



PIXIE DRIVER – User Manual

48 Universe (24 output) master controller for a PLINK system.



ENTTEC's PIXELATOR is the 24-port Ethernet pixel controller within the PIXELATOR family. Using ENTTEC's PLINK protocol each port provides data to ENTTEC's PLINK INJECTORS which can control up to 2 Universes each, making the PIXELATOR powerful enough to control up to 24,576 channels (8,192 RGB pixels) with perfect synchronization across all of its outputs.

The PIXELATOR supports a wide range of pixel protocols, which can be controlled with sACN, Art-Net, ESP and Kling-Net through an intuitive web browser, controlling LED pixels, dots and digital strips has never been easier.

Our PLINK protocol can transmit up to 1024 channels (2 Universes) over a 300m distance using Cat5e/Cat6 cable to each ENTTEC PLINK INJECTOR. This allows for control of up to 340 RGB or 256 RGBW pixel per output. This satellite system provides great flexibility, and since all data conversion is processed on the PIXELATOR, the P-Link injector is kept as compact as possible.

Depending on the application, choose between the indoor or outdoor IP PLINK INJECTORS, ensuring that the voltage is compatible with the pixels and power supply which is installed locally to the PLINK INJECTORS.

Features

- **24* RJ-45 ports (each providing 2 Universes of PLINK data output)**
- **48 Universe Ethernet to PLINK data over Cat5e/Cat6 cable**
- **1U Rack form factor**
- **Easy to setup & update through any web browser**
- **Supports sACN, Art-Net, ESP and Kling-Net**
- **RJ45 Ethercon connector (10/100 Mbps)**
- **Static or Dynamic (DHCP) IP configuration (DHCP by default)**
- **Compatible with ENTTEC PLINK INJECTORS**
- **Pixel Grouping is configurable for each PLINK port. (1 to 340) for RGB and (1 to 256) for RGBW**
- **Each PLINK output can be assigned up to 2 Ethernet Universes.**
- **Pixel Ordering is configurable for each PLINK port. Drives 2 DMX universes of Pixel Tape/Dots.**
- **Each port outputs at 40 frames per second**
- **ArtSync support to ensure all outputs are in synchronization with each other.**
- **Clock module to sync multiple universes output and an in-built DMX Generator**
- **Dual core CPU, with a clock speed 2GHz – provides efficient and reliable output**
- **1GB DDR3 RAM – allows best utilization of the system.**

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Safety

 **Ensure you are familiarized with all key information within this guide and other relevant ENTTEC documentation before specifying, installing, or operating an ENTTEC device. If you are in any doubt about system safety, or you plan to install ENTTEC device in a configuration that is not covered within this guide, contact ENTTEC or your ENTTEC supplier for assistance.**

ENTTEC’s return to base warranty for this product does not cover damage caused by inappropriate use, application, or modification to the product.

Electrical safety



- This device must be operated in accordance with applicable national and local electrical and construction codes.
- This device can be damaged by excess voltage outside the operating range defined within this products datasheet.
- To reduce the risk of fire or electrical faults do not exceed the ratings and limitations defined in the product datasheet or this guide.
- Ensure there are no opportunities for cables to short circuit and cabling cannot be snagged or pulled.
- Do not over stretch cabling to the device's connectors and ensure that cabling does not exert force on the PCB.
- Isolate your installation from power immediately if accessories power cables or connectors is in any way damaged, defective, shows signs of overheating or are wet.
- Remove power from this product during cleaning or when it is not in use.
- Do not connect this device to a dimmer pack or mains electricity.
- Do not connect any of this device's V- or GND connectors to earth.
- Ensure your installation is protected from short circuits and overcurrent.
- Ensure all connections are complete and secure before providing power to the device.

System Planning and Specification



- To contribute to an optimal operating temperature, where possible keep this device out of direct sunlight.
- This unit has an IP20 rating and is not designed to be exposed to moisture or condensing humidity.
- Ensure this device is only operated within the specified ranges within the product datasheet.

Protection from Injury During Installation



- Always use suitable personal protective equipment when installing ENTTEC products.
- Once installation is completed, check that all hardware and components are securely in place and fastened to supporting structures if applicable.

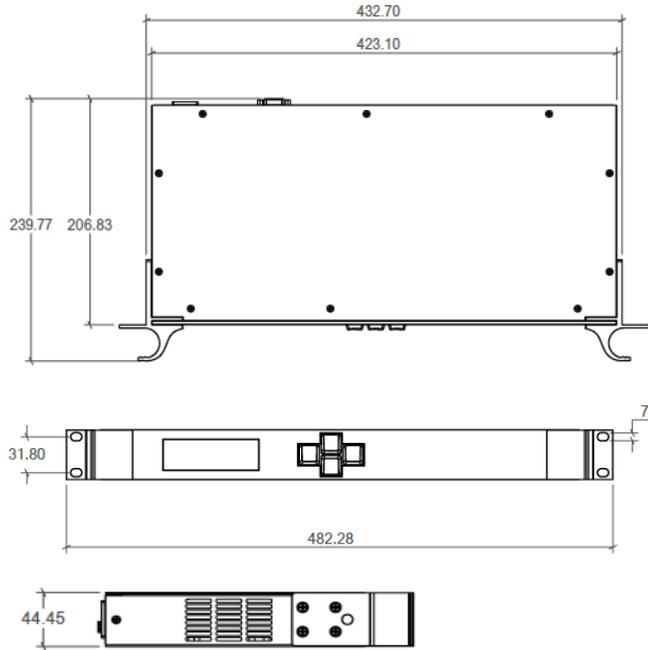
Installation Safety Guidelines



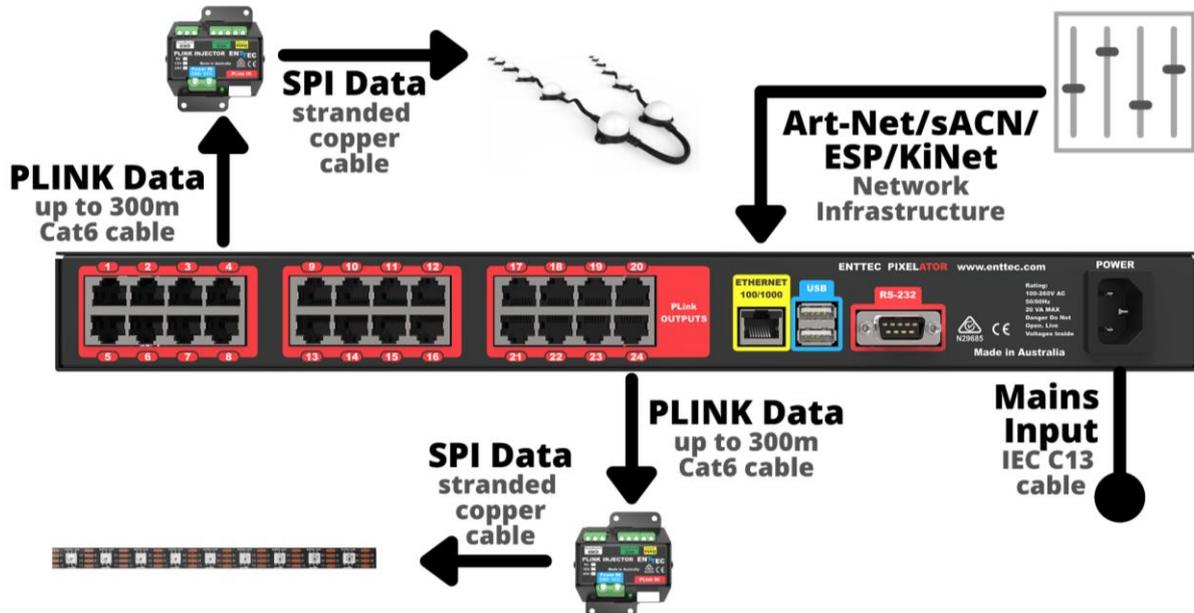
- The device is convection cooled, ensure it receives sufficient airflow so heat can be dissipated.
- Do not cover the device with insulating material of any kind.
- Do not operate the device if the ambient temperature exceeds that stated in the device specifications.
- Do not cover or enclose the device without a suitable and proven method of dissipating heat.
- Do not install the device in damp or wet environments.
- Do not modify the device hardware in any way.
- Do not use the device if you see any signs of damage.
- Do not handle the device in an energized state.
- Do not crush or clamp the device during installation.
- Do not sign off a system without ensuring all cabling to the device and accessories has been appropriately restrained, secured and is not under tension.

Physical Dimensions

All dimensions are in millimetres unless specified otherwise.



Wiring Diagrams



Revision History

Rev C

A core software change. Introduction of new low level base operating system for faster boot times and security improvements.

Removal of RS232 features (RevB).

Rev B

Updated hardware introducing shared processing on the main and output card.

Increased processing power resulting in higher refresh rates.

Web Interface – Settings - RS232 String: This provided the ability activate different profiles using the following RS232 string template: P-xxx. As an example if you wanted to trigger Profile ID 4, then the RS232 command would be P-004.

- Baud Rate: 9600, Data: 8-bit, Parity: none, Stop: 1-bit, Flow Control: none.
- To test the connection, send character 'V'. This should return the version info string.

Rev A – No Longer Supported.

Functional features

Profiles

The PIXELATOR has a set of default profiles which you can activate via the web interface or the LCD, to start you off. For example:

- Artnet24->Pixel24: This profile will take 24 Art-Net universes and convert them to 24 Pixel-Link streams on ports 1 to 24.
- Artnet48->Pixel24: This profile will take 48 Art-Net universes and convert them to 24 Pixel-Link streams on ports 1 to 24. (Each Port will be mapped to 2 Art-Net Universes consecutively)

Profiles can be edited or created within the web interface of the PIXELATOR. With the use of an intuitive drag and drop system to add 'modules' to the PIXELATOR's Profile. Add and configure incoming ethernet stream (Art-Net, ESP, Kinet, sACN) and assign them to different PLINK output.

The PIXELATOR can store multiple Profiles allowing different configuration to be created. Changing from one profile to another can be done in a web browser window, or with the touch of a few buttons on the front panel (LCD menu).

PLINK INJECTORS

From one of the PIXELATOR's PLINK Data outputs, you can run up to 300m of Cat6 cable to a single PLINK INJECTOR. Since all data conversion is processed on the PIXELATOR, the PLINK INJECTOR is kept as compact as possible. At the PLINK INJECTOR, you can wire up an external DC power supply. The PLINK has the capability to handle 10amps through the device. It is important that your power supplies voltage matches the voltage of your Pixels, as well as having a PLINK which is compatible with the voltage range:

- SKU 73546 is designed for Pixels with a 5 volt input.
- SKU 73544 is designed for Pixels with a 12-24 volt input.

Each PLINK INJECTOR can then be wired up to 3m (total cable length) away from the first Pixel. The PLINK INJECTOR can drive up to 340 RGB individual pixels (2 DMX universes) - PLINK 2U module must be used in PIXELATOR Profile.

The PIXELATOR can control a range of SPI (Pixel) protocols, a full list can be found on our website.

PLINK Data: The PIXELATOR converts Art-Net, sACN, ESP and KiNet into our own PLINK data, which over Cat6 cable can run up to 300m to a PLINK INJECTOR, where it is converted to the SPI (Pixel) protocol.

PLINK Data Pinout: PLINK Data is sent over Cat6 cable using 3 pins of an RJ45 connector. These pins are:

- Pin 1: Data +
- Pin 2: Data -
- Pin 7: 0V

Hardware features

- 24* PLINK Output (RJ-45)
- 1* LAN port (RJ45)
- 1* DB9 Connector (un-used)
- 2* USB Ports (un-used)

LCD Menu

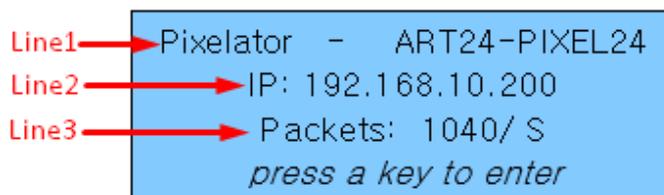
The LCD Menu is navigated through the four panel buttons on the front of the unit.

The Menu button acts as the “Back” button, which takes you to the previous Menu/screen.

The Enter button goes into the selected option on the screen and activating the option.

The Top & Bottom button are used to navigate/scroll through the options on any screen. The currently selected option is highlighted with a white background on the screen.

Main Menu



Line1: Displays the System Name and currently Selected Profile.

Line2: Displays the network status of the PIXELATOR. If a connection is made, the PIXELATOR’s IP address (DHCP or Static) will be shown, this address can be used to access the web interface. If no connection is made, a message would display as DHCP Failed or disconnected.

Line3: Displays the number of packets currently passing through the PIXELATOR. This number of packets per second, can be used as an indicator of the activity on your network.

Pressing any of the panel buttons/keys will activate the Selection Menu.

Selection Menu

1-load profile
 2-Setup
 3-Status
 4-Lock Unit
 5-Restart

1-Load Profile: Lists all available profiles on the PIXELATOR, list can be scrolled using up & down keys. Scrolling indicator is visible when the list allows scrolling. Pressing Enter at the selected profile will activate the profile.

2-Setup: Setup screen allows changing the IP address of the unit via “Change IP” or doing Factory Reset.

1-Change IP
 2-Factory Reset

■ **Change IP:** This screen further gives two options DHCP or Static IP. When Static IP is selected, the screen allows you to change the IP address using the top and bottom button to scroll the digits and the menu & enter buttons to select the segment. Once you are on the last segment of the IP address, pressing the Enter button, will activate the IP address. It will take a few seconds for the change to go through, please wait 30 seconds, before attempting to try again.

Change IP Address
 IP: 192.168.001.003

■ **Factory Reset:** Activating Factory Reset, leads to a simple prompt confirming your action. Once confirmed, the Factory Reset will take a few seconds to run. It will end up deleting all your user created profiles, as well as any saved settings. Please use this only when needed, or as directed by ENTTEC support team.

F-Reset in progress
 please wait ...

3-Status: Provides read-only information for both the system and the network. These require no user-input and serve as a way of checking the performance of the unit.

1-System
 2-Network

4-Lock Unit (revB only): Provides the option to lock your device by disabling the web interface to provide an additional level of security to your installation. By locking your device, the web server becomes inactive meaning that your configuration cannot be modified. Factory resetting a device will not unlock the device, this must be done using the LCD menu. ENTTEC strongly recommend you secure your network and do not connect your lighting control network to the internet without with relevant precautions in place. If unsure consult a specialist within this field.

To lock and unlock your device follow these simple steps on the devices LCD menu:

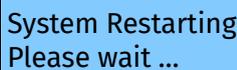
1. Press Enter on the units LCD menu
2. Navigate to option 4-Lock Unit and press Enter
3. Select Yes to lock or No to unlock.
4. Wait 10 seconds for this to take effect.

5-Restart: You will be asked to confirm that you want to restart your PIXELATOR.



1-YES
2-NO

Once confirmed, the PIXELATOR will stop the output engine and restart the system. This process will take a couple of minutes. While rebooting the LCD screen will change between a couple of screens, the restart will be complete once the Main Menu is displayed



System Restarting
Please wait ...

Out of the Box

As default, the PIXELATOR will have the Artnet48->Pixel24 Profile active, this profile will take 48 Art-Net universes starting at universe 0 (0x00) and convert them to 24 Pixel-Link streams on ports 1 to 24. (Each Port will be mapped to 2 sequential Art-Net Universes).

The PIXELATOR will be set to a DHCP IP address as default. A DHCP server is required be required.

Networking

The PIXELATOR can either be configured to be a DHCP or Static IP address.

DHCP: On power up and with DHCP enabled, if the PIXELATOR is on a network with a device/router with a DHCP server, the PIXELATOR will request an IP address from the server. If the DHCP server is slow to respond, or your network does not have a DHCP server, the PIXELATOR will fall back to the Static IP address. If a DHCP address is provided, this can be used to communicate with the PIXELATOR.

Static IP: By default (out of the box) the Static IP address will be unique based on the devices Serial Number (See out of the box section for details). If the PIXELATOR has DHCP disabled or if the PIXELATOR falls back to the Static IP address after being unable to find a DHCP server, the Static IP address given to the device will become the IP address to communicate with the PIXELATOR. The fall-back address will change from the default once it is modified in the web interface.

Web Interface

Configuring the PIXELATOR is done through a web interface which can be brought up on any modern web browser.

- A Chromium based browser (i.e. Google Chrome) is recommended for accessing the PIXELATOR web interface.
- As the PIXELATOR is hosting a web server on the local network and does not feature an SSL Certificate (used to secure online content), the web browser will display the 'Not secure' warning, this is to be expected.

Identified IP address: If you are aware of the PIXELATOR IP address (either DHCP or Static), then the address can be typed directly into the web browsers URL field. The PIXELATOR's IP address can be located on the LCD's Main Menu.

Unidentified IP address: If you are not aware of the PIXELATOR's IP address (either DHCP or Static) the following discovery methods can be used on a local network to discover devices:

- An IP scanning software application (i.e. Angry IP Scanner) can be run on the local network to return a list of active devices on a local network.
- Devices can be discovered using Art Poll (i.e. DMX Workshop if set to use ArtNet).
- The device Default IP address will be printed on the physical label on the rear of the product.
- ENTTEC free NMu (Node Management Utility) software for Windows and MacOS (support up to Mac OSX 10.11), which will Discover ENTTEC devices on the Local Area Network, displaying their IP addresses before opting to Configure the device, opening the Web Interface.



Note: The eDMX protocols, the controller and the device using to configure the PIXELATOR must be on the same Local Area Network (LAN) and be within the same IP address range as the PIXELATOR. For example, if your PIXELATOR is on Static IP address 10.8.17.38, then your computer should be set to an IP on the similar subnet i.e. 10.8.17.20. It's recommended that all devices Subnet Mask are the same across your network.

Home

The landing page for the PIXELATOR web interface is the Home tab. This tab is designed to give you a read-only device overview.

This will display:

- IP Address
- Subnet
- Broadcast Address
- Hardware ID
- Art-Net 3 Net
- System status
- Active Profile
- System Name
- Packets per sec
- License Information
- System Version Number
- IO version numbers

The screenshot shows the ENTTEC PIXELATOR - HOME PAGE web interface. The interface is divided into several sections:

- Network Information:**
 - IP Address: 10.10.0.116 (Speed: 100Mbps)
 - Subnet Mask: 255.0.0.0
 - Broadcast Address: 10.255.255.255
 - Mac Address: 00:50:c2:97:bc:9d
 - Hardware ID: 165166c795c354c3
 - Art-Net 3 Net: 0 (universe range 0 - 255)
- System Information:**
 - System Status: Active (Stop Engine)
 - Active Profile: 20_PLINK2(ORB)
 - System Name: Pixelator
 - Packets per sec: 0
- License Information:**
 - PIXELATOR (PLINK OUTPUT): ✓
 - TRIAL (15 MINS. TIMEOUT): ✓
- Firmware Information:**
 - System Version: V1.0.000 - revC (update: 20/Oct/2016)
 - IO Driver Version: Pixelator driver V3.2
 - IO Firmware Version: Pixelator Firmware V3.3
 - IO Boot Version: Pixelator Boot V3.2

The interface also features a sidebar with navigation options: Home, Profiles, Settings, Backup+Restore, Stream Auditor, and User Manual. The current IP address 10.10.0.116 is displayed at the bottom of the sidebar.

Profiles

Within this window you can create, manage, and activate Profiles within the PIXELATOR. Profiles allow you to configure that Data is sent to the 24 outputs, as well as allowing you to change between profiles during the installation if required.

The PIXELATOR comes with some Read-Only profiles on the PIXELATOR as default, these will be displayed within the 'Remarks' column. These will reappear after a Factory Reset.

PIXELATOR - PROFILES				
Active	ID	Profile Name	Description	Remarks
<input checked="" type="radio"/>	001	24U-PLink24	24 Art-Net Universe to 24 PLINK Ports (1U each)	Read-Only
<input type="radio"/>	002	48U-PLink24	48 Art-Net Universe to 24 PLINK Ports (2U each)	Read-Only
<input type="radio"/>	003	2U-PLink24(GRB)	2U to 24 Ports (All Ports connected to same 2U)	
<input type="radio"/>	004	COLOR-LED-TEST	Static Colors to each Port - useful to test led strips	
<input type="radio"/>	005	SYNCED-24U	Sync output to Universe 24 (Art-Net)	
<input type="radio"/>	006	SYNCED-48U	Sync output to Universe 48 (Art-Net)	

Use the radio button under the 'Active' column to select a Profile to use the functionality along the bottom of the page. Clicking on the Profile name will launch the profile in the profile editor window.

Profile Editor:

Create a new profile or edit an existing one using the profile-editor. Profile Editor opens in a new page in your web browser. Select a module on the left and the right panel will provide help about that panel. Connect a module to another using wires from one point to another.



The direction of the wire (arrow) is important, the arrow signifies output, and reflects the flow of data. The same PLINK port# cannot be re-used within the same profile.

Profile Modules:

Each profile is made up of two or more connected Modules or Actions. The relationship between them forms the layout of the data flow within the profile. The following modules are available:

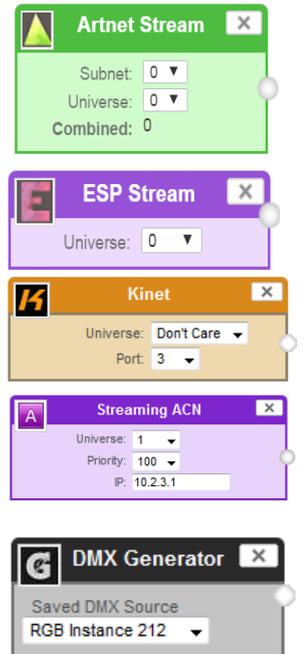
- **PLINK 1U:** The PLINK 1U module represents one of the physical ports on the rear of this unit, and maps to 1 Universe. Within this Module you will need to select:
 - Protocol:** select the led protocol that the pixel tape conforms to.
 - Ordering:** RGB or RGBW mapping that the pixel tape conforms to. RGB modes use 3 DMX slots per LED pixel, and RGBW modes use 4 DMX slots.
 - Grouping:** it allows one DMX pixel to drive multiple physical LED pixels
 - Start-Ch:** DMX Start Channel for the 1st pixel can be changed as needed.



- **PLINK 2U:** The PLINK 2U module represents one of the physical ports on the rear of this unit, and maps to 2 Universe. Within this Module you will need to select:
 - Each PLINK 2U module has 2 input nodes that can be connected to two Ethernet streams. Top one (U1) is mapped to the First universe and Bottom one (U2) is mapped to the Second universe relative to the pixel-tape.
 - Protocol: select the led protocol that the pixel tape conforms to.
 - Ordering: RGB or RGBW mapping that the pixel tape conforms to.



- **Art-Net Stream:** "Send IP address": is the destination address used when the stream is sending data only.
- **ESP Stream:** ENTTEC Show protocol DMX over Ethernet stream (ESP).
- **Kinet Stream:** For example: You can connect Kinet Stream to an Art-Net Stream to convert and output as Art-Net. (Kinet stream is supported as input only).
- **Streaming ACN:** "IP address" is the destination address used when the stream is sending data only (default is disabled = 0.0.0.0)
- **DMX Generator:** Define your own custom DMX Channel values and assign the selected ones. Snapshot feature can be used to capture values from an input stream. All modifications can be done using the DMX Grid Page.
- **Clock:** Allows you to synchronize ALL Pixel Link output only when the connected Input Stream is received. The Clock module can be used to make sure the output is always synced to the "latest universe" - especially if the source adds a delay to each universe.
 - Auto-repeat allows user to repeat the output once every "number of seconds" regardless of Synced Stream
 - Default behavior [Auto-repeat = Never]: Will only refresh Pixe Link when Synced Stream is received



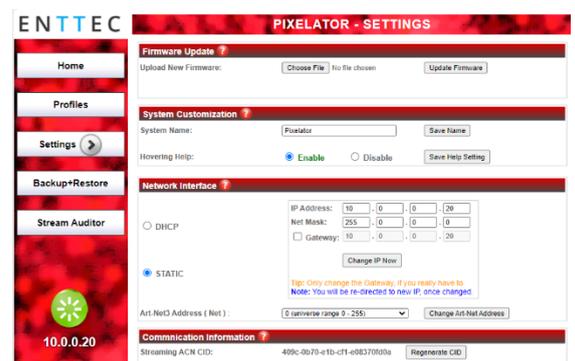
Settings / Firmware Update

The PIXELATOR's settings can be configured within the Settings tab.

Firmware Update: The latest firmware can be downloaded from our website. Using the Choose File button, browse on your local drive for downloaded PIXELATOR firmware file, this will have a .bin extension. Next click on the Update Firmware button to begin updating.

Note: Updating the firmware will cause the PIXELATOR's normal operation to stop.

After the firmware has updated the PIXELATOR will reboot to allow the changes to take place. Please see the LCD screen on the front of the PIXELATOR to see the IP address of the unit.



System Name: The name will be discoverable within Poll replies. This needs to be saved for the change to take effect.

Hovering Help: Help screens can be Enabled/Disabled depending on if you want to see the help pop ups. This needs to be saved for the changes to take effect.

Network Interface: Here you can change the Network settings to either Enable/Disable DHCP, or to set a Static IP address including Net Mask and optional Gateway. When DHCP is enabled, the DHCP server on the network is expected to automatically provide the IP address to the PIXELATOR. If no DHCP router/server is present or DHCP is disabled, the PIXELATOR will fall back to the static IP address. Any changes will need to

be saved to take effect and the PIXELATOR will reboot. Please see the LCD screen on the front of the PIXELATOR to see the IP address of the unit.

Art-Net3 Address (Net): Whilst using Art-Net on the PIXELATOR, all universes must be within the same Net range (example universe range 0-255 or 256 to 511).

sACN CID: The PIXELATOR's unique sACN Component Identifier (CID) is displayed here and will be use in all sACN communication.

Backup and Restore

Full System Backup: This includes a full backup of the system, including all settings, options and profiles. This can be used to later restore the PIXELATOR to previous settings, or can be used to migrate or duplicate from one PIXELATOR to another.

Full System Restore: Using a previous backup file, you can restore a PIXELATOR back to previous settings to migrate or duplicate from one PIXELATOR to another. Ensure that the file name matches with the formatting displayed on the web interface. Warning: This will replace any settings, options and profiles on the PIXELATOR.

Individual Profile Export: This will export a single profile from the PIXELATOR, which can be used as a backup or to migrate to another PIXELATOR. Use the drop down to select the Profile before clicking 'Export Profile'.

Individual Profile Import: This will import a single profile to the PIXELATOR. The profile should have been taken from another PIXELATOR. Use 'Choose File' to locate the profile on your local computer. Click 'Import Profile' to add the new profile to this PIXELATOR's profile list.

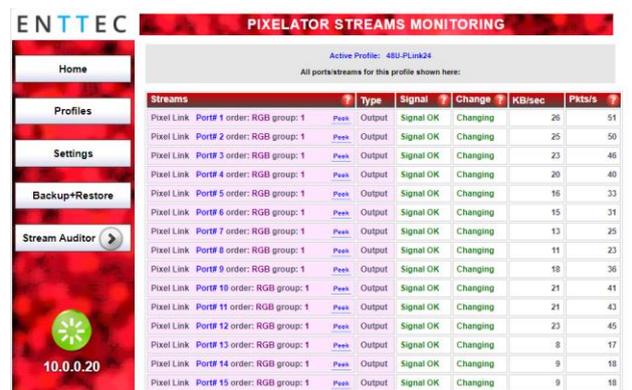
Reset to Factory Defaults: Warning: This will reset all options, settings and profiles to their Factory Defaults. After the reset is complete the PIXELATOR will reboot to allow the changes to take place. Please see the LCD screen on the front of the PIXELATOR to see the IP address of the unit.



Stream Auditor

The Stream Auditor will provide you an overview of the PLINK outputs as well as the inputs which are being using on the active profile. Here you can see if signal is being received and if those values are changing, as well as the packet information.

Use the Peek button to monitor the values for each stream.



Servicing, Inspection & Maintenance

-  ■ **The device has no user serviceable parts. If your installation has become damaged, parts should be replaced.**
-  ■ **Power down the device and ensure a method is in place to stop the system from becoming energized during servicing, inspection & maintenance.**

Key areas to examine during inspection:

- Ensure all connectors are mated securely and show no sign of damage or corrosion.
- Ensure all cabling has not obtained physical damage or been crushed.
- Check for dust or dirt build up on the device and schedule cleaning if necessary.
- Dirt or dust buildup can limit the ability for a device to dissipate heat and can lead to damage.

The replacement device should be installed in accordance with all steps within the installation guide.

To order replacement devices or accessories contact your reseller or message ENTTEC directly.

Cleaning

Dust and dirt build up can limit the ability for the device to dissipate heat resulting in damage. It's important that the device is cleaned in a schedule fit for the environment it is installed within to ensure maximum product longevity.

Cleaning schedules will vary greatly depending on the operating environment. Generally, the more extreme the environment, the shorter the interval between cleanings.

-  ■ **Before cleaning, power down your system and ensure a method is in place to stop the system from becoming energized until cleaning is complete.**

-  ■ **Do not use abrasive, corrosive, or solvent-based cleaning products on an device.**
-  ■ **Do not spray device or accessories. The device is an IP20 product.**

To clean an ENTTEC device, use low-pressure compressed air to remove dust, dirt and loose particles. If deemed necessary, wipe the device with a damp microfiber cloth.

A selection of environmental factors that may increase the need for frequent cleaning include:

- Use of stage fog, smoke or atmospheric devices.
- High airflow rates (i.e., in close proximity to air conditioning vents).
- High pollution levels or cigarette smoke.
- Airborne dust (from building work, the natural environment or pyrotechnic effects).

If any of these factors are present, inspect all elements of the system soon after installation to see whether cleaning is necessary, then check again at frequent intervals. This procedure will allow you to determine a reliable cleaning schedule for your installation.

Package Contents

- PIXEATOR
- Ethernet Cable
- IEC cable
- Read Me Card with ELM Promo Code (48 Universes)

Revision update

The Read Me Card with Promo Code is implemented on PIXELATOR (70060) after SN: 0050C2084699 (August 2022).

Ordering Information

For further support and to browse ENTTEC's range of products visit the [ENTTEC website](#).

Item	Part No.
PIXELATOR	70060
PLink 5v	73546
PLink 12v-24v	73544

enttec.com

MELBOURNE AUS / LONDON UK / RALEIGH-DURHAM USA

Due to constant innovation, information within this document is subject to change.