

TECHNICAL NOTE

→ XAP GWARE 125

XAP400 and TH2 Telephone line/switch operating parameters for North America/Brazil/Japan/Mexico/South Africa

Introduction

This document outlines the parameters of the analog line that are required for correct operation of a XAP product in the North America/Brazil/Japan/South Africa country code setting. Parameters that are outside of the optimal performance range may or may not yield satisfactory operational results depending upon the environment and how the device is used.

The XAP TH2 and XAP 400 products interface to the public switched telephone network to provide audio for a hands-free conferencing environment. They are designed to work with analog telephone lines using loop signaling provided by a public switched network provider, referred to as a POTS (Plain Old Telephone Service) line. All parameters (levels, impedance, etc.) of this type of phone line are defined and regulated by the FCC. Any devices, such as the XAP TH2/XAP 400, that connect to this type of phone line must be FCC compliant.

Telco Line Parameters

Table 1 outlines the operating limits and the range where optimal performance is achieved for the telco line parameters to work with the XAP 400 and XAP TH2. All data assumes 48V.

→ Table 1

Recommended setting for Non-Linear Processing (NLP)

AC Characteristics	Operating limits		Optimal performance	
	Min	Max	Min	Max
Loop Impedance	200 Ohms	2500 Ohms	300 Ohms	900 Ohms
Loop Loss		25 dB		10 dB
Receive signal level		-1 dBu	-10 dBu to -20 dBu average speech level	
Maximum transmit level ¹		-1 dBu		
Longitudinal balance ^c			>50 dB	
Crosstalk ²			>50 dB	
Distortion ²			>50 dB	
Noise ²		25 dBmC		15 dBmC
Frequency response			200 Hz–3.5 kHz +/- 3 dB	
Echo delay ³	0 mS	20 mS		5 mS
DC Characteristics	Operating limits		Optimal performance	
	Min	Max	Min	Max
DC voltage ⁴	20 V	70 V		
Polarity	Independent			
On hook current	7 uA			
Off hook current (loop current)	15 mA	120 mA	20 mA	100 mA
Signaling	Operating limits		Optimal performance	
	Min	Max	Min	Max
Ring voltage ⁵	24 Vrms	120 Vrms		
Ring frequency ⁵	15 Hz	80 Hz		
Dial tone detection window ⁶	320 Hz – 450 Hz			
Hook Flash detection at switch ⁷	10 mS less than selection on			
Minimum DTMF detection duration		140 mS		
DTMF detection frequency tolerance	+/- 1.5% of nominal frequency values			

Table 1 Notes:

1. Transmit level is measured at RJ-11 interface, 48 VDC supply with 600 Ohm line impedance.
2. Specification applies across in band frequencies.
3. Assumes 6 dB of echo attenuation.
4. Minimum voltage requirement is measured at RJ-11 connector while unit is on hook. Minimum voltage required at the switch will vary with loop length.
5. Ring requirements are required in order for the unit to indicate a ring.
6. The frequency of all dial tone signals must be contained within the limits in order for dial tone detection to operate.
7. Hook flash tolerance applies to the current user selection.

Physical characteristics of the RJ-11 connector

The physical characteristics of the RJ-11 connector are show in Table 2.

→ Table 2

RJ-11 Connector Physical Characteristics

Pin 1	Not Used
Pin 2	A-Lead
Pin 3	Tip
Pin 4	Ring
Pin 5	A-Lead
Pin 6	Not Used

→ CLEARONE LOCATIONS

Headquarters:
Salt Lake City, UT USA
1825 Research Way
Salt Lake City, UT 84119
Tel: 801-975-7200;
800-945-7730
Fax: 801-977-0087
sales@clearone.com

Champlin, MN USA
Tel: 801-942-3776
sales@clearone.com

Latin America Offices
Tel: 801-974-3621
global@clearone.com

London, UK
Tel: 801-974-3792
global@clearone.com

Hong Kong
Tel: 801-303-3441
global@clearone.com

Singapore
Tel: 801-303-3495
global@clearone.com