NSI®

DDS
Digital Dimming Systems

DDS
Digital Dimming Systems

NSI DDS dimming systems are fully digital products providing reliable, responsive performance with smooth, accurate control adjustments.

Extensive filtering reduces the potential of dimmer generated noise. Individual channels are user assignable as dimmers or on/off relays for non-dim applications.

The NSI DDS digital dimming systems include:

- Microprocessor based digital design for high performance and fast response.
- Fully-filtered outputs to reduce noise for quiet operation.
- User switchable "SOFT START" mode gives you longer lamp life.
- Non-dim operation can be selected for individual channels.

- Load protection for each output is externally accessible.
- LEDs indicate individual channel and control status.
- Multiplex address is selectable up to 512 channels.
- 0-10 volt analog and NSI Micro-Plex control inputs are standard.
- Optional control inputs include DMX 512 and NSI architectural control networks.
- Automatic internal sequences can be activated for stand alone display lighting.

Contact your area NSI dealer or factory representative for assistance in selecting products and appropriate options for your application.

DDS 5300
SATELLITE DIMMER / RELAY PACK

Mechanical:
- Dimensions:
  - 6.6" High
  - 9.8" Wide
  - 2.6" Deep
- Mounting:
  - 8.5" From Hole Centers
- Weight:
  - 4 lbs.

Capacity:
- Four individual dimmer/relay channels.
- 300 watts per channel. 1200 watts maximum power capability.
- Single standard AC output receptacle per channel.
- External fusing for each individual channel.

Features:
- Fully digital design provides fast, reliable response.
- Filtering reduces noise for quiet performance.
- User jumper select for dimmer/relay operation.
- Internal jumpers activate eight auto sequence control programs. Sequence rate adjustable from 1 to 60 seconds.
- Softstart can be activated for increased lamp life.
- Control status indicator LED.
- Power on LED indicator.
- Individual channel function LED's.
- 512 channel address.

Control Interface:
- NSI 128 channel Micro-Plex (standard 3 conductor audio cable) is standard.
- Analog control with 0-10 volts DC is standard.
- U.S.I.T.T. standard DMX-512 is optional.
- NSI architectural control network interface is optional.

DDS 5600
SATELLITE DIMMER / RELAY PACK

Capacity:
- Four individual dimmer/relay channels.
- 600 watts per channel. 2400 watts maximum power capability.
- Dual standard AC output receptacle per channel.
- External fusing for each individual channel.

Features:
- Fully digital design provides fast, reliable response.
- 160 microseconds of toroidal filtering reduces noise for quiet performance.
- User jumper select for dimmer/relay operation.
- Internal jumpers activate eight auto sequence control programs. Sequence rate adjustable from 1 to 60 seconds.
- Dual SCR circuit design insures reliable operation.
- Softstart may be activated for increased lamp life.
- Control status indicator LED.
- Power on LED indicator.
- Individual channel function LED's.
- 512 channel address.

Control Interface:
- NSI 128 channel Micro-Plex (standard 3 conductor audio cable) is standard.
- Analog control with 0-10 volts DC is standard.
- U.S.I.T.T. standard DMX-512 is optional.
- NSI architectural control network interface is optional.

Mechanical:
- Dimensions:
  - 8.25" High
  - 9.8" Wide
  - 2.6" Deep
- Mounting:
  - 8.5" From Hole Centers
- Weight:
  - 7 lbs.

DDS 6000
SATELLITE DIMMER / RELAY PACK

Capacity:
- Four individual dimmer/relay channels.
- 1200 watts per channel. 2400 watts maximum power capability.
- Dual standard AC output receptacle per channel.
- External fusing for each individual channel.
- Optional second power cable for dual 120 volt operation and full 4800 watt operating power.
- Optional screw terminal outputs.

Features:
- Fully digital design provides fast, reliable response.
- 400 microseconds of toroidal filtering reduces noise for quiet performance.
- User jumper select for dimmer/relay operation.
- Internal jumpers activate eight auto sequence control programs. Sequence rate adjustable from 1 second to full minute steps.
- Softstart may be activated for increased lamp life.
- Control status indicator LED.
- Power on LED indicator.
- Individual channel function LED's.
- 512 channel address.

Mechanical:
- Dimensions:
  - 10.9" High
  - 9.5" Wide
  - 3.75" Deep
- Mounting:
  - 8.25" From Hole Centers
- Weight:
  - 12 lbs.

Control Interface:
- NSI 128 channel Micro-Plex (standard 3 conductor audio cable) is standard.
- Analog control with 0-10 volts DC is standard.
- U.S.I.T.T. standard DMX-512 is optional.
- NSI architectural control network interface is optional.

Specifications subject to change without notice.

Specifications subject to change without notice.

DDS 8600

RACK MOUNTABLE DIMMER / RELAY PACK

Capacity:
- Six individual dimmer / relay channels. **(Eight on 8800)**
- 1200 watts per channel, 7200 watts **(9600 watts on 8800)** maximum power capability.
- External front panel circuit breakers for each individual channel.
- Single / three phase power operation.

Features:
- Fully digital design provides fast, reliable response.
- 512 channel address.
- 400 microseconds of toroidal filtering reduces noise for quiet performance.
- User select for dimmer / relay operation.
- User select for soft start operation.
- Internal jumpers activate eight auto sequence control programs. Sequence rate adjustable from 1 second to full minute steps.
- Individual channel lamp test controls.
- Multiplex control status indicator LED.
- DC power LED indicator.
- Phase power LED indicators.
- Individual channel function LED's.
- Over Temp LED indicator.
- Internal variable speed cooling fan.
- Removable front panel for easy service.
- Removable rack mounting ears.
- No load LED indicators.

Control Interface:
- NSI 128 channel Micro-Plex (standard 3 conductor audio cable) is standard.
- Analog control with 0-10 volts DC is standard.
- U.S.I.T.T. standard DMX-512 is optional.
- NSI architectural control network interface is optional.

Mechanical:
- Dimensions:
  - 3.5" High
  - 16.8" Wide
  - 14.1" Deep
- Mounting:
  - Standard 19" Rack Mountable
  - Two rack spaces.
- Weight:
  - 24 lbs. **(26 lbs. — 8800)**

DDS 8800

DDS 9600

RACK MOUNTABLE DIMMER / RELAY PACK

Capacity:
- Six individual dimmer / relay channels. **(Eight on 9800)**
- 2400 watts per channel, 14,400 watts **(19,200 watts on 9800)** maximum power capability.
- External front panel circuit breakers for each individual channel.
- Three / single phase power operation.

Features:
- Fully digital design provides fast, reliable response.
- 512 channel address.
- 500 microseconds of toroidal filtering reduces noise for quiet performance.
- User select for dimmer / relay operation.
- User select for soft start operation.
- Internal jumpers activate eight auto sequence control programs. Sequence rate adjustable from 1 second to full minute steps.
- Individual channel lamp test controls.
- Multiplex control status indicator LED.
- DC power LED indicator.
- Phase power LED indicators.
- Individual channel function LED's.
- Over Temp LED indicator.
- Internal variable speed cooling fan.
- Removable front panel for easy service.
- Removable rack mounting ears.
- No load LED indicators.

Control Interface:
- NSI 128 channel Micro-Plex (standard 3 conductor audio cable) is standard.
- Analog control with 0-10 volts DC is standard.
- U.S.I.T.T. standard DMX-512 is optional.
- NSI architectural control network interface is optional.
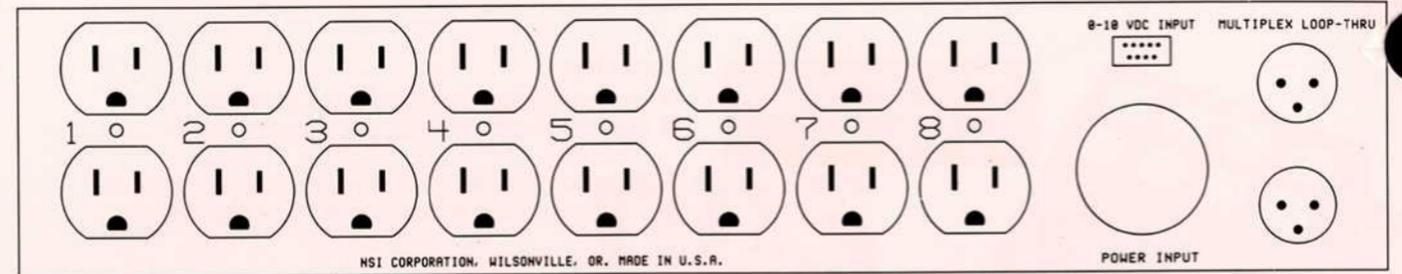
Mechanical:
- Dimensions:
  3.5" High
  16.8" Wide
  14.1" Deep
- Mounting:
  Standard 19" Rack Mountable
  Two rack spaces.
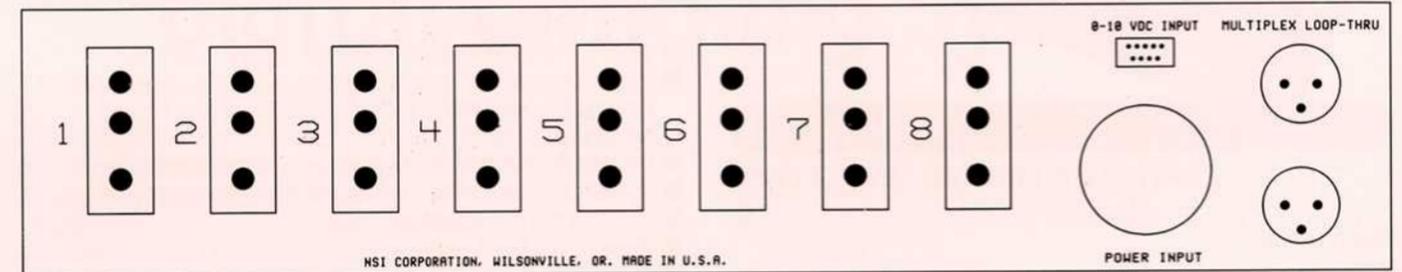- Weight:
  33 lbs. **(38 lbs. — 9800)**

DDS 9800

Specifications subject to change without notice.

DDS Load Panel Options for Rack Mountable Dimmers

Standard outlets for 6 channel (PB6) or 8 channel (PB8)

Stage pins for 6 channel (SP6) or 8 channel (SP8)
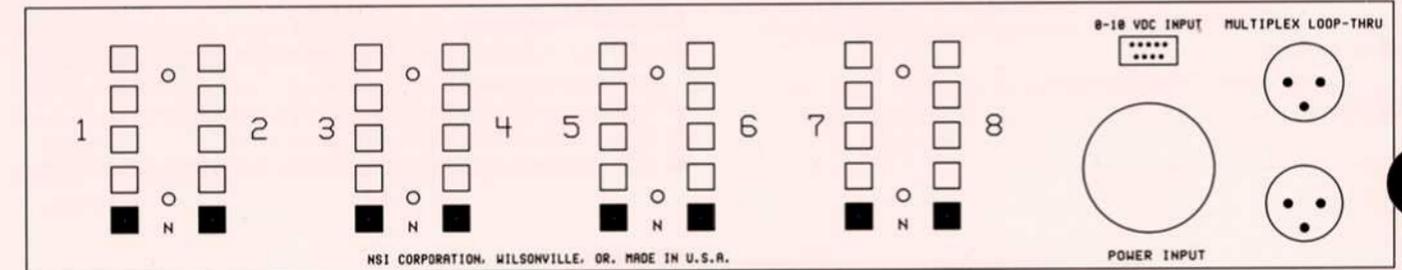
Patch panel for 8 channel (PP8) or 6 channel (PP6)
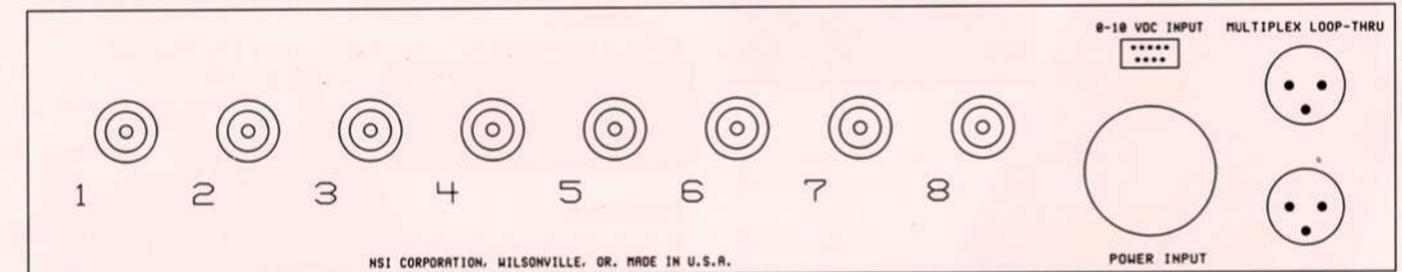
Knockout panel for 6 channel (KO6) or 8 channel (KO8)

Twistlocks for 6 channel only (TL6)

1-800-864 2502

DMX 16
DEMULTIPLEXR
MIDI 616

"INNOVATIONS IN ILLUMINATION"

NSI CORPORATION
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I/F 501

INTERFACE UNIT
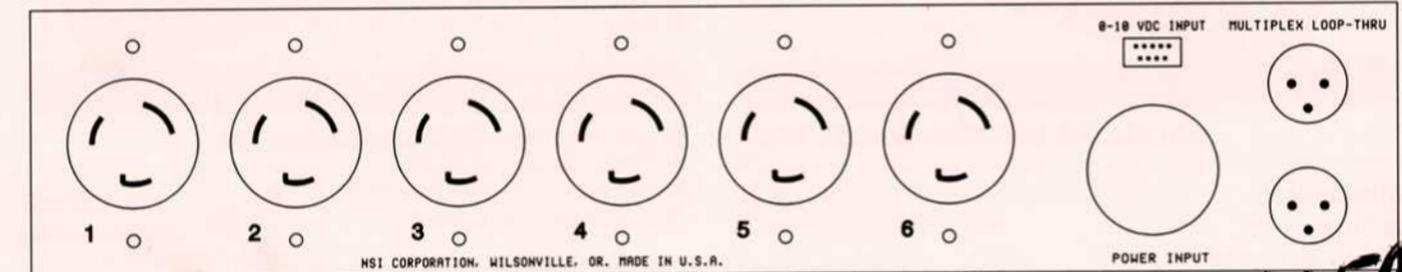
INSTALLATION AND OPERATION GUIDE

Software Revision 1.00, Version A

INTRODUCTION

The I/F 501 interface unit allows a variety of comunication protocals used in NSI and other industrial equipment to be translated between one another. In addition the I/F 501 can serve as an independent, programmable lighting controller. The I/F 501 also serves as the interface between NSI's Luma-net network and a personal computer.

SPECIFICATIONS:

Microplex Input (I/O)	3 pin XLR male
Microplex Ouput (I/O)	3 pin XLR female
DMX 512 Input	5 pin XLR male (USITT spec)
DMX 512 Output	5 pin XLR female (USITT spec)
AMX 192 Output (optional, replaces 512)	4 pin XLR female (USITT spec)
RS-232 I/O	9 pin "D" connector
MIDI input / Analog input	5 pin din 180 degree connector
Luma-net I/O	Modular style telephone connector
Power requirements	+ 15VDC 200ma (power supply included)

IMPORTANT

Although many different connectors are present on this unit, in most configurations, one or more of the connectors may serve no function. It is important that the installer verify that the required inputs and outputs operated in the mode required for the application. Please read the appropriate application sheets in this manual carefully before installing.

Front Panel

CONTROL INTERFACE   I/F-501

DC PWR   ADDRESS   CONFIG   P W R   S T A T   E R R   MIDI/ANALOG   LUMA-NET   RS-232
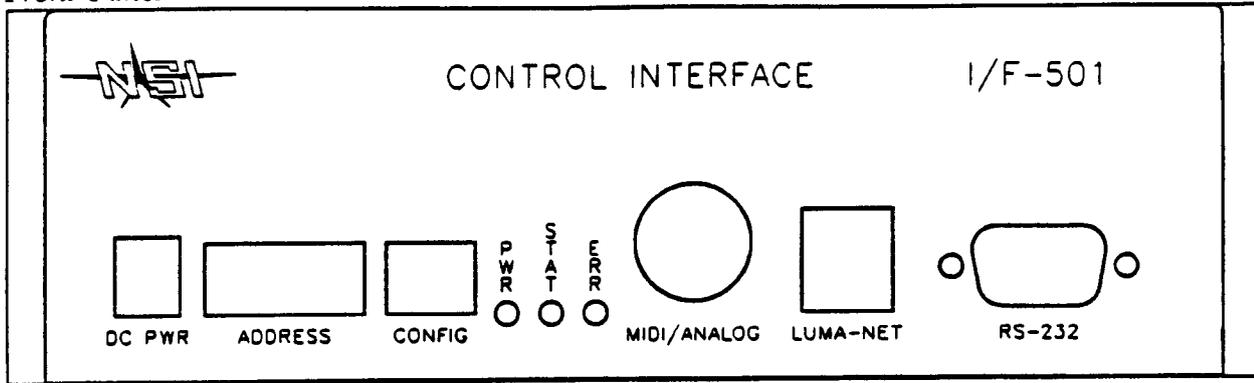
1   DC Power input - Connect 15VDC (+ tip, - ring) 250ma here. (Supplied with unit.)

2   Address - Controls translation of adresses (and other special functions). See individual applications details.

3   Config - Determines the operating mode of the unit.

4   PWR - Indicates presence of +15VDC

5   STAT - Usually indicates presence of input signal.

6   ERR - Indicates an input signal error.

7   MIDI/ANALOG - Midi input or analog input depending on application.

8   LUMA-NET I/O - Connects to a Luma-net network.

9   RS-232 - Connects to a personal computer.

Rear Panel

SEE INSTRUCTION MANUAL

OUT   IN   I/O-OUT   I/O-IN
DMX / AMX   MICROPLEX
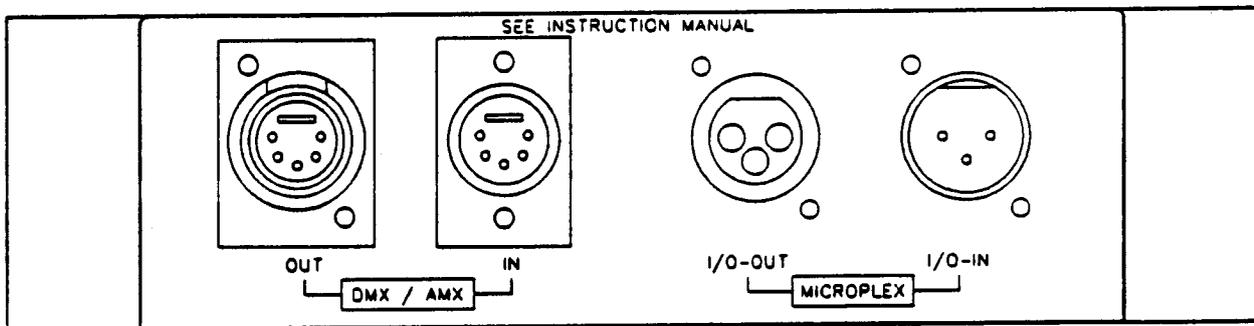
1   MICROPLEX IN - Input Microplex here. Also may serve as pass- through I/O in some applications.

2   MICROPLEX OUT - Output Microplex here. Also may serve as pass-through I/O in some applications.

3   DMX 512 IN - Input DMX 512 here.

4   DMX 512 (AMX 192) OUT - Output DMX 512 here (or optionally AMX 192).

JUMPER LOCATIONS
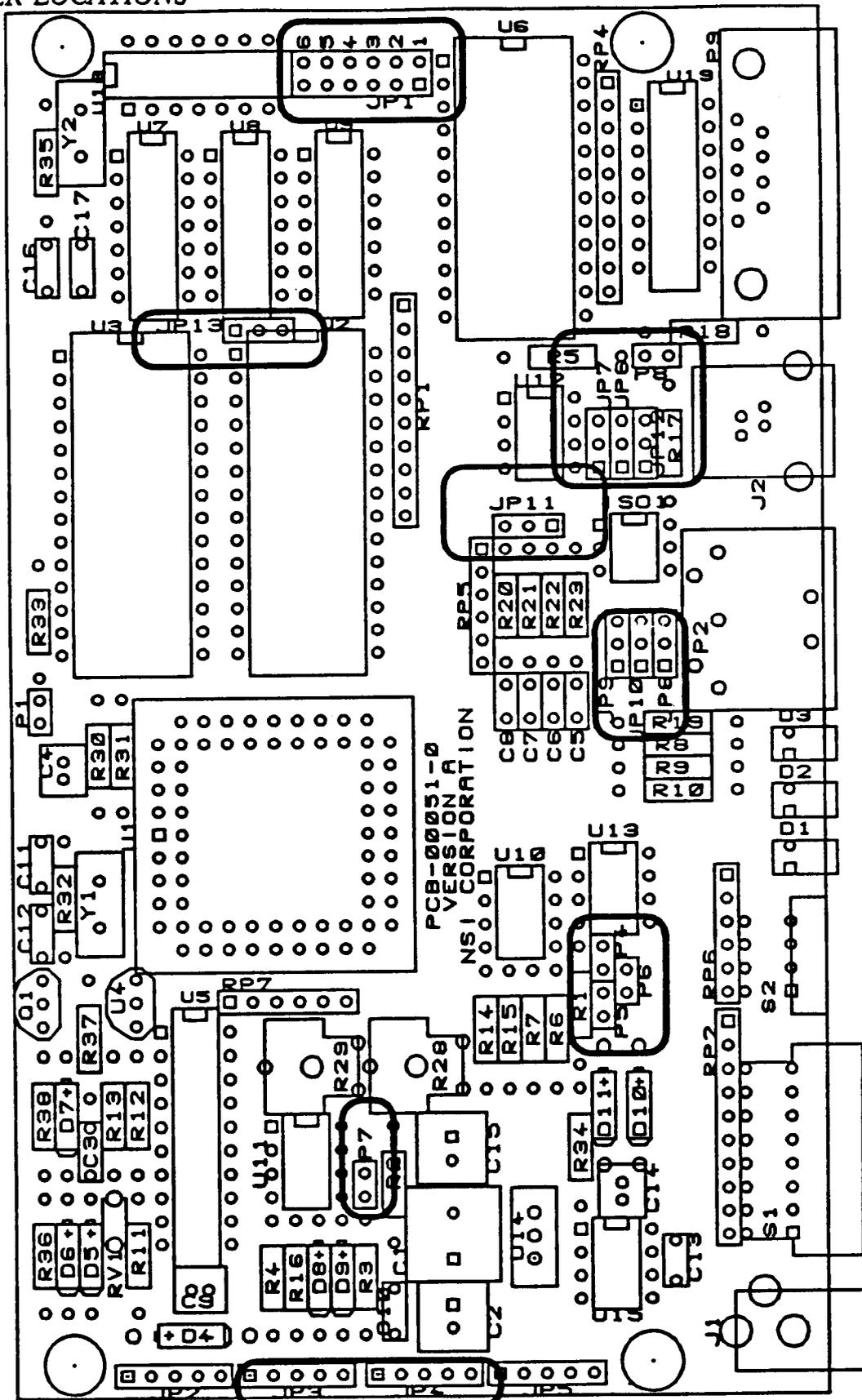
PCB locations of jumpers / internal connectors

PINOUTS

I/F 501 to 25 pin computer

I/F 501 to most 9 pin computer ports
NOTE: pins 2,3 and / or 4,6 may swap in some systems

Please note that () indicates AMX 192 MODE
Caution +15V on pin 2 in AMX 192 mode

LUNA-NET JACK
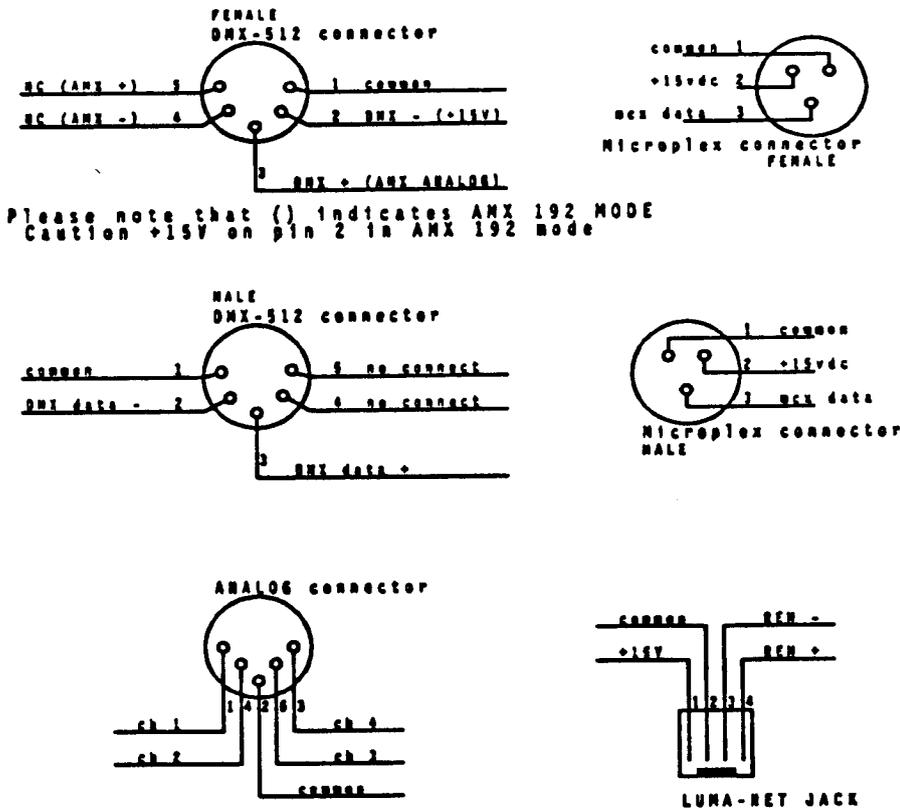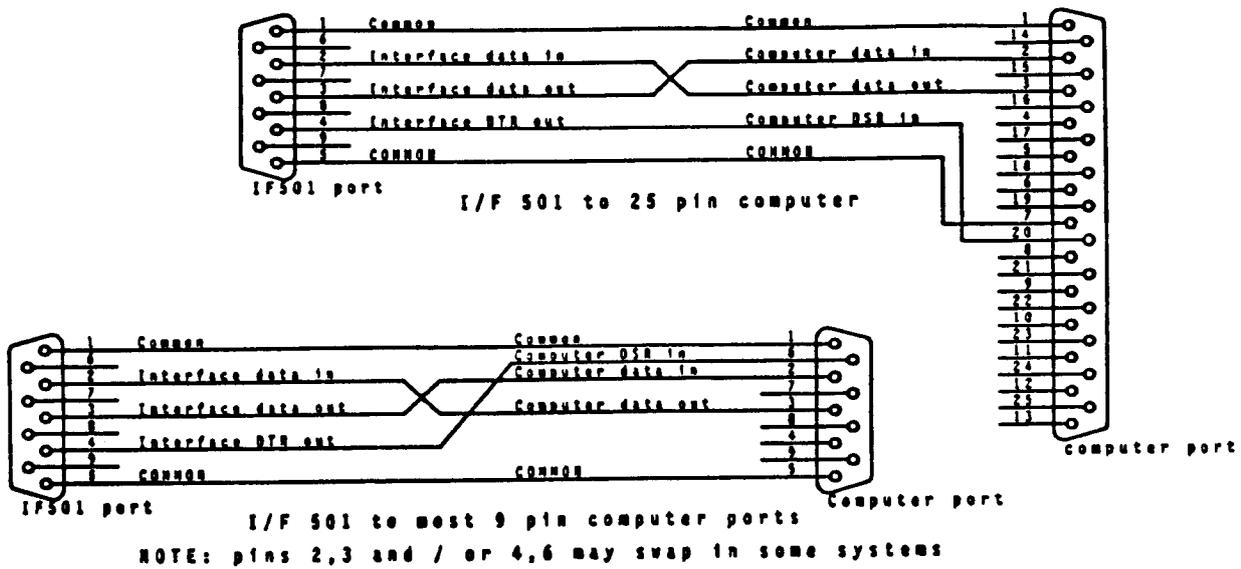
Pinouts of the various connectors

INTERFACE UNIT
Software Revision 1.00, Version A

MICROPLEX TO DMX 512

MICROPLEX TO DMX 512

In this application, Microplex is converted to DMX-512. The Microplex is then retransmitted.

NSI MICROPLEX   INTERFACE   DMX512
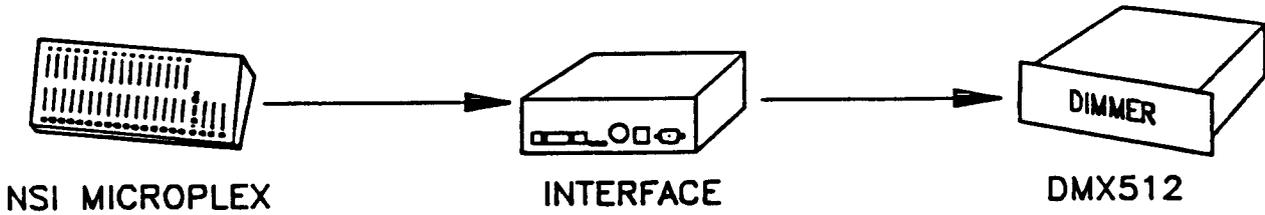
JUMPER LOCATIONS							
P4 & 5	P7	JP6 & 7	JP8 & 9	JP10	JP11	JP12	JP13
OPEN	CLOSED	N/A	N/A	2-3	2-3	N/A	2-3
P6		P8		JP1		DMX OUT CABLE	
N/A		N/A		N/A		JP4	

DIPSWITCH POSITIONS					
C1	C2	C3	C4	ADDRESS 1 - 7	A8
DN	DN	DN	DN	NOT USED	DN:64

CONNECTOR	OPERATION
Microplex IN	Input Microplex
Microplex OUT	Retransmitting Microplex (64 or 128)
DMX IN	Not used
DMX out	Output DMX 512
MIDI / Analog	Not used
Luma-net	Not Used
RS-232	Not Used

Microplex is converted channel to channel so address is not used.

DMX output is sent as either 64 or 128 channels, depending on the setting of switch A8.

MICROPLEX TO AMX 192

In this application, Microplex is converted to AMX-192. The 5 pin XLR may be replaced with a 4 pin XLR (USITT) if desired.

NSI MICROPLEX
or DMX512

INTERFACE

AMX192
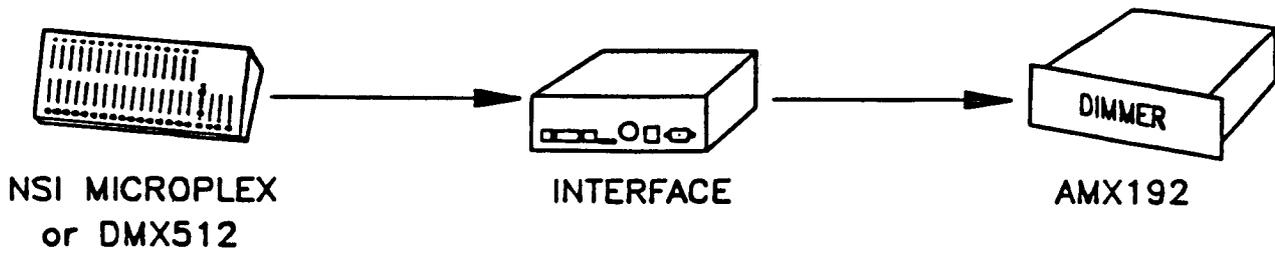
JUMPER LOCATIONS							
P4 & 5	P7	JP6 & 7	JP8 & 9	JP10	JP11	JP12	JP13
OPEN	OPEN	N/A	N/A	2-3	2-3	N/A	2-3
P6		P8		JP1		DMX OUT CABLE	
N/A		N/A		N/A		JP3	

DIPSWITCH POSITIONS					
C1	C2	C3	C4	ADDRESS 1 - 7	A8
UP	DN	DN	DN	N/A	DN:64

CONNECTOR	OPERATION
Microplex IN	Input Microplex
Microplex OUT	Not Used
DMX IN	Not used
DMX out	Output AMX 192 (64 or 128 channels)
MIDI / Analog	Not used
Luma-net	Not Used
RS-232	Not Used

Microplex is converted channel to channel so address is not used.

AMX output is sent as either 64 or 128 channels, depending on the setting of switch A8.

DMX 512 TO MICROPLEX

In this application, DMX 512 is converted to Microplex.

DMX-512　　　　　　INTERFACE　　　　NSI MICROPLEX
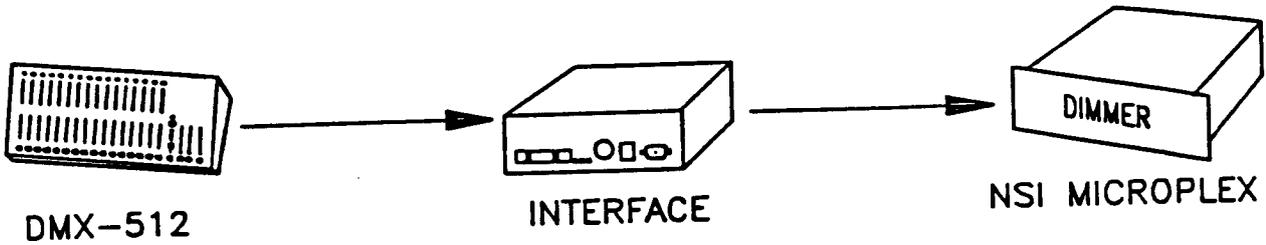
JUMPER LOCATIONS							
P4 & 5	P7	JP6 & 7	JP8 & 9	JP10	JP11	JP12	JP13
CLOSED	CLOSED	N/A	N/A	2-3	2-3	N/A	2-3
P6		P8		JP1		DMX OUT CABLE	
CLOSE TO TERM DMX		N/A		N/A		JP4	

DIPSWITCH POSITIONS					A8
C1	C2	C3	C4	ADDRESS 1 - 7	DN:64
DN	UP	DN	DN	STARTING DMX CHANNEL FOR MICROPLEX BY 16 INCR.	

CONNECTOR	OPERATION
Microplex IN	Not used
Microplex OUT	Output Microplex (64 or 128)
DMX IN	Input DMX 512
DMX out	Pass through DMX 512
MIDI / Analog	Not used
Luma-net	Not Used
RS-232	Not Used

Microplex channel 1 is equal to starting DMX channel. Address switch 1 - 6 sets starting DMX channel in increments of 16. See chart at the end of this manual.

Microplex output is sent as either 64 or 128 channels, depending on the setting of switch A8.

NSI CORPORATION

MIDI TO MICROPLEX and DMX 512

In this application, MIDI note commands are converted to Microplex and DMX 512 dimmer levels.

MIDI → INTERFACE → DIMMER NSI MICROPLEX or DMX512
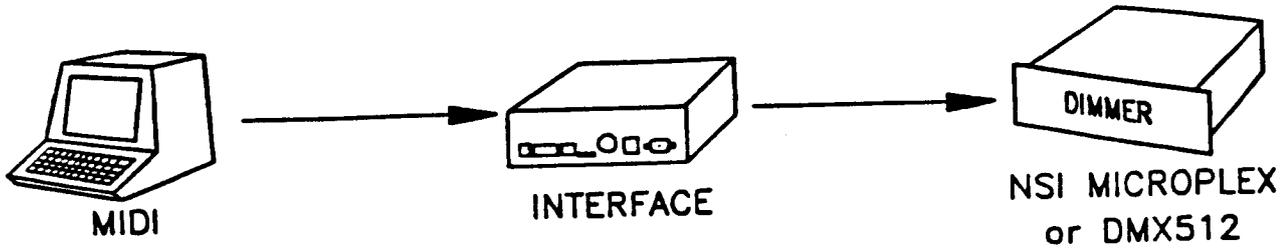
JUMPER LOCATIONS							
P4 & 5	P7	JP6 & 7	JP8 & 9	JP10	JP11	JP12	JP13
OPEN	CLOSED	N/A	1-2	2-3	2-3	2-3	2-3
P6		P8		JP1		DMX OUT CABLE	
N/A		N/A		POSITION 2		JP4	

DIPSWITCH POSITIONS					A8
C1	C2	C3	C4	ADDRESS 1 - 7	
UP	UP	DN	DN	A1-4 SELECTS MIDI CHAN, 5 UP SETS IGNORE NTOFF	DN:64

CONNECTOR	OPERATION
Microplex IN	Not Used
Microplex OUT	Output Microplex (64 or 128)
DMX IN	Not Used
DMX out	Output DMX 512
MIDI / Analog	Input MIDI
Luma-net	Not Used
RS-232	Not Used

MIDI Channel 1 - 16 can be selected with switch A1-4 (see chart at end).

Velocity of MIDI Note On messages set respective dimmer levels. C0 = dimmer channel 1.

Note Off (or Note On = 0) will turn off channel unless A5 is in the up position.

DMX or Microplex output is sent as either 64 or 128 channels, depending on the setting of switch A8.

NSI CORPORATION

MIDI TO AMX-192

In this application, MIDI is converted to AMX 192.

MIDI   INTERFACE   AMX192
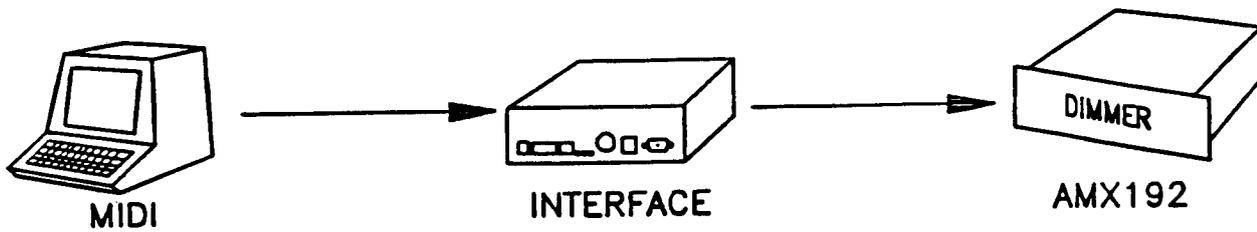
JUMPER LOCATIONS							
P4 & 5	P7	JP6 & 7	JP8 & 9	JP10	JP11	JP12	JP13
OPEN	OPEN	N/A	1-2	2-3	2-3	2-3	2-3
P6		P8		JP1		DMX OUT CABLE	
N/A		N/A		POSITION 2		JP3	

DIPSWITCH POSITIONS					
C1	C2	C3	C4	ADDRESS 1 - 7	A8
DN	DN	UP	DN	A1-4 SELECTS MIDI CHAN, A5 UP SETS IGNORE NTOFF	DN:64

CONNECTOR	OPERATION
Microplex IN	Not used
Microplex OUT	Not Used
DMX IN	Not used
DMX out	Output AMX 192 (64 or 128 ch)
MIDI / Analog	MIDI Input
Luma-net	Not Used
RS-232	Not Used

MIDI Channel 1 - 16 can be selected with switch A1-4 (see chart at end).

Velocity of MIDI Note On messages set respective dimmer levels. C0 = dimmer channel 1.

Note Off (or Note On = 0) will turn off channel unless A5 is in the up position.

AMX output is sent as either 64 or 128 channels, depending on the setting of switch A8.

RS-232 to MICROPLEX and DMX 512

In this application, a computer may send simple ASCII commands to operate individual dimmer channels.
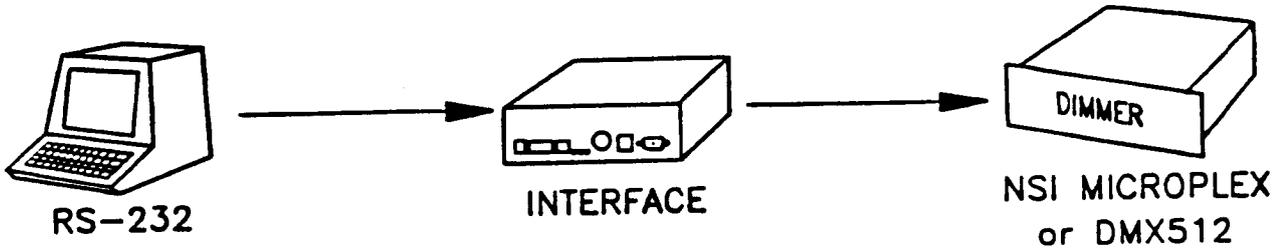
RS-232   INTERFACE   NSI MICROPLEX
                                   or DMX512

JUMPER LOCATIONS							
P4 & 5	P7	JP6 & 7	JP8 & 9	JP10	JP11	JP12	JP13
OPEN	CLOSED	2-3 1-2	N/A	2-3	2-3	1-2	2-3
P6		P8		JP1		DMX OUT CABLE	
N/A		N/A		POS 5 OR 6 (BELOW)		JP4	

DIPSWITCH POSITIONS					A8
C1	C2	C3	C4	ADDRESS 1 - 7	
UP	DN	UP	DN	N/A	DN:64

CONNECTOR	OPERATION
Microplex IN	Not Used
Microplex OUT	Output Microplex (64 or 128)
DMX IN	Not used
DMX out	Output DMX 512 (64 or 128)
MIDI / Analog	Not used
Luma-net	Not Used
RS-232	RS-232 Input

Baudrate is either 9600 (JP1 - 6) or 2400 (JP1 - 5) with 8 data bits, 1 stop bit, no parity

Dimmer channels 1 to 100 can be controlled with these simple ASCII commands:

ASCII characters supported: F D G R - @ + : . 0-9
Fxx:xx.x (FADERATE, x = fade time in minutes : seconds . tenths),
Dccc-ccc@xx (DIMMER LEVEL, c = channel number, - = to, + = and, x = level)
G (EXECUTE) R (RESET or BLACKOUT)
Carriage return after each command. Max fade time is 50 minutes.

DMX and Microplex output is sent as either 64 or 128 channels, depending on the setting of switch A8.

RS-232 TO AMX 192

In this application, a personal computer may send ascii commands to operate individual dimmer channels.
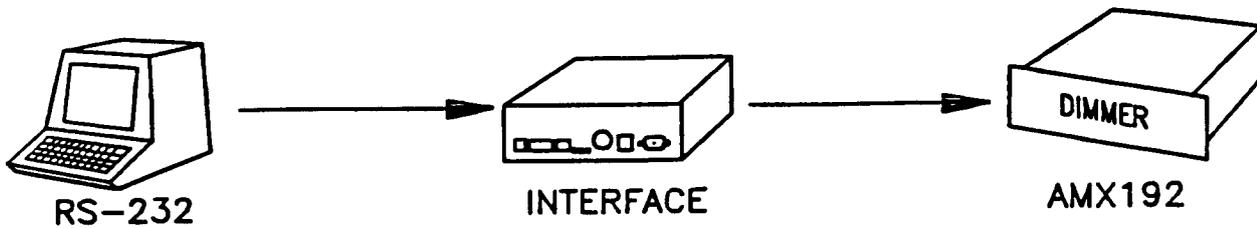
RS-232   INTERFACE   AMX192

JUMPER LOCATIONS							
P4 & 5	P7	JP6 & 7	JP8 & 9	JP10	JP11	JP12	JP13
OPEN	OPEN	2-3	N/A	2-3	2-3	1-2	2-3
P6		P8		JP1		DMX OUT CABLE	
N/A		N/A		POS 5 OR 6 (BELOW)		JP3	

DIPSWITCH POSITIONS					
C1	C2	C3	C4	ADDRESS 1 - 7	A8
DN	UP	UP	DN	N/A	DN:64

CONNECTOR	OPERATION
Microplex IN	Not Used
Microplex OUT	Not Used
DMX IN	Not used
DMX out	Output AMX 192 (64 or 128)
MIDI / Analog	Not used
Luma-net	Not Used
RS-232	Input RS-232

Baudrate is either 9600 (JP1 - 6) or 2400 (JP1 - 5) with 8 data bits, 1 stop bit, no parity

Dimmer channels 1 to 100 can be controlled with these simple ASCII commands:

Max fade time is 50 minutes.

AMX output is sent as either 64 or 128 channels, depending on the setting of switch A8.

LUMA-NET to MICROPLEX

In this application, Microplex or DMX is mixed with LUMA-NET and transmitted as Microplex.

NSI MICROPLEX
or DMX512

AND

INTERFACE

DIMMER

NSI MICROPLEX

LUMA—NET
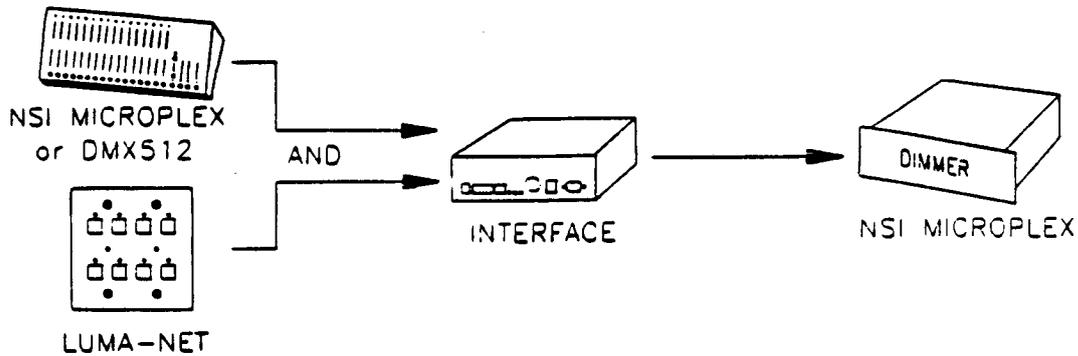
JUMPER LOCATIONS							
P4 & 5	P7	JP6 & 7	JP8 & 9	JP10	JP11	JP12	JP13
CLOSED	CLOSED	2-3	N/A	2-3	2-3	1-2	2-3
P6		P8		JP1		DMX OUT CABLE	
CLOSED TO TERM DMX		CLOSED / TERM LUMA		POSITION 2		JP4	

DIPSWITCH POSITIONS					
C1	C2	C3	C4	ADDRESS 1 - 7	A8
UP	UP	UP	DN	STARTING ADDR OF LUMA-NET IN 16 INCREMENT	DN:64

CONNECTOR	OPERATION
Microplex IN	Input Microplex
Microplex OUT	Retransmitting Microplex (64 or 128)
DMX IN	Input DMX 512
DMX out	Pass through DMX-512
MIDI / Analog	Not used
Luma-net	Luma-net network
RS-232	Not Used

Allows 128 channels of Luma-net to be merged with microplex in a "last action takes precedence" fashion.

Terminate DMX or Luma-net by closing jumper P6 or P8 if last device on line.

See operator's manual of Luma-net device for additonal information.

Microplex output is sent as either 64 or 128 channels, depending on the setting of switch A8.

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LUMA-NET to DMX-512

In this application, Microplex or DMX is mixed with LUMA-NET and transmitted as DMX 512.
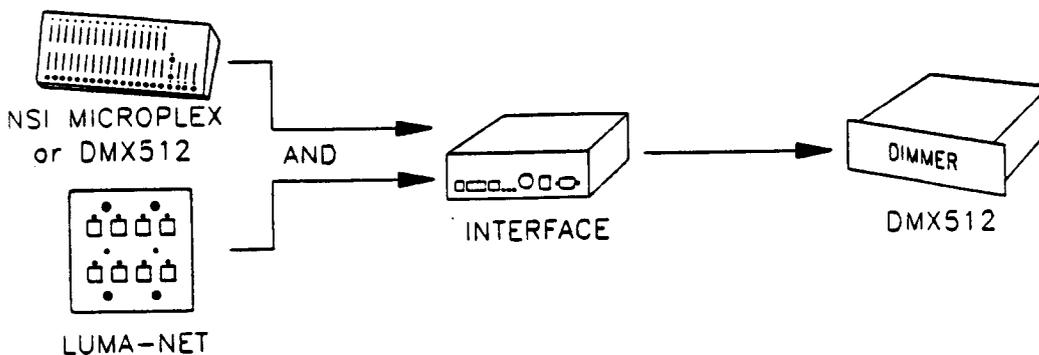
JUMPER LOCATIONS							
P4 & 5	P7	JP6 & 7	JP8 & 9	JP10	JP11	JP12	JP13
OPEN	N/A	2-3	N/A	2-3	2-3	1-2	2-3
P6		P8		JP1		DMX OUT CABLE	
CLOSE		CLOSE TO TERM LUMA		POSITION 2		JP4	

DIPSWITCH POSITIONS					A8
C1	C2	C3	C4	ADDRESS 1 - 7	
DN	DN	DN	UP	STARTING ADDR OF LUMA-NET IN 16 INCREMENT	

CONNECTOR	OPERATION
Microplex IN	Input Microplex
Microplex OUT	Not Used
DMX IN	Input DMX 512
DMX out	Output new DMX-512
MIDI / Analog	Not used
Luma-net	Luma-net network
RS-232	Not Used

Allows 128 channels of Luma-net to be merged with DMX 512 in a "last action takes precedence" fashion.

Terminate Luma-net by closing jumper P8 if last device on line.

See operator's manual of Luma-net device for additional information.

DMX output is sent as either 64 or 128 channels, depending on the setting of switch A8.

LUMA-NET to AMX - 192

In this application, Microplex or DMX is mixed with LUMA-NET and transmitted as AMX-192.
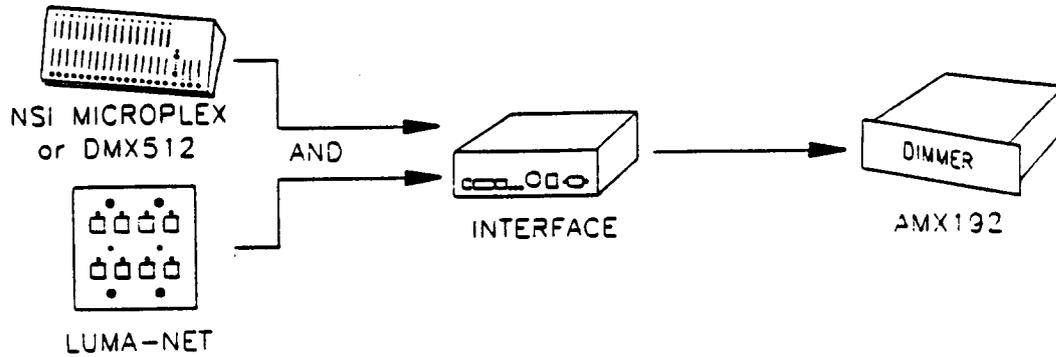
JUMPER LOCATIONS							
P4 & 5	P7	JP6 & 7	JP8 & 9	JP10	JP11	JP12	JP13
OPEN	OPEN	2-3	N/A	2-3	2-3	1-2	2-3
P6		P8		JP1		DMX OUT CABLE	
CLOSE TO TERM DMX		CLS TO TERM LUMA		POS 2		JP3	

DIPSWITCH POSITIONS					
C1	C2	C3	C4	ADDRESS 1 - 7	A8
UP	DN	DN	UP	STARTING ADDR OF LUMA-NET IN 16 INCREMENT	DN:64

CONNECTOR	OPERATION
Microplex IN	Input Microplex
Microplex OUT	Not Used
DMX IN	Input DMX 512
DMX out	Output AMX-192
MIDI / Analog	Not used
Luma-net	Luma-net network
RS-232	Not Used

Allows up to 128 channels of Luma-net to be merged with DMX or Microplex and output as AMX 192 in a "last action takes precedence" fashion.

Terminate DMX or Luma-net by closing jumper P6 or P8 if last device on line.

See operator's manual of Luma-net device for additonal information.

AMX output is sent as either 64 or 128 channels, depending on the setting of switch A8.

NSI CORPORATION

ANALOG TO / MERGED WITH DMX 512 and MICROPLEX

In this application, 0 to 10VDC is converted to Microplex or and DMX 512..

NSI MICROPLEX
or DMX512   AND   INTERFACE   DIMMER

NSI MICROPLEX
or DMX512

4-CH 0-10v
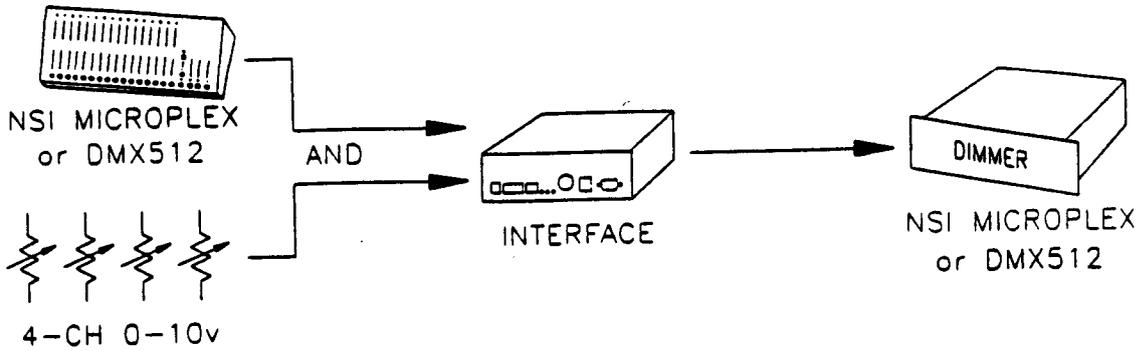
JUMPER LOCATIONS							
P4 & 5	P7	JP6 & 7	JP8 & 9	JP10	JP11	JP12	JP13
OPEN	CLOSED	N/A	2-3	2-3	2-3	N/A	2-3
P6		P8		JP1		DMX OUT CABLE	
CLOSE TO TERM DMX		N/A		N/A		JP4	

DIPSWITCH POSITIONS					A8
C1	C2	C3	C4	ADDRESS 1 - 7	
DN	UP	DN	UP	STARTING ADDR OF ANALOG CHAN 1 BY 1 INCREMENT	DN:64

| CONNECTOR	OPERATION
Microplex IN	Input Microplex
Microplex OUT	Output Microplex (64 or 128)
DMX IN	Input DMX 512
DMX out	Output new DMX 512
MIDI / Analog	0-10VDC input
Luma-net	Not Used
RS-232	Not Used

Four analog 0-10V channels are merged with DMX-512 or Microplex and output as DMX-512 and Microplex.

Channel number of first analog channel is determined by A1-7.

DMX and Microplex output is sent as either 64 or 128 channels, depending on the setting of switch A8.

ANALOG TO AMX-192

In this application, 0 - 10VDC is converted to AMX 192.
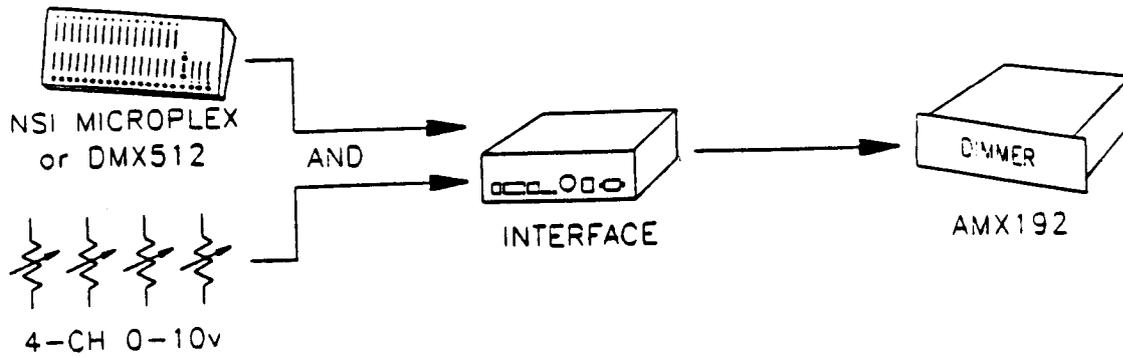
JUMPER LOCATIONS							
P4 & 5	P7	JP6 & 7	JP8 & 9	JP10	JP11	JP12	JP13
OPEN	OPEN	N/A	2-3	2-3	2-3	N/A	2-3
P6		P8		JP1		DMX OUT CABLE	
CLOSE TO TERM DMX		N/A		N/A		JP3	

DIPSWITCH POSITIONS					A8
C1	C2	C3	C4	ADDRESS 1 - 7	
UP	UP	DN	UP	STARTING ADDR OF ANALOG CHAN 1 BY 1 INCREMENT	

CONNECTOR	OPERATION
Microplex IN	Input Microplex
Microplex OUT	Not Used
DMX IN	Input DMX 512
DMX out	Output AMX 192
MIDI / Analog	0-10VDC input
Luma-net	Not Used
RS-232	Not Used

Four analog 0-10V channels are merged with DMX-512 or Microplex and output as AMX-192.

Channel number of first analog channel is determined by A1-7.

AMX output is sent as either 64 or 128 channels, depending on the setting of switch A8.

AUTOCHASE TO MICROPLEX AND DMX 512.

In this application, the unit serves as a stand alone chaser.

INTERFACE

NSI MICROPLEX
or DMX512
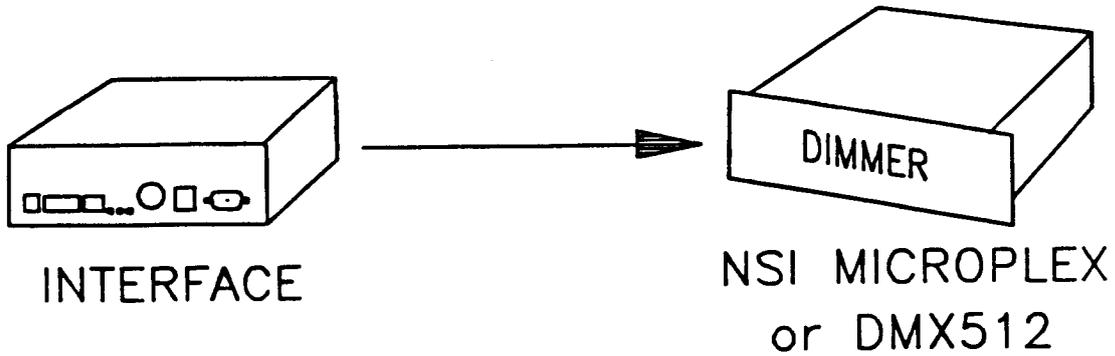
JUMPER LOCATIONS							
P4 & 5	P7	JP6 & 7	JP8 & 9	JP10	JP11	JP12	JP13
N/A	CLOSED	N/A	N/A	2-3	2-3	N/A	2-3
P6		P8		JP1		DMX OUT CABLE	
N/A		N/A		N/A		JP4	

DIPSWITCH POSITIONS					
C1	C2	C3	C4	ADDRESS 1 - 7	A8
DN	DN	UP	UP	SETS CHASE PATTERN AND SPEED	DN:64

CONNECTOR	OPERATION
Microplex IN	Not Used
Microplex OUT	Output Microplex (64 or 128)
DMX IN	Not Used
DMX out	Output DMX 512 (64 or 128)
MIDI / Analog	Not Used
Luma-net	Not Used
RS-232	Not Used

See chase speed and pattern chart at then end of the guide for settings of A1-7.

DMX and Microplex output is sent as either 64 or 128 channels, depending on the setting of switch A8.

RS-232 AUTO-CUEING TO MICROPLEX AND DMX.

In this application, the unit serves as a stand alone programmable memory lighting controller with precise timed crossfading. Optionally contact closures serve for manual control.

RS-232   INTERFACE   NSI MICROPLEX
or DMX512
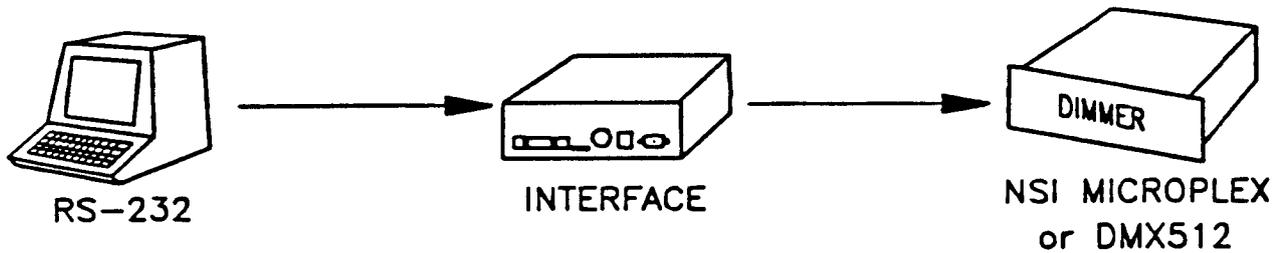
JUMPER LOCATIONS							
P4 & 5	P7	JP6 & 7	JP8 & 9	JP10	JP11	JP12	JP13
N/A	CLOSED	2-3	2-3	1-2	2-3	1-2	2-3
P6		P8		JP1		DMX OUT CABLE	
N/A		N/A		SETS BAUD RATE		JP4	

DIPSWITCH POSITIONS					
C1	C2	C3	C4	ADDRESS 1 - 7	A8
UP	DN	UP	UP	N/A	DN:64

CONNECTOR	OPERATION
Microplex IN	Not Used
Microplex OUT	Output Microplex (64 or 128)
DMX IN	Not Used
DMX out	Output DMX 512 (64 or 128)
MIDI / Analog	Contact Closures
Luma-net	Not Used
RS-232	Personal Computer or Melange (for programming).

Use analog input for optional contact closures:

1-2 STOP NOW, 4-2 STOP AT END OF CHAIN, 5-2 REWIND AND B/O, 3-2 STOP AT END OF CUE.

Only 16 channels are output. 20 ASCII cues max. can be down loaded via the RS-232 port of a PC or Melange.

Cue numbers are ignored, cues execute in the order they are down loaded.

Baudrate = 9600 baud (JP1 pos 6) or 2400 baud (JP1 pos 5), 8 bits, no parity, 1 stop bit, DTR-DSR handshake.

See chart at end of guide for ASCII CUE systax accepted.

LUMA-NET 404CP EMULATION WITH EXTERNAL CONTACTS.

In this application, the unit serves as a 404CP panel with external contact closures.

LUMA-NET

LIGHTING NETWORK

INTERFACE
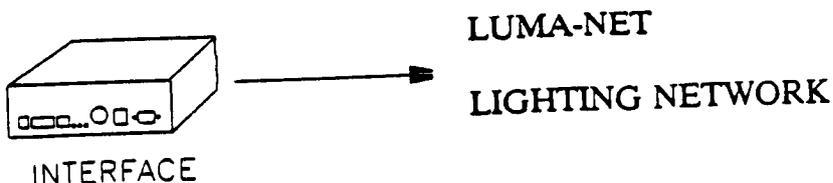
JUMPER LOCATIONS							
P4 & 5	P7	JP6 & 7	JP8 & 9	JP10	JP11	JP12	JP13
OPEN	N/A	1-2	2-3	1-2	2-3	N/A	2-3
P6		P8		JP1		DMX OUT CABLE	
N/A		CLS TO TERM LUMA		N/A		JP4	

DIPSWITCH POSITIONS					
C1	C2	C3	C4	ADDRESS 1 - 8	
				LUMANET NETWORK ID	
DN	UP	UP	UP		

| CONNECTOR	OPERATION
Microplex IN	Not Used
Microplex OUT	Not Used
DMX IN	Not Used
DMX out	Not Used
MIDI / Analog	Contact Closures
Luma-net	Luma-net Network
RS-232	Not Used

Use analog input for contact closures:

1-2 SCENE 1, 4-2 SCENE 2, 5-2 SCENE 3, SCENE 4.

Must be programmed from Luma-net PC Software and in conjuction with another IF 501.

See 404CP operator's guide for details on operation.

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LUMA-NET SOFTWARE INTERFACE.

This application is for use with the Luma-net Computer Software. This unit serves as the interface between the computer and the network.

RS-232   INTERFACE   LUMA-NET

LIGHTING NETWORK
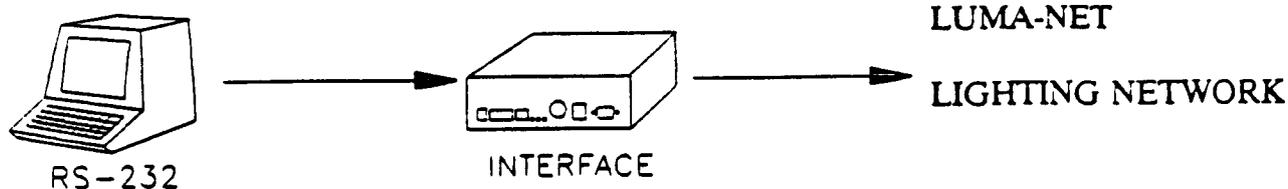
JUMPER LOCATIONS							
P4 & 5	P7	JP6 & 7	JP8 & 9	JP10	JP11	JP12	JP13
OPEN	N/A	1-2	N/A	2-3	2-3	1-2	2-3
P6		P8		JP1		DMX OUT CABLE	
N/A		CLS TO TERM LUMA		BAUD RATE		JP4	

DIPSWITCH POSITIONS					
C1	C2	C3	C4	ADDRESS 1 - 8	
UP	UP	UP	UP	NETWORK ID	

CONNECTOR	OPERATION
Microplex IN	Not Used
Microplex OUT	Not Used
DMX IN	Not Used
DMX out	Not Used
MIDI / Analog	Not Used
Luma-net	Luma-net Network
RS-232	Personal Computer

Baudrate = 9600 baud (JP1 pos 6) or 2400 baud (JP1 pos 5), 8 bits, no parity, 1 stop bit, DTR-DSR handshake.

See Luma-net Software Operation Guide for more information.

Channel number codes / dipswitch settings.

Multiply channel listed by increment required. Subtract one for Luma-net network ID no.

Chan	1234567	Chan	1234567	Chan	1234567
1	0000000	2	1000000	3	0100000
4	1100000	5	0010000	6	1010000
7	0110000	8	1110000	9	0001000
10	1001000	11	0101000	12	1101000
13	0011000	14	1011000	15	0111000
16	1111000	17	0000100	18	1000100
19	0100100	20	1100100	21	0010100
22	1010100	23	0110100	24	1110100
25	0001100	26	1001100	27	0101100
28	1101100	29	0011100	30	1011100
31	0111100	32	1111100	33	0000010
34	1000010	35	0100010	36	1100010
37	0010010	38	1010010	39	0110010
40	1110010	41	0001010	42	1001010
43	0101010	44	1101010	45	0011010
46	1011010	47	0111010	48	1111010
49	0000110	50	1000110	51	0100110
52	1100110	53	0010110	54	1010110
55	0110110	56	1110110	57	0001110
58	1001110	59	0101110	60	1101110
61	0011110	62	1011110	63	0111110
64	1111110	65	0000001	66	1000001
67	0100001	68	1100001	69	0010001
70	1010001	71	0110001	72	1110001
73	0001001	74	1001001	75	0101001
76	1101001	77	0011001	78	1011001
79	0111001	80	1111001	81	0000101
82	1000101	83	0100101	84	1100101
85	0010101	86	1010101	87	0110101
88	1110101	89	0001101	90	1001101
91	0101101	92	1101101	93	0011101
94	1011101	95	0111101	96	1111101
97	0000011	98	1000011	99	0100011
100	1100011	101	0010011	102	1010011
103	0110011	104	1110011	105	0001011
106	1001011	107	0101011	108	1101011
109	0011011	110	1011011	111	0111011
112	1111011	113	0000111	114	1000111
115	0100111	116	1100111	117	0010111
118	1010111	119	0110111	120	1110111
121	0001111	122	1001111	123	0101111
124	1101111	125	0011111	126	1011111
127	0111111	128	1111111		

ASCII Cues Implementation

Overview

Following are the rules for editing ASCII Cues as implemented on the IF501, software revision 1.00:

If you use a word processor for editing ASCII Cues you must set WORD WRAP OFF and the margin should be set to 80 characters per line. DO NOT use any "special" features; such as BOLD or UNDERLINING.

Format

Each line of an ASCII Cues file must begin with a keyword. Keywords may be up to eight characters and may only consist of letters A - Z, numbers, or the "$" character.

Keywords cannot be shortened, but any number of spaces or tabs may be inserted before the keyword.

The maximum length of each line is 80 characters (including spaces).

Each line must be terminated with a CR or CR/LF (carriage return/line feed or "hard return").

The file may be as big as the word processor or editor may allow.

The file should end with a $END keyword to make sure the IF501 records the last cue received.

Keywords Supported

CUE

This keyword must start the description of each cue. This keyword is followed by a space and then the cue number in the range of ".1" to "999.9". The decimal point is not necessary if no decimal is specified.

Note: The Cue number is meaningless to the IF501 since it always executes cues in sequence received.

EXAMPLE: CUE 238.5

UP

This keyword specifies the fade up time of the new cue. This keyword must be followed by a space and the time in the range of "0" to "9:59.9". Minutes are optional but must be followed by a colon. In the absence of minutes, seconds may be specified up to "999.9". The decimal point is not necessary if no decimal is specified. If the UP keyword is not specified in a cue definition then either "0" or the UP value of the previous cue will be used.

EXAMPLE: UP 10.5

DOWN

This keyword specifies the fade down time of the previous cue. This keyword must be followed by a space and the time in the range of "0" to "9:59.9". Minutes are optional but must be followed by a colon. In the absence of minutes, seconds may be specified up to "999.9". The decimal point is not necessary if no decimal is specified. If the DOWN keyword is not specified in a cue definition then either "0" or the DOWN value of the previous cue will be used.

EXAMPLE: DOWN 1:30

DELAY

This keyword specifies the time delay before the downfade of the previous cue. This keyword must be followed by a space and the time in the range of "0" to "9:59.9". Minutes are optional but must be followed by a colon. In the absence of minutes, seconds may be specified up to "999.9". The decimal point is not necessary if no decimal is specified. If the DELAY keyword is not specified in a cue definition then either "0" or the DELAY value of the previous cue will be used.

EXAMPLE: DELAY 30

WAIT

This keyword specifies the time delay before the execution of a linked cue. This keyword must be followed by a space and the time in the range of "0" to "9:59.9". Minutes are optional but must be followed by a colon. In the absence of minutes, seconds may be specified up to "999.9". The decimal point is not necessary if no decimal is specified. If the WAIT keyword is not specified in a cue definition then a automatic link will not be performed, and the GO button must be pressed to execute the cue specified.

EXAMPLE: WAIT 1.1

CHANNEL

This keyword is used to specify the channel levels (in percent) of each non-zero channel of the cue. This keyword must be followed by a space and the channel levels in the format of "channel,level". As many channel/level pairs may be included on a line as will fit. Each channel/level pair must be separated by a space. Each additional line specifying channel levels must also begin with the keyword. Full level is represented by "100" ,"FF", or "FL". Any channel not specified will be zero.

EXAMPLE: CHANNELS 1,50 20,25 21,25 22,100

WARRANTY

NSI Corporation Limited Warranty

NSI Corporation warrants new electronics products to be free from defective materials and workmanship for a period of one (1) year from the date of purchase to the original owner when purchased from an authorized NSI dealer.

The purchaser is responsible for completing and mailing to NSI, within 15 days of purchase, the warranty registration card enclosed with each product. NSI products that have been subject to accident, alteration, abuse, or defacing of the serial number are not covered by this warranty. The normal wear and tear of items such as knobs, jacks, and switches are not covered under this warranty.

If your NSI product requires service during the warranty period, NSI will repair or replace, at its option, defective materials provided you have identified yourself as the original owner of the product to NSI or any authorized NSI dealer. Transportation charges to and from an authorized dealer or the NSI factory for repair shall be the responsibility of the owner. All products returned to NSI must have factory authorization for return prior to shipping.

NSI Corporation is not liable for any incidental or consequential damages resulting from defect or failure other than repairs of the NSI product subject to the terms of this warranty. This warranty gives you specific legal rights, and you may have other rights which vary from state to state. This warranty is expressly in lieu of all other agreements and warranties expressed or implied except as may be otherwise required by law.

NSI DIGITAL DIMMING SYSTEM

DDS 5300 / 5600 DIMMER PACK

INSTALLATION AND OPERATION GUIDE

Software Revision 1.0, Version A

INTRODUCTION

The NSI DDS 5300 and DDS 5600 dimmers represent a key part of a state of the art, integrated lighting control system. These dimmers may operate in a "stand alone" mode for automated lighting of displays or may be combined with an NSI memory lighting console for total lighting control.

The DDS 5300 provides four channels of 300 watts each while the DDS 5600 provides four 600 watt channels. These dimmers are designed for portable or semi-permanent use for entertainment or display lighting. Several DDS dimmer packs may be combined for more channels of lighting.

SPECIFICATIONS

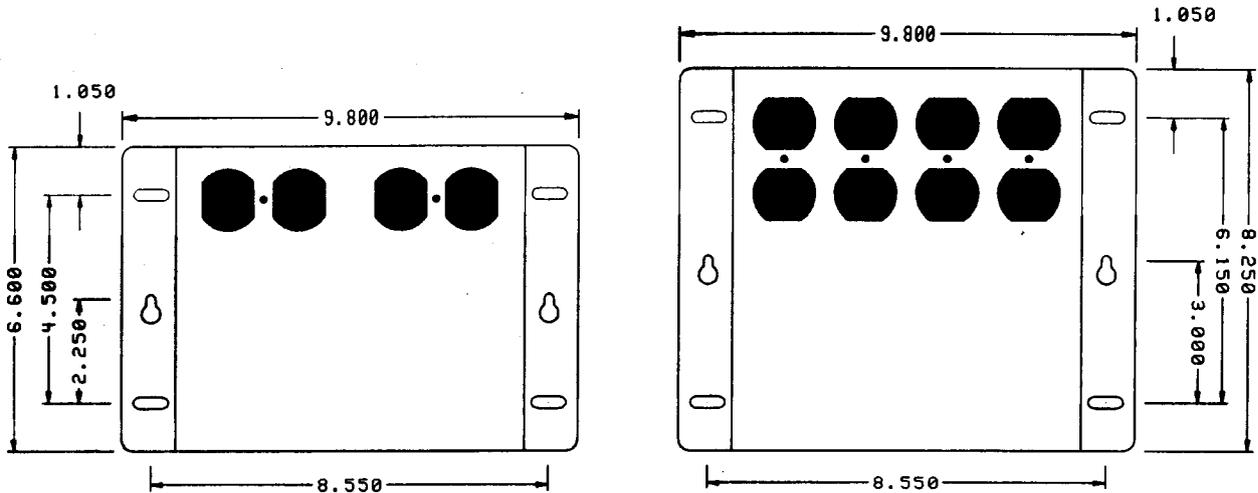|	
Number of Channels:	4
Output capacity:	300 watts per channel : DDS 5300 600 watts per channel : DDS 5600
Input Power:	120 VAC
Dimmer control system:	Microprocessor digital phase control dimming or zero-crossing relay mode.
Load filtering:	> 100us rise time.
Control Input Types:	0 - 10VDC each channel on 5 pin din connector. MICROPLEX multiplex signal (128 channel) on three pin XLR type connector. DMX-512 digital signal (512 channel) on five pin XLR optional.
Control Wiring:	Class 2 low voltage.
Output Connections:	1 NEMA 5-15 outlet per ch. : DDS 5300. 2 NEMA 5-15 outlet per ch. : DDS 5600.
Cooling System:	Passive internal aluminum heatsinks.

MOUNTING

The NSI DDS 5300 / 5600 dimmer packs are designed to be mounted vertically. Each dimmer pack is provided with two mounting flanges or ears designed for securing to the center of truss bars or attaching to other vertical surfaces.

Since the DDS 5300 / 5600 depends upon convection cooling, room air flow must be insured. Keep the air vents located on each side of the dimmer pack clear of dust or any obstructions.

If several units are to be operated in a small enclosed room, adequate ventilation must be provided to prevent the room temperature from exceeding 100 degrees fahrenheit

AC POWER CABLE.

This is the main power cord for your dimmer pack which ultimately carries all of the ac power consumed by lights connected to the dimmer pack. It must be connected to a power source capable of supplying the total power drawn by the lights. (See specifications for details on maximum power capability.)

WARNING: Do not remove grounding prong of AC plug. To do so may allow exposure to potentially lethal voltage levels and will void the warranty on this product.

AC OUTPUT RECEPTACLES

The DDS 5300 has one AC receptacle for each channel while the DDS 5600 has two for each channel. These receptacles provide power to the lamps in your lighting system. The amount of power supplied to these outlets controls the intensity of the lamps connected.

The total lamp wattage connected to each channel must not exceed the rating of each channel (see specifications). Most 120VAC lamps and fixtures and some transformer type low-voltage fixtures may be connected to these outlets, DO NOT connect motors or fluorescent lighting to these outlets when channel is operating in dimmer mode.
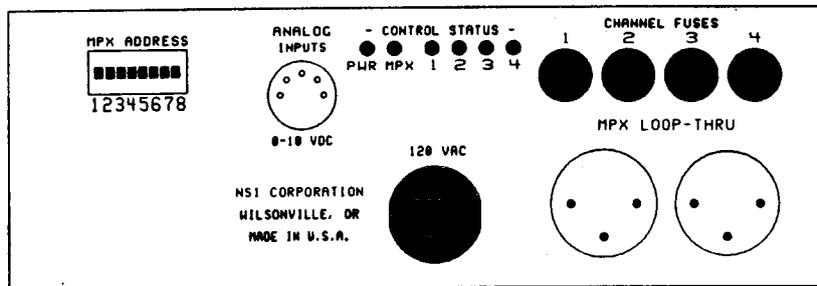
NOTE: Some inductive type loads such as transformers, ballasts, and motors with poor power factor may cause the dimmer to output D.C. type current. This may cause the load to draw excessive current and overheat, causing damage to the transformer, ballast, or motor. For this reason, it is necessary to insure any inductive loads are fused individually for their respective normal operating current.

MICROPLEX MULTIPLEX CONTROL WIRING.

Microplex is the control protocol used on most NSI lighting consoles. This system uses a single three conductor cable to transmit up to 128 channels of dimmer control. For short distances (50 feet or less) a standard microphone cable may be used to carry both the control signal and the DC power source for NSI control consoles. Longer distances may be accommodated with 18 gauge or better cable to reduce voltage losses of the power supply.

Connect the Microplex control cable to either of the three pin XLR jacks. Since both jacks are wired in parallel, another control cable may connected between the remaining jack and another dimmer pack. Many dimmer packs may be "daisy chained" together in this manner.
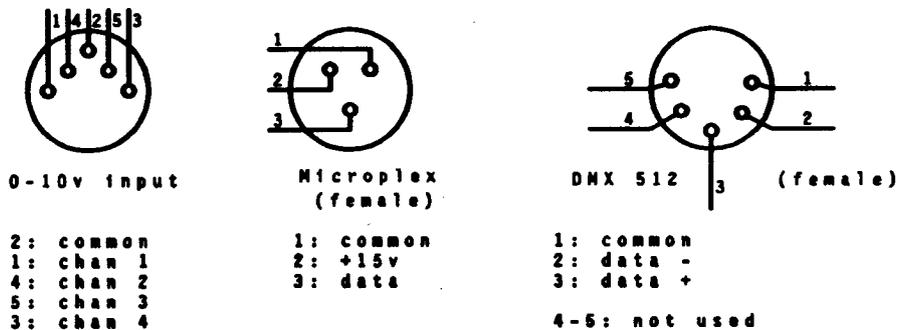
Be sure to set the Channel Address dip switch as required (see DIP SWITCH SETTINGS).

ANALOG 0 - 10 VDC CONTROL WIRING.

Each of the four dimmer channels of the may be operated by an analog 0 - 10 VDC control voltage. This type of control will provide 0% intensity at 0 volts and 100% intensity at 10 volts. Any or all of the DDS 5300 / 5600 dimmer channels may be operated in this manner simultaneously with the any multiplex control input. Each dimmer will respond to the greater of any control inputs.

The analog control input uses a standard 5 pin DIN plug which is available from most electronics supply houses. Connect each of the positive channel control wires to the desired dimmer channel input pins (see diagram) of the plug. Connect the common (ground) control wire to the pin indicated on the diagram. Consult the documentation of the analog control console or device you are using for the proper connections. The control input impedance is 4.7K ohms.

0-10v Input	Microplex (female)	DMX 512 (female)
2: common	1: common	1: common
1: chan 1	2: +15v	2: data -
4: chan 2	3: data	3: data +
5: chan 3		
3: chan 4		4-5: not used

DMX-512 multiplex control wiring.

DMX 512 is the United States Institute of Theater Technology (USITT) standard for the digital control of dimmers. NSI DDS Dimmer products can be converted from Microplex to DMX 512 digital multiplex with a simple kit available from your dealer.

DMX-512 is the preferred type of control wiring when many dimmer channels are used, because of the high update rate and the resistance to interference. It is recommended in locations subject to electrical noise. DMX-512 only requires 3 wires to transmit lighting levels for as many as 512 dimmer channels. Most of the NSI lighting control consoles can optionally use this interface.

Connect the DMX 512 cable from the control console to the male input connector. Another cable may be connected from the female connector to the male connector on another pack. Many dimmer packs may be "daisy chained" connect together in this manner.

Be sure to set the Channel Address dip switch as required (see DIP SWITCH SETTINGS).

LED INDICATORS

The front panel indicator LEDs indicate the status of the dimmer.

- RED - Indicates the firing card is receiving DC power.

- GREEN - Steady indicates a multiplex control signal is being received.

- YELLOW - Indicates a respective dimmer channel is active and the LED indicates relative intensity.

AUTO LAMP TEST

Whenever dipswitch #8 is in the off (down) position and there is no multiplex signal detected, all channel outputs will come to full intensity. The automatic sequencing feature must be disabled for this Auto Lamp test to operate (see INTERNAL JUMPER SELECTIONS).

CHANNEL FUSES

Each channel is protected by a fuse to help prevent overload and damage to the power control devices used in the dimmer. Be sure to replace the fuse with the same type and rating. Replacement with the wrong fuse is dangerous and will void your warranty.

Note: Lamps may sometimes cause a temporary "short-circuit" when the filament burns out and cause the fuse to blow. This is normal and protects the internal dimmer circuitry from damage.

INSTALLATION and OPERATION TIPS

Care should always be taken to:

1) Keep all AC wiring away from control wiring.

2) We also recommend powering up and performance checks be done one unit at a time. This can be a real time saver should problems arise thus eliminating unnecessary isolation techniques to resolve problems

SWITCH SETTINGS

When using any of the multiplex control systems the dip switches on the front panel of the DDS 53/5600 must be set to assign the desired dimmer channels. The switches control the dimmer channels in groups of four. See the following chart for settings.

DIP SWITCH CHANNEL ASSIGNMENTS

CONTROL	1234567	CONTROL	1234567	CONTROL	1234567
1-4	0000000	5-8	1000000	9-12	0100000
13-16	1100000	17-20	0010000	1-24	1010000
25-28	0110000	29-32	1110000	33-36	0001000
37-40	1001000	41-44	0101000	45-48	1101000
49-52	0011000	53-56	1011000	57-60	0111000
61-64	1111000	65-68	0000100	69-72	1000100
73-76	0100100	77-80	1100100	81-84	0010100
85-88	1010100	89-92	0110100	93-96	1110100
97-100	0001100	101-104	1001100	105-108	0101100
109-112	1101100	113-116	0011100	117-120	1011100
121-124	0111100	125-128	1111100	129-132	0000010
133-136	1000010	137-140	0100010	141-144	1100010
145-148	0010010	149-152	1010010	153-156	0110010
157-160	1110010	161-164	0001010	165-168	1001010
169-172	0101010	173-176	1101010	177-180	0011010
181-184	1011010	185-188	0111010	189-192	1111010
193-196	0000110	197-200	1000110	201-204	0100110
205-208	1100110	209-212	0010110	213-216	1010110
217-220	0110110	221-224	1110110	225-228	0001110
229-232	1001110	233-236	0101110	237-240	1101110
241-244	0011110	245-248	1011110	249-252	0111110
253-256	1111110	257-260	0000001	261-264	1000001
265-268	0100001	269-272	1100001	273-276	0010001
277-280	1010001	281-284	0110001	285-288	1110001
289-292	0001001	293-296	1001001	297-300	0101001
301-304	1101001	305-308	0011001	309-312	1011001
313-316	0111001	317-320	1111001	321-324	0000101
325-328	1000101	329-332	0100101	333-336	1100101
337-340	0010101	341-344	1010101	345-348	0110101
349-352	1110101	353-356	0001101	357-360	1001101
361-364	0101101	365-368	1101101	369-372	0011101
373-376	1011101	377-380	0111101	381-384	1111101
385-388	0000011	389-392	1000011	393-396	0100011
397-400	1100011	401-404	0010011	405-408	1010011
409-412	0110011	413-416	1110011	417-420	0001011
421-424	1001011	425-428	0101011	429-432	1101011
433-436	0011011	437-440	1011011	441-444	0111011
445-448	1111011	449-452	0000111	453-456	1000111
457-460	0100111	461-464	1100111	465-468	0010111
469-472	1010111	473-476	0110111	477-480	1110111
481-484	0001111	485-488	1001111	489-492	0101111
493-496	1101111	497-500	0011111	501-504	1011111
505-508	0111111	509-512	1111111		

When the automatic sequencing feature is operating, the dip switch selects the operating sequence pattern and speed. See the section on INTERNAL JUMPER SELECTION for details.

INTERNAL JUMPER SELECTIONS

Caution: The follow procedures should be performed by qualified personnel only.

Remove all power and remove the cover of the dimmer pack. Locate and change jumper settings on the firing card as indicated in the following section.

Softstart

The Softstart mode of operation forces at least a 1/10th second delay between the output being full off to the output being full on to allow a more gradual warming of the lamp filaments. Thermal shock and inrush currents are reduced thereby increasing lamp life. Softstart should not be used when quick dimmer response is desired such as chasing.

To activated Softstart; remove the jumper block from the pin marked P13 on the firing card. Replacing the jumper block will restore Softstart.
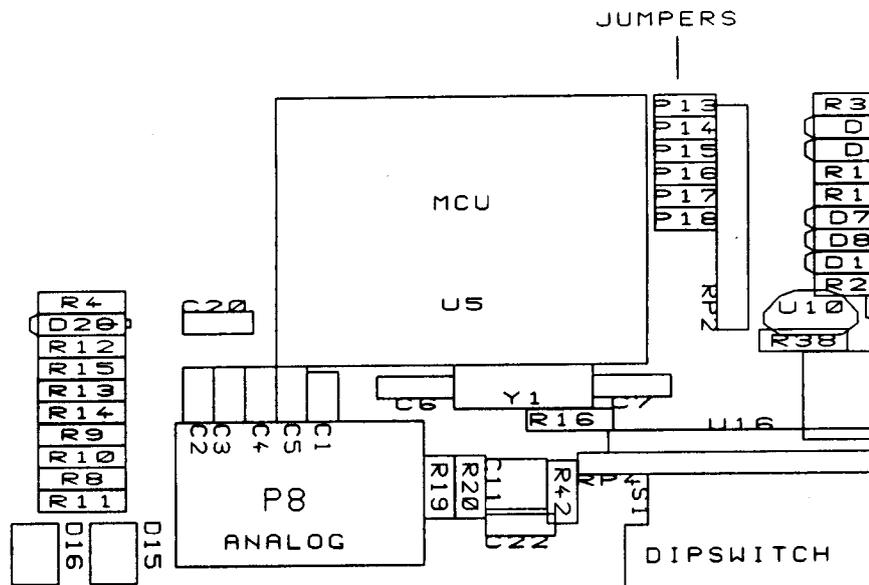
NOTE: The channels of the DDS 53/5600 configured for NON DIM operation will not be affected by softstart.

Non Dim Channels (Relay Mode)

Any of the channels of the DDS 53/5600 may be configured as NON DIM channels. This will cause the output of the channel to go to full on whenever the input signal is over 15%. When the input signal drops to less than 10%, the channel output goes to full off. This is the equivalent of a zero-crossing solid state relay.

To configure a channel for NON DIM operation simply remove the jumper block from the pins on the firing card as indicated. Replacing the jumper block will restore dimming operation.

CHANNEL	JUMPER BLOCK	CHANNEL	JUMPER BLOCK
1	P15	2	P16
3	P17	4	P18

AUTO SEQUENCING MODE

The DDS 53/5600 dimmers can be configured to perform stand alone Automatic Sequencing in place of Auto Lamp Test. This is useful for lighting displays and show windows. The four channels will automatically fade from one to another in a preprogrammed pattern and time selected by the front panel dipswitch whenever dipswitch #8 is up and no multiplex signal is detected. The Analog control input will continue to operate while the dimmer is sequencing.

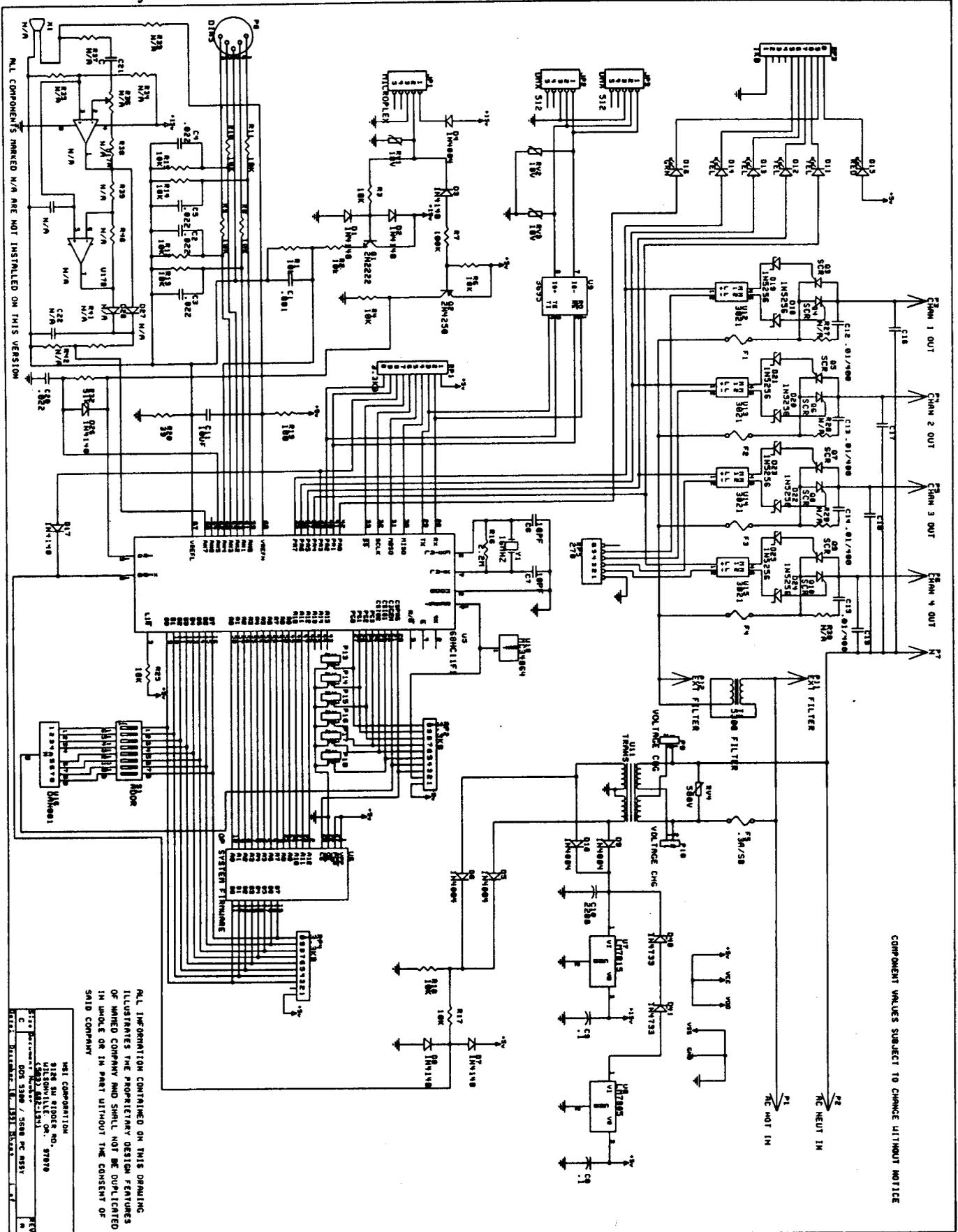To enable Automatic Sequencing Mode remove jumper from position P14.

Dipswitch settings

STEP TIME	SWITCH 1,2,3	PATTERN	SWITCH 4,5,6
1 SECOND	OFF,OFF,OFF	2 CHAN BUILD	OFF,OFF,OFF
3 SECOND	ON,OFF,OFF	3 CHAN SEQUENCE	ON,OFF,OFF
5 SECOND	OFF,ON,OFF	3 CHAN BUILD	OFF,ON,OFF
10 SECOND	ON,ON,OFF	2 & 4 CHAN ALT	ON,ON,OFF
15 SECOND	OFF,OFF,ON	4 CHAN SEQUENCE	OFF,OFF,ON
30 SECOND	ON,OFF,ON	4 CHAN BUILD	ON,OFF,ON
45 SECOND	OFF,ON,ON	4 CHAN BUILD +	OFF,ON,ON
60 SECOND	ON,ON,ON	4 CHAN RANDOM	ON,ON,ON

Dipswitch # 7 on causes all above sequences to ping-pong.

Service Information

WARRANTY

NSI Corporation Limited Warranty

NSI Corporation warrants new electronics products to be free from defective materials and workmanship for a period of one (1) year from the date of purchase to the original owner when purchased from an authorized NSI dealer.

The purchaser is responsible for completing and mailing to NSI, within 15 days of purchase, the warranty registration card enclosed with each product. NSI products that have been subject to accident, alteration, abuse, or defacing of the serial number are not covered by this warranty. The normal wear and tear of items such as knobs, jacks, and switches are not covered under this warranty.

If your NSI product requires service during the warranty period, NSI will repair or replace, at its option, defective materials provided you have identified yourself as the original owner of the product to NSI or any authorized NSI dealer. Transportation charges to and from an authorized dealer or the NSI factory for repair shall be the responsibility of the owner. All products returned to NSI must have factory authorization for return prior to shipping.

NSI Corporation is not liable for any incidental or consequential damages resulting from defect or failure other than repairs of the NSI product subject to the terms of this warranty. This warranty gives you specific legal rights, and you may have other rights which vary from state to state. This warranty is expressly in lieu of all other agreements and warranties expressed or implied except as may be otherwise required by law.

NSI DIGITAL DIMMING SYSTEM

DDS 5300 / 5600 DIMMER PACK

INSTALLATION AND OPERATION GUIDE

Software Revision 1.0, Version A

INTRODUCTION

The NSI DDS 5300 and DDS 5600 dimmers represent a key part of a state of the art, integrated lighting control system. These dimmers may operate in a "stand alone" mode for automated lighting of displays or may be combined with an NSI memory lighting console for total lighting control.

The DDS 5300 provides four channels of 300 watts each while the DDS 5600 provides four 600 watt channels. These dimmers are designed for portable or semi-permanent use for entertainment or display lighting. Several DDS dimmer packs may be combined for more channels of lighting.

SPECIFICATIONS

Number of Channels:	4
Output capacity:	300 watts per channel : DDS 5300 600 watts per channel : DDS 5600
Input Power:	120 VAC
Dimmer control system:	Microprocessor digital phase control dimming or zero-crossing relay mode.
Load filtering:	> 100us rise time.
Control Input Types:	0 - 10VDC each channel on 5 pin din connector. MICROPLEX multiplex signal (128 channel) on three pin XLR type connector. DMX-512 digital signal (512 channel) on five pin XLR optional.
Control Wiring:	Class 2 low voltage.
Output Connections:	1 NEMA 5-15 outlet per ch. : DDS 5300. 2 NEMA 5-15 outlet per ch. : DDS 5600.
Cooling System:	Passive internal aluminum heatsinks.

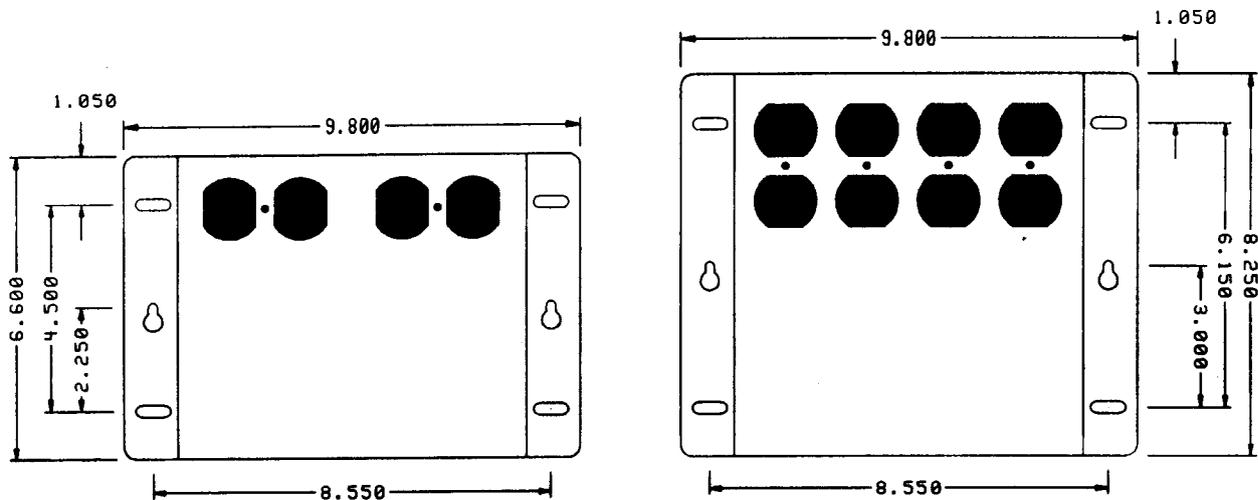## MOUNTING

The NSI DDS 5300 / 5600 dimmer packs are designed to be mounted vertically. Each dimmer pack is provided with two mounting flanges or ears designed for securing to the center of truss bars or attaching to other vertical surfaces.

Since the DDS 5300 / 5600 depends upon convection cooling, room air flow must be insured. Keep the air vents located on each side of the dimmer pack clear of dust or any obstructions.

If several units are to be operated in a small enclosed room, adequate ventilation must be provided to prevent the room temperature from exceeding 100 degrees fahrenheit

AC POWER CABLE.

This is the main power cord for your dimmer pack which ultimately carries all of the ac power consumed by lights connected to the dimmer pack. It must be connected to a power source capable of supplying the total power drawn by the lights. (See specifications for details on maximum power capability.)

WARNING: Do not remove grounding prong of AC plug. To do so may allow exposure to potentially lethal voltage levels and will void the warranty on this product.

AC OUTPUT RECEPTACLES

The DDS 5300 has one AC receptacle for each channel while the DDS 5600 has two for each channel. These receptacles provide power to the lamps in your lighting system. The amount of power supplied to these outlets controls the intensity of the lamps connected.

The total lamp wattage connected to each channel must not exceed the rating of each channel (see specifications). Most 120VAC lamps and fixtures and some transformer type low-voltage fixtures may be connected to these outlets, DO NOT connect motors or fluorescent lighting to these outlets when channel is operating in dimmer mode.
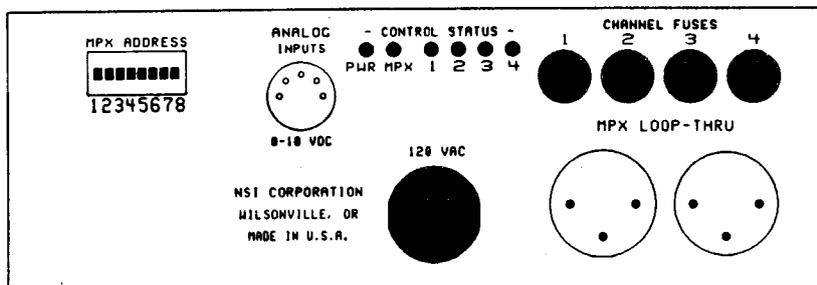
NOTE: Some inductive type loads such as transformers, ballasts, and motors with poor power factor may cause the dimmer to output D.C. type current. This may cause the load to draw excessive current and overheat, causing damage to the transformer, ballast, or motor. For this reason, it is necessary to insure any inductive loads are fused individually for their respective normal operating current.

MICROPLEX MULTIPLEX CONTROL WIRING.

Microplex is the control protocol used on most NSI lighting consoles. This system uses a single three conductor cable to transmit up to 128 channels of dimmer control. For short distances (50 feet or less) a standard microphone cable may be used to carry both the control signal and the DC power source for NSI control consoles. Longer distances may be accommodated with 18 gauge or better cable to reduce voltage losses of the power supply.

Connect the Microplex control cable to either of the three pin XLR jacks. Since both jacks are wired in parallel, another control cable may connected between the remaining jack and another dimmer pack. Many dimmer packs may be "daisy chained" together in this manner.
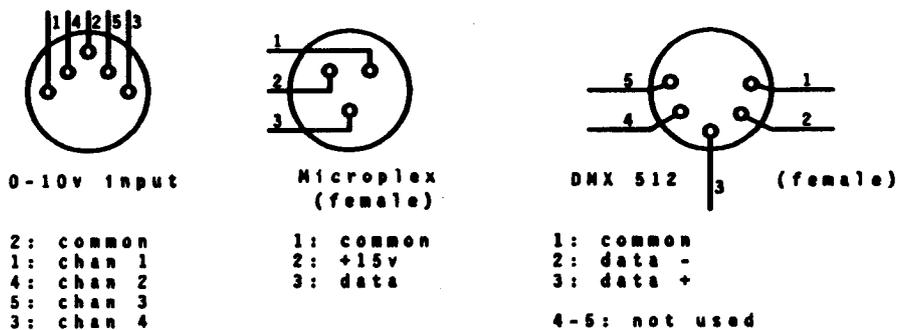
Be sure to set the Channel Address dip switch as required (see DIP SWITCH SETTINGS).

ANALOG 0 - 10 VDC CONTROL WIRING.

Each of the four dimmer channels of the may be operated by an analog 0 - 10 VDC control voltage. This type of control will provide 0% intensity at 0 volts and 100% intensity at 10 volts. Any or all of the DDS 5300 / 5600 dimmer channels may be operated in this manner simultaneously with the any multiplex control input. Each dimmer will respond to the greater of any control inputs.

The analog control input uses a standard 5 pin DIN plug which is available from most electronics supply houses. Connect each of the positive channel control wires to the desired dimmer channel input pins (see diagram) of the plug. Connect the common (ground) control wire to the pin indicated on the diagram. Consult the documentation of the analog control console or device you are using for the proper connections. The control input impedance is 4.7K ohms.

0-10v input

2: common
1: chan 1
4: chan 2
5: chan 3
3: chan 4

Microplex (female)

1: common
2: +15v
3: data

DMX 512   (female)

1: common
2: data -
3: data +

4-5: not used

DMX-512 multiplex control wiring.

DMX 512 is the United States Institute of Theater Technology (USITT) standard for the digital control of dimmers. NSI DDS Dimmer products can be converted from Microplex to DMX 512 digital multiplex with a simple kit available from your dealer.

DMX-512 is the preferred type of control wiring when many dimmer channels are used, because of the high update rate and the resistance to interference. It is recommended in locations subject to electrical noise. DMX-512 only requires 3 wires to transmit lighting levels for as many as 512 dimmer channels. Most of the NSI lighting control consoles can optionally use this interface.

Connect the DMX 512 cable from the control console to the male input connector. Another cable may be connected from the female connector to the male connector on another pack. Many dimmer packs may be "daisy chained" connect together in this manner.

Be sure to set the Channel Address dip switch as required (see DIP SWITCH SETTINGS).

LED INDICATORS

The front panel indicator LEDs indicate the status of the dimmer.

- RED - Indicates the firing card is receiving DC power.

- GREEN - Steady indicates a multiplex control signal is being received.

- YELLOW - Indicates a respective dimmer channel is active and the LED indicates relative intensity.

AUTO LAMP TEST

Whenever dipswitch #8 is in the off (down) position and there is no multiplex signal detected, all channel outputs will come to full intensity. The automatic sequencing feature must be disabled for this Auto Lamp test to operate (see INTERNAL JUMPER SELECTIONS).

CHANNEL FUSES

Each channel is protected by a fuse to help prevent overload and damage to the power control devices used in the dimmer. Be sure to replace the fuse with the same type and rating. Replacement with the wrong fuse is dangerous and will void your warranty.

Note: Lamps may sometimes cause a temporary "short-circuit" when the filament burns out and cause the fuse to blow. This is normal and protects the internal dimmer circuitry from damage.

INSTALLATION and OPERATION TIPS

Care should always be taken to:

1) Keep all AC wiring away from control wiring.

2) We also recommend powering up and performance checks be done one unit at a time. This can be a real time saver should problems arise thus eliminating unnecessary isolation techniques to resolve problems

SWITCH SETTINGS

When using any of the multiplex control systems the dip switches on the front panel of the DDS 53/5600 must be set to assign the desired dimmer channels. The switches control the dimmer channels in groups of four. See the following chart for settings.

DIP SWITCH CHANNEL ASSIGNMENTS

CONTROL	1234567	CONTROL	1234567	CONTROL	1234567
1-4	0000000	5-8	1000000	9-12	0100000
13-16	1100000	17-20	0010000	1-24	1010000
25-28	0110000	29-32	1110000	33-36	0001000
37-40	1001000	41-44	0101000	45-48	1101000
49-52	0011000	53-56	1011000	57-60	0111000
61-64	1111000	65-68	0000100	69-72	1000100
73-76	0100100	77-80	1100100	81-84	0010100
85-88	1010100	89-92	0110100	93-96	1110100
97-100	0001100	101-104	1001100	105-108	0101100
109-112	1101100	113-116	0011100	117-120	1011100
121-124	0111100	125-128	1111100	129-132	0000010
133-136	1000010	137-140	0100010	141-144	1100010
145-148	0010010	149-152	1010010	153-156	0110010
157-160	1110010	161-164	0001010	165-168	1001010
169-172	0101010	173-176	1101010	177-180	0011010
181-184	1011010	185-188	0111010	189-192	1111010
193-196	0000110	197-200	1000110	201-204	0100110
205-208	1100110	209-212	0010110	213-216	1010110
217-220	0110110	221-224	1110110	225-228	0001110
229-232	1001110	233-236	0101110	237-240	1101110
241-244	0011110	245-248	1011110	249-252	0111110
253-256	1111110	257-260	0000001	261-264	1000001
265-268	0100001	269-272	1100001	273-276	0010001
277-280	1010001	281-284	0110001	285-288	1110001
289-292	0001001	293-296	1001001	297-300	0101001
301-304	1101001	305-308	0011001	309-312	1011001
313-316	0111001	317-320	1111001	321-324	0000101
325-328	1000101	329-332	0100101	333-336	1100101
337-340	0010101	341-344	1010101	345-348	0110101
349-352	1110101	353-356	0001101	357-360	1001101
361-364	0101101	365-368	1101101	369-372	0011101
373-376	1011101	377-380	0111101	381-384	1111101
385-388	0000011	389-392	1000011	393-396	0100011
397-400	1100011	401-404	0010011	405-408	1010011
409-412	0110011	413-416	1110011	417-420	0001011
421-424	1001011	425-428	0101011	429-432	1101011
433-436	0011011	437-440	1011011	441-444	0111011
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457-460	0100111	461-464	1100111	465-468	0010111
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481-484	0001111	485-488	1001111	489-492	0101111
493-496	1101111	497-500	0011111	501-504	1011111
505-508	0111111	509-512	1111111		

When the automatic sequencing feature is operating, the dip switch selects the operating sequence pattern and speed. See the section on INTERNAL JUMPER SELECTION for details.

INTERNAL JUMPER SELECTIONS

Caution: The follow procedures should be performed by qualified personnel only.

Remove all power and remove the cover of the dimmer pack. Locate and change jumper settings on the firing card as indicated in the following section.

Softstart

The Softstart mode of operation forces at least a 1/10th second delay between the output being full off to the output being full on to allow a more gradual warming of the lamp filaments. Thermal shock and inrush currents are reduced thereby increasing lamp life. Softstart should not be used when quick dimmer response is desired such as chasing.

To activated Softstart; remove the jumper block from the pin marked P13 on the firing card. Replacing the jumper block will restore Softstart.
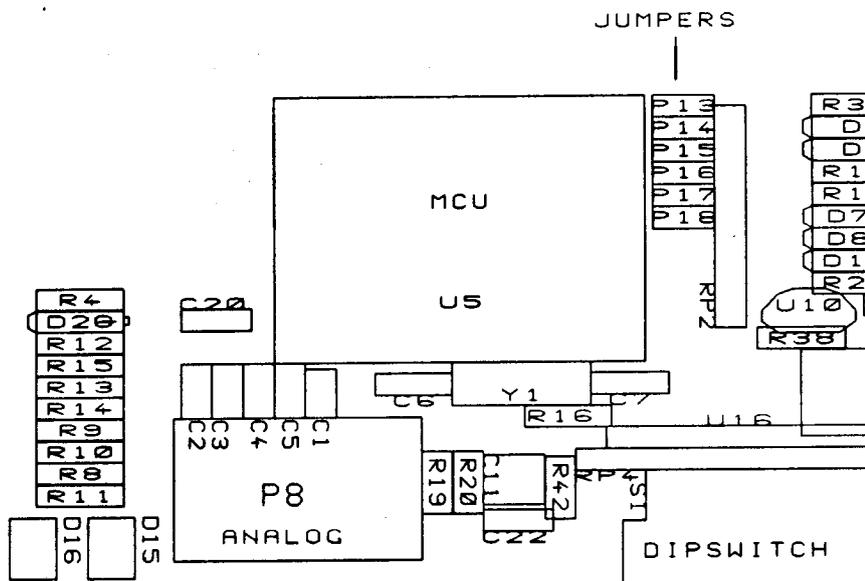
NOTE: The channels of the DDS 53/5600 configured for NON DIM operation will not be affected by softstart.

Non Dim Channels (Relay Mode)

Any of the channels of the DDS 53/5600 may be configured as NON DIM channels. This will cause the output of the channel to go to full on whenever the input signal is over 15%. When the input signal drops to less than 10%, the channel output goes to full off. This is the equivalent of a zero-crossing solid state relay.

To configure a channel for NON DIM operation simply remove the jumper block from the pins on the firing card as indicated. Replacing the jumper block will restore dimming operation.

CHANNEL	JUMPER BLOCK	CHANNEL	JUMPER BLOCK
1	P15	2	P16
3	P17	4	P18

AUTO SEQUENCING MODE

The DDS 53/5600 dimmers can be configured to perform stand alone Automatic Sequencing in place of Auto Lamp Test. This is useful for lighting displays and show windows. The four channels will automatically fade from one to another in a preprogrammed pattern and time selected by the front panel dipswitch whenever dipswitch #8 is up and no multiplex signal is detected. The Analog control input will continue to operate while the dimmer is sequencing.

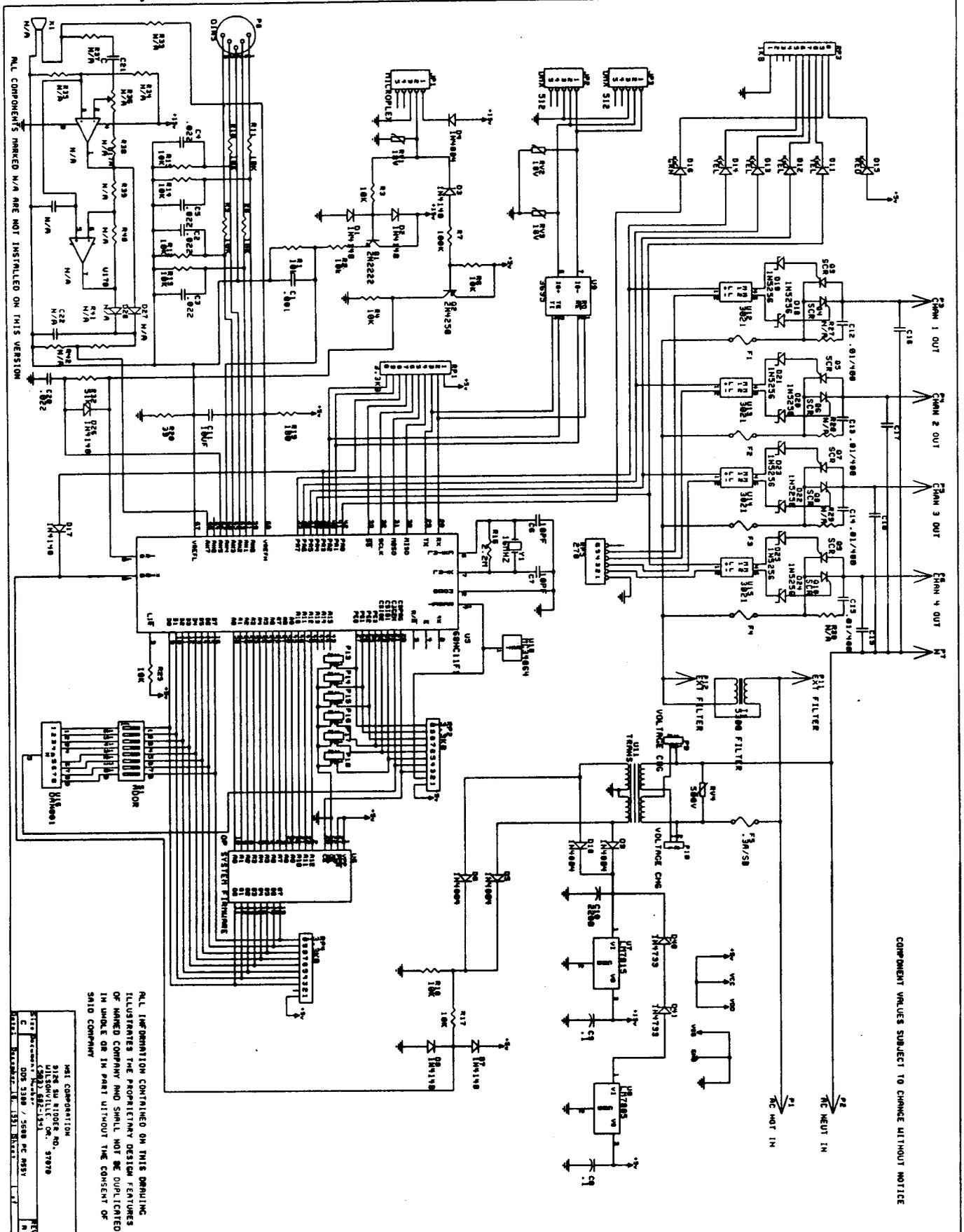To enable Automatic Sequencing Mode remove jumper from position P14.

Dipswitch settings

STEP TIME	SWITCH 1,2,3	PATTERN	SWITCH 4,5,6
1 SECOND	OFF,OFF,OFF	2 CHAN BUILD	OFF,OFF,OFF
3 SECOND	ON,OFF,OFF	3 CHAN SEQUENCE	ON,OFF,OFF
5 SECOND	OFF,ON,OFF	3 CHAN BUILD	OFF,ON,OFF
10 SECOND	ON,ON,OFF	2 & 4 CHAN ALT	ON,ON,OFF
15 SECOND	OFF,OFF,ON	4 CHAN SEQUENCE	OFF,OFF,ON
30 SECOND	ON,OFF,ON	4 CHAN BUILD	ON,OFF,ON
45 SECOND	OFF,ON,ON	4 CHAN BUILD +	OFF,ON,ON
60 SECOND	ON,ON,ON	4 CHAN RANDOM	ON,ON,ON

Dipswitch # 7 on causes all above sequences to ping-pong.

Service Information

WARRANTY

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FAX Message

Date: 4/05/94

To: WOODY VASULKA

Company:

Fax Phone Number: 9,1-505-473-0614

CC:

From:

Subject:

# of Pages (including this cover sheet)   3

Message:

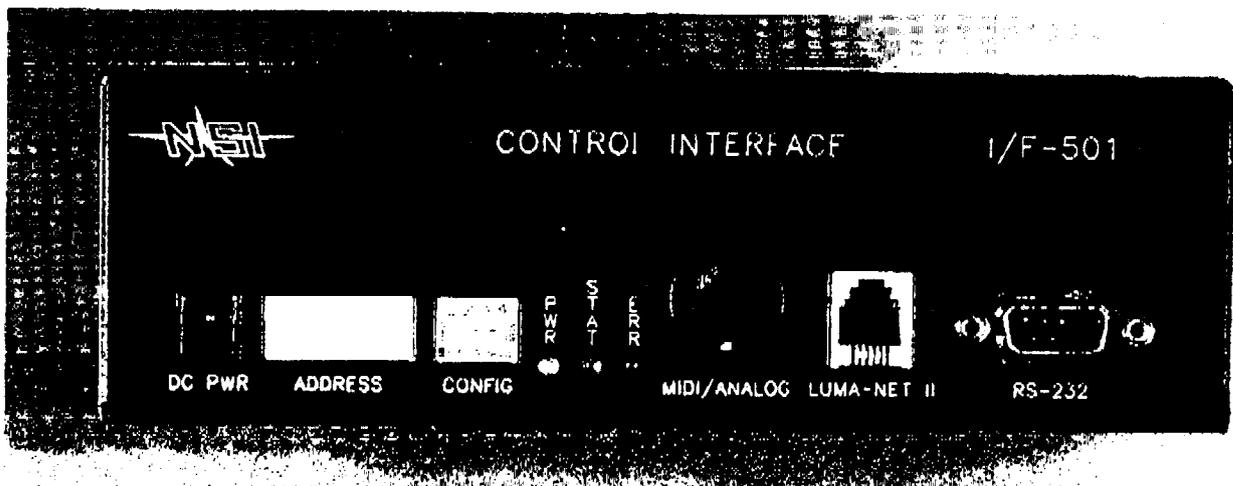**If you do not receive all pages, please call back immediately.**

Voice: FAX: Telex:

CONTROL INTERFACE

The NSI I/F 501 Control Interface is your simple solution for dimmer and control systems compatibility. Increased flexibility of control system design is achieved with the multiple signal ports and protocols available with the I/F 501. The NSI I/F 501 may be configured to combine and convert analog, analog multiplex and digital control signals.

In addition to interfacing a variety of control signals, the NSI I/F 501 is programmable as a stand alone auto sequence control device. Eight preprogrammed crossfading chase effects with step times from 1 to 60 seconds may be selected. A precision 20 cue sequence with fade and wait times from .1 second to 50 minutes may be programmed into the non-volatile memory via the RS-232 port and triggered remotely.

- Up to 512 control channel address
- Configure Mode select switches
- Four line analog (0-10V DC) / contact closure input port
- AMX 192 / DMX 512 output port (4 pin optional)
- DMX 512 input port
- NSI Micro-plex input / output ports
- RS-232 input / output port (D-9 connector)
- MIDI Input Port
- NSI Luma-Net Architectural Lighting port (RJ-14 style connector)
- NSI Luma-Net Software Interface capability
- Eight preprogrammed auto sequence chases
- Programmable precision cue sequence
- Real time ASCII control over dimmers via RS-232
- Bottom chassis key holes positioned for easy wall mounting
- 15 Volts DC external power supply port
- Power on indicator LED
- Control signal status indicator LED
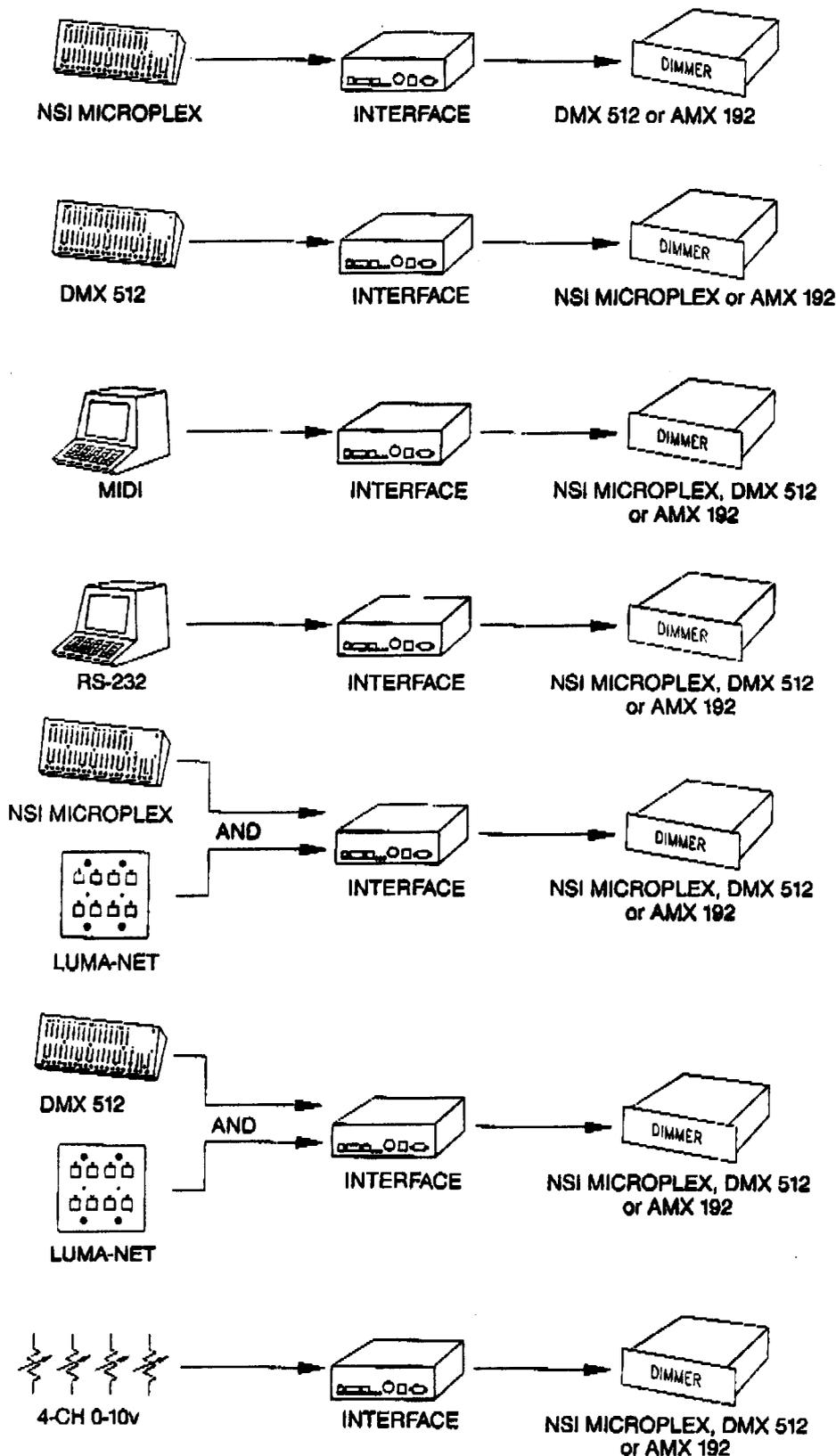- Control signal error indicator LED

"INNOVATIONS IN ILLUMINATION"

NSI CORPORATION
P.O. Box 635 • Wilsonville, Oregon 97070
(503) 682-1941 • FAX (503) 682-5784

CONTROL INTERFACE

Operating Modes of the NSI I/F-501 Interface

| NSI MICROPLEX | → | INTERFACE | → | DMX 512 or AMX 192 |

| DMX 512 | → | INTERFACE | → | NSI MICROPLEX or AMX 192 |

| MIDI | → | INTERFACE | → | NSI MICROPLEX, DMX 512 or AMX 192 |

| RS-232 | → | INTERFACE | → | NSI MICROPLEX, DMX 512 or AMX 192 |

| NSI MICROPLEX AND LUMA-NET | → | INTERFACE | → | NSI MICROPLEX, DMX 512 or AMX 192 |

| DMX 512 AND LUMA-NET | → | INTERFACE | → | NSI MICROPLEX, DMX 512 or AMX 192 |

| 4-CH 0-10v | → | INTERFACE | → | NSI MICROPLEX, DMX 512 or AMX 192 |

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(503) 682-1941
FAX (503) 682-5784

Notes on Pneumatic Systems

General Notes

Pneumatic systems have several characteristics that should be considered when designing mechanical systems. These center around the force medium (air) and the motion.

All pneumatic systems have moving parts, including seals around piston rods and piston rings. These parts and seals must be lubricated to function properly. Although they may work over the short haul, failure of the seals is certain if lubrication is not provided. Most pneumatic systems employ an oilier somewhere in the air supply line. This device atomizes tiny droplets of oil into the air supply. This oil mist is enough to keep the seals lubricated, but not enough (generally) to collect anywhere in the system. Some parts (like push rod bushings on single acting cylinders) may need external lubrication (such as a drop of oil) if they are not exposed to the oiled air.

The motion of pneumatic systems has one characteristic quite different from electric motor drives. With very few (and very complex) exceptions, the motion of a pneumatic system is all or nothing. Cylinders must move the entire movement stroke, without stopping in the middle. This means that mechanical stops must be employed to stop the motion at the desired point. One advantage, however, is that unlike most electric motors, pneumatic cylinders are perfectly happy to sit applying pressure to the stop. This makes them ideal for pushing a piece of the equipment into place and holding it.

An additional characteristic of air systems is the ability to control the rate of the movement. Flow orifices can be used to restrict the amount of air flowing into a cylinder at a given pressure. This has the result of making a cylinder move more slowly. One problem should be noted, however. Using a flow orifice to control the air into a cylinder that moves an item with considerable inertia can give surprising results. When the valve is first opened, the air flows in at a slow rate until enough pressure builds up to move the high inertia item. Once in motion, if the item requires little effort to keep it moving, the residual pressure in the cylinder (more than is needed to keep the item moving, but just enough to cause it to move) can cause a rapid movement regardless of the size of the orifice. This is particularly a problem in systems with small volume/small area cylinders (such as we have here).

Care must be exercised to reduce the inertia of the item to be moved. An additional possibility is the addition of a mechanical drag or 'dash-pot'. The idea is to add drag during the movement but not substantially increase the inertia. A dash-pot is essentially a cylinder in reverse, with the outlet air being regulated to control the rate of movement.

With care and an eye towards these limitations an air system can be designed to produce a very reliable and very unique movement system.

Miniature Regulators

The items provided included two small regulators. These are the air equivalent of a voltage regulator. They will keep a line at a certain pressure, pretty much regardless of the amount of air flowing through them. They have an adjustment to set the pressure, but should not be subjected to an inlet pressure of more than 100 psi or so. The outlet of the regulator should have a gauge on it to allow the operator to see the pressure adjusted to.

Clippard EVO-3 Valves

The Clippard model EVO-3 valves are usable upto 100 psi, for low (0.6 scfm) flow rates. The particular valves in hand are EVO-3-12s, using a 12 volt dc coil. These have three ports for air pressure. The top port is normally used as the supply line. The two bottom ports are labeled 'out' and 'in'. The valve operates as follows.

With no power on the valve, the top supply port is connected to the out port, and the in port is blocked off. This is the normal or no-power configuration, and hence the 'normally closed' designation, as it supplies air to the out port with no power applied.

When enough power is applied to the coil (12v at ~60 mA for the EVO-3-12s) the valve changes state. The top supply port is blocked off, and the in port is connected to the out port. The feature of blocking off the supply port prevents the valve from leaving an open path for the loss of system air pressure.

These valves are best used with a 'single acting' cylinder, where the supply port would be connected to the air supply, the in port would be the exhaust, and the out port tied to the cylinder. In this configuration, the cylinder would be extended when no power is applied to the valve. To reverse this, connect the air supply to the in port, the cylinder to the out port, and use the top port for the exhaust. The latter configuration is not completely correct, though, as it applies reverse pressure to the poppet seals. With enough pressure on the supply, the valve could leak open. This should not be a problem at low pressures, but should be tested prior to completing the design.

Bimba Single Acting Cylinders

The air cylinders given are called a 'single acting' type of cylinder. This is because they use air pressure to only move one direction, and rely on an internal (and/or external) spring or force to return the cylinder. These cylinders are quite strong when extended by the air

pressure, but have little strength (like about a pound or so) in the return stroke. They are effective when used to move something that returns to the rest position by gravity.

These cylinders have a short stroke, but can be quite powerful. They can exert a force at the cylinder rod of 15% of the air pressure used. That means that at 100 psi, they would exert a force of 15 pounds.

These cylinders require the use of lubricated air to keep the piston ring or seal lubricated. Side loads of the piston rod should be avoided, so the design should allow for the cylinder and piston rod to swivel if used in translating a linear motion into a rotary motion.

Flow Orifices

Three types of flow orifices are included. Two are fixed, and are made of plastic, while the third is made of brass and is adjustable. A flow orifice is essentially the same as a resistor in electronics. For a given pressure differential, the orifice will only allow a certain amount of airflow to pass through. This is handy, since it can be used to slow down the movement of a cylinder, subject to the cautions described earlier.

Fixed orifices come in different sizes. The red plastic orifice (with hose barbs on both ends) is the smaller one, with the turquoise colored unit being slightly larger.
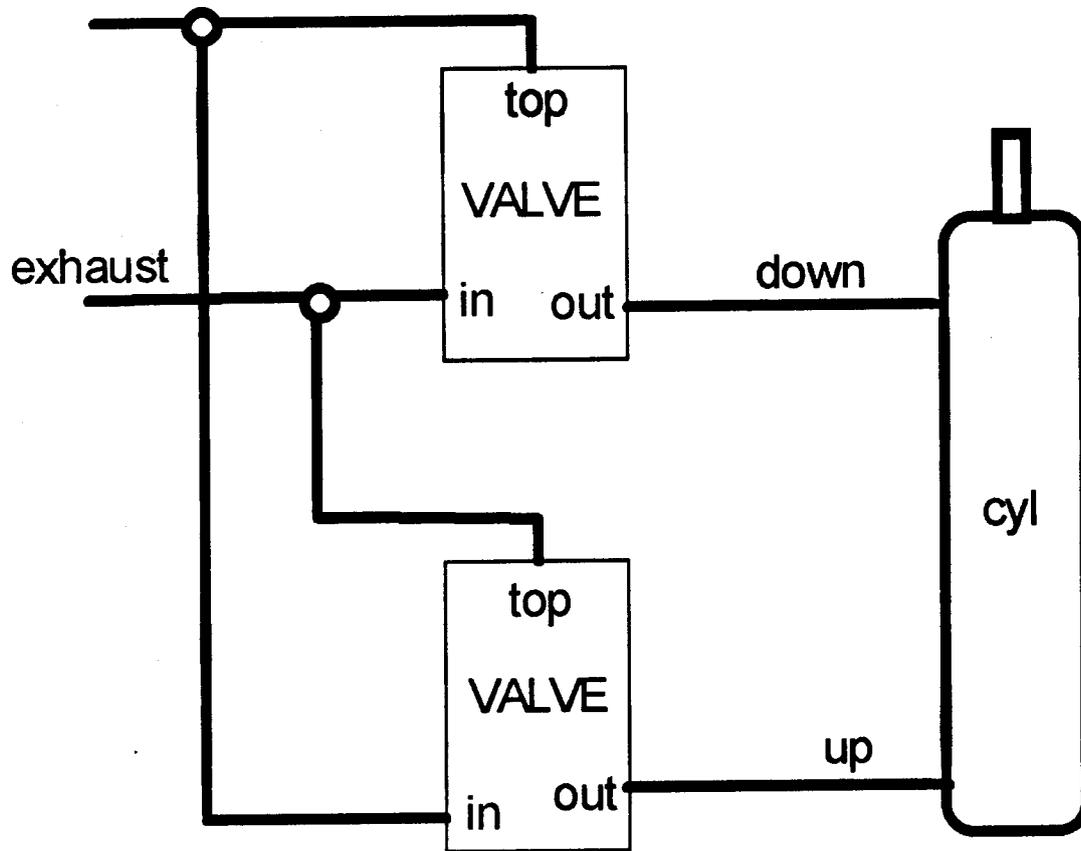
The brass adjustable orifices are usable when desiring to fine-tune a movement. They are essentially valves, but with a long needle as the valve element. This permits fine adjustment and linear operation over a wide range of flow rates.

Should any questions arise please feel free to contact me for more information. I have included some manufacturers data sheets on the various products.
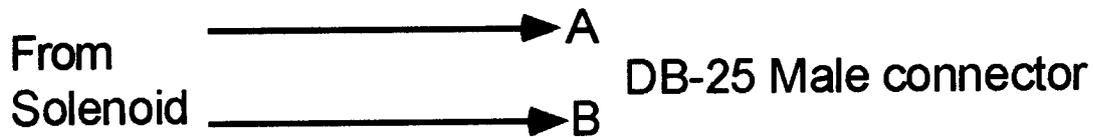
Wiring on pneumatic valves

4/8/94

press feed

top

VALVE

exhaust

in   out

down

cyl

top

VALVE

in   out

up

Wire valve solenoids in parallel

From
Solenoid

→ A

→ B

DB-25 Male connector

Cylinder	A	B
1	1	14
2	2	15
3	3	16
4	4	17
5	5	18
6	6	19

Wiring on pneumatic valves

4/8/94

press feed

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exhaust

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Wiring on pneumatic valves

4/8/94

press feed

```
top
VALVE
in    out
```

exhaust

down

```
top
VALVE
in    out
```

up

cyl

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