



### General Description

The Data Sentry 10 is a microprocessor-based Data Communications Analyzer which evaluates the performance of virtually all network components including data communications links, terminals and communications equipment. The Data Sentry 10 performs many data circuit tests and functions including error analysis, message generation and analysis, data trapping, distortion and delay measurements, clock frequency measurements and voice frequency measurements.

### Applications

The Data Sentry 10 serves the low and medium speed data communications markets, performing synchronous and recovered clock testing from 10 b/s to 500 kb/s and asynchronous testing from 10 b/s to 20 kb/s in either full or half duplex modes. The Data Sentry 10's versatility allows it to test modems, time division and statistical multiplexers, terminals, printers and a variety of other network components. These capabilities, in combination with complete remote control through the RS-232, IEEE-488 or HP-IL control/printer interfaces, make the Data Sentry 10 superior for automated production test as well as remote, unattended communications analysis.

### Applications

- Production line testing of communication equipment, such as multiplexers, modems and terminals.
- Automatic analysis of communication links.
- Testing of primary and secondary data channels.
- Optional voice frequency testing for the measurement of analog transmission impairments.
- Remote and automatic testing via RS-232, IEEE-488 or HP-IL control interfaces.
- Data trapping.
- Long-term unattended testing with printout.

### Key Features

- Synchronous and recovered clock testing from 10 b/s to 500 kb/s; asynchronous testing from 10 b/s to 20 kb/s.
- Three alpha-numeric displays allow correlation of voice frequency, signal analysis and error analysis test results.
- Data output of pseudorandom and fixed patterns, FOX message and four 200-character user messages programmable in any 5- to 8-level code.
- Telegraph, jitter, start/stop, and bias distortion measurements.
- Time delay measurements between transitions of selected data or signalling leads.
- Instrument set up, all user programs and user messages retained with power off.
- Operator selected preamble and data trap sequences.
- Automatic self-test on power-up and manual loopback testing.
- Battery back up of internal date generator and real-time clock.

**...EXPECT EXCELLENCE**

## Data Sentry 10 Functions and Specifications

### Operating Modes:

Full duplex, half duplex continuous, half duplex single, single transmit and self test mode.

### Timing:

Synchronous, recovered clock and asynchronous.

### User Messages:

1- to 4-character Preamble, 1- to 4-character trap sequence and four 1- to 200-character messages in any 5- to 8-level code.

### User Programs:

Ten programmable sets of front panel control settings including transmit and receive frequency synthesizer, trap, preamble and auxiliary parameters.

### Non-Volatile Memory:

All user programs, user messages, preamble, trap sequence and current front panel control setting retained.

### Keypad:

Twenty key keypad for parameter entry.

### Receive Modes:

Error analysis and trap.

### Interface emulation:

DTE or DCE.

### Bit Rate:

Synchronous and recovered clock from 10 b/s to 500 kb/s; asynchronous from 10 b/s to 20 kb/s.

### Clock Sources:

Internal frequency synthesizer, through the data interface module received clock and external BNC.

### Frequency Synthesizer:

User selected 10 Hz to 500 kHz,  $\pm 35$  ppm ( $\pm 7$  ppm optional) with resolution to 4 digits. External output via BNC.

### Code Levels:

Any 5- to 8-level code.

### Parity Select:

Odd, even or none

### Asynchronous Stop Bit Select:

1, 1.5 or 2.

### Test Data Generation:

63, 511, 2047, 4095 pseudorandom patterns, constant mark, 1:1 and repeating 5-to 8-bit character.

### Test Messages:

FOX and four user messages up to 200 characters in length in any 5- to 8-level code.

### Preamble:

Up to 4 user-selected characters preceding each transmission of character formatted data.

### Data Inversion:

Available by Auxiliary function for either transmit or receive data.

### Error Insertion:

Single error or a constant  $1.0 \times 10^{-3}$  error rate.

### Full Duplex Error Analysis:

Errors, bit error rate, blocks, block errors, seconds of test, error-free seconds, character errors and clock slips.

### Half Duplex Error Analysis:

Errors, blocks analyzed, blocks, block errors, seconds, preambles missed and character errors.

### BER Measurement Interval:

$10^3$ ,  $10^4$ ,  $10^5$ ,  $10^6$ ,  $10^7$ , and  $10^8$  bits.

### BER Range:

$0 \times 10^{-8}$  to  $1.0 \times 10^{-9}$ .

### Block Length:

Equal to pattern or message length or may be set from 63 to 65,535 bits.

### Frequency Measurements:

10 Hz to 500 kHz  $\pm 35$  ppm ( $\pm 7$  ppm optional) over 1, 10 or 100 seconds to 1, 0.1 or 0.01 Hz resolution.

### Telegraph Distortion Measurements:

Peak, jitter and stop-start from 10 to 9999 b/s scaled from 0 to 50% early and 0 to 50% late over a 2 second period with 1% resolution. Maximum values since start of test are also displayed every 10 seconds.

### Bias Distortion Measurements:

From 10 to 500,000 b/s scaled from 100% Mark (all Mark) to 100% Space (all Space) with 1% resolution.

### Delay Measurement:

Starts on rising or falling edge of DTR, DSR, RTS, CTS, CD, generated data, generator activity, X input. Ends on rising or falling edge of DTR, DSR, RTS, CTS, CD, receiver data, trap character detect, Y input. Range is from 0 to 9999 ms.

### Data Trapping:

User selected 1- to 4-character trap sequence in any 5- to 8-level code traps 128 characters preceding and following the trap sequence in memory for all timing modes, or traps the first 255 received characters.

### Power:

Selectable 100/120/220/240 Vac  $\pm 10\%$ , 48 to 66 Hz.

### Size:

17 1/4" (43.8 cm) W x 13 1/2" (34.3 cm) D x 5 1/4" (13.3 cm) H

### Weight:

Approximately 18 lbs. (8.2 kg) with all options.

### Environmental:

0° to 45°C operating range, -30° to 75°C storage.

### Data Interfaces:

RS-232-C/V.24, V.35/306 and RS-449/MIL-188-114/MIL-188C.

### Remote Control Interfaces:

Serial RS-232 ASCII, IEEE-488 and HP-IL.

## Voice Frequency Measurement Module Specifications

(North American version complies with Bell publication 41009)

### VF Transmitter:

Output impedance: 600 ohms balanced with  $> 30$  dB return loss

Frequency range: 200 to 3906 Hz

Accuracy:  $\pm 1$  Hz

Output level: +10 to -40 dBm in 1 dB increments

Level accuracy:  $\pm 0.2$  dB

Sweep range: 204 to 3904 Hz, 100 Hz per step with 4 Hz offset and 7 second duration per step

Selectable frequency skip: omit 2504, 2604 and 2704 Hz

### VF Receiver:

Input impedance: 600 ohms balanced with  $> 30$  dB return loss or high impedance (bridging)

### Level measurements:

Range: 80 to 4000 Hz

Frequency dynamic range: +10 to -40 dBm

### Accuracy:

$\pm 0.2$  dB from 200 to 4000 Hz;

$\pm 0.5$  dB from 80 to 200 Hz;

$\pm 0.1$  dB at 1000 Hz, 0 to -19 dBm

Detector type: averaging.

### Noise measurements:\*

Filter type: selectable 3 KHz flat, C-Message, or C-Message with 1010 Hz notch.

Dynamic range: -75 dBm (15 dBm) to +10 dBm (100 dBm).

Accuracy:  $\pm 1$  dB

Detector type: RMS

### Frequency measurements:

Range: 80 to 4000 Hz

Dynamic range: +10 to -40 dBm

Accuracy:  $\pm 1$  Hz

\*Psophometric measurements with 820 Hz notch available for CCITT.