

# INSTALLATION & OPERATION GUIDE



## WS100R

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WALL-MOUNT INFRARED SENSOR



BLENDING HIGH FIDELITY AND ARCHITECTURE®

# WS100R

Wall-Mount  
Infrared Sensor

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## Introduction

The WS100R is a wall-mount, Decora® style IR sensor designed for use with the Niles infrared extender systems.

Installed in a remote room location, the WS100R receives the IR commands transmitted from your existing hand-held remotes in that room. The commands are carried via a category 5 cable to your A/V equipment in another room, and instantly “repeated”.

The WS100R is compatible with all current Niles infrared systems. It may be used along with, or as an alternative to, the Niles TS100, MS100, MS200, MVC100IR and CS100 sensors or the IntelliPad®.

The WS100R is just one part of the three building blocks necessary to complete a Niles IR repeating system:

- IR Main System Unit—Models MSU140, MSU250, MSU480 and MSU440Z.
- IR Sensors/Keypads—Models WS100, TS100, MS100, MS200, CS100, MVC100IR and the IntelliPad®.
- IR Flashers—Models MF1, MF2, MF1FV, MF2FV and the IRB1.

An IR sensor expansion hub, Model IRH610, is available to provide additional sensor inputs to your system.

## Features and Benefits

The WS100R offers a number of improvements over other wall-mount IR sensors.

- Plasma-proof performance— allows placement of the WS100R near plasma displays.
- CFL interference resistant— expands installation flexibility to areas with fluorescent lighting.
- Works under most lighting conditions, including indirect sunlight— eliminates environmental restrictions.
- Universal system— compatible with virtually all brands of A/V equipment and remote controls.
- Excellent IR receiving range— you get 18' to 30' of remote control range (depending upon the strength of your handheld remote).
- 100% factory tested for pickup range and angle.
- Small size of only 2-3/4" wide by 4-1/2" high by 1-1/4"— fits in a one-gang box.
- Printed circuit board design uses surface mount technology (SMT), assuring high reliability.
- Ideal for both home and commercial installations.
- Removable Decora-style snap-in color insert. (Available in four colors).
- Two year parts and labor warranty.

## Installation Considerations

The WS100R 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.

### Type of Cable

The WS100R connects to the Niles infrared main systems unit or IRH610 sensor expansion hub with an individual home run of category 5 cable. 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.

### WS100R Mounting Location

Locating the WS100R 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 WS100R closest to the primary location of the user will ensure the best performance.

### Receiving Range and Pickup Angle

The receiving range of the WS100R 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' to a maximum of about 30'.

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 WS100R.

The IR pickup angle of the WS100R is 30° off-axis (horizontal and vertical) at 18'.

### **Junction Boxes**

The mounting depth of the WS100R is 1-1/4". When installed, the unit extends 3/4" behind the sheetrock wall (assuming 1/2" sheetrock). Suitable electrical boxes are available from your Niles dealer or local electrical supply company.

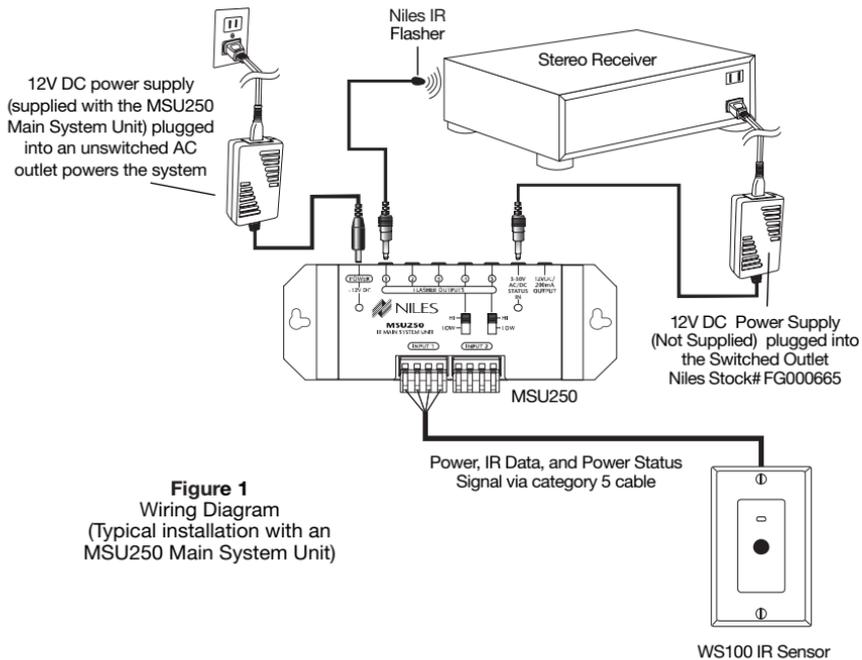
### **DO NOT INSTALL THE WS100R INTO ELECTRICAL BOXES WITH 110 VOLT DEVICES.**

Some states or municipalities allow devices such as the WS100R 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 WS100R can act as an "antenna" for electrical noise. Locating the WS100R cable too close to a light dimmer or switch may interfere with the WS100R. If you must locate the WS100R near electrical devices, install it in a separate metal electrical box, ground the box to the electrical system ground, and route the WS100R cable several feet away from all electrical wiring.

### **TOOLS REQUIRED**

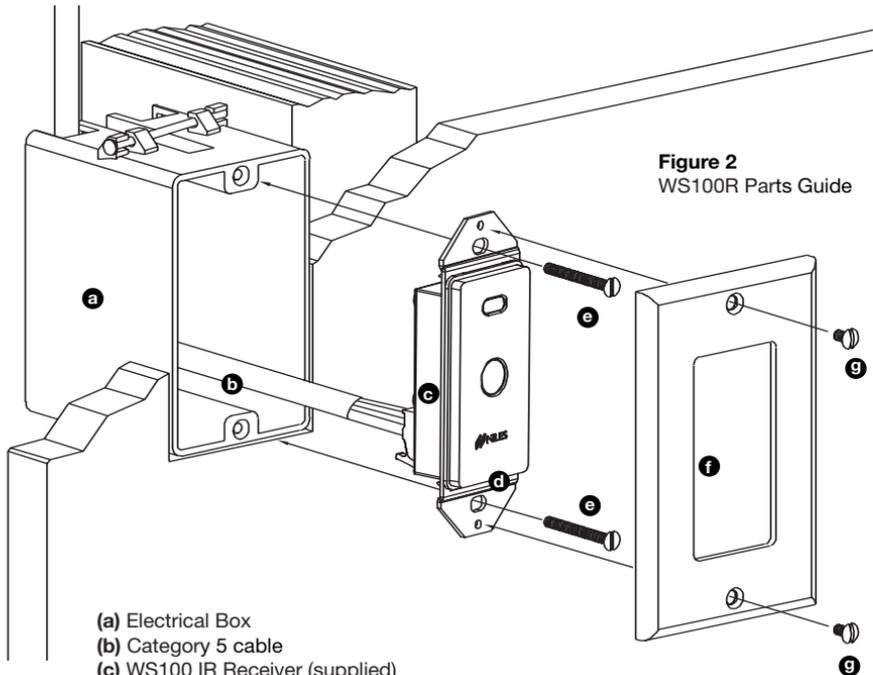
- 1/8" Standard Slotted Screwdriver
- 1/4" Standard Slotted Screwdriver
- Wire Stripper

# WALL-MOUNT INFRARED SENSOR

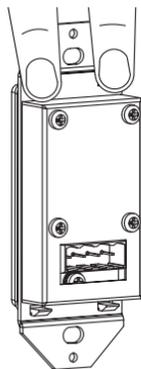


# WALL-MOUNT INFRARED SENSOR

**Figure 2**  
WS100R Parts Guide



- (a) Electrical Box
- (b) Category 5 cable
- (c) WS100 IR Receiver (supplied)
- (d) Snap-on Color Insert (supplied)
- (e) Device Screws (2 supplied)
- (f) Decora Faceplate (supplied)
- (g) Faceplate Screws (2 supplied)



**Figure 3**  
Removing the  
Decora-style Insert

### “TECH TIP”

Do not exert  
excessive pressure  
on the plastic  
mounting tabs.

### Avoiding Interference

The WS100R is designed to work in most applications including plasma displays and in areas where CFL lighting and indirect sunlight are present. You should avoid locating the WS100R near potential sources of electrical or optical noise, such as light dimmers or low-voltage lights.

### Avoiding Electrical Interference

Avoid locating the WS100R near any potential sources of electrical or optical noise, such as light dimmers, low-voltage lights, and neon lights.

### Avoiding Optical Feedback

If installing the WS100R in the same room as an IR flasher, it is possible for the flasher's IR output to be picked-up by the WS100R. 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. Re-position the flasher(s) and/or the sensor.
2. Use Niles MF1 or MF2 flashers and cover them with the supplied IR blockers.

### Changing the Color of the WS100R

The Decora-style insert on the WS100R 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 WS100R:

1. Obtain the WS100R Decora-style insert in the desired color from your Niles dealer.

2. Hold the WS100R as shown in (Figure 3). Locate the two plastic mounting tabs at the top rear of the Decora-style 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-style insert. Hold the WS100R 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.

### Using the WS100R with the Intellipad Ci system.

The WS100R is fully compatible with the Niles Intellipad Ci line, follow the wiring instructions in Figure 4. For specific information see your Intellipad Ci manual.



**Figure 4**

This color code is based on the industry standard T568A coding for the RJ45 connector. When connecting the WS100R to the Niles Ci system observe this Pin configuration.

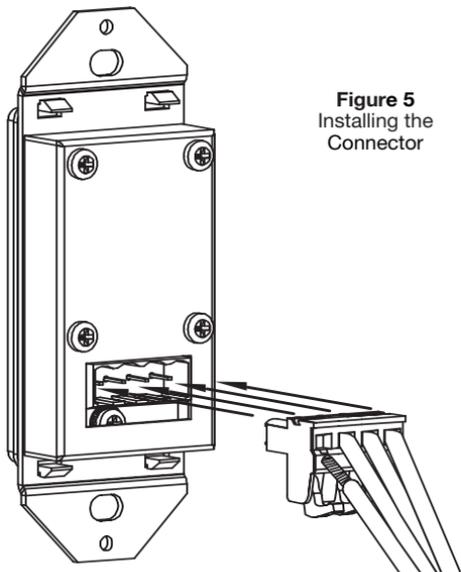
**“TECH TIP”**

Avoid installing the WS100R next to a light dimmer.

## Installation

If you are installing the WS100R into an existing wall, take time to consider any possible obstructions which may be hidden inside the wall, such as wood or metal studs, electrical, telephone or other types of wiring, plumbing, AC or heating conduit, etc.

1. Locate the connector plug.
2. Strip 1/4" of insulation from the end of each wire.
3. Use a small flathead screwdriver or your thumbnail to raise the locking tabs, exposing the holes on the removable connector plug.
4. Insert each wire into the appropriate hole on the removable connector plug, and snap the locking tab down. To help you, the connector plug is keyed. Insert the smooth side of the connector plug into the smooth side of the socket. Don't force the scalloped side of the connector plug into the smooth side of the socket. (Figure 5)
5. Use the shorter plate screws to fasten the Decora cover plate to the WS100R. **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.



**Figure 5**  
Installing the  
Connector

**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.

**IntelliPad Wiring**

See your MSU manual if you are connecting the WS100R with an IntelliPad system.

**Operation**

Operation of the WS100R is simple. Stand within the operational range of your WS100R. Aim your hand-held remote at the WS100R and press the button for the desired command. Your IR command is instantly repeated to your A/V equipment.

**Green “Power Status” LED**

When the WS100R is correctly connected (as shown in Figure 1), the Green LED will stay lit as long as the preamp/receiver is on. When your preamp/receiver is off, the LED will stay off.

**Blue “Flash-back” LED**

The blue “flash-back” LED on the WS100R visually confirms the reception of an IR command.

## Troubleshooting

This manual contains instructions for the WS100R only. For specific information on the adjustment and operation of your Niles infrared extender system, please refer to the instruction manual included with your Niles IR main system unit (MSU140, MSU250, MSU480 MSU440Z, IntelliControl®).

The bi-color blue/green LED on the front of the WS100R is a useful troubleshooting aid. The led should light solid green when status is detected.

The blue LED should light only when a remote command is being received. If the LED on the WS100R “flickers”, and the WS100R functions normally, there is no cause for concern, some stray IR signal are being received by the WS100R but are not being repeated.

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 WS100R's and on the main system unit. Look for open, shorted or reversed wires.
3. Test for interference from the following sources:
  - Neon or halogen lights in the room.
  - Light dimmers, beginning with those closest to the WS100R.

Observe the WS100R's LED while performing all the tests. It is possible to have interference from more than one source.

**Eliminating optical feedback**

In some installations, two conditions combine to create an optical feedback loop. Symptoms can include: poor range, intermittent operation or no operation.

The conditions which sometimes combine to create a feedback loop are:

1. Both a sensor and a flasher are located within the same room.
2. There is some low-level noise or interference on your system.

You can eliminate optical feedback by replacing any IRB1 “flooding flasher” with MF1 or MF2 MicroFlashers and covering all flashers with the supplied IR blocking covers.

**Identifying the type of interference**

The “flash-back” LED on the front of the WS100R is a useful trouble-shooting aid.

The LED should light blue only when a remote command is being received. However, if the LED on the WS100R “flickers”, and the WS100R functions normally, there is no cause for concern.

**If the WS100R does not work, and the LED does not light at all:** Test the remote control(s) by operating the A/V equipment directly. Replace the batteries if needed. Double check the cable connections on all WS100R’s Main System Unit and on the IR main system unit. Consult your IR Main System Unit’s manual for more detail.

**If the WS100R does not work, and the LED flickers or remains solidly lit:** Cover up the Sensor with a piece of cardboard (your hand will actually create electromagnetic interference under some conditions). Observe the IR test LED.

**IR Test LED Off:**

Optical Interference.

**IR Test LED On or Flickering:**

Electromagnetic Interference.

**EMI (Electromagnetic Interference)**

Identify the source of the interference. The most common sources of electromagnetic interference are listed in the Installation Considerations section on page 3. To eliminate EMI try the following methods:

1. Move the sensor or the sensor cable away from the EMI source or move the source of the EMI away from the sensor or the cable.
2. Connect the Sensor's GND terminal to true earth ground (if this isn't feasible use the main system unit's GND terminal).

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

#### **TECH NOTE**

The feedback LED can be disabled if it continues to flicker or visual feedback is not desired. Discrete on and off IR commands are available on the Niles Technical support website for disabling the feedback LED. The address is: [nilesaudio.com/techsupport](http://nilesaudio.com/techsupport).

## Specifications

### IR System

Compatible with virtually all brands of remotes using carrier frequencies between 26 and 105 kHz.

### IR Receiving Range

Varies depending on remote strength; 18 to 30' typical.

### IR Receiving Angle

30° 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 Category 5 cable.

### Unit Dimensions

1-5/8" wide x 2-5/8" high x 1-1/4" deep.

### Face Plate Dimensions

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

## Contents

WS100R Sensor x1

Decora Insert x1

Decora faceplate x 1

Removable connector x 1

Device Mounting Screws x 2

Faceplate Spaces x 2

## Notes

## Notes



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