

atlas imaging colorimeter with integrated spectrometer







# Contents

1	Atlas	3
2	Highlights	3
3	Communication	4
4	Hardware	5
5	Specifications	6
6	Mechanical specification	8





#### 1 Atlas

The Atlas 2D analysis system is the ultimate 2D imaging CCD combined with a spectrometer. The Atlas combines two fundamentally different devices in one solution giving it unprecedented capabilities and flexibility. Due to the software the operation of the Atlas is very user-friendly. The Atlas is focused on two markets:

- Display market
- LED panel market

### 2 Highlights

- Luminance & colour uniformity measurements
- Mura measurements
- White point adjustment
- Self-calibrating 2D part due to the spectrometer
- High accuracy due to spectrometer
- 2D and spectrometer Auto-range measure function
- Dark current compensated
- Programmable regions of interest

The Atlas consists of a 2D RGB imaging CCD and a spectrometer (spectral range between 380-780nm) with the following camera choices:

2D CCD choices		
2MP RGB CCD		
8MP RGB CCD		
16MP RGB CCD		

Spectro	meter o	choices
---------	---------	---------

Spectral engine (380nm-780nm)	
Spectral engine (380nm-780nm) + luminance photodiode (flicker)	







#### **3** Communication

The Atlas should be connected by the Ethernet port and the USB port. In order to control the Atlas the following items are required:

- 1) GIGE driver for communication with the 2D CCD imager
- 2) VISA driver for communication with the spectrometer
- Generic engine software this is the control software which operates the Atlas and does all the calculations. It can be accessed by SCPI commands through Ethernet.
- 4) GUI the graphical interface communicates through TCP/IP with the engine. You can install our standard GUI or you can make you own GUI.

The engine software is the heart of the Atlas, it takes care of everything. It controls the Atlas, it takes care of the calculation necessary for 2D analysis (mura, uniformity...etc).

The GUI sends a command to Generic engine as for example CAPture:image. The Engine will on its turn send back the image to the GUI.



The Atlas can be controlled remote or locally on a single pc, communication is always through TCP/IP.







The Atlas system is a combination of instruments and software. The standard Atlas system consists of a camera (8, 16, 29 Megapixel) and a Hera spectrometer. However it can also be configured with a Cronus spectro-colorimeter so that it also can measure flicker.

This specification focusses on the camera part and describes what the software can do with the camera image after it has been converted into an XYZ image. The software uses standards from the German automotive workgroup for flat panel displays (further referred to as DFF) and the IDMS.

- German Flat Panel Display Forum (DFF) http://www.displayforum.de/
- IDMS (former VESA) http://icdm-sid2.org/index.html

Additionally Admesy developed new algorithms for specific defects that cannot easily be found by any of the above algorithms. We refer to this as Admesy Mura.

The choice of camera depends on the display size to be inspected and the working distance to this display. From this, the so called virtual resolution is calculated, which determines which camera resolution is suitable.

The specification below describes one case of display size and the maximum display size that can be inspected according to the human eye resolution. The human resolution is the capability of the eye to resolve details with a certain size.

For other size displays the values can be extrapolated. For example if the indicated maximum display size is 8", then on a 4" display the smallest detectable defect size would become 2x smaller, however it has to be kept in mind that the system should be used to mimic the human eye, so the previous only applies if the working distance for both systems is equal. In other words: for the 4" display it would be possible to use a camera with half of the resolution.

Increation items	
inspection items	
Uniformity	By DFF uniformity algorithm
Line defects	By Admesy algorithm
Blob defects	By AdmesyMura algorithm
Dust	By DFF Mura algorithm
Pixel defects (1)	By DFF Mura algorithm and colour
	uniformity algorithm
Colour blobs	By colour uniformity algorithm
Light leakage (edge Mura)	By DFF uniformity algorithm



# **5** Specifications

Interface	
USB	USBMTC compliant, SCPI command set, high speed device
Ethernet	GIGE Ethernet interface (should support jumbo packets)
12V power	12V DC regulated

Power rating	IS			
	Min	Typical	Max	Max
	voltage	vollage	voltage	current
12V power	11V	12V	13V	3000mA

General	
Temperature	15°C to +35°C
Humidity	10% to 90% non-condensing
Weight	5.5kg
Optics	Manually adjustable focus and apperture
2D System accuracy	Y<1%; x,y < 0.001 compared to spectrometer
2D System repeatibility 1	Y<0.1%; x,y<0.0005
Measurement range <sup>2</sup>	0.01 cd/m <sup>2</sup> – 25000 cd/m <sup>2</sup>

1 Based on 1% of horizontal and vertical pixels of total detector size.

2 This is indication can vary due to choice of lens system and aperture setting.

Spectrometer part	
Model	Hera 01 – VIS
Spectral range	380-780nm
Optical resolution (FWHM)	2.3nm
Order sorting filter	2 <sup>nd</sup> order sorting filter
Wavelength accuracy	+/- 0.5nm
Stray light	<0.2% (measured at 400nm with 455nm cut-off
	filter with broadband light source)
Luminance accuracy <sup>3</sup>	+/-2%
Chromaticity accuracy <sup>3</sup>	+/- 0.0015
Non-Linearity	< 1%
Integration time	1.3ms – 20s
Data processing time	14ms
Wavelength accuracy	+/-0.5nm

3 After calibration to the working standard.

ad	m	e	5 Y
ADVANCED	MEASURE	MENT	SYSTEMS

-
1

2MP camera	
Resolution	1600x1200
Sensor	KAI-02050 TrueSense CCD
Output format	12bit
Non - Linearity	< 1%
S/N ratio	60dB
Integration time	1ms - 16 seconds
Dynamic range	60dB
Minimum measurement time*1	TBD

8MP camera	
Resolution	3312x2488
Sensor	KAI-08050 TrueSense CCD
Output format	12bit
Non - Linearity	< 1%
S/N ratio	60dB
Integration time	1ms - 16 seconds
Dynamic range	60dB
Minimum measurement time*1	TBD

16MP camera	
Resolution	4872x3248
Sensor	KAI-16000 TrueSense CCD
Output format	12bit
Non - Linearity	< 1%
S/N ratio	60dB
Integration time	1ms - 16 seconds
Dynamic range	60dB
Minimum measurement time <sup>1</sup>	600ms

1 Measured at 100 cd/m<sup>2</sup>, please note that tact time can vary for different aperture settings and lens choices. This is an indication. Tact time is for colour and for photopic since we always transform RGB to XYZ by means of a spectrometer.





# 6 Mechanical specification

Admesy supplies several optics for the camera systems, please ask our sales department for all options. We assist in choosing the right option.







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

The material in this document is subject to change. No rights can be derived from the content of this document. All rights reserved. No part of this document may be reproduced, stored in a database or retrieval system, or published in any form or way, electronically, mechanically, by print, photo print, microfilm or any other means without prior written permission from the publisher.

Version 1.0.11 06/2017