Welcome!

We greatly appreciate your purchase of the MT109-100 8-In 1-Out Stereo Audio Switcher Card. We are sure you will find it reliable and simple to use. Superior performance for the right price, backed by solid technical and customer support is what ALTINEX has to offer.

We are committed to providing our customers with Signal Management Solutions® to the most demanding audiovisual installations at very competitive pricing and we welcome you to join the ranks of our many satisfied customers throughout the world.

1. Precautions and Safety Warnings

Please read this manual carefully before using your MT109-100. Keep this manual handy for future reference. These safety instructions are to ensure the long life of your MT109-100 and to prevent fire and shock hazards. Please read them carefully and heed all warnings.

1.1 General

- Qualified ALTINEX service personnel or their authorized representatives must perform all service.

1.2 Installation Precautions

- The MT109-100 contains components sensitive to electrostatic discharge (ESD). Always use ESD safety precautions when touching the card.
- To prevent fire or shock, do not expose this unit to water or moisture. Do not place the MT109-100 in direct sunlight, near heaters or heat-radiating appliances, or near any liquid. Exposure to direct sunlight, smoke, or steam can harm internal components.
- Handle the MT109-100 carefully. Dropping or jarring can cause damage.
- Do not pull any cables that are attached to the MT109-100.
- Insert the card carefully into the slots of the MultiTasker without bending any edges.
- When removing a card, pull it halfway through to avoid damage to internal cables. If an expansion card is being removed, please make sure that the main card to which it is attached is pulled out simultaneously.

1.3 Cleaning

- Clean only the connector area with a dry cloth. Never use strong detergents or solvents such as alcohol or thinner. Do not use a wet cloth or water to clean the card. Do not clean or touch any component or PCB.

1.4 FCC Notice

- This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
- This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions found herein, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.
- Any changes or modifications to the unit not expressly approved by ALTINEX, Inc. could void the user's authority to operate the equipment.

2. Installation Procedures

Step 1. Determine how the MT109-100 is going to be configured. A standard MT109-100 is an 8-In, 1-Out switcher, but two MT109 100s may be configured as a 15-In, 1-Out switcher. See Diagram 4 on page 7 of the online manual for expansion card installation.

Step 2. Turn off power to the MultiTasker system.

Step 3. Slide the MT109-100 into an available slot in the MultiTasker in order to connect to the bus. Make sure that the MT109-100 fits into place and then secure the card by tightening the retainer screws located on the top and bottom of the card. Identify the slot number and note that it is for RS-232 control.

Step 4. Restore power to the MultiTasker system.

Step 5. The LED on the card panel will turn red indicating the card is operational.

Step 6. Connect the audio sources to the input connectors and the output to the receiving device.

Step 7. The MT109-100 is now operational.

3. Limited Warranty/Return policies

Please see the ALTINEX website at www.altinex.comfor details on warranty and return policies.

ALTINEX® SIGNAL MANAGEMENT SOLUTIONS®
Tel: 714-990-2300 • Toll-Free: 1-800-ALTINEX • FAX: 714-990-3303 • E-mail: solutions@altinex.com • Web: www.altinex.com

4. Technical Specifications

Specifications are subject to change. See www.altinex.com for up-to-date information.

Features/Description	MT109-100
General	
Inputs	
Input Connectors	3.5 mm stereo jack (8)
Outputs	
Local Output Connector	5-pin terminal block (1)
Compatibility	Stereo or Mono Audio

Table 1. MT109-100 General

Mechanical	MT109-100
Enclosure Slots Required	One
Weight	1.0 lb (0.45 kg)
Connector Panel	Black
T°Operating	10℃-40℃
T°Maximum	0 to 50℃
Humidity	90% non-condensing
MTBF (calc.)	55,000 hrs

Table 2. MT109-100 Mechanical

Electrical	MT109-100
Input Signals	
Max Level	0 dBu
Impedance	10 kohms
Audio Throughput	
Gain	0 dB unbalanced, 6dB balanced
Frequency Response	20 Hz to 20 kHz +/- 0.5 dB
Output Signals	
Level	1 Vp-p
Impedance	Low – drives 600 ohms
Gain	0 dB
Power (from enclosure)	
+6V	100 mA (0.6 W)
-6V	50 mA (0.3 W)
+13V	50 mA (0.6 W)
-13V	40 mA (0.5 W)
Total Power	2 W max.

Table 3. MT109-100 Electrical

ALTINEX® SIGNAL MANAGEMENT SOLUTIONS®
Tel: 714-990-2300 • Toll-Free: 1-800-ALTINEX • FAX: 714-990-3303 • E-mail: solutions@altinex.com • Web: www.altinex.com

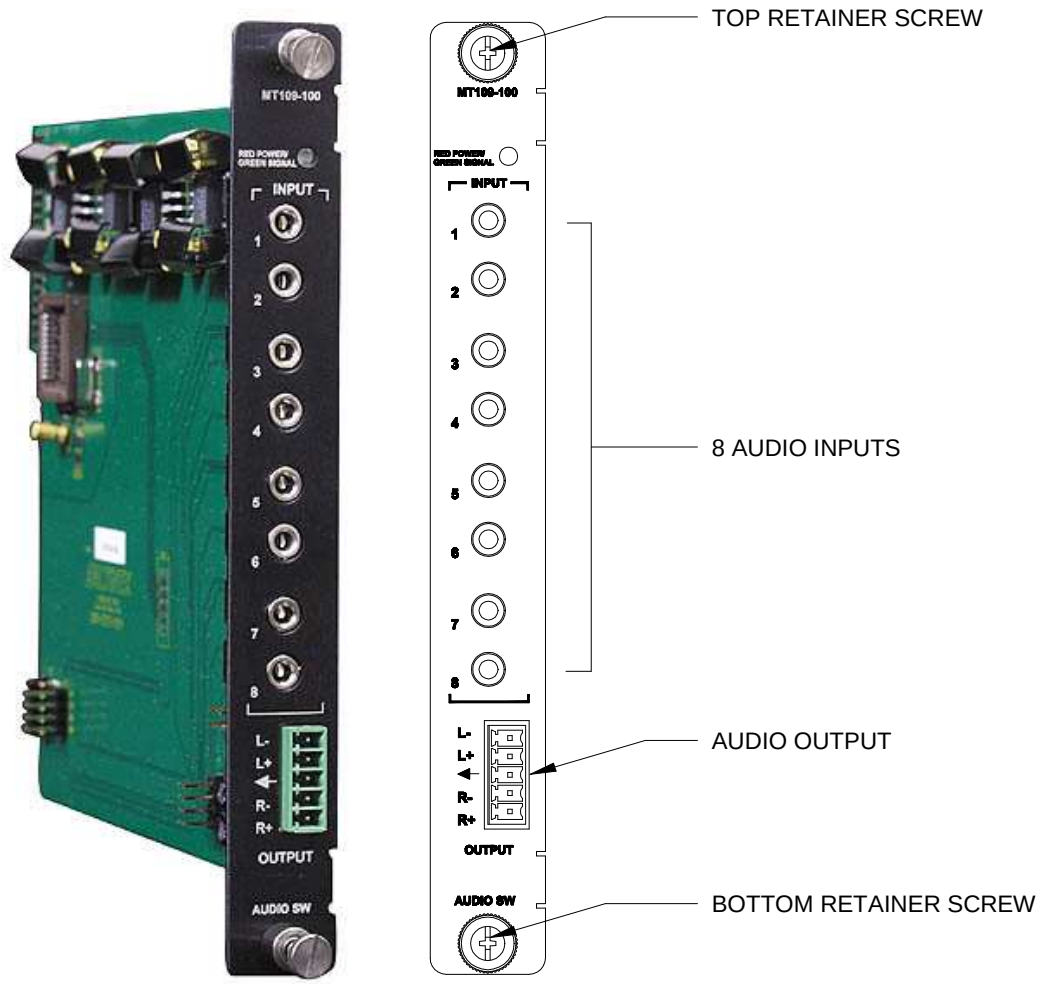
5. About Your MT109-100

The MT109-100 is a Stereo Audio Switcher Card that allows the connection of 8 stereo audio sources to a single receiving device such as a cassette recorder, mixer, and/or amplifier for sound reinforcement.

Inputs are selected through easy-to-use ASCII commands from a control system or computer connected to the RS-232 port of the MultiTasker enclosure. While the MT109-100 can accept only unbalanced audio inputs, the output is a balanced output that can be wired for either balanced or unbalanced audio.

The MT109-100 is primarily designed to utilize the inputs and output offered on the connector panel. However, it also offers a special feature that enables the MT109-100 to send or receive stereo audio signals to or from another MT109-100.

This feature can be used in a variety of ways to expand the capabilities of the card. For example, two MT109-100 cards can be installed in the MultiTasker and the output of one can be routed to an input of the other, creating a 15-In, 1-Out switcher.



6. Application Diagrams

Diagram 1: Typical Setup

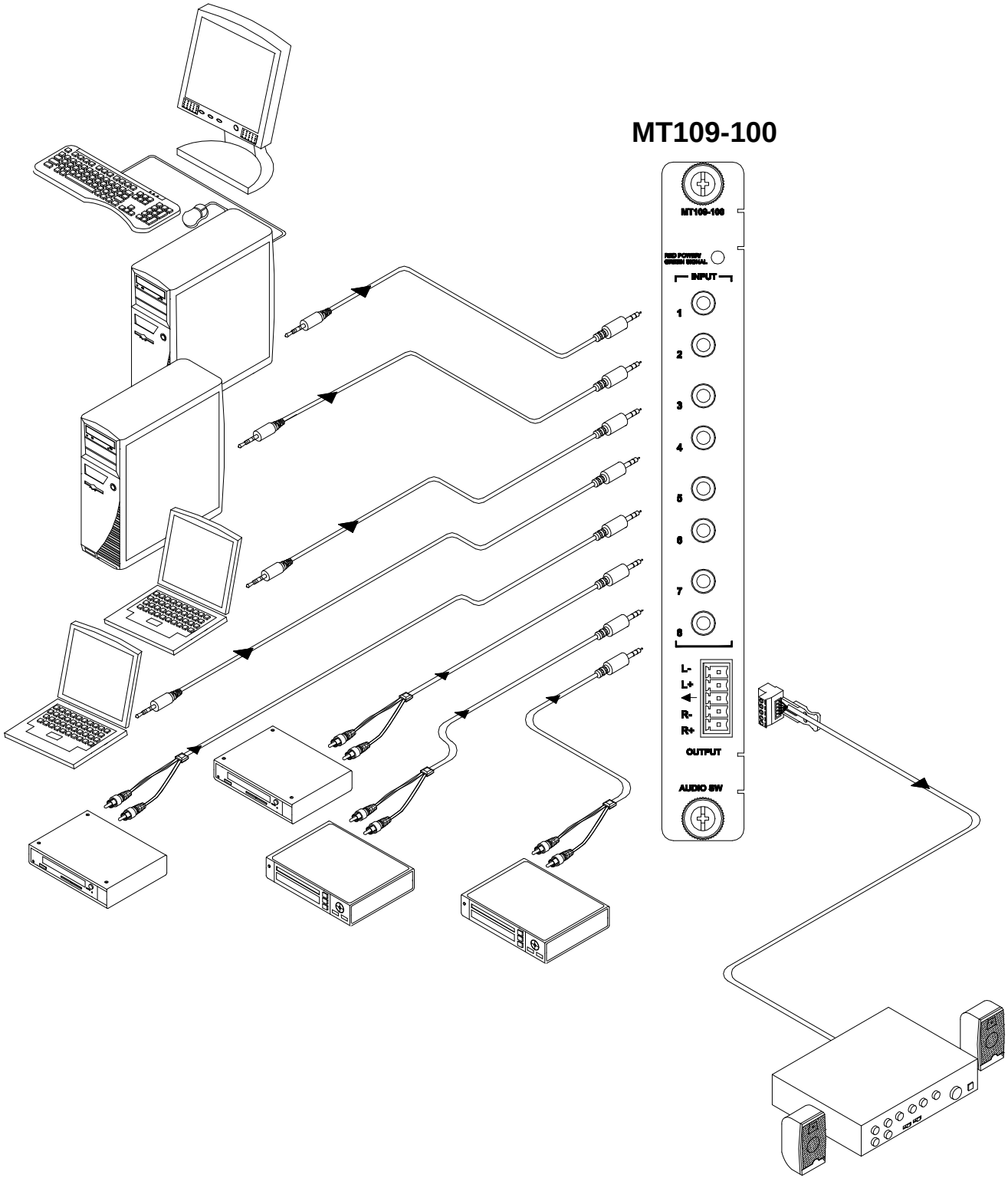


Diagram 2: Internal View

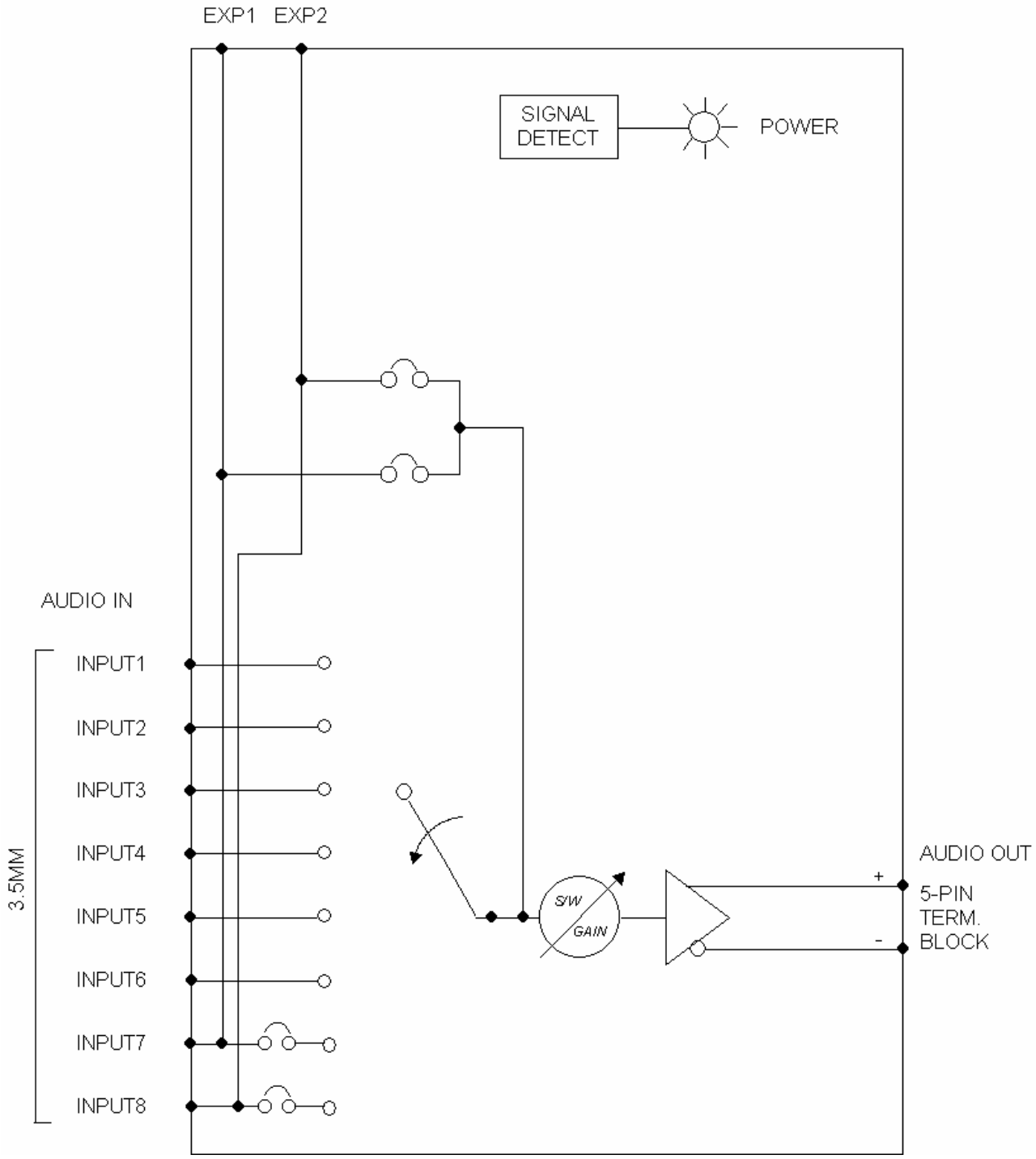
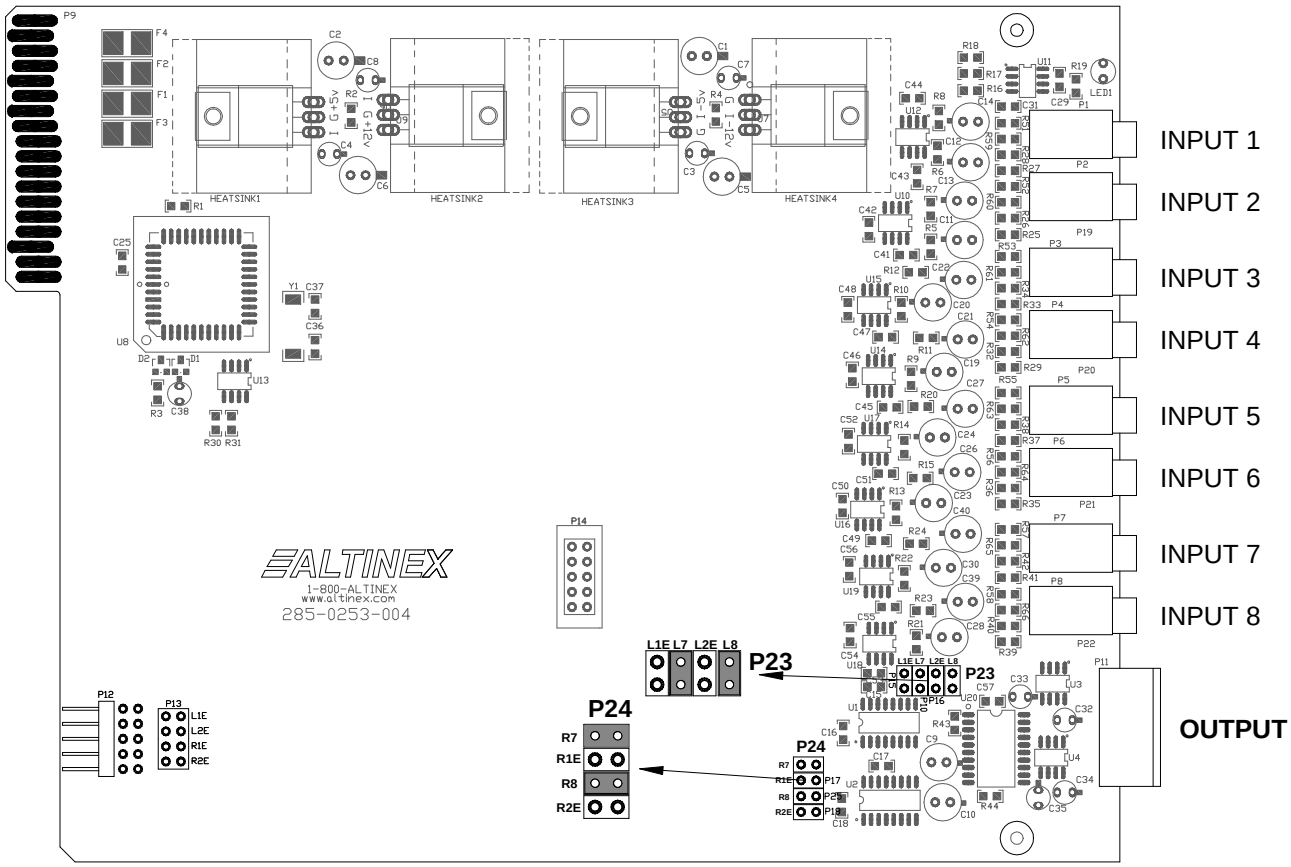


Diagram 3: Jumper Settings



Default jumper settings shown.

The MT109-100 has 8 external inputs, 1 internal input, and 1 output. The internal inputs come from an Expansion card using a 10-pin IDC cable connected between P12s of the Expansion and Master cards.

The internal input is configured as input 7 or input 8. Only one of two internal inputs is used at a time and it depends on how the jumpers on the Expansion are set. In order to use one of the internal inputs, one of the external inputs (7 or 8) cannot be used.

Setting Jumpers:

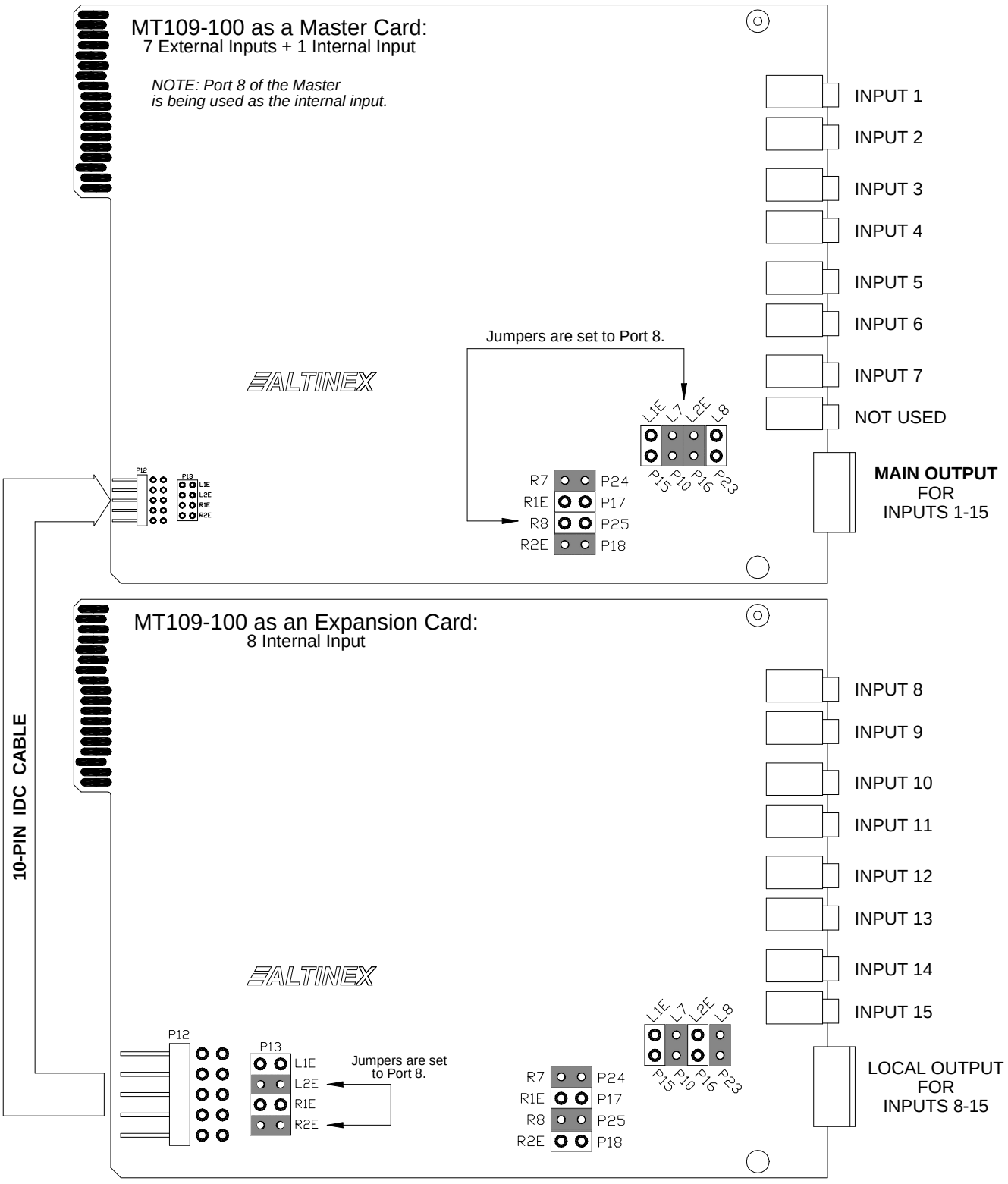
1) As an Expansion card: set P13 as port 7 (L1E and R1E) or port 8 (L2E and R2E).
2) As a Master card: set jumpers on P23 and P24 as described below.

If the Expansion card's jumpers on P13 are set on L1E and R1E, the Master card must select internal input 7 on P23 (L1E) and P24 (R1E).

If the Expansion card's jumpers on P13 are set on L2E and R2E, the Master card must select internal input 8 on P23 (L2E) and P24 (R2E).

Note: The MT109-100 is an 8-In, 1-Out switcher. For a 15-In, 1-Out switcher, use two MT109-100 cards, one as a Master card and the other as an Expansion card. (See page 8.)

Diagram 4: 15-In, 1-Out Switcher



7. Operation

7.1 RS-232 Control

The MT109-100 has many advanced remote-control capabilities accessible through standard RS-232 communication using a computer, control system, or any device capable of RS-232 communication.

7.1.1 RS-232 Interface

The control commands for the MT109-100 are in a simple ASCII character format.

1. Square brackets "[ ]" are part of the command.
2. Use uppercase letters for all commands.
3. Spaces are NOT legal characters.

The cards in a MultiTasker are capable of performing various functions, as well as providing feedback to the user or control system. Commands instruct a card to perform specific actions or request information from the card. Some commands do both simultaneously.

A command that instructs the card only to perform an action will generate feedback of "[ ]". The open bracket immediately followed by a closed bracket indicates the card received a valid command. If the command requested information from the card, the feedback generated by the card is the acknowledgement of having received a valid command. Invalid commands generate feedback that includes "ERR" plus an error code.

Example 1: [ERR001] Error number

Example 2: [ERRC04] Card error C4

After processing a command, an "OK" or error is returned as feedback if "F" is included at the end of a command string.

Commands ending in "S" will be saved into memory. Commands not ending in "S" are executed, but not restored at reset or powered-up.

7.1.2 Conventions Used in this Manual

Card IDs:

In this manual, cards are referenced by their card ID; typically equivalent to the slot number:

C1, C2, C3, C4 ... C99

Group IDs:

Groups are referenced by their group ID:

G1, G2, G3 ... G8

Unit IDs:

Units are referenced by their unit ID:

U0, U1, U2 ... U20

Examples for each command in the following sections do not include the unit ID. Commands sent to a MultiTasker without a unit ID are executed by all MultiTaskers connected to the RS-232 bus. It is only necessary to include the unit ID when there is more than one MultiTasker connected to the bus and the command is intended for cards in that MultiTasker only.

[VERC3]: Executed by all MultiTaskers on the RS-232 bus.
[VERC3U1]: Executed by MultiTasker unit ID U1 only.

7.2 Description of Commands

Each command consists of three parts: Function, Card ID, and Unit ID.

[Function , Card ID , Unit ID **]**

Example: [VERC3U2]

VER = Function

C3 = Card ID or Group ID

U2 = Unit ID (optional for Unit ID 0)

For Function, see a detailed explanation under each description.

The card ID is a unique identifier. It is equal to the enclosure slot number, or it may be an assigned value. As the slot number, the value can range from 1-4 up to 1-20 depending on the enclosure. If the value is assigned, the ID may be a maximum of 99. Card ID 0 (C0) is used for the controller and cannot be reassigned.

The group ID is a number representing a group of cards defined with the [WR] command. When using the group ID, all cards in the group perform the given instruction.

Changing the position of a card significantly affects the commands recorded on software definitions or third-party control systems.

Example:

[VERC3]: For U0 or all MultiTaskers on the bus.

[VERC3Ui]: For IDs other than U0 or all MultiTaskers.

[VERC3]: Equivalent to [VERC3U0] for U0.

Command Organization

The RS-232 commands in this section are organized into the following 6categories:

Basic Commands

Feedback Control

Card Control

Volume Control

Card IDs

Groups

See the Summary of Commands (Section 7.3) for one-line descriptions of each command.

Basic Commands

The basic commands are used to provide general information about the card. These commands are most useful during the initial stages of setting up and operating the card.

1. **[VER]**

   This command displays the software version and card type for the card.

   Command Format: [VERCn]

   Cn = Card ID (n = # from 1 to max slots)

   Example:

   Send the command [VERC2] to check the version of the MT109-100 in slot 2. The system will return with feedback similar to the following:

   [MT109-100 690-0179-006]

   MT109-100 = card type

   690-0179-006 = software version

2. **[C]**

   This command displays the status of the card.

   Command Format: [Cn]

   Cn = card ID (n = # from 1 to max slots)

   Example:

   An MT109-100 card is in slot 4. Sending [C4] will yield feedback similar to the following:

   ON 1 C04
   OUTVOL=32/32
   INVOL1=32/32
   INVOL2=32/32
   INVOL3=32/32
   INVOL4=32/32
   INVOL5=32/32
   INVOL6=32/32
   INVOL7=32/32
   INVOL8=32/32

   If there is no card in slot 4, sending the [C4] command will not return any feedback.

3. **[CnS]**

   This command saves the status of the card's current settings to be restored after the system is reset, or powered off and then on.

   Command Format: [CnS]

   Cn = card number

   S = save configuration

   Example:

   Save the card's current settings by sending the command [C4S]. The feedback will display the status and a save message.

   ON1C04
   OUTVOL=32/32
   INVOL1=16/32
   INVOL2=16/32
   INVOL3=16/32
   INVOL4=16/32
   INVOL5=16/32
   INVOL6=16/32
   INVOL7=16/32
   INVOL8=16/32
   [SAVED]

4. **[CLR]**

   This command clears the card's settings and returns them to the factory defaults. Input 1 is selected, the output volume is set to 32/32, and all the input levels are each set to 32/32.

   Command Format: [CLRCn]

   Cn = Card ID (n = # from 1 to max slots)

   Example:

   Send the command [CLRC4] to reset the MT109-100 in slot 4 to its factory defaults.

5. **[TEST]**

   This command performs a series of tests on the internal memory.

   Command Format: [TESTCn]

   Cn = Card ID (n = # from 1 to max slots)

   Example:

   Send [TESTC4] to test C4's internal memory. Upon completion, the system will display "MEMORY IS GOOD" if all tests pass; otherwise, failures will be indicated.

6. **[HELP]**

   This command displays information available for the MultiTasker interface commands.

   Command Format: [HELPCn]

   Cn = card ID (n = # from 1 to max slots)

   Example:

   Display the RS-232 commands available for the MT109-100 card in slot 4 by sending [HELPC4]. The commands along with a brief description will be displayed in the Terminal Window.

Feedback Control

The next commands are a function of both the card and the front panel and allow flexibility over when and how card information is displayed.

7. **[FBD]**

   This command turns feedback delay on or off. It is necessary when installing some newer cards in older systems. If the system does not receive all of the feedback from the card, the card may be communicating too fast. This command will slow down the card's communication rate.

   Command Format: [FBDm]

   m = Delay (0= no delay, 1= delay 100mS)

   Example:

   The command [HELPC4] is sent to the card in slot 4. Some of the Help file is displayed on the screen, but most is missing. Send the command [FBD1] to slow down the rate at which the card sends feedback to the system.

8. **[?]**

   This command displays general information about a MultiTasker and its installed cards.

   Command Format: [?Ui]

   Ui = Unit ID (i = from 0 to 20)

   Example:

   A MultiTasker with unit ID 1 has a front panel with part number MT101-101 and contains an MT103-122, MT103-123, and MT109-100. Send the command [?U1] and receive the following feedback:

   [(MT101-101U1)(MT103-122C01)
   (MT103-123C02)(MT109-100C03)]

MT101-101U1	= Panel number/unit ID
MT103-122C01	= MT103-122 is in slot 1
MT103-123C02	= MT103-123 is in slot 2
MT109-100C03	= MT109-100 is in slot 3

9. **[?C]**

   This command displays general information about a card and its status.

   Command Format: [?Cn]

   Cn = Card ID (n = # from 1 to max slots)

   Example:

   The MT109-100 in slot 4 has Input 1 selected. Send the command [?C4] to receive feedback status similar to the following.

   Example:

   [(MT109-100C04)(VR690-0179-006C04)
   (IN1C04)(VO32C04)(VI3232323232323232C04)(VM0C04)]

   All status feedback is enclosed in brackets, "[ ]". Each data field within the status is enclosed in parentheses. The first two characters identify the status type. The last three characters are the card's ID.

MT109-100	= Card model number
VR690-0179-006	= Firmware version
IN1	= Input select (1-8)
VO32	= Volume level (1-32)
VI3232...32	= Input gain settings
VM0	= Mute (0= off, 1= on)

   The input gain line is read left to right representing Inputs 1-8 and the gain level to which each is set. The first two digits show the gain level for Input 1. The third and forth digits are for Input 2 and so on.

10. **[STA1]**

    This command enables automatic feedback from the front panel. The command affects any card with auto-feedback capability, not just the MT109-100. The default at power on or reset is STA0, off. For more details, see the [?Cn] command definition.

    Command Format: [STA1]

    Feedback Prefix Definitions:

MT	Card model number
VR	Firmware version
IN	Input selection
VO	Output Volume
VI	Input gain settings
VM	Mute on/off

    Example:

Command	=	[VLOA16C4]	
Feedback	=	(VO16C04)	
		VO	= Output volume
		16	= Setting (16 of 32)
		C04	= Card ID/slot number

11. **[STA0]**

    This command disables automatic feedback from the card and front panel. The command affects any card with auto-feedback capability, not just the MT109-100 card. The default at power on or reset is STA0, Off.

    Command Format: [STA0]

12. **[...F]** – Feedback

    After processing a command, an "OK" or "[ERR001]" will be returned as feedback if "F" is included at the end of a command string.

Card Control

Card control commands allow the main functions of the card to be executed over the RS-232 bus, or from the front panel's programmable keys.

13. **[…S] – Save**

    This command will save the configuration command being sent in memory. When sending the command [VLI1A16C4S], after reset or power up, Input 1 on C4 will be restored with an input gain level of 16.

14. **[ONm]**

    This command is used to select the input to be active on the output connector.

    Command Format: [ONmCn]

    m = Input number (m = # from 1 to 8)

    Cn = Card ID (n = # from 1 to max slots)

    Example:

    There is an MT109-100 card in slot 4. Send the command [ON3C4] to select Input 3 as the active input. If the output is disabled (muted), it will remain disabled.

15. **[ON]**

    This command is the same as the MUT0 command.

16. **[OFF]**

    This command is the same as the MUT1 command.

17. **[MUT0]**

    This command turns on the output volume without changing the input port selected and without changing any volume settings.

    Command Format: [MUT0Cn]

    Cn = Card ID (n = # from 1 to max slots)

    Example:

    Send the command [MUT0C4] to turn on the output volume for the card in slot 4.

18. **[MUT1]**

    This command turns off the output volume without changing the input port selected and without changing any volume settings.

    Command Format: [MUT1C*n*]

    Cn = Card ID (n = # from 1 to max slots)

    Example:

    Send the command [MUT1C4] to turn off the output volume for the card in slot 4.

19. **[…P]** – Path

    This command sets the path for the output, but is not active until the switch command, [SW], is executed. Commands ending in "P" are not executed immediately. The path for outputs on one or more cards can be preloaded. See the [SW] command for details.

20. **[SW]** – Switch

    The switch command immediately connects inputs and/or outputs, which were previously set with the path command on this card and all other cards in the system.

    Example:

    There is an MT109-100 in slot 2 and another MT109-100 in slot 3. Switch C2 to Input 1 at the same time a switching C3 to Input 4 by sending the following commands:

    [ON1C2P] [ON4C3P] [SW]

21. **[+]**

    See the [SEL] and [SELm] commands.

22. **[-]**

    See the [SEL] and [SELm] commands.

23. **[SEL] and [SELm]**

    These commands allow the output volume and input levels to be adjusted incrementally.

    Output Volume

    Command Format: [SELCn]

    Cn = Card ID (n = # from 1 to max slots)

    Input Level

    Command Format: [SELmCn]

    m = Input (m # from 0 to 8)

    Cn = Card ID (n = # from 1 to max slots)

    Increment/Decrement

    Command Format: [+] / [-]

    [+] = Increment level by one

    [-] = Decrement level by one

    Example:

    An MT109-100 is in slot 4. Adjust the gain on Input 2 from a level of 10 to 15.

    1. [SEL2C4]
       The current gain level is 10.
    2. [-] [-] [-]
       The level is now 7 and is too low.
    3. [+] [+] [+] [+] [+] [+] [+] [+]
       The level is now 15 and no further adjustments are required.

24. **[+O]**

This command increases the output volume level by 1 up to the maximum level of 32. If the command is sent after a level of 32 has been reached, it will have no effect on the output.

Command Format: [+OCn]

Cn = Card ID (n = # from 1 to max slots)

Example:

Increase the output volume of C4 (slot 4) from 31 to 32 by sending the command [+OC4].

25. **[-O]**

This command is the same as [+O] except that it decreases the output volume level by 1 down to a minimum level of 1.

26. **[+I]**

This command increases an input level by 1 up to the maximum of 32. Attempts to increase the level after reaching 32 have no effect.

Command Format: [+ImCn]

m = Input No. (m - # from 1 to 8)

Cn = Card ID (n = # from 1 to max slots)

Example:

Increase the input level of Input 2 on C4 from 31 to 32 by sending the command [+I2C4].

27. **[-I]**

This command is the same as [+Im] except that it decreases an input level by 1 down to the minimum level of 1.

28. **[VLO]**

This command sets the absolute output volume to a specific value.

Command Format: [VLOAvCn]

v = Volume Level (# from 01 to 32)

Cn = Card ID (n = # from 1 to max slots)

Example 1:

Set the output volume level to a level of 16 using the command [VLOA16C4].

29. **[VLI]**

This command sets an input level to a specific gain value.

Command Format: [VLImAvCn]

m = Input (m = # from 1-8)

v = Gain level (v = # from 01 to 32)

Cn = Card ID

Example 1:

Set the input gain level for Input 4 to a value of 24 using the command [VLI4A24C4].

Volume Ramping Commands

The following commands are used to control the volume of the MT109-100. They may be used with computer control, or with the {SETVK} command using keys on the front panel. The following code sample sets front panel keys 8 and 10 to Ramp Up and Ramp Down respectively. See your Front Panel User's Guide for more details.

When defined as a volume control key, the key will respond to two conditions: press and release. Below is an example of how to use the ramping feature. Subroutine 8 starts ramping up when key 8 is pressed and subroutine 10 starts ramping down when key 10 is pressed. Subroutine 108 stops ramping when either key is released.

```
{WRS8=RUPC4}          //Ramp Up
{WRK8=8,108,0,0,0}    //Press= start, release= stop
{WRS10=RDNC4}         //Ramp Down
{WRK10=10,108,0,0,0}  //Press= start, release= stop
{WRS108=RSTC4}        //Stop Ramping
{SETVK8}              //Set key 8 as volume key
{WRLK8=VOL_UP}        //Define Key 8 Label
{SETVK10}             //Set key 8 as volume key
{WRLK10=VOL_DN}       //Define Key 8 Label
[RAMP=10C4]           //Set the ramp rate.
```

30. **[RUP]**

This command ramps the output volume to its maximum level at the rate defined using the [RAMP] command.

Command Format: [RUPCn]

Cn = Card ID (n = # from 1 to max slots)

Example:

Ramp the output volume from a starting level of 10 to the maximum level of 32 for the card in slot 4. Send the command [RUPC4] and the system will respond with the following feedback:

[11][12][13][14]…[32]

31. **[RUP=]**

This command ramps the output volume to a user defined level at a rate defined using the [RAMP] command.

Command Format: [RUP=xxCn]

xx = Stop Level (xx = # from 01-32)

Cn = Card ID (n = # from 1 to max slots)

Example:

Ramp the output volume from a starting level of 1 to a level of 20 for the card in slot 4. Send the command [RUP=20C4] and the system will respond with the following feedback:

[02][03][04]…[20]

32. **[RDN]**

This command ramps the output volume down to a level of 1 at a rate defined using the [RAMP] command.

Command Format: [RDNCn]

Cn = Card ID (n = # from 1 to max slots)

Example:

Ramp the output volume from a starting level of 32 down to 1 for the card in slot 4. Send the command [RDNC4] and the system will respond with the following feedback:

[31][30][29]…[01]

33. **[RDN=]**

This command ramps the output volume down to a user defined level at a rate defined using the [RAMP] command.

Command Format: [RDN=xxCn]

xx = Stop Level (xx = # from 01-32)

Cn = Card ID (n = # from 1 to max slots)

Example:

Ramp the output volume from a starting level of 32 down to 16 for the card in slot 4. Send the command [RDN=16C4] and the system will respond with the following feedback:

[31][30][29]…[16]

34. **[RAMP]**

This command displays the ramping time for 32 steps. The time between each step is equal to the time in seconds divided by 32.

Command Format: [RAMPCn]

Cn = Card ID (n = # from 1 to max slots)

Example:

Display the ramp-rate setting for the card in slot 4 by sending the command [RAMPC4]. The system will respond with feedback similar to the following:

RAMPTIME = 6 SECONDS

35. **[RAMP=]**

This command sets the ramp-rate for 32 steps. The settings range from 4 to 18 seconds, in two-second intervals.

Command Format: [RAMP=xCn]

x = Rate in Seconds

- 4 = 0.13 seconds/step
- 6 = 0.19 seconds /step
- 8 = 0.25 seconds /step
- 10 = 0.31 seconds /step
- 12 = 0.38 seconds /step
- 14 = 0.44 seconds /step
- 16 = 0.50 seconds /step
- 18 = 0.56 seconds /step

Cn = Card ID (n = # from 1 to max slots)

Example:

There is an MT109-100 in slot 4. Send the command [RAMP=16C4] to set the ramp rate to 16 seconds. After this is set, any ramping will occur at a rate of 32 steps in 16 seconds, or 0.50 seconds per step. Confirm the setting by sending the command [RAMPC4] and receiving the feedback:

RAMPTIME = 16 SECONDS

36. **[RST]**

This command stops ramping and maintains the last volume setting.

Command Format: [RSTCn]

Cn = Card ID (n = # from 1 to max slots)

Example:

The card in slot 4 is ramping up from a volume level of 1 to 32. Send the command [RSTC4] and the card will stop ramping the output volume. The last displayed volume setting will remain the current volume level.

ID Commands

The default card ID is the same as the card slot number. The next several commands allow the user to change the card ID to a value other than the slot number. Once the ID is changed, moving the card to another slot will not change the card ID. If a card in slot 4 is set to ID 1, then moved to slot 10, its ID will remain 1. The [RSI] command forces each installed card to take its slot number as its ID number, regardless of the slot in which it is installed.

Some cards require more than one slot in the MultiTasker system. As an example, some matrix switcher cards require 4 slots. If 5 of these cards are installed, they would be numbered C4, C8, C12, C16, and C20. Changing the ID allows the user to define the cards as C1, C2, C3, C4, and C5.

Another use for changing the card ID is to be able to use multiple systems without having to set each unit to a different unit ID. All systems may be left as unit ID 0 for ease of programming. The cards in the first unit may be numbered 1-10 and in the second unit 11-20.

37. **[RSI]**

This command resets the card IDs in the system. After sending this command, each card ID in the system will match the slot number of the card. If the card is moved to another slot, its ID number will be the new slot number.

Command Format: [RSI]

Example:

Send the command [RSI] to the system with
Unit ID 0. The card in slot 1 will have ID 1, the card in slot 2 will have ID 2, and so on. If the card in slot 1 is then moved to slot 4, the card ID will then be 4.

38. **[SIDn]**

This command sets all the cards installed in the MultiTasker system to the same card ID. After sending this command, all cards will be addressed with the same ID. Use caution when sending this command to a system with multiple board types.

Command Format: [SIDn]

n = Card ID (n = # from 1 to 99)

Example:

Send the command [SID1] to the system. All the cards in the system now have ID 1. Any commands that are sent to card ID 1 will be received and executed by each card.

39. **[SIDnCi]**

This command sets the card ID of a single card to a number from 1 to 99.

Command Format: [SIDnCi]

n = Card ID (n = # from 1 to 99)
Ci = Slot Number (i = # from 1 to max slots)

Example:

Send the command [SID50C10] to set the ID of the card in slot 10 to an ID of 50.

40. **[SID+]**

This command sets the card ID of all the cards in a system to their slot number plus the offset value.

Command Format: [SID+n]

n = Offset amount (n = # from 0 to 99)
The maximum card ID is 99, so subtract the highest slot number from 99 to find the maximum offset. For example, in an 8-slot enclosure, the maximum offset would be 91. The slot number (8) plus the offset (91) equals 99.

Example:

There are two 20-slot enclosures to be connected together during normal operation. The first unit will use the default IDs where the card ID is equal to the slot number. The second unit will have the same unit ID, but each card ID will be offset by 20.

Connect the computer to the second unit only and send the command [SID+20] to set the ID of all the cards in the second enclosure to their slot number plus 20. Reconnect both units to the computer.

The cards in the first unit will be referenced as card IDs 1-20 and the cards in the second unit will be referenced by card IDs 21-40.

41. **[RSN]**

This command displays the slot number of a card with a specified ID number. If more than one card has the same ID, each slot number will be displayed.

Command Format: [RSNCi]

Ci = Card ID (i = # from 1 to 99)

Example:

The card in slot 4 takes up four slots in the enclosure. Its ID was set to 1 since it is the first card installed in the system, reading from left to right. Send the command [RSNC1] to find the slot number of this card. The system responds with the following feedback:

[4]

Group Commands

Group commands allow several cards with the same functions to be controlled simultaneously with a single command. Up to 8 groups (G1-G8) may be defined. These commands apply to all cards, not only the MT109-100.

42. **[WR]**

This command adds cards to a group. In MultiTasker systems with audio and video cards, the groups are typically as follows:

Group 1 = Video Cards
Group 2 = Audio Cards
Group 3 = Video and Audio Cards

Command Format: [WRCn1Cn2…Gk]

Cn = Card ID (n = slot # from 1 to max slots)

Gk = Group ID (k = # from 1-8)

Example:

Add C2, C4, and C6 to G5 by sending the command [WRC2C4C6G5]. After executing this command, G5 will consist of C2, C4, and C6. Next, add C8 to G5 by sending [WRC8G5]. C8 is added to G5, and G5 is not overwritten. View the contents of G5 by sending [RDG5] and receiving the following feedback:

[G5=C2C4C6C8]

43. **[RMC]**

This command removes one or more cards from a group.

Command Format: [RMCn1Cn2…Gk]

Cn = Card ID (n= # from 1 to max slots)

Gk = Group ID (k = # from 1-8)

Example:

G5 consists of C2, C4, C6, and C8. Remove C6 and C8 by sending [RMC6C8G5]. View the contents of G5 by sending [RDG5] and receiving the following feedback:

[G5=C2C4]

44. **[RMG]**

This command deletes one or all groups.

Command Format: [RMGk]

Gk = Group ID (k = # from 1-8, * for all)

Example:

Remove all cards from G5 by sending [RMG5]. The system will return the following feedback:

[G5=0]

Example 2:

Remove all cards from all groups, effectively deleting all groups, by sending [RMG*]. The system will return the following feedback:

G1-G8: EMPTY

45. **[RD]**

This command reads and then displays the members in a group.

Command Format: [RDGk]

Gk = Group ID (k = # from 1-8)

Example:

C2, C4, and C6 make up G5. Read the member data for G5 by sending the command [RDG5]. The system will return feedback as follows:

[G5=C2C4C6]

The feedback shows G5 and then the cards that make up G5. In this case, G5 includes C2, C4, and C6.

7.3 Summary of Commands

Basic Commands

1)	[VER]	Display firmware version
2)	[C]	Display card status
3)	[CnS]	Save card settings
4)	[CLR]	Reset card to defaults
5)	[TEST]	Test internal memory ICs
6)	[HELP]	Display available commands

Feedback Commands

7)	[FBD]	Feedback delay on/off
8)	[?]	Display system cards
9)	[?C]	Display card information
10)	[STA1]	Auto-feedback on
11)	[STA0]	Auto-feedback off
12)	[...F]	Display OK after command

Card Control Commands

13)	[…S]	Save command configuration
14)	[ONm]	Select the active input
15)	[ON]	Enable output
16)	[OFF]	Disable output
17)	[MUT0]	Enable output
18)	[MUT1]	Disable output
19)	[…P]	Set the path, preload for [SW]
20)	[SW]	Switch preloaded output buffer
21)	[+]	Increment value by one
22)	[-]	Decrement value by one
23)	[SEL]	Select output volume to adjust
	[SELm]	Select input level to adjust
24)	[+O]	Increment output volume
25)	[-O]	Decrement output volume
26)	[+I]	Increment input gain
27)	[-I]	Decrement input gain
28)	[VLO]	Set output volume level
29)	[VLI]	Set an input level

Volume Ramping Commands

30)	[RUP]	Ramp volume UP to 32
31)	[RUP=]	Ramp volume UP to a value
32)	[RDN]	Ramp volume DOWN to 1
33)	[RDN=]	Ramp volume DOWN to a value
34)	[RAMP]	Return ramp rate
35)	[RAMP=]	Set ramp rate
36)	[RST]	Stop ramping

ID Commands

37)	[RSI]	Reset Card IDs to defaults
38)	[SIDn]	Set all Card IDs
39)	[SIDnCi]	Set one Card ID
40)	[SID+]	Set all Card IDs to an offset
41)	[RSN]	Display card slot number

Group Commands

42)	[WR]	Add card(s) to a group
43)	[RMC]	Remove card(s) from group
44)	[RMG]	Delete group
45)	[RD]	Display group members

7.4 Menu Mode

Menu Mode commands allow virtually the same functionality as programming commands. Unlike the programming commands in the previous sections, menu commands prompt the user to select from a list of available options and the system responds based upon user selections.

7.4.1 Menu Command Definitions

Refer to section 7.2 for details on card functions and examples.

Menu	Command
Control	
Select	n/a
Save	[CnS]
Clear	[CLR]
Switch	[ON]
Volume	[VLO], [RUP], [RDN], [RST]
Mute	[MUT0], [MUT1], [OFF], [ON]
Setup	
Group	[WR], [RM]
Input Volume	[VLI]
Ramp Time	[RAMP]
Status	[VER], [C]
Help	[HELP]

7.4.2 Using Menu Mode

Do NOT press any keys except those relating to the current menu. If you press the ENTER key after entering a letter or digit, the original list of systems will be displayed.

1. In order to enter Menu Mode, the system needs to be connected to a computer running RS-232 control software.
2. In the Terminal Window, press the ENTER key on the keyboard.
3. The system checks all MultiTaskers on the RS-232 bus and displays a list of available systems.

   Example: 1: U1
   2: U2
   3: U3
4. Enter the ID number of the desired system. In the example above, enter a "1" for the MultiTasker with unit ID 1.
5. The system then interrogates all the cards available in its enclosure and displays a list of available cards.

   Example: 01: MT103-122
   02: MT103-123
   04: MT109-100
6. Enter the 2-digit ID and a menu for the card will be displayed. In the example above, enter "04" for the MT109-100.
7. The system prompts for selections specific to the selected card.
8. Read each menu carefully, and continue selections as prompted.

NOTE: Menus for data entry have two prompts: "Key=" and "ESC" (escape). Enter the selection at the "Key=" prompt, or press escape to return to the previous menu.

7.4.3 Menu Types

1. Main Menu

   The first menu displayed after selecting the card is the Main Menu. This menu provides access to the key functions related to the card. Press the key representing the menu item for access and a sub-menu will appear.

2. Sub-Menus

   Each menu item will display either a sub-menu, or a list of options. Press the key corresponding to the desired choice.

7.4.4 MT109-100 Menus

Following are the menus available to the MT109-100. The first menu is the Main Menu only. The second listing is an expanded view of the Main Menu.

Subsequent menus can contain values that indicate the current setting or value of a parameter. The value is usually in parentheses, or otherwise indicated at the top of a sub-menu.

Caution: Pay special attention to the top of the Control menu. After selecting the Control menu, This Card or a group will be identified at the top of the sub-menu. Since group functions may be modified from this menu, make sure the desired card or group is selected.

MT109-100 Main Menu

PRESS KEY TO SELECT

1: CONTROL

2: SETUP

3: STATUS

4: HELP

ESC: GO BACK

MT109-100 Menus

1: CONTROL
- SELECT CARD/GROUP
- SAVE
- CLEAR
- SWITCH
- VOLUME
- MUTE

2: SETUP
- SET GROUP
- SET INPUT VOLUME
- SET RAMP TIME

3: STATUS

4: HELP

7.4.5 Menu Mode Examples

All Menu Mode examples assume an MT109-100 is installed in slot 4 of unit ID 1.

Note: The communication software you use may echo each character as it is typed when entering numeric values (not selecting menu items). For example, entering a value of 03 may appear as 0033 on the screen.

1. Select An Input

Follow the keystrokes below to select Input 3 as the source input.

Enter	List available systems
1	Select unit ID 1
04	Select MT109-100 in slot 4
1	Select Control Menu
1	Select Card/Group Select
0	Select This Card (card #1) The Control menu will read This Card at the top.
ESC	Return to Control menu
4	Select Switch sub-menu
3	Select Input 3
ESC	Return to Control Menu
ESC	Return to the Main Menu

2. Set Input 3 Gain Level

Start from the Main Menu and set Input 3 gain level to 16. Follow the keystrokes below.

2	Select Setup Menu
2	Select Set Input Volume
3	Select Input 3 Volume
16	Enter 16
	Note: The system may echo the 1 and the 6 entries depending on the software settings.
ESC	Return to Setup
ESC	Return to the Main Menu

3. Set Output Volume

Start from the Main Menu and set the output volume level to 16 using the keystrokes below.

1	Select Control Menu
5	Select Volume
1 or 2	Use "1" to increase and "2" to decrease until the desired level is obtained.
ESC	Return to Control menu
ESC	Return to the Main Menu

4. Set Ramp Time

Start from the Main Menu and set the ramp time to 10 seconds using the keystrokes below.

2	Select Setup Menu
3	Select Set Ramp Time
4	Select Ramp Time = 10 seconds
ESC	Return to Setup menu
ESC	Return to the Main Menu

5. Display Card Status

Start from the Main Menu and follow the keystrokes below.

3	Display card status
Note:	*The status will be displayed, followed by the Main Menu being redisplayed.*

8. Troubleshooting Guide

We have carefully tested and have found no problems in the supplied MT109-100; however, we would like to offer suggestions for the following:

8.1 LED is Not Lit

Cause 1: The card is not plugged in.

Solution: Plug the card in all the way. If the LED turns on, the problem is solved. If the LED is still not on, see Cause 2.

Cause 2: The card is not plugged in all the way.

Solution: Push the card in all the way. If the LED is still not on, see Cause 3.

Cause 3: The card cage slot has a problem.

Solution 1: Test the card in other slots of the card cage. If the slot was damaged, the card may work in other slots. If other slots work and the LED turns on, the problem is the card cage slot. The card cage may require service. Please, call ALTINEX at (714) 990-2300. If the other slots do not work and the LED is still not lit, see Solution 2.

Solution 2: Take any other known good card with an LED and verify that the slot used is good by seeing if the other card's LED lights in that slot. If it lights, then the original card may be the source of the problem. Please, call ALTINEX at (714) 990-2300.

8.2 No Sound

Cause 1: The source has a problem.

Solution: Check the source and make sure that it is working at an appropriate volume level and all source connections are correct. If the source is working and there is still no sound, see Cause 2.

Cause 2: The proper card input may not be selected.

Solution: Select the card input that is used by RS-232 accessible commands in section 7. If no sound is present, see Cause 3.

Cause 3: Cable connections to the destination are incorrect.

Solution: Make sure that cables are connected properly. Also, make sure that the continuity and wiring are good. If there is still no sound present, see Cause 4.

Cause 4: The destination amplifier has a problem.

Solution 1: Make sure that the destination amplifier is powered. If there is still no sound, see Solution 2.

Solution 2: Set the volume of the destination amplifier to a reasonable level. If there is still no sound, call ALTINEX at (714) 990-2300.

8.3 Sound Distortion

Cause 1: The source level is above 1 Vp-p.

Solution: Make sure that the source level is below 1 Vp-p. If the sound is still distorted, see Cause 2.

Cause 2: The destination amplifier provides excessive amplification.

Solution: Make sure that the source signal level is high enough so that the destination amplifier does not have to provide excessive amplification and thereby distort the signal. If there is still sound distortion, call ALTINEX at (714) 990-2300.

8.4 Sound Level is Low

Cause 1: Input volume is low.

Solution 1: Turn up the source volume. If the sound level is still low, see Solution 2.

Solution 2: Turn up the destination amplifier volume. If the sound level is still low, see Cause 2.

Cause 2: Poor signal transmission.

Solution: Check the cables for continuity and make sure that connections are wired properly to verify that there is good signal transmission.

Note: Test the system by removing the MT109-100 card from between the source and the destination amplifier. If the problem persists, call ALTINEX at (714) 990-2300.