

Model 3540 Version 2: Telephone Network Emulator and Voiceband Analyzer



The Model 3540 is an advanced test instrument that combines central office simulation, Caller ID / SMS generation, analog network emulation, and key measurements for testing smart phones, modems, gateways, and VoIP products - all in a single platform.

The 3540 has broad application in R&D, quality assurance, manufacturing, and service of international telephony products.

The Model 3540 is a rugged DSP-based instrument that offers two channels, configured as FXS or FXO, for full network emulation and testing of telephony products. The flexible design permits generation of virtually any level, frequency and timing of network tones or SMS, Caller ID, FSK, noise, and voice signals. A suite of analog measurements allows in-depth performance evaluation of units under test.

The Model 3540 includes a PC-based Windows 98SE/2000/ME/XP application program that allows quick device configuration based on over 30 countries. Menu options permit easy customization of any signaling parameter. A powerful scripting language allows test sequencing for automated operation.

Network Emulation:

- ✓ Selectable CO line voltage and source impedance
- ✓ Programmable ringing and call progress tones
- ✓ SMS, Caller ID, and FSK signal generation and decoding
- ✓ Transmit/Receive attenuation and noise generation
- ✓ Return loss, talker echo, and listener echo simulation
- ✓ Terminal Equipment on-hook and off-hook simulation

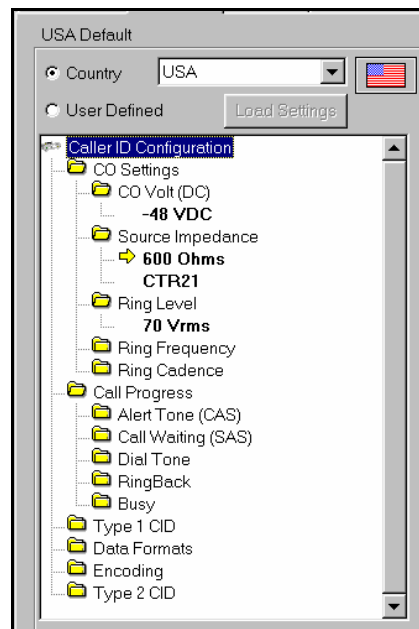
Test and Measurement:

- ✓ International SMS and Caller ID decoding and analysis
- ✓ Receive signal level and noise level
- ✓ Active speech level (as per ITU P.56, method B)
- ✓ FSK decoding and DTMF decoding & analysis
- ✓ Frequency sweep and single frequency response
- ✓ DTMF, MF, and programmable tone generation
- ✓ Audio recording and playback of signals and events

Key Applications:

The flexible design of the Model 3540 hardware and software insures instrument portability across a wide range of product development and test applications, including:

- ✓ Research and development of equipment, components, and systems
- ✓ Design verification and quality assurance testing of new products
- ✓ Product evaluation and compliance testing of new and mature products
- ✓ Manufacturing test in both a single station and automated test environment
- ✓ On-site and outsourced product repair and upgrade service
- ✓ Product performance monitoring under network conditions





Model 3540 Specifications

(Applicable accuracy is given in parentheses)

Central Office (FXS) Emulation

- Type
- Source Impedance
- CO Voltage
- Ringing Voltage
- Transmitted Idle Channel Noise

Either or both channels

Two-Wire, Loop Start
Selectable 600 Ohms or CTR21 Complex
Programmable -15 to -48 VDC
10 to 90 Hz, 10 to 90 Vac RMS (+/- 2 Vac)
< 10 dBrnC

Terminal Equipment (FXO) Interface

- Type
- Off-hook Impedance
- On-hook Impedance

Either or both channels

Two-Wire, Loop Start DAA, FCC Part 68
600 Ohms
>6 M Ω for Caller ID and Audio Monitoring

FSK Signal Generation and Detection

- FSK Modem Standards
- Transmit Range
- Receive Detection Range

Bell 202 and ITU V.23 in Simplex or Half-Duplex Modes
-50 to +2 dBm (+/- 0.5 dB)
-30 to +2 dBm with SNR >14 dB

USB Digital Audio Processor

- Type
- Frequency Characteristics
- Audio Format
- Audio Record Sources
- Audio Playback

Full-Duplex Stereo Record and Playback
Flat, 200 to 10000 Hz (+/- 0.5 dB, 300 to 4000 Hz)
22 kHz Sampling Rate, 16-Bit PCM
Channel A/B/Bridge (left), Channel A/B/Bridge (right)
Channel A (left stereo channel), Channel B (right)

Measurements

- Signal Conversion
- Receive Signal Level
- Speech Level
- Idle Channel Noise

- DTMF Analysis
- Programmable Tones

- Noise Generation

Calibrated 16-bit A/D Converter and 14-Bit CODEC
10 to 10000 Hz (+/- 0.5 dBm, 300 to 4000 Hz)
ITU P.56 method B (+/- 0.5 dBm, 300 to 4000 Hz)
C-Message and D Filters with 1010 Hz Notch Option, as
per IEEE 743-1995 (+/- 1.0 dB)
Level (+/- 0.5 dB), Twist (+/- 1 dB), Duration (+/- 2 ms)
4 tones: 10 to 10000 Hz (+/- 1 Hz), -50 to +2 dBm (+/- 0.5
dB, 300 to 4000 Hz), Duration 1 to 64000 mS
Pseudo-random, Flat (+/- 0.5 dB, 300 to 4000 Hz)

Network Emulation

- Attenuation
- Return Loss
- Talker & Listener Echo Level and Delay

0 to 50 dB (+/- 1 dB, 300 to 4000 Hz.)
12 to 24 dB (+/- 2 dB, 300 to 4000 Hz.)
-50 to 6 dB (+/- 2 dB, 300 to 4000 Hz.), 5 to 100 mS

Host PC and Interface

- Recommended speed
- Operating Systems
- USB Type

500 MHz or higher
Windows™ 98 Second Edition, 2000, ME, and XP
Version 1.1-compatible (12 MHz full speed)

Mechanical

- Size and Weight
- Operating Temperature
- AC Power

25 x 33 x 7 cm (10" x 13" x 2.75"), 3.6 kgs (8 lbs)
10°C to 40°C (50°F to 104°F)
100 to 240 VAC, 50 to 60 Hz, 1.5A Max.

Note: Specifications are subject to change without notice.