USER MANUAL

MODELS:

DA3-24-H USB-C/HDMI Switcher & 1:4 Distributor Amplifier

DA3-28-H USB-C/HDMI Switcher & 1:8 Distributor Amplifier

Contents

Introduction **1**
Getting Started 1
Overview 2
Typical Applications 3
Defining DA3-24-H and DA3-28-H **4**
DA3-24-H & DA3-28-H Front & Rear Panel 4
Mounting DA3-24-H / DA3-28-H **6**
Connecting DA3-24-H **7**
Connecting Output to a Balanced/Unbalanced Stereo Audio Acceptor 8
Connecting to DA3-24-H via RS-232 8
Operating and Controlling DA3-24-H **9**
Principles of Operation 9
Using Front and Rear Panel Buttons 11
Operating via Ethernet 11
Using Embedded Web Pages **15**
Operation 16
AV Settings 18
Managing EDID 20
Setting Control Gateway Properties 21
Setting Device Properties 29
Security 33
Viewing the About Page 38
Technical Specifications **39**
Default Communication Parameters 40
Protocol 3000 **41**
Understanding Protocol 3000 41
Protocol 3000 Commands 42
Result and Error Codes 49

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!

This user manual describes **DA3-24-H** and **DA3-28-H.** These devices are identical except for the number of their outputs. Note that whenever **DA3-24-H** is used in the user manual, it also refers to **DA3-28-H**, unless specified otherwise. (A device is named specifically only when a device-specific feature is described).

Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment.
- Review the contents of this user manual.

Go to www.kramerav.com/downloads/DA3-28-H or www.kramerav.com/downloads/DA3-24-H 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 **DA3-24-H** away from moisture, excessive sunlight and dust.

Safety Instructions

Caution:

- This equipment is to be used only inside a building. It may only be connected to other equipment that is installed inside a building.
- For products with relay terminals and GPI\O ports, please refer to the permitted rating for an external connection, located next to the terminal or in the User Manual.
- There are no operator serviceable parts inside the unit.

Warning:

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

Recycling Kramer Products

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

Overview

DA3-24-H and **DA3-28-H** are premium 2x1:4 (1:8 respectively) switchers and distribution amplifiers for up to 4K60 4:4:4 HDR, video signals that comply with HDCP 2.3 content protection standard. The unit switches between one of two inputs HDMI or USB-C, equalizes and re-clocks the selected signal and distributes it to eight (four respectively) identical outputs.

Exceptional Quality

- Max. Resolution — 4K@60Hz (4:4:4).
- Intelligent EDID Handling — Use connected display EDID or default EDID, with EDID lock and RGB–force options, to ensure proper operation of HDMI source and display systems.
- Force RGB — When the display lacks YCbCr capabilities, the user can force native delivery of the RGB color format in HDMI content to improve picture quality.
- Selectable HDCP Authorization — Allows the user to control the appearance of an HDCP or non–HDCP input to the source to permit delivery of protection–free content, such as personal clips and charts, without HDCP encryption. HDCP protected content is not passed in non–HDCP mode.
- Analog audio output - de-embedded from the HDMI/USB-C input signal

Advanced and User-friendly Operation

- Sophisticated CEC mediator with flexible routing options
- Various unit management options including a WEB GUI/P3K commands over LAN or P3K commands over RS232

Flexible Connectivity

- Secured Operation – Standard IT-grade 802.1x authentication for secured IT LAN connectivity operation.
- Easy Installation — Compact half-U 19' enclosure for over–ceiling mounting, or side–by–side rack mounting.

Typical Applications

DA3-24-H and **DA3-28-H** are ideal for the following typical applications:

- Distribution of high–resolution 4K signals in retail, corporate, education, hospitals and government facilities

Defining DA3-24-H and DA3-28-H

This section defines **DA3-24-H** & **DA3-28-H** front and rear panels.

DA3-24-H & DA3-28-H Front & Rear Panel

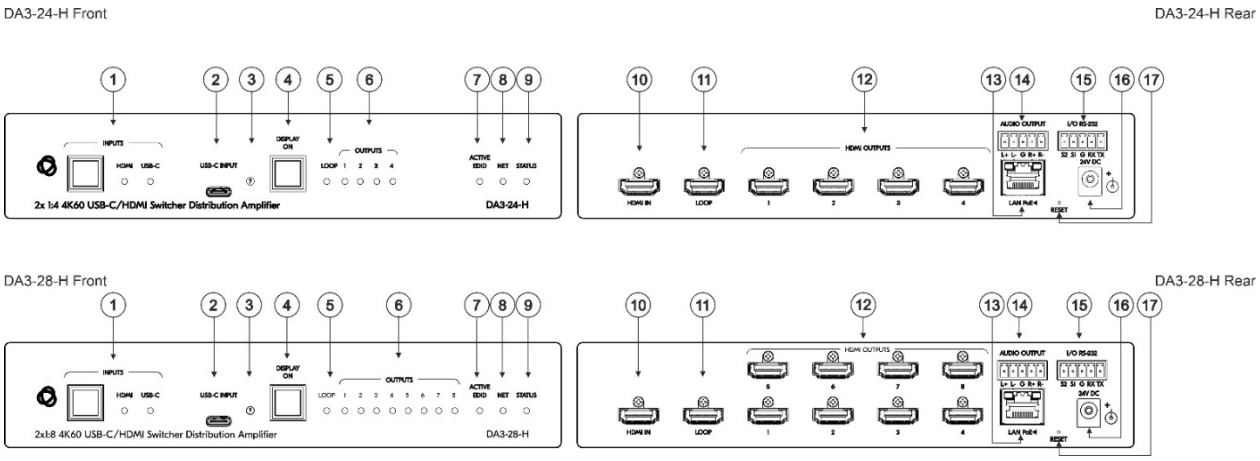


Figure 1:DA3-24-H & DA3-28-H Combined 2:1 Switcher & 1:8 (1:4 respectively) Distributor Amplifier Front & Rear Panel

#	Feature		Function	
1	LEDs	INPUTS	Press to toggle between HDMI and USB-C inputs.	
		HDMI	LED lights blue when an active input is detected and selected. LED lights green when an active input is detected (but not selected).	
		USB-C	LED lights blue when an active input is detected and selected. LED lights green when an active input is detected (but not selected).	
2	USB-C INPUT		Connect to USB-C AV source: • that supports DisplayPort Alternate Mode, (for example, a laptop) to share content. • to charge the connected source (that supports USB Power Delivery 3.0). ⓘ While charging, the charging icon (to the right of the connector) becomes visible and lights yellow.	
3	USB-C Charge LED		While charging, the charging icon becomes visible and lights yellow.	
4	DISPLAY ON Button		Press to mute/unmute the AV outputs. LED lights orange when the AV outputs are muted.	
5	LOOP LED		LED lights blue when a local display is connected and an active input is selected.	
6	OUTPUTS LED	DA3-24-H (X4) DA3-28-H (X8)	LEDs light blue when an output(s) is connected and active.	
7	ACTIVE EDID LED		**LED status**	**Indicates**
			Yellow	Default EDID is active
			Blue	Output-acquired EDID is active
			Green	Custom EDID is active
8	NET LED		**LED status**	**Indicates**
			Dark	No IP address acquired.
			Green	A valid IP address has been acquired.

#	Feature		Function	
			Flashes green for 60s	A means to identify the device in a system, using command #IDV (Flag Me).
			Flashes red/white	IP fallback address has been acquired.
			Red	Security-blocked IP-access.
9	STATUS LED		**LED status**	**Indicates**
			White	Stand-by
			Red	Power On
10	HDMI IN Connector		Connects to the HDMI source.	
11	LOOP Connector		Connect to a local HDMI display.	
12	HDMI OUTPUTS Connectors	DA3-24-H (X4)	Connect to the HDMI acceptors.	
		DA3-28-H (X8)		
13	LAN PoE◄ RJ-45 Connector		LAN connector for managing the unit over the network. This port can provide PoE to power the unit.	
14	AUDIO OUTPUT 5-pin Terminal Block Connector		Connect to a balanced stereo analog audio acceptor.	
15	I/O RS-232 5-pin Terminal Block Connector (GND is common for I/O and RS-232).	I/O (S1-S2)	Connect to: • Input-triggering devices (for example, remote buttons or sensors), **OR** • Output-triggered devices (for example, remote alarm LED indication). Each of these GPIO ports may be configured as a digital input, digital output, or an analog input port.	
		RS-232 (Rx, Tx,)	• Connect and control the DA3-24-H unit (default), **OR** • Connect to an RS-232 controlled device (for example, the connected PTZ USB camera) to be controlled via the unit's control gateway functionality.	
16	24V DC Power Connector		• When the unit is not PoE powered, connector enabling power supply to the unit. • Use the included 24V 6A power supply for powering the unit and charging the source device connected to the USB-C port. ⚠ Make sure to use your Kramer 24V Power Supply!	
17	RESET		For restoring factory default settings, press the RESET button and connect power to device.	

Mounting DA3-24-H / DA3-28-H

This section provides instructions for mounting **DA3-24-H** / **DA3-28-H**. 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 SWT3-41-H before connecting any cables or power.

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

Mount DA3-24-H in a rack:

- Use the recommended rack adapter (see http://www.kramerav.com/product/DA3-24-H / www.kramerav.com/product/DA3-28-H).

Mount DA3-24-H on a surface using one of the following methods:

- Attach the rubber feet and place the unit on a flat surface (included in the box).
- Mount the unit under table brackets RK-19N (option).
- Mount the unit in a rack using the recommended rack adaptor RK-1 (option).
- Attach the rubber feet and place the unit on a flat surface.

Connecting DA3-24-H

Since the main difference between **DA3-24-H** and **DA3-28-H** are the number of outputs, from this section on, any description of **DA3-24-H** applies also to **DA3-28-H**, unless stated otherwise.

Always switch off the power to each device before connecting it to your **DA3-24-H**. After connecting your **DA3-24-H** , connect its power and then switch on the power to each device.

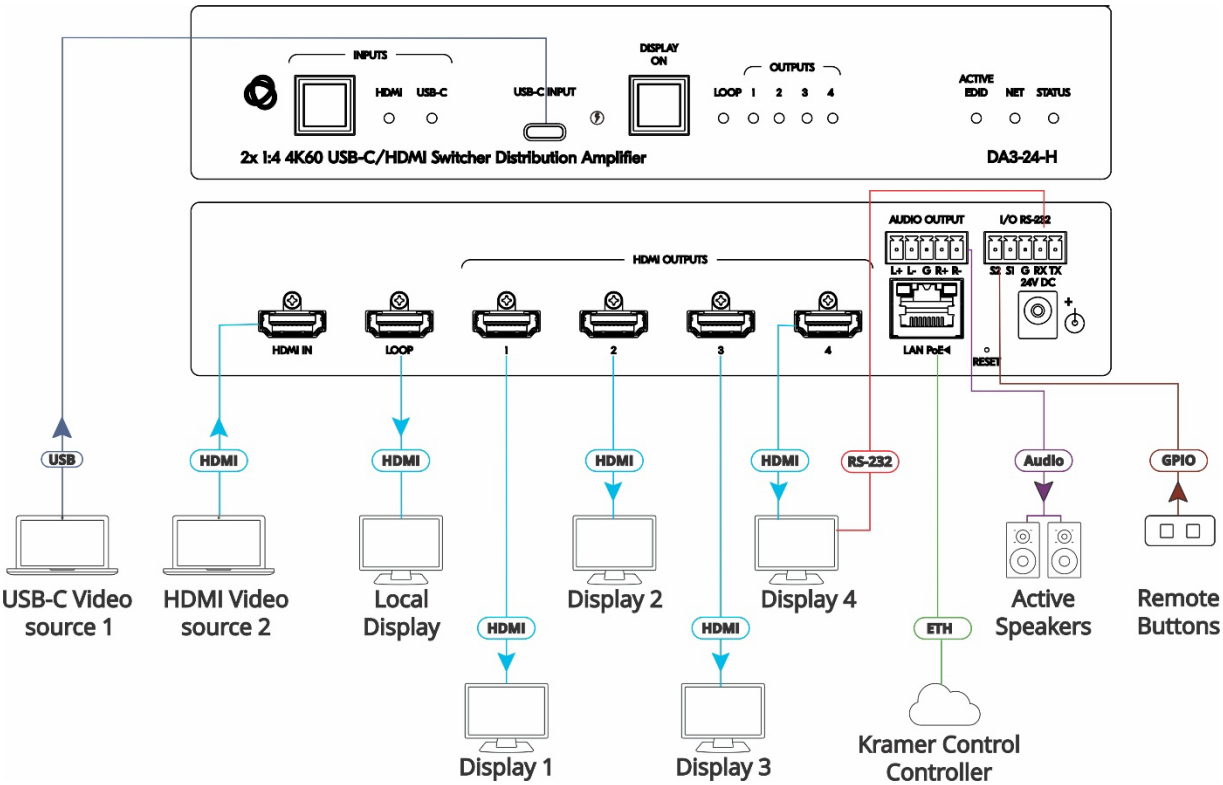


Figure 2: Connecting to the **DA3-24-H** Rear Panel

To connect DA3-24-H as illustrated in the example in Figure 2:

1. Connect a USB-C source (for example, a laptop) to the USB-C INPUT connector (2).
2. Connect an HDMI source (for example, a laptop or a desktop) to the HDMI IN connector (10).
3. Connect the HDMI LOOP connector (11) to an HDMI acceptor (for example, a local monitor).
4. Connect the HDMI OUTPUTS connectors (12) to an HDMI acceptor (for example, a display).
5. Connect AUDIO OUT to a balanced stereo audio acceptor (14) (for example, Kramer **Tavor 5-O** active speakers).
6. Connect remote contact-closure buttons to I/O terminal block connectors (15), and configure buttons function, for example to select an input (see Configuring I/O (GPIO) Ports on page 24).

7. Connect a room controller (for example, the Kramer **KC-VB1**) via LAN to the LAN PoE Ethernet RJ-45 port (13).

   Send serial commands from LAN-connected Kramer controller (13) (for example **KC-VB1**) to the display via control gateway.

8. Connect a room controller (for example, the Kramer **KC-VB1**) via LAN to the LAN PoE Ethernet RJ-45 port (13).

Connecting Output to a Balanced/Unbalanced Stereo Audio Acceptor

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

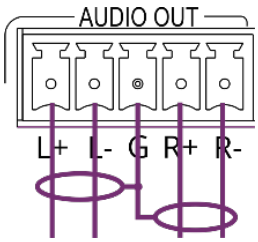


Figure 3: Connecting to a Balanced Stereo Audio Acceptor

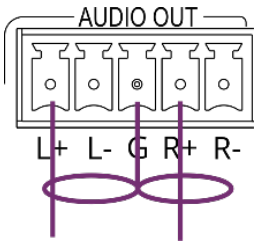


Figure 4: Connecting to an Unbalanced Stereo Audio Acceptor

Connecting to DA3-24-H via RS-232

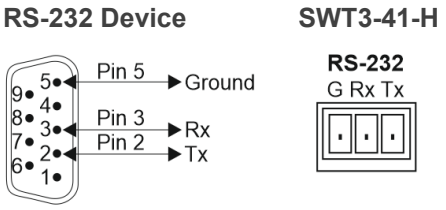
You can connect to **DA3-24-H** via an RS-232 connection (15) using, for example, a PC.

DA3-24-H features an RS-232 3-pin terminal block connector allowing the RS-232 to control **DA3-24-H**.

Connect the RS-232 terminal block on the rear panel of **DA3-24-H** to a PC/controller, as follows:

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

- Pin 2 to the TX pin on the **DA3-24-H** RS-232 terminal block.
- Pin 3 to the RX pin on the **DA3-24-H** RS-232 terminal block.
- Pin 5 to the G pin on the **DA3-24-H** RS-232 terminal block.



Operating and Controlling DA3-24-H

Principles of Operation

This section covers the following topics:

Flexible DA3-24-H Auto Switching Policy on page 9.

Routing IP-Driven Control Signals via Built-in Control Gateway on page 10.

Flexible DA3-24-H 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, **DA3-24-H** will switch to it.

If the signal on the current input is lost, **DA3-24-H** automatically selects the last connected input.

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

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

Remote IP connected clients can send from the LAN, via the **DA3-24-H** built-in control gateway, CEC, RS-232 and I/O commands, and receive responses and notifications, to control devices connected to **DA3-24-H** HDMI-OUT, RS-232 and I/O 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.

Figure 5 shows the **DA3-24-H** built-in control gateway connection. The Kramer Control controller is connected to the switcher via LAN, sends IP commands to the switcher control gateway over the LAN connection, to send control messages to, and receive control responses from:

- The display connected to the HDMI output (CEC) and the RS-232 port.
- The Occupancy Detector & Select In Button connected to the switcher via the I/O ports.

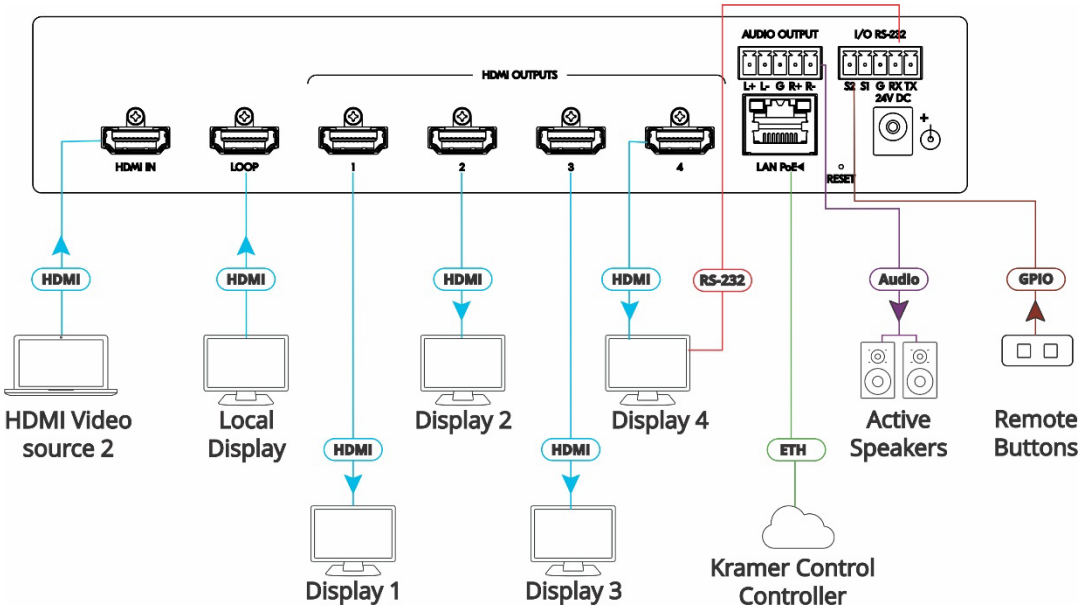


Figure 5: Controlling remotely via Control Gateway

Built-in control gateway activation, activation of the associated control ports and their attributes (such as the CEC logical address of the control gateway), as well as manual commands testing operation, is done via DA3-24-H control gateway webpages (see Setting Control Gateway Properties on page 21).

Using Front and Rear Panel Buttons

DA3-24-H front and rear 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 Controlling the Display on page 22).
- Resetting device to its factory settings (for additional instructions on resetting and resetting device (see Resetting and Restarting Device on page 30).

Operating via Ethernet

You can connect to **DA3-24-H** via Ethernet using either of the following methods:

- Directly to the PC using a crossover cable (see Connecting Ethernet Port Directly to a PC on page 11).
- Via a network switch or router, using a straight-through cable (see Connecting Ethernet Port via a Network Switch on page 13).

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 **DA3-24-H** directly to the Ethernet port on your PC using a crossover cable with RJ-45 connectors.

This type of connection is recommended for identifying **DA3-24-H** with the factory configured default IP address.

After connecting **DA3-24-H** to the Ethernet port, configure your PC as follows:

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

3. 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 6).

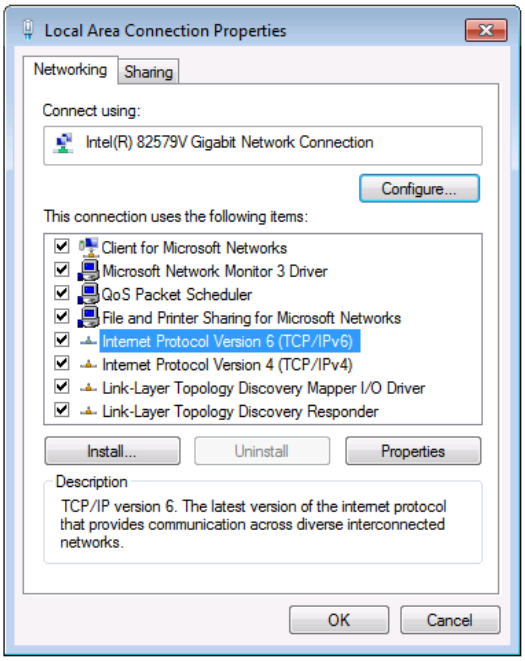


Figure 6: Local Area Connection Properties Window

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

5. Click **Properties**.
   The Internet Protocol Properties window relevant to your IT system appears as shown in Figure 7: Internet Protocol Version 4 Properties Window or Figure 8: Internet Protocol Version 6 Properties Window.

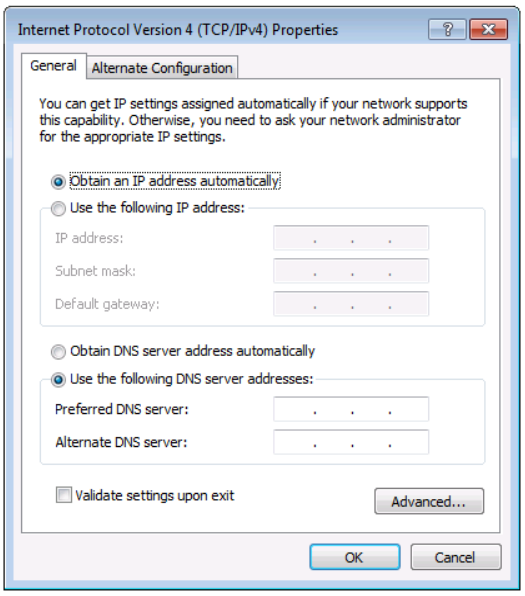


Figure 7: Internet Protocol Version 4 Properties Window

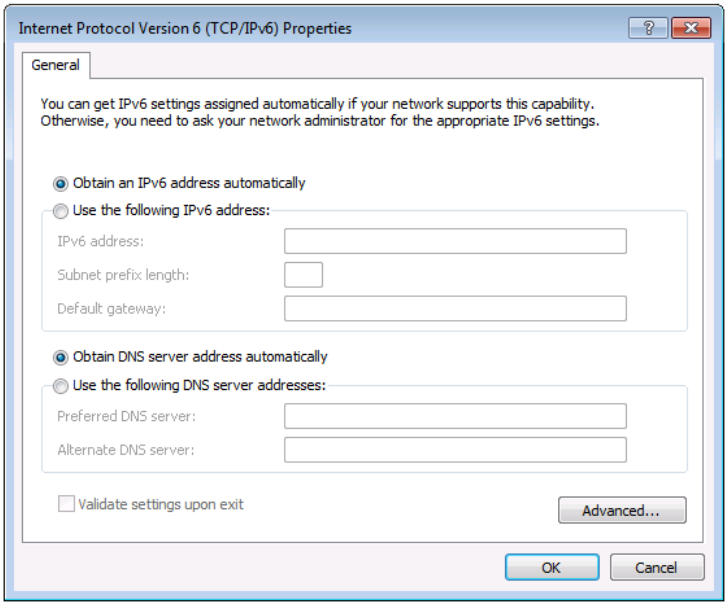


Figure 8: Internet Protocol Version 6 Properties Window

6. Select **Use the following IP Address** for static IP addressing and fill in the details as shown in Figure 9: Internet Protocol Properties Window
   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.

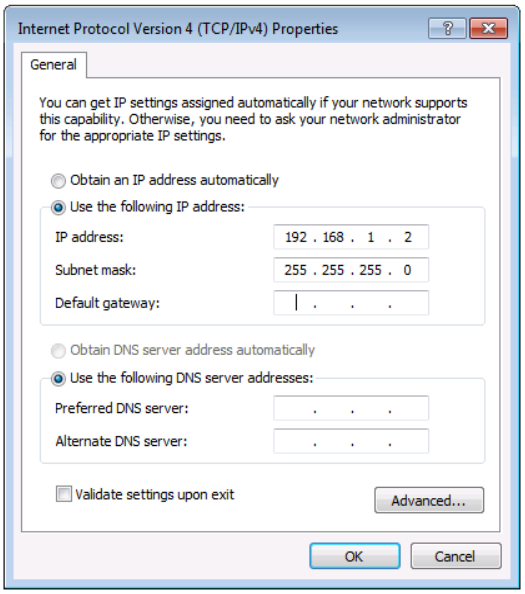


Figure 9: Internet Protocol Properties Window

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

Connecting Ethernet Port via a Network Switch

You can connect the Ethernet port of **DA3-24-H** to the Ethernet port on a network switch or router using a straight-through cable with RJ-45 connectors.

Configuring Ethernet Port

You can set the Ethernet parameters via the embedded Web pages.

Discovering and acquiring IP address

DA3-24-H 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

DA3-28-H 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.

- This section displays the webpages for the **DA3-28-H**. For this section, any description of **DA3-28-H** applies also to **DA3-24-H**, unless stated otherwise.
- You can also configure **DA3-28-H** via Protocol 3000 commands (see Protocol 3000 Commands on page 42).

Before attempting to connect:

- Perform the procedure in (see Operating via Ethernet on page 11).
- Ensure that your browser is supported.

The following operating systems and Web browsers are supported:

Operating Systems	Browser
Windows 7	Chrome
Windows 10	Edge
	Chrome
Mac	Safari
iOS	Safari
Android	N/A

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.

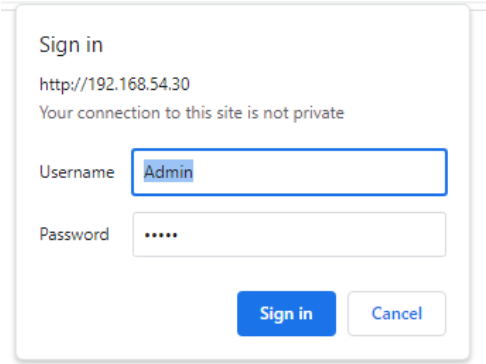


Figure 10: Embedded Web Pages Login Window

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

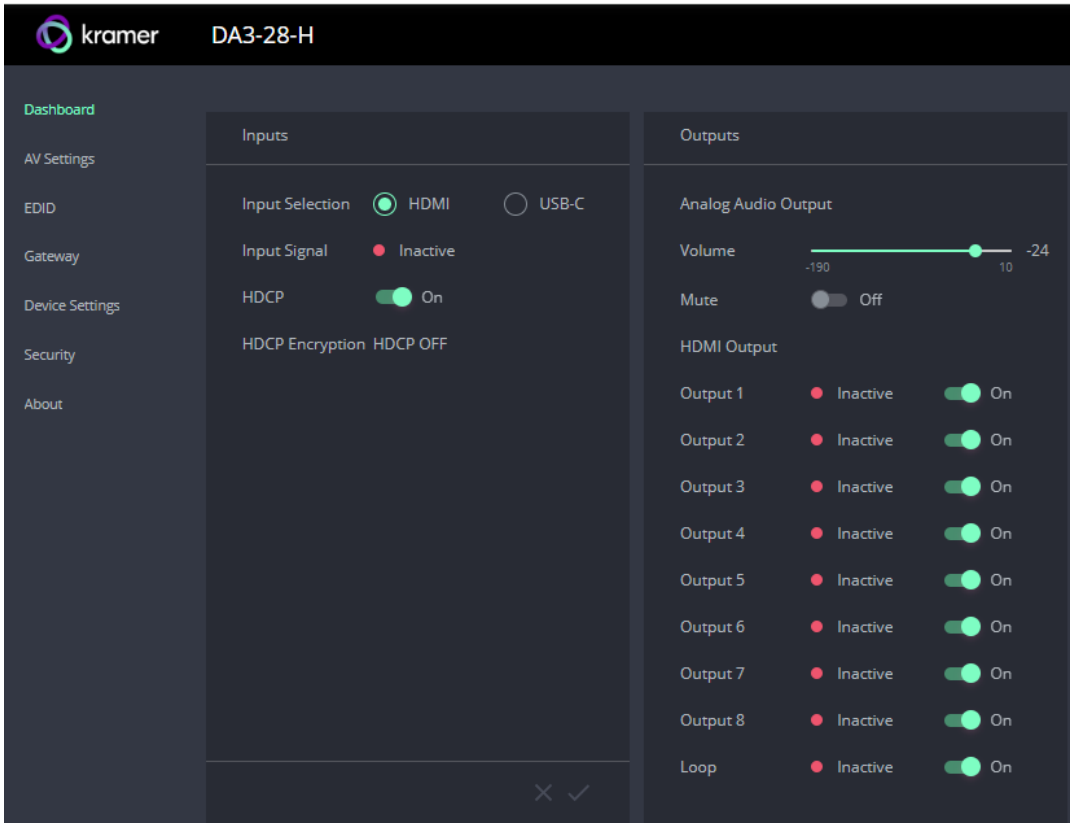


Figure 11: Dashboard Landing Page

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

DA3-28-H web pages enable performing the following actions:

- Operation on page 16.
- AV Settings on page 18.
- Managing EDID on page 20.
- Setting Control Gateway Properties on page 21.
- Setting Device Properties on page 29.
- Security on page 33.
- Viewing the About Page on page 38.

Operation

Routing AV Signals

This section details the following actions:

- Routing an Input to an Output on page 17.
- Setting Analog Audio Output Level on page 18.

Routing an Input to an Output

Route one of the two inputs to any of the eight outputs.

DAF-24-H displays four outputs and one Loop output.

To route the inputs to the output:

1. Go to the Dashboard Landing page.

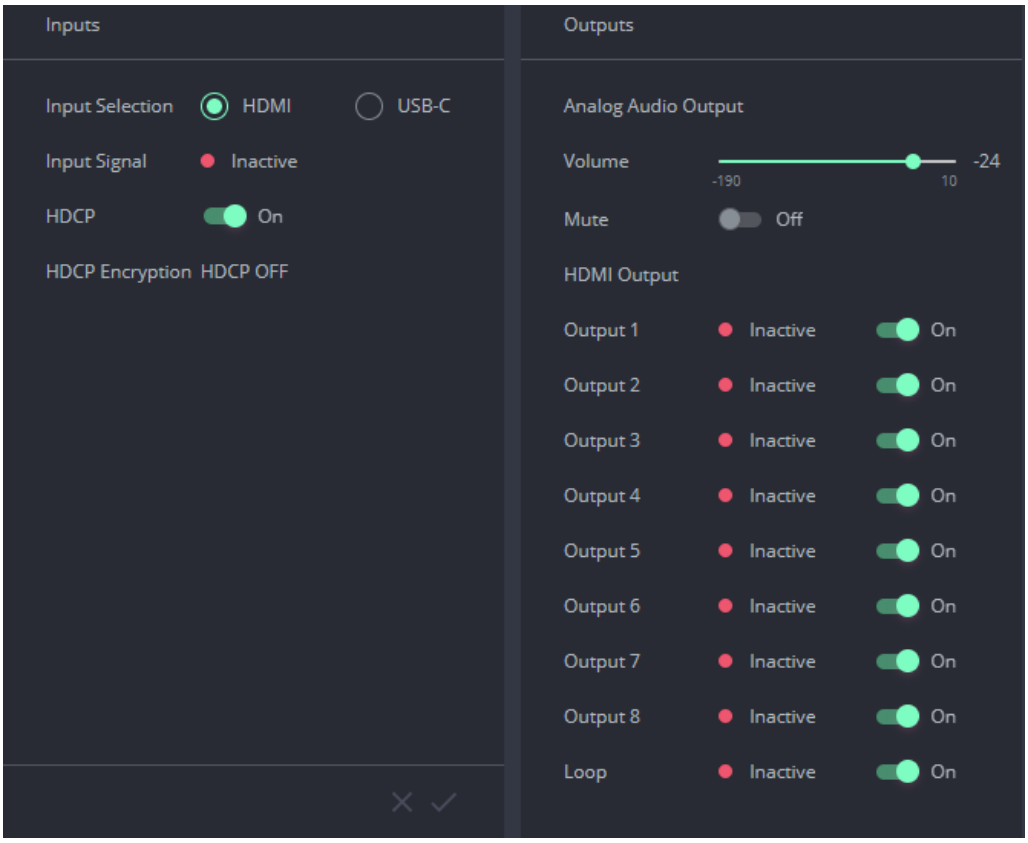


Figure 12: Dashboard Landing Page

2. Perform the following functions:

   Input Selection: Select between the HDMI or USB-C source.

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

   Input Signal:

   - A green light indicates Active input signal.
   - A red light indicated Inactive input signal.

   HDCP: For the inputs, select the **ON** (default) /**OFF** switch to enable/disable HDCP for that input.

3. Select the HDMI outputs:

   Select the **ON** (default) /**OFF** switch to enable/disable the 1-8 / Loop outputs.

   Output Signal:

- A green light indicates Active input signal.
- A red light indicates Inactive input signal.
- No LED indicates no detection of Sink on output.

To learn how to configure the output settings, refer to Configuring the Output Settings on page 18.

4. The selection is automatically saved.

An input is routed to the output.

Setting Analog Audio Output Level

To set the audio output level:

1. Go to the Dashboard Landing page.
2. Set the audio level using the slider next to Analog Audio volume (dB, from -190 to 10).
3. Set the audio level using the slider next to Analog Audio Output Volume (dB, from -190 to 10).
4. Select the **ON /OFF Mute** switch to mute / unmute the Analog Audio Volume for all outputs.

Audio level is set.

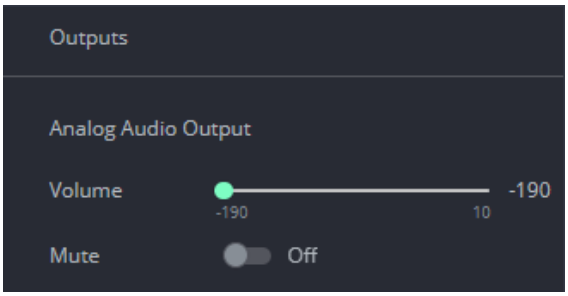


Figure 13: Setting Audio Output Level

AV Settings

This section details the following actions:

- Output Settings on page 18.
- Auto Switching Properties on page 19.

Output Settings

Configuring the Output Settings

1. Go to the **AV Settings>Outputs** tab.

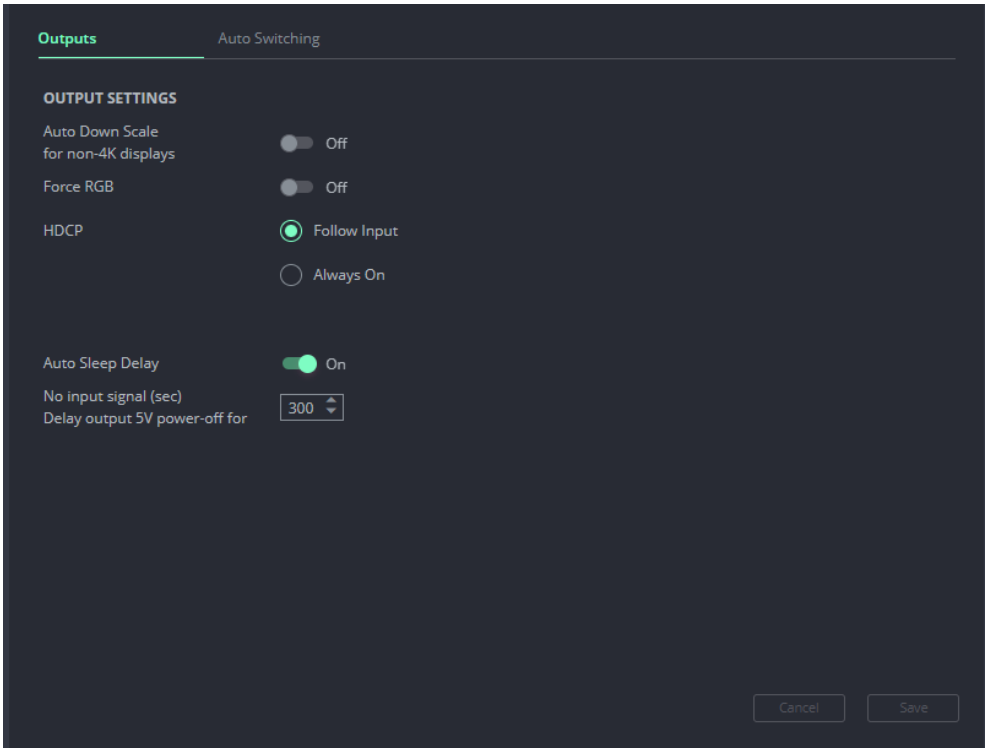


Figure 14: AV Settings>Outputs Tab

2. Perform the following actions:

Auto Down Scale for non-4K displays – **Enable** or **Disable** (default) for all outputs.

Force RGB – **Enable** or **Disable** (default). If the sink does not support YCbCr, select Enable to force the source to output in RGB color space.

HDCP – Select **Always On** keep HDCP enabled or **Follow Input** (default) to define the output HDCP setting according to the active input.

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 the next setting.

- No input signal (sec) Delay output 5V power off for (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.

3. Click **Save / Cancel** to Save / Cancel the configuration.

Output configurations are set.

Auto Switching Properties

Setting the AV Auto-Switching Policy

1. Go to the **AV Settings>Auto Switching** tab.

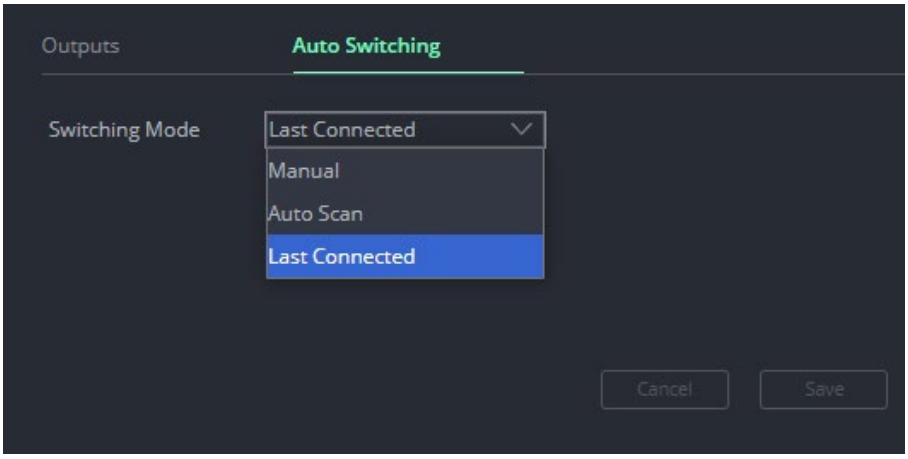


Figure 15: AV Settings>Auto Switching Tab

2. Next to the Switching Mode drop-down box, select the auto switching policy: **Manual**, **Auto Scan** or **Last Connected**.

   For further details, refer to Flexible **DA3-24-H** Auto Switching Policy on page 9.

3. Click **Save / Cancel** to Save / Cancel the Auto Switching mode.

Switching policy is set.

Managing EDID

DA3-28-H enables you to copy an EDID from several different sources to the inputs.

To copy the EDID to the inputs:

1. Go to the EDID Management page.

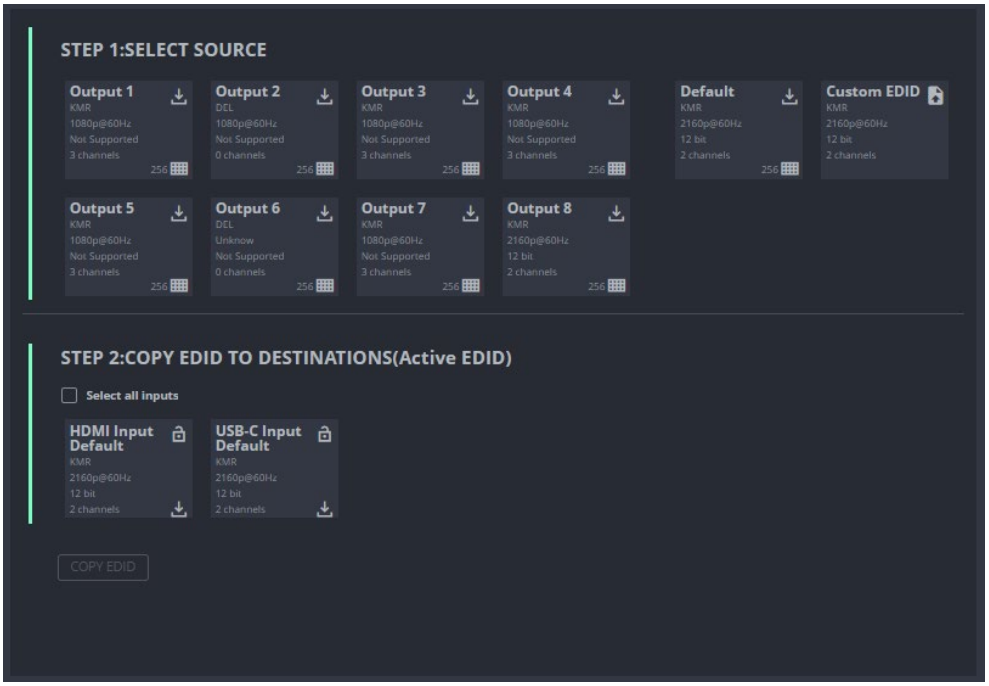


Figure 16: EDID Management Page

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 Control Gateway Properties

This section details the following actions:

- Setting Serial Port Properties on page 21.
- Defining CEC Gateway Settings on page 22.
- Configuring I/O (GPIO) Ports on page 24.
- Defining and Testing Commands via Action Editor on page 28.

Setting Serial Port Properties

DA3-28-H enables configuring the RS-232 port in one of the following ways:

- Controlling the DA3-28-H on page 21.
- Controlling an External Device on page 22.
- Controlling the Display on page 22.

Controlling the DA3-28-H

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

1. Go to the Gateway page. The RS-232 tab appears.

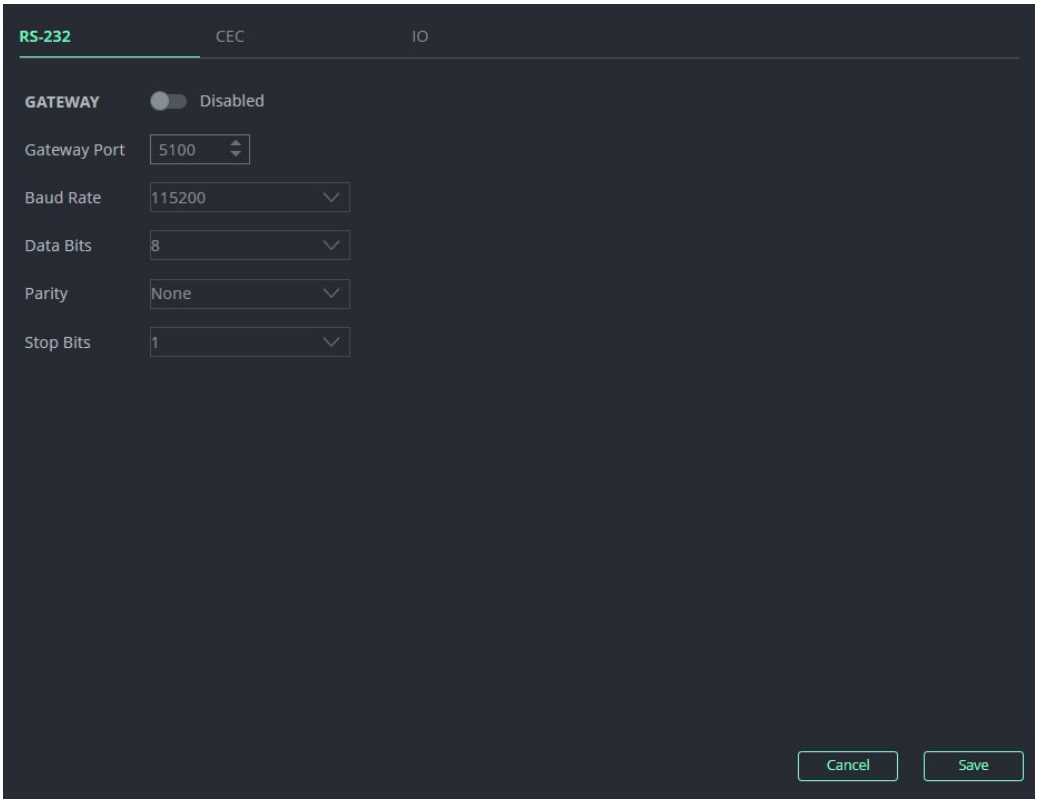


Figure 17: RS-232 Device Control

2. Next to GATEWAY, select Disabled.
3. Click **SAVE**.

RS-232 port controls the **DA3-28-H**.

Controlling an External Device

Control an external 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 Gateway page. The RS-232 tab appears.
2. Next to **Gateway** select **Enabled.**

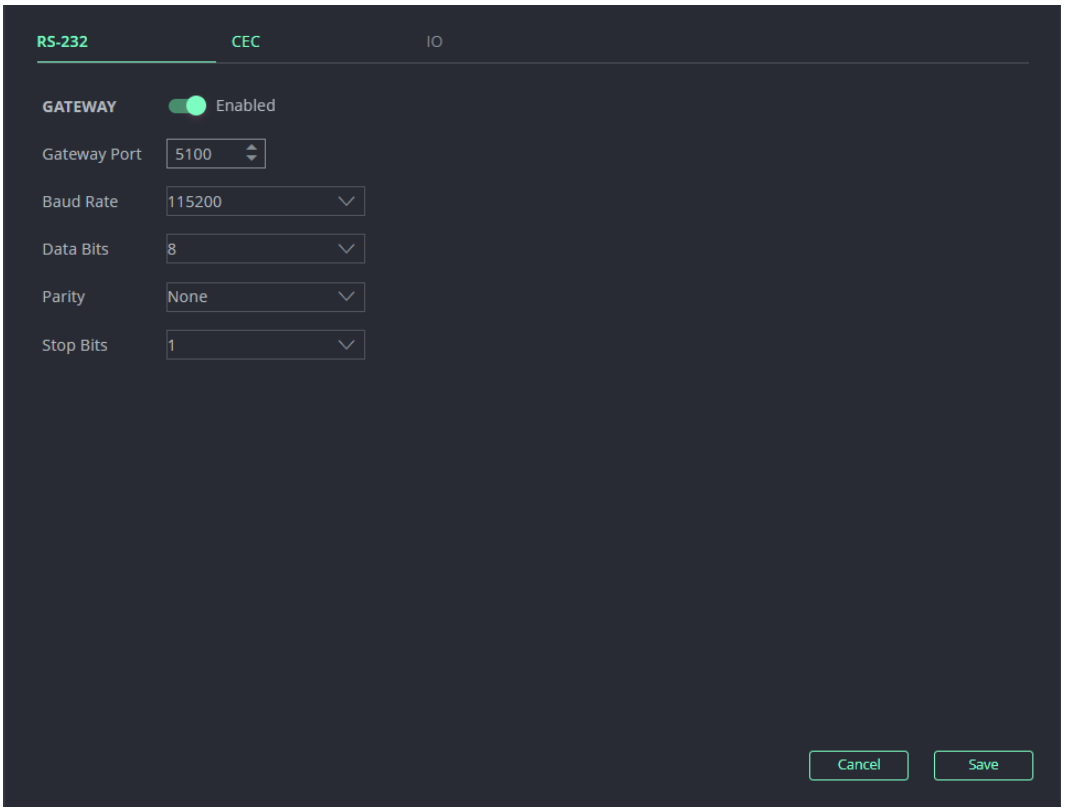


Figure 18: RS-232 as Gateway

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

RS-232 port controls an external device.

Defining CEC Gateway Settings

DA3-28-H built-in CEC gateway enables IP control of control system, via CEC messages, on HDMI connected devices to the selected input and the output port. The Members address list shows the logical addresses of connected CEC-enabled devices.

By default, CEC gateway is enabled.

To disable CEC gateway feature:

1. In the navigation pane, select **Gateway**.
2. Select the **CEC** tab. The CEC Gateway page appears.
3. Click **GATEWAY Off**.

When Gateway is off, it serves as a passthrough from input to output of the HDMI CEC commands.

4. Select Output 1-8 using the **Pass-through with** drop-down list:
5. Enter CEC Command

You can view the logical addresses of CEC-enabled devices that are connected via HDMI output port to DA3-28-H.

6. Click **Save**.

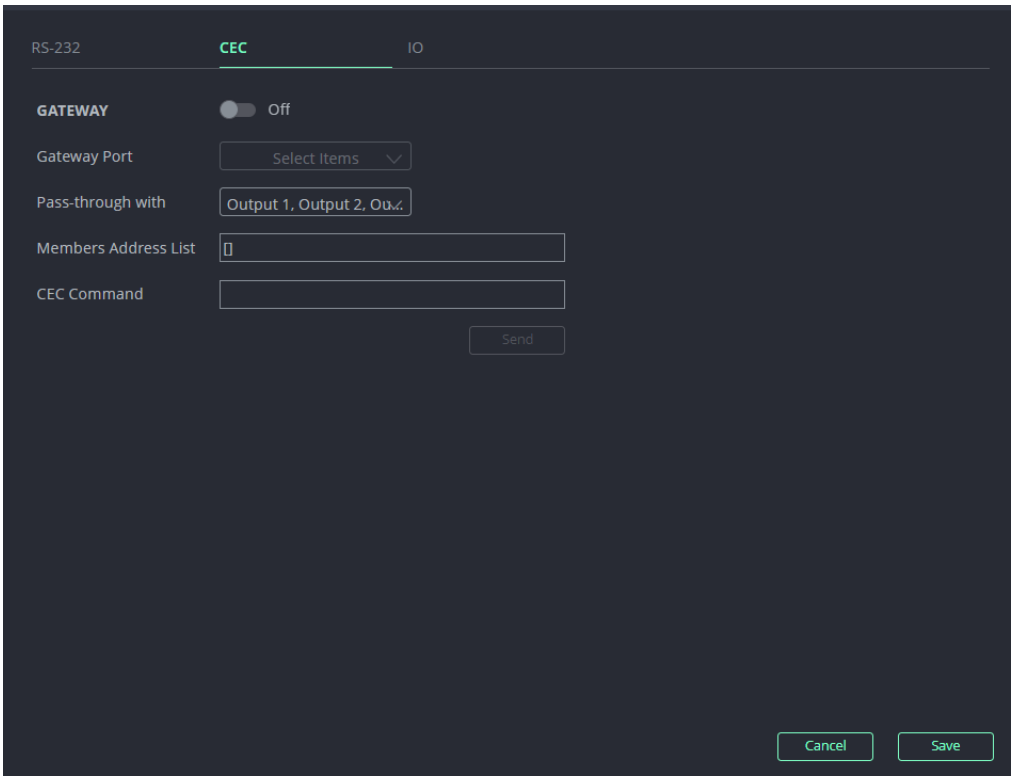


Figure 19: CEC Gateway Enable/Disable Tab

CEC gateway is disabled.

To Enable CEC gateway feature:

1. In the navigation pane, select **Gateway**.
2. Select the **CEC** tab. The CEC Gateway page appears.
3. Select the HDMI port from the drop-down list to which CEC commands are sent:
   - HDMI Input (HDMI IN)
   - Output 1-8 (HDMI OUT)
4. Enter the CEC command. Use hex format for the CEC command, up to 32 hex digits.

5. Click **Send**.
6. View the CEC-enabled device response.

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 configure an I/O port:

1. In the Navigation pane, click **Gateway**. The IO tab appears.
2. Select the IO tab. The IO tab appears.

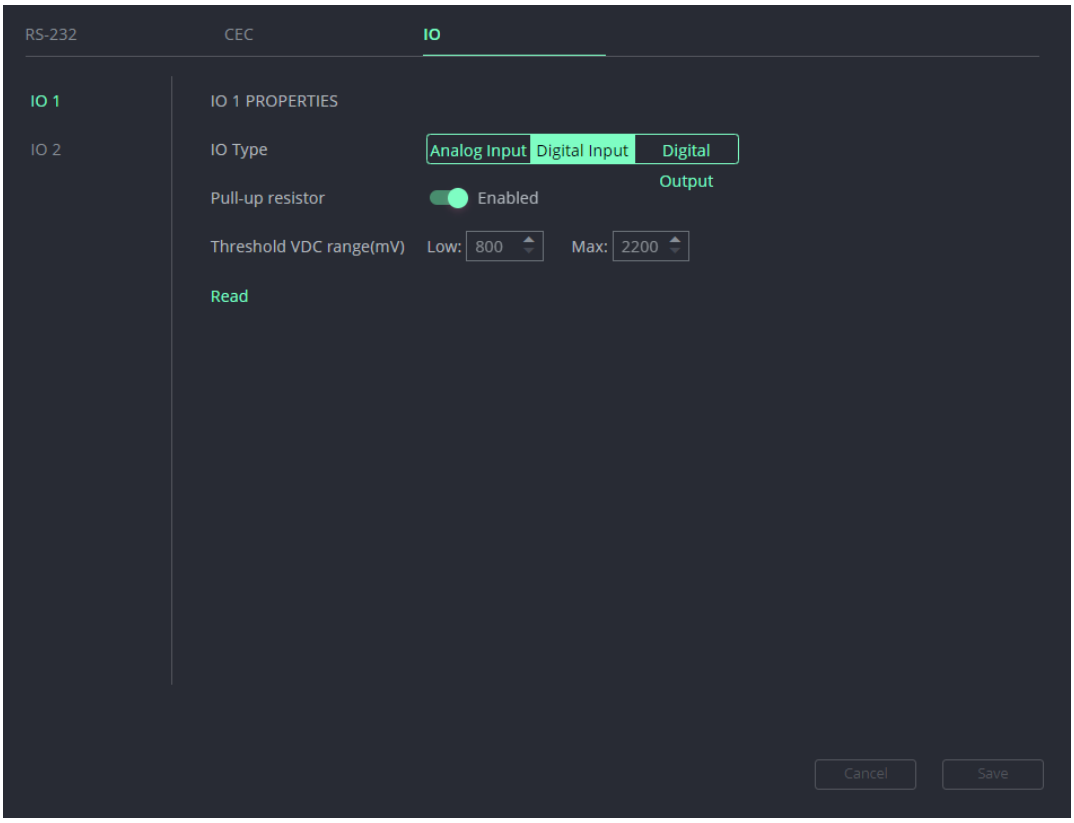


Figure 20: I/O Ports Settings Page

3. Select the I/O port to be configured (IO 1 to IO 2).
4. Select one of the following I/O types:

   Digital Input (default setting) (see Configuring a Digital Input I/O Type on page 25).

   Digital Output (see Configuring a Digital Output I/O Type on page 25).

   Analog Input (see Configuring an Analog Input I/O Type on page 27).

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 Max threshold from Low state) or Low (upon passing Min threshold from High state) port states according to the user defined voltage 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 31).
2. Select one of the following for the Pull-up resistor setting:

   Disabled
   Suitable, for example, for a high temperature alarm that exceeds the maximum voltage threshold. When the pull-up resistor is disabled, the port state is low and to be triggered it must be pulled high by the externally connected sensor.

   Enabled – Detection of an open circuit as High, or 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 circuit that activates a series of actions. When the pull-up resistor is enabled, the port state is high, and to be triggered it must be pulled low by the externally connected sensor.
3. Set the Threshold VDC Low and High Range (threshold voltage at which the port changes state).
4. Click **Read** to refresh port status information.
5. 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.

When selecting Digital Output and the pull-up resistor is disabled, you must install a current-limiting resistor to prevent damage to the port.

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

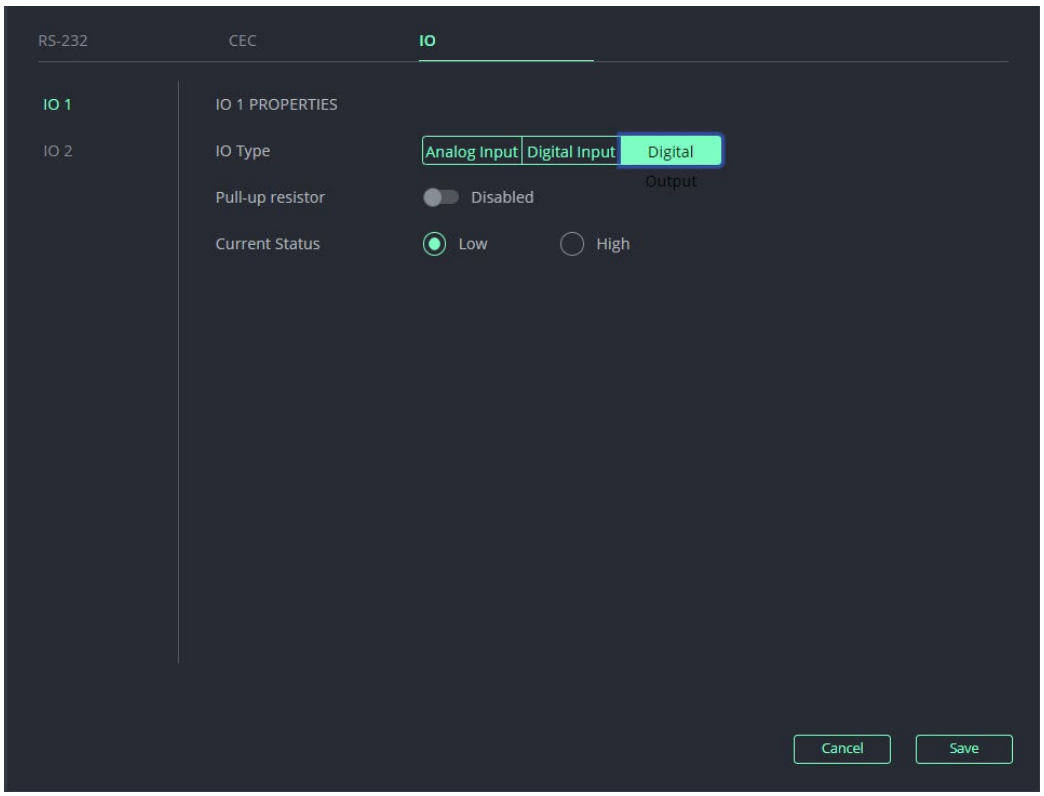


Figure 21: GPIO Settings Page – Digital Output I/O Type

3. 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.
   When the pull-up resistor is enabled, the port state is high. For the state to be low, you must select **Low** for the Current Status.

   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.
   When the pull-up resistor is disabled, the port state is low. For the state to be high, select **High** for the Current Status.

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

4. Click **SAVE**.

Digital Output I/O type is configured.

Configuring an Analog Input I/O Type

When selectin 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.

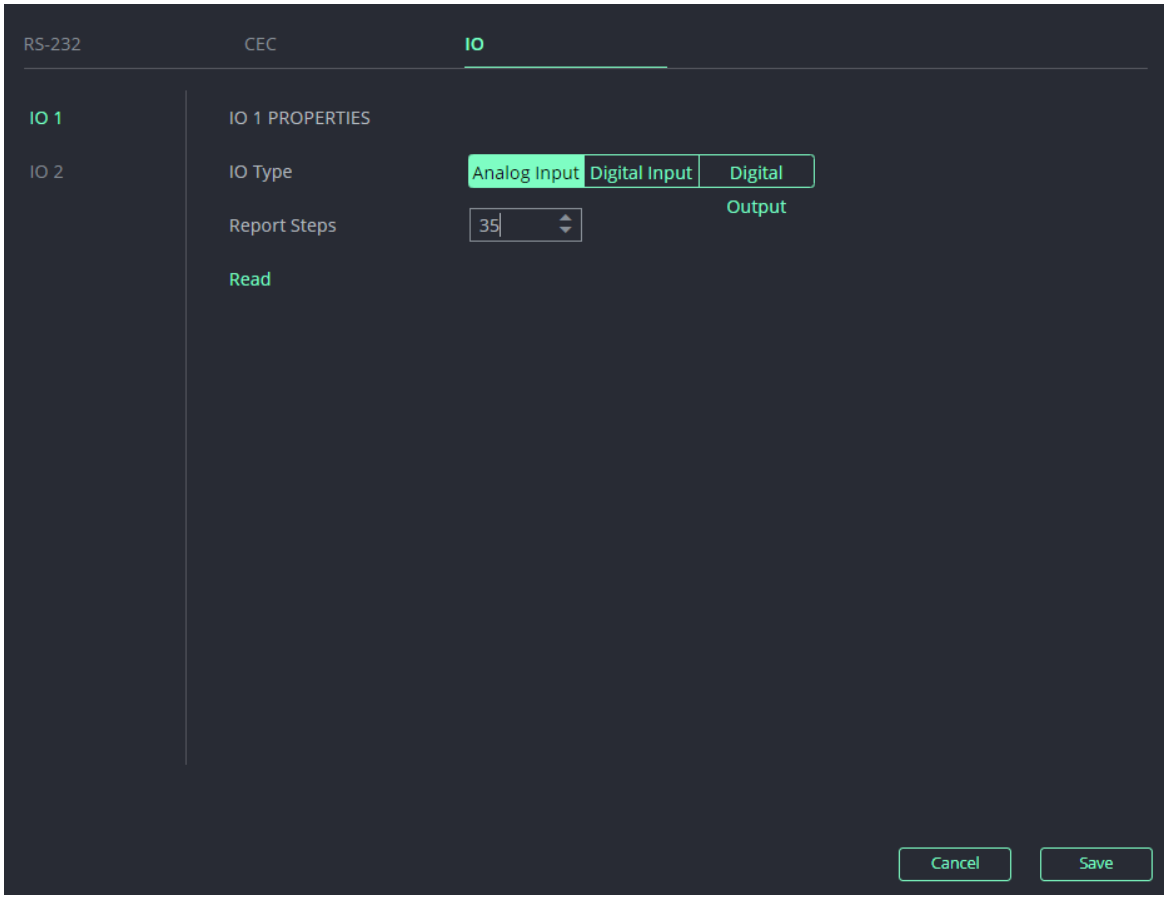


Figure 22: GPIO Port Settings Page Analog Input

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 or UART 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.

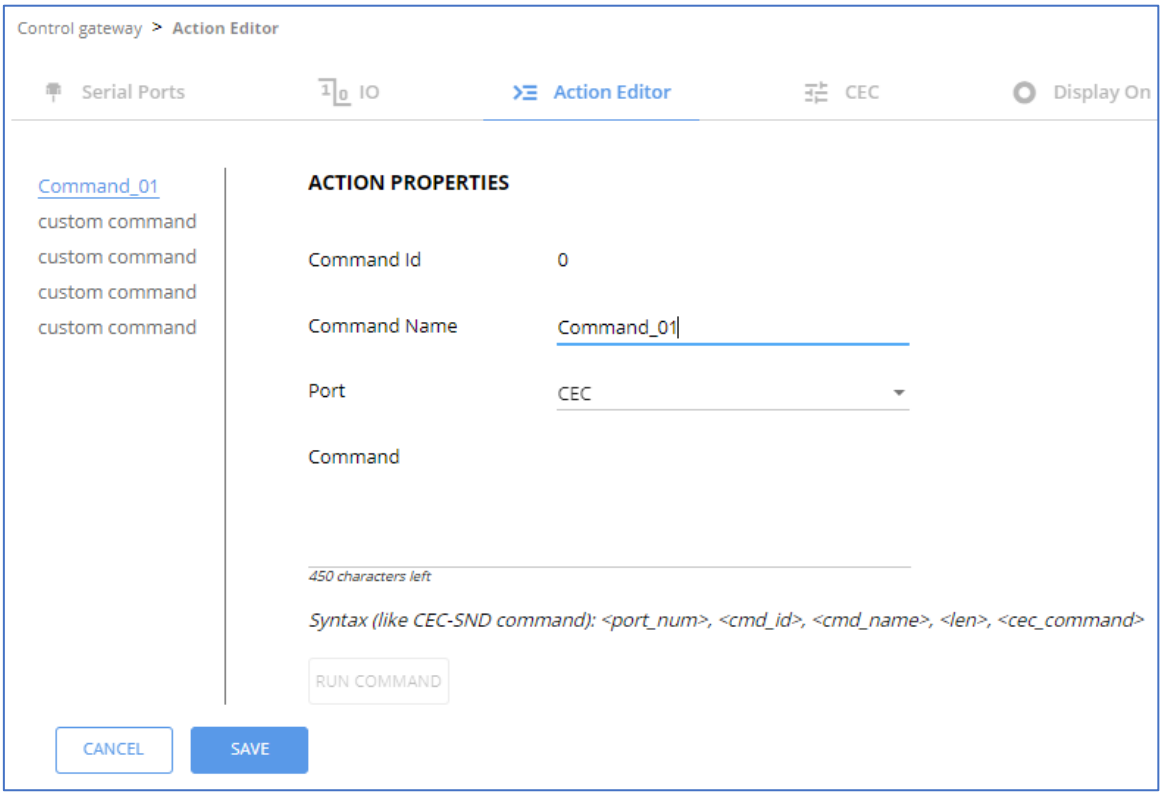


Figure 23: Action Editor Tab

3. Select a command name on the left side of the window.
4. Change the command name, if required.
5. Select the port (CEC or UART).
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 RS232 - PON

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

An action

Setting Device Properties

This section details the following actions:

- Device Profile and Maintenance on page 29.
- Settings Networking Properties on page 31.
- Setting Time and Date on page 32.

Device Profile and Maintenance

Changing Device Name

DA3-28-H enables you to change the DNS name of the device.

To change the device name:

1. Go to the Device Settings > General page.

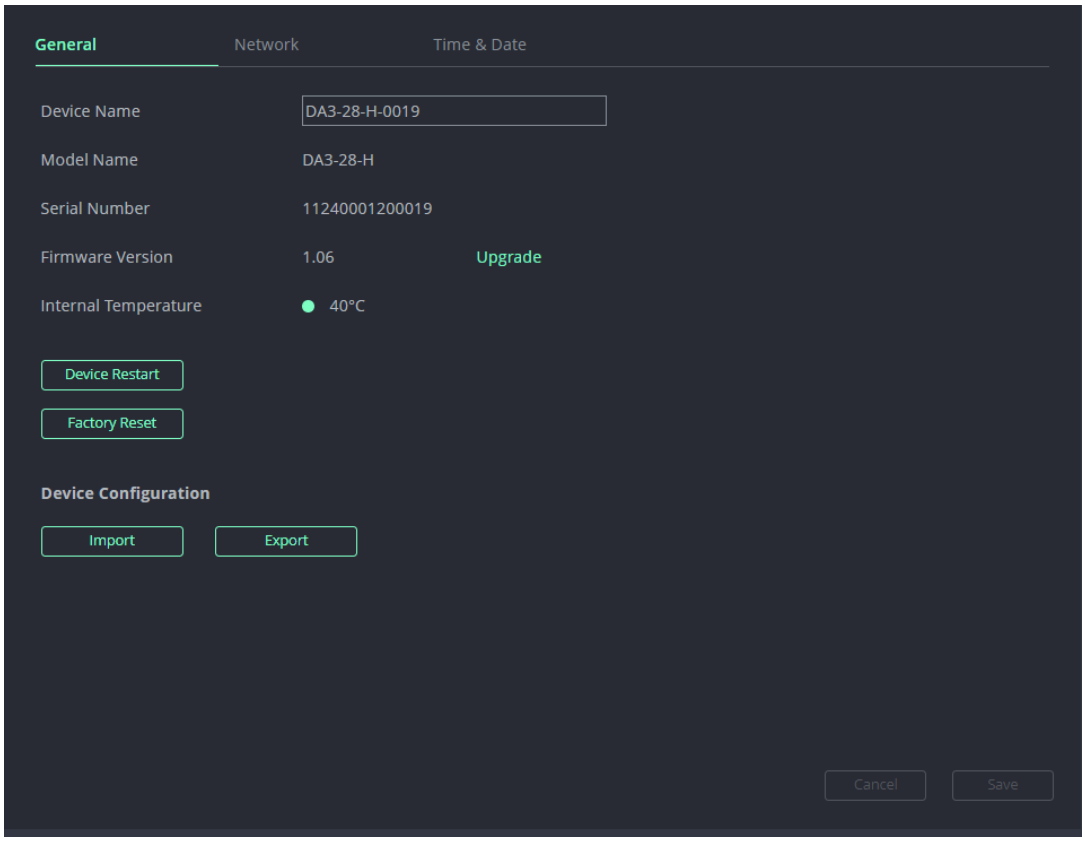


Figure 24: Device Settings> General Page

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

The device name is changed.

Upgrading Firmware

To upgrade the device firmware:

1. Go to the **Device Settings**> **General** page (Figure 24).
2. Under General, click **Upgrade**, 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.

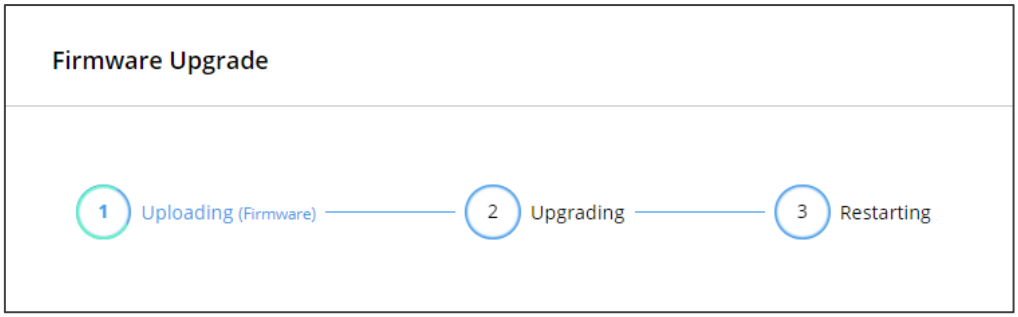


Figure 25:Firmware Upgrade Process

Resetting and Restarting Device

Two types of resets can be performed:

- Device Restart – Reboots your device and keeps all your device settings, including the IP address and password.
- Factory 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 Settings**> **General** page (Figure 24).

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

Click **FACTORY RESET** on the **Device Settings**> **General** page (Figure 24).

Using protocol 3000 commands, send 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

DA3-28-H enables you to export and store (in connected browsing PC storage) a configuration file, that records all current device settings except the routing operation setup. The stored file can then be imported to the same or different **DA3-28-H** 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 Settings**> **General** page (Figure 24).
2. Under Device Configuration, 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 Settings**> **General** page (Figure 24).
2. Under Device Configuration, 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.

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 Settings**> **General** page (Figure 24).
2. Select the **Network** tab.

The network page appears.

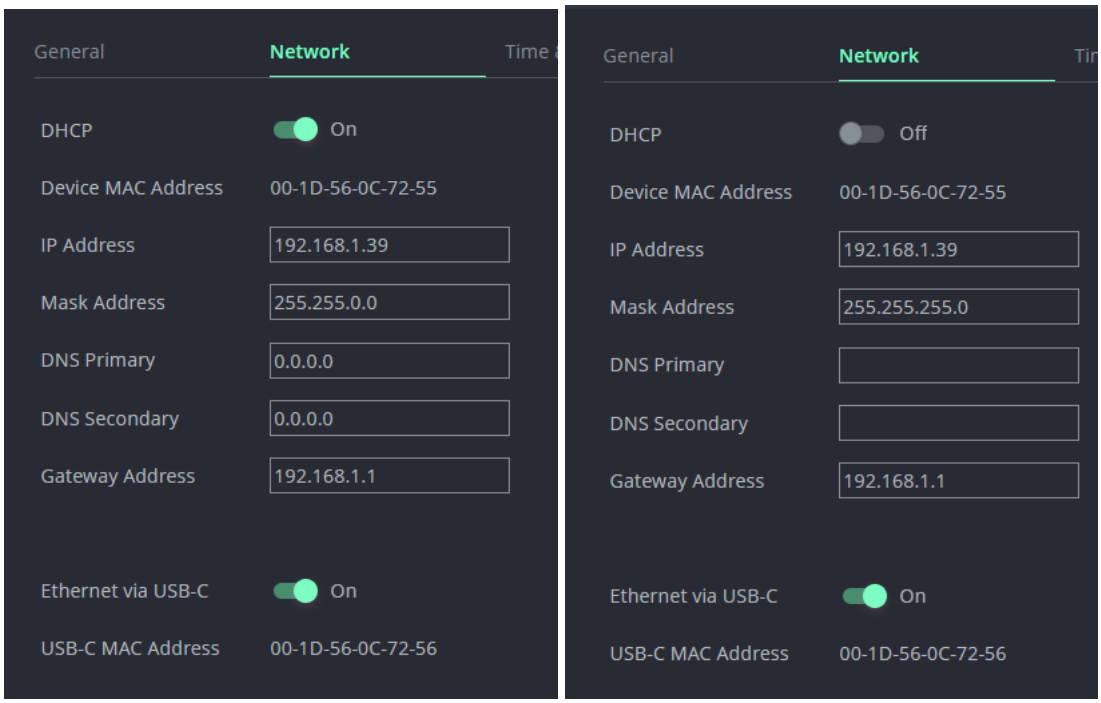


Figure 26: Device Settings > Network Page (DHCP On/DHCP Off)

3. Change settings as needed.

   If required, Set to **DHCP** (default) or static IP address resolution modes.

4. When in Static IP mode, perform the following actions:
   - Change the IP address.

- Change the Mask address.
- Enter the DNS Primary.
- Enter DNS Secondary.
- Change the Gateway address.

Network settings are defined.

Setting Time and Date

You can sync the device time and date to any server around the world.

To sync device time and date to a server:

1. In the Navigation pane, click **Device Settings**. The General tab in the Device page appears.
2. Select the **Time and Date** tab. The Time and Date tab appears.

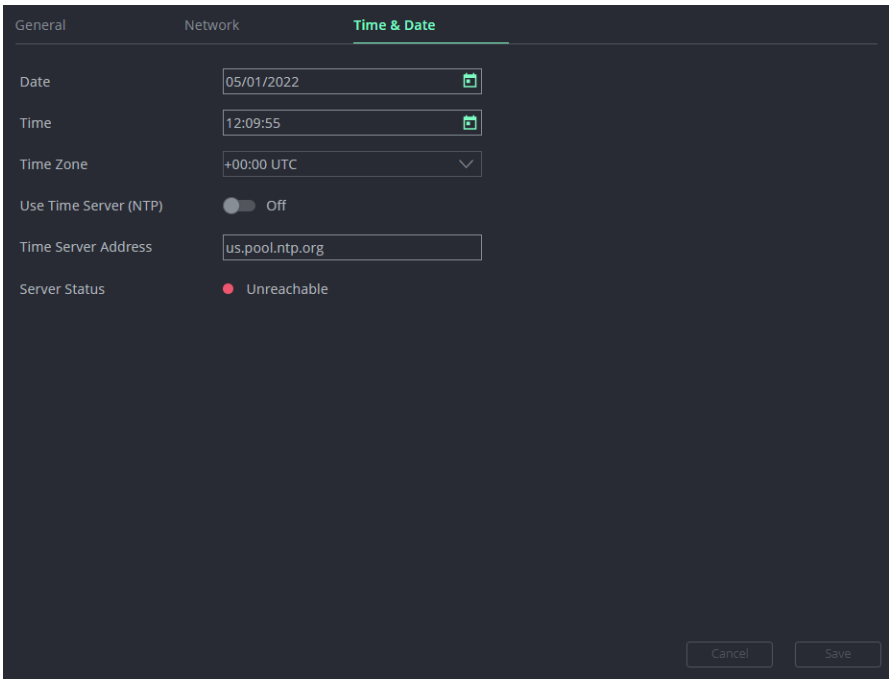


Figure 27: Device Settings – Time and Date Tab

3. Set the Date and Time.
4. Select the Time Location.
5. In the Use Time Server (NTP) drop-down box, click:
   - **Disabled** to disable the time server.
   - **Manual** to enable time server (NTP).
6. If enabled, type in server information:
   - Enter the time server address.
7. Click **SAVE** for any change.

The devices date and time are synchronized to the server address entered.

Security

Setting Security Properties

This section details the following actions:

- Changing Security Status on page 33.
- Defining 802.1X Authentication on page 35.

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.
2. Select the Device Security tab. The Security settings appears (Figure 37).

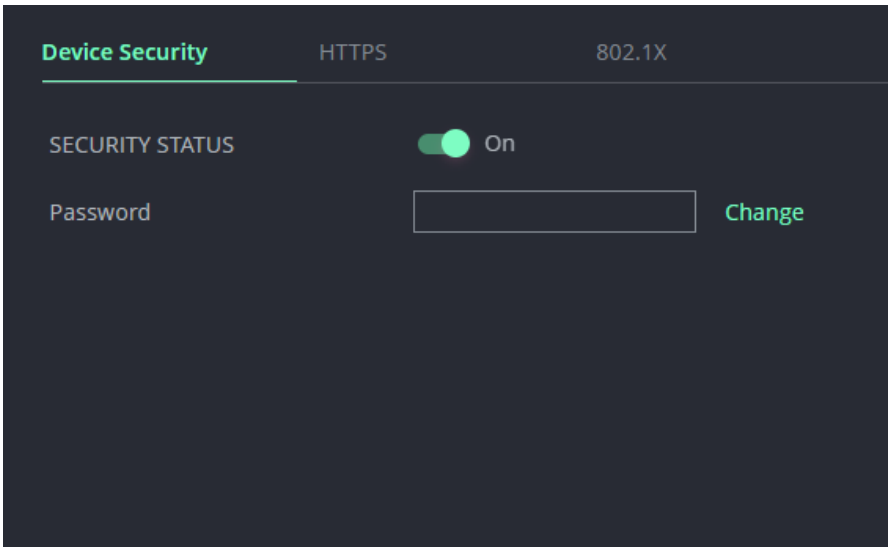


Figure 28: Security – Device Security Tab

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

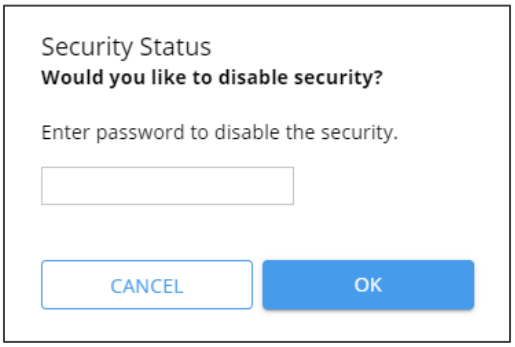


Figure 29: Security Status Message

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 >Device Security (Figure 28).).
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 28).
2. Select the Device Security Tab. The Security settings appear (Figure 30).
3. Enter the Current Password and click **Change**. The new password settings appear.

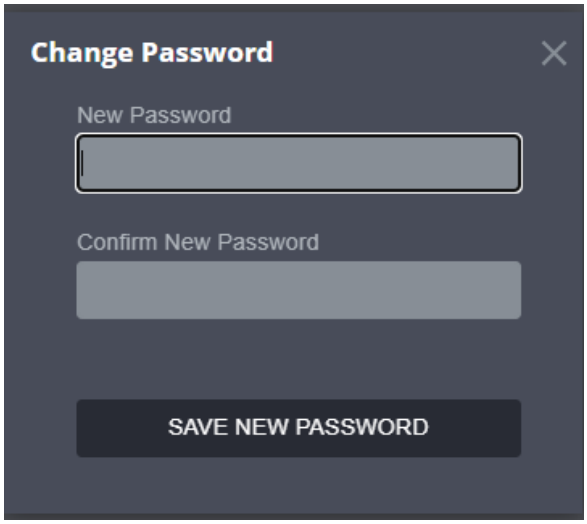


Figure 30: Device Settings – Changing the Password

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

The password is changed.

Configuring HTTPS

To configure HTTPS:

1. In the Navigation pane, click **Security**. The Device Security tab appears (Figure 28).
2. Select **HTTPS** tab.

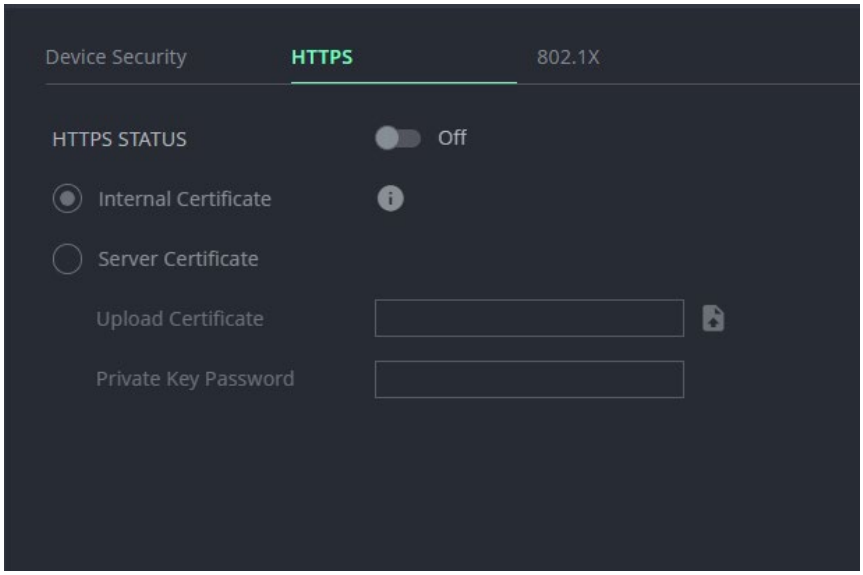


Figure 31: Security – HTTPS Tab

3. For HTTPS server, click **ON** to enable HTTPS authentication service (default) or **Off** to disable HTTPS authentication.
4. When set to ON check one of the following settings:
   - **Internal Certificate** – To use the factory default certificate for authentication.

     Click to view certificate info:

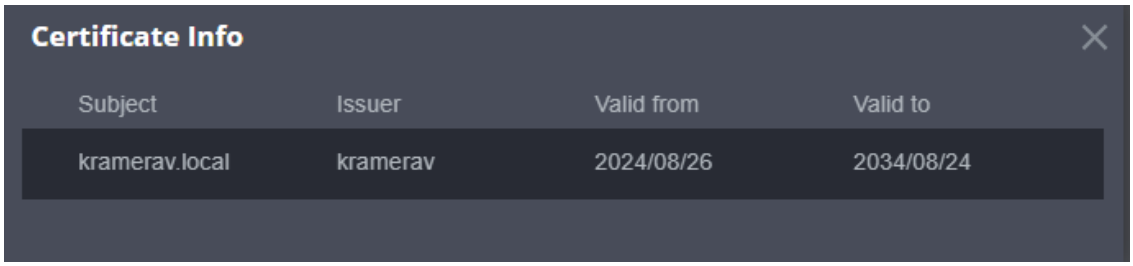


Figure 32: Security – Certificate Info

   - **Server Certificate –** To submit certificate from the server for authentication. To do so, click to upload the certificate. enter the private key password (assigned by the IT administrator) and click **Save**.

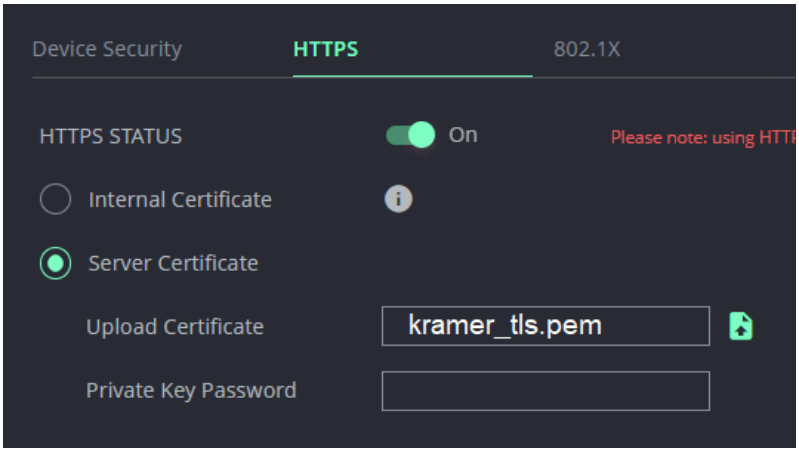


Figure 33: Security Tab – Server Certificate

HTTPS is configured.

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 (Figure 34).

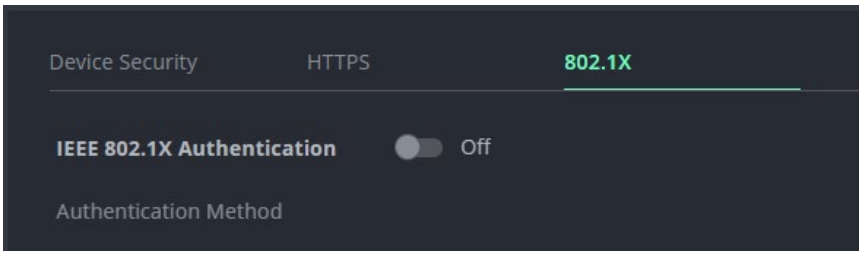


Figure 34: 802.1X Tab

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

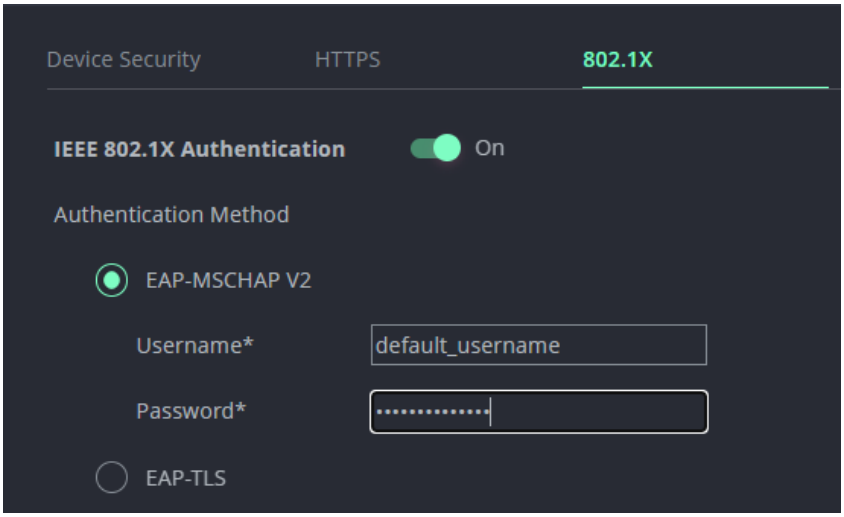


Figure 35: Security Tab – EAP-MSCHAP V2 Authentication

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

- Enter Username,
- Click to upload the certificates and keys,
- Enter the private key password (assigned by IT administrator),
- Set Server Certificate On.

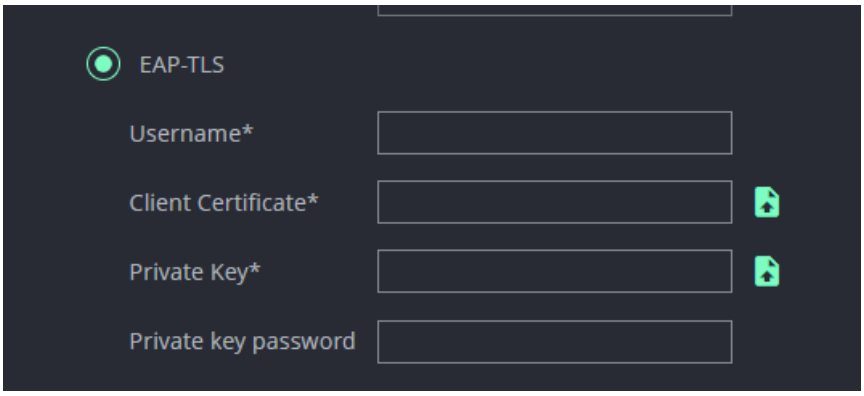


Figure 36: EAP-TLS – Certificates and Password

Server Certificate

CA Certificate – Upload certificate (PEM file) to the Radius server for authentication:

The RADIUS server is responsible for handling authentication requests from network access devices and verifying user credentials against a database

Server Certificate –Click to set server certificate to on/off. When it is set to on, users need to submit a CA certificate for authentication.

To submit a CA Certificate from the server:

1. Set Server Certificate On
2. Click to upload the certificate

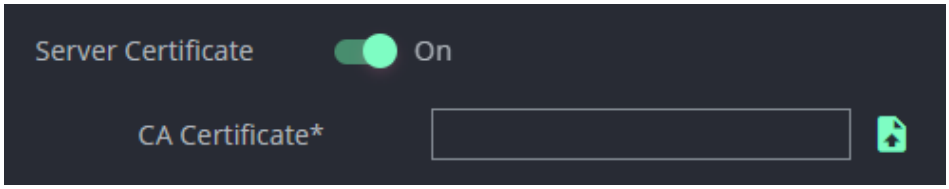


Figure 37: CA – Certificate

5. Click **Save**.

802.1x authentication security is configured.

Viewing the About Page

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

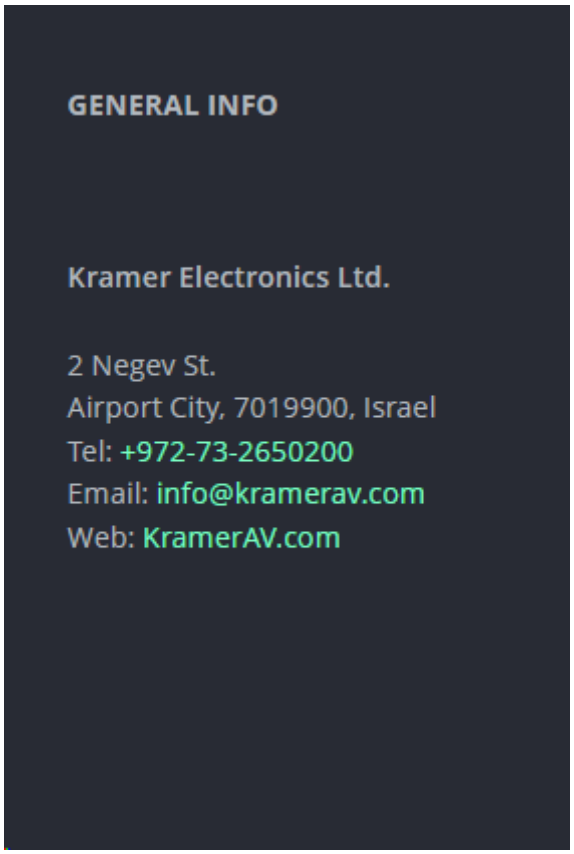


Figure 38: About Page

Technical Specifications

Video Ports	1 HDMI input		HDMI female connectors
	1 USB-C input		UBS-C connectors
	4 HDMI outputs	DA3-24-H	HDMI female connectors
	8 HDMI outputs	DA3-28-H	
	1 HDMI local output		HDMI female connector
Ports	1 1000BaseT Ethernet		RJ-45 female connector for LAN connection & extension
	Analog Audio		5-pin R-L analog audio output
	IO		2-pin terminal block connectors
	2 RS-232		3-pin terminal block connectors
Video	Max Bandwidth		18Gbps (6Gbps per graphic channel)
	Max Resolution		4K@60Hz 4:4:4 24bpp resolution
	Content Protection		HDCP 2.3
	Compliance		HDMI 2.0b
Security	Web-UI Communication		HTTPS
	User Access		Multiple roles and credentials
	IT LAN Authentication		802.1x
	Penetration Protection Certification		OWASP–10
Power	Source		24 VDC
	Max Consumption	DA3-24-H	76W
		DA3-28-H	79W
	Max Power Providing Per HDMI Port		2.5W (5V@0.5A)
Environmental Conditions	Operating Temperature		0° to +40°C (32° to 104°F)
	Storage Temperature		-40° to +70°C (-40° to 158°F)
	Humidity		10% to 90%, RHL non-condensing
Regulatory Compliance	Safety		CE, FCC, UL
	Environmental		RoHs, WEEE
Enclosure	Type		Half-U 19”
	Type		Aluminum
	Cooling		Low noise fan
Accessories	Included		Power adaptor
Specifications are subject to change without notice at www.kramerav.com			

Default Communication Parameters

RS-232	
Baud Rate:	115,200
Data Bits:	8
Stop Bits:	1
Parity:	None
Command Format:	ASCII
Example (Route video input 2 to the output):	#ROUTE␣1,1,2<CR>

IP DHCP ON	
To reset the IP settings to the factory reset values go to: Menu->Setup -> Factory Reset-> press Enter to confirm	
IP Address:	192.168.1.39
Subnet mask:	255.255.255.0
Default 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 Settings>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**:

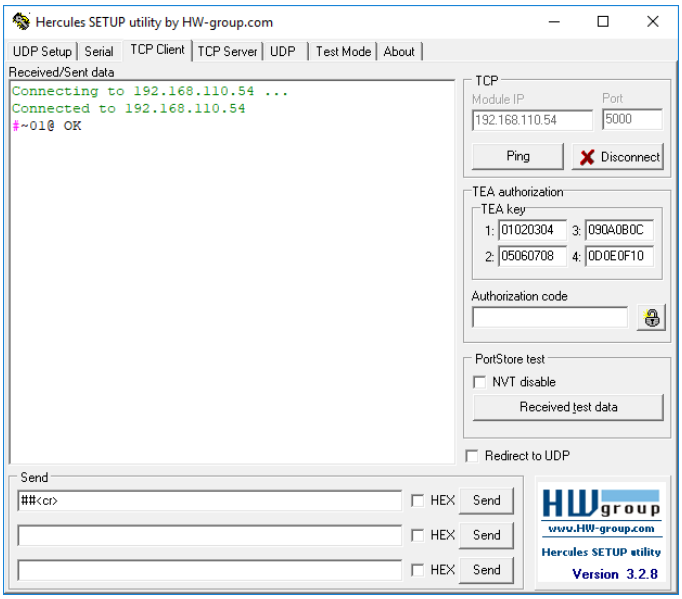
Prefix	Command Name	Constant (Space)	Parameter(s)	Suffix
#	Command	␣	Parameter	<CR>

- **Feedback format**:

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

- **Command parameters** – Multiple parameters must be separated by a comma (,). In addition, multiple parameters can be grouped as a single parameter using brackets ([and]).
- **Command chain separator character** – Multiple commands can be chained in the same string. Each command is delimited by a pipe character (|).
- **Parameters attributes** – Parameters may contain multiple attributes. Attributes are indicated with pointy brackets (<…>) and must be separated by a period (.).

The command framing varies according to how you interface with SWT3-41-H. The following figure displays how the # command is framed using terminal communication software (such as Hercules):



Protocol 3000 Commands

Function	Description	Syntax	Parameters/Attributes	Example
#	Protocol handshaking. ⓘ Validates the Protocol 3000 connection and gets the machine number. Step-in master products use this command to identify the availability of a device.	COMMAND #<CR> FEEDBACK ~nn@␣ok<CR><LF>		#<CR>
AUD-LVL	Set volume level.	COMMAND #AUD-LVL␣io_mode,io_index,vol_level<CR> FEEDBACK ~nn@AUD-LVL␣io_mode,io_index,vol_level<CR><LF>	io_mode – 1 – Output io_index – 1 vol_level – Volume level -190db to 10dB; ++ (increase current value by 1dB); -- (decrease current value by 1dB)	Set AUDIO OUT level to -50.0dB: #AUD-LVL␣1,1,-50.0<CR>
AUD-LVL?	Get volume level.	COMMAND #AUD-LVL?␣io_mode,io_index<CR> FEEDBACK ~nn@AUD-LVL␣io_mode,io_index,vol_level<CR><LF>	io_mode – 1 – Output io_index – 1 vol_level – Volume level -190db to 10dB;	Get AUDIO OUT level: #AUD-LVL?␣1,1<CR>
AUTO-DOWN-SCALE	Enable 4K to 1080P auto-downscaling	COMMAND #AUTO-DOWN-SCALE␣scale_mode<CR> FEEDBACK ~nn@AUTO-DOWN-SCALE␣scale_mode<CR><LF>	scale_mode – auto-scaling mode: 0 – Disable auto-downscaling 1 – Enable auto-downscaling	Set auto-downscaling: #AUTO-DOWN-SCALE␣1<CR>
AUTO-DOWN-SCALE?	Get 4K to 1080P auto-downscaling mode setting	COMMAND #AUTO-DOWN-SCALE?␣<CR> FEEDBACK ~nn@AUTO-DOWN-SCALE␣scale_mode<CR><LF>	scale_mode – auto-scaling mode: 0 – Auto-downscaling disabled 1 – Auto-downscaling enabled	Get auto-downscaling mode: #AUTO-DOWN-SCALE?␣<CR>
AV-SW-MODE	Set input auto switch mode (per output).	COMMAND #AV-SW-MODE␣layer_type,out_index,connection_mode<CR> FEEDBACK ~nn@AV-SW-MODE␣layer_type,out_index,connection_mode<CR><LF>	layer_type – Number that indicates the signal type: 1 – Video 2 – Audio out_index – 1 connection_mode – Connection mode 0 – manual 1 –auto scan 2 – last connected switch	Set the input audio switch mode to Manual for HDMI OUT: #AV-SW-MODE␣1,1,0<CR>
AV-SW-MODE?	Get input auto switch mode (per output).	COMMAND #AV-SW-MODE?␣layer_type,out_index<CR> FEEDBACK ~nn@AV-SW-MODE␣layer_type,out_index,connection_mode<CR><LF>	layer_type – Number that indicates the signal type: 1 – Video 2 – Audio out_index – 1 connection_mode – Connection mode 0 – manual 1 – auto scan 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 4 – Disable 5V on video output if no input signal detected time_out – Timeout in seconds time_out – Timeout in seconds 0 – 900 0 – off 1 –4 Prohibit 5-900 – normal	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?	Get 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 4 – Disable 5V on video output if no input signal detected time_out – Timeout in seconds 0 – 900 0 – off 1 –4 Prohibit 5-900 – normal	Get the auto switching timeout in the event of 5V disable when no input signal is detected: #AV-SW-TIMEOUT?␣4<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␣state<CR> FEEDBACK ~nn@CEC-GW-PORT-ACTIVE␣ state<CR><LF>'	state – Global gateway activation state: ○ 0 – as a passthrough ○ 1 – as a gateway	Activate CEC for the HDBaseT port as a passthrough: #CEC-GW-PORT-ACTIVE␣1<CR>
COM-ROUTE	Set tunneling port routing. ⓘ This command sets tunneling port routing. Every com port can	COMMAND #COM-ROUTE␣com_id,port_type,port_id,eth_rep_en,ping_val <CR> FEEDBACK ~nn@COM-ROUTE␣com_id,port_type,port_id,eth_rep_en,ping_val<CR><LF>	com_id – Machine dependent, * (get all route tunnels) port_type – TCP/UDP 0 – TCP port_id – TCP/UDP port number eth_rep_en – Ethernet Reply	Get tunneling port routing for all route tunnels: #COM-ROUTE␣*<CR>

Function	Description	Syntax	Parameters/Attributes	Example
	send or receive data from the ETH port. Set command can edit an existing configuration.		0 – COM port does not send replies to new clients ping_val – Send an empty string to TCP client every 0 to 3600 seconds. 0 - 3600	
COM-ROUTE?	Get tunneling port routing. ⓘ 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?␣com_id<CR> FEEDBACK ~nn@COM-ROUTE␣com_id,port_type,port_id,eth_rep_en,ping_val<CR><LF>	com_id – Machine dependent, * (get all route tunnels) port_type – TCP/UDP 0 – TCP port_id – TCP/UDP port number eth_rep_en – Ethernet Reply 0 – COM port does not send replies to new clients ping_val – 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>
CPEDID	Copy EDID data from the output to the input EEPROM. ⓘ Destination bitmap size depends on device properties (for 64 inputs it is a 64-bit word). Example: bitmap 0x0013 means inputs 1,2 and 5 are loaded with the new EDID. In certain products Safe_mode is an optional parameter. See the HELP command for its availability.	COMMAND #CPEDID␣edid_io,src_id,edid_io,dest_bitmap<CR> or #CPEDID␣edid_io,src_id,edid_io,dest_bitmap,safe_mode<CR> FEEDBACK ~nn@CPEDID␣edid_io,src_id,edid_io,dest_bitmap<CR><LF> ~nn@CPEDID␣edid_io,src_id,edid_io,dest_bitmap,safe_mode<CR><LF>	edid_io – *EDID* source type (usually output) 1 – Output src_id – Number of chosen source stage 1 – HDMI1 2 – HDMI2 3 – HDMI3 4 – HDMI4 5 – HDMI5 6 – HDMI6 7 – HDMI7 8 – HDMI8 9 – Custom 10 – Default edid_io – *EDID destination* type 0 – Input dest_bitmap - *HDMI(0x01)/USBC(0x02)/HDMI+USBC (0x03)*	Copy the EDID data from the HDBaseT Output to the HDMI Input: #CPEDID␣1,1,0,0x1<CR>
CS-CONVERT	Set the "force RGB color space" convert mode.	COMMAND #CS-CONVERT␣out_index,cs_mode<CR> FEEDBACK ~nn@CS-CONVERT␣out_index,cs_mode<CR><LF>'	out_index – The port number: 1 cs_mode – color space mode: ○ 0 – Color space pass (default) ○ 1 – Enable "force RGB color space" convert mode	Enable force RGB color space: #CS-CONVERT␣1,1<CR>
CS-CONVERT?	Get the "force RGB color space" convert mode.	COMMAND #CS-CONVERT?␣out_index<CR> FEEDBACK ~nn@CS-CONVERT␣out_index,cs_mode<CR><LF>'	out_index – The port number: 1 cs_mode – color space mode: ○ 0 – Color space pass (default) ○ 1 – Enable "force RGB color space" convert mode	Get force RGB color space mode: #CS-CONVERT?␣1<CR>
DISPLAY?	Get output HPD status.	COMMAND #DISPLAY?␣out_index<CR> FEEDBACK ~nn@DISPLAY␣out_index,status<CR><LF>	out_index – Number that indicates the specific output: 1 HDMI1(1)/HDMI2(2)/HDMI3(3)/HDMI4(4)/HDMI5(5)/HDMI6(6)/HDMI7(7)/HDMI8(8)	Get the output HPD status of Output 1: #DISPLAY?␣1<CR>
ETH-PORT	Set Ethernet port protocol. ⓘ If the port number you enter is already in use, an error is returned. The port number must be within the following range: 0-(2^16-1).	COMMAND #ETH-PORT␣port_type,port_id<CR> FEEDBACK ~nn@ETH-PORT␣port_type,port_id<CR><LF>	port_type – TCP port_id – TCP port number (5000-5099)	Set the Ethernet port protocol for TCP to 12457: #ETH-PORT␣TCP,12457<CR>
ETH-PORT?	Get Ethernet port protocol. ⓘ If the port number you enter is already in use, an error is returned. The port number must be within the following range: 0-(2^16-1).	COMMAND #ETH-PORT?␣port_type<CR> FEEDBACK ~nn@ETH-PORT␣port_type,port_id<CR><LF>	port_type – TCP/UDP port_id – TCP/UDP port number (5000 – 5099/5000)	Get the Ethernet port protocol for UDP: #ETH-PORT?␣UDP<CR>
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>

Function	Description	Syntax	Parameters/Attributes	Example
GEDID	Set 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 3 – Custom EDID in_index – Number that indicates the specific input: **Input(0): 1-2/Output(1): 1-8/Default EDID(2):1/Custom EDID(3): 1** size – Size of data to be sent from device, 0 means no EDID support edid_string – EDID content	Set EDID support information for input 1: #GEDID␣0,1<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 3 – Custom EDID in_index – Number that indicates the specific input: **Input(0): 1-2/Output(1): 1-8/Default EDID(2):1/Custom EDID(3): 1** 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 Analog(0): input(0) Digital(1): input(0)/Output(1) 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 Analog(0): input(0) Digital(1): input(0)/Output(1) 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>
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 – 1-100 See note in description. currentstep – The actual step depending on the measured voltage 0-33000 ⓘ GPIO-CFG Analog(0), input(0)	Set GPIO 2 (set to Analog In) configuration step to 38mV: #GPIO-STEP␣2,38<CR>

Function	Description	Syntax	Parameters/Attributes	Example
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 – 1-100 See note in description. currentstep – The actual step depending on the measured voltage 0-33000 ⓘ GPIO-CFG Analog(0), input(0)	Get GPIO 2configuration: #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 33000 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: 0 – Input 1 – Output mode – HDCP mode: 0 – Input (HDMI (1)/ USBC (2) 1 – Output: (HDMI (1)	Set the input HDCP-MODE of HDMI IN to off: #HDCP-MOD␣0,1<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: 0 – Input 1 – Output mode – HDCP mode: 0 – Input (HDMI (1)/ USBC (2) 1 – Output: (HDMI (1)	Get the input HDCP-MODE of HDMI IN : #HDCP-MOD?␣1<CR>
HELP	Get command list or help for specific command.	COMMAND #HELP<CR> #HELP␣cmd_name<CR> FEEDBACK 1. Multi-line: ~nn@Device␣cmd_name,␣cmd_name…<CR><LF> To get help for command use: HELP (COMMAND_NAME)<CR><LF> ~nn@HELP␣cmd_name:<CR><LF> description<CR><LF> USAGE:usage<CR><LF>	cmd_name – Name of a specific command	Get the command list: #HELP<CR> To get help for AV-SW-TIMEOUT: HELP␣av-sw-timeout<CR>
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␣ok<CR><LF>		#IDV<CR>
MODEL?	Get device model.	COMMAND #MODEL?␣<CR> FEEDBACK ~nn@MODEL␣model_name<CR><LF>	model_name – String of up to 19 printable ASCII chars	Get the device model: #MODEL?␣<CR>
MUTE	Set audio mute.	COMMAND #MUTE␣out_index,mute_mode<CR> FEEDBACK ~nn@MUTE␣out_index,mute_mode<CR><LF>	out_index – Number that indicates the specific output: 1-8 mute_mode – On/Off 0 – Off 1 – On	Set Output 1 to mute: #MUTE␣1,1<CR>
MUTE?	Get audio mute.	COMMAND #MUTE?␣out_index<CR> FEEDBACK ~nn@MUTE␣out_index,mute_mode<CR><LF>	out_index – Number that indicates the specific output: 1-8 mute_mode – On/Off 0 – Off 1 – On	Get mute status of output 1 #MUTE␣1?<CR>

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 #NAME␣machine_name<CR> FEEDBACK ~nn@NAME␣machine_name<CR><LF>	machine_name – String of up to 15 alpha-numeric chars (can include hyphen, not at the beginning or end)	Set the DNS name of the device to room-442: #NAME␣room-442<CR>
NAME?	Get machine (DNS) name. ⓘ The machine name is not the same as the model name. The machine name is used to identify a specific machine or a network in use (with DNS feature on).	COMMAND #NAME?␣<CR> FEEDBACK ~nn@NAME␣machine_name<CR><LF>	machine_name – String of up to 15 alpha-numeric chars (can include hyphen, not at the beginning or end)	Get the DNS name of the device: #NAME?␣<CR>
NAME-RST	Reset machine (DNS) name to factory default. ⓘ Factory default of machine (DNS) name is "KRAMER_" + 4 last digits of device serial number.	COMMAND #NAME-RST<CR> FEEDBACK ~nn@NAME-RST␣ok<CR><LF>		Reset the machine name (S/N last digits are 0102): #NAME-RST␣kramer_0102<CR>
NET-DHCP?	Get DHCP mode. ⓘ For Backward compatibility, the id parameter can be omitted. In this case, the Network ID, by default, is 0, which is the Ethernet control port.	COMMAND #NET-DHCP?␣netw_id<CR> FEEDBACK ~nn@NET-DHCP␣netw_id,dhcp_state<CR><LF>	netw_id – Network ID–the device network interface (if there are more than one). Counting is 0 based, meaning the control port is '0', dhcp_state – 0 – Static 1 – Dynamic	Get DHCP mode for port 1: #NET-DHCP?␣1<CR>
NET-GATE	Set gateway IP. ⓘ A network gateway connects the device via another network and maybe over the Internet. Be careful of security issues. For proper settings consult your network administrator.	COMMAND #NET-GATE␣ip_address<CR> FEEDBACK ~nn@NET-GATE␣ip_address<CR><LF>	ip_address – Format: xxx.xxx.xxx.xxx	Set the gateway IP address to 192.168.0.1: #NET-GATE␣192.168.000.001<CR>
NET-GATE?	Get gateway IP. ⓘ A network gateway connects the device via another network and maybe over the Internet. Be aware of security problems.	COMMAND #NET-GATE?␣<CR> FEEDBACK ~nn@NET-GATE␣ip_address<CR><LF>	ip_address – Format: xxx.xxx.xxx.xxx	Get the gateway IP address: #NET-GATE?␣<CR>
NET-IP	Set IP address. ⓘ For proper settings consult your network administrator.	COMMAND #NET-IP␣ip_address<CR> FEEDBACK ~nn@NET-IP␣ip_address<CR><LF>	ip_address – Format: xxx.xxx.xxx.xxx	Set the IP address to 192.168.1.39: #NET-IP␣192.168.001.039<CR>
NET-IP?	Get IP address.	COMMAND #NET-IP?␣<CR> FEEDBACK ~nn@NET-IP␣ip_address<CR><LF>	ip_address – Format: xxx.xxx.xxx.xxx	Get the IP address: #NET-IP?␣<CR>
NET-MAC?	Get MAC address. ⓘ For backward compatibility, the id parameter can be omitted. In this case, the Network ID, by default, is 0, which is the Ethernet control port.	COMMAND #NET-MAC?␣id<CR> FEEDBACK ~nn@NET-MAC␣id,mac_address<CR><LF>	id – Network ID–the device network interface (if there are more than one). Counting is 0 based, meaning the control port is '0', additional ports are 1,2,3…. mac_address – Unique MAC address. Format: XX-XX-XX-XX-XX-XX where X is hex digit	#NET-MAC?␣id<CR>
NET-MASK	Set subnet mask. ⓘ For proper settings consult your network administrator.	COMMAND #NET-MASK␣net_mask<CR> FEEDBACK ~nn@NET-MASK␣net_mask<CR><LF>	net_mask – Format: xxx.xxx.xxx.xxx	Set the subnet mask to 255.255.0.0: #NET-MASK␣255.255.000.000<CR>
NET-MASK?	Get subnet mask.	COMMAND #NET-MASK?␣<CR> FEEDBACK ~nn@NET-MASK␣net_mask<CR><LF>	net_mask – Format: xxx.xxx.xxx.xxx	Get the subnet mask: #NET-MASK?<CR>
PROT-VER?	Get device protocol version.	COMMAND #PROT-VER?␣<CR> FEEDBACK ~nn@PROT-VER␣3000:v.3.0<CR><LF>	version – XX.XX where X is a decimal digit	Get the device protocol version: #PROT-VER?␣<CR>

Function	Description	Syntax	Parameters/Attributes	Example
RESET	Reset device. ⓘ To avoid locking the port due to a USB bug in Windows, disconnect USB connections immediately after running this command. If the port was locked, disconnect, and reconnect the cable to reopen the port.	COMMAND #RESET<CR> FEEDBACK ~nn@RESET␣ok<CR><LF>		Reset the device: #RESET<CR>
ROUTE	Set layer routing. ⓘ This command replaces all other routing commands.	COMMAND #ROUTE␣layer_type,out_index,in_index<CR> FEEDBACK ~nn@ROUTE␣layer_type,out_index,in_index<CR><LF>	layer_type Layer Enumeration 1 – Video+ Audio 6 – CEC out_index Video+Audio(1): OUT 1 HDMI(1) CEC: Output 1(1)/Output 2(2)/Output 3(3)/Output 4(4)/Output 5(5)/Output 6(6)/Output 7(7)/Output 8(8) in_index – Source id for Video+ Audio: Video+Audio(1): HDMI(1)/USBC(2) CEC (6): Disconnect CEC on the output(0)/Connect CEC to Input 1(1)	Route video input 2 to the output: #ROUTE␣1,1,2<CR>
ROUTE?	Get layer routing state. ⓘ This command replaces all other routing commands.	COMMAND #ROUTE?␣layer_type,out_index<CR> FEEDBACK ~nn@ROUTE␣layer_type,out_index,in_index <CR><LF>	layer_type Layer Enumeration 1 – Video+ Audio 6 – CEC out_index Video+Audio(1): OUT 1 HDMI(1) CEC: Output 1(1)/Output 2(2)/Output 3(3)/Output 4(4)/Output 5(5)/Output 6(6)/Output 7(7)/Output 8(8) in_index – Source id for Video+ Audio: Video+Audio(1): HDMI(1)/USBC(2) CEC (6): Disconnect CEC on the output(0)/Connect CEC to Input 1(1)	Get video routing output: #ROUTE?␣1,1<CR>
SECUR	Start/stop security. ⓘ The permission system works only if security is enabled with the "SECUR" command.	COMMAND #SECUR␣security_state<CR> FEEDBACK ~nn@SECUR␣security_state<CR><LF>	security_state – Security state 0 – OFF (disables security) 1 – ON (enables security)	Enable the permission system: #SECUR␣1<CR>
SECUR?	Get security state. ⓘ The permission system works only if security is enabled with the "SECUR" command.	COMMAND #SECUR?␣security_state<CR> FEEDBACK ~nn@SECUR␣security_state<CR><LF>	security_state – Security state 0 – OFF (disables security) 1 – ON (enables security)	Enable the permission system: #SECUR?␣<CR>
SIGNAL?	Get input signal status.	COMMAND #SIGNAL?␣in_index<CR> FEEDBACK ~nn@SIGNAL␣in_index,status<CR><LF>	in_index – Number that indicates the specific input: 1 – HDMI 2 – USBC 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. ⓘ The year must be 4 digits. The device does not validate the day of week from the date. Time format - 24 hours. Date format - Day, Month, Year.	COMMAND #TIME␣day_of_week,date,data<CR> FEEDBACK ~nn@TIME␣day_of_week,date,data<CR><LF>	day_of_week – One of {SUN,MON,TUE,WED,THU,FRI,SAT} date – Format: DD-MM-YYYY. data – Format: hh:mm:ss where hh = hours mm = minutes ss = seconds	Set device time and date to December 5, 2020 at 2:30pm: #TIME␣mon␣05-12-2020,14:30:00<CR>
TIME?	Get device time and date. ⓘ The year must be 4 digits. The device does not validate the day of week from the date. Time format - 24 hours. Date format - Day, Month, Year.	COMMAND #TIME?␣<CR> FEEDBACK ~nn@TIME␣day_of_week,date,data<CR><LF>	day_of_week – One of {SUN,MON,TUE,WED,THU,FRI,SAT} date – Format: YYYY/MM/DD where YYYY = Year MM = Month DD = Day data – Format: hh:mm:ss where hh = hours mm = minutes ss = seconds	Get device time and date: #TIME?<CR>

Function	Description	Syntax	Parameters/Attributes	Example
TIME-SRV	Set time server. ⓘ This command is needed for setting UDP timeout for the current client list.	COMMAND #TIME-SRV␣mode,time_server_ip <CR> FEEDBACK ~nn@TIME-SRV␣mode,time_server_ip, <CR><LF>	mode – On/Off 0 – Off 1 – On	Set time server with IP address of 128.138.140.44 to ON: #TIME-SRV␣1,128.138.140.44,1<CR>
TIME-SRV?	Get time server. ⓘ 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 <CR><LF>	mode – On/Off 0 – Off 1 – On	Get time server: #TIME-SRV?<CR>
UART	Set com port configuration. ⓘ 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 – 7-8 parity – Parity Type 0 – No 1 – Odd 2 – Even 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 commad 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 – 7-8 parity – Parity Type 0 – No 1 – Odd 2 – Even 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>
USBC-ETH	**Enable ETH over USB-C**	COMMAND #USBC-ETH␣USB-ETH_mode<CR> FEEDBACK ~nn@USBC-ETH␣USBC-ETH_mode<CR><LF>	USBC-ETH_mode **– ETH over USB-C setting:** **0 – Disable ETH over USB-C** **1 – Enable ETH over USB-C**	**Enable ETH over the USB-C port:** #USBC-ETH␣1<CR>
USBC-ETH?	Get ETH over USB-C mode setting.	COMMAND #USBC-ETH?␣<CR> FEEDBACK ~nn@USBC-ETH␣USBC-ETH_mode<CR><LF>	USBC-ETH_mode – ETH over USB-C setting 0 – ETH over USB-C disabled 1 – ETH over USB-C enabled	Get ETH over USB-C mode: **#USBC-ETH?**␣<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. ⓘ Video mute parameter 2 (blank picture) is not supported.	COMMAND #VMUTE␣out_index,flag<CR> FEEDBACK ~nn@VMUTE␣out_index,flag<CR><LF>	out_index – Number that indicates the specific output – HDMI Output(1-8)/LOOP(0) 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. ⓘ Video mute parameter 2 (blank picture) is not supported.	COMMAND #VMUTE?␣out_index<CR> FEEDBACK ~nn@VMUTE␣out_index,flag<CR><LF>	out_index – Number that indicates the specific output – HDMI Output(1-8)/LOOP(0) 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
ERR_WRONG_CRC	7	Wrong CRC
ERR_TIMEDOUT	8	Timeout
ERR_RESERVED	9	(Reserved)
ERR_FW_NOT_ENOUGH_SPACE	10	Not enough space for data (firmware, FPGA…)
ERR_FS_NOT_ENOUGH_SPACE	11	Not enough space – file system
ERR_FS_FILE_NOT_EXISTS	12	File does not exist
ERR_FS_FILE_CANT_CREATED	13	File can’t be created
ERR_FS_FILE_CANT_OPEN	14	File can’t open
ERR_FEATURE_NOT_SUPPORTED	15	Feature is not supported
ERR_RESERVED_2	16	(Reserved)
ERR_RESERVED_3	17	(Reserved)
ERR_RESERVED_4	18	(Reserved)
ERR_RESERVED_5	19	(Reserved)
ERR_RESERVED_6	20	(Reserved)
ERR_PACKET_CRC	21	Packet CRC error
ERR_PACKET_MISSED	22	Packet number isn't expected (missing packet)
ERR_PACKET_SIZE	23	Packet size is wrong
ERR_RESERVED_7	24	(Reserved)
ERR_RESERVED_8	25	(Reserved)
ERR_RESERVED_9	26	(Reserved)
ERR_RESERVED_10	27	(Reserved)
ERR_RESERVED_11	28	(Reserved)
ERR_RESERVED_12	29	(Reserved)
ERR_EDID_CORRUPTED	30	EDID corrupted
ERR_NON_LISTED	31	Device specific errors
ERR_SAME_CRC	32	File has the same CRC – not changed
ERR_WRONG_MODE	33	Wrong operation mode
ERR_NOT_CONFIGURED	34	Device/chip was not initialized

P/N: 2900-301816 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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