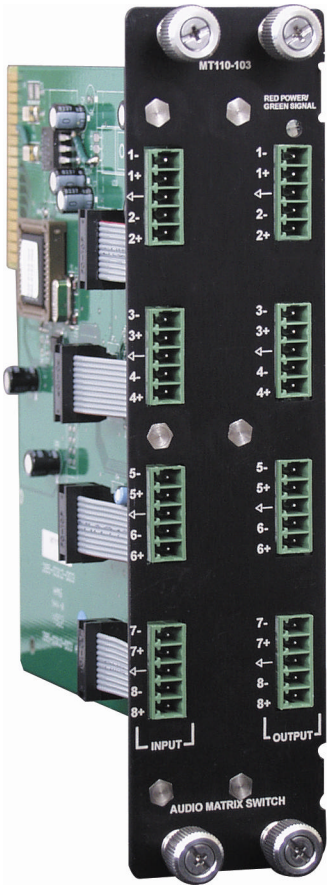

MultiTasker®

MANUAL PART NUMBER: 400-0197-006

MT110-103

8 X 8 MONO AUDIO MATRIX SWITCHER CARD USER'S GUIDE

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PRECAUTIONS / SAFETY WARNINGS 1

Please read this manual carefully before using your **MT110-103** and keep it handy for future reference. These safety instructions are to ensure the long life of your **MT110-103** and to prevent fire and shock hazards. Please read them carefully and heed all warnings.

1.1 GENERAL

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

1.2 HANDLING

- Handle the **MT110-103** carefully. Dropping or jarring can damage the card.
- The **MT110-103** contains components that are 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 **MT110-103** in direct sunlight, near heaters, or heat-radiating appliances, or near any liquid. Exposure to direct sunlight, smoke, or steam can harm internal components.
- Do not pull any cables that are attached to the **MT110-103**.

1.4 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.

1.5 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 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.

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ABOUT YOUR MT110-103 2

MT110-103
8X8 Mono Audio Matrix Switcher

The **MT110-103** is a Balanced Audio Matrix Switching Card. This card allows any input to be independently switched to any or all of the outputs. All inputs and outputs can be wired for unbalanced audio, or they can be wired for balanced audio allowing longer cable runs and superior noise resistance. Additionally, the **MT110-103** has variable gain for each output.

As a "transparent" distribution amplifier, this card utilizes AC coupling on its inputs for ideal signal transfer characteristics. Switching is controlled with easy-to-use ASCII commands from a control system or computer connected to the RS-232 port of a MultiTasker enclosure or from the keys programmed on the front panel of the MultiTasker. Each card uses two slots in a MultiTasker enclosure, and all input and output connections are accomplished via captive-screw terminal blocks.

Although designated as an 8x8 matrix switcher, the **MT110-103** can be used in a variety of ways to provide different capabilities. For example, one 8x8 card can handle mono audio while two 8x8 cards handle stereo audio, or a single 8x8 card can be used to create a 4x4 stereo audio matrix.

The HelpInside™ feature allows programmers to have access to command structures and control of the **MT110-103** from any terminal using the [HELP] command. In conjunction with ALTINEX's unique command structure, HelpInside™ provides easier-than-ever control of MultiTasker cards with simple keyboard commands. No typing of long keyboard strings is necessary.

TECHNICAL SPECIFICATIONS 3

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

FEATURES/ DESCRIPTION	MT110-103
GENERAL	
Inputs	
Input Connectors	(4) 5-pin Terminal Blocks
Outputs	
Output Connectors	(4) 5-pin Terminal Blocks
Compatibility	Stereo or Mono Audio

Table 1. **MT110-103** General

MECHANICAL	MT110-103
Enclosure Slots Required	2
Weight	1.0 lb (0.45 kg)
Connector Panel	Black
T° Operating	10°C-35°C
T° Maximum	0 to 50°C
Humidity	90% non-condensing
MTBF (calc.)	40,000 hrs

Table 2. **MT110-103** Mechanical

ELECTRICAL	MT110-103
Input Signals	
Max Level	0 dBu
Impedance	10kΩ
Audio Throughput	
Gain	0 dB unbalanced, 6 dB balanced.
Frequency Response	20 Hz to 20 kHz ±0.05 dB
Output Signals	
Level	1 Vp-p max.
Impedance	Low – drives 600Ω
Gain	0 dB ±0.5 dB
Power (from enclosure)	
+6V	200 mA (1.2 W)
-6V	100 mA (0.6 W)
Total Power	1.8W

Table 3. **MT110-103** Electrical

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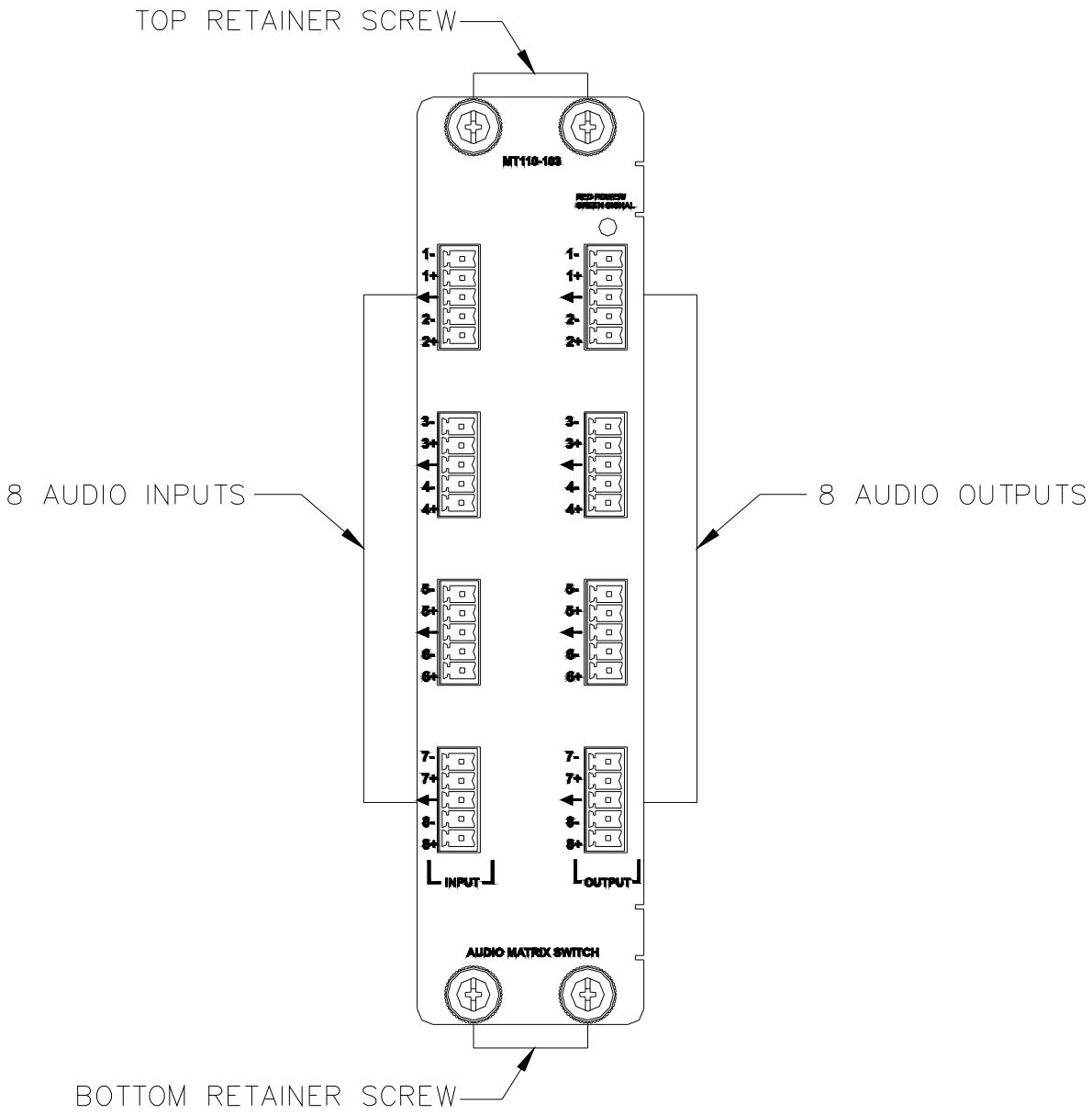
PRODUCT DESCRIPTION 4



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APPLICATION DIAGRAMS 5

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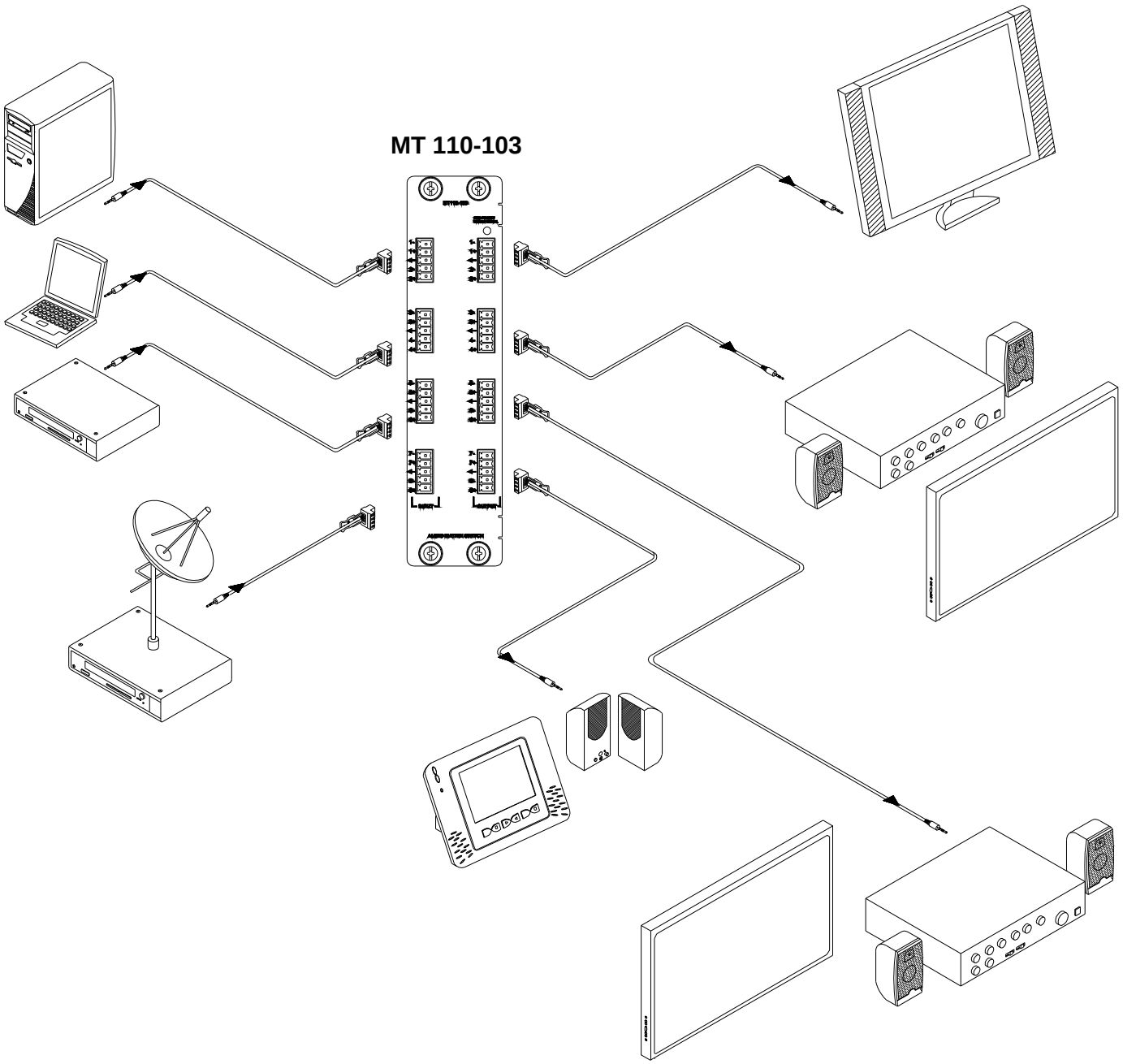

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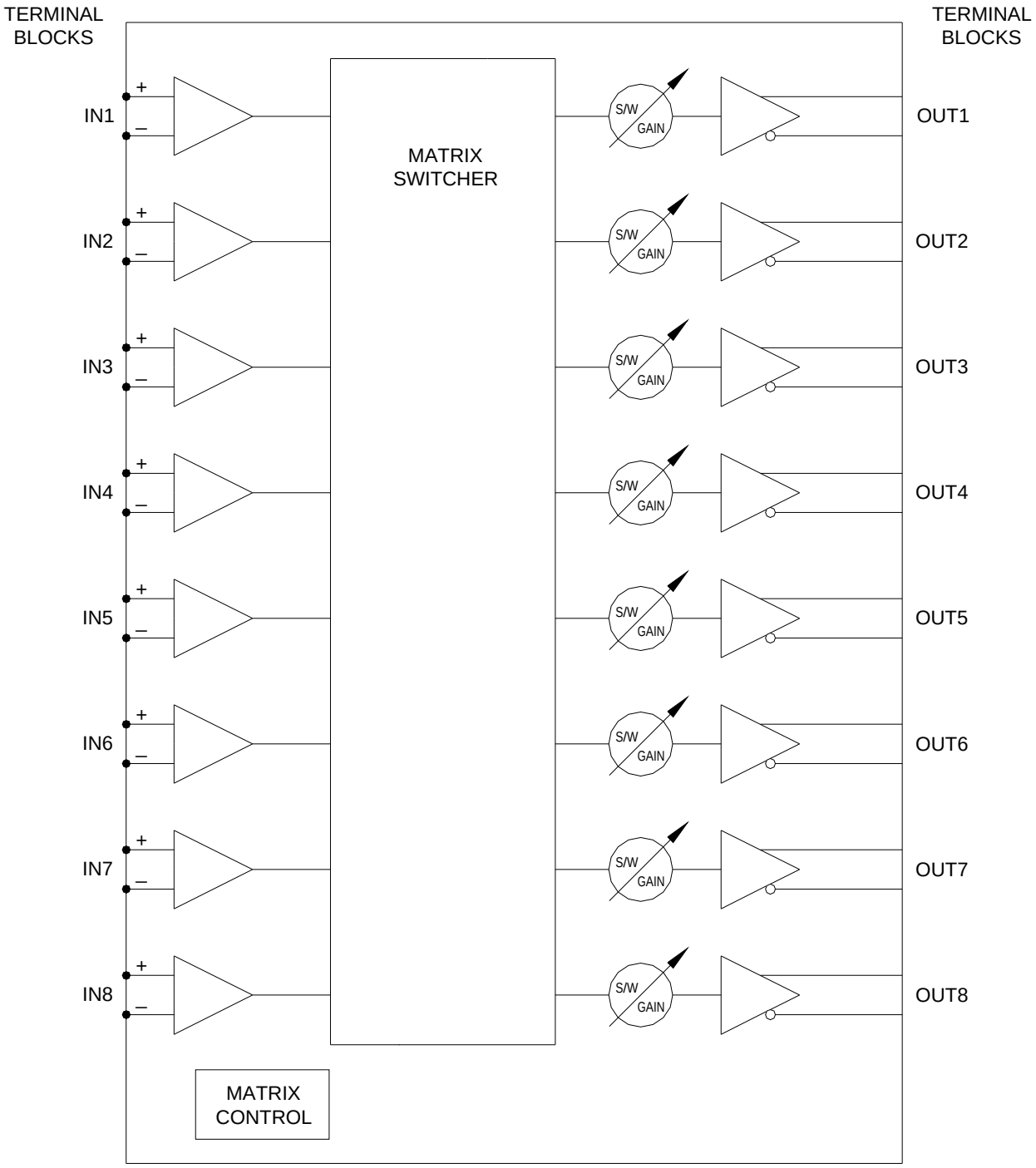
DIAGRAM 2: INTERNAL VIEW



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INSTALLING YOUR MT110-103 6

Step 1. Turn off power to the MultiTasker enclosure.

Step 2. Slide the **MT110-103** into an available slot in the MultiTasker enclosure in order to connect to the bus. Make sure that the **MT110-103** card fits into place. Secure the card to the MultiTasker by tightening the retainer screws located on the top and bottom of the card.

Step 3. Connect audio cables from the audio sources to the input connectors of the **MT110-103**. Connect the output connectors of the **MT110-103** to the audio equipment through high-quality audio cable.

Step 4. Starting from the left, identify the slot number where the **MT110-103** card is plugged into the enclosure and note that it is for RS-232 control.

Step 5. Turn on power to the MultiTasker enclosure.

Step 6. The LED on the card panel will turn red indicating that the card is in full operation.

OPERATION 7

7.1 RS-232 CONTROL

The **MT110-103** has many advanced remote-control capabilities accessible through standard RS-232 communication. Control may be accomplished through a computer, control system, or any device capable of RS-232 communication.

7.1.1 RS-232 INTERFACE

The control commands for the **MT110-103** 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 will be 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" will still be executed, but will not be restored when the system is reset or powered off, then on.

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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 command 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 will perform the given instruction.

NOTE: In this guide, cards are referenced by their IDs (C1, C2...C99). Typically, the ID number will be equivalent to the slot number. Groups will be referenced by their IDs (G1-G8).

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

The unit ID has a range from U0 to U20. U0 should be used for single unit operation. If the ID is set to U0, each command may be used without Ui. Use the command [SETU0], as explained in the MT101-101 User's Guide.

Example:

[VERC3]: For U0

[VERC3Ui]: For ID other than U0

[VERC3]: Equivalent to [VERC3U0]

COMMAND ORGANIZATION

The RS-232 commands in this section are organized into the following 5 categories:

Basic Commands

Feedback Control

Card Control

Volume Ramping Controls

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 [VERC4] to check the version of the **MT110-103** in slot 4. The system will return the following feedback:

   [MT110-103 690-0152-011 C04]

   MT110-103 = model number

   690-0152-011 = software version

   C04 = card ID

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2. **[C]**

   This command receives the status of the card.

   Command Format: [Cn]

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

   Example:

   There is an **MT110-103** card in slot 4. Sending the command [C4] to the MultiTasker will yield feedback similar to the following:

   CONFIGURATION:

   Matrix:8x8, In-Offset=0, Out-Offset=0

CONNECTION	OUTPUT VOLUME
In01-Out01 ON	32/32
In02-Out02 ON	32/32
In01-Out03 ON	32/32
In01-Out04 ON	32/32
In01-Out05 ON	32/32
In01-Out06 ON	32/32
In01-Out07 ON	32/32
In01-Out08 ON	32/32

   In this example, Input 1 is connected to all outputs except for Output 2, which is connected to Input 2. All outputs are turned on.

   The volume level for each output is shown next to its connection. The maximum level is 32 out of 32 which is equal to a gain of one.

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

3. **[CnS]**

   This command saves the input to output connections, on/off status and output volume settings for each output. The saved configuration will be restored after the system is reset or powered off, then on.

   Command Format: [CnS]

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

   S = Save configuration

   Example:

   If Input 1 is connected to all outputs, but only 1 through 4 are on, the feedback after sending the command [C4S], for slot 4, would be similar to the following:

   CONFIGURATION:

   Matrix:8x8, In-Offset=0, Out-Offset=0

CONNECTION	OUTPUT VOLUME
In01-Out01 ON	32/32
In01-Out02 ON	32/32
In01-Out03 ON	32/32
In01-Out04 ON	32/32
In01-Out05 OFF	32/32
In01-Out06 OFF	32/32
In01-Out07 OFF	32/32
In01-Out08 OFF	32/32

   [SAVED]

4. **[…S] – SAVE**

   This command saves the configuration command being sent in memory. When sending the command [I1O1C4S], after reset or power up, Input 1 will be connected to Output 1 on C4. This command only saves the Input 1 to Output 1 connection above. In order to save all the current settings, use the [CnS] command.

5. **[CLR]**

   This command clears the card, restoring the default settings. In this case, Input 1 to all outputs, all outputs on and all input levels to maximum.

   Command Format: [CLRCn]

   Cn = Group ID (n = # from max slots)

   Example:

   Clear the card in slot 4 by sending [CLRC4]. The card in slot 4 is now set to its default values.

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6. **[TEST]**

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

   Command Format: [TESTCn]

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

   Example:

   Test the internal memory of the **MT110-103** in slot 4 by sending [TESTC4]. The card will respond with feedback similar to the following:

   MEMORY IS GOOD

   Otherwise, failures would be indicated in the feedback from the card.

7. **[HELP]**

   This command displays information available for the MultiTasker interface commands.

   Command Format: [HELPCn]

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

   Example:

   In order to display the RS-232 commands available for the **MT110-103** card in slot 4, send the command [HELPC4]. The commands along with a brief description will be displayed.

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.

8. **[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.

9. **[?]**

   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 MT110-103. Send the command [?U1] and receive the following feedback:

   [(MT101-101U1)(MT103-122C01)
   (MT103-123C02)(MT110-103C04)]

   MT101-101U1 = Panel number/unit ID
   MT103-122C01 = MT103-122 is in slot 1
   MT103-123C02 = MT103-123 is in slot 2
   MT110-103C04 = MT110-103 is in slot 4

10. **[?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 MT110-103 in slot 4 has Input 1 connected to all outputs and all outputs are on. Send the command [?C4] to receive feedback status similar to the following.

    [(MT110-103C04)(VR690-0152-011C04)
    (ON11111111C04)(MA0101010101010101C04)
    (MX8x8C04)(VO32323232323232C04)
    (MU0C04)]

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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.

MT110-103	= Card model number
VR690-0152-011	= Firmware version
ON1111111	= Output ON/OFF status
MA01010101...01	= Matrix connections
MX8x8C04	= Matrix configuration
VO323232...32	= Output volume settings
MU0C04	= Mute status

The ON/OFF status line is read from left to right as Outputs 1-8. A "1" indicates the output is on and a "0" indicates the output is off.

The matrix connections are also read left to right representing Outputs 1-8 and the input to which each is connected. The first two digits show the input number to which Output 1 is connected. The third and forth digits are for Output 2 and so on.

The matrix configuration is the size of the matrix. In this case, the matrix has 8 inputs and 8 outputs.

The output volume settings are read left to right representing Outputs 1-8 and the volume to which each is set. The first two digits show the volume level for Output 1. The third and forth digits are for Output 2 and so on.

11. **[STA1]**

This command enables automatic feedback from the front panel. The command affects any card with auto-feedback capability, not just the **MT110-103**. 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
ON	Output on/off status
MA	Matrix connections
MX	Matrix configuration
VO	Output volume
MU	Mute

Example:

Command = [I1O*C4]

Feedback = (MA01010101010101C04)

MA	= Matrix connections
0101...01	= Input 1 to all outputs
C04	= Card ID/slot number

12. **[STA0]**

This command disables automatic feedback from the card and front panel. The command affects any card with auto-feedback capability, not just the **MT110-103** card**.** The default at power on or reset is STA0, OFF.

Command Format: [STA0]

13. **[…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.

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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.

14. **[MATmXy]**

The matrix command allows the matrix switcher to be setup for different matrix sizes. The following tables show how the inputs and outputs will be configured when the matrix is changed. The input and output layouts are as viewed from the front of the card.

Example:

In the 4x4 configuration, when Input 1 is connected to Output 4, the entire channel, 1a and 1b, will be switched to Outputs 4a and 4b respectively.

Command Format: [MATmXyCn]

m = number of inputs (m = 8, 4 or 2)

y = number of outputs (y = 8, 4 or 2)

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

8 x 8	
INPUTS	**OUTPUTS**
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8

4 x 4	
INPUTS	**OUTPUTS**
1 a	1 a
1 b	1 b
2 a	2 a
2 b	2 b
3 a	3 a
3 b	3 b
4 a	4 a
4 b	4 b

2 x 2	
INPUTS	**OUTPUTS**
1 a	1 a
1 b	1 b
1 c	1 c
1 d	1 d
2 a	2 a
2 b	2 b
2 c	2 c
2 d	2 d

15. **[ON]**

This command will enable an output of a single card, or a group of cards.

SINGLE CARD OPERATION

Command Format: [ONmCn]

m = Output No. (m = # from 1 to 8)

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

Example:

There is an **MT110-103** card in slot 4. All of the outputs on the card are off.

1) [ON1C4]: Turn on only Output 1 of the **MT110-103** card.

2) [ONC4]: Turn on all outputs of the **MT110-103** card.

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GROUP OPERATION

This command enables one or all outputs for all cards in a group.

Command Format: [ONmGk]

m = Output number (m = # from 1-8)

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

Example:

Turn on Output 1 for all cards in Group 1 by sending [ON1G1]. See the GROUP commands for a detailed explanation.

PATH OPERATION

The path for outputs on the same or multiple cards may be preloaded. This will set the path for the output, but it is not active until the switch command, [SW], is executed. Commands ending in "P" are not executed immediately.

Command Format: [ONmCnP]

m = Output No. (m = # from 1 to 8)

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

P = Path

Example:

An **MT110-103** card is in slot 4 and another in slot 8. Enable Output 1 of C4 and Output 3 of C8 simultaneously by sending the following:

[ON1C4P]

[ON3C8P]

[SW]

16. **[OFF]**

This command disables one or all outputs of a single card or a group of cards.

SINGLE CARD OPERATION

Command Format: [OFFmCn]

m = Output No. (m = # from 1 to 8)

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

Example:

C4 has Output 1 turned on. The following commands may be used to turn off the input.

1) [OFF1C4]: Turn off only Output 1.

2) [OFFC4]: Turn off all outputs.

GROUP OPERATION

This command disables one or all outputs for all cards in a group.

Command Format: [OFFmGk]

m = Output No. (m = # from 1-8, * for all)

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

Example:

1. [OFF1G1]: Turn off Output 1 for each card in Group 1.

2. [OFFG1]: Turn off all outputs for each card in Group 1.

PATH OPERATION

This command will set the path for the output, but it is not active until the switch command, [SW], is executed. Commands ending in "P" are not executed immediately. The path for outputs on multiple cards or the same card may be preloaded.

Command Format: [OFFmCnP]

m = Output (m = # from 1 to 8, * for all)

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

P = Path

Example:

There are two **MT110-103** cards in slots 4 and 8. Disable Output 1 of C4 and Output 3 of C8 simultaneously using the following commands:

[OFF1C4P]

[OFF3C8P]

[SW]

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17. **[IO]**

This command connects a single input to a single output in the current matrix configuration.

Command Format: [ImOxCn]

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

x = Output (x = # from 1 to 8)

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

Example:

Connect Input 1 to Output 1 for the **MT110-103** in slot 4. Send the command [I1O1C4] and Input 1 will be connected to Output 1.

18. **[IO*]**

This command connects a single input to all the outputs in the current matrix configuration.

Command Format: [ImO*Cn]

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

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

Example:

Connect Input 1 to all outputs for the **MT110-103** in slot 4. Send the command [I1O*C4] and Input 1 will be connected to all outputs.

19. **[…P] – PATH**

This command will set the path for the output, but it is not active until the switch command, [SW], is executed. Commands ending in 'P' are not executed immediately. The path for outputs on multiple cards or the same card can be preloaded. See the examples for the [ON] and [OFF] commands.

20. **[SW] – SWITCH**

This command immediately connects inputs and outputs previously set with the PATH command. The command switches all paths set on this card and all other cards in the enclosure. See the examples for the [ON] and [OFF] commands.

21. **[OSI]**

This command sets the input offset value that is applied to all inputs. The default is zero, or Input 1 equals Input 1.

Command Format: [OSImCi]

m = Offset (m = # from 0 to 128)

Ci = Card ID (i = # from 1 to max slots)

Example:

[OSI16C4] sets the input offset to 16 for C4. The inputs on C4 will now be their physical number plus the offset value. In this case, Input 1 would now be Input 17.

22. **[OSO]**

This command sets the output offset value that is applied to all outputs. The default is zero, or Output 1 equals Output 1.

Command Format: [OSOmCi]

m = Offset (m = # from 0 to 128)

Ci = Card ID (i = # from 1 to max slots)

Example:

[OSO16C4] sets the output offset to 16 for the C4. The outputs on C4 will now be addressed by the value of their physical number plus the offset value. In this case, Output 1 would now be Output 17.

23. **[VLO]**

This command sets the absolute volume level for a given output.

Command Format: [VLOmAvCn]

m = Output (m = # from 1 to 8)

v = Volume Level (v = # from 1 to 32)

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

Example:

There is an **MT110-103** card in slot 4. Set the output volume of Output 2 to 16 by sending the command [VLO2A16C4].

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24. **[SEL]**

This command is the output select command. It sets the path to adjust the output volume level for the current matrix. It is used in conjunction with the [+] and [-] commands.

Command Format: [SELmCn]

m = Output No. (m = # from 1 to 8)

Cn = Card ID/slot number

Example:

An **MT110-103** is in slot 4. Adjust the volume on Output 2. The current value is 10, but after sending the following commands, a level of 15 is obtained:

1. [SEL2C4]
   The current output 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.

25. **[+]**

This command increments a selected property to be adjusted from the keyboard or front panel.

Command Format: [+]

[+] = Increment level by one-step

Example:

See the [SEL] command example.

26. **[-]**

This command decrements a selected property to be adjusted from the keyboard or front panel.

Command Format: [-]

[-] = Decrement level by one-step

Example:

See the [SEL] command example.

27. **[MUT0]**

This command turns on the all the outputs without changing other settings.

Command Format: [MUT0Cn]

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

Example:

Send the command [MUT0C4] to enable the outputs for C4.

28. **[MUT1]**

This command turns off all the outputs without changing other settings.

Command Format: [MUT1Cn]

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

Example:

Send the command [MUT1C4] to mute all the outputs for C4.

VOLUME RAMPING COMMANDS

The following commands are used to control the volume of the **MT110-103**. They may be used with computer control or from the front panel with the {SETVK} command. 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, subroutine 8 starts ramping up when key 8 is pressed. Subroutine 10 starts ramping down when key 10 is pressed. Subroutine 108 stops ramping when either key is released.

Since there are multiple outputs on this card, the output to ramp must first be selected using the [SEL] command. For example, send [SEL2C4] and then [RDNC4] to ramp down the volume level on Output 2 of C4. Then, send the [SEL2C4] and [RUPC4] commands to ramp the level back up.

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{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.

29. **[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 volume on Output 1 from 10 to the maximum of 32 for C4. Send the commands [SEL1C4] then [RUPC4] and the system will respond with the following feedback:

[11][12][13][14]…[32]

30. **[RDN]**

This command ramps the output volume down to a level of 00 at a rate defined using the [RAMP] command.

Command Format: [RDNCn]

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

Example:

Ramp the volume on Output 1 from a starting level of 32 down to 00 for C4. Send the commands [SEL1C4] then [RDNC4] and the system will respond with the following feedback:

[31][30][29]…[00]

31. **[RUPm]**

This command ramps up the volume for the specified output. The ramping continues to its maximum level at the rate defined using the [RAMP] command. The ramping may be stopped at any time using the [RST] command.

Command Format: [RUPmCn]

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

m = Output No. (n = # from 1 to 8)

Example:

Ramp the volume for Output 2 from a starting level of 10 to the maximum level of 32 for C4. Send the command [RUP2C4] and the system will respond with the following feedback:

[11][12][13][14]…[32]

32. **[RUPm=xx]**

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

Command Format: [RUPm=xxCn]

m = Output No. (m = # from 1-8)

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

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

Example:

Ramp the volume on Output 7 from a starting level of 1 to a level of 20 for C4. Send the command [RUP7=20C4] and the system will respond with the following feedback:

[02][03][04]…[20]

33. **[RDNm]**

This command ramps down the volume for the specified output. The ramping continues to its minimum level at the rate defined using the [RAMP] command. The ramping may be stopped at any time using the [RST] command.

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Command Format: [RDNmCn]

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

m = Output No. (n = # from 1 to 8)

Example:

Ramp the volume for Output 8 from a starting level of 32 down to 00 for C4. Send the command [RDN8C4] and the system will respond with the following feedback:

[31][30][29]…[00]

34. **[RDNm=xx]**

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

Command Format: [RDN=xxCn]

m = Output No. (xx = # from 1-8)

xx = Stop Level (xx = # from 00-32)

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

Example:

Ramp the volume for Output 8 from a starting level of 32 down to 16 for C4. Send the command [RDN8=16C4] and the system will respond with the following feedback:

[31][30][29]…[16]

35. **[RST]**

This command stops ramping and maintains the last volume setting. It can be used as a stand-alone command, or as a volume key on the front panel. As a volume key, the ramping action begins when the key is depressed and then stops when the key is released. See the code sample at the beginning of the volume ramping section.

Command Format: [RSTCn]

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

Example:

The card in slot 4 is ramping from 1 to 32 at a rate of 32 steps in 18 seconds. Send the command [RSTC8] and the card will stop ramping. The last displayed volume setting will remain the current volume level.

36. **[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

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37. **[RAMP=x]**

This command sets the ramp rate for 32 steps. The range is from 4s to 18s, in 2s steps.

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:

Send the command [RAMP=16C4] to set the ramp rate to 16 seconds. Ramping will occur at a rate of 32 steps in 10 seconds, or 0.50 seconds per step. Confirm the setting by sending [RAMPC4] and receiving the feedback:

RAMP TIME = 16 SECONDS

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.

38. **[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.

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39. **[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.

40. **[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.

41. **[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.

42. **[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]

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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 **MT110-103**.

43. **[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: [WRCn_1Cn_2…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.

Now 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]

44. **[RMC]**

This command removes one or more cards from a group.

Command Format: [RMCn_1Cn_2…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]

45. **[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 G52 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

46. **[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.

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7.3. SUMMARY OF COMMANDS

Basic Commands

1) [VER] Display software version
2) [C] Display card status
3) [CnS] Save card settings
4) […S] Save the command being sent
5) [CLR] Reset card to default values
6) [TEST] Test internal memory ICs
7) [HELP] Display available commands

Feedback Commands

8) [FBD] Feedback delay on/off
9) [?] Show system cards
10) [?C] Show card information
11) [STA1] Enable auto feedback
12) [STA0] Disable auto feedback
13) […F] Show command feedback

Card Control Commands

14) [MAT] Set/show matrix configuration
15) [ON] Turn on one or more outputs
16) [OFF] Turn off one or more outputs
17) [IO] Connect an input to output
18) [IO*] Connect an input to all outputs
19) […P] Set the path, preload for [SW]
20) [SW] Switch preloaded output buffer
21) [OSI] Set input offset
22) [OSO] Set output offset
23) [VLO] Set absolute output volume
24) [SEL] Select input volume to adjust
25) [+] Increment volume
26) [-] Decrement volume
27) [MUT0] Output volume ON
28) [MUT1] Output volume OFF

Volume Ramping Commands

29) [RUP] Ramp UP to maximum
30) [RDN] Ramp DOWN to minimum
31) [RUPm] Ramp UP to maximum
32) [RUPm=] Ramp UP to a value
33) [RDNm] Ramp DOWN to minimum
34) [RDNm=] Ramp DOWN to a value
35) [RST] Stop ramping
36) [RAMP] Display ramp rate
37) [RAMP=] Set ramp rate

ID Commands

38) [RSI] Reset Card IDs
39) [SIDn] Set all Card IDs
40) [SIDnCi] Set one Card ID
41) [SID+] Set Card ID offset
42) [RSN] Read Card slot number

Group Commands

43) [WR] Groups multiple cards
44) [RMC] Remove members from group
45) [RMG] Delete group
46) [RD] Displays group members

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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. The system then responds based upon selections made by the user.

7.4.1 MENU COMMAND DEFINITIONS

Refer to section 7.2 for details on card functions and examples. Following is a cross-reference of menu mode sections versus programming commands.

MENU	COMMAND
Control	
Select	[WR]
Save	[CnS]
Clear	[CLR]
On/Off	[MUT0], [MUT1], [OFF], [ON]
In-Out	[IO], [IO*]
Volume	[VOL], [RUP], [RDN], [RST], [RAMP]
Mute	[MUT1], [MUT0], [ON], [OFF]
Setup	
Set Group	[WR]
Matrix	[MAT]
Offsets	[OSI], [OSO]
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: MT110-103
6. Enter the 2-digit ID and a menu for the card will be displayed. In the example above, enter “04” for the **MT110-103**.
7. The system will prompt for selections specific to the selected card.
8. Read each menu carefully, and continue selecting keys as prompted.

NOTE: Menus for data entry have two prompts: “Key=” and “ESC” (escape). Press the escape key to return to the previous menu without making changes.

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.

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7.4.4 MT110-103 MENUS

Following are the menu items available on the **MT110-103**'s Main Menu. The expanded menu contains 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. In some cases, additional comments are provided for clarification and are not part of the menu feedback.

CAUTION: Pay special attention to the top of each 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.

MT110-103 MAIN MENU

PRESS KEY TO SELECT

1: CONTROL

2: SETUP

3: STATUS

4: HELP

ESC: GO BACK

KEY =

7.4.5 MENU MODE EXAMPLES

All Menu Mode examples assume an **MT110-103** 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. Switch Input 2 to Output 1

Follow the keystrokes below to connect Input 2 to Output 1.

Enter	List available systems
1	Select unit ID 1
04	Select **MT110-103** in slot 4
1	Select CONTROL Menu
5	Select IN-OUT control
02	Enter Input 02
01	Enter Output 01
S	Show new status
ESC	Return to CONTROL Menu
ESC	Return to the MAIN Menu

2. Set Ramp Time

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

2	Select SETUP Menu
5	Select Set Ramp Time
4	Select Ramp Time = 10 seconds
ESC	Return to SETUP menu
ESC	Return to the MAIN Menu

3. Display Card Status

Start from the Main Menu and follow the keystrokes below.

3	Displays card status

NOTE: The status will be displayed, followed by the Main Menu being redisplayed.

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TROUBLESHOOTING GUIDE 8

We have carefully tested and have found no problems in the supplied **MT110-103**; however, we would like to offer suggestions for the following:

8.1 LED IS NOT LIT

Cause 1: Card cage is not plugged in.

Solution: Plug card cage in. If the LED lights, the problem is solved. If the LED is still not on, see Cause 2.

Cause 2: 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: 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 lights, the problem is the card cage slot. The card cage may require service. 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. 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 input card 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. DISTORTED SOUND

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

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

Cause 2: The destination amplifier provides excessive amplification.

Solution 1: 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, see Solution 2.

Solution 2: Call ALTINEX at (714) 990-2300.

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8.5. SOUND LEVEL IS LOW

Cause 1: Volume levels are inappropriate.

Solution 1: Turn up the source volume. If 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 **MT110-103** card from between the source and the destination amplifier. If the problem persists, call ALTINEX at (714) 990-2300.

ALTINEX POLICIES 9

9.1 LIMITED WARRANTY/RETURN POLICIES

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

9.2 CONTACT INFORMATION

ALTINEX, Inc.

592 Apollo Street

Brea, CA 92821 USA

TEL: 714 990-2300

TOLL FREE: 1-800-ALTINEX

WEB: www.altinex.com

E-MAIL: solutions@altinex.com

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