

**Multi-
Tasker™**



MANUAL PART NUMBER: 400-0237-006

MT112-104

**2 RS-232 OUT, 6 RELAYS, 4 IR OUT, 4 I/O
CONTROL CARD for Multi-Tasker™
USER'S GUIDE**

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PRECAUTIONS / SAFETY WARNINGS 1

Please read this manual carefully before using your **MT112-104**. Keep this manual handy for future reference. These safety instructions are to ensure the long life of your **MT112-104** and to prevent fire and shock hazard.

1.1 GENERAL

- Qualified ALTINEX service personnel, or their authorized representatives must perform all service on the **MT112-104**.
- To prevent fire or shock, do not expose this unit to rain or moisture. Do not place the **MT112-104** in direct sunlight, near heaters or heat radiating appliances, or near any liquid.
- Handle the **MT112-104** carefully. Dropping or jarring can damage the card.
- Do not pull the cables that are attached to the **MT112-104**.
- Insert the card carefully into the slots of the MultiTasker™ without bending any edges.
- When removing a card, please make sure that the card to which it is attached is also pulled out simultaneously.

1.2 CLEANING

- Clean only the connector area with a dry cloth. Never use strong detergents or solvents, such as paint thinner or acetone or nail polish remover.

1.3 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 their 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 MT112-104 2

MT112-104 Universal Control Card

The **MT112-104** is a Universal Control Card designed to give external control of various audio and visual devices. These include VCR's, DVD Players, displays, projectors and projection screens.

TWO RS-232 PORTS

The RS-232 ports may be used to control projectors or any other equipment using an RS-232 port. These ports are "Output" only ports. They are able to send RS-232 strings out only. The **MT112-104** will ignore any string received from an RS-232 device. Built-in RS memory allows command strings to be stored directly on the **MT112-104**.

SIX RELAYS

Each relay is capable of passing 1 Amp at up to 48 Volts. The loads should be resistive only. These relays are not designed to drive motors or any type of inductive or capacitive load.

FOUR INPUT/OUTPUT (I/O) PORTS

These ports are jumper configurable as input or output ports. When configured as an Input port, the contact closure to ground will activate the port. When the port is activated, a subroutine may be programmed to execute desired commands. When configured as an Output port, the port outputs TTL levels, 0 to 5 Volts, with 24mA drive capability.

FOUR INFRA-RED (IR) PORTS

The IR ports are capable of driving IR LED's to control VCRs, DVDs, TVs, or any other equipment using IR control. A learning function is provided to learn different control codes. The learning function is used in conjunction with "Smart IR" cable, Altinex P/N **RC5218IR**. Each port can be programmed for different IR modes to accommodate different IR units. Built-in IR memory allows binary IR data to be stored directly on the **MT112-104**. Communication software is available on the Altinex web site to help with learning the IR codes.

TECHNICAL SPECIFICATIONS 3

FEATURES/DESCRIPTION	MT112-104
GENERAL	
Control Ports	
Connectors	(6) 5-pin Terminal Blocks

Table 1. **MT112-104** General

MECHANICAL	MT112-104
Basic Enclosure Slots Required	One
Weight	1.0 lb (0.45 kg)
Connector Panel	Black
T° Operating	10°C-55°C
T° Maximum storage	0 to 75°C
Humidity	90% non-condensing
MTBF (calc.)	40,000 hrs

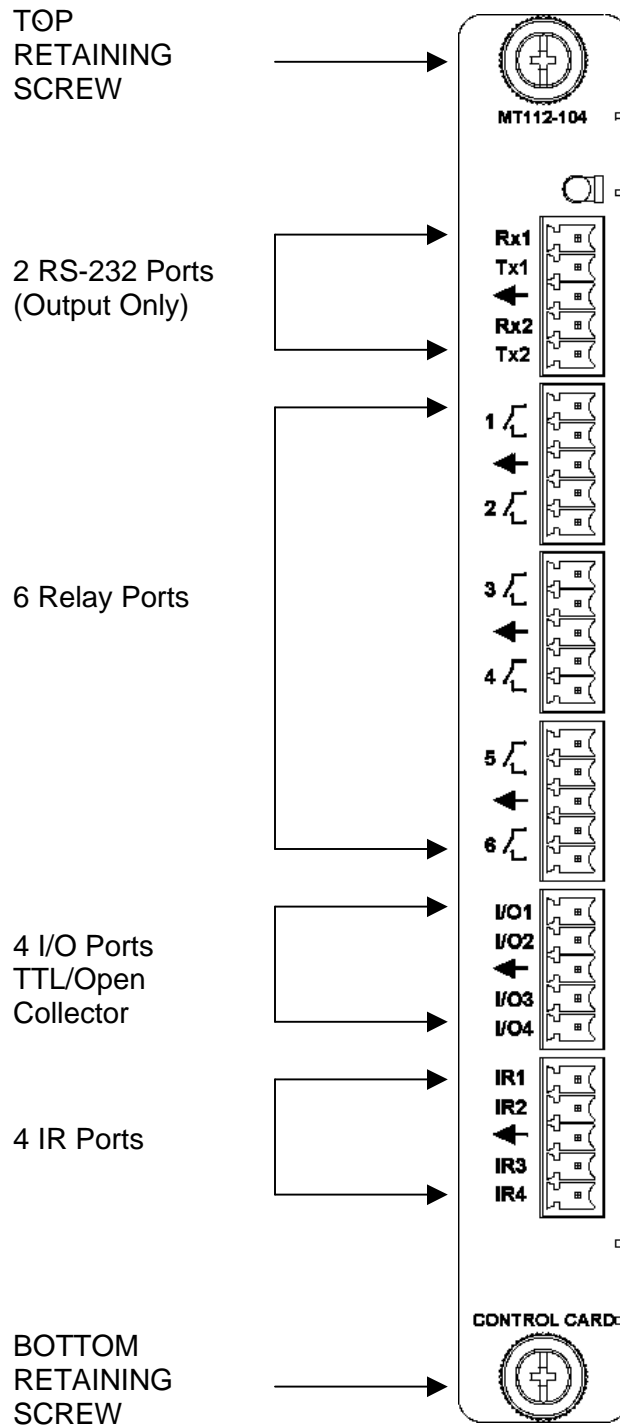
Table 2. **MT112-104** Mechanical

ELECTRICAL	MT112-104
I/O Port	
Type	Optocoupler Isolated
Voltage	TTL
Current	24mA
IR Port	
Output Type	38KHz/42KHz Carrier
Relays	
Maximum Voltage	48VDC
Maximum Current	1A AC/DC Resistive

Table 3. **MT112-104** Electrical

PRODUCT DESCRIPTION

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APPLICATION DIAGRAM

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DIAGRAM 1: TYPICAL SETUP

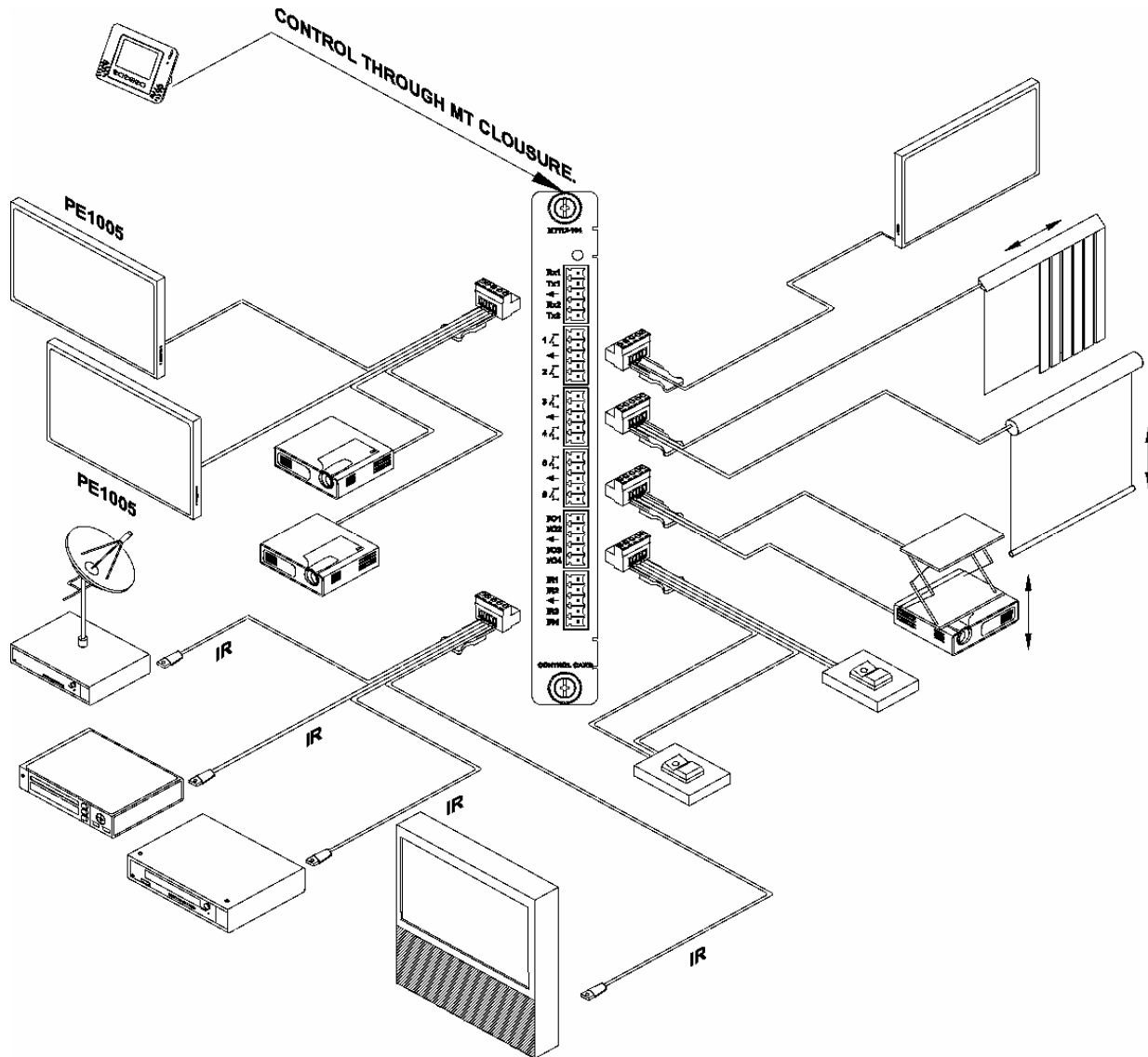
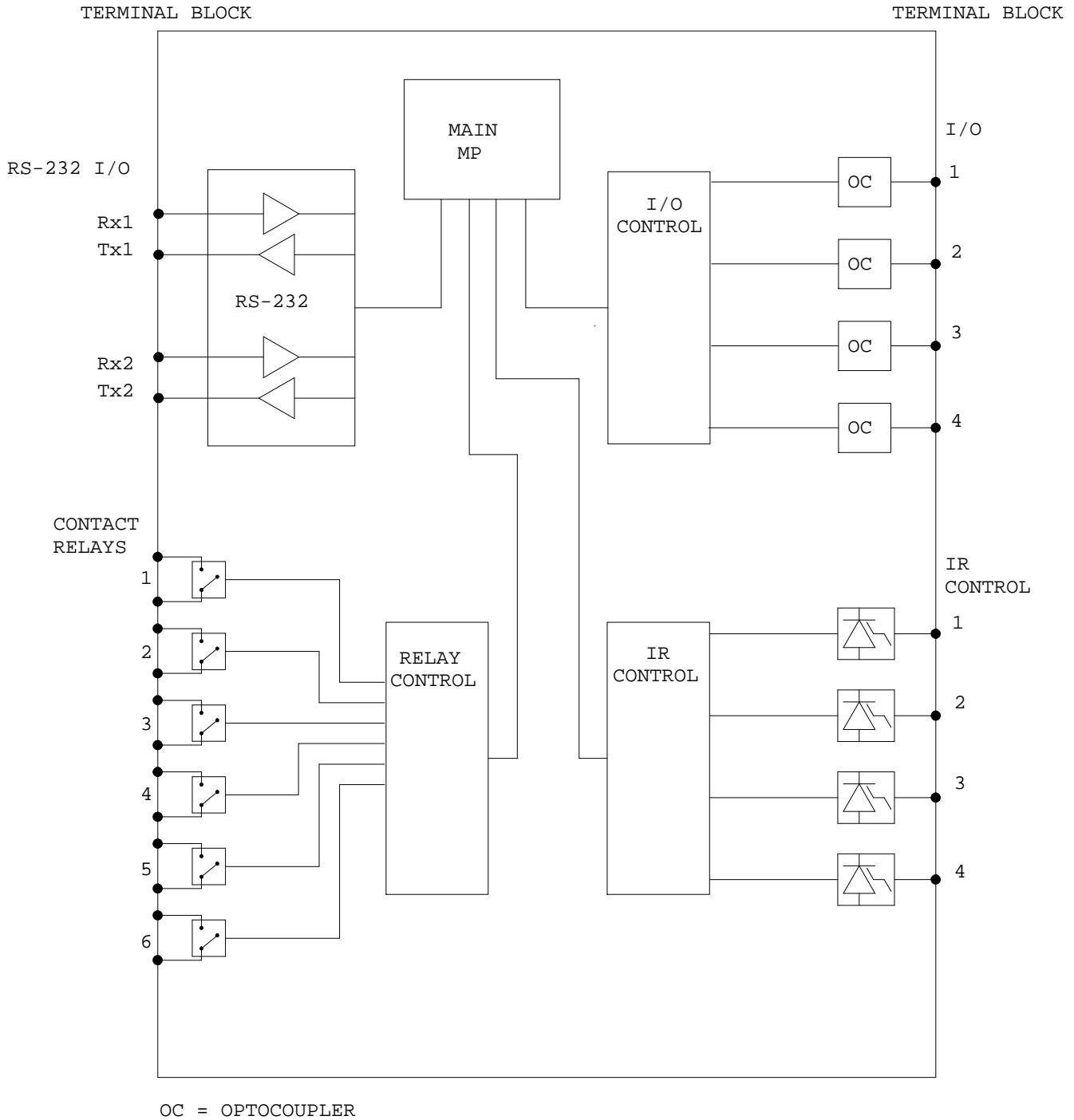


DIAGRAM 2: INTERNAL VIEW

MT112-104



INSTALLING YOUR MT112-104 6

- Step 1.** Determine if any external switches and LED's are to control or be controlled through the I/O ports. If so, configure the I/O port jumpers. See the command definition for [RDIS] for details.
- Step 2.** Turn off power to the Multi-Tasker™ enclosure.
- Step 3.** Slide the **MT112-104** into an available slot in the MultiTasker™ Basic Enclosure in order to connect to the bus. Make sure that the **MT112-104** card fits into place. Secure the card to the Multi-Tasker™ by tightening the retainer screws located on the top and bottom of the **MT112-104** card.
- Step 4.** Turn on power to the Multi-Tasker™ enclosure.
- Step 5.** Connect control cables as required to the input/output connectors of the **MT112-104**.
- Step 6.** Starting from the left, identify the slot number where the **MT112-104** card is plugged into the Enclosure and note that it is for RS-232 control.

OPERATION 7

7.1 RS-232 CONTROL

The **MT112-104** has many advanced remote control capabilities, which are accessible through standard RS-232 communication. Actual control may 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 **MT112-104** are in a simple ASCII character format.

1. Square brackets “[]” are part of the command.
2. Use uppercase letters for all commands.

The cards in a Multi-Tasker™ system are capable of performing various functions, as well as providing feedback to the user or control system. Some commands instruct a card to perform specific actions. Other commands request information about the status of the card. Other commands do both at the same time.

A command that instructs the card to simply perform an action will generate feedback of “[]”. The open and close brackets indicate the card received a valid command. If the command requested information from the card, the feedback generated by the card is the acknowledgement of having received a valid command. Invalid commands generate feedback of “[ERR001]”.

After processing a command, an OK or [ERR001] will be returned as feedback if "F" is included at the end of a command string.

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 or Group ID
U2 = Unit ID

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

The Card ID is a unique identifier. It is equal to the enclosure slot number, or it may be an assigned value. As the slot number, the value can range from 1 to 4 up to 1 to 20 depending on the enclosure. If the value is assigned, the ID may be a maximum of 99.

Card ID 0 (C0) is used for the controller and cannot be reassigned.

The Group ID is a number representing a group of cards defined with the [WR] command. When using the Group ID, all cards in the group will perform the given instruction.

Changing the position of a card will significantly affect the commands recorded on software definitions or third party control systems.

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 zero, each command may be used without Ui. Use the command [SETU0], as explained in the MT100-100 User's Guide.

Example:

[VERC3]: For Unit ID Zero
[VERC3Ui]: For Unit ID other than Zero
[VERC3]: Equivalent to [VERC3U0]

1. [C]

This command displays 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:

There is an **MT112-104** card is in slot 4. All I/O ports are on and all relays are open. All four IR ports are in Mode 1. The RS-232 ports are set for 9600 baud, eight data bits, no parity and one stop bit.

Send the command [C4], and the system will return the following feedback:

```
CONTROL CARD 6RL,4IO,4IR,2RS232
RL1-6: 111111
IO1-4: 1111
IR#1 : Mode=1
IR#2 : Mode=1
IR#3 : Mode=1
IR#4 : Mode=1
RS#1 : 9600,8bit,1
RS#2 : 9600,8bit,1
```

The feedback provides the current status of the **MT112-104**. The IO Status shows all 1's, or on. The relay status shows all 1's, or open. The remaining lines show the current settings for the IR and RS-232 ports.

FEEDBACK COMMANDS ?, ?Cn and STA

The next three commands are a function of both the card and the front panel and are only available with Multi-Tasker™ Front Panel systems that have the following firmware:

690-0122-015 = Version 015 or later.
690-0123-004 = Version 004 or later.
690-0124-018 = Version 018 or later.

Send the command [VER], and the system will respond with feedback that includes the following:

690-0122-015 690-0123-004 690-0124-018

Check the last three digits against the numbers above to determine if the option is available.

2. [?]

This command will return general information about the Multi-Tasker™ and cards installed in the unit.

Command Format: [?Ui]

Ui = Unit ID (i = # from 0 to 9)

Example:

A Multi-Tasker™ with Unit ID 1 has a front panel with part number MT101-101 and contains an MT103-122, MT103-123 and **MT112-104**. Send the command [?U1] and receive the following feedback:

```
[(MT101-101U1)(MT103-122C01)
(MT103-123C02)(MT112-104C04)]
```

MT101-101U1 = Panel Number and Unit ID
MT103-122C01 = An MT103-122 is in slot 1
MT103-123C02 = An MT103-123 is in slot 2
MT112-104C04 = An MT112-104 is in slot 4

3. [?Cn]

This command will return general information about the card and its status.

Command Format: [?CnUi]

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

Example:

There is an **MT112-104** card in slot 4. Send the command [?C4] to receive card status information.

All status feedback is enclosed in brackets, “[]”. Each data field within the status is enclosed in parentheses. The first two characters identify the status type. The last three characters are the card’s ID. The feedback will be similar to the following:

```
[(MT112-104C04)(VR690-0153-016C04)
(IO1111C04)(RL111111C04)(IR2C1AC04)
(RI20212021C04)]
```

MT112-104	= Model Number
VR690-0153-016	= Firmware version
IO1111	= I/O Port Status
RL111111	= Relay Status
IR2C1A	= IR Port Mode Status
RI20212021	= RS-232 Port Setup

The IO status line is read from left to right as ports one through four. A "1" indicates the port is high and a "0" indicates the port is low.

The relay status line is also read left to right as relays one through six. In this case, all the relays are open as indicated by a "1". A "0" would indicate the relay is closed.

The IR status line shows the output mode of each port. In this case, Port 1 is in Mode 2, Port 2 is in Mode C, Port 3 is in Mode 1 and Port 4 is in Mode A. See the [MODEIR] command for an explanation on the different IR modes.

The RS-232 status line is also read left to right. The first four numbers are Port 1 settings and the second four are for Port 2. In this case, reading left to right, the four digits (2021) define the ports as 9600 baud, 8 data bits, no parity and one stop bit. See the [MODERS] command for further details.

2021	2 = 9600 baud
	0 = 8 data bits
	2 = no parity
	1 = 1 stop bit

4. [STA1]

This command enables automatic feedback from the front panel. The command affects any card with auto-feedback capability, not just the **MT112-104**. The default at power on or reset is STA0, off. For more details, see the [?Cn] command definition.

Command Format [STA1] = ON

NOTE: The CLR command will return feedback on those parameters that change.

Feedback Prefix Definitions:

IO	I/O Port Status
RL	Relay Status
IR	IR Port Status
RI	RS-232 Port Status

Example 1:

```
Command = [WRRL*=1C4]
Feedback = (RL111111C04)
          RL      = Relay status
          111111 = Relays 1-6 open
          C04    = Card ID/Slot number
```

Example 2:

```
Command = [WRIO1=1C4]
Feedback = (IO1000C04))
          IO = IO Port Status
          1000 = port 1 = 1, high
                ports 2,3,4 = 0, low
          C04 = Card ID/Slot number
```

5. [STA0]

This command disables automatic feedback from the card and front panel. The command affects any card with auto-feedback capability, not just the **MT112-104**. The default at power on or reset is STA0, off.

Command Format [STA0]

6. [CLR]

This command performs a reset of the card and restores settings to the factory defaults.

Command Format: [CLRCnUi]

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

Example:

Send the command [CLRC4] to reset the card in slot 4 to factory defaults. After the reset, the status of C4 will be as follows:

Control Card 6RL,4IO,4IR,2RS-232

RL1-6: 111111

IO1-4: 1111

IR#1: Mode# =1

IR#2: Mode# =1

IR#3: Mode# =1

IR#4: Mode# =1

RS#1:9600,8bit,none,1

RS#2:9600,8bit,none,1

Command Format: [CLRRSCnUi]

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

Ui = Unit ID (i = # from 0 to 9)

Example:

Clear all RS memory locations for the **MT112-104** in slot 4 by sending the command [CLRRSC4]. The card will respond with the following message while it clears the memory.

Please wait

When the memory has been cleared, “[]” will be displayed. Any attempts to read RS memory locations will result in a message similar to the following, where “01”) is the memory address:

01) Memory Empty

7. [CLRIR]

This command clears the contents of all 64 IR memory locations, including the memory location labels. The RS memory locations and regular subroutines are not affected.

Command Format: [CLRIRCnUi]

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

Ui = Unit ID (i = # from 0 to 9)

Example:

Clear all IR memory locations for the **MT112-104** in slot 4 by sending the command [CLRIRC4]. The card will respond with the following message while it clears the memory.

Please wait

When the memory has been cleared, “[]” will be displayed. Any attempts to read IR memory locations will result in a message similar to the following, where “01”) is the memory address:

01) Memory Empty

8. [CLRRS]

This command clears the contents of all 64 RS memory locations, including the memory location labels. The IR memory locations and regular subroutines are not affected and remain unchanged.

9. [CLRI]

This command disassociates the subroutines assigned to one or all IO ports as defined using the [WRI] command. The contents of the subroutines remain unchanged.

Command Format: [CLRIxCnUi]

x = I/O Port (x = # from 1 to 4, * for all)

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

Ui = Unit ID (i = # from 0 to 9)

Example:

In order to disassociate the subroutines assigned to IO port 2 of card 4, send the command [CLRI2C4]. Then, use the [RDIS] command to read the port. After the port is cleared, the list of subroutines is as follows:

Before = Port02:Sub020,Sub021

After = Port02:Sub000,Sub000

10. [CLRS]

This command clears the contents of one or all of the 180 subroutine memory locations. The IR and RS memory locations are unaffected.

Command Format: [CLRSmCnUi]

Sm = Subroutine (m = # from 1 to 180, * = all)

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

Ui = Unit ID (i = # from 0 to 9)

Example 1: Clear One

Clear Subroutine 2 of the card in slot 4. Send the command [CLRS2C4] and observe the following feedback:

[]

Example 2: Clear ALL

Clear all subroutines of the card in slot 4. Send the command [CLRS*C4] and observe the following feedback. The open and close brackets indicate the task was completed.

Please Wait

[]

11. [TEST]

This command performs a test of the memory IC's on the **MT112-104**.

Command Format: [TESTCnUi]

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

Ui = Unit ID (i = # from 0 to 9)

Example:

Perform a test of the memory on the **MT112-104** in slot 4. Send the command [TESTC4] and observe the following feedback:

MEMORY IC TEST RESULTS

U14 OK

U19 OK

U20 OK

U21 OK

U31 OK

U32 OK

12. [VER]

This command requests the software version and card type.

Command Format: [VERCnUi]

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

Ui = Unit ID (i = # from 0 to 9)

Example:

There is an **MT112-104** in slot 4. Send the command [VERC4] and receive the following feedback:

[MT112-104 690-0153-016 C04]

MT112-104 = Card Model Number

690-0153-016 = Software Version

C04 = Card ID

13. [FBD]

This command turns feedback delay on or off. It is necessary when installing some newer cards in older systems. If the system does not receive all of the feedback from the card, the card may be communicating too fast. This command will slow down the card's communication rate.

Command Format: [FBDmCnUi]

m = Delay (0= no delay, 1= delay 100mS)

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

Ui = Unit ID (i = # from 0 to 9)

Example:

The command [HELPC4] is sent to the card in slot 4. Some of the HELP file is displayed on the screen, but most is missing. Send the command [FBD1] to slow down the rate at which the card sends feedback to the system.

ID COMMANDS: RSI, SIDn, SIDnCi, SID+, RSN

The default Card ID is the same as the card slot number. The next several commands allow the user to change the Card ID to a value other than the slot number. Once the ID is changed, moving the card to another slot will not change the card ID. If a card in slot 4 is set to ID 1, then moved to slot 10, its ID will remain 1. The RSI command forces the installed cards to take their slot number as their ID number, regardless of the slot in which they are installed.

Some cards require more than one slot in the Multi-Tasker™ system. As an example, some matrix switcher cards require 4 slots. If there are 5 of these cards installed, they would be numbered C4, C8, C12, C16 and C20. Changing the Card ID allows the user to define the cards as C1, C2, C3, C4 and C5.

Another use for changing the Card ID is to be able to use multiple systems without having to set each unit to a different Unit ID. All systems may be left as Unit ID 0 for ease of programming. The cards in the first unit may be numbered 1-10 and in the second unit 11-20.

The ID commands work with all Multi-Tasker™ Front Panel systems. However, front panels that have firmware releases prior to the following will not be able to address Card ID's greater than the number of slots in the system:

690-0122-019 = Version 019 or later.

690-0123-005 = Version 005 or later.

690-0124-019 = Version 019 or later.

Send the command [VER], and the system will respond with feedback that includes the following:

690-0122-019 690-0123-005 690-0124-019

Check the last three digits against the numbers above to determine if the Card ID commands can address all 99 Card ID's.

14. [RSI]

This command resets the card ID's in the system. After sending this command, each card ID in the system will match the slot number of the card. If the card is moved to another slot, its ID number will be the new slot number.

Command Format: [RSI]

Example:

Send the command [RSI] to the system with Unit ID 0. The card in slot 1 will have ID 1, the card in slot 2 will have ID 2 and so on.

15. [SIDn]

This command sets all the cards installed in the Multi-Tasker™ system to the same Card ID. After sending this command, all cards will be addressed with the same ID. Use caution when sending this command to a system with multiple board types.

Command Format: [SIDn]

n = Card ID (n = # from 1 to 99)

Example:

Send the command [SID1] to the system. All the cards in the system now have ID 1. Any commands that are sent to Card ID 1 will be received and executed by each card.

16. [SIDnCi]

This command sets the Card ID of a single card to a number from 1 to 99.

Command Format: [SIDnCi]

n = Card ID (n = # from 1 to 99)

Ci = Slot Number (i = # from 1 to max slots)

Example:

Send the command [SID50C10] to set the ID of the card in slot 10 to an ID of 50.

17. [SID+n]

This command sets the Card ID of all the cards in a system to their slot number plus the offset value.

Command Format: [SID+n]

n = Offset amount (n = # from 0 to 99)
The maximum Card ID is 99, so subtract the highest slot number from 99 to find the maximum offset. For example, in an 8 slot enclosure, the maximum offset would be 91. The slot number, 8, plus the offset, 91, equal 99.

Example:

There are two, 20 slot enclosures to be connected together during normal operation. The first unit will use the Card ID defaults which are equal to their slot numbers. The second unit will have the same Unit ID, but will have the card ID's offset by 20.

Connect the computer to the second unit only and send the command [SID+20] to set the ID of all the cards in the enclosure to their slot number plus 20. Reconnect both units to the computer.

The cards in the first unit will be referenced as Card ID's 1-20 and the cards in the second unit will be referenced by Card ID's 21-40.

18. [RSN]

This command reads the slot number of the card with a specified ID number, and returns the value to the system to be displayed in the terminal window. If more than one card has the same ID, each slot number will be displayed.

Command Format: [RSNCi]

Ci = Card ID (i = # from 1 to 99)

Example:

The card in slot 4 takes up four slots in the enclosure. Its ID was set to 1 since it is the first card installed in the system, reading from left to right. Send the command [RSNC1] to find the slot number of this card. The system responds with the following feedback:

[4]

19. [RDIO]

This command reads and displays the status of the I/O ports. Each port status is a "1" or a "0".

0 = Port is OFF

1 = Port is ON

Command Format: [RDIOkCnUi]

k = I/O port number (1 to 4, or * for all)

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

Ui = Unit ID (i = # from 0 to 9)

Example 1:

There is an **MT112-104** in slot 4. I/O port number "4" is on. Send the command [RDIO4C4] and the system will return the following feedback:

1

The "1" indicates the control is on. If there had been a "0", that would indicate the control was off.

Example 2:

There is an **MT112-104** in slot 4. I/O Controls 1 and 2 are off while 3 and 4 are on. Send the command [RDIO*C4] and receive the following feedback:

0011

The ports are displayed left to right. The left most digit represents port 1 and the rightmost represents port 4. The first two 0's indicate ports 1 and 2 are off. The right two 1's indicate ports 3 and 4 are on.

20. [WRIO]

This command writes to all of the I/O ports and sets the outputs high or low.

Command Format: [WRIOx₁x₂x₃x₄CnUi]

x = I/O state to set for I/O's 1 to 4

0 = Set I/O port low (GND)

1 = Set I/O port high (+5V@24ma)

X = Do NOT change status of I/O port

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

Ui = Unit ID (i = # from 0 to 9)

Example 1:

Send the command [WRIO1000C1] to set I/O #1 on and I/O's 2-4 off for the card in slot 1.

Example 2:

Send the command [WRIO0XXXC1] to set I/O #1 off and not change I/O's 2-4 for the card in slot 1.

21. [WRIOk]

This command writes to a single I/O port or all the I/O ports and sets the output high or low. All ports must be set to the same state using this command.

Command Format: [WRIOk=xCnUi]

k = Port Number (1 to 4, * for all)

x = I/O state to set port

0 = Set I/O port low (GND)

1 = Set I/O port high (+5V@24ma)

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

Ui = Unit ID (i = # from 0 to 9)

Example 1:

Set I/O #1 on for card in slot 1 by sending the command [WRIO1=1C1].

Example 2:

Set all I/Os off for the card in slot 1 by sending the command [WRIO*=0C1].

22. [RDRL]

This command displays the current state of one or all of the relays.

Feedback is in the form of a "1" or a "0".

0 = Closed (ON)

1 = Open (OFF)

Command Format: [RDRLkCnUi]

k = Relay number (k = # from 1 to 6, or *)

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

Ui = Unit ID (i = # from 0 to 9)

Example 1:

There is an **MT112-104** in slot 4. Relay #1 is closed. Send the command [RDRL1C4] and receive the following feedback:

0

Example 2:

All the relays on the card in the previous example are open. Send the command [RDRL*C4] and note the following feedback:

111111

23. [WRRL]

This command is used to open or close a relay.

Command Format: [WRRLx₁x₂...x₆CnUi]

x = Represents the relay state and position

= 0, Close Relay (on)

= 1, Open Relay (off)

= X, Don't change the state of the relay

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

Ui = Unit ID (i = # from 0 to 9)

Example 1:

There is an **MT112-104** in slot 4. Open Relay #2 and close Relay #5. Do NOT change any of the other relay states. To do this, send the command [WRRLX1XX0XC4].

Example 2:

Set all six relays open from the previous example. To do this, send the command [WRRL111111C4].

24. [WRRLk]

This command is used to open or close a single relay or all the relays. All must be set to the same state using this command.

Command Format: [WRRLk=xCnUi]

k = Relay Number (1 to 6, or * for all)

x = Represents the relay state and position

= 0, Close Relay (on)

= 1, Open Relay (off)

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

Ui = Unit ID (i = # from 0 to 9)

Example 1:

Open Relay #2 only for the MT112-104 in slot 4 by sending the command [WRRL2=1C4].

Example 2:

Set all six relays from the previous example open by sending [WRRL*=1C4].

25. [MODEIR]

This command is used to set an IR port to a specific mode depending on the different types of remote controls.

Command Format: [MODEIRmkCnUi]

m = IR port number (m = # from 1 to 4)

k = IR mode (k = # from 1 to 9)

Select the mode for the appropriate manufacturer and device:

1 = Apex, Altinex, Pioneer, Toshiba, Pacific and others.

2 = Panasonic.

3 = Sony, Aiwa and others.

4 = Philips, Magnavox and others.

5 = Sharp.

6 = JVC.

7 = Panasonic VCR and DVD Players.

8 = Sony Combo VCR/DVD Players.

9 = Scientific Atlanta Cable Boxes.

A = Panasonic PAL/NTSC/SECAM VCRv(AG-W1).

B = SONY Professional VCR U-matic SP VO-9600.

C = Samsung DVD/VCR Combo.

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

Ui = Unit ID (i = # from 0 to 9)

Example:

There is an **MT112-104** in slot 4. Set IR Port #1 to Mode 3 for Aiwa by sending the command [MODEIR13C4].

26. [SAVIR]

This command saves binary IR data (1's and 0's) to IR memory locations.

A maximum of 8 bits may be written at a time with this command. A total of up to 1016 bits (254 hex characters) may be stored in a single memory location. Any characters that are not a 1 or 0 will be ignored.

If less than 8 bits are sent in the command, the system will append 0's to the end of the data sent to achieve 8 bytes. For example, if "1111" is sent to memory location "2", "11110000" will be stored in memory.

Command Format: [SAVIRp,y₁...y₈,MkCnUi]

- p = Saving instructions (1 or 0)
 - 0 = Append to existing data
 - 1 = Overwrite existing data
- y₁...y₈ = Data to be saved into memory may only be 0's or 1's
- Mk = Memory location (k = # from 1 to 64)
- Cn = Card ID (n = # from 1 to max slots)
- Ui = Unit ID (i = # from 0 to 9)

Example 1:

The **MT112-104** card is in slot 2. Save the pattern "10101111" to IR memory location 64 and overwrite any existing data in that location. To do this, send the command [SAVIR1,10101111,M64C2].

Read the data back by sending the command [RDIRM64C2] and receiving the following feedback:

10101111

Example 2:

Continue from the previous example. This time, append the data in IR memory location 64 with the pattern "01101001". To do this, send the command [SAVIR0,01101001,M64C2].

Read the data back by sending the command [RDIRM64C2] and receiving the following feedback:

1010111101101001

27. [WRIR]

This command writes up to 16 hex characters to an IR memory location. The hex characters are stored as 4 bit binary bytes. A total of 254, 4 bit bytes may be stored in each IR memory location.

Command Format: [WRIRp,y₁...y₁₆,MkCnUi]

- p = Saving instructions (1 or 0)
 - 0 = Append to existing data
 - 1 = Overwrite existing data
- y₁...y₁₆ = Hex characters to be saved
- Mk = Memory location (k = # from 1 to 64)
- Cn = Card ID (n = # from 1 to max slots)
- Ui = Unit ID (i = # from 0 to 9)

Example 1:

The **MT112-104** card is in slot 4. Save the pattern "1F" to IR memory location 64 and overwrite any existing data in that location. To do this, send the command [WRIR1,1F,M64C2].

Read the data back by sending the command [RDIRM64C4] and receiving the following feedback:

00011111

The hex data may also be read back using [RDHIRM64C4] for the following feedback:

1F

28. [WRLIR]

This command programs a label for an IR memory location and may be used to identify what data is stored in each memory location. The label may be a maximum of 16 characters.

NOTE: This command requires front panel firmware revision 690-0122-019, 690-0123-005 and 690-0124-019 or later. Send the command [VER] to verify firmware revision.

Command Format: [WRLIRMk=xx...xCnUi]

k = Memory Location (01-64)
xx...x = Label Name (0 to 16 characters)
Cn = Card ID (n = # from 1 to max slots)
Ui = Unit ID (i = # from 0 to 9)

Example 1: Add a Label

The **MT112-104** card in slot 4 is used to control a VCR. IR Memory Location 01 is used for the PLAY command. Label the memory location PLAY by sending the following command:

```
[WRLIRM01=PLAYC4]
```

When reading back the data in IR memory location 01, the label will be displayed first, followed by the stored data. The format will be as follows:

```
01) PLAY      00011111
```

Example 2: Clear a Label

Send the command [WRLIRM01=C4] to remove the label defined in the previous example.

```
01)          00011111
```

29. [RDIR]

Read data from an IR Memory location and display in binary format. This command is used to determine what is stored in a memory location. Use this command to verify that data is properly stored.

Command Format: [RDIRMkCnUi]

Mk = memory location (k = 1 to 64, * for all)
Cn = Card ID (n = # from 1 to max slots)
Ui = Unit ID (i = # from 0 to 9)

Example:

The **MT112-104** card is in slot 4. The following pattern of 1's and 0's was stored in memory location 2: 1111000010101010.

Read the data stored in memory location 2 by sending the command [RDIRM2C4]. The system will return the following feedback:

```
02)          1111000010101010
```

30. [RDHIR]

This command reads the contents of the IR memory and displays it in hex format.

Command Format: [RDHIRMkCnUi]

Mk = memory location (k = 1 to 64, * for all)
Cn = Card ID (n = # from 1 to max slots)
Ui = Unit ID (i = # from 0 to 9)

Example:

The **MT112-104** card is in slot 4. The following pattern of 1's and 0's was stored in memory location 2: 1111000010101010.

Read the data stored in memory location 2 by sending the command [RDHIRM2C4]. The system will return the following feedback:

```
02)          F0AA
```

31. [SDIR]

This command reads the contents of an IR memory location and displays it in machine format.

Command Format: [SDIRMkCnUi]

k = Memory location (k = 1 to 64,* for all)
Cn = Card ID (n = # from 1 to max slots)
Ui = Unit ID (i = # from 0 to 9)

Example:

Read memory location 2 of the card in slot 4 from the previous example. Send the command [SDIRM2C4] and receive feedback in the following format:

```
[1111000010101010]
```

32. [OUTIR]

This command outputs data stored in an IR memory location through a specified port. Use it to verify the proper operation of the IR transmitter and to make sure that the IR code is properly captured.

Command Format: [OUTIRmMkCnUi]

m = IR Port (m = # from 1 to 4)
Mk = Memory location (k = # from 1 to 64)
Cn = Card ID (n = # from 1 to max slots)
Ui = Unit ID (i = # from 0 to 9)

Example:

An **MT112-104** is in slot 4. A pattern of 1's and 0's is stored in IR Memory Location 1. Output that pattern of 1's and 0's to IR Port 2 by sending the command [OUTIR2M1C4].

33. [LEARNIR]

This command sets the card in the mode to receive IR code from an IR remote control and display it for further processing.

The card may learn data received from an IR transmitter or remote control device.

This command is best to execute with MTSetup™ software and requires Altinex Learn IR Cable, P/N RC5218IR.

The software will automatically convert the IR code to the programmable number.

Command Format: [LEARNIRCnUi]

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

Ui = Unit ID (i = # from 0 to 9)

Example:

Connect the Learn cable to RS-232 Port. In MTSetup™, select IR Port 1 and clear the RS-232/IR Control box.

Click the Learn IR button. The Terminal Window will display the following:

```
[LEARNIRC4] READY TO LEARN
```

Wait for the progress bar beneath the "Learn IR" button to be displayed, then aim the remote at the cable sensor and press a key on the remote. A pattern of HI's and LO's will be read and displayed in the Terminal Window followed by the word "DONE".

```
Example: 11111____111111____  
         1111____1111111____  
         11111111 ___etc... DONE
```

A pattern of 1's and 0's will also be displayed in the RS-232/IR Control box. Set the memory location (1 to 64) to store the data in. Click the SAVE button to save the data to memory.

Clear the Terminal Window, then click the READ button to read back the data. The pattern read back will be the same as that saved, but with an additional eight 0's at the end.

34. [MODERS]

This command sets the RS-232 output mode for a specific RS-232 port.

Command Format: [MODERSk,m,x,y,zCnUi]
[MODERSk,m,8,3,1CnUi]

k = Port number (k = # from 1 to 2)

m = Baud Rate (m = # from 1 to 4)

1 = 2400Bps

2 = 4800Bps

3 = 9600Bps

4 = 19200Bps

x = Data bits (x = 8)

x = 8 (only active protocol)

y = Parity (y = 3)

3 = No Parity (only active protocol)

2 = Reserved for future

1 = Reserved for future

z = Stop bits (z = 1)

z = 1 (only active protocol)

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

Ui = Unit ID (i = # from 0 to 9)

NOTE: The following attributes are fixed values and cannot be altered: DATA BITS=8
PARITY = None, and STOP BITS=1.

Example:

An **MT112-104** is in slot 4. Set RS-232 Port 1 to 9600 Baud, 8 data bits, no parity and one stop bit. To do this, send the command [MODERS1,3,8,3,1C4].

35. [SAVRS]

This command saves ASCII character data to an RS memory location.

A maximum of 8 characters may be written at a time when sending commands manually. When using MTSetup, a complete text string may be entered into the RS-232/IR Control box and sent at one time.

A total of up to 127 eight bit characters may be stored in a single memory location

Command Format: [SAVRSp,y₁...y₈,MkCn]

- p = Saving instructions (1 or 0)
 - 0 = Append to existing data
 - 1 = Overwrite existing data
- y₁...y₈ = Text data to be saved into memory
- Mk = Memory location (k = # from 1 to 64)
- Cn = Card ID (n = # from 1 to max slots)
- Ui = Unit ID (i = # from 0 to 9)

Hex commands can be added to the string by using the % sign in front of the hex number. Sending %31 will send the hex 31 character. The three characters making up the hex number cannot be separated and must be in the same string. Below are some common hex numbers:

- %5B = ' [' %5D = '] '
- %7B = ' { ' %7D = ' } '
- %3C = ' < ' %3E = ' > '

Sending a hex number, like %5B, counts as one character, not three.

Example:

An **MT112-104** is located in slot 4. Save the text string "[ON1234C2]" into RS memory location 1. In order to do this, send the commands:

```
[SAVRS1,%5BON1234,M1C4]
and
[SAVRS0,C4%5D,M1C4]
```

The first command overwrites memory location 1 with the first 7 characters of the new function. The second command appends memory location 1 with the remaining characters of the new function. Remember, a maximum of 8 characters may be sent at a time.

Send the command [RDRSM1C4] and the system will return the following feedback:

```
01)                    [ON123C4]
```

36. [WRRS]

This command writes up to 16 bytes of ASCII data into RS memory. There are 64 RS memory locations and each may store a total of up to 127 eight bit bytes/characters. The following characters are reserved for the system:

[] # { } , < > | \$

The following punctuation and special characters may be saved:

` ~ ! @ & * () - _ = + \ " ; : / ? . % ^ ' '

Command Format: [WRRSp,y₁...y₁₆,MkCn]

- p = Saving instructions (1 or 0)
 - 0 = Append to existing data
 - 1 = Overwrite existing data
- y₁...y₁₆ = Text data to be saved into memory
- Mk = Memory location (k = # from 1 to 64)
- Cn = Card ID (n = # from 1 to max slots)
- Ui = Unit ID (i = # from 0 to 9)

Example:

Write "PLAY" to RS memory location 1 of the card in slot 4. Send the command [WRRS1,PLAY TRACK 1,M1C4]. Read back the memory location using [RDRSM1C4] and receive the following feedback:

```
01)                    PLAY TRACK 1
```

37. [WRLRS]

This command programs a label for an RS memory location and may be used to identify what data is stored in each memory location. The label may be up to 16 characters.

NOTE: This command requires front panel firmware revision 690-0122-019, 690-0123-005 and 690-0124-019 or later. Send the command [VER] to verify firmware revision.

Command Format: [WRLRSMk=xx...xCnUi]

- k = Memory Location (01-64)
- xx...x = Label Name (0 to 16 characters)
- Cn = Card ID (n = # from 1 to max slots)
- Ui = Unit ID (i = # from 0 to 9)

Example 1: Add A Label

The **MT112-104** card in slot 4 is used to control a VCR. The command in RS memory location 1 is used to play track 1. Label the memory location PLAYT1 by sending the following command:

```
[WRLRSM1=PLAYT1C4]
```

When reading back the data in RS memory location 1, the label will be displayed first, followed by the stored data. The format will be as follows:

01) PLAYT1 PLAY TRACK 1

Example 2: Clear A Label

Send the command [WRLRSM01=C4] to remove the label defined in the previous example.

38. [RDRS]

This command reads data from a single RS-232 memory location or all RS-232 memory locations. Use it to verify that data is properly stored.

Command Format: [RDRSMkCnUi]

Mk = Memory (k = # from 1 to 64, * for all)
 Cn = Card ID (n = # from 1 to max slots)
 Ui = Unit ID (i = # from 0 to 9)

Example ONE:

An **MT112-104** is in slot 4. RS memory location 64 contains the label "Model" and the text "ALTINEX_MT112-104". Read back the contents of this memory location by sending the command [RDRSM64C4] and receiving the following feedback:

64) Model ALTINEX_MT112-104

Example ALL:

An **MT112-104** is in slot 4. Read back the contents of all RS memory locations by sending the command [RDRSM*C4] and receiving the following feedback:

01) PLAYT1 PLAY TRACK 1
 02) Memory Empty
 ...
 64) Model ALTINEX_MT112-104

39. [SDRS]

This command reads the contents of an RS memory location and displays it in machine format.

Command Format: [SDRSMkCn]

k = Memory Location (k = 1 to 64, * for all)
 Cn = Card ID (n = # from 1 to max slots)
 Ui = Unit ID (i = from 0 to 9)

Example:

Send the command [SDRSM1C4] to display the contents of memory location 1 in machine format from the previous example.

[PLAY TRACK 1]

40. [OUTRS]

This command sends data stored in an RS Memory Location to a specified RS-232 port.

Command Format: [OUTRSmMkCnUi]

m = IR Port (m = # from 1 to 4)
 Mk = Memory location (k = # from 1 to 64)
 Cn = Card ID (n = # from 1 to max slots)
 Ui = Unit ID (i = # from 0 to 9)

Example:

An **MT112-104** located in slot 4. There is a text string stored in RS memory location 32. Output the text string through RS-232 port 1 by sending the command [OUTRS1M32C4].

41. [TRRS]

This command sends a text string directly to a one of the RS-232 ports. The maximum number of characters that may be sent at one time is 28. Hex characters may be sent by preceding them with the "%" character.

Command Format: [TRRSmMkCnUi]

m = IR Port (m = # from 1 to 4)
 Mk = Memory location (k = # from 1 to 64)
 Cn = Card ID (n = # from 1 to max slots)
 Ui = Unit ID (i = # from 0 to 9)

Example:

An **MT112-104** located is in slot 4. Output the text string "MAIN MENU" through RS-232 port 1 by sending the command:

[TRRS1=MAIN MENU C4].

Example: Form Feed

Output the string “%0C” to send the form feed command to RS-232 port 1.

[TRRS1=%0CC4].

42. [WRI]

This command assigns a subroutine to perform when there is a transition on an I/O port.

Command Format: [WRIx,y=SUBkCnUi]

x = I/O Port (x = # from 1 to 24)

y = Port Transition (y= 0 or y=1)

0 = Low to High transition

1 = High to Low transition

k = Subroutine (k = # from 1 to 180)

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

Ui = Unit ID (i = from 0 to 9)

Example HIGH to LOW:

An **MT112-104** is in slot 4. Send the command [WRI2,1=SUB100C4] to assign subroutine 100 to be performed when I/O Port #2 changes from a high to a low.

Example LOW to HIGH:

An **MT112-104** is in slot 4. Send the command [WRI2,0=SUB101C4] to assign subroutine 101 to be performed when I/O Port #2 changes from a low to a high.

43. [RDIS]

This command displays the subroutines associated with an IO port.

Command Format: [RDISxCnUi]

x = I/O Port (x = # from 1 to 4)

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

Ui = Unit ID (i = from 0 to 9)

Example:

An **MT112-104** is in slot 4. Send the command [RDIS2C4] and receive the following feedback for the previous example:

Port02: Sub101, Sub100

Port 02 is the port queried. Sub101 is the subroutine performed when there is a low to high transition and Sub100 is performed when there is a high to low transition.

44. [RDIS*]

This command displays the subroutines associated with all the IO ports.

Command Format: [RDIS*CnUi]

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

Ui = Unit ID (i = from 0 to 9)

Example:

An MT112-104 located in slot 4. Send the command [RDIS*C4] and receive feedback similar to the following:

Port01: Sub000, Sub000

Port02: Sub101, Sub100

Port03: Sub000, Sub000

Port04: Sub000, Sub000

45. [WRKEY]

This command allows external switches and LED's to control or be controlled through the I/O ports. Subroutines are assigned to be executed when an external key (switch) is pressed and the external LED is in a given state.

The ports are designed to work in pairs. Port 1 handles external Key #1 and Port 2 handles external LED #1. Port 3 handles external Key #2 and Port 4 handles external LED #2.

In this setup, the Port 1 jumper should be set to the INPUT position. Port 2's jumper should be in the OUTPUT position and so on.

Command Format: [WRKEY_{x,y}=SUB_kC_nU_i]

x = Key number

y = LED state (0= on, 1= off)

k = Subroutine number (# from 1 to 180)

C_n = Card ID (n = # from 1 to max slots)

U_i = Unit ID (i = # from 0 to 9)

Example:

The external keys (switches) and LED's are wired to the I/O ports as follows:

I/O#1 = KEY#1 Port 1 jumpered for INPUT

I/O#2 = LED#1 Port 2 jumpered for OUTPUT

I/O#3 = KEY#2 Port 3 jumpered for INPUT

I/O#4 = LED#2 Port 4 jumpered for OUTPUT

Assign subroutine 10 to be executed if external Key #1 is pressed and external LED #1 is on.

[WRKEY1,0=SUB10C4]

The system knows external LED#1 (Port 2) is on since the WRIOx1xxx... must have been issued. Port 2 was turned on to drive the LED.

46. [WRS]

This command writes/programs a subroutine in the **MT112-104** by adding functions to its subroutine. The subroutines may be used to control other cards in the Multi-Tasker™ system, but cannot be used to control the Front Panel LED's.

The maximum number of characters, including commas, that may be sent to a subroutine in a single command is 16 and the total number that may be stored in a subroutine, including the commas, is 128.

If the length of the command string exceeds the maximum 16 characters, break the functions into smaller groups. Previous commands are NOT overwritten. The subroutine is appended with the new commands.

CAUTION: Do NOT confuse this command with the {WRS} command, which writes subroutines to the Front Panel memory.

Command Format: [WRS_m=F₁,F₂,...;C_nU_i]

S_m = Subroutine ID (m = # from 1 to 180)

F₁,F₂,... = Functions: functions must be separated by a comma.

C_n = Card ID (n = # from 1 to max slots)

U_i = Unit ID (i = # from 0 to 9)

Example:

Program Subroutine 2 for slot 4 with the following functions: ON1C3 and ON2C3. Send the command [WRS2=ON1C3,ON2C3;C4].

NOTE: A comma must be used between functions.

Add more functions such as ON3C6 and ON4C6 to the subroutine. Subroutines are written accumulatively. That is, each command is appended to the functions that are already part of the subroutine. Therefore, to add the functions ON3C6 and ON4C6, it is only necessary to send the command [WRS2=ON3C6, ON4C6;C4].

After sending the command above, the contents of Subroutine 2 will contain the following:

ON1C3, ON2C3, ONC6, ON4C6

47. [RDS]

This command reads and displays the functions programmed in a subroutine.

Command Format: [RDS_mC_nU_i]

S_m = Subroutine (m = # from 1 to 180)

C_n = Card ID (n = # from 1 to max slots)

U_i = Unit ID (i = # from 0 to 9)

Example 1:

Read back the subroutine in the previous example for the WRS command. The card is in slot 4 and the Subroutine is 2. Send the command [RDS2C4] and receive the following feedback:

ON1C3, ON2C3, ONC6, ON4C6

Example 2:

Read back the contents of an empty subroutine. The card is in slot 4 and the subroutine is Subroutine 9. Send the command [RDS9C4] and receive the following feedback:

Subroutine Empty

48. [SUB]

This command executes the functions stored in a subroutine.

These subroutines are stored directly on the card and are separate from the commands stored in the Front Panel. Therefore, the front panel LED's cannot be controlled with commands stored on the control card, but they may be used to control other cards.

Command Format: [SUBmCnUi]

m = Subroutine (m = # from 1 to 180)

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

Ui = Unit ID (i = # from 0 to 9)

Example:

The function ON1C3 is stored in Subroutine 55 of the card in slot 1. Send the command [SUB55C1] and the stored function will be executed. Output 1 of card 3 will be turned on.

49. [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)

Example:

View the RS-232 commands available for the **MT112-104** card in slot 2, by sending the command [HELPC2]. The commands and a brief description, will be displayed.

GROUP COMMANDS

The next commands are group commands. These commands are not normally used with control cards like the **MT112-104**, but are provided as added information for controlling other cards in the system. The subroutines on the **MT112-104** may be programmed with commands to control other cards in the system as well as card groups.

50. [WR]

This command groups multiple cards in the enclosure allowing all the group members to be controlled simultaneously with the same command. Each unit may define a maximum of eight groups.

In Multi-Tasker™ systems with both audio and video cards, boards are typically grouped as follows:

Group 1 = Video Cards

Group 2 = Audio Cards

Group 3 = Video and Audio Cards

Command Format: [WRCn₁Cn₂...GkUi]

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

Gk = Group number (k = # from 1-8)

Ui = Unit ID (i = # from 0-9)

Example:

Group cards 2, 4, and 6 as group 5 of Unit ID 1 by sending the command [WRC2C4C6G5U1]. After executing this command, cards 2, 4 and 6 will be grouped together as group 5 of Unit ID 1. The system will return the following feedback to the terminal:

[G5=C2C4C6]

Now, when a command is sent to G5, each card in G5 will received and execute the same command.

51. [RMC]

This command may be used to remove one or more group members from a single group. Reset the system after using this command for all changes to take effect.

Command Format: [RMCn₁Cn₂...GkUi]

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

Gk = Group number (k = # from 1-8)

Ui = Unit ID (i = # from 0-9)

Example:

Group 5 consists of the cards located in slots numbered 2, 4, and 6. Remove only the cards in slot 4 and slot 6 from the group. To do this, send the command [RMC4C6G1]. The system will disassociate the cards from the group and return the following feedback:

[G5=C2]

52. [RMG]

This command is used to delete an entire group definition. It may also be used to delete all the groups defined in the system.

REMOVE A GROUP

Remove all the members from the group, effectively deleting the group.

Command Format: [RMGkUi]

Gk = Group number (k = # from 1-8)

Ui = Unit ID (i = # from 0-9)

Example:

Group 5 consists of the cards located in slots number 2, 4 and 6. Remove all cards from the group by sending the command [RMG5]. The system will return the following feedback:

[G5=0]

REMOVE ALL GROUPS

Remove all the members from every group, effectively deleting all groups.

Command Format: [RMG*Ui]

Ui = Unit ID (i = # from 0-9)

Example:

Group 5 consists of cards 2, 4 and 6. Group 2 consists of cards 1, 2, 3, 4 and 5. Delete all the groups by sending the command [RMG*]. The system will return the following feedback:

G1-G8:EMPTY

53. [RD]

This command reads and then displays the members in each group.

Command Format: [RDGkUi]

Gk = Group number (k = # from 1-8)

Ui = Unit ID (i = # from 0-9)

Example:

The cards in slots 2, 4 and 6 are part of group 5. Read the member data for group 5, by sending the command [RDG5]. The system will return feedback as follows:

[G5=C2C4C6]

The feedback shows G5 (Group 5) and then the cards that make up Group 5. In this case, Group 1 includes C2, C4 and C6.

7.3 SUMMARY of COMMANDS

Card Commands

- 1) [C] Receives card status.
- 2) [?] Show system cards.
- 3) [?Cn] Show card information.
- 4) [STA1] Enable auto feedback
- 5) [STA0] Disable auto feedback
- 6) [CLR] Reset card to defaults.
- 7) [CLRIR] Clear IR memory.
- 8) [CLRRS] Clear RS memory.
- 9) [CLRI] Clear IO programming.
- 10) [CLRS] Clear the contents of an MT112-104 subroutine.
- 11) [TEST] Tests the memory IC's.
- 12) [VER] Display software version.
- 13) [FBD] Turn feedback delay on/off.
- 14) [RSI] Reset Card ID.
- 15) [SIDn] Set all card ID's in system.
- 16) [SIDnCi] Set a single card ID.
- 17) [SID+n] Set card ID offset.
- 18) [RSN] Read slot number of card.
- 19) [RDIO] Display I/O port status.
- 20) [WRIO] Set one or more I/O ports to different states.
- 21) [WRIOk] Set one or more I/O ports to the same state.
- 22) [RDRL] Display relay status.
- 23) [WRRL] Set one or more relays to different states.
- 24) [WRRLK] Set one or all relays.
- 25) [MODEIR] Sets an IR port mode.
- 26) [SAVIR] Saves data to IR memory.
- 27) [WRIR] Save IR HEX data to memory.
- 28) [WRLIR] Program label for IR memory location.

- 29) [RDIR] Display IR binary data.
- 30) [RDHIR] Display IR HEX data.
- 31) [SDIR] Display IR binary data in machine format.
- 32) [OUTIR] Output data to an IR port.
- 33) [LEARNIR] Sets the card to receive IR code data from IR source.
- 34) [MODERS] Sets RS-232 port mode.
- 35) [SAVRS] Write 8 bytes RS, ASCII or binary.
- 36) [WRRS] Write 16 bytes RS, ASCII only.
- 37) [WRLRS] Program label for RS memory location.
- 38) [RDRS] Display data from an RS Memory Location.
- 39) [SDRS] Display RS memory location data in machine format.
- 40) [OUTRS] Output data to RS-232 port.
- 41) [TRRS] Send text string to port.
- 42) [WRI] Assigns subroutine to an I/O port state change.
- 43) [RDIS] Read one IO setting
- 44) [RDIS*] Read all IO settings
- 45) [WRKEY] Program external switches and LED's.
- 46) [WRS] Write a subroutine to the MT112-104.
- 47) [RDS] Read/display a subroutine.
- 48) [SUB] Execute a subroutine.
- 49) [HELP] Display available commands

Group Commands

- 50) [WR] Groups multiple cards
- 51) [RMC] Remove group members
- 52) [RMG] Delete group
- 53) [RD] Displays group members

7.4 MENU MODE

Menu mode commands are RS-232 commands that allow virtually the same functionality as programming commands. Unlike the programming commands, menu commands prompt the user to select from a list of available options.

Menu commands may be issued in response to prompts from within the RS-232 communication software.

The menu driven commands are only available with Multi-Tasker™ Front Panel systems that have the following firmware:

690-0122-015 = Version 015 or later.

690-0123-004 = Version 004 or later.

690-0124-018 = Version 018 or later.

Send the command [VER], and the system will respond with feedback that includes the following:

[690-0122-015 690-0123-004 690-0124-018]

Check the last three digits to determine if the menu mode option is available.

7.4.1 MENU COMMAND DEFINITIONS

Refer to section 7.2 for details on individual card functions and examples. Following is table showing menu mode to manual commands cross reference.

MENU	COMMAND
Control	
I/O	[RDIO], [WRIO]
Relay	[RDRL], [WRRL]
IR	[OUTIR]
RS-232	[OUTRS]
Setup	
IR	[MODEIR]
RS-232	[MODERS]
Status	[VER], [C]
Help	[HELP]

7.4.2 USING MENU MODE

SUGGESTION: Before using the menu mode, it is best to disable the automatic feedback feature. The values and current settings will be displayed in the menu mode, but the automatic feature will display after each setting change making the menus difficult to read.

1. The system needs to be connected to a computer running RS-232 control software to enter menu mode.
2. Insert the card into an empty slot and push in all the way for a secure fit.
3. Reset the system or power the system off and then on.
4. In the terminal window, press ENTER.
5. The system will interrogate the enclosure and return a list of cards installed and their slot locations.

Example: 08: **MT112-104**

NOTE: Only cards supporting the menu feature will be displayed.

5. Find the two digit number representing the card whose setup requires changing. It will be the first one or two characters in the line.
 6. Enter the numbers associated with the card, and a menu with options available for that card will appear on the screen. In the example above, press "08".
- WARNING:** Do NOT enter any characters except the one relating to the desired menu. Pressing ENTER after "08" will force the system back to the original prompt.
7. After selecting the **MT112-104** as described above, the system will prompt for selections specific to that card.
 8. Read each menu carefully, and continue selecting keys as prompted for further functions. (Example prompt: "Key= ")

7.4.3 MENU TYPES

1. MAIN MENU

The first menu displayed after selecting the card is the Main Menu. This menu provides access to the main functions related to the card. Press the key representing the menu item for access. A sub menu will appear next.

2. SUB MENU

Each sub menu will display either another menu (sub menu) or a list of available options or settings. Press the key corresponding to the menu choice to change a setting or select the next menu.

NOTE: Pressing the ESCAPE (ESC) key in most menus will take you up to the previous menu without making changes in the current menu.

7.4.4 MT112-104 MENUS

Following are the menus available to the **MT112-104**. The first menu is the Main Menu only. The second listing is an expansion of all the menu items available.

The expanded menu contains values in parentheses that indicate the current setting or value of that parameter. In some areas, additional comments are provided for clarification.

Some menu settings act as toggle features. For example, if I/O port 1 is off (0), pressing 1 in the I/O Control menu will change the value to '1', or on. The value displayed in parentheses will become '1'. Press '1' again and the port will turn off. In short, pressing 1 repeatedly will toggle I/O port 1 ON and OFF.

MT112-104 MAIN MENU

PRESS KEY TO SELECT

1: CONTROL

2: SETUP

3: STATUS

4: HELP

ESC: GO BACK

KEY =

MT112-104 EXPANDED MENU

1. CONTROL:

1: I/O PORT

PRESS KEY TO TOGGLE PORTS

1: Port1 (1)

2: Port2 (1)

3: Port3 (1)

4: Port4 (1)

ESC: GO BACK; S: STATUS

2: RELAY PORT

PRESS KEY TO TOGGLE RELAYS

1: Relay1 (1)

2: Relay2 (1)

3: Relay3 (1)

4: Relay4 (1)

5: Relay5 (1)

6: Relay6 (1)

ESC: GO BACK; S: STATUS

3: IR PORT

PLEASE DO THE FOLLOWING:

1) Select IR Output (1 digit number 1 to 4)

2) Select Memory (2 digit number 01 to 64)

3) Press 'S' To Send

SELECT OUTPUT (1-4) :

4: RS232 PORT

PLEASE DO THE FOLLOWING:

1) Select RS-232 Port (1 digit number 1 to 2)

2) Select Memory (2 digit number 01 to 64)

3) Press 'S' To Send

SELECT RS PORT (1-2) :

2. SETUP

1: IR

IR SETUP:

1: IR1 (mode 1)

2: IR2 (mode 1)

3: IR3 (mode 1)

4: IR4 (mode 1)

ESC: GO BACK

Press the number of the IR port to change. Each time the port number is pressed the mode will increment by one and cycle through modes 1-C.

2: RS232

RS232 SETUP:

1: RS232-1 (9600,8,N,1)

2: RS232-2 (9600,8,N,1)

ESC: GO BACK

Press the key for the RS-232 port to cycle through the available baud rates.

ESC: GO BACK

3. STATUS

Equivalent to the [C] and [VER] commands.

Returns the card status and firmware version.

4. HELP

Equivalent to the [HELP] command., it displays a list of commands available for the **MT112-104** and a brief description.

ESC

Returns to the parent menu.

7.4.5 MENU MODE EXAMPLES

All MENU MODE examples assume an **MT112-104** is installed in slot 4. Start by clicking the mouse in the terminal window. Press ENTER for a list of available cards.

NOTE When entering numeric values, (not selecting menu items) the system may echo character as typed depending on the communication software settings. For example, entering a delay time of 03 may appear as 0033 on the screen.

1. Set I/O Port 1 to ON

Follow the keystrokes below to set the I/O port number one on:

Enter	List available cards
04	Select MT112-104 in slot 4
1	Select CONTROL Menu
1	Select I/O Port Control
	Port 1's current setting is shown in parenthesis. If the value is '1', the port is already on. Skip the next step.
1	Toggle port 1 from off to on.
ESC	Return to CONTROL Menu
ESC	Return to the MAIN Menu

2. Set RS-232 Port 1 to 4800 Baud.

Starting from the Main Menu, change the baud rate for RS-232 port 1 from 9600 baud to 4800 baud. Follow the keystrokes below.

2	Select SETUP Menu
2	Select RS232 Menu
	The current settings for ports 1 and 2 are shown. Port 1 is at 9600 baud.
1	Begin cycling through port 1' baud rates. Baud rate is now 19200
1	Cycling through port 1' baud rates. Baud rate is now 2400
1	Cycling through port 1' baud rates. Baud rate is now 4800
ESC	Return to SETUP
ESC	Return to the MAIN Menu

3. Output the contents of RS memory port 1.

Starting from the Main Menu, follow the keystrokes below.

1	Select CONTROL Menu
4	Select RS-232 port
1	Select Port 1
01	Select memory location 01
	<i>NOTE The system may echo the '0' and the '1'.</i>
S	Send the data
	<i>Keep pressing 'S' to repeatedly output the data.</i>
ESC	Return to CONTROL menu
ESC	Return to the MAIN Menu

4. Display Card Status

Starting from the Main Menu, follow the keystrokes below.

3	Displays card status
	<i>NOTE: The status will be displayed, followed by the Main Menu being redisplayed.</i>

TROUBLESHOOTING GUIDE

8

We have carefully tested and have found no problems in the supplied **MT112-104**. However, we would like to offer the suggestions below.

NOTE: This section assumes there is communication between the computer and the Multi-Tasker™.

8.1 RELAY DOES NOT SWITCH

Cause 1: Bad Command

Solution 1: If the relay is not switching from a programmed key or software control, the problem may be in the programming. Use the terminal window to send the commands directly (see the [WRRL] command).

If the relay switches, the problem is in the programming or there is a problem with the key, see Solution 2.

Solution 2: If the relay cannot be controlled from the assigned button, assign a known good key to control the relay. If the relay switches, the card cage may require service. Call ALTINEX at (714) 990-2300.

Solution 3: If there is still no response from the relay, there may be a problem with the programmed functions. Call ALTINEX at (714) 990-2300.

Cause 2: Bad Relay

Solution 1: Disconnect the cables attached to the relay port. Attach an ohmmeter across the two connector pins of the problem relay. Send commands to repeatedly open and close the relay (see Section 23. [WRRL]). If the ohmmeter indicates the relay is opening and closing properly, there may be a problem with the cable. If there is no change indicated by the ohmmeter, see Solution 2.

Solution 2: Move the ohmmeter to another relay port and repeat the above process on a working port. If the relay operates properly, there may be a problem with the card. Call ALTINEX at (714) 990-2300.

8.2 I/O PORT NON RESPONSIVE

Cause 1: Jumpers are not set.

Solution 1: The I/O ports may be used as input or output ports. Verify the jumpers are set to the correct position.

Solution 2: Check the cable and verify there is continuity for both the I/O port pin and the Ground pin. If there is still no response, please call Altinex at (714) 990-2300.

8.3 RS-232 COMMUNICATION PROBLEM

Cause 1: Receiving device does not respond.

Solution 1: The **MT112-104** has two RS-232 ports. Verify the receiving device is connected to the port sending the commands. If the device is connected correctly, see Solution 2.

Solution 2: Check the data being sent to the device. Use the [RDRS] command to view the data in the memory location that is being used to send the data. Make sure the data stored represents a valid command. If the data is good, see Solution 3.

Solution 3: Check the RS-232 port's setup. Use the [C] command to display the mode information. Verify the receiving device has the same baud rate and is set as follows:

Data Bits = 8
Stop Bits = 1
Parity = None

If all the parameters match and there is still a problem, see Cause 2.

Cause 2: No data is being sent out.

Solution 1: Send text strings to the RS-232 port. Store text to an RS memory location, then repeatedly click the OUT button. The LED should flash each time the button is clicked. If not, there may be a problem with the card, please call Altinex at (714) 990-2300. If the LED flashes, see Solution 2.

Solution 2: Check the cable and verify there is continuity from end to end. If continuity is good, see Solution 3.

Solution 3: Connect the cable from the **MT112-104** to another device or terminal that can receive RS-232 commands. Send commands to the device and see if any data is being received. If there is still no indication of data transmission, there may be a problem with the card, please call Altinex at (714) 990-2300.

8.4 IR PORT IS NOT WORKING

Cause 1: Receiving device does not respond.

Solution 1: The **MT112-104** has four IR ports. Make sure the transmitter is connected to the port sending the commands. If so, see Solution 2.

Solution 2: Check the IR port's setup. Use the [C] command to display the mode in the Terminal Window. Make sure the mode is the correct one for the receiving device. If the mode is correct, see Solution 3.

Solution 3: The data being sent may be incorrect. Relearn the IR protocol for a single command (see Section 33. [LEARNIR]) and try sending the signal again. If there is still no response, see Cause 2.

Cause 2: No data is being sent out.

Solution 1: Send data to the IR port. Use data from the same memory location of the command that is not working. Click the OUT button repeatedly. The LED should flash each time the button is clicked. If not, there may be a problem with the card, please call Altinex at (714) 990-2300. If the LED flashes, see Solution 2.

Solution 2: Check the cable going to the transmitter for damage. If the cable is good, see Solution 3.

Solution 3: If available, try another cable and transmitter. If there is still no indication of data transmission, there may be a problem with the card, 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

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