

**Alcorn
McBride
Inc.**

V4X User's Guide

SHOW CONTROLLER



May 12, 2021

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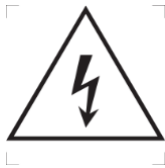
Every effort has been made to assure the accuracy of the information contained in this manual, and the reliability of the Alcorn McBride V4X hardware and software. Errors can sometimes go undetected, however. If you find one, please bring it to our attention so that we can correct it for others. Alcorn McBride welcomes comments and suggestions on the content and layout of its documentation.

Applications described herein are for illustrative purposes only. Alcorn McBride Inc. assumes no responsibility or liability for the use of these products, and makes no representation or warranty that the use of these products for specific applications will be suitable without further testing or modification. Alcorn McBride products are not intended for use in applications where a malfunction can reasonably be expected to result in personal injury. Customers using or selling Alcorn McBride products for use in such applications do so at their own risk, and agree to fully indemnify Alcorn McBride for any damages resulting from such improper use or sale. Alcorn McBride Inc. reserves the right to make changes to these products, without notice, in order to improve their design or performance. The unit requires installation into a suitable fire enclosure in the final assembly.

V4X™ 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 shiny new Alcorn McBride V4X Show Controller!

The V4X is designed to incorporate the same powerful show control core as the top-of-the-line V16X for smaller scale applications that don't require advanced synchronization capabilities.

Many attractions require advanced control and monitoring over many different types of third-party equipment. This includes devices like the PLC systems commonly used for ride control, projectors, video players, audio players, audio DSPs, matrix switchers, motion controllers (animatronics), and much more. The V4X harnesses the power of the Alcorn McBride show control engine to easily integrate with many industry-standard devices and serve as a sub-system show controller control for theme park attractions or a master show control system for museum applications. This includes features like timelines to precisely manage A/V playback or triggering complex show control sequences via GPIO, Serial, or Ethernet commands.

The V4X also works in tandem with our ShowTouch apps and devices to provide intuitive touch panel controls (HMI) that can be tailored to the needs of the attraction's operations and maintenance staff.

This product leverages 32 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 powerful and flexible Alcorn McBride ControlCore. This technology provides the ability to control and monitor components deployed in themed attractions like PLCs, animation controllers, video playback, projection, DSP systems, matrix switchers, and much more.

The control feature set is as follows:

- **Alcorn McBride Show Control Core**
 - Control of 3rd Party Devices (PLC, DSP, Animation, AV, etc.)
 - Timeline Programming
 - ShowTouch Integration
 - PLC Integration – ride control monitoring/triggering
 - Advanced Scripting Control
- **2 x Network Control Ports (Isolated)**
- **4 x Serial Control Ports**
 - 4 x RS422/RS232
 - 1 x DMX
- **8 x CC/Voltage Inputs**
- **8 x CC Outputs /w Self-Healing Polymer Fuse**
- **8 x User-Programmable Front-Panel Buttons**
- **4.3” Touch-Enabled TFT Display**



PHYSICAL FEATURES

This product's solid-state design enables it to integrate well into any commercial A/V installation. It's designed to be mounted into a standard 19" equipment rack and requires only 2RU of space. The rear-panel of the unit offers professional-grade phoenix terminals for easy wire termination in the field, and industry standard connectors for network, and power.

- Phoenix connectors for solder-free installation
- Flexible Power Supply Options
 - **V4X** - Built-in 110-240VAC Auto-sensing power supply
 - **V4X-DC** – Built-in 24VDC power supply
- 4.3” TFT Display
- Control status LEDs
- IO status LEDs
- Front-panel buttons
- Removable SD Card for storage of scripts and panels
- Dimensions – 19” W x 14” D x 3.5” H - 2U Rack Mount
- Weight – 10 Lbs.

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	support@alcorn.com
Telephone Support	(407) 296-5800 (Mon-Fri 9am-6pm EST)

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 an V4X.

WIRING AND CONNECTIVITY

A few connections are required to experience the core functionality of an V4X. If you're the DIY-type that's comfortable with purchasing and terminating your own connectors, you'll be happy to know that this product uses industry-standard connectors which are documented in detail in the **Hardware Information** section of this User's Guide.

POWER

The V4X can be ordered with one of two power supply options:

- **V4X** - Built-in 110-240VAC Auto-sensing power supply
- **V4X-DC** – Built-in 24VDC power supply

The AC option is the standard and preferred by many customers; however, there are many applications that benefit from having a DC power input. Whichever your preference, be sure to order the appropriate version of the V4X for your power needs.



For the standard V4X, you simply need to connect AC power using the included IEC power cable.

For the V4X-DC, you need to apply a 24VDC power source to the power input terminals. Be sure to observe the correct polarity for the Positive (+24VDC) and Negative (-) terminals.

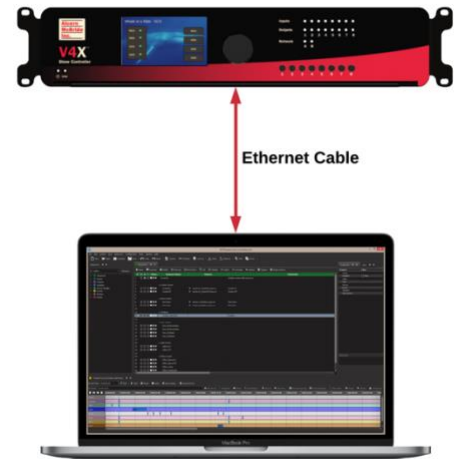
Once you have connected the power source, the V4X can be powered up by simply flipping the power switch to the ON position. HEY!!! What are you doing?!? We didn't actually say to power up yet, but you went ahead and did it anyway didn't you!!!! <Head Slap> Alright... clearly you're excited so I guess we'll cut you some slack, but could you at least try to follow instructions next time?

NETWORK CONTROL

While the V4X 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 a V4X to your Windows or macOS computer running our WinScript Live software. This application empowers you to configure, program and monitor the unit.

The V4X has 2 standard RJ45 Ethernet connectors that support 10/100/1000BT networks. They provide access to 2 isolated networks labeled Network A and B that can be used by the V4X to control and monitor devices that are connected to the networks.

Let's go ahead and plug in one end of your Ethernet cable to Port A and the other end to your computer.



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 an V4X. Before we get started, it's helpful to know that a V4X ships with the following default IP address configurations:

Port A	
Control IP	192.168.0.254
Subnet Mask	255.255.255.0

Port B	
Control IP	192.168.1.254
Subnet Mask	255.255.255.0

If you're at ease in the world of networking, you can easily adjust these settings for your V4X to operate on an existing network. For more information on how to access the network configuration menu, see the **Display and Navigation Buttons** section of this User's Guide.

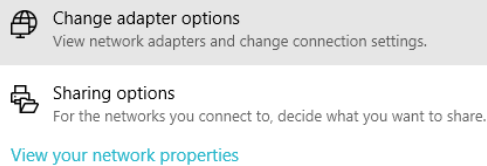
For those that just wish to connect a computer directly to Network A of the V4X, the easiest way is to set your computer to a static IP address that is compatible with V4X default network settings. For example, this configuration would work nicely for your computer:

Computer Ethernet Port	
IP	192.168.0.100
Subnet Mask	255.255.255.0

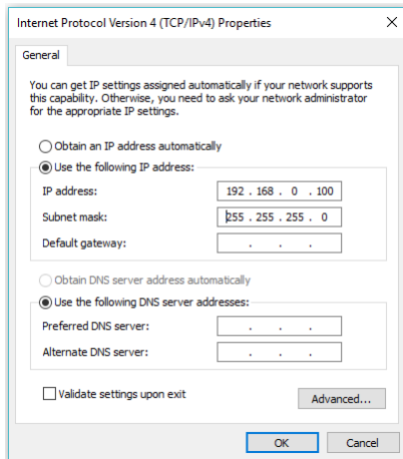
CONFIGURING STATIC IP - WINDOWS 10

1. Right-click on the Windows icon in the bottom-left and select **Network Connections**
2. Select **Change adapter options**

Change your network settings



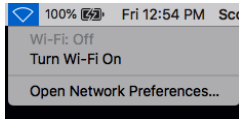
3. Right-click on the network interface that is connected to the V4X and select **Properties**
4. Select **Internet Protocol Version 4 (TCP/IPv4)** from the list of items and click the **Properties** button below.
5. Select **Use the following IP address**, enter the IP address as **192.168.0.100**, and enter the Subnet Mask as **255.255.255.0** as indicated in the screenshot below:



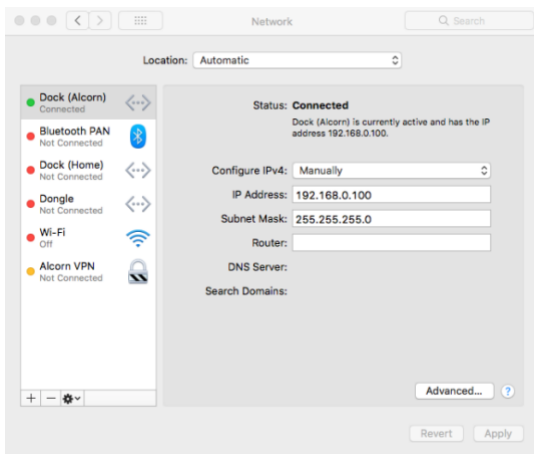
6. Click the **Ok** button to apply the static IP address.

CONFIGURING STATIC IP – OS X

1. 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 the V4X 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.



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

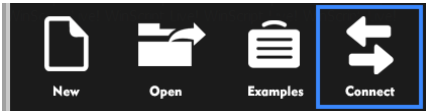
CONTROLLING WITH WINSCRIPT LIVE

At this point, everything should be wired up, configured, and ready to go. The next step is to connect to the V4X using our WinScript Live software. Once connected, you will have access to configure, control, and monitor your V4X 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 www.alcorn.com.

Once the software is installed, follow these instructions to start a test sequence:

1. Launch WinScript Live and click the **Connect** button on the splash screen



2. Your V4X unit should automatically appear in the connection list. Click it once to select, and then click the **OK** button to connect.



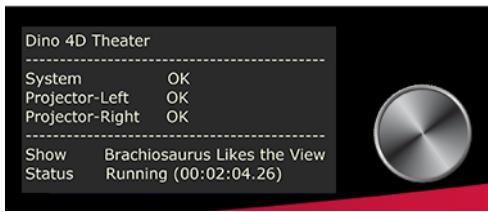
3. Select **Retrieve** and click **OK**. WinScript Live will then load the project currently stored on the V4X.
4. Congratulations! You are in control of your V4X unit. There are many places you can go from here, but here are some helpful suggestions:
 - The powerful show control engine of the V4X empowers you with advanced scripting capability, timeline features, and device control. To learn more, the detailed documentation of our show control platform is built right into the WinScript Live software. If you are new to Alcorn McBride show control, we also strongly encourage you to access the training content included with WinScript Live using the **Examples** screen and/or sign up for our next training class.
 - Visit our Applications page at www.alcorn.com to access more detailed examples on application-specific topics.

HARDWARE INFORMATION

OVERVIEW

The V4X has an assortment of dedicated hardware for the purpose of configuration, status monitoring, and interfacing to other hardware. This section covers these features in more detail.

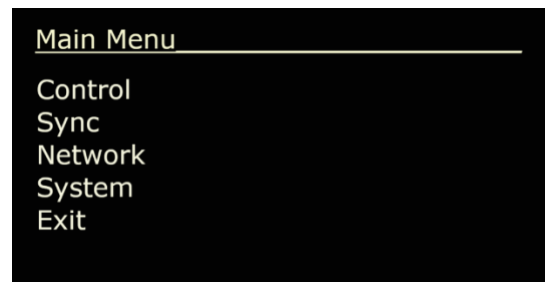
DISPLAY AND NAVIGATION WHEEL



The V4X features a 4.3” TFT display. This display is primarily used to share project-specific information (i.e. “Preshow – Running - 01:02:03.00”) from the show control script. However, this display also offers a full menu system that can be accessed using the navigation wheel adjacent to the display.

To access the menu system, simply press in the navigation wheel. The wheel can then be rotated and pressed to browse the menu system, select items, and change settings.

MAIN MENU



This menu provides access to the following sub-menus:

- **Control** – Monitor show control performance and script status
- **Sync** – View sync configuration
- **Network** – Configure network interfaces
- **System** – Configure and monitor generic system status

CONTROL MENU

```
Control
-----
Script      DinoTheater_V100.ws4
CPU Load    3%
Back
```

- **Script** – View currently active show control script
 - Select to access a screen to view full script name and load different scripts
- **CPU Load** – View current load of show control processor

SYNC MENU

```
Sync
-----
Sync Source    Internal
Frame Rate     60fps
Back
```

- **Sync Source** – View sync clock reference ('Internal' only for V4X).
- **Frame Rate** – View operating frame rate of show control core.

NETWORK MENU

```
Network
-----
Network A
Network B
Back
```

- **Network A** – View Status and Configure 'Network A'.
- **Network B** – View Status and Configure 'Network B'.

NETWORK SETUP MENU

Network A	
DHCP	Disabled
IP	192.168.000.254
Subnet Mask	255.255.255.000
Gateway	192.168.000.001
DNS	127.000.000.001
MAC	00:10:46:12:34:56
Link	Connected

- **DHCP** – Enable/Disable DHCP network configuration
- **IP** – View/Configure Show Control IP address
- **Subnet Mask** – View/Configure subnet mask
- **Gateway** – View/Configure gateway IP address
- **DNS** – View/Configure DNS address
- **MAC** – View MAC address for Show Control Ethernet interface
- **Link** – Current link status of network port

SYSTEM MENU

System	
Name	Theater-Controller
Version	v2.30
Build	33
Status	
Format SSD	
Reset Settings	
Reboot	

- **Name** – Shows the user-assigned device name of the V4X unit.
- **Version** – Firmware version
- **Build** – Build revision of firmware
- **Status** – View status info such as temperature, fan speed, input voltage, etc.
- **Format SSD** – Erase and Format internal SSD media
- **Reset Settings** – Reset all configuration data (i.e. network, device name, etc.) to factory defaults
- **Reboot** – Reboot V4X and re-launch script

INDICATOR LEDS

The front-panel of a V4X has a full set of indicator LEDs to provide an overall status of different features of the device.



STATUS



Power – ON whenever power is applied to the unit and the power switch is on

Live – ON whenever WinScript Live is connected to the unit

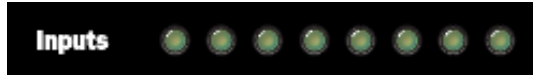
NETWORK



These indicators display both network link and activity for all of the Control Network ethernet ports.

LED State	Description
OFF	No network link
SOLID ORANGE	Network link active – No network activity detected
BLINKING ORANGE	Network link active – Network activity detected

INPUTS



These are digital inputs that can be used to trigger show control events. These inputs can be configured via software to accept contact-closure or voltage triggers (5-24VDC).

LED State	Description
OFF	Inactive – No contact closure detected or voltage input is <9VDC
GREEN	Active – Contact closure detected or voltage input is 9-24VDC

OUTPUTS



These are dry-contact relay outputs that are rated to 900mA and protected with inline self-healing polymer fuses. These relays are normally open (NO) and both relay contacts (COMMON = C, and NORMALLY OPEN = NO) are accessible for each output.

LED State	Description
OFF	Inactive – Relay contact is OPEN
RED	Active – Relay contact is CLOSED

BUTTONS

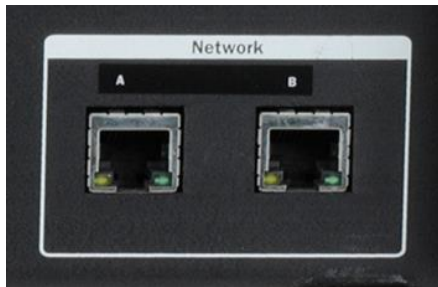
The front panel buttons can be configured by WinScript Live software to trigger show control. Panel space is left above these buttons to allow for labels to be installed.



CONNECTORS

NETWORK PORTS

These are standard RJ45 Ethernet connectors that support 10/100/1000BT networks. They provide access to 2 isolated networks that can be used by the V4X to control and monitor devices that are connected to the networks. They are also used by a computer running our WinScript Live software to connect to the V4X to configure, program, and monitor the unit.



Connector Information

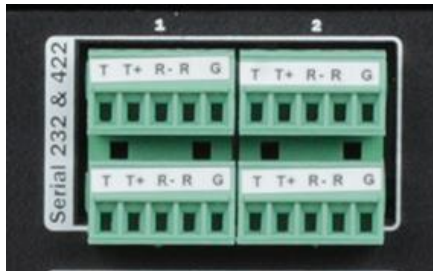
Connector Type	RJ45 Female
Mating Plug	RJ45 Male

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

SERIAL PORTS

The V4X has a total of 4 serial ports that can be used to control devices. These ports can be configured to operate in either RS422 or RS232 mode. Port 1 can also be configured to output DMX512 for basic lighting control applications.



Connector Information

Connector Type	Phoenix
Mating Plug	Phoenix Contact 5447890
Recommended Wire	18 AWG Stranded

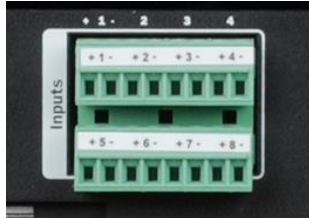
Pinouts

Serial Port 1	
RS232 TX	1
RS422 TX (-)	
DMX OUT (-)	
RS422 TX (+)	2
DMX OUT (+)	
RS422 RX(-)	3
RS232 RX	4
RS422 RX (+)	

Serial Ports (2-4)	
RS232 TX	1
RS422 TX (-)	
RS422 TX (+)	2
RS422 RX(-)	3
RS232 RX	4
RS422 RX (+)	

DIGITAL INPUTS

These are digital inputs that can be used to trigger show control events. These inputs can be configured via software to accept contact-closure or voltage triggers (5-24VDC).



Connector Information

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

Pinout

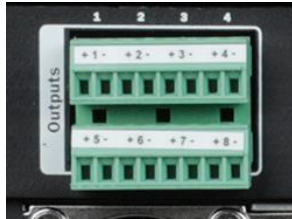
T1	T2	T3	T4	T5	T6	T7	T8
B1	B2	B3	B4	B5	B6	B7	B8

Digital Inputs (1-4)	
IN1(+)	T1
IN1(-)	T2
IN2(+)	T3
IN2(-)	T4
IN3(+)	T5
IN3(-)	T6
IN4(+)	T7
IN4(-)	T8

Digital Inputs (5-8)	
IN5(+)	B1
IN5(-)	B2
IN6(+)	B3
IN6(-)	B4
IN7(+)	B5
IN7(-)	B6
IN8(+)	B7
IN8(-)	B8

DIGITAL OUTPUTS

These are dry-contact relay outputs that are rated to 900mA and protected with inline self-healing polymer fuses. These relays are normally open (NO) and both relay contacts (COMMON = C, and NORMALLY OPEN = NO) are accessible for each output.



Connector Information

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

Pinout

T1	T2	T3	T4	T5	T6	T7	T8
B1	B2	B3	B4	B5	B6	B7	B8

Digital Outputs (1-4)	
OUT1(NO)	T1
OUT1(C)	T2
OUT2(NO)	T3
OUT2(C)	T4
OUT3(NO)	T5
OUT3(C)	T6
OUT4(NO)	T7
OUT4(C)	T8

Digital Outputs (5-8)	
OUT5(NO)	B1
OUT5(C)	B2
OUT6(NO)	B3
OUT6(C)	B4
OUT7(NO)	B5
OUT7(C)	B6
OUT8(NO)	B7
OUT8(C)	B8

WIRING GUIDE

DIGITAL INPUT WIRING

VOLTAGE

Using Voltage Inputs instead of Contact Closures will add complexity to the wiring but will provide greater reliability over long distance cable runs.

Advantages

- The installer can overcome long distances when connecting contact closures by using higher voltage sources to compensate for resistance in wiring.
- Inputs can be completely isolated from one another.

Disadvantages

- The installer must provide an external power supply for the contact closure(s).

CONTACT CLOSURE

Using Contact Closures over Voltage Inputs provides a simple installation but limits cabling distance.

Advantages

- Contact closure installations require only wiring and contacts
- No external power supply is required.

Disadvantages

- To be reliable, the contact closure must be located close (10-20 ft) from the unit.
- The wiring will not be isolated. Errors and problems in any circuit could affect other contact closure inputs.
- A high voltage short to this wiring could damage the V4X.

SPECIFICATIONS

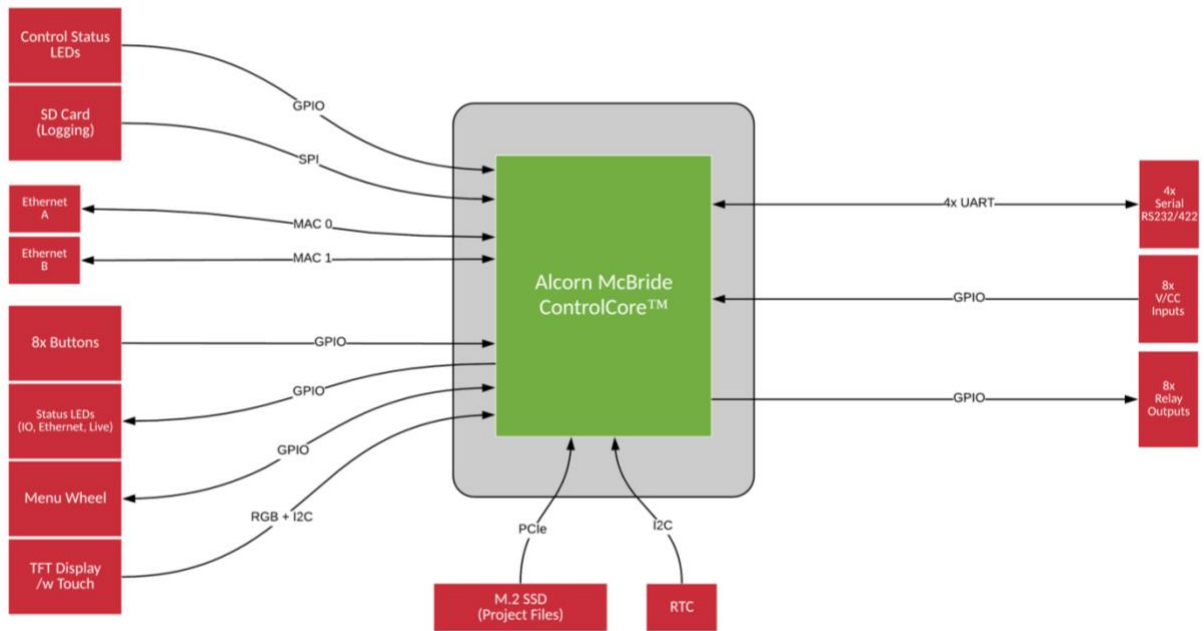
CONTROL

Show Control	Advanced Scripted Control Timeline Programming ShowTouch Touch Panel Integration Intuitive Device Control (PLC, DSP, Animation, AV, etc.)
Display	4.3" TFT LCD /w navigation wheel
LED Indicators	Power, Live Mode, Ethernet, Inputs, Outputs
Ethernet	2 x 100/1000BT (RJ45) Isolated Networks – No internal switch/bridge Device Control Programming
Serial	4 x RS232/RS422 (5-pin Phoenix)
DMX	1 x DMX512 Output (Serial Port 1 – 5-pin Phoenix)
Digital Inputs	8 x Contact/Voltage Inputs (2 x 8-pin Phoenix) Software Configurable for Voltage (5-24VDC) or Contact Closure
Relay Outputs	8 x N.O. Dry-contact Relay Outputs (2 x 8-pin Phoenix) Self-restoring Polymer Fuses (900mA)
Show Memory	Removable SD Card /w Captive Socket

PHYSICAL

Power	V4X – 110-240VAC V4X-DC – 24VDC
Dimensions	19"W x 14"L x 3.5"H (483mm x 356mm x 89mm)
Weight	14lbs (6.4kg)
Environment	0°C (32°F) to 38°C (100°F) 0-90% Relative Humidity
Mounting	2U 19" Rack Mount
Compliance	UL, CE, CB, WEEE, RoHS

BLOCK DIAGRAM



PRODUCT PHOTOS

Front View



Rear View

