

# XAP TH2



## Telephone Interface



## Installation & Operation Manual

**Gentner**

Perfect Communication through Technology, Service, and Education.®

**XAP TH2 Telephone Interface Installation and Operation Manual**  
**Gentner Part No. 800-151-301**  
**Revision 1.1**

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# 1 Introduction

## Congratulations

Congratulations on purchasing the XAP TH2 telephone interface. The XAP TH2 is a single-line digital hybrid which uses digital signal processing (DSP) to separate the transmit and receive audio, eliminating distortion, weak signals, and feedback. It continually filters low and high frequency noise to provide pure sound.

The XAP TH2 is designed to function as a standalone telephone hybrid or as an accessory to the XAP 800 (echo cancelling, audio processing, microphone mixing matrix), enabling you to add remote callers to your audioconferences.

This manual explains how to install, configure, and operate the XAP TH2 in a step-by-step format.

## Technical Services

If you need any additional information on how to install, set up or operate your system, please contact us at one of the locations listed below. We welcome and encourage your comments so we can continue to improve our products and serve your needs.

### **Gentner Communications Corporation**

1825 Research Way, Salt Lake City, UT 84119

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**E-mail:** tech2@gentner.com

**Web site:** www.gentner.com

### **Sales and Customer Service**

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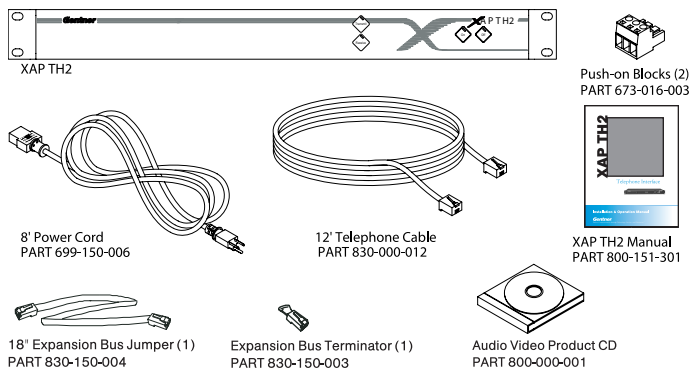
**E-mail:** sales@gentner.com

## Product Registration

Please register your XAP TH2 online by visiting Gentner Technical Support at **www.gentner.com**. When your product is properly registered, Gentner Communications is better able to serve you should you require technical assistance. Registration information is also used to notify you of upgrades and new product information.

## Unpacking

Ensure that the following items (See Figure 1, below) were received with your shipment:



**!** **Gentner Communications is not responsible for product damage incurred during shipment. You must make claims directly with the carrier. Inspect your shipment carefully for obvious signs of damage. If the shipment appears to be damaged, retain the original boxes and packing material for inspection by the carrier. Contact your carrier immediately.**

## Features

- Gentner's 100% digital signal processing (DSP) technology ensures crystal-clear audio with the deepest, most reliable hybrid null.
- Balanced line-level input and output
- Touch-tone dialing capability (40 character dial string)
- Full-time telco echo cancellation with 31 millisecond tail time
- Conference up to 16 callers (with 16 XAP TH2s) within a XAP 800 system
- Adjustable audible connect and disconnect tones
- Selectable caller automatic level control (ALC)
- Adjustable dial tone, DTMF attenuation
- Simultaneous two-wire/four-wire operation
- Continual adaptation to telephone line conditions
- Digital anti-alias filter to minimize hum and Central Office switching noise
- Compatible with analog telephone lines
- Program and operate with a connected PC or any other type of serial remote control device via Expansion Bus or RS-232 port

## Controls and Connections

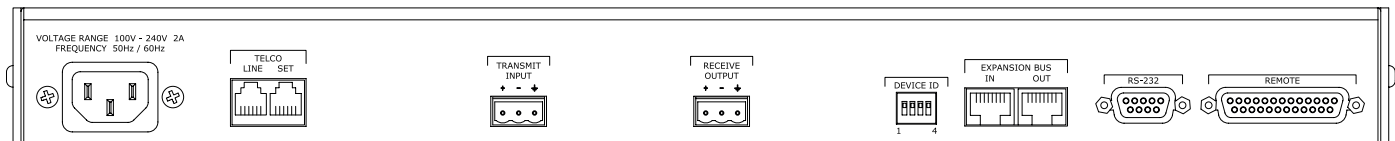


XAP TH2 front-panel controls

### Front View

The XAP TH2 front-panel controls perform the following functions:

1. **Transmit LED** This bicolored LED indicates the audio levels being transmitted from the room to the telephone line.
2. **Receive LED** This bicolored LED indicates the audio level the room is receiving from the telephone line.
3. **On LED** This bicolored LED indicates the hybrid's ON state. The LED will illuminate green when the hybrid is in the ON state.
4. **Off LED** This bicolored LED indicates the hybrid's OFF state. The LED will illuminate red when the hybrid is in the OFF state.
5. **On** The ON button connects the XAP TH2 to the telephone line and automatically adapts the hybrid to the line. Pressing and holding the ON button for more than a half-second while the hybrid is active will readapt the hybrid. When the hybrid is activated from the OFF to ON state, the XAP TH2 will send the updated status via the Expansion Bus.
6. **Off** The OFF switch disconnects the hybrid from the telephone line and mutes all audio.



XAP TH2 back-panel connectors

### Rear View

The XAP TH2 back-panel connectors perform the following functions:

1. **Power** The AC power cord input is a NEMA type connector allowing 100–240VAC, 50/60Hz.



2. **Telco Line** This RJ-11 connector provides connection of a standard analog telephone line to the hybrid.
3. **Telco Set** This RJ-11 connector allows connection to a standard telephone set. Tip and ring from the phone line are present at this connector when the hybrid is in its off state. Tip and ring from the phone line are not present at this point when the hybrid is in its on state.
4. **Transmit Input** This Phoenix connection provides a non-gated electronically balanced line level input. The nominal input level is 0 dBu. This line input is mutable. The default setting is off (not muted).
5. **Receive Output** This Phoenix connection provides a balanced line level output. The nominal output level is 0 dBu. The output adjusts for line imbalances and maintains a constant output level. This line output is mutable. The default setting is off (not muted).
6. **Device ID** This four-position DIP Switch is used to assign a device ID number to the XAP TH2. See page 9 for more details.
7. **Expansion Bus In, Out** This RJ-45 connector is used to connect the XAP TH2 to the XAP 800 for control. G-Ware is capable of accessing and controlling an Expansion Bus local area network (LAN) of up to eight XAP 800/PSR1212 units and 16 XAP TH2 units, where the total number of microphone inputs does not exceed 64. The Expansion Bus supports a distance of up to 80 feet between each connected XAP 800 or PSR1212.
8. **RS-232** This female DB9 serial port is for interconnection between the XAP TH2 and a PC, modem, or other custom remote controller. For serial protocol, see 29.
9. **Remote** This DB25 connector provides control and status of the XAP TH2 and unbalanced audio. See Appendix B for pinouts.

## Before You Install



**Warning: The country code must be set correctly in G-Ware to ensure that the unit operates properly when connected to the telco network and complies with the country's telco requirements. Changing this code to a country other than the intended country of operation might cause the XAP TH2 to be non-compliant.**

### Power Requirements

The XAP TH2 automatically accommodates voltage requirements of 100–240VAC, 50/60Hz, 15W.

### Telephone Line Requirements

The XAP TH2 model operates on a standard analog telephone line and connects to the telephone system with a standard RJ-11C modular jack. If you do not have an RJ-11C jack where you want to install your XAP TH2, call your telephone company for installation.

The XAP TH2 can be configured to meet compliance requirements of different countries via the G-Ware software. See page 12.

### Equipment Placement

The XAP TH2 models are designed for installation in a standard 19-inch equipment rack. You can also purchase side panels for desktop placement.

### Network Requirements

The Expansion Bus (RS-485 LAN) lets you connect up to eight XAP 800s and 16 XAP TH2 units, where the total number of microphone inputs does not exceed 64. The maximum distance between interconnected XAP 800 or PSR1212 units is 80 feet (24 meters). Gentner recommends that category five twisted-pair (10BaseT LAN) cable be used.

### Environmental Requirements

The XAP TH2 can be safely operated in a room with varying temperatures between 32 °F (0 °C) and 110 °F (43 °C).

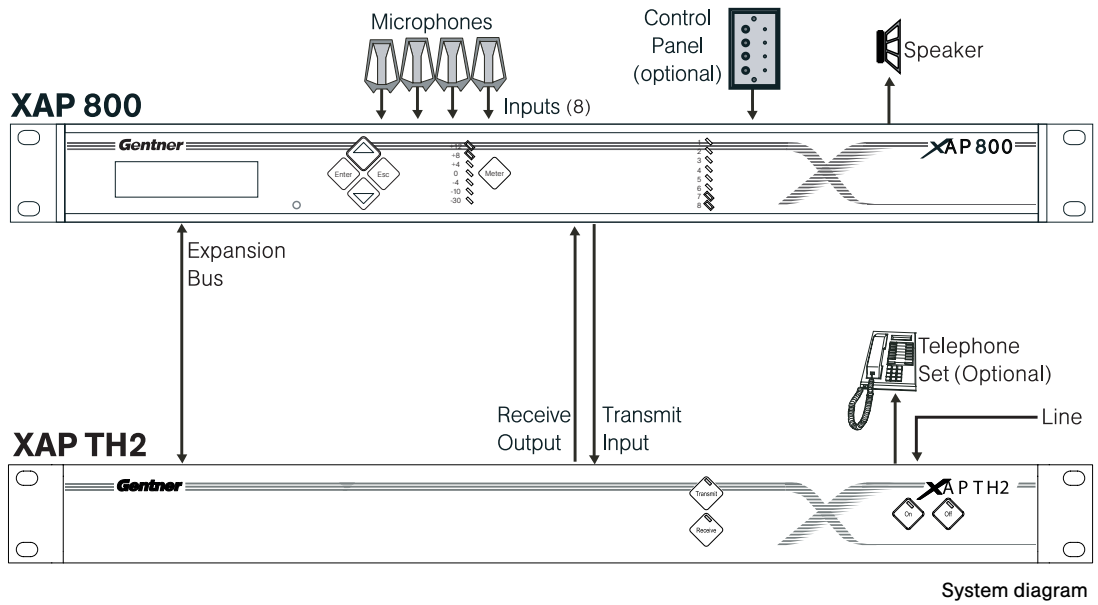
# 2 Installation

## Overview

The XAP TH2 is designed for easy installation and setup. All connections are made through rear-panel connectors. This section provides instructions on installing the units in the rack and making initial connections, assigning device ID numbers, and creating an Expansion Bus (E-Bus) network.

The diagram below illustrates the typical connections that are made when adding a XAP TH2 to a XAP 800.

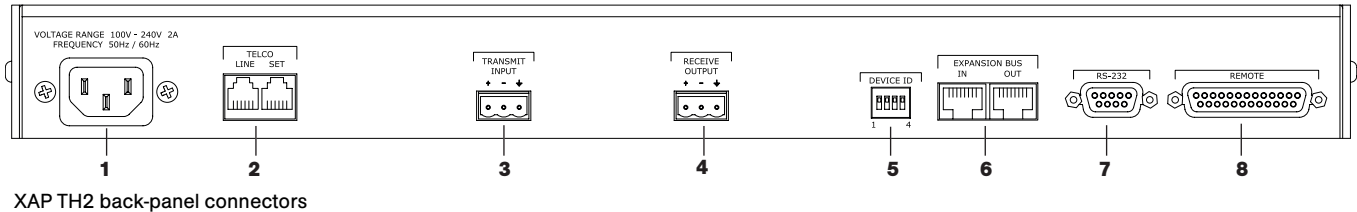
### Typical Installation in XAP 800 System



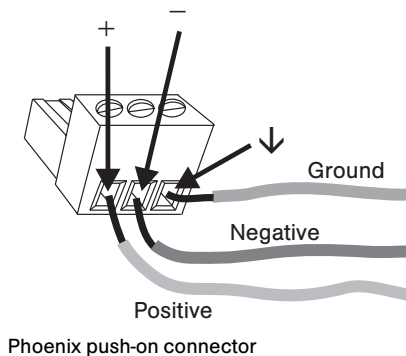
## Hardware Setup

### Connect the Unit

Refer to XAP TH2 back-panel drawing below. Each connector is numbered for easy identification.



**The three terminals in the Phoenix connector correspond with the back-panel audio contacts (from left to right): +(positive), -(negative), and ↓(ground).**



1. Place the unit in the rack and attach it securely. XAP TH2 models are designed for installation in a standard 19-inch equipment rack.
2. Connect your telephone line from the wall jack to the RJ-11C Line jack [2].
3. Plug your telephone set into the RJ-11C Set jack [2].
4. If you are using a custom controller for control and hybrid status, plug it into the DB25 Remote connector [8].

If you are using an external RS-232 controller, connect it to the RS-232 port [7].

5. Wire the XAP TH2 to the XAP 800 using the provided three-terminal Phoenix push-on connectors. These connectors are designed for easy wiring; simply insert the desired wire into the appropriate connector opening and tighten down the top screw.

- **Transmit Input** Audio connected to the Transmit Input [3] will be sent down the telephone line.
- **Receive Output** Audio from the telephone participant is passed to Receive Output [4].

## Assign Device ID Numbers

Before creating an Expansion Bus network, you need to set up unique Expansion Bus Device ID numbers for each XAP TH2 on the network. There are 16 Expansion Bus network device locations that can be selected (0-F). As shipped from the factory, all XAP TH2 units default as binary address 0.

Set Device ID numbers for each XAP TH2 unit at your site by manipulating rear-panel DIP switches 1–4 [5], selecting/deselecting each switch to set up address 0–15 in binary code. The table below illustrates DIP switch settings. DIP switch changes are only read when the unit is powered up so you will need to power cycle the unit to have the changes recognized.

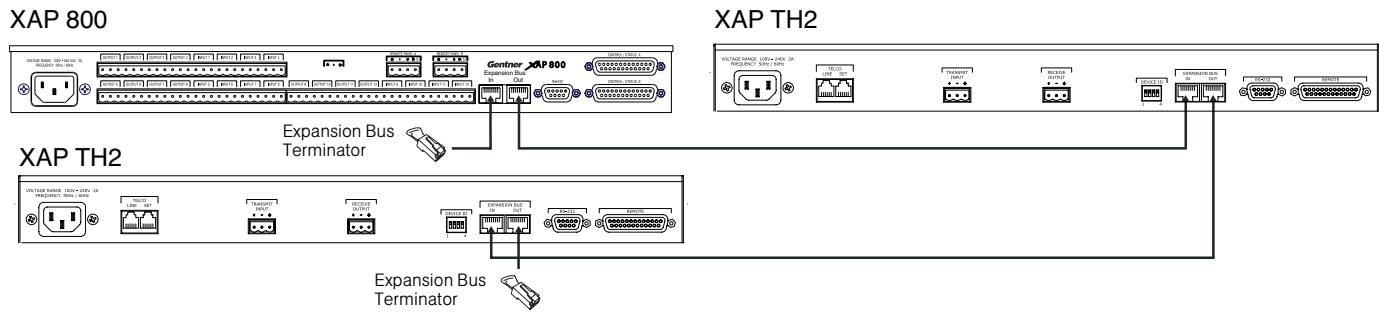


**If more than one XAP TH2 is assigned the same device ID number, the Transmit and Receive LEDs will flash red and green on the affected units until the error is corrected.**

### Device ID DIP Switch Settings

| Binary Address | DIP Switch 1 Position | DIP Switch 2 Position | DIP Switch 3 Position | DIP Switch 4 Position |
|----------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 0 (default)    | 0 (UP)                | 0 (UP)                | 0 (UP)                | 0 (UP)                |
| 1              | 0 (UP)                | 0 (UP)                | 0 (UP)                | 1 (DOWN)              |
| 2              | 0 (UP)                | 0 (UP)                | 1 (DOWN)              | 0 (UP)                |
| 3              | 0 (UP)                | 0 (UP)                | 1 (DOWN)              | 1 (DOWN)              |
| 4              | 0 (UP)                | 1 (DOWN)              | 0 (UP)                | 0 (UP)                |
| 5              | 0 (UP)                | 1 (DOWN)              | 0 (UP)                | 1 (DOWN)              |
| 6              | 0 (UP)                | 1 (DOWN)              | 1 (DOWN)              | 0 (UP)                |
| 7              | 0 (UP)                | 1 (DOWN)              | 1 (DOWN)              | 1 (DOWN)              |
| 8              | 1 (DOWN)              | 0 (UP)                | 0 (UP)                | 0 (UP)                |
| 9              | 1 (DOWN)              | 0 (UP)                | 0 (UP)                | 1 (DOWN)              |
| 10 (A)         | 1 (DOWN)              | 0 (UP)                | 1 (DOWN)              | 0 (UP)                |
| 11 (B)         | 1 (DOWN)              | 0 (UP)                | 1 (DOWN)              | 1 (DOWN)              |
| 12 (C)         | 1 (DOWN)              | 1 (DOWN)              | 0 (UP)                | 0 (UP)                |
| 13 (D)         | 1 (DOWN)              | 1 (DOWN)              | 0 (UP)                | 1 (DOWN)              |
| 14 (E)         | 1 (DOWN)              | 1 (DOWN)              | 1 (DOWN)              | 0 (UP)                |
| 15 (F)         | 1 (DOWN)              | 1 (DOWN)              | 1 (DOWN)              | 1 (DOWN)              |

## Create an Expansion Bus Network



**If networked XAP 800s and TH2s are stacked vertically, connect them using the short RJ-45 jumper. When networking between long distances, use category five twisted-pair (10BaseT LAN) cable. The maximum cable run between XAP 800 and PSR1212 units is 80 feet (24 meters).**

1. Place the XAP TH2 unit in the rack. The back-panel Expansion Bus In and Expansion Bus Out connectors are designed for setting up your Expansion Bus network. Connections between units are made in daisy-chain fashion using category five twisted-pair cable.
2. The first XAP unit in the chain must have the Expansion Bus In connector terminated with an Expansion Bus terminator (provided).
3. The first XAP unit's Expansion Bus Out connector is then attached to the Expansion Bus In connector on the next unit in the chain. At the end of the network, the final unit must have the Expansion Bus Out connector terminated with an Expansion Bus terminator as well.

An Expansion Bus network will allow interconnection of up to 16 XAP TH2s and any combination of XAP 800s and PSR1212s where the number of microphone inputs does not exceed 64.

### Connecting Power

The power input [ 1 ] will operate at any level between 100–240VAC, 50–60Hz, 15W (typical). Plug in the XAP TH2 to complete the hardware installation.

# 3 Configuration

## Adding a XAP TH2

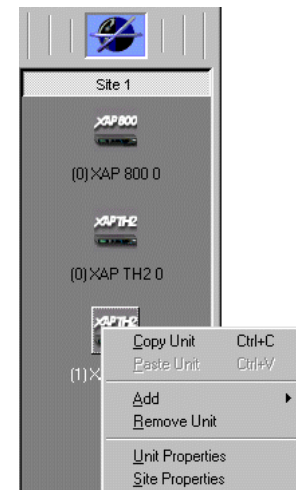
Gentner's G-Ware software provides an easy interface for configuring and controlling your XAP TH2. This chapter assumes you have already installed G-Ware and have created a site. If you need help installing G-Ware, creating a new site, or would like to see system requirements, consult the XAP 800 manual or help file.

### To Add XAP TH2 to a Site File

You can add XAP TH2(s) to your site file by connecting to your networked site and letting G-Ware automatically create icons for the detected units or you can work offline and manually add the unit(s) to the site file and connect to the site at later time.

1. Open G-Ware software from the Start menu, or by double-clicking the desktop icon, and select the site to which you will be adding the XAP TH2.
2. Click the **Connect** button on the G-Ware taskbar or select **Connect** from the Connect Menu. Choose to sync to **Unit(s)**. G-Ware will automatically create icons for any new units it detects on the network and place them in the Site pane. Right-click the unit icon and select Unit Properties.

If you are working offline, click the **Add** button on the G-Ware toolbar and select **XAP TH2**. The XAP TH2 Unit Properties window will open.

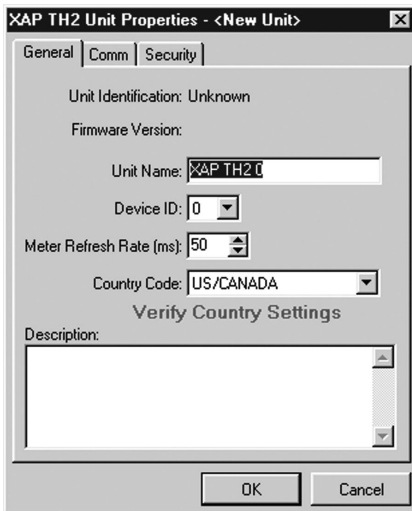


Unit Icons in Site Pane with Unit Menu Showing

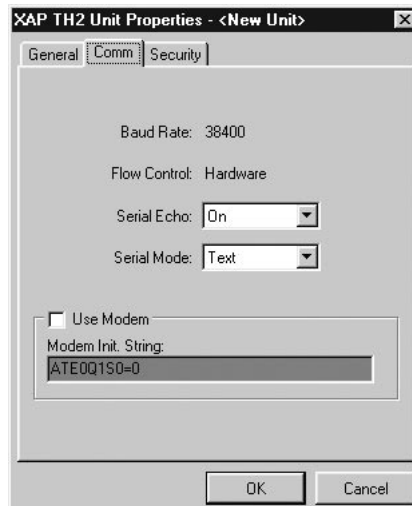


**When connecting to your site, you can choose to sync to Unit(s) or Document.**

**If you sync to the Unit(s), you will update your G-Ware site file with the current state of the unit(s). If you sync to the Document, you will update your units with the settings you have saved in the site file.**



Unit Properties Window, General Tab



Unit Properties Window, Comm Tab



Unit Properties Window, Security Tab

## To Configure Unit Properties

1. Type a descriptive **Unit Name** in the space provided. The **Unit Identification** and **Firmware Version** will be supplied by the unit when a connection is made.
2. If you have already establish a connection with the site, the Device ID will be assigned. If you are working offline, select the **Device ID** that matches the ID you assigned the unit via the back-panel DIP switches. Device IDs ensure the software will sync up with the proper unit when there are multiple TH2s on a network.
3. Adjust the **Meter Refresh** rate as necessary. The default rate is 50.
4. Select the country where this product is being used from the **Country Code** list.

**Warning: The country code must be set correctly to ensure that the unit operates properly when connected to the telco network and complies with the country's telco requirements. Changing this code to a country other than the intended country of operation might cause the XAP TH2 to be non-compliant.**

5. Click the **Comm tab** to select the **Serial Echo** and **Serial Mode** you want to use.

Serial Echo enables the unit to echo back the commands you send over the E-Bus network. Serial Mode determines the format (binary or text) in which the commands return over the E-Bus network. The default setting when G-Ware is connected to a unit is binary. When the unit is disconnected, the default is text.

6. Select **Use Modem** if a modem will be used with the unit.
7. Click the **Security tab** to enter a **Modem Password**. This password will be required for all connections made to the RS-232 port whether it be modem, direct connection to PC, or AMX touch panel.
8. Click **OK** to save settings and close the Unit Properties window.

You will need to repeat this process for all XAP TH2 units on your network.



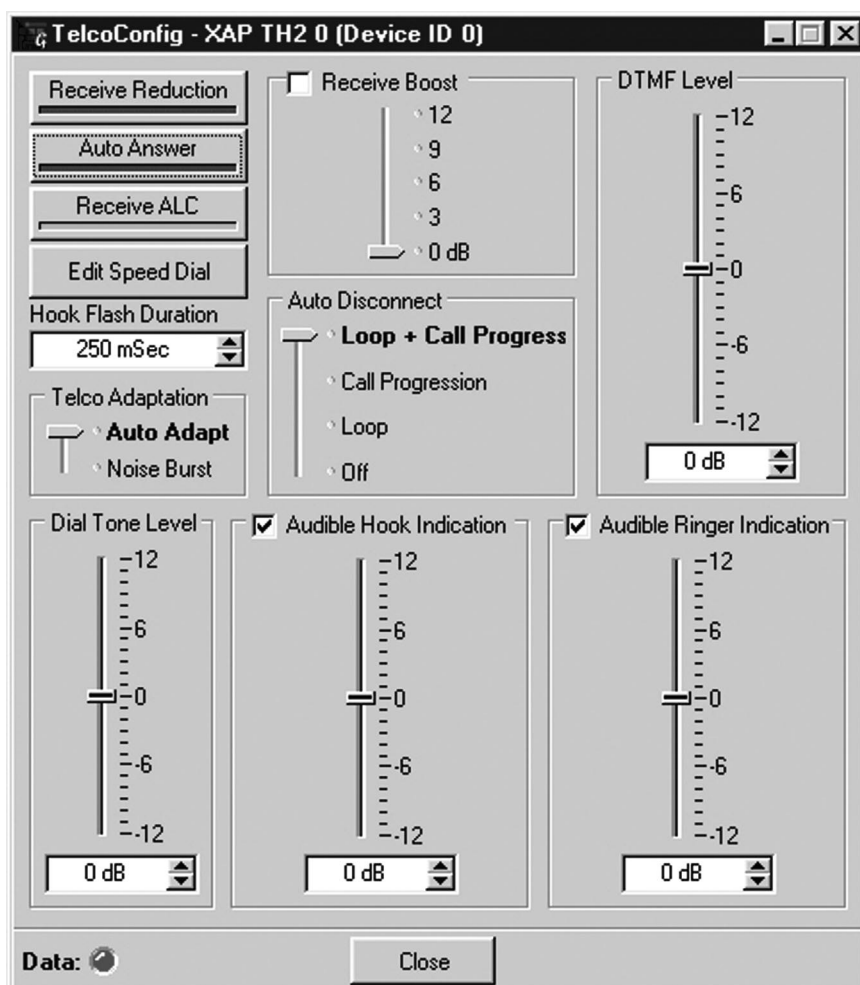
## Configuring the XAP TH2

### XAP TH2 Flow Screen

The XAP TH2 Flow Screen shows a detailed block diagram of the audio path in relation to the TH2. There are four buttons on the Flow Screen: Telco, Telco Config, Telco Meters, and GPIO builder. The Flow Screen is displayed for the selected unit in the site panel on the left of the G-Ware screen.

### To Configure the XAP TH2

1. Click the Telco Config button on the XAP TH2 Flow Screen.
2. The Telco Configuration window opens. Refer to the table on the opposite page for a description of configurable settings.
3. Click **Close** when you have finished making changes to save the settings and close the window.



Telco Configuration Window for XAP TH2

| Feature                             | Description  |
|-------------------------------------|--|
| <b>Receive Reduction</b>            | This feature lowers receive audio coming in through the telephone line when transmit audio is present. This feature is typically used in applications where the transmit party needs control of the conversation. When activated, the receive audio is ducked by 6dB. Receive Reduction can be turned on or off. The default is off.   |
| <b>Auto Answer</b>                  | The XAP TH2 can be programmed to answer after one complete valid ring has been detected. The unit connects to the line automatically in the same manner it would connect if the you issued a connect command. Auto Answer can be turned on or off. The default is off.   |
| <b>Receive ALC</b>                  | Automatic Level Control (ALC) may be selected on the telco input. This feature is designed to keep soft and loud telephone participants at a consistent level. The parameters of ALC are not user adjustable. ALC can be turned on or off. The default setting is on.  |
| <b>Edit Speed Dial</b>              | The XAP TH2 supports 10 speed dial numbers. Each number can be 40 digits long and can have a 20 character label associated with it. These numbers and labels are stored in non-volatile memory and the number can be called by a single command. Any valid touch-tone digit and the pause character (comma) may be stored. All speed dial numbers are empty except for number 9 which is programmed with Gentner's technical support number 10 which is programmed with the conference calling services number.  |
| <b>Hook Flash Duration</b>          | Hook Flash is supported by a single command. When the command is received, the unit will execute a flash for the duration programmed. Variable length Hook Flash is programmable on the unit. The on/off time is programmable from 50msec to 2 seconds in 10msec steps. The default is 250msec.  |
| <b>Telco Adaptation</b>             | In some applications, it may be desirable to adapt the hybrid with a white-noise burst rather than allowing the hybrid to adapt automatically to line conditions. This feature allows you to choose between Noise Burst and Auto Adapt. The default is Auto Adapt.   |
| <b>Receive Boost</b>                | The Receive Boost adds 6dB of gain to the receive signal delivered from the phone line. This is typically used for low-level telephone lines allowing the signal to be boosted into a range where the hybrid can perform at an adequate level of acceptance. The Receive Boost can be turned on or off. The default is off. This feature is setup during the initial configuration and is not used to adjust level from call to call.  |
| <b>Auto Disconnect</b>              | The XAP TH2 supports automatic disconnection of calls either from loop drop or from call progress tone detection. Auto Disconnect can be turned on (Loop + Call Progression, Call Progression, Loop) or off. The default is Loop which is on.  |
| <b>Loop Drop + Call Progression</b> | If either a call progress tone or loop drop/reversal is detected, the unit will perform a normal disconnect.   |
| <b>Call Progression</b>             | If a call progress tone is detected, the unit will perform a normal disconnect.  |
| <b>Loop</b>                         | When a valid loop drop or reversal is detected, the unit will perform a normal disconnect. This is the default state.  |
| <b>DTMF Level</b>                   | This feature allows you to adjust the DTMF tone level in relationship to the participant audio level in the room. The level can be adjusted in 1dB steps from a nominal level 0 (default) to plus or minus 12dB.   |
| <b>Dial Tone Level</b>              | This feature allows you to adjust the Dial Tone level in relationship to the participant audio level in the room. The level can be adjusted in 1dB steps from a nominal level 0 (default) to plus or minus 12dB.   |
| <b>Audible Hook Indication</b>      | When the unit goes off hook (connects) a beep is injected into the receive channel and transmit channel of the unit. When the unit goes on hook (disconnects), a series of 2 beeps is injected into the receive channel to indicate that the call has been dropped. This indicator can be turned on and off by selecting and deselecting the checkbox. The default is on. The level adjustment allows you to customize the level in relationship to the participant audio level in the room. the level can be adjusted in 1dB steps from a nominal level 0 (default) to plus or minus 12dB.                      |
| <b>Audible Ring</b>                 | In the On mode, when a valid ring is detected the front panel LED flashes, a serial command is transmitted, and an audible ring is heard from the receive channel. In the Off mode, the front panel LED flashes and a serial command is transmitted, however, no ring tone is generated. This indicator can be turned on and off by selecting and deselecting the checkbox. The default is on. The level adjustment allows you to customize the level in relationship to the participant audio level in the room. the level can be adjusted in 1dB steps from a nominal level 0 (default) to plus or minus 12dB. |

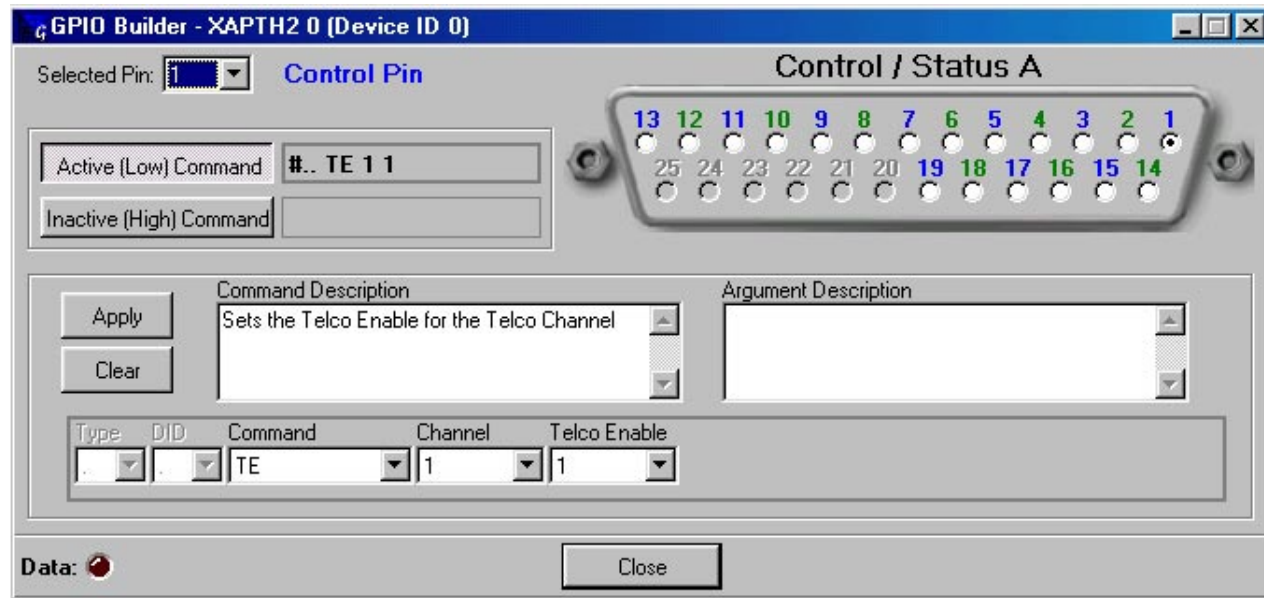
## Creating Custom Control

### To Use GPIO Builder

GPIO, or general purpose input/output, allows you to establish pin assignments for the XAP TH2's Control/Status Port. These pins provide control via contact closure and status via open collector functions in the unit.



1. Open the GPIO Builder by clicking the GPIO Builder button on the Flow Screen.



GPIO Builder in G-Ware

Note that odd-numbered pins (blue) are control pins, and that even-numbered pins (green) are status pins. Pins 20-25 are not user-definable.

2. Select the Control/Status pin you want to program.
3. Select the command state to change—Active (Low)/Inactive (High).
4. To make changes to the command string, select the desired parameters from the drop-down menus along the bottom of the window. For a list of commands and their descriptions, see the G-Ware Help File.



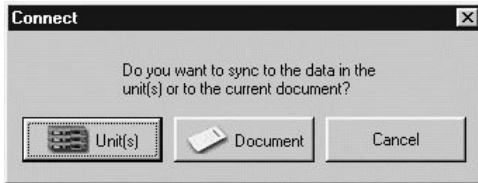
**The Active Command pane reflects the default command string for the pin selected.**

When you select a different command in the Command menu, the other drop-down menus change to reflect available parameters. The Command Description and Argument Description panes reflect command and argument information. You can modify this information as desired.

5. Click **Apply** to save changes or **Clear** to return to the default settings. To exit the window, click **Close**.

## Synchronize Site File to the XAP TH2

If you have created your site file offline, or have made changes to your site file, you will need to connect to your site and sync the units to the site file.



Connection Choices



**If you sync to the Unit(s), you will update your G-Ware site file with the state of the unit. If you sync to the Document, you will update your units with the configurations you have saved in the site file.**

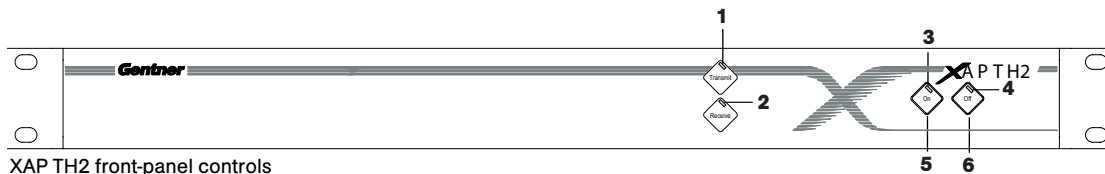
### To Sync Site File to the XAP TH2

1. Connect to your site or unit using one of the following methods:
  - Establish a direct serial connection from the RS-232 port on the XAP TH2 to the COM port on your PC
  - Establish a direct serial connection from you PC to the XAP 800 which is linked to the XAP TH2(s) via the E-Bus
2. Click the **Connect** button on the G-Ware toolbar or select **Connect** from the Connect menu. Choose to sync to Documents. This will update your units with the configurations you have made in the site file.

# 4 Operation

The XAP TH2 has four basic functions: make a call, answer a call, disconnect a call, and mute. This chapter explains how to perform these functions with the TH2 unit and a telephone handset (optional) and with the Dial interface in G-Ware. You can also use touch panels and custom control devices.

## Using the XAP TH2



XAP TH2 front-panel controls

### To Answer a Call

Depending on how you have configured your XAP TH2, an incoming call can ring on the telephone set connected to the XAP TH2, the receive output, and pass a serial ring to the control device. An incoming call will also cause the front panel ON LED [3] to flash. You can answer the call in one of two ways:

- Press the ON button [5] on either the front panel or from your remote control. This will route the call through the XAP TH2 to the XAP 800. The green ON LED [3] will light. The red OFF LED [4] will extinguish. Upon connection, the XAP TH2 automatically adjusts to the line conditions.
- Answer the call by picking up the telephone handset and talking to your party over the telephone.



If you have turned on Audible Ringer Indication (see page 13), you will hear a ringing sound from the receive channel when a call comes in.



If you have enabled auto-answer, the XAP TH2 will connect to the call after one ring.

### To Make and Disconnect a Call

1. Call the party using your handset.
2. After the other party has answered, route the call through the XAP TH2 by pressing the ON button [5]. The ON LED [3] will light and the XAP TH2 will take control of the call, disabling the telephone set. You may now safely hang up the handset without disconnecting your call.

If using an external controller, it is not necessary to press the ON button [5]. The DIAL serial port command automatically engages the XAP TH2. See Serial Commands, page 29.

3. When the conversation is complete, press the OFF button [6] to disconnect the call. You can also disconnect using an external controller. If the handset is off hook, audio will be routed to the telephone.

If your call is through the handset only (the red OFF LED [4] will be lit), hang up when the conversation is complete.

## Using the Dial Interface



### To Make and Disconnect a Call

1. Open the Dial Interface by clicking the Dial button on the Flow Screen.
2. Activate the telephone interface by clicking **Connect**.
3. When the green light above the Connect button illuminates, enter the number to be dialed, including any dial-out prefixes.
4. Click **Dial**.
5. When you are finished with the call, click **Disconnect** to end the call. If there is noise on the phone line during a call, you might need to click the Re-Null button to force the interface to readapt to the line. After the unit sends a noise burst down the line for adaptation, it automatically switches to auto adapt mode. The receive signal is muted during a noise burst.

### To Dial Multiple Numbers

Numbers can be dialed one at a time or a string can be dialed at one time (In-Block). When dialing multiple numbers, the maximum length of the string is 40 characters. A comma is interpreted as a two second pause. If a command to dial is issued while the unit is on hook, the unit will go off hook and dial the number.

**Connect LED.** This green LED illuminates when the dialing interface is active.

**Connect.** Click Connect to activate the dialing interface.

**Keypad Display.** Numbers dialed on the Dial keypad are displayed here.

**Disconnect LED.** This red LED illuminates when the dialing interface is inactive.

**Disconnect.** Click Disconnect to terminate a call.

**Dial Keypad.** This functions as a typical telephone keypad and displays the digits being dialed in the space above as you click on the numbers.

**In-Block Dialing.** Numbers typed on your computer keyboard are displayed here. You can dial one phone number at a time or a block of numbers.

**View Last #.** Displays the last number called.

**Edit.** Allows you to add/modify Speed Dial numbers.

**Hook Flash.** Sends a momentary interruption in the line seizure allowing options such as 3-way calling, call wating, and call hold. This feature is dependent on the services offered by your telephone company.

**Mute Receive LED.** Illuminates red when signal is muted.

**Mute Receive.** Mutes the Receive Output.

**Dial.** Dial activates when a number is entered in the In-Block Dialing field. Click it to Dial the number.

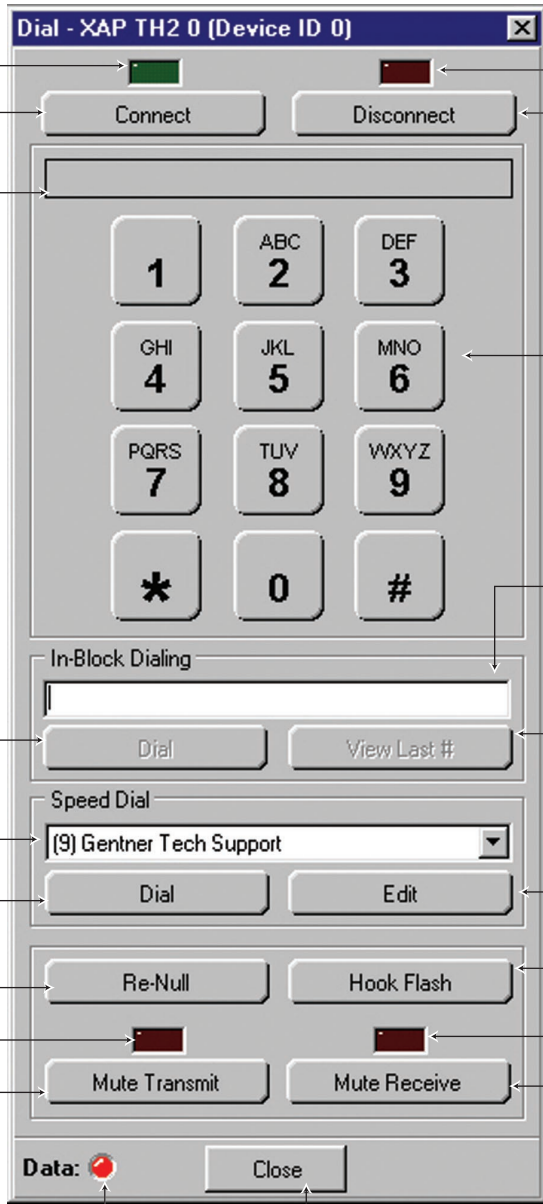
**Speed Dial.** Up to 10 numbers can be stored in Speed Dial.

**Dial.** Dials the selected Speed Dial number.

**Re-Null.** Sends a short noise burst down the telephone line and forces the XAP TH2 to adapt to the telephone line for maximum telephone echo cancellation.

**Mute Transmit LED.** Illuminates red when signal is muted.

**Mute Transmit.** Mutes the Transmit Input.



**Data LED.** Illuminates Green when connected to the unit.

**Close.** Exits the Dial Interface.

**To Mute**

Click **Mute Transmit** to mute the transmit audio (audio being sent to the telephone line). Click **Mute Receive** to mute the receive audio (audio being received from the telephone line).



## Controllers

### **Custom Control (DB25) Option**

A customer-supplied remote control or contact-closure switch can be programmed to perform functions such as: mute on/off, system on, and system off. For pinouts, see Connector Pinouts, page 27.

### **External Control System**

The XAP products are designed to function with external control systems. The controller is connected to the XAP 800 RS-232 port. Via the Expansion Bus network, all networked XAP products can be accessed and controlled from that single point. The controller can also be connected directly to the XAP TH2 RS-232 port.

Using an external controller, the XAP TH2 can be turned on or off; transmit and receive audio can be muted; DTMF tones can be generated (See Serial Commands, Page 29); the XAP TH2's binary address can be queried; telephone interface can be renulled; input and output can be metered and muted; and ERL and ERLE can be read. These commands are also available in the G-Ware software which can communicate with the XAP TH2 via the RS-232 serial port, the Expansion Bus network, or directly.

### **Touch-Tone Dialing**

Through the Expansion Bus (and serial commands), the XAP TH2's touch-tone (DTMF) dialing capability can be accessed. This allows outbound calls to be initiated by the XAP TH2 without requiring an external dialer or telephone set. This feature continues to function after connection, enabling the user to issue tones for voice mail/pager interaction. See Serial Commands on page 29.



# 5 Optimization

## Adjusting Levels

In order to optimize the audio levels, you will need to place a call on the XAP TH2. This will enable you to evaluate the levels for caller audio, audio being sent to the telephone, dial tone, DTMF tone, audible hook indication, and audible ring indication.

### Adjusting Receive Audio

To increase or decrease the caller audio level that is being sent to all sources (power amplifier, video codec, recording device, etc.), adjust the gain on the XAP 800 input channel that is connected to the XAP TH2 Receive Output. This will affect only the incoming caller audio. See the XAP 800 manual or G-Ware help file for detailed instructions.

### Receive Boost

If incoming caller audio is consistently low, activate the Receive Boost in the XAP TH2 Telco Config window. Using Receive Boost, you can increase the signal from the phone line in 3dB steps from 0 to 12dB. This setting is not used to correct variances in call audio from one call to the next.

### Receive ALC

If incoming caller audio has a mix of soft and loud talkers, activate Receive ALC in the Telco Config window. This feature helps keep telephone participants at a consistent level.

### Receive Reduction

If local audio needs to take priority over caller audio, activate Receive Reduction. This feature reduces audio from the caller by 6dB when local audio is present.



**When making adjustments to the receive and transmit audio level, refer to the TH2 Telco Meters window in G-Ware for a meter view of levels. See page 23 for more information.**

### **Adjusting Transmit Audio**

To increase or decrease audio being sent to the telephone line, adjust the output gain on the XAP 800 output channel that is connected to the XAP TH2 Transmit Input. This will affect only the audio being sent to the telephone on that channel. See the XAP 800 manual or G-Ware help file for detailed instructions.

### **Adjusting DTMF Level**

If the DTMF tones are too loud or too soft in relation to the caller audio, adjust DTMF Level in the Telco Config window. The level can be adjusted in 1dB steps from a nominal level 0 (default) to plus or minus 12dB.

### **Adjusting Dial Tone Level**

If the dial tone is too loud or too soft in relation to the caller audio, adjust Dial Tone Level in the Telco Config window. The level can be adjusted in 1dB steps from a nominal level 0 (default) to plus or minus 12dB.

### **Audible Hook Indication**

When the unit goes off hook (connects), a beep is placed on the receive channel and the transmit channel of the unit. When the unit goes on hook (disconnects), a series of 2 beeps is placed on the receive channel to indicate that the call has been dropped. This indicator can be turned on and off by selecting and deselecting the checkbox. The default is on. The level adjustment allows you to customize the level of the beeps in relationship to the caller audio level in the room. The level can be adjusted in 1dB steps from a nominal level 0 (default) to plus or minus 12dB.

### **Audible Ringer Indication**

If you have the Audible Ringer Indication turned on, a valid call will cause the front panel On LED to flash, a serial ring command to transmit, and an audible ring to be heard from the receive channel. In the Off mode, the front panel On LED flashes and a serial command is transmitted. However, no ring tone is generated. This indicator can be turned on and off by selecting and deselecting the checkbox. The default is on. The level adjustment allows you to customize the level of the ring in relationship to the caller audio level in the room. The level can be adjusted in 1dB steps from a nominal level 0 (default) to plus or minus 12dB.

## Telco Meters

### Using Meters

Open the XAP TH2 Telco Meters window by clicking the Telco Meters button on the XAP TH2 Flow Screen. The Telco Meters window is a diagnostic tool which allows you to observe the performance of various aspects of XAP TH2 operation. Refer to the Transmit and Receive meters when making level adjustments.



### Telco Echo Return Loss (TERL)

The Telco Echo Return Loss meter shows the coupling between the transmit signal and the input to the telephone echo canceller. It is the ratio of the two levels. The range of the meter is -30 to +20dB. It is a peak meter and only updates when transmit signal is present.

### Telco Echo Return Loss Enhancement (TERLE)

The Telco Echo Return Loss Enhancement meter shows the loss through the telephone echo cancellation and non-linear processing chain. It is the ratio of the two levels. The range of the meter is -30 to +20dB. It is a peak meter and only updates when signal is present.

### Total Telco Echo Reduction

The Total Telco Echo Reduction meter is the sum of the TERL and TERLE meters. It indicates the total echo return loss in the system. The range of the meter is -50 to 0dB. It is a peak meter and only updates when signal is present.

### Transmit Input

This meter shows the audio level input to the XAP TH2 for transmission to the telephone line. The range of the meter is -30 to +20dB.

### Transmit Output

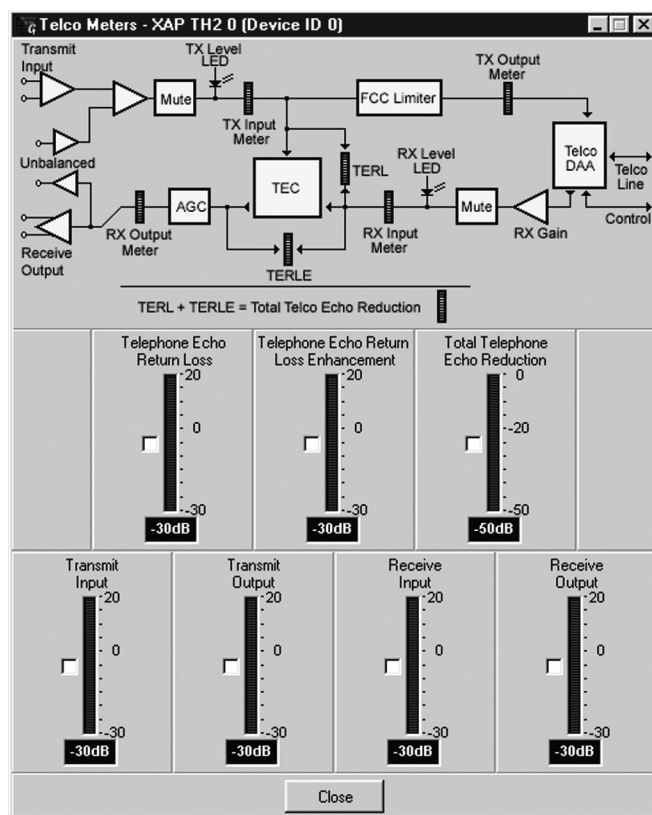
This meter shows the transmit audio level output from the XAP TH2 to the Telco DAA. The range of the meter is -30 to +20dB.

### Receive Input

This meter shows the audio level input to the XAP TH2 as it is received from the Telco DAA. The range of the meter is -30 to +20dB.

### Receive Output

This meter shows the receive audio level output from the XAP TH2 to the XAP 800. The range of the meter is -30 to +20dB.



XAP TH2 Telco Meters Window



# A

# Appendices

## Appendix A: Specifications

### Dimensions (LxDxH)

17.25" x 10.25" x 1.75"  
43.8 x 26 x 4.5 cm

### Weight

7 lb/3.18 kg dry  
12 lb/5.4 kg shipping

### Operating Temperature

32–100° F  
0–38° C

### Humidity

15% to 80%, non-condensing

### Power Input Range

Auto-adjusting  
100– 240VAC; 50/60Hz

### Power Consumption

15W typical

### Device ID

4-position DIP switch

### Expansion Bus In/Out

Proprietary Network  
RJ-45 (2), 115.2kbps, 110k $\Omega$  Impedance  
Category five twisted-pair cable

80' (24 meters)

maximum cable length between any two  
PSR1212s, XAP800s or XAP400s

### RS-232

DB-9 female  
9,600 / 19,200/38,400(default)/57,600 baud  
rate  
8 bits, 1 stop, no parity  
Hardware flow control on (default) / off

### Control / Status

DB25 female  
Inputs: active low (pull to ground)  
Outputs: Open collector, 40VDC max, 40mA  
each  
+5VDC (300mA over-current protected)

### Telco Line

RJ-11  
POTS (plain old telephone service) or analog  
extension from a PBX  
A-lead supervision provided

### Telco Set

RJ-11  
Connect analog telephone set  
A-lead supervision provided

**Transmit Input**

Push-on terminal block, balanced, bridging  
Impedance: > 10k $\Omega$   
Nominal Level: 0dBu  
Maximum Level: 15dBu

**Receive Output**

Push-on terminal block, balanced  
Impedance: <50 $\Omega$   
Nominal Level: 0dBu  
Maximum Level: 19dBu

**Audio Performance**

Conditions: Unless otherwise specified all measurements are performed with a 22Hz to 22kHz BW Limit (no weighting).  
Transmit Limiter and Receive ALC Disabled  
Frequency Response: 250Hz to 3.3kHz  $\pm$  1dB  
THD+N: <0.2% re Max Level  
SNR: >62dB re Max Level

**Telco Echo Cancellation**

Tail time: 31ms  
Null: 55dB nominal

**Approvals**

FCC, CSA, IC, CE, NOM, ACA, SABS, JATE

**Set-Up Software**

G-Ware

## Appendix B: Connector Pinouts

### Remote Connector Pinout

| <u>Pin</u> | <u>User Definable</u> | <u>Type</u>     | <u>Default Description</u> |
|------------|-----------------------|-----------------|----------------------------|
| 1          | Yes                   | Control (Input) | Telco On                   |
| 2          | Yes                   | Status (Output) | Telco On Indicator         |
| 3          | Yes                   | Control (Input) | Telco Off                  |
| 4          | Yes                   | Status (Output) | Telco Off Indicator        |
| 5          | Yes                   | Control (Input) |                            |
| 6          | Yes                   | Status (Output) |                            |
| 7          | Yes                   | Control (Input) |                            |
| 8          | Yes                   | Status (Output) |                            |
| 9          | Yes                   | Control (Input) | Transmit Mute              |
| 10         | Yes                   | Status (Output) | Transmit Mute Indicator    |
| 11         | Yes                   | Control (Input) | Receive Mute               |
| 12         | Yes                   | Status (Output) | Receive Mute Indicator     |
| 13         | Yes                   | Control (Input) |                            |
| 14         | Yes                   | Status (Output) |                            |
| 15         | Yes                   | Control (Input) |                            |
| 16         | Yes                   | Status (Output) |                            |
| 17         | Yes                   | Control (Input) |                            |
| 18         | Yes                   | Status (Output) |                            |
| 19         | Yes                   | Control (Input) |                            |
| 20         | No                    | Analog          | Unbalanced Transmit        |
| 21         | No                    | Analog          | Analog Ground              |
| 22         | No                    | Analog          | Unbalance Receive          |
| 23         | No                    | Analog          | Analog Ground              |
| 24         | N/A                   | N/A             | +5V 300 mA                 |
| 25         | N/A                   | N/A             | Ground                     |

Inputs: Remote control provided via contact closure to Switch/Indicator Common

Outputs: Remote indicators provided via open collector outputs to Indicator Common (<40V, <40mA)

### RS-232 Com Port

| <u>Pin</u> | <u>Description</u> | <u>Pin</u> | <u>Description</u> |
|------------|--------------------|------------|--------------------|
| 1          | Not used           | 6          | Not used           |
| 2          | TXD                | 7          | Not used           |
| 3          | RXD                | 8          | Not used           |
| 4          | Not used           | 9          | Not used           |
| 5          | Ground             |            |                    |

## Set Connector Pinout

---

| <u>Pin</u> | <u>Description</u>     | <u>Pin</u> | <u>Description</u>      |
|------------|------------------------|------------|-------------------------|
| 1          | To pin 6 of SET RJ-11C | 4          | Tip                     |
| 2          | To pin 5 of SET        | 5          | To pin 2 of LINE        |
| 3          | Ring                   | 6          | To pin 1 of LINE RJ-11C |

---

## Line Connector Pinout

---

| <u>Pin</u> | <u>Description</u>      | <u>Pin</u> | <u>Description</u>     |
|------------|-------------------------|------------|------------------------|
| 1          | To pin 6 of LINE RJ-11C | 4          | Ring                   |
| 2          | To pin 5 of LINE        | 5          | To pin 2 of SET        |
| 3          | Tip                     | 6          | To pin 1 of SET RJ-11C |

---



## Appendix C: Serial Commands

The XAP TH2 accepts serial commands through the serial port or the Expansion Bus. The commands in this manual pertain only to the XAP TH2.

RS-232 serial port protocol is 9,600, 19,200, 38,400 (default), or 57,600 baud; 8 bits, 1 stop bit, no parity.

### Conventions

This section uses the following typographic conventions:

| Convention  | Description   |
|-------------|---|
| <X>         | Parameters enclosed in <> indicate a mandatory parameter.   |
| [X]         | Parameters enclosed in [ ] indicate an optional parameter.  |
| 1-8         | Parameters separated by a - indicate a range between the values.  |
| 4,7,9       | Parameters separated by a , indicate a list of available values.  |
| <b>MREF</b> | Words in uppercase bold indicate command text.  |
| DEVICE      | Indicates the device type and device number on the Expansion Bus network. It is composed of a device type character and a device number. The device type for the XAP TH2 is always 6 and the device ID will always be 0 - 15, or * (to select all TH2 units). |

### Command Structure

Commands can be either UPPER CASE or lower case. Also, extra spaces or tabs between arguments in text commands is allowed. Return values are always in upper case. In order for a command to be recognized by the serial port, the command must be terminated by a carriage return.

The structure of serial commands is as follows:

```
#DEVICECOMMAND[X ][X]
```

|                |   |
|----------------|---|
| #              | indicates the start of a command line   |
| DEVICE         | represents the device type and device number  |
| <b>COMMAND</b> | is the command text   |
| [X] [X]        | represents any additional options in the order that they appear in the command descriptions that follow |

### Example

A command to enable auto-answer on the XAP TH2 device "0" would have the command line: #60 AA 1 1. In this command line, 6=XAP TH2, 0=unit 0, AA=command, 1=Telco channel 1, 1=on state. If a command calls for a "null" value, leave a blank in the command line. For example, "#60 AA" would return the current auto-answer state on device 60.

## Designations

The following tables define the relationship between alpha and numeric representations. Text commands use the alpha designation and binary commands use the numeric. In addition, different groups have different allowable channel ranges.

**Table 1. Group and Channels**

| Group         | Alpha | Numeric | Channel Range |
|---------------|-------|---------|---------------|
| Inputs        | I     | 1       | 1-12          |
| Outputs       | O     | 2       | 1-12          |
| Mic Input     | M     | 3       | 1-8           |
| Gating Group  | G     | 4       | 1-8           |
| Processing    | P     | 5       | 1-8           |
| Ambient       | A     | 6       | 1-8           |
| Line Inputs   | L     | 7       | 9-12          |
| Expansion Bus | E     | 8       | 1-16          |
| Unit          | U     | 9       | 0             |
| GPIO          | Y     | 10      | 0             |
| Matrix        | X     | 11      | 0             |
| Wall plates   | W     | 12      | 0             |
| Presets       | S     | 13      | 1-32          |
| Macros        | C     | 14      | 1-255         |
| Unknown       | N     | 0       | N/A           |
| Transmit      | T     | 16      | 1             |
| Receive       | R     | 17      | 1             |

If a channel has a numeric value of 0xff or an alpha value of '\*', the command is to be applied to all channels. For example, a group value of 0x3 and a channel value of 0xff would mean that the command is to be applied to all channels of group 3 (mic inputs).

**Table 2. Gating Channel Definitions**

| Alpha | Numeric |
|-------|---------|
| 1     | 1       |
| 2     | 2       |
| 3     | 3       |
| 4     | 4       |
| A     | 5       |
| B     | 6       |
| C     | 7       |
| D     | 8       |

**Table 3. Processing Channel Definitions**

| Alpha | Numeric |
|-------|---------|
| A     | 1       |
| B     | 2       |
| C     | 3       |
| D     | 4       |
| E     | 5       |
| F     | 6       |
| G     | 7       |
| H     | 8       |

**Table 4. Expansion Bus Audio Channel Definitions**

| Alpha | Numeric |
|-------|---------|
| O     | 1       |
| P     | 2       |
| Q     | 3       |
| R     | 4       |
| S     | 5       |
| T     | 6       |
| U     | 7       |
| V     | 8       |
| W     | 9       |
| X     | 10      |
| Y     | 11      |
| Z     | 12      |

**Table 5. Expansion Bus Echo Canceller Reference Channel Definitions**

| Alpha | Numeric |
|-------|---------|
| 1     | 13      |
| 2     | 14      |
| 3     | 15      |
| 4     | 16      |

**Table 6. Meter Type Definitions**

| Alpha | Numeric | Level position for Mics                              | Level position for Line Inputs | Level position for Outputs and Telco Transmits | Level Position for Processors      | Level Position for Telco Receives  |
|-------|---------|--|--------------------------------|--|------------------------------------|------------------------------------|
| I     | 1       | Input level  | Input level                    | Input level                                    | Level into processor               | Input Level                        |
| A     | 2       | Level after gain adjustment, but before filter       | Level after gain adjustment    | Level after gain adjustment                    | Amount of compression              | Level after gain adjustment        |
| N     | 3       | Level after filter but before gate (non-gated level) | N/A                            | N/A  | Level after compressor and filters | N/A                                |
| G     | 4       | Level after gate (gated level)                       | N/A                            | N/A  | N/A                                | N/A                                |
| R     | 5       | Echo Return Loss                                     | N/A                            | N/A  | N/A                                | Telco Echo Return Loss             |
| E     | 6       | Echo Return Loss Enhancement                         | N/A                            | N/A  | N/A                                | Telco Echo Return Loss Enhancement |
| T     | 7       | ERL + ERLE   | N/A                            | N/A  | N/A                                | TERL + TERLE                       |
| D     | 8       | Impulse Duration (Tail Time)                         | N/A                            | N/A  | N/A                                | N/A                                |
| C     | 9       | AGC  | AGC                            | N/A  | N/A                                | AGC                                |
| Y     | 10      | Pre AGC RMS meter                                    | Pre AGC RMS meter              | N/A  | N/A                                | Pre AGC RMS meter                  |
| Z     | 11      | Post AGC RMS meter                                   | Post AGC RMS meter             | N/A  | N/A                                | Post AGC RMS meter                 |

## XAP TH2 Serial Commands

| Command           | Function   | Command           | Function   |
|-------------------|--|-------------------|--|
| <b>AA</b>         | Sets auto-answer for a telco channel   | <b>NULL</b>       | Renulls XAP TH2 to telephone line  |
| <b>ACONN</b>      | Sets the audible connect signal to on/off  | <b>PGPIO*</b>     | Programs/reports the pin setting of the control/status port                              |
| <b>ACONNLVL</b>   | Sets the level of the audible connect signal                                       | <b>PRGSTRING*</b> | Sets/reports a programmed string   |
| <b>AD</b>         | Sets auto-disconnect for a telco channel   | <b>REDIAL</b>     | Redials the last number  |
| <b>ALC</b>        | Sets the ALC for the telco receive   | <b>RING*</b>      | Indicates a ringing line and the caller ID information, when available (reportable only) |
| <b>BAUD*</b>      | Selects/reports the baud rate of the serial port                                   | <b>RINGER</b>     | Sets the audible ringer for a telco channel  |
| <b>COUNTRY*</b>   | Sets/reports the country for compliance  | <b>RINGERLVL</b>  | Sets the audible ring indication level   |
| <b>DIAL*</b>      | Dials a DTMF sequence or reports last sequence dialed                              | <b>RXBOOST</b>    | Sets the receive boost at 0, 3, 6, 9, or 12dB  |
| <b>DID*</b>       | Selects/reports the device ID  | <b>RXBSTEN</b>    | Enables/disables receive boost   |
| <b>DTMFLVL</b>    | Sets the DTMF tone level in the room   | <b>RXRD</b>       | Sets the RX reduction for the telco channel  |
| <b>DTONELVL</b>   | Selects/reports the audible dial tone level  | <b>SERECHO*</b>   | Selects/reports the serial echo of the RS-232 port                                       |
| <b>FLOW*</b>      | Selects/reports the flow control of the serial port                                | <b>SERMODE*</b>   | Selects/reports the serial mode of the RS-232 port                                       |
| <b>HOOK</b>       | Sends a hook flash to the telephone line   | <b>SPEEDDIAL</b>  | Dials one of ten numbers on the telco channel  |
| <b>HOOKD</b>      | Sets hook-flash duration   | <b>STOREDIAL*</b> | Saves a number in a speed dial or reports the current value                              |
| <b>LABEL*</b>     | Selects/reports the label of the specific channel or unit                          | <b>STRING</b>     | Executes a string for the RS-232 port  |
| <b>LVL*</b>       | Reports the level of a channel (read only)   | <b>TAMODE</b>     | Sets the telco adapt mode for the telco channel  |
| <b>LVLRRATE*</b>  | Sets the level report rate for the unit  | <b>TE</b>         | Sets the telco enable for the telco channel  |
| <b>LVLREPORT*</b> | Selects/reports the status of level reporting for the specified channel            | <b>TERL*</b>      | Reports the telco echo return loss (read only)   |
| <b>MDMODE*</b>    | Enables/disables the modem mode for the unit                                       | <b>TERLE*</b>     | Reports the telco echo return loss enhancement (read only)                               |
| <b>MINIT*</b>     | Sets/reports the modem initialization string of the serial port when in modem mode | <b>UID*</b>       | Reports the unit ID (read only)  |
| <b>MUTE</b>       | Sets the mute for an input, output, telco transmit, or telco receive               | <b>VER*</b>       | Reports the version of the unit (read only)  |

\* Command not available for macro or Control Panel use

**AA - Auto-Answer Enable/ Disable****DESCRIPTION**

This command selects/reports the setting of auto-answer.

**ARGUMENT DETAILS**

| Name    | Type             | Size | Values                             | Units |
|---------|------------------|------|------------------------------------|-------|
| Channel | Channel          | 1    | See Groups and Channels on page 30 |       |
| Value   | Unsigned Integer | 2    | 0 = Off<br>1 = On<br>2 = Toggle    |       |

**TEXT FORM DETAILS**

COMMAND FORM:                    DEVICE **AA** <Channel> [Value]

**RETURN VALUES**

Unit will return the updated state of the last selection in the same form as the command.

**EXAMPLE**

If auto-answer is on, the command returns DEVICE **AA** 1 1.

**ACONN - Audible Connect / Disconnect Indication****DESCRIPTION**

This command selects/reports the status of the audible connect / disconnect indication.

**ARGUMENT DETAILS**

| Name    | Type             | Size | Values   | Units |
|---------|------------------|------|--|-------|
| Channel | Channel          | 1    | See Group and Channels on page 30                          |       |
| Value   | Unsigned Integer | 2    | 0 = Off<br>1 = On<br>2 = Toggle<br>(Null to query in text) |       |

**TEXT FORM DETAILS**

COMMAND FORM:                    DEVICE **ACONN** <Channel> [Value]

**RETURN VALUES**

Unit will return the updated state of the last selection in the same form as the command.

**EXAMPLE**

If audible connect/disconnect indication is enabled, the command returns DEVICE **ACONN** 1 1.

## ACONNLVL - Audible Connect / Disconnect Level

### DESCRIPTION

This command selects/reports the audible connect / disconnect indicator's level.

### ARGUMENT DETAILS

| Name    | Type         | Size | Values                                    | Units |
|---------|--------------|------|---|-------|
| Channel | Channel      | 1    | See Groups and Channels on page 30        |       |
| Value   | Signed Float | 2    | -12.00 – 12.00<br>(Null to query in text) | DB    |

### TEXT FORM DETAILS

COMMAND FORM:                    DEVICE **ACONNLVL** <Channel> [Value]

### RETURN VALUES

Unit will return the updated state of the last selection in the same form as the command.

### EXAMPLE

If audible connect/disconnect level is set to -6dB, the command returns DEVICE **ACONNLVL** 1 -6.

## AD - Auto-Disconnect Enable/ Disable

### DESCRIPTION

This command selects/reports the setting of auto-disconnect.

### ARGUMENT DETAILS

| Name    | Type             | Size | Values  | Units |
|---------|------------------|------|---|-------|
| Channel | Channel          | 1    | See Groups and Channels on page 30  |       |
| Value   | Unsigned Integer | 2    | 0 = Off<br>1 = Loop Drop<br>2 = Call Progress<br>3 = Loop Drop + Call Progress<br>(Null to query in text) |       |

### TEXT FORM DETAILS

COMMAND FORM:                    DEVICE **AD** <Channel> [Value]

### RETURN VALUES

Unit will return the updated state of the last selection in the same form as the command.

### EXAMPLE

If auto-disconnect is set to Loop Drop + Call Progress, the command returns DEVICE **AD** 1 3.

## ALC - Automatic Level Control

### DESCRIPTION

This command selects/reports the state of the automatic level control.

### ARGUMENT DETAILS

| Name    | Type             | Size | Values   | Units |
|---------|------------------|------|--|-------|
| Channel | Channel          | 1    | See Group and Channels, page 30                            |       |
| Group   | Group            | 1    | 17 (R)   |       |
| Value   | Unsigned Integer | 2    | 0 = Off<br>1 = On<br>2 = Toggle<br>(Null to query in text) |       |

### TEXT FORM DETAILS

COMMAND FORM: DEVICE **ALC** <Channel> <Group> [Value]

### RETURN VALUES

Unit will return the updated state of the last selection in the same form as the command.

### EXAMPLE

If ALC is on, the command returns DEVICE **ALC** 1 1.

## BAUD - Baud Rate

### DESCRIPTION

This command selects/reports the baud rate of the serial port.

### ARGUMENT DETAILS

| Name  | Type             | Size | Values   | Units |
|-------|------------------|------|--|-------|
| Value | Unsigned Integer | 4    | 9600, 19200, 38400, 57600<br>(Null to query in text) |       |

### TEXT FORM DETAILS

COMMAND FORM: DEVICE **BAUD** [Value]

### RETURN VALUES

Unit will return the updated state of the last selection in the same form as the command.

### EXAMPLE

If the baud rate of the RS-232 port is set to 38400, the command returns DEVICE **BAUD** 38400.

## COUNTRY – Country Selection

### DESCRIPTION

This command sets / reports the country for compliance.

### ARGUMENT DETAILS

| Name  | Type             | Size | Values   | Units |
|-------|------------------|------|--|-------|
| Value | Unsigned Integer | 4    | 1 = US / Canada<br>2 = Europe (CTR21)<br>3 = Mexico<br>4 = Australia<br>5 = South Africa<br>6 = Japan<br>7 = Brazil<br>(Null to query in text) |       |

### TEXT FORM DETAILS

COMMAND FORM:                    DEVICE **COUNTRY** [Value]

### RETURN VALUES

Unit will return the updated state of the last selection in the same form as the command.

### EXAMPLE

If the country selection is set to US/Canada, the command returns DEVICE **COUNTRY** 1.

## DIAL – DTMF Dialing

### DESCRIPTION

This command dials a DTMF sequence or reports back the last sequence dialed.

### ARGUMENT DETAILS

| Name    | Type    | Size | Values  | Units |
|---------|---------|------|---|-------|
| Channel | Channel | 1    | See Group and Channels. page 30   |       |
| Number  | String  | 40   | 1 – 40 Chars of '0' – '9', 'A' – 'D', '*', '#', ','<br>(Null to query last number dialed in text) |       |

### TEXT FORM DETAILS

COMMAND FORM:                    DEVICE **DIAL** <Channel> [Number]

### RETURN VALUES

Unit will return the updated state of the last selection in the same form as the command.

### EXAMPLE

If the number dialed was 1,8002835936, the command returns DEVICE **DIAL** 1 1,8002835936.



**DID - Device ID****DESCRIPTION**

This command selects/reports the device ID.

**ARGUMENT DETAILS**

| Name  | Type             | Size | Values   | Units |
|-------|------------------|------|--|-------|
| Value | Unsigned Integer | 4    | See Type and DeviceIDs, page 32<br>(Null to query in text) |       |

**TEXT FORM DETAILS**

COMMAND FORM:                    DEVICE **DID** [Value]

**RETURN VALUES**

Unit will return the updated state of the last selection in the same form as the command.

**EXAMPLE**

If the device ID is 5, the command returns DEVICE **DID** 5.

**DTMFLVL - DTMF Tone Level****DESCRIPTION**

This command selects/reports the DTMF tone's level.

**ARGUMENT DETAILS**

| Name    | Type         | Size | Values                                    | Units |
|---------|--------------|------|---|-------|
| Channel | Channel      | 1    | See Group and Channels, page 30           |       |
| Value   | Signed Float | 2    | -12.00 – 12.00<br>(Null to query in text) | DB    |

**TEXT FORM DETAILS**

COMMAND FORM:                    DEVICE **DTMFLVL** <Channel> [Value]

**RETURN VALUES**

Unit will return the updated state of the last selection in the same form as the command.

**EXAMPLE**

If the DTMF tone level is set to 6dB, the command returns DEVICE **DTMFLVL** 1 6.

## DTONELVL - Dial Tone Level

### DESCRIPTION

This command selects/reports the audible dial tone's level.

### ARGUMENT DETAILS

| Name    | Type         | Size | Values                                    | Units |
|---------|--------------|------|---|-------|
| Channel | Channel      | 1    | See Group and Channels, page 30           |       |
| Value   | Signed Float | 2    | -12.00 – 12.00<br>(Null to query in text) | DB    |

### TEXT FORM DETAILS

COMMAND FORM:                    DEVICE **DTONELVL** <Channel> [Value]

### RETURN VALUES

Unit will return the updated state of the last selection in the same form as the command.

### EXAMPLE

If the dial tone level is set to -3dB, the command returns DEVICE **DTONELVL** 1 -3.

## FLOW - Flow Control

### DESCRIPTION

This command selects/reports the flow control of the serial port on the unit. Hardware flow control is implemented using DTR and DSR.

### ARGUMENT DETAILS

| Name  | Type             | Size | Values   | Units |
|-------|------------------|------|--|-------|
| Value | Unsigned Integer | 4    | 0 = Off<br>1 = On<br>2 = Toggle<br>(Null to query in text) |       |

### TEXT FORM DETAILS

COMMAND FORM:                    DEVICE **FLOW** [Value]

### RETURN VALUES

Unit will return the updated state of the last selection in the same form as the command.

### EXAMPLE

If flow control is enabled, the command returns DEVICE **FLOW** 1.

## HOOK - Hook Flash

### DESCRIPTION

This command sends a hook flash. There is no query for this command.

### ARGUMENT DETAILS

| Name    | Type    | Size | Values                           | Units |
|---------|---------|------|----------------------------------|-------|
| Channel | Channel | 1    | See Groups and Channels, page 30 |       |

### TEXT FORM DETAILS

COMMAND FORM: DEVICE **HOOK** <Channel>

### RETURN VALUES

Unit will return the updated state of the last selection in the same form as the command.

### EXAMPLE

When a hook flash occurs, the command returns DEVICE **HOOK** 1.

## HOOKD - Hook Flash Duration

### DESCRIPTION

This command selects/reports the hook flash duration.

### ARGUMENT DETAILS

| Name    | Type             | Size | Values                               | Units |
|---------|------------------|------|--------------------------------------|-------|
| Channel | Channel          | 1    | See Groups and Channels, page 30     |       |
| Value   | Unsigned Integer | 2    | 50 – 2000<br>(Null to query in text) | Ms    |

### TEXT FORM DETAILS

COMMAND FORM: DEVICE **HOOKD** <Channel> [Value]

### RETURN VALUES

Unit will return the updated state of the last selection in the same form as the command.

### EXAMPLE

If the hook flash duration is set to 500ms, the command returns DEVICE **HOOKD** 1 500.



**LVLRRATE - Level Report Rate****DESCRIPTION**

Sets the level report rate for the unit.

**ARGUMENT DETAILS**

| Name  | Type             | Size | Values   | Units |
|-------|------------------|------|--|-------|
| Value | Unsigned Integer | 4    | 0 = Turn off reporting but leave current list<br>1 = Turn off reporting and clear the list<br>50 – 1000 = Set Rate (1 meter every x ms)<br>(Null to query in text) | Ms    |

**TEXT FORM DETAILS**

COMMAND FORM: DEVICE **LVLRRATE** [Value]

**RETURN VALUES**

Unit will return the updated state of the last selection in the same form as the command.

**EXAMPLE**

If you request the meter to repeat every 100ms, the command returns **DEVICE LVLRRATE 100**.

**LVLREPORT - Level Report****DESCRIPTION**

This command selects/reports the status of level reporting for the specified channel.

**ARGUMENT DETAILS**

| Name     | Type             | Size | Values  | Units |
|----------|------------------|------|---|-------|
| Channel  | Channel          | 1    | See Groups and Channels, page 30  |       |
| Group    | Group            | 1    | 1, 2, 3, 5, 6, 7, 16, 17 (I, O, M, P, A, L, T, R)   |       |
| Position | Meter Type       | 2    | See Meter Type Definitions, page 35   |       |
| Value    | Unsigned Integer | 4    | 0 = Off (Delete from list being reported)<br>1 = On (Add to list being reported)<br>2 = Toggle<br>(Null to query in text) |       |

**TEXT FORM DETAILS**

COMMAND FORM: DEVICE **LVLREPORT** <Channel> <Group> <Position> [Value]

**RETURN VALUES**

Unit will return the updated state of the last selection in the same form as the command.

**Note:** The level report rate (LVLRRATE) must also be set for levels to be reported.

**EXAMPLE**

If you request the level of the transmit input to be reported, the command returns **DEVICE LVLREPORT 1 T I**.

## MDMODE - Modem Mode

### DESCRIPTION

This command enables or disables the modem mode for the unit. When the modem mode is enabled, the modem initialization string is sent out the serial port and the serial port now requires a password before a command is processed. After five minutes of serial inactivity the password will be requested to continue serial activity.

### ARGUMENT DETAILS

| Name  | Type             | Size | Values   | Units |
|-------|------------------|------|--|-------|
| Value | Unsigned Integer | 4    | 0 = Off<br>1 = On<br>2 = Toggle<br>(Null to query in text) |       |

### TEXT FORM DETAILS

COMMAND FORM:                   DEVICE **MDMODE** [Value]

### RETURN VALUES

Unit will return the updated state of the last selection in the same form as the command.

### EXAMPLE

If the modem mode is disabled, the command returns DEVICE **MDMODE** 0.

## MINIT - Modem Initialization String

### DESCRIPTION

This command sets/reports the modem initialization string of the serial port when in modem mode.

### ARGUMENT DETAILS

| Name  | Type   | Size | Values  | Units |
|-------|--------|------|---|-------|
| Value | String | 80   | CLEAR = Clear current value<br>1 – 80 Characters<br>(Null to query in text) |       |

### TEXT FORM DETAILS

COMMAND FORM:                   DEVICE **MINIT** [Value]

### RETURN VALUES

Unit will return the updated state of the last selection in the same form as the command.

### EXAMPLE

If the modem initialization string is ATZ, the command returns DEVICE **MINIT** ATZ.

**MUTE - Mute****DESCRIPTION**

This command selects/reports the setting of mute on a channel.

**ARGUMENT DETAILS**

| Name    | Type             | Size | Values   | Units |
|---------|------------------|------|--|-------|
| Channel | Channel          | 1    | See Groups and Channels, page 30                           |       |
| Group   | Group            | 1    | 1, 2, 3, 5, 7, 16, 17 (I, O, M, P, L, T, R)                |       |
| Value   | Unsigned Integer | 2    | 0 = Off<br>1 = On<br>2 = Toggle<br>(Null to query in text) |       |

**TEXT FORM DETAILS**

COMMAND FORM:                   DEVICE **MUTE** <Channel> <Group> [Value]

**RETURN VALUES**

Unit will return the updated state of the last selection in the same form as the command.

**EXAMPLE**

If the Receive mute is enabled, the command returns DEVICE **MUTE** 1 R 1.

**NULL - Null the line****DESCRIPTION**

This command nulls the line. There is no query for this command.

**ARGUMENT DETAILS**

| Name     | Type    | Size | Values                           | Units |
|----------|---------|------|----------------------------------|-------|
| Channel  | Channel | 1    | See Groups and Channels, page 30 |       |
| Reserved |         | 2    | 0                                |       |

**TEXT FORM DETAILS**

COMMAND FORM:                   DEVICE **NULL** <Channel>

**RETURN VALUES**

Unit will return the updated state of the last selection in the same form as the command.

**EXAMPLE**

If the phone is nulled, the command returns DEVICE **NULL** 1.

## PGPIO - Programming Control/Status Pins

### DESCRIPTION

This command programs/reports the pin setting of the control/status ports.

### ARGUMENT DETAILS

| Name              | Type             | Size | Values   | Units |
|-------------------|------------------|------|--|-------|
| Pin               | Unsigned Integer | 2    | For XAP 800 & PSR 1212 1 – 16<br>For TH2 1 – 19  |       |
| Port              | Unsigned Integer | 1    | 1  |       |
| Inactive / Active | Unsigned Integer | 1    | 0 = Inactive State<br>1 = Active State   |       |
| Command           |                  | 16   | Any defined binary command with one argument for the local unit or all zeros to clear the pin. |       |

### TEXT FORM DETAILS

COMMAND FORM: This command is not text supported.

### RETURN VALUES

Unit will return the updated state of the last selection in the same form as the command.

## PRGSTRING - Program String

### DESCRIPTION

This command sets/reports a programmed string.

### ARGUMENT DETAILS

| Name  | Type             | Size | Values   | Units |
|-------|------------------|------|--|-------|
| ID    | Unsigned Integer | 4    | 0 – 7  |       |
| Value | String           | 80   | CLEAR = Clear current value<br>1 – 80 Chars<br>(Null to query in text) |       |

### TEXT FORM DETAILS

COMMAND FORM: DEVICE **PRGSTRING** <ID> [Value]

### RETURN VALUES

Unit will return the updated state of the last selection in the same form as the command.

### EXAMPLE

If the string programmed into location 5 is TE 1, the command returns DEVICE **PRGSTRING** 5 TE 1.



## REDIAL – Dial the last number again

### DESCRIPTION

This command redials the last number. There is no query for this command.

### ARGUMENT DETAILS

| Name     | Type    | Size | Values                           | Units |
|----------|---------|------|----------------------------------|-------|
| Channel  | Channel | 1    | See Groups and Channels, page 30 |       |
| Group    | Group   | 1    | 17 (R)                           |       |
| Reserved |         | 2    | 0                                |       |

### TEXT FORM DETAILS

COMMAND FORM: DEVICE **REDIAL** <Channel>

### RETURN VALUES

Unit will return the updated state of the last selection in the same form as the command.

### EXAMPLE

When you redial the last number, the command returns DEVICE **REDIAL** 1.

## RING - Ring Indication

### DESCRIPTION

This command indicates a ringing line and the caller id information when available. This command is reportable only. It cannot be queried or set.

### ARGUMENT DETAILS

| Name      | Type    | Size | Values                           | Units |
|-----------|---------|------|----------------------------------|-------|
| Channel   | Channel | 1    | See Groups and Channels, page 30 |       |
| Group     | Group   | 1    | 17 (R)                           |       |
| Reserved  |         | 2    | 0                                |       |
| Caller ID | String  | 40   | '0' – '9', 'A' – 'D', '*', '#'   |       |

### TEXT FORM DETAILS

COMMAND FORM: DEVICE **RING** <Channel> <Caller ID>

### RETURN VALUES

Unit will return the updated state of the last selection in the same form as the command.

### EXAMPLE

If the TH2 detects an incoming ring signal, the command returns DEVICE **RING** 1.

## RINGER - Audible Ring Selection

### DESCRIPTION

This command sends/reports the use of an audible ring.

### ARGUMENT DETAILS

| Name    | Type             | Size | Values   | Units |
|---------|------------------|------|--|-------|
| Channel | Channel          | 1    | See Groups and Channels, page 30                           |       |
| Group   | Group            | 1    | 17 (R)   |       |
| Value   | Unsigned Integer | 2    | 0 = Off<br>1 = On<br>2 = Toggle<br>(Null to query in text) |       |

### TEXT FORM DETAILS

COMMAND FORM:                    DEVICE **RINGER** <Channel> [Value]

### RETURN VALUES

Unit will return the updated state of the last selection in the same form as the command.

### EXAMPLE

If the audible ring indicatin is enabled, the command returns DEVICE **RINGER** 1 1.

## RINGERLVL - Audible Ring Level

### DESCRIPTION

This command selects/reports the audible ring level.

### ARGUMENT DETAILS

| Name    | Type         | Size | Values                                    | Units |
|---------|--------------|------|---|-------|
| Channel | Channel      | 1    | See Groups and Channels, page 30          |       |
| Group   | Group        | 1    | 17 (R)                                    |       |
| Value   | Signed Float | 2    | -12.00 – 12.00<br>(Null to query in text) | DB    |

### TEXT FORM DETAILS

COMMAND FORM:                    DEVICE **RINGERLVL** <Channel> [Value]

### RETURN VALUES

Unit will return the updated state of the last selection in the same form as the command.

### EXAMPLE

If the audible ring indication is set to 3dB, the command returns DEVICE **RINGERLVL** 1 3.

**RXBOOST - Receive Boost****DESCRIPTION**

This command selects/reports the receive boost status.

**ARGUMENT DETAILS**

| Name    | Type             | Size | Values                                    | Units |
|---------|------------------|------|---|-------|
| Channel | Channel          | 1    | See Groups and Channels                   |       |
| Group   | Group            | 1    | 17 (R)                                    |       |
| Value   | Unsigned Integer | 2    | 0, 3, 6, 9, 12<br>(Null to query in text) | dB    |

**TEXT FORM DETAILS**

COMMAND FORM:                    DEVICE **RXBOOST** <Channel> [Value]

**RETURN VALUES**

Unit will return the updated state of the last selection in the same form as the command.

**EXAMPLE**

If the receive boost is set to 6dB, the command returns DEVICE **RXBOOST** 1 6.

**RXBSTEN - Receive Boost Enable****DESCRIPTION**

This command selects/reports the receive boost status.

**ARGUMENT DETAILS**

| Name    | Type             | Size | Values   | Units |
|---------|------------------|------|--|-------|
| Channel | Channel          | 1    | See Groups and Channels                                    |       |
| Group   | Group            | 1    | 17 (R)   |       |
| Value   | Unsigned Integer | 2    | 0 = Off<br>1 = On<br>2 = Toggle<br>(Null to query in text) |       |

**TEXT FORM DETAILS**

COMMAND FORM:                    DEVICE **RXBSTEN** <Channel> [Value]

**RETURN VALUES**

Unit will return the updated state of the last selection in the same form as the command.

**EXAMPLE**

If receive boost is enabled, the command returns DEVICE **RXBSTEN** 1 1.

## RXRD - Telco Receive Reduction

### DESCRIPTION

This command selects/reports the status of the Telco receive reduction.

### ARGUMENT DETAILS

| Name    | Type             | Size | Values   | Units |
|---------|------------------|------|--|-------|
| Channel | Channel          | 1    | See Groups and Channels, page 30                           |       |
| Group   | Group            | 1    | 17 (R)   |       |
| Value   | Unsigned Integer | 2    | 0 = Off<br>1 = On<br>2 = Toggle<br>(Null to query in text) |       |

### TEXT FORM DETAILS

COMMAND FORM:                   DEVICE **RXRD** <Channel> [Value]

### RETURN VALUES

Unit will return the updated state of the last selection in the same form as the command.

### EXAMPLE

If receive reduction is enabled, the command returns DEVICE **RXRD** 1 0.

## SERECHO - Serial Echo

### DESCRIPTION

This command selects/reports the serial echo of the RS232 port.

### ARGUMENT DETAILS

| Name  | Type             | Size | Values   | Units |
|-------|------------------|------|--|-------|
| Value | Unsigned Integer | 4    | 0 = Off<br>1 = On<br>2 = Toggle<br>(Null to query in text) |       |

### TEXT FORM DETAILS

COMMAND FORM:                   DEVICE **SERECHO** [Value]

### RETURN VALUES

Unit will return the updated state of the last selection in the same form as the command.

### EXAMPLE

If the serial echo is set, the command returns DEVICE **SERECHO** 1.

**SERMODE - Serial Mode****DESCRIPTION**

This command selects/reports the serial mode of the RS232 port.

**ARGUMENT DETAILS**

| Name  | Type             | Size | Values  | Units |
|-------|------------------|------|---|-------|
| Value | Unsigned Integer | 4    | 1 = Text<br>2 = Binary<br>(Null to query in text) |       |

**TEXT FORM DETAILS**

COMMAND FORM:                    DEVICE **SERMODE** [Value]

**RETURN VALUES**

Unit will return the updated state of the last selection in the same form as the command.

**EXAMPLE**

If the serial mode is set to text, the command returns DEVICE **SERMODE** 1.

**SPEEDDIAL - Speed Dialing****DESCRIPTION**

This command dials a speed dial number.

**ARGUMENT DETAILS**

| Name    | Type             | Size | Values                            | Units |
|---------|------------------|------|-----------------------------------|-------|
| Channel | Channel          | 1    | See Groups and Channels, page 30  |       |
| Group   | Group            | 1    | 17 (R)                            |       |
| Value   | Unsigned Integer | 2    | 1 – 10<br>(Null to query in text) |       |

**TEXT FORM DETAILS**

COMMAND FORM:                    DEVICE **SPEEDDIAL** <Channel> [Value]

**RETURN VALUES**

Unit will return the updated state of the last selection in the same form as the command.

**EXAMPLE**

If the speed dial number 1,8002835936 (location 9) was dialed, the command returns DEVICE **SPEEDDIAL** 1 5 1,8002835936.

## STOREDIAL – Store a Number as a Speed Dial

### DESCRIPTION

This command saves a number in a speed dial or reports the current value.

### ARGUMENT DETAILS

| Name   | Type             | Size | Values   | Units |
|--------|------------------|------|--|-------|
| ID     | Unsigned Integer | 4    | 1 – 10   |       |
| Number | String           | 40   | 1 – 40 chars '0' – '9', 'A' – 'D', '*', '#'<br>(Null to query in text) |       |
| Label  | String           | 20   | 1 – 20 chars   |       |

### TEXT FORM DETAILS

COMMAND FORM:                    DEVICE **STOREDIAL** <ID> [Number Label]

### RETURN VALUES

Unit will return the updated state of the last selection in the same form as the command.

### EXAMPLE

If the number 1,8004478556 is saved as EXPRESS CONFERENCE in speed dial location 10, the command returns DEVICE **STOREDIAL** 10 1,8004478556 EXPRESS CONFERENCE.

## STRING - String Execution

### DESCRIPTION

This command sends the specified string out the serial port

### ARGUMENT DETAILS

| Name | Type             | Size | Values                                       | Units |
|------|------------------|------|--|-------|
| ID   | Unsigned Integer | 4    | 0 – 7<br>(Null to query last string in text) |       |

### TEXT FORM DETAILS

COMMAND FORM:                    DEVICE **STRING** [ID]

### RETURN VALUES

Unit will return the updated state of the last selection in the same form as the command.

### EXAMPLE

If the command stored in string location 3 is executed, the command returns DEVICE **STRING** 3.

## TAMODE - Telco Adapt Mode

### DESCRIPTION

This command selects/reports the Telco adapt mode.

### ARGUMENT DETAILS

| Name    | Type             | Size | Values   | Units |
|---------|------------------|------|--|-------|
| Channel | Channel          | 1    | See Groups and Channels, page 30                 |       |
| Group   | Group            | 1    | 17 (R)   |       |
| Value   | Unsigned Integer | 2    | 0 = Auto<br>1 = Burst<br>(Null to query in text) |       |

### TEXT FORM DETAILS

COMMAND FORM: DEVICE **TAMODE** <Channel> [Value]

### RETURN VALUES

Unit will return the updated state of the last selection in the same form as the command.

### EXAMPLE

If the telco adapt mode is set to auto adapt, the command returns DEVICE **TAMODE** 1 0.

## TE - Telco Enable

### DESCRIPTION

This command selects/reports the hook status.

### ARGUMENT DETAILS

| Name    | Type             | Size | Values   | Units |
|---------|------------------|------|--|-------|
| Channel | Channel          | 1    | See Groups and Channels, page 30                           |       |
| Group   | Group            | 1    | 17 (R)   |       |
| Value   | Unsigned Integer | 2    | 0 = Off<br>1 = On<br>2 = Toggle<br>(Null to query in text) |       |

### TEXT FORM DETAILS

COMMAND FORM: DEVICE **TE** <Channel> [Value]

### RETURN VALUES

Unit will return the updated state of the last selection in the same form as the command.

### EXAMPLE

If the XAP TH2 goes off hook, the command returns DEVICE **TE** 1 1.

## TERL - Telco Echo Return Loss

### DESCRIPTION

This command reports the Telco echo return loss. This command is read only.

### ARGUMENT DETAILS

| Name    | Type         | Size | Values                           | Units |
|---------|--------------|------|----------------------------------|-------|
| Channel | Channel      | 1    | See Groups and Channels, page 30 |       |
| Group   | Group        | 1    | 17 (R)                           |       |
| Value   | Signed Float | 2    | (Sent with a Null in text)       | DB    |

### TEXT FORM DETAILS

COMMAND FORM:                    DEVICE **TERL** <Channel> [Value]

### RETURN VALUES

Unit will return the updated state of the last selection in the same form as the command.

### EXAMPLE

If the telco echo return loss is -12dB, the command returns DEVICE **TERL** 1 -12.

## TERLE - Telco Echo Return Loss Enhancement

### DESCRIPTION

This command reports the Telco echo return loss enhancement. This command is read only.

### ARGUMENT DETAILS

| Name    | Type         | Size | Values                           | Units |
|---------|--------------|------|----------------------------------|-------|
| Channel | Channel      | 1    | See Groups and Channels, page 30 |       |
| Group   | Group        | 1    | 17 (R)                           |       |
| Value   | Signed Float | 2    | (Sent with a Null in text)       | DB    |

### TEXT FORM DETAILS

COMMAND FORM:                    DEVICE **TERLE** <Channel> [Value]

### RETURN VALUES

Unit will return the updated state of the last selection in the same form as the command.

### EXAMPLE

If the telco echo return loss is -24dB, the command returns DEVICE **TERLE** 1 -24.



**UID - Unit ID****DESCRIPTION**

This command reports the unit id. This command is read only.

**ARGUMENT DETAILS**

| <b>Name</b> | <b>Type</b> | <b>Size</b> | <b>Values</b>                              | <b>Units</b> |
|-------------|-------------|-------------|--|--------------|
| Value       | Hexadecimal | 4           | (Sent with a Null, value returned in text) |              |

**TEXT FORM DETAILS**

COMMAND FORM:                    DEVICE **UID** [Value]

**RETURN VALUES**

Unit will return the updated state of the last selection in the same form as the command.

**EXAMPLE**

If the unit has an ID of XXXXXXXX, the command returns DEVICE **UID** XXXXXXXX.

**VER - Version****DESCRIPTION**

This command reports the version of the unit. This command is read only.

**ARGUMENT DETAILS**

| <b>Name</b> | <b>Type</b> | <b>Size</b> | <b>Values</b>  | <b>Units</b> |
|-------------|-------------|-------------|--|--------------|
| Value       | String      | 8           | Version of format MM.mm.rr<br>(Sent with a Null in text, value returned) |              |

**TEXT FORM DETAILS**

COMMAND FORM:                    DEVICE **VER** [Value]

**RETURN VALUES**

Unit will return the updated state of the last selection in the same form as the command.

**EXAMPLE**

If the unit has firmware version of 1.0.0, the command returns DEVICE **VER** 1.0.0.

## Appendix D: Warranty and Compliance

Gentner Communications Corporation (Manufacturer) warrants that this product is free of defects in both materials and workmanship. Should any part of this product be defective, the Manufacturer agrees, at its option, to:

A. Repair or replace any defective part free of charge (except transportation charges) for a period of one year from the date of installation for the end-user, provided the owner returns the product to the Manufacturer at the address set forth below. No charge will be made for parts or labor during this period;

B. Furnish replacement for any defective parts in the product for a period of one year from the date of original purchase. Replacement parts shall be furnished without charge, except labor and transportation.

This Warranty excludes assembled products not manufactured by the Manufacturer whether or not they are incorporated in a Manufacturer product or sold under a Manufacturer part or model number.

THIS WARRANTY IS VOID IF:

A. The product has been damaged by negligence, accident, act of God, or mishandling, or has not been operated in accordance with the procedures described in the operating and technical instructions; or,

B. The product has been altered or repaired by other than the Manufacturer or an authorized service representative of the Manufacturer; or,

C. Adaptations or accessories other than those manufactured or provided by the Manufacturer have been made or attached to the product which, in the determination of the Manufacturer, shall have affected the performance, safety or reliability of the product; or,

D. The product's original serial number has been modified or removed.

NO OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR USE, APPLIES TO THE PRODUCT. MANUFACTURER'S MAXIMUM LIABILITY HEREUNDER SHALL BE THE AMOUNT PAID BY THE END-USER FOR THE PRODUCT. No person or entity authorized to assume any obligation or other liability in connection with the products. No action, regardless of form, arising out of or relating to the product or this Warranty, may be brought by end-user more than one (1) year after

the cause of action has accrued.

Manufacturer shall not be liable for punitive, consequential, or incidental damages, expenses, or loss of revenue or property, inconvenience, or interruption in operation experienced by the end user due to a malfunction in the purchased product. No warranty service performed on any product shall extend the applicable warranty period.

In case of unsatisfactory operation, the end-user shall promptly notify the Manufacturer at the address set forth below in writing, giving full particulars as to the defects or unsatisfactory operation. Upon receipt of such notice, the Manufacturer will give instructions respecting the shipment of the product, or such other matters as it elects to honor this warranty as above provided. This warranty does not cover damage to the product during shipping and the Manufacturer assumes no responsibility for such damage. All shipping costs shall be paid by the customer.

This warranty extends only to the original end user and is not assignable or transferable. This Warranty is governed by the laws of the State of Utah, without regard to the conflicts of interests provisions thereof.

Gentner Communications Corporation  
1825 Research Way  
Salt Lake City, Utah 84119

**Warning: The country code settings must be set for the desired country of operation in order to ensure proper operation of the XAP TH2 and to ensure that the XAP TH2 complies with the countries Telco requirements. Changing these settings to a country other than the intended country of operation may cause the XAP TH2 to be non-compliant.**

### **FCC Part 15 Compliance**

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/her own expense.

Changes or modifications not expressly approved by Gentner Communications Corporation could void the user's authority to operate the equipment.

### **FCC Part 68 Compliance**

**FCC Registration Number: US:FBIBROOBXAPTH2 Ringer Equivalence Number (REN): 0.0B(ac)**

A label containing, among other information, the FCC registration number and Ringer Equivalence Number (REN) for this equipment is prominently posted on the top plate, near the rear of the equipment. If requested, this information must be provided to your telephone company. USOC Jacks: This device uses RJ-11C and RJ21X terminal jacks.

The REN is used to determine the quantity of devices, which may be connected to the telephone line. Excessive RENs on the telephone line may result in the devices not ringing in response to an incoming call. In most, but not all areas, the sum of the RENs should not exceed five (5). To be certain of the number of devices that may be connected to the line, as determined by the total RENs, contact the telephone company to obtain the maximum RENs for the calling area.

If this equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. If advance notice is not practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of the equipment. If this happens, the

telephone company will provide advance notice for you to make the necessary modifications in order to maintain uninterrupted service.

If you experience problems with this equipment, contact Gentner Communications Corporation, 1825 Research Way, Salt Lake City, Utah 84119, or by phone at (801) 975-7200 for repair and warranty information. If the trouble is causing harm to the telephone network, the telephone company may request you remove the equipment from the network until the problem is resolved.

No user serviceable parts are contained in this product. If damage or malfunction occurs, contact Gentner Communications for instructions on its repair or return.

This equipment cannot be used on telephone company provided coin service. Connection to Party Line Service is subject to state tariffs.

## **IC Compliance**

**IC Certification Number: 1970 11802**

**Ringer Equivalence Number (REN): 0.0B(ac)**

NOTICE: The Industry of Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective operational and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by Gentner Communications. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

## **Safety Information**

CAUTION: Users should not attempt to make such connections themselves, but should contact the appropriate electrical inspection authority, or electrician, as appropriate.

## European Compliance

This equipment has been approved in accordance with Council Directive 1999/5/EC "Radio Equipment and Telecommunications Equipment"

Conformity of the equipment with the guidelines below is attested by the CE mark.

## EC Declaration of Conformity

**CE** Application of Council Directive(s): 1999/5/EC Radio equipment and Telecommunications Terminal Equipment Directive  
(R&TTE)

Manufacturer's Name: Gentner Communications Corporation  
Manufacturer's Address: 1825 West Research Way  
Salt Lake City, Utah 84119 U.S.A.

Model No.: XAP TH2

### Standard(s) to which Conformity is declared:

#### 89/336/EEC "Electromagnetic Compatibility (EMC) Directive":

|                              |  |
|------------------------------|--|
| EN 55022: 1998 (Emissions)   | Specification for limits and methods of measurement of radio interference characteristics of information technology equipment.                     |
| EN 61000-3-2:1995/A1/A2:1998 | Part 3: Limits – Section 2: Limits for harmonic current emissions.   |
| EN 61000-3-3:1995            | Section 3: Limitation of voltage fluctuations and flicker in low voltage supply systems for equipment with rated current up to and including 16 A. |
| EN 55024: 1998 (Immunity)    | Information technology equipment – Immunity characteristics – Limits and methods of measurement.   |
| EN 61000-4-2: 1995/A1:1998   | Electrostatic Discharge  |
| EN 61000-4-3: 1996/A1:1998   | Radiated RF Immunity   |
| EN 61000-4-4: 1995           | Electrical Fast Transients   |
| EN 61000-4-5: 1995           | Lighting Surge   |
| EN 61000-4-6: 1996           | Conducted RF Immunity  |
| EN 61000-4-8: 1993           | Radiated Magnetic Field Immunity   |
| EN 61000-4-11: 1994          | Voltage Dips and Voltage Interruptions   |

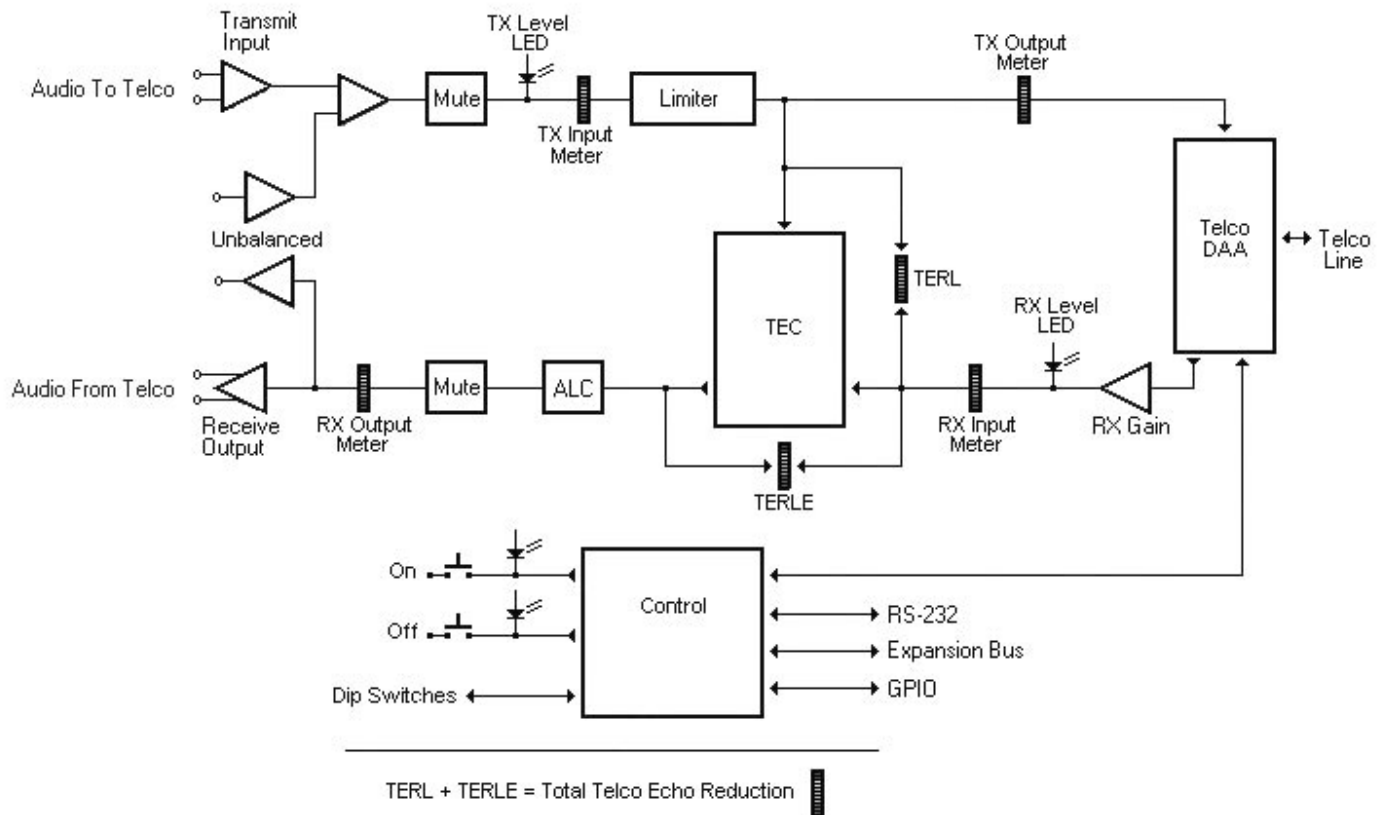
**73/23/EEC "Low Voltage Directive (LVD)":**

EN 60950: 1992                      Safety of Information Technology Equipment, Including  
A1, A2, A3, A4 and A11              Electrical Business Equipment.

**Telecommunications Terminal Equipment:**

CTR21 Attachment requirements for pan-European approval for connection to the Public Switched Telephone Network.

## Appendix E: Block Diagram





# G

# Glossary

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**Acoustic Echo Cancellation (AEC)** A process in which acoustical echo is removed from a signal. AEC can be used to remove unwanted signals from mic audio if the unwanted acoustic signal is available separately as an electronic signal.

**Ambient Noise** The existing room-level noise, such as that caused by ventilation systems, paper shuffling, and background chatter.

**ASCII** The American Standard Code (for) Information Interchange. Standard code for transmitting alphanumeric characters electronically.

**Attenuation** A reduction of signal amplitude.

**Audio Processor** A device that modifies an audio signal in response to certain requirements.

**Automatic Level Control (ALC)** Automatically increases or decreases audio level to maintain a consistent audio level.

**Baud Rate** The number of signal transitions per second, or the clock rate of the serial bit stream in hertz. Given 7 or 8 bits for data plus start and stop, the approximate ASCII character transmission rate is one-tenth the baud rate.

**Clipping** A condition in which a signal level exceeds the maximum level a circuit can handle. This is usually caused by overdriving an input. It always causes distortion and typically leads to listener fatigue and accelerated failure of loudspeaker drivers.

**Compression** An induced reduction in the dynamic range of part or all of an audio signal. Compression is usually used to protect individual loudspeaker components from the damaging effects of transients.

**DSP** Digital signal processor.

**Echo Canceller Reference** The signal point which contains an electronic copy of all signals which will be removed from the signal the mics pick up. This is always the far-end audio and, optionally, local program material.

**Expansion Bus** Consists of two RJ-45 connectors on the rear panel of the XAP TH2. An Expansion Bus allows multiple XAP TH2s to be networked together using category five twisted-pair (10BaseT) cable.

**Gain** The amount a signal is increased over a given reference, typically 0. Normally specified in dB (decibels). On the XAP 800, gain is adjustable from -65 to 20dB (85dB range) in .5dB increments.

**Gain Structure** The configuration of parameters which define gain adjustment of a signal. The optimal input gain setting is one which provides both an adequate signal-to-noise ratio and reasonable headroom.

**GPIO (general purpose input/output)** The Remote port on the rear of the XAP TH2 unit.

**G-Ware Software** The XAP TH2's setup and configuration software.

**Macro** A series of user-created instructions, stored within the unit, which can be executed from an RS-232 command or contact closure.

**Matrix Mixer** A mixer that allows routing of any input or combination of inputs to an output or any combination of outputs. In the case of the XAP 800, the matrix mixer permits level control at each cross point in the matrix.

**Mute** A condition in which an audio signal is attenuated below the audible threshold.

**Reverberation** A diffuse acoustic energy field fed and maintained by sound reflections from the room surfaces.

**Serial Command** A bit description designed to execute an instruction or command.

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