asteria

light meter

Contents

1 Asteria: luminance / illuminance & flicker measurement device

Admesy's Asteria light meter provides a CIE 1931 high speed luminance measurement function, targeting application for display and lighting industries. Asteria works like all Admesy products on USB and RS232 and can perform all complex calculations inside due to a high speed CPU and large internal memory. The Asteria is available with lens system or cosine corrector, for luminance or illuminance & luminous intensity measurements respectively. For remote sensing and connecting to accessories, fibre connected versions of the Asteria are available. All optical configurations are suitable for response time and flicker measurements supporting the following standards.

- Contrast min/max
- Contrast RMS
- JEITA
- VESA
- Flicker percentage (IES)
- Flicker index (IES)
- IEEE 1789

2 Highlights

- Absolute luminance and illuminance & luminous intensity measurement according to the human eye (CIE1931 luminosity function)
- All flicker measurement standards supported for display (Contrast, JEITA, VESA) and lighting (percentage, index)
- Measure high and low frequencies at the same time through a high sample rate (186.567 samples/second) and large memory size
- Windows, Linux, OSX and embedded systems compatible
- SCPI command interface for easy integration in other applications
- Supported in all major programming languages Labview / Labwindows / Visual Studio (C++, C#, VB)/ Other programming languages that support VISA can be used
- USBTMC standard compliant
- Integrating- and sampling mode available
- 3 gain stages for every mode
- Auto-range function
- User calibration function and pre-programmed calibration values
- Trigger in and output for inline applications
- USB and RS232 communication interface

3 Asteria general specifications

Interfaces

USB 2.0	USBMTC compliant, SCPI command set, full speed device
RS 232	For PC and embedded purposes, using same command set as USB
Trigger in & out	5V compliant

Power ratings

	Min voltage	Typical voltage	Max voltage	Max current
USB powered	4.75V	5.00V	5.25V	220mA

System information

Photo detector	Silicon photo diode
Spectral response	Approximates CIE 1931 luminosity curve, fs value 8% typical
Measurement parameters	Luminance, illuminance & luminous intensity, flicker (contrast, JEITA, VESA, Percentage, Index), Response time.
Optical systems	10mm lens system & cosine corrector
Measurement speed in sample mode	186.567 samples/second. Memory for 250.000 samples. For samples/delay versus total measurement time see table below.
Operating Temperature	10-35°C (1)

Mechanical dimensions

Size (HxWxD)	69 x 31 x 93 mm
Weight	320 gram
Mounting	12 M3 threat holes spread over four sides of Asteria

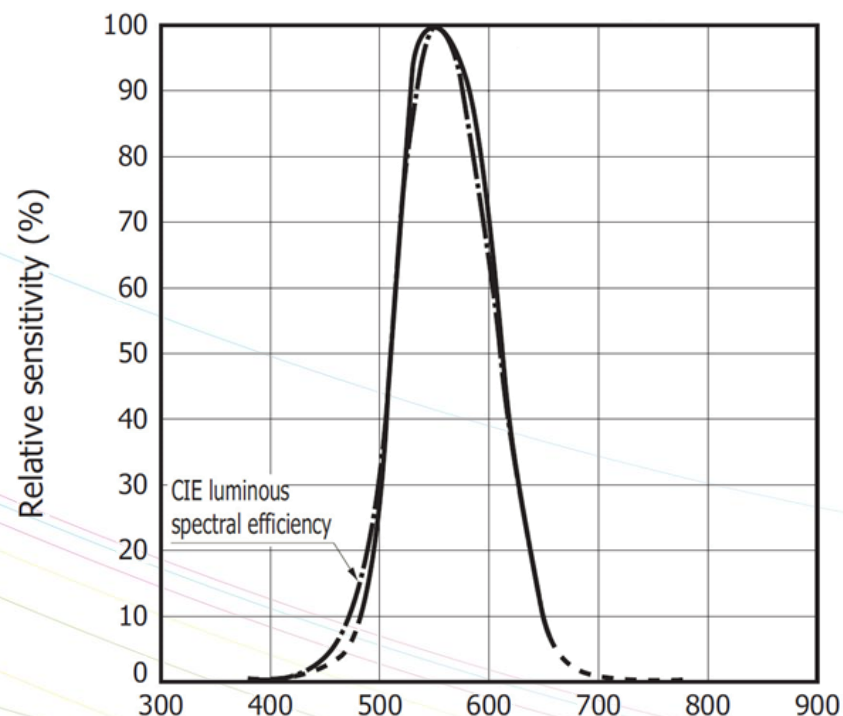# 4 Typical spectral sensitivity of Asteria light meter

Fig 1 Spectral sensitivity of the Asteria light meter.

5   Asteria 10mm specifications

Optical system			
Optics	10mm lens		
Acceptance angle	Acceptance angle 5º (+/- 2.5)		
Measurement spot size	12mm at 50mm distance	15.5mm at 75mm distance	19mm at 100mm distance

Sample mode signal frequency response	
Parameter	f_{3db} [1]
Gain 1	DC – 20kHz
Gain 2	DC – 50kHz
Gain 3	DC – 120kHz

Measurement specification					
Parameter	Range	Accuracy	Light level (cd/m²)	Repeatability [2]	Speed (samples/s) [2]
Luminance (Y) (integrating mode)	0.005 – 15000cd/m² integration time between 1ms and 5s	+/- 2% of measured value. Measured at white image of LED LCD display. Luminance ~150cd/m²	0.1	+/- 0.20%	4 - 10
			1	+/- 0.10%	10 - 20
			5	+/- 0.05%	20 - 100
			>150	+/- 0.03%	20 - 100
Luminance (Y) (sampling mode)	1 – 15.000cd/m²	+/- 2% of measured value. Measured at white image of LED LCD display. Luminance ~150cd/m²	1	+/- 0.20%	4 - 10
			5	+/- 0.10%	10 - 20
			20	+/- 0.05%	20 - 100
			>150	+/- 0.03%	20 - 100
Flicker (Contrast Method)	1 – 15.000cd/m²	+/- 1% Flicker frequency: 30Hz AC/DC 10% sine wave at 10cd/m²			
Flicker (JEITA method)	1 – 15.000cd/m²	+/- 1dB Flicker frequency: 30Hz AC/DC 10% sine wave at 10cd/m²			

1 Based on calculation of a sinusoidal waveform.

2 All measurements are performed 20 times on a LED LCD screen with sufficient signal noise ratio; value is based on 2 sigma. Luminance values are based on best performance possible, while measurement speed is determined by Admesy with a signal noise ratio which is still acceptable according Admesy. Sample speed depends on the measured sample as well: If the sample uses PWM it will take longer so use the lower rated values. Detailed measurement data is available upon request.

6 Asteria cosine corrector specifications

| Optical system						
Optics	1 cm² cosine corrector					
Cosine response	Lambertian					
Sample mode signal frequency response						
Parameter	f_{3db} [1]					
Gain 1	DC – 20kHz					
Gain 2	DC – 50kHz					
Gain 3	DC – 120kHz					
Measurement specification						
Parameter	Range	Accuracy		Light level (lx)	Repeatability [2]	Speed (samples/s) [2]
Illuminance (Y) (integrating mode)	0.05 – 150000lx integration time between 1ms and 5s	+/- 2% of measured value. Measured on halogen light source with illuminance level ~1800lx		1	±0.20%	4 - 10
				10	±0.10%	10 - 20
				50	±0.05%	20 - 100
				>1500	±0.03%	20 - 100
Illuminance (Y) (sampling mode)	10 – 150000lx	+/- 2% of measured value. Measured on halogen light source with illuminance level ~1800lx		10	±0.20%	4 - 10
				50	±0.10%	10 - 20
				200	±0.05%	20 - 100
				>1500	±0.03%	20 - 100
Percentage flicker	10 – 150000lx	+/- 1% Flicker frequency: 100Hz AC/DC 10% sine wave at 100lx				
Flicker index	10 – 150000lx	+/- 0.01 Flicker frequency: 100Hz AC/DC 10% sine wave at 100lx				

1 Based on calculation of a sinusoidal waveform.

2 All measurements are performed 20 times on a halogen lamp with sufficient signal noise ratio; value is based on 2 sigma. Illuminance values are based on best performance possible, while measurement speed is determined by Admesy with a signal noise ratio which is still acceptable according Admesy. Sample speed depends on the measured sample as well: If the sample uses PWM it will take longer so use the lower rated values. Detailed measurement data is available upon request.

7   Asteria 10mm dimensions
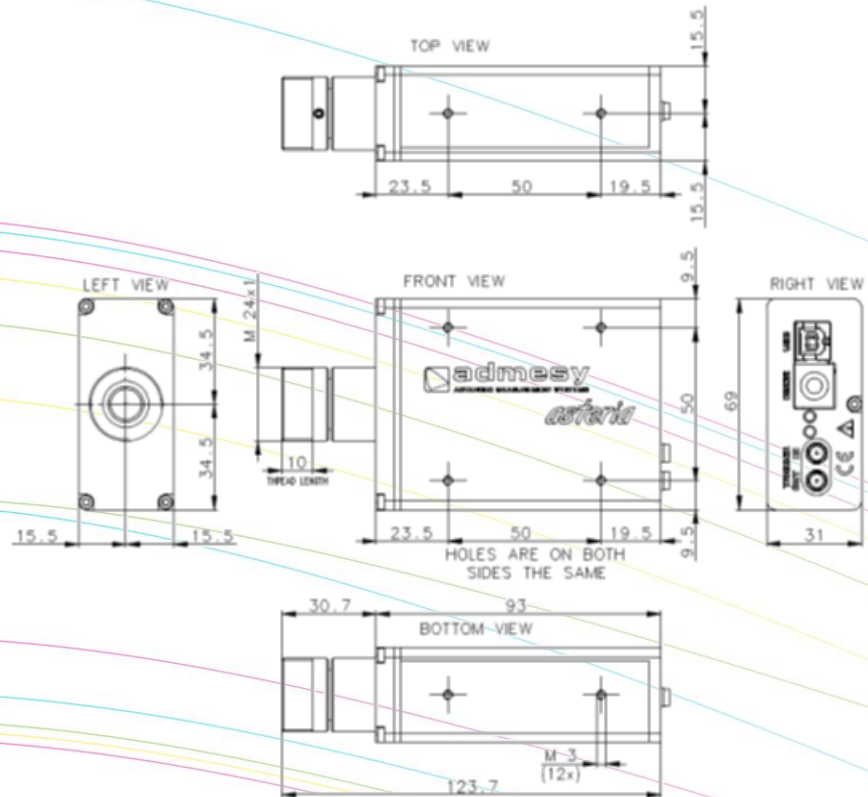
8   Asteria cosine corrector dimensions
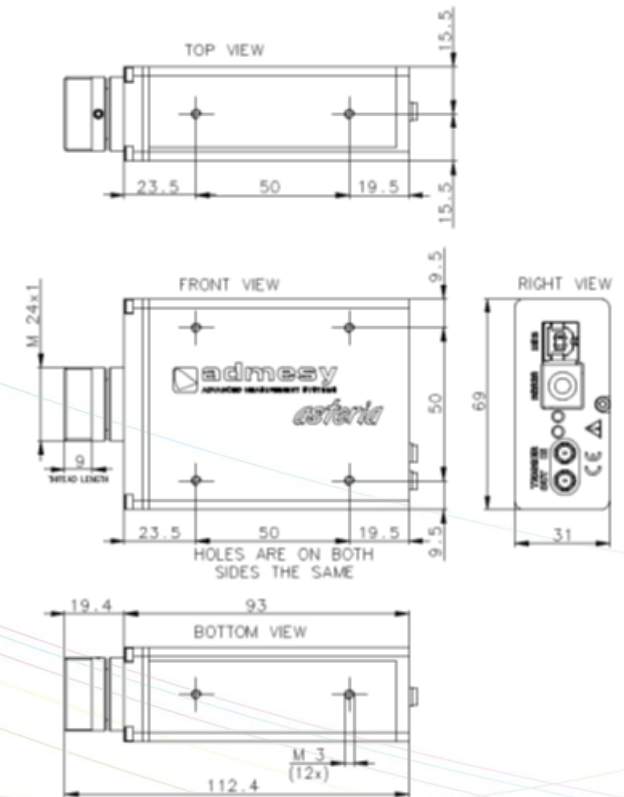
Admesy B.V.
Sleestraat 3
6014 CA Ittervoort
The Netherlands

T   +31 (0)475 600 232
F   +31 (0)475 600 316

www.admesy.com
info@admesy.com

Version 1.0.18   04/2018