



TRUCAST EXPRESS

User's Manual

Version: 01

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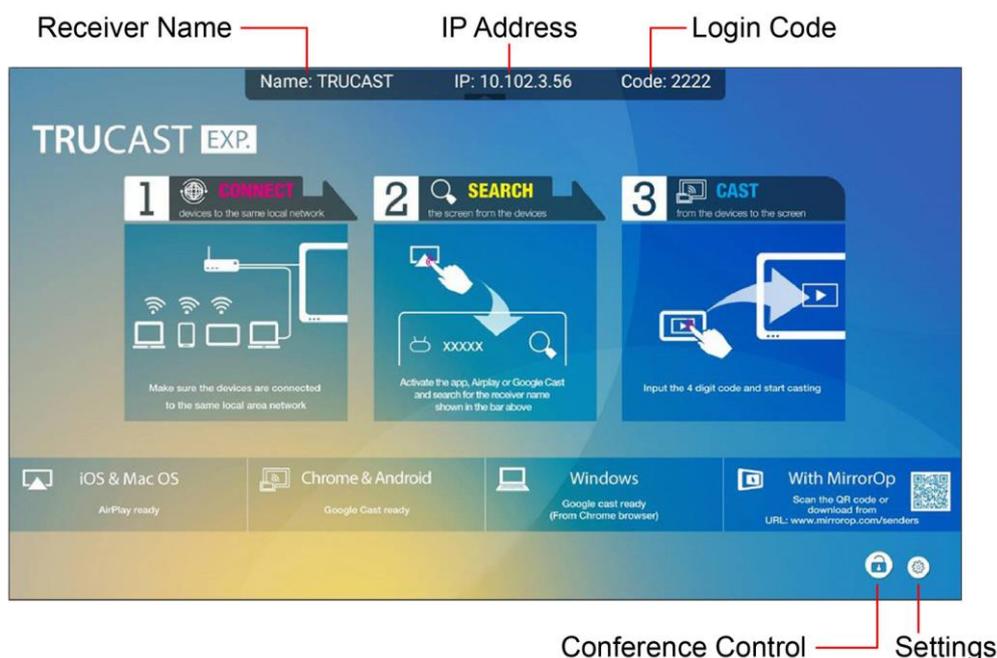
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1. Introduction

TRUCAST (EXPRESS) is a display receiver app which can receive text, image, audio and video content wirelessly from iOS, macOS, Android, Chrome and Windows devices. It supports content sharing via AirPlay, Google Cast (Chromecast) and MirrorOp (including MirrorOp Sender and MirrorOp Presenter apps). The option of a split-screen (4-quadrant display) is available if content is shared via MirrorOp. On-screen moderation is also a handy feature to use in conferences and classes.

2. Standby Screen of TRUCAST

When you open the TRUCAST (EXPRESS) app, a standby screen will be shown on the display (receiver device) as below:

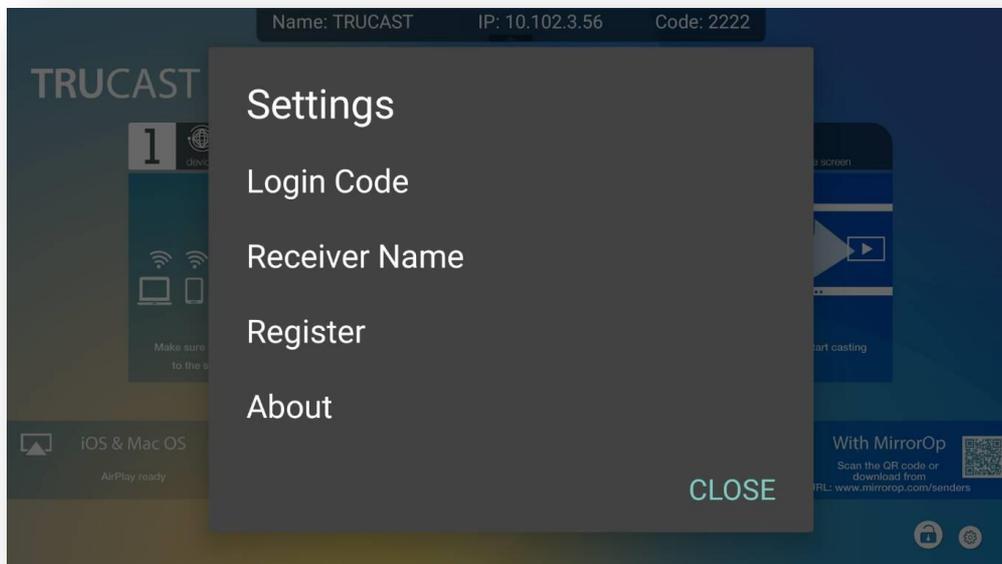


You will see the following information on the standby screen: (a) receiver name (name of the receiver device with the TRUCAST app installed); (b) IP address of the receiver device; (c) login code/passcode (if a code is set on the receiver device); (d) a quick guide on how to use TRUCAST; (e) available casting options.

Whether the system is in Standby mode, Connection mode or Projection mode, you can hide the info bar (with receiver name, IP address and login code) by clicking on the bar itself. After the info bar is hidden, you can click on  to expand it.

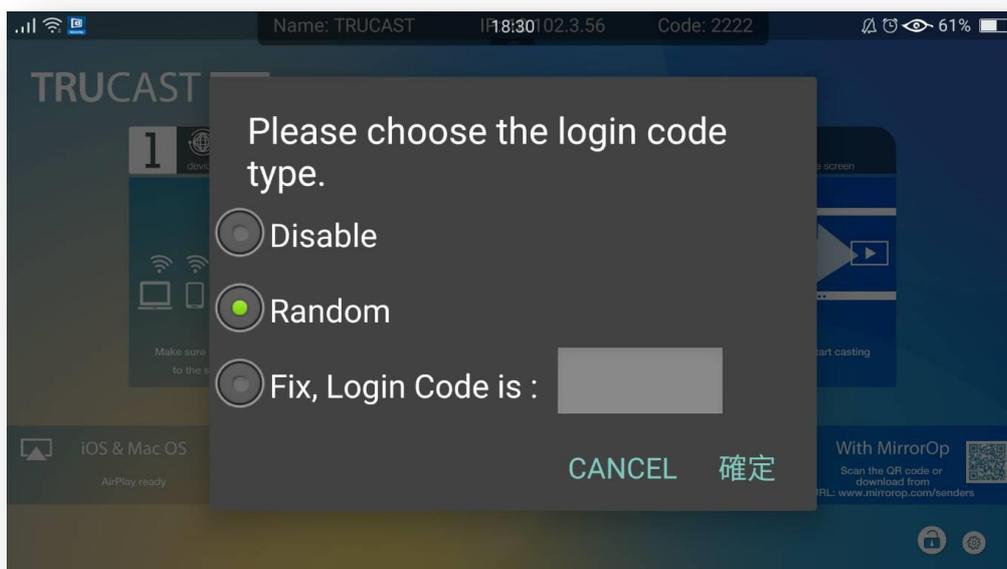
2.1 The Settings button

Click on the Settings button  in the lower-right corner of the standby screen, and you will see a toolbar as shown below.



(1) Login Code/Passcode:

If the option of “Disable” is checked, you do not need to enter a login code/passcode before projecting content via AirPlay or MirrorOp. If you choose to set a random or fixed 4-digit numeric code, a login code/passcode is required before connection/projection via AirPlay or MirrorOp.



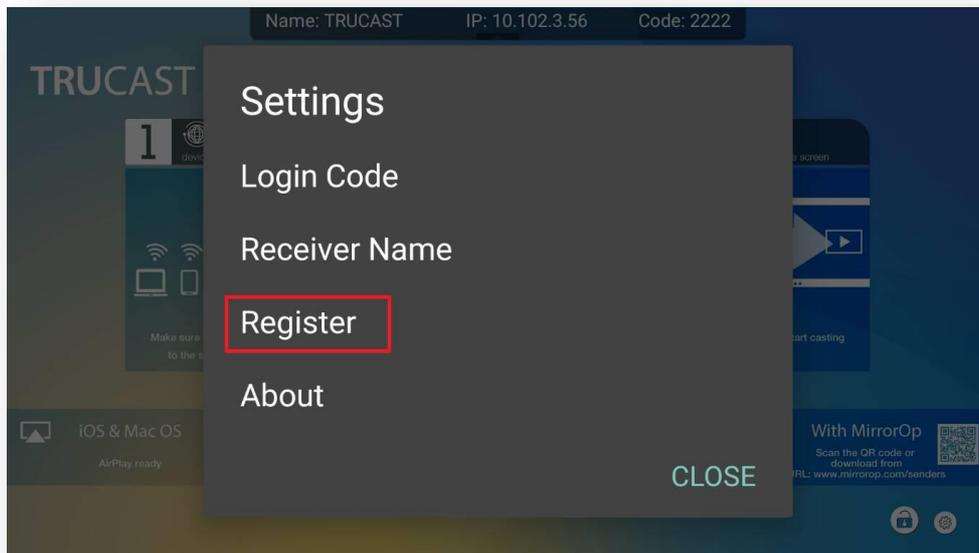
(2) Receiver Name:

The default receiver name is “TRUCAST”. Nevertheless, your receiver name is customizable, and you can set a receiver name which is more easily recognized.

(3) Register/Unregister:

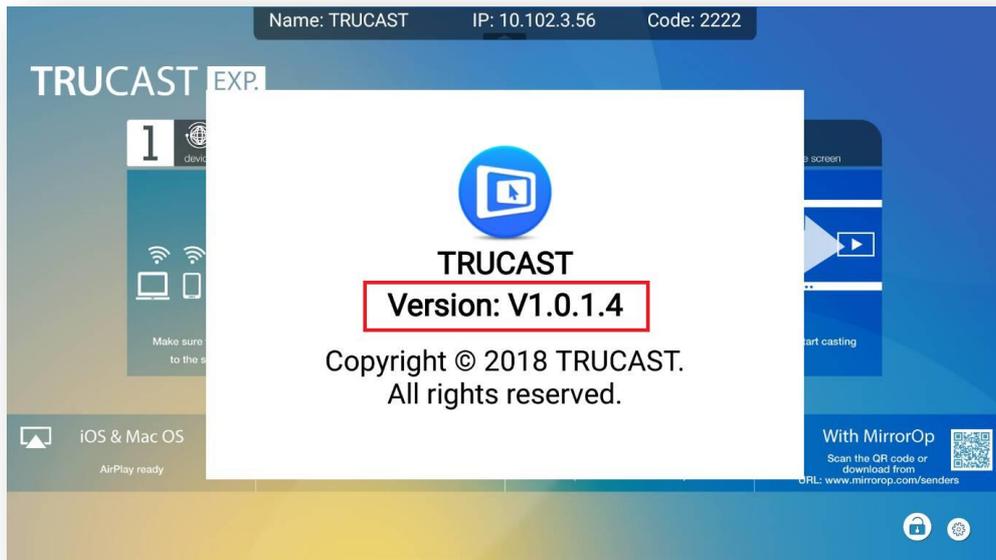
Normally, registration is not required as TRUCAST (EXPRESS) comes with a license key. However, if the key is absent, you need to contact your vendor to get a valid key

and then manually enter it in the Register field. (Click  in the lower-right corner of the TRUCAST standby screen and you can see “Register” in the Settings menu.) You can also unregister the app by clicking “Unregister” in the Settings menu.



(4) About:

Click on “About”, and the version number of the TRUCAST app will be shown.



2.2 The Conference Control button

You can click on the Conference Control button in the lower-right corner of the standby screen to enable/disable the Conference Control mode. When the Conference Control mode is

enabled (), no one is allowed to share content freely, and only the moderator can decide which sender to cast content. The moderator can also keep the Conference Control mode disabled () to allow senders to present content to TRUCAST freely.

The Conference Control button is a great tool to keep meetings or classes running in an orderly manner. **Aside from the Conference Control button, a number of other on-screen moderation tools are also available. Please refer to “7. Toolbars in Connection & Projection Modes”.**

3. Network Connection

Make sure your sender devices (such as laptops, tablets and smartphones) and receiver device (display/monitor/large screen with the TRUCAST app installed) are connected to the same local area network (LAN) or the same WiFi network. **To put it more precisely, if casting is done via MirrorOp (Sender/Presenter), your sender device(s) and receiver device only need to be on the same intranet. However, if casting is done via AirPlay/Google Cast, they need to be on the same subnet.** Otherwise, the content-sharing mechanism is not going to work.

Note:

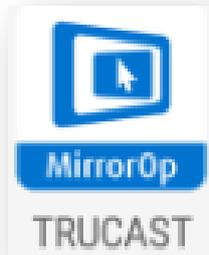
To check if your sender and receiver devices are connected to the same subnet, please check the IP address of the sender device, and compare it with the IP address shown on the standby screen of the TRUCAST receiver device. **They should be identical in the first three sections, and only differ in the last section.** For example, the IP address of the sender device is 192.168.100.11 while that of the receiver device is 192.168.100.10. If they are not on the same subnet, try to connect them to the same wireless router, and make sure they get an IP address automatically from the router.



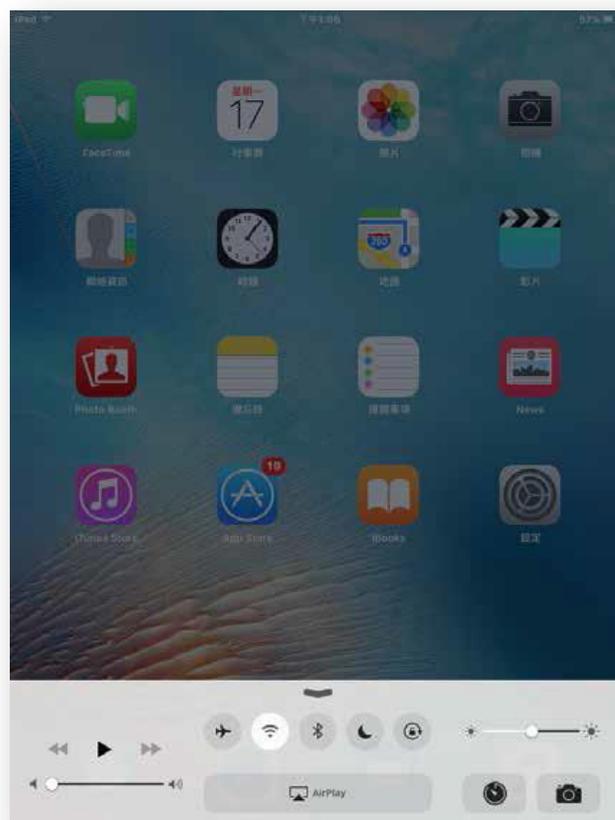
4. Casting via AirPlay

4.1 Casting from iPad/iPhone to TRUCAST

(1) Open the TRUCAST (EXPRESS) app on your receiver device.

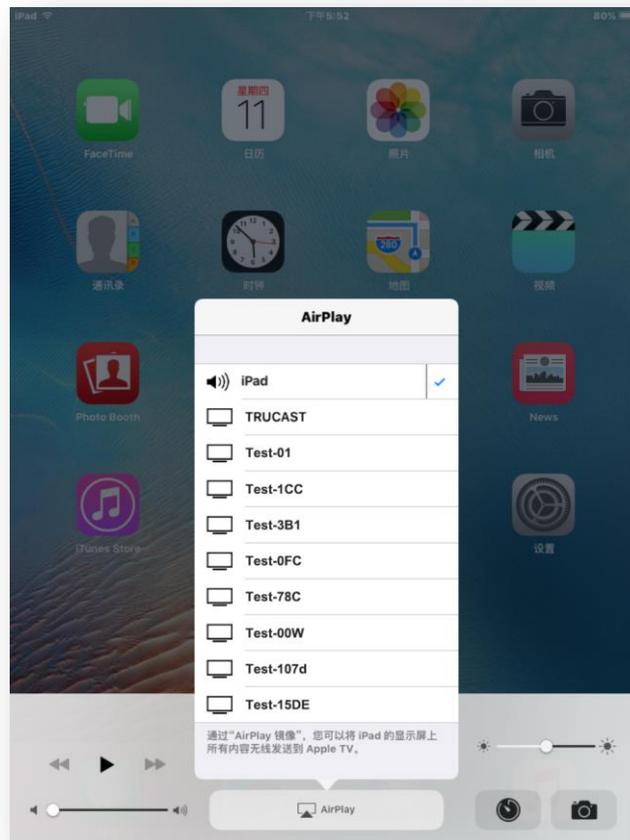


(2) Swipe up from the bottom of the iPad/iPhone screen to bring up the Control Center and you can see the AirPlay icon ().



(3) Click on AirPlay () and select “TRUCAST” from the list of available AirPlay receivers. **[Enter the 4-digit login code/passcode if there is one (shown in the upper-**

left corner of TRUCAST's standby screen).] Now you can mirror your iPad/iPhone screen to the display.

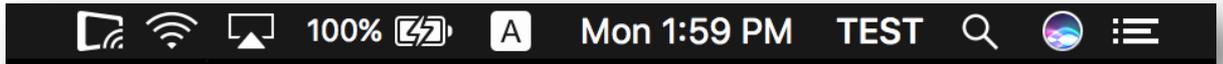


4.2 Casting from Mac to TRUCAST

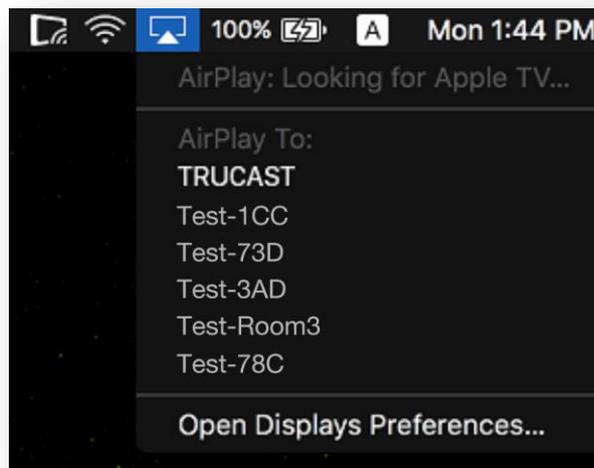
(1) Open the TRUCAST (EXPRESS) app on your receiver device.



(2) Click the AirPlay icon () in the menu bar at the top of your Mac screen.



- (3) Click on AirPlay () and select “TRUCAST” from the list of available AirPlay receivers. **[Enter the 4-digit login code/passcode if there is one (shown in the upper-left corner of TRUCAST’s standby screen).]** Now you can mirror your Mac screen to the display.



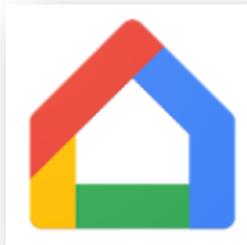
5. Casting via Google Cast (Chromecast)

5.1 Casting from Android device to TRUCAST

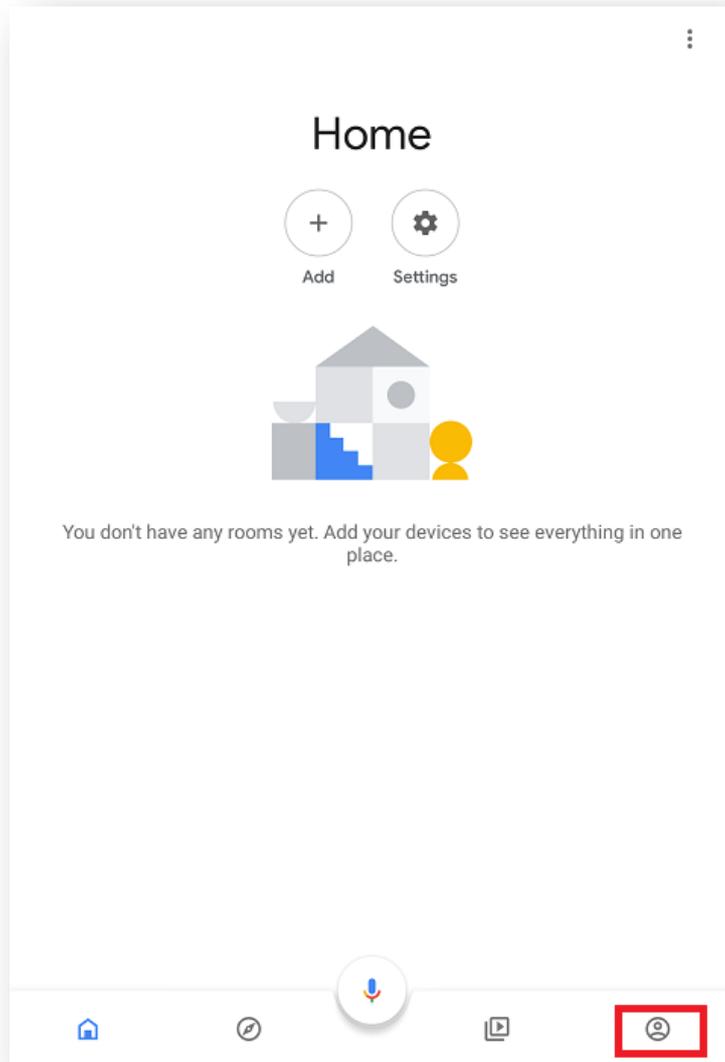
(1) Open the TRUCAST (EXPRESS) app on your receiver device.



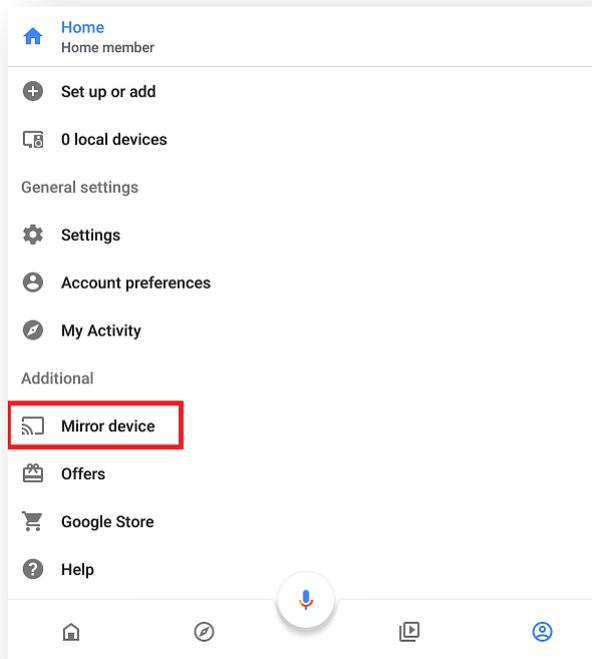
(2) Install the **“Google Home”** app on your Android device.



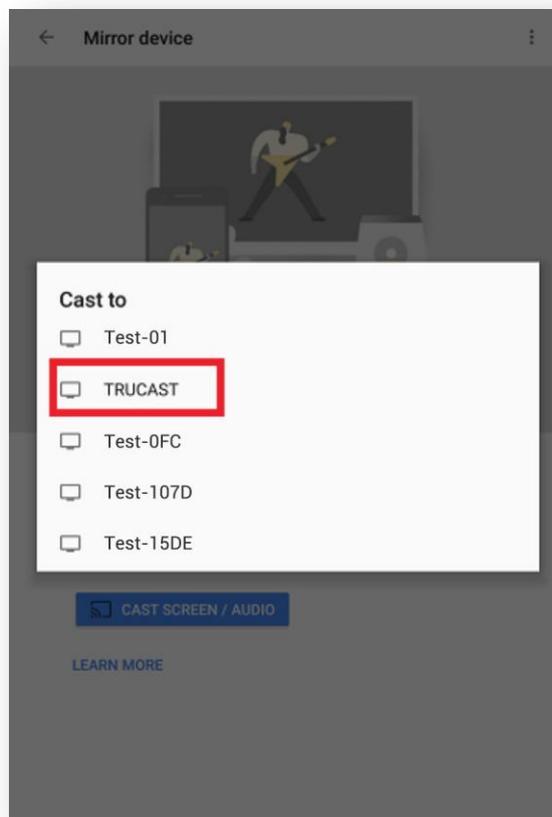
(3) Open the Google Home app. Click  at the bottom of the app's home screen.



- (4) Tap  (“Mirror device”) in the menu bar and you will see a list of available Google Cast receivers.

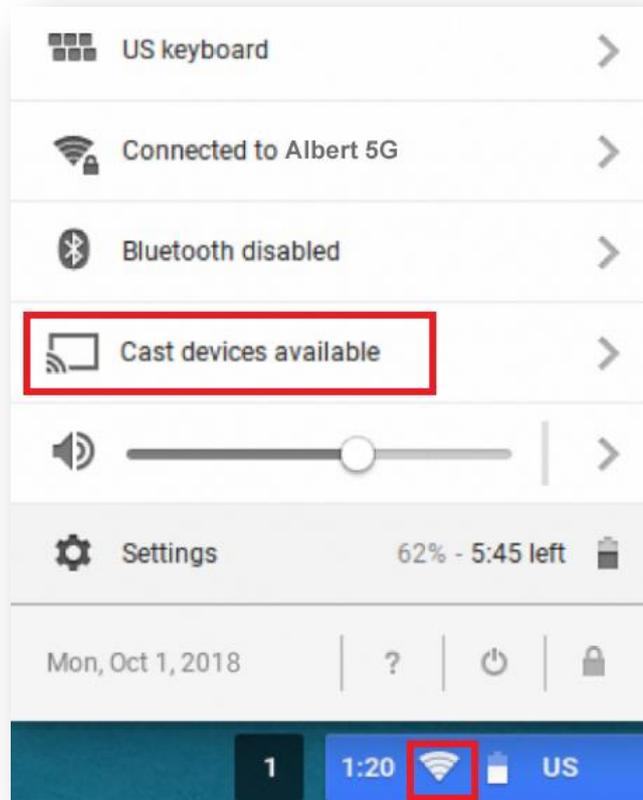


(5) Select “TRUCAST” from the receiver list. Now you can mirror your Android device screen to the display.

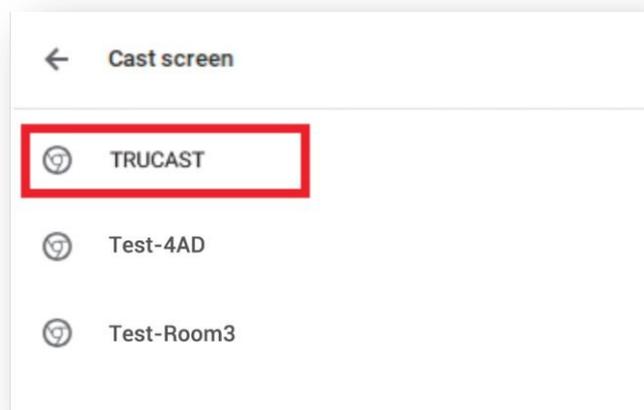


5.2 Casting from Chromebook to TRUCAST

- (1) Click on the WiFi icon  in the lower-right corner of the Chromebook screen, and then tap  (“Cast devices available”) in the menu bar.



- (2) Select “TRUCAST” from the list of available Google Cast receivers. Now you can mirror your Chromebook screen to the display.



5.3 Casting from PC (Windows Computer) to TRUCAST

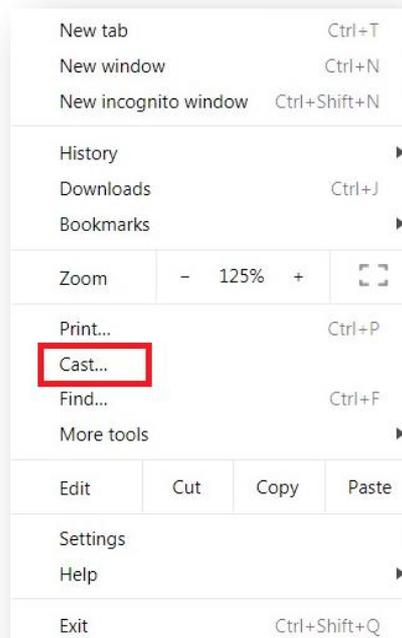
(1) Open the TRUCAST (EXPRESS) app on your receiver device.



(2) Open **the Chrome browser** on your PC.



(3) Click the menu icon  in the upper-right corner of your PC screen, and select “Cast” in the menu bar.



(4) Now you can mirror your PC screen to the display.

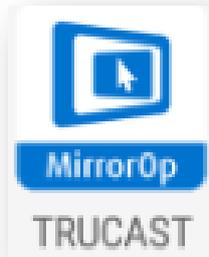
6. Casting via MirrorOp

Besides AirPlay and Google Cast, content sharing can also be achieved via the MirrorOp apps. Before projecting your content to the display (receiver device), you need to install the MirrorOp Sender app on your computer or the MirrorOp Presenter app on your mobile device. The MirrorOp apps offer a number of advanced features in addition to real-time content sharing. Details will be provided in the following sections.

6.1 Casting from PC/Mac to TRUCAST via MirrorOp Sender

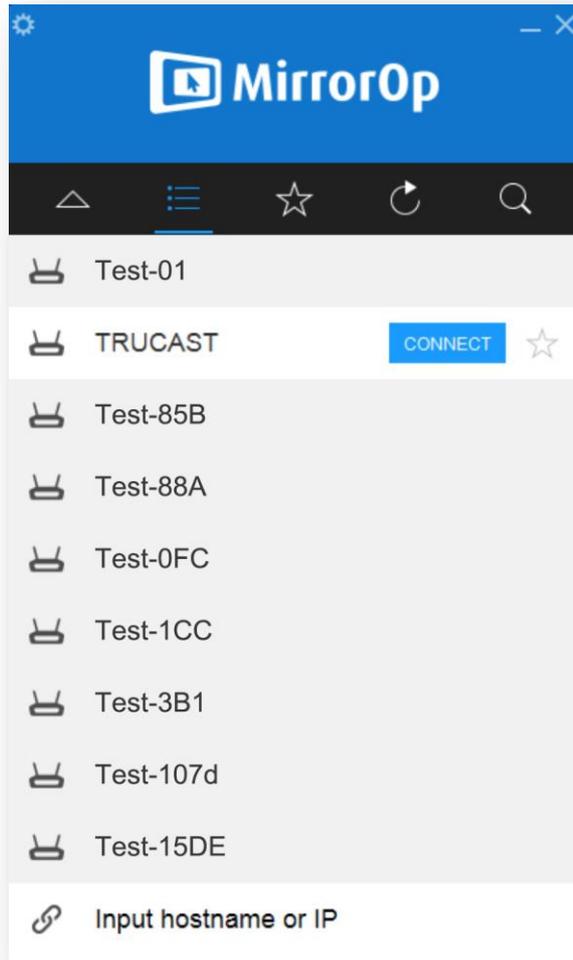
6.1.1 Getting started with MirrorOp Sender

(1) Open the TRUCAST (EXPRESS) app on your receiver device.

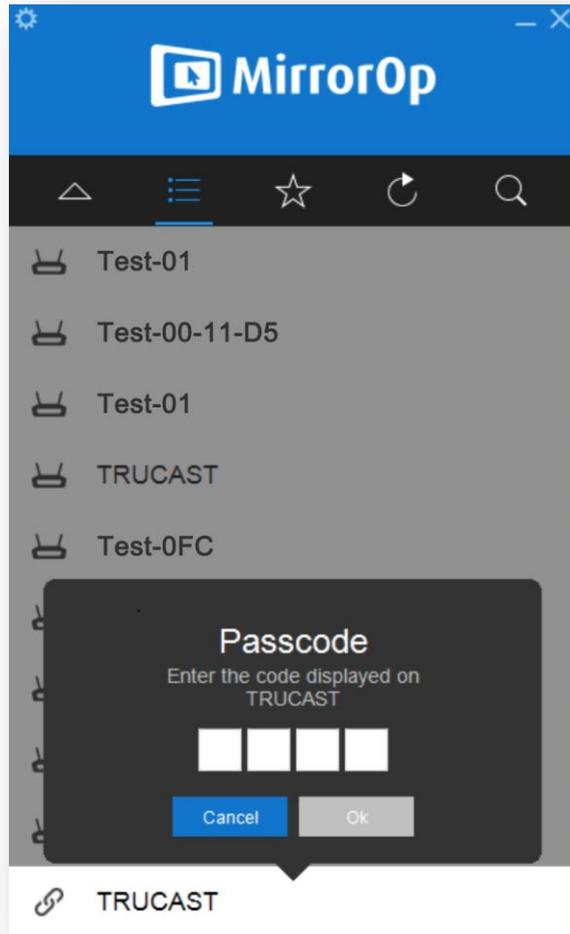


(2) Download the MirrorOp Sender app for Windows/Mac from www.mirrorop.com/senders/, and install the app on your PC/Mac.

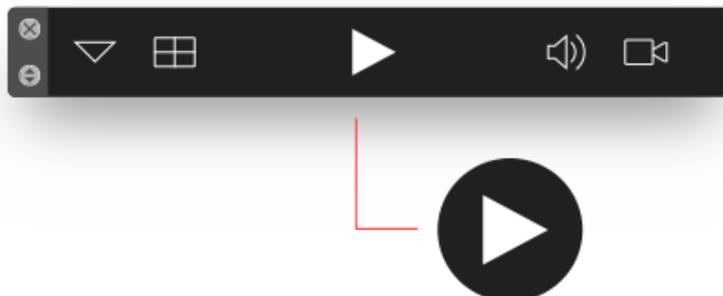
(3) Open the MirrorOp Sender app. Select “TRUCAST” from the list of available receivers, and click "CONNECT". **If you cannot find the receiver you want to use, please input the “IP address” of the receiver in the textbox at the bottom of the interface.**



(4) Enter the 4-digit login code/passcode if there is one (**shown in the upper-left corner of TRUCAST's standby screen**).



(5) Click the Play  button. Now you can mirror your PC/Mac screen to TRUCAST.



Note:

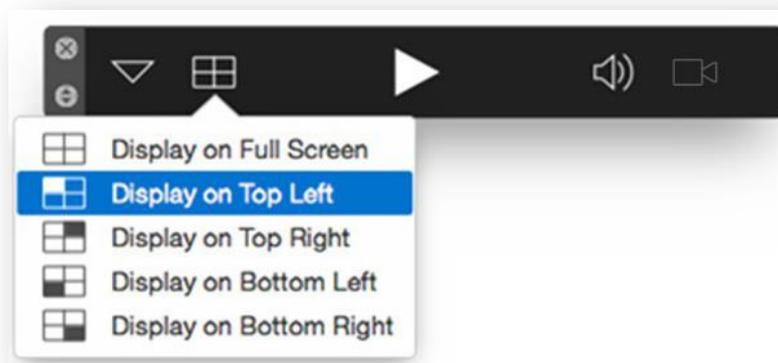
- You can also choose to save receiver(s) you use frequently to “Favorites” , telling MirrorOp Sender to launch from the Favorites list next time.

- The “Refresh List” button  only works for receivers that reside on the same subnet (that is, the first three sections of the IP address of the receiver are the same as those of the computer).
- For those receivers not on the same subnet, you can input the “IP address” of the receiver in the textbox at the bottom of the interface.

6.1.2 Advanced features of MirrorOp Sender

(1) Split Screen (Quad Screen):

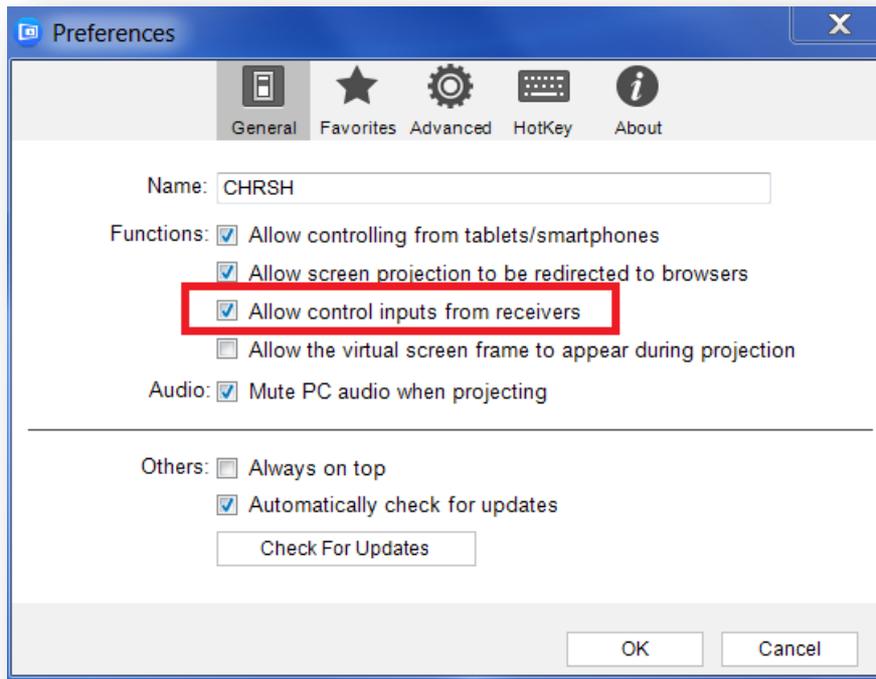
Select full screen or one of the corners where you want to display on the receiver screen. When you click the Play button , the position selected on the split menu will be used.



(2) Remote Control/Remote Touch Control (UMT)) via a Touch Screen:

Users can remotely control the projecting computer from the display **via a touch screen**. **This feature is only supported in full-screen mode.**

Please make sure that the option of remote control (“**Allow control inputs from receivers**”) is enabled in the (General) Preferences tab of MirrorOp Sender.



Note:

- The UMT (universal multi-touch) function can only support USB HID touch devices compatible with Windows 7/8/10. Therefore, when the operating system of the sender device is macOS, touch events on the display (monitor) screen are translated into mouse events on the screen of the sender device.
- Please also be aware that Windows 7 can only provide limited multi-touch capability for specific applications.

(3) **Extended Screen (Extended Desktop):**

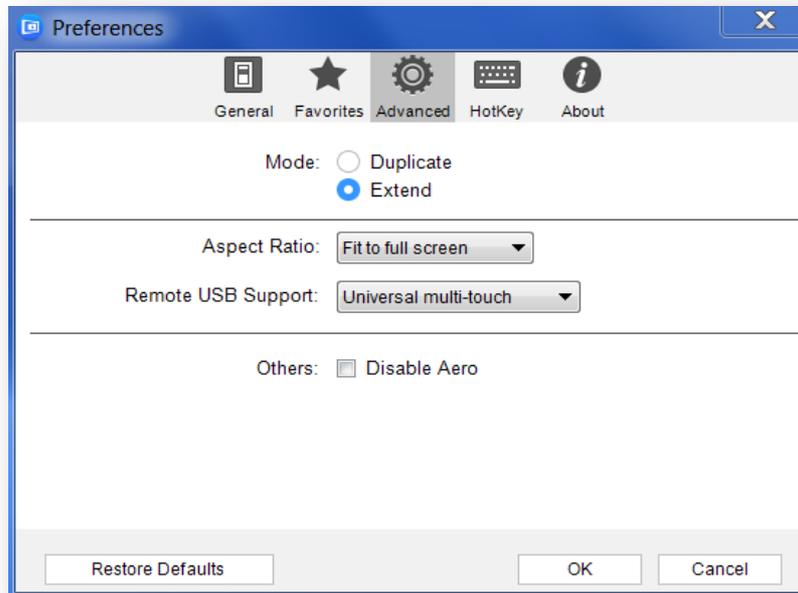
Besides displaying your main desktop, it is also possible to display an extended desktop to the receiver. This is useful when you want to present a document to the audience while using your main desktop to read your notes or confidential data.

Extended screen can be enabled on most Windows 7/8/10 computers. However, depending on the driver support of your graphic card, an additional driver may be required to turn on the "virtual" extended screen. In this case, the MirrorOp Sender application will ask to download and install an additional driver.

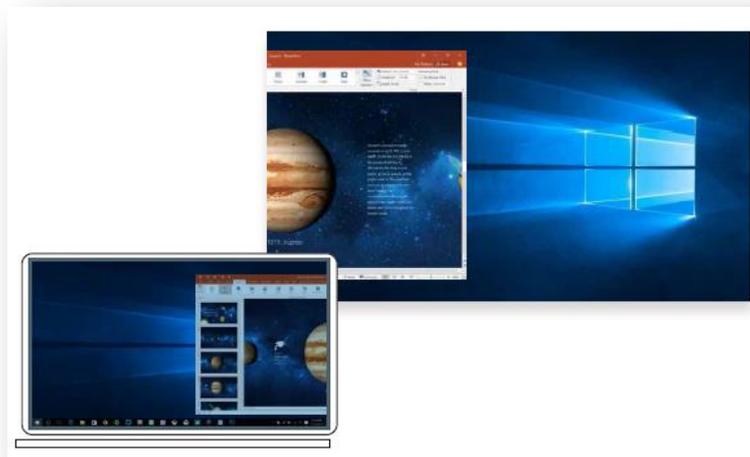
For Mac computers, an additional driver is always required to use the virtual extended desktop. **(Please note that the Extended Screen feature is not supported by macOS 10.13.4 and above.)**

To use the extended screen, please follow the steps below:

(a) Choose "Extend" in the "(Advanced) Preferences" tab of MirrorOp Sender.



(b) Use MirrorOp Sender to project your computer screen to the display. Drag the window off the computer screen to the right. The window will be shown on the display.



6.2 Casting from mobile device to TRUCAST via MirrorOp Presenter

6.2.1 Getting started with MirrorOp Presenter

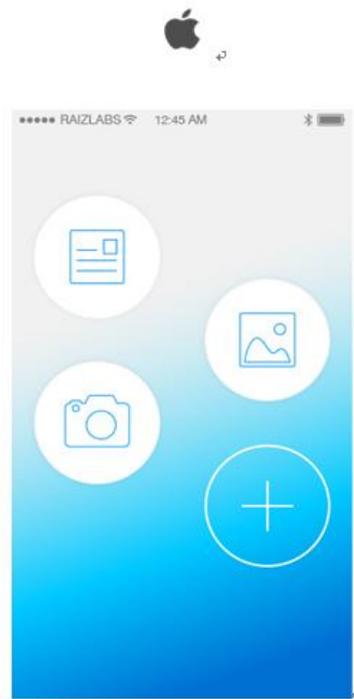
(1) Open the TRUCAST (EXPRESS) app on your receiver device.



- (2) You can visit the Apple App Store or the Google Play Store to download the MirrorOp Presenter app on your iOS/Android device. You can also use the following QR code to get to the app stores directly.



- (3) Open the MirrorOp (Presenter) app, and you will see its home screen where you can select which function to use. There are several buttons on the home screen:

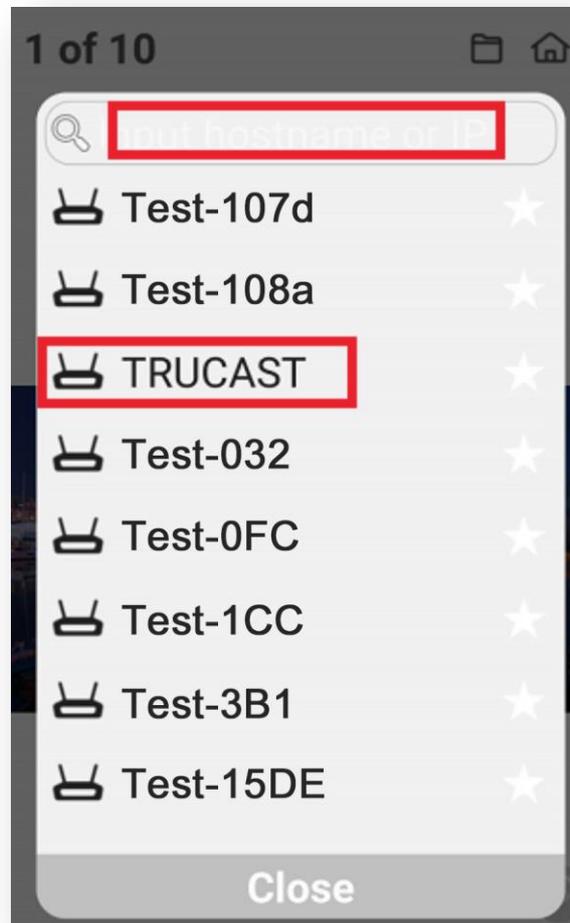


| | | |
|---|-------------------------|---|
|  | Screen Mirroring | Mirror the screen of the sender device to the receiver device. [Only Android devices (used as sender devices) have this function.] |
|  | Document | Select a specific folder and open a specific document file you want to project. |
|  | Photo | Select a specific folder and open a specific image file you want to project. |
|  | Live Camera | Use the camera on the sender device to show live images of non-digital objects. |
|  | Add Function | Add a new function (Browser, Dropbox/Google Drive/One Drive or Setting) to the home screen. |

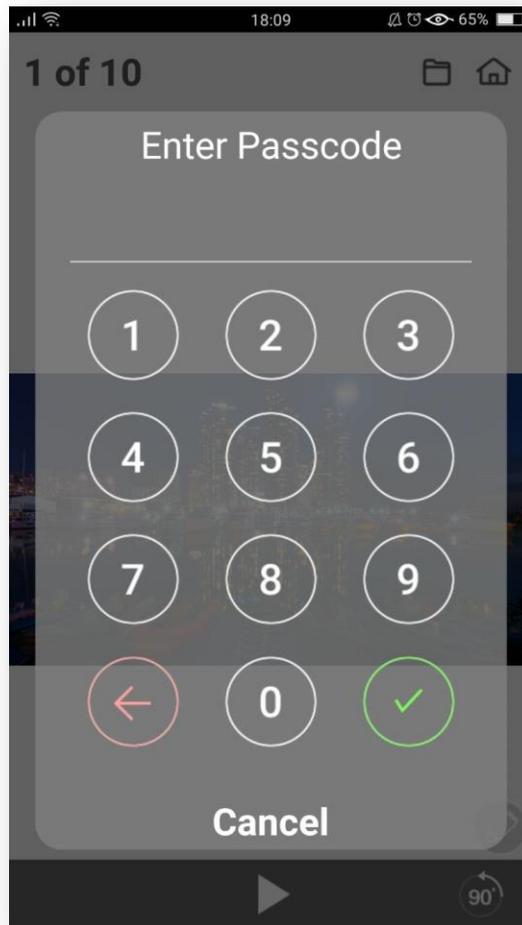
Note:

The “Video Streaming” function () is not available as TRUCAST does not support DLNA streaming.

- (4) Click on one of the abovementioned buttons, and then click the Play button . Select “TRUCAST” from the list of available receivers. **If you cannot find the receiver you want to use, please input the “IP address” of the receiver in the textbox on the top of the interface.**



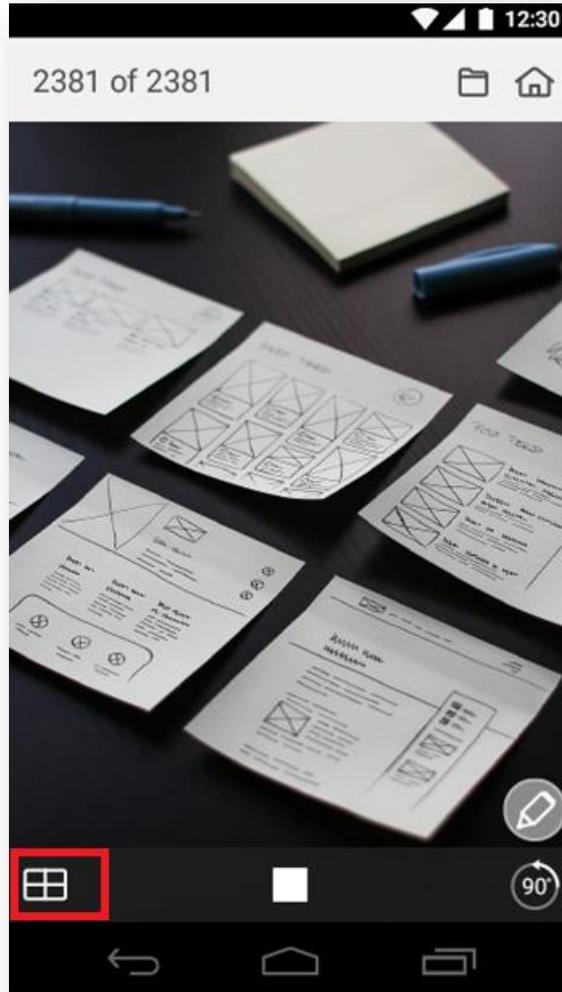
- (5) Enter the 4-digit login code/passcode if there is one (**shown in the upper-left corner of TRUCAST’s standby screen**). Now you can share content from your mobile device to TRUCAST.



6.2.2 Advanced features of MirrorOp Presenter

(1) **Split Screen (Quad Screen):**

Besides the full-screen mode, many of MirrorOp Presenter's features also support the split-screen (quad-screen) mode. Click the Quad-Screen icon  in the lower-left corner of the screen, and you can select one of the corners where you want to show the content on the receiver screen.



(2) **Annotation:**

A very useful function in MirrorOp Presenter is that you can annotate on the screen during the presentation. That is to say, you can use the annotation tools to write, draw, or highlight anywhere on the screen when presenting documents, photos, web pages or camera views.

To start annotation, click the Annotation icon  in the lower-right corner of the screen. A horizontal toolbar will appear with the following options:



Annotation Tools:

| | | |
|---|---|---|
|  | Marker Mode | To annotate in an opaque color. |
|  | Marker Mode + One-Stroke Mode | To annotate in an opaque color; previous strokes will be cleared when a new stroke is drawn. |
|  | Highlighter Mode | To annotate in a semi-transparent color. |
|  | Highlighter Mode + One-Stroke Mode | To annotate in a semi-transparent color; previous strokes will be cleared when a new stroke is drawn. |
|  | Pen Color |    |
|  | Pen Width |    |
|  | Eraser | To erase part of or the whole of the annotations. |
|  | Clear All | To clear all the annotations on the current image. |
|  | Save | To save the current screen (with annotations) as an image file |
|  | Hide | To hide the horizontal toolbar. |

(3) **Live Camera:**

MirrorOp Presenter's built-in camera function enables you to capture live images or to do live reporting, which is essential in certain situations.

- Please follow the steps below:
- Click the Camera button  on the home screen.
- Click on the Play button , and select "TRUCAST" from the list of available receivers.
- Now you can start to capture live images or to do live reporting.



7. Toolbars in Connection & Projection Modes

7.1 Toolbar in Connection mode

When any sender device is connected to TRUCAST **via MirrorOp**, the system will enter the Connection mode. You will then see a toolbar with the following icons:



Settings:

Please refer to “2.1 The Settings button”.



Sender-List:

Click on the “Sender-List” button to show all the login senders. The moderator can:
(a) pick which sender to cast content; (b) determine the content to be shown in full-screen or split-screen mode; (c) to decide in which quadrant of the receiver screen the content will be displayed.



Conference Control:



Please refer to “2.2 The Conference Control button”.



Disconnect All:

Click on the “Disconnect All” button to disconnect all sender devices from TRUCAST (receiver device).

7.2 Toolbar in Projection mode

When any sender casts content to TRUCAST via **AirPlay, Google Cast or MirrorOp**, the system will enter the Projection mode. You will then see a toolbar with the following icons:



Expand:

Click on the “Expand” button to expand the toolbar.



Sender-List:

Click on the “Sender-List” button to show all the login senders. The moderator can:
(a) pick which sender to project content; (b) determine the content to be shown in full-screen or split-screen mode; (c) to decide in which quadrant of the receiver screen the content will be displayed.

(Note: This function is not supported by AirPlay or Google Cast.)



Conference Control:



Please refer to “2.2 The Conference Control button”.



Stop:

Click on the “Stop” button to stop projection.

(Note: This function is not supported by AirPlay or Google Cast.)



Disconnect All:

Click on the “Disconnect All” button to disconnect all sender devices from TRUCAST (receiver device).



Hide:

Click on the “Hide” button to hide the toolbar.

8. Frequently Asked Questions

Q: Can multiple senders cast content to TRUCAST at the same time?

A: This can only be achieved via MirrorOp (Sender/Presenter) in split-screen mode.

Below are a number of other casting scenarios for your reference:

(1) 1 AirPlay sender + 1 MirrorOp sender

The second sender, whether using AirPlay or MirrorOp, dictates what shows up on the display.

(2) 1 Google Cast sender + 1 MirrorOp sender

The second sender, whether using Google Cast or MirrorOp, dictates what shows up on the display.

(3) Multiple AirPlay/Google Cast senders

The first sender, whether using AirPlay or Google Cast, dictates what shows up on the display.

(4) Multiple AirPlay senders

The first sender dictates what shows up on the display

(5) Multiple Google Cast senders

The first sender dictates what shows up on the display.

(6) Multiple MirrorOp senders (in full-screen mode)

The last sender dictates what shows up on the display

Q: Why is Google Cast (Chromecast) not working with TRUCAST?

A: There are several factors which may cause the Google Cast issue. You can try any of the following to fix it:

(1) Time settings

Please synchronize your sender and receiver devices. Google Cast does not work properly if there is a significant disparity between the system time on the sender device and that on the receiver device (TRUCAST receiver). Thus, **you need to ensure that:** (a) the sender and receiver devices are set to the same time zone; (b) their time gap is less than 5 minutes.

(2) Network settings

Make sure that your sender and receiver devices are connected to the same subnet. (For detailed information, please refer to “3. Network Connection”.)

(3) Firewall settings

Please check the settings of your router, **ensuring that AP (access point) isolation is disabled on your router**. Please also disable any firewall features on your router that might block incoming connections to your Google Cast device.

You also need to open the following ports in the firewall of your router:

| | USAGE | DIRECTION | PORT# |
|-----|------------------|-----------|------------|
| TCP | Google Cast | Both | 7000 |
| | | | 7100 |
| | | | 47000 |
| | | | 8008 |
| | | | 8009 |
| UDP | Google Cast | Outbound | 4101~4199 |
| | | | 5353 |
| | Device Discovery | Inbound | 2048~65535 |
| | | | 1047 |
| | | | 1048 |
| | | | 1049 |

(4) **After the first three steps are accurately followed** (the time is synced, and your network & firewall are properly configured), **you'd better wait a few minutes before using Google Cast**. This is because after your network and firewall are configured, it may take a short while for the Chrome browser to seek the TRUCAST receiver device and establish a handshake with it. It is only after these processes are correctly completed that the TRUCAST receiver device will be shown in the list of available receivers for Google Cast.)

(5) Open the Chrome browser of your sender device and enter “chrome://inspect/#devices” in the address bar (URL bar). If the TRUCAST receiver device is not shown in the list, there must be something wrong with the time settings, network settings or firewall settings. Please go back to the first three steps to check what is wrong.

(6) Please check if your Android device can cast content to TRUCAST via the Google Home app. If not, there must be something wrong with the time settings, network settings or firewall settings. Please go back to the first three steps to check what is wrong.

(7) You can also consult the following link for more information:

<https://support.google.com/chromecast/answer/3249268>

Q: Why does my sender device disconnects from TRUCAST every 5 minutes?

A: Whether you use AirPlay, Google Cast or MirrorOp (Sender/Presenter), the connection between your sender device and receiver device (installed with the TRUCAST app) automatically stops every 5 minutes, if the receiver device does not come with the license of TRUCAST. Please consider purchasing a license key from the vendor.

9. Appendix: TRUCAST Port Table

Port Table

| | USAGE | DIRECTION | PORT# | NOTE |
|-----------------------|------------------|-----------|--|------------------------------|
| TCP | Command | Both | 443 | AirPlay also uses this port. |
| | | | 3268 | |
| | | | 389 | |
| | Data | Both | 8080 | |
| | | | 31865 | |
| 515 | | | | |
| Audio | Both | 1688 | Used for screen projection and audio data transfer; need to open it to let audio projection work | |
| AirPlay & Google Cast | Both | 7000 | | |
| | | 7100 | | |
| | | 47000 | | |
| | | 8008 | | |
| | | 8009 | | |
| | | 4101~4199 | | |
| UDP | AirPlay | Both | 5353 | |
| | Google Cast | Both | 2048~65535 | |
| | Device Discovery | Inbound | 1047 1048 1049 | |