TouchBeam Interactive

Table of contents

Usage Notice

Please follow all warnings, precautions and maintenance as recommended in this user's manual.

- Warning - Do not disassemble the TouchBeam module.
- Warning - Do not use, store, or leave the TouchBeam module near fire, or in places with a high temperature, e.g., in direct sunlight, or in sun-heated cars.
- Warning – Use a standard USB cable (maximum length: 5m). To extend the USB cable length over 5m, a certified active extension USB cable is required.
- Warning - Do not allow liquid or foreign material to enter the TouchBeam module.

Precautions

The IR camera on the projector receives infrared signals from the TouchBeam module which is attached to the whiteboard.

To operate normally:

- The IR camera should face the projection area of the whiteboard.
- Remove any obstacle in between the IR camera and the TouchBeam module.
- Do not place other infrared communication devices, lighting equipment, or residential heating equipment etc., nearby.

  Maintenance: Gently clean the optical port with dust blower.

How it works

- TouchBeam covers the entire whiteboard with a thin invisible IR light.
- When a finger or stylus breaks the TouchBeam, IR light reflects to the IR camera.
- The camera module tracks multiple touch points and reports positions to a PC or laptop via USB.
- To optimize the touch function the whiteboard needs to be flat and in good condition, without dents or warping.

Package Overview
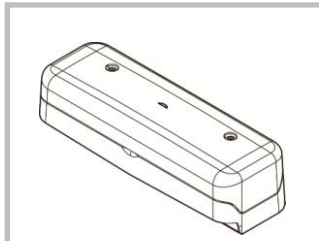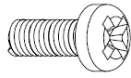
TouchBeam module	2x (M2 6mm) screws	2x (M6 6mm) screws	Interactive cable
2x Alignment sticker	TouchBeam bracket	Double sided tape	5m USB cable
2x Passive pens	CD user manual		
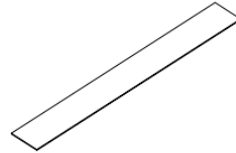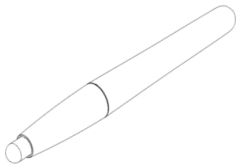
Before Installation - Environment Check

Before setting up and installing the projector and TouchBeam module ensure that the power supply and wiring work for the installation location of the mount in advance.

Note:

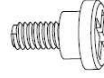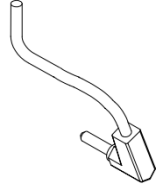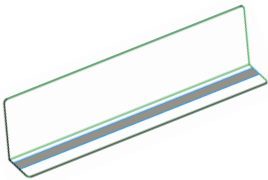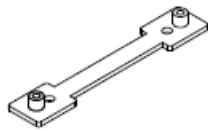- Install the projector away from other electrical devices such as florescent lights or air conditioners. Some kinds of florescent lights could interfere with the remote control of the projector

- We recommend to keep source cable length less than 20 meters to reduce external noise

- We recommend using a steel backed whiteboard

- Make sure the projector is installed under the following conditions
  - the projected image is a rectangular shape without any distortion
  - the projector is tilted at an angle no more than +/-3 degrees vertically and horizontal in relation to the screen

- When using the interactive function install the projector so that the projected image is within reach

- Do not install the projector or screen in a location subject to direct sunlight. If the projector and screen are subject to direct sunlight, the interactive function may not operate correctly.

TouchBeam installation information

Before installing the TouchBeam module, the projection surface must meet the following conditions/criteria:
1. The screen surface is a flat, smooth surface with no unevenness of more than 5mm. The surface can either be a flat wall or a whiteboard. For details on how to check surface flatness see page 8.
2. The surface must be magnetic or allow for the TouchBeam module to be secured with screws
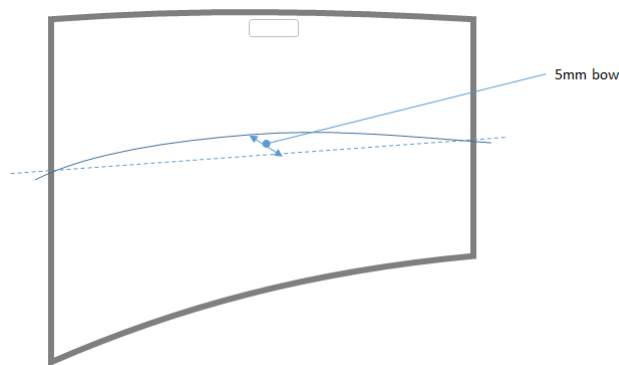
If the projection surface meets the criteria above, the projector and TouchBeam module can then be installed in one of the following ways
1. Mount the projector and TouchBeam module to the wall
2. Mount the projector to the wall and attached the TouchBeam module to the whiteboard
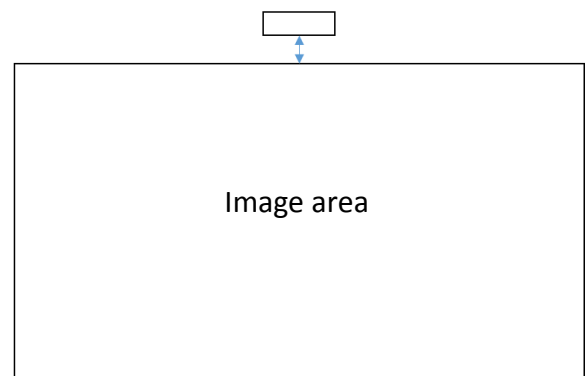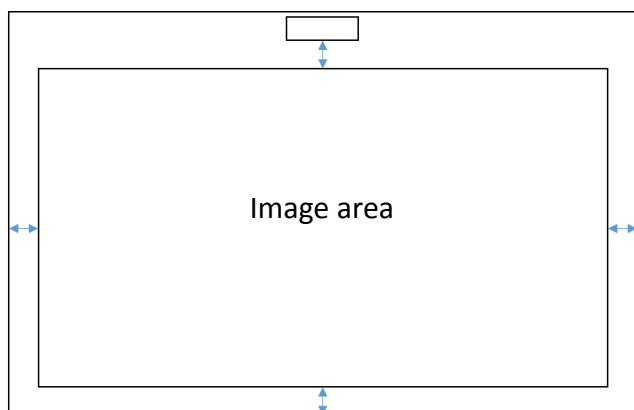
Whiteboard guideline

When installing the TouchBeam module on a whiteboard please follow the guidelines below

For standard aspect ratio (4:3, 16:10 and 16:9) image sizes
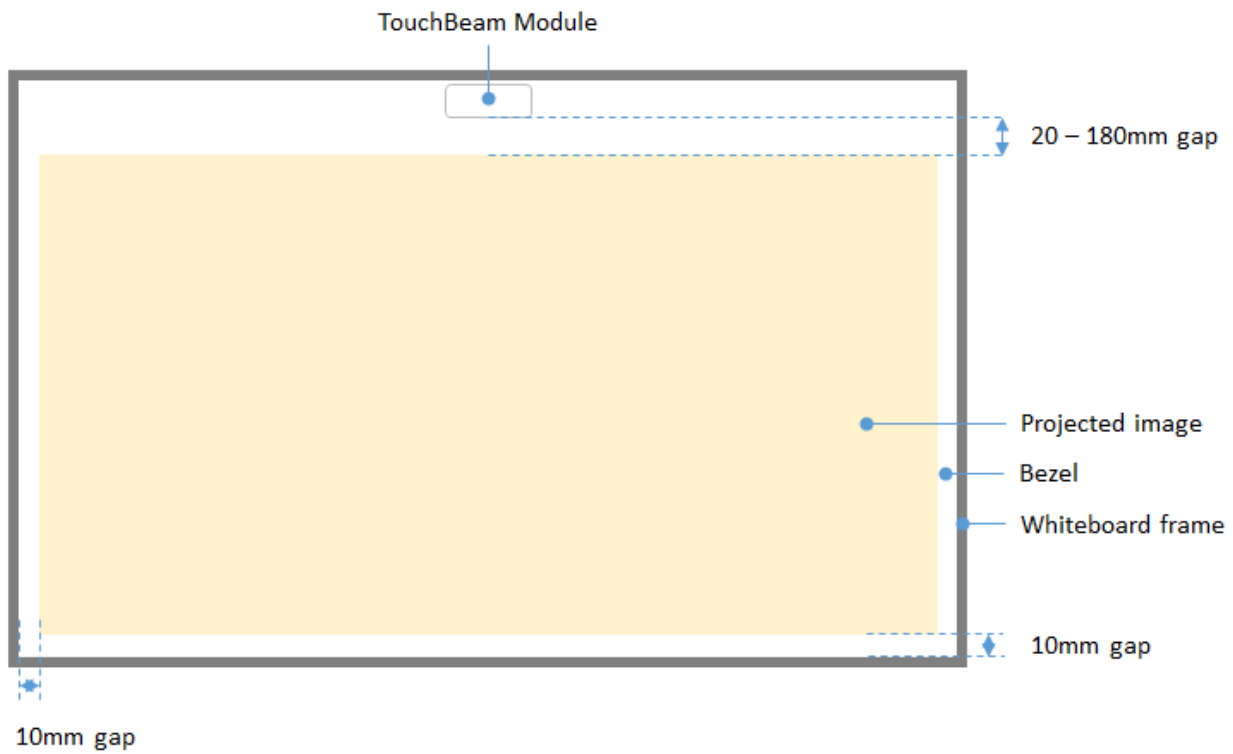
- Image size: 70" ~ 115"*
- From the top of image area, a 20~100mm gap must be kept away from the bottom of TouchBeam module
- For a whiteboard with a frame height of <3mm, keep a 10mm bezel at left/right/bottom of the projected image area
- For a regular whiteboard (ex: aluminum frame) with a frame height >3mm, keep a 50mm bezel at left/right/bottom of the projected image area

For ultra-wide (24:9) image size
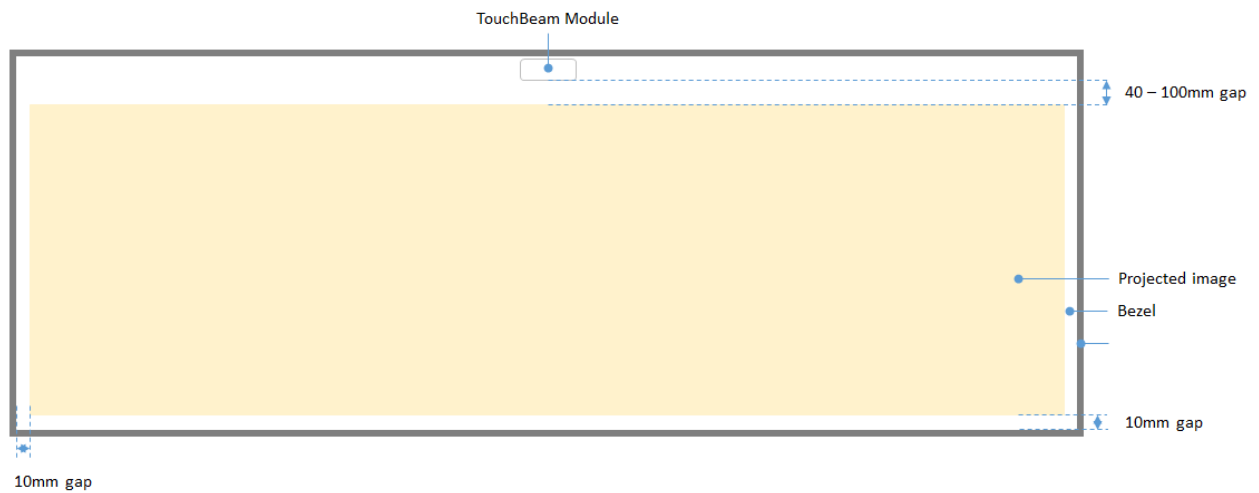
- Image size: 120" ~ 140" Ultra wide
- From the top of image area, a 40~100mm gap must be kept away from the bottom of TouchBeam module
- For a suggested whiteboard with a frame height of <3mm, keep a 10mm bezel at left/right/bottom of the projected image area
- For a regular whiteboard (ex: aluminum frame) with a frame height >3mm, keep a 50mm bezel at left/right/bottom of the projected image area

Note:

If the whiteboard frame thickness is greater than 3mm the reflected light interference from the whiteboard frame may be detected by IR camera. This can compromise the touch function. To reduce the risk of this happening it is recommend that a 50mm border is kept around the projected image instead of 10mm as shown in diagram on the previous page.

If the whiteboard frame thickness is less than 3mm, ensure the reflected light interference is not observed when completing TouchBeam alignment.
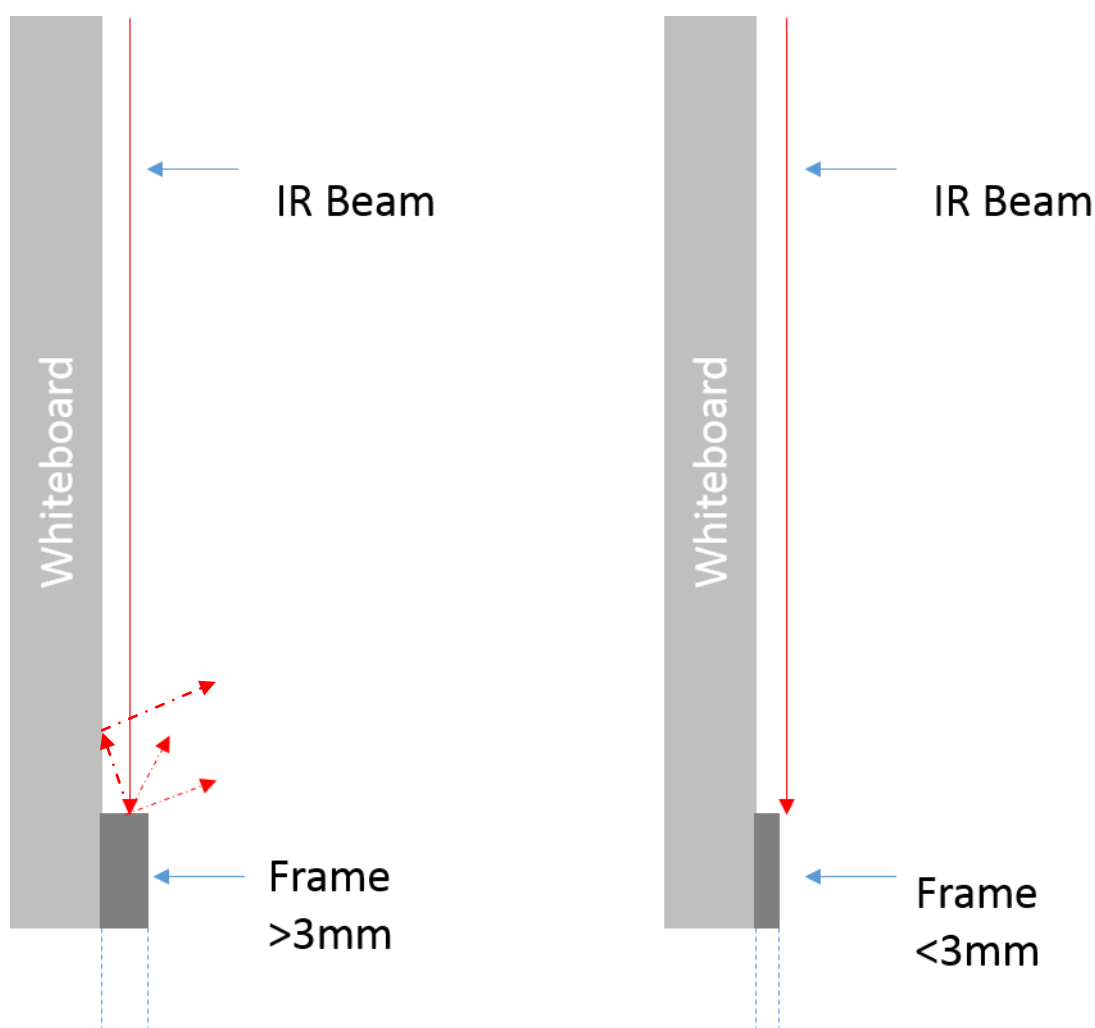
It is suggested that a whiteboard with a frame of less than 3mm is used. However if a larger frame size is required it must follow the conditions shown below:

- Surface treatment: Matt, with mold texture ≥11010

- Shape: as figure on next page

Projected image

IR Beam

Whiteboard

10mm

>10mm

25mm

Frame

45°
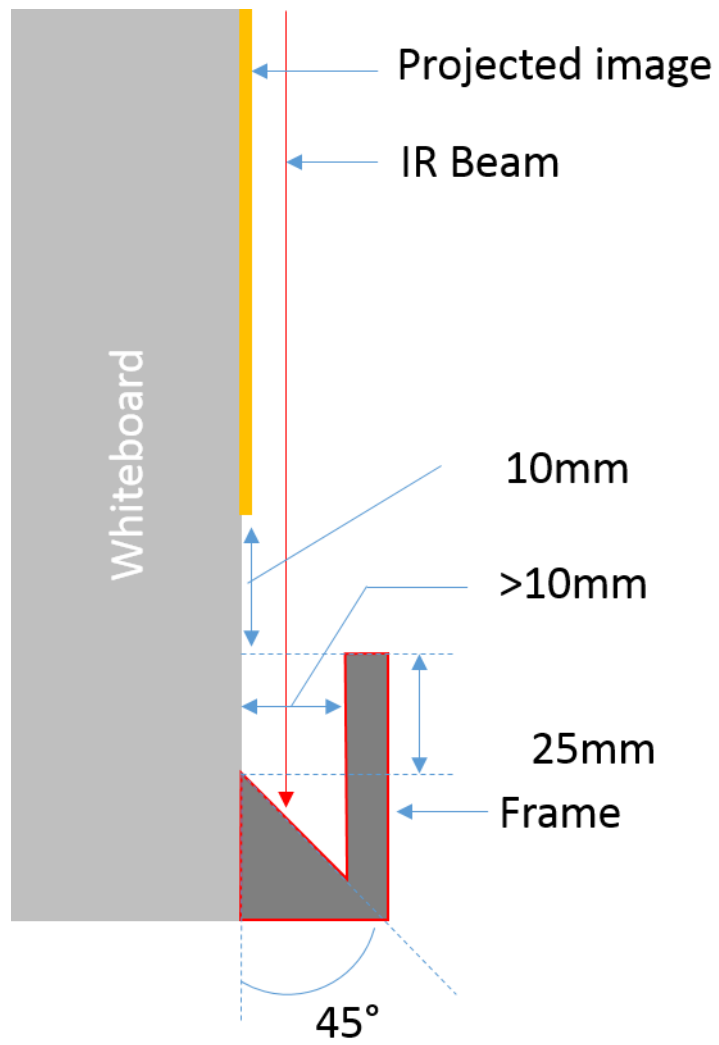
Measuring projection surface flatness

- ✓ Criteria: overall surface flatness should have variance of less than 5mm.

- ✓ Equipment: leveling instrument (1.2~1.5m) and thickness gauge.

Split projection area into 16 segments equally as shown on chart below. Place leveling instrument on whiteboard.

Insert the 5mm thickness gauge at point 1~9 positions following below order:

Horizontal:	Vertical:
- Measure point 1, 2 & 3.	- Measure point 1, 4 & 7.
- Measure point 4, 5 & 6.	- Measure point 2, 5 & 8.
- Measure point 7, 8 & 9.	- Measure point 3, 6 & 9.
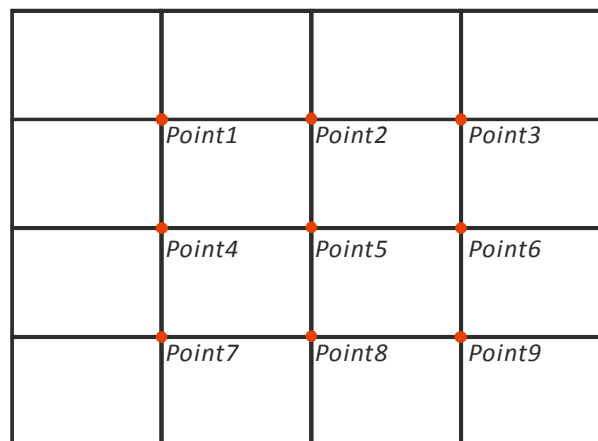
If a 5mm thickness gauge cannot be inserted between the whiteboard and the level then the whiteboard is not suitable for finger touch control.

Installation guide

Installation workflow

- o Install the projector mount (See mount installation guide)
- o Attach the projector to mount (See mount installation guide)
- o Connect sources to the projector
- o Adjust projected images (See mount installation guide)
- o Install the whiteboard (See whiteboard installation guide)
- o Install the TouchBeam module
  - Attach to board
  - Connect to projector / PC
  - Calibrate

Note: If the whiteboard is already installed please see page 36.

Installing the mount

Step 1: Attach the wall plate to the wall
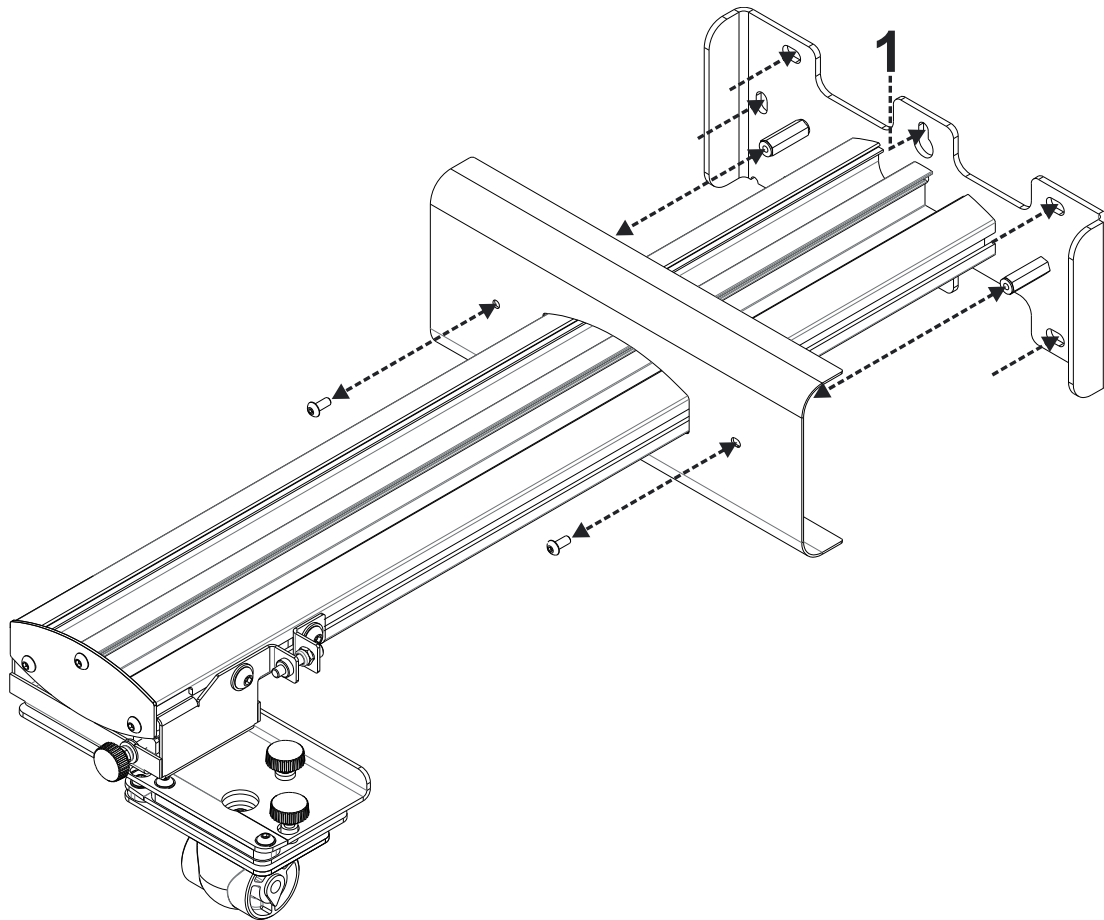
- For ease of installation mount the bracket on the wall using position **1** and mark other positions using a spirit level.
- Remove bracket and drill other positions
- Use fixings suitable for your type of wall construction
- Use all available fixing points
- If in any doubt of the suitability of the wall, it's construction or what type of fixings to use, consult a qualified builder or installer

Note: Remove wall plate cover before attaching to wall. Retain fixings for re-attaching cover later.

Step 2: Attach the projector to the mount plate

Ax5
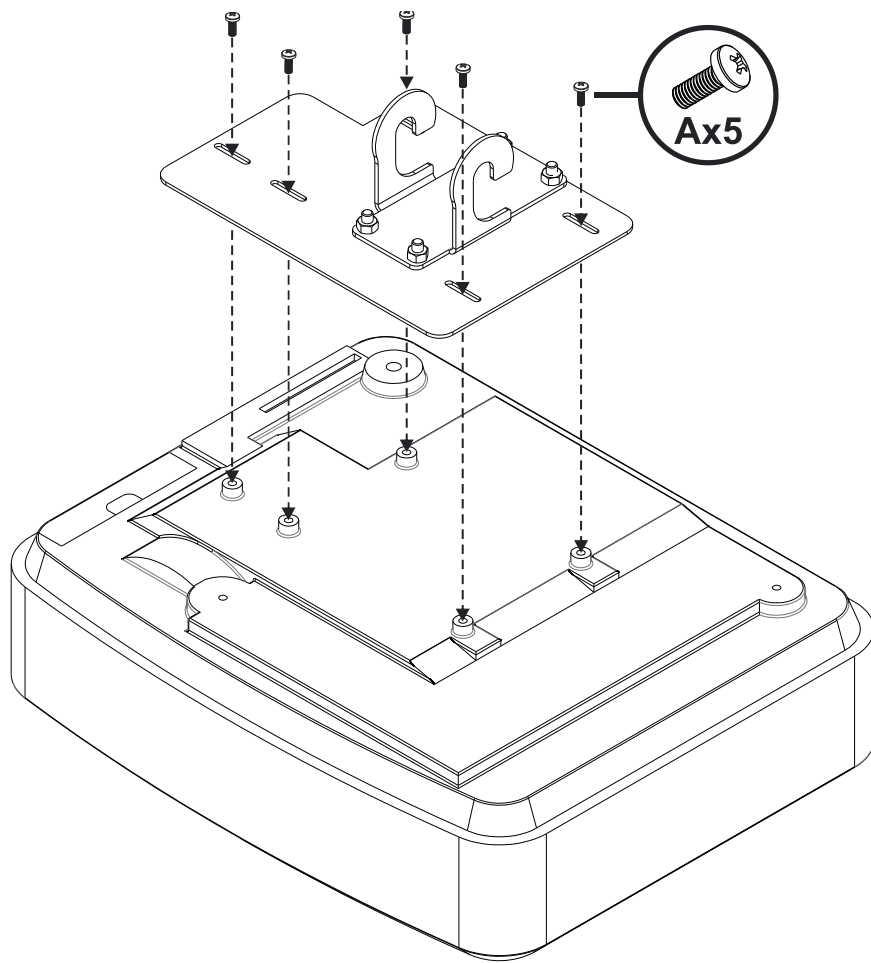
- Place the projector on a soft clean surface
- Position the pre-assembled mounting plate on top of the projector
- Insert **5xA** (M4 x 10mm) screws from the fixing kit, tighten with a posidrive screwdriver

Step 3: Attach the projector to the mount
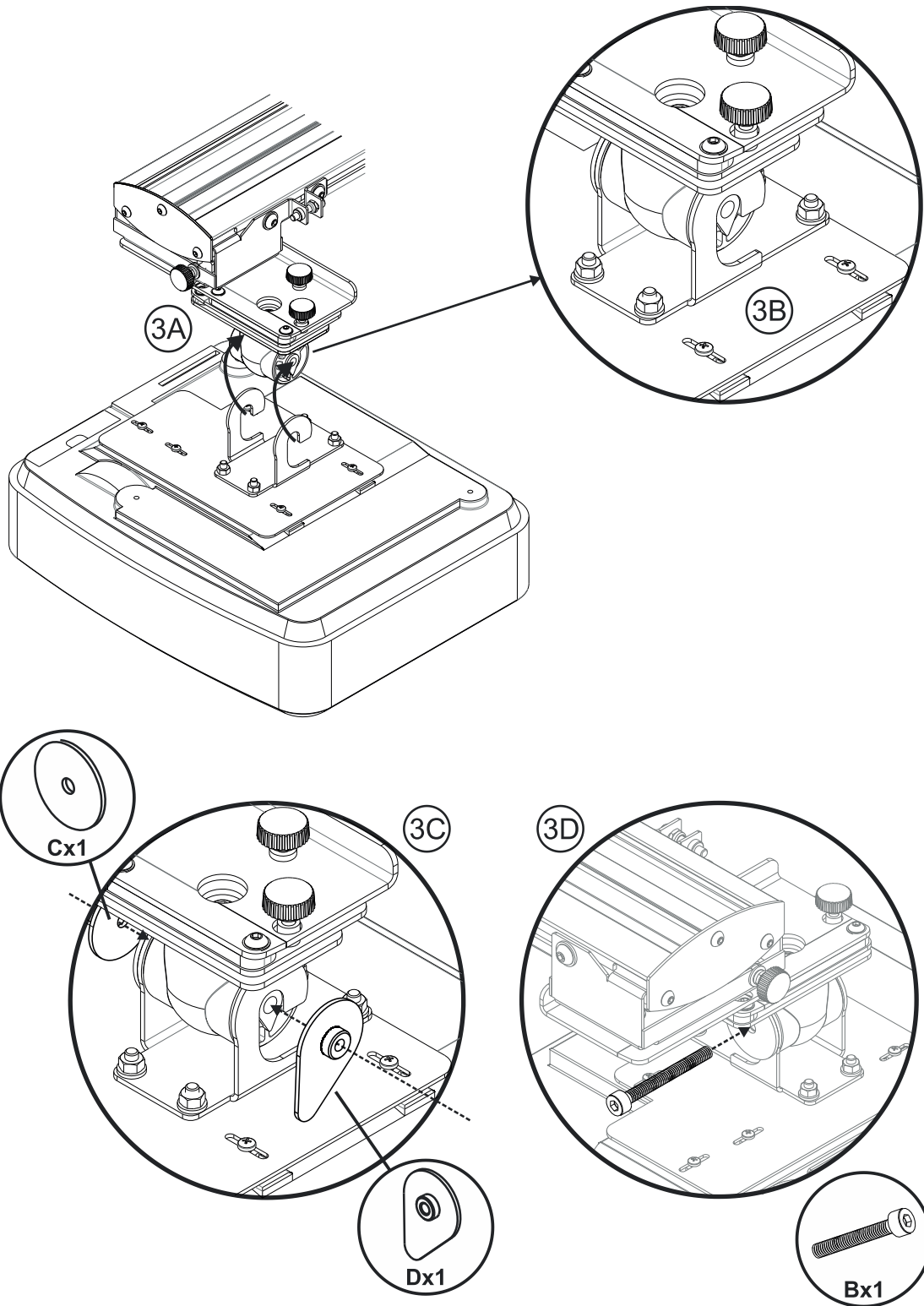
- Lift the projector and mounting plate in to position – **Fig 3A**
- Lift the projector so the two hooks slip over the protrusions on the black molding – **Fig 3B**
- Position the washer **C** and teardrop shaped locking washer **D** against the hooks – **Fig 3C**
- Insert bolt **B** (M8 x 75mm) and tighten it using the one of the allen keys provided – **Fig 3D**

Step 4: Adjusting the projected image size
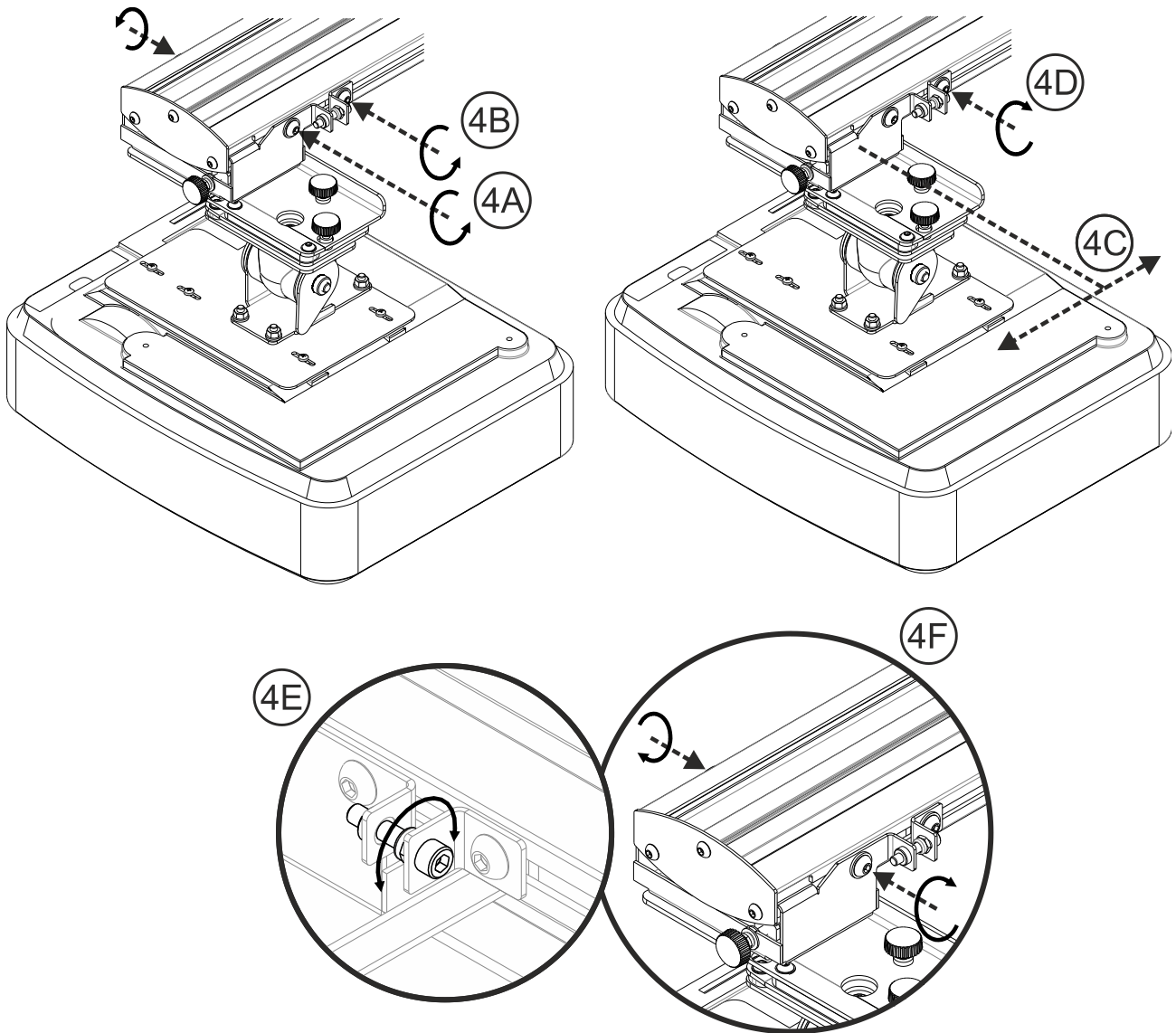
- Loosen the two bolts on the projector caddy – **Fig 4A**
- Loosen the bot on the fine length adjustor – **Fig 4B**
- Slide the caddy and fine adjuster together until the screen size is nearly correct – **Fig 4C**
- Tighten the fixing bolt on the fine adjuster – **Fig 4D**
- Adjust highlighted bolt to fine adjust the throw distance – **Fig 4E**
- To reduce the projected image size, tighten the bolt clockwise using one of the allen keys provided to move the projector closer to the screen
- To increase the projected image size, loosen the bolt anticlockwise using one of the allen keys provided to move the projector away from the screen
- Once fine adjustment is done. Tighten the two caddy mounting bolts – **Fig 4F**

Step 5: Adjusting the tilt (vertical keystone)
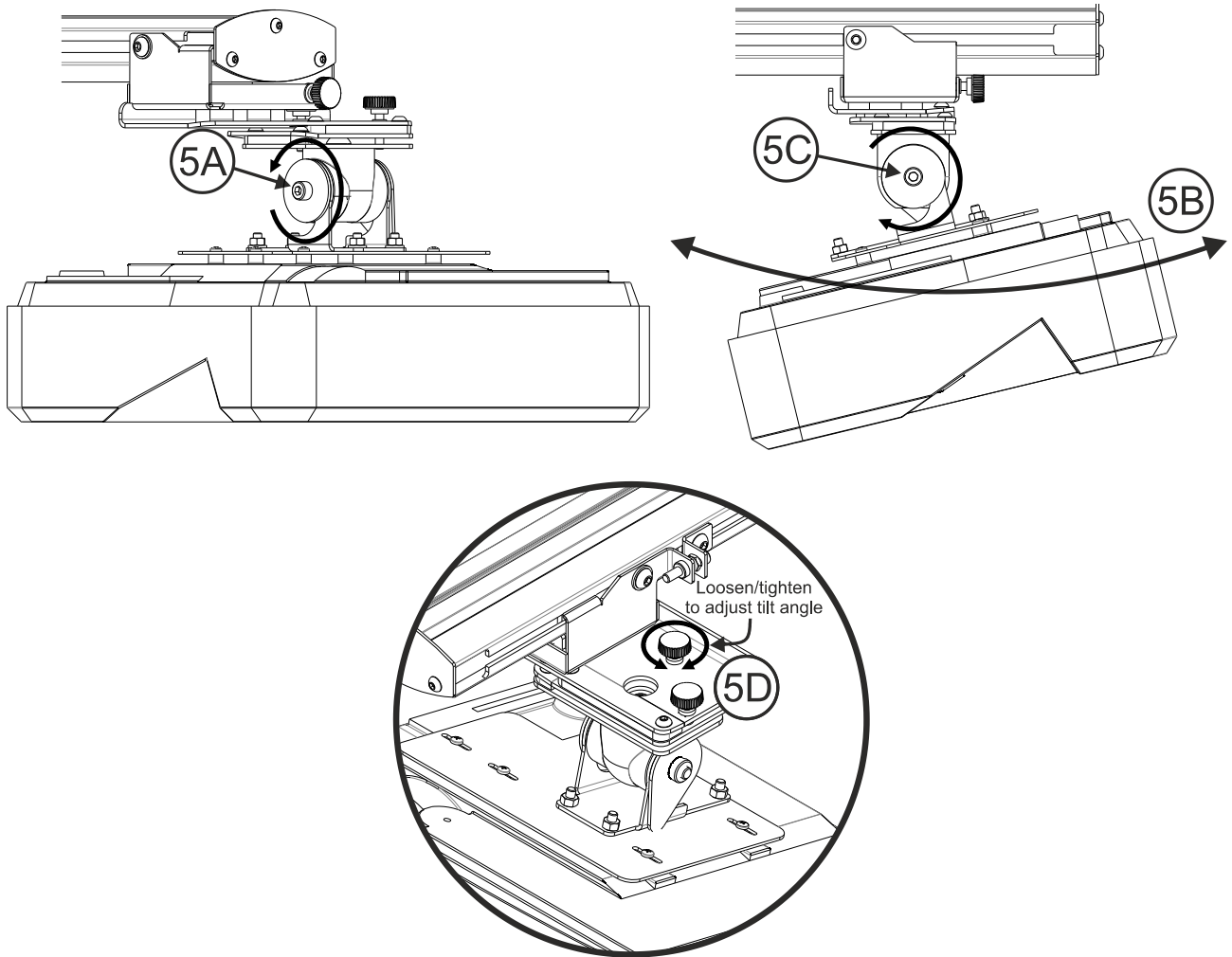
- Loosen the single M8 x 75mm bolt **– Fig 5A**
- Adjust the projector to the required angle **– Fig 5B**
- Tighten the bolt to lock the angle of the projector **– Fig 5C**
- Adjust the highlighted thumbwheel to fine adjust the tilt angle **– Fig 5D**
- To decrease the angle of projection, tighten the thumbwheel clockwise
- To increase the angle of projection, loosen the thumbwheel anticlockwise

Step 6: Adjusting the tilt (yaw)

Tighten (clockwise)   Loosen (anticlockwise)
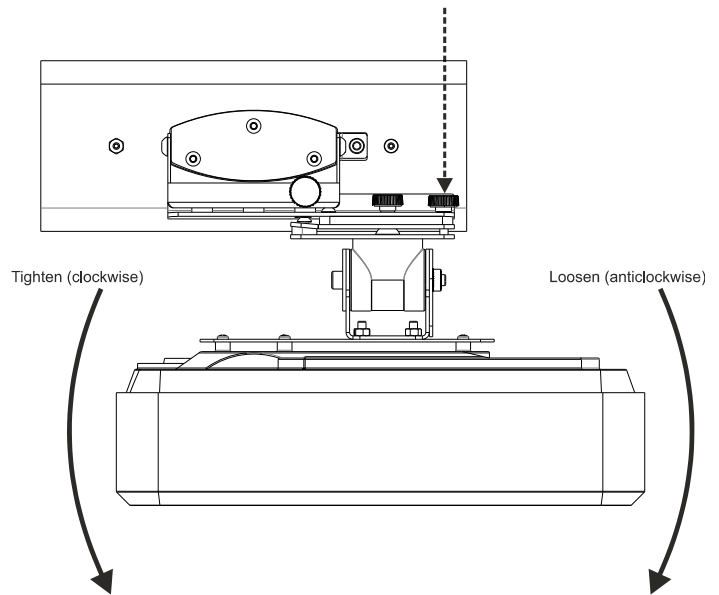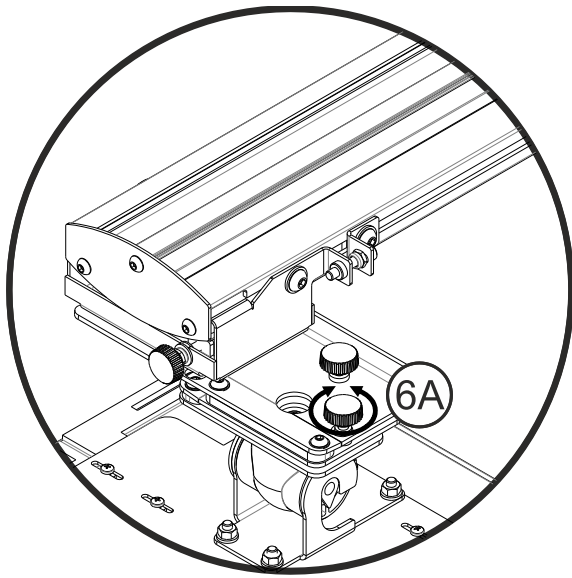
- Adjust the highlighted thumbwheel to fine adjust the yaw angle – **Fig 6E**
- To lower the left hand side of the projector, tighten the thumbwheel clockwise
- To lower the right hand side of the projector, loosen the thumbwheel anticlockwise

Step 7: Adjusting the tilt (horizontal keystone)

Tighten (clockwise)   Loosen (anticlockwise)
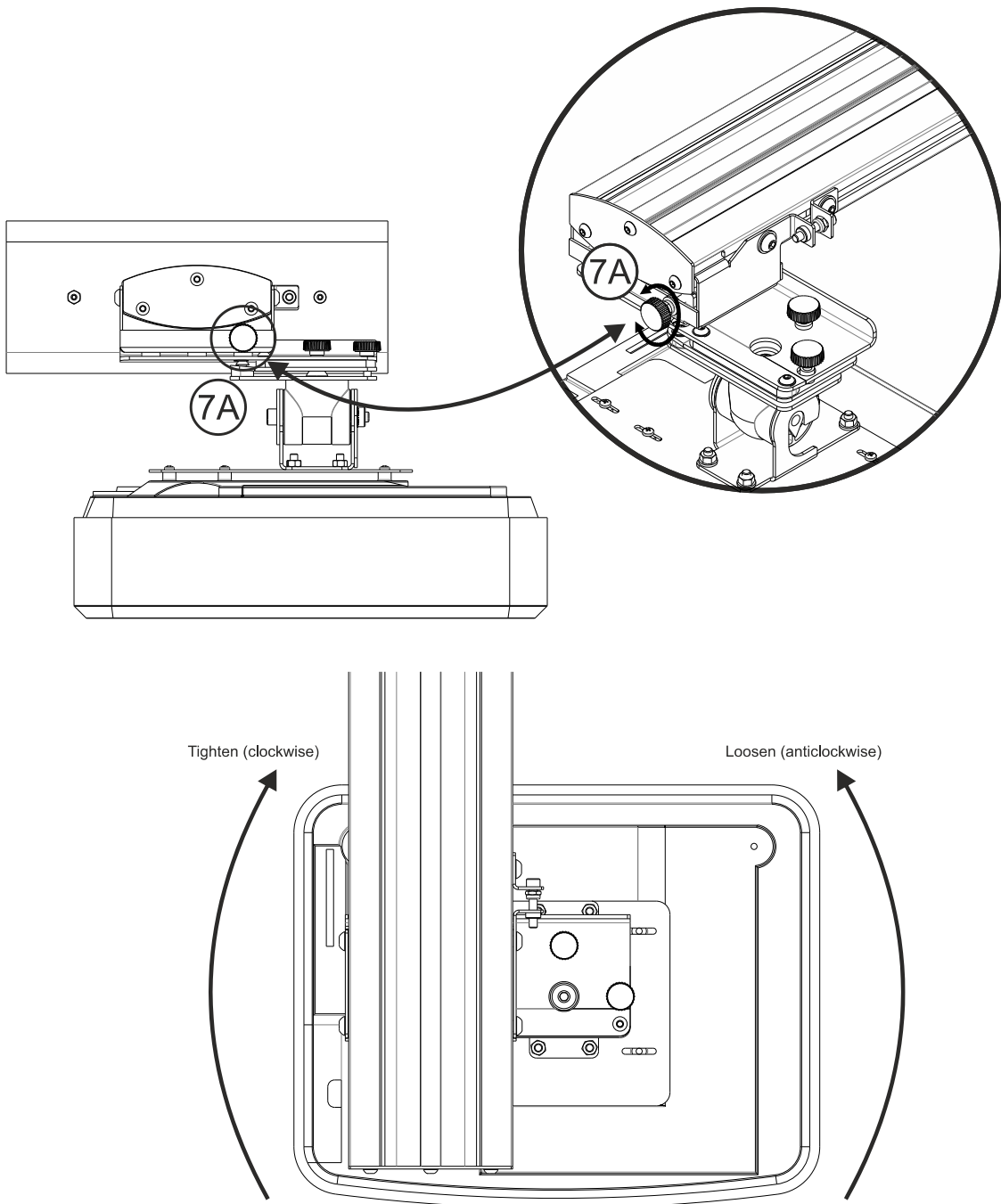
- The projector mount is pre-tensioned and can be rotated by hand
- Adjust the highlighted thumbwheel to fine adjust the rotation of the projector **– Fig 7A**
- To bring the left hand side of the projector closer to the screen, tighten the thumbwheel clockwise
- To bring the right hand side of the projector close to the screen, loosen the thumbwheel anticlockwise

Installing the whiteboard
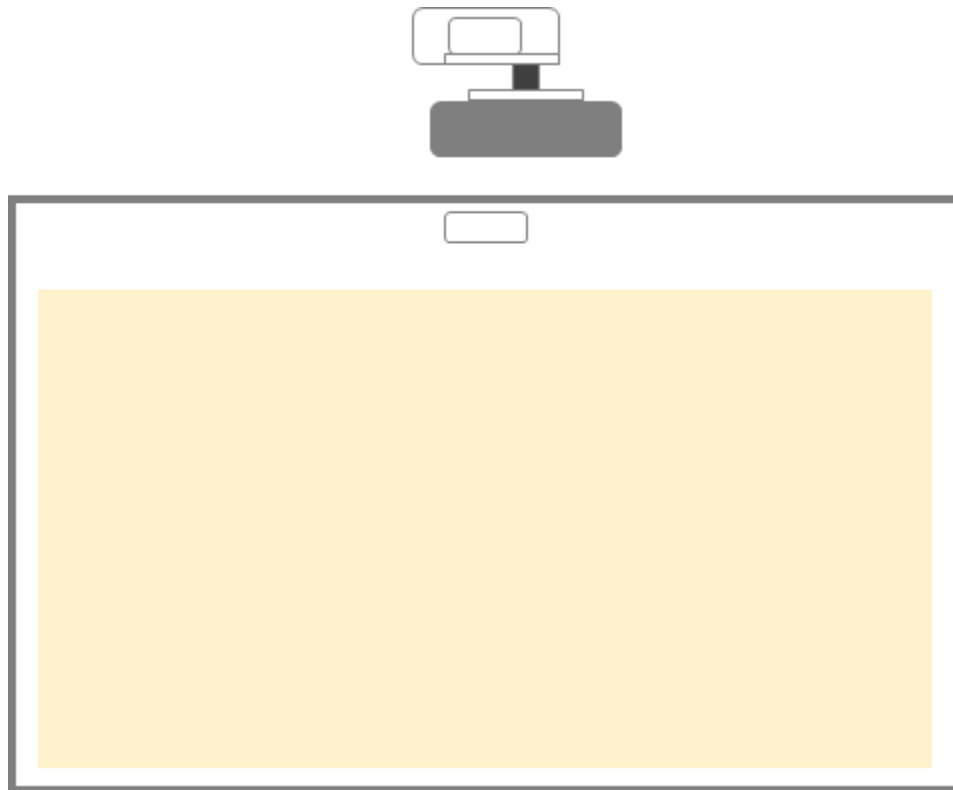
- Please refer to the whiteboard installation instructions

Note: The whiteboard and projector should be installed centrally to each other. The bottom of the image must be a minimum of 10mm from the bottom of the whiteboard border. Enough room must be left on top for the TouchBeam module.

Note: If the whiteboard is already installed please see page 36

Installing the TouchBeam module

Step 1: Mounting the TouchBeam module

1. **Open top cover with a screwdriver.**
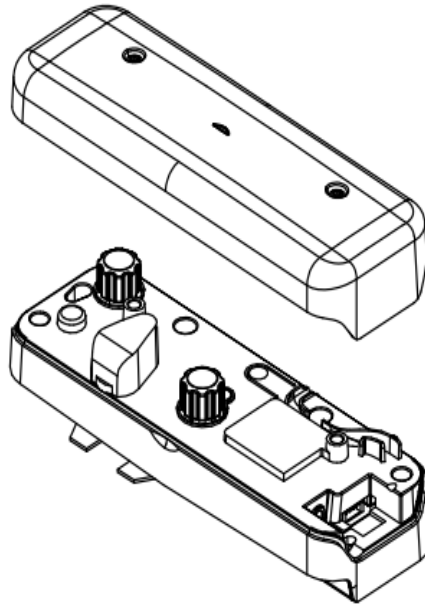
1.2 Mount bracket to whiteboard or wall

The module must be installed away from the projected image

- At least 13.5cm from the base plate

- At least 10cm from the bottom of the TouchBeam module

1.3a For short-term demonstration:
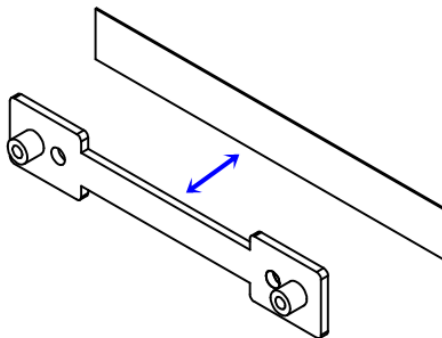
Adhere double-sided tape (enclosed in accessory box) onto bracket, then paste onto the whiteboard or wall.

Note: 7.5 – 13.5cm from bottom of base plate

1.3b For long-term use:
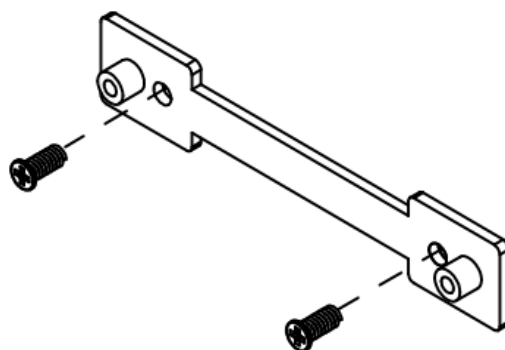
Use screws to fix the TouchBeam bracket onto the whiteboard:

- Drill tip: Φ O=2.3mm

- Screw type: M3x6L

- Screw head: Φ O<5.5mm, thickness <2.5mm

1.4 Attach the module to the bracket with screws
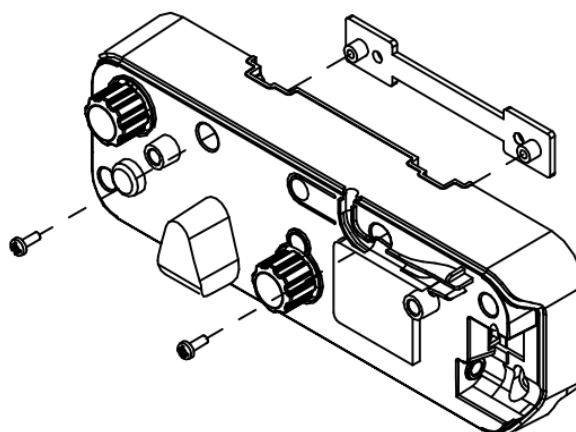
1.5 Connect the interactive cable into the TouchBeam module
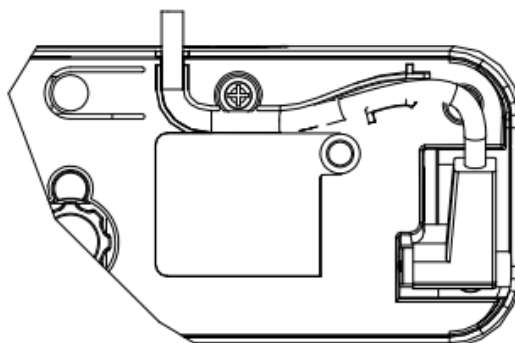
Note: The right angle connector must plug into the TouchBeam module.

Step 2: Install Utility Software

1. **System requirements**

   To ensure normal operation of the touch function, your computer must meet the system requirements shown in the table below.

System requirement	
Operating system	Microsoft Windows XP (SP3)/Windows 7 (32bit/64bit)/Windows 8 (Must be installed. NET Framework 4.0)
CPU	Intel® Core™ i3 or above
Memory	2GB or higher
Min. hard disk space	110 MB

2. Install the software utility from the CDROM. The status of the software is shown in the task bar, the icons shown below describe the mode the software is set to:

	Touch mode
	Pen mode
	Disconnected

Step 3: Initial Setup

For first time setup, follow the installation guide to complete the installation procedure (✔).
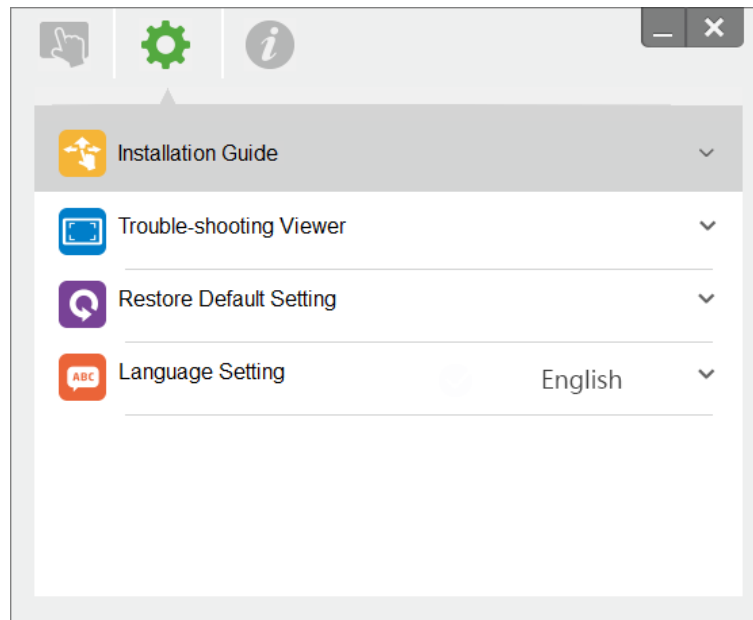
Step 4: Operation Mode

Windows 7 and Windows 8 operating systems support multi-point touch control. Users can select default Touch Mode ( ) for **multi-point touch,** Or switch to Pen Mode ( ) when using the light pen (IR pen).
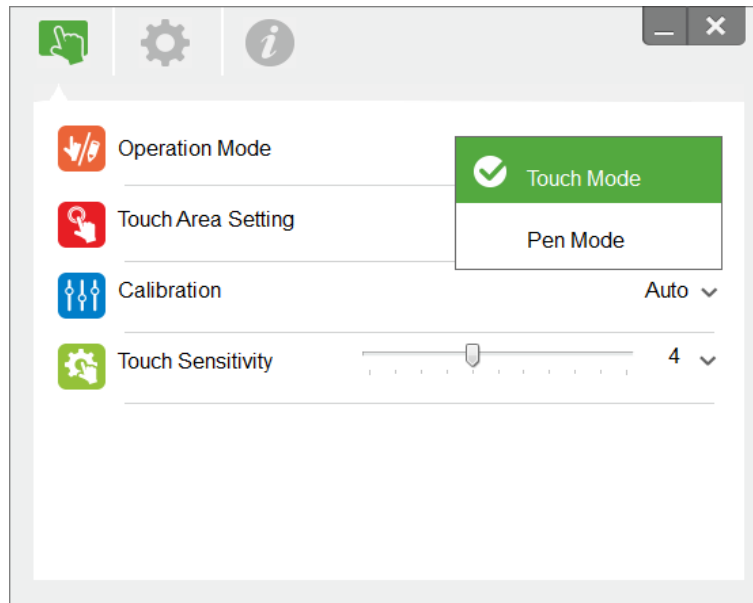
Please note: Windows XP and MAC operating systems only support **single-point touch**

Step 5: TouchBeam Alignment

1. Press the button to switch to visible light mode (The Red LED will blink continuously)
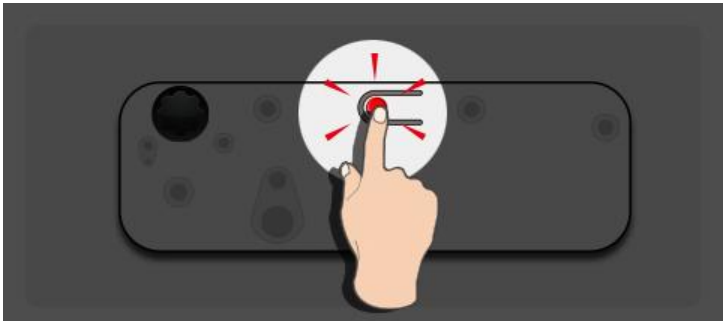
LED indicator			
Mode	**Blue LED**	**Red LED**	**Description**
IR Laser mode	Solid	--	IR laser ON
Visible light mode	Solid	Blinking	Visible light ON (IR Laser OFF, touch disabled)
Error	--	Solid	Error of LD module occurred.

2. Connect PC and Projector via USB cable
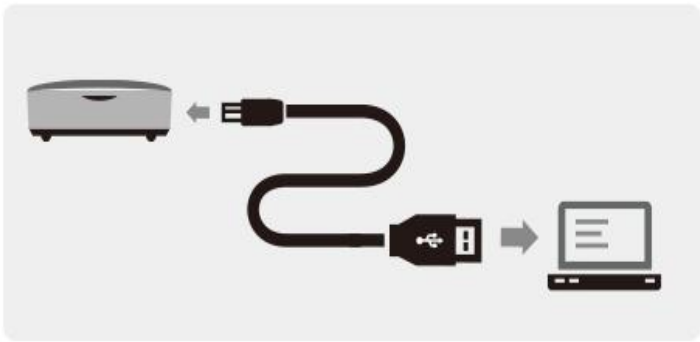
3. Rotate the black and grey adjustment knobs clockwise until they stop

4. Rotate the grey knob counter-clockwise, until both beams are symmetrically at the same level.
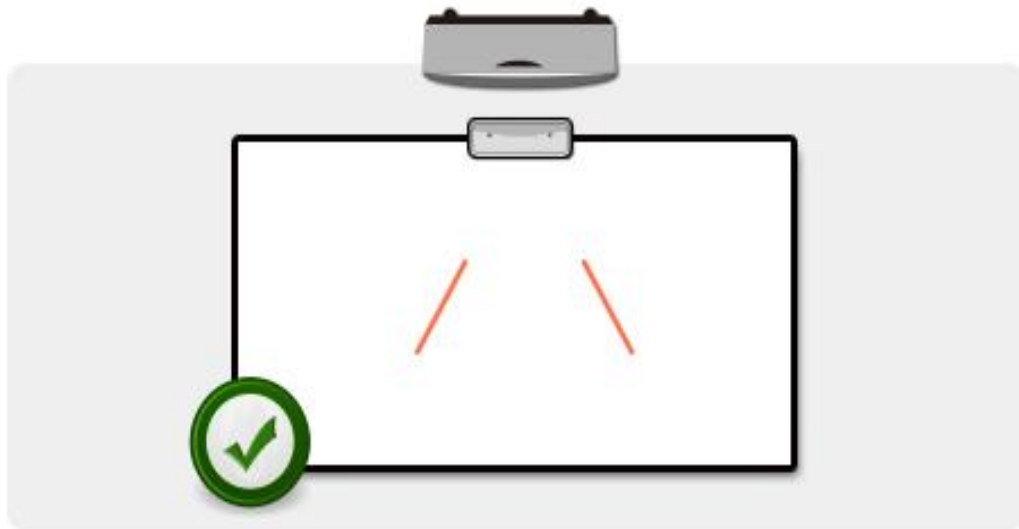
5. Rotate black knob counter-clockwise, move beams downwards until they hit whiteboard frame.
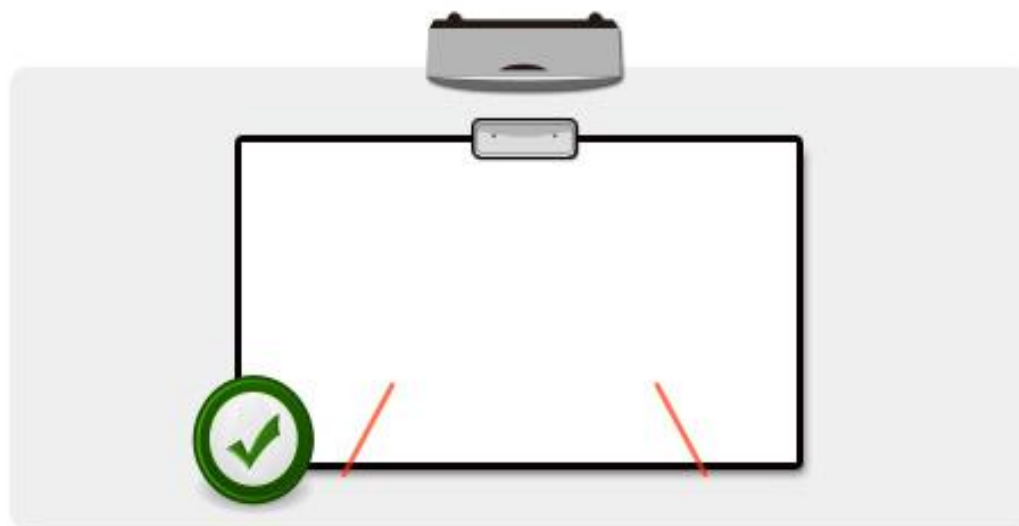
6. Check the beam height with alignment the sticker for both left and right beams. The beams should be located within the grey strip. You will see a little red dot on the dark grey line. Use the black and grey knobs to adjust the beams to locate them on the alignment sticker.

4-6mm
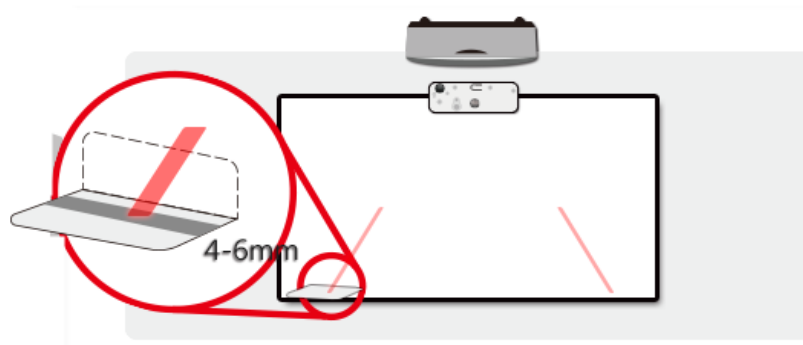
7. Press the button again to switch back to IR mode (The Blue LED will stay solid)
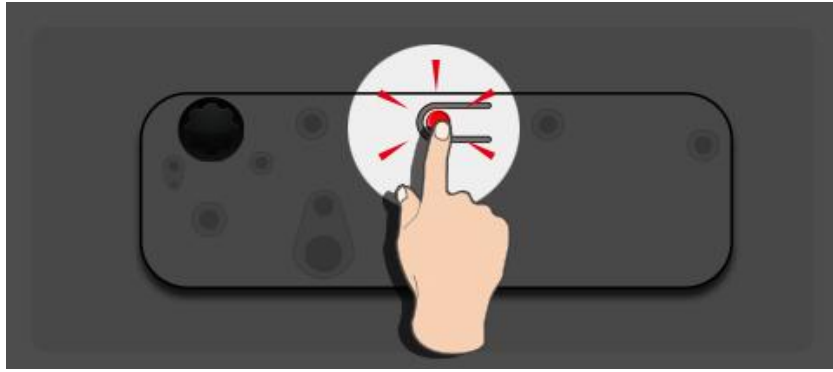
LED indicator			
Mode	**Blue LED**	**Red LED**	**Description**
IR Laser mode	Solid	--	IR laser ON
Visible light mode	Solid	Blinking	Visible light ON (IR Laser OFF, touch disabled)
Error	--	Always ON	Error of LD module occurred.

8. Put top cover back on and tighten the screws.
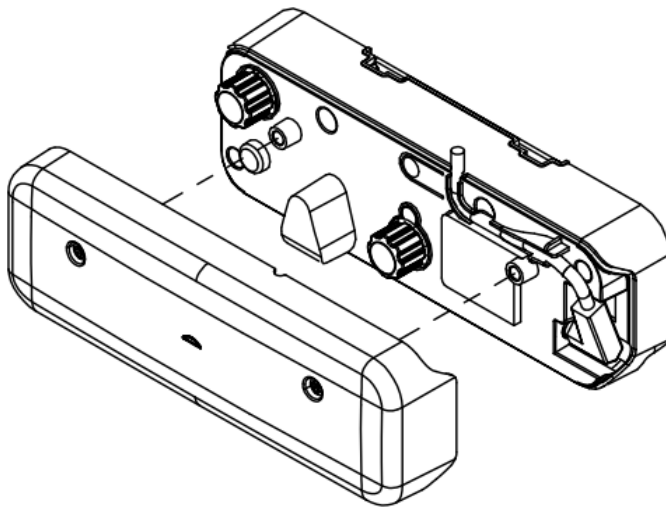
Step 6: Touch Area Setting

A. Select Auto Touch Area Setting:
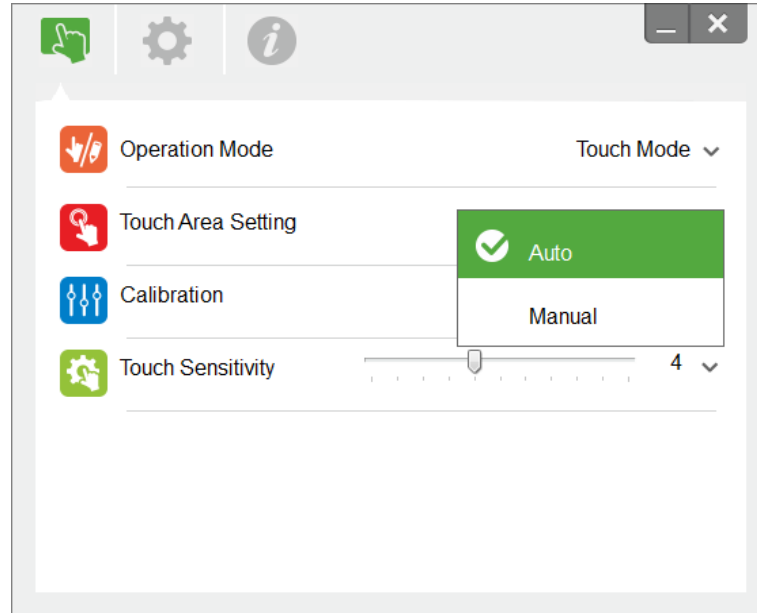
Note:

- Quit all software applications
- Reduce ambient light
- Do not obstruct or shake lens during Touch Area Setting
- Check if projection image is clear. If not, adjust focus to sharpen the image

If fail message pops up, switch to Manual Touch Area Setting.

B. Select Manual Touch Area Setting:
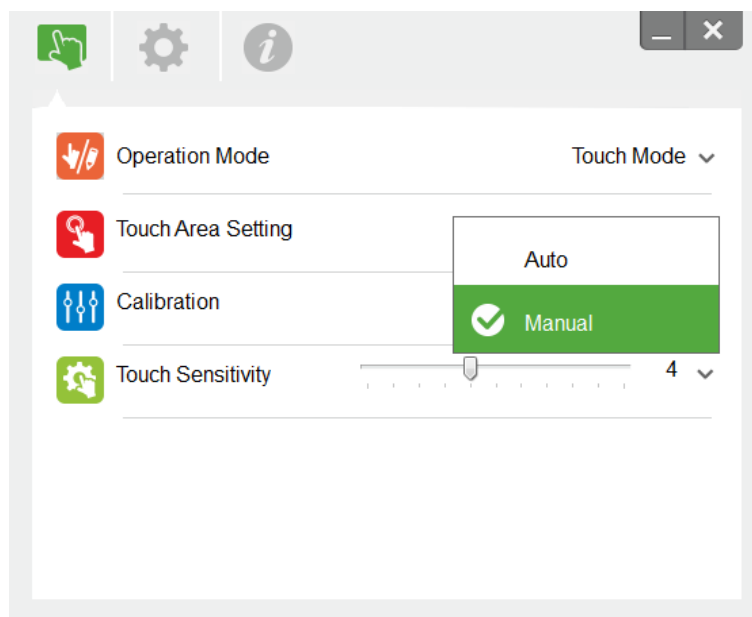
B-1. After the camera captures the projection image, a Touch Area window will pop up. If the captured image is not clear enough, please re-select "Ambient light mode selection" from "Auto" to "Bright" or "Dim" according to actual ambient light condition.

Remark: Captured image shows the actual camera view, which is reversed from projection image. For example: P1 is lower right corner, P2 is lower left corner and so on.
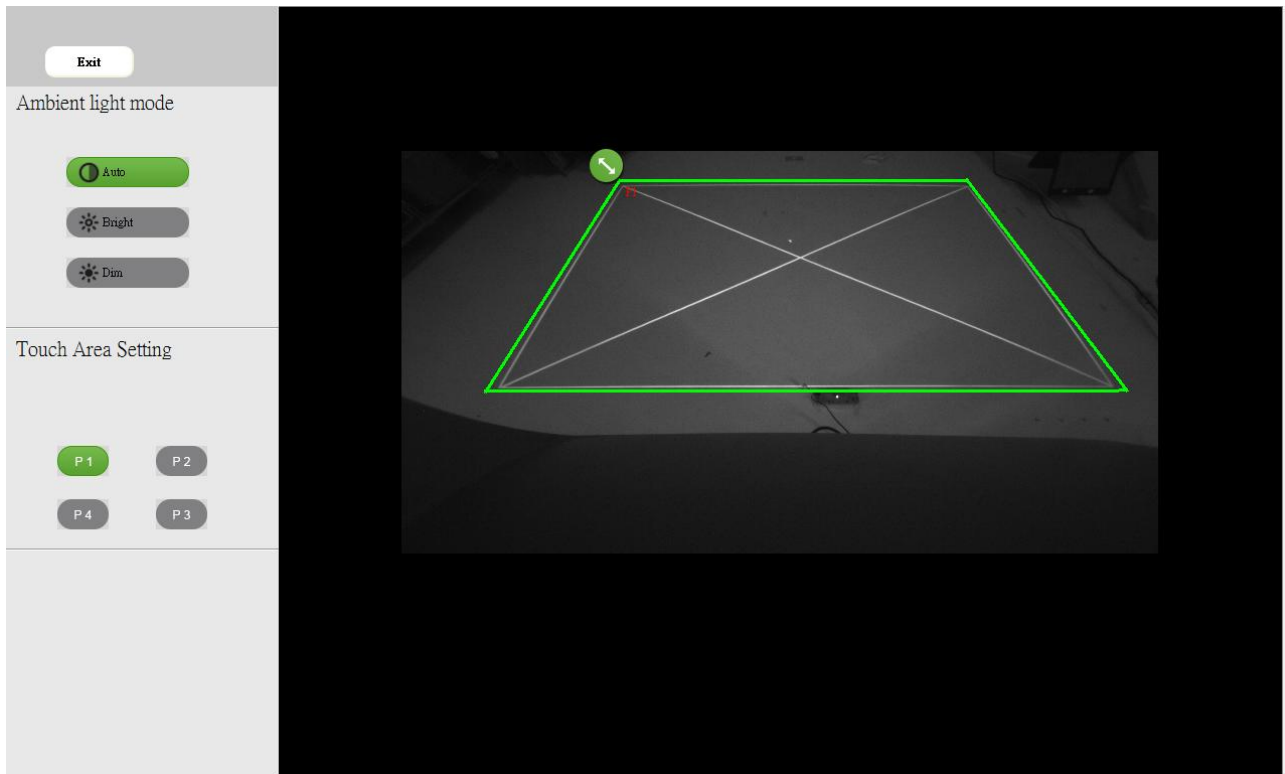
B-2. Touch Area Boundary Fine-tuning

Step 1: Click on P1, use mouse to drag P1 to upper left corner. Align adjustable green zone with projected white frame.

Step 2: Adjust P2 to P4 accordingly; adjustable green zone should completely overlaps the projected white frame.

Step 3: Finally, check again if the green frame completely overlaps the projected white frame. If not, fine-adjust again.

B-3. When the Touch Area is correctly located click "close" to exit.

Step 7: Calibration

A. Select Auto Calibration
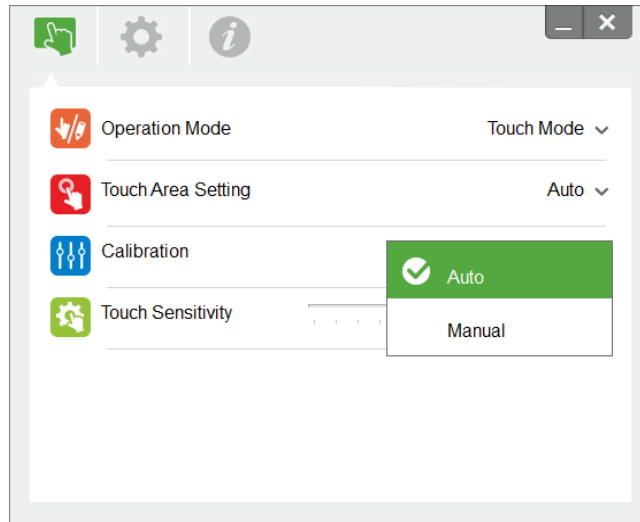
Note:

 If the fail message pops up, follow the steps shown below to troubleshoot the issues.

- Close all software applications
- Reduce ambient light
- Do not obstruct or shake lens during calibration
- Check if projection image is clear. If not, adjust focus to sharpen the image

If the Auto Calibration fail message still pops up on screen, switch to Manual Calibration.

B. Select Manual Calibration:
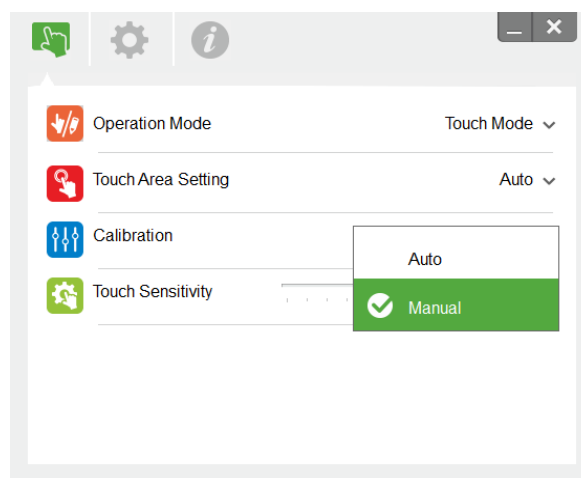
Note:

Manual Calibration is suggested for better accuracy.

Step 8: Touch Sensitivity

When touch function is unresponsive or writing is intermittent. You can adjust the sensitivity by adjusting Touch Sensitivity level:
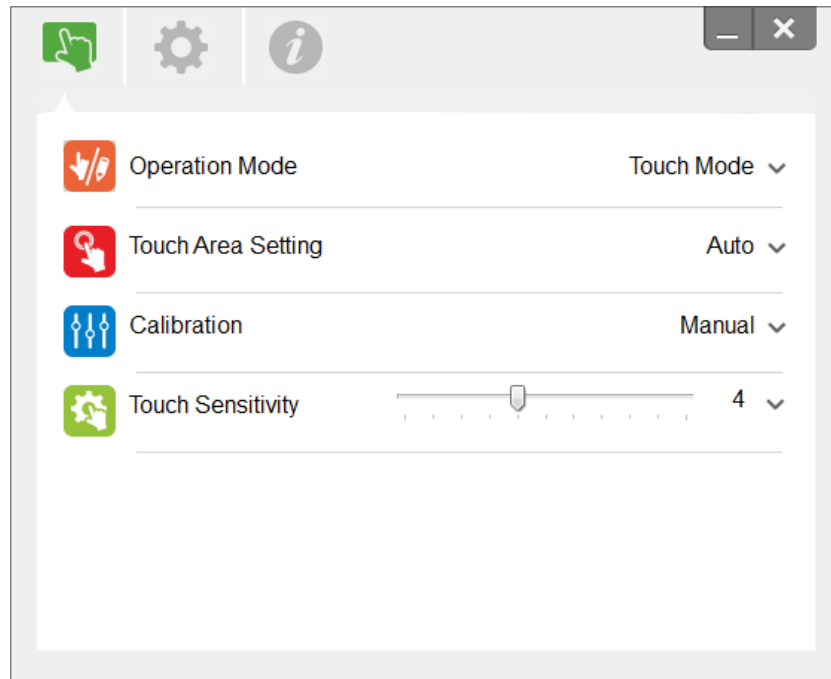
- Default: 4

- Max.: 10 (most sensitive)

- Min.: 0 (least sensitive)

Step 9: Trouble-shooting Viewer

Sometimes infrared red light (IR light) from ambient light sources may interfere with touch performance. The troubleshooting viewer shows real time images for debugging purposes. Any light interference is marked in green. If green obstacles appear within image area, remove to secure proper interactivity.

Note: Interactive function is disabled under trouble-shooting viewer, click to exit.
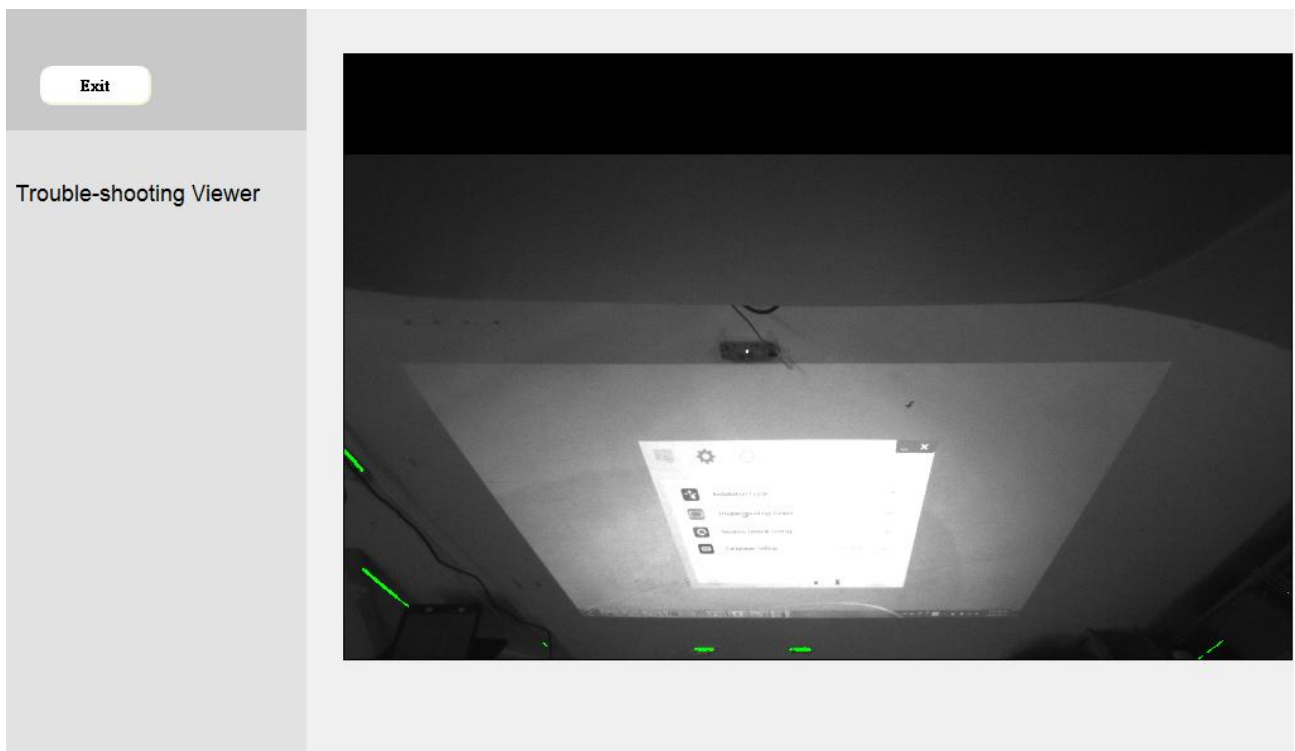
Appendix

Troubleshooting

Q1 Why won't the PC boot when the USB cable is connected to the projector?

A:

1. Unplug USB cable from PC; or
2. Go to BIOS setup page of PC and modify the "Boot priority order." Choose Hard disk as top priority, save the change and reboot PC.
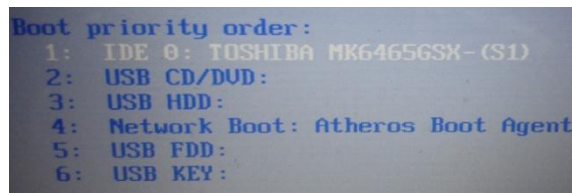
Q2 What to do when Windows system cannot identify the USB device?

A:

1. Unplug/re-plug in the USB cable and check again.
2. Switch to another USB port and check again.
3. Restart your computer and check again.
4. Go to Power Options in Control Panel, check USB selective suspend settings status in USB settings under Advance Settings. Switch to "Disabled".
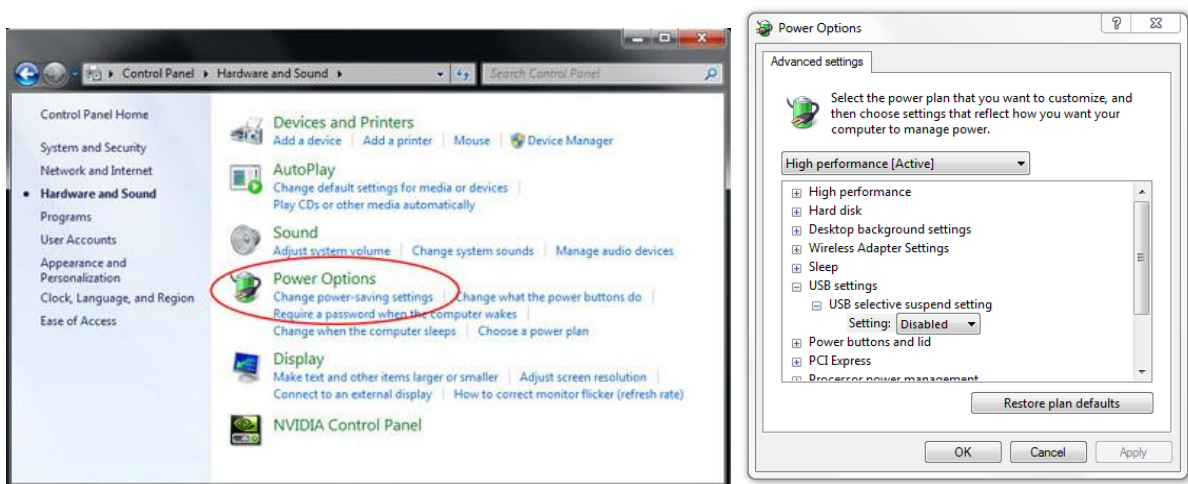
5. Go to the official website of the laptop/PC manufacturer, and update the USB driver to the latest version.
6. Use the USB cable included with your projector and check again. If a USB extension is needed please contact your distributor.
7. The USB port of your computer may not be working. Please contact your IT staff.

Q3 Why is the utility icon (⊘) red and not green (⊘ / ⊘)?

A: Red icon (⊘) indicates a failed connection. This may be caused by the following:

1. Unplug/re-plug in the USB cable and check again.

2. Switch to another USB port and check again.

3. Restart your computer and check again.

4. Go to Power Options in Control Panel; check USB selective suspend settings status in USB settings under Advance Settings. Switch to "Disabled".
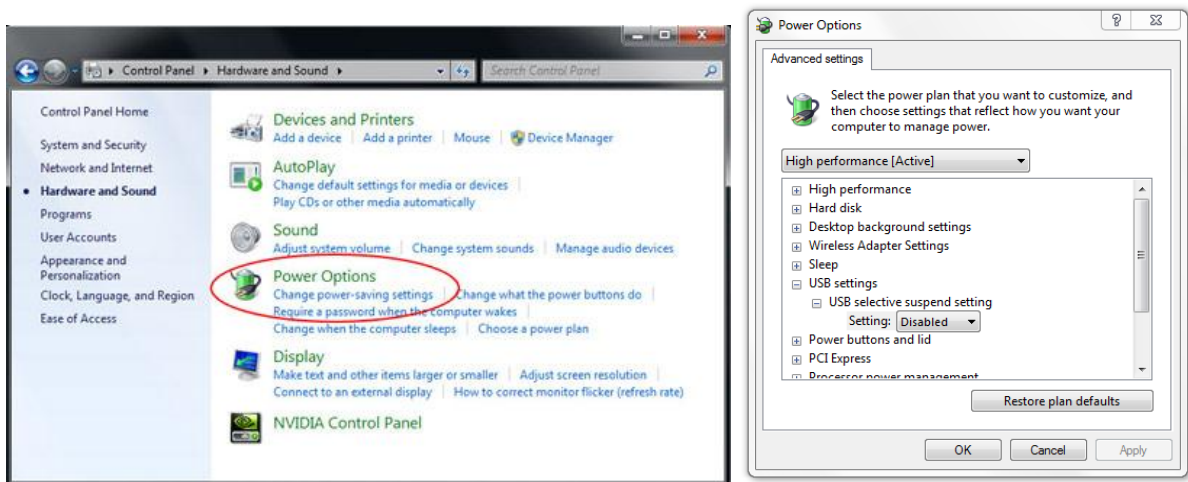
5. Go to official website of the laptop/PC manufacturer, and update the USB driver to the latest version.

6. Go to official website of the laptop/PC manufacturer, and update the BIOS driver to the latest version.

7. Use the USB cable included with your projector and check again. If an USB extension is needed, please contact your distributor.

8. The USB port of your computer may not be working. Please contact your IT staff.

Q4 What to do when there is only single touch point?

A:

1. Re-plug USB cable from PC.

2. Go to "Control Panel" and make sure "Tablet PC Components" is selected.
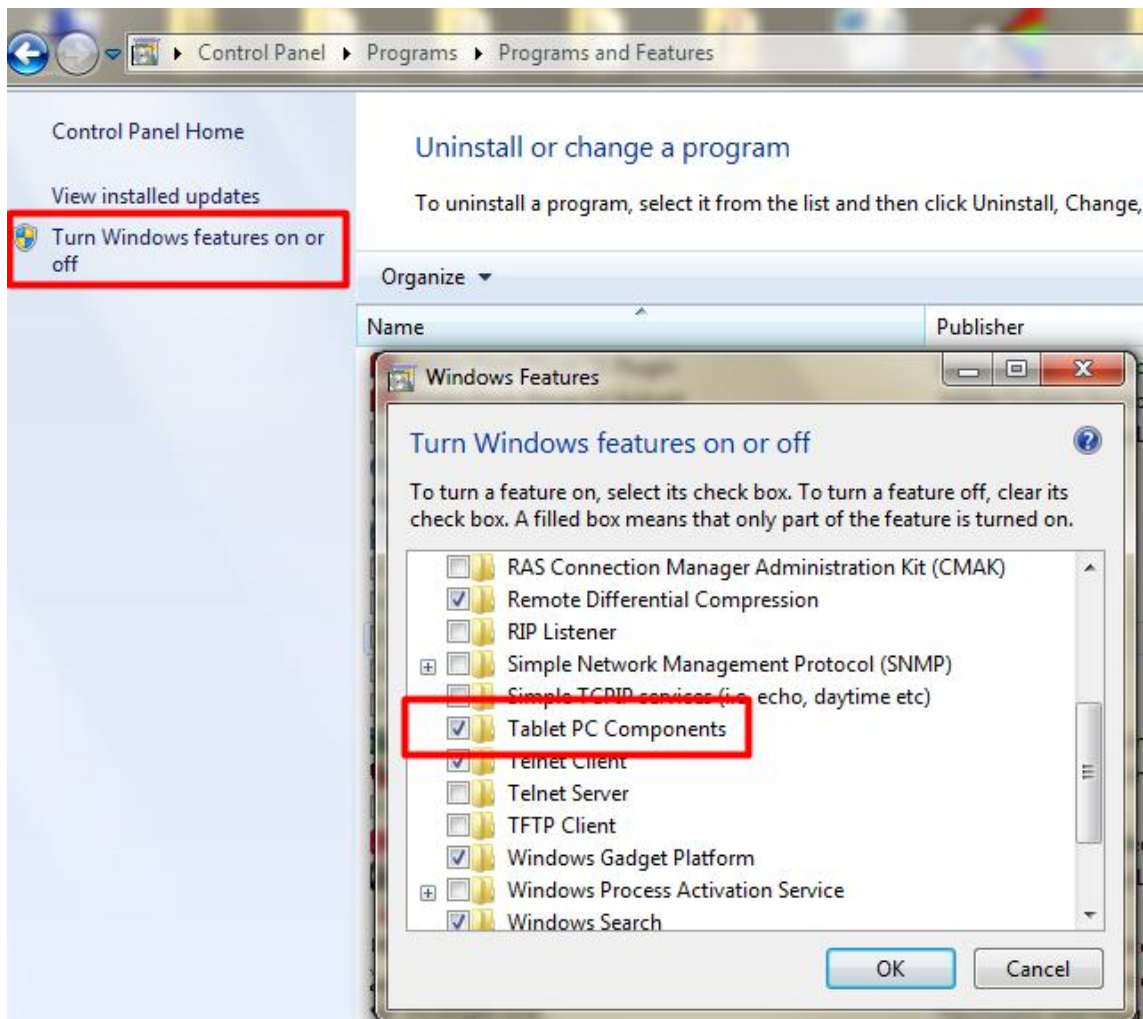
Q5 **When should Calibration and Touch Area Setting be completed?**

A: Please perform Calibration and Touch Area setting during first installation. If the projector or whiteboard is moved, Touch Area Setting and Calibration should be performed again.

-    When Laptop/PC resolution is changed, calibrate again.

-    For better accuracy, please complete manual calibration.

-    If an overlarge offset is observed, please perform Manual Calibration and see Step 8 Calibration for troubleshooting.

Q6 **What to do when Auto Calibration and Auto Touch Area Setting both fail?**

A:

1. When the projectors OSD message is shown, this may result in Auto Calibration failure and Auto Touch Area Setting failure. Please wait until the OSD message is hidden before performing Auto Calibration and Auto Touch Area Setting.

2. Please follow the troubleshooting steps shown below to perform Auto Calibration and Auto Touch Area Setting again.
   a. Quit all software applications
   b. Reduce ambient light
   c. Do not obstruct or shake lens during Calibration
   d. Check if projection image is clear. If not, adjust focus to sharpen the image.
   e. If the "Auto Touch Area Setting failed" or "Auto Calibration failed" message pops up on screen again, please switch to Manual Mode to complete Touch Area Setting and Calibration.
3. Please check Projector Brightness Mode selection. Lower lamp brightness (ECO mode) may affect both Auto Touch Area Setting and Auto Calibration. Please switch to Bright mode to complete Touch Area Setting and Calibration.

Brightness Mode
◀   Bright   ▶
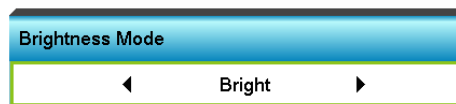
4. Please check Projector Display Mode selection. To ensure accuracy of both Auto Touch Area Setting and Auto Calibration, it is suggested to switch display mode to Bright Mode.

Display Mode
▲
🖵 Presentation
☀ Bright
🎞 Movie
♥ User
▼

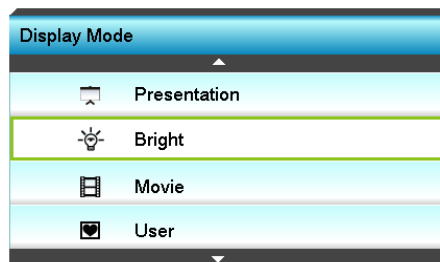**Q8   What to do when the mouse cursor ( ) flashes or jumps on screen, or when the Touch function does not work well for a certain projection area?**

A:

1. Check if there is strong ambient light shown on the whiteboard. If yes, turn off the light.
2. Check if there are any foreign objects on the whiteboard. If yes, remove the object.
3. Refer to Step 6 Laser Beam Alignment for detailed procedures, to see if laser beam is aligned.
4. Refer to Step 7 Touch Area Setting for detailed procedures, check if Manual Touch Area boundary is located properly.

Q9   What to do when the projection area corner is insensitive or intermittent lines are observed?
A:

1. Adjust the level of Touch Sensitivity to enhance sensitivity, see Step 9 Touch Sensitivity for troubleshooting.
2. If Touch function remains insensitive, please check the optical port condition. If dust or

particles are observed, gently clean the optical port with dust blower.

Q10   What to do when the touch function is not accurate?

A: Touch accuracy may be impacted when the Windows default display has been changed.

1. Go to the setting page <Start menu/Control Panel/Appearance and Personalization>
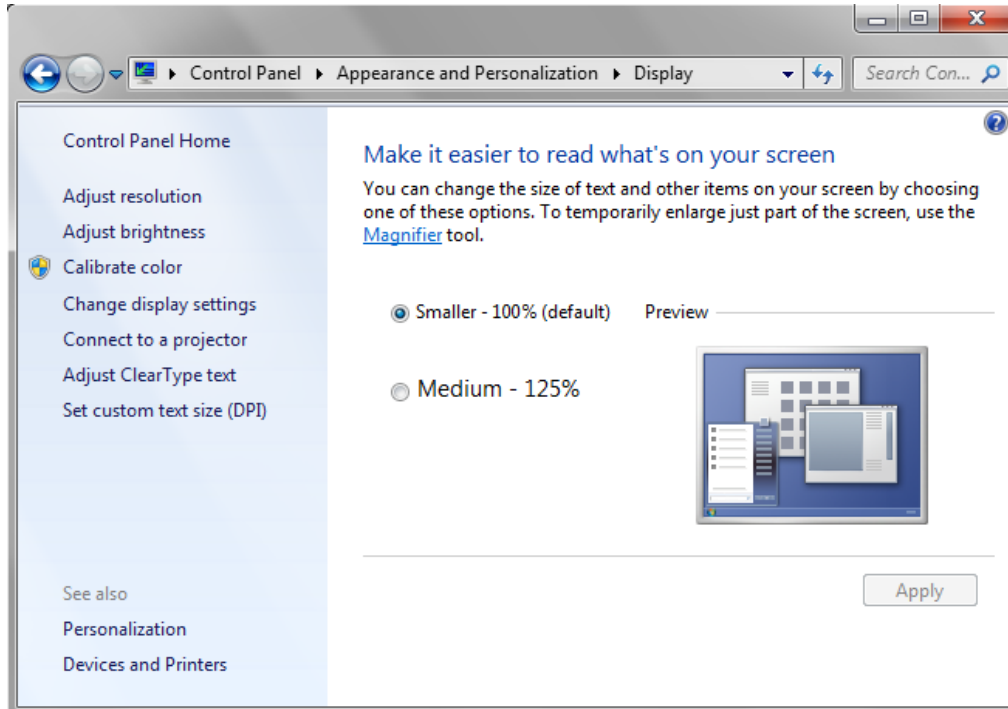
2. Select "Smaller - 100%(Default) " and click "Apply".

Appendix

Interactive cable layout

```
3.5mm Plug

┌──────┐ █ █ █
│      │ 
└──────┘
     │ │ │ └──── 12V Output
     │ │ └────── Curtain Module Detect
     │ └──────── GND
     └────────── LASER ENABLE
```

Distance calculator

XGA
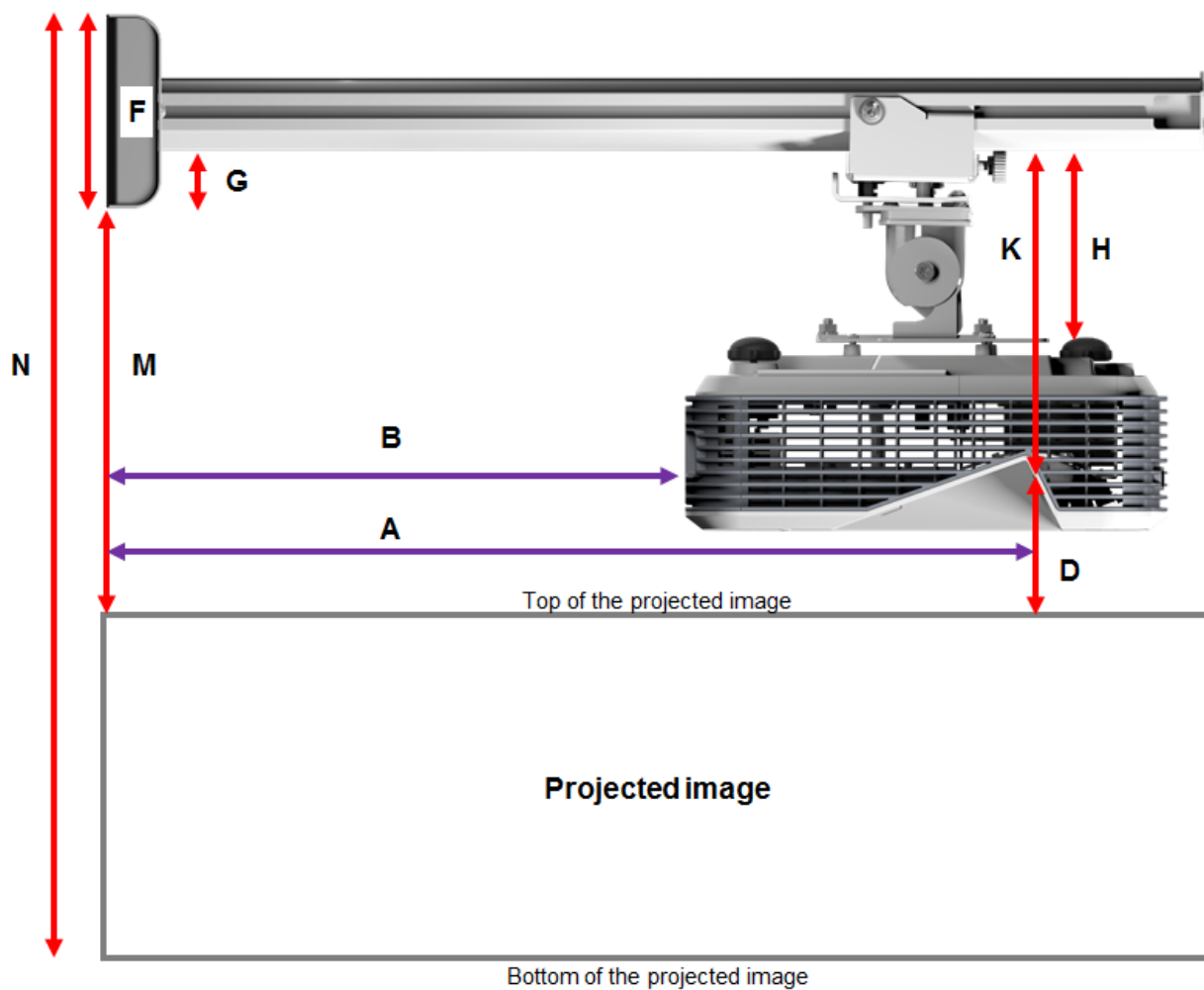
B	A	W	H	Image size	D	M	N
0.219m	0.472m	1.422m	1.066m	1.777m / 70"	0.181m	0.37m	1.57m
0.252m	0.505m	1.521m	1.141m	1.879m / 75"	0.194m	0.38m	1.64m
0.287m	0.540m	1.627m	1.220m	2.033m / 80"	0.207m	0.40m	1.75m
0.354m	0.607m	1.828m	1.371m	2.285m / 90"	0.233m	0.43m	1.92m
0.422m	0.675m	2.033m	1.525m	2.541m / 100"	0.259m	0.45m	2.10m

WXGA

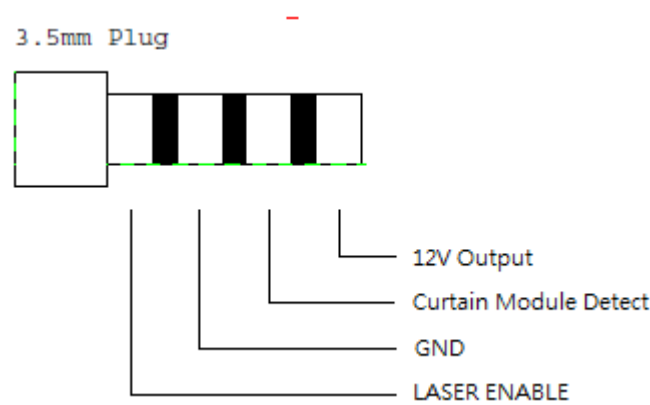| B	A	W	H	Image size	D	M	N
0.232m	0.485m	1.830m	1.144m	2.158m / 85"	0.172m	0.36m	1.63m
0.245m	0.498m	1.879m	1.175m	2.216m / 87"	0.176m	0.37m	1.67m
0.261m	0.514m	1.940m	1.212m	2.287m / 90"	0.182m	0.37m	1.71m
0.318m	0.571m	2.155m	1.347m	2.541m / 100"	0.202m	0.40m	1.87m
0.375m	0.628m	2.370m	1.481m	2.795m / 110"	0.222m	0.42m	2.02m
0.403m	0.656m	2.475m	1.547m	2.919m / 115"	0.232m	0.43m	2.10m

1080p

B	A	W	H		D	M	N
0.193m	0.446m	1.770m	0.996m	2.031m / 80"	0.179m	0.37m	1.49m
0.244m	0.497m	1.972m	1.109m	2.263m / 89"	0.200m	0.39m	1.63m
0.249m	0.502m	1.992m	1.121m	2.286m / 90"	0.202m	0.39m	1.64m
0.305m	0.558m	2.214m	1.246m	2.541m / 100"	0.224m	0.42m	1.79m

Ultra wide*

B	A	W	H		D	M	N
0.467m	0.72m	2.857m	1.071m	3.05m / 120"	0.193m	0.39m	1.58m
0.497m	0.75m	2.976m	1.116m	3.18m / 125"	0.201m	0.39m	1.63m
0.527m	0.78m	3.095m	1.161m	3.30m / 130"	0.209m	0.40m	1.69m

*longer arm mount required

F	G	H	K
0.125m	0.037m	0.125m	0.18

Specification

I. TouchBeam Touch Module	
Laser Safety	Class 1
Curtain to Screen Distance	20mm ~ 100mm @75"~115" XGA/WXGA/1080p 40mm ~ 100mm @ 120"~140" 16:6 ultra-wide
LED Indicator	Blue/Red
I/O Port	Interactive Jack x1
ID Size(W*L*H)	150.0 (W) x 50.0 (L) x 40.0 (H) mm
Weight	<330g
Power Consumption	12V/0.3A
Operation Temperature	0℃~+40℃(without cooling fan)
Storage Temperature	-20℃~+60℃
II. General Specifications	
Calibration	Auto Calibration Manual Calibration
Multi-touch	10-touch points (Win 7 and Win8 compliant)
Multi-touch Min. Distance	≥40mm
Hover (Z-depth)	Default hover height is 5.5mm.
Working Projection Image Size	70"~100" @XGA (co-operate with TR0.33 UST projector) 85"~115" @WXGA (co-operate with TR0.27 UST projector) 80"~100" @1080P (co-operate with TR0.25 UST projector) 120"~140" @ Ultra-wide 16:6 (co-operate with TR0.25 UST projector)
Display mode	Support Ceiling mode only
IR camera hot plug	IR camera cannot support hot plug. Please unplug AC power cord of projector before install IR camera.
III. Installation Software		
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System Requirements	OS Required:	● Microsoft Windows XP (SP3): Mouse mode supported. ● Windows 7/Windows 8: Touch mode-10 touch points supported and Mouse mode supported (Windows: .NET Framework 4.0 installation is required) ● Max OS X(10.7~10.10)
	Processor Type	Intel Core™ i3 or above
	RAM	2GB or higher
	Min. HHD Space	110 MB