

PixLite® Mk3 Processor

Pixel Controller Firmware



DATASHEET

OVERVIEW

All PixLite Mk3 pixel controllers are equipped with the PixLite Mk3 Processor. This processor uses sophisticated 3rd generation firmware that provides the commands, logic and complex calculations to enable the device to drive the worlds most amazing lighting displays.

From time-to-time, Advatek will release firmware updates to enable new features or improve product performance. This document explains the key features and benefits of this processor for various customer uses and applications.

KEY FEATURES

- Extreme Refresh Rates
- Universe Data Hardware Firewall
- Auto Synchronization to Data Source
- Electronic Fuse Control and Monitoring on Pixel Outputs
- Gamma Correction Now Supported on 8 Bit Pixels
- Dithering to Achieve Improved Gamma Correction
- Web-Based Management Interface
- Advatek Assistant 3 Software Tool
- Import / Export of Hardware Configuration Profiles
- HTTP and WebSocket API
- Advanced Diagnostic Information and Statistics

SHOW Time

- Record Scenes and Create Playlists
- Playback to Pixels and/or Aux Port
- Live and Programmed Intensity Control
- Create Up to 25 Powerful Triggers

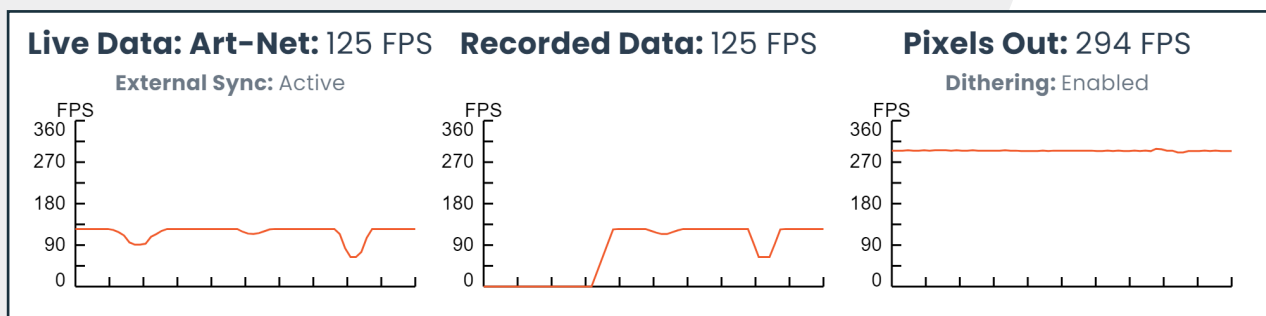
SHOW Time

RECORD INCOMING DATA AS SCENES

Frame-Perfect Recordings Powerful control to capture recordings at an exact frame, using start and stop conditions. Choose any external channel to match some pattern, or record for a duration of time.

Independant and Automatic Matching Frame Rates Pixel and Aux Port frame rates are independent to each other and will be recorded at the rate of incoming data, whether fixed or variable rate.

Monitor Frame Rates Graphical monitoring of Recording and Playback frame rates.



PLAYBACK SCENES AND PLAYLISTS

Playback to Pixels and Aux Scenes will play content on the pixel outputs and Aux port if applicable. Set the behavior of each during playback to one of Playback, Live Data, Blank, or Freeze.

Play Count / Play Duration Loop a scene for a number of times or a duration of time.

SD Card Management View information, Format the SD card, Import / Export scene and playlist files.

Recorded Scenes Record incoming data as a scene for later playback of custom content.

Built-In Scenes Blank and Freeze. Play these Built-In scenes to blank, or to freeze all outputs.

Playlists Add recorded and built-in scenes in a customized order, with optional Play Count and Duration to create a playlist of scenes.

Playback with Triggers Use triggers to playback scenes and playlists, and control behavior of playback. Triggers are explained further on the next page.

The screenshot shows the 'Playlist Creator' interface. At the top, there's a 'Playlist Name' field with the text 'My First Playlist'. Below this is a 'Select All' checkbox. The main area is a list of 6 items, each with a checkbox, a scene name, and a behavior/duration setting.

Item	Scene Name	Behavior/Duration
1	Startup scene	Forever
2	Rainbow Pulse	Once
3	Blank	Duration: 0 mins, 20 secs, 500 msec
4	Blue-Purple Shoc...	Once
5	Pastel White Snake	Count: 2
6	Freeze	Forever

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SHOW Time

Trigger Sources

	Source	Universe/Port
1	Trigger Source Nickname	DMX512 (Aux Port)
2	sACN Computer	sACN (E1.31)
3	UDP Tablet Device	UDP Port

Triggers

1	<input type="checkbox"/>	Startup Playlist	<input checked="" type="checkbox"/>
2	<input type="checkbox"/>	Set Intensity to 50%	<input type="checkbox"/>
3	<input type="checkbox"/>	Start Recording - sACN Ch50	<input checked="" type="checkbox"/>

Event

TypeTrigger Source Pattern

Source2: sACN Computer

Channel50

Equals255

Action

TypeStart Recording

RecordIndefinitely

Add a Trigger

DUPLICATE TRIGGER(S)

DELETE TRIGGER(S)

TRIGGERS

25 Triggers Create up to 25 powerful triggers per PixLite device – each with a configurable event and action.

3 Trigger Sources Create up to 3 sACN / Art-Net / DMX512 universes or UDP ports can be used for trigger events.

Events Each trigger has one event that will fire its action – on device startup, when a trigger source matches a pattern (e.g. sACN Uni 1 Ch 1 equals 255; or UDP Port 8000 String “PLAY_SCENE_20” received), or when another trigger starts or finishes.

Actions Each trigger has one action that will occur when the event is detected – play a scene or playlist, change to live mode, start recording, control playback (play, pause, skip, etc.), program the intensity, and stop transient mode.

INTENSITY CONTROL

Live Intensity Use an external sACN, Art-Net, or DMX512 channel to drive the live intensity of pixel outputs and the Aux port, independantly.

Programmed Intensity Use triggers to set intensity value, or set in the Management Interface.

Override Live Intensity Either override or prioritize Live Intensity when intensity is programmed.

Intensity Control

Pixel Outputs 127 (50%)

Live Intensity255

Programmed Intensity

☐ Prioritize Live Intensity

☒ Override Live Intensity

Aux Port 215 (84%)

Live IntensityTimed Out

Programmed Intensity

☒ Prioritize Live Intensity

☐ Override Live Intensity

Action

TypeProgram the Intensity

Pixel Outputs

☒ Set BehaviorOverride Live Intensity

☒ Set Intensity127

TransitionImmediately

Aux Port

☐ Set BehaviorPrioritize Live Intensity

☒ Set Intensity255

TransitionFade over a duration

Fade Time0 : 10 : 500

minssecsmsec

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PIXEL PROCESSING

50+ Pixel Protocols Supported Compatible with most pixel types, with frequent additional protocols to be supported. See the List of Supported Pixel Protocols.

Gamma Correction for Pixels of All Resolutions Adjust dimming curves of pixels to better match the human eye – no longer limited to pixels above 8 bits.

Dithering When working with extremely fast refresh rates, artificially generate higher resolution pixel control, so that gamma correction is more effective on 8-bit pixels.

16 Bit Input Data For pixels greater than 8 bits, optionally use 16 bits per color directly from the source of input data.

Current Control Digitally control the current of supported pixels (APA102, HD108, UCS5603 and more). Drive pixels at low intensities and tune the RGB(W) color mixing without sacrificing on resolution.

Extreme Refresh Rates Can be in the order of hundreds of frames per second.

Advanced Mapping Options Null Pixels, Zig Zag, Grouping, Intensity Scaling & Reversing.

	Start Universe	Start Channel	End Universe	End Channel	Pixels	Null Pixels	Zig Zag	Group	Intensity Scale (%)	Reversed	RGB(W) Order
Output 1	1	1	6	510	1020	0	1	1	100	<input type="checkbox"/>	RGB
Output 2	7	1	12	510	1020	0	1	1	65	<input checked="" type="checkbox"/>	BRG
Output 3	13	1	13	33	1020	0	1	100	90	<input type="checkbox"/>	GRB
Output 4	13	34	16	33	1020	0	100	2	100	<input type="checkbox"/>	RGB

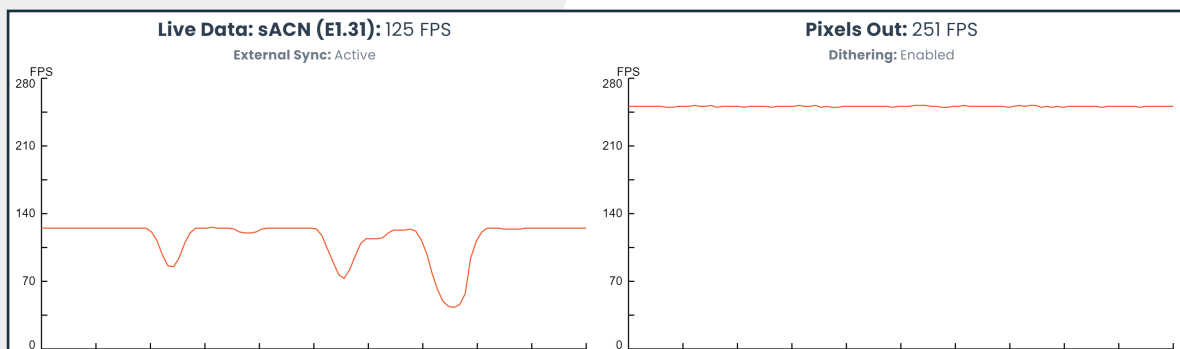
Auto Patch Option Patch the first output, and all remaining outputs can sequentially patch.

Hold Last Frame Option Pixels can continue displaying their last frame if the data source is lost.

Drop Frame on Overrun Option If a frame is received while a previous frame is being processed, the behavior can be fine-tuned to suit your system perfectly.

Adjustable Speed configure the speed of the data transfer, or clock line (up to 2.5MHz).

Frame Rate Monitoring Graphically monitor incoming, outgoing, and recording rates.



Pixel Outputs

Pixel Type TLS3001

Color Type ☒ RGB ☐ RGBW

Hold Last Frame ☐

Drop frame on overrun ☒

Speed 1000kHz 1000

Expanded Mode ☐

Gamma Correction ☒

Dithering ☐

Gamma Values:

Red 1.8

Green 2

Blue 1.9

UNIVERSE DATA

High Capacity Pixel Outputs Up to 6 universes per pixel output.

Universe Data Hardware Firewall Multicast sACN and Broadcast Art-Net Universes that are not relevant to the PixLite will be filtered pre-processor. This ensures perfect performance even with poorly configured software or daisy chained controllers.

**Not available on "E" series controllers*

Monitor Data Source View frame rates, external sync, and overrun information.

Advanced Diagnostic Information per Universe Monitor each incoming universe, including packet counts, packet status, source information and more.

Art-Net and sACN (E1.31) Sync Compatible with Art-Sync and sACN Sync Universes to synchronize many devices together in an installation. Supports separate external sync source for pixel outputs and Aux Port where applicable.

Auto Sync to Data Source Failback If there is no external sync, PixLite Mk3 will still automatically synchronize its outgoing frame rate to match the incoming frame rate on every frame.

Split Pixels Across Universes Option Optionally use all 512 channels in a universe for RGB pixels.

ADVANCED NETWORKING

Gigabit Ethernet Switching Dual Ethernet ports act as a 2 port Gigabit switch, enabling Ethernet loop-through and redundant network topologies. Combined with the critically important "Universe Data Hardware Firewall", reliably daisy chain controllers without worrying about latency and performance problems which are normally encountered in a daisy chain topology.

**Not available on "E" series controllers*

Advanced Ethernet Switch Diagnostic Information Monitor each Ethernet port, including link status, incoming packets, outgoing packets, filtered packets and more.

**Not available on "E" series controllers*

Advanced CPU Network Diagnostic Information Monitor the Processor's Ethernet port, including incoming and outgoing packets, packet type and more.

AutoIP Addressing Connect directly to a computer and AutoIP Addressing allows immediate communication without network configuration (requires Advatek Assistant 3 software for discovery). Automatically over-ridden by DHCP where available.

DHCP Addressing Use a router to automatically acquire an IP address through DHCP.

Static IP Addressing Configure a static IP, subnet mask and gateway address.

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DEVICE MANAGEMENT

Web-Based Management Interface Configuration, management and monitoring via Advatek Assistant 3, or any modern web browser.

Advanced Discovery / Recovery Protocol Reliably discover/monitor large installations of PixLite Mk3 devices. Possible to route the protocol across VLANs & VPNs in complex environments where required.

Apply, Revert or Save Configuration Changes Configuration can be applied to a PixLite Mk3, without saving to its start-up configuration. Applied changes can then be saved or reverted.

Import / Export Configuration Save an entire configuration to a local computer and import any saved configuration with optional exclusions.

HTTP and WebSocket APIs Develop custom software interfaces with any PixLite Mk3 device.

Nickname Device Assign a nickname to each PixLite Mk3 for easy identification.

Remotely Trigger Identification Pattern Set the Status LED to a distinguishable pattern.

Temperature Monitoring Monitor the current ambient temperature of the device, as well as the historical high and low values during its current running time.

Extensive Physical / Digital Version Information Bootloader version, hardware version, firmware version, MAC address and more.

Increased Reliability during Firmware Update Firmware updates are more resilient and immune to congested network traffic and interruptions.

Device

Bank 1 Voltage (V)	Minimum Temperature (°C)	Current Temperature (°C)	Maximum Temperature (°C)
11.7	32	33	33

RESET

Network Details

IP Address	Subnet Mask	Gateway Address
192.168.1.50	255.255.255.0	0.0.0.0

RESET

Pixel Data

Out Rate (Hz)	In Rate (Hz)	Sync Universe	Force Sync	External Sync	Overrun	Overrun Drop
181	182	0	False	False	0	0

RESET

External Ethernet Ports

	Link Up	Link Speed (Mbps)	Duplex	In Unicast	In Multicast	In Broadcast	In Discard	In Filtered	Out Unicast	Out Multicast	Out Broadcast
Eth Port 1	True	1000	Full	869	1395	846	0	0	537	171	38
Eth Port 2	True	1000	Full	182	91	13	0	0	181	1182	691

RESET

Processed Ethernet Packets

In Good	In Unicast	In Multicast	In Broadcast	Out Good	Out Unicast	Out Multicast	Out Broadcast
1969	685	1208	76	460	355	80	25

RESET

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POWER MANAGEMENT

**Not available on "E" or "T" series controllers*

Electrical Details		
Bank 1 11.5V		
Output 1	1.5A	Fuse Good
Output 2	0.0A	Fuse Good
Output 3	0.0A	Fuse Good
Output 4	0.0A	Fuse Good
Bank 2 11.7V		
Output 5	0.0A	Fuse Good
Output 6	0.0A	Fuse Good
Output 7	0.0A	Fuse Good
Output 8	0.0A	Fuse Good
Bank 3 0.0V		
Output 9	0.0A	Bank Inactive
Output 10	0.0A	Bank Inactive
Output 11	0.0A	Bank Inactive
Output 12	0.0A	Bank Inactive

Electronic Fuse Control on Pixel Outputs

Each pixel output is protected by a smart electronic fuse that will automatically trip when an output's current exceeds its limit.

Auto Recovery After Fuse Trip Smart electronic fuses will automatically attempt to re-enable power output.

Fuse Status Report View the status of each fuse via the Management Interface.

Input Voltage Monitoring Dynamically monitor the voltage on each bank.

Output Current Monitoring Dynamically monitor the current draw on each pixel output.

AUX PORT

DMX512 Output Mode Connect DMX512 devices and control them via sACN or Art-Net.

DMX512 Input Mode Connect a single universe of DMX512 for pixel data or triggering.

Hold Last Frame on Timeout Option Aux Port can continue displaying its last frame if data is dropped.

Auto Synchronization to Data Source Outgoing frame rate will dynamically adjust to the incoming frame rate, even without an external synchronization source.

Drop Frame on Overrun Option If a frame is received while a previous frame is being processed, the behaviour can be fine-tuned to suit your system perfectly.

INTERNAL TEST GENERATOR

Multiple Test Modes Generate a test pattern directly from a PixLite Mk3 device, including RGBW Cycle, Color Fade, or custom colors.

Test All Outputs or Individual Outputs Apply the test pattern to a specific output, or to all.

Test All Pixels or Individual Pixels Apply the test pattern to a specific pixel, or to all.

Pixel Counter Automatically or manually count through pixels.