

MT105-120 is shown above.

MANUAL PART NUMBER: 400-0362-002

MT105-120/121

8X8/8X4 VGA - MATRIX SWITCHER

(15 Pin HD IN/OUT)

FOR

MULTI-TASKER

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PRECAUTIONS / SAFETY WARNINGS 1

Please read this manual carefully before using your **MT105-120/121**. Keep this manual handy for future reference. These safety instructions are to ensure the long life of your **MT105-120/121** 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 **MT105-120/121** 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 **MT105-120/121** carefully. Dropping or jarring can damage the card.
- Do not pull the cables that are attached to the **MT105-120/121**.
- Insert the card carefully into the slots of the Multi-Tasker™ without bending any edges.

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 MULTI-TASKER™ 2

MT105-120/121 Re-Configurable VGA-QXGA Video Matrix Switcher Cards

The **MT105-120/121** are VGA-UXGA Video Matrix Switcher Cards designed to switch 325 MHz high bandwidth RGBHV video signals. This **MT105-120** card has eight fixed inputs and eight fixed outputs with 15-pin HD connectors. The **MT105-121** card has eight fixed inputs and four fixed outputs, also with 15-pin HD connectors.

Both cards provide signal detection on input and output through horizontal SYNC. This feature enables for easy remote diagnostics throughout RS-232 commands, from the source all the way to the output connectors.

The **MT105-120/121** provides an economical application due to the space saving design by using of D-connectors instead of BNC connectors.

Inputs are switched to outputs through easy-to-use ASCII commands from a control system or computer connected to the **RS-232 port** of the Multi-Tasker enclosure. Both cards allow muting video output through **RS-232**. Inputs and outputs may be programmed in batches and switches all at the same time with single command.

Used in combination with **MT110-100** and **MT110-101** Audio Matrix Switcher cards, it is possible to group audio and video inputs and outputs to be switched as audio follow video or independently.

TECHNICAL SPECIFICATIONS 3

FEATURES/DESCRIPTION	MT105-120/121
GENERAL	
Inputs	8
Input Connectors	15 PIN HD Female
Internal I/O Con	None
Outputs	MT105-120 = 8 MT105-121 = 4
P&P compatible	YES all inputs
Output Connector	15 PIN HD Female
Compatibility	
Signal type	RGBHV, RGBS, RGsB, Component Video
Signal resolution	VGA through UXGA

Table 1. **MT105-120/121** General

MECHANICAL	MT105-120/121
Enclosure Slots Required	MT105-120 = 4 MT105-121 = 3
Weight	1.1 lb (0.5 kg)
Connector Panel	Black Anodized
T° Operating	10°C-50°C
T° Maximum	75°C
Humidity	90% non-condensing
MTBF (calc.)	50,000 hrs

Table 2. **MT105-120/121** Mechanical

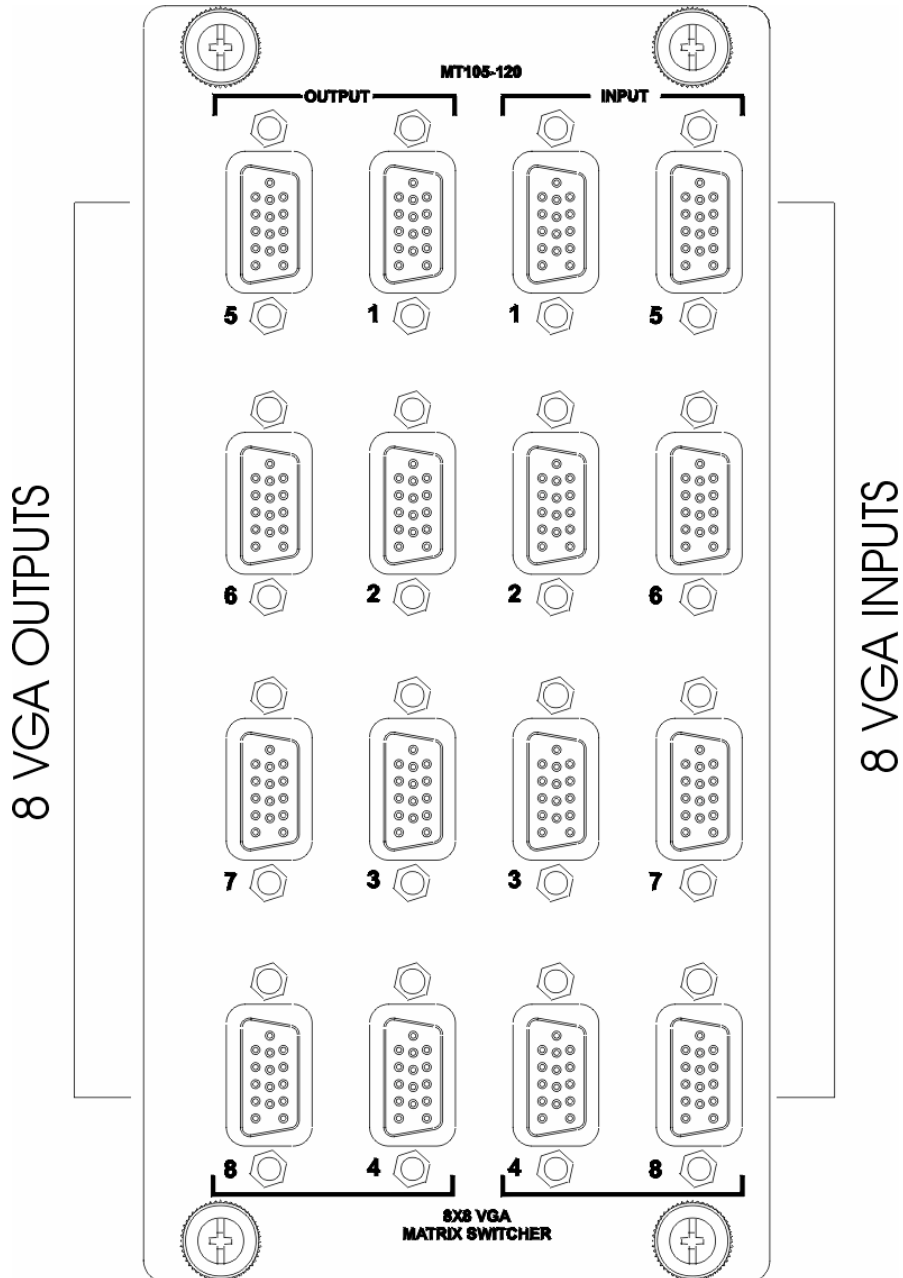
ELECTRICAL	MT105-120/121
Video Input Signals	R,G,B
Impedance Analog	75 Ohms
Analog Signal Level	1.5V p-p max.
Sync Input Signals	H,V
Impedance	10 kOhm
Signal Level	3 - 5 Volts TTL
Output Video Signals	
Impedance Analog	75 Ohms
Gain	1.05
Bandwidth	325 MHz @ -3dB
Output Sync Signals	
Impedance	75 Ohms
Signal Level	4.5 Volts TTL

Table 3. **MT105-120/121** Electrical

PRODUCT DESCRIPTION

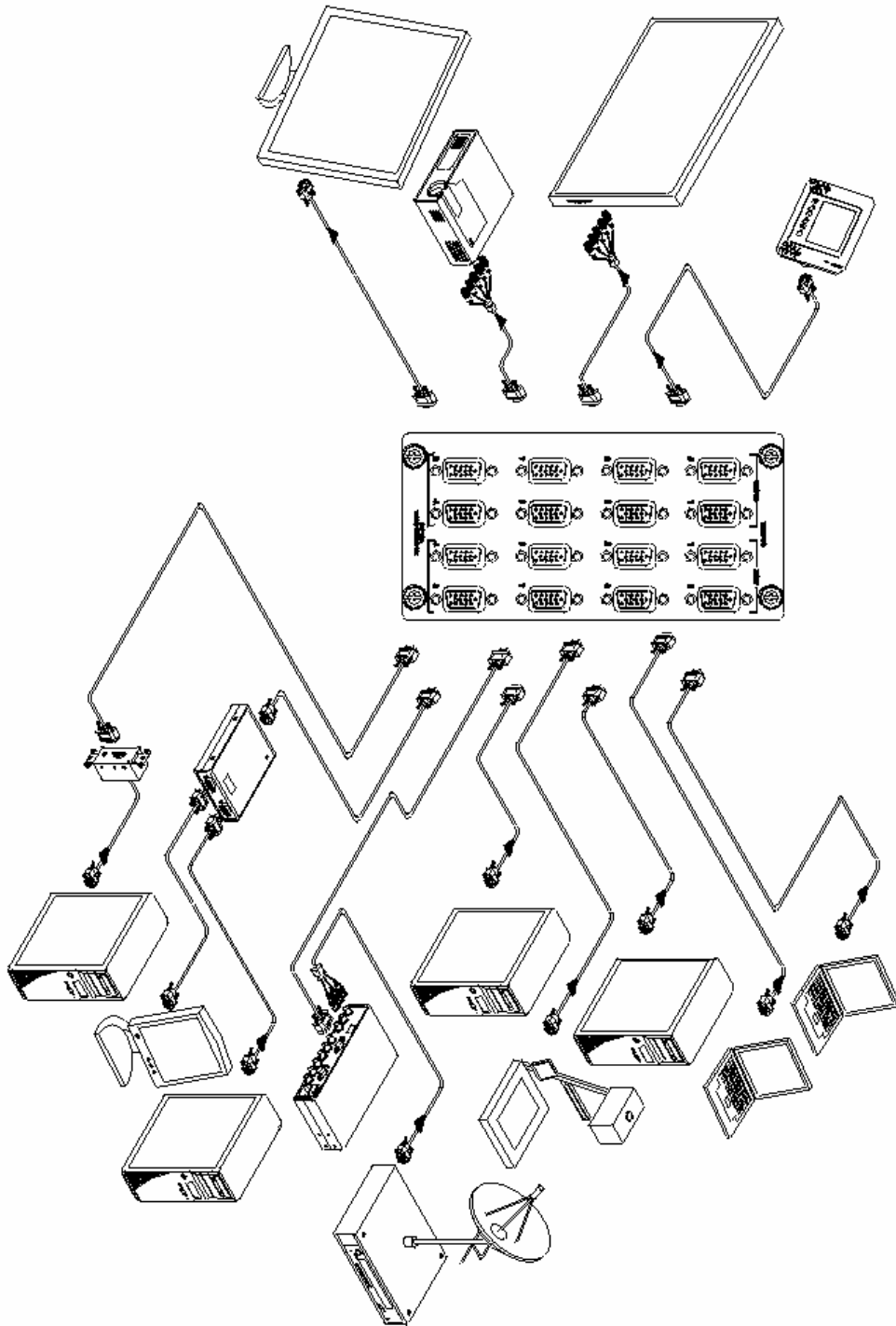
4

MT105-120 Front Panel



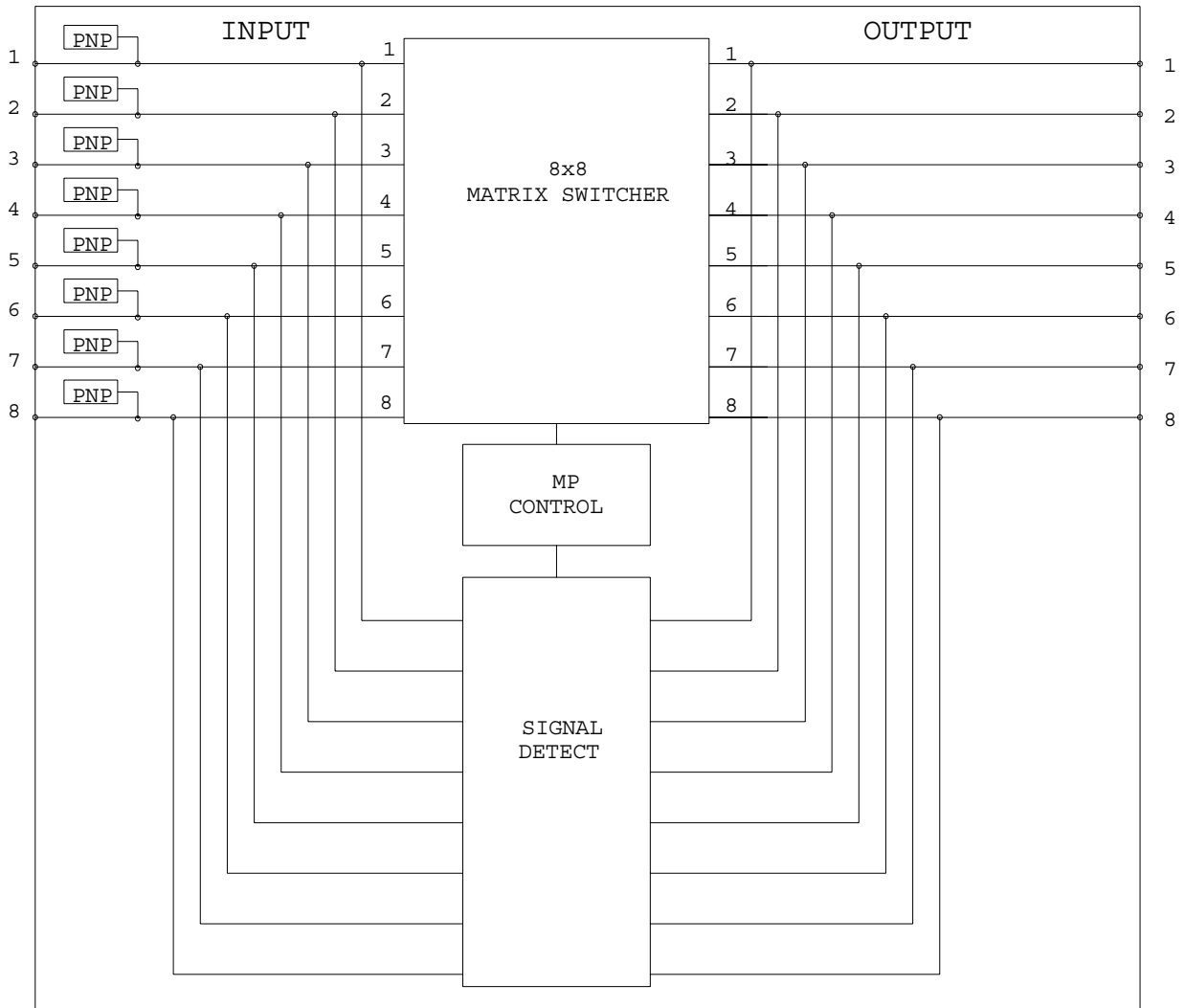
APPLICATION DIAGRAM

5

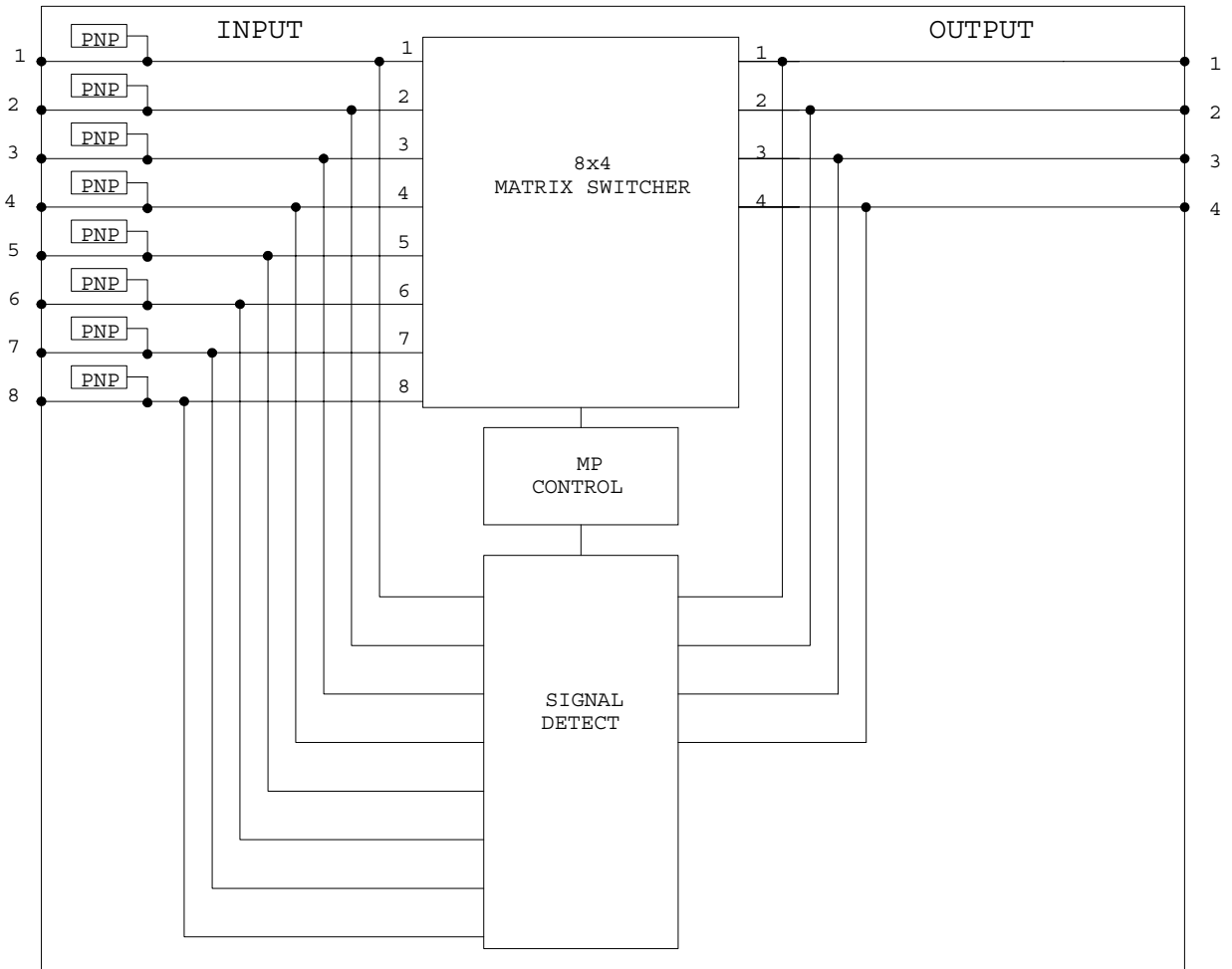


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MT105-120 Internal Block Diagram



MT105-121 Internal Block Diagram



INSTALLING YOUR MULTI-TASKER™ 6

- Step 1.** Slide the **MT105-120/121** into an available slot in the Multi-Tasker™ Enclosure in order to connect to the bus. Make sure that the **MT105-120/121** card fits into place. Secure the card to the Multi-Tasker™ by tightening the retainer screws located on the top and bottom of the **MT105-120/121**.
- Step 2.** Connect a VGA cable from the video source to the input connector of the **MT105-120/121**. Connect the output connectors of the **MT105-120/121** to the display devices through a VGA cable.
- Step 3.** Starting from the left, identify the slot number where the **MT105-120/121** 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 **MT105-120/121** 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.

7.2 RS-232 INTERFACE

The RS-232 commands for the MT105-120/121 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 or powered off then on.

7.3 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); based on which slot the card is put in. 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 displays the software version and card type for the MT105-120/121 card.

Command Format: [VERCnUi]

Cn = card ID (n = slot # from 1 to 19)

(1 to 8 for MT100-101 or 1 to 4 for MT100-106)

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

Example:

If one **MT105-120/121** card is in slot #2 of unit number 3:

When sending command [**VERC2U3**], the Multi-Tasker™ Enclosure will return feedback as:
MT105-120 690-0170-001

MT105-120 = the card model

690-0170-001 = the software version

2. [C]

This command displays the status of the card and connections of the Matrix Switcher.

Command Format: [CnUi]

Cn = card ID (n = a slot # from 1 to 19)

(1 to 8 for MT100-101 or 1 to 4 for MT100-106)

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

Example:

If one MT105-120 card is in slot #2 of unit 3 with output 1, 2 and 3 ON:

When sending command [C2U3], feedback will be returned as:

```
Config:8X8
In1 Out1 ON
In2 Out2 ON
In1 Out3 ON
In2 Out4 OFF
In8 Out5 OFF
In7 Out6 OFF
In2 Out7 OFF
In5 Out8 OFF
```

Description of Feedback:

Input1 is connected to Output1 and Output1 is enabled

Input2 is connected to Output2 and Output2 is enabled

Input1 is connected to Output3 and Output3 is enabled

Input2 is connected to Output4 and Output4 is disabled

Input8 is connected to Output5 and Output5 is disabled

Input7 is connected to Output6 and Output6 is disabled

Input2 is connected to Output7 and Output7 is disabled

Input5 is connected to Output8 and Output8 is disabled

Note: 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 system is reset or powered off then on. If Input 1 is connected to all 8 outputs, but only 1 through 4 are ON, the feedback after sending the command [C4S], for slot 4, would be:

```
Config:8X8
In1 Out1 ON
In1 Out2 ON
In1 Out3 ON
In1 Out4 ON
In1 Out5 OFF
In1 Out6 OFF
In1 Out7 OFF
In1 Out8 OFF
```

Card Status Saved

4. [IO]

This command will connect input x with output y, but the user needs to use [ON] command to enable the output.

Command Format: [IxOyCnUiS]

Ix = select input x (x is from 1 to 8)

Oy = connect to output y (y is from 1 to 8)

Cn = card ID number (n is from 1 to 19)
(1 to 8 for MT100-101 or 1 to 4 for MT100-106)

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

(Refer to MT100-100 user's guide to set Unit ID)

S = saves command to memory

5. [IO*]

This command sets one input to all outputs at the same time. Sending the command [I2O*C4] to an MT105-120 configured as an 8X8 matrix, will connect input 2 to outputs 1 through 8 on the card in slot 4.

6. [ON]

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

[ONmCnUiS]: for a single card

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

Default when plugged in = Input 1 is ON

m = Output number (m = 1 to 8)

n = Card ID number (n = 1 to 19)
(1 to 8 for MT100-101 or 1 to 4 for MT100-106)

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

S = saves command to memory

Example:

- 1) [ON12C5U3]: Turns ON only output 1 and 2 of the **MT105-120** card located in slot #5 of the MT100-100 Enclosure with unit ID3.
- 2) [ON3C5U3]: Turns ON only output 3 of the MT105-120 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)

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

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

S = saves command to memory

Example:

1. [ON1G5U1]: Turns ON output 1 for each card in group5 of unit 1.
2. [ONG5U1]: Turns ON all outputs for each card in group5 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 is executed ([SW]). 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)

n = card ID No. (n = a slot # from 1 to 19)
(1 to 8 for MT100-101 or 1 to 4 for MT100-106)

P = path

Example:

If 2 cards are in slots 6 and 7 of unit 3:

To enable output 1 and 2 of card in slot 6 and output 3 and 4 of card in slot 7 simultaneously, use the following commands:

```
[ON12C6U3P]
[ON34C7U3P]
[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 or if the unit ID is zero.

Example:

[ON1C2U3F]: if path is not set

[ON1C2U3PF]: if path is set

7. [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)

n = card ID No. (n = slot # from 1 to 19)
(1 to 8 for MT100-101 or 1 to 4 for MT100-106)

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

S = saves command to memory

[OFFCnUi]: Turns OFF all outputs of the card

Example:

- 1) If card in slot 5 of unit 3 has output 1, 2 and 3 ON:
 - a) [OFF1C5U3]: Turns OFF output 1 while output 2 and 3 remain ON.
 - b) [OFF23C5]: Turns OFF output 2 and 3.
- 2) If card in slot 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 [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)

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

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

S = saves command to memory

Example:

1. [OFF1G5U1]: Turns OFF output 1 for each card in group5 of unit 1.
2. [OFFG5U1]: Turns OFF all outputs for each card in group5 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 is executed ([SW]). Commands ending in "P" are not executed immediately. The path for outputs on multiple cards or the same card can be loaded.

Command Format: [OFFmCnUiP]

m = number (m =1 to 8)

n = card ID No. (n = a slot # from 1 to 19)
(1 to 8 for MT100-101 or 1 to 4 for MT100-106)

P = path

Example:

If 2 cards are in slots 6 and 7 of unit 3:

To enable output 1 and 2 of card 6 and output 3 and 4 of card in slot 7 simultaneously, use the following commands:

```
[OFF12C6U3P]
[OFF34C7U3P]
[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 or if the unit ID is zero.

Example:

```
[OFF1C2U3F]: if path is not set
[OFF1C2U3PF]: if path is set
```

8. [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]
```

9. [...S] – Save

This command will save the configuration command being sent in memory. When sending the command [I1O8C4S], after reset or power up, input 1 will be connected to output 8 on C4.

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 path for outputs on multiple cards or the same card can be loaded. See examples in ON and OFF commands.

11. [...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 or if the unit ID is zero.

12. [CLR]

This command reset card configuration (All Outputs are connected with input 1)

13. [SIGImCi]

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

m = Input Number
i = Card Number

Example:

To check for the presence of an input signal on input 2 of card 4, send the command [SIGI2C4] and verify feedback of "1" or "0".

14. [SIGOmCi]

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

m = Input Number
i = Card Number

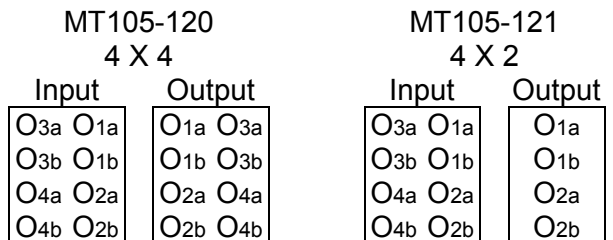
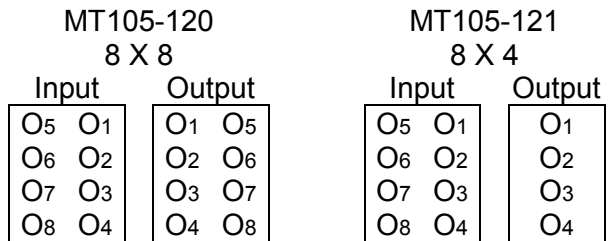
Example:

To check for the presence of an input signal on output 1 of card 4, send the command [SIGO1C4] and verify feedback of "1" or "0".

15. [MATmXnCi]

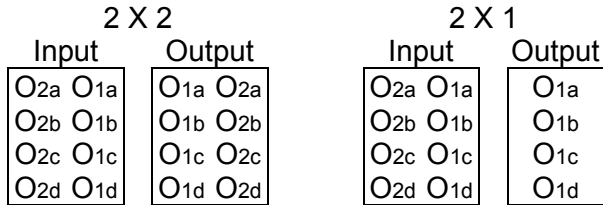
This Matrix command allows the switcher card to be setup for different matrix sizes.

m = number of inputs (8,4,2)
n = number of outputs (8,4,2,1)
i = card number (1-20)



MT105-120

MT105-121



16. [WR]

This command groups multiple cards in the MT100-100 Enclosure. Each unit contains a maximum of nine groups.

Command Format: [WRCn...GkUi]

n = card ID No. (n = slot # from 1 to 19)
(1 to 8 for MT100-101 or 1 to 4 for MT100-106)

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

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

Example:

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

17. [CLM]

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

[CLMCnUi]: for a single card

n = Card ID number (n = 1 to 19)
(1 to 8 for MT100-101 or 1 to 4 for MT100-106)

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

Note that all outputs will be connected to input1.

[CLMGkUi]: for a group of cards

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

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

Example:

a) To clear group #1, send the [CLMG1U1] command. This command clears the members for the specified group only.

b) To clear all groups of unit 1, send the [CLMG*U1] command. 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.

18. [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]

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

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

Example:

If group 1 has DA Cards with output 1, 2 and 3 on, while group 2 has SW Cards with input 2 on:

- 1) [G1]: will return feedback as [On123G1].
- 2) [G2]: will return feedback as [On2G2].

19. [RD]

This command displays the members in each group.

Command Format: [RDGkUi]

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

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

member = C1 - C19 (card 1 to 19)
(1 to 8 for MT100-101 or 1 to 4 for MT100-106)

Example:

To read member data for group 5 of unit 1, send the [RDG5U1] command. The system will return feedback as C1C2C3 G5U1.

20. [HELP]

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

7.4 SUMMARY OF COMMANDS

- 1) [VER] Receives software version
- 2) [C] Receives status of the card
- 3) [CnS] Saves card configuration
- 4) [IO] Connects the input to the output.
- 5) [IO*] Connects one input to all outputs
- 6) [ON] Turns on one or more outputs for a single card or a group of cards
- 7) [OFF] Turns off one or more outputs for a single card or a group of cards
- 8) [SW] Switch (outputs the preloaded buffer)
- 9) [...S] Save the command configuration sent
- 10) [...P] Sets the path, preload for [SW]
- 11) [...F] Provides feedback upon sending
- 12) [CLR] Reset card configuration
- 13) [SIGI] Input Signal Present
- 14) [SIGO] Output Signal Present
- 15) [MAT] Matrix Configuration
- 16) [WR] Groups multiple cards
- 17) [CLM] Clears members of a single group or all groups
- 18) [G] Requests group data
- 19) [RD] Displays the members in each group
- 20) [HELP] Display all available commands

TROUBLESHOOTING GUIDE

8

We have carefully tested and have found no problems in the supplied **MT105-120/121**; however, we would like to offer suggestions for the following:

8.1 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

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9.0 LIMITED WARRANTY / RETURN POLICY

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

9.1 CONTACT INFORMATION

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