Introduction

NetWS-340 will drive up to two Art-Net/sACN Pixel Universes (340 WS2811/WS2812/WS2813/Neopixel Pixel-LEDs) over a wired Ethernet network. DMX Protocol Selection, Device IP, Art-Net/sACN Settings and LED configuration is adjustable directly from your Browser interface, a simple pixel test is included. Two 3-pin JST connections are provided for outputting the pixel data to the Pixel LED strips/matrix. Operational Mode is indicated by a simple 7 segment display. Product Firmware updates can be sent over USB, and a serial diagnostics interface has also been included.

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 Art-Net II & III and sACN (E1.31) decoding pixel data at 25fps typical
Power Input : 5V USB Powered, or **MAX 5V** external power applied to RED wire of 'Brown' 3-Pin JST Connector

Parts Supplied

NetWS-340 Interface, 2 x 3-Pin JST Plug/Cable, 1 x USB-MiniUSB cable (power, configuration & firmware upload)

Product & Pixel LED Connection

Connect a strip of WS2811 or WS2812 LEDs to the 3-pin JST connector. Most Pixel-LED strips come with this connector already supplied, if not then a female 3-pin JST connector is supplied with the kit. Use a 5V external power supply capable of powering your LEDs. 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.
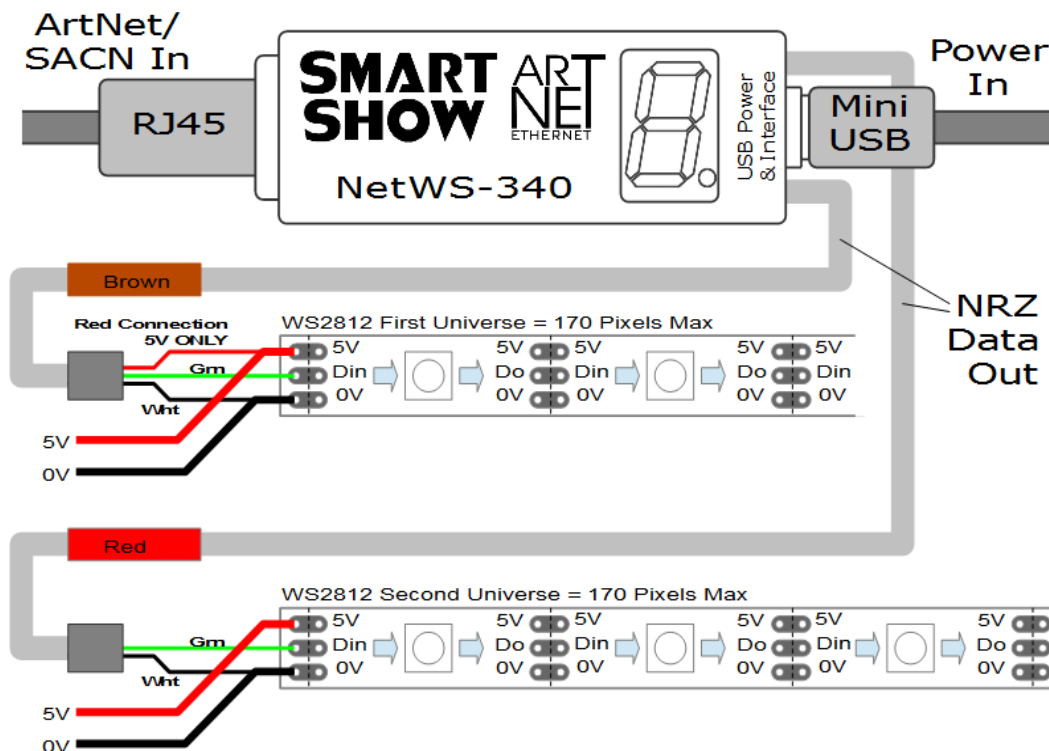
Powering Options

The NetWS-340 can be powered either from a USB power source, such as a quality mains-plug-in source (500mA min) or alternatively 5V power can be taken from the Pixel Strip supply, as long as 5V only is used. The Brown output JST connector has an additional Red wire available for this purpose. Applying more than 5V to the product in this way may cause damage internally.

LAN Ethernet Connection

The NetWS-340 can be configured for almost any IP setting, although a default IP of 192.168.1.200 is supplied with the unit. In general this will be a similar IP to your home router/hub, therefore the NetWS-340 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.

Device Configuration

It is possible to configure your device in one of two ways, either directly from your PC Browser (if you are on a 192.168.1.x network) or via a Serial Configuration using the USB connection, this is useful for directly setting to an alternative network.

Browser Configuration Mode

To access the browser configuration, the NetWS-340 must be put in Configuration mode. Configuration mode is available for the first 8 seconds after power up, during this time the devices IP address will be shown in the display. To activate Configuration mode you should open your PC browser (most browsers are supported) and type into the URL bar 192.168.1.200 and press return, hitting the return within the 8 second window will activate Configuration mode and will show a 'C' on the display (If you allow 8 seconds to elapse without any browser intervention then the NetWS-340 will go directly into Art-Net mode 'A', or sACN mode 'S'). As long as the PC and the NetWS-340 are connected to the same network at 192.168.1.200 the configuration interface should appear as follows:

Ethernet Settings & IP Configuration

Device IP: It is possible to set the IP Address of the NetWS-340 to almost any value, (Many Art-Net 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.
MAC Address: This is not adjustable and is a unique number created in conjunction with the serial number of the supplied unit
[SAVE] New IP configuration will not take place until NetWS-340 has its power cycled (or by pressing REBOOT). Saving the configuration will write the Device IP and SubNetMask values to the NetWS-340 internal memory, so on the next power-up the new settings will be used.

DMX Protocol

Select either Art-Net 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 NetWS-340.

Art-Net/sACN Settings

These values can be configured to match the requirements of your system. There are a total of 256 Universe values for Art-Net II and 32,768 for Art-Net III, and 63,999 for sACN
Net: any value in the range 0-127
SubNet: any value in the range 0-15
Universe: Art-Net : any value in the range 0-15 – sACN : any value in the range 1-15
Art-Net Node Name *(Art-net only)*: each NetWS-340 can be numbered (0-255) so it can be identified easily on a network with ArtPoll
[SAVE]: New Art-Net/sACN settings will take immediate effect after they are saved.

Pixel LED Test

Buttons have been provided for testing connected Pixel LEDs, both output connections are tested at the same time. Pressing **RGB-[1]**,**[2]** or **[3]** will test individual RGB channels. Pressing **RGBW-[1]**,**[2]**,**[3]** or **[4]** will test individual RGBW channels. Pressing **[OFF]** will clear all colour channels.

Pixel Colour Order

In general the default is GRB(W) which covers GRB & GRBW Pixels. If your application sends data out in RGB order, then select RGB for 3 colour Pixels, or RGBW for 4 colour pixels.

REBOOT DEVICE

Pressing [REBOOT DEVICE] will restart the NetWS-340 interface (a bit like cycling the power) and display the devices IP Address before entering Art-Net/sACN streaming mode, indicated by 'A' or 'S'. All newly saved settings (including IP values) will be used after reboot.

Private Wired Network Connection

It is highly recommended that you move the NetWS-340 away from your home network and onto a private wired network connected directly between your PC and the NetWS-340 device. Generally your home network (192.168.1.x) could have lots of traffic that could affect the consistency of Art-Net/sACN data, and may cause visual disturbances.

To move NetWS-340 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 (eg 255.255.255.0) in the fields provided
NOTE : The IP Address entered here MUST match the NetWS-340 IP SUBNET for communications to work
Leave the DNS Settings blank, click OK then click Close
Plug in the NetWS-340 (if you haven't already done so)

Serial Configuration Mode - Set-Up

Firstly, you will need to install the correct CH340 serial driver for the NetXX devices these can be found at :
Windows 7 - http://www.arduined.eu/tag/windows-7/
Windows 8 - http://www.arduined.eu/ch340-windows-8-driver-download/
Once installed, connect the NetWS-340 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/CH340 device)
If you havent already got a Serial Communications application, we recommend HTComm for simplicity.
You can find HTComm at http://www.hobbytronics.co.uk/ht-comm
Set the **PORT number** to the ComPort that the NetWS-340 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, the NetWS-340 must be put into Configuration mode. Configuration mode is available for the first 8 seconds after power up, this is shown as the devices IP address on the LED display. To activate Configuration mode you should type '?' in the HTComm chat window and press return, hitting the return within the 8 second window will activate Configuration mode and will show a 'C' on the display (If you allow 8 seconds to elapse without any user intervention then the NetWS-340 will go directly into Art-Net mode 'A' or sACN mode 'S'). In response to sending a '?' the device will respond with its Device Settings, and a Function Guide:

```
*********** DEVICE SETTINGS **********
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  Art-Net
Pixel Order   GRB(W)
*********** FUNCTION GUIDE ***********
'i192.168.1.200<CR>'   Change local IP
's255.255.255.0<CR>' Change SubNetMask
'u0<CR>'              Change Start Uni
'a<CR>'          Change to Art-Net Mode
'e<CR>'       Change to sACN(E1.31) Mode
'r<CR>'                  Reboot device
'?<CR>'          Display settings & help
'$RESET<CR>'    Reset Defaults & Reboot
***(ensure <CR> is enabled on send)***
```

For example, pressing 'i2.0.0.1' and pressing return will change the device IP to 2.0.0.1
Changes can be made to IP, SubNetMask, Starting Universe, DMX protocol and LED Configuration.
For more information see 'Browser Configuration'

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-340 device, by selecting it as an 'Art-Net or sACN' device type from the *'SetUp>OutputDevices'* menu
2. Ensure the Broadcast check box is not checked
3. Enter the IP number of your NetWS-340 interface (as you have set in NetWS-340 config)
4. Select 512 channels, and set Net, SubNet and **First** Output Universe (as you have set in NetWS-340 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) – Note : sACN starts at universe ONE
7. Design your matrix size and shape within *'SetUp>MatrixOptions'*
8. Patch your matrix to the NetWS-340 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.
9. Ensure BOTH universes are patched to different parts of the Matrix
10. *'SetUp>StartOutput'* to start the show.
11. Ensure NetWS-340 is in Art-Net/sACN mode this should be identified by an 'A' or 'S' on the LED display.
12. 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 used.
13. Once Art-Net/sACN data is being received the 'A' or 'S' 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, 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 NetWS-340 to your network and have them controlled from the same application. Each NetWS-340 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.

Using RGBW (4-colour) LEDs

    The NetWS-340 is able to output data to either RGB or RGBW Leds (depending on your host application). RGB LEDs use 3 channels per pixel and RGBW LEDs use 4 channels per pixel. Since RGBW uses 4 channels and there is a maximum of 512 channels per universe on Art-Net/sACN/DMX, the maximum number of Pixel-LEDs that can be connected to one universe is 128. Ensure you select the correct Pixel Colour Order from within the browser Configuration.

Art-Net/sACN Unicast, Multicast & Broadcast mode

    It is recommended that Unicast mode is used when sending Art-Net/sACN data to the NetWS-340.
    Art-Net Broadcasts are also accepted, but not recommended

Art-Net Device Discovery & DHCP

    There is the 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 NetWS-340

    WS2811, WS2812, WS2813, UCS1903, UCS2903, TM1804, SK6812

Dimensions

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

Software Compatibility

    NetWS-340 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 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 Art-Net Interface'
      Select the COM port which the NetWS-340 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

Additional Software

    On request we can supply an alternative version of NetWS-340 software that will output both universes into ONE output, thus enabling 340 Pixel-LEDs to be connected in one long string. This version of software does not have the Browser Configuration Interface, but just uses a simple Serial Configuration Interface.

Power Supply

    It is recommended that you use a quality USB power source with this product, a mains plug-in variety is best, and it is good to avoid using a phone charger type as these generally have weak current supply

Technical Support

email : sales@smartshow.lighting

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