Controlling AudioVAULT using Axia GPIO IP interface

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Axia GPIO signals:

The Axia IP-Audio Driver provides GPIO interface over TCP (port 93). The driver handles routing of the control to make sure the GPIO follows fader/channel assignment on the control surface.

All commands correspond to signals available on the DB connectors on Axia GPIO Nodes. Each port has 5 input pins and 5 output pins. Function of those pins is determined by source profile defined in Element Control Surface configuration.

For computer playback devices "GPIO Line Input Logic" is used most commonly. This profile defines the following function:

INPUTS

ON Command	GPI pin 1	Turns channel ON
OFF Command	GPI pin 2	Turns channel OFF & sends 100 msec STOP pulse
PREVIEW Command	GPI pin 3	Turns preview ON
RESET Command	GPI pin 4	Turns channel OFF, does not send a STOP pulse
READY Command	GPI pin 5	Illuminates OFF lamp to indicate source's readiness

OUTPUTS

ON Lamp	GPO pin 1	Illuminates when channel is ON
OFF Lamp	GPO pin 2	Illuminates when channel is OFF and READY is active
PREVIEW Lamp	GPO pin 3	Illuminates when PREVIEW is ON
START Pulse	GPO pin 4	Sends 100 msec pulse when the channel status changes from OFF to ON
STOP Pulse	GPO pin 5	Sends 100 msec pulse when the channel status changes from ON to OFF

Audio Communication Setup:

AudioVAULT needs to open a connection to the Axia IP-Audio Driver. A section like the following can be added in the audiovau.ini file for the application that will be sending the commands:

```
[REMOTECONTROL.UDP1]
DeviceType=Socket
Protocol=TCP
SocketType=caller
HostName=127.0.0.1
ServiceName=93
```

If the AudioVAULT application (e.g. AVAir or Audiovau.exe) runs on a different machine than the IP driver, you need to change "127.0.0.1" to the IP address of the machine where the driver is installed.

Audio VAULT Events:

Please refer to Audio VAULT Programming Manual for details on using remote control interface.

We are going to use the following commands from an [AVAir] section of the audiovau.ini file.

```
IDD_StartN - Events and input control associated with start of deck N
IDD_StopN - Events associated with loading and unloading the deck and playback stop
               control
```

Each command can contain multiple mappings, which are separated with a semicolon. Command mappings take format of <REMOTECONTROL_NAME>:[<prefix>]<text>, where REMOTECONTROL_NAME is a name specified in audiovau.ini section (e.g. "UDP1"), text is the actual string sent over TCP connection, prefix defines type of the command.

Specification of commands sent by Audio Vault differ from the external triggers by a prefix which is either "+" or "-". The "+" tells AV to send a command when an event occurs (like Channel ON), while "-" tells AV send a command when the opposite action happens (e.g. Stop).

Comma separates the function lamp indicator from the function circuit board input assignment.

Some commands tend to be very long. Make sure that single line does not exceed 250 characters. You may consider using shorter REMOTECONTROL identifiers.

```
IDD_StartN=,<Start control><Channel ON/OFF Event>
IDD_StopN=<Deck Loaded Event>,<Stop control>;<Deck Unloaded Event>
```

<Start control> specifies the external GPIO command, which triggers start on the deck. In Axia 5-pin gpio convention, it is Pin 1 going Low, i.e. "GPO N L".

<Stop control> specifies external GPIO command which triggers stop on the deck. In Axia 5-pin gpio convention it is Pin 1 going High, i.e. "GPO N H".

\<Deck Loaded Event\> is a command, which is sent out by Audio Vault once deck is loaded. To make it light up the OFF button on the control surface, we need to send READY (Pin 5 Low): "GPI N xxxxL". This command needs to be sent with "+" prefix.

\<Deck Unloaded Event\> is a command, which is sent out by Audio Vault once deck is cleared. To make the OFF light go off on the control surface, we need to send READY (Pin 5 High): "GPI N xxxxH". This command needs to be sent with "-" prefix.

\<Channel ON/OFF Event\> defines commands to be sent when channel changes state fo ON or OFF. The ON command will be indicated by the "+" prefix: "+GPI N LH", while the OFF command is indicated by "-" prefix: "-GPI N HL".

Axia protocol requires LOGIN before sending to it any commands changing pin state. We are going to add "LOGIN\r\n" to every command sent by Audio Vault. Technically LOGIN is required only once, but it can be as well sent with each command.

In order to activate GPIO indications, Audio Vault must send a subscription message "ADD GPO". It can be done as a part of <Deck Loaded> event.

The following example demonstrates full control implemented for Decks 1 and 2. Each deck uses a different GPIO port. In Axia setup, GPIO ports are associated with the Livewire channel corresponding to the Audio Source (Wave Out Device) with the same index. In other words "GPI 1" will control "Axia Wave01" playback device. It is assumed that Audio Vault is using "Axia Wave01" for Deck 1, "Axia Wave02" for Deck 2, etc.

Examples

```
IDD_Start1=UDP1:+LOGIN\r\nGPI 1 LH\r\n,UDP1:GPO 1 L;UDP1:-LOGIN\r\nGPI 1
    HL\r\n;
IDD_Stop1=UDP1:+ADD GPO\r\nLOGIN\r\nGPI 1 xxxxL\r\n,UDP1:GPO 1 H;UDP1:-
    LOGIN\r\nGPI 1 xxxxH\r\n;

IDD_Start2=UDP1:+LOGIN\r\nGPI 2 LH\r\n,UDP1:GPO 2 L;UDP1:-LOGIN\r\nGPI 2
    HL\r\n;
IDD_Stop2=UDP1:+ADD GPO\r\nLOGIN\r\nGPI 2 xxxxL\r\n,UDP1:GPO 2 H;UDP1:-
    LOGIN\r\nGPI 2 xxxxH\r\n;
```

Examples above use READY signal. You need to make sure that this function is enabled in "Source Profile" on your Element:

Extra outputs

In order to control extra GPIO outputs from Audio Vault on an external GPIO unit, you need to specify additional TCP connection parameters:

```
[REMOTECONTROL.AXIAGPIOAUX]
DeviceType=Socket
Protocol=TCP
SocketType=caller
HostName=192.168.2.210
ServiceName=93
```

In this example, 192.168.2.210 is an IP address of the external GPIO unit.

We are going to extend the previous example with control of output pins on port 1 on AXIAGPIOAUX. Pin 1 will go Low when channel is turned ON, Pin 2 will go Low when channel is turned OFF.

Example of controlling multiple outputs from single Audio Vault event:

```
IDD_Start1= UDP1:+LOGIN\r\nGPI 1 LH\r\n,UDP1:GPO 1 L;UDP1:-LOGIN\r\nGPI 1
    HL\r\n;AXIAGPIOAUX:+LOGIN\r\nGPO 1 LH\r\n;AXIAGPIOAUX:-LOGIN\r\nGPO 1
    HL\r\n;
```

Multiple buttons per function

Sometimes Audio VAULT Deck needs to be activated by two different GPIO signals, e.g. regular ON/OFF control from Element Control Surface and external RIOT box. This can be accomplished by separating multiple assignments with a semicolon.

Example:

```
IDD_Start1=,UDP1:GPO 1 L;UDP1:+LOGIN\r\nGPI 1 LH\r\n;UDP1:-LOGIN\r\nGPI 1
    HL\r\n;,TCP43:IN0.1+;TCP43:+OUT0.1+OUT0.2-;TCP43:-OUT0.1-OUT0.2+;
```

IDD_Stop1=UDP1: +ADD GPO\r\nLOGIN\r\nGPI 1 xxxxL\r\n,UDP1:GPO 1 H;UDP1:-
LOGIN\r\nGPI 1 xxxxH\r\n; ,TCP43:IN0.2+;TCP43: +OUT0.2+;TCP43:-OUT0.2-;

In this example, we assume TCP43 is a connection to BE RIOT GPIO device.