Multi Tasker™

MT105-115 is shown above.

MANUAL PART NUMBER: 400-0332-001

MT105-115/MT105-118

8-IN, 16-OUT VIDEO/SYNC MATRIX

SWITCHER

CARDS FOR MULTI-TASKER

USER'S GUIDE

ALTINEX

SIGNAL MANAGEMENT SOLUTIONS™

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PRECAUTIONS / SAFETY WARNINGS   1

Please read this manual carefully before using your **MT105-115/118**. Keep this manual handy for future reference. These safety instructions are to ensure the long life of your **MT105-115/118** 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 **MT105-115/118** 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 **MT105-115/118** carefully. Dropping or jarring can damage the card.

- 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.

MULTI-TASKER™

MT105-115/MT105-118
8-in 16-out Sync and Video Matrix Switcher Cards

The **MT105-115/MT105-118** 8-in, 16-out Video Matrix Switcher card is designed for use in the Multi-Tasker™ enclosure to allow the routing of computer and broadcast video in audio/visual presentation systems. When installed in the 19 slot, 8 slot or 4 slot enclosure, this card enables 8 composite video sources to be connected and switched to 16 different display or recording devices.

MT 105-115 provides a bandwidth of 325MHz. Special features such as GLI on the Inputs, and Genlock capability are available. Genlock allows for vertical Interleave Switching (VIS) on the outputs.

The **MT105-118** 8-in, 16-out Sync Matrix Switcher card is designed to accommodate special impedance requirement for the HSYNC+VSYNC channels.

The combination of **MT105-115** and **MT105-118** allows easy set up of RGBHB, RGBS, RGsB switching configurations.

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.

Multiple **MT105-115/118** cards can be installed in the enclosure to provide additional functionality. For example, two cards can be used to handle the two components of an S-Video signal (Chroma and Luma), three cards to handle Component Video, and five cards to handle RGBHV. When using these cards to switch RGBHV format signals, it is possible to adapt the 5 BNC connectors to a VGA-type, 15-pin HD connector using ALTINEX adapter cables, such as part # MS8102CA.

| FEATURES/ DESCRIPTION	MT105-115/118
GENERAL	
Inputs	8
External Input Connectors	8 BNC Female
Outputs	16
Output Connector	16 BNC Female
Compatibility	
Using 1 Card (MT105-118)	Composite Sync
Using 2 Cards (MT105-118)	H+V Sync
Using 2 Cards (MT105-115)	S-Video
Using 3 Cards (MT105-115)	RGsB
Using 4 Cards (MT105-115/-118)	RGBS
Using 5 Cards (MT105-115/118)	RGBHV

Table 1. **MT105-115/118** General

| MECHANICAL	MT105-115/118
Enclosure Slots Required	Four
Weight	1.79 lb (0.81 kg)
Connector Panel	Black
T° Operating	10°C-50°C
T° Maximum	75°C
Humidity	90% non-condensing
MTBF (calc.)	40,000 hrs

Table 2. **MT105-115/118** Mechanical

ELECTRICAL		MT105-115/118	
Input Signals			
Impedance (MT105-115)		75 ohm	
Impedance (MT105-118)		10K Ohms	
Analog/TTL		1.5 – 5V max.	
Output Signals			
Impedance (MT105-115)		75 Ohms	
Impedance (MT105-118)		22 Ohms	
Power			
Power from MT100-100	**+6V**	**-6V**	**Power Consumption**
MT105-115	450mA	380mA	5 watts
MT105-118	200mA	150mA	2.1 watts

Table 3. **MT105-115/118** Electrical

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SIGNAL MANAGEMENT SOLUTIONS

BLOCK AND APPLICATION DIAGRAM   4
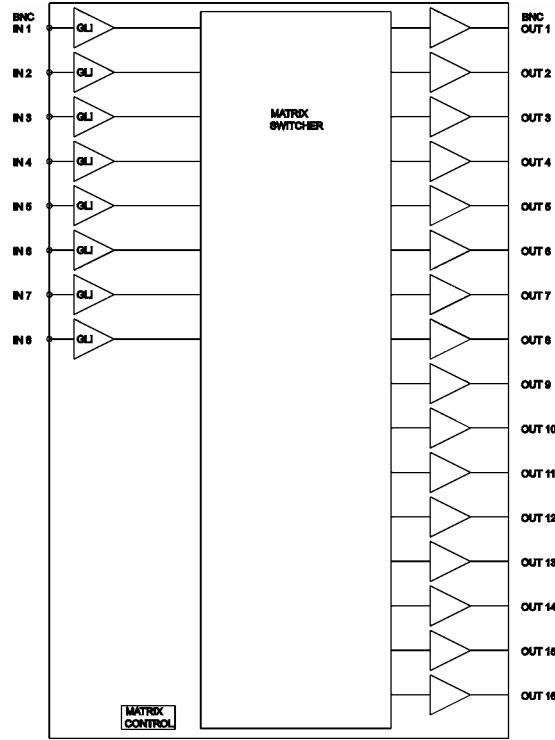
Block diagram of MT105-115/MT105-118
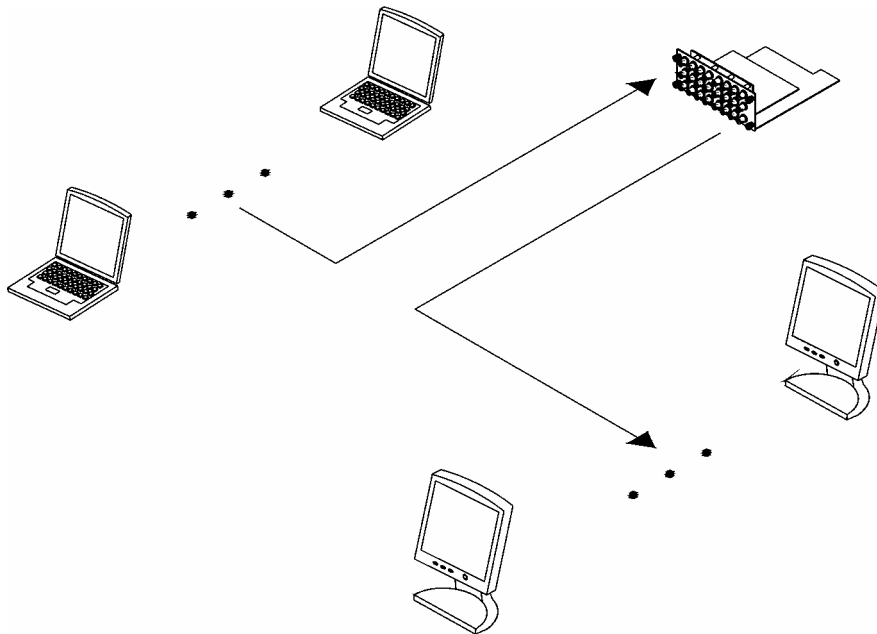
Up to 8 inputs and 16 outputs can be connected and switched using these cards.

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MULTI-TASKER™

INSTALLING YOUR MULTI-TASKER™   5

Step 1. Slide the **MT105-115/118** into an available slot in the Multi-Tasker™ Enclosure in order to connect to the bus. Make sure that the **MT105-115/118** card fits into place. Secure the card to the Multi-Tasker™ by tightening the retainer screws located on the top and bottom of the **MT105-115/118** card.

Step 2. Connect a coaxial cable from the video source to the input connector of the **MT105-115/118**. Connect the output connectors of the **MT105-115/118** to the display devices through a coaxial cable.

Step 3. Starting from the left, identify the slot number where the **MT105-115/118** card is plugged into the Enclosure and note that it is for RS-232 control.

OPERATION   6

6.1 RS-232 CONTROL

When used in the Multi-Tasker™ Enclosure, the **MT105-115/118** 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.

6.1.1 RS-232 INTERFACE

The RS-232 commands for the **MT105-115/118** 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).

6.2 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.
Card ID is an assigned value from 1 to 19 (1 to 8 or 1-4 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 (equivalent to [VERC3U0])
[VERC3Ui]: for unit ID other than zero

1. [VER]

This command displays the firmware version and card type for the **MT105-115/118** card.
Command Format: [VERCnUi]
Cn = card ID (n = slot # from 1 to 19)
Ui = Unit ID (i = # from 0 to 9) (refer to the MT100-100 user's guide for explanation)

Example:

If one **MT105-115** card is in slot #3 of unit 3:
When sending command **[VERC3U3]**, the Multi-Tasker™ Enclosure will return feedback as:
MT105-115 690-0148-005

2. [C]

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Tel: 714-990-2300 • Toll-Free: 1-800-ALTINEX • FAX: 714-990-3303 • E-mail: solutions@altinex.com • Web: www.altinex.com

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 **MT105-115/118** card is in slot #3 of unit 3 with output 1, 2 and 3 ON:
When sending command **[C3U3]**, feedback will be returned as:
CONFIG: 8x16 VIS:ON

In1   Out1   ON

In2   Out2   ON

.
.
.
In1 Out16 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 Output16 and Output16 is disabled
Note: If there is no card in slot #3 of unit 3, sending the **[C3U3]** command will not return any feedback.

ERROR CODES

ER01: CPU Error

This type of error indicates that the CPU is <u>not</u> working properly.
ER02: I²C Communication Error

This means that the communication between the **MT105-115/118** card and its serial device has failed.

ER03: RS485 Communication Error

This type of error is a communication error between the **MT105-115/118** card and the controller of the Multi-Tasker™ Enclosure.

3. [IO]

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

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

Oy = connect to output y (y is # from 1 to 16)

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

Example:

To connect input 4 to output 2 (card 3 of unit 3), use the [I4O2C3U3] command.

4. [ON]

This command enables output of a single card or a group of cards.

[ONmCnUiS]: for a single card

This command enables output "m" without affecting any other outputs.
Default when plugged in = ALL OFF
m = Output number (m = 1 to 16)
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) **[ON12C3U3]:** Turns ON only output 1 and 2 of the **MT105-115/118** card located in slot #3 of the MT100-100 Enclosure with unit ID3.
2) **[ON3C3U3]:** Turns ON only output 3 of the **MT105-115/118** card located in slot #3 of the MT100-100 Enclosure with unit ID3. After the **[ON12C3U3]** and **[ON3C3U3]** commands have been executed, output 1, 2 and 3 will be ON.
3) **[ONC3U3]:** Turns ON all outputs of the card.

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[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 1-16)
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 16)
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 at slot 3 and 6 of unit 3:
To enable output 1 and 2 of card 3 and output 3 and 4 of card 6 simultaneously, use the following commands:
[ON12C3U3**P**]
[ON34C6U3**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 or if the unit ID is zero.
Example:
[ON1C3U3**F**]: if path is not set
[ON1C3U3**PF**]: if path is set

5. [OFF]

This command disables output of 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 16)
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 6 of unit 3 has output 1, 2 and 3 ON:
a) **[OFF1C6U3]:** Turns OFF output 1 while output 2 and 3 remain ON.
b) **[OFF23C6]:** Turns OFF output 2 and 3.
2) If card 6 of unit 3 has output 1, 2, 3, 4, 5, 6, 7 and 8 ON:
a) **[OFFC6U3]:** Turns OFF all outputs, which is equivalent to **[OFF12345678C6U3]**.

[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 1-16)
k = group number (k = # from 1-9)
i = unit number (i = # from 0-9)
S = saves command to memory

Example:

1. [OFF1G6U1]: Turns OFF output 1 for each card in group6 of unit 1.
2. [OFFG6U1]: Turns OFF all outputs for each card in group6 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 = output number (m =1 to 16)
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 at slot 3 and 6 of unit 3:

ALTINEX

To enable output 1 and 2 of card 3 and output 3 and 4 of card 6 simultaneously, use the following commands:
[OFF12C3U3**P**]
[OFF34C6U3**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 or if the unit ID is zero.
Example:
[OFF1C3U3**F**]: if path is not set
[OFF1C3U3P**F**]: if path is set

6. [SW]

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

Example:

[ON12C6U3P]
[ON34C10U3P]
[SW]
The system will return feedback as OK if the unit ID is zero.

7. [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 #3, 6, and 9 as group 5 of unit #1, send the [WRC3C6C9G5U1] command. After executing this command, card 3, 6, and 9 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.

8. [CLR]

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

[CLRCnUi]: for a single card

n = Card ID number (n = 1 to 19) *(1 to 8 MT100-101 or 1 to 4 for MT100-106)for*
Ui = Unit ID number (i = 0 to 9)
Note that all outputs will be connected to input1.

[CLRGkUi]: for a group of cards

Gk = group number (k = # from 1-9)
Ui = unit number (i = # from 0-9)

Example:

a) To clear group #1, send the [CLRG1U1] command. This command clears the members for the specified group only.
b) To clear all groups of unit 1, send the [CLRG✳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.

9. [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:

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].**

10. [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.

11. [MATmmXnn]

This command allows changes in the configuration of the matrix. User can configure the **MT105-115 and MT105-118** Matrix Switcher as 8x16, 4x8, 2x4 or 1x2 .

8x16

Input	Output	
O_1	O_1	O_9
O_2	O_2	O_{10}
O_3	O_3	O_{11}
O_4	O_4	O_{12}
O_5	O_5	O_{13}
O_6	O_6	O_{14}
O_7	O_7	O_{15}
O_8	O_8	O_{16}

4x8

Input	Output	
O_{1a}	O_{1a}	O_{5a}
O_{1b}	O_{1b}	O_{5b}
O_{2a}	O_{2a}	O_{6a}
O_{2b}	O_{2b}	O_{6b}
O_{3a}	O_{3a}	O_{7a}
O_{3b}	O_{3b}	O_{7b}
O_{4a}	O_{4a}	O_{8a}
O_{4b}	O_{4b}	O_{8b}

2x4

Input	Output	
O_{1a}	O_{1a}	O_{3a}
O_{1b}	O_{1b}	O_{3b}
O_{1c}	O_{1c}	O_{3c}
O_{1d}	O_{2d}	O_{3d}
O_{2a}	O_{2a}	O_{4a}
O_{2b}	O_{2b}	O_{4b}
O_{2c}	O_{2c}	O_{4c}
O_{2d}	O_{2d}	O_{4d}

1x2

Input	Output	
O_{1a}	O_{1a}	O_{2a}
O_{1b}	O_{1b}	O_{2b}
O_{1c}	O_{1c}	O_{2c}
O_{1d}	O_{1d}	O_{2d}
O_{1e}	O_{1e}	O_{2e}
O_{1f}	O_{1f}	O_{2f}
O_{1g}	O_{1g}	O_{2g}

The 8x16 configuration will switch each individual input to any individual output, e.g., [I2O1C5] will connect input 2 with output 1.

The 4x8 configuration will switch 2 inputs to 2 outputs at the same time, e.g., [I2O1C5] will connect input 2a with output 1a and input 2b with output 1b.

The 2x4 configuration will switch 4 inputs to 4 outputs at the same time, e.g., [I3O2C5] will connect input 3a with output 2a, 3b to 2b, 3c to 2c, 3d to 2d.

The 1x2 configuration will switch 8 inputs to 8 outputs at the same time, e.g., [I1O2C5] will connect input 1a to output 2a, 1b to 2b, 1c to 2c, 1d to 2d, 1e to 2e, 1f to 2f, 1g to 2g and 1h to2h.

12. [ImMx…] [OnMx..] [CiMx..]

Im: m is from 1 to 8 for 8 inputs (maximum 3 characters: I8)
On: n is from 1 to 16 for 16 outputs (maximum 3 characters: O16)
Ci: i is from 1 to 18 for 18 cards (maximum 3 characters: C19)
Mx: x is from 1 to 8 for 8 different links (maximum 2 characters: M8)
This command usefully for using in MT system with front panel. User can use 3 different keys to send 3 different strings of commands.
KEY 1: to select inputs (use a single key to select different inputs)
KEY 2: to select outputs (use a single key to select different outputs).
KEY 3: to select card for link factor (use a single key to select different cards).
When the **MT105-115/118** receives this kind of command, it will wait until third command string received ([CiMx..]) and then, will link the commands together by looking at CiMx group. Each command can be as long as 42 characters.

13 [VIS=nCi]

This command enables/disables VIS feature:
If n=1 VIS will be enabled
If n=0 VIS will be disabled
Example:
Command [VIS=1C5] will enable VIS feature for switcher card in slot 5.

14 [TVCi]

This command tests VIS circuit (with signal ON on input 1).

15 [HELPCi]

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

6.3. SUMMARY OF COMMANDS

1) [VER]: Receives software version

2) [C]: Receives status of the card

3) [IO]: Connects the input to the output

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) [SW]: Switch (outputs the preloaded buffer)

7) [WR]: Groups multiple cards

8) [CLR]: Clears members of a single group or all groups

9) [G]: Requests group data

10) [RD]: Displays the members in each group

11) [MATmmXnn]: Allows changes in the configuration of the matrix.

12) [ImMx…] [OnMx..] [CiMx..]: Usefull for using MT system with front panel.

13) [VIS=nCi]: Enable/disable VIS feature

14) [TVCi]: Test VIS curcuit

15) [HELP Ci]: Display all available interface commands.

TROUBLESHOOTING GUIDE   7

We have carefully tested and have found no problems in the supplied **MT105-115/118**; however, we would like to offer suggestions for the following:

7.1 NO DISPLAY

A) Cause 1: The source has a problem.

Solution: Check the source and make sure hat 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.

B) 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.

C) 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.

D) 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   8

8.1 LIMITED WARRANTY

See Altinex Inc. web site for complete details.

8.2 RETURN POLICY

See Altinex web site for complete details.

8.3 CONTACT INFORMATION

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