



KRAMER ELECTRONICS LTD.

USER MANUAL

MODEL:

TP-576
HDMI/CAT 5 Line Driver

P/N: 2900-000760 Rev 4



TP-576 Quick Start Guide

This guide helps you install and use your product for the first time. For more detailed information, go to http://www.kramerelectronics.com/support/product_downloads.asp to download the latest manual or scan the QR code on the left.

Step 1: Check what's in the box

- ✓ TP-576 HDMI/CAT5 Line Driver
- ✓ 1 Power supply 12V DC
- ✓ 4 Rubber feet
- ✓ 1 Quick Start sheet
- ✓ Kramer RC-IR3 Infrared Remote Control Transmitter with batteries and user manual



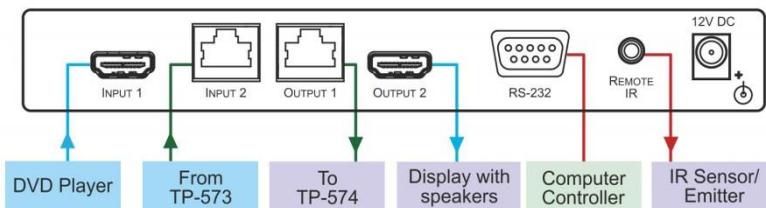
Save the original box and packaging materials in case you need to return your TP-576 for service.

Step 2: Install the TP-576

Attach the rubber feet and place on a table or mount the TP-576 in a rack (using an optional RK-T2B rack mount).

Step 3: Connect the inputs and outputs

Always switch off the power on each device before connecting it to your TP-576.



Always use Kramer high-performance cables for connecting AV equipment to the TP-576.

Step 4: Connect the power

Connect the 12V DC power adapter to the TP-576 and plug the adapter into the mains electricity.



Step 5: Operate the TP-576

To acquire the EDID, do the following:

1. Connect the power.
2. Connect the output or outputs from which you want to acquire the EDID.
3. Press and hold the EDID SETUP button to select the desired EDID. The OUT LEDs illuminate in the following cycle: OUT 1, OUT 2, both flash (Default) and both illuminate (Auto-mix).
4. Release the button when reaching the desired set up.

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1 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 video, audio, presentation, and broadcasting professionals on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better!

Our 1,000-plus different models now appear in 11 groups that are clearly defined by function: GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Routers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Range Extenders and Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Scalers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Accessories and Rack Adapters and GROUP 11: Sierra Products.

Congratulations on purchasing your Kramer **TP-576** *HDMI/CAT 5 Line Driver*, which is ideal for the following typical applications:

- Home theater, presentation and multimedia applications
- Rental and staging

2 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 http://www.kramerelectronics.com/support/product_downloads.asp to check for up-to-date user manuals, application programs, and to check if firmware upgrades are available (where appropriate).

2.1 Achieving the Best Performance

To achieve 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 **TP-576** 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.



You must use shielded twisted pair (STP) cabling with the **TP-576**, (refer to [Section 3.1](#) for further details).

2.2 Safety Instructions



Caution: There are no operator serviceable parts inside the unit

Warning: Use only the Kramer Electronics input power wall adapter that is provided with the unit

Warning: Disconnect the power and unplug the unit from the wall before installing

2.3 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 <http://www.kramerelectronics.com/support/recycling/>.

3 Overview

The **TP-576** is a twisted pair line driver for HDMI, bidirectional RS-232 and infrared signals. The **TP-576** receives an HDMI signal either from a local HDMI source or from a transmitter (for example, the Kramer **TP-573**) via the LINE IN RJ-45 connector. The **TP-576** decodes these input signals to the local outputs and simultaneously transmits them to a TP receiver (for example, the **TP-574**) which converts them back to HDMI, RS-232 and infrared signals.

Using the **TP-576**, you can pass via the twisted pair cable:

- EDID (Extended Display Information Data) and HDCP signals between the **TP-573** and **TP-574**
- HPD (Hot Plug Detect) signals from the display device to the source

The **TP-576** features:

- 6.75Gbps (2.25Gbps per graphic channel, HDMI); 4.95Gbps (1.65Gbps per graphic channel, twisted pair inputs and outputs)
Suitable for resolutions up to UXGA at 60Hz, and for all HD resolutions.
- An RS-232 baud rate of up to 38.4kbps
- HDTV compatibility and HDCP compliance
- Bidirectional RS-232 and IR interfaces. The IR input/output transmits and receives IR commands over CAT 5 cable between the transmitter and receiver
Compatible with a Kramer transmitter and via a Kramer external remote receiver: C-A35M/IRR or C-A35M/IRE or C A35M/2IRE
- A system range of up to 90m (295ft) at 1080i, or up to 30m (98ft) at 1080p on shielded **BC-DGKat524** cable; 90m (295ft) at 1080i, or up to 70m (230ft) at 1080p on shielded **BC-DGKat623** cable; 100m (330ft) at 1080i or up to 90m (295ft) at 1080p on shielded **BC-DGKat7a23** cable

Note that the transmission range depends on the signal resolution, graphics card and display used. The distance using non-Kramer CAT 5, CAT 6 and CAT 7a cables may not reach these ranges



Use only shielded cables with the **TP-576** in which the cable Ground shielding must be connected/soldered to the shield of both RJ-45 connectors

- HDMI support for Deep Color (on the HDMI input), x.v.Color™, HDMI Uncompressed Audio Channels, Dolby TrueHD, DTS-HD
- 3D pass-through
- The Power Connect System™ where a single connection to the **TP-576** powers the transmitter, receiver and line driver units
- The ability to read and store, in non-volatile memory, the default EDID, or the EDID block from either or both of the output display devices, so it can then provide the EDID information to the HDMI sources even if the display device is not connected
- LEDs indicating the selected input and active output LED indicators

The **TP-576** is 12V DC fed and is housed in a MegaTOOLS® enclosure where two units can be rack mounted side-by-side in a 1U rack space with the optional **RK-T2B** rack adapter.

3.1 Using Twisted Pair Cable

Kramer engineers have developed special twisted pair cables to best match our digital twisted pair products; the Kramer: **BC-DGKat524** (CAT 5 24 AWG), the Kramer: **BC-DGKat623** (CAT 6 23 AWG cable), and the Kramer: **BC-DGKat7a23** (CAT 7a 23 AWG cable). These specially built cables significantly outperform regular CAT 5/CAT 6/CAT 7a cables.



The **TP-573 / TP-574** cannot work with unshielded cables.

3.2 About the Power Connect™ Feature

The Power Connect™ feature here means that the **TP-576** unit can power both the transmitter and receiver when they are within 270 feet (**90 meters**) from the **TP-576**. The Power Connect™ feature applies as long as the cable can carry power. The distance does not exceed 90 meters on standard CAT 5 cable, for longer distances, heavy gauge cable should be used.

CAT 5 cable is still suitable for the video/audio transmission, but not for feeding the power at these distances.

3.3 Defining the TP-576 HDMI/CAT 5 Line Driver

This section defines the **TP-576**.

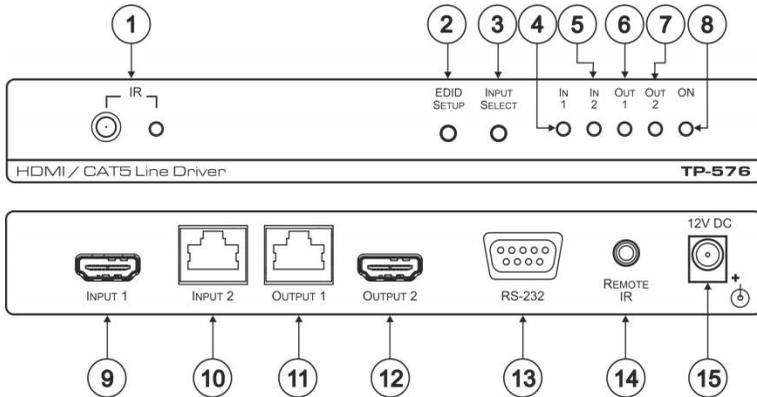


Figure 1: TP-576 HDMI/CAT 5 Line Driver

#	Feature	Function
1	IR Receiver	The yellow LED lights when receiving signals from the infrared remote control transmitter
2	EDID SETUP Button	Press briefly to determine the type of EDID stored in the non-volatile memory Press and hold to select the desired EDID setup and then release to acquire EDID (see Section 5.4)
3	INPUT SELECT Button	Press to select the input. The relevant IN LED illuminates
4	IN 1 LED	Illuminates when input 1 is selected
5	IN 2 LED	Illuminates when input 2 is selected
6	OUT 1 LED	Illuminates when output 1 is connected and active Flashes when the monitor does not support HDCP This LED also illuminates or flashes during EDID setup (see Section 5.4)
7	OUT 2 LED	Illuminates when output 2 is connected and active Flashes when the monitor does not support HDCP
8	ON LED	Illuminates when receiving power
9	INPUT 1 HDMI Connector	Connects to the HDMI source
10	INPUT 2 RJ-45 Connector	Connects to the CAT 5 IN RJ-45 connector on the TP-573 or TP-571
11	OUTPUT 1 RJ-45 Connector	Connects to the CAT 5 IN RJ-45 connector on the TP-574 or TP-572+
12	OUTPUT 2 HDMI Connector	Connects to the HDMI acceptor
13	RS-232 9-pin D-sub Connector	Connects to a PC or other controller
14	REMOTE IR 3.5mm Mini Jack	Connects to an infrared receiver/emitter Compatible with a Kramer transmitter and via a Kramer external remote IR receiver: C-A35M/IRR or C-A35M/IRE or C A35M/2IRE
15	12V DC	+12V DC connector for powering the unit

4 Connecting the TP-576



Always switch off the power to each device before connecting it to your **TP-576**. After connecting your **TP-576**, connect its power and then switch on the power to each device.

To connect the **TP-576** together with the **TP-573 HDMI/RS-232/IR Line Transmitter** and the **TP-574 HDMI/RS-232/IR Line Receiver**, as illustrated in the example in [Figure 2](#), connect the following:

On the **TP-573** connect:

1. An HDMI source (for example, a DVD player) to the HDMI IN connector.
2. An IR sensor or emitter to the IR 3.5mm mini jack connector (see [Section 4.2](#)).
3. A PC to the RS-232 9-pin D-sub connector.
Alternatively, you can connect an RS-232 controllable device to the RS-232 port of the **TP-573** and a PC to the RS-232 port of the **TP-574**.
4. A CAT 5 or CAT 6 cable to the LINE OUT RJ-45 twisted pair connector.

On the **TP-576** connect:

1. An HDMI source (for example, a DVD player) to the HDMI INPUT 1 connector.
2. The CAT 5 or CAT 6 cable from the **TP-573** to the INPUT 2 RJ-45 twisted pair connector (to power the **TP-576** as well as the **TP-573** and **TP-574**).
3. An IR sensor or emitter to the REMOTE IR 3.5mm mini jack connector (see [Section 4.2](#)).
4. The 12V DC power supply to the **TP-576** (not shown in [Figure 2](#)) (to power the **TP-576** as well as the **TP-573** and **TP-574**)

On the **TP-574** connect:

1. The HDMI OUT connector to an HDMI acceptor (for example, an LCD display with speakers).
2. An IR emitter or sensor to the IR 3.5mm mini jack connector (see [Section4.2](#)).
3. The RS-232 9-pin D-sub connector to an RS-232 acceptor (for example, an RS-232 controllable device).
Alternatively, you can connect an RS-232 controllable device to the RS-232 port of the **TP-573** and a PC to the RS-232 port of the **TP-574**.
4. The CAT 5 or CAT 6 cable from the **TP-576** to the LINE IN RJ-45 twisted pair connector.
5. The 12V DC power supply to the **TP-576** (not shown in [Figure 2](#)).

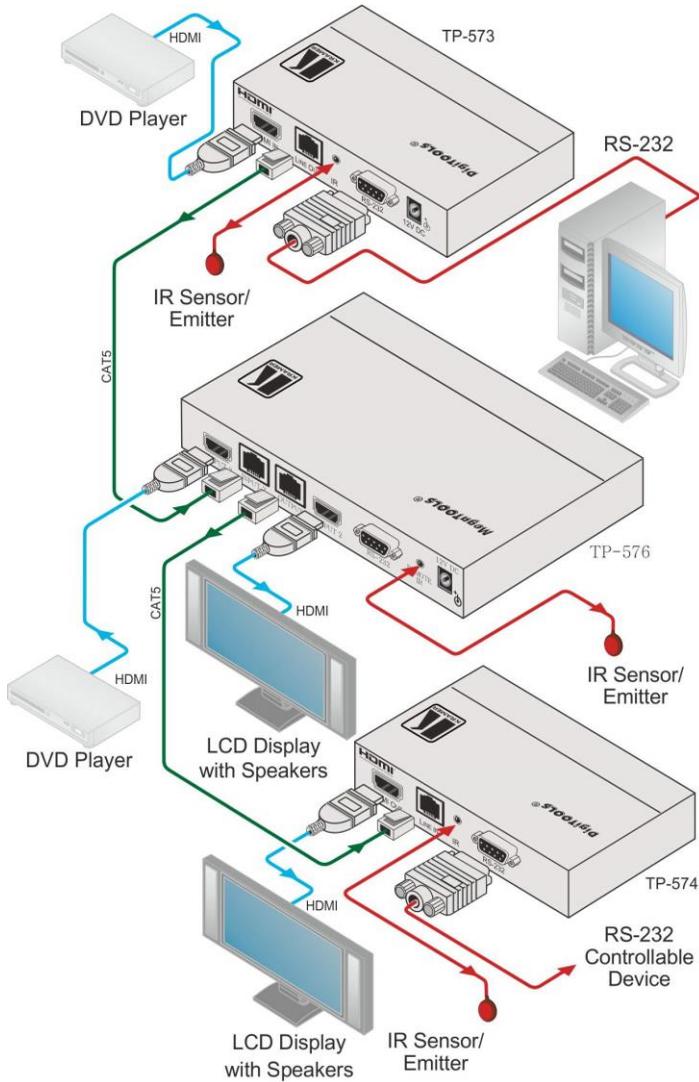


Figure 2: Connecting the TP-576 HDMI/CAT 5 Line Driver

4.1 Connecting to the TP-576 via RS-232

You can connect to the **TP-576** via an RS-232 connection using, for example, a PC. Note that a null-modem adapter/connection is not required.

To connect to the **TP-576** via RS-232, connect the RS-232 9-pin D-sub rear panel port on the **TP-576** unit via a 9-wire straight cable (only pin 2 to pin 2, pin 3 to pin 3, and pin 5 to pin 5 need to be connected) to the RS-232 9-pin D-sub port on your PC.

4.2 Connecting an IR Emitter/Sensor

The **TP-576** consists of an IR receiver and a REMOTE IR 3.5mm mini jack connector that can connect to either an emitter or receiver.

In a transmitter-receiver configuration that includes, for example, the **TP-573** and **TP-574**, IR control behavior is determined by the IR items (emitter or receiver) that are connected to the REMOTE IR or IR (for the **TP-573** and **TP-574**) 3.5mm mini jack connectors.

To control any device in this configuration, use the appropriate IR remote control transmitter. For example, the Kramer remote controller will be able to control Kramer devices. For controlling an LCD display you will need to use the LCD remote controller unit, and so on.

5 Operating the TP-576

This section explains how to:

- Control the **TP-576** via RS-232 or infrared signals
- Wire the TP cable
- Acquire the EDID

5.1 Controlling via RS-232

The **TP-576** passes bidirectional RS-232 signals between the **TP-573** and the **TP-574**. For example, a PC connected to the RS-232 port on the **TP-573** can control an RS-232 controllable device on the **TP-574**.

You can connect a PC to the RS-232 port on the **TP-576** via a straight connection (see [Section 5.1](#)) to control the **TP-576** only.

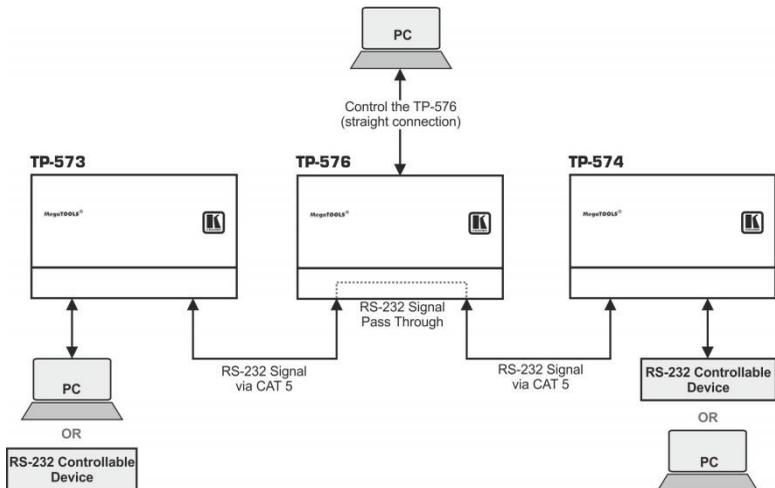


Figure 3: TP-576 RS-232 Signals

5.2 Controlling via Infrared

Many IR control configurations are available; this section shows several possibilities.

5.2.1 Controlling the System via IR - Example I

In the example illustrated in [Figure 4](#), IR emitters are attached to the DVD player connected to the **TP-573** and the LCD display connected to the **TP-574**.

Point the appropriate IR remote control transmitters to the **TP-576** IR receiver window (or IR sensor that is connected to the REMOTE IR 3.5mm mini jack connector) to control the **TP-576**, the DVD player and the LCD display.

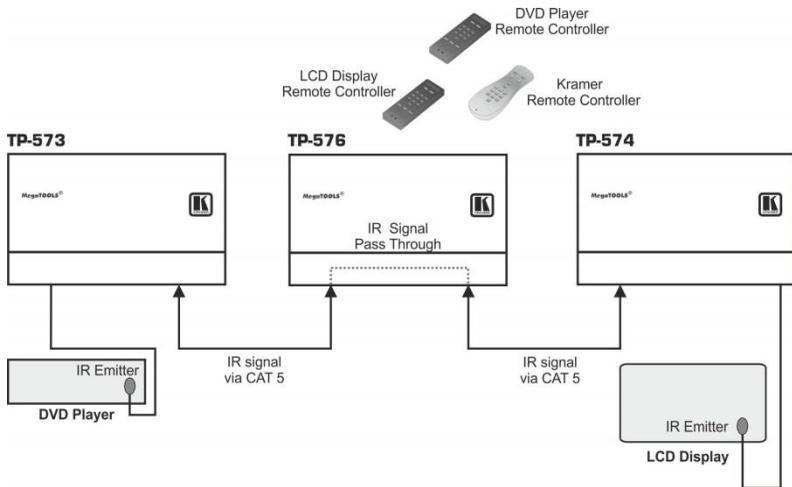


Figure 4: TP-576 IR Control – Example I

5.2.2 Controlling the System via IR – Example II

In the example illustrated in [Figure 5](#), an IR sensor is connected to the IR 3.5mm mini jack connector of the **TP-573** and an IR emitter is attached to the LCD display connected to the **TP-574**.

Point the LCD display remote controller either to the IR sensor of the **TP-573** or the IR receiver window of the **TP-576** to control the LCD display. Point the Kramer remote controller to IR receiver window of the **TP-576** to control the **TP-576**.

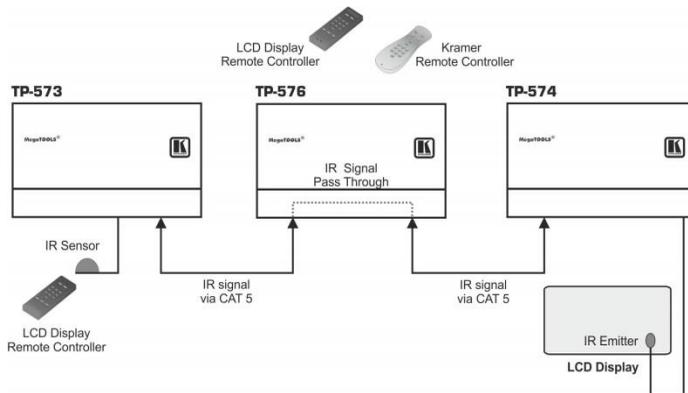


Figure 5: TP-576 IR Control – Example II

5.2.3 Controlling the System via IR – Example III

In the example illustrated in [Figure 6](#), an IR sensor is connected to the IR 3.5mm mini jack connector of the **TP-574** and an IR emitter is attached to the DVD 1 player connected to the **TP-573**.

Point the DVD 1 player remote controller to the IR sensor of the **TP-574** to control the DVD 1 player, and also the DVD 2 player remote controller to control the DVD 2 player (that is connected to the **TP-576**).

In addition, an IR emitter is attached to the DVD 2 player that is connected to the **TP-576**. Once an IR emitter is connected to the IR REMOTE 3.5mm mini jack connector, IR control on the **TP-576** becomes local.

Point the Kramer remote controller to the IR receiver window of the **TP-576** to control the **TP-576**.

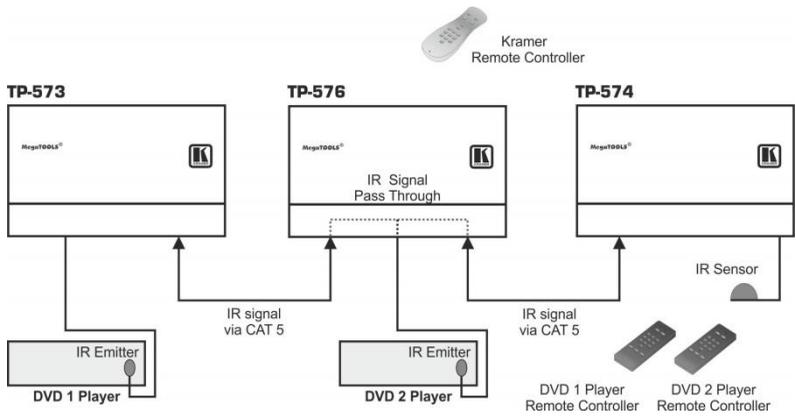


Figure 6: TP-576 IR Control – Example III

5.3 Wiring the TP LINE IN / LINE OUT RJ-45 Connectors

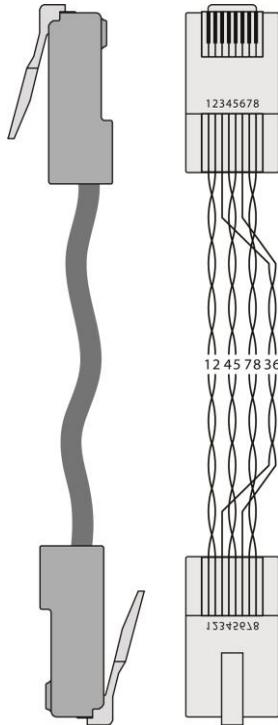
This section defines the TP pinout, using a **straight** pin-to-pin cable with RJ-45 connectors.



Note, that the cable Ground shielding must 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

Figure 7: TP PINOUT



5.4 Acquiring the EDID

Acquiring the EDID is usually done only once, when the machine is being set up in an installation. Once acquired, the EDID is saved in non-volatile memory and further acquisition is not necessary.

Initially, the **TP-576** operates with the factory default EDID. This lets you connect the power before connecting one of the acceptors or sources.

You can acquire the EDID from:

- One output (the local output and the output on the transmitter). The relevant output illuminates
- Two connected outputs, the auto-mix mode (both output LEDs illuminate)
The EDID acquired is a weighted average of all the connected outputs. For example, if several displays with different resolutions are connected to the outputs, the acquired EDID supports all the resolutions, as well as other parameters included in the EDID.
- The default EDID (both output LEDs flash)

To acquire the EDID, do the following:

1. Connect the power.
2. Connect the output or outputs from which you want to acquire the EDID.
3. Press and hold the EDID SETUP button to select the desired EDID.
The OUT LEDs illuminate in the following cycle: OUT 1, OUT 2, both flash (default) and both illuminate (auto-mix).
4. Release the button when reaching the desired set up.
The EDID is now acquired.
If you set the machine to acquire the EDID from an output that is not connected, the Default EDID is acquired.

5.5 Disabling/Enabling Deep Color Support

You can disable EDID deep color support to prevent signal deterioration when using long twisted pair cables on INPUT 2.

To disable deep color and acquire EDID:

1. Disconnect the power.
2. Connect the output or outputs from which you want to acquire the EDID.
3. Connect the power while pressing the EDID SETUP button.
4. Perform steps 3 and 4 in [Section 5.4](#).

To enable deep color and acquire EDID:

1. Disconnect the power.
2. Connect the output or outputs from which you want to acquire the EDID.
3. Connect the power while pressing the INPUT SELECT button.
4. Perform steps 3 and 4 in [Section 5.4](#).

6 Default EDID

Monitor [Real-time 0x0031]

Model name..... TP576-r0
Manufacturer..... KMR
Plug and Play ID..... KMR0576
Serial number..... 505-707455010
Manufacture date..... 2009, ISO week 10
Filter driver..... None

EDID revision..... 1.3
Input signal type..... Digital
Color bit depth..... Undefined
Display type..... RGB color
Screen size..... 520 x 320 mm (24.0 in)
Power management..... Standby, Suspend, Active off/sleep
Extension blocs..... 1 (CEA-EXT)

DDC/CI..... Not supported

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.. 1280x720p 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
640 x 480p at 60Hz - IBM VGA
640 x 480p at 75Hz - VESA
800 x 600p at 60Hz - VESA
800 x 600p at 75Hz - VESA
1024 x 768p at 60Hz - VESA
1024 x 768p at 75Hz - VESA
1280 x 1024p at 75Hz - VESA
1280 x 1024p at 60Hz - VESA STD
1600 x 1200p at 60Hz - VESA STD
1152 x 864p at 75Hz - VESA STD

7 Technical Specifications

INPUTS:	1 HDMI connector 1 CAT 5 on an RJ-45 connector
OUTPUTS:	1 CAT 5 on an RJ-45 connector 1 HDMI connector
PORTS:	1 bidirectional IR port on a 3.5mm mini jack 1 bidirectional RS-232 port on a 9-pin D-sub connector (for local control)
MAX. DATA RATE:	6.75Gbps (2.25Gbps bandwidth per graphic channel HDMI); 4.95Gbps (1.65Gbps per graphic channel twisted pair inputs and outputs)
COMPLIANCE WITH HDMI STANDARD:	Supports HDMI and HDCP
RS-232 BAUD RATE:	Up to 38.4kbps
CONTROLS:	EDID SETUP button, input select button
INDICATOR LEDs:	IN 1, IN 2, OUT 1, OUT 2, and ON LEDs
POWER CONSUMPTION:	12V DC, 1.1A (full load, for example, when connected with TP-573 and TP-574)
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
DIMENSIONS:	12.1cm x 7.18cm x 2.42cm (4.76" x 2.83" x 0.95"), W, D, H
WEIGHT:	0.3kg (0.67lbs) approx.
ACCESSORIES:	12V DC 2.1A power supply, bracket installation kit
OPTIONS:	RK-3T 19" rack mount, Kramer remote external receiver, C-A35M/IRR or C-A35M/IRE or C-A35M/2IRE
Specifications are subject to change without notice at http://www.kramerelectronics.com	

8 Default Communication Parameters

RS-232	
Protocol 2000	
Baud Rate	9600
Data Bits	8
Stop Bits	1
Parity	None
Command Format	HEX
Example (Output 1 to Input 1)	0x01, 0x81, 0x81, 0x81

9 Kramer Protocol 2000

This RS-232/RS-485 communication protocol uses four bytes of information as defined below. The default data rate is 9600 baud, with no parity, 8 data bits, and 1 stop bit.

	MSB	INSTRUCTION						LSB
	DESTINATION	N5	N4	N3	N2	N1	N0	
0	D							
7	6	5	4	3	2	1	0	
1st byte								
	INPUT							
1	I6	I5	I4	I3	I2	I1	I0	
7	6	5	4	3	2	1	0	
2nd byte								
	OUTPUT							
1	O6	O5	O4	O3	O2	O1	O0	
7	6	5	4	3	2	1	0	
3rd byte								
	MACHINE NUMBER							
1	OVR	X	M4	M3	M2	M1	M0	
7	6	5	4	3	2	1	0	
4th byte								

1st BYTE: Bit 7 – Defined as 0. D – “DESTINATION”:
 0 - for sending information to the switchers (from the PC);
 1 - for sending to the PC (from the switcher).
 N5...N0 – “INSTRUCTION”

The function that is to be performed by the switcher(s) is defined by the INSTRUCTION (6 bits). Similarly, if a function is performed using the machine's keyboard, then these bits are set with the INSTRUCTION NO., which was performed. The instruction codes are defined according to the table below (INSTRUCTION NO. is the value to be set for N5...N0).

2nd BYTE: Bit 7 – Defined as 1.
 I6...I0 – “INPUT”.

When switching (i.e. instruction codes 1 and 2), the INPUT (7 bits) is set as the input number which is to be switched. Similarly, if switching is done using the machine's front-panel, then these bits are set with the INPUT NUMBER which was switched. For other operations, these bits are defined according to the table.

3rd BYTE: Bit 7 – Defined as 1.
 O6...O0 – “OUTPUT”.

When switching (i.e. instruction codes 1 and 2), the OUTPUT (7 bits) is set as the output number which is to be switched. Similarly, if switching is done using the machine's front-panel, then these bits are set with the OUTPUT NUMBER which was switched. For other operations, these bits are defined according to the table.

4th BYTE: Bit 7 – Defined as 1.
 Bit 5 – Don't care.
 OVR – Machine number override.
 M4...M0 – MACHINE NUMBER.

Used to address machines in a system using their machine numbers. When several machines are controlled from a single serial port, they are usually configured together with each machine having an individual machine number. If the OVR bit is set, then all machine numbers will accept (implement) the command, and the addressed machine will reply.

For a single machine controlled using the serial port, always set M4...M0 = 1, and make sure that the machine itself is configured as MACHINE NUMBER = 1.

Note: All values in the table are decimal, unless otherwise stated.

INSTRUCTION		DEFINITION FOR SPECIFIC INSTRUCTION		NOTE
#	DESCRIPTION	INPUT	OUTPUT	
1	SWITCH VIDEO	Set equal to video input which is to be switched (0 = disconnect)	Set equal to video output which is to be switched (0 = to all the outputs)	2, 15
61	IDENTIFY MACHINE	1 - video machine name 3 - video software version	0 - Request first 4 digits 1 - Request first suffix	13
62	DEFINE MACHINE	1 - number of inputs 2 - number of outputs 3 - number of setups	1 - for video 3 - for SDI 4 - for remote panel 5 - for RS-422 controller	14

NOTES on the above table:

NOTE 2 - These are bi-directional definitions. That is, if the switcher receives the code, it will perform the instruction; and if the instruction is performed (due to a keystroke operation on the front panel), then these codes are sent. For example, if the HEX code

01 85 88 83

was sent from the PC, then the switcher (machine 3) will switch input 5 to output 8. If the user switched input 1 to output 7 using the front panel keypad, then the switcher will send HEX codes:

41 81 87 83

to the PC.

When the PC sends one of the commands in this group to the switcher, then, if the instruction is valid, the switcher replies by sending to the PC the same four bytes that it was sent (except for the first byte, where the DESTINATION bit is set high).

NOTE 13 - This is a request to identify the switcher/s in the system. If the OUTPUT is set as 0, and the INPUT is set as 1, 2, 5 or 7, the machine will send its name. The reply is the decimal value of the INPUT and OUTPUT. For example, for a 2216, the reply to the request to send the machine name would be (HEX codes):

7D 96 90 81 (i.e. $128_{dec} + 22_{dec}$ for 2nd byte, and $128_{dec} + 16_{dec}$ for 3rd byte).

If the request for identification is sent with the INPUT set as 3 or 4, the appropriate machine will send its software version number. Again, the reply would be the decimal value of the INPUT and OUTPUT - the INPUT representing the number in front of the decimal point, and the OUTPUT representing the number after it. For example, for version 3.5, the reply to the request to send the version number would be (HEX codes):

7D 83 85 81 (i.e. $128_{dec} + 3_{dec}$ for 2nd byte, $128_{dec} + 5_{dec}$ for 3rd byte).

If the OUTPUT is set as 1, then the ASCII coding of the lettering following the machine's name is sent. For example, for the VS-7588YC, the reply to the request to send the first suffix would be (HEX codes):

7D D9 C3 81 (i.e. $128_{dec} + \text{ASCII for "Y"}$; $128_{dec} + \text{ASCII for "C"}$).

NOTE 14 - The number of inputs and outputs refers to the specific machine which is being addressed, *not* to the system. For example, if six 16X16 matrices are configured to make a 48X32 system (48 inputs, 32 outputs), the reply to the HEX code

3E 82 81 82 (i.e. request the number of outputs)

would be HEX codes

7E 82 90 82

i.e. 16 outputs

NOTE 15 - When the OVR bit (4th byte) is set, then the "video" commands have universal meaning. For example, instruction 1 (SWITCH VIDEO) will cause all units (including data, etc.) to switch. Similarly, if a machine is in "FOLLOW" mode, it will perform any "video" instruction.

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SAFETY WARNING

Disconnect the unit from the power supply before opening and servicing



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Rev: 4