

ZEKTOR

Designed by you. Built by us.™

Zektor 2CAT™ Z57BD2C

HDMI™ 1.3 over CAT5 Extender with
Bi-directional IR Pass-through

User Manual



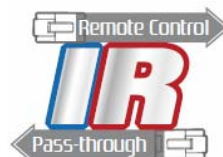
HDMI™
HIGH-DEFINITION MULTIMEDIA INTERFACE

HDCP™
HIGH-DEFINITION CONTENT PROTECTION



Full HD
1080

7.1 CH
AUDIO



Assembled in the USA



Safety and Notice

The Zektor 2CAT™ Z57BD2C HDMI™ 1.3c over CAT5e/6 extender with Bi-directional IR Pass-through has been tested for conformance to safety regulations and requirements, and has been certified for international use. However, like all electronic equipments, the Z57BD2C 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.



The Zektor 2CAT™ Z57BD2C HDMI™ 1.3c over CAT5e/6 extender with Bi-directional IR Pass-through boosts up your HDMI transmission distance up to 60m (200ft) in HDTV 720p / 1080i format. With two low cost Cat-5/5e/6 cables, 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 remote HDM™I displays such as HDTV, LCD PC monitors, or projectors. This cost effective flexibility makes HDCP compliant DVD players or PS3 transmit high quality video and audio at a greater distance and the minimal cost. In addition, with the embedded infrared (IR) receiver and blaster on both TX and RX units to facilitate the IR pass-through, users can enjoy high quality audio/video and control the HDMI™ sources from the remote site instantly.

The Z57BD2C includes two units: Z57BD2C [TX] as the transmitting unit and Z57BD2C [RX] as the receiving unit. The transmitting unit is used to transfer the audio/video and capture and receive IR signals through two low cost Cat-5/5e/6 cables. The receiving unit is responsible for equalizing transferred HDMI multimedia data and re-sending IR signals received from the remote control of the HDMI™ source device or capturing IR packets to bypassing IR signals to nearby IR equipped devices. The transmission distance between the sending and receiving units can be up to 60m (200ft) under HD resolution (720p or 1080i) or 40m (130ft) under Full HD resolution (1080p). With 8-level equalization rotary control switch on the receiving unit, users can adjust the strength of the signal level to the received HDMI™ signals accordingly, and therefore optimize the transmission length between HDM™I source and display.

Features

- HDMI™ 1.3c compliant
- 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 bandwidth 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
- Allows cascading
- Perfectly integrated with other HDM™I over CAT5 series products

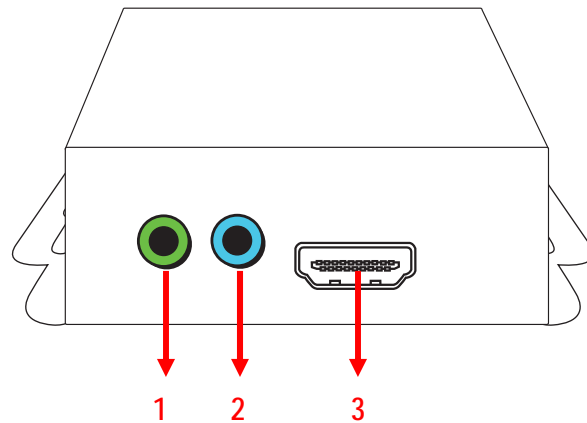


The length depends on the characteristics and quality of the cables. Higher resolutions and longer transmission distances require low skew cables (<25ns/100m) for best performance. Unshielded CAT6 with metal RJ-45 connectors is recommended.

Specifications & Package Contents

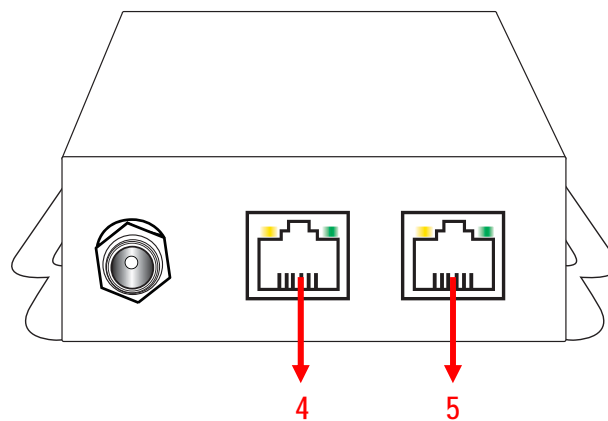
Model Name				Z57BD2C	
Technical				Z57BD2C [TX]	Z57BD2C [RX]
Role of usage				Transmitter [TX]	Receiver [RX]
HDMI compliance		HDMI 1.3c			
HDCP compliance		Yes			
Video bandwidth		Single-link 225MHz [6.75Gbps]			
Video support		480i / 480p / 720p / 1080i / 1080p60			
HDMI over UTP transmission [8-bit]		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-thru				Bi-directional	
Input				1x HDMI 1x 3.5mm	1x RJ-45 1x 3.5mm
Output				1x RJ-45 1x 3.5mm	1x HDMI 1x 3.5mm
HDMI source control				Controllable via Bi-directional IR pass-through path	
IR remote control				Electro-optical characteristics: τ = 25° Carrier frequency: 20-60kHz	
HDMI connector		Type A [19-pin female]			
RJ-45 connector		WE/SS 8P8C with 2 LED indicators			
3.5mm connector				IR blaster	IR receiver
Rotary control switch		None		None	Signal level
Mechanical				Z57BD2C	
Housing		Metal enclosure			
Dimensions [L x W x H]	Model	[TX/RX] - 85x60x25mm [3.3"x2.4"x1"]		93x60x25mm [3.7"x2.4"x1"]	
	Package	270 x 175 x 80mm [10.6"x6.9"x3.1"]			
	Carton	450 x 370 x 300mm (1'6"x1'3"x1')			
Weight	Model	315g [11oz]	320g [11oz]	405g [14oz]	
	Package	685g [1.5 lbs]	720g [1.6 lbs]	815g [1.8 lbs]	
Fixedness		Wall-mounting case with screws			
Power supply				5V 2A DC	
Power consumption		1 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]			
Package Contents				1x Z57BD2C [TX & RX] 2x IR blaster 2x IR receiver 1x 5V power adapter 1x User Manual	

Front Panel — Transmitting Unit Z57BD2C [TX]



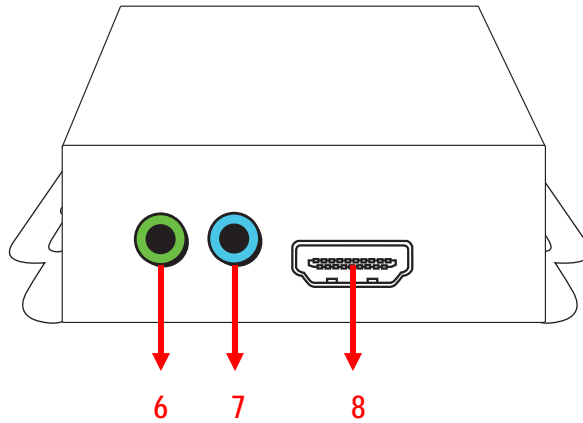
1. **IR Receiver:** Infrared 3.5mm socket for plugging in the extension cable of IR receiver.
2. **IR Blaster:** Infrared 3.5mm socket for plugging in the extension cable of IR blaster
3. **HDMI IN:** Connect to a HDM™I source with a HDM™I male-male cable here

Rear Panel — Transmitting Unit Z57BD2C [TX]



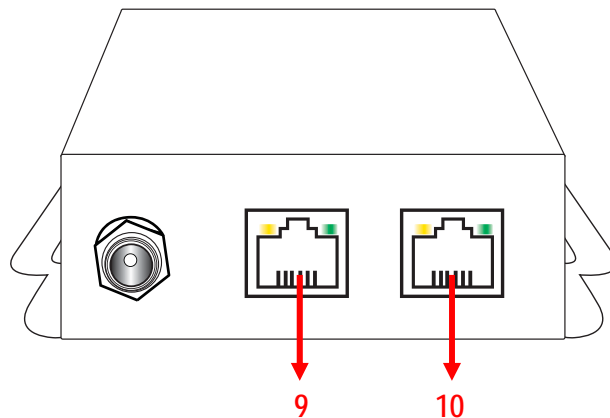
4. **AV SIGNAL:** Plug in a Cat-5/5e/6 cable that needs to be linked to the **AV SIGNAL** port of the receiving unit Z57BD2C [RX].
5. **CTRL CHANNEL:** Plug in a Cat-5/5e/6 cable that needs to be linked to the **CTRL CHANNEL** port of the receiving unit Z57BD2C [RX].

Front Panel — Receiving Unit Z57BD2C [RX]

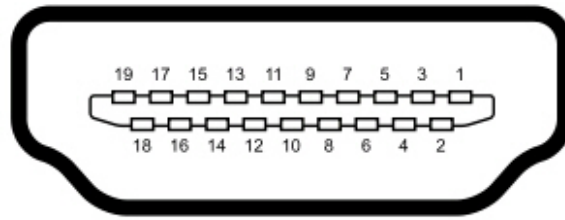


6. **IR Receiver:** Infrared 3.5mm socket for plugging in the extension cable of IR receiver.
7. **IR Blaster:** Infrared 3.5mm socket for plugging in the extension cable of IR blaster
8. **HDMI OUT:** Connect to a HDMI™ display with a HDMI™ male-male cable here.

Rear Panel — Receiving Unit Z57BD2C [RX]



9. **AV SIGNAL:** Plug in a Cat-5/5e/6 cable that needs to be linked to the **AV SIGNAL** port of the transmitting unit Z57BD2C [TX].
10. **CTRL CHANNEL:** Plug in a Cat-5/5e/6 cable that needs to be linked to the **CTRL CHANNEL** port of the transmitting unit Z57BD2C [TX].



Type A (Receptacle) HDMI

Pin 1	TMDS Data2+	Pin 8	TMDS Data0 Shield	Pin 15	SCL
Pin 2	TMDS Data2 Shield	Pin 9	TMDS Data0-	Pin 16	SDA
Pin 3	TMDS Data2-	Pin 10	TMDS Clock+	Pin 17	DDC/CEC Ground
Pin 4	TMDS Data1+	Pin 11	TMDS Clock Shield	Pin 18	+5 V Power
Pin 5	TMDS Data1 Shield	Pin 12	TMDS Clock-	Pin 19	Hot Plug Detect
Pin 6	TMDS Data1-	Pin 13	CEC		
Pin 7	TMDS Data0+	Pin 14	Reserved (N.C. on device)		

CAT5 [RJ-45]

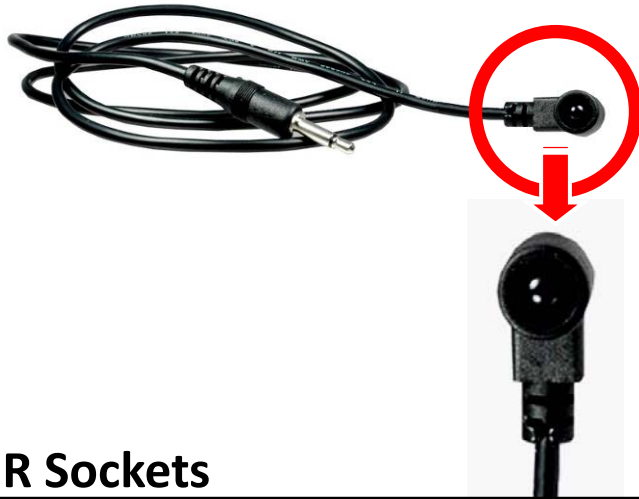
T568A and T568B Wiring

Pin	T568A Pair	T568B Pair	Wire	T568A Color	T568B Color	Pins on plug face (socket is reversed)
1	3	2	tip	white/green stripe	white/orange stripe	
2	3	2	ring	green solid	orange solid	
3	2	3	tip	white/orange stripe	white/green stripe	
4	1	1	ring	blue solid	blue solid	
5	1	1	tip	white/blue stripe	white/blue stripe	
6	2	3	ring	orange solid	green solid	
7	4	4	tip	white/brown stripe	white/brown stripe	
8	4	4	ring	brown solid	brown solid	

Pair of Cat-5/5e/6 Cable	Definition
	TX0-
	TX0+
	TX1-
	TX2-
	TX2+
	TX1+
	TXC-
	TXC+

IR Pass-through

IR Blaster



IR Receiver



IR Sockets

IR Blaster: Plug in the IR blaster here to emit all IR command signals received from the IR receiver to control the HDMI source devices.

IR Receiver: Plug in the IR receiver here to receive all IR command signals from the IR remote controls of the HDMI source devices.

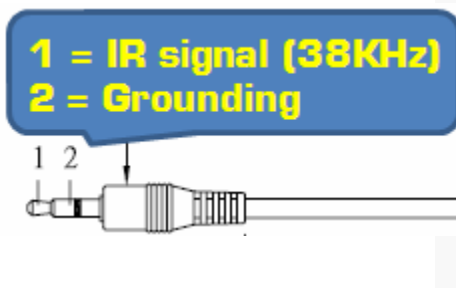


CAUTION!

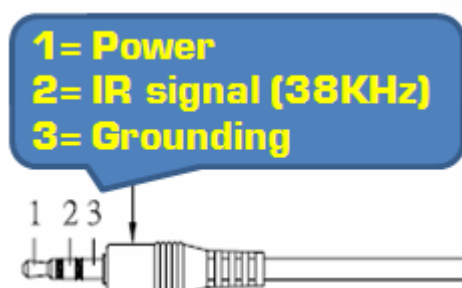
Incorrect insertion for IR blaster and IR receiver to wrong 3.5mm infrared sockets may result in the failure of the IR extenders. Please check carefully before plugging in the IR extender to the respective IR sockets.

3.5mm connection

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.

Hardware Installation

!! MAKE SURE YOU CONNECT THE IR CONNECTIONS CORRECTLY !!

1. Connect your HDM™ or DVI source (such as a Blu-ray Disc player) to the transmitting unit Z57BD2C [TX].
2. Connect the IR blaster and receiver to the transmitting unit Z57BD2C [TX], and typically make the IR blaster directly point to the IR sensor of the HDM™ source device(s).
3. Connect your HDMI or DVI display (such as a LCD or plasma HDTV) to the receiving unit Z57BD2C [RX].
4. Connect the IR receiver and blaster to the receiving unit Z57BD2C [RX], and typically make the IR receiver directly point to the user.
5. Connect two CAT5e/6 cables between the transmitting and receiving units via **AV SIGNAL** and **CTRL CHANNEL** ports respectively.
6. Make sure your Cat-5/5e/6 cables are tightly connected and not loose.
7. Plug in 5V DC power cord to the power jack of the receiving unit Z57BD2C [RX].
8. **If you see flickering or blinking image on the display, try to adjust the rotary control switch to improve the cable skew. 0 stands for the strongest HDMI™ signal level for longest possible transmission length while 7 stands for the weakest HDMI™ signal level for short transmission length. Try adjusting the signal level from 7 to 0 to find the optimal setting for the HDMI™ over CAT5 transmission.**

1. If the DVI or HDMI™ device requires the EDID information, please use EDID Reader/Writer to retrieve and provide EDID information of the DVI or HDMI™ display.
2. All HDMI™ over CAT5 transmission distances are measured using Belden 1583A CAT5e 125MHz UTP cable and ASTRODESIGN Video Signal Generator VG-859C.
3. 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 or 1,000ft bulk cables) can transmit a lot longer signals than stranded UTP cables (usually in the form of fixed length patch cords). A solid UTP Cat-5e cable shows longer transmission range than a stranded STP Cat-6 cable. For long extension applications, solid UTP/STP cables are the only viable choice.
4. EIA/TIA-568-B termination (T568B) for Cat-5/5e/6 cables is recommended for better performance.
5. To reduce the interference among the unshielded twisted pairs of wires in Cat-5/5e/6 cable, shielded STP cables are better suited than unshielded UTP cables to improve EMI problems, which is worsen in long transmission.
6. Because the quality of the CAT-5/6 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.
7. 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.
8. Wrongly inserted 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.



Performance Guide for HDMI over CAT5/6 Cable Transmission

Performance rating		Type of CAT5/6 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		

Zektor Incorporated warrants the **Z57BD2C HDMI 1.3c over CAT5e/6 extender with Bi-directional IR Pass-through** to be free from defects in the material and workmanship for 1 year from the date of purchase from Zektor Incorporated or an authorized dealer. Should this product fail to be in good working order within 1 year warranty period, Zektor Incorporated, at its option, repair or replace the unit, provided that the unit has not been subjected to accident, disaster, abuse or any unauthorized modifications including static discharge and power surge. This warranty is offered by Zektor Incorporated for its BUYER with direct transaction only. This warranty is void if the warranty seal on the metal housing is broken.

Unit that fails under conditions other than those covered will be repaired at the current price of parts and labor in effect at the time of repair. Such repairs are warranted for 90 days from the day of reshipment to the BUYER. If the unit is delivered by mail, customers agree to insure the unit or assume the risk of loss or damage in transit. Under no circumstances will a unit be accepted without a return authorization number.

The warranty is in lieu of all other warranties expressed or implied, including without limitations, any other implied warranty or fitness or merchantability for any particular purpose, all of which are expressly disclaimed.

Proof of sale may be required in order to claim warranty. Customers outside Taiwan are responsible for shipping charges to and from Zektor Incorporated. Cables and power adapters are limited to a 30 day warranty and must be free from any markings, scratches, and neatly coiled.

The content of this manual has been carefully checked and is believed to be accurate. However, Zektor Incorporated assumes no responsibility for any inaccuracies that may be contained in this manual. Zektor Incorporated will NOT be liable for direct, indirect, incidental, special, or consequential damages resulting from any defect or omission in this manual, even if advised of the possibility of such damages. Also, the technical information contained herein regarding the **Z57BD2C** features and specifications is subject to change without further notice.

