

HDAV[®]

HDMI[™] Audio & Video Dual CAT5/RJ45 Extender Kit With Bi-Directional IR Pass-Through And Phantom Power

User Manual
(HDMI-C5IRB)



[Must be used with Solid CAT5e or CAT6 Cable]

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Rev.1012



Made in Taiwan



Safety and Notice

The **HDMI-C5IRB HDMI Audio & Video Dual CAT5/RJ45 Extender Kit With Bi-Directional IR Pass-Through And Phantom Power** has been tested for conformance to safety regulations and requirements, and has been certified for international use. However, like all electronic equipments, the **HDMI-C5IRB** should be used with care. Please read and follow the safety instructions to protect yourself from possible injury and to minimize the risk of damage to the unit.

- Follow all instructions and warnings marked on this unit.
- Do not attempt to service this unit yourself, except where explained in this manual.
- Provide proper ventilation and air circulation and do not use near water.
- Keep objects that might damage the device and assure that the placement of this unit is on a stable surface.
- Use only the power adapter and power cords and connection cables designed for this unit.
- Do not use liquid or aerosol cleaners to clean this unit. Always unplug the power to the device before cleaning.



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INTRODUCTION

The **HDMI-C5IRB HDMI Audio & Video Dual CAT5/RJ45 Extender Kit With Bi-Directional IR Pass-Through And Phantom Power** boosts your audio/video transmission distance up to 200ft (60m) in HDTV 1080i format, 130ft (40m) in HDTV 1080p format, and 65ft (20m) in HDTV 1080p with 36 bit color depth. With two cost effective solid Cat-5/5e/6 UTP/STP cable, users can readily extend HDTV sources from DVD players, Blu-ray Disc player, PS3, PC, and any other kinds of sources compliant with TMDS to distant display monitors including HDMI or DVI enabled TV sets or LCD PC monitors. The HDMI-C5IRB also features with embedded IR input and output on both Transmitting and Receiving units so users can control the source device or HDMI display at remote site via IR remote in di-directional IR pass-through.

The HDMI-C5IRB includes two units: Transmitting unit and Receiving unit. The Transmitting unit sends the HDMI or DVI signals received from the source device and receives IR signals from the Receiving unit or sends the received IR signal from the Transmitting unit via two low cost Cat-5/5e/6 cables. The Receiving unit is responsible for equalizing the audio/video data received from the Transmitting unit and sends the IR signals received from the IR Receiving to the Transmitting unit or receives IR signals from the Transmitting unit. The transmission distance between the audio/video source and the display can be up to 60m / 200ft at HD resolution (720p/1080i), or 40m / 130ft at Full HD resolution (1080p). With 8-level digital signal equalization control on the Receiving unit, users can adjust the signal level equalization scale to the received audio/video signals, and therefore optimize the transmission distance between source and display.

Features

- HDMI 1.3c compliant, all HDMI 3D formats supported
- Extends the transmission distance up to 60m (200ft) from the sources under 1080i or 720p
- Extends the transmission distance up to 40m (130ft) from the sources under 1080p
- Provides independent DDC channel, fully HDCP compliant
- Minimizes the cable skew by adjustable 8-level equalization rotary control switch
- Support bi-directional full frequency of IR signal, 20kHz ~ 60kHz
- Pure unaltered uncompressed 7.1ch digital HDMI over CAT5/6 cable transmission
- Wall mounting housing design for easy and robust installation
- Only needs power supply at either TX or RX unit
- Perfectly integrated with other HDMI over CAT.X series products



The claimed transmission distance here is subject to the grade of installed cable(s), source device and display.

For over CAT.X transmission, the cable(s) has to be solid, not stranded. Any keystone jack along the transmission path will kill the transmission performance significantly!

Package Contents

- 1x HDMI-C5IRB (TX and RX)
- 1x IR blaster
- 1x User Manual
- 1x DC 5V power supply unit
- 1x IR receiver (20-60kHz)

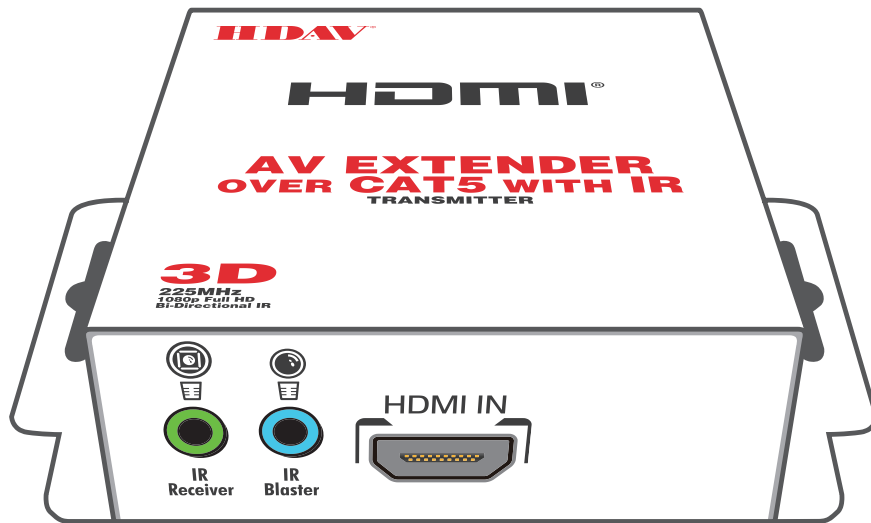
Specifications

Model Name		HDMI-C5IRB	
Technical			
Role of usage		Transmitter [TX]	Receiver [RX]
HDMI compliance		Yes	
HDCP compliance		Yes	
Video bandwidth		Single-link 225MHz [6.75Gbps]	
Video support		480i / 480p / 720p / 1080i / 1080p60	
HDMI over UTP transmission [8-bit]		Full HD (1080p)-40m (130ft) [CAT5e] / 50m (165ft) [CAT6] HD (720p/1080i)-50m (165ft) [CAT5e] / 60m (200ft) [CAT6]	
Audio support		Surround sound (up to 7.1ch) or stereo digital audio	
Signal equalization		8-level digital rotary switch for signal level control at RX	
Input TMDS signal		1.2 Volts [peak-to-peak]	
Input DDC signal		5 Volts [peak-to-peak, TTL]	
ESD protection		[1] Human body model — 19kV [air-gap discharge] & 12kV [contact discharge] [2] Core chipset — 8kV	
PCB stack-up		4-layer board [impedance control — differential 100Ω ; single 50Ω]	
IR pass-through		Half-duplex bi-directional	
Input		1x HDMI + 1x 3.5mm	2x RJ45 + 1x 3.5mm
Output		2x RJ45 + 1x 3.5mm	1x HDMI + 1x 3.5mm
HDMI source & display control		Controllable via bi-directional IR pass-through path	
IR remote control		Electro-optical characteristics: $\tau = 25^\circ$ / Carrier frequency: 20-60kHz	
HDMI connector		Type A [19-pin female]	
RJ45 connector		WE/SS 8P8C with 2 LED indicators	
3.5mm connector		IR blaster or receiver	
Rotary control switch		None	Signal level equalization
Mechanical			
Housing		Metal enclosure	
Dimensions [L x W x H]	Model	74 x 83 x 27mm (2.9" x 3.3" x 1.1")	
	Package	175 x 270 x 80mm (6.9" x 10.6" x 3.1")	
Weight	Model	405g (14oz)	
	Package	815g (1.8 lbs)	
Fixedness		Wall-mounting case with screws	
Power supply		5V DC at either TX or RX (phantom power)	
Power consumption		1.5 Watt (max)	
Operation temperature		0~40°C (32~104°F)	
Storage temperature		-20~60°C (-4~140°F)	
Relative humidity		20~90% RH (no condensation)	

PANEL DESCRIPTIONS

Transmitting unit of HDMI-C5IRB

Front Panel

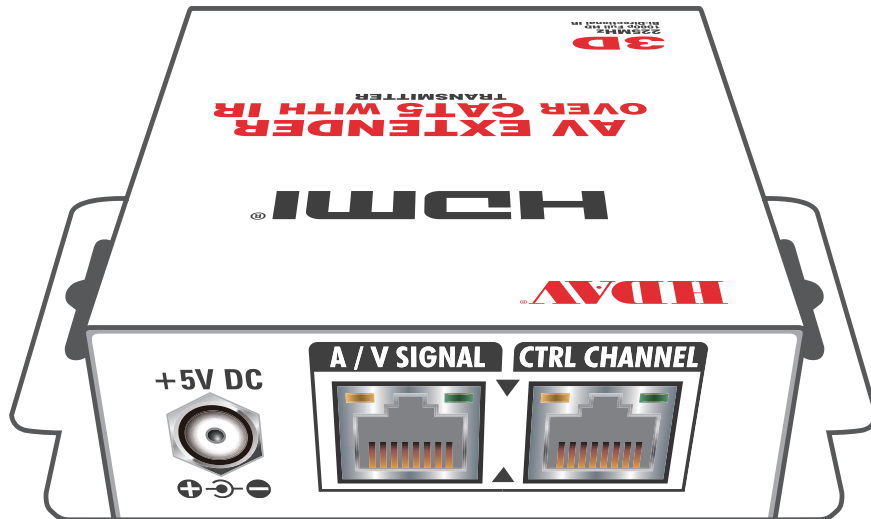


IR Receiver: 3.5mm infrared socket for plugging in the extension cable of IR receiver

IR Blaster: 3.5mm infrared socket for plugging in the extension cable of IR blaster

HDMI IN: Connects to a HDMI source with a HDMI male-male cable

Rear Panel



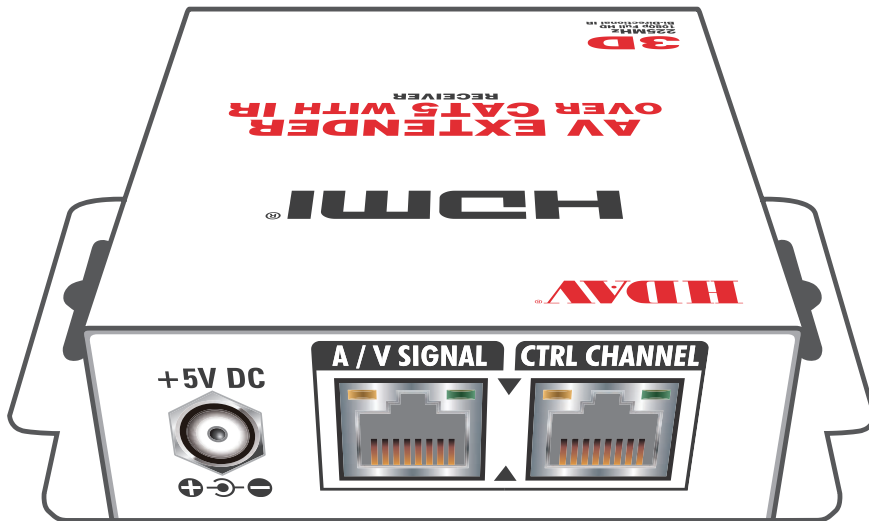
+5V DC: Connect to 5V DC power supply unit either at the Transmitting Unit or the Receiving Unit. Powered at one end is enough to supply the whole extender set.

A / V SIGNAL: Connect a Cat-5/5e/6 cable to the AUDIO/VIDEO port on the Receiving unit

CTRL CHANNEL: Connect a Cat-5/5e/6 cable to the CONTROL CHANNEL port on the Receiving unit

Receiving Unit of HDMI-C5IRB

Front Panel

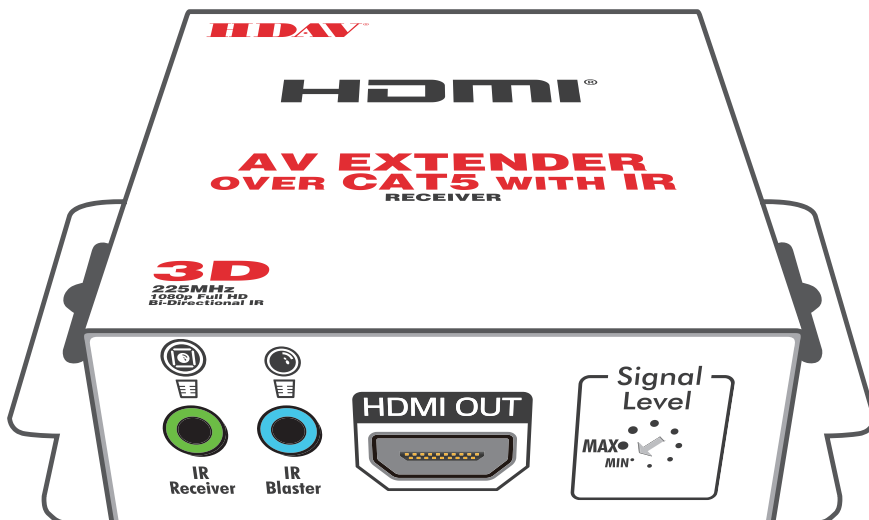


+5V DC: Connect to 5V DC power supply unit either at the Receiving Unit or the Transmitting Unit. Powered at one end is enough to supply the whole extender set.

A / V SIGNAL: Connect a Cat-5/5e/6 cable to the AUDIO/VIDEO port on the Transmitting unit

CTRL CHANNEL: Connect a Cat-5/5e/6 cable to the CONTROL CHANNEL port on the Transmitting unit

Rear Panel



IR Receiver: 3.5mm infrared socket for plugging in the extension cable of IR receiver

IR Blaster: 3.5mm infrared socket for plugging in the extension cable of IR blaster

HDMI OUT: Connects to a HDMI display or projector with a HDMI male-male cable

Signal Level: Adjust the 8-level signal equalization control to the received HDMI signals. The HDMI signal level varies from MAX (strongest) to MIN (weakest) for respective transmission length from longest possible range to short distance. Dial the EQ from MIN to MAX and stop turning the rotary switch whenever the audio/video is playing normally. Inappropriate signal level setting may cause overpowering issues that would shorten the product's life significantly!

IR Extenders

IR Blaster



IR Receiver



IR Sockets

IR Blaster: plug in the IR blaster to emit all IR command signals received from the IR receiver from the other end to control the devices corresponding to the IR signals.

IR Receiver: plug in the IR receiver to receive all IR command signals from the IR remote controls of the corresponding devices.

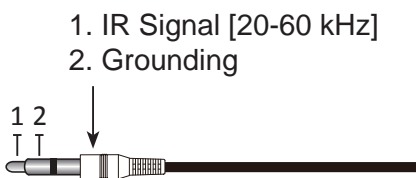


CAUTION!

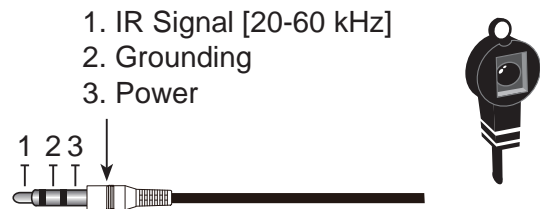
Incorrect placement of IR Blaster and Receiver may result in the failure of the IR extenders. Please check carefully before plugging in the IR extender to the respective IR sockets. Warranty will not cover the damage.

Definition of IR Earphone Jack

IR Blaster



IR Receiver



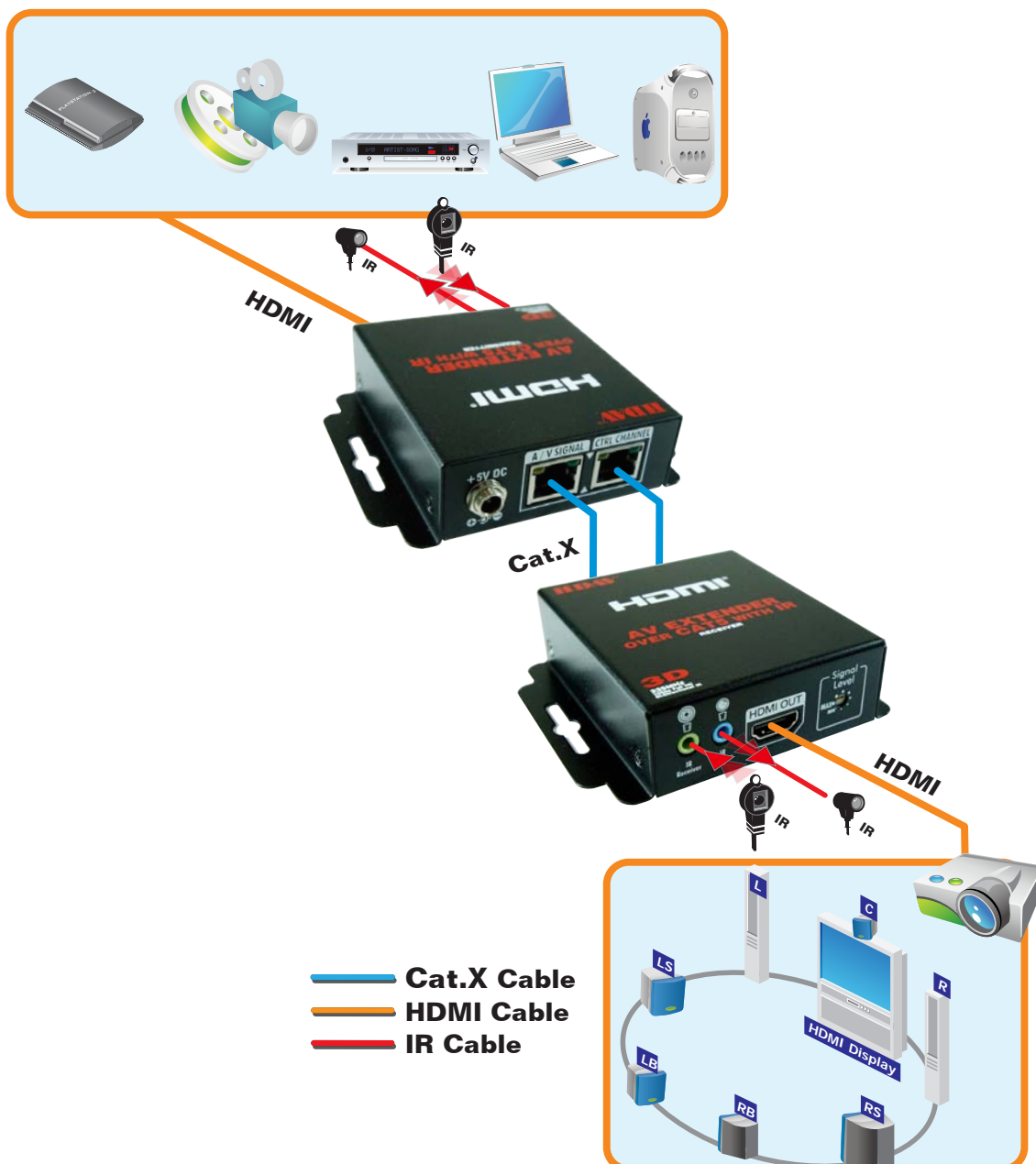
You can buy any IR extension cables in the market that are compatible to the definition of the IR sockets for the matrix if necessary for replacement use. However, IR cables longer than 2m (6-ft) may not work.

Supported IR Data Format

Data Format	Suitable	Not Recommended
NEC	✓	
RC5	✓	
TOSHIBA MICOM CODE	✓	
GRUNDIG CODE	✓	
SONY 12 BIT CODE	✓	
SONY 15 BIT CODE	✓	
SONY 20 BIT CODE	✓	
RCA CODE		✓
RCM CODE		✓
MATSUSHITA CODE		✓
mitsubishi CODE	✓	
ZENITH CODE	✓	
JVC CODE	✓	
M50560-001P	✓	
MN6125H	✓	
MN6125L	✓	
MN6014_C5D7	✓	
MN6014-C6D6	✓	
MC14457P	✓	
LC7464(AHEA)	✓	
GEMINI_CM	✓	

HARDWARE INSTALLATION

1. Connect a HDMI or DVI source (e.g., a Blu-ray Disc player) to the Transmitting Module.
2. Connect a HDMI or DVI display (e.g., a HDTV) to the Receiving Module.
3. Connect two solid Cat-5/5e/6 UTP/STP cable between the Transmitting and Receiving Modules.
4. Make sure these two solid Cat-5/5e/6 UTP/STP cable are tightly connected and not loose.
5. If you want to control the source devices at display side, plug in the IR blaster to the Transmitting Module and the IR receiver to the Receiving Unit. If you want to control the display at source side, plug in the IR receiver to the Transmitting Module and the IR blaster to the Receiving Module.
6. Plug in the 5V DC power supply unit to the latch-locking power jack on either the Transmitting Unit or the Receiving Unit.
7. If you see flickering or blinking image on the display, adjust the rotary control switch to improve the cable skew. MAX stands for the strongest HDMI signal level for longest possible transmission length while MIN stands for the weakest HDMI signal level for short transmission length. Try adjusting the signal level from MIN to MAX to find the optimal setting for the HDMI over CAT5 transmission.



1. When adjusting the signal level on the Receiving unit, please dial the rotary control switch from MIN to MAX and stop turning the rotary switch whenever the audio/video is playing normally. Inappropriate signal level setting may cause overpowering issue that would shorten the product life significantly!
2. Wrongly insert IR blaster and IR receiver to wrong 3.5mm infrared sockets may result in the failure of the IR extenders. Please check carefully before plugging in the IR extender to the respective IR sockets.
3. If the DVI or HDMI device requires the EDID information, please use EDID Reader/Writer to retrieve and provide DVI or HDMI display EDID information.
4. All HDMI over CAT5 transmission distances are measured using Belden 1583A CAT5e 125MHz UTP cable and ASTRODESIGN Video Signal Generator VG-859C & VG-870B.
5. The transmission length is largely affected by the type of Cat-5/5e/6 cables, the type of HDMI sources, and the type of HDMI display. The testing result shows solid UTP cables (usually in the form of 300m [1,000ft] bulk cables) can transmit a lot longer signals than stranded UTP cables (usually in the form of fixed length patch cords). Shielded STP cables are better suited than unshielded UTP cables. A solid UTP Cat-5e cable shows longer transmission range than stranded STP Cat-6 cable. For long extension applications, solid UTP/STP cables are the only viable choice.
6. EIA/TIA-568-B termination (T568B) for Cat-5/5e/6 cables is recommended for better performance.
7. To reduce the interference among the unshielded twisted pairs of wires in Cat-5/5e/6 cable, one can use shielded STP cables to improve EMI problems, which is worsen in long transmission.
8. Because the quality of the CAT5/6 cables has the major effect on how long the transmission limit can achieve and how good is the received picture quality, the actual transmission range is subject to one's choice of Cat-5/5e/6 cables. For desired resolutions greater than 1080i or 1280x1024, a Cat-6 cable is recommended.
9. If your HDMI display has multiple HDMI inputs, it is found that the first HDMI input [HDMI input #1] generally can produce better transmission performance among all HDMI inputs.











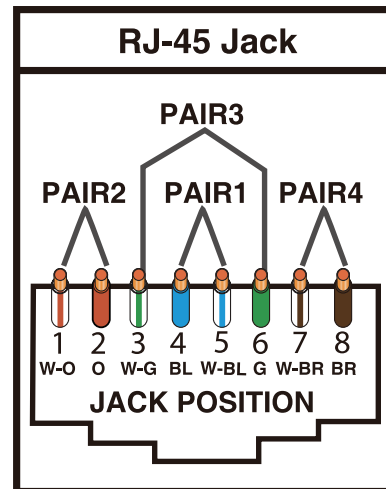
Performance Guide for HDMI over Category Cable Transmission

Performance rating		Type of category cable		
Wiring	Shielding	CAT5	CAT5e	CAT6
Solid	Unshielded (UTP)	★★★★	★★★★	★★★★★
	Shielded (STP)	★★★	★★★	★★★★★
Stranded	Unshielded (UTP)	★	★★	★★
	Shielded (STP)	★	★	★★
Termination		Please use EIA/TIA-568-B termination (T568B) at any time		









RJ45 / CAT5 PIN DEFINITION

Audio/Video Port

Data Link TIA/EIA-568-B		
PIN	Color	Function
1	 W-O	TX0-
2	 O	TX0+
3	 W-G	TX1-
4	 BL	TX2-
5	 W-BL	TX2+
6	 G	TX1+
7	 W-BR	TXC-
8	 BR	TXC+



Control Channel Port

Data Link TIA/EIA-568-B		
PIN	Color	Function
1	 W-O	IR
2	 O	Power
3	 W-G	DDC SCL
4	 BL	DDC SDA
5	 W-BL	GND
6	 G	GND
7	 W-BR	Power
8	 BR	CEC

