Martin Professional
P3 Visualizer Protocol
Specification
1.00

30 Sep 2025, Revision 2

Revision History

Date	Document Revision	Protocol Version	Author	Description
12/05/2025	1	1.00	Wouter Verlinden	Initial Public Release
30/09/2025	2	1.00	Wouter Verlinden	Changed Merging Pixel Data and DMX Data responsibility for fixtures featuring a P3 Switch DMX Channel

Contents

Introduction

Purpose

The P3 Visualizer Protocol serves as an interface between a Martin P3 System Controller (or Martin P3-PC Software) and any (3D) visualization software. It thereby enables the visualization software to visualize fixtures driven via P3 or a mix of P3 and DMX.

Contents

The P3 Visualizer Protocol will provide the listener(s) with real-time data covering all fixtures mapped on the Martin P3 System Controller. Fixture information, pixel-data, gamma curve(s) and a sync pulse will be delivered to the visualizer via the P3 Visualizer Protocol.

Transport

The P3 Visualizer Protocol builds on the User Datagram Protocol (UDP) of the TCP/IP protocol suite. All data transport is unidirectional from the P3 System Controller to the visualizer.

Compatible P3 System Controller Hardware & Software

The P3 Visualizer Protocol is available on following hardware:

- P3-175 System Controller
- P3-275 System Controller
- P3-PC System Controller

When running P3 System Controller Software 6.2.0 or higher.

P3 Visualizer Protocol Sender Test Application

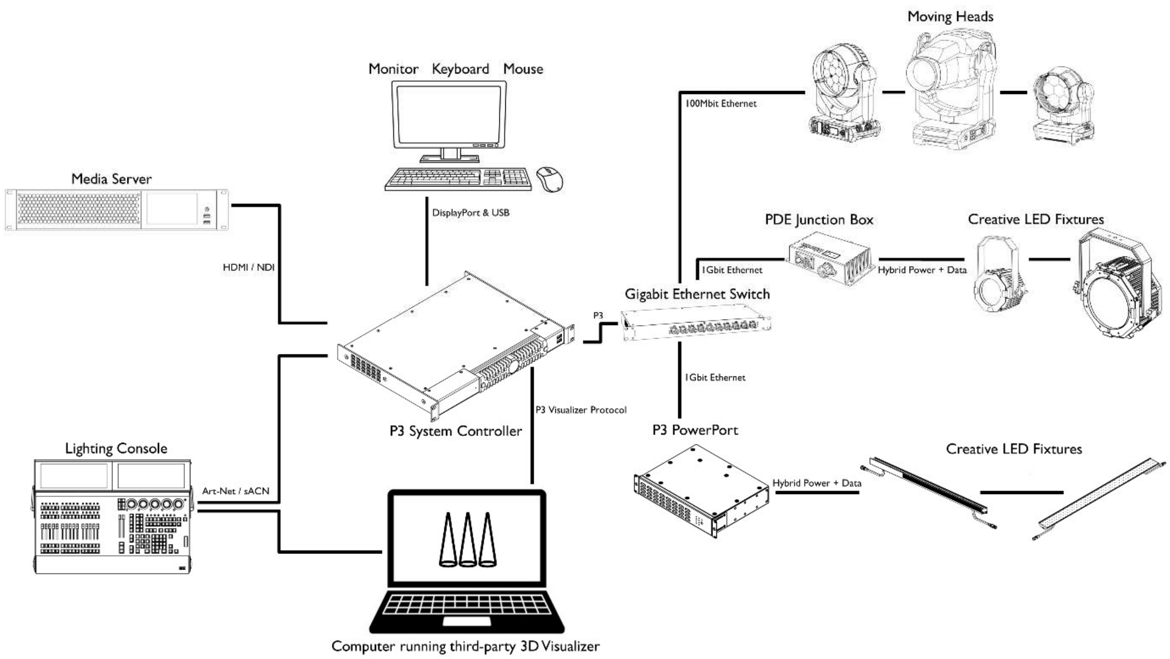
For developers implementing a receiver for the P3 Visualizer Protocol, a P3 Visualizer Protocol Sender Test Application is made available. This application enables single packets to be sent in a controlled way, to help development and debugging of a receiver.

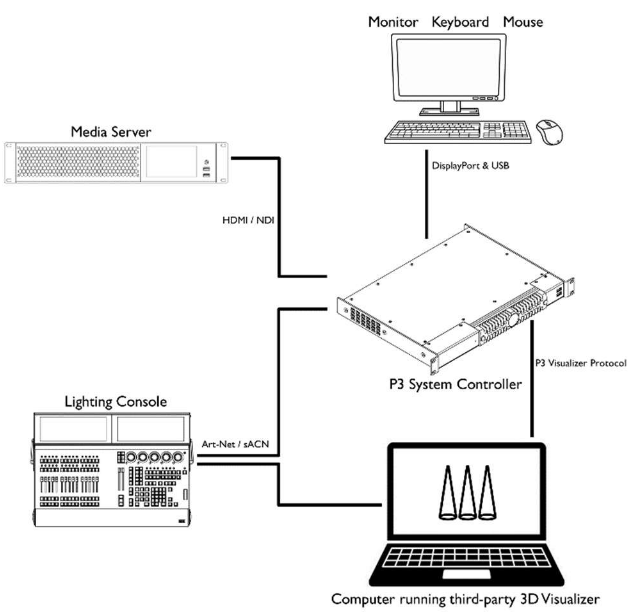
Please contact us at martinsoftware@harman.com to receive this application, or with any questions you may have regarding the implementation of the P3 Visualizer Protocol.

Typical System Diagram

A computer running the (3D) visualization software is connected to a P3 System Controller using the Martin P3 Visualizer Protocol, via the MGMT port on the P3 System Controller. The computer running the (3D) visualization software is usually also connected to a lighting console using standard Art-Net or sACN.

P3-driven fixtures can be connected to the P3 Output port(s) (running the Martin P3 Fixture Protocol) of the P3 System Controller at the same time, but it is also possible to do visualization without any physical fixtures being connected.





Ethernet Implementation

The P3 Visualizer Protocol can be used on any type of IPv4 network. All P3 Visualizer Protocol packets are enclosed in an UDP packet (within an IP packet).

Addressing

The P3 System Controller will send all P3 Visualizer Protocol packets to the directed broadcast address of the subnet it is configured to. This allows multiple listeners / visualizers (on one or multiple machines) to receive the packets.

Use-cases with multiple P3 System Controllers

It is allowed to have multiple P3 System Controllers on the same network to broadcast P3 Visualizer Protocol packets. The listener(s) / visualizer(s) will use the source IP Address to determine the source of the packets.

Byte Ordering

All packets are constructed in network byte order (big-endian).

Versioning

Any changes to the protocol that make it impossible for a receiver, unaware of the new version, to correctly interpret all packets will result in a major protocol version increment.

Small changes that do not impact correct reception by receivers not aware of these new changes can be covered in a minor protocol version increment.

Reserved bits and Bytes

All Reserved bit and bytes shall be transmitted as zero and not tested by receivers.

UDP Port Numbering

All P3 Visualizer Protocol packets shall be packed in a UDP packet with both source and destination port set to 20531 (0x5033).

Packet Length and Checksum

The P3 Visualizer Protocol packets do not contain a length field, hence the length field from the underlying UDP header is used.
The P3 Visualizer Protocol packets do not contain built-in error checking, hence the checksum from the UDP header is used. Packets with checksum mismatch shall be discarded.

Maximum Packet Length

P3 Visualizer Protocol packets are limited by the maximum length of a UDP packet inside a single Ethernet frame (1472 bytes). P3 Visualizer Protocol packets that need to transport more information for the same fixture (Pixel Data for large fixture) feature a mechanism of packet index and packet count (see below) to split information over multiple packets.

Packet Types

The P3 Visualizer Protocol defines four types of packets:
- Fixture Info
- Pixel Data
- Sync Pulse
- Gamma Curve

Fixture Info Packet

This packet contains information about one or multiple fixtures mapped on the P3 System Controller. It enables the visualizer to discover the list of fixtures and their parameters.
Fixture Info Packets are repeated for each fixture at 5000mS intervals to allow for timely update when a fixture is added/removed from the P3 System Controller (or a new listener / visualizer is connected to the network). The packets are spread evenly to avoid traffic bursts (if the P3 System Controller has 1700 fixtures mapped, it will send a Fixture Info Packet (containing information for up to 17 fixtures) every 50mS).
The P3 System Controller shall immediately send a packet (and not wait for the 5000mS interval) if any of the parameters for the given fixture is changed (change of DMX mode or address, change of fixture selection status, …). In this case usually only the information for that one fixture is included in the Fixture Info Packet.

Pixel Data Packet

This packet contains (video) pixels for one or multiple fixtures (with one or multiple layers) as mapped on the P3 System Controller. The rate at which these packets are sent can be configured on the P3 System Controller. They can follow the frame rate of the video being sent into the P3 System Controller (24-75Hz) or be sent at a lower rate to prevent flooding of the visualizer.

Sync Pulse Packet

This packet is sent after pixel data for all fixtures has been sent and notifies the listeners(s) to "use / visualize" that frame of pixel data. The rate of the sync pulse packet follows the frame rate of the video being sent into the P3 System Controller (24-75Hz) or can be sent at a lower rate to prevent flooding of the visualizer.

Gamma Curve Packet

This packet contains a transfer curve to be applied to the received pixel data before "outputting" into the visualizer. The same gamma curve is to be applied to all fixtures, but different curves can be sent for different colors (R/G/B). Gamma Curve Packets are repeated at 5000mS intervals to allow for timely update when a new listener / visualizer is connected to the network. The P3 System Controller shall immediately send a packet (and not wait for the 5000mS interval) if the user changes the gamma curve (brightness fader change or gamma curve selection on P3 System Controller).

Fixture Info Packet

Bytes	Field	Notes
HEADER		
5	Protocol Identifier	‘P’ ’3’ ‘V’ ‘P' 0x00
1	Protocol Version	Upper nibble is major version (currently 1). Lower nibble is minor version (currently 0).
1	Packet Type	0x01: Fixture Info Packet.
1	Sequence ID	Running counter, to be used to compensate for out of order packet reception. 256 wraps around to 0.
REPETITIONS OF:		
FIXTURE IDENTIFICATION		
2	P3 Fixture Number	Unique fixture identifier on the P3 System Controller. Integer in range 1-65535.
1	P3 Layer Quantity	Quantity of “video layers” this fixture contains. For example: - MAC Aura PXL = 2 layers of pixels - VDO Sceptron = 1 layer of pixels Integer in range 1-255.
1	Reserved	Reserved.
16	UUID	Unique fixture identifier that remains unchanged, even when fixtures are repatched or given a new P3 Fixture Number. Identical to the MVR UUID when a show is imported or exported to/from P3 using MVR. Can be used to match P3 fixtures with MVR file fixtures.
2	Manufacturer ID	16-bit fixture manufacturer identification (0x4D50 for Martin Professional).
2	Series ID	16-bit fixture series identification.
2	Product ID	16-bit fixture identification.
2	RDM Device Model ID	16-bit RDM Device Model ID of the fixture.
32	Product Name	Null-terminated string containing the fixture model name.
FIXTURE PATCH INFORMATION		
1	DMX Mode	Number of the DMX mode, as in RDM and GDTF. Special value 0x00 indicates that the fixture is not patched to DMX on the P3 System Controller; and that the DMX Protocol, DMX Universe and DMX Start Address fields should be ignored.
1	DMX Protocol	Protocol to which the fixture is patched on the P3 System Controller. 0x01: Art-Net 0x02: sACN Other values are reserved.
2	DMX Universe	Universe to which the fixture is patched on the P3 System Controller. 0-32767 when patched to Art-Net. 1-63999 when patched to sACN.
2	DMX Start Address	Address to which the fixture is patched on the P3 System Controller. 1-512.

		Set to 0 if fixture is not patched to DMX/Art-Net/sACN on the P3 System Controller.
FIXTURE STATUS INFORMATION		
1	Fixture Status	Bitfield representing status of the fixture on the P3 System Controller: D0 Selection Status (1 = selected on P3; 0 = not selected on P3). Can be used to track fixture selection between P3 and visualizer. D1 DMX Override Status (1 = DMX override enabled; 0 = DMX override not enabled). When override is enabled, the fixture will always output (video-) pixels instead of DMX-controlled colors. D2 PixelFlip (1 = Pixel Order Inverted; 0 = Pixel Order Regular) When set to 1, the DMX channel to LED pixel mapping is inverted (does not affect pixel data). D3-D7 Reserved.
1	Reserved	Reserved.
LAYER COLOR COORDINATES (REPEATED NUMBER OF TIMES SPECIFIED IN LAYER QUANTITY FIELD)		
2	White x coordinate	In CIE1931 color space. Pre-multiplied by 1000.
2	White y coordinate	In CIE1931 color space. Pre-multiplied by 1000.
2	Red x coordinate	In CIE1931 color space. Pre-multiplied by 1000.
2	Red y coordinate	In CIE1931 color space. Pre-multiplied by 1000.
2	Green x coordinate	In CIE1931 color space. Pre-multiplied by 1000.
2	Green y coordinate	In CIE1931 color space. Pre-multiplied by 1000.
2	Blue x coordinate	In CIE1931 color space. Pre-multiplied by 1000.
2	Blue y coordinate	In CIE1931 color space. Pre-multiplied by 1000.
DATA FOR MORE FIXTURES FOLLOWS (UP TO MAXIMUM FRAME SIZE)		

Sequence ID

The Sequence ID allows the receiver to ignore packets that were received out of order. When the receiver receives a Fixture Info Packet with Sequence ID lower than the previously received Fixture Info packet, he will ignore its information for P3 Fixture Numbers that were included in the “newer” packet.

Packet Filling

Information for multiple fixtures can be combined into a single P3 Visualizer Protocol Fixture Info Packet. This optimizes networking efficiency and reduces overhead. A single Fixture Info Packet can contain information for up to 17 fixtures (less if a fixture has multiple layers, and thus sends out multiple sets of color coordinates).

End Of Packet Detection

As the Fixture Info Packet can contain blocks of information for multiple fixtures, the receiver must detect the end of the packet (no more repetitions of fixture data). This can be done using two methods:

- Length of UDP header indicates total length and can be used to detect that no more data will follow.
- P3 Fixture Number 0 is invalid, so when a repeating block starting with 0 is seen the receiver can assume the packet has ended.

Pixel Data Packet

Bytes	Field	Notes
HEADER		
5	Protocol Identifier	‘P’ ’3’ ‘V’ ‘P' 0x00
1	Protocol Version	Upper nibble is major version (currently 1). Lower nibble is minor version (currently 0).
1	Packet Type	0x02: Pixel Data Packet.
1	Frame ID	Indicates the number of the frame being sent, to be used to compensate for out of order packet reception. 256 wraps around to 0.
REPETITIONS OF:		
FIXTURE IDENTIFICATION		
2	P3 Fixture Number	Unique fixture identifier on the P3 System Controller. Integer in range 1-65535.
1	Layer Number	Unique identifier for the layer within the P3 Fixture. Integer in range 0-255. Fixtures with a single layer fill this with 0x00. Fixtures with two layers fill this with 0x00 and 0x01.
FRAME INFORMATION		
1	Flags	D0 Bit depth per channel, defines the number of bits representing each primary color for each pixel: 0 = 8-bit 1 = 16-bit D1-D7 Reserved.
1	Packet Index	Packet counter within this layer of this fixture.
1	Packet Count	Number of packets needed to send this full layer for this fixture.
2	Pixel Count	Number of pixels within this layer in this packet. (if frame is split over multiple packets, each packet specifies the pixel count within that packet) Integer in range 1-485.
INTENSITY FACTORS		
2	Red Intensity	16-bit unsigned value, interpreted as a scaling factor for the red pixel data in the range of 0 to 1.
2	Green Intensity	16-bit unsigned value, interpreted as a scaling factor for the green pixel data in the range of 0 to 1.
2	Blue Intensity	16-bit unsigned value, interpreted as a scaling factor for the blue pixel data in the range of 0 to 1.
2	Reserved	Reserved.
PIXEL DATA (REPEATED NUMBER OF TIMES SPECIFIED IN PIXEL COUNT FIELD)		
1 or 2	Pixel Data Red	Red intensity.
1 or 2	Pixel Data Green	Green intensity.
1 or 2	Pixel Data Blue	Blue intensity.
DATA FOR MORE FIXTURES/LAYERS FOLLOWS (UP TO MAXIMUM FRAME SIZE)		

Packet Index & Packet Count

The Packet Count is the number of Pixel Data Packets needed to assemble the entire frame for the given layer of the given fixture. It must remain the same for all Pixel Data Packets received with the same Frame ID for the same P3 Fixture Number and Layer Number.

The Packet Index is which of the packets this is within the frame, it is 0-based and so must be below Packet Count. For a frame to be valid the P3 Fixture Number and Layer Number combination must receive packets with Packet Index at each index up to Packet Count. Should it receive the same Packet Index twice or miss a Packet Index then the frame is not valid and should be discarded.

For example, if a frame is sent using 3 packets, then the Packet Count for all packets would be 3 and the packets would have a Packet Index of 0, 1 and 2 respectively.

Intensity Factors

The Intensity Factors act as "dimmer" to be applied to the Pixel Data. Upon receiving Pixel Data, the receiver shall multiply the Pixel Data with the corresponding Intensity Factor. The resulting 16-bit values shall then be used as input to the Gamma Curves (see Gamma Curve Packet chapter).

Packet Filling

Information for multiple fixtures and multiple layers can be combined into a single Pixel Data Packet. This optimizes networking efficiency and reduces overhead.

For example, a single Pixel Data Packet may contain Pixel Data for:

- P3 Fixture Number 1 / Layer Number 0 (dual layer fixture) / Complete
- P3 Fixture Number 1 / Layer Number 1 (dual layer fixture) / Complete
- P3 Fixture Number 2 / Layer Number 0 (single layer fixture) / Complete
- P3 Fixture Number 3 / Layer Number 0 (single layer fixture) / Complete
- P3 Fixture Number 4 / Layer Number 0 (dual layer fixture) / Partial

The next Pixel Data Packet would then start with the remaining pixels from P3 Fixture Number 4 / Layer Number 0 and then continue with P3 Fixture Number 4 / Layer Number 1.

End Of Packet Detection

As the Pixel Data Packet can contain blocks of information for multiple fixtures, the receiver must detect the end of the packet (no more repetitions of fixture data). This can be done using two methods:

- Length of UDP header indicates total length and can be used to detect that no more data will follow.
- P3 Fixture Number 0 is invalid, so when a repeating block starting with 0 is seen the receiver can assume the packet has ended.

Sync Pulse Packet

Bytes	Field	Notes
HEADER		
5	Protocol Identifier	‘P’ ’3’ ‘V’ ‘P' 0x00
1	Protocol Version	Upper nibble is major version (currently 1). Lower nibble is minor version (currently 0).
1	Packet Type	0x03: Sync Pulse Packet.
1	Frame ID	Indicates the number of the pixel data frame this sync should be used for. 256 wraps around to 0.
SYNC INFORMATION		
4	Frame Rate	Frame Rate at which the P3 System Controller is currently sending Pixel Data and Sync Pulse Packets. Encoded as frame rate multiplied by 65536 and rounded to nearest integer. Example: 59.94Hz would encode as 0x003BF0A4
4	Time Stamp	Time Stamp at which the Sync Pulse Packet was sent from the P3 System Controller. 32-bit microsecond counter which wraps around.

Sync Pulse Packet Timing

The P3 System Controller will first send all Pixel Data Packets for the given frame. These packets shall be “spaced out” within the frame time to prevent network congestion as much as possible.

Once all Pixel Data Packets have been sent, the P3 System Controller will introduce a “dead time” on the network to allow the listener(s) to process them. Then the P3 System Controller will send the Sync Pulse Packet (with the matching Frame ID), which triggers the listener(s) / visualizer(s) to use/display the previously sent Pixel Data in a synchronized way.

Gamma Curve Packet

Bytes	Field	Notes
HEADER		
5	Protocol Identifier	‘P’ ’3’ ‘V’ ‘P' 0x00
1	Protocol Version	Upper nibble is major version (currently 1). Lower nibble is minor version (currently 0).
1	Packet Type	0x04: Gamma Curve Packet.
1	Sequence ID	Running counter, to be used to compensate for out of order packet reception. 256 wraps around to 0.
GAMMA CURVE INFORMATION		
1	Curve ID	Bitfield indicating for which color(s) this curve should be used: D0 Red Gamma (1 = use this curve for Red Pixel Data; 0 = do not use this curve for Red Pixel Data). D1 Green Gamma (1 = use this curve for Green Pixel Data; 0 = do not use this curve for Green Pixel Data). D2 Blue Gamma (1 = use this curve for Blue Pixel Data; 0 = do not use this curve for Blue Pixel Data). D3-D7 Reserved.
2	Curve Size	Number of points in the curve LUT. Currently we always use 257 points in the LUT.
curve size * 2	Curve Data	Array of unsigned 16-bit values plotting the output value of the transfer curve at linearly spaced intervals between 0% and 100% input. Linear interpolation is to be used for any input falling between two points on the curve.

Sequence ID

The Sequence ID allows the receiver to ignore packets that were received out of order. When the receiver receives a Gamma Curve Packet with Sequence ID lower than the previously received Gamma Curve packet, it will simply ignore the packet (as the curve is outdated).

Gamma Curve Implementation

The gamma curve should be applied to incoming Pixel Data, after multiplication with the corresponding intensity factor.

Default Gamma Curve

When no gamma curve is sent by the P3 System Controller, the receiver may assume a linear gamma curve (0x0000, 0x00FF, 0x01FF, 0x02FF, … , 0xFEFF, 0xFFFF).

Merging Pixel Data and DMX Data

The P3 Visualizer Protocol simply delivers (video) pixel data to the visualizer. In most applications, the visualizer will also receive DMX Data (in the form of Art-Net or sACN) directly from a lighting controller / console.

It is up to the visualizer to merge this data before visualization. In this chapter we explain how different fixture types merge pixel and DMX data, enabling the visualizer to implement the same logic.

Legacy Fixtures (featuring a *P3 Switch* DMX Channel in some of their DMX Modes)

Fixtures in this category:

- EC-10 & EC-20 LED Video Panels
- Exterior Dot-HP RGB & Exterior Dot-HP CW
- Exterior PixLine 10, Exterior PixLine 20 & Exterior PixLine 40
- LC1140, LC1140+, LC2140 & LC2140+ LED Video Panels
- VC-Dot 1, VC-Dot 4 & VC-Dot 9
- VC-Grid 15, VC-Grid 25, VC-Grid 30 & VC-Grid 60
- VC-Strip 15, VC-Strip 25, VC-Strip 30 & VC-Strip 60
- VDO Dotron
- VDO Face 5 HB & VDO Face 5 HC LED Video Panels
- VDO Fatron 20
- VDO Sceptron 10, VDO Sceptron 20 & VDO Sceptron 40

When these fixtures are patched in a DMX Mode that does not feature “P3” in the name, they will only respond to DMX controls and ignore any Pixel Data.

When these fixtures are patched in a “P3 Pixelmap” DMX Mode, they will only respond to DMX controls and ignore any Pixel Data. Only exception is when their DMX Override flag is set in the Fixture Status field, in which case they will output the incoming Pixel Data to their LEDs.

When these fixtures are patched in “P3 Intensity” DMX Mode, the LED output is controlled by Pixel Data, with the DMX Intensity channel simply “dimming” the Pixel Data (multiply Dimmer channel with the Pixel Data).

When these fixtures are patched in “P3 RGB” DMX Mode, the LED output is controlled by Pixel Data, with DMX Data subtracting colors from the Pixel Data (multiply Pixel Data with RGB channels).

When these fixtures are patched in “P3 Basic” DMX Mode, the LED output is controlled by Pixel Data, with DMX Data subtracting intensity and colors from the Pixel Data (multiple Pixel Data with RGB channels and Dimmer channel).

When these fixtures are patched in “P3 Hybrid” DMX Mode, the *P3 Switch* channel determines if the fixture outputs DMX Data or Pixel Data.
At 0-127, the LED output is driven purely by the DMX Data, in the quantity of RGB segments set by the DMX mode.

At 128-255, the LED output is controlled by Pixel Data, with DMX Data subtracting colors from the Pixel Data (multiply Pixel Data with RGB channels from the FIRST RGB segment set by the DMX mode).

<u>Example:</u>
- DMX Mode set to P3 Hybrid 2 Segments
- DMX Intensity set to 50%
- DMX RGB set to 255/0/0 for first segment
- DMX RGB set to 255/0/255 for second segment
- Pixel Data sending white line pattern
- P3 Switch at 0: fixture outputs red in first segment and magenta in second segment at 50% intensity
- P3 Switch at 255: fixture outputs red line pattern (DMX RGB of first segment “colors” the Pixel Data) at 50% intensity

When these fixtures are not patched in any DMX Mode, the LED output is controlled by Pixel Data only (they behave like a video panel).

Additive Color Mixing Fixtures (featuring a *P3 Mix* DMX Channel in some of their DMX Modes)

Fixtures in this category:

- Exterior Dot-1 Pro, Exterior Dot-4 Pro & Exterior Dot-9 Pro
- Exterior Dot-HP Pro
- MAC Allure Profile & MAC Allure Wash PC
- MAC Aura PXL, MAC Aura Raven XIP & MAC Aura XIP
- MAC One
- VDO Atomic Bold
- VDO Atomic Dot CLD & VDO Atomic Dot WRM
- VDO Sceptron XB

When these fixtures are patched in a DMX Mode that does not feature a *P3 Mix* channel (typically Compact Mode), they will only respond to DMX controls and ignore any Pixel Data. Only exception is when their DMX Override flag is set in the Fixture Status field, in which case they will output the incoming Pixel Data to their LEDs.

When these fixtures are patched in a DMX Mode that does feature a *P3 Mix* channel, that DMX Channel does determine how the DMX Data and Pixel Data is *mixed* towards the LEDs.

At 0-26, the LED output is fully controlled by the DMX Data.

At 27-228, the fixture performs a linear crossfade between DMX Data controlling the LEDs and Pixel Data controlling the LEDs (27: full DMX Data | 128: 50/50 mix between DMX Data and Pixel Data | 228: full Pixel Data).

At 229-255, the LED output is controlled by Pixel Data, with DMX Data subtracting colors from the Pixel Data (multiply Pixel Data with DMX Data).

<u>Example:</u>
- DMX Data set to full red and Pixel Data sending white line pattern

- P3 Mix at 0: fixture outputs solid red
- P3 Mix at 27: fixture outputs solid red
- P3 Mix at 128: fixture outputs 50% red with 50% white line pattern on top
- P3 Mix at 228: fixture outputs white line pattern
- P3 Mix at 255: fixture outputs red line pattern (DMX Data “colors” the Pixel Data)

When a fixture has multiple LED layers, as seen in the Fixture Info Packet and Pixel Data Packet, it will feature multiple P3 Mix channels (one P3 Mix channel per LED layer).

Subtractive Color Mixing Fixtures (featuring a *P3 Mix* DMX Channel in some of their DMX Modes)

Fixtures in this category:

- MAC Ultra Performance & MAC Ultra Wash
- MAC Viper XIP

When these fixtures are patched in a DMX Mode that does feature a *P3 Mix* channel, that DMX Channel does determine how the DMX Data and Pixel Data is *mixed* towards the LEDs.

At 0-26, the LED output and CMY flags are fully controlled by the DMX Data.

At 27-228, the fixture performs a linear crossfade between DMX Data controlling the LED output / CMY flags and Pixel Data controlling the LED output / CMY flags (27: full DMX Data | 128: 50/50 mix between DMX Data and Pixel Data | 228: full Pixel Data). If the fixture has multiple individually controllable LED segments, these will have their intensity controlled individually based on the corresponding pixel on the P3 System Controller. The CMY color will be taken as an average of the pixels corresponding to the fixture.

At 229-255, the LED output is controlled by Pixel Data, while the CMY flags remain controlled by DMX Data (video is interpreted as greyscale only, and color is added via DMX).

<u>Example:</u>
- DMX Data set to full red and Pixel Data sending white line pattern
- P3 Mix at 0: fixture outputs solid red
- P3 Mix at 27: fixture outputs solid red
- P3 Mix at 128: CMY flags mix light red (average of pixels being red and pixels being white), while the intensity chases over the individual LED segments (following the moving white line pattern)
- P3 Mix at 228: CMY flags open white, while the intensity chases over the individual LED segments (following the moving white line pattern)
- P3 Mix at 255: CMY flags mix solid red, while the intensity chases over the individual LED segments (following the moving white line pattern)

DMX Override

The DMX Override Status Flag in the Fixture Info Packet indicates that the P3 System Controller wants to force “pure video output” from the fixture, bypassing any DMX controls that might hinder “pure video” from coming out of the fixture.

Fixtures typically respond to the DMX Override command by:

- Open Shutter and Dimmer
- Give pixel data direct control over CMY Flags / colored LEDs
- Remove any effects (Color Wheel, Gobo Wheel, Animation Wheel, Frost, Prism, Iris, Framing Blades, …) from the output

A visualizer is expected to behave the same on a set DMX Override flag in the P3 Visualizer Protocol.

PixelFlip

The PixelFlip Status Flag in the Fixture Info Packet indicates that the fixture has inverted its pixel order. Where it would normally have LED 1 respond to the lowest DMX channel, it will now have its last LED respond to the lowest DMX channel.

This function is only available on linear fixtures such as VDO Sceptron XB, where inverting the pixel order can be very convenient to counter fixtures hanging upside down.

PixelFlip only affects the DMX Data to LED mapping.

Pixel Data to LED mapping remains unaffected (user would simply rotate fixture on the P3 System Controller workspace).

Bandwidth Calculation Examples

This chapter provides a few examples on the expected network bandwidth required by the P3 Visualizer Protocol. These are based on a worst-case scenario in which data for multiple fixtures / layers is not combined within the same packet.

Example 1: 500x VDO Sceptron 10 1000mm

100 Pixels.

- Fixture Info Packet: 50 bytes (Ethernet+IPv4+UDP) + 92 bytes payload = 142 bytes * 0.2 / sec = 28.4 bytes / sec
- Pixel Data Packet: 50 bytes (Ethernet+IPv4+UDP) + 316 bytes payload = 366 bytes * 60 / sec = 21960 bytes / sec

≈ 11.0 Mbyte/s ≈ 110Mbit/s

Example 2: 120x MAC Aura PXL

160 Pixels.

- Fixture Info Packet: 50 bytes (Ethernet+IPv4+UDP) + 108 bytes payload (two layers, so two sets of color coordinates) = 158 bytes * 0.2 / sec = 31.6 bytes / sec
- Pixel Data Packet: 50 bytes (Ethernet+IPv4+UDP) + 496 bytes payload = 546 bytes * 60 / sec = 32760 bytes / sec

≈ 3.9 Mbyte/s ≈ 39Mbit/s