admesy
ADVANCED MEASUREMENT SYSTEMS

Specification

MSE 10mm

Version 1.01


admesy
ADVANCED MEASUREMENT SYSTEMS
MSE

1. About this specification

The material in this specification is subject to change. No rights can be derived from the content of this specification.

All correspondence regarding copyrights:
Admesy B.V.
Branskamp 5
6014CB Ittervoort
The Netherlands
Tel : +31 (0) 475 600232
Fax : +31 (0) 475 600316
http://www.admesy.com

2. General introduction

The MSE colorimeter offers a unique combination of high speed and accurate colour measurement. Our products are developed with the highest care for usability and robustness of both hardware and software.

2.1. MSE 10mm highlights

- Color measurement even at low luminance values.
- Color measurement in XYZ, Yxy, Yu'v'.
- Other color spaces available via a supplied color library.
- Fast color measurement (200 samples per second at luminance level 200Cd/m2).
- High speed luminance (Y) function (22.000 Samples per second)
- Trigger in and output for in line applications
- Mechanical shutter for accurate dark level measurements
- USB and RS232 communication interfaces.

2.2. Standards

The MSE is compliant to the USBTMC standard and can be used in combination with external provided USBTMC compliant drivers. Currently it has been tested on Windows, Linux and Apple OSX using NI VISA (http://ww.ni.com/visa) and using the open source drivers on Linux (i686, x86_64 and ARM). Refer to the Admesy support site for a more detailed description and free source code.

3. General specification

Interfaces	
USB2.0	USBTMC compliant, SCPI command set, Full speed device
RS232	For PC and embedded purposes, using the same command set as USB
Trigger input and output	5V compliant

Power ratings				
	Min Voltage	Typ. Voltage	Max. Voltage	Current Consomption
USB powered – no shutter operation	4.75V	5.00V	5.25V	Typ. 70mA
USB powered – shutter operation	4.75V	5.00V	5.25V	Typ. 225mA

Mechanical dimensions	
Height, width and depth	See mechanical drawing
Mounting	12xM3 mounting holes spread over all sides of the MSE

Measurement system	
Photo detector	Silicon photo diode using XYZ interference filters
Spectral response	Approximates CIE1931 color matching functions (see spectral response graph)
Measurement parameters	XYZ, Yxy, Yuv, Lab, Luv, CCT, dom. wavelength, flicker, response time
Optical system	Acceptance angle is 5 degrees (±2.5)
Measurement spot size	10mm spot size at 50mm, 12mm spot size at 100mm distance
Measurement speed	Luminance at 22,000 samples/second , Colour measurement at 7ms or higher, depending on luminance level. 150Cd/m² with DC level light at 50ms. PWM requires longer integration (multiple frames). Correct detected frequency = 1kHz

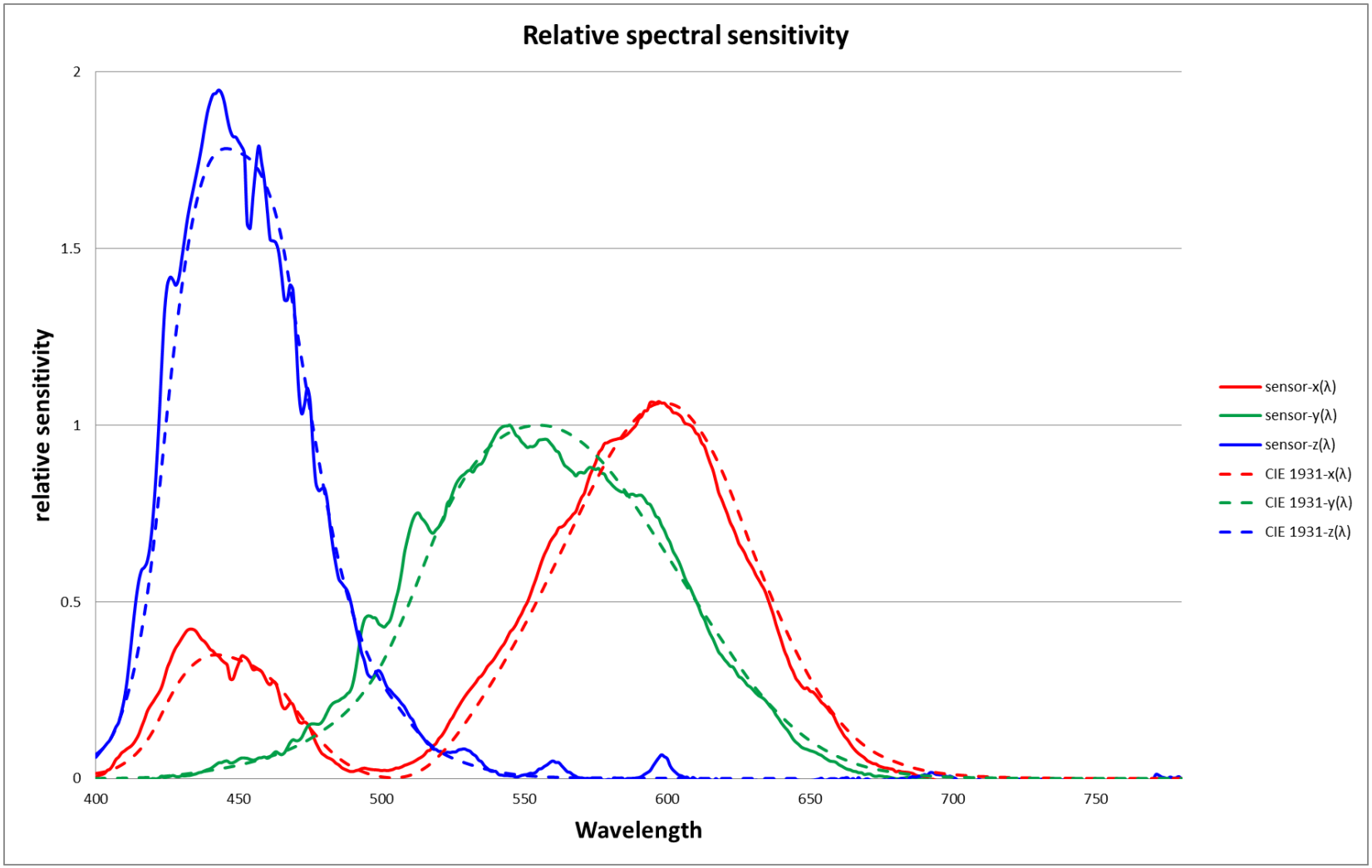
4. Colorimeter specification

Colorimeter specification			
Parameter	Range	Accuracy	Repeatability
Resolution	15bit for X, Y and Z	>78dB without averaging	
Luminance (Y)	0.05cd/m^2–3,000 cd/m^2 Integration time between 1ms and 5sec.	±4% of measured value Measured at white image of CCFL LCD display. Luminance ~150 cd/m^2; x,y = 0.325 0.355	Y: ±0.3% for Y at 0.1cd/m^2 (1)
			Y: ±0.15% for Y at 1cd/m^2 (1)
			Y: ±0.08% for Y at 5cd/m^2 (1)
			Y: ±0.06% for Y at 150cd/m^2 (1)
Chromaticity: x,y		±0.001 (after calibration) Measured at white image of CCFL LCD display. Luminance ~150 cd/m^2; x,y = 0.325 0.355	x,y: ±0.003 for Y at 0.1cd/m^2 (1)
			x,y: ±0.001 for Y at 1cd/m^2 (1)
			x,y: ±0.0005 for Y at 5cd/m^2 (1)
			x,y: ±0.0002 for Y at 150cd/m^2 (1)
Measurement speed			1 sample per sec. for Y at 0.1cd/m^2 (1)
			2-5 samples per sec. for Y at 1cd/m^2 (1)
			5-10 samples per sec. for Y at 5cd/m^2 (1)
			10-50 samples per sec. for Y at 150cd/m^2 (1)
CR measurement	>200,000	±5% (depending on lowest Y value)	±5% (depending on lowest Y value)
Flicker (contrast Method)	10 cd/m^2 or higher	±2% Flicker frequency:30Hz AC/DC 10% sine wave	±1%
Flicker (Jeita Method)	10 cd/m^2 or higher	±2dB Flicker frequency:30Hz AC/DC 10% sine wave	±1dB
Operating temperature	10-35°C (2)		
Shutter lifetime	More than 1 Million		
Shutter speed	70ms-120ms Close or open time	Depending on temperature and lifetime	

(1) All measurements are performed 20 times on a CCFL LCD screen with sufficient signal noise ratio, value is based on 2 sigma. Sample speed depends on the measured sample as well : If the sample uses PWM it will take longer so use the lower rated values.

(2) Operating temperature reaches from 0- 40 degrees, but dark level compensation works best between 10-35 degrees. Other temperature ranges can be calibrated using the mechanical shutter if necessary.

5. Typical spectral sensitivity



6. Mechanical dimensions