



VM700 Video Measurement Set

VM700

Video Measurement Set

- Automatic Monitoring
- User-Programmable Functions
- Digital Waveform Monitor/Vectorscope
- Hard Copy Capability

The VM700 is a complete video monitoring and measuring instrument which can be used for automatic monitoring, as well as for manual measurements. The user can select a display of numeric values to confirm the quality of the signal path, or may select graphic displays for more detailed analysis.

Automatic Video Measurement Set

The VM700 makes most standard tele-video measurements automatically, including those specified in RS-250B/EIA-250C, NTC-7, and RS-170A. These measurements can be compared with user-defined limits and an alarm message generated when these limits are violated.

New graphic displays are provided for measurements such as signal-to-noise ratio and group delay, enabling the user to better understand (and improve) the transmission path.

User-Programmable Functions

Any sequence of operations may be identified with a user-defined function. For example, the measurements to be made on a transmitter demodulator output could be identified with a function labeled DEMOD. A technician would simply select this function to make all measurements, including a print-out.

Digital Waveform Monitor/Vectorscope

For more detailed analysis of the waveform, the actual signal may be displayed and additional measurements made manually.

In waveform mode, cursors are available to aid in measuring time, frequency and amplitude. These cursors allow a very quick and precise location of the 10%, 50%, or 90% points on any transition.

The WAVEFORM DISPLAY can be expanded around any point both vertically and horizontally. Because the data is digitized, the display remains bright at all expansion factors. The axes automatically expand with the waveform, so all units are correct as displayed.

The VECTOR DISPLAY mode provides the normal vectorscope display. The vectors may be rotated or expanded, with the rotation angle and gain values displayed numerically on the screen.

Line Select can be used to quickly specify any line for display or automatic measurement.

Hard Copy

All information on the screen may be printed on printers supporting Epson® or Postscript® graphics via the standard RS-232C interface. Automatic measurement results can be printed on most ASCII printers using the same interface.

Picture Mode

The signal source can be quickly verified using the picture display, and any line may be selected on the picture for viewing in the waveform or vector displays.

CHARACTERISTICS

Measurement	Range	Accuracy	Test Signal
RS-170A Horizontal Blanking Interval Timing Measurements			
Color Burst Width	6-13 cycles	±1 cycle	Horizontal Blanking
Front Porch Duration	0.5-2 μs	±20 ns	Horizontal Blanking
Horizontal Blanking Width	6-30 μs	±50 ns	Horizontal Blanking
Horizontal Sync Rise Time and Fall Time	80-120 ns 120-300 ns 300 ns to 1.0 μs	-10 to +30 ns ±20 ns ±30 ns	Horizontal Blanking
Horizontal Sync Width	1-8 μs	±15 ns	Horizontal Blanking
SCH Phase	+90 deg	±5 deg	Horizontal Blanking
Sync to Setup	5-18 μs	±20 ns	Horizontal Blanking
Sync-to-Start-of-Burst	4-8 μs	±140 ns (0.5 cycles) ±20 ns	Horizontal Blanking
RS-170A Vertical Blanking Interval Timing Measurements			
Equalizing Pulse Width	1-20 μs	±15 ns	Vertical Blanking
Serration Width	1-20 μs	±15 ns	Vertical Blanking
Vertical Blanking Width	19-29 lines	-0.1 to +0.2 lines	Vertical Blanking
FCC Horizontal Blanking Interval Timing Measurements			
Breezeway Width	0.2-3.5 μs	±25 ns	Horizontal Blanking
Color Burst Width	6-13 cycles	±0.1 cycle	Horizontal Blanking
Front Porch Duration	0.5-2 μs	±25 ns	Horizontal Blanking
Horizontal Blanking Width	6-30 μs	±25 ns	Horizontal Blanking
Horizontal Sync Rise Time and Fall Time	80-120 ns 120-300 ns 300 ns to 1.0 μs	-10 to +30 ns ±20 ns ±30 ns	Horizontal Blanking
Horizontal Sync Width	1-8 μs	±25 ns	Horizontal Blanking
Sync to Setup	5-18 μs	±25 ns	Horizontal Blanking
Sync-to-End-of-Burst	6-15 μs	±20 ns	Horizontal Blanking
FCC Vertical Blanking Interval Timing Measurements			
Equalizing Pulse Width	25-200% of nominal horizontal sync pulse width	±0.5%	Vertical Blanking
Serration Width	1-20 μs	±25 ns	Vertical Blanking
Vertical Blanking Width	19-29 lines	-0.1 to +0.2 lines	Vertical Blanking
Amplitude and Phase Measurements			
Bar Top	0-90% of max carrier	±0.4%	FCC/NTC-7 Composite
Bar Amplitude	0-200 IRE	±0.5 IRE	FCC/NTC-7 Composite
Chrominance-Luminance Delay	±300 ns	±10 ns	FCC/NTC-7 Composite
Chrominance-Luminance Gain	0-160%	±1%	FCC/NTC-7 Composite
Differential Gain	0-100%	±0.3%	FCC/NTC-7 Composite
Differential Phase	0-360 deg	±0.3 deg	FCC/NTC-7 composite
Luminance Non-linear Distortion	0-50%	±0.5%	FCC/NTC-7 Composite
Relative Burst Gain	±100%	±0.3%	FCC/NTC-7 Composite
Relative Burst Phase	±180 deg	±0.3 deg	FCC/NTC-7 Composite
Burst Amplitude (% of Sync)	25-200% of sync	±1.3% of sync or ±0.5 IRE, whichever is greater	Horizontal Blanking
Burst Amplitude (% of Bar) (Bar not used)	10-80% of Bar (10-80 IRE)	±0.5% (±0.5 IRE)	Horizontal Blanking
Sync Amplitude (Bar not used)	20-80% of Bar (20-80 IRE)	±0.5% (±0.5 IRE)	Horizontal Blanking
Blanking Level	0-90% of max carrier	±0.5%	Horizontal Blanking
Sync Variation (Zero Carrier not used) (Zero Carrier & Bar not used)	0-50% of max carrier (0-50% of Bar) (0-50 IRE)	±0.5% (±0.5%) (±0.5 IRE)	Horizontal Blanking
Blanking Variation (Zero Carrier not used) (Zero Carrier & Bar not used)	0-50% of max carrier (0-50% of Bar) (0-50 IRE)	±0.5% (±0.5%) (±0.5 IRE)	Horizontal Blanking

TEK VIDEO MEASUREMENT SET

Measurement	Range	Accuracy	Test Signal
Frequency Response and Group Delay Measurements			
Multiburst Flag Amplitude (Zero Carrier not used) (Zero Carrier & Bar not used)	0-90% of max carrier (20-130% of Bar) (20-130 IRE)	$\pm 0.5\%$ ($\pm 0.5\%$) (± 0.5 IRE)	Multiburst/NTC-7 Combination
Multiburst Packet Amplitudes (6 results)	0-100% of Flag	$\pm 2\%$	Multiburst/NTC-7 Combination
Frequency Response and Group Delay Measurements (cont)			
Envelope (Group) Delay	± 300 ns	± 10 ns	SIN X/X
Amplitude Response vs Frequency	$\pm 50\%$	$\pm 2\%$	SIN X/X
Incidental Carrier Phase Modulation			
ICPM	0-30 deg	± 1.0 deg	FCC/NTC-7 Composite
Color Bar Measurements			
Color Bar Amplitude Errors	$\pm 100\%$ of nominal	$\pm 1\%$ or ± 1 IRE, whichever is greater	FCC/EIA/SMPTE Color Bars
Color Bar Phase Errors	± 180 deg from nominal	± 1 deg	FCC/EIA/SMPTE Color Bars
Color Bar Chrominance- Luminance Gain Ratio	0-200% of nominal	$\pm 2\%$	FCC/EIA/SMPTE Color Bars
Waveform Distortion Measurements			
Line Time Distortion	0-40% of Bar	$\pm 0.5\%$	FCC/NTC-7 Composite
Pulse-to-Bar Ratio	10-125%	$\pm 1\%$	FCC/NTC-7 Composite
Short-Time Waveform Distortion	0-25% SD	$\pm 1\%$ SD	NTC-7 Composite
Chrominance Non-linear Gain Distortion	5-35 IRE (20 IRE chroma) 45-160 IRE (80 IRE chroma)	± 0.5 IRE	NTC-7 Combination
Chrominance Non-linear Phase Distortion	0-360 deg	± 0.5 deg	NTC-7 Combination
Chrominance to Luminance Intermodulation	± 50 IRE	± 0.5 IRE	NTC-7 Combination
2T K-Factor	0-10% Kf	$\pm 0.5\%$ Kf	FCC/NTC-7 Composite
VIRS Measurements			
VIRS Setup (Reference Black) (Bar not used)	-20 to 130% of Bar (-20 to 130 IRE)	$\pm 0.5\%$ (± 0.5 IRE)	VIRS
VIRS Chrominance Reference Amplitude (Burst not used) (Burst & Bar not used)	0-200% of burst amplitude (0-80% of Bar) (0-80 IRE)	$\pm 1.0\%$ ($\pm 0.1\%$) (± 1.0 IRE)	VIRS
VIRS Chrominance Phase Relative to Burst	± 180 deg	± 1.0 deg	VIRS
VIRS Luminance Reference (Bar not used)	30-100% of Bar (30-100 IRE)	$\pm 1.0\%$ (± 1.0 IRE)	VIRS VIRS
Signal-To-Noise Ratio Measurements			
Unweighted SNR	26-60 dB	± 1.0 dB	Quiet Line
	61-70 dB	± 2.0 dB	
Luminance Weighted SNR	26-60 dB	± 1.0 dB	Quiet Line
	61-70 dB	± 2.0 dB	
Periodic SNR	26-60 dB	± 1.0 dB	Quiet Line
	61-70 dB	± 2.0 dB	
Out-Of-Service Measurements			
Long Time Distortion	0-20 IRE	± 0.5 IRE	Bounce
	20-100 IRE	± 1.0 IRE	
Field Time Distortion	0-40%	$\pm 0.5\%$	Field Square Wave

ORDERING INFORMATION

VM700 Video Measurement Set \$15,000
(Option 01 is required)

OPTIONS

Option 01—NTSC Measurements + \$3,000
Option C1—Cabinet Version + \$300