NILES®

INSTALLATION GUIDE

WALL-MOUNT IR SENSOR

WS120

CONGRATULATIONS!

Thank you for choosing the **WS120 Wall-Mount Infrared Remote Sensor** from Niles. With proper installation and operation, you should enjoy years of trouble-free use.

Niles manufactures the industry's most complete line of custom installation components and accessories for audio/video systems. To see the complete Niles product assortment, visit us on the internet at: www.nilesaudio.com.

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INTRODUCTION

The Niles WS120 is a wall-mount, Decora® style IR sensor designed for use with the Niles infrared extender systems.

Installed in a remote room location, the WS120 receives the IR commands transmitted from your existing hand-held remotes in that room. The commands are carried via a CAT-5 cable to your A/V equipment in another room, and instantly "repeated".

The WS120 is compatible with all current Niles infrared systems. It may be used along with, or as an alternative to, the Niles TS120, MS120, MS220, and CS120 sensors or the Niles MultiZone Keypad.

The WS120 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 WS120, TS120, MS120, MS220, CS120, and the IntelliPad®.*

• *IR Flashers—Models MF1, MF2, MF1VF, MF2VF and the IRB1.*

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

CONTENTS

- WS120 Sensor
- Decora Insert
- Decora faceplate
- Removable Connector
- Device Mounting Screws (2)
- Faceplate Spaces (2)

FEATURES AND BENEFITS

The WS120 offers a number of improvements over other wall-mount IR sensors.

- *Wideband High-Fidelity Design enables operation with virtually any brand of equipment*
- *Patent Pending Universal Noise Suppression Design enables operation in virtually any environment: near plasma and LCD displays, compact fluorescent lights, and indirect sunlight*
- *Excellent IR receiving range— you get 20' to 35' of remote control range (depending upon the strength of your handheld remote)*
- *Small size of only 2-3/4" wide by 4-1/2" high by 1-1/4" deep — 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*
- *Two year parts and labor limited warranty*

INSTALLATION CONSIDERATIONS

The WS120 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.

TOOLS REQUIRED

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

TYPE OF CABLE

The WS120 connects to the Niles infrared main systems unit or IRH610 sensor expansion hub with an individual home run of CAT-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.

WS120 MOUNTING LOCATION

Locating the WS120 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 WS120 closest to the primary location of the user will ensure the best performance.

RECEIVING RANGE AND PICKUP ANGLE

The receiving range of the WS120 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 20' to a maximum of about 35'.

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 WS120. The IR pickup angle of the WS120 is 30° off-axis (horizontal and vertical) at 25'.

JUNCTION BOXES

The mounting depth of the WS120 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 WS120 INTO ELECTRICAL BOXES WITH 110 VOLT DEVICES.

Some states or municipalities allow devices such as the WS120 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 WS120 can act as an "antenna" for electrical noise. Locating the WS120 cable too close to a light dimmer or switch may interfere with

INSTALLATION CONSIDERATIONS *(CONTINUED)*

the WS120. If you must locate the WS120 near electrical devices, install it in a separate metal electrical box, ground the box to the electrical system ground, and route the WS120 cable several feet away from all electrical wiring.

AVOIDING INTERFERENCE

The WS120 is designed to work in most applications including plasma and LCD displays and in areas where CFL lighting and indirect sunlight are present. You should avoid locating the WS120 near potential sources of electrical or optical noise, such as light dimmers or low-voltage lights. Avoid locating the WS120 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 WS120 in the same room as an IR flasher, it is possible for the flasher's IR output to be picked-up by the WS120. 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.

12V DC power supply (supplied with the MSU250 Main System Unit) plugged into an unswitched AC outlet powers the system

Niles IR Flasher

Stereo Receiver

12V DC Power Supply (Not Supplied) plugged into the Switched Outlet Niles Stock# FG01035

MSU250

Power, IR Data, and Power Status Signal via CAT-5 cable
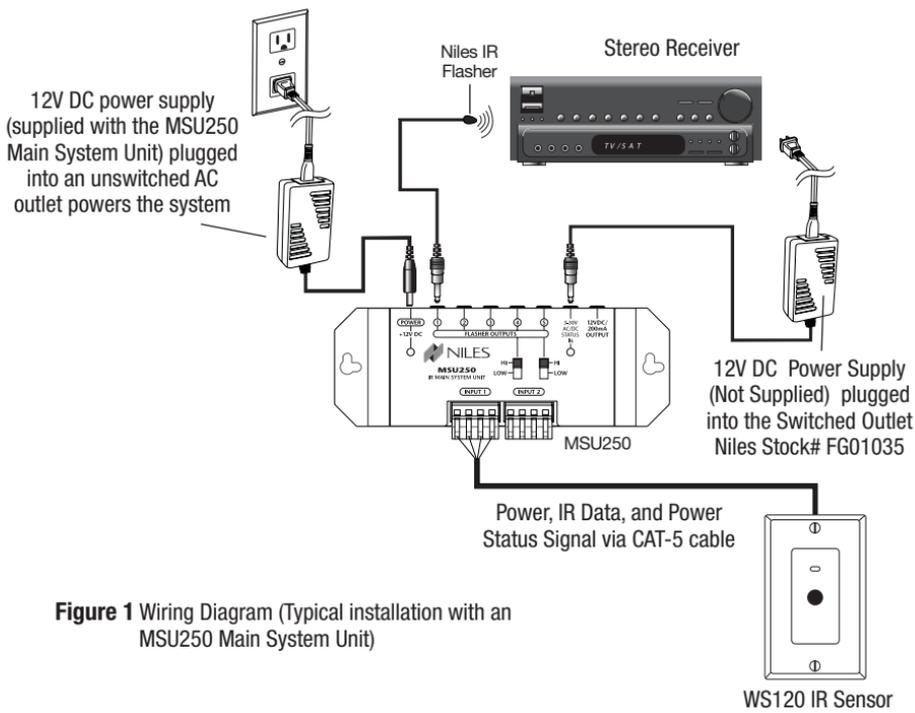
Figure 1 Wiring Diagram (Typical installation with an MSU250 Main System Unit)

WS120 IR Sensor

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INSTALLATION CONSIDERATIONS (*CONTINUED*)

Figure 2
WS120 Parts Guide
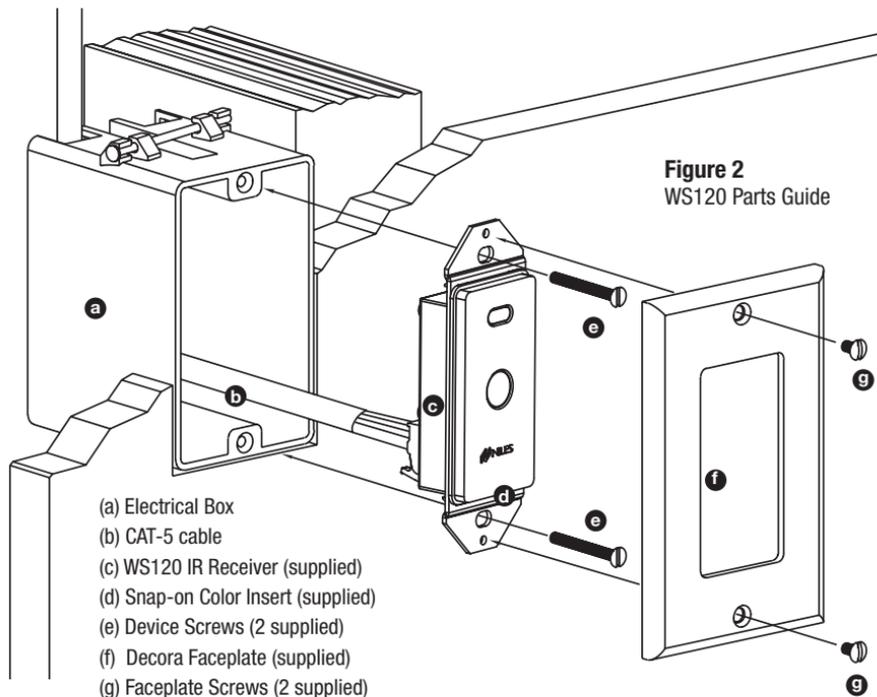
(a) Electrical Box
(b) CAT-5 cable
(c) WS120 IR Receiver (supplied)
(d) Snap-on Color Insert (supplied)
(e) Device Screws (2 supplied)
(f) Decora Faceplate (supplied)
(g) Faceplate Screws (2 supplied)

USING THE WS120 WITH NILES MULTIZONE KEYPADS

The WS120 is fully compatible with the Niles MultiZone Keypad that have an IR-Sensor connection, follow the wiring instructions in **Figure 4**. For specific information see your Niles MultiZone Keypad manual.

1 = Green/White **-** 12V
2 = Green **-** DATA
3 = Orange/White **-** GROUND
4 = Blue **-** EMPTY
5 = Blue/White **-** STATUS
6 = Orange **-** EMPTY
7 = Brown/White **-** EMPTY
8 = Brown **-** EMPTY

Tab Down

5 = STATUS
3 = GROUND
1 = 12V
2 = DATA

1 = STATUS
2 = DATA
3 = GROUND
4 = 12V DC

ST   IR   G   V+

Figure 4   This color code is based on the industry standard T568A coding for the RJ45 connector. When connecting the WS120 to the Niles MultiZone Keypad that have IR-Sensor connection observe this pin configuration.

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INSTALLATION

If you are installing the WS120 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 WS120. 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.

INTELLIPAD WIRING

See your MSU manual if you are connecting the WS120 with an IntelliPad® system.

OPERATION

Operation of the WS120 is simple. Stand within the operational range of your WS120. Aim your hand-held remote at the WS120 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 WS120 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 "FEEDBACK" LED

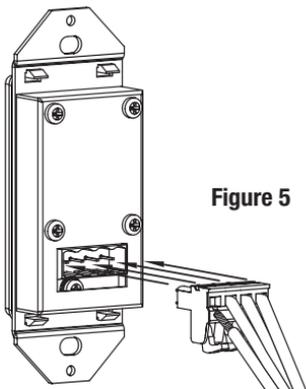The blue "feedback" LED on the WS120 visually confirms the reception of an IR command.

Figure 5 Installing the Connector

TROUBLESHOOTING

This manual contains instructions for the WS120 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).

The bi-color blue/green LED on the front of the WS120 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 WS120 "flickers", and the WS120 functions normally, there is no cause for concern, some stray IR signal are being received by the WS120 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 WS120's and on the main system unit. Look for open, shorted or reversed wires.*

   3. *Test for interference from the following sources:*

        • *Neon, Compact Florescent Lighting (CFL), or halogen lights in the room.*

        • *Light dimmers, beginning with those closest to the WS120.*

Observe the WS120's LED while performing all the tests. It is possible to have interference from more than one source.

TROUBLESHOOTING (*CONTINUED*)

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 an MF1 or MF2 MicroFlasher® and covering all flashers with the supplied IR blocking covers.

IDENTIFYING THE TYPE OF INTERFERENCE

The "feedback" LED on the front of the WS120 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 WS120 "flickers", and the WS120 functions normally, there is no cause for concern.

IF THE WS120 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 WS120's Main System Unit and on the IR main system unit. Consult your IR Main System Unit's manual for more detail.

IF THE WS120 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.

TROUBLESHOOTING (*CONTINUED*)

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 5. 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 call Niles Technical Support at 305-238-4373 or 1-800-289-4434 (M-F 8:00 AM - 7:00PM ET). You can also email Niles Technical Support at support@nilesaudio.com.

SPECIFICATIONS

IR System
Compatible with virtually all brands of remotes using carrier frequencies between 25kHz and 90kHz

IR Receiving Range
Varies depending on remote strength;
Typically 20' to 35' (6.1 meters to 10.7 meters)

IR Receiving Angle
30° off-axis (horizontal and vertical) at 25'
(7.6 meters)

Mounting
In-wall, fits into most 18 cu. in. single-gang electrical boxes at least 2-3/4" (7.0 cm) deep, Decora-style face plate

Wiring Requirements
Individual home-runs of CAT-5 cable

Unit Dimensions
1-5/8" wide x 2-5/8" high x 1-1/4" deep
(4.13 cm wide x 6.67 cm high x 3.18 cm deep)

Face Plate Dimensions
Decora wall plate; 2-3/4" wide x 4-1/2" high
(7.0 cm wide x 11.4 cm high)

NOTES

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LIMITED WARRANTY

Niles Audio Corporation ("NILES") warrants its active products (those requiring AC or battery power) to the original purchaser to be free of manufacturing defects in material and workmanship for a period of two years from date of purchase.

This Warranty is subject to the following additional conditions and limitations. The Warranty is void and inapplicable if NILES deems that the product has been used or handled other than in accordance with the instructions provided by the manufacturer, including but not limited to damage caused by accident, mishandling, improper installation, abuse, negligence, or normal wear and tear, or any defect caused by repair to the product by anyone other than NILES or an authorized NILES dealer.

To obtain warranty service, take the unit to the nearest authorized NILES dealer, who will test the product and if necessary, forward it to NILES for service. If there are no authorized NILES dealers in your area, you must write to NILES and include your name, model and serial number of your unit, along with a brief description of the problem. A factory Return Authorization Number will be sent to you. DO NOT RETURN ANY UNIT WITHOUT FIRST RECEIVING WRITTEN AUTHORIZATION AND SHIPPING INSTRUCTIONS FROM NILES.

If the above conditions are met, the purchaser's sole remedy shall be to return the product to NILES, in which case NILES will repair or replace, at its sole option, the defective product without charge for parts or labor. NILES will return a unit repaired or replaced under warranty by shipping same by its usual shipping method from the factory (only) at its expense within the United States of America. **THERE ARE NO OTHER WARRANTIES, INCLUDING WITHOUT LIMITATION, EITHER EXPRESS OR IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE PRODUCT.**

REPAIR OR REPLACEMENT AS PROVIDED UNDER THIS WARRANTY IS THE EXCLUSIVE REMEDY OF THE CONSUMER/PURCHASER. NILES SHALL NOT BE RESPONSIBLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES EXCEPT TO THE EXTENT PROVIDED (OR PROHIBITED) BY APPLICABLE LAW.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

For the name of your nearest authorized NILES dealer, contact:
NILES AUDIO CORPORATION, P.O. BOX 160818, Miami, Florida 33116.

Please fill in your product information and retain for your records.

Model _____ WS120 _____   Serial No. _____   Purchase Date _____

WARRANTY REGISTRATION CARD

Model Purchased _____ WS120 _____ Serial Number _____

Date Purchased (month/day/year) _____ Dealer Name and Location _____

○ Dr.   ○ Miss   ○ Mr.   ○ Mrs.   ○ Ms.

Name _____   Address _____

City _____ State_____ Zip _____ Tel ( ) _____

Age:
○ *Under 25*
○ *25-34*
○ *35-44*
○ *45-54*
○ *55 & over*

Income:
○ *Under $24,999*
○ *$25,000-$44,999*
○ *$45,000-$74,999*
○ *$75,000-$99,999*
○ *$100,000-$129,999*
○ *Over $130,000*

Occupation:
○ *Arts/Entertainment*
○ *Business Owner*
○ *Engineer*
○ *Finance/Accounting*
○ *General Office*
○ *Management*
○ *Professional*
○ *Sales/Marketing*
○ *Student*
○ *Tradesperson*

Musical tastes: (Please check all that apply)
○ *Alternative* ○ *Classical*
○ *Country* ○ *Jazz*

○ *New Age* ○ *Popular*
○ *R&B* ○ *Rock*
○ *Other _____*

How did you hear about Niles?
○ *Architect/Developer*
○ *Custom Installer*
○ *Direct Mail*
○ *Friend/Family*
○ *In-Store Display*
○ *Interior Designer*
○ *Magazine Ad*
○ *Mail-Order Catalog*
○ *Newspaper Ad*
○ *Product Brochure*
○ *Product Review*
○ *Retail Salesperson*
○ *E-Tailer*

What magazines do you read?
1. _____
2. _____
3. _____

Who will install the product?
○ *Custom Installer*
○ *Electrician*
○ *Friend*

○ *Myself*

Which factor(s) influenced the purchase of your Niles product? (Please check all that apply)
○ *Ease of Use*
○ *Price/Value*
○ *Product Features*
○ *Quality/Durability*
○ *Reputation*
○ *Style/Appearance*
○ *Warranty*

Do you . . . ?
○ *Own a House. If yes, how many square feet?*

_____

○ *Own a Town House/ Condominium/Co-op*
○ *Rent an Apartment*
○ *Rent a House*

Are you interested in receiving literature on other Niles products?
○ *Yes* ○ *No*

Are there products/capabilities that you would like to see introduced?

_____

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BLENDING HIGH FIDELITY AND ARCHITECTURE®