



**Multi
Tasker™**

MT103-101 is shown above

MANUAL PART NUMBER: 400-0080-004

MT103-101/106/112

**8-OUT VIDEO DISTRIBUTION AMPLIFIER
EXPANSION CARDS FOR MULTI-TASKER™
ENCLOSURES USER'S GUIDE**

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PRECAUTIONS / SAFETY WARNINGS 1

Please read this manual carefully before using your **MT103-101/106/112**. Keep this manual handy for future reference. These safety instructions are to ensure the long life of your **MT103-101/106/112** 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 **MT103-101/106/112** 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 **MT103-101/106/112** carefully. Dropping or jarring can damage the card.
- Do not pull the cables that are attached to the **MT103-101/106/112**.
- 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 MT103-101/106/112 2

MT103-101, MT103-106 & MT103-112 8-out MT Video Distribution Amplifier Expansion Cards

The **MT103-101**, **MT103-106** and **MT103-112** are 8-out Video Distribution Amplifier (DA) Expansion Cards designed for use with either the MT103-100 or MT103-111 in Multi-Tasker™ enclosures. When installed along with an MT Video DA Card in a Multi-Tasker™ enclosure, these Expansion cards expand the total number of video outputs by 8. For example, one **MT103-101** used together with one MT103-100 provides a total of 14 video outputs. Up to four **MT103-101** cards can be used with an MT103-100 or MT103-111 to provide a total of 38 video outputs.

The input to these Expansion cards is made via an internal cable from the internal output of an MT Video DA card. Thus, an Expansion card must be installed in a slot of a Multi-Tasker™ enclosure along with an expansion-capable MT Video DA card.

Different signal types can be routed through multiple expansion cards. For example, two MT Video DA Expansion cards can be used with two MT Video DA cards to handle the two components of an S-Video signal (chroma and luma). Three sets could be used to handle Component Video, and five to handle RGBHV, with expansion up to the limit of the Multi-Tasker™ enclosure used.

For high-bandwidth performance, look to the **MT103-101** or **MT103-106**. Each card offers industry-leading 350 MHz bandwidth, with the **MT103-101** adding “on-off control” of each output. Many combinations of “always on” and “on-off controlled” outputs – up to 38 total outputs – can be achieved by adding up to four of the MT Video DA Expansion cards to the MT103-100 or MT103-111.

For the most economical configurations, the **MT103-112** offers a low cost expansion solution for “always on” distribution, and solid 250 MHz bandwidth performance.

TECHNICAL SPECIFICATIONS 3

| FEATURES/ DESCRIPTION | MT103-101/106/112 |
|--------------------------|--|
| GENERAL | |
| Input | |
| Internal Cable | 10-pin IDC |
| Outputs | 8 |
| Output Connector | 8 BNC Female (Analog Video or TTL Sync) |
| Capability | Video Formats |
| Using 1 Card | Composite Video |
| Using 2 Cards | S-Video (Y/C) |
| Using 3 Cards | Component Video, RGsB & RsGsBs |
| Using 4 Cards | RGBS |
| Using 5 Cards | RGBHV, VGA thru UXGA*, QXGA* (MT103-101, MT103-106 only) *requires adapters, see <i>Optional Accessories</i> |
| Approvals | CE, FCC |

Table 1. **MT103-101/106/112** General

| MECHANICAL | MT103-101/106/112 |
|--------------------------|--------------------|
| Enclosure Slots Required | One |
| Weight | 0.7 lb. (32 kg) |
| Shipping Weight | 1.2 lb. (45kg) |
| Connector Panel | Black |
| T° Operating | 10°C-40°C |
| T° Storage | 0°C to 50°C |
| Humidity | 90% non-condensing |
| MTBF (calc.) | 55,000 hrs |

Table 2. MT103-101/106/112 Mechanical

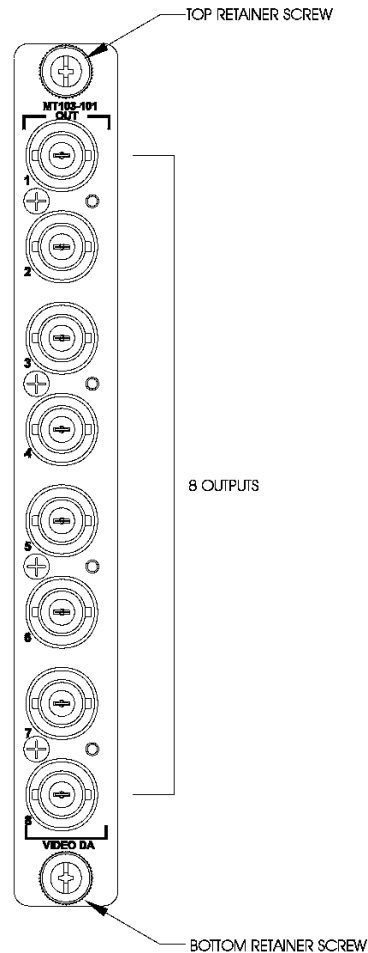
| ELECTRICAL | MT103-101/106/112 |
|--------------------------|-------------------|
| Output Signals | |
| Gain | 10.5 (+/-5%) |
| Impedance | 75 Ohms |
| Propagation Delay (Sync) | 4nS max. |
| Rise/Fall Time (Sync) | 9nS max. |
| Differential Phase Error | 01° @ 4.5 MHz |
| Bandwidth | |
| MT103-101, MT103-106 | 350 MHz @ -3dB |
| MT103-112 | 250 MHz @ -3dB |

| Power | +6V | -6V | Power Consumption |
|-----------|--------|--------|-------------------|
| MT103-101 | 200 mA | 200 mA | 2.4 watts |
| MT103-106 | 140 mA | 130 mA | 1 watt |
| MT103-112 | 70 mA | 60 mA | 0.8 watts |

| Optional Accessories | |
|----------------------|--|
| MS8102CA | 6ft, 15-pin HD Male to 5-BNC Male |
| MS8112CA | 6ft, 15-pin HD Female to 5-BNC Male |
| MS8132MG | 1ft, 4-pin mini DIN Male to 2-BNC Male |
| MS8133MG | 1ft, 4-pin mini DIN Female to 2-BNC Male |

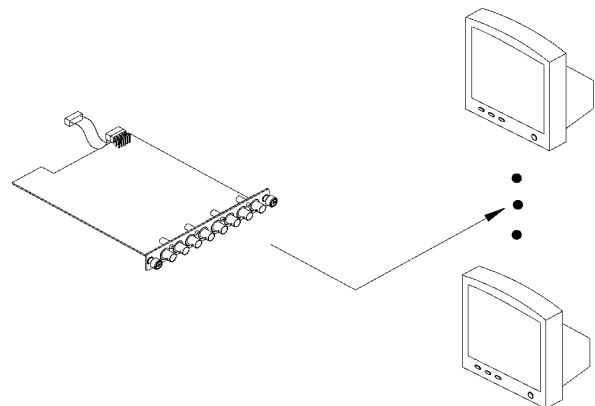
Table 3. MT103-101/106/112 Electrical

PRODUCT DESCRIPTION 4



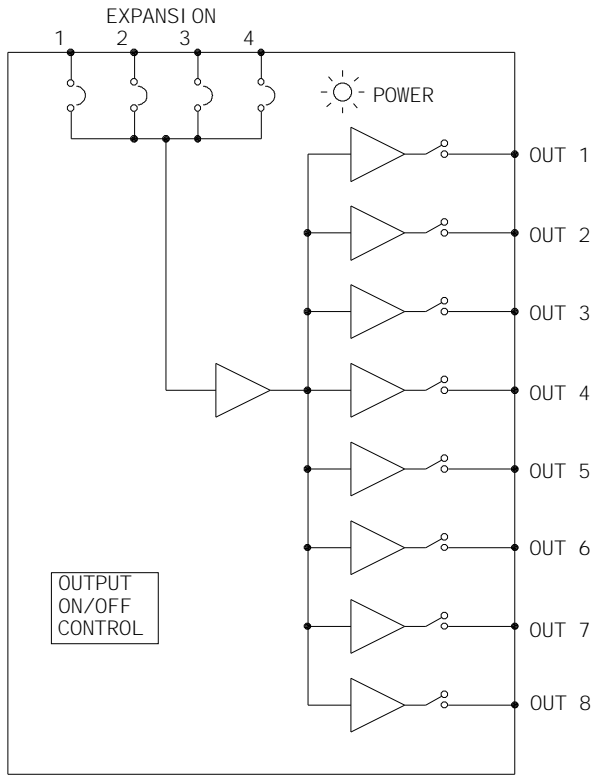
APPLICATION DIAGRAM 5

Application 1

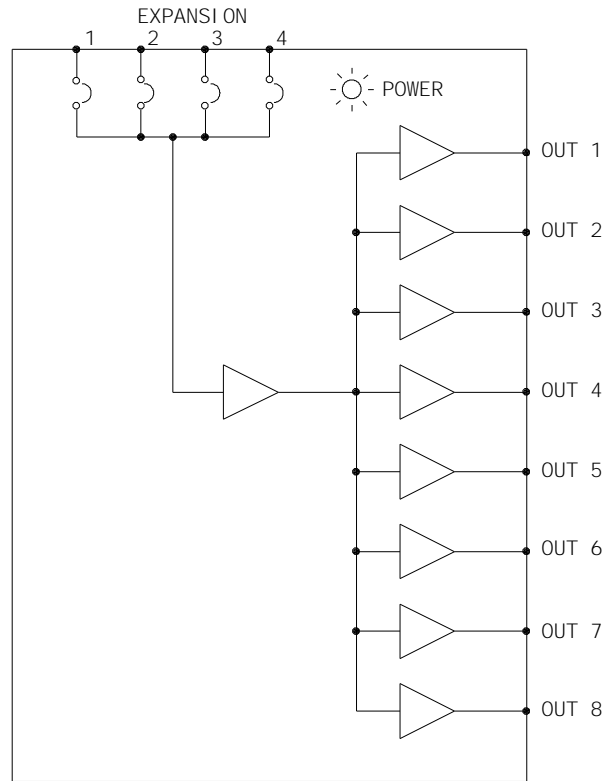


Application 2: Internal View of the MT DA Expansion Cards

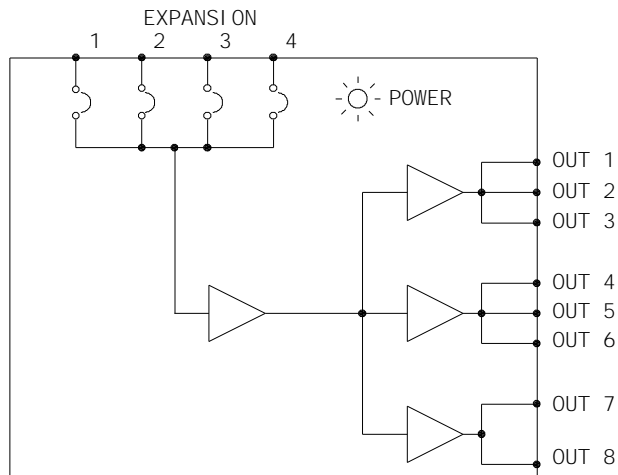
MT103-101
8 OUT BNC EXPANSION CARD DA + 350 MHZ + GLI + ON/OFF



MT103-106
8 OUT BNC EXPANSION CARD DA + 350 MHZ + GLI

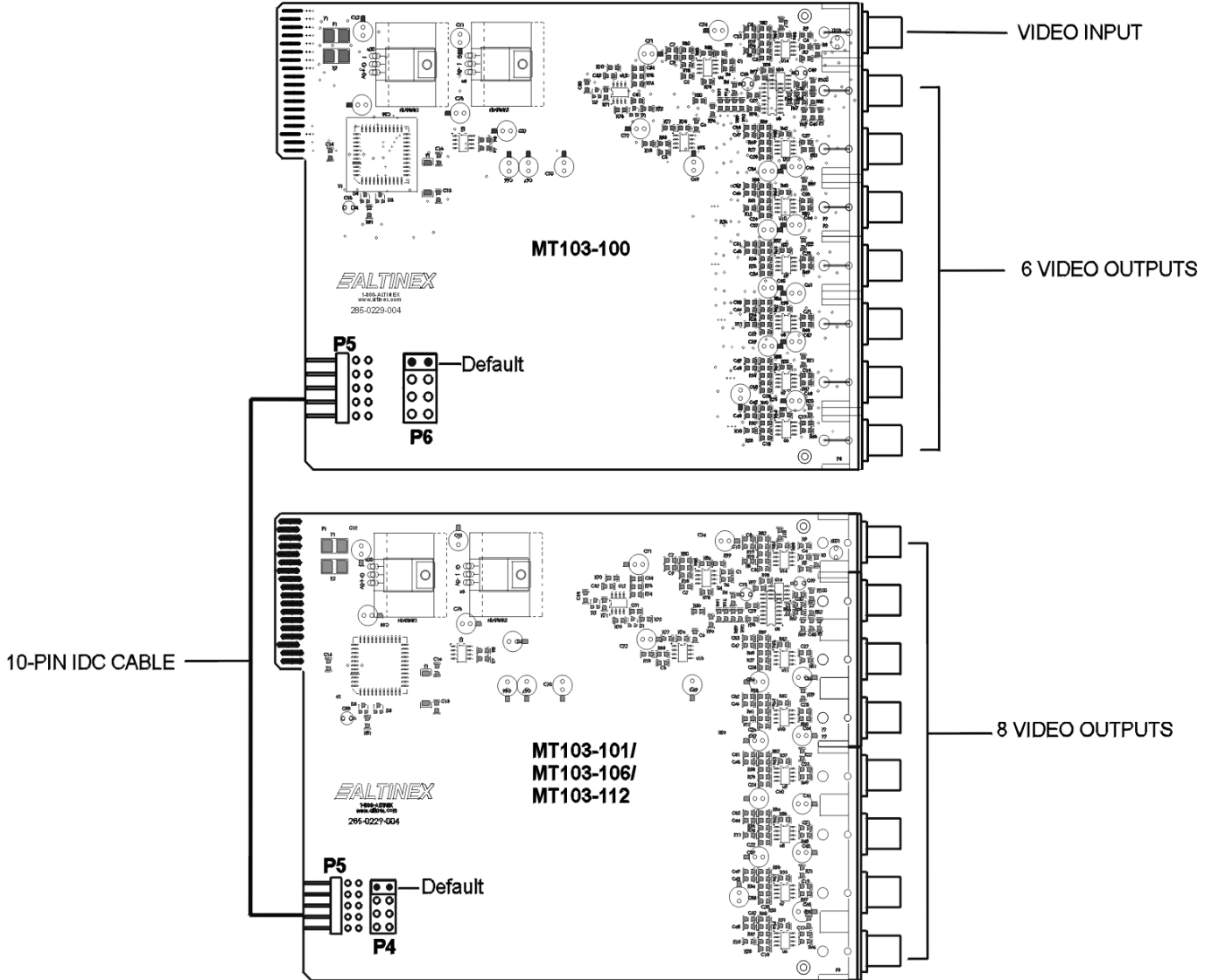


MT103-112
8 OUT BNC EXPANSION CARD DA + 250MHZ + GLI



Application 3

Connection of MT103-101/106/112 and MT103-100 to form a 1-in 14-out Video DA System



NOTE: The location of the jumper on the MT103-100 (P6) should be the same as the jumper on the MT103-101/106/112 (P4)

INSTALLING YOUR MT103-101/106/112 6

- Step 1.** Locate the MT103-100 from which the internal output cable is received for the **MT103-101/106/112**. Connect the 10-pin jumper of the MT103-100 to the 10-pin jumper located on the **MT103-101/106/112** using a 10-pin IDC cable.
- Step 2.** Slide the (previously connected) MT DA Card (MT103-100) and the expansion **MT103-101/106/112** into available slots in the Multi-Tasker™ Enclosure. Make sure that the **MT103-101/106/112** and the MT DA Card (MT103-100) fit into place. Secure the cards to the Multi-Tasker™ by tightening the retainer screws located on the top and bottom of each card.
- Step 3.** Connect an output cable from the video source to the input connector of the **MT103-101/106/112**. Connect the output connector of the MT DA Card (MT103-100) to the display devices through an input cable.
- Step 4.** Starting from the left, count the slot number of the MT100-100 where the **MT103-101/106/112** is plugged into the Enclosure and note that it is for RS-232 control.

OPERATION (for MT103-101 only) 7

7.1 RS-232 CONTROL

The outputs of the **MT103-106** card and the **MT103-112** card are always enabled; therefore, no RS-232 control is necessary.

When used in the Multi-Tasker™ Enclosure, the **MT103-101** 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 **MT103-101** 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 string will be returned as feedback if "F" is included at the end of a command string or if the unit ID is zero.

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 and 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 based on the enclosure slot where it is installed. The slot number is a number between 1 and 19, 1 and 8 or 1 and 4, depending on which enclosure is being used. The 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.

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 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 displays the software version and card type for the **MT103-101** Expansion card.

Command Format: [VERCnUi]

Cn = card ID (n = # from 1 to max slots)
Ui = Unit ID (i = # from 0 to 9)

Example:

If one **MT103-101** Expansion card is in slot #2 of unit 3:

When sending the command **[VERC2U3]**, the Multi-Tasker™ Enclosure will return feedback as follows:

MT103-101 690-0125-009

MT103-101 = card number
690-0125-009 = 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 **MT103-101** card is in slot #2 of unit 3 with outputs 1 and 2 ON. Sending the command **[C2U3]** to the Multi-Tasker™ Enclosure will yield the following feedback:

ON: 1,2 C02

ON: 1,2 = Outputs 1 and 2 ON
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. [CiS]

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

Ci = card number

S = save configuration

If Inputs 1,2,3,4,5 and 6 are enabled, the feedback after sending the command **[C4S]**, for slot 4, would be:

ON:1,2,3,4,5,6 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 or more outputs of a single card or a group of cards.

[ONmCnUiS]: for a single card

This command enables output "m" without affecting any other outputs.

m = Output number (m = 1 to 8)
Cn = Card ID number (n = 1 to max slots)
Ui = Unit ID number (i = 0 to 9)
S = saves command to memory

Example:

- 1) **[ON12C5U3]**: Turns ON only outputs 1 and 2 of the **MT103-101** card located in slot #5 of the MT100-100 Enclosure with unit ID3.

2) **[ON3C5U3]**: Turns ON only output 3 of the **MT103-101** card located in slot #5 of the MT100-100 Enclosure with unit ID3. After the **[ON12C5U3]** and **[ON3C5U3]** commands have been executed, outputs 1, 2 and 3 will be ON.

3) **[ONC5U3]**: Turns ON all outputs of the card.

[ONmGkUiS]: for a group of cards

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

m = card output (m = # from 1-8)
Gk = group number (k = # from 1-9)
Ui = unit number (i = # from 0-9)
S = saves command to memory

Example:

1. **[ON1G5U1]**: Turns ON output 1 for each card in group 5 of unit 1.
2. **[ONG5U1]**: Turns ON all outputs for each card in group 5 of unit 1.

[ON.....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 loaded.

Command Format: [ONmCnUiP]

m = output number (m = 1 to 8)
Cn = card ID No. (n = 1 to max slots)
Ui = Unit ID number (i = 0 to 9)
P = path

Example:

If 2 cards are at slot 6 and 7 of unit 3: To enable output 1 and 2 of card 6 and output 3 and 4 of card 7 simultaneously, use the following commands:

```
[ON12C6U3P]
[ON34C7U3P]
[SW]
```

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

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

Example:

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

6. [OFF]

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

[OFFmCnUiS]: for a single card

This command disables output "m" without affecting any other outputs.

m = output number (m = 1 to 8)
Cn = card ID No. (n = 1 to max slots)
Ui = Unit ID number (i = 0 to 9)
S = saves command to memory

[OFFCnUi]: Turns OFF all outputs of the card.

Example:

- 1) If card 5 of unit 3 has outputs 1, 2 and 3 ON:
 - a) **[OFF1C5U3]**: Turns OFF output 1 while outputs 2 and 3 remain ON.
 - b) **[OFF23C5]**: Turns OFF outputs 2 and 3.
- 2) If card 5 of unit 3 has output 1, 2, 3, 4, 5, 6, 7 and 8 ON:
 - a) **[OFFC5U3]**: Turns OFF all outputs, which is equivalent to the command **[OFF12345678C5U3]**.

[OFFmGkUiS]: for a group of cards

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

Command Format: [OFFmCnUiP]

m = card output (m = # from 1-8)
Gk = group number (k = # from 1-9)
Ui = unit number (i = # from 0-9)
S = saves command to memory

Example:

1. **[OFF1G5U1]:** Turns OFF output 1 for each card in group 5 of unit 1.
2. **[OFFG5U1]:** Turns OFF all outputs for each card in group 5 of unit 1.

[OFF.....P]: sets 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, but are preloaded.

Command Format: [OFFmCnUiP]

m = number (m = 1 to 8)
Cn = card ID No. (n = 1 to max slots)
Ui = unit number (i = # from 0-9)
P = path

Example:

If 2 cards are at slot 6 and 7 of unit 3: To disable outputs 1 and 2 of card 6 and outputs 3 and 4 of card 7 simultaneously, use the commands:

```
[OFF12C6U3P]
[OFF34C7U3P]
[SW]
```

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

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

Example:

```
[ON12C6U3P]
[ON34C7U3P]
[SW]
```

The system will return feedback as OK if the unit ID is zero.

8. [...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.

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. [...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 paths for outputs on one or more cards are preloaded. See examples in ON and OFF commands.

11. [HELP]

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

Command Format: [HELPCnUi]

Cn = card ID number (n = 1 to max slots)
Ui = Unit ID (i = # from 0 to 9)

Example:

In order to view the RS-232 commands available for the **MT103-101** 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 No. (n = 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 slots)

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**Card Commands**

- 1) [VER] Receives software version
- 2) [C] Receives status of the card
- 3) [CiS] Saves card configuration
- 4) [SIG] 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) [SW] Switch preloaded output buffer
- 8) [...S] Save the command configuration
- 9) [...F] Provides feedback upon sending
- 10) [...P] Sets the path, preload for [SW]
- 11) [HELP] Display available commands

Group 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 **MT103-101/106/112**; however, we would like to offer suggestions for the following:

8.1 NO FEEDBACK

There is no feedback from the card when communicating through the enclosure.

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 there is still an error, see Solution 3.

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

Cause 2: The MT103-101/106/112 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 Solution 2.

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

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: If there is still a 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 selected.

Solution: Select the card output. See RS- 232 accessible commands in Section 7. If there is still no display 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 display present, see Cause 4.

Cause 4: The display has a problem.

Solution: Make sure that the display is powered. If there is still no display, call ALTINEX at (714) 990-2300.

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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

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