

### Introduction

AirPixel Mini-Plus is a Wifi ArtNet/sACN(E1.31) to WS2811/12 (NRZ) and IC/USC1903 Driver interface. It is capable of receiving up to 4 DMX universes of up to 512 channels per universe. The data is then converted into a continuous NRZ data stream that will appear on the JST output connection. Network connection can be made by utilising a special Access-Point Mode. Device IP, ArtNet/sACN, and LED Settings are adjustable directly from a second browser interface once the Wireless Network Connection has been made. A Javascript Colour-Picker is also accessible, which can be driven directly from a mobile phone to select wash colours when in standby. Product Firmware updates can be sent over-the-air, and a serial configuration & diagnostics interface has also been included.

### Specifications

Browser Configuration Server and UDP Client mode  
Serial Configuration Server  
Four Universe ArtNet II & III and sACN E1.31 decoding DMX512 data to WS2811/12/IC1903 in NRZ Format  
Radio Module : Wireless standard 802.11 b/g/n, Frequency range 2.4-2.5 GHz, with external antenna  
Power input : 5V USB Powered, or **MAX 5V** external power applied to RED wire of 3-Pin JST Connector

### Parts Supplied

AirPixel Mini-Plus Interface    1 x USB-MM Cable    1 x 3 pin JST Cable

### Status LEDs

**Network Select** : Flashing RED=APMode, not connected – Flashing GREEN=APMode, connected  
**Network Connect** : Flashing RED=ClientMode, not connected – Flashing GREEN=ClientMode, connected  
**Data Streaming** : Flashing BLUE=ArtNet/sACN data being received that matches universe selection group

### Access-Point Connection

On first power-up (when the device has not been set up before), it will appear as an Access Point. If you check your list of wireless network connections you will find the device in the list as 'AirPixel xxyy' (where xxyy are the last two octets of the device mac). The devices 'Network Select' LED will be flashing RED. Select the device from the list of wireless network connections and enter 'smartshow' for the password. Once connected the 'Network Select' LED will be flashing GREEN.

```
[Laptop/PC] <--- direct wifi connection ---> [AirPixel in APMode : 192.168.4.1]
```

### 'Join A Network' Configuration Page

To access the 'Join A Network' configuration page, type into the URL bar '192.168.4.1' and press return, the configuration interface should appear as follows:

#### Network SSID & Password Settings

**Network SSID:** Enter the name (SSID) of the wireless router for the network you wish to join

**Network PASS:** Enter the password (PASS) for the above network.

**[Save SSID & Password]** The above SSID and Password will be saved so that next time the device reboots, the connection will be made automatically (unless the Network/Pass cannot be verified)

**[Connect to Network]** This will allow the device to connect to the Network as specified above, the device will close down its Access-Point 'Join-a-Network' connection and restart as a Network Client/Node. The 'Network Connect' LED may briefly flash RED before changing to flashing GREEN which confirms the connection to your chosen Wireless Network.

#### Device Settings & IP Configuration

**Device IP Address:** It is possible to set the IP Address of the AirPixel to almost any value. Many ArtNet devices will use standard IP addresses of 10.x.x.x or 2.x.x.x, only values of 0-254 can used, 255 is not allowed.

*Note : If you change this IP address, the new IP address will be the one that will allow you access to this configuration page next time you reboot. Also take care to only change to an IP address that you actually have access to.*

**Device SubNetMask:** Normally this should be left at 255.255.255.0, which will cover most applications.

**[Save Device Settings]** Saving the configuration will write the Device IP and SubNetMask values to the AirPixel's internal memory, so on next power-up the new settings will be used.

### Resuming Network Connection

Once the device has connected to your chosen Network (Flashing 'Network Connect' Green LED), then you should disconnect your Laptop/PC from the AirPixel's AP-Mode (it might automatically do this anyway), and then manually connect your Laptop/PC back to your existing Network (Save SSID as above)

```
[Laptop/PC] <--- wifi ---> [ROUTER] <--- wifi ---> [AirPixel in ClientMode : 192.168.1.200]
```

**Note :** *If the 'Network Connect' LED stays flashing RED then you have not been able to connect to your desired network (you may have entered the SSID & PASS incorrectly). If you cycle the power to the device you will start in AP mode once again, the device will do this until a confirmed network connection has been made.*

## Browser Configuration Mode

Note : Access to the Browser Configuration page is only available when ArtNet/sACN data is NOT streaming to the device over the network, therefore access can only be granted when the 'Network Connect' LED is flashing GREEN.

To access the browser configuration page, type into the URL bar the Network IP Address (this will be default value '192.168.1.200' unless you have changed it from within the 'Join-a-Network' page) and press return. The configuration interface should appear as follows:

## Device Settings & IP Configuration

**Network:** The page should announce the currently connected network name as 'Connected to..'

**RSSI Value:** Received signal strength indication as received at the AirPixel

**Device IP Address:** It is possible to set the IP Address of the AirPixel to almost any value. Many ArtNet devices will use standard IP addresses of 10.x.x.x or 2.x.x.x, only values of 0-254 can be used, 255 is not allowed. Note : If you change this IP address, the new IP address will be the one that will allow you access to this configuration page next time you reboot. Also take care to only change to an IP address that you actually have access to.

**Device SubNetMask:** Normally this should be left at 255.255.255.0, which will cover most applications.

**MAC Address:** This is not adjustable and is a unique number created when the device was manufactured.

**[SAVE]** New IP configuration will not take place until the AirPixel has its power cycled (or by pressing [Reboot]). Saving the configuration will write the Device IP and SubNetMask values to the AirPixel's internal memory. On the next power-up the new settings will be used.

## DMX Protocol

Select either ArtNet or sACN (E1.31) to match the DMX Data Protocol coming from the host application

**[SAVE]** New DMX Protocol settings will take immediate effect after they are saved to the AirPixel.

## Art-Net/sACN Starting Universe

These values can be configured to match the requirements of your system. There are a total of 256 Universe values for ArtNet II and 32,768 for ArtNet III, and 63,999 for sACN

**ArtNet Mode: Net:** Range 0-127 **SubNet:** Range 0-15 **Universe:** Range 0-15

**sACN Mode:** Range 1-32767

**[SAVE]:** New ArtNet/sACN settings will take immediate effect after they are saved.

## Pixel Test

Connected Pixel colours can be tested by pressing buttons for either RGB or RGBW, clear all using OFF.

## Colour-Picker Javascript Application

Press [PICK] to access the colour picker, select one of the 35 colours from the matrix PLUS one of the brightness values (at the bottom of the page), Pressing the [BACK] symbol will return back to the main configuration AND save the chosen colour to memory for use when the device next powers back up.

## Universe Sizes & Pixel Order

**Uni Size:** If your application is unable to set the size of the Universe, then the universe size can be entered into the boxes, one for each of the four universes.

**Pixel Order:** If your application sends data out as RGB, then select RGB, otherwise default is GRB

## Reboot

Pressing [Reboot] will restart the AirPixel Device (a bit like cycling the power). All newly saved settings (including IP values) will be used after reboot.

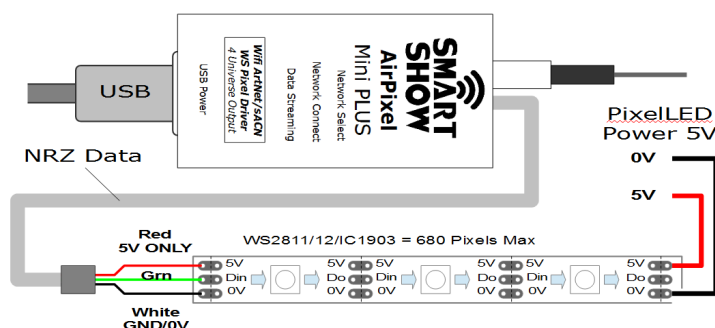
## Delete Connection

Pressing [Delete Connection] will remove the details of the currently connected network from the device, this may be required if you want to move from one wireless router to another. The next time you power up the device it will go into Access-Point mode again which will allow a new SSID & PASS to be entered (see Join-A-Network)

## Firmware Upload

Pressing [Firmware Upload] will open the connection and allow new firmware to be sent to the device over the wifi using the current connection (see further details below)

## Product Connections



A USB-A connection can be used for powering the AirPixel from a 5V USB supply, although if you have 5V available from the PixelLED connections then you can use that instead. The 3-wire cable has the following connections:

**WHITE :** Ground    **GREEN :** Data Out    **RED :** 5V ONLY (power into the AirPixel)

**IMPORTANT : DO NOT COVER OR BEND THE FLEXIBLE ANTENNA**

### **Lets Animate !**

Open your LED animation application, we suggest Jinx as a good starting point, this can be downloaded free of charge from <http://www.live-leds.de/>

1. Configure Jinx to use your AirPixel device, by selecting it as an 'ArtNet or sACN' device type from the '*SetUp>OutputDevices*' menu
2. Universes/Devices can be added manually (see below) or automatically using 'SCAN' (only available for ArtNet). If a scan is done and 4 universes are automatically added, you may need to edit each entry with the specific requirement of your set-up.
3. Ensure the Broadcast check box is not checked
4. Enter the IP number of your AirPixel interface (as you have set in AirPixel config)
5. Select the number of data channels required for this universe, and set Net, SubNet and **First** Output Universe (as you have set in AirPixel config)
6. Click OK to save changes
7. For the all subsequent Output Universes, add another device (as above) but with the NEXT Universe value. (the second Universe assumes it is one after the first Universe) – Note : sACN starts at universe ONE
8. Design your matrix size and shape within '*SetUp>MatrixOptions*'
9. Patch your matrix to the AirPixel universe(s) within '*SetUp>OutputPatch*'. Be careful to select the correct colour order for your LEDs, WS2812 are GRB, and NOT RGB, starting at channel zero.
10. Ensure ALL universes are patched to different parts of the Matrix
11. '*SetUp>StartOutput*' to start the show.
12. If you have configured and patched everything correctly the BLUE streaming LED will flash.
13. Ensure your WS2812 LED strip/matrix is connected to the JST outputs, following the correct connections of GREEN=DataOut, WHITE=GROUND/0V. The RED Connection is not a power output, but it can be used to supply 5V power to the AirPixel rather than using the USB connection. This device is 5V ONLY !
14. Select the effect you want to see from the Channel Effects and have fun !

### **Serial (Alternative) Configuration Mode – Set-Up**

Firstly, you will need to install the correct CP2104 serial driver, these can be found at :

<https://www.silabs.com/products/development-tools/software/usb-to-uart-bridge-vcp-drivers>

Once installed, connect the AirPixel via the USB connection and allow the driver install to complete.

Make a note of the serial port number for the device (see Device manager/Com Ports/CP2104 device)

If you haven't already got a Serial Communications application, for Windows, we recommend HTComm.

You can find HTComm at <http://www.hobbytronics.co.uk/ht-comm>

Set the **PORT number** to the ComPort that the AirPixel is connected to

The serial communications use serial settings of 9600 N/8/1, so set **Baud to 9600**

Ensure that the **checkbox for [CR] is set**, to allow a carriage return to be sent after any communications

### **Serial Configuration Mode - Use**

To access the Serial Configurator, open the Serial Communications Application (above), and set the port and baud rate. Then type '?' in the HTComm chat window and press return. In response to sending a '?' the device will respond with its Device Settings, and a Function Guide:

```
***** SmartShow AirPixel-Mini *****
Firmware v1.23 - SerialNo 12345
***** DEVICE SETTINGS *****
Network SSID ShowNetOne
Network PASS MyPassword
MAC Address CA:EF:FF:1E:02:34
Device IP 192.168.1.200
SubNetMask 255.255.255.0
Starting Uni (Net)0 (Subnet)0 (Uni)0
DMX Protocol ARTNET
***** FUNCTION GUIDE *****
'i192.168.1.200<CR>' Change local IP
's255.255.255.0<CR>' Change SubNetMask
'c1<CR>' Change AP Wifi Channel
'u0<CR>' Change Start Uni
'a<CR>' Change to Artnet Mode
'e<CR>' Change to sACN(E1.31) Mode
'X or Y<CR>' WS2812 or IC1903 PixelLED
'?<CR>' Display settings & help
'$RESET<CR>' Reset Defaults (CAUTION)
'C or D<CR>' Cap/Del OffLine Scene
*** (ensure <CR> is enabled on send) ***
```

It is possible to change and configure the AirPixels settings using this interface, which is very useful if you happen to forget its IP address or need to reset the device back to defaults. Other settings are also available. For example, pressing 'i2.0.0.1' and pressing return will change the device IP to 2.0.0.1

### **Serial Configuration Mode – Additional Features**

**Change AP Wifi Channel:** AirPixel defaults at Wifi Channel 1 when in AP(join-a-network) mode. Sometimes this channel is already busy with other local devices. To change the wifi channel to another channel (1-9 only) press 'c1<CR>' to 'c9<CR>'. Once you have joined your choice of network the Wifi Channel will be decided by your router.

**RESET DEVICE TO FACTORY DEFAULTS:** To reset the device completely, type '\$RESET<CR>'. This full reset will also remove the network connection SSID and Password.

### **RSSI During Data Streaming**

While data is being streamed to the device the BLUE LED will flash, its rate is determined by the strength of signal that it is receiving from the router, A fast flash ~2/sec means good signal strength, and will slow to ~1/sec for poor signal strength

### **ArtNet/sACN Unicast, Multicast & Broadcast mode**

It is recommended that Unicast mode is used when sending ArtNet/sACN data to AirPixel. Broadcast mode should be avoided.

### **ArtNet Device Discovery & DHCP**

There is limited ability to discover IP addressing and device Information using ArtNetPoll, IP Scan is available on most software. If unavailable, addressing can be done manually as described above. There is no DHCP function as IP addressing is Static, utilising client port 6454 for Artnet and 5568 for sACN.

### **Dimensions**

Length : 65mm (plus JST cable) – Width 32mm – Height 12mm

### **Software Compatibility**

AirPixel works with all free and commercial Art-Net/sACN compatible software. For free software, Jinx! is highly recommended, visit <http://www.live-leds.de/> for more information.

### **Firmware Uploads**

From time to time we may issue revised firmware for our products. The latest firmware can be uploaded wirelessly to AirPixel, for this you will need the .Bin firmware file. Please ensure that the firmware file matches the product you are downloading to. For AirPixel 'over-the-air' firmware upgrades, there are several options depending on your operating system :

**Windows :** Use Chrome Browser

**Mac OSX and iOS :** support is already built in, no any extra software required

**Linux :** Avahi <http://avahi.org/>

Firmware uploads can be initialised by pressing [Firmware Upload] found at the bottom of the Browser Configuration Page. Now open your browser, for Windows this will be Chrome. Type "192.168.1.200/update" (or whatever your device IP is) into the URL bar and press return. You should now be faced with the options to 'Browse' for a file and 'Upload'. Pressing [Browse] will allow you to select the required .Bin file you want to upload to AirPixel, once selected press [Upload]. Once the upload is complete a message will show it is complete and rebooting (the browser page may timeout at this point). DO NOT disconnect AirPixel, the device will require up to a minute to transfer its data internally and reboot, during this time no LEDs will be shown, but once complete the device should go back to connecting to your current network and the GREEN LED will be flashing. The upload success can be tested by accessing the browser configuration page and checking the firmware version number, written as "AirPixel Mini vX.XX

**Note :** If you press [Firmware Upload] from within the browser configuration page and decide not to go ahead with it, no damaged has been done and recycling the power to the device will resume normal operation.

**IMPORTANT :** Please note that this is a 5V Device only, if the power input exceeds 5V the AirPixel could be damaged internally

### **Technical Support**

email : [sales@smartshow.lighting](mailto:sales@smartshow.lighting)

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