

# TC-3000A Bluetooth Tester

## Product Description

TESCOM's TC-3000A Bluetooth Tester combines all of the necessary features required for testing Bluetooth modules and products in a single unit. Designed for applications in R&D, manufacturing, QA, and service, this versatile instrument is also lightweight and portable, and may be operated from all standard AC supplies. In addition to Bluetooth testing applications, TC-3000A may be used as general-purpose RF source and receiver for testing certain transceivers in 2.4GHz ISM band.



### System Architecture:

TC-3000A is made up of two parts, an RF/DSP module and a host CPU module, connected by host control interface (HCI) and borrowing the same system concept of Bluetooth. The RF/DSP module provides RF interface to DUT, performs physical measurements and manages the Bluetooth link. The internal host CPU (PC), which runs on a Linux platform, takes care of user interface (UI) functions, including display, key input and I/O controls (including RS-232C, USB, PCMCIA, LAN and other standard peripheral devices). Adopting open OS minimizes unnecessary constraints on system optimization. This simple, elegant system architecture takes advantage of high-performance DSP and the conveniences of PCs.

### Protocol Stack:

TC-3000A bluetooth protocol stack is developed from the ground up in order to gain total control of performance and the feature set of the tester. Unique protocol stack architecture, using 'queues' between protocol layers, is conceptually simple and easy to apply. This approach helps guarantee the quality of the system, as well as efficient handling of future customization and enhancement requirements.

### Versatility of TC-3000A:

TC-3000A can interface with DUT through most known interfaces. Another feature is that the RF/DSP module can relinquish the control to external PC through standard HCI, allowing a Bluetooth development environment.

### Speed test mode:

It is essential to minimize the test time in manufacturing. TC-3000A has the capability of skipping time-consuming INQUIRY procedure by reading the Bluetooth device (BD) address directly through HCI. Test configuration can be customized to reduce the number and time of tests.

## Key Features

- PC based versatility:
  - Provides UI functions including display, key input and I/O controls.
  - Control of the DUT through RS-232, USB, PCMCIA and other peripheral devices.
- Bluetooth specification: All the measurements follows the Bluetooth test specification:
  - RF test cases: RF power, frequency, spectrum, modulation and receiver sensitivity.
  - Baseband test cases for access procedures (inquiry and paging).
- Speed test mode: Enabling test mode through HCI. Test parameters may be customized to reduce test time (e.g. inquiry procedure may be skipped by reading the BD address).
- OTA(over the air) test mode.
- Communication with the tester through TCP/IP LAN or high performance RS-232C.
- User-friendly GUI: Easy to change test control using soft keys.
- Complete HCI test options: USB, RS-232 and PCMCIA ports.
- High accuracy digital signal generation and detection
- Digital signal generator
- DSP-based high performance receiver
- Spectrum and modulation analysis
- Power versus time analysis

## Specification

### Signal Source

#### Frequency

- Range: 2.4GHz ~ 2.5GHz
- Accuracy:  $\pm 46\text{Hz} + \text{Frequency Reference Drift}$
- Resolution: 1 KHz
- PLL Settling Time:  $<150\mu\text{s}, \pm 75\text{kHz}$  of the final frequency

#### Level

- Range: 0 ~ -80dBm
- Accuracy:  $\pm 1\text{dB}$
- Resolution:  $\pm 0.1\text{dB}$

#### Modulation

- GFSK
- Modulation Index 0.20 ~ 0.50
- Mod index resolution: 0.01
- Mod index accuracy: 1KHz
- Baseband filter:  $\text{BT}=0.5$

## Signal Monitor

### Frequency

- Range: 2.4GHz ~ 2.5GHz
- Accuracy:  $\pm 46\text{Hz}$  + Frequency Reference Drift
- PLL Settling Time:  $<150\mu\text{s}$ ,  $\pm 75\text{KHz}$  of the final frequency
- Resolution: 1 KHz

Measurement Channel Bandwidth: 10MHz

### Level

- Input Range:  $+20 \sim -80\text{dBm}$ ,
- Absolute Max:  $+25\text{dBm}$
- Accuracy:  $+20 \sim -60\text{dBm}$ ,  $\pm 1\text{dB}$ , 0.1dB resolution  
 $-60 \sim -80\text{dBm}$ ,  $\pm 2\text{dB}$ , 0.1dB resolution

### Receiver Sensitivity Test

- BER measurement range: 0.00% ~ 100%
- Transmitter output range:  $0 \sim -80\text{dBm}$

### Modulation Measurement

- Modulation: FM, GFSK
- Deviation range:  $0 \sim 1\text{MHz}$
- Deviation Accuracy: 1KHz
- Carrier Frequency Drift:  $0 \sim 200\text{KHz}$ , for  $>20\text{KHz}/50\mu\text{s}$
- Initial Frequency Error:  $0 \sim \pm 150\text{KHz}$

### Frequency Standard Accuracy

- Internal Frequency Reference: 12.8MHz
- Temperature Stability:  $\pm 1\text{ppm}$ ,  $-20 \sim 70^\circ\text{C}$
- Aging: 0.5ppm/year

Symbol Timing Measurement Error:  $\pm 20\text{ppm}$

## Miscellaneous

Impedance: 50 ohm nominal, VSWR  $<1.5$

Operating temperature:  $5 \sim 40^\circ\text{C}$

I/O Interface: RS-232C, USB, PCMCIA, LAN

Line Voltage: 100 to 240 VAC, 50/60Hz

Dimension: 345(w) x 432(d) x 220(h) mm

Weight: 9Kg

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT PRIOR NOTICE