ATTEROTECH®
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Axiom

Audio Extension I/O Modules

3rd Party Control API

1 Axiom Control Overview

The Axiom family of products utilize a simple ASCII based protocol for device control.   This document describes the device control for the Axiom BT1 and USB1.

1.1 Transport

There are different methods of transport available to control Axiom devices. The different methods depend on the installed configuration of the Axiom device. Axiom devices can be installed using the Axiom AXPIO as the interface device, or can be connected to the Axiom port of the AXON D2i device. When an Axiom device is connected to a AXPIO an RS232 port of a PC or other device can be used to send commands to the Axiom device. When connected to a Axon D2i, the D2i Ethernet interface using UDP port 49494 is used to interface to the device.

Additionally on both the USB1 and the BT1 the USB Mini port on the device can be used as a direct interface to the device. When attached to a PC the USB port appears as a COM port. Use any available COM port utility, such as PuTTY, to interface to the Axiom device.

1.2 Message Format

The ASCII control messages have a very simple format. No matter what the device, the format of the message is always the same. The overall format of the message contains only printable ASCII characters so that they can be debugged easily. Each message contains a number of data fields each separated by a space. A carriage return terminates the message. The general format of a message is shown below:

<Command> <Parameter1> <Parameter2><CR>

Field Name	Description
<Command>	The command that will be given to the device.
<Parameter1>	First optional parameter. See device command tables below for specific details.
<Parameter2>	Second optional parameter. See device command tables below for specific details.
<CR>	Carriage return character (ASCII character 13).

Table 1 – Common ASCII Command Format

A typical message would look something like the following:

SET_AXIOM_OV 50 75<CR>

1.3 Command Responses

Each command sent to a device should return a response. Like the original command, the response only contains printable ASCII characters, each field is separated by a space and the message is terminated carriage return. The general format of a response message is shown below.

<ACK> <Command> <Parameter1> <Parameter2><CR>

Field Name	Description
<ACK>	Success or failure indication: "ACK" if successful; "NACK if unsuccessful.
<Command>	The original command that was given to the device.

`<Parameter1>`	First optional parameter from the original command message.
`<Parameter2>`	Second optional parameter from the original command message.
`<CR>`	Carriage return character (ASCII character 13).

Table 2 – Common ASCII Response Format

If the command is successful, the device will return an ACK response. The ACK message for our example message above would be

```
ACK SET_AXIOM_OV 50 75<CR>
```

If the command is processed but for some reason unsuccessful, the device will return a NACK response instead of an ACK. Just like the ACK, the original command will also be included in the NACK message.

```
NACK SET_AXIOM_OV 50 75<CR>
```

There are cases where the device will not respond to a command at all. This is caused when the device is unable to process the message it was sent for some reason. The most typical situation where this could happen is that the terminating <CR> character missing. Alternatively, it could also be that the device is currently supporting the wrong command interface.

2 BT1 Command Overview

The following commands are available for the BT1.

Description	Command	Param 1	Param 2
Version Info	VERSION	-	-
Bootloader Version Info	BVERSION	-	-
Identify Device	ID	Mode (0 = Off, 1= On)	-
Get Current Settings	QUERY	-	-
Get Model	MODEL	-	-
Restore Default Settings	DEFAULTS	-	-
Reboot Device	REBOOT	-	-
Get Axiom Output Volumes	GET_AXIOM_OV	-	-
Set Axiom Output Volumes	SET_AXIOM_OV	Axiom Bluetooth Audio Output Volume (0 to 100)	Axiom AUX Audio Output Volume (0 to 100)
Get AUX Output Volume	GET_AUX_OV	-	-
Set AUX Output Volume	SET_AUX_OV	AUX Output Volume (0 to 100)	-
Get Bluetooth Playback Stereo Mode	GET_BTSTEREO	-	-
Set Bluetooth Playback Stereo Mode	SET_BTSTEREO	Mode (0 = Mono, 1 = Stereo)	-
Get Bluetooth RSSI	RSSI	-	-
Clear Bluetooth Cache	CBC	-	-
Get/Set Bluetooth Name	BTN	Optional Parameter: Name	-
Get Bluetooth Status	BTS	-	-
Get/Set Bluetooth Functionality Mode	BTMODE	Optional Parameter: Mode (0 to 2)	-
Get/Set Bluetooth Front Panel Button Lock	BTL	Optional Parameter: Mode (0 = Off, 1 = On)	-
Simulate Bluetooth Front Panel Button Press	BTB	-	-
Get/Set Bluetooth Connection Mode	BTCMODE	Optional Parameter: Mode (0 to 2)	-
Bluetooth Close Connection	BCC	-	-
Get Bluetooth MAC Address	BTMAC	-	-
Reset Bluetooth Module	BTRST	-	-
Play Bluetooth Audio	BTPLAY	-	-
Pause Bluetooth Audio	BTPAUSE	-	-
Stop Bluetooth Audio	BTSTOP	-	-

Select Next Track on Bluetooth Device	BTNEXT	-	-
Select Previous Track on Bluetooth Device	BTPREV	-	-
Increase Bluetooth Volume	BTVOLUP	-	-
Decrease Bluetooth Volume	BTVOLDN	-	-
Get Connected Bluetooth Device Name	BTCDN	-	-
Get Bluetooth Track Title	BTSONG	-	-
Get Bluetooth Track Artist	BTARTIST	-	-
Get Bluetooth Track Album	BTALBUM	-	-
Get AUX Jack Detect State	AUX_DETECT	-	-
MCU Firmware Update	FWUPDATE	-	-
Bluetooth Module Update	BTUPDATE	-	-
Bluetooth Module Version	BTVERSION	-	-
MCU Firmware Update	FWUPDATE	-	-
Bluetooth Module Update	BTUPDATE	-	-
Bluetooth Module Version	BTVERSION	-	-
Bluetooth Pair List	BTPAIRLIST	-	-
Bluetooth Pair Info	BTPAIRINFO	MAC Address	-
Bluetooth Keep Pair	BTKEEPPAIR	MAC Address	Mode (0 = Off, 1 = On)

Table 3 – BT1 Command Set

2.1 Firmware/Bootloader Version

A VERSION command shall return the MCU firmware version of the device.
A BVERSION command shall return the MCU version of the bootloader.

Description of Command	Example Command	Example Response	Description of Response
Recall MCU firmware version	VERSION<CR>	ACK VERSION 1.0<CR>	Firmware version is 1.0
Recall MCU bootloader version	BVERSION<CR>	ACK BVERSION 1.0<CR>	Bootloader version is 1.0

Table 4 – Version Recall Syntax Example

2.2 Identify

Used to find a device by flashing the device's front panel LED. When the identify function is activated, the LED will flash white on and off at a duty cycle of 1 second. The Identify Device command (ID) turns on the identify function and it will remain active until the appropriate identify command is sent to turn it off, or the device is factory reset or power cycled.

Description of Command	Example Command	Example Response	Description of Response
Turn on identify function	ID 1<CR>	ACK ID 1<CR>	The identify function is activated
Turn off identify function	ID 0<CR>	ACK ID 0<CR>	The identify function is deactivated

Table 5 – Identify Device Syntax Example

2.3 Query

A QUERY command returns a concatenated version of the "get" commands in a single response. The values in the response are space-delimited.

Note: *In the Bluetooth name ("BTN"), a space is represented by the · character (Keystroke: Alt+0183).*

Description of Command	Example Command	Example Response	Description of Response
Query for device state	QUERY<CR>	ACK QUERY ID=0 AXIOM_OV_BT=75 AXIOM_OV_AUX=75 AUX_OV=75 BTSTEREO=0 BTN=BT1-cc:48:13 BTS=0 BTMODE=1 BTL=0 BTCMODE=0<CR>	Identify Mode = Off, Axiom Bluetooth and AUX Output Volumes = 75, AUX Output Volume = 75, Bluetooth Playback=Mono, Bluetooth Name = BT1-cc:48:13, Bluetooth Status = IDLE, Bluetooth Mode = Media Bridging, Bluetooth Button Lock = Off, Bluetooth Connect Mode = Manual

Table 6 - Query Syntax Example

2.4 Get Model

This command requests the model of the device's MCU firmware.

Note: *The value returned is hard-coded into firmware itself. This can be used to ensure that the device has the correct MCU firmware loaded in it for what the device is supposed to be.*

Description of Command	Example Command	Example Response	Description of Response
Get Model	MODEL<CR>	ACK MODEL BT1<CR>	Model is BT1

Table 7 – Get Model Syntax Example

2.5   Defaults

This command forces the BT1 to restore factory default settings.

The factory default settings are as follows:
- Bluetooth Front Panel Button Lock = Off
- Bluetooth Functionality Mode = Media Audio Bridging Only
- Bluetooth Connection Mode = Manual
- Bluetooth Playback Stereo Mode = Off (Mono)
- Bluetooth Friendly Name = "BT1-xx:yy:zz" where xx:yy:zz is the lower portion of the Bluetooth MAC address
- AXIOM Bluetooth Playback Output Volume = 75
- AXIOM AUX Playback Output Volume = 75
- AUX Output Volume = 75

Description of Command	Example Command	Example Response	Description of Response
Restore default settings	DEFAULTS<CR>	ACK DEFAULTS<CR>	The device is restored to the factory default settings

Table 8 - Defaults Syntax Example

Note: *Using this command restores the device settings to the original factory values removing any user changes. It should be used with caution.*

2.6   Reboot Device

This command resets the MCU firmware application. The front panel LED will be lit red until after the device has finished rebooting, at which time the LED will be lit green.

Description of Command	Example Command	Example Response	Description of Response
Reboot device	REBOOT<CR>	ACK REBOOT<CR>	The device will reboot

Table 9 - Reboot Device Syntax Example

2.7   Get/Set Axiom Output Volumes

This command gets/sets the Axiom output volumes for Bluetooth audio and AUX audio.

This command has two parameters, representing the Axiom output volumes for Bluetooth and AUX audio, respectively. The volume parameters range from 0 (i.e., mute) through 100 (i.e., maximum volume) with a step size of 1.

The Axiom output volume parameter for Bluetooth audio is applied when the device detects that there is no AUX connector present in the AUX jack (i.e., device is in BT mode).
The Axiom output volume parameter for AUX audio is applied when the device detects an AUX connector in the AUX jack (i.e., device is in AUX mode).

Description of Command	Example Command	Example Response	Description of Response
Get Axiom output volumes	GET_AXIOM_OV<CR>	ACK GET_AXIOM_OV 75 75<CR>	Axiom output volumes are 75 for Bluetooth and AUX

Set Axiom output volumes: Bluetooth = 50 AUX = 75	SET_AXIOM_OV 50 75<CR>	ACK SET_AXIOM_OV 50 75<CR>	Axiom output volumes are 50 for Bluetooth and 75 for AUX

<p align="center">**Table 10 - Get/Set Axiom Output Volumes Syntax Example**</p>

2.8   Get/Set AUX Output Volume

This command gets/sets the AUX output volume.

This command has one parameter, representing the AUX output volume. The volume parameter ranges from 0 (i.e., mute) through 100 (i.e., maximum volume) with a step size of 1.

Description of Command	Example Command	Example Response	Description of Response
Get AUX output volume	GET_AUX_OV<CR>	ACK GET_AUX_OV 75<CR>	AUX output volume is 75
Set AUX output volume to 60	SET_AUX_OV 60<CR>	ACK SET_AUX_OV 60<CR>	AUX output volume is 60

<p align="center">**Table 11 - Get/Set AUX Output Volume Syntax Example**</p>

2.9   Get/Set Bluetooth Playback Stereo Mode

This command gets/sets the stereo mode for Bluetooth playback via the Axiom port.

This command has one parameter representing the stereo mode. The parameter values are:
- 0 = Stereo disabled (Mono enabled)
- 1 = Stereo enabled (Mono disabled)

The stereo mode only applies to Bluetooth media streaming, where all of the following are true:
- The device detects that there is no AUX connector present in the AUX jack (i.e., device is in BT mode).
- The device has Bluetooth media audio bridging only enabled (i.e., BTMODE = 1).

The table below illustrates the Axiom port audio mapping with regards to the Bluetooth playback stereo mode.

Stereo Mode	Bluetooth Bridging	Axiom Pair A	Axiom Pair B
N/A	1x1 Call Bridging	BT Mic	BT Far End
1	2x0 Media Audio Bridging	BT Playback Left	BT Playback Right
0	1x0 Media Audio Bridging	BT Playback Mono	N/A (Axiom Daisy Chain Input)

<p align="center">**Table 12 - Axiom Port Audio Mapping**</p>

Description of Command	Example Command	Example Response	Description of Response
Get stereo mode	GET_BTSTEREO<CR>	ACK GET_BTSTEREO 0<CR>	Bluetooth playback stereo mode off
Set stereo mode on	SET_BTSTEREO 1<CR>	ACK SET_BTSTEREO 1<CR>	Bluetooth playback stereo mode on

<p align="center">**Table 13 - Get/Set Bluetooth Playback Stereo Mode Syntax Example**</p>

2.10 Get Bluetooth RSSI

This command requests the Receiver Signal Strength Indication (RSSI) value of the active Bluetooth connection. The returned RSSI value can range from -128 (poor link) to 20 (good link).

When the device does not have an active Bluetooth connection (i.e., Bluetooth status is IDLE or DISCOVERABLE), then the command response shall be "ACK RSSI NONE<CR>".

Description of Command	Example Command	Example Response	Description of Response
Get RSSI from active Bluetooth connection	RSSI<CR>	ACK RSSI 15<CR>	Bluetooth RSSI value is 15
Attempt to get RSSI (no active Bluetooth connection)	RSSI<CR>	ACK RSSI NONE<CR>	There is no active Bluetooth connection

Table 14 - Get Bluetooth RSSI Syntax Example

2.11 Clear Bluetooth Cache

This command clears the cached Bluetooth pairings stored in the Bluetooth module.

Description of Command	Example Command	Example Response	Description of Response
Clear cached Bluetooth pairings	CBC<CR>	ACK CBC<CR>	The device has cleared the cached Bluetooth pairings

Table 15 - Clear Bluetooth Cache Syntax Example

2.12 Get/Set Bluetooth Friendly Name

This command gets/sets the Bluetooth friendly name. The maximum name length is 31 characters. In the Bluetooth name, a space is represented by the · character (Keystroke: Alt+0183). For example, the parameter "Example·Name" represents the name "Example Name".

Description of Command	Example Command	Example Response	Description of Response
Get Bluetooth friendly name	BTN<CR>	ACK BTN BT1-cc:48:13<CR>	The Bluetooth friendly name is "BTN BT1-cc:48:13"
Set Bluetooth friendly name	BTN RoomA·BT1<CR>	ACK BTN RoomA·BT1<CR>	The Bluetooth friendly name is "RoomA BT1"

Table 16 - Get/Set Bluetooth Friendly Name Syntax Example

2.13 Get Bluetooth Status

This command gets the Bluetooth status, which represents the state of the MCU application. If the device has an active Bluetooth connection, then the status also indicates whether there is an active AVRCP connection.

An active AVRCP connection indicates that the connected Bluetooth device may support the following features:
- Pass-through commands: BTPLAY, BTPAUSE, BTSTOP, BTNEXT, BTPREV.
- Bluetooth track metadata: BTSONG, BTARTIST, BTALBUM.

The status values are:
- 0 = IDLE
- 1 = DISCOVERABLE
- 2 = CONNECTED – There is no AVRCP connection*
- 3 = CONNECTED – There is an active AVRCP connection

*Note that it may take several seconds for the AVRCP connection to establish.

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Description of Command	Example Command	Example Response	Description of Response
Get Bluetooth status	BTS<CR>	ACK BTS 0<CR>	Bluetooth status is IDLE.

Table 17 - Get Bluetooth Status Syntax Example

2.14   Get/Set Bluetooth Functionality Mode

This command gets/sets the Bluetooth functionality mode, which configures the Bluetooth profiles supported by the device.

The acceptable parameter values are:
- 0 = Both Call Bridging and Media Audio Bridging enabled
- 1 = Only Media Audio Bridging enabled (Default)
- 2 = Only Call Bridging enabled

The Bluetooth functionality mode cannot be changed during an active Bluetooth connection. If there is an active Bluetooth connection, then this setter command response will be NACK.

Description of Command	Example Command	Example Response	Description of Response
Get Bluetooth functionality mode	BTMODE<CR>	ACK BTMODE 1<CR>	Bluetooth functionality mode is media bridging only
Set Bluetooth functionality mode to call bridging only	BTMODE 2<CR>	ACK BTMODE 2<CR>	Bluetooth functionality mode is call bridging only

Table 18 - Get/Set Bluetooth Functionality Mode Syntax Example

2.15   Get/Set Bluetooth Front Panel Button Lock

This command gets/sets the Bluetooth front panel button lock state (0 = unlock, 1 = lock). When the front panel button is locked, all front panel button presses will be ignored. This lock state has no effect on the BTB command.

Description of Command	Example Command	Example Response	Description of Response
Get the Bluetooth front panel button lock state	BTL<CR>	ACK BTL 0<CR>	Bluetooth front panel button lock state is unlocked
Set the Bluetooth front panel button lock state to locked	BTL 1<CR>	ACK BTL 1<CR>	Bluetooth front panel button lock state is locked

Table 19 - Get/Set Bluetooth Front Panel Button Lock Syntax Example

2.16   Simulate Bluetooth Front Panel Button Press

This command simulates a Bluetooth front panel button press. If the device's Bluetooth connection mode is "Exclusive Reconnect Mode" and the exclusive Bluetooth device has already been designated, then this command will have no effect.

Description of Command	Example Command	Example Response	Description of Response
Simulate a Bluetooth front panel button press	BTB<CR>	ACK BTB<CR>	Device simulated button press

Table 20 - Simulate Bluetooth Front Panel Button Press Syntax Example

2.17   Get/Set Bluetooth Connection Mode

This command sets/gets the Bluetooth connection mode.

The three connection modes are:

- 0 = Manual Reconnect Mode (Default)
  - o User must press front panel button or send "BTB" command to connect BT device.
- 1 = Reconnect Mode
  - o User can connect BT device without pressing front panel button, if the BT device has previously paired.
- 2 = Exclusive Reconnect Mode
  - o User can connect an exclusive BT device without pressing front panel button, if the BT device is set as the exclusive BT device.

For Exclusive Reconnect Mode, the two ways to set the exclusive BT device are:
- Set the connection mode to Exclusive Reconnect Mode. Clear Bluetooth cached pairings ("CBC" command). Press front panel button or send "BTB" command to activate BT discovery mode. Connect the BT device.
- Connect the BT device in Manual Reconnect Mode or Reconnect Mode. Set the connection mode to Exclusive Reconnect Mode.

Description of Command	Example Command	Example Response	Description of Response
Get Bluetooth connection mode	BTCMODE<CR>	ACK BTCMODE 0<CR>	Bluetooth connection mode is Manual Reconnect Mode
Set Bluetooth connection mode to Reconnect Mode	BTCMODE 1<CR>	ACK BTCMODE 1<CR>	Bluetooth connection mode is Reconnect Mode

Table 21 - Get/Set Bluetooth Connection Mode Syntax Example

2.18 Bluetooth Close Connection

This command closes an active Bluetooth connection.

Description of Command	Example Command	Example Response	Description of Response
Close active Bluetooth connection	BCC<CR>	ACK BCC<CR>	Device has closed the Bluetooth connection

Table 22 - Close Bluetooth Connection Syntax Example

2.19 Get Bluetooth MAC Address

This command gets the Bluetooth module MAC address.

Description of Command	Example Command	Example Response	Description of Response
Get Bluetooth MAC address	BTMAC<CR>	ACK BTMAC 00:07:80:cc:48:13<CR>	Bluetooth module MAC address is 00:07:80:cc:48:13

Table 23 - Get Bluetooth MAC Address Syntax Example

2.20 Reset Bluetooth Module

This command forces a soft reset of the Bluetooth module.

Description of Command	Example Command	Example Response	Description of Response
Reset Bluetooth module	BTRST<CR>	ACK BTRST<CR>	Device has reset the Bluetooth module

Table 24 - Reset Bluetooth Module Syntax Example

2.21 Play Bluetooth Audio

This command sends a Bluetooth AVRCP (Audio/Video Remote Control Profile) pass-through command to play audio streaming from the connected Bluetooth device.

This command requires an active Bluetooth connection with AVRCP or AVRCP PDU support (i.e., BTS = 4 or 5). If there is no active Bluetooth connection, the response will be NACK. If the Bluetooth connection does not support AVRCP or AVRCP PDU, then this command will have no effect.

Description of Command	Example Command	Example Response	Description of Response
Play Bluetooth audio	BTPLAY<CR>	ACK BTPLAY<CR>	Device sent AVRCP command to play Bluetooth audio from connected Bluetooth device

Table 25 - Play Bluetooth Audio Syntax Example

2.22   Pause Bluetooth Audio

This command sends a Bluetooth AVRCP (Audio/Video Remote Control Profile) pass-through command to pause the audio streaming from the connected Bluetooth device.

This command requires an active Bluetooth connection with AVRCP or AVRCP PDU support (i.e., BTS = 4 or 5). If there is no Bluetooth connection, the response will be NACK. If the Bluetooth connection does not support AVRCP or AVRCP PDU, then this command will have no effect.

Description of Command	Example Command	Example Response	Description of Response
Pause Bluetooth audio	BTPAUSE<CR>	ACK BTPAUSE<CR>	Device sent AVRCP command to pause Bluetooth audio from connected Bluetooth device

Table 26 - Pause Bluetooth Audio Syntax Example

2.23   Stop Bluetooth Audio

This command sends a Bluetooth AVRCP (Audio/Video Remote Control Profile) pass-through command to stop the audio streaming from the connected Bluetooth device.

This command requires an active Bluetooth connection with AVRCP or AVRCP PDU support (i.e., BTS = 4 or 5). If there is no active Bluetooth connection, the response will be NACK. If the Bluetooth connection does not support AVRCP or AVRCP PDU, then this command will have no effect.

Description of Command	Example Command	Example Response	Description of Response
Stop Bluetooth audio	BTSTOP<CR>	ACK BTSTOP<CR>	Device sent AVRCP command to stop Bluetooth audio from connected Bluetooth device

Table 27 - Stop Bluetooth Audio Syntax Example

2.24   Select Next Track on Bluetooth Device

This command sends a Bluetooth AVRCP (Audio/Video Remote Control Profile) pass-through command to select the next track on the connected Bluetooth device.

This command requires an active Bluetooth connection with AVRCP or AVRCP PDU support (i.e., BTS = 4 or 5). If there is no active Bluetooth connection, the response will be NACK. If the Bluetooth connection does not support AVRCP or AVRCP PDU, then this command will have no effect.

Description of Command	Example Command	Example Response	Description of Response

Select next track	BTNEXT<CR>	ACK BTNEXT<CR>	Device sent AVRCP command to select next track

Table 28 - Select Next Bluetooth Track Syntax Example

2.25   Select Previous Track on Bluetooth Device

This command sends a Bluetooth AVRCP (Audio/Video Remote Control Profile) pass-through command to select the previous track on the connected Bluetooth device.

This command requires an active Bluetooth connection with AVRCP or AVRCP PDU support (i.e., BTS = 4 or 5). If there is no active Bluetooth connection, the response will be NACK. If the Bluetooth connection does not support AVRCP or AVRCP PDU, then this command will have no effect.

Description of Command	Example Command	Example Response	Description of Response
Select previous track	BTPREV<CR>	ACK BTPREV<CR>	Device sent AVRCP command to select previous track

Table 29 - Select Previous Bluetooth Track Syntax Example

2.26   Increase Bluetooth Volume

This command increases the Bluetooth volume by one. The range for volume level is 0 through 15. If the volume level has already reached 15, then this command will do nothing.

This command requires a Bluetooth connection, otherwise the command will have no effect on Bluetooth volume.

Description of Command	Example Command	Example Response	Description of Response
Increase Bluetooth volume	BTVOLUP<CR>	ACK BTVOLUP<CR>	Increased Bluetooth module volume

Table 30 - Increase Bluetooth Volume Syntax Example

2.27   Decrease Bluetooth Volume

This command decreases the Bluetooth volume by one. The range for volume level is 0 through 15. If the volume level has already reached 0, then this command will do nothing.

This command requires a Bluetooth connection, otherwise the command will have no effect on Bluetooth volume.

Description of Command	Example Command	Example Response	Description of Response
Decrease Bluetooth volume	BTVOLDN<CR>	ACK BTVOLDN<CR>	Decreased Bluetooth module volume

Table 31 - Decrease Bluetooth Volume Syntax Example

2.28   Get Connected Bluetooth Device Name

This command requests the Bluetooth friendly name of the connected Bluetooth device.

This command requires an active Bluetooth connection, otherwise the response will be NACK.
This command does not require AVRCP or AVRCP PDU support.

Description of Command	Example Command	Example Response	Description of Response
Get the connected device name	BTCDN<CR>	ACK BTCDN "Phone 1"<CR>	Connected device name is "Phone 1"

2.29   Get Bluetooth Track Title

This command requests the title of the track selected on the connected Bluetooth device.

This command requires an active Bluetooth connection with AVRCP PDU support (i.e., BTS = 5), otherwise this command will return a blank string. If there is no active Bluetooth connection, the response will be NACK.

Description of Command	Example Command	Example Response	Description of Response
Get Bluetooth track title	BTSONG<CR>	ACK BTSONG "Track 1"<CR>	Bluetooth track title is "Track 1"

Table 34 - Get Bluetooth Track Title Syntax Example

2.30   Get Bluetooth Track Artist

This command requests the artist name of the track selected on the connected Bluetooth device.

This command requires an active Bluetooth connection with AVRCP PDU support (i.e., BTS = 5), otherwise this command will return a blank string. If there is no active Bluetooth connection, the response will be NACK.

Description of Command	Example Command	Example Response	Description of Response
Get Bluetooth track artist	BTARTIST<CR>	ACK BTARTIST "Artist 1"<CR>	Bluetooth track artist is "Artist 1"

Table 35 - Get Bluetooth Track Artist Syntax Example

2.31   Get Bluetooth Track Album

This command requests the album title of the track selected on the connected Bluetooth device.

This command requires an active Bluetooth connection with AVRCP PDU support (i.e., BTS = 5), otherwise this command will return a blank string. If there is no active Bluetooth connection, the response will be NACK.

Description of Command	Example Command	Example Response	Description of Response
Get Bluetooth track album title	BTALBUM<CR>	ACK BTALBUM "Album 1"<CR>	Bluetooth track album title is "Album 1"

Table 36 - Get Bluetooth Track Album Syntax Example

2.32   Get AUX Jack Detect State

This command gets the state of the AUX jack detection.

This command returns a single parameter:
- 0 = The MCU detects no presence on the AUX jack.
- 1 = The MCU detects a presence on the AUX jack.

Description of Command	Example Command	Example Response	Description of Response
Get AUX jack detect state	AUX_DETECT<CR>	ACK AUX_DETECT 0<CR>	MCU detects no presence on the AUX jack
Get AUX jack detect state	AUX_DETECT<CR>	ACK AUX_DETECT 1<CR>	MCU detects a presence on the AUX jack

Table 37 - Get AUX Jack Detect State Syntax Example

2.33   Firmware Update

This command initiates the MCU firmware update process. Upon reception of this command, the MCU will enter the bootloader in the firmware update state. Note that the firmware update process uses the USB serial connection.

Description of Command	Example Command	Example Response	Description of Response
Initiate firmware update	FWUPDATE	N/A	This command has no response

Table 38 - Firmware Update Syntax Example

2.34   Get Bluetooth Pairing List

The BTPAIRIST command returns the MAC address of every Bluetooth device in the pairing list.

Description of Command	Example Command	Example Response	Description of Response
Get Bluetooth Pairing list	BTPAIRLIST<CR>	ACK BTLIST 11:22:33:44:55:66 77:88:99:AA:BB:CC<CR>	Two devices are present in the pairing list, which have MAC addresses of 11:22:33:44:55:66 and 77:88:99:AA:BB:CC.

Table 39 – Get Bluetooth Pairing List Syntax Example

2.35   Get Bluetooth Pairing Info

The BTPAIRINFO command returns the Bluetooth pairing information for the device with the given MAC address. The response contains the target device's Bluetooth friendly name in quotes and the "keep" priority setting.

Description of Command	Example Command	Example Response	Description of Response
Get Bluetooth Pairing Info	BTPAIRINFO 11:22:33:44:55:66<CR>	ACK BTPAIRINFO 11:22:33:44:55:66 "Johns iPhone" KEEP=1 <CR>	The paired device with MAC address 11:22:33:44:55:66 is named "Johns iPhone" and has Keep priority enabled.

Table 40 - Get Bluetooth Pairing Info Syntax Example

2.36 Set Bluetooth Keep Priority

The BTKEEP command sets the "Keep" Bluetooth pairing configuration for the given MAC address. The parameter is 0 = Keep Disabled, 1 = Keep Enabled.

Description of Command	Example Command	Example Response	Description of Response
Set Bluetooth Keep On	BTKEEP 11:22:33:44:55:66 1<CR>	ACK BTKEEP 11:22:33:44:55:66 1<CR>	Enabled the Bluetooth "Keep" pairing priority for paired device with MAC address 11:22:33:44:55:66

Table 41 – Set Bluetooth Keep Priority Syntax Example

3.0 USB1 Supported ASCII Command Set

The following commands are available for the USB1.

Description	Command	Param	
System			
Version Info	VERSION	-	-
Bootloader Version Info	BVERSION	-	-
Identify Device	ID	Mode (0: Off, 1: On)	-
Get Current Settings	QUERY	-	-
Get Model	MODEL	-	-
Restore Default Settings	DEFAULTS	-	-
Reboot Device	REBOOT	-	-
Get Control Mode	CM	-	-
Set Control Mode	CM	Control Mode	-
Get Audio Mode	AM	-	-
Set Audio Mode	AM	Audio Mode	-
USB			
Get USB Connected	USBC	-	-
Get USB Device Name	USBN	-	-
Set USB Device Name	USBN	Name	-
Get Call State	USBCS	-	-
Set Call State	USBCS	State (0: Inactive, 1: Active)	-
Codec			
Get Playback Volume	PV	Channel ([0..2])	-
Set Playback Volume	PV	Channel ([0..2])	Volume ([-100..0])
Get Playback Mute	PM	-	-
Set Playback Mute	PM	State (0: Unmuted, 1: Muted)	-
Get Record Volume	RV	-	-
Get Record Mute	RM	-	-
Set Record Mute	RM	State (0: Unmuted, 1: Muted)	-

Table 3 – USB1 Command Set

3.1   Firmware/Bootloader Version

A VERSION command shall return the MCU firmware version of the device.
A BVERSION command shall return the MCU version of the bootloader.

Description of Command	Example Command	Example Response	Description of Response
Recall MCU firmware version	VERSION<CR>	ACK VERSION 1.0<CR>	Firmware version is 1.0
Recall MCU bootloader version	BVERSION<CR>	ACK BVERSION 1.0<CR>	Bootloader version is 1.0

<p align="center">Table 4 – Version Recall Syntax Example</p>

3.2   Identify

Used to find a device by flashing the device's front panel LED. When the identify function is activated, the LED will flash white on and off at a duty cycle of 1 second. The Identify Device command (ID) turns on the identify function and it will remain active until the appropriate identify command is sent to turn it off, or the device is factory reset or power cycled.

Description of Command	Example Command	Example Response	Description of Response
Turn on identify function	ID 1<CR>	ACK ID 1<CR>	The identify function is activated
Turn off identify function	ID 0<CR>	ACK ID 0<CR>	The identify function is deactivated

<p align="center">Table 5 – Identify Device Syntax Example</p>

3.3   Query

A QUERY command returns a concatenated version of the "get" commands in a single response. The values in the response are space-delimited.

Description of Command	Example Command	Example Response	Description of Response
Query for device state	QUERY<CR>	ACK QUERY ID=0 AM=1 CM=0 PV0=0 .0 PV1=-10.0 PV2=-8.0 RV=-5.0 PM=0 RM=0 <CR>	Identify Mode = Off, Audio Mode = Playback only, Control Mode = OS only, Master Playback Volume = 0.0 dB, Channel 1 Playback Volume = -10.0 dB, Channel 2 Playback Volume = -8.0 dB, Record Volume = -5.0 dB Playback Mute = Off, Record Mute = Off

<p align="center">Table 6 - Query Syntax Example</p>

3.4   Get Model

This command requests the model of the device's MCU firmware.

Note: *The value returned is hard-coded into firmware itself. This can be used to ensure that the device has the correct MCU firmware loaded in it for what the device is supposed to be.*

Description of Command	Example Command	Example Response	Description of Response

| Get Model | MODEL<CR> | ACK MODEL USB1<CR> | Model is USB1 |

Table 7 – Get Model Syntax Example

3.5   Defaults

This command forces the USB1 to restore factory default settings.

The factory default settings are as follows:
- USB Product Description = Axiom-USB1
- Audio Mode = 1x1 Playback + Record
- Control Mode = OS Only
- Channel 1 and 2 Playback Volume = 0

Description of Command	Example Command	Example Response	Description of Response
Restore default settings	DEFAULTS<CR>	ACK DEFAULTS<CR>	The device is restored to the factory default settings

Table 8 - Defaults Syntax Example

Note: *Using this command restores the device settings to the original factory values removing any user changes. It should be used with caution.*

3.6   Reboot Device

This command resets the MCU firmware application.

Description of Command	Example Command	Example Response	Description of Response
Reboot device	REBOOT<CR>	ACK REBOOT<CR>	The device will reboot

Table 9 - Reboot Device Syntax Example

3.7   Get/Set Control Mode

The CM command gets or sets the control mode. The single optional parameter specifies the control mode.
- 0 = Standalone
- 1 = Passthrough

Description of Command	Example Command	Example Response	Description of Response
Get control mode	CM<CR>	ACK CM 0<CR>	The control mode is configured for Standalone
Set control mode to Passthrough	CM 1<CR>	ACK CM 1<CR>	The control mode has been set to Passthrough

Table 12 - Get/Set Control Mode Syntax Example

3.8   Get/Set Audio Mode

The AM command gets or sets the USB audio mode. The single optional parameter specifies the audio mode, if setting:
- 0 = 1x1 Playback/Record - Speakerphone (no host AEC)
- 1 = 1x1 Playback/Record - Speakerphone (host AEC)
- 2 = 2x0 Playback - Line out
- 3 = 1x0 Playback - Line out

Description of Command	Example Command	Example Response	Description of Response
Get audio mode	AM<CR>	ACK AM 0<CR>	The audio mode is configured for 1x1 Playback/Record Speakerphone (no host AEC)
Set audio mode to 2x0 Playback Line out	AM 2<CR>	ACK AM 2<CR>	The audio mode has been set to 2x0 Playback Line out

Table 13 - Get/Set Advanced Mode Syntax Example

3.9   Get USB Connected

The USBC command gets the USB audio port connection state (0: Disconnected, 1: Connected). This command has no parameters.

Description of Command	Example Command	Example Response	Description of Response
Get USB connection state	USBC<CR>	ACK USBC 1<CR>	USB is connected to the USB1

Table 13 - Get USB Connected Syntax Example

3.10   Get/Set USB Device Name

The USBN command gets or sets the USB friendly name. The single optional parameter specifies the friendly name, if setting. The name must be between 2 and 32 characters, and must be enclosed in quotes if it includes spaces. The returned name will always be enclosed in quotes.

Description of Command	Example Command	Example Response	Description of Response
Get USB friendly name	USBN<CR>	ACK USBN "USB1"<CR>	USB friendly name is "USB1"
Set USB friendly name to "Lobby"	USBN Lobby<CR>	ACK USBN "Lobby"<CR>	Set USB friendly name to "Lobby"
Set USB friendly name to "Conference Room"	USBN "Conference Room"<CR>	ACK USBN "Conference Room"<CR>	Set USB friendly name to "Conference Room"

Table 13 - Get/Set USB Device Name Syntax Example

3.11   Get/Set Call State

The USBCS command gets or sets the call state (0: Inactive, 1: Active). The single optional parameter specifies the call state, if setting.

Description of Command	Example Command	Example Response	Description of Response
Get call state	USBCS<CR>	ACK USBCS 1<CR>	Call state is active
Set call state to inactive	USBCS 0<CR>	ACK USBCS 0<CR>	Call state is inactive

Table 13 - Get/Set Call State Syntax Example

3.12   Get/Set Playback Volume

The PV command gets or sets the USB playback volume. The first parameter specifies the channel (0 to 2), where 0 specifies the master channel, 1 specifies channel 1 (left), and 2 specifies channel 2 (right). The volume parameter ranges from -100 dB (i.e., mute) to 0 (i.e., maximum volume) with a step size of 0.1 dB.

Description of Command	Example Command	Example Response	Description of Response
Get master playback volume	PV 0 <CR>	ACK PV 0 -15.0<CR>	The master playback volume is -15 dB
Set master playback volume to 50	PV 0 -50.0<CR>	ACK PV 0 -50.0<CR>	The master playback volume is set to -50 dB
Get playback volume for channel 1	PV 1<CR>	ACK PV 1 -15<CR>	The playback volume for channel 1 is -15 dB
Set playback volume for channel 2	PV 2 -50.0<CR>	ACK PV 2 -50.0<CR>	The playback volume for channel 2 is set to -50 dB
Set playback volume for channel 2	PV 2 -50.0<CR>	NACK PV 2 -50.0<CR>	A parameter of 2 is invalid because the USB1 is not in Line Out (2x0) mode

Table 13 - Get/Set Playback Volume Syntax Example

3.13   Get/Set Playback Mute

The PM commands gets or sets the USB playback mute state (0: Unmuted, 1: Muted). The optional parameter specifies the mute state, if setting.

Description of Command	Example Command	Example Response	Description of Response
Get playback mute state	PM<CR>	ACK PM 0<CR>	Playback mute state is unmuted
Set playback mute state to muted	PM 1<CR>	ACK PM 1<CR>	Playback mute state is muted

Table 15 - Get/Set Playback Mute Syntax Example

3.14   Get Record Volume

The RV command gets the USB record volume (-100 to 0 dB). This command has no parameters.

Description of Command	Example Command	Example Response	Description of Response
Get USB record volume	RV<CR>	ACK RV -75<CR>	The USB record volume is -75 dB

Table 15 - Get/Set Playback Mute Syntax Example

3.15   Get/Set Record Mute

The RM command gets or sets the USB record mute state (0: Unmuted, 1: Muted). The optional parameter specifies the mute state, if setting.

Description of Command	Example Command	Example Response	Description of Response
Get record mute state	RM<CR>	ACK RM 0<CR>	Record mute state is unmuted
Set record mute state to muted	RM 1<CR>	ACK RM 1<CR>	Record mute state is muted

Table 16 - Get/Set Record Mute Syntax Example

3.2 Asynchronous Status Protocol

The USB1 supports asynchronous notifications sent out its Axiom port. All notifications use the same format as their corresponding command syntax.

The supported notifications are:
- USB Connected State (USBC)
- Master Playback Volume (PV 0)
- Playback Mute (PM)
- Record Volume (RV)
- Record Mute (RM)
- Call State (USBCS)

Description of Message	Message
The USB1 has connected to a host over USB	USBC 1<CR>
The USB1 has changed its master playback volume to -45 dB	PV 0 -45.0<CR>