

INFRARED RECEIVER AND AMPLIFIER SYSTEM

IR2/IR4 Channel User Guide





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Manufacturer Declarations

Warranty

HDi gives a limit warranty of 1 year on this product In compliance with the following requirements:





Declaration of Conformity

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

Safety Precautions



DO NOT OPEN

Caution :

To Reduce The Risk Of Electric Shock Do Not Remove Cover (Or Back) No User-serviceable Parts Inside Refer Servicing To Qualified Personnel

Certifications





HDi systems are manufactured using lead free processes and are free of materials harmful to the environment They conform to the most stringent new European guidelines for consumer products (RoHS).

Safety Instructions

Read Instructions

All safety and operation instructions should be read before operating this product.

Retain Instructions

Safety and operating instructions should be kept for future reference.

Water & Moisture

This product should not be operated near water.

Heat Environment

Do not subject this product to excessive heat conditions.

Power Source

This product must be connected to an AC power source per the voltage input specified and marked on the power supply.

Power Cord Caution

Power cable should be routed clear of foot traffic and supported clear of kinking or abrasion.

Object Protection

Locate the operating unit so it will not be subjected to falling objects or water entry.

Internal Service

User should not attempt to service this product. All internal service must be accomplished by a qualified technician.

Electric Shock

Do not adapt or modify the AC power plug thus lifting the earth ground connection.

Features

The HDi IR2/IR4 Channel utilises reliable infrared transmission and is loaded with excellent integration and exceptional versatility. The two infrared wireless microphone receiver channels provide freedom of movement and permit hands free performance. The four auxiliary inputs offer multimedia integration with even distribution of sound for all audio in the classroom and with two separate outputs for assistive listening and recording with active board. It has 5-band equalizer, a powerful Class D amplifier and RS-232 functionality which accomplish IR2/IR4 Channel a full range comprehensive integration device. The IR2/IR4 Channel also interfaces with other applications and services such as computer, broadcasting system, fire alarm control unit and emergency alert system.

The system is comprised of an infrared detecting sensor. The sensor collects the IR wireless signal from the microphone/transmitter and sends a composite signal to the receiver.

The microphone/transmitter can be T6r pendant type or IRM-202 Handheld type. The rechargeable batteries will provide approx. 6~8 hours of service per charge.

- IR2 Channel: 50-Watt Class D power amplifier IR4 Channel: 100-Watt Class D power amplifier
- 4 media inputs for computer, DVD/iPod[™] , MP3, and Aux
- Auxiliary input with Mic or Line level switch
- 2 outputs for both assistive listening and audio recording
- RS-232 integration.
- In the event of fire alarm activation, system is muted simultaneously which allows you clearly hearing the alarm warning
- Page override (muting) with page pass through to classroom speakers input level 100V, 70V, 25V
- Teacher's voice priority- Channel A priority over line input
- 5-band EQ
- Security / Panic alert contact connection coordinate with emergency alert system (EAS)
- Ground loop filter switch for computer input to eliminate hum noise
- Charger connection 5V DC USB
- Compatible with the HDi stylish pendant transmitter, T6r, which allows remote volume control of input medias

T6r Infrared Pendant Transmitter

Туре	Pendant	0
Infrared Ray	050	
Wavelength	850 nm	Si
Transmission	1- channel A : 2.08 MHZ / 2- channel B: 2.54 MHZ/	R
Frequency	3- channel B: 2,54 MHZ (push to talk)	Po
Modulation	FM	D.
Pilotone Frequency	32.768KHz	n
Transmission Angle	180°, Conical	D
Microphone Capsule	Condenser, Unidirectional	W
Location of IR Emitter	Built-in, Top	
Power Switch	On / Off / Mute Push Button	
Volume Control	HIGH / MIDDLE / LOW Switch	
External Aux Input	One 3.5mm Stereo Jack for line or Mic in	
	Overall Inputs Volume Up - Thumb Rotary Up	
Function Control	Overall Inputs Volume Down - Thumb Rotary Down	
Switch	Teacher (Ch. A) Priority – press the button momentarily	
Switch	Security Alert – Press & hold down the button for	
	5 seconds correspond to IR2 Channel/400 only	/
Push to Talk	Switch to CH 3 - channel B, Press and hold the	
rush to falk	Function Control Switch to Talk	
Current Consumption	90mA	
Battery Used	HDi Li-Polymer Battery (3.7V / 600mAh)	
Battery Life	Approx. 7 hours	
	ON = Blue	
	Mute = Flashing Blue	
Power LED Indicator	Battery Capacity = Full to Low (Blue ->Purple ->Red)	
Fower LED Indicator	Flashing Red = Battery Low, Needs Charging	
	Push to Talk (on CH 3-channel B) = Green	
	Charging = RED Charging complete = Green	
External Power Charge	DC+5V , Micro USB connecter	
	Charging source is compatible from any laptop,	
	PC or provided travel adaptor	
Clin and Lanuard	Clip and Adjustable neck strap with break	
	away clip	
Dimensions	19(Thickness) \times 93(H) \times 30.6(W) mm	
Weight	Approx. 39 g (with Battery)	

IRS-55 Infrared Sensor

Dperating Frequency	2MHz to 2.8 MHZ
Operating Range	15m radius to central of sensor
ignal / Power Interface	Female RCA
Reception Area	Approx. 232m ² / 2500ft ²
ower Indicator LED	Green
Angla	360° full semi-spherical
leception Angle	(half dome) coverage
Dimensions	118(DIA)x 35(H) mm
Veight	210g

Specification

Infrared Receiver Amplifier

Model	IR2 Channel IR4 Channel		
Receiver Input	Infra	ared	
Modulation	FM Wid	le-band	
Infrared Wavelength	850	nm	
Reception Frequencies	CH A : 2.08 MHz /	/ CH B : 2.54 MHz	
Tone Signal	32.76	8 KHz	
Frequency Response	40 Hz-18 KHz ± 3 dB		
S/N Ratio	>70) dB	
THD	< 1% 0	@ 1KHz	
Nominal Deviation	± 10	KHz	
Maximum Deviation	± 25	KHz	
De-emphasis	50 µs		
Connectivity Coverage	2500 Sq. Ft.		
Aux input	(1)DVD, Line level, Dual RC	A with +10 dB gain control	
	(1) Computer, Line level, 3.5mm with GLI switch		
	(1) Aux, Mic/Line level switchable, 3.5mm		
	(1) MP3, Line level, 3.5mm @ front panel		
Aux ouput	(1), Line level, 3.5m	m ALD (post-fader)	
	(1), Line level 3.5mm REC (post-fader)		
Equalizer	5 Band ±12dB		
	Class D, Two Amplifiers,	Class D, Four Amplifiers,	
Amplifier	25 Watts ea. (RMS),	25 Watts ea. (RMS),	
	50 Watts total (RMS) @4Ω	100 Watts total (RMS) @4Ω	
Page Over Ride	Input voltage: 100V-70V-25V		
l'age over-filde	Sensitivity: 0-10dB		
Fire Alarm	AC/DC 5-24V		
Coourity Alort	Contact Closure N/O, N/C		
Security Alert	Triggered by T6r		
RS-232	Yes		
Teacher Priority	Yes		
Sensor Inputs	2, RCA type		
Charger Output	DC 5V, USB		
Power Supply	DC 19V / 3.4A	DC 19V / 6.3A	
Dimensions	215(W) x 190(D) x 44(H) mm		
Weight	74	0g	

IRM-202AB Infrared Transmitter

CHR-303 Charger

Туре	Handheld
Infrared Ray Wavelength	850 nm
Transmission Frequency	CH A : 2.08 MHz
Transmission Trequency	CH B : 2.54 MHz (Switchable)
Modulation	FM
Pilotone Frequency	32.768KHz (A / B CH)
Transmission Angle	360°
Microphone Capsule	Condenser, Unidirectional
Location of ID Emitter	Two locations, Top and bottom
Location of the Emitter	of Tubular
Power Switch	On/Off Slide
Current Consumption	220 mA
Battery Used	Dual "AA" Ni-MH Rechargeable
Battery Life	Approx. 9 hours
Devues I ED In diseter	Green - Usable
Fower LED Indicator	Red - Needs Charging
Dimensions	247(L) x 55(Ø) mm
Weight	240g

Charging Slot	Three slots, (2)pendant and (1)handheld	
Charging Mode	Switching	
Charging Current	220mA for pendant	
	400mA [±] 10% for handheld	
Charging Time	3.5 hours for pendant	
	6 hours for handheld	
	Blue=Standby (Handheld)	
Charging Indicators	Red = Charging	
	Green = Full	
	Red Flashing = Defective Battery	
	Red & Green Flashing = One time	
	battery or non-rechargeable battery	
Power Supply	DC12V / 600mA	
Dimensions	144(D)x 70(W)x 28(H) mm	
Weight	261g (with microphone holders and adapter)	

Checking the supplied items

First check the model number of the main system purchased. The accessories supplied may differ depending on the model and your request.







IR2/IR4 Channel

Adaptor for IR2/IR4 Channel

User Manual

Common accessories



Adaptor for CHR-303

Optional accessories



CHR-303 Charger

> CHR-103 Charger

Overview of the IR2/IR4 Channel Receiver Amplifier



A Front Panel

- **1 Power Switch** with an associate LED to indicate presence of power.
- Channel "A" & "B" wireless microphone volume controls.
- IR Indictor, LED adjacent to each control knob will light "Green" when a transmitter on that channel is turned "on", validating an IR transmission signal is being received.
- Input Controls for adjusting the volume of each media input source; DVD, COMPUTER and AUX.
- **5** Front Panel Auxiliary Input for "ipod", MP3 or similar device (3.5mm).
- **6 REC** is used as a record output for lesson capture.

Trouble Shooting

Problem	Solution
System is turned "on" but there is no sound	 Verify AC power; the LED lights up when turned "on" Check if system has been unplugged Check circuit breaker Call maintenance for assistance
System has power but no sound	 Turn "on" microphone/transmitter Check for IR transmission, Signal presence Check the LED in the sensor If sensor LED is not lit Sensor has been disconnected (unpluged or broken cable) Power output to sensor has failed (Receiver/amplifier needs to be replaced) Check speaker and speaker connection
Voice is distorted and/or signal dropout occurs	 Check the charge on your batteries Verify that the diodes on transmitter or sensor are not being covered Obstruction between transmitter and sensor

Contact:

If your problem persists and this guide has not resolved the issue, call our customer service department or your nearest dealer for additional assistance.

Notes:

- 1. Noise or hearing static may occur if the infrared sensors are in the path of sunlight or other bright light sources, or if they are blocked by something. Noise in such cases is a natural occurrence due to the way the infrared sensors work. It does not indicate any problem with the equipment.
- 2. Noise or hearing static may occur when you disconnect and then connect an infrared sensor while a signal is being received.
- 3. Noise or hearing static may occur if you turn the power on and off while a signal is being received.

Test using a handheld microphone

- Turn "on" the microphone with slide switch and observe, Green LED.
- Observe the LED next to Ch. B volume control of the IR2/IR4 Channel, indicating IR signal being received when the microphone is turned "on".
- If Ch. A LED turns "on", unscrew the bottom half of the handheld and slide the channel selector switch to Ch. B.
- Speak into the microphone and adjust the volume using Ch. B control on IR2/IR4 Channel.
- While talking, walk around the perimeter of the room to verify 100% reception of the signal.
- Upon completion of test, put the microphone in the charger for recharging.

Rear Panel

Connect the auxiliary audio sources

- Connect an auxiliary audio source (computer, Video projector, DVD player, VCR, ipod) using a shielded cable with appropriate connectors, plugged into the designated jack
- Turn the audio source "on" and engage its operation. Adjust the volume level of each auxiliary input to the desired listening level.
- Once all the auxiliary inputs have been verified and adjusted, the system is ready for full operation

Speak Output

IR2 Channel

Two Amplifier Outputs each terminated by a four pin Phoenix connector (facilitating connecting two speakers in parallel).

Power output of each amplifier: 25 watt (RMS) into 4 Ω l $\,$ oad, o r approx. 12.5-15 watt (RMS) into 80hm load

IR4 Channel

Four Amplifier Outputs e ach terminated by a two pin Phoenix connector Power output of each amplifier: 25 watt (RMS) into 4 Ω l oad, o r approx. 12.5-15 watt (RMS) into 80hm load

- ⁽⁸⁾ Fire alarm input 2-pin captive screw connector
- Page input, voltage selector and sensitivity control
- ALS output(Post-fader) with +10dB gain
- Five-band Equalizer provides the installer capability to compensate for acoustical variance and maximum vocal clarity.
- RS-232 connectivity
- ^(B) Security alert (panic) output
- Aux input with mic/line level switch
- Computer input with Anti-Hum ON/OFF
- **DVD Inputs** (Dual RCA) for various media sources such as: DVD, Projector, VCR, or other.
- Sensor Inputs (RCA) for powering the sensor and receiving IR transmission signal. Two sensor inputs allow installation of an additional sensor for odd shaped or large rooms requiring additional coverage. Normally only one sensor is required.
- 5V USB charging port
- Power Input IR2 Channel: 19 volts DC, 3.4 A IR4 Channel: 19 volts DC, 6.3 A

Installation

Application Diagram

Set up IR2/IR4 Channel receiver amplifier

 Place IR2/IR4 Channel on a flat surface or Mount it into a electronic racks & cabinets or under the shelf with special rack



Operating the System

Now that the system has been installed, we are ready to turn the system "on" and test its operation. We'll assume the inputs will include a wireless T6r pendant transmitter, handheld microphone and at least one auxiliary audio source.

- Turn IR2/IR4 Channel "on"
- The LED will light to indicate power
- Confirm power to sensor, LED on edge of sensor lights up
- Set the Ch. A and Ch. B controls to counter clock-wise position.



Test using a T6r microphone

- Verify that the batteries are fully charged for optimum performance.
- Set the T6r gain switch to the mid position, between the "HI" and "LOW" .
- Turn "on" the T6r via the front switch, push and hold for three seconds.
- Observe the push button LED turn Green, Yellow, Red, Purple then stay on Blue indicating the transmitter is on and a good charge on battery.
- On the IR2/IR4 Channel observe the green LED next to Ch. A volume control indicating IR signal is being received when the T6r mic is turned "on".
- If Ch. B LED illuminates remove the T6r cover and battery and slide the channel selector switch to Ch. A.
- Locate yourself directly under a ceiling speaker.
- While speaking into the microphone, have someone slowly adjust the volume using Ch.A control on IR2/IR4 Channel
- When you begin to hear a ringing sound (initial indication of feedback) reduce volume to stable sound.
- While talking, walk around the perimeter of the room to verify 100% reception of the signal.
- Upon completion of the test, put the T6r in the charger for recharging.

CHR-103 Charger **Diagram and Instruction**



Charging

0

6

Connect the sensors

The preferred location for the ceiling sensor would be in the center (side to side) and favored forward towards the front. This will provide a clear and direct IR transmission path from transmitter to sensor without any obstruction or interference. The 360° reception pattern provides coverage through the entire room.

Attaching the Ceiling Sensor - IRS-55



Installation 2 ----- Attach to wood surface

Installation 3 ----- Attach to concrete surface

• Turn on the receiver power

of sensor lights up

• Confirm power to sensor, LED on edge

Recommended sensor location



Connect the sensor cable and plug into either sensor input on receiver

CHR-303 Charger Diagram and Instruction



A slot charging area (for pendant microphone transmitter only)

- B slot charging indicator light
- C slot charging area (for pendant microphone transmitter only)
- B slot charging area (for handheld microphone transmitter only)
- **(5)** Handhold microphone holder jack
- 6 DC12V input



IRM-202 Infrared handheld microphone transmitter **Diagram and Instruction**



Channel selector
 Cartridge and s

Cartridge and steel mesh

Access Microphone Battery

- Step1 : Unscrew the cover from the lower half of the microphone.
- Step2 : Place the two "AA" rechargeable batteries into the plastic tube as the picture shown. Insert battery with (+)contact toward the bottom side. Be aware of the (+)(-) battery polarity.
- Step3 : Screw the cover back to the microphone compartment tube.

Operating

- 1. Remove the battery compartment tube cover and set the channel to the desire one.
- Turn on the microphones.
 When the microphone is turn on, the green power indicator light illuminats. If the battery level is low, this indicator light will turn to red.
 Do not block emitter diodes with hand.
- 3. Turn on the main receiver and the other connected equipment. % The system will not receive any signal for approximately 5 seconds after the power is turned on.
- 4. The IR indicator of the corresponding channel on the receiver front panel grows green. This indicates the sensor receiving the microphone signal.

Connect the speakers to IR2 Channel

The IR2 Channel can accommodate maximum four (80hm) speakers. Four speakers will be adequate to distribute sound evenly throughout a classroom of approximately 2500 sq. ft.

For **four ceiling speaker installation**, designate the listening area and divide the area into four quadrants. Then install one speaker in the center of each quadrant.

For **four Wall speaker installation**, locate the two wall speakers (one on each side) approximately even with the front row listeners. Locate the other pair approximately mid-way toward the rear of the listening area.

Smaller rooms may only require two (40hm) speakers. This will distribute 25 watt to each speaker. For **two ceiling speaker installation**, locate the speakers in the center of the listening area (front to back) and equidistant side to side of the listening area. Install one speaker in the center of each half quadrant. For **two wall speaker installation**, locate the speakers (one on each side), orient the speakers toward the center of the listening area and pointed mid way toward the rear.



terminal and Black wire to Black (-) terminal.

Amplifier output

Amplifier output

two speakers











Connect the speakers to IR4 Channel

The IR4 Channel can accommodate maximum eight (8ohm) speakers. Normally four speakers will be adequate to distribute sound evenly throughout a classroom of approximately 2500 sq.ft. This will distribute 25 watt to each speaker.

For **ceiling speaker installation**, designate the listening area and divide the area into four quadrants. Then install one speaker in the center of each quadrant.

For **Wall speaker installation**, locate the two wall speakers (one on each side) approximately even with the front row listeners. Locate the other pair approximately mid-way toward the rear of the listening area.



Caution : Observe polarity, connect Red wire to (+) Red terminal and Black wire to Black (-) terminal.

Amplifier output

four speakers 4x25 watt @ 4ohm (RMS)







eight speakers 8x12.5 watt @ 8ohm (RMS)



T6r Infrared Pendant transmitter

Diagram and Instruction



- 1 Built-in microphone
- Infrared signal emitter diodes (Do not block)
- Aux & Mic input This provides opportunity to input an external microphone or an auxiliary device such as iPod, MP3 or similar device for wireless transmission of supplementary program material.
- Remote up down control Remote control the overall volume of the media inputs which connect to the receiver amplifier
- 6 Priority Button
 - a. Teacher (Channel A) priority: Press the button momentarily to activate teacher priority mode, press again to recover.
 - b. Security alert: Press and hold down the button for 5 seconds to initiate security alert, repeat the same action again to disengage from the security alert mode
- a. ON / OFF Power button and indicator light
 - b. Transmitter mute button
 Press this mute button
 momentarily as needed for private
 conversion. (The power LED will
 flash blue on the mute position)

- Micro-USB receptacle Convenient charger solution, allows T6r to charge from laptop, PC or AC outlet by the accompanied USB to Micro-USB extension cord and USB power adaptor.
- Transmitter volume control knob This control knob allows Hi-Mid-Low volume level adjustments for T6r.
- Detachable clip To clip T6r to the shirt pocket
- Lanyard with breakaway clip T6r is designed to be worn under the chin suspended by an adjustable lanyard.



- Channel (number) Selector Switch to 1 for channel A, 2 for channel B, and 3 for channel B(Push to talk). If you are using a single channel receiver, switch to "1" - channel A only. We also recommend using "1" - channel A if you are using a single microphone.
- Battery Compartment To access the battery compartment, slid the door downward

Security alert features

The security Alert features allows the teacher/presenter to send a silent wireless electronic signal with a simple press of a button, in the event of an in-classroom security incident. The signal is easily generated by the teacher who is wearing T6r wireless pendant microphone. This same microphone transmitter which is used for in-room amplification, has a special button (labelled PRIORITY) on the side for initiating the Security Alert. Simply holding down the button for 5 seconds, "closes" a contact closure on the rear panel of the HDi receiver amplifier and sends the Security Alert Signal to the appropriate location possibly the principal's or security monitoring station. The front panel power switch on the front of the amplifier will "blink" with a soft green background.

To disengage from the Security Alert mode, simply hold down the same button for 5 seconds, and the amplifier will return to its normal state with the front panel power button illuminated with a solid blue background.

The output is a three pin NO/NC contact closure labeled Alert.

Security alert contacts





Page over-ride/page pass through

The page over-ride feature allows you to connect HDi receiver amplifier to the school paging/intercom system for muting purposes. A simple connection between the inclassroom paging speaker (typically 25V ,70V or 100V) and the page input will mute all the inputs and pass the page to the speakers connected to the HDi receiver amplifier

- Unplug the 2 pin green Phoenix connector
- Connect the speaker cable from the paging system to the 2 pin Phoenix connector of the Page input
- Reconnect the 2 pin green Phoenix connector
- Determine the signal level of the paging system (25V ,70V or 100V)
- Set the slide switch to the appropriate speaker level setting
- With the HDi receiver amplifier turned ON, send a page signal through the page input
- Adjust the page input SENSITIVITY control so that an incomong page/intercom signal will override any audio (mics, dvd etc) plugged into the HDi receiver amplifier.



In the event of a loss of AC power, the HDi receiver amplifier will continue to pass the page on to the speakers as shown in RED/Circle on the diagram below.

IR2 Channel





Fire alarm input

The 2 pin orange Phoenix connector labelled Fire Alarm, was designed to provide an emergency mute of the HDi receiver amplifier. When interfaced to the fire alarm relay contact output, all audio devices (microphones, dvd, etc.) will turn SILENT. In the event of a fire, this will help to lower the overall decible levels and help students and staff hear the audible fire alarm tones/instruction within the classroom. This feature only requires a 5-24 volt AC or DC source.



Anti Hum ON/OFF Switch

Ground loop noise commonly occurs when multiple devices of sound equipment are connected to each other. These hum or buss noise is usually generated by the power supply or video equipment and may enter through the ground to the power amplifier host IR2/IR3 Channel.

The Anti hum ON/OFF switch is used as a group loop filter for the input to effectively eliminate the buzzing sound made by the ground loop.



RS-232 features

The RS-232 feature allows the user to remotely operate the line level media inputs via a convenient wall panel controller.

Audio levels very often need to be adjusted when switching from computer audio to DVD players and other audio sources. Such operations as level UP, DOWN and MUTE are easily accomplished via a typical eight button controller, as shown here. This allows the receiver/amplifier to be placed in an area or compartment that is not easily accessed by the user. Codes that are required for this setup are also available below or from HDi website.



Baud Rate: 9600 Parity Bit: NONE Data Bit: 8 Stop Bit: 1	
COMMAND	Functionstring
POWER ON	HDi: Power: ON
POWER OFF	HDi: Power: OFF
Gain DVD UP	HDi: Gain: DVD UP
Gain DVD UPDOWN	HDi: Gain: DVD DOWN
Gain DVD MUTE	HDi: Gain: DVD MUTE
Gain Computer UP	HDi: Gain: Computer UP
Gain Computer DOWN	HDi: Gain: Computer DOWN
Gain Computer MUTE	HDi: Gain: Computer MUTE

RS-232 codes

HEX

4c 69 6e 6b 78 3a 50 6f 77 65 72 3a 4f 4e 4c 69 6e 6b 78 3a 50 6f 77 65 72 3a 4f 46 46 4c 69 6e 6b 78 3a 47 61 69 6e 3a 41 55 58 3a 55 50 4c 69 6e 6b 78 3a 47 61 69 6e 3a 41 55 58 3a 44 4f 57 4e 4c 69 6e 6b 78 3a 47 61 69 6e 3a 41 55 58 3a 4d 55 54 45 4c 69 6e 6b 78 3a 47 61 69 6e 3a 44 56 44 3a 55 50 4c 69 6e 6b 78 3a 47 61 69 6e 3a 44 56 44 3a 44 4f 57 4e 4c 69 6e 6b 78 3a 47 61 69 6e 3a 44 56 44 3a 44 4f 57 4e 4c 69 6e 6b 78 3a 47 61 69 6e 3a 44 56 44 3a 44 55 54

RS-232 contacts

