LUTRON

Application Note #665

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Integrating Infratech Heaters with Lutron Residential Systems

Overview

Lutron residential systems are capable of controlling 0–10 V⁻⁻⁻ devices and lighting loads via LMJ-5T-DV-B, LQSE-4T5-120-D/ LQSE-4T20-120-D, GRX-TVM2, or GRX-TVI-CPN3876. This document describes how to utilize LMJ-5T-DV-B, LQSE-4T5-120-D/LQSE-4T20-120-D, GRX-TVM2, or GRX-TVI-CPN3876 to control Infratech heaters.

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WARNING – Entrapment Hazard – To avoid the risk of entrapment, serious injury, or death, these controls must not be used to control equipment that is not visible from every control location or that could create hazardous situations if operated accidentally or through malfunction (for example, motorized gates, garage doors, industrial doors, microwave ovens, heating pads, fireplaces, space heaters, etc.) It is the installer's responsibility to ensure that these controls are connected only to suitable loads and equipment types and that such equipment is visible from every control location. Failure to do so could result in serious injury or death.

1.0 Controlling Infratech Heaters Using 0–10 V---

Infratech heaters require a control device to source a 0–10 V== signal. For more information on the ANSI standard for sourcing 0–10 V== controls, refer to Application Note #587 (048587) at www.lutron.com. In order to turn off an Infratech heater, the Lutron control will need to interrupt the 0–10 V== signal using an EPC-2-D manufactured by LVS Controls (not sold by Lutron). An EPC-2-D is required because the relays used to turn on/off 0–10 V== lighting are not rated to control Infratech heaters.

2.0 LMJ-5T-DV-B Controlling Infratech Heaters in HomeWorks/RadioRA Systems

2.1 Installation

Items needed for this installation:

Item	Company	Function
LMJ-5T-DV-B	Lutron	Controls the 0–10 V load
EPC-2-D	LVS Controls	Interrupts the 0–10 V signal
Infratech relay module	Infratech	Interrupts line voltage to heaters
HomeWorks or RadioRA processor	Lutron	Stores the database
HomeWorks hybrid repeater (if using a HomeWorks processor)	Lutron	Creates Clear Connect wireless signal

The diagram below demonstrates how an LMJ-5T-DV-B needs to be wired to the Infratech system.



• The neutral wires of the LMJ-5T-DV-B and the EPC-2-D must originate in the same distribution panel. This neutral may only return loads supplied by the same circuit breaker as the LMJ-5T-DV-B and EPC-2-D (Split/Single Phase and Three Phase systems: This neutral may not be shared with other circuit breakers).



2.1 Installation (continued)

Important Note: LMJ-5T-DV-B is a wireless device and must be located within 30 ft (9 m) of a repeater or wireless processor. In a HomeWorks system, an RF link with a hybrid repeater (HQR-REP-120) or dual-radio wireless processor (HQP7-RF-2) is required.

Wired and RF Configuration (RadioRA and HomeWorks)



* In HomeWorks and RadioRA systems, hybrid/auxiliary repeaters can be used to extend the wireless range.

2.2 HomeWorks Database Design

2.2.1 HomeWorks Load Schedule

Important Note: HomeWorks Designer version 7.0 or higher is required to use LMJ-5T-DV-B.

To begin building the load schedule, go to the *design* tab menu and select *loads*.

design	loads 🗸 🗸
	controls
HomeWorl	loads
	shades
	equipment
🚍 1st	link assignment
	line items

Select an area that will contain the Infratech heaters by clicking on that area name in the tree to the left. The selected area will be highlighted green.

HomeWorks QSX Project	
 Main House 	
 1st Floor 	
Kitchen	+ 📭 🖌 Edit
Garage	
Dining Room	
- 2nd Floor	

In the upper-right corner of the software window, click *Edit Fixture Types*.



2.2 HomeWorks Database Design (continued)

2.2.1 HomeWorks Load Schedule (continued)

The **System Fixtures** configuration window will appear which allows you to create fixture placeholders for easy placement into the load schedule. On the **Custom** tab, create a fixture placeholder for the 0–10 V== devices/loads that will be controlled by an LMJ-5T-DV-B. There are two options for 0–10 V== loads: **LED** or **Fluorescent**. Selecting either **LED** or **Fluorescent** will still control the Infratech heaters even though a lighting load is selected. Choosing either **LED** or **Fluorescent** changes the trim level that can be set to 1% on the low-end and 99% on the high-end. You may need to show **High End** and **Low End** by customizing the columns.

System Fixt	tures						
Custom	Ketra	Ivalo Dov	vnlights	Ivalo Pe	ndants/Sc	onces	
Fixture $_{ heta}$	Voltage $_{ heta}$	Load Type 💡	Lamp Wattage [∂]	Lamp ∂ Qty.	Wattage 💡	High End $ heta$	Low θ End
Infratech	120 V	LED 0-10 V	10	1	10	99%	1%

Click **Done** to close the **System Fixtures** window and return to the load schedule for the selected area. Double-click in the **Fixture Type** field to reveal a drop-down menu with all currently created custom or lvalo fixture options within the project. Select **Infratech** and the software will add a load schedule line item in the selected area for the Infratech heaters in that space.

Loads	HVAC Zones							
Lood cont	ains customized prope	rties 🕜						
Zone #	Zone Name	Fixture Ty	pe	Fixture Wattage	Product Type	Load Type	Total Watts	Voltage
3	Infratech Heater	Infratech	*	-10	34 	LED 0-10 V	12	120 V
		Undefined	8					
		infratech						
		Entit Fixture	Types					

Provide a zone name, zone description, and any other pertinent information. Repeat this process for each Infratech heater that is to be controlled by an LMJ-5T-DV-B.

2.2 HomeWorks Database Design (continued)

2.2.2 Adding an LMJ-5T-DV-B to a HomeWorks System

Add the LMJ-5T-DV-B to which the Infratech heaters will be assigned. To add the LMJ-5T-DV-B to the database, go to the *design* tab drop down menu and select *controls*.

File Edit	Reports Tools Help
design	controls progr controls loads shades equipment link assignment line items

Select the area in which the LMJ-5T-DV-B is to be physically located using the area tree on the left side of the screen.



Use the **Controls** toolbox to add an LMJ-5T-DV-B to the area. If the LMJ-5T-DV-B is not currently available in the toolbox, click **Edit Toolbox** and add the LMJ-5T-DV-B to the toolbox.

Construite .	(AF HAR	-			
Controls	RF Link	QS Link	H48 Link	÷	
Tab Name 1	RF Line	NUCCESS, 452-	5	nite Sati	
	Pupin per	re			Pug-in Sertin
R ^I Modules					
•	ſ	Ľ	ľ	Ó	
			0		

2.2 HomeWorks Database Design (continued)

2.2.3 Assigning Infratech Heaters to an LMJ-5T-DV-B in a HomeWorks System

Go to the **design** tab drop down menu and select **controls**. To the right of the LMJ-5T-DV-B image, there will be assign links which will show the **Assign** window when clicked. Click on the **Assign** link for an LMJ-5T-DV-B controlling an Infratech heater.

Device Locations Auto-Create Loads	xpand all	Collapse all
Infratech Heater X Edit Cut	Сору	View Propertie
1	Output	1
		Model
	1,5	LMJ-5T-DV-B

Find the appropriate Infratech heater to assign to the LMJ-5T-DV-B and click **Assign** for that zone.

Assign	×
Expand all Collapse all	Advanced Settings
Main House	Assign
1st Floor	Assign
Kitchen	Assign
	Assign

The zone will now be assigned to the selected output on the LMJ-5T-DV-B.



Important Note: If using the Lutron mobile app, the Infratech heater will appear as a lighting zone.

2.3 Adding an LMJ-5T-DV-B to a RadioRA 3 Database

Add the LMJ-5T-DV-B to which the Infratech heaters will be assigned. To add the LMJ-5T-DV-B to the database, go to the *design* tab drop down menu and select *controls*.

File Edit Repo	orts Tools Help			
design	controls 🔹			
	controls			
Snell Condo	smart lights			
Primary Suite	shades			
Primary I	equipment			

Select the area in which the LMJ-5T-DV-B is to be physically located using the area tree on the left side of the screen.



Use the **Controls** toolbox to add an LMJ-5T-DV-B to the area. If the LMJ-5T-DV-B is not currently available in the toolbox, click **Edit Toolbox** and add the LMJ-5T-DV-B to the toolbox.



Important Note: If using the Lutron mobile app, the Infratech heater will appear as a lighting zone.

2.4 Adding an LMJ-5T-DV-B to a RadioRA 2 Database

Important Note: RadioRA 2 Inclusive version 7.5 or higher is required to use LMJ-5T-DV-B.

Select the room where the LMJ-5T-DV-B is located. To the right of the selected room, click the "+" above Click here to add device location.

Rooms	
 Main Repeater Equipment Room Kitchen Master Bedroom Living Room Kids Bedroom Patio 	Click here to add a device location
Garage Edit	

To add the LMJ-5T-DV-B that will control the Infratech heater to the database, click on the picture of the LMJ-5T-DV-B under *Available Devices* > *Dimmers & Switches*.



2.4 Adding an LMJ-5T-DV-B to a RadioRA 2 Database (continued)

Available Devices	RF Modules	
Dimmers & Switches	·	
	8.	
- A 2	10-1	
	Device Location	
PARTITUM.	Device Type	Switch
Keypads	Zone Name	Switch Contact Closure
	Zone Location	0-10V Dimmer
E E 22 E	Load Type	Fluorescent Non-Dirr
and the second s	Fixture Wattage	0
A	Fixture Quantity	1
Auxiliary Repeaters	Total Zone Wattage	0

Once the LMJ-5T-DV-B is added, select **0-10V Dimmer** from the **Device Type** drop down menu.

On the right side of the screen the model number will change to LMJ-5T-DV-B. Add the **Device Location**, **Zone Name**, and **Load Type** and click **Done**. This will add the Infratech heater to the area specified.

There are two options for 0–10 V=== loads: *LED* or *Fluorescent*. Selecting either *LED* or *Fluorescent* will still control the Infratech heaters even though a lighting load is selected. Choosing either *LED* or *Fluorescent* changes the trim level that can be set to 1 on the low-end and 99 on the high-end.

Important Note: If using the Lutron mobile app, the Infratech heater will appear as a lighting zone.

RF Modules		
		Family RF Modules Model Number LMJ-ST-DV-B Description RF 0-10V module mounted in an electrical junction box.
Device Location	Patio Ceiling	
Device Type	0-10V Dimmer 🗸 🥆	
Zone Name	Infratech Heater	
Zone Location	Patio 🔽	
Load Type	LED 0-10V	
Fixture Wattage	0	
Fixture Quantity	1	
Total Zone Wattage	0	

3.1 Installation

Items needed for this installation:

Item	Company	Function
EPC-2-D	LVS Controls	Interrupts the 0–10 V signal
Infratech relay module	Infratech	Interrupts line voltage to heaters
LQSE-4T5-120-D/LQSE-4T20-120-D	Lutron	Controls the 120 V \sim switching and provides the 0–10 V=== to control load (Infratech heater).
HomeWorks System	Lutron	Stores the database

The diagram below demonstrates how a LQSE-4T5-120-D/LQSE-4T20-120-D needs to be wired to the Infratech system. 0-10 V=== (+)



- The neutral wires of the LQSE-4T5-120-D/LQSE-4T20-120-D and the EPC-2-D must originate in the same distribution panel. This neutral may only return loads supplied by the same circuit breaker as the LQSE-4T5-120-D/LQSE-4T20-120-D and EPC-2-D (Split/Single Phase and Three Phase systems: This neutral may not be shared with other circuit breakers).
- Connect the black wire of the EPC-2-D to the output of the LQSE-4T5-120-D/LQSE-4T20-120-D.
- Power switching and 0-10 V=== must be on the same zone (zone 1 shown).
- One LQSE-4T5-120-D/LQSE-4T20-120-D can control up to 4 zones of Infratech heaters using separate EPC-2-D relays and Infratech relay modules.

3.2 Database Design

3.2.1 Load Schedule

To begin building the load schedule, go to the *design* tab menu and select *loads*.

design	loads	-	Ľ
	controls		Ł
HomeWorl	loads		L
Main I	shades		L
	equipment		L
🚍 1st	link assignment		L
	line items		Ł

Select an area that will contain the Infratech heaters by clicking on that area name in the tree to the left. The selected area will be highlighted green.

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Equipment Room	
Living Room	
Patio	+ 📭 × Edi

In the upper-right corner of the software window, click *Edit Fixture Types*.



3.2 Database Design (continued)

3.2.1 Load Schedule (continued)

The **System Fixtures** configuration window will appear which allows you to create fixture placeholders for easy placement into the load schedule. On the **Custom** tab, create a fixture placeholder for the 0-10 V== devices/loads that will be controlled by a LQSE-4T5-120-D/LQSE-4T20-120-D. There are two options for 0-10 V== loads: **LED** or **Fluorescent**. Selecting either **LED** or **Fluorescent** will still control the Infratech heaters even though a lighting load is selected. Choosing either **LED** or **Fluorescent** changes the trim level that can be set to 1% on the low-end and 99% on the high-end.

System Fixtures Custom Ketra Ivalo Downlights Ivalo Pendants/Sconces											
Fixture 💡	Voltage	Ŷ	Load Type 💡	Lamp Wattage [⊕]	Lamp Qty.	θ	Wattage 🤞	High End	θ	Low End	θ
Infratech	120 V		LED 0-10 V	10	1		10	99%		1%	

Click **Done** to close the **System Fixtures** window and return to the load schedule for the selected area. Double-click in the **Fixture Type** field to reveal a drop-down menu with all currently created custom or lvalo fixture options within the project. Select **Infratech Heater** and the software will add a load schedule line item in the selected area for the Infratech heaters in that space.

Loads	HVAC Zones										
* Load contai	ns customized prope	rties 🥐									
Zone #	Zone Name	Fixture Ty	ype	Fixture Wattage	Product Type	Load Type	Total Watts	Voltage			
1	Infratech Heater	Infratech	•	10	-	LED 0-10 V	12	120 V			
		Undefined	ł								
		Infratech									
		Edit Fixture	e Types								

Provide a zone name, zone description, and any other pertinent information. Repeat this process for each Infratech heater that is to be controlled by a LQSE-4T5-120-D/LQSE-4T20-120-D zone.

3.2 Database Design (continued)

3.2.2 Adding Equipment

Next, add the equipment to which the Infratech heaters will be assigned. In this case, the equipment being added would be the DIN rail panel. To add the panel to the database, go to the *design* tab menu and select *equipment*.

design	loads	\bullet
HomeWorl Main H	controls loads shades equipment link assignment line items	

Select the area in which the dimming panel is to be physically located using the area tree on the left side of the screen.



Use the *Equipment* toolbox to add a DIN rail device compatible dimming panel to the area. In this case, a PD9-59F-120 has been selected. If the dimming panel is not currently available in the toolbox, click *Edit Toolbox* and add the dimming panel to the toolbox.



3.2 Database Design (continued)

3.2.2 Adding Equipment (continued)

Configure the DIN rail panel in the software to match the needs of the application. In the example below, for the QS communication link, a QS-WLB has been added to position 10. For the Infratech heater, one LQSE-4T5-120-D/ LQSE-4T20-120-D has been added to position 1.



3.2 Database Design (continued)

3.2.3 Assigning the Infratech Heaters to the Panel

Proceed to the *design* > *equipment* section of the programming software. To the right of the panel 9 image and parameters, there will be assign links which will show the *Assign* window when clicked. Click on the *Assign* link for one of the zones that will control an Infratech heater via a LQSE-4T5-120-D/LQSE-4T20-120-D.



Find the zone to assign within the *Assign* window and click *Assign* for that zone.



The zone will be assigned to the selected output on the panel. A LQSE-4T5-120-D/LQSE-4T20-120-D should appear in the *Interface* field along with the address of the LQSE-4T5-120-D/LQSE-4T20-120-D.

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	Type	Area	Zone Name	Load Type	Fixture Quantity	Interface
-1	0-10 V Modure	Patio	Pable + installach Heatler	LED 0-10 V	1	None
1.2	8-10 V Module		Asign_			
1-3	0-10 V Module		Asign			
1.4	0-10 V Module		Ampha			

4.1 Installation

Items needed for this installation:

Item	Company	Function
GRX-TVM2	Lutron	Controls the 0–10 V load. Fits in the 8 th RPM location near the top of the panel.
EPC-2-D	LVS Controls	Interrupts the 0–10 V signal
Infratech relay module	Infratech	Interrupts line voltage to heaters
HW-RPM-4U-120	Lutron	Controls the 120 V \sim switching of the Infratech heater
HW-TVMKIT-120	Lutron	Provides power to the GRX-TVM2 through a GRX-TVM-ISO2. Also includes DIN rail mounting hardware and wire harness.

The diagram below demonstrates how an GRX-TVM2 needs to be wired to the Infratech system. An output of a RPM module is needed for switching since the GRX-TVM2 controls only 0-10 V----.



- The neutral wires of the HW-RPM-4U and the EPC-2-D must originate in the same distribution panel. This neutral may only return loads supplied by the same circuit breaker as the HW-RPM-4U or HW-RPM-4A and EPC-2-D (Split/Single Phase and Three Phase systems: This neutral may not be shared with other circuit breakers).
- Connect the black wire of the EPC-2-D to the output of the HW-RPM-4U or HW-RPM-4A.

4.2 Database Design

4.2.1 Load Schedule

To begin building the load schedule, go to the *design* tab menu and select *loads*.



Select an area that will contain the Infratech heaters by clicking on that area name in the tree to the left. The selected area will be highlighted green.

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HomeWork	s QS Project	
🖃 Main H	louse	
🗖 1st	Floor	
	Kitchen	+ 📭 🖌 Edit
	Dining Room	
🖃 2nd	Floor	
– 1	Vaster Bedroom Suite	
	···Master Bedroom	

In the upper-right corner of the software window, click *Edit Fixtures*.



4.2 Database Design (continued)

4.2.1 Load Schedule (continued)

The **System Fixtures** configuration window will appear which allows you to create fixture placeholders for easy placement into the load schedule. On the **Custom** tab, create a fixture placeholder for the 0-10 V== devices/loads that will be controlled by a GRX-TVM2. There are two options for 0-10 V== loads: **LED** or **Fluorescent**. Selecting either **LED** or **Fluorescent** will still control the Infratech heaters even though a lighting load is selected. Choosing either **LED** or **Fluorescent** changes the trim level that can be set to 1 on the low-end and 99 on the high-end.

System Fixt	ure	s										
Custom	Ivalo Downlights Ivalo Pendants/Sconces											
Fixture	θ	Description	θ	Voltage	θ	Load Type	Lamp Wattage [⊕]	Lamp _∂ Qty.	Wattage 💡	High End	Low End	θ
Infatech Heate	er			120V		LED 0-10V	0	1	0	99	1	

Click **Done** to close the **System Fixtures** window and return to the load schedule for the selected area. Double-click in the **Fixture** field to reveal a drop-down menu with all currently created custom or Ivalo fixture options within the project. Select **Infratech Heater** and the software will add a load schedule line item in the selected area for the Infratech heaters in that space.

Lut	tron Designer - Ne	w Un	saved Project*						_ 8 >
nostics									
							Edit Fixtu	res Customize	columns
AFCI 0	Fixture	θ	Voltage	Load Type	Fixture Wattage	Fixture Qty	Total Watts	Interface θ	Interfa
No I	Infatech Heater	•	120V	LED 0-10V	0	1	0		
	Undefined								
J	Infatech Heater								

Provide a zone name, zone description, and any other pertinent information. Repeat this process for each Infratech heater that is to be controlled by a GRX-TVM2.

4.2 Database Design (continued)

4.2.2 Adding Equipment

Next, add the equipment to which the Infratech heaters will be assigned. In this case, the equipment being added would be the HWI-PNL-8. To add the panel to the database, go to the **design** tab menu and select **equipment**.

design	loads 🗸 🔻	
HomeWorl Main H	controls loads shades equipment link assignment line items	-

Select the area in which the dimming panel is to be physically located using the area tree on the left side of the screen.

HomeWorks QS Project
Main House
1st Floor
Dining Room
2nd Floor
Master Bedroom Suite
Lower Level
Equipment Room + 🔍 Kait
Exterior

Use the *Equipment* toolbox to add an HWI-PNL-8 dimming panel to the area. If the dimming panel is not currently available in the toolbox, click *Edit Toolbox* and add the dimming panel to the toolbox.

Q Instea	
Equipment Beckroom +	
Hybrid Repearer Engle zone Ethernet Device LV.21 EV.27 Power Eugly 1 shase 2CA. PNL.8 HVA2 Controller AVCI Have AVCI Have	
Tat Name : Robotom	
baanin ito mutaa numaasi, siooontahinin, etti.	
Ramote Parcel - Food Through	
	1. A
B RPM 5 RPM	C108
Remote Power Panel - with Braakers	Default Part Namber: Pril, 8 HWC Pil, 8
	- Description

4.2 Database Design (continued)

4.2.2 Adding Equipment (continued)

Configure the HWI-PNL-8 dimming panel in the software to match the needs of the application. A single panel can be configured to have a maximum of 32 zones; however, the GRX-TVM2 takes the eighth spot in the panel (top location) and can control the first 24 loads in the panel.



Add the GRX-TVM2 kit to the eighth spot in the panel (top location)



4.2 Database Design (continued)

4.2.3 Assigning the Infratech Heaters to the Panel

Proceed to the **design** > **equipment** section of the programming software. To the right of the PNL-8 panel image and parameters, there will be assign links which will show the **Assign** window when clicked. Click on the **Assign** link for one of the zones that will control an Infratech heater via a GRX-TVM2.

	0.4put	Shout		
		RPM Type	Area	Zone Name
al al and a second	1-1	Dimming Module		Anop-
	1-2	Dimming Module		Assign-
· · · · · · · · · · · · · · · · · · ·	1-3	Dimming Module		All gr
	1.4	Dimming Module		Ange
	2.4	Adaptive Module		Augr-
	2.5	Adaptive Module		Autign
	2.3	Adaptive Module		Aure-
	2.4	Adaptive Module		Assign-
	3-1	Dimming Module		Autopr-
	3-2	Dimming Module		Autor-
	3-3	Divining Module		Anige_
Dell	3.4	Dimming Module		Asign-

Find the zone to assign within the **Assign** window and click **Assign** for that zone.

×
Advanced Settings
Assign
Assign
Assign

The zone will be assigned to the selected output on the panel. A GRX-TVM2 should appear in the *Interface* field along with the address of the GRX-TVM2.

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Output	Input					
	RPM Туре	Area	Zone Name	Load Type	Fixture Quantity	Interface
1-1	Dimming Module	Patio	• Patio • Infratech Heater	LED 0-10V	1	GRX-TVM2 1-1
1-2	Dimming Module		Assign			-

5.1 Installation

Items needed for this installation:

Item	Company	Function
GRX-TVI-CPN3876	Lutron	0–10 V source signal
EPC-2-D	LVS Controls	Interrupts the 0–10 V signal
Infratech relay module	Infratech	Interrupts line voltage to heaters
HomeWorks, RadioRA, or Caséta Wireless neutral wire dimmer	Lutron	Control point

The diagram below demonstrates how a GRX-TVI-CPN3876 needs to be wired to the Infratech system and to the neutral wire dimmer.



• The neutral wires of the neutral wire dimmer, GRX-TVI-CPN3876, and the EPC-2-D must originate in the same distribution panel. This neutral may only return loads supplied by the same circuit breaker as the neutral wire dimmer, GRX-TVI-CPN3876, and EPC-2-D (Split/Single Phase and Three Phase systems: This neutral may not be shared with other circuit breakers.

Important Note: In order to utilize this solution, the GRX-TVI-CPN3876 model must be used since the Infratech heaters require the control to source the 0–10 V== signal. The GRX-TVI model acts as a sink and follows the IEC standard of 0–10 V== control which is not compatible with Infratech heaters.

5.2 HomeWorks Database Design

5.2.1 HomeWorks Load Schedule

To begin building the load schedule, go to the *design* tab menu and select *loads*.

design	loads	-	I
	controls		
HomeWorl	loads		
- Main I	shades		
	equipment		
💻 1st	link assignment		
	line items		ł

Select an area that will contain the Infratech heaters by clicking on that area name in the tree to the left. The selected area will be highlighted green.

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In the upper-right corner of the software window, click *Edit Fixture Types*.



5.2 HomeWorks Database Design (continued)

5.2.1 HomeWorks Load Schedule (continued)

The **System Fixtures** configuration window will appear which allows you to create fixture placeholders for easy placement into the load schedule. On the **Custom** tab, create a fixture placeholder for the Infratech heaters that will be controlled by an GRX-TVI-CPN3876 and driven by the output of the neutral wire dimmer. There are two options for 0-10 V== loads: **LED** or **Fluorescent**. Select either **LED** or **Fluorescent** changes the trim level that can be set to 1% on the low-end and 99% on the high-end. You may need to show **High End** and **Low End** by customizing the columns. As a best practice, give the fixture a name that will provide a good reminder that the load is tied to the GRX-TVI-CPN3876 controlled by neutral wire dimmer.

Important Note: The Lamp Wattage must be entered as "10" or greater when using GRX-TVI-CPN3876.

System	Fixt	ures											
Custom	Ketra Ivalo Downlights Ivalo Pendants/Sconces												
Fixture	Ð	Voltage	θ	Load Type 💡	Lamp ∂ Wattage	Lamp Qty.	0	Wattage	Ð	High End	θ	Low End	Ŷ
Infratech		120 V		LED 0-10 V	10	1		10		99%		1%	

Click **Done** to close the **System Fixtures** window and return to the load schedule for the selected area. Double-click in the **Fixture Type** field to reveal a drop-down menu with all currently created custom or lvalo fixture options within the project. Select **Infratech Heater** and the software will add a load schedule line item in the selected area for the Infratech heaters in that space.

Loads * Load conta	HVAC Zones	rties ?							
Zone #	Zone Name	Fixture Type	e	Fixture Wattage	Product Type	Load Type	Total Watts	Voltage	
1	Infratech Heater	Infratech	•	10	-	LED 0-10 V	12	120 V	
		Undefined							
		Infratech							
		Edit Fixture Ty	ypes						

Provide a zone name, zone description, and any other pertinent information. Repeat this process for each Infratech heater that is to be controlled by a neutral wire dimmer driving a GRX-TVI-CPN3876.

Continued on next page...

5.2 HomeWorks Database Design (continued)

5.2.2 Adding Controls

Add the equipment to which the Infratech heaters will be assigned. In this case, the equipment being added is the neutral wire dimmer. To add the panel to the database, go to the **design** tab drop down menu and select **controls**.

File Edi	Reports Tools Help
design HomeWor	controls controls loads shades equipment link assignment line items

Select the area in which the dimming panel is to be physically located using the area tree on the left side of the screen.

- Game Room	
Patio	
Garage	+ 🔩 🗙 Edit
Equipment Room	

Uncheck **Auto-Create Loads** under Device Locations and use the **Controls** toolbox to add a neutral wire dimmer to the area. If the neutral wire dimmer is not currently available in the toolbox, click **Edit Toolbox** and add the neutral wire dimmer to the toolbox.



5.2 HomeWorks Database Design (continued)

5.2.3 Assigning Infratech Heaters to the Neutral Wire Dimmer

Remain in the *design* > *controls* section of the programming software. To the right of the dimmer image and parameters, there will be assign links which will show the *Assign* window when clicked. Click on the *Assign* link for one of the zones that will control an Infratech heater via a GRX-TVI-CPN3876.

0.074/002222038/04				
infratech Heater				
	Output			
		Model	Device Name	Zone Name
	1 T	HORD LOUIS	000 000	Acres 1

Find the zone to assign within the **Assign** window and click on **Assign** for that zone

As	sign	×
Expand a	II Collapse all	Advanced Settings
E Ma	ain House	Assign
÷	Patio	Assign
÷	Garage	Assign
	- ↓← Infratech Heater (LED 0-10V)	Assign

The zone will be assigned to the output of the dimmer. A GRX-TVI-CPN3876 should appear in the Interface field.

Copy	View Properties	🔒 Not Ass	gned		
Output	ſ				
	Model	Device Name	Load #	Zone Name	Interface
1.5	HORD-10ND	CSD 001	1	_+ Infratech Heater	GRX-TVI

5.3 Adding a Neutral Wire Dimmer to a RadioRA 3 System for Control of an Infratech Heater via GRX-TVI-CPN3876

Add the equipment to which the Infratech heaters will be assigned. In this case, the equipment being added is the neutral wire dimmer. To add the panel to the database, go to the **design** tab drop down menu and select **controls**.

Select the area in which the neutral wire dimmer is to be physically located using the area tree on the left side of the screen.

-	
Game Room	
Patio	
Garage	+ 📭 🖌 Edit
Equipment Room	

Use the **Controls** toolbox to add a neutral wire dimmer to the area. If a neutral wire dimmer is not currently available in the toolbox, click **Edit Toolbox** and add a neutral wire dimmer to the toolbox.

program		
Controls	Misc Equip	+
,	, r	¹ 2,
1000 W Neutral	Sunnata PRO LED + Dimmer	RF Sunnata 3 Button with Raise Lower Hybrid

Note: For proper operation with the GRX-TVI-CPN3876, verify/adjust the neutral dimmer trim settings per section **6.2 Setting Trim Levels via RadioRA 3 Software**.

5.4 Adding a Neutral Wire Dimmer to a RadioRA 2 System for Control of an Infratech Heater via GRX-TVI-CPN3876

Select the room where the Infratech heaters are located. To the right of the selected room, click the "+" above Click here to add device location.

M	aın Kepeater	5/100	
	Equipment Room		
	Garage	Edit	
	Patio		
	Kitchen		
	Master Bath		Click here to add a device location
	Measter Bedroom		Click here to add a device location
	Game Room		
	Deck		
j			

Under the *Available Devices* section, select the dimmer style and then select *0-10 V Dimming With Interface* in the *Device Type* drop down menu. By default, this will add an RRD-10ND with a GRX-TVI.

Available Devices	RF Maestro Ne	utral Dimmer	
Dimmers & Switches	Congretions Device Location Device Location Device Location Device Type Zone Name Zone Location Histore Waltage Histore Waltage	0-10 V Districting W	Family RF Macatho Model Nember RDD-TologD-WH GRO-TW Chone Altimate Moder Macathe Model Number CM-1-3W1 Description Machte 1000 W Dimmer With Neutrix mer (Q-White Driver A-Series LID onver (3-wing)
Auxiliary Repeaters		Dimmer With Interface 0.10 V Dimming With Interfa LED Constant Voltage Switch Duel Voltage Switch RadioRA2 Neutral Switch	cr
Note: Please refer to the product specificatio	n sheet for the selected device to ensu	Fan Control Fan Soeed Control	
		Mutti-location Control Remote Olimmer	

5.4 Adding a Neutral Wire Dimmer to a RadioRA 2 System for Control of an Infratech Heater via GRX-TVI-CPN3876 (continued)

If an RRD-10ND is not the model to be used, click **Choose Alternate Model** under the **Model Number** section on the right side of the **Add New Device** screen.



From the drop down list of neutral wire dimmers, select the appropriate dimmer for the application.

Family RF Maestro
Model Number
RRD-10ND (default) 🔽 Done
RRD-10ND (default)
RRD-6NA
RRD-6ND
RRD-PRO
Description
Maestro 1000 W Dimmer With

If using a GRAFIK T dimmer, select the GRAFIK T dimmer image under **Available Devices** and select either **C.L Dimmer** or **Phase Selectable Dimmer** in the **Device Type** field.

vailable Devices Dimmers & Switches	RF GRAFIK T	
4	Device Location	
Keypads	Device Type Zone Name Zone Location Load Type Fixture Wattage Fixture Quantity Total Zone Wattage	CL Dimmer CL Dimmer Phase Selectable Dimmer Switch Remote Dimmer/Switch 0 1 0

5.4 Adding a Neutral Wire Dimmer to a RadioRA 2 System for Control of an Infratech Heater via GRX-TVI-CPN3876 (continued)

In the *Load Type* drop down menu, select any 0–10 V=== load. This will auto populate the GRX-TVI under the *Model Number* section.

If using a GRAFIK T keypad, select the GRAFIK T keypad image under **Available Devices** and select either **C.L Dimmer** or **Phase Selectable Dimmer** in the **Device Type** field.

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RF GRAFIK T		
		Family RF GRAFIK T
		Model Number RRT-G25LW GRX-TVI
Change Colors		Faceplate Model Number LWT-G-WH
Device Location		Description RF GRAFIK T 250W LED / 600W
Device Type	C.L Dimmer	INC Dimmer With Optional Neutral
Zone Name		
Zone Location	Garage 🔽	
Load Type	LED 0-10V	
Fixture Wattage	0	
Fixture Quantity	1	
Total Zone Wattage	0	
		Cancel Done
he selected device to ensur	e that it meets local regulatory re	quirements.

Once added, there will be a "*" next to the load name



6.0 Setting Trim Levels on Neutral Wire Dimmers

6.1 Setting Trim Levels via HomeWorks Software

To begin setting the trim levels, go to the *design* tab menu and select *loads*.



Select an area that will contain the Infratech heaters by clicking on that area name in the tree to the left. The selected area will be highlighted green.



In the upper-right corner of the software window, click Edit Fixture Types.



The **System Fixtures** configuration window will appear which allows you to create fixture placeholders for easy placement into the load schedule. On the **Custom** tab, create a fixture placeholder for the Infratech heaters by selecting either **LED** or **Fluorescent**. Choosing either **LED** or **Fluorescent** changes the trim level that can be set based on the dimmer being used. You may need to show **High End** and **Low End** by customizing the columns. When using a neutral wire dimmer with GRX-TVI-CPN3876, refer to **Section 6.4** for trim level settings.

Custom	ustom Ketra Ivalo Downlights Ivalo Pendants/Sconces										
Fixture $_{\theta}$	Voltage	θ	Load Type 💡	Lamp Wattage [⊕]	Lamp Qty.	θ	Wattage $_{\theta}$	High End	Ð	Low End	θ
Infratech	120 V		LED 0-10 V	10	1		10	99%		1%	

6.2 Setting Trim Levels via RadioRA 3 Software

Select the room where the Infratech heater is located.

-	
Game Room	
Patio	
Garage	+ 🖣 🗙 Edit
Equipment Room	

Select the dimmer that is controlling the Infratech heater and click View Properties.



Set the *Intensity Low End* and *Intensity High End* according to the trim settings specified in Section 6.4 Setting Trim Levels When Using GRX-TVI-CPN3879.

elected Device Properties			
Intensity Low End:	28%		
Intensity High End:	81%		
Use Locked Preset:		Apply to all	

6.3 Setting Trim Levels on a Caséta Wireless Dimmer (PD-10NXD)

The PD-10NXD trim levels need to be set on the dimmer itself and not through the Caséta Wireless app.

6.3.1 Setting Low-End Trim

Press and hold the "☆" and " " buttons until a status LED starts to flash (about 6 seconds).



Press and hold the " \checkmark " button until the Infratech heater is on the lowest setting.



Press and hold the "Q" button until the status LED stops flashing.



6.3 Setting Trim Levels on a Caséta Wireless Dimmer (PD-10NXD) (continued)

6.3.2 Setting High-End Trim

Press and hold the ": ? and " • " buttons until a status LED starts to flash (about 6 seconds).



Press and hold the " " button until the Infratech heater is on the highest setting.



Press and hold the "Q" button until the status LED stops flashing.



6.4 Setting Trim Levels When Using GRX-TVI-CPN3876

Below is a list of devices used in HomeWorks, RadioRA, and Caséta Wireless systems that can control Infratech heaters through a GRX-TVI-CPN3876. Trim levels need to be set on each device and a phase needs to be selected for dimmers capable of either forward or reverse phase control. This is due to the fact that the GRX-TVI-CPN3876 is looking for a signal from a fluorescent dimmer. When using any of the dimmers below to control the Infratech heaters through the TVI use the following settings:

- Set the low-end trim to 28%.
- Set the high-end trim to 81%.
- Set dimmers capable of forward- and reverse- phase control to forward-phase.

Important Note: If using a fluorescent dimmer, no trim level adjustments are required.

System	Model Number
HomeWorks QS	HW-RPM-4A
HomeWorks QS	HW-RPM-4U
HomeWorks	HQRD-6NA or HQRA-6NA
HomeWorks	HQRD-10ND or HQRA-10ND
HomeWorks	HQRD-F6AN or HQRA-F6AN
HomeWorks	HQRD-H or HQRA-H
HomeWorks	HQRD-HN or HQRA-HN
HomeWorks	HQRT-5NEW
HomeWorks	HQRT-G25LW
HomeWorks	HQRT-GH2B, HQRT-GH4B, HQRT-GH5B, or HQRT-GH6B
HomeWorks	HQRD-PRO or HQRA-PRO
HomeWorks	LQSE-4A5-120-D
HomeWorks/RadioRA 3/RadioRA 2	LQRJ-WPM-6P
HomeWorks/RadioRA 2	QSGRJ-3P, QSGRJ-4P, or QSGRJ-6P
RadioRA 3/RadioRA 2	RRD-6NA
RadioRA 3/RadioRA 2	RRD-10ND
RadioRA 3/RadioRA 2	RRD-F6AN
RadioRA 2	RRD-H
RadioRA 3/RadioRA 2	RRD-HN
RadioRA 2	RRD-G5NEW
RadioRA 3/RadioRA 2	RRD-PRO
RadioRA 2	RRT-G25LW
RadioRA 2	RRT-GH2B, RRT-GH4B, RRT-GH5B, or RRT-GH6B
Caséta Wireless	PD-5NE
Caséta Wireless	PD-10NXD
RadioRA 3	RRST-PRO-N
RadioRA 3	RRST-HN

6.5 Setting Trim Levels via RadioRA 2 Software

Select the room where the Infratech heater is located.

	Rooms			
Þ	Main Repeater	6 / 100		
	Equipment Room			
	Garage	Edit		
	Patio			
	Kitchen			
	Master Bath			
Measter Bedroom				
	Game Room			
	Deck			

Right click on the control for the Infratech heater and select *Advanced Settings*.

Garag	je Ce	eiling		
-	V	Devic	e Ctrl+V	
_	8	Paste	Ctrl+V	
	X	Delete	Del	
≭ Infr		Edit		it
Advanced Settings				

In the *Advanced Settings* screen, fill in the *Low End Trim* and *High End Trim* fields and click *Done*. When using a neutral wire dimmer with GRX-TVI-CPN3876, refer to **Section 6.4** for trim level settings.

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Advanced Settings			
Low End Trim	28%		Apply to all
High End Trim	89%		Apply to all
On Level	75%	•	Apply to all
Fade On Rate	0.75		Apply to all
Fade Off Rate	2.5		Apply to all
Delayed Long Fade To Off	30	▼	Apply to all
			Done

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