MANUAL PART NUMBER: 400-0375-001

MT104-110

8-IN, 1-OUT CAT5 SWITCHER CARD FOR MULTI-TASKER™ ENCLOSURES USER'S GUIDE

ALTINEX

TABLE OF CONTENTS

ALTINEX

SIGNAL
MANAGEMENT
SOLUTIONS

PRECAUTIONS / SAFETY WARNINGS　　1

Please read this manual carefully before using your **MT104-110**. Keep this manual handy for future reference. These safety instructions are to ensure the long life of your **MT104-110** and to prevent fire and shock hazard. 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

- To prevent fire or shock, do not expose this unit to rain or moisture. Do not place the **MT104-110** 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 **MT104-110** carefully. Dropping or jarring can damage the card.

- Do not pull the cables that are attached to the **MT104-110**.

- Insert the card carefully into the slots of the Multi-Tasker™ without bending any edges.

- When removing a card, please make sure that the card to which it is attached is also 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 / CE 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 instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

- Any changes or modifications to the unit not expressly approved by ALTINEX, Inc. could void the user's authority to operate the equipment.

MULTI-TASKER™

MT104-110
8-in 1-out CAT5 Switcher Card

The **MT104-110** is an 8-in, 1-out 4UTP (four twisted pair) switcher card. Eight twisted pair sources may be connected and switched to a single twisted pair output. The four twisted pair signals can be delivered over CAT5, CAT5E, CAT6, or UTP cables.   The **MT104-110** is compatible with Altinex Standard 4TP signal equipment like DA1920SX, DA1930SX and the MT103-115.

The **MT104-110** card uses low power switching relays and offers a bandwidth of 350 MHz, enabling it to pass high-resolution video signals without degradation. Inputs are selected via easy-to-use ASCII commands from a control system or a computer connected to an RS-232 port on Multi-Tasker™ enclosure.

The output may also be switched to ON or OFF via RS-232 control.   The automatic signal detect feature informs the user if a signal is present on the output.

A typical application for this card would be in a boardroom or training room setup. Computer video and audio from multiple sources is transmitted through a CAT5 transmitter like the DA1930CT. The DA1930CT converts the AV signals so they may be sent over the twisted pair cable. Any of these input sources may now be switched to a single output. The switched output signal is then converted back to VGA and Stereo Audio using the DA1931CT receiver.

The cards may also be used to switch standard network connections in your local LAN or audio signals as well.

FEATURES/DESCRIPTION	MT104-110
GENERAL	
Inputs	(8)
Input Connectors	RJ45 Female
Outputs	(1)
Output Connector	RJ45-Female
Compatibility	VGA thru UXGA, Stereo Audio

Table 1. **MT104-110** General

MECHANICAL	MT104-110
Enclosure Slots	One
Weight	0.43lb (0.19kg)
Shipping Weight	1 lb. (0.45kg)
Connector Panel	Black
T° Operating	10°C to 40°C
T° Storage	0°C to 50°C
Humidity	90% non-condensing
MTBF (calc.)	40,000 hrs

Table 2. **MT104-110** Mechanical

ELECTRICAL	MT104-110
Input Signals, CAT-5/6 Twisted Pair	Video/Sync/Audio Signals Altinex Standard
Output Signal, CAT-5/6 Twisted Pair	Video/Sync/Audio Signals Altinex Standard
Bandwidth	350 MHz @ -3dB
Power	
Power from Enclosure	+6V DC (600mA)
Power Consumption	3.6 watt max.

Table 3. **MT104-110** Electrical

ALTINEX

SIGNAL MANAGEMENT SOLUTIONS

PRODUCT DESCRIPTION   4

TOP RETAINER SCREW

MT104-110

CAT5 RJ-45 OUTPUT

OUT

IN1

IN2

IN3

IN4

CAT5 RJ-45 INPUTS

IN5

IN6

IN7

IN8

4 TP
SWITCHER

BOTTOM RETAINER SCREW
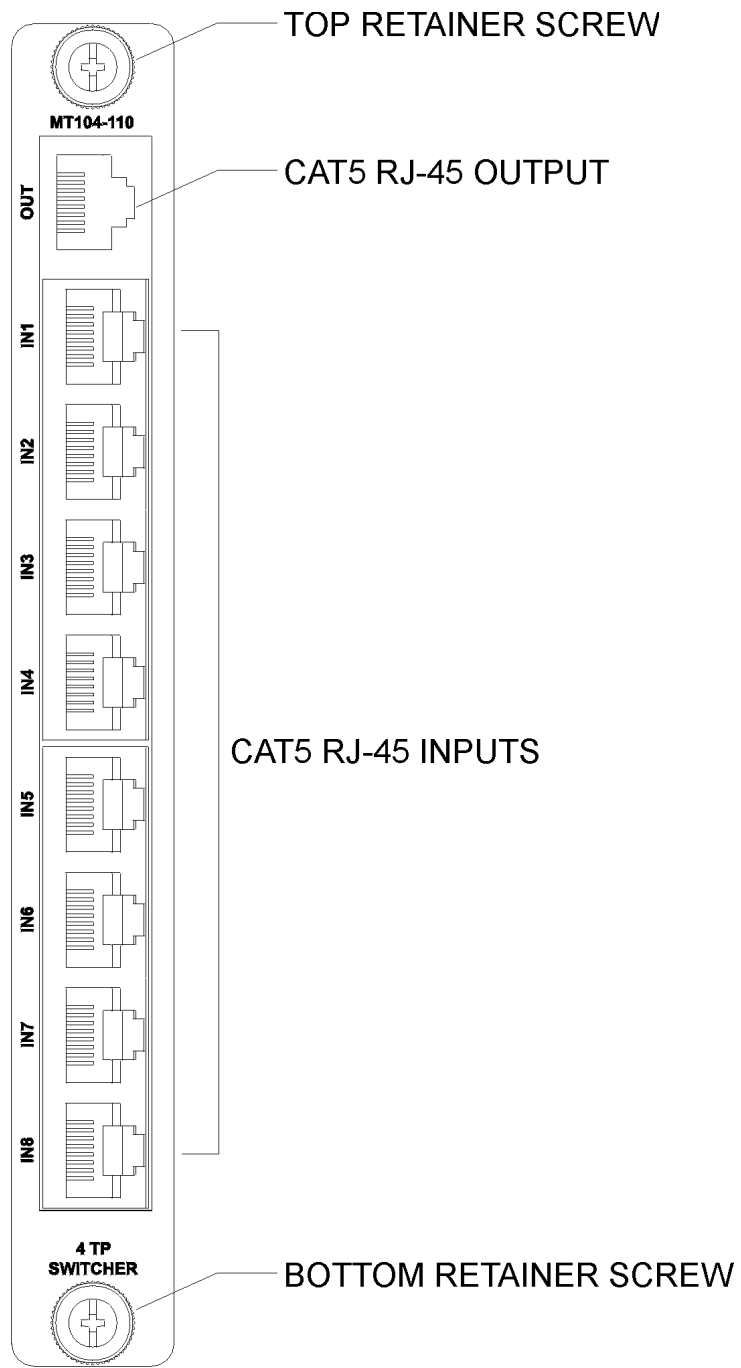
APPLICATION DIAGRAM　　　　5

DIAGRAM 1: TYPICAL CONFIGURATION

DIAGRAM 2 INTERNAL VIEW

MT104-110 CAT-5 Switcher Card

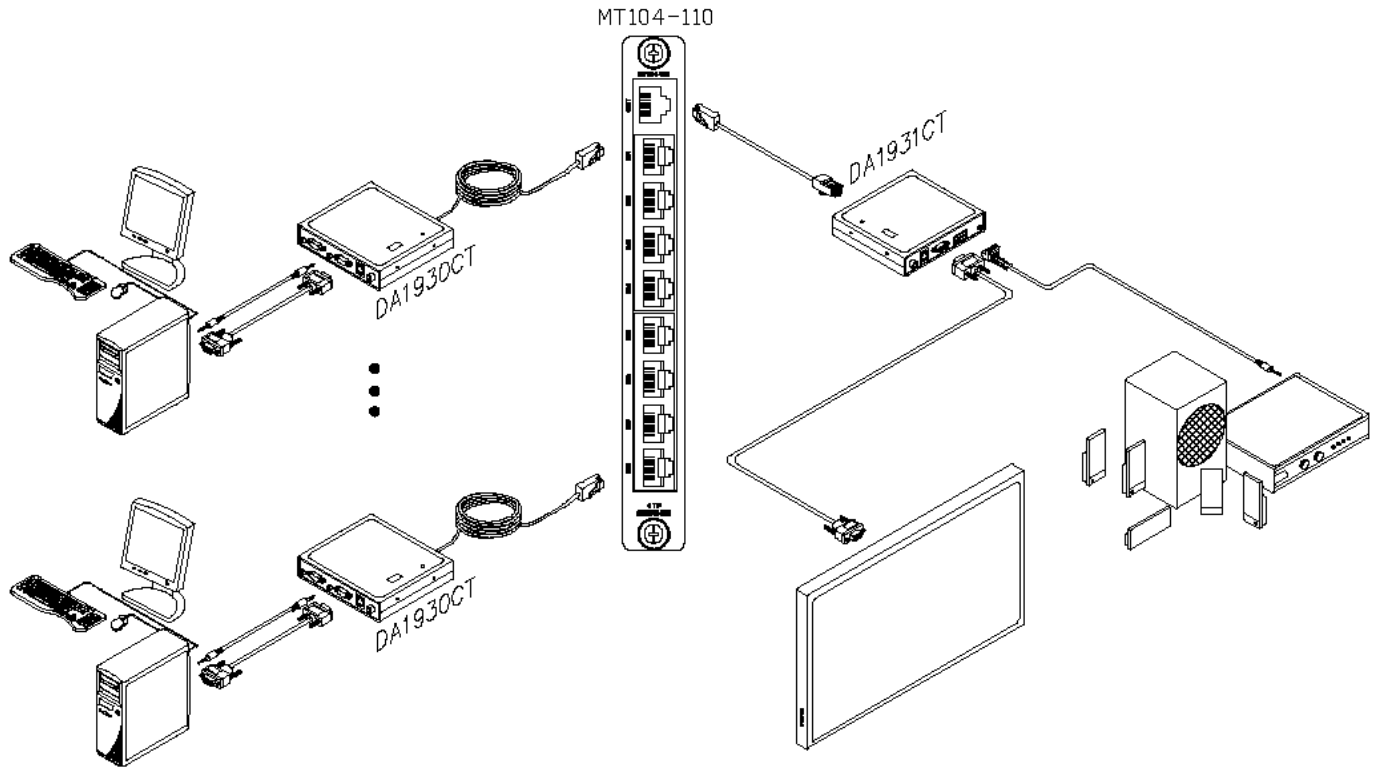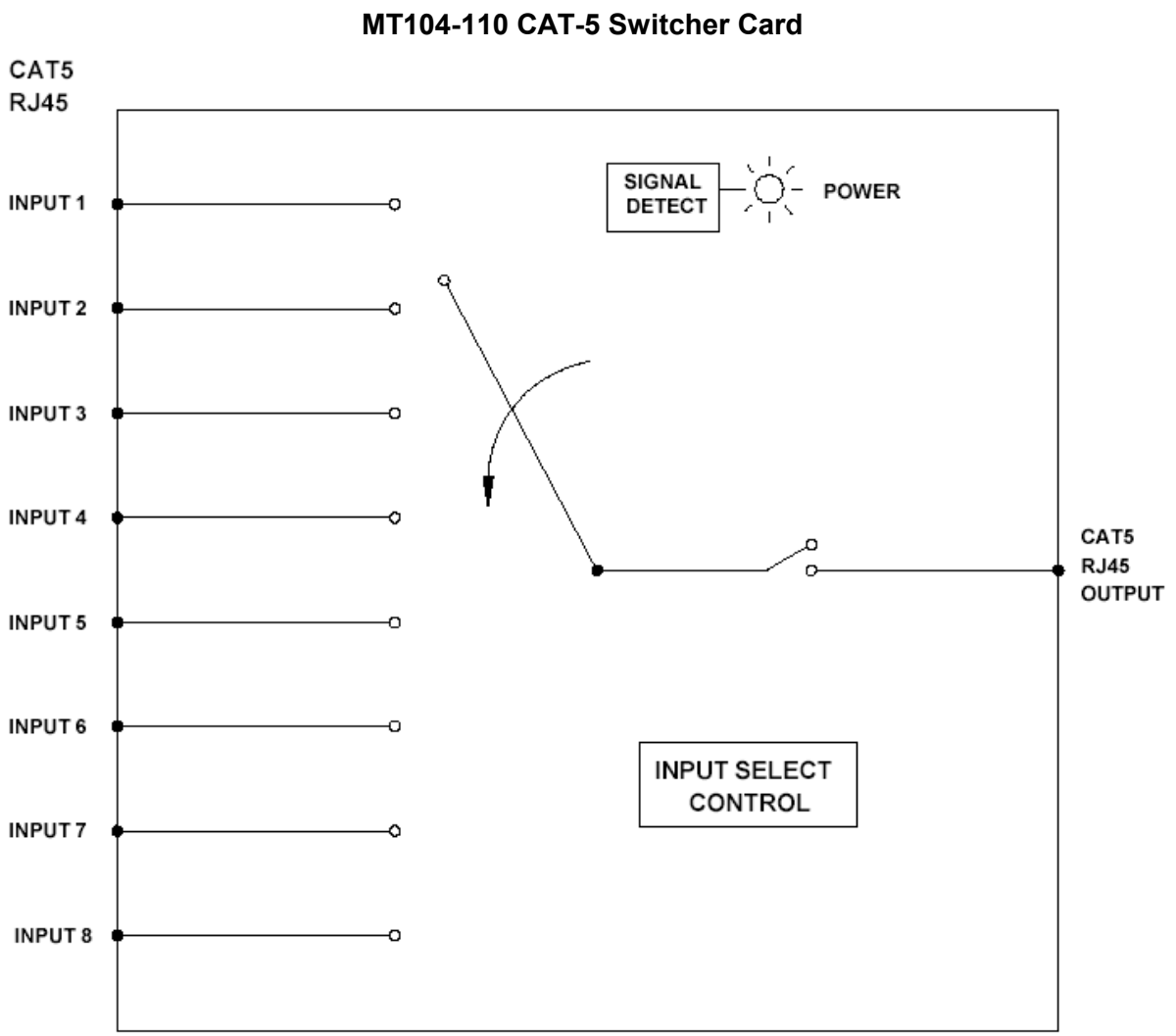## INSTALLING YOUR MT104-110   6

Step 1. Slide the **MT104-110** into an available slot in the Multi-Tasker™ Enclosure in order to connect to the bus. Make sure that the **MT104-110** card fits into place. Secure the card to the Multi-Tasker™ by tightening the retainer screws located on the top and bottom of the **MT104-110** card.

Step 2. Connect a CAT-5 cable from the CAT-5 Transmitter to one of the inputs on the **MT104-110**. Connect the output of the **MT104-110** to the input of the CAT-5 Receiver.

Step 3. Starting from the left, identify the slot number where the **MT104-110** card is plugged into the Enclosure and note that it is for RS-232 control.

Step 4. Use MTSetup, or other RS-232 control software, to select the input desired and to enable the output.

OPERATION   7

7.1 RS-232 CONTROL

When used in the Multi-Tasker™ Enclosure, the **MT104-110** has many advanced remote control capabilities, which are accessible through standard RS-232 communication. The actual controlling can be accomplished through a computer control system or any other device capable of sending RS-232 commands.

7.1.1 RS-232 INTERFACE

The RS-232 commands, for the **MT104-110**, are in a simple ASCII character format.

> 1. **Square brackets "[ ]" are part of the command.**
>
> 2. **Use uppercase letters for all commands.**

After processing a command, an OK or ER 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.

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

For Function, see a detailed explanation under each command description.

The Card ID is an assigned value. It is equal to the enclosure slot number in which the card is installed. The value can range from 1 to 4 up to 1 to 20 depending on the enclosure.

Card ID 0 (C0) is used for the controller. See the MT100-100 User's Guide for details.

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.

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 value from 0 to 9. Unit ID 0 should be used for single unit operation. If the Unit ID is set to zero, each command may be used without Ui. Use the command [SETU0], as explained in the MT100-100 User's Guide.

Example:

[VERC3]:   For Unit ID Zero
[VERC3Ui]:   For Unit ID other than Zero
[VERC3]:   Equivalent to [VERC3U0]

1. **[VER]**

   This command receives the software version and card type for the **MT104-110** card.

   Command Format: [VERCnUi]

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

   Ui = Unit ID (i = # from 0 to 9)

   Example:

   One **MT104-110** card is in slot #2. Send the command [VERC2] and the Multi-Tasker™ Enclosure will return:

   MT104-110 690-0184-001

   MT104-110   = card type
   690-0184-001 = software version

2. **[C]**

   This command receives the status of the card.

   Command Format: [CnUi]

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

   Ui   = unit ID (i = from 0 to 9)

   Example:

   An **MT104-110** card is in slot #2 and input 1 is ON. Sending the command [C2] will yield the following feedback from the Multi-Tasker™:

   `IN1 OUT ON Signal ON`

   IN 1   = Input 1 is selected.
   OUT ON   = The output is enabled.
   Signal ON   = There is a valid signal present.

   If there is no card in slot #2, sending the [C2] command will not return any feedback.

3. **[CnS]**

   This command saves the input/output settings. This configuration will be restored after the system is reset or powered off then on.

   Cn = card number

   S   = save configuration

   Example:

   Input 1 of the card in slot 4 is enabled. Save the card's state by sending the command [C4S]. The feedback will be as follows:

   IN1 OUT ON Signal ON

4. **[CLR]**

   This command is used to clear the card and return it to its factory settings or to the last settings saved with the [CnS] command.

   Command Format: [CLRCnUi]

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

   Ui   = unit ID (i = from 0 to 9)

   Example:

   Send the command [CLRC8] to restore the card in slot #8 to its last saved settings.

5. **[IN]**

   This command selects the input number and connects it to the output. It has no effect on the output enable function. Use the [ON] and [OFF] commands to enable or disable the output.

   Command Format: [INmCnUi]

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

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

   Ui   = unit ID (i = from 0 to 9)

   Example:

   There is an **MT104-110** in slot #8. Send the command [IN2C8] to connect the source at input 2 to the output. If the output is not enabled, send the command [ONC8] to turn on the output.

6. **[ON]**

   This command enables the output of a single card or a group of cards. It has no effect on the selected input.

   [ONCnUi]: for a SINGLE card

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

   Ui   = Unit ID number (i = 0 to 9)

Example:

There is an **MT104-110** card in slot #8. Input 1 has been selected using the [IN] command. Send the command [ONC8] to enable the output on the card in slot #8.

[ONGkUi]: for a GROUP of cards

This command enables the output for each card in group "k" of unit "i".

Gk = Group ID (k = group # from 1 to 8)

Ui = Unit ID number (i = 0 to 9)

Example:

Send the command [ONG1] to enable the outputs for all the cards in Group 1. See the group commands at the end of this section for more details.

7. **[OFF]**

This command disables the output of a single card or a group of cards. It has no effect on the selected input.

[OFFCnUi]: for a SINGLE card

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

Ui = Unit ID number (i = 0 to 9)

Example:

There is an **MT104-110** card in slot #8. Input 1 has been selected using the [IN] command. Send the command [OFFC8] to disable card's output.

[OFFGkUi]: for a GROUP of cards

This command disables the output for each card in group "k" of unit "i".

Gk = Group ID (k = group # from 1 to 8)

Ui = Unit ID number (i = 0 to 9)

Example:

Send the command [OFFG1] to disable the outputs for all the cards in Group 1. See the group commands at the end of this section for more details.

8. **[…S] – Save**

This command will save the configuration command being sent in memory. Sending the command [ONC4S] will turn ON the output of the card in slot 4 after reset or power up

9. **[…F] – Feedback**

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

10. **[SDO]**

This command checks for the presence of an output signal. If a '1' is returned as feedback, there is a signal on the output. If there is no input signal, or the output is disabled, the feedback will be '0'.

Command Format: [SDOCnUi]

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

Ui = Unit ID (i = # from 0 to 9)

Example:

There is an **MT104-110** in slot #8. Send the command [SDOC8], and the system will return feedback similar to the following if a signal is present and the output is enabled:

1

11. **[HELP]**

This command displays information available for the Multi-Tasker interface commands.

Command Format: [HELPCnUi]

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

Ui = Unit ID (i = # from 0 to 9)

Example:

In order to display the RS-232 commands available for the **MT104-110** card in slot #2, send the command [HELPC2]. The commands along with a brief description will be displayed in the Terminal Window.

12. **[WR]**

This command groups multiple cards in the Enclosure. Each unit contains a maximum of eight groups.

In Multi-Tasker™ systems with audio and video cards, boards are typically grouped as follows:

Group 1 = Video Cards

Group 2 = Audio Cards

Group 3 = Video and Audio Cards

If assigning group commands to button functions, it is best to use the "Press and Hold on Power Up" to make group settings.

Command Format: [WRCn…GkUi]

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

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

Ui   = Unit ID (i = # from 0-9)

Example:

To group cards 1, 2, and 3 as group 5 of Unit ID 1, send the command [WRC1C2C3G5U1]. After executing this command, cards 1, 2 and 3 will be grouped together as group 5 of Unit ID 1. The system will return the following feedback:

G1=C1C2C3

13. **[CLRG]**

This command clears the members for a single group or for all groups. The clear command restores the cards to default settings.

Command Format: [CLRGkUi]

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

Ui   = Unit ID (i = # from 0-9)

Example:

1) To clear group 1, send the command [CLRG1U1]. This command clears the members for the specified group only.

2) To clear all groups of Unit ID 1, send the [CLRG∗U1] command.

NOTE: Since this command is sending the [CLR] command to its group members, each card will display its own reset message, if any.

14. **[RD]**

This command displays the members in each group.

Command Format: [RDGkUi]

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

Ui   = Unit ID (i = # from 0-9)

Example:

The cards in slots 1, 2 and 3 are part of group 5 in Unit ID 1. Read the member data for group 5 of Unit ID 1, by sending the command [RDG5U1]. The system will return feedback as follows:

G1=C1C2C3

The feedback shows G1 (Group 1) and then the cards that make up Group 1. In this case, Group 1 includes C1, C2 and C3.

15. **[CLM]**

This command removes the members in a group and leaves the group empty.

Command Format: [CLMGkUi]

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

Ui   = Unit ID (i = # from 0-9)

Example:

Group 5 of Unit ID 1 contains the cards in slots 1, 2 and 3. Read the member data for group 5 of Unit ID 1. Send the command [RDG5U1] and receive the following feedback:

G1=C1C2C3

Now, clear group 5 by sending the command [CLMG5U1]. Reread the member data as above and note the following feedback:

G1=EMPTY - PLEASE RESET THE SYSTEM WHEN FINISHED

MULTI-TASKER™

7.3 SUMMARY OF COMMANDS

Card Commands

1) **[VER]**   **Receives software version**

2) **[C]**   **Receives status of the card**

3) **[CnS]**   **Saves card settings**

4) **[CLR]**   **Resets card to saved settings**

5) **[IN]**   **Selects the input number**

6) **[ON]**   **Enables the output**

7) **[OFF]**   **Disables the output**

8) **[…S]**   **Save the command configuration**

9) **[…F]**   **Provides feedback upon sending**

10) **[SDO]**   **Detect signal on output**

11) **[HELP]** **Display available commands**

Group Commands

12) **[WR]**   **Groups multiple cards**

13) **[CLRG]** **Clears group members**

14) **[RD]**   **Displays group members**

15) **[CLM]**   **Removes members from group.**

TROUBLESHOOTING GUIDE   8

We have carefully tested and have found no problems in the supplied **MT104-110**. 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 the 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 DISPLAY

Cause 1:   **The source has a problem.**

Solution: Check the source and make sure that there is a signal present and all source connections are correct. If the source is working and there is still no display, see Cause 2.

Cause 2: **The card output is not enabled.**

Solution: Make sure the card output is enabled and the correct input is selected. See RS-232 accessible commands, [IN] and [ON], in Section 7. If no display is present, see Cause 3.

Cause 3: **Cable connections are incorrect.**

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

Cause 4: **The display has a problem.**

Solution: Make sure the display has power and is turned ON. If there is still no display, please call Altinex at (714)-990-2300.

ALTINEX POLICY 9

9.1 LIMITED WARRANTY/RETURN POLICY

Please see the Altinex website at www.altinex.com for details on warranty and return policy.

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