

# Alcorn McBride Inc.



# A/V Binloop Uncompressed

# User's Manual



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Every effort has been made to assure the accuracy of the information contained in this manual, and the reliability of the Alcorn McBride A/V Binloop Uncompressed hardware and software. Errors can sometimes go undetected, however. If you find one, please bring it to our attention so that we can correct it for others. Alcorn McBride welcomes comments and suggestions on the content and layout of its documentation.

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# Welcome

## Organization of this Manual

Before you use the Binloop, it is suggested that you read this instruction manual thoroughly. The Getting Started section contains some simple operational examples and explains how to quickly get up and running with the A/V Binloop Uncompressed hardware. Later sections contain more detailed information on programming and operation, including how to integrate your Binloop into a control system and the various hardware configuration options that you'll need to set up.

## Technical Support

Should questions or issues come up, which are not covered in this User's Manual, please do not hesitate to contact us. We are here to help!

You can contact us:

<b>On The Web:</b>	<a href="http://www.alcorn.com">http://www.alcorn.com</a>
<b>By E-mail:</b>	<a href="mailto:support@alcorn.com">support@alcorn.com</a>
<b>By Phone:</b>	(407) 296-5800 (M-F 9-6 EST)

# Getting Started

In this section, you will learn how to:

- Install the Binloop
- Play a test video

## Installation

These instructions assume that you have received your Binloop from Alcorn McBride with the Controller card and the appropriate reproducers already installed. For detailed instructions and information on installing the Binloop see the **Installation Guidelines** section later in this manual.

## Unpacking Instructions

When you unpack this product you may want to consider holding on to the original packing material for shipment to the installation site, or in case you need to return it to the factory for repair or exchange.  
**PLEASE DON'T THROW AWAY THIS MANUAL!**

## Installation Instructions

The Binloop is designed to be installed in an equipment rack. It is recommended that you leave an empty space (1U) above and below the unit for free-air circulation, and install it in a climate-controlled room. **Failure to do so could result in damage or intermittent operation of the Binloop.**

**Note:** *It is always ideal to use power protection such as surge protection and/or an uninterruptible power supply to ensure a reliable power source for the Binloop.*

1. Place the Binloop in the appropriate position on the rack.
2. Insert screws into the rack-mounting holes on both sides of the unit and tighten.
3. Connect the power plug to an appropriate outlet.
4. The Binloop will operate with 100-240VAC, 6-3A Max. 60-50 Hz.
5. Connect the audio/video cables from the Reproducer outputs to the A/V equipment (i.e. displays, amplifiers, etc.)

## Playing a Test Video

Now it's time to put that nice shiny new Binloop to work and make it play some video. This section will guide you through the steps necessary to make that happen.

### Preparation

---

Before you can play video on the Binloop, you need to load video content onto an SSD (Solid State Disk). To do this, you'll need the following items:

1. **SSD**
2. **USB to SATA cable or dock**
3. **A/V Binloop Uncompressed Test Video**

#### ***Solid State Disk***

In order for reliable and trouble-free operation, please purchase your SSD's from Alcorn McBride. The A/V Binloop Uncompressed requires extremely high performance that many SSD models cannot achieve. Performance variations exist even between the same model of SSD due to internal firmware and die changes by the drive manufacturer. Drives purchased from Alcorn McBride have been tested and confirmed to work in the A/V Binloop Uncompressed. To help you select a size that suits your needs, be sure to read over **Appendix B: SSD Media Capacities**.

#### ***USB to SATA cable***

Your A/V Binloop Uncompressed came with a USB 3.0 to SATA3 cable that can be used to transfer data to the drive. Other options for transferring data to the SSD include Thunderbolt SATA docks, or an eSATA to SATA cable and power supply.

#### ***A/V Binloop Uncompressed Test Video***

The A/V Binloop Uncompressed test video can be downloaded from the test media page on our website. Here's a link:

<http://www.alcorn.com/ftp/media>

## Formatting the SSD

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*When you insert a flash card, do so with the top of the SSD to the right. The SSD should insert easily and require very little force to fully seat.*

Once you have the necessary materials, you are ready to get started. First, it is recommended that you format the SSD card in the Binloop. This can be accomplished by following these instructions:

With the SSD removed, power up the Binloop using the power switch on the back of the unit.

Press and hold the Test Button on Reproducer card. You may see the Reproducer indicate a fault (flashing red LED), but this is normal.

While holding the Test Button, insert the SSD into the SSD socket. Wait for the status LED to turn orange to indicate that the card is being formatted (approximately 5 seconds).

When the status LED turns off, the formatting is complete. You may now remove the card.

## Loading the Test Video

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Now that the SSD has been properly formatted, we're ready to load the A/V Binloop Uncompressed Test Video onto the card. Here's what you do:

1. Connect the SATA side of the USB to SATA cable to the drive.
2. Connect the USB side of the USB to SATA cable to your PC. The SSD will appear as an additional drive (i.e. Drive F:) in your computer.
3. Copy and Paste the Test Clip directory to the flash card.
4. Using the A/V Binloop Uncompressed software, index the drive by selecting the drive letter and clicking the "index" button.
5. Verify that the name of the test clip directory is **VID00001**.
6. Eject the drive and remove the SSD from the cable.

## Playing Video

---

All of your hard work is about to pay off. Follow these step-by-step instructions to play the test video in the Binloop.

1. If you have not already done so, connect a display to one of the A/V outputs of channel #1 (HDMI or 3G-SDI).
2. Insert the SSD that is loaded with the A/V Binloop Uncompressed test clip into the channel #1 SSD socket.
3. Power-up the Binloop.
4. Wait for the Binloop to finish initializing. You can determine this by watching status display and the 'READY' status LED.
5. Press the channel #1 test button. The channel #1 status LED should turn green to indicate that the video is playing.

At this point, channel #1 should be outputting video on the rear-panel connectors, and this should be apparent on your display. If it is not, please consult the **Troubleshooting Guide** for help.





# About the Binloop

## What is the Binloop?

Put simply, the A/V Binloop Uncompressed is a solid-state multi-channel video player that provides up to 8 separate channels of HD or 2K video, or up to 2 channels of UltraHD (3840x2160) or 4K (4096x2160) resolution. These video channels can be played together synchronously or independently from one another. For stand-alone applications, the Binloop can be configured to play files automatically based on a programmable timeline. For more complex applications, this product can be controlled externally by SMPTE/EBU timecode, MIDI, RS-232, Ethernet or contact closures.

That being said, the Binloop is not your everyday multi-channel video player. Its ability to provide synchronous playback, impeccable precision, and a variety of easy-to-use control interfaces requires unique system architecture. The purpose of this section is to familiarize you with how the Binloop works so that you can gain a better understanding of how best to use it to meet your goals.

## What's inside the Binloop?

The Binloop consists of four main types of components –

1. **Card Cage**
2. **Controller Card**
3. **Reproducer Card(s)**
4. **CobraNet Card or Dante/AVB Card (optional)**

## The Card Cage

*The Reproducer slots and Network Audio slot may or may not be populated depending on how your Binloop was ordered.*

The Card Cage is the 'skeleton' that integrates the components of the Binloop. This cage contains a Power Supply, a status display, a Controller card slot, a Network Audio card slot, and 8 Reproducer card slots. The Reproducer card slots are numbered from 1 to 8, from left to right as viewed from the front of the Binloop.

The back of the Card Cage contains all of the connectors for the Binloop control interfaces, as well as Audio/Video outputs for all 8 Reproducer card slots.

## The Controller Card

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The Controller Card is responsible for the core functionality of the Binloop. This card updates the Status Display with information and provides front-panel buttons for controlling basic Binloop functions. It also handles all external communication from the remote control interfaces of the Binloop, as well as internal communication with the Reproducer cards. In addition, it provides the Binloop with the ability to either Generate or Read SMPTE timecode. It also has the ability to store a list of SMPTE triggers that can be precisely executed at specified times. To maintain synchronization between Binloop components, this card also supplies all audio and video sync signals to the Reproducer cards.

## The Reproducer Cards

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The main function of each Reproducer is to play video files from a removable SSD drive. During playback, the video and audio output generated by the reproducer is available on the connectors found on the back of the Binloop cage. Each reproducer has output connectors for HDMI, 3G-SDI, and Digital Audio (AES/EBU).

The reproducer cards receive all playback commands (i.e. Play, Stop, Pause, etc.) from the controller card. To ensure perfect synchronization, the reproducers share common Video and Audio clocks that are supplied by the controller card as well.

The clips themselves are directories containing an image sequence of TARGA files. For more specific information regarding the type of media content that the reproducer cards can play, refer to the chapter that covers **Media Files**.

## The CobraNet Card

---

CobraNet is a common industry standard for distributing audio over an Ethernet-based network. When a Binloop is equipped with the CobraNet option, you can distribute the stereo audio outputs of up to 8 reproducers (that's 16 channels of audio) over a CobraNet network. When this option is installed, an additional RJ-45 Ethernet jack is located on the back of the Binloop cage. For more information about CobraNet, including how to configure and use this feature, refer to the **CobraNet** section of this manual.

## The Dante/AVB Card

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Dante is a combination of software, hardware, and network protocols that deliver uncompressed, multi-channel, low-latency digital audio over a standard Ethernet network.

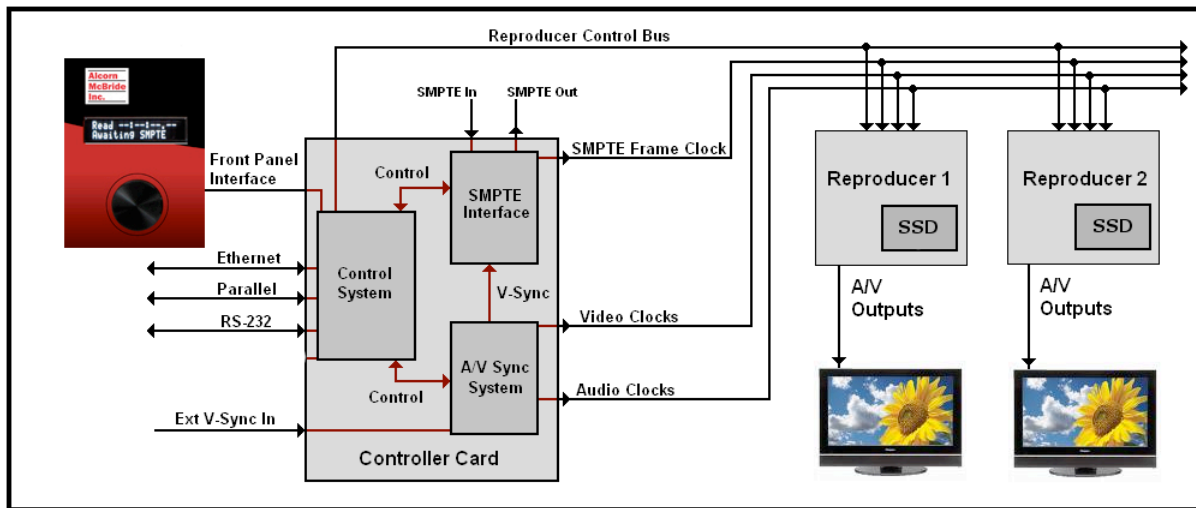
Like most other audio over Ethernet technologies, Dante is primarily for professional, commercial applications. Most often, it is used in applications where a large number of audio channels must be transmitted over relatively long distances or to multiple locations.

Dante provides several advantages over traditional analog audio distribution. Audio transmitted over analog cables can be adversely affected by signal degradation due to electromagnetic interference, high-frequency attenuation, and voltage drop over long cable runs. Thanks to digital multiplexing, the cabling requirements for digital audio distribution are almost always reduced when compared to analog audio. Dante also provides specific advantages over first-generation audio over Ethernet technologies, such as CobraNet and EtherSound. Technological advancements include the ability to pass through network routers, native gigabit support, higher channel count, lower latency, and automatic configuration.

When this option is installed, two additional RJ-45 Ethernet jacks are located on the back of the Binloop cage. For more information about Dante, including how to configure and use this feature, refer to the **Dante** section of this manual.

## How the Binloop Works

Now that you're more familiar with the various hardware components that comprise the Binloop, let's get more familiar with how those components actually work together. The diagram below outlines the different components we've covered as well as their functional relationship with one another.



The sections that follow will cover the various systems you see in this diagram, so please use it as a visual reference.

## Control System

---

The Control system of the controller card is the heart of the Binloop. This system handles all of the Binloop's control interfaces. In addition, the Control system is responsible for configuring and controlling both the SMPTE Interface and the A/V Sync system that also reside on the controller card. This system's final significant role is to configure and control the reproducers over a shared communications line.

### ***Control Interfaces***

The Control system monitors all of the control interfaces, which include Ethernet, Parallel, RS-232, and the Front Panel interface. Anything that happens on these interfaces, in one way or another, is translated by the Control system into a command to do something.

For example, the Control system may receive an RS-232 command to play video 1 on reproducer 1. It must interpret this command, and then send the appropriate control signal to the reproducer to make it happen. Another common example would be using the Parallel control port to start the SMPTE generator. The Control system would sense a contact closure on the Parallel control port, and then instruct the SMPTE Interface to start generating timecode.

You can read more about these control interfaces, and how they work in a later chapter in this manual titled **Controlling the Binloop**.

### ***Reproducer Control***

Without the Control system, the reproducers would do nothing except generate black video and waste electricity. They have no knowledge of the SMPTE clock value, RS-232 commands, Parallel input status, or anything of the sort. They are simply designed to obey basic playback commands and, in that regard, the Control system is their boss. It is responsible for issuing configuration and playback commands to the reproducers, and is capable of doing so with tremendous precision.

## A/V Sync System

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The A/V Sync system plays a critical role in the operations of the Binloop. This system is responsible for generating the Audio and Video clocks used throughout the Binloop. Most notably, these clocks are used directly by the reproducers to ensure that the video and audio outputs are precisely synchronized with one another.

### Configuration Options

This system has a few straight-forward, yet important, configuration settings. The first of these settings, Video Format, configures the type of video clocks to generate. There are only two options that cover the primary video systems used throughout the world; NTSC, PAL, and FILM. The other setting is the audio sample rate, which determines how to generate the audio clocks. Here's a table that shows the settings that are available to you.

Setting	Options
Video Format	NTSC, PAL, FILM
Sample Rate	32kHz, 44.1kHz, 48kHz, 96kHz

These settings can be configured using the Menu Wheel interface on the front of the Binloop, as well as the Binloop Configuration software.

### External V-Sync

If you refer to the diagram earlier in this section, you will see that the A/V Sync system allows for an optional external video sync source. When a supported sync source is connected to V-Sync input of the Binloop, the A/V clocks are locked directly to the source.

*The A/V Sync system always generates the A/V clocks regardless of whether or not an external sync source is present.*

This input is designed to accept a Blackburst video sync signal. Keep in mind that the Video Format setting of the A/V Sync system must match the video format of the Blackburst sync source. If it does not, the A/V Sync system will not attempt to lock to the source.

## SMPTE Interface

---

The SMPTE Interface is what gives the Binloop the ability to generate and read SMPTE and EBU timecode. Whether it is generating or reading, this interface provides the Control system with the current SMPTE time. The most important purpose for this is to execute precisely timed user-programmed commands, or triggers, to the reproducer cards. In addition, it provides a SMPTE Frame Clock which is used throughout the Binloop for synchronization purposes.

### ***Configuration Options***

The SMPTE Interface is a very powerful and flexible system and, as a result, it has a variety of configurable settings. Here is a summary of those settings:

Setting	Description
<b>SMPTE Mode</b>	Determines whether the SMPTE Interface will generate timecode, or read external timecode.
<b>Framerate</b>	The framerate in which SMPTE is generated.
<b>Preroll Time</b>	The initial time of SMPTE generator when it is first enabled.
<b>Start Time</b>	The time that the SMPTE generator returns to after it reaches the End Time (when looping)
<b>End Time</b>	The time when the SMPTE generator either stops or loops back to the Start Time.
<b>Loop Mode</b>	Determines whether the SMPTE generator loops continuously from Start to End Time.
<b>Powerup Mode</b>	Determines whether SMPTE is Enabled or Disabled when the Binloop powers up.
<b>Restart Mode</b>	Determines how the SMPTE generator responds when it is told to start again. It can either restart or ignore the start command.
<b>Idle Mode</b>	Determines if the SMPTE Output is muted or active when the SMPTE Interface is idle.
<b>Self-Gen Mode</b>	Determines how long the SMPTE reader will free-wheel when external SMPTE is lost.
<b>Output Level</b>	Configures the voltage level (in dB) of the SMPTE output.

These settings can all be configured using the Menu Wheel interface on the front of the Binloop, or with through the Binloop software. Please read on to learn more about these settings and how they can be used to configure the SMPTE Interface to meet your needs.

## SMPTE Mode

There are 3 basic modes that the SMPTE Interface can operate in. It can be configured to **Read** timecode, **Generate** timecode, or generate timecode in reference to the Binloop's video clocks (**Generate /w V-Sync**).

In **Read** mode, the SMPTE module will listen for incoming timecode on the Binloop's SMPTE In connector whenever the SMPTE module is enabled. While operating in this mode, the SMPTE Interface will repeat the incoming timecode on the SMPTE Out connector.

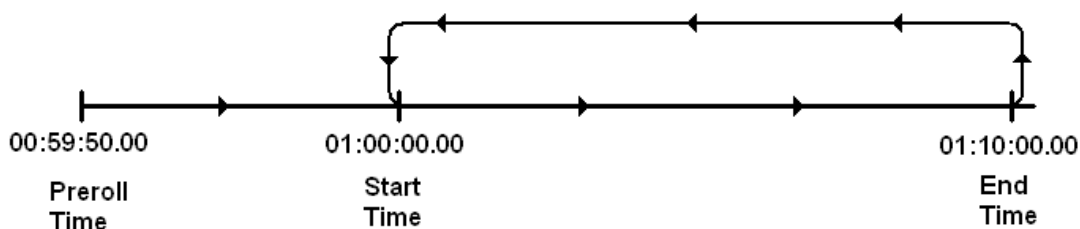
In SMPTE **Read** mode, the Binloop will attempt to lock its video and audio clocks to the incoming SMPTE code. Lock indicator will light up on the front panel if the lock is successful.

In **Generate** mode, the SMPTE Interface will generate timecode when it is enabled (or started). This timecode is used internally, and is also generated on the SMPTE Out connector.

The **Generate /w V-Sync** mode operates exactly like the normal Generate mode, except that the SMPTE clock is generated synchronously with the vertical sync video signal of the Binloop. For example, if the Binloop's A/V Sync system is configured for NTSC (29.97fps), the SMPTE module can generate 29.97fps timecode that is perfectly synchronous. This means that each 'tick' of the SMPTE clock will coincide with the beginning of each video frame, even after a long period of time. This feature is useful when you want the SMPTE clock to remain in perfect sync with a video presentation, or with an external video sync source.

## SMPTE Times

The Preroll, Start, and End times are all used by the SMPTE Interface when it is programmed to generate timecode. This graphic demonstrates how these times are used by the generator.



As you can see, the timecode starts running from the Preroll Time when the SMPTE Interface is first enabled. The timecode then continues to run until the End Time is reached. What happens at this point depends on the next setting; Loop Mode.



## Loop Mode

The Loop mode setting determines what the timecode generator does when the End Time is encountered. If the SMPTE module is configured to loop, the timecode jumps back to the Start Time. If loop mode is disabled, the timecode stops running.

## Powerup Mode

The Powerup setting simply tells the SMPTE Interface whether or not to start running when the Binloop first turns on. When the Binloop is configured to start on powerup, the SMPTE Interface will begin generating/reading timecode as soon as the system is 'ready' (this is indicated by both the 'ready' output and 'ready' unit status LED).

## Restart Mode

*The Start SMPTE Command can come from any of the Binloop's control interfaces, including Parallel, RS-232, Ethernet, MIDI, or the front-panel.*

The Restart Mode setting only applies when the SMPTE Interface is configured to generate timecode. This setting determines how the generation process is affected if a 'Start SMPTE' command occurs when timecode is currently running. If the Restart Mode is enabled, another Start command causes the timecode to jump back to the Start Time. If the Restart Mode is disabled, any start commands received while the timecode is running will be completely ignored.

## Idle Mode

The Idle Mode determines the state of the SMPTE Output when the SMPTE Interface is Stopped. If the Idle Mode is configured to mute SMPTE, the SMPTE output will be silent when the SMPTE clock is stopped. If the Idle Mode is configured for SMPTE to be active, the SMPTE Output will continuously repeat the timecode value where the clock stopped running on the SMPTE Output.

## Self-Gen Mode

*If external SMPTE drops out, the SMPTE reader will automatically re-lock when it is restored. The Self-Gen Mode simply determines what to do in the meantime.*

This setting applies only when the SMPTE Interface is configured to Read external timecode. It determines how the SMPTE reader should react in the event that the external SMPTE signal drops out, or is lost completely. When this occurs, the SMPTE reader has the ability to continue generating (free-wheel) SMPTE on its own. This allows the Binloop to 'get by' until the external SMPTE clock is restored. If you want to implement this feature, this setting can configure the SMPTE Reader to self-generate timecode for a period of 1-8 seconds, or indefinitely. If you don't want to use this feature, Self-Gen mode can be disabled completely so that the timecode within the Binloop always represents the timecode coming in on the SMPTE Input.



# Controlling the Binloop

To ensure that the Binloop can meet the needs of almost any application, it has been designed with several different control interfaces. These interfaces include:

1. **Serial (RS-232)**
2. **Ethernet**
3. **Parallel**
4. **Timecode**

## Serial Control (RS-232)

The Binloop provides a dedicated **Show Control** RS-232 port to allow external RS-232 devices to control the product. For added flexibility, this port can be configured to use a variety of serial protocols. Here's a table that outlines the differences between these protocols:

Protocol	Baud Rate	Description
<b>Alcorn 9-bit</b>	9600	For use with legacy Alcorn Show Controllers.
<b>AMI/Pioneer</b>	9600	Generic ASCII-based protocol intended for use by almost any serial control device, including Alcorn Show Controllers.
<b>Debug</b>	38400	Debug output only. Not used for control.

Once you determine which protocol is best for your system, you must configure the **Show Control** port for one of these 4 protocols. This can be done using the front-panel Menu Wheel, or by downloading a configuration from the Binloop software. When you are ready to control the Binloop, you must connect a NULL RS-232 cable between the controlling device and the Binloop's **Show Control** port. Once you have done this, read on to the **Control Protocols** section of this manual to obtain the full list of commands you can send to the Binloop.

## Ethernet Control

For Ethernet control, the Binloop uses a standard Ethernet Protocol called UDP (User Datagram Protocol).

UDP is a very simple Ethernet protocol that allows an Ethernet device to transmit a generic string of data to another Ethernet device. Since UDP is such a broad standard, UDP packets can be generated by a large variety of controllers and PC applications. The UDP packet handles all of the complexities of getting the message where it needs to go in one piece. The good news is that you do not have to understand those complexities. As a matter of fact, you only need to know the following information to send a UDP message.

**Destination IP Address** – This needs to be the IP address of the Binloop you intend to control. The default IP address of the Binloop is **192.168.0.254**.

**Destination Port** – This value needs to be the UDP port that the Binloop is listening to for UDP commands. This value is always **2638**.

**Source Port** - This is the UDP port that your PC or controller will use to send the UDP message. It does not matter what port you choose, as long as it is a valid UDP port. If you have no idea what a valid UDP port is, just use **2638**.

**Data** – This is the actual message that you are sending to the Binloop. This message needs to be an AMI/Pioneer Protocol command. (i.e. 1R1PL<CR>).

Since the UDP commands use the AMI/Pioneer Protocol, they are ASCII based and are terminated with a carriage return (hexadecimal value 0x0D). The complete list of supported commands can be found in the **AMI/Pioneer Protocol** section of this manual.

## Parallel Control

The Binloop's Parallel Control interface is designed to provide a very basic control from simple voltage and contact closure inputs. This interface also has 3 dry-contact relay outputs and 2 TTL level outputs that indicate the status of the Binloop. All of these signals are available on the DB-37 **Parallel Control** connector located on the back of the Binloop.

## Parallel Inputs

---

The following table lists the available inputs of the Binloop's Parallel control interface, as well as description of their functions:

Function	Contact Closure Pins	Voltage Pins	Description
<b>*Start</b>		7(+),8(-)	Start SMPTE
<b>*Pause</b>		9(+),10(-)	Pause SMPTE at next SMPTE loop point
<b>*Stop</b>		11(+),12(-)	Stop SMPTE, Stop all reproducers.
<b>*Mute Audio</b>		13(+),14(-)	Mute Audio on all reproducers
<b>Play Group #1</b>	20, GND**		Play and Loop clip #1 on Group #1
<b>Play Group #2</b>	21, GND**		Play and Loop clip #2 on Group #2
<b>Play Group #3</b>	22, GND**		Play and Loop clip #3 on Group #3
<b>Play Group #4</b>	23, GND**		Play and Loop clip #4 on Group #4
<b>Play Group #5</b>	24, GND**		Play and Loop clip #5 on Group #5
<b>Play Group #6</b>	25, GND**		Play and Loop clip #6 on Group #6
<b>Play Group #7</b>	26, GND**		Play and Loop clip #7 on Group #7
<b>Play Group #8</b>	27, GND**		Play and Loop clip #8 on Group #8
<b>Reset SMPTE</b>	28, GND**		Stop SMPTE
<b>Idle SMPTE</b>	29, GND**		Pause SMPTE immediately

**Note: Pins not listed here or in the Parallel Outputs table should be left unconnected.**

\*These functions are identical to the front-panel control buttons of the Binloop.

\*\*GND can be any one of the ground pins on the Binloop's Parallel Control Connector. This includes pins 16, 17, 18, and 19.

## Parallel Outputs

---

The following table lists the status outputs that are provided by the Parallel control interface of the Binloop:

Function	TTL Output Pins	Contact Closure Pins	Description
<b>*Running</b>		1,2	CLOSED when SMPTE is running
<b>*Fault</b>		3,4	CLOSED when Binloop is in Fault state
<b>*Ready</b>		5,6	CLOSED when Binloop is ready to receive commands
<b>SMPTE Lock</b>	33, GND**		HIGH (5V) when locked on to external SMPTE
<b>VSync Lock</b>	34, GND**		HIGH (5V) when locked on to external Video Sync

**Note: Pins not listed here or in the Parallel Inputs table should be left unconnected.**

\*These relay outputs directly mimic the **Run**, **Fault**, and **Ready** unit status LED's on the front panel of the Binloop.

\*\*GND can be any one of the ground pins on the Binloop's Parallel Control Connector. This includes pins 16, 17, 18, and 19.

## Using the Group Control Inputs

---

The Binloop has contact-closure inputs on the rear panel that can be used to command groups of Reproducers to Play. When used on their own, these 8 'Play Group' inputs cause the associated group to play and loop the associate file. For example, activating the 'Play Group 2' input will cause all reproducers assigned to group 2 to play and loop file #2. Activating 'Play Group 4' will cause all members of group 4 to play and loop file #4.

## Using the Start SMPTE Input

---

*Please refer to the **Hardware** section of this manual for pin assignments and other electrical details for the Parallel Control connector.*

The Parallel Control connector also contains inputs for starting or stopping the SMPTE Interface. Unlike the Group Control inputs, the SMPTE Control inputs are Opto-Isolated and require a voltage (24V) to be input to them from an external source.

The way to start playback using the SMPTE Control inputs is to configure the Binloop to generate SMPTE, program a playback trigger in the SMPTE Trigger Table and start SMPTE using the Start SMPTE input. When the timecode reaches the programmed trigger time, playback begins.

Single Reproducers, Groups of Reproducers, or All Reproducers can be triggered. It's all in how you program the trigger.

## Using the Mute Input

---

The Parallel Control connector also contains an input that can Mute the audio output on all of the Reproducers. When this input is active, all reproducer audio outputs are muted. The audio will remain muted until this input is released.

## Timecode Control

In this method of control, the commands are pre-programmed ahead of time using the Binloop software, and then downloaded and stored in the Binloop.

The concept is pretty simple. When you program the commands, you must specify a SMPTE timecode value for that command. If the SMPTE clock ever equals that timecode value, the command (or trigger) is executed. This concept applies whether the SMPTE is being read from an external source, or generated internally by the Binloop.

There are several benefits to using this control interface. First, this interface allows the Binloop to operate completely on its own. For example, you could program the Binloop to automatically generate SMPTE timecode when it powers-up. You could then create a 'Play' command that gets triggered by the timecode shortly after it starts running. The result is that the Binloop automatically starts playing after power-up with no external control required!

The other benefit to this interface is precision. Each command's SMPTE execution time is accurate down to the frame. For example, you could make a video start playing at exactly 01:02:05.21. Again, it doesn't matter if that timecode is being read from an external source or generated internally. This precision also helps with tweaking the playback timing. Is the video starting a little too soon? Just add 1 or 2 frames to the SMPTE execution time to make it start a little later.

For more information about using this method of control, please refer to the **Binloop Configuration Software** section of this manual. If you would like to configure the Binloop to automatically play upon power up, please see the **Application Notes** section of this manual.



# Control Protocols

## AMI/Pioneer Control Protocol

*For specific information about the RS-232 and Ethernet interfaces, refer to the **Controlling the Binloop** section of this manual.*

The AMI/Pioneer protocol commands listed in this section are available for use on both the RS-232 **Show Control** port and the **Ethernet** port of the Binloop. This section discusses the most commonly used commands in detail.

*This protocol inherits its name from the fact that it closely resembles the popular Pioneer protocol used throughout the A/V industry.*

The protocol is ASCII-based. Upper or lower case characters can be used interchangeably. **All commands and responses are terminated with the Carriage Return character. This character is represented by the hexadecimal value 0x0D.**

### Get Firmware Version

---

Description: This command will return the controller firmware version number.

Command: **?V**  
Response: **DBAP5 Vx.xx**

Example: Command: **?V**  
Response: **DBAP5 V1.00**

### Get Hardware Version

---

Description: This command will return hardware revision and hardware configuration version number.

Command: **?H**  
Response: **FPGA Vx.xx PCB Rev X**

Example: Command: **?H**  
Response: **FPGA V1.00 PCB Rev B**

## Get SMPTE Firmware Version

---

Description:	This command will return the firmware version of the SMPTE module.		
Comments:	It is possible for the SMPTE firmware to be corrupted. If this occurs, this command will return a hardware error (E01).		
Command:	<b>?S</b>		
Response:	<b>SMPTE Vx.xx</b>		
Example:	Command:	<b>?S</b>	
	Response:	<b>SMPTE V1.23</b>	

## Get/Set Unit ID

---

Description:	This command will get or set the unit ID number.		
Parameters:	<b>xx</b> represents a decimal number between 1 – 49.		
Set Command:	<b>xxID</b>		
Response:	<b>R</b>		
Example:	Command:	<b>1ID</b>	
	Response	<b>R</b>	
Get Command:	<b>ID</b>		
Response:	<b>xx</b>		
Example:	Command:	<b>ID</b>	
	Response:	<b>1</b>	

## Get/Set IP address

---

Description:	This command will get or set the unit IP address.		
Parameters:	<b>xxx.xxx.xxx.xxx</b> represents a standard IPv4 IP address.		
Get Command:	<b>IP</b>		
Response:	<b>xxx.xxx.xxx.xxx</b>		
Example:	Command:	<b>IP</b>	
	Response:	<b>192.168.0.254</b>	
Set Command:	<b>xxx.xxx.xxx.xxxIP</b>		
Response:	<b>R</b>		
Example:	Command:	<b>192.168.0.254IP</b>	
	Response:	<b>R</b>	

## Get/Set Subnet Mask number

---

Description: This command will get or set the number used to isolate the subnet.

Parameters: **xxx.xxx.xxx.xxx** is a standard IPv4 subnet mask.

Get Command: **SM**

Response: **xxx.xxx.xxx.xxx**

Example: Command: **SM**  
Response: **255.255.255.0**

Set Command: **xxx.xxx.xxx.xxxSM**

Response: **R**

Example: Command: **255.255.255.0SM**  
Response: **R**

## Get/Set Gateway address

---

Description: This command will get or set the IP address of the network gateway.

Parameters: **xxx.xxx.xxx.xxx** is a standard IPv4 IP gateway address.

Get Command: **GW**

Response: **xxx.xxx.xxx.xxx**

Example: Command: **GW**  
Response: **192.168.0.1**

Set Command: **xxx.xxx.xxx.xxxGW**

Response: **R**

Example: Command: **192.168.0.1GW**  
Response: **R**

## Enable SMPTE

---

Description:	This command will Enable the SMPTE interface.
Comments:	If the SMPTE module is configured to Generate, this command will cause the clock to start generating at the configured Preroll time. If the SMPTE module is configured to Read, it will start listening for SMPTE time code on the SMPTE Input. If the SMPTE clock is in a paused state, this command will cause it to resume from its current position.
Command:	<b>ES</b>
Response:	<b>R</b>

## Disable SMPTE

---

Description:	This command will disable the SMPTE interface.
Comments:	If the SMPTE module is configured to Generate, this command will cause the SMPTE clock to stop at its current time. If the SMPTE module is configured to Read, this command will cause the SMPTE clock to stop running and ignore any incoming time code.
Command:	<b>DS</b>
Response:	<b>R</b>

## Pause SMPTE

---

Description:	This command will pause the SMPTE clock at the next loop point.
Comments:	This command only applies when the SMPTE module is in Generate mode and is also configured to loop. When paused, the SMPTE clock can be resumed by sending an Enable SMPTE command.
Command:	<b>PS</b>
Response:	<b>R</b>

## Idle SMPTE

---

Description:	This command will pause the SMPTE clock immediately.
Comments:	When paused, the SMPTE clock can be resumed by sending an Enable SMPTE command.
Command:	<b>IS</b>
Response:	<b>R</b>

## Get/Set SMPTE time

---

Description: This command will get or set the current SMPTE time.

Parameters:        **hh**     = hours  
                     **mm**     = minutes  
                     **ss**     = seconds  
                     **ff**     = frames

Get Command:        **CT**  
Response:            **hh:mm:ss.ff**

Example:             Command:     **CT**  
                     Response:    **01:59:59.30**

Set Command:        **hh:mm:ss.ffCT**  
Response:            **R**

Example:             Command:     **01:59:59.30CT**  
                     Response:    **R**

## Get/Set SMPTE Mode

---

Description: This command will get or set the operating mode of the SMPTE module.

Parameters:        **x** = mode number:  
                       **0** = read  
                       **1** = generate  
                       **2** = generate with V-sync

Get Command:        **SO**  
Response:            **x**

Example:             Command:     **SO**  
                     Response:    **2**

Set Command:        **xSO**  
Response:            **R**

Example:             Command:     **2SO**  
                     Response:    **R**

## Get/Set SMPTE Frame Rate Mode

---

Description: This command will get or set the SMPTE frame rate.

Parameters: **x** = mode number:  
**0** = 23.976 fps  
**1** = 24 fps  
**2** = 25 fps  
**3** = 29.97 fps  
**4** = 30d fps  
**5** = 30 fps

Get Command: **FR**

Response: **x**

Example: Command: **FR**  
Response: **5**

Set Command: **xFR**

Response: **R**

Example: Command: **5FR**  
Response: **R**

## Get/Set SMPTE Preroll time

---

Description: This command will get or set the SMPTE preroll time.

Parameters: **hh** = hours  
**mm** = minutes  
**ss** = seconds  
**ff** = frames

Get Command: **PT**

Response: **hh:mm:ss.ff**

Example: Command: **PT**  
Response: **00:01:30.10**

Set Command: **hh:mm:ss.ffPT**

Response: **R**

Example: Command: **00:01:30.10PT**  
Response: **R**

## Get/Set SMPTE Start time

---

Description: This command will get or set the SMPTE start time.

Parameters: **hh** = hours  
**mm** = minutes  
**ss** = seconds  
**ff** = frames

Get Command: **RT**  
Response: **hh:mm:ss.ff**

Example: Command: **RT**  
Response: **00:00:01.00**

Set Command: **hh:mm:ss.ffRT**  
Response: **R**

Example: Command: **00:00:01.00RT**  
Response: **R**

## Get/Set SMPTE End time

---

Description: This command will get or set the SMPTE end time.

Parameters: **hh** = hours  
**mm** = minutes  
**ss** = seconds  
**ff** = frames

Get Command: **ET**  
Response: **hh:mm:ss.ff**

Example: Command: **ET**  
Response: **01:00:00.00**

Set Command: **hh:mm:ss.ffET**  
Response: **R**

Example: Command: **01:00:00.00ET**  
Response: **R**

## Get/Set SMPTE Loop Mode

---

Description: This command will get or set the current SMPTE loop mode.

Parameters: **x** = mode number:  
                  **0** = SMPTE looping is Disabled on power up  
                  **1** = SMPTE looping is Enabled on power up

Get Command: **LM**  
Response: **x**

Example: Command: **LM**  
          Response: **1**

Set Command: **xLM**  
Response: **R**

Example: Command: **1LM**  
          Response: **R**

## Get/Set SMPTE Powerup Mode

---

Description: This command will get or set the current SMPTE power up mode.

Parameters: **x** = mode number:  
                  **0** = SMPTE Disabled on power up  
                  **1** = SMPTE Enabled on power up

Get Command: **PM**  
Response: **x**

Example: Command: **PM**  
          Response: **1**

Set Command: **xPM**  
Response: **R**

Example: Command: **1PM**  
          Response: **R**



## Get/Set SMPTE Restart Mode

---

Description: This command will get or set the current SMPTE restart mode.

Parameters: **x** = mode number:  
                  **0** = SMPTE restart is Disabled on power up  
                  **1** = SMPTE restart is Enabled on power up

Get Command: **RM**  
Response: **x**

Example: Command: **RM**  
          Response: **1**

Set Command: **xRM**  
Response: **R**

Example: Command: **1RM**  
          Response: **R**

## Get/Set SMPTE Idle Mode

---

Description: This command will get or set the current SMPTE idle mode.

Parameters: **x** = mode number:  
                  **0** = SMPTE output is active when idle  
                  **1** = Mute SMPTE output when idle

Get Command: **IM**  
Response: **x**

Example: Command: **IM**  
          Response: **1**

Set Command: **xIM**  
Response: **R**

Example: Command: **1IM**  
          Response: **R**

## Get/Set Video Format

---

Description:	This command will get or set the current video mode of the Binloop. This command determines internal clocks in the Binloop, which in turn determines the available framerates for the reproducers. Choose NTSC for 29.97 or 59.94fps. PAL for 25 or 50fps. FILM for 24 or 48fps. Note that you still must configure the resolution and framerate of the individual reproducers.		
Parameters:	<b>x</b> = mode number: <b>0</b> = NTSC <b>1</b> = PAL <b>2</b> = FILM		
Get Command:	<b>VF</b>		
Response:	<b>x</b>		
Example:	Command:	<b>VF</b>	
	Response:	<b>0</b>	
Set Command:	<b>xVF</b>		
Response:	<b>R</b>		
Example:	Command:	<b>0VF</b>	
	Response:	<b>R</b>	

## Get/Set Synchronous Play Delay

---

Description:	This command configures the synchronous play delay of the Binloop reproducers. By default, this delay is <b>60 SMPTE frames</b> , or around 2 seconds at 29.97fps, but this setting allows you to override that default if necessary. Be warned that decreasing this delay too much <u>will</u> result in synchronization problems. The reproducers must have adequate time to load the video or audio clip before it is capable of starting playback.		
Parameters:	<b>nnn</b> is a number between 0-127 that represents the S-Play delay setting <b>0</b> – Use Reproducer Default Delay (60 Frames) <b>1-127</b> – Delay (in frames)		
Get Command:	<b>SD</b>		
Response:	<b>nnn</b>		
Set Command:	<b>nnnSD</b>		
Response:	<b>R</b>		
Example:	Set S-Play Delay to <b>16</b> frames:	<b>16SD</b>	
	Set S-Play Delay to the <b>Reproducer Default</b> :	<b>0SD</b>	

## Search Clip

---

Description:	This command causes the Binloop to preload the specified video clip and then pause on the first frame of the video. After this happens, the next <b>Play</b> command causes the video file to start playing from the first frame onward.		
Command:	<b>nnnnaaaSE</b>		
Parameters:	<b>nnnn</b> is an ASCII file number between 0-1023 <b>aaa</b> is the address of the card(s) you want to process the command <b>Rxx</b> – Reproducer address between R1-R8 <b>Gxx</b> – Group address between G1-G13 <b>Fx</b> – 4K Group, F1 or F2 * - Wildcard address for all reproducers		
Response:	<b>R</b>		
Examples:	Search File 1 on Reproducer #2:	<b>1R2SE</b>	
	Search File 2 on Group #1:	<b>2G1SE</b>	
	Search File 150 on 4K Group #2	<b>150F2SE</b>	
	Search File 52 on All Reproducers:	<b>52*SE</b>	

## Play / Resume

---

Description:	This command will start playing a clip that was previously loaded by a Search Clip command. This command will also resume playback when the reproducer has been stilled or paused.		
Command:	<b>aaaPL</b>		
Parameters:	<b>aaa</b> is the address of the card(s) you want to process the command <b>Rxx</b> – Reproducer address between R1-R8 <b>Gxx</b> – Group address between G1-G13 <b>Fx</b> – 4K Group, F1 or F2 * - Wildcard address for all reproducers		
Response:	<b>R</b>		
Example:	Search File 1 on 4K Group #2:	<b>1F2SE</b>	
	Play pre-searched file on 4K Group #2	<b>F2PL</b>	

## Loop / Resume

---

Description:	This command functions just like the Play / Resume command except that the video loops once the end of the clip is reached.		
Command:	<b>aaaLP</b>		
Parameters:	<b>aaa</b> is the address of the card(s) you want to process the command <b>Rxx</b> – Reproducer address between R1-R8 <b>Gxx</b> – Group address between G1-G13 <b>Fx</b> – 4K Group, F1 or F2 * - Wildcard address for all reproducers		
Response:	<b>R</b>		
Example:	Search File 1 on 4K Group #2:	<b>1F2SE</b>	
	Loop pre-searched file on 4K Group #2:	<b>F2LP</b>	

## Play Clip

---

Description:	This command will play the specified clip on the addressed reproducer card(s). Playback starts as soon as possible after the command is received.		
Command:	<b>nnnnaaaPL</b>		
Parameters:	<b>nnnn</b> is an ASCII file number between 0-1023 <b>aaa</b> is the address of the card(s) you want to process the command <b>Rxx</b> – Reproducer address between R1-R8 <b>Gxx</b> – Group address between G1-G13 * - Wildcard address for all reproducers		
Response:	<b>R</b>		
Comments:	Since playback starts as quickly as possible once this command is received, it should never be used for synchronous playback. For this, you should use the Synchronous Play command for a consistent synchronized start of playback. Using a Search command along with a timed Play/Resume command works well for synchronous playback too.		
Examples:	Play File 3 on Reproducer #1:	<b>3R1PL</b>	
	Play File 4 on Group #2:	<b>4G2PL</b>	
	Play File 52 on All Reproducers:	<b>52*PL</b>	

## Loop Clip

---

Description:	This command functions exactly like the Play Clip command, except that the video loops once the end of the clip is reached.		
Command:	<b>nnnnaaaLP</b>		
Parameters:	<b>nnnn</b> is an ASCII file number between 0-1023 <b>aaa</b> is the address of the card(s) you want to process the command <b>Rxx</b> – Reproducer address between R1-R8 <b>Gxx</b> – Group address between G1-G13 * - Wildcard address for all reproducers		
Response:	<b>R</b>		
Examples:	Loop File 3 on Reproducer #1:	<b>3R1LP</b>	
	Loop File 4 on Group #2:	<b>4G2LP</b>	
	Loop File 52 on All Reproducers:	<b>52*LP</b>	

## Synchronously Play Clip

---

Description:	This command functions exactly like the Play Clip command, except that the playback does not begin as quickly as possible. Instead, the reproducer waits a consistent amount of time ( <b>60 SMPTE frames</b> by default) after the command is received before it starts playback. This ensures that all reproducers that receive this command at the same time, start playing at the same time.		
Command:	<b>nnnnaaaSP</b>		
Parameters:	<b>nnnn</b> is an ASCII file number between 0-1023 <b>aaa</b> is the address of the card(s) you want to process the command <b>Rxx</b> – Reproducer address between R1-R8 <b>Gxx</b> – Group address between G1-G13 <b>Fx</b> – 4K Group, F1 or F2 * - Wildcard address for all reproducers		
Response:	<b>R</b>		
Comments:	This command is almost always addressed to either a Group or All reproducers to ensure that they all start playing synchronously.		
Examples:	Synchronously Play File 2 on Group 1:	<b>2G1SP</b>	
	Synchronously Play File 2 on 4K Group 1:	<b>2F1SP</b>	
	Synchronously Play File 2 on All Reproducers:	<b>2*SP</b>	

## Synchronously Loop Clip

---

Description:	This command functions like the Synchronously Play Clip command, except that the video loops once the end of the clip is reached.		
Command:	<b>nnnnaaaSL</b>		
Parameters:	<b>nnnn</b> is an ASCII file number between 0-1023 <b>aaa</b> is the address of the card(s) you want to process the command <b>Rxx</b> – Reproducer address between R1-R8 <b>Gxx</b> – Group address between G1-G13 <b>Fx</b> – 4K Group, F1 or F2 * - Wildcard address for all reproducers		
Response:	<b>R</b>		
Examples:	Synchronously Loop File 2 on Group 1: <b>2G1SL</b> Synchronously Loop File 2 on 4K Group 1: <b>2F1SL</b> Synchronously Loop File 2 on All Reproducers: <b>2*SL</b>		
Comments:	If you plan to synchronously loop files on multiple reproducers, the video clips MUST be identical in length (down to the frame). If they are not, the clips will not remain in sync after the loop point.		

## Play Next

---

Description:	This command causes the specified file to be "queued" for playback at the completion of the current video clip. If a file is currently playing, the queued transition to the selected file will be seamless. If a file is currently looping, the seamless transition will occur at the next loop point. If a video is not currently playing, the video specified in this command will begin playing immediately.		
Command:	<b>nnnnaaaPN</b>		
Parameters:	<b>nnnn</b> is an ASCII file number between 0-1023 <b>aaa</b> is the address of the card(s) you want to process the command <b>Rxx</b> – Reproducer address between R1-R8 <b>Gxx</b> – Group address between G1-G13 <b>Fx</b> – 4K Group, F1 or F2 * - Wildcard address for all reproducers		
Response:	<b>R</b>		
Example:	Play File #2 on Reproducer 1: <b>2R1PL</b> Queue File #3 to play after file #2 finishes: <b>3R1PN</b>		

## Loop Next

---

Description:	This command functions exactly like the Play Next command except that the queued file loops after it finishes playing.		
Command:	<b>nnnnaaaLN</b>		
Parameters:	<b>nnnn</b> is an ASCII file number between 0-1023 <b>aaa</b> is the address of the card(s) you want to process the command <b>Rxx</b> – Reproducer address between R1-R8 <b>Gxx</b> – Group address between G1-G13 <b>Fx</b> – 4K Group, F1 or F2 * - Wildcard address for all reproducers		
Response:	<b>R</b>		
Example:	Play File #2 on Reproducer 1:	<b>2R1PL</b>	
	Queue File #3 to loop after file #2 finishes:	<b>3R1LN</b>	

## Stop Playback

---

Description:	This command will stop currently playing clip. After playback stops, the last frame that was displayed will remain on screen.		
Command:	<b>aaaRJ</b>		
Parameters:	<b>aaa</b> is the address of the card(s) you want to process the command <b>Rxx</b> – Reproducer address between R1-R8 <b>Gxx</b> – Group address between G1-G13 <b>Fx</b> – 4K Group, F1 or F2 * - Wildcard address for all reproducers		
Response:	<b>R</b>		
Examples:	Stop Reproducer #1:	<b>R1RJ</b>	
	Stop Group #2:	<b>G2RJ</b>	
	Stop 4K Group #1:	<b>F1RJ</b>	
	Stop All Reproducers:	<b>*RJ</b>	

## Still Playback

---

Description:	This command will pause the currently playing clip at its present position. The stilled video frame will remain on screen.		
Command:	<b>aaaST</b>		
Parameters:	<b>aaa</b> is the address of the card(s) you want to process the command <b>Rxx</b> – Reproducer address between R1-R8 <b>Gxx</b> – Group address between G1-G13 <b>Fx</b> – 4K Group, F1 or F2 * - Wildcard address for all reproducers		
Response:	<b>R</b>		
Example:	Still Reproducer #1:	<b>R1ST</b>	
	Resume Reproducer #1:	<b>R1PL</b>	

## Pause Playback

---

Description:	This command will pause the currently playing clip at its present position. The screen will mute to black while the video is paused (this is the only difference between the Pause and Still commands). When the Play/Resume command is used after this command, the video is unmuted and restored automatically.		
Command:	<b>aaaPA</b>		
Parameters:	<b>aaa</b> is the address of the card(s) you want to process the command <b>Rxx</b> – Reproducer address between R1-R8 <b>Gxx</b> – Group address between G1-G13 <b>Fx</b> – 4K Group, F1 or F2 * - Wildcard address for all reproducers		
Response:	<b>R</b>		
Example:	Pause Reproducer #1:	<b>R1PA</b>	
	Resume Reproducer #1:	<b>R1PL</b>	



## Mute/Unmute Video

---

Description:	This command controls muting on the video outputs of the Binloop. When muted, the video outputs are black. When unmuted, the video outputs display video normally.		
Command:	<b>naaaVD</b>		
Parameters:	<b>n</b> is a number between 0-1 that represents the mute state <b>0</b> – Muted (black output) <b>1</b> – Unmuted (normal output) <b>aaa</b> is the address of the card(s) you want to process the command <b>Rxx</b> – Reproducer address between R1-R8 <b>Gxx</b> – Group address between G1-G13 <b>Fx</b> – 4K Group, F1 or F2 * - Wildcard address for all reproducers		
Response:	<b>R</b>		
Example:	Mute Video on Reproducer #1:	<b>0R1VD</b>	
	Unmute Video on Reproducer #1:	<b>1R1VD</b>	

## Mute/Unmute Audio

---

Description:	This command controls muting on the audio outputs of the Binloop. When muted, all audio outputs are silent. When unmuted, the audio outputs are normal.		
Command:	<b>naaaAD</b>		
Parameters:	<b>n</b> is a number between 0-1 that represents the mute state <b>0</b> – Muted (silent) <b>1</b> – Unmuted (normal output) <b>aaa</b> is the address of the card(s) you want to process the command <b>Rxx</b> – Reproducer address between R1-R8 <b>Gxx</b> – Group address between G1-G13 <b>Fx</b> – 4K Group, F1 or F2 * - Wildcard address for all reproducers		
Response:	<b>R</b>		
Example:	Mute Audio on Reproducer #1:	<b>0R1AD</b>	
	Unmute Audio on Reproducer #1:	<b>1R1AD</b>	

## Set HD Video Format

---

Description:	This command configures the high-definition video format for the outputs of the specified reproducer(s). If using the Binloop as a 4K player, set the desired 4K group to 1080P for a total resolution of 3840x2160, or 2K for a total resolution of 4096x2160.	
Command:	<b>ffffaaaVO</b>	
Parameters:	<b>ffff</b> is one of the following strings <b>2KP59</b> – 2K(2160x1080) @ 59.94fps <b>2KP50</b> – 2K(2160x1080) @ 50fps <b>2KP29</b> – 2K(2160x1080) @ 29.94fps <b>2KP23</b> – 2K(2160x1080) @ 23.976fps <b>1080P59</b> – 1080p @ 59.94fps <b>1080P50</b> – 1080p @ 50fps <b>1080P29</b> – 1080p @ 29.97fps <b>1080P23</b> – 1080p @ 23.976fps <b>720P59</b> – 720p @ 59.94fps <b>720P50</b> – 720p @ 50fps <b>aaa</b> is the address of the card(s) you want to process the command <b>Rxx</b> – Reproducer address between R1-R8 <b>Gxx</b> – Group address between G1-G13 <b>Fx</b> – 4K Group, F1 or F2 * - Wildcard address for all reproducers	
Response:	<b>R</b>	
Example:	Set Reproducer #1 to 1080p @ 59.94fps:	<b>1080P59R1VO</b>
	Set 4K Group #2 to 3840x2160 @ 59.94fps:	<b>1080P59F2VO</b>

## Get Reproducer Firmware Version

---

Description:	This command requests the firmware version of the specified reproducer. If the specified reproducer is not installed in the Binloop, there will be no response.	
Command:	<b>aaa?V</b>	
Parameters:	<b>aaa</b> is the address of the card(s) you want to process the command <b>Rxx</b> – Reproducer address between R1-R8	
Response:	REPRO-2KU Vx.xx	
Example:	Request firmware version of Reproducer #1:	<b>R1?V</b>
Example Responses:	Reproducer with V1.00:	<b>REPRO-2KU V1.00</b>

## Get Reproducer Status

---

Description:	This command requests the playback status of the specified reproducer. If the specified reproducer is not installed in the Binloop, there will be no response. Keep in mind that using this command will briefly tie up the Reproducer communication interface, so it is not recommended for use immediately before or after time-sensitive commands (like Synchronous Play).	
Command:	<b>aaa?P</b>	
Parameters:	<b>aaa</b> is the address of the card(s) you want to process the command <b>Rxx</b> – Reproducer address between R1-R8	
Response:	<b>Pnn</b>	
Parameters:	<b>nn</b> is a number that represents the status of the reproducer <b>P00</b> – Error (Fault) <b>P01</b> – Stopped <b>P04</b> – Playing <b>P05</b> – Stilled <b>P06</b> – Paused	
Example:	Request status of Reproducer #1:	<b>R1?P</b>
Example Responses:	Reproducer is Playing:	<b>P04</b>
	Reproducer is Stopped:	<b>P01</b>
	Reproducer has an Error:	<b>P08</b>

## Get Reproducer Clip Number

---

Description:	This command requests the number of the clip currently playing in the specified reproducer. The clip number is the number included in the directory name of the directory that contains the image sequence. If the specified reproducer is not installed in the Binloop, there will be no response. Keep in mind that using this command will briefly tie up the Reproducer communication interface, so it is not recommended for use immediately before or after time-sensitive commands (like Synchronous Play). <b>If a clip is not playing, the response will only be a Carriage Return (0x0D) character.</b>	
Command:	<b>aaa?C</b>	
Parameters:	<b>aaa</b> is the address of the card(s) you want to process the command <b>Rxx</b> – Reproducer address between R1-R8	
Response:	<b>xxxxxxxx.xxx</b>	
Example:	Request clip name of Reproducer #1:	<b>R1?C</b>
Example Responses:	Clip number is 128:	<b>128</b>



# Binloop Configuration Software

## Introduction to the Binloop Software

The Binloop Configuration Software is a Windows application that provides an easy-to-use interface for programming and configuring the Binloop. While it's true that most of the Binloop's configuration settings can be accessed from the front-panel Menu Wheel interface, the Binloop application provides a more visual alternative for configuring these settings. In addition, this software is necessary to program SMPTE timecode triggers for applications where you want the Binloop to operate without any external control system.

## Requirements

The Binloop software requires that you have PC running Microsoft Windows XP, Vista, 7, 8, or 10. This PC must have either an Ethernet port and/or an RS-232 Serial port so that it may communicate with the Binloop.

## Installing the Binloop Software

If you have Internet access, we recommend downloading the latest version from the Alcorn McBride website at <http://www.alcorn.com>. Once you locate the installation file, simply run it on your Windows PC and follow the on-screen instructions.

## Connecting your PC to the Binloop

There are two ways in which the Binloop software can interface to the Binloop from your PC:

1. **Ethernet**
2. **RS-232 Serial**

### Connecting with RS-232 Serial

---

*If your PC is not equipped with an RS-232 serial port, you can use a USB-to-Serial adapter. Just make sure that the adapter will support “Mark-Space Parity” operation.*

*For a list of USB-to-Serial adaptor manufacturers that support this protocol visit [www.alcorn.com](http://www.alcorn.com) and use our Knowledge Base.*

The Binloop software can communicate with the Binloop through a PC Serial Port via a 9-pin straight-through serial cable (included with the unit). Before this can happen, you must first connect the serial cable between a serial port on your PC and the **Programmer** port of the Binloop.

Once you make this connection, you are ready to use the Binloop software to program and communicate with the your Binloop.

### Connecting with Ethernet

---

Ethernet is also a common method of interfacing the Binloop software to the Binloop. This requires a PC to be connected to the Binloop directly, or over a network, using a CAT5 (or better) rated Ethernet cable. When the Binloop has a good network connection, the green Link LED will illuminate.

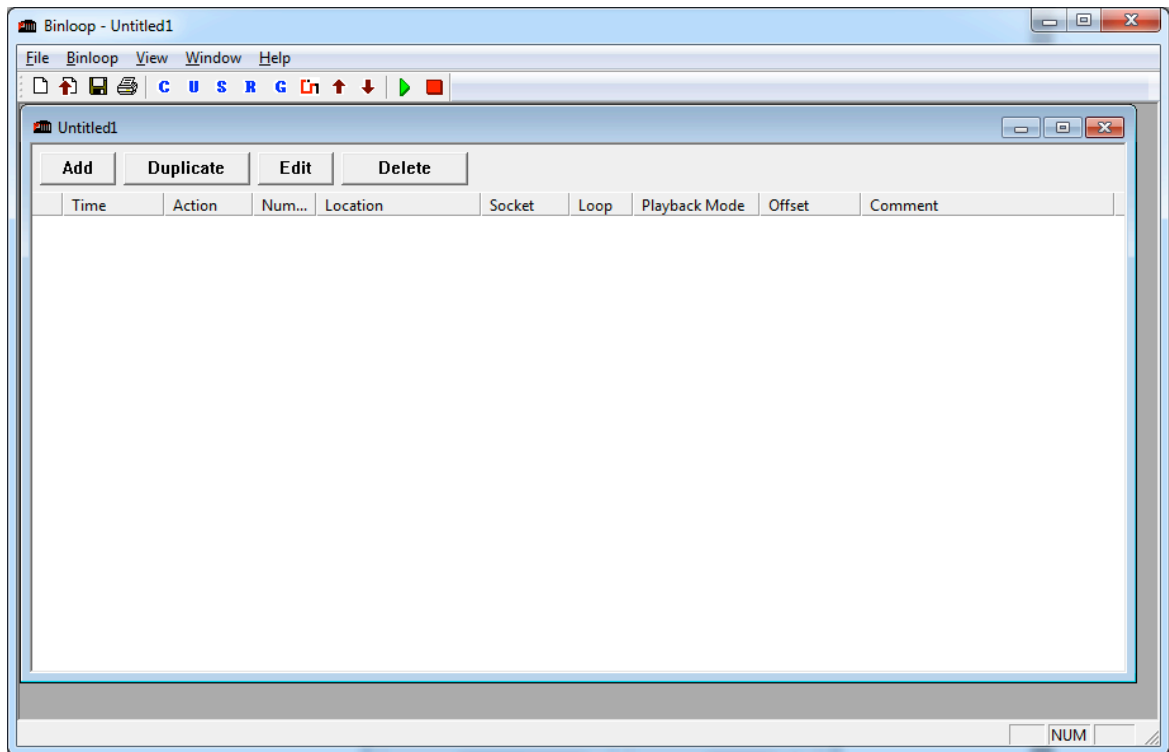
Beyond a good physical connection, Ethernet communication requires properly configured network settings on both the Binloop and your PC. Although Ethernet network design and administration is beyond the scope of this manual, we have provided a step-by-step guide in this manual that will walk you through connecting directly to the Binloop over Ethernet using the Binloop’s default settings. Please refer to the **Application Notes** section if you would like more information on this.

## Running Binloop Software

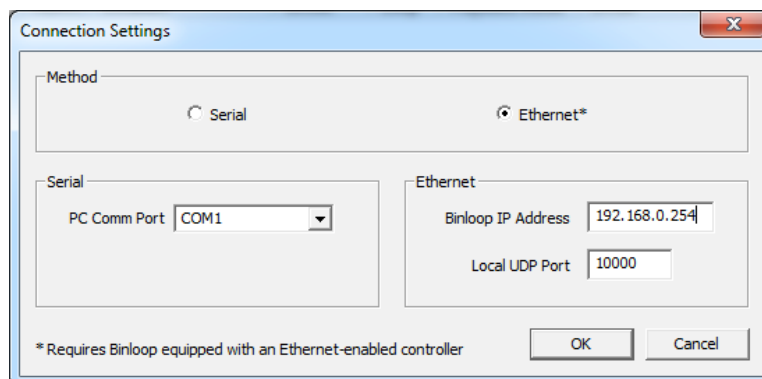
*The Binloop icon on your Desktop looks like this:*



Start the program by double-clicking the Binloop icon that was put on your desktop during the installation. The program can also be launched from the Windows Start menu from the **Programs→Alcorn McBride Inc** folder. When the program opens, you'll see this window...




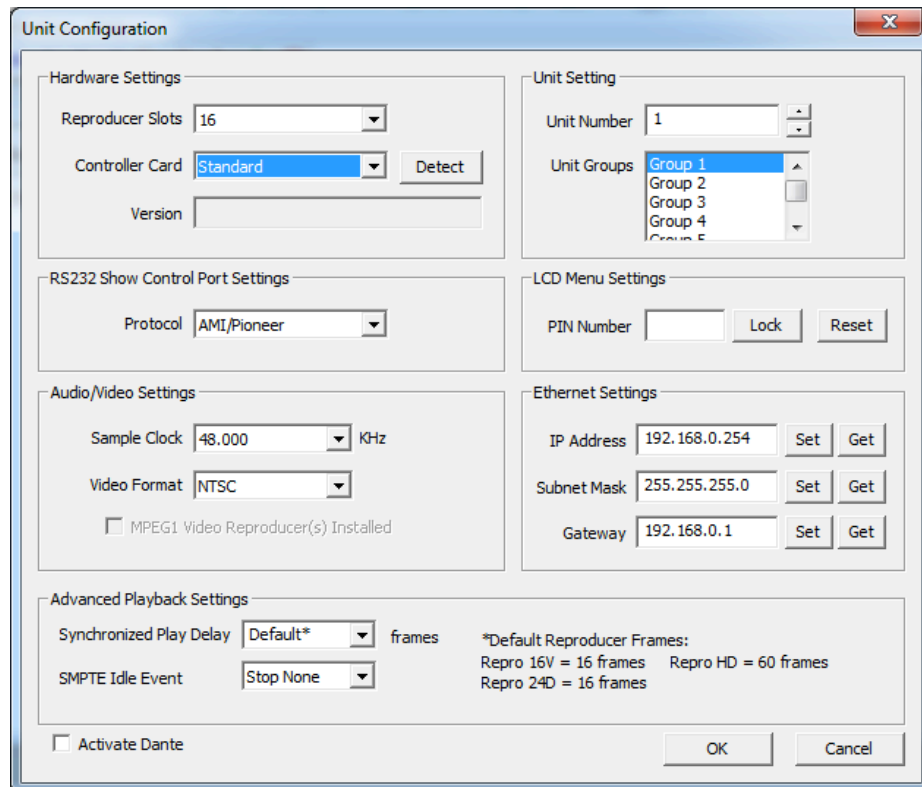
Before we get started, you'll need to configure your PC's connection with the Binloop. To do this, click on the **C** icon at the top of the Binloop window. A window will appear that will allow you to choose your preferred connection method.



If you intend to communicate with RS-232, you must select the **Serial** option and specify the COM port in your PC that is connected with the

Binloop. If you are using Ethernet, you must select **Ethernet** as the communication method and then enter the Binloop's IP address in the provided box. Once you have setup the appropriate connection, click the **OK** button to close this window.

To make sure that the connection is working properly, click on the  icon at the top of the Binloop window. This will open the Unit Configuration window you see below.



The Unit Configuration window is a dialog box with a title bar and a close button. It contains several sections for configuring the Binloop unit:

- Hardware Settings:** Includes a dropdown for Reproducer Slots (set to 16), a dropdown for Controller Card (set to Standard) with a Detect button, and a Version text box.
- Unit Setting:** Includes a dropdown for Unit Number (set to 1) and a list box for Unit Groups (Group 1 is selected).
- RS232 Show Control Port Settings:** Includes a dropdown for Protocol (set to AMI/Pioneer).
- LCD Menu Settings:** Includes a PIN Number text box and Lock/Reset buttons.
- Audio/Video Settings:** Includes a dropdown for Sample Clock (set to 48.000 KHz), a dropdown for Video Format (set to NTSC), and a checkbox for MPEG1 Video Reproducer(s) Installed.
- Ethernet Settings:** Includes text boxes for IP Address (192.168.0.254), Subnet Mask (255.255.255.0), and Gateway (192.168.0.1), each with Set and Get buttons.
- Advanced Playback Settings:** Includes a dropdown for Synchronized Play Delay (Default\*) with a frames label, a dropdown for SMPTE Idle Event (Stop None), and a checkbox for Activate Dante.
- \*Default Reproducer Frames:** A section showing default frame counts: Repro 16V = 16 frames, Repro HD = 60 frames, and Repro 24D = 16 frames.

At the bottom right are OK and Cancel buttons.

Click on the **Detect** button. If the connection is working properly, the **Version** box will display the current version of the Binloop's controller card. If this is not the case, please refer to the **Troubleshooting Guide** for assistance.



## Controlling the Binloop with the Binloop Software

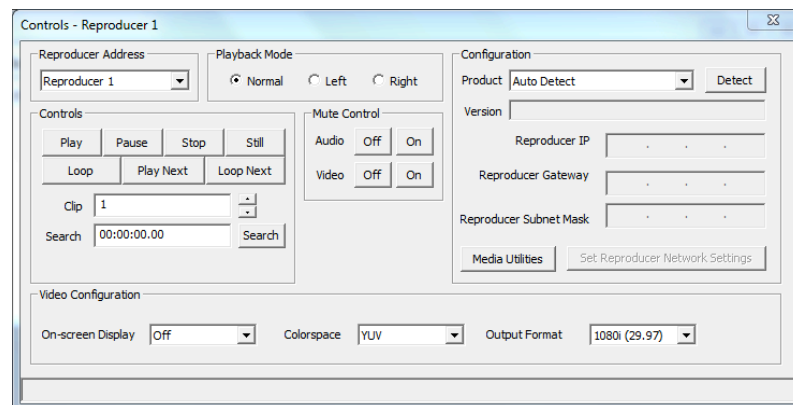
**Note:** Please refer to the **Media** section of this manual for more information on creating your own videos and file naming conventions for the Binloop.

Now that you are connected to the Binloop using the Binloop Software, let's go through an example of how you can use this software to control the Binloop in real-time. Specifically, this example will demonstrate how to command the Binloop to play a video file. Before we get started, it is assumed that you already have a known-working video assigned as clip #1 loaded onto the SSD of reproducer #1. It is also assumed that the outputs of reproducer #1 are properly connected to a video display. If these assumptions frighten you, then you should refer to the **Playing a Test Video** guide located in the **Getting Started** section of this manual before moving on.

1. Make sure that Reproducer 1 has a flash card loaded with a video clip named as clip 1 (i.e. VID00001).
2. Make sure that the Binloop, your video display, and your audio system are powered on.
3. Select *Binloop* → *Reproducer* → *Controls* from the menu of the Binloop Software.

*This window serves as an interface for manually controlling the Binloop. This lets you test the functionality of the Binloop before you apply that functionality to any of the Binloop's other control interfaces.*

*If you try to play a file that does not exist on the media the Red Error LED on the Reproducer Flashes rapidly*



4. Select *Reproducer 1* from the list on the left-hand side. Assuming that the number of the video file you want to play is 1, you can leave the *Segment* number as the default (1).
5. In the *Reproducer 1 Controls* window, use the buttons to control the playback.
6. Click on the *Play* button to start the video. The status LED of reproducer 1 will turn green.
7. Click on the *Stop* button to stop the video.

# Navigating through the Menus

## File Menu

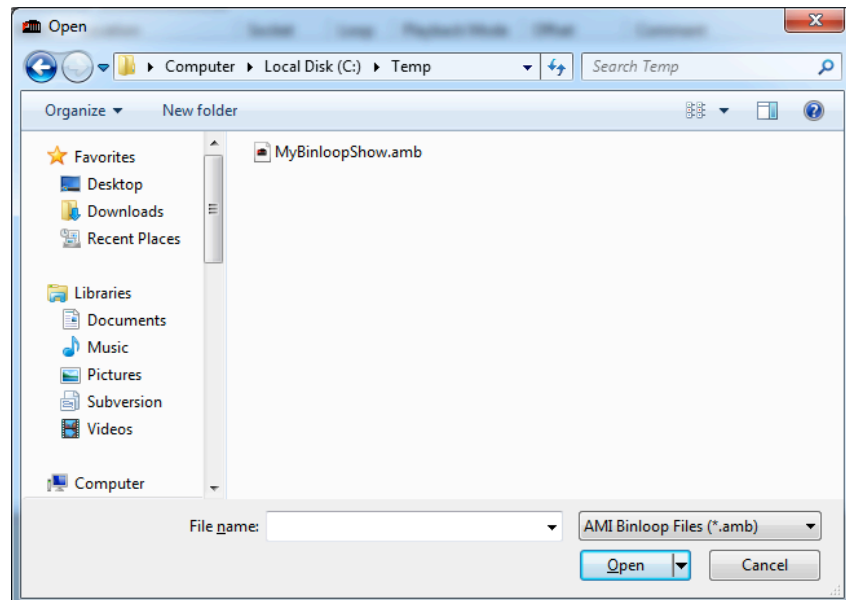
The first selection in the main menu is the **File** menu, which allows you to access **.AMB** Binloop files. These files hold all of the Binloop configuration and playback parameters including address, sample clock frequency, SMPTE frame rate, and timecode triggers.

### *New*

The first selection, **New**, creates a new Binloop configuration with default values and an empty timecode trigger list.

### *Open...*

The second selection is **Open...** which pops up a window allowing you to open a previously saved file containing all of your program settings. Previously-stored files are recalled by browsing to the correct directory location and selecting the saved file name.



Clicking on **OK** without selecting a file does not initiate any action. Clicking on **Cancel** closes the window without opening any file or changing any settings.

## **Save**

The **Save** option causes one of two actions. If you are using a file which was previously saved, choosing this option will immediately save the file with the same name and update the saved version with the new information, replacing the old version. If you are using a new file which has not yet been saved, will present the **Save** window. This window allows you to name your configuration file and choose a location to store it. The **Save** window is identical to the **Save As** window.

## **Save As...**

The **Save As...** option displays a window allowing you to save your current settings in a file with a new name.

The file name defaults to the name of the file you are currently using. The name can be changed from the default by typing a new name into the **File name** box.

## **Print Setup...**

The **Printer Setup...** selection allows you to select and configure your printer.

Once you've programmed some timecode triggers (explained later in this chapter) options for printing the table appear in this menu.

## **Print...**

The **Print** selection prints the timecode trigger list contained in the AMB file that you're currently viewing.

## **Print Preview...**

The **Print Preview** option shows what the timecode trigger list printout will look like before you actually print it.

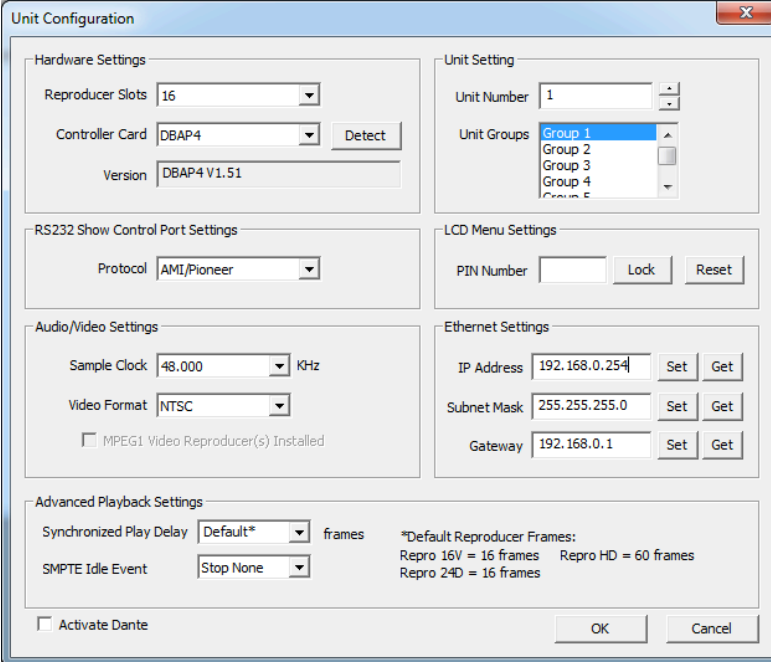
## **Exit**

The final option in the **File** sub-menu is **Exit**. This allows you to exit the program and returns you to Windows. If you have made any changes to the settings, you will be asked if you want to update the unit and if you want to save the file with the current settings before you exit the Binloop application.

## Binloop Menu

The next selection in the main window is *Binloop*. It contains two groups containing selections called *Settings...*, *SMPTE...*, *Reproducer*, and *Download to Binloop* and *Upload to Binloop*. Each of these selections is explained in what follows.

### Settings...Unit...



The Unit Configuration window is a dialog box with a title bar and a close button. It contains several sections for configuring the unit:

- Hardware Settings:** Includes a dropdown for Reproducer Slots (set to 16), a dropdown for Controller Card (set to DBAP4) with a Detect button, and a text field for Version (DBAP4 V1.51).
- Unit Setting:** Includes a dropdown for Unit Number (set to 1) and a list box for Unit Groups (Group 1, Group 2, Group 3, Group 4, Group 5).
- RS232 Show Control Port Settings:** Includes a dropdown for Protocol (set to AMI/Pioneer).
- LCD Menu Settings:** Includes a text field for PIN Number and Lock/Reset buttons.
- Audio/Video Settings:** Includes a dropdown for Sample Clock (set to 48.000) with a KHz label, a dropdown for Video Format (set to NTSC), and a checkbox for MPEG1 Video Reproducer(s) Installed.
- Ethernet Settings:** Includes text fields for IP Address (192.168.0.254), Subnet Mask (255.255.255.0), and Gateway (192.168.0.1), each with Set and Get buttons.
- Advanced Playback Settings:** Includes a dropdown for Synchronized Play Delay (set to Default\*) with a frames label, a dropdown for SMPTE Idle Event (set to Stop None), and a checkbox for Activate Dante. It also displays default frame counts: \*Default Reproducer Frames: Repro 16V = 16 frames, Repro HD = 60 frames, Repro 24D = 16 frames.

At the bottom right are OK and Cancel buttons.

### Reproducer Card Slots

*Many previous generations of Binloop products are supported by the Binloop Software.*

The Unit Configuration window permits the user to select the number of reproducers in the Binloop. The A/V Binloop Uncompressed has 8 slots.

### Control Port Protocol

The *Control Port Protocol* determines the protocol that is used on the Show Control Port. These settings can be either *Alcorn Show Control* (Alcorn 9-bit), *MIDI*, *ASCII* (Pioneer/AMI), and *Debug*. For more information on these protocols, please refer to the **Control Protocols** section of this manual.

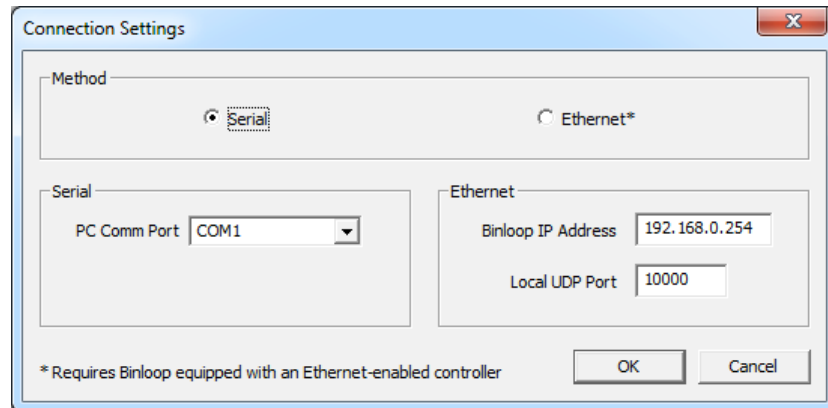
### Unit Number

The *Unit Number* is the device address used for the MIDI protocol and when addressing multiple units.

## Unit Groups

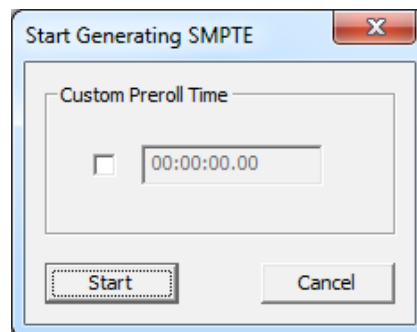
You can place the Binloop into a Group with other Binloops and address them as a single group. The *Unit Groups* selects which groups this Binloop is a member of.

## Settings...Connection...



This Connection Settings window provides settings for the serial COM port your using on your PC to communicate to the Binloop. It defaults to *Offline*.

## SMPTE...Start...

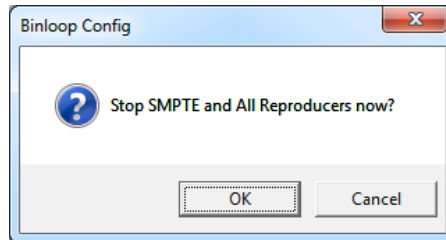


*You can also set a Custom Preroll Time where SMPTE Generation can begin earlier the first time it is started.*

This window presents you with a Start button for starting the SMPTE interface. This window will change depending on whether you have the SMPTE interface configured to Generate or Read SMPTE.

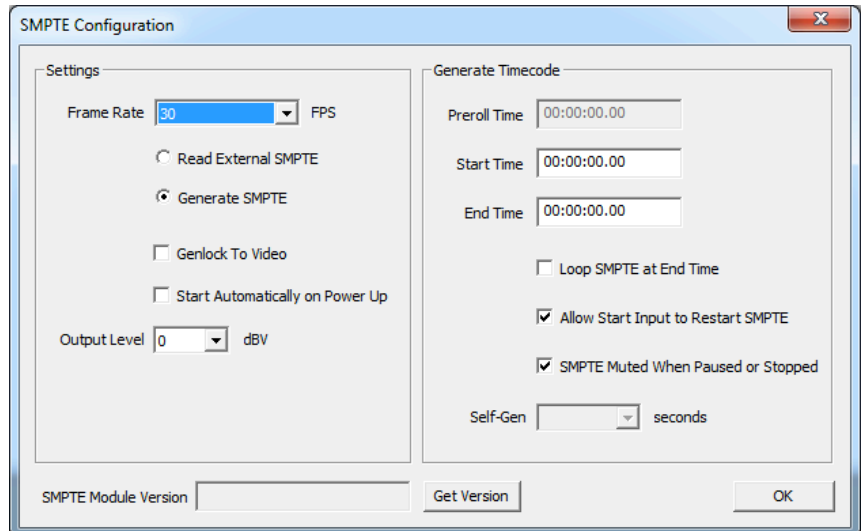
## ***SMPTE Stop...***

This option stops the SMPTE interface as well as the reproducers. A confirmation window appears with *OK* and *Cancel*.



## ***SMPTE Configuration...***

The SMPTE Configuration window allows you to set all of the parameters associated with the Binloop's SMPTE interface.



### **Frame Rate**

This is the Frame Rate used for generating SMPTE. The choices are 23.976, 24, 25, 29.97, 30-drop, and 30 frames-per-second.

### **Read External SMPTE**

This button configures the SMPTE interface to Read incoming SMPTE from the SMPTE In connector.

### **Generate SMPTE**

This button configures the SMPTE interface to Generate timecode. This timecode is used internally to process the timecode triggers, and is also fed to the SMPTE Out connector.

## **Genlock to Video**

*Only 23.976, 25 (PAL) and 29.97(NTSC) frame rates are supported when in Genlock to Video mode.*

*Since the A/V clock interface of the Binloop can lock to an external V-Sync source, this means that you can generate SMPTE synchronously with your video sync source as well.*

When this option is selected, the SMPTE interface will generate timecode synchronously with the internal V-Sync clock of the Binloop. This ensures that the SMPTE clock and reproducers operate at the same exact rate.

Since the SMPTE clock is used as a timing reference for timecode triggers, it's recommended that this option is enabled whenever you are synchronizing multiple video tracks. This will ensure that the reproducers start reliably in sync with one another.

## **Start Automatically on Power UP**

If this checkbox is active the Binloop will begin Generating or Reading timecode as soon as the system reaches the 'Ready' state.

## **Preroll Time**

This is the timecode value at which the SMPTE generator will begin when first started.

## **Start Time**

This is the time at which SMPTE timecode will loop back to when it is looping, or when a restart condition has occurred.

## **End Time**

This is the time at which SMPTE will stop or loop (depending on the Loop setting).

## **Loop SMPTE at End Time**

If this option is enabled, then the SMPTE generator will loop back to the *Start Time* when the *End Time* is reached.

## **Allow Start Input to Restart SMPTE**

When this option is enabled, a SMPTE Start command from any control interface will cause the SMPTE generator to jump back to the *Start Time*.

## **SMPTE Muted When Stopped or Paused**

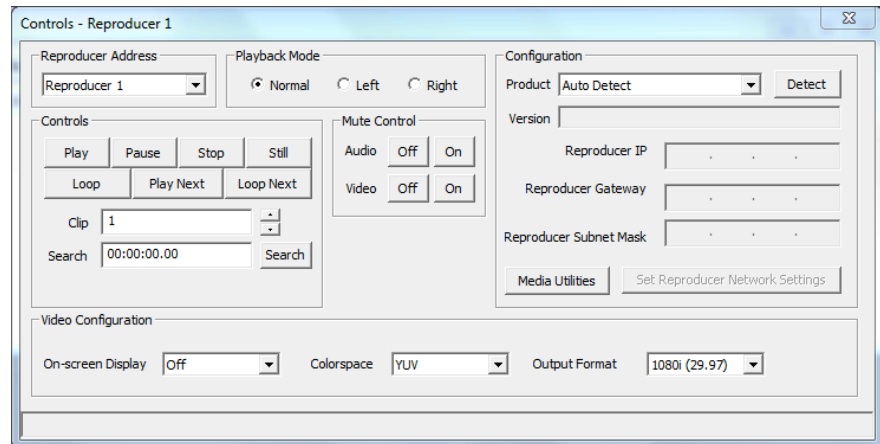
When SMPTE is paused or stopped, SMPTE output will be muted when this checkbox is active. If this checkbox is inactive, the current frame will be repeated over and over again when timecode is paused or stopped.

## **Version – Get Version**

This allows you to get the current firmware version of the SMPTE interface on your Binloop's Controller card.

## ***Reproducer...Controls...***

When you select this menu item, the Reproducer Controls window appears.



This window presents many controls that are good for playback testing and troubleshooting. Each is explained below. The next menu item allows you to select an individual Reproducer to control.

### **Reproducer Address**

This option changes which Reproducer or Reproducer Group you are configuring / accessing.

### **Playback Mode**

This option changes which audio playback is enabled: Normal (stereo), Left or Right.

### **Mute Control - Audio On/Off, Mute Video On/Off**

These buttons cause the audio and video to be muted or unmuted, . When video is muted, the video outputs are black.

## **Controls**

### **Play**

This will cause the selected Reproducer to *Play* the selected file segment. Clicking *Play* again will start playback over from the beginning.

### **Pause**

This causes the currently playing file to stop and blank the screen. Clicking *Play* will cause it to continue playback from where it was paused.



## Stop

This will cause the selected Reproducer to *Stop* the selected file segment. Clicking *Play* again will start playback over from the beginning.

## Still

This will cause the selected Reproducer to *Still* the selected file segment, but leave the last frame played up instead of blanking the screen. Clicking *Play* will cause it to continue playback from where it was paused.

## Loop

This will cause the selected Reproducer to *Loop* the selected file segment. Clicking *Loop* again will start playback over from the beginning.

## Play Next

If a file is currently playing, clicking the *Play Next* button will queue the specified file segment to play immediately after the current file is finished playing.

## Loop Next

If a file is currently playing, clicking the *Loop Next* button will queue the specified file segment to play in loop immediately after the current file is finished playing.

## Clip

*Please refer to the **Media Files** section of this manual for the correct way to name and number files.*

The Clip refers to the particular video file that you want to play. It is a number referring to the file number on the media.

## Search

You can *Search* a video file so that when you click *Play* it will begin playing immediately. Since the A/V Binloop Uncompressed does not support playing video from an offset, the offset value should always be 00:00:00.00.

## Search

## Colorspace

*RGB is actually RGsB w/ sync on green.*

This setting allows you to configure the component video output *Colorspace* as either *RGB* or *YUV*.

## Output Format

This setting allows you to change the output format of the video that is playing.

## Configuration

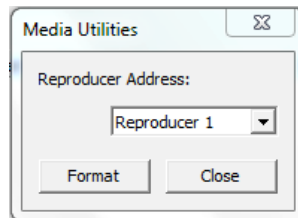
### Product / Detect

Here you can select the *Product* you are configuring manually or click **Detect** to have the *Product* and *Version* be detected for you.

### Media Utilities

*Important: You should always Format the media in the Binloop before you use it.*

This button accesses another window that allows you to Format the SSD media on the selected Reproducer. Formatting will erase the contents of the drive.



Pressing **Detect** will fetch the current network settings on the card.

### Reproducer IP

Here you can set the *IP* for the Reproducer.

### Reproducer Gateway

Here you can set the *Gateway* for the Reproducer.

### Reproducer Subnet Mask

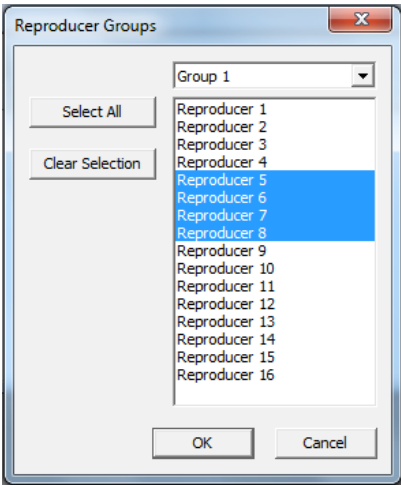
Here you can set the *Subnet Mask* for the Reproducer.

### Reproducer Groups

*Note: By grouping the reproducers together, Reproducers can be simultaneously commanded using any of the Binloop's control interfaces.*

Reproducers can be assigned to Groups using this selection. A Reproducer that is a member of a Group will respond simultaneously with other members to any command that is addressed to the Group. This provides the ability for one Play command to trigger synchronized multi-channel video playback.

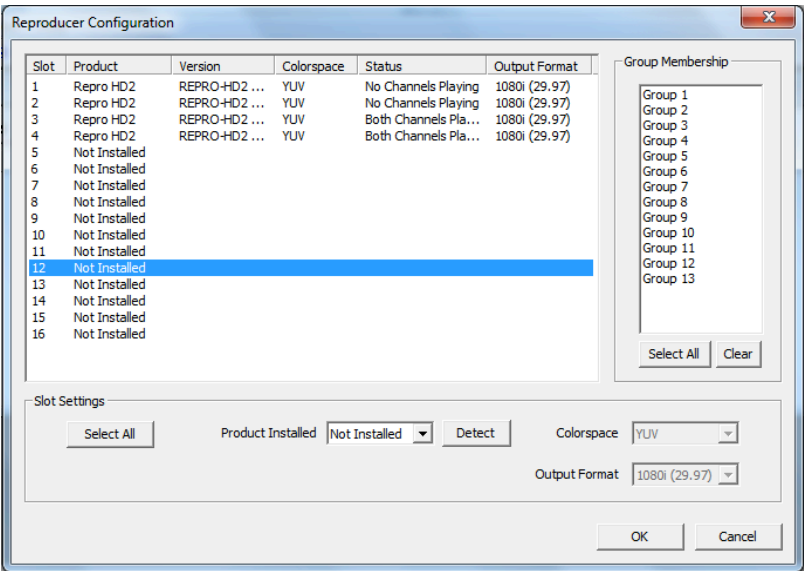
You can assign a Reproducer to be a member of more than one Group. Below is a screenshot showing the Group assignment window. This example assigns Reproducers 5, 6, 7, and 8 to be members of Group 1.



### Configuration...

You can determine the current playing configuration of each Reproducer by opening the *Configuration* window. When this window opens, select the cards you want and click *Detect* and after a brief moment each Reproducer will report their current status.

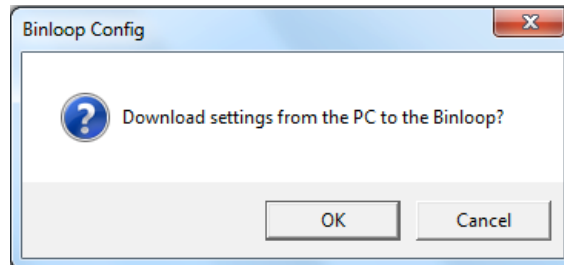
A Not Installed message appears if no Reproducer is installed in the slot.



### **Download to Binloop ...**

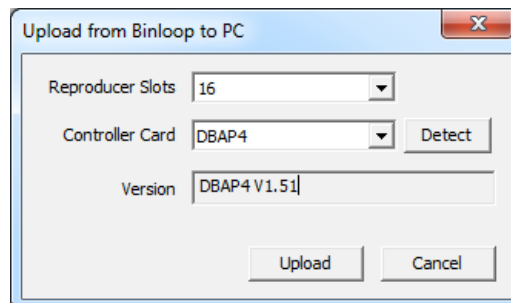
*Note: If the optional CobraNet card is installed, please disconnect the CobraNet interface before downloading the CobraNet configuration otherwise it may fail.*

This option allows you to download the configuration you are currently viewing. This includes all of the SMPTE interfaces settings, unit configuration settings, as well as any programmed timecode triggers. A confirmation window will appear.



### **Upload to Binloop**

This option allows you to retrieve the configuration from an A/V Binloop Uncompressed, view it within the Binloop software. When you click the Upload Configuration button you will be presented with a window asking you to select your Binloop and Reprodncer type.



## **View Menu**

---

The *View* button allows you to turn on or off the Tool Bar at the top of the main window, or the Status Bar at the bottom.

## **Window Menu**

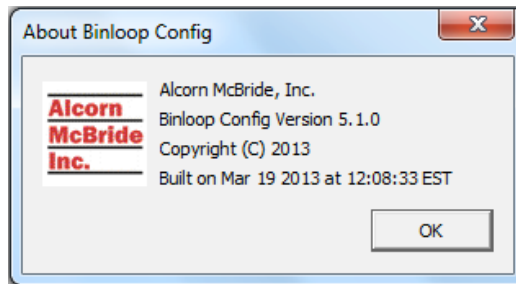
---

The *Window* button is a standard Windows control that allows you to open a *New Window* for Triggers, *Cascade* or *Tile* windows, and *Arrange Icons*.

## Help Menu

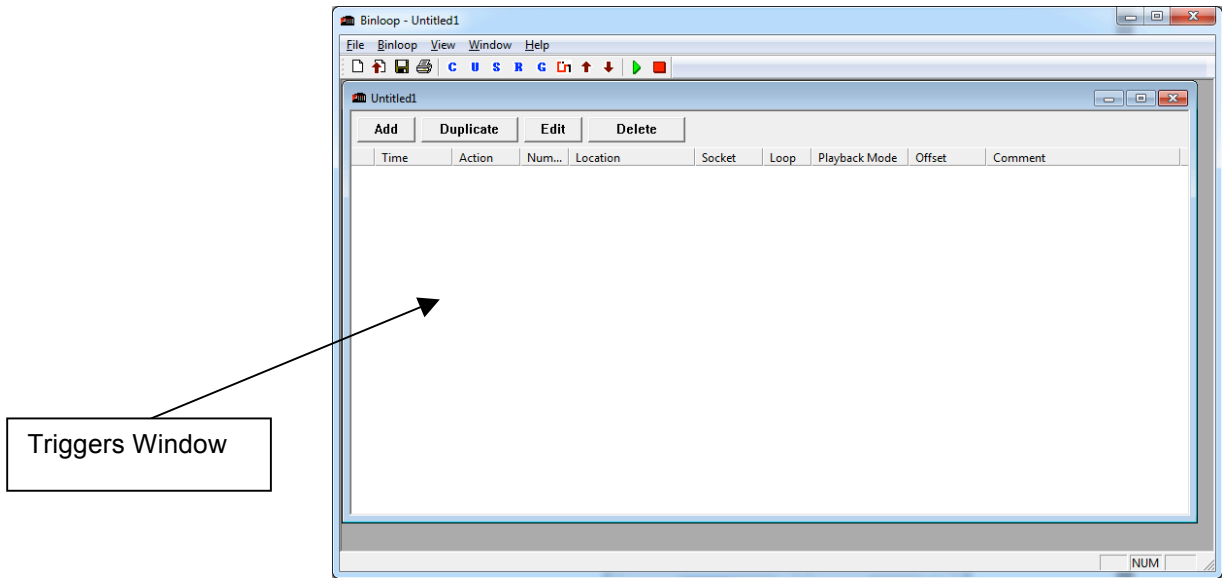
---

The **Help** sub-menu shows a window containing current revision information.



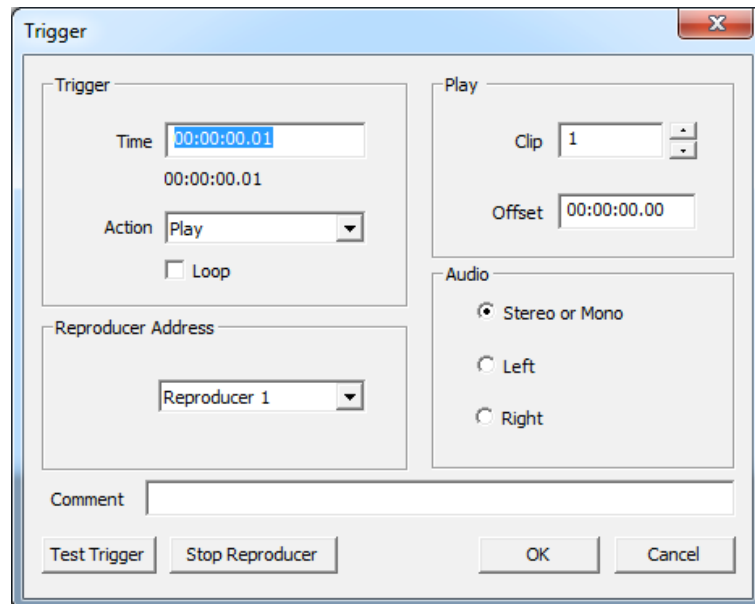
## Timecode Trigger List

The Timecode Trigger List is the portion of the Binloop software that allows you to program precisely timed commands that are triggered based on the Binloop's timecode clock. It has a row of button at the top that allow you to **Add**, **Duplicate**, **Edit**, or **Delete** triggers.



### Add

Clicking **Add** brings up a window that allows you to add a trigger.



### Time

This is the timecode value at which you want the trigger to occur.

## Action

This is the action (command) you want to have happen at the trigger *Time*. Available selections are *Play*, *Play Next*, *Pause*, *Still*, *Stop*, *Search*, *Start Sequence*, and *Set Variable*.

Action	Description
<b>Play</b>	Plays a file (Synchronous Play). Also used to resume from a search, still, or pause. (segment number is ignored when used to resume)
<b>Play Next</b>	Queue a file to play when the current clip is finished.
<b>Pause</b>	Pause video and audio playback, and mute video output
<b>Still</b>	Pause video and audio playback, still frame remains on-screen.
<b>Stop</b>	Stop playback
<b>Search</b>	Prepare a video for playback, first frame appears on-screen when search is complete.
<b>Start Sequence</b>	Send a Start Sequence command to an Alcorn McBride Show Controller out of the Show Control Port. (Show Control Port must be set to Alcorn 9-bit)
<b>Set Variable</b>	Send a Set Variable command to an Alcorn McBride Show Controller out of the Show Control Port. (Show Control Port must be set to Alcorn 9-bit)

## Loop

Check this box if you want the Play trigger to be a Play-and-Loop command where playback will loop back to the beginning of the clip after the clip ends.

## Location

You can have the *Action* apply either to an individual *Reproducer*, a *Reproducer Group*, or *All Reproducers*.

## Number

This is either the *Number* of the individual *Reproducer* or *Reproducer Group* selected in the *Location*. This field is disabled when *All Reproducers* is selected.

**Socket**

This field is used for older Binloop systems that have multiple flash memory sockets. This value is not relevant for the A/V Binloop Uncompressed.

**Segment**

This is the number of the video clip that you want to play (for Play triggers).

**Offset**

This field is used for reproducers that support playback from a specified offset into a video or audio file.

**Stereo or Mono versus Independent**

For Binloops that support audio playback, this option is used to trigger independent audio playback on the left or right channel. The A/V Binloop Uncompressed does not support this type of audio playback, so leave this setting on 'Stereo or Mono' at all times.



## A Word About Trigger Latency:

---

The Binloop uses two different types of Play commands. The first one, called “Unsynchronized Play” is used mostly for “point-source” or other audio/video applications where synchronization between channels is not important.

The other type of Play command is called “Synchronous Play”. This command needs to be used in those situations where absolute frame synchronization is required across channels. This is the type of play command issued by the *Play* action. There are important differences between how the Binloop reacts to these two commands.

### ***Unsynchronized Play Latency***

When this type of play command is sent to a reproducer, it starts playing the file as soon as it possibly can. The latency is determined only by the amount of time it takes the reproducer to process the play command, load the clip from the SSD, and begin decoding and playing the file. This latency is very short, but it is not predictable. For that reason, this command is not recommended for use when the goal is to synchronize playback between multiple reproducer cards. The unsynchronized play command is normally used for applications that require multiple channels of video that are unrelated to one another (like individual kiosks, etc.).

### ***Synchronized Play Latency***

*The exact amount of latency time will depend on the SMPTE frame rate being used.*

*When using Play commands from the Timecode trigger list, it is highly recommended that the SMPTE clock is locked to V-Sync. This ensures that the timecode framerate and the video framerate of the reproducers is synchronous.*

A Synchronized Play is the same as an Unsynchronized Play with one key difference. Rather than playing the video as quickly as possible, the reproducer will wait a consistent amount of time after the play command was received before playback starts. This ensures that every reproducer that received this command starts playing at the same time.

The latency between when the play command occurs and when the file actually starts playing is exactly **2 seconds** for a ***Synchronized Play***. This delay provides the reproducer with more than adequate time to process the command and load the video from the SSD so that it's ready to start playing when the consistent wait period is over.

Use the Synchronized Play command for playing groups of Reproducers, which must start playback in perfect synchronization (i.e. multi-channel music tracks, video wall presentations, or 4K playback).



# CobraNet

## Description

CobraNet is an industry standard interface for distributing multiple channels of audio over an Ethernet based network. This is useful for both transmitting audio over long distances, as well as easily interfacing to CobraNet compatible systems using a simple Ethernet cable rather than many individual analog connections.

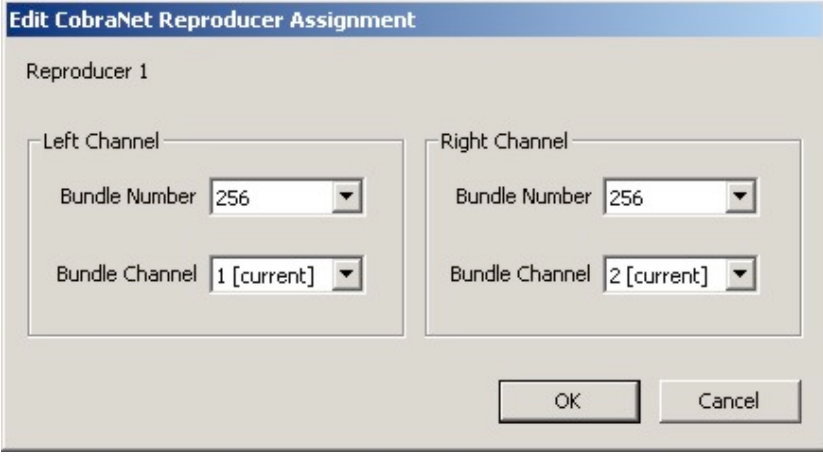
## Details

CobraNet is digitally encoded audio over Ethernet, and as such it does not suffer the effects of long distance analog transmission issues. It is not within the scope of this manual to provide a detailed installation and implementation of CobraNet; however, feel free to contact Alcorn McBride for additional details.

CobraNet uses standard Ethernet packets and network infrastructure (controllers, hubs, repeaters, switches, cabling, etc.).

## Reproducer Configuration

---



The image shows a software dialog box titled "Edit CobraNet Reproducer Assignment". Inside the dialog, there is a label "Reproducer 1". Below this, there are two main sections: "Left Channel" and "Right Channel". Each section contains two dropdown menus: "Bundle Number" and "Bundle Channel". In the "Left Channel" section, "Bundle Number" is set to "256" and "Bundle Channel" is set to "1 [current]". In the "Right Channel" section, "Bundle Number" is set to "256" and "Bundle Channel" is set to "2 [current]". At the bottom right of the dialog, there are two buttons: "OK" and "Cancel".

Reproducer 1

Left Channel

Bundle Number 256

Bundle Channel 1 [current]

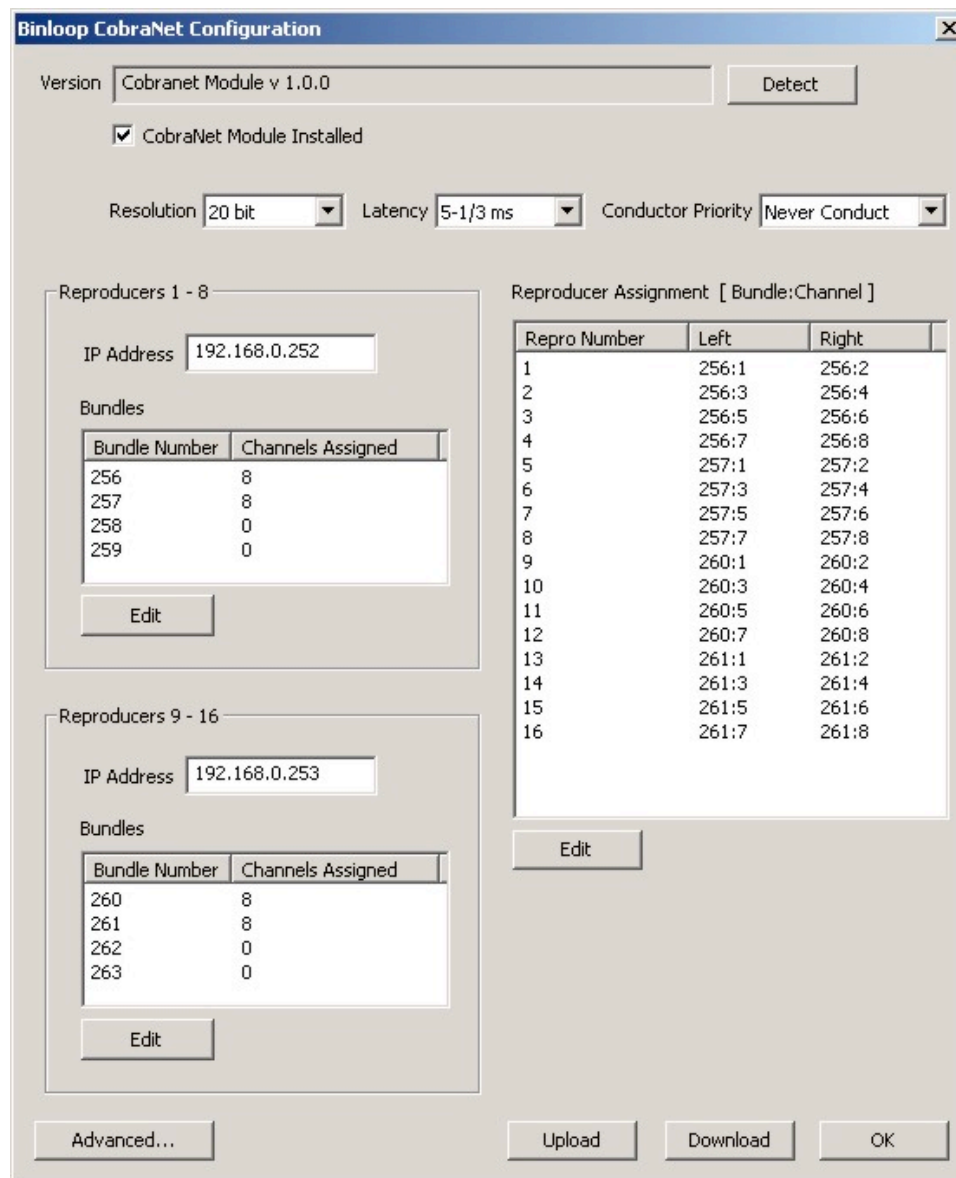
Right Channel

Bundle Number 256

Bundle Channel 2 [current]

OK Cancel

## CobraNet Configuration



The Binloop CobraNet Configuration window is a graphical user interface for setting up CobraNet hardware. It includes a version field, a 'Detect' button, a checkbox for 'CobraNet Module Installed', and dropdown menus for 'Resolution' (20 bit), 'Latency' (5-1/3 ms), and 'Conductor Priority' (Never Conduct). The window is divided into two main sections for 'Reproducers 1 - 8' and 'Reproducers 9 - 16'. Each section contains an 'IP Address' field, a 'Bundles' table, and an 'Edit' button. The 'Reproducer Assignment' table on the right lists 16 reproducers with their 'Left' and 'Right' channel assignments. At the bottom, there are buttons for 'Advanced...', 'Upload', 'Download', and 'OK'.

Version:

☒ CobraNet Module Installed

Resolution:  Latency:  Conductor Priority:

Reproducers 1 - 8

IP Address:

Bundles

Bundle Number	Channels Assigned
256	8
257	8
258	0
259	0

Reproducers 9 - 16

IP Address:

Bundles

Bundle Number	Channels Assigned
260	8
261	8
262	0
263	0

Reproducer Assignment [ Bundle:Channel ]

Repro Number	Left	Right
1	256:1	256:2
2	256:3	256:4
3	256:5	256:6
4	256:7	256:8
5	257:1	257:2
6	257:3	257:4
7	257:5	257:6
8	257:7	257:8
9	260:1	260:2
10	260:3	260:4
11	260:5	260:6
12	260:7	260:8
13	261:1	261:2
14	261:3	261:4
15	261:5	261:6
16	261:7	261:8

**Detection** – The configuration process starts by locating the CobraNet hardware. Upon locating the CobraNet interface the hardware will report back the revision number for identification purposes.

***A Note about Downloading the CobraNet configuration*** – When downloading the CobraNet configuration, please first disconnect the CobraNet interface otherwise the configuration download may timeout and fail.

## CobraNet Advanced Configuration

Binloop CobraNet Advanced Configuration

☒ CobraNet Chip 1 ☐ CobraNet Chip 2

Settings

IP Address: 192.168.0.252 Resolution: 20 bit Latency: 5-1/3 ms Conductor Priority: Never Conduct

Bundle 1			Bundle 2			Bundle 3			Bundle 4		
Channel	Repro	Left / Right	Channel	Repro	Left / Right	Channel	Repro	Left / Right	Channel	Repro	Left / Right
1	1	Left	1	5	Left	1			1		
2	1	Right	2	5	Right	2			2		
3	2	Left	3	6	Left	3			3		
4	2	Right	4	6	Right	4			4		
5	3	Left	5	7	Left	5			5		
6	3	Right	6	7	Right	6			6		
7	4	Left	7	8	Left	7			7		
8	4	Right	8	8	Right	8			8		

OK

### CobraNet Clip -

**IP Address** – This is the network address, which is used to identify the source of the session. The function of this address is the same as any other IP address used on the network

**Resolution** – This is the encoded resolution of the audio source. 20 or 24 bits are the standard options

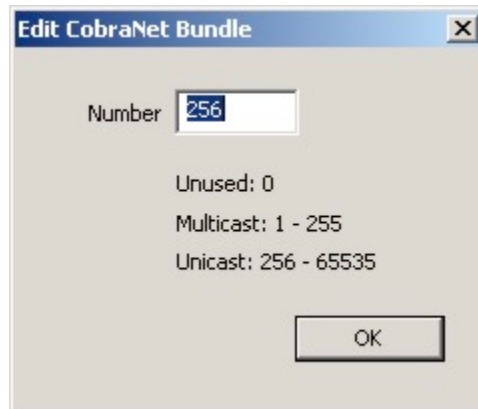
**Latency** – This option allows the operator to set the maximum delay tolerated in the communications channel

**Conductor Priority** – This establishes the point of control for the communications session.

**Bundle Assignments** – The bundle number is assigned to the communications channel as well as the audio channels to be carried with in the bundle. Note: Left and right stereo channels are identified as individual channels in a bundle.

## Bundle

---



The “Bundle” is the term used for the network channel in which the sending device will connect with the receiving unit. Many audio channels can be transmitted within a bundle. Bundle numbers 0-255 are defined as “Multicast” point-to-many channels and bundles 256-65279 are “Unicast” or point-to-point transmissions. For additional information on CobraNet, contact Cirrus Logic support at the link below:

**<http://www.cirrus.com/en/support/cobranet/>**

# Dante

## Description

*NOTE: A Binloop equipped with a Dante interface will come from the factory with the Dante "Installed" setting selected in the front panel Menu under "Unit Setup."*

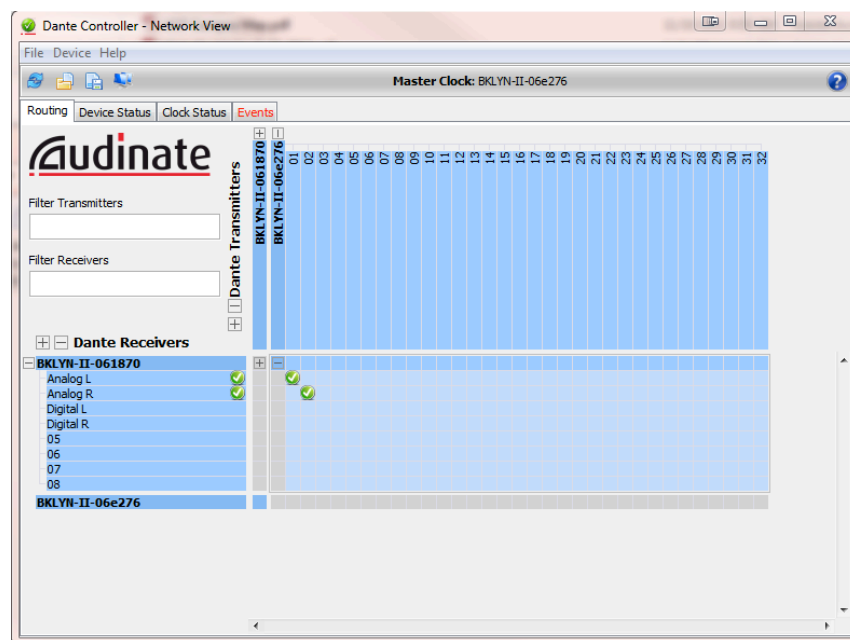
Dante is a combination of software, hardware, and network protocols that deliver uncompressed, multi-channel, low-latency digital audio over a standard Ethernet network.

## Details

Dante is a Layer 3 Ethernet Protocol which encapsulates audio data in standard IP packets. For complete details please visit [www.audinate.com](http://www.audinate.com).

## Dante Controller

The Dante interface is configured and controlled with the Dante Controller program. This is a Windows program is accessible through Binloop.exe configuration program.



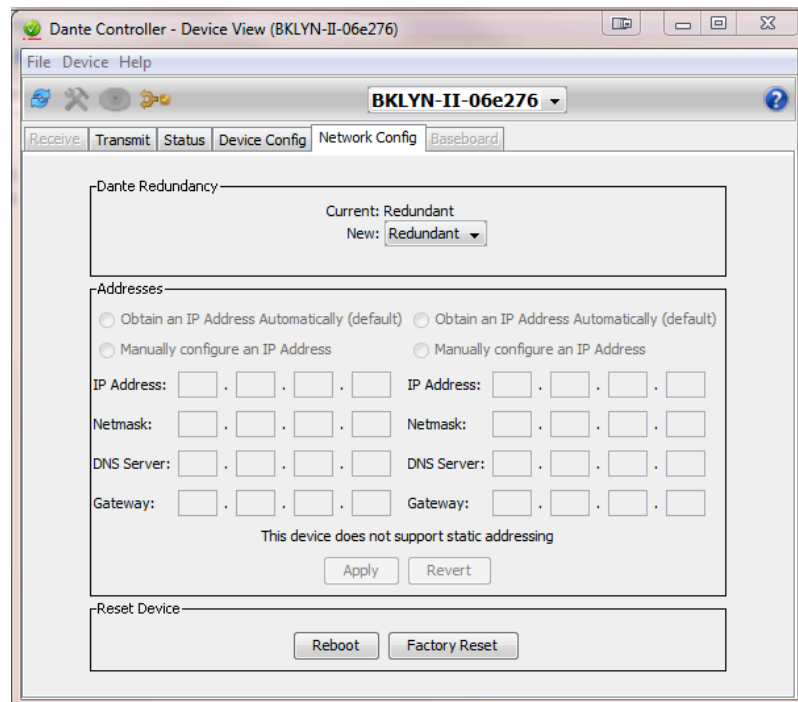


For complete details on how to use the program a complete Help menu system is accessible by clicking 'Help' in the program.

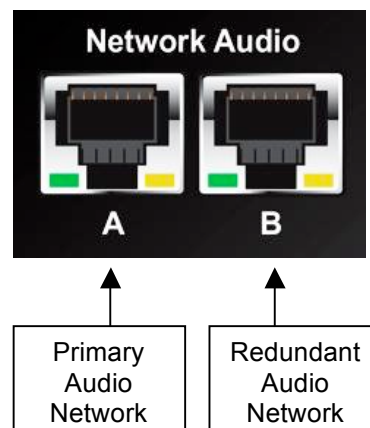
## Primary and Redundant Network

A Binloop equipped with a Dante Interface card supports a Primary and Redundant network, available through two separate RJ45 jacks. If for some reason, the Primary Dante network fails, the Redundant network will seamlessly take over and audio will not be interrupted.

The Redundant Dante Network is enabled from the factory by default. This can be changed in Dante Controller using the Device View tab and then the Network Config tab.



On the rear panel of the Binloop the Primary Network RJ45 jack is labeled 'A'. The Secondary Network RJ45 jack is labeled 'B'.





# Hardware Description


## Controls and Indicators

The Binloop is normally controlled either internally using a configuration loaded from our Binloop software, or remotely from an external control system. However, the product does have several controls and status indicators located on the front panel.

### Unit Status LED's

---

On the front of the Binloop are nine LED's corresponding to the status of the unit. Below is a brief description of their meaning:



*Power*  
*Fault*  
*Lock*  
*Gen*  
*Ready*  
*Run*  
*Pause*  
*Stop*  
*Mute*

**Power** (Green) - Power is being applied to the unit.

**Fault** (Yellow) - The unit has detected a fault condition.

**Lock** (Red) - The unit has detected an external sync source (video by default) and is locked to it. This lock can also be from SMPTE/GPS.

**Gen** (Red) - The unit is actively generating SMPTE timecode.

**Ready** (Red) - The unit is ready to accept commands. This LED should almost always be on.

**Run** (Red) – This indicator is illuminated whenever the SMPTE output is active.

**Pause** (Red) - This LED is illuminated during SMPTE generation when the Pause button has been pressed and a Pause at the SMPTE End or Loop Time is pending.

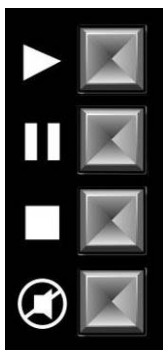
**Stop** (Red) - This is illuminated whenever the SMPTE Generator/Reader is idling and ready to begin SMPTE generation or external SMPTE synchronization.

**Mute** (Red) - This LED is illuminated when the Mute button on the unit has been pressed. This indicates that the audio outputs of all reproducers are muted.

## Control Buttons

---

Directly beneath the Unit Status LED's, there are four control buttons. Their functions are defined briefly here but they will be discussed in more detail over the course of the next two chapters:



**▶ Start** - If the Binloop is programmed to generate SMPTE, pushing this button starts the generation of timecode. If the Binloop is programmed to read external timecode, this causes the unit to start listening for external timecode. If SMPTE is already being generated, this button can be optionally configured to restart the SMPTE clock.

**⏸ Pause** – This button is only applicable when the Binloop is configured to generate and loop SMPTE. Pushing this button causes the SMPTE generation to pause the next time the configured End Time (the loop point) is reached. After this button is pressed, the Pause status LED will illuminate.

**■ Reset** – If the Binloop is configured to generate timecode, pushing this button halts the generation. If the Binloop is configured to read external timecode, this button causes the Binloop to ignore any incoming timecode. In addition, pressing this button stops playback on all reproducers.

**🔇 Mute** – Pressing this button toggles between muting and unmuting the audio outputs of all reproducers. When this button is in the mute position, the reproducer status LED's will be red to indicate that they are muting the audio output. The Mute status LED will also be illuminated in this case.

## Reset to Factory Defaults

---

This will clear ALL user settings and will load factory defaults. To reset to factory defaults:

1. Turn off the Binloop
2. Hold down the first three Control Buttons: Start, Pause and Reset.
3. Turn the Binloop back on while still holding down these buttons.
4. You should see "DEFAULTS LOADED REBOOTING..." within 5 seconds.
5. Release the buttons and wait for the Binloop to initialize. The first boot after defaults are loaded will take a bit longer than a regular boot sequence. Do not be alarmed.

## Display and Menu Wheel

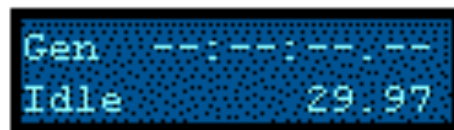
---

The Binloop is equipped with 2x16 character LCD Display. This display is primarily used to indicate the current status of the Binloop. Here's an example of that status display:



Gen\* 01:00:12.23  
Running 29.97

The current SMPTE mode is indicated at the top-left of this screen. The 3 possible modes are displayed as **Gen**, **Gen\*** (Generate /w V-Sync), and **Read**. The current state of the SMPTE generator/reader is displayed at the bottom left, and the SMPTE frame rate is displayed at the bottom right. The time at the top-right of the display represents the current SMPTE timecode value in hours, minutes, seconds, and frames. In the event that there is no current timecode value (meaning timecode is not currently being read or generated), this time will be displayed as dashes like the following example:



Gen --:--:--.--  
Idle 29.97

In addition to providing system status, the display can also be used in conjunction with the nearby Menu Wheel to access the configuration settings of the Binloop. To enter this menu, simply press in the menu wheel.



---MAIN MENU---  
Unit Setup >

**Note:** The menu wheel 'clicks' when rotated to provide tactile feedback between selections.

After you do this, you can navigate through the various settings of the Binloop by rotating the menu wheel to change the selection, and pressing it to select the current item. When you are finished, simply browse to the 'Exit' selection and push the menu wheel to return to the status screen. To see a complete map of this menu interface, refer to **Appendix D - Wheel Menu Map**.

## Reproducer Status LED

---

Each reproducer has a single multi-color LED located directly above the SSD slot. The color and blink pattern of this LED signifies the current state of the reproducer. Here's a table of those states and the corresponding LED behavior:

LED State	Reproducer State
Off	Stopped
Green	Playing
Orange	Paused, Stilled, or Searched
Red	Audio Muted
Flashing Red	Fault
Pulsing Green	Power-on Initialization
Pulsing White	Firmware Update
Pulsing Orange	Formatting SSD

## Reproducer Test Button

---

Each reproducer has a test button located directly above the SSD slot. As you can probably tell from the name, this button is intended only for testing purposes and not for normal operational control. When this button is pressed, the reproducer reacts differently depending on its current state.

**Note:** *Clip Number 1 is VID00001. Please refer to the **Media Files** chapter in this manual for further details on clip naming.*

1. If the reproducer is stopped, pressing this button will cause the lowest numbered file to start playing.
2. If the reproducer is playing, pressing this button will cause it to stop playing.
3. If the reproducer is in a fault condition (status LED flashing red), pressing this button will clear the fault.

## Connectors

This table lists all connectors on the Binloop Card Cage and their related function. The connectors are all located on the rear of the Binloop. If the connector is a single signal, then the signal is listed. If the connector contains multiple signals, the connector's pins are identified in further tables.

### Connector Summary

---

Connector	Type	Function
3G-SDI	BNC Female (up to 8)	SMPTE 424M 3G-SDI Digital Video Outputs
HDMI	HDMI Female (up to 8)	HDMI Interface for Digital Video and Audio
Show Control	DB-9/M	RS-232 to Control System
Programmer Port	DB-9/M	RS-232 to Programmer
VSYNC	BNC Female	Blackburst Video Sync Input
SMPTE	DB9/F	SMPTE Input/Output
Parallel Control	DB37/F	Control and I/O
AES/EBU & S/PDIF I/O	DB37/F x 2	AES/EBU or S/PDIF Digital Audio I/O
CobraNet/Dante	RJ-45 (2 for Dante)	CobraNet/Dante Audio Network
Ethernet	RJ-45	Ethernet Control

## Digital Audio (AES/EBU)

---

This connector contains outputs for AES/EBU, S/PDIF, or AC3 digital audio data for the Reproducers 1 – 8.

Reproducer Slot	Output
1	1(+), 20(-)
2	2(+), 21(-)
3	3(+), 22(-)
4	4(+), 23(-)
5	5(+), 24(-)
6	6(+), 25(-)
7	7(+), 26(-)
8	8(+), 27(-)

## Show Control Port

---

The Show Control serial port is intended for applications where the Binloop is to be controlled remotely via an RS-232 capable control system. This could be an Alcorn McBride show controller, a PC, or practically any device with an RS-232 serial port. Since this interface is designed to be flexible, it supports a variety of different serial protocols. These protocols include **Alcorn 9-bit**, **Pioneer/AMI**, and **MIDI**. For more information on how to use the serial control interface, please refer to the section titled **Controlling the Binloop**.

Pin	Signal
1	N/C
2	RXD
3	TXD
4	N/C
5	GND
6 – 9	Not Used



## Programmer Port

---

The Programmer serial port is specifically intended to connect with a PC serial port for configuring and programming the Binloop using the Binloop software. This connection should be made with a straight-through (not null) 9-pin serial cable, which is included with the Binloop.

Pin	Signal
1	N/C
2	TXD
3	RXD
4	N/C
5	GND
6 – 9	Not Used

## Ethernet

---

The Ethernet jack of the Binloop is intended to connect the Binloop to a 10/100 Ethernet network. This interface can be used by the Binloop Configuration software to control the Binloop as well as download new configurations. For other methods of Ethernet control, this interface also provides a simple control interface that uses the Pioneer/AMI protocol over the common Ethernet protocol called UDP. For more information on how to use the Ethernet interface of the Binloop, please read the section of this manual called **Controlling the Binloop**.

## V-Sync

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The V-Sync connector is a female BNC connector that is designed to accept a blackburst video sync signal. When a sync signal is applied to this connector, the A/V system of the Binloop will use this as a reference for all audio and video generated within the Binloop. For more details about using external video sync with the Binloop, refer to the **A/V Sync System** chapter in the **About the Binloop** section of this manual.

## SMPTE

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The SMPTE connector provides both an input and output for the SMPTE interface of the Binloop. The balanced input is 600 ohm transformer-isolated and will accept levels between 1- 5 Vpp. The balanced output level defaults to 0dBV into 150 ohms, but can be adjusted between 0-4dBV using the front-panel menu of the Binloop. For backward compatibility with previous Binloop systems, an alternate V-Sync input is also provided on this connector.

Pin	Signal
1	SMPTEIN +
2	SMPTEIN -
3	N/C
4	VSYN CIN
5	GND
6	N/C
7	N/C
8	SMPTEOUT-
9	SMPTEOUT+

## Parallel Control

---

This connector contains various inputs and outputs that can be used to control and monitor the Binloop. Pins 7-14 are optically-isolated inputs designed to trigger on 24V. Pins 20-37 are designed to accept a contact closure between the specified pin and a GND pin (16, 17, 18, or 19).

Pin	Signal
1	SMPTE Running output (Contact 1)
2	SMPTE Running output (Contact 2)
3	Fault output (Contact 1)
4	Fault output (Contact 2)
5	Ready output (Contact 1)
6	Ready output (Contact 2)
7	SMPTE Start input (+)
8	SMPTE Start input (-)
9	SMPTE Pause input (+)
10	SMPTE Pause input (-)
11	SMPTE Stop input (+)
12	SMPTE Stop input (-)
13	Mute input (+)
14	Mute input (-)
15	VCC (+5VDC) supplied by Binloop power supply
16	GND
17	GND
18	GND
19	GND
20	Play and Loop clip 1 of group 1.
21	Play and Loop clip 2 of group 2.
22	Play and Loop clip 3 of group 3.
23	Play and Loop clip 4 of group 4.
24	Play and Loop clip 5 of group 5.
25	Play and Loop clip 6 of group 6
26	Play and Loop clip 7 of group 7.
27	Play and Loop clip 8 of group 8.
28	Reset SMPTE.
29	Idle SMPTE (refresh)
30	Reserved (leave unconnected)
31	Reserved (leave unconnected)
32	Reserved (leave unconnected)
33	High = SMPTE Locked, Low = not locked
34	High = Video Sync locked, Low = no sync detected
35-37	(not used)

## Control Card Jumpers

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The following Controller cards have jumpers located on them that can be used to change certain settings on the card itself.

### **DBAP5 Controller Revision B**

**JP1** is the video sync type jumper:

**POS 1-2** = Blackburst

**POS 2-3** = Composite Sync

**W1** is the 75 ohm termination jumper for V-sync, and should be installed.

**JP2**, **JP3**, and **JP4** are used to switch the Show Control port between RS232 and RS422

**POS 1-2** = RS232

**POS 2-3** = RS422

# Media Files

The reproducer cards in an A/V Binloop Uncompressed play back sequences of images, one for each frame, contained in folders on the SSD. This section provides detailed information on those requirements so that you can successfully create and load content into the A/V Binloop Uncompressed.

## File Types

The A/V Binloop Uncompressed stores clips as a sequence of still image files in a directory. These images can be either in the Targa format, or in Alcorn McBride's AMT file format. Use the free file conversion function of Alcorn McBride's MediaFlow software to convert image sequences to the appropriate file format.

# File Naming

## Clip Naming

Each clip on the A/V Binloop Uncompressed is stored in its own directory on the SSD and referenced by a clip number. That clip number is taken from the last characters of the directory name.

For instance, an SSD loaded with three clips could have the following directories on the SSD:

*MorningShow00001*  
*AfternoonShow00002*  
*EveningShow00003*

Each of these directories contains hundreds or thousands of image files which make up your video clip. The clip number at the end of the directory name should be between 0 and 1023.

The clip number should not be more than 5 digits, but does not have to be padded with any particular number of zeroes, MyClip01 and MyClip00001 are equivalent.

The clip number should be unique. Do not have directories with the same clip number, such as MyClip01 and MyClip00001 on the same SSD.

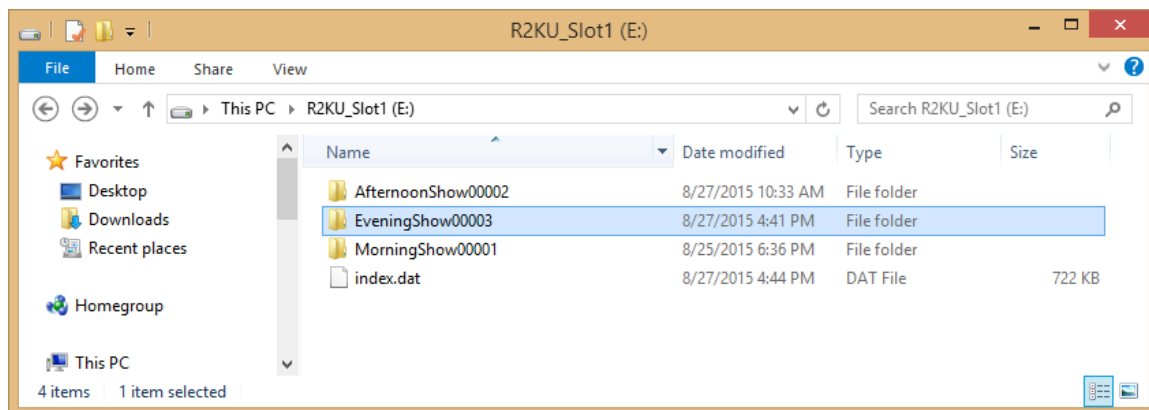
### Valid Clip Directory Names:

*Vid00001*  
*MyClip2*  
*OtherClip0003*

### Invalid Clip Directory Names:

*001* (clip number should have prefix)  
*MyClip0000002* (clip number has too many digits)  
*SundayVideo* (no clip number in name)

The following screenshots shows an example of an SSD with the three example clips loaded:



## Image Sequence Naming

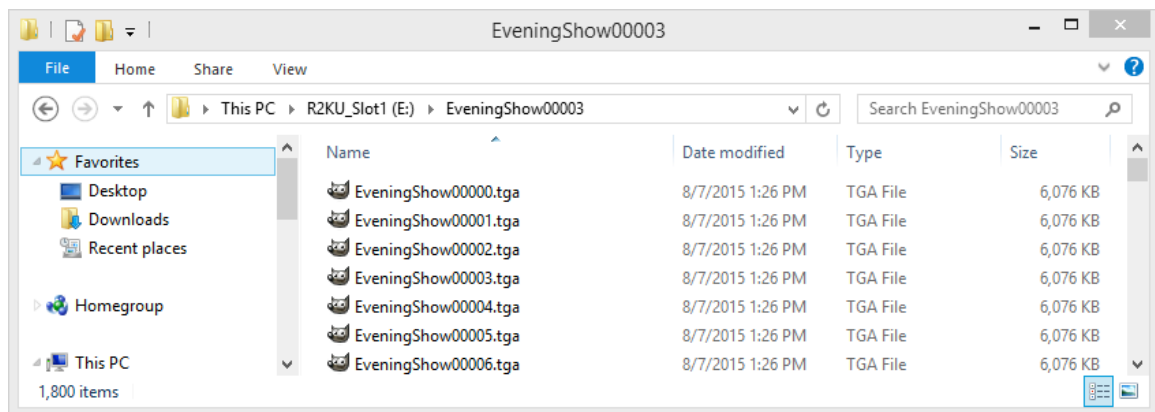
Within each directory is a sequence of still image files consisting of each frame of the clip. For instance, the above *EveningShow00003* directory could contain the following files, each a frame from the clip:

*EveningShow 00000.tga*  
*EveningShow 00001.tga*  
...  
*EveningShow 01799.tga*

In this example, clip #3 is 1800 frames long. If a 59.94fps framerate is selected, this means the playback time of that clip is about 30 seconds.

Frame file numbers within a directory should start at 0 and be consecutive.

The following screenshot shows an example of the first few files in a clip directory:



# Installation Guidelines

## A Word on Temperature

The Binloop requires free air ventilation. All models are designed to operate between temperatures of 32 to 100 degrees F and 0 to 99% non-condensing relative humidity. Like all other electrical equipment, this means that an air-conditioned equipment room is the optimal environment. Temperatures can easily exceed the high limit if the Binloop is mounted without proper ventilation or mounted directly above or below a piece of equipment that normally runs hot (i.e. power amplifier). Remember, high temperature is the enemy of all electronic equipment. For adequate ventilation, please leave an empty 1U rack space on the top and bottom of the A/V Binloop Uncompressed.

## SSD Media Reliability

The SSD drives supplied with your A/V Binloop Uncompressed are data-center class drives designed for 24/7 operation and sustained performance. The manufacturer's MTBF (Mean-Time Between Failure) is 2,000,000 hours.

When failures do occur they normally occur during the first few hours of use. Often this is called "infant mortality." Even this failure mode is extremely rare, however.

Nonetheless, it is always prudent to properly backup all of the audio and video data contained in your Binloop. This can easily be done by simply copying the data to a PC hard drive or by making CDR or Data-DVD/R backups.

Like any other computer system, your sound and video files for the Binloop should be treated as critical data. Successful operation of your installation depends on this data.

Unlike consumer-grade SSD's, these data-center class SSD's run special firmware designed for the demanding 24/7/365 environment that your Binloop is designed for. For this reason, please only use SSD's supplied by Alcorn McBride, or you will see performance issues.



## Removing a Card from the Cage

**WARNING:** The following information should only be used when a card (Controller, or Video Reproducer) has failed and must be returned to Alcorn McBride Inc. Removing a card carelessly could result in further damage, which would not be covered under your warranty. **PLEASE BE EXTREMELY CAREFUL!!!**

1. Disconnect power from the unit.
2. Remove the magnetic front panel from the unit.
3. If removing a reproducer card, proceed to step 5. If removing the controller card, use a Phillips head screwdriver to remove four screws holding on the left bracket holding the display and encoder knob. These screws also hold on the powerful magnets that hold the front cover – after removal don't let the screws/magnets slam together, they could break! Also, be careful of the cables connecting the display and encoder. Observe the polarity of these cable connections and be sure to reconnect in the same way if either becomes disconnected.
4. Inside the unit should be:
  - The Power Supply (a silver box on the left side)
  - The Controller Card (the card on the left with four buttons on the lower end and an array of ten LEDs on the top.
  - Various Audio and/or Video Reproducers - Cards with one button on the top, an LED right underneath, and a slot for an SSD.
5. Verify the stability of each card (Controller, Audio/Video Reproducers) to make sure that it has not simply become disconnected:
  - **GENTLY** push on the card to make sure that is not off of the tracks in the slot. If it is stable, proceed to step 7.
6. If the card is not stable:
  - **GENTLY** pull the card out of the slot.
  - Carefully align the card in between the guides. The solder side of the circuit board should be facing away from the power supply on the left.
  - **GENTLY** push the card toward the back end of the unit until you feel the pins lock into place. **DO NOT FORCE THE CARD IN!**
7. To Remove the Card:
  - Find the card that needs to be replaced.

- **GENTLY** pull the card toward you. At first you will feel some resistance as you pull the card from its connectors in the back. After the card has been detached, it will slide easily.
8. Place the card in a Static Shielding bag to protect the board from static discharge.
  9. Place the card-in-the-bag on a stable surface.
  10. If you removed the encoder/display bracket, replace it and tighten the screws. Do not overtighten these screws, as it could break the magnets!
  11. Carefully place the magnetic cover back onto the unit. Make sure that it is facing the right direction (The Alcorn McBride logo should be right-side up).
  12. Pack the card-in-the-bag in a box, padded to protect against damage.

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***Please be sure to obtain an RMA number from your distributor (if outside USA) or from Alcorn McBride before returning product.***

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# Specifications

## Physical

Power:	100 - 240VAC, 6-3A Max. 60-50 Hz.
Size and Weight:	19" W x 5.25" H x 11.50" D, 19 lbs.
Environment:	0° C (32°F) to 38° C (100° F) 0-90% Relative Humidity

## Control Information

Push Button Controls:	Start/Stop or Mute (1 per Reproducer) SMPTE Start, Pause, Stop, Mute All
LED Indicators:	Power, Fault, Lock, Gen, Ready, Run, Pause, Stop, Mute
OLED Display:	2 x 16 Characters
Parallel Inputs:	Loop, Stop (for 8 groups) Start SMPTE, Pause SMPTE, Stop, Opto-Isolated
Parallel Outputs:	Ready, Running, Fault, dry contact relay outputs
Show Control Serial:	RS-232C – Settings vary by protocol
Programmer Port Serial:	RS-232C at 9600 baud (9th-bit parity)

## Video

Formats:	Targa or AMT Image Sequences
Resolution:	2Kp (2048x1080), 1080p, 720p
Frame Rates (fps):	59.94, 50, 47.952, 29.97, 25, 23.976
Digital Output:	HDMI, 3G/HD-SDI (SMPTE-292M/SMPTE-424M)

## Audio

**NOTE:** Audio is currently supplied by a Repro16V/Repro24D reproducer. Digital Audio output from the uncompressed Repro2KU cards will be enabled in a future firmware update. Contact Alcorn McBride for more details.

Formats:	WMA-9, WMA-9 Pro, MPEG-1 Layer I/II, MPEG-2 Layer II, MPEG-2 AAC, MPEG-4 AAC LC2-Channel/5.1 Channel, Dolby® Digital EX, Pro Logic®II, MLP and DTS®
Digital Outputs:	AES/EBU or S/PDIF
Unbalanced Outputs:	+4 Volts Maximum into 20K
Balanced Outputs:	+8 Volts Maximum into 150 ohms (+20dBm)
Output Impedance:	DC Coupled, less than 10 ohms
Quantization:	16 bit
Dynamic Range:	104 dB
Sample Rate:	44.1 KHz 48.0 KHz
Frequency Response:	DC - 20,000 Hz +/- 0.5 dB
Signal-to-Noise:	120 dB Below Full Scale when muted
THD+N:	-97dB
Track Skew:	Less than 100 nanoseconds
Sync Format:	NTSC at 29.97 Hz, or PAL at 25 Hz

## SMPTE

Frame Rates:	23.976, 24, 25, 29.97, 30-drop, or 30
Trigger Skew:	23 µSec max
Lock Range:	+/- 20%
Timing Stability:	7 ppm
Dropout Tolerance:	Configurable (None, Infinite, or 1-8 seconds)
Input:	Transformer Isolated
Input Impedance:	600Ω balanced
Output:	Balanced 2-10 VPP selectable 0dBV to +4dBV selectable
Output Impedance:	10Ω maximum
Load Impedance:	10KΩ

# Application Notes

## Note 1: Automatically Play on Power-Up

Many times, all you may want the Binloop to do is to play and loop a video clip when it is powers up. This can be accomplished using the Binloop's built-in SMPTE generator, and the Timecode control interface. This application note will lead you through the process of configuring the unit to use these features to perform this type of function.

### Preparation

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If you do not already have a SSD loaded with a video clip, then follow the procedures found in the **Playing A Test Video** section before going any further. This section will take you through the steps needed to format an SSD and load it with a test video.

This application note also requires that you have the Binloop Configuration software installed on a PC, and that the PC is connected to the Binloop using Ethernet or RS-232. If you do not have this software or you need guidance with connecting your PC to the Binloop, refer to the **Binloop Configuration Software** section before continuing with this example.

### Connecting to the Binloop

---

To get started, launch the Binloop software and verify that you have established a connection with the PC to the Binloop. An easy way to do this is to upload the configuration from the Binloop to your PC. To do this, click on **File→New Upload from Binloop...** Unless you have already established a connection with the Binloop, a screen will appear prompting you to select the communication method. Select the appropriate method, and the click **OK** to begin uploading the Binloop configuration to your PC.


Once the upload is complete, a window will appear within the Binloop application. This window is called the Trigger List, and contains a list of all timecode triggers that were stored in the Binloop. If there were no triggers stored in the Binloop, this list will be empty. If you have reached this point without receiving any communication errors, you have successfully established a connection with the Binloop.

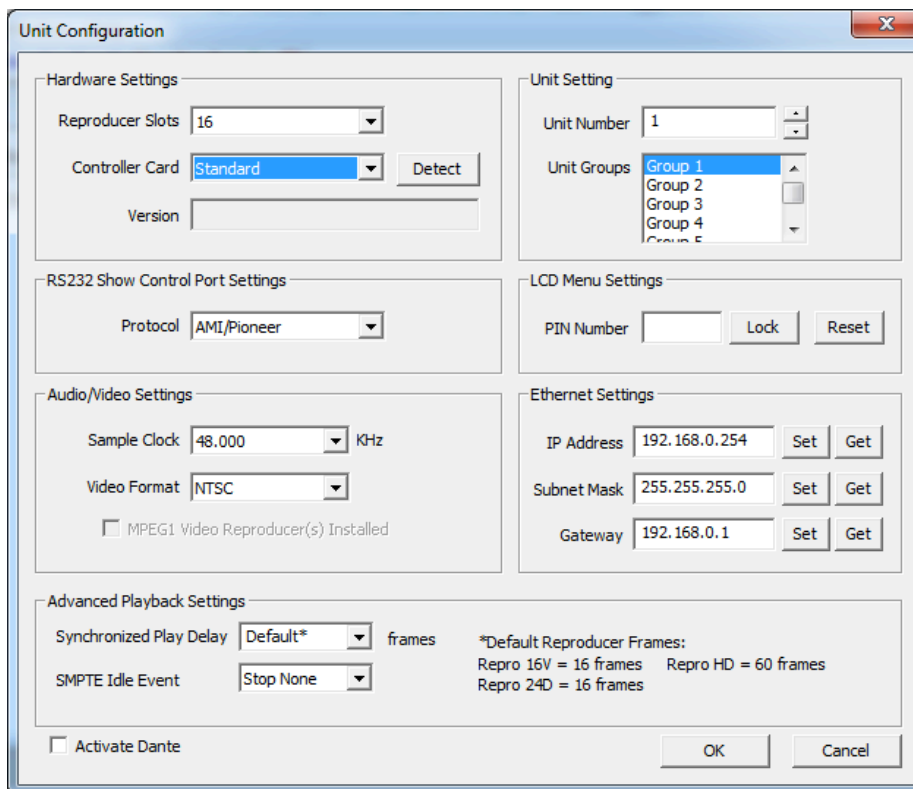
## Modifying the Binloop Configuration

There are a few important things that need to happen before the Binloop can automatically play video on power-up. First, we need to configure the Binloop's SMPTE timecode interface to automatically generate timecode when the unit powers on. Next, we have to create a timecode trigger that will instruct the Binloop channels (Reproducers) to begin playing a video.

The idea is that the SMPTE clock will begin running on power up. When this clock reaches a certain value, a trigger will instruct the Binloop reproducers to play a video. When the video is finished, the SMPTE clock will loop back to its starting value and cause this process to repeat indefinitely.

### Unit Configuration

Let's begin by configuring some of the basic Binloop settings. In the Binloop software, navigate to the **Unit Configuration** screen. To do this, select **Binloop→Settings→Unit...** from the application menu or by click on the  icon in the menu bar.



The Unit Configuration dialog box is divided into several sections:

- Hardware Settings:** Reproducer Slots (16), Controller Card (Standard), Detect button, Version field.
- Unit Setting:** Unit Number (1), Unit Groups (Group 1, Group 2, Group 3, Group 4, Group 5).
- RS232 Show Control Port Settings:** Protocol (AMI/Pioneer).
- LCD Menu Settings:** PIN Number field, Lock button, Reset button.
- Audio/Video Settings:** Sample Clock (48.000 KHz), Video Format (NTSC), ☐ MPEG1 Video Reproducer(s) Installed.
- Ethernet Settings:** IP Address (192.168.0.254), Subnet Mask (255.255.255.0), Gateway (192.168.0.1), Set/Get buttons for each.
- Advanced Playback Settings:** Synchronized Play Delay (Default\* frames), SMPTE Idle Event (Stop None), \*Default Reproducer Frames: Repro 16V = 16 frames, Repro HD = 60 frames, Repro 24D = 16 frames.

At the bottom, there is an ☐ Activate Dante checkbox and OK/Cancel buttons.

For the sake of this example, the majority of these settings are not important. Just make sure that the number of reproducer slots is configured for **8**, and that the **Standard** controller card is selected. Once you have verified these settings, click **OK** to exit this screen.

## SMPTE Configuration

Next, we will setup the SMPTE interface in the **SMPTE Configuration** screen. You can access this screen by selecting **Binloop→SMPTE→Configuration...** or by clicking on the **S** icon.

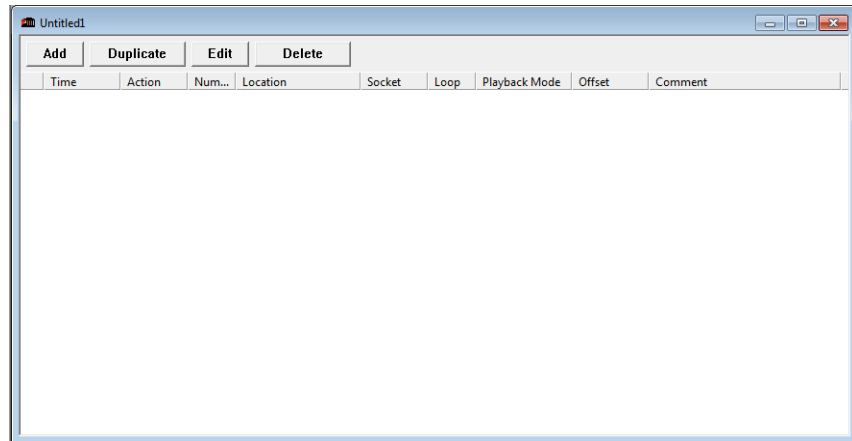
The screenshot shows the 'SMPTE Configuration' window. The 'Settings' panel on the left has 'Frame Rate' at 29.97 FPS, 'Generate SMPTE' selected, 'Genlock To Video' checked, 'Start Automatically on Power Up' unchecked, and 'Output Level' at 0 dBV. The 'Generate Timecode' panel on the right has 'Preroll Time' at 00:59:55.00, 'Start Time' at 01:00:00.00, 'End Time' at 00:00:00.00, 'Loop SMPTE at End Time' checked, 'Allow Start Input to Restart SMPTE' checked, and 'SMPTE Muted When Paused or Stopped' unchecked. The 'Self-Gen' dropdown is set to 'seconds'. At the bottom, there is a version field, a 'Get Version' button, and an 'OK' button.

Even though there is only one trigger at the start, we'll have the SMPTE clock run synchronous to the video. Select **29.97** as the frame rate and enable the **Genlock To Video** option. Make sure **"Start Automatically on Power Up"** is checked. Uncheck **"Loop SMPTE at End Time"** to make sure that the trigger is only executed once.

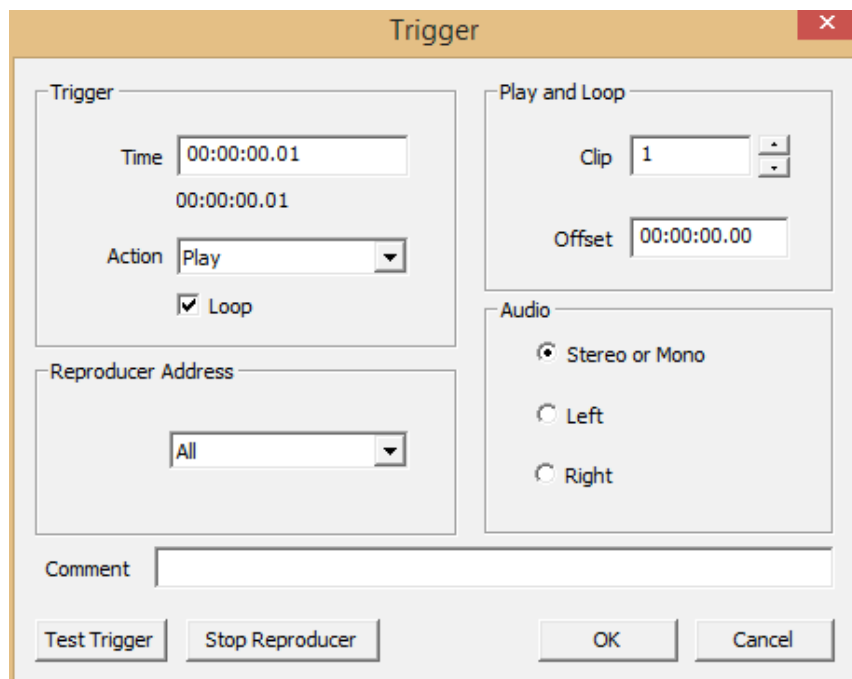
Now, the only thing left to configure is the range of time that the SMPTE interface will generate. First, set the **Preroll Time** to **00:59:55.00** and the **Start Time** to **01:00:00.00**. Because we only have one trigger, to loop continuously, SMPTE End Time is not relevant.

## Trigger List

Now we have the important configuration screens set up, we need to add a **Loop** trigger to the trigger list. This trigger will command the reproducers to play a video at the time we specify.



To create a new trigger, click the **Add** button at the top left of the trigger list window. The following window will appear.




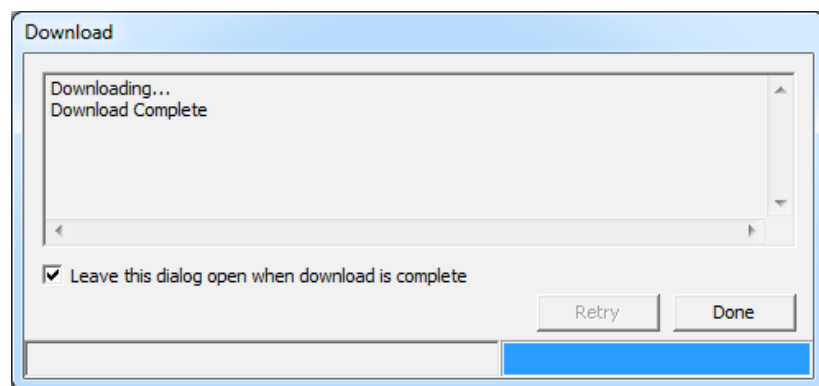
First, we need to enter the SMPTE time when we want this trigger to occur. Enter **01:00:00.00** in the **Time** box. Select **Play** as the **Action**, and make sure the **Loop** option is checked. In the **Location** box, select **All Reproducers**. Next, verify that the **Segment** is set to **1** (this assumes that you have named your clip as clip #1, as instructed in the **Playing a Test Video** section). Click on **OK** to add the trigger to the trigger list.



## Downloading the New Configuration

---

We've now created a configuration that will cause the Binloop to play and loop video when it powers up. All we have to do is download that configuration to the Binloop so that it will take effect. To initiate the download, click on the  icon or select **Binloop→Download to Binloop...** A window will prompt you to make sure that you want to download the new configuration and overwrite the configuration currently in the Binloop. When you proceed, the following progress window will appear to show you the real-time progress of the download.



The configuration we just created is now stored in the Binloop. To verify that it works, turn the Binloop off and then back on again. After it finished initializing, the SMPTE clock will start running. When the clock reaches 01:00:02.00, every reproducer in the Binloop with a video #1 will start playing video and continue to loop this video.

## Note 2: Controlling the Binloop with an Alcorn McBride Show Controller

While the Binloop has some very powerful features that allow it to operate as a stand-alone device in many circumstances, there are inevitably applications where an external control system is required. An installation may have other elements besides video such as lighting, audio, special effects, interactive interfaces, etc. In addition to making A/V products like the Binloop, Alcorn McBride also specializes in making Show Control systems to easily manage applications like these.

This goal of this application note is to show how easy it is to integrate one of our show control products with the Binloop for simple remote control. This particular example will use an Alcorn McBride V4Pro to start video playback in the Binloop from a button press. Keep in mind that, although we're using a V4Pro in this example, all of our controllers would be programmed using the exact same method.

### Preparation

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This application note requires that you have video clips loaded onto the Binloop. If this is not the case, then follow the procedures found in the **Playing A Test Video** section before going any further. This section will take you through the steps needed to format the SSD and load it with a test clip.

This application note also requires that you have the Alcorn McBride WinScript Live software installed on a Windows PC. This software is always available as a free download from our website at <http://www.alcorn.com/>. Your PC must be connected to the Show Controller's Programmer port using an RS-232 serial cable or connected via Ethernet.

Last but not least, the V4Pro and the Binloop must be connected via RS-232 or Ethernet. In this example, we will be controlling the Binloop from RS-232 Port 1 of the V4Pro. This means that a Null-model RS-232 cable must be connected between **Port 1** of the V4Pro to the **Show Control** port of the Binloop.

## Configuring the Binloop

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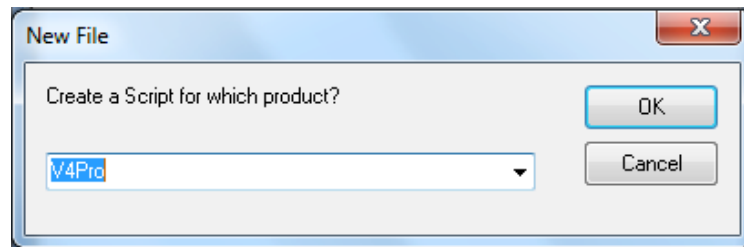
Before the V4Pro can properly control the Binloop, some steps must first be taken to prepare the Binloop. We must make sure that the Binloop is not doing anything that will interfere with the commands from the show control system. For example, if you followed the steps in the previous application note, the Binloop would currently be configured to trigger itself to play periodically. Connecting a show controller will not prevent this, so you must take steps to prevent any undesired behavior. This could be accomplished by deleting triggers from the Trigger List, configuring the SMPTE clock to be idle, or both. If you need assistance doing these things, you can use the previous application note as a guide on changing the Binloop's configuration.

## Programming the Show Controller

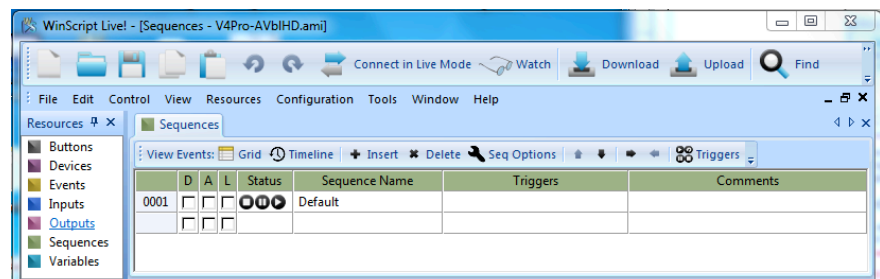
---

Alcorn McBride Show Controllers are designed to be programmed initially by a PC, and then operate independently of the PC once the programming is complete. We call this program a 'script', and it is created and transferred using the WinScript Live application mentioned earlier in the application note.

To get started on writing a show control script, launch the WinScript Live software. Select **New** from the startup screen, or click on **File→New**. The following screen will appear:



Select the show controller you wish to use, and then click **OK**. In this example we will be using **V4Pro**. After that, a new blank script will be created that looks like this:



Before modifying the new script, click on **File→Save** to give it a descriptive name and store a copy of the script on your PC. For this example, we will save our script as “**V4Pro-AVbiUC**”.

## **Port Configuration**

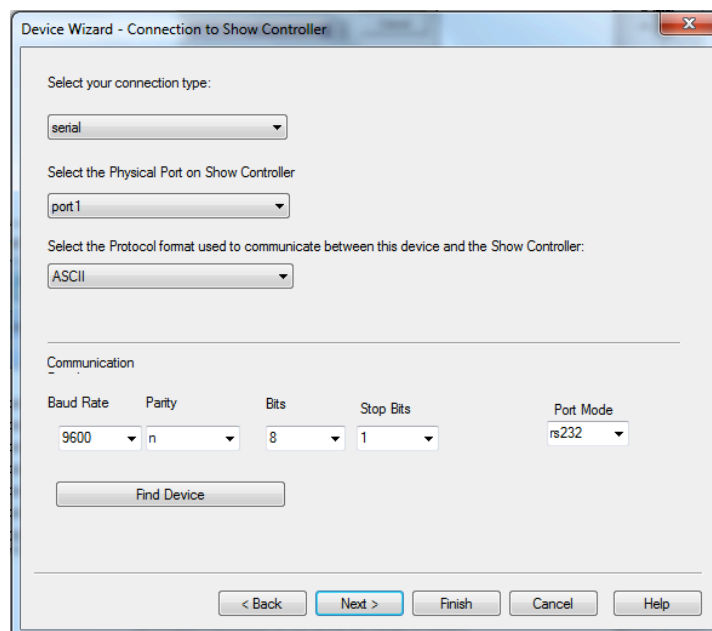
Next, we need to tell WinScript Live that an A/V Binloop Uncompressed is connected to Port 1 of the show controller. Click on **Resources→Devices** to open up the devices form.

Follow these steps to add the A/V Binloop Uncompressed as a device:

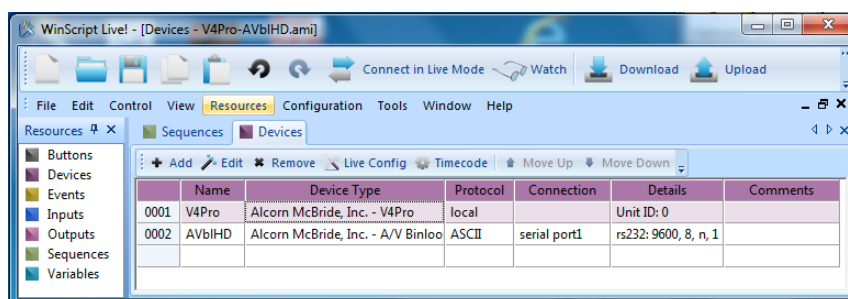
1. Double click the first box under the Double Click on first box under the **Name column** and enter “**BinloopUC**” as the name of the first device. This name is arbitrary and you can use anything you want, just try to make it something obvious and descriptive. For example, if you have more than one A/V Binloop Uncompressed in your show you might want to name them BinloopUC\_1 and BinloopUC\_2, or BinloopUC\_Preshow and BinloopUC\_Mainshow. Do not use spaces in naming system resources.
2. Move to the **Device Type column** and double click the box. A series of dialog boxes will open asking for the following information...
3. The first dialog form asks for the **Manufacturer**, **Model**, and **Version** of the equipment to be connected to the show controller. Here we choose “**Alcorn McBride, Inc.**” as the **Manufacturer** and “**A/V Binloop Uncompressed**” as the **Model**. The **Version** refers to the current version of the Product File, which is the file used by Winscript Live to tell it how to communicate with the Device. Here it comes up as Version 1.0.

4. Click **Next** to advance to the next dialog to set up the connection type. The default is Ethernet, and if selected, the user will be

prompted for the Ethernet port letter, protocol format, etc. We'll use serial port, with port1, ASCII protocol, and the defaults for the communication fields. These being a baud rate of 9600, a parity of n, 8 bits, 1 stop bits, and port mode of rs232.

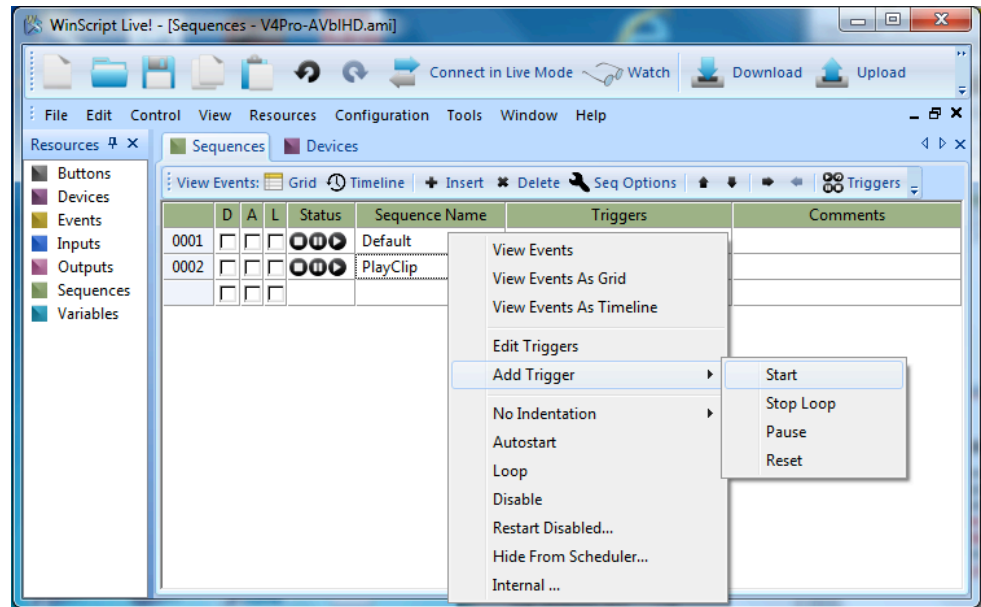


5. Click **Next** to advance to the next dialog, where you can assign Device Variables. These are variables that can be controlled by the Device itself and are useful for error detection and unsolicited device status indications. We won't be using them in this example, so just click **Next** again to advance to the next dialog.
6. The last dialog allows you to include some comments about the Device. Here is where you could describe where the device is located, or what it is used for (i.e. "Preshow main video", or something like that). Click **Finish** to and you will have added the A/V Binloop Uncompressed to your list of Devices...



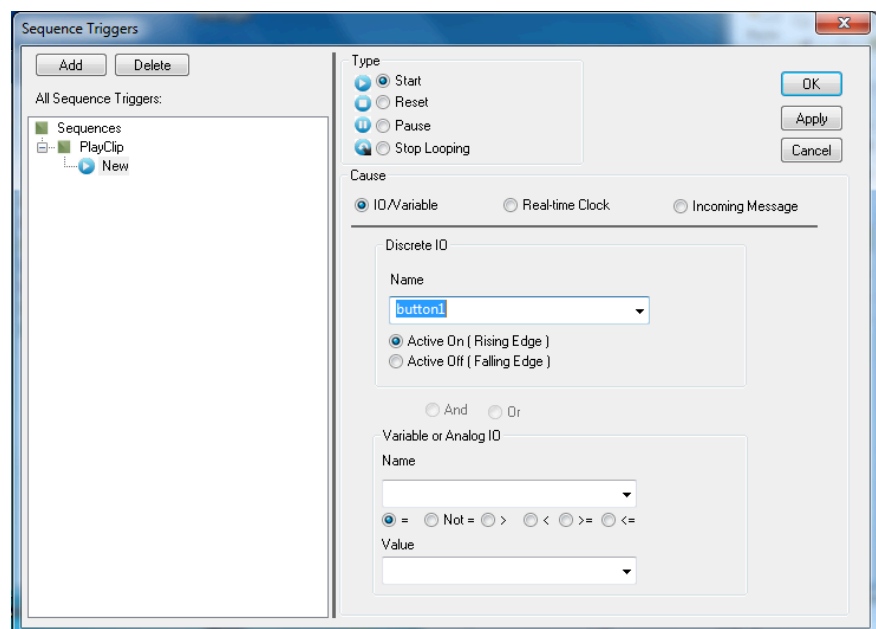
## Creating a Sequence

Next, let's add a new sequence called **PlayClip**. Click on the **Sequences** tab, then double-click on the empty cell just below the cell that contains **Default**. Type in the name "**PlayClip**".

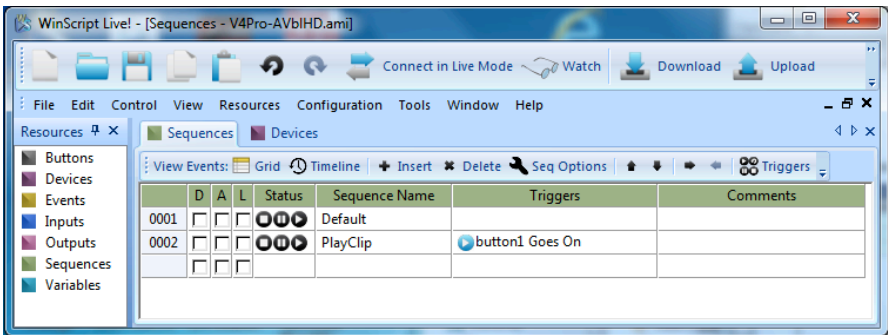


### ***Creating the Input Trigger***

We have now created a sequence that we will eventually program to start playing a file in the A/V Binloop Uncompressed. Before we get to that part, let's first configure this sequence to be triggered by pressing Button #1 of the V4Pro. To do this, right-click on the **PlayClip** sequence and select **Add Trigger**→**Start**. This will open a window that will allow you to specify a trigger to start the PlayClip sequence. Under **Discrete IO** select **button1** as the input name, and then click the **OK** button.



Your script should look like this:



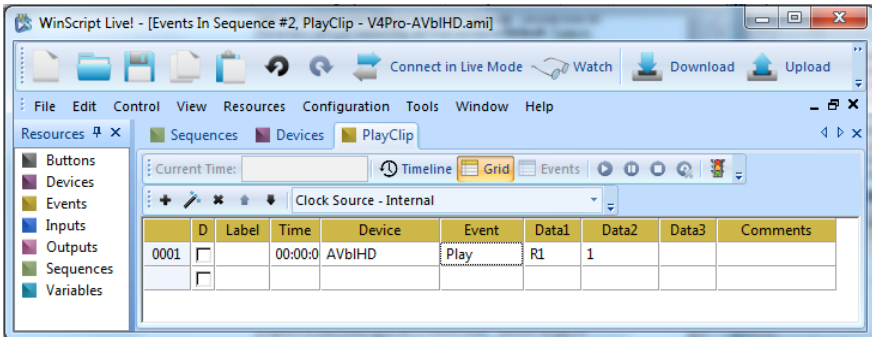
Now, the **PlayClip** sequence will be triggered when **Button #1** on the front of the controller is pushed.

### Editing the PlayFile Sequence

At this point, the **PlayClip** sequence is empty, so nothing will happen when it is activated. That means that the next step is to add events in the **PlayClip** sequence so that it commands the Binloop to play a file.

To access the event list for the **PlayClip** sequence, right-click on PlayClip and select **View Events**. You can also double-click the sequence number on the left-hand side (i.e. **0002**) to access the event list.

Most events in WinScript Live require additional information, or data parameters, to work. For example, the **Play** event needs to know which Binloop to talk to (there might be more than one!), which reproducer to control, and what file to play. On the next page, there is an outline as to what to put into each field. However, to determine what information to enter in each column, you can always right-click and select **Event Wizard** for guidance.



Here's an explanation of the event fields, as well as how you should fill them out for this application.

**Time** – This field specifies when to execute the event in relation to the when the sequence is started. We want our **Play** event to happen

immediately after the sequence is started, so leave the time value as **00:00:00.00**.

**Event** – This is the action that is to be taken at the specified time. In this case, we are using the Binloop **Sync Play** event which instructs one or more channels of the Binloop to synchronously play a file.

**Data1** – For the **Sync Play** event, this data parameter needs to specify the name of the port connected to the Binloop we want to receive the command. We are using Port 1, which we named BinloopUC earlier in this application note. Enter **BinloopUC** in this column.


**Data2** – The **Sync Play** event uses this parameter to identify which card (or cards) to command to play. This event allows you to command a single reproducer (R1-R8), a 4K channel (F1, F2), a group of reproducers (G1-G13), or all reproducers (All). Enter **F1** in this column to specify 4K channel #1.

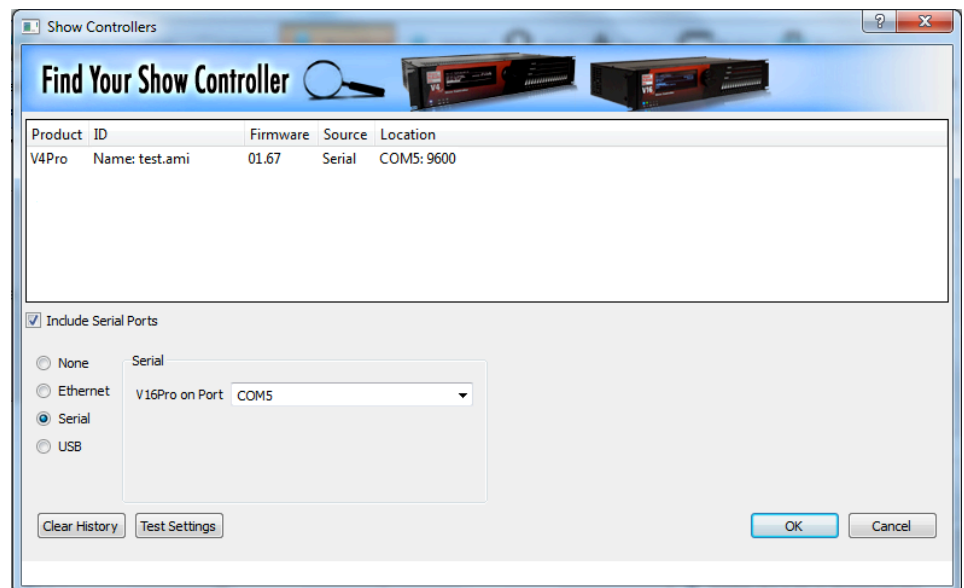
**Data3** – The **Sync Play** event uses this field for the video clip number. Reproducers can have multiple clips stored on their SSD, so it's important to specify which clip to play. Enter the number **1** in this field.

We have now created an event that will command the Binloop to synchronously play file #1 on 4K Channel #1 as soon as the PlayFile sequence is started. You can now close the PlayFile Event list, and return to viewing the Sequence list.

## ***Downloading the Script to the Show Controller***

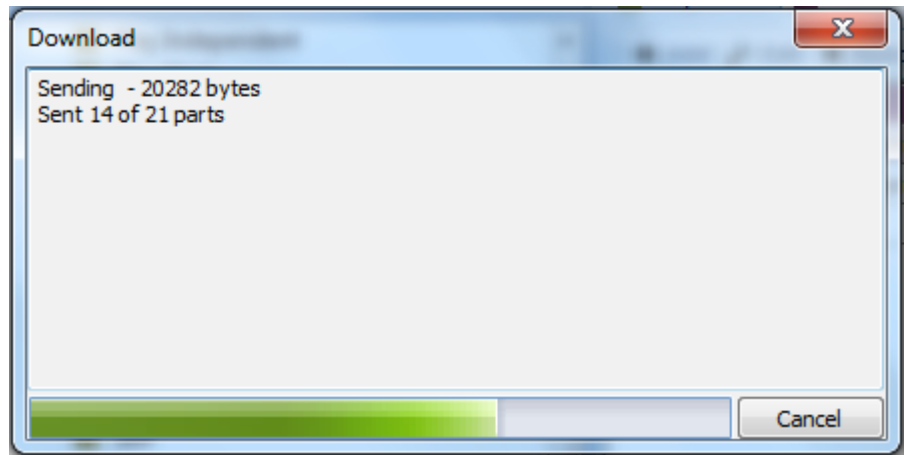
Our script is now finished and ready to compile and download. Start by

clicking on the  icon in the menu bar, or by selecting **Control→Download Script**. The script is then compiled and checked for errors. If no errors are found the screen will look like this.





After pressing **OK**, the following window will appear showing the progress of the transfer of the script.



When the script is successfully transferred, the window will close, allowing you to move on to the next step.

## Testing the Show Control Script

---

At this point, the script is now running on the show controller. You can now press Button #1 on the front of the show controller to play video #1 on reproducer #1 of the Binloop. Immediately after you press the button, you will see the serial LED 1 blink to indicate that the controller is sending a serial message on RS-232 Port 1. You will then see the green status LED of Reproducers 1-4 illuminate green to indicate that it is playing a video.

Now that you have the basics, you can easily modify this script to do other things more suited for your application. Perhaps you want to play different files based on which button is pressed? Maybe you want to trigger playback from a motion sensor wired into the controller? Having a Show Controller in your system provides all kinds of possibilities.



## Note 3: Connecting to the Binloop using Ethernet

Ethernet is a very common communication interface used to connect devices together. Using the Binloop's Ethernet interface, you can download configurations and even control the Binloop across an Ethernet network.

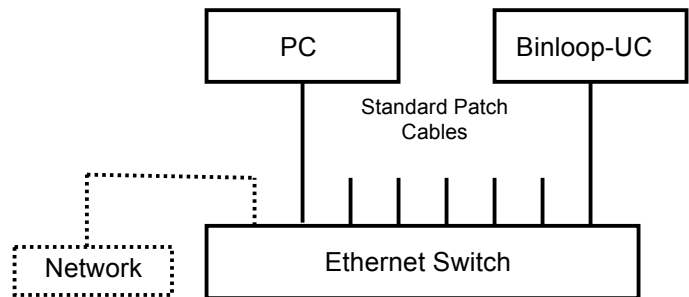
Ethernet is a very broad standard with many complexities that go way beyond the scope of this manual. The intention of this application note is to simply demonstrate how to connect a Windows PC directly to the Binloop using Ethernet.

### Preparation

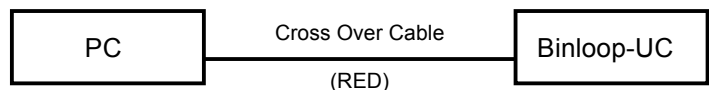
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This application note also requires that you have the Binloop Configuration software installed on a PC, and that the PC is connected to the Binloop via Ethernet. If you do not have this software, refer to the **Binloop Configuration Software** section before continuing with this example.

As for the Ethernet connection itself, there are two ways to do this. The most common way is to use standard Ethernet patch cables and a network switch. When you connect the PC and the Binloop to the numbered ports of the switch, the status LED's of the switch should indicate a connection.



Another way to connect your PC to the Binloop over Ethernet is using an Ethernet crossover cable, like the red one included with the Binloop packaging. This cable allows you to connect the PC directly to the Binloop without the need for a switch or hub.

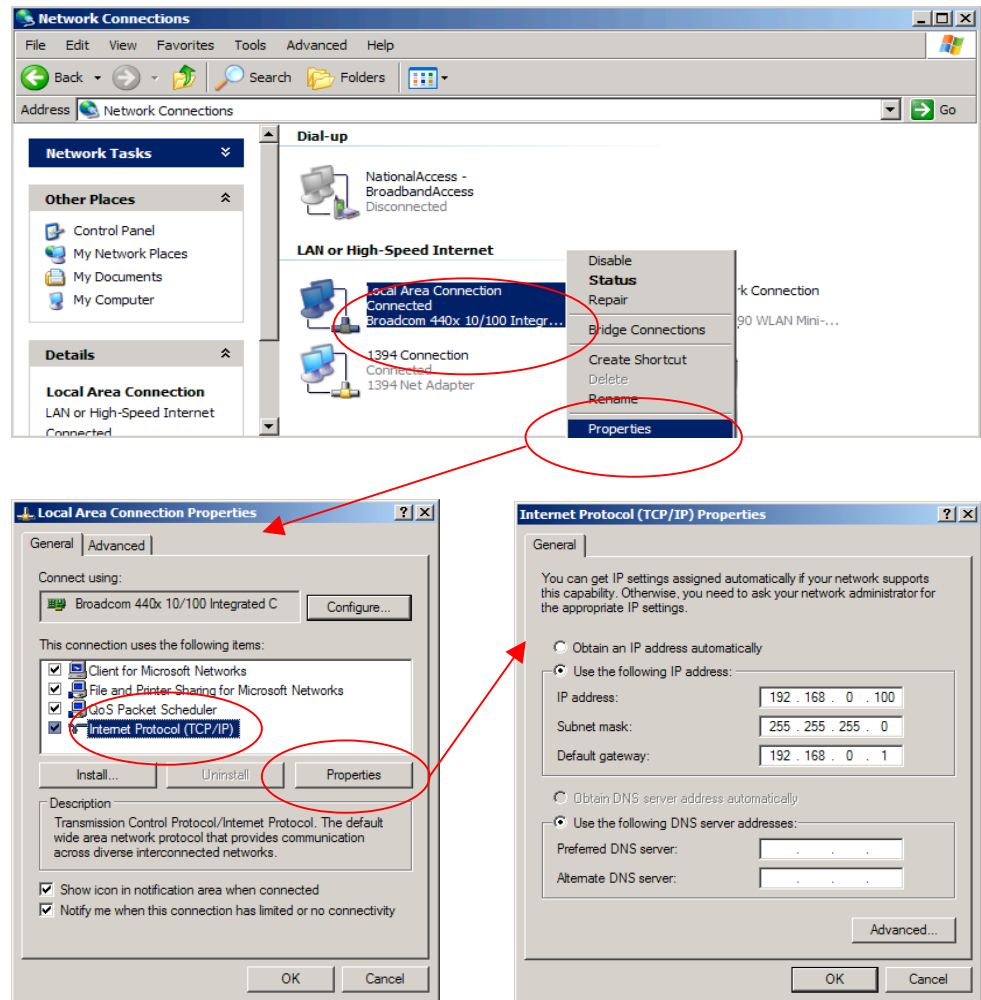


## Changing the Network Settings of your PC

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In order for a PC to communicate to a Binloop over an IP-based Ethernet network, the PC and the Binloop must be on the same Subnet. By default, the Binloop uses the 192.168.0.xxx subnet. This will most likely require you to change the network settings of your PC before you are able to communicate with a Binloop that is using default network settings. The following steps will guide you through checking and setting a Windows XP-based PC correctly. Other computer operating systems may differ in method and appearance, but the concept is still the same.

1. Open the Windows **Control Panel** and open **Network Connections**. Your PC's Ethernet connection will appear in this list, and is usually named **Local Area Connection**. Keep in mind that you may have several network connections, so it's important that you select the connection that is connected to the Binloop.
2. Right-click on this connection and select **Properties**. Click on the **Internet Protocol (TCP/IP)** item then click the **Properties** button.
3. When the TCP/IP properties window opens, write down all of your current settings before making any changes. When you are done communicating with the Binloop, you will need to return to this screen and restore your previous settings.
4. Click the option **Use the following IP address**.
5. Enter **192.168.0.100** into the **IP address** box
6. Enter **255.255.255.0** in the **Subnet mask** box
7. Enter **192.169.0.1** as the **Default gateway**
8. Click **OK** to apply the new IP Address to your PC.
9. Click **OK** once again to exit the connection properties screen.



## Configuring the Network Settings of the Binloop


This application note requires your Binloop is configured for the factory default network settings, which are as follows:

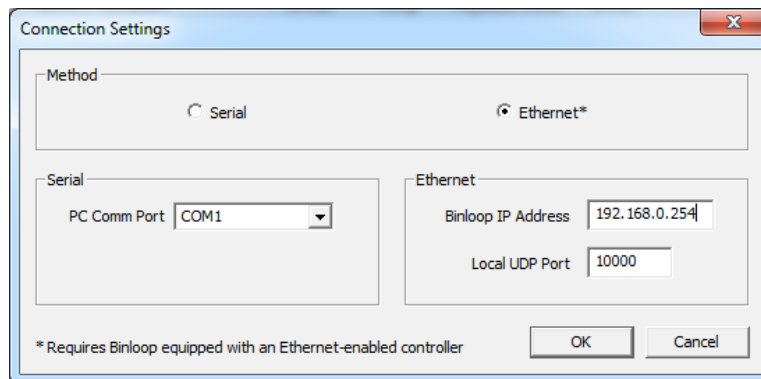
<b>IP Address</b>	192.168.0.254
<b>Subnet Mask</b>	255.255.255.0
<b>Gateway</b>	192.168.0.1

If you believe that these settings may have been altered, you should verify them using the front-panel menu wheel interface of the Binloop. Browse to the **Network Setup** screen and make sure that all of the settings match these values.

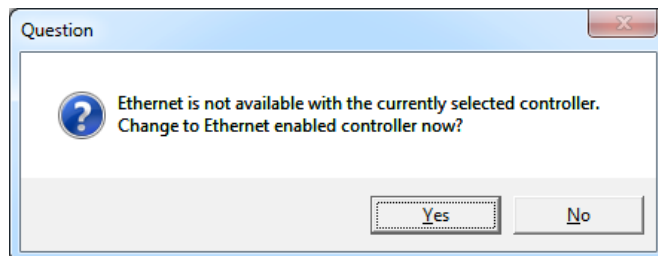
## Connecting over Ethernet with the Binloop Software

At this point, your PC is now physically connected to the Binloop through Ethernet. We've also made sure that both the Binloop and your PC have network configurations that are compatible, and capable of communicating with one another. The next step is to actually use this interface to communicate with and control the Binloop.


Begin by launching the Binloop Software. When the program is loaded, open the **Connection Settings** screen by clicking on the  icon or selecting **Binloop**→**Settings**→**Connection...**

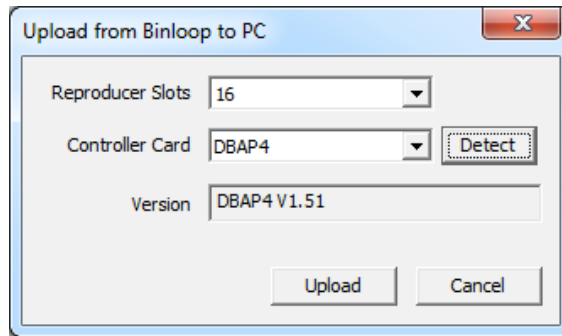


Select **Ethernet** as the communication method and verify the default address of **192.168.0.254** is in the **Binloop IP Address** box. When you select Ethernet, the following message may appear.



If it does, select **Yes** and then click **OK** to exit the Connection Settings screen.

We can now verify the Ethernet connection by uploading the configuration from the Binloop to your PC. To do this, click on the  icon or select **Binloop**→**Upload From Binloop...**



When this screen appears, click on the **Detect** button. If the Ethernet connection is working, the version box should fill with the current firmware version of the Binloop's controller card.

If you wish, you may click **Upload** to transfer the Binloop's configuration to your PC over the Ethernet connection. You can also use all of the features of the Binloop software to change configuration settings, and control the Binloop over Ethernet.

# Appendix A - Troubleshooting Guides

Card Cage Troubleshooting Guide		
Symptom	Cause(s)	Solution(s)
1) No Front Panel display or LEDs	a) No Power b) Bad Power Supply	a) Check Power connections b) Cycle Power
2) One or more of the reproducers not responding to test button press.	a) Incompatible Video File b) Faulty Button c) Faulty Reproducer d) Faulty Controller	a) Press Reproducer Test Button to see if reproducer responds. b) Press Mute Button and make sure Reproducer LED's illuminate RED. (This verifies communication) c) Cycle Power

Video Troubleshooting Guide		
Symptom	Cause(s)	Solution(s)
1) No Video Output - no fault indicated. Status and/or Mute indicator off or always lit. Reproducer does not respond.	a) Reproducer microprocessor hung up due to "hot-carding" of CF cards.	a) Cycle power on unit.



# Appendix B - Updating Firmware

The various components of the Binloop are all capable of accepting firmware updates. The following guides will instruct you on how to update the firmware of each component.

## Reproducer Card Firmware

The Repro2KU Uncompressed Video Reproducers within the Binloop can be updated by copying a firmware update file to a SSD and inserting the drive into the Reproducer's SSD slot. These step-by-step instructions will walk you through this process:

1. Download the latest firmware for the Repro2KU from:  
<http://www.alcorn.com/support/firmware.html>
2. Extract the zipped firmware update file to your PC.
3. Power down the Binloop, and remove the SSD from the reproducer you wish to update.
4. Copy the **OS.NEW** file from the downloaded update to the SSD using a SATA dock or USB to SATA cable.
5. Re-insert the SSD into the Reproducer.
6. Power on the Binloop.
7. The reproducer's status LED will turn WHITE to indicate that it is updating the firmware.
8. Wait for LED to turn off, indicating that the firmware update is complete.
9. When you reach this point, you're done. The **OS.NEW** file will be renamed to **OS.SAV** to flag the successful operation.
10. Use the **Version** command to verify that the Reproducer's firmware has actually been updated to match the version on the website.
11. Repeat this process for each reproducer.

---

**NOTE:** If multiple updates are to be performed, you can rename **OS.NEW** to **FACTORY.NEW**. This causes the update to occur without the file name changing to **OS.SAV** after the update is complete. This allows you to update an entire cage of reproducer cards with a single SSD containing the **FACTORY.NEW** file.

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## Controller Card Firmware Update

The DBAP5 Controller Card used in the Binloop must be updated over an RS-232 serial connection. This will require a Windows PC with an RS-232 port (or a USB→RS-232 serial adapter). This PC should also have the latest version of the Binloop Config software installed.

Once these requirements are met, please follow the following instructions to update the DBAP5 Controller Card:

1. Download the latest firmware from:  
<http://www.alcorn.com/support/firmware.html>
2. Extract the zipped firmware update file to your PC.
3. Power on the Binloop.
4. Connect a straight-through RS-232 cable between a PC and the Binloop's **Programmer** serial port on the back.
5. Launch the Binloop Config software.
6. From the Binloop software menu, select **Help→Update Firmware...**
7. Choose the COM port for the PC serial port that is connected to the Binloop.
8. Click the **Connect** button and verify that the Binloop responds with "Connecting...success!".
9. Click the Browse button, and browse to the folder you extracted in step #2. Select the **.AMU** and click **Open**.
10. Click on the **Update** button, and wait for the "All updates finished successfully" message in the log.

*You have now successfully updated the DBAP5 controller card.*

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