WheatNet-IP

Audio Over IP Network

LIO-48 Multiple Port Logic I/O Blade

Technical Manual

Wheatstone Corporation

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TECHNICAL
MANUAL

Wheatstone Corporation
May 2013

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Attention!

Federal Communications Commission (FCC) Compliance Notice:
Radio Frequency Notice

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

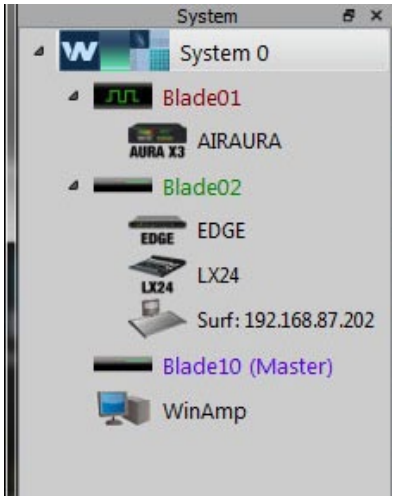
This is a Class A product. In a domestic environment, this product may cause radio interference, in which case, the user may be required to take appropriate measures.

This equipment must be installed and wired properly in order to assure compliance with FCC regulations.

Caution! ***Any modifications not expressly approved in writing by Wheatstone could void the user's authority to operate this equipment.***

Adding The LIO-48 To The Peripheral Devices* Tab

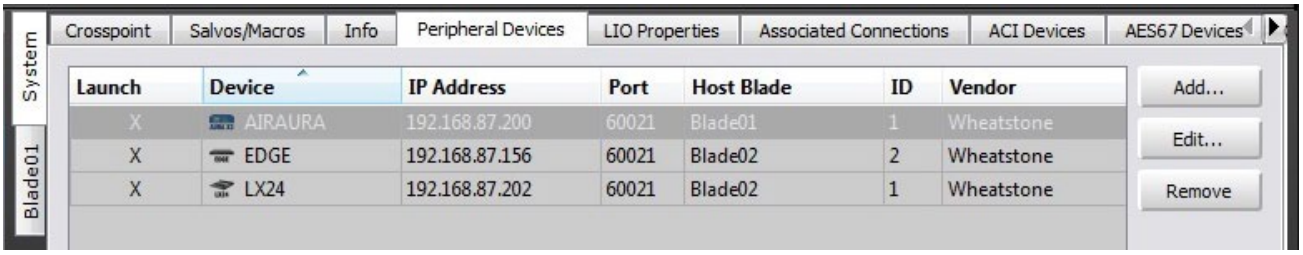
In order to utilize all the features of the LIO-48 Multiple Port Logic I/O BLADE the device must be added to the System *Peripheral Devices* tab in the Wheatstone WheatNet-IP Navigator program (aka the Navigator GUI). This sheet shows you the basics of that procedure. Refer to the *WheatNet-IP Audio Over IP Network Technical Manual* for additional details.



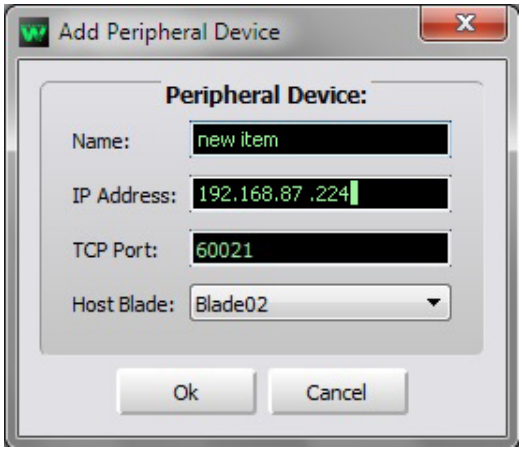
You will need to know the IP address of the device being added, so you will want to find that out before you start.

Launch the Navigator GUI and make sure that **System 0** is selected in the *System* pane. You will see something like this:

Now select the *Peripheral Devices* tab.



Click the *Add* button to bring up the *Add Peripheral Device* dialog:



Type in a convenient *Name* and insert the *IP Address* of the device being added. Leave the *TCP Port* at the default setting of **60021**. From the *Host BLADE* drop down select the BLADE that you want to associate the Peripheral device with. Click *Ok*.

This completes the process of adding the device to the *Peripheral Devices* tab. The added device should show up in the *System* pane under the BLADE you added it to. If it does not show up, or if it shows up but has a yellow question mark on it, then there is either a network issue that needs attention, or the device is not connected to the network at all, or one or more steps have been omitted or done incorrectly in the configuration process.

* In previous Navigator GUI versions this was the **System 3rd Party Devices** tab.

LIO-48 Technical Manual

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Chapter 5 - Additional Razor Setup Tool Details

General Information

Chapter Contents

General Information

Introduction

Congratulation on acquiring the Wheatstone LIO-48 Multiple Port Logic I/O BLADE. This exciting new addition to the WheatNet-IP Intelligent Network is a high-density logic BLADE that can handle all those new conditional logic functions needed for today's busy studios. The LIO-48 provides 48 universal logic I/O ports, each individually configurable. A logic I/O meter lets you drill down and see the information for each of the 48 ports. Broadcasters have been asking for more logic ports for new logic-intensive shows and applications, and the LIO-48 now offers this capability in one convenient BLADE add-on.

Rack Mounting

The LIO-48 is designed to be mounted in an industry standard 19" equipment rack, and requires one rack unit (1.75 inches) of vertical space. The LIO-48 BLADE has a depth of 9-1/2" behind the rack rails (including chassis connectors). An additional five inches of space is required for wiring cables to pass through. The chassis has a width of 17-3/8". Space needed in front of the rack rails is 3/4". Ideally, four screws should be used to mount the unit. If only two screws are being used they must be used in the bottom holes in order to provide proper support.

The LIO-48 has vertical slots positioned in the side panels for venting. Make sure your installation does not obstruct these slots. There is no fan inside the LIO-48 because its power consumption is low enough to not require one.

The LIO-48 may be mounted between other devices in the equipment rack and in accordance with good engineering practice should not be mounted directly above devices that generate significant amounts of heat. If such a location is unavoidable then it is advisable to utilize an extra 1RU blank rack panel between the WheatNet-IP and devices immediately above and/or below it.

***WARNING!* Under no circumstances should the LIO-48 unit be opened! The unit contains high voltage circuits that are hazardous and potentially harmful. The unit has no user-serviceable parts inside! If you have a problem the unit must be returned to Wheatstone Corporation for repair.**

Installation Tips

- Place any surge protection circuits as close as possible to the LIO-48 or other device being protected.
- Establish a low impedance common ground in your facility and try to route all grounds to that point.
- Choose the best power conditioning / UPS units that you can afford and suitable for your equipment – focus on the features and options you need. The better UPS products can prevent thousands of dollars in equipment damage – some even come with an external equipment damage warranty.

Energizing

Once it has been installed in the rack, the LIO-48 may be energized by connecting the factory supplied power cord to a source of AC power. The AC line input voltage is permitted to be between 90 and 260VAC, 50 or 60Hz. Power consumption is under 100VA.

Aggressive AC input filtering is utilized at the AC input of the LIO-48; however, it is always advisable to use external surge protection and/or an uninterruptible power supply (UPS), especially where AC power quality is questionable, such as at a remote transmitter site.

Power conditioning, surge suppression, and even power backup devices are wise investments when using sensitive modern electronic devices that use an internal computer.

Use of a UPS (uninterruptible power supply) is a good idea and will protect the LIO-48 from short duration power interruptions which may cause it to reboot.

A Word About Nomenclature

Throughout this manual references are made to "BLADEs," "sources," "destinations," and other terms whose meanings may not be instantly understood by everyone. Let's take a moment to clarify some terms.

1. BLADE. In the WheatNet-IP system a "BLADE" is taken to mean an individual member of a WheatNet-IP system; any device that has a unique BLADE ID. It commonly refers to an individual input/output rackmount unit, but a more complete definition would include any network connected PC running a WheatNet-IP driver as well, including Automation servers and even the Program Director's PC if they are running the WheatNet-IP driver to listen to audio streams. Conversely, any PC that is running the WheatNet-IP Navigator GUI program or using a browser for interfacing to the built in web servers on BLADEs is not a BLADE itself. Only those devices that can transmit and/or receive WheatNet-IP audio streams are "BLADEs." The one exception to this last statement is the LIO-48, which does not have audio inputs or outputs, but is still termed a BLADE.

2. Source. A source is any audio signal in the WheatNet-IP system that is uniquely generated. Any WheatNet-IP signal that is created by accepting and packetizing an input is a source, as is any signal generated within the system. Source signals may be audio, logic, or both. A logic source might be a logic port triggered by an external switch. We generally avoid using the term "input" to describe WheatNet-IP signals because the term can be misleading. One would easily understand that an external audio input jack could be an "input" or "source," but less obvious is the fact that an audio mix bus output is also a WheatNet-IP source because it is generating a unique signal (the mix) and making it available to stream throughout the system. Likewise, PCs streaming audio from a file via the WheatNet-IP driver can clearly be seen as a "source."

3. **Destination**. A destination is the opposite of a source. It is a signal that can accept any WheatNet-IP stream. A destination can take the received WheatNet-IP stream and convert it to a physical analog or digital output, or, in the case of a PC, a virtual output that subsequent PC application programs can convert to an audio output at the PC's speakers, or lay down as an audio track on the hard disc. Destinations can be audio, logic, or both. A logic destination might be a logic port wired to a lamp or relay. We avoid using the term "output" for WheatNet-IP signals. While it is clear that a WheatNet-IP

destination wired to an output jack is an "output," control surface fader channels would not normally be considered "outputs" but they *are* "destinations" in the WheatNet-IP system, because you can route a WheatNet-IP audio stream to them.

4. **LIO**. Shorthand for **L**ogic **I**nput or **O**utput. In the WheatNet-IP system, an LIO signal is a signal that either generates or receives logic state information created either physically via a logic port or virtually via some state change within a mixing control surface. In the WheatNet-IP system logic information can be routed and cross connected just as audio can be.

5. **GUI**. Shorthand for **G**raphical **U**ser **I**nterface. A method of providing for user interaction with the system using a special computer program that displays information in the form of images and text on the computer screen and accepts user input via typing and mouse clicking within the computer program. The WheatNet-IP Navigator is a computer program that provides a GUI.

Model LIO-48 Multiple Port Logic I/O BLADE

Wheatstone's new LIO-48 is a high-density logic BLADE for the WheatNet-IP Intelligent Network that can handle all those new conditional logic functions needed for today's busy studios. The LIO-48 provides 48 universal logic I/O ports, each individually configurable, for turning devices on or off by time or event, for automatically adjusting the audio processing settings when a certain mic turns on, and for any other logic control you need in your studio operation.

The front panel of the LIO-48 has a logic I/O meter array that lets you drill down to see the information for each of the 48 ports. The front panel also sports a display which can show various status messages relating to the BLADE's performance and configuration. A SCROLL knob, a TAKE button, and four status indicator LEDs complete the front panel.

The rear panel has eight RJ-45 connectors that have the connections for all 48 ports (each RJ-45 has connections for six ports). Two DB-25 female connectors duplicate the logic port connections. A DB-9 female connector provides access to +5VDC from the BLADE. Two additional RJ-45 connectors are stacked at the right side of the rear panel. The top one of there is reserved for future use, while the bottom one provides a 1 Gigabit connection to the WheatNet-IP network. At the far right of the rear panel is a standard IFC power connector. The LIO-48 has an internal power supply that will accept 100-240 Volts 50/60 Hertz AC power.

Network Switches

The next component of the WheatNet-IP system is your network switch(es). These are standard Ethernet devices that form the core of your LAN. You may already have a suitable one in place in your facility. There are literally hundreds of different models available in the market place which vary widely in size and capability, costing anywhere from $30 to $30,000 and up. Obviously the $30,000 switch has more features and capability than the $30 switch. The important thing to remember is that most Gigabit switches will work with WheatNet-IP – up to a point. As the size of your system increases, it's easy to exceed the capability of inexpensive switches. Large systems need high capacity managed switches to avoid the bane of Ethernet audio systems, network overload. Simply put, if the WheatNet-IP devices are streaming packets faster than the Ethernet switch can distribute them, packets get dropped and the audio starts to break up. This is why your Ethernet switches must be sized appropriately, and your network traffic managed and controlled so that the sizing assumptions you made remain valid. Because 24 bit 48K sample rate audio streams represent a much larger packet rate than Ethernet networks were originally assumed to contain, they can represent the vast majority of data in the network. Consequently just about any switch or link can get overloaded if you are streaming lots of channels and don't attempt to manage your network and switch configuration. Conversely, because we use Gigabit ports for the WheatNet-IP to minimize link overload issues, a smaller system will run just fine on an inexpensive unmanaged switch, ***as long as it is a Gigabit switch***. It's all in the numbers.

It is important that the Ethernet network be properly set up in order for the LIO-48 to successfully join in with the rest of the WheatNet-IP system. Network setup and configuration rules for the LIO-48 are the same as those of the rest of the WheatNet-IP system. Therefore we refer you to chapter three of the *WheatNet-IP Audio Over IP Network Technical Manual* if you have any questions about the system network.

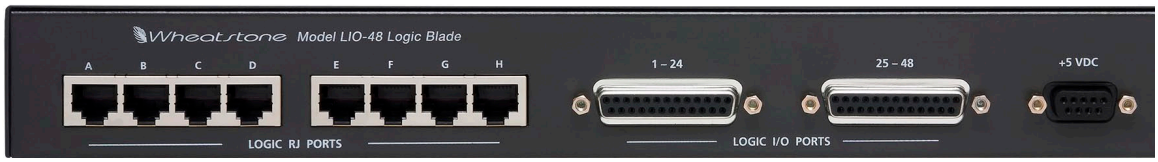
CAT-5e Wiring

The next component of your WheatNet-IP system is the CAT-5e wiring itself. Each "BLADE" requires a single 1 Gigabit network connection, which is typically a CAT-5e cable. Due to the nature of Ethernet and CAT-5e cabling, these connections must be at least 1 meter but less than 100 meters in length. If you must connect devices together that are more than 100 meters apart, use an interim Ethernet "edge" switch, or else use optical fiber and copper/fiber convertors to extend the range of the Ethernet LAN connections.

Software Tools

The next components of your WheatNet-IP system are the software tools used to administer it. While the WheatNet-IP system is completely functional (unlike some competitors) without running any software on a PC, you will find the Navigator GUI program very handy for administrating normal system functions like setting access passwords, controlling signal visibilities, naming sources and destinations, etc. The LIO-48 also employs the Razor Setup Tool for configuration. These tools are described later in this manual.

Logic Ports Connections



The rear panel has eight RJ-45 connectors that have the connections for all 48 ports (each RJ-45 has connections for six ports). Two DB-25 female connectors duplicate the logic port connections. A DB-9 female connector provides access to +5VDC from the BLADE.

LOGIC I/O "A" RJ-45

RJ-45 Pin 1 – Digital Ground
RJ-45 Pin 2 – Logic 1 In/Out
RJ-45 Pin 3 – Logic 2 In/Out
RJ-45 Pin 4 – Logic 3 In/Out
RJ-45 Pin 5 – Logic 4 In/Out
RJ-45 Pin 6 – Logic 5 In/Out
RJ-45 Pin 7 – Logic 6 In/Out
RJ-45 Pin 8 – +5V Digital

All "LOGIC RJ PORTS" connectors wired in same manner as the "A" connector shown above.

LOGIC I/O "1 - 24" DB-25

Pin 1 – Logic 1 In/Out
Pin 2 – Logic 2 In/Out
Pin 3 – Logic 3 In/Out
Pin 4 – Logic 4 In/Out
Pin 5 – Logic 5 In/Out
Pin 6 – Logic 6 In/Out
Pin 7 – Logic 7 In/Out
Pin 8 – Logic 8 In/Out
Pin 9 – Logic 9 In/Out
Pin 10 – Logic 10 In/Out
Pin 11 – Logic 11 In/Out
Pin 12 – Logic 12 In/Out
Pin 13 – Logic 13 In/Out
Pin 14 – Logic 14 In/Out
Pin 15 – Logic 15 In/Out
Pin 16 – Logic 16 In/Out
Pin 17 – Logic 17 In/Out
Pin 18 – Logic 18 In/Out
Pin 19 – Logic 19 In/Out
Pin 20 – Logic 20 In/Out
Pin 21 – Logic 21 In/Out
Pin 22 – Logic 22 In/Out
Pin 23 – Logic 23 In/Out
Pin 24 – Logic 24 In/Out
Pin 25 – Digital Ground

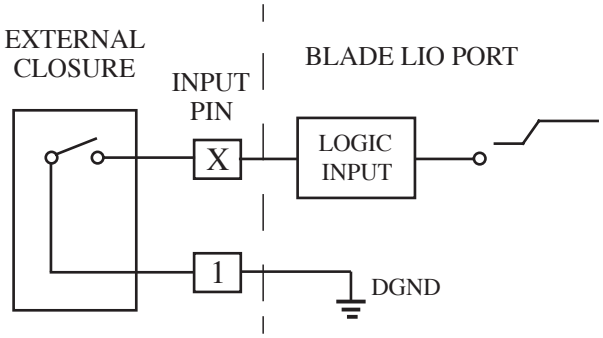
The "25-48" DB-25 connector wired in same manner as the "A" connector shown above.

+5VDC LOGIC DB-9

Pin 1 – +5V Logic 1
Pin 2 – +5V Logic 2
Pin 3 – +5V Logic 3
Pin 4 – +5V Logic 4
Pin 5 – +5V Logic 5
Pin 6 – +5V Logic 6
Pin 7 – +5V Logic 7
Pin 8 – +5V Logic 8
Pin 9 – Digital Ground

Simplified BLADE Logic I/O

Input Logic

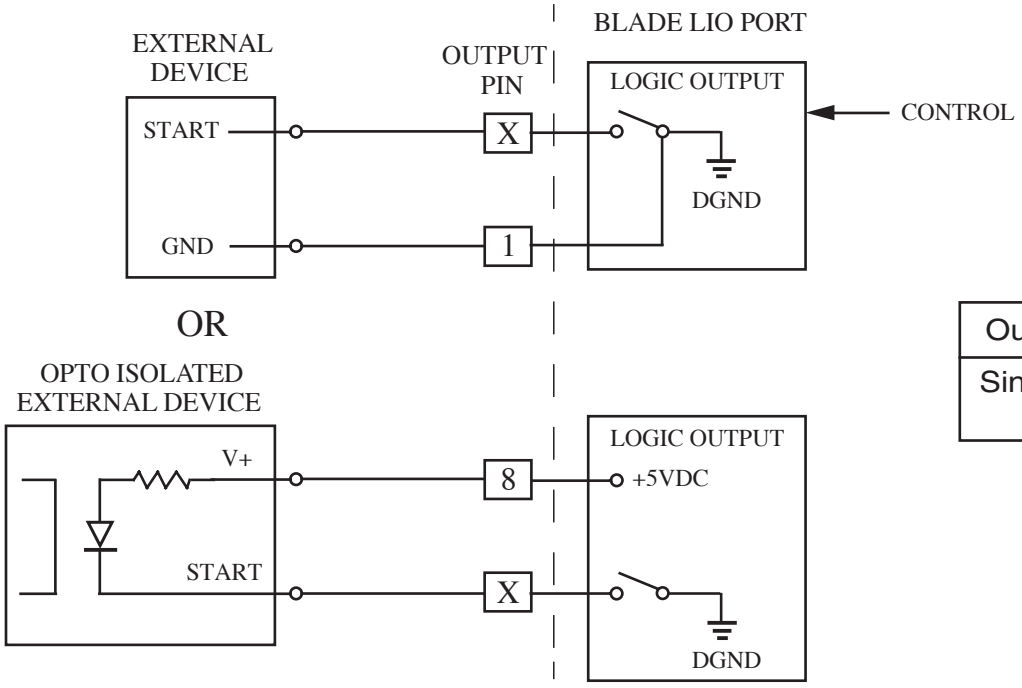


Input Port Specs
• Internally current limited • No pull up required

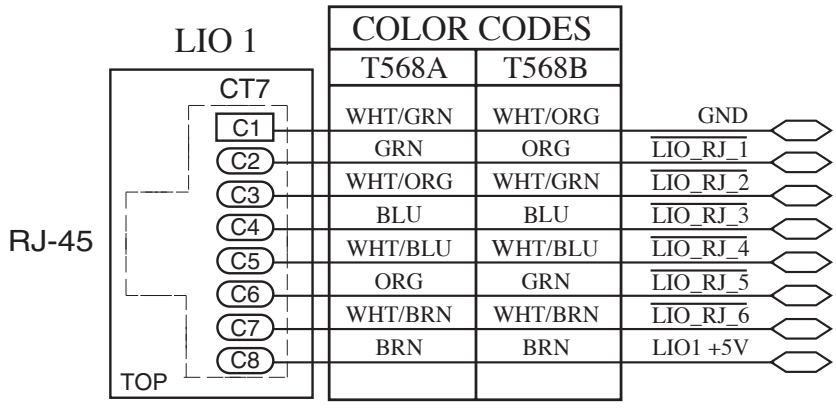
Logic Inputs are activated when the input pin is pulled to DGND.

Output Logic

Logic Ouput ports are pulled to DGND when activated.



Output Port Specs
Sink: • 50mA nom • 100mA max



COLOR CODES		
T568A	T568B	
WHT/GRN	WHT/ORG	GND
GRN	ORG	LIO_RJ_1
WHT/ORG	WHT/GRN	LIO_RJ_2
BLU	BLU	LIO_RJ_3
WHT/BLU	WHT/BLU	LIO_RJ_4
ORG	GRN	LIO_RJ_5
WHT/BRN	WHT/BRN	LIO_RJ_6
BRN	BRN	LIO1 +5V

LOGIC RJ PORTS

A RJ-45

1	DIGITAL GROUND
2	LOGIC 1 IN/OUT
3	LOGIC 2 IN/OUT
4	LOGIC 3 IN/OUT
5	LOGIC 4 IN/OUT
6	LOGIC 5 IN/OUT
7	LOGIC 6 IN/OUT
8	+5V DIGITAL

E RJ-45

1	DIGITAL GROUND
2	LOGIC 25 IN/OUT
3	LOGIC 26 IN/OUT
4	LOGIC 27 IN/OUT
5	LOGIC 28 IN/OUT
6	LOGIC 29 IN/OUT
7	LOGIC 30 IN/OUT
8	+5V DIGITAL

C RJ-45

1	DIGITAL GROUND
2	LOGIC 7 IN/OUT
3	LOGIC 8 IN/OUT
4	LOGIC 9 IN/OUT
5	LOGIC 10 IN/OUT
6	LOGIC 11 IN/OUT
7	LOGIC 12 IN/OUT
8	+5V DIGITAL

F RJ-45

1	DIGITAL GROUND
2	LOGIC 31 IN/OUT
3	LOGIC 32 IN/OUT
4	LOGIC 33 IN/OUT
5	LOGIC 34 IN/OUT
6	LOGIC 35 IN/OUT
7	LOGIC 36 IN/OUT
8	+5V DIGITAL

C RJ-45

1	DIGITAL GROUND
2	LOGIC 13 IN/OUT
3	LOGIC 14 IN/OUT
4	LOGIC 15 IN/OUT
5	LOGIC 16 IN/OUT
6	LOGIC 17 IN/OUT
7	LOGIC 18 IN/OUT
8	+5V DIGITAL

G RJ-45

1	DIGITAL GROUND
2	LOGIC 37 IN/OUT
3	LOGIC 38 IN/OUT
4	LOGIC 39 IN/OUT
5	LOGIC 40 IN/OUT
6	LOGIC 41 IN/OUT
7	LOGIC 42 IN/OUT
8	+5V DIGITAL

D RJ-45

1	DIGITAL GROUND
2	LOGIC 19 IN/OUT
3	LOGIC 20 IN/OUT
4	LOGIC 21 IN/OUT
5	LOGIC 22 IN/OUT
6	LOGIC 23 IN/OUT
7	LOGIC 24 IN/OUT
8	+5V DIGITAL

H RJ-45

1	DIGITAL GROUND
2	LOGIC 43 IN/OUT
3	LOGIC 44 IN/OUT
4	LOGIC 45 IN/OUT
5	LOGIC 46 IN/OUT
6	LOGIC 47 IN/OUT
7	LOGIC 48 IN/OUT
8	+5V DIGITAL

LOGIC I/O PORTS

1 - 24 DB-25

DIGITAL GROUND	25 / 13	LOGIC 13 IN/OUT
LOGIC 24 IN/OUT	24 / 12	LOGIC 12 IN/OUT
LOGIC 23 IN/OUT	23 / 11	LOGIC 11 IN/OUT
LOGIC 22 IN/OUT	22 / 10	LOGIC 10 IN/OUT
LOGIC 21 IN/OUT	21 / 9	LOGIC 9 IN/OUT
LOGIC 20 IN/OUT	20 / 8	LOGIC 8 IN/OUT
LOGIC 19 IN/OUT	19 / 7	LOGIC 7 IN/OUT
LOGIC 18 IN/OUT	18 / 6	LOGIC 6 IN/OUT
LOGIC 17 IN/OUT	17 / 5	LOGIC 5 IN/OUT
LOGIC 16 IN/OUT	16 / 4	LOGIC 4 IN/OUT
LOGIC 15 IN/OUT	15 / 3	LOGIC 3 IN/OUT
LOGIC 14 IN/OUT	14 / 2	LOGIC 2 IN/OUT
	1	LOGIC 1 IN/OUT

25 - 48 DB-25

DIGITAL GROUND	25 / 13	LOGIC 37 IN/OUT
LOGIC 48 IN/OUT	24 / 12	LOGIC 36 IN/OUT
LOGIC 47 IN/OUT	23 / 11	LOGIC 35 IN/OUT
LOGIC 46 IN/OUT	22 / 10	LOGIC 34 IN/OUT
LOGIC 45 IN/OUT	21 / 9	LOGIC 33 IN/OUT
LOGIC 44 IN/OUT	20 / 8	LOGIC 32 IN/OUT
LOGIC 43 IN/OUT	19 / 7	LOGIC 31 IN/OUT
LOGIC 42 IN/OUT	18 / 6	LOGIC 30 IN/OUT
LOGIC 41 IN/OUT	17 / 5	LOGIC 29 IN/OUT
LOGIC 40 IN/OUT	16 / 4	LOGIC 28 IN/OUT
LOGIC 39 IN/OUT	15 / 3	LOGIC 27 IN/OUT
LOGIC 38 IN/OUT	14 / 2	LOGIC 26 IN/OUT
	1	LOGIC 25 IN/OUT

+5VDC DB-9

DIGITAL GROUND	9 / 5	+5V LOGIC 5
+5V LOGIC 8	8 / 4	+5V LOGIC 4
+5V LOGIC 7	7 / 3	+5V LOGIC 3
+5V LOGIC 6	6 / 2	+5V LOGIC 2
	1	+5V LOGIC 1

100M RJ-45

1	TX +
2	TX -
3	RX +
4	N/C
5	N/C
6	RX -
7	N/C
8	N/C

NOT USED

ETHERNET

1G RJ-45

1	TRD0 +
2	TRD0 -
3	TRD1 +
4	TRD2 +
5	TRD2 -
6	TRD1 -
7	TRD3 +
8	TRD3 -

NOTE: DB-25 logic connections and RJ-45 logic connections are paralleled. Either may be used.

LOGIC RJ PORTS

A RJ-45

1	DIGITAL GROUND
2	LOGIC 1 IN/OUT
3	LOGIC 2 IN/OUT
4	LOGIC 3 IN/OUT
5	LOGIC 4 IN/OUT
6	LOGIC 5 IN/OUT
7	LOGIC 6 IN/OUT
8	+5V DIGITAL

E RJ-45

1	DIGITAL GROUND
2	LOGIC 25 IN/OUT
3	LOGIC 26 IN/OUT
4	LOGIC 27 IN/OUT
5	LOGIC 28 IN/OUT
6	LOGIC 29 IN/OUT
7	LOGIC 30 IN/OUT
8	+5V DIGITAL

C RJ-45

1	DIGITAL GROUND
2	LOGIC 7 IN/OUT
3	LOGIC 8 IN/OUT
4	LOGIC 9 IN/OUT
5	LOGIC 10 IN/OUT
6	LOGIC 11 IN/OUT
7	LOGIC 12 IN/OUT
8	+5V DIGITAL

F RJ-45

1	DIGITAL GROUND
2	LOGIC 31 IN/OUT
3	LOGIC 32 IN/OUT
4	LOGIC 33 IN/OUT
5	LOGIC 34 IN/OUT
6	LOGIC 35 IN/OUT
7	LOGIC 36 IN/OUT
8	+5V DIGITAL

C RJ-45

1	DIGITAL GROUND
2	LOGIC 13 IN/OUT
3	LOGIC 14 IN/OUT
4	LOGIC 15 IN/OUT
5	LOGIC 16 IN/OUT
6	LOGIC 17 IN/OUT
7	LOGIC 18 IN/OUT
8	+5V DIGITAL

G RJ-45

1	DIGITAL GROUND
2	LOGIC 37 IN/OUT
3	LOGIC 38 IN/OUT
4	LOGIC 39 IN/OUT
5	LOGIC 40 IN/OUT
6	LOGIC 41 IN/OUT
7	LOGIC 42 IN/OUT
8	+5V DIGITAL

D RJ-45

1	DIGITAL GROUND
2	LOGIC 19 IN/OUT
3	LOGIC 20 IN/OUT
4	LOGIC 21 IN/OUT
5	LOGIC 22 IN/OUT
6	LOGIC 23 IN/OUT
7	LOGIC 24 IN/OUT
8	+5V DIGITAL

H RJ-45

1	DIGITAL GROUND
2	LOGIC 43 IN/OUT
3	LOGIC 44 IN/OUT
4	LOGIC 45 IN/OUT
5	LOGIC 46 IN/OUT
6	LOGIC 47 IN/OUT
7	LOGIC 48 IN/OUT
8	+5V DIGITAL

LOGIC I/O PORTS

1 - 24 DB-25

DIGITAL GROUND	25 / 13	LOGIC 13 IN/OUT
LOGIC 24 IN/OUT	24 / 12	LOGIC 12 IN/OUT
LOGIC 23 IN/OUT	23 / 11	LOGIC 11 IN/OUT
LOGIC 22 IN/OUT	22 / 10	LOGIC 10 IN/OUT
LOGIC 21 IN/OUT	21 / 9	LOGIC 9 IN/OUT
LOGIC 20 IN/OUT	20 / 8	LOGIC 8 IN/OUT
LOGIC 19 IN/OUT	19 / 7	LOGIC 7 IN/OUT
LOGIC 18 IN/OUT	18 / 6	LOGIC 6 IN/OUT
LOGIC 17 IN/OUT	17 / 5	LOGIC 5 IN/OUT
LOGIC 16 IN/OUT	16 / 4	LOGIC 4 IN/OUT
LOGIC 15 IN/OUT	15 / 3	LOGIC 3 IN/OUT
LOGIC 14 IN/OUT	14 / 2	LOGIC 2 IN/OUT
	1	LOGIC 1 IN/OUT

25 - 48 DB-25

DIGITAL GROUND	25 / 13	LOGIC 37 IN/OUT
LOGIC 48 IN/OUT	24 / 12	LOGIC 36 IN/OUT
LOGIC 47 IN/OUT	23 / 11	LOGIC 35 IN/OUT
LOGIC 46 IN/OUT	22 / 10	LOGIC 34 IN/OUT
LOGIC 45 IN/OUT	21 / 9	LOGIC 33 IN/OUT
LOGIC 44 IN/OUT	20 / 8	LOGIC 32 IN/OUT
LOGIC 43 IN/OUT	19 / 7	LOGIC 31 IN/OUT
LOGIC 42 IN/OUT	18 / 6	LOGIC 30 IN/OUT
LOGIC 41 IN/OUT	17 / 5	LOGIC 29 IN/OUT
LOGIC 40 IN/OUT	16 / 4	LOGIC 28 IN/OUT
LOGIC 39 IN/OUT	15 / 3	LOGIC 27 IN/OUT
LOGIC 38 IN/OUT	14 / 2	LOGIC 26 IN/OUT
	1	LOGIC 25 IN/OUT

+5VDC DB-9

DIGITAL GROUND	9 / 5	+5V LOGIC 5
+5V LOGIC 8	8 / 4	+5V LOGIC 4
+5V LOGIC 7	7 / 3	+5V LOGIC 3
+5V LOGIC 6	6 / 2	+5V LOGIC 2
	1	+5V LOGIC 1

100M RJ-45

1	TX +
2	TX -
3	RX +
4	N/C
5	N/C
6	RX -
7	N/C
8	N/C

NOT USED

ETHERNET

1G RJ-45

1	TRD0 +
2	TRD0 -
3	TRD1 +
4	TRD2 +
5	TRD2 -
6	TRD1 -
7	TRD3 +
8	TRD3 -

NOTE: DB-25 logic connections and RJ-45 logic connections are paralleled. Either may be used.

Front Panel Operation

Chapter Contents

Front Panel Operation

First Time Power Up

With the LIO-48 disconnected from the network, apply power by connecting its AC power cord to the AC power source. You will see a test pattern of LEDs on the front panel, and there will be a sequence of characters on the backlit display. The character sequence will eventually go away, as will the array of lit LEDs, and the display will read

while the front panel ERROR LED is lit. After a few seconds the ERROR LED will go out and the display will read

Front Panel Controls

There are two front panel controls that you will use whenever you need to do any configuring or testing from the front panel.

The SCROLL knob serves a dual purpose. It is used to scroll through menu selections and parameter choices, by rotating the knob, and in some instances it is used to advance through parameter fields, by pressing and releasing the knob, a process we will refer to by the term “dobby” in this manual. Thus, if we say at some point to dobby the SCROLL knob, we mean press it, then release it.

The other control is the square TAKE button. You can’t rotate this, so we will only tell you to press it. When we say this we also imply that, once pressed, you will release it.

Basic Network Settings

It is assumed, since the LIO-48 is not designed to be, nor expected to be used as, a standalone device, that you already have your WheatNet-IP Intelligent Network system up and running, and are now preparing to merge your LIO-48 into the system. If such is not the case, then you should expect at this point only to do some basic setup of the LIO-48. It isn’t really feasible to attempt to dive headlong into configuring the logic ports on the LIO-48 until you have worked out some of the details of logic interaction within the basic system.

The LIO-48 BLADE is going to work in conjunction with other BLADEs in the system. The LIO-48 must have its network settings configured for it to be a working part of the larger system. To this end, the LIO-48 must have its IP address, subnet mask, and gateway settings configured according to the rules of the system it is joining. Since all BLADEs must be on the same subnet, you will need to configure the LIO-48 to be compatible with the existing system. In a small system that has no need to be set differently than our standard defaults, your BLADEs will have IP addresses on the 192.168.87.xxx subnet, noting that each BLADE, and each other networked device in the system, will need to have a unique IP address on that subnet. In such a system the subnet mask is typically set to 255.255.255.0 and the gateway is set to the IP address of the network switch that ties the system together. This latter address is often (192.168.1) .1 or .2.

Making The Basic Network Settings

Let's say, for our example, that the LIO-48 we are currently setting up is going to use an IP address of 192.168.87.236, a subnet mask of 255.255.255.0, and a gateway setting of 192.168.87.1.

Now we can go to the front panel and make the settings. Turn the SCROLL knob until the display reads

and press the TAKE button. Turn the SCROLL knob again until the display reads

and press TAKE again. The display will show you the current IP address of the LIO-48. For the sake of discussion we assume that you want a different IP address than the one displayed. Turn SCROLL until the display reads

and press TAKE. The display will again show the IP address, and the number representing the first octet of the IP address will have a flashing underline. If the first octet is not correct, rotate SCROLL until you have the correct number, in our example 192. Dobby the SCROLL knob to advance to the second octet of the IP address. Rotate SCROLL if needed to set the second octet, then dobby SCROLL to go to the third octet. Rotate SCROLL to change that octet if needed, then dobby SCROLL to advance to the fourth and final octet. Rotate SCROLL to set this octet. If you are using our example your display will now read:

Press TAKE to accept the new IP address you've set.

The display will now most likely read

and the entire subnet mask setting will have a flashing underline. Turn the SCROLL knob through the various settings that can be made, noting that many, but not all, combinations are possible. Since we will use the default 255.255.255.0, make sure that is the setting you leave it at, then press TAKE.

The display will now show you the gateway address. The factory default setting would be

This, too, shows with the entire setting having a flashing underline. Turning the SCROLL knob will only give you potential gateway addresses that make sense with the already selected IP address and subnet mask settings. For our example, the default as shown above is good. Press TAKE. After a brief pause the display will read

for a second or two, then will change again to read

At this point you will need to power cycle the LIO-48 to apply the new settings. Disconnect the AC power cord, wait 10 seconds, then reconnect the AC power to the unit. Once it has come back up it will be using the new settings.

Please note that you can also make network setting changes from the Razor Setup Tool, which will be discussed in detail later.

Regarding The LIO-48 As Part Of A System

Up to this point the front panel controls we've discussed have not depended on the LIO-48 being connected to a WheatNet-IP system. However, the remaining front panel control items do require that the LIO-48 be connected to the system in order to work as described. The process of connecting the LIO-48 to a WheatNet-IP system will be described later in this manual.

BLADE Status Information

There are several pieces of BLADE status information that can be seen from the front panel. Rotate SCROLL until the display reads

and press TAKE. Go ahead and use SCROLL to discover the available information.

Logic Testing – LOGIC METER ARRAY

The front panel also provides a way to observe the status of the logic ports on the LIO-48. First, the LOGIC METER ARRAY is an array of LED indicators that shows the current status of each of the 48 ports. The indicator array is grouped into eight sections, one for each of the eight RJ logic connectors on the back of the LIO-48. Within each group are six pairs of LED indicators representing the individual logic ports. Each pair has a green LED on the left to represent the status of the port if it is configured as an input, and a red LED to the right to represent the status of the port if it is configured as an output. If a logic port is ON, its appropriate LED indicator is lit, and if the port is OFF the LED is not lit.

Logic Testing – Drilling Deeper

The front panel display can show us more information about the logic ports. Rotate SCROLL until the display reads

and press TAKE. The display will now read

where the 'x' and 'y' characters are replaced with the appropriate status indicator from this list:

'-' means that the port in that position is not defined as the type of port indicated

'0' means that the port in that position is the type of port indicated and is OFF

'1' means that the port in that position is the type of port indicated and is ON

An example can help clarify this description. Let's say the display reads like this:

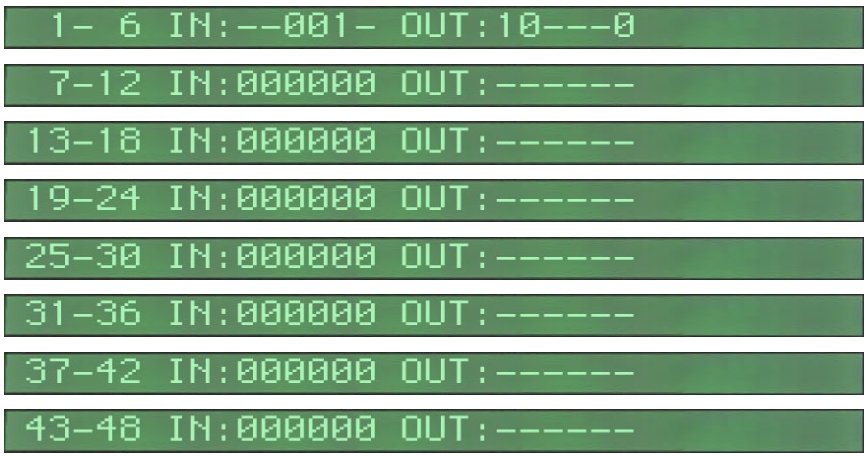
The IN section indicates the following information about logic ports 1 – 6:

port 1 is **not** an input port
port 2 is **not** an input port
port 3 is an input port and is OFF
port 4 is an input port and is OFF
port 5 is an input port and is ON
port 6 is **not** an input port

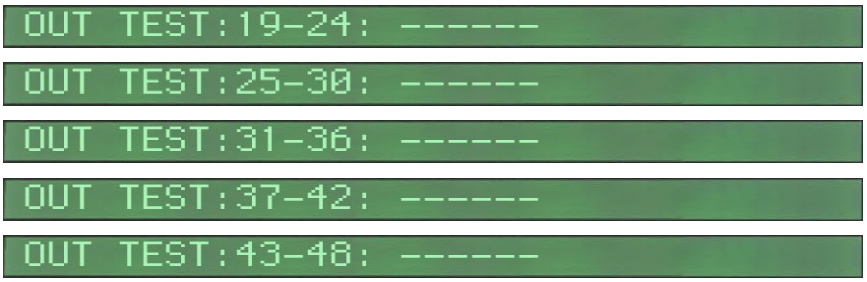
while the OUT section indicates that

port 1 is an output port and is ON
port 2 is an output port and is OFF
port 3 is **not** an output port
port 4 is **not** an output port
port 5 is **not** an output port
port 6 is an output port and is OFF

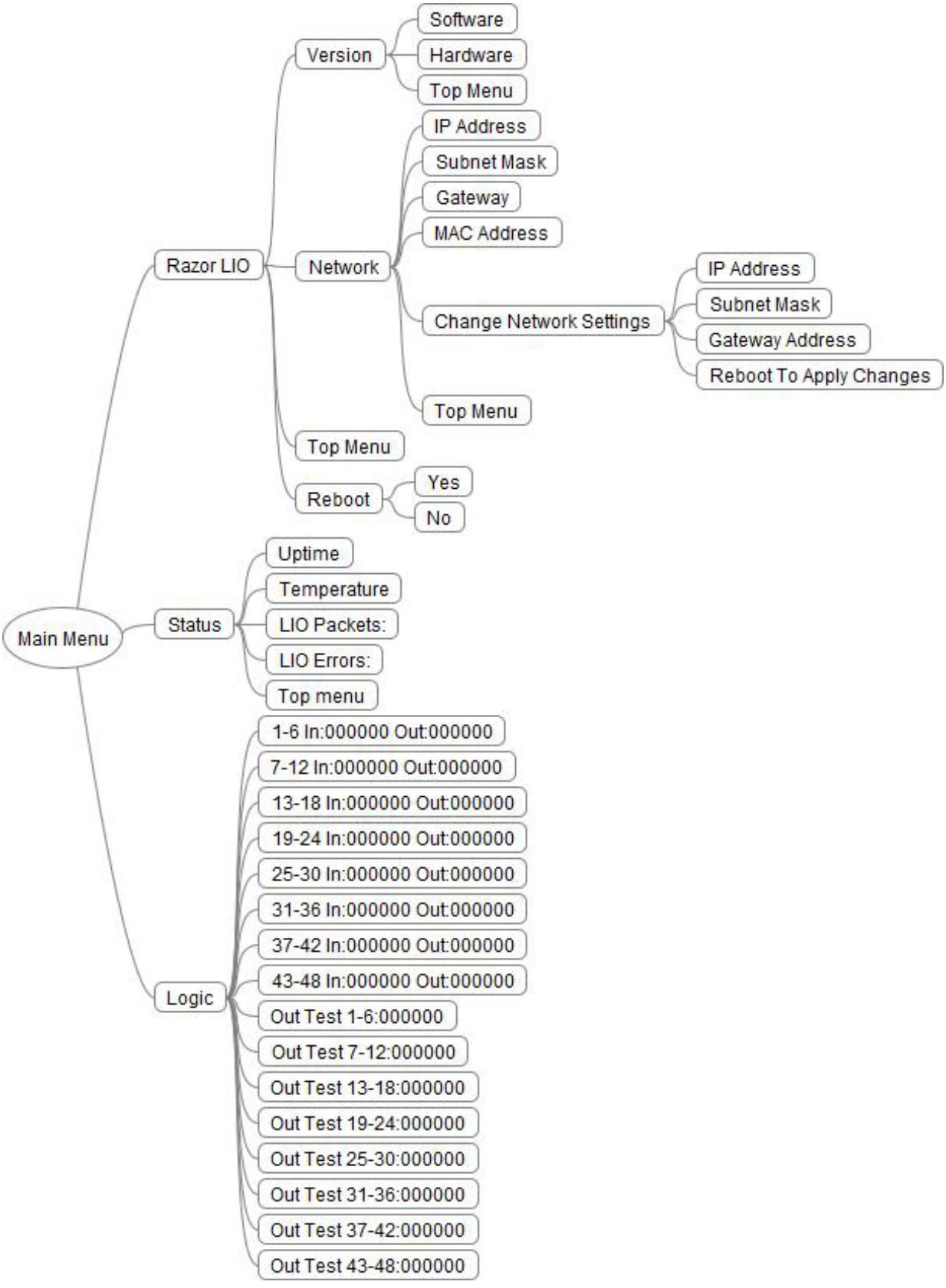
As you continue rotating the SCROLL knob you will see status displays for the other five groups of ports.



Since we often are concerned more about the status of output logic ports than we are about input logic ports, there is a set of test displays that deal only with output port status. These displays otherwise function as described above for the combined input/ output testing.


OUT TEST:19-24: ------
OUT TEST:25-30: ------
OUT TEST:31-36: ------
OUT TEST:37-42: ------
OUT TEST:43-48: ------

Front Panel Menu Diagram



The Software Tools And Basic LIO-48 Setup

Chapter Contents

The Software Tools And Basic LIO-48 Setup

Software Basics

There are two basic software packages you will use when working with the LIO-48. The first of these, Navigator, is a program you should already be familiar with, since it is heavily used in setting up and operating the WheatNet-IP system. Installation and normal use of Navigator are topics that are well covered in the *WheatNet-IP Audio Over IP Network Technical Manual*, and will not be covered here. We will discuss Navigator here only to the extent that it is needed for working with the LIO-48.

The second software package is the Razor Setup Tool.

Razor Setup Tool

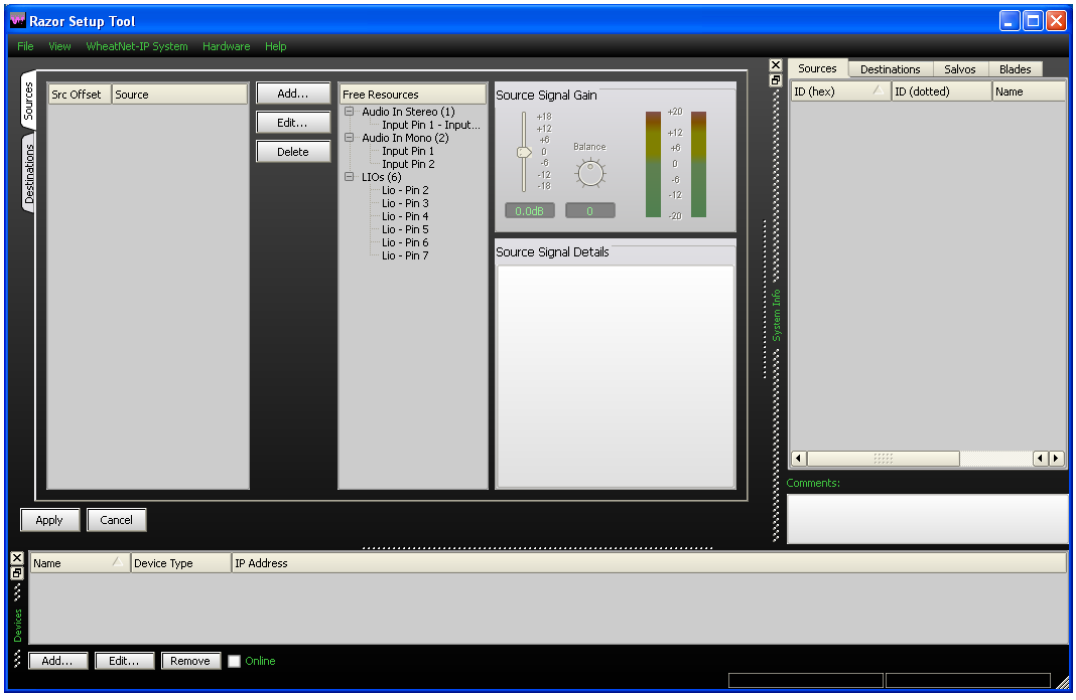
Run the included installer file, **wheatnetip_razor_setup_X.Y.Z.exe** (where X, Y and Z are replaced by numbers representing the software version), to install the Razor Setup Tool. Simply follow the installer instructions on screen; the process is a straightforward one.

You can launch the Razor Setup Tool from the Windows Start menu by selecting *start>All Programs>Wheatstone>Wheatnet IP Razor>Razor GUI*. You can also copy this shortcut to your desktop if needed.

Please note that the computer running the Razor Setup Tool must be a valid member of the WheatNet-IP system network in order that the tool can successfully communicate with the LIO-48, and the rest of the system.

Razor Setup Tool – First Launch

The first time you launch the program you will see a screen like this:



Down the left side of the main panel are tabs for *Sources* and *Destinations*. This area will be discussed later.

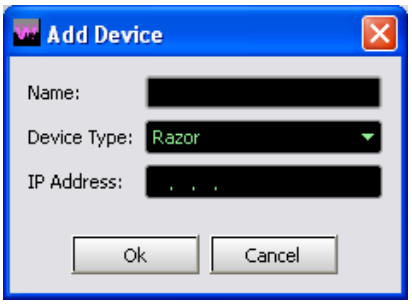
At the right side of the program window you will see the *System Info* panel, containing tabs labeled *Sources*, *Destinations*, *Salvos,* and *Blades*. At the moment those tabs will be empty. We will deal with that shortly.

Across the bottom of the program window you will see the *Devices* panel. It will also be empty at the moment, and we will deal with it shortly as well.

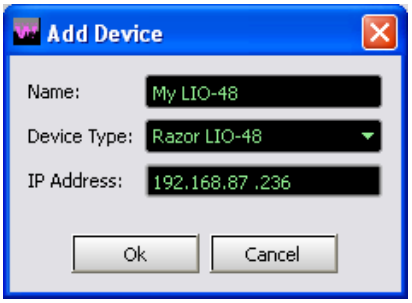
If for some reason you do not see the *Devices* or *System Info* panels you can enable them by selecting *View>Devices* and *View>System Info*, respectively, from the Razor Setup Tool menu.

Adding A Device To The Devices Panel

We need to add the LIO-48 as a device before we can work with it in the Razor Setup Tool. Click the *Add...* button along the bottom of the *Devices* panel to bring up the *Add Device* dialog:

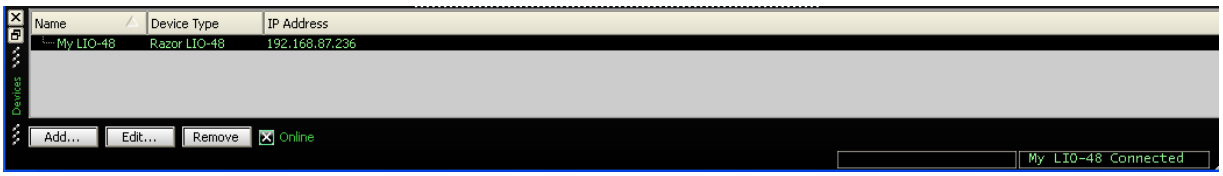


Give the device a convenient *Name:* (note that the system doesn't care what name you use; it will display it for you so you can recognize the device, but it will not otherwise make use of the name). Click on the down arrow at the right end of the *Device Type:* field and select *Razor LIO-48*. Then fill in the *IP Address:* field with the IP address of the LIO-48 you are adding. Your *Add Device* dialog should look something like this:



Click *Ok*. The device now shows up on the *Devices* panel.

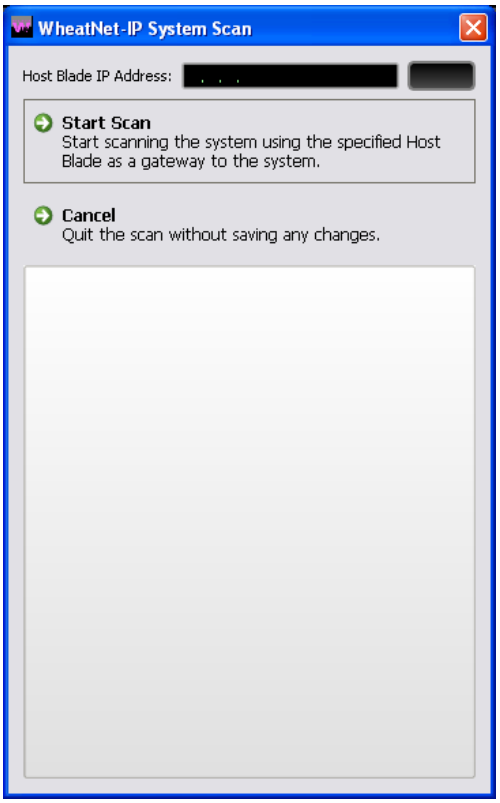
Click once on the device in the *Devices* panel list to highlight it. Make sure the *Online* check box has an X in it (click it once if it is empty), and then observe the lower right corner of the program window. If all is well and the LIO-48 and the computer running the Razor Setup Tool are both on the same network, you should see a message indicating you are connected to the LIO-48.



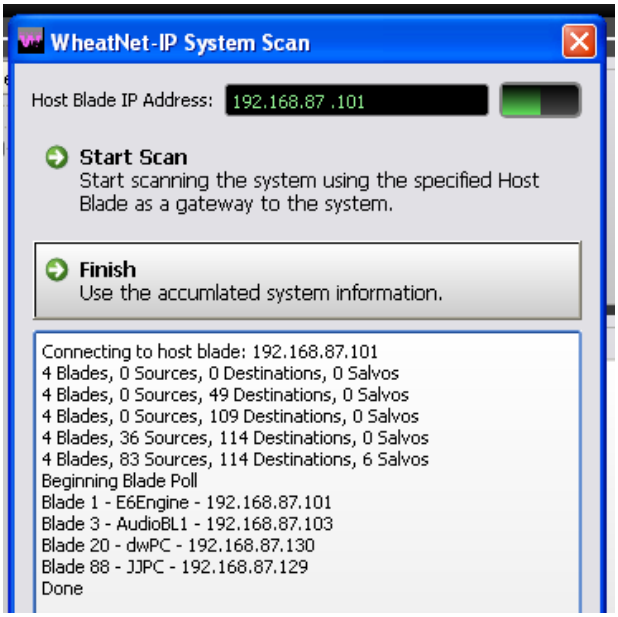
Discovering The System

Let's turn our attention now to the *System Info* panel. As mentioned earlier, the first time you start up the Razor Setup Tool this area will be blank. So let's get it to fill in.

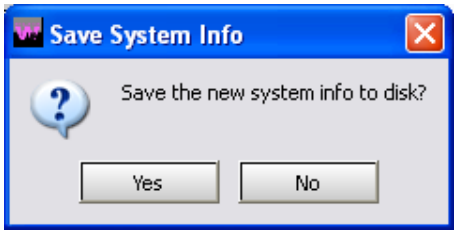
Select *WheatNet-IP System>System Scan...* from the Razor Setup Tool menu to see this dialog:



Enter the IP address of an audio or engine BLADE in the system in the *Host Blade IP Address:* field. The Razor Setup Tool will query the chosen BLADE to get a map of the system resources. DO NOT use an LIO-48 IP Address for this operation; it will not provide the needed results. Once the BLADE IP address is entered, click *Start Scan*. The data area will start to fill in and after a period of time will indicate the scan is done.

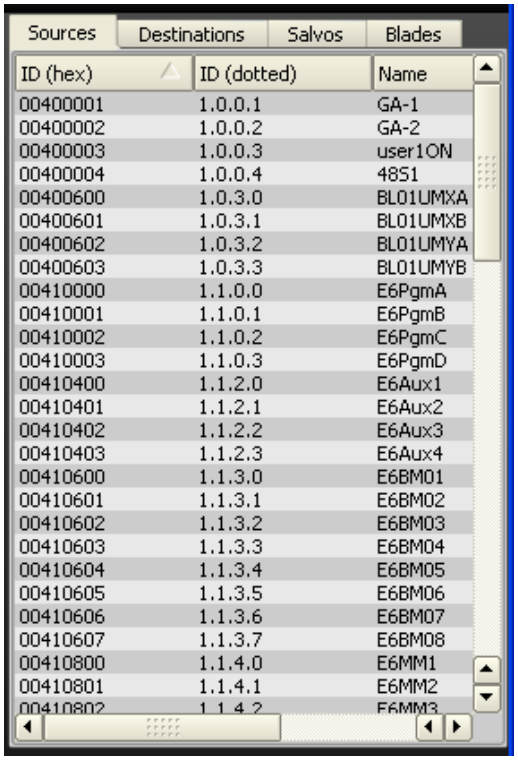


Click the *Finish* button. You will be asked if you want to save the system information just gathered.



It is a good idea to save this information at some point in time. Otherwise, every time you start the Razor Setup Tool you'll need to do a scan to discover the available resources. On the flip side, any time you make a configuration change, such as adding or removing a BLADE, or changing a signal name, you will need to do a fresh scan, and a save, to keep the program's knowledge of the system in sync with the changes. If you choose to save at this time, click *Yes*. You'll be prompted to add an (optional) comment to the file, after which you'll be presented with the usual Windows file save dialog. Once the save is done you'll be able to continue. If you won't be saving right now, click *No* to continue.

At this point in time you can inspect the available resources by checking the various tabs in the *System Info* panel. We will use some of this information later.



The LIO-48 Is A 3rd Party Device

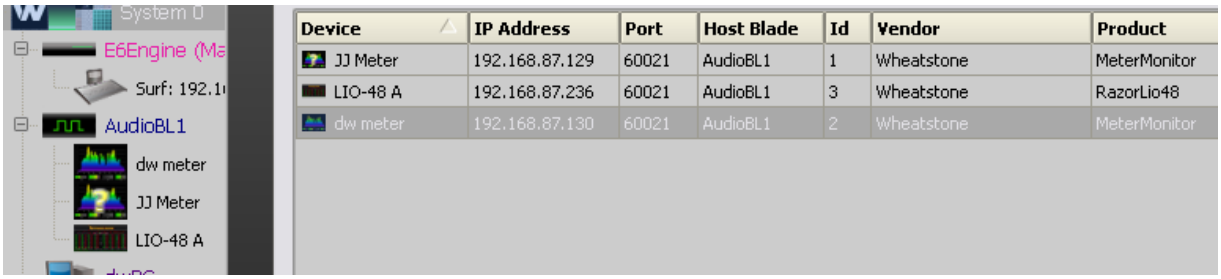
Depending on the amount of work you've already done with the WheatNet-IP system, and depending on what various components you have in your system, you may be familiar with the designation of 3rd party device. If not, suffice it to say that certain components in a WheatNet-IP system have to be added in as 3rd party devices, and the LIO-48 is one such device. Even though the procedure for adding 3rd party devices is covered in the *WheatNet-IP Audio Over IP Network Technical Manual*, we will cover it here as well.

With the Navigator application running, switch to the *System 3rd Party Devices* tab. In our example we already have a couple of devices added.

Click *Add...* to bring up the Add 3rd Party Device dialog.

Provide a *Name:* for the LIO-48. This name will appear next to the LIO-48 icon in the Navigator System panel. Enter the LIO-48 *IP Address:* and use the *Host Blade:* drop down box to specify a BLADE in the system that the LIO-48 will communicate with to gain access to the system. Leave the *TCP Port:* setting at its default of **60021**. Click *Ok*.

If all is well you will see that the LIO-48 has been added to the 3rd party device list, and also shows up in the *System* panel under the selected host BLADE.



At this point, we have done the basic setup required to make the LIO-48 be a part of our WheatNet-IP system. In the next chapter we'll dive deeper and program the LIO-48 to do something useful.

Drilling Deeper – Programming The LIO-48

Chapter Contents

Drilling Deeper – Programming The LIO-48

Programming The LIO-48

In order to use the LIO-48 logic ports it is necessary to do some programming to configure the ports for the desired application. The tools, Wheatstone Navigator and the Razor Setup Tool, have already been introduced. The required steps will vary depending on the intended application.

We will introduce the various programming steps and techniques as we work through a couple of practical examples. Please note that you will be using both the Navigator program and the Razor Setup Tool as you work through an example, so be sure to keep track of which program is being used at any given step.

Wiring Switches And LEDs To The Logic Ports

Please take a look back at page 1 – 8 (one dash eight) of this manual and observe the diagrams and descriptions on that page.

If you are wiring a switch to a logic input port, all you need to do is connect the switch's normally open (N.O.) contact to the port pin on the RJ connector and the switch's common contact to the port connector's DGND (digital ground) pin. The switch closure thus completes the connection from the port pin to ground and activates the input port.

To wire an LED indicator to an output port, wire the +5V pin on the RJ connector through a resistor to the anode of the LED, and wire the LED's cathode back to the logic port pin. When the port is activated it completes the path between the logic pin and ground, effectively applying 5V in the proper polarity to the LED. The resistor is used to limit current. Although the logic output port can sink up to 100 mA max, typically you will want to keep the LED current down to a value in the 10 to 20 mA range, which would use a resistor with a value around 220 ohms.

The same connection rules apply to logic ports on other BLADEs in the system. Thus it won't matter if you are wiring to a logic port on an LIO-48, or an IP-88a, or any other BLADE.

Notes Regarding The Examples

Please note as we work through the following examples that the names of BLADEs and signals used in the examples will almost certainly be different than those names in your system. It's important to remember this as you compare your screen shots to ours.

Example 1 – Toggling An Indicator LED Remotely

Overview of Example 1

For this example, we will endeavor to light an indicator in one room by pressing a switch in another room. This type of action could be handy if you wanted a person at one location to get the attention of someone at a different physical location, but still part of the same WheatNet-IP system. In our case we will be wiring the switch into port 7 on the LIO-48, and wiring the LED into port 12 of our system's BLADE 3.

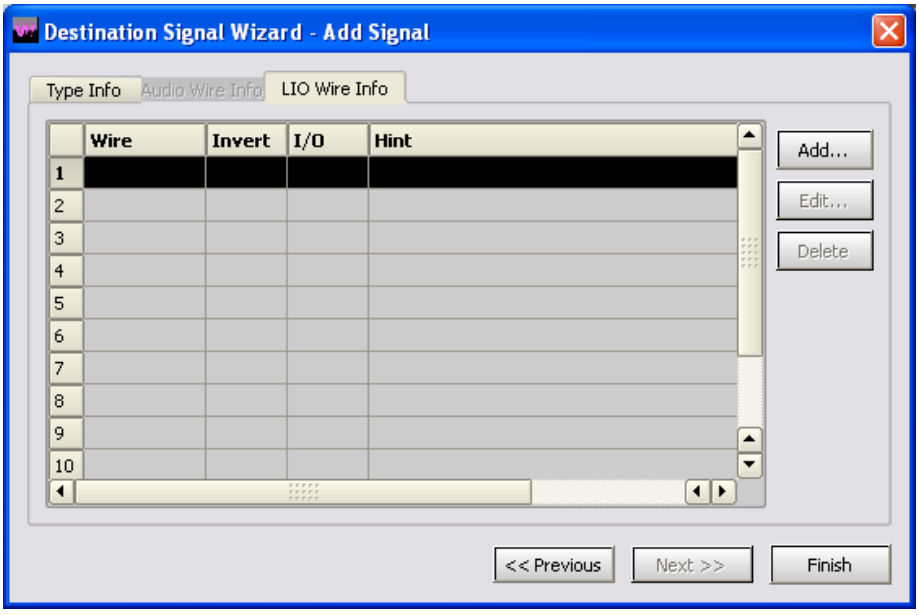
Program Logic On The Remote BLADE

We begin by creating a logic only source on BLADE 3 in Navigator. We name it **LightA** (later in this example we will create a second such logic signal and name it **LightB**), map it to LIO 2 PIN 7 on the BLADE, configure it as an output, and use the function named *User 1*. We will wire our LED indicator to logic port 12 on the BLADE.

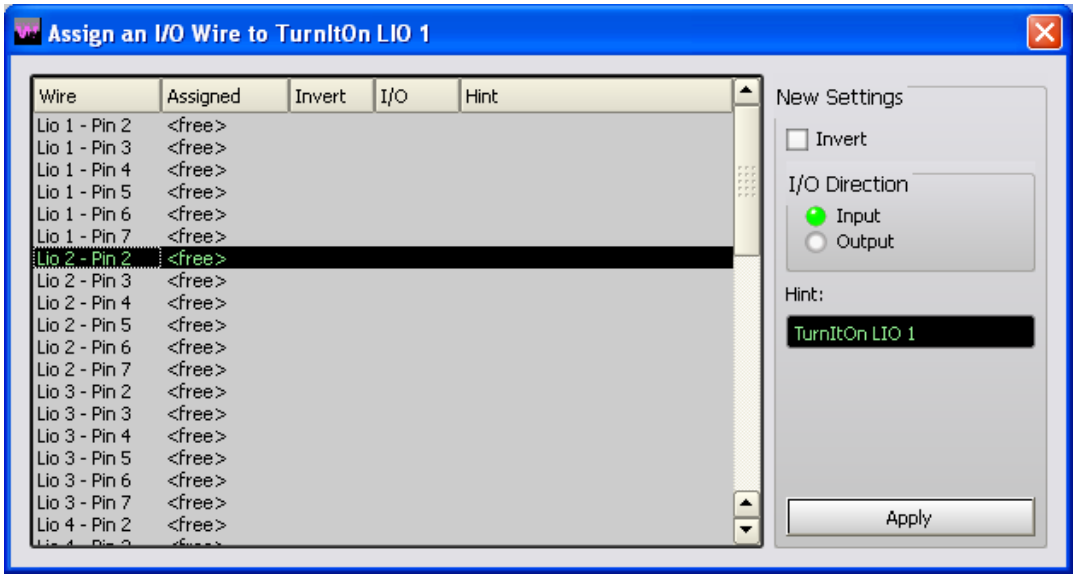
Program Logic On The LIO-48

On the LIO-48 we will create a logic only destination named **TurnItOn**. In the Razor Setup Tool switch to the *Destinations* tab along the left side and click the *Add...* button to bring up the *Add Signal* dialog:

We will keep everything as-is on the *Type Info* tab except that we will change the *Default Name:* to *TurnItOn*. Make this change, then click the *Next* >> button, which will switch to the *LIO Wire Info* tab:



Click *Add...* to bring up the *Assign an I/O Wire to TurnItOn LIO 1* dialog.



Click the line for *Lio 2 – Pin 2* (this corresponds to logic port 7 on the LIO-48) to highlight it. Keep the *I/O Direction* at *Input*. Click *Apply*.

Click *Finish*. Back on the Razor Setup Tool main screen, click the *Apply* button below the *Destinations* tab area at the left of the window. This step is very important; do not skip it!

The last step in the process is to reboot the LIO-48. Remove AC power from the LIO-48, count to 10, then reapply power.

Once the LIO-48 is back online you will see the new destination appear on the Navigator *System Crosspoint* tab. Since the Razor Setup Tool assigns default function names to signals as they are created, and since the function name assigned may not be the one we want, we may need to change the function name. Right-click on the **TurnItOn** destination name on the *System Crosspoint* tab and select *Modify Signal...* from the popup menu to bring up the *Edit Signal* dialog for that destination. Switch to the *LIO Info* tab, highlight the LIO, and click the *Edit* button. Change the *Function:* to *User 1* to match the function on the **LightA** signal. Click *Apply*. Click *Close*. Click *Finish*.

Make a crosspoint that connects **TurnItOn** to **LightA**.

Test Example 1

Pressing the switch connected to port 7 of the LIO-48 should now turn on the LED connected to port 12 of BLADE 3. The light should go off when the button is released.

Multiple Indicators

Let's add a twist to this example and say that we want to use the button to signal the talent in Studio A when Studio A is being used, but sometimes we switch things up and use Studio B instead of Studio A. At those times we want to signal the talent in Studio B by using the same button.

We can accomplish this by creating a second logic only source for the second studio and control which source is connected to the destination by making a crosspoint change

when we want to switch studios. The crosspoint change could be programmed into the same salvo that is probably already in use for switching other resources between Studio A and Studio B. For the purposes of this manual we will not get into programming salvos. To test the results of our example you can just switch the crosspoint manually.

Program More Logic On The Remote BLADE

Create another logic only source on BLADE 3 in Navigator and name it **LightB**, map it to LIO 2 PIN 6 on the BLADE, configure it as an output, and use the function named *User 1*. Wire another LED indicator to logic port 11 on the BLADE.

Testing The Modified Example

Now when you press the switch connected to port 7 of the LIO-48, the LED connected to port 12 of BLADE 3 will light if there is a crosspoint between **TurnItOn** and **LightA**, but the LED on port 11 of BLADE 3 will light instead if there is a crosspoint between **TurnItOn** and **LightB**.

Beyond Example 1

The ideas in this example could be expanded upon in applications such as switching resources between studios, handling the logic involved in an intercom, and transmitting multiple relay closures to multiple studios from the rack room.

There are times when you may want to create a logic only source on the LIO-48. To do this you select the *Sources* tab in the Razor Setup Tool. Then proceed in the same manner as you did in creating the logic only destination.

Example 2 – Controlling A Control Surface Channel

Overview of Example 2

It's possible to set up switches at a remote location to control the ON status of a control surface fader, and to reflect that status back to the remote operator via LED indicators. This is typically done at a microphone location in a studio, allowing the talent using the mic to turn their control surface fader on and off.

For our example, we're going to use a Wheatstone GP-4 panel to perform these functions. If you don't have access to a GP-4 you can use any four illuminated switches you have at your disposal. The GP-4 will be wired to a single RJ connector on the LIO-48 (in our example we will use the third RJ connector, corresponding to logic ports 13 to 18). The ON switch and OFF switch use up two logic ports each, one for the switch contacts and one for the LED that lights the switch. Since the RJ connector gives us access to a total of six LIO-48 ports, we can use the other two ports to provide COUGH and TB (talkback) functions. This is very typically what a GP-4 is used for in a system.

The control surface in our example is an E-6. If you have a surface other than an E-6 you may need to adjust the procedure to accommodate differences in the surfaces. And if you don't have a control surface in your system then skip this example.

Connecting The GP-4 To The LIO-48

The LIO-48 logic port RJ connectors have +5VDC on pin 8 and the corresponding ground on pin 1, with the 6 logic port connections using pins 2 to 7. The GP-4 has an

RJ connector that works nicely with this, so connection between the GP-4 and the LIO-48 can be made with a single normal (straight, pin-for-pin) CAT5 or CAT6 cable.

The main consideration is that the GP-4's pins 2 through 7 are used for specific functions, and so the LIO-48 port setup must adhere to that configuration. Thus pin 2 is for the COUGH switch, pin 3 is for the TB switch, pin 6 is for the OFF switch, and pin 7 is for the ON switch, while pin 4 is for the OFF switch indicator and pin 5 is for the ON switch indicator. The ports used for switches are configured as inputs, and the ports used for the indicators are configured as outputs.

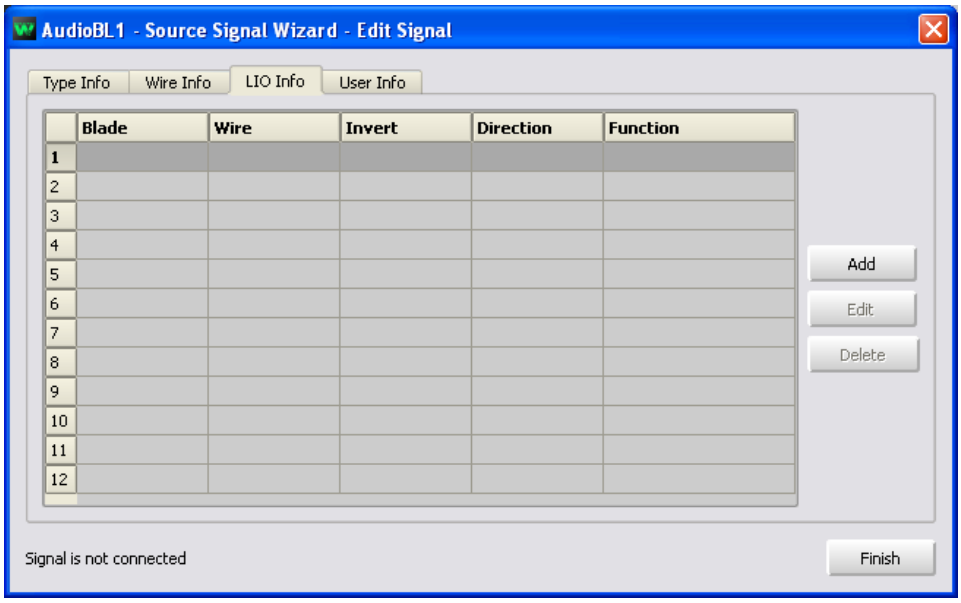
Go ahead and connect the GP-4 RJ connector to the third RJ connector on the LIO-48.

Program Logic On The Remote BLADE

We need to set up the required logic on our audio source to react to logic inputs from the switches and generate logic outputs to control the switch LEDs wired to the LIO-48. This will be done in the Wheatstone Navigator program. Since we are programming logic on an audio source, this setup will work no matter which fader the source is assigned to on the surface.

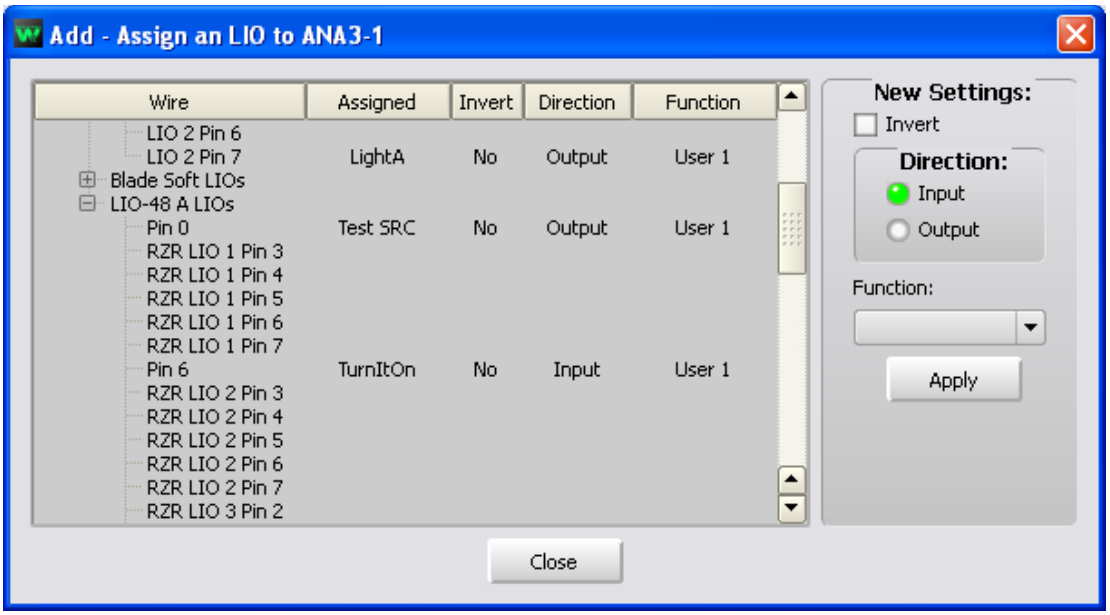
Note that when we set up logic on a signal we have the option of specifying, or mapping to, a hardware logic port that exists on the same BLADE that the signal lives on, or a hardware logic port that exists on a different BLADE than the one that the signal lives on. We can also map to Software LIOs on the BLADE that the signal lives on or on any other BLADE. We can also map to the hardware logic ports on any LIO-48 in the system.

In Navigator, find the audio source you want to interact with from among the sources listed across the top of the *System Crosspoint* tab. Make sure the source is not currently connected to any destination, since we can't program logic on a signal while it is connected. Then right click on the source name label on the *System Crosspoint* tab and select *Modify Signal...* from the popup menu to summon the BLADEs *Source Signal Wizard – Edit Signal* dialog. Select the *LIO Info* tab on this dialog.

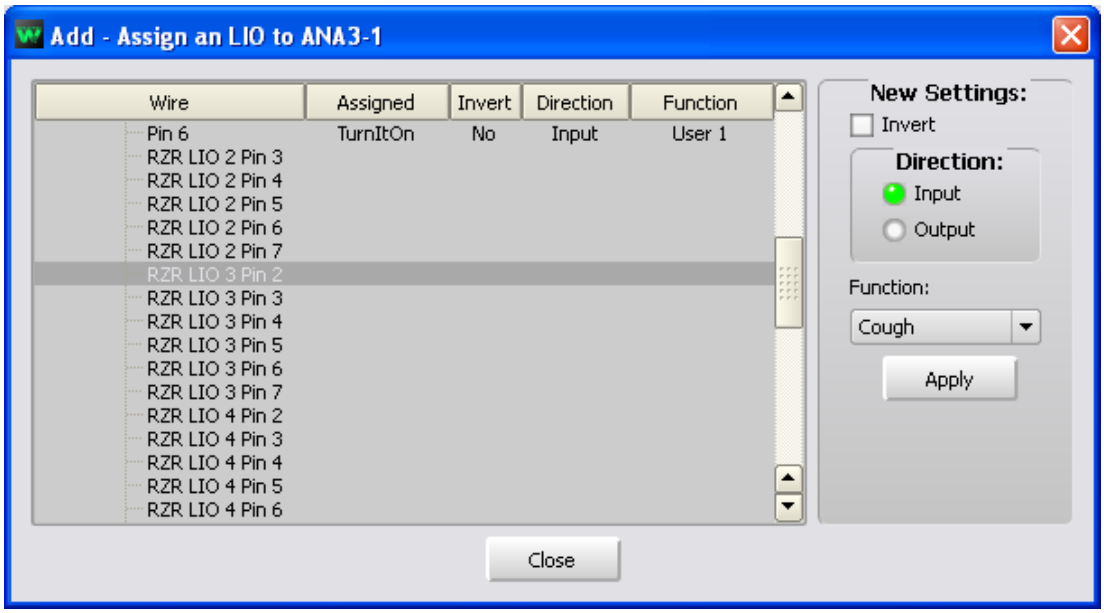


Click the *Add* button to add the first LIO to this signal.

In the *Wire* column of the *Assign an LIO to ANA3-1* dialog (remember, your signal name is probably not going to be **ANA3-1**) expand the *LIO-48 A LIOs* item to show all available LIOs on the LIO-48. Again, note that your LIO-48 may not have the same name as our example, "LIO-48 A".



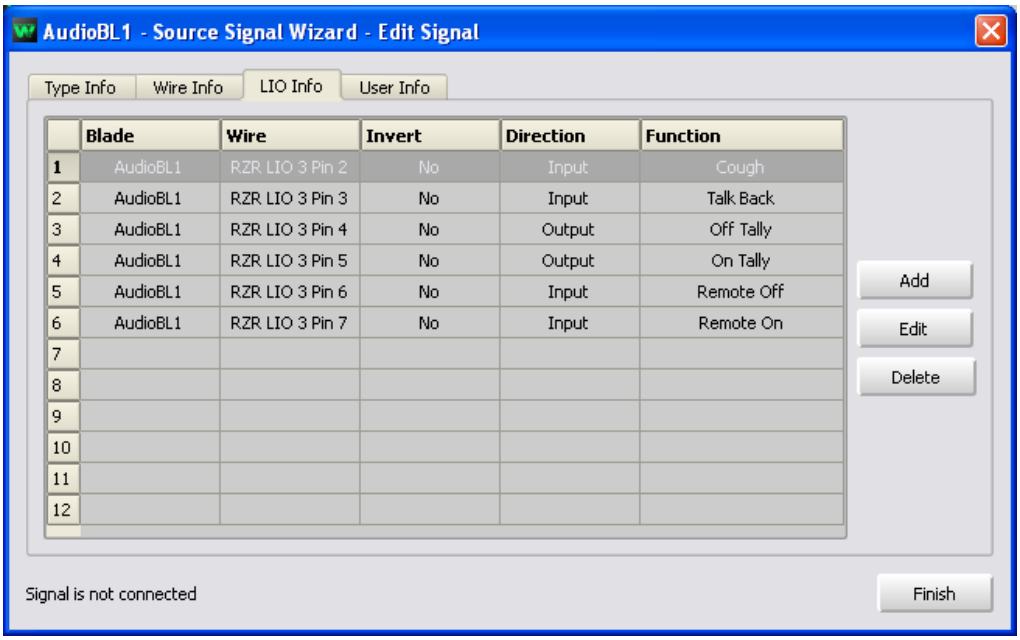
Scroll down until you see the *Wire* rows that read *RZR LIO 3 Pin 2* through *RZR LIO 3 Pin 7* – these are the six logic ports on the third RJ connector on the back of the LIO-48. Click on the pin 2 row of this group to select the first port. Make sure the *Direction:* is set to *Input* and the *Function:* is set to *Cough*. Click *Apply*.



Program the remaining rows of this group, using the following for *Direction:* and *Function:*

- Pin 3 – *Input – Talk Back*
- Pin 4 – *Output – Off Tally*
- Pin 5 – *Output – On Tally*
- Pin 6 – *Input – Remote Off*
- Pin 7 – *Input – Remote On*

After programming all six pins, click *Close* and double check that you now see this:



Click *Finish*. That completes the LIO programming on the selected source signal.

Test Example 2

Connect the programmed source to a fader on your control surface. Now, pressing switch one (ON) should turn that fader on, and pressing switch two (OFF) should turn the fader off. When the fader is on switch one should be lit, and when the fader is off switch two should be lit. And when you turn the fader on or off at the surface the lighting of the switches will follow.

Additionally, if the fader is on and you press switch three (COUGH) you will see the ON switch on the fader go off while the OFF switch stays off. You will not, however, see the remote ON switch go off. And pressing switch four on the remote panel will force the fader into cue; but once again the remote panel lighting will not reflect this.

Although it is possible to control the illumination of buttons three and four on the remote panel, as well as have the remote ON reflect the COUGH state, that is beyond the scope of this document.

Beyond Example 2

The ideas in this example could be expanded upon in applications where control of a machine (CD, tape deck, cart machine, etc.) transport is needed.

Additional Razor Setup Tool Details

Chapter Contents

Additional Razor Setup Tool Details

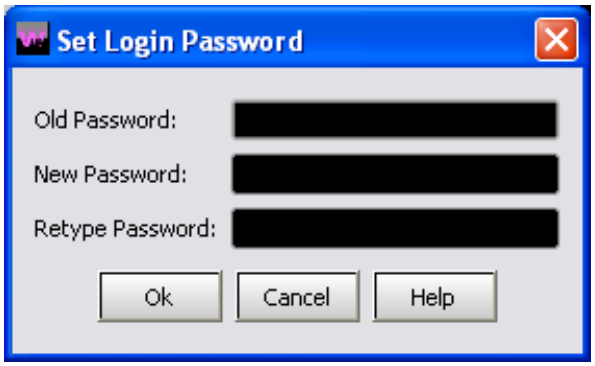
What Else Can I Do?

We haven't covered everything that you can do in the Razor Setup Tool. This chapter will go through the program's menu structure and screen controls. Along the way we will uncover some other things you can do, and other ways to do things you've already seen.

The File Menu

Set Password...

You may not want just anyone to run the Razor Setup Tool. You can set a password that must be entered to use the program. Select *File>Set Password...* to bring up the dialog.



Like most any password setting dialog, you have to first enter the current password to prove you have the authority to change the password. Then you enter the new password twice and click *Ok*. If you have entered the correct old password and enter the new password exactly the same in both fields, you will now have a new password in effect the next time you start the program. The correct password will need to be entered to use the program.

When working with the dialog, if there is no current password you would leave the *Old Password:* field blank. Similarly, if there is a current password but you want to remove it so no password is necessary, you would leave both *New Password:* and *Retype Password:* fields blank.

Exit

Like most programs that operate in the Windows O/S, you can quit the program by simply clicking the red X at the upper right corner of the program window. You can also select *File>Exit* from the menu.

The View Menu

The *View* menu gives you the opportunity to make some changes to the program's appearance. If you click the *View* menu you will see three check boxes. The first two enable program panels. If a box has an X in it the corresponding panel of the program will be visible. The third changes the overall appearance of the program. Click the box to make the X disappear or reappear.

Devices

This check box affects the visibility of the *Devices* panel.

System Info

This check box affects the visibility of the *System Info* panel.

Stylized

The third box affects the overall appearance of the program. Try it to see the difference it makes.

The WheatNet-IP System Menu

File Open...

This menu item allows you to open a file to which you have previously saved the results of the System Scan. This is handy mainly if you are running the Razor Setup Tool on a laptop which you will take with you to different client sites having different system configurations. By saving the scan results to a different file for each system you support you can connect and make changes without having to perform a scan each time. Of course, if you make any changes to a system you will need to do a fresh scan anyway to maintain an accurate picture of the system for use in the Razor Setup Tool.

If you are only working with one system the Razor Setup Tool will automatically load the last snapshot of the system that you saved.

File Save...

Select this menu item to save the current System Scan to a file, as described in Chapter 3. Note that after doing a scan you are automatically prompted to do a save, but this menu option allows you to defer that operation to a later time.

System Scan...

This menu item is used to begin a System Scan, as described in Chapter 3. This is a necessary step to enable you to properly integrate the LIO-48 into the WheatNet-IP system.

The Hardware Menu

Add New Device...

This menu choice is an alternate way to reach the Add Device dialog. See Chapter 3 regarding adding a device to the *Devices* panel.

Edit "*<device name>*" ...

This menu selection brings up an *Edit Device* dialog which is quite similar in appearance to the *Add Device* dialog, and which allows you to edit the definition of a device that has already been added to the *Devices* panel. The same dialog can be brought up by clicking the *Edit*... button at the bottom of the *Devices* panel.

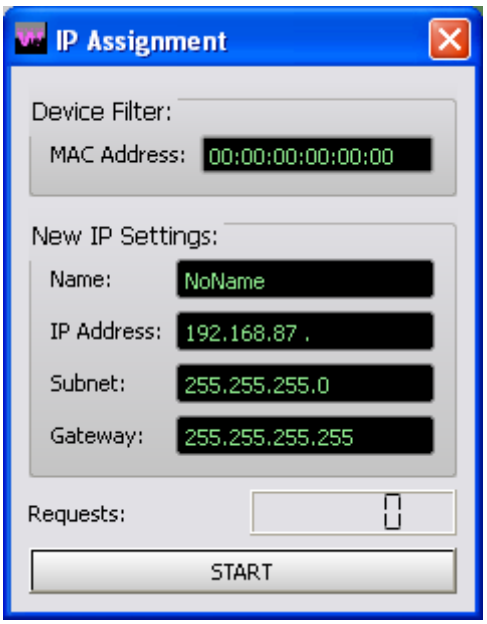
Remove "*<device name>*" ...

This selection is used if you want to remove a device definition from the *Devices* panel. You will be prompted to verify the action. Clicking *Yes* at that point will remove

the device from the *Devices* panel, while clicking *No* will cancel the removal. You can also trigger the removal action by clicking the *Remove...* button at the bottom of the *Devices* panel.

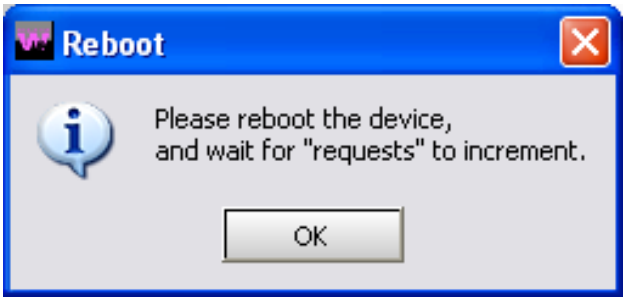
Assign IP Address...

In Chapter 2 we discussed setting the network parameters of the LIO-48 from the unit's front panel. Alternatively, this can be done from the Razor Setup Tool by selecting *Hardware>Assign IP Address...* from the menu. This brings up the *IP Assignment* dialog:

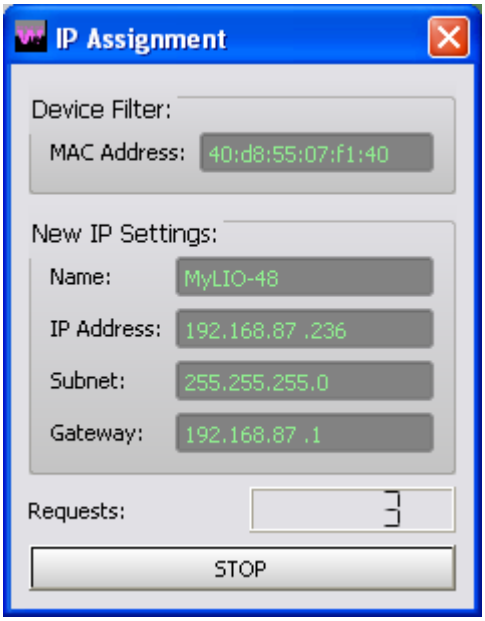


Fill in the *MAC Address* field with the LIO-48 MAC address as found on the device's printed label. The MAC address can also be found via the front panel – see the Front Panel Menu Diagram at the end of Chapter 2.

Fill in a *Name* for the device and the desired *IP Address*, *Subnet*, and *Gateway* settings. Click *START*. The *Reboot* dialog will appear:



Click *OK*, then remove power from the LIO-48, count to 10, and power the LIO-48 back up. Verify that the *Requests* display on the *IP Assignment* dialog has increased from 0.



Click *STOP*, then click the red X at the upper right corner of the *IP Assignment* dialog to dismiss it. The LIO-48 will now use the new network settings.

Version...

If it is necessary to contact Wheatstone Customer Support in regard to the LIO-48 you may be asked what version of software the unit is running. You can find this out by selecting *Hardware>Version...* from the menu. Please note that the Razor Setup Tool must be connected to the LIO-48 to obtain the version this way. You can also obtain the unit's version from the front panel – see the Front Panel Menu Diagram at the end of Chapter 2.

Update...

The LIO-48's software can be updated using the Razor Setup Tool. If the factory has recommended that you update the LIO-48 you will be provided with an update file. It will have a name similar to **wheatnetip_rzr_lio_X.X.X.rbn**, where the **X.X.X** is replaced with the software version information. Place this file in a convenient location on the computer running the Razor Setup Tool, such as the Desktop. Select *Hardware>Update...* from the Razor Setup Tool menu. This will bring up a typical Windows file open dialog. Locate the update file in this dialog and click *Open*. A new dialog will open asking you to confirm the update operation. Click *Yes* to continue with the update, or *No* to cancel. If you clicked *Yes* you will see a series of progress report bars. When the update is complete you will be prompted to reboot the computer. Once you perform the reboot the LIO-48 will begin operating at the new version.

Reboot...

Selecting *Hardware>Reboot...* is an alternate way of rebooting the LIO-48.

The Help Menu

About...

Help>About... brings up a message that tells you the version of the Razor Setup Tool.

The Main Area Controls

Add...

If you have the *Sources* tab selected at the left side of the Razor Setup Tool, clicking the *Add...* button on the *Sources* tab allows you to add a source signal to the LIO-48. If you have the *Destinations* tab selected at the left side of the Razor Setup Tool, clicking the *Add...* button on the *Destinations* tab allows you to add a destination signal to the LIO-48.

Edit...

If you have the *Sources* tab selected at the left side of the Razor Setup Tool, clicking the *Edit...* button on the *Sources* tab allows you to edit a highlighted source signal. If you have the *Destinations* tab selected at the left side of the Razor Setup Tool, clicking the *Edit...* button on the *Destinations* tab allows you to edit a highlighted destination signal.

Delete

Click the *Delete* button to delete a highlighted source or destination.

Apply

Clicking *Apply* at the bottom of the *Sources* / *Destinations* area saves any source or destination changes you've made. If you fail to click this your changes will not be saved.

Cancel

Clicking *Cancel* at the bottom of the *Sources* / *Destinations* area cancels any source or destination changes you've made since the last time you clicked *Apply*.

The Devices Panel Controls

Add...

Clicking *Add...* at the bottom of the *Devices* panel brings up the dialog for adding a panel to the *Devices* list.

Edit...

Clicking *Edit...* at the bottom of the *Devices* panel brings up the dialog for editing a panel definition in the *Devices* list.

Remove

Clicking *Remove* at the bottom of the *Devices* panel brings up the dialog for removing a panel definition from the *Devices* list.

Online

Clicking the *Online* box at the bottom of the *Devices* panel toggles between the online (an X in the box) and offline (no X) modes of the Razor Setup Tool. The online mode must be selected in order for the Razor Setup Tool to communicate with the panel selected in the *Devices* list.