

TECHNICAL NOTE

→ MAX 104

Using the North America MAX Wireless on a PBX line

Introduction

This document outlines the parameters of the analog line that are required for correct operation of the MAX Wireless on a PBX line in the US/Canada country code settings. 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 MAX Wireless conference phone is designed to work with analog telephone lines using loop signaling provided from a public switched network provider. This is also referred to as a POTS (Plain Old Telephone Service) line. It is also possible to interface the MAX Wireless to an analog extension provided by a Private Branch Exchange or PBX. The internal line parameters of the PBX are proprietary. This can result in a wide variety of levels and impedances, which may result in less than optimal performance of the MAX Wireless. Some side effects may include low transmit level, distorted receive audio and in extreme cases, intermittent side-tone or ringing (usually at the beginning of every call).

Description

Table 1 outlines the limits within which the Max Wireless will operate and range where optimal performance is achieved. All data assumes 48V.

→ Table 1

| AC Characteristics | Operating limits | | Optimal performance | |
|--|-------------------------------|-----------|-------------------------------------|----------|
| | Min | Max | Min | Max |
| Loop Impedance | 150 Ohms | 2000 Ohms | 600 Ohms | 900 Ohms |
| Loop Loss | | 25 dB | | 10 dB |
| Receive signal level | | +1 dBu | -10 dBu-20 dBu average speech level | |
| Maximum transmit level ¹ | | +1 dBu | | |
| Longitudinal balance ² | | | >50 dB | |
| Crosstalk ² | | | >50 dB | |
| Distortion ² | | | >50 dB | |
| Noise ² | | 27 dBmC | | 15 dBmC |
| Frequency response | | | 200 Hz-3.5kHz +/- 3dB | |
| Echo Delay ³ | 0 mS | 20 mS | | 5 mS |
| DC Characteristics | Operating limits | | Optimal performance | |
| | Min | Max | Min | Max |
| DC Voltage ⁴ | 15 V | 120 V | | |
| Polarity | Independent | | | |
| On hook current | 7 uA | | | |
| Off hook current (loop current) | 10 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 | 60 Hz | | |
| Dialtone detection window ⁶ | 328 Hz - 466 Hz | | | |
| Hook Flash detection tolerance at switch for selected hook flash time ⁷ | - 12 mS | +12 mS | | |
| Minimum DTMF detection duration | | 100 mS | | |
| DTMF detection frequency tolerance | +/- 1.5% of nominal frequency | | | |

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 R-J11 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.
8. All specifications are subject to change without notice.

Physical characteristics of the RJ-11 connector

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

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