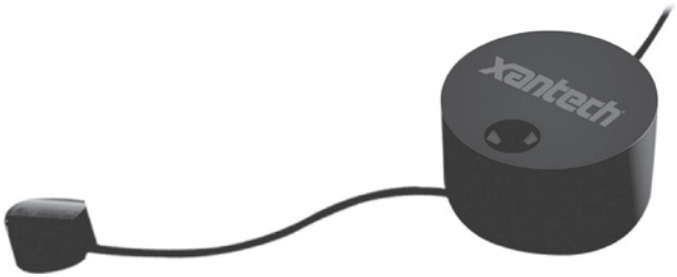
xantech®

INSTALLATION INSTRUCTIONS

EN85K
Ensemble Universal IR Kit

Surface Mount / TV Mount / Flush Mount / Shelf Mount
Plasma / LCD / LED / CFL Friendly
Convertible IR Receiver Kit



DESCRIPTION

The EN85K Ensemble is a convertible IR Receiver Kit that can be adapted to almost any surface mount, flush mount or shelf mount application. It includes all of the parts necessary for installing a single-room IR Repeater System for controlling a TV, Audio/Video Receiver, Blu-ray player, Cable Box, Satellite Receiver...just about any IR controlled A/V home entertainment device.

The kit includes an IR Receiver that can be attached to the front of a TV, or extended from behind on flat panel TVs that have a minimal frame around the display area. The receiver can also be adapted to a low-profile shelf-top case or cabinet door adapter for controlling IR components hidden in an equipment cabinet.

The EN85 IR Receiver adapts and connects in minutes! Please read the instructions in this manual carefully to enjoy arm chair control of your favorite audio/video components!

FEATURES

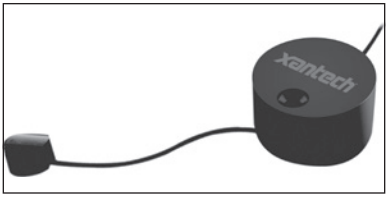
- IR Receiver shelf mount, flush mount, surface mount and TV mount adapters allow installation almost anywhere
- IR Receiver compatible with most Plasma, LCD and LED TVs
- IR Receiver compatible with most CFL light bulbs
- Includes one 789-44 Connecting Block, one 781ERGPS Power Supply, and four 283D IR Emitters for easy system installation

SPECIFICATIONS

- Infrared carrier frequency bandwidth: 30-60 kHz
- Reception range: Up to 80 feet*
- Reception angle: +/- 45º
- Cable requirements: See section: **Extending The Receiver Wire**
- Max. Transmission length: 1 mile using 18 gauge wire
- Maximum current output: 100mA
- IR Receiver Dimensions: .55" diameter (14mm)
- Power requirements: +12VDC, 100mA

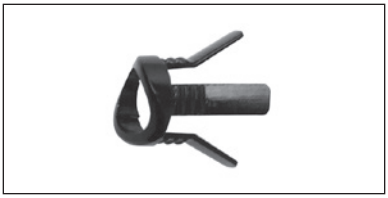
* Depending on remote control output strength and ambient conditions.

WHAT'S INCLUDED



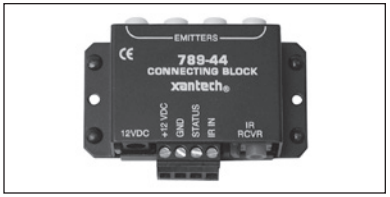
1 - EN85 IR Receiver

1 - Tabletop Adapter

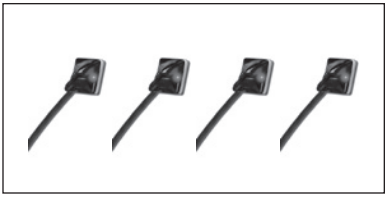


1 - Flush Mount Adapter

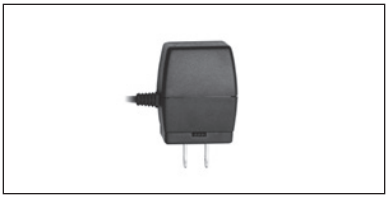
1 - TV Mount Adapter



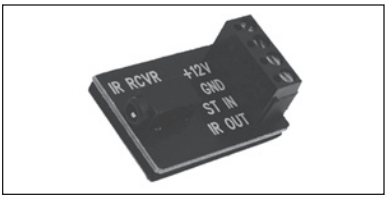
1 - 789-44 Connecting Block



4 - 283D IR Emitters



1 - 781ERGPS Power Supply



1 - BOT-1.0 IR Terminal

1 - PTP-1 Plug to Plug Jumper

1 - IR Parallel Block

READ THIS BEFORE YOU DO ANYTHING!

FOUR IMPORTANT CONSIDERATIONS

1. **Where is the IR Receiver going to be located?** The IR Receiver must be 'line-of-sight' to the remote control being used to be able to control the system audio/video components. This location should be in a convenient spot in front of the user when seated in a typical location for watching TV or listening to music. This will determine how the IR Receiver is going to be mounted.

2. **How is the IR Receiver going to be mounted?** The IR Receiver can be surface mounted directly to the frame on the front of some flat panel TVs. For TVs that do not have a wide enough frame, the TV Mount Adapter can be used to extend the IR Receiver out from the back of the TV. If the IR Receiver is going to be mounted in a cabinet door, the Flush Mount Adapter will mount the IR Receiver in an 11⁄16" hole in the cabinet door. If the IR Receiver is going to be placed on a shelf or on top of a cabinet, the Tabletop Adapter provides an attractive, low profile case for that application.

3. **Where are the audio/video components that are going to be controlled?** The IR Receiver, Emitters and Power Supply all connect to the 789-44 Connecting Block. The Connecting Block should be in the same location as the audio/video components. If the A/V components are in a wall unit or cabinet in the same room and within a few feet of the IR Receiver, then once the IR Receiver has been mounted, find a convenient location that allows access to the Connecting Block for making connections and then simply connect the IR Receiver, Emitters and Power Supply. (The IR Receiver has a total wire length of 6 feet, 8 inches, and the Emitters have a wire length of 10 feet, usually enough wire to make connections in a typical cabinet or wall unit.)

   If the IR Receiver is going to be mounted across the room or in a different room from the A/V components, the wire length of the IR Receiver can be extended to accommodate those situations. Please see the section: **Extending the Receiver Wire** for additional information.

4. **IMPORTANT NOTE - Placement** - The IR Receiver should be located so that it is not directly facing a light source such as sunlight, lamps or video displays (CRT, LCD, and Plasma). When mounted near a display, it should be flush to the display and away from light reflections that may occur.

With answers to these three important questions, you're ready to install your EN85K IR Receiver...So let's go!

INSTALLING THE IR RECEIVER

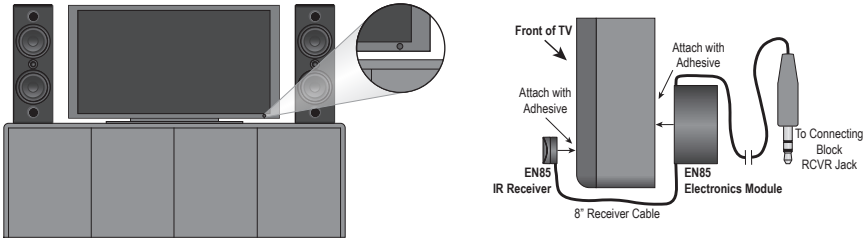


Figure 1 - Surface Mount - Flat Panel TV

SURFACE MOUNT

The first, and easiest, option is to mount the IR Receiver on the front frame of a flat panel TV. This application can also be used to surface mount the IR Receiver to other objects.

1. Select a location on the TV frame to mount the IR Receiver. Be sure the receiver will not be blocked by any object to allow 'line-of-sight' to the remote control in normal use.

2. With the IR Receiver 8" Receiver Cable directed toward the edge of the TV, using one of the round adhesive strips, carefully attach the IR Receiver to the TV frame. **Figure 1**

3. Carefully flatten and wrap the 8" Receiver Cable around to the back of the TV. The Receiver Cable can be secured to the TV with tape or a wire holder if necessary. Do not block any TV vents.

4. Using one of the round adhesive strips, carefully attach the Electronics Module to the rear of the TV. Do not block any TV vents.

5. Carefully run the plug end of the Receiver Cable into the cabinet with the A/V components to where the Connecting Block will be located. Be careful not to pinch or strain the Receiver Cable. The Receiver Cable can be secured to the back of the TV with tape or a wire holder. Do not block any TV vents.

If this is your application, when finished, proceed to section: **Typical Connections**.

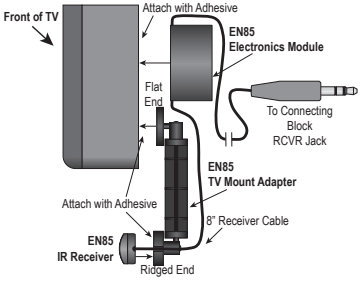


Figure 2 - TV Mount Adapter - Rear Mount

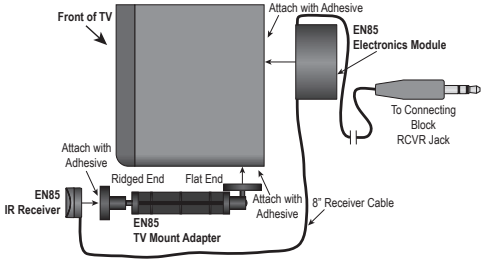


Figure 3 - TV Mount Adapter - Bottom/Side Mount

TV MOUNT ADAPTER

The TV Mount Adapter allows mounting the IR Receiver on an extension attached to the rear or side panel of a flat panel TV that does not have a frame on the front that is wide enough to directly mount the IR Receiver. This application can also be used to mount the IR Receiver in just about any position on just about any object.

Both ends of the TV Mount Adapter rotate and swivel allowing the Adapter and IR Receiver to be manipulated into different positions as shown in **Figure 4**.

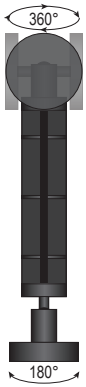


Figure 4

1. Select a location on the TV to mount the TV Mount Adapter. Be sure that once mounted, the IR Receiver will not be blocked by any object to allow 'line-of-sight' to the remote control in normal use.

2. With the 8" Receiver Cable aligned to the Wire Gap on the ridged end of the TV Mount Adapter, **(Figure 5)** using one of the round, notched adhesive strips, attach the IR Receiver to the TV Mount Adapter. **Figures 2 & 3**

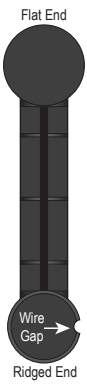


Figure 5

3. Using one of the round adhesive strips, attach the flat end of the TV Mount Adapter to the TV frame. **Figures 2 & 3 & 5**

4. Carefully flatten and wrap the 8" Receiver Cable around to the back of the TV. The Receiver Cable can be secured to the TV with tape or a wire holder if necessary. Do not block any TV vents.

5. Using one of the round adhesive strips, attach the Electronics Module to the rear of the TV. Do not block any TV vents. **Figures 2 & 3**

6. Carefully flatten and wrap the plug end of the Receiver Cable into the cabinet with the A/V components. Be careful not to pinch or strain the Receiver Cable. The Receiver Cable can be secured to the back of the TV with tape or a wire holder. Do not block any TV vents. If this is your application, when finished, proceed to section: **Typical Connections**.

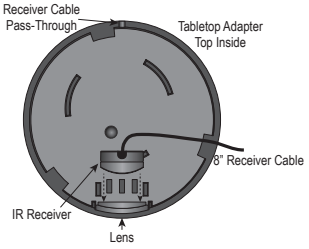


Figure 6 - Tabletop Adapter - Insert IR Receiver

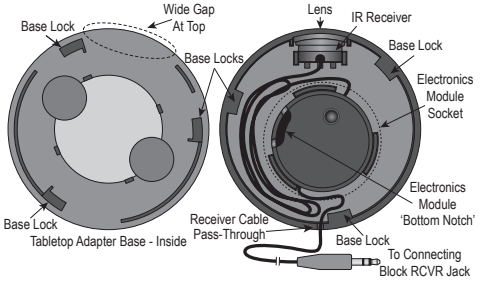


Figure 7 - Tabletop Adapter - Insert Electronics Module

TABLETOP ADAPTER

The Tabletop Adapter allows mounting the IR Receiver in an attractive low-profile case creating an IR Receiver that can be placed on any shelf or tabletop.

1. Remove the Tabletop Adapter Base by rotating it counter-clockwise as shown in **Figure 8**.

2. Position the Tabletop Adapter top so the lens is facing down as shown in **Figure 6.**

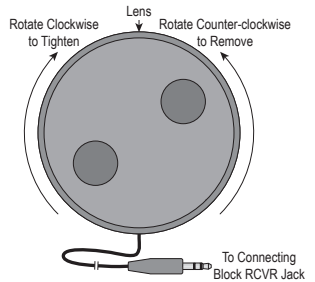


Figure 8 - Tabletop Adapter - Remove/Tighten Base

3. With the 8" Receiver Cable on the IR Receiver facing up, carefully insert the IR Receiver into the socket on the backside of the lens as shown in **Figure 6.** The receiver should snap into place when properly inserted.

4. With the 'bottom notch' of the Electronics Module facing you, carefully slide the module onto the post in the Electronics Module Socket as shown in **Figure 7.**

5. Carefully wrap the 8" Receiver Cable around the Electronics Module and extend the plug end of the Receiver Cable out of the Tabletop Adapter case via the Receiver Cable Pass Through as shown in **Figure 7.**

6. Align the Adapter Base to the Adapter Top with the 'wide gap' aligned at the top with the IR Receiver as shown in **Figure 7**. Tighten the base to the top as shown in **Figure 8.**

If this is your application, when finished, proceed to section: **Typical Connections**.

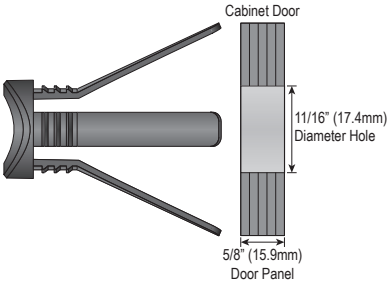


Figure 9 - Flush Mount Adapter - 11⁄16" Hole

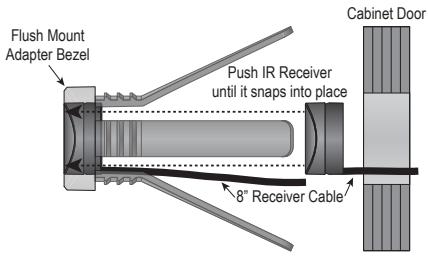


Figure 10 - Flush Mount Adapter - Install IR Receiver

FLUSH MOUNT ADAPTER

The Flush Mount Adapter allows mounting the IR Receiver in an equipment cabinet door. This allows IR controlled audio/video components to be controlled with the cabinet door closed.

This application requires drilling an 11⁄16" (17.4mm) hole in the cabinet door as shown in **Figure 9**. It is recommended that the IR Receiver be mounted closer to the hinged side of the cabinet door so the Electronics Module can be mounted to an inside wall rather than the door.

1. Select a location on the cabinet door to mount the Flush Mount Adapter. Be sure to leave adequate clearance from the back of the cabinet door to the front of the A/V components to allow room for the Adapter Locks with the door closed. **(Figure 12)** Also be sure that once mounted, the IR Receiver will not be blocked by any object to allow 'line-of-sight' between the remote control and the IR Receiver in normal use.

2. Drill an 11⁄16" (17.4mm) diameter hole in the cabinet door. **Figure 9**

3. From the back side of the cabinet door, feed the IR Receiver through the hole in the cabinet door. Carefully pull the 8" Receiver Cable straight back from the IR Receiver and with the receiver lens oriented to match the orientation of the adapter (thick sections 12 and 6 o'clock) push the IR Receiver into the back of the adapter until it snaps into place. **Figure 10**

4. Pinch the Adapter Locks together and carefully slide the adapter/receiver assembly through the hole until the adapter bezel is pressed against the front of the cabinet door. Be sure to align the thick sections of the bezel at 12 and 6 o'clock for best left to right off-axis performance. (It will look better that way as well.) **Figure 11**

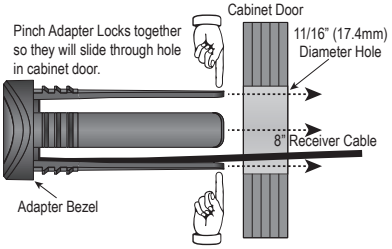


Figure 11 - Flush Mount Adapter - Install Adapter

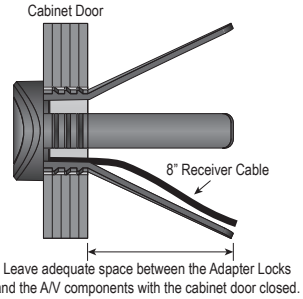


Figure 12 - Flush Mount Adapter - Adapter Installed

5. **NOTE: It is recommended that the Electronics Module be mounted to an inside wall of the cabinet. If attached with adhesive, there is some possibility that if mounted to the door, in time, the module could come loose from the action of the door opening and closing and ultimately fall off, potentially damaging the IR Receiver the Electronics Module or both.** Using an appropriate length wood screw (not included) attach the Electronics Module to an inside wall of the cabinet. Use a screw that will secure the module but will not penetrate the outside wall of the cabinet. Do not overtighten the screw to avoid damaging the Electronics Module case. **Figure 13** OR... Use one of the included adhesive strips to attach the Electronics Module to the inside of the cabinet.

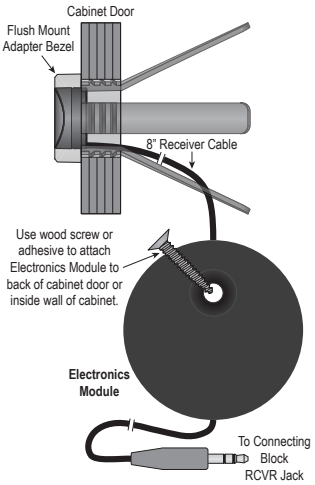


Figure 13 - Flush Mount Adapter - Secure Electronics Module

6. Carefully run the plug end of the Receiver Cable to where the Connecting Block will be located. Be careful not to pinch or strain the cable.

If this is your application, when finished, proceed to section: **Typical Connections**.

TYPICAL CONNECTIONS

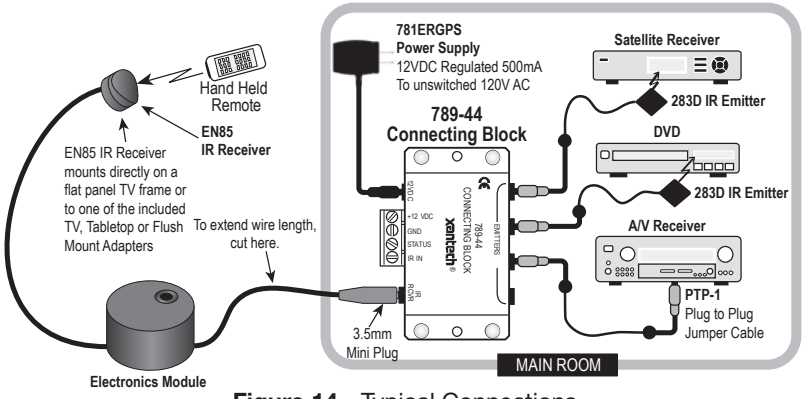


Figure 14 - Typical Connections

SINGLE ROOM - EQUIPMENT CABINET

With the IR Receiver configured and installed in a surface mount, TV mount, flush mount or tabletop application as described on the previous pages, install the Connecting Block and then connect the IR Receiver, Emitters and Power Supply to the Connecting Block as described below.

1. Find a convenient location in the equipment cabinet to mount the 789-44 Connecting Block. This location should allow easy access for making connections and be located so the IR Receiver, Emitter and Power Supply wires can all be connected without modification. Attach the Connecting Block to a cabinet wall or shelf with the included wood screws. Be sure the screws are long enough to secure the block but not so long that they extend out of the side of the cabinet.

2. Connect the IR Receiver to the “IR RCVR” jack on the 789-44 Connecting Block. (Connect the red IR Receiver plug to the red Connecting Block jack.)

3. Carefully position the 283D IR Emitters over the IR Eye on each audio/video component to be controlled. (If the eye is not obvious, shine a small flashlight into the front panel of the component to locate the eye, or refer to the component’s owner’s manual.)

4. Position the IR Emitter so the mini-wire is positioned toward the nearest top or bottom edge on the component being controlled.

5. Carefully wrap the Emitter mini-wire around to the back of the component and run the Emitter wire to the Connecting Block, being careful to not pinch the wire between components.

6. Connect the Emitter to one of the 'Emitters' jacks on the Connecting Block. (Connect the yellow IR Emitter plug to one of the yellow Connecting Block jacks.) Repeat for all Emitters.

7. As an option, use the PTP-1 Plug to Plug Jumper Cable to connect an Emitter OUT on the Connecting Block to a device with a 3.5mm mini IR IN jack. If it doesn't work, use an Emitter for IR control.

8. Connect the 781ERGPS Power Supply to the 12VDC jack on the 789-44 Connecting Block. Connect the Power Supply to an UNSWITCHED AC outlet.

9. To test, point an IR Remote at the EN85 IR Receiver. Press a specific function button on the remote (Cable/Satellite ON/OFF for example). All connected Emitters (283D) should flash red, and the selected component should respond to the command (Cable/Satellite ON/OFF).

   If any of that didn't happen, check IR system connections and try again. If the system still hasn't responded, check the **Troubleshooting** section at the end of this manual.

EXTENDING THE RECEIVER WIRE

In some applications it may be necessary to extend the IR Receiver wire. Typical examples would be if the IR Receiver is going to be located across the room from the Connecting Block and A/V components or if the IR Receiver is going to be located in a remote room. This will give the user the ability to control IR controlled audio/video components from a location where the remote control no longer has direct line-of-sight to the equipment.

To extend the IR Receiver wire, use the included BOT-1.0 IR Terminal as shown in **Figure 17** or the IR Parallel Block as shown in **Figure 18**. Use unshielded, 3-conductor stranded wire as detailed in the Wire Length/Gauge Table on the next page.

IMPORTANT NOTE: DO NOT EXTEND THE WIRE LENGTH BETWEEN THE IR RECEIVER AND THE ELECTRONICS MODULE. THIS WILL REDUCE THE SENSITIVITY OF THE IR RECEIVER AND VOID THE WARRANTY. IF IT IS NECESSARY TO EXTEND THE WIRE LENGTH TO THE CONNECTING BLOCK WITHOUT USING THE BOT-1.0 IR TERMINAL, EXTEND THE WIRE THAT RUNS BETWEEN THE ELECTRONICS MODULE AND 3.5MM MINI PLUG **(FIGURE 15)**. SEE **FIGURE 16** FOR THE WIRE PIN-OUT OF THE RECEIVER WIRE. USE THE IR PARALLEL BLOCK TO MAKE CONNECTIONS AS SHOWN IN **FIGURE 18**.

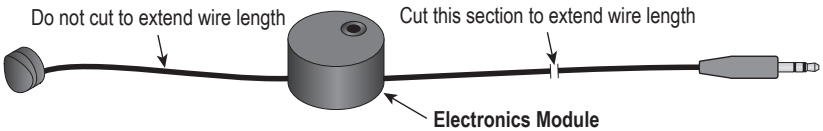


Figure 15 - Only Extend The Plug End of the IR Receiver Cable

Use unshielded, 3 conductor stranded wire per the table, when extending the plug end of the IR Receiver Cable. (4 conductor provides an extra wire for back-up if one of the conductors gets damaged.)

IR WIRE LENGTH	IR WIRE GAUGE
UP TO 200' (61m)	24 AWG
UP TO 600' (183m)	22 AWG
UP TO 2000' (610m)	20 AWG
UP TO 5000' (1524m)	18 AWG

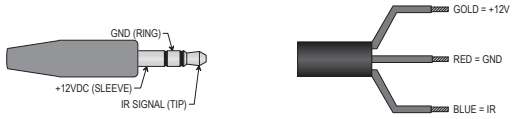


Figure 16 - 3.5mm Stereo Mini Plug & Wire Pin-Out

When adding wire length, as a first option, use the BOT-1.0 **(Figure 17).** This will allow complete installation without having to cut the IR Receiver wires. The IR Parallel Block **(Figure 18)** has been included as a second option for that type of connection when desirable. Confirm that the IR Signal, +12VDC and GND wires are properly connected to both the BOT-1.0 or IR Parallel Block and the IR Router (Signal to Signal; +12 to +12; GND to GND). Improper connection will affect performance and possibly damage the IR Receiver. The Xantech EN85K Warranty does not cover this type of damage.

While it is possible to make wired connections without the BOT-1.0, IR Parallel Block or IR Router, it is not recommended. Their use will reduce installation time, help eliminate errors, allow easy troubleshooting and permit easy system upgrades later, if needed.

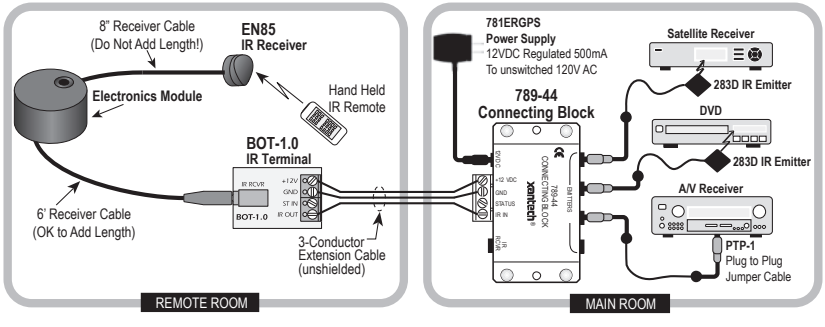


Figure 17 - Extending the IR Receiver Wire

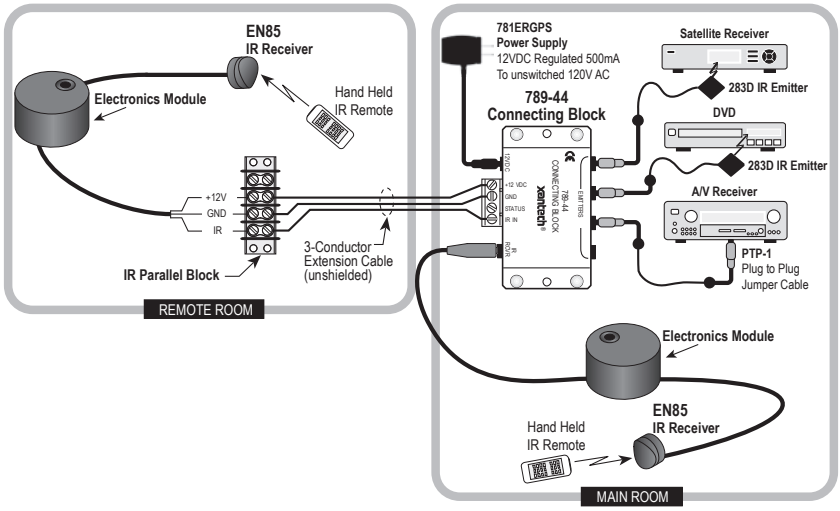


Figure 18 - Multi-Room Application

MULTI-ROOM APPLICATION

Another application is multi-room IR control. If an audio receiver or amplifier is being used to drive speakers in multiple rooms, it may be desirable to place an IR Receiver in some or all of those rooms to control the audio components from another room. In many cases, this same application can be used to control the main zone and second zone of a two-zone A/V Receiver.

This will allow a user to turn the system ON/OFF with an IR remote via the IR Receiver(s) in the remote room(s). The system can also be controlled from the main room with an IR remote using the IR Receiver in the main room.

Installation combines the connections described in the previous **Single Room** and **Extending the Wire** sections. The Main Room IR Receiver gets connected to the red 'IR RCVR' jack on the Connecting Block and the multi-room receiver(s) get connected to the screw terminals on the Connecting Block using either the BOT-1.0 **(Figure 17)** or IR Parallel Block (**Figure 18).**

IR Troubleshooting Guide

NOTE: Due to the many variables in a given installation, the troubleshooting measures you may need to take can vary in different situations.

Each installation is different due to the number of IR Receivers, length of wire runs, type of wire, amount of ambient IR noise present, etc….

Therefore, your troubleshooting measures for a particular job can range from nothing at all, to any combination of the solutions listed below.

Symptom #1: 283D IR Emitters dimly lit or flickering.

	Cause	Solution
1.	Signal and ground wires are reversed or shorted either at the Connecting Block or IR Receiver.	Recheck wiring.
2.	Defective Emitter.	Replace Emitter.
3.	Relatively high levels of ambient light noise. This can be due to any of the following: sunlight, florescent lighting or Plasma Displays.	Reposition the IR Receiver away from the light source or eliminate the light source.
4.	EMI induced noise (electromagnetic interference). This can be due to light dimmer controls or other radiating electronic devices (PC's or any poorly shielded electronic device).	Reposition the IR Receiver and/or cabling away from emitting device. You can also place a 470-ohm resistor in parallel with the IR Signal and GND connections on the Connecting Block. This will also help alleviate any stray capacitance in the cable.
5.	Plasma Interference.	Plasma interference can be reflected off of any item it comes into contact with within approx. 3 feet of the front of the display. Keeping this in mind, make sure that the IR Receiver is free from any object that might reflect Plasma interference into the receiving eye.

Symptom #2: 283D IR Emitters constantly on.

	Cause	Solution
1.	Plasma Interference	Plasma interference can be reflected off of any item it comes into contact with within approx. 3 feet of the front of the display. Keeping this in mind, make sure that the IR Receiver is free from any object that might reflect Plasma interference back into the receiving eye.
2.	Voltage and Ground wires are reversed at the Connecting Block or IR Receiver	Recheck wiring.
3.	Relatively high levels of ambient noise. This can be due to any of the following: sunlight, florescent lighting or Plasma Displays.	Reposition the IR Receiver or eliminate the light source.
4.	EMI induced noise (electromagnetic interference). This can be due to light dimmer controls or other radiating electronic devices (PC's or any poorly shielded electronic device).	Reposition the IR Receiver and/or cabling away from emitting device. You can also place a 470-ohm resistor in parallel with the IR Signal and GND connections on the Connecting Block. This will also help alleviate any stray capacitance in the cable.
5.	Power Supply not putting out proper voltage.	Verify supply is a 12VDC regulated supply reading between 11.5 to 13VDC under load.

Symptom #3: Intermittent IR control (i.e. buttons on remote need to be pressed multiple times)

	Cause	Solution
1.	Plasma Interference.	Plasma interference can be reflected off of any item it comes into contact with within approx. 3 feet of the front of the display. Keeping this in mind, make sure that the IR Receiver is free from any object that might reflect Plasma interference back into the receiving eye.
2.	Relatively high levels of ambient noise. This can be due to any of the following: sunlight, florescent lighting or Plasma Displays.	Reposition the IR Receiver or eliminate the light source.
3.	Long Wire Runs – shielded wire typically of 100 feet (30 meters) or longer causes a filter effect due to accumulated capacitance of the wire. Intermittent, or no IR control, could actually be because of the longer wire runs.	Putting a 470-ohm resistor in parallel at the Connecting Block between signal and ground will effectively discharge the capacitance of the wire. Adding a resistor between the input and ground of the Connecting Block will drop the IR level down somewhat.
4.	Low batteries in Remote	Replace batteries.
5.	IR Signal is cancelled out.	If the A/V source (i.e. cable box, DVR or satellite box) sees the IR signal twice, the source will not process it correctly. Place a Xantech 28DES Designer Emitter Shield or a piece of black electrical tape over the emitter to block reflected IR signals.

Symptom #4: Emitters function but some (or all) components do not respond.

	Cause	Solution
1.	Emitter placement is incorrect.	Reposition the Emitter so that it is directly over the component's IR eye. Shine a small flashlight into the front panel of the component to locate the eye or consult the component's owner's manual for the exact location of the IR eye.
2.	Emitter placement is correct but the signal is overpowering the unit or there is bleed-through from other Emitters close by.	Reposition the Emitter so it is not directly over the IR eye to reduce the amount of IR signal the IR eye on the component being controlled 'sees'. If the A/V source (i.e. cable box, DVR or satellite box) sees the IR signal twice, the source will not process it correctly. Place a Xantech 28DES Designer Emitter Shield or a piece of black electrical tape over the emitter to block reflected IR signals.

Symptom #5: Absolutely No Functionality (How to determine which component is at fault)

	Component to Test	Instructions
1.	Verify Power Supply	With a Multimeter, measure the DC Voltage of the Power Supply while it is connected to the Connecting Block. Put the negative lead of the meter on the terminal marked GND and the positive lead on the terminal marked 12VDC (or V). You should get a reading between 11.5VDC and 13.0VDC. If not, remove the supply from the Connecting Block and measure again - this time directly on the 2.5mm coaxial plug. If it reads between 11.5VDC and 13VDC, the Power Supply is most likely good. Reconnect to the Connecting Block and proceed to **Step 2**. **NOTE:** In most cases this will indicate the Power Supply is good but in some cases the Power Supply can still be bad (i.e. reads good when not plugged in but may not be able to handle the current load of the system.)
2.	Verify Emitter. (283D or 286D Blink Style ONLY)	Remove the Power Supply from the Connecting Block and all Emitters from the output. Place a jumper wire on the Connecting Block between IR and +12V. Reconnect the Power Supply and one Emitter. The Emitter should light bright and solid. Repeat for all Emitters.

Limited Warranty

Xantech® warrants its products to be free of defects in materials or workmanship. This is a Limited Lifetime warranty from the date of purchase by the original consumer. Any products returned to Xantech and found to be defective by Xantech within the warranty period will be repaired or replaced, at Xantech's option, at no charge. Xantech will not be responsible for the actual cost of installation or removal of the product, nor for any incidental or consequential damages. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation may not apply to you.

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