Extron

HC 402 EU/MK • Setup Guide

HC 402 System

The Extron HC 402 EU and HC 402 MK systems are AV presentation solutions that incorporate a built-in control processor for display control via HDMI Consumer Electronics Control (CEC), RS-232, IR, or Ethernet. Each system also includes digital I/O ports.

Each system is a transmitter-receiver pair that is factory-optimized to work together as if it were a single unit. Together each transmitter-receiver system extends video, audio, and control signals up to 230 feet (70 m) over a single CAT *x* cable.

Each system offers two auto-input switching modes, one of which automatically selects sources based on input signals and also allows manual source selection via buttons. Auto-switching modes can be enabled or disabled via Extron Product Configuration Software (PCS). The "last connected" auto-switching mode is enabled by default.

The HC 402 EU and HC 402 MK each feature two AV inputs and one output. Each consists of a one-input transmitter (HCT 101 EU or HCT 101 MK) and a scaling receiver (HCR 102) that has one HDMI input and one connection from the transmitter. The transmitter can be mounted into a standard EU or MK 1-gang junction box. The receiver is wall, furniture, or rack mountable.

Transmitter

The HCT 101 EU or HCT 101 MK transmitter includes one digital (HDMI) video input and one analog audio input. The extended HDMI video signal can be HDCP-compliant.

HCT 101 EU   **HCT 101 MK**

Receiver

The HCR 102 receiver incorporates a high performance, HDCP compliant scaler that scales video to provide a consistent output resolution to a display. It accepts video with resolutions from 480i up to 1920x1200, 1080p, and 2K, and performs upscaling and downscaling with multiple output rates up to 1920x1200, including HDTV 1080p/60 and 2K. The receiver includes an on-screen display, test patterns, and EDID Minder.

HCR 102

This guide provides instructions for an experienced installer to install the HCT 101 EU or HCT 101 MK and the HCR 102. The guide provides information needed to configure the most essential settings for the system and the receiver. It also describes basic operations using front panel controls and the on-screen display (OSD) menu system. Full details are available in the *HC 400 Series User Guide*.
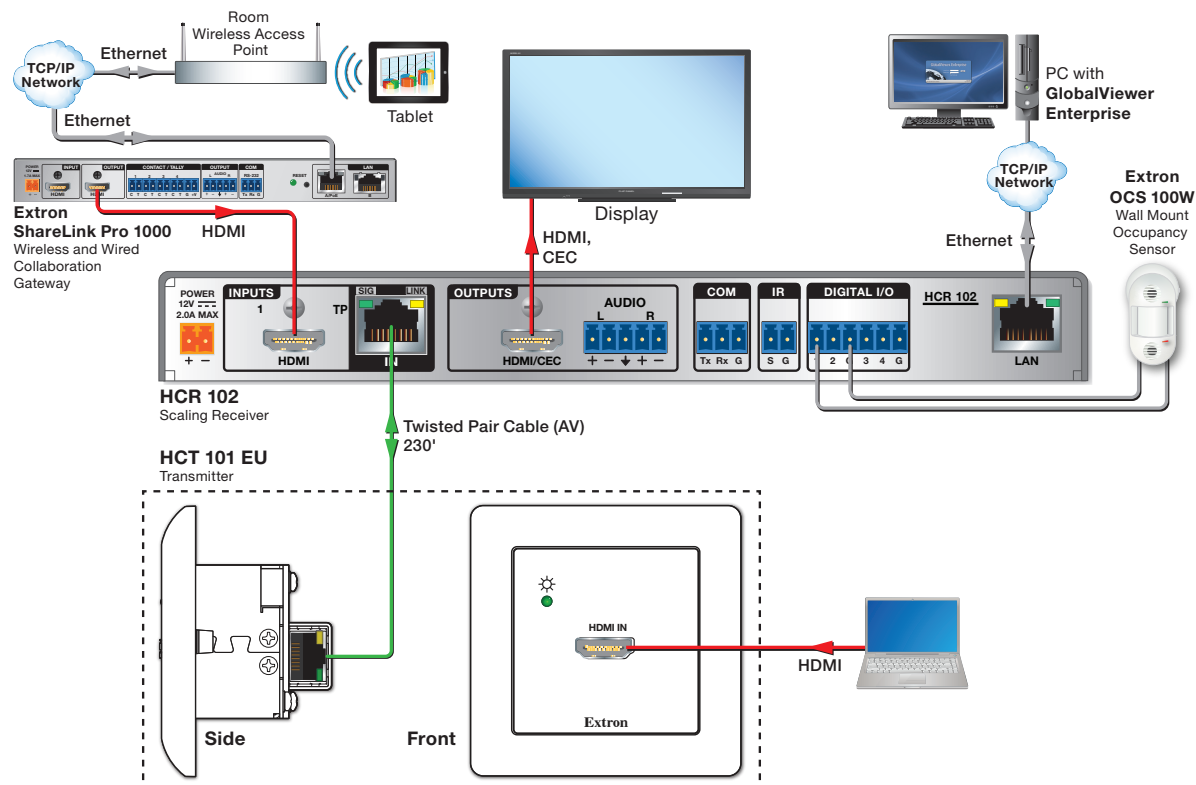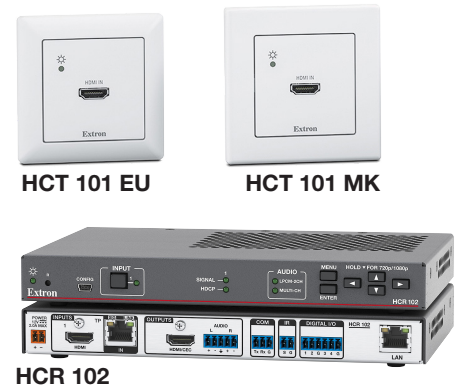
Figure 1. An HC 402 System Application

HC 402 EU/MK • Setup Guide (Continued)

Panels and Features

Front Panel Features
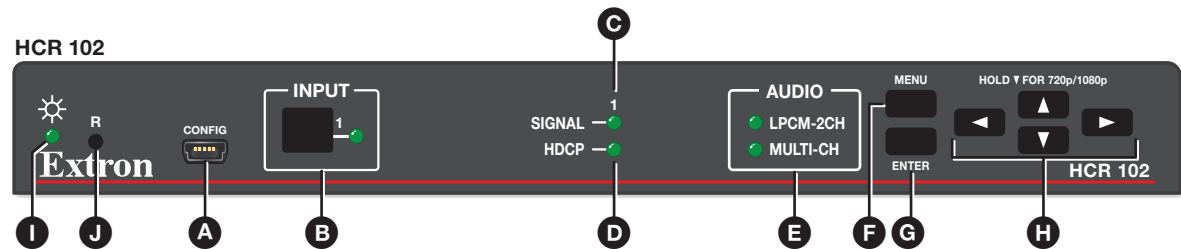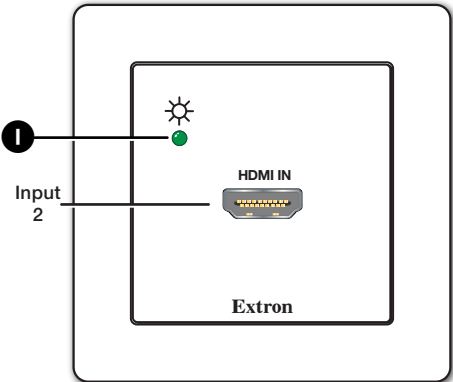
HCR 102

Figure 2. HCR 102 Front Panel (Above),
HCT 101 EU and HCT 101 MK Front Panels (Right)

Ⓐ **Configuration** (Config) connector (USB mini-B), page 11

Ⓑ **Input selection button and LED**, page 14

Ⓒ **Input signal presence (Signal) LED**, page 14

Ⓓ **HDCP status LED**, page 14

Ⓔ **Audio input type LEDs** (LPCM-2Ch and Multi-Ch, page 14

Ⓕ Menu button,

Ⓖ Enter button, and

Ⓗ Navigation (right ▶, left ◀, up ▲, and down ▼ arrow) buttons (see **To configure the AV settings using the OSD and front panel buttons:** on page 7)

Ⓘ Power LED (HCT 101 EU or HCT 101 MK), power and reset indicator LED (HCR 102) — This green LED indicates either the power status of the HCT transmitter or the HCR 102 receiver, or the reset mode of the receiver. For LED indications, see the table below.

Ⓙ **Reset button** (HCR 102) — Pressing this recessed button causes various product settings to be reset to the factory defaults (see **Reset Modes: a Brief Summary** on page 15).

Reset and power LED (**Ⓘ**) indications are as follows:

HCT 101 EU or MK Transmitter	HCR 102 Receiver
• **Off** — The unit is not powered on. • **On, lit amber** — The unit is powered on but there is no active signal at that input. • **On, lit green** — The unit is powered on and there is an active signal at that input.	• **Off** — The unit is not powered on. • **On, lit steadily** — The unit is powered on. • **Blinking** — The unit is powering up or the HCR 102 is performing a reset. The blink pattern depends on the selected reset mode. For full descriptions of reset modes, how to use the reset button to activate them, and details of LED indications of each mode, see the *HC 400 Series User Guide*.

HCT 101 EU Front (With Frame)
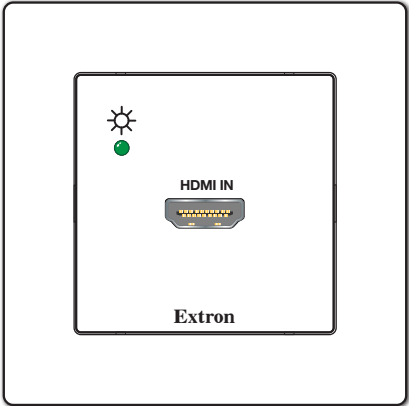
HCT 101 MK Front (With Frame)

NOTE: For other connectors on the HCT, see **Rear and Side Panel Features** on page 3.
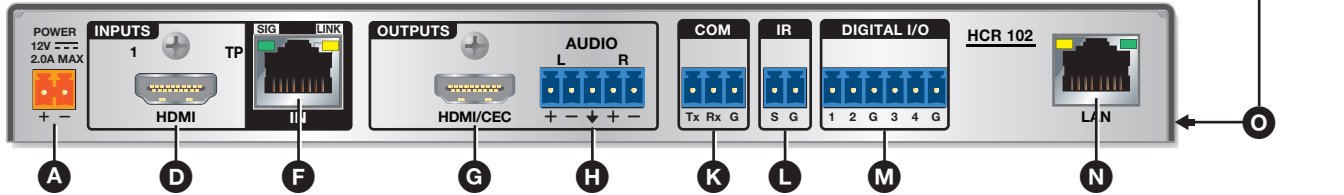
Rear and Side Panel Features

HCR 102 Rear

Figure 3. HCR 102 Rear Panel

Ⓐ **Power input** connectors, page 13

Ⓓ **HDMI input** connectors, page 10

Ⓔ **Transmitter output** RJ-45 connector (twisted pair interconnection), page 10

Ⓕ **Receiver input** RJ-45 connector (twisted pair interconnection), page 10

Ⓖ **HDMI/CEC output** connector, page 11

Ⓗ **Analog audio output** connector, page 11

Ⓚ **COM RS-232** control port, page 11

Ⓛ **IR output** control port, page 11

Ⓜ **Digital I/O** (digital input/output) control ports, page 12

Ⓝ **LAN (Ethernet)** connector and LEDs, page 12

Ⓞ **MAC address** (on side of receiver), page 12

Ⓠ **Grounding screw**, page 12

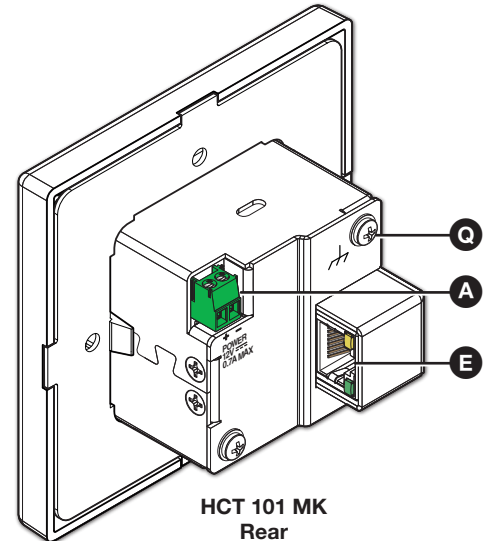> **NOTE:** Features Ⓑ, Ⓒ, Ⓘ, Ⓙ, and Ⓟ are available on other HC 400 Series transmitter models.
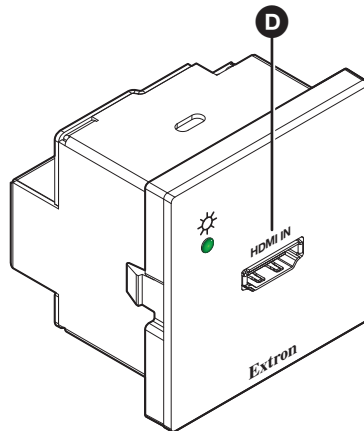
HCT 101 EU/MK Device Module Front
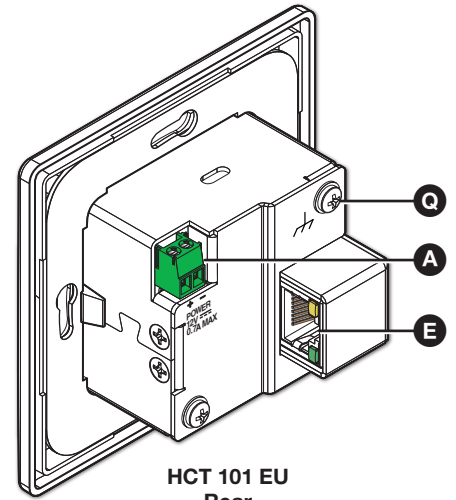
HCT 101 EU Rear

HCT 101 MK Rear

Figure 4. HCT 101 EU and MK Front Panel (Top Left), Rear Panels (Right)

Installation and Configuration

ATTENTION:
- Installation and service must be performed by experienced personnel.
- L'installation et l'entretien doivent être effectués par du personnel expérimenté.

Step 1 — Get Ready

1. Familiarize yourself with the features of the transmitter and receiver (see **Front Panel Features** and **Rear and Side Panel Features** on page 3).

2. Download and install the latest version of the following:

   - **PCS Product Configuration Software** — for detecting and configuring the AV settings for the transmitter-receiver pair

   - **Toolbelt software** — for discovering the HCR 102 receiver and other control products on the network, for managing core settings, and for upgrading firmware if the need arises

   - **Global Configurator® (GC) software** — for setting up and configuring the control system. GC Professional and GC Plus modes include a link to the **Toolbelt** software.

   - **IP Link® Pro device drivers** — for use with GC, to make control of other AV devices possible

   All are available from **www.extron.com** (see **Locating Software, Firmware, and Driver Files on the Extron Website** on page 16).

3. Obtain network information for the unit from the network administrator. You will need the following details for each HCR 102 receiver and for any other Extron Pro control product that is part of the system:

   - ☐ DHCP setting (on or off)   ☐ Subnet mask   ☐ Username
   - ☐ Device (HCR 102) LAN IP address   ☐ Gateway IP address   ☐ Passwords

4. Write down the MAC address of each HCR 102 (see figure 3, **O** on the previous page) or other IP Link Pro device to be used.

5. Obtain model names and setup information for devices the HCR 102 will control.

Step 2 — Mount the Receiver, Prepare the Installation Site for the HCT 101 EU or HCT 101 MK

Turn off or disconnect all equipment power sources and mount the transmitter and receiver as required.

Mounting the HCR 102

The HCR 102 receiver ships with furniture mounting brackets attached for mounting to furniture or a wall.

NOTE: The receiver is designed so that its vents face away from the wall or furniture when mounted in order to achieve optimal air circulation and cooling.

Each receiver is one inch high, one half rack wide, and can be rack mounted. The product page on **www.extron.com** includes links to recommended optional rack shelves or rack mounting kits. Alternatively, you can remove the pre-installed furniture mounting brackets and attach four rubber feet at the corners of each unit and place it on a table or desk.

Observe local and UL safety guidelines for mounting devices to equipment racks. See the *HC 400 Series User Guide* for UL rack mounting guidelines.
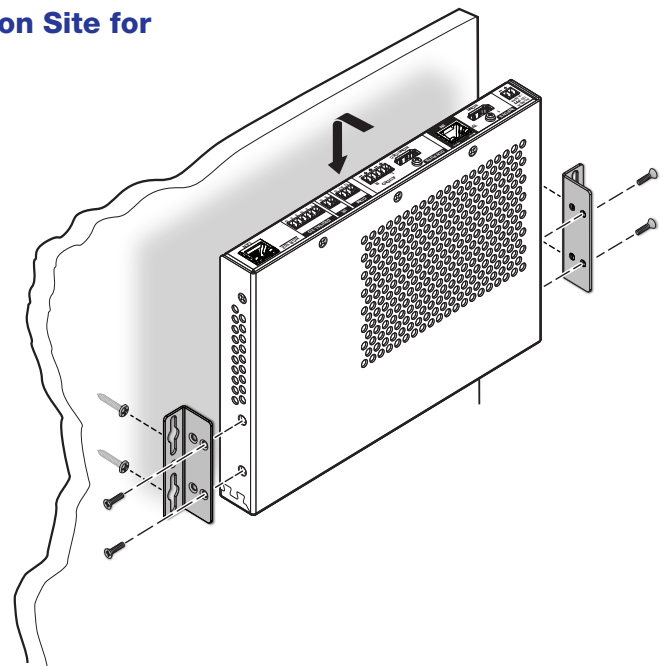
Figure 5. Mounting the Receiver

Prepare the Installation Site for the HCT 101 EU or HCT 101 MK

ATTENTION:
- Installation and service must be performed by authorized personnel only.
- L'installation et l'entretien doivent être effectués uniquement par un technicien qualifié.

- Extron recommends installing the HCT 101 EU or HCT 101 MK into a grounded electrical junction box.
- Extron recommande d'installer le HCT 101 EU ou HCT 101 MK dans une boîte de dérivation électrique mise à la terre, certifiée UL.

ATTENTION:

- If the HCT will be installed into fine furniture, it is best to hire a licenced, bonded craftsperson to cut the access hole and perform the physical installation so the surface will not be damaged.
- S'il est prévu d'installer le HCT dans du beau mobilier, il est préférable de faire appel à un artisan autorisé et qualifié pour couper le trou d'accès et réaliser l'installation de telle façon que la surface ne soit pas endommagée.
- Follow all national and local building and electrical codes that apply to the installation site.
- Respectez tous les codes électriques et du bâtiment, nationaux et locaux, qui s'appliquent au site de l'installation.

Americans with Disabilities Act (ADA) compliance

When planning where to install the HC system, you may need to consider factors affecting accessibility of the units such as height from the floor, distance from obstructions, and how far a user must reach to press the buttons or insert a cable. For guidelines, see sections 307 ("Protruding Objects") and 308 ("Reach Ranges") of the *2010 ADA Standards for Accessible Design* available at **http://www.ada.gov/regs2010/2010ADAStandards/2010ADAStandards.pdf**.

Site preparation

The HCT 101 EU fits a standard one-gang European (EU) wall (junction) box or external wall box with mounting holes that are 60 mm on center, or Extron Flex55 enclosures.
The HCT 101 MK fits a standard one-gang MK-type junction box or external wall box.

- The end user or installer must furnish the wall (junction) box. It is not included with the unit.
- Read any installation instructions and safety and regulatory guidelines that come with the wall box before installation.
- Protect the mounting surface to prevent damage.

To prepare the site:

1. **For installation into a wall or furniture:** Measure, mark, and carefully cut a hole in the mounting surface.
   For all types of installations: Run cables to the junction box.
2. Secure the cables with a clamp for strain relief and so they do not slip back down into the wall or furniture.
3. Secure the box to the raceway, stud, wall, or furniture.
4. **For wall mount installations,** attach the metal mounting bracket to the junction box or external wall box.
   For raceway installations, attach the metal mounting bracket to the junction box or external wall box and raceway.
   a. Hold the mounting plate and feed the cables through the mounting plate.
   e. Place the mounting bracket against the box, aligning the holes in the plate with the corresponding threaded holes on the edges of the box.
   f. Insert the provided screws into those holes, hold the metal mounting bracket to ensure it is aligned straight (visually level), and tighten the screws to secure the plate to the mounting surface.

Step 3 — Connect AV, Interconnection, and Control Cables

1. Ground the HCT 101 EU or HCT 101 MK transmitter (see **Grounding** on page 12).
2. Connect AV sources to the input connectors (see **AV Inputs** on page 10).
3. Use a shielded twisted pair cable to connect the transmitter to the receiver via the Output and Input RJ-45 connectors (see **Transmitter-Receiver Interconnection** on page 10).
4. Connect AV output devices (display, projector, or other device, and an amplifier or powered speakers) to the output connectors (see **AV Outputs** on page 11).
5. Cable the control ports on the receiver as desired for controlling AV devices and for communicating with the system via LAN (see **Control** on page 11).

Step 4 — Connect Power

Connect the power supply or power supplies to the HC 400 Series system (see **Power** on page 13), connect power cords, and power on all the devices.

NOTE: The power supplies can be set on a tabletop, or mounted to a rack or furniture. Follow the mounting directions included with each power supply or see the power supply installation guides available on the **PS Series Power Supplies page** on the Extron website.

HC 402 EU/MK • Setup Guide (Continued)

Step 5 — Configure Network Settings

You can configure the basic network settings in one of the following ways:

- Via **front panel controls and the OSD menu** — a quick method you can use whether or not you need to configure other control settings (see **Using the OSD menu to configure the AV settings** on page 8). This requires connection to a display device.

- Via **PCS software** — a method that provides basic network configuration and is convenient when you are ready to use PCS to configure AV settings. This requires a PC, software, and a LAN or USB connection.

- Via **Toolbelt software** — a method that allows you to configure additional connection settings and is convenient when you want to configure additional device, password, system, and control port settings. This requires a PC, software, and a LAN connection.

To configure network settings from the OSD menu:

From the `Quick Setup` menu:

- DHCP — Select and enter the `DHCP Mode` submenu and press the arrow buttons to turn DHCP on or off (default: off).

- IP address — Select and enter the `IP Address` submenu. Press the **left ◄** or **right ►** arrow button to move between octets. Press the **up ▲** and **down ▼** arrow buttons to change the value in the selected octet.
Default: 192.168.254.250.

From the `Communication` menu:

> **NOTE:** Press and hold the `Enter` button for 10 seconds to edit settings in the `Communication` submenu.

- DHCP — Select and enter the `DHCP Mode` submenu and press the arrow buttons to turn DHCP on or off (default: off).

- IP address — Select and enter the `IP Address` submenu. Press the **left ◄** or **right ►** arrow button to move between and select octets. Press the **up ▲** and **down ▼** arrow buttons to change the value in the selected octet.

- Subnet mask — Select and enter the `Subnet Mask` submenu. Press the **left ◄** or **right ►** arrow buttons to select an octet of the subnet mask address. Press the **up ▲** and **down ▼** arrow buttons to adjust the value of the selected octet.
Default: 255.255.255.0.

- Gateway — Select and enter the `Gateway` submenu. Press the **left ◄** or **right ►** arrow buttons to select an octet of the gateway address. Press the **up ▲** and **down ▼** arrow buttons to adjust the value of the selected octet.
Default: 0.0.0.0.

To configure network settings using PCS:

1. Connect the PC and the LAN port of the HCR 102 receiver (see **LAN port** on page 12) to the same network.
Or
Connect the PC to the front panel Config port of the HCR 102 receiver using a USB type A male to USB mini-B male cable (such as the Extron USB CFG cable).

2. Apply power to the PC and the HCR 102.

3. Open PCS. You might need to open the application as an administrator by right-clicking the PCS icon and selecting `Run as administrator`. PCS opens to the `Device Discovery` page. The Device Discovery process begins automatically. The page displays a list of all Extron devices connected to the network as PCS detects them.

4. Using the MAC address, locate the desired device (HCR 102) in the list.

5. In the row for the HCR 102, click the `Edit` button in the `IP Address` column. The `Communication Settings` dialog box opens, displaying controls for network configuration.

6. Either select (enable) the `Use DHCP` checkbox to have the receiver obtain an IP address automatically from a DHCP server, or enter the static IP address for the unit in the `IP Address` field.

> **NOTE:** When setting up DHCP during network configuration or if using a host name instead of an IP address, the user must enter a qualified host name (*Username.HostName.Domain*). For example: `somename.extron.com`.

7. Configure the other items (device name, subnet mask, gateway address, DNS server address) as needed.

8. Click `Apply` to save the configuration changes. Alternatively, you can click `Apply and Connect` to save the configuration changes and then establish a connection from the PCS software to the receiver to configure AV settings or front panel lockout.
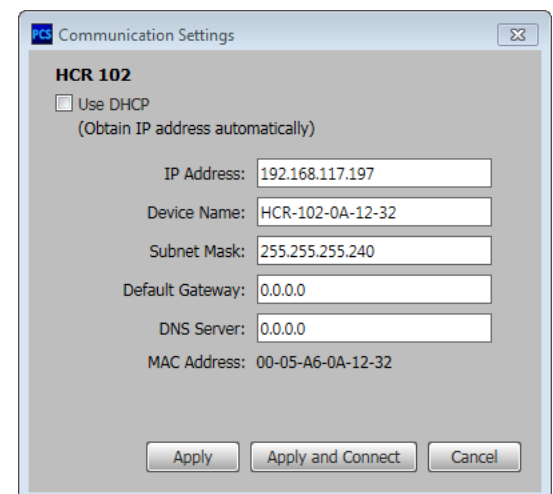
Figure 6. The PCS Communication Settings Dialog Box

To configure network settings using Toolbelt:

1. Connect the PC that you will use for setup and the HCR 102 receiver to the same network, and apply power to all devices. For details on the LAN connection, see **LAN** on page 12.

2. Start Toolbelt.

3. Start device discovery from within Toolbelt. Toolbelt displays a list of all Extron control devices connected to the network.

4. In Toolbelt, use the MAC address to locate the desired device (the HCR 102) in the list and select it.

5. Use the Set IP feature in Toolbelt or use the Toolbelt `Manage` > `Network Settings` tab feature to enter the IP address and subnet address, then configure other network settings as needed.

   NOTE: When setting up DHCP during network configuration or if using a host name instead of an IP address, the user must enter a qualified host name (*Username.HostName.Domain*). For example: `somename.extron.com`.

Step 6 — Configure AV Settings

The AV and scaling settings for the system can be configured via a host connection through the LAN port or the USB port using PCS software or the on-screen display. Many settings can be configured using either method (OSD or PCS). Some settings are available only in the PCS software.

To configure the AV settings using PCS software:

1. Install Extron PCS on a PC and start the program.

2. Connect the PC to the receiver via the rear panel LAN port (see **figure 4**, **N** on page 3) or the front panel Config USB connector (see **figure 2**, **A** on page 2). USB connection requires a user-provided USB A to USB mini-B cable.

3. Use the PCS program to set the output resolution and rate, configure EDID Minder, adjust the video color bit depth, or monitor the signal and HDCP status, or other AV settings, as required. For details, see the *HC 400 Series User Guide*, or access the *PCS Help File* (press <**F1**> on the keyboard or click the **?** button in the software and select `Help File`.

To configure the AV settings using the OSD and front panel buttons:

1. Connect an HDMI display device to the HDMI/CEC output connector on the HCR 102.

2. Power on the receiver and the display device, if they are not already powered on.

3. Press the front panel **Menu** button on the HCR 102 (see **figure 2**, **F**, or the image at right). The OSD main menu appears on the display (see the example below, at right).
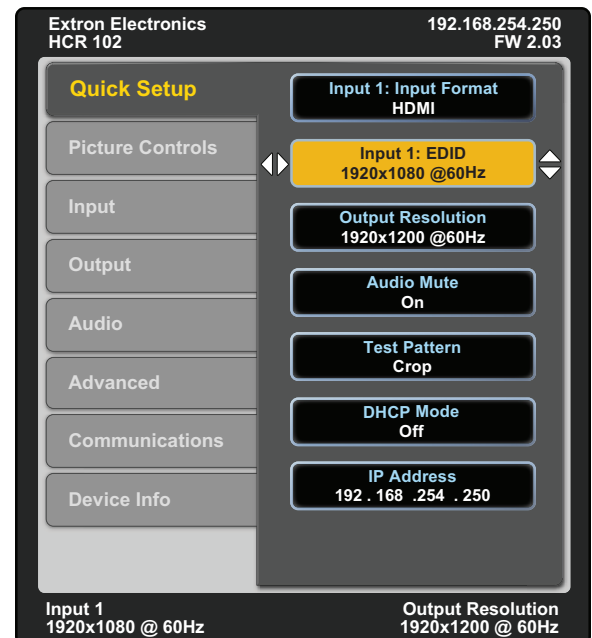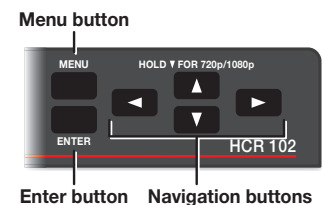
   The OSD menu system consists of the following menus:
   - `Quick Setup`
   - `Picture Controls`
   - `Input`
   - `Output`
   - `Audio`
   - `Advanced`
   - `Communications`

   and one read-only information screen (`Device Info`).

4. Navigate through the menus and make adjustments.

   a. Press the **up** ▲ and **down** ▼ arrow navigation buttons (see **H**) to navigate to and highlight the desired menu or submenu.

   e. Press the **Enter** button (**G**) or **right** ▶ arrow button to access submenu items for the selected submenu (see **Using the OSD menu to configure the AV settings** for information about the contents of each submenu).

   f. Press the **up** ▲ and **down** ▼ arrow buttons to navigate to and highlight submenu items.

   g. Press the **Enter** or **right** ▶ arrow button to adjust a submenu item.

   NOTE: The OSD times out and closes after one minute if no buttons are pressed.

Menu button

MENU   HOLD ▼ FOR 720p/1080p

ENTER   HCR 102

Enter button   Navigation buttons

Extron Electronics   192.168.254.250
HCR 102   FW 2.03

Quick Setup

Picture Controls

Input

Output

Audio

Advanced

Communications

Device Info

Input 1: Input Format
HDMI

Input 1: EDID
1920x1080 @60Hz

Output Resolution
1920x1200 @60Hz

Audio Mute
On

Test Pattern
Crop

DHCP Mode
Off

IP Address
192 . 168 .254 . 250

Input 1   Output Resolution
1920x1080 @ 60Hz   1920x1200 @ 60Hz

Using the OSD menu to configure the AV settings

- Use the `Quick Setup` submenu to set input EDID settings, set output resolution, mute audio, activate video test patterns, enable or disable DHCP, and set the IP address.

- Use the `Picture Controls` submenu to view the image position and size.

- Use the `Input` submenu to set the input format for digital inputs, set horizontal and vertical start values, set the total pixels and phase, set HDCP authorization, and set the EDID for the current input.

- Use the `Output` submenu to set output resolution, HDMI output format, and HDCP notification.

- Use the `Audio` submenu to mute audio, set the audio input format (see table below) for the selected input, set program audio volume, and set audio output format (stereo, mono).

Audio Input Format	Details
None	Mutes all audio for selected input. Sets "No Audio" EDID.
Analog	Sets the selected input to analog (default for input 1). Sets "No Audio" EDID.
LPCM-2Ch	Sets the selected input to LPCM-2Ch digital audio (default for input 2). Sets 2Ch audio EDID.
Multi-Ch	Sets the selected input to Multi-Ch digital audio. Sets Multi-Ch audio EDID.
LPCM-2Ch auto	Sets the selected input to prioritize digital audio (default for inputs 3-4). Analog audio is passed when digital audio is not present. Sets 2Ch audio EDID.
Multi-Ch auto	Sets the selected input to prioritize digital audio. Analog audio is passed when digital audio is not present. Sets Multi-Ch audio EDID.

- Use the `Advanced` submenu to select a test pattern, set the screen saver, set the aspect ratio, configure auto switching, and reset the device to factory defaults.

- Use the `Communication` submenu to view the device MAC address, DHCP status, the current IP address and subnet mask, and gateway.

  > **NOTE:** Press and hold the **Enter** button for 10 seconds to edit settings in the `Communication` submenu.

- Use the `Device Info` screen to view the device name, firmware build, temperature, input and output information, and detected display. This screen is read-only.

See the *HC 400 Series User Guide* for details about the menus and available settings, and for a list of output scaler rates.

Step 7 — Configure the Control Settings

To use the COM, IR, or digital I/O ports on the receiver, you must configure them. Also, CEC control of the output device can be customized during configuration with Global Configurator.

The basic steps are outlined below in the recommended order.

> **NOTE:** See the *Toolbelt Help File* or *Global Configurator Help File*, and *GUI Designer Help File* as needed for step-by-step instructions and detailed information. The help file for GC includes an introduction to the software and how to start a project and configuration.

1. Using GC, **create a new GC Pro or GC Plus project and configure the receiver and other IP Link Pro devices**. The configuration tells the receiver:

   - How its control ports function
   - How to control other products
   - Which touchpanels to interact with
   - What to monitor
   - When to do things
   - Whom to notify, how, and under what circumstances

   a. Configure the control ports on the receiver.
      - Select device drivers and link them to each serial, IR, or Ethernet port.
      - Select settings (serial protocol or digital I/O settings) as needed.
      - Configure CEC controls, if desired

   b. Set up monitors, schedules, macros, timers, and local variables.

   c. Add any optional touchpanels and set them up:
      - Create the GUI configuration for the touchpanels and add it to the project.
      - Program functions, monitors, or schedules to the touchpanels and their buttons.

4. Save and build the project.

5. Upload the system configuration to the HCR 102 receiver.

Step 8 — Test and Troubleshoot the System

1. Test the system. See the *HC 400 Series User Guide* for an outline of the system testing procedure.

2. Make adjustments to wiring or configuration as needed.

Step 9 — Mount the HCT 101 EU or HCT 101 MK

NOTE: Extron recommends taking safety precautions to avoid electrostatic discharge issues during installation.

Before mounting the transmitter, ensure that all device cables have been fed through the wall or furniture and mounting box.

To mount the transmitter (see figures 7 and 8 at right):

1. Disconnect power at the source from all devices in the system.

2. Align the wallplate or frame with the metal mounting bracket. (The mounting bracket was attached to the wall box in **Site preparation** on page 5.)

3. Ensure that the cables and grounding wire are connected to the rear panel (see **Cabling** starting on page 10, especially **Grounding** on page 12).

4. Secure the transmitter to the mounting bracket: Insert the cabled HCT module through the opening in the frame and firmly press it into place so its side tabs snap into the mounting bracket.

5. Reconnect power to all devices.
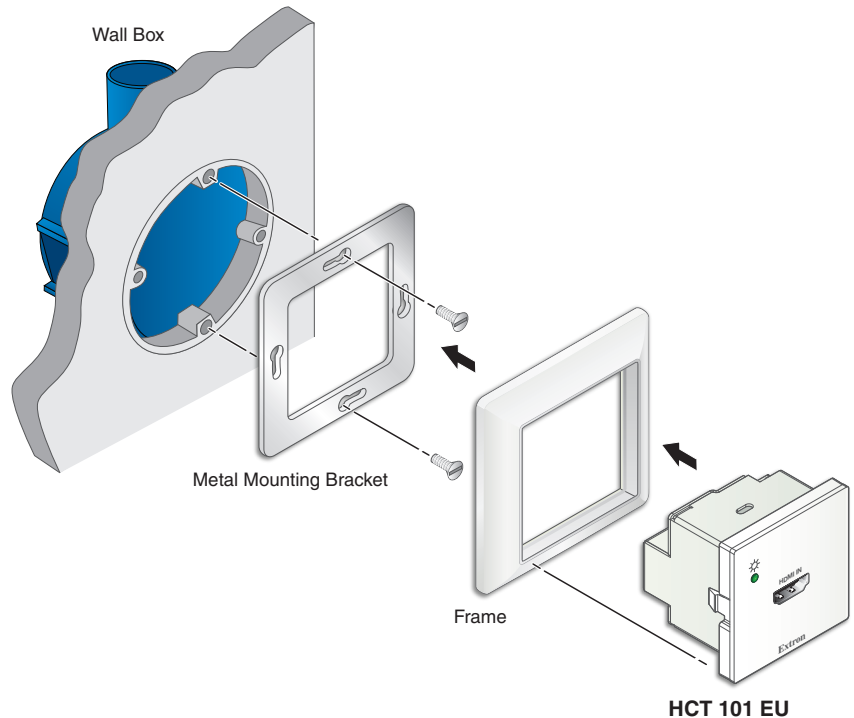
Figure 7. Mounting the HCT 101 EU to an EU Wall Box
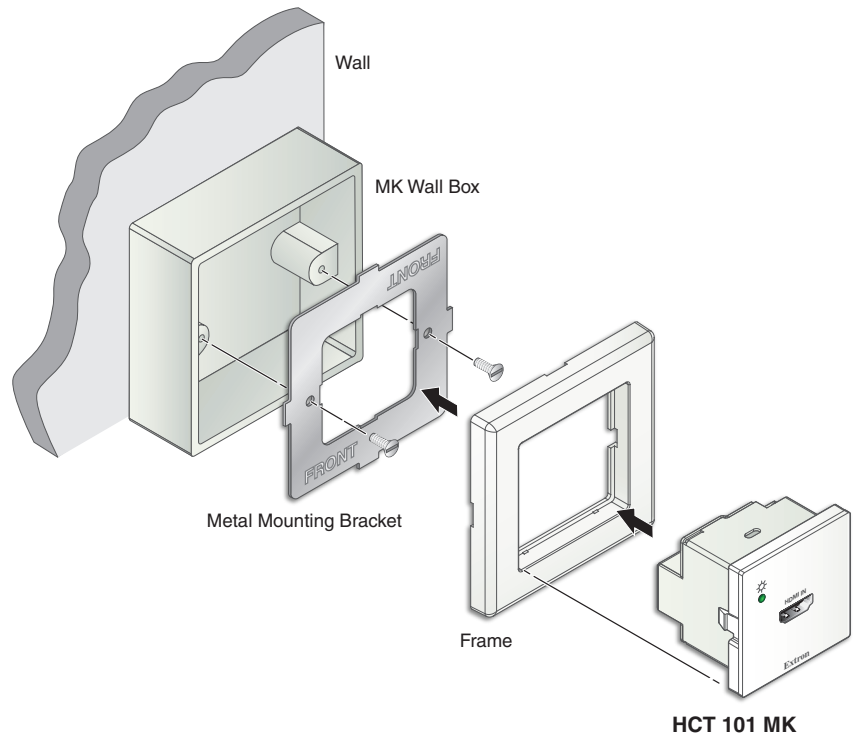
**Figure 8.** Mounting the HCT 101 MK to an MK Wall Box.

Cabling

Attach cables using the wiring diagrams on the following pages as a guide. Full details are available in the *HC 400 Series User Guide*.

AV Inputs

Digital AV input

For HDMI video and for digital audio embedded within HDMI signals:

1. Connect a digital video source device to any HDMI input connector on the transmitter or receiver (see **figure 3** and **figure 4**, **D** in **Rear and Side Panel Features** on page 3).

2. To secure a cable to the unit, attach an Extron LockIt® bracket to the receiver and secure it to the cable with a zip tie.

    a. Plug the HDMI cable into the panel connection (see **a** at right).

    c. Loosen the HDMI connection mounting screw from the panel enough to allow the LockIt lacing bracket to be placed over it (**b**). The screw does not have to be removed.

    d. Place the LockIt lacing bracket on the screw and against the connector (**c**), then tighten the screw (**d**) to secure the bracket.

    e. Loosely place the included tie wrap around the connector and the LockIt lacing bracket as shown (**e**).

    f. While holding the connector securely against the lacing bracket, tighten the tie wrap, then remove any excess length.
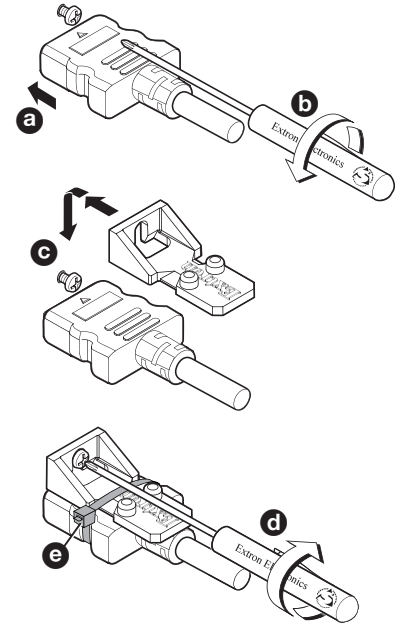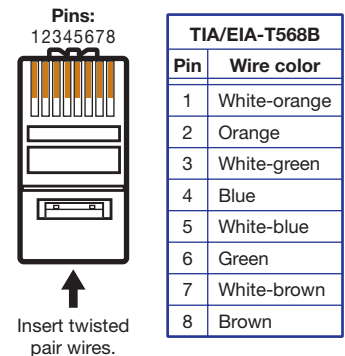
Complete details on LockIt installation are available in the *LockIt HDMI Cable Lacing Bracket Installation Guide*.

Transmitter-Receiver Interconnection

Connect the Out port of the transmitter (**figure 3**, **E**) to the In port of the receiver (**F**) using a shielded twisted pair CAT *x* cable of up to 230 feet (70 m), as shown in **figure 1** on page 1. Terminate the cable with shielded RJ-45 connectors using the TIA/EIA-T568B wiring standard at both ends, as shown at right.

> **ATTENTION:**
> - Do not connect this port to a computer data network or a telecommunications network.
> - Veuillez ne pas connecter ce port à un réseau de données informatiques ou à un réseau de télécommunications.
> - Do not use Extron UTP23SF-4 Enhanced Skew-Free AV UTP cable or STP201 cable.
> - N'utilisez pas le câble AV Skew-Free UTP version améliorée UTP23SF-4 d'Extron ou le câble STP201.

Pins:
12345678

Insert twisted pair wires.

TIA/EIA-T568B	
Pin	Wire color
1	White-orange
2	Orange
3	White-green
4	Blue
5	White-blue
6	Green
7	White-brown
8	Brown

For optimal performance, Extron highly recommends the following:

- Use the TIA/EIA-T568B wiring standard for terminating all STP cables with RJ-45 connectors.
- Use shielded twisted pair cable, 24 AWG solid conductor or better, with a minimum cable bandwidth of 400 MHz.
- Use shielded RJ-45 plugs to terminate the cable.
- Overall transmission distance capabilities vary depending on the number of patches used. If possible, limit the number of patches to 2 total.
- If patches must be used in the system, Extron recommends shielded CAT 6 (or better) patch cables.

AV Outputs

1. Connect a display, projector, or other AV device to the Outputs HDMI/CEC connector (see **figure 3**, **G** on page 3) on the receiver rear panel for HDMI AV output.

2. Connect the cable and install the LockIt bracket (see step 2 within **Digital AV input** on the previous page) in the same method as for the HDMI inputs.

3. For analog audio output, connect an amplifier, powered speaker or other audio device to the 3.5 mm, 5-pole captive screw connector. See the diagrams at right for the appropriate wiring for your application. For unbalanced audio, connect the sleeve(s) to the ground contact; do not connect the sleeve(s) to the negative (-) contacts.

Balanced Audio Output

Unbalanced Audio Output
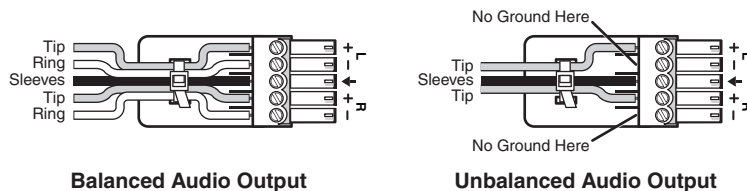
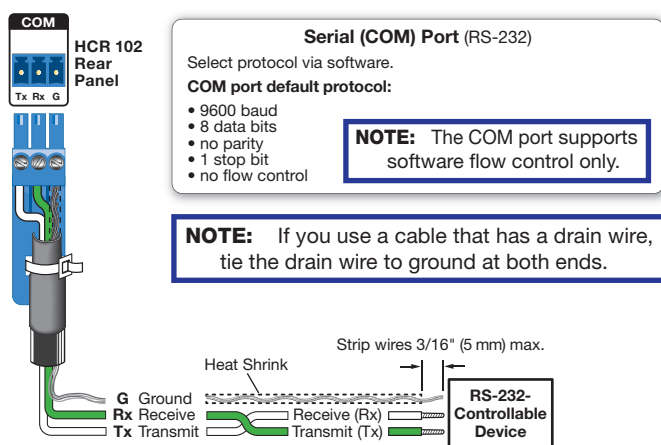## Control

USB connections

Connect a host computer to the USB mini-B port on the receiver (see **figure 2**, **A** on page 2) for AV configuration.

Receiver connections for display or device control

The serial, IR, digital I/O, LAN, and CEC ports can all be used for device control. All of these ports must be configured using Global Configurator
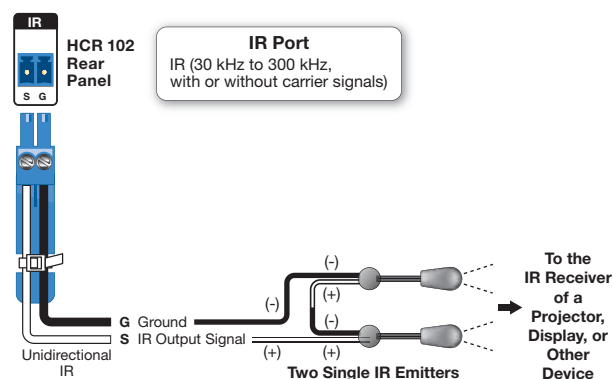
Serial

For serial control using RS-232, connect the serial control port of the AV device to the COM port (see **figure 3**, **K** on page 3) of the HCR 102 receiver as shown below.

HCR 102 Rear Panel

Serial (COM) Port (RS-232)

Select protocol via software.

COM port default protocol:

• 9600 baud
• 8 data bits
• no parity
• 1 stop bit
• no flow control

NOTE: The COM port supports software flow control only.

NOTE: If you use a cable that has a drain wire, tie the drain wire to ground at both ends.

Strip wires 3/16" (5 mm) max.

Heat Shrink

G Ground
Rx Receive
Tx Transmit

Receive (Rx)
Transmit (Tx)

RS-232-Controllable Device

Infrared
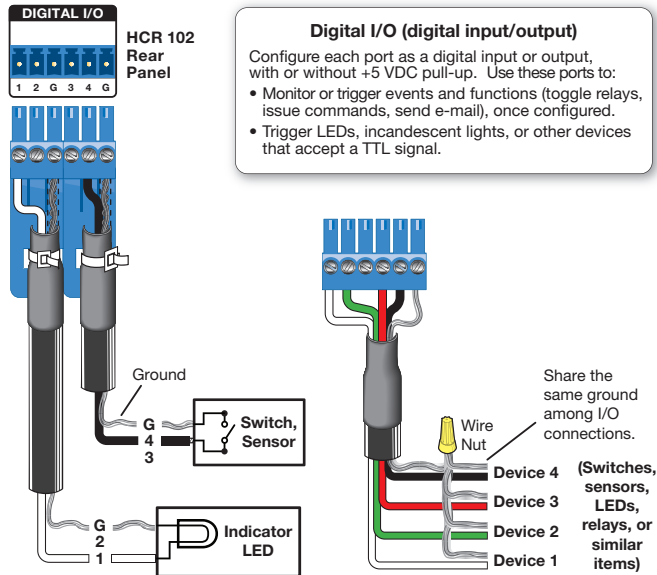
For IR control of AV equipment, connect one or two IR emitters to the IR port (**L**) of the HCR 102 receiver as shown below.

HCR 102 Rear Panel

IR Port

IR (30 kHz to 300 kHz, with or without carrier signals)

(-)
(-) (+)
(-) (-)
G Ground
S IR Output Signal
(+) (+)

Unidirectional IR

Two Single IR Emitters

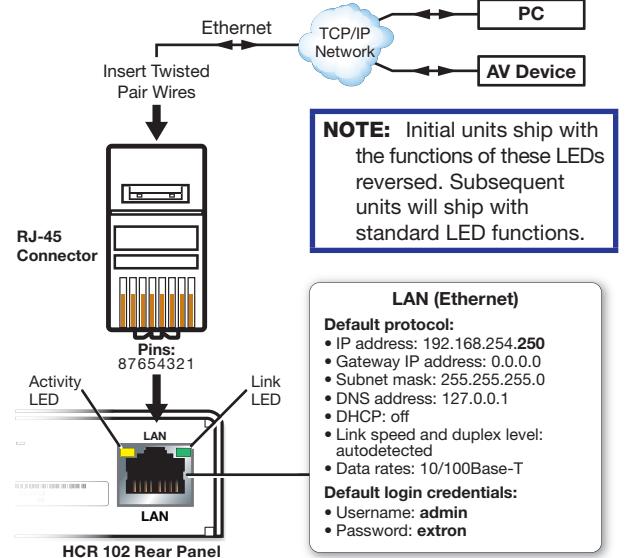**To the IR Receiver of a Projector, Display, or Other Device**

Digital I/O

To use digital input or output to control other devices, provide feedback to the receiver, or trigger actions, connect devices to the digital I/O ports (see **figure 3**, **M** on page 3) as shown in the following diagram.

DIGITAL I/O

HCR 102 Rear Panel

1 2 G 3 4 G

> **Digital I/O (digital input/output)**
> Configure each port as a digital input or output, with or without +5 VDC pull-up. Use these ports to:
> • Monitor or trigger events and functions (toggle relays, issue commands, send e-mail), once configured.
> • Trigger LEDs, incandescent lights, or other devices that accept a TTL signal.

Ground

G 4 3 → Switch, Sensor

G 2 1 → Indicator LED

Wire Nut

Share the same ground among I/O connections.

Device 4
Device 3
Device 2
Device 1

(Switches, sensors, LEDs, relays, or similar items)

LAN

Connect the receiver to a network via the LAN port (**N**) for remote monitoring and configuration of the system, for touchpanel control, or to allow the receiver to control an Ethernet-enabled product. You will need the MAC address (**O**) during device discovery and configuration.

Ethernet

Insert Twisted Pair Wires

TCP/IP Network

PC

AV Device

RJ-45 Connector

Pins: 87654321

Activity LED

Link LED

LAN

LAN

HCR 102 Rear Panel

> **NOTE:** Initial units ship with the functions of these LEDs reversed. Subsequent units will ship with standard LED functions.

> **LAN (Ethernet)**
> **Default protocol:**
> • IP address: 192.168.254.**250**
> • Gateway IP address: 0.0.0.0
> • Subnet mask: 255.255.255.0
> • DNS address: 127.0.0.1
> • DHCP: off
> • Link speed and duplex level: autodetected
> • Data rates: 10/100Base-T
> **Default login credentials:**
> • Username: **admin**
> • Password: **extron**

> **NOTE:** The factory configured password for this device has been set to the device serial number. Passwords are case sensitive. Performing a Reset to Factory Defaults reset (see **Reset Modes: a Brief Summary** on page 17) sets the password to `extron`.

HDMI/CEC

Connect an AV device that supports CEC control to the HDMI/CEC output port on the receiver (**G**) to allow the HCR 102 to automatically turn display power on or off based on whether an active signal is detected at the selected input.

The HCR 102 sends CEC driver commands to the display for basic control functions. CEC control is pre-configured and works "out of the box" but it can be customized further using GC.

HCR 102 Rear Panel

LINK

OUTPUTS

AUDIO L R

HDMI/CEC

HDMI

CEC

CEC-Compliant Display

> **NOTE:** It can take up to 2 minutes after powering up the receiver to initiate CEC display control.
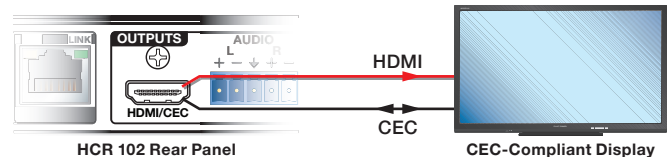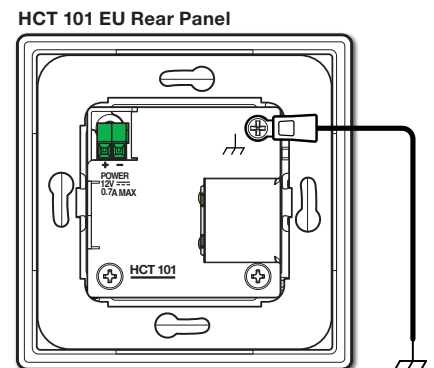
Grounding

If the HCT 101 EU or HCT 101 MK transmitter is not mounted to a grounded metal junction box, Extron recommends connecting the unit to an earth ground to protect the unit from electrostatic discharge.

To ground the unit:

1. Securely terminate a grounding cable with a ring terminal.

2. Remove the grounding screw in the upper right corner of the rear panel, insert the grounding cable, replace and securely fasten the screw (see the figure at right). Do not overtighten the screw. Maximum torque is 2 inch-pounds (0.2 Newton-meter).

3. Connect the other end of the grounding cable to an earth ground.

HCT 101 EU Rear Panel

POWER 12V 0.7A MAX

HCT 101

**Figure 9.** Connecting a Grounding Wire to the HCT 101 EU or HCT 101 MK

Power

For port locations, see **figure 3** and **figure 4**, Ⓐ on page 3. You have two options for powering the system:

- Connect the **included** 12 VDC, 4.2 A power supply (Extron PS 1242) at the receiver to remotely power the transmitter.
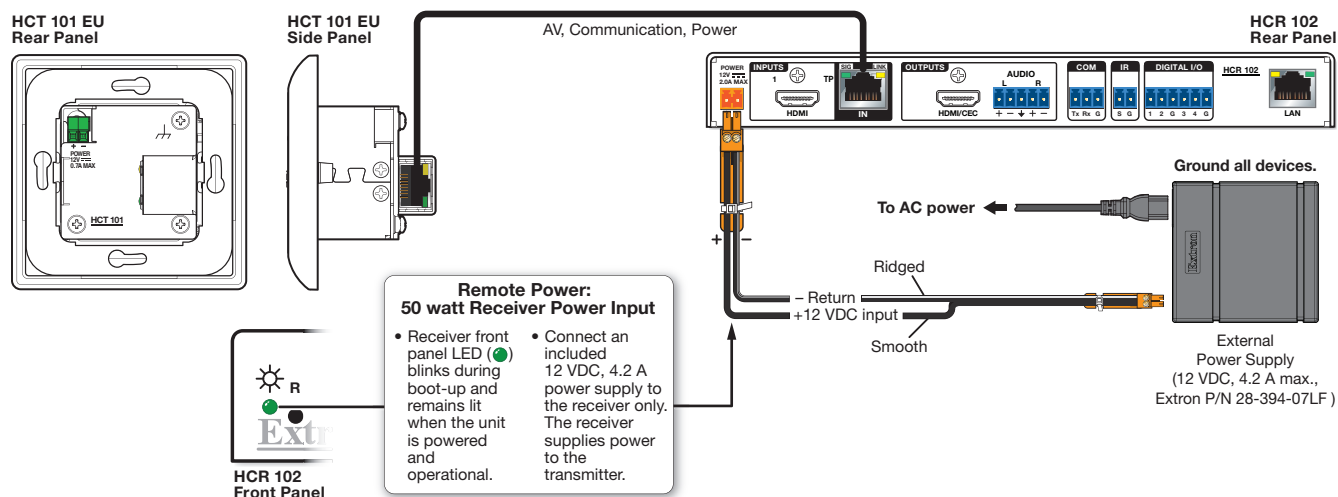
NOTE: The receiver can provide power remotely to the transmitter using a 50 watt power supply. Remote power mode requires at least 2.5 A. The transmitter can receive power from but cannot provide power to the receiver. The remote power feature is enabled by default but can be disabled by using a control in the PCS software.

- Alternatively, you can connect an **optional** 12 VDC, 1.5 A power supply (Extron PS 1215 C) at the transmitter, and connect an **optional** 12 VDC, 2 A power supply (Extron PS 1220) at the receiver.
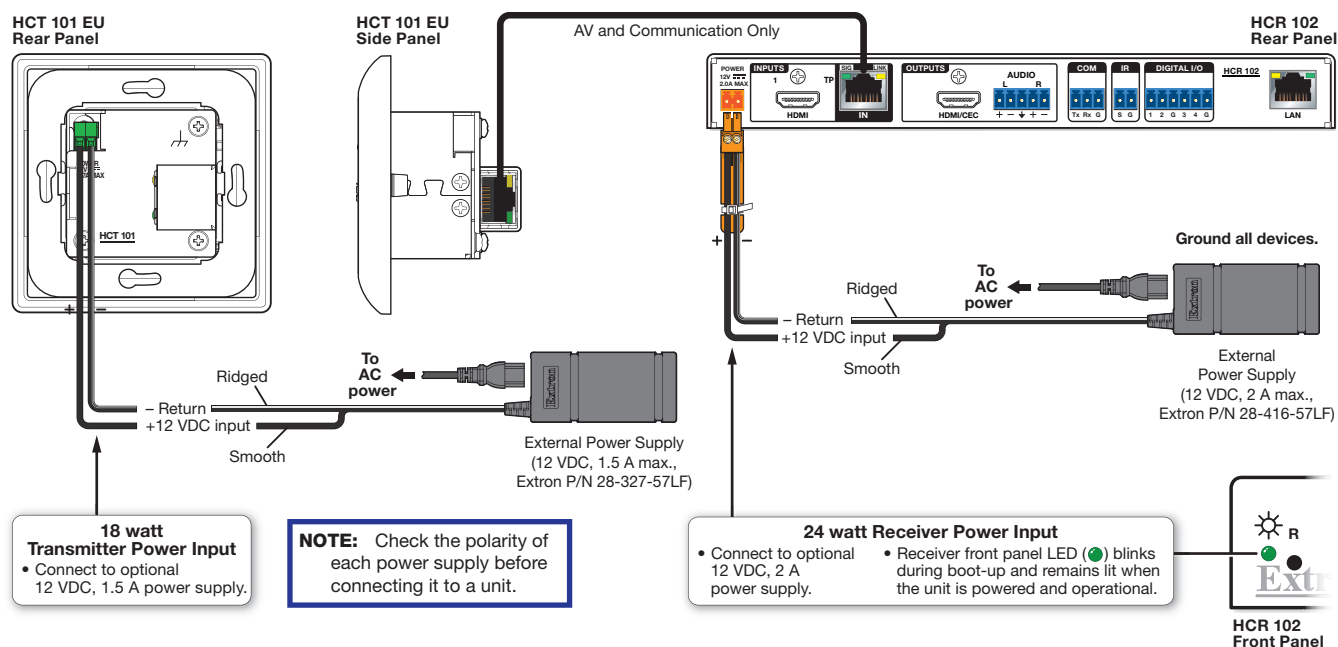
For both options, connect the external power supply or supplies to a 100 to 240 VAC power source.

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Front Panel Operation and Indications

Input Selection and Indication

Input selection button and LED

To select an input from the receiver front panel, push the input 1 button (see **figure 2**, **B**, on page 2) to select the input connected to receiver input 1.

The corresponding LED lights to indicate that that input is selected (active). If the input is deselected, the LED turns off (is unlit).

Use the auto-switching feature, which is active by default. In the "last connected" auto switch mode, the system automatically switches to the input where an active AV source device was last connected. If that device is disconnected, the system switches to the last device connected before that, as long as it has an active signal.

Signal, HDCP, and Audio LEDs

Signal LED — This LED (see figure 2, **C**) lights to indicate the presence of an active signal at the corresponding input connector. If there is no active signal, the LED is unlit.

HDCP LED —This LED (**D**) lights to indicate the presence of an active signal with HDCP encryption at the corresponding input connector.

HDCP LED State and Indication	
On (Lit Steadily)	**Off (Unlit)**
An HDCP encrypted TMDS signal is detected at the corresponding input.	An unencrypted TMDS signal is detected at the corresponding input or no active TMDS signal is detected.

Audio input signal LEDs (LPCM-2Ch and Multi-Ch)— These two LEDs (**E**) on the receiver indicate the presence or absence of the specific types of audio signal on the selected (active) input.

	Audio Input LED State and Indication	
LED Type	**On (Lit Steadily)**	**Off (Unlit)**
LPCM-2Ch	An embedded LPCM-2Ch audio signal is present on the selected HDMI TMDS input.	There is no LPCM-2Ch audio signal in the selected TMDS input. There is no TMDS signal on the selected input. The audio embedded in the selected input is in Multi-Ch format.
Multi-Ch	Multi-Ch or bitstream (non-PCM) audio is present on the selected HDMI TMDS input.	There is no Multi-Ch audio signal in the selected TMDS input. There is no TMDS signal on the selected input. The audio embedded in the selected input is in LPCM-2Ch format.

OSD Use

See the section on page 7 of this guide about configuring the AV settings using the on-screen display and front panel buttons, and see the *HC 400 Series User Guide* for full details on the OSD and how to use it.

Locking the Front Panel (Executive Mode)

To prevent unauthorized access or accidental changes to device settings, you can lock the front panel controls, making control available only by software. (The default state is unlocked.)

- You can lock and unlock the front panel by using a control in the PCS software.
- Front panel lockout (Executive) mode 2 can also be enabled and disabled by pressing and holding the `Menu` and `Enter` buttons for 2 or more seconds.

Firmware Upgrades

The firmware can be upgraded via the HCR 102 embedded web page, or via Extron Toolbelt (available at **www.extron.com**).

Reset Modes: a Brief Summary

The HCR 102 receiver offers the following reset modes:

- **Use Factory Firmware**: Press and hold the receiver front panel `Reset` button (see **figure 2**, **J** on page 2 for location) while applying power to the unit. Keep holding the button down until the Power LED (**I**) blinks twice, or for 6 seconds, then release the button. The receiver enters factory firmware mode. Use this mode to revert to factory firmware in the event of a firmware failure.

  Do not continue to operate the control processor using the factory firmware version. If you want to use the factory default firmware version, you must upload that version again.

- **Project Recovery**: See the *HC 400 Series User Guide* for instructions. Use this mode to recover the project in the event of a lost user name and password.

- **Run/Stop Program**: Hold down the `Reset` button for about 3 seconds, until the `Power` LED blinks once. Release and press the `Reset` button momentarily (for <1 second) within 1 second*. (*Nothing happens if the momentary press does not occur within 1 second.) The LED blinks 2 times if the program is starting. The LED blinks 3 times if the program is stopping. This mode allows you to restart any scripts or events stopped by an IP settings reset.

- **Toggle DHCP Client**: Press the `Reset` button five times (consecutively). Release the button. Do not press the button within 3 seconds following the fifth press. Use this mode to enable or disable the DHCP client for the LAN port.
  - The `Reset` LED blinks 6 times if the DHCP client is enabled.
  - The `Reset` LED blinks 3 times if the DHCP client is disabled.

  > **NOTES:**
  > - DHCP toggle mode is supported on firmware version 1.01 or higher.
  > - By default DHCP is off and the unit uses a static IP address.
  > - When you disable the DHCP client by using this mode, the unit reverts to using the previously-set static IP address.

- **Reset All IP Settings**: Press and hold the HCR 102 front panel `Reset` button for 6 seconds. After the Power LED blinks twice, release and momentarily press the `Reset` button. Use this mode to reset all network settings to factory default values without affecting user-loaded files. This reset mode also stops any running programs.

- **Reset to Factory Defaults**: Press and hold the HCR 102 front panel `Reset` button for 9 seconds. After the Power LED blinks three times, release and momentarily press the `Reset` button within 1 second. Use this mode to return the receiver to factory default settings. This mode also deletes all user-loaded files and configurations from the HCR 102, and also the factory default GC configuration. The basic GC configuration project can be downloaded from the Extron website if you want to restore it to the unit after a reset.

For detailed information on each mode and its use, see the *HC 400 Series User Guide* at **www.extron.com**.

Resources

Obtaining Control Drivers

Extron provides an extensive selection of device drivers available on the Extron website. If the system requires a control driver that is not already available, you can request a new IR, serial (RS-232), or Ethernet driver from Extron.

Obtaining Instructions, Information, and Assistance

Basic setup steps are outlined in this guide. For additional information see the help files and the *HC 400 Series User Guide*, available at **www.extron.com**. If you have questions during installation and setup, call the **Extron S3 Sales & Technical Support Hotline** or the Extron S3 Control Systems Support Hotline (1.800.633.9877).

Locating Software, Firmware, and Driver Files on the Extron Website

There are three main ways to find software, firmware, and device drivers within **www.extron.com**:

- Via links from the web page for the specific product
- Via the **Download Center** page (Click on the `Download` tab at the top of any page within **www.extron.com**.)
- Via links from search results

NOTES:

- For some software you have the option to click the `Download Now` button to begin downloading the software file. For other software there is a link for contacting an Extron support representative who can provide you access to the latest version.

  To obtain Extron control product software, you must have an Extron Insider account. Extron provides training to our customers on how to use the software. Access to the full features of Global Configurator Professional is available to users who successfully complete Extron Control Professional Certification.

- You must use serial and Ethernet drivers developed specifically for the IP Link Pro platform. With the exception of IR device drivers, drivers used for IP Link (non-Pro) devices are not compatible.

For information on safety guidelines, regulatory compliances, EMI/EMF compatibility, accessibility, and related topics, see the **Extron Safety and Regulatory Compliance Guide** on the Extron website.

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