INSTALLATION

If you are installing the MS110 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 conduits; old wall safes; etc.

1. Determine a mounting location for the MS110. Select a location where you will have access to the rear of the MS110 after it is installed. This will allow you to securely tighten the MS110 to the mounting surface using the supplied hardware.

2. Drill a 1/2" hole where the MS110 will be mounted.

3. Run the MS110's IR cable. Label the cable for future reference. The MS110 is supplied with 10' of pre-stripped IR cable. The IR cable may be shortened or lengthened as needed. If you want to make the MS110's cable shorter, use a pair of wire cutters to cut the cable to the desired length. The IR cable may be lengthened by splicing it to a recommended IR cable (See Installation Considerations—Type of Cable). You may splice the MS110 cable to another cable by soldering or crimping the connections.

4. Connect the MS110 cable to the main system unit. 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 the end of

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each wire into the appropriate hole on the main system units' screwless connector (Figure 2), 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.

6. Secure the MS110 by tightening the hex nut. DO NOT OVER-TIGHTEN.

Tools Required
• 1/8" Standard Slotted Screwdriver
• Adjustable wrench or pliers
• Wire Stripper

NOTE: Do not install the MS110 next to a light dimmer

OPERATION

Operation of the MS110 is straightforward. Simply aim your hand-held remote at the MS110. Your IR command is instantly repeated to your A/V equipment.

TROUBLESHOOTING

This manual contains instructions for the MS110 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).

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 the MS110 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 MS110

Observe the main system unit IR confirmation 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.

EMI (Electromagnetic Interference)

Identify the source of the interference. The most common sources of electromagnetic interference are listed in the Installation Considerations section. 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 of 38kHz, 40kHz, and 56kHz

IR Receiving Range

Varies depending on remote strength;

typically 20' to 35'

IR Receiving Angle

60° off-axis (horizontal and vertical) at 20'

Mounting

Thru-hole, fits into a 1/2" diameter hole; requires a minimum of 2-5/8" mounting depth

Wiring Requirements

Individual home-run of CAT 5 cable

Unit Dimensions

Front Bezel: 3/4" diameter x 1/4" high

Overall Unit: 1/2" diameter x 2-7/8" long

Contents

MS110 Sensor x 1

Washer x 1

Hex Nut x 1

LIMITED WARRANTY

NILES®

INSTALLATION & OPERATION GUIDE

FLUSH-MOUNT IR MICROSENSOR®

MS110

The MS110 is a flush-mount IR sensor designed for use with the Niles infrared extender systems.

Installed in a remote room location, the MS110 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 MS110 is compatible with all current Niles infrared systems. It may be used along with, or as an alternative to, the Niles TS110, WS110R, MS210 and CS110 sensors or the IntelliPad®.

The MS110 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 WS110R, TS110, MS110, MS210, CS110, and the IntelliPad.
- IR Flashers—Models MF1, MF1VF, MF2, MF2VF and the IRB1.

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

IMPORTANT: Refer installation to a professional custom installer if you are unfamiliar with any of the following procedures.

The MS110 offers a number of improvements over other miniature IR sensors.

- *Plasma and LCD-proof performance—allows placement of the MS110 near plasma or LCD 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 — 20' to 35' of remote control range (depending upon the strength of your handheld remote)*
- *100% factory tested for pickup range and angle.*
- *Small size of only 1/2" diameter by 2-7/8" long—fits almost anywhere*
- *10' connecting cable included*
- *Printed circuit board design uses surface mount technology, assuring high reliability*
- *Ideal for both home and commercial installations*
- *Two year parts and labor warranty*

Type of Cable

The MS110 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.

MS110 Mounting Location

The MS110 is ideal for use in applications when tabletop, ceiling, or wall-mounting is undesirable. Its small size and unobtrusive appearance makes it ideal for installation in obscure, hidden locations, in cabinet facings, or in the sensor knockout built into Niles in-wall loudspeakers. Installing the MS110 close to the primary location of the user will ensure best performance.

The MS110 is designed to flush-mount almost anywhere. Convenient mounting locations for the MS110 are:

- In a cabinet door
- In a wall, or wall-plate
- Behind a speaker grille.*

NOTE: Some types of speaker grilles will reduce the IR pickup range of the MS110. If unsure, test the pickup range before permanently installing the MS110 behind the speaker grille.

Receiving Range and Pickup Angle

The receiving range of the MS110 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 75'.

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 MS110.

The IR pickup angle of the MS110 is 60° off-axis (horizontal and vertical) at 20'.

Avoiding Electrical Interference

Avoid locating the MS110 near any potential sources of electrical or optical noise, such as light dimmers, low-voltage lights, and neon lights.

Do not install the MS110 into electrical boxes with 110 volt devices

Some states or municipalities allow devices such as the MS110 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 MS110 can act as an "antenna" for electrical noise. Locating the MS110 cable too close to a light dimmer or switch may interfere with the MS110. If you must locate the MS110 near electrical devices, install it in a separate metal electrical box, ground the box to the electrical system ground, and route the MS110 cable several feet away from all electrical wiring.

Avoiding Optical Feedback

If installing the MS110 in the same room as an IR flasher, it is possible for the flasher's IR output to be picked-up by the MS110. 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.

Using the MS110 with the Intellipad Ci System

The MS110 is fully compatible with the Niles Intellipad Ci line, follow the wiring instructions in **Figure 2**. For specific information see your Intellipad Ci manual.
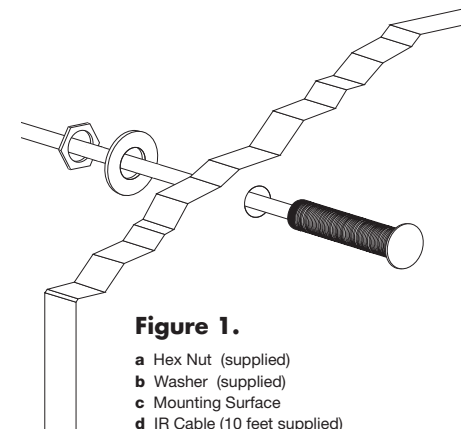

Figure 1.

a Hex Nut (supplied)
b Washer (supplied)
c Mounting Surface
d IR Cable (10 feet supplied)
e MS110 Miniature IR Sensor (supplied)
f MS110 Lens Bezel (supplied)

Red = 12V+
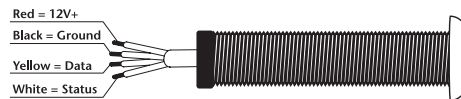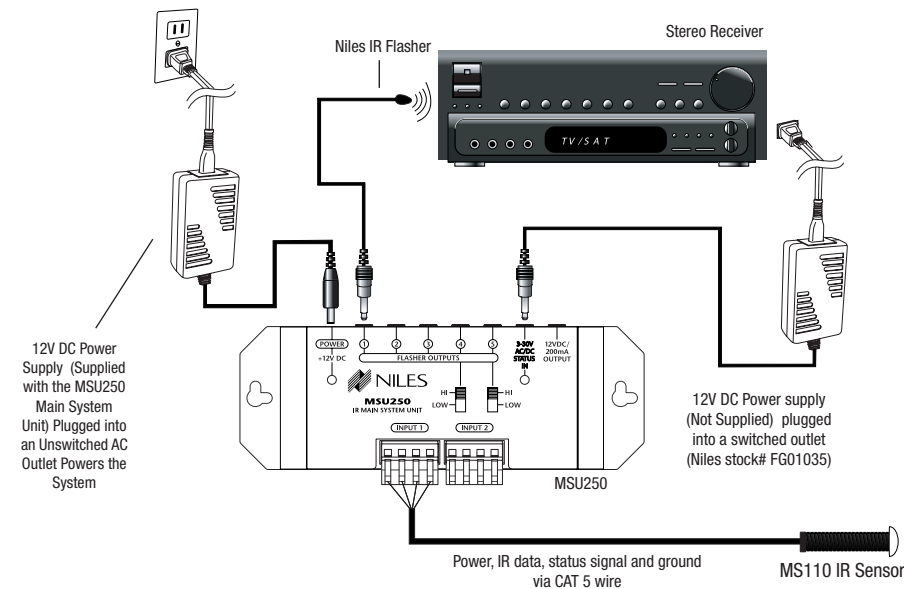Black = Ground
Yellow = Data
White = Status

Figure 2. Wiring legend

Niles IR Flasher

Stereo Receiver

12V DC Power Supply (Supplied with the MSU250 Main System Unit) Plugged into an Unswitched AC Outlet Powers the System

12V DC Power supply (Not Supplied) plugged into a switched outlet (Niles stock# FG01035)

MSU250

Power, IR data, status signal and ground via CAT 5 wire

MS110 IR Sensor

Figure 3. Wiring Diagram (Typical installation with an MSU250 Main System Unit)

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

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

Tab Down

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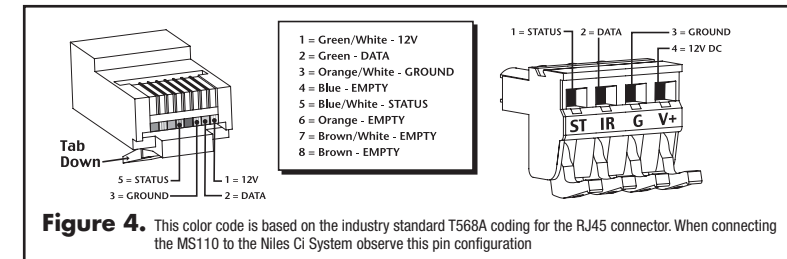3 = GROUND
1 = 12V
2 = DATA

ST R G V+

Figure 4. This color code is based on the industry standard T568A coding for the RJ45 connector. When connecting the MS110 to the Niles Ci System observe this pin configuration

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