

Crestron **TPMC-CH-IMC**  
CAT5 Balanced AV Interface Module

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Operations Guide



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# CAT5 Balanced AV Interface Module: TPMC-CH-IMC

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## Introduction

### Features and Functions

The TPMC-CH-IMC is an audio/video interface module that is included as standard with many Isys<sup>®</sup> touchpanels that utilize Crestron Home<sup>®</sup> (CH) CAT5 AV connectivity. The interface module can connect to the touchpanel using a “triamese” interface cable (included with tilt model touchpanels) or using CresCAT-IM (or D) cable (sold separately). Installed neatly out of view near the touchpanel or mounted remotely in the central equipment cabinet, the TPMC-CH-IMC provides connections for Cresnet<sup>®</sup>, bidirectional audio and one video input signal. The balanced CAT5 AV outputs support cable runs up to 300 feet (90 meters) (observe distance limitations based upon power consumption for the touchpanel in use).

Additional interface modules may be purchased and installed to facilitate connectivity for a single movable touchpanel at multiple locations. The TPMC-CH-IMC can also be used as a CAT5 balanced AV interface for use with other Crestron<sup>®</sup> CAT5 AV products.

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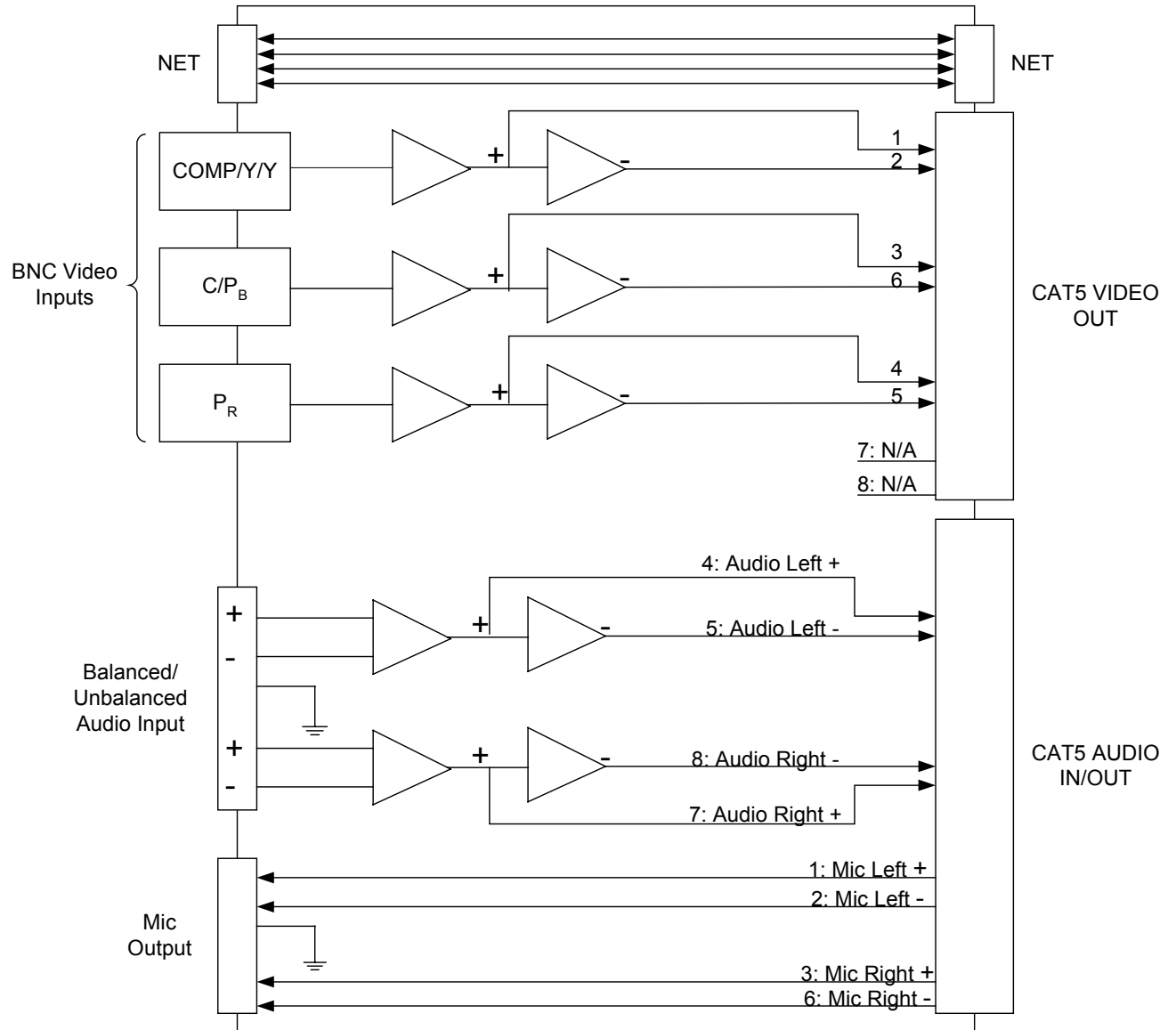
**NOTE:** The TPMC-CH-IMC is not compatible with QuickMedia<sup>®</sup> or 10-pin RJ-45 based systems.

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## Internal Block Diagram

The following diagram illustrates the function of the TPMC-CH-IMC.

### *Internal Block Diagram of the TPMC-CH-IMC*



## Specifications

Specifications for the TPMC-CH-IMC are listed in the following table.

### *TPMC-CH-IMC Specifications*

<b>SPECIFICATION</b>	<b>DETAILS</b>
Power Requirements Cresnet Power Usage	2 Watts (0.08 Amps @ 24 Volts DC)
Environmental Temperature Humidity Heat Dissipation	41° to 122° F (5° to 50° C) 10% to 90% RH (non-condensing) 7 BTU/Hr
Enclosure	Black metal, surface mount box with (2) integral mounting flanges
Dimensions Height Width Depth	1.29 in (3.28 cm) 7.30 in (18.54 cm) 3.95 in (10.03 cm)
Weight	9.7 lbs (0.28 kg)

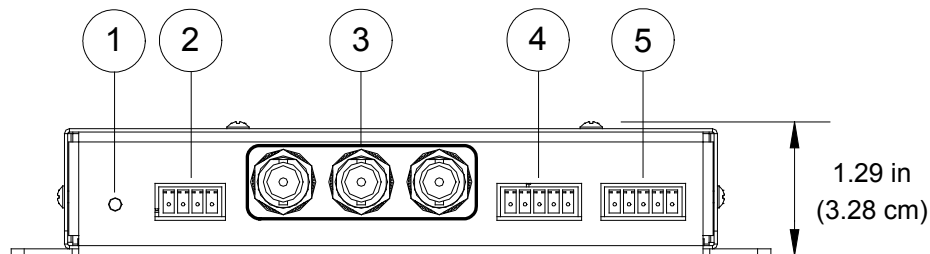
## Physical Description

This section provides information on the connections, controls and indicators available on your TPMC-CH-IMC.

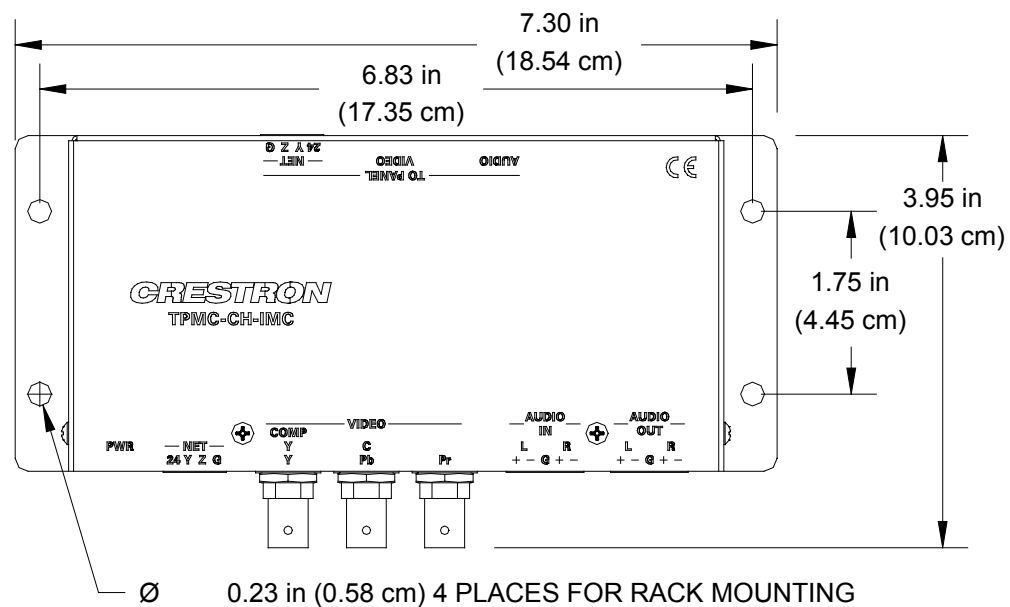
### *TPMC-CH-IMC Physical View*



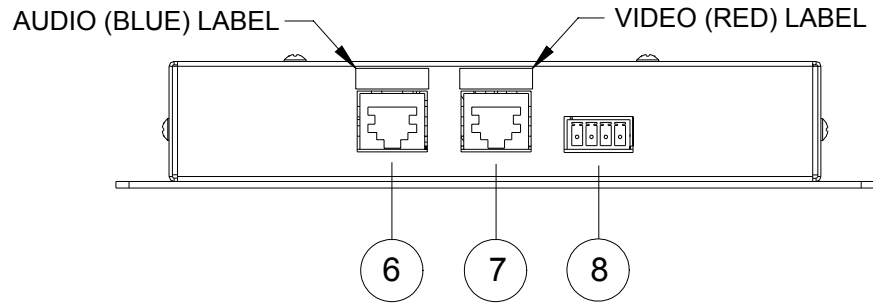
### *TPMC-CH-IMC Overall Dimensions (Front View)*



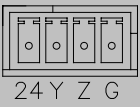
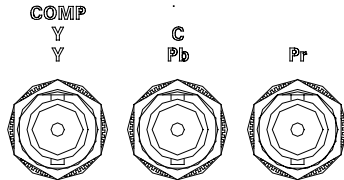
### *TPMC-CH-IMC Overall Dimensions (Top View)*



**TPMC-CH-IMC Overall Dimensions (Rear View)**

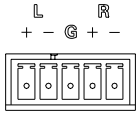
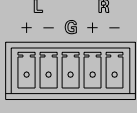
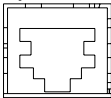
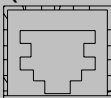


**Connectors, Controls & Indicators**

#	CONNECTORS <sup>1</sup> , CONTROLS & INDICATORS	DESCRIPTION
1	PWR	(1) Green LED, indicates 24 Volts DC power supplied from Cresnet control network.
2	NET 	Four-position terminal block connector for data and power. Connects to Cresnet control network. <b>24:</b> Power (24 Volts DC) <b>Y:</b> Data <b>Z:</b> Data <b>G:</b> Ground
3	VIDEO 	(3) BNC female; Provides (1) composite, S-video or component video input; Input impedance: 75 Ω; Input level: 1 V <sub>p-p</sub> nominal, 1.5 V <sub>p-p</sub> maximum; Maximum DC offset: 1.5 Volts

*(Continued on following page)*

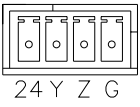
*Connectors, Controls & Indicators (Continued)*

#	CONNECTORS <sup>1</sup> , CONTROLS & INDICATORS	DESCRIPTION
4	<p>AUDIO IN</p> 	<p>(1) 5-pin 3.5 mm detachable terminal block; Balanced/unbalanced stereo line level input; Input impedance: 20 k<math>\Omega</math> balanced, 10 k<math>\Omega</math> unbalanced; Maximum input level: 4 V<sub>rms</sub> balanced, 2 V<sub>rms</sub> unbalanced</p>
5	<p>AUDIO OUT</p> 	<p>(1) 5-pin 3.5 mm detachable terminal block; Balanced stereo line level output (unbuffered pass-through from <b>AUDIO (TO PANEL)</b>)</p>
6	<p>AUDIO (TO PANEL)<sup>2</sup></p> 	<p>(1) 8-pin RJ-45 female; Bidirectional CAT5 balanced stereo audio port; Output impedance: 100 <math>\Omega</math> balanced; Maximum output level: 2 V<sub>rms</sub>; Input impedance: infinite (unbuffered pass-through to <b>AUDIO OUT</b>)</p>
7	<p>VIDEO (TO PANEL)<sup>3</sup></p> 	<p>(1) 8-pin RJ-45 female; CAT5 balanced video output port; Output impedance: 100 <math>\Omega</math> balanced</p>

*(Continued on following page)*

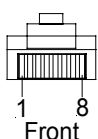
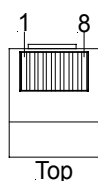


*Connectors, Controls & Indicators (Continued)*

#	CONNECTORS <sup>1</sup> , CONTROLS & INDICATORS	DESCRIPTION
8	NET (TO PANEL) 	Four-position terminal block connector for data and power. Pass-through from <b>NET</b> port. <b>24</b> : Power (24 Volts DC) <b>Y</b> : Data <b>Z</b> : Data <b>G</b> : Ground

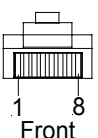
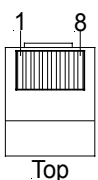
1. Interface connectors for **NET**, **AUDIO IN**, **AUDIO OUT** and **NET (TO PANEL)** ports are provided with the unit.

2. **AUDIO (TO PANEL)** pinouts:



PIN	WIRE COLORS (568B)	WIRE COLORS (568A)	AUDIO I/O
1	WHITE/ORANGE	WHITE/GREEN	+ Mic Left Out
2	ORANGE	GREEN	- Mic Left Out
3	WHITE/GREEN	WHITE/ORANGE	+ Mic Right Out
4	BLUE	BLUE	+ Audio Left In
5	WHITE/BLUE	WHITE/BLUE	- Audio Left In
6	GREEN	ORANGE	- Mic Right Out
7	WHITE/BROWN	WHITE/BROWN	+ Audio Right In
8	BROWN	BROWN	- Audio Right In

3. **VIDEO (TO PANEL)** pinouts:



PIN	WIRE COLORS (568B)	WIRE COLORS (568A)	COMPOSITE	S-VIDEO	COMPONENT
1	WHITE/ ORANGE	WHITE/ GREEN	+ Composite	+ Luminance	+ Y
2	ORANGE	GREEN	- Composite	- Luminance	- Y
3	WHITE/ GREEN	WHITE/ ORANGE	N/A	+ Chrominance	+ P <sub>b</sub>
4	BLUE	BLUE	N/A	N/A	+ P <sub>r</sub>
5	WHITE/ BLUE	WHITE/ BLUE	N/A	N/A	- P <sub>r</sub>
6	GREEN	ORANGE	N/A	- Chrominance	- P <sub>b</sub>
7	WHITE/ BROWN	WHITE/ BROWN	N/A	N/A	N/A
8	BROWN	BROWN	N/A	N/A	N/A

## Industry Compliance

As of the date of manufacture, the TPMC-CH-IMC has been tested and found to comply with specifications for CE marking and standards per EMC and Radiocommunications Compliance Labelling.



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**NOTE:** This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
  - Increase the separation between the equipment and receiver.
  - Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
  - Consult the dealer or an experienced radio/TV technician for help.
-

## Setup

### Network Wiring

When wiring the Cresnet network, consider the following:

- Use Crestron Certified Wire.
- Use Crestron power supplies for Crestron equipment.
- Provide sufficient power to the system.

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**CAUTION:** Insufficient power can lead to unpredictable results or damage to the equipment. Please use the Crestron Power Calculator to help calculate how much power is needed for the system ([www.crestron.com/calculators](http://www.crestron.com/calculators)).

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- For networks with 20 or more devices, use a Cresnet Hub/Repeater (CNXHUB) to maintain signal quality.

For more details, refer to “Check Network Wiring” which starts on page 13.

### CAT5 Wiring

Category 5 (CAT5) wiring is a twisted pair cable designed for Ethernet networks. These networks operate at speeds of up to 100 Megabits per second (Mbps) using the 100BASE-T standard. Crestron takes advantage of this specification for a variety of audio and video applications.

Crestron recommends using CresCAT-IM (or D) wire for transmitting video signals from the **VIDEO (TO PANEL)** port.

When using a Crestron wiring solution, the CresCAT-IM (or D) wire can carry audio and video signals up to 500 feet (observe distance limitations based upon power consumption for the device in use).

For more information, refer to the latest version of the Crestron CAT5 Wiring Reference Guide (Doc. 6137), which is available for download from the Crestron website ([www.crestron.com/manuals](http://www.crestron.com/manuals)).

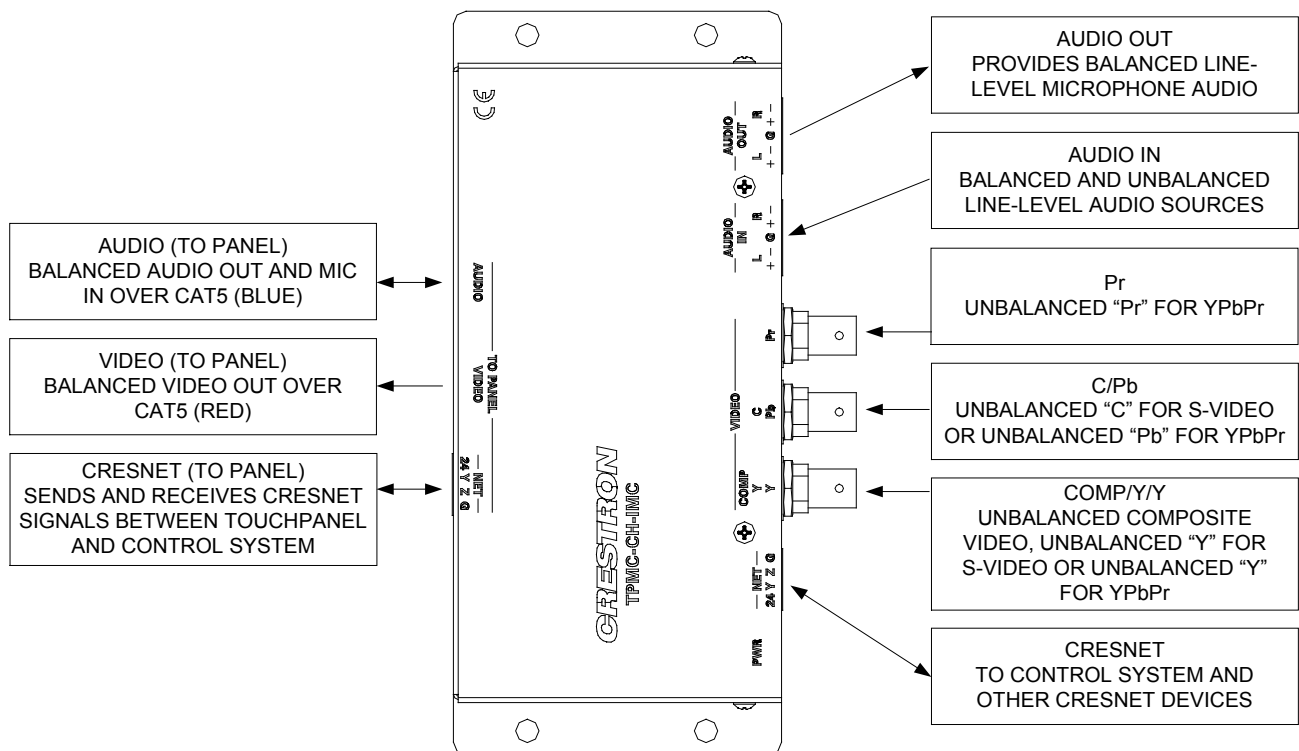
## Hardware Hookup

Make the necessary connections as called out in the illustration that follows this paragraph. Refer to “Network Wiring” on page 9 before attaching the 4-position terminal block connector. Apply power after all connections have been made.

It is not necessary to make connections to a video source unless a video window object resides on a page within the uploaded Crestron VisionTools® Pro-e (VT Pro-e) project.

When making connections to the TPMC-CH-IMC, use Crestron power supplies for Crestron equipment.

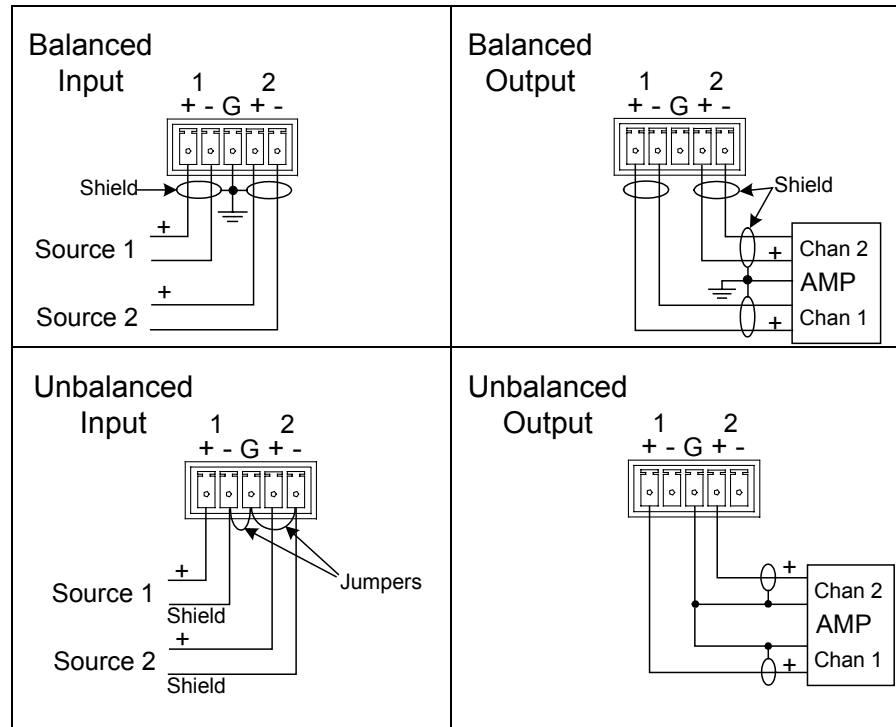
### *Hardware Connections for the TPMC-CH-IMC*



A triamese cable included with the touchpanel has an RJ-45 connector with a blue cover to match the blue label on the TPMC-CH-IMC and an RJ-45 connector with a red cover to match the red label on the TPMC-CH-IMC. The cable also has a 4-position mini terminal block connector for making a network connection between the touchpanel and the TPMC-CH-IMC.

The TPMC-CH-IMC can send and receive balanced or unbalanced audio signals. Refer to the following diagrams when connecting balanced and unbalanced signals to the TPMC-CH-IMC.

***Typical Balanced/Unbalanced Outputs***



**NOTE:** Ensure the unit is properly grounded.

**NOTE:** The TPMC-CH-IMC can only be powered by the 4-position terminal block connector labeled **NET**. Power cannot be supplied from network devices that are connected to the mini-terminal block connectors.

**NOTE:** For CAT5 connections, use Crestron Certified Wire.

## Problem Solving

### Troubleshooting

The following table provides corrective action for possible trouble situations. If further assistance is required, please contact a Crestron customer service representative.

#### *TPMC-CH-IMC Troubleshooting*

<b>TROUBLE</b>	<b>POSSIBLE CAUSE(S)</b>	<b>CORRECTIVE ACTION</b>
Touchpanel does not function.	Touchpanel is not communicating with the network.	Use Crestron Toolbox to poll the network. Verify network connection to the device.
Video window on touchpanel has no display.	Improper video connection.	Verify proper connections on the touchpanel and TPMC-CH-IMC.
	Incorrect video format selection.	Select the proper video input configuration in the touchpanel Setup menu.
	Incorrect VT Pro-e project file loaded.	Ensure the video window object resides in the project, recompile and reload.
	Damaged connector pins.	Inspect connector pins. If bent, straighten carefully. If broken, contact Crestron customer service.
No audio from touchpanel speakers.	Improper audio connection.	Verify proper connections on the touchpanel and TPMC-CH-IMC.

## Check Network Wiring

### Use the Right Wire

In order to ensure optimum performance over the full range of your installation topology, Crestron Certified Wire and only Crestron Certified Wire may be used. Failure to do so may incur additional charges if support is required to identify performance deficiencies because of using improper wire.

### Calculate Power

**CAUTION:** Use only Crestron power supplies for Crestron equipment. Failure to do so could cause equipment damage or void the Crestron warranty.

**CAUTION:** Provide sufficient power to the system. Insufficient power can lead to unpredictable results or damage to the equipment. Please use the Crestron Power Calculator to help calculate how much power is needed for the system ([www.crestron.com/calculators](http://www.crestron.com/calculators)).

When calculating the length of wire for a particular Cresnet run, the wire gauge and the Cresnet power usage of each network unit to be connected must be taken into consideration. Use Crestron Certified Wire only. If Cresnet units are to be daisy-chained on the run, the Cresnet power usage of each network unit to be daisy-chained must be added together to determine the Cresnet power usage of the entire chain. If the unit is home-run from a Crestron system power supply network port, the Cresnet power usage of that unit is the Cresnet power usage of the entire run. The wire gauge and the Cresnet power usage of the run should be used in the following equation to calculate the cable length value on the equation's left side.

### *Cable Length Equation*

$$L < \frac{40,000}{R \times P}$$

Where: L = Length of run (or chain) in feet  
R = 6 Ohms (Crestron Certified Wire: 18 AWG (0.75 MM<sup>2</sup>))  
or 1.6 Ohms (Cresnet HP: 12 AWG (4 MM<sup>2</sup>))  
P = Cresnet power usage of entire run (or chain)

Make sure the cable length value is less than the value calculated on the right side of the equation. For example, a Cresnet run using 18 AWG Crestron Certified Wire and drawing 20 watts should not have a length of run more than 333 feet (101 meters). If Cresnet HP is used for the same run, its length could extend to 1250 feet.

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**NOTE:** All Crestron certified Cresnet wiring must consist of two twisted pairs. One twisted pair is the +24V conductor and the GND conductor and the other twisted pair is the Y conductor and the Z conductor.

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**Strip and Tin Wire**

When daisy-chaining Cresnet units, strip the ends of the wires carefully to avoid nicking the conductors. Twist together the ends of the wires that share a pin on the network connector and tin the twisted connection. Apply solder only to the ends of the twisted wires. Avoid tinning too far up the wires or the end becomes brittle. Insert the tinned connection into the Cresnet connector and tighten the retaining screw. Repeat the procedure for the other three conductors.

**Add Hubs**

Use of a Cresnet Hub/Repeater (CNXHUB) is advised whenever the number of Cresnet devices on a network exceeds 20 or when the combined total length of Cresnet cable exceeds 3000 feet (914 meters).

## Reference Documents

The latest version of all documents mentioned within the guide can be obtained from the Crestron website ([www.crestron.com/manuals](http://www.crestron.com/manuals)). This link will provide a list of product manuals arranged in alphabetical order by model number.

### *List of Related Reference Documents*

DOCUMENT TITLE
CAT5 Wiring Reference Guide

## Further Inquiries

If you cannot locate specific information or have questions after reviewing this guide, please take advantage of Crestron's award winning customer service team by calling Crestron at 1-888-CRESTRON [1-888-273-7876].

You can also log onto the online help section of the Crestron website ([www.crestron.com/onlinehelp](http://www.crestron.com/onlinehelp)) to ask questions about Crestron products. First-time users will need to establish a user account to fully benefit from all available features.



## **Future Updates**

As Crestron improves functions, adds new features and extends the capabilities of the TPMC-CH-IMC, additional information may be made available as manual updates. These updates are solely electronic and serve as intermediary supplements prior to the release of a complete technical documentation revision.

Check the Crestron website periodically for manual update availability and its relevance. Updates are identified as an “Addendum” in the Download column.

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## Return and Warranty Policies

### Merchandise Returns / Repair Service

1. No merchandise may be returned for credit, exchange or service without prior authorization from CRESTRON. To obtain warranty service for CRESTRON products, contact an authorized CRESTRON dealer. Only authorized CRESTRON dealers may contact the factory and request an RMA (Return Merchandise Authorization) number. Enclose a note specifying the nature of the problem, name and phone number of contact person, RMA number and return address.
2. Products may be returned for credit, exchange or service with a CRESTRON Return Merchandise Authorization (RMA) number. Authorized returns must be shipped freight prepaid to CRESTRON, 6 Volvo Drive, Rockleigh, N.J. or its authorized subsidiaries, with RMA number clearly marked on the outside of all cartons. Shipments arriving freight collect or without an RMA number shall be subject to refusal. CRESTRON reserves the right in its sole and absolute discretion to charge a 15% restocking fee plus shipping costs on any products returned with an RMA.
3. Return freight charges following repair of items under warranty shall be paid by CRESTRON, shipping by standard ground carrier. In the event repairs are found to be non-warranty, return freight costs shall be paid by the purchaser.

### CRESTRON Limited Warranty

CRESTRON ELECTRONICS, Inc. warrants its products to be free from manufacturing defects in materials and workmanship under normal use for a period of three (3) years from the date of purchase from CRESTRON, with the following exceptions: disk drives and any other moving or rotating mechanical parts, pan/tilt heads and power supplies are covered for a period of one (1) year; touchscreen display and overlay components are covered for 90 days; batteries and incandescent lamps are not covered.

This warranty extends to products purchased directly from CRESTRON or an authorized CRESTRON dealer. Purchasers should inquire of the dealer regarding the nature and extent of the dealer's warranty, if any.

CRESTRON shall not be liable to honor the terms of this warranty if the product has been used in any application other than that for which it was intended or if it has been subjected to misuse, accidental damage, modification or improper installation procedures. Furthermore, this warranty does not cover any product that has had the serial number altered, defaced or removed.

This warranty shall be the sole and exclusive remedy to the original purchaser. In no event shall CRESTRON be liable for incidental or consequential damages of any kind (property or economic damages inclusive) arising from the sale or use of this equipment. CRESTRON is not liable for any claim made by a third party or made by the purchaser for a third party.

CRESTRON shall, at its option, repair or replace any product found defective, without charge for parts or labor. Repaired or replaced equipment and parts supplied under this warranty shall be covered only by the unexpired portion of the warranty.

Except as expressly set forth in this warranty, CRESTRON makes no other warranties, expressed or implied, nor authorizes any other party to offer any warranty, including any implied warranties of merchantability or fitness for a particular purpose. Any implied warranties that may be imposed by law are limited to the terms of this limited warranty. This warranty statement supersedes all previous warranties.

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**11.08**

Specifications subject to  
change without notice.