Introduction

NetSPI-340 will drive up to two ArtNet Pixel Universes (340 WS2801/WS2803/APA102(c) and many other SPI-type Pixel-LEDs) over a wired Ethernet network. Device IP, ArtNet Settings and LED configuration is adjustable directly from your Browser interface. Two colour coded SPI cables are provided for outputting the SPI-data to the Pixel LED strips/matrix. Operational Mode is indicated by a simple 7 segment display.

Specifications

IEEE 802.3 compatible Ethernet Controller, Integrated MAC and 10BASE-T PHY
Browser Configuration Server and UDP Client modes
Isolated RJ45 Ethernet Connection
Dual Universe ArtNet II & III decoding NRZ data at 25fps typical

Parts Supplied

NetSPI-340 Interface 1 x USB-MiniUSB cable (for power & firmware upload)

LAN Ethernet Connection

The NetSPI-340 can be configured for almost any IP setting, although a default IP of 192.168.1.202 is supplied with the unit. In general this will be a similar IP to your home router/hub, therefore the NetWS can be connected directly to one of your router LAN Ports. Once connected it can be accessed from a PC that is also connected to that same Network.

Browser Configuration Mode

To access the browser configuration, the NetSPI must be put in CONFIGURATION mode. Configuration mode is available for the first 5 seconds after power up, this is shown as a circulating symbol on the LED display. To activate Configuration mode you should open your PC browser (most browsers are supported) and type into the URL bar 192.168.1.202 and press return, hitting the return within the 5 second window will activate Configuration mode and will show a 'C' on the display (If you allow 5 seconds to elapse without any browser intervention then the NetSPI will go directly into ArtNet mode 'A'). As long as the PC and NetSPI are connected to the same network at 192.168.1.202 the configuration interface should appear as follows:

Ethernet Settings & IP Configuration

MAC Address: This is not adjustable and is a unique number created in conjunction with the serial number of the supplied unit
Device IP: It is possible to set the IP Address of the NetSPI 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.
SubNet Mask: Normally this should be left at 255.255.255.0, which will cover most applications.
[SAVE Configuration] New IP configuration will not take place until NetSPI has its power cycled (or by pressing REBOOT). Saving the configuration will write the Device IP and SubNetMask values to the NetSPI internal memory, so on next power-up the new settings will be used.

Art-Net Settings

These values can be configured to match the requirements of your system. There is a total of 256 Universe values for ArtNet II and 32,768 for ArtNet III.
Net: any value in the range 0-127
SubNet: any value in the range 0-15
Universe: (first output channel) any value in the range 0-14. The second output channel will automatically occupy the next Universe adjacent to the first output channel
[SAVE Configuration]: New ArtNet settings will take immediate effect after they are saved to the NetSPI internal memory.

LED Configuration

Number of Pixels per universe: Set this value to the number of Pixel-LEDs you will be connecting, it has a maximum of 170 for standard RGB LEDs
[SAVE Configuration]: New LED configuration settings will take immediate effect after they are saved to the NetWS internal memory

Pixel LED Test

Select one or more colour channels and press [TEST], the selected colour should be lit on ALL the LEDs, on both universes (if connected). To switch off a colour just Unselect it and press [TEST] again.

REBOOT DEVICE

Pressing [REBOOT DEVICE] will restart the NetSPI interface (a bit like cycling the power) and once again test for browser intervention (circulating symbol) before entering ArtNet streaming mode, indicated by 'A'. All newly saved settings (including IP values) will be used after reboot.

Private Wired Network Connection

It is highly recommended that you move the NetSPI away from your home network and onto a private wired network connected directly between your PC and the NetSPI device. Generally your home network (192.168.1.x) could have lots of traffic that could affect the consistency of ArtNet data, and may cause visual disturbances.

To move NetSPI to a direct-wired network follow these instructions (MS Windows):
Go to Control Panel, select Network and Internet, then select Network and Sharing Centre
In the left hand column, click on 'Change Adapter Settings'
'Local Area Connection' should be shown, double click on it
Under the 'Networking' tab, select the line that says 'Internet Protocol Version 4 (TCP/IPv4)'
Then click 'Properties'
Click the radio button beside 'Use the following IP address'
Enter your required IP address & Subnet mask (255.255.255.0) in the fields provided
NOTE : The IP Address entered here MUST match the NetSPI IP address for communications to work
Leave the DNS Settings blank, click OK then click Close
Plug in the NetSPI-340 (if you haven't already done so)

Pixel LED Connection

Connect a strip of WS/APA (or other SPI driven) LEDs to one of the two Colour-coded cables :
The cable with the BROWN Sleeve is the FIRST Universe, the cable with the RED Sleeve is the SECOND Universe
RED = 5V output BLACK = 0V/GND output GREEN = CLOCK/CLK output WHITE = DATA output

DO NOT connect a total of more than 10 Pixel-LEDs directly to the NetSPI outputs. The NetSPI device is only capable of driving 500mA when powered by the USB connection, 10 Pixel LEDs will consume 500mA when they are all on (producing white). For strips of MORE than 10 Pixel-LEDs **DO NOT** connect the RED wire of the connector, use a 5V external power supply capable of powering your LEDs instead. To calculate the power supply required, multiply the number of LEDs by 0.25 (each Pixel-LED draws 0.25W). For example 340 Pixel-LEDs will require 340x0.25W = 85W, therefore a 100W/5V power supply should be perfectly adequate.

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 NetWS device, by selecting it as an 'ArtNet' device type from the *'SetUp>OutputDevices'* menu
2. Ensure the Broadcast check box is not checked
3. Enter the IP number of your NetWS interface (as you have set in NetSPI config)
4. Select 512 channels, and set Net, SubNet and **First** Output Universe (as you have set in NetSPI config)
5. Click OK to save changes
6. For the **Second** Output Universe, add another device (as above) but with the NEXT Universe value. (the second Universe assumes it is one after the first Universe)
7. Design your matrix size and shape within *'SetUp>MatrixOptions'*
8. Patch your matrix to the NetSPI universe(s) within *'SetUp>OutputPatch'*. Be careful to select the correct colour order for your LEDs, (WS2801/03 are GRB, and NOT RGB) starting a channel zero.
9. Ensure BOTH universes are patched to different parts of the Matrix
10. *'SetUp>StartOutput'* to start the show.
11. Ensure NetSPI is in ArtNet-receive mode (no jumpers across JST outputs) this should be identified by a steady 'A' on the LED display.
12. Ensure your WS2801/03 LED strip/matrix is connected to the output(s) as detailed above
13. Once ArtNet data is being received the 'A' LED Display will flash. It will flash twice a second for TWO universes received, and Once a second for ONE universe received
14. Select the effect you want to see from the Channel Effects and have fun !

Multiple Universe Connections

If you have more than one universe of 170 RGB Pixels, the second universe will always be the Configured Universe PLUS ONE, so if you have the NetSPI configured to Universe0, then the BROWN output will be the FIRST Universe and the RED output will be SECOND Universe

Make sure you patch different device outputs to different areas of the overall matrix design. As an example, you could create a 26 wide by 13 high matrix, patch Universe0 to the left 13*13 array, and Universe1 to the right 13*13 array.

Multiple Device Connections

If required you can add several NetSPI to your network and have them controlled from the same application. Each NetWS would need to have a different IP address (x.x.x.1, x.x.x.2, x.x.x.3 etc) and be added to your application as a new device and patched accordingly into its own area of the matrix. Your Ethernet connection can be split into several outputs using a simple and inexpensive Ethernet 4 or 8 way switch.

ArtNet Unicast & Broadcast mode

It is recommended that Unicast mode is used when sending ArtNet data to the NetSPI. 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.

Pixel-LEDs that can be driven from the NetSPI-340

WS2801, WS2803, APA102, APA102C

Dimensions

Length : 68mm (plus output cables) – Width 24mm – Height 24mm

Software Compatibility

NetSPI-340 works with all free and commercial Art-Net compatible software. For free software, Jinx is highly recommended, visit http://www.live-leds.de/ for more information.

Firmware Upgrades

From time to time we may issue revised firmware for our products. The latest firmware can be uploaded to any of our products using the Xloader tool plus the latest HEX file for the product. Please ensure that the firmware file matches the product you are downloading to.

Xloader can be provided on request or downloaded from our website www.smartshow.lighting
Unpack the zip file and run the Xloader executable
Select the '…' browse button and navigate to the hex file, and select it
Select the device as 'NetWS/SPI/DMX ArtNet Interface'
Select the COM port which the NetWS is connected to (see Device manager/Com Ports/CH340 device)
Leave the BaudRate as 57600 and press UPLOAD
Once the upload is complete, there will be a notification

TroubleShooting Guide

I can't access the Configuration page from my browser:
Have you lost track of the IP ?
Has the IP been set but not connected to the correct network for that IP ?
Check the NetSPI LEDs to see status of connection - Green=LAN connected, Orange=IP traffic.
Is the IP address incorrectly entered into browser URL bar ?
The NetSPI interface may require power cycling, wait for the the circulating symbol to enter browser config mode.
If the Module doesn't have "C" indicated it is not in config mode;

My LED matrix/strips are flickering:
In your application, you may have more than two universes patched to one NetSPI devices IP.
Is the application running faster than 25fps ? try slowing to 25fps.
Are you using a home network that is very busy with internet/TV ? Try moving to a private network.

LED Display is flickering during Configuration mode:
It is possible that you are still streaming ArtNet and trying to run the NetSPI as a config server simultaneously.
Stop the stream of ArtNet data and the display should stop flickering.

There is No output to my LED strips:
Power supply to LEDs not switched on (check power across LED strip).
Host application Streaming not started, or device incorrectly patched on host software application.
Incorrect Net/Subnet/Universe entered into configuration, it must match those entered in host application.
NetSPI device is not in ArtNet mode; check display for 'A'.
- if solid then no matching ArtNet data is being received on the right IP and universe.
- if flashing then data is being received (once per second = One Uni, twice per second = Two Uni).
Check data connection between module and pixel strip/matrix.

There is still no output to my LED strips:
Are your LED strips actually SPI Driven ?
Perhaps they are damaged, try some more !

Technical Support

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