

# BinloopX User's Guide

MULTI-CHANNEL SYNCHRONOUS A/V PLATFORM





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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 BinloopX 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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BinloopX<sup>™</sup> is a trademark of Alcorn McBride Inc., all rights reserved.

This unit has been tested and found to comply with the following:

FCC 47 CFR Part 15B:2017, ISED ICES-003: Issue 06 (2016) EN 55032 Class A Conducted and Radiated Emissions EN 55035, EN 61000-3-2, and EN61000-3-3 Immunity



Caution, shock hazard, disconnect all power sources before servicing.

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

# WELCOME!

Congratulations on your brand-new Alcorn McBride BinloopX!

BinloopX is designed to serve as a scalable and synchronous A/V playback platform that can be configured to suit the needs of any themed attraction. Since these needs can vary widely, the BinloopX offers a scalable 8-slot frame that can be outfitted with up to 8 high-quality audio or video playback modules.

Each audio module is capable of sourcing up to 16 outputs of 24-bit 48kHz uncompressed audio. This includes 64 tracks of playback with the ability to route, mix, and crossfade between tracks on any of the available outputs. This allows for discrete playback of separate tracks like background music, vocals, and sound effects all mixed on a single audio output. Each output is also equipped with DSP capabilities like 7-band parametric EQ, Low-Pass, High-Pass, and several other filter options. Distribution is a piece of cake with the redundant 16x16 AES67/Dante network audio interface.

Any combination of A/V modules can be installed within any of the 8 A/V module slots of the BinloopX. This means a single chassis can be scaled to provide anywhere between 16 to 128 discrete audio outputs. Need more? Multiple BinloopX chassis can be easily combined and synchronized using the power of SyncCore and our V16X show controller.

No matter how great the quality is, A/V playback alone is far from being the only important feature for themed attractions. With show elements like audio, video, lighting, animatronics, special effects, and ride control; synchronization is typically the biggest obstacle for any type of ride-based attraction. To tackle this challenge, BinloopX incorporates Alcorn McBride SyncCore technology which uses multiple methods to ensure extremely precise synchronization with other show system components. These industry-standard methods include PTP (IEEE-1588/CIP Sync), NTP, GPS, SMPTE LTC, and Video Genlock. When used in conjunction with other SyncCore enabled products like RidePlayer and V16X, synchronizing even the most complex attractions is a breeze.

All of this powerful technology is intuitively managed and configured using our license-free WinScript Live software. This software empowers you to create timelines to easily synchronize A/V playback with other show elements. Whether you're using digital input triggers, SMPTE LTC, ShowTouch panels, or our VI6X show controller, the flexibility of WinScript allows you to take complete control of your A/V experience.

This product leverages 33 years of experience designing products specifically for themed entertainment applications. In true Alcorn McBride fashion, the solid-state and rugged design will ensure years of 24/7 maintenance free operation which is essential to zero downtime for attractions. At Alcorn McBride, it is our passion to engineer solutions that are uniquely suited for themed entertainment. We hope that you love using this product as much as we enjoyed designing it!

# **PRODUCT FEATURES**

## SHOW CONTROL FEATURES

This product features the very powerful and flexible Alcorn McBride X-Series ControlCore. This enables the BinloopX to leverage the flexibility of timelines, triggers, advanced scripting capabilities, and touch-panel control. This also provides you with the capability to trigger A/V playback from standard control interfaces like digital inputs, serial, Ethernet, or SMPTE LTC.

The show control feature set includes:

- Alcorn McBride X-Series ControlCore
  - Advanced Scripted Control
  - Timeline Programming
  - ShowTouch Integration
  - Media File Management
- Integrated 4.3" Touchscreen
- I x IGbps Network Control Port
- 8 x CC/Voltage inputs
- I x RS-232/RS-422 Serial Port
- I x SMPTE LTC In/Out Interface
- Power Supply Monitoring



## SYNCHRONIZATION FEATURES

BinloopX is equipped with the Alcorn McBride SyncCore system to provide for extremely precise synchronization between the on-board and off-board systems. This technology uses several industry-standard methods to maintain a very precise clock between BinloopX and other SyncCore enabled products like the VI6X and RidePlayer.

The supported synchronization methods include:

- PTP (IEEE-1588)
- NTP
- GPS /w PPS Clock Input
- SMPTE LTC
- Genlock

## PHYSICAL FEATURES

This product's solid-state purpose-built design allows it to endure the heavy use that comes with running highprofile attractions. It offers 3U rack mounting, industrial-grade connectors, redundant power supply, and a rocksolid chassis design.

Physical features include:

- Rugged Purpose-Built Design
- 3U 19" Rack Mount
- Redundant Power Supply
- Monitored Cooling System
- 8 A/V Module Slots See A/V Modules section for available options



## AUDIO AND VIDEO FEATURES

I'm terribly sorry to give you the run-around, but the audio and video capabilities of the BinloopX depend on which wonderful A/V Modules you choose to install in the BinloopX. These modules (and their capabilities) are listed in the **A/V Modules** section of this manual.

# **TECHNICAL SUPPORT**

Now that we've tantalized you with all of the wonderful things this product can do, I'll bet you're chomping at the bit to flip all the switches and push all the buttons. Not so fast! Before we get to the fun stuff, we just want to take a moment to remind you that we are here to help. Chances are that you're building something really cool and we want you to have access to the resources and support you need to be successful.

To start, you'll find a wealth of information on our website. This includes Application Notes that give you detailed documentation and examples for how this product is used in common types of themed entertainment projects. You'll also find the latest downloads for software, firmware, drawings, 3D models, cutsheets, and other helpful resources on our Support page. The Knowledge Base is especially handy for common questions and helpful troubleshooting tips. And last, but certainly not least, you always have our friendly and mildly entertaining staff available by email or telephone.

Training	https://www.alcorn.com/training
Application Notes	https://www.alcorn.com/applications
Support Resources	https://www.alcorn.com/support
Knowledge Base (FAQ)	https://alcornmcbride.zendesk.com/hc/en-us
Email Support	<u>support@alcorn.com</u>
Telephone Support	(407) 296-5800 (Mon-Fri 9am-6pm EST)

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# GETTING STARTED

Alright, time to roll up your sleeves and get to work! This section will guide you through basic concepts that will help you get on your way with BinloopX.

## A/V MODULE INSTALLATION

The BinloopX is a modular platform with 8 A/V module slots. If you order your BinloopX pre-configured, we install these modules for you at the factory. However, if you order these components separately (perhaps at a later time to expand the capabilities of a BinloopX), you will need to install these modules yourself.

Thankfully, this process is extremely easy. First, you need to remove two screws from the cover plate of an empty slot. This will expose the slot so that a new A/V module can be inserted.



Next, insert the new A/V module into the empty slot and then tighten the thumb screws to secure the module.



Once you have installed the A/V modules you wish to use, proceed to the next section to properly connect your BinloopX.

#### WIRING AND CONNECTIVITY

A few connections are required to experience the core functionality of BinloopX.

## POWER

Our engineers are working around the clock to eliminate the need for those pesky Electrons. However, until they inevitably succeed, BinloopX needs power to work properly.

You'll want to start by connecting the BinloopX power supply to a 110-240VAC power source. This product has a redundant power supply so, while it will work just fine with only one power connection, it is recommended that you connect both power supply inputs. Otherwise, the power supply will emit an intentionally obnoxious **BEEEEEP** and quickly drive you mad.

Once you have connected the power source, BinloopX can be powered up by simply flipping the power switch to the ON position.



HEY!!! What are you doing?!? We didn't actually say to power up yet, but you went ahead and did it anyway didn't you?!?! <Head Slap> Alright... clearly you're excited so I guess we'll cut you some slack, but could you at least <u>TRY</u> to follow instructions next time?

#### NETWORK

While BinloopX sure looks pretty when you power it up, network connectivity is required to actually make it do magical things. The goal here is to interface BinloopX to your Windows or macOS computer running our WinScript Live software. This application empowers you to configure, program, and load media content to the unit over the network connection.

To make this connection, you'll use need a standard RJ45 Ethernet patch cable. You'll want to connect the main **Network** port of BinloopX to your network switch or computer. When the unit is powered on, you will see a link indicator illuminate on the ethernet port to indicate a good network connection.



#### NETWORK CONFIGURATION

Now that we're good to go with connections, we just need to do a little bit of configuration before we can connect your computer to BinloopX. Before we get started, it's helpful to know that BinloopX ships with the following default IP address configuration:

BinloopX Network Port					
IP Address 192.168.0.254					
Subnet Mask	255.255.255.0				

If you're at ease in the world of networking, you can easily adjust these settings for BinloopX to operate on an existing network. For more information on how to access the network configuration menu, see the **Display and Navigation Wheel** section of this User's Guide.

For those that just wish to connect a computer directly to BinloopX, the easiest way is to set your computer to a static IP address that is compatible with BinloopX's default network settings. For example, this configuration would work nicely for your computer:

Computer Network Port				
IP Address 192.168.0.100				
Subnet Mask	255.255.255.0			

## CONFIGURING STATIC IP - WINDOWS 10

I. Right-click on the Windows icon in the bottom-left and select Network Connections

#### 2. Select Change adapter options

Change your network settings



- 3. Right-click on the network interface that is connected to RidePlayer and select Properties
- 4. Select Internet Protocol Version 4 (TCP/IPv4) from the list of items and click the Properties button below.

5. Select **Use the following IP address**, enter the IP address as **192.168.0.100**, and enter the Subnet Mask as **255.255.255.0** as indicated in the screenshot below:

nternet Protocol Version 4 (TCP/IPv4	) Properties X
General	
You can get IP settings assigned autor this capability. Otherwise, you need to for the appropriate IP settings.	matically if your network supports o ask your network administrator
Obtain an IP address automatical	ly
• Use the following IP address:	
IP address:	192 . 168 . 0 . 100
Subnet mask:	255.255.255.0
Default gateway:	
Obtain DNS server address autor	matically
Use the following DNS server add	tresses:
Preferred DNS server:	
Alternate DNS server:	
Validate settings upon exit	Advanced
	OK Cancel

6. Click the **Ok** button to apply the static IP address.

# CONFIGURING STATIC IP - OS X

I. Click on the network icon in the OS X menu bar and select **Open Network Preferences**.



- 2. Select the network interface that is connected to RidePlayer from the available interfaces on the left.
- 3. Configure the network interface **Manually**, specify an IP address of **192.168.0.100**, and a Subnet Mask of **255.255.255.0** as indicated in the screenshot below.

$\bullet \bullet \bullet \checkmark ($		Network		
	Location:	Automatic	٥	
Dock (Alcorn)     Connected	<>	Status:	Connected	active and has the ID
Bluetooth PAN Not Connected	*		address 192.168.0.100.	
Dock (Home) Not Connected	<·->	Configure IPv4:	Manually	٥
Dongle	<>	IP Address:	192.168.0.100	
- Wi-Fi	~	Subnet Mask:	255.255.255.0	
Off	÷.	Router:		
Alcorn VPN Not Connected		DNS Server:		
		Search Domains:		
+ - &-				Advanced ?
				Revert Apply

4. Click **Apply** to enable the new static IP configuration

## CREATING A BINLOOPX PROJECT

At this point, everything should be wired up, configured, and ready to go. The next step is to create a new script and then connect to the BinloopX using our WinScript Live software. Once connected, you will have access to transfer media content, configure, and control the BinloopX unit.

Before we can get started, you'll want to make sure to install the latest version of WinScript Live on your Windows or macOS computer. This software can be downloaded for free from our website at <u>www.alcorn.com</u>.

Once the software is installed, follow these instructions to create a project for your BinloopX:

- I. Go ahead and power on the BinloopX using the power switch.
- 2. Launch WinScript Live and click the **New** button on the splash screen



3. Select **BinloopX** and then enter a device **Name** in the properties below (i.e. "BinloopX-WhaleTheater").

	Edit Device
V16X	BinloopX
V16Pro	RidePlayer VCore
Property	Value
✓ Main Controller	
Main Controller Name	BinloopX-WhaleTheater
Main Controller Description/Comments	
<ul> <li>One Script, Multiple Controllers</li> </ul>	
Script runs on multiple controllers	🗌 False
	< Back Next > Finish Cancel

4. Click Next to proceed to the Module Type screen.

5. Now, we need to configure which modules are installed within your BinloopX. Use the dropdown below each A/V Module Slot to select the modules you have installed. Click Next to proceed to the Module Properties screen.



Alternatively, you can automatically scan your BinloopX using the Retrieve Module Types button. This method will scan your network interface for the BinloopX, request its current module configuration, and automatically select the correct modules for each slot.

6. This screen can be used to name the modules you have installed and configure their Media Network ports if you intend to use them.



The name you enter here will be shown on the front-panel status display for this module.



7. Click Finish to create the project. Now is a great time to Save the project.

## PLAY A TEST CLIP

Regardless of what kind of A/V playback module you have installed, test clips will be preloaded. Let's learn how to play one of these test clips!

1. First, let's get connected to the BinloopX by clicking the **Connect** button located in the Menu bar at the top of WinScript.

		WinScript Live 5 - Getting	Started.wsl
🗄 🗋 New 🛛 😁 Open   🗎 Examples	Save   🖍 Undo 🌈	Ƴ Redo 🗧 🗲 Connect ₀ <sup>©</sup> Live	e Dashboards 🚬 İ 🛧 Send 🛛 🕹 Retrieve 🗌
Resources 🖷 🗙	Sequences 🔳 🗙		
BinloonY-WholeTheatty T	+ New ≟ Insert ♥	Comment X Delete (*) Move L	lp 🕲 Move Down 📄 View Events
Binopx-whatemeak · Devices	#⊤ D A L Status	Sequence Name Triggers	Comments
Sequences		Default	
<ul> <li>Inputs</li> <li>Variables</li> </ul>	2		
Davice Variables			

2. Next, let's create a new sequence by clicking the **New** button in the **Sequence** list. Enter 'TestClip' as the sequence name and select **Timeline** as the sequence type.

			Sequen	ce (	Optior	ns for	. 111		
Cou	norol								
Ger	neral	Behavior	Advanced						
				_					
				Seq	uence	è			
1	Name	TestClip							
	Туре:	Timed							
				Di	splay				
	O Grid	View			О Т	imeli	ne View		
	D								
	Previev	v:							
	Canad Taxas - Co-Co-Co-Co	Testerberg (Sector Parts	∎lest dispingt   8 for						
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	1 2000.0								
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	1 0000.0 DetB	-							
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:	I NOLDER					_	and the second		
	1 Note 10.00	- 1					191100220000		
$\square \subseteq$									
_								Cano	el OK

3. Click **OK** to create the sequence.

4. Using the **Resources** section on the left of WinScript Live, browse to the **Media Files** of an A/V module. When connected to the BinloopX, the available test clips will appear when you expand this resource.



5. Click-and-hold a test clip and drag it onto the Sequence timeline that you just created. Once you release this clip on the timeline, it will be automatically added to the timeline and plotted based on the length of the clip.

			WinScript Li	ve 5 - Getting S	tarted.wsl*		
🗄 🗋 New 🛛 🗃 Open 🚊 Examples	Save   🕥 l	Jndo 🦳 Red	lo 🛛 🕇 Conn	nect <sub>O</sub> O Live	Dashboards _	Send	↓ Retrieve
Resources 🖷 🗶	Sequences	e 🗙 🗖 Ti	meline Events [	TestClip] 🕊	×		
BinloopX-WhaleTheatt T Devices	Current Time:	00:00:00.00	🛰 Options 🛛	Start II Pa	ause 🔲 Reset	🔊 🔊 Stop Loo	oping 1
	View Time: 00	• 00:00:00	New 🕂 Sequ	ence 🕂 Med	ia 🗙 Delete	🖋 Edit 🔢 🖣	Zoom In
<ul> <li>▶ ■ Inputs</li> </ul>		00:00:00.00	00:00:03.15	00:00:07.00	00:00:10.15	00:00:14.00	00:00:17.1
Variables	Audio	1ktone.wav					
<ul> <li>► Events</li> <li>■ Panels</li> </ul>	1 00:00:00.00	1ktone.wav					
<ul> <li>✓ Modules</li> <li>✓ Slot1 (BX-16A)</li> </ul>	Control		<u></u>	<u></u>			
Device Variables	Video						
<ul> <li>Media Files</li> <li>1ktone.wav</li> </ul>							
Audio Outputs							

6. Next, we need to configure the playback of this clip in a little more detail. Go ahead and double-click on the clip within the timeline to enter the **Edit Event** screen.

	Edit Event		
Select an Event			
Device	Event	Time	
BinloopX-WhaleTheater 🔻	Media Play	00:00:00.00	
Run this event synchronous Event Description	y .		
Play a file to a single output			Î

7. As you can see, dragging this clip to the timeline has automatically created a **Media Play** event. Click **Next** to proceed to the next screen.

	Edit Event	
File to Play		
Single File    Folder (Multiple Files)		
Slot1		
"1ktone.wav"		
☐ Fade In 00:00:00.00		
🗌 Loop at End		
Player		
Auto		
Trim 🗌		
	< <u>Back</u> <u>Next</u> >	Cancel

8. This screen will already be pre-filled with the test clip you dragged onto the timeline. Other options will likely be included on this screen for more advanced playback features. For example, the audio playback module allows you to fade in clips or trim the end of the clip. For this getting start guide, there's no need to change anything here. Just click **Next** to proceed.

		Edit Event	
c	Dutput		
С	) Single Output 🖲 Multiple	Outputs	
		"1ktone.wav" [1]	Â
	Slot1.Audio Output 1	×	
	Slot1.Audio Output 2	×	
	Slot1.Audio Output 3	×	
	Slot1.Audio Output 4		
	🗌 Adjust Output Levels		
	Output Options		
	🗆 Mix Tracks 💡		
			< <u>Back</u> <u>Finish</u> Cancel

9. The next screen allows you to specify which output to play the clip. For this example, the audio playback module has 16 outputs to choose from. I've chosen to play this clip from outputs 1, 2, and 3. Feel free to select whichever outputs you wish and click **Finish**.

10. Now, click the **Start** button to start the sequence.

			WinScript Li	ive 5 - Getting S	started.wsl*		
🗄 🗋 New 🚔 Open 🚊 Examples	Save   🕥 l	Jndo 🦳 Red	lo 🛛 🖛 Conr	nect <sub>O</sub> O Live	Dashboards	∱ Send	L Retrieve
Resources 🖷 🗙	Sequences	е × 🗖 ті	meline Events [	TestClip] 🖷	× -	<b>6</b> 0+ 1	
BinloopX-WhaleTheatt - Devices	Current Time:	00:00:00		► Start	ause Reset		ping 1
Sequences	View Time: 00	• • • • • • • • • • • • • • • • • • • •	New 🕂 Sequ	ience 🕂 Med	ia 🗙 Delete	🔊 Edit 🔰 🍳	Zoom In
► Inputs		00:00:00.00	00:00:03.15	00:00:07.00	00:00:10.15	00:00:14.00	00:00:17.1
<ul> <li>Variables</li> <li>Device Variables</li> </ul>	Audio	1ktone.wav					
► Events ■ Panels	1 00:00:00.00	1ktone.wav					
<ul> <li>✓ Modules</li> <li>✓ Slot1 (BX-16A)</li> </ul>	Control						
▶ Device Variables	Video						
1ktone.wav							

11. The test clip will play along with the sequence. To confirm, view the front-panel display of the A/V module that is playing and you should see activity:



12. At this point, audio and/or video is available on the corresponding A/V outputs. Viewing video will require you to connect a display device to one of the outputs of the video module. Listening to audio will require you to route the network audio outputs to an audio device.

# HARDWARE INFORMATION

#### OVERVIEW

The BinloopX chassis includes a built-in 110-240VAC redundant power supply, 4.3" TFT status display, navigation wheel, status LEDs, BC-CON1 controller module, and 8 A/V module slots.



## DISPLAY AND NAVIGATION WHEEL



The front panel of BinloopX features a 12-line by 43-character TFT status display. This display is primarily used to share application-specific information (i.e. "Status: Playing") from the show control script. However, this display also offers a full menu system that can be accessed by pushing the navigation wheel located just below the display.

Below, you will find a description of the menu items that are available from this interface.

## MAIN MENU

Main Menu
> System
Real-Time Clock
Network
Password
Script
Senc
LTCZSMPTE
Exit

This menu provides access to the following sub-menus:

- System Configure and monitor generic system status
- Real-Time Clock Configure and monitor real-time clock
- **Network** Configure network interface
- Password Configure front-panel lockout password
- Script Monitor show control performance and script status
- **Sync** Monitor sync system status
- LTC/SMPTE Monitor the SMPTE LTC status

# SYSTEM MENU

<u>s</u> .	st	2 ľú		I ŀ	"ı+	i r	11'''	ľľ		١ <u>:</u> .	ł	11	·"I																			
									•••••	•••••	•••••	•••••	•••••	•••••	•••••	 	 •••••	 	 	 	 ••••	•••••	•••••	•••••	•••••	•••••	•••••	•••••				••••
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	j,																															

- Firmware Version Firmware version of BX-CON1 controller module
- Hardware Revision Revision of BX-CONI controller module hardware
- CPU Load Current CPU utilization
- Serial Number BinloopX chassis serial number
- Build Number Build revision of firmware
- **Reboot System** Reboot BinloopX and re-launch script
- Reset Settings Reset all configuration data (i.e. network, device name, etc.) to factory defaults

# CLOCK MENU

ŀ	l	1.				t,	i	ľ	11		0	. 1	ı	 : •		1		 ŀ	. I.																I		
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	١.	ı İ			==																							l.		ď	1	N.		9		2	
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	1.	U.	:	¢,																																	
																													Π								
																													Π								
																													Π								

- Time Current system clock time
- Date Current system clock date
- RTC Config Used to set system clock time and date

# NETWORK MENU

Ethernet	
IP Address:	192.168.000.254
Subnet Mask:	255.255.255.000
Gateway:	192.168.000.001
ONS:	000.000.000.000
Back	

- IP Address View/Configure IP address
- Subnet Mask View/Configure subnet mask
- Gateway View/Configure gateway IP address
- **DNS** View/Configure DNS address

# PASSWORD MENU



- Password Protect Front Panel Enable/Disable Password Protection
- Set Password Set/Modify front panel password

# SCRIPT MENU

Script (	Configuration	
Script P		BinloopX Example.ami
Script. B	ldit Date	2021-01-16 20:20:50
Reload S	iet.	
Device h		Binloop-Theater
Device I		
Device h	lickname:	
View Wat	)Chas	
Back		

- Script Filename Currently active show control script
- Script Edit Date Current load of show control processor
- Reload Script Selecting this reloads and restarts the show control script
- Device Name Assigned text name of the BinloopX
- Device ID Assigned ID number of the BinloopX
- Device Nickname Optional text nickname of the BinloopX
- View Watches View watch list that is generated within the WinScript project

# SYNC MENU

Sync Confliguration	
Sync Source:	
Frame Rate:	EQ PPS
PTP Master:	l No
NTP Master Address:	None
Genlock Out:	Enabled
Status:	Lockec
Master Offset:	2.31ns
Last Update:	0
PTP Info	
Back	

- Sync Source The configured sync source
- Frame Rate Master frame rate of BinloopX
- **PTP Master** Displays 'Yes' if BinloopX is operating as a PTP Master
- NTP Master Address Show the NTP Server Address if BinloopX is operating as NTP Server
- Genlock Out State of Genlock Output
- Status Current state of BinloopX with configured Sync Source
- Master Offset Accuracy of synchronized clocks
- Last Update Time that has passed since last sync update
- PTP Info Detailed status of PTP synchronization system

# SMPTE/LTC MENU



- Status Generate/Read, Current LTC value, framerate, and active status
- Start SMPTE Enables the SMPTE interface to either Generate or Read based on configuration

## INDICATOR LEDS

This BinloopX has a very simple set of indicator LEDs located in the lower left corner of the front-panel.



Power – ON whenever power is applied to the unit and the power switch is on
 LTC – ON whenever SMPTE LTC is being actively generated or read
 Lock – ON whenever the sync system is locked to the configured sync source
 Live – ON whenever WinScript Live is connected to the unit

## CONNECTORS

## POWER INPUT

These connectors are used to supply the BinloopX with redundant power. This is a universal power supply that supports 110-240VAC at a frequency between 50-60Hz. These connectors use standard IEC320 C14 sockets, which can be used with IEC320 C13 cables that are suitable for your region.

A power switch is located just below the power supply, which is used to power the unit ON or OFF.

When both power supply modules are operating properly, a status LED directly next to the power connections will illuminate. If a power supply module is removed or fails, it's LED will turn off. Also, a loud and purposefully obnoxious alarm will sound to notify you that the unit is no longer operating with redundant power. This alarm can be silenced by pressing the recessed 'Silence The Faulty Unit' button. This STFU button is located just above the top power connector. Alternatively, inserting a functioning power supply module will also silence the alarm.

These modules can be removed by pushing UP on the small black lever located at the bottom-left of the module while pulling the metal handle away from the BinloopX unit. See the Accessories section of this manual for information on ordering a replacement module.

Two IEC Type B power cords are included with the BinloopX.



#### **Connector Information**

Connector Type	IEC320 C14
Mating Plug	IEC320 C13

# NETWORK

The main network interface for the BinloopX is located on the back of the controller module and is simply labeled **Network**. This interface requires a standard RJ45 connection and serves as the main link between a computer running WinScript Live and the BinloopX. It is the primary interface used to store/retrieve script files as well as media content with the BinloopX.



#### **Connector Information**

Connector Type	RJ45 Female
Mating Plug	RJ45 Male

Some portions of the network interface, such as FTP access, are protected with a configurable username and password. By default, these credentials are configured to:

User Name	admin
Password	password

# GENLOCK

These BNC connectors are used to connect external devices to the BinloopX genlock interface. When configured to lock to an external video sync source, the BinloopX will expect to see a Tri-level, Blackburst, or Composite Sync input on the 'IN' connector.

Regardless of the source sync reference, the BinloopX will always output a Composite Sync genlock signal on the 'OUT' connector. This allows external genlock devices like cameras, video servers, show controllers, etc. to lock and synchronize directly to the A/V clocks generated within BinloopX.



#### **Connector Information**

Connector Type	BNC Female
Mating Plug	BNC Male

# DIGITAL INPUTS

These 8-pin terminal-style connectors provide access to 8 discrete digital inputs that can be used as show control triggers within your BinloopX script. Each input has two contacts and can be software-configured within the WinScript Live project for two modes of operation; contact closure or voltage.



#### **Connector Information**

Connector Type	Phoenix 1843130
Mating Plug	Phoenix 5447926
Recommended Wire	18 AWG Stranded



Plug Layout (Wire-Side View)

Inputs (Left)			
Input 4 (+)	LI		
Input 4 (-)	L2		
Input 3 (+)	L3		
Input 3 (-)	L4		
Input 2 (+)	L5		
Input 2 (-)	L6		
Input I (+)	L7		
Input I (-)	L8		

Inputs (Right)			
Input 8 (+)	RI		
Input 8 (-)	R2		
Input 7 (+)	R3		
Input 7 (-)	R4		
Input 6 (+)	R5		
Input 6 (-)	R6		
Input 5 (+)	R7		
Input 5 (-)	R8		

# SERIAL/GPS

These 7-pin terminal-style connectors provide access to the Serial control and GPS features. This includes two serial ports that can be configured to operate in either RS232 or RS422 modes. One of these ports is a dedicated GPS interface used for highly accurate clock synchronization and triggering based upon geographic location. The second port is multi-purpose and can be configured for RS232/RS422 control of the BinloopX.

Mating Plugs for these connectors ship pre-installed with the BinloopX.

GPS	
Serial/	

## **Connector Information**

Connector Type	Phoenix 1843127
Mating Plug	Phoenix 5447913
Recommended Wire	18 AWG Stranded



Plug Layout (Wire-Side View)

Serial Port				
Ground	LI			
Serial RS232 TX	12			
Serial RS422 TX(-)	LZ			
Serial RS422 TX(+)	L3			
Serial RS422 RX(-)	L4			
Serial RS232 RX	15			
Serial RS422 RX(+)	LS			
Ground	L6			
Ground	L7			

GPS Port			
GPS PPS IN	RI		
GPS RS232 TX	D٦		
GPS RS422 TX(-)	ΝZ		
GPS RS422 TX(+)	R3		
GPS RS422 RX(-)	R4		
GPS RS232 RX	DE		
GPS RS422 RX(+)	КЭ		
GPS Power	R6		
Ground	R7		

# SMPTE LTC

These 3-pin terminal-style connectors provide access to the SMPTE Timecode (LTC) input and output.

Mating Plugs for these connectors ship pre-installed with the BinloopX.



#### **Connector Information**

Connector Type	Phoenix 1843088		
Mating Plug	Phoenix 5447874		
Recommended Wire	18 AWG Stranded		



Plug Layout (Wire-Side View)

#### **Pinouts**

LTC Out			
LTC Out (+)	LI		
LTC Out (-)	L2		
LTC Out (Shield)	L3		

LTC In			
LTC In (+)	RI		
LTC In (-)	R2		
LTC In (Shield)	R3		

# SYNCHRONIZATION

Precise synchronization between show systems, especially those involving ride vehicles, is one of the biggest challenges faced in themed entertainment applications. Doing this properly involves achieving two critical conditions:

- 1. Phase-locked Clocks All clocks must operate at the same rate to avoid 'drifting' from one another
- 2. Precise Triggering All systems must start playback simultaneously with extreme precision

The unique design of the SyncCore technology integrated into RidePlayer, VI6X, and BinloopX enables these products to easily achieve both conditions and ensure precise synchronization between all on-board and off-board show systems throughout the entire attraction.

#### PHASE-LOCKED CLOCKS

Let's say you and a friend buy identical wristwatches and set both to the exact same time. When you meet up again a week later, you might be surprised to see that the watches are likely many seconds off from one another. Why? Well, there are many contributing factors such as crystal frequency precision, temperature, mechanical tolerance, etc. Bottom line... the watches run at slightly different rates and this difference compounds over time. The same concept also holds true with the audio and video clocks used as the basis for AV playback. Without a shared reference clock, all AV components will play at slightly different rates and drift from one another over time.

The solution to this problem is to phase-lock these clocks with each other. This generally involves one piece of equipment serving as the clock 'master' and distributing its clock to other 'slave' devices. The 'slave' devices then speed up or slow down their clocks to stay in perfect time with the 'master' device.

SyncCore allows AV clocks to be phase-locked by any of the following methods:

- PTP (IEEE-1588)
- NTP
- GPS
- SMPTE LTC
- Genlock

#### PRECISE TRIGGERING

No matter how perfectly synchronized two clocks may be, it doesn't do much good if you can't start playback at the same time. To illustrate by example, let's walk through a typical dark ride system that requires synchronized on-board audio and off-board audio. If the on-board audio starts playing 300ms late, it's going to be off consistently for 300ms the entire time. There are several common factors that make this a challenging problem to contend with.

## PLAYBACK LATENCY

First, most AV playback equipment is not capable of triggering consistently upon command. This is especially true for PC-based hardware running operating systems that are often busy running unpredictable tasks. Let's say you send a command to play audio and playback begins about 100ms after the command is issued. Repeat this same process, and next time it might take 200ms. It is simply impossible to ensure synchronization between two (or more) devices when playback reaction time is not consistent.



#### Network Latency + Inconsistent Playback Device

#### NETWORK LATENCY

Specialized AV playback equipment can greatly improve this situation by offering consistent reaction time. Let's say that this equipment guarantees that playback will begin exactly 100ms after a command is received. The idea is that you send the same command to two different devices and they both start after exactly 100ms. Viola! They are synchronized! The catch is that those commands must be received by both devices at exactly the same time for this concept to work. This is quite challenging, especially via wireless networks where packet latency can sometimes exceed 300ms.





# SCHEDULED PLAYBACK

To overcome these common problems, SyncCore enabled products take a unique approach. The same clock references that are used to maintain phase-lock between on-board and off-board devices are also used to maintain a very precise master clock. In other words, all devices keep track of the current hour, minute, second, and millisecond with a precision as tight as a few nanoseconds.

With this approach, playback times are scheduled based upon this shared master clock. This greatly reduces the impact of network latency because the time that the command arrives is irrelevant as long as it arrives before the scheduled playback time.



#### **Scheduled Playback Time**

## SYSTEM ARCHITECTURE

Sounds great, right? But how do we actually use it in a real application?

To answer that question with a pretty picture, here is a representation of a typical dark ride system that uses the Ride Control PLC as the PTP clock master for the entire attraction. In this example, the VI6X, BinloopX, and RidePlayer would all be configured to lock directly to the PLC's master PTP clock to ensure perfect synchronization for all show systems throughout the attraction.



## SYNC CONFIGURATION

The SyncCore system is able to achieve precise synchronization from any of the following reference clocks:

- PTP (IEEE-1588)
- NTP
- GPS
- SMPTE LTC
- Genlock

Here's a simple diagram to illustrate these synchronization methods, how they can be selected, and the resulting outputs that can be used to synchronize the entire system:



# LOCKING TO A SYNC REFERENCE

Within your WinScript Live project, you can configure an external sync reference by accessing the **Configuration** $\rightarrow$ **Sync** menu option. Here, you can choose the reference source you want this unit to synchronize with and specify a master Frame Rate for the show control system.

Timecode and Sync Configuration						
Clock Settings	TC (SMPTE)	Clock Status	Event Timing	Audio Settings		
Master Clock						
Lock Clock To	PTP (IEEE 15	88)			•	Settings
Frame Rate	30.0					

If your application does not require the use of an external reference clock, you can leave this selection at its default value of **Internal**. In this mode, the product will generate its own clocks internally.

# DISTRIBUTING A SYNC REFERENCE

Not only can this product lock to an external sync reference, it is also capable of distributing sync references as well.

Genlock is always distributed automatically based upon the master Frame Rate you have selected. There's also the option to distribute a clock via network using NTP or PTP as well. This option is also configured from the Sync Configuration screen which is accessed using the **Configuration**  $\rightarrow$  **Sync** menu.

	Clock Out
🕱 Distribute clock using	
NTP server 🔹 👻	

One important thing to note is that it is possible for SyncCore products to lock to an external reference and simultaneously distribute another type of reference. A common example of this would be configuring a VI6X to lock to an external PTP Master (i.e. Ride Control PLC). This VI6X may then need to synchronize precisely with RidePlayers over a wireless network which may not support PTP distribution. To overcome the limitations of the wireless network, the VI6X could be configured to distribute a sync reference as an NTP Server. We would then configure the RidePlayer units to lock to the VI6X via NTP.

The hybrid system architecture would look like this:



# **BLOCK DIAGRAM**

This block diagram shows the internal architecture for the BX-CON1 controller module, which is the core of the BinloopX chassis.



# **SPECIFICATIONS**

These are the specifications of the BinloopX chassis with the BX-CON1 controller card installed. For specifications on the A/V capabilities, refer to the **A/V Modules** section of this manual.

Control	
Show Control	Advanced Scripted Control
	Timeline Programming
	Media File Management
Display	4.3" TFT LCD Main Display + 8 x 1.8" A/V Module Status Displays
Indicators	Power, LTC, Sync, Live Mode
Ethernet	100/1000BT (RJ45)
Serial	RS232/RS422 (7-pin Phoenix)
Digital Inputs	8 x Contact/Voltage (5-24VDC) Inputs (2 x 8-pin Phoenix)
	Software Configurable for Voltage (5-24VDC) or Contact Closure

Synchronization	
Sync Inputs	PTP In – IEEE-1588/CIP-Sync (RJ45)
	NTP In (RJ45)
	GPS In (7-pin Phoenix)
	SMPTE LTC In (3-Pin Phoenix)
	Genlock In - Blackburst, C-Sync, Tri-level (BNC)
Sync Outputs	PTP Out – IEEE-1588 (RJ45)
	NTP Out (RJ45)
	SMPTE LTC Out (3-Pin Phoenix)
	Genlock Out - C-Sync (BNC)
Frame Rates	23.976, 24, 25, 29.97, 30, 47.952, 48, 50, 59.94, 60
GPS Type	NMEA-0183 /w PPS Clock Input
Clock Accuracy	GPS - <ius <ippb="" accuracy<="" free-run="" th="" w=""></ius>
	PTP - <ius <ippb="" accuracy<="" free-run="" th="" w=""></ius>
	Genlock + NTP - <1mS /w <10ppB Free-run accuracy

Physical	
Power	110-240VAC Redundant Power Supply
	150W Typ, 300W Max
Dimensions	19.3"W x 17.2"L x 5.2"H (490mm x 437mm x 131mm)
Weight	Empty Slots – 20 lbs (9.1 kg)
	Fully Loaded – 36 lbs (16.3 kg)
Environment	0°C (32°F) to 38°C (100°F)
	0-90% Relative Humidity
Mounting	3U 19" Rack-Mount
Compliance	UL, CE, CB, WEEE, RoHS

# A/V MODULES

Although the BinloopX doesn't need any A/V capabilities to be a super cool product, it's even more amazing when you actually install A/V modules in the 8 available slots.



Below is a summary the A/V modules that are available for the BinloopX. Be sure to contact our sales team for pricing and availability!

Module	Description
BX-16A	Audio Playback – 16-Channel, 64-Track Polyphonic Playback, 16x16 Dante/AES67, DSP

## BX-16A - AUDIO PLAYBACK MODULE



## AUDIO FEATURES

The BX-16A audio module designed for the BinloopX is equipped with an incredibly powerful audio playback system that includes many advanced features designed to eliminate the need for external components like DSPs, amplifiers, multiple audio players, etc. These features enable high-quality surround sound effects to enhance the guest experience and make integration and content production a breeze.

The audio features are:

- Uncompressed WAV Audio Playback
- Sample-Accurate Synchronization
- 16 Channels of 24-bit 48kHz Audio Output
- 64 Tracks of Polyphonic Playback with Dynamic Mixing, and Crossfade
- DSP with 9-band parametric EQ, high and low pass filters, and more
- I6x16 AES67/Dante Network Audio interface /w Redundant Ports
- Media Update Network Port



# CONNECTORS

## NETWORK AUDIO

The BX-16A audio playback module distributes audio using the Dante and AES67 network audio standards. Both of these standards support redundant networks, which is why we have designed this module to provide both a Primary and Secondary audio network. Both of these interfaces utilize a standard RJ45 connection that you use to patch into your Dante or AES67 audio network.

Once connected, this network audio interface can be configured used the Audinate Dante Controller software. This application provides the ability to configure IP settings, name outputs, create Dante/AES67 flows, and route transmitters to receivers.



#### **Connector Information**

Connector Type	RJ45 Female
Mating Plug	RJ45 Male

#### MEDIA NETWORK

This optional network interface can provide direct access to the media storage device of the BX-16A. While content can be transferred using the main Ethernet connector located on the BinloopX controller module, it is possible for transfer rates to be reduced on this interface since it is shared with the entire chassis. This Media Network interface allows for enhanced transfer rates since it offers a more direct transfer method to the BX-16A. When this connection is in use, WinScript Live will automatically detect it and attempt to use this interface for all media file transfers.



#### **Connector Information**

Connector Type	RJ45 Female
Mating Plug	RJ45 Male

# BLOCK DIAGRAM



# SPECIFICATIONS

Audio	
Formats	WAV (Multichannel, Stereo, or Mono)
Output Channels	16
Playback Tracks	64 (Polyphonic)
Samples Rates	48 kHz
	44.1 kHz
Bit Depths	24-bit
	l6-bit
Dynamic Range	>104 dB
Network Audio	16x16 Dante (RJ45 - Primary & Secondary)
	16x16 AES67 (RJ45 - Primary & Secondary)
DSP	9-band Parametric EQ
	High-Pass, Low-Pass, Notch Filters
	Phase Shift, Treble Shelf, Bass Shelf
Storage	128GB M.2 SSD (Internal)
	250+ hours of uncompressed audio content
	Thousands of clips

Physical	
Power	Powered by BinloopX Chassis
	16W Typ, 25W Max
Dimensions	1.6"W x 14.9"L x 5.1"H (40mm x 378mm x 130mm)
Weight	2 lbs (0.9 kg)
Environment	0°C (32°F) to 38°C (100°F)
	0-90% Relative Humidity
Mounting	BinloopX A/V Module Slot
Compliance	UL, CE, CB, WEEE, RoHS

# **CONFIGURING NETWORK AUDIO**

Audio modules for the BinloopX utilize Dante or AES67 network audio to output audio signals. This section is a basic overview of how to configure and route these audio signals using Audinate's Dante Controller software. This software is a free download available from Audinate's website (<u>http://www.audinate.com</u>).

# CONNECTING THE AUDIO NETWORK

First, we have to make sure your audio network is connected properly. Audio network architecture can vary wildly so to keep this example simple, let's just assume that you have a completely separate audio network running on a simple switch like so:



Your computer should be connected to the audio network using a wired network connection, either through a dedicated wired Ethernet port or a wired Ethernet dongle.

The BinloopX is connected using the port (or ports if you are configuring a redundant network) labeled Network Audio:



#### CONFIGURING NETWORK AUDIO ADDRESSES

A good first step is configuring all of your network audio devices with compatible network settings. In other words, getting them all on the same subnet so that they can actually transmit data to one another.

When you launch the Dante Controller software, it will be able to scan the network for network audio devices. The network addresses can be configured by selecting the device and then browsing to the **Network Config** tab. One you have configured these settings, be sure to click the **Reboot** button to ensure the new settings are applied.

🧕 Dante Controller - Device View (B	(16A-160f9a)		-	×
File Device View Help				
🔗 🐹 💿 🔩 🕂 🔓		BX16A-160f9a	,	0
Transmit Status Latency Device Con	ig Network Config	AES67 Config		
	-Dante Redundanci Curri N O Obtain an IP Manually cor IP Address: DNS Server: Gateway: Reset Device Reboot	//       ////////////////////////////////////		

Note – If the device you are trying to configure is on a different subnet, it may be necessary to change the IP address of your computer to access these settings.

#### CONFIGURING NETWORK AUDIO SETTINGS

Once the network addresses are configured properly, you will have full visibility into the network audio settings of the BinloopX audio module. Using screens like the ones shown below, you have the ability to configure things like the Device name of the module, the sample rate, and other detailed settings specific to the network audio interface.

🧶 Dante Controller - Device View (BX16A-160f9a) —	□ ×	👷 Dante Controller - Device View (BX16A-160f9a)	- 0	×
File Device View Help		File Device View Help		
	0			0
Transmit Status Latency Device Config Network Config AES67 Config		Transmit Status Latency Device Config Network Config AES67 Config		
Manufacturer Information				
Manufacturer: Alcorn McBride		rRename Device		
Model Name: BX-16A Product Version: 1.1.0		BX16A-160f9a Apply		
Software Version: 1.1.0 Firmware Version: 1.1.0				
Dante Information		Sample Rate		
Dante Model: Brooklyn II		Sample Rate: 48k V Pul-up/down:		
Dante Firmware Version: 4.0.9.1 Hardware Version: 4.0.2.7		This device does not support		
ROM/Boot Version: 1.3.64		Pull-up/down configuration.		
Clock Synchronisation		Encoding		
Mute Status: Unmuted		Preferred Encoding: PCM 24 $\lor$ Unicast Delay Requests: Disabled $\lor$		
External Word Clock: No				
Frequency Offset: 0 ppm		r Device Latency		
Interfaces		Latency: 1.0 msec 🕹		
IP Address: 192.168.10.2		Reset Device		
P 1G Tx Utilisation: 5 Mbps Errors: 0 Clear Counters		Reboot Clear Config		
Rx Utilisation: 4 Kbps Errors: 0				

## ROUTING AUDIO OUTPUTS

Once the basic setup is complete, routing the audio outputs of the BinloopX audio module is a piece of cake. Simply connect the Transmitters of the BinloopX to the Receivers of your destination device and the audio signal will flow!

) 🗲 🖿 🛃	. 🔤 🕂 💩 🌒														
Search	Routing Device Info Clock Status Ne	twork Sta	tus	E	vents										
Clear All	Dante		- e6j0	16	= 0	2	2 4	2 12	-	20 20	0	- 0	10	4 1	9.00
E Device Lock	Filter Transmitters		A-16	-	00	, d	00			하 성 성	Ŧ	5,3	5	흉흉	5
E Sample Rate		ter -	X16		3X16	3X16	3X16	3X16	3X16	3X16	(164	164	164	164	164
Sync to External		Ť	-			-	-				6	66	6	66	6
E Latency	Filter Receivers	§													
E Subscriptions															
Tx Multicast Flows		Jan													
E AES67		Ē													
E Sample Rate Pull-up	± - Dante Receivers	±													
	RideAmp-9328ea		Ξ												
	- 14 IN1 IN2 IN3 IN4	0000		1	•	0	0								

For more information on the more advanced features of Dante and AES67 audio distribution, Audinate periodically offers training classes that are extremely helpful.

# MOUNTING

BinloopX is designed to mount in a standard 19" equipment rack.

Rear mount brackets are also included in the box to provide the option of additional support. These brackets are designed to slide into the sides of the BinloopX so that they can be easily adjusted from 16"-26" to reach the rear mounts of the equipment rack. I'm sure you've also realized that it's REALLY fun to hold them like Wolverine claws and frighten your coworkers.



# ACCESSORIES

## POWER SUPPLY

Part Number: PSBXACR



This is a complete replacement power supply for the BinloopX. It includes the power supply chassis, two power supply modules, and the wiring harnesses.

## POWER SUPPLY MODULE

#### Part Number: PSBACX-MOD



This is a replacement module for the PSBACX power supply of the BinloopX. In the event one of these modules fails, the BinloopX will beep loudly to notify you. The defective power supply module can then be removed and replaced without powering off the product.

# **PRODUCT PHOTOS**



Side



Rear

