

MM8

12 INPUT / 8 OUTPUT MATRIX MIXER

**OPERATING INSTRUCTIONS
and trouble-shooting guide**

LECTROSONICS, INC.

Rio Rancho, NM

INTRODUCTION

The MM8 is a high quality 12 input, 8 output audio matrix mixer. Any combination of inputs may be routed to any combination of outputs. Output channel gain can be adjusted from +10dB to -68dB in 1dB increments, plus Off. Input send levels to each output offer three selectable gains: -6dB, 0dB, +3dB, plus Off. Each output has a Mic/Line selector switch. The Line position drives other line level equipment, while the Mic position is optimized for recording and other mic level applications. The MM8 has an RS-232 port for remote set-up or control by a computer or other RS-232 compatible controller. More than one MM8 may be coupled together when applications call for more than 12 input channels.

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This product meets the CE Compliance Standards - EN55022 and EN50082-1:1998. A copy of the Declaration of Conformity may be requested from your dealer or by contacting the factory directly:

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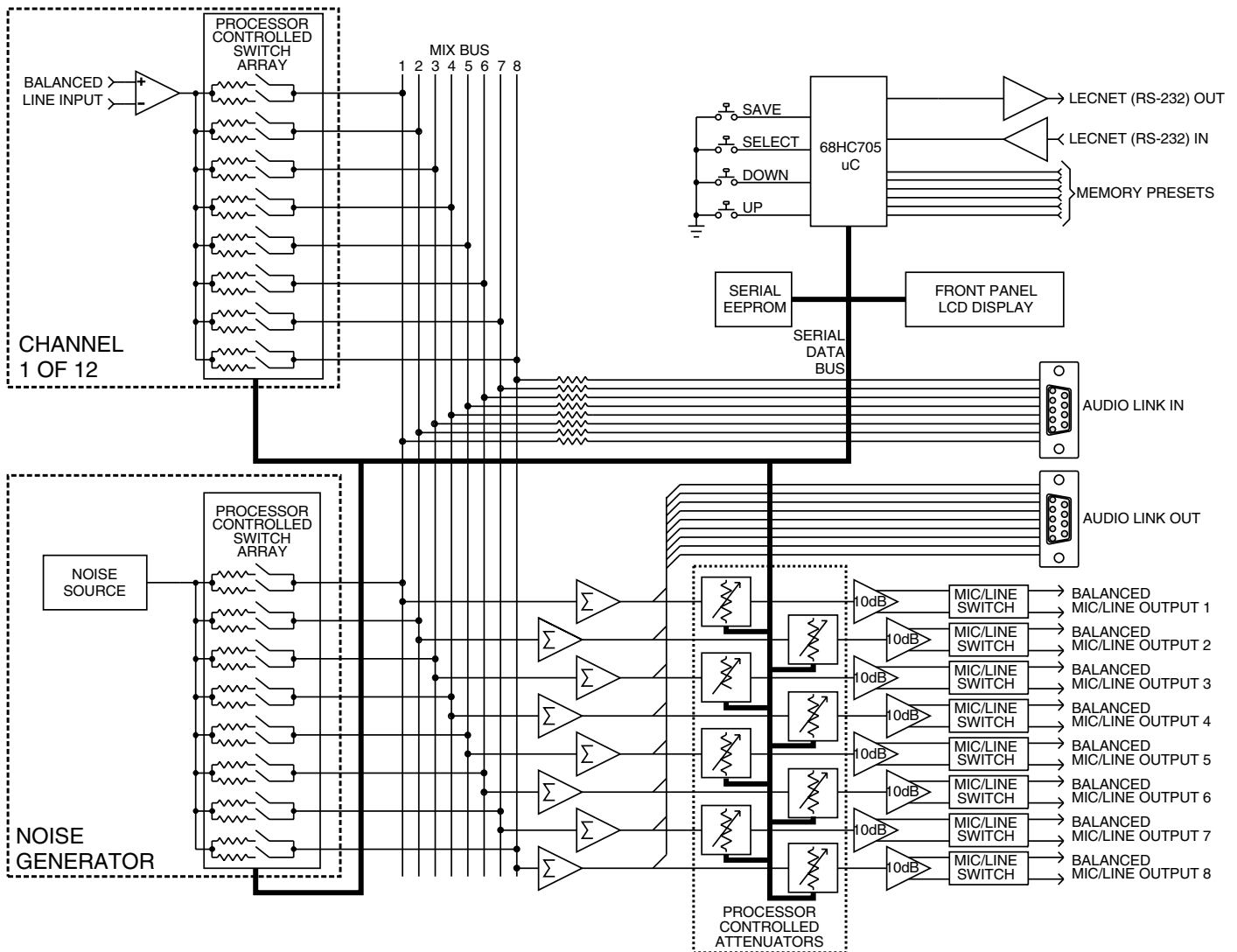
GENERAL TECHNICAL DESCRIPTION

The MM8 combines a high quality digitally-controlled analog signal path with a sophisticated microcontroller to provide flexible, high-performance matrix mixing. Low distortion (.005% THD) CMOS analog switches are used as the signal crosspoint connectors. These switches also allow an input to send signal to various outputs at different send levels. A specially designed audio attenuator provides 78dB of output level control in 1dB increments. In addition, individual switches on the outputs provide for either a microphone or line level signals.

A frequency shaped noise source is provided for use in situations where noise masking might be needed as one of the setup options. An example is a bench conference in a courtroom, where noise is output over system loudspeakers in areas remote from the judges' bench in order to keep the conference from being overheard.

9 nonvolatile memories can be used to store multiple setups, 6 of which can be recalled from contact closures to rear panel connectors. This allows for basic room combining applications, as well as accommodating flexible microphone placement in a room. The MM8 matrix may be extended with extra units if more inputs are needed. The Audio Link In and Out connectors allow simple expansion of the input capability of the system.

An RS-232 port is available to allow many of the functions of the MM8 to be controlled either by a computer or a dedicated control system (such as the AMX or Crestron systems).

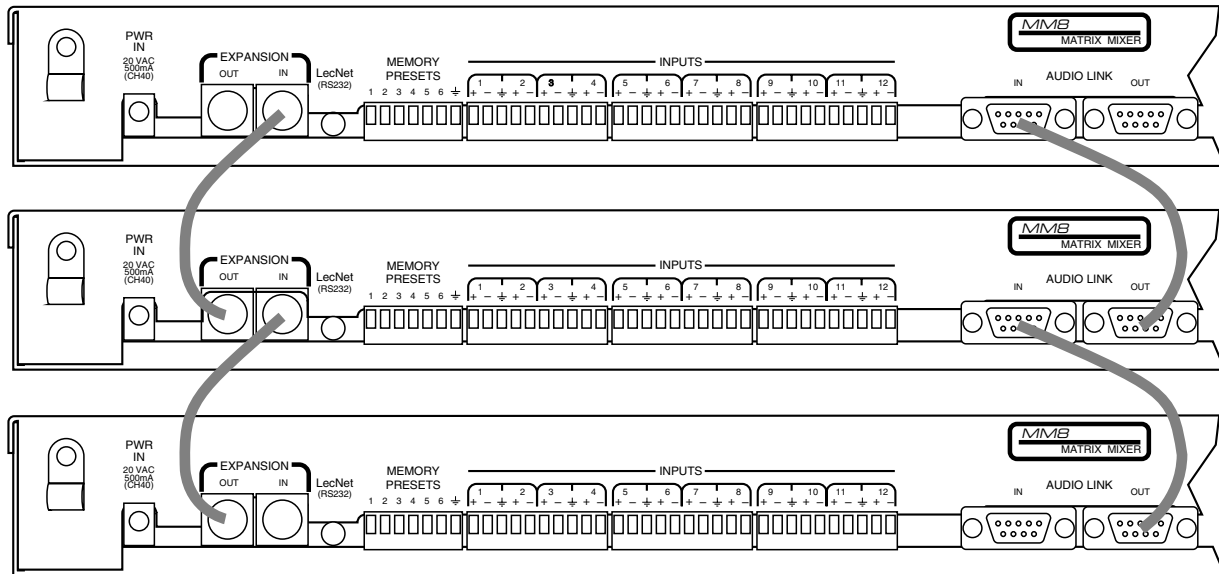


MM8 Block Diagram

INSTALLATION

Installing the MM8 properly is simple, and only requires attention to a few issues. The MM8 should be used in a grounded metal rack. More than one MM8 may be used if more than 12 inputs are necessary. The 9-pin Audio Link In/Out D-sub connectors allow the audio paths of multiple MM8s to be interconnected. The MM8 manual shows the correct interconnection for multiple MM8s.

When using multiple MM8s in an installation, a unique LecNet address must be assigned to each MM8 if computer control is desired. The factory default LecNet address is 134. The LecNet address may be set from the "LecNet Address:" menu item.



Line input connections should be made with good quality braid or foil shielded twisted pair. The shield should be used for the ground (Pin 1) connection. If an unbalanced signal is used, the unbalanced signal lead should be connected to the "+" input terminal, while the unbalanced ground lead should be connected to both the "-" and ground terminals of the input connector.

Output connections can be made balanced or unbalanced. If an unbalanced connection is desired, simply connect the unbalanced signal lead to the "+" output terminal, and the unbalanced ground lead to the output ground terminal. Leave the "-" output terminal unconnected. The Output Level dip switches allow the nominal output level to be changed from line to mic. The Output Level switch introduces approximately 40dB attenuation to the output signal. This allows proper output level matching to mic level inputs, such as some types of tape recorders.

FRONT PANEL DESCRIPTION



MM8 Front Panel

POWER SWITCH and LED - Indicates that the MM8 has AC power and is turned on.

LCD DISPLAY - Shows the available menus for configuring the MM8

SAVE Button - Saves the current value of all MM8 parameters to nonvolatile memory. Used if changes are made from the front panel which should become permanent. If the SAVE button is not pressed after any changes, the changes will be lost when the power is removed from the MM8.

SELECT Button - Moves the active cursor between menu categories.

UP and DOWN Buttons - Increments or decrements the values in the active menu category. If the Up and Down buttons are both pushed while the power is turned on, the MM8 will be returned to factory default condition. Factory defaults are as follows:

- 1) All input gains in all memories are set to Off.
- 2) All output gains in all memories are set to 0dB.
- 3) LCD display contrast is set to the factory default.
- 4) Operational mode is set to Local.

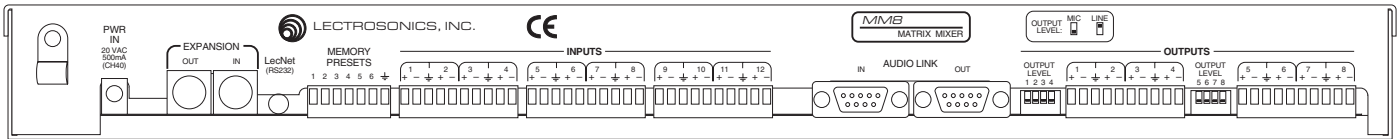
MM8 Menu Options:

MM8 LecNet Address - Allows the LecNet address of the MM8 to be changed. The factory default address is 134.

In/Out Gain Adjust - Allows the input send levels and output levels to be adjusted. In addition, the active memory is shown on the far right side of the first line. The active memory can be adjusted from 1 to 9. The SAVE button will save the current setup to the active memory shown on this menu.

Display Contrast - Allows the contrast ratio of the LCD display to be adjusted to accommodate different viewing angles.

REAR PANEL DESCRIPTION



MEMORY PRESETS 1-6 - Allows matrix setups stored in nonvolatile memory to be recalled using contact closures between one of the Memory Preset terminals and ground. A momentary dry contact between the ground and any one of the numbered connectors will instantly recall and load the configuration stored in the memory location with the same number as the terminal.

INPUTS 1-12 - Provides the balanced, RF protected line level inputs into the MM8.

OUTPUTS 1-8 - Provides the balanced system outputs. The outputs may also be used in an unbalanced mode by connecting the “+” terminal of an output to the signal lead of the unbalanced device, and the ground terminal of the an output to the ground of the unbalanced device. If an unbalanced MIC level signal is required, it is necessary to connect the “-” terminal to the ground terminal.

OUTPUT LEVEL DIP SWITCHES - Introduces approximately 40dB attenuation to the output signal. This allows proper output level matching to mic level inputs, such as some types of tape recorders.

AUDIO LINK IN/OUT - Allows multiple MM8s to be connected together to increase the number of inputs available. Note that the number of outputs available is 8, no matter how many MM8s are interconnected.

RS-232 SERIAL PORT - Provides access to and control of some of the operational features of the MM8. The port is compatible with the serial port of a PC, or other controllers with RS-232 type serial ports. For hardware interconnection and software details, see Appendix 1, “Serial Port Hardware and Software”.

EXPANSION IN/OUT - Allow multiple MM8s to be used together. The Expansion Out of the second MM8 is connected to the Expansion In of the first MM8, using the supplied cable.

PWR IN - Connects to the power supply to provide power for the MM8.

OPERATING INSTRUCTIONS

Setup of the MM8 consists of choosing the desired input-to-output gains and selecting the desired output level (line or mic), using the rear panel Output Level dip switches. Each of 12 inputs may be routed to any or all of the 8 outputs. An input may be sent to an output at one of three levels: -6dB, 0dB, and +3dB. Each output can be adjusted in 1dB increments from +10dB to -68dB, plus Off. If multiple setups are needed, the MM8 has 9 nonvolatile memories. All memories may be recalled either from the front panel LCD menu of the MM8 or from this control panel. Memories 1-6 can be recalled using contact closures between any of the Memory Recall pins and ground, on the rear panel connector.

- 1) Determine which inputs (and/or noise) will send to each output, and program the appropriate send gain from each input.
- 2) Adjust the output level to achieve the desired signal level. Both the Up and Down buttons are push and hold (i.e. they will continue to increment or decrement gain if held).
- 3) After setting the input and output levels, the setup may be saved to one of the 9 nonvolatile memories. Each time power is applied to the MM8, it loads the setup from Memory 1. As a result, Memory 1 should be used to store the setup that is desired at power-up.
- 4) If other matrix setups will be used, they may be stored in Memories 2-9. These can then be recalled as needed from the front panel LCD menu of the MM8 or from the LecNet control panel. Memories 1-6 can be recalled using contact closures between any of the Memory Recall pins and ground, on the rear panel connector.
- 5) If the MM8 outputs are driving tape recorders or other devices with microphone level inputs, the Output Level dip switches should be set to the mic mode (dip switch down). This reduces the output level by 40dB relative to the line level signal.
- 6) More than 12 inputs may be used by combining MM8s, but only 8 outputs are ever available. If combining MM8s is needed, simply connect the Audio Link Out from the second MM8 to the Audio Link In of the first MM8 using the optionally available 9-pin cable.

The system is now ready for use.

Resetting the MM8 to Factory Defaults

Note that the MM8 may be reset to factory default conditions by simultaneously pressing the Up and Down buttons while turning on the power. The default conditions are as follows:

- 1) All input gains in all memories are set to Off.
- 2) All output gains in all memories are set to 0dB.
- 3) LCD display contrast is set to the factory default.
- 4) Operational mode is set to Local.

Any setups stored in memory are, of course, lost as a result of the reset.

TROUBLESHOOTING

If your system malfunctions, you should attempt to correct or isolate the trouble before concluding that the equipment needs repair. Make sure you have followed the setup procedure and operating instructions. Check out the interconnecting cords and use the following short troubleshooting guide.

SYMPTOM

No sound from system

POSSIBLE CAUSES

- 1) Output level in the Off position.
- 2) No inputs (or incorrect inputs) sent to the output.
- 3) Rear panel Mic/Line dipswitch in the Mic position (this would cause very low output).
- 4) Power is not on.

SERVICE AND REPAIR

If your system malfunctions, you should attempt to correct or isolate the trouble before concluding that the equipment needs repair. Make sure you have followed the setup procedure and operating instructions. Check out the interconnecting cords and then go through the TROUBLE SHOOTING section in the manual

We strongly recommend that you **do not** try to repair the equipment yourself and **do not** have the local repair shop attempt anything other than the simplest repair. If the repair is more complicated than a broken wire or loose connection, send the unit to the factory for repair and service. Don't attempt to adjust any controls inside the units. Once set at the factory, the various controls and trimmers do not drift with age or vibration and never require readjustment.

There are no adjustments inside that will make a malfunctioning unit start working.

LECTROSONICS service department is equipped and staffed to quickly repair your equipment. In-warranty repairs are made at no charge in accordance with the terms of the warranty. Out of warranty repairs are charged at a modest flat rate plus parts and shipping. Since it takes almost as much time and effort to determine what is wrong as it does to make the repair, there is a charge for an exact quotation. We will be happy to quote approximate charges by phone for out of warranty repairs.

RETURNING UNITS FOR REPAIR

You will save yourself time and trouble if you will follow the steps below:

A. DO NOT return equipment to the factory for repair without first contacting us by letter or by phone. We need to know the nature of the problem, the model number and the serial number of the equipment. We also need a phone number where you can be reached 8 am to 4 pm (Mountain Standard Time).

B. After receiving your request, we will issue you a return authorization number (R.A.). This number will help speed your repair through our receiving and repair departments. The return authorization number must be clearly shown on the outside of the shipping container.

C. Pack the equipment carefully and ship to us, shipping costs prepaid. If necessary, we can provide you with the proper packing materials. UPS is usually the best way to ship the units. Heavy units should be "double-boxed" for safe transport.

D. We also strongly recommend that you insure the equipment, since we cannot be responsible for loss of or damage to equipment that you ship. Of course, we insure the equipment when we ship it back to you.

Mailing address:

Lectrosonics, Inc.
PO Box 15900
Rio Rancho, NM 87174
USA

Shipping address:

Lectrosonics, Inc.
581 Laser Rd.
Rio Rancho, NM 87124
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Toll Free (800) 821-1121
FAX: (505) 892-6243

World Wide Web: <http://www.lectrosonics.com>

Email: sales@lectrosonics.com

SPECIFICATIONS

Line Input	
Type:	Electronically balanced and RF filtered
Impedance:	Greater than 10K, balanced or unbalanced
Input Gain Settings:	-6dB, 0dB, +3dB, plus Off
Maximum Input Level:	+20dBu at 0dB gain
Line/Mic Output	
Type:	Electronically balanced and RF filtered
Impedance:	Line: 600 Ohms balanced, 300 Ohms unbalanced
	Mic: 125 Ohms balanced
Output Gain Range:	+10dB to -68dB, 1dB increments, plus Off
Maximum Output Level:	Line: +20dBu
	Mic: -20dBu
Attenuation in Mic Mode:	40dB
Maximum System Gain	
Input to Output:	13dB
System THD:	Less than 0.05%, 0dB input/output gain +10dBu out
System IMD:	Less than 0.05%, 0dB input/output gain +10dBu out
System Noise:	Less than -86dBu (20Hz-20KHz, Output at 0dB gain, Inputs 1-12 at 0dB gain)
System Frequency Response:	15Hz - 55KHz , +0/-3dB
System Crosstalk:	Less than -55dB at 20KHz, less than -75dB at 1KHz (Any single input driven to any output)
Serial Communication (RS-232):	9600 baud, 8 data bits, no parity, 1 stop bit
Power Consumption:	10 Watts max at 20VAC
Weight:	3 lbs, 4 ozs
Dimensions:	19"wide x 1.75"high x 8"deep

Specifications subject to change without notice.

FCC PART 15 NOTICE

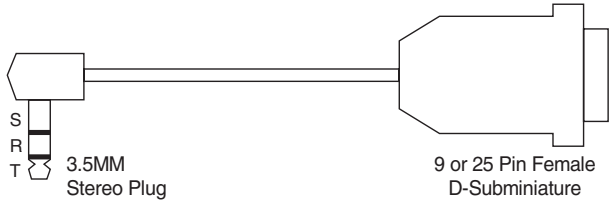
This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

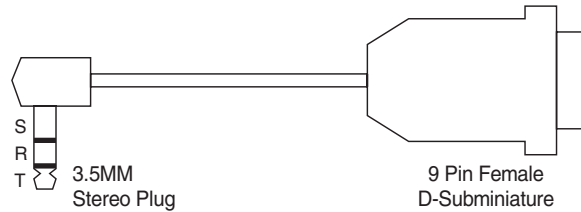
SERIAL CABLE WIRING DIAGRAM

The serial port on the LecNet device is a minimal RS-232 implementation. The figure shows the wiring diagram to accommodate interconnection with either a 9 or a 25 pin serial port on a PC or other serial device.

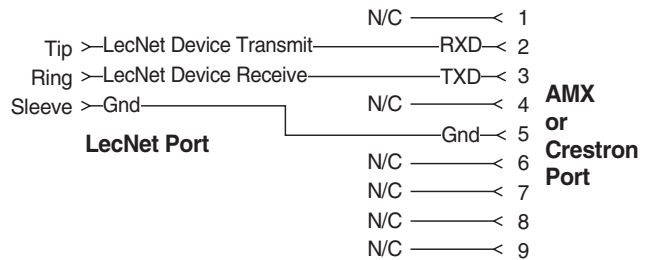
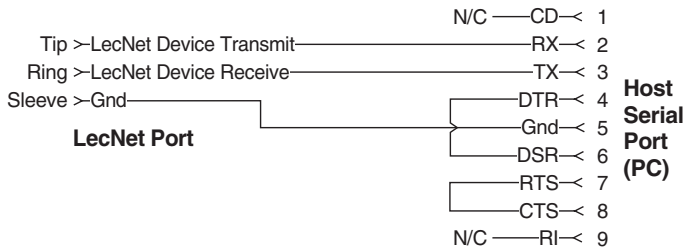
LecNet Device to PC



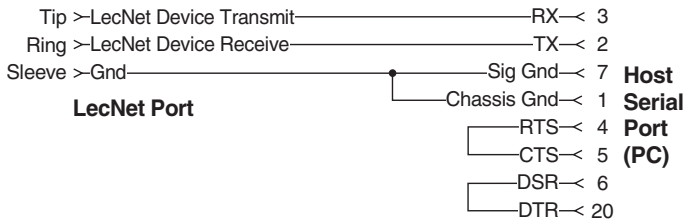
LecNet Device to AMX or Crestron



Wiring Diagram, 9 Pin D-Sub



Wiring Diagram, 25 Pin D-Sub



AMX Programming Notes

If you are using an AMX system to control your LecNet equipment, you'll want to purchase the Lectrosonics PT3 Protocol Translator. The PT3 connects between the AMX bus and any LecNet equipment. With the PT3, the LecNet equipment looks just like native AMX equipment. The PT3 is the fastest and most productive way to control LecNet devices with an AMX system.

SERIAL PORT COMMANDS AVAILABLE

The MM8 uses a modification of the typical one-to-one connection between two RS-232 compatible devices. The MM8 has both an RS-232 transmitter and receiver section. The transmitter section is “tri-stated”, or placed in a high impedance mode, until the particular device is addressed. To facilitate the simple parallel connection of multiple devices on a single RS-232 port, an addressing scheme is employed to route commands from the host to the proper device. When a device receives its address from the host computer, it temporarily turns on its RS-232 transmitter long enough to send whatever data is requested by the host. In this way, multiple devices may drive a single transmit signal back to the host, because only the addressed MM8 will turn on its transmitter.

Valid address values are 128-254 (80h-FEh). 255 (FFh) is an invalid address and must not be used. Because the MM8 will interpret any single data byte whose value is greater than 127 as an address, single byte data (as opposed to addresses) sent from the host must be in the range of 0-127. If a data value needs to be output that exceeds 127, two bytes are output such that the first byte is the lower 7 bits of the 8 bit value, and the second byte is 1 if the MSB of the data byte is 1, or 0 if the MSB of the data byte is 0.

Every MM8 command must be preceded by the address of the device to be controlled. If a device with the requested address exists on the system, it will respond by sending a “0” back to the host. The following code fragment, in BASIC, would be used to get an “Acknowledge” name string back from an MM8:

```

'Open Com1:9600, N, 8, 1.
OPEN "COM1:9600,N,8,1" FOR RANDOM AS #1 LEN = 25
...
...

'Output the device address.
PRINT #1, CHR$(134)

'Receive "0" byte. The ASC function is used to convert
'the received string data to numeric data.
DataByte% = ASC(INPUT$(1,#1))

'Output the "Acknowledge" command.
PRINT #1, CHR$(1)

'Receive the length of the acknowledge string (3 for the MM8).
DataByte% = ASC(INPUT$(1,#1))

'Receive the name string ("MM8")
Name$ = INPUT$(DataByte%,#1)

```

The first PRINT and INPUT\$ sequence must precede every command sent, even if the command is sent to the same MM8 as the previous command. Thus, each interchange with an MM8 follows this pattern:

- 1) Host sends device address (1 byte);
- 2) Host receives byte of “0” from MM8 as acknowledgement;
- 3) Host sends command (1 byte) to MM8;
- 4) Host and MM8 interact based on particular command sent.

The following is a listing of available commands grouped based on the MM8 function to which the commands are related. The word “Host” in the command descriptions means the IBM PC or compatible to which the MM8 is connected.

General Device Commands

Acknowledge - Causes the MM8 sends its "name" bytes back

Host sends command - 1

Host receives 4 data bytes: Byte 1 is the number of bytes in the name string (3 for the MM8), followed by the ASCII characters "MM8".

Change Device Address - Changes the MM8 device address and stores the new address in EEPROM.

Host sends command - 2

Host sends data byte: device address, valid range 128 to 254.

Output Firmware Version - Outputs the version number of the current '705 firmware. For example, Version 1.0 software would be returned as 10.

Host sends command - 25

Host receives data byte: firmware version.

Output Local/Remote Status - Outputs the current status of the MM8, Local or Remote. Zero (0) indicates Local mode Local_mode , one (1) indicates Remote mode.

Host sends command - 21

Host receives data byte: Local/Remote status.

Set Local/Remote Mode - Allows the Local/Remote status of the MM8 to be set. 0 is Local mode, 1 is Remote. New value is stored in EEPROM.

Host sends command - 22

Host sends data byte: Status data (0 or 1 as above)

Host receives data byte: 100, to acknowledge EEPROM write completion.

Input/Output Gain Commands

Output Current Input Gain - Outputs the input gain associated with a particular input/output pair. Range is from 0-3, where 0 corresponds to Off, 1 to -6dB, 2 to 0dB, and 3 to +3dB.

Host sends command - 3

Host sends 2 data bytes:

Byte 1: Desired input number.

0 - Input 1	5 - Input 6	10 - Input 11
1 - Input 2	6 - Input 7	11 - Input 12
2 - Input 3	7 - Input 8	12 - Noise Input
3 - Input 4	8 - Input 9	
4 - Input 5	9 - Input 10	

Byte 2: Output number associated with the input number.

0 - Output 1	4 - Output 5
1 - Output 2	5 - Output 6
2 - Output 3	6 - Output 7
3 - Output 4	7 - Output 8rb

Host receives data byte: Input gain as above

Set Current Input Gain - Allows the current input gain to be set. Range is from 0-3, where 0 corresponds to Off, 1 to -6dB, 2 to 0dB, and 3 to +3dB.

Host sends command - 4

Host sends 3 data bytes:

Byte 1: Desired input number.

0 - Input 1	5 - Input 6	10 - Input 11
1 - Input 2	6 - Input 7	11 - Input 12
2 - Input 3	7 - Input 8	12 - Noise Input
3 - Input 4	8 - Input 9	
4 - Input 5	9 - Input 10	

Byte 2: Output number associated with the input number.

0 - Output 1	4 - Output 5
1 - Output 2	5 - Output 6
2 - Output 3	6 - Output 7
3 - Output 4	7 - Output 8

Byte 3: New input gain (as above)

Output Current Output Gain - Outputs the gain level associated with one of the eight outputs. Output level range is 0-96 corresponds to +10dB to -38dB in .5dB steps, 97-126 to -39dB to -68dB in 1dB steps, and 127 is Mute.

Host sends command - 5

Host sends data byte: Desired output number, 0-7 which corresponds to outputs 1-8

Host receives data byte: Output gain as above.

Set Current Output Gain - Allows the current output gain to be set. Output level range is 0-96 corresponds to +10dB to -38dB in .5dB steps, 97-126 to -39dB to -68dB in 1dB steps, and 127 is Mute.

Host sends command - 6

Host sends 2 data bytes:

Byte 1: Desired output number.

0 - Output 1	4 - Output 5
1 - Output 2	5 - Output 6
2 - Output 3	6 - Output 7
3 - Output 4	7 - Output 8

Byte 2: New gain level, from 0-127 as above.

Memory Commands

Output Complete Memory Setup - Outputs a complete memory data setup. This data consists of all input and output gains, either from the current setup or from memories 1-9. The 60 bytes of data are organized as follows:

Host sends command - 7

Host sends data byte: Desired memory number, 0-9. 0 returns the current memory setup, while 1-9 return the memory setups stored in EEPROM memories 1-9.

Host receives 60 data bytes: Complete matrix setup as defined below.

Each of the first 52 bytes represents the send levels from an input to two outputs. Each group of four bytes represents the input send level from one of the inputs to the eight outputs. The high nibble is the send level to odd number outputs, and the low nibble is the send to even number outputs. Valid nibble values are:

0 / Off, 1 / -6dB, 2 / 0dB, 3 / +3dB

The last eight bytes are the gain levels for the eight outputs. Valid values range from 0-127 with the following meanings:

0-96 = +10dB to -38dB in .5dB steps
97-126 = -39dB to -68dB in 1dB steps
127 = Mute

A typical memory setup is as follows:

	Byte 1 Out1 Out2	Byte 2 Out3 Out4	Byte 3 Out5 Out6	Byte 4 Out7 Out8
In 1	Snd1 Snd2	Snd3 Snd4	Snd5 Snd6	Snd7 Snd8
In 2	Snd1 Snd2	Snd3 Snd4	Snd5 Snd6	Snd7 Snd8
In 3	Snd1 Snd2	Snd3 Snd4	Snd5 Snd6	Snd7 Snd8
In 4	Snd1 Snd2	Snd3 Snd4	Snd5 Snd6	Snd7 Snd8
In 5	Snd1 Snd2	Snd3 Snd4	Snd5 Snd6	Snd7 Snd8
In 6	Snd1 Snd2	Snd3 Snd4	Snd5 Snd6	Snd7 Snd8
In 7	Snd1 Snd2	Snd3 Snd4	Snd5 Snd6	Snd7 Snd8
In 8	Snd1 Snd2	Snd3 Snd4	Snd5 Snd6	Snd7 Snd8
In 9	Snd1 Snd2	Snd3 Snd4	Snd5 Snd6	Snd7 Snd8
In 10	Snd1 Snd2	Snd3 Snd4	Snd5 Snd6	Snd7 Snd8
In 11	Snd1 Snd2	Snd3 Snd4	Snd5 Snd6	Snd7 Snd8
In 12	Snd1 Snd2	Snd3 Snd4	Snd5 Snd6	Snd7 Snd8
Noise	Snd1 Snd2	Snd3 Snd4	Snd5 Snd6	Snd7 Snd8
	Output 1 Output 5	Output 2 Output 6	Output 3 Output 7	Output 4 Output 8

Load New Matrix Setup from EEPROM - Allows the host to trigger new memory setups from EEPROM memory. Upon receipt of the memory number, the MM8 will be set up with the values stored in EEPROM.

Host sends command - 8

Host sends data byte: New memory number, 1-9, to load as the current setup.

Load Current Matrix Setup from Host - Allows the host to download an entire memory setup to replace the current one in the MM8.

Host sends command - 9

Host sends 60 data bytes: New current memory setup, formatted as in Output Complete Memory Setup (7) above.

Store Matrix Setup to EEPROM - Allows the host to download a memory setup directly to EEPROM.

Host sends command - 10

Host sends 61 data bytes:

Byte 1: EEPROM memory number, 1-9

Bytes 2-61: Matrix setup data bytes, formatted as in Output Complete Memory Setup (7) above. Note that after each data byte is sent by the host, the MM8 will send a byte of 100 as an acknowledgement of a successful write to EEPROM.

Output Current Active Memory Number - Outputs the current active memory number.

Host sends command - 11

Host receives data byte: Current active memory, 1-9.

Misc.

Mute Crosspoint - Allows muting of specific or all input channels to a specific output.

Host send command: Dec 112 or Hex 70

Host sends two data bytes:

First Data has a range of 0-12

0 = All Input Channels exclusive of the Noise Source

1-12 = Specific Input Channel

13 = Noise Source

Second Data has a range of 1-8

1-8 = Specific Output Channel

Set Crosspoint to 0 dB - Allows setting to 0 dB of specific or all input channels to a specific output.

Host send command: Dec 113 or Hex 71

Host sends two data bytes:

First Data has a range of 0-12

0 = All Input Channels exclusive of the Noise Source

1-12 = Specific Input Channel

13 = Noise Source

Second Data has a range of 1-8

1-8 = Specific Output Channel

Mute Output Gain - Allows muting of specific or all output channels.

Host send command: Dec 114 or Hex 72

Host sends one data byte: Data has a range of 0-8. 0 = All Output Channels,

1-8 = Specific Output Channel

Restore Output Gain - Allows restoring of specific or all output channels.

Host send command: Dec 115 or Hex 73

Host sends one data byte: Data has a range of 0-8. 0 = All Output Channels,

1-8 = Specific Output Channel

Ramp Volume Up Output Gain - Allows ramping up of specific or all output channels.

Host send command: Dec 116 or Hex 74

Host sends one data byte: Data has a range of 0-8. 0 = All Output Channels,

1-8 = Specific Output Channel

Ramp Volume Down Output Gain - Allows ramping down of specific or all output channels.

Host send command: Dec 117 or Hex 75

Host sends one data byte: Data has a range of 0-8. 0 = All Output Channels,

1-8 = Specific Output Channel

Change Memory Preset - Allows current preset to be changed.

Host send command: Dec 118 or Hex 76

Host sends one data byte: Data has a range of 1-9 representing a specific memory preset

Change Multiple Outputs - Allows changes to a specific combination of the outputs.

Host send command: Dec 119 or Hex 77

Host sends three data bytes:

First Data has a range of 0-127

Byte1 = 0 CH7 CH6 CH5 CH4 CH3 CH2 CH1,

a "1" in any bit position will apply the gain change

Second Data has a range of 0-1.

Byte2 = 0 0 0 0 0 0 CH8,

a "1" in the first bit position will apply gain change

Third Data has a range of 0-83

0-78 represents gain of +10dB to -68dB

79 represents OFF

80 represents INC 1 dB function

81 represents DEC 1 dB function

82 represents MUTE function

83 represents RESTORE function

LIMITED ONE YEAR WARRANTY

The equipment is warranted for one year from date of purchase against defects in materials or workmanship provided it was purchased from an authorized dealer. This warranty does not cover equipment which has been abused or damaged by careless handling or shipping. This warranty does not apply to used or demonstrator equipment.

Should any defect develop, Lectrosonics, Inc. will, at our option, repair or replace any defective parts without charge for either parts or labor. If Lectrosonics, Inc. cannot correct the defect in your equipment, it will be replaced at no charge with a similar new item. Lectrosonics, Inc. will pay for the cost of returning your equipment to you.

This warranty applies only to items returned to Lectrosonics, Inc. or an authorized dealer, shipping costs prepaid, within one year from the date of purchase.

This Limited Warranty is governed by the laws of the State of New Mexico. It states the entire liability of Lectrosonics Inc. and the entire remedy of the purchaser for any breach of warranty as outlined above. NEITHER LECTROSONICS, INC. NOR ANYONE INVOLVED IN THE PRODUCTION OR DELIVERY OF THE EQUIPMENT SHALL BE LIABLE FOR ANY INDIRECT, SPECIAL, PUNITIVE, CONSEQUENTIAL, OR INCIDENTAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THIS EQUIPMENT EVEN IF LECTROSONICS, INC. HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT SHALL THE LIABILITY OF LECTROSONICS, INC. EXCEED THE PURCHASE PRICE OF ANY DEFECTIVE EQUIPMENT.

This warranty gives you specific legal rights. You may have additional legal rights which vary from state to state.

LECTROSONICS, INC.

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November 1, 2001