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1. Introduction

The Versa® DRIVE C1 is a stand-alone controller for Versa TILE and Versa TUBE. AVI or BMP based patterns are combined with a pixel map in the RasterMAPPER™ software application, saved onto a Compact Flash card, and loaded into the C1. Playback is via front panel controls, DMX, or contact closure.

2. Quick Start

1. Connect Power & Data Cables. Use the Local or Serial Data output to connect to your Versa TILE or TUBE system.
2. Create a map of your system in RasterMAPPER.
3. Import .AVI videos or .BMP still images into RasterMAPPER to create patterns.
4. Output the patterns as .CFF files and store them on a Compact Flash (CF) card.
5. Insert the CF card into the C1 and turn the power on.
6. Use the **MODE**, **UP (▲)**, and **DOWN (▼)** buttons to select different patterns and playback modes.

3. General Information

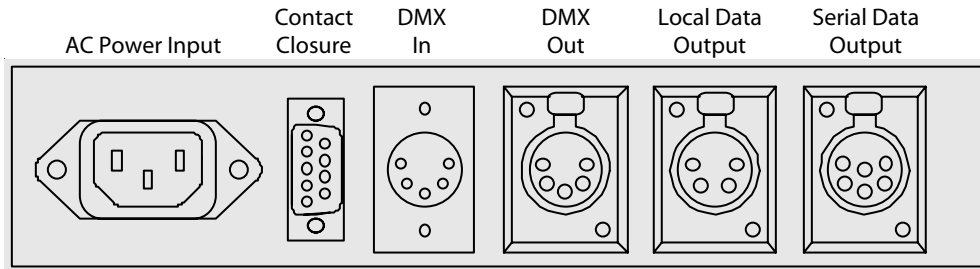
3.1 Front Panel



The Versa DRIVE C1 has the following controls and displays on its front panel:

- Three function buttons: **MODE**, **UP (▲)** and **DOWN (▼)**
- Compact Flash Card Slot
- 3 Digit Numeric LED Display
- **POWER** switch

3.2 Rear Panel



The Versa DRIVE C1 has the following connectors on its rear panel:

- AC Power Input (85-264VAC, 50/60Hz) _____ Male IEC Connector
- Contact Closure Input _____ Female DB-9 Connector
- DMX Input _____ Male 5 pin XLR
- DMX Output (thru) _____ Female 5 pin XLR
- Local Data Output _____ Female 4 pin XLR
- Serial Data Output _____ Female 6 pin XLR

3.3 Firmware Versions

The standard version of firmware supports 1,024 pixels and 2048 pixels. (See Engineering section) The tradeoff for doubling the pixel output is a reduced response time to some commands and internal functions.

Changing firmware involves replacing two IC chips on the C1's motherboard. This process can be done by the end user, dealer, or at Element Labs. Please contact your dealer or Element Labs for more information.

The Current Firmware is Version 5-1.

4. Setup

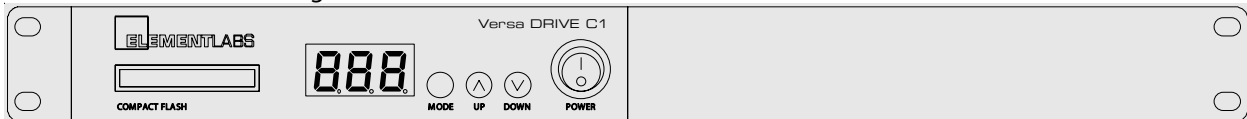
4.1 Mounting

The C1 is equipped with four plastic feet for tabletop operation. If necessary, the feet can be easily removed. Pry the center peg up with a small screwdriver and then pull the foot out of its mounting hole.

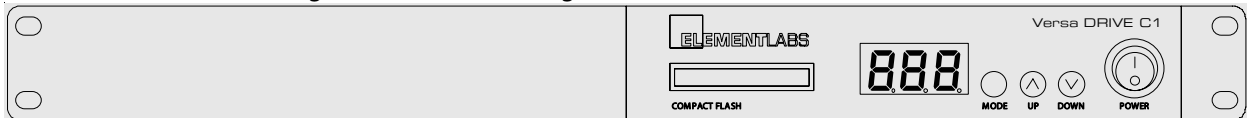
The C1 can be rack mounted with the included accessories. Each rack ear attaches to the side of the C1 enclosure with four 3mm screws (included).

There are three possible configurations for rack mounting

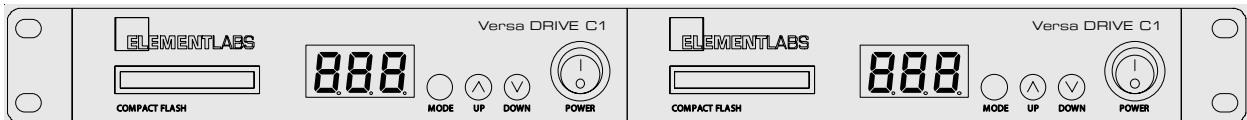
One short and one long rack ear with C1 on left side:



One short and one long rack ear with C1 on right side:



Two C1s with two short rack ears:



For the above configuration, open the tops of both C1s and use the 4mm screws and locknuts (included) to attach the two C1 enclosures together.

4.2 Connections

1. Connect the data output cable from the back of the C1 into the first Versa TUBE or TILE.
 - The Serial and Local Data Outputs send identical data.
 - The Serial Data Output may be connected to a Versa TILE panel, TUBE, RAY, or Buffer Box up to 100m away.
 - The Local Data Output may be connected directly to the data input of a Versa TUBE or Versa TILE X2, or Versa RAY up to 3m away.
2. Connect AC power from an outlet to the Versa DRIVE C1.
4. Insert a Compact Flash card into the slot on the front of the C1.
5. Power on Versa DRIVE C1.

4.3 Compact Flash Cards

The Versa DRIVE C1 reads CompactFlash® cards. System mapping and pattern creation are executed in the RasterMAPPER™ software and copied to a CompactFlash card for use in the Versa DRIVE C1.

The Versa DRIVE C1 is compatible with any size (32MB to 2GB) Type I or Type II CompactFlash card. The number, and size, of patterns that are capable of being stored is dependant on the memory size of the CompactFlash Card used.

4.3.1 CF Card Formatting

To be used in a Versa DRIVE C1 a CompactFlash(CF) card must be PC Formatted to the FAT32 File System

To Format a CompactFlash card:

1. Right-click on 'My Computer'
2. Click 'Manage'
3. Click on 'Disk Management' from the list in the left-hand window
4. From the list on the right select the drive letter for your CF card
5. Right-click on the CF Card and choose 'Format'
6. Choose 'FAT 32' for the file system and click ok

5. Menu System

5.1 Navigation

The C1 can be controlled from the front panel with a simple menu system. A three digit numeric LED display shows the current menu item and its value.

Navigation is done with the three buttons:

MENU – Steps forward through the menu modes.

UP (Λ) – Steps up through available menu items or parameter values. Press and hold for rapid scrolling.

DOWN (V) – Steps down through menu items or parameter values. Press and hold for rapid scrolling.

5.2 Selecting Modes and Modifying Parameters

To change the value for a parameter:

1. Press **MODE** to scroll through the modes. The LED display will show the name of the mode and then after two seconds will change to display the mode's current value.
2. When a new mode is selected, the **UP (Λ)** or **DOWN (V)** button can be pressed once, immediately to display the current value. You do not need to wait for the display to change to the mode's value.
3. Press the **UP (Λ)** and **DOWN (V)** buttons to adjust the mode value.
The numeric values can roll-over in either direction between the lowest and highest values.
4. Press **MODE** again to save the new value and proceed to the next mode.

After short period of inactivity (about 15 seconds), the **UP (Λ)** and **DOWN (V)** buttons go into the Lock mode, and are disabled. This prevents accidentally changing of parameter values. If the **UP (Λ)** or **DOWN (V)** buttons are pressed while the C1 is in Lock mode, the display will show **Loc**.

Pressing the **MODE** button immediately unlocks the C1. When the C1 is unlocked, it immediately goes into the PATTERN mode: **PAt**.

While in the Lock mode, the display will revert to showing the current pattern number after a two second delay.

5.3 Modes

When the **MODE** button is pressed, the C1's display will advance to the next mode.

The Versa DRIVE C1 modes are as follows:

PAt (Pattern): Selects the current pattern from 0-255

PLA (Playback): Sets the playback mode to LOOP, HOLD, ONCE, BOUNCE, ALL, or PAUSE.

Id (ID): Selects the DMX start address from 0-512

rES (DMX Resolution): Sets the DMX resolution mode to either HIGH or LOW.

brt (Brightness): Sets the output brightness level from 1 to 10

rb (Red Balance): Sets the White Balance level for Red from 0-63

Gb (Green Balance): Sets the White Balance level for Green from 0-63

bb (Blue Balance): Sets the White Balance level for Blue from 0-63

F (Firmware): Displays the C1's firmware version

LnH (Link): Sets the Master / Slave Link Mode to either MASTER, SLAVE, or OFF

5.3.1 Pattern **PAE**

The C1 can use up to 255 individual patterns. Patterns 0, 254, and 255 are fixed in the C1's firmware and cannot be changed. Patterns 1 – 253 are user-definable and stored on the compact flash card.

Pattern 0: *Black*

Patterns 1 – 253: *User-definable*

Patterns created in RasterMAPPER and stored on the Compact Flash card.

The filename format is ###XXXXXX.cff (eg. 001MyTestPattern.cff)

is three numeric digits from 001 through 253.

XXXXXX is any number of alphanumeric characters. These are ignored by the controller.

.cff is the file extension (compact flash format).

Pattern 254: *Test Pattern / Moving Pixel ID*

Pattern 254 sets all pixels to black and then sequentially sets one pixel at a time to white. This is useful for troubleshooting addressing or wiring problems.

NOTE: Test pattern 254 cycles sequentially through all 1024 (or 2048) pixels, so it can take quite some time to complete. If you have a small system with less than 1024 (or 2048) pixels, you will see no change in your fixtures after the last pixel is flashed until the pattern completes and starts over again. You can reselect the pattern or reset the controller to start the pattern over again without waiting.

Pattern 255: *Test Pattern / Solid Colors*

Pattern 255 cycles the entire output through red, blue, green, white, odds (odd numbered pixels in white, even numbered pixels in black), and evens (the inverse of odds).

By default, when the C1 is powered on, it will resume playing the same pattern that was active when the controller was last turned off.

5.3.2 Playback **PLA**

The C1 can playback a pattern in any of six different modes:

- **Loo** (LOOP): The pattern continuously loops, starting over at frame 1 immediately after the last frame.
- **hLd** (HOLD): The pattern plays once until the end, and then freezes on the last frame of the pattern. The last frame is displayed until a new pattern is selected.
- **onE** (ONCE): Similar to HOLD, the pattern plays once until the end. After the last frame, the output is set to black and remains black until a new pattern is selected.
- **bnc** (BOUNCE): The pattern plays continuously forward, then backwards.
- **ALL** (ALL): All user-definable patterns are played sequentially. After the last pattern is finished, the first pattern starts to play again.
- **PAU** (PAUSE): The current pattern will pause, or freeze, in the current frame. The pattern will resume when any of the five other playback modes are selected. This function is primarily for

use with a DMX console which can access the playback modes instantly.

5.3.3 ID *id*

The ID mode sets the C1's start address for the incoming DMX data. See the DMX section for details.

5.3.4 Resolution *rES*

The Resolution mode sets the C1's DMX resolution. See the DMX section for details.

5.3.5 Brightness *brt*

The C1 has a brightness level ranging from 1 (dimpest) to 10 (brightest). This can be used to match the system output to low ambient light levels.

5.3.6 Red, Green, and Blue Balance *rb, gn, bb*

These three modes offer the ability to adjust the white balance color of the output by decreasing the output for each primary LED color (Red, Green, and Blue). The default maximum level for each color is 63. The range of possible values is from 0 – 63.

5.3.7 Firmware *F*

This mode displays the current firmware version of the C1. The **UP (Λ)** and **DOWN (V)** buttons have no effect in this mode.

5.3.8 Link (Master / Slave) *LnH*

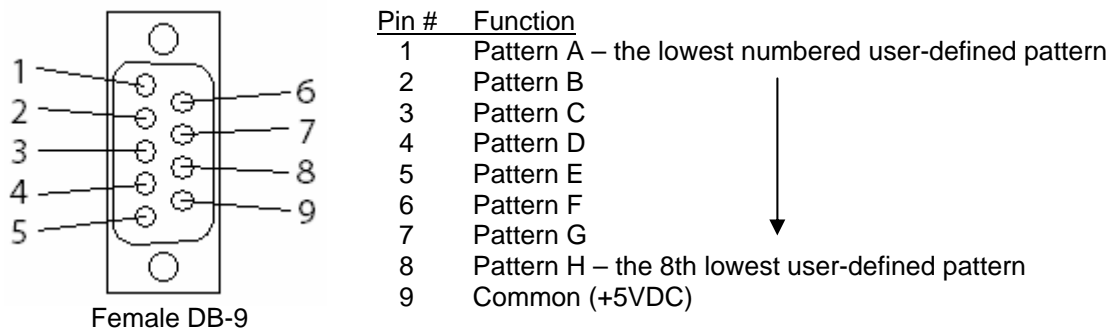
The Link mode sets the type of control the Versa DRIVE has over a system. *PPS* (Master), *SLA* (Slave), and *OFF* (OFF) are the three options. See the Link (Master / Slave) section for details.

6. Contact Closure

A “dry-contact” is simply a normally open, single-pole, single-throw (SPST) switch or pushbutton, such as the output side of a relay, etc.

The contact closure can be used to trigger playback of the first 8 user-defined patterns in the C1. It is not restricted specifically to patterns 1 – 8. For example, if the lowest number pattern on the CF card is 17, then contact closure #1 would trigger pattern 17.

The contact closure connector is a standard, commonly available DB-9.



The contact closures use 5VDC at 1mA per closure. A dry contact switch can be connected at a distance of up to 1,000 meters using 24 AWG wire.



WARNING: Never connect any external voltage source to the Contact Closure DB9 connector.

7. DMX Control

The C1 requires 6 channels of DMX for Pattern, Playback, and Direct Color modes:

DMX CH	FUNCTION
1	Pattern Select
2	Playback Mode
3	Direct Color Mode (0%-25% is additive, 26%-75% undefined, 76%-100% is subtractive)
4	Direct Color Red
5	Direct Color Green
6	Direct Color Blue

NOTE: Link Mode must be set to Master for the C1 to send and receive DMX data.

7.1 DMX Start Address

Set the **id** (ID) value to the desired DMX start address from 1 to 512.
Example: If the ID=5, then that C1 would use DMX channels 5 through 10.

Set the ID to 0 (zero) to ignore all DMX input.

7.2 DMX Resolution

The C1 supports two different DMX resolutions: **Hi** (High) and **Lo** (Low). This only affects how the C1 interprets pattern selection on DMX input channel 1.

7.2.1 High Resolution

In High resolution mode, DMX channel 1 accesses all of the available patterns from 0 to 255. Set the decimal value of the DMX channel to the value of the pattern that you want to play.
Example: DMX channel 1 @ 178 ⇒ C1 plays pattern #178

If no pattern number exists that matches the DMX value, no action is taken.

7.2.2 Low Resolution

In Low resolution mode, DMX channel 1 is divided into 20 steps. Each step will playback one of the 20 lowest numbered user defined patterns. Note: this does not strictly mean patterns #001 through #020. low resolution mode accesses the first 20 patterns on the CF card, regardless of their actual numbers.

DMX %	DMX Decimal Value	Pattern	DMX %	DMX Decimal Value	Pattern
0%	0 - 3	0 (black)	55%	137 - 144	11th
5%	9 - 16	1st	60%	150 - 157	12th
10%	22 - 29	2nd	65%	163 - 170	13th
15%	35 - 42	3rd	70%	175 - 182	14th
20%	48 - 55	4th	75%	188 - 195	15th
25%	60 - 67	5th	80%	201 - 208	16th
30%	73 - 80	6th	85%	213 - 220	17th
35%	86 - 95	7th	90%	226 - 233	18th
40%	99 - 106	8th	95%	239 - 246	19th
45%	111 - 118	9th	100%	252 - 255	20th
50%	124 - 131	10th			

Pattern 0 (default blackout) is also available. The two test patterns #254 and #255 are not available.

Low resolution mode is useful for DMX consoles with limited capabilities (i.e. – if the output can only be programmed in percentage, not decimal values).

There are also five or six null DMX values between each step. These prevent accidental fluctuation between adjacent steps.

7.3 Playback Mode

DMX channel 2 selects the Playback mode.

DMX VALUE	PARAMETER
0-50	Loop
51-100	Hold
101-150	Once
151-200	Bounce
201-255	All

8. Direct Color

The Versa DRIVE C1 offers a unique feature called "Direct Color."

Using DMX channels, over 16 million solid colors can be mixed and output by the C1. In addition, these colors can be added to or subtracted from any of the patterns, in effect, colorizing the output.

DMX CH	FUNCTION
3	Direct Color Mode (0%-25% is additive, 26%-75% undefined, 76%-100% is subtractive)
4	Direct Color Red
5	Direct Color Green
6	Direct Color Blue

The Direct Color function has two modes: additive and subtractive.

In the additive mode, the Direct Color values for are added to the color values in the pattern.

In the subtractive mode, the Direct Color values for are subtracted from the color values in the pattern.

There are three main uses for this function:

1. When used with Pattern 0 (Black) in the additive mode, then it is possible to create any solid color on the entire system of tiles or tubes.

Likewise, it can be used in subtractive mode with a user-defined all white pattern to achieve the same effect.

2. When used with a pattern, it will colorize the original video clip.

For example, the original pattern is white text scrolling across a black background. Using the subtractive mode to remove the blue and green, the final output would be red text scrolling on a black background. Alternately, in additive mode, adding red would create white text scrolling across a black background.

3. This function can also be used to fade a pattern in or out, to either black or white.

9. Link (Master / Slave)

The C1 has a Master and Slave mode allowing multiple C1s to be controlled by one master. To link C1s together use the DMX output. Attach the DMX Output to the DMX input of the next unit. XX units can be chained together. Front panel and DMX information is transmitted through a system of C1's.

9.1 Link Off

When link is set to off NO DMX will be sent by the C1. The C1 acts as a stand-alone unit.

9.2 Master Mode

When the C1 is in Master Mode all of the front panel selection will be duplicated on all Slave C1's. Incoming DMX data will also be resent to all slave C1's

A dot will appear after the first character to indicate that the unit is in master mode.

9.3 Slave Mode

When a C1 is in slave mode it will duplicate all front panel and DMX commands that are sent to the master C1.

10. Engineering Mode

The Versa DRIVE C1 is equipped with an Engineering Mode for modifying low level parameters of the device. Engineering Mode is most frequently used to adjust the output length of the data that the C1 generates from 1024 pixels (its default output length) to 2048 pixels.

To enter Engineering Mode:

1. Goto Firmware (**F**) menu and hit up
2. Press the up and down buttons and hold for 5 seconds.

The three decimal points on the display will blink to indicate that you are in engineering mode.

The first menu option will appear on screen for about 5 seconds.

Hitting the mode button will go to the next menu option

To exit Engineering Mode press Mode and Up buttons simultaneously

10.1 Output *oUt*

The first menu option is output setting, either 1 or 2.

A setting of 1 indicates that the C1's output is set for 1024 pixels.

A setting of 2 indicates that the C1's output is set for 2048 pixels.

Ensure that all buffer boxes, include all those include with a Vera TILE system are set to D1 mode, or 1024 pixels.

10.2 Balance Enable *bEn*

Not Implemented

10.3 Balance *bAL*

Not Implemented

10.4 Error Code *cod*

Not Implemented

11. Specifications

Part Number VD-C1

Width 1/2 standard rack unit (19.0" / 430mm)

Height 1U (1.75" / 44.4mm)

Depth 12" (304.8mm)

Weight 160.2 oz 10.0125 lbs = 4.542 kg

Construction Powder Coated Steel

Mounting Stand alone with plastic feet or rack mounted with included rack ears

Environmental IP30 (indoor use only)

Cooling Passive

Storage Temperature -40°C to 70°C

Operating Temperature 0°C to 50°C

Operating Humidity 10% to 85%, non condensing

Front Panel Power Switch

LED Display

3 control buttons - Mode, Up, Down

Compact Flash Slot

Rear Panel AC Power: 100-240 VAC 50/60Hz (female IEC connector)

Serial Data output for Versa fixtures (female XLR, 6-pin)

Local Data output for Versa fixtures (female XLR, 4-pin)

DMX input (male XLR, 5-pin)

DMX output (female XLR, 5-pin)

Contact Closure (female DB-9)

Output Data 1,024 pixel output on Serial Data and Local Data ports simultaneously

2,048 pixel output with optional v2-4 firmware

Data Output Rate 30 FPS (frames per second) maximum output rate

Included Accessories Rack mounting ears and hardware (one long ear, one short ear)

Hardware for attaching two C1s in a single rack space

WARNING Severe risk of electric shock. No user-serviceable parts inside.

12. Contacting Element Labs

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