Integration Note

Manufacturer:	ELAN Home Systems
Model Number(s):	**HR2 Wi-Fi Handheld Remote Control**
Minimum Core Module Version:	g! 5.2 build 562
Comments:	ELAN HR2 – Main Application 1.0.1.6, Boot loader version 1.0.0.3 USB MSD Version 1.0.1.6, Radio Configurator version 1.0.1.6
Document Revision Date:	04/24/2015

OVERVIEW AND SUPPORTED FEATURES

The HR2 Handheld Remote Control utilizes instant-on WiFi technology to provide a quick and seamless interface to a g! system for control of media devices and various subsystems in the home. The remote includes a touch screen interface for feedback and control plus adds several of the most common hard buttons found on typical universal remotes.

Important! The HR2 remote is not compatible with legacy HomeBrick and MultiBrick controllers.

THE HR2 HANDHELD REMOTE CONTROL SUPPORTS THE FOLLOWING FEATURES:

Wireless Connectivity: The HR2 connects via Wi-Fi and can be used up to 30' from its WAP. See the Wi-Fi connections section below for details on the HR2 compatibility.

System Mode Control: The home interface may be optionally configured to provide system mode status and control.

Current Weather and Forecast information: The home interface may be optionally configured to display basic weather conditions and forecast information. (USA ONLY) Press and hold the home icon on the HR2 main menu page to access the house mode and all weather pages.

Lighting Control: The lighting interface can be configured to display one or more custom lighting keypads and custom lighting pages on the touchscreen interface for 2-way control of scenes or lighting devices. Lighting scheduling is not supported. Press and hold the lighting icon on the HR2 main menu page to access the lighting keypad and lighting custom page list.

Security Control: The security interface can be configured to display status of one or more partitions on the touchscreen interface and provides a keypad to arm/disarm the security panel. Press and hold the security icon on the HR2 main menu page to access the security partition list.

Climate Control: The climate interface displays status of one or more climate zones and provides mode and fan control plus climate set point adjustments. Scheduling and custom tabs are not supported. Press and hold the climate icon on the HR2 main menu page to access the climate zone list.

Media Control: The media touchscreen interface displays status of one or more media zones and provides an interface for source selection and control. Press and hold the media icon on the HR2 main menu page to access the media zone list. The touchscreen interface provides metadata feedback for supported two way devices or customizable single or multi-page interfaces for one way device control. Custom controls that are supported for use on the remotes touchscreen UI are: Audio Button, Audio Keypad, Audio Keypad Text View, Audio Mode Control, Audio Sound Adjust, Channel Favorite Button, & Static Text control. See other limitations below.

OSD Control: The HR2 remote can be used to navigate the On Screen Display.

Zone Settings Page: Media zones can be configured to have a zone settings page on the HR2 remote. The page is customizable in the configurator and is accessed on the HR2 by pressing and holding the MEDIA hard button.

All Zones Off: An 'All Media Zones Off' macro can be executed by pressing and holding the power button at the top of the HR2.

IR Blaster: The HR2 includes an IR blaster for providing power control of a video display where it is not possible to run an IR emitter or other control method to the display.

Note: This method will prevent proper control in cases where a macro may be executed from a device other than the HR2. For example; executing an 'All Zones Off' macro from a touchscreen will not turn off any displays that only use the HR2 IR Blaster for control. See Using the HR2 IR Blaster below for more information.

THE HR2 HANDHELD REMOTE CONTROL DOES **NOT** SUPPORT THE FOLLOWING FEATURES:

Unsupported Subsystems: The HR2 does not include feedback or control for Video, Messaging, Irrigation, and Pool/Spa subsystems.

Various custom controls: Not all custom controls are supported on the HR2 interface. Any custom controls other than those listed above are not supported. The result of this may be limited source control of various 3rd party AV sources.

Custom Homepages: Custom Homepages are not supported on the HR2.

IR Blaster for source control: The HR2 IR blaster is not supported for source control or any use other than the case explained above. See Using the HR2 IR Blaster below for more information.

Stand-alone remote control: The HR2 is an interface to a g! system controller and is not supported for stand-alone control. It does not learn or store IR and a compatible g! system controller is required for operation.

Any feature not specifically noted as "supported" is not supported.

INSTALLATION OVERVIEW

1. Install and test the system controller and all subsystems.

2. Verify the system HC controller is configured with a static IP address. If it is not then stop and configure the controller with a static IP address and retest the system functionality and remote access to the system.

3. Fully charge then power up the HR2 remote. Refer to the HR2 Quick Reference guide for details.

4. Verify proper firmware versions as described in the HR2 configuration section below.

5. Use the Configurator to assign the Wi-Fi properties and connect the remote to the wireless network and the system controller.

6. Use the Configurator to select all pages and options for subsystem control. This includes defining what zones and subsystems are available for control on the HR2.

7. Configure and test all subsystems for proper operation. In some cases this may include editing or creating custom UI pages for desired control.

HR2 CONFIGURATION

The following steps will configure the HR2 remote to communicate with the system controller via your wireless network. Setup the remote(s) one at a time using the following procedure. For detailed information about the HR2 wireless compatibility refer to the Wi-Fi Connections section later in this document.

Notes:

- ELAN has verified the HR2 performance with the ELAN HWRTR100 router/access point. We strongly recommend that you use this device as the router/access point when using an HR2 in your installation. Due to the quantity of wireless access points available on the market today and their complexity ELAN tech support will not be able to provide support for connecting an HR2 to any wireless access point or wireless router other than the HWRTR100.

- You will need to have the wireless network SSID, encryption type and password, and a predefined static IP address for each remote you are setting up. If you do not have this information you will need to consult with the network administrator to get it.

- If you have trouble getting your HR2 to connect to the wireless network refer to the Wi-Fi Connections section below for tips and troubleshooting steps.

- Conflicts have been reported with the Spectralink Series 3640 WiFi Telephone. Both the Remote and the phone system use Port 2000. Using these 2 systems on the same port will result in the Remote dropping from the network, hang/lockups in the Remote, and rapid discharge of the remote's battery.

1. Check the system tab, system in the Configurator to verify the system controller software version is as indicated in this document header or newer.

2. Verify the HR2 firmware is as indicated in this document header or newer. If the firmware is not the minimum from this document header then stop and contact ELAN tech support for details on updating.

    a. Power up the remote

    b. Simultaneously press the **–CLR** button, the **g!** button, and the **arrow** button located directly above the g! button to access the SETUP MENU.

    c. Use the arrow buttons to navigate the menu to Code version then click OK to view the HR2 version information.

3. Use g!ConnectPro to connect to your system controller with the Configurator application.

4. Add the HR2 Com device on the interface tab as shown in the g! Configuration details table below. NOTE: Only one COM device is required for a system even if you have multiple HR2 remotes.

5. Switch the HR2 remote off using the power switch located under the bottom endcap.

6. Connect the remote to your PC with the included USB-USB mini cable.

7. Switch on the remote power and let it boot up to the "Enter password" screen.

8. On the remote press digits 3526 then press ENTER. The remote's screen should display "Correct" and switch to "USB active".

9. If a window pops up saying there are disk / file errors, click on the "Fix" or "Run Scan" button, then close the window after it runs.

10. If any other window notifications or explorer windows open on your PC close them now.

11. Right-click on the HR2 communication device added in step 4 above and select "Configure Attached HR2" from the menu. This will bring up the Configure HR2 dialog box as shown below.

Configure HR2 ✕

HR2 IP	192 . 168 . 0 . 100

Netmask	255 . 255 . 255 . 0
Gateway	192 . 168 . 0 . 1
Controller IP	192 . 168 . 0 . 2

Load Controller Settings

SSID	HR2 WiFi

○ WEP (128 Bit) *
KEY (26 HEX Digits) [   ]
KEY (13 Characters) [   ]

◉ WPA/TKIP or WPA2/AES *
Passphrase password

○ No Encryption

* Disabled encryption at access point or router will override these settings

Cancel   Save Configuration

12. Click the Load Controller Settings to automatically set the net mask, Gateway address, and Controller IP address. This will also set the HR2 IP address to a default value based on the Gateway address loaded from the Controller. (Note: Your HC Controller must be assigned a static IP for this function!)

13. Enter your predetermined static IP address for the HR2 in the HR2 IP field. Note the static IP must be outside of the network DHCP range, and not currently in use by another device. If you do not know this address you will need to get it from your network administrator.

14. Enter the SSID for the wireless access point that the HR2 will be connecting to.

15. Select the encryption type and enter the wireless password in the appropriate field.

16. Click Save Configuration to write all of this information down to the remote. Once complete you will get the notification below that it is safe to disconnect the USB.

HLCONFIG ✕

⚠ HR2 Configuration Complete
Safe to Detach Device

OK

17. Click OK to close the dialog box and remove the USB cable. The remote will display "Configuring Radio" then connect to the access point and finally the system controller. Once connected to the system controller it will automatically log an entry under Interface Devices as shown below.
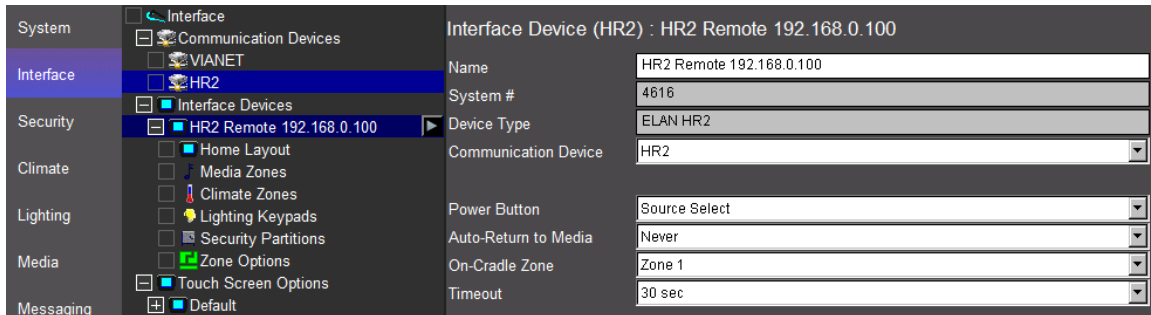
18. Click + next to the remote to expand its options and configure the remote's display for each subsystem. The choices include selecting subsystem visibility, hidden or shown, and a zone map to define default subsystems based on the currently selected media source. Refer to the Configurator Training Guide and/or the Online Help (F1) for details on configuration.

19. Once the remote is online and associated you can check the remotes name by pressing the Menu and Info button at the same time. The HR2 Screen will display the name as it is in the configurator on the interface tab. This is useful to identify which remote you are working on if you have multiple remotes in one install.

g! CONFIGURATION DETAILS

The following table provides settings used in the g! Configurator. Please refer to the *Configurator Reference Guide* for more details.

- o   "<Select>"   Select the appropriate item from the list (or drop-down) in the Configurator.

- o   "<User Defined>", etc.   Type in the desired name for the item.

- o   "<Auto>"   This field will automatically populate during configuration

Devices	Variable Name	Setting	Comments
Communication Devices	**Name**	<User Defined> (Example: **ELAN HR2**)	
	Typ	**Ethernet**	
	Communication Type	**ELAN HR2 Controller**	Only 1 Com device required for HR2(s)
	Location	<User Defined> (Not Required)	
	Enable Sharing	Not Applicable	
	Sharing Port	Not Applicable	
	Ethernet Address	<Auto>	
	Port	<Auto>	Default is 2000
Interface Devices<Auto Discover>	**Name**	<User Defined> (Default: **HR2 XXX.XXX.XXX.XXX**)	See Note#1
	Device Type	**ELAN HR2**	
	COM Device	<Auto> (Example: **ELAN HR2**)	See Note #2
	Power Button	<Select>	See Note #3
	Auto – Return to Media	<Select>	See Note #4
	On-Cradle Zone	<Select>	See Note #5
	Timeout	<Select>	See Note #6

Notes:
1. The HR2 remotes are automatically discovered; refer to Initial Configuration Notes above
2. If not already chosen, select the COM device that refers to the HR2 Comm. Device set above
3. Select the desired Power button behavior
4. Select the desired return to media control time
5. Select the desired zone to switch to when cradled
6. Select the desired sleep timeout behavior

USING THE HR2 IR BLASTER

The HR2 can be used to flash IR out of its front IR blaster for local control of video displays when it is not possible to run an IR emitter or other control method to the display. Configuring the remote for local IR control is done in a similar fashion to any IR control in g!. The only exception is to select the HR2 IR Sender as the default sender on the IR device. See the training guide or online help for more details.

1. On the input/output tab of configurator add the IR device for the video display

2. Import or learn the discrete IR power codes (cycling power codes are not recommended)

3. Select the HR2 IR Sender as the Default Sender for the IR display.

4. On the media tab configure the video display and map the power commands.

5. Select this video display in the desired zone and set the power states in the Auxiliary Source Function matrix.

6. Test the commands by aiming the remote at the displays IR receiver and turning the zone on and off. *NOTE: the Test Commands function in the Configurator will not send IR to the HR2 remote.*

Notes on HR2 IR Blaster Operation:

The HR2 has an IR Blaster at the top of the remote similar to any standard remote control. The HR2 differs in that it does not store any IR codes, it only transmits IR codes as sent to it by a HC-Series Controller. The HR2 also differs from standard remote controls in that it is specifically designed to be a multi-zone control point, and as such it has some unique behavior:

- When selecting the IR Sender for HR2's, by default there is only ONE HR2 Sender selection; regardless of how many HR2's may be in the installation.

- When a HR2 requests an IR code, the HC controller determines what HR2 to send the code to, based on the zone and the last HR2 to request a command.

- It is not possible to configure the IR output of any HR2 as a discrete emitter, or to set a specific HR2 to always send certain codes. All IR codes are routed to individual HR2's only by the HC using the last button press received routing method.

- It is theoretically possible, though unlikely, that two HR2's could both request an IR code to be sent at the exact same time, causing a misdirected IR code.

- Due to the nature of HR2's being portable, and the possibility of a HR2 being placed in a position where the IR Blaster cannot "see" devices they may control, the HR2 blaster is not recommended for automating control of IR devices. For example, if the HR2 is in the cradle or held upright pointing at the ceiling and a zone is activated where the TV is to be controlled by the HR2 blaster, the display may fail to activate. **It is always preferred for reliable function to control IR devices with dedicated emitters or pursue other control options where available to avoid potential issues with control from the HR2 blaster.**

- In the 5.2 release of software, the only supported use case of the IR blaster on the HR2 is to control a display where there is no other control option (serial, running an emitter etc). Controlling other devices or sources with the HR2 IR Blaster is not recommended or supported.

WI-FI CONNECTIONS

What type of access point is required?

Any 2.4 GHz wireless access point capable of one or more of the supported encryption types listed below should work. The access point MUST also allow connections from 802.11g devices.

What encryption types are NOT supported

1) 64 bit WEP
2) WPA-PSK + AES
3) WPA2-PSK + TKIP
4) WPA-Enterprise
5) WPA2-Enterprise

These options are not supported because the radio module in the HR2 doesn't implement them.

What encryption types are supported

1) No encryption
2) 128 bit WEP
3) WPA-PSK + TKIP
4) WPA2-PSK + AES

There are a few terms here which can appear with different names on different access points. For instance, WPA-PSK can also be referred to ask WPA-Personal. Similarly, WPA2-PSK can also be called WPA2-Personal. Some access points may refer to AES as CCMP instead.

There is an additional limitation on the 128 bit WEP option. The actual key needed for 128 bit WEP is 26 hexadecimal[1] characters. The Configurator software allows you to enter either the 26 hexadecimal characters or 13 ASCII[2] characters. The Configurator will convert the 13 ASCII character into the 26 hex characters as you type. However, this conversion is unusual and may not be supported by most access points. If the WEP key in the WAP is not 13 or 26 characters, please try using the tool that can be found at http://www.wepkey.com/.

Also note that many access points support "auto" modes for WPA+WPA2 or TKIP+AES. Some access points are known to not work if these "auto" options are used.

If an access point claims to implement all of the requirement listed here, but still does not work, then Engineering should be informed. The important information is the manufacturer, model number, and software version.

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[1] Hexadecimal characters are 0 through 9 and A through F.
[2] Without getting too technical, ASCII characters are basically anything on your keyboard.

ELAN has verified the HR2 performance with the ELAN HWRTR100 router/access point. ELAN strongly recommends that you use this device as the router when using an HR2 in your installation. Due to the quantity of wireless access points available on the market today and their complexity ELAN tech support will not be able to provide support for connecting an HR2 to any wireless access point or wireless router other than the HWRTR100.

Below are some basic guidelines for HR2 Wi-Fi configuration. This information if for reference only and is provided to try to help if you are having trouble with the radio configuration on a non-ELAN router or AP.

Do not call ELAN tech support until you have read and understood the following information and completed the troubleshooting steps below.

- o The HR2 is compatible with b and g modes but can also work in a mixed mode environment.

- o The ELAN HWRTR100 ships with the encryption set WPA Personal with Auto (WPA or WPA2) using TKIP and AES cipher type. It is configured with a 10 digit Pre-Shared key.

- o For reference only, below are some other encryption modes on the HWRTR100 and ELAN's experience with them:

WPA Mode	Cipher Type	Notes
WPA	TKIP	Ok
WPA	AES	Not recommended
WPA	TKIP and AES	Not recommended
WPA2	TKIP	Not recommended
WPA2	AES	Ok
WPA2	TKIP and AES	Ok
Auto (WPA or WPA2)	TKIP	Ok
Auto (WPA or WPA2)	AES	Ok
Auto (WPA or WPA2)	TKIP and AES	Ok

Basic Wi-Fi best practices:

- Do not use a router as an access point unless you have verified that it is running in access point mode. This typically includes assigning a static IP to it outside the DHCP range, disabling the DHCP server on it, and disabling the UPNP functionality.

- Install the WAP in a location open to the area where the remote will be used, it should be located high (not on the floor) and not adjacent to any other devices that may interfere with it.

- Use only the antennas supplied with the WAP or Router. There are several aftermarket antennas that are available but they may not be compatible with your device.

Recommended HR2 Wi-Fi Connectivity troubleshooting steps:

1. Review all of the information under Wi-Fi Connections above.

2. Download one of the free wireless site analysis tools (such as "inSSIDer") and perform a basic Wi-Fi site survey. Check the site for other Wi-Fi networks. Determine all of the SSIDs in use and which channel they are using. You will want to use a SSID that is not in use and set the channel as far from any utilized channels as possible.

3. Configure your WAP or Router using the SSID and channel determined in step 1 above with **no encryption**.

4. Configure the HR2 for this SSID with no encryption as described in HR2 Configuration Above.

5. Verify the radio configuration on the HR2 completes successfully by watching the screen when it is disconnected from the configurator. There will be notification on the HR2 screen during this process.

6. Test the HR2 connectivity.

    a. If this test succeeds and the HR2 connects to the system then the encryption settings or type may be causing the problem.

        i. First check your WAP or Router settings and re-download the SSID and encryption settings to the HR2.

        ii. If it still fails then check the table above for encryption settings that work with the ELAN HWRTR100 and try another encryption method.

    b. If this test fails then your WAP may be faulty or incompatible with the HR2. Try using the ELAN HWRTR100.

COMMON MISTAKES:

1. No Wi-Fi Connectivity. See Wi-Fi connections above.

2. Incorrect Wi-Fi configuration. If you enter the wireless access point information incorrectly you will get an error message when configuring the radio. If you see an error message, verify all the Wi-Fi settings and repeat the remote configuration.

3. HR2 On Screen Error messages:

    a. System Controller not found – The remote has a Wi-Fi connection to the network but is not connecting to the system controller. Verify the WAP is on the same network as the system controller and the system controller is powered on and connected to the network at the "Controller IP" address designated the HR2 Configuration steps above.

    b. Wireless Network not found – The remote does not have connection to the wireless network.

        i. Verify the wireless access point is powered on and within range of the remote.

        ii. Check for other devices that may be interfering with the wireless network.

        iii. Re-connect the HR2 to the configurator and verify all Wi-Fi and network settings.

        iv. Confirm the HR2 IP is not conflicting with another network device.

4. Incorrect universal function mapping for source control. Verify your button mapping on your source device page.

5. **Actiontec** routers – there have been a few reports of issues with the HR2 remotes communicating within an Actiontec served network. If you are using an Actiontec router and are seeing problems with HR2 communications then you will need to add the ELAN D-Link router behind the Actiontec router to resolve the problem. This D-Link will then become the home router and the Actiontec will only serve its clients and the D-Link WAN port. This requires that the Actiontec ports are forwarded to the D-Link WAN port for proper remote access to the system. Refer to the **2 Router Install** tech note for details on configuring embedded routers.

6. **Spectralink Series 3640 WiFi Phone System interference:** Spectralink and the Hand-Held remote both default to port 2000. If attempting to use the Hand-Held Remote and see issues such as: HHR dropping off the network repeatedly; HHR Locking up/Freezing when the phone rings; AND HHR rapidly depleting its battery; resolve the port conflict.

INFORMATION ABOUT HR2 COMMUNICATIONS AND PROGRAMMING:

1. Disrupted Communications

   Communications between the HC and HR2 may be disrupted when the Configurator is being used to configure certain data. This is analogous to all Viewers (TS7, Profile 700, etc) jumping to the Home Page when certain modifications are performed. Communications to and from the HR2s are disrupted from one to thirty seconds (or longer) depending on the number of HR2s in the system and the change being made.

   The worst case scenario is making changes (adding, deleting, changing size) to TV Icons being used on the HR2. For example, when using all TV Icons and having 20+ HR2's in the system, HR2 communications will be lost for 2 minutes or more while the changes are being applied.

   When communications is lost, HR2 button pushes will not work and the HR2 may display "System Controller not found".

   Once the Configurator has completed its calculations, the HR2s will resume normal operations.

2. Heavy traffic may affect download times

   When a download to an HR2 is in progress, the amount of traffic on the Wireless Router / Access Point may affect the download times. Under extremely heaving traffic, downloads may fail and will be restarted.

   If experiencing problems downloading to multiple HR2s at the same time with heavy traffic, try waking fewer HR2s at the same time.

3. Downloading new / modified TV Icons to the HR2

   When TV Icons are changed, the system needs to recalculate data for each HR2 in the system. A status message is displayed on the bottom status bar of the Configurator for each HR2 once its data has been recalculated. The HR2s are processed in the order they appear on the Interface Tab. When the last one has been processed, the system is now ready to download the new data to the HR2s.

   If all TV Icons are in use, it will take approximately 5 seconds to perform the calculations for each HR2.

   Be sure to wait till all calculations have been completed!

   As each HR2 is awakened (by shaking or by key press), it will initiate a download of the new data. On a wireless network with light traffic, there should be no problem downloading to eight HR2s at the same time. If a download experiences problems, it will attempt the download again until it succeeds.

   In the worst case, if a download is not successful due to heavy traffic, the HR2 will abort the download at this time.   It will re-try either the next time it wakes up or when the TV Icons are needed for display on the HR2 ("just-in-time downloading").

4. Roaming – having two or more Access Points

If there are two or more Access Points, the HR2 will connect to the Access Point with the strongest signal (usually the closest one). The only exception to this is if there is heavy traffic on the closest Access Point, the HR2 may connect to the next closest (strongest signal) Access Point. Access Points with heavy traffic may not respond quick enough to the HR2 request for connection so the HR2 will seek out another Access Point.

While connected to the weaker signal, the HR2 performance may be degraded slightly. Once the HR2 goes to sleep and is awoken at a later time, it will attempt to connect to the stronger signal. If the nearest Access Point is not under heavy traffic at this time, the HR2 will connect to this Access Point.