IntelliControl® ICS

INTEGRATED CONTROL SOLUTIONS

SYSTEM DESIGN GUIDE

VOLUME 1

INCLUDES:

• DESIGNING AND IMPLEMENTING A NILES ZIGBEE® RF NETWORK

• iREMOTE®TS APPLICATIONS

• INTEGRATING HOME THEATER CONTROL

• INTELLIFILE®3 PROGRAMMING OVERVIEW

ENGINEERED   BY   ⧄NILES®

IntelliControl ICS
SYSTEM DESIGN GUIDE

INTRODUCTION

The following information simplifies and optimizes the design and specification of the iRemoteTS into existing and future installations. You'll become familiar with the iRemoteTS, its benefits, related accessories and how it integrates into a variety of applications. You will also learn how to design and implement a reliable Niles ZigBee® RF network.
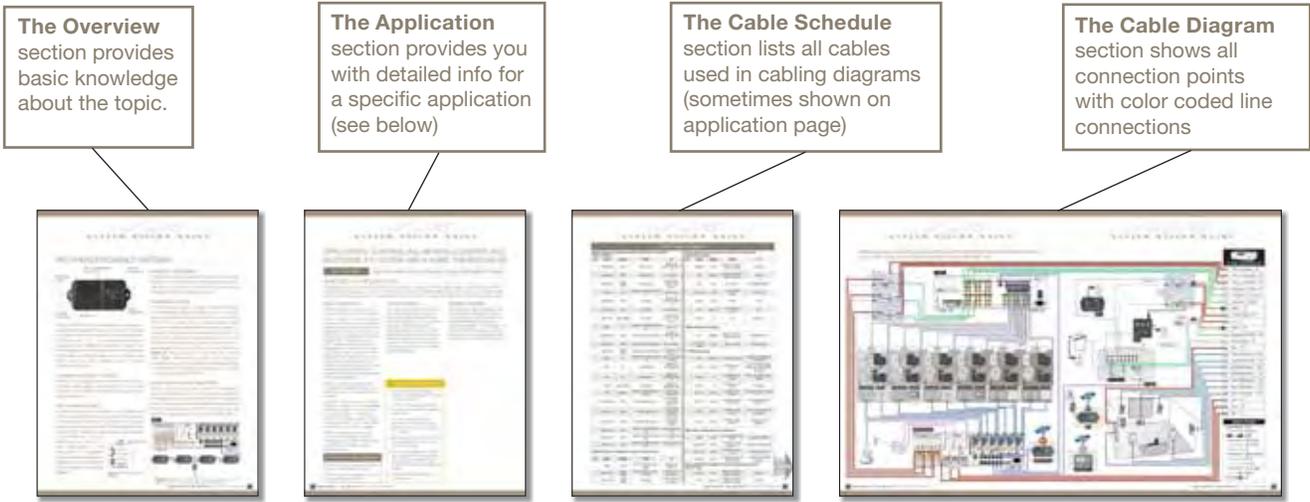
TABLE OF CONTENTS

HOW TO USE THIS SYSTEM DESIGN GUIDE

Each chapter in the System Design Guide is broken up into sections to make comprehension easier. Each section contains specific information that is presented with graphic examples to further aid in understanding. Below is a description of what information is contained within each section.

The Overview section provides basic knowledge about the topic.

The Application section provides you with detailed info for a specific application (see below)

The Cable Schedule section lists all cables used in cabling diagrams (sometimes shown on application page)

The Cable Diagram section shows all connection points with color coded line connections

Do This First Installation instructions on what you need to know before you begin

What Does this Application Do? Description of application

Key Considerations Important information that you need to consider when planning your design

Installation Requirements Specific installation details that you need to know

Customer Benefits What this application does for your customer

Installer Benefits What the application does for you

Critical Knowledge These are "must know" details that you need to know

OVERVIEW: DESIGNING A NILES ZIGBEE RF NETWORK

WHAT IS A MESH NETWORK?

Mesh networking is a method used to route data and instructions between nodes (points of communication) to complete a line of communication. Its design enables data to hop from node to node until it reaches its intended destination. In a fully connected mesh network, nodes are interconnected with other nodes so that at least two pathways connect each node (see **Figure 1**). This type of connectivity is decentralized in nature and when designed appropriately, is very reliable. Additionally, it is considered "self-healing." For example, if one of the nodes becomes disabled, the data automatically advances using the alternate path (see **Figure 2**).

In a partial mesh network some of the nodes are connected to only one other node, which is not uncommon in the types of system designs we'll be discussing (see **Figure 3**). If designed properly, a partial mesh network can also be reliable. A partial mesh network is a mesh network that includes at least one wireless remote that has only one wireless path back to the system.

There are three types of devices in the ZigBee mesh network:

1. Master RF Base, sometimes referred to as the *coordinator*
2. RF Repeater Base, sometimes referred to as the *router*
3. End-Point, sometimes referred to as the *end device (e.g., a hand-held RF remote control)*

All ZigBee RF mesh networks require, at the very minimum, one Master RF Base and one End-Point to complete a network. The Master RF Base is the device that talks to the main equipment being controlled, such as a GXR2 MultiZone Receiver.
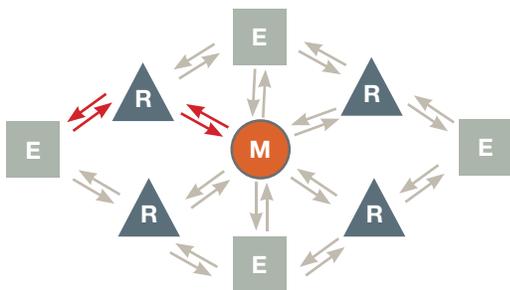

Figure 1 Example of fully functional mesh network with all nodes operational.

DESIGN CONSIDERATIONS

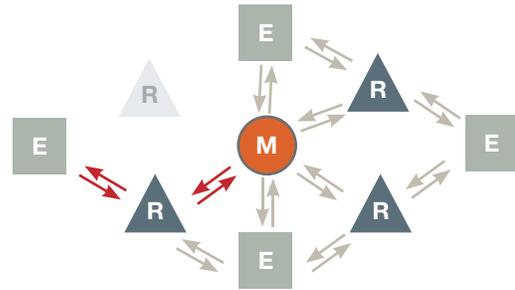*NOTE: End-Points only communicate with RF Repeater Bases and Master RF Bases, not to other End-Points.*

Figure 2 Example of fully functional mesh network that has self-healed after one RF Repeater Base became disabled.
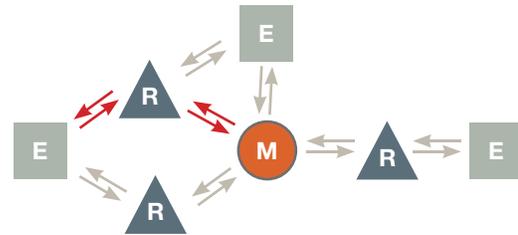
Figure 3 Example of a partial mesh network.

DEFINITION OF TERMS

Nodes - Points of RF origin that make up a ZigBee network. A node must be assigned as either a *Master RF Base, RF Repeater Base or End-Point.*

M *Master RF Base* – The node assigned as the central communication hub for the ZigBee network. There is only one (1) Master RF Base per ZigBee network and it is the only node required to be hard-wired via CAT-5 to the GXR2 MultiZone Receiver.

R *RF Repeater Base* – The node(s) assigned to "repeat" the signal from an *End-Point* to a *Master RF Base* or from the *Master RF Base* to an *End-Point*.

E *End-Point* – The node(s) assigned as the starting point of a command or end-point for metadata. For example, the iRemoteTS is considered an end-point.

Hop(s) – The jump between nodes that RF communication travels. For instance, when an End-Point talks to a RF Repeater Base, that distance is considered a 'hop'. If you have an End-Point talking to a RF Repeater Base that then talks to a Master RF Base, your ZigBee line of communication is considered to have 2 hops to complete the transmission. IMPORTANT: Your design should never exceed 4 hops to transport data (see **Figure 4**).

Figure 4 Data should never exceed four hops to reach its destination

DESIGN CONSIDERATIONS

Take these potential obstructions into consideration as they will affect the ZigBee RF communication of the RF Bases and End-point:

• Air-conditioning duct work
• Metal mirrors
• Stainless steel appliances
• Lathe and plaster construction
• Metal studs

ZIGBEE NODE RANGE & SHAPE

When unobstructed, a ZigBee RF node creates a 75+ foot radius sphere of communication. Any Master RF Base, RF Repeater, or End-Point nodes within this sphere are able to communicate with the originating node (see **Figure 5**). The sphere can be deformed by any type of metal obstruction that is placed in the path of the RF transmission (see **Figure 6**). Common metal obstructions found in modern residential construction are shown in the ***Design Considerations*** box above. When deciding on node placement within a house always consider any metal obstructions that may deform the sphere of range and place nodes away from these obstructions. ZigBee End-Points will always communicate with an ZigBee RF node base until it can no longer communicate, and it will then switch to another ZigBee RF node. **Figure 7** shows an example of a ZigBee End-Point still within range of and communicating with the Master RF Base even though the End-Point is actually closer to the Repeater RF Base.
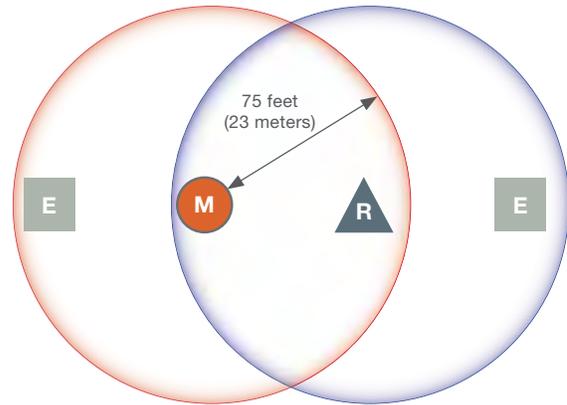
Figure 5 Example of ZigBee RF bubble of range (Master RF Base in red, RF Repeater in blue).
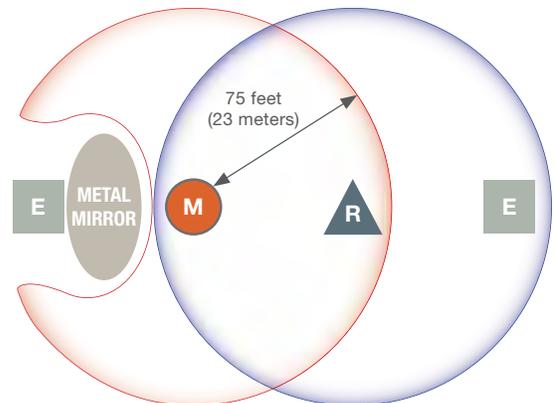
Figure 6 Example of ZigBee RF bubble of range being deformed by metal mirror (Master RF Base in red, RF Repeater in blue). Because of the "RF shadow" caused by the mirror the End-Point on the left would be unable to communicate to the Master RF Base. In this instance you would want to locate an additional RF Repeater Base to circumvent the obstacle.
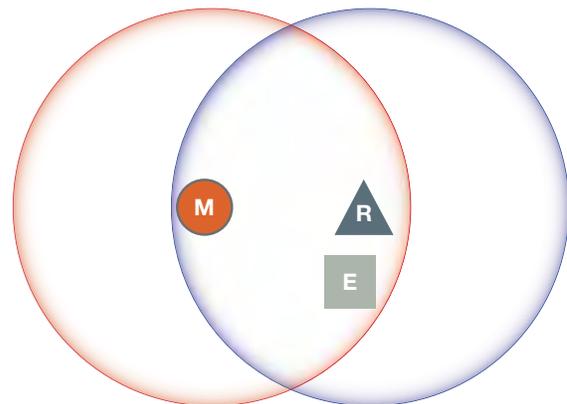
Figure 7 End-Points will continue communicating with a ZigBee RF node as long as it is within range, even if another ZigBee RF node is closer.

OVERVIEW: NILES ZIGBEE RF PRODUCTS

Below are the available Niles ZigBee RF products and the node they are able to function as. As you can see, some devices are dedicated as End-Points (i.e., iRemote® Handset and iRemoteTS). Other devices can be configured to operate as a Master RF Base, a RF Repeater Base, or an End-Point. Unlike the iRemote, the iRemoteTS DOES NOT contain a ZigBee RF radio in its charging base.

Product	Model	Stock No.	Description	Master RF Base	RF Repeater Base	End-Point
	RFG	FG01407	Radio Frequency Gateway (stand alone ZigBee Node)	X	X	X[1]
	RBX-1	FG01269	iRemote Charging Base	X	X	
	iRemote® RHS-1	FG01270	Wireless Remote			X
	iRemoteTS	FG01341	Wireless Color Touchscreen			X
	HT-MSU	FG01343	Home Theater Main System Unit	X[2]	X[3]	

[1] When used to make a keypad wireless.

[2] The HT-MSU functions as a Master RF Base when used in a stand-alone application (no connections to GXR2).

[3] Build 140 or greater of IntelliFile 3 allows the HT-MSU to function as a RF Repeater Base.

OVERVIEW: RFG RADIO FREQUENCY GATEWAY

External Antenna

Set-Up Dipswitches (underneath)

System Connection

Mounting Wings

Power Connection

Keypad Connection

Power LED

The RFG (FG01407) is the ultimate system design component for implementing a ZigBee RF Network. The RFG is an RF Base that can be configured as a Master RF Base, RF Repeater Base, or an End-Point. It can be preconfigured manually or configured via the IntelliFile®3 programming software. The RFG design is such that its placement is based solely on how it benefits the system design. This is in contrast to the RBX-1 which may have constraints due to end-user placement preferences.

FLEXIBLE PLACEMENT OPTIONS

The RFG has no charging circuit in it and its housing is made from high-impact plastic enabling the unit to be placed anywhere—from an attic to a basement crawl space, or even inside a wall space. RFGs should also be located in accessible locations as they must be hard-wired during programming and the antenna must be oriented vertically.

EASY CONFIGURATION

The RFG has two set-up dipswitches on the bottom that allow you to preconfigure the RFG as a Master RF, RF Repeater Base or Wireless Keypad (End-Point). The installer then manually (using dipswitches) or via IntelliFile 3 Programming Software sets up the RF Channel and Network ID, and if required, the End-Point Unit ID. The dipswitches also allow for a fourth setup Mode of "Not Assigned." In this configuration only the IntelliFile3 Configuration Software is used to configure the RFG for the ZigBee Network (see **Figure 7**).

Dipswitches

REPEATER BASE

WIRELESS KEYPAD

MASTER BASE

NOT ASSIGNED SEE MANUAL

RFG DIP SWITCH MODES
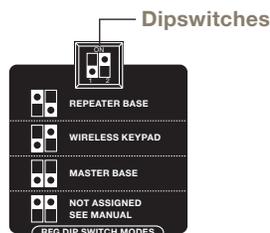
Figure 7 RFG Dipswitch Settings

SMART IN-LINE DESIGN

The RFG has two RJ-45 Ethernet connections (one labeled Keypad and one labeled System) that allow the installer to wire RFGs in-line and on the same CAT-5 cable that an IntelliControl ICS keypad or touchscreen is using.

POWERING THE RFG

The RFG requires power from either an IntelliControl ICS Modular MultiZone Receiver (GXR2) or from an optional power supply. When connected to a GXR2, up to two RFGs can be wired in series with no additional power supply needed. When adding a third RFG connected in series, you must add a Niles Universal Power Supply (FG01035). The added power supply will provide enough power to run two additional RFGs connected in series. Continue to add a power supply for every three RFGs connected in series (see **Figure 8**). Using this method, it is possible to create an entire ZigBee network using a single CAT-5 cable run. Installations using one or more RFGs as a free-standing RF Repeater Base (not connected to the GXR2) require the use of a Niles Universal Power Supply (FG01035) for each RFG.

USING THE RFG AS AN END-POINT

An RFG can be used to create a "quasi-wireless" keypad in areas of a house where a CAT-5 cable cannot be pulled from the equipment location to the desired location of the keypad. Simply adjust the RFG's set-up dipswitches for Wireless Keypad, connect the keypad to the RFG via CAT-5 cable, and plug the RFG power supply into an unswitched AC outlet.

GXR2

Figure 8 Multiple RFGs: Can be connected over a single CAT-5 cable run (only 2 can be powered directly from GXR2)

OVERVIEW: HOW TO CREATE A RELIABLE ZIGBEE NETWORK IN 3 STEPS

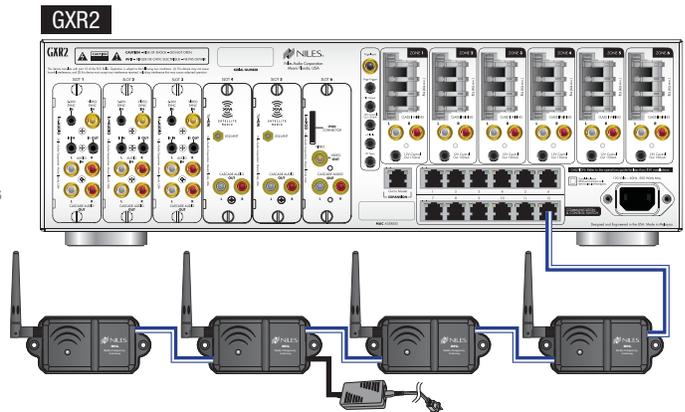**STEP 1**: Always place the Master RF Base in a central location in the structure (see **Figure 9**). For single-story homes this would be in the center of the floor plan. For multi-story homes this would be on a middle floor in the center of the floor plan. The RFG is always the best choice as the Master RF Base since it can be placed virtually anywhere.

STEP 3: Finally, confirm that all locations where End-Points must operate are 75' or less from an RF Repeater Base(s) and/or the Master RF Base (see **Figure 11**). Remember that the optimum ZigBee network always offers multiple paths for the End-Points to communicate with the Master RF Base.

Figure 9 Centrally locate the Master RF Base.
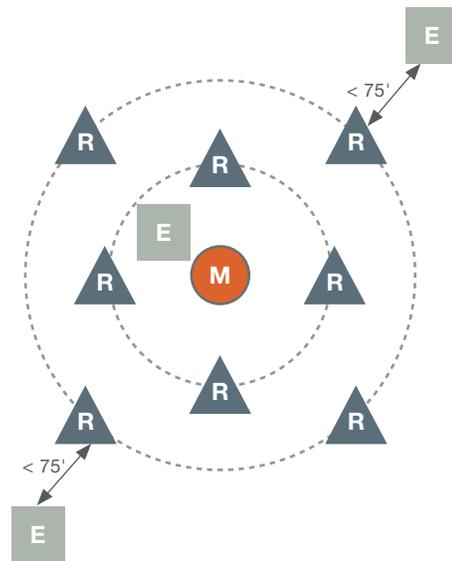
Figure 11 End-points must be with 75' of RF Repeater Base or Master RF Base.

STEP 2: Locate your RF Repeater Bases within 75' (23 meters) of the Master RF Base in a concentric pattern (see **Figure 10**). Consider metal obstructions in your placement. RF Repeaters must have a clear communications path to the Master RF Base free of metal obstructions. If metal obstructions exist, you may need to locate the RF Repeater closer to the Master RF Base or add a second RF Repeater to navigate around the obstruction.

When designing the network, consideration should be given to the types of controls planned for the system. An End-Point that is a wireless portable control requires a different approach than an End-Point that is fixed in a specific location, such as a wall-mount control. With a portable control, you want to ensure ample coverage for all areas that the user will venture with the control, whereas a control that has a fixed location only requires reception available to that specific location.

Figure 10 RF Repeater Bases should be placed in concentric circles from Master RF Base.

EXAMPLE OF REPEATER RF BASES CONCENTRICALLY LOCATED AROUND MASTER RF BASE
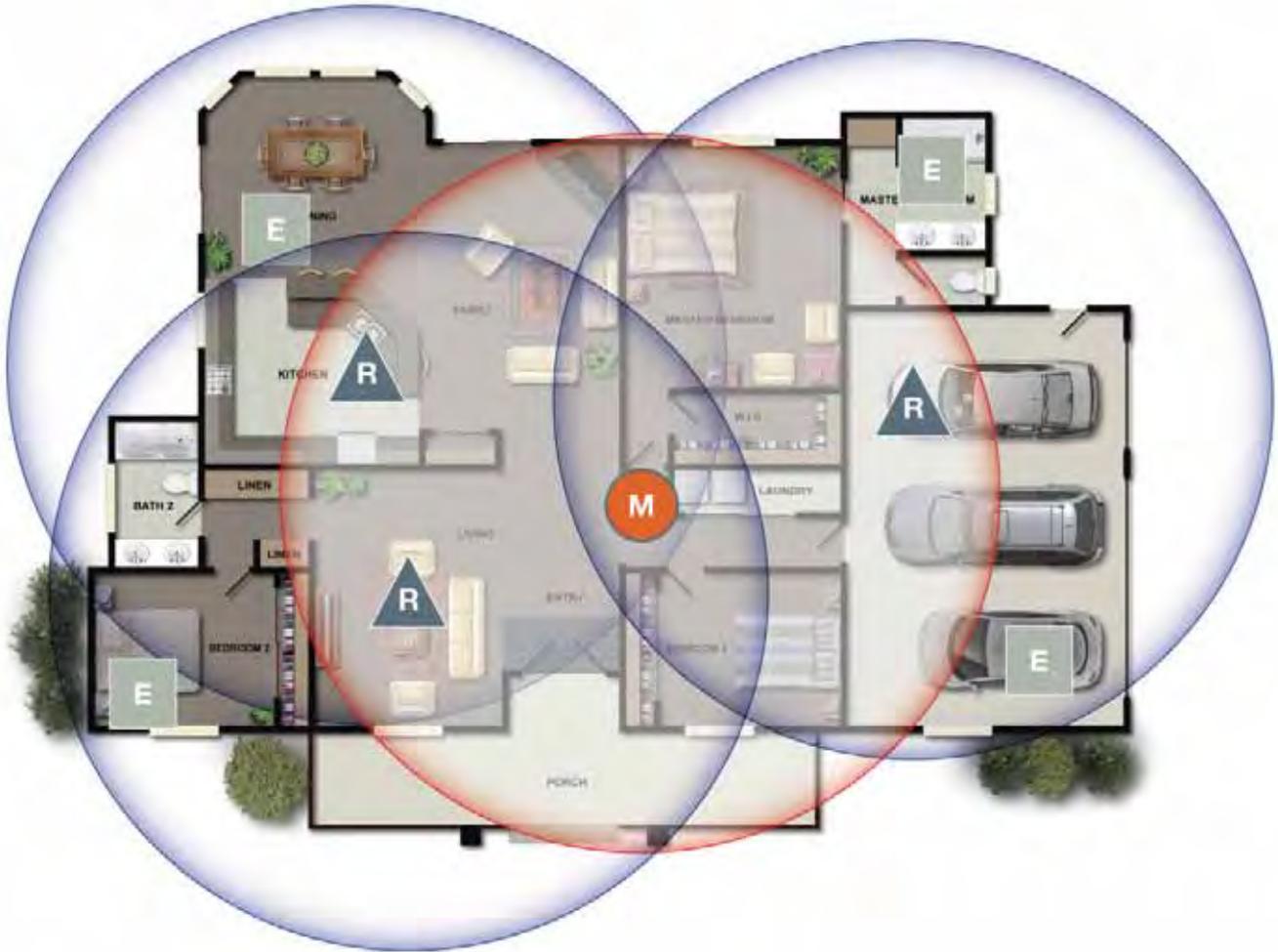
STEP 1: Locate Master RF Base in center of house

STEP 2: Locate RF Repeater Base in a concentric circle within 75' of the Master RF Base

STEP 3: Confirm End-Points are within 75' range of Master RF Base and/or RF Repeater Base

APPLICATION: IMPLEMENTING A NILES ZIGBEE RF NETWORK IN A SINGLE STORY STRUCTURE

DO THIS FIRST	Review the information on ZigBee RF networks on the preceding pages.

WHAT DOES THIS APPLICATION DO?

A robust ZigBee RF network is required for our wireless products to function properly. This section demonstrates how to optimally design and specify a ZigBee RF network in a single story structure.

Key Considerations

Planning a ZigBee RF network is a lot like planning an automation system. With an automation system, you need a solid understanding of the equipment being controlled to ensure reliable operation. With a ZigBee RF network you need to understand the environment in which the RF network will be operating, in particular, items that can affect reception range such as home construction, metal obstacles, appliances, etc. In addition, you will benefit greatly from understanding basic system parameters for the ZigBee RF network.

Key parameters include:

- Max number of Master RF Bases per Network: ONE

- Max number of End-Points per Master RF Base: TEN

- Max number of RF Repeater Bases per Master RF Base: TEN

- Max number of "hops" within a Network: FOUR

- Max number of networks: TWO

Customer Benefits

Your customer will have access to all of their playlists, artists and albums from wireless controls and wired keypads. The wireless controls will allow them to roam the house and operate any audio and/or video zone of the house or a home theater, as well as have access to all metadata from capable devices.

Installation Benefits

A properly designed ZigBee RF network will allow all of our wireless remote products to function flawlessly. In addition, having a solid network in place will create sales opportunities in the future by providing an infrastructure for add-on products.

CRITICAL KNOWLEDGE

1. All wireless devices must be hard-wired during programming of the IntelliControl ICS system.

2. The Master RF Base must be hard-wired to ICS system at all times.

3. When multiple RFGs are connected in series using a single CAT-5 cable all RF Repeater Base communication is performed via RF (4 hop maximum rule applies). The CAT-5 is used for power and programming only (2 RFGs can be powered directly by the GXR2).

4. The antenna of the RFG must be oriented vertically for proper operation.

INSTALLATION REQUIREMENTS

- One Master RF Base

- At least one End-Point

- RF Repeater must be within 75' of the Master RF Base

- After programming with IntelliFile 3, perform a "Reset Net" from one wireless remote.

EXAMPLE OF TRADITIONALLY
SHAPED SINGLE STORY HOME
WITH ZIGBEE RF MESH NETWORK
PROPERLY DEPLOYED

HOW TO READ THIS FIGURE:

- Master RF Base RF bubbles are indicated as red circles.
- RF Repeater Base RF bubbles are indicated as blue circles.

Master RFG   RFG   RBX-1   iRemoteTS

EXAMPLE OF UNIQUELY SHAPED
CUSTOM SINGLE STORY HOME
WITH ZIGBEE RF MESH NETWORK
PROPERLY DEPLOYED

HOW TO READ THIS FIGURE:

- Master RF Base RF bubbles are indicated as red circles.
- RF Repeater Base RF bubbles are indicated as blue circles.

APPLICATION: IMPLEMENTING A NILES ZIGBEE RF NETWORK IN A MULTIPLE STORY STRUCTURE

DO THIS FIRST	Review the information on ZigBee RF networks on the preceding pages.

WHAT DOES THIS APPLICATION DO?

A robust ZigBee RF network is required for many of our wireless products to function properly. This section demonstrates how to optimally design and specify a ZigBee RF network in a multi-story structure.

Key Considerations

When deploying a Niles ZigBee RF network in a multi-story structure you must know what type of construction is used between floors. Traditional wood construction will pass ZigBee RF signals with minimal reduction in range. Laminate beams can cause additional loss of range. Finally, steel i-beams and pre-engineered concrete can greatly reduce or completely block ZigBee RF transmissions. In this type of construction creating two networks is recommended.

Key parameters include:

• Max number of Master RF Bases per Network: ONE

• Max number of End-Points per Master RF Base: TEN

• Max number of RF Repeater Bases per Master RF Base: TEN

• Max number of "hops" within a Network: FOUR

• Max number of networks: TWO

Customer Benefits

Your customer will have access to all of their playlists, artists and albums from wireless controls and wired keypads. The wireless controls will allow them to roam the house and operate any audio and/or video zone of the house or a home theater, as well as have access to all metadata from capable devices.

Installation Benefits

A properly designed ZigBee RF network will allow all of our wireless remote products to function flawlessly. In addition, having a solid network in place will create sales opportunities in the future by providing an infrastructure for add-on products.

CRITICAL KNOWLEDGE

1. When deploying a Niles ZigBee network in a multi-story structure you must know what type of construction is used between floors.

2. All wireless devices must be hard-wired during programming of the IntelliControl ICS system.

3. The Master RF Base must be hard-wired to ICS system at all times.

4. When multiple RFGs are connected in series using a single CAT-5 cable all RF Repeater Base communication is performed via RF (4 hop maximum rule applies). The CAT-5 is used for power and programming only (2 RFGs can be powered directly by the GXR2).

5. The antenna of the RFG must be oriented vertically for proper operation.

INSTALLATION REQUIREMENTS

• One Master RF Base

• At least one End-Point

• RF Repeater must be within 75' of the Master RF Base

EXAMPLE OF MULTIPLE STORY STRUCTURE WITH ZIGBEE RF NETWORK PROPERLY DEPLOYED
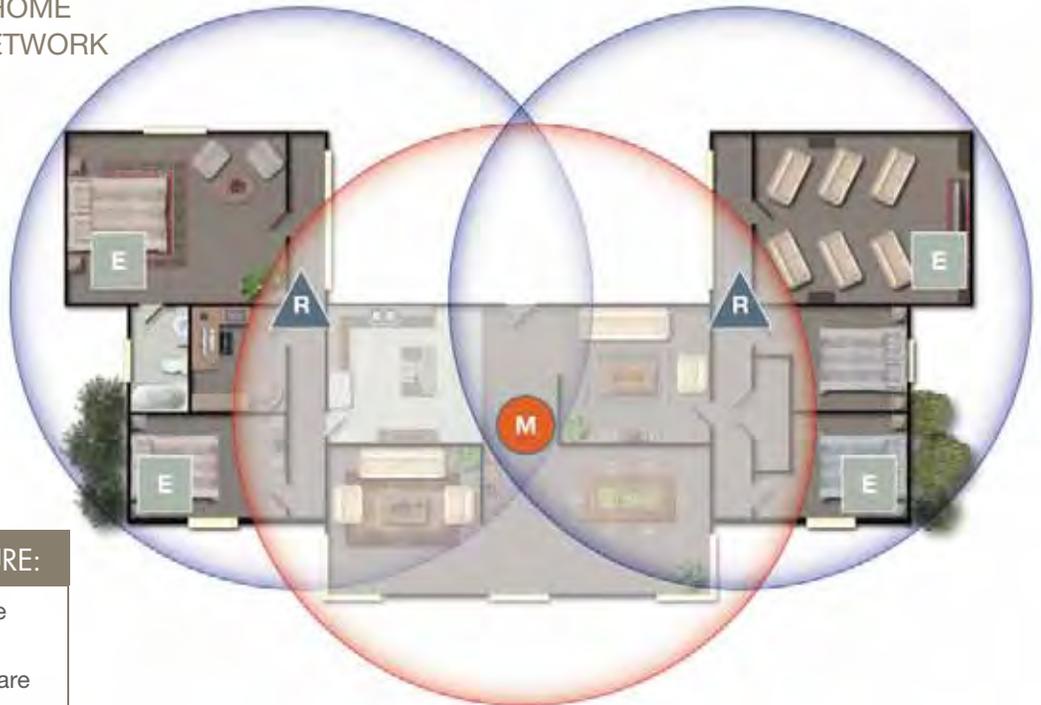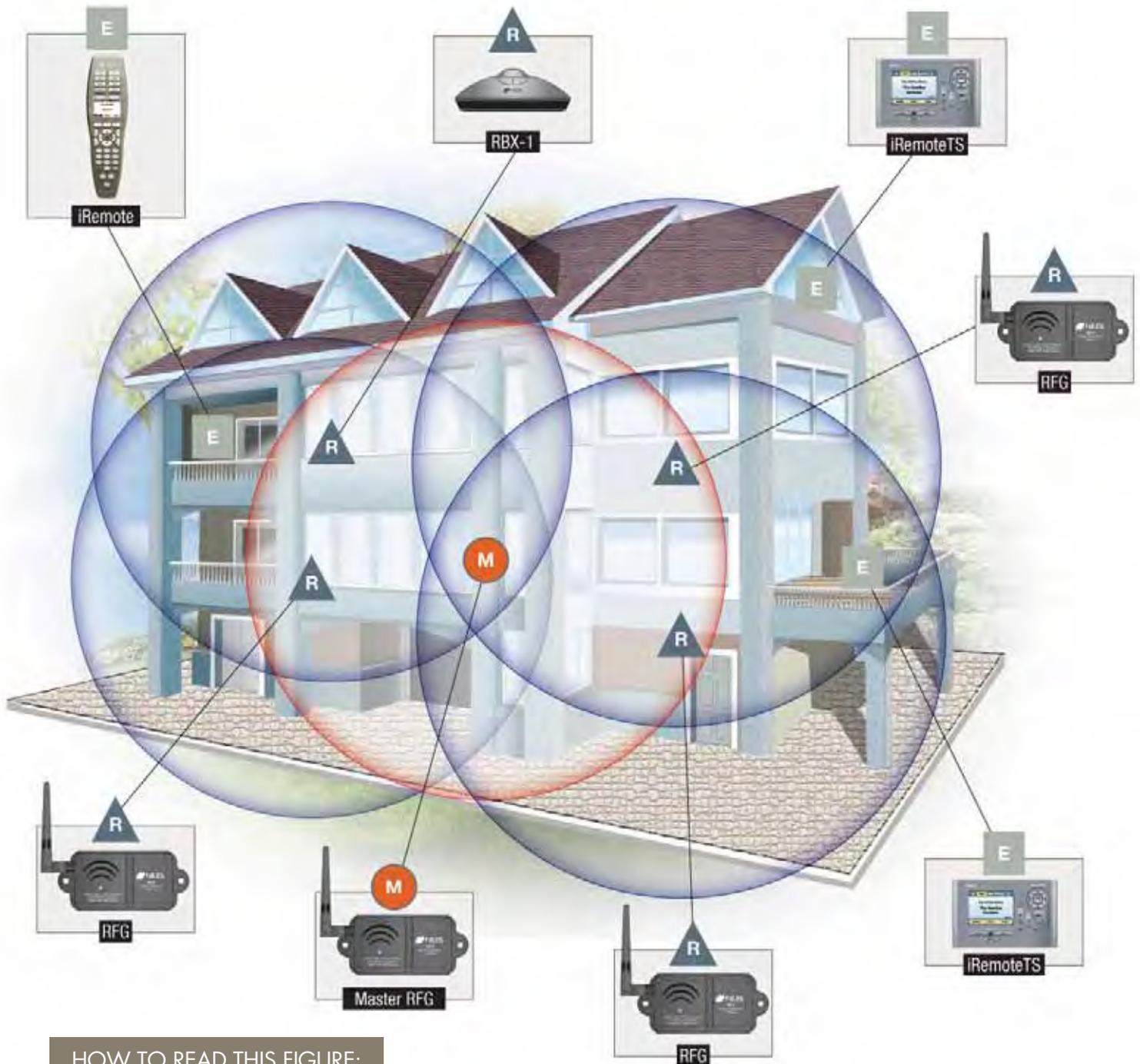

HOW TO READ THIS FIGURE:

- Master RF Base RF bubbles are indicated as red circles.
- RF Repeater Base RF bubbles are indicated as blue triangles.

APPLICATION: CREATING A SECOND RF NETWORK

DO THIS FIRST	Review the information on ZigBee RF networks on the preceding pages.

WHAT DOES THIS APPLICATION DO?

This application allows you to utilize a second RF network on an IntelliControl ICS System. A single RF network can support up to ten repeaters, up to ten end-points, with no more than four hops. A second RF network is needed when more than ten end-points are specified, or to prevent exceeding four hops.

Key Considerations

Planning a ZigBee RF network is a lot like planning an automation system: You need a solid understanding of the equipment being controlled to ensure reliable operation. When planning a ZigBee RF network, you need to understand the environment in which the RF network will be operating. In particular, you need to understand items that can affect reception range such as the type of home construction, metal obstacles, appliances, etc. You will also benefit by knowing the key parameters for a Niles ZigBee RF network.

The key parameters include:

- Max number of Master RF Bases, per network: ONE

- Max number of end-points per Master RF Base: TEN

- Max number of RF repeater bases per Master RF base: TEN

- Max number of hops within a network: FOUR

- Max number of networks: TWO

Customer Benefits

Your customer will have access to their playlists, artists, and albums from wireless controls and wired keypads. The wireless controls will allow them to roam the house and operate any audio and/or video zone or home theater zone with access to all metadata from capable devices.

Installation Benefits

Most importantly a second RF network allows you to create a system with more than ten End-Points and overcome issues caused by computer networks and other ZigBee devices covering the same area. Careful attention must be paid to the limitations outlined in the *Critical Knowledge* section.

CRITICAL KNOWLEDGE

1. When deploying a second RF network, it's important to understand that end-points assigned to RF network 1 will only communicate through network 1, and end-points assigned to RF network 2 will only communicate through network 2.

2. When designing your networks you must also consider physical layout, intended usage, user desires, and end-point types – a stationary wall-mount keypad versus a mobile wireless remote.

3. When using a wireless remote such as the iRemote® or iRemoteTS, it is imperative that the user understand the "boundaries" of the assigned network.

4. The antenna of the RFG must be oriented vertically for proper operation.

INSTALLATION REQUIREMENTS

- IntelliFile®3 Capture Station and latest version of IntelliFile3 software. See page 37 for IntelliFile3 programming instructions.

EXAMPLE OF TWO ZIGBEE WIRELESS NETWORKS IN AN INTELLICONTROL ICS SYSTEM
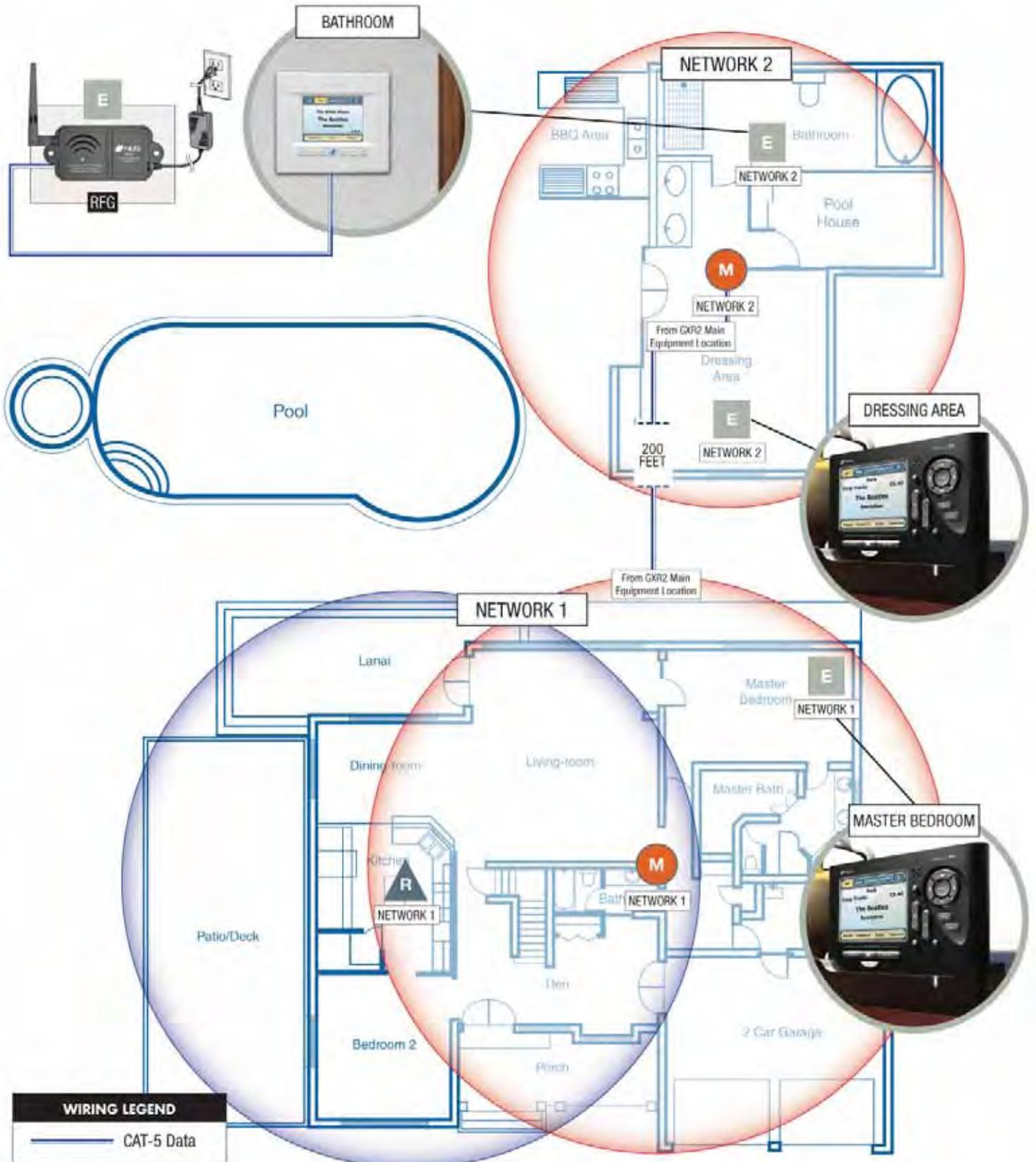
APPLICATION: CREATING A ZIGBEE RF WIRELESS KEYPAD

DO THIS FIRST	Review the information on ZigBee RF networks on the preceding pages.

WHAT DOES THIS APPLICATION DO?

This application allows you to install a Single, Display, Contact, or Contact-TT without any CAT-5 cabling to the GXR2.

Key Considerations

Planning a ZigBee RF network is a lot like planning an automation system. With an automation system, you need a solid understanding of the equipment being controlled to ensure reliable operation. With a ZigBee RF network you need to understand the environment in which the RF network will be operating, in particular, items that can affect reception range such as home construction, metal obstacles, appliances, etc. In addition, you will benefit greatly from understanding basic system parameters for the IntelliControl ICS ZigBee RF network.

Key parameters include:

• Max number of Master RF Bases per Network: ONE

• Max number of End-Points per Master RF Base: TEN

• Max number of RF Repeater Bases per Master RF Base: TEN

• Max number of "hops" within a Network: FOUR

• Max number of networks: TWO

Customer Benefits

Your customer will have complete control of all zones of the IntelliControl ICS system and also access to all of their playlist, artists, albums from a keypad. This includes all metadata from capable devices.

Installation Benefits

You can sell additional areas of music and control in places where running CAT-5 cable is costly or impossible.

CRITICAL KNOWLEDGE

1. The RFG will be configured as an End-Point and must be within range of at least one RF Repeater Base or the Master RF Base.

2. The RFG must be powered locally with an optional 12V power supply.

3. You cannot exceed four hops to communicate to the Master RF Base.

4. All wireless devices must be hard-wired during programming of the ICS system.

5. The Master RF Base must be hardwired to ICS system at all times.

6. The antenna of the RFG must be oriented vertically for proper operation.

INSTALLATION REQUIREMENTS

• The RFG must be powered locally with optional 12V power supply (FG01035).

IntelliControl ICS

EXAMPLE OF WIRELESS INTERFACE CONNECTION TO A GXR2 MODULAR MULTIZONE RECEIVER

POOL HOUSE

MASTER BEDROOM

Pool House

Pool

Lanai

Dining-room

Living-room

Master Bath

Kitchen

Bath 2

Den

Bedroom 2

Porch

2 Car Garage

RFG

RFG

WIRING LEGEND

CAT-5 Data
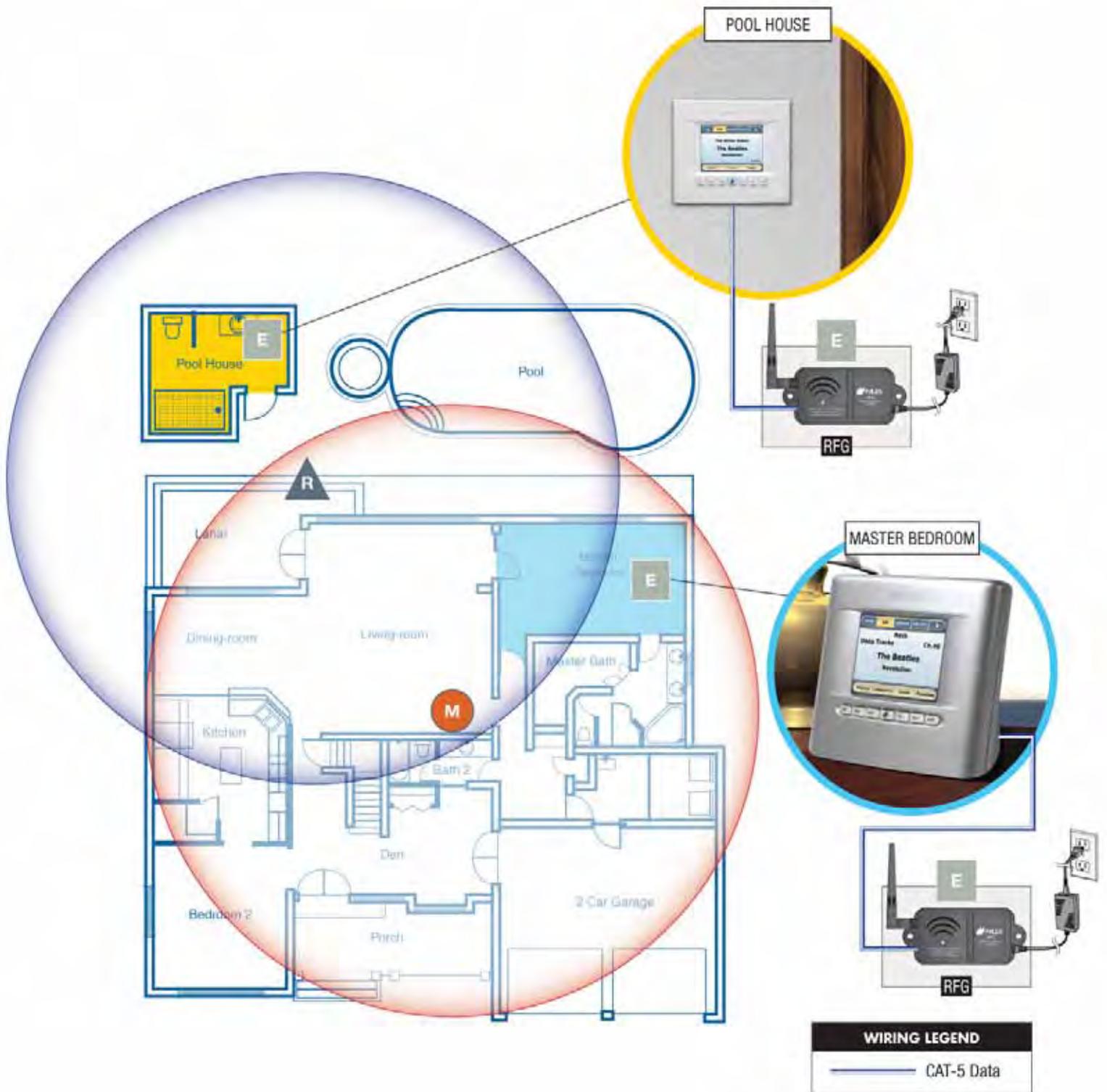
OVERVIEW: iREMOTE®TS

The iRemote®TS is a two-way wireless RF touchscreen user interface that provides control over the home's IntelliControl®ICS MultiZone Audio/Video System and up to *three home theaters*. This enables the user to have a single control that operates their entire house-wide entertainment system. The iRemoteTS readily integrates with an IntelliControl ICS System so installation is dramatically streamlined. It also integrates with the Niles Home Theater Main System Unit (HT-MSU) to deliver simple, automated control over even the most sophisticated home theater systems. Both systems are configured quickly and easily via IntelliFile®3 configuration software.

The iRemoteTS operates much like a wireless version of Niles' popular Contact In-Wall Touchscreen Control. The interface is comprised of a full color touchscreen combined with a complement of frequently used hard buttons in an elegant and ergonomically designed form factor. It communicates via two-way ZigBee® RF, which displays available metadata from the IntelliControl ICS System, and can also control components via infrared. The ability to operate equipment via RF or IR provides the installer with added flexibility, particularly in retrofit installations.

The iRemoteTS organizes "operation" into two distinct functions, controlling an IntelliControl ICS MultiZone System (House) and controlling a home theater (Theater). By pressing the iRemoteTS's "House" button, the user is presented with all the information needed to operate the home's multizone audio/video system. In turn, by pressing the iRemoteTS's "Theater" button, the user is provided with all the information necessary to operate a home theater. The iRemoteTS features preset source control screens that, while offering a level of customization, provide a proven, intuitive format that simplifies operation for the user and reduces programming time for the systems integrator.

OVERVIEW: iREMOTETS KEY FEATURES

SINGLE UNIFYING CONTROL

The iRemoteTS simplifies operation for the user by enabling operation of both the multizone audio/video system and the home theater(s) using a single intuitive user interface.

FLEXIBLE, INTELLIGENT SYSTEM MANAGEMENT

The iRemoteTS is a control solution that is supported by a robust system architecture that includes all the right connections, which helps ensure that the system works as it should each and every time. The systems integrator can choose from a flexible array of automation and control options including RS-232 and IR when used with the Niles HT-MSU.

TWO-WAY ZIGBEE RF TECHNOLOGY

ZigBee RF communication provides a flexible, reliable method for communication. In addition, its two-way design provides real-time system status and data to the user.

STREAMING METADATA SIMPLIFIES OPERATION

The iRemoteTS displays menus, guides, favorite channel lists, and tuner data required to operate today's popular digital sources.

THE PERFECT RETROFIT SOLUTION

Because the iRemoteTS doesn't require a CAT-5 cable to function, even homes originally wired with basic speaker selectors and volume controls can be upgraded to an IntelliControl ICS system. Your customer gets full access to all of their artists, playlists, and albums—without any new wires!

DUAL IR/RF COMMUNICATION CAPABILITY

The ability to control equipment via Radio Frequency (RF) and/or Infrared (IR) provides the installation professional with added flexibility when designing a system. For instance, in situations where running an IR flasher to a local component, such as a flat panel TV, doesn't make sense for logistical or aesthetic reasons, you can choose to operate the local source via IR and send all other commands via RF.

TRUE PLUG-AND-PLAY INTEGRATION

The iRemoteTS delivers true plug-and-play integration. Unlike conventional multizone systems, IntelliControl ICS's auto enumeration and auto configuration enables the iRemoteTS to automatically upload all system settings for the IntelliControl ICS system to the iRemoteTS.

NONE OF THE COMPLICATED PROGRAMMING

The iRemoteTS utilizes IntelliFile3 wizard-based programming that prompts the system designer through the configuration process. This intuitive approach greatly reduces the dependency on specialized programming skills and the need for continuous, in-depth training.

ERGONOMIC FORM FACTOR

The iRemoteTS was designed from the ground up to create a pleasurable experience for the user. Frequently used hard keys are placed within comfortable reach and buttons are custom-shaped for easy recognition. The unit is contoured for comfort when it's held or placed on one's lap.

HIGH-DESIGN STYLE

The iRemoteTS's unique styling and luxurious tones complement any décor. Its attention to detail, including perfectly balanced weighting and exceptional fit and finish, reinforces its superior design philosophy.

NILES QUALITY AND RELIABILITY

For more than 30 years Niles has been the recognized leader in quality and reliability in the custom-installed audio/video industry.

IntelliFile3 Configuration Software

APPLICATION: CONTROLLING AN ICS MULTIZONE A/V SYSTEM

DO THIS FIRST	Read the complete section on *Designing a Niles ZigBee RF Network (on pages 3-4).*

WHAT DOES THIS APPLICATION DO?

This application covers the use of an iRemoteTS with a IntelliControl ICS distributed A/V system in the following scenarios:

• As a portable control device within a single room or area

• As a portable house-wide control device that can be used in any area of a home

Key Considerations

The hard button cursor keys can be programmed for devices connected to an IM-Audio card but are not used for controlling Niles audio sources. For Niles audio sources, the navigation soft keys on the touchscreen are used.

If the user presses the THEATER button, when the iRemoteTS is configured to control only an IntelliControl ICS Modular MultiZone System, the iRemoteTS touchscreen will display a message that the theater side has not been configured and therefore is not available.

Customer Benefits

The iRemoteTS provides portable operation of an IntelliControl ICS system which allows the customer to control their system from any room within the home. All of this control is through a similar GUI (graphical user interface) as the Contact or Contact-TT.

Installation Benefits

The iRemoteTS is designed to communicate with and control the IntelliControl ICS Modular MultiZone audio video distribution system via RF ZigBee communication, providing the user with a 2-way wireless RF/IR System Control Remote with color touchscreen. The iRemoteTS provides the user with the same control interface as an IntelliControl ICS Contact control touchscreen. Essentially, the iRemoteTS is a wireless Contact control touchscreen.

CRITICAL KNOWLEDGE

1. The iRemoteTS must be within range of a Niles ZigBee RF network in all areas where the customer desires control. Please read the section *Designing a Niles ZigBee RF Network* thoroughly to understand how best to deploy a ZigBee RF network. Doing so will provide optimum coverage to all desired areas.

INSTALLATION REQUIREMENTS

• Flasher for each video component

• IntelliFile3 Capture Station and latest version of IntelliFile3 software

CABLE SCHEDULE FOR APPLICATION DIAGRAM ON PAGES 21-22

Source connections to Master GXR2 & VS-6

QTY	CABLE	SIGNAL	FROM	TO
1	Stereo RCA	Audio	Parent's TiVo	Master GXR2/IM-AUDIO #1
1	Component	Video	Parent's TiVo	VS-6/Input 1
1	Flasher	IR	Master GXR2/IM-AUDIO #1	Parent's TiVo
1	Stereo RCA	Audio	Kid's TiVo	Master GXR2/IM-AUDIO #2
1	Component	Video	Kid's TiVo	VS-6/Input #2
1	Flasher	IR	Master GXR2/IM-AUDIO #2	Kid's TiVo
1	Stereo RCA	Audio	Blu-Ray Player	Master GXR2/IM-AUDIO #3
1	Component	Video	Blu-Ray Player	VS-6/Input #3
1	RG-6	RF	Sat. Radio Antenna	Master GXR2/TM-XM #1
1	RG-6	RF	Sat. Radio Antenna	Master GXR2/TM-XM #2
1	30 pin	Audio+Data	SmartDock®2	Master GXR2/IM-iCARD2
1	CAT-5	Network	Master GXR2/Network Switch	VS-6/Out to Master GXR2

ZigBee network connections

QTY	CABLE	SIGNAL	FROM	TO
1	CAT-5	Network	Master GXR2/Network Switch	RFG (Master RF Base)
1	12V Power Supply	Power	Wall AC Outlet	RFG (RF Repeater Base)
1	12V Power Supply	Power	Wall AC Outlet	RFG (RF Repeater Base)

Room connections (needed for each area that accesses audio sources only)

QTY	CABLE	SIGNAL	FROM	TO
1	Speaker	Audio	Master GXR2/Zone 1 Speaker	Speakers
1	CAT-5	Network	Master GXR2/Network Switch	Contact

Connections from Master GXR2 to Slave GXR2

QTY	CABLE	SIGNAL	FROM	TO
1	Stereo RCA	Audio	Master GXR2/IM-AUDIO #1	Slave GXR2/IM-AUDIO #1
1	Stereo RCA	Audio	Master GXR2/IM-AUDIO #2	Slave GXR2/IM-AUDIO #2
1	Stereo RCA	Audio	Master GXR2/IM-AUDIO #3	Slave GXR2/IM-AUDIO #3
1	Stereo RCA	Audio	Master GXR2/TM-XM #1	Slave GXR2/IM-AUDIO #4
1	Stereo RCA	Audio	Master GXR2/TM-XM #2	Slave GXR2/IM-AUDIO #5
1	Stereo RCA	Audio	Master GXR2/IM-iCARD2	Slave GXR2/IM-AUDIO #6
1	CAT-5	Network	Master GXR2/Network Switch	Slave GXR2/Expansion

Room connections (needed for each area that accesses the audio/video sources)

QTY	CABLE	SIGNAL	FROM	TO
1	Speaker	Audio	Master GXR2/Zone 1 Speaker	Speakers
1	CAT-5	Network	Master GXR2/Network Switch	Contact
1	CAT-5	Video	VS-6/Zone 1	C5-HDDAWM Balun
1	Component	Video	C5-HDDAWM Balun	Plasma TV
1	3.5mm	Sync	CS-12V	IRG
1	CAT-5	Network	VS-6/Network Switch	IRG
1	Flasher	IR	IRG	Plasma TV

ADDITIONAL CABLE SCHEDULE FOR APPLICATION DIAGRAM ON PAGES 23-24

Connections from Master VS-6 to Slave VS-6

QTY	CABLE	SIGNAL	FROM	TO
3	Component	Video	Master VS-6	Slave VS-6

Connection from Slave VS-6 to Slave GXR2

QTY	CABLE	SIGNAL	FROM	TO
1	CAT-5	Network	Slave VS-6	Slave GXR2

Room connections (needed for each area that accesses the audio/video sources)

QTY	CABLE	SIGNAL	FROM	TO
1	Speaker	Audio	Master GXR2/Zone 1 Speaker	Speakers
1	CAT-5	Network	Master GXR2/Network Switch	Contact
1	CAT-5	Video	VS-6/Zone 1	C5-HDDAWM Balun
1	Component	Video	C5-HDDAWM Balun	Plasma TV
1	3.5mm	Sync	CS-12V	IRG
1	CAT-5	Network	VS-6/Network Switch	IRG
1	Flasher	IR	IRG	Plasma TV

SEE NEXT PAGE
FOR DIAGRAM

APPLICATION: CONTROLLING AN ICS MULTIZONE A/V SYSTEM
(Example shown is a 12 zone audio system with 6 zones of video distribution)

APPLICATION: CONTROLLING AN ICS MULTIZONE A/V SYSTEM
(Example shown is a 12 zone audio system with 8 zones of video distribution)

MASTER VS-6

SLAVE VS-6

Blu-ray Player

Kid's TiVo

Parent's TiVo

RF
M
Master RFG

C5-HDDAWM

ZONE 9
BEDROOM 4
CS-12V
Plasma/LCD
IRG
Loudspeakers   Display

ZONE 10
LIVING ROOM
CS-12V
Plasma/LCD
IRG
Loudspeakers   Display

ZONE 7
MASTER BALCONY
Loudspeakers   Single

ZONE 8
LANAI
Loudspeakers   Single

ZONE 11
MASTER BATH
Loudspeakers   Single

ZONE 12
DINING
Loudspeakers   Contact

ZONE 1
KITCHEN
CS-12V
Plasma/LCD
IRG
Loudspeakers   Contact

ZONE 2
MASTER BEDROOM
CS-12V
Plasma/LCD
IRG
Loudspeakers   iRemoteTS

ZONE 3
OFFICE
CS-12V
Plasma/LCD
IRG
Loudspeakers   Contact

ZONE 4
GAME ROOM
CS-12V
Plasma/LCD
IRG
Loudspeakers   iRemoteTS

ZONE 5
BEDROOM 2
CS-12V
Plasma/LCD
IRG
Loudspeakers   Display

ZONE 6
BEDROOM 3
CS-12V
Plasma/LCD
IRG
Loudspeakers   Display

RF
E
RFG

MASTER GXR2

SmartDock®2

Additional accessories required.

RF
R
RFG

SLAVE GXR2

3.5 mm to **IR In** on **Master GXR2** Source Cards (If original Remote being used in Zones)

WIRING LEGENDS

- Audio
- HD Video
- CAT-5 Data
- CAT-5 Video
- RF
- Speaker Cable
- RS232
- 3.5 mm
- 30 Pin Cable
- Flasher
- AC

APPLICATION: CONTROLLING AN ICS MULTIZONE A/V SYSTEM & HOME THEATER USING AN HT-MSU

DO THIS FIRST	Read the complete section on *Designing a Niles ZigBee RF Network (on pages 3-4).*

WHAT DOES THIS APPLICATION DO?

This application covers the use of an iRemoteTS as the primary controller of a home theater system and an IntelliControl ICS audio/video system. In this scenario some or all of the sources connected to the IntelliControl ICS system are shared with the home theater receiver. In this scenario the iRemoteTS is used in a single room which also contains the home theater.

Key Considerations

When the iRemoteTS is configured with an HT-MSU and an IntelliControl ICS system, the sources can be shared between the audio distribution system and the home theater (e.g., an IM-CARD2 card can be shared between the GXR2 and the home theater receiver). In this configuration, metadata will be displayed on the home theater side of the remote when these sources are selected. Additionally, the home theater can have dedicated sources that are not accessible from the audio/video distribution system (e.g., a DVR that is only connected to the home theater receiver).

You should think of the iRemoteTS as two separate remotes in one. The "House" side of the remote is accessed by pressing House and provides similar functionality with metadata to a Contact or Contact-TT. The "Theater" side of the remote is accessed by pressing Theater and includes the following:

- Up to 12 Master Keys which can be used to access dedicated sources of a home theater, sources shared with the IntelliControl ICS AV system, or can be used for tasks (e.g., a Master Key label "LiveTV" and a second one labeled "List" would access a single DVR).

- Each Master Key can access up to four touchscreen pages (transport, numeric, extra, and favorites) which are configured in the IntelliFile3 software.

INSTALLATION REQUIREMENTS

- IntelliFile3 Capture Station and latest version of IntelliFile3 software

- The favorites page can have up to 20 channel icons or generic labelled buttons. Each favorite page shows five favorites.

- When a Master Key for a source that is also shared with the IntelliControl ICS AV system is selected, metadata screens are automatically included in the pages for that Master Key (if available from the source).

When accessing the "House" side of the iRemoteTS, the hard button cursor keys can be programmed for use with devices connected to an IM-Audio card but cannot be used for controlling Niles audio sources, such as a TM-Sirius card. For Niles audio sources, the navigation soft keys on the touchscreen are used.

CRITICAL KNOWLEDGE

1. An HT-MSU is required in order to have metadata screens displayed on the "Theater" side of the remote.

2. The iRemoteTS must be within range of a Niles ZigBee network in all areas where the customer desires control. Please read the *How to Design and Implement a Niles ZigBee RF Network* section thoroughly to understand how to deploy a ZigBee network in order to provide coverage in all desired areas.

3. The ZigBee transmitter in the HT-MSU is disabled when connected to the GXR2.

4. IntelliFile3 allows the HT-MSU radio to be configured as an RF Repeater for the GXR2.

Customer Benefits

Your customer will have full access to all sources whether they are part of the home theater or the audio/video distribution system from an ergonomic and easy to use wireless remote. Additionally, channel surfing is further simplified through icon-based favorite channels. Finally, these controls can be used to control any zone in the house as long as it is within range of a Niles ZigBee network.

Installation Benefits

This application allows positive control of a home theater system via IR or RS-232, and the sharing of sources to the home theater that are available to the house audio distribution system. All sources with metadata can be easily controlled via the color touchscreen.

CABLE SCHEDULE

Shared source connections to Master GXR2, VS-6, and Home Theater Receiver

QTY	CABLE	SIGNAL	FROM	TO
1	Stereo RCA	Audio	Parent's TiVo	Master GXR2/IM-AUDIO #1
1	Component	Video	Parent's TiVo	VS-6/Input 1
1	Mono RCA	Digital Audio	Parent's TiVo	HT Receiver/Video 2 Coax Dig. In
1	Flasher	IR	Master GXR2/IM-AUDIO #1	Parent's TiVo
1	Stereo RCA	Audio	Kid's TiVo	Master GXR2/IM-AUDIO #2
1	Component	Video	Kid's TiVo	VS-6/Input #2
1	Mono RCA	Digital Audio	Kid's TiVo	HT Receiver/Video 1 Coax Dig. In
1	Flasher	IR	Master GXR2/IM-AUDIO #2	Kid's TiVo
1	Stereo RCA	Audio	Blu-Ray Player (shared)	Master GXR2/IM-AUDIO #3
1	Component	Video	Blu-Ray Player (shared)	VS-6/Input #3
1	Mono RCA	Digital Audio	Blu-Ray Player (shared)	HT Receiver/DVD Coax Dig. In
1	Flasher	IR	Master GXR2/IM-AUDIO #3	Blu-Ray Player (shared)
1	RG-6	RF	Sat. Radio Antenna	Master GXR2/TM-XM #1
1	RG-6	RF	Sat. Radio Antenna	Master GXR2/TM-XM #2
1	30 pin	Audio+Data	SmartDock2	Master GXR2/IM-iCARD2
1	CAT-5	Network	Master GXR2/Network Switch	VS-6/Out to Master GXR2
1	Component	Video	VS-6/Cascade Out #1	HT Receiver/Component Video 1 In
1	Component	Video	VS-6/Cascade Out #2	HT Receiver/Component Video 2 In
1	Component	Video	VS-6/Cascade Out #3	HT Receiver/Component DVD In
1	Stereo RCA	Audio	Master GXR2/TM-XM Out	HT Receiver/Aux 3 In
1	Stereo RCA	Audio	Master GXR2/TM-XM Out	HT Receiver/Aux 2 In
1	Stereo RCA	Audio	Master GXR2/IM-iCARD2 Out	HT Receiver/Aux 1 In

Dedicated source connections to Home Theater Receiver

QTY	CABLE	SIGNAL	FROM	TO
1	HDMI	Video	Blu-Ray Player (dedicated)	HT Receiver/HDMI 1 In
1	Mono RCA	Digital Audio	Blu-Ray Player (dedicated)	HT Receiver/TV Coax Dig. In
1	Mono RCA	Digital Audio	CD Player	HT Receiver/CD Coax Dig. In

Room connections (needed for each area that accesses the audio/video sources)

QTY	CABLE	SIGNAL	FROM	TO
1	Speaker	Audio	Master GXR2/Zone 1 Speaker	Speakers
1	CAT-5	Network	Master GXR2/Network Switch	Contact
1	CAT-5	Video	VS-6/Zone 1	C5-HDDAWM Balun
1	Component	Video	C5-HDDAWM Balun	Plasma TV
1	3.5mm	Sync	CS-12V	IRG
1	CAT-5	Network	VS-6/Network Switch	IRG
1	Flasher	IR	IRG	Plasma TV

ZigBee network connections

QTY	CABLE	SIGNAL	FROM	TO
1	CAT-5	Network	Master GXR2/Network Switch	RFG (Master RF Base)
1	12V Power Supply	Power	Wall AC Outlet	RFG (RF Repeater Base)

HT-MSU connections

QTY	CABLE	SIGNAL	FROM	TO
1	CAT-5	Network	HT-MSU/Expansion	Master GXR2/Network Switch
1	3.5 mm	12V DC	HT-MSU/Src #1 Sync	LS-1 (sensing Toslink output on dedicated Blu-Ray player
1	Flasher	IR	HT-MSU/Src #1 IR Out	Blu-Ray Player (dedicated)
1	Flasher	IR	HT-MSU/Src #2 IR Out	CD Player
1	RS-232	Control	HT-MSU/TV RS-232 Out	Projector RS-232 Control In
1	RS-232	Control	HT-MSU/Receiver RS-232 Out	HT Receiver RS-232 Control In
1	3.5mm	12V DC	HT-MSU/Trigger #1 Out	AC-3 (Switch outlet for CD player)
1	3.5mm	12V DC	HT-MSU/Trigger #2 Out	Projection Screen Trigger In

Other Home Theater Receiver connections

QTY	CABLE	SIGNAL	FROM	TO
1	HDMI	Video	HT Receiver/HDMI Out	Projector HDMI In
1	Component	Video	HT Receiver/Component Out	Projector Component In
1	Mono RCA	Audio	HT Receiver/Sub Out	Subwoofer LFE In
1	Speaker	Audio	HT Receiver/L/C/R/SL/SR/RL/RR	L/C/R/SL/SR/RL/RR Speakers

Room connections (needed for each area that accesses audio sources only)

QTY	CABLE	SIGNAL	FROM	TO
1	Speaker	Audio	Master GXR2/Zone 1 Speaker	Speakers
1	CAT-5	Network	Master GXR2/Network Switch	Contact

APPLICATION: CONTROLLING AN ICS MULTIZONE A/V SYSTEM & HOME THEATER USING AN HT-MSU
(Example shown is a 12 zone audio system with 6 zones of video distribution with an automated home theater system)

TO HOME THEATER RECEIVER

DVD Coax Digital – *IN*	
Video 1 Coax Digital – *IN*	
Video 2 Coax Digital – *IN*	
Component – *Video 1 IN*	
Component – *Video 2 IN*	
Component – *DVD IN*	
HDMI 1 – *IN*	
TV Coax Digital – *IN*	
CD – *IN*	
HDMI – *OUT*	
Component Monitor – *OUT*	
RS232 Control – *IN*	
SUB – *OUT*	
Front Left Speaker – *OUT*	
Front Center Speaker – *OUT*	
Front Right Speaker – *OUT*	
Rear Right Speaker – *OUT*	
Back Right Speaker – *OUT*	
Back Left Speaker – *OUT*	
Rear Left Speaker – *OUT*	
Aux 1 – *IN*	
Aux 2 – *IN*	
Aux 3 – *IN*	

WIRING LEGENDS
- Audio
- HD Video
- HDMI
- CAT-5 Data
- CAT-5 Video
- RF
- Speaker Cable
- RS232
- 3.5 mm
- 30 Pin Cable
- Flasher
- AC

APPLICATION: CONTROLLING AN ICS MULTIZONE A/V SYSTEM AND A HOME THEATER VIA IR

DO THIS FIRST	Read the complete section on *Designing a Niles ZigBee RF Network (on pages 3-4).*

WHAT DOES THIS APPLICATION DO?

This application covers the use of an iRemoteTS as the primary controller of a home theater system (via IR) and an IntelliControl ICS multizone audio/video system. In this scenario, all of the sources are independent between the IntelliControl ICS system and the home theater receiver (no sharing of sources). In this scenario, the iRemoteTS is used in a single room which also contains the home theater.

Key Considerations

In this configuration, there are some unique situations you need to consider.

First, the "Theater" and "House" sides of the remote will control two independent systems that are not interconnected via preamp level. This means that the only connection is at speaker-level through the Niles SPK-1 A/B Switcher. One SPK-1 will be required for each pair of speakers you wish to switch to the home system with a maximum of two pair (i.e., fronts and rears). The house music system will automatically be routed to the speakers unless the home theater receiver is activated. When activated the home theater always takes control of the speakers.

Second, although each system will be operated as expected there is one detail that the must be explained to the customer. Any time the customer wants to switch from home theater to the IntelliControl ICS distributed audio/video system, they must press the system off button. This will shut down the home theater receiver which will trigger the SPK-1(s) to switch back to the IntelliControl ICS audio distribution system.

Finally, we highly recommend that you use an IR Repeater System consisting of an IR sensor, Main System Unit (MSU), and flasher to ensure reliable operation.

INSTALLATION REQUIREMENTS

- IntelliFile3 Capture Station and latest version of IntelliFile3 software
- IR sensor should be placed in the line of sight of the iRemoteTS

Customer Benefits

Your customer will have full access to all sources whether they are part of the home theater or the audio/video distribution system from an ergonomic and easy to use wireless remote. Additionally, channel surfing is further simplified through icon-based favorite channels. Finally, this control can be used to control any zone in the house as long as it is within range of a Niles ZigBee RF network.

Installation Benefits

This application allows speakers in the home theater to be shared between the home theater system and the IntelliControl ICS audio/video distribution system by utilizing a Niles SPK-1 A/B Switcher. The iRemoteTS will have control of a home theater system via IR and separate control of the house audio distribution system via ZigBee RF.

CRITICAL KNOWLEDGE

1. The iRemoteTS must be within range of a Niles ZigBee RF network in order to function.

2. A SPK-1 A/B Switcher must be specified for each pair of speakers (2 pair max).

3. 12V power supply must be specified for the home theater receiver (unit must have switched AC outlets) or 12VDC trigger with 100+ mA.

4. Metadata from the ICS system will only be displayed on the "House" side of the remote.

5. The customer will need to press the "System Off" button any time they want to switch from home theater to the ICS audio distribution system.

6. IR Repeater System is highly recommended.

CABLE SCHEDULE

Source connections to Master GXR2, VS-6, and SPK-1

QTY	CABLE	SIGNAL	FROM	TO
1	Stereo RCA	Audio	Parent's TiVo	Master GXR2/IM-AUDIO #1
1	Component	Video	Parent's TiVo	VS-6/Input 1
1	Mono RCA	Digital Audio	Parent's TiVo	HT Receiver/Video 2 Coax Dig. In
1	Flasher	IR	Master GXR2/IM-AUDIO #1	Parent's TiVo
1	Stereo RCA	Audio	Kid's TiVo	Master GXR2/IM-AUDIO #2
1	Component	Video	Kid's TiVo	VS-6/Input #2
1	Mono RCA	Digital Audio	Kid's TiVo	HT Receiver/Video 1 Coax Dig. In
1	Flasher	IR	Master GXR2/IM-AUDIO #2	Kid's TiVo
1	Stereo RCA	Audio	Blu-Ray Player (MultiZone System)	Master GXR2/IM-AUDIO #3
1	Component	Video	Blu-Ray Player (MultiZone System)	VS-6/Input #3
1	Mono RCA	Digital Audio	Blu-Ray Player (MultiZone System)	HT Receiver/DVD Coax Dig. In
1	Flasher	IR	Master GXR2/IM-AUDIO #3	Blu-Ray Player (MultiZone System)
1	RG-6	RF	Sat. Radio Antenna	Master GXR2/TM-XM #1
1	RG-6	RF	Sat. Radio Antenna	Master GXR2/TM-XM #2
1	30 pin	Audio+Data	SmartDock2	Master GXR2/IM-iCARD2
1	CAT-5	Network	Master GXR2/Network Switch	VS-6/Out to Master GXR2

SPK-1 connections (one additional SPK-1 and the AVS-2 can be used to switch more speakers and the subwoofer)

QTY	CABLE	SIGNAL	FROM	TO
1	Speaker (4 conductor)	Audio	Master GXR2/Zone 6 Speaker Out	SPK-1/A Speaker In
1	Speaker (4 conductor)	Audio	HT Receiver/Front Speaker Out	SPK-1/B Speaker In
1	Speaker	Audio	SPK-1/Common Out	Front Speakers
1	12V Power Supply	Power	HT Receiver/Switched AC Outlet	SPK-1/Control In

ZigBee network connections

QTY	CABLE	SIGNAL	FROM	TO
1	CAT-5	Network	Master GXR2/Network Switch	RFG (Master RF Base)
1	12V Power Supply	Power	Wall AC Outlet	RFG (RF Repeater Base)

Home Theater Receiver connections

QTY	CABLE	SIGNAL	FROM	TO
1	HDMI	VIDEO	HT Receiver/HDMI Out	Projector HDMI In
1	HDMI	VIDEO	Blu-Ray Player (Home Theater)	HT Receiver/HDMI 1 In
1	Mono RCA	Digital Audio	Blu-Ray Player (Home Theater)	HT Receiver/TV Coax In
1	Stereo RCA	Audio	CD Player	HT Receiver/CD In
1	Mono RCA	Audio	HT Receiver/Sub Out	Subwoofer LFE In
1	Speaker	Audio	HT Receiver/SL/SR/RL/RR	SL/SR/RL/RR Speakers

ZigBee network connections

QTY	CABLE	SIGNAL	FROM	TO
1	CAT-5	Network	Master GXR2/Network Switch	RFG (Master RF Base)
1	12V Power Supply	Power	Wall AC Outlet	RFG (RF Repeater Base)

ZigBee network connections

QTY	CABLE	SIGNAL	FROM	TO
1	3.5mm	IR	MSU250/Flasher 1 Out	Blu-Ray Player (dedicated)
1	3.5mm	IR	MSU250/Flasher 2 Out	CD Player
1	3.5mm	IR	MSU250/Flasher 3 Out	Projector
1	3.5mm	IR	MSU250/Flasher 4 Out	Receiver IR In
1	3.5mm	12V DC	MSU250/12VDC Output	Projection Screen Trigger In

Room connections (needed for each area that accesses the audio/video sources)

QTY	CABLE	SIGNAL	FROM	TO
1	Speaker	Audio	Master GXR2/Zone 1 Speaker	Speakers
1	CAT-5	Network	Master GXR2/Network Switch	Contact
1	CAT-5	Video	VS-6/Zone 1	C5-HDDAWM Balun
1	Component	Video	C5-HDDAWM Balun	Plasma TV
1	3.5mm	Sync	CS-12V	RFG
1	CAT-5	Network	VS-6/Network Switch	IRG
1	Flasher	IR	IRG	Plasma TV

APPLICATION: CONTROLLING AN ICS MULTIZONE A/V SYSTEM AND A HOME THEATER VIA IR
(Example shown is 6 zone audio system with 6 zones of video distribution)

WIRING LEGENDS

Audio	
HD Video	
HDMI	
CAT-5 Data	
CAT-5 Video	
RF	
Speaker Cable	
RS232	
3.5 mm	
30 Pin Cable	
Flasher	
AC	

TO HOME THEATER RECEIVER

HDMI 1 – *IN*	
TV Coax Digital – *IN*	
CD – *IN*	
HDMI – *OUT*	
IR – *IN*	
Front Left Speaker – *OUT*	
Front Right Speaker – *OUT*	
Switched A/C – *OUTLET*	
SUB – *OUT*	
Front Center Speaker – *OUT*	
Rear Right Speaker – *OUT*	
Back Right Speaker – *OUT*	
Back Left Speaker – *OUT*	
Rear Left Speaker – *OUT*	

APPLICATION: CONTROLLING A STAND-ALONE HOME THEATER USING AN HT-MSU

DO THIS FIRST	Read the complete section on *Designing a Niles ZigBee RF Network (on pages 3-4).*

WHAT DOES THIS APPLICATION DO?

This application covers the use of an iRemoteTS as the primary controller of an automated home theater system using a Niles HT-MSU. In this scenario, the iRemoteTS is used in a single room which also contains the home theater.

Things You Should Consider

Because the iRemoteTS utilizes a Niles ZigBee network, the HT-MSU must be located in the range of the iRemoteTS. If this is impossible, an RFG (Radio Frequency Gateway) can be used to relocate the antenna within range of the iRemoteTS.

The HT-MSU features "power sync" technology which allows the unit to know the status of all home theater gear. Use of this feature allows the HT-MSU to manage power state and power on dead time during system operation. The benefit of this for the customer is shorter system configuration setup time when switching between sources.

The HT-MSU also has eight routed IR outputs and eight RS-232 outputs. This allows for solid control over any product.

Benefits for Your Customer

Your customer will have control of their home theater from an ergonomic and easy to use wireless remote. Additionally, channel surfing is further simplified through icon-based favorite channels.

Benefits for You

This application allows positive control of a home theater system via IR or RS-232. Additional triggers and contact closures are available for control of motorized products.

INSTALLATION REQUIREMENTS

• IntelliFile3 Capture Station and latest version of IntelliFile3 software

CRITICAL KNOWLEDGE

• The iRemoteTS must be within range of the HT-MSU or an RFG connected to the HT-MSU

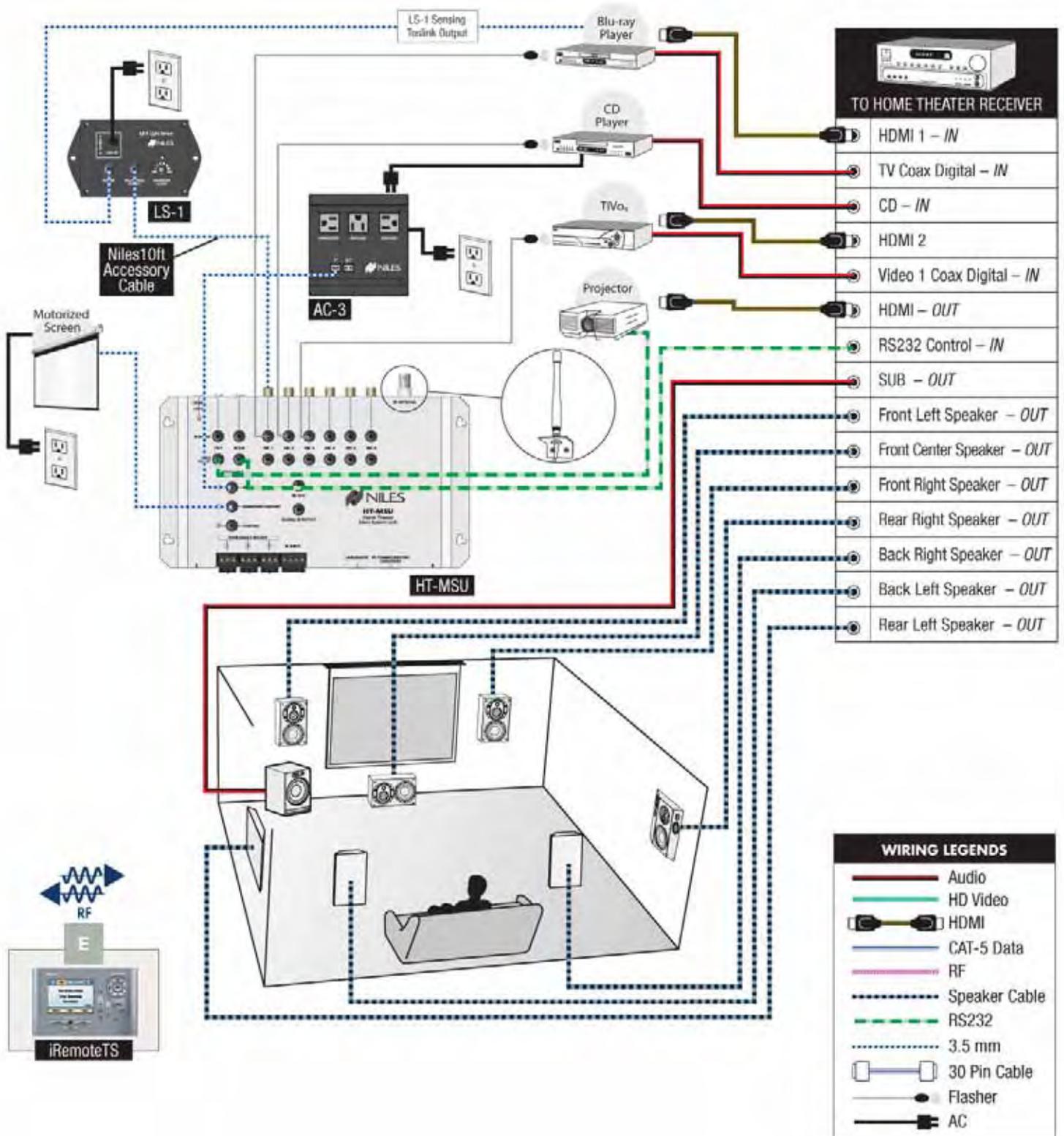• Using Power Sync allows faster switching between video sources

CABLE SCHEDULE

Home Theater Receiver connections					HT-MSU connections				
QTY	CABLE	SIGNAL	FROM	TO	QTY	CABLE	SIGNAL	FROM	TO
1	HDMI	Video	Blu-ray Player	HT Receiver/ HDMI 1 In	1	3.5mm	12V DC	HT-MSU/Src #1 Sync	LS-1 (sensing Toslink output on dedicated Blu-Ray player
1	Mono RCA	Digital Audio	Blu-Ray Player	HT Receiver/ TV Coax Dig. In	1	Flasher	IR	HT-MSU/Src #1 IR Out	Blu-Ray Player (dedicated)
1	HDMI	Video	TiVo	HT Receiver/ HDMI 2 In	1	Flasher	IR	HT-MSU/Src #2 IR Out	CD Player
1	Mono RCA	Digital Audio	TiVo	HT Receiver/ Video 1 Coax Dig. In	1	RS-232	Control	HT-MSU/TV RS-232 Out	Projector RS-232 Control In
1	Stereo RCA	Digital Audio	CD Player	HT Receiver/ CD In	1	RS-232	Control	HT-MSU/ Receiver RS-232 Out	HT Receiver RS-232 Control In
1	HDMI	Video	HT Receiver/ HDMI Out	Projector HDMI In	1	3.5mm	12V DC	HT-MSU/ Trigger #1 Out	AC-3 (Switch outlet for CD player)
1	Mono RCA	Audio	HT Receiver/Sub Out	Subwoofer LFE In	1	3.5mm	12V DC	HT-MSU/ Trigger #2 Out	Projection Screen Trigger In
1	Speaker	Audio	HT Receiver/L/ C/R/SL/SR/ RL/RR	L/C/R/SL/ SR/RL/RR Speakers					

iREMOTE TS AS A CONTROL DEVICE FOR AN AUTOMATED HOME THEATER USING AN HT-MSU

TO HOME THEATER RECEIVER
HDMI 1 – *IN*
TV Coax Digital – *IN*
CD – *IN*
HDMI 2
Video 1 Coax Digital – *IN*
HDMI – *OUT*
RS232 Control – *IN*
SUB – *OUT*
Front Left Speaker – *OUT*
Front Center Speaker – *OUT*
Front Right Speaker – *OUT*
Rear Right Speaker – *OUT*
Back Right Speaker – *OUT*
Back Left Speaker – *OUT*
Rear Left Speaker – *OUT*

WIRING LEGENDS

─────	Audio
─────	HD Video
HDMI	HDMI
─────	CAT-5 Data
━━━━━	RF
··········	Speaker Cable
─ ─ ─ ─	RS232
··········	3.5 mm
▭───▭	30 Pin Cable
───●─	Flasher
───▬	AC

APPLICATION: CONTROLLING A STAND-ALONE HOME THEATER VIA IR

DO THIS FIRST	No beginning knowledge required.

WHAT DOES THIS APPLICATION DO?

This application covers the use of an iRemoteTS as the primary controller of a home theater system using Infrared (IR) control. In this scenario, the iRemoteTS is used in a single room which also contains the home theater.

Key Considerations

It is highly recommend that you use an IR Repeater System consisting of an IR sensor, Main System Unit (MSU), and IR flasher to ensure reliable operation.

Customer Benefits

Your customer will have control of their home theater from an ergonomic and easy to use wireless remote. Additionally channel surfing is further simplified through icon-based favorite channels.

Installation Benefits

This application allows control of a home theater system via IR, which creates opportunities to upgrade systems already wired for IR control.

INSTALLATION REQUIREMENTS

• IntelliFile3 Capture Station and latest version of IntelliFile3 software

CRITICAL KNOWLEDGE

1. The IR Sensor of the IR Repeater system should be placed high enough in order to avoid blockage of the IR commands by someone walking in between the iRemoteTS and the IR sensor, but low enough as to not be severely off axis from the customer's preferred seating location.

2. If an IR Repeater system is not used then careful attention should be paid to making all sequences as short as possible. This will minimize the possibility of unreliable system operation due to the blockage of the IR commands by a person walking in front of the remote during operation.
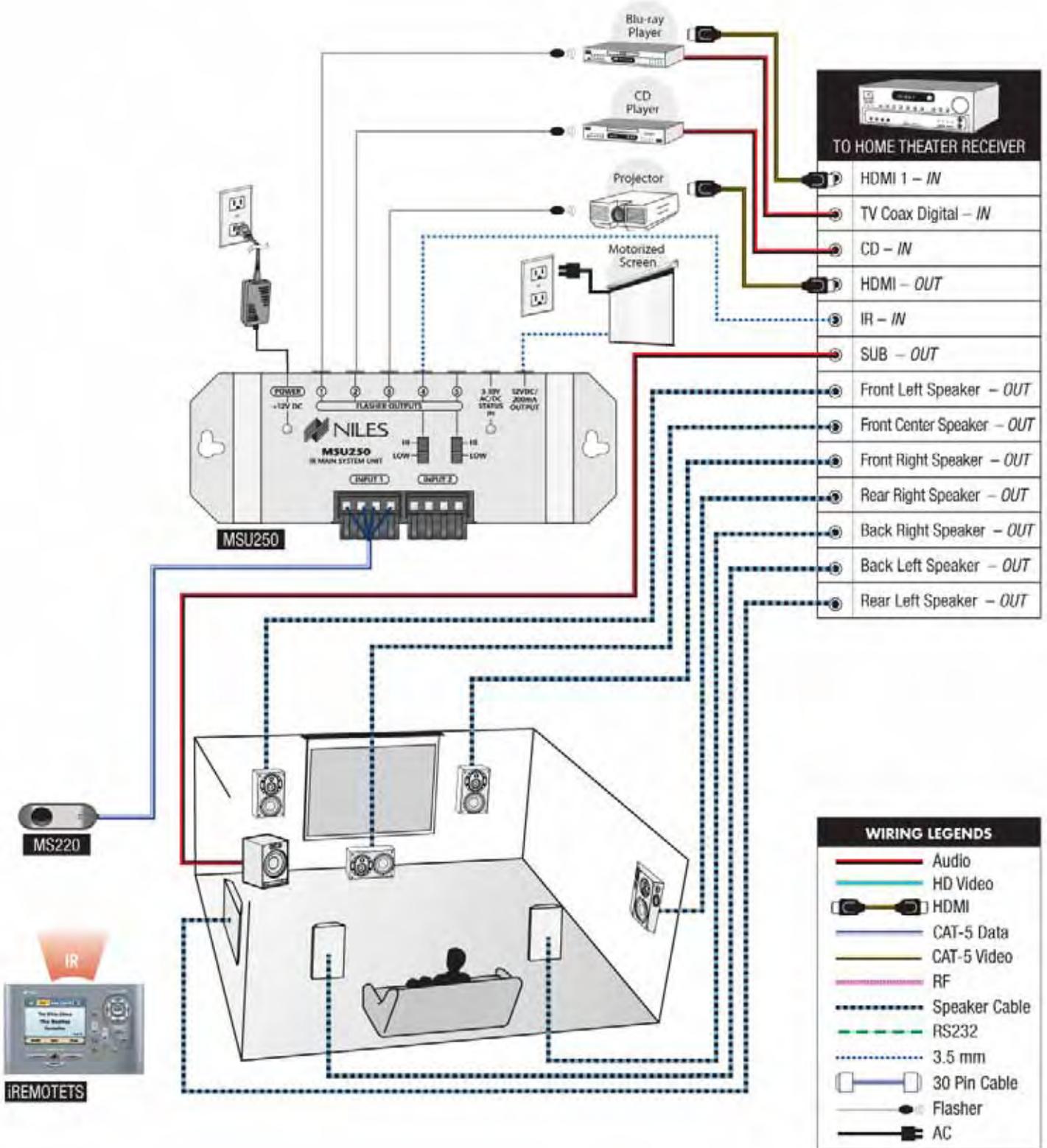
CABLE SCHEDULE

Home Theater Receiver connections					IR RF Repeater connections				
QTY	CABLE	SIGNAL	FROM	TO	QTY	CABLE	SIGNAL	FROM	TO
1	HDMI	Video	Blu-Ray Player	HT Receiver/ HDMI 1 In	1	3.5mm	IR	MSU250/Flasher 1 Out	Blu-Ray Player
1	Mono RCA	Digital Audio	Blu-Ray Player	HT Receiver/ TV Coax In	1	3.5mm	IR	MSU250/Flasher 2 Out	CD Player
1	Stereo RCA	Audio	CD Player	HT Receiver/ CD In	1	3.5mm	IR	MSU250/Flasher 3 Out	Projector
1	HDMI	Video	HT Receiver/ HDMI Out	Projector HDMI In	1	3.5mm	IR	MSU250/Flasher 4 Out	Receiver IR In
1	Mono RCA	Audio	HT Receiver/Sub Out	Subwoofer LFE In	1	3.5mm	12V DC	MSU250/12VDC Output	Projection Screen Trigger In
1	Speaker	Audio	HT Receiver/SL/ SR/RL/RR	SL/SR/RL/ RR Speakers					

iREMOTE TS AS A STAND-ALONE HOME THEATER CONTROL DEVICE USING INFRARED

TO HOME THEATER RECEIVER

HDMI 1 – *IN*
TV Coax Digital – *IN*
CD – *IN*
HDMI – *OUT*
IR – *IN*
SUB – *OUT*
Front Left Speaker – *OUT*
Front Center Speaker – *OUT*
Front Right Speaker – *OUT*
Rear Right Speaker – *OUT*
Back Right Speaker – *OUT*
Back Left Speaker – *OUT*
Rear Left Speaker – *OUT*

WIRING LEGENDS

	Audio
	HD Video
	HDMI
	CAT-5 Data
	CAT-5 Video
	RF
	Speaker Cable
	RS232
	3.5 mm
	30 Pin Cable
	Flasher
	AC

MSU250

MS220

IR

iREMOTETS

INTELLIFILE3 PROGRAMMING STEPS

UPDATE PROGRAMMING SOFTWARE

Always update your software to the latest version of IntelliFile3 before installing any products. IntelliFile3 can be downloaded at **www.intellicontrol.com/techsupport**

UPDATE FIRMWARE

All units must be hard-wire connected to the GXR2 during firmware update. Always perform a firmware update on all previously installed IntelliControl ICS products before adding new products. Follow this sequence:

     1. Upload previous programming from the GXR2

     2. Firmware update the current system

     3. Unplug the GXR2

     4. Connect the new products to the GXR2

     5. Reconnect the power to the GXR2

     6. Perform firmware update on the new products, including the HT-MSU and the iRemoteTS

     7. Upload previous programming from the GXR2 again

PROGRAMMING SEQUENCE
ALL UNITS MUST BE HARD-WIRE CONNECTED TO THE GXR2 DURING PROGRAMMING:

1. Perform MultiZone programming first

2. Then perform the home theater programming and upload to the HT-MSU
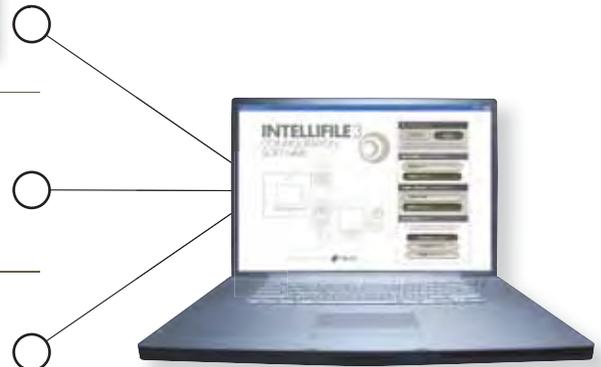
3. Upload the home theater programming to the iRemoteTS

4. Take and position all wireless devices to their final position in the house

5. Perform a "Reset Net" from the installer screen of one of the End-Points (iRemote, iRemoteTS or wireless keypad)

ADDITIONAL INFORMATION

WARRANTY

All Niles products are manufactured with reliability in mind and backed by factory warranties against defects in materials or workmanship. For details, see warranty statement included with each product.

We are eager to hear your product suggestions.

Please e-mail your suggestions to: productsuggestions@nilesaudio.com

Niles strives to constantly improve our products, all specifications may change without notice.

CUSTOMER SERVICE - TECHNICAL SUPPORT:

BY PHONE (IN USA OR CANADA)
1-800-BUY-HIFI (289-4434)
BY PHONE (OUTSIDE USA)
1-305-238-4373
CUSTOMER SERVICE HOURS
8:00 AM to 5:30 PM ET
TECHNICAL SUPPORT HOURS
8:00 AM to 7:00 PM ET
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