



Communications Signal Analyzer

CSA 803C

Features

Applications

CSA 803C

- DC to 50 GHz with up to 12.5 GHz Trigger Bandwidth
- Design and Evaluation of Datacomm/Telecomm Components, Transceiver Subassemblies, and Transmission Systems.
- Fully Automatic Jitter, Noise, and Extinction Ratio Measurements
- Normal, Infinite, Variable Persistence, and Color Graded Display Modes
- Compatible with Optional O/E Converters
- Automatic Measurements on Eye-diagrams
- Time and Voltage Histograms
- Automated ITU/ANSI Mask Testing with 47 Predefined Standard Masks

Digital Communications Analysis Solutions

Specifically designed for communications applications, the CSA 803C Communications Signal Analyzer is the ideal tool for design and evaluation of datacomm/telecomm components, transceiver subassemblies, and transmission systems.

The CSA 803C oscilloscope generates measurement results, not just raw data, with time and voltage histograms, mask testing, and statistical pulse parameter measurements. It provides a communications-tailored measurement set that includes jitter, noise, duty cycle, overshoot, undershoot, extinction ratio and amplitude measurements.

In addition, mask testing of SDH/SONET, Fiber Channel, and other standards simplifies compliance testing. A full color display helps you to discriminate waveform details. A color-graded display mode adds a third dimension - sample density - to your signal acquisitions and analysis. Color hardcopy capabilities allow you to accurately document your measurement results.

Modularity and Flexibility

The modularity of the instrument lets you choose the right bandwidth sampling head for your application, including the 2.5 GHz high impedance (100 k Ohm), low capacitance (0.475 pF) SD-14 up to 50 GHz with the SD-32.

High bandwidth probes are also available for constructing a total acquisition and measurement solution.

Superior Triggering Capabilities

In addition to its full-function DC-coupled 4.0 GHz trigger (typical), the CSA 803C offers a built-in, AC-coupled 12.5 GHz (typical) prescaler trigger for direct triggering on high-speed data at bit rates such as 9.953 GB/S OC192/STM64.

Customers doing pass/fail testing to communications standards benefit from the excellent metastability characteristics of these triggers. Metastability is a condition of all logic devices when they do not latch to a valid ON or OFF logic level, and can occur during trigger events with all sampling oscilloscopes and circuits under test. The raw metastability of the CSA 803C direct trigger is an impressive 5 parts per billion or less, and with Enhanced Triggering ON metastable trigger events are essentially eliminated. This is possible because Enhanced Triggering is capable of detecting possible metastable sample points and discarding them.

Characteristics

Vertical Systems

Rise Time/Bandwidth - Determined by the sampling head used.*¹

Vertical Resolution - 8-bits full screen (78 μ V LSB at 2mV/div deflection factor).

Amplifier Gain Accuracy - $\pm 1\%$ of all settings.

Deflection Factors - 2 to 255 mV/div in 1 mV/div increments.

Offset Range - ± 2 V.

*¹ Vertical system specifications of CSA 803C with SD-14 non-applicable.

Horizontal System

Main and Window Time Base - 1 ps/div to 5 ms/div, settable in 1-2-5 sequence or in 1 ps increments.

Time Interval Accuracy -

8 ps + 0.01% x (interval) + 0.001% x (position), guaranteed;
4 ps + 0.004% x (interval) + 0.0004% x (position), typical, where interval \geq 1 ns;
2.5 ps + 0.0004% x (position), typical, where interval = 100 ps;
1 ps + 0.0004% x (position), typical, where intervals \leq 10 ps.

Notes:

- 1) For intervals <100 ps, the above holds for time/div \leq 20 ps/div.
- 2) For other intervals not listed above, linearity interpolate the cardinal points.

Record Length - 512, 1024, 2048, 4096 and 5120 samples.

Windows - Any number of window records may be placed on any number of main records, up to a maximum of 8 displayed traces. All window records have the same duration, but may be independently positioned on any main record. Windows may be set to automatically track a moving edge on the main record.

Maximum Sampling Rate - 200 kHz.

Trigger System*²

Trigger Bandwidth - Direct 4 GHz typical, Prescaled 12.5 GHz typical.

Trigger Sensitivity - Direct DC to 4 GHz: 50 mV typical.

Prescaled 2 to 10 GHz: 500 mV,

10 to 12.5 GHz: 800 mV typical.

Delay Jitter - 1.1 ps +4 ppm of a position typical. 2.0 ps +5 ppm of position maximum (rms).

Metastability - Raw <0.005 ppm at 2.488 GHz with 200 mV input trigger voltage, typical. Enhanced is theoretically zero.

Internal Clock - 100 kHz (drives TDR, Internal Clock Output and Calibrator).

Trigger Level Range - \pm 1.0 V.

Trigger Input Range - \pm 1.5 V (\pm 1.5 V, 5 V rms maximum with 10X).

Trigger Holdoff - 5 μ s to 2.5 s.

*² CSA 803C has external trigger only; requires 21 ns pretrigger or DL-11 Delay Lines to view trigger point.

Measurement System

Waveform Processing Functions - Add, subtract, multiply, divide, absolute, average, differentiate, envelope, exponent, integrate, natural log, log, signum, square root, smoothing and filter.

Measurement Set - Max, min, mid, p-p, mean, rms, amplitude, extinction ratio, overshoot, undershoot, noise*³, rise, fall, spectral magnitude, spectral frequency, THD, SNR, frequency, period, prop delay, cross, width, phase, duty cycle, jitter*³, area +, area -, and energy. Measurements are constantly updated; mean and standard deviation available on all measurements.

Measurement Parameters - (Proximal, mesial, distal and start/stop levels): May be set to absolute levels.

Cursors - Paired or split dots, vertical bars, and horizontal bars.

*³ Available only in statistical measurement mode.

TDR System (SD-24 Only)

Combined TDR/Acquisition Reflected Risettime - 35 ps or less.

TDR Step Amplitude - Adjustable to ± 250 mV (polarity of either step may be inverted).

Time Coincidence Between TDR Steps - Adjustable to less than 1 ps.

Source Resistance - 50 ± 0.5 Ohm.

Typical Aberrations (at ± 250 mV Amplitude) - 10 ns to 20 ps before step: $\pm 3\%$ or less; less than 300 ps after step: $+10\%$, -5% or less; 300 ps to 5 ns after step: $\pm 3\%$ or less; elsewhere: $\pm 1\%$ or less.

CRT and Display Features

CRT - 9 in. diagonal, magnetic deflection, vertical raster scan orientation. Color.

Colors - Eight-color default color set included; or, colors are user-selectable from palette of 262,144 colors.

Video Resolution - 552 horizontal by 704 vertical displayed pixels.

Power Requirements

Line-Voltage Ranges - 90 to 132 V rms, 180 to 250 V RMS.

Line Frequency - 48 to 440 Hz.

Maximum Power Consumption - 320 W.

Environmental and Safety

Temperature - Operating: 0°C to $+50^{\circ}\text{C}$; nonoperating: -40°C to $+75^{\circ}\text{C}$.

Humidity - Operating and nonoperating: up to 95% relative humidity, up to 50°C. Per Mil-T-28800E, Type III, Class 5.

Altitude, Vibration, Shock nonoperating, Bench Handling - Meets MIL-T-28800E, Type III, Class 5.

Electromagnetic Compatibility (with sampling heads or optional blank panels installed in all sampling head compartments) - Meets the requirements of: MIL-STD-461B; FCC Part 15, sub-part J, Class A; VDE 0871/6.78 Class B.

Safety - UL3111-1, CSA 1010.1, EN 61010-1, IEC 61010-1.

Physical Characteristics

	Cabinet	Cabinet	Rackmount	Rackmount
Dimensions	mm	in.	mm	in.
Width	448	17.6	483	19
Height	238	9.4	222	8.8
Depth	599	23.6	550	21.6
Weight	kg	lb.	kg	lb.
Net	22.3	49	23.2	51
Shipping	25.9	57	26.8	59



Tektronix Measurement products are manufactured in ISO registered facilities.



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