

## ALADDIN SOLAR BLANKET PRODUCT DESCRIPTION

The Redwire Space Aladdin Solar Array is a high-performance deployable composite panel solar solution. The uses array design minimal mechanization to provide a robust, reliable, and deployable solar array. Redwire manufactures the Aladdin solution with a simple, direct bonding of solar cells to the panel (close CTE match of solar cells and composite panel). Aladdin offers high deployed stiffness, plus a significant cost reduction (30%-40%) over existing technologies due to one-piece structure. The Aladdin Solar Array has packaging flexibility for a wide variety of spacecraft - Flip out, flat-rolled, or wrap-around configurations are available.



#### IMPORTANT SPECIFICATIONS

- + 385 100 W/Kg Specific power
- + 200 W to 2500 W Wing Size
- + 30% 50% projected cost reduction at solar array system level
- + Affordability >12 kW/m3 (BOL) Compact stowage volume







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### MAGBOOM

### PRODUCT DESCRIPTION

The Redwire MagBoom Instrument / Sensor Booms are an ultra-compact sensor boom solution that allows longer booms to deploy from smaller stowed volumes. The MagBoom Sensor Boom is a repeatable, ultra-compact, sturdy, customizable spacecraft boom solution.





### IMPORTANT SPECIFICATIONS

- + 85 x 81 x 72mm stowed
- + 1200mm deployed (scalable)
- + 350 g mass
- + Brushed DC motor

### **FURL**

### PRODUCT DESCRIPTION

Deployable and on-orbit retractable membrane aperture that can be used as a solar sail, sunshade, or other applications requiring a large tensioned membrane aperture.



### IMPORTANT SPECIFICATIONS

Current FURL is approximately 4m x 4m deployed aperture. However, technology is scalable to larger apertures.



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### NARWHAL

#### **PRODUCT DESCRIPTION**

Introducing the Redwire Space NARWHAL CubeSat Helical Antenna, a customizable, broadband, high gain, low-volume cubesat antenna. The scalable design of the antenna accomodate both large and small spacecraft missions. The NARWAL antenna supports applications through 4 GHz and offers flexible frequency and gain pattern options.



#### IMPORTANT SPECIFICATIONS

- + **125mm x 125mm x 200mm** Stowed Dimensions
- + <4 GHz (as shown here: supports Link-16 frequencies) Frequency Band
- + 2.5 kg Mass

### EAGLE EYE

#### **PRODUCT DESCRIPTION**

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The Redwire Space Eagle Eye Star Tracker is a versatile technology optimal for geosynchronous equatorial orbit (GEO) missions. The Eagle Eye is a multiple-head star tracker with separate optical heads and electronic units. Because of its modular engineering, the Star Tracker is extremely versatile and can be configured to suit a wide variety of missions.







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# MINIATURE SPINNING SUN SENSOR

#### **PRODUCT DESCRIPTION**

Redwire Spinning Sun Sensors are uniquely designed to provide sun aspect angle and sun crossing pulses for spinning spacecraft.

- + This information is used to determine spin rate and spin axis orientation relative to the sun.
- The Miniature Spinning Sun Sensor is designed for use on small spinning satellites. This sensor has flown on the ST5, Themis, and MMS satellite clusters.
- + The MSSS is Rad Tolerant, or Rad hard to 100 krad (Si).



#### IMPORTANT SPECIFICATIONS

- + **12 V TO +15 V** (Consumption less than 0.5 W) Input Power
- + 0.25 KG MAX Mass
- + 57MM x 51.5MM x 51MM Dimensions







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### **DIGITAL SUN SENSOR ±32°**

#### **PRODUCT DESCRIPTION**

Redwire Digital Sun Sensors provide a large field of view with moderate accuracy and resolution.

- + Each system consists of one or more optical heads, each of which provides two axes of sun angle data.
- + Redwire ±32° Digital Sun Sensors are typically used for medium accuracy attitude determination.
   Systems can be configured with one or more optical heads per electronics.
- + ±32° Digital Sun Sensors are Rad hard to 100 krad (Si).

#### IMPORTANT SPECIFICATIONS

- + 12 V TO +15 V (Other ranges available) (Typical Power Dissipation 1 W) Input Power
- + SENSOR 0.66 LB (0.3 kg) Nominal Electronics SENSOR 2.2 LB (1.0 kg) Nominal Weight
- + SENSOR 3.8" X 3.7" X 2.1" (96 X 94 X 53 MM) ELECTRONICS 7.5" X 5" X 2.1" (190 X 127 X 53 MM) Size





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### FINE SUN SENSOR ±50° PRODUCT DESCRIPTION

Redwire Fine Sun Sensors are used in attitude control applications where sub-arcminute accuracy and millidegree angular resolution are required.

Redwire Fine Sun Sensors are designed in single or two-axis configurations.Each sensor can be custom designed to meet specific performance requirements for Field of View (FOV), accuracy, resolution, and other key parameters.

Redwire Fine Sun Sensors have flown on more than 100 spacecrafts; applications include high accuracy attitude determination, payload instrument pointing, and gyro updates.

**Radiation:** The standard  $\pm 50^{\circ}$  Fine Sun Sensor is rad hard to 100 krad (Si) by design. An option for 150 krad is available. A separate option for 300 krad is also available.



#### IMPORTANT SPECIFICATIONS

- + **100° X 100°** (Each sensor) Field of View
- + ±0.01° TO ±0.05° Accuracy
- + 0.001° TO 0.004° LSB Size







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### **COARSE SUN SENSOR PYRAMID**

#### **PRODUCT DESCRIPTION**

The Redwire Coarse Sun Sensor (CSS) Pyramid is a 2 axis sensor containing four detectors, used for applications including solar array pointing, sun acquisition, and failsafe recovery.

- + The Coarse Sun Sensor Pyramid is a navigational instrument used by spacecraft to detect the position of the sun.
- Redwire is able to design baffles to accommodate nearly any unique Field of View (FOV) requirements your mission requires.
- + The Coarse Sun Sensor Pyramid is Rad hard to more than 100 krad (Si).



#### IMPORTANT SPECIFICATIONS

- + MOUNTING BASE 2.3"×2.3" (58×58) MM WITH BAFFLES 3.5"×3.5"×1.7" (89×89×43 MM) Dimensions
- + 0.29 LB (0.13 KG) NOMINAL Mass
- + NONE Input Power
- + 500 uA TO 1300 uA, EACH DETECTOR Peak Output





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### **SPECTRACAM**

#### PRODUCT DESCRIPTION

The Redwire Coarse Sun Sensor (CSS) Pyramid is a 2 axis sensor containing four detectors, used for applications including solar array pointing, sun acquisition, and failsafe recovery.

Featuring GigE Vision<sup>®</sup> image streaming over 1 Gb/s \_ Ethernet, the camera's low light sensitivity and wide dynamic range make the system ideal for high contrast imaging found in orbital sun-illuminated applications.



With GigE Vision compatible control and image capture, SpectraCAM's ease of integration and low deployment cost make it an ideal solution for multiple LEO applications. The complementary metal-oxide semiconductor (CMOS) imaging camera offered in the SpectraCAM flight camera enables superior

+ low-light performance. Low noise imaging electronics ensure clear and sharp images that render details with superior accuracy. Available in a 50mm x 50mm x 47mm (boresight) configuration, weighing under 180g (without optics), and typical power consumption of 5VDC@ 400mA (full resolution, 10 fps), the SpectraCAM camera is engineered with weight, power, and reliability as top priorities.

The advanced camera supports any user-specified image resolution and aspect ratio to 2592 x 1944 with 5MP monochrome resolution (color resolution is available). Offering 12-bit image depth, responsivity of 1.4V/lux-sec (550nm), dynamic range of 70.1 dB, and an image SNR of  $\leq$  38.1 dB, the SpectraCAM can support a range of mission profiles and applications. Exposure time settings of 0.1 msec to 5000 msec and precise exposure timing to 1 µsec resolution are standard, and the system supports operating temperatures of -30°C to +55° C.

#### IMPORTANT SPECIFICATIONS

#### + 50MM X 50MM X 47MM

(BORESIGHT) CONFIGURATION Dimensions

+ < 180G WITHOUT OPTICS Mass

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+ 5VDC@ 400MA (FULL RESOLUTION, 10 FPS) **Power Requirements** 



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# **ARGUS VERSION 1 CAMERA**

#### PRODUCT DESCRIPTION

The Redwire Argus v1 is the first step in the development and deployment of the next generation camera system. This version of the camera systems boasts a 13 MP image sensor capable of capturing 13MP stills both in JPEG and RAW (10-bit depth) image format, and record or stream resolutions up to 4k at 30 FPS both with h.264 and h.265 compression. It includes 128 GB of on-board storage and a 60 lumen white light LED illuminator for light scene brightening and use with retroreflectors. It is compatible with input voltages ranging fom 5V to 36V, and commanding, telemetry, and video stream are over WiFi 802.11n.



Its packaging allows the use of any screened M12 lens and therefore is capable of a wide variety of FOVs. The design also includes a built-in close loop heater with a software defined tempeature setpoint. Last but not least, the camera comes with a built-in 8-Core computing platform, with integrated GPU, Digital Signal Processor (DSP) capable of performing on-board vision processing, 4 or 6GB of RAM and up to 64 GB of flash memory.

#### SWaP:

- + 140 grams including lens
- + 3-5W power consumption depending on operational mode
- + 76 x 69 x 40 mm volume

### IMPORTANT SPECIFICATIONS

- + Quantity one 13MP image sensor
- + Snapshot, video, and streming capability
- + WiFi 802.11n data interface
- + 128 GB of on-board storage
- + 8-Core CPU
- + Integrated GPU
- + Integrated DSP
- + Up to 6GB of RAM
- + Up to 64 GB of Flash Memory
- + 5-36V input voltage range
- + 3-5W power consumption
- + 140 grams mass
- + 76 x 69 x 40 mm

Colleges and uevelopers

Find out more about redwire solutions.

**Vioad developers**dwirespace.com |@redwirespace |sales@redwirespace.com





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# ARGUS TRI-HEAD CAMERA

#### PRODUCT DESCRIPTION

The Redwire Argus Tri-head Camera is the next step in the development and deployment of the next generation camera system. This version of the camera systems boasts three 13 MP image sensor capable of capturing 13MP stills both in JPEG and RAW (10-bit depth) image format, and record or stream resolutions up to 4k at 30 FPS both with h.264 and h.265 compression. It includes 128 GB of on-board storage and is compatible with input voltages ranging fom 5V to 36V, and commanding, telemetry, and imagery are over RS-422 or Ethernet.



Its packaging allows the use of any screened M12 lens and therefore is capable of a wide variety of FOVs. Multiple FOVs can be used on one camera for optimized range performance in applications such as RPOD. The design also includes a built-in close loop heater with a software defined tempeature setpoint. Last but not least, the camera comes with a built-in 8-Core computing platform, with integrated GPU, Digital Signal Processor (DSP) capable of performing on-board vision processing, 4 or 6GB of RAM and up to 64 GB of flash memory.

#### SWaP:

- + ~250 grams including lens
- + 3-5W power consumption depending on operational mode
- + ~90 x 80 x 50 mm volume

#### IMPORTANT SPECIFICATIONS

- + Quantity THREE 13MP image sensor
- + Snapshot, video, and streming capability
- + RS-422 data interface
- + 128 GB of on-board storage
- + 8-Core CPU
- + Integrated GPU
- + Integrated DSP
- + Up to 6GB of RAM
- + Up to 64 GB of Flash Memory
- + 5-36V input voltage range
- + 3-5W power consumption
- +~250 grams mass
- + ~90 x 80 x 50 mm volume



Joad developers dwirespace.com |@redwirespace |sales@redwirespace.com





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### **RDW CAMERA SYSTEMS**



Flying on Dream Chaser 1 Mission



#### APPLICATIONS





- + Spacecraft State Monitoring Inspection, Deployments, Assembly, Metrology
- + Vision Navigation RPOD, Precision Landing, Hazard Avoidance
- + Space Exploration Multi-spectral imaging, Photometry

### CAPABILITIES

- + Low SWaP
- + Unparalleled imaging performance
- + Unparalleled processing capabilities



**NASA Artemis I-V Missions** 





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V1 MAR 2021



Flying on CLPS 19D **BlueGhost Mission** 



### **RDW CAMERA SYSTEMS**









**Custom Optics with Narrow** Field of View (<6 degrees)

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ges and universities





**Multi-head Camera** System on Deployable Boom Flying on CLPS 19D **BlueGhost Mission** 





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