WR-5 Remote Control Troubleshooting:

WR-5 Hardware Basics

1) Wiring the WR-5

The single most common wiring mistake is to wire the connection between the host processor and remote in a "mirror image", making it appear as if pin 1 connects to pin 1, but in fact it is connected to pin 4. Lay one connector directly on top of the other, both facing in the same direction, and verify pin 1 to 1, 2 to 2, etc. between both connectors.

Another common wiring mistake is to swap J2 and J3 data connectors between WR-5s in series. They are *not* interchangeable. J2 is the WR-5 data input, and J3 is the WR-5 data output. In series-wired applications, the WR-5 output (J3) must connect to the next WR-5 input (J2) using straight through pin to pin wiring.

2) Installing the J6 data termination shunt (see owner's manual)

In series-wired WR-5 configuration, the J6 shunt must only be installed on the last WR-5 in the chain, even if there's only one WR-5. This completes the data loop back to the host processor. Placing a J6 shunt on any WR-5 other than the last one in series will interrupt the data flow to any WR-5 remotes beyond that point.

In **star-wired** or **parallel** WR-5 configuration, every WR-5 has it's own dedicated wire return to the host, so the J6 shunt must be installed on *every* WR-5.

Hardware Troubleshooting

1) Is There a Heartbeat?

The heartbeat LED is found on the top right side of the circuit board and flashes green when the WR-5 is properly powered up. If there is no heartbeat, check the +18V (pin 4) and Ground (pin 3) for proper wiring, making sure data pins 1,2,3,4 from the host or prior WR-5 output are wired to the same pins on the WR-5 input. Use a DC voltmeter to verify +18V at the host processor's data output (pin 4) and at all WR-5s inputs wired in series.

If more than four WR-5s are wired in series from one remote, an Ashly RPS-18 remote power supply must be added. Note also that a long cable run may create voltage drop due to resistive wire loss, so verify that each WR-5 has a minimum of +15V referenced to ground. All WR-5s wired in series must be properly powered up for successful data flow.

2) Some WR-5s Power Up, but Some Do Not

This is almost always a case of bad wiring between the last working remote and the first nonfunctioning remote. Causes include a broken conductor, especially in the case of solid conductor cable, pinched insulation, insulation inside the Euroblock connector screw terminal, or incorrect pin to pin wiring. Visual inspection is the first step, then use a voltmeter to verify +18V on each WR-5 input connector (J2 pin 4) relative to ground (J2 pin 3).

3) No Remotes Power Up

a) With the first WR-5 still connected to the host, measure the voltage at the +18V pin on the host data output. If there is no voltage present, disconnect the WR-5 from the host and measure again. If the host +18V works with the WR-5 disconnected, then there is a short circuit in the wiring to the first WR-5 which is loading down the host power supply. Now we at least know that the host power supply is working.

b) Reconnect the WR-5 wiring to the host, but disconnect at the WR-5 end and measure for +18V on pin 4 of the WR-5 end of the wire. If there is no +18V on pin 4, check all wiring connections for bad, shorted, or incorrect pin to pin wiring. Continue until +18V is measured on pin 4 at the WR-5 end of the cable.

c) Reconnect *a single* WR-5 to the wiring from the host unit and check for a heartbeat. If there is still no heartbeat, check for +18V on the WR-5 J2 pin 4, and check that the host is powered on. If there is +18V and ground present on the WR-5 but still no heartbeat, try a different WR-5, or contact Ashly for further instructions.

4) What do Dashes in the LED Display Mean?

The WR-5 relies on a single data loop between the host processor and it's WR-5 remotes. Any break in the loop will cause a total communications failure. In the WR-5 LED display, the location of two dashes indicate if the remote has received data, received confirmation from the host that it has connected to available remotes, or whether the remotes & host are functioning properly together.

a) **Dashes at bottom of display**: This means that the WR-5 is not receiving data from the output of the device before it, whether it be from the host unit or the prior WR-5 in series. Check pin 2 connections between both units. Remember, host pin 1 is wired to WR-5 pin 1, pin 2 to pin 2, etc, all pins are to be wired straight through.

b) **Dashes at top of display**: This means that the WR-5 has received data from the previous device. In the case of brand new or un-programmed remotes, the dashes will remain at the top until the remote is selected from the Protea software network tree for programming, at which point they will move to the middle of the display.

c) **Dashes in the middle of display**: This indicates that the data loop is fully functional and that the software has identified the WR-5. The WR-5 has received a data ping from the host or previous WR-5, and has also received confirmation from the host that the data loop is complete. If all remotes show dashes in the middle of the display, then the host, WR-5s, wiring, and software are properly set up.

5) Troubleshooting data communications problems

To help isolate data communication problems, use the J6 data termination shunt to close the data loop at any WR-5 wired in series, reducing the number of remotes that could be causing problems. Placing the shunt on J6 will route the data output from that WR-5 back to the host unit, closing the data loop at that point and disabling all data flow downstream. Use this method to test for data function on multiple remotes, one remote at a time, beginning with the WR-5 closest to the host and using known good wiring.

WR-5 Software Basics and Troubleshooting

1) Protea NE Software

The WR-5 gets programmed using Protea NE (network enabled) software for Windows®, available for free on the Ashly website. The software must first communicates with the WR-5's host amplifier or processor via a standard Ethernet network, then the WR-5 must be wired to that host's data port. Sometimes it may be necessary to disable the PC's Wi-Fi and make a firewall exception before proceeding.

2) Ashly network device tree and WR-5 discovery

After successfully connecting the PC and host device via Ethernet, and after wiring the WR-5 to the host device data port, launch Protea NE software. The main software window will have two sections, the Ashly Network device tree on the left, and the Ashly Project canvas on the right.

The Ashly Network Device Tree shows all *networked* devices and groups discovered on the network. If a device name is green, that means it is a live unit currently on the network. If the device name is red, that means it has been previously discovered but is now offline. Right-click on "Ashly Network" to add or clear all devices or groups that are offline, or right click on an individual device to delete it. Note that at the bottom of the device tree section, there is a "Scan for Devices" button which refreshes the device tree with all *networked* devices, however may not discover a WR-5 (see next paragraph).

A WR-5 will appear as a "child" underneath it's hosting network device. *Since the WR-5 is connected only to it's host and not directly to the network, there are conditions where the software may not recognize the WR-5. If there is an interruption in communications between the host and WR-5, such as the addition of a new WR-5 or the reconnecting of one after troubleshooting, the WR-5 may need to be manually rediscovered.* **To rediscover a WR-5, right-click on it's host in the device tree and click <Scan For Remotes>. Do this any time there is an addition, removal, or reconnection of a WR-5**. This action sends out a special prompt, for the express purpose of finding available remotes which may not have originally been communicating when the software was launched. **Scanning for devices *and* scanning for remotes guarantees that the device tree is up to date.**

3) Ashly project canvas

The Ashly Project Canvas is a user-created area for visually representing a project, that can also be saved as a file. Ashly networked products in the device tree may automatically appear in the canvas (see options), or can be dragged from the device tree onto the canvas. The project canvas can also be used to create virtual projects by adding device items that are not live but can be linked to live devices later.

Devices on the project canvas will always have a surrounding green box if they are live, or a surrounding red box if they are offline or virtual added devices. Note that the WR-5 will never automatically appear on the canvas since it is not a networked device, it must be dragged onto the canvas from the device tree.

Previously installed, offline, or any virtual devices that are no longer wanted on the canvas can be manually deleted one at a time by clicking on them and pressing the delete keyboard key, or can be deleted all at once using the <Clear Inactive Devices> or <Clear All Groups> function by right-clicking "Ashly Network" at the top of the device tree.

4) Wi-Fi Conflicts

If you have both a LAN *and* Wi-Fi connection on your PC, the software may not know which connection to use. As a result, it may switch between the two, and communications will be intermittent. You can easily spot this by watching the device name in the network tree, where it will repeatedly turn from green to red and back to green again. For initial discovery, disable the Wi-Fi connection on the PC by clicking on the Windows start menu button, going to "control panel" / "network and sharing center", then right clicking on your Wi-Fi connection, selecting "disable".

5) Firewall Conflicts

If the Windows firewall is turned on, it may block communications from WR-5, even though the device appears to be on and discovered by software. This is because the firewall may block a-synchronous or unsolicited messages sent from the WR-5. To allow these messages through the firewall, use the Windows control panel security section and add <ashlysystemsoftware> and <proteasystemsoftwarene.exe> as allowed programs.

6) Antivirus Program Conflicts

Third party anti-virus programs can be even more aggressive than the firewall at blocking communications, and more difficult to seek out & disable, but they need to be taken into consideration if the software is still having difficulties communicating with or discovering a WR-5.

7) Excessive Network Traffic

If there are multiple off-line (red) items in the network device tree, network traffic could be negatively impacted as the software tries to communicate with devices that are not there. Delete any offline devices to optimize network speed.

For further details on the WR-5 usage, wiring, or programming, see the WR-5 owner's manual on the Ashly website.