MT100-100/MT101-100/MT101-102

19-SLOT MULTI-TASKER™

ENCLOSURE USER'S GUIDE

ALTINEX

SiGNAL MANAGEMENT SOLUTIONS™

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

TABLE OF CONTENTS

Page

This manual covers:

  MT100-100 - MultiTasker 19-slot Enclosure

  MT101-100 - Blank Front Panel for MT100-100 (No micro, no buttons)

  MT101-102 - Blank Front Panel for MT100-100 (Micro included, no buttons)

ALTINEX

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

PRECAUTIONS / SAFETY WARNINGS   1

Please read this manual carefully before using your **MT100-100** 19-Slot Multi-Tasker™ Enclosure. Keep this manual handy for future reference. These safety instructions are to ensure the long life of your **MT100-100** 19-Slot Multi-Tasker™ Enclosure 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 **MT100-100** 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 your **MT100-100** carefully. Dropping or jarring can damage the unit. If the **MT100-100** is not used for an extended period, disconnect the power cord from the power outlet or turn off the main connection.

1.3 RACK-MOUNT INSTALLATION

- Use only ALTINEX supplied **MB1001** rack-mount ears for mounting the **MT100-100** into a rack.

- The maximum operating ambient temperature is 45 degrees Centigrade.

- When installing the **MT100-100** into a rack, distribute individual units evenly, otherwise hazardous conditions may be created by an uneven weight distribution. This will reduce heat build up and will prolong the life of the **MT100-100** should be maintained by connecting using the provided 3-prong power cord only. Furthermore, make sure that the rack is properly grounded.

1.4 CLEANING

- Unplug the **MT100-100** power cord before cleaning.

- Clean surfaces 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 unit.

1.5 FCC 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 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 MT100-100   2

MT100-100
Multi-TaskerÔ 19-Slot Enclosure

- Empty card-cage with 19 slots available
- Basic foundation of Multi-Tasker™ solutions
- 4U high, full rack wide
- Rack ears included

The MultiTasker™ 19-Slot Enclosure, **MT100-100**, comes with a front panel installed. However, the front panel must be ordered separately to insure that you select the best solution for your application. ALTINEX currently offers three front panel choices: part numbers **MT101-100**, MT101-101 and **MT101-102**.

For applications in which the MultiTasker will strictly be controlled with a computer or third-party control system, use the **MT101-100** Standard Blank Panel. Although it does not offer any buttons, it does have the main microprocessor for the MultiTasker installed on the inside of the panel, which is required for external RS-232 control of the **MT100-100**. In addition, the **MT101-100** panel provides an LED to indicate "power on" status, and a 9-pin D sub connector for RS-232 connection from the front of the unit. (This connector is provided mostly for convenience during initial setup of the MultiTasker, since the primary connection would typically be made using the 9-pin D sub Control connection on the back panel of the **MT100-100**).

The **MT101-102** is a completely blank front panel without any microprocessor control; use this panel when the MultiTasker is populated with cards that require no external control, such as video and audio distribution and signal conditioning.

TECHNICAL SPECIFICATIONS   3

FEATURES/ DESCRIPTION	MT100-100
GENERAL	
RS-232	9-pin D connector (GND, RXD & TXD)
Compatibility	Cards designed for the Multi-Tasker™ System

Table 1. **MT100-100** General

MECHANICAL	MT100-100
Weight (without cards)	12lbs. (544kg)
Width	17in. (432mm)
Depth	7in. (178mm)
Height	12in (305mm)
Available Slots	19
Back Panel	Black
T° Operating	10°C-35°C
T° Maximum	50°C
Humidity	90% non-condensing
MTBF (calc.)	40,000hrs

Table 2. **MT100-100** Mechanical

ELECTRICAL	MT100-100
Power Input	85VAC - 264VAC @ 50/60Hz

Table 3. **MT100-100** Electrical

MULTI-TASKER™

FRONT PANEL OPTIONS

MT101-100 FRONT PANEL

RS-232 CONTROL FROM FRONT PANEL

MT101-101 FRONT PANEL

36 PROGRAMMABLE BUTTONS

RS-232 CONTROL FROM FRONT PANEL

MT101-102 FRONT PANEL

BACK PANEL

9-PIN D CONNECTOR

POWER SWITCH

AC POWER RECEPTACLE

SLOT NUMBER FROM 1 TO 19
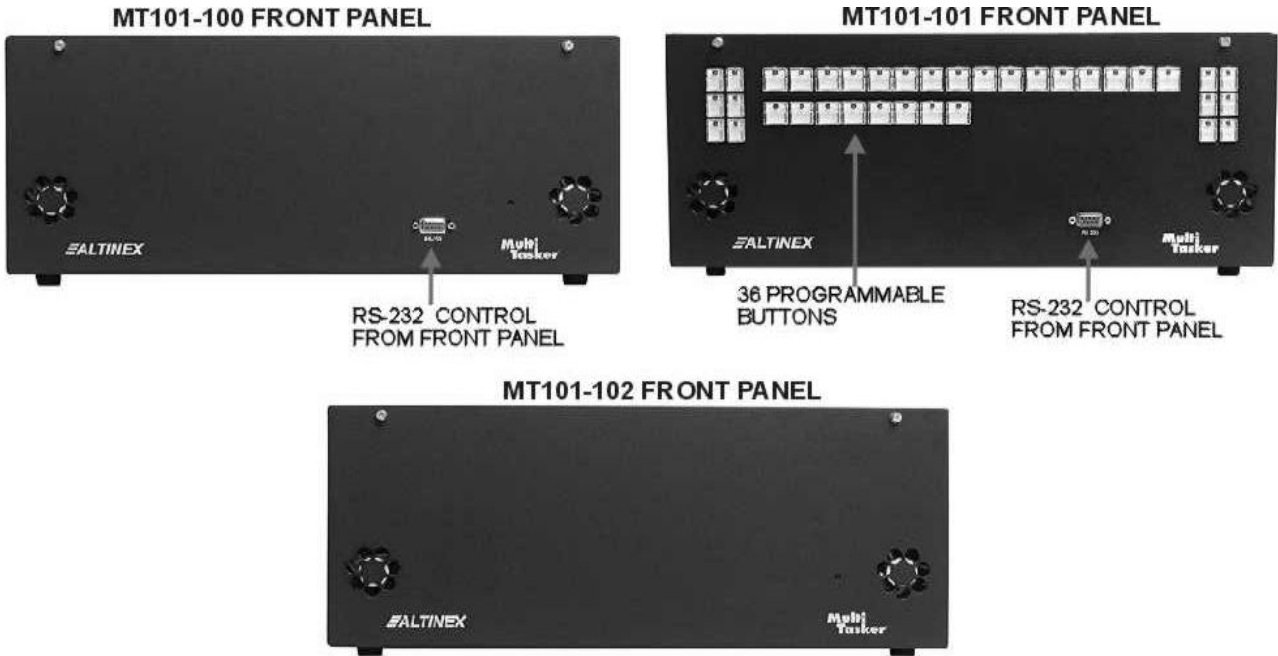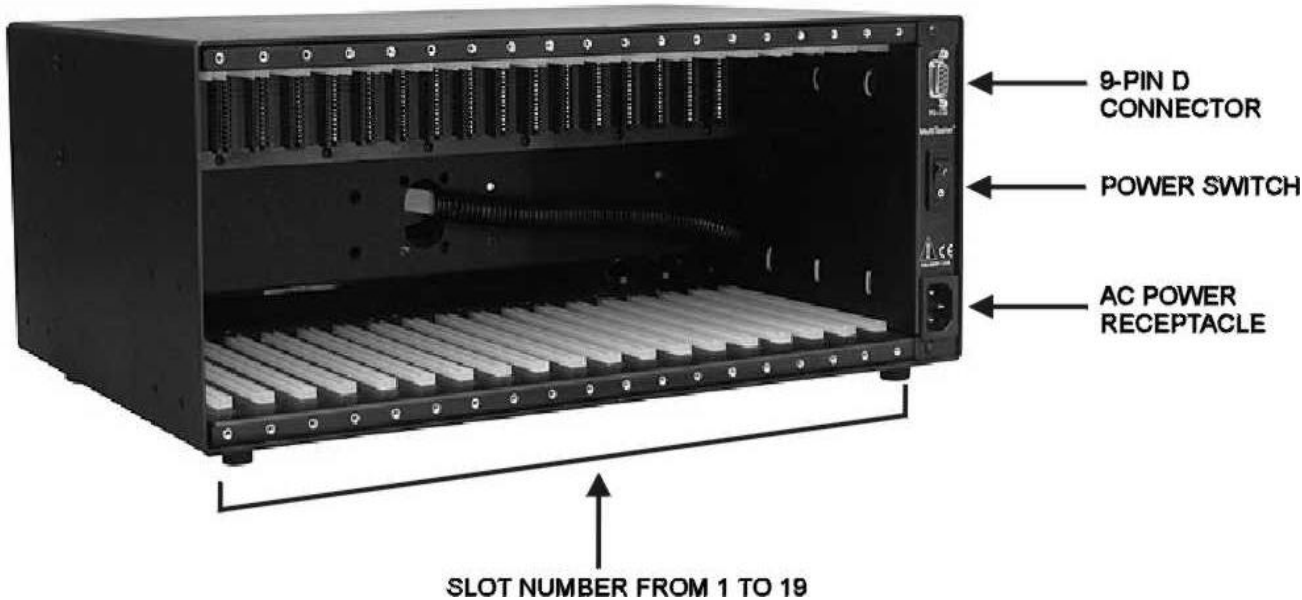
INSTALLING YOUR MT100-100　　　　5

Step 1. Connect the power entry connector of the **MT100-100** to the power outlet with the provided power cord. The power supply is universal and will work throughout the world with voltages from 85V to 264VAC.

Step 2. If a control system is used to control the cards in the **MT100-100** Multi-Tasker™, connect the 9-pin D connector of the **MT100-100** to the control system's RS-232 port as shown in Table 4.

9-pin D Connector of Multi-Tasker™	Computer or Control System
GND (Ground)	Ground
RXD (Receive)	Transmit
TXD (Transmit)	Receive

Table 4. **MT100-100** RS-232 control

*Note: Make sure that the transmit pin of the control unit is connected to the receive pin of the **MT100-100**. Also, make sure that the receive pin of the control unit is connected to the transmit pin of the **MT100-100**. See figure 1 and 2.*

Step 3. Turn on the power switch of the **MT100-100** Multi-Tasker™.

OPERATION　　　　6

The **MT100-100** has many advanced remote control capabilities, which are accessible through standard RS-232 communication. The actual controlling can be accomplished through a computer, a control system, or any other device capable of sending RS-232 commands. The factory settings for the RS-232 port are 9600 baud, 8 bits, 1 stop, and No parity.

Commands used for MultiTasker cards such as [ON], [OFF], and [IO] that end in "S" will be saved to 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).

In this section, "Basic Enclosure" or "Unit" has the same meaning. The basic enclosure is a complete and independent card cage that has a controller and 19 slots for plug-in cards. Each unit or basic enclosure has its own unit ID that is based on a

number from 0 to 9. Each plug-in card also has its own unit ID that is a number from 1 to 19.

6.1 RS232 CONNECTION

If a control system is used to control the cards in the **MT100-100** Multi-Tasker™ Basic Enclosure, connect the 9-pin D connector of the **MT100-100** to the control system's RS-232 port. To connect the Multi-Tasker™ (MT) to a computer or a terminal, you must have the proper interface cable.

The interface cable must also have the appropriate connector on each end and the internal wiring must be correct. Connectors typically have 9 pins (DB-9 connector) or 25 pins (DB-25 connector) with a "male" or "female" pin configuration.
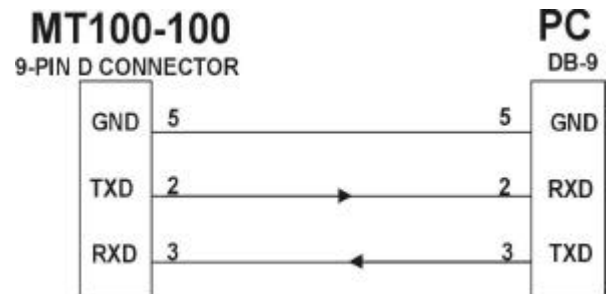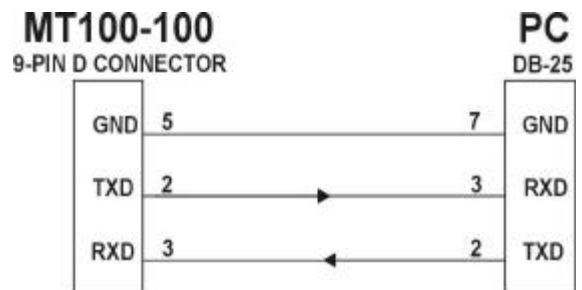

Figure 1: DB-9 Serial Connection

Figure 2: DB-25 Serial Connection

6.2 RS-232 PROTOCOL

The RS-232 protocol for the **MT100-100** uses a simple ASCII character format.

1. **Square brackets "[   ]" are part of the command.**
2. **Use uppercase letters for all commands.**
3. **Commands may be executed with or without a space.**
4. **One command may carry up to 40 characters including brackets.**

The input buffer is a 256-character ring buffer for 256 bytes. Use caution when sending consecutive commands from a computer or control system. To avoid an overflow of the command buffer, the user may send commands with the delay time.

Each character requires 1ms to reach the buffer. Each command will be executed every 50ms. After the first 50ms interval, the first command has been executed and removed, therefore the buffer has extra space available to accept another command. The user may send consecutive commands, if the total number of characters does not exceed 300.

There are two ways to send commands, see examples below.

1) Send commands with a delay time of 50ms.

   [ON123456C2U1]
     Delay 50ms
   [OFF123C2U1]
     Delay 50ms
   [OFF6C2U1]

2) Send consecutive commands without delay up to 300 characters and then send the rest of the commands with a 50ms delay as shown above. The user may also calculate time to execute all commands in the buffer by multiplying the number of commands by 50ms. After the execution time, the user can send another 300-character string without delay.

6.3 RS-232 COMMANDS

[RES], [VER C0], [C0], [SET], [ID]

If there is only one **MT100-100** Basic Enclosure being used, unit ID 0 should be used to simplify the command (no Ui in the command). Use command **[SETUi]** to assign ID 0 to the Basic Enclosure. If multiple **MT100-100** Enclosures are used in the same system under a common RS-232 control port, then a unit ID from 1 to 9 should be used to distinguish which Enclosure is being sent the command.

1. [RES]

The [RES] command resets the Enclosure. The controller and all cards in the Enclosure will be reset.

If the unit has a unit ID of zero, it will beep once and return feedback to the controller or computer in the form of ASCII text that says PLEASE WAIT. After 3 seconds when all initializations are complete, the unit will beep twice and return feedback to the controller or computer in the form of ASCII text that says **READY**. This will let the user know that the unit is ready for operation. The reset process will take 3 seconds.

If the unit ID is any number other than zero (# from 1 -9), the unit will beep once. After 3 seconds when all initializations are complete, the unit will beep two times.

2. [VERC0Ui]

This command displays the current version of the firmware for the controller unit located in the **MT100-100**.

C0 = card ID (0 is for controller card of the **MT100-100**)

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

Example:

[VERC0U1] will return feedback as [Ver 122001 123001 124001]

122001: software version of control CPU
123001: software version of process CPU
124001: software version of Panel CPU

Note: Controller card has 3 different CPU's: Control CPU, Process CPU, and Panel CPU (LED/KEY).

3. [C0Ui]

This command receives the status of the controller card.

C0 = ID 0 is for the controller card of the **MT100-100**.

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

Example:

To see the status of Controller unit #1, send the [C0U1] command.

The Multi-Tasker™ system will return feedback as [CONTROL:OK] if the control card is working properly.

[CONTROL: ER03] will be returned as feedback if there is an error 3 on controller card.

ERROR CODES

ER01: CPU Error

This error indicates that the CPU is not working properly.

ER02: I²C Communication Error

This means that the communication between the controller and its serial device has failed.

ER03: RS485 Communication Error

This type of error is a communication error between the serial device and Controller unit and the cards in the Multi-Tasker™ Enclosure.

4. [SETUi]

This command sets the unit ID number for the **MT100-100** Multi-Tasker™ Enclosure.

Ui = Unit ID
i = number from 0 to 9

To assign an ID for a unit, first turn ON that particular unit leaving other units OFF.

Example:

a) **[SETU0]**

  After this command is executed, all commands for this unit may either include U0 or not include U0.
  example:

   [Cn] = [CnU0]
   [VERCn] = [VERCnU0]
   [ON123Cn] = [ON123CnU0]

b) **[SETU6]**

  After this command is executed, all commands for this unit must include U6 (i.e. **[CnU6]**, **[VERCnU6]**, etc). This command can be used for single or multiple unit operation. If there are

3 enclosures being used, set unit ID's using the following procedure:

1) Turn OFF all units.

  a) Turn ON the unit that you want to assign unit ID no. 1
  b)   Send the **[SETU1]** command.

2) Turn OFF all units.

  a) Turn ON the unit that you want to assign unit ID no. 2
  b) Send the **[SETU2]** command.

  3) Turn OFF all units.
   a) Turn ON the unit that you want to assign unit ID no. 3
   b) Send the **[SETU3]** command.

5. [IDUi]

This command identifies the **MT100-100** using a specific unit ID. The status LED on the front panel will blink green for 10 seconds to indicate which unit has the ID.

6. [WR]

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

Command Format: [WRCn…GkUi]

Cn = card ID No. (n = slot # from 1 to 19)
(1-8 for MT100-101 or 1-2 for MT100-102)
Gk = group number (k = # from 1-9)
Ui = 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 together as group 5 of unit 1

7. [RD]

This command displays the members in each group.

Command Format: [RDGkUi]

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

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

member = C1 - C19 (card 1 to 19)
(1-8 for MT100-101 or 1-2 for MT100-102)

Example:

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

8. [CLR]

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

Command Format: [CLRGkUi]

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

Example:

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 [CLR G✳U1] command.

6.4 ASSIGNING THE SAME UNIT ID TO MULTIPLE UNITS

When there is more than one unit being used, unit ID 0 to 9 can be used for each unit. If identical units are used, the user may assign the same unit ID in order to operate these units simultaneously with the same command.

Example:

To assign unit ID 1 for 3 different units:

a) Turn on only these 3 units.
b) Send this command: [SETU1]

After sending this command, all of the 3 units will have unit ID=1;

Command [ON1C2U1] will turn on input/output#1 on card 2 of these 3 units at simultaneously.

Caution must be used when multiple units are assigned the same unit ID.

1) Do not use the following commands for multiple units with the same unit ID:

[Ci], [VER] and [RD]

These commands will request feedback such

as card status, version, or content of a register.

2) Do not use suffix "F" in a command for multiple units with the same unit ID. (note: using F will request feedback)

Note: Using commands [Ci], [VER] and [RD] or suffix "F" for multiple units with the same unit ID may return an unwanted response because more than card will send feedback simultaneously.

6.5. SUMMARY OF COMMANDS

1) [RES]: Resets the Enclosure to power on or off.

2) [VER C0]: Displays the current firmware version for the controller unit.

3) [C0]: Receives the status the controller card.

4) [SET]: Sets unit ID number for the Enclosure.

5) [ID]: Recognizes the location of the unit by sending an ID number.

6) [WR]: Groups multiple cards

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

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

6.6 WINDOWS BASED CONTROL SOFTWARE

This Windows 95/98/NT based control software is available from the ALTINEX website at www.altinex.com in the Download section.

We have carefully tested and have found no problems in the supplied **MT100-100**; however, we would like to offer suggestions for the following:

- **7.1 CARD CAGE IS NOT WORKING**
- **7.2 CARD IS NOT WORKING**

7.1. CARD CAGE IS NOT WORKING

A) Cause 1:   Card cage is not plugged in.

Solution: Plug card cage in. If the card cage works, the problem is solved. If the card still does not work, see Cause 2.

B) Cause 2:   Card cage slot has a problem.

Solution 1:   Test the card in other slots of the card cage. If the slot was damaged, the card may work in other slots. If other slots work, the problem is the card cage slot. The card cage may require service. Call ALTINEX at (714) 990-2300. If the other slots do not work, see Solution 2.

Solution 2:   Take any other known good card with an LED and verify that the slot used is good by seeing if the other card's LED lights in that slot. If it lights, then the original card may be the source of the problem. Call ALTINEX at (714) 990-2300. If the original card was not the source of the problem, see Cause 3.

C) Cause 3:   The input power voltage is incorrect.

Solution: Make sure that the input power range is within 85-264VAC and also make sure that the power is connected to the input power connector. If there is still a problem, call ALTINEX at (714) 990-2300.

7.1 CARD IS NOT WORKING

A) Cause 1:   Card is not plugged in all the way.

Solution 1:   Push the card in all the way. If

the card still does not work, see Solution 2.

Solution 2:   See the troubleshooting section of each Multi-Tasker™ Card user's guide or call ALTINEX at (714) 990-2300.

ALTINEX POLICY   8

8.1 LIMITED WARRANTY

ALTINEX warrants that its products and cables are free from defects in materials under normal use and service. This warranty is limited to repairing at company's factory any part or parts of the product, which upon company's examination shall disclose to be, thus defective. Products considered defective should be returned to company with transportation charges pre-paid within 2 years (90 days for cables) from date of shipment to the purchaser. The warranty is expressly instead of all other warranties expressed or implied. ALTINEX neither assumes nor authorizes any other person to assume for it any other liability in connection with the sale of the products. This warranty shall not apply to any product that shall have been repaired or altered outside of company's factory in any way so as, in its judgment, to affect its stability or reliability, or that has been subject to misuse, negligence, or accident.

8.2 RETURN POLICY

It is very important to ALTINEX that you receive the products that you have ordered and that this product meets your expectations. In the unlikely event, that an ALTINEX product needs to be returned please follow the policy below:

ALTINEX will accept product returns for a period of 30 days from authorized ALTINEX dealers. Products must be returned in an unopened package.

If a product has been opened, the restocking fees will apply. For the restocking fee amount, please contact an ALTINEX Sales Representative.

If the product is in your possession for more than 30 days, the restocking fees will apply.

ALTINEX will not accept any returns on cables or custom products.

If your product is in warranty and needs service, contact the ALTINEX Sales Department for an RMA (Return Material Authorization). Products returned without an RMA number may experience a delay in service.

If your product is out of warranty and needs service, contact the ALTINEX Sales Department for an RMA (Return Material Authorization). Products returned without an RMA number may experience a delay in service. The service charges will be quoted to you before the actual repairs are done.

8.3 CONTACT INFORMATION

ALTINEX, INC.
592 Apollo Street
Brea, CA 92821 USA

TEL: 714-990-2300
TOLL FREE: 1-800-ALTINEX
WEB: www.altinex.com
E-MAIL: soultions@altinex.com
FAX: 714-990-3303