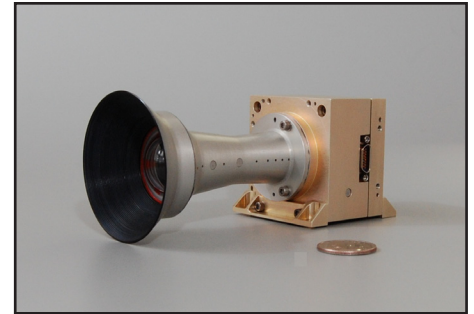


### Features

- Acquire still images and high-definition video
- Small and lightweight
- 2592 (H) x 1944 (V) active pixels
- 20 megapixel/second video rate
- 1/2.5 inch optical format
- Standardized optics interface
- RGB Bayer Pattern filter
- Low dark current
- Superior low-light performance
- Programmable gain and exposure
- Programmable window selection
- Row and column skip and binning modes
- Integral pixel companding
- Radiation tolerant design
- Also available with monochrome sensor, as ECAM-M50

### ECAM-C50

Color CMOS Camera, 5 Megapixel



ECAM-C50 Alternate Mounting Configurations

The ECAM Imaging System minimizes spacecraft overhead and flexibly delivers the features, performance, and reliability required to service a variety of applications, including:

- In-flight engineering diagnostics
- Deployment/actuator monitoring
- Space situational awareness
- Science observations
- Public outreach

Leveraging the experience of more than a dozen science instruments delivered to deep space that have returned more than 700,000 images, the ECAM imaging system delivers cost-effective, short lead-time, high-performance, and reliable space imaging as a modular off-the-shelf solution.

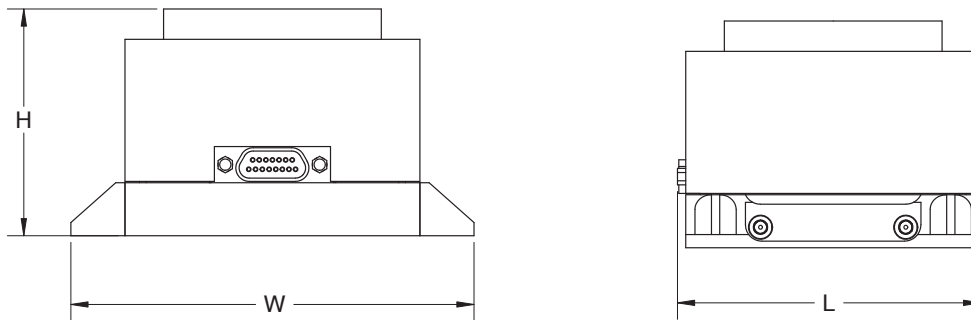
The C50 utilizes a CMOS image sensor with integral RGB Bayer Pattern color filter array. The sensor outputs 10-bit pixels that are square-root companded to 8-bits before being transmitted to the DVR on a 200 Mbit/s serial link. Within the DVR, video is pre-processed and compressed in real-time, then buffered to memory for playback at a later time. Preprocessing typically includes Bayer Pattern interpolation and direct conversion to the YCbCr color space using a 5 x 5 filter kernel. The video is also reformatted as needed for input to either a JPEG (lossy) or Huffman First Difference (lossless) compressor.

The C50 is highly configurable. The exposure and gain may be adjusted to support widely varying scene conditions and the DVR supports automatic gain and exposure control.

The C50 also supports windowing, allowing smaller format images and video to be acquired from anywhere within the scene. To acquire larger portions of the scene at lower resolution, binning and summing may be enabled. Video frame rate is fully adjustable, with the maximum supported frame rate varying with frame size.

Three standard lens options are available for the ECAM series visible-band cameras. ECAM optics are designed for the rigors of space flight, utilizing proven design and manufacturing methodologies with decades of heritage across more than a dozen missions. Our standard lens options have no moving parts, are athermalized to provide stable performance over a wide range of temperatures, and are built to withstand the hazards of launch and long-term operation in orbit.

The C50 includes mounting flanges that may be configured to mount the camera in one of four orientations.



#### MSSS FACTS

Headquarters: **San Diego**  
 Type: **Small Business**  
 Quality: **ISO9001:2008 Compliant**  
 DUNS Number: **62-680-9032**  
 CAGE Code: **OR9V5**  
 NAICS Codes: 333316, 336419, 541512, 541690, 541712, 927110

Version: 20130506  
 ©2013 Malin Space Science Systems  
 All copyright and trademark rights reserved

Parameter	ECAM-C50
Mass (without optics)	256 g
Dimensions	78(W) x 58(L) x 44(H) mm
Power Consumption	1.75 W (idle), 2.5 W (imaging)
Color Bands	RGB Bayer Pattern Filter 400-500 nm (blue) 500-575 nm (green) 575-750 nm (red)
Frame Size	Full 2650 x 1944, WQXGA 2560 x 1600, QXGA 2048x1536, HD1080p 2048x1080, HD720p 1280x720, VGA 640x480
Pixel Size	2.2µm
Pixel Rate	20 Mpixel/s
Frame Rate	Full 3 frame/s, WQXGA 3.5 frame/s, QXGA 2.5 frames/s, HD1080p 4 frames/s, HD720 8 frames/s, VGA 20 frames/s
Readout Type	Unbuffered (Buffered in DVR)
Companding	12-bit to 8-bit
Preprocessing	Performed in DVR
Compression	Performed in DVR
Data Interface	Spacewire
Supply Voltage	5 V
Design Life	Nominal 10 year (radiation determined)
Radiation Dose	5 years (GEO)
Recommended Operating Temperature	-30°C to 40°C