

DATAFLASH[®]

●●::AF1000::●●

***System
LCD Controller***

User Manual

Please read all cautions and warnings inside.

PRELIMINARY

High End[®]



SYSTEMS

2217 West Braker Lane
Austin, Texas U.S.A. 78758



LIGHTWAVE
RESEARCH

DATAFLASH[®]

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RESEARCH

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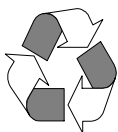
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Dataflash/AF1000 System LCD Controller User Manual
Version 1.0 April 1996

P/N 60600041



Declaration of Conformity

according to ISO/IEC Guide 22 and EN45104

Manufacturer's name: Lightwave Research

Manufacturer's address: Lightwave Research
High End Systems Inc.
2217 West Braker Lane
Austin, Texas 78758
U.S.A.

Declares that the product

Product Name: AF1000 LCD Controller

Product Number: AF1000 LCD Controller

Product Options: All

conforms to the following EEC directives:

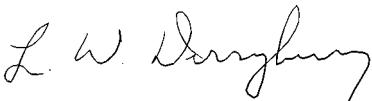
73/23/EEC, as amended by 93/68/EEC
89/336/EEC, as amended by 92/31/EEC and 93/68/EEC

Equipment referred to in this declaration of conformity first manufactured in 1995 in compliance with the following standards:

Safety: EN 60950 : 1992
A1 : 1993
A2 : 1994

EMC: EN 55022 Class A ITE December 1, 1995
IEC 801-2 : 1991 Level 2 (4/8 kV) November 29, 1995
IEC 801-3: Draft 5 Level 2 (3 V/m) November 29, 1995
IEC 801-4: 1988 Level 2 (1kV/.5 kV) November 29, 1995

U.S.A., Friday, September 19, 1997



Lanny Derryberry, Compliance Engineer

IMPORTANT SAFETY INFORMATION

INSTRUCTIONS PERTAINING TO CONTINUED PROTECTION AGAINST FIRE, ELECTRIC SHOCK, AND INJURY TO PERSONS ARE FOUND IN APPENDIX A.

READ ALL CAUTIONS AND WARNINGS PRIOR TO ASSEMBLY, MOUNTING, AND OPERATING THIS EQUIPMENT.

IMPORTANT: INFORMATIONS DE SÉCURITÉ

INSTRUCTIONS RELATIVES À UNE PROTECTION CONTINUE CONTRE L' INCENDIE, LE CHOC ÉLECTRIQUE, ET CONTRE DES BLESSURES POSSIBLES SUR DES INDIVIDUS SE TROUVENT DANS L'APPENDICE A.

PRIÈRE DE LIRE TOUTES LES PRÉCAUTIONS ET LES AVERTISSEMENTS AVANT D'ASSEMBLER, DE MONTER, ET DE FAIRE FONCTIONNER CET ÉQUIPEMENT.

WICHTIGE SICHERHEITSHINWEISE

DIE NACHSTEHENDEN HINWEISE BETREFFEN DEN SCHUTZ GEGEN BRAND, ELEKTRISCHEN SCHLAG, SOWIE VERLETZUNGEN. SIE BEFINDEN SICH IN APPENDIX A.

LESEN SIE ALLE WARNUNGEN SORGFÄLTIG, BEVOR SIE DAS GERÄT ZUSAMMENBAUEN, INSTALLIEREN UND BENUTZEN!

INFORMACIÓN IMPORTANTE DE SEGURIDAD

SE ENCUENTRAN EN EL APÉNDICE A LAS INSTRUCCIONES CONCERNIENTES A LA PROTECCIÓN CONTINUA CONTRA INCENDIO, CHOQUE ELÉCTRICO, Y LESIONES A PERSONAS.

POR FAVOR LEA TODAS LAS PRECAUCIONES Y LAS ADVERTENCIAS ANTES DE ENSAMBLAR, MONTAR Y OPERAR ESTE EQUIPO.

INFORMAZIONI IMPORTANTI DI SICUREZZA

ISTRUZIONI PERTINENTI LA PROTEZIONE CONTRO IL FUOCO, LE SCOSSE ELETTRICHE, I DANNI ALLE PERSONE SI TROVANO NEL APPENDICE A.

LEGGERE TUTTI GLI AVVERMENTI PRIMA DI MONTARE E USARE QUESTO APPARECCHIO.

FCC Information

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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Congratulations

Thank you for your purchase of the Lightwave Research® Dataflash® AF1000 LCD Controller. The AF1000 LCD Controller allows you to address up to 256 individual AF1000 strobes for dazzling visual and pyrotechnic effects. As an extension of the LCD controller line, many of the features will be familiar to those who have used other Lightwave LCD controllers in the past. The major departure from the other LCD controllers is that this one is tailored to control strobes, and as with previous Dataflash controllers, the entire group of strobes is treated collectively as a system rather than as individual fixtures. Fixture level programming is performed separately using FlashCad software.

Features

- Up to 99 programs per internal memory or PCMCIA style RAM card
- Control up to 256 channels of *AF1000* strobes
- 64 intensity steps
- 99 program rate steps
- 64 duration steps
- random effects
- lightning effects
- Audio synchronization
- Audio modulation
- 16 program multiply factors (total multiply up to 256)
- Two year warranty

Specifications

Model:	AF1000 LCD Controller
Manufacturer:	Lightwave Research High End Systems, Inc. 2217 West Braker Lane Austin, Texas 78758 U.S.A.
Height	178mm (7.00")
Width	482mm (19.00")
Depth	264mm (10.38")
Weight	6.4Kg (14 lbs)
Audio Input	100mV to a maximum of 1V peak to peak
Rated Voltage:	115/230 VAC Only
Rated Current:	.25/.15 A
Rated Frequency:	50-60 Hz
RAM Card	256KB SRAM, Type 2 PC Card (<i>nee</i> PCMCIA adapter) (You can use a larger-capacity PC Card, but the controller utilizes only 256KB.) A PC Card of this type is available from your High End Systems dealer/distributor (part number 80440017)



Class 1 equipment-For continued protection against electric shock, connect this equipment to a grounded power source only.

Use in dry locations only.

Caution and Warning Symbols

The following caution and warning symbols appear in the margins throughout this manual to highlight caution and warning messages:



Caution: This symbol appears adjacent to caution messages. Ignoring these messages could result in damage to your equipment.



Warning: This symbol appears next to high voltage warning messages. Ignoring these messages could result in serious personal injury.

Getting Help

U.S. and Canada From 8 a.m. to 5 p.m. (U.S. Central time) Monday through Friday: (800) 890-8989

24-hour FAX: (512) 834-9195

24-hour voice mail: (512) 837-3063 or (800) 890-8989

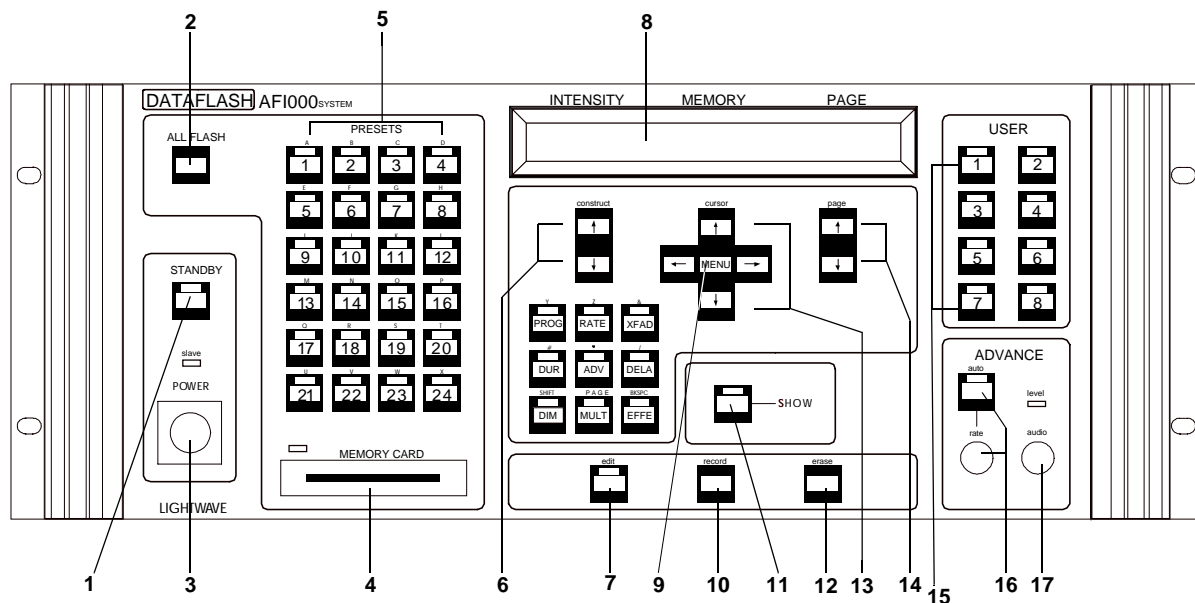
24-hour BBS: (512) 339-3043

24-hour World Wide Web site <http://www.highend.com>

Europe Voice: +49 8122 9903-0
FAX: +49 8122 9903-33

Singapore Voice: +65 742 8266
FAX: +65 743 9322

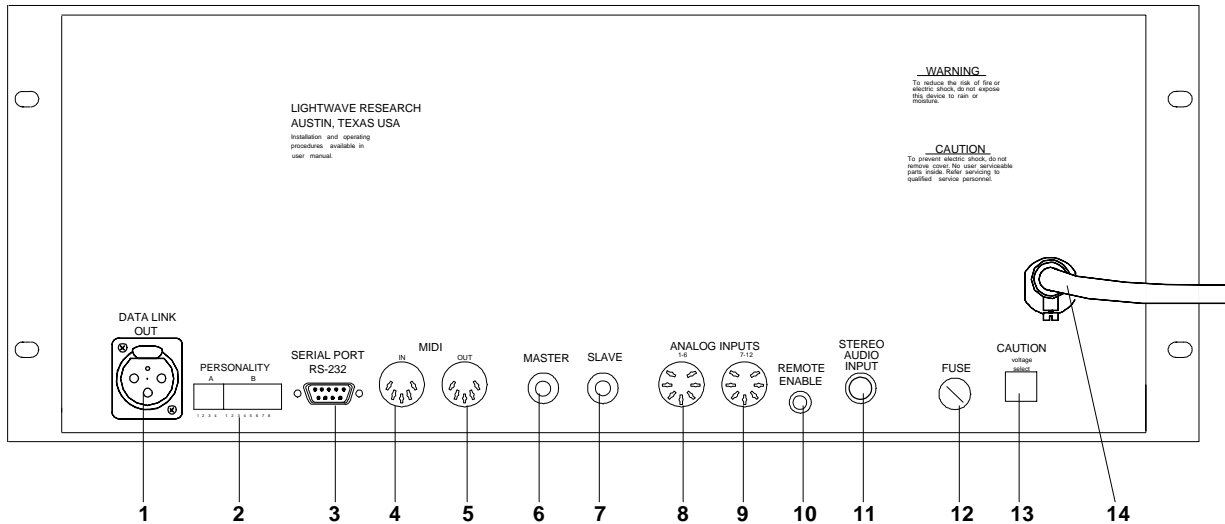
Front Panel



1. Standby Key—disables output of programs from the controller
2. All Flash Key—latches on all fixtures for 0.5 sec. at the systems maximum intensity, set in the program menu. The All Flash Key will momentarily override a standby condition.
3. Keyed Power Switch—powers the controller and enables any connected fixtures. The key provides protection from unauthorized users.
4. Memory Card Slot—allows you to save and load Dataflash Programs or User Memory and Page data, or to upgrade or transfer the controller's operating system to PCMCIA RAM memory cards.
5. Presets Keys—each of these keys corresponds to a programmable preset, which can be anything you want to assign to it from a single page to a loop of pages (up to 99 consecutive pages within a memory).
6. Construct Keys—in intensity/memory/page (IMP) mode, these keys adjust the master intensity level. In edit mode, use these keys to adjust the values of each construct selected.
7. Edit Key—this key puts the controller into edit mode where you can adjust the constructs of whatever you are programming.
8. LCD Display
9. Menu Key—toggles the controller between IMP mode and menu mode. When the controller is in IMP mode, the LCD window shows the current master intensity level, current memory and the current page number. When the controller is in menu mode, the LCD window shows the available menu selections: HELP, PROGRAM, BACKUP, etc.

10. Record Key—used to store changes to pages or presets.
11. Show Key—if pressed during playback, this key overrides the delay setting as long as the key is pressed, allowing you to continue playback of a program longer than its delay setting. This also means that a program with its delay set to zero will play only as long as this key is pressed. When editing, the intensity of the program being shown by the fixtures will be low but visible, and the show key will bring the intensity to its full level defined by the master intensity.
12. Erase key—use this key to erase a page or preset memory. Pressing this key twice marks the page as a *non-initialized* page. A *non-initialized* page signals the beginning or end of a loop or sequence.
13. Cursor Up/Down Left/Right Arrow Keys—in IMP mode, the up/down arrow keys change which memory you're programming pages in. In edit mode, the left/right arrow keys move you through the list of constructs. In menu mode, the left/right keys move you through the menu list, the down arrow key takes you into the item that you selected in the menu, and the up arrow key brings you back to the menu list when you are through.
14. Page Up/Down Arrow Keys—these keys change the page number (1–99) while in edit or IMP mode. Press and hold either page arrow key to wrap the page numbers in either direction (99 to 1 or 1 back to 99).
15. User Programmable Keys—these keys come factory programmed for different page to page advancing effects. You may also record macros to these keys to save yourself a few key presses, but this removes the factory program. The factory programs can be reset later.
16. Auto Advance Key and Rate Knob—when this key is pressed, the controller advances pages automatically at a rate set by the rate knob. When the auto function is engaged, the LED indicator illuminates and disengages the audio1 and audio2 functions. In auto mode, delay times programmed into a page are added to the rate set by the rate knob. Programmed delay times are completed before page advancement regardless of the rate knob setting.
17. Audio Knob—adjusts the controller's sensitivity to the musical information for audio advance functions and effects functions. When the knob is turned all the way to the right, it is most sensitive.

Back Panel



1. Data Link Out—an XLR female jack that sends control signals to all connected fixtures. The data cables that carry the control signals must be three-pin XLR male to female. Pin 1 is shield, pin 2 is negative and pin 3 is positive.
2. Personality Dipswitches—dipswitch A is reserved for future use, so keep all switches set to the off position to prevent conflicts with any software updates that might assign functions to this dipswitch. Dipswitch B define how the controller operates. The table below summarizes the individual switch functions:

Table 1: Personality Dipswitch B Settings

Switch #	ON	OFF
1	Slave mode	Master mode
2	50 Hz	60 Hz
3	Preset access	Page access
4	NOT USED	NOT USED
5	Binary preset access	12 level preset access
6	Independent mode	Dependent mode
7	NOT USED	NOT USED
8	NOT USED	NOT USED

3. RS-232 Serial Port—a standard PC/AT 9-pin serial port. Used for transfer of data with computers when using Lightwave Show Control (or a similar program) to arrange and playback controller presets from a computer. The port operates at 9600 BAUD, 8 data bits, no parity, and 1 stop bit.
4. MIDI In Port—this is where the MIDI input signal enters the controller using standard MIDI connections. The controller supports the MIDI show control “GO” command. The MIDI Cue numbers are “one-for-one” with the controller’s preset numbers. The controller will only respond to whole cue numbers. The

fractional part of “Point cues” will be ignored. For example, if you send cue number 101.5, the controller will call up cue (preset) number 101. The Dataflash AF1000 LCD controller supports Cue (preset) numbers 1–1024.

5. MIDI Out Port—this is where the MIDI output signal exits the controller. The port is switchable between OUT and THRU, with THRU being the default. When using the RS-232 port, the MIDI out port functions as MIDI THRU.
6. Master Out Port—this is a 6mm (1/4”) stereo jack that you use to link a master controller to a slave controller. Use this feature to expand the system to control more than 256 strobe channels. Using the dipswitches on the rear panel of the controller, you can assign one controller as the master and one or more as the slaves. Link the controllers together with a shielded, two conductor cable with male 6mm (1/4”) jacks on either end, and you can operate all slave controllers from the master controller.
7. Slave In Port—this is a 6mm (1/4”) stereo jack that you use to link a slave controller to the master controller or to another slave controller. Use this feature to expand the system to control more than 256 strobe channels. Using the dipswitches on the rear panel of the controller, you can assign one controller as the master and one or more as the slaves. Link the controllers together with a shielded, two conductor cable with male 6mm (1/4”) jacks on both ends, and you can operate all slave controllers from the master controller.
8. Analog Input Connector (Channels 1–6)—a locking 8-pin DIN connector that enables the remote recall of a memory’s pages or presets using an analog control device, such as a dimmer console or touch panel.
9. Analog Input Connector (Channels 7–12)—a locking 8-pin DIN connector that enables the remote recall of a memory’s pages or presets using an analog control device, such as a dimmer console or touch panel.
10. Remote Enable—a 3.5mm (1/8”) mini jack for input of a remote signal to enable or disable standby mode. Standby mode is enabled whenever the jack is receiving less than 5 volts DC. Supply the jack with 5–16 volts DC to enable the controller.
11. Stereo Audio Input—a 6mm (1/4”) jack for accepting line level audio signals to trigger audio effects. Adjust the sensitivity by turning the audio knob on the front panel.
12. Fuse—a 5mm (0.195”) x 20mm (0.78”), 1.5 amp slow blow fuse.
13. Voltage Select Switch—used to set the controller to run off of 115V AC or 230V AC power.



Warning: Changing the voltage selection switch means you must change the fuse out for one with the proper rating for the new voltage source.

14. AC Line Cord—main input power supply for the controller.

Setup Instructions

The cores in the mains lead are coloured in accordance with the following code:

- green and yellow: earth
- blue: neutral
- brown: live

Installing a Power Cord Cap

You must obtain and install a power cord cap before you can connect the controller to a power outlet. The type of power cord cap you must obtain depends on the location in which the controller will be used; different locations (even within the same country) might have different power cord cap requirements.


Note Because of the wide variety of power cord caps used worldwide, High End Systems cannot make specific recommendations for the particular power cord cap you should use. Contact a local authority if you are unsure which type of power cord cap you need.

Important Power Cord Cap Information - U.K. Only

IMPORTANT The cores in the mains lead are colored in accordance with the following code:

- **green and yellow:** earth
- **blue:** neutral
- **brown:** live

Since the colors of the cores in the mains lead of this equipment may not correspond with the colored markings identifying the terminals in your plug, proceed as follows:

The core which is colored green and yellow must be connected to the terminal in the plug which is marked with the letter "E" or by the earth symbol , or colored green or green and yellow.

The core which is colored blue must be connected to the terminal which is marked with the letter "N" or colored black.

The core which is colored brown must be connected to the terminal which is marked with the letter "L" or colored red.

Class 1 equipment: THIS EQUIPMENT MUST BE EARTHED.

Setting the Controller Input Voltage

The controller is factory-set to customer requirements. Normally, the factory setting is correct for your typical use. However, if you change venues and need to change the controller's input voltage, refer to the procedure in this section.

Location of Components

The controller's voltage selection switch and primary (line) fuse are located on the rear panel, as shown in Figure 1.

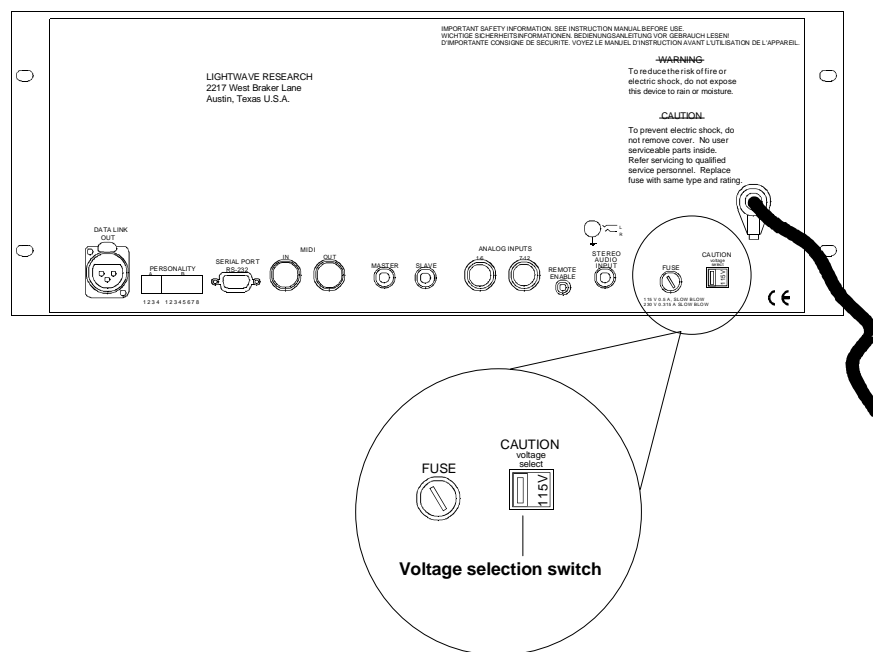


Figure 1. The controller's voltage selection switch shows its present voltage setting.

The controller can be set to either 115V or 230V; the controller's present setting is showing through the window on the switch. If you need to change the controller's voltage setting, follow the instructions in the remainder of this section.

Replacement Fuses

The primary (line) fuse is accessed from the rear panel of the controller:

115 V operation-use 0.5 A, 250 V, Slow Blow Only

230 V operation-use 0.3 A, 250 V, Slow Blow Only

Replacing the Line Fuse and Changing the Voltage

After obtaining the proper type and rating of fuse, follow the procedure below:

1. Make sure the controller is powered OFF and is not connected to a power source.
2. Using a small flat blade screwdriver or a coin, turn the fuse holder (shown in Figure 1) counterclockwise to remove the fuse.
3. Pull the old fuse straight out of the fuse holder. If the old fuse is still good, store it in a safe place nearby the controller.
4. Insert the new fuse into the fuse holder, carefully insert the holder back into the controller and turn it clockwise to reinstall it.
5. Using your fingers or a small flat blade screwdriver, move the voltage selection switch so the correct voltage is showing through the window. For example, Figure 2 shows a controller set for 115V:

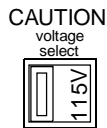
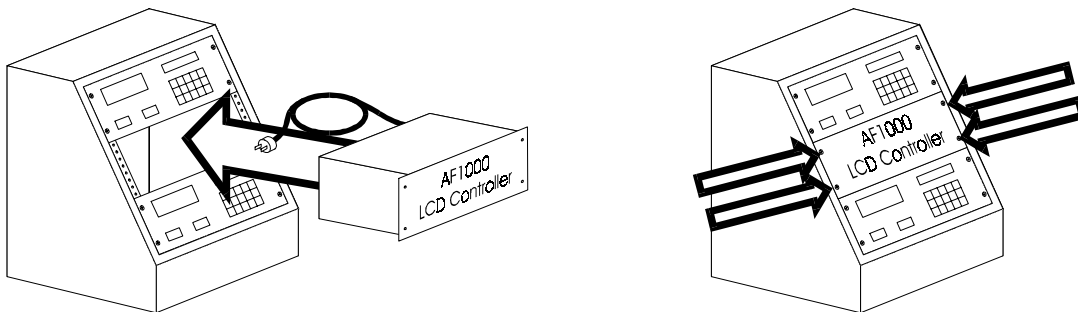


Figure 2. The voltage selection switch above indicates the controller is set for 115V.

Rack Mounting the LCD Controller

The AF-1000 LCD Controller is designed to mount into an equipment rack meeting MIL-STD-189 and ANSI/EIA RS-310-C-77 specifications. The unit occupies 4 standard rack spaces.

Rack Mounting Procedure



1. Insert the unit into the front of the equipment rack. There must be at least 7 inches (4 units) of available rack space. Be sure to feed the power cord in first,

being careful not to pinch or otherwise damage the power cord. Do not use the unit if the power cord is damaged.

2. Attach the unit to the equipment rack through the two mounting holes behind the handles on each side of the controller. Use only the correct hardware for the rack being used. Do not use the incorrect hardware. Attach the unit by the lower two mounting holes first as this is where the majority of weight is supported. Finish by attaching the unit through the remaining two holes.

Configuring the LCD Controller DIP Switches

To complete the controller installation, you configure the Personality DIP switches as required, although all switches in the “Off” position is the normal operating mode. Then, depending on your installation, you mount the controller. For some installations, it may be easier to first connect the cables to the rear panel and then mount the controller in a console.

After you set the switches, mount or install the controller away from any sources of heat or moisture. If you are using audio effects, connect a suitable line-level stereo audio feed to the Stereo Audio Input jack on the rear panel. Connect all the data cables between the controller and all fixtures.

Located on the rear panel of the controller are two DIP (dual in-line package) switches labeled Personality A and B. Switch A is currently not used, ensure all switches are “Off” or down on this switch.

The eight switches on DIP Switch B are used for testing, set up, and control. You must set them properly, as explained in this section, before powering up the system.

Configuring Personality DIP Switch B

The purpose of Personality DIP Switch B on the rear panel of the controller is to configure the controller for specific requirements. By setting particular switches On or Off, the controller will respond in different ways. For example, with all switches in the “OFF” position, the controller operates in a normal manner as a Master controller. The purpose of each of the switches is outlined below.

Note: A switch is “ON” in the **up** position and “OFF” in the **down** position.

No Switches On: Normal Mode

All switches in the “OFF” position, the controller operates in a normal manner.

Switch 1: Master/Slave Mode

Personality DIP Switch B



Switch 1 configures the Master/Slave capability. The system is expandable beyond the first 8 addresses by linking multiple controllers together via the Master/Slave ports.

Switch 1 On – the controller operates in **Slave mode**. The controller can be connected to and run by another controller (set as Master) via the 6 mm (1/4 in) Slave plug located on the rear panel of the controller. The Slave LED indicator located above the Power key switch is lit when in Slave mode.

The slaved controller retains its programming and editing functions, but can not play back any programs. All Standby, Advance, and Modulate settings of the slaved controller are determined by the Master controller. The accessible function keys on the Slaved controllers are POWER, HOME, RECORD, ERASE, and Construct keys.

Switch 1 Off – the controller functions as a **Master controller**. The Slave LED indicator will be “Off” indicating Master mode. All front panel keys function normally. When a controller is in Master mode, it dictates the mode of playback for all controllers that are slaved to it.

Switch 2: Time Base

Personality DIP Switch B



Switch 2 sets the controller’s frequency to 50 or 60 Hertz. It is important to properly set this switch. The controller senses this frequency as part of its internal timing circuits.

Switch 2 On – the controller operates at 50 Hertz.

Switch 2 Off – the controller operates at 60 Hertz

Switch 3: Page or Preset Access

Personality DIP Switch B



Switch 3 sets up how the controller responds to the Analog Inputs port. It responds to either Pages or Presets as follows:

Switch 3 On – the controller is in Preset Level Mode. In Preset Level Mode, the Analog Inputs port shift the controller to different **Preset levels**.

Switch 3 Off – the controller is in the Page Access mode. In Page Access Mode, the Analog Inputs port access the **Pages** in memory (default setting).

Switch 4: Not Used

Switch is not used and should be set to “Off.”

Switch 5: Binary Preset Access

Personality DIP Switch B



Switch 5 On – the controller accesses Preset numbers in a binary fashion (the controller must first be in Preset Access Mode, therefore, **DIP Switch 3 must also be in the “ON” position.**). It uses the first 10 of the 12 Analog Input channels in binary combinations to provide remote access to 1024 different Presets. The remaining two Analog Input channels control Blackout and Standby respectively. Channel 11 puts the controller in Blackout mode. Blackout effectively cuts the system intensity to zero, but leaves everything else running. Channel 12 functions just like the **STANDBY** key on the controller. If the controller is in Standby, Channel 12 takes it out of Standby. The fixtures go back to whatever they were doing before the controller was put in Standby mode. On the AF1000 LCD controller, blackout and standby are essentially the same. Both functions are included for compatibility with other Lightwave Research LCD controllers.

Switch 5 Off – the controller accesses Preset numbers on 12 levels. In the Twelve Level Preset Access mode, each channel can activate one of 12 levels of 24 Presets. When a level has been selected using a remote access device, the Presets are called up from the Presets key pad on the controller.

Switch 6: Independent/Dependent Presets Mode

Personality DIP Switch B



Switch 6 sets the mode of the Presets as they relate to the Master Dimmer.

The two modes were developed to offer the operator a choice based on personal preference.

Switch 6 On – the controller is in Independent Presets mode. In Independent Presets mode, the Presets are independent of the master dim. When Presets are called, intensity remains unchanged from the last setting. Although the intensity setting is not recalled, intensity is recorded with Presets for compatibility with Dependent Presets mode. Slaved controllers' modulation effects respond to the audio input of each individual controller. Sequencing (Auto, Audio 1 and 2) is controlled by the Master controller. Slaved controllers' intensities are independent of the Master, and may be controlled by any RS-232 show control program.

Switch 6 Off – the controller is in Dependent Presets mode. In Dependent Presets mode, the Presets store and recall master intensity as part of the Preset. Slaved controllers' modulation effects respond to audio input at the Master controller. Slaved controllers follow the master dim of the Master controller.

Switches 7 and 8:

Switches 7 and 8 are not used and should be set to "Off."

Connecting Data Cables

Data Cable Connections: General Information

The *AF1000* fixture and controller require standard 3-pin XLR connectors for data input and data output. Construct the data cables using shielded, two-conductor cable with a male 3-pin XLR connector on one end and a female 3-pin XLR connector on the other end. Pin 1 is the shield, Pin 2 is the data compliment (negative), and Pin 3 is the data true (positive). For best results, cabling should conform to EIA-422 and/or EIA-485 specification. The *AF1000* fixture is self terminating, The fixture electrically regenerates the data signal to the next fixture. Separate termination is not required.

You can use microphone cables if the pin connections are correct (as described above), though maximum cable length may be reduced if the cables do not comply with the above specifications. (See the *AF1000* manual for additional details).

The LCD Controller DATA LINK OUT connector is a female (sockets) connector located on the rear panel of the controller as Figure 3 shows. This

is where you make the cable connections to the fixtures.

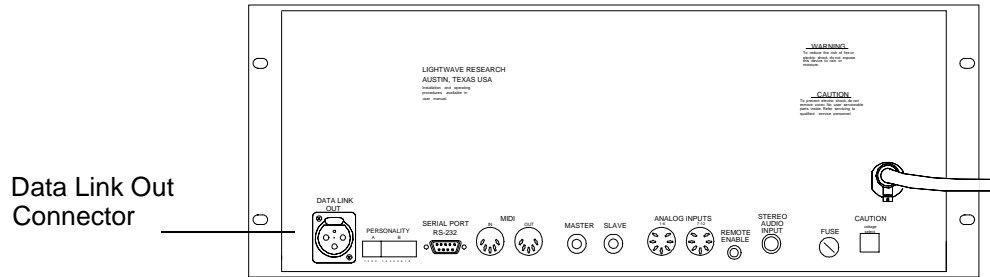


Figure 3. LCD Controller Rear Panel

The AF1000 fixture DATA IN connector is a male (pins) connector located on the rear panel of the fixture on the right side of the panel as Figure 4 shows. The DATA OUT connector is a female connector located above the DATA IN connector as Figure 4 shows.

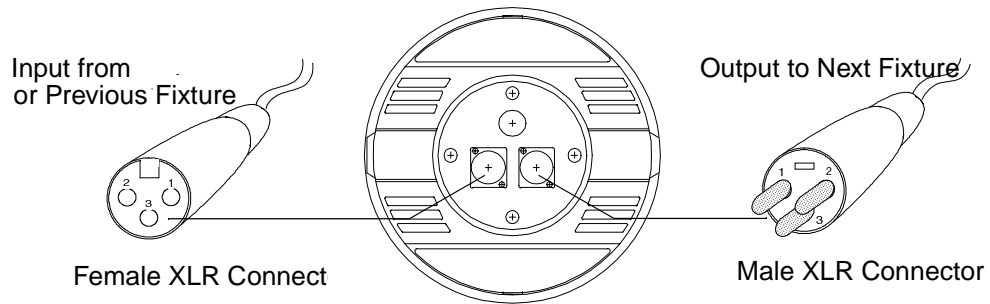


Figure 4. AF1000 Fixture Rear Panel Connections

Daisy Chain Method of Connecting the Data Cables

Use this procedure to daisy chain fixtures to the LCD Controller. Daisy chain is a term that simply means to connect the output of one fixture to the input of the next fixture, and so on. This is the easiest method to connect fixtures to a controller.

You will need . . . one data cable for each fixture

1. Plug the male end (pins) of a data cable into the Data Link Out connector on the rear panel of the controller. Refer to Figure 5.
2. Then, plug the female end (sockets) of the data cable into the Data In (male)

connector of the first fixture. Refer to Figure 5.

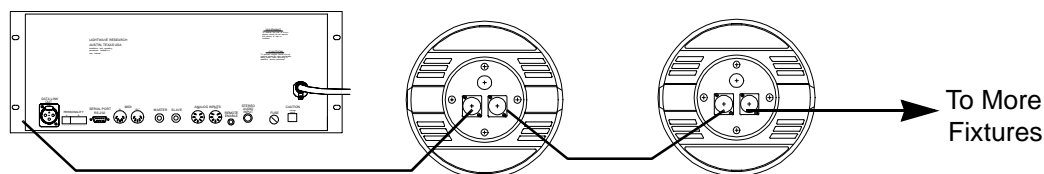


Figure 5. Connecting Cables Using the Daisy Chain Method

3. To connect additional fixtures, connect the Data Out connection (female XLR) of the first fixture (from step 2) to the Data In connection (male XLR) of the second fixture. Then continue connecting fixture in this same manner until all fixtures are connected.

Serial Data Distributor Method

4. A Lightwave Research Serial Data Distributor is the preferred way to split (or “Y”) the data signal up to six ways. The single-unit rack-mountable distributor is an active signal splitter. It is commonly used in situations where a group or groups of instruments are separated by a long distance. Refer to Figure 6.

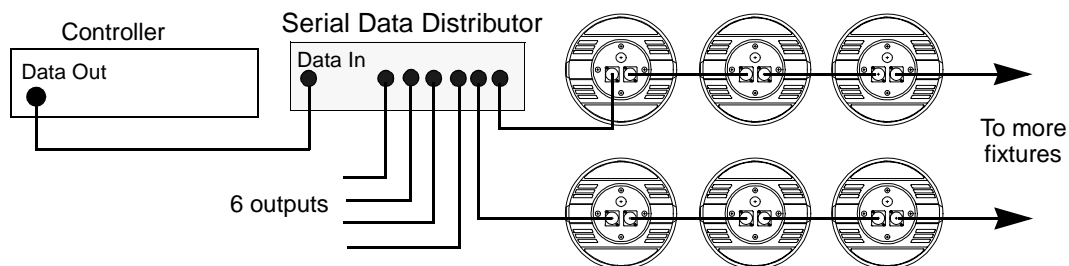


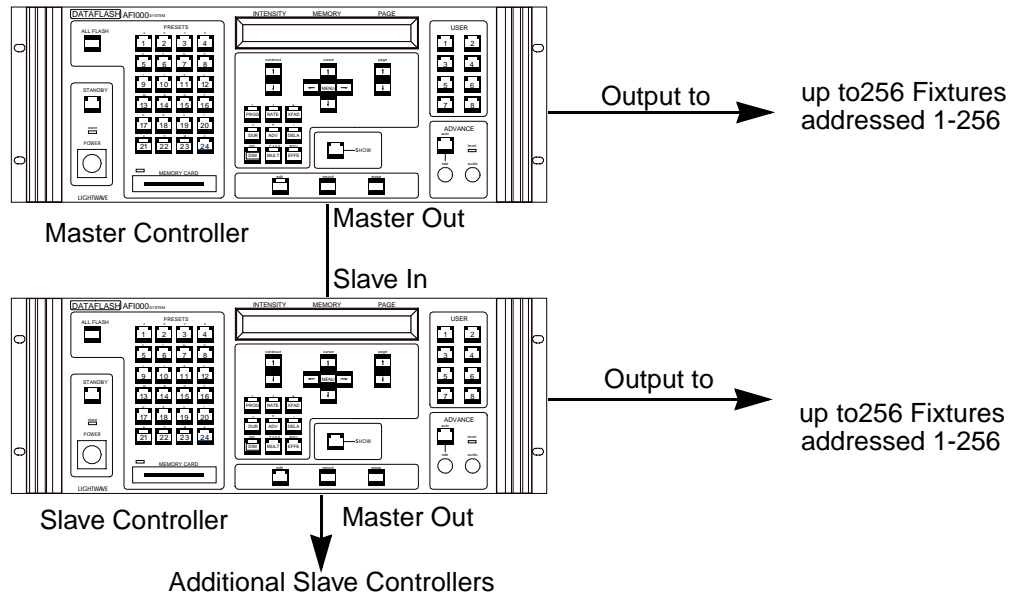
Figure 6. Connecting Cables Using Serial Data Distributor

Master/Slave Configuration

You can practically expand an AF1000 system infinitely by slaving any number of controllers together. When controllers are slaved, one controller, called the Master controller controls the mode of playback of all of the slaved controllers. The Slave controllers are programmed separately in the normal manner, but their mode of playback is dictated by the Master controller.

You can slave controllers together to include any multiple of up to 256 fixtures. Each fixture or set of fixtures is Addressed as 1 to 256. Refer to Figure 7.

Figure 7. Slaved LCD Controllers



Connect One or More Controllers in Slave Mode

1. Set Personality DIP Switch 1 on the rear panel of the controller to the “On” or up position.
2. The Slaved controllers retain their programming and editing functions, but do not play back any programs. The Master controller determines all Standby, Advance and Modulate settings of the Slaved controllers. The only Slave controller function keys that you can access are: Power, Show, Edit, Record, Standby, Erase, and Constructs. In Slave mode the Slave LED is “On”.
3. Run a stereo cable (with a 6 mm (1/4 in) connector on each end) from the Master controller's Master (out) jack located on the rear panel to the Slave controller's Slave (in) jack.
4. To slave more than one controller to a single Master controller, continue running cables from one controller to the next, as described in step 2, in a daisy chain fashion. The Master and Slave ports on the LCD Controller are wired in parallel. This allows you to connect from either port of the Master

controller to either port of the Slave controller(s). Refer to Figure 8.)

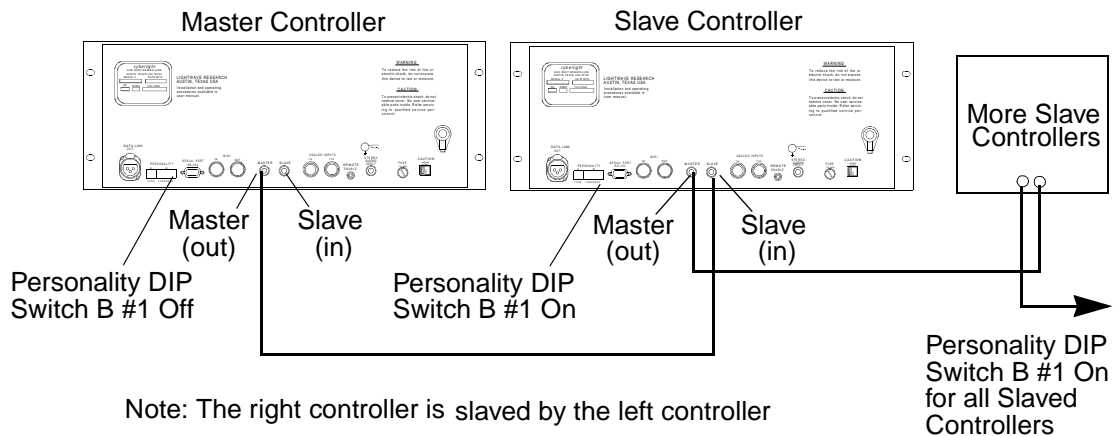


Figure 8. Connecting Cables in Master/Slave Configuration

Programming a system in the Master/Slave Configuration

You must program each controller from its own front panel; While the master must be used to select a page and to store and recall presets, editing the constructs of a page must be performed on each respective controller. Synchronization between master and slave controllers is on a page by page basis. There is no step by step synchronization of the Dataflash programs. However, since the controllers do use a crystal controlled timebase, playback will be quite close to synchronization. All of the LED indicators of the Slave controllers, including Standby, Auto, Audio 1 and 2, and Effects 1, 2, and 3 will mimic the LED indicators on the front panel of the Master controller. If User Definable keys perform a common function, such as, Standby, then the Slave will also mimic them. The only control functions that are retained by the Slave controllers are Power, Show, Edit, Record, Erase, and Constructs.

MIDI In and Out ports

The LCD Controller features standard MIDI connectors. The controller supports MIDI Show Control “GO” command (Protocol). The MIDI Cue numbers are one-for-one with the LCD Controller’s Preset numbers. The LCD Controller only accepts whole Cue numbers. The controller will only respond to whole cue numbers. The fractional part of “Point cues” are ignored. For example, if you send cue number 101.5, the controller will call up cue (preset) number 101. The Dataflash AF1000 LCD controller supports Cue (preset) numbers 1–1024.

The MIDI IN port is where the MIDI signal enters the controller. The MIDI OUT port is where the MIDI signal exits the controller. The MIDI OUT port is switchable between OUT and THRU. THRU is the default as no commands are currently generated by the controller. When you use the (RS-232 port,

MIDI OUT functions as a MIDI THRU. Refer to Figure 9.

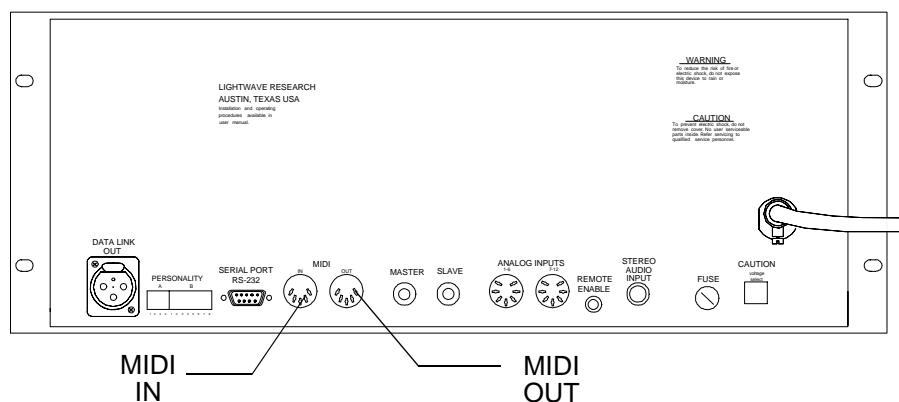


Figure 9. Location of MIDI IN/OUT Ports

Initial Power Up

In this section you power up the system and connected fixtures.

Turning On the Controller

Your *AF1000* system should be completely and properly set up as explained in previous sections in this manual. Also, your *AF1000* fixtures should be assembled, configured, and connected to an appropriate power source as explained in the manual shipped with the fixtures.

To power up your *AF1000* system:

1. Apply power to all fixtures connected to the *AF1000* LCD Controller.
2. Insert the controller key into the front panel Power key switch and turn the key clockwise. The LCD window briefly shows the Boot version number and all LEDs briefly flash. In a moment the Standby LED will light.
3. If there is a Memory Card inserted into the Memory Card slot that contains Operating System data, the LCD window displays a message that asks you whether or not you want to replace the controller's Operating System with the Operating System saved on the Memory Card. Follow the instructions in the LCD window to proceed.
4. If there is no Memory Card inserted, or if you do not respond to the prompt in the LCD window within 10 seconds, the controller performs a self test. The LCD window displays: "Checking memory 1-9, Please wait." as it runs the self-test. The test counts up through the Memories from 1 to 9 slowly and then again quickly.
5. The LCD window displays the IMP (Intensity, Memory, and Page) mode

parameters: “Intensity:99 Memory:1 Page:1.” IMP mode is explained in detail later in this manual.

6. At the same time, the controller remotely powers up all connected fixtures.

LCD Controller Top Level Modes

The LCD Controller operates in either Menu mode or IMP mode.

- **Menu mode** – you perform setup and house keeping operations, such as, backups and configuring edit/copy operations. You also assign submasters, as required, in this mode. All other controller functions are performed in IMP mode. Menu mode is seldom used when compared to IMP mode usage.
- **IMP (Intensity, Memory, and Page) mode** – this is the normal system operating mode. In this mode you program and playback scenes and chases. You also monitor the parameters of any connected fixture and control the master dim for all fixtures. You learn about IMP mode in the *Programming* section.

Menu Mode Features

- Help
- Backup
- Submasters
- Setup

IMP Mode Features

- Preset Mode Programming
- Copy/Edit/Erase Operations
- Playback Operations
- Monitor Operations
- Master Dim Operations

Menu Mode

This section explains how to navigate and use the Menu mode submenus.

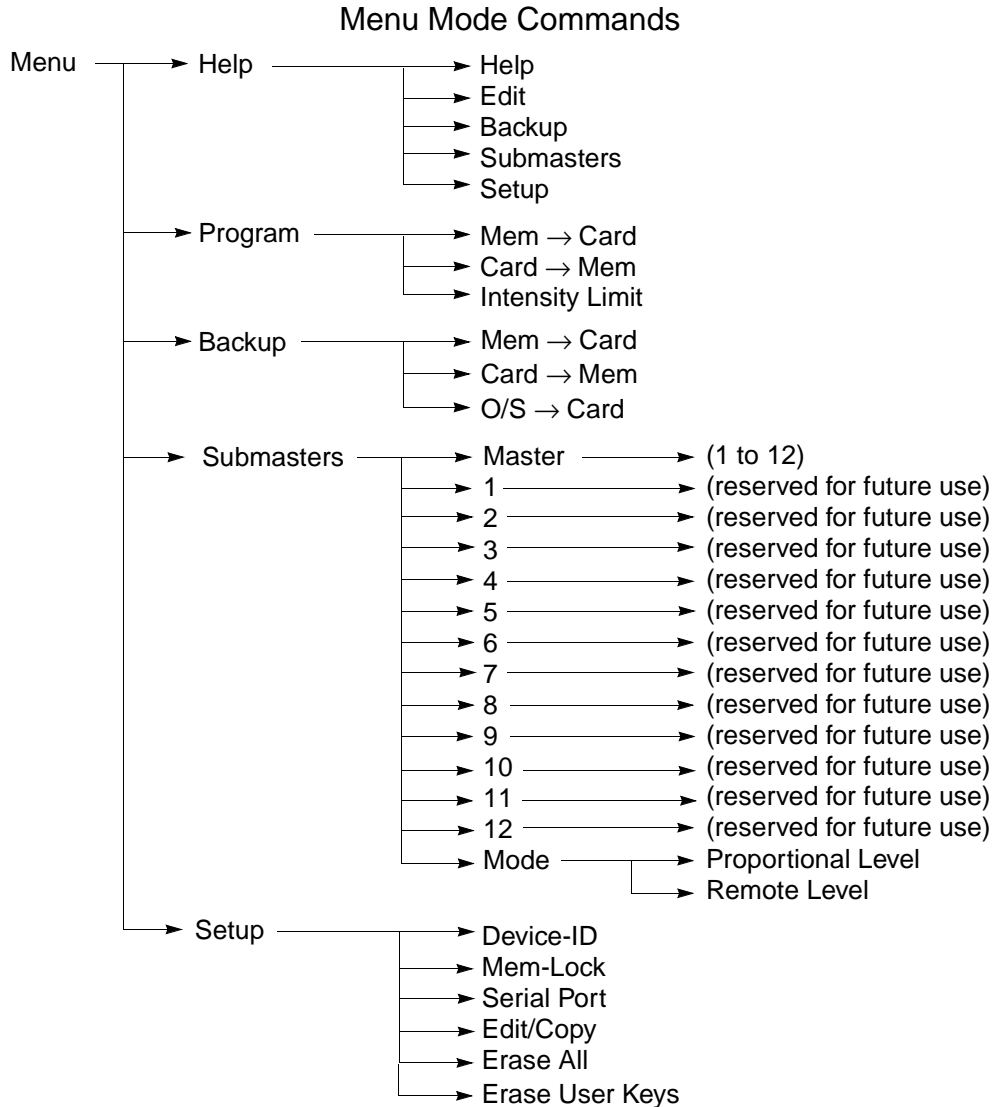
How to get around in Menu Mode

In Menu mode you can back up the controller’s Memory in several different ways and assign submasters. The Setup command in the Menu mode allows you to set the Device ID for Show Control and select which Memories you want to lock out.

Note Any sequence or Preset which is playing back continues while the controller is in Menu mode.

The following diagram maps out all of the Menu mode commands available

through the LCD window.



To access the Menu mode:

1. Press the MENU key. The LCD windows displays the Main menu showing all the submenus as Figure 10 shows.

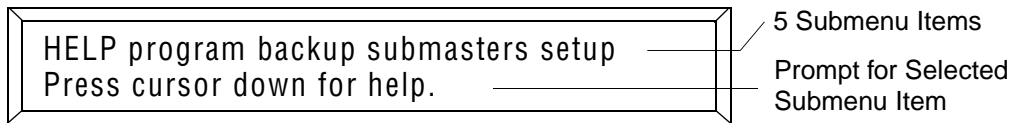


Figure 10. Main Menu

Notice that all the submenus are listed only in the top row. The second row provides the prompts or values for the selected submenu item. To select a submenu item from the Main menu, press the **CURSOR** Left or Right Arrow key. The four menu **CURSOR** keys surround the **M E N U** key. Notice that each time you press the **CURSOR** Left or Right Arrow key a different menu item changes. Also notice that the letters in the name of the selected submenu item are capitalized or, in some cases, an item is enclosed in square brackets “[]”. Figure 10 shows **HELP** as the default item and that you press the **CURSOR** Down Arrow to display the help messages. Remember that capital letters, bracketed letters, or numbers indicate *selected* menu item.

2. Select any item in the Main menu by pressing the **CURSOR** Right Arrow key next to the **M E N U** key. You can only go right from the Help submenu.
3. After you select the submenu item that you want to alter, press the **CURSOR** Down Arrow key under the **M E N U** key to view the selections.
4. Use the **CONSTRUCT** Up and Down Arrow keys to change the values if any are assigned to the submenu item. The **CONSTRUCT** keys are located to the left of the **CURSOR** keys below the LCD window. For example, in the Setup submenu, you configure any Device ID number between 1 and 223. To change the value of this number, press the **CONSTRUCT** Up and Down Arrow keys.
5. Return to the Main menu by pressing the **CURSOR** Up Arrow key.
6. To exit Menu mode and return to IMP mode, press the **MENU** key.

Using Menu Mode Submenus

In this section you learn how to perform the operations related to each of the following submenu items:

- Help
- Function
- Setup

Help

The Help menu displays information about each of the submenu items.

1. Press the **MENU** key to display the menu items.
2. Then, you use the **CURSOR** Left or Right Arrow key to select items from the display except for the first menu item. Since Help is the first menu item it is already displayed in all capital letters. The second line of the LCD window

prompts: "Press cursor down for help."

```
HELP program backup submasters setup
Press cursor down for help.
```

3. Press the CURSOR Down key. A submenu appears similar to the Main menu, except "edit" is added to the list of submenus.

```
HELP program backup submasters setup
Press cursor down for help on help.
```

4. Use the CURSOR Left and Right Arrow keys to select the submenu item that you want for additional help. The second line of the LCD window prompts: "Press cursor down for help on (submenu name)."
5. Press the CURSOR Down Arrow key to read the help screens. Follow the instructions in the LCD window to continue.
6. Press the MENU key at any time to exit help.

Program

Select the Program submenu to:

- save the LCD Controller's internal Dataflash Programs to a removable Memory Card.
- load (update) the LCD Controller's internal Dataflash Programs from a Memory Card.
- Set the system wide absolute maximum intensity limit. No controller functions will output an intensity higher than this limit.

Backup

Select the Backup submenu to:

- save the LCD Controller's internal User RAM to a removable Memory Card.
- load (update) the LCD Controller's internal User RAM from a Memory Card.

Submasters

Reserved for future implementation. A submaster is an analog, 0-10 volt, control board that lets you remotely adjust, in real time, various Constructs or system parameters. This is a future function for the AF1000 LCD Controller. It

is important to leave these unassigned to avoid interfering with remote analog access to pages or presets

Assign a Channel for Master Dim

When you assign a channel to the Master dim level it has priority over the other channels. The channel you select for the Master cannot also function as a Submaster. For example, if you select channel 1 for the Master dim, then you cannot assign any fixtures to Submaster 1.

Note When the Master dim is assigned to a channel, any change in the remote input will override a value set with the master intensity Up/Down Arrows keys.

To assign a channel to a Master dim level:

1. Press the MENU key to display the menu items.
2. Press the CURSOR Right Arrow key twice to select `s u b m a s t e r s` from the Main menu. `S U B M A S T E R` is capitalized when selected.

```
help backup SUBMASTERS setup
Press cursor down for submaster function
```

3. Press the CURSOR Down Arrow key to view the submaster submenu. The first line of the LCD window displays: “[M a s t e r] 1 2 3 4 5 6 7 8 9 10 11 12 M O D E .” These indicate the Master dim, the twelve assignable submasters, and the Mode selection.

```
[ M A S T E R ] 1 2 3 4 5 6 7 8 9 10 11 12 M O D E
No channel assigned to master dim
```

4. The second line of the LCD window displays the status of the Master dim setting. If there is no channel assigned to the Master dim, the second line of the LCD window displays: “N o c h a n n e l a s s i g n e d t o m a s t e r d i m .”
5. Use the CONSTRUCT Up and Down Arrow keys to select a channel for master dim. Remember that the channel you assign to Master dim cannot also be assigned as a submaster.
6. After you set the channel for Master dim, you can assign submaster channels while the controller is in the submaster submenu. You do this by pressing the CURSOR Left and Right Arrow keys, or you can return to the Main menu by pressing the CURSOR Up Arrow key.

Setup

In Setup mode you:

- set the controller's Device ID for Show Control operation
- lock out Memory to prevent inadvertent editing
- set the controller to use either the RS-232 serial port or the MIDI port
- erase all of User Memory
- erase User keys (restore)

Set Device ID

The Device ID uniquely identifies the controller and any other devices that respond to a Show Control signal (for example: theater boards, hoist controllers, and so on). The Device ID has different meaning depending on which show control mode you use, Lightwave Show Control or MIDI Show Control.

In Lightwave Show Control mode, ID = 0 means that the device responds to any ID. For example, even if you were to send out Device ID=7, the controller with Device ID=0 would respond. Device ID= 0 is the default setting.

MIDI Show Control uses Device ID= 127 (7Fh) instead of ID = 0 to tell a device to respond to any signal.

To set the Device ID:

1. Press the MENU key to display the menu items.
2. Press the CURSOR Right Arrow key three times to select setup from the Main menu. The word S E T U P appears in all capital letters when selected.

```
help program backup submasters SETUP
Press cursor down for setup functions.
```

3. Press the CURSOR Down Arrow key to access the setup submenus. The LCD window displays the options: device-id, mem-lock, serial port, edit/copy, and erase all. Notice the right pointing arrow in the LCD window indicating to scroll in this direction for more items.

```
DEVICE-ID mem-lock serial port edit/cop→
Device ID = 0
```

4. Since Device-ID is the first menu item it is already selected and displayed in all capital letters. The second line of the LCD window prompts: " D e v i c e I D = 0 . "
5. Press the CONSTRUCT Up and Down Arrow keys to change the value of

the device-id for this particular LCD Controller. Values range from 0 to 223.

6. Press the CURSOR Left or Right Arrow keys to select another Setup submenu item, or press the CURSOR Up Arrow key to return to the Main menu.

Set Memory Locks

Use the Memory Lock function to lock out a Memory so that it cannot be edited without first being unlocked.

1. Press the MENU key to display the menu items.
2. Press the CURSOR Right Arrow key three times to select setup from the Main menu. The word S E T U P appears in all capital letters when selected.

```
help program backup submasters SETUP
Press cursor down for setup functions.
```

3. Press the CURSOR Down Arrow key to access the setup submenus. The LCD window displays the options: device-id, mem-lock, serial port, edit/copy, and erase all. Notice the right pointing arrow in the LCD window indicating to scroll in this direction for more items.

```
DEVICE-ID mem-lock serial port edit/cop→
Device ID = 0
```

4. Press the CURSOR Right Arrow key once to select mem-lock. The words MEM-LOCK appear in all capital letters when selected.

```
device-id MEM-LOCK serial port edit/cop→
Use A/P keys 1-9, Off = locked
```

5. The second line of the LCD window displays: "Use A/P keys 1-9, off=locked."
6. Press the A/P keys of the Memories that you want to lock out and thus prevent unwanted editing. The LEDs for each Memory (1-9) turn "Off" when you press its A/P key. When the LED is "Off" the Memory is locked.

Note

The AF1000 LCD controller does not have "A/P" keys; instead, press one of the "Presets" keys.

7. Press CURSOR Left or Right arrow keys to select another Setup submenu item, or press the CURSOR Up Arrow key to return to the Main menu.

Serial Port

Use the Serial Port function to set the controller to use either its RS-232 serial port or the MIDI ports.

1. Press the MENU key to display the menu items.
2. Press the CURSOR Right Arrow key three times to select setup from the Main menu. The word S E T U P appears in all capital letters when selected.

```
help program backup submasters SETUP
Press cursor down for setup functions.
```

3. Press the CURSOR Down Arrow key to access the setup submenus. The LCD window displays the options: device-id, mem-lock, serial port, edit copy, and erase all. Notice the right pointing arrow in the LCD window indicating to scroll in this direction for more items.

```
DEVICE-ID mem-lock serial port edit/cop→
Device ID = 0
```

4. Press the CURSOR Right Arrow key twice to select serial port. The words SERIAL PORT appears in all capital letters when selected.

```
device-id mem-lock SERIAL PORT edit/cop→
Use RS-232 for Lightwave Backup/Control
```

5. Depending on the current setting of the controller, the second line of the LCD window displays: "Use RS-232 for Lightwave Backup/Control" or "Use MIDI Show Control and Sysex Backup."

Note

Currently, the RS-232 serial port cannot be used for backup. It can, however, be used for control using Lightwave Research (LWR) control protocol with the Lightwave Control Console (LCC) software.

6. Press the CONSTRUCT Up or Down Arrow keys to change the selection between MIDI or RS-232.
7. Press CURSOR Left or Right Arrow keys to select another Setup submenu. Press the CURSOR Up Arrow key to return to the main menu.

Erase All

The Erase All function provides a quick way to clear all of User Memory. This operations clears everything, but the Operating System. You may want to temporarily backup User Memory to a Memory Card before you Erase All.

To execute the Erase All feature:

1. Press the MENU key to display the menu items.

2. Press the CURSOR Right Arrow key three times to select setup from the Main menu. The word S E T U P appears in all capital letters when selected.

```
help program backup submasters SETUP
Press cursor down for setup functions.
```

3. Press the CURSOR Down Arrow key to access the setup submenus. The LCD window displays the options: device-id, mem-lock, serial port, edit/copy, and erase all. Notice the right pointing arrow in the LCD window indicating to scroll in this direction for more items.

```
DEVICE-ID mem-lock serial port edit/cop→
Device ID = 0
```

4. Press the CURSOR Right Arrow key four times to select the erase all item. The words ERASE ALL appears in all capital letters when selected. Notice this time that the LCD window shows a left pointing arrow indicating that the menu items shifted to the left to display ERASE ALL. The second line in the LCD window displays: "Hold SELECT, press ERASE to clear memory."

```
←em-lock serial port edit/copy ERASE ALL
Hold SELECT, press ERASE to clear memory
```

Note

The AF1000 LCD controller does not have a Select key; instead, press the Edit key.

5. Press and hold the EDIT key and then press the ERASE key. Do not release the EDIT key. The second line in the LCD window now displays: "ERASE again to confirm, SELECT to cancel."

```
←em-lock serial port edit/copy ERASE ALL
ERASE again to confirm, SELECT to cancel
```

6. To complete the erase operation, while still holding the EDIT key, press the ERASE key again. The LCD window first displays: "ERASING... Memory: 1-9". Then it displays: "The controller will now restart...". The system performs a normal power-on restart.

Erase User Keys

The Erase User keys function allows you to erase or restore User keys 1 through 8 to their pre-programmed values. That is, Random, Audio 1, Audio 2, Color, gobo, and dim modulate. You would perform this operation to restore the keys to their original values when you no longer need the macros. Note that when you perform this operation that keys 1 to 6 are returned to their pre-programmed values and keys 7 and 8 are erased.

Note Color and gobo functions are not supported by AF1000 fixtures.

To erase all eight User keys:

1. Press the MENU key to display the menu items.
2. Press the CURSOR Right Arrow key three times to select setup from the Main menu. The word `SETUP` appears in all capital letters when selected.

```
help backup submasters SETUP function
Press cursor down for setup functions.
```

3. Press the CURSOR Down Arrow key to access the setup submenu. The LCD window displays the options: device-id, mem-lock, serial port, edit/copy, erase all and erase user. Notice the right pointing arrow in the LCD window indicating to scroll in this direction for more items.

```
DEVICE-ID mem-lock serial port edit/cop→
Device ID = 0
```

4. Press the CURSOR Right Arrow key five times to select the erase user item. The words `ERASE USER` appears in all capital letters when selected. Notice this time that the LCD window shows a left pointing arrow indicating that the menu items shifted to the left to display `ERASE USER`. The second line in the LCD window displays: "Hold SELECT & ERASE to clear user keys."

```
←serial port edit/copy erase all ERASE USER
Hold SELECT & ERASE to clear user keys
```

Note The AF1000 LCD controller does not have a Select key; instead, press the Edit key.

5. Press and hold the EDIT key and then press the ERASE key. Do not release the EDIT key. The second line in the LCD window now displays: "ERASE again to confirm, SELECT to cancel."

```
←serial port edit/copy erase all ERASE USER
ERASE again to confirm, SELECT to cancel
```

6. To complete the erase operation, while still holding the EDIT key, press the ERASE key again. The LCD window displays: "ERASING... USER KEYS".

Programming

The *Dataflash AF1000* LCD Controller is particularly unusual in that programming is not performed on a fixture by fixture basis as with other Lightwave Research LCD controllers. A single Dataflash system may consist of up to 256 fixtures with looks based on complex chases or animation sequences. This level of complexity is impractical to create and manipulate on a small menu driven LCD character display. The building of the fixture sequences is accomplished using external computer software such as **FlashCad** or purchased separately for a particular quantity and configuration of fixtures (i.e. 32 linear or 49 (7*7) grid). The LCD Controller is used to playback and manipulate these **Dataflash Programs**. The programs are loaded into the LCD controller in **Blocks** of up to 99. The controller can hold one block internally, and one block on ramcard.

The basic element of programming on the LCD controller is the **Page**. The page is roughly equivalent to traditional scenes except that instead of storing individual channel levels or other fixture parameters, each page holds all the parameters necessary to playback any one Dataflash program. Each page provides adjustment of the following parameters, called **Constructs**:

PROGRAM - (program number) Selects 1 of 99 pre programmed *Dataflash Programs* for playback

BLOCK - (program block) Select between the block of programs in internal RAM, and the block of programs on ramcard

ADVANCE - (playback advance mode) The advance mode construct on each page controls playback of the Dataflash program. The Options are *auto*, for automatic step by step playback at a set rate, and *audio*, which uses the audio input to determine the rate of playback.

RATE - (program rate) When using the auto advance mode, this construct sets the rate of playback from one step every 2 seconds, up to 120 steps per second depending on the specific program selected.

MULTIPLY - This sets the number of times each step of the selected program will be repeated before advancing to the next step. At the default value of 1, playback will occur as programmed in each Dataflash program. At higher values, the program will appear to freeze on each step, repeating the selected number of times. If any steps of the program have multiply already programmed in, the multiply will multiply the multiply, up to 256 repeats for each step.

FX-RANDOM - (random program start effect) By default, each time a different program is select, playback will start with step 1 of the program. With Random start selected, playback will start with a different randomly selected step each time that program is selected.

DIM - (dim or intensity) This value scales down (dims) the intensity programmed for each fixture. At the maximum value of 99, each fixture will flash at the intensity set in the selected program. At the minimum level of 0, no fixtures will flash. At all other levels, the programmed intensity levels will be scaled down proportionally.

DURATION - (flash duration) This value scales up the flash duration programmed for each fixture. At the minimum value of 1, each fixture will flash at the duration set in the selected program. At the maximum level of 64, all fixtures will flash at full duration (about 1/2 second). At all other levels, the programmed duration levels will be scaled up proportionally.

FX-MODULATE - (intensity modulation effect) When enabled, this effect will scale the programmed intensity levels proportionally the level of audio input.

DELAY - (page delay) This is the length of time that the page will 'run' before advancing to the next page (if used in a sequence). The selected program will run at the program rate for the length of the delay.

Since each Dataflash program is in effect a sequence or chase, and since pages themselves can be sequenced, the AF1000 LCD Controller is actually a sequencer within a sequencer. Parameters programmed on each page control the 'inside' program sequence, while controls on the LCD Controllers front panel (i.e. AUTO and RATE) affect the 'outside' page sequence. These front panel settings can then be recorded as a **Preset**, discussed below.

Page Programming

The AF1000 LCD Controller has nine separate **Memories**, each containing 99 Pages. This provides a total of 891 Pages of storage in the controller's memory. You can program each Page individually, in a sequence, or in loops.

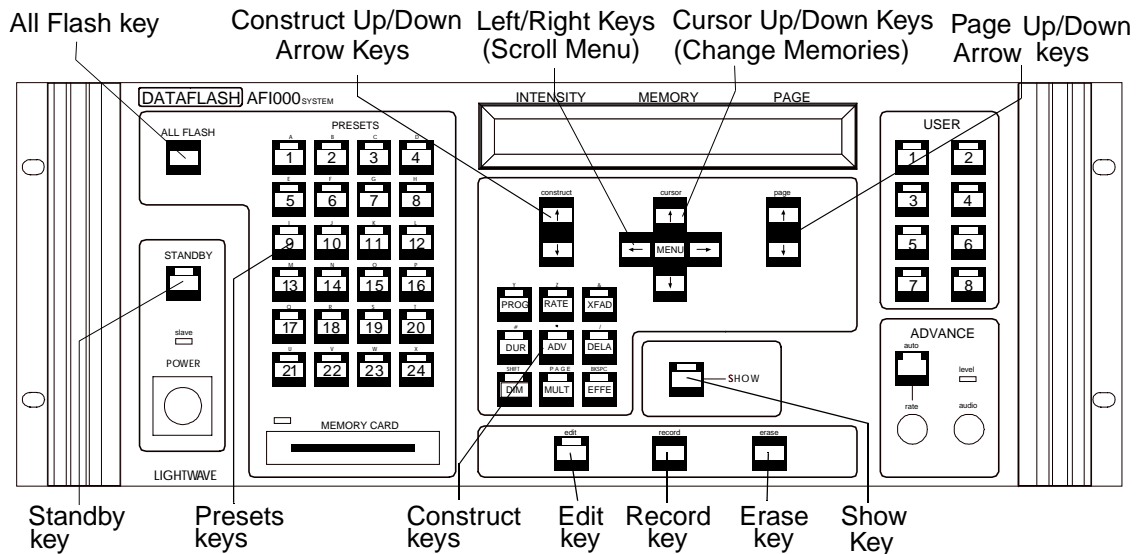


Figure 11. AF1000 Controller Front Panel

Record or Edit a Single Page Program

- To begin Programming, **make sure you are in IMP (Intensity, Memory, Page) mode**. If the LCD window does not show the current Intensity, Memory and Page setting, the controller is in Menu mode. Press the MENU key to exit Menu mode. In IMP mode, you select the Memory and Page where you begin programming.
 - Use the CURSOR Up/Down Arrow keys to select the Memory and the PAGE Up/Down keys to select the Page where you want to begin programming. For example, Memory 1, Page1, or Memory 3, Page 4.
1. Press the EDIT key. The EDIT key LED flashes. Ensure that the Standby lamp is out. You can program in Standby, it's just hard to see what you're doing. Refer to Figure 11. (Note to experienced LCD users: Do not press one of the 24 Presets keys)
 2. Select the Construct parameter to edit using the 9 Construct keys, or by using the Left/Right Arrow keys to scroll through the Edit menu. Some Constructs are only available by scrolling the menu.
 3. Use the CONSTRUCT Up/Down Arrow keys to change the value of the selected Construct.
 4. While Editing, the fixtures are limited to minimum intensity to allow comfortable viewing and 100% duty cycle. To momentarily preview the full effect, press and hold the SHOW key.
 5. Repeat steps 2 to 4 as needed for each Construct that you want to change.
 6. To save changes, press the RECORD key. The LCD window indicates recording. To discard changes, press the EDIT key.

Record a Loop (chase)

A loop is a sequence of Pages that runs continuously until you stop it. For example, you may have created a sequence in Pages 5 and 6 that moves the beam from position A to position B, changes gobo patterns from a “splash” to a “star”, and then changes colors from red to green. You now want to continuously run these two pages in a loop.

To continuously play a sequence of Pages in a loop you must bracket the Pages that you want to include in the loop with two Non-Initialized Pages. In the previous example, you would make Pages 4 and 7 Non-Initialized pages. Then, when you run the loop, it would run continuously from Pages 5 through 6.

To record a loop:

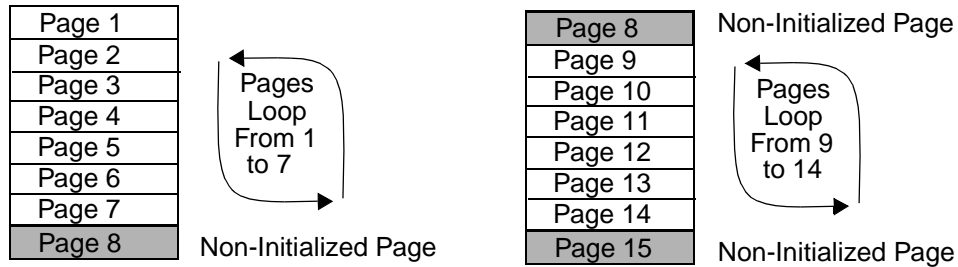
1. Record the sequence of Pages that you want to include in the loop. Refer to the *Record a single Page Program* section.

- Record two non-initialized Pages. One before the first Page in the sequence and one after the last Page in the sequence. Refer to the following *Record a Non-Initialized Page* section. A non-initialized page is not required before page 1 or after page 99

To make the loop into a One-Shot Sequence:

- The Delay construct can be set from 0.0 seconds up to 99 seconds. In between 99 and 0.0 is the *Hold* function. When a sequence reaches a page with delay programmed to “hold”, the sequence will remain on that page indefinitely. Press the page up arrow key to continue the chase.

Record a Non-Initialized Page



To record a Non-Initialized (un-initialize) Page:

- Select the first or beginning Page that you want to “Un-Initialize.” Use the PAGE Up/Down keys to select the Page. Use the CURSOR Up/Down keys to select the Memory.
- Press the EDIT key . The EDIT key LED flashes. Disregard the LCD window display for this step.
- Press the ERASE key once. The LCD window displays:

Press ERASE to un-initialize M: x P: x
or press SELECT to exit.

- Press the ERASE key a second time to un-initialize the page. In a moment the controller returns to IMP Mode.

Repeat steps 1 to 4 for the second or ending Non-Initialize page.

Playback a Loop (Chase)

With the loop created and bracketed with Non-Initialized Pages you can now run the loop.

To playback a loop:

1. Use the PAGE Up/Down keys to display in the LCD window any Page in the loop.
2. Then, press the AUTO key located over the RATE knob. The auto LED lights and the loop runs beginning from the Page you set in the LCD window.
3. The controller advances the Pages at the rate you set with the RATE knob. Adjust the knob clockwise to run the loop faster and counterclockwise to run the loop slower. Note that any delay times you program will add to the per-page time of the rate setting.

Preset Programming

Presets provide immediate access to a particular Page or Sequence (loop), including a snapshot of the front panel settings for Advance mode (Auto, Audio 1, Audio 2), Page Advance Rate, Master Intensity, and Any Effects Functions used. The only effective difference between a Page and Sequence preset is whether The Auto button is on or off when the preset is recorded.

Presets are selected by front panel access, using the 24 PRESET keys. Internally, there are many *Levels* of 24 presets for a total of 1024. While there are more presets than pages, multiple presets can access the same page or sequence in different ways (i.e. a sequence played at different rates). On power up, the preset keys will access level 1, the left and right cursor keys may be used in IMP mode to select other levels. The full range of presets may also be accessed via RS-232 Serial, MIDI Show Control, or by using a remote analog input device. The 24 Presets keys will always access the same level as the last called preset. When a preset is recalled by any means, the display will show the preset number.

Note If you lock out any Memories you also lock out Presets from those Memories.

Recording a Preset

To create a preset, you should have already created the Page or Sequence to be used. The preset only records the page number, or first page number of a sequence, so the pages may be modified later without affecting the preset.

To record a Preset:

1. Select the Memory and Page that you want to record as a Preset.
2. Adjust the front panel settings for the desired effect. These settings include Master Intensity, Any Effects Functions used. Advance mode (off for static one page presets, or Auto, Audio 1, Audio 2 for sequences) and Page Advance Rate (for sequences).
3. Once the desired effect is achieved, Press the EDIT key.
4. Press the numbered Presets key (1 to 24) where you want to store the Preset. Adjustments may still be made at this point.
5. Press the RECORD key to record the Preset and return to the Main menu.

Recalling and Adjusting Presets

You can now recall this Preset by pressing the PRESETS key you assigned in step 4.. When the preset key is pressed, all of the stored parameters are recalled, placing the controller in the same state as when the preset was recorded. This state will remain only until changed by any other action. Presets are recalled, not turned 'on' and 'off'. Thus, once a preset key is pressed and the preset recalled, all system settings are still available for adjustment. No adjustments will be recorded except by repeating the above procedure.

Using Presets in Twelve Level Preset Access Mode

Twelve Level Preset Access is one method for accessing multiple levels of 24 Presets by using an external controller. To use this option, the *AF1000* Controller must be configured for Twelve Level Preset Access by setting Personality DIP Switch B on the rear of the *AF1000* Controller to have Switch 3 "On" and Switch 5 "Off." Also, a 0-10 volt analog controller must be correctly patched to the Analog Inputs connector on the rear of the controller. For the purpose of twelve level preset access, the analog inputs are considered either activated (ON = above 50%), or deactivated (OFF = below 50%). The exact threshold is inexact, so only zero and maximum values should be used. Do not crossfade the analog inputs in this mode as results will be unpredictable.

To Record a Preset using Twelve Level Preset Access:

1. Select the Memory and Page that you want to record as a Preset.
2. Adjust the front panel settings for the desired effect. These settings include Master Intensity, Any Effects Functions used. Advance mode (off for static one page presets, or Auto, Audio 1, Audio 2 for sequences) and Page Advance Rate (for sequences).
3. Once the desired effect is achieved, Press the EDIT key.
4. Activate the analog input channel corresponding to the one of twelve levels where you want to Preset stored. For example, to program the first level of 24 Presets, turn on channel one on the analog controller. To program the second level of 24 Presets (25 to 48), turn on channel two on the analog controller, and so on through the 12 levels. Twelve levels times 24 equals a maximum of 288 presets using this method.
5. Press the numbered Presets key (1 to 24) where you want to store the Preset. Adjustments may still be made at this point.
6. Press the RECORD key to record the preset and return to the Main menu.

Recall a Preset in Twelve Level Preset Access Mode

Presets can be recalled either by pressing one of the Presets keys on the controller or by activating one of the twelve analog input channels. Pressing a preset key recalls the corresponding preset in the most recently selected level. Activating one of the 12 analog input channels recalls the last selected preset (1-24) of the newly selected level to be recalled. It is thus possible to treat the system as either 12 sets of 24 presets, or 24 sets of 12 presets.

Using Presets in Binary Preset Access Mode

Binary Preset Access is a way of expanding the number of available Presets from 24 (the 24 Presets buttons on the front panel of the LCD controller) to 1023 by using an auxiliary controller. Programming in Binary Preset Access is similar to programming Presets as usual with the LCD Controller with one additional step described in the following procedure.

Before you begin, ensure that the controller is configured for Binary Preset Access by setting Personality DIP Switch B on the rear of the controller to: Switches 3 and 5 "On." Also, make sure an analog controller is correctly patched to the Analog Inputs connector on the rear of the LCD Controller.

Record a Preset in Binary Preset Access Mode

To record a Preset using Binary Preset Access:

1. Select the Memory and Page that you want to record as a Preset.
2. Adjust the front panel settings for the desired effect. These settings include Master Intensity, Any Effects Functions used. Advance mode (off for static one page presets, or Auto, Audio 1, Audio 2 for sequences) and Page Advance Rate (for sequences).
3. Once the desired effect is achieved, press the EDIT key.
4. Press a numbered PRESETS key (1-24) on the front panel of the *AF1000* Controller. Which PRESETS key that you press is not important; this action only alerts the controller that you are about to record Presets.
5. Activate any combination of the first 10 (of 12) analog input channels. The selected preset number is shown in the LCD display.

quick lesson about binary:

The analog input channels actually work in binary combinations where input channels 1 through 10 select presets 1, 2, 4, 8, 16, 32, 64, 128, 256, and 512 respectively. Any other preset up to 1023 is selected by adding up the individual channels to reach the desired preset number. For example, to select preset 25, activate the channels for 1+8+16 which would be channels 1, 4, and 5.

6. Press the RECORD key. One of the PRESETS key LEDs on the front panel lights up indicating that you recorded a Preset. The LED that lights will correspond to the binary combination selected in step 5, not necessarily the one that you originally pressed in step 4.

Recall a Preset in Binary Preset Access Mode

To recall the Preset, activate the same combination of analog input channels that was used to record the preset.

Using Presets with Serial or MIDI Show Control

Either RS-232 Serial or MIDI Show Control may be used to trigger presets from a remote computer, show control system, or the newer generation of Lighting Desks. Programming for show control is similar to programming Presets as usual with the LCD Controller with one additional step described in the following procedure.

RS-232 Control requires Lightwave Research serial show control protocol, while MIDI control follows the "GO" command of the MIDI Show Control

protocol specification, with Cue number used as Preset number

Before you begin, ensure that the controller is configured for either RS-232 Serial or MIDI Show Control by setting the SERIAL_PORT option in the SETUP menu. Whenever the serial port is switched between RS-232 and MIDI, the controller must be restarted for the change to take effect. Whether using RS-232 or MIDI, you must also set the DEVICE_ID in the SETUP menu to agree with the controlling device.

Record a Preset using Serial or MIDI Show Control

To record a Preset using Binary Preset Access:

1. Select the Memory and Page that you want to record as a Preset.
2. Adjust the front panel settings for the desired effect. These settings include Master Intensity, Any Effects Functions used. Advance mode (off for static one page presets, or Auto, Audio 1, Audio 2 for sequences) and Page Advance Rate (for sequences).
3. Once the desired effect is achieved, press the EDIT key.
4. Press a numbered PRESETS key (1-24) on the front panel of the *AF1000* Controller. Which PRESETS key that you press is not important; this action only alerts the controller that you are about to record Presets.
5. Send the Show control command for the desired preset to the LCD Controller. The Selected Preset will be shown in the LCD display. Using MIDI Show Control, this would be the GO {Cue#} command. Using Lightwave Serial protocol, send a Preset Request. This is the same command that will be used to call the preset later.
6. Press the RECORD key. One of the PRESETS key LEDs on the front panel lights up indicating that you recorded a Preset. The LED that lights will correspond to the preset number received in step 5, not necessarily the one that you originally pressed in step 4.

Recall a Preset using Serial or MIDI Show Control

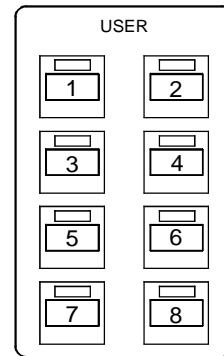
To recall the Preset, send the same command that was used when recording the preset. Using MIDI Show Control, this would be the GO {Cue#} command. Using Lightwave Serial protocol, send a Preset Request.

User Keys

This section explains how to record, playback, and edit the eight front panel USER keys. This section also explains how to abort a USER key playback operation. USER Keys 1 to 6 are factory programmed for common usage of these keys, that is, Random advance, Audio 1 advance, Audio 2 advance, and Color, Gobo, and Dim Effects. However, you can easily record your own macros using these eight keys to suit your special purposes as explained in this section. If you record macros with any of the USER keys, you can still access the pre-programmed functions through the USER key *function* menu operation. Refer to the SETUP submenu earlier in this manual on how you can easily restore the eight keys back to the factory pre-programmed values.

User keys 1 through 8 are factory programmed as follows:

- User 1 – Random (time) Advance Key
- User 3 – Audio Advance 1 Key
- User 5 – Audio Advance 2 key
- User 2 – Effect 1 Color Modulate Key
- User 4 – Effect 2 Gobo Modulate Key
- User 6 – Effect 3 Dim Modulate Key
- User 7 – Undefined (not programmed)
- User 8 – Undefined (not programmed)



Eight User Keys

Note Color modulate and gobo modulate are not supported by the AF1000 fixture.

User Key States

When you press a USER key one of three states occur depending on how long you press and hold the key.

1. Press and hold the selected USER key in for up to 1 second to playback the macro assigned to the key.
2. Press and hold the selected USER key in for 2 to 3 seconds to enter the Edit menu where you can playback, record, or perform one of the pre-programmed functions.
3. Pressing and holding the USER key for 3 seconds or more *does not* cancel macro playback. Instead, to cancel macro playback, press the same USER key again.

Playback User Key Macros

Follow this procedure to playback a macro assigned to USER keys 1 to 8:

Simply press and release the desired USER key within 1 second and the macro begins playing back.

You can also playback macros through the USER Key EDIT menu.

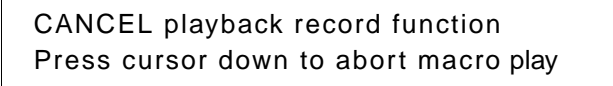
Edit User Keys

The Edit state provides a submenu where you are provided with an alternate method to abort and playback macros. More importantly though, this is where you record (create) the USER key macros. This is also where you can activate the pre-programmed special effects (Random advance, Audio advance/halt, and dim) without performing the restore (erase) procedure. Thus, you can define all six USER keys and still have access to the original pre-programmed special effect functions.

To enter the EDIT state:

1. Press and hold the desired USER key from 2 to 3 seconds. If you exceed 3 seconds you enter the Abort state. The LCD window displays the EDIT menu:

EDIT Menu



CANCEL playback record function
Press cursor down to abort macro play

The top line lists the available item that you can perform from this menu. When you select menu items with the CURSOR Right/Left Arrow keys the menu items change to capital letters. The bottom line prompts you with the required action to perform the selected menu item. It will usually request that you press the CURSOR Down Arrow key to continue.

2. Then, go to the following section associated to the menu item that you want to perform. For example, to record a macro go to the following *Record User Key Macros* section.

Cancel Playing Macro

The cancel menu option *does not* cancel macro playback. Instead, press the same USER key again. This stops the macro.

Playback Macros

Select this item to playback macros from within the EDIT menu. Otherwise, you playback macros by just pressing the appropriate USER key.

To playback macros from the EDIT menu:

1. From the EDIT menu press the CURSOR Right Arrow key once to select playback. Playback changes to capital letters.
2. Then, press the CURSOR Down Arrow key to play the macro assigned to the USER key that you pressed to enter the EDIT menu.

Record User Key Macros

You can program any one or all of these eight keys as desired. When you record a macro and assign it to a USER key, you cannot then use the key to recall its pre-programmed function. However, you can still recall the pre-programmed function through the EDIT menu *function* item; see the following section. When you decide to restore the pre-programmed values remember that the controller restores the six pre-programmed keys.

A macro is a recording of key presses that you assign to one of the six USER keys. Then, you simply press the USER key once to playback the macro.

To record a macro for the selected USER key:

1. From the EDIT menu press the CURSOR Right Arrow key twice to select record. Record changes to capital letters.
Note: when you complete your macro key presses you will reenter the EDIT menu again to stop the macro recorder.
2. Next, press the CURSOR Down Arrow key to open the macro recorder.
3. Now, every key press you make is recorded in this macro. The macro accepts up to 256 key presses.
4. When you have completed your macro press the same USER key again that you started with to re-open the EDIT menu. That is, the USER key that you want to assign to this macro. This time the EDIT menu displays stop recording rather than recording.
5. Press the CURSOR Right Arrow twice to select the stop recording item.
6. Then, press the CURSOR Down Arrow key to complete the operation.

Additional Controller Functions

Erase Pages and Create Blackout Pages

You may want to erase a Page when there is undesirable or old Pages in Memory. It is often best to clear out these Pages to prevent confusion in future programming. Otherwise, you can record over the old Pages. An erased Page is still an Initialized Page; it acts as a “placeholder” Page in a loop of Pages. Therefore, use this feature to create Blackout pages.

Note To prevent inadvertent erasing of Presets, you cannot directly erase Pages used as Presets. You record over existing Presets to change them.

To erase a Page:

1. Select the Page you wish to delete using the PAGE Up/Down Arrow keys.
2. Press the EDIT key. The LCD window displays: "Select fixtures to edit using A/P keys, or press SELECT to exit."

Select fixtures to edit using A/P keys,
or press SELECT to exit.

Note The AF1000 LCD controller does not have “A/P” keys; instead, press one of the “Presets” keys.

3. Press the ERASE key once. The LCD window displays: "Press ERASE to un-initialize M:x P:x, or press SELECT to exit."

Press ERASE to un-initialize M: x P: x
or press SELECT to exit.

4. **Do not press the ERASE key** again as stated in the LCD window, instead press the RECORD key. The LCD window briefly displays: "Recording." The controller then returns to the IMP mode. All of the parameter settings are set back to the default settings.

Note If you inadvertently press the ERASE key a second time you create an Un-initialized Page rather than an erased or Blackout Page. To re-initialize the Page, record any fixture Construct in the Page.

Memory Lock/Unlock

You can protect entire Memories from unauthorized editing or programming.

To lock a Memory:

1. Press the MENU key.
2. Press the CURSOR Right Arrow key three times to select setup. SETUP is capitalized when selected.
3. Press the CURSOR Down Arrow key.
4. Select mem-lock from the SETUP menu by pressing the CURSOR Right Arrow key once. MEM-LOCK is capitalized when selected. The second line of the LCD window displays: "Use A/P keys 1-9, off=locked."

```
device-id MEM-LOCK serial port edit/cop→  
Use A/P keys 1-9, off = locked
```

Note

The AF1000 LCD controller does not have "A/P" keys; instead, press one of the "Presets" keys.

5. The LEDs above PRESETS keys 1-9 are lit (unless a Memory is already locked out).
6. Press the PRESETS key (1-9) corresponding to the number of the Memory that you want to lock out. When the LED above the key goes out the Memory is locked.
7. Press the MENU key to exit back to IMP mode.

To unlock a locked memory:

1. Perform steps 1 through 5 in the previous "To lock a Memory" procedure.
2. Then, press the PRESETS key (1-9) corresponding to the number of the Memory you want to unlock. The LEDs on locked Memories are off. The LED above the PRESETS key turns on when you unlock the Memory.
3. Press the MENU key to exit back to IMP mode.

A locked Memory is protected from all Erase and Record functions. If someone tries to access a protected Memory, the LCD window displays: "Memory x is locked out." Where x equals the locked Memory.

```
LOCKOUT. . . Memory: x      Page: x  
Memory x is locked out
```

When program data is crossloaded between controllers or downloaded from a computer and the controller receiving the data has one or more Memories locked, those Memories will **not** be overwritten by the new data.

For example, if you want to copy Memories 1, 2, and 3 from controller A to controller B, while keeping Memories 4 through 9 on controller B the way they

are, you need to lock Memories 4 through 9 on controller B before the program data is transferred.



Caution: loading controller User Memory from a Memory Card replaces all of the controller's User Memory, *including* locked Memories.

Playback

You can playback a program manually or automatically. Programs consist of single Pages, a sequence of Pages, a loop (chase) of Pages, or a Preset. You can also playback all Pages of all Memories in sequence.

Playing Single Pages — You playback single Pages manually by simply selecting the Memory with the CURSOR Up/Down keys and the Page with the PAGE Up/Down keys. The moment you select the Page it performs the operations recorded in the Page.

Manually playing a sequence of Pages — You can play a sequence of Pages manually. Play them manually by selecting the Memory and first Page in the sequence and then keep “bumping” the Page Up/Down keys to proceed through the sequence.

Automatically playing a sequence of Pages — To play a sequence automatically, select the first Page in the sequence and then press the AUTO key. The sequence will play from the current Page until it finds a Non-Initialized Page. If there is no Non-Initialized Page, then the sequence will wrap at Page 99 and continue with Page 1 running continuously until you deselect the AUTO key; the sequence stays in the same Memory. If there is a Non-Initialized Page anywhere in the Memory other than 0 and 99, the sequence will act like a loop or chase and loop back to Page 1.

Playing a loop — You playback a loop automatically. A loop has a Non-Initialized Page as its first and last page. You select any Page in the loop and then press the AUTO key; the loop runs continuously. When it encounters the ending Non-Initialized Page it loops back to the beginning Non-Initialized Page and continues until you deselect the AUTO key.

Playing a Preset — You playback a Preset in a similar fashion as a loop. That is, when you select a Preset it runs continuously until you select another Preset or exit Preset mode.

Varying Playback rate — To vary the playback rate during Auto mode adjust the RATE knob under the AUTO KEY; clockwise is faster, counterclockwise is slower. If you have a delay programmed into the Page it is added to the time set by the RATE knob adjustment.

Auto mode also provides several audio input override effects where you can advance or halt Pages according to the program information. You can also change fixture colors and light intensity according to the program information.

Page Playback - Manual Advance

To manually playback the Pages within a Memory:

1. If the controller is in Standby mode, remove the controller from Standby by pressing the STANDBY key; the STANDBY key LED turns "Off".

Note

When the controller exits Standby it immediately plays the Page currently displayed in the LCD window.

2. Then, use the PAGE Up/Down Arrow keys to select any Page that you want to Playback. The fixtures change their settings immediately according to what is recorded on each Page. The controller advances one Page at a time each time you press either the PAGE Up or Down Arrow keys.
3. If you press and hold either the PAGE Up or Down Arrow key, the Pages change quickly until 1 or 99 is reached. If you release and press the PAGE Up/Down Arrow key again, the process repeats.

Page Playback - Auto Mode

To automatically playback Pages within a Memory:

1. If the controller is in Standby mode, remove the controller from Standby by pressing the STANDBY key; the STANDBY key LED turns "Off".

Note

When the controller exits Standby it immediately plays the Page currently displayed in the LCD window.

2. Select the starting Page within the loop (although you can start from any Page within the loop). Press the AUTO key, it is located to the right of the joystick. As soon as you press the AUTO key the controller begins to playback all of the Pages within the current Memory until it encounters a Non-Initialized Page. When it encounters a Non-Initialized Page it loops back to the starting Non-Initialized Page in the loop and continues with the first programmed Page after the Non-Initialized Page. The controller runs continuously sequencing through the loop until you deselect the AUTO key.
3. To vary the playback rate (speed) turn the RATE knob, located just below the AUTO key. Turn the RATE knob clockwise to speed the playback rate or counterclockwise to slow the playback rate. The RATE knob adds to the Delay time programmed into each Page.

Audio Input Playback Modes

You can use a musical source to control *AF1000* auto playback through five *AF1000* playback modes. Plug your musical source into the 6 mm (1/4 inch) Stereo Audio Input jack on the LCD Controller's rear panel. Although the input jack is a stereo connector, the controller accepts a monaural input on one of the stereo connections. Then, follow the directions as explained for the applicable mode: Audio 1, Audio 2, Effect 1, Effect 2, and Effect 3. The five keys associated to these modes are labeled USER keys 2 through 6 as explained in the following. USER 1 Key is used for the Random Advance feature.

- USER 3** **Audio 1:** Press USER 3 key; its LED lights. This Auto playback method ***advances Pages with the amplitude of the musical information***. You can adjust the strength of the audio input signal by using the AUDIO (level) knob located directly to the right of the RATE knob. The strength of the signal is indicated by the Audio level LED located just above the AUDIO knob. Turn the AUDIO knob counterclockwise to decrease signal strength and clockwise to increase signal strength. Full counterclockwise is "off" and full clockwise is maximum signal.
- USER 5** **Audio 2:** Press USER 5 key; its LED lights. This Auto playback method ***halts the advance of Pages with the amplitude of the musical information***. You can adjust the strength of the audio input signal by using the AUDIO (level) knob located directly to the right of the RATE knob. The strength of the signal is indicated by the Audio level LED located just above the AUDIO knob. Turn the AUDIO knob counterclockwise to decrease signal strength and clockwise to increase signal strength. Full counterclockwise is "off" and full clockwise is maximum signal.
- USER 2** **Effect 1: Color Modulate:** Color modulate is not supported by AF1000 fixtures.
- USER 4** **Effect 2: Gobo Modulate:** Gobo modulate is not supported by AF1000 fixtures.
- USER 6** **Effect 3: Dim Modulate:** Press USER 6 key to implement this feature; its LED lights. The Light Modulate effect causes the light intensity of all active fixtures to follow the amplitude of the audio input. When the light modulate effect is engaged, all fixtures are dimmed to their minimum intensity level until it senses an audio input. You can adjust the strength of the audio input signal by using the AUDIO (level) knob located directly to the right of the RATE knob. The strength of the signal is indicated by the Audio level LED located just above the AUDIO knob. Turn the audio knob counterclockwise to decrease signal strength and clockwise to increase signal strength. Full counterclockwise is "Off" and full clockwise is maximum signal.

Preset Playback

Presets store a Page or group of Pages and their Advance, Effect, Master dim, and RATE knob settings. However, you can alter the Advance and Effect controls by implementing “live” control over the Preset playback. Any changes made to the Advance and Effect selections during Preset playback will not affect the Advance and Effect selections stored in the Preset Memory. When you playback a Preset, it continues to playback indefinitely until another Preset is selected or you exit Preset mode. You playback Presets in the same manner as playing back a loop of Pages within a Memory.

To Playback a Preset:

1. Select the number of the Preset that you want to play back by pressing the corresponding key on the PRESETS keypad. The Preset immediately begins to playback and runs continuously. Refer to the previous *Programming a Preset in Twelve Level Preset Access Mode* section for information on selecting Presets in this mode.
2. If you want to change to another Preset during the currently running Preset, select another Preset. To quit Preset playback press the PRESETS key.

Automatic All-Memory Playback

The AF1000 Controller can automatically sequence through (playback) all 99 Pages in all nine Memories.

To perform an all-Memory playback:

Press the Menu CURSOR Up/Down Arrow key until the LCD window “Memory:” field displays either: 1-all or 9-all.

The Initialized Pages in Memory 1 begin sequencing according to the Advance and Rate setting. When the controller completes playing back Memory 1’s highest Initialized Page, the controller advances to Memory 2, and plays back all of its Initialized Pages. This playback process continues through Memory 9, Page 99. When all Pages in Memory 9 playback the operation wraps around and continues with Memory 1 and runs continuously until you disable All-Memory playback.

Each Memory number will be followed by “-all” as the Memories playback.

To disable All-Memory Sequencing:

Press the CURSOR Up/Down Arrow key until “-all” no longer appears as part of the Memory value in the LCD window

Master Dim


You can easily perform Master Dim operation from the front panel that affect all fixtures. The Intensity field displays the current state of the Master Dim. The default value is "99" which equates to full bright. The "0" value equates to off or full dark (off). To adjust the Master Dim press the INTENSITY Up or Down key. Notice that the dim value in the Intensity field follows the CONSTRUCT Up/Down keys similar to using a fader control. Press and hold the INTENSITY Up/Down key to quickly change the dimming value.

Appendix A - IMPORTANT SAFETY INFORMATION

WARNING: FOR CONTINUED PROTECTION AGAINST FIRE.

1. This equipment is designed for connection to a branch circuit having a maximum overload protection of 20 A.
2. Replace fuses with the specified type and rating ONLY.

WARNING: FOR CONTINUED PROTECTION AGAINST ELECTRIC SHOCK.

1. Refer servicing to qualified service personnel. No user serviceable parts inside.
2. Do not expose to rain or moisture.
3. If this equipment was received without a line cord plug, attach the appropriate line cord plug according to the following code:
 - BROWN–LIVE
 - BLUE–NEUTRAL
 - GREEN/YELLOW–EARTH
4. As the colours of the cores in the mains lead of this equipment may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:
 - the core which is coloured green and yellow must be connected to the terminal in the plug which is marked with the letter E or by the earth symbol , or coloured green or green and yellow.
 - the core which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black.
 - the core which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.
5. **THIS EQUIPMENT MUST BE EARTHED.**

Appendice A

IMPORTANT: INFORMATIONS DE SÉCURITÉ

MISE EN GARDE: POUR UNE PROTECTION PERMANENTE CONTRE LES INCENDIES.

1. Cet équipement est conçu pour connexion à un circuit de dérivation ayant une protection de surcharge maximum de 20 A.
2. Remplacez les fusibles UNIQUEMENT par le type et la puissance précisés.

MISE EN GARDE: POUR UNE PROTECTION PERMANENTE CONTRE LES CHOCS ÉLECTRIQUES.

1. L'utilisateur ne peut pas accéder aux pièces à l'intérieur de cet appareil. Seul du personnel qualifié est habilité à réparer cet appareil.
2. Ne pas exposer l'appareil à la pluie ou l'humidité.
3. Si l'appareil n'a pas été livré avec une prise de cordon électrique, attacher la prise de corde électrique conformément au code suivant:
 - BRUN- BRANCHE
 - BLEU- NEUTRE
 - VERT/JAUNE - TERRE
4. **L'EQUIPEMENT DOIT ETRE MIS A LA TERRE.**

Anhang A

WICHTIGE SICHERHEITSHINWEISE

WARNUNG: ZUM SCHUTZ VOR BRANDGEFAHR.

1. Dieses Gerät ist für den Anschluß an ein Stromnetz mit einem Überlastungsschutz von höchstens 20 A bestimmt.
2. Ersatzsicherungen müssen den angegebenen Spezifikationen und Kennwerten entsprechen.

WARNUNG: ZUM SCHUTZ GEGEN GEFÄHRLICHE KÖRPERSTRÖME.

1. Das Gerät enthält keine wartungsfähigen Teile. Service sollte stets nur von Fachpersonal durchgeführt werden.
2. Vor Feuchtigkeit und Nässe schützen.
3. Falls dieses Gerät ohne Netzstecker geliefert wurde, schließen Sie bitte ein Netzstecker nach folgendem Farbschlüssel an:
 - BRAUN- STROMFÜHREND
 - BLAU- NEUTRAL
 - GRÜN/GELB- GEERDET
4. **DIESES GERÄT MUSS GEERDET WERDEN.**

Apéndice A

INFORMACIÓN IMPORTANTE DE SEGURIDAD

ADVERTENCIA: PARA PROTECCIÓN CONTINUA CONTRA INCENDIOS.

1. Este equipo está diseñado para conectarse a un circuito derivado con protección máxima contra aflujos de al menos 20 amperios.
2. Reemplace SOLAMENTE con fusibles que sean del tipo y potencia indicados.

ADVERTENCIA: PARA LA PROTECCIÓN CONTINUA CONTRA ELECTROCUCIONES.

1. El interior de la unidad no contiene repuestos que puedan ser reparados por el usuario. Solicite el servicio de reparación de personal calificado.
2. No exponga la unidad a la lluvia o a la humedad.
3. Si se ha recibido este equipo sin un enchufe macho de cable de alimentación, conecte el enchufe macho de cable alimentación adecuado según los códigos siguientes:
 - MARRÓN - CON CORRIENTE
 - AZUL - NEUTRO
 - VERDE/AMMARRILLO - TIERRA
4. **ESTE EQUIPO DEBE CONECTARSE A TIERRA.**

Appendice A

INFORMACIÓN IMPORTANTE DE SEGURIDAD

AVVERTENZA: PER PREVENIRE INCENDI.

1. Questo apparecchio può essere connesso ad un circuito ramificato con una protezione di massima di 20A.
2. Sostituire i fusibili SOLO di tipo e di amperaggio comoda specifica.

AVVERTENZA: PER PREVENIRE LE SCOSSE ELETTRICHE.

1. L'utente non deve riparare nessuna parte dentro l'unità. Per qualsiasi riparazione rivolgersi al personale specializzato.
2. Questa apparecchiatura non deve essere esposta ne alla pioggia ne all'umidità.
3. Nel caso in cui questa apparecchiatura fosse ricevuta senza il debito cavo completo di spina, collegarne uno appropriato seguendo i successivi codici:
 - MARRONE-SOTTO TENSIONE
 - BLU-NEUTRALE
 - VERDE/GIALLO-A TERRA
4. **QUESTA APPARECCHIATURA DEVE METTERSI A TERRA.**

Appendiks A

VIGTIG FIKKER HEDS INFORMATION

ADVARSEI: RESKYTTEKSE MOD ELEKTRISK SHOCK.

Viktigt! Ledere med groen/gul isolation ma kun tilsluttes en klemme maerket

 eller 