USER MANUAL

MODEL:

**WP-20CT
Wall-Plate HDBaseT Auto
Switcher/Transmitter**

Contents

Introduction

Welcome to Kramer Electronics! Since 1981, Kramer Electronics has been providing a world of unique, creative, and affordable solutions to the vast range of problems that confront the video, audio, presentation, and broadcasting professional on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better!

Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment.

- Review the contents of this user manual.

Go to www.kramerav.com/downloads/WP-20CT to check for up-to-date user manuals, application programs, and to check if firmware upgrades are available (where appropriate).

Achieving Best Performance

- Use only good quality connection cables (we recommend Kramer high-performance, high-resolution cables) to avoid interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables).

- Do not secure the cables in tight bundles or roll the slack into tight coils.

- Avoid interference from neighboring electrical appliances that may adversely influence signal quality.

- Position your Kramer **WP-20CT** away from moisture, excessive sunlight and dust.

Safety Instructions

Caution:
- This equipment is to be used only inside a building. It may only be connected to other equipment that is installed inside a building.

- For products with relay terminals and GPI\O ports, please refer to the permitted rating for an external connection, located next to the terminal or in the User Manual.

- There are no operator serviceable parts inside the unit.

Warning:
- Use only the power cord that is supplied with the unit.

- To ensure continuous risk protection, replace fuses only according to the rating specified on the product label which is located on the bottom of the unit.

Recycling Kramer Products

The Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC aims to reduce the amount of WEEE sent for disposal to landfill or incineration by requiring it to be collected and recycled. To comply with the WEEE Directive, Kramer Electronics has made arrangements with the European Advanced Recycling Network (EARN) and will cover any costs of treatment, recycling and recovery of waste Kramer Electronics branded equipment on arrival at the EARN facility. For details of Kramer's recycling arrangements in your particular country go to our recycling pages at www.kramerav.com/il/quality/environment.

Overview

Congratulations on purchasing your Kramer **WP-20CT Wall-Plate HDBaseT Auto Switcher/Transmitter**. **WP-20CT** is an intelligent 2x1 automatic wall-plate switcher transmitter over long-reach HDBaseT for 4K USB-C and HDMI™ video signals. **WP-20CT** offers an intelligent switching experience with built-in Maestro room control and the standard priority / last-connected switching function based on active video signal detection.

- High Performance Switcher Transmitter – Professional HDBaseT switcher transmitter for providing long-reach signals over twisted pair copper infrastructures. This switcher transmitter is a standard transmitter that can be connected to any market-available HDBaseT-compliant extension product.

- Simple and Powerful Maestro Room Control – Out-of-the-box configured room control for a typical meeting room setup, and intuitive user interface enables you to control your meeting room elements. Room devices are controlled, locally or remotely via HDBaseT, right out-of-the-box by an extensive range of triggers, including input/output connectivity and routing. By minimizing user intervention, Maestro room control saves meeting prep time and minimizes human error before presentations.

- Automatic Display Operation – Part of the out-of-the-box Maestro configured room automation. Meeting presentation is simplified by automatically turning ON/OFF a CEC-enabled display when the presentation source is plugged in / unplugged with user-defined shut-down delay.

- BYOD Ease and Convenience – Connect any DP-Alt-Mode-capable USB-C device as an AV presentation source, while providing the connected device (if PD-2.0-capable) with up to 60 watts of power.

- Plug & Play Auto Switcher – Automatically plays the switched user device source signal on the connected display according to user-configured preferences, such as priority or last-connected input. When the user manually switches, the auto switching is overridden.

- HDMI™ Signal Switching – HDCP 2.3 compliant, supporting deep color, x.v.Color™, lip sync, HDMI uncompressed audio channels, Dolby TrueHD, DTS-HD, 2K, 4K, and 3D as specified in HDMI 2.0.

- I-EDIDPro™ Kramer Intelligent EDID Processing™ – Intelligent EDID handling, processing, locking and pass-through algorithm ensures plug & play operation for HDMI source and display systems.

- Multi-channel Audio Switching – Up to 8 channels of digital stereo uncompressed signals for supporting studio-grade surround sound.

- Audio De-embedding – The digital audio signal passing-through to the output, is de-embedded, converted to an analog signal and sent to the stereo analog audio output. This enables playing the audio on locally connected speakers, in parallel to playing it on the speakers connected to the AV acceptor device (such as TVs with speakers).

- Bidirectional RS-232 Extension – Serial interface data flows in both directions, allowing data transmission and device control.

- Reliable PoE (Power over Ethernet) Powering – Auto-senses the HDBaseT extension line PoE status, it accepts power from a remote PoE provider such as a PoE matrix, with optional mains powering from connected power adapter.

- Cost-effective Maintenance and Management – Status LED indicators for Power, HDMI, and HDBaseT ports facilitate easy local maintenance and troubleshooting. Local device management using built-in web interface via the USB-C connection. Local firmware upgrade via USB-C and RS-232 connection tool ensure lasting, field-proven deployment.

- Easy Installation – Compactly fits into standard US, EU, and UK 1 gang in-wall box size, supporting decorative integration with room deployed user interfaces such as electrical switches. Wall-plate installation is fast and cost-effective via a single twisted pair cable, providing both video signal and power (PoC) connections.

Typical Applications

WP-20CT is ideal for the following typical applications:

- Podium-mounted switcher in lecture halls, training rooms, auditoriums, and hospitality applications.

- Wall-mounted switcher within any AV distribution system.

- Multimedia and presentation source selection in various enterprise applications.

Defining WP-20CT Wall-Plate HDBaseT Auto Switcher/Transmitter

This section defines **WP-20CT**.

US-D Version
Front

EU/UK Version
Front

US-D/EU/UK Version
Rear
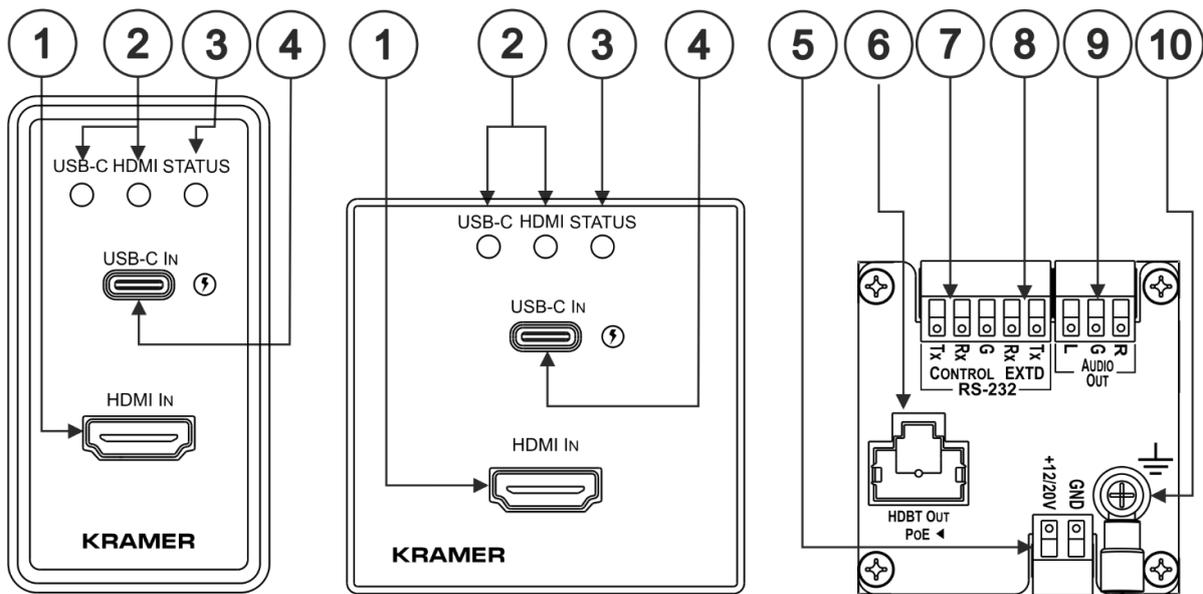
Figure 1: WP-20CT Wall-Plate HDBaseT Auto Switcher/Transmitter Front Panel

#	Feature	Function
1	HDMI™ IN Connector	Connects to an HDMI source.
2	USB-C LED	• Off – an input source is not connected.
	HDMI LED	• Blue – an active signal is detected on the input. • Blue, flashing – the source is connected but an active signal is not detected.
3	STATUS LED	• Off – the device is not receiving power. • Red – the powered device is inactive or booting. • Green – the device is active and powered via power supply. • Orange – the device is active and powered via PoE. • Green or orange (depending on power source), flashing slowly – the device is in the power-save standby mode. • Green or orange (depending on power source), fast-flashing – firmware is downloading in the background.

#	Feature	Function
④	USB-C IN Port	Connect to a USB-C source (that supports DisplayPort Alternate Mode video, USB data and power charging). • When powered by a Kramer 20V power supply (optional), charges sources (that support USB Power Delivery 2.0) up to 60W. • Use to access **WP-20CT** embedded web pages via connected browser.
⑤	12V/20V Power Supply 2-pin Terminal Block Connector	Connect to the power supply (required for USB charging). Connect GND to GND, +12V/20V to +12/20V. • If you need to charge a device via the USB-C port, use Kramer 20V power supply (optional).
⑥	HDBT OUT PoE ◄ RJ-45 Connector	Connect to the HDBaseT IN port on a PoE-provider receiver (for example, **TP-789R**) or a receiver (for example, **TP-580R**). • When **WP-20CT** is connected to a PoE providing receiver, it is not necessary to connect a power supply, unless the USB-C charging feature is used which requires the Kramer 20V power supply.
⑦	CONTROL RS-232 3-pin Terminal Block Connector (Tx, Rx, and common G)	Connect to a controller to control the device.
⑧	EXTD RS-232 3-pin Terminal Block Connector (Tx, Rx, and common G)	Connect to a controller to extend an RS-232 bi-directional communication signals (even if no A/V signal is extended) over HDBT to the RS-232 port of the remote receiver. Note: applicable only when this port is set to RS-232 extension (see Setting HDBT RS-232 Control Communication on page 14).
⑨	AUDIO OUT 3-pin Terminal Block Connector	Connect to an unbalanced analog audio acceptor.
⑩	Ring Tongue Terminal Grounding Screw	Connect to grounding wire (optional).

Mounting WP-20CT

This section provides instructions for mounting **WP-20CT**. Before installing, verify that the environment is within the recommended range:

- Operation temperature – 0° to 40°C (32 to 104°F).
- Storage temperature – -40° to +70°C (-40 to +158°F).
- Humidity – 10% to 90%, RHL non-condensing.

Before mounting, connect the HDBaseT cable and power

Warning:
- Ensure that the environment (e.g., maximum ambient temperature & air flow) is compatible for the device.
- Avoid uneven mechanical loading.
- Appropriate consideration of equipment nameplate ratings should be used for avoiding overloading of the circuits.
- Reliable earthing of rack-mounted equipment should be maintained.

To mount WP-20CT:

Insert the device into the in-wall box (note that first you need to connect the HDBaseT cable and power) and connect the parts as shown in the illustrations below:
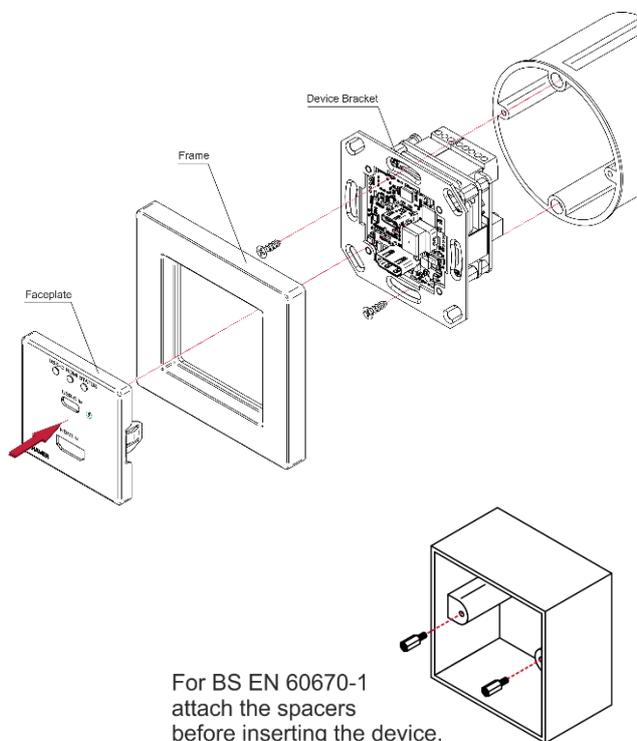
EU/UK Version   **US-D Version**
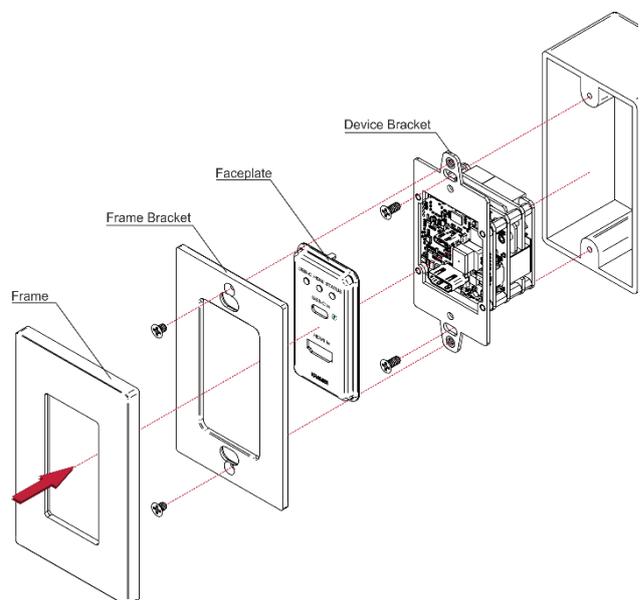
DECORA® design frames are included in US-D models. DECORA® is a registered trademark of Leviton Manufacturing Co., Inc.

We recommend that you use any of the following standard 1 Gang in-wall junction boxes (or their equivalent):

- **US-D**: 1 Gang US electrical junction boxes.
- **EU**: 1 Gang in-wall junction box, with a cut-hole diameter of 68mm and depth that can fit in both the device and the connected cables (DIN 49073).
- **UK**: 1 Gang in-wall junction box, 75x75mm (W, H) and depth that can fit in both the device and the connected cables
(BS 4662 or BS EN 60670-1 used with supplied spacers and screws).

Connecting WP-20CT

ⓘ Always switch off the power to each device before connecting it to your **WP-20CT**.
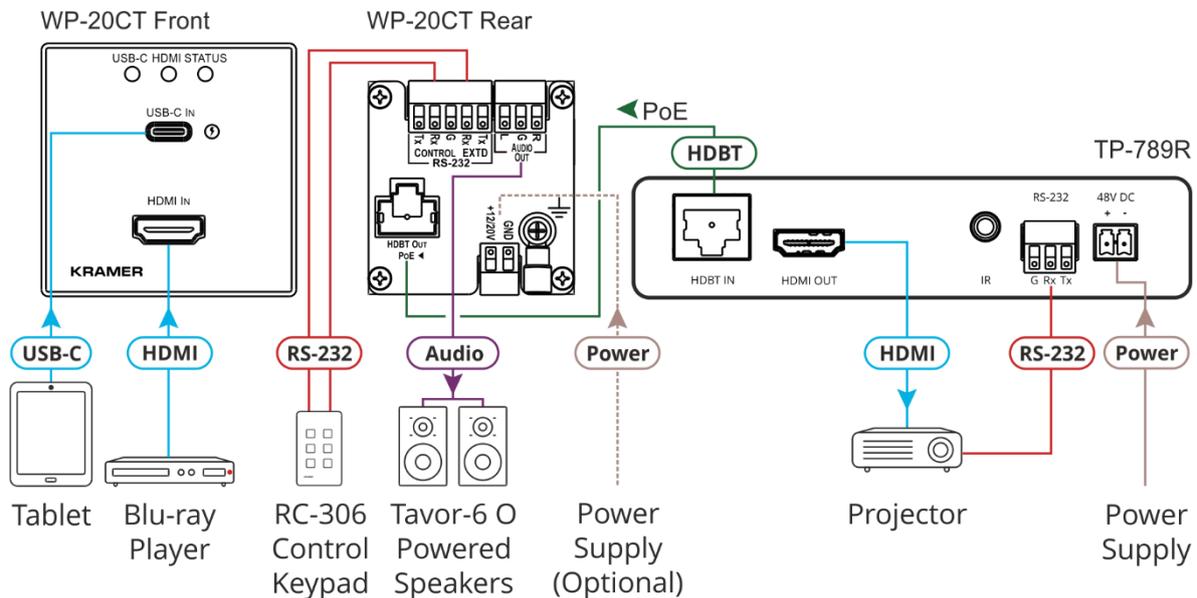
Figure 2: Connecting to the WP-20CT Rear Panel

To connect WP-20CT as illustrated in the example in Figure 2:

1. Connect the HDMI source (for example, a Blu-ray player) to the HDMI IN connector ①.

2. Connect the USB-C source (for example, a tablet) to the USB-C IN connector ④.

3. Connect a controller (for example, **RC-306** control keypad) to the Control RS-232 connector ⑦ to control **WP-20CT** and to the EXTD RS-232 connector ⑧ to control a device on the receiver side via serial communication.

4. Connect the HDBaseT OUT connector ⑥ to the HDBaseT input of a PoE-provider receiver (for example, **TP-789R**) or a non-PoE receiver (for example, **TP-580R**).

5. Connect an RS-232-controlled device (for example, a projector) to the receiver HDMI input and RS-232 connector.

6. Connect the included 12V power supply to the 12V/20V connector ⑥ for powering the unit when connected to a non-PoE receiver.

   -OR-

   Connect an optional PS-2006-O 20V/6A Kramer power supply to the 12V/20V connector ⑥ to enable the USB-C charging feature.

Connecting to WP-20CT via RS-232

You can connect to **WP-20CT** via an RS-232 connection ⑬ using, for example, a PC.

WP-20CT features an RS-232 3-pin terminal block connector allowing the RS-232 to control **WP-20CT**.

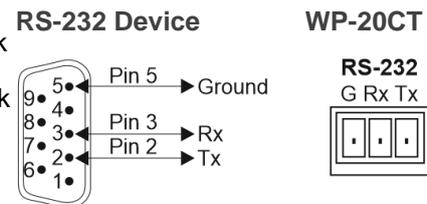Connect the RS-232 terminal block on the rear panel of **WP-20CT** to a PC/controller, as follows:

From the RS-232 9-pin D-sub serial port connect:

- Pin 2 to the TX pin on the **WP-20CT** RS-232 terminal block
- Pin 3 to the RX pin on the **WP-20CT** RS-232 terminal block
- Pin 5 to the G pin on the **WP-20CT** RS-232 terminal block

Wiring RJ-45 Connectors

This section defines the HDBT pinout, using a straight pin-to-pin cable with RJ-45 connectors.

ⓘ For HDBaseT cables, it is recommended that the cable ground shielding be connected/soldered to the connector shield.

EIA /TIA 568B	
PIN	Wire Color
1	Orange / White
2	Orange
3	Green / White
4	Blue
5	Blue / White
6	Green
7	Brown / White
8	Brown
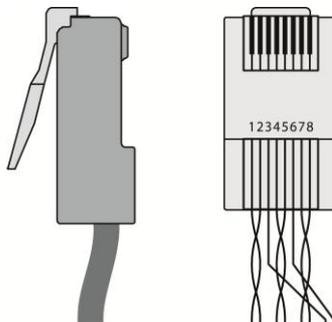
Connecting USB-C Port Directly to PC

You can connect the USB-C IN port of **WP-20CT** directly to the USB port on your PC using a USB-C to USB-C cable. This enables you to configure and operate the device using the embedded web pages (see Operating and Controlling WP-20CT on page 17).

After connecting **WP-20CT** to the USB-C port, configure your PC as follows:

1. Click **Start** > **Control Panel** > **Network and Sharing Center**.

2. Click **Change Adapter Settings**.

3. Highlight the **ASIX** network adapter to connect to the device and click **Change settings of this connection**.

The Ethernet Properties window for the selected network adapter appears as shown in Figure 3.
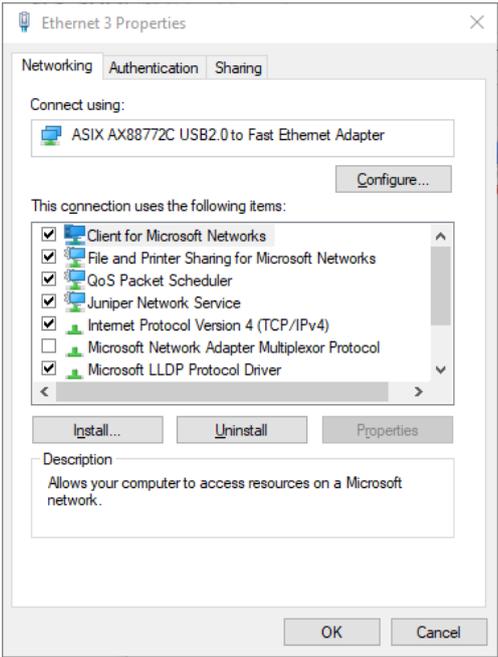
Figure 3: Local Area Connection Properties Window

4. Highlight **Internet Protocol Version 4 (TCP/IPv4)** depending on the requirements of your IT system.

5. Click **Properties**.
The Internet Protocol Properties window relevant to your IT system appears as shown in Figure 4 or Figure 5.
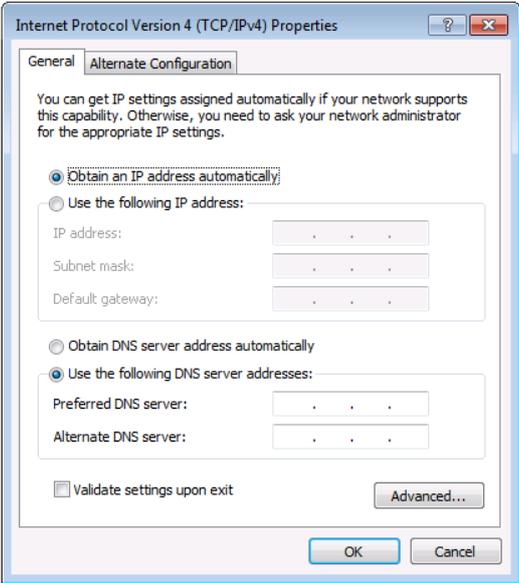
Figure 4: Internet Protocol Version 4 Properties Window
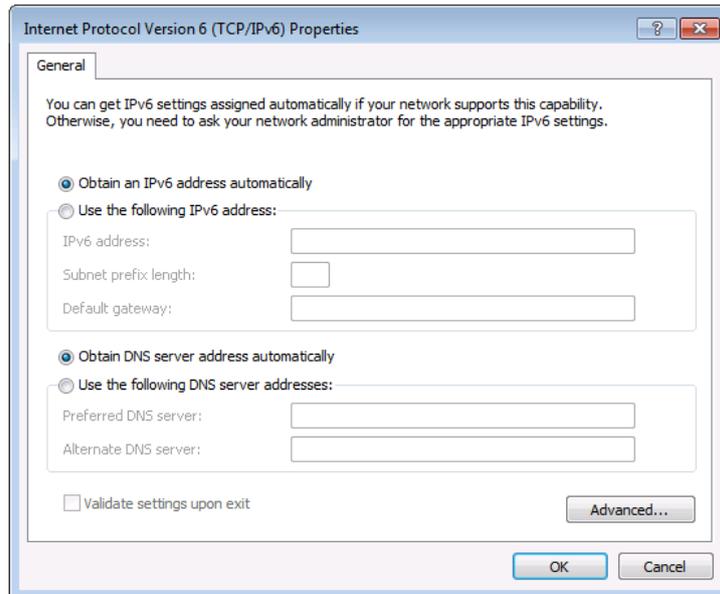
Figure 5: Internet Protocol Version 6 Properties Window

6. Select **Use the following IP Address** for static IP addressing and fill in the IP address and Subnet mask as shown in Figure 6.

   You can use any IP address in the range 192.168.1.1 to 192.168.1.255 (excluding 192.168.1.39) that is provided by your IT department.
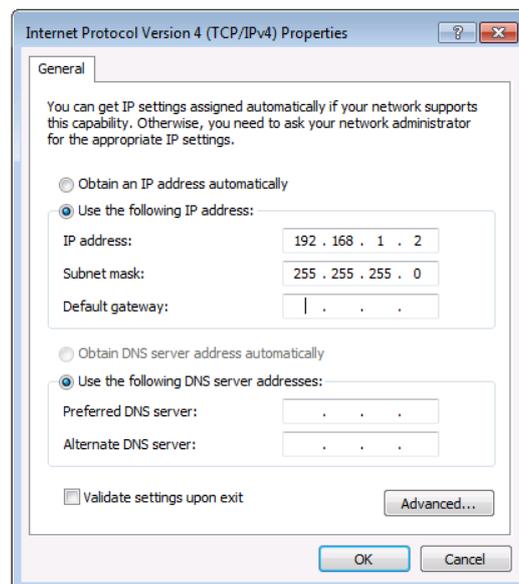
Figure 6: Internet Protocol Properties Window

7. Click **OK**.

8. Click **Close**.

9. Browse to the fallback IP address or default hostname of the device.

Principles of Operation

Input Auto-Switching

Input selection is set via the web pages (see <u>Configuring Auto-Switching Mode</u> on page <u>21</u>) to one of the following modes:

- Manual

- Last connected

- Priority

By default, switching is set to Last connected.

> ⓘ When in Manual mode, note the following:
> - Switching to an unconnected input, results in a blank screen on the output.
> - Manual switching overrides auto-switch mode.

In manual mode, select an input by:

- Sending RS-232 serial commands control (see <u>Protocol 3000 Commands</u> on page <u>43</u>).

- Using the embedded web pages (see <u>Browsing WP-20CT Web Pages</u> on page <u>18</u>).

In auto-switching mode, switching selection is performed based on either last connected or priority input:

- In last connected mode, if the signal on the current input is lost, **WP-20CT** automatically selects the last connected input (the delay depends on a configurable timeout).

- In priority mode, when the input sync signal is lost for any reason, the input with a live signal and next in priority is selected automatically, (the delay depending on the configurable signal-lost timeout, (see <u>Defining Signal Timeout Settings</u> on page <u>22</u>).

Maestro Built-in Automation Configuration

WP-20CT built-in Maestro automation enables configuring triggers to simply create a sequence of actions that are carried out following trigger activation (see Configuring Device Automation on page 29).

Thanks to out-of-the-box default configuration, **WP-20CT** is ready to control the following typical room configuration that can be controlled via several Maestro triggers.
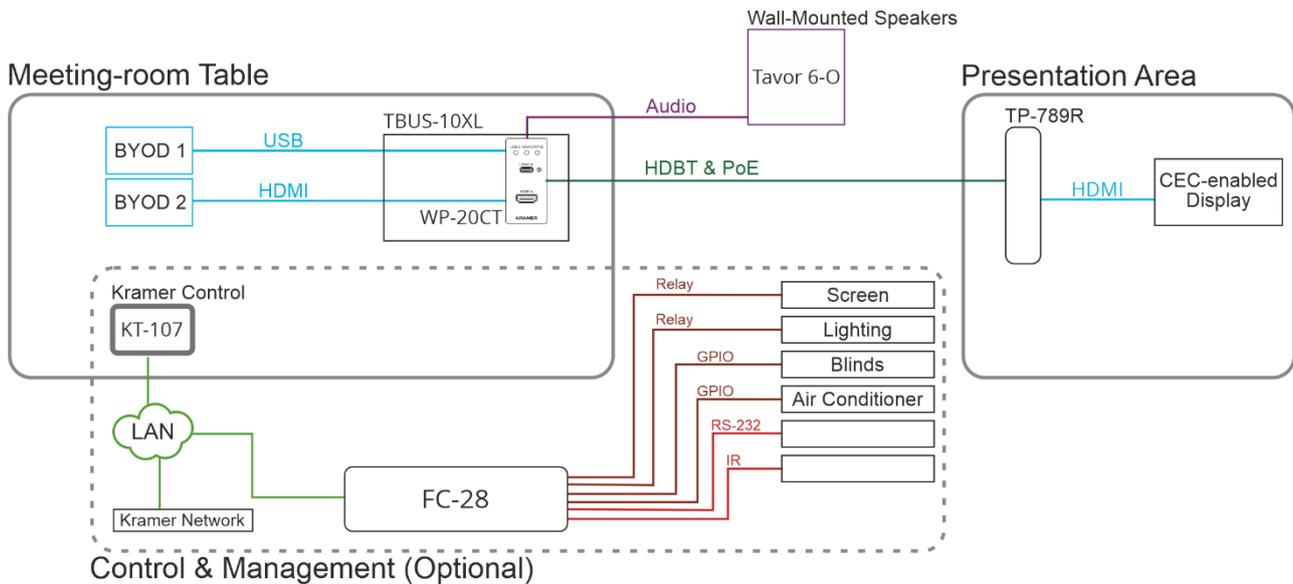
Figure 7: Typical Room Configuration

This room includes a meeting-room table, a presentation area, and so on, as follows:

On the meeting table:	• **WP-20CT** mounted onto a **TBUS-10XL** table mount.
	• Various BYOD sources, of which one or two are connected to the **WP-20CT** HDMI port (for example, a laptop) and/or the USB-C port (for example, a tablet).
	• A **KT-107** touch panel supporting Kramer Control controller and connected to the LAN.
On the Wall:	• **Tavor 6-O** wall-mounted speakers connected to **WP-20CT**.
In the presentation area:	• **TP-789R** receiver, connected via HDBT to **WP-20CT**.
	• A CEC-enabled display connected to the **TP-789R** HDMI output.
In the room:	• The window blinds, projector screen, lighting, and air conditioning are connected to GPIO/relay ports on the **FC-28** IP control gateway.
LAN connections	• **KT-107 Kramer Control** touch panel controller to **FC-28** IP control gateway and a **Kramer Network** management system.

WP-20CT, built-in Maestro configuration enables almost immediate control over these elements for different scenarios, once all the elements in the room are connected (with minimal settings via built-in Maestro automation embedded web pages, such as device-specific IP addresses, see Configuring Device Automation on page 29).

ⓘ **KT-107** and **FC-28** (in the optional control and management system) are not included in the built-in Maestro configuration and should be configured separately.

For example, an active input that is detected, is a trigger (First On) for starting a presentation.

Once the input signal is detected, the **Presentation Start**, built-in script, runs a series of actions such as unmuting the audio and video outputs, turning the display ON via CEC, lowering the screen rolling the blinds down, etc.

In this example, the display is turned on via the HDBT CEC channel connection through the **TP-789R** receiver, and audio and video are unmuted by the internal port.

Factory default triggers, Scripts, actions and ports are listed in Default Control and Automation Settings on page 37.

Setting HDBT RS-232 Control Communication

WP-20CT supports RS-232 control communication (via HDBT RS-232 channel) with the display that is connected to the receiver in any of the following ways:

- Setting HDBT RS-232 Communication via the RS-232 EXTD Port on page 14.
- Setting HDBT RS-232 Communication via Maestro on page 15.

Setting HDBT RS-232 Communication via the RS-232 EXTD Port

By default, **WP-20CT** extends RS-232 communication between a controller that is connected to the RS-232 EXTD port and the remote display.

For example, in Figure 2, Kramer **RC-306** is connected to the RS-232 EXTD port so that **RC-306** can serially communicate with the display on the receiver side via HDBT.

To extend RS-232 communication via local controller:

1. Connect A controller to the RS-232 EXTD port on the rear side of the device.

2. Make sure that the **WP-20CT** is set to RS-232 communication extension via local controller).

   - If it is not, and the device is set to Maestro control, use the following #Route command to reset it to its default state (RS-232 communication extension via local controller): **#ROUTE 3,1,2\x0D** (see **ROUTE** command in Protocol 3000 Commands on page 43).

3. Send/receive RS-232 commands between the controller, via the HDBT RS-232 channel, and the display on the receiver side.

There is now serial communication between the RS-232 EXTD port and the remote display via HDBT.

Setting HDBT RS-232 Communication via Maestro

To send RS-232 commands to the display via a script in Maestro:

1. Make sure that the baud rate is set to 9600 on far-side terminal (for example, the display that is connected to the receiver).

2. Set the RS-232 EXTD mode (local by default) to the Maestro mode, by adding the `#ROUTE 3,1,3\x0D` command to the script under Data.
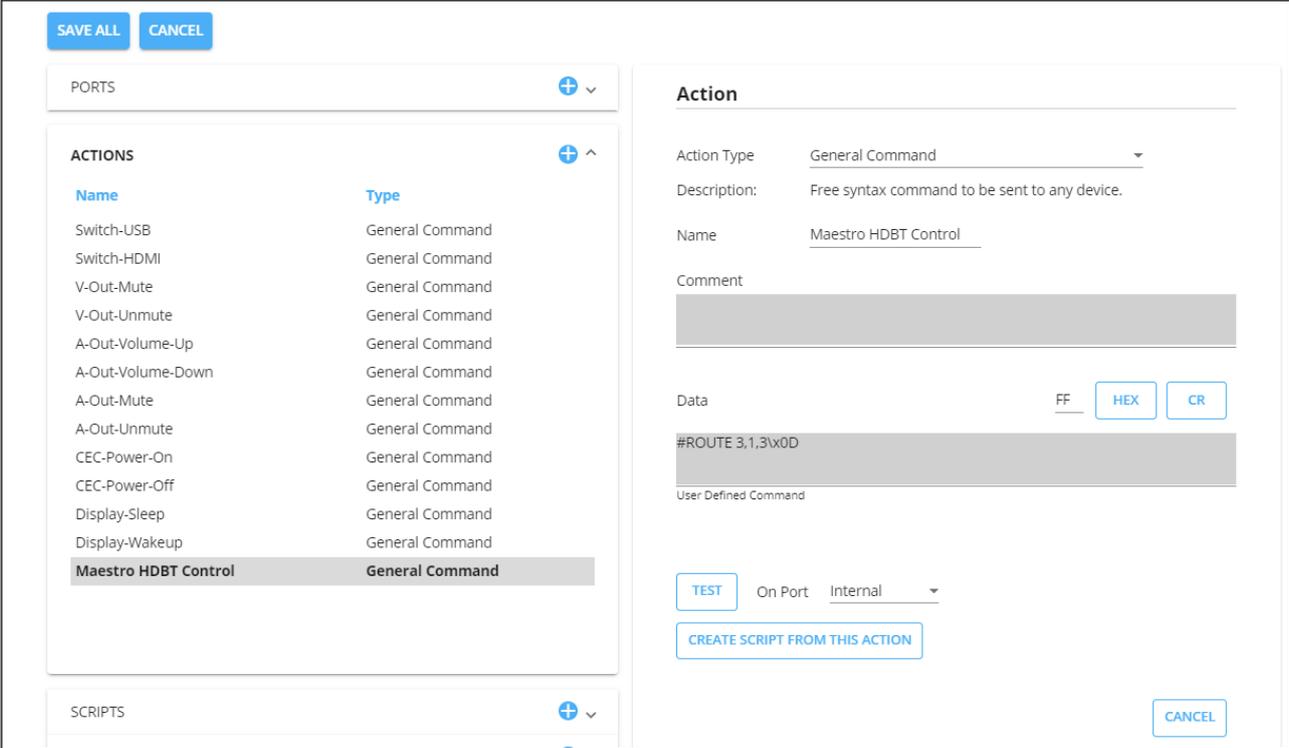
Figure 8: Setting RS-232 Communication to Maestro HDBT Control

Alternatively, you can set Maestro HDBT control mode via P3K IP command (see **ROUTE** command in).

3. Click **SAVE ALL**.

4. Create a script. For example, Display wakeup, and add the Maestro HDBT Control (which defines RS-232 communication via Maestro) as the first action. When the script is ready, click **SAVE ALL**. See Maestro Built-in Automation Configuration on page 13 for further details.

Figure 9: Adding Maestro HDBT Control to a Script

RS-232 command and responses can be sent and received between Maestro and the display on the receiver side.

Operating and Controlling WP-20CT

You can operate **WP-20CT** using the embedded web pages, by connecting to **WP-20CT** with a computer via the USB-C connector (see Connecting USB-C Port Directly to PC on page 9).

WP-20CT enables you to do the following:

- Browsing WP-20CT Web Pages on page 18.
- Switching Input to Output on page 19.
- Muting and Adjusting Audio Output on page 20.
- Turning Off Video Output on page 20.
- Configuring Auto-Switching Mode on page 21.
- Defining Signal Timeout Settings on page 22.
- Configuring AV Settings on page 23.
- Copying EDID on page 24.
- Changing Device Name on page 25.
- Setting Auto Standby Delay on page 26.
- Exporting and Importing a Configuration File on page 26.
- Resetting Device on page 27.
- Configuring Network Settings on page 27.
- Configuring Time and Date on page 28.
- Changing Web Pages Access Password on page 28.
- Setting Web Pages Auto Logoff Timeout on page 29.
- Configuring Device Automation on page 29.

Browsing WP-20CT Web Pages

ⓘ If a web page does not update correctly, clear your Web browser's cache.

If security is enabled, the Login window appears.

Figure 10: Embedded Web Pages Login Window

5. Enter the Username (default = Admin) and Password (default = Admin) and click **Sign in**.

The Main > AV Routing page appears.
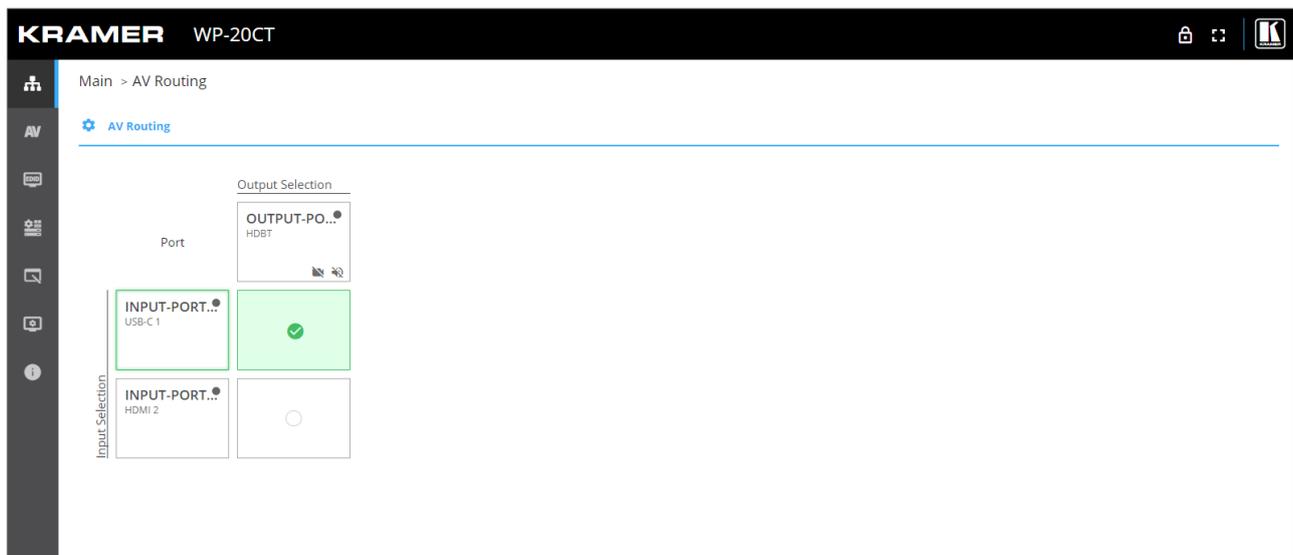
Figure 11: Embedded Web Pages Main > AV Routing Page

6. Click the Navigation Pane on the left side of the screen to access the relevant web page.

ⓘ Hover over the icons on the navigation pane to hide/show the names of the pages.

Switching Input to Output

WP-20CT enables you to switch one of the two inputs to the output.

The AV Routing page shows the following information:

- Name of each input and output (to change the name, see <u>Configuring AV Settings</u> on page <u>23</u>).

- Connection status of each input and output – The indicator next to the name lights green when an active input or output is connected.

- Switching status – The input that is currently connected to the output shows a green checkmark in the column next to it.

To switch an input to the output:

1. Go to the Main > AV Routing page.
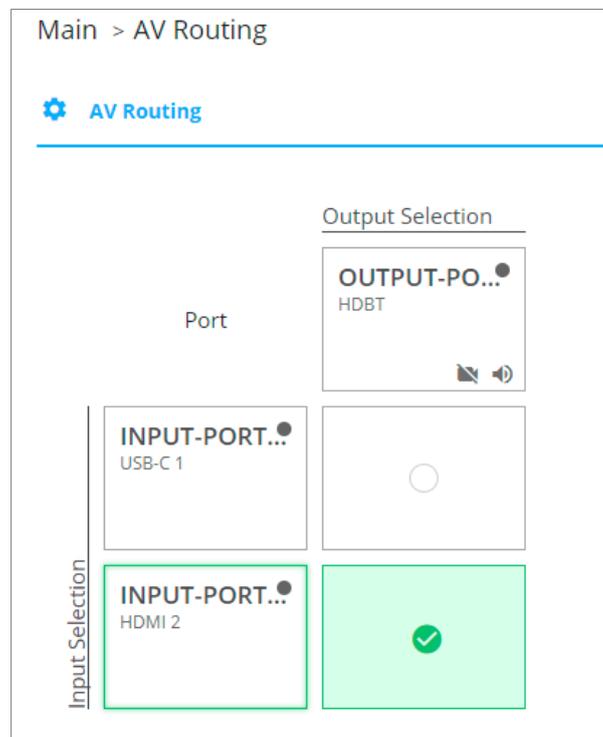
Figure 12: Main > AV Routing Page

2. Click the box next to the input to which you would like to switch the output.

A green check appears in the selected box and the input is switched.

Muting and Adjusting Audio Output

WP-20CT enables you to mute the audio output and adjust it from -100dB to +15dB (default = 0bD).

To mute and adjust the audio output:

- On the Main > AV Routing page ([Figure 12](#)), click the audio icon under the output name and mute or adjust the audio as needed.

Turning Off Video Output

WP-20CT enables you to turn off the video output so that the connected display goes blank. The audio output is not affected by this setting.

To turn off the video output:

- On the Main > AV Routing page ([Figure 12](#)), click the video icon under the output name.

  The video output is turned off and the connected display goes blank.

ⓘ Click the disabled video icon to turn on the video output.

Configuring Auto-Switching Mode

WP-20CT enables you to configure how the system automatically decides which input to switch to the output.

To configure auto-switching:

1. Go to the AV Settings > Auto switching tab.
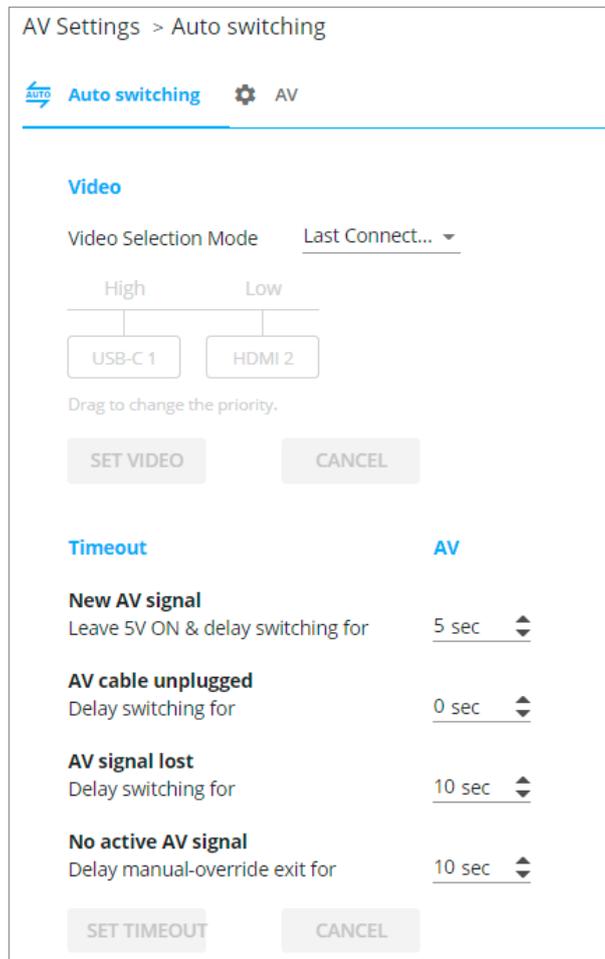
Figure 13: AV Settings > Auto switching Tab

2. Select one of the following auto-switching modes from the Video Selection Mode dropdown:

   ▪ Manual – Switching is only done manually. Auto-switching is disabled.

   ▪ Last Connected (default) – When a new source is connected, automatically switch to that input.

   ▪ Priority – The system first looks to switch to the priority input (default = USB-C input). Drag the input name to change the priority.

3. Click **SET VIDEO**.

   Auto-switching mode is configured.

Defining Signal Timeout Settings

WP-20CT enables you to define a time delay before an automatic switching operation is initiated by the system.

To define timeout settings:

1. Go to the AV Settings > Auto switching tab (Figure 13).

2. Define timing for the following:

   - New AV signal – When a new AV source is connected to the inactive input, delay switching to this new signal (from 0 to 90 sec, default = 0).

   - AV cable unplugged – When the active input is unplugged, delay switching to the other input (from 0 to 90 sec, default = 0).

   - AV signal lost – When the active input signal is lost without being unplugged (for example when player is on stop), delay switching to the other input (from 5 to 90 sec, default = 10).

   - No active AV signal – In a case where the active input was switched manually, and there is no active signal on that input, the switching back to the other input time is 10 seconds.
   If there is an active signal on the manual selected input, and then this signal is lost, this setting delays switching back to the other input (from 5 to 90 sec, default = 10).

3. Click **SET TIMEOUT**.

Configuring AV Settings

Figure 14: AV Settings > AV Tab

WP-20CT enables you to configure the following general settings on the AV Settings > AV tab:

- Label – Change the name of an input or output as it appears on the Main (switching) page and EDID Management page.

- HDCP – For the inputs, select the **Yes** (default) **/No** switch to enable/disable HDCP for that input. For the output, select **Always On** keep HDCP enabled or **Follow Input** (default) to define the output HDCP setting according to the active input.

- Device Color Depth – **Follow Output** (default) or **Force 8 bit**.

- Force RGB on Output – **Enable** or **Disable** (default).

- Device Auto-Unmute on volume change – When enabled (default), changing the volume will unmute the device.

- Auto Sleep Delay – When no input signal is detected, the device automatically goes into sleep mode, and output is set to off. When this setting is enabled (default), it delays sleep mode for an amount of time specified in the next setting.

- No input signal (active when Auto Sleep Delay is enabled) – Set the number of seconds (30 to 60,000 seconds; default = 900 seconds) after there is no signal detected, until the device goes into sleep mode. Click **SET TIMEOUT** after defining this setting.

Copying EDID

WP-20CT enables you to copy an EDID from one of several different sources to the inputs.

To copy the EDID to the inputs:

1. Go to the EDID Management page.
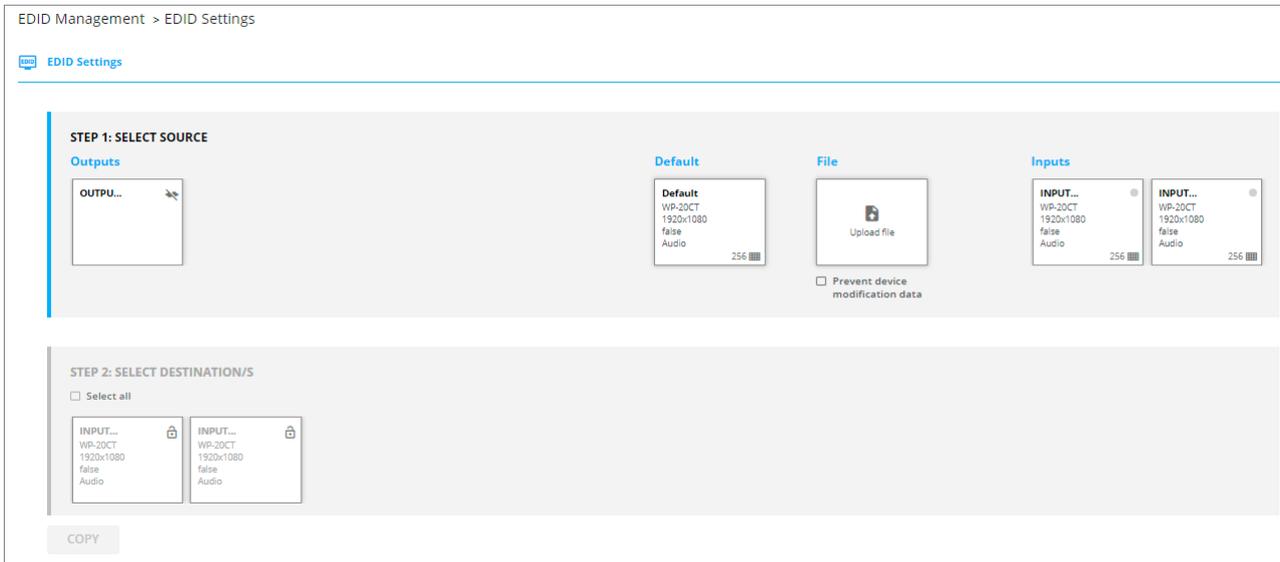
Figure 15: EDID Management Page

2. Under Step 1, select the EDID source.

3. Under Step 2, select one or both of the inputs as the destination for the EDID.

4. Click **Copy**.

The EDID is copied.

Changing Device Name

WP-20CT enables you to change the DNS name of the device.

To change the device name:

1. Go to the Device Settings > General page.
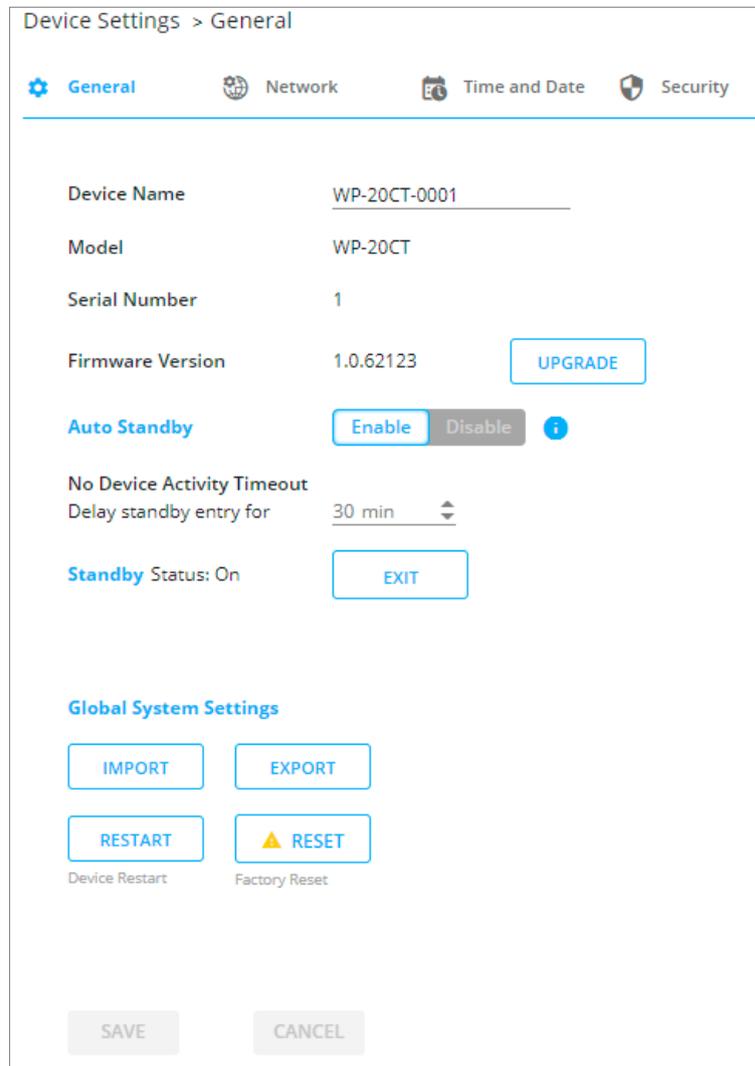
Device Settings > General

⚙ General   🌐 Network   📅 Time and Date   🛡 Security

Device Name   WP-20CT-0001

Model   WP-20CT

Serial Number   1

Firmware Version   1.0.62123   UPGRADE

Auto Standby   Enable   Disable   ℹ

No Device Activity Timeout
Delay standby entry for   30 min ⬍

Standby Status: On   EXIT

Global System Settings

IMPORT   EXPORT

RESTART   ⚠ RESET
Device Restart   Factory Reset

SAVE   CANCEL

Figure 16: Device Settings > General Page

2. Under General Preferences, change the device name and click **SAVE**.

The device name is changed.

Setting Auto Standby Delay

WP-20CT enables you to set the delay time (up to 900min, never 0; default = 30min) before the device goes into standby mode after a period of no device activity.

To set auto standby delay time:

1. Go to the Device Settings > General page ([Figure 16](#)).
2. Under Auto Standby, click **ENABLE**.
3. Under No Device Activity Timeout, set the delay time.
4. Click **Save**.

Auto standby delay time is set.

ⓘ To manually enter or exit standby mode, next to Standby Status, click **ENTER**/**EXIT**.

Exporting and Importing a Configuration File

WP-20CT enables you to export a configuration file that records all current device settings except the switching configuration. This file can then be imported to the same or different **WP-20CT** device to load the recorded settings.

To export a configuration file of the current device settings:

1. Go to the Device Settings > General page ([Figure 16](#)).
2. Under Global System Settings, click **Export**.
3. Select the location on your computer to save the configuration file and click **Save**.

The configuration file is exported and saved.

To import a configuration file of the current device settings:

1. Go to the Device Settings > General page ([Figure 16](#)).
2. Under Global System Settings, click **Import**.
3. Select the relevant configuration file and click **Save**.

The configuration file is imported and the device restarts with the settings from the configuration file.

Resetting Device

Two types of resets can be performed:

- Restart – Reboots your device and keeps all your device settings, including the IP address and password.

- Reset – Reboots your device and restores all factory settings including input/output definitions, switching configuration, IP address and password.

To restart the device:

- Click **Restart** on the Device Settings > General page ([Figure 16](#)).

To perform a factory reset on the device:

- Click **Reset** on the Device Settings > General page ([Figure 16](#)).

Configuring Network Settings

To configure network settings:

- Change settings as needed on the Device Settings > Network page.
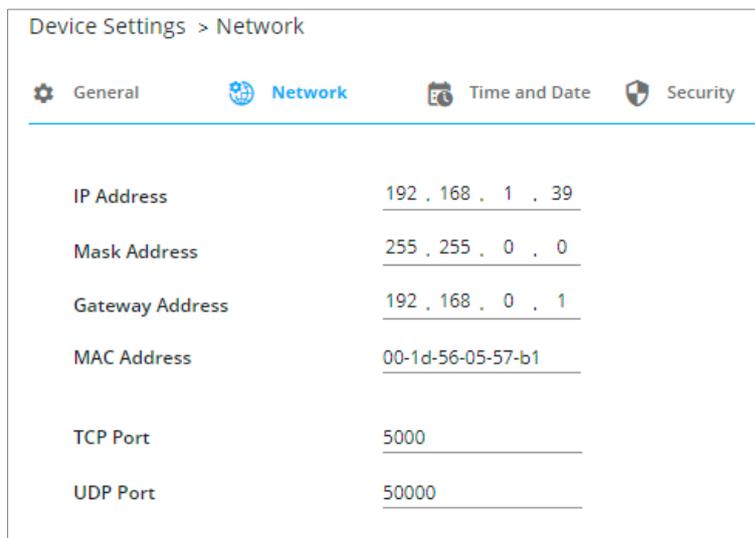
Device Settings > Network

| ⚙ General | 🌐 **Network** | 🕒 Time and Date | 🛡 Security |

IP Address	192 . 168 . 1 . 39
Mask Address	255 . 255 . 0 . 0
Gateway Address	192 . 168 . 0 . 1
MAC Address	00-1d-56-05-57-b1
TCP Port	5000
UDP Port	50000

Figure 17: Device Settings > Network Page

Configuring Time and Date

To configure time and date settings:

- Change settings as needed on the Device Settings > Time and Date page.
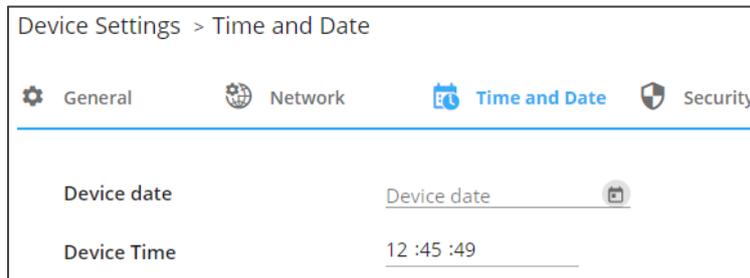
Figure 18: Device Settings > Time and Date Page

Changing Web Pages Access Password

To change the password for accessing the embedded web pages:

1. Go to the Device Settings > Security page.
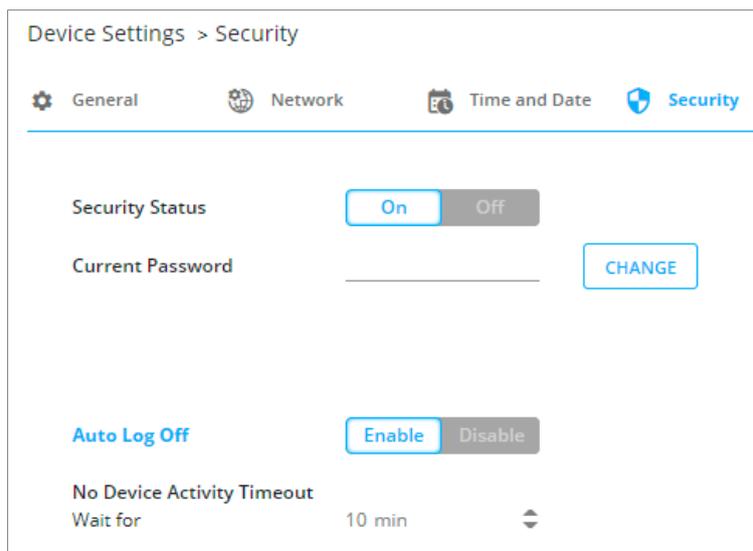
Figure 19: Device Settings > Security Page

2. Under Current Password, enter a new password and click **CHANGE**.

   The new password settings appear.

3. Enter the new password and confirmation password and click **SAVE**.

   The password is changed.

Setting Web Pages Auto Logoff Timeout

WP-20CT enables you to set the time delay before being logged out of the web pages if no activity is detected.

To set the web pages timeout:

1. Go to the Device Settings > Security page (Figure 19).

2. Under Auto Logoff, click **ENABLE** and set the timeout duration (up to 60min, never 0; default = 10min).

The web pages inactivity timeout is set.

Configuring Device Automation

Use the Automation page to configure **Kramer Maestro** V1.5 room automation for **WP-20CT**. **Kramer Maestro** is a powerful software tool that enables you to configure trigger-based room control and automation scenarios without the need for complicated programming.

To use Maestro control and automation, you need to define triggers that, upon an event, execute scripts which include a sequence of actions (commands, which can appear in different scenarios) that can be carried out via any defined ports.

Download the **Kramer Maestro** User Manual from the Kramer web site at www.kramerav.com/downloads/WP-20CT to learn how to use **Kramer Maestro**.

ⓘ Note that all the ports, actions and triggers that are relevant to **WP-20CT** are included in the **Kramer Maestro** interface, as well as ports, actions and triggers that are relevant to other Kramer devices.

Configuring Ports

Maestro enables configuring the ports used to control specific room devices. For a full list of default ports (see Ports List on page 37).
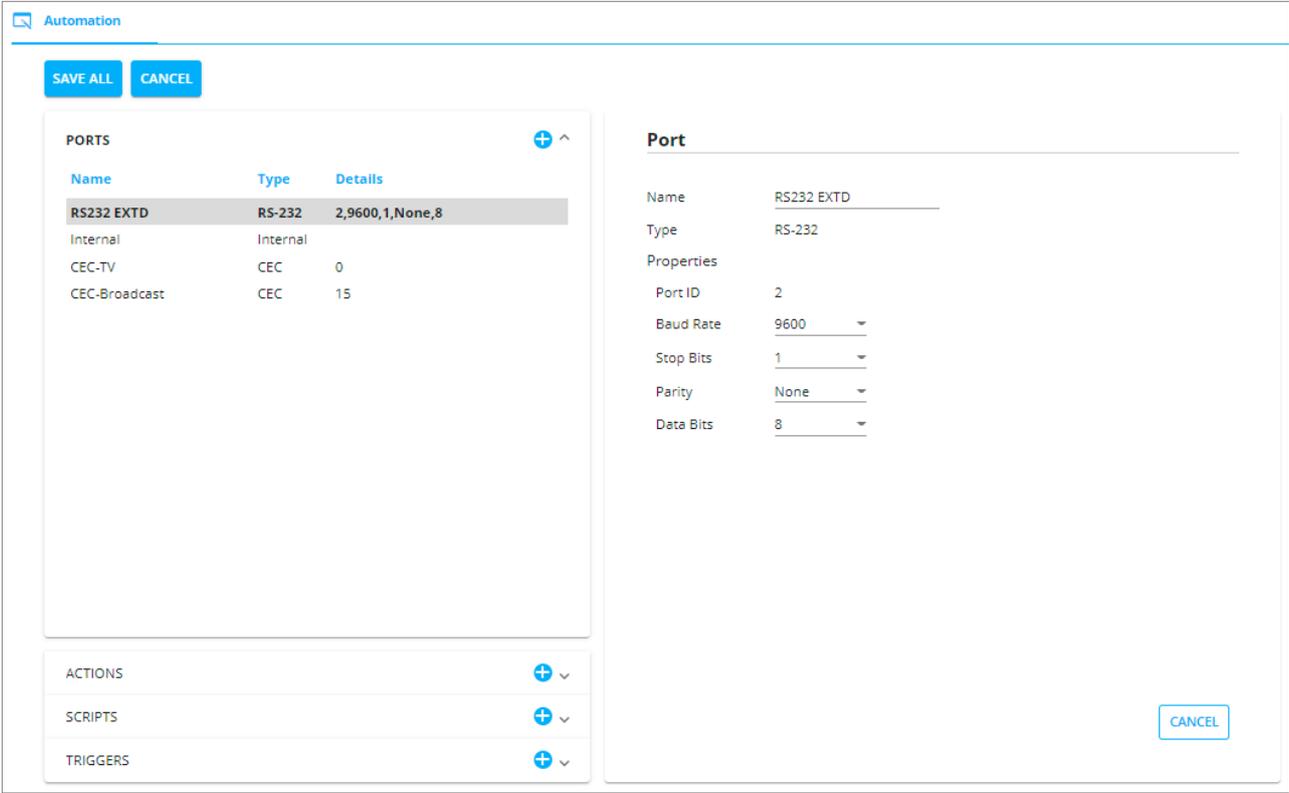
Figure 20: Maestro Page – Ports List

Configuring Actions

In the Actions tab you can create new commands, and also view and edit the default commands (see Actions List on page 37) that are device specific.
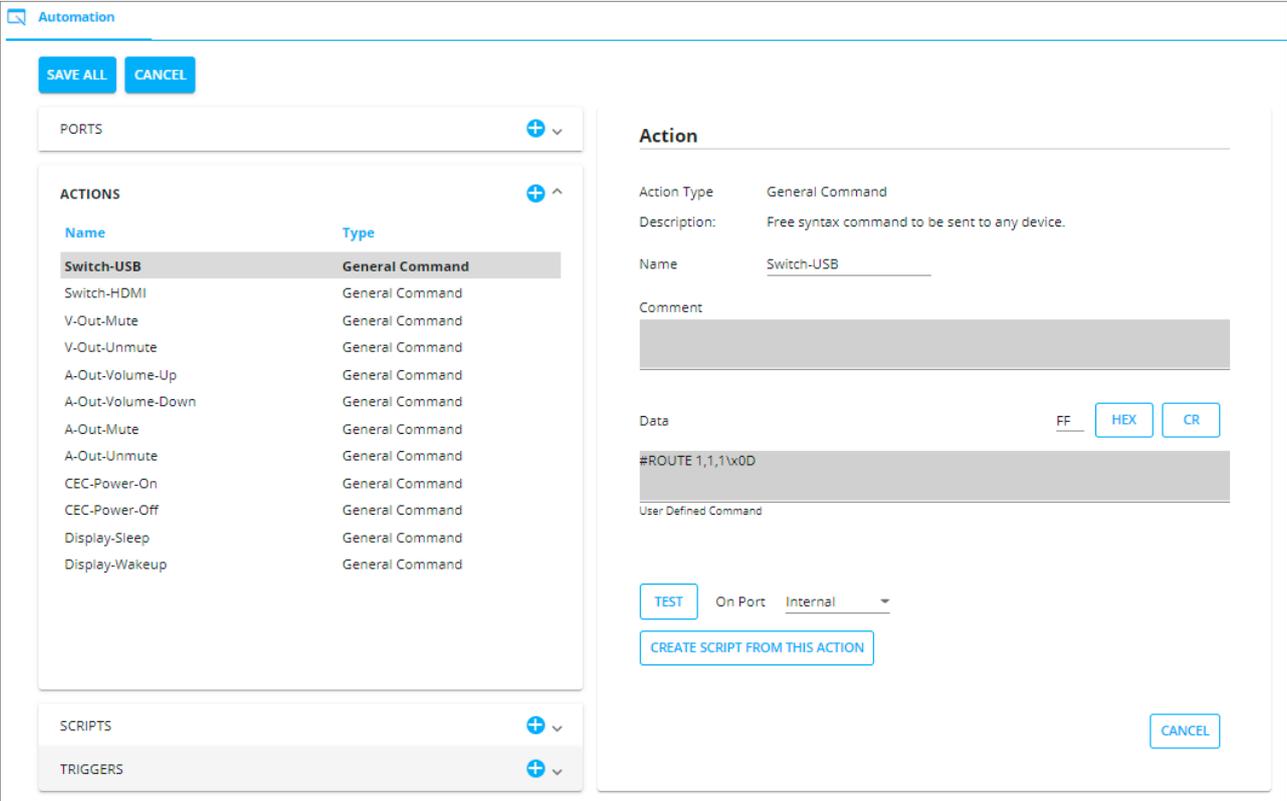
Figure 21: Maestro Page – Actions List

You can add actions by duplicating an action from the list of built-in actions and changing it as required, or by a creating new action altogether (see www.kramerav.com/downloads/WP-20CT).

Configuring Scripts

A script includes several actions. You can add commands to an existing script, create new scripts or use the available built-in scripts (see Scripts List on page 38). For example, click the Presentation Start script to view its list of actions.
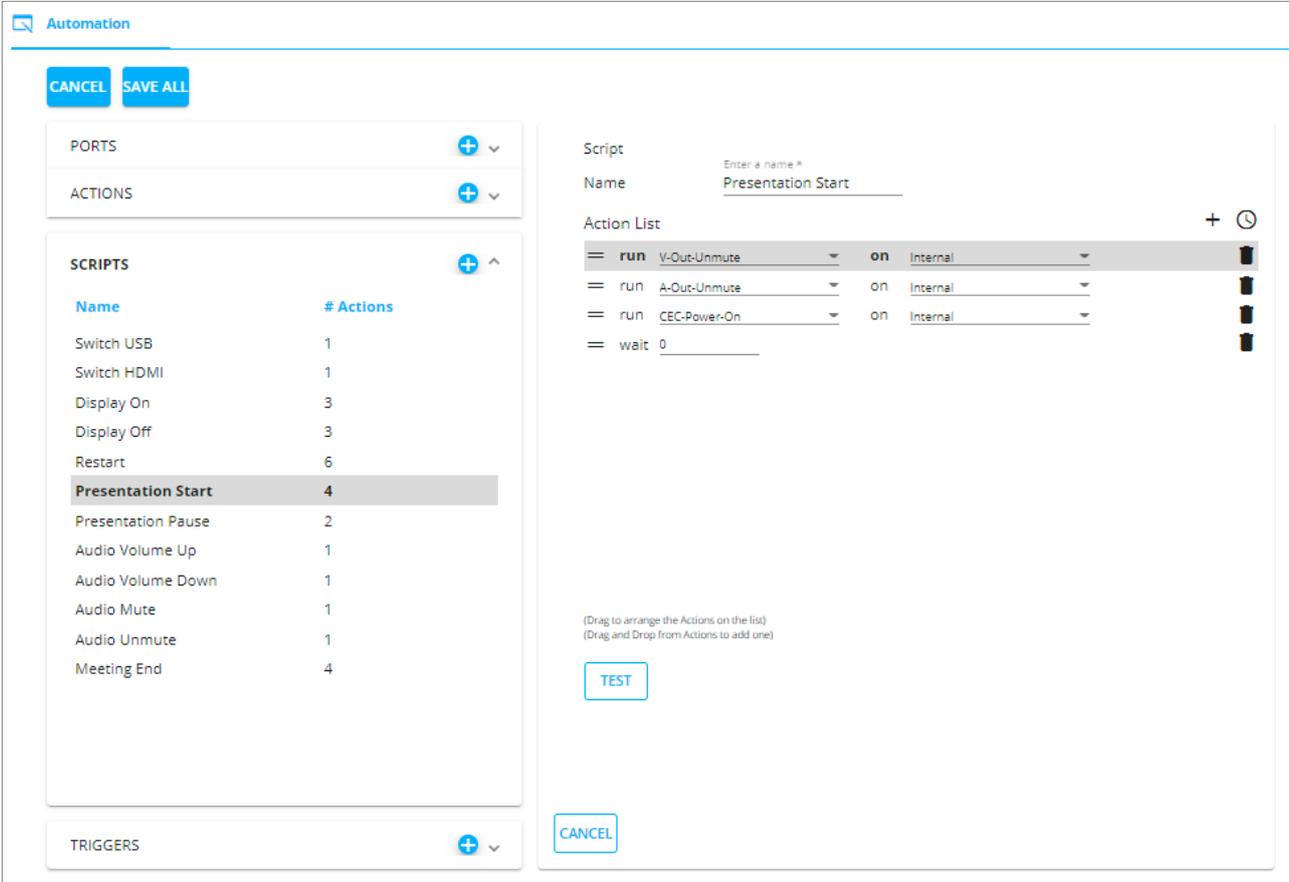
Figure 22: Maestro Page – Scripts List

You can add, delete, or change the order of the actions in the list.

Configuring Triggers

The trigger is a predefined event that, when activated, causes the script associated to it to run. For example, click the built-in First On trigger that triggers the Presentation Start script so that when an active input signal is detected, the Presentation Start script runs automatically. See list of default triggers in .

Figure 23: Automation Page – Triggers List

You can add, delete, or modify a trigger (see www.kramerav.com/downloads/WP-20CT).

Maintaining Device

WP-20CT enables you to perform the following maintenance activities:

- Upgrading Firmware on page 34.
- Monitoring Device Status on page 34.

Upgrading Firmware

To upgrade the device firmware:

1. Go to the Device Settings > General page (Figure 16).
2. Under General Preferences, click **UPGRADE** and open the relevant firmware file and follow the instructions.

Monitoring Device Status

Go to the Diagnostics page Status tab to monitor overall device status, internal device temperature, and input/output activity status.

> ⓘ For Heat status, when the temperature is in the normal range (up to 85°C), the indication light appears green; when above normal (85° to 90°C), appears orange, when it exceeds temperature limits (over 90°C) the indication light appears red.

Viewing Status Diagnostics

To view status diagnostics:

1. Go to the Diagnostics > Status. The Diagnostics page appears.
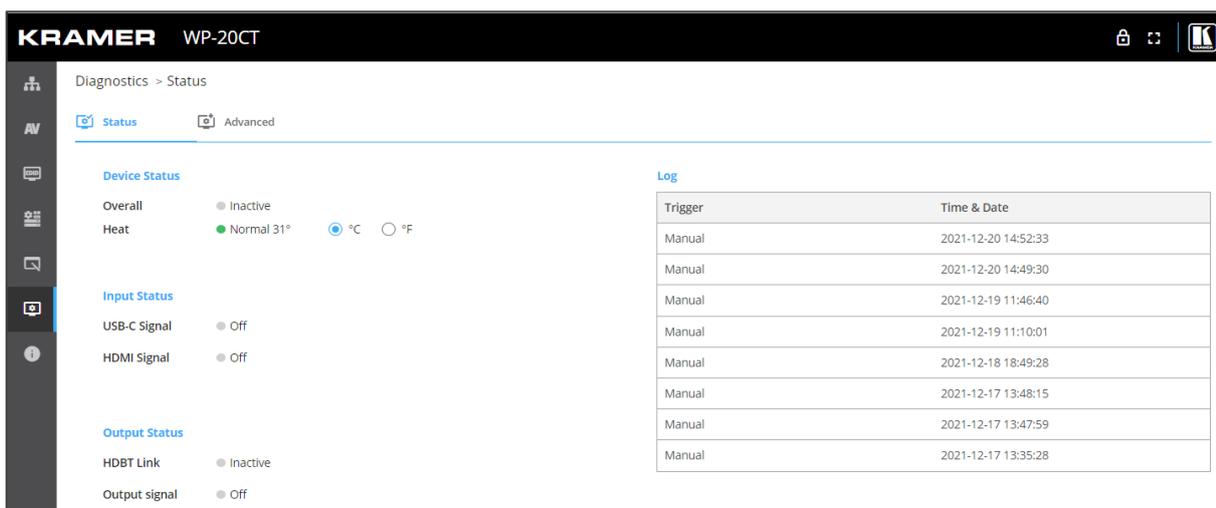
Figure 24: Diagnostics – Status Tab

2. Set Heat temperature to Celsius or Fahrenheit.
3. View inputs signal status.

4. View HDBT Link status:

    ▪ **Inactive** indication off – the receiver is connected (linked) to the output.

    ▪ **Inactive** indication on – a receiver is not connected to the output.

5. On the window right-hand side, view the reset log (auto or manual).

Status diagnostics are viewed.

Viewing Advanced Diagnostics

To view status diagnostics:

1. Go to the Diagnostics > Status. The Diagnostics page appears.

2. Click **Advanced** tab. The Advanced tab appears.

Figure 25: Diagnostics – Advanced Tab

3. Under Traffic Counters, view the Sent and Received CEC commands to and from the display.

4. Perform the following actions if required:

    ▪ Click ⊗ to clear the sent / received CEC command counters.

    ▪ Click **CLEAR ALL** to clear both sent and received counters.

    ▪ Click **REFRESH ALL** to refresh counting status view.

5. On the window right-hand side, view the event log and click:

    ▪ REFRESH, to refresh the list.

    ▪ EXPORT, to export the log to text file.

Advanced diagnostics are viewed.

Technical Specifications

Inputs	1 DP Alt Mode & PD 3.0 USB-C	On a USB type-C connector
	1 HDMI	On HDMI connector
Outputs	1 HDBaseT	On an RJ-45 connector
	1 Unbalanced Stereo Audio	On 3-pin terminal block connector
Ports	1 RS-232	On a 3-pin terminal block for serial link extension
	1 RS-232	On a 3-pin terminal block for device serial control
	1 DC Power Input	On a 2-pin terminal block connector
Video	Max. Data Rate	10.2Gbps (3.4Gbps per graphic channel)
	Max. Resolution	4K@60Hz (4:2:0) 24bpp resolution
	HDMI Support	Deep color, x.v.Color™, lip sync, HDMI uncompressed audio channels, Dolby TrueHD, DTS HD, 2K, 4K, and 3D as specified in HDMI 2.0
	Compliance	HDCP 2.3 & 1.4
Extension line	Up to 40m (130ft)	At 4K @60Hz (4:2:0)
	Up to 70m (230ft)	At full HD (1080p @60Hz 36bpp)
	Note	To achieve specified extension distances, use the recommended Kramer HDBaseT cables.
	Compliance	HDBaseT 1.0
Extended RS-232	Baud rate	300 to 115200
Control RS-232	Baud Rate	115200
Power	Source	12V DC 2A (included) 20V DC 6A (optional) PoE
	Consumption	12V: 0.6A 20V: 3.7A
	Standby Power Savings	12V: ~5W 20V: ~71W
Environmental Conditions	Operating Temperature	0° to +40°C (32° to 104°F)
	Storage Temperature	–40° to +70°C (–40° to 158°F)
	Humidity	10% to 90%, RHL non–condensing
Enclosure	Cooling	Convection
	Type	Aluminum
	Size	1 Gang
Regulatory Compliance (Standards Compliance)	Environmental	RoHs, WEEE, and CE
Accessories	Included	12V Power adapter, multi signal USB-C 1m cable

Specifications are subject to change without notice at www.kramerav.com

Default Communication Parameters

RS-232	
Baud Rate:	115,200
Data Bits:	8
Stop Bits:	1
Parity:	None
Command Format:	ASCII
Example (Set the auto switching timeout to 5 seconds in the event of 5V disable when no input signal is detected):	#AV-SW-TIMEOUT 4,5<CR>
IP	
IP Address:	192.168.1.39
Subnet mask:	255.255.255.0
Default gateway:	192.168.1.39
TCP Port #:	5000
UDP Port #	50000
Default username:	Admin
Default password:	Admin
Full Factory Reset	
Embedded Web Pages:	Click **Reset** on the Device Settings > General page.

Default Control and Automation Settings

Ports List

Port Name	Type	Port Properties	Port Description	Comment
CEC-TV	CEC	0		
CEC-Broadcast	CEC	15		
Local-serial Service	RS232	2, 9600, 1, None, 8	Local serial port	For custom use
Device-internal	Internal			

Actions List

Action Name	Commands List	On Port	Comment
Switch-USB	#ROUTE 1,1,1\x0D	Device-internal	USB web-UI
Switch-HDMI	#ROUTE 1,1,2\x0D		USB web-UI
V-Out-Mute	#VMUTE 1,1\x0D		Display sleep via USB web-UI
V-Out-Unmute	#VMUTE 1,0\x0D		Display wake-up via USB web-UI
A-Out-Volume-Up	#AUD-LVL 1,1,++\x0D		USB web-UI audio output port action
A-Out-Volume-Down	#AUD-LVL 1,1,--\x0D		
A-Out-Mute	#AUD-MUTE 1,1\x0D		
A-Out-Unmute	#AUD-MUTE 1,0\x0D		
CEC-Power-On	0x04	CEC-TV	
CEC-Power-Off	0x36	CEC-Broadcast	
Display-Sleep	#VMUTE 1,1\x0D	Device-internal	
Display-Wakeup	#VMUTE 1,0\x0D		

Scripts List

Script Name	Actions List	Relevant Ports	Comment
Switch HDMI	Switch-HDMI	Device-internal	Web-UI button
Switch USB	Switch-USB	Device-internal	Web-UI button
Display On	V-Out-Unmute Wait (0) CEC-Power-On	Device-internal, - CEC-TV	Trigger
Display Off	V-Out-Mute Wait (900) CEC-Power-Off	Device-internal, - CEC-Broadcast	Trigger
Restart	Wait 2sec V-Out-Mute A-Out-Mute Wait 1sec CEC-Power-Off Wait 0sec	- Device-internal, Device-internal, - CEC-Broadcast, -	Trigger
Presentation Start	V-Out-Unmute A-Out-Unmute CEC-Power-On Wait 0sec	Device-internal, Device-internal, CEC-TV, -	Trigger
Presentation Pause	V-Out-Mute A-Out-Mute Wait 0sec	Device-internal, Device-internal, -	Trigger
Audio Volume Up	A-Out-Volume-Up	Device-internal	Web-UI button
Audio Volume Down	A-Out-Volume-Down	Device-internal	Web-UI button
Audio Mute	A-Out-Mute	Device-internal	Web-UI button
Audio Unmute	A-Out-Unmute	Device-internal	Web-UI button
Meeting End	V-Out-Mute A-Out-Mute CEC-Power-Off Wait 0sec	Device-internal, Device-internal, CEC-Broadcast, -	Schedule-trigger

Triggers List

The following triggers are included in the default Maestro automation parameters:

Trigger Name	Description	Triggered Script	Comment
First IN Plugged	1st input connected	Presentation Start	First ON
Last IN Unplugged	Last input disconnected	Presentation Pause	Last Off
5V On (Input detected)	When input activity is detected	Display On	
5V Off (No input detected)	When "delay power off" timeout period expires with no input activity	Display Off	
Power On	Device powered on	Restart	This recommended trigger is NOT included in Maestro default settings to prevent undesired auto-triggering of its associated script. You may set the trigger accordingly upon device installation or later. (i) This script works well when the room is inactive (e.g. at night time, turning off active TVs), but may cause disruption when running during actual meetings.
After Office Hours	Prescheduled event occurred	Meeting End	This recommended trigger is NOT included in Maestro default settings to prevent undesired auto-triggering of its associated script. You can set the trigger accordingly upon device installation or later and customize the After Office Hours duration according to your needs. For example, set After Office Hours Day/Time scheduling to: Monday-to-Friday: 18:00 Saturday-Sunday: 00:00.

Default EDID

```
Model name.............. WP-20CT
 Manufacturer............ KMR
 Plug and Play ID........ KMR1200
 Serial number........... 295-883450100
 Manufacture date........ 2018, ISO week 255
 Filter driver........... None
 ------------------------
 EDID revision........... 1.3
 Input signal type....... Digital
 Color bit depth......... Undefined
 Display type............ Monochrome/grayscale
 Screen size............. 520 x 320 mm (24.0 in)
 Power management........ Standby, Suspend, Active off/sleep
 Extension blocs......... 1 (CEA-EXT)
 ------------------------
 DDC/CI.................. n/a

Color characteristics
 Default color space...... Non-sRGB
 Display gamma............ 2.20
 Red chromaticity........ Rx 0.674 - Ry 0.319
```

Green chromaticity....... Gx 0.188 - Gy 0.706
Blue chromaticity........ Bx 0.148 - By 0.064
White point (default).... Wx 0.313 - Wy 0.329
Additional descriptors... None

Timing characteristics
Horizontal scan range.... 30-83kHz
Vertical scan range...... 56-76Hz
Video bandwidth.......... 170MHz
CVT standard............. Not supported
GTF standard............. Not supported
Additional descriptors... None
Preferred timing......... Yes
Native/preferred timing.. 1920x1080p at 60Hz (16:9)
  Modeline............... "1920x1080" 148.500 1920 2008 2052 2200 1080 1084 1089 1125 +hsync +vsync

Standard timings supported
  720 x 400p at 70Hz - IBM VGA
  720 x 400p at 88Hz - IBM XGA2
  640 x 480p at 60Hz - IBM VGA
  640 x 480p at 67Hz - Apple Mac II
  640 x 480p at 72Hz - VESA
  640 x 480p at 75Hz - VESA
  800 x 600p at 56Hz - VESA
  800 x 600p at 60Hz - VESA
  800 x 600p at 72Hz - VESA
  800 x 600p at 75Hz - VESA
  832 x 624p at 75Hz - Apple Mac II
 1024 x 768i at 87Hz - IBM
 1024 x 768p at 60Hz - VESA
 1024 x 768p at 70Hz - VESA
 1024 x 768p at 75Hz - VESA
 1280 x 1024p at 75Hz - VESA
 1152 x 870p at 75Hz - Apple Mac II
 1280 x 1024p at 75Hz - VESA STD
 1280 x 1024p at 85Hz - VESA STD
 1600 x 1200p at 60Hz - VESA STD
 1024 x 768p at 85Hz - VESA STD
  800 x 600p at 85Hz - VESA STD
  640 x 480p at 85Hz - VESA STD
 1152 x 864p at 70Hz - VESA STD
 1280 x 960p at 60Hz - VESA STD

EIA/CEA-861 Information
Revision number.......... 3
IT underscan............. Supported
Basic audio.............. Supported
YCbCr 4:4:4.............. Not supported
YCbCr 4:2:2.............. Not supported
Native formats........... 1
Detailed timing #1....... 1920x1080p at 60Hz (16:10)
  Modeline............... "1920x1080" 148.500 1920 2008 2052 2200 1080 1084 1089 1125 +hsync +vsync
Detailed timing #2....... 1920x1080i at 60Hz (16:10)
  Modeline............... "1920x1080" 74.250 1920 2008 2052 2200 1080 1084 1094 1124 interlace +hsync +vsync
Detailed timing #3....... 1280x720p at 60Hz (16:10)
  Modeline............... "1280x720" 74.250 1280 1390 1430 1650 720 725 730 750 +hsync +vsync
Detailed timing #4....... 720x480p at 60Hz (16:10)
  Modeline............... "720x480" 27.000 720 736 798 858 480 489 495 525 -hsync -vsync

CE audio data (formats supported)
  LPCM   2-channel, 16/20/24 bit depths at 32/44/48 kHz

CE video identifiers (VICs) - timing/formats supported
  1920 x 1080p at 60Hz - HDTV (16:9, 1:1) [Native]
  1920 x 1080i at 60Hz - HDTV (16:9, 1:1)
  1280 x 720p at 60Hz - HDTV (16:9, 1:1)
   720 x 480p at 60Hz - EDTV (16:9, 32:27)
   720 x 480p at 60Hz - EDTV (4:3, 8:9)
   720 x 480i at 60Hz - Doublescan (16:9, 32:27)
   720 x 576i at 50Hz - Doublescan (16:9, 64:45)
   640 x 480p at 60Hz - Default (4:3, 1:1)
  NB: NTSC refresh rate = (Hz*1000)/1001

CE vendor specific data (VSDB)
 IEEE registration number. 0x000C03
 CEC physical address..... 1.0.0.0
 Maximum TMDS clock....... 165MHz

CE speaker allocation data
 Channel configuration.... 2.0
 Front left/right......... Yes
 Front LFE................ No

WP-20CT – Technical Specifications

Front center............. No
Rear left/right.......... No
Rear center............. No
Front left/right center.. No
Rear left/right center... No
Rear LFE................ No

Report information
  Date generated.......... 26/08/2019
  Software revision........ 2.60.0.972
  Data source............. File - NB: improperly installed
  Operating system......... 6.2.9200.2

Raw data
00,FF,FF,FF,FF,FF,FF,00,2D,B2,00,12,00,00,00,00,FF,1C,01,03,80,34,20,78,E2,B3,25,AC,51,30,B4,26,
10,50,54,FF,FF,80,81,8F,81,99,A9,40,61,59,45,59,31,59,71,4A,81,40,02,3A,80,18,71,38,2D,40,58,2C,
45,00,A0,5A,00,00,00,1E,00,00,00,FF,00,32,39,35,2D,38,38,33,34,35,30,31,30,30,00,00,00,FC,00,56,
53,2D,34,31,31,58,0A,20,20,20,20,20,00,00,00,FD,00,38,4C,1E,53,11,00,0A,20,20,20,20,20,20,01,AA,
02,03,1B,C1,23,09,07,07,48,90,05,04,03,02,07,16,01,65,03,0C,00,10,00,83,01,00,00,02,3A,80,18,71,
38,2D,40,58,2C,45,00,07,44,21,00,00,1E,01,1D,80,18,71,1C,16,20,58,2C,25,00,07,44,21,00,00,9E,01,
1D,00,72,51,D0,1E,20,6E,28,55,00,07,44,21,00,00,1E,8C,0A,D0,8A,20,E0,2D,10,10,3E,96,00,07,44,21,
00,00,18,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,77

Protocol 3000

Kramer devices can be operated using Kramer Protocol 3000 commands sent via serial or Ethernet ports.

Understanding Protocol 3000

Protocol 3000 commands are a sequence of ASCII letters, structured according to the following.

- **Command format**:

Prefix	Command Name	Constant (Space)	Parameter(s)	Suffix
#	Command	␣	Parameter	**<CR>**

- **Feedback format**:

Prefix	Device ID	Constant	Command Name	Parameter(s)	Suffix
~	nn	@	Command	Parameter	**<CR><LF>**

- **Command parameters** – Multiple parameters must be separated by a comma (,). In addition, multiple parameters can be grouped as a single parameter using brackets ([and]).

- **Command chain separator character** – Multiple commands can be chained in the same string. Each command is delimited by a pipe character (|).

- **Parameters attributes** – Parameters may contain multiple attributes. Attributes are indicated with pointy brackets (<…>) and must be separated by a period (.).

The command framing varies according to how you interface with **WP-20CT**. The following figure displays how the # command is framed using terminal communication software (such as Hercules):
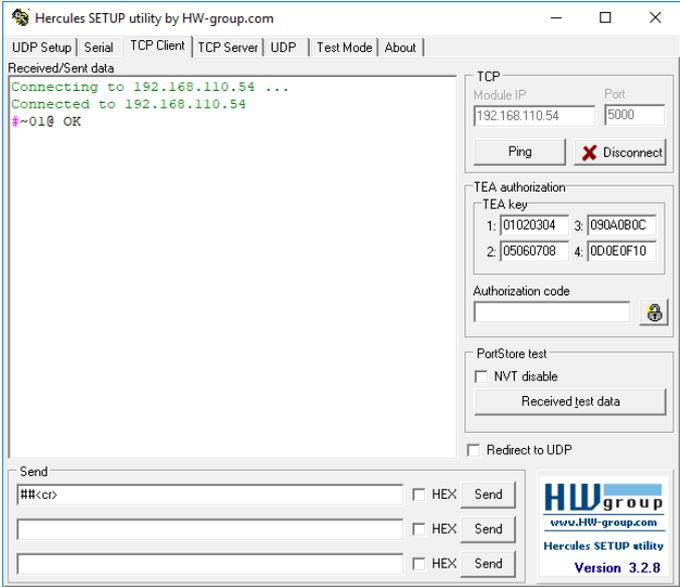
Protocol 3000 Commands

Function	Description	Syntax	Parameters/Attributes	Example

#	Protocol handshaking.
	
	ⓘ Validates the Protocol 3000 connection and gets the machine number.
	
	Step-in master products use this command to identify the availability of a device.
		COMMAND
		`#<CR>`
		FEEDBACK
		`~nn@␣ok<CR><LF>`
				`#<CR>`

AUD-LVL	Set volume level.	**COMMAND**
		`#AUD-LVL␣io_mode,io_index,vol_level<CR>`
		FEEDBACK
		`~nn@AUD-LVL␣io_mode,io_index,vol_level<CR><LF>`
			`io_mode` –
			  1 – Output
			`io_index` – 1
			`vol_level` – Volume level -100db to 15dB;
			++ (increase current value by 1dB);
			–– (decrease current value by 1dB)
				Set AUDIO OUT level to -50.0dB:
				`#AUD-LVL␣1,1,-50.0<CR>`

AUD-LVL?	Get volume level.	**COMMAND**
		`#AUD-LVL?␣io_mode,io_index<CR>`
		FEEDBACK
		`~nn@AUD-LVL␣io_mode,io_index,vol_level<CR><LF>`
			`io_mode` –
			  1 – Output
			`io_index` – 1
			`vol_level` – Volume level -100db to 15dB;
				Get AUDIO OUT level:
				`#AUD-LVL?␣1,1<CR>`

AUD-LVL-RANGE?	Get volume level min and max range.	**COMMAND**
		`#AUD-LVL-RANGE?␣io_mode,io_index<CR>`
		FEEDBACK
		`~nn@AUD-LVL-RANGE␣io_mode,io_index,min_val,max_val<CR><LF>`
			`io_mode` –
			  1 – Output
			`io_index` – 1
			`min_val` – -100db
			`max_val` – 15dB
				Get AUDIO OUT level range:
				`#AUD-LVL-RANGE?␣1,1<CR>`

AUD-MUTE	Set audio mute.	**COMMAND**
		`#AUD-MUTE␣out_index,mute_mode<CR>`
		FEEDBACK
		`~nn@AUD-MUTE␣out_index,mute_mode<CR><LF>`
			`out_index` – 1
			`mute_mode` – On/Off
			  0 – Off
			  1 – On
				Set Output 1 to mute:
				`#AUD-MUTE␣1,1<CR>`

AUD-MUTE?	Set audio mute.	**COMMAND**
		`#AUD-MUTE␣out_index<CR>`
		FEEDBACK
		`~nn@AUD-MUTE␣out_index,mute_mode<CR><LF>`
			`out_index` – 1
			`mute_mode` – On/Off
			  0 – Off
			  1 – On
				Get Output 1 to mute:
				`#AUD-MUTE␣1,1<CR>`

AUD-MUTE-PERSIST	Set the auto audio unmute status upon volume change.	**COMMAND**
		`#AUD-MUTE-PERSIST␣unmute_status<CR>`
		FEEDBACK
		`~nn@AUD-MUTE-PERSIST␣unmute_status<CR><LF>`
			`unmute_status` –
			  0 – Mute state is not persistent and changes upon volume change
			  1 – Mute state is persistent upon volume change
				Set mute mode to be persistent and not change upon volume change:
				`#AUD-MUTE-PERSIST␣1<CR>`

AUD-MUTE-PERSIST?	Get the auto audio unmute status.	**COMMAND**
		`#AUD-MUTE-PERSIST?␣<CR>`
		FEEDBACK
		`~nn@AUD-MUTE-PERSIST␣unmute_status<CR><LF>`
			`unmute_status` –
			  0 – Mute state is not persistent and changes upon volume change
			  1 – Mute state is persistent upon volume change
				Get auto unmute status upon volume change:
				`#AUD-MUTE-PERSIST?␣<CR>`

AV-SW-MODE	Set input auto switch mode (per output).	**COMMAND**
		`#AV-SW-MODE␣layer_type,out_index,connection_mode<CR>`
		FEEDBACK
		`~nn@AV-SW-MODE␣layer_type,out_index,connection_mode<CR><LF>`
			`layer_type` – Number that indicates the signal type:
			  1 – Video
			  2 – Audio
			`out_index` – 1
			`connection_mode` – Connection mode
			  0 – manual
			  1 – priority switch
			  2 – last connected switch
				Set the input audio switch mode to Manual for HDMI OUT:
				`#AV-SW-MODE␣1,1,0<CR>`

AV-SW-MODE?	Get input auto switch mode (per output).	**COMMAND**
		`#AV-SW-MODE?␣layer_type,out_index<CR>`
		FEEDBACK
		`~nn@AV-SW-MODE␣layer_type,out_index,connection_mode<CR><LF>`
			`layer_type` – Number that indicates the signal type:
			  1 – Video
			  2 – Audio
			`out_index` – 1
			`connection_mode` – Connection mode
			  0 – manual
			  1 – priority switch
			  2 – last connected switch
				Get the input audio switch mode for HDMI OUT:
				`#AV-SW-MODE?␣1,1<CR>`

AV-SW-TIMEOUT	Set auto switching timeout.	**COMMAND**
		`#AV-SW-TIMEOUT␣switching_mode,time_out<CR>`
		FEEDBACK
		`~nn@AV-SW-TIMEOUT␣switching_mode,time_out<CR><LF>`
			`switching_mode` – Switching mode
			  0 – Video signal lost
			  1 – New video signal detected
			  4 – Disable 5V on video output if no input signal detected
			  5 – Video cable unplugged
			  7 – Video signal lost for signal routed as a result of a manual override action
			`time_out` – Timeout in seconds
			0 - 60000
				Set the auto switching timeout to 5 seconds in the event of 5V disable when no input signal is detected:
				`#AV-SW-TIMEOUT␣4,5<CR>`

AV-SW-TIMEOUT?	Set auto switching timeout.	**COMMAND**
		`#AV-SW-TIMEOUT?␣switching_mode<CR>`
		FEEDBACK
		`~nn@AV-SW-TIMEOUT␣switching_mode,time_out<CR><LF>`
			`switching_mode` – Switching mode
			  0 – Video signal lost
			  1 – New video signal detected
			  4 – Disable 5V on video output if no input signal detected
			  5 – Video cable unplugged
			  7 – Video signal lost for signal routed as a result of a manual override action
			`time_out` – Timeout in seconds
			0 - 60000
				Get the auto switching timeout in the event of 5V disable when no input signal is detected:
				`#AV-SW-TIMEOUT?␣4<CR>`

Function	Description	Syntax	Parameters/Attributes	Example

BEACON-INFO?	Get beacon information, including IP address, UDP control port, TCP control port, MAC address, model, name.	**COMMAND**
		`#BEACON-INFO?_<CR>`
		FEEDBACK
		`~nn@BEACON-INFO_port_id,ip_string,udp_port,tcp_port,mac_address,model,name<CR><LF>`
			`port_id` – ID of the Ethernet port
			`ip_string` – Dot-separated representation of the IP address
			`udp_port` – UDP control port
			`tcp_port` – TCP control port
			`mac_address` – Dash-separated mac address
			`model` – Device model
			`name` – Device name
				Get beacon information:
				`#BEACON-INFO?_<CR>`

BUILD-DATE?	Get device build date.	**COMMAND**
		`#BUILD-DATE?_<CR>`
		FEEDBACK
		`~nn@BUILD-DATE_date,time<CR><LF>`
			`date` – Format: YYYY/MM/DD where
			 YYYY = Year
			 MM = Month
			 DD = Day
			`time` – Format: hh:mm:ss where
			 hh = hours
			 mm = minutes
			 ss = seconds
				Get the device build date:
				`#BUILD-DATE?<CR>`

CEC-GW-PORT-ACTIVE	Set the CEC activation state.	**COMMAND**
		`#CEC-GW-PORT-ACTIVE_direction_type,port_format,port_index,state<CR>`
		FEEDBACK
		`~nn@CEC-GW-PORT-ACTIVE_direction_type,port_format,port_index,state<CR><LF>'`
			`direction_type` – Direction of the port: out
			`port_format` – Type of signal on the port: hdbt
			`port_index` – The port number: 1
			`state` – Global gateway activation state:
			 o 0 – as a passthrough
			 o 1 – as a gateway
				Activate CEC for the HDBaseT port as a passthrough:
				`#CEC-GW-PORT-ACTIVE_in,hdmi,1,0<CR>`

CEC-GW-PORT-ACTIVE?	Get the CEC activation state.	**COMMAND**
		`#CEC-GW-PORT-ACTIVE?_direction_type,port_format,port_index<CR>`
		FEEDBACK
		`~nn@CEC-GW-PORT-ACTIVE_direction_type,port_format,port_index,state<CR><LF>'`
			`direction_type` – Direction of the port: out
			`port_format` – Type of signal on the port: hdbt
			`port_index` – The port number: 1
			`state` – Global gateway activation state:
			 o 0 – as a passthrough
			 o 1 – as a gateway
				Get the Activate CEC status for the HDBaseT port as a passthrough:
				`#CEC-GW-PORT-ACTIVE_in,hdmi,1<CR>`

CEC-NTFY-ACTIVE	Set CEC notification activity (valid until the next power up).	**COMMAND**
		`#CEC-NTFY-ACTIVE_cec_ntf<CR>`
		FEEDBACK
		`~nn@CEC-NTFY-ACTIVE_cec_ntf<CR><LF>`
			`cec_ntf` –
			0 – Inactive
			1 – Active
				Enable CEC notification:
				`#CEC-NTFY-ACTIVE_1<CR>`

AUD-NTFY-ACTIVE?	Get CEC notification activity status.	**COMMAND**
		`#CEC-NTFY-ACTIVE?_<CR>`
		FEEDBACK
		`~nn@CEC-NTFY-ACTIVE_cec_ntf<CR><LF>`
			`cec_ntf` –
			0 – Inactive
			1 – Active
				Get CEC notification activity status::
				`#CEC-NTFY-ACTIVE?_<CR>`

CEC-MEMBERS?	Get list of CEC logical addresses.	**COMMAND**
		`#CEC-MEMBERS?_port_index<CR>`
		FEEDBACK
		`~nn@CEC-MEMBERS_port_index,<la1>,<la2>...<CR><LF>`
			`Port_index` – 1
			`la` – 1 to 15
				Set gateway members:
				`#CEC-MEMBERS?_1<CR>`

CEC-SND	Send CEC command to port.	**COMMAND**
		`#CEC-SND_port_index,sn_id,cmd_name,cec_len,cec_command<CR>`
		FEEDBACK
		`~nn@CEC-SND_port_index,sn_id,cmd_name,cec_mode<CR><LF>`
			`port_index` – CEC port transmitting the command: 1
			`sn_id` – 1
			`cmd_name` – command name
			`cec_len` – 1–16
			`cec_command` – CEC format command (in HEX format, no leading zeros, no '0x' prefix)
			`cec_mode` – CEC mode
			 0 – Sent
			 1 – Gateway disabled
			 2 – Inactive CEC-Master
			 3 – Busy
			 4 – Illegal Message Parameter
			 5 – Illegal CEC Address Parameter
			 6 – Illegal CEC Command
			 7 – Timeout
			 8 – Error
				Send TV-OFF CEC command to the HDBaseT port:
				`#CEC-SND_1,1,TV-OFF,2,e004<CR>`

COUNTER?	Get the sent or received CEC messages count.	**COMMAND**
		`#COUNTER?_category_id,sub_category_id<CR>`
		FEEDBACK
		`~nn@COUNTER_category_id,sub_category_id,count<CR><LF>`
			`category_id` – CEC messages: 0
			`Sub_category_id` – Type of message:
			 0 – Sent message
			 1 – Received message
			`count` – Number range: 0-65535
				Get the number of sent messages:
				`#COUNTER?_0,0<CR>`

COUNTER-CLR	Clear CEC messages.	**COMMAND**
		`#COUNTER-CLR?_category_id,sub_category_clr<CR>`
		FEEDBACK
		`~nn@COUNTER-CLR_category_id,sub_category_id,count<CR><LF>`
			`category_id` – CEC messages: 0
			`Sub_category_clr` – Type of message to clear:
			 0 – Clear sent messages
			 1 – Clear received messages
			 * – Clear all CEC messages
				Clear all CEC messages:
				`#COUNTER-CLR?_0,*<CR>`

Function	Description	Syntax	Parameters/Attributes	Example
CPEDID	Copy EDID data from the output to the input EEPROM. ⓘ Destination bitmap size depends on device properties (for 64 inputs it is a 64-bit word). Example: bitmap 0x0013 means inputs 1,2 and 5 are loaded with the new EDID. In certain products Safe_mode is an optional parameter. See the HELP command for its availability.	**COMMAND** **#CPEDID␣**edid_io,src_id,edid_io,dest_bitmap**<CR>** or **#CPEDID␣**edid_io,src_id,edid_io,dest_bitmap,safe_mode**<CR>** **FEEDBACK** **~nn@CPEDID␣**edid_io,src_id,edid_io,dest_bitmap**<CR><LF>** **~nn@CPEDID␣**edid_io,src_id,edid_io,dest_bitmap,safe_mode**<CR><LF>**	**edid_io** – *EDID* source type (usually output) 0 – Input 1 – Output 2 – Default EDID 3 – Custom EDID **src_id** – Number of chosen source stage 0 – Default EDID source 1 – HDBaseT OUT or USB-C IN 2 – HDMI IN **edid_io** – *EDID destination* type 0 – Input **dest_bitmap** – Bitmap representing destination IDs. Format: XXXX…X, where X is hex digit. The binary form of every hex digit represents corresponding destinations. 0 – indicates that EDID data is not copied to this destination. 1 – indicates that EDID data is copied to this destination. **safe_mode** – Safe mode (optional parameter) 0 – device accepts the EDID as is without trying to adjust (default value if no parameter is sent) 1 – device tries to adjust the EDID	Copy the EDID data from the HDBaseT Output to the HDMI Input: **#CPEDID␣**1,1,0,0x1**<CR>**
CS-CONVERT	Set the "force RGB color space" convert mode.	**COMMAND** **#CS-CONVERT␣**out_index,cs_mode**<CR>** **FEEDBACK** **~nn@CS-CONVERT␣**out_index,cs_mode**<CR><LF>'**	**out_index** – The port number: 1 **cs_mode** – color space mode: ○ 0 – Color space pass (default) ○ 1 – Enable "force RGB color space" convert mode	Enable force RGB color space: **#CS-CONVERT␣**1,1**<CR>**
CS-CONVERT?	Get the "force RGB color space" convert mode.	**COMMAND** **#CS-CONVERT?␣**out_index**<CR>** **FEEDBACK** **~nn@CS-CONVERT␣**out_index,cs_mode**<CR><LF>'**	**out_index** – The port number: 1 **cs_mode** – color space mode: ○ 0 – Color space pass (default) ○ 1 – Enable "force RGB color space" convert mode	Get force RGB color space mode: **#CS-CONVERT?␣**1**<CR>**
DEV-STATE?	Get the device state.	**COMMAND** **#DEV-STATE?␣<CR>** **FEEDBACK** **~nn@DEV-STATE␣**dev_state**<CR><LF>'**	**dev_state** – device state 0 – Active 1 – Power-on and no connected AV I/O ports (detecting cable connection faults) 2 – Power-on and standby (low power; cables are either connected or not)	Get device status: **#DEV-STATE?␣<CR>**
DISPLAY?	Get output HPD status.	**COMMAND** **#DISPLAY?␣**out_index**<CR>** **FEEDBACK** **~nn@DISPLAY␣**out_index,status**<CR><LF>**	**out_index** – Number that indicates the specific output: 1 **status** – HPD status according to signal validation 0 – Signal or sink is not valid 1 – Signal or sink is valid 2 – Sink and EDID is valid	Get the output HPD status of Output 1: **#DISPLAY?␣**1**<CR>**
EDID-DC	Force removal of deep color on EDID or leaving it as in the original EDID.	**COMMAND** **#EDID-DC␣**in_index,deep_color_state**<CR>** **FEEDBACK** **~nn@EDID-DC␣**in_index,deep_color_state**<CR><LF>**	**in_index** – Number that indicates the specific input: 1 – Input 1 2 – Input 2 **deep_color_state** – 0 – Don't change 1 – Remove deep color	Remove deep color on EDID for input 1. **#EDID-DC␣**1,1**<CR>**
EDID-DC?	Get deep color status on EDID.	**COMMAND** **#EDID-DC?␣**in_index **<CR>** **FEEDBACK** **~nn@EDID-DC␣**in_index,deep_color_state**<CR><LF>**	**in_index** – Number that indicates the specific input: 1 – Input 1 2 – Input 2 **deep_color_state** – 0 – Don't change 1 – Remove deep color	Get deep color state on EDID for input 2. #EDID-DC?␣2**<CR>**
ETH-PORT	Set Ethernet port protocol. ⓘ If the port number you enter is already in use, an error is returned. The port number must be within the following range: 0-(2^16-1).	**COMMAND** **#ETH-PORT␣**port_type,port_id**<CR>** **FEEDBACK** **~nn@ETH-PORT␣**port_type,port_id**<CR><LF>**	**port_type** – TCP/UDP **port_id** – TCP/UDP port number (0 – 65535)	Set the Ethernet port protocol for TCP to 12457: **#ETH-PORT␣**TCP,12457**<CR>**
ETH-PORT?	Get Ethernet port protocol. ⓘ If the port number you enter is already in use, an error is returned. The port number must be within the following range: 0-(2^16-1).	**COMMAND** **#ETH-PORT?␣**port_type**<CR>** **FEEDBACK** **~nn@ETH-PORT␣**port_type,port_id**<CR><LF>**	**port_type** – TCP/UDP **port_id** – TCP/UDP port number (0 – 65535)	Get the Ethernet port protocol for UDP: **#ETH-PORT?␣**UDP**<CR>**

Function	Description	Syntax	Parameters/Attributes	Example

FACTORY	Reset device to factory default configuration.
	
	ⓘ This command deletes all user data from the device. The deletion can take some time.
	
	Your device may require powering off and powering on for the changes to take effect.
		COMMAND
		`#FACTORY<CR>`
		FEEDBACK
		`~nn@FACTORY_ok<CR><LF>`
				Reset the device to factory default configuration:
				`#FACTORY<CR>`

HDBT-STAT?	Get HDBT link status.	**COMMAND**
		`#HDBT-STAT?_io_mode,in_index,status_type<CR>`
		FEEDBACK
		`~nn@HDBT-STAT_io_mode,in_index,status_type,status<CR><LF>`
			`io_mode` – Input/Output
			　0– Input
			　1 – Output
			`io_index` – Number that indicates the specific number of inputs or outputs (based on io_mode):
			　1 – HDBaseT OUT
			`Status_type` – HDBT status:
			　0– Link
			`status` – HDBT status:
			　0– No link
			　1– Link
				Get the HDBT link status:
				`#HDBT-STAT?_0,1,0<CR>`

HDCP-MOD	Set HDCP mode.
	
	ⓘ Get HDCP working mode on the device input:
	
	HDCP supported – HDCP ON [default].
	
	HDCP not supported - HDCP OFF.
	
	HDCP support changes following detected sink - MIRROR OUTPUT.
		COMMAND
		`#HDCP-MOD_in_index,mode<CR>`
		FEEDBACK
		`~nn@HDCP-MOD_in_index,mode<CR><LF>`
			`in_index` – Number that indicates the specific input:
			　1 – USB-C IN
			　2 – HDMI IN
			`mode` – HDCP mode:
			　0 – HDCP Off
			　1 – HDCP On
			　2 – Follow Input
			　3 – HDCP defined according to the connected output
				Set the input HDCP-MODE of HDMI IN to off:
				`#HDCP-MOD_2,0<CR>`

HDCP-MOD?	Get HDCP mode.
	
	ⓘ Get HDCP working mode on the device input:
	
	HDCP supported – HDCP ON [default].
	
	HDCP not supported - HDCP OFF.
	
	HDCP support changes following detected sink - MIRROR OUTPUT.
		COMMAND
		`#HDCP-MOD?_in_index<CR>`
		FEEDBACK
		`~nn@HDCP-MOD_in_index,mode<CR><LF>`
			`in_index` – Number that indicates the specific input:
			　1 – USB-C IN
			　2 – HDMI IN
			`mode` – HDCP mode:
			　0 – HDCP Off
			　1 – HDCP On
			　2 – Follow Input
			　3 – HDCP defined according to the connected output
				Get the input HDCP-MODE of HDMI IN :
				`#HDCP-MOD?_2<CR>`

HDCP-OUT	Set HDCP mode.
	
	ⓘ Get HDCP working mode on the device input:
	
	HDCP supported – HDCP ON [default].
	
	HDCP not supported - HDCP OFF.
	
	HDCP support changes following detected sink - MIRROR OUTPUT.
		COMMAND
		`#HDCP-OUT_out_index,mode<CR>`
		FEEDBACK
		`~nn@HDCP-OUT_out_index,mode<CR><LF>`
			`out_index` – Number that indicates the specific input:
			　1 – HDBaset OUT
			`mode` – HDCP mode:
			　0 – Follow Input
			　1 – HDCP always ON (i.e. output signal is always HDCP-encrypted, regardless of input HDCP)
				Set the output HDCP mode of HDBaseT OUT to follow input:
				`#HDCP-OUT_1,0<CR>`

HDCP-OUT?	Get HDCP mode.
	
	ⓘ Get HDCP working mode on the device input:
	
	HDCP supported – HDCP ON [default].
	
	HDCP not supported - HDCP OFF.
	
	HDCP support changes following detected sink - MIRROR OUTPUT.
		COMMAND
		`#HDCP-OUT?_out_index<CR>`
		FEEDBACK
		`~nn@HDCP-OUT_out_index,mode<CR><LF>`
			`out_index` – Number that indicates the specific input:
			　1 – HDBaset OUT
			`mode` – HDCP mode:
			　0 – Follow Input
			　1 – HDCP always ON (i.e. output signal is always HDCP-encrypted, regardless of input HDCP)
				Get the output HDCP-MODE of HDBaseT OUT :
				`#HDCP-OUT?_1<CR>`

Function	Description	Syntax	Parameters/Attributes	Example
HDCP-STAT?	Get HDCP signal status of a connected device. ⓘ io_mode =1 – get the HDCP signal status of the sink device connected to the specified output. io_mode =0 – get the HDCP signal status of the source device connected to the specified input.	**COMMAND** **#HDCP-STAT?** io_mode,in_index**<CR>** **FEEDBACK** **~nn@HDCP-STAT** io_mode,in_index,status**<CR><LF>**	**io_mode** – Input/Output 0 – Input 1 – Output **io_index** – Number that indicates the specific number of inputs or outputs (based on io_mode): 1 – HDBaseT OUT or USB-C IN 2 – HDMI IN **status** – Signal encryption status - valid values On/Off: 0 – HDCP Off 1 – HDCP On	Get the HDCP status of the source device connected to USB-C IN: **#HDCP-STAT?** 0,1**<CR>**
HELP	Get command list or help for specific command.	**COMMAND** **#HELP<CR>** **#HELP** cmd_name**<CR>** **FEEDBACK** 1. Multi-line: **~nn@Device** cmd_name, cmd_name…**<CR><LF>** To get help for command use: HELP (COMMAND_NAME)**<CR><LF>** **~nn@HELP** cmd_name:**<CR><LF>** **description<CR><LF>** **USAGE:usage<CR><LF>**	**cmd_name** – Name of a specific command	Get the command list: **#HELP<CR>** To get help for AV-SW-TIMEOUT: HELP av-sw-timeout**<CR>**
LABEL	Set input/output label	**COMMAND** **#LABEL** io_mode,io_index,switch,label_txt**<CR>** **FEEDBACK** **~nn@LABEL** io_mode,io_index,switch,label_txt**<CR><LF>**	**io_mode** – Number that indicates the specific input: 0 – Input 1 – Output **io_index** – Number that indicates the specific input: **For inputs –** 1 – USB-C IN 2 – HDMI IN **For output** 1 – HDBT output **switch** – 0 **label_txt** – Custom label string between 1 and 32 (at least one character and not bigger than 32).	Set the HDMI input label on: **#LABEL** 0,2,0,hdmi**<CR>**
LABEL?	Get input/output label	**COMMAND** **#LABEL?** io_mode,io_index,switch,label_txt**<CR>** **FEEDBACK** **~nn@LABEL** io_mode,io_index,switch,label_txt**<CR><LF>**	**io_mode** – Number that indicates the specific input: 0 – Input 1 – Output **io_index** – Number that indicates the specific input: **For inputs –** 1 – USB-C IN 2 – HDMI IN **For output** 1 – HDBT output **switch** – 0 **label_txt** – Custom label string between 1 and 32 (at least one character and not bigger than 32). label string	Get the HDMI input label: **#LABEL?** 0,2,0,hdmi**<CR>**
LOCK-EDID	Lock last read EDID.	**COMMAND** **#LOCK-EDID** in_index,lock_mode**<CR>** **FEEDBACK** **~nn@LOCK-EDID** in_index,lock_mode**<CR><LF>**	**in_index** – Number that indicates the specific input: 1 – USB-C IN 2 – HDMI IN **lock_mode** – On/Off 0 – Off unlocks EDID 1 – On locks EDID	Lock the last read EDID from input 2: **#LOCK-EDID** 2,1**<CR>**
LOCK-EDID?	Get EDID Lock status.	**COMMAND** **#LOCK-EDID?** in_index **<CR>** **FEEDBACK** **~nn@LOCK-EDID** in_index,lock_mode**<CR><LF>**	**in_index** – Number that indicates the specific input: 1 – USB-C IN 2 – HDMI IN **lock_mode** – On/Off 0 – Off unlocks EDID 1 – On locks EDID	Get input 2 Lock EDID status: **#LOCK-EDID?** 2**<CR>**
LOG-TAIL?	Get the list of the N last events.	**COMMAND** **#LOG-TAIL?** last_event**<CR>** **FEEDBACK** **~nn@LOG-TAIL** last_event,ok,<list>**<CR><LF>**	**last_event** – the number of last events to view <N = 1,2,3…>	Get the protocol permission level to Admin: **#LOG-TAIL?** 8**<CR>**

Function	Description	Syntax	Parameters/Attributes	Example
LOGIN	Set protocol permission. (i) The permission system works only if security is enabled with the "SECUR" command. LOGIN allows the user to run commands with an End User or Administrator permission level. When the permission system is enabled, LOGIN enables running commands with the User or Administrator permission level When set, login must be performed upon each connection It is not mandatory to enable the permission system in order to use the device In each device, some connections allow logging in to different levels. Some do not work with security at all. Connection may logout after timeout.	**COMMAND** **#LOGIN‿**login_level,password**<CR>** **FEEDBACK** **~nn@LOGIN‿**login_level,password‿ok**<CR><LF>** or **~nn@LOGIN‿**err‿004**<CR><LF>** (if bad password entered)	**login_level** – Level of permissions required (User or Admin) **password** – Predefined password (by PASS command). Default password is an empty string	Set the protocol permission level to Admin (when the password defined in the PASS command is 33333): **#LOGIN‿**admin,33333**<CR>**
LOGIN?	Get protocol permission state. (i) The permission system works only if security is enabled with the "SECUR" command. LOGIN allows the user to run commands with an End User or Administrator permission level. When the permission system is enabled, LOGIN enables running commands with the User or Administrator permission level When set, login must be performed upon each connection It is not mandatory to enable the permission system in order to use the device In each device, some connections allow logging in to different levels. Some do not work with security at all. Connection may logout after timeout.	**COMMAND** **#LOGIN‿**login_level **<CR>** **FEEDBACK** **~nn@LOGIN‿**login_level,password‿ok**<CR><LF>** or **~nn@LOGIN‿**err‿004**<CR><LF>** (if bad password entered)	**login_level** – Level of permissions required (User or Admin) **password** – Predefined password (by PASS command). Default password is an empty string or NO SECURE if authentication is removed.	Get the protocol permission level to Admin: **#LOGIN?‿**admin**<CR>**
LOGOUT	Cancel current permission level. (i) Logs out from End User or Administrator permission levels to Not Secure.	**COMMAND** **#LOGOUT<CR>** **FEEDBACK** **~nn@LOGOUT‿**ok**<CR><LF>**		**#LOGOUT<CR>**
MODEL?	Get device model.	**COMMAND** **#MODEL?‿<CR>** **FEEDBACK** **~nn@MODEL‿**model_name**<CR><LF>**	**model_name** – String of up to 19 printable ASCII chars	Get the device model: **#MODEL?‿<CR>**
NAME	Set machine (DNS) name. (i) The machine name is not the same as the model name. The machine name is used to identify a specific machine or a network in use (with DNS feature on).	**COMMAND** **#NAME‿**machine_name**<CR>** **FEEDBACK** **~nn@NAME‿**machine_name**<CR><LF>**	**machine_name** – String of up to 15 alpha-numeric chars (can include hyphen, not at the beginning or end)	Set the DNS name of the device to room-442: **#NAME‿**room-442**<CR>**

Function	Description	Syntax	Parameters/Attributes	Example

NAME?	Get machine (DNS) name.
	
	ⓘ The machine name is not the same as the model name. The machine name is used to identify a specific machine or a network in use (with DNS feature on).
		COMMAND
		`#NAME?␣<CR>`
		FEEDBACK
		`~nn@NAME␣machine_name<CR><LF>`
			machine_name – String of up to 15 alpha-numeric chars (can include hyphen, not at the beginning or end)	Get the DNS name of the device:
				`#NAME?␣<CR>`

NAME-RST	Reset machine (DNS) name to factory default.
	
	ⓘ Factory default of machine (DNS) name is "KRAMER_" + 4 last digits of device serial number.
		COMMAND
		`#NAME-RST<CR>`
		FEEDBACK
		`~nn@NAME-RST␣ok<CR><LF>`
				Reset the machine name (S/N last digits are 0102):
				`#NAME-RST␣kramer_0102<CR>`

NET-CONFIG	Set a network configuration.
	
	ⓘ Parameters **[DNS1]** and **[DNS2]** are optional.
	
	ⓘ For Backward compatibility, the **id** parameter can be omitted. In this case, the Network ID, by default, is 0, which is the Ethernet control port.
	
	ⓘ If the gateway address is not compliant to the subnet mask used for the host IP, the command will return an error. Subnet and gateway compliancy specified by RFC950.
		COMMAND
		`#NET-CONFIG␣netw_id,net_ip,net_mask,gateway,[dns1],[dns2]<CR>`
		FEEDBACK
		`~nn@NET-CONFIG␣netw_id,net_ip,net_mask,gateway<CR><LF>`
			netw_id – 0
			net_ip – Network IP
			net_mask – Network mask
			gateway – Network gateway
				Set the device network parameters to IP address 192.168.113.10, net mask 255.255.0.0, and gateway 192.168.0.1:
				`#NET-CONFIG␣0,192.168.113.10,255.255.0.0,192.168.0.1<CR>`

NET-CONFIG?	Get a network configuration.
	
	ⓘ Parameters **[DNS1]** and **[DNS2]** are optional.
	
	ⓘ For Backward compatibility, the **id** parameter can be omitted. In this case, the Network ID, by default, is 0, which is the Ethernet control port.
	
	ⓘ If the gateway address is not compliant to the subnet mask used for the host IP, the command will return an error. Subnet and gateway compliancy specified by RFC950.
		COMMAND
		`#NET-CONFIG␣netw_id,net_ip,net_mask,gateway,[dns1],[dns2]<CR>`
		FEEDBACK
		`~nn@NET-CONFIG␣netw_id,net_ip,net_mask,gateway<CR><LF>`
			netw_id – 0
			net_ip – Network IP
			net_mask – Network mask
			gateway – Network gateway
				Get the device network parameters:
				`#NET-CONFIG?␣0<CR>`

NET-DHCP?	Get DHCP mode.
	
	ⓘ For Backward compatibility, the **id** parameter can be omitted. In this case, the Network ID, by default, is 0, which is the Ethernet control port.
		COMMAND
		`#NET-DHCP?␣netw_id<CR>`
		FEEDBACK
		`~nn@NET-DHCP␣netw_id,dhcp_state<CR><LF>`
			netw_id – Network ID–the device network interface (if there are more than one). Counting is 0 based, meaning the control port is '0', additional ports are 1,2,3….
			dhcp_state –
			0 – Do not use DHCP. Use the IP set by the factory or using the **net-ip** or **net-config** command.
			1 – Try to use DHCP. If unavailable, use the IP set by the factory or using the **net-ip** or **net-config** command.
				Get DHCP mode for port 1:
				`#NET-DHCP?␣1<CR>`

NET-GATE	Set gateway IP.
	
	ⓘ A network gateway connects the device via another network and maybe over the Internet. Be careful of security issues. For proper settings consult your network administrator.
		COMMAND
		`#NET-GATE␣ip_address<CR>`
		FEEDBACK
		`~nn@NET-GATE␣ip_address<CR><LF>`
			ip_address – Format: xxx.xxx.xxx.xxx	Set the gateway IP address to 192.168.0.1:
				`#NET-GATE␣192.168.000.001<CR>`

NET-GATE?	Get gateway IP.
	ⓘ A network gateway connects the device via another network and maybe over the Internet. Be aware of security problems.
		COMMAND
		`#NET-GATE?␣<CR>`
		FEEDBACK
		`~nn@NET-GATE␣ip_address<CR><LF>`
			ip_address – Format: xxx.xxx.xxx.xxx	Get the gateway IP address:
				`#NET-GATE?␣<CR>`

Function	Description	Syntax	Parameters/Attributes	Example
NET-IP	Set IP address. ⓘ For proper settings consult your network administrator.	**COMMAND** **#NET-IP␣**ip_address**<CR>** **FEEDBACK** **~nn@NET-IP␣**ip_address**<CR><LF>**	**ip_address** – Format: xxx.xxx.xxx.xxx	Set the IP address to 192.168.1.39: **#NET-IP␣**192.168.001.039**<CR>**
NET-IP?	Get IP address.	**COMMAND** **#NET-IP?␣<CR>** **FEEDBACK** **~nn@NET-IP␣**ip_address**<CR><LF>**	**ip_address** – Format: xxx.xxx.xxx.xxx	Get the IP address: #NET-IP?␣<CR>
NET-MAC?	Get MAC address. ⓘ For backward compatibility, the **id** parameter can be omitted. In this case, the Network ID, by default, is 0, which is the Ethernet control port.	**COMMAND** **#NET-MAC?␣**id**<CR>** **FEEDBACK** **~nn@NET-MAC␣**id,mac_address**<CR><LF>**	**id** – Network ID–the device network interface (if there are more than one). Counting is 0 based, meaning the control port is '0', additional ports are 1,2,3…. **mac_address** – Unique MAC address. Format: XX-XX-XX-XX-XX-XX where X is hex digit	**#NET-MAC?␣**id**<CR>**
NET-MASK	Set subnet mask. ⓘ For proper settings consult your network administrator.	**COMMAND** **#NET-MASK␣**net_mask**<CR>** **FEEDBACK** **~nn@NET-MASK␣**net_mask**<CR><LF>**	**net_mask** – Format: xxx.xxx.xxx.xxx	Set the subnet mask to 255.255.0.0: **#NET-MASK␣**255.255.000.000**<CR>**
NET-MASK?	Get subnet mask.	**COMMAND** **#NET-MASK?␣<CR>** **FEEDBACK** **~nn@NET-MASK␣**net_mask**<CR><LF>**	**net_mask** – Format: xxx.xxx.xxx.xxx	Get the subnet mask: #NET-MASK?<CR>
PASS	Set password for login level. ⓘ The default password is an empty string.	**COMMAND** **#PASS␣**login_level,password**<CR>** **FEEDBACK** **~nn@PASS␣**login_level,password**<CR><LF>**	**login_level** – Level of login to set (End User or Administrator). **password** – Password for the *login_level*. Up to 15 printable ASCII chars	Set the password for the Admin protocol permission level to 33333: **#PASS␣**admin,33333**<CR>**
PASS?	Get password for login level. ⓘ The default password is an empty string.	**COMMAND** **#PASS␣**login_level **<CR>** **FEEDBACK** **~nn@PASS␣**login_level,password**<CR><LF>**	**login_level** – Level of login to set (End User or Administrator). **password** – Password for the *login_level*. Up to 15 printable ASCII chars	Get the password for the Admin protocol permission: #PASS?␣admin<CR>
PRIORITY	Set input priority. ⓘ WP-577VH – layer parameter is not used.	**COMMAND** **#PRIORITY␣**layer_type,priority_1,priority_2…priority_4**<CR>** **FEEDBACK** **~nn@PRIORITY␣**layer_type,priority_1,priority_2…priority_n**<CR><LF>**	**layer_type** – Layer Enumeration 1– Video **priority** – Priority of inputs (1-2) 1– USB-C 2– HDMI	Set the priority to USB-C first and HDMI second, is 1,2: **#PRIORITY␣**1,1,2**<CR>**
PRIORITY?	Set input priority.	**COMMAND** **#PRIORITY?␣**layer_type**<CR>** **FEEDBACK** **~nn@PRIORITY␣**layer_type,priority_1,priority_2…priority_4**<CR><LF>**	**layer_type** – Layer Enumeration 1– Video **priority** – Priority of inputs (1-2) 1– USB-C 2– HDMI	Get the input priority: **#PRIORITY?␣**1**<CR>**
PROT-VER?	Get device protocol version.	**COMMAND** **#PROT-VER?␣<CR>** **FEEDBACK** **~nn@PROT-VER␣**3000:version**<CR><LF>**	**version** – XX.XX where X is a decimal digit	Get the device protocol version: **#PROT-VER?␣<CR>**
RESET	Reset device. ⓘ To avoid locking the port due to a USB bug in Windows, disconnect USB connections immediately after running this command. If the port was locked, disconnect, and reconnect the cable to reopen the port.	**COMMAND** **#RESET<CR>** **FEEDBACK** **~nn@RESET␣**ok**<CR><LF>**		Reset the device: **#RESET<CR>**
ROUTE	Set layer routing. ⓘ This command replaces all other routing commands.	**COMMAND** **#ROUTE␣**layer_type,out_index,in_index**<CR>** **FEEDBACK** **~nn@ROUTE␣**layer_type,out_index,in_index**<CR><LF>**	**layer_type** Layer Enumeration 1– Video 3– Data **out_index** 1– Output **in_index** – Source id for Video: 1 – USB-C IN 2 – HDMI IN Source id for Data: 2 –RS232EXTD extension mode. 3 – Maestro HDBT control mode	Route video input 2 to the output: **#ROUTE␣**1,1,2**<CR>** Connect HDBT to Maestro "RS232EXTD" (the Far Side Terminal needs to be configured to 9600bps): **#ROUTE␣**3,1,3**<CR>**

Function	Description	Syntax	Parameters/Attributes	Example
ROUTE?	Get layer routing state. ⓘ This command replaces all other routing commands.	**COMMAND** **#ROUTE?** layer_type,out_index**<CR>** **FEEDBACK** **~nn@ROUTE** layer_type,out_index,in_index **<CR><LF>**	**layer_type** Layer Enumeration 1 – Video 3 – Data **out_index** 1 – OUT 1 HDMI **in_index** – Source id for Video 1 – USB-C IN 2 – HDMI IN Source id for Data: 2 – RS232EXTD extension mode. 3 – Maestro HDBT control mode	Get video routing output: **#ROUTE?** 1,1**<CR>**
SECUR	Start/stop security. ⓘ The permission system works only if security is enabled with the "SECUR" command.	**COMMAND** **#SECUR** security_state**<CR>** **FEEDBACK** **~nn@SECUR** security_state**<CR><LF>**	**security_state** – Security state 0 – OFF (disables security) 1 – ON (enables security)	Enable the permission system: **#SECUR** 1**<CR>**
SECUR?	Get security state. ⓘ The permission system works only if security is enabled with the "SECUR" command.	**COMMAND** **#SECUR?** security_state**<CR>** **FEEDBACK** **~nn@SECUR** security_state**<CR><LF>**	**security_state** – Security state 0 – OFF (disables security) 1 – ON (enables security)	Enable the permission system: **#SECUR?** **<CR>**
SIGNAL?	Get input signal status.	**COMMAND** **#SIGNAL?** in_index**<CR>** **FEEDBACK** **~nn@SIGNAL** in_index,status**<CR><LF>**	**in_index** – Number that indicates the specific input: 1 – USB-C IN 2 – HDMI IN **status** – Signal status according to signal validation: 0 – Off 1 – On	Get the input signal lock status of IN 1: **#SIGNAL?** 1**<CR>**
SN?	Get device serial number.	**COMMAND** **#SN?** **<CR>** **FEEDBACK** **~nn@SN** serial_num**<CR><LF>**	**serial_num** – 14 decimal digits, factory assigned	Get the device serial number: **#SN?** **<CR>**
STANDBY	Set standby mode.	**COMMAND** **#STANDBY** value**<CR>** **FEEDBACK** **~nn@STANDBY** value**<CR><LF>**	**value** – Standby state: 0 – Exit 1 – Enter	Enter standby mode: **#STANDBY** 1**<CR>**
STANDBY?	Get standby mode.	**COMMAND** **#STANDBY?** **<CR>** **FEEDBACK** **~nn@STANDBY** value**<CR><LF>**	**value** – Standby state 0 – Exit 1 – Enter	Get standby mode: **#STANDBY?** **<CR>**
STANDBY-TIMEOUT	Set the delay time before the device goes into standby mode after a period of no device activity.	**COMMAND** **#STANDBY-TIMEOUT** value**<CR>** **FEEDBACK** **~nn@STANDBY-TIMEOUT** value**<CR><LF>**	**value** – Standby timeout: (up to 900min, never 0; default = 30min)	Set standby timeout after 5 minutes of inactivaty: **#STANDBY-TIMEOUT** 5**<CR>**
STANDBY-TIMEOUT?	Get the delay time before the device goes into standby mode after a period of no device activity.	**COMMAND** **#STANDBY-TIMEOUT?** **<CR>** **FEEDBACK** **~nn@STANDBY-TIMEOUT** value**<CR><LF>**	**value** – Standby timeout: (up to 900min, never 0; default = 30min)	Get standby timeout: **#STANDBY-TIMEOUT?** **<CR>**
TIME	Set device time and date. ⓘ The year must be 4 digits. The device does not validate the day of week from the date. Time format - 24 hours. Date format - Day, Month, Year.	**COMMAND** **#TIME** day_of_week,date,data**<CR>** **FEEDBACK** **~nn@TIME** day_of_week,date,data**<CR><LF>**	**day_of_week** – One of {SUN,MON,TUE,WED,THU,FRI,SAT} **date** – Format: DD-MM-YYYY. **data** – Format: hh:mm:ss where hh = hours mm = minutes ss = seconds	Set device time and date to December 5, 2020 at 2:30pm: **#TIME** mon 05-12-2020,14:30:00**<CR>**
TIME?	Get device time and date. ⓘ The year must be 4 digits. The device does not validate the day of week from the date. Time format - 24 hours. Date format - Day, Month, Year.	**COMMAND** **#TIME?** **<CR>** **FEEDBACK** **~nn@TIME** day_of_week,date,data**<CR><LF>**	**day_of_week** – One of {SUN,MON,TUE,WED,THU,FRI,SAT} **date** – Format: YYYY/MM/DD where YYYY = Year MM = Month DD = Day **data** – Format: hh:mm:ss where hh = hours mm = minutes ss = seconds	Get device time and date: **#TIME?<CR>**
VERSION?	Get firmware version number.	**COMMAND** **#VERSION?** **<CR>** **FEEDBACK** **~nn@VERSION** firmware_version**<CR><LF>**	**firmware_version** – XX.XX.XXXX where the digit groups are: major.minor.build version	Get the device firmware version number: **#VERSION?** **<CR>**

Function	Description	Syntax	Parameters/Attributes	Example

VMUTE	Set enable/disable video on output.
	
	ⓘ Video mute parameter 2 (blank picture) is not supported.
		COMMAND
		#VMUTE␣out_index,flag**\<CR>**
		FEEDBACK
		~nn@VMUTE␣out_index,flag**\<CR>\<LF>**
			out_index – Number that indicates the specific output – 1
			flag – Video Mute
			  0 – Video enabled
			  1 – Video disabled
			  2 – Blank picture
				Disable the video output on output:
				#VMUTE␣1,0\<CR>

VMUTE?	Get video on output status.
	
	ⓘ Video mute parameter 2 (blank picture) is not supported.
		COMMAND
		#VMUTE?␣out_index**\<CR>**
		FEEDBACK
		~nn@VMUTE␣out_index,flag**\<CR>\<LF>**
			out_index – Number that indicates the specific output – 1
			flag – Video Mute
			  0 – Video enabled
			  1 – Video disabled
			  2 – Blank picture
				Get video on output status:
				#VMUTE?␣1\<CR>

Result and Error Codes

Syntax

In case of an error, the device responds with an error message. The error message syntax:

- **~NN@ERR XXX\<CR>\<LF>** – when general error, no specific command

- **~NN@CMD ERR XXX\<CR>\<LF>** – for specific command

- **NN** – machine number of device, default = 01

- **XXX** – error code

#VMUTE␣out_index,flag**\<CR>**

#VMUTE?␣out_index**\<CR>**

Error Codes

Error Name	Error Code	Description
P3K_NO_ERROR	0	No error
ERR_PROTOCOL_SYNTAX	1	Protocol syntax
ERR_COMMAND_NOT_AVAILABLE	2	Command not available
ERR_PARAMETER_OUT_OF_RANGE	3	Parameter out of range
ERR_UNAUTHORIZED_ACCESS	4	Unauthorized access
ERR_INTERNAL_FW_ERROR	5	Internal FW error
ERR_BUSY	6	Protocol busy
ERR_WRONG_CRC	7	Wrong CRC
ERR_TIMEDOUT	8	Timeout
ERR_RESERVED	9	(Reserved)
ERR_FW_NOT_ENOUGH_SPACE	10	Not enough space for data (firmware, FPGA…)
ERR_FS_NOT_ENOUGH_SPACE	11	Not enough space – file system
ERR_FS_FILE_NOT_EXISTS	12	File does not exist
ERR_FS_FILE_CANT_CREATED	13	File can't be created
ERR_FS_FILE_CANT_OPEN	14	File can't open
ERR_FEATURE_NOT_SUPPORTED	15	Feature is not supported
ERR_RESERVED_2	16	(Reserved)
ERR_RESERVED_3	17	(Reserved)
ERR_RESERVED_4	18	(Reserved)
ERR_RESERVED_5	19	(Reserved)
ERR_RESERVED_6	20	(Reserved)
ERR_PACKET_CRC	21	Packet CRC error
ERR_PACKET_MISSED	22	Packet number isn't expected (missing packet)
ERR_PACKET_SIZE	23	Packet size is wrong
ERR_RESERVED_7	24	(Reserved)
ERR_RESERVED_8	25	(Reserved)
ERR_RESERVED_9	26	(Reserved)
ERR_RESERVED_10	27	(Reserved)
ERR_RESERVED_11	28	(Reserved)
ERR_RESERVED_12	29	(Reserved)
ERR_EDID_CORRUPTED	30	EDID corrupted
ERR_NON_LISTED	31	Device specific errors
ERR_SAME_CRC	32	File has the same CRC – not changed
ERR_WRONG_MODE	33	Wrong operation mode
ERR_NOT_CONFIGURED	34	Device/chip was not initialized

SAFETY WARNING
Disconnect the unit from the power supply before opening and servicing

P/N: 2900- 301523

Rev: 2

For the latest information on our products and a list of Kramer distributors, visit our website where updates to this user manual may be found.

We welcome your questions, comments, and feedback.

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