



USER MANUAL

MODEL:

SWT3-22-HU-WP-T

**2x2 4K60 USB-C/HDMI Wallplate Switcher
Transmitter**



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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 <https://www.kramerav.com/downloads/SWT3-22-HU-WP-T-EU/UK/> / <https://www.kramerav.com/downloads/SWT3-22-HU-WP-T-US> 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 SWT3-22-HU-WP-T 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 GPIO 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:

- If using a power cord, only use the Kramer approved power cord.

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/quality/environment.

Overview

Congratulations on purchasing your Kramer SWT3-22-HU-WP-T 2x2 4K60 USB-C/HDMI Wallplate Switcher Transmitter.

SWT3-22-HU-WP-T is a high-performance auto-switcher transmitter with two inputs – one USB-C and one HDMI+USB Host, and independently routable HDMI and extended-range HDBaseT outputs. It extends 4K60Hz (4:4:4) HDMI, USB, Ethernet, RS-232, IR and power signals over twisted pair cable to a remote compatible receiver. The unit includes an active USB host and supports switching of local and remote USB peripherals, such as a room camera and microphone, making it ideal for hybrid meetings with both room and online participants.



SWT3-22-HU-WP-T-US device includes HDBT PoE Powering.

Exceptional Quality

- Hybrid-meeting Collaborative Switching - Controllable coupled-signals switching of both AV and USB host inputs, for concurrent connection with AV output and space USB devices, allows collaborative hybrid meeting where multiple meeting participants are switched to share their content with both room and online meeting participants.
- BYOD Ease and Convenience - Connect any DP-Alt-Mode-capable USB-C device as an AV presentation source, while providing the connected device with USB 2.0 and Ethernet connection, and (if PD-2.0-capable) up to 60 watts of power, via a single USB-C cable connection only.
- High Performance Standard Extender - Professional HDBaseT extender for providing extended-reach signals over twisted-pair copper infrastructures. SWT3-22-HU-WP-T is a standard extender that can be connected to any market-available HDBaseT-compliant extension product. For optimum extension reach and performance, use recommended Kramer cables.
- HDMI Signal Switching - HDCP 2.3 compliant, supporting deep color, x.v.Color™, CEC, HDMI uncompressed audio channels, Dolby TrueHD, DTS-HD, 2K, 4K, and 3D as specified in HDMI 2.0
- Flexible USB Switching and Extension- An active USB 3.2 host is connected to the switcher transmitter on either the transmitter or receiver sides. USB 2.0 signals are extended between the switcher transmitter and receiver sides, enabling connection and switching of the active USB host to both local USB 3.2 and remote USB 2.0 devices, such as camera and audio devices, or HID (Human Interface Devices) mouse or keyboard devices.
- I-EDIDPro™ Kramer Intelligent EDID Processing™ - Intelligent EDID handling, processing and pass-through algorithm that ensures Plug and Play operation.
- Multi-channel Audio Transmission - Up to 32 channels of digital stereo uncompressed signals for supporting studio-grade surround sound.
- Audio De-embedding - The digital audio output signal is de-embedded, converted to an analog signal and sent to the stereo balanced analog audio output. This enables playing the audio on a locally connected professional audio system

and speakers, in addition to playing it on the speakers connected to the AV acceptor device (such as TVs with speakers).

Advanced and User-friendly Operation

- Auto Switcher Ease of Use - Automatically switches to a source when it is plugged in (according to user-configured preferences, such as last-connected input).
- Easy Online Meeting System Integrated Connectivity - Built-in flexible auto-disconnection operation of USB devices, such as room cameras and soundbars, enable detection of BYOD presenter disconnection by online meeting systems for their auto-activation, convenient integration, and ease of end-user operation according to space changing hybrid session needs.
- Display On/Off Operation - Meeting presentation is simplified by manually or automatically turning ON/OFF a CEC-enabled or serially-controlled display when the presentation source is plugged in / unplugged (with user-defined shut-down delay).
- Simple Control - Remote IP-controller connection, browser operation webpage, local panel buttons, or remotely connected contact-closure buttons, for easy and fully flexible user ports selection, signals routing, and switcher control.

Flexible Connectivity

- Built-in Intelligent Control Gateway - Remote IP-driven intelligent control of connected AV, USB and sensor devices via CEC, RS-232, IR or I/O. Eliminating the need for an external control gateway, this feature reduces installation complexity and costs, to enable easy integration with control systems, such as Kramer Control.
- Ethernet Extension - Ethernet interface data flows in both directions, allowing extension of up to 1 Gbps Ethernet connectivity for LAN communication and device control.
- Bidirectional RS-232 Extension - Serial interface data flows in both directions, allowing data transmission and device control.
- Secured Network Connection - Standard IT-grade 802.1x authentication for secured IT LAN connectivity.
- Comprehensive Management - Local panel indication LED to facilitate easy local maintenance and troubleshooting. Remote IP-driven firmware upgrade and management via user-friendly embedded web pages and optional whole site management system, ensure lasting and field proven deployment.
- Easy and Elegant Installation - Compactly fits into standard WW 2-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.

Typical Applications

SWT3-22-HU-WP-T is ideal for the following typical applications:

- Enterprise and education hybrid meeting rooms and classrooms.
- Hybrid user connection element in advanced hybrid meeting solutions.

Controlling your **SWT3-22-HU-WP-T** device

Control your SWT3-22-HU-WP-T directly via the front panel push buttons, or via:

- A browser, using the built-in, user-friendly Web pages.
- RS-232 serial commands transmitted by a touch screen system, PC, or a serial controller.

Defining SWT3-22-HU-WP-T

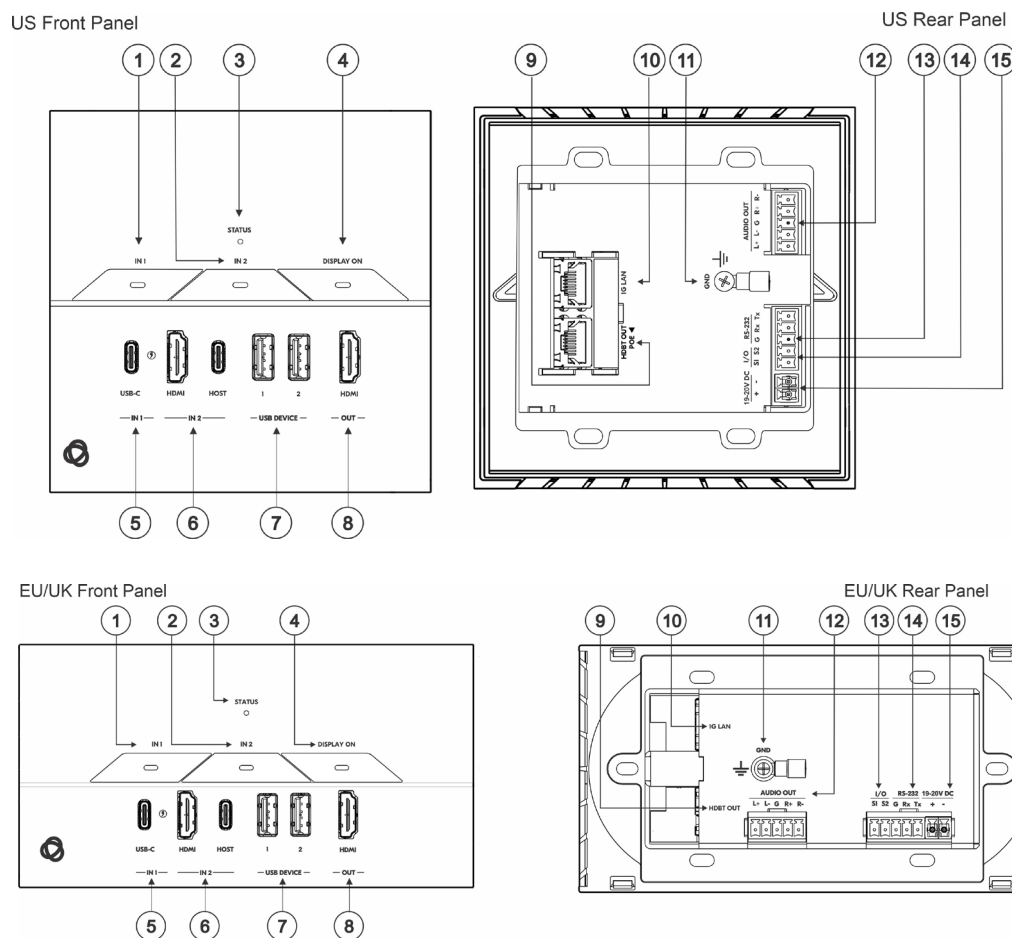


Figure 1: SWT3-22-HU-WP-T 2x2 4K60 USB-C/HDMI Wallplate Switcher Transmitter Front and Rear Panel

#	Feature	Function
1	IN 1 Button (USB-C)	Press to select the USB-C input port. The button lights white when an active signal is detected.
2	IN 2 Button (HDMI, USB-C Host)	Press to select HDMI port. Press to toggle between the HDMI and Host ports. The button lights white when an active signal is detected.
3	STATUS LED	Lights green when there is an HDBT link and an active input signal.
4	DISPLAY ON Button	Press to toggle the remote display on or off. The button lights white after instructing the display to turn on.
5	IN 1 USB-C Connector	Connect to the USB-C source (AV + USB Host + LAN): - that supports DisplayPort Alternate Mode, (for example, a laptop) to share content. - to connect to the LAN, using your USB-C wired connection. - to charge the connected sources (that supports USB Power Delivery 2.0).

			While charging, the charging icon (to the right of the connector) becomes visible and lights orange.
6	IN 2	HDMI Connector	Connect to a compatible HDMI display.
		USB-C Host	Connect to a USB-C host (for example, a room PC).
7	USB DEVICE USB A 3.1 Connector 1 & 2		Connect to the USB local peripheral devices (for example, a USB camera, a soundbar, microphone, a keyboard & mouse, and so on).
8	OUT HDMI		Connect to a compatible HDMI display.
9	HDBT OUT RJ-45 Connector		Connect to the HDBT IN RJ-45 connector on a receiver (for example, EXT3-XR-TR).
10	1G LAN RJ-45 Connector		Connect to a LAN to provide Network and Internet to the source device that is connected to the USB-C IN port, and/or Ethernet extension to the receiver.
11	GND Grounding Screw Ring Tongue Terminal		Connected to grounding wire.
12	AUDIO OUT 5-pin Terminal Block Connector		Connect to a balanced stereo analog audio acceptor.
13	I/O 2-pin Terminal Block		Connect to: • Input-triggering devices (for example, remote buttons or sensors), OR • Output-triggered devices (for example, remote alarm LED indication). Each GPIO port may be configured as a digital input, digital output, or analog input port.
14	RS-232 3-pin Terminal Block Connector		Connect to an RS-232 controlled device (for example, the connected PTZ USB camera), or to an RS-232 controller.
15	19/20V DC		Use the included 19V 6A power supply for powering the unit and charging the source device connected to the USB-C port.  For SWT3-22-HU-WP-T-US only: - This power input may be left unconnected if the device is powered by a PoE PSE receiver unit. - In case of PoE powering, USB-C charging is not supported.

Mounting the SWT3-22-HU-WP-T Devices

This section provides instructions for mounting SWT3-22-HU-WP-T. 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.



Caution:

- Mount SWT3-22-HU-WP-T before connecting any cables or power.

Warning:

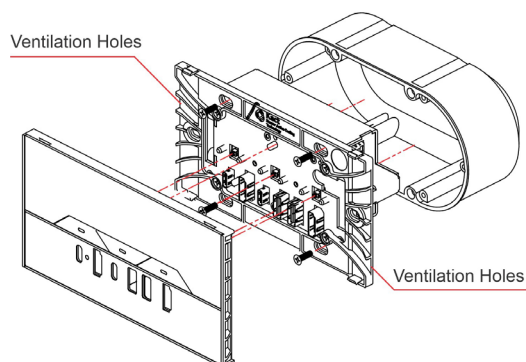
- Ensure that the environment (e.g., maximum ambient temperature & air flow) is compatible with the device.
- Avoid uneven mechanical loading.
- Appropriate consideration of equipment nameplate ratings should be used for avoiding overloading of the circuits.
- Reliable earthing of rack-mounted equipment should be maintained.
- Maximum mounting height for the device is 2 meters.

Insert the device into the in-wall box (note that first you need to connect the HDBT cable and power) and connect the parts as shown in the illustrations below.

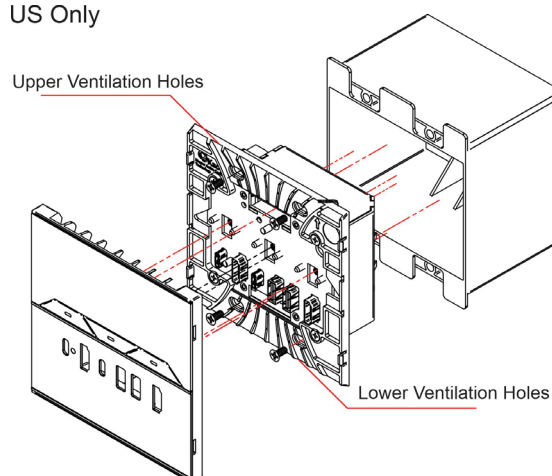


Caution: When installing the device, take care not to obstruct the upper and lower ventilation holes.

EU/UK Only



US Only



Caution:

- EU: 2 gang in-wall junction box, with a cut-hole diameter of 2x68mm and depth that can fit in both the device and the connected cables (DIN 49073).
- UK: 2 gang in-wall junction box (BS 4662), 135x75mm (W, H) and depth that can fit in both the device and the connected cables.

Connecting SWT3-22-HU-WP-T

This section provides instructions for connecting the SWT3-22-HU-WP-T-EU/UK transmitter to a compatible receiver (for example, Kramer EXT3-XR-TR).

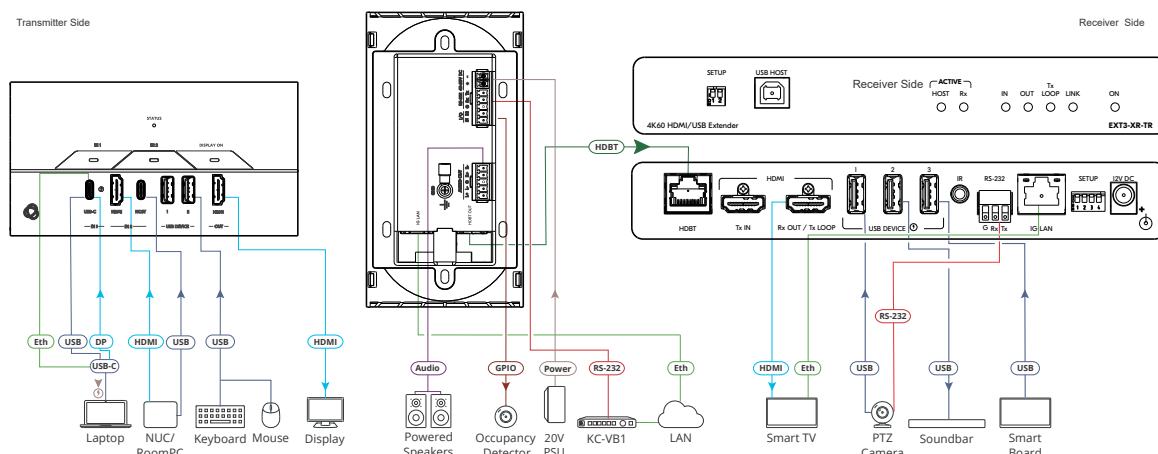


Figure 2: Connecting SWT3-22-HU-WP-T-EU/UK to EXT3-XR-TR

To connect SWT3-22-HU-WP-T-EU/UK as illustrated in the example in Figure 3:

1. Connect the inputs:

Connect USB-C source ① (for example, a server or a laptop) to the USB-C IN connector on the SWT3-22-HU-WP-T-EU/UK.

Connect HDMI source ① (for example, a NUC or Room PC) to the HDMI IN connector on the SWT3-22-HU-WP-T-EU/UK.

2. Connect the outputs:

- Connect the HDMI OUT source ⑥ on the SWT3-22-HU-WP-T-EU/UK to HDMI devices (for example, a display).
- Connect the AUDIO OUT 5-pin terminal block connector ⑪ on the SWT3-22-HU-WP-T-EU/UK to a balanced stereo audio acceptor (for example, an audio amplifier).

3. Connect the HDBT OUT port ⑧ on the SWT3-22-HU-WP-T to the HDBT IN on the EXT3-XR-TR.

4. Connect the USB type A ports:

- On the SWT3-22-HU-WP-T-EU/UK, connect a mouse and a keyboard to the two USB type A ports ⑦.
- On the EXT3-XR-TR, connect a PTZ camera, soundbar or smartboard to the USB type A ports.

5. Connect the control ports:

- Connect the 1G LAN (PoE) RJ-45 port ⑨ on the SWT3-22-HU-WP-T-EU/UK to a LAN.
- Connect the SWT3-22-HU-WP-T-EU/UK DATA RS-232 3-pin terminal block connector to a controller ⑬ (for example, Kramer KC-VC1).

- Connect the SWT3-22-HU-WP-T-EU/UK I/O 2-pin terminal block connector ⁽¹²⁾ to an occupancy detector.
 - Connect the EXT3-XR-TR DATA RS-232 3-pin terminal block connector to an RS-232 controlled device (for example, the PTZ camera).
6. Connect the power adapter to SWT3-22-HU-WP-T-EU/UK device.

Connecting the Audio/Input Output

The following are the pinouts for connecting the input/output to a balanced or unbalanced stereo audio acceptor:

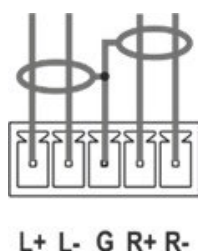


Figure 3: Connecting to a Balanced Stereo Audio Acceptor

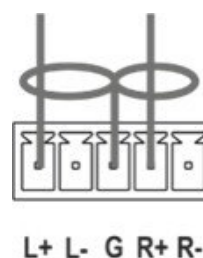


Figure 4: Connecting to an unbalanced Stereo Audio Acceptor

Connecting to a SWT3-22-HU-WP-T device with RS-232

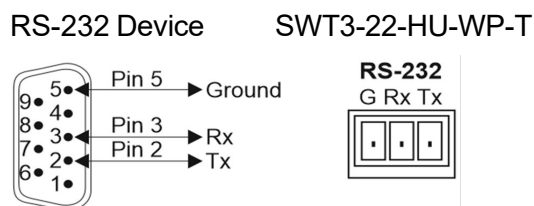
You can connect via an RS-232 connection or using, for example, a controller.

SWT3-22-HU-WP-T features an RS-232 3-pin terminal block connector to extend RS-232 signals via the SWT3-22-HU-WP-T transmitter to the connected receiver.

Connect the RS-232 terminal block on the rear panel of the to a device, as follows:

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

- Pin 2 to the TX pin on the SWT3-22-HU-WP-T RS-232 terminal block
- Pin 3 to the RX pin on the SWT3-22-HU-WP-T RS-232 terminal block
- Pin 5 to the G pin on the SWT3-22-HU-WP-T terminal block



Operating and Controlling SWT3-22-HU-WP-T

Principles of Operation

This section describes the following actions:

• Coupled or Individual AV+USB Switching	13
• Flexible SWT3-22-HU-WP-T Auto Switching Policy	13
• Online Meeting Systems Integration	14
• Flexible USB-C Mix of Signals	14
• Routing IP-Driven Control Signals via Built-in Control Gateway	14
• Flexible Remote Buttons Control	14
• Controlling Display Power On/Off	15

Coupled or Individual AV+USB Switching

SWT3-22-HU-WP-T multi-signal switching of any of the inputs to the AV output and connected USB devices, is configurable to use one of the following operation modes:

- USB follows AV coupled routing (↑) – Selecting an AV input, routes the AV signal to the AV output and connects, in parallel, the input-associated USB host with the connected USB devices.
- USB signal individual routing (↑) – Selecting an AV input, routes the AV signal to the AV output only. The USB host can be independently selected to connect with the connected USB devices (see Individual USB Host Routing).

See [Routing AV and USB Host Signals on page 21](#).

This is very useful in hybrid sessions, for convenient switching between multiple presenters using either their BYOD laptops and/or connected space PC devices.

Flexible SWT3-22-HU-WP-T Auto Switching Policy

Set the switching policy to:

- Manual – Select an input manually and switching occurs whether a live signal is present on the input or not.
- Auto – Auto Switching selection is performed according to either the Last Connected or the Priority policy.

In Last Connected policy:

- If a signal is plugged in this mode, SWT3-22-HU-WP-T will switch to it.
- If the signal on the current input is lost, SWT3-22-HU-WP-T automatically reverts to the last connected input.



The auto-switching delay depends on the configurable signal-lost timeout.

In Priority policy:

- If a signal with a higher priority than the current one is plugged in this mode, SWT3-22-HU-WP-T will switch to it.
- When the input sync signal is lost for any reason, the input with a live signal and next in priority is selected automatically.



The auto-switching delay depends on the configurable signal-lost timeout. Inputs priority is configurable; the default setting is USB-C1 > HDMI 2



In both Last Connected and Priority modes, manually selecting an input (using the front panel, remote or web UI input select button) overrides automatic selection

See [Using Embedded Web Pages on page 19](#)

Online Meeting Systems Integration

USB device ports can be set to auto-disconnect following presenter disconnection, to allow smooth integration and auto-activation of connected online meeting room systems.

See [Auto-disconnecting a USB Device on Inactive Host on page 29](#).

Flexible USB-C Mix of Signals

AV and USB signals mix are combined and the USB-C host port data rate, can be flexibly set to either one of:

- High USB 3.0 data rate and lower 4K60 4:2:0 AV resolution mix, or
- High 4K60 4:4:4 AV resolution and lower USB 2.0 data rate mix

See [Setting USB-C Host Port Signals Mix on page 28](#).

Routing IP-Driven Control Signals via Built-in Control Gateway

Using the LAN, remote IP connected clients can send and receive CEC, RS-232, I/O and IR commands via SWT3-22-HU-WP-T's built-in control gateway, to control devices connected to these control ports. The built-in control gateway sends the control commands (converted from the client received IP messages) to the connected controlled devices, and distributes the responses received from the connected controlled devices to all connected clients.

See [Setting Control Gateway Properties on page 29](#).

Flexible Remote Buttons Control

Remote contact-closure buttons can be connected to the I/O ports, for easy end-user control of device functions by button press and release operation. Flexible configuration of button press/release actions and latching (default) or momentary operation mode, enable simple and custom control according to user needs.

See [Configuring Remote Buttons on page 36](#).

Controlling Display Power On/Off

SWT3-22-HU-WP-T communicates with the remote HDMI display that is connected to the HDBaseT receiver, via the pass-through CEC channel. Use the DISPLAY ON button on the SWT3-22-HU-WP-T to turn the receiver's display on or off.

The DISPLAY ON button LED lights blue when display on the receiver side is powered on.



SWT3-22-HU-WP-T supports CEC functionality and has been tested and verified with many display models. However, Kramer cannot guarantee CEC compatibility with all CEC displays due to command variations and proprietary commands implemented by some manufacturers in some of their displays.

See [Associating CEC Commands to DISPLAY ON/OFF on page 38](#).

Using Front Panel Buttons

SWT3-22-HU-WP-T front panel buttons enable the following actions:

- Selecting an INPUT.
 - Turning the display on or off via the DISPLAY ON or sending on or off commands that are configured via the UI (see [Using Embedded Web Pages on page 19](#)).
-

Operating via Ethernet

You can connect to SWT3-22-HU-WP-T via Ethernet using either of the following methods:

- Directly to the PC using a crossover cable (see [Configuring the Ethernet Port on page 17](#)).
- Via a network switch or router, using a straight through cable (see [Connecting Ethernet Port via a Network Switch on page 17](#)).



If you want to connect via a router and your IT system is based on IPv6, speak to your IT department for specific installation instructions.

Connecting Ethernet Port Directly to a PC

You can connect the Ethernet port of SWT3-22-HU-WP-T directly to the Ethernet port on your PC using a crossover cable with RJ 45 connectors.



This type of connection is recommended for identifying SWT3-22-HU-WP-T with the factory configured default IP address.

After connecting SWT3-22-HU-WP-T to the Ethernet port, configure your PC as follows:

1. Click **Start > Settings > Network and Sharing Center**.
2. Click **Change Adapter Settings**.

- Highlight the network adapter you want to use to connect to the device and click **Change settings of this connection**.

The **Local Area Connection Properties** window for the selected network adapter appears as shown in [Figure 8](#).

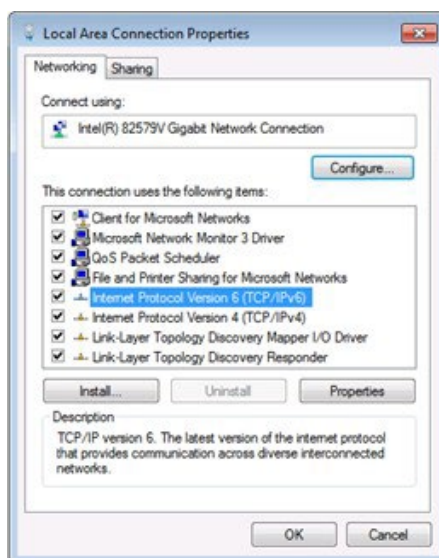


Figure 5: Local Area Connection Properties Window

- Highlight either **Internet Protocol Version 6 (TCP/IPv6)** or **Internet Protocol Version 4 (TCP/IPv4)** depending on the requirements of your IT system.
- Click **Properties**.

The Internet Protocol Properties window relevant to your IT system appears as shown in [Figure 6](#) and [Figure 7](#).

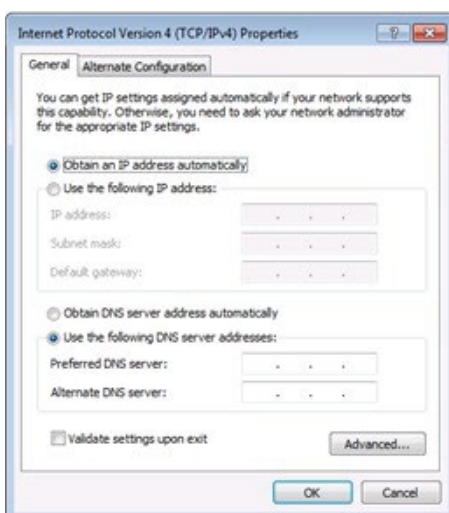


Figure 6: Internet Protocol Version 4 Properties Window

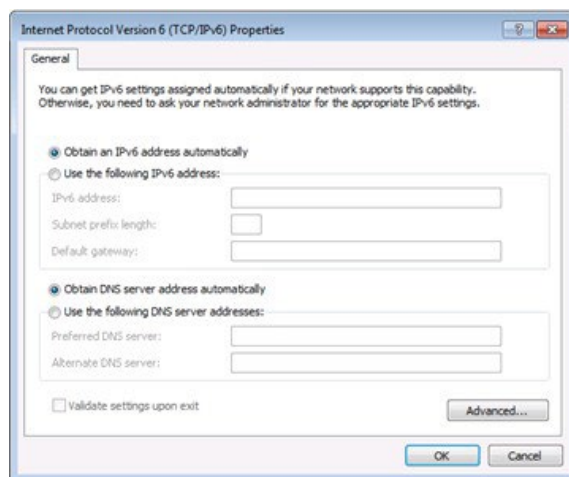


Figure 7: Internet Protocol Version 6 Properties Window

6. Select **Use the following IP Address** for static IP addressing and fill in the details as shown in [Figure 8](#).

For TCP/IPv4 you can use any IP address in the range 192.168.1.1 to 192.168.1.255 (excluding default 192.168.1.39 fallback address) that is provided by your IT department.



Figure 8: Internet Protocol Properties Window

7. Click **OK**.
8. Click **Close**.

Connecting Ethernet Port via a Network Switch

You can connect the Ethernet port of SWT3-22-HU-WP-T to the Ethernet port on a network switch or router using a straight through cable with RJ 45 connectors.

Configuring the Ethernet Port

You can set the Ethernet parameters via the embedded web pages (requires a network hub or switch connection).

SWT3-22-HU-WP-T includes IP address auto acquiring policy via LAN-connected DHCP server by default. When no DHCP server is detected, a fallback static IP address of 192.168.1.39, and 255.255.255.0 subnet mask (class C), is assigned until an IP address is acquired via the DHCP server.

Using Embedded Web Pages

SWT3-22-HU-WP-T enables you to configure settings via Ethernet using built-in, user-friendly web pages. The Web pages are accessed using a Web browser and an Ethernet connection.



To apply a USB-C type changes, the device must be power cycled.



USB-C Ethernet connection is disabled by default and is enabled only by API command (See [Protocol 3000 on page 46](#))

Before attempting to connect:

- Perform the procedure in (see [Operating via Ethernet on page 15](#)).



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



Check that Security/firewalls are not blocking HTTP traffic between the device and the user PC.

To access the web pages:

1. Enter the IP address of the device in the address bar of your internet browser (default = 192.168.1.39).

If security is enabled, the Login window appears.

1. Enter the Username (default = Admin) and Password (default = Admin) and click **Sign in**. The default web page appears.

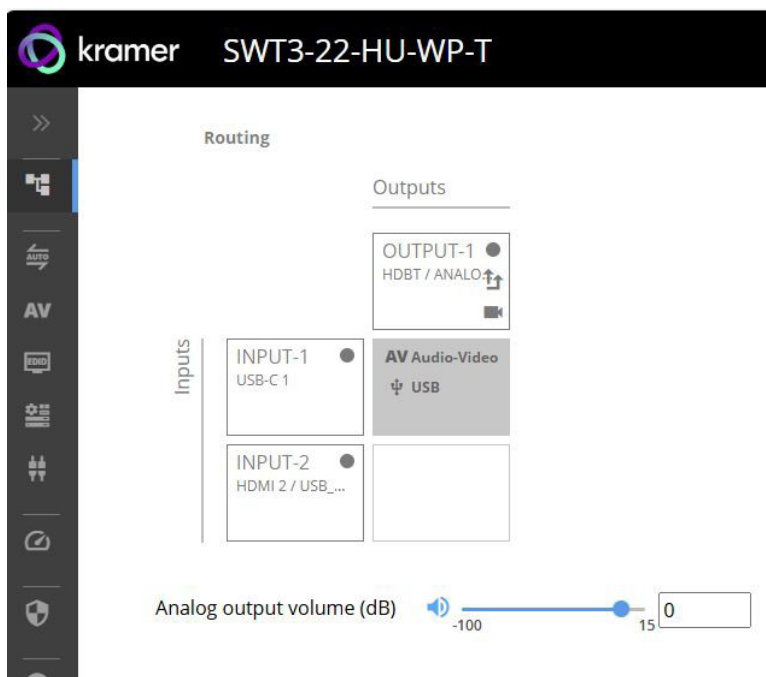


Figure 9: Default Landing Page

- Click the arrow at the top of the navigation list to view the menu items in detail.

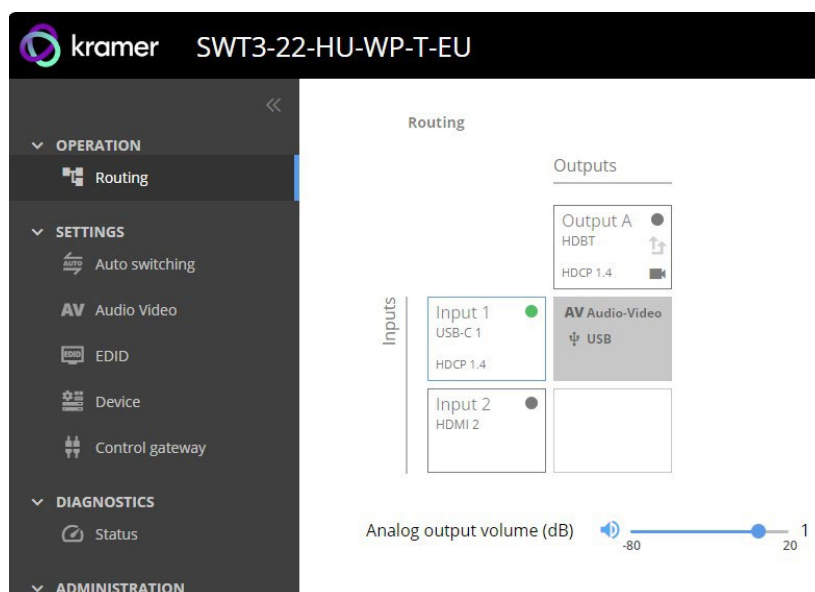


Figure 10: Pages and Tabs Navigable List

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

SWT3-22-HU-WP-T web pages enable performing the following actions:

Routing Signals	21
Setting AV Properties	22
Setting Device Properties	25
Setting Control Gateway Properties	29
Viewing Device Status	38
Viewing the About Page	41

Routing Signals

This section details the following actions:

Routing a Video Input to an Output

You can set each inputs to route the AV signal together with its USB signal (USB follows video coupled routing) or to route each individual signal independently.

To route the video inputs to the outputs:

1. Go to the Routing Settings page.

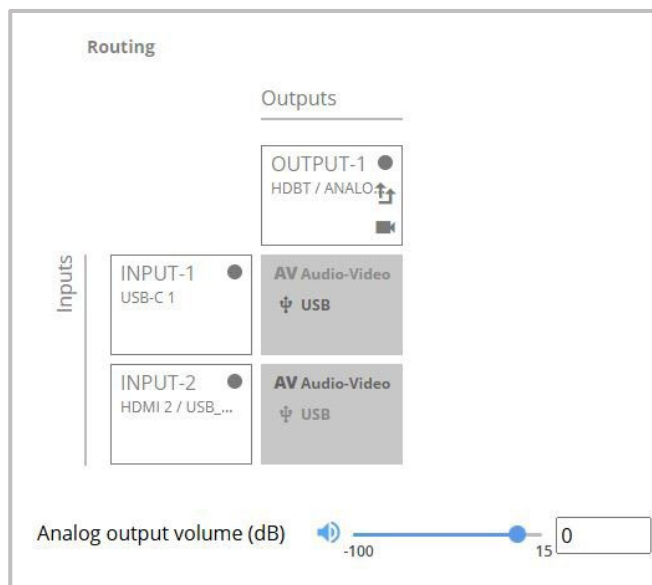


Figure 11: Routing Page

2. Perform the following functions:
 - Click an Input/Output cross-point (see [Routing AV and USB Host Signals below](#)).



A green light on a button indicates a connected source/acceptor.

- Click  to activate USB following video coupled routing.
- Click  to stop/play the video.

An input is routed to the output.

Routing AV and USB Host Signals

SWT3-22-HU-WP-T enables switching any of the inputs to the output in one of the following modes:

- USB follows AV coupled routing () – Selecting an input, routes the AV signal to the output and associates the USB devices to that selected USB host.

- USB signal individual routing () – Selecting an input, routes only the AV signal to the output. The USB host can be selected separately from any of the other inputs.

Individual USB Host Routing

In the following example, USB routing does not follow video, so you can individually select the AV signal on input 1 and the USB signal on input 2. This means that the HDMI input 2 AV signal is routed to the output and the USB devices are associated with the USB-C host (Input 1).

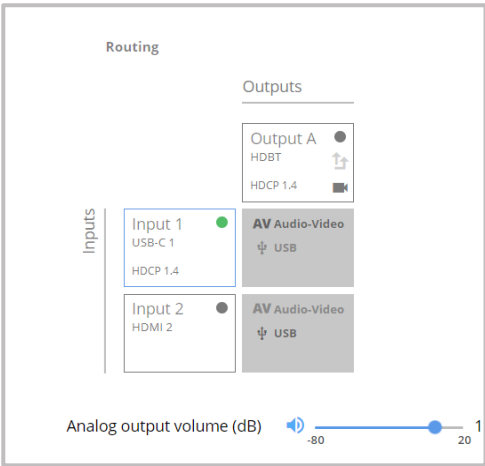


Figure 12: Selecting AV Signal on Input1 and USB Signal on Input 2

Setting the Analog Audio Output Level

To set the audio output level:

1. Go to the Routing Settings page.
2. Under Analog Outputs click .
3. Set the audio level using the slider next to Analog output volume (dB, from -80 to 20). Audio level is set.



Figure 13: Setting Audio Volume

Setting AV Properties

This section details the following actions:

Setting the Auto-Switching Policy	22
Configuring AV Settings	24
Managing EDID	25

Setting the Auto-Switching Policy

To set the auto-switching policy:

1. Go to the Auto switching page.
2. Next to the Selection Mode drop-down box, select the auto switching policy: **Manual**, **Last Connected** or **Priority**.

Switching policy is set.

To change input priorities:

1. Go to the Auto switching page.
2. Next to the Selection Mode drop-down box, select **Priority**.
3. Click and drag an input between high and low to change the priorities.

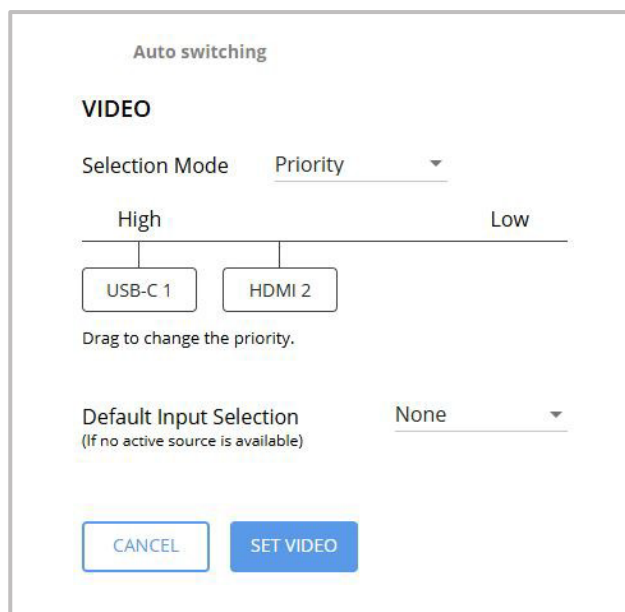


Figure 14: Changing Input Priorities

4. Click **SET VIDEO**.
- Input priorities are set.

To select default input selection:

1. Next to the Default Input Selection drop-down box, select the desired input to be selected if no active source is available.

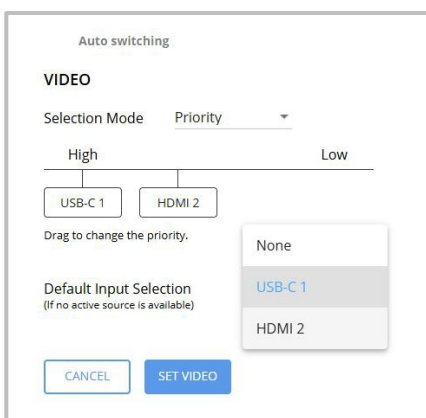


Figure 15: Selecting Default Input Source

2. Click **SET VIDEO**.
- Default input is selected when no source is available.

Configuring AV Settings

SWT3-22-HU-WP-T enables configuring the device's audio and video settings.

To configure audio and video settings:

1. Go to the Audio Video Settings page. The Audio Video Settings page appears.

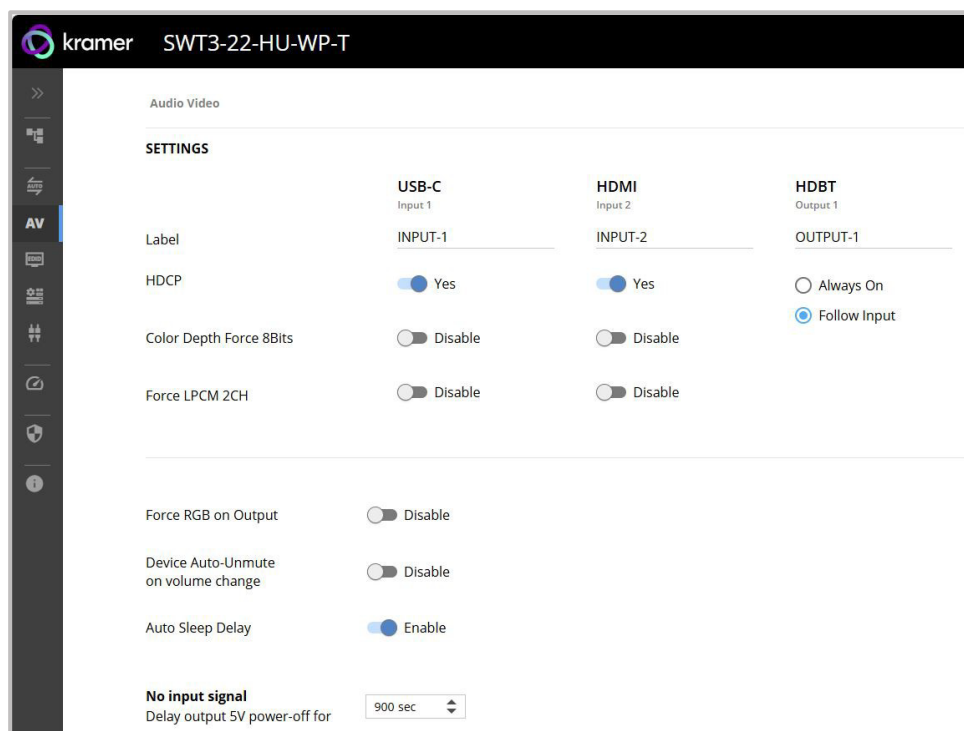


Figure 16: Audio Video Settings

2. Perform the following actions:

- Label – Change the name of an input or the output as it appears on the Routing page and EDID management page.
- HDCP – For the inputs, select the **Yes** (default) /**No** switch to enable/disable HDCP on that input. For the output, select **Always On** to keep HDCP enabled at all times, or **Follow Input** (default) to define the output HDCP setting according to the HDCP setting on the active input.
- Color Depth Force 8Bits – **Enable** or **Disable** (default) on each input.
- Force LPCM 2CH – **Enable** or **Disable** (default) on each input.
- Force RGB on Output – **Enable** or **Disable** (default).
- Device Auto-Unmute on volume change – When enabled changing the volume will auto-unmute the audio output.
- Auto Sleep Delay – When no input signal is detected, the display 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 **TIMEOUT** setting (see below).
- 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 display goes into sleep mode. Click **SET TIMEOUT** after defining this setting.

Audio and video settings are configured.

Managing EDID

SWT3-22-HU-WP-T 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.

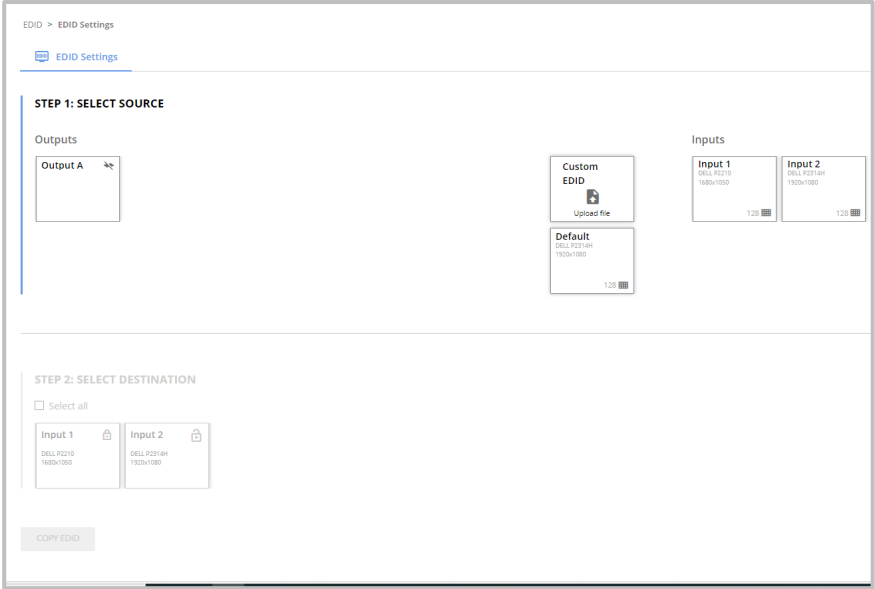


Figure 17: EDID Management Page

- 2. Under Step 1, select the EDID source (the output, any of the inputs, default or custom EDID).
- 3. Under Step 2, select one or more inputs as the destination for copying the EDID.
- 4. Click **COPY EDID**.

The EDID is copied.

Setting Device Properties

This section details the following actions:

Device Profile and Maintenance	25
Settings Networking Properties	27

Device Profile and Maintenance

Changing Device Name

SWT3-22-HU-WP-T enables you to change the DNS name of the device.

To change the device name:

1. Go to the Device > General page.

Figure 18: Device>General Page

2. Under General Preferences, change the device name and click **SAVE**.
The device's name is changed.

Upgrading Firmware

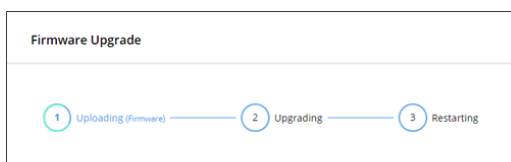
To upgrade the device firmware:

1. Go to the **Device > General** page (Figure 18).
2. Under General, click **Update**, open the relevant firmware file, and follow the instructions.
The upgrade takes approximately 30-60 seconds.



During FW upgrade, the device continues to operate, but the device UI and protocol 3000 communication are inactive. When device restarts, the status LED is lit, and HDMI output signal is disconnected until restart completes.

Firmware is updated.



Resetting and Restarting 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 (a DHCP-acquired IP address is retained).

To restart the device:

- Click **DEVICE RESTART** on the **Device > General** page (Figure 18).

To perform a factory reset on the device, use one of the following actions:

- Click **FACTORY RESET** on the **Device > General** page (Figure 18).
- Using protocol 3000 commands, send the FACTORY command then RESET commands.
- On the rear panel, press and hold the RESET button while connecting the power for several seconds.

Exporting and Importing a Configuration File

SWT3-22-HU-WP-T enables you to export and store a configuration file, which records all current device settings except the routing operation setup. The stored file can then be imported to the same or different SWT3-22-HU-WP-T device to load the recorded settings, for configuration backup and/or solution-replication purposes.

Exporting a Configuration File

To export a configuration file of the current device settings:

1. Go to the **Device > General** page (Figure 18).
2. Under Global System Settings, click **EXPORT**.
3. Select the storage location on your computer to save the configuration file and click **SAVE**.

The configuration file is exported and saved.

Importing a Configuration File

To import a configuration file of the current device settings:

1. Go to the **Device > General** page (Figure 18).
2. Under Global System Settings, click **IMPORT**.
3. Select the relevant configuration file from your computer storage and click **SAVE**.

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

Identifying Your Device

To identify the device:

1. Go to the **Device > General** page (Figure 18).
2. Under Global System Settings, click **FLAG ME**. NET LED flashes.

Settings Networking Properties



By default, DHCP is set to on. The IP address shows the actual IP address acquired from the DHCP server, or the auto-acquired fallback IP address when there is no DHCP server detection.

To configure network settings:

1. Go to the **Device > General** page (Figure 18).
2. Select the **Network** tab.

The network page appears.

3. Change settings as needed.
If required, set to **DHCP** (default) or static IP address resolution mods.
4. When in Static IP mode, perform the following actions:
 - Change the IP address.
 - Change the Mask address.
 - Change the Gateway address.

Network settings are defined.

Setting USB-C Host Port Signals Mix

AV and USB combine and the USB-C host port data rate, can be flexibly set.



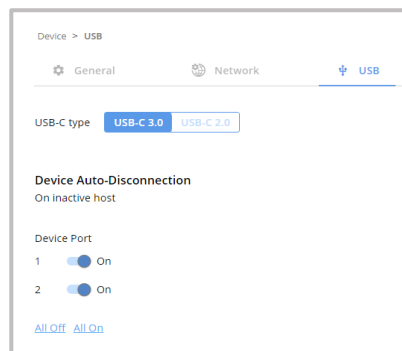
To apply the USB-C type change, the device must be power cycled.



USB-C ethernet connection is disabled by default and is enabled only by API command (see Protocol 3000 on page 46).

To select USB-C host port signal combining:

1. Go to the **Device > General** page (Figure 21).
2. Select the USB tab.
3. Disconnect the USB-C cable from the device.



4. For the USB-C type, select one of the following:
 - **USB-C 3.0** - Higher USB data rate (10Gbps); lower AV resolution (4K60 4:2:0).
 - **USB-C 2.0** – Higher AV resolution (4K60 4:4:4); lower USB data rate (480Mbps).
5. Before you Click **SAVE**, disconnect the USB--C cable from the unit. Click **SAVE** and wait until the web screen re-appears (may take 1 min).
6. Power cycle the device, while the USB-C is still disconnected from the device.
7. After unit power up, verify the new USB setup took place (USB-C 2.0 or USB-C 3.0). At this stage you can connect the USB-C cable to the device.

USB-C host signal combination configuration is set.

Auto-disconnecting a USB Device on Inactive Host

1. Go to the **Device > General** page (Figure 21).
2. Select the USB tab (Figure above).
3. For each USB Device Port, set the auto disconnection status to **On** or **Off**. You can also Select **All Off** or **All On** to set all device ports to off or on, respectively.
4. Click **SAVE**.

USB devices are set.

Setting Control Gateway Properties

This section details the following actions:

Setting Serial Port Properties	29
Configuring I/O (GPIO) Ports	32
Defining and Testing Commands via Action Editor	35
Configuring Remote Buttons	36
Defining CEC Gateway Settings	37
Associating CEC Commands to DISPLAY ON/OFF	38

Setting Serial Port Properties

The serial ports serve as one of the following:

- RS-232 extension – From panel port, via HDBT RS-232 channel, to control a peripheral connected to the HDBT paired unit RS-232 port (see [Extending the RS-232 via the SWT3-22-HU-WP-T](#)).
- External peripheral IP control – Remote IP control of port-connected peripheral, via device built-in control gateway (see [Controlling the SWT3-22-HU-WP-T](#)).

- Device management and control – Device service and control using P3000 commands (see [Controlling an External Device via IP Messages](#)).

Extending the RS-232 via the SWT3-22-HU-WP-T

Setting the HDBT Extension Mode:

Set the HDBT as an RS-232 extender to control the remote peripheral device.

To set the HDBT extension mode:

1. Go to the Control Gateway page. The Serial Ports tab appears.

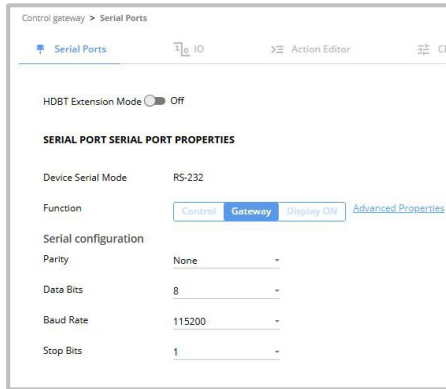


Figure 19: Control Gateway Page

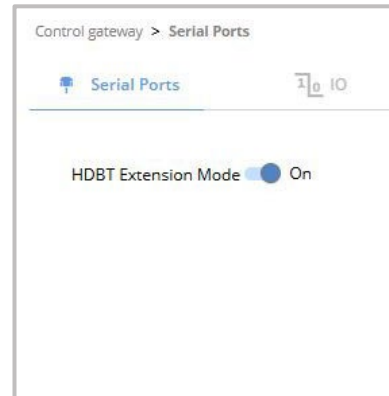


Figure 20: Enabling HDBT Extension Mode

2. Enable **HDBT Extension Mode** to ON (OFF is default mode).
 - SWT3-22-HU-WP-T is set to operate as an RS-232 extender, with end-to-end extension between RS-232 panel port and HDBT RS-232 channel.



In extension mode, no configuration of port properties and functions are available ([Figure 20](#)).

Controlling the SWT3-22-HU-WP-T

To set the RS-232 port to control the SWT3-22-HU-WP-T:

1. Go to the Control Gateway page. The Serial Ports tab appears.

Control gateway > Serial Ports

Serial Ports IO Action Editor CEC

HDBT Extension Mode ☐ Off

SERIAL PORT SERIAL PORT PROPERTIES

Device Serial Mode RS-232

Function **Control** Gateway Display ON Advanced Properties

Serial configuration

Parity None

Data Bits 8

Baud Rate 115200

Stop Bits 1

Figure 21: RS-232 Device Control

2. Next to Tunneling, select **Control**.
 3. Click **SAVE**.
- RS-232 port controls the SWT3-22-HU-WP-T.

Controlling an External RS-232 Device via IP Messages

Control an external RS-232 device via an IP-connected Controller (for example SL-240C that is connected via LAN)

To set the RS-232 port to control an external device:

1. Go to the Control Gateway page. The Serial Ports tab appears.
2. Next to Function, select **Gateway**.

Control gateway > Serial Ports

Serial Ports IO Action Editor CEC

HDBT Extension Mode ☐ Off

SERIAL PORT SERIAL PORT PROPERTIES

Device Serial Mode RS-232

Function **Gateway** Control Display ON Advanced Properties

Serial configuration

Parity Odd

Data Bits 8

Baud Rate 9600

Stop Bits 1

3. Define the external device RS-232 settings (Parity, Data Bits, Baud Rate and Stop Bits).
4. Click **Save**.

The TUNNELING ADVANCED PROPERTIES Settings tab appears.

TUNNELING ADVANCED PROPERTIES

Protocol: TCP

IP Port: 5001

Send replies to new client by default Bits: ☒ On

CLOSE

Figure 22: Setting Advanced Tunneling Properties

5. Click up/down arrows to select IP Port.
6. Press to toggle ON Send replies to new clients by default Bits.
7. Click **Close**.
8. Click **SAVE**.

RS-232 port controls an external device.

Controlling SWT3-22-HU-WP-T Connected Display

Control an external device via a Controller (for example SL-240C that is connected via LAN).

To set the RS-232 port to control an external device:

1. Go to the Control Gateway page. The Serial Ports tab appears.
2. Next to Tunneling, select **Display ON**.

Control gateway > Serial Ports

Serial Ports

HDBT Extension Mode: Off

SERIAL PORT SERIAL PORT PROPERTIES

Device Serial Mode: RS-232

Function: Control Gateway **Display ON** Advanced Properties

Serial configuration

Parity: Odd

Data Bits: 8

Baud Rate: 9600

Stop Bits: 1

Figure 23: RS-232 Control for Display on/off

3. Define the display RS-232 settings (Parity, Data Bits, Baud Rate and Stop Bits).
4. Click **SAVE**.

RS-232 port controls the DISPLAY ON/OFF.

Configuring I/O (GPIO) Ports

The 2 I/O ports can control devices such as sensors, door locks, remote contact-closure buttons, audio volume and lighting control devices and can be configured via the webpages.



To enable I/O operations, Remote Button must be set to Off.

To configure an I/O port:

1. In the Navigation pane, click **Control Gateway**. The Serial Ports tab in the Device Settings page appears.
2. Select the IO tab. The IO tab appears.

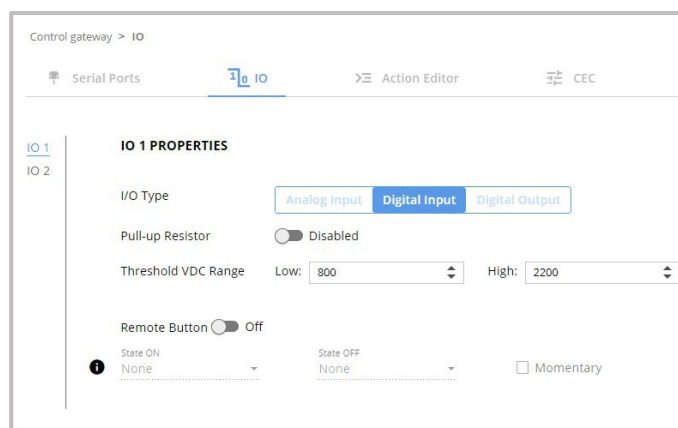


Figure 24: Digital Output I/O Type

3. Select the I/O port to be configured (IO 1 or IO 2).
4. Select one of the following I/O types:
 - Digital Input (default setting) (see [Configuring a Digital Input I/O Type below](#)).
 - Digital Output (see [Configuring a Digital Output I/O Type on the next page](#)).
 - Analog Input (see [Configuring an Analog Input I/O Type on page 35](#)).



The settings available on the page change depending on which trigger type is selected.

5. Click **SAVE** after setting the selected I/O type.

Configuring a Digital Input I/O Type

The Digital Input trigger mode reads the digital input of an external sensor device that is connected to the I/O port. It detects High (upon passing the High threshold from a Low state) or Low (upon passing Low threshold from a High state) states according to the user-defined threshold levels.

To configure a digital input I/O type:

1. On the GPIO page, select Digital Input next to I/O Type.
The Digital Input options appear ([Figure 26](#)).
2. Select one of the following for the Pull-up resistor setting:
 - **Disabled** – When the pull-up resistor is disabled, the port state must be triggered (pulled high or low) by the externally connected sensor. This is suitable, for example, for a high temperature alarm with logic levels according to the defined voltage thresholds. For example, the externally connected alarm sensor may be in a low state under normal conditions, and when the temperature rises above a certain level, it goes to a high state (or visa-versa).

- **Enabled** – When the pull-up resistor is enabled, the port detects an open circuit as High, and a short to ground as Low. This is suitable, for example, for a pushbutton switch (connecting one terminal of the switch to ground, and the other to the input) or for an alarm closing a relay.

Set the Threshold VDC Low and High Range (threshold voltage at which the port changes state).

3. Click **Read** to refresh port status information.

4. Click **SAVE**.

Digital input I/O type is configured.

Configuring a Digital Output I/O Type

To configure a digital output I/O type:

1. On the GPIO page, select Digital Output next to I/O type.

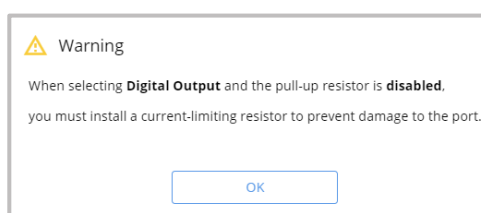


Figure 25: Digital Output Warning

2. Make sure to follow the instructions in this warning.

3. Click **OK**. The Digital Output options appear.

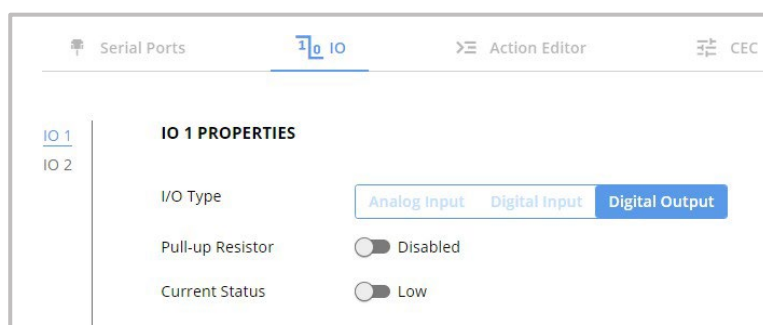


Figure 26: GPIO Settings Page – Digital Output I/O Type

4. Select one of the following for the Pull-up resistor setting:

- Pullup resistor set to **Enabled**:

The port can be used for controlling devices that accept a TTL signal such as for powering LEDs. The voltage output is TTL positive logic: high: >2.4V; low: < 0.5V.

- Pullup resistor **Disabled**:

The port is used for controlling external devices such as room or light switches. The external source device determines the voltage output; the maximum voltage is 30V DC and the maximum current is 100mA.



Make sure that the current in this configuration does not exceed 100mA.

5. The Current Status switch may be used to manually change the GPIO output state.

6. Click **SAVE**.

Digital Output I/O type is configured.

Configuring an Analog Input I/O Type

When selecting the Analog Input I/O type, the port is triggered by an external analog device, such as a volume control device. The trigger is activated once when the detected voltage is within the 0 to 30V DC voltage range.

To configure an analog input I/O type:

1. On the GPIO page, select Analog Input next to I/O type.

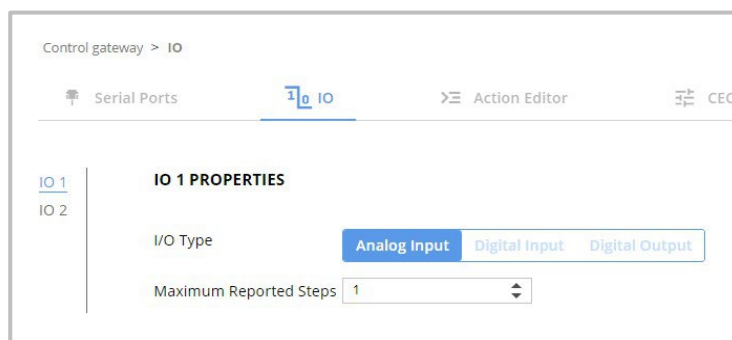


Figure 27: GPIO Port Settings Page Analog Input

2. Enter or use the arrows to scroll to a value (1–100) for the Maximum reported steps. This value is the number of steps that the analog input signal is divided into. To calculate the voltage of each step, use the following formula:
Voltage of one step = 30V / number of steps.

3. Click **SAVE**.

Analog input I/O type is configured.

Defining and Testing Commands via Action Editor

Use action editor to create and test control commands via CEC, UART or IR control interfaces. You can create up to 5 commands.

To add an action:

1. In the navigation pane, select **Control Gateway**. The Serial Ports tab opens.
2. Select the **Action Editor** tab. The Action Editor appears.

ACTION PROPERTIES

Command Id: 0

Command Name: custom_command

Port: CEC
UART
IR

Command:

450 characters left
Special characters (@, ~, #, %, ", |, comma, space) will be replaced by their hexadecimal value

Syntax: <port_num>, Free text or hex decimal characters \xAB

RUN COMMAND

Figure 28: Action Editor Tab

3. Select a command name on the left side of the window.
4. Change the command name, if required.
5. Select the port (CEC, UART or IR).
6. Enter the appropriate command line, such as one of the following Display On sample commands:

- For CEC - 1,1,tv-on,2,E004



The command to power on a TV can vary depending on the specific TV model and manufacturer. However, above is a common example of a standard command to power on a TV.

- For UART (RS232) - PON
- For IR -
1,1,TVON,1,1,1,0000,006f,0022,0002,014d,00a6,0015,0015,0014,0015,0013,0014,0015,0015,0014,0014,0014,0014,0015,0015,0014,003e,0016,003d,0014,003f,0014,003e,0015,003f,0013,003f,0014,003e,0015,003f,0013,0016,0013,0015,0014,0015,0013,0016,0013,003f,0013,003e,0015,0015,0013,003e,0015,003f,0013,003f,0013,003e,0015,003e,0015,0015,0014,0015,0013,003f,0014,0015,0013,0014,0015,05c9,014d,0053,0015,0e0a

7. Click **SAVE**.
8. Click **RUN COMMAND** to run the command test.

An action is entered and can be run.

Configuring Remote Buttons

You can connect remote button to the GPIO ports and define the actions to be performed when the GPI is triggered.

To Configure Remote Buttons:

1. In the Navigation pane, click Control Gateway. The Serial Ports tab in the Device Settings page appears.
2. Select the IO tab. The IO tab appears.

3. Press to toggle Remote Button to On.
4. Configure defined control actions, for button on/off states, using the **State ON**, **State OFF** drop-down boxes.
 - Button default operation mode is latching. For momentary mode, check the Momentary checkbox.

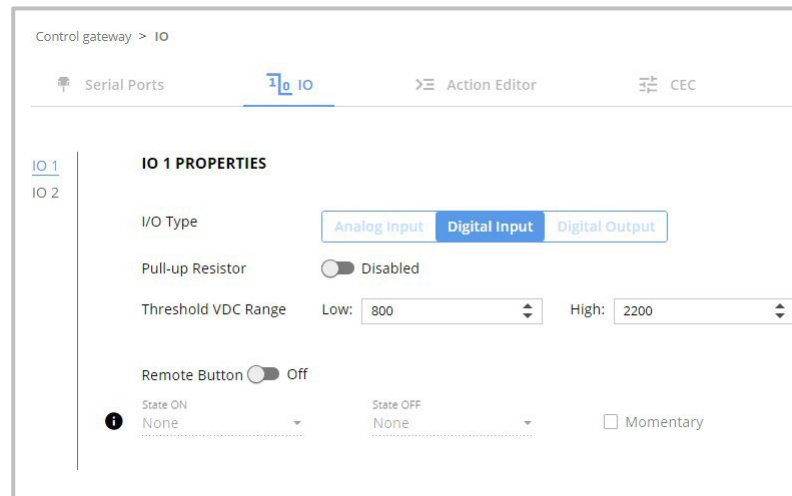


Figure 29: I/O ports settings tab – Configuring Remote Buttons

5. Click **Save**.

A control action remote button can now be remotely operated.

Defining CEC Gateway Settings

SWT3-22-HU-WP-T built-in CEC gateway enables IP control, via CEC messages, on the HDMI ports. The Members address list shows the logical addresses of connected CEC-enabled devices.

 By-default, the CEC gateway is enabled.

To disable the CEC gateway feature:

1. In the navigation pane, select **Control Gateway**. The Serial Ports tab opens.
2. Select the **CEC** tab. The CEC Gateway page appears.
3. Click CEC gateway **OFF**.

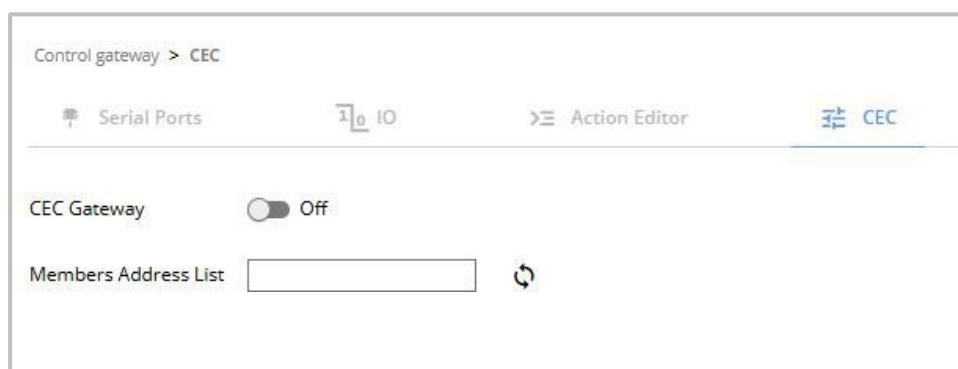


Figure 30: CEC Gateway Enable/Disable Tab

CEC gateway is disabled.

You can view the logical addresses of CEC-enabled devices connected to the HDMI port on SWT3-22-HU-WP-T. Click **Refresh** to refresh the list.

Associating CEC Commands to DISPLAY ON/OFF

Configure CEC commands to send via the DISPLAY ON button.

To add an action:

1. In the navigation pane, select **Control Gateway**. The Serial Ports tab opens.
2. Select the **Display On** tab. The Display ON settings appears.

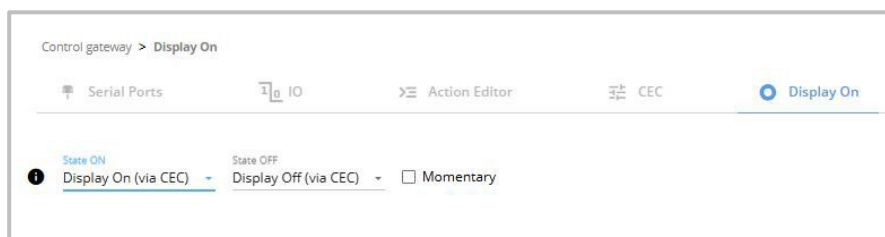


Figure 31: Action Editor Tab

3. Define the State On and State Off commands.
4. Check **Momentary** for the button to send a command on the press of a button.
5. Click **SAVE**.

DISPLAY ON button is configured.

Viewing Device Status

View the device status.

To view the device status:

1. In the navigation pane, select **Status**.
2. Select the **Devices** tab. The Devices Status appears.

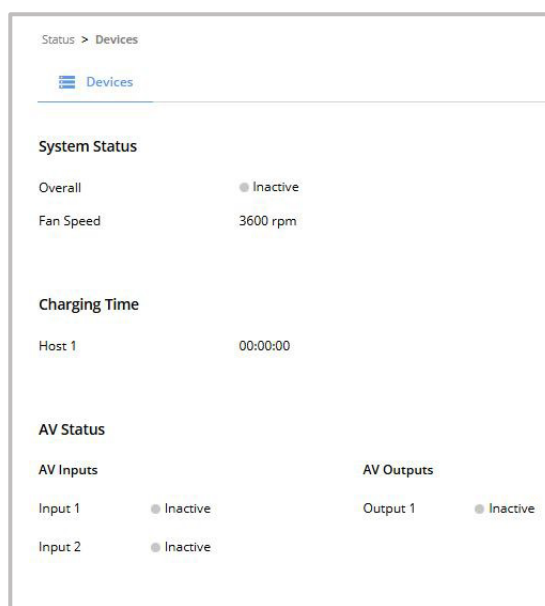


Figure 32: Device Status Page

3. View device status.
- Device status can be viewed.

Setting Security Properties

This section details the following actions:

Changing Security Status	39
Defining 802.1X Authentication	40

Changing Security Status

By default, security status is set to On.

Setting Security Status to Off

To set security status to Off:

- 1. Go to the Security page (Figure 33).
- 2. Select the Security tab. The Security settings appears.

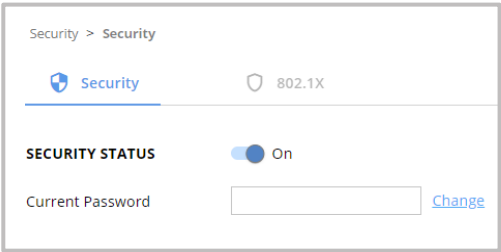


Figure 33: Security – Security Tab

- 3. Set **SECURITY STATUS** to **Off**. The Security Status window appears.

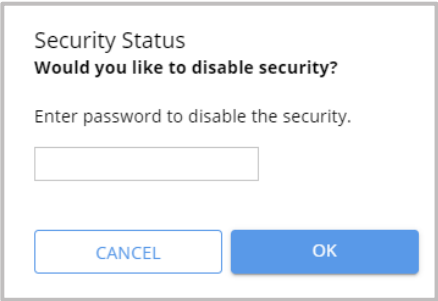


Figure 34: Security Status Message

- 4. Enter the current password.
- 5. Click **OK**.

Security status is set to Off.

Setting Security Status to On

To set security status to on:

- 1. Go to the **Security > Security** (Figure 33).
- 2. Set **SECURITY STATUS** to **On**.

Security status is set to On.

Changing Web Pages Access Password

To change the password for accessing the embedded web pages:

1. Go to the Security page (Figure 33).
2. Select the Security Tab. The Security settings appear (Figure 35).
3. Enter the Current Password and click **Change**. The new password settings appear.

Figure 35: Device Settings – Changing the Password

4. Enter the new password and confirmation password and click **SAVE**.
The password is changed.

Defining 802.1X Authentication

802.1x security standard supports IT networking authentication based on LAN port and MAC address.

To configure security:

1. In the Navigation pane, click **Security**. The Security settings tab in the Security page appears.
2. Select **802.1X** tab. The 802.1X settings tab appears (see below).

Figure 36: 802.1X Tab

3. For 802.1x authentication, click **ON** to enable 802.1x authentication service. 802.1x supports authentication based on port and MAC address.
4. When set to ON check one standard authentication method to set its security attributes.
 - **PEAP-MSCHAP V2** – Enter:
 - Username - up to 24 alphanumeric characters, including “_” and “-” characters within the username, and
 - Password - up to 24 ASCII characters

Security > 802.1X

Security 802.1X

IEEE 802.1X AUTHENTICATION ☒ On

Authentication Method

☒ EAP-MSCHAP V2

Username* default_username

Password*

☐ EAP-TLS

Figure 37: Security Tab – EAP-MSCHAP V2 Authentication

- **EAP-TLS** – To submit certificate from the server for authentication:

- Enter Username,
- Click to upload certificates and keys



File format must be pem.

- Enter the private key password (assigned by IT administrator),
- Set Server Certificate **On**

Security > 802.1X

Security 802.1X

IEEE 802.1X AUTHENTICATION ☒ On

Authentication Method

☐ EAP-MSCHAP V2

☒ EAP-TLS

Username* default_username

Client Certificate* client_cert.crt

Private Key* private_key.key

Private Key Password *****

Figure 38: EAP-TLS – Certificates and Password

5. Click **APPLY**.

802.1x authentication security is configured.

Viewing the About Page

View the firmware version and Kramer Electronics Ltd details in the About page.

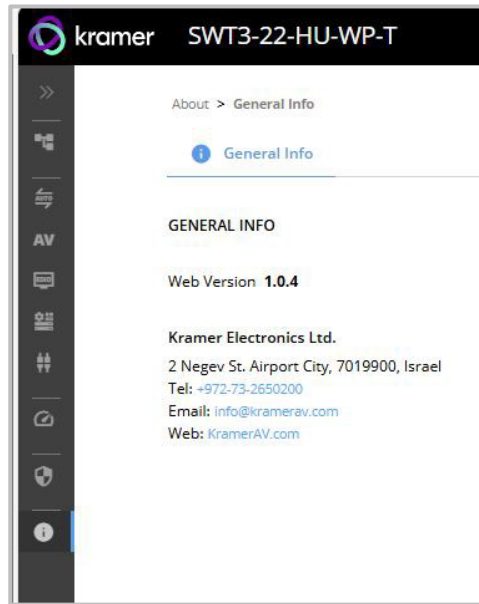


Figure 39: About Page

Upgrading Firmware

Use the Kramer K-UPLOAD software to upgrade the firmware via ethernet or the RS-232 port, allowing RS-232 to control/program the device). The device continues to operate and once FW upload complete, you are asked to Restart no or later.

The latest version of K-UPLOAD and installation instructions can be downloaded from our website at: www.kramerav.com/support/product_downloads.asp.



Note that in order to use the micro USB port, you need to install the Kramer USB driver, available at www.kramerav.com/support/product_downloads.asp.

Technical Specifications

Inputs	1 DP Alt Mode & PD 3.0 USB-C		On a USB type-C female connector
	1 HDMI		On an HDMI female connector
Outputs	1 HDBT PoE accepting	For SWT3-22-HU-WP-T-US Only	On an RJ-45 female connector
	1 HDBT	For SWT3-22-HU-WP-T-UK/EU Only	
	1 HDMI		On an HDMI female connector
	1 Balanced Stereo Audio Line		On 5-pin terminal block connector
Ports	2 USB 3.2 Host		On a USB-C female connectors
	2 USB 3.2 Device		On USB type-A female connectors
	1 PoE accepting 1000BaseT Ethernet	For SWT3-22-HU-WP-T-US Only	On an RJ-45 female connector for LAN connection & extension
	1000BaseT Ethernet	For SWT3-22-HU-WP-T-UK/EU Only	
	1 RS-232		On a 3-pin terminal block
	2 GPIO		On a 2-pin terminal block
Extension Line	Reach		Up to 100m (330ft), using Kramer HDBaseT cables
	Standard Compliance		HDBaseT 3.0
Video	Max Data Rate		18Gbps bandwidth (6Gbps per graphic channel)
	Max Resolution		4K@60Hz (4:4:4) resolution
	Content Protection		HDCP 2.3
	HDMI Support		Deep Color, 3D, HDR as specified in HDMI 2.0b
USB Features	Integrated USB Hubs		1
	Standards Compliance		USB 3.2 GEN 2, 2.0 and 1.1
Extended USB	USB 2.0 Data Rate		Up to 480Mbps
	Transmitted Data Bandwidth		Up to 300Mbps
	Standards Compliance		USB 2.0 and 1.1
Extended Ethernet	Max Data Rate		1 Gbps
Extended RS-232	Baud Rate		300 to 115200

Analog Audio	Max Output Signal Level	15dBu	
	Impedance:	500Ω	
	Bandwidth	20Hz — 20kHz	
	THD + N	0.002% @1kHz at nominal level	
	S/N Ratio	−93dB, 20Hz — 20kHz	
	Coupling	DC	
Power	Power Adaptor	Source	20VDC 6A
		Consumption:	4.4A
		Max. Power	84W
	PoE (For SWT3-22-HU-WP-US Only)	Consumption	144mA
		Compliance	802.3at, Type 1
		Max. Power	7.8W
	USB-C Charging	Max. Power	60W
		Compliance	PD 3.0
Environmental Conditions	USB Device Charging	Max. Total Current	2A
	Operating Temperature	0° to +40°C (32° to 104°F)	
	Storage Temperature	−40° to +70°C (−40° to 158°F)	
Regulatory Compliance (Standards Compliance)	Humidity	10% to 90%, RHL non-condensing	
	Safety	CE, UL	
Enclosure	Environmental	RoHs, WEEE	
	Size	WW 2 Gang	
	Material	Aluminum	
	Cooling	Fan Ventilation	

Default Communication Parameters

RS-232	
Baud Rate:	115.200
Data Bits:	8
Stop Bits:	1
Parity:	None
Command Format:	ASCII

Example (Route video input 2 to the output):	#ROUTE_1,1,2<CR>...
Ethernet	
To reset the IP settings to the factory reset values go to: Menu->Setup -> Factory Reset-> press Enter to confirm	
Fallback IP Address:	192.168.1.39
Fallback Subnet mask:	255.255.255.0
Fallback gateway:	192.168.0.1
Default username:	Admin
Default password:	Admin
Full Factory Reset	
P3K	"#FACTORY" command. After receiving "FACTORY OK" perform one of the following to restart the device and complete the procedure: - Power cycle - Send command "#RESET"
Embedded webpages	Go to: Device>General and click FACTORY RESET

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.

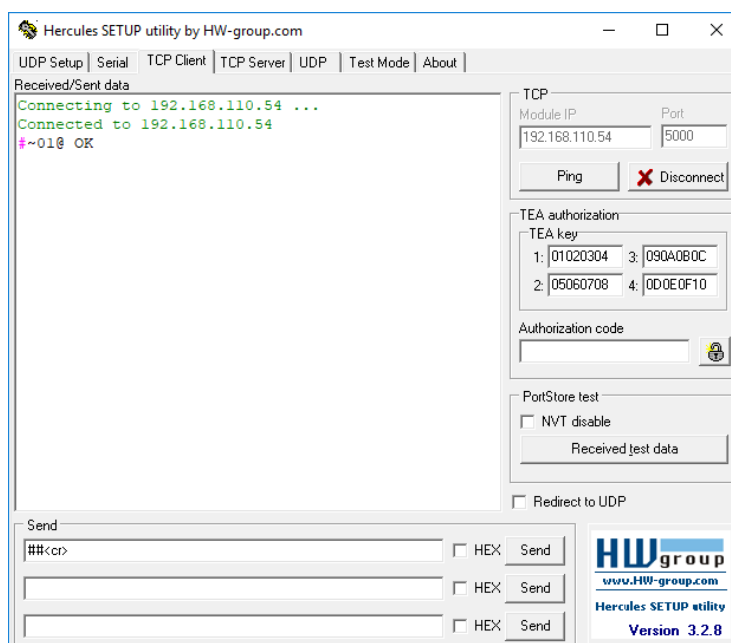
- Command Format:

#	Command	Parameter	<CR>
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- Feedback Format:

- **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 (|).
- **Parameter 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 SWT3-22-HU-WP-T. The following figure displays how the # command is framed using terminal communication software (such as Hercules):



Protocol 3000 Commands

#	Protocol handshaking. ① Validates the Protocol 3000 connection and gets the machine number. Step-in master products use this command to identify the availability of a	COMMAND #<CR> FEEDBACK ~nn@ok<CR><LF>		#<CR>
AUD-LVL	Set volume level.	COMMAND #AUD-LVL_ <u>io_mode</u> , <u>io_index</u> , <u>vol_level</u> <CR> FEEDBACK ~nn@AUD-LVL_ <u>io_mode</u> , <u>io_index</u> , <u>vol_level</u> <CR><LF>	<u>io_mode</u> – 1 – Output <u>io_index</u> – 1 <u>vol_level</u> – Volume level -100db to 15dB; ++ (increase 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?_ <u>io_mode</u> , <u>io_index</u> <CR> FEEDBACK ~nn@AUD-LVL_ <u>io_mode</u> , <u>io_index</u> , <u>vol_level</u> <CR><LF>	<u>io_mode</u> – 1 – Output <u>io_index</u> – 1 <u>vol_level</u> – Volume level -100db to	Get AUDIO OUT level: #AUD-LVL?_1,1<CR>
AUD-LVL-RANGE?	Get volume level min and max range.	COMMAND #AUD-LVL-RANGE?_ <u>io_mode</u> , <u>io_index</u> <CR> FEEDBACK ~nn@AUD-LVL- <u>io_mode</u> <u>io_index</u> <u>min_val</u> <u>max_val</u>	<u>io_mode</u> – 1 – Output <u>io_index</u> – 1 <u>min_val</u> – -100db <u>max_val</u> – 15dB	Get AUDIO OUT level range: #AUD-LVL-RANGE?_1,1<CR>
AUD-MUTE	Set audio mute.	COMMAND #AUD-MUTE_ <u>out_index</u> , <u>mute_mode</u> <CR> FEEDBACK	<u>out_index</u> – 1 <u>mute_mode</u> – On/Off 0 – Off 1 – On	Set Output 1 to mute: #AUD-MUTE_1,1<CR>
AUD-MUTE?	Set audio mute.	COMMAND #AUD-MUTE_ <u>out_index</u> <CR> FEEDBACK	<u>out_index</u> – 1 <u>mute_mode</u> – 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_ <u>unmute_status</u> <CR> FEEDBACK ~nn@AUD-MUTE-PERSIST <u>unmute_status</u> <CR><LF>	<u>unmute_status</u> – 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 <u>unmute_status</u> <CR><LF>	<u>unmute_status</u> – 0 – Mute state is not persistent and changes upon volume change 1 – Mute state is persistent upon	Get auto unmute status upon volume change: #AUD-MUTE-PERSIST?_ <CR>
AUTH-802-1X-ENABLE	Set authentication 802.1X feature for the specific interface.	COMMAND #AUTH-802-1X-OP-STAT?_ <u>interface</u> ID <CR> FEEDBACK ~nn@AUTH-802-1X-ENABLE <u>interface</u> , <u>enable_status</u> <CR><LF>	<u>interface</u> – Interface ID – 0 <u>enable_status</u> – 0 – Off 1 – On	Get the authentication 802.1X operation status: #AUTH-802-1X-OP-STAT_0<CR>
AUTH-802-1X-ENABLE?	Get authentication 802.1X feature for the specific interface.	COMMAND #AUTH-802-1X-ENABLE?_ <u>interface</u> <CR> FEEDBACK ~nn@AUTH-802-1X-ENABLE <u>interface</u> , <u>enable_status</u> <CR><LF>	<u>interface</u> – Interface ID – 0 <u>enable_status</u> – 0 – Off 1 – On	Get the authentication 802.1X feature status: #AUTH-802-1X-ENABLE?_0<CR>
AUTH-802-1X-OP-STAT?	Get authentication 802.1X operational status.	COMMAND #AUTH-802-1X-OP-STAT_ <u>interface</u> ID <CR> FEEDBACK ~nn@AUTH-802-1X-OP-STAT <u>interface</u> ID <u>status</u> <CR><LF>	<u>interface</u> – Interface ID – 0 <u>Status</u> – Status 0 – Not authenticated	Get the authentication 802.1X operation status: #AUTH-802-1X-OP-STAT?_0<CR>
AV-SW-MODE	Set input auto switch mode (per output).	COMMAND #AV-SW-MODE_ <u>layer_type</u> , <u>out_index</u> , <u>connection_mode</u> <CR> FEEDBACK ~nn@AV-SW-MODE_ <u>layer_type</u> , <u>out_index</u> , <u>connection_mode</u> <CR><LF>	<u>layer_type</u> – Number that indicates the signal type: 1 – Video 2 – Audio <u>out_index</u> – 1 <u>connection_mode</u> – Connection mode 0 – manual 1 – priority switch	Set the input audio switch mode to Manual for HDMI OUT: #AV-SW-MODE_1,1,0<CR>

Function	Description	Syntax	Parameters/Attributes	Example
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?_4,5<CR>
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-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-NTFY-ACTIVE	Set CEC notification activity (valid until the next power up).	COMMAND #CEC-NTFY-ACTIVE_cec_ntfy<CR> FEEDBACK ~nn@CEC-NTFY-ACTIVE_cec_ntfy<CR><LF>	cec_ntfy – 0 – Inactive 1 – Active	Enable CEC notification: #CEC-NTFY-ACTIVE_1<CR>
CEC-NTFY-ACTIVE?	Get CEC notification activity status.	COMMAND #CEC-NTFY-ACTIVE?_<CR> FEEDBACK ~nn@CEC-NTFY-ACTIVE_cec_ntfy<CR><LF>	cec_ntfy – 0 – Inactive 1 – Active	Get CEC notification activity status: #CEC-NTFY-ACTIVE?_<CR>

Function	Description	Syntax	Parameters/Attributes	Example
CEC-SND	Send CEC command to port.	COMMAND #CEC- SND, <u>port_index</u> , <u>sn_id</u> , <u>cmd_name</u> , <u>cec_len</u> , <u>cec_command</u> <CR> FEEDBACK ~nn@CEC- SND, <u>port_index</u> , <u>sn_id</u> , <u>cmd_name</u> , <u>cec_mode</u> <CR> <LF>	<u>port_index</u> – CEC port transmitting the command: 1 <u>sn_id</u> – 1 <u>cmd_name</u> – command name <u>cec_len</u> – 1-16 <u>cec_command</u> – CEC format command (in HEX format, no leading zeros, no '0x' prefix) <u>cec_mode</u> – 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>
COM-ROUTE?	Get tunneling port routing. <i>i</i> This command sets tunneling port routing. Every com port can send or receive data from the ETH port. Set command can edit an existing configuration.	COMMAND #COM-ROUTE?, <u>com_id</u> <CR> FEEDBACK ~nn@COM-ROUTE, <u>com_id</u> , <u>port_type</u> , <u>port_id</u> , <u>eth_rep_en</u> , <u>ping_val</u> <CR> <LF>	<u>com_id</u> – Machine dependent, * (get all route tunnels) <u>port_type</u> – TCP/UDP 0 – TCP 1 – UDP <u>port_id</u> – TCP/UDP port number <u>eth_rep_en</u> – Ethernet Reply 0 – COM port does not send replies to new clients 1 – COM port sends replies to new clients. <u>ping_val</u> – Send an empty string to TCP client every 0 to 3600 seconds. 0 - 3600	Get tunneling port routing for all route tunnels: #COM-ROUTE?, * <CR>
COM-ROUTE-MODE	Set the communication at certain USRT port <i>i</i> Indexes not continuous because of bitwise operation (this is Mask values)	COMMAND #COM-ROUTE-MODE, <u>uart_port</u> , COM-MODE <CR> FEEDBACK ~nn@COM-ROUTE-MODE, <u>uart_port</u> , COM-MODE <CR> <LF>	USRT Port – 1 – Control (p3k) 2 – Gateway (tunneling) 4 – Remote button Uart port – Uart Port 1-N COM-MODE – communication mode that UART port is set to 1-Control 2- Gateway 4-Remote button)mask values and not continuous)	Change com-mode to Gateway (tunneling) #COM-ROUTE-MODE, 1, 2 <CR>
COM-ROUTE-MODE?	Get the communication at certain USRT port <i>i</i> Indexes not continuous because of bitwise operation (this is Mask values)	COMMAND #COM-ROUTE-MODE?, <u>uart_port</u> , COM-MODE <CR> FEEDBACK ~nn@COM-ROUTE-MODE, <u>uart_port</u> , COM-MODE <CR> <LF>	USRT Port – 1 – Control (p3k) 2 – Gateway (tunneling) 4 – Remote button Uart port – Uart Port 1-N COM-MODE – communication mode that UART port is set to 1-Control 2- Gateway 4-Remote button)mask values and not continuous)	Get the communication mode of certain UART port. #COM-ROUTE-MODE?, 1 <CR>
CONF-EXPORT	Export configuration file	COMMAND #CONF-EXPORT, <u>file_name</u> <CR> FEEDBACK ~nn@CONF-EXPORT, <u>file_name</u> <CR> <LF>	<u>file_name</u> – the name of the file we want to upload for the export.	Export configuration file: #CONF-EXPORT, <u>file_name</u> <CR>
CONF-IMPORT	Export configuration file	COMMAND #CONF-IMPORT, <u>file_name</u> <CR> FEEDBACK ~nn@CONF-IMPORT, <u>file_name</u> <CR> <LF>	<u>file_name</u> – the name of the file we want to upload for the import.	Import configuration file: #CONF-IMPORT, <u>file_name</u> <CR>
COUNTER?	Get the sent or received CEC messages count.	COMMAND #COUNTER?, <u>category_id</u> , <u>sub_category_id</u> <CR> FEEDBACK ~nn@COUNTER, <u>category_id</u> , <u>sub_category_id</u> , <u>count</u> <CR> <LF>	<u>category_id</u> – CEC messages: 0 <u>Sub_category_id</u> – Type of message: 0 – Sent message 1 – Received message <u>count</u> – Number range: 0-65535	Get the number of sent messages: #COUNTER?, 0, 0 <CR>
COUNTER-CLR	Clear CEC messages.	COMMAND #COUNTER-CLR?, <u>category_id</u> , <u>sub_category_clr</u> <CR> FEEDBACK ~nn@COUNTER-CLR, <u>category_id</u> , <u>sub_category_id</u> , <u>count</u> <CR> <LF>	<u>category_id</u> – CEC messages: 0 <u>Sub_category_clr</u> – 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 _u edid_io,src_id,edid_io,dest_bitmap<CR> or #CPEDID _u edid_io,src_id,edid_io,dest_bitmap,safe_mode<CR> FEEDBACK ~nn@CPEDID _u edid_io,src_id,edid_io,dest_bitmap<CR><LF> ~nn@CPEDID _u 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 _u 1,1,0,0x1<CR>
CS-CONVERT	Set the “force RGB color space” convert mode.	COMMAND #CS-CONVERT _u out_index,cs_mode<CR> FEEDBACK ~nn@CS-CONVERT _u out_index,cs_mode<CR><LF>’	out_index – The port number: 1 cs_mode – color space mode: o 0 – Color space pass (default) o 1 – Enable “force RGB color space” convert mode	Enable force RGB color space: #CS-CONVERT _u 1,1<CR>
CS-CONVERT?	Get the “force RGB color space” convert mode.	COMMAND #CS-CONVERT? _u out_index<CR> FEEDBACK ~nn@CS-CONVERT _u out_index,cs_mode<CR><LF>’	out_index – The port number: 1 cs_mode – color space mode: o 0 – Color space pass (default) o 1 – Enable “force RGB color space” convert mode	Get force RGB color space mode: #CS-CONVERT? _u 1<CR>
DEV-STATE?	Get the device state.	COMMAND #DEV-STATE? _u <CR> FEEDBACK ~nn@DEV-STATE _u 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? _u <CR>
DISPLAY?	Get output HPD status.	COMMAND #DISPLAY? _u out_index<CR> FEEDBACK ~nn@DISPLAY _u 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? _u 1<CR>
EDID-AUDIO	Set audio capabilities for EDID.	COMMAND #EDID-AUDIO _u <direction_type>.<port_format>.<port_index>.<signal_type>.<index>,audio_format<CR> FEEDBACK ~nn@EDID-AUDIO _u <direction_type>.<port_format>.<port_index>.<signal_type>.<index>,audio_format<CR><LF>	The following attributes comprise the signal ID: ▪ <direction_type> – Direction of the port: o IN – Input o OUT – Output ▪ <port_format> – Type of signal on the port: o HDMI o ANALOG_AUDIO o USB_C ▪ <port_index> – The port number as printed on the front or rear panel ▪ <signal_type> – Signal ID attribute: o AUDIO ▪ <index> – Indicates a specific channel number when there are multiple channels of the same type audio_format – Audio block added to EDID: 0 – Auto 1 – LPCM 2CH 2 – LPCM 6CH 3 – LPCM 8CH 4 – Bitstream 5 – HD	Set HDMI IN 2 audio capabilities for EDID (LPCM 6CH): #EDID-AUDIO _u in.hdmi.2.audio.1,2<CR>

Function	Description	Syntax	Parameters/Attributes	Example
EDID-AUDIO?	Get audio capabilities for EDID.	COMMAND #EDID-AUDIO?_<direction_type>.<port_format>.<port_index>.<signal_type>.<index><CR> FEEDBACK ~nn@EDID-AUDIO_audio_format<CR><LF>	The following attributes comprise the signal ID: ▪ <direction_type> – Direction of the port: ○ IN – Input ○ OUT – Output ▪ <port_format> – Type of signal on the port: ○ HDMI ○ ANALOG_AUDIO ○ USB_C ▪ <port_index> – The port number as printed on the front or rear panel ▪ <signal_type> – Signal ID attribute: ○ AUDIO ▪ <index> – Indicates a specific channel number when there are multiple channels of the same type audio_format – Audio block added to EDID: 0 – Auto 1 – LPCM 2CH 2 – LPCM 6CH 3 – LPCM 8CH 4 – Bitstream 5 – HD	Get HDMI IN 2 audio capabilities for EDID: #EDID-AUDIO?_in.hDMI.2.audio.1,2<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. <i>i</i> 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. <i>i</i> 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>
ETH-TUNNEL?	Get an open tunnel parameters.	COMMAND #ETH-TUNNEL?_tunnel_id<CR> FEEDBACK ~nn@ETH-TUNNEL_tunnel_id,cmd_name,port_type,port_id,eth_ip,remote_port_id,eth_rep_en,connection_type<CR><LF>	tunnel_id – Tunnel ID number, * (get all open tunnels) cmd_name – UART number port_type – TCP/UDP 0 – TCP 1 – UDP port_id – TCP/UDP port number eth_ip – Client IP address remote_port_id – Remote port number eth_rep_en – Ethernet Reply 0 – COM port does not send replies to new clients 1 – COM port sends replies to new clients connection_type – Connection type 0 – not wired connection 1 – wired connection	Set baud rate to 9600, 8 data bits, parity to none and stop bit to 1: #ETH-TUNNEL?_*<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>
FW-TYPE?	Get the current FW type status. Used by Kramer Network and KUpload to identify recovery process.	COMMAND #FW-TYPE?_<CR> FEEDBACK ~nn@FEATURE-LIST_fw_type<CR><LF>	fw_type – 0 – Application 1 – Safe mode (kboot)	Get the current FW type status: #FW-TYPE?_<CR>
GEDID	Get EDID support on certain input/output.  For old devices that do not support this command, ~nn@ERR 002<CR><LF> is received.	COMMAND #GEDID_io_mode,in_index<CR> FEEDBACK ~nn@GEDID_io_mode,in_index,size,edid_string<CR><LF>	io_mode – Input/Output 0 – Input 1 – Output 2 – Default EDID in_index – Number that indicates the specific input: 1-4 size – Size of data to be sent from device, 0 means no EDID support edid_string – EDID content	Get EDID support information for input 1: #GEDID_0,1<CR>
GPIO-CFG	Set HW GPIO configuration.	COMMAND #GPIO-CFG_gpio_id,gpio_type,gpio_dir,pullup<CR> FEEDBACK ~nn@GPIO-CFG_gpio_id,gpio_type,gpio_dir<CR><LF>	gpio_id – Hardware GPIO number (1-2) gpio_type – Hardware GPIO type 0 – analog 1 – digital gpio_dir – Hardware GPIO direction 0 – input 1 – output pullup – Enable/Disable pull-up 0 – disable 1 – enable	Set HW GPIO 1 configuration: #GPIO-CFG_1,1,1,1<CR>
GPIO-CFG?	Get HW GPIO configuration.	COMMAND #GPIO-CFG?_gpio_id<CR> FEEDBACK ~nn@GPIO-CFG_gpio_id,gpio_type,gpio_dir<CR><LF>	gpio_id – Hardware GPIO number (1-2) gpio_type – Hardware GPIO type 0 – analog 1 – digital gpio_dir – Hardware GPIO direction 0 – input 1 – output pullup – Enable/Disable pull-up 0 – disable 1 – enable	Get HW GPIO configuration: #GPIO-CFG?_1<CR>
GPIO-STATE	Set HW GPIO state.  GPIO-STATE? can only be set in digital out mode and the answer is 0=Low, 1=High. In all other modes an error message is sent. The device uses this command to notify the user of any change regarding the step and voltage in: In digital mode the answer is 0 (low), 1 (high). In analog mode the answer is 0 to 100.	COMMAND #GPIO-STATE_gpio_id,gpio_mode<CR> FEEDBACK ~nn@GPIO-STATE_gpio_id,gpio_mode<CR><LF>	gpio_id – Hardware GPIO number (1-2) gpio_mode – Hardware GPIO state 0 – Low 1 – High	Set GPIO 2 to High: #GPIO-STATE_2,1<CR>

Function	Description	Syntax	Parameters/Attributes	Example
GPIO-STATE?	Get HW GPIO state. ❗ GPIO-STATE? can only be set in digital out mode and the answer is 0=Low, 1=High. In all other modes an error message is sent. The device uses this command to notify the user of any change regarding the step and voltage in: In digital mode the answer is 0 (low), 1 (high). In analog mode the answer is 0 to 100.	COMMAND #GPIO-STATE?_gpio_id<CR> FEEDBACK ~nn@GPIO-STATE_gpio_id,gpio_mode<CR><LF>	gpio_id – Hardware GPIO number (1-2) gpio_mode – Hardware GPIO state 0 – Low 1 – High	Get GPIO 2 state: #GPIO-STATE?_2<CR>
GPIO-STEP	Set HW GPIO step. ❗ In digital mode the response is 2. In analog mode the response is 1 to 100. In other modes an error is returned.	COMMAND #GPIO-STEP_gpio_id,step_id<CR> FEEDBACK ~nn@GPIO-STEP_gpio_id,step_id,currentstep<CR><LF>	gpio_id – HW GPIO number (1-2) step_id – The configuration step – See note in description. currentstep – The actual step depending on the measured voltage	Set GPIO 2 (set to Analog In) configuration step to 38mV: #GPIO-STEP_2,38<CR>
GPIO-STEP?	Get HW GPIO step. ❗ In digital mode the response is 2. In analog mode the response is 1 to 100. In other modes an error is returned.	COMMAND #GPIO-STEP?_gpio_id<CR> FEEDBACK ~nn@GPIO-STEP_gpio_id,step_id,currentstep<CR><LF>	gpio_id – HW GPIO number (1-2) step_id – The configuration step – See note in description. currentstep – The actual step depending on the measured voltage	Get GPIO 2 configuration: #GPIO-STEP?_2<CR>
GPIO-THR	Set HW GPIO voltage levels.	COMMAND #GPIO-THR_gpio_id,low_level,high_level<CR> FEEDBACK ~nn@GPIO-THR_gpio_id,low_level,high_level<CR><LF>	gpio_id – Hardware GPIO number (1-2) low_level – Voltage 500 to 28000 millivolts high_level – Voltage 2000 to 30000 millivolts	Set GPIO 2 to a low level of 800mV and a high level of 2200mV: #GPIO-THR_2,800,2200<CR>
GPIO-THR?	Get HW GPIO voltage levels that were set.	COMMAND #GPIO-THR?_gpio_id<CR> FEEDBACK ~nn@GPIO-THR_gpio_id,low_level,high_level<CR><LF>	gpio_id – Hardware GPIO number (1-2) low_level – Voltage 500 to 28000 millivolts high_level – Voltage 2000 to 30000 millivolts	Get GPIO 2: #GPIO-THR?_2<CR>
GPIO-VOLT?	Get active voltage levels of HW GPIO. ❗ This command is not available in digital out mode.	COMMAND GPIO-VOLT?_gpio_id<CR> FEEDBACK ~nn@GPIO-VOLT_gpio_id,voltage<CR><LF>	gpio_id – Hardware GPIO number (1-2) voltage – Voltage 0 to 30000 millivolts	Get GPIO 1 voltage: #GPIO-VOLT?_1<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>

Function	Description	Syntax	Parameters/Attributes	Example
HDCP-OUT	Set output port HDCP mode. HDCP supported – HDCP ON [default]. HDCP not supported - HDCP OFF. HDCP support changes following detected sink - MIRROR OUTPUT.	COMMAND #HDCP-OUT <u>port number</u> ,mode<CR> FEEDBACK ~nn@HDCP-OUT <u>port number</u> ,mode<CR><LF>	Port number – output port number: 1 – N mode – HDCP mode: 0 – Follow Input 1 – Follow Output	Set the output port 1 HDCP follow output: #HDCP-OUT <u>1</u> ,1<CR>
HDCP-OUT?	Get output 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? <u>port number</u> ,mode<CR> FEEDBACK ~nn@HDCP-OUT <u>port number</u> <CR><LF>	Port number – output port number: 1 – N	Get HDCP mode for output port 1: #HDCP-OUT? <u>1</u> <CR>
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? <u>io_mode</u> ,in_index<CR> FEEDBACK ~nn@HDCP-STAT <u>io_mode</u> ,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? <u>0</u> ,1<CR>
HELP	Get command list or help for specific command.	COMMAND #HELP<CR> #HELP <u>cmd_name</u> <CR> FEEDBACK 1. Multi-line: ~nn@Device <u>cmd_name</u> , <u>cmd_name</u> ...<CR><LF> To get help for command use: HELP (COMMAND_NAME)<CR><LF> ~nn@HELP <u>cmd_name</u> :<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>
IDV	Set visual indication from device. ❗ Using this command, some devices can light a sequence of buttons or LEDs to allow identification of a specific device from similar devices.	COMMAND #IDV<CR> FEEDBACK ~nn@IDV <u>ok</u> <CR><LF>		#IDV<CR>
IR-MOD	Set the IR modulation	COMMAND #IR-MOD? <u>port modulation</u> <CR> FEEDBACK ~nn@IR-MOD <u>port modulation</u> <CR><LF>	Port – port number 1 Modulation – 0 – no modulation 1 – 38K	Set IR modulation to 38k: #IR-MOD <u>1</u> ,1<CR>
IR-MOD?	Get the IR modulation	COMMAND #IR-MOD <u>port</u> <CR> FEEDBACK ~nn@IR-MOD <u>port</u> <CR><LF>	Port – port number 1 Modulation – 0 – no modulation 1 – 38K	Get the IR modulation: #IR-MOD? <u>1</u> <CR>

Function	Description	Syntax	Parameters/Attributes	Example
IR-SND	Send IR command to port.	COMMAND #IR-SND _{ir_index,sn_id,cmd_name,repeat_amount,total_packages,package_id,<pronto command...>} <CR> FEEDBACK ~nn@IR-SND _{ir_index,sn_id,cmd_name,ir_status} <CR><LF>	ir_index – Number that indicates the specific ir port: 1-N (N= the total number of inputs) * - broadcasts to all ports sn_id – Serial number of command for flow control and response commands from device cmd_name – Command name (length limit 15 chars) repeat_amount – Of times the IR command is transmitted (limited to 50; repeats > 50 are truncated to 50), default = 1 total_packages – Number of messages the original command was divided into, default = 1 package_id – Chunk serial number (only valid when <i>Total_packages</i> >1) pronto_command – Pronto format command (in HEX format, no leading zeros, no '0x' prefix) ir_status – IR Status 0 – Sent (no error) 1 – Stop 2 – Done 3 – Busy 4 – Wrong Parameter 5 – Nothing to Stop 6 – Start 7 – Timeout 8 – Error	Send IR command to port: #IR-SND _{1,1,1,1,1,1,1} <CR>
IR-STOP	Send IR stop command to port.	COMMAND #IR-STOP _{ir_index,sn_id,cmd_name} <CR> FEEDBACK ~nn@IR-STOP _{ir_index,sn_id,cmd_name,ir_status} <CR><LF>	ir_index – Number that indicates the specific ir port: 1-N (N= the total number of inputs) * - broadcasts to all ports sn_id – Serial number of command for flow control and response commands from device cmd_name – String: IR command name limited to 15 chars. Controlling device must send the correct name (white space or commas forbidden) ir_status – IR Status 0 – Sent (no error) 1 – Stop 2 – Done 3 – Busy 4 – Wrong Parameter 5 – Nothing to Stop 6 – Start 7 – Timeout 8 – Error	Send IR stop command to IR Port 2: #IR-STOP _{2,1,power} <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 1 2 – HDMI IN 2 3 – HDMI IN 3 For output 1 – HDMI 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,hdm1} <CR>

Function	Description	Syntax	Parameters/Attributes	Example												
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 1 2 – HDMI IN 2 3 – HDMI IN 3 For output 1 – HDMI 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> >												
LDEDID	Write EDID data from external application to device. ? When the unit receives the LDEDID command it replies with READY and enters the special EDID packet wait mode. In this mode the unit can receive only packets and not regular protocol commands. If the unit does not receive correct packets for 30 seconds or is interrupted for more than 30 seconds before receiving all packets, it sends timeout error ~nn@LDEDID_err01<CR><LF> and returns to the regular protocol mode. If the unit received data that is not a correct packet, it sends the corresponding error and returns to the regular protocol mode.	COMMAND Multi-step syntax FEEDBACK Step 1: #LDEDID_edid_io,dest_bitmask,edid_size,safe_mode<CR> Response 1: ~nn@LDEDID_edid_io,dest_bitmask,edid_size,safe_mode_ready<CR><LF> or ~nn@LDEDID_errnn<CR><LF> Step 2: If ready was received, send EDID_DATA Response 2: ~nn@LDEDID_edid_io,dest_bitmask,edid_size,safe_mode_ok<CR><LF> or ~nn@LDEDID_errnn<CR><LF>	edid_io – EDID destination type (usually input) 0 – Input 1 – Output 2 – Default EDID 3 – Custom EDID dest_bitmask – Bitmap representing destination IDs. Format: 0x* *, where * is ASCII presentation of hex digit. The binary presentation of this number is a bit mask for destinations. Setting '1' means EDID data has to be copied to this destination edid_size – EDID data size safe_mode – Safe mode 0 – Device accepts the EDID as is without trying to adjust 1 – Device tries to adjust the EDID edid_data – Data in protocol packets Using the Packet Protocol Send a command: LDRV, LOAD, IROUT, LDEDID Receive Ready or ERR### If Ready: a. Send a packet, b. Receive OK on the last packet, c. Receive OK for the command Packet structure: Packet ID (1, 2, 3...) (2 bytes in length) Length (data length + 2 for CRC) – (2 bytes in length) Data (data length -2 bytes) CRC – 2 bytes <table><tr><td>01</td><td>02</td><td>03</td><td>04</td><td>05</td><td></td></tr><tr><td>Packet ID</td><td>Length</td><td>Data</td><td>CRC</td><td></td><td></td></tr></table> 5. Response: ~nnnn_ok<CR><LF> (Where NNNN is the received packet ID in ASCII hex digits.)	01	02	03	04	05		Packet ID	Length	Data	CRC			Write the EDID data from an external application to the HDMI In 1 input without adjustment attempts: #LDEDID_0,0x1,2340,0<CR> Write the EDID data from an external application to HDMI In 1 and PC In inputs with adjustment attempts: #LDEDID_0,0x5,2340,1<CR>
01	02	03	04	05												
Packet ID	Length	Data	CRC													
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.  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 <pre>#LOGIN_login_level,password<CR></pre> FEEDBACK <pre>~nn@LOGIN_login_level,password_ok<CR><LF></pre> or <pre>~nn@LOGIN_err_004<CR><LF></pre> (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): <pre>#LOGIN_admin,33333<CR></pre>
LOGIN?	Get protocol permission state.  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 <pre>#LOGIN_login_level <CR></pre> FEEDBACK <pre>~nn@LOGIN_login_level,password_ok<CR><LF></pre> or <pre>~nn@LOGIN_err_004<CR><LF></pre> (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: <pre>#LOGIN?_admin<CR></pre>
LOGOUT	Cancel current permission level.  Logs out from End User or Administrator permission levels to Not Secure.	COMMAND <pre>#LOGOUT<CR></pre> FEEDBACK <pre>~nn@LOGOUT_ok<CR><LF></pre>		<pre>#LOGOUT<CR></pre>
MODEL?	Get device model.	COMMAND <pre>#MODEL?_<CR></pre> FEEDBACK <pre>~nn@MODEL_model_name<CR><LF></pre>	model_name – String of up to 19 printable ASCII chars	Get the device model: <pre>#MODEL?_<CR></pre>

Function	Description	Syntax	Parameters/Attributes	Example
NAME	Set 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 <pre>#NAME _machine_name<CR></pre> FEEDBACK <pre>~nn@NAME _machine_name<CR><LF></pre>	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: <pre>#NAME _room-442<CR></pre>
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 <pre>#NAME?_<CR></pre> FEEDBACK <pre>~nn@NAME _machine_name<CR><LF></pre>	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: <pre>#NAME?_<CR></pre>
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 <pre>#NAME-RST<CR></pre> FEEDBACK <pre>~nn@NAME-RST _ok<CR><LF></pre>		Reset the machine name (S/N last digits are 0102): <pre>#NAME-RST _kramer_0102<CR></pre>
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 <pre>#NET-CONFIG _net_id,net_ip,net_mask,gateway,[dns1],[dns2]<CR></pre> FEEDBACK <pre>~nn@NET-CONFIG _net_id,net_ip,net_mask,gateway<CR><LF></pre>	net_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: <pre>#NET-CONFIG _0,192.168.113.10,255.255.0.0,192.168.0.1<CR></pre>
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 <pre>#NET-CONFIG _net_id,net_ip,net_mask,gateway,[dns1],[dns2]<CR></pre> FEEDBACK <pre>~nn@NET-CONFIG _net_id,net_ip,net_mask,gateway<CR><LF></pre>	net_id – 0 net_ip – Network IP net_mask – Network mask gateway – Network gateway	Get the device network parameters: <pre>#NET-CONFIG? _0<CR></pre>

Function	Description	Syntax	Parameters/Attributes	Example
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?_id<CR> FEEDBACK ~nn@NET-DHCP_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?_id<CR> FEEDBACK ~nn@NET-GATE_id_ip_address<CR><LF>	ip_address – Format: xxx.xxx.xxx.xxx	Get the gateway IP address: #NET-GATE?_id<CR>
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?_id<CR> FEEDBACK ~nn@NET-IP_id_ip_address<CR><LF>	ip_address – Format: xxx.xxx.xxx.xxx	Get the IP address: #NET-IP?_id<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?_id<CR> FEEDBACK ~nn@NET-MASK_id_net_mask<CR><LF>	net_mask – Format: xxx.xxx.xxx.xxx	Get the subnet mask: #NET-MASK?_id<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_id<CR> FEEDBACK ~nn@PASS_login_level_id,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_id<CR>
PORTS-LIST?	Get the port list of this machine. ❗ The response is returned in one line and terminated with<CR><LF>. The response format lists port IDs separated by commas. This is an Extended Protocol 3000 command.	COMMAND #PORTS-LIST?_id<CR> FEEDBACK ~nn@PORTS-LIST_id[<direction_type>.<port_format>.<port_index>,...]<CR><LF>	The following attributes comprise the port ID: ▪ <direction_type> – Direction of the port: ○ IN ○ OUT ▪ <port_format> – Type of signal on the port: ○ HDMI ○ USB_C ▪ <port_index> – The port number as printed on the front or rear panel	Get the ports list: #PORTS-LIST?_id<CR>

Function	Description	Syntax	Parameters/Attributes	Example
PRG-ACTION	Add new user command.  Programs matrix action as a response for external event (programmable button pressed).	COMMAND #PRG-ACTION <u>commandNum</u> , <u>type</u> , <u>name</u> , <u>command</u> <CR> FEEDBACK ~nn@PRG-ACTION <u>commandNum</u> , <u>type</u> , <u>name</u> , <u>command</u> <CR> <LF>	<u>commandNum</u> – Command number 0 to 4 <u>type</u> – External programmable button 0 – CEC 1 – UART 2 – IR <u>name</u> – Bitmap representing <u>command</u> – External programmable button ID	Add a new user command: #PRG-ACTION <u>1</u>, <u>3</u>, <u>1</u>, <u>0</u> <CR>
PRG-ACTION?	Add new user command.  Programs matrix action as a response for external event (programmable button pressed).	COMMAND #PRG-ACTION? <u>commandNum</u> <CR> FEEDBACK ~nn@PRG-ACTION <u>commandNum</u> , <u>type</u> , <u>name</u> , <u>command</u> <CR> <LF>	<u>commandNum</u> – Command number 0 – Input 1 – Output <u>type</u> – External programmable button ID <u>name</u> – Bitmap representing <u>command</u> – External programmable button ID	Add a new user command: #PRG-ACTION? <u>0</u>, <u>3</u>, <u>1</u>, <u>0</u> <CR>
PRG-BTN-ACTION	Set device's programable button, link to commands On & Off, and set command to momentary or not momentary.	COMMAND #PROG-BTN- MOD <u>btnNum</u> , <u>mode</u> , <u>actionOn</u> , <u>actionOff</u> , <u>btnBehavior</u> <CR> FEEDBACK ~nn@PROG-BTN- MOD <u>btnNum</u> , <u>mode</u> , <u>actionOn</u> , <u>actionOff</u> , <u>btnBehavior</u> <CR> <LF> >	<u>btnNum</u> – Button number 0 to 4 1 and 2 are enabled when remote button is (<u>mode</u>) On 1 – IO 1 button 2 – IO 2 button 3 – Display On button <u>mode</u> – Remote button state 0 – Off 1 – On <u>actionOn</u> – 100 – None 101 – Switch Input 102 – Display On (via CEC) 103 – Display Off (via CEC) 104 – Mute 105 – Unmute 106 – Volume ++ 107 – Volume -- 0 – Command_01 1 – Command_02 2 – Command_03 3 – Command_04 4 – Custom 5 <u>actionOff</u> – Button_mode 100 – None 101 – Switch Input 102 – Display On (via CEC) 103 – Display Off (via CEC) 104 – Mute 105 – Unmute 106 – Volume ++ 107 – Volume -- 0 – Command_01 1 – Command_02 2 – Command_03 3 – Command_04 4 – Custom 5 <u>btnBehavior</u> – Button_mode 0 – Momentary mode disabled 1 – Momentary mode enabled	Set the DISPLAY ON button to mute/unmute with the press of a button: #PROG-BTN-MOD <u>3</u>, <u>1</u>, <u>104</u>, <u>105</u>, <u>0</u> <CR>

Function	Description	Syntax	Parameters/Attributes	Example
PROG-BTN-MOD?	Get device's programmable button, link to commands On & Off, and set command to momentary or not momentary.	COMMAND #PROG-BTN-MOD?<CR> FEEDBACK ~nn@PROG-BTN-MOD_<button_mode><CR><LF>	btnNum – Button number 0 to 4 1 and 2 are enabled when remote button is (mode) On 1 – IO 1 button 2 – IO 2 button 3 – Display On button mode – Remote button state 0 – Off 1 – On actionOn – 100 – None 101 – Switch Input 102 – Display On (via CEC) 103 – Display Off (via CEC) 104 – Mute 105 – Unmute 106 – Volume ++ 107 – Volume -- 0 – Command_01 1 – Command_02 2 – Command_03 3 – Command_04 4 – Custom 5 actionOff – Button_mode 100 – None 101 – Switch Input 102 – Display On (via CEC) 103 – Display Off (via CEC) 104 – Mute 105 – Unmute 106 – Volume ++ 107 – Volume -- 0 – Command_01 1 – Command_02 2 – Command_03 3 – Command_04 4 – Custom 5 btnBehavior – Button_mode 0 – Momentary mode disabled 1 – Momentary mode enabled	Get the mode of button 3: #PROG-BTN-MOD?_3<CR>
PRIORITY	Set input priority.	COMMAND #PRIORITYV<layer_type>,priority_1,priority_2<CR> FEEDBACK ~nn@PRIORITYV<layer_type>,priority_1,priority_2<CR><LF>	layer_type – Layer Enumeration 1 – Video priority – Priority of inputs 1 – USB-C 2 – HDMI	Set the priority to first HDMI, then USB-C: #PRIORITY_1,2,1<CR>
PRIORITY?	Get input priority.	COMMAND #PRIORITYV<layer_type><CR> FEEDBACK ~nn@PRIORITYV<layer_type>,priority_1,priority_2<CR><LF>	layer_type – Layer Enumeration 1 – Video priority – Priority of inputs 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.	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 5 – USB out_index 1 – Output in_index – Source id for Video: 1 – USB-C 2 – HDMI	Route video input 2 to the output: #ROUTE_1,1,2<CR>

Function	Description	Syntax	Parameters/Attributes	Example
ROUTE?	Get layer routing state.	COMMAND #ROUTE?_layer_type,out_index<CR> FEEDBACK ~nn@ROUTE_layer_type,out_index,in_index <CR><LF>	layer_type Layer Enumeration 1 – Video 5 – USB out_index 1 – Output in_index – Source id for Video: 1 – USB-C 2 – HDMI	Get video routing output: #ROUTE?_1,1<CR>
SECUR	Start/stop security. <i>i</i> 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. <i>i</i> 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 2 – HDMI 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>
TIME	Set device time and date. <i>i</i> 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. <i>i</i> 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>
TIME-LOC	Set local time offset from UTC/GMT. <i>i</i> If the time server is configured, device time calculates by adding UTC_off to UTC time (that it got from the time server) + 1 hour if daylight savings time is in effect. TIME command sets the device time without considering these settings.	COMMAND #TIME-LOC_utc_off,dst_state<CR> FEEDBACK ~nn@TIME-LOC_utc_off,dst_state<CR><LF>	utc_off – Offset of device time from UTC/GMT (without daylight time correction) dst_state – Daylight saving time state 0 – no daylight saving time 1 – daylight saving time	Set local time offset to 3 with no daylight-saving time: #TIME-LOC_3,0<CR>

Function	Description	Syntax	Parameters/Attributes	Example
TIME-LOC?	Get local time offset from UTC/GMT. i If the time server is configured, device time calculates by adding UTC_off to UTC time (that it got from the time server) + 1 hour if daylight savings time is in effect. TIME command sets the device time without considering these settings.	COMMAND #TIME-LOC?_<CR> FEEDBACK ~nn@TIME-LOC_UTC_off,dst_state<CR><LF>	UTC_off – Offset of device time from UTC/GMT (without daylight time correction) dst_state – Daylight saving time state 0 – no daylight saving time 1 – daylight saving time	Get local time offset from UTC/GMT: #TIME-LOC?<CR>
TIME-SRV	Set time server. i This command is needed for setting UDP timeout for the current client list.	COMMAND #TIME-SRV_mode,time_server_ip,sync_hour<CR> FEEDBACK ~nn@TIME-SRV_mode,time_server_ip,sync_hour,server_status<CR><LF>	mode – On/Off 0 – Off 1 – On time_server_ip – Time server IP address sync_hour – Hour in day for time server sync server_status – On/Off	Set time server with IP address of 128.138.140.44 to ON: #TIME-SRV_1,128.138.140.44,0,1<CR>
TIME-SRV?	Get time server. i This command is needed for setting UDP timeout for the current client list.	COMMAND #TIME-SRV?_<CR> FEEDBACK ~nn@TIME-SRV_mode,time_server_ip,sync_hour,server_status<CR><LF>	mode – On/Off 0 – Off 1 – On time_server_ip – Time server IP address sync_hour – Hour in day for time server sync server_status – On/Off	Get time server: #TIME-SRV?<CR>
TXRX-MODE	Set tx/rx mode. i This command will reset the device and restore factory defaults.	COMMAND #TXRX-MODE_hdbt_port_id,hdbt_mode<CR> FEEDBACK ~nn@TXRX-MODE_hdbt_port_id,hdbt_mode<CR><LF>	Hdbt_port_id : HDBT port number hdbt_mode : HDBT mode 0-Transmitter 1-Receiver	Set device in Transmitter mode #TXRX-MODE_1,0<CR>
UART	Set com port configuration. i In the FC-2x the serial port is selectable to RS-232 or RS-485 (usually serial port 1). If Serial is configured when RS-485 is selected, the RS-485 UART port automatically changes. The command is backward compatible, meaning that if the extra parameters do not exist, FW goes to RS-232. Stop_bits 1.5 is only relevant for 5 data_bits.	COMMAND #UART_com_id,baud_rate,data_bits,parity,stop_bits_mode,serial_type,485_term<CR> FEEDBACK ~nn@UART_com_id,baud_rate,data_bits,parity,stop_bits_mode,serial_type,485_term<CR><LF>	com_id – 1 to n (machine dependent) baud_rate – 9600 - 115200 data_bits – 5-8 parity – Parity Type 0 – No 1 – Odd 2 – Even 3 – Mark 4 – Space stop_bits_mode – 1/1.5/2 serial_type – 232/485 0 – 232 1 – 485 485_term – 485 termination state 0 – disable 1 – enable (optional - this exists only when serial_type is 485)	Set baud rate to 9600, 8 data bits, parity to none and stop bit to 1: #UART_9600,8,node,1<CR>
UART?	Get com port configuration. The command is backward compatible, meaning that if the extra parameters do not exist, FW goes to RS-232. Stop_bits 1.5 is only relevant for 5 data_bits.	COMMAND #UART?_com_id<CR> FEEDBACK ~nn@UART_com_id,baud_rate,data_bits,parity,stop_bits_mode,serial_type,485_term<CR><LF>	com_id – 1 to n (machine dependent) baud_rate – 9600 - 115200 data_bits – 5-8 parity – Parity Type 0 – No 1 – Odd 2 – Even 3 – Mark 4 – Space stop_bits_mode – 1/1.5/2 serial_type – 232/485 0 – 232 1 – 485 485_term – 485 termination state 0 – disable 1 – enable (optional - this exists only when serial_type is 485)	Set baud rate to 9600, 8 data bits, parity to none and stop bit to 1: #UART_1,9600,8,node,1<CR>

Function	Description	Syntax	Parameters/Attributes	Example
USBC-ETH	Set USBC to Ethernet connection.	COMMAND #USBC-ETH_<state><CR> FEEDBACK ~nn@USBC-ETH_<state><CR><LF>	state – On/Off 0 – Off 1 – On	Set USBC to Ethernet connection state to ON: #USBC-ETH_1<CR>
USB-FV	Set USB auto-switching mode.	COMMAND #USB-FV_<mode><CR> FEEDBACK ~nn@USB-FV_<mode><CR><LF>	mode – On/Off 0 – Off 1 – On	Set auto-switching mode to ON: #USB-FV_1<CR>
USB-FV?	Get USB auto-switching mode.	COMMAND #USB-FV?_<mode><CR> FEEDBACK ~nn@USB-FV_<mode><CR><LF>	mode – On/Off 0 – Off 1 – On	Set auto-switching mode to ON: #USB-FV_1<CR>
USBA-DISCONNECT-MODE	Set USB device auto-disconnection mode..	COMMAND #USBA-DISCONNECT-MODE_<USBDevice>,<mode><CR> FEEDBACK ~nn@USBA-DISCONNECT-MODE_<mode><CR><LF>	USBDevice – USB device number 1 – USB Device 1 2 – USB Device 2 mode – On/Off 0 – Off 1 – On	Set USB Device 1 polycorn mode to ON: #USBA-DISCONNECT-MODE_1,1<CR>
USBA-DISCONNECT-MODE?	Get USB device auto-disconnection mode..	COMMAND #USBA-DISCONNECT-MODE?_<USBDevice><CR> FEEDBACK ~nn@USBA-DISCONNECT-MODE_<mode><CR><LF>	USBDevice – USB device number 1 – USB Device 1 2 – USB Device 2 mode – On/Off 0 – Off 1 – On	Get USB Device 1 polycorn mode: #USBA-DISCONNECT-MODE?_1<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>
VMUTE	Set enable/disable video on output.	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	Disable the video output on output: #VMUTE_1,0<CR>
VMUTE?	Get video on output status.	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	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

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
RR_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_FW_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



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Rev: 1



SAFETY WARNING

Disconnect the unit from the power supply before opening and servicing

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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