

Setup and Install Guide

020-102804-02

Terra Controlled Systems

NOTICES

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The warranty does not obligate Christie to provide any on-site warranty service at the product site location.


REGULATORY

The product has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the product is operated in a commercial environment. The product generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of the product in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at the user's own expense.

CAN ICES-3 (A) / NMB-3 (A)

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ENVIRONMENTAL

The product is designed and manufactured with high-quality materials and components that can be recycled and reused. This symbol  means that electrical and electronic equipment, at their end-of-life, should be disposed of separately from regular waste. Please dispose of the product appropriately and according to local regulations. In the European Union, there are separate collection systems for used electrical and electronic products. Please help us to conserve the environment we live in!

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Important Safeguards

To prevent personal injury and to protect the device from damage, read and follow these safety precautions.

General Safety Precautions

To prevent personal injury and to protect the device from damage, read and follow these safety precautions.



Warning! If not avoided, the following could result in death or serious injury.

- SHOCK HAZARD! Disconnect the product from AC before moving, servicing, cleaning, removing components, or opening any enclosure.
- Motors and fans may start without warning.

Power Precautions

Ensure all power precautions are understood before installing the product.



Warning! If not avoided, the following could result in death or serious injury.

- FIRE AND SHOCK HAZARD! Do not operate the system unless certified power connections, providing the recommended voltage, are used.
- FIRE AND SHOCK HAZARD! Do not attempt operation unless the power cord, power socket, and power plug meet the appropriate local rating standards.



Caution! If not avoided, the following could result in minor or moderate injury.

- SHOCK HAZARD! Only use the AC power cord provided with the product or recommended by Christie.
- TRIP OR FIRE HAZARD! Position all cables where they cannot contact hot surfaces, be pulled, be tripped over, or damaged by persons walking on or objects rolling over the cables.
- FIRE HAZARD! Do not use a power cord, harness, or cable that appears damaged.
- FIRE OR SHOCK HAZARD! Do not overload power outlets and extension cords.
- SHOCK HAZARD! The AC power cord must be inserted into an outlet with grounding.
- SHOCK HAZARD! Do not attempt operation if the AC supply is not within the specified voltage and power range, as specified on the license label.

Service Warning

All servicing instructions are for use by qualified service personnel only. There are no procedures, exchange, or parts that are inside the unit that are intended to be performed by the user.

Unplug all power and power supply cords from the unit before servicing.




Product Overview

Christie Terra is an AV over IP solution enabling the transport, processing and control of audiovisual content, including 4K@60Hz video formats, over 10G Ethernet networks. Built on standardized SDVoE technology, Christie Terra provides unprecedented performance capabilities including the delivery of uncompressed, zero-frame latency, artifact-free video over readily available and affordable 10G components.

For additional information, view the Terra product literature at <http://bit.ly/TerraDownloads>.

Hardware

The Terra solution consists of transmitters, receivers, and a controller. Each features front-facing LED indicators providing quick status.

	<p>Transmitter (TX) processes audiovisual sources and control signals to deliver uncompressed, zero-frame latency, artifact-free content over 10G networks. The Terra TX supports video resolutions up to 4K@60Hz and accepts multiple content and control connections, including HDMI 2.0, USB, HDCP 2.2, DisplayPort 1.2, serial RS-232, EDID and more. This powerful and flexible component does not require additional devices to process signals.</p>
	<p>Receiver (RX) delivers audiovisual data and control from an SDVoE system to displays and other devices. Benefit from full signal management and processing including magnification, downscaling, KVM, PiP, image compositing and multiviewer application. Terra RX delivers artifact-free video at resolutions up to 4K@60Hz with zero-frame latency, and device control over standard 10G networks.</p>
	<p>Terra Controller provides secure operational control and management of SDVoE systems.</p>

Related Documentation

Access the latest documentation from the Christie website at <http://bit.ly/TerraDownloads>

Additional information is available in the following documents:

- Terra Transmitters and Receivers Setup and Installation Guide (020-102814-*nn*)
- Terra Product Safety Guide (020-102786-*nn*)
- Terra User Guide (020-102838-*nn*)
- Terra XY Switcher User Manual (020-102883-*nn*)
- Terra XY Switcher API Reference Manual (020-102884-*nn*)
- Terra JSON API Reference Manual (020-102837-*nn*)

Install and Setup

Use the following information to install Terra TXs and RXs for Extender applications.

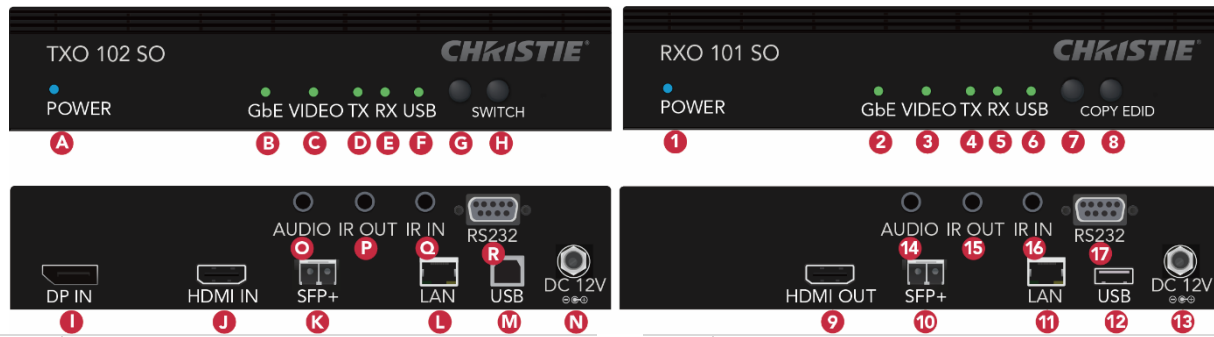
Extender Applications

Christie Terra TXs and RXs extend and process audiovisual content, including 4K@60Hz video formats, over fiber connections.

Accessories

Required	Optional
OM3 multimode 850nm fiber cable with duplex LC-LC connectors (300m maximum distance) Single mode fiber or Category cable such as CAT-6a can be used with Terra TXs and RXs by substituting compatible 10G SFP+ transceivers and compatible cables. 10G SFP+ Direct Attach Cables or Twinax copper cables with hard wired SFP+ transceivers can also be used.	Audio cable: 3.5 mm stereo mini-jack
HDMI IN cable or DisplayPort cable	Remote control cables: IR transmitter 3.5 mm DC mini-jack cable; IR receiver 3.5 mm stereo mini-jack cable
HDMI out cable	USB 2.0 type-A cable, keyboard, mouse
AV source device	Speaker for analog audio
AV display device (embedded audio ready for HDMI audio)	

TX and RX Ports and Status Indicators



A	Power indicator
B-F	Signal and system indicators
G	Button (currently unused but can be set using Terra Manager)
H	Switch button to switch between inputs; or to reset to factory defaults.
I	DisplayPort 1.2 input port
J	HDMI 2.0 input port
K	10G SFP+ Transceiver with LC-LC port
L	1G Ethernet (RJ-45) port
M	USB 2.0 Type-B port

1	Power indicator
2-6	Signal and system indicators
7	Button (currently unused but can be set using Terra Manager)
8	Button used to copy EDID to Transmitter; or to reset to factory defaults.
9	HDMI 2.0 output port
10	10G SFP+ Transceiver for with LC-LC port
11	1G Ethernet (RJ-45) port
12	USB 2.0 type-A port
13	External power port

N	External power port	14	Analog stereo audio (3.5 mm stereo mini-jack) female port
O	Analog stereo audio (3.5 mm stereo mini-jack) female port	15	Serial IR control out (3.5 mm DC mini-jack) female port
P	Serial IR remote control out (3.5 mm DC mini-jack) female port	16	Serial IR control in (3.5 mm stereo mini-jack) female port
Q	Serial IR remote control in (3.5 mm stereo mini-jack) female port	17	Serial RS-232 (9Pin DIN) female port
R	Serial RS-232 (9Pin DIN) female port		

Extension Setup

i For proper ventilation and to prevent damage to the unit, ensure the wiring or other material does not obstruct the air flow to or from the air vents.

1. Power off all equipment and install in a rack or set on a table.
2. Connect AV source to the DP IN (I) or HDMI IN (J) port on the TXO using a DisplayPort cable or HDMI cable.
3. Optionally, connect a stereo analog audio source to the TXO (O) using an audio cable.
4. Connect the TXO and RXO using OM3 multimode 850nm fiber cable with duplex LC-LC connectors on each end by inserting the cable into the SFP+ transceivers on the TXO (K) and RXO (10).
5. Connect an AV display to the HDMI OUT (9) port on the RXO using an HDMI cable.

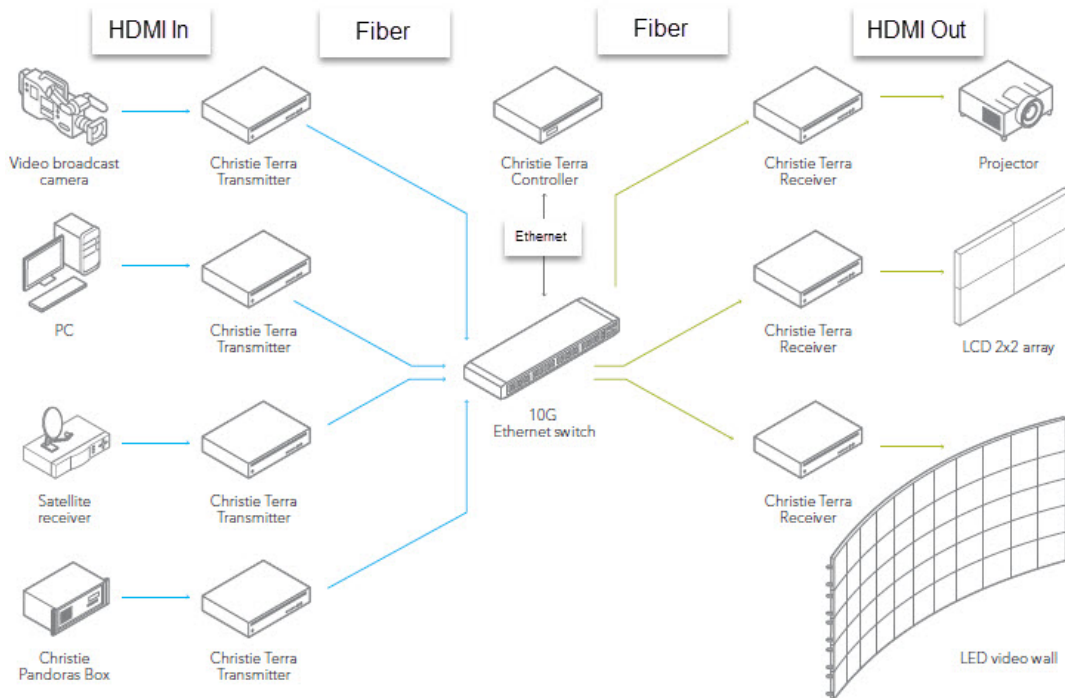
i Use the supplied HDMI Cable Lock to secure the HDMI cables to the TXO and RXO.

6. Optionally, to transport IR control commands between units, connect an IR receiver to the IR IN (Q or 16) port on the TXO or RXO near the remote control source; and connect an IR emitter to the IR OUT (P or 15) port on the opposite (far) TXO or RXO that is near the device you want to control.
7. Optionally, make connections from the source USB connection to the USB (M) on the TXO and connect a mouse and/or keyboard to the USB (12) on the RXO.
8. Supply power to the units by connecting the external power supply to the units (N and 13) and to a power source. The power indicator on the TXO (A) and RXO (1) should light up. Green signal indicators (C-E and 3-5, and optionally F and 6 for USB) light when a signal is present and transported between the TXO and RXO.

i If the source is not displayed, change the source signal that is transmitted (HDMI or DisplayPort) by pressing the SWITCH (H) button on the TXO.

AV Processing Applications

The AV Processing application requires a 10G network switch and a Terra Controller. The Controller and all TXs and RXs are connected to the same network.



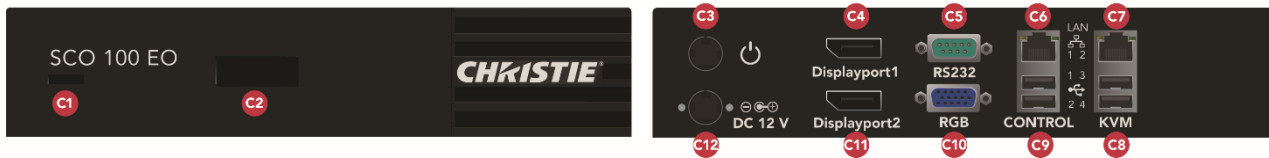
Christie Terra Systems use a Terra Controller and a 10G network to configure, program, and control switching and processing functions. This section contains quick start instructions using the Terra Startup Assistant application to start to configure the system. For additional details, refer to the Terra User Manual (020-001355-*nn*).

 Go to <http://bit.ly/TerraDownloads> for the current user documentation.

Accessories

Required	
10G Network switch	PC or other Window-based device with a web browser
One 1G Ethernet cables (CAT-6) If the network switch does not offer RJ45 connections for 1G Ethernet communications, use two 1G SFP transceivers compatible with the SFP+ adapters on the network switch, or connect to the Terra 1G LAN ports.	For each TX and RX, one 10G Ethernet Twinax cable (.5 to 7m); or SFP+ 10G transceivers compatible with the network switch and OM3 multimode 850nm fiber cable with duplex LC-LC connectors (300m maximum distance) <i>i</i> Single mode fiber or Category cable such as CAT-6a can be used with Terra TXs and RXs by substituting compatible 10G SFP+ transceivers and compatible cables. 10G SFP+ Direct Attach Cables or Twinax copper cables with hard wired SFP+ transceivers can also be used.
HDMI out cable for each RX	HDMI IN cable or DisplayPort cable for each TX
AV source devices	AV display devices (embedded audio ready for HDMI audio)
Optional	
Audio cable: 3.5 mm stereo mini-jack	USB cables
Remote control cables: IR transmitter 3.5 mm DC mini-jack cable; IR receiver 3.5 mm stereo mini-jack cable	Serial RS-232 cable 9PinD male and female connectors

Terra Controller Ports and Status Indicators



C1	Power indicator
C2	LED display for IP address and startup status
C3	Power switch
C4	DisplayPort 1.2 output port (female), unused
C5	Serial RS-232 port for connecting to 3 rd Party control system
C6	1000BASE-T Ethernet connector for device control and optional access for 3 rd Party control system
C7	Unused
C8	USB connectors V2.0, unused
C9	USB connectors V2.0, unused
C10	15PinHD output port,, unused
C11	DisplayPort 1.2 output port (female), unused
C12	Power supply port (low voltage)

Terra TX and RX Connections

Refer to *TX and RX Ports and Status Indicators*, page 6.

AV Processing System Setup

i For proper ventilation and to prevent damage to the unit, ensure the wiring or other material does not obstruct the air flow to or from the air vents.

Prepare a networking plan including the IP address range, subnet mask, and gateway values for the controller and associated Terra devices.

For ease of identifying all the hardware, attach the extra MAC address sticker (found in the accessory bag) to the front or rear of each TX and RX.

Power off all equipment and install in a rack or set on a table.

Power on the 10G network switch.

Prepare the network for Terra multicast by configuring the switch for IGMP V2 Multicast management including IGMP Snooping and Querier, Immediate leave, and Drop unregistered multicast on the SDVoE VLAN.

i Use Wireshark or Netmon applications on a laptop or PC connected to the Terra 10G network to validate the presence of these protocols while operating the Terra system.

Connect the Controller Ethernet port (C6) to the 10G network switch using a CAT6 Ethernet cable; and use compatible SFP transceiver if the switch only has SFP+ adapters. Optionally, if the switch has RJ45 ports, connect the Controller Ethernet port (C6) to the 10G network switch using a CAT6 Ethernet cable.

1. Power on the Controller by connecting the power cable and pressing the Power button (C2).
 - i** If the controller hasn't been configured, the MAC Address of the Controller is displayed on the front panel. After the Controller is configured, the IP address of the Controller is displayed.
2. Connect all TXs using Twinax cable; or use SFP+ transceivers and OM3 multimode 850nm fiber cable with duplex LC-LC connectors on each end inserted into TXO (K) and a SFP+ transceiver into a port on the 10G network switch.
3. Repeat step 8 for the RXs using RXO (10).
4. Connect an AV source to the DP IN (I) or HDMI IN (J) port on the TXO units using a DisplayPort cable or HDMI cable.
5. Optionally, connect a stereo analog audio source to the TXO (O) units using an audio cable.
6. Connect an AV display to the HDMI OUT (9) port on the RXO units using an HDMI cable.
 - i** Use the supplied HDMI Cable Lock to secure the HDMI cables to the TXO and RXO units.
7. Optionally, to transport IR control commands between units, connect an IR receiver to the IR IN (Q or 16) port on the TXO or RXO unit near the remote control source; and connect an IR emitter to the IR OUT (P or 15) port on the opposite (far) TXO or RXO unit that is near the device you want to control.
8. Optionally, make connections from the source USB connection to the USB (M) on the TXO units and connect a mouse and/or keyboard (or other USB devices) to the USB (12) on the RXO units.
9. Power on the TXs by connecting the external power supply to the units (N) and to a power source. The blue power indicator on the TXO (A) should light. Green signal indicators (C-E and optionally F for USB) light or flash when signals are present and transported between the TXO and RXO.

GbE	Solid when the LAN connector is plugged in	RX	Flashing when receiving audiovisual signals or other system data.
Video	Solid when video signal is detected by a TX or supplied to a RX.	USB	Flashing when powered on. Solid when USB connections are in place from a TX or to a RX.
	i This indicator on a RX flashes blue if it is supplying video on its HDMI output. The signal may be black video.		
TX	Flashing when transmitting audiovisual signals or other system data.		

10. Power on the RXs by connecting the external power supply to the units (13) and to a power source. The blue power indicator on the RXO (1) should light. Green signal indicators (5 and optionally 6 for USB) light or flash when a signal is detected between the Controller and RXO unit. See description above.
11. Connect a PC or other Windows-based device to the network switch and configure an IP address/subnet for it that matches the network for the Terra Controller and other Terra devices.
12. Obtain the Terra Manager (TerraManager.exe) from the Christie website (<http://bit.ly/TerraDownloads>).
13. Install Terra Manager.
14. Click **Launch Terra Startup Assistant** on the login page.

CHRISTIE®
terra

Please login below.

Online Offline

IP

Username

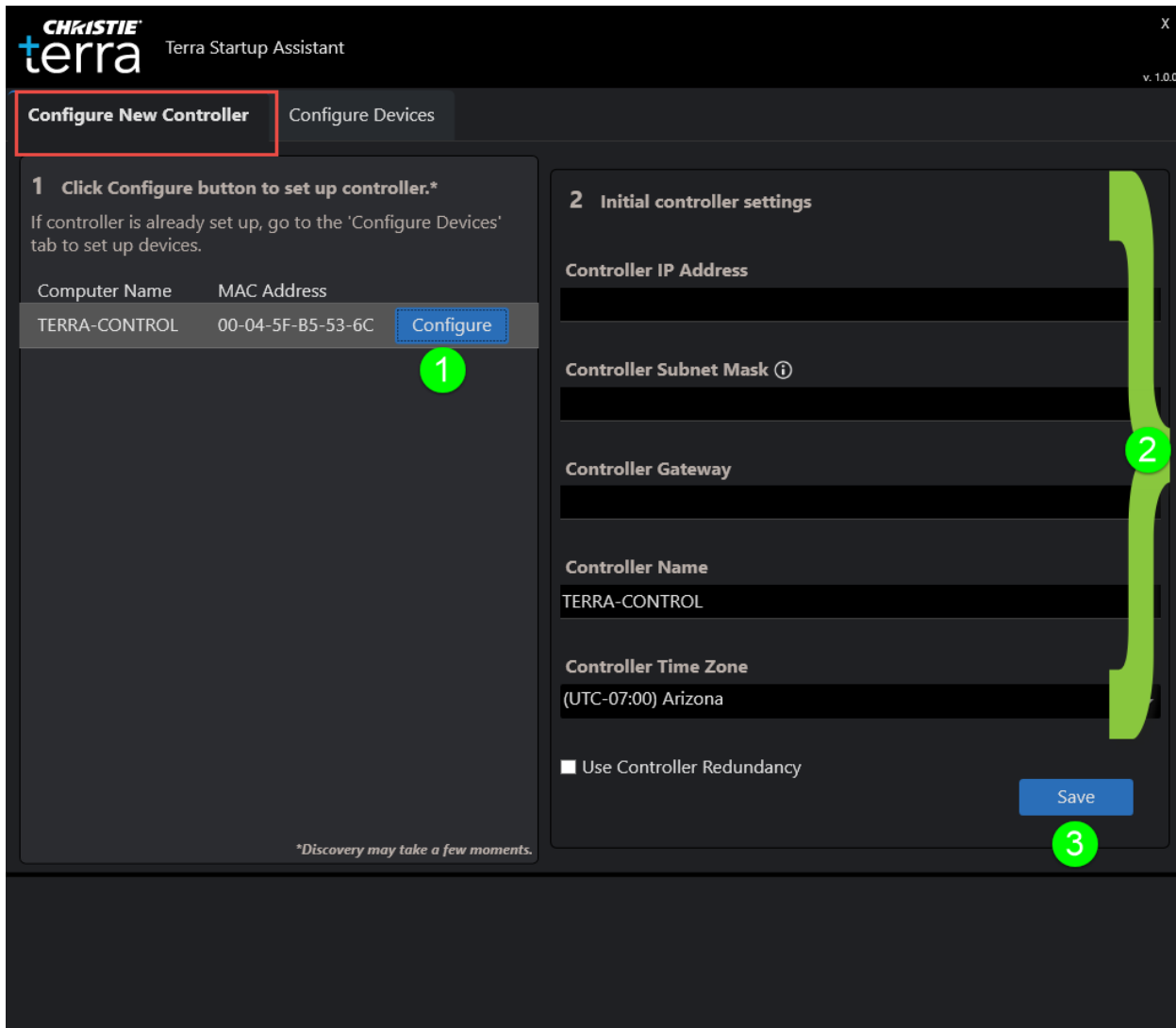
Password

Sign In

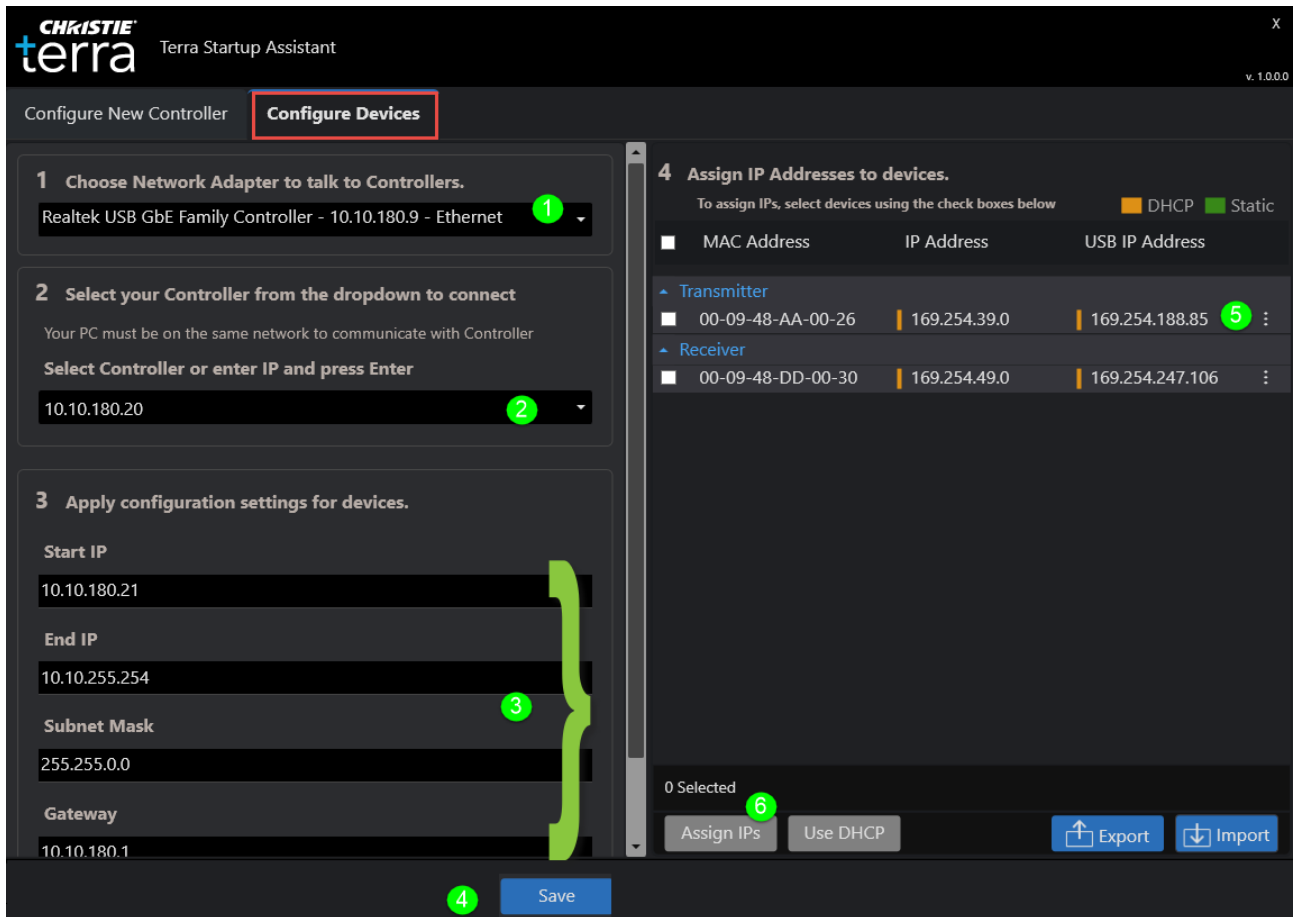
Forgot Password

Launch Terra Startup Assistant

15. Use the Terra Startup Assistant, to Configure a New Controller. Configuration includes assigning the network settings for the Controller (including a network range, name, and time zone) and assigning IP information to discovered TXOs and RXOs units.



16. On the Configure New Controller tab, click **Configure** next to the Controller you want to configure.
17. Enter the IP information for the Controller.
18. Click **Save**. The Controller will be restarted. It takes approximately one-four minutes to restart the Controller. When the Controller is ready (displaying the IP address on the front of the Controller), Terra Startup Assistant will attempt to connect to it. If you want to connect to a different Controller, type the IP address in the **Select Controller or Enter IP and Press Enter** field.
19. Use the Terra Startup Assistant, to assign IP addresses to the discovered devices.
 - i** To configure a redundant Controller, refer to the Terra User Guide.



20. From the Configure Devices tab, select the Network Adapter you want to use to connect to the Controller.



If your device has multiple network adapters, select the one that is on the same network as the Terra Controller.
 For example: if the Terra controller has an IP Address of 10.10.160.10 and your device has two network adapters, one that is wired with an IP address of 10.10.160.50 and one that is wireless with an IP of 192.168.0.50; the wired network adapter (10.10.160.50) would be the one that can communicate with the Controller.
 If you select an adapter and it doesn't connect, select another adapter from the list until one connects.

- 21. Select the Controller; or type the IP address of the Controller and press the Enter key.
- 22. Review the calculated IP range, subnet, and gateway information to be assigned to TX/RX devices and optionally make any changes.
- 23. Click **Save**.
- 24. Select the checkbox for the devices you want to assign IPs (this can be done individually or through the check all checkbox (MAC Address)) and click **Assign IPs**.



Each TX and RX uses two IP addresses; one for video and one for USB reach back. You will need twice the number of Terra TXs and RXs.
 If you add additional devices in the future, use the Configure Devices tab to configure the IP addresses.

- 25. Exit Terra Startup Assistant.
- 26. To complete additional setup, login to Terra Manager using the default credentials:
 user name: service
 password: service

Connecting a computer

To interact with the Terra system, you must connect a computer to the same LAN and the same subnet address as the controller.

Computer Requirements

A computer used to access the Terra system requires the following:

- One Ethernet port
- 64-bit Windows operating system
- .Net Framework 4.5.1 or higher
- 1GB free storage space
- 2GB RAM

Connecting the Controller to the Network

When connecting a Controller, best practices include:

- Selecting the Controller using the Terra Startup Assistant software to configure IP information for Terra devices.
- Include the Gateway address for the Controller.
- Apply static IP addresses.



Best practice is to apply static IP addresses to Terra devices. Static addresses are superior for managing permanently installed AV devices and for verifying system configuration, device status, and troubleshooting. DHCP address management is popular for desktop PCs because they frequently migrate and this eliminates configuration time for IT staff. Terra Controllers, TXs, and RXs are network appliances that are similar to printers and servers that do not migrate and are better managed using static IP addresses.

Use of static IP addresses also reduces the amount of DHCP/DNS network traffic resulting in greater efficiency. A compromise that can be used when network policies dictate use of DHCP addressing is to reserve a block of static IP addresses for use with Terra TXs and RXs and other AV devices.

1. Connect a standard CAT6 Ethernet cable to the Ethernet CONTROL port (C6) on the Controller and other end to the switch.
2. Power on the Controller.
3. Review the front panel display, and verify an IP address is displayed.
4. Refer to the Terra User Guide (020-001355-*nn*) to configure display and source configuration and programming.

Specifications

Due to continuing research, specifications are subject to change without notice. The latest specifications are available on the Christie website at <http://bit.ly/TerraDownloads>.

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