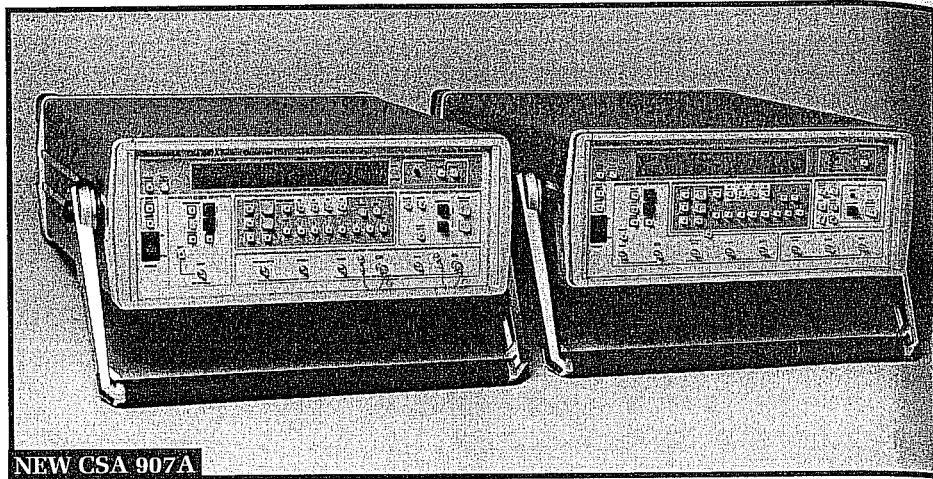


FDDI, SDH,
SONET
Pattern
Generation

CSA 907A

- SDH/SONET and FDDI pattern generation
- 150 KHz to 700 MHz internal PLL clock source
- PRBS patterns: $2^{(7,15,17,20,23)} - 1$
- Optional 128K bit programmable word memory
- PC based frame editing software for added versatility
- Error injection: single errors, selectable error rate, or gated errors
- Differential and single ended inputs
- External reference data input for user generated patterns
- Automatic data/clock setup
- Versatile Bit Error Rate measurements and analysis
- Centronics, RS-232 and GPIB (IEEE-488.2) remote interfaces
- ECL, PECL and programmable voltage levels



NEW CSA 907A

CSA 907A

The CSA 907A Bit Error Rate Tester is a stimulus-response system that features a high-speed serial pattern generator, the CSA 907A TX, and a companion error detector, the CSA 907A Rx. Each unit is portable, and can be used in a lab, production testing, or field environment. The CSA 907A Bit Error Rate Tester can be used to evaluate transmission quality of high speed modules and systems for a variety of testing applications including SDH/SONET, FDDI, and satellite communications.

Along with the CSA 803 Communications Signal Analyzer, and a full line of optical test products, a complete SDH/SONET/FDDI Standards Test System is formed to verify compliance to physical layer standards for bit error rate, noise, jitter, and mask templates. See page 224 for more information.

DATA PATTERN GENERATION

Pseudo Random Bit Sequence patterns (PRBS) simulate real data and are important in order to make statistical measurements such as error rate, jitter and noise on communication devices, modules and systems. The CSA 907A Tx has the ability to generate five PRBS patterns that include $2^{(7,15,17,20,23)} - 1$. In addition, single errors, a programmed error rate, or burst errors can be transmitted in the data stream for continuity checks and system stress evaluation. In addition to the PRBS patterns, the CSA 907A features ten 16 bit programmable words.

FDDI/SDH/SONET PATTERN GENERATION

For long word lengths, the Framewriter software package, together with an 128K extended memory option provide the tools to make application specific or user defined patterns. Applications include the ability to send 20 contiguous STS-1 patterns, up to 6 contiguous STM-1/STS-3c patterns, or a single STM-4/STS-12c pattern. To insure test repeatability the extended memory option also features 10 fixed ROM based patterns:

- FDDI: 4B/5B NRZ pattern, 4B/5B NRZ-I pattern
- SDH: STM-1 pattern, STM-1 scrambled pattern
- SONET: STS-1 pattern, STS-1 scrambled pattern, 4 STS-1 patterns, 4 STS-1 scrambled patterns, STS-3 pattern, STS-3 scrambled pattern

DATA PATTERN EDITING SOFTWARE

A menu driven IBM-PC compatible software package, "FrameWriter™", is provided with the CSA 907A. FDDI, and SDH/SONET patterns are easily created and edited on a computer or controller external to the CSA 907A, and then down-loaded to the CSA 907A through the GPIB interface. These signal frames can then be quickly and reliably recalled with a single front panel button on the CSA 907A or recalled automatically under program control.

VERSATILE CLOCKING SOURCES

The CSA 907A has an internal PLL clock source that transmits patterns at speeds of 150 KHz to 700 MHz, thereby eliminating the need for an external clock synthesizer. The clock source has a resolution of 1 KHz and 10 ppm stability. This extra resolution is especially important in:

- SDH/SONET applications where frequencies are allocated in increments of 10KHz
- Testing a clock recovery circuit where the user wants to sweep across the bandpass of the PLL to check lock-in and hold ranges.

To order, contact your local sales office (listed on the inside back cover) or call the National Marketing Center at 1-800-426-2200, Ext. 99.

GPIB
IEEE-488

The CSA907A complies with IEEE Standard 488.2-1987, and with Tektronix Standard Codes and Formats.

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www.accusrc.com

Ten commonly used frequencies can be stored and later recalled for repeatability and standards compliance testing. For applications where the test is to be performed using a known reference clock, the CSA 907A Tx has the ability to accept an external clock input. The external clock input can be used to inject jitter in conjunction with an external signal generator. The CSA 907A Tx external clock input is conditioned to accept a clock burst, and output a pattern with periods of no data (burst mode). The CSA 907A Rx can recognize the pattern with periods of no data without losing synchronization. The burst mode simulates communication and telemetry systems that often send data in "bursts" with variable times of inactivity between bursts.

AUTO SET AND SYNC

The CSA 907A "auto-set" synchronization feature allows effortless system setup and operation. The "auto-set and sync" feature simplifies adjusting multiple input parameters by providing automatic clock /data threshold level, clock to data phase adjustment, appropriate data pattern selection (and polarity), and bit synchronization to data patterns. These powerful automatic synchronization features allow the user to immediately perform a wide range of tests on systems and components.

VERSATILE MEASUREMENT AND ANALYSIS

The CSA 907A allows a wide range of concurrent Bit Error Rate measurements and analysis for fully characterizing and testing communication devices, subsystems, and links. In addition to total errors and error rate, the Error Detector measures errors in a programmable time, bit length, or sliding window. Report printouts are available both at end-of-test, and when exceeding a user defined error threshold.

EXTERNAL REFERENCE DATA

The external data reference mode in the CSA 907A allows the user to measure and analyze transmission errors for virtually any user generated data pattern. It is useful when evaluating the performance of a component or system against a user supplied reference data. Delay compensation up to 4 nanoseconds, data threshold adjust, and input termination voltage selection is also possible with the external reference data input.

OPERATIONAL SUPPORT

For test repeatability and programmed control, the CSA 907A supports both RS-232 and IEEE-488.2 GPIB (with Tektronix Standard Codes & Formats) remote interfaces. The battery backed-up non-volatile RAM memory provides storage of ten 16 bit word patterns, eight 128K bit word patterns (optional), 10 clock frequencies, error measurements and unit setup for loss of power conditions. The Error Detector provides monitor outputs for viewing eye diagrams on the CSA 803 and CSA 404 Communication Signal Analyzers. The rear panel has specialized inputs and outputs for customized data generation and BER measurements.

Characteristics

CSA 907A TX PATTERN GENERATOR

Frequency Range: - 150 KHz to 700 MHz (Mbit/s) with internal or external clock.

Resolution - 1 KHz with 10 ppm stability.

Frequency Memory - 10 frequencies.

External Clock Input - Selectable termination: (50 Ω to GND, or 50 Ω to -2 V) DC coupled, 1.4 Vp-p.

Data Output Formats - NRZ, Normal and complement; PRBS patterns and programmable WORD.

PRBS Patterns - 2^(7,15,17,20, or 23)-1.

Maximum WORD Length - 16 bits (128K pattern memory optional).

WORD Memories - 10 x 16 bits (8 x 128K bits optional).

Data and Clock Outputs - 50 Ω true and complement (differential); Amplitude: 500 mVp-p to 2 Vp-p into 50 Ω ; Baseline Offset: -2.0 V to +1.8 V (50 Ω to GND), -3.0 V to +0.8 V (50 Ω to -2 V), -0.5 V to 3.3 V (50 Ω to +3 V); Rise/Fall Times: 200 ps, typical @ 1 Vp-p.

Internal Error Injection - 1 x 10^{-3, 4, 5, 6} or 7 rate.

External Error Injection - 1 error injected for each rising edge, ECL.

Auxiliary Outputs - Clock/4 and pattern sync; 500 mVp-p into 50 Ω centered to GND.

CSA 907A RX ERROR DETECTOR

Frequency Range - Clock Input: 150 KHz to 700 MHz; Data Input: 150 Kbit/s to 700 Mbit/s.

Error Measurements and Analysis -

Measurements: BER, total errors; Sliding BER Window: *Time* - 1 second to 24 hours, *Bits* - 1 x 108 to 1 x 1016; Error Analysis: Error Seconds, Error Free Seconds, Severely Error Seconds, Degraded Minutes, Unavailable Seconds, Loss Of Signal, Threshold Error Seconds.

Clock, Data and Data Reference Inputs -

NRZ, RZ, Normal and complement (data only); Input Threshold: -2 V to +4 V (50 Ω to GND), -3 V to +3 V (50 Ω to -2 V), -1.5 V to +4.5 V (50 Ω to +3 V); Input Amplitude: 0.5 to 6.0 Vp-p; Impedance: 50 Ω , selectable terminations (GND, -2 V, +3 V, or floating); Delay Range: 0 to 4 ns, variable.

Monitor Outputs - Pattern sync, clock, data, and error; DC coupled, 500 mVp-p centered on GND.

CSA 907A TX/CSA 907A RX GENERAL SPECIFICATIONS

Front Panel Connectors - SMA female.

Power Requirements - 90 to 132 VAC, or 180 to 264 VAC, 47 to 63 Hz, 100 VA max.

Operating Temperature - 0 to 50° C.

EMI - Complies with FCC A and VDE B specifications.

PHYSICAL CHARACTERISTICS

Dimensions	mm	in.
Width	366	14.4
Height	152	6
Depth	340	13.4
Weight \approx	kg	lb
Net	10.9	24

ORDERING INFORMATION

- CSA 907A**
 Bit Error Rate Tester\$36,990
Includes: Pattern Generator, Error Detector, CSA 907A User Manual (P/N 070-8685-00), CSA 907A Programmer Manual (P/N 070-8686-00), "FrameWriter" IBM-PC compatible software frame editing package.
INSTRUMENT OPTIONS
Opt. 1R - Rackmount+\$590
Opt. 5D - 75 Ω termination+\$1,995
Opt. 6D - 128K Ext. Patt. Memory (Tx & Rx).....+\$13,000

- Opt. 7D** - 128K Ext. Patt. Memory (Tx).....+\$6,500
Opt. 8D - 128K Ext. Patt. Memory (Rx).....+\$6,500
Opt. 9R - Delete Error Detector-\$13,000
Opt. 9T - Delete Pattern Generator.....-\$15,000
Opt. 94 - Statement of Conformance.....N/C
INTERNATIONAL POWER PLUG OPTIONS
Opt. A1-A5 - Available. See General Customer Information Section for additional description.
Plotter - Order HC100 with Opt. 01\$1,180
Cart - Order K218.....\$695

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