



NV1000 Terminal Equipment

Operations Manual Introduction

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*Manual Part No. MI1000-01
February, 1996*

Table 1 - NV1000 Terminal Equipment Power Consumption

Model Number	Module Description	Typical Power Dissipation	Worst Case Power Dissipation*
NV1020	AES3 Digital Audio CODEC	5.8 Watts	8 Watts
NV1021	AES3 Processing Distribution Amplifier	3 Watts	
NV1022	AES3 Distribution Amplifier	3 Watts	
NV1023	SDIF-2 Word Clock Distribution Amplifier	3 Watts	
NV1035/6	20-Bit AES3 Analog-to-Digital Converters	4.5 Watts	
NV1045/6	20-Bit AES3 Digital-to-Analog Converters	6 Watts	9-10 Watts
NV1050	Four-Channel AES3 Digital Audio Sample Rate Converter	4 Watts	
NV1055	Four-Channel AES3 Mix/Minus with Router	4 Watts	
NV1060	Four-Channel AES3 Digital Audio Delay Generator	4 Watts	
NV1061	Single-Channel Longitudinal Time Code Delay Generator	4 Watts	
NV1080	AES3 Digital Audio Reference Generator	4.5 Watts	
NV1082	AES3/SDIF-2 Digital Audio Reference Generator	4.5 Watts	
NV1083	AES3/SDIF-2 Off-Speed Digital Audio Reference Generator	4.5 Watts	
NV1087	HDTV Sync Separator	4.5 Watts	
NV1308A	Asynchronous AES3 Digital Audio Router Module	4 Watts	
NV1308SA Input Module	Synchronous AES3 Digital Audio Router Output Module	3.5 Watts	
NV1308SA Output Module	Synchronous AES3 Digital Audio Router Input Module	4 Watts	

1. Manual Description

This manual provides detailed installation and operating information for NVISION NV1000 terminal equipment. It covers a variety of system and board-level configurations and includes interface information for typical applications. Maintenance and troubleshooting information is included along with relevant drawings and schematic diagrams.

The NV1000 Operations Manual comprises title and warranty pages at the front of the binder, this Operations Manual Introduction section, along with individual Manual Inserts for the frame/power supply assembly and each product you purchased. Manual Inserts are separated by divider tabs indexed by product model number.

An Appendix at the back of the manual may contain supplementary information which applies to the entire product line. The Appendix is also a convenient place to add notes and other important information regarding your equipment and installation.

2. NV1000 System Overview

The NV1000 line of digital audio terminal equipment is designed for mounting in standard 19" equipment racks. A wide variety of NV1000 signal processing and distribution products are available packaged in separate active modules. Up to 12 active modules and two power supplies can be installed in a two rack unit (3-1/2") frame without regard to the functional mix of product. Each module is furnished with a captive mating backplane that mounts in the rear of the frame, enabling external cable connections from the rear. Regulated DC power to the modules is furnished by a power distribution motherboard that runs across the rear of the frame along the bottom. Refer to the section on Power and Thermal Considerations for more information on installing NV1000 active modules.

A connector on the frame power supply backplane can be used to control external alarms or indicators to alert an operator if one or both power supplies fail. Refer to the FR1000/PS2001 Manual Insert (MI2001-xx) for details on how to implement this feature.

The NV1000 frame and power supply assemblies are UL listed.

The captive backplanes use high quality industry-standard connectors. Compact screw-type pluggable terminal blocks are used instead of XLR connectors for analog audio, time code and balanced AES/EBU (AES3-1992) signals. Standard BNC connectors are used for SDIF-2 and AES-3ID inputs and outputs. Mating terminal blocks are supplied with each backplane to facilitate field installation.

Specific information regarding individual modules and backplanes can be found in the Manual Inserts for each product.

3. Power and Thermal Considerations

NOTE:

THE FOLLOWING POWER AND THERMAL CONSTRAINTS MUST BE OBSERVED WHEN INSTALLING NV1000 TERMINAL EQUIPMENT.

3.1 Power

The PS2001 power supply furnished with the FR1000 frame has sufficient capacity to power most combinations of installed modules, even when the frame is fully loaded. A second, fully-redundant PS2001 supply may be installed to provide protection against a failure in the primary supply or to guard against accidental loss of line voltage. For maximum protection, the line voltage for the redundant power supply should be taken from a different mains circuit.

Under some conditions, a frame may need to be fan-cooled or a second power supply installed. The following section covers the requirements for cooling heavily-loaded or multiple-frame installations.

3.2 Thermal Considerations

The operating temperature in the FR1000 frame must be kept below 50 Degrees C (122 Degrees F). Since the frame contains no internal fans, heavily-loaded frames must be fan-cooled using NVISION fan assemblies available separately.

Some rules for fan configuration follow:

1. The combined power dissipation of the active modules installed in a frame should not exceed 70 watts, and then only in a well-ventilated environment where the top and bottom of the frame is clear of obstructions and open to freely-moving air. In typical installations where equipment density is high and air movement is limited, the frame must be fan-cooled when the power dissipated in the frame reaches 45 watts.

CAUTION:

SOME COMBINATIONS OF ACTIVE MODULES CAN EXCEED THE 70 WATT CAPACITY OF A SINGLE PS2001 POWER SUPPLY. IF YOU PLAN TO USE MORE THAN FOUR (4) NV1020 OR NV1035 MODULES IN A FRAME AND IF THE ANALOG OUTPUT CABLES ARE OVER 300 METERS (1000 FEET) IN LENGTH, CONTACT NVISION TECHNICAL SUPPORT BEFORE PROCEEDING.

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- 2. Table 1 - NV1000 Terminal Equipment Module Power Consumption lists the typical and worst-case power dissipation for each of the NV1000 modules available at the time this manual was issued. If your frame contains several digital-to-analog converter modules, you should also refer to the power consumption graphs in the Appendix at the rear of the instruction manual binder. Carefully add up the power requirements of your modules and plan your installation to minimize excess power dissipation in any one frame.
 - 3. One FA1001 fan assembly will keep two fully-loaded frames (140 watts total) within acceptable limits. A bi-directional fan assembly (FA1002) is available which can cool two pairs of frames (140 watts per pair) when properly installed between them. See Figure 1 - Side View of Typical Fan Assembly Installations for typical cooling arrangements.
 - 4. Position each fan assembly adjacent to or between their target frames in the rack. Maintain one rack unit of clear air space above or below the stack of NV1000 frames, depending on the cooling configuration used.
 - 5. If you need help assessing cooling requirements for installations in demanding environments, contact NVISION Technical Support for assistance.

4. System Installation

4.1 Frame

- 1. Determine the placement of NV1000 frames in the rack. Where multiple frames are racked with fan assemblies, place each fan adjacent to the set of frames it is intended to cool. Refer to Section 3-2 above for fan installation information.
- 2. Using the 2.0 mm Allen wrench supplied, remove and set aside the FR1000 frame front door assemblies. See Figure 2 - NV1000 Frame Assembly.
- 3. Replace the appropriate frame rear panel covers with the captive backplanes furnished with each active module, leaving unused slots covered. Use the 2.5 mm Allen wrenches supplied for your convenience. The backplane mounting holes are oriented such that the assembly cannot be installed incorrectly. Figure 3 - Rear Panel Layout provides more detail. Ensure proper alignment of each active module to its backplane with the following procedure:
 - a. Install the backplane, leaving the mounting screws loose.
 - b. Plug the active module into the loose backplane, carefully aligning the connector and ensuring that it is fully seated.

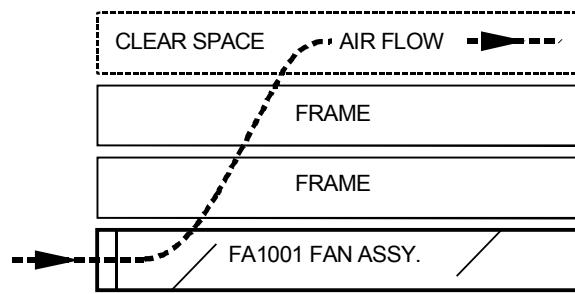


Figure 1a – FA1000 Fan Assembly Located Below Frames

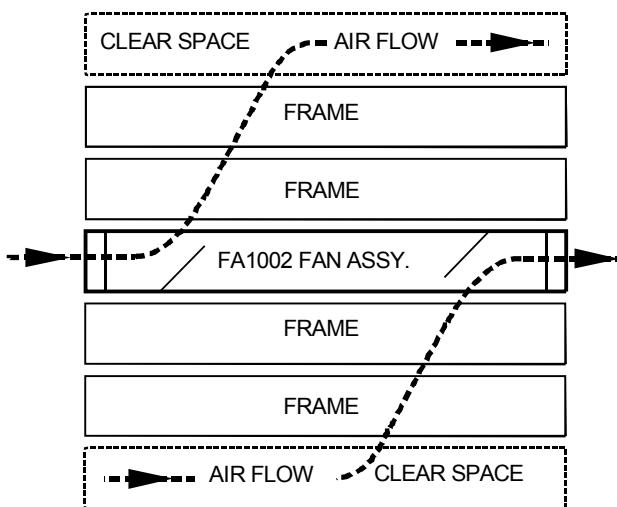


Figure 1b – FA1002 Bi-directional Fan Assembly Located Between Frames

Figure 1 - Side View of Typical Fan Assembly Installations

- c. With the active module inserted, tighten the screws securing the backplane.
- d. Remove the active module and continue with the installation.

CAUTION: **LEAVE ALL UNUSED PROGRAM SLOTS COVERED TO PREVENT EXPOSURE OF THE INTERNAL VOLTAGE DISTRIBUTION BUSES.**

- 4. Support the frame at the rear if it is loaded with many modules and is heavy. Some racks with metric mounting hole spacing require that you use the two innermost mounting holes on the front rack-mounting ears when installing the frame. For these installations, rear support is mandatory.

To add rear support, attach the rack-support hangers to the mounting rails in the rear of the rack. Position the hangers to receive the rear supports on the sides of the frame. Referring to Figure 2, remove the rearmost two bolts on each side of the FR1000 frame using a 5.5 mm nut driver (not supplied). Readjust the rear supports as necessary so that they will mate with the rack-support hangers when the frame is placed into position. Replace the bolts and proceed to the next step.

- With the help of an assistant, lift the frame into position and guide the rear rack supports through the rear rack support hangers. Attach the front rack-mounting ears to the front of the rack with the appropriate screws. Ensure that the alignment of the frame is correct and that the rear supports are resting in the rear support hangers.

4.2 Fan Assembly

- Position the fan assembly(ies) adjacent to the NV1000 frames which require cooling as previously discussed.
- Attach the fan assembly rack mounting ears to the equipment rack with mounting screws.
- Connect the external wall-mounted power transformer cable to the jack at the rear of the fan enclosure. Ensure that the fans are operational and that air moves freely through the frames before

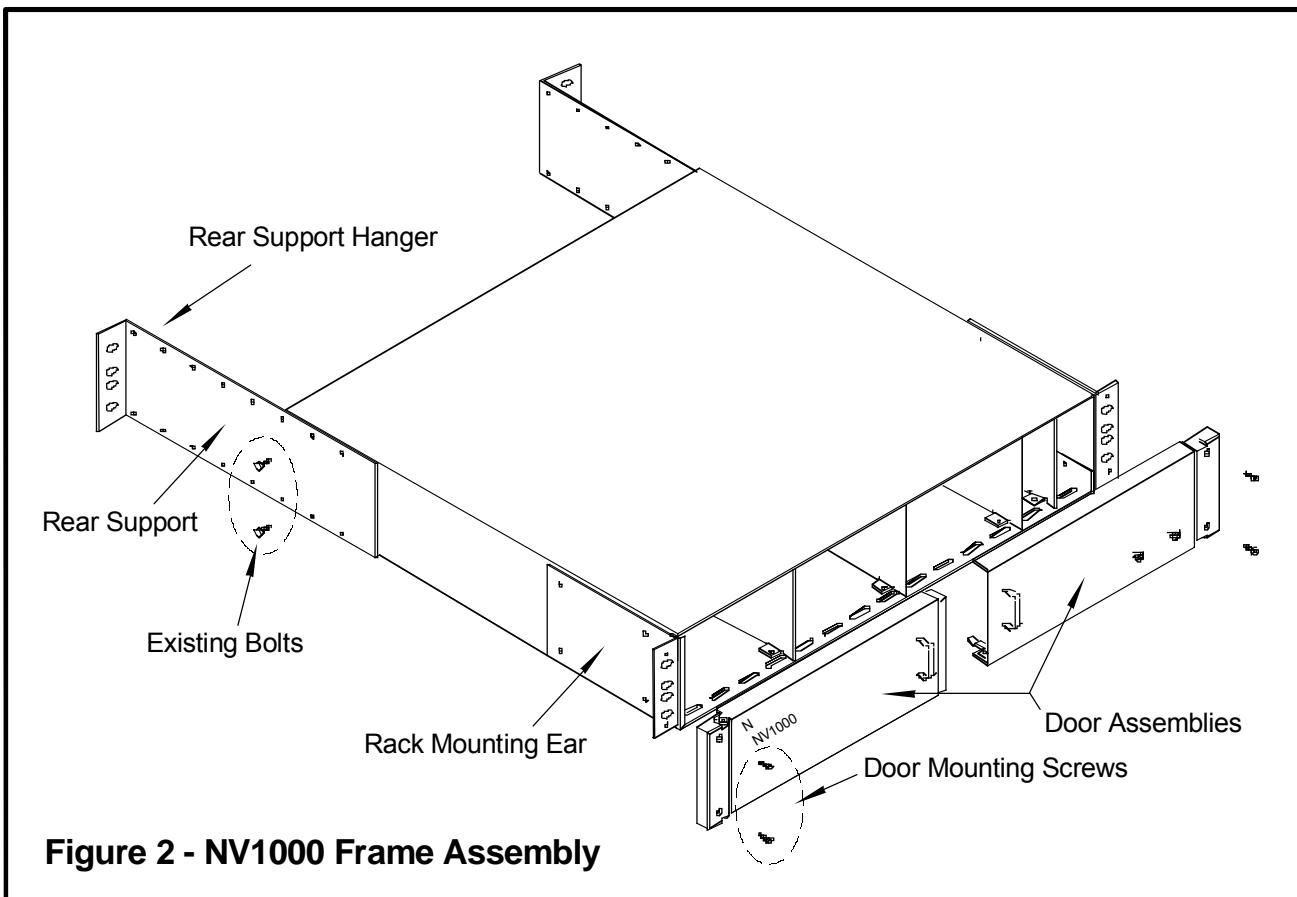


Figure 2 - NV1000 Frame Assembly

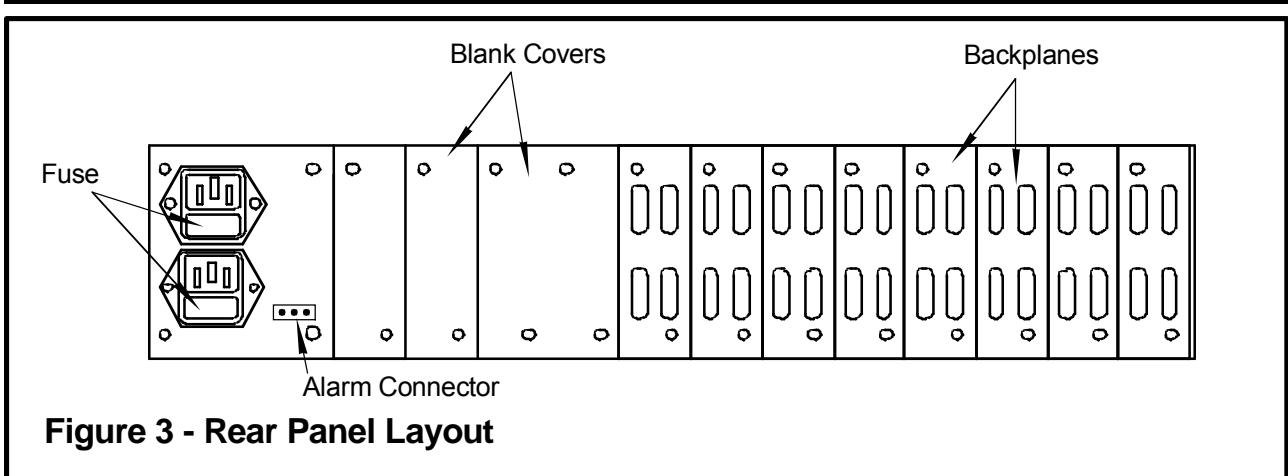


Figure 3 - Rear Panel Layout

proceeding.

4.3 External Cabling

With the frame installed in the rack, make external connections to the system as required. Application-specific installation information and cabling instructions are included in the Manual Insert for each active module.

4.4 Power Supply

CAUTION: THE FOLLOWING INSTALLATION PROCEDURES ARE TO BE PERFORMED BY QUALIFIED SERVICE PERSONNEL ONLY.

1. Referring to Table 2 - PS2001 Jumper Table, ensure that Jumper J1 on each PS2001 power supply matches the incoming line voltage, either 120 VAC/60 Hz or 230 VAC/50 Hz, before inserting the power supply modules into the frame.

CAUTION: JUMPER J1 ON THE PS2001 POWER SUPPLY MUST BE SET TO MATCH THE INCOMING LINE VOLTAGE, EITHER 120 VAC/60 HZ OR 230 VAC/50 HZ, OR DAMAGE TO THE EQUIPMENT MAY RESULT.

2. Apply power to the NV1000 frame by attaching the line cord to each operational PS2001 power supply slot. Reapply power to any fan assemblies before adding power supplies and active modules.
3. Plug each PS2001 supply into one of the two slots on the right side of the FR1000 frame. Either slot is acceptable for a single supply. Power supply LEDs should glow indicating normal function.
4. Measure the power supply voltages on the front-panel test points

Table 2 - PS2001 Jumper Settings

Jumper No.	Setting	Function
J1	115 VAC	Configures PS2001 for 120 VAC nominal line voltage.
	230 VAC	Configures PS2001 for 230 VAC nominal line voltage.

on each PS2001 power supply. They should fall within the range of values indicated in Table 3 - Power Supply Voltages.

4.5 Final

1. Remove the mains power from the frame by disconnecting the power cord(s) at the rear of the frame. Plug the active modules into the proper slots and reconnect the mains power. Proceed with system checkout.
2. After verifying system operation, replace the front door assemblies. Check door alignment before tightening the Allen screws that secure the cover.
3. Be sure to complete any warranty registration materials and return them to NVISION, Inc. This validates your warranty and adds your

Table 3 - Acceptable Test Point Voltages for PS2001 Power Supplies

PS2001 Test Points	Loaded Frame (One or More NV1000 Modules Installed)	Unloaded Frame (No NV1000 Modules Installed)
±7 VDC	6 < VI < 8.5	7 < VI < 10*
±17 VDC	16 < VI < 18.5	17 < VI < 22*

* When unloaded, the upper voltage limit may exceed the values shown.

