Nucleus²

User Guide

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Introduction

Nucleus²

Welcome to Nucleus², SSL's integrated DAW controller and soundcard for the Dante audio-over-IP network. Nucleus² allows you to record audio and monitor your studio software through SSL's legendary analogue circuitry and converters, while placing full control of your session underneath your fingertips. While the basic configurations created by SSL's studio engineers allow you to get working with Nucleus² straight out of the box, the functions assigned to much of the control surface can be adapted to suit the specifics of your working environment, as configured within the Nucleus² Logictivity Remote software.

DAW Control Principles

A DAW controller is part mixing console and part computer keyboard. It is a mixing console insofar as it uses channel strips and faders etc. to mix and manipulate audio. It is a computer keyboard insofar as, rather than affecting any audio electronics within it, it simply sends (and receives) commands to a computer program.

Of course, Nucleus²'s two analogue channels makes it more than a DAW controller.

Nucleus² can be used to control DAW software using either HUI or MCU protocols. These are the standardised control 'languages' used by the majority of DAW software on the market today: HUI is used by ProTools, MCU by Logic and Nuendo. Please refer to your DAW software's user guide if you are unclear which protocol you use.

The Nucleus² control surface also replicates a number of computer keyboard keys, such as modifiers (<Shift>, ⌘ or 'command', <Ctrl>, <Alt>), <Enter> and <Esc> keys, and shortcuts such as 'Save' and 'Undo'. Nucleus² uses two connections to control DAW sessions: ipMIDI (a conventional MIDI signal, sent over Ethernet) for HUI or MCU control, and USB for standard keyboard commands.

Using Nucleus²'s Layer structure, different DAW programs can be connected simultaneously, although only one can be controlled at one time.

Because each DAW is different and the precise application of HUI and MCU protocols is specific to the DAW software being used, this manual does not provide detailed descriptions of specific DAW operations. Please refer to your DAW User Guide for information about how to apply the control offered by Nucleus².

HOW TO USE THIS MANUAL

After this introduction, you will find a quick overview of Nucleus², followed by more detailed sections covering installation, use of the Nucleus² Logictivity Remote, and general Nucleus² operation.

Conventions

Throughout this manual, the following conventions will be used:

- Labels found on the Nucleus² control surface are indicated in capitals **LIKE THIS**.

- Labels and text shown in the Nucleus² Remote or other computer dialogues are indicated in bold **Like This**.

- The few instances where we refer directly to computer filenames etc. will be shown `Like This`.

- Where necessary, DAW computer keyboard key strokes will be shown `like this` whilst function keys (as opposed to normal numbers, symbols and characters) such as the 'Control' key will be shown with 'angle' brackets such as `<Ctrl>`.

- Where DAW protocol commands appear, the command or function will be shown with 'curly' brackets `{like_this}`.

Notes and additional information appear like this.

- The Nucleus² Logictivity Remote app will in some cases be abbreviated to just 'Remote'.

- The Nucleus² itself may be refered to either by name, as the 'DAW controller' or as the 'control surface'.

Please be aware that screenshots shown may differ slightly in appearance from their on-screen equivalents.

Glossary

The following terms are either concerned with general DAW control, or specific Nucleus² operations:

CC Layer	A Continuous Controller ('CC') Profile for use with MIDI devices.
Dante	Digital Audio Network Through Ethernet. A combination of software, hardware, and network protocols that deliver uncompressed, multi-channel, low-latency digital audio over a standard Ethernet network.
DAW	Digital Audio Workstation. Software which emulates a recording studio, such as ProTools, Logic and Nuendo.
ipMIDI	MIDI control data sent over Ethernet.
HUI	Human User Interface. The DAW control protocol used by ProTools and others.
Layers	Different DAW programmes, one of which can be controlled by Nucleus² at a time, though all transports can be activated simultaneously from one transport master.
MCU	Mackie Control Unit. The DAW control protocol used by Logic, Nuendo and others.
SD Card	An SD memory card fitted to the rear of Nucleus² for Profile storage.
Soft Keys	Many switches on Nucleus² can be programmed through the Nucleus² Remote to perform DAW specific functions. These switches are grouped together as 'soft key sets'.
USER	The **USER 1** and **USER 2** switches located in the centre section area of Nucleus² are used to apply soft key sets to the switches above and below the scribble strip displays.
V-Pot	In-channel rotary encoder used to control a variety of parameters. The V-Pot is located below the digital display.
V-Sel	In-channel encoder switch, used to control a variety of parameters, often associated with the V-Pot. The switch is activated by pressing the V-Pot. Note that the **V-SEL** switch is different from the channel select (**SEL**) switch.

Software Versions

The information in this manual is correct for Nucleus² software V2.0/1 or greater, Nucleus² firmware V2.0/0 or greater and Nucleus² Browser V2.0/0 or greater.

Help!

Should you require assistance with Nucleus² that is not addressed by this manual, please refer to the Support pages of the SSL Website at www.solidstatelogic.com/support/Nucleus2 and click on 'Ask a Question' to get in contact with us.

1. Nucleus² Overview

The diagrams below and overleaf provide an overview of the Nucleus² control surface along with the main **DAW** screen of the Nucleus² Remote.

CHANNEL STRIP AND MODE SWITCHES

Channel meter and record status indicator

Mode Switches
The Mode switches are not part of the channel in which they are located. In normal operation, they select V-Pot modes. By default only Mode switches 1-8 are assigned. Note that the V-Pot modes are printed beneath the switches, and not shown in the digital display.
When the **USER** switches in the centre section are pressed, the Mode and V-Sel switches in channels 9-16 become soft switches (**Soft Keys**) which can be configured using the Nucleus² Remote.

CHAN 1 CHAN 2 CHAN 3 CHAN 4 CHAN 5 CHAN 6 CHAN 7 CHAN 8

Channel Cut and Solo switches

Channel Select switch.
Also used for track arming, automation and plug-in control.

V-Pots and V-Sel Switches
- Turn for the V-Pot
- Press for the V-Sel switch
Functions are defined by the host application, or by pressing a Mode switch.
When the centre section **USER** switches are selected, Mode and V-Sel switches in channels 9-16 become additional soft switches.

2-Row 'Scribble Strip' Display
In normal operation, the top row displays the channel name and the bottom row the V-Pot function.
When the centre section **USER** switches are selected, the digital display on channels 9-16 shows the soft key assignments for each corresponding Mode and V-Sel switch.

Channel Fader

CENTRE SECTION AND ANALOGUE CONTROL

USER Soft Key Set selectors

DAW Channel Control modifiers

*DAW Computer modifier keys *

Channel/Bank scrollers

* *Transport Control*

Analogue Control: Monitoring and Mic inputs

* *Global DAW Control keys*

Additional DAW Layer Selectors

Note
The function of switches in areas with asterisks are defined in the Nucleus² Remote.
(Default functions are shown.)

Nucleus² REMOTE

Defines which layer is being edited in the Remote

Defines the DAW being controlled

Selects soft key sets for the Soft Key Setup display

Soft Key Setup

Select **DAW** to view or edit Nucleus² setup

Defines default function of Jog Wheel

Enables single-letter automation display

Defines which DAW is transport master

2. Nucleus² Configurations

Connection of Nucleus² to a Dante network requires the following:

- An Ethernet connection between either of Nucleus²'s Ethernet ports and the DAW computer(s) – *for DAW control, the Nucleus² Remote and Dante Standard Audio, if applicable*
- A USB connection between Nucleus² and the host DAW computer(s) – *for DAW keyboard commands*
- Audio connections – *for recording sources plus monitoring*

The way in which audio is sent between Nucleus² and the host DAW computer is dependant on the connectivity options associated with the DAW(s) being used. The rest of this section describes the installation and connections involved in each option.

DAWs With a Dante Network Connection

For software which can send and receive audio via any soundcard connected to the computer, Nucleus² can be connected directly to the DAW using the Ethernet connection.
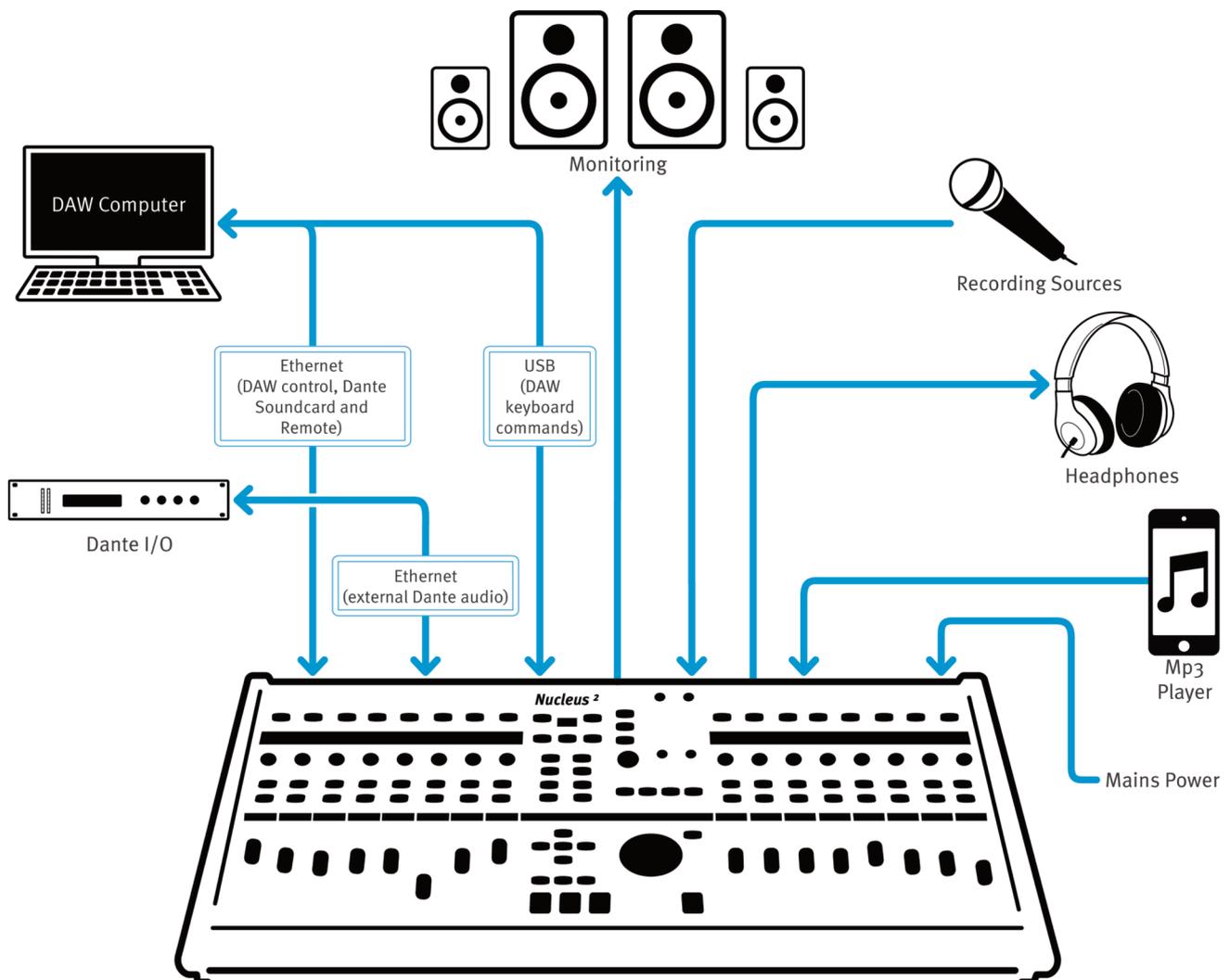
DAWs With Proprietary Soundcards

Some DAWs can only receive audio via their own proprietary soundcard hardware. Many of these soundcards provide digital (S/PDIF) connections, allowing you to take full advantage of the SSL quality pre-amps and converters. The two Nucleus² input channels are sent using the left and right channels of the S/PDIF Out, and the S/PDIF In feeds the monitor inputs.

*If your S/PDIF connections are coaxial (usually using phono sockets), simple coaxial to optical S/PDIF converters will be required to connect the soundcard digitally to the Nucleus² **PRE** (pre-amp) outputs.*

Using Nucleus²'s Digital IO
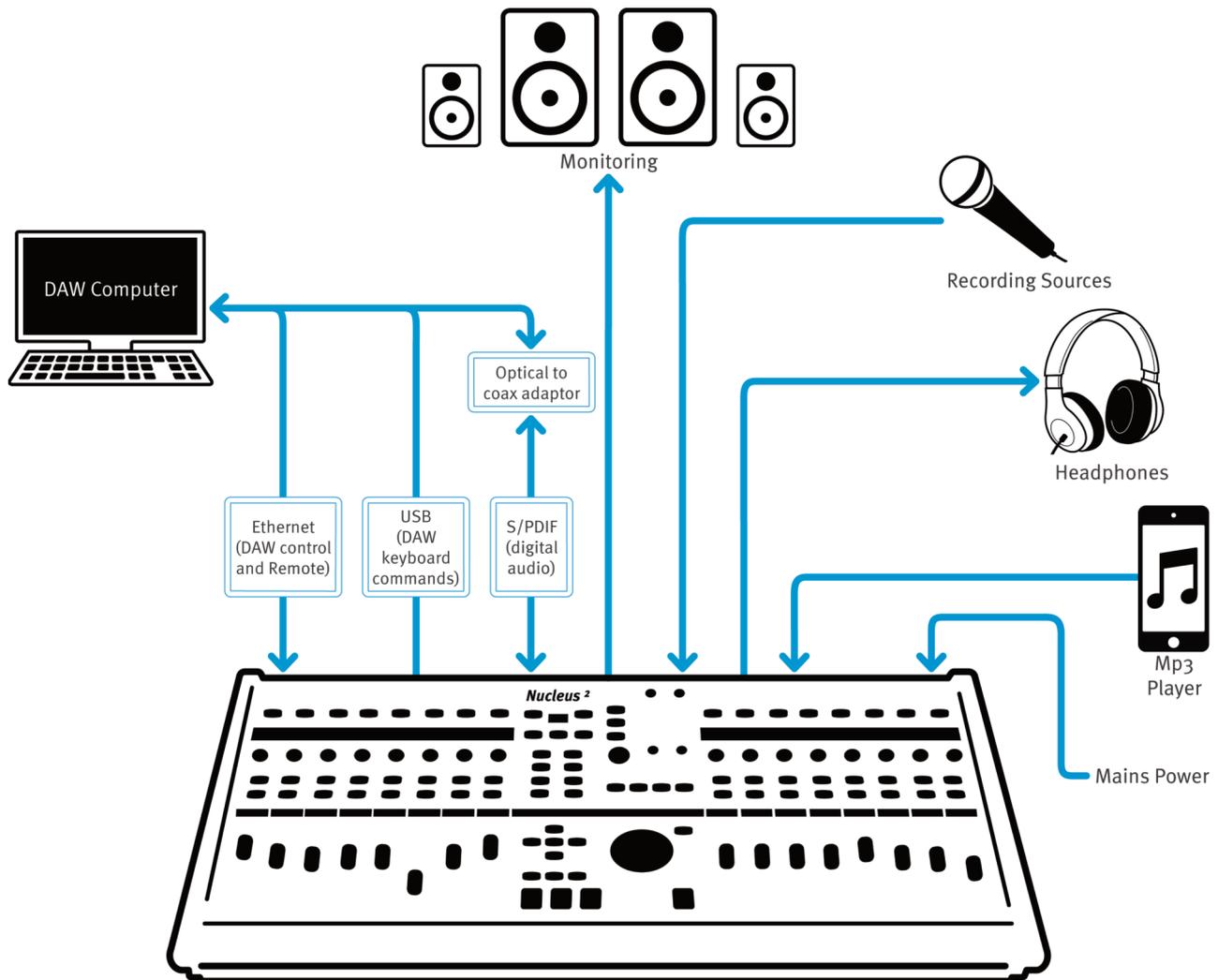
Using Nucleus²'s Analogue IO

For soundcards which don't have digital IO, line-level analogue connections allow you still to make use of Nucleus²'s SSL pre-amps. Nucleus² **PRE** (Pre-Amp) outputs and **EXTERNAL** monitor inputs can be used to connect Nucleus² to the soundcard inputs and outputs. (Note that the PRE amp outputs are sourced from the pre amp's Insert Send, so are always active.)
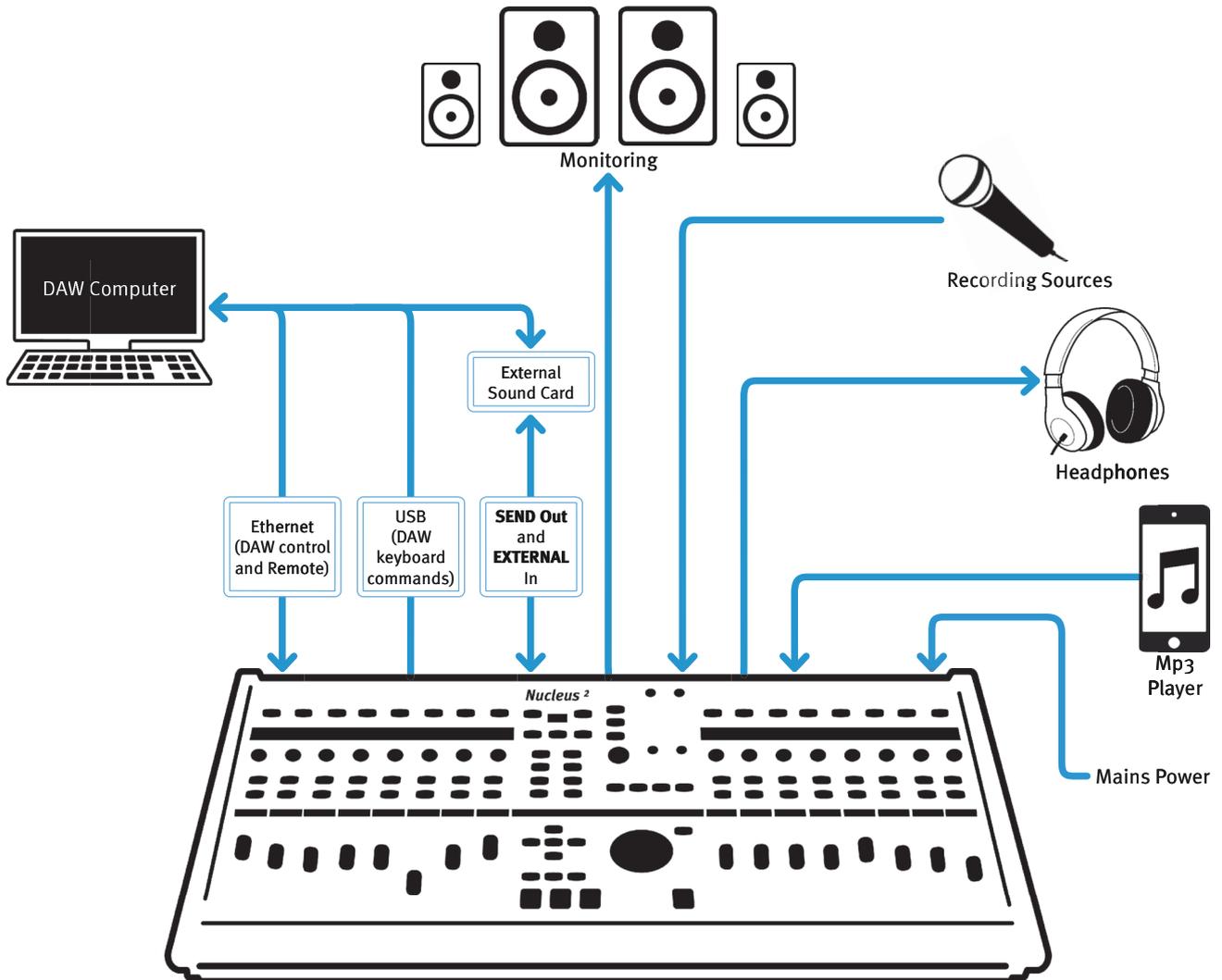
Multiple DAWs

Up to three DAW applications on up to three computers can be connected to Nucleus² simultaneously, as described on Page 14. This configuration requires both a Network Router and USB switcher.
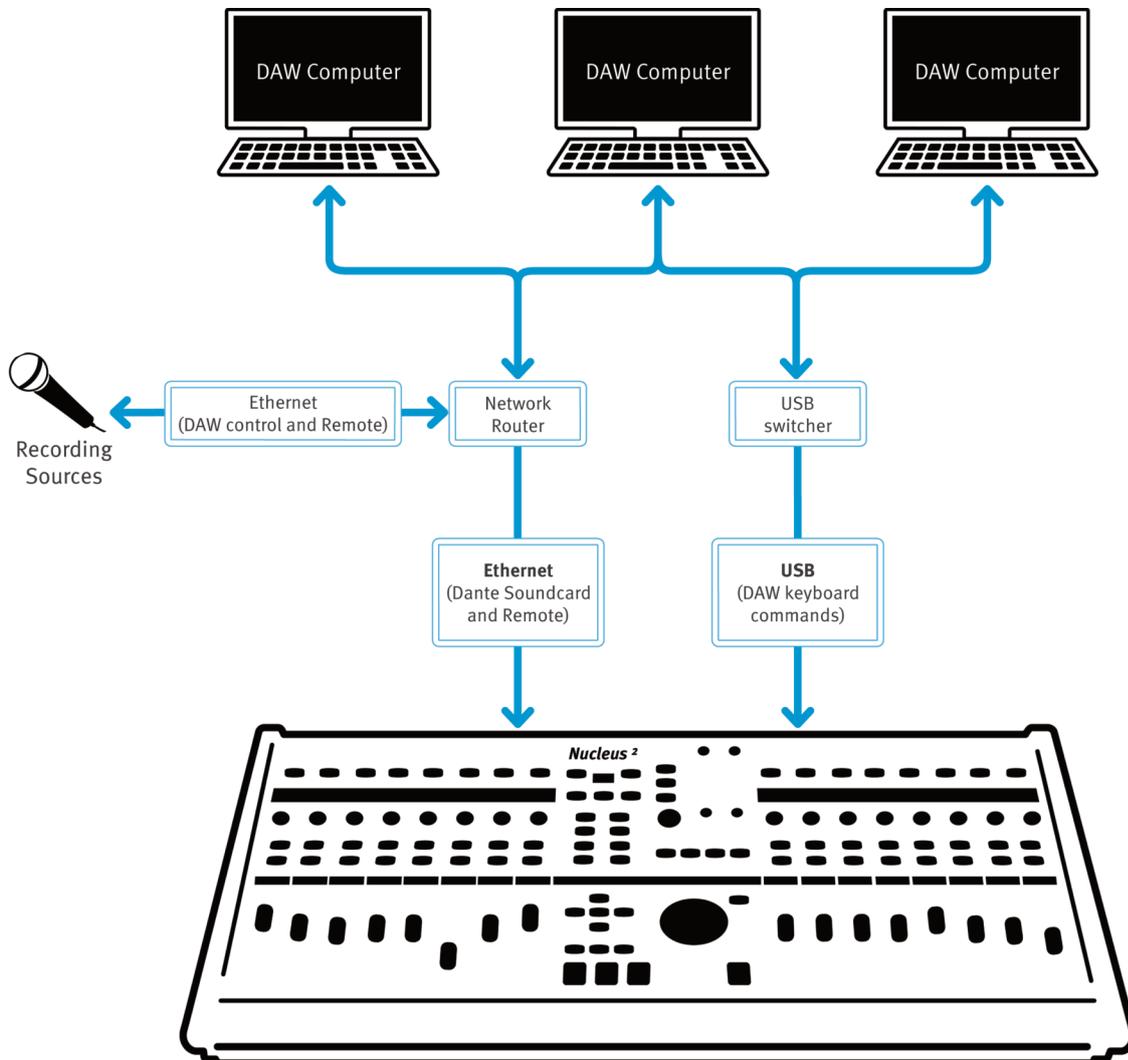
3. Software Installation

In order for Nucleus² to integrate into your working environment, it will be necessary to install drivers and supporting software on your DAW computer(s) and/or studio computer(s). The following computers and operating systems are supported:

Mac
- Intel Core2 Duo, 1.2GHz or faster
- OS X Version 10.8.5 'Mountain Lion' or greater

Windows
- 1.2GHz or faster
- Windows 7, 8, 8.1 and 10 (32 or 64bit)

For all computers, the following resources are required:
- 4GB RAM
- 15MB Hard Disk space
- Internet connection *(for product registration and software download)*

*The **ipMIDI** and Dante Virtual Soundcard software will be required for one or more DAW computers, **Nucleus² Remote** can either be installed onto one of the DAW computers or onto an entirely different computer if required.*

Software Installation – Mac

1. Go to www.solidstatelogic.com, click 'Register' in the top right-hand corner, and create an SSL account. If you already have an SSL account, please login.

2. Click on your Username in the top right-hand corner of the website, then go to 'My Products', and click 'Register a product'. Select 'Nucleus', enter your console serial number, and click 'Add'.

3. Click on the 'Downloads' link that will appear next to your registered Nucleus² console, and download the latest support file for your OS.

Dante Virtual Soundcard

To install the **Dante Virtual Soundcard** application:

- To obtain a **Dante Virtual Soundcard license**, go to www.audinate.com. Click 'Register' in the top right hand corner and create an Audinate account. If you already have an Audinate account, please login.

- Click on your 'My Account' in the top right-hand corner and go to 'My Products'. Beneath 'Redeem a Software token', enter the **Dante Virtual Soundcard token** included in the Nucleus² packaging, and submit.

- A **DVS license code** will now appear in your account – make note of this license code.

- Run the `DVS-3.10.1.1_macos.dmg` installer to install **Dante Virtual Soundcard** in the Applications Folder.

- Open the Applications folder, and double-click the **Dante Virtual Soundcard** icon. Click on **Licensing**, and enter the license that was generated in your Audinate account. To find this again, go to www.audinate.com, login, and go to **My Products**.

- To uninstall Dante Virtual Soundcard simply drag the application to the **Trash**.

Dante Controller

- To install Dante Controller, run the `DanteController-3.10.2.3_osx.dmg` installer. The installer will place the Dante Controller app in the Applications folder.

- If it becomes necessary to uninstall Dante Controller, simply drag the application folder to the **Trash**.

Nucleus² Remote

- To install **Nucleus² Remote**, simply drag the **Nucleus² Remote** icon to the **Applications** folder alias. This will copy the application onto the computer.

- To run **Nucleus² Remote**, locate and double-click the **Nucleus² Remote** icon in the **Applications** folder. If required, drag this icon to the **Dock** on the **Desktop** to provide quick and easy access.

- If it is necessary to uninstall **Nucleus² Remote**, simply locate the **Nucleus² Remote** icon in the **Applications** folder and drag it to the **Trash**.

ipMIDI Driver

*If an older version of the **ipMIDI** driver is already present on the computer, it must be removed prior to running the installer; simply delete the `ipMIDIDriver.bundle` file from the `/Library/Audio/MIDI Drivers` folder.*

- To install the **ipMIDI** driver, locate the **ipMIDI** package in the **Finder** window. Double-click this icon to launch the ipMIDI installer. Follow the instructions in the installer (it should be safe to accept the defaults).

It will be necessary to log out and back in again after the driver has been installed.

- To uninstall the **ipMIDI** driver, simply delete the `ipMIDIDriver.plugin` file from the `/Library/Audio/MIDI Drivers` folder.

Software Installation – Windows

1. Go to www.solidstatelogic.com click 'Register' in the top right-hand corner, and create an SSL account. If you already have an SSL account, please login.

2. Click on your Username in the top right-hand corner of the website, then go to 'My Products', and click 'Register a product'. Select 'Nucleus', enter your console serial number, and click 'Add'.

3. Click on the 'Downloads' link that will appear next to your registered Nucleus² console, and download the latest support file for your OS.

Dante Virtual Soundcard

To install the **Dante Virtual Soundcard** application:

- To get a **Dante Virtual Soundcard license**, go to www.audinate.com. Click 'Register' in the top right hand corner, and create an Audinate account. If you already have an Audinate account, please login.

- Click on your 'My Account' in the top right-hand corner, and go to 'My Products'. Beneath 'Redeem a Software token' enter the **Dante Virtual Soundcard token** included in the Nucleus² packaging, and submit.

- A **DVS license code** will now appear in your account – make note of this license code.

- Run the `DVS-3.10.1.1_windows.exe` installer to install **Dante Virtual Soundcard**.

- Open Dante Virtual Soundcard from the Desktop icon. Click on **Licensing**, and enter the license that was generated in your Audinate account. To find this again, go to www.audinate.com, login, and go to **My Products**.

- To uninstall Dante Virtual Soundcard run the **Uninstall** application located in the Dante Virtual Soundcard folder.

Dante Controller

- To install **Dante Controller**, run the `DanteController-3.10.2.4_windows.exe` installer.

- If it becomes necessary to uninstall Dante Controller, run the **Uninstall** application located in the Dante Controller folder.

Nucleus² Remote

- To install **Nucleus² Remote**, locate the **Nucleus² Setup** application and double-click this file to run the Nucleus² Remote installer. Follow the instructions in the installer (it should be safe to accept the defaults).

- On completion of the installation process, the installer will place a shortcut on the **Desktop**; double-click this icon to run **Nucleus² Remote**.

- The **Nucleus² Remote** can be un-installed by running the **Uninstall** application located in the Nucleus² Remote folder.

ipMIDI Driver

*If an older version of the **ipMIDI** driver is already present on the computer, it should be uninstalled (using **Add/Remove Programs**) before running the installer.*

• To install the **ipMIDI** driver, locate the **ipMIDI Setup** application and double-click this file to launch the ipMIDI installer. Follow the instructions in the installer (it should be safe to accept the defaults).

It will be necessary to restart the computer after the driver has been installed.

• To remove the **ipMIDI** driver, simply run the **Uninstall** application located in the ipMIDI folder.

USING THE DANTE INTERFACE ON NUCLEUS² WITH AN EXISTING I/O SETUP

There are several ways to integrate the Nucleus² mic pre's & monitor section with an existing sound card setup.

On pages 6&7 there are example setups that use the Nucleus² optical SPDIF and analogue I/O for connecting an external sound card; an alternative is to use **Dante Via**.

Dante Via is a software that allows you to route audio sources on your computer to the Dante network (and therefore to the Nucleus² Dante soundcard). The example below shows how Pro Tools I/O can be used alongside Nucleus²; outputs 1 and 2 of Pro Tools are going to Dante Via, and routed using Dante Controller to the Nucleus² monitoring section. The Nucleus² outputs 1 and 2 (from the SuperAnalogue mic pre's) are routed over Dante to Dante Via, which routes them to inputs 1 & 2 of Pro Tools.
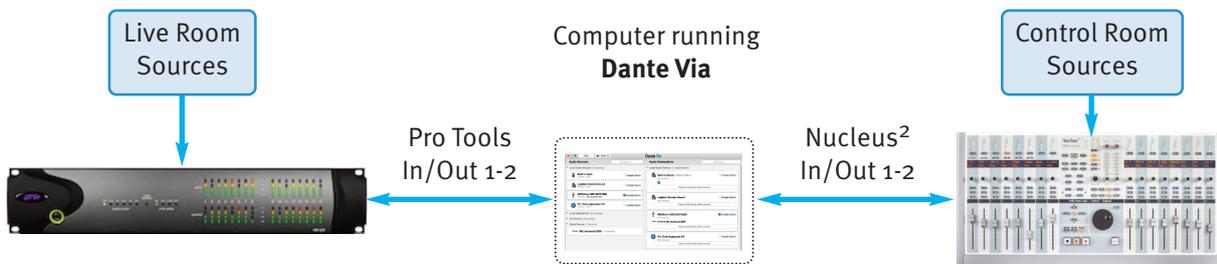
Dante Via Install and Setup

1. Go to www.audinate.com

2. Go to **Products › Dante Via**

3. Click on **Buy Dante Via**, select your OS from the dropdown menu, then click and download the installer. At this point you can purchase a Dante Via license, or use the free trial.

4. Run the Dante Via installer and open the software – *please note that you will need to 'stop' Dante Virtual Soundcard, if it is already running*.

You will also need to install Dante Controller – instructions on how to do this can be found on pages 10&11.

Configuration

On the left side of the Dante Via window is a list of Audio Sources, and on the right Audio Destinations.

1. Under the Audio Sources list, click **Enable Dante** for the soundcard you wish to connect to the Dante network.

2. Under the Audio Destinations list, click **Enable Dante** for the soundcard you wish to connect to the Dante network. The soundcard will now be available on the Dante network, and visible in Dante Controller.
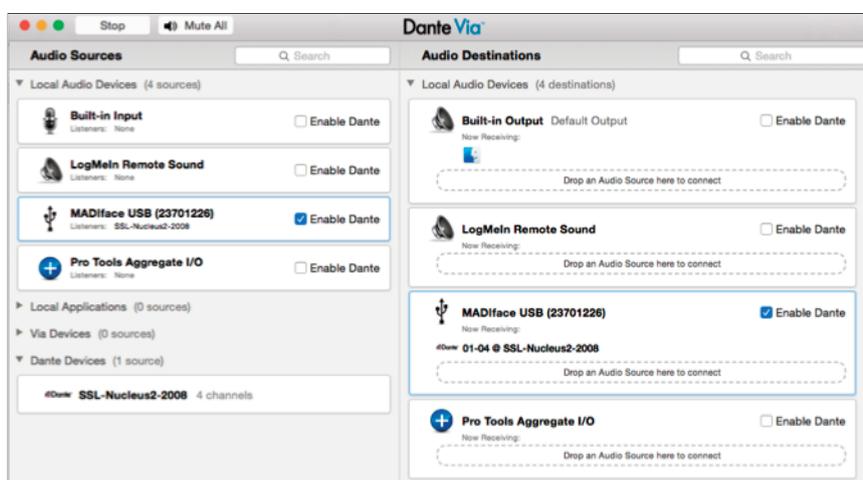
3. Go to Dante Controller and make the audio routes between your soundcard and Nucleus². To do this, expand the transmitter/receiver I/O by clicking on the '+' signs, then click on the channel cross-points to route your soundcard channels to Nucleus2 and vice-versa (as shown below).
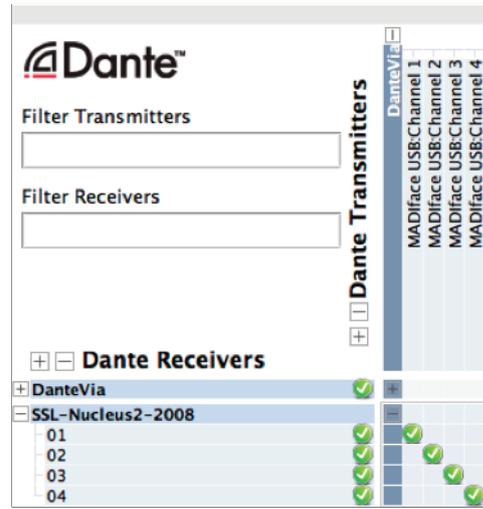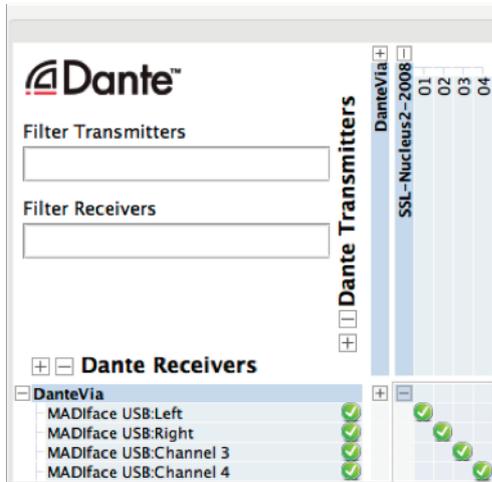
4. Connection and Software Configuration

PHYSICAL CONNECTIONS

The Installation Guide that came with Nucleus² contains important safety information. Please be sure to read that guide before attempting to connect Nucleus².

The mains power connection for Nucleus² is via a standard 3-pin IEC320 power cable into its external power supply. The following audio and data connections can be found on the Nucleus² back panel:

Audio Connections

PRE 1 IN, PRE 2 IN   Combi inputs for Nucleus² pre-amps 1 and 2, XLR connections are routed via the pre-amps; plugging in a 1/4" jack will automatically select the high input impedance on the channel strip.

SEND/RETURN 1 and **2**   Balanced 1/4" jack Insert Send and Return connections for pre-amps 1 and 2. *(The Sends also function as balanced Mic-pre outputs)*

Inserts can also be used on the monitor circuits – see Page 42 for details.

EXTERNAL L and **R**   Balanced XLR input for connecting an additional stereo signal to the Nucleus² monitoring

MONITOR L and **R**   Balanced XLR outputs for connecting the Nucleus² monitoring to a pair of loudspeakers

MINI L and **R**   Balanced XLR outputs for connecting Nucleus² to an auxiliary pair of loudspeakers

HEADPHONES   1/4" stereo headphone connections. Both sockets send identical signals

TALKBACK IN   Balanced XLR input for talkback; with adjustable gain

IJACK   3.5mm stereo jack input provides an additional source into the monitoring and headphone sends

SPDIF   Optical S/PDIF stereo IO. The outputs of the Nucleus² pre-amps feed the S/PDIF output (channel 1 is left, channel 2 is right) and the S/PDIF inputs feed the External monitor connection

Data Connections

Both Network and USB connections must be made between Nucleus² and the DAW computer(s) – for systems using multiple computers, see Page 16.

NETWORK   Standard RJ45 Ethernet connector for DAW data and Dante audio. The two ports function as a network switch so either can be used for Dante and DAW control. The unused port may be used for additional Dante Network devices.

USB   Use a standard USB A-B cable to connect Nucleus² to a USB port on your DAW computer. This connection is used for keyboard commands to the DAW.

Defining Keyboard Nationality (Mac)

Nucleus² emulates a UK keyboard. When Nucleus² is first connected to a Mac, a dialogue will be displayed which asks you to identify the new keyboard. In order to identify the keyboard type, the Mac then requires the key to right of the left Shift key to be pressed. Mode switch 16 on Nucleus² (see Page 27), is assigned a 'Keyboard ID' command by default; pressing this switch will send the required keystroke to the Mac to correctly identify Nucleus² as a UK keyboard.

FOOTSWITCH   Two footswitches can be connected to Nucleus² using the single 1/4" stereo (X-Y) jack **FOOTSWITCH** connector – use a mono-to-stereo splitter cable to separate the two footswitch connections.

TERMINAL   The **TERMINAL** D-connector is used for advanced system configuration and diagnostics. We strongly suggest not using this unless you are confident with terminal procedures and have an in-depth understanding of quantum theory.

CONFIGURING NETWORK CONNECTIONS

Network Wiring

To ensure the fastest possible communication between your DAW computer and Nucleus² – and to simplify the installation wiring – Nucleus² communicates with your workstation over Ethernet using the ipMIDI driver to emulate a multiport MIDI interface. To ensure minimum latency ipMIDI uses multicast UDP rather than TCP/IP. This means that:

- The network connection should be short and direct.
  Where possible all cables should be as short as possible and only routers that can support high data transfer rates should be used. Problems have been experienced with some domestic routers, particularly when used with Pro Tools. Typical symptoms of a slow network connection are:
  - The Nucleus² fails to synchronise all controls when first connecting with the DAW.
  - Channel controls and scribble strips on channels 9-16 fail to update reliably when using the **CHANNEL** scroller switches.

- All computers on the network will receive ipMIDI packets.

Notes for network wizards

Because ipMIDI uses multicast UDP packets, messages between one computer and Nucleus² will be received by all other computers on the network, potentially causing problems in installations with more than one Nucleus². The UDP packets can be blocked by using a firewall router and connecting the main network to the WAN connector. The firewall can then be configured to allow all traffic apart from UDP ports 21928 through 21947 which are used by ipMIDI and port 50081 which is used by the Nucleus² Remote application. Note that it may be necessary to use a separate Ethernet switch in place of the integrated firewall router switch, as some of these can not support the high data transfer rate required. The NetGear GS108 (an eight port switch) has been used successfully at SSL Begbroke.
A pre-configured LAN Integration Network Switch can be purchased from the SSL web store.
Also see setup example on page 16

To avoid the latency and communication issues illustrated above, we recommend that Nucleus² and the DAW computers be connected directly on a dedicated network. In practice, most systems can be configured with a direct connection.

Assigning the Nucleus² IP Address

The Nucleus² IP address is configured via the **Network Setup** tab in the Nucleus² Remote.

By default, Nucleus² uses a fixed IP address of **169.254.1.2** – the **IP Address**, **Subnet** and **Gateway** shown in the picture should work for a direct connection to a single DAW computer.

We suggest you do not attempt to change these unless you are familiar with Ethernet configuration as doing so may break communication between Nucleus² and the Remote.

If Nucleus² must be connected via a wider network – ideally, in that case, through a network switch or router – Nucleus² should probably be set to use a DHCP server (check the **Use DHCP** option) to automatically set an **IP Address**, **Subnet** and **Gateway** suitable for your wider network. If there is any possibility that a DHCP server is not available the **Fixed** option should be used.
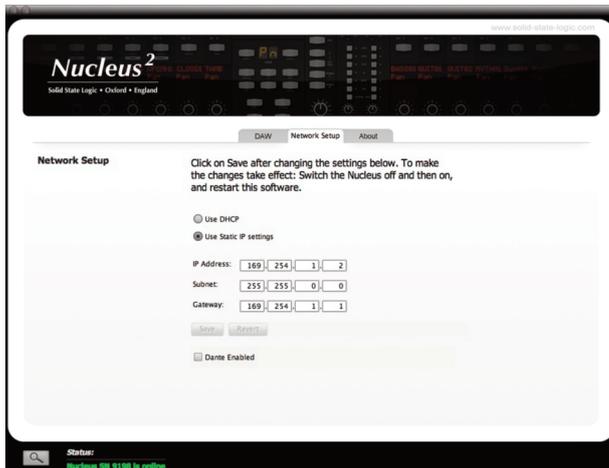
Direct Network Connection Configuration (Mac)

Connect your Nucleus² directly to the DAW computer using a standard network cable, and check that the IP address is set to **Fixed** in the Nucleus² Remote (see previous page).

OS X does not currently allow two ports to be used for IP traffic – your main network connection will become unavailable when using Nucleus².

- On the Mac, open the **Network** control panel in **System Preferences** and use the **LOCATION:** drop-down to create a new location. Next, select the Mac Ethernet port to which you have connected Nucleus² and configure ipv4 to **Using DHCP** (as shown). The computer will 'fall over' to a static IP address in the link local range.

*On OSX version 10.11 'El Capitan', a router address will be required for two-way data communications. For this reason you will need to manually enter a static IP address with a 'Router' address. Set **Configure ipv4:** to **Manually**, **IP Address:** to **169.254.1.1**, **Subnet Mask:** to **255.255.0.0**, and **Router:** address to the IP address of the console, typically 169.254.1.2.*

- Launch the Nucleus² Remote application and check it connects to your Nucleus², as described on Page 21.
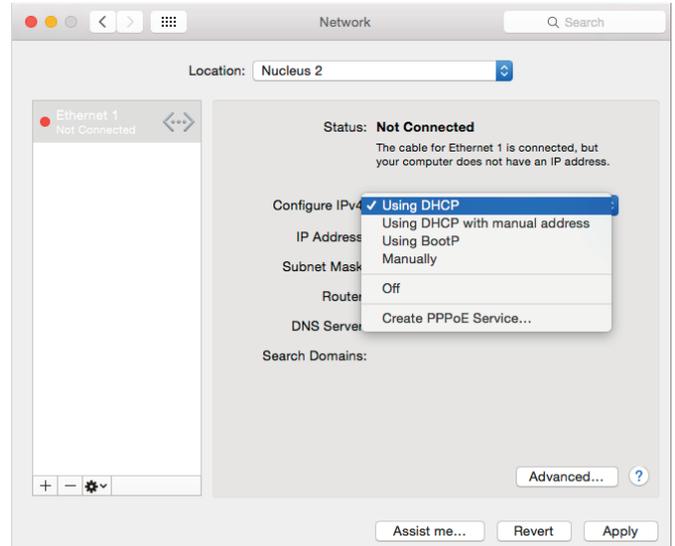
Wider Network with a DHCP Server Configuration (Mac)

For connecting Nucleus² to a wider network (a multi-studio facility for example), you will need to set the Mac Network setting 'Configure IPV4' to **Using DHCP**. The same must be done in the Nucleus Remote 'Network' Tab.

Both the Nucleus² and your computer will then be assigned IP addresses automatically.

If using more than one ipMIDI controller/console, a pre-configured switch is available from the SSL web store which will prevent the two consoles from communicating across the network.

Direct Network Connection Configuration (Windows)

- Connect your Nucleus² directly to the DAW computer using a standard network cable, and then check that the IP address is set to Fixed in the Nucleus² Remote (see Page 14)

- On the PC, open the control panel, click on 'view network status and tasks', the 'local area connection' for your Nucleus², 'Properties', then double-click 'Internet Protocol Version 4 (TCP/IPV4). Make sure that the port is set to 'Use the following IP address', and set the IP as shown below.

- Launch the Nucleus² Remote application and check it connects to your Nucleus² as described on Page 21.

Wider Network with a DHCP Server Configuration (Windows)

For connecting Nucleus² to a wider network (a multi-studio facility for example), you will need to configure your computer to **Obtain an IP address automatically** in the Properties window.

Both the Nucleus² and your computer will then be assigned IP addresses automatically.
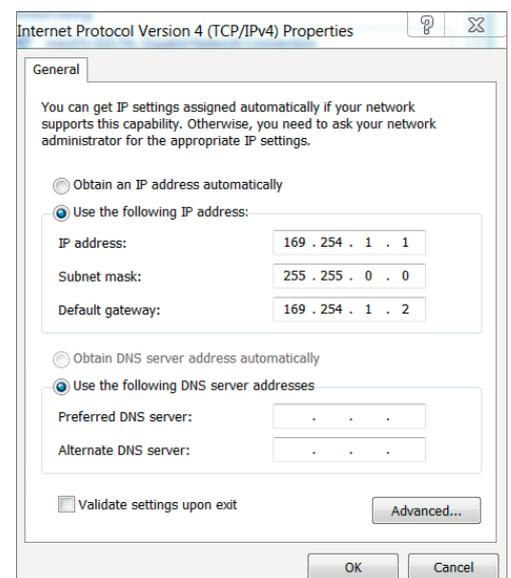
Connecting Nucleus² to Multiple Computers

Connecting a Nucleus² to multiple DAW computers introduces a little more complexity.

Network

To connect Nucleus² to multiple DAW computers, you will probably need to connect the Nucleus² and all the computers via a network switch or router with sufficient bandwidth to cope with the volume of data which is transferred to and from Nucleus². It is essential that you take note of the configuration issues described previously.

Note that when connected to a wider network, via a router or switch, a DHCP server will probably be available and so Nucleus² would normally be set to use it rather than the default fixed IP address. See Page 14 for details.

USB

A USB switch will be necessary for switching the USB connection between computers. This can best be provided by using KVM ('Keyboard, Video, Mouse') switch with switchable USB ports. If an 'automatic' unit is obtained, Nucleus² can be configured to issue the appropriate command 'KVM hot key' to the KVM to select the correct USB port whenever a different DAW Layer is selected on Nucleus². By plugging your keyboard (& mouse) into the Nucleus² USB hub, both Nucleus² and your keyboard (& mouse) can be switched together.
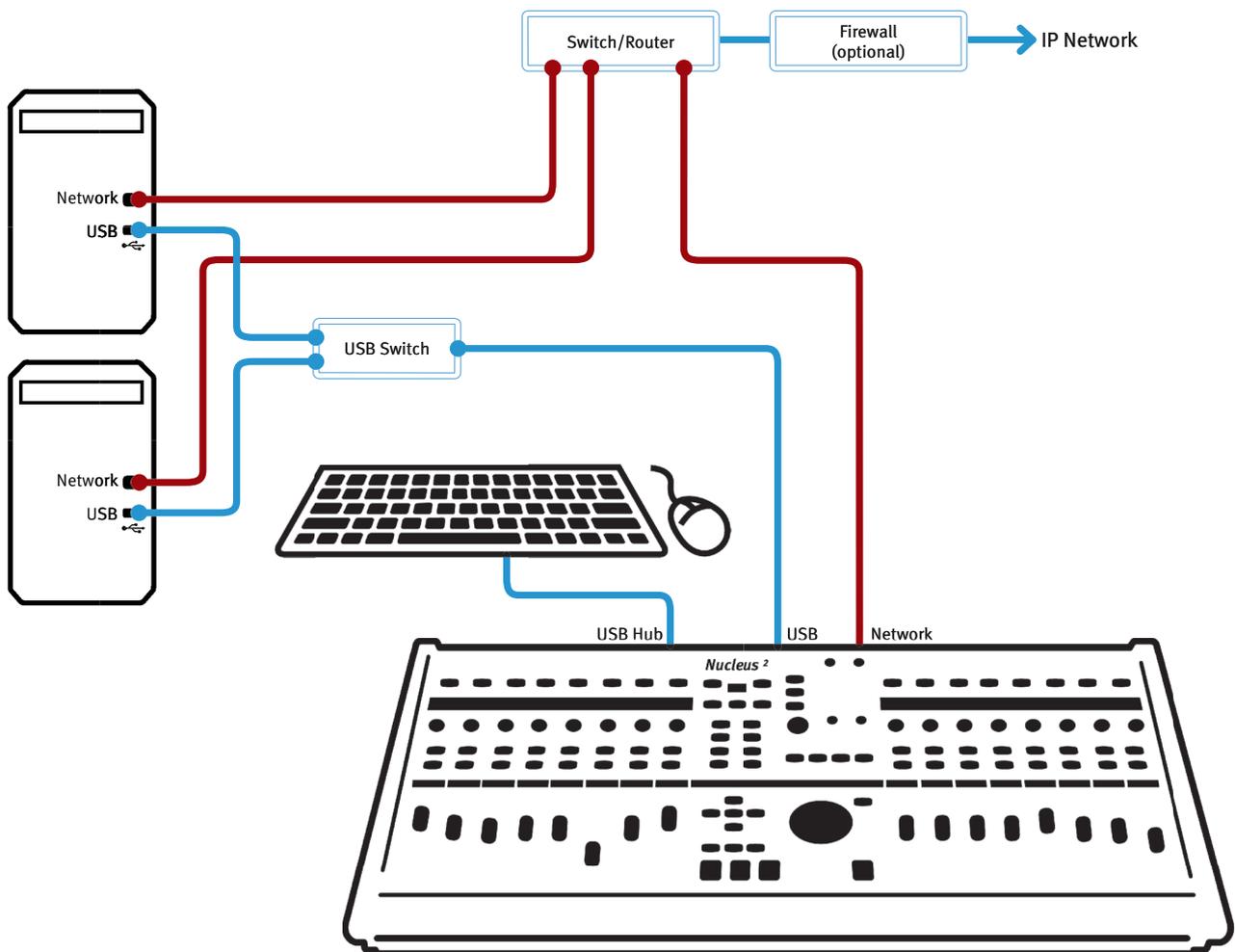
Nucleus² Internal Network Architecture

There are two network devices within Nucleus² and each can have a separate IP address. The two devices are: the original Nucleus DAW control element (logictivity CPU) and the Dante interface chip.

These are networked together using an internal switch; you only need to use one ethernet port / cable to connect to both internal devices.


Dante Soundcard
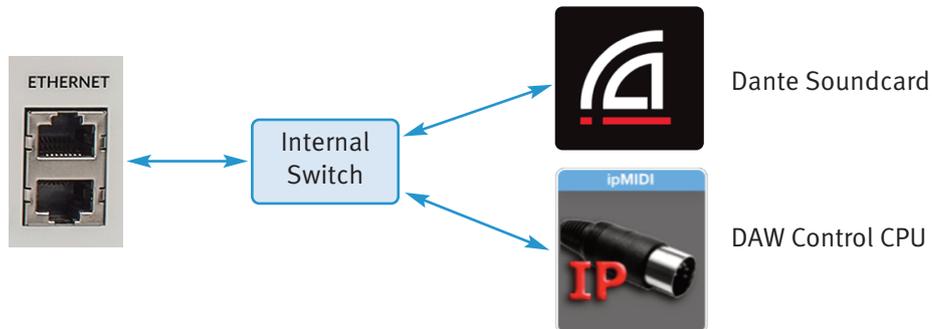
DAW Control CPU

IP Address configuration

For DAW control and Dante audio to work, the Dante soundcard, DAW control CPU and the computer all need to be in the same IP address range.

Many devices when set to 'use DHCP' will eventually 'fall over' to a link-local address when not connected to a DHCP server (which assigns IP addresses to devices on the network automatically). This link-local address will be in the range 169.254.x.x. The Nucleus² DAW control CPU doesn't do this, so it must be assigned a fixed IP address:

- The factory default for the **DAW control CPU** is a fixed IP address of 169.254.1.2, and can be reconfigured from the *Nucleus² Remote application* › *Network Setup* tab.

- The factory default for the **Dante Soundcard** is 'Using DHCP', which in a direct setup will 'fall over' to a link local address (169.254.x.x) after not being assigned an IP address by the network. The Dante soundcard will therefore be in the same IP range as the DAW control CPU. The IP address for the Dante soundcard can be reconfigured from **Dante Controller** by double-clicking on the *Device List*, and going to the *Network Config* tab (as shown below).
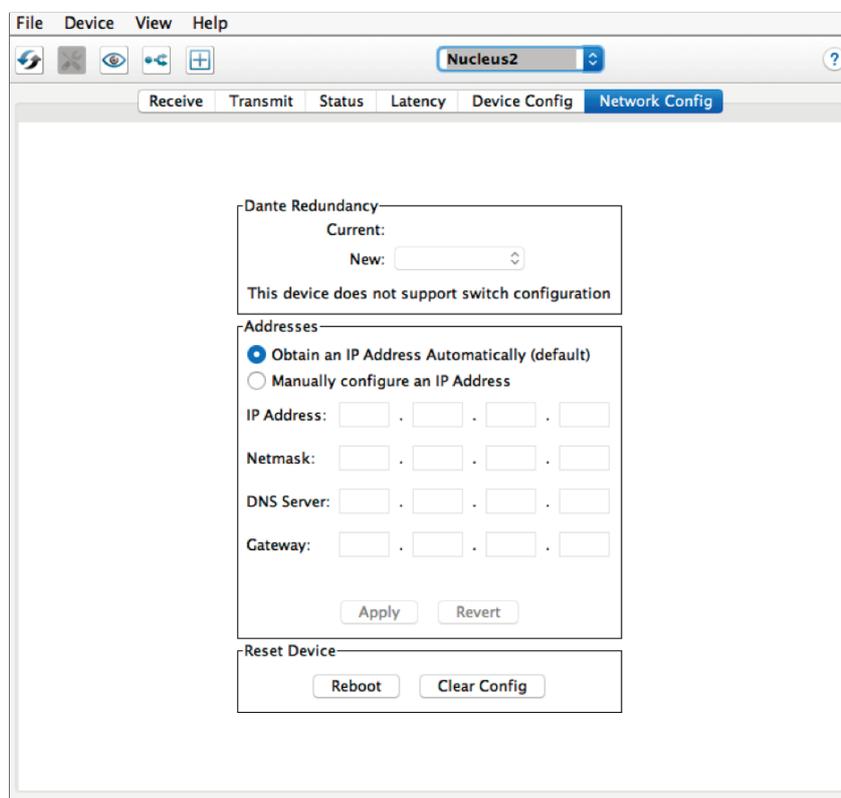
ipMIDI Configuration

The ipMIDI driver enables your DAW to send and receive MIDI control data via the network connection, and must be configured to match the requirements of Nucleus² before it can be used.

Mac

Once the driver has been installed and you have logged back in, use the **Finder** to navigate to the **Utilities** folder (in **Applications**). Double-click **Audio MIDI Setup**, select **MIDI Devices** and double-click on the **ipMIDI** icon. Set the number of MIDI ports to **6** in the resulting pop-up.

Windows

Once the computer has restarted after installing the driver, right-click on the **ipMIDI** icon in the **Task Bar**, select **ipMidi - MIDI over Ethernet** and set the number of MIDI ports to 6 in the resulting pop-up.

MIDI Port Mapping

MIDI control for the three Nucleus² Layers is split across the six ipMIDI ports which means that your DAW must be configured to match the following:

Nucleus² DAW Layer	Nucleus² Channels	ipMIDI port
1	1 to 8	1
1	9 to 16	2
2	1 to 8	3
2	9 to 16	4
3	1 to 8	5
3	9 to 16	6

Note that CC Layers only use the first MIDI port in their layer. All CC data is sent on MIDI Channel 1.

Setting which ipMIDI ports the DAW should use is performed using the MIDI controller configuration page of your DAW. Below and overleaf are two examples using Pro Tools 8 and Logic Pro 9.

Pro Tools

In the **Setup** menu, click on **Peripherals** and select the **MIDI Controllers** tab.

For MIDI controllers 1 and 2, select '**HUI**' as the MIDI controller '**Type**' and assign the MIDI ports for this layer's DAW to the two MIDI controllers, as listed in the table above.

As an example, if Pro Tools has been assigned to Layer 1 (so using ipMIDI ports 1 & 2), the **MIDI Controllers** tab should look as shown.
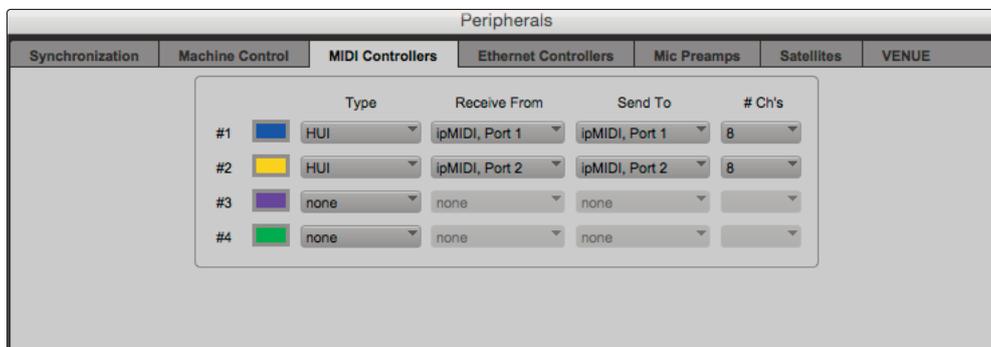
Logic Pro

Control surfaces are setup via the **Logic Pro X** › **Control Surfaces** › **Setup** menu (or **Preferences** › **Control Surface Setup** if using Logic 9 or below). In this example we will setup Logic for operation on DAW layer 1 of Nucleus².

1. Choose **New** and then **Install...**

2. Choose Nucleus (left) and then **Add**

3. Set both **Output Port** and **Input Port** to **Port 1**

4. Again, Choose **New** and then **Install...**

5. Choose 'Nucleus (right)' and then **Add**

6. Set both **Output Port** and **Input Port** to **Port 2**

The actual ipMIDI ports used will depend on which layer (or layers) have a Logic Profile assigned. (Refer to the previous page for a list of Nucleus²'s MIDI port assignments.)

It is recommended that you delete any controllers automatically created on set-up, and recreate them manually. *Note that if the physical arrangement is reversed, then the Nucleus² faders will not map correctly to the on-screen faders in Logic.*

If Logic is the only DAW connected to Nucleus², then provided that there is only one DAW Layer set up with an MCU based Profile, Logic should automatically detect the two virtual controllers which will be shown in the **Logic Control Surface Setup** menu (as shown above), with the appropriate Nucleus² ipMIDI ports assigned. If Logic fails to detect the control surfaces, then the controllers can be added manually via **New** › **Install menu** and the appropriate MIDI Out port and Input assigned. Full details can be found in the online Logic Pro Control Surfaces Support Guide in the Logic **Help** menu.

If Nucleus² is set up with multiple MCU profiles in the DAW layers, then the automatic detection option must be disabled and the controllers added and configured manually. Check the **Disable Handshake** box in the **DAW** tab in Nucleus² Remote (located below the **Edit Profiles** button) for all the DAW layers assigned to a MCU Profile *prior* to starting the Logic application. This will prevent Logic automatically detecting multiple Nucleus² Controller layers.
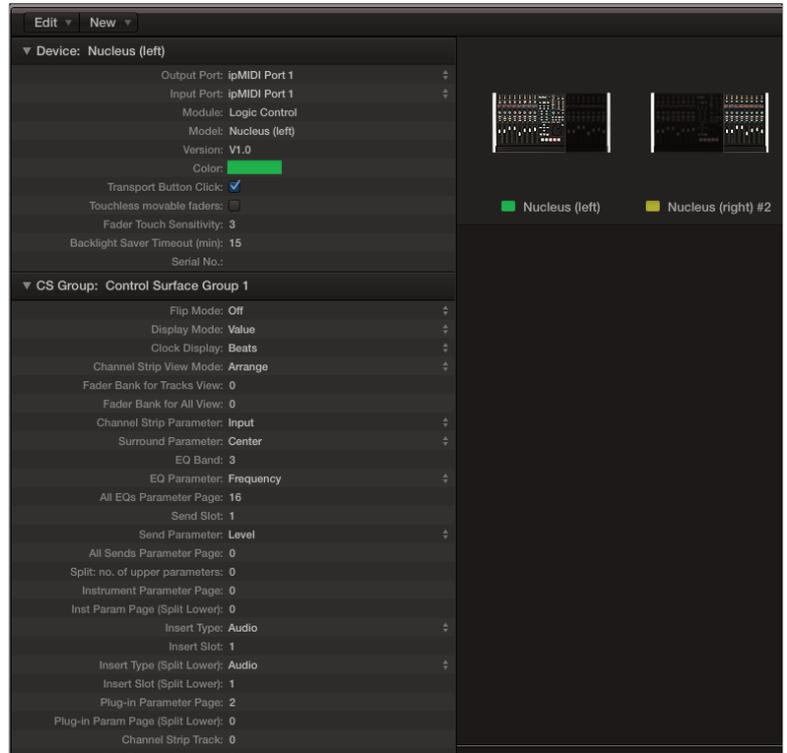
For other DAWs, please refer to the relevant User Guide for details about configuring MIDI controllers.

*See Section 5 for a description of the Remote's **DAW** tab.*

Dante Soundcard Configuration

Setup

Go to www.audinate.com, click **Register** in the top right hand corner, and create an account. Under **My Account** go to **My Products**, and enter the Dante Virtual Soundcard token code – included with Nucleus² – in this box.

Click **submit**, and this will provide you your license listed in the account. Take note of this license code.

Below the license code you will see a link appear. This will take you to the latest installer for Dante Virtual Soundcard. Download and run the installer.

Once installed, open Dante Virtual Soundcard, enter the license code and click **Activate**.

- Set the Audio Channels to **2 x 2***, latency to **4ms,** and Network interface to **en**0. Click **Start,** and your computer will now be available as a device on your Dante network.

    Or **4x4 if using the SPDIF alongside the analogue connections.*
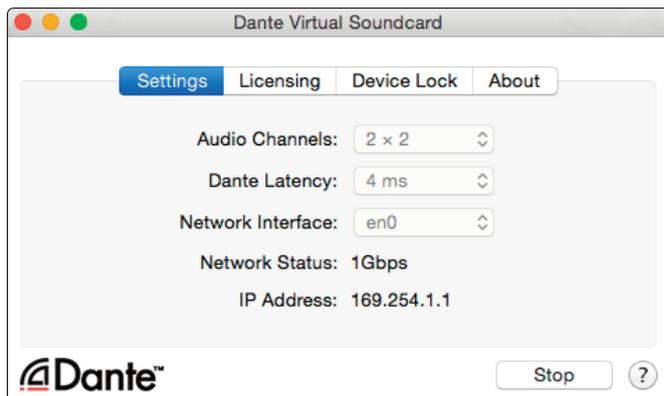
It is important to configure your computer IP address before proceeding. See pages 15 and 16 for details.

Now you need to connect the audio routes from the Nucleus² to the computer. This is achieved using the Dante Controller software.

- Open Dante Controller (after installation), expand the routing matrix by clicking the '**+**' button

- Click the two audio cross-points between the Nucleus² and your computer for the inputs, and then the two audio cross-points for your outputs. *You make a connection by clicking on the cross-point*

- For a standalone system with the mic pre's routed into the DAW, and the DAW 'Mix' output routed to the monitor outputs, you should connect channels 1&2 (on the Nucleus²) to channels 1&2 (on the computer) for both the inputs and outputs. *See image to the right*

- Inputs and outputs 3&4 of Nucleus² are the SPDIF Left and Right input and SPDIF Left and Right output respectively.
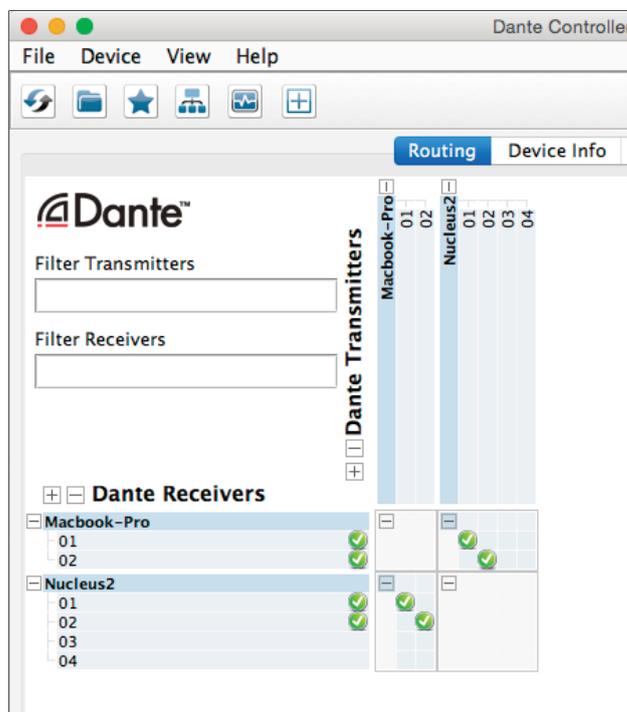
The SPDIF I/O on channels 3&4 is only available on the Dante Network at low sample rates (44.1/48kHz). At higher sample rates (88.2/96kHz) only the analogue I/O on channels 1&2 will be available.

Sample rate

To change the sample rate on both your Nucleus² and the Virtual Soundcard:

- On the computer, double-click on the device you wish to change in Dante controller

- Select the **Device Config** tab. The sample rate for each device can be selected via the drop down list (see image).

The **LOCK** LED in the centre of the console will be illuminated when locked and off if there is an error with the Dante clock.
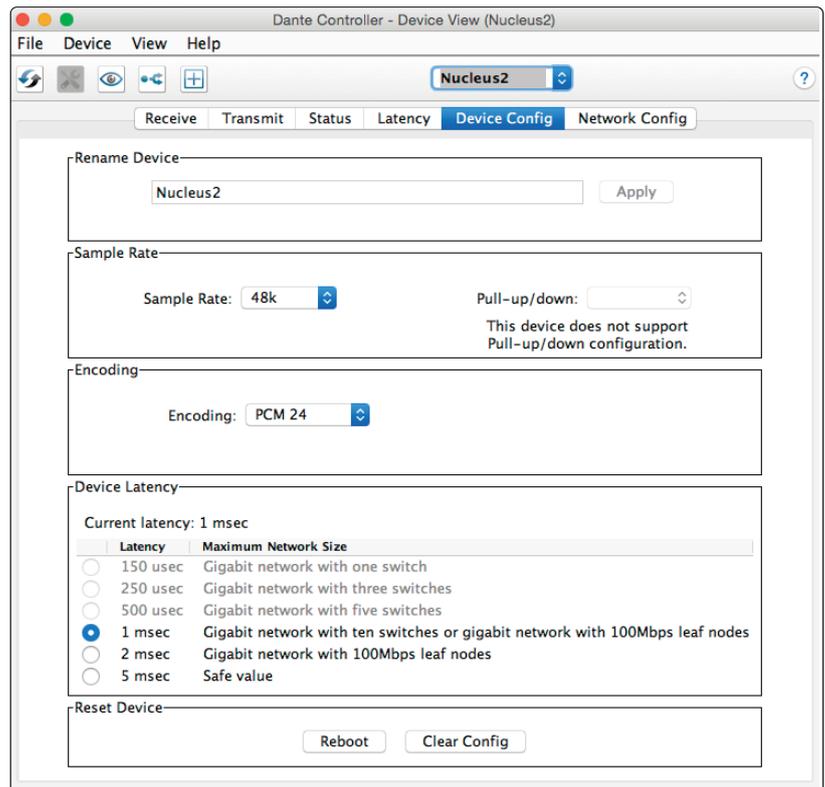
Stand-alone System vs Wider Dante Network

The description here is for configuring the Nucleus² soundcard in a stand-alone system (with the DAW control and Nucleus² audio being the only networked device connected to one computer at any time). For more details on configuring an expanded Dante audio network with other Dante based products, please see the Audinate website here.

We also recommend viewing the useful videos about Dante Virtual Soundcard and Dante Controller here

SPDIF I/O & EXTERNAL SOUNDCARD

Setup

If you do not need to use the Dante soundcard in Nucleus² and instead want to configure the SPDIF inputs and outputs with an existing soundcard in your setup, you need to first go to the Nucleus² Remote application, go to the Network Setup tab and un-tick the **Dante Enabled** option (see image). The 'Dante' LED in the centre of the console will switch off.

Clocking

The SPDIF inputs have sample-rate conversion, and the outputs clock to the internal soundcard. This means that when both SPDIF inputs and outputs are connected, the Nucleus² must be the clock-master. The external SPDIF device you connect should clock to the SPDIF outputs. When only using the SPDIF inputs for monitoring, the external device can be clock-master as these have SRC's on the input.
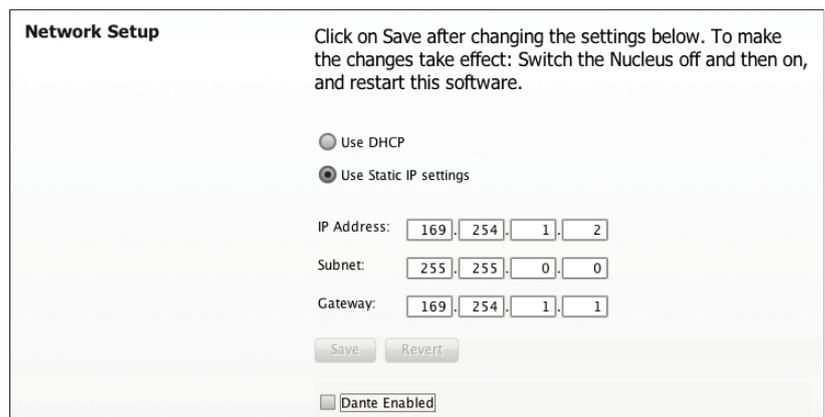
The SPDIF I/O will only operate at lower sample rates (44.1/48kHz)

Nucleus: *noun*. The central and most important part of an object, movement or group.

5. Nucleus² Remote

The Nucleus² Remote performs an essential role in defining how Nucleus² functions, from the control protocol being used to the functions assigned to many of the Nucleus² switches. The Remote can be run from any computer that has access to Nucleus² over Ethernet.

ESTABLISHING THE REMOTE CONNECTION

In the bottom left-hand corner of the Remote window there is a Find (🔍) button, along with an indication regarding the current status of the connection to Nucleus².


Find button
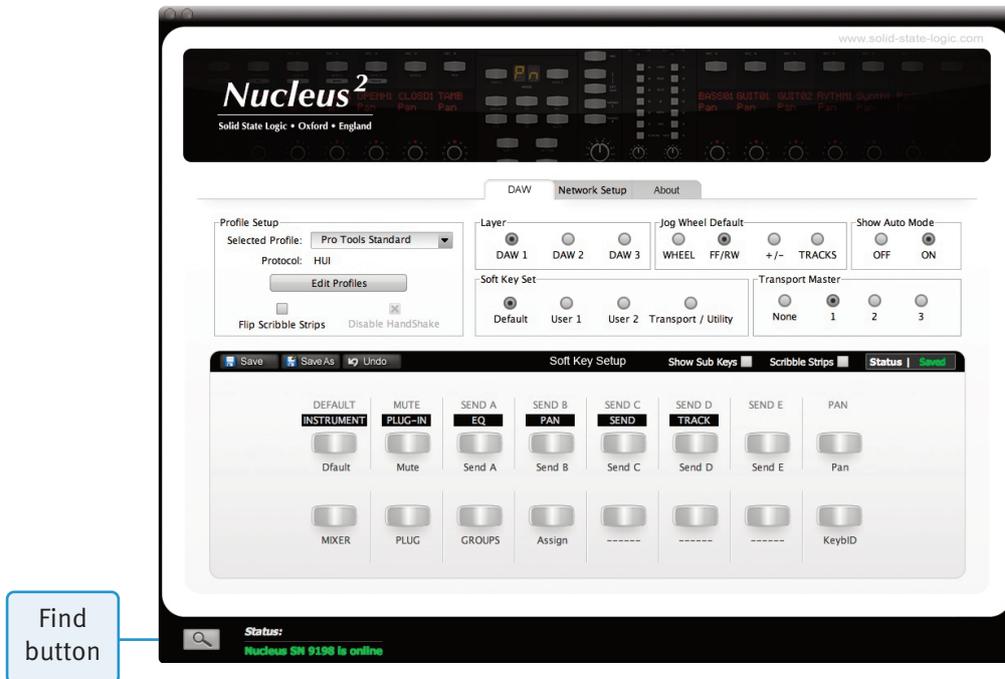
When the Nucleus² Remote first opens, it searches for a Nucleus² console to control. If it finds one, it will automatically link to that console and a **Nucleus² SN nnnn is online** message will appear (in green) in the **Status** field, where '**SN nnnn**' is the ID of the selected Nucleus² console .

If this is the first time that you have run the Nucleus² Remote, and it is unable to locate a Nucleus² unit, the current status will be shown (in red) as **No Nucleus² Selected – Click on Find**. Alternatively, if the Remote has previously been used but it cannot find the Nucleus² console it expected to locate, the current status will instead display the message **Nucleus² SN nnnn is offline** where '**SN nnnn**' is the ID of the Nucleus² console expected.

If this happens, first check your connections and then click on the 🔍 button to bring up the **Find** pop-up. Clicking the **Find** button in the top right of the pop-up will cause the Remote to then scan for consoles. The **Choose A Network Interface** Controller dropdown menu is used to focus the search when connected to different networks. In a standalone, single console setup, select the **Default** option.

Once the Remote has found the console, it will appear in the pop-up. Check the **Select** box for the correct console and click on the **Close** button.

Once a connection has been made to a Nucleus², a **Nucleus SN nnnn is online** message will appear in the **Status** field, where '**SN nnnn**' is the ID of the Nucleus² console selected.
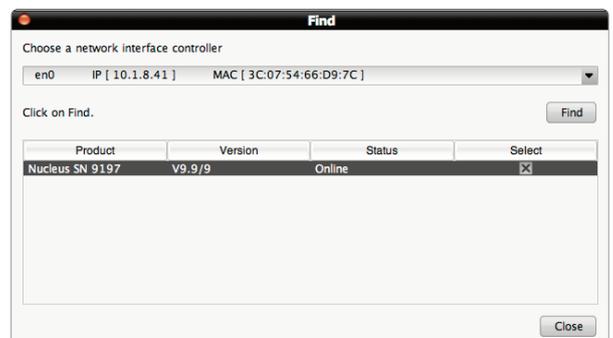
REMOTE TABS

The row of tabs across the top of the window define what is displayed in the rest of the window.

The DAW Tab

The **DAW** tab is where most of the action occurs and is used for configuring the selected Nucleus² and its control protocol as described in this Section of the manual.

The Network Setup Tab

The **Network** tab is used for configuring the Nucleus² network connection, as described in Section 4.

The About Tab

The **About** tab displays current software and firmware versions, and provides links to support areas of the Solid State Logic website.
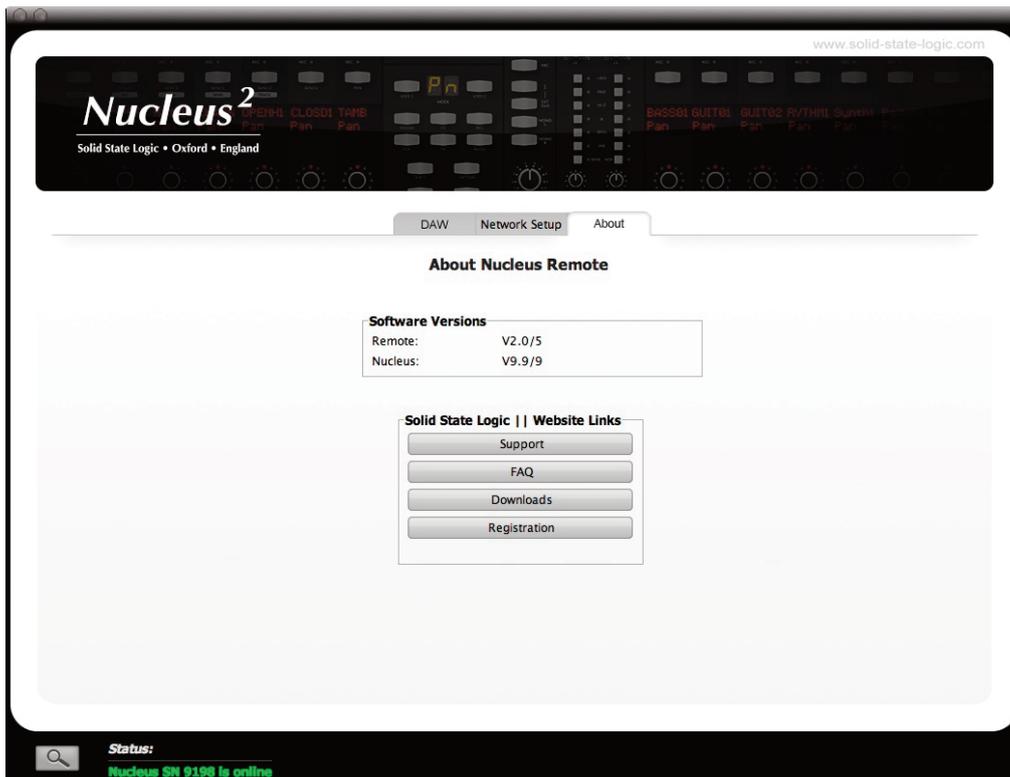
Remote Layer Selection

Before adjusting any of the settings in the Remote, the Layer to which the settings refer must be defined. This is done by clicking on the **DAW 1**, **DAW 2** and **DAW 3** buttons in the **Layer** area towards the top of the **DAW** tab in the Remote window.

The only area of the DAW tab which is not Layer-specific is the Transport Master area – see Page 26 for details.

Layer Profile Configuration

Protocols

DAW control protocols are selected as part of the Layer's Profile, configured in the **Profile Setup** area in the top left corner of the Remote's **DAW** tab.

There are eight default Profiles supplied with Nucleus²:

A HUI Profile configured for Pro Tools   An MCU Profile for Nuendo/Cubase

An MCU Profile configured for Logic   An MCU Profile for Reason

An MCU Profile configured for Ableton Live   An MCU Profile for Samplitude

A Continuous Controller (CC) Profile for use with MIDI devices   An MCU Profile for Studio One

These Profiles provide starting points for the creation of more personalised Profiles. They include only basic soft key assignments, allowing plenty of space for the user to configure their own Profiles.

Profiles for other DAW packages can also be created from the default Profiles, using the Pro Tools default Profile for DAWs that support the HUI interface, and the Logic default Profile for DAWs that conform to the MCU protocol.

Note that the default Profiles themselves cannot be edited. Profiles are personalised by creating copies of a default Profile which can then be edited, as described on the following pages.

The soft key sets included in the default Profiles are described on Pages 27 and 28 and the full list of functions available within each protocol can be found in the Appendix.

All the Profiles available to Nucleus² are stored on the SD card in the card slot on the rear panel of the unit. If the card is not present no Profiles will be available – when a blank card is inserted, the eight default Profiles will be created and stored on the card when firmware is re-installed.

Creating Profiles – Method 1

1. To create a new Profile, press **Edit Profiles** to bring up the **Profile Editor** pop-up. Select the Profile which you wish to use as a starting point and click the **Copy** button.

2. Type a name for the new Profile into the **Copy Profile** pop-up which appears, and click on **OK**.

3. After a moment, the new Profile will appear in the Profile list in the **Profile Editor**. The selected Profile's protocol is indicated at the bottom of the pop-up, as well as in the **Profile Setup** area.

4. Click **OK** to exit the **Profile Editor**.

Creating Profiles – Method 2

An alternative way to create new Profiles is to use the **Save As** button in the **Soft Key Setup** area which makes up the bottom half of the **DAW** tab.
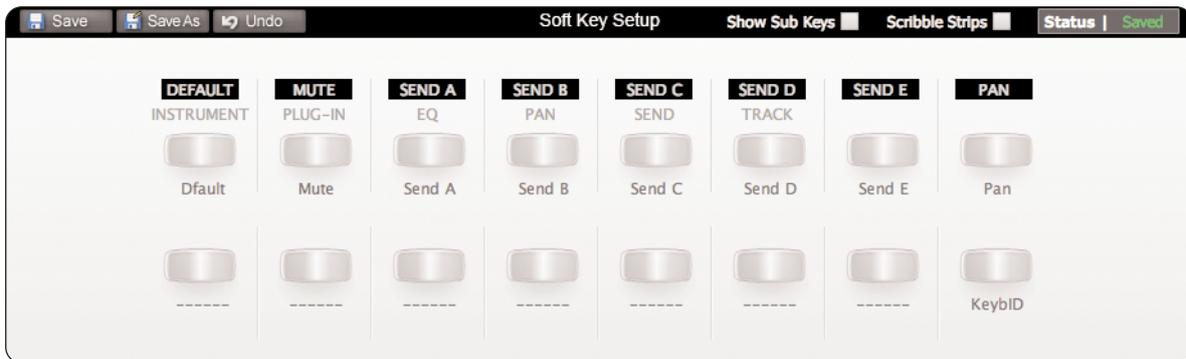
1. First select the Profile you want to use as a starting point and assign it to a layer, as described on the previous pages.

2. Click the **Save As** button in the **Soft Key Setup** area at the bottom of the window to bring up the **Save Profile As** pop-up.

3. Type a name for the new Profile into the pop-up and click on **OK**.

After a moment, the new Profile will be created and become active in that layer.

Selecting a Profile

Profiles are selected and managed using the **Profile Setup** area in the top left corner of the **DAW** tab. The four default Profiles are listed in the drop-down **Selected Profile** menu, along with any derivatives of them which you have created.

If the Profile you select uses a different protocol than that currently assigned to the layer selected in the Remote, or if the layer previously contained no Profile, a pop-up will appear asking you to restart Nucleus² – with a 'Now' or 'Later' option. Press **OK** to close the pop-up. A number of functions within the **DAW** tab will now be locked out until the restart. However, further Profile selections can be made before restarting. To perform a restart simply re-power Nucleus² using the power switch on the rear of the unit.

MCU User Display Configuration

In order to cater for variations in the ways in which MCU protocol DAWs return channel data to the scribble strip displays, there is a **Flip Scribble Strips** box in the **Profile Setup** area. Actioning this function switches the two rows of the Nucleus² scribble strip display, allowing Nuendo labelling to emulate the Logic format for example. By default, **Flip Scribble Strips** is therefore *enabled* for the default Nuendo Profile and *disabled* for the default Logic Profile. For other MCU protocol DAWs, the labelling format described in the DAW's Control Surface documentation will enable you to ascertain whether or not to activate this function.

MCU User Handshake Disabling

The **Disable Handshake** box located below the **Edit Profiles** button is also only required for MCU protocol DAWs. This function will only be of use in systems where there are multiple MCU layers in use, *and* where these layers include both Logic and other MCU protocol DAWs. Checking this box will stop MCU programs from handshaking with each other via Nucleus², thus preventing Logic from scanning for external controllers and subsequently creating ghost controllers of any other MCU programs.

*Nucleus² must be power cycled before a **Disable Handshake** status change will take effect.*

Managing Profiles

The Profiles are all stored on the SD card plugged into the rear of Nucleus², not the computer the Remote is running on. Profiles are however easily copied, renamed, deleted and backed up using the browser as well as being physically transferable from one unit to another if required.

Deleting Profiles

To delete a Profile, click on **Edit Profile** to bring up the **Profile Editor** pop-up, select the Profile which you wish to delete, and click **Delete**.

Click **OK** in the warning pop-up which appears, and after a moment the Profile will disappear from the list in the pop-up. Click **OK** to exit the Profile Editor.

Renaming Profiles

To rename a Profile, press **Edit Profile** to bring up the **Profile Editor** pop-up and select the Profile which you wish to rename.

Click on **Rename** to bring up the **Rename Profile** pop-up. Type a new name for the Profile into the pop-up and click **OK**. The Profile's name will change in the Profile list in the Profile Editor.

Backing up Profiles

To back up a Profile or export it for use elsewhere, click on **Edit Profile** to bring up the **Profile Editor** popup, select the Profile which you wish to back up, and click **Backup**. In the pop-up which appears, edit the name and destination of the file if necessary, and click on **Save**. Your Profile will be exported as a compressed `.zip` file.

Restoring Profiles

To restore a Profile from back-up or import a Profile created using another Nucleus² Remote, click on **Edit Profile** to bring up the **Profile Editor** popup and click **Restore**. In the pop-up which appears, locate the Profile file (a compressed `.zip` file) that you wish to restore and click on **Open**. The restored Profile will appear in the Profile list.

If the Profile name already exists the restored filename will be appended with number to distinguish it from the existing Profile of the same name. You can rename the Profile as described above.

Timeline Functions

Transport Master

Nucleus² directs transport commands to whichever DAW is currently selected on Nucleus² but if multiple DAWs are being used simultaneously it is possible for one DAW to be made the Transport Master. When a DAW has been set as the Transport Master, Nucleus² will then always direct transport commands to that DAW, regardless of the DAW (Layer) selected on the control surface. DAW transports on other Layers will be slaved to the master DAW.
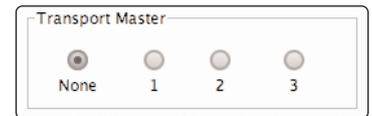
To assign a DAW Layer to be the Transport Master, click on the **1, 2** or **3** button in the **Transport Master** area of the Remote's **DAW** tab. To have no Transport Master, select the **None** button.

> *Note that the **Transport Master** is the only area of the **DAW** tab which is not specific to the Layer selected in the tab's **Layer** area.*

> *Note also that a DAW Transport Master is not required when controlling multiple DAWs that are connected as 'ReWire' slaves to the Master DAW. See the relevant DAW User Guide(s) for more information.*

Jog Wheel Function

The function of the centre section jog wheel is selected in the **Jog Wheel Default** area of the Remote's **DAW** tab.

The four options are as follows:
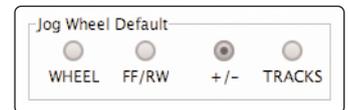
Wheel   Sends basic control information which scrolls the timeline in most DAWs

> ***Pro Tools Users.*** *Note that the wheel does nothing in 'Wheel' mode until 'Jog/Shuttle' mode is activated – by default 'Jog/Shuttle' mode is assigned to the jog wheel switch adjacent to Nucleus²'s jog wheel. This assignment is set via the **Jog Wheel** button in the **Transport / Utility** soft key set in the **DAW** tab.*

FF/RW   HUI only timeline scrolling – resolution is controlled by the DAW's Timeline format

+/−   HUI only timeline scrolling – resolution is controlled by the DAW's Nudge value

TRACKS   Assigns the channel scrolling function to the jog wheel

Automation Display (HUI Only)

In HUI protocol DAWs, a single letter indicating the current automation mode of each channel can be added to the end of each channel name in the upper row of the display; 'Write' modes are indicated by a flashing W, 'Read' modes by a flashing R, and 'Off' is indicated by no flashing letter.

This single letter display is activated by clicking on the **ON** button in the **Show Auto Mode** area of the Remote's **DAW** tab.
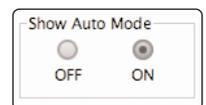
Soft Key Configuration

The functions assigned to almost half of the switches on Nucleus² are 'soft' and can be altered. This is done in the **Soft Key Setup** area at the bottom of the Remote's **DAW** tab.

There are four **Soft Key Setup** pages, selected via the **Soft Key Set** buttons in the middle of the **DAW** tab – **Default**, **User 1**, **User 2** and **Transport / Utility**.

Default Soft Keys

The **Default** soft keys are the 16 switches located above the channel displays on either side of Nucleus². The **Default** soft key set is active when neither of the centre section **USER** keys are selected. The Mode switches on the left-hand side of Nucleus² are displayed in the top row, and the right-hand switches in the bottom row.
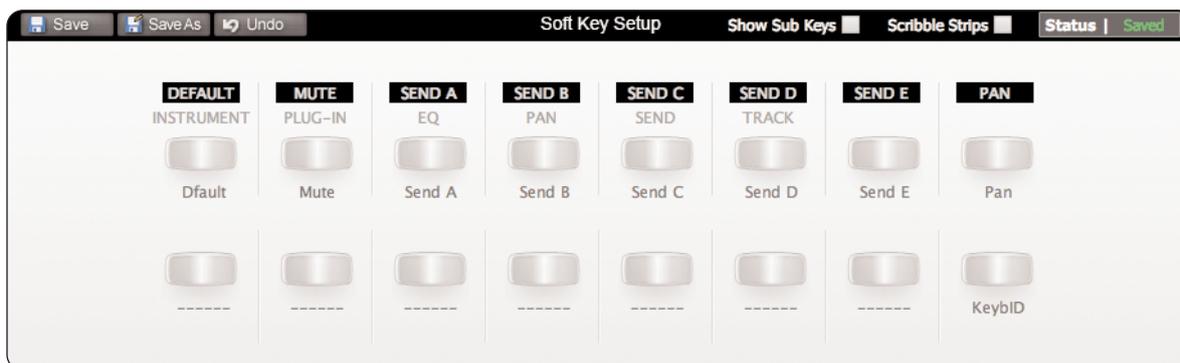
Mode switches 1-8 on the left-hand side come pre-assigned to the functions printed beneath them on Nucleus²:

- The HUI protocol defaults are in white boxes
- The MCU protocol defaults are in white letters below the HUI defaults.

Mode switch 16 – labelled '**KEYBID**', on the far right-hand side – also comes pre-assigned, to the 'Keyboard ID' function. This function is required for part of the USB set up as described in Section 4.

The upper row of buttons (left-hand Mode switches) can become menu selectors, accessing eight sub-functions assigned to the lower row of buttons (right-hand Mode switches).

User 1, User 2 Soft Keys

The **User 1** and **User 2** soft key sets are comprised of the Mode switches and the V-Sel switches in the right-hand channel section (channels 9-16). There are two sets of User keys – **User 1** and **User 2** – and they are accessed by pressing the **USER 1** or **USER 2** switches in the centre section, beneath the Nucleus² logo. The Mode switches can be run either as simple soft keys, or as menu keys – each menu key accesses a subset of soft keys arranged across the V-Sel switches below.
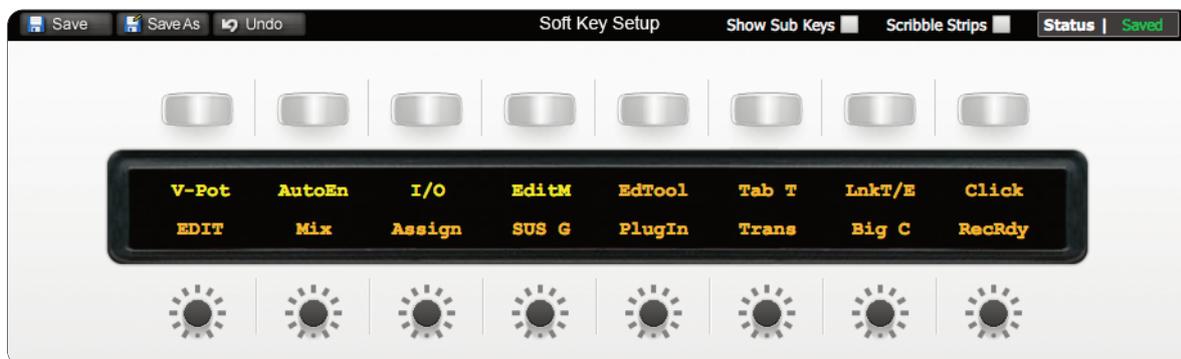
*An initial set of functions are assigned to the **User 1** soft key set in each of the default Profiles.*

Transport / Utility Soft Keys

The **Transport / Utility** soft key set comprises all of the assignable switches within the Nucleus² centre section.
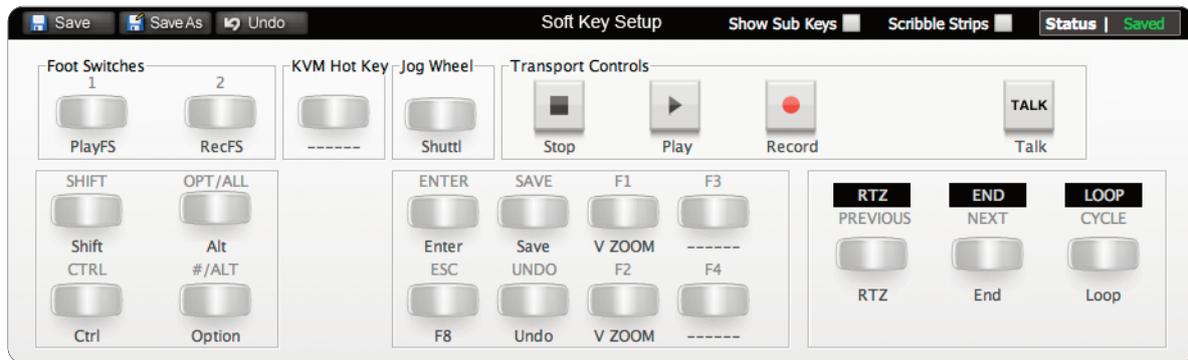
All of these switches (with the exception of F3 and F4) come pre-assigned to the functions printed on the Nucleus² control surface.

*Due to the constraints of displaying a faithful representation of the Nucleus² centre section within the Remote, the layout of switches in the **Transport / Utility** page of the **DAW** tab differs from the actual control surface layout.*

There are three additional switches shown in the **Transport / Utility** soft key page which do not actually feature on Nucleus² control surface.

Foot Switches 1 and **2**   The two foot switch keys in the top-left corner allow the two momentary foot switch inputs on the rear panel of Nucleus² to have commands assigned to them. Both the HUI and MCU protocols provide dedicated codes for use with foot switches which actuate the DAW transport Play and Record functions. These are shown in the command list as **Play Foot Switch** and **Record Foot Switch**.

KVM Hot Key   This key, located adjacent to the foot switch keys, is only required on setups where there is more than one DAW computer connected to Nucleus². The key can be programmed with a command to control an automatic USB KVM switch, telling it to switch between computer ports. When programmed, it outputs a keyboard command whenever its layer is selected using the **DAW 1** and **DAW 2** switches on Nucleus², telling the KVM switch to select the USB port connecting to the computer on which the layer's DAW or MIDI device is hosted. The specific commands used by your KVM switch can be found in the KVM switch operating manual.

Assigning Soft Key Functions

There are different assignments that can be given to soft keys:

- Any command within the relevant DAW control protocol
- Any command that can be sent using the DAW keyboard (either single key presses or multiple key press commands)
- The Mode keys within the User soft key sets can also be made into menu buttons, opening a sub-menu of functions assigned to the V-Sel switches

Each of these assignment procedures are described over the following pages.

DAW Protocol Commands

To assign a HUI or MCU protocol function to a switch, select the relevant **Soft Key Set** in the Remote's **DAW** tab and click on the on-screen key that you wish to assign. The key will go yellow to indicate that it is being edited. From the drop-down menu which appears, selecting **DAW CMDS** produces a second drop-down which lists all of the functions and commands available to you within the selected Profile.

Note that the list shown below is for Pro Tools. See the Appendix for a full list of the commands available for each supported DAW.

Keyboard ID	Auto Enable Fader	Kpad =	Loop	Artist Talkback Switch
Mix to foreground	Auto Enable Send Mute	Kpad /	Quick Punch	Jog
Edit to foreground	Auto Enable Send	Kpad *	Forward	Shuttle
Open/close transport	Auto Enable Mute	Kpad –	Rewind	
Open/Close Mem	Auto Mode Read	Kpad +	Stop	
Open/close session setup	Auto Mode Latch	Kpad .	Play	
Open/close plugin editor	Auto Mode Trim	Kpad Enter	Record	
Input	Auto Mode Touch	Kpad 0	Next Marker	
Output	Auto Mode Write	Kpad 1	Prev Marker	
Assign	Auto Mode Off	Kpad 2	Last Marker	
Pan	Option/All	Kpad 3	Reset Marker	
Mute	CMD/Alt/Fine	Kpad 4	Edit Capture	
Send A	Rec/Rdy all	Kpad 5	Edit Seperate	
Send B	Shift/All	Kpad 6	Edit Cut	
Send C	Edit Tool	Kpad 7	Edit Copy	
Send D	Edit Mode	Kpad 8	Edit Paste	
Send E	Fkey 1	Kpad 9	Edit Delete	
Bypass	Fkey 2	Audition	Status Auto	
Default	Fkey 3	Audition Pre	Status Monitor	
Undo	Fkey 4	Audition In	Status Phase	
Control	Fkey 5	Audition Out	Status Group	
Auto Suspend	Fkey 6	Audition Post	Group Suspend	
Save	Fkey 7	RTZ	Group Create	
Auto Enable Plugin	Fkey 8/Esc	End	Play Foot Switch	
Auto Enable Pan	Kpad Clr	On–line	Record Foot Switch	

Select the required command from the list, and its name will appear in the appropriate part of the Browser's soft key display.

Soft key assignments must be saved before they become active on Nucleus². If there are any unsaved changes when you try to exit the current **Soft Key Set**, a pop-up will appear inviting you to save your changes before exiting. Click **No** to exit without saving your changes, or **Yes** to save changes and return to the **Default** soft key set.

DAW Keyboard Shortcuts

Soft keys can be set up to issue DAW keyboard key presses; either single keys or more complex combinations such as `<Shift>OZ<Alt>G`. To assign key presses, first select the relevant **Soft Key Set** in the **DAW** tab and click the on-screen button that you wish to assign key presses to. The button will go yellow to indicate that it is being edited. From drop-down menu which appears, selecting **Key Assign** produces the **Keyboard Shortcut Setup** pop-up which will record your key presses in order to replicate them when the soft key switch is pressed.

Click the **Learn** button to start recording your key presses. The button will darken to indicate that it is recording. Now press the key, or combination of keys, which you want the selected soft key to emulate. The **Keyboard Shortcut Setup** window will display the depression and release of every key you press in the sequence in which they happen. Key releases are distinguished from key depressions by the presence of a caret symbol (**^**) immediately before it.

If you make an error, press **Cancel** and start again. Once you have completed the sequence correctly, press **Learn** again to stop the recording, followed by **OK** to close the **Keyboard Shortcut Setup** box.

Soft key assignments must be saved before they become active on Nucleus². If there are any unsaved changes when you try to exit the current **Soft Key Set**, a pop-up will appear inviting you to save changes before exiting. Press **No** to exit without saving your changes, or **Yes** to save changes.

First Key Modifiers

Selecting **First Key Modifier** in the **Keyboard Shortcut Setup** box before pressing **Learn** causes any modifier key release signals to be delayed until **Learn** is pressed again. This allows key combinations which the DAW computer would ordinarily recognise and hijack, to be programmed without the associated control message actually being sent. For example, to program ⌘`<Tab>` on a Mac (`<Ctrl><Tab>` on Windows), without causing the computer to switch between programs:

 - Select the **First Key Modifier** box
 - Press **Learn**
 - On the DAW computer keyboard, press and release the ⌘ key (or `<Ctrl>` key on Windows)
 - On the DAW computer keyboard, press and release the `<Tab>` key
 - Deselect **Learn**

You will notice that the ⌘ (or `<Ctrl>`) release does not appear in the pop-up until after the **Learn** button is deselected

Follow Key State

Selecting the **Follow Key State** box before pressing **Learn** causes the Nucleus² to recognise an on and an off state to the assigned button. This is useful when you need to assign a modifier key (e.g. Option/Ctrl/Alt/Shift) and it needs the ability to recognise when you are holding it down with your finger. Under normal circumstances, if you assigned a keyboard modifier to a button and did not select **Follow Key State** first, it would simply register a single message (equivalent to pressing and releasing the key straight away).

The 'Cubase/Nuendo Standard' profile comes pre-assigned with Follow Key State modifier messages.

Soft Key Menus

To create a menu under a soft key switch, select the **Soft Key Set** for **Default**, **User 1** or **User 2** in the **DAW** tab and click on the on-screen key corresponding to the Nucleus² switch which you wish to use to access the new menu. From the drop-down menu which appears, selecting **Menu** sets that switch on Nucleus² as a menu selector when the relevant **Soft Key Set** (**Default**, **User 1** or **User 2**) is active. The new menu switch can now be used to access a menu of eight additional functions via the eight V-Sel switches.

Assigning Functions Under Soft Key Menus

Clicking the **Show Sub Keys** box to the right of the **Soft Key Setup** label will blank the scribble strip shown in the Remote, leaving only those top row buttons which have been set to be menu selectors. The **Show Sub Keys** box will be checked (**X**) to indicate that you are assigning functions within the sub keys of a menu.

Select the Mode key whose menu you wish to edit, and it will go yellow to indicate that it is being edited. The on-screen scribble strip will then contain dashes above each V-Sel switch, indicating that they are available for assigning:

You can now assign functions to the V-Sel switch in the same way as you would for any other soft key, as described previously. Once you have created the soft key assignments for this menu, selecting another top row button that has been assigned as a menu selector will switch the on-screen scribble strip and V-Sel switches to that menu selector. Once you have completed the soft key assignments within all the menus, deselect the **Show Sub Keys** box to return the window to normal operation.

Soft key assignments must be saved before they become active on Nucleus². If there are any unsaved changes when you try to exit the current **Soft Key Set**, a pop-up will appear inviting you to save changes before exiting. Press **No** to exit without saving your changes, or **Yes** to save changes.

*Note that the above illustration is true for the **User 1** and **User 2** soft key sets which use the right-hand Mode and V-Sel switches on Nucleus²; for the **Default** soft keys it is the left-hand Mode switches which are the menu selectors, and the right-hand Mode switches are the sub keys. The method of assigning sub-menus is however the same.*

Renaming Softkey Assignments

Every time you assign a soft key in any of the ways described above, they are named automatically:

- DAW protocol functions are labelled according to the function you have chosen, as listed in the Appendix
- DAW keyboard shortcuts are labelled '**USB n**' where '**n**' is a number that individually identifies that particular shortcut
- Menu selectors are named '**Menu n**' where '**n**' reflects the position of the soft key in the top row, counted from the left

To rename a soft key, go to the relevant **Soft Key Set** in the **DAW** tab and press the on-screen button you wish to rename. The button will go yellow to indicate that it is being edited. From dropdown menu which appears, selecting **Rename** brings up the **Keycap Name** pop-up. Type the new name in the box provided (using a maximum of six characters) and press **OK**. Once the **Soft Key Set** has been saved, the new names will appear on the Nucleus² control surface.

Assigning Modified Functions to Soft Keys

It is possible to assign more than one command to a soft key, this allows 'modifiers' for more complex DAW functions.

The soft key is then named according to the most recent assignment made, with an asterisk (*****) added after it to indicate that there are multiple assignments on that soft key. The button can then be renamed in the normal way, though it will retain its asterisk to remind you that there are multiple functions assigned to it. Hovering over the button will bring up a list of all the commands assigned to that button.

When the soft key switch is pressed, each key 'press' signal is sent in the order in which they are programmed, and the key 'release' signals are sent in the reverse order. In other words (using HUI DAW protocol as an example), if {Shift/All} is the first command and {Play} the second, then when the switch is pressed it will send the press of {Shift/All} followed by the press of {Play}, and when the switch is released it will send the release of {Play} followed by the release of {Shift/All}. This means that modifiers need to be programmed before the function they are modifying. Up to three modifiers can be added to a command function on one soft key.

*Note that modifiers can only be assigned within the same command type as its modified function: **DAW CMDS** or **Key Assign**. Menu selectors cannot be part of multiple soft key assignments. Reassigning a menu selector will cause that menu selector and its soft key contents to be lost.*

Removing and Replacing Soft Key Assignments

In most instances, if a new command is assigned to a soft key, the new command will replace the old command. However, in order to allow for the modified function assignments described above, replacing a **DAW CMDS** function with another **DAW CMDS** function will require the previous function to be removed first, otherwise the new function will simply be *added* to the old one.

To completely remove the assignment of a soft key, select the relevant **Soft Key Set** and click the on-screen button whose assignment you wish to remove. The button will go yellow to indicate that it is being edited. From drop-down menu which appears, select **Unassign**. The scribble strip will return to a line of dashes, indicating that there is no function assigned to it and that it is available for reassigning.

In order to protect menus and all their sub-keys from being removed accidentally, a warning pop-up will appear when a menu is removed or replaced, allowing the action to be cancelled or confirmed.

Configuring Continuous Controller Layers

When a Continuous Controller Profile is assigned to a Nucleus² DAW Layer, Continuous Controller ('CC') messages are sent on channel 1 of the first MIDI send port assigned to that Layer. These messages can be used to control software instruments within the current DAW by using the DAW's MIDI 'learn' mode to attach messages to instrument plug-in parameters.

Alternatively, an external hardware MIDI device can be controlled by assigning it to the output of a MIDI track in the DAW whose input is receiving the CC control data from a Nucleus² DAW Layer. Logic provides a further mechanism to integrate external MIDI hardware via the capabilities of the Logic Environment.

CC Layers are unidirectional (one way). No CC data is returned from the device to Nucleus² and all front panel positional indication is derived locally, not from the device itself.

Nucleus² controls are mapped to CC numbers and values as follows:

Nucleus² Control	Continuous Controller Number	Value	'On' State Tally
Faders 1 to 16	0 to 15	0 to 127	-
V-Pots 1 to 16	16 to 31	0 to 127	-
SEL switches 1 to 16	64 to 79	0 = 'off' 127 = 'on'	Switch illuminates
V-Sel switches 1 to 16	80 to 95	0 = 'off' 127 = 'on'	Red LED beneath the V-Pot illuminates

*Note that the V-Pots function as absolute controllers, not as incremental devices and that the **SEL** and V-Sel switches emulate latched switches sending appropriate 'on' and 'off' values as they change state.*

Please refer to your MIDI device's manual for instructions regarding mapping these CC numbers within the MIDI device.

CC Displays

When a Nucleus² DAW Layer that is controlling a MIDI device is selected, the bottom row of the scribble strip displays the V-Pot CC Number or User label. When a fader or V-Pot is moved, the associated label switches to a momentary display of the value being altered.

The **FLIP** switch to the right of the left scribble display (see Page 37) interchanges the controllers assigned to the Faders and V-Pots as well as the DAW channel **SEL** and V-Sel switches. This makes it possible to have 3^2 controller channels available to the faders, using **FLIP** to switch between channels 0-15 and 16-31.

*Note that **Flip Scribble Strips** cannot be used on a CC layer.*

Blank page – well, nearly

6. DAW Operations

This section provides an overview of Nucleus²'s DAW control capabilities once Nucleus² and the Nucleus² Remote have been fully connected, installed and configured. We will concentrate on the three main areas of control: the channel strip, the transport, and additional master controls. You may want to keep a finger in the previous Section (Nucleus² Remote), as many of the DAW operations are defined by the Remote.

Layer Select

It is important to ensure that Nucleus² is controlling the correct DAW Layer, in order to prevent unintentional adjustments from being made to the wrong DAW.

Note. Layers allow Nucleus² to be connected to up to three DAWs, only one of which can be controlled by Nucleus² at one time, though all transports can be controlled simultaneously from one transport master.

The active layer is selected by pressing the **DAW 2** and **DAW 3** switches above the jog wheel. DAW 1 is controlled when neither switch is selected.
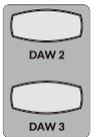
Soft Keys

While most of the switches on Nucleus² come with a function assigned, many of them can be altered to trigger any DAW keyboard command, or any command within the appropriate DAW protocol. Switch functions can be altered via the **Transport / Utility** page within the Nucleus² Remote (as described in Section 5). The switches overlaid in blue in the diagram below are the switches that can be altered – the blue labels indicate the switch labels within the Remote. As you read this section, be aware that any of these switches might have had their function edited.
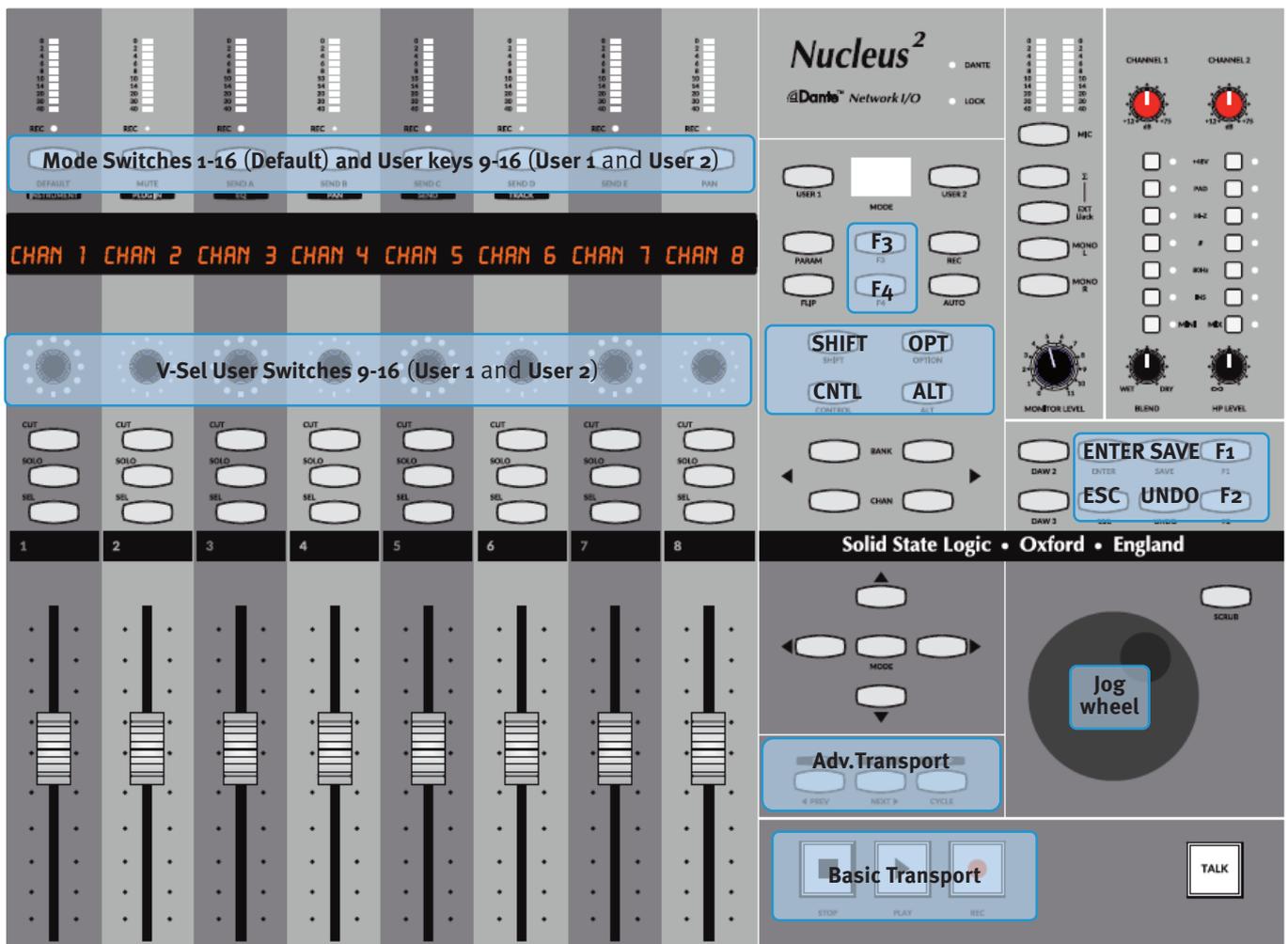
Channel Control

Channel Scrolling

On sessions with more than 16 channels, the **CHANNEL** and **BANK** switches allow you to choose which DAW channels are controlled by the 16 Nucleus² faders.

To scroll the Nucleus² through the DAW channels in increments of one, use the left and right **CHANNEL** switches. To scroll in increments of 16 DAW channels, use the left and right **BANK** switches.
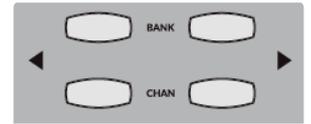
> *A channel scrolling function can also be assigned to the Nucleus² jog wheel via the Nucleus² Remote. Select **TRACKS** for the **Jog Wheel Default**. See Page 26 for more details.*

> *Logic users: Note that the tracks in the session may not appear on Nucleus² in the order that they are displayed in the **ARRANGE** window unless the **ARRANGE Channel Strip View** mode is selected in the Logic control surface set up menu.*

Basic Channel Parameters

The channel faders and the three switches above them are used for basic control of the DAW channels selected using the **CHANNEL** and **BANK** scrolling functions described above:

- The Nucleus² fader controls the DAW channel fader
- The Nucleus² **CUT** and **SOLO** switches control the DAW channel cut and solo functions.

> *The CUT switches will flash red whenever the SOLO function is active in the DAW.*

- The Nucleus² **SEL** switch is used to select the channel in the DAW, for purposes such as channel naming. The switch lights to indicate that it's corresponding DAW channel is selected. It can also be used for track arming (by pressing the centre section **REC** switch – see below), automation (using the centre section **AUTO** switch – see below) and for assigning plug-ins to the Nucleus² plug-in editor (using the centre section **PARAM** switch – see Page 42).

Channel Metering

DAW channel meters are replicated at the top of each Nucleus² channel strip, above the Mode switch.

Track Arming

The channel **SEL** switches can be used as track arming switches. To do this, select the **REC** switch above-left of the **MONITOR LEVEL** control. You will notice that the **SEL** switches now light red and emulate the status of the channel record ready indicator. Once the **REC** switch is deselected, the **REC** LED just below the relevant channel meter lights to indicate 'Record Ready' status.

Automation Control

The DAW channel's automation mode can be controlled by selecting the **AUTO** switch above-left of the **MONITOR LEVEL** control. Use the channel **SEL** switches to select which channel's automation mode is being edited, then press the V-Sel switches to trigger the mode shown in the lower row of the display above them. The upper row of the display will indicate the selected mode for the selected channel.

> *Note that the automation modes can be accessed using the V-Sel switches in either side of Nucleus².*

> *HUI Users: Single-letter indication of automation modes can be permanently displayed after the channel name in the upper row of the display – this is determined by **Show Auto Mode** in the **DAW** tab of the Remote. Write modes are indicated by a flashing W, read modes by a flashing R, and Off is indicated by no flashing letter. See the Nucleus² Remote Section for more information.*

### V-Pot and V-Sel Control

The channel V-Pots and V-Sel switches below the digital display fulfill a number of different DAW-specific functions. The V-Pot value is displayed using the LEDs surrounding it and the small red LED beneath indicates that the V-Sel switch is in its active position (as shown).

The V-Sel switch is activated by pressing on the V-Pot. Note also that the Mode switches do not hold any function specific to the channel strip in which they are located.

Nucleus² 's Pro Tools and Logic profiles come programmed with a number of essential V-Pot modes assigned to the Mode switches above the left-hand display. These are printed below the switches. Full lists of default assignments are listed in the Appendix.

Turn for V-Pot
Press for V-Sel

V-Pot level

V-Sel status
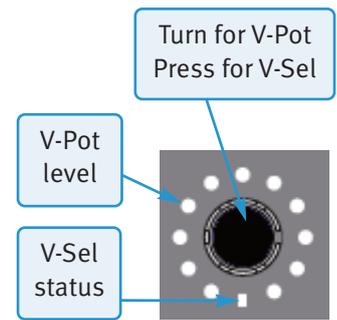
PRO TOOLS

The default Mode switch functions are shown in white boxes immediately beneath the switches. They are:

DEFAULT   Initialises selected values: Hold **DEFAULT** and press V-Pot to set it to 0dB (sends) or centre (pan), or **SEL** to set fader to 0dB

MUTE   When V-Pots are assigned to a Send, **MUTE** switches the V-Sel function between mute/unmute and pre/post switching

SEND A to **E**   Assigns control of Sends A to E to V-Pots

PAN   Assigns V-Pots to the channel pan function

LOGIC

The default Mode switch functions are shown in white text, immediately above the display. Use the **SEL** switches to select the channel to which modes are applied. Some functions involve holding a Mode key and pressing a V-Sel:

INSTRUMENT   Opens the instrument editor on an instrument track

PLUG IN   Opens the plug-in editor

EQ   Opens the EQ editor

PAN   Assigns pan control to the V-Sel switches

SEND   Opens the Sends editor

TRACK   Assigns channel parameters to V-Pots

Mode switch 16 – on the far right-hand side – also comes pre-assigned, to the 'Keyboard ID' function. This function is required for part of the USB set up as described in Section 4.

Note that Mode switch assignments do not appear in the scribble strip display. If you change a Mode switch function or assign functions to the right-hand Mode switches, we suggest creating your own labels to indicate the new function.

*The right-hand Mode switches are not available if **USER 1** or **USER 2** (user soft keys) are selected.*

Note also that the functions assigned to the Mode switches are programmed in the Nucleus² Remote. See Section 5 for more information.

Flip Mode

Pressing the **FLIP** switch to the right of the left-hand display, triggers the HUI 'Shift' command or the MCU 'Flip' command, and assigns the V-Pot parameter to the fader.

***Pro Tools users:** FLIP only works on Sends A to E. In **FLIP** mode, the send pan control is assigned to the V-Pot.*

Plug-in Control (Pro Tools Only)

Nucleus² is able to control plug-ins and their parameters using the standard HUI plug-in editor. This consists of four encoders with integral switches, a two-line 40-character parameter display, plus additional switches to assign and control the plug-ins within a Pro Tools channel strip.

> *Note that the alignment of some of the labels in the Nucleus² scribble strip is approximate.*

Full details of the plug-in editor's functions can be found in the Pro Tools MIDI Control Surfaces guide. The following description provides a brief overview of the functionality.

To open the HUI plug-in editor, select the **PARAM** switch immediately to the right of the left-hand display.

To select the insert slot containing the plug-in to be edited, click on ***Send Slot*** in the mixer page. This will automatically assign the plug-in to the editor and open the plug-in window on-screen.

> *In Pro Tools software, selecting a channel via the **SEL** switches only works for tracks assigned to faders 1 to 8. For channels 9 to 16 the track selected to the plug-in editor is displayed in the top half of the scribble strip.*

Press V-Sel 16 to switch between Insert and Param mode – the red LED below the V-pot lights to indicate Param mode. Insert mode is used to select which insert (1- 5) is being configured, and Param allows the parameters of the selected plug-in to be controlled.

Insert Mode

V-Pot 16 scrolls the page between Inserts 1-4 and Insert 5, as indicated in the top row of the scribble strip. In the Inserts 1-4 page, Inserts 1-4 can be accessed by pressing V-Sels 9, 11, 12 and 14. In the Insert 5 page, Insert 5 is accessed via V-Sel 9. The selected insert label will flash to indicate that it has been selected.

Channel 15's V-Sel switches Assign mode on and off, and the red LED below the pot flashes when Assign mode is on. In Assign mode, the V-Pot for each insert scrolls through a full list of available plug-ins, with the LEDs around the VPot indicating how far through the list you have scrolled. Once the desired plug-in has been located, it can be assigned to the track insert by pressing the associated V-Sel.

Param Mode

Param mode, activated either by pressing V-Sel 16 or by pressing any of the inserts which are currently assigned, brings the parameters of the plug-in on the currently selected track insert into the plug-in editor. The plug-in parameters are accessed using V-Sels and V-Pots 9, 10, 11 and 12. The upper row of the scribble strip displays any parameter switch options controlled by the V-Sels, and the lower row on the scribble strip displays the parameters controlled by the V-Pots. In Param mode, V-Pot 16 scrolls between the pages of plug-in parameters. When a new page is accessed, the current page is displayed momentarily (along with the number of parameter pages) in the top row of the scribble strip, in Channels 9 and 10.

V-Sel 7 and 8 are always assigned to the Bypass and Compare functions of the plug-in.

MASTER CONTROL

Basic Transport

Your DAW's transport can be controlled from the stop, play and record **TRANSPORT** switches at the bottom of the centre section.

Above the main transport controls are three smaller switches. The functions assigned to these switches are defined in the Nucleus² Remote by selecting the **Transport / Utility Soft Key Set**. Their default HUI functions are printed above them, their default MCU functions are printed below them.
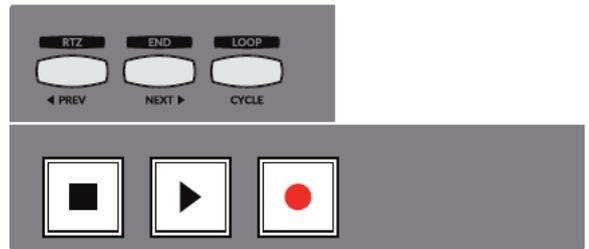
Navigation Controls

The cursor switches (the four arrowed switches with a central **MODE** key to the left of the jog wheel) perform various DAW-specific operations. Please refer to your DAW's User Guide for more information.

The large jog wheel performs a number of different functions, as configured in the Nucleus² Remote.

The switch above and to the right of the jog wheel is user assignable – in protocols which include a function associated with the wheel, it is assigned to this switch by default.
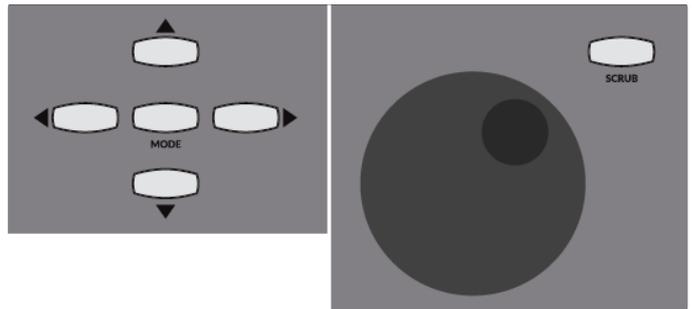
The jog wheel's default function is '**Wheel**', which is a basic scrolling function in most DAWs. The other modes are **FF/RW** and **+/–** (HUI only timeline scrolling – resolution is controlled by the Timeline format and Nudge value respectively), and **TRACKS** which assigns the channel scrolling function to the jog wheel.

*Pro Tools Users: Note that the wheel does nothing in '**Wheel**' mode until Jog or Shuttle mode is activated using the jog wheel switch. Jog or Shuttle mode is assigned to the jog wheel switch via the **Transport / Utility** page within in the Nucleus² Remote. Jog mode is assigned by default.*

Additional Master Controls

The modifier switches to the left of the **MONITOR LEVEL** control (labelled **SHIFT, CTRL, OPT** and **ALT**) as well as the **ESC** and **ENTER** keys above the jog wheel are protocol-specific. Please refer to your DAW's User Guide for more information.

The **SAVE, UNDO, F1** and **F2** switches above the jog wheel replicate their DAW functions.

All of these switches belong to the **Transport / Utility** soft key set – each of the functions performed by these switches can be modified using the Nucleus² Remote.

Some of these default assignments will not function with some DAWs.

*Also note that the **F3** and **F4** switches towards the top of the centre section are currently unassigned.*

MODE Display (MCU Only)

The two digit **MODE** display beneath the Nucleus² logo displays the 'Mode' number within protocols which support this.

USER KEYS

Two soft keys sets are available for users to configure. These soft keys employ the Mode and V-Sel switches in channels 9-16:
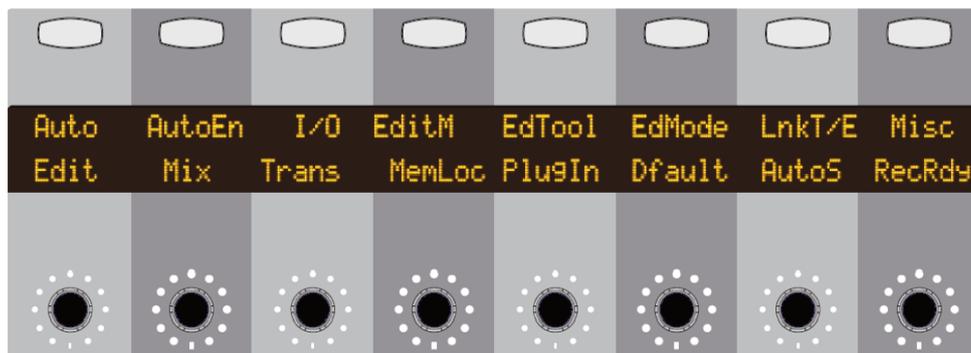
The two soft key sets are called **User 1** and **User 2**, and are activated by pressing the **USER 1** or **USER 2** switch, below the Nucleus² logo in the centre section. The top row of the scribble strip display indicates the Mode switch function, the bottom row the V-Sel function. To return the Mode and V-Sel switches to their normal functions, deselect both **USER 1** or **USER 2** switches.

Each Mode switch can be run either as a simple soft key (triggering any DAW computer keyboard command or any command within the relevant DAW protocol), or as a menu switch – each menu switch accesses a subset of soft keys laid out across the V-Sel switches below:
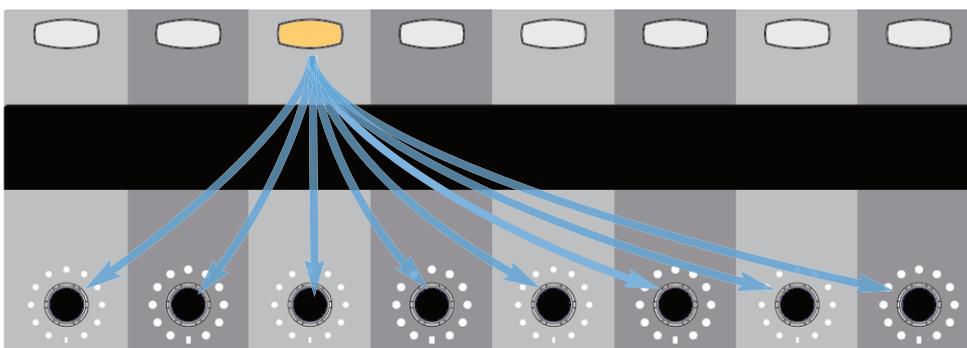
Taking the V-Sel assignments which will be active with no Mode switches selected in to account, the two **USER** soft key sets can be configured to provide access to up to 144 functions. This is of course in addition to all of the other user-assignable switches across the control surface.

*The **USER 1** and **USER 2** soft key sets are programmed using the Nucleus² Remote, as described in Section 5.*

7. Analogue Operations

Nucleus² has two areas of analogue operation: the input section (used for recording sources to the DAW) and the monitoring.

RECORDING SOURCES

The input section of Nucleus² is located in the top right-hand corner of the centre section. There are two input channels, with insert circuits for introducing external processing to the signal. The inputs have 'combi' connectors for plugging in microphone XLRs or instrument jacks, and the inserts are on 1/4" jack plugs, all located on the Nucleus² back panel.

*Note that the insert circuit can be sourced from the DAW outputs instead of the channel inputs by pressing the **MIX** button below the input area. See the following page for details.*

The input controls are as follows:

Input Level Control (+12dB to +75dB)

HI-Z switches the XLR (microphone) input from low to high impedance *(Jack input is always high impedance.)*

Switch the insert circuit in by pressing **INS**

Activates **+48V** Phantom power

Introduces a −20dB **PAD** (gain reduction)

Ø inverts the signal's phase

Introduces an **80HZ** high-pass filter
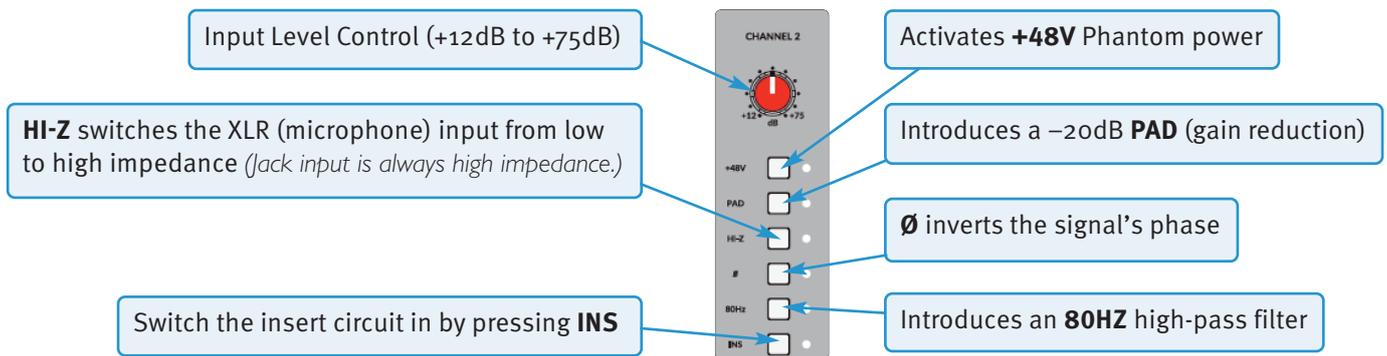
MONITORING

The Nucleus² monitoring is controlled using the source selector switches to the right, and the controls beneath, the input section.

The level of the main monitors is controlled by turning the **MONITOR LEVEL** control in the centre of the centre section. The **MINI** button switches the main monitor outputs to the MINI monitor outputs.

The headphone level is controlled independently using the **HP LEVEL** control below **CHANNEL 2**.

Normally, the monitor and headphone outputs receive a mix of the inputs to Channels 1 and 2 and the DAW return, allowing for true zero latency monitoring. The mix between the two is adjusted using the **BLEND** control below **CHANNEL 1**; to hear more of the inputs turn it towards **DRY**, and to hear more of the computer, turn it towards **WET**.

By default, the monitoring treats the channel inputs as a single stereo input, with Channel 1 fed to the left monitor stem, and Channel 2 fed to the right. Press the **MONO L** and **MONO R** switches above the **MONITOR LEVEL** control to treat the channel inputs as mono:
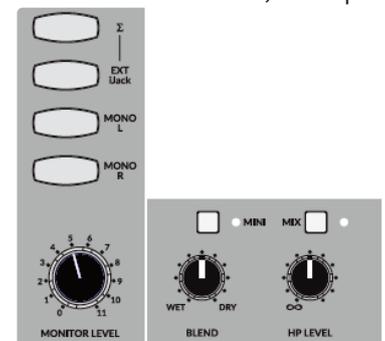
- With **MONO L** selected, the signal from Channel 1 will be sent to both sides of the monitors and Channel 2 will be muted.
- With **MONO R** selected, the signal from Channel 2 will be sent to both sides of the monitors and Channel 1 will be muted.
- With **MONO L** and **MONO R** selected, the signals from both Channels will be sent to both sides of the monitors.

MIX Mode

When mixing down, Nucleus² can be used to insert external processing to the stereo master by pressing the **MIX** switch above the **HP LEVEL** control. In Mix mode, the monitor inputs replace the input channels as the source for the channel insert sends. The insert return is routed to the channel outputs in the normal way, allowing the processed signal to be re-recorded within the DAW.

In Mix mode, none of the monitor controls affect the insert send or return. However, the monitoring continues to function normally.

External and iJack

A choice of external sources can be fed to the monitors and headphones, enabling auditioning without having to use up channel inputs. The **EXTERNAL** XLR sockets, located on the back panel, allow a balanced line-level stereo source to be connected whilst the **IJACK** socket, a 3.5mm stereo jack also located on the back panel, allows external sources such as MP3 players to be connected. To listen to either input, press the **EXT** switch above the **MONO L** and **MONO R** switches.

*The External and iJack inputs are internally blended; both inputs are selected with the one **EXT** switch.*

The external source(s) can replace the normal monitor source, or be added to it: Press the **Σ** switch (above the **EXT** switch) to sum the monitor sources together, or leave it unselected to replace the normal monitoring with the external signal.

Take care to avoid creating a feed-back loop by feeding the processed signal to the stereo master within the DAW!
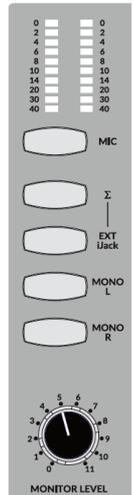
TALKBACK

The Talkback input on the rear of the console feeds the headphone inputs when the momentary **TALK** switch is pressed. The input has a built-in mic-pre circuit, with gain adjustable between +20dB and +55dB via the flathead screw above the XLR socket.

The talkback feed triggers a 20dB drop in the Main and Mini monitor output levels; this can be switched via the **MON DIM Defeat** button on the rear of the console. The talkback can be routed to channel 2 of the Dante soundcard for remote communications over the network by pressing the **TB to Net** button on the rear of the console.

METERING

The pair of meters at the top of the centre section can be used to meter three different signals:

Monitors   The left and right monitor blend of channel input and DAW return. The meters are sourced after the **BLEND** pot but before the **MONITOR LEVEL** control. This is the default meter source.

Note that when the iJack is the selected monitor source, the meters will still show the input and return blend level rather than the iJack level.

Inputs   Press the **MIC** switch below the meters to display **CHANNEL 1** on the left meter and **CHANNEL 2** on the right meter. This signal is sourced from after the channel's insert send and return, just before the signal is sent to the DAW via the USB Soundcard.

Mix Return   With the **MIC** button active, press the **MIX** button above the **HP LEVEL** control to meter the left and right mix signals. This meter source is after the insert send and return, just before the signal is sent back to the DAW via the Dante Soundcard.

See above for an explanation of mix mode.

Appendix

TRANSPORT/UTILITY FUNCTION MAP

The chart below details the assignments of the transport and utility functions within Pro Tools, Logic and Nuendo/Cubase:

Switch Type		Pro Tools	Logic	Nuendo/Cubase
Transport	RTZ	RTZ	Stop Stop	USB
	END	End	-	-
	LOOP	Loop	Cycle	Cycle
	ONLINE	On-Line	-	USB
	PUNCH	Quick Punch	Drop	Punch
	PREVIOUS	Prev Marker	USB	Previous
	NEXT	Next Marker	USB	Next
	LAST CUE	Last Marker	-	-
	NUDGE –	Keypad –	USB	USB
	NUDGE +	Keypad +	USB	USB
Utility	SHIFT	Shift/All	Shift	Shift
	OPT/ALL	Option/All	Option	-
	CTRL	Control	Control	USB
	ALT	CMD/Alt/Fine	Alt	USB
	ESC	Function Key 8/Esc	USB	USB
	ENTER	Keypad Enter	Enter	USB
	SAVE	Save	Save	Save
	UNDO	Undo	Undo	Undo
	FOOT 1	Play Foot Switch	Play Foot Switch	Play Foot Switch
	FOOT 2	Record Foot Switch	Record Foot Switch	Record Foot Switch

All USB key commands listed refer to the Logic or Nuendo/Cubase default command key mappings; see your DAW User Guide for more details.

Key assignments for DAW profiles can also be found under **Nucleus² › Documents** on the SSL website.

DAW Protocol Command Soft Key Labelling

The following list details the way in which each DAW protocol command is labelled when the command is assigned to a Nucleus² soft key. Non-standard commands are asterisked (*):

Pro Tools

Function	Soft Key Label	Function	Soft Key Label
Mix to Foreground	Mix	Keypad /	/
Edit to Foreground	Edit	Keypad *	*
Open/Close Transport	Trans	Keypad −	−
Open/Close Mem	Memloc	Keypad +	+
Open/Close Session Setup	Status	Keypad .	.
Open/Close Plugin Editor	Alt	Keypad Enter	Enter
Input	Input	Keypad 0	0
Output	Output	Keypad 1	1
Assign	Assign	Keypad 2	2
Pan	Pan	Keypad 3	3
Mute	Mute	Keypad 4	4
Send A	Send A	Keypad 5	5
Send B	Send B	Keypad 6	6
Send C	Send C	Keypad 7	7
Send D	Send D	Keypad 8	8
Send E	Send E	Keypad 9	9
Bypass	Bypass	Audition	Auditn
Default	Dfault	Audition Pre	AudPre
Undo	Undo	Audition In	AudIn
Control	Ctrl	Audition Out	AudOut
Auto Suspend	AutoS	Audition Post	AudPst
Save	Save	RTZ	RTZ
Auto Enable Plugin	Plugin	End	End
Auto Enable Pan	Pan	On-line	Online
Auto Enable Fader	Fader	Loop	Loop
Auto Enable Send Mute	SMute	Quick Punch	QPunch
Auto Enable Send	Send	Forward	Forwrd
Auto Enable Mute	Mute	Rewind	Rewind
Auto Mode Read	Read	Stop	Stop
Auto Mode Latch	Latch	Play	Play
Auto Mode Trim	Trim	Record	Record
Auto Mode Touch	Touch	* Next Marker	Next
Auto Mode Write	Write	* Prev Marker	Prev
Auto Mode Off	Off	* Last Marker	Last
Option/All	Option	* Reset Marker	Reset
CMD/Alt/Fine	Alt	Edit Capture	Capt
Rec/Rdy all	RecRdy	Edit Separate	Seper
Shift/All	Shift	Edit Cut	Cut
Edit Tool	EdTool	Edit Copy	Copy
Edit Mode	EdMode	Edit Paste	Paste
Function Key 1	F1	Edit Delete	Delete
Function Key 2	F2	Status Auto	Auto
Function Key 3	F3	Status Monitor	Mon
Function Key 4	F4	Status Phase	Phase
Function Key 5	F5	Status Group	Group
Function Key 6	F6	Group Suspend	Suspend
Function Key 7	F7	Group Create	Create
Function Key 8/Esc	F8	Play Foot Switch	PlayFS
Keypad Clr	Clr	Record Foot Switch	RecFS
Keypad =	=	Jog/Shuttle	Jog/Shuttle

Logic

Function	Soft Key Label	Function	Soft Key Label
Track	Track	Write	Write
Pan/Surround	PanSur	Touch	Touch
EQ	EQ	Latch	Latch
Send	Send	Trim	Trim
Plugin	Plugin	Save	Save
Instrument	Instr	Undo	Undo
Flip	Flip	Group	Group
Global	Global	Cancel	Cancel
Name/Value	NM/VAL	Enter	Enter
SMPTE/Beats	SMPTE	Marker	Marker
Function Key 1	F1	Nudge	Nudge
Function Key 2	F2	Cycle	Cycle
Function Key 3	F3	Drop	Drop
Function Key 4	F4	Replace	Rplace
Function Key 5	F5	Click	Click
Function Key 6	F6	Solo	Solo
Function Key 7	F7	Forward	Forwrd
Function Key 8	F8	Rewind	Rewind
MIDI Tracks	MIDITr	Stop	Stop
Inputs	Inputs	Play	Play
Audio Tracks	AudTr	Record	Record
Audio Instruments	AudIns	VSel 1	VSel 1
Aux	Aux	VSel 2	VSel 2
Busses	Busses	VSel 3	VSel 3
Outputs	Outpts	VSel 4	VSel 4
User	User	VSel 5	VSel 5
Shift	Shift	VSel 6	VSel 6
Option	Option	VSel 7	VSel 7
Control	Ctrl	VSel 8	VSel 8
Alt	Alt	Play Foot Switch	PlayFS
Read	Read	Record Foot Switch	RecFS

Nuendo

Function	Soft Key Label	Function	Soft Key Label
Page Down	PageDn	Save	Save
Pan	Pan	Revert	Revert
EQ	EQ	Read	Read
Page Up	PageUp	Write	Write
Inserts	Insert	Project	Prject
FX Sends	FXSend	Mixer	Mixer
Flip	Flip	Sends	Sends
Edit	Edit	Instruments	Instrm
Name/Value	Nm/Val	Master	Master
SMPTE/Beats	SMPTE	Motors	Motors
Function Key 1	F1	Solo Defeat	SolDef
Function Key 2	F2	Shift	Shift
Function Key 3	F3	Left	Left
Function Key 4	F4	Right	Right
Function Key 5	F5	Cycle	Cycle
Function Key 6	F6	Punch	Punch
Function Key 7	F7	Previous	Prev
Function Key 8	F8	Add	Add
Fader Group 1	FadGp1	Next	Next
Fader Group 2	FadGp2	Forward	Forwrd
Fader Group 3	FadGp3	Rewind	Rewind
Fader Group 4	FadGp4	Stop	Stop
Fader Group 5	FadGp5	Play	Play
Fader Group 6	FadGp6	Record	Record
Fader Group 7	FadGp7	Play Foot Switch	PlayFS
Fader Group 8	FadGp8	Record Foot Switch	RecFS
Undo	Undo	Scrub	Scrub
Redo	Redo		

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