MICROVISION

SS400 Series Response Time Measurement Module

APPLICATIONS

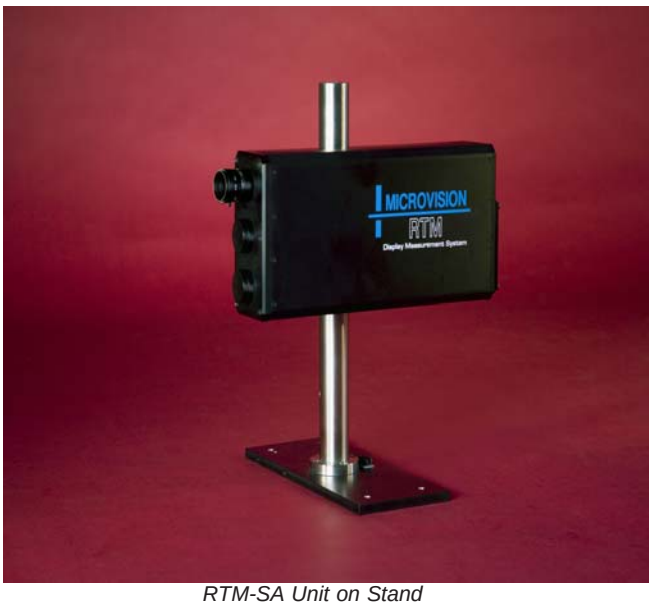
- LCD Televisions and Monitors
- PDP Displays

MEASUREMENTS

- Motion Blur & Artifacts
- MPRT
- Response Time
- Gray Level Transition Time
- Overshoot Percentage
- Flicker

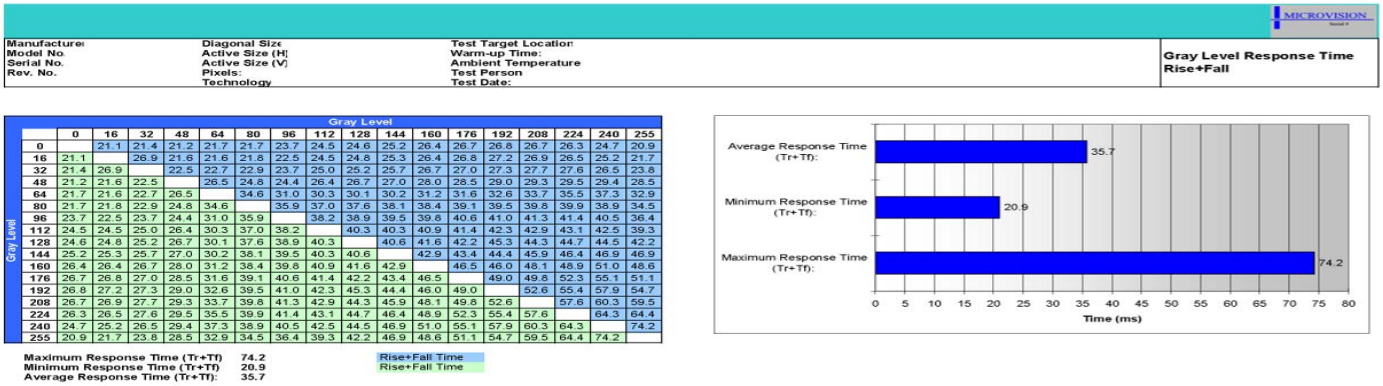
FEATURES

- Turnkey system - System Controller Included
- Fully Automatic
- Auto Gain/Scaling Adjust
- Customizable Setup
- Proprietary Filtering Techniques for Increased Accuracy
- Large Dynamic Range (no ND filters needed)
- Data includes text files, .csv files, 2D and 3D plots
- Multiple Rise/Fall Time Profiles Overlaid for Comparison
- BNC connection for raw data (to oscilloscope)
- Automatic ISO Dominant Flicker Component



RTM-SA Unit on Stand

Gray Level Transition Spreadsheet



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Manufacturer:	Diagonal Size:	Test Target Location:
Model No.	Active Size (H):	Warm-up Time:
Serial No.	Active Size (V):	Ambient Temperature:
Rev. No.	Pixels:	Test Person:
	Technology:	Test Date:

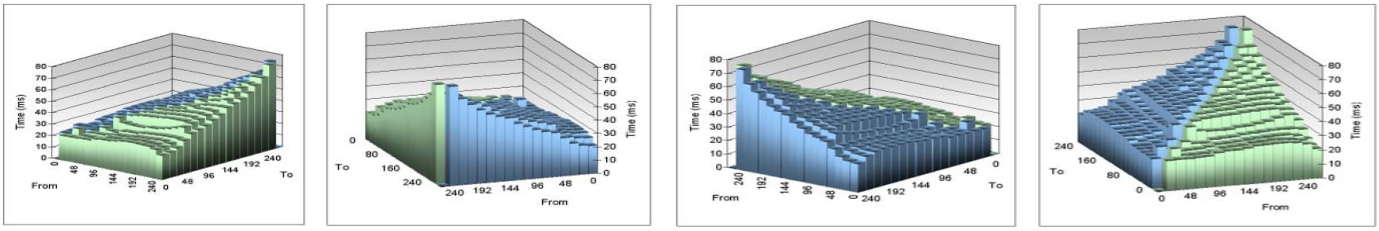
Gray Level Response Time
Rise+Fall

Gray Level

Gray Level	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240	255
0		21.1	21.4	21.2	21.7	21.7	23.7	24.5	24.6	25.2	26.4	26.7	26.8	26.7	26.3	24.7	20.9
16	21.1		26.9	21.6	21.8	22.5	24.5	24.6	25.3	26.4	26.8	27.2	26.9	26.5	25.2	21.7	
32	21.4	26.9		22.5	22.7	22.9	23.7	25.0	25.2	25.7	26.7	27.0	27.3	27.7	27.6	26.5	23.8
48	21.2	21.6	22.5		26.5	24.8	24.4	26.4	26.7	27.0	28.0	28.5	29.0	29.3	29.5	29.4	28.5
64	21.7	21.6	22.7	26.5		34.6	31.0	30.3	30.1	30.2	31.2	31.6	32.6	33.7	35.5	37.3	32.9
80	21.7	21.8	22.9	24.8	34.6		35.9	37.0	37.6	38.1	38.4	39.1	39.5	39.8	39.9	38.9	34.5
96	23.7	22.5	23.7	24.4	31.0	35.9		38.2	38.9	39.5	39.8	40.6	41.0	41.3	41.4	40.5	36.4
112	24.5	24.5	25.0	26.4	30.3	37.0	38.2		40.3	40.3	40.9	41.4	42.3	42.9	43.1	42.5	39.3
128	24.6	24.8	25.2	26.7	30.1	37.6	38.9	40.3		40.6	41.6	42.2	45.3	44.3	44.7	44.5	42.2
144	25.2	25.3	25.7	27.0	30.2	38.1	39.5	40.3	40.6		42.9	43.4	44.4	45.9	46.4	46.9	46.9
160	26.4	26.4	26.7	28.0	31.2	38.4	39.8	40.9	41.6	42.9		46.5	46.0	48.1	48.9	51.0	48.6
176	26.7	26.8	27.0	28.5	31.6	39.1	40.6	41.4	42.2	43.4	46.5		49.0	49.8	52.3	55.1	51.1
192	26.8	27.2	27.3	29.0	32.6	39.5	41.0	42.3	45.3	44.4	46.0	49.0		52.6	55.4	57.9	54.7
208	26.7	26.9	27.7	29.3	33.7	39.8	41.3	42.9	44.3	45.9	48.1	49.8	52.6		57.6	60.3	59.5
224	26.3	26.5	27.6	29.5	35.5	39.9	41.4	43.1	44.7	46.4	48.9	52.3	55.4	57.6		64.3	64.4
240	24.7	25.2	26.5	29.4	37.3	36.9	40.5	42.5	44.5	46.9	51.0	55.1	57.9	60.3	64.3		74.2
255	20.9	21.7	23.8	28.5	32.9	34.5	36.4	39.3	42.2	46.9	48.6	51.1	54.7	59.5	64.4	74.2	

Maximum Response Time (Tr+Tf): 74.2
Minimum Response Time (Tr+Tf): 20.9
Average Response Time (Tr+Tf): 35.7

Rise+Fall Time
Rise+Fall Time



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Dedicated to the Needs of the Display Industry

SYSTEM OVERVIEW:

The RTM module is an optional test module that can be integrated into any Microvision SS400 Series System. The RTM module can also be purchased as a stand-alone device including a computer, Microvision's proprietary software and Win' Xp platform.

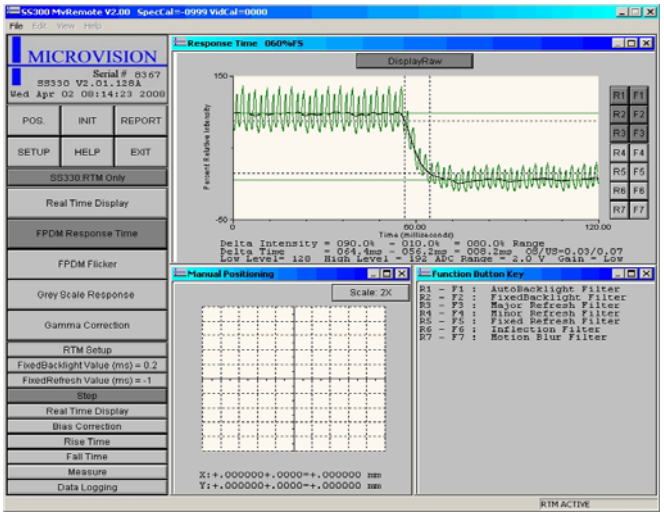
The RTM sensor consists of a variable focus/aperture lens system imaged on a fast response photodiode. The photodiode output is filtered and then input into a 16 bit AD card with a variable sample rate.

The response time function is designed to measure Rise (Ton) and Fall (Toff) times of a blinking target as specified in ISO-13406-2 and VESA FPDM 2.0, section 305-1. Please refer to these documents for the specification requirements and (especially in the FPDM document) notes on the general Response Time Measurement procedure.

Also included is an automatic gray level transition time measurement. The response time module can measure an array of gray levels automatically from 0 –255.

In early 2007, Microvision made some very innovative enhancements to response time testing. Our new proprietary filtering algorithms are the most accurate in the testing industry. We have added many new innovative features to response time such as automatic gain and scaling adjustments for maximum sensitivity, overlayed output (raw data and filtered data on same plot to allow the user to observe the effects of the filtering), and faster automated measurements.

The result is the most powerful, flexible and accurate measuring device of temporal performance available.

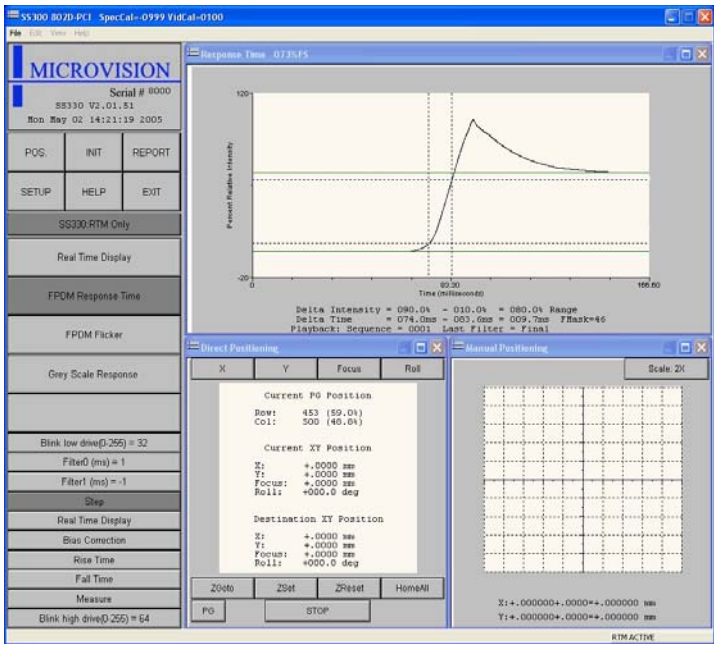


Fall Time(raw and filtered data)

RTM SPECIFICATIONS:

Optical Type:	Fast Response Photo Diode
Sample Rate:	1000 kHz Max.
Resolution:	16 bit with 5 gain ranges
Detector Response:	20kHz
Transition Time:	Measures .1 ms to 4 s
Lens:	25mm "C" mount, f1.6 to f22 adjustable
Sync:	Software and external options
Operating System:	PC included with Win XP
Repeatability:	3%
Memory Length:	2 MB
Input/Output Interface:	USB ADC attached to MV Computer

Specifications are subject to change without notice.



Rise Time with Overshoot

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