

MODEL
IRR4D+



IRR4D+

INFRARED REMOTE CONTROL EXTENDER



INSTALLATION & OPERATION GUIDE

IRR4D+

Wall-Mount
IR Sensor

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Introduction

The IRR4D+ is a wall-mount, Decora® style IR sensor designed for use with the Niles Infrared Repeating and IR Routing Systems.

Installed in a remote room location, the IRR4D+ receives the IR commands transmitted from your existing hand-held remotes in that room. The commands are carried via a small 2-conductor shielded cable to your A/V equipment in another room, and instantly "repeated".

The IRR4D+ is compatible with all current Niles infrared systems. It may be used along with, or as an alternative to, the Niles IRR4S+, TIR1+, MS-1, MS-2 and CMS-3 IR sensors or the IntelliPad™.

The IRR4D+ is just one part of the three building blocks necessary to complete a Niles IR repeating system:

- IR Main System Unit—Models IRP2+, IRP6+, IRZ6+ and RVL-6.
- IR Sensors/Keypads—Models IRR4S+, IRR4D+, SCW-UIR, TIR1+, MS-1, MS-2, CMS-3 and the IntelliPad.
- IR Flashers—Models IRC-1 and the IRC-2.

An IR sensor expansion unit, Model XRP6+, is available for IR repeater systems used in more than six rooms.

Features and Benefits

Power Status and Flashback Display

The bicolor LED display on an IRR4D+ sensor eliminates the guesswork common with other IR control systems. The green LED indicates the On/Off condition of the system's preamp/receiver. Whenever your preamp receiver is on the LED glows green, whenever it is off, the LED is off. When the IRR4D+ receives a signal from your hand-held remote control, the LED flashes red.

Backwards Compatible with Niles IR Repeaters Without Status

If connected to an IRP-2, IRP-6, or IRZ-6 IR main system unit, the IRR4D+ will operate fine but without the "power status" feature. The LED will flash red when a signal is received. Niles' new line of IR main system units (IRP2+, IRP6+, IRZ6+, and the RVL-6) have built-in technology which broadcasts the power status of your preamplifier/receiver.

Greater IR Receiving Range

You get 18 to 30 feet of remote control range instead of the typical 15 to 25 (actual range may vary, depending upon the strength of the remote control).

Sunlight Filter

Included with the IRR4D+ is a square piece of black plastic grille. This is a sunlight filter which allows the IRR4D+ to be used in a location where sunlight falls directly on the

sensor. With the filter installed, the IRR4D+ will operate with reduced range (8 to 12 feet) in direct sunlight.

Improved Rejection of ElectroMagnetic Interference (EMI)

The IRR4D+ had been redesigned to shield itself from EMI Interference.

Universal System

Compatible with most brands of A/V equipment and remotes using carrier frequencies 26 to 60 kHz.

Interchangeable Decora Inserts

Snap in inserts provide for fast, easy color changes. Inserts (sold separately) are available in a variety of colors.

Four Designer Colors to Choose From

Available in white, bone, almond, or black.

100% factory tested

Every IRR4D+ is 100% tested for IR receiving range and angle. Printed circuit board design uses no hand wiring, assuring high reliability.

Guaranteed Performance

The IRR4D+ is backed by a two year parts and labor warranty.

Made in the USA

The IRR4D+ is proudly manufactured in Miami, Florida.

Installation Considerations

The IRR4D+ is a Decora-style module and is designed to use standard Decora-style cover plates and mounting hardware. Decora cover plates (up to 6-gang) with color-matched plate screws are available from your Niles dealer.

Using the Power Status Display

The green power status LED can only be activated by a “power status” broadcast from a Niles IR main system unit (IRP2+, IRP6+, IRZ6+ or the RVL-6). The IR main system unit will broadcast the power status signal if the preamp/receiver is on and one end of a 12V DC wall adapter is plugged into the preamp/receiver’s switched AC outlet with the other end connected to the IR main system unit’s Status input jack. See (Figure 1) on page 5.

Note: The 12V DC wall adapter plugged into the switched outlet of the receiver shown in the illustration (reverse side) is not included with the IR main system unit. It should be 12V DC with a minimum of 100mA output. It can be ordered through your Niles dealer (Stock# XF00009 12V DC Wall Adapter).

P-Rings and Electrical Boxes

The mounting depth of the IRR4D+ is 2-3/4". When installed, the unit extends 2-1/4" behind the sheetrock wall (assuming 1/2" sheetrock). For installation, you must choose between a standard light switch plaster ring (p-ring) or a

TOOLS REQUIRED

- No. 2 Phillips Screwdriver
- 1/8" Standard Slotted Screwdriver
- 1/4" Standard Slotted Screwdriver
- Wire Stripper

W A L L - M O U N T I R S E N S O R

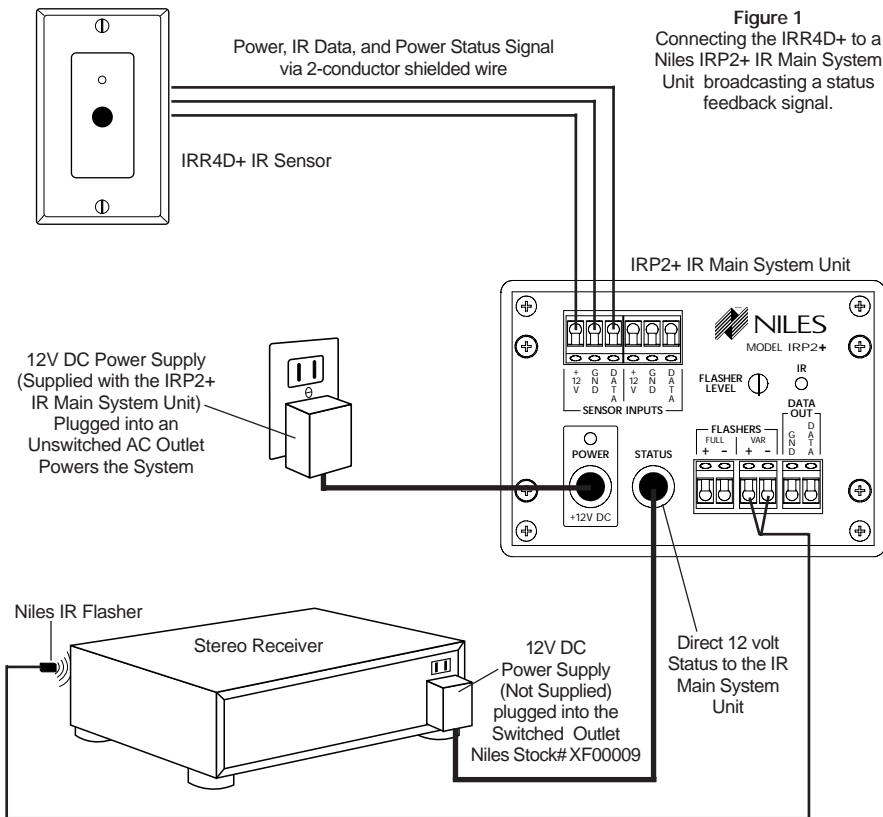


Figure 1
Connecting the IRR4D+ to a Niles IRP2+ IR Main System Unit broadcasting a status feedback signal.

standard 18 cu. in. (or larger) electrical box. Suitable p-rings and electrical boxes are available from your Niles dealer or local electrical supply company. Using the p-ring is best because it gives you unobstructed access to the full depth of the wall. In some instances, the use of a p-ring may be inappropriate, such as in a retro-fit (existing) installation, or when building codes require that wall devices be enclosed in electrical boxes. Contact your local building code and inspection department if unsure.

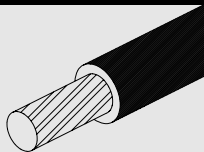
Type of Cable

The IRR4D+ connects to the Niles Infrared Systems with an individual home run of 2-conductor shielded cable. Recommended cables are West Penn D291, Belden 8761, Carol C2516 or equivalent, made of two 22 gauge (or larger) conductors surrounded by a foil shield and a bare drain (ground) wire.

DO NOT USE UNSHIELDED CABLE WITH THE IRR4D+.

When running wires inside walls, most states and municipalities in the U.S. specify that you must use a special type of wire. Usually, the requirement is that the wire has a specific "CL" fire rating, such as "CL-2" or "CL-3". Consult your Niles dealer, building contractor, or local building and inspection department if unsure about which type of wire is best for your application.

"TECH TIP"



Wire size is expressed by it's AWG (American Wire Gauge) number. The lower the AWG number, the larger the wire, i.e., 20 AWG wire is physically larger than 22 AWG.

IRR4D+ Mounting Location

Locating the IRR4D+ in the center of a room usually results in the most even IR receiving coverage, especially if the room is square shaped. Rooms that are L-shaped or long and narrow require more careful consideration. With these types of rooms, installing the IRR4D+ closest to the primary location of the user will ensure the best performance.

Receiving Range and Pickup Angle

The receiving range of the IRR4D+ will vary according to the IR output strength of the remote control being used. Remote strength varies among brands depending on the number and size of batteries used, and how many IR emitters the remote has. For example, remotes that operate on two small AAA batteries and have only one IR emitter are generally not as strong as remotes that use the larger AA size batteries and have two emitters. Tests with various manufacturers' remote controls have shown that the operating range can vary from a minimum of 18 feet to a maximum of about 30 feet.

Infrared signals travel essentially line-of-sight. They will not pass through or around solid objects. Do not rely on an IR signal being able to "bounce" off a wall or object to the IRR4D+.

The IR pickup angle of the IRR4D+ is 60° off-axis (horizontal and vertical) at 18 feet.

Avoiding Interference

As with any type of IR sensor, avoid locating the IRR4D+ where it will be exposed to direct sunlight. The sun emits an enormous amount of IR energy, many times stronger than that of a hand-held remote. Although the AGC circuitry in the IRR4D+ automatically compensates for ambient sunlight, keep in mind that the less sunlight the IRR4D+ receives, the better the range of the remotes.

If you must install the IRR4D+ in direct sunlight, it is recommended that you use the sunlight filter. Avoid locating the IRR4D+ near any potential sources of electrical or optical noise, such as light dimmers, florescent lighting fixtures, low-voltage lights, and televisions (both tube-type and projection-type).

DO NOT INSTALL THE IRR4D+ INTO ELECTRICAL BOXES WITH 110 VOLT DEVICES.

Some states or municipalities allow devices such as the IRR4D+ to be installed into the same electrical box as 110 volt devices, provided a "low-voltage partition" is used between the devices. We do not recommend this. The cable connected to the IRR4D+ can act as an "antenna" for electrical noise. Locating the IRR4D+ cable too close to a light dimmer or switch may interfere with the IRR4D+. If you must locate the IRR4D+ near electrical devices, install it in a separate metal electrical box, ground the box to the

electrical system ground, and route the IRR4D+ cable several feet away from all electrical wiring.

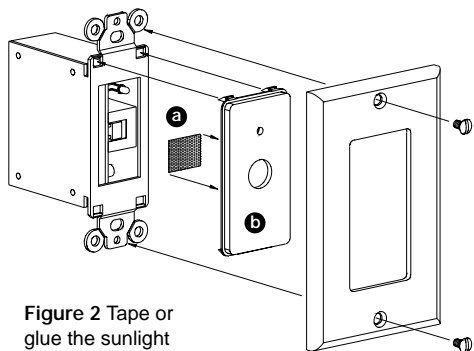


Figure 2 Tape or glue the sunlight filter (a) to the rear of the red lens on the snap-on insert (b). To remove the insert, see page 10.

Using the Sunlight Filter

The use of the sunlight filter will reduce the receiving range of the IRR4D+ to between eight and twelve feet. The filter is installed *behind* the red lens. Unsnap the Decora insert (see page 10) and use tape or glue to affix the filter to the rear of the red lens see (Figure 2).

Avoiding Optical Feedback

If installing the IRR4D+ in the same room as an IR flasher, it is possible for the flasher's IR output to be picked-up by the IRR4D+. This effect, known as an optical feedback loop, can cause erratic operation.

Optical feedback is similar to acoustical feedback: the howling or whistling sound heard in a P.A. system when the microphone is too close to the speaker. To avoid optical feedback:

1. Lower the output power of the flasher(s) using the variable flasher level control(s) on the Niles IR main system units.

2. Re-position the flasher(s) and/or the sensor.
3. Use Niles IRC-2 flashers and cover them with the supplied IR blockers.

Changing the Color of the IRR4D+

The Decora-style insert on the IRR4D+ is removable, allowing fast and easy color changes as needed. Inserts are available in a variety of colors.

If you need to change the color of the IRR4D+:

1. Obtain the IRR4D+ Decora insert in the desired color from your Niles dealer.
2. Hold the IRR4D+ as shown in **(Figure 3)**. Locate the two plastic mounting tabs at the top rear of the Decora insert. Using two fingers, simultaneously press both tabs down (towards the center of the insert) and forward (away from you) until the insert pops free from its mounting slots.
3. Locate the new Decora insert. Hold the IRR4D+ so that it is facing you. Insert the two bottom tabs into the bottom slots first, followed by the two tabs on the top. Snap the insert into place by carefully pressing on the front of the insert.

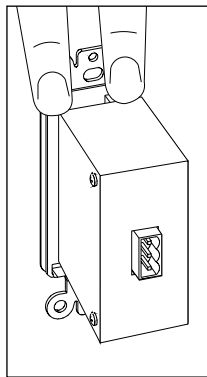


Figure 3
Removing the
Decora®-style Insert

"TECH TIP"

Do not exert
excessive pressure
on the plastic
mounting tabs.

Installation

If you are installing the IRR4D+ into an existing wall, take time to consider any possible obstructions which may be hidden inside the wall, such as wood and metal studs; electrical, telephone or other types of wiring; plumbing; conduit; old wall safes; etc see **(Figure 4)**.

"TECH TIP"

Avoid installing the IRR4D+ next to a light dimmer.

1. Install the electrical box or p-ring in the usual manner.
2. Run the cable to the IRR4D+. Label the cable for future reference.
3. Make the connections to the IRR4D+. Locate the connector on the IRR4D+ and remove it see **(Figure 5)**. Next, strip 1/4" of insulation from the end of each wire. Tightly twist the end of each wire until there are no frayed ends. Insert each wire into the appropriate hole on the removable connector block; secure the wiring to the connector by tightening the small connector screws. Double-check all connections. Plug the connector back into its socket on the IRR4D+.

Continued on page 13

WALL-MOUNT IR SENSOR

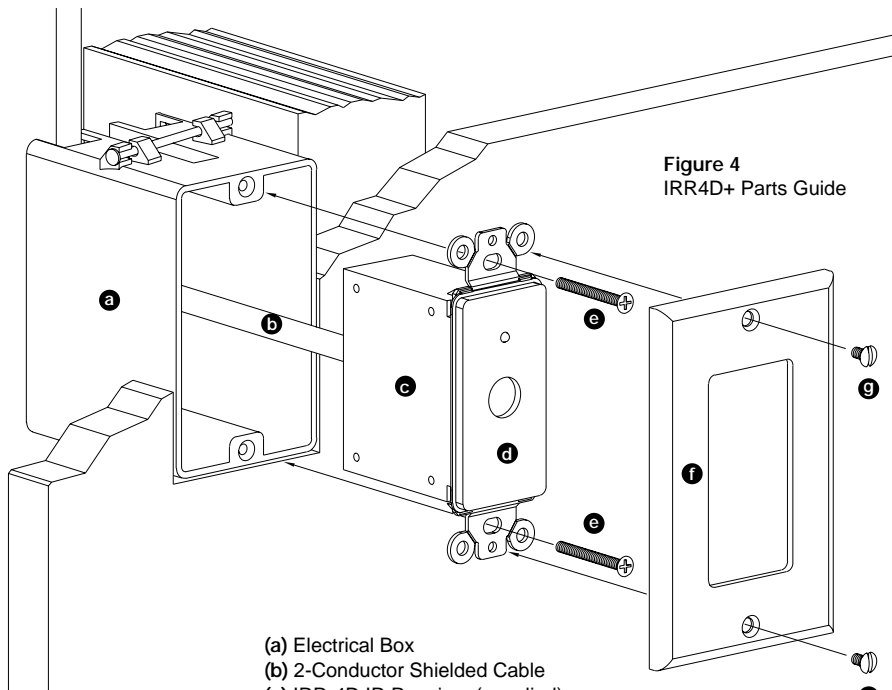


Figure 4
IRR4D+ Parts Guide

- (a) Electrical Box
- (b) 2-Conductor Shielded Cable
- (c) IRR-4D IR Receiver (supplied)
- (d) Snap-on Color Insert (supplied)
- (e) Device Screws (2 supplied)
- (f) Decora Faceplate (supplied)
- (g) Faceplate Screws (2 supplied)

WALL-MOUNT IR SENSOR

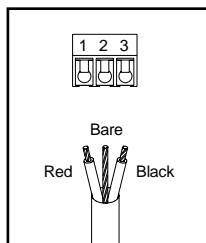
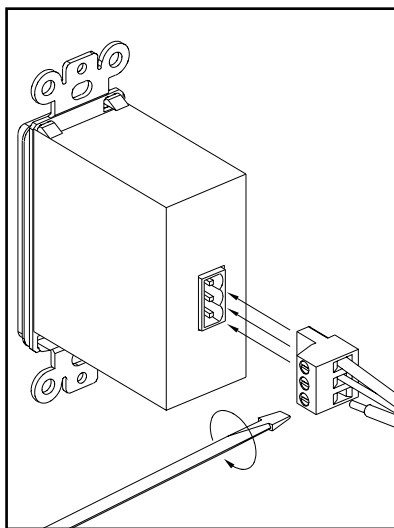


Figure 5
Installing the
Connector

IRR4D+ Wiring Configuration

PIN 1 = Red (+12V DC)

PIN 2 = Bare (GND)*

PIN 3 = Black (DATA)

NOTE: The color code shown above is for West Penn D291 IR cable. Actual color code of recommended cables may vary.

* You must use the bare drain wire for the ground connection.

4. Secure the IRR4D+ to the electrical box or p-ring. Insert the 1 1/4" long device screws into the oblong-shaped screw holes on the top and bottom of the IRR4D+. Note that the oblong shape of the screw holes allow you to position the IRR4D+ so that it is vertical. Position the IRR4D+ so that the screws are aligned with the threaded holes in the electrical box or p-ring. Tighten the screws using a phillips screwdriver. **DO NOT OVER-TIGHTEN.** In some instances, you may need to loosen these screws several turns to allow the IRR4D+ to fit flush with the Decora cover plate. See (Figure 6).

5. Use the shorter plate screws to fasten the Decora cover plate to the IRR4D+. **DO NOT OVER-TIGHTEN THE PLATE SCREWS OR YOU MAY DAMAGE THE COVER PLATE.** Line up all the screws in the same direction for a finished look.

NOTE: Certain "old work" or "retro-fit" boxes, such as the Carlon B225R, have a plastic "lip" which interferes with the Decora plate screws. This lip prevents you from being able to tighten these screws completely. To make the clearance necessary for these screws, you must remove the parts of the lip causing the interference. There are two ways to accomplish this:

1. Drill through the lip of the box at the screw points.
2. Cut notches into the lip with a pair of diagonal cutters.

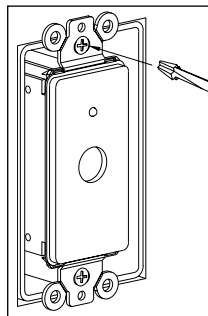


Figure 6
Loosening the Screws
for a Flush Fit

Operation

This manual contains instructions for the IRR4D+ only. For specific information on the adjustment and operation of your Niles Infrared system, please refer to the instruction manual included with your Niles IR main system unit.

Operation of the IRR4D+ is straightforward. Simply aim your hand-held remote at the IRR4D+. Your IR command is instantly repeated to your A/V equipment. A bicolor LED on the IRR4D+ visually confirms remote control operation.

Troubleshooting

The bicolor LED on the front of the IRR4D+ is a useful troubleshooting aid.

The LED should light only when a remote command is being received.

If the IRR4D+ does not work, and the LED does not light at all:

1. Test the remote control(s) by operating the A/V equipment directly. Replace the batteries if needed.
2. Double check the cable connections on all IRR4D+'s and on the IR main system unit. Look for open, shorted or reversed wires.

If the IRR4D+ does not work, and the LED remains solidly lit:

1. Double check the cable connections on all IRR4D+'s and on the IR main system unit. Look for shorted or reversed wires.
2. Test for interference from the following sources:
 - Reduce the amount of sunlight in the area of the IRR4D+.
 - Turn off florescent, neon or halogen lights in the room.
 - Turn off light dimmers, beginning with those closest to the IRR4D+.

Observe the IRR4D+ LED while performing all the tests. It is possible to have interference from more than one source.

There are many methods for reducing interference. Which solution is best for you depends on your situation. Contact Niles Technical Support at 1-800-289-4434 if you require further assistance.

If the LED on the IRR4D+ "flickers" dimly, and the IRR4D+ functions normally, there is no cause for concern.

SPECIFICATIONS

IR System

Compatible with virtually all brands of remotes using carrier frequencies between 26 and 60 kHz

IR Receiving Range

Varies depending on remote strength; 18-30' typical

IR Receiving Angle

60° off-axis (horizontal and vertical) at 18'

Mounting

In-wall, fits into most 18 cu. in. single-gang electrical boxes at least 2-3/4" deep, Decora-style face plate

Wiring Requirements

Individual home-runs of 2-conductor shielded cable, West Penn D291 or equivalent

Unit Dimensions

1-5/8" wide x 2-5/8" high

Face Plate Dimensions

Decora wall plate; 2-3/4" wide x 4-1/2" high

Depth Behind Plate

2-3/4"



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