

**Multi
Tasker™**

MANUAL PART NUMBER: 400-0164-002

MT104-109

2-IN, DUAL-OUT VGA SWITCHER

CARD FOR MULTI-TASKER™

USER'S GUIDE

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PRECAUTIONS / SAFETY WARNINGS 1

Please read this manual carefully before using your **MT104-109**. Keep this manual handy for future reference. These safety instructions are to ensure the long life of your **MT104-109** 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 **MT104-109** 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 **MT104-109** carefully. Dropping or jarring can damage the card.
- Do not pull the cables that are attached to the **MT104-109**.
- 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.

ABOUT YOUR MT104-109 2

MT104-109 2-in Dual-out MT VGA Switcher Card

The **MT104-109** 2-in 1-out MT VGA SW Card uses one slot in Multi-Tasker™ enclosures. This card enables two computer video sources to be connected and switched to two scan-rate compatible displays. Resolutions supported range from VGA to QXGA. The **MT104-109** is not a matrix switcher. The output from the MT104-109 has two VGA connectors that are fed by internal 1-in 2-out distribution amplifier. In addition, The **MT104-109** can be connected together with the Keyboard Mouse switcher to form a 2x1KVM.

Female 15-pin HD (VGA-type) connectors are provided for input and output. If used together with 15-pin HD to 5 BNC adapter cables, available from ALTINEX, the **MT104-109** can pass RGBHV format computer video signals as well. Inputs are selected via easy-to-use ASCII commands from a control system or computer connected to the RS-232 port of the Multi-Tasker™ Basic Enclosure.

For convenience and flexibility, the **MT104-109** offers Sync Delay™, which briefly “blanks” the video channel signals while switching between signals, thereby avoiding any visual “glitch.” The **MT104-109** is Plug & Play compatible.

TECHNICAL SPECIFICATIONS 3

FEATURES/ DESCRIPTION	MT104-109
GENERAL	
Inputs	
Input Connector	(2) 15-pin HD Female
Outputs	
Output Connector	(2) 15-pin HD Female
Compatibility	VGA thru QXGA, RGBHV & RGBS

Table 1. **MT104-109** General

MECHANICAL	MT104-109
Enclosure Slots Required	One
Weight	1.0 lb (0.45 kg)
Connector Panel	Black
T° Operating	10°C-35°C
T° Storage	50°C
Humidity	90% non-condensing
MTBF (calc.)	40,000 hrs

Table 2. **MT104-109** Mechanical

ELECTRICAL	MT104-109		
Input Video Signals			
Analog	1.7Vp-p max		
Impedance	75 Ohms +/-1% (terminated)		
Type	Differential		
Input Sync Signal			
Horizontal, Vertical	TTL (+/-)		
Impedance	10k Ohms		
Output Video Signals			
Analog	1.7V p-p max (terminated)		
Impedance	75 Ohms		
Output Sync Signals			
Horizontal, Vertical	TTL (+/-)		
Impedance	22 Ohms		
Frequency Compatibility			
Horizontal	15-130 kHz		
Vertical	25-180 Hz		
Bandwidth	350 MHz @-3dB		
Power			
Power from MT100-100	+6V	-6V	Power Consumption
MT104-109	125mA	90mA	1.3 watts

Table 3. **MT104-109** Electrical

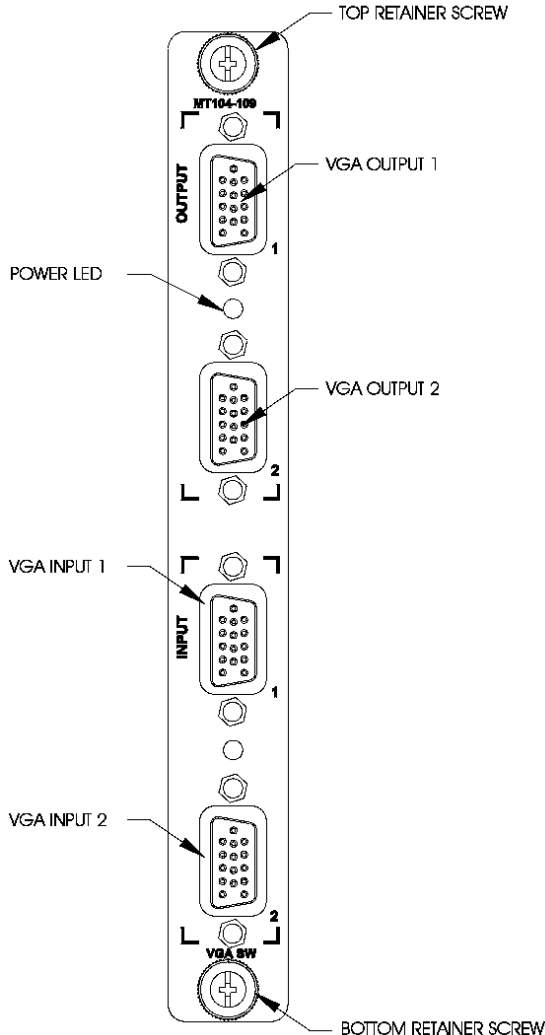


Diagram 1: Connections

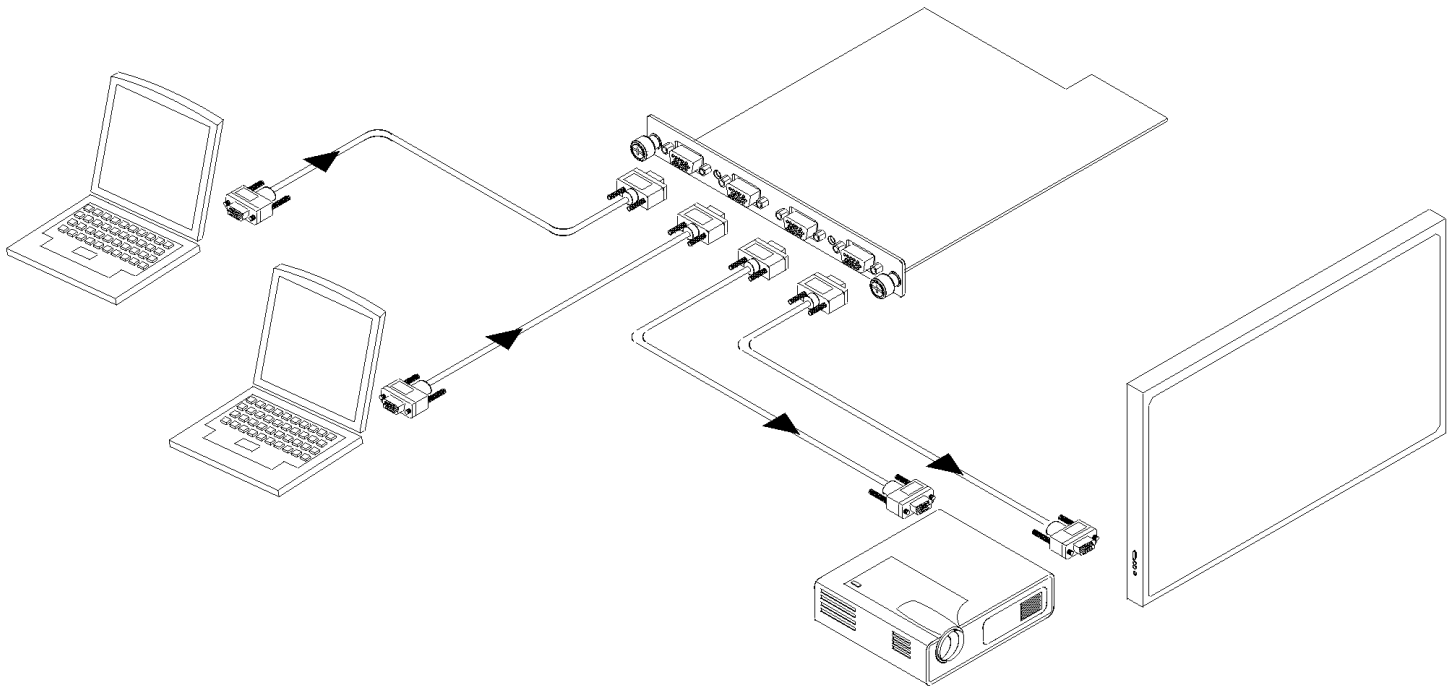
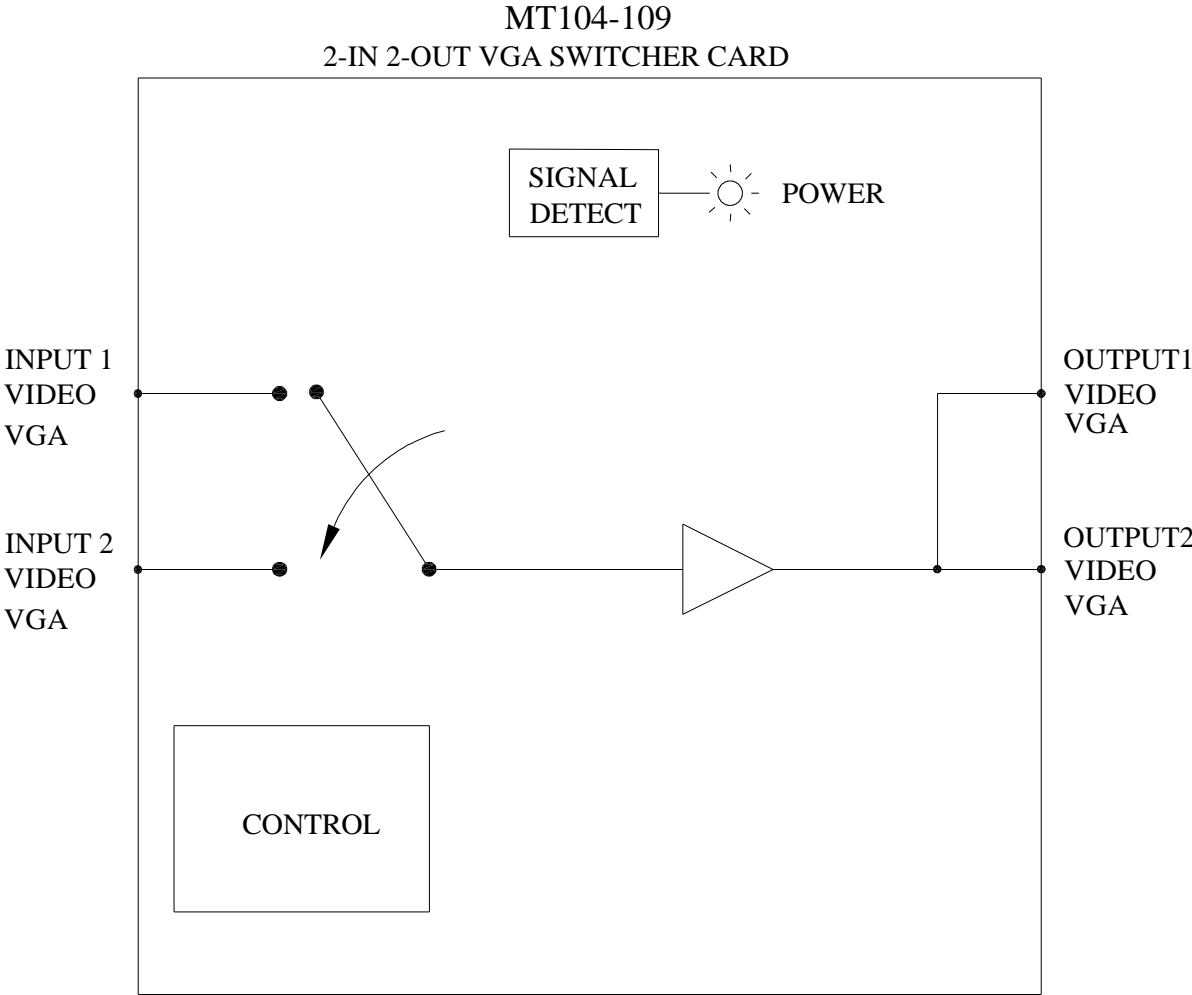


Diagram 2: Internal View



INSTALLING YOUR MT104-109 6

- Step 1.** Slide the **MT104-109** into an available slot in the Multi-Tasker™ Enclosure in order to connect to the bus. Make sure that the **MT104-109** card fits into place. Secure the card to the Multi-Tasker™ by tightening the retainer screws located on the top and bottom of the **MT104-109** card.
- Step 2.** The LED on the card panel will turn red indicating that the card is in full operation. A green LED indicates that a signal is present. An LED that is blinking red indicates that the card is experiencing a problem. If the LED is blinking, see Troubleshooting Guide in section 8.
- Step 3.** Connect a VGA cable from the computer video source to the input connector of the **MT104-109**. Connect the output connectors of the **MT104-109** to the display devices through a VGA cable.
- Step 4.** Starting from the left, identify the slot number where the **MT104-109** card is plugged into the Enclosure and note that it is for RS-232 control.

OPERATION 7

7.1 RS-232 CONTROL

When used in the Multi-Tasker™ Enclosure, the **MT104-109** 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 **MT104-109** 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 such as [ON], [OFF], and [IO] that end 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 (power off & power on again).

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
U2 = Unit ID

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

The Card ID is an assigned value from 1 to 19 (1 to 8 or 1 to 4 depending on which enclosure is being used), which represents the number of slots. Card ID 0 (C0) is used for the controller (see user's guide for the MT100-100). Changing the position of a card will significantly affect the commands recorded on software definitions or a third party control system.

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 0, then each command can be used without Ui (use command [SETU0]; see user's guide for the MT100-100).

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 **MT104-109** card.

Command Format: [VERCnUi]

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

Ui = Unit ID (i = # from 0 to 9) (refer to the MT100-100 user's guide for explanation)

Example:

One **MT104-109** card is in slot #2 of unit 3. To receive the card type and version, send the command **[VERC2U3]** to the Multi-Tasker™. The feedback from the Multi-Tasker™ will look as follows:

MT104-109 690-0158-003

MT104-109 = card type
690-0158-003 = 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) (*refer to the MT100-100 user's guide for explanation*)

Example:

There is an **MT104-109** card in slot #2 of unit 3. Input 1 is ON. To check the status of the card, send the command **[C2U3]**. The Multi-Tasker™ will return the following feedback:

ON 1 C02

ON 1 = Input 1 is ON and selected
C02 = card is in slot 2

If there is no card in slot #2 of unit 3, sending the **[C2U3]** command will not return any feedback.

3. [CnS]

This command saves the status of the card's configuration. This configuration will be restored after the system is reset or powered off then on.

Cn = card number
S = save configuration

If Input 2 is selected, the feedback after sending the command **[C4S]**, for slot 4, would be:

ON 2 C04 Saved

4. [SIG]

The Signal Present command tests for the presence of a signal on the input. After sending the command, the feedback will be either "1" signifying a signal is present, or a "0" indicating no signal was detected.

Command Format: [SIGCnUi]

Cn = card number
Ui = unit ID

Example:

To check for the presence of an input signal on card 4, send the command **[SIGC4]** and verify feedback of "1" or "0".

5. [ON]

This command enables one input of a single card or a group of cards.

[ONmCnUiS]: for a SINGLE card

This command enables input "m" and disables all other inputs.

Default when plugged in = All inputs are off

m = Input (m = 0 to 2, 0 is OFF)
Cn = Card ID (n = # from 1 to max slots)
Ui = Unit ID number (i = 0 to 9)
S = saves command to memory

Example:

The card is in slot #5 of unit 3 and all of the inputs are OFF:

- 1) **[ON1C5U3]**: Turns ON only input 1 of the card.
- 2) **[ON2C5U3]**: Turns ON only input 2. Input 1 is now OFF.

[ONmGkUiS]: for a GROUP of cards

This command enables input "m" for each card in group "k" of unit "i".

m = card input (m = # from 0-2, 0 is OFF)
Gk = group number (k = # from 1-9)
Ui = unit number (i = # from 0-9)
S = saves command to memory

Example:

[ON1G1U1]: Turns ON input 1 for each card in group 1 of unit 1.

[ON.....P]: sets path

This command will set the path for the input, but it is not active until the switch command, [SW], is executed. Commands ending in "P" are not executed immediately. The path for inputs on multiple cards or the same card can be preloaded and then switched simultaneously.

Command Format: [ONmCnUiP]

m = input (m = 0 to 2, 0 is OFF)
 Cn = card ID (n = slot # from 1 to max slots)
 P = path

Example:

There are two **MT104-109** cards in slots 6 and 7 of unit 3. Enable input 1 of card 6 and input 2 of card 7 simultaneously. Use the following commands:

[ON1C6U3P]
 [ON3C7U3P]
 [SW]

If "F" is included use the [ONmCnUiPF] command or the [ONmCnUiFP] command.

[ON.....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.

Example:

[ON1C2U3F]: if path is not set
 [ON1C2U3PF]: if path is set

6. [OFF]

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

[OFFmCnUiS]: for a SINGLE card

This command disables input "m" or all inputs. In this case, it is equivalent to the command [OFFC5CnUi] which turns OFF all inputs to the card.

m = Input (m = 0 to 2, 0 is OFF)
 n = Card ID (n = slot # from 1 to max slots)
 i = Unit ID number (i = 0 to 9)
 S = saves command to memory

Example:

Card 5 of unit 3 has input 1 ON. The following commands can be used to turn OFF the input.

- 1) [OFF1C5U3]: Turns OFF only input 1.
- 2) [OFFC5U3]: Turns OFF all inputs.

[OFFmGkUi]: for a GROUP of cards

This command disables input "m" for each card in group "k" of unit "i".

m = card input (m = # from 0-2, 0 is OFF)
 k = group number (k = # from 1-9)
 i = unit number (i = # from 0-9)

Example:

- 1) [OFF1G1U1]: Turns OFF input 1 for each card in group 1 of unit 1.
- 2) [OFFG1U1]: Turns OFF all inputs for each card in group 1 of unit 1.

[OFF.....P]: sets 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 and then switched simultaneously.

Command Format: [OFFmCnUiP]

m = input (m = 0 to 2, 0 is OFF)
 Cn = card ID (n = slot # from 1 to max slots)
 P = path

Example:

There are two **MT104-109** cards in slots 6 and 7 of unit 3. Disable input 1 of card 6 and input 2 of card 7 simultaneously. Use the following commands:

[OFF1C6U3P]
 [OFF2C7U3P]
 [SW]

If "F" is included use the [OFFmCnUiPF] command or the [OFFmCnUiFP] command.

[OFF.....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.

Example:

[OFF1C2U3F]: if path is not set

[OFF1C2U3PF]: if path is set

7. [...S] – Save

This command will save the configuration command being sent in memory. When sending the command [ON1C4S], after reset or power up, output 1 on C4 will be enabled.

8. [...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.

9. [...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 loaded. See examples in ON and OFF commands.

10. [SW] – Switch

The switch command immediately connects inputs and outputs, which were previously set with the path command on this card and all other cards in the MT100-100 system.

Example:

[ON1C6U3P]

[ON3C7U3P]

[SW]

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) (*refer to the MT100-100 user's guide for explanation*)

Example:

In order to view the RS-232 commands available for the **MT104-109** card in slot 2 of unit 3, send the command [HELPC2U3]. 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 nine groups.

Command Format: [WRCn...GkUi]

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

Gk = group number (k = # from 1-9)

Ui = unit number (i = # from 0-9)

Example:

To group cards #1, 2, and 3 as group 5 of unit #1, send the command [WRC1C2C3G5U1]. After executing this command, cards 1, 2 and 3 will be grouped together as group 5 of unit 1.

13. [CLR]

This command clears the members for a single group or for all nine groups.

Command Format: [CLRGkUi]

Gk = group number (k = # from 1-9)

Ui = unit number (i = # from 0-9)

Example:

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

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

14. [G]

This command is used to request group data. With the command, the user can identify which input or output of a particular group is on.

Command Format: [GkUi]

Gk = group number (k = # from 1-9)

Ui = unit number (i = # from 0-9)

Example:

In unit ID0, if group 1 has DA Cards with outputs 1 and 2 on, while group 2 has SW Cards with input 2 on:

[G1]: will return feedback as **ON12 G1U0.**

[G2]: will return feedback as **ON2 G2U0.**

15. [RD]

This command displays the members in each group.

Command Format: [RDGkUi]

Gk = group number (k = # from 1-9)

Ui = unit number (i = # from 0-9)

member = C1 - C19 (card 1 to max cards)

Example:

The cards in slots 1, 2 and 19 are part of group 5 in unit 1. Read the member data for group 5 of unit 1, by sending the command [RDG5U1]. The system will return feedback as follows:

C1C2C19 G5U1.

7.3. SUMMARY OF COMMANDS

- 1) [VER] Receives software version
- 2) [Ci] Receives status of the card
- 3) [CiS] Saves card configuration
- 4) [SIGCi] Check for input signal
- 5) [ON] Turns on one or more outputs for a single card or a group of cards
- 6) [OFF] Turns off one or more outputs for a single card or a group of cards
- 7) [...S] Save the command configuration
- 8) [...F] Provides feedback upon sending
- 9) [...P] Sets the path, preload for [SW]

- 10) [SW] Switch preloaded output buffer
- 11) [HELP] Display available commands
- 12) [WR] Groups multiple cards
- 13) [CLR] Clears members of a single group or all groups
- 14) [G] Requests group data
- 15) [RD] Displays group members

TROUBLESHOOTING GUIDE

8

We have carefully tested and have found no problems in the supplied **MT104-109**; 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 LED IS BLINKING RED

Cause 1: The CPU on the card is not working properly.

Solution 1: Look at the card and verify that there is no damage. If there is no damage, see Solution 2.

Solution 2: Verify that all IC's are seated in their sockets. If the LED is still blinking red, see Cause 2.

Cause 2: The card and its serial device are not communicating.

Solution 1: Turn the system OFF and then ON again. If there is still an error, see Cause 3.

Cause 3: RS485 communication error

Solution 1: Make sure that the card is pushed all the way into the slot. If there is still an error, see Solution 2.

Solution 2: Turn the system OFF and then ON again. If there is still an error, see Solution 3.

Solution 3: Call ALTINEX at (714) 990-2300.

8.3 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 selected.

Solution: Select the card output. See RS-232 accessible commands 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

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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