

Application Note 110:

Teltone Simulators and 600- vs. 900-Ω Line Impedance

Impedance is the opposition of current flow offered by an electronic component, circuit, or system — based on resistance and reactance and measured in ohms (Ω). This document discusses the use of 600- versus 900- Ω line impedance and testing with Teltone simulators. It also covers the input line impedance of the central office switch and the significance of FCC-Part 68 and supporting Bellcore (now Telcordia) documentation.

Central Office Input Impedance

When establishing a path through a switch in North American central offices, the common input line impedance for two-wire analog loop-start (POTS [plain old telephone service]) lines is 900 Ω . Teltone TLSs (Telephone Line Simulators) all use the 900- Ω standard.

The common input line impedance for four-wire analog trunks is 600 Ω . Teltone's TLE (Telephone Line Emulator) has the ability to be set to 600 Ω as well as to its default 900 Ω .

Bellcore Standard

Bellcore's LSSGR TR-TSY-000507 Issue 2, July 1987, Table 7.4-B states the specific input impedances for two-wire and four-wire near-end interfaces. This table is referenced in Section 7.4.2.1, Input Impedance Requirements for Digital End Offices.

FCC Part 68 Testing

FCC Part 68 focuses on testing terminal equipment for connecting to the PSTN (public switched telephone network). Load impedances for FCC Part 68 focus exclusively on signal level measurement. The impedance referenced in all the documents is specifically for standardizing test results. For example, a 600- Ω load is often used to standardize signal level measurement, where 0.775 V equals 0 dBm. References to actual central office input impedance do not appear in the documents and do not apply to the impedance specifications of Teltone simulators.

Summary

The common input impedance for POTS lines on North American switches is 900 Ω and supporting documentation can be found in Bellcore recommendations. This specification is used for Teltone's TLSs and the default setting for Teltone's TLE. FCC Part 68 does not address the specific input impedances of central office switches.