Introduction

NetSERVO is an Art-Net/sACN(E1.31) to Dual Servo interface. It is capable of creating two separate Servo outputs from Art-Net/sACN data over a wired Ethernet network. Device IP, Art-Net/sACN, and Servo channel select are adjustable directly from your Browser interface, or from a USB/Serial Application. Two 3-way JST output plugs are provided to connect directly to your target Servos. The Servos can be standard movement of up to 180°, or continuous rotation (360°) types. Min & Max pulse durations can be set to suit specific servos, and a simple servo test is also included. Operational Mode is indicated by a simple 7 segment display.

Specifications

IEEE 802.3 compatible Ethernet Controller, Integrated MAC and 10BASE-T
Browser Configuration Server and UDP Client modes
Isolated RJ45 Ethernet Connection
Single Universe Art-Net II & III and sACN E1.31 decoding DMX512 data to Servo pulses
Servo Timing (adjustable) : Default 1ms=100% CCW, 2ms=100% CW, and 1.5ms=50% position (relating to DMX values 0-255)

Parts Supplied

NetSERVO Interface, 1 x USB-MiniUSB cable (for power, config & firmware upload), 1 x Ethernet Cable, 2 x 3Pin JST cable

Product Connections

There are two 3-pin JST connectors, one is marked with a BROWN tag (output A) and the other with a RED tag (output B)
The BROWN (output A) cable :
White = Common Ground – Connect to Servo Ground
Green = ServoA output
Red = 5V-6V Power input for the NetSERVO
The RED (output B) cable :
White = Common Ground (must be connected to the ground of your servo)
Green = ServoB output

LAN Ethernet Connection

The NetSERVO can be configured for almost any IP setting, although a default IP of 192.168.1.206 is supplied with the unit. In general this will be a similar IP to your home router/hub, therefore the NetSERVO 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 NetSERVO must be put into CONFIGURATION mode. Configuration mode is available at any time if there is no Live data being sent to the device. To activate Configuration mode you should open your PC browser (most browsers are supported) and type into the URL bar 192.168.1.206 and press return, the display will show a 'C' and serve the page to your browser. (At all other time the NetSERVO will go directly into Art-Net mode 'A' or sACN mode 'S'). As long as the PC and NetSERVO are connected to the same network at 192.168.1.206 the configuration interface should appear as follows:

Ethernet Settings & IP Configuration

Device IP: It is possible to set the IP Address of the NetSERVO 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 device.
[SAVE] New IP configuration will not take place until NetSERVO has its power cycled (or by pressing REBOOT). Saving the configuration will write the Device IP and SubNetMask values to the NetSERVO internal memory, so on 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
[SAVE] New DMX Protocol settings will take immediate effect after they are saved to the NetSERVO.

Art-Net/sACN Settings

These values can be configured to match the requirements of your system. There is a total of 256 Universe values for Art-Net II and 32,768 for Art-Net III, and 63,999 for sACN
Net: (Art-Net only) any value in the range 0-127
SubNet: (Art-Net only) any value in the range 0-15
Universe: Art-Net : any value in the range 0-15 – sACN : any value in the range 1-32767
[SAVE]: New Art-Net/sACN settings will take immediate effect after they are saved.

Servo Settings

Servo Channels: The DMX channels correlating to ServoA output and ServoB output can be entered here
Min & Max (us): The minimum and maximum pulse times can be adjusted to suit your servo
[SAVE] Saves this setting which will take immediate effect

Servo Test

A simple Servo test has been included which will drive both servos to min, mid or maximum position

REBOOT DEVICE

Pressing [REBOOT DEVICE] will restart the NetSERVO interface (a bit like cycling the power) and display the Devices IP address before entering Art-Net streaming mode (indicated by 'A') or sACN streaming mode (indicated by '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 NetSERVO away from your home network and onto a private wired network connected directly between your PC and the NetSERVO 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 disturbances within your DMX/Servo data.

To move NetSERVO to a direct-wired network follow these instructions (MS Windows):
Go to Control Panel, select Network and Internet, then select Network and Sharing Center
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 NetSERVO subnet IP address for communications to work
Leave the DNS Settings blank, click OK then click Close
Plug in the NetSERVO (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 NetSERVO 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 NetSERVO 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 NetSERVO must be put into Configuration mode. Configuration mode is available only when there is no DMX data being streamed to the device. To activate Configuration mode you should type '?' in the HTComm chat window and press return and a 'C' will be shown on the display. In response to sending a '?' the device will respond with its Device Settings, and a Function Guide:

```
********* SmartShow NetServo *********
Device IP    192.168.1.206
*********** FUNCTION GUIDE ***********
'i192.168.1.206<CR>'   Change local IP
'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

Multiple Device Connections

If required you can add several NetSERVO to your network and have them controlled from the same application. Each NetSERVO 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. Your Ethernet connection can be split into several outputs using a simple and inexpensive Ethernet 4 or 8 way switch.

Art-Net/sACN Unicast, Multicast & Broadcast mode

It is recommended that Unicast mode is used when sending Art-Net/sACN data to the NetSERVO.
Limited & Directed Broadcasts are also accepted. SACN Multicast is not supported

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.

Dimensions

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

Software Compatibility

NetSERVO works with all free and commercial Art-Net/sACN(E1.31) compatible software.

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 NetSERVO 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

NOTE : Do not attempt to run XLoader and HTComm simultaneously.

Technical Support

email : sales@smartshow.lighting

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