Multi Tasker™

MT104-107

3-IN, 1-OUT DUAL VIDEO/S-VIDEO

SWITCHER CARD FOR MULTI-TASKER™

USER'S GUIDE

ALTINEX

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PRECAUTIONS / SAFETY WARNINGS   1

Please read this manual carefully before using your **MT104-107**. Keep this manual handy for future reference. These safety instructions are to ensure the long life of your **MT104-107** 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 **MT104-107** 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 the cables that are attached to the **MT104-107**.

- 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.

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ABOUT YOUR MULTI-TASKER™   2

MT104-107
3-IN 1-OUT, Dual Video/S-Video Switcher Card

The **MT104-107** is a dual 3-IN 1-OUT Video/S-Video Switcher Card. There are 3 inputs (+1internal) for Video and 3 inputs (+1internal) for S-Video. It is designed for use in Multi-Tasker™ enclosures. The MT Video/S-Video SW card enables composite video sources and S-Video sources to be connected and switched to a single display or recording device.

The **MT104-107** card utilizes solid state switching technology, and offers a video bandwidth of 350MHz. This bandwidth enables the **MT104-107** to pass high-resolution video signals without degradation. Inputs are selected via easy-to-use ASCII commands from a control system or computer connected to the RS-232 port of a Multi-Tasker™ enclosure. Also available through ASCII control is "on-off" control of individual outputs.

TECHNICAL SPECIFICATION   3

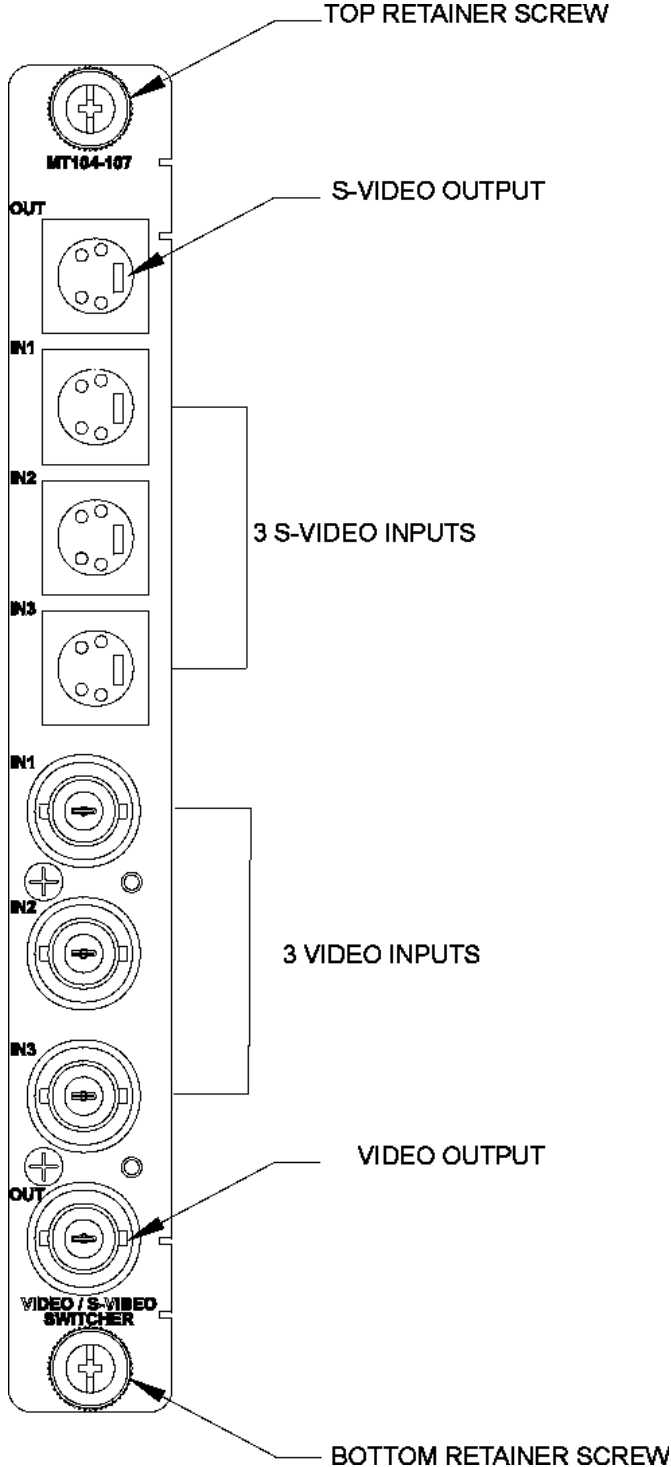| FEATURES/ DESCRIPTION	MT104-107
GENERAL	
Inputs	
External Input Connectors	(3) BNC Female Connectors & (3) 4-pin Mini-DIN Connectors
Internal Input Connectors	(1) BNC Female Connector & (1) 4-pin Mini-DIN Connector
Outputs	
S-Video Output Connectors	(1) BNC Female Connector (1) 4-pin Mini-DIN Connector
Approvals	CE/FCC

Table 1. **MT104-107** General

MECHANICAL	MT104-107
Enclosure Slots Required	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.)	55,000 hrs

Table 2. **MT104-107** Mechanical

ELECTRICAL	MT104-107
Input Signals	
Analog	+/-1.5V (1.5Vp-p)
Or Digital	+5V
Impedance	75 Ohms
Type	Differential
Return Loss	-38dB @ 50MHz
Maximum DC Offset	10mV
Output Signals	
Gain	1.05 (+/-5%)
Impedance	75 Ohms
Propagation Delay (Sync)	4nS max.
Rise/Fall time (Sync)	6nS max.
Differential Phase Error	01° @ 4.5 MHz
Bandwidth	350 MHz @ -3dB
Power	
Power (from **MT100-100**)	+6V DC (80mA) -6V DC (60mA)
Power Consumption	1 watt max.
Optional Accessories	
MS8102CA	6ft., 15-pin HD Male to 5 BNC Male
MS8112CA	6ft., 15-pin HD Female to 5 BNC Male

Table 3. **MT104-107** Electrical

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MULTI-TASKER™

TOP RETAINER SCREW

MT104-107

OUT

S-VIDEO OUTPUT

IN1

IN2

3 S-VIDEO INPUTS

IN3

IN1

IN2

3 VIDEO INPUTS

IN3

VIDEO OUTPUT

OUT

VIDEO / S-VIDEO
SWITCHER

BOTTOM RETAINER SCREW

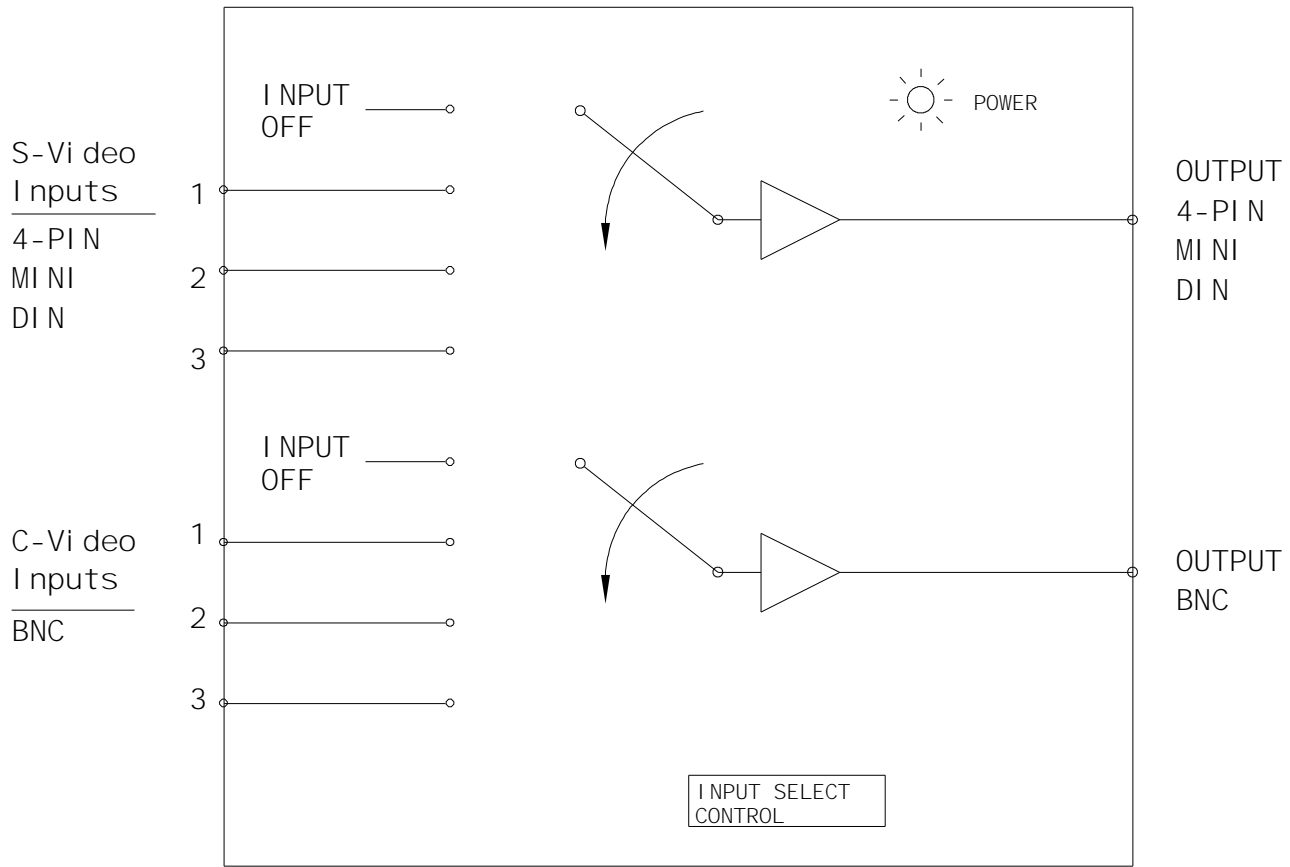## APPLICATION DIAGRAM   5

Application 1
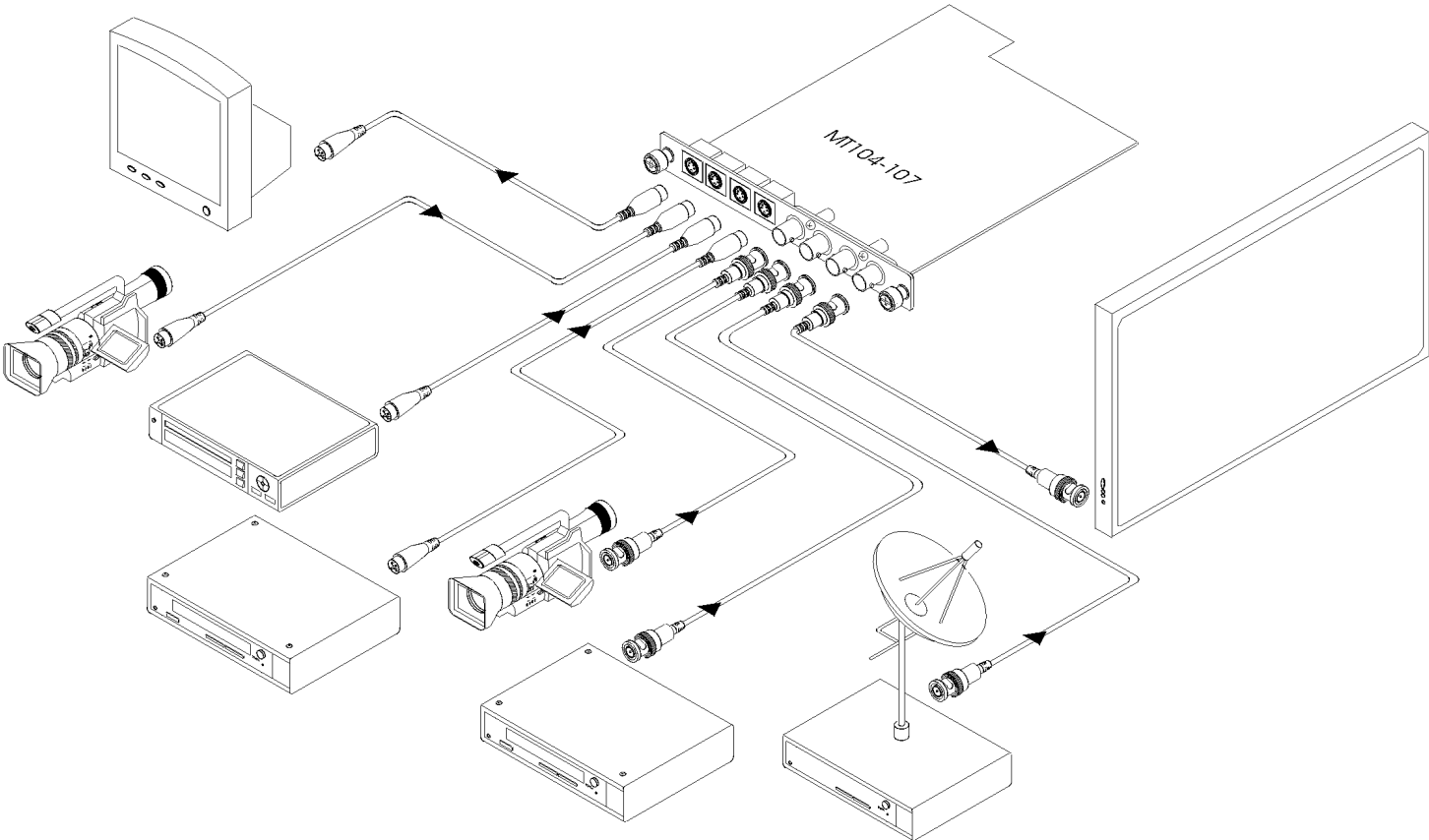
Application 2: Internal View

MT104-107

3-IN 1-OUT VIDEO, S-VIDEO SWITCHER (BNC, 4-PIN DIN IN/OUT)

INSTALLING YOUR MULTI-TASKER™   6

Step 1. Slide the **MT104-107** into an available slot in the Multi-Tasker™ Enclosure in order to connect to the bus. Make sure that the **MT104-107** card fits into place. Secure the card to the Multi-Tasker™ by tightening the retainer screws located on the top and bottom of the **MT104-107** card.

Step 2. The LED on the card panel will turn red indicating that the card is in full operation.

Step 3. Connect a coaxial cable from the video source to the input connector of the **MT104-107**. Connect the output connectors of the **MT104-107** to the display devices through a coaxial cable.

Step 4. Starting from the left, identify the slot number where the **MT104-107** 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 **MT104-107** 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 **MT104-107** 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 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
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 in 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. <u>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).</u>

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 **MT104-107** card.

Command Format: [VERCnUi]

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

Example:

An **MT104-107** card is in slot #2 of unit 3. Retrieve the card type and version by sending

the command **[VERC2U3]**. The Multi-Tasker™ will return the following feedback:

MT104-107 690-0160-002

MT104-107   = card type
690-0160-002 = software version

2. [C]

This command receives the status of the card.

Command Format: [CnUi]

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

Example:

There is an **MT104-107** card is in slot #2 of unit 3. S-Video Input 1 is ON and C-Video Input 3 is ON. To get the status of the card, send the command **[C2U3]**. The feedback will be as follows:

ON: 1-SVID 3-CVID

1-SVID   = S-Video Input 1 ON
3-CVID   = Composite Video Input 3 ON

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 current status of the card's input to output configuration. This configuration will be restored after the system is Reset or powered OFF then ON.

Cn = card number
S   = save configuration

If S-Video Outputs 1,2,3 and Video Outputs 1,2,3 are enabled, the feedback after sending the command [C4S], for slot 4, would be:

SVID: 1,2,3 CVID: 1,2,3 C04   Saved

4. [ON]

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

SINGLE CARD

[ONmVCnUiS] for Composite Video

[ONmSCnUiS] for S-Video

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

[ONm**V**CnUi]: Enables one composite video input (C-Video)

[ONm**S**CnUi]: Enables one S-Video input

Default when plugged in:
    S-Video Input #1 = ON
    C-Video Input #1 = ON

m   = Input number (m = 1 to 4)
        (input 4 is internal)
Cn = Card ID (n = # from 1 to max slots)
Ui = Unit ID number (i = 0 to 9)
S   = activates S-Video input
V   = activates C-Video input
S   = saves command to memory

Example:

All of the inputs on the **MT104-107** card are OFF and the card is in slot #5 of unit 3:

1) **[ON1VC5U3]**: Turns ON C-Video input 1.

2) **[ON3VC5U3]**: Turns ON C-Video input 3

    Since only one of each input type may be selected at a time, Input 1 is now OFF. It was turned OFF automatically when Input 3 was turned ON.

3) **[ON2SC5U3]**: Turns ON S-Video input 2.

GROUP OF CARDS
    [ONmVGkUiS] for Composite Video
    [ONmSGkUiS] for S-Video

This command enables input "m" for each card in group "k" of unit "i".
[ONm**V**GkUi]: Enables a group of composite video inputs (C-Video)

[ONm**S**GkUi]: Enables a group of S-Video inputs

m   =   Input number (m = 1 to 4)
(input 4 is internal)
Gk =   group number (k = # from 1-9)
Ui =   unit number (i = # from 0-9)
S   =   activates S-Video input
V   =   activates C-Video input

S   =   saves command to memory

Example:

[ON1VG1U1]: Turns ON C-Video input 1 for each card in group 1 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 may be set on a single card or for multiple cards. In either case, all Paths will be switched when the [SW] command is executed.

Command Formats:
    [ONmVCnUiP] and
    [OnmSCnUiP]

m   =   Input number (m = 1 to 4)
            (input 4 is internal)
S   =   activates S-Video input
V   =   activates C-Video input
Cn   =   card ID (n = slot # from 1 to max slots)
P   =   path

Example:

There are two **MT104-107** cards in slot 6 and 7 of unit 3. Enable S-Video input 1 of card 6 and S-Video input 3 of card 7 simultaneously. Use the following commands:

[ON1SC6U3**P**]
[ON3SC7U3**P**]
[SW]

If "F" is included, use the [ONmCnUi**PF**] command or the [ONmCnUi**FP**] 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:

[ON1VC2U3**F**]: if path is not set
[ON1VC2U3**PF**]: if path is set

5. [OFF]

This command disables one input of a single

card or a group of cards.

SINGLE CARD
    [OFFmVCnUiS] for Composite Video
    [OFFmSCnUiS] for S-Video

This command disables input "m" or all inputs. **[OFFVC5CnUi]**: Turns OFF all C-Video inputs of the **MT104-107** card.

m   =   Input number (m = 1 to 4)
            (input 4 is internal)
Cn   =   Card ID (n = slot # from 1 to max slots)
Ui   =   Unit ID number (i = 0 to 9)
S   =   activates S-Video input
V   =   activates C-Video input
S   =   saves command to memory

Example:

Card 5 of unit 3 has S-Video input 1 and C-Video input 2 ON. The following commands can be used to turn OFF the inputs.

1)   **[OFF1SC5U3]** or **[OFFSC5U3]**: Turns OFF S-Video input.

2)   **[OFFVC5U3]:** Turns OFF C-Video input.

GROUP OF CARDS
    [OFFmVGkUiS] for Composite Video
    [OFFmSGkUiS] for S-Video

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

m   =   Input number (m = 1 to 4)
            (input 4 is internal)
Cn   =   Card ID (n = slot # from 1 to max slots)
Ui   =   Unit ID number (i = 0 to 9)
S   =   activates S-Video input
V   =   activates C-Video input
S   =   saves command to memory

Example:

1)   **[OFF1SG1U1]**: Turns OFF S-Video input 1 for each card in group 1 of unit 1.

2)   **[OFF1VG1U1]**: Turns OFF C-Video input 1 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 loaded.

Command Formats:
[OFFmVCnUiP] and
[OFFmSCnUiP]

m = Input number (m = 1 to 4)
       (input 4 is internal)
Cn = card ID (n = slot # from 1 to max slots)
P   = path

Example:

There are two **MT104-107** cards in slot 6 and 7 of unit 3. Enable C-Video input 1 of card 6 and C-Video input 3 of card 7 simultaneously. Use the following commands:

[OFF1VC6U3**P**]
[OFF3VC7U3**P**]
[SW]

If "F" is included, use the [OFFmCnUi**PF**] command or the [OFFmCnUi**FP**] 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:

[OFF1VC2U3**F**]: if path is not set
[OFF1VC2U3**PF**]: if path is set

6. […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.

7. […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.

8. […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 examples in ON and OFF commands.

9. [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 Multi-Tasker™ Enclosure.

Example:

[ON1C6U3P]
[ON3C7U3P]
[SW]

The above example turns ON input 1 of card 6 of unit 3 at the same time as input 3 of card 7 of unit 3.

10. [HELP]

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

Command Format: [**HELPCnUi**]

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

Example:

In order to view the RS-232 commands available for the **MT104-107** 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.

11. [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.

12. [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.

13. [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 ID 0, 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.**

14. [RD]

This command displays the members in each group.

Command Format: [RDGkUi]

Gk = Group number (k = # from 1-9)
Ui   = Unit ID (i = # from 0-9)

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

C1   = Card in Slot 1
C2   = Card in Slot 2
C19 = Card in slot 19
G5   = Group 5
U1   = Unit ID 1

15. [CLM]

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

Command Format: [CLMGkUi]

Gk = Group number (k = # from 1-9)
Ui   = Unit ID (i = # from 0-9)

Example:

Group 5 of Unit 1 contains the cards in slots 1, 2 and 19. Read the member data for group 5 of unit 1, by sending the command [RDG5U1]:

C1C2C19 G5U1.

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

NONE G5U1

7.3 SUMMARY OF COMMANDS

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

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

3) **[CiS]**   **Saves card configuration**

4) **[ON]**   **Turns on one or more outputs for a single card or a group of cards**

5) **[OFF]**   **Turns off one or more outputs for a single card or a group of cards**

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

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

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8) […P] **Sets the path, preload for [SW]**

9) [SW] **Switch preloaded output buffer**

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

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

12) [CLR] **Clears members of a single group or all groups**

13) [G] **Requests group data**

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

15) [CLM] **Remove members from a group**

TROUBLESHOOTING GUIDE   8

We have carefully tested and have found no problems in the supplied **MT104-107**; 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 install it in the questionable slot. If the LED on the good card comes ON, 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 input is not selected.**

Solution: Select the card input. See RS- 232 accessible commands in section 7. If no display 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 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.

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

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