



eyeheight



# NS-21

two input video/audio switch.

## user manual

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# I System overview

This manual describes the function of the NS-21. This unit is an electronic SDI Video and AES audio switcher. The input SDI video and AES audio is simply switched to the output. A mechanical relay bypass is enabled if the power is removed and provides connection between input 1 and the output. The SDI video is relocked. The AES audio is re-shaped but not re-clocked.

The NS-21 is a unit that will accept two SDI video/AES inputs and has one SDI/AES output.

The main features are :-

- 2 Input, 1 output SDI video/AES Audio switch.
- A mechanical relay bypass, from input 1 to the output on SDI and AES.
- Control by FP-9/FP-10 control panel. 2 LCD legenable pushbutton switches for control.
- GPI control.

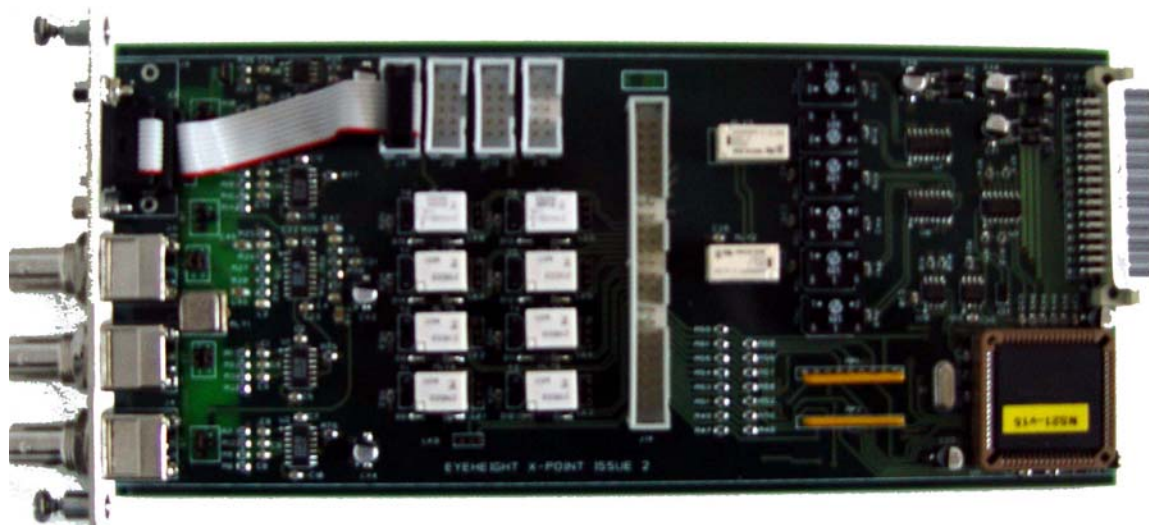


Figure 1-1 NS-21 module.

## I.I Applications for the NS-21

Applications for the NS-21 include the following:-

- A preview switcher.
- Emergency bypass switching.

## I.2 Associated Equipment for the NS-21

The NS-21 is a module and requires both a chassis and a control surface to function.

### I.2.1 Chassis Types

- **flexiBox** is a 1RU chassis. The order code is FB-9. This will hold a maximum of 6 NS-21 Modules with “Hot Swap” redundant PSU option and “Hot Swap” NS-21 modules.
- **maxiBox** is an alternative low cost 1RU chassis. The order code is MX-9. This also will hold a maximum of 6 NS-21 modules but it has no redundant PSU option and the NS-21 units must be factory fitted.



Figure 1-2 FlexiBox with flexiPanel fitted

### I.2.2 Control Surfaces

- **flexiPanel** is a 1RU control surface that fits on the Front of a 1RU flexiBox. The order code is FP-9. A FlexiPanel can also be used in conjunction with a miniBox, in this case the extra accessory (Order code RR-9) will be required
- **FP-10** is a desk mounting control surface (Order code FP-10). This unit is a modular unit which can be used in conjunction with the units below.



Figure 1-3 FP-10 desktop modular panel



Figure 1-4 FP-9 1RU panel.

## 2 Installation

### 2.1 Installation of the NS-21 product

If this unit is already pre-installed in a flexiBox (FB-9), or a maxiBox, with either a local or a remote panel from the factory then refer to the "Hardware Installation Guide" which will be enclosed with the system. If this unit is pre-installed in a miniBox (MB-9), then also refer to the "Hardware Installation Guide" which will be enclosed with the system

If this unit has been ordered separately, we assume here that you already have a flexiBox system with a Flexipanel and that the flexiBox has at least two spare slots above each other for the NS-21 card.

### 2.2 Installing the NS-21 into a flexiBox

To install the NS-21 into a flexiBox it is desirable (but not necessary) to power down the flexiBox. Follow these instructions.

On the rear of the flexiBox are 6 slots for Products. Remove any pair of spare blanking plates one above another. There are 2 off M2.5 Screws, which require unfastening for each blanking plate.

Slide the Product PCB into the spare slots and firmly push it "home".

Use the two thumbscrews to fasten the unit in place. Take care that the ribbon cable for the upper circuit board stays attached to the lower board.

Now refer to the "GeNETics User Guide". If your system consists of a single flexiBox with a single flexiPanel then refer to the section titled "flexiPanel Auto Set-up". If your system is part of a network with more than one flexiPanel then refer to the section titled "flexiPanel Manual Set-up". This will guide you through acquiring your product as a device on the flexiPanel.

### 2.3 Connecting to an NS-21.

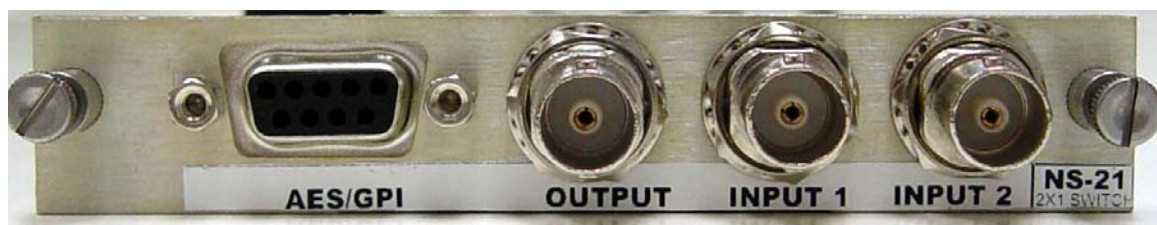


Figure 2-1 connections of an NS-21 module.

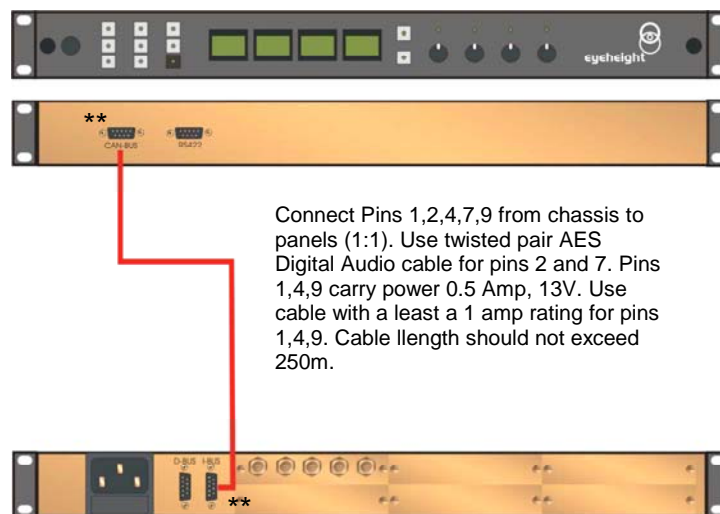
Above are the rear connectors for the NS-21 module. The SDI Video BNC Inputs and output are clearly shown. Below is a pin-out for the 9 Way D-Type.

PIN NUMBER	FUNCTION
1	Ground
6	AESOP+1, Audio output
2	AESOP-1, Audio output
7	AESA+, Audio input#1
3	AESA-, Audio input#1
8	AESB+, Audio input#2
4	AESB-, Audio input#2
9	GPI 1, Input Select, Short to ground selects Input2, otherwise selects Input1
5	Not used

## 2.4 Connecting Panels to the NS-21

The NS-21 may be operated using a FP-9 or FP-10 Flexipanel locally, or remotely mounted. For detailed information on connecting remote panels refer to the section “Connection of Remote Panels to a flexiBox” in the geNETics Hardware Installation Guide.

Below is shown a typical system consisting of an NS-21 in a flexiBox controlled by an FP-9.



Connect Pins 1,2,4,7,9 from chassis to panels (1:1). Use twisted pair AES Digital Audio cable for pins 2 and 7. Pins 1,4,9 carry power 0.5 Amp, 13V. Use cable with a least a 1 amp rating for pins 1,4,9. Cable llength should not exceed 250m.

I-Bus pins 2 & 7

\*\* The I-BUS Network requires terminating with 100 Ohms at each extreme end of the network. Ensure that this is done either by an external 100 ohm resistor OR ONE Panel/Product at each end has the termination set. See the "Genetics User Guide" Under the sections "Flexipanel Power/I-BUS Jumpers". For the 4RU Panels see "4RU Panel (FP-10) Jumpers for I-BUS" and "4RU Panel (VP-10, SW-10, AP-10) Jumpers for I-BUS". Alternatively The termination can be set on a Product (ie the AS-2 module). Information about this is given in this manual.

N.B. From 1/10/02, Eyeheight introduced a change in the flexiBox Chassis. Most versions now have two 9 way connectors on the rear labelled “I-Bus” and “D-Bus”. The “I-Bus” connector is the same as the previously labelled “Can-B”

connector. Although a maxiBox is shown in this diagram the same, arrangement applies for a flexiBox chassis.

# 3 Operation

## 3.1 Manual control of the NS-21

Manual Control of the NS-21 is done using one or more of the following control surfaces:

- The 1RU FP-9 flexiPanel.
- The FP10 desk mounting Panel

The FP-9 and the FP-10 have identical manual control systems. (The FP-10 is simply a desktop version of the FP-9). The NS-21 is, as are all genetics modules, controlled using a set of MENUS. Each of these menus contains up to 3 parameters that are adjusted using the rotary digipots. The Menus define all of the adjustable operational parameters in the NS-21. Pressing the rotary digipots brings the parameter to its default value. Device selection is done using the device select switches which, when pressed, will offer the name of the device in the LCD Window. Modules can be acquired and then de-acquired using the set-up switch. For a full description of the operation philosophy of the geNETics system refer to the “geNETics User Guide” (section “Operation of the flexiPanel”)

A full list of the Menus and their functions are given in section 3 of this chapter.

## 3.2 Automation Control of the NS-21

Automation of the geNETics products is achieved via an RS422 port.\*\* This port is marked RS422 on the rear of a flexiBox. For the port to work a flexiPanel MUST be connected locally on the front of the flexiBox.

Automation control of the NS-21 can be done using the following protocol method:

- geNETics Automation Protocol.

Genetics protocol is described in detail in the “GeNETics User Guide” section titled “Automation Protocol on the geNETics Platform”. The menu list in section 3 of this chapter contains the data information for the protocol.

\*\*On most flexiBoxes later than 1/10/02 the RS422 port has been replaced by a “D-Bus” Port. The D-Bus port is for High Speed data transfer and is not used for serial control. In order to achieve serial control of any products on an I-Bus network Eyeheight Ltd have developed a RS232→I-bus converter “dongle”, (DG-9) which enables greater flexibility of products on the I-Bus network whilst using the same protocols as the RS422 port. Please refer to the “User guide for the DG-9 eyeheight dongle and set-up software.

## 3.3 Assigning names to the two NS-21 inputs.

Names may be assigned to the two NS-21 inputs. These names appear on the menu 01→02 LCD displays.

The two named sources to the NS-21 can be renamed.

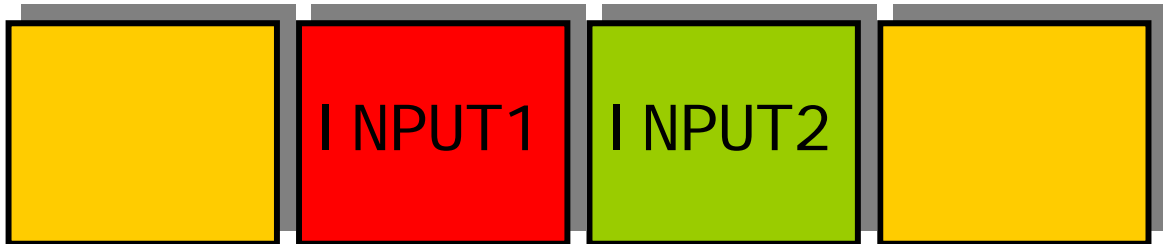
The procedure is as follows:

- Plug in a PS-2 Keyboard into the flexiPanel that has control of the NS-21.
- Ensure that the correct NS-21 is selected on the device buttons.
- Press NEXT until menu#4 is visible on the LCD display
- On menu#4 select the input which requires the name changing
- Hit the RETURN key, and a block cursor will appear on menu#4
- Type in the new name (6 chrs)
- Hit the RETURN key.

### 3.4 Operation menus for the NS-21

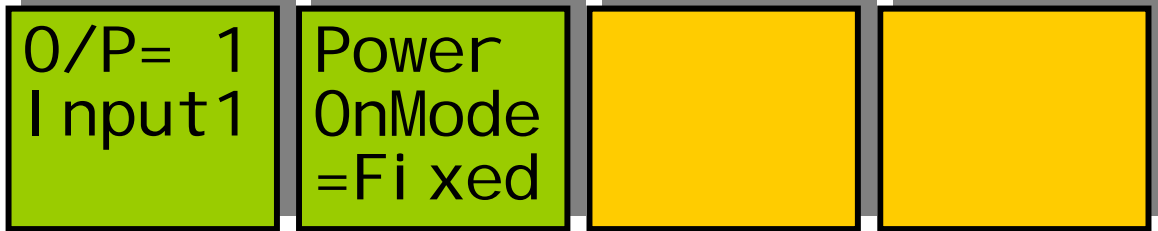
The following set of menus defines the operation of the NS-21.

#### 3.4.1 Menu 00-03: Top level controls



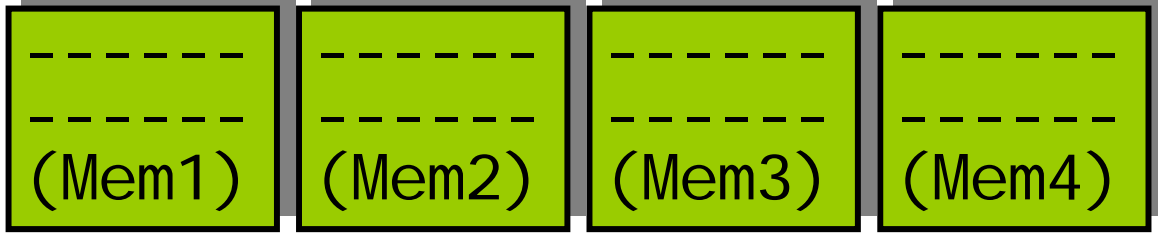
Menu Num.	Heading	Automation	Function
0			
1	INPUT 1 (user defined)	1=switch output to this input.	Pressing this button switches the output to this input. The switch lights up red to indicate when selected.
2	INPUT 2 (user defined)	1=switch output to this input.	Pressing this button switches the output to this input. The switch lights up red to indicate when selected.
3			

### 3.4.2 Menu 04-07: Set up Controls



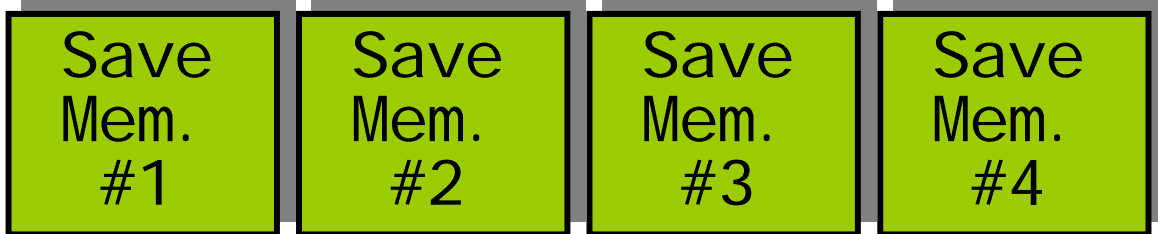
Menu Num.	Heading	Automation	Function
4	O/P= 1 INPUT 1  (user defined)	1 to 2	This button will select which input is routed to the output. Pressing return will bring up a cursor enabling the user to type their required label for the currently selected input. Pressing return again will store the new label and return to normal operation.
5	Power On Mode	0=Last 1=Fixed 2=GPI	This menu decides which action is taken on power-up. After adjusting this the user <b>MUST</b> set this as the Power on default. (See menu 16)  Last, means that the unit will power up selecting the Last input before power down.  Fixed means that the unit will power up selecting whichever input is set as the power on default (See menu 16)  GPI, means that the unit will power up and set itself to the value coming in on the GPI Input
6	No menu		
7	No menu		

### 3.4.3 Menu 08-II: Memory Controls



Menu Num.	Heading	Automation	Function
08	MEM1	1=Recall	Pressing this will recall Memory number 1.
09	MEM2	1=Recall	Pressing this will recall Memory number 2.
10	MEM3	1=Recall	Pressing this will recall Memory number 3.
11	MEM4	1=Recall	Pressing this will recall Memory number 4.

### 3.4.4 Menu 12-15: Memory Controls continued



Menu Num.	Heading	Automation	Function
12	Save Mem. 1	1= Save	Pressing this will Save Memory number 1.
13	Save Mem. 2	1= Save	Pressing this will Save Memory number 2.
14	Save Mem. 3	1= Save	Pressing this will Save Memory number 3.
15	Save Mem. 4	1= Save	Pressing this will Save Memory number 4.

### 3.4.5 Menu 16-20: Reset options



Menu Num.	Heading	Automation	Function
16	Set As Pow On Memory	1=save	Pressing this will save the current set up as the power on default. (See also menu 5)
17	Recall Pow On Memory	1=Recall	Pressing this will recall the power on default settings.
18	TOTAL RESET	1=Reset	Pressing this will reset the system.
19	NS-21 04032	N/A	Information about the current issue of software.

# 4 Technical Specification for the NS-21

Number of Inputs	2 Input BNCs
Type of Inputs	1 off 270Mbit Serial Digital Video Inputs 75Ohm, and one BNC acts as a video input to enable synchronised switching.
Line Length	At least 200 Meters of PSF1/3 (Typically 275 Meters)
Number of Outputs	1 Output BNCs
Type Of Outputs	270Mbit Serial Digital Video Outputs, 75 Ohm, 800mV
Audio Connections	3, AES, 48K/44.1K available on a 9 way D-Type
SDI Output Jitter	The system will add less than 0.2UI to the input Jitter. (This is only guaranteed on issue 2 or later cards)
Current Consumption	<800mA at +5V
Size	215mm by 100mm

## 4.1 I-BUS (CAN-BUS) Termination

The I-BUS Network is the "control system" under which all Products and Panels are networked together. Under certain circumstances it is necessary to terminate the network. This can be done on a Panel or a "Product". To terminate this product, locate J5 on the NS-21 Processor Card supplied which is between U1 (The large square "chip") and the Edge connector. (This is on the half of the card labelled "CHP-100 Spartan2 Processor"). Jumper this with a 2mm link.

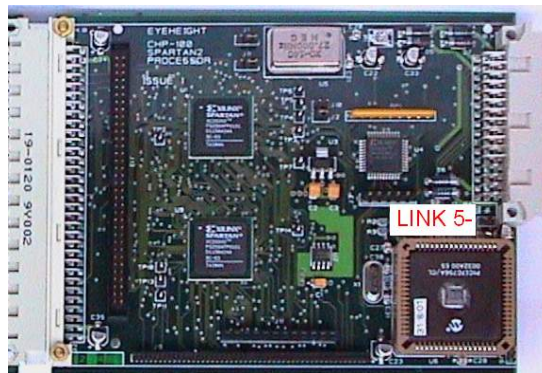


Figure 4-1 Location of I-Bus Termination