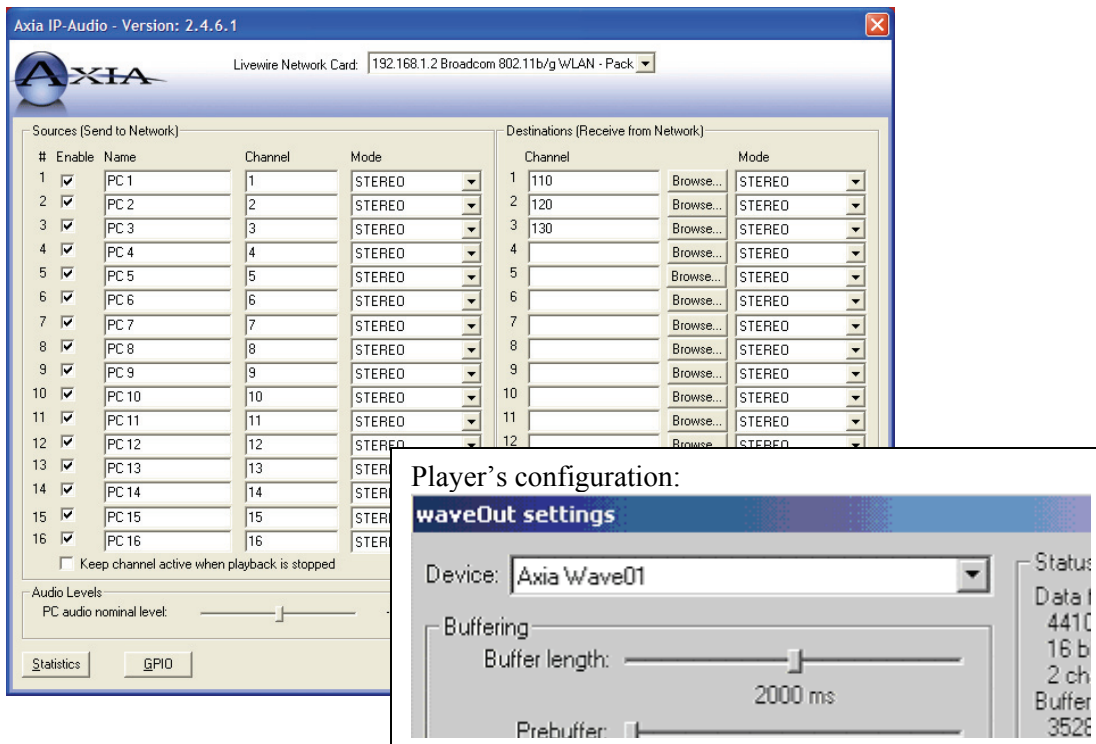


Using Axia Windows Driver GPIO

31 January 2007

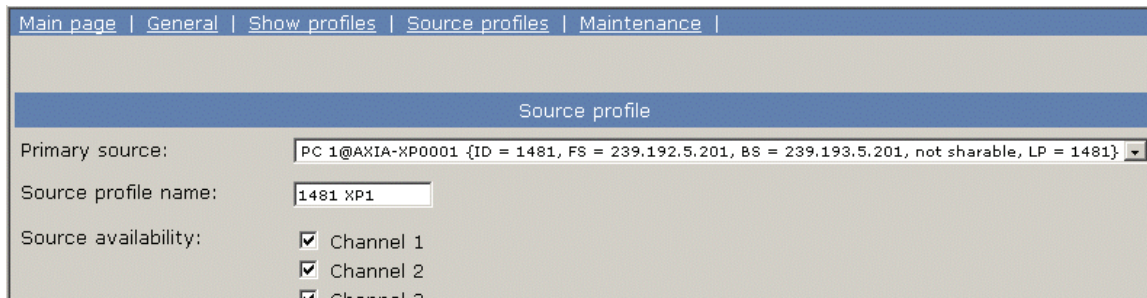
Setup

The driver has the following sources configured. In our example, we are going to use source 1, which corresponds to audio device: “Axia Wave01”



The screenshot shows the Axia IP-Audio software interface. The main window displays two tables: 'Sources (Send to Network)' and 'Destinations (Receive from Network)'. The 'Sources' table lists 16 PC sources (PC 1 to PC 16) with their respective channels and modes set to STEREO. The 'Destinations' table lists 12 channels (110 to 112) with modes set to STEREO. Below the tables are 'Audio Levels' and 'GPIO' buttons. An inset window titled 'Player's configuration: waveOut settings' shows the 'Device' set to 'Axia Wave01', 'Buffer length' set to 2000 ms, and 'Prebuffer' set to 1. The status bar on the right of the inset shows 'Data 4410', '16 b', '2 ch', and 'Buffer 3528'.

Axia Element or SmartSurface consoles will use this source, so a Source Profile must be configured, as shown below (See the Element or SmartSurface users manual for instructions on how to construct a Source Profile).



The screenshot shows the Axia web interface for configuring a Source Profile. The navigation bar includes 'Main page', 'General', 'Show profiles', 'Source profiles', and 'Maintenance'. The 'Source profile' section is active, showing the following configuration:

- Primary source: PC 1@AXIA-XP0001 {ID = 1481, FS = 239.192.5.201, BS = 239.193.5.201, not sharable, LP = 1481}
- Source profile name: 1481 XP1
- Source availability:
 - Channel 1
 - Channel 2
 - Channel 3



For automation systems, the “Computer Player” source type should be used (older software does not have this type, so “Line Input Logic” should be selected instead). Logic port must be enabled. GPIO signals available for every source type are defined in Element and SmartSurface manuals available at www.AxiaAudio.com/manuals .

Source type:	<input type="radio"/> CR host
	<input type="radio"/> CR producer
	<input type="radio"/> CR guest
	<input type="radio"/> Studio guest
	<input checked="" type="radio"/> Line
	<input type="radio"/> Phone
	<input type="radio"/> Codec
Fader mode:	<input checked="" type="radio"/> Normal
	<input type="radio"/> Fader start
Preview switching mode:	<input checked="" type="radio"/> Normal, auto switching disabled
	<input type="radio"/> CHANNEL ON turns Preview OFF
Hybrid answer mode:	<input checked="" type="radio"/> Normal, auto answer disabled
	<input type="radio"/> Channel ON answers hybrid
	<input type="radio"/> Channel ON or Preview ON answer hybrid
Backward feed enabled/disabled:	<input type="radio"/> Disabled
	<input checked="" type="radio"/> Enabled
Logic port enabled/disabled:	<input type="radio"/> Disabled
	<input checked="" type="radio"/> Enabled

In the example above, the channel is configured as “Line” source type. The Element and SmartSurface manuals refer to hardware pin numbers; in the GPIO protocols those pins are directly mapped to logical inputs and outputs.

All GPIO pins are active Low. This means that the automation system will react to state changes from High to Low.

GPIO protocol

Computer player opens a TCP/IP connection to port 93. Developers can use telnet to test commands and troubleshoot the system.

```
telnet 127.0.0.1 93
```

Commands sent by automation system (or user from telnet session) are in bold. Indications sent by GPIO module to the automation system are in normal text.

The automation system listens to GPO control messages from the console. From the console's point of view, the automation system is a playback device, so the console controls its "virtual" general-purpose outputs.

The automation system will send GPI commands to trigger actions on the console. Through the protocol, the PC triggers changes on "virtual" console's inputs.

First, the automation system subscribes for GPI and GPO updates using 'ADD GPI' and 'ADD GPO' commands, as illustrated below:

```
ADD GPI  
BEGIN  
GPI 1 IIIII  
GPI 2 IIIII  
[...]  
GPI 16 IIIII  
END
```

```
ADD GPO  
BEGIN  
GPO 1 hhhhh  
GPO 2 hhhhh  
[...]  
GPO 16 IIIII  
END
```

Operator turns the channel OFF by pressing button on the Console:

```
GPO 1 hhhhL      from GPIO logic table: STOP Pulse (Low)  
GPO 1 hLhhl     from GPIO logic table: OFF Lamp (Low)  
GPO 1 hlhhH     from GPIO logic table: STOP Pulse (High)
```

Operator turns the channel ON by pressing button on the Console:

```
GPO 1 hHhlh     from GPIO logic table: OFF Lamp (High), START Pulse (Low)  
GPO 1 Lhhlh     from GPIO logic table: ON Lamp (Low)  
GPO 1 lhHhH     from GPIO logic table: START Pulse (High)
```

An automation system turns the channel ON, remotely:

```
GPI 1 HHHHH  
GPI 1 Lxxxxx
```

An automation system turns the channel OFF, remotely:

```
GPI 1 HHHHH  
GPI 1 xLxxxx
```

Custom GPIO messages

This extension to GPI/GPO commands allows user messages to be routed along established GPIO routes. Livewire Routing Protocol needs to be used to establish a GPIO route from one device to another, and PathFinder PC software provides a user interface to allow such configurations. The functionality can be tested using standard telnet client (TCP/IP connection to port 93).

To send custom message use the following syntax (must LOGIN before):

GPI <source port number> CMD:"<custom command>"

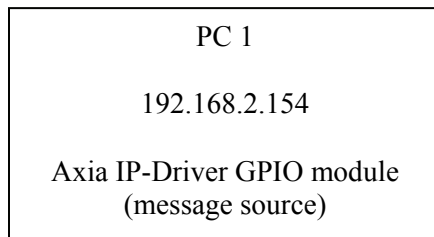
Indications syntax (must ADD GPO before):

GPO <destination port number> CMD:"<custom command>"

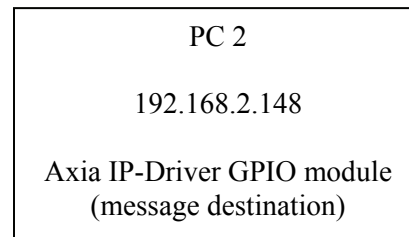
Test example:

Let's connect two PC work stations with Axia Driver installed.

Scenario below, demonstrates LWRP message exchange between GPIO clients. Custom command, "My Command" is sourced at Port 7 of PC1 and delivered to Port 4 of PC2.



telnet 192.168.2.154 93



telnet 192.168.2.148 93

Step 1:

Establish GPIO route from Port 7 of PC 1 to Port 4 of PC 2:

CFG GPO 4 SRCA:"192.168.2.154/7"

SAVE (optional, save configuration)

Step 2:

Subscribe to receive GPO indications:

ADD GPO

Step 3:

Send GPIO command on Port 7

LOGIN

GPI 7 CMD:"My Command"

Step 3 - indication:

Received:

GPO 4 CMD:"My Command"

Custom GPIO messaging requires Axia IP-Audio Driver v2.4.6.1 or later.