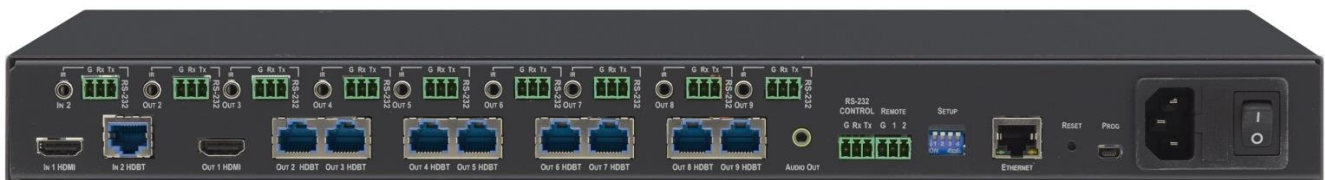


USER MANUAL

MODELS:

VM-218DTxr, VM-218DT
HDMI/HDBT Switcher DA



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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 www.kramerav.com/downloads/VM-218DTxr to check for up-to-date user manuals, application programs, and to check if firmware upgrades are available (where appropriate).

Achieving the 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 **VM-218DTxr** / **VM-218DT** away from moisture, excessive sunlight and dust.



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

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:**

- Use only the power cord that is supplied with the unit.
- Disconnect the power and unplug the unit from the wall before installing.
- Do not open the unit. High voltages can cause electrical shock! Servicing by qualified personnel only.
- To ensure continuous risk protection, replace fuses only according to the rating specified on the product label which 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/support/recycling.

Overview



The devices described in this user manual are generally referred to as **VM-218DTxr** or **HDMI/HDBT Switcher DA**. A device is named specifically only when a device-specific feature is described.

The differences between **VM-218DTxr** and **VM-218DT** are summarized in the following table:

Product	Extension	Resolution	Reach
VM-218DTxr	HDMI™, RS-232, IR, Ethernet	4K @60Hz (4:2:0)	Up to 100m (330ft)
		1080p @60Hz 36bpp	Up to 130m (430ft)
		1080p @60Hz 24bpp	Up to 180m (590ft)
VM-218DT	HDMI, RS-232, IR	4K @60Hz (4:2:0)	Up to 40m (130ft)
		1080p @60Hz 36bpp	Up to 70m (230ft)

Congratulations on purchasing your Kramer **VM-218DTxr HDMI/HDBT Switcher DA**.

VM-218DTxr is a high-quality, extended-reach 4K@60Hz (4:2:0) HDBaseT (HDBT) distributor that takes either an HDMI or an extended-reach HDBaseT input (selectable), equalizes and reclocks the signal and distributes it to eight identical extended-reach HDBaseT outputs, each with its own Ethernet, RS-232 and IR control signals. The unit also includes a loop HDMI output along with audio de-embedding (extraction) to analog stereo port. As an integrated extender distributor, **VM-218DTxr** re-extends and distributes native extended-reach HDBaseT signals with up to 4K video resolution.



VM-218DT distributes the selected input signal (HDMI or long-reach HDBaseT) to the eight long-reach HDBaseT outputs together with RS-232 and IR control signals.

VM-218DTxr provides exceptional quality, advanced and user-friendly operation, and flexible control.

Exceptional Quality

- High Performance Extender Distributor – High-quality professional 1:8 distribution of native extended-reach HDBaseT signals, for deploying mid-way between an AV source and multiple remote displays and gaining extra extended-reach extension. It is coupled with both sides, input and output, extension of a maximum 4K@60Hz (4:2:0) 24bpp video resolution signal to maximum 100m (330ft) extended-reach over CAT copper cable, and even further reach for lower HD video resolution. The extender distributor is standard and capable of being connected to any market-available HDBaseT compliant extending product.
- I-EDIDPro™ Kramer Intelligent EDID Processing™ – An intelligent EDID handling, processing and pass-through algorithm that ensures Plug and Play operation for HDMI source and display systems.
- Audio De-embedding (Extraction) – The transmitted digital audio signal is converted to an analog signal and de-embedded to stereo unbalanced analog audio output. This enables user-selectable de-embedding of input digital audio to play at local hi-quality speakers separate from a remote receiver-connected AV sink device, such as a TV display or audio speakers, to provide higher quality audio playback.

Advanced and User-friendly Operation

- HDMI Signal Extension – HDMI 2.0 and HDCP 1.4 compliant signal, supporting deep color, x.v.Color™, lip sync, 7.1 PCM, Dolby TrueHD, DTS-HD, 2K, 4K, and 3D. EDID signals are passed through from the source to the display.
- Bidirectional RS-232 Extension – Serial interface data flows in both directions, on each extension line, enabling data transmission and control of devices.
- Bidirectional Infrared Extension – IR interface data flows in both directions, on each extension line, enabling remote control of peripheral devices located at either end of the extended line.
- For VM-218DTxr only, Ethernet Extension – Ethernet interface data flows in both directions on each extension line, enabling extension of up to 100Mbps Ethernet connectivity for LAN communication and control of devices.
- Cost-effective Maintenance – Status LED indicators for HDMI and HDBT ports to facilitate easy local maintenance and troubleshooting.
- Remote IP device management via built-in web pages or RS-232 control connection.
- Simple System Management – Remote system management support to enable quick and efficient remote system and device life-cycle management.
- Easy operation and control using front panel buttons, or remotely via the Embedded web pages.
- Local and remote firmware upgrade via mini-USB, control RS-232 or Ethernet connection and the K-Upload tool to ensure long field-proven deployment.

Flexible Connectivity

- Selectable Inputs – HDMI or HDBT inputs, selectable via front panel buttons, Web UI or remote system management.
- HDBT Outputs – one HDMI output (loop) and Eight HDBT outputs.
- Field-upgradable Scalability – Multiply your outputs by connecting an additional unit to the HDMI loop output even while the device is active and operating. The original high-quality signal is duplicated at the same quality and simultaneously routed to the cascaded DA and to all the, transforming your 2x8 unit into a 2x16 switchable DA.
- Flexible control extension – Bidirectional IR, RS-232 or Ethernet (for **VM-218DTxr**) for HDBT input and each of the HDBT outputs for control extension.
- Easy Installation – Twisted-pair cables for HDBaseT signals wiring. Rack mountable enclosure for mounting in a 1U rack space with included rack ears and universal 100–240V AC power connection.

Typical Applications

VM-218DTxr is ideal for the following typical applications:

- Presentation and multimedia applications.
- Signal distribution to multiple displays spread within large spaces.
- Digital signage.
- Rental and staging.

Controlling your VM-218DTxr

Control your **VM-218DTxr** directly via the front panel push buttons, or:

- By RS-232 serial commands transmitted by a touch screen system, PC, or other serial controller.
- Remotely, from the infrared remote-control transmitter.
- Via the Ethernet using built-in user-friendly web pages.
- Via Kramer Network management system.

Defining VM-218DTxr HDMI/HDBT Switcher DA

 VM-218DTxr and VM-218DT appear identical.

This section defines VM-218DTxr.

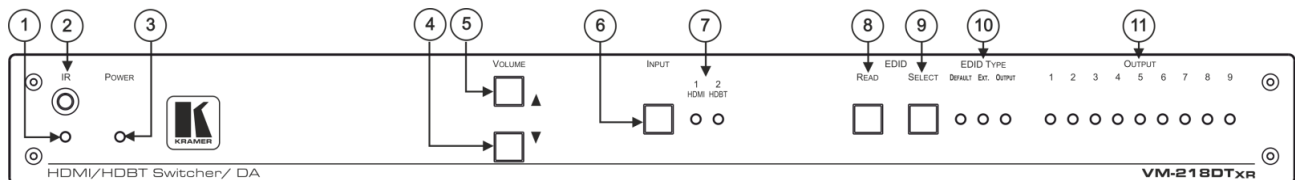


Figure 1: VM-218DTxr HDMI/HDBT Switcher DA Front Panel

#	Feature	Function
①	IR LED	Lights orange when the unit accepts IR remote commands.
②	IR Sensor	Use to control a peripheral device connected to OUT 2 HDBT with that device's remote controller.
③	POWER LED	Lights when the unit is powered.
④	VOLUME (▼)	Press to decrease the volume of the analog audio output.
⑤	VOLUME (▲)	Press to increase the volume of the analog audio output.
⑥	INPUT Selector Button	Press to select input 1 HDMI or input 2 HDBT.
⑦	INPUT LEDs	Lights green to indicate the selected input: 1 HDMI or 2 HDBT.
⑧	EDID READ Button	Press to read the selected EDID and write it to both inputs.
⑨	EDID SELECT Button	Press to cycle through the sources from which to read the EDID: Default, External, or Output. When Output is selected, cycles through outputs 1 to 9. The relevant EDID TYPE and OUTPUT LEDs light green.
⑩	EDID TYPE LEDs	Lights green to indicate the selected EDID type: DEFAULT, EXT. (external) or OUTPUT.
⑪	OUTPUT LEDs (1 to 9)	In normal operation mode: lights green when an acceptor is connected to the output. In EDID mode: when EDID TYPE OUTPUT LED lights green, press the EDID SELECT button briefly to cycle through output 1 to 9 to select the output from which to read EDID. The relevant LED lights during EDID setup and remains lit after completing the EDID setup.

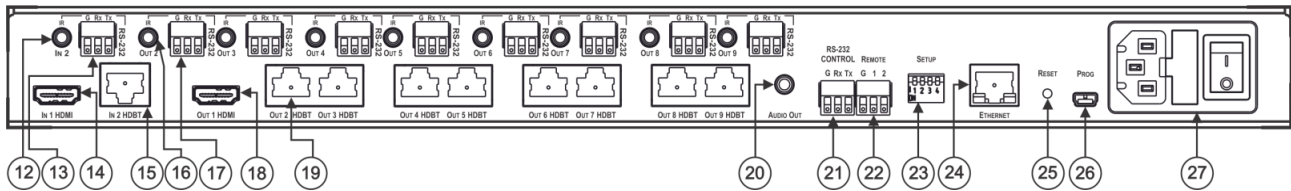


Figure 2: VM-218DTxr HDMI/HDBT Switcher DA Rear Panel

#	Feature	Function
12	IN 2 IR on a 3.5 Mini Jack	Connect to an IR emitter/sensor cable for IR link extension via IN 2 HDBT.
13	IN 2 RS-232 (G, Rx, Tx) Terminal Block Connector	Connect to a serial controller for RS-232 link extension via IN 2 HDBT.
14	IN 1 HDMI Connector	Connect to an HDMI source.
15	IN 2 HDBT on RJ-45 Connectors	Connect to an HDBT transmitter (for example: TP-780Txr for VM-218DTxr and TP-580T for VM-218DT).
16	IR on 3.5 Mini Jacks (for OUT 2 to 9)	Connect to remote IR emitter/sensor cables to IR control the devices that are connected to the HDBT acceptors.
17	RS-232 OUT (G, Rx, Tx) Terminal Block Connectors (2 to 9)	Connect to serially control the devices connected to the HDBT acceptors.
18	OUT 1 HDMI Connector	Connect to the HDMI input of an additional DA or connect to a local monitor.
19	OUT HDBT RJ-45 Connectors (2 to 9)	Connect to HDBT receivers (for example: TP-780Rxr for VM-218DTxr and TP-580R for VM-218DT).
20	AUDIO OUT 3.5mm Mini Jack	Connect to an analog audio acceptor.
21	RS-232 CONTROL 3-pin Terminal Block	Connect to the serial controller to control the VM-218DTxr .
22	REMOTE 3-pin Terminal Block	For future use.
23	SETUP DIP-switches	Use to set the device behavior.
24	ETHERNET RJ-45 Connector	Connect to LAN for Ethernet extension via IN and OUT HDBT ports and remote IP control of the VM-218DTxr .
25	RESET Button	Press and hold while powering on the device to reset to factory default parameters.
26	PROG Mini USB Connector	Connect to a PC to perform firmware upgrades.
27	Mains Power Connector, Fuse and Switch	Connect to the mains supply.

Installing in a Rack

This section provides instructions for rack mounting **VM-218DTxr**. Before installing in a rack, verify that the environment is within the recommended range:

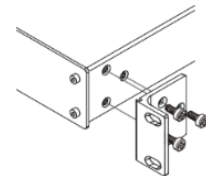
- Operation temperature – 0° to 40°C (32 to 104°F).
- Storage temperature – -40° to +70°C (-40 to +158°F).
- Humidity – 10% to 90%, RHL non-condensing.



When installing on a 19" rack, avoid hazards by taking care that:

- It is located within recommended environmental conditions. Operating ambient temperature of a closed or multi-unit rack assembly may exceed ambient room temperature.
- Once rack mounted, there is enough air flow around **VM-218DTxr**.
- **VM-218DTxr** is placed upright in the correct horizontal position.
- You do not overload the circuit(s). When connecting **VM-218DTxr** to the supply circuit, overloading the circuits may have a detrimental effect on overcurrent protection and supply wiring. Refer to the appropriate nameplate ratings for information. For example, for fuse replacement, see the value printed on the product label.
- **VM-218DTxr** is earthed (grounded) and connected only to an electricity socket with grounding. Pay particular attention when electricity is supplied indirectly (for example, when the power cord is not plugged directly into the wall socket but to an extension cable or power strip). Use only the supplied power cord.

To rack mount the machine, attach both ear brackets (by removing the screws from each side of the machine and replacing those screws through the ear brackets) or place the machine on a table.



- Detachable rack ears can be removed for desktop use.
- Always mount **VM-218DTxr** in the rack before connecting any cables or power.

Connecting the HDMI/HDBT Switcher DA

Although both the VM-218DTxr and VM-218DT appear identical, the VM-218DTxr also extends Ethernet signals, therefore the connecting procedures in this section are described separately for each device.



Always switch off the power to each device before connecting it to your VM-218DTxr. After connecting your VM-218DTxr, connect its power and then switch on the power to each device.

Connecting VM-218DTxr

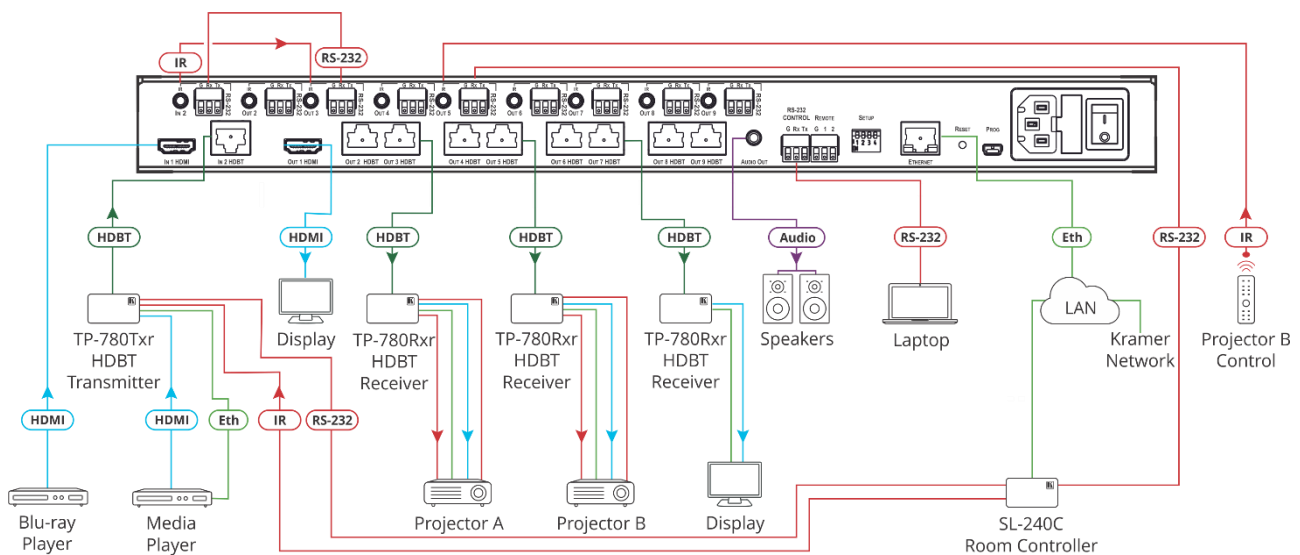


Figure 3: Connecting to VM-218DTxr

To connect the VM-218DTxr as illustrated in the example in [Figure 3](#):

1. Connect an HDMI source (for example, a Blu-ray player) to the IN 1 HDMI connector (14).
2. Connect an HDBT transmitter (for example, Kramer TP-780Txr) to the IN 2 HDBT RJ-45 connector (15).
3. Connect the OUT 1 HDMI connector (18) to an HDMI acceptor (for example, a display).
4. Connect the 8 OUT HDBT RJ-45 connectors (19) (2 to 9) to up to 8 HDBT receivers (for example, Kramer TP-780Rxr receivers).
5. Connect the AUDIO OUT 3.5mm mini jack (20) to an analog audio acceptor (for example, Kramer Tavor 6-O speakers).
6. Connect the RS-232 terminal block connector (21) to a serial control device (for example, a laptop) to control VM-218DTxr.
7. Connect the Ethernet RJ-45 port (24) to the Ethernet LAN to control the VM-218DTxr and LAN-connected peripheral devices, either local LAN or through input HDBT extended

Ethernet, via IP control device (for example, a laptop) and/or an IP room controller (for example, Kramer **SL-240C**).

8. Connect the power adapter to the **VM-218DTxr** and to the mains electricity (27) (not shown in [Figure 3](#)).
9. Connect signal extensions (see [Extending Control Signals](#) on page 10).



The USB connector (26) and power cord are not shown in [Figure 3](#).

Connecting VM-218DT

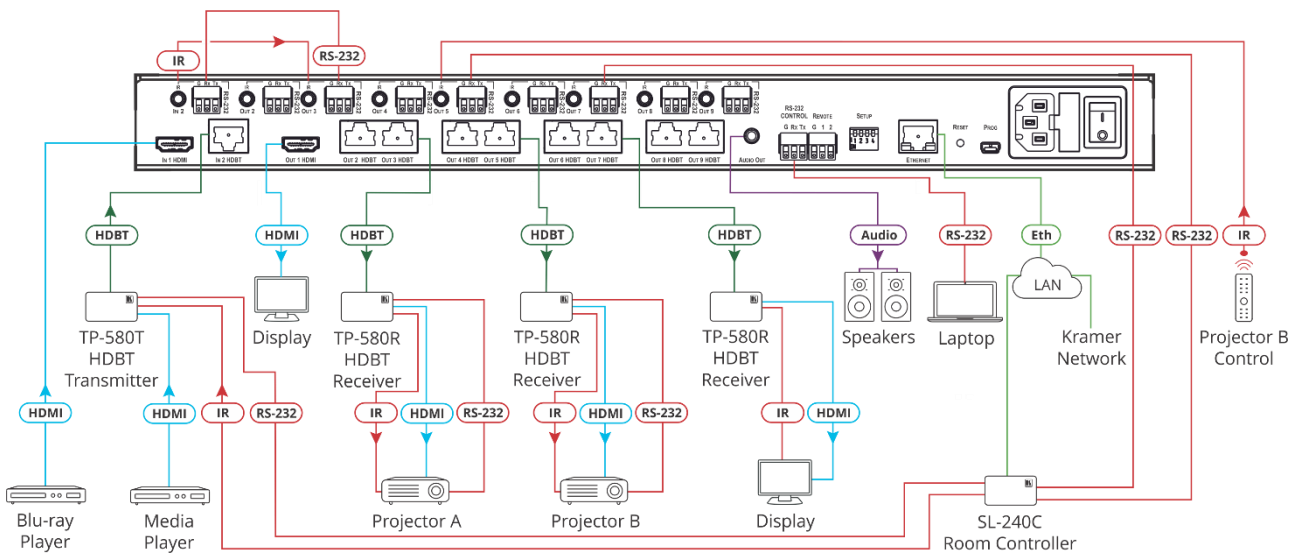


Figure 4: Connecting to VM-218DT

To connect the **VM-218DT** as illustrated in the example in [Figure 4](#):

1. Connect an HDMI source (for example, a Blu-ray player) to the IN 1 HDMI connector (14).
2. Connect an HDBT transmitter (for example, Kramer **TP-580T**) to the IN 2 HDBT RJ-45 connector (15).
3. Connect the OUT 1 HDMI connector (18) to an HDMI acceptor (for example, a display).
4. Connect the 8 OUT HDBT RJ-45 connectors (19) (2 to 9) to up to 8 HDBT receivers (for example, Kramer **TP-580R** receivers).
5. Connect the AUDIO OUT 3.5mm mini jack (20) to an analog audio acceptor (for example, Kramer **Tavor 6-O** speakers).
6. Connect the RS-232 terminal block connector (21) to a serial control device (for example, a laptop) to control the **VM-218DT**.
7. Connect the Ethernet RJ-45 port (24) to the Ethernet LAN to control the **VM-218DT** and its peripheral devices and/or to a room controller (for example, Kramer **SL-240C**).
8. Connect the power adapter to the **VM-218DT** and to the mains electricity (27) (not shown in [Figure 4](#)).

9. Connect signal extensions. See:

- [IR Extension](#) on page [10](#).
- [RS-232 Extension](#) on page [11](#).



The USB connector [\(26\)](#) and power cord are not shown in [Figure 4](#).

Extending Control Signals

VM-218DTxr can extend IR, RS-232 and Ethernet control signals to peripheral devices that are connected to the relevant ports on the transmitter and receivers that are connected to the **VM-218DTxr**.

VM-218DT can extend IR and RS-232 control signals in the same way.

The following procedures provide examples for extending signals.



You can extend only one type of signal (RS-232, IR or Ethernet-for **VM-218DTxr** only) to control a peripheral device.

Figure 3 (for **VM-218DTxr**) and Figure 4 (for **VM-218DT**) show several types of signal extensions for each HDBT device, for illustrating device capabilities only.

IR Extension

Use the IR 3.5mm mini jacks for the HDBT input [\(12\)](#) and outputs [\(16\)](#) to extend IR control signals between any set of IR ports on the HDBT transmitter and receivers.

To extend an IR signal, for example, from VM-218DTxr to Projector B:

1. Connect an IR sensor cable to the OUT 5 IR 3.5mm mini jack.
2. Connect an IR emitter cable between the **TP-780Rxr** receiver (that is connected to OUT 5) and Projector B.
3. Point the Projector B IR remote-control transmitter to the IR sensor to control Projector B via the **TP-580Rxr** receiver that is connected to HDBT OUT 5.

In the same way you can control other peripheral devices connected to the HDBT-connected transmitter and/or receivers.

To extend an IR signal, for example, from a remote room controller to Projector A:

1. Connect an IR cable between a room controller (for example, Kramer **SL-240C**) and the IR port of the IN 2 HDBT-connected on the **TP-780Txr** transmitter.
2. Connect an IR cable between the IN 2 IR 3.5mm mini jack and the OUT 3 3.5mm mini jack.
3. Connect an IR emitter cable between the IR port of the **TP-780Rxr** receiver that is connected to OUT 3 and the IR port on Projector A.
4. Send an IR signal from the room controller to Projector A via the IN 2 **TP-780Txr** transmitter and the OUT 3 **TP-780Rxr** receiver.

In the same way you can pass IR signals to control other connected peripheral devices using the IR ports of the **VM-218DTxr**, HDBT transmitter and HDBT receivers.

RS-232 Extension

Use the RS-232 3-pin terminal block connectors for the HDBT input (13) and outputs (17) to extend RS-232 control signals between any set of RS-232 ports on the HDBT transmitter and receivers.

To extend an RS-232 signal, for example, from VM-218DTxr to Projector B:

1. Connect OUT 5 RS-232 3-pin terminal block connector to a room controller (for example, the Kramer **SL-240C** room controller).
2. Connect the RS-232 port on the **TP-780Rxr** receiver (that is connected to HDBT OUT 5) to Projector B.
3. Send an RS-232 command from the room controller to Projector B.

In the same way you can control other peripheral devices that are connected to the transmitter and/or receivers.

To extend an RS-232 signal, for example, from a remote room controller to Projector A:

1. Connect an RS-232 cable between a room controller (for example, Kramer **SL-240C**) and the RS-232 port on the **TP-780Txr** transmitter that is connected to HDBT IN 2.
2. Connect an RS-232 cable between the IN 2 RS-232 3-pin terminal block connector and the OUT 3 RS-232 3-pin terminal block connector.
3. Connect an RS-232 cable between the **TP-780Rxr** (that is connected to OUT 3 HDBT) RS-232 port and Projector A.
4. Send an RS-232 command from the room controller to Projector A on the **TP-780Rxr** via the HDBT IN 1 port.

In the same way you can send RS-232 commands to control other peripheral devices connected to the transmitter/receivers.

In the same way you can send RS-232 signals and commands to control other peripheral devices connected between the RS-232 ports of the **VM-218DTxr**, HDBT transmitter and HDBT receivers.

Ethernet Extension (VM-218DTxr only)

Use the ETHERNET RJ-45 port input (15) and outputs (19) to extend Ethernet signals via control devices and/or control software to and from the HDBT transmitter/receivers.

To send a command from a room controller, for example, to the display:

1. Connect the ETHERNET RJ-45 port to the Ethernet.
2. Connect the ETH port of a room controller (for example, the Kramer **SL-240C** room controller) to the Ethernet.

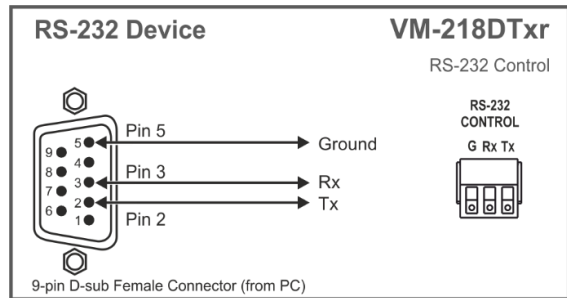
- Send an RS-232 command from the room controller to the display on the **TP-780Rxr** via the HDBT OUT 7 port.

In the same way you can control other peripheral devices connected to the transmitter/receivers.

Controlling VM-218DTxr via RS-232 CONTROL

VM-218DTxr features an RS-232 CONTROL 3-pin terminal block connector allowing the RS-232 to control the VM-218DTxr. To do so, connect the VM-218DTxr to a controller (for example a PC) via the RS-232 CONTROL terminal block (13) on the rear panel as follows:

- Pin 2 to the TX pin on the VM-218DTxr RS-232 CONTROL terminal block.
- Pin 3 to the RX pin on the VM-218DTxr RS-232 CONTROL terminal block.
- Pin 5 to the G pin on the VM-218DTxr RS-232 CONTROL terminal block.

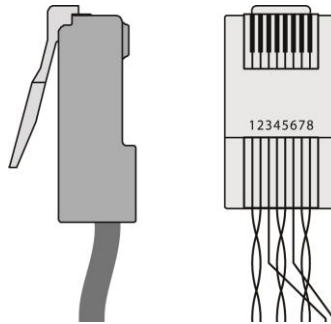


Wiring the RJ 45 Connectors

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




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

EIA /TIA 568B	
PIN	Wire Color
1	Orange / White
2	Orange
3	Green / White
4	Blue
5	Blue / White
6	Green
7	Brown / White
8	Brown



Setting the DIP-switches

Changes to the DIP-switches ⁽²³⁾ only take effect following power-up. After changing a switch, reboot the device. All DIP-switches are set to Off (up) by default.

#	Feature	Dip-switch Settings
1	Reserved	
2	Range mode	Off (up) – Normal range (default). On (down) – HDBaseT Ultra-long range (provides increased range at a reduced bandwidth).  Note that range mode affects the HDBT input only.
3	Audio de-embedding	Off (up) – Enable 2-channel uncompressed audio de-embedding to the analog audio output port (default).  Note that compressed audio pass-through is disabled. On (down) – Disable audio de-embedding and enable pass-through of all audio formats.  Note that the analog audio output port is muted.
4	Force RGB	Off (up) – Normal mode (default). On (down) – Force RGB mode.

Cascading Devices

Use the OUT 1 HDMI connector (18) on **VM-218DTxr** to connect a local monitor or to distribute the signal to an additional receiver, thus creating a 2x16 DA system as described in the following example.

To cascade **VM-218DTxr**:

1. Connect the inputs and outputs to the primary device as described in [Connecting the HDMI/HDBT Switcher DA](#) on page 8, except for the OUT 1 HDMI connector.
2. On the cascaded DA device, connect the receivers as required.



Connect the power to the receivers only after connecting them to the cascaded device.

3. Connect the OUT 1 HDMI connector on the primary device to the IN 1 HDMI connector (14) on the cascaded DA device.
4. After powering the cascaded device, make sure that the HDMI input is selected on the cascaded device.

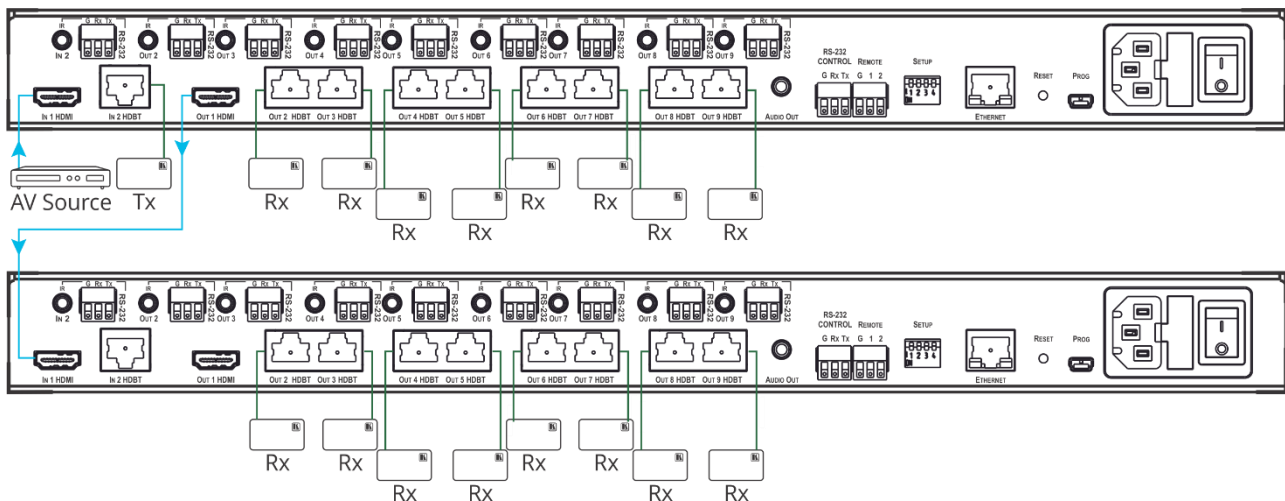


Figure 5: Cascading DAs

Operating and Controlling the VM-218DTxr

Control VM-218DTxr in the following ways:

- [Using the Front Panel Buttons](#) on page [15](#).
- [Acquiring the EDID](#) on page [15](#).
- [Using the Ethernet](#) on page [16](#).

Using the Front Panel Buttons

Use the VM-218DTxr front panel buttons:

- Press **VOLUME** (4) and (5) to set the analog audio output volume.
- Press **INPUT** (6) to select the required input (indicated by HDMI and HDBT LEDs (7)).
- Press **EDID SELECT** (9) and **EDID READ** (8) to acquire the EDID (see [Acquiring the EDID](#) on page [15](#)).

Acquiring the EDID

Initially, each input on the VM-218DTxr has a factory default EDID loaded (see [Default EDID](#) on page [38](#)). This lets you connect the power to VM-218DTxr while an active source is connected before having to connect one of the acceptors. VM-218DTxr reads the EDID, which is stored in the non-volatile memory and uses it for the active connected sources.

In the same way, the acquired EDID from a connected output or an external source is stored in the non-volatile memory.

You can acquire the EDID from any of the following sources:

- **DEFAULT:** The factory default EDID.
- **OUTPUT:** Active acceptors that are connected to OUT 1 HDMI or OUT (2 to 9) HDBT.
- **EXTERNAL:** A custom EDID (acquired via EDID Designer software, by connecting a PC to VM-218DTxr via RS-232 or USB ports).

You can acquire the EDID using:

- The front panel buttons (see [Acquiring EDID via the Front Panel Buttons](#) on page [16](#))
- The embedded web pages (see [Managing EDID](#) on page [24](#))

- **EDID Designer** software.



VM-218DTxr Supports EDID Designer (via the mini USB port) that can be loaded from our Web site: [Kramer EDID Designer](#).

To use the mini USB port, you need to download and the Kramer USB driver from our Web site at: www.kramerav.com/support/product_downloads.asp and install it.

Acquiring EDID via the Front Panel Buttons

The following procedure is usually done only once, when the device is being set up.

To acquire the EDID:

1. Press **EDID SELECT** (9) repeatedly until the required EDID source is selected, (either DEFAULT, EXT, or OUTPUT LED lights (10)).



When selecting OUTPUT, keep pressing repeatedly to select the desired output. The relevant LED lights green.

2. Press **EDID READ** (8).

EDID READ flashes once and the EDID is copied to the currently selected input.



EDID READ flashing 3 times indicates that the EDID was not read.

The device reverts to the last stored EDID type, as indicated by the relevant EDID TYPE LEDs.

If the EDID READ button is not pressed for five seconds, the procedure is terminated, the device does not store a new EDID and the OUTPUT 1 to 9 LEDs revert to normal operation.

Forcing the RGB Mode

Normally (the default state), when acquiring EDID, the device supports any color space that is defined in the acquired EDID parameters. In case of a color space problem, enabling Force RGB mode may improve the colors of the image on the display.

Force RGB mode is enabled via the DIP-switches on the rear panel (see [Setting the DIP-switches](#) on page 13).

Using the Ethernet

You can connect to the VM-218DTxr via Ethernet using either of the following methods:

- Locally, directly to the laptop using a crossover cable (see [Connecting the Ethernet Port Directly to a Laptop](#) on page 17).
- Remotely over IP LAN, via a network hub, switch, or router, using a straight-through cable (see [Connecting the Ethernet Port via IP LAN](#) on page 19).

Note: 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 the Ethernet Port Directly to a Laptop

You can connect the Ethernet port (24) of the VM-218DTxr directly to the Ethernet port on your PC using a crossover cable with RJ-45 connectors.

 This type of connection is recommended for identifying the VM-218DTxr with the factory configured default IP address.

After connecting the VM-218DTxr 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](#).

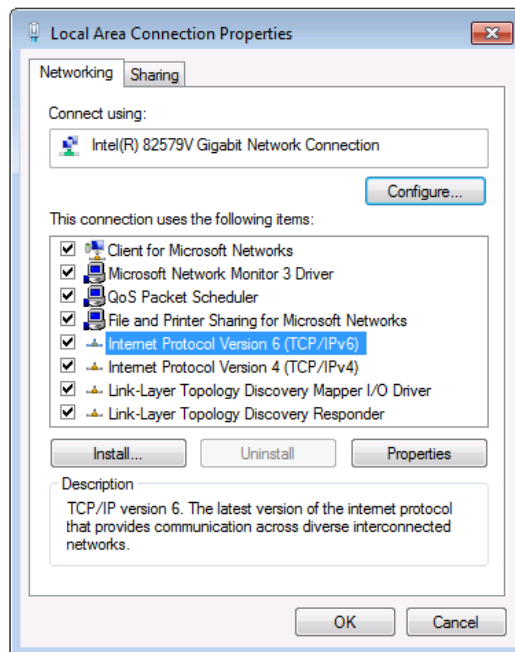


Figure 6: Local Area Connection Properties Window

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](#) or [Figure 8](#).

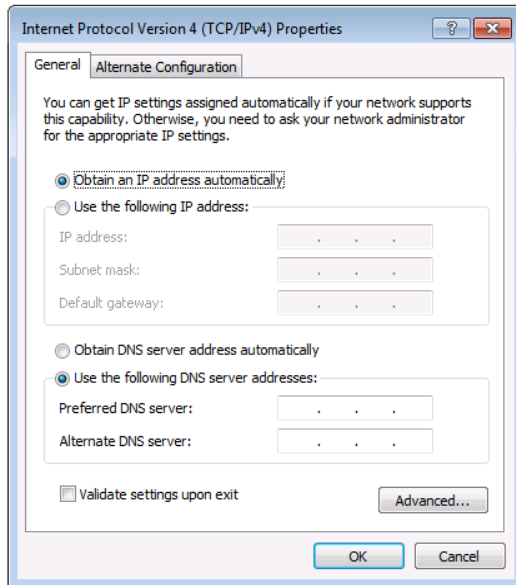


Figure 7: Internet Protocol Version 4 Properties Window

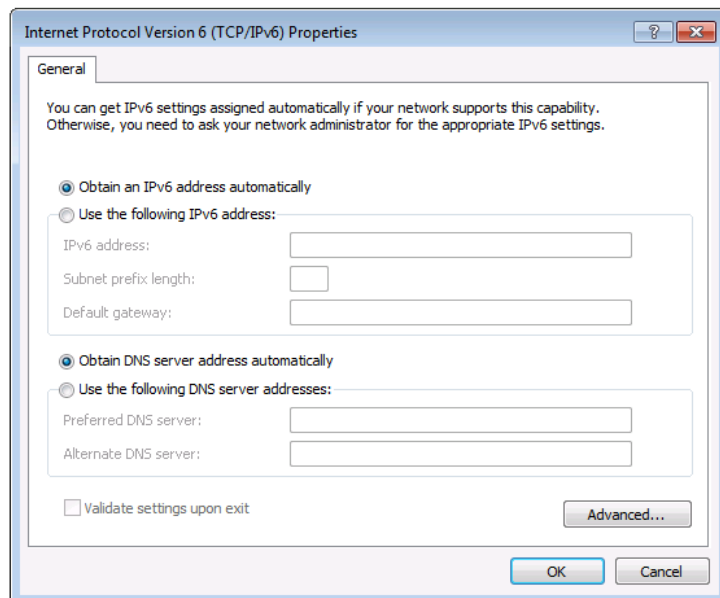


Figure 8: Internet Protocol Version 6 Properties Window

6. Select **Use the following IP Address** for static IP addressing and fill in the details as shown in [Figure 9](#).

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

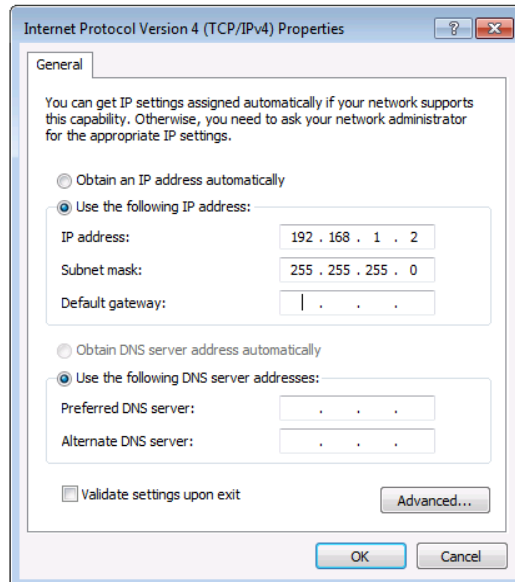


Figure 9: Internet Protocol Properties Window

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

Connecting the Ethernet Port via IP LAN

You can connect the Ethernet port of the VM-218DTxr, via IP LAN, to the Ethernet port on a network hub or using a straight-through cable with RJ-45 connectors.

Configuring the Ethernet Port

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

Using the Embedded Web Pages

The VM-218DTxr can be operated remotely using the embedded web pages. The web pages are accessed using a web browser and an Ethernet connection.

Before attempting to connect:

- Perform the procedures in [Using the Ethernet](#) on page 16.
- Ensure that your browser is supported.

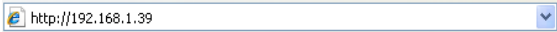
The following operating systems and Web browsers are supported:

OS	Version
Windows 7	IE
	Firefox
	Chrome
	Safari
Windows 10	IE
	Edge
	Firefox
	Chrome
Mac	Safari
iOS	Safari

Browsing VM-218DTxr Web Pages

To browse the VM-218DTxr Web pages:

1. Open your Internet browser.
2. Type the IP number of the device in the Address bar of your browser. For example, the default IP number:



The Authentication window appears (if set, security is enabled):

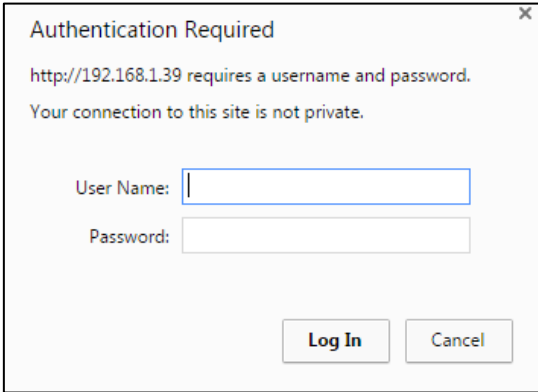


Figure 10: Using the Embedded Web Pages – The Authentication Window

3. Enter the **User Name** and **Password** (Admin, Admin) and click **OK**.
The Switching Web page appears (see [Figure 11](#)).

The VM-218DTxr Web pages enable performing the following:

- [Switching the Inputs and Setting the Output Volume](#) on page [22](#).
- [Defining Video and Audio Settings](#) on page [23](#).
- [Setting the Output Labels](#) on page [24](#).
- [Managing EDID](#) on page [24](#).
- [Setting Web Page Access Permission](#) on page [29](#).
- [Changing Device Settings](#) on page [31](#).
- [Upgrading the Firmware](#) on page [33](#).
- [Viewing the About Page](#) on page [34](#).

Switching the Inputs and Setting the Output Volume

The Switching page enables performing the following functions:

- [Switching the Inputs](#) on page 22.
- [Setting the Volume](#) on page 22.

Switching the Inputs

To select an input to switch to the outputs:

1. In the Navigation pane, click **Switching**. The Switching page appears.

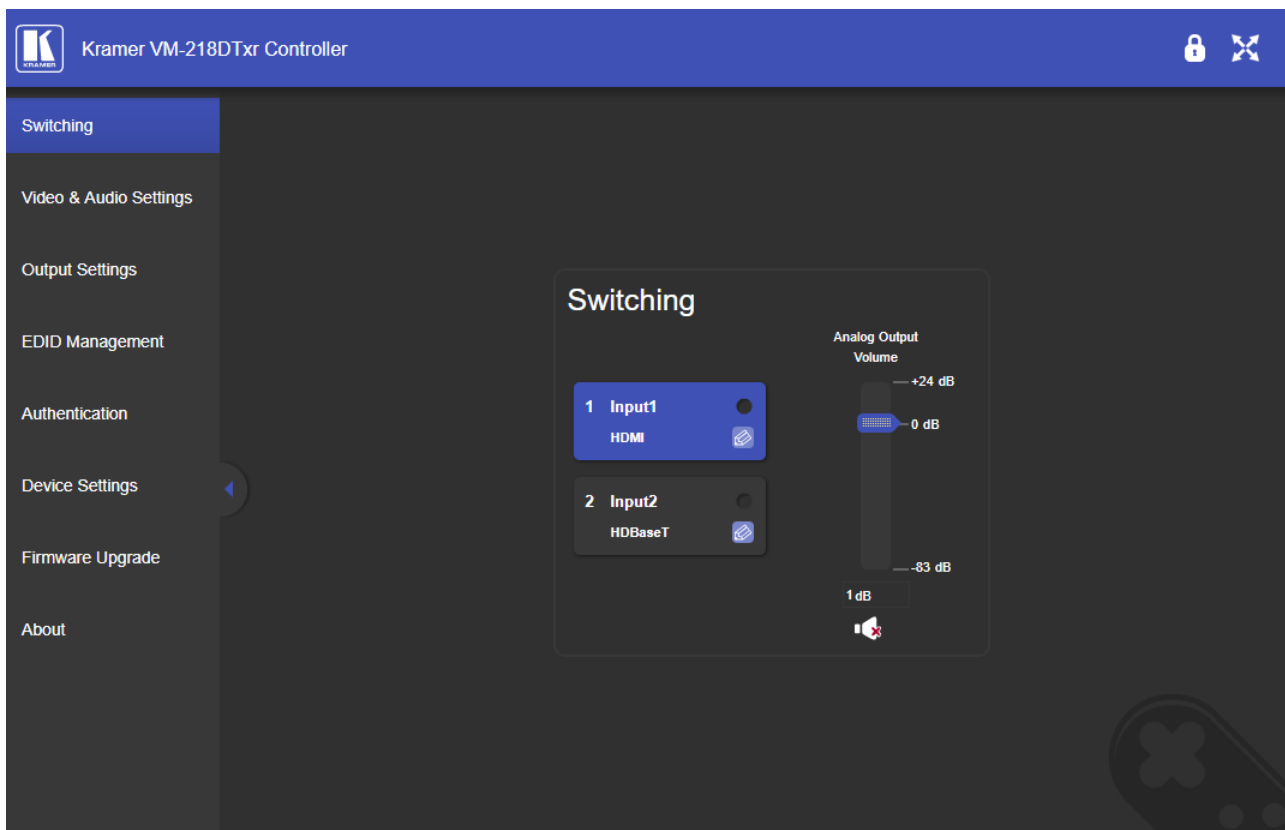


Figure 11: Switching Page with Navigation List on the Left

2. Click an input to route it to the outputs.



A green dot on the input button indicates that the input is connected and active.

3. Click to edit the input label name.

Setting the Volume

To set the analog audio volume:

1. In the Navigation pane, click **Switching**. The Switching page appears.
2. Use the slider to set the Analog Output Volume (0dB, by default).
3. If required, click to mute/unmute the output.

Defining Video and Audio Settings

The Video and Audio Settings page enables performing the following functions:

- [Setting the Power-Off Delay](#) on page [23](#).
- [Supporting HDCP Mode](#) on page [23](#).
- [Viewing Audio De-Embedding Status](#) on page [24](#).

Setting the Power-Off Delay

When a signal is lost, you can set the output 5V power off delay time.



When 5V on the output is powered down, it indicates to the display connected to it that no video signal is present.

To set the power-off delay time:

1. In the Navigation pane, click **Video & Audio Settings**. The Video & Audio Settings page appears.

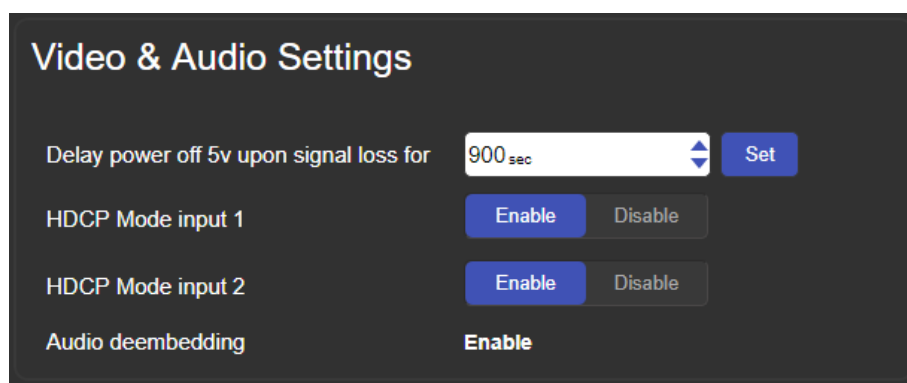


Figure 12: Video & Audio Settings Page

2. Set the delay time (900sec, by default).
3. Click **Set**.

The delay time is set.

Supporting HDCP Mode

To Enable/disable HDCP for each input:

1. In the Navigation pane, click **Video & Audio Settings**. The Video & Audio Settings page appears.
2. Click **Enable** (default)/**Disable** per input.



Setting HDCP support to disabled on the HDMI input allows the source to transmit a non-HDCP signal if required (for example, when working with a Mac computer).

HDCP mode is set per input.

Viewing Audio De-Embedding Status

In the Navigation pane, click **Video and Audio Settings** to view the audio de-embedding status as set by DIP-switch 3 (see [Setting the DIP-switches](#) on page 13).

Setting the Output Labels

Use the Output Settings page to label the different outputs. This can be very helpful (for example, for supporting the system) since HDBT outputs 2 to 9 that are connected to receivers can be identified easily on location.

To change an output label name:

1. In the Navigation pane, click **Output Settings**. The Output Settings page appears.

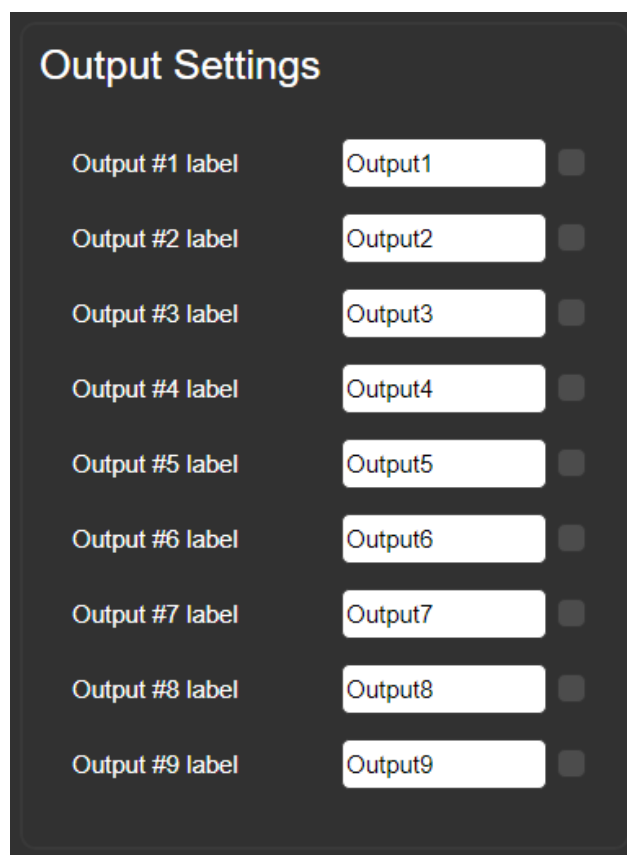


Figure 13: Output Settings Page

2. Type the new output label and click .


Managing EDID

Use the EDID page to read the EDID from:

- Any of the inputs.
- Any of the outputs.
- The default EDID.

You can also load an external custom EDID file from your PC onto the **VM-218DTxr**.

The selected EDID can be copied to the selected input/s.

 View the currently selected EDID source Bytemap by clicking **Bytemap** on the right side.

To copy an EDID from an input (or output) to an input:

- 1. In the Navigation pane, click **EDID Management**. The EDID Management page appears.

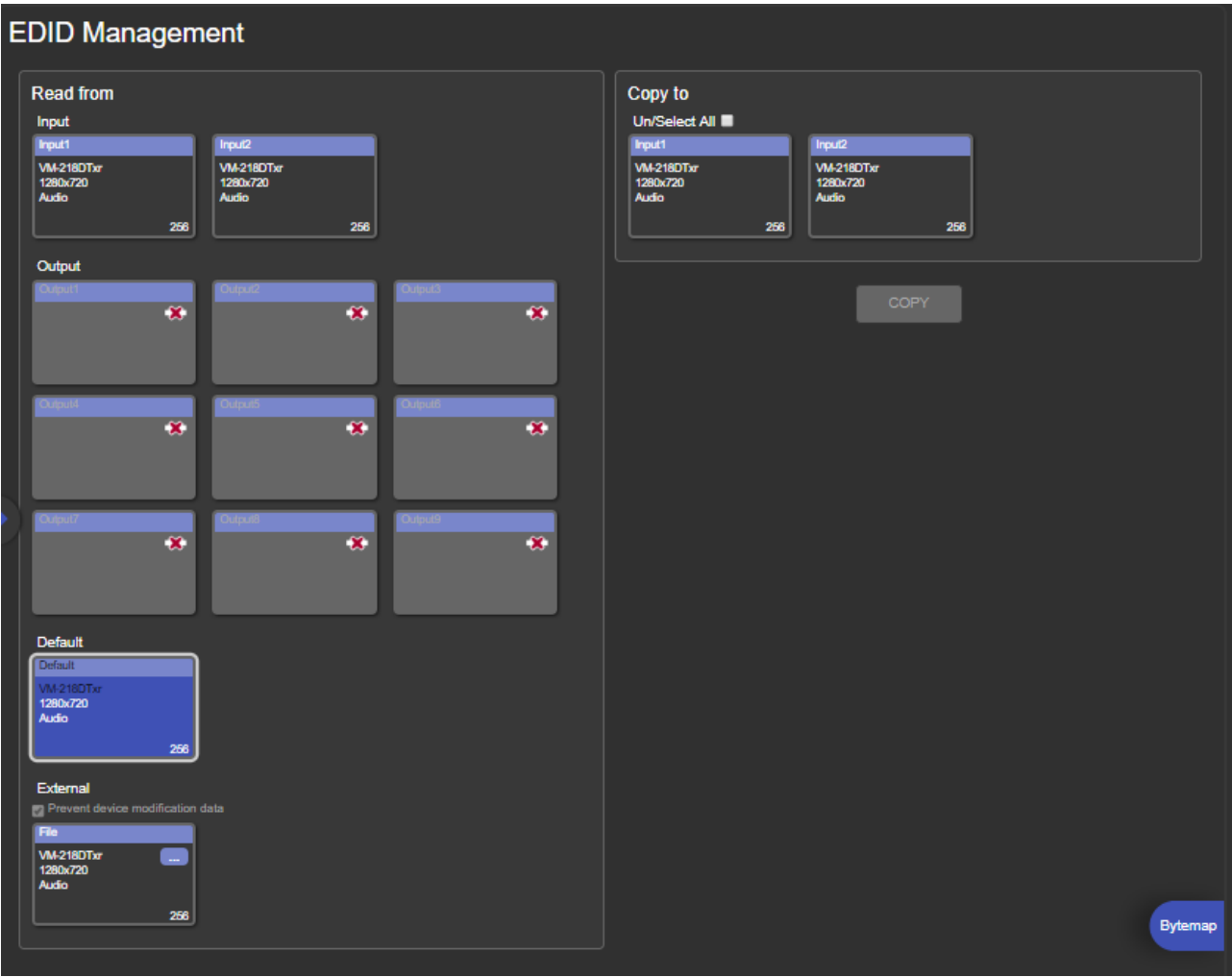


Figure 14: EDID Management Page

2. Select the EDID source (for example, one of the inputs).



If you are reading EDID from an output, make sure that that output is connected to an acceptor.

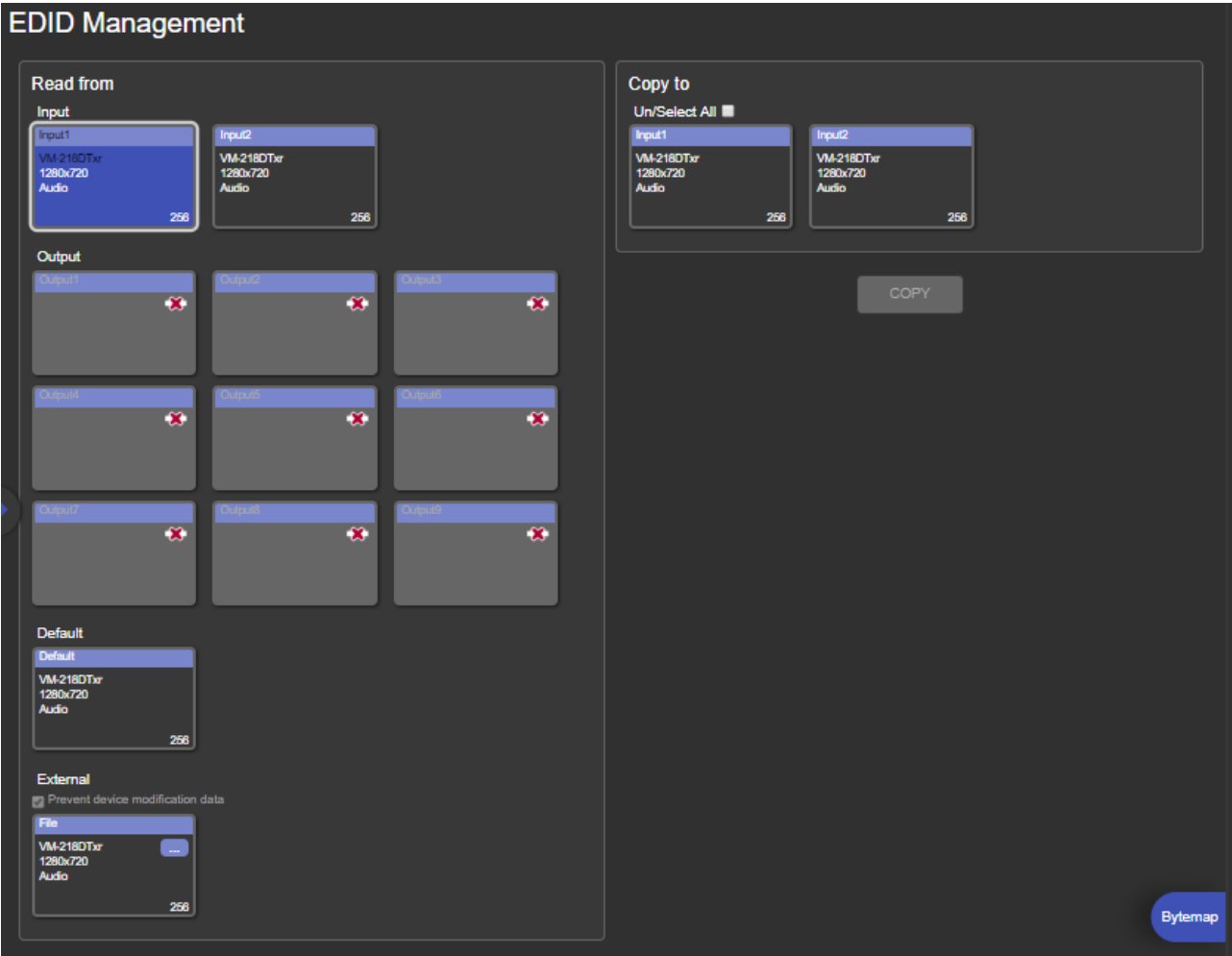


Figure 15: EDID Management Page – Select an EDID Input (Read From)

3. Select the input/s (or all the inputs) to which the EDID is copied.

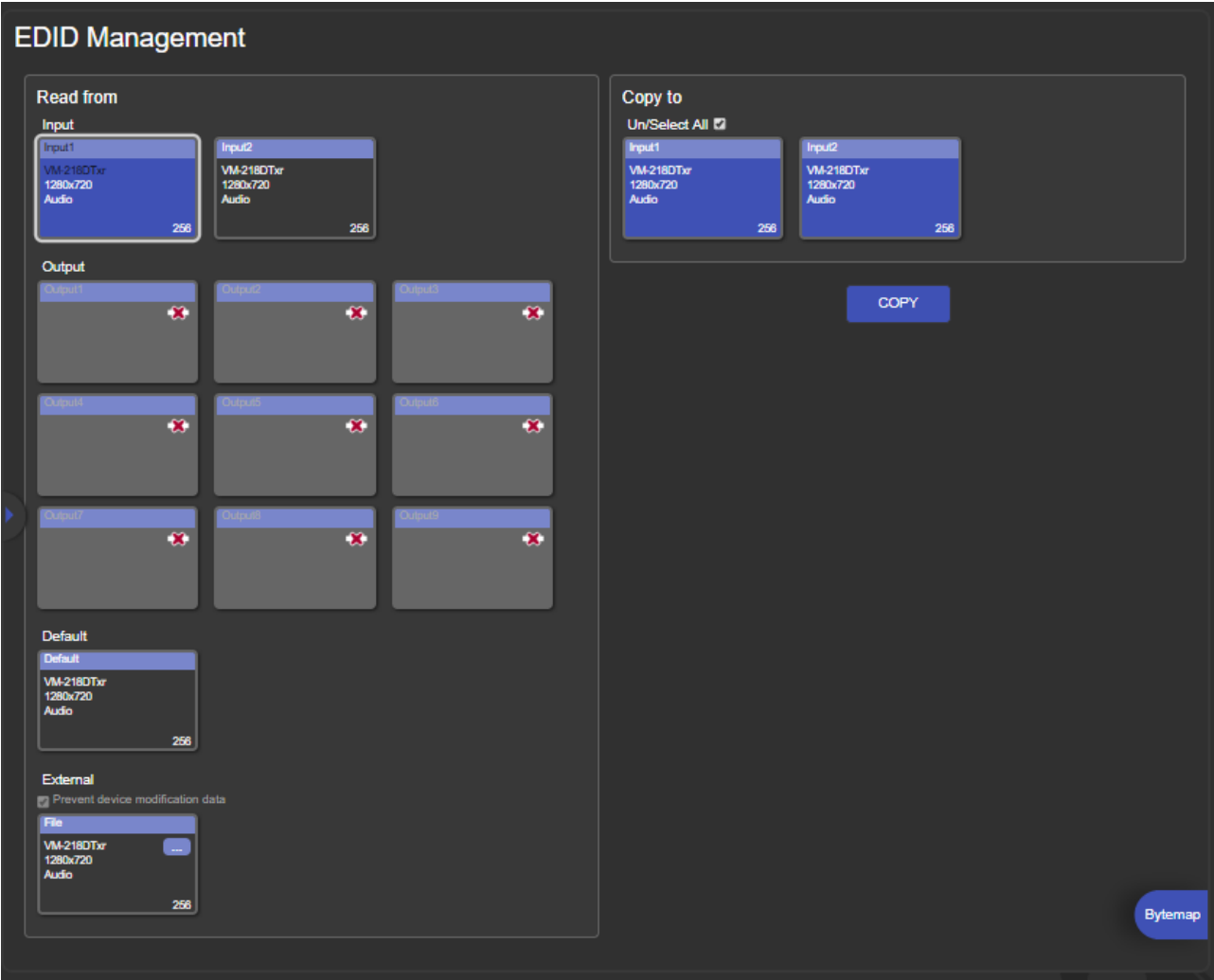


Figure 16: EDID Management Page – Select the Inputs (Copy To)

- 4. Click **COPY**.
The Input 2 EDID is copied to the selected inputs.

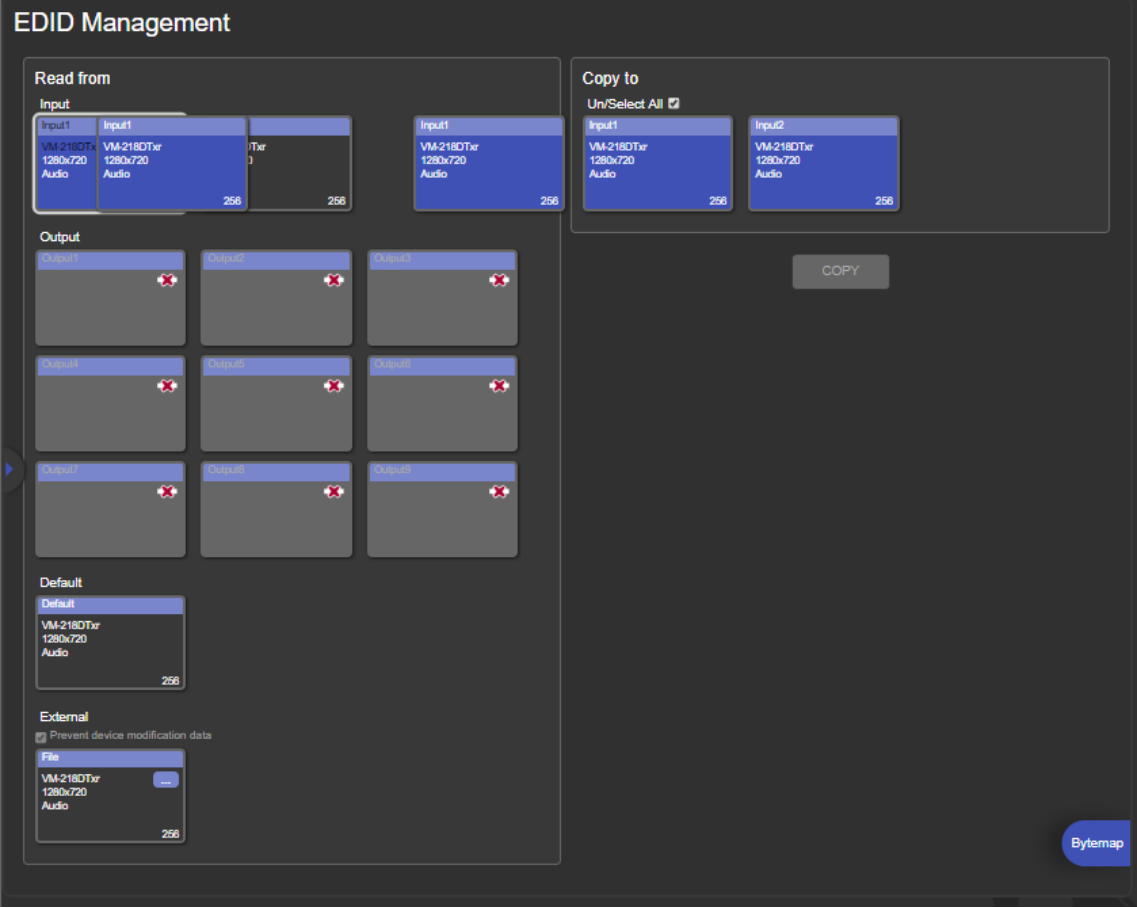


Figure 17: EDID Management Page – EDID Copied

Once the EDID is copied, a success message appears:

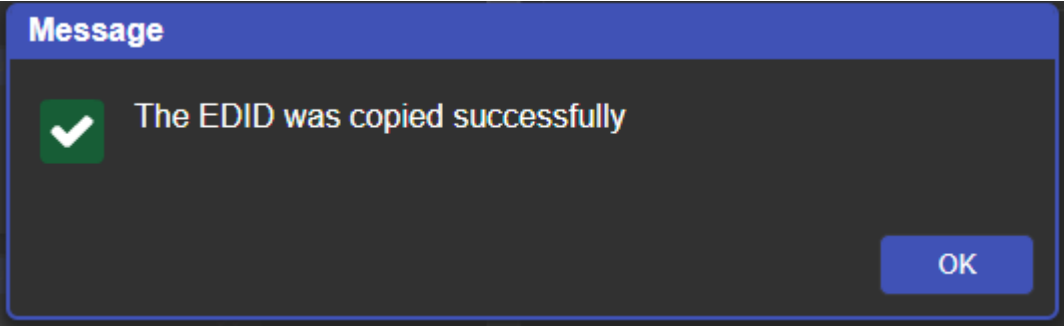


Figure 18: EDID Management Page – EDID Copied Successfully

- 5. Click **OK**.

To read the EDID from the default EDID:

- 1. In the Navigation pane, click **EDID Management**. The EDID Management page appears.
- 2. Click **Default**.
- 3. Select the input/s (or all the inputs) to which the default EDID is copied.
- 4. Click **Copy** and follow the instructions on-screen.

To load an external EDID file:

1. In the Navigation pane, click **EDID Management**. The EDID Management page appears.
2. In the **File** area, click ... to browse for the EDID file location.
3. Open the EDID file.
4. Select the input/s (or all the inputs) to which the EDID is copied.
5. Click **Copy** and follow the instructions on-screen.

Setting Web Page Access Permission

To define access permission to the web pages in the Navigation pane, click **Authentication**. The Authentication page appears.

By default, the Web pages are secured (username and password are both **Admin**).

Figure 19: Authentication Page

To change the password:

1. In the Navigation pane, click **Authentication**. The Authentication page appears.
2. Type current password and then type the new password twice.
3. Click **Change** to store the new password. The following message appears:

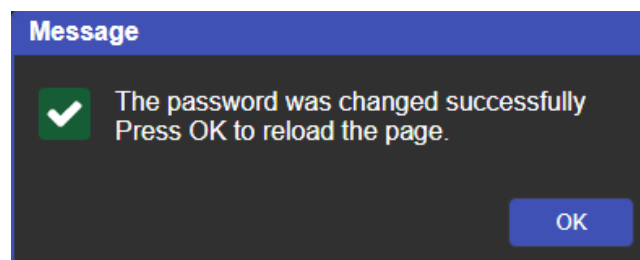


Figure 20: Authentication – Reloading Web Page

To disable security:

1. In the Navigation pane, click **Authentication**. The Authentication page appears.
2. Click **Disabled**.
3. The Confirm window appears.

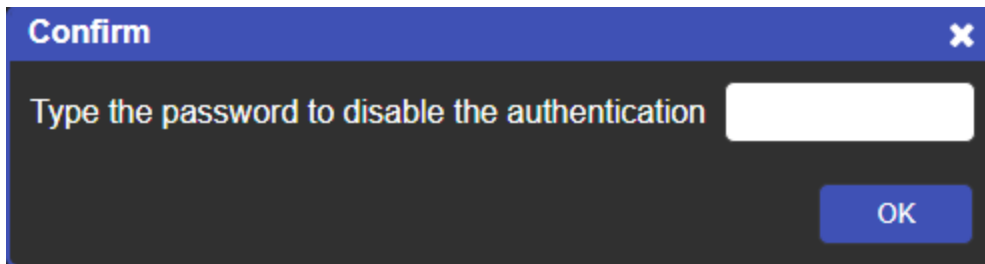


Figure 21: Authentication – Confirm Window

4. Type the password to disable the authentication.
5. Click **OK**.

Authentication is disabled:

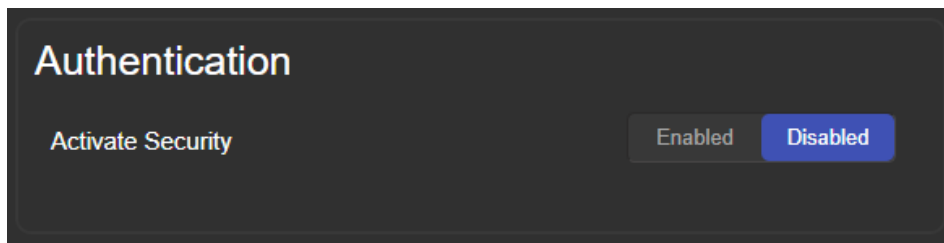


Figure 22: Authentication – Authentication Disabled

To enable security:

1. In the Navigation pane, click **Authentication**. The Authentication page appears.
2. Click **Enabled**.

The following message appears:

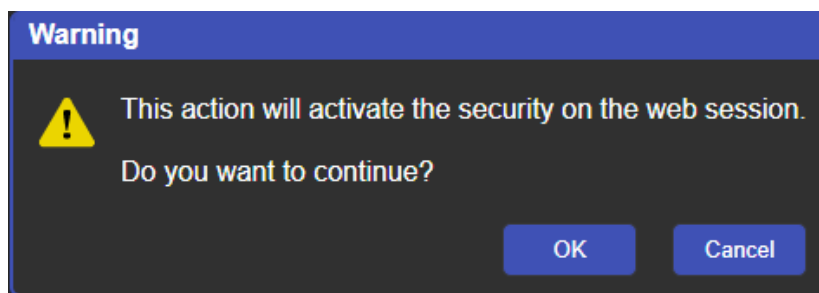


Figure 23: [Figure Caption]

3. Click **OK**.
The page reloads, and authentication is required.

Changing Device Settings

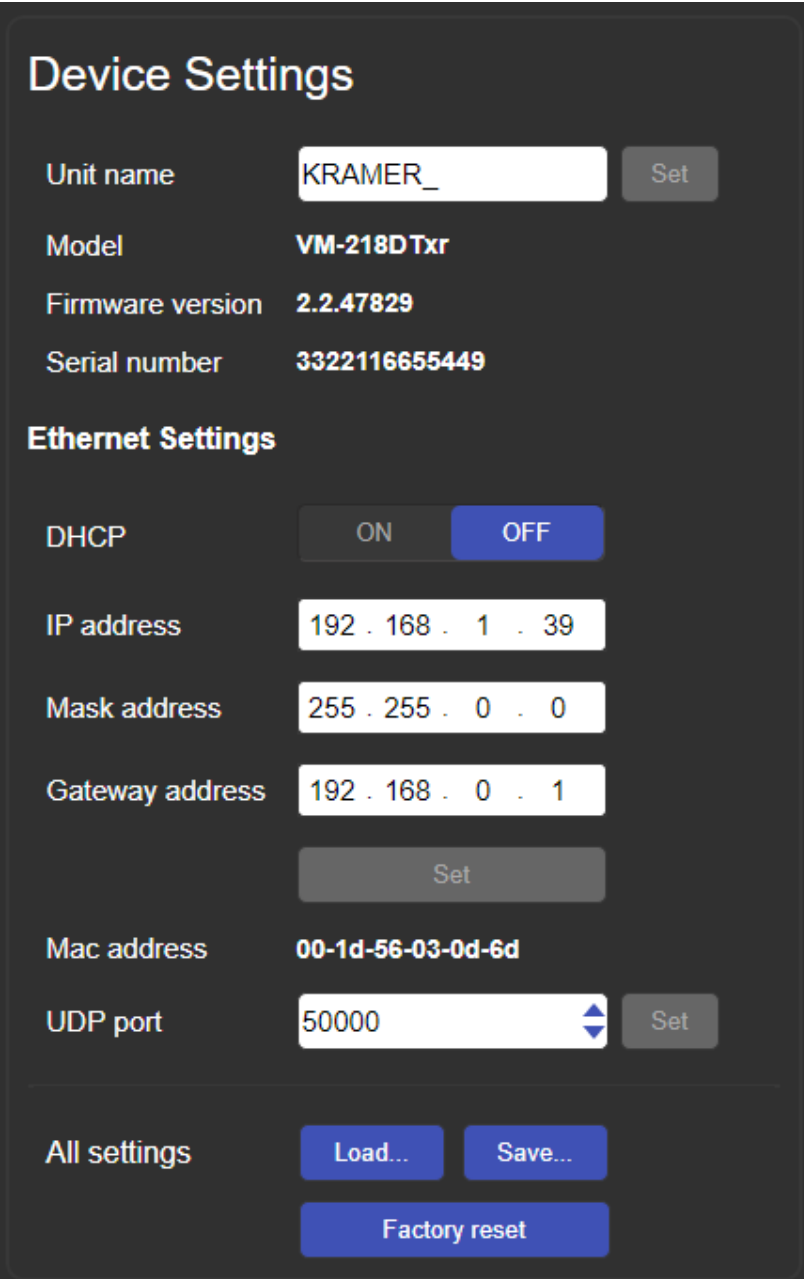
Use the Device Settings page to change the device name (click **Set**) and perform the following operations:

- [Changing the Ethernet Settings](#) on page [31](#).
- [Loading/Saving a Configuration](#) on page [32](#).
- [Factory Reset](#) on page [33](#).

Changing the Ethernet Settings

To change the Ethernet settings:

1. In the Navigation pane, click **Device Settings**. The Device Settings page appears:



The screenshot displays the 'Device Settings' web interface. At the top, the title 'Device Settings' is shown. Below it, there are four rows of information: 'Unit name' with a text input field containing 'KRAMER_' and a 'Set' button; 'Model' with the value 'VM-218DTxr'; 'Firmware version' with the value '2.2.47829'; and 'Serial number' with the value '3322116655449'. A section titled 'Ethernet Settings' follows. It includes a 'DHCP' toggle switch currently set to 'OFF'. Below this are four text input fields for 'IP address' (192 . 168 . 1 . 39), 'Mask address' (255 . 255 . 0 . 0), and 'Gateway address' (192 . 168 . 0 . 1), each followed by a 'Set' button. The 'Mac address' is displayed as '00-1d-56-03-0d-6d'. The 'UDP port' is set to '50000' with a 'Set' button. At the bottom, there are three buttons: 'Load...' and 'Save...' under the heading 'All settings', and a 'Factory reset' button.

Figure 24: The Device Settings Page

2. Set DHCP **ON** or **OFF** (default).
3. If DHCP is **OFF**, change any of the parameters (IP Address, Netmask and/or Gateway).
4. Click **Set**.



- After changing the IP Address, or DHCP to ON, reload the Web page with the new IP address.
- After changing the Subnet mask, turn the VM-218DTxr power off and then on again.

Loading/Saving a Configuration

To Save a configuration file to your PC:

1. In the Navigation pane, click **Device Setting**. Device Settings page appears.
2. Click **Save**.

The configuration is saved, and the following message appears:

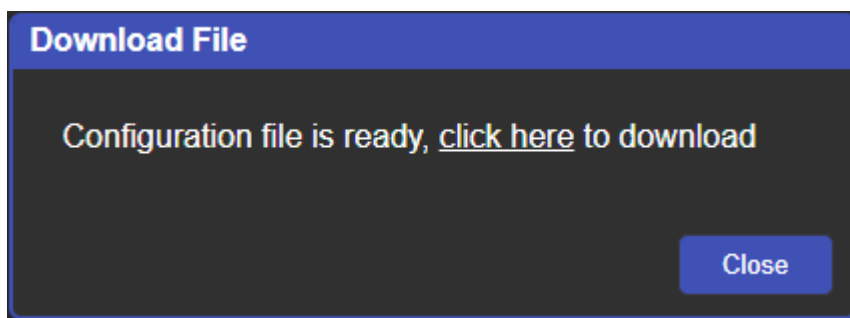


Figure 25: Device Settings - Saving the Configuration

3. Click [click here](#) to save and download the configuration to your PC.

To Load a configuration from your PC:

1. In the Navigation pane, click **Device Setting**. Device Settings page appears.
2. Click **Load** and browse for the configuration file.
3. Select the configuration file and click **Open**. The configuration file is uploaded, and the following message appears:

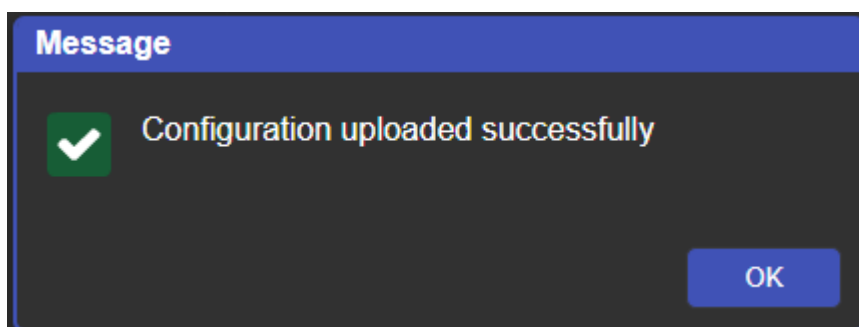


Figure 26: Device Settings – Configuration Uploaded

4. Click OK.

Factory Reset

To reset the device to its factory default parameters:

1. In the Navigation pane, click **Device Settings**. The Device Settings page appears.
2. Click **Factory reset** the following message appears:

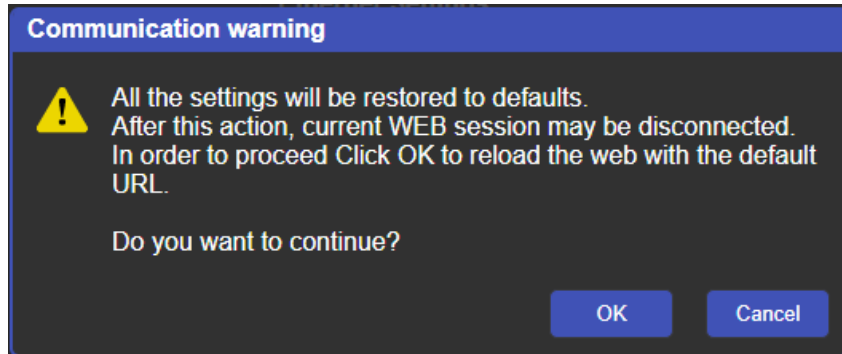


Figure 27: Device Settings Page – Factory Reset Message

3. Click **OK** and wait for the web page to reload following factory reset.



See [Default Communication Parameters](#) on page [37](#) to view other factory reset procedures.

Upgrading the Firmware

To perform firmware upgrade:

1. In the Navigation pane, click **Firmware Upgrade**. The Firmware Upgrade page appears.

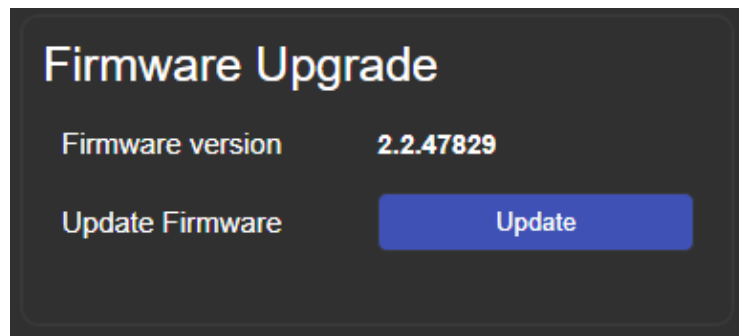


Figure 28: Firmware Upgrade Page – Selecting the New Firmware File

2. Click **Update** and select the new firmware file from the new firmware folder.

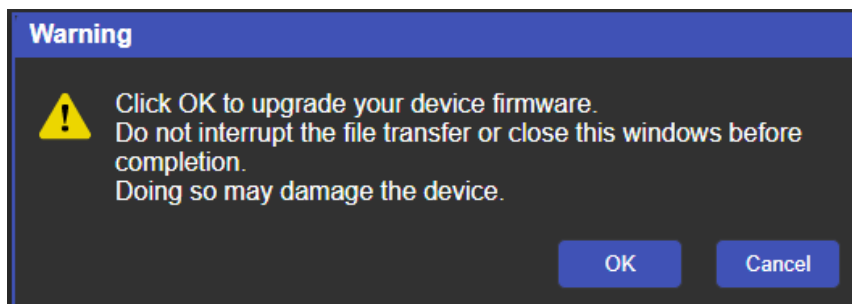


Figure 29: Firmware Upgrade Page – Update Warning Message

- Click **OK**. Wait for the new firmware update completion:

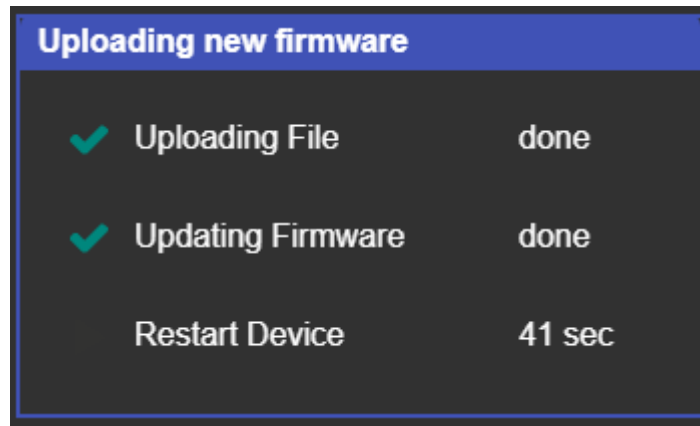


Figure 30 Firmware Upgrade Page – Uploading New Firmware

- Once complete, the web page reloads.
- Make sure that the new version appears in the Firmware Upgrade page.

Viewing the About Page

In the Navigation pane, click **About** to view the VM-218DTxr Web page version and Kramer Electronics Ltd details.



Figure 31: About Page

Upgrading the Firmware

Upgrade the firmware in any of the following ways:

- Remotely, via the Embedded web pages (see [Upgrading the Firmware](#) on page 33).
- Remotely, via Kramer Network (see [www.kramerav.com/manual/Kramer Network](http://www.kramerav.com/manual/Kramer%20Network)).
- Locally, via Kramer **K-UPLOAD** software connecting the device to your PC by PROG micro USB port ①, or via the RS-232 (when DIP-switch 6 set to Off (up position) allowing RS-232 to control/program the device).

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 HDMI	On a female HDMI connector
	1 HDBT	On an RJ-45 connector
Outputs	1 HDMI	On a female HDMI connector
	8 HDBT	On RJ-45 connector
	1 Unbalanced Stereo Audio	On a 3.5mm mini jack
Ports	1 IR IN	On a 3.5mm mini jack for IR link extension via IN 2 HDBT
	8 IR OUT	On 3.5mm mini jacks for IR link extension via OUT HDBT (2 to 9)
	1 RS-232 IN	On a 3-pin terminal block for serial link extension via IN 2 HDBT
	8 RS-232 OUT	On 3-pin terminal blocks for serial link extension via OUT HDBT (2 to 9)
	1 Mini USB	On a female USB connector for firmware upgrade
	1 RS-232	On a 3-pin terminal block for device control
	1 10/100BaseT Ethernet	On an RJ-45 female connector for device control via LAN and Ethernet link extension via IN HDBT and OUT HDBT (2 to 9)
Extension Reach	VM-218DTxr	
	4K @60Hz (4:2:0)	Up to 100m (330ft)
	Full HD (1080p @60Hz 36bpp)	Up to 130m (430ft)
	HDBaseT Ultra Mode and Full HD (1080p @60Hz 24bpp)	Up to 180m (590ft)
	VM-218DT	
	4K @60Hz (4:2:0)	Up to 40m (130ft)
	Full HD (1080p @60Hz 36bpp)	Up to 70m (230ft)
	Compliance	HDBaseT 1.0
Video	Max. Resolution	4K@60Hz (4:2:0) and 4K@30Hz (4:4:4)
	Compliance	Supports HDMI 2.0 and HDCP 1.4
RS-232 Extension	Baud Rate	300 to 115,200
Analog Audio	Max Level	1 Vrms
	THD + Noise	0.03% @1kHz at nominal level
Controls	Front Panel	Front panel buttons: input select, volume, EDID, IR
		Indication LEDs: input select, EDID type, outputs
	Rear Panel	RS-232 device control
		RS-232 remote control via HDBT ports
		IR remote control via HDBT ports
		Ethernet
DIP-switches		
Power	Consumption	65VA
	Source	100-240V AC, 50/60Hz
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
	Environmental	RoHs, WEEE

Enclosure	Size	19" 1U
	Type	Aluminum
	Cooling	Fan ventilation
General	Net Dimensions (W, D, H)	43.6cm x 23.7cm x 4.4cm (17.2" x 9.3" x 1.7")
	Shipping Dimensions (W, D, H)	52.5cm x 33cm x 10.7cm (20.7" x 13" x 4.2")
	Net Weight	2.5kg (5.5lbs) approx.
	Shipping Weight	3.2kg (7.1lbs) approx.
Accessories	Included	Power cord, rack ears
	Optional	For optimum range and performance use the recommended USB, Ethernet, serial and IR Kramer cables available at www.kramerav.com/product/VM-218DTxr
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 input 1 to output 1):	#ROUTE 1,1,1 <cr>
Ethernet	
IP Address:	192.168.1.39
Subnet mask:	255.255.0.0
Default gateway:	192.168.0.1
Default UDP Port #:	50000
Maximum UDP Ports:	1
Default TCP Port #:	5000
Full Factory Reset	
Front Panel Buttons:	Front panel buttons: power off the device, press and hold the RESET button for 3 seconds while powering the device, and then release.
Protocol 3000:	"#factory" command.
Web Pages:	In the Device Settings page, click Reset.
Web Page Authentication	
User/Password:	Admin/Admin

Default EDID

Each input on the VM-218DTxr is loaded with a factory default EDID.

```

Monitor
Model name..... VM-218DTxr
Manufacturer..... KMR
Plug and Play ID..... KMR1200
Serial number..... 295-883450100
Manufacture date..... 2014, ISO week 255
Filter driver..... None
-----
EDID revision..... 1.4
Input signal type..... Digital
Color bit depth..... Undefined
Color encoding formats... RGB 4:4:4
Screen size..... 520 x 320 mm (24.0 in)
Power management..... Standby, Suspend, Active off/sleep
Extension blocs..... 1 (CEA-EXT)
-----
DDC/CI..... n/a
Color characteristics
Default color space..... Non-sRGB
Display gamma..... 2.20
Red chromaticity..... Rx 0.674 - Ry 0.319
Green chromaticity..... Gx 0.188 - Gy 0.706
Blue chromaticity..... Bx 0.148 - By 0.064
White point (default)... Wx 0.313 - Wy 0.329
Additional descriptors... None
Timing characteristics
Horizontal scan range... 30-83kHz
Vertical scan range..... 56-76Hz
Video bandwidth..... 170MHz
CVT standard..... Not supported
GTF standard..... Not supported
Additional descriptors... None
Preferred timing..... Yes
Native/preferred timing.. 1920x1080p at 60Hz (16:10)
Modeline..... "1280x720" 74.250 1280 1390 1430 1650 720 725 730 750 +hsync +vsync
Standard timings supported
720 x 400p at 70Hz - IBM VGA
720 x 400p at 88Hz - IBM XGA2
640 x 480p at 60Hz - IBM VGA
640 x 480p at 67Hz - Apple Mac II
640 x 480p at 72Hz - VESA
640 x 480p at 75Hz - VESA
800 x 600p at 56Hz - VESA
800 x 600p at 60Hz - VESA
800 x 600p at 72Hz - VESA
800 x 600p at 75Hz - VESA
832 x 624p at 75Hz - Apple Mac II
1024 x 768i at 87Hz - IBM
1024 x 768p at 60Hz - VESA
1024 x 768p at 70Hz - VESA
1024 x 768p at 75Hz - VESA
1280 x 1024p at 75Hz - VESA
1152 x 870p at 75Hz - Apple Mac II
1280 x 1024p at 75Hz - VESA STD
1280 x 1024p at 85Hz - VESA STD
1600 x 1200p at 60Hz - VESA STD
1024 x 768p at 85Hz - VESA STD
800 x 600p at 85Hz - VESA STD
640 x 480p at 85Hz - VESA STD
1152 x 864p at 70Hz - VESA STD
1280 x 960p at 60Hz - VESA STD
EIA/CEA-861 Information
Revision number..... 3
IT underscan..... Supported
Basic audio..... Supported
YCbCr 4:4:4..... Not supported
YCbCr 4:2:2..... Not supported
Native formats..... 1
Detailed timing #1..... 1920x1080p at 60Hz (16:10)
Modeline..... "1920x1080" 148.500 1920 2008 2052 2200 1080 1084 1089 1125 +hsync +vsync
Detailed timing #2..... 1920x1080i at 60Hz (16:10)
Modeline..... "1920x1080" 74.250 1920 2008 2052 2200 1080 1084 1094 1124 interface +hsync +vsync
Detailed timing #3..... 1280x720p at 60Hz (16:10)
Modeline..... "1280x720" 74.250 1280 1390 1430 1650 720 725 730 750 +hsync +vsync
Detailed timing #4..... 720x480p at 60Hz (16:10)
Modeline..... "720x480" 27.000 720 736 798 858 480 489 495 525 -hsync -vsync
CE audio data (formats supported)
LPCM 2-channel, 16/20/24 bit depths at 32/44/48 kHz
CE video identifiers (VICs) - timing/formats supported
1920 x 1080p at 60Hz - HDTV (16:9, 1:1)
1920 x 1080i at 60Hz - HDTV (16:9, 1:1)
1280 x 720p at 60Hz - HDTV (16:9, 1:1) [Native]
720 x 480p at 60Hz - EDTV (16:9, 32:27)
720 x 480p at 60Hz - EDTV (4:3, 8:9)
720 x 480i at 60Hz - Doublescan (16:9, 32:27)
720 x 576i at 50Hz - Doublescan (16:9, 64:45)
640 x 480p at 60Hz - Default (4:3, 1:1)
NB: NTSC refresh rate = (Hz*1000)/1001

```


CE vendor specific data (VSDB)
IEEE registration number. 0x000C03
CEC physical address..... 1.0.0.0
Maximum TMDS clock..... 165MHz
CE speaker allocation data
Channel configuration.... 2.0
Front left/right..... Yes
Front LFE..... No
Front center..... No
Rear left/right..... No
Rear center..... No
Front left/right center... No
Rear left/right center... No
Rear LFE..... No
Report information
Date generated..... 18/02/2016
Software revision..... 2.60.0.972
Data source..... File
Operating system..... 6.1.7601.2.Service Pack 1
Raw data
00,FF,FF,FF,FF,FF,FF,00,2D,B2,00,12,01,01,01,FF,18,01,04,80,34,20,78,E2,B3,25,AC,51,30,B4,26,
10,50,54,FF,FF,80,81,8F,81,99,A9,40,61,59,45,59,31,59,71,4A,81,40,01,1D,00,72,51,D0,1E,20,6E,28,
55,00,07,44,21,00,00,1E,00,00,00,FF,00,32,39,35,2D,38,38,33,34,35,30,31,30,30,00,00,00,FC,00,56,
4D,2D,32,31,34,44,54,20,20,20,20,00,00,00,FD,00,38,4C,1E,53,11,00,0A,20,20,20,20,20,01,DF,
02,03,1B,C1,23,09,07,07,48,10,05,84,03,02,07,16,01,65,03,0C,00,10,00,83,01,00,00,02,3A,80,18,71,
38,2D,40,58,2C,45,00,07,44,21,00,00,1E,01,1D,80,18,71,1C,16,20,58,2C,25,00,07,44,21,00,00,9E,01,
1D,00,72,51,D0,1E,20,6E,28,55,00,07,44,21,00,00,1E,8C,0A,D0,8A,20,E0,2D,10,10,3E,96,00,07,44,21,
00,00,18,00,77

Protocol 3000

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

Understanding Protocol 3000

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

- **Command format:**

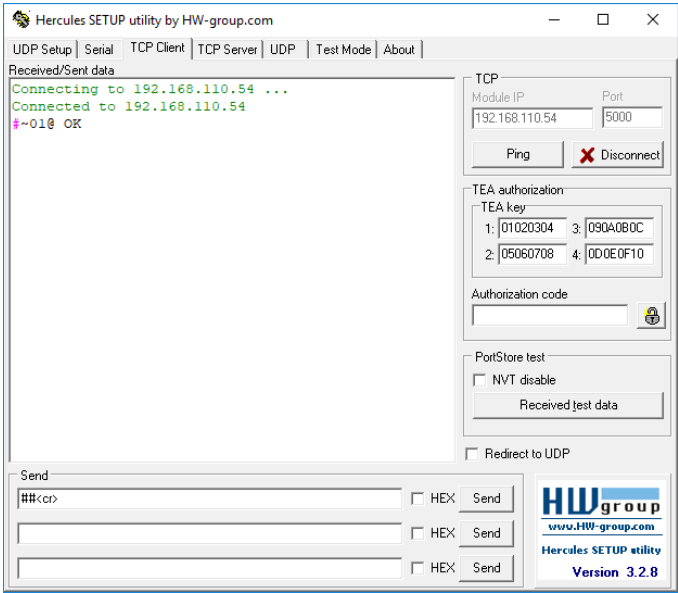
Prefix	Command Name	Constant (Space)	Parameter(s)	Suffix
#	Command	_	Parameter	<CR>

- **Feedback format:**




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

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

The command framing varies according to how you interface with VM-218DTxr. 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_ <u>stage</u> , <u>channel</u> , <u>volume</u> <CR> FEEDBACK ~nn@AUD-LVL_ <u>stage</u> , <u>channel</u> , <u>volume</u> <CR><LF>	stage – 1 (Output processing) channel – 1 (Analog audio output) volume – Volume level -60db to 30dB; ++ (increase current value by 1dB); -- (decrease current value by 1dB)	Set AUDIO OUT 2 level to -50dB: #AUD-LVL_ <u>1</u> , <u>1</u> , <u>-50</u> <CR>
AUD-LVL?	Get volume level.	COMMAND #AUD-LVL? <u>stage</u> , <u>channel</u> <CR> FEEDBACK ~nn@AUD-LVL_ <u>stage</u> , <u>channel</u> , <u>volume</u> <CR><LF>	stage – 1 (Output processing) channel – 1 (Analog audio output) volume – Volume level -60db to 30dB	Get AUDIO OUT 1 level #AUD-LVL? <u>1</u> , <u>1</u> <CR>
AV-SW-TIMEOUT	Set auto switching timeout.	COMMAND #AV-SW-TIMEOUT_ <u>action</u> , <u>time_out</u> <CR> FEEDBACK ~nn@AV-SW-TIMEOUT_ <u>action</u> , <u>time_out</u> <CR><LF>	action – 4 – Disable 5V on video output if no input signal detected. 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_ <u>4</u> , <u>5</u> <CR>
AV-SW-TIMEOUT?	Get auto switching timeout.	COMMAND #AV-SW-TIMEOUT? <u>action</u> <CR> FEEDBACK ~nn@AV-SW-TIMEOUT_ <u>action</u> , <u>time_out</u> <CR><LF>	action – 4 – Disable 5V on video output if no input signal detected time_out – Timeout in seconds	Get the Disable 5V on video output if no input signal detected timeout: #AV-SW-TIMEOUT? <u>4</u> <CR>
BEACON-INFO?	Get beacon information, including IP address, UDP control port, TCP control port, MAC address, model, name.  There is no Set command. Get command initiates a notification.	COMMAND #BEACON-INFO? <u>port_id</u> <CR> FEEDBACK ~nn@BEACON-INFO_ <u>port_id</u> , <u>ip_string</u> , <u>udp_port</u> , <u>tcp_port</u> , <u>mac_address</u> , <u>model</u> , <u>name</u> <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? <u>1</u> <CR>
BUILD-DATE?	Get device build date.	COMMAND #BUILD-DATE? <u>date</u> <CR> FEEDBACK ~nn@BUILD-DATE_ <u>date</u> , <u>time</u> <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? <u>1</u> <CR>
DISPLAY?	Get output HPD status.	COMMAND #DISPLAY? <u>out_id</u> <CR> FEEDBACK ~nn@DISPLAY_ <u>out_id</u> , <u>status</u> <CR><LF>	out_id – Output number 1 – OUT 1 HDMI 2 – OUT 2 HDBT 3 – OUT 3 HDBT 4 – OUT 4 HDBT 5 – OUT 5 HDBT 6 – OUT 6 HDBT 7 – OUT 7 HDBT 8 – OUT 8 HDBT 9 – OUT 9 HDBT 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</u> <CR>
DPSW-STATUS?	Get the DIP-switch state.	COMMAND #DPSW-STATUS? <u>dp_sw_id</u> <CR> FEEDBACK ~nn@DPSW-STATUS_ <u>dp_sw_id</u> , <u>status</u> <CR><LF>	dp_sw_id – 1 to 4 (number of DIP switches) status – Up/down 0 – Up 1 – Down	get the DIP-switch 2 status: #DPSW-STATUS? <u>2</u> <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_ <u>portType</u> , <u>ETHPort</u> <CR> FEEDBACK ~nn@ETH-PORT_ <u>portType</u> , <u>ETHPort</u> <CR><LF>	portType – TCP/UDP ETHPort – TCP/UDP port number (0 – 65535)	Set the Ethernet port protocol for TCP to port 12457: #ETH-PORT_ <u>0</u> , <u>12457</u> <CR>
ETH-PORT?	Get Ethernet port protocol.	COMMAND #ETH-PORT? <u>portType</u> <CR> FEEDBACK ~nn@ETH-PORT_ <u>portType</u> , <u>ETHPort</u> <CR><LF>	portType – TCP/UDP 0 – TCP 1 – UDP ETHPort – TCP / UDP port number (0 – 65535)	Get the Ethernet port protocol for UDP: #ETH-PORT? <u>1</u> <CR>

Function	Description	Syntax	Parameters/Attributes	Example
FACTORY	<p>Reset device to factory default configuration.</p> <p>i This command deletes all user data from the device. The deletion can take some time.</p> <p>Your device may require powering off and powering on for the changes to take effect.</p>	<p>COMMAND</p> <pre>#FACTORY<CR></pre> <p>FEEDBACK</p> <pre>~nn@FACTORY_0<CR><LF></pre>		<p>Reset the device to factory default configuration:</p> <pre>#FACTORY<CR></pre>
HDCP-MOD	<p>Set HDCP mode.</p> <p>i Set HDCP working mode on the device input:</p> <p>HDCP supported – HDCP ON [default].</p> <p>HDCP not supported - HDCP OFF.</p> <p>HDCP support changes following detected sink - MIRROR OUTPUT.</p> <p>When you define 3 as the mode, the HDCP status is defined according to the connected output in the following priority: OUT 1, OUT 2. If the connected display on OUT 2 supports HDCP, but OUT 1 does not, then HDCP is defined as not supported. If OUT 1 is not connected, then HDCP is defined by OUT 2.</p>	<p>COMMAND</p> <pre>#HDCP-MOD_0inp_id,mode<CR></pre> <p>FEEDBACK</p> <pre>~nn@HDCP-MOD_0inp_id,mode<CR><LF></pre>	<p>inp_id – Input number:</p> <ul style="list-style-type: none"> 1 – IN 1 HDMI 2 – IN 2 HDBT <p>mode – HDCP mode:</p> <ul style="list-style-type: none"> 0 – HDCP Off 3 – HDCP defined according to the connected output 	<p>Set the input HDCP-MODE of IN 1 to Off:</p> <pre>#HDCP-MOD_0,1,0<CR></pre>
HDCP-MOD?	<p>Get HDCP mode.</p> <p>i Set HDCP working mode on the device input:</p> <p>HDCP supported - HDCP_ON [default].</p> <p>HDCP not supported - HDCP OFF.</p> <p>HDCP support changes following detected sink - MIRROR OUTPUT.</p>	<p>COMMAND</p> <pre>#HDCP-MOD?_0inp_id<CR></pre> <p>FEEDBACK</p> <pre>~nn@HDCP-MOD_0inp_id,mode<CR><LF></pre>	<p>inp_id – Input number:</p> <ul style="list-style-type: none"> 1 – IN 1 HDMI 2 – IN 2 HDBT <p>mode – HDCP mode:</p> <ul style="list-style-type: none"> 0 – HDCP Off 3 – HDCP defined according to the connected output 	<p>Get the input HDCP-MODE of IN 1 HDMI:</p> <pre>#HDCP-MOD?_0,1<CR></pre>
HDCP-STAT?	<p>Get HDCP signal status.</p> <p>i Output stage (1) – get the HDCP signal status of the sink device connected to the specified output.</p> <p>Input stage (0) – get the HDCP signal status of the source device connected to the specified input.</p>	<p>COMMAND</p> <pre>#HDCP-STAT?_0stage,stage_id<CR></pre> <p>FEEDBACK</p> <pre>~nn@HDCP-STAT_0stage,stage_id,status<CR><LF></pre>	<p>stage – Input/Output</p> <ul style="list-style-type: none"> 0 – Input 1 – Output <p>stage_id – Number of chosen stage for the input stage</p> <ul style="list-style-type: none"> 1 – IN 1 HDMI 2 – IN 2 HDBT <p>For the output stage</p> <ul style="list-style-type: none"> 1 – OUT 1 HDMI 2 – OUT 2 HDBT 3 – OUT 3 HDBT 4 – OUT 4 HDBT 5 – OUT 5 HDBT 6 – OUT 6 HDBT 7 – OUT 7 HDBT 8 – OUT 8 HDBT 9 – OUT 9 HDBT <p>status – Signal encryption status - valid values On/Off</p> <ul style="list-style-type: none"> 0 – HDCP Off 1 – HDCP On 	<p>Get the output HDCP-STATUS of IN 1:</p> <pre>#HDCP-STAT?_0,1<CR></pre>
HELP	<p>Get command list or help for specific command.</p>	<p>COMMAND</p> <pre>#HELP<CR></pre> <pre>#HELP_0command_name<CR></pre> <p>FEEDBACK</p> <p>1. Multi-line:</p> <pre>~nn@Device_0command_0command...<CR><LF></pre> <p>To get help for command use: HELP (COMMAND_NAME)<CR><LF></p> <pre>~nn@HELP_0command:<CR><LF></pre> <pre>description<CR><LF></pre> <pre>USAGE: usage<CR><LF></pre>	<p>command – Name of a specific command</p>	<p>Get the command list:</p> <pre>#HELP<CR></pre> <p>To get help for AV-SW-TIMEOUT:</p> <pre>HELP_AV-SW-TIMEOUT<CR></pre>

Function	Description	Syntax	Parameters/Attributes	Example
LOGIN	<p>Set protocol permission.</p> <p>i 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.</p> <p>The permission system works only if security is enabled with the "SECUR" command.</p> <p>It is not mandatory to enable the permission system in order to use the device.</p> <p>In each device, some connections allow logging in to different levels. Some do not work with security at all.</p> <p>Connection may logout after timeout.</p>	<p>COMMAND</p> <pre>#LOGIN login_level,password<CR></pre> <p>FEEDBACK <pre>~nn@LOGIN login_level,password_OK<CR><LF></pre> <p>or</p> <pre>~nn@LOGIN_ERR_004<CR><LF></pre> <p>(if bad password entered)</p> </p>	<p>login_level – Level of permissions required (User or Admin)</p> <p>password – Predefined password (by PASS command). Default password is an empty string</p>	<p>Set the protocol permission level to Admin (when the password defined in the PASS command is 33333):</p> <pre>#LOGIN Admin,33333<CR></pre>
LOGIN?	<p>Get current protocol permission level.</p> <p>i For devices that support security, LOGIN allows the user to run commands with an End User or Administrator permission level.</p> <p>In each device, some connections allow logging in to different levels. Some do not work with security at all.</p> <p>Connection may logout after timeout.</p> <p>The permission system works only if security is enabled with the "SECUR" command.</p>	<p>COMMAND</p> <pre>#LOGIN?<CR></pre> <p>FEEDBACK <pre>~nn@LOGIN login_level<CR><LF></pre> </p>	<p>login_level – Level of permissions required (User or Admin)</p>	<p>Get the LOGIN definition:</p> <pre>#LOGIN?<CR></pre>
LOGOUT	<p>Cancel current permission level.</p> <p>i Logs out from User or Administrator permission levels to Not Secure.</p>	<p>COMMAND</p> <pre>#LOGOUT<CR></pre> <p>FEEDBACK <pre>~nn@LOGOUT_OK<CR><LF></pre> </p>		<pre>#LOGOUT<CR></pre>
MODEL?	<p>Get device model.</p> <p>i This command identifies equipment connected to Step-in master products and notifies of identity changes to the connected equipment. The Matrix saves this data in memory to answer REMOTE-INFO requests.</p>	<p>COMMAND</p> <pre>#MODEL?<CR></pre> <p>FEEDBACK <pre>~nn@MODEL model_name<CR><LF></pre> </p>	<p>model_name – String of up to 19 printable ASCII chars</p>	<p>Get the device model:</p> <pre>#MODEL?<CR></pre>
MUTE	<p>Set audio mute.</p>	<p>COMMAND</p> <pre>#MUTE channel,mute_mode<CR></pre> <p>FEEDBACK <pre>~nn@MUTE channel,mute_mode<CR><LF></pre> </p>	<p>channel – 1 (Output number)</p> <p>mute_mode – On/Off</p> <p>0 – Off</p> <p>1 – On</p>	<p>Set speaker output to mute:</p> <pre>#MUTE 1,1<CR></pre>
MUTE?	<p>Get audio mute.</p>	<p>COMMAND</p> <pre>#MUTE? channel<CR></pre> <p>FEEDBACK <pre>~nn@MUTE channel,mute_mode<CR><LF></pre> </p>	<p>channel – 1 (Output number)</p> <p>mute_mode – On/Off</p> <p>0 – Off</p> <p>1 – On</p>	<p>Get mute status of output 1</p> <pre>#MUTE 1?<CR></pre>
NAME	<p>Set machine (DNS) name.</p> <p>i The machine name is not the same as the model name. The machine name is used to identify a specific machine or a network in use (with DNS feature on).</p>	<p>COMMAND</p> <pre>#NAME machine_name<CR></pre> <p>FEEDBACK <pre>~nn@NAME machine_name<CR><LF></pre> </p>	<p>machine_name – String of up to 15 alpha-numeric chars (can include hyphen, not at the beginning or end)</p>	<p>Set the DNS name of the device to room-442:</p> <pre>#NAME room-442<CR></pre>
NAME?	<p>Get machine (DNS) name.</p> <p>i The machine name is not the same as the model name. The machine name is used to identify a specific machine or a network in use (with DNS feature on).</p>	<p>COMMAND</p> <pre>#NAME?<CR></pre> <p>FEEDBACK <pre>~nn@NAME machine_name<CR><LF></pre> </p>	<p>machine_name – String of up to 15 alpha-numeric chars (can include hyphen, not at the beginning or end)</p>	<p>Get the DNS name of the device:</p> <pre>#NAME?<CR></pre>

Function	Description	Syntax	Parameters/Attributes	Example
NAME-RST	<p>Reset machine (DNS) name to factory default.</p> <p>① Factory default of machine (DNS) name is "KRAMER_" + 4 last digits of device serial number.</p>	<p>COMMAND</p> <pre>#NAME-RST<CR></pre> <p>FEEDBACK</p> <pre>~nn@NAME-RST_OK<CR><LF></pre>		<p>Reset the machine name (S/N last digits are 0102):</p> <pre>#NAME-RST_KRAMER_0102<CR></pre>
NET-CONFIG	<p>Set a network configuration.</p> <p>① Parameters, [DNS1] and [DNS2] are optional.</p> <p>② 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.</p> <p>③ 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.</p>	<p>COMMAND</p> <pre>#NET-CONFIG_id,ip,net_mask,gateway,[DNS1],[DNS2]<CR></pre> <p>FEEDBACK</p> <pre>~nn@NET-CONFIG_id,ip,net_mask,gateway<CR><LF></pre>	<p>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....</p> <p>ip – Network IP</p> <p>net_mask – Network mask</p> <p>gateway – Network gateway</p>	<p>Set the device network parameters to IP address 192.168.113.10, net mask 255.255.0.0, and gateway 192.168.0.1:</p> <pre>#NET-CONFIG_0,192.168.113.10,255.255.0.0,192.168.0.1<CR></pre>
NET-CONFIG?	<p>Get a network configuration.</p>	<p>COMMAND</p> <pre>#NET-CONFIG?_id<CR></pre> <p>FEEDBACK</p> <pre>~nn@NET-CONFIG_id,ip,net_mask,gateway<CR><LF></pre>	<p>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....</p> <p>ip – Network IP</p> <p>net_mask – Network mask</p> <p>gateway – Network gateway</p>	<p>Get network configuration:</p> <pre>#NET-CONFIG?_id<CR></pre>
NET-DHCP	<p>Set DHCP mode.</p> <p>① Only 1 is relevant for the mode value. To disable DHCP, the user must configure a static IP address for the device.</p> <p>Connecting Ethernet to devices with DHCP may take more time in some networks.</p> <p>To connect with a randomly assigned IP by DHCP, specify the device DNS name (if available) using the NAME command. You can also get an assigned IP by direct connection to USB or RS-232 protocol port, if available.</p> <p>For proper settings consult your network administrator.</p> <p>② 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.</p>	<p>COMMAND</p> <pre>#NET-DHCP_id,mode<CR></pre> <p>FEEDBACK</p> <pre>~nn@NET-DHCP_id,mode<CR><LF></pre>	<p>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....</p> <p>mode –</p> <p>1 – Try to use DHCP. (If unavailable, use the IP address set by the factory or the NET-IP command).</p>	<p>Enable DHCP mode for port 1, if available:</p> <pre>#NET-DHCP_1,1<CR></pre>
NET-DHCP?	<p>Get DHCP mode.</p> <p>① 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.</p>	<p>COMMAND</p> <pre>#NET-DHCP?_id<CR></pre> <p>FEEDBACK</p> <pre>~nn@NET-DHCP_id,mode<CR><LF></pre>	<p>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....</p> <p>mode –</p> <p>0 – Do not use DHCP. Use the IP set by the factory or using the NET-IP or NET-CONFIG command.</p> <p>1 – Try to use DHCP. If unavailable, use the IP set by the factory or using the NET-IP or NET-CONFIG command.</p>	<p>Get DHCP mode for port 1:</p> <pre>#NET-DHCP?_1<CR></pre>
NET-GATE	<p>Set gateway IP.</p> <p>① 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.</p>	<p>COMMAND</p> <pre>#NET-GATE_ip_address<CR></pre> <p>FEEDBACK</p> <pre>~nn@NET-GATE_ip_address<CR><LF></pre>	<p>ip_address – Format: xxx.xxx.xxx.xxx</p>	<p>Set the gateway IP address to 192.168.0.1:</p> <pre>#NET-GATE_192.168.000.001<CR></pre>

Function	Description	Syntax	Parameters/Attributes	Example
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>
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 (User or Admin). password – Password for the login_level . Up to 15 printable ASCII chars	Set the password for the Admin protocol permission level to 33333: #PASS_Admin,33333<CR>
PASS?	Get password for login level. ⓘ The default password is an empty string.	COMMAND #PASS?_login_level<CR> FEEDBACK ~nn@PASS_login_level,password<CR><LF>	login_level – Level of login to set (User or Admin). password – Password for the login_level . Up to 15 printable ASCII chars	Get the password for the Admin protocol permission level: #PASS?_Admin<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. ⓘ We recommend that you 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,dest,src<CR> FEEDBACK ~nn@ROUTE_layer,dest,src<CR><LF>	layer Layer Enumeration 1 – Video dest 1 – OUT 1 HDMI 2 – OUT 2 HDBT 3 – OUT 3 HDBT 4 – OUT 4 HDBT 5 – OUT 5 HDBT 6 – OUT 6 HDBT 7 – OUT 7 HDBT 8 – OUT 8 HDBT 9 – OUT 9 HDBT * – ALL x – disconnect src – Source id 1 – IN 1 HDMI 2 – IN 2 HDBT	Route video IN 2 HDBT to video OUT 8 HDBT: #ROUTE_1,8,2<CR>
ROUTE?	Get layer routing. ⓘ This command replaces all other routing commands.	COMMAND #ROUTE?_layer,dest<CR> FEEDBACK ~nn@ROUTE_layer,dest,src<CR><LF>	layer Layer Enumeration 1 – Video Dest 1 – OUT 1 HDMI 2 – OUT 2 HDBT 3 – OUT 3 HDBT 4 – OUT 4 HDBT 5 – OUT 5 HDBT 6 – OUT 6 HDBT 7 – OUT 7 HDBT 8 – OUT 8 HDBT 9 – OUT 9 HDBT * – ALL x – disconnect src – Source id 1 – IN 1 HDMI 2 – IN 2 HDBT	Get the layer routing: #ROUTE?_layer,dest<CR>

Function	Description	Syntax	Parameters/Attributes	Example
SECUR	Start/stop security.  The permission system works only if security is enabled with the "SECUR" command.	COMMAND #SECUR_ <u>security_mode</u> <CR> FEEDBACK ~nn@SECUR_ <u>security_mode</u> <CR><LF>	security_mode – 0 – OFF (disables security) 1 – ON (enables security)	Enable the permission system: #SECUR_ <u>0</u> <CR>
SECUR?	Get current security state.  The permission system works only if security is enabled with the "SECUR" command.	COMMAND #SECUR? <u> </u> <CR> FEEDBACK ~nn@SECUR_ <u>security_mode</u> <CR><LF>	security_mode – 0 – OFF (disables security) 1 – ON (enables security)	Get current security state: #SECUR? <u> </u> <CR>
SIGNAL?	Get input signal status.	COMMAND #SIGNAL? <u>inp_id</u> <CR> FEEDBACK ~nn@SIGNAL_ <u>inp_id,status</u> <CR><LF>	inp_id – Input number 1 – IN 1 HDMI 2 – IN 2 HDBT status – Signal status according to signal validation: 0 – Off 1 – On	Get the input signal lock status of IN 1: #SIGNAL? <u>1</u> <CR>
SN?	Get device serial number.	COMMAND #SN? <u> </u> <CR> FEEDBACK ~nn@SN_ <u>serial_number</u> <CR><LF>	serial_number – 14 decimal digits, factory assigned	Get the device serial number: #SN? <u> </u> <CR>
VERSION?	Get firmware version number.	COMMAND #VERSION? <u> </u> <CR> FEEDBACK ~nn@VERSION_ <u>firmware_version</u> <CR><LF>	firmware_version – XX.XX.XXXX where the digit groups are: major.minor.build version	Get the device firmware version number: #VERSION? <u> </u> <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 – no changed
ERR_WRONG_MODE	33	Wrong operation mode
ERR_NOT_CONFIGURED	34	Device/chip was not initialized

The warranty obligations of Kramer Electronics Inc. ("Kramer Electronics") for this product are limited to the terms set forth below:

What is Covered

This limited warranty covers defects in materials and workmanship in this product.

What is Not Covered

This limited warranty does not cover any damage, deterioration or malfunction resulting from any alteration, modification, improper or unreasonable use or maintenance, misuse, abuse, accident, neglect, exposure to excess moisture, fire, improper packing and shipping (such claims must be presented to the carrier), lightning, power surges, or other acts of nature. This limited warranty does not cover any damage, deterioration or malfunction resulting from the installation or removal of this product from any installation, any unauthorized tampering with this product, any repairs attempted by anyone unauthorized by Kramer Electronics to make such repairs, or any other cause which does not relate directly to a defect in materials and/or workmanship of this product. This limited warranty does not cover cartons, equipment enclosures, cables or accessories used in conjunction with this product.

Without limiting any other exclusion herein, Kramer Electronics does not warrant that the product covered hereby, including, without limitation, the technology and/or integrated circuit(s) included in the product, will not become obsolete or that such items are or will remain compatible with any other product or technology with which the product may be used.

How Long this Coverage Lasts

The standard limited warranty for Kramer products is seven (7) years from the date of original purchase, with the following exceptions:

1. All Kramer VIA hardware products are covered by a standard three (3) year warranty for the VIA hardware and a standard three (3) year warranty for firmware and software updates; all Kramer VIA accessories, adapters, tags, and dongles are covered by a standard one (1) year warranty.
2. All Kramer fiber optic cables, adapter-size fiber optic extenders, pluggable optical modules, active cables, cable retractors, all ring mounted adapters, all Kramer speakers and Kramer touch panels are covered by a standard one (1) year warranty.
3. All Kramer Cobra products, all Kramer Calibre products, all Kramer Minicom digital signage products, all HighSecLabs products, all streaming, and all wireless products are covered by a standard three (3) year warranty.
4. All Sierra Video MultiViewers are covered by a standard five (5) year warranty.
5. Sierra switchers & control panels are covered by a standard seven (7) year warranty (excluding power supplies and fans that are covered for three (3) years).
6. K-Touch software is covered by a standard one (1) year warranty for software updates.
7. All Kramer passive cables are covered by a ten (10) year warranty.

Who is Covered

Only the original purchaser of this product is covered under this limited warranty. This limited warranty is not transferable to subsequent purchasers or owners of this product.

What Kramer Electronics Will Do

Kramer Electronics will, at its sole option, provide one of the following three remedies to whatever extent it shall deem necessary to satisfy a proper claim under this limited warranty:

1. Elect to repair or facilitate the repair of any defective parts within a reasonable period of time, free of any charge for the necessary parts and labor to complete the repair and restore this product to its proper operating condition. Kramer Electronics will also pay the shipping costs necessary to return this product once the repair is complete.
2. Replace this product with a direct replacement or with a similar product deemed by Kramer Electronics to perform substantially the same function as the original product.
3. Issue a refund of the original purchase price less depreciation to be determined based on the age of the product at the time remedy is sought under this limited warranty.

What Kramer Electronics Will Not Do Under This Limited Warranty

If this product is returned to Kramer Electronics or the authorized dealer from which it was purchased or any other party authorized to repair Kramer Electronics products, this product must be insured during shipment, with the insurance and shipping charges prepaid by you. If this product is returned uninsured, you assume all risks of loss or damage during shipment. Kramer Electronics will not be responsible for any costs related to the removal or re-installation of this product from or into any installation. Kramer Electronics will not be responsible for any costs related to any setting up this product, any adjustment of user controls or any programming required for a specific installation of this product.

How to Obtain a Remedy Under This Limited Warranty

To obtain a remedy under this limited warranty, you must contact either the authorized Kramer Electronics reseller from whom you purchased this product or the Kramer Electronics office nearest you. For a list of authorized Kramer Electronics resellers and/or Kramer Electronics authorized service providers, visit our web site at www.kramerav.com or contact the Kramer Electronics office nearest you.

In order to pursue any remedy under this limited warranty, you must possess an original, dated receipt as proof of purchase from an authorized Kramer Electronics reseller. If this product is returned under this limited warranty, a return authorization number, obtained from Kramer Electronics, will be required (RMA number). You may also be directed to an authorized reseller or a person authorized by Kramer Electronics to repair the product.

If it is decided that this product should be returned directly to Kramer Electronics, this product should be properly packed, preferably in the original carton, for shipping. Cartons not bearing a return authorization number will be refused.

Limitation of Liability

THE MAXIMUM LIABILITY OF KRAMER ELECTRONICS UNDER THIS LIMITED WARRANTY SHALL NOT EXCEED THE ACTUAL PURCHASE PRICE PAID FOR THE PRODUCT. TO THE MAXIMUM EXTENT PERMITTED BY LAW, KRAMER ELECTRONICS IS NOT RESPONSIBLE FOR DIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY BREACH OF WARRANTY OR CONDITION, OR UNDER ANY OTHER LEGAL THEORY. Some countries, districts or states do not allow the exclusion or limitation of relief, special, incidental, consequential or indirect damages, or the limitation of liability to specified amounts, so the above limitations or exclusions may not apply to you.

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Other Conditions

This limited warranty gives you specific legal rights, and you may have other rights which vary from country to country or state to state.

This limited warranty is void if (i) the label bearing the serial number of this product has been removed or defaced, (ii) the product is not distributed by Kramer Electronics or (iii) this product is not purchased from an authorized Kramer Electronics reseller. If you are unsure whether a reseller is an authorized Kramer Electronics reseller, visit our web site at www.kramerav.com or contact a Kramer Electronics office from the list at the end of this document.

Your rights under this limited warranty are not diminished if you do not complete and return the product registration form or complete and submit the online product registration form. Kramer Electronics thanks you for purchasing a Kramer Electronics product. We hope it will give you years of satisfaction.



P/N:



2900-300931

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 Web site where updates to this user manual may be found.

We welcome your questions, comments, and feedback.

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