LINEAR ACOUSTIC®

THE TELOS ALLIANCE

MT2000 Multichannel Bitstream Analyzer SNMP Guide

Version 1.0

MT2000 version 0.0.44 and later

R16/18143

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If the date the customer's notice of warranty claim is received by Linear Acoustic (such date the "**Warranty Claim Notice Date**") is within the first 90 days following the Receipt Date, Linear Acoustic will pay the costs of shipping such warranted Product to and from the end user's location, and the cost of repair or replacement of such warranted Product.

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In each of the above, the unit is to be returned directly to Linear Acoustic with a return authorization (RA) number clearly marked on the packaging. Please note, this RA number must be present or package will be refused and returned to sender.

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All requests for repairs MUST include the unit serial number to ensure quick and accurate service.

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Chapter 1: SNMP Operation

1.1.   Introduction

The MT2000 is capable of supporting SNMP v1 gets and trap messaging.

This functionality is optional, and is easily installed in the field by providing an electronic key to the unit. When ordering the SNMP option, the unit's serial number and MAC Address must be provided in order to generate the correct key.

System level traps, such as Cold Start, Battery Operation, Low Battery Charge, Audio Detected are supported, along with traps from the MT2000 Alerts and Loudness Logs. The MT2000's MIB file (provided), includes all of the information regarding the SNMP traps supported by the MT2000.

Any SNMP management system or trap software, such as Trap Receiver, may be used to receive, display, log, or take actions based on the SNMP traps generated by the MT2000.

1.2.   MT2000 IP Configuration

1.2.1. MT2000 Communications Menu

The IP communication port must be configured before the MT2000 will send SNMP traps. The MT2000 supports both DHCP and static IP configurations.

To configure the MT2000's communications settings, navigate to:
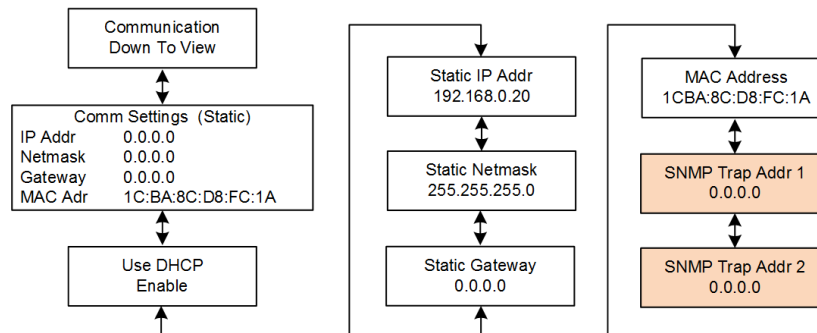
System → Communication

Figure 1 - Communication Sub-Menu

When setting the Static IP Address, Netmask, Gateway, or either SNMP Trap Addresses, each of the four address fields will have to be cycled through.   To adjust each field, rotate the encoder to select the desired number, then click right to move to the next address field.   Once all four address fields have been set to their desired setting, click the encoder to the right to finish setting that field. The star symbol which appears to the left of the address will disappear once this field has been set.

Once all of the addresses have been set, cycle back to the main Communication Settings screen, then click right to set the IP settings.
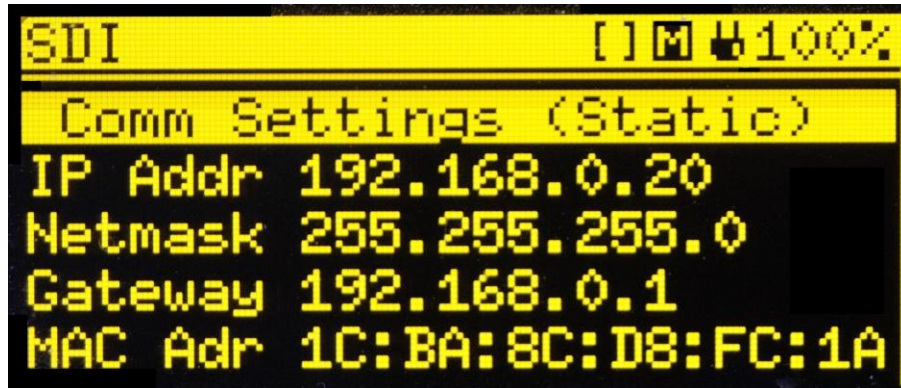
Figure 2 - Communications Status Display

Note!

It is important to return to the main Comm Settings screen after setting the IP communication parameters and press the encoder to the right.   This will set all of the IP communication port settings at once.

1.2.2. SNMP Destinations

The MT2000 is capable of sending SNMP output traps to two different IP addresses simultaneously.

The SNMP trap receiver addresses are also configured in the

System → Communication

submenu.

The following two parameters determine the addresses to send traps to:

- SNMP Trap Addr 1
- SNMP Trap Addr 2

The SNMP Trap Addresses are configured as described in the section above.

To deactivate either trap destination, set its address to 0.0.0.0.

1.3. Traps

1.3.1. Timestamps

Every SNMP trap includes a time stamp. If ATC is available from a SDI input stream, it will be used for the time stamp value. If not, the relative time from when the MT2000 powered up will be used for the time stamp.

1.3.2. Alert Traps

The MT2000 sends traps for the 4 configurable Alerts. A trap will be sent each time an alert is triggered on or released off. The alerts are configured in the:

System → Alerts

menu.

Each Alert may be configured for:
- Off
- Loudness Over Threshold
- Loudness Under Threshold
- Center Channel Under Threshold
- Silence Detected
- Automatic channel under Threshold
- Any channel over threshold
- Loss of Reference clock
- Bitstream Error

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Each Alert includes an "On Delay" control and an "Off Delay" control, which allow some hysteresis to be built into the Alert.

A threshold adjustment is also included with each Alert for audio level and loudness based triggers.

A single control to set the integration time for all loudness based alerts is provided via the "Alert Loud Type" parameter.

The status of the Alerts may be monitored on the MT2000's display as well. Please refer to MT2000 User Guide for further information regarding this functionality. The Alert Status display is at the top of the Alert submenu.

Figure 3 - Alert Status Display

1.3.3. Loudness Logs

The MT2000 is capable of sending loudness measurement logs via SNMP trap messages. Each loudness measurement log includes readings for:

- Main loudness level
- Secondary Loudness Level
- Logging Loudness Level

To configure the settings of the loudness measurement log, navigate to:

Out/Meter Setup → Loudness Meter

The parameters that impact the loudness logs which may be configured are:

Main Loud Type
Sec Loud Type
Log Loud Type

These controls determine the integration time of the loudness measurement, or whether it is a Maximum True Peak measurement, or a Loudness Range (LRA) measurement.

The settings for Main Loud Type and Sec Loud Type will affect the loudness measurement shown on the MT2000's display as well.

Log Frequency:
This determines how often a loudness measurement trap message is sent.   The choices for this parameter are:
- No logging
- 1 sec
- 2 sec
- 3 sec
- 4 sec
- 5 sec
- 10 sec
- 15 sec
- 20 sec
- 30 sec
- 40 sec
- 50 sec
- 60 sec

Loudness Format:
This parameter determines if the loudness measurement results are presented in ITU format, which is used in ATSC A/85 based measurements, or following the EBU R128 format. This parameter also affects the loudness measurements shown on the MT2000's display.

Metering Type:
This controls whether the loudness measurements are calculated based on BS-1770-1, BS1770-1 with Dolby Dialogue Intelligence, Leq(A), Leq(A) with Dolby Dialogue Intelligence, BS1770-2, or BS1770-2 with Dolby Dialogue Intelligence. This parameter also affects the loudness measurements shown on the MT2000's display.

1.4. Monitoring SNMP Activity

1.4.1. SNMP Status Menu

Figure 4 - SNMP Activity Status Window

The SNMP Activity Status Window is located in the

System → Statistics

menu.

It will display information regarding the number of packets transmitted, received, and the number of traps sent

To reset the count, press the encoder to the right.

> *Note!*
>
> The SNMP status screen will be displayed whether or not SNMP is enabled. The MT2000 will respond to SNMP gets and/or send traps only if the SNMP option is enabled.

Chapter 2: Option Key Installation

2.1. Overview

Optional features for the MT2000 may easily be enabled in the field. This section provides instructions to perform the upgrade.

The license key will be supplied as a file with a *.opt file extension. The file name will include the serial number of the unit it is intended for, and the serial number will start with a "73-". This file must be placed onto a USB thumb drive for transfer into the MT2000 device.

> ### *Note!*
>
> When ordering an option key, the MT2000's serial number and MAC address must be provided to Linear Acoustic.

Occasionally, a software update may be required to support the desired functionality being added with an option. If this is necessary, it is recommended to install the new software before installing the option key.

2.2. Requirements

The following items are required in order to install an option key into a MT2000:

License Key

This will be provided as a file with a *.opt file extension. The file name will include the serial number of the unit it is intended for.

Software Upgrade Package (if updated software is required to support the option).

This will be provided as a file with a .pkg file extension.   The file will be named 1601-00547-xxx-MT2000-a.b.cc.pkg where "a.b.cc" is the package version number.

USB Thumb Drive

A USB Thumb Drive is required drive to place the software package onto for transfer to the MT2000 unit.

MT2000 unit and power supply

It is strongly recommended that the Option Key install, as well as the Software Update process, be performed with the MT2000 connected to an AC Mains power source.

2.3. Installation Procedure

To install the option key into the MT2000:

1. Copy the option file to the root folder (top-level folder) of a USB thumb drive.

2. Power up the MT2000 unit.

3. After the MT2000 displays its starting screen, insert the USB thumb drive.

4. Navigate to **System → Maintenance → Device Options File Load**.

    The MT2000 should find the option key file, which includes the MT2000's serial number (starting in "73-") in the filename.

    If the filename is not displayed, remove the USB thumb drive and reinsert it. After a few seconds the file name should be displayed.

5. Turn the rotary encoder to show "Action: *Load" in the bottom line of the display.

Figure 6 - Device Options File Load 2

6. Press the joystick to the Right to start the key install process.

> *Note!*
>
> It is strongly recommended that the Option Key install, as well as the Software Update process, be performed with the MT2000 connected to an AC Mains power source.

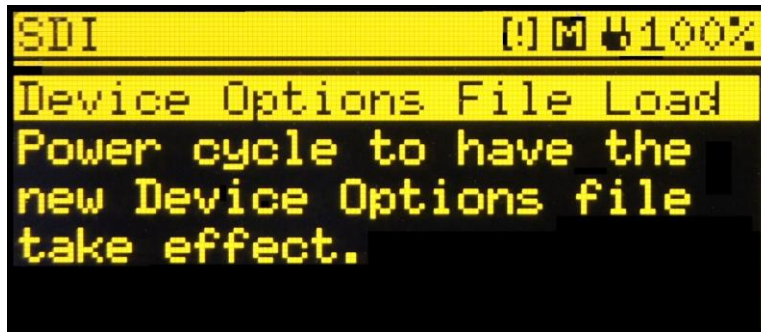7. When prompted, remove the USB thumb drive and power cycle the MT2000

Figure 7 - Instruction to Power Cycle

2.4. Verification of Key Installation

To verify the installation of the option key, navigate to:

System → Statistics

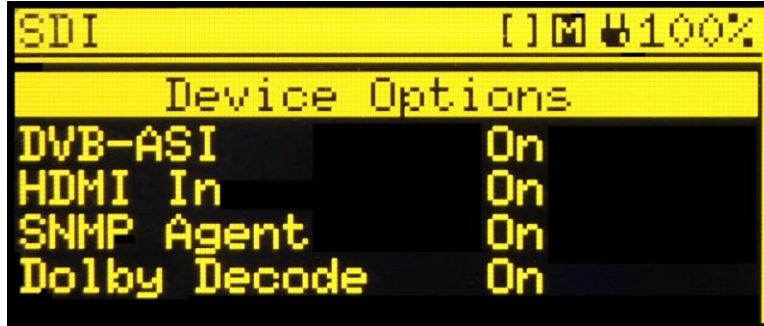Click down until the Device Options Status field is displayed

Figure 8 - MT2000 Installed Option Display

If necessary, rotate the encoder to view the status of the option desired.

Chapter 3: MIB

3.1. MIB File

The MT2000's MIB is listed below. The MIB file is available electronically on the USB thumb drive provided with the MT2000, as well as from the Linear Acoustic website (www.linearacoustic.com). Please contact your Linear Acoustic support or your representative if you need the MIB file.

3.1.1. MIB Description

```
LINEAR-ACOUSTIC-MT2000-MIB DEFINITIONS ::= BEGIN

-- MIB for Linear Acoustic mt2000 devices

IMPORTS
        enterprises                         FROM RFC1155-SMI
        TRAP-TYPE                            FROM RFC-1215
        OBJECT-TYPE                          FROM RFC-1212;

linearAcoustic   OBJECT IDENTIFIER ::= { enterprises 28660 }
mt2000           OBJECT IDENTIFIER ::= { linearAcoustic 2222 }
mt2000-system    OBJECT IDENTIFIER ::= { mt2000 1 }
mt2000-status    OBJECT IDENTIFIER ::= { mt2000 2 }

--
--  mt2000-system
--

-- model
la-model           OBJECT-TYPE
    SYNTAX      OCTET STRING (SIZE (0..40))
    ACCESS      read-only
    STATUS      mandatory
    DESCRIPTION
      "Linear Acoustic Model."
    ::= { mt2000-system 1 }

-- software version
software-version OBJECT-TYPE
    SYNTAX      OCTET STRING (SIZE (0..40))
    ACCESS      read-only
    STATUS      optional
    DESCRIPTION
      "Device's software version."
    ::= { mt2000-system 2 }
```

```
-- firmware version
firmware-version OBJECT-TYPE
    SYNTAX      OCTET STRING (SIZE (0..40))
    ACCESS      read-only
    STATUS      optional
    DESCRIPTION
      "Devices's firmware version."
    ::= { mt2000-system 3 }


-- package version
package-version OBJECT-TYPE
    SYNTAX      OCTET STRING (SIZE (0..100))
    ACCESS      read-only
    STATUS      optional
    DESCRIPTION
      "Devices's package version."
    ::= { mt2000-system 4 }


--
-- mt2000-status
--

-- Power Source
power-source  OBJECT-TYPE
    SYNTAX      INTEGER {line (1), battery (2)}
    ACCESS      read-only
    STATUS      mandatory
    DESCRIPTION
      "Power source."
    DEFVAL { 1 }
    ::= { mt2000-status 1 }

-- Battery Low
battery-low  OBJECT-TYPE
    SYNTAX      INTEGER {no (1), yes (2)}
    ACCESS      read-only
    STATUS      optional
    DESCRIPTION
      "Battery low status."
    DEFVAL { 1 }
    ::= { mt2000-status 2 }

-- System Reference
system-reference OBJECT-TYPE
    SYNTAX      INTEGER {absent (1), present (2)}
    ACCESS      read-only
    STATUS      optional
    DESCRIPTION
      "Status of System Reference."
    DEFVAL { 1 }
    ::= { mt2000-status 3 }

-- Audio Detected (Primary)
pri-audio-detected  OBJECT-TYPE
```

16

```
    SYNTAX      INTEGER {no (1), yes (2)}
    ACCESS      read-only
    STATUS      optional
    DESCRIPTION
      "Detection of Primary Audio Signal."
    DEFVAL { 1 }
    ::= { mt2000-status 4 }

-- Alert1 Current State
alert1-status  OBJECT-TYPE
    SYNTAX      INTEGER {off (1), on (2)}
    ACCESS      read-only
    STATUS      optional
    DESCRIPTION
      "Status of Alert1."
    DEFVAL { 1 }
    ::= { mt2000-status 5 }

-- Alert2 Current State
alert2-status  OBJECT-TYPE
    SYNTAX      INTEGER {off (1), on (2)}
    ACCESS      read-only
    STATUS      optional
    DESCRIPTION
      "Status of Alert2."
    DEFVAL { 1 }
    ::= { mt2000-status 6 }

-- Alert3 Current State
alert3-status  OBJECT-TYPE
    SYNTAX      INTEGER {off (1), on (2)}
    ACCESS      read-only
    STATUS      optional
    DESCRIPTION
      "Status of Alert3."
    DEFVAL { 1 }
    ::= { mt2000-status 7 }

-- Alert4 Current State
alert4-status  OBJECT-TYPE
    SYNTAX      INTEGER {off (1), on (2)}
    ACCESS      read-only
    STATUS      optional
    DESCRIPTION
      "Status of Alert4."
    DEFVAL { 1 }
    ::= { mt2000-status 8 }

-- Alert1 On Current Assignment
alert1-on-assignment  OBJECT-TYPE
    SYNTAX      OCTET STRING (SIZE (0..100))
    ACCESS      read-only
    STATUS      optional
    DESCRIPTION
```

```
          "Assignment of Alert1 when ON."
        ::= { mt2000-status 9 }


-- Alert1 Off Current Assignment
alert1-off-assignment  OBJECT-TYPE
      SYNTAX       OCTET STRING (SIZE (0..100))
      ACCESS       read-only
      STATUS       optional
      DESCRIPTION
        "Assignment of Alert1 when OFF."
        ::= { mt2000-status 10 }


-- Alert2 On Current Assignment
alert2-on-assignment  OBJECT-TYPE
      SYNTAX       OCTET STRING (SIZE (0..100))
      ACCESS       read-only
      STATUS       optional
      DESCRIPTION
        "Assignment of Alert2 when ON."
        ::= { mt2000-status 11 }


-- Alert2 Off Current Assignment
alert2-off-assignment  OBJECT-TYPE
      SYNTAX       OCTET STRING (SIZE (0..100))
      ACCESS       read-only
      STATUS       optional
      DESCRIPTION
        "Assignment of Alert2 when OFF."
        ::= { mt2000-status 12 }


-- Alert3 On Current Assignment
alert3-on-assignment  OBJECT-TYPE
      SYNTAX       OCTET STRING (SIZE (0..100))
      ACCESS       read-only
      STATUS       optional
      DESCRIPTION
        "Assignment of Alert3 when ON."
        ::= { mt2000-status 13 }


-- Alert3 Off Current Assignment
alert3-off-assignment  OBJECT-TYPE
      SYNTAX       OCTET STRING (SIZE (0..100))
      ACCESS       read-only
      STATUS       optional
      DESCRIPTION
        "Assignment of Alert3 when OFF."
        ::= { mt2000-status 14 }


-- Alert4 On Current Assignment
alert4-on-assignment  OBJECT-TYPE
      SYNTAX       OCTET STRING (SIZE (0..100))
      ACCESS       read-only
      STATUS       optional
      DESCRIPTION
```

```
        "Assignment of Alert4 when ON."
    ::= { mt2000-status 15 }


-- Alert4 Off Current Assignment
alert4-off-assignment  OBJECT-TYPE
    SYNTAX      OCTET STRING (SIZE (0..100))
    ACCESS      read-only
    STATUS      optional
    DESCRIPTION
      "Assignment of Alert4 when OFF."
    ::= { mt2000-status 16 }


-- Encoder/Decoder
codec           OBJECT-TYPE
    SYNTAX      INTEGER {error (1), ok (2)}
    ACCESS      read-only
    STATUS      optional
    DESCRIPTION
      "Status of Encoder/Decoder module."
    DEFVAL { 1 }
    ::= { mt2000-status 17 }


-- Loudness Log record
loudness-log-rec OBJECT-TYPE
    SYNTAX      OCTET STRING (SIZE (0..255))
    ACCESS      read-only
    STATUS      optional
    DESCRIPTION
      "Loudness Log record."
    ::= { mt2000-status 18 }


-- Loudness Log Frequency
loudness-log-freq OBJECT-TYPE
    SYNTAX      INTEGER (0..60)
    ACCESS      read-only
    STATUS      optional
    DESCRIPTION
      "Loudness Log Frequency in seconds.  Zero indicates No
Logging."
    DEFVAL { 0 }
    ::= { mt2000-status 19 }


--
--  traps
--


-- 12/07/2012 RDC
-- Linear Acoustic rules for enterprise-specific traps
-- 1. Use trap numbers from 10 to 127.
--    This makes them different from generic traps (0 - 5) and
--    lets them fit into a consistent and small space in BER TLV
packet.
-- 2. Use VARIABLES sparingly to keep the overall BER packet
--    size small and processing down.
```

```
-- Using Battery Power
trap-using-battery-power TRAP-TYPE
    ENTERPRISE  mt2000
    DESCRIPTION
      "Trap, Using Battery Power."
    ::= 10


-- Battery Low
trap-battery-low TRAP-TYPE
    ENTERPRISE  mt2000
    DESCRIPTION
      "Trap, Battery is low."
    ::= 11


-- Audio Loss (Primary)
trap-pri-audio-loss       TRAP-TYPE
    ENTERPRISE  mt2000
    DESCRIPTION
      "Trap, Primary Audio lost or not detected."
    ::= 12


-- Audio Detected (Primary)
trap-pri-audio-detected   TRAP-TYPE
    ENTERPRISE  mt2000
    DESCRIPTION
      "Trap, Primary Audio detected."
    ::= 13


-- Alert1 Turned On
trap-alert1-on    TRAP-TYPE
    ENTERPRISE  mt2000
    VARIABLES   {alert1-on-assignment}
    DESCRIPTION
        "Trap, Alert1 On"
    ::= 14


-- Alert1 Turned Off
trap-alert1-off    TRAP-TYPE
    ENTERPRISE  mt2000
    VARIABLES   {alert1-off-assignment}
    DESCRIPTION
        "Trap, Alert1 Off"
    ::= 15


-- Alert2 Turned On
trap-alert2-on    TRAP-TYPE
    ENTERPRISE  mt2000
    VARIABLES   {alert2-on-assignment}
    DESCRIPTION
        "Trap, Alert2 On"
    ::= 16


-- Alert2 Turned Off
```

```
trap-alert2-off    TRAP-TYPE
    ENTERPRISE  mt2000
    VARIABLES   {alert2-off-assignment}
    DESCRIPTION
        "Trap, Alert2 Off"
    ::= 17

-- Alert3 Turned On
trap-alert3-on    TRAP-TYPE
    ENTERPRISE  mt2000
    VARIABLES   {alert3-on-assignment}
    DESCRIPTION
        "Trap, Alert3 On"
    ::= 18

-- Alert3 Turned Off
trap-alert3-off    TRAP-TYPE
    ENTERPRISE  mt2000
    VARIABLES   {alert3-off-assignment}
    DESCRIPTION
        "Trap, Alert3 Off"
    ::= 19

-- Alert4 Turned On
trap-alert4-on    TRAP-TYPE
    ENTERPRISE  mt2000
    VARIABLES   {alert4-on-assignment}
    DESCRIPTION
        "Trap, Alert4 On"
    ::= 20

-- Alert4 Turned Off
trap-alert4-off    TRAP-TYPE
    ENTERPRISE  mt2000
    VARIABLES   {alert4-off-assignment}
    DESCRIPTION
        "Trap, Alert4 Off"
    ::= 21

-- Codec Failed
trap-codec-failed    TRAP-TYPE
    ENTERPRISE  mt2000
    DESCRIPTION
      "Trap, Encoder/Decoder failed or not detected."
    ::= 22

-- Codec Detected
trap-codec-detected  TRAP-TYPE
    ENTERPRISE  mt2000
    DESCRIPTION
      "Trap, Encoder/Decoder detected."
    ::= 23

-- Loudness Log record
```

```
trap-log-record    TRAP-TYPE
    ENTERPRISE  mt2000
    VARIABLES   {loudness-log-rec}
    DESCRIPTION
      "Trap, Loudness Log record."
    ::= 24

END
```