Spectral DEVICES INC.

Product Sheet

Multispectral Imaging System

MSIS-RGBN-1-A

MSIS-RGBN-1-A

Preliminary – specifications subject to change

Revised April 28, 2020

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1. Description

The MSIS-RGBN-1-1 is a multispectral imaging system incorporating an MSC-RGBN-1-A snapshot multispectral camera and a 4-channel LED illuminator into a single water-resistant housing. The housing provides an adjustable mount enabling the system to be pointed in increments of 4.5° around a central axis. The LED illuminator contains 16 high power LEDs arranged in a ring pattern surrounding the lens of the camera. The camera and LEDs are protected by a polycarbonate window. The LEDs are arranged into 4 channels. The four LED channels are matched to the spectral transmission characteristics of the snapshot multispectral camera. Each LED channel is controlled with a strobe circuit capable of overdriving the LEDs to achieve high light output. The system is shipped with an external water-resistant control box that houses the strobe controller and an optional embedded computer system. Control of the system can be either using Windows graphical desktop application, or optional web-based interface with built in database service. A variety of SDKs are available for building custom applications. The system is CNC machined from 6061 aluminum with black anodization.

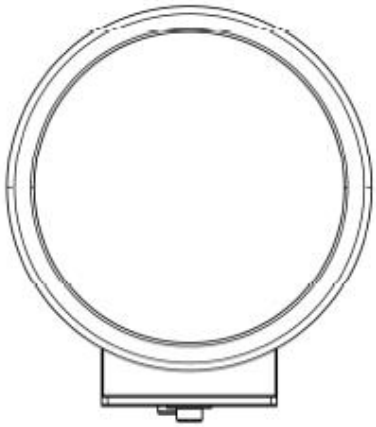
2. General Specifications

Camera	MSC-AGRI-1-A Sensor size: 1” Bands: Red, Green, Blue, NIR
Lens	6.5 mm focal length, for 1” sensor (other options available) c-mount, manual iris, manual focus, locking screws
Number of LED channels	4
Number of LEDs per channel	4 (40W per channel)
LED control	Each channel controllable via serial interface and manually through front panel Strobe output from camera flashes all 4 LED channels simultaneously. Each LED output channel has independently controllable pulse duration and pulse delay.
LED channels	White LED (3 channels) and 800 nm, or Red, Green, Blue, and 800 nm
Camera Triggering	Hardware – 5-24 Vdc signal, rising or falling edge, pre-wired to LED controller. External trigger input available.
Software	2ndLook multicamera acquisition software for Windows 10 (optional)
SDK	Medley SDK for Windows 10 (C++, C#, VB, MATLAB, LabVIEW, Python, OpenCV, Micro-Manager, Java, plus others). Sample code included.
External construction	6061 aluminum, polycarbonate, 316 stainless steel hardware, and polymer
Surface finish	Camera head: black anodization Control box: Aluminum (standard), Stainless Steel (optional)
Power Requirement	100 - 240 VAC (250 W) Supplied with 2 m power cord
Dimensions	Camera head: 200 mm diameter x 170 mm deep Control box: 356 mm x 305 mm x 180 mm (HxWxD)
Weight	Camera head: 2.5 kg Control box: 6 kg

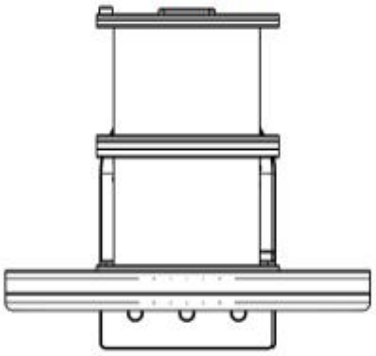
3. Drawing: Camera Head

RENDERED VIEW

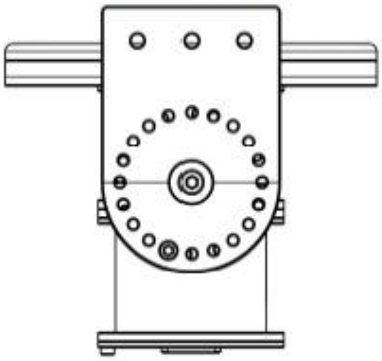
FRONT VIEW



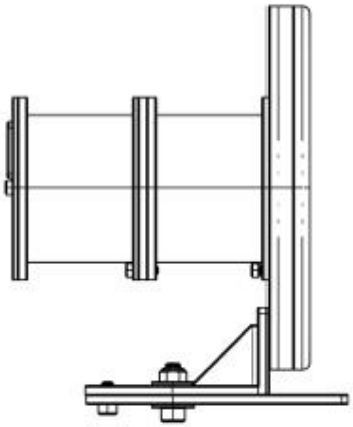
TOP VIEW



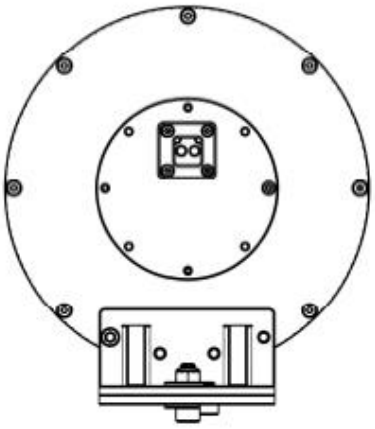
BOTTOM VIEW



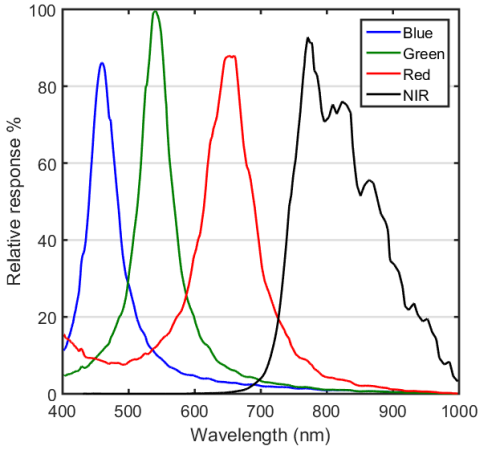
SIDE VIEW



BACK VIEW



4. Camera Specifications

Lens Mount	C-mount
Interface	USB3 Vision
Maximum Bit Depth	8,10,12 bit
Shutter	Global Shutter
Sensor Type	CMOS
Capture Method	Area
Sensor Model	CMV4000
Sensor Format	1-inch
Number of Channels	4 bands
Pixel per Channels	512 by 512
Channels	Red, Green, Blue, and NIR
Pixel Size (H x V)	5.5 x 5.5 (µm)
Dynamic Range	60 dB
Dark Noise	13 e- (RMS)
Dark Current	125 e-/s (25 °C)
Power Requirement	USB 3.0 interface
Maximum Frame Rate	94 fps
Relative Response Versus Wavelength (nm)	

5. LED Controller Specifications

Number of channels	4 channels
LED nominal input voltage	24 V
Input voltage	100-240 Vac
Trigger function	Bidirectional input, regardless of polarity
Trigger input voltage	5-24 Vdc
Total output power	4 channels total 120 W
Output voltage (peak value)	48 Vdc (LED overdrive mode)
Output current (peak value)	Single channel ＜ 20 A
Luminous delay	＜ 1 µS
Strobe time	0-999 µs adjustable
Camera output delay time	0-999 µs adjustable
Light source delay time	0-999 µs adjustable
Trigger mode	Divided into internal trigger and external trigger
Error indication	Digital display
Overcurrent protection	Yes
Operating environment	Temperature: -10 ~ 50°C Humidity: 20 ~ 85% RH (no frosting)
Storage environment	Temperature: -20 ~ 60°C Humidity: 20 ~ 85% RH (no frosting)
Cooling	Natural convection
Material, surface treatment	Steel enclosure with painted surface

6. Optional Computer Specifications

Operating System	Microsoft Windows 10	Ubuntu 18.04
SBC	UDOO Bolt V8	UDOO Bolt V8
CPU	AMD Ryzen™ Embedded V1605B Quad Core/eight Thread @ 2.0 GHz (3.6 GHz Boost)	AMD Ryzen™ Embedded V1605B Quad Core/eight Thread @ 2.0 GHz (3.6 GHz Boost)
Memory	16 GB DDR4 Dual-channel 64-bit 2400MHZ	16 GB DDR4 Dual-channel 64-bit 2400MHZ
Video	AMD Radeon™ Vega 8 Graphics (8 GPU) 2 X HDMI 1.4 / 2.0a 2 X DP Alternate Mode On USB Type-C	AMD Radeon™ Vega 8 Graphics (8 GPU) 2 X HDMI 1.4 / 2.0a 2 X DP Alternate Mode On USB Type-C
OS Drive	32 GB EMMC 5.0 High Speed Drive	32 GB EMMC 5.0 High Speed Drive
Data Drive	SATA III 6 Gb/s M.2 2280 SSD 512 GB, 1TB, 2TB options	SATA III 6 Gb/s M.2 2280 SSD 512 GB, 1TB, 2TB options
Wi-Fi	Wi-Fi (IEEE 802.11ax) NGFF M. 2 2230 FORM FACTOR	Wi-Fi (IEEE 802.11ax) NGFF M. 2 2230 FORM FACTOR
Ethernet	Gigabit	Gigabit
USB	2x USB 3.0 Type-A 2x USB Type-C:	2x USB 3.0 Type-A 2x USB Type-C:
Software	2ndLook multicamera acquisition software	Spectral Devices msCapture camera acquisition software. Web-based embedded solution with built-in database.
Digital I/O	Arduino Leonardo-compatible ATmega32U4	Arduino Leonardo-compatible ATmega32U4
Power Requirement	19V 65W	19V 65W
Other	Installed inside control box	Installed inside control box