

# TA220

Digital Jitter Meter

NEW

YOKOGAWA 



For Blu-ray Disc  
TA220 Digital Jitter Meter

The TA220 Digital Jitter Meter is a jitter measuring instrument designed for production line applications for Blu-ray Disc — the next generation high capacity optical disc standard. The TA220 includes a Blu-ray Disc equalizer and PLL circuit that enable measurement from RF signals to jitter directly. And for remote control, Ethernet and GP-IB communication functions come standard.

## ■ Features a Blue-Ray Disc Equalizer and PLL Circuit

The TA220 features a Blue-ray Disc equalizer, auto-slicer, and PLL clock re-generation circuit (66 MHz). A DC clamp function on the input circuit yields stable measurement results even if DC offset are included in RF signals, such as occurs with the mirror area of the disc.

## ■ Enables Measurement of Data-to-Clock Jitter and Pulse Width Jitter

The TA220 lets you measure Blu-ray Disc data-to-clock jitter and data-to-data jitter (pulse width jitter). Also, you can measure not only 2T jitter but 3T and other record lengths by setting an arbitrary window for measuring pulse widths and average values.

## ■ Ethernet and GP-IB Communication Functions Come Standard

Using the Ethernet and GP-IB interfaces, you can load the results measured by the TA220 onto a PC, and use the PC to set measurement conditions and control measurement start and stop.

## ■ Inhibit and Block Sampling Functions

The inhibit function lets you select data from a measuring range determined by a gate signal, allowing you to limit your measurements to a specified data area within a sector. Also, the instrument comes with a block sampling function that lets you accumulate data over repeated measurements. For the measurement of a narrow recorded area, the usage of the inhibit function and block sampling function together is useful to increase the number of samples and be stable the result.

## ■ Multiple Displays: Analog Meter, Dot Matrix LED, Seven-Segment LED

Two LED displays are provided in addition to the analog meter. While changing settings, you can confirm the numerical and analog measured results.

Bulletin 7046-01E

## Specifications

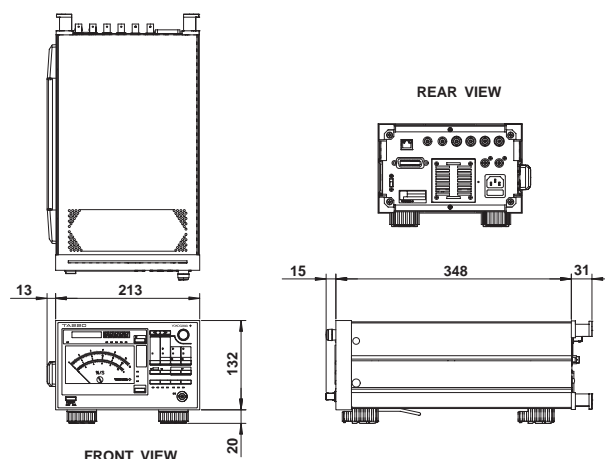
Item	Specifications
Input Specifications	<b>RF input</b> Minimum pulse width: 10 ns Input range: 0.1 Vp-p to 5 Vp-p (Equalizer and AGC OFF) 0.1 Vp-p to 0.7 Vp-p (Equalizer and AGC ON) Input coupling: AC or DC <b>Trigger</b> AUTO: Auto-slicer (10 kHz) AUTO+MANUAL: Trigger setting range: AUTO + setting value CODE setting (-1000: approx. -2.2 V to +1000: approx. +2.2 V) MANUAL: Trigger setting range: CODE setting (-1000: approx. -2.2 V to +1000: approx. +2.2 V) When equalizer and AGC are OFF, and pulse width measurement and MANUAL trigger is selected; Trigger setting range: $\pm 2$ V, (in 1 mV steps) Trigger setting accuracy: $\pm(10 \text{ mV} + 4\% \text{ of setting value})$ <b>Arming input</b> Setting: Select from Internal, External $\uparrow$ , or External $\downarrow$ Input: $Z_{in} = 10 \text{ k}\Omega$ , TTL level Arming delay: 0 to 100 ms (in 0.1 ms steps) <b>Inhibit input</b> Setting: Select from Internal, POS, or NEG Input: $Z_{in} = 10 \text{ k}\Omega$ , TTL level Inhibit effective time: 0.1 ms to 100 ms
Measurement Items	Data-to-clock phase difference jitter and average value Measuring range: 0 to 20%, 0 to 40 ns Trigger settings: $\uparrow / \downarrow / \uparrow \& \downarrow$ Pulse width jitter and average value (arbitrarily set window range LEFT or RIGHT) Window setting range: 7.0 ns to 99.9 ns (in 0.01 ns steps) <b>Level measurement</b> Measuring function: ON/OFF Switching Measuring range: 100 mVp-p to 2 Vp-p (3 mVp-p resolution) Measurement accuracy: $\pm(5\% + 10 \text{ mV})$ (for measurement of amplitude 1 Vp-p, 100 kHz sinewave)
Display	<b>Analog meter</b> Display: Jitter $\sigma$ (s), Jitter ratio $\sigma/T$ (%) Jitter ratio scale: 10%/20% scale switching Jitter value scale: select from 0.5 ns, 1.0 ns, 5.0 ns, 10 ns, 50 ns, 0.1 $\mu$ s, 0.5 $\mu$ s, 1.0 $\mu$ s, or 5.0 $\mu$ s. <b>Seven-segment LED display</b> Display: Measured values (jitter $\sigma$ , jitter ratio $\sigma/T$ , average value (AVE), clock period (T), No. of samples (Snum), level measurement (Level)) and setting values. Display range: jitter ratio 0 to 25%, jitter value 0 to 99.999 ns <b>Dot matrix display: setting items, scale range</b> GO/NO-GO LED display: green (GO), red (NO-GO) Judgment items are jitter $\sigma$ , or jitter ratio $\sigma/T$
Measurement Update Rate	50 ms (GATE: 30 ms when measuring both edges of the BDx1 data-to-clock phase difference)
Measurement Gate Equalizer	Setting range: 1 ms to 1 s (in 0.1 ms steps) Conventional equalizer circuit: ON/OFF (Blu-ray Disc standard Part1 Version 1.0 compliant) Frequency characteristics: 16.5 MHz: $+5.8 \text{ dB} \pm 0.3 \text{ dB}$ (amplitude ratio with 100 kHz as a reference) Maximum group delay deviation: 1 nsp-p (typical, 3.0 MHz $\leq f \leq 22 \text{ MHz}$ , 50 $\Omega$ ) Boost variation range: $+3.0 \text{ dB}$ to $+9.0 \text{ dB}$ (in 0.1 dB steps)

Item	Specifications
PLL Clock Re-Generation Circuit	Synchronizable signals: Basic clock is 1-7 modulation signals equivalent to 64 MHz to 68 MHz PLL characteristics: $f_n = 8 \text{ kHz}$ $\xi = 2.0$ PLL hold: When ON and inputting INHIBIT signal, holds the oscillating frequency for INHIBIT input time of +220 $\mu$ s (typ.)
DC Clamp Function	When DC clamp ON and inputting INHIBIT signal, DC cut-off frequency is set to 3 MHz.
Rear Panel I/O	<b>Output Terminal</b> LEVEL DCOUT Output level: 0 V to +5 VDC (initial setting 1 V/Vp-p), 600 $\Omega$ output Output accuracy: $\pm 10 \text{ mV}$ JITTER DC OUT Output level: 0 V to +5 VDC (initial setting 0.2 V/V%), 600 $\Omega$ output Output accuracy: $\pm 10 \text{ mV}$ EQUALIZED OUT: 50 $\Omega$ output MONITOR OUT: 50 $\Omega$ output CLOCK OUT: 50 $\Omega$ TTL output SLICED RF OUT: 50 $\Omega$ TTL output <b>Input terminal</b> EXT ARM IN: DC 10 k $\Omega$ TTL INHIBIT IN: DC 10 k $\Omega$ TTL
Preset Function	Up to seven settings can be saved and read out
Communication	GP-IB: IEEE Std.488.2-1992 Ethernet: 100BASE-TX, 10BASE-T
General Specifications	Rated power supply voltage: 100 to 120 VAC, 200 to 240 VAC Rated power supply frequency: 50/60 Hz Maximum power consumption: 100 VA External dimensions (approximate): 213 (W) $\times$ 132 (H) $\times$ 350 (D) mm (excluding protrusions) Weight: approximately 5 kg

The performance characteristics above reflect normal operating conditions after a sufficient warm-up. Standard operating conditions: Ambient temperature  $23^\circ\text{C} \pm 5^\circ\text{C}$ , ambient humidity  $50\% \pm 10\% \text{ RH}$ , within 1% of power supply voltage rating.

## External Dimension

(unit: mm)



### CAUTION



- Read the product manual before using this product to ensure safe use.

## Model and Suffix Codes

Model	Suffix code	Description
704610	-BDS	TA220 Digital Jitter Meter Conventional Equalizer for Blu-ray Disc
Power Cord	-D	UL/CSA standard
	-F	VDE standard
	-R	AS standard
	-Q	BS standard
	-H	GB standard

## Related instruments

### TA520 Time Interval Analyzer



#### Special model for Blu-ray Disc

- Built-in Conventional Equalizer conformed to Blu-ray Disc standard
- Adjustable equalizer boost
- PLL circuit for BDx1
- 43 MS/s sampling rate

### TA720 Time Interval Analyzer



#### Continuous measurement for Blu-ray Disc x2

- Up to 80 MS/s high speed sample
- 1024k sample huge memory
- Dual channel measurement
- GP-IB (standard) & Ethernet (option)

\* Please read the user's manual for safe and proper use of the instrument.

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