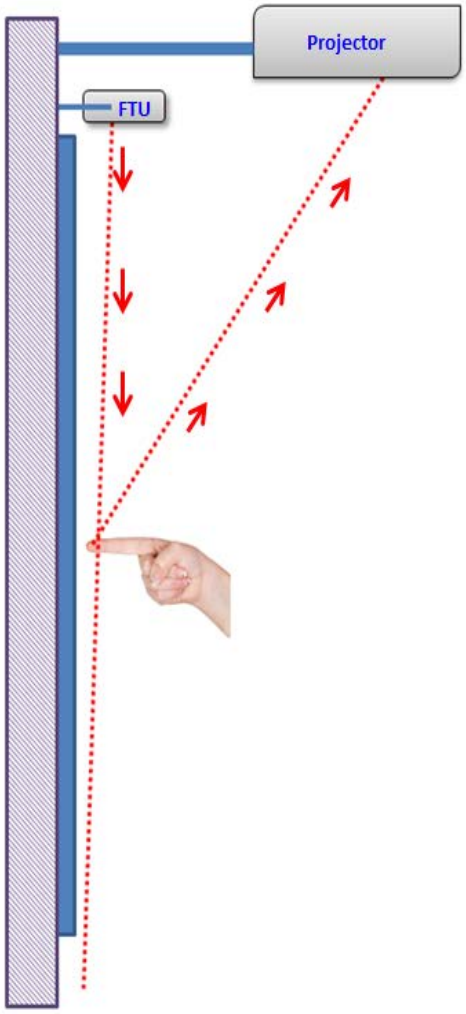


Introduction

This document is intended to be an addendum to the main installation manual that is provided with finger touch equipped projectors.

Please refer to the main installation manual first – as it provides the specific instructions on how to install and configure the touch unit on the projector. The purpose of this guide is to provide some additional information which further explains the entire process.

The main installation guide can be downloaded from www.epson.com.au

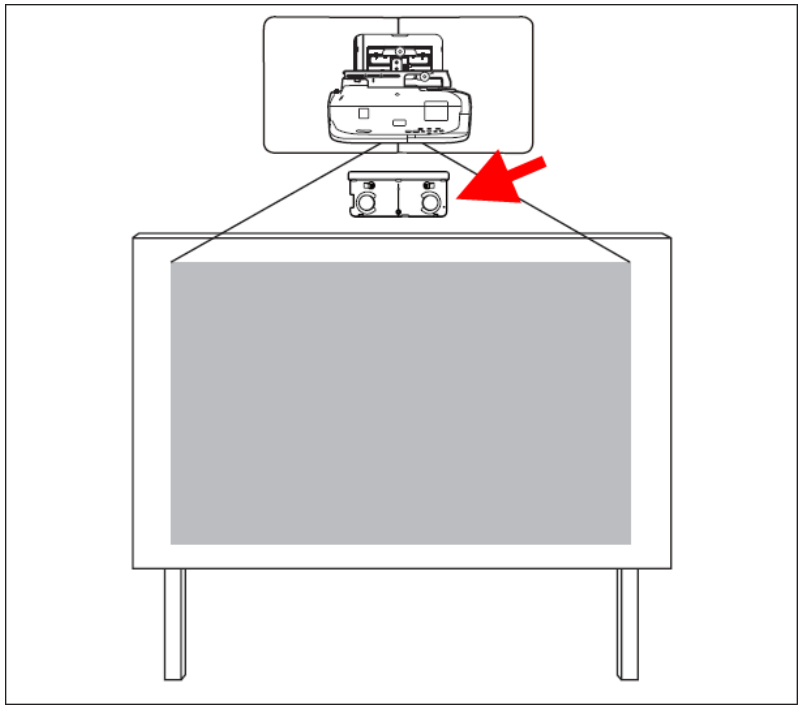


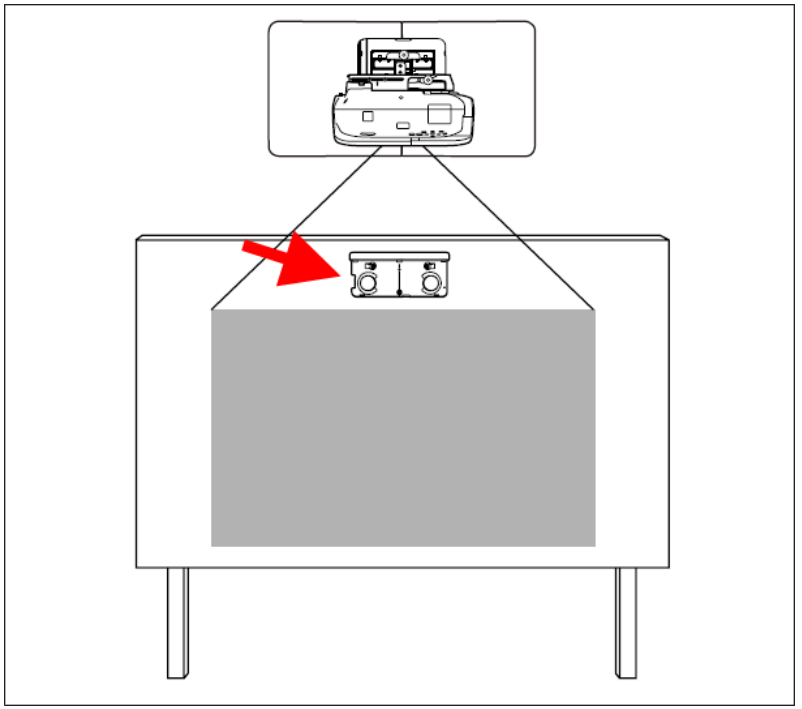
The Finger Touch Unit (hereby referred to as “FTU”; also referred to as “LCU: Light Curtain Unit” in some literature) employs infrared-emitting laser technology to overlay an “Infrared laser light curtain” over the surface of the whiteboard. Any contact on the board results in this beam being interrupted, and that interruption subsequently being detected by the infrared camera on the projector. The projector’s internal logic then maps the point of this interference, relative to the display area, to create the touch effect.

For this technology to work according to specification, it is critical that the FTU be mounted and calibrated correctly. This document aims to provide some points to take into consideration during the installation and configuration process to ensure the proper operation of the FTU.

Mounting of the FTU

The ideal mounting position for the FTU is on the actual surface of the whiteboard (the FTU was originally designed to be mounted this way). However, if there is a requirement to use the whole surface area of the board, then the FTU can be mounted above the board as well.



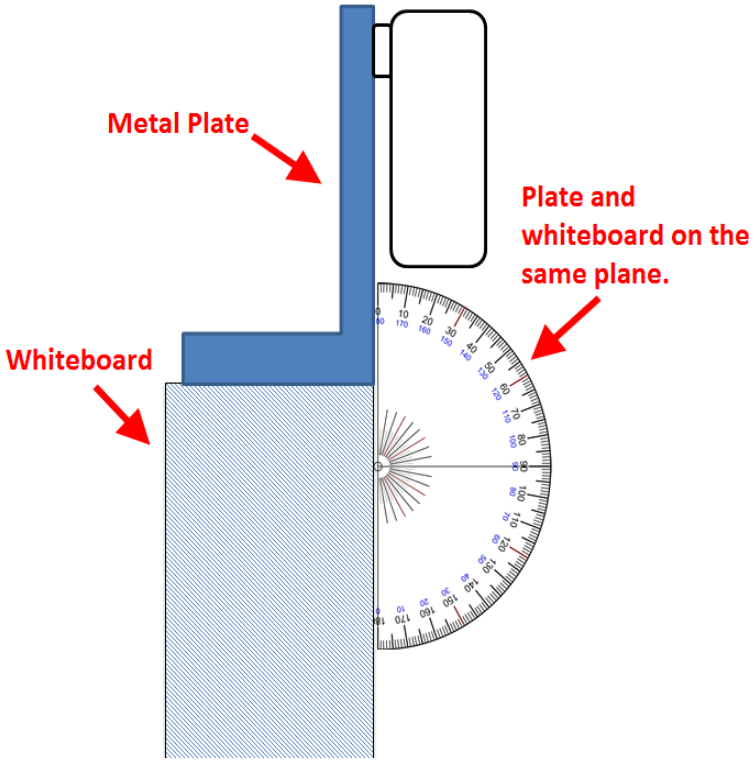


There are two common methods of mounting the FTU:

Method 1: Affixed to a plate attached to the top of the whiteboard;
Method 2: Using the bundled Epson FTU mount.

Method 1: using a metal plate attached to the whiteboard

As shown in the image on the right, the FTU is affixed to a metal plate (“L” shaped bracket), which is then attached to the top of the whiteboard.



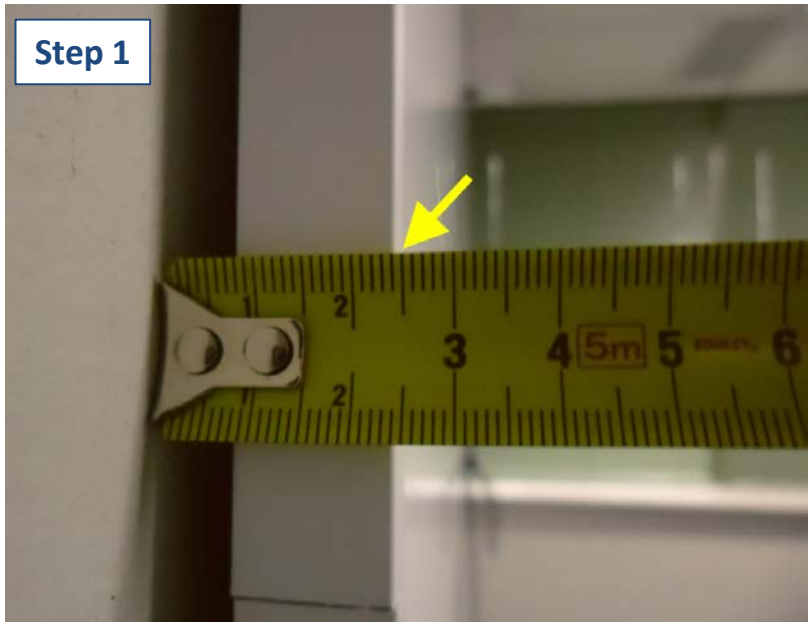
If this is the preferred method for mounting the FTU, please make sure that the metal plate is on the same plane as the whiteboard.

Method 2: using the included Epson FTU mount

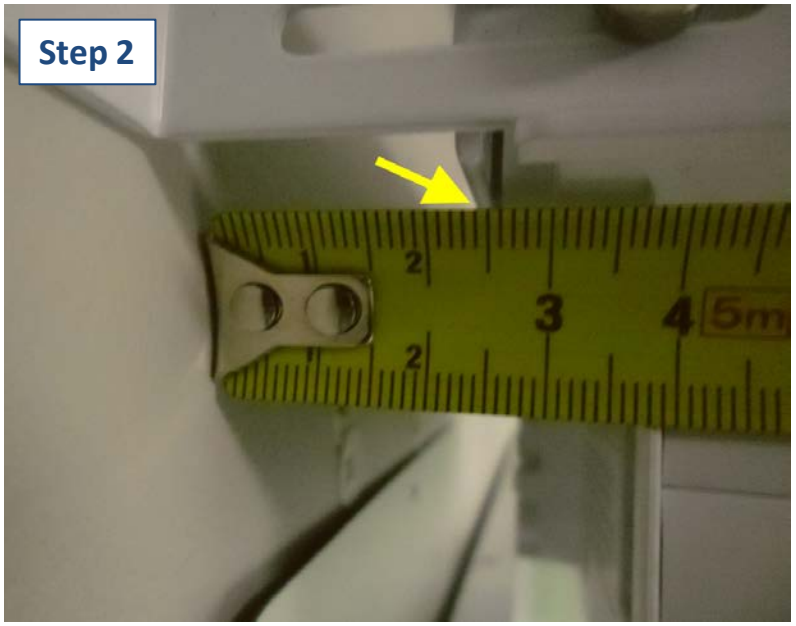
The EB-595Wi and the EB-1430Wi models now ship with a FTU mount designed by EPSON. This mount enables the FTU to be fixed to a solid wall, and then be “depth-adjusted” to suit the thickness of the whiteboard.

Placement of the EPSON FTU mount

Installation of the FTU is a simple 2-step process:

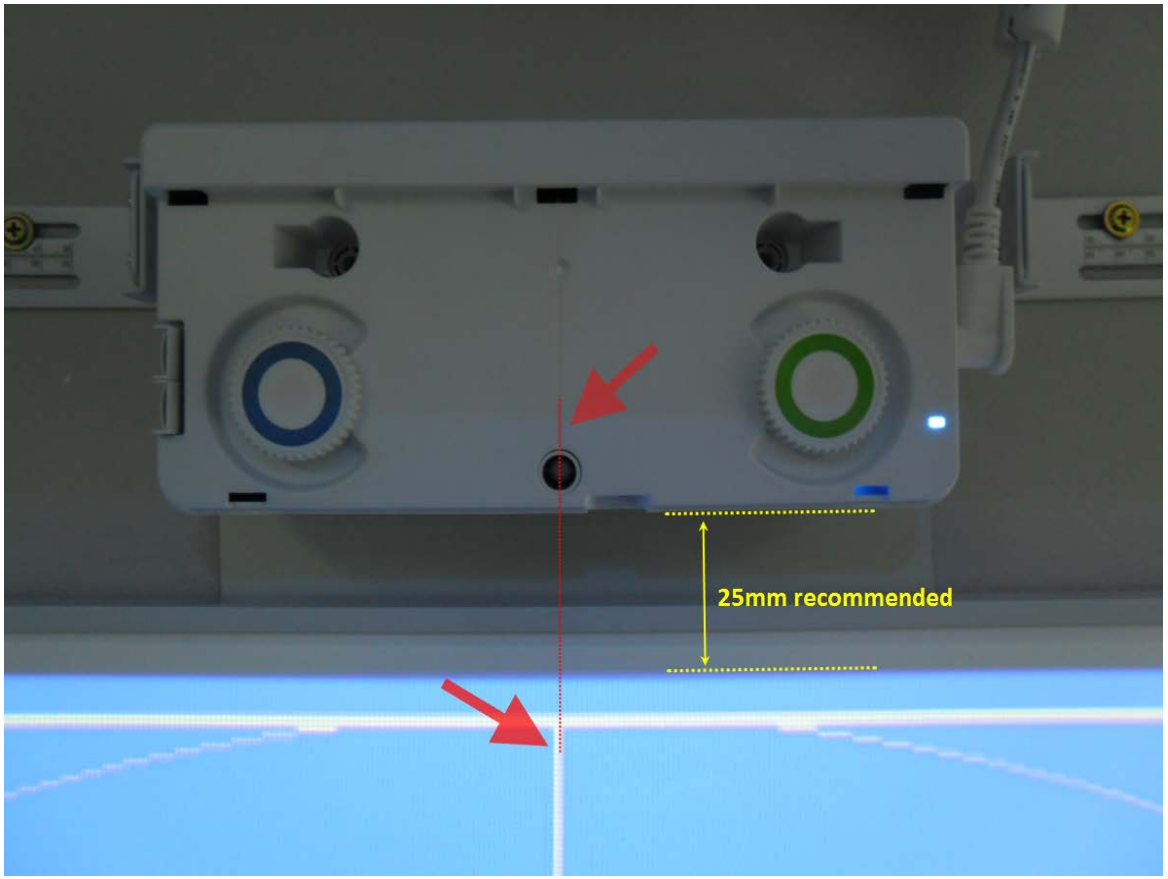


measure the thickness of the board from the wall to the edge of the bezel.



set the distance of the FTU, from the wall, to the thickness (depth) measured in Step 1. This will ensure that the FTU is sitting on the same plane as the board (or bezel, if the board has one).

Placement of the EPSON FTU mount… (contd.)

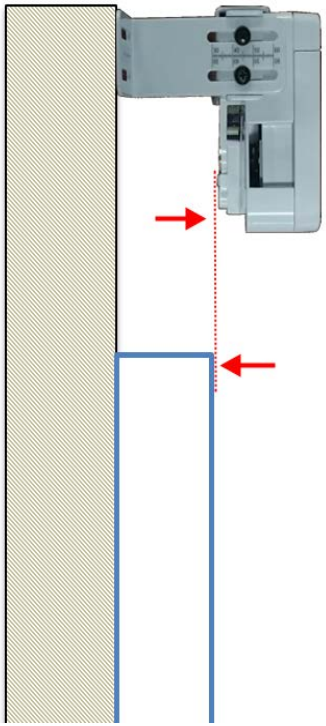


EPSON's recommendation is that the FTU be mounted approximately 25mm above the display area of the projector - as shown in the image on the left.

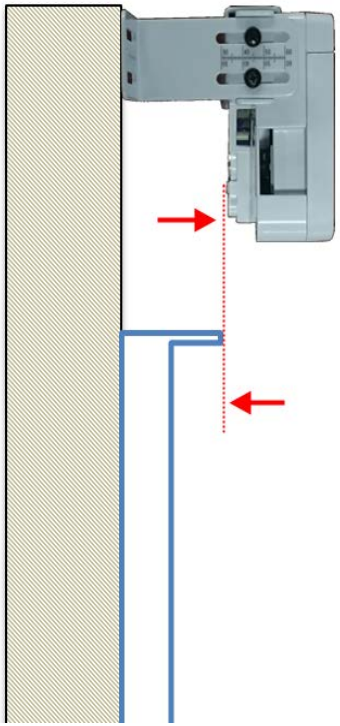
Please make sure to align the centre line on the FTU to the centre marking of the display, as shown here.

The FTU can be mounted at a distance of up to 100mm above the display area. However, 25mm would provide optimal coverage of the whiteboard. Where possible, please adhere to the 25mm specification.

Positioning the FTU above the whiteboard



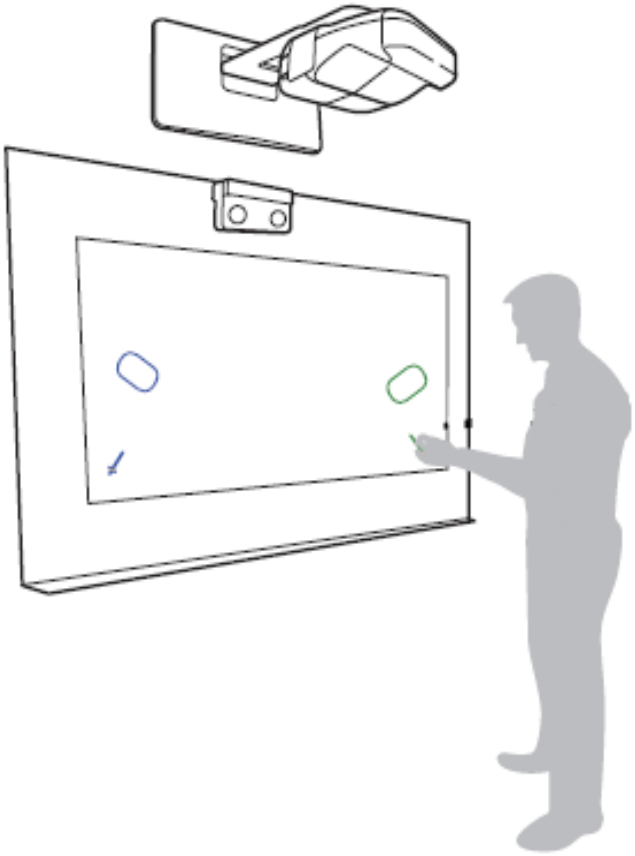
As mentioned previously, the FTU should be mounted in such a way that it sits on the same virtual plane as the surface of the whiteboard (denoted by the dotted red line).



If the FTU is being mounted above a whiteboard with a bezel, then please make sure that the bezel is **no thicker than 3mm**. If the bezel thickness is greater than 3mm, then the operation of the FTU cannot be guaranteed.

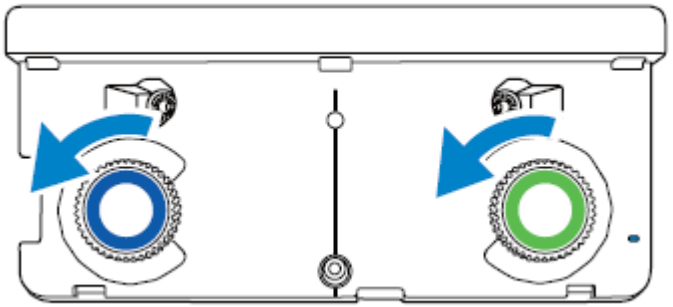
In this scenario, the FTU should be positioned so that it is on the same virtual plane as the bezel.

FTU Calibration Process

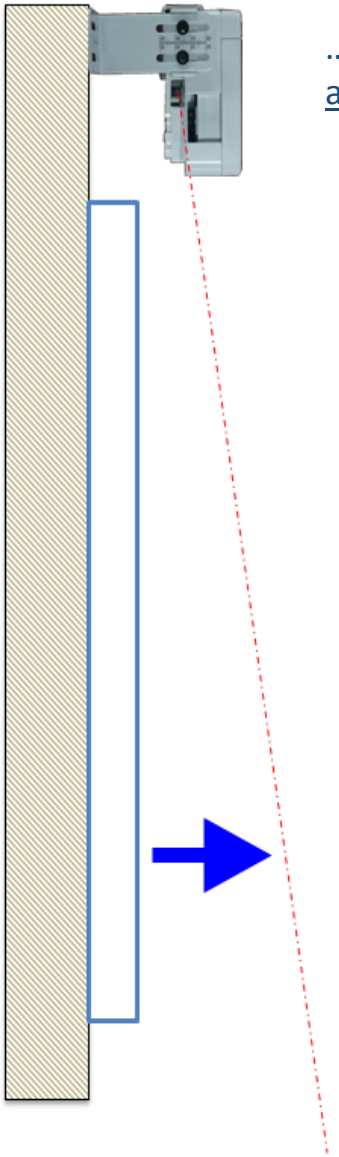


The calibration utility in the Epson finger touch model projectors provides step-by-step instructions. Please make sure to read and follow these instructions carefully as you progress through the various steps.

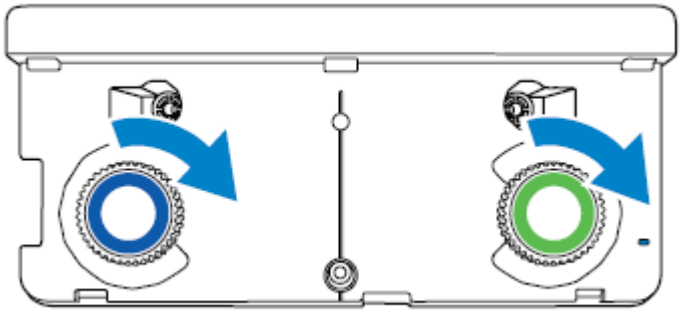
The purpose of this section is to discuss this process, and also to provide some background information on each of the steps and why they are important.



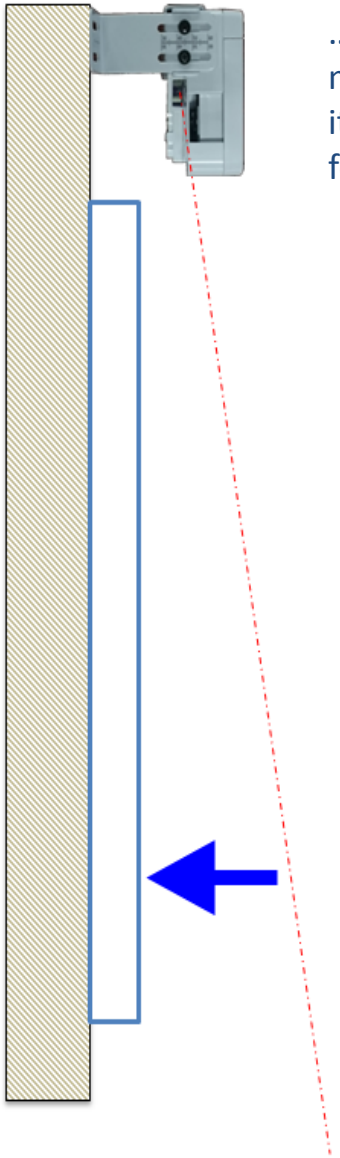
As per the main installation guide, the very first step of the calibration process requires you to turn both the Blue and Green dials in a counter-clockwise direction…



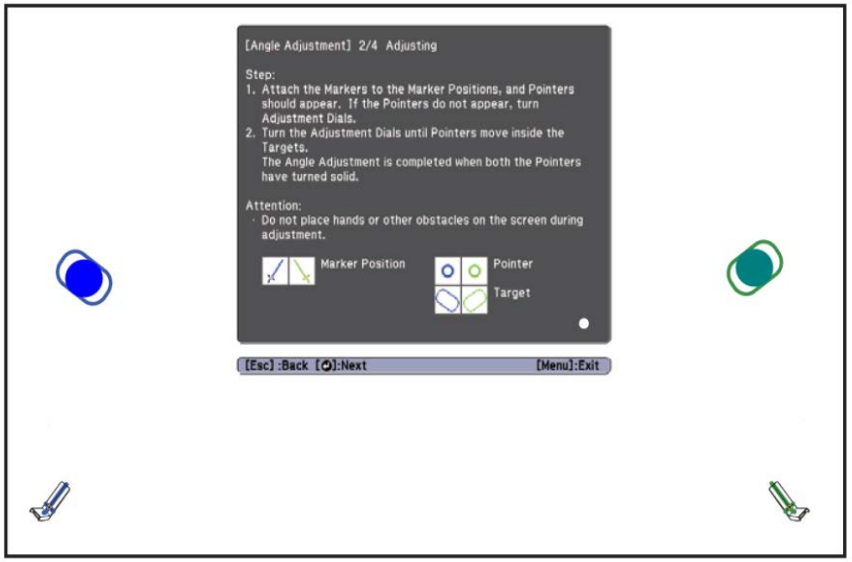
… this results in the light curtain moving away from the board.



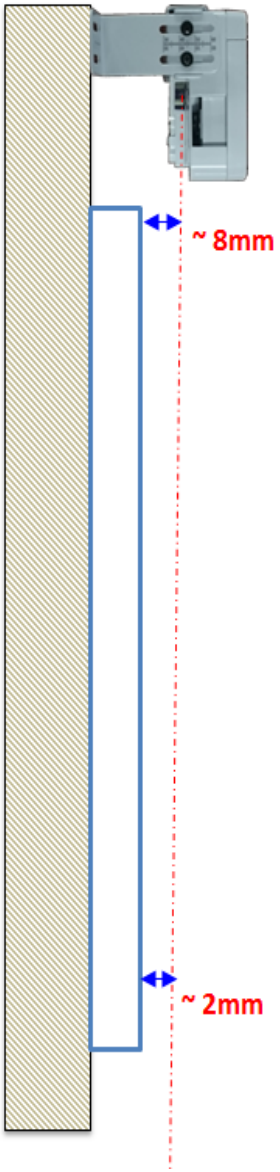
The next step of the calibration process involves turning the dials in a clock-wise direction…



… this results in the light curtain moving towards the board – until it reaches the optimal distance for finger touch operation.

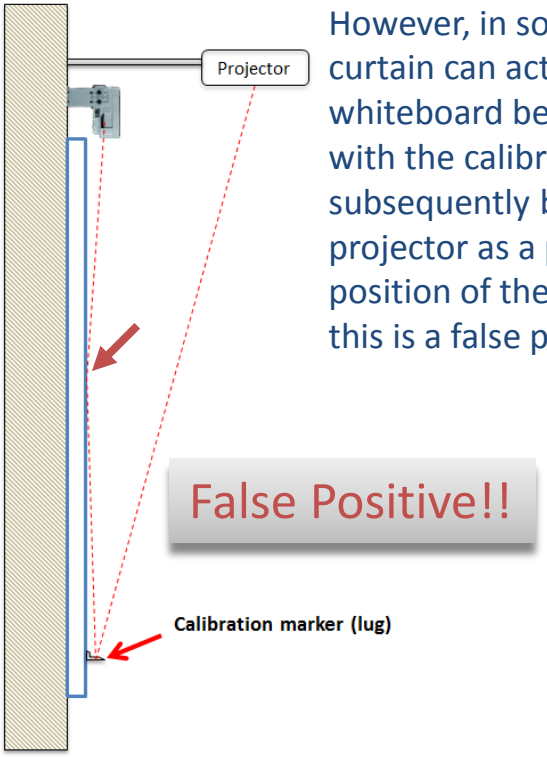


As you continue turning the dials, the Blue and Green circles (referred to as “pointers” in the adjustment utility) will eventually move into their respective squares (referred to as “targets” in the utility). When this occurs, the projector determines that it has a positive reading of the position of the laser curtain; and the adjustment process progresses to the next step.

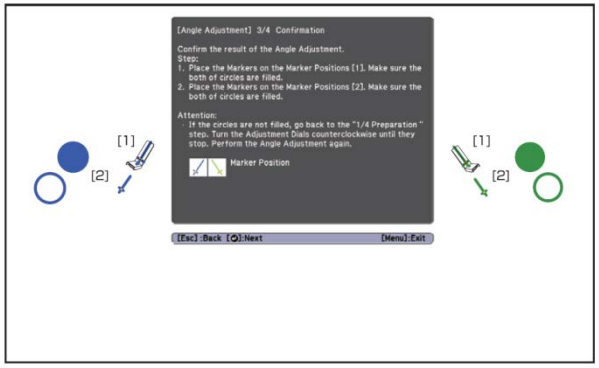


When the Blue/Green circles move into their respective squares, the laser curtain reaches it’s optimal position, relative to the whiteboard. At this point, the laser curtain should be approx. 8mm from the surface of the board at the top, and approx. 2mm from the surface at the bottom.

If the laser curtain is correctly calibrated, then it should reflect off the calibration marker and subsequently be detected by the projector (as shown on the left).



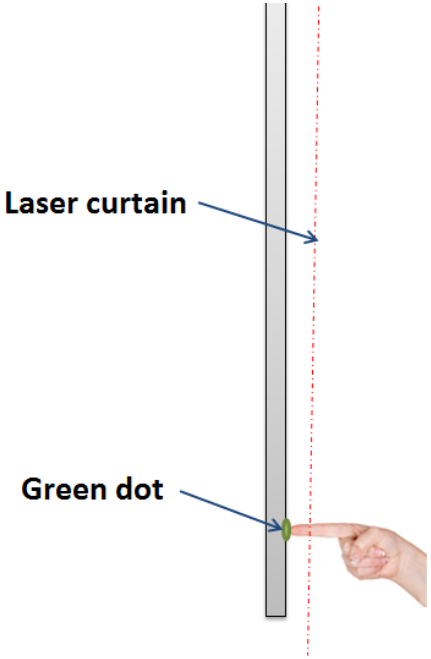
However, in some rare cases, the curtain can actually bounce off the whiteboard before making contact with the calibration marker; and then subsequently be detected by the projector as a positive reading of the position of the curtain; when in fact, this is a false positive reading.



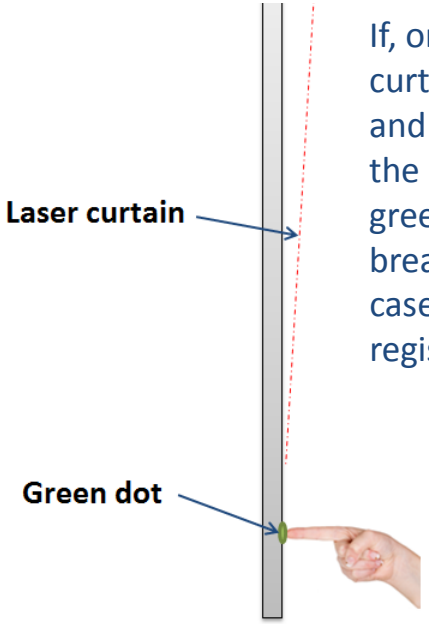
This is why the second step – where the markers are moved to two separate positions to ensure that the respective Green and Blue circles are filled – is vital. This step will verify whether or not the laser curtain is firing correctly, without making contact with the board. If the two circles aren't filled, or if only one is filled, then this would indicate that the laser curtain is bouncing off the board instead - if this is the case, please restart the calibration process.

The next step in the process is to trace the green dots with a finger, until they all disappear from the screen.

The purpose of this step is to ascertain whether the laser curtain is correctly overlayed on the board. If any of the dots don't react as you move your finger across them, then this indicates that laser curtain isn't correctly overlayed.



If the laser curtain is properly calibrated (i.e. it lies over the board, without making any contact with it), then the green dot should lie behind the curtain (as shown on the left). When the finger makes contact with the dot, then the projector detects the break in the curtain and registers the touch event.

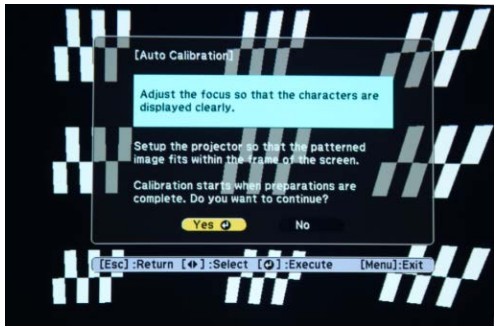


If, on the other hand, the laser curtain is not properly configured, and ends up making contact with the board, then touching the green dot doesn't result in a break in the curtain – in which case, the projector will not register a legitimate touch event.

FTU Calibration Workflow

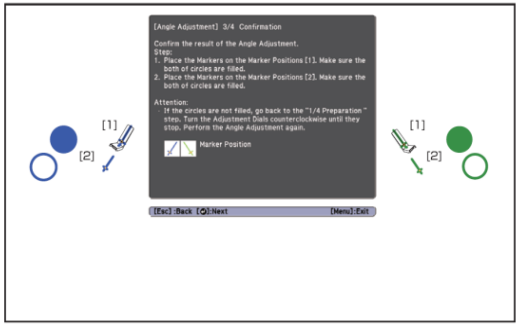
Below is proper workflow (process) recommended by EPSON when commencing calibration.

Step 1: Auto calibrate…



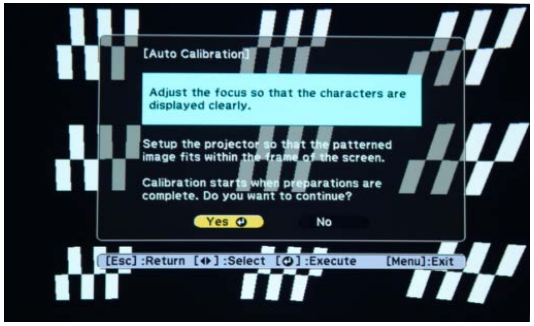
Step 2: Angle adjustment…

Step 3: Confirm angle adjustment…

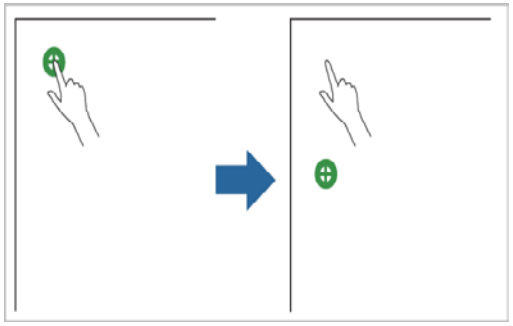


Step 4: verify curtain coverage…

Step 5: Another auto calibration…

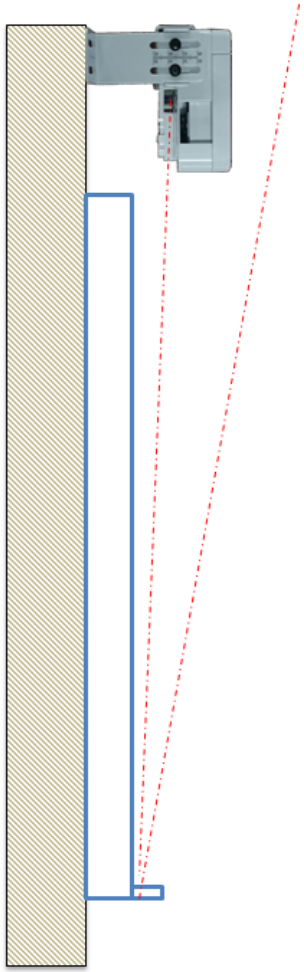


Step 6: Touch Calibration.

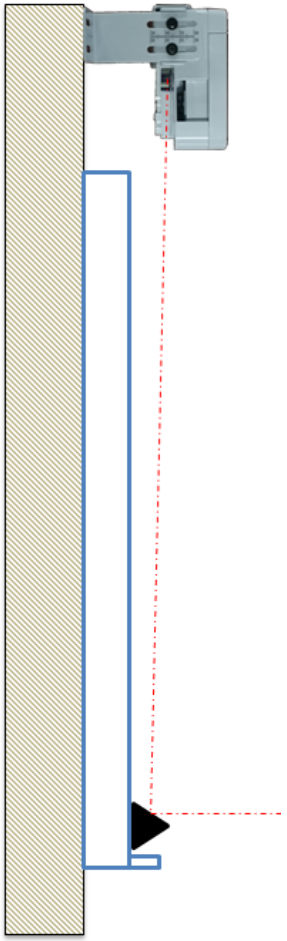


Technical Tips And Troubleshooting

Whiteboards with pen trays…

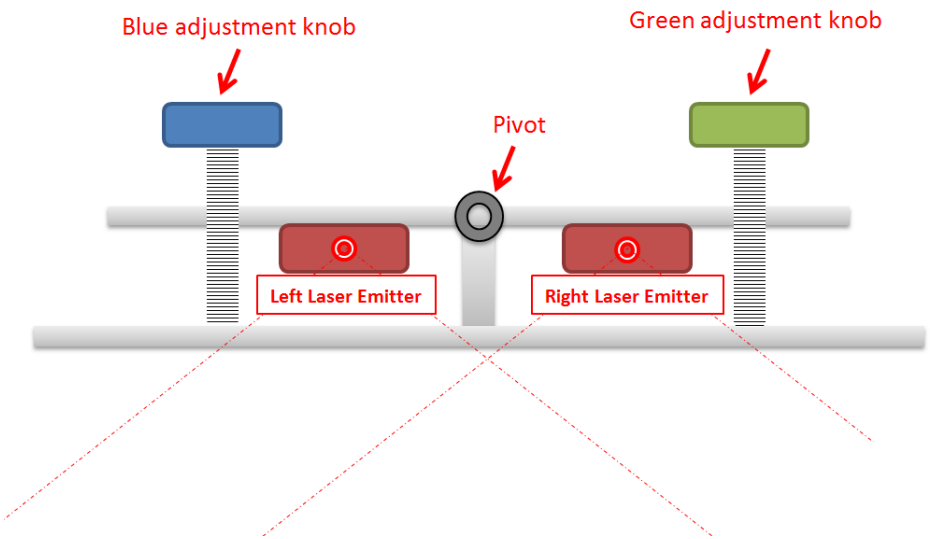


Ideally, the FTU should be installed to a board that doesn't have a pen tray at the base. A pen tray, or any other obstacle in the path of the laser curtain will cause the laser to reflect and create a "secondary" curtain. Consequently, the projector will detect two contacts on the board when there should be one (resulting in a duplication/ghosting of any annotation made on the board).



If removing the pen tray isn't an option, then the "IR Deflector" strips (provided with the projector) can be used to deflect the laser curtain away from the pen tray, in order to avoid creating a secondary curtain.

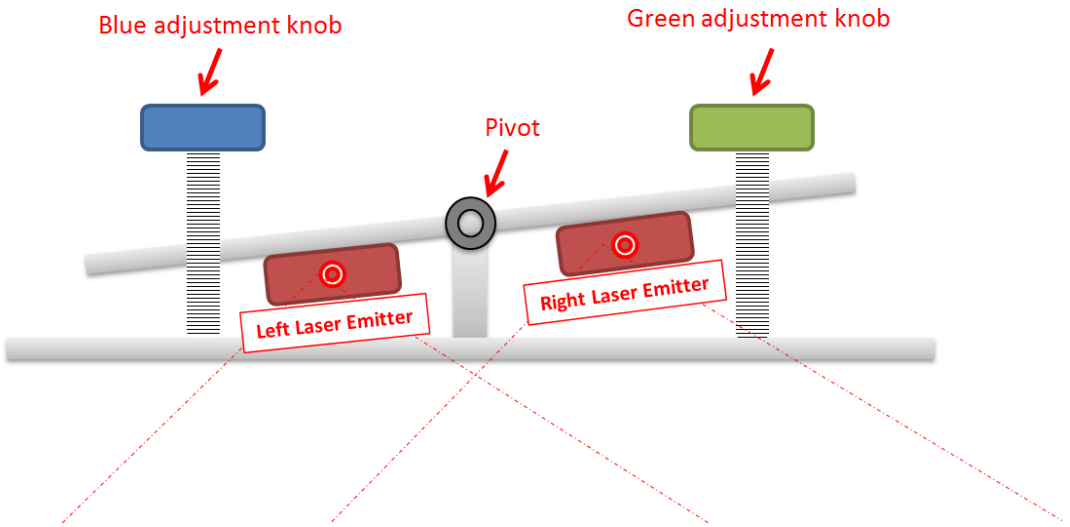
Turning the adjustment knobs on the FTU…



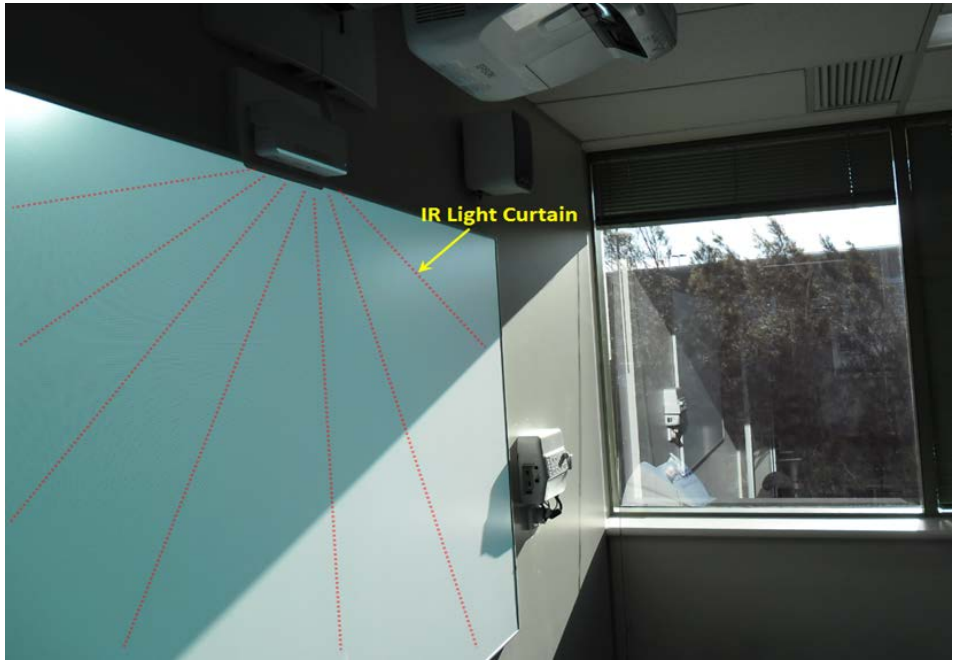
The FTU adjustment knobs work on a pivot system. When making adjustments, it is recommended to do so in an alternating fashion - that is, 2x turns of the Blue knob, then 2x turns of the Green, then 2x turns of the Blue, etc….

Try and avoid focusing on one colour first, and then the other. Because the two are connected to a pivot, doing so will cause one or the other to drift and subsequently misalign the curtain.

Performing the adjustment as mentioned above will make the process a lot easier.



Infra-red interference caused by direct sunlight…



The FTU is classified as a “Class 1” laser emitting device (which emits an infra-red laser beam in the 940nm wavelength).

Being a low energy laser emitting device, any source of strong IR radiation may cause interference and result in erratic touch behaviour.

The image on the left is a unique case where the laser curtain is completely inactive on the part of the board exposed to direct sunlight. In this particular scenario, closing the blinds rectified this issue.

It would be prudent to be mindful of infra-red interference sources when dealing with FTU enabled projectors.

Two FTU equipped projectors mounted in close proximity…

The image on the left is that of an installation where two finger touch equipped projectors were mounted adjacent to one another. This resulted in erratic finger touch behaviour on the left projector: annotations in the area outlined by the yellow triangle resulted in drawings/annotations being duplicated.

It was later discovered that this was due to the laser curtain of the two finger touch units overlapping each other on the left mounted projector. This caused the projector on the left to detect a “double-touch” event, as discussed in the previous section.

The remedy to this is to install some sort of “IR deflector”, or some other barrier, to prevent the two laser curtains from overlapping each other.