ENTTEC

PIXELATOR MINI

70067

User Manual

16 Universes (8 outputs) master SPI pixel controller for a PLINK system.

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Safety

⚠️ **Ensure you are familiarized with all key information within this guide, datasheet 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 product must be installed in accordance with applicable national and local electrical and construction codes by a person familiar with the construction and operation of the product and the hazards involved. Failure to comply with the following installation instructions may result in death or serious injury.

■ Do not exceed the ratings and limitations defined in the product datasheet or this document. Exceeding can cause damage to the device, risk of fire and electrical faults.

■ Ensure that no part of the installation is or can be connected to power until all connections and work is complete.

■ Before applying power to your installation, ensure your installation follows the guidance within this document. Including checking that all power distribution equipment and cables are in perfect condition and rated for the current requirements of all connected devices and factor in overhead and verify that it is appropriately fused and voltage is compatible.

■ Remove power from your installation immediately if accessories power cables or connectors is in any way damaged, defective, shows signs of overheating or are wet.

■ Provide a means of locking out power to your installation for system servicing, cleaning and maintenance. Remove power from this product when it is not in use.

■ Ensure your installation is protected from short circuits and overcurrent. Loose wires around this device whilst in operation, this could result in short circuiting.

■ Do not over stretch cabling to the device's connectors and ensure that cabling does not exert force on the PCB.

■ Do not 'hot swap' or 'hot plug' power to the device or its accessories.

■ Do not connect any of this device's V- (GND) connectors to earth.

■ Do not connect this device to a dimmer pack or mains electricity.

■ Label any PLINK output Cat5/6 connector and DO NOT connect to non-PLINK device (eg Ethernet Switch). Connecting unlike systems could result in serious damage to equipment.

System Planning and Specification

■ To contribute to an optimal operating temperature, where possible keep this device out of direct sunlight.

⚠️ ■ The maximum recommended cable distance between the PIXELATOR MINI's output and Plink Injector is 300m (1000ft). ENTTEC advises against running cabling close to sources of electromagnetic interference (EMF) i.e., mains power cabling / air conditioning units.

■ This device has an IP20 rating and is not designed to be exposed to moisture or condensing humidity.

■ Ensure this device is operated within the specified ranges within its product datasheet.

Protection from Injury During Installation

⚠️ ■ Installation of this product must be performed by qualified personnel. If ever unsure always consult a professional.

■ Always work with a plan of the installation that respects all system limitations as defined within this

guide and product datasheet.

- Keep product and its accessories in its protective packaging until final installation.
- Note the serial number of each product and add it to your layout plan for future reference when servicing.
- All network cabling should be terminated with an RJ45 connector in accordance with the T-568B standard.
- 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.

Wiring Diagrams
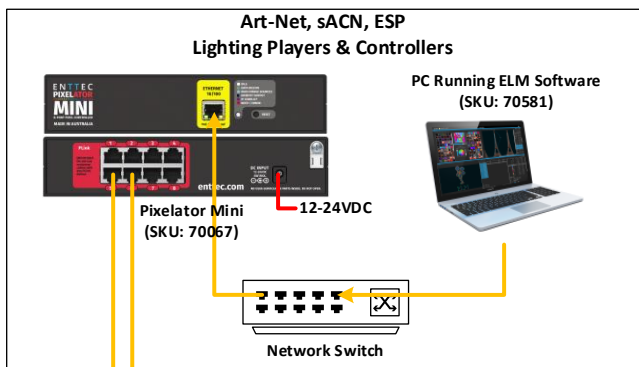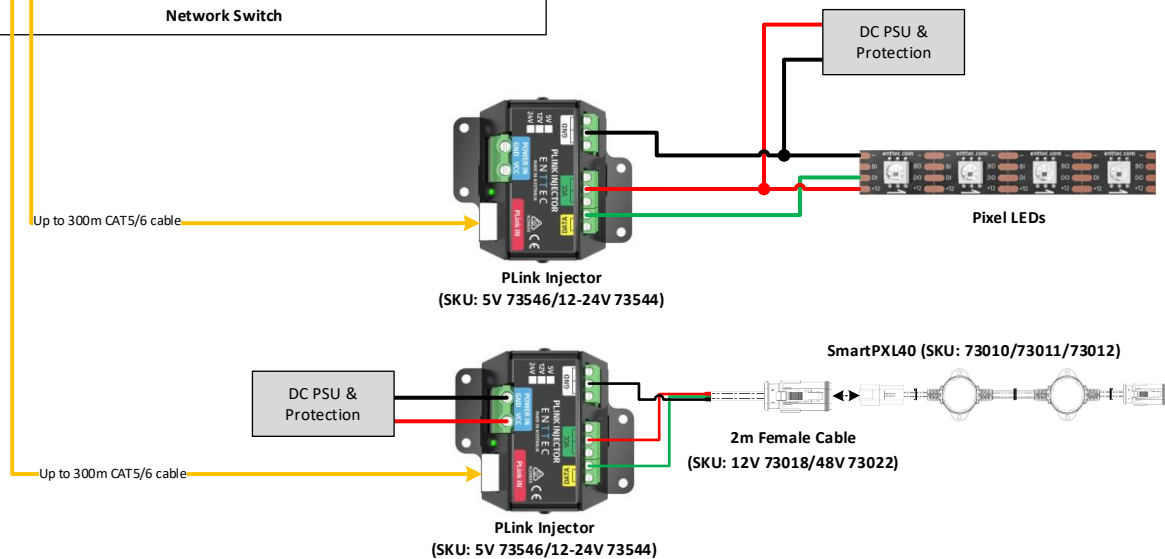
Functional Features

- 16 Universes Ethernet to PLINK data over Cat5e/Cat6 cable.
- Easy to configure & update through any web browser.
- Supports input protocols: Art-Net, sACN and ESP.
- Compatible with multiple asynchronous pixel output protocols with custom voltage timing.
- Allows creation of custom pixel protocols. (Criteria apply, see 'Custom Protocol Creation Guide' document)
- Static or Dynamic (DHCP) IP configuration (DHCP by default).
- Pixel grouping is configurable for each PLINK port. (1 to 340) for RGB / (1 to 256) for RGBW.
- Each PLINK output can be assigned up to 2 Ethernet Universes.
- Pixel colour order is configurable for each PLINK port.

Hardware Features

- 8* RJ45 ports (each providing 2 Universes of PLINK data output)
- RJ45 connector (10/100 Mbps)
- Active IEEE 802.3AF Active PoE or 12-24v DC power input
- Power and output status LED indicators
- All ports feature ESD surge protection and resettable fuses to block external faults & electrical noise propagation through control infrastructure
- 1U Half Width form factor with mounting options for 1U Half Width Rack, 19" Rack, Surface mount, TS-35 DIN mounting
- Compatible with ENTTEC PLINK INJECTOR range
- Compatible with ENTTEC CVC4 RGBW auto-addressable LED dimmer

PLINK INJECTORs (Sold Separately)

From one of the PIXELATOR MINI'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 MINI, 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 5VDC input
- SKU 73544 is designed for Pixels with a 12-24VDC 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).

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

PLINK Data: The PIXELATOR MINI converts Art-Net, ESP and sACN into our own PLINK data where it is converted to the SPI (Pixel) protocol by Plink Injector.

PLINK Data Pinout: PLINK Data is sent over Cat5/6 cable over 3 pins within a RJ45 connector.

These pins are:

- Pin 1: Data +
- Pin 2: Data −
- Pin 7/8: Ground

Do not use crossover cables with any PLINK device

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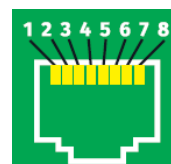
LED Status Indicator

The PIXELATOR MINI comes with one Network LED built-in RJ45 Ethernet port and one forward-facing RGB status LED which indicates the following device states:

Colour	Status
White (Static)	Idle
Green (Static)	Outputting Pixel Link Data
Blue (Static)	Device is starting up
Blue (Flashing)	Identifying
Cyan (Static)	Multiple merge sources
Purple (Static)	IP conflict
Red (Static)	Device in boot / error

Out of the Box

By default, the PIXELATOR MINI will output first 16 Universes of Art-Net to the WB2812B protocol starting at universe 0 and 1, with two Universes per port.

PIXELATOR MINI factory default settings out of the box:

■ Device name: PIXELATOR MINI

■ DHCP: Enabled. If the DHCP server is slow to respond, or your network does not have a DHCP server, PIXELATOR MINI will fall back to 192.168.0.10.

■ Static IP Address: 192.168.0.10

■ Gateway IP address: 192.168.0.254

■ Netmask: 255.255.255.0

■ Input protocol: Art-Net

■ LED protocol: WS2812B

■ Pixel colour: RGB

■ All 8 ports are set to output 2 universes. The start universe for each output is set to be 0 and 1.

■ Mapped pixels value: 340 pixels

■ DMX start address: 1

■ TM1814 global intensity: 63 (maximum)

Networking

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

DHCP: On power up and with DHCP enabled, if the PIXELATOR MINI is on a network with a device/router with a DHCP server, the PIXELATOR MINI 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 MINI will fall back to the IP address 192.168.0.10 and netmask 255.255.255.0. If a DHCP address is provided, this can be used to communicate with the PIXELATOR MINI.

Static IP: By default (out of the box) the Static IP address will be 192.168.0.10. If the PIXELATOR MINI has DHCP disabled, the Static IP address given to the device will become the IP address to communicate with the PIXELATOR MINI. The IP address will change from the default once it is modified in the web interface. Please note down the Static IP address after setting.

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Web Interface

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

Note: A Chromium based browser (i.e. Google Chrome) is recommended for accessing the PIXELATOR MINI's web interface.

Note: As the PIXELATOR MINI 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 MINI's IP address (either DHCP or Static), then the address can be typed directly into the web browsers URL field.

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

- ENTTEC EMU software for Windows and MacOS (support Mac OSX 10.13 or later), which will Discover ENTTEC devices on the Local Area Network, displaying their IP addresses before opting to Configure the device, opening the Web Interface.
- 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 Art-Net).
- The device default IP address 192.168.0.10 will be printed on the physical label on the product.

Note: The eDMX protocols, the controller and the device used to configure the PIXELATOR MINI must be on the same Local Area Network (LAN) and be within the same IP address range as the PIXELATOR MINI. For example, if your PIXELATOR MINI is on Static IP address 192.168.0.10 (Default), then your computer should be set to something such as 192.168.0.20. It is also recommended that all devices Subnet Mask are the same across your network.

Top Menu

The top menu allows all the PIXELATOR MINI web pages to be accessed. Menu option is highlighted blue to indicate which page the user is on. The 'Light' switch on the right-hand side enables dark mode providing flexible viewing experience.

Home

The landing page for the PIXELATOR MINI web interface is the Home tab.

This tab is designed to give you a read-only device overview and will display:

Network Information:

- DHCP status – (either enabled or disabled).
- IP address
- Netmask
- Gateway
- Mac Address
- Link Speed

System Information:

- Node Name
- Firmware version on device
- System uptime
- Input protocol set on device
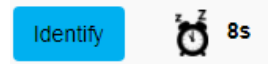- Output SPI (Pixel) protocol set on device

Identification:

■ Identify

This command on the webpage identifies pixels connected to a specific PIXELATOR MINI without the need to provide control data. This offers a convenience check-up for correct wiring.

Note: The timer will not restart when pressed consecutively.


Settings

The PIXELATOR MINI can be configured within the Settings tab. Changes will only take affect after being saved; any unsaved changes will be discarded.

Node Name: The name of PIXELATOR MINI will be discoverable within Poll replies.

DHCP: Enabled by default. When enabled, the DHCP server on the network is expected to automatically provide the IP address to the PIXELATOR MINI. When DHCP enabled but there is no DHCP server or slow to response, the PIXELATOR MINI will fall back to 192.168.0.10.

IP Address / NetMask / Gateway: These are used to set when DHCP is disabled. These options set the Static IP address, Netmask and Gateway IP settings which should be compatible with other devices on the network.

LED Protocol: Select the SPI (Pixel) protocol from the drop-down list or set a custom value that matches the pixels which the PIXELATOR MINI will control.
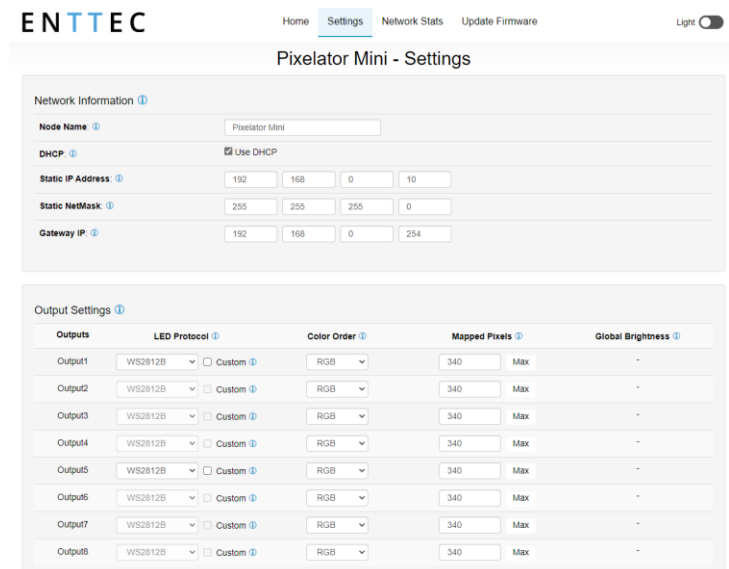
The PIXELATOR MINI provides more than 20 output SPI (Pixel) protocols listed below:

- APA 104
- GS8208B
- SPXL (16bit & 8bit)
- SJ1221 (16bit & 8bit)
- SK6812
- TLC5973 (16bit & 8bit)
- TM1804, TM1812, TM1814
- UCS1903, UCS2903, UCS2904, UCS8903 (16bit & 8bit), UCS8904 (16bit & 8bit)
- WS2811, WS2812, WS2812B, WS2813, WS2815, WS2818
- 9PDOT (16bit & 8bit)

The pixel protocols selected can be output directly to your pixel fixtures. User is allowed to set up to 2 different protocols output simultaneously. Port 1 - 4 and Port 5 - 8 are grouped for the same protocol; protocol can be different between groups.

The PIXELATOR MINI features **Custom Voltage Timing** to most of the pixel protocols which is configurable through Port 1 and 5. The voltage timing of the chosen pixel protocol can be adjusted according to its datasheet. It also allows **Custom Protocol Creation** (criteria apply). Visit ENTTEC website to view the 'Custom Protocol Creation Guide' document if your SPI protocol is not listed.

- **Note:** TLC5973 (16bit & 8bit) is not compatible with Custom Voltage Timing at the current firmware.

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The adjustable custom voltage timing values are:

Bit 0 High Time (T0H)	The voltage high time required for code 0.
Bit 1 High Time (T1H)	The voltage high time required for code 1.
Overall Bit Time	The total voltage time for a single bit which can be calculated from TH+TL. Lower limit = T0H+T0L Upper limit = T1H+T1L
Reset Time	The total voltage low time required to reset the data transmission between each data batch.

▪ **Example**: The information required from WS2812B datasheet is 'Data Transfer Time' as below:

* Please test on your pixel fixture for the optimal transmission time among the range according to the datasheet.

Colour Order: Each port can configure how RGBW colours are mapped to pixels.

Mapped Pixels: Define the number of mapped pixels each port controls.

Global Brightness: This is a function of protocol TM1814 and SJ1221 that sets the maximum brightness for the tape without hindering the DMX range available.

DMX Protocol (Input): Choose between Art-Net, sACN, and ESP as the input protocol.

Output Universes

The PIXELATOR MINI converts up to 2 universes of DMX over Ethernet to pixel data per output. All ports are set to output Universe 0 and 1 as default.

All outputs can be specified to use the same universes, e.g., All outputs use universe 1 and 2. Each output can also be specified to use its own individual group of universes, e.g., output 1 uses universes 100, 101 however output 2 uses 1, 2.

Only the first universe of each port can be specified; the remaining universe is automatically assigned subsequent universe to the first one from each port.

Enable the 'Autofill' function to manage group port settings. Any port settings after the one changed will autofill to match unless it has already been changed.

■ **Art-Net:** Supports Art-NET 1/2/3/4. Each output port can be assigned a universe number in the range 0 to 32767.

■ **sACN:** Outputs can be assigned a universe number in the range 1-63999. Please note the PIXELATOR MINI supports a maximum of 1 multicast universe with sACN sync. (i.e., all universes set to the same value)

■ **ESP:** Outputs can be assigned a universe number in the range 0-255. More details of the ESP protocol can be found at www.enttec.com.

Group Pixels:

This setting allows multiple pixels to be controlled as one 'virtual pixel'. This reduces the overall amount of input channels required to control pixel strip or dots.

- **Example:** When Group Pixels is set to 10 on a PIXELATOR MINI connected to a length of RGB pixel strip, by patching a single RGB pixel within your control software and sending the values to the PIXELATOR MINI, the first 10 LEDs would respond to it.

- **Note:** The maximum number of physical LED pixels that can be connected to each port is 340 (RGB) or 256 (RGBW). When grouping pixels, the number of control channels required is reduced, this function does not increase the number of physical LED's each PIXELATOR MINI can control.

DMX Start Address (DSA)

Assigns the first DMX channel, this is where the PIXELATOR MINI will start listening for DMX values within the universe. When the universes/output is more than one, the DMX start address only applies to the first universe.

However, where it applies, a start address offset may result in the split of a pixel. e.g., **R** channel in first universe and **GB** channels in the seconds universe for a **RGB** LED.

For ease of pixel mapping, ENTTEC recommend offsetting the DMX start address to a number divisible by the number of channels per pixel. i.e.:

- Increments of 3 for RGB (i.e., 1,4,7, 10)
- Increments of 4 for RGBW (i.e., 1,5,9,13)
- Increments of 6 for RGB-16 bit (i.e., 1,7,13,19)
- Increments of 8 for RGBW-16 bits (i.e., 1,9,17,25)

Save Settings: All changes must be saved to take effect.

Reset to Defaults: This button allows the PIXELATOR MINI to reset back to factory default via web interface. Please refer to the Reset to Factory Defaults section of this document for mor e information.

Reboot: Please allow up-to 10 seconds for the device to reboot. When the web interface page refreshes the PIXELATOR MINI is ready.

Network Stats

The Network Stats page shows statistics for the input DMX protocol selected.

Art-Net

The information provided is:

- Poll packets received
- Data packets received
- Sync packets received
- Last IP where Art-Net packets were received from
- Last port data received from

Network Protocol ⓘ Art-Net	
Poll Packets Received:	5
Data Packets Received:	8473
Sync Packets Received:	0
Last IP:	10.10.3.187
Last Port:	6454
	Refresh

sACN

The information provided is:

- Data packets received
- Sync packets received
- Last IP packets were received from
- Last port data received from

Network Protocol: sACN	
Poll Packets Received:	0
Data Packets Received:	0
Sync packets received:	0
Last IP:	0.0.0.0
Last Port:	0
	Refresh

ESP

The information provided is:

- Poll packets received
- Data packets received
- Last IP where ESP packets were received from
- Last port data received from

Update Firmware

When selecting the Update Firmware tab, the PIXELATOR MINI will stop outputting and the web interface boots into the Update Firmware mode. It may take a while depending on the network setting.

This mode will display basic information regarding the device including current Firmware Version, Mac Address and IP address information.

The latest firmware can be downloaded from www.enttec.com. Use the Browse button to select an PIXELATOR MINI firmware from your computer. PIXELATOR MINI firmware files have a .bin extension.

Next click on the Update Firmware button to begin updating.

After the update has completed, the web interface will load the Home tab, where you can check the update was successful under Firmware Version. Once the Home tab has loaded, the PIXELATOR MINI will resume operation.

Reset to Factory Defaults

The PIXELATOR MINI can be reset by either the web interface or the reset button on the device. It resumes the device's settings back to factory default, see Out of the Box section for the factory default settings.

Resetting via Web Interface

The reset to defaults command can be found under the Settings tab of the PIXELATOR MINI's local hosted web interface.

Once the command is pressed, a pop-up would appear as shown in the image below:

Manually refresh the page after resetting to defaults to ensure the webpage information is updated.

Resetting by Reset Button

The reset button on the device restores the network configuration of the PIXELATOR MINI to factory defaults. To reset to factory defaults, the following procedure must be performed:

- Power off the unit.
- Press and hold the Reset button.
- While holding the Reset button, power up the unit, and keep holding the button for approximately 3 seconds after the LED starts blinking.
- Release the Reset button.
- Power cycle the unit.

Frequently Asked Questions

I'm unable to connect to the PIXELATOR MINI web interface.

Ensure that the PIXELATOR MINI and your computer are on the same subnet.

To troubleshoot:

1. Connect the PIXELATOR MINI directly to your computer using a Cat5 cable and power it on.
1. Give your computer a Static IP address (e.g.: 192.168.0.20).
2. Change computer Netmask to (255.255.255.0).
3. Open ENTTEC EMU software.
4. Once EMU finds the PIXELATOR MINI, you will be able to open the device webpage and configure it.

Factory Reset the device using the reset button if the above steps do not resolve the issue.

The PIXELATOR MINI's factory default resets the device to static IP address 192.168.0.10 and Netmask 255.255.255.0 with DHCP enabled.

When the PIXELATOR MINI has DHCP enabled but DHCP server is unavailable (e.g. the device is connected to a computer without DHCP server), the IP address will fall back to 192.168.0.10 with netmask 255.255.255.0.

What if my LED strip protocol is not in drop down list? How to add new LED strip protocol to PIXELATOR MINI?

The PIXELATOR MINI allows the user to choose a pixel output protocol even it is not found in the drop-down list.

Visit the ENTTEC Website to view the 'Custom Protocol Creation Guide' document for more information about the key criteria and the step-by-step guide.

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Servicing, Inspection & Maintenance

- **The device has no user serviceable parts. If your installation has become damaged, device 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 build-up 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 cleaning.

- **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 a 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 Content

- PIXELATOR MINI (70067)
- 1 x 2m cat5 cable (79102)
- 1 x 12V PSU adaptor with international plugs
- 2 x Rack mounting bracket (79161) + 6pcs x screws
- 2 x Surface/Din mounting bracket (79162) + 4 pcs x screws
- 2 x Din Clip + 4pcs x screws
- 1 x ELM Promo Code (16 Universes) on device's sticker.

Revision History

Please check your serial number and artwork on your device for support:

- PIXELATOR MINI (SKU:70067) SN up to 0050C20845D6, please load firmware up to V1.12.
- PIXELATOR MINI (SKU:70067) released after SN: 0050C20845D6, please load firmware version V2.0 onwards only.
- Use the Serial Number to claim free license for ELM software unless there is a Promo Code sticker on the device. The ELM Promo code sticker is implemented from PIXELATOR MINI (70067) SN:0050C20845D6 onwards.

Ordering information

For further support and browse ENTTEC'S range of products, visit the ENTTEC website

Item	SKU
PIXELATOR MINI	70067
PLINK INJECTOR (5v)	73546
PLINK INJECTOR (12v-24v)	73544

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MELBOURNE AUS / **LONDON** UK / **RALEIGH-DURHAM** USA

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

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