



# Malin Space Science Systems

## Exploration Through Imaging

### ECAM-IR3A

LWIR (8-14 $\mu$ m) Uncooled Microbolometer  
640x480, 17 $\mu$ m pitch

Electro-Optical	
Band	LWIR
Wavelength Range	8-14 $\mu$ m
Electronic Shutter Modes	Rolling
Pixels	0.3 Mpixel
Horizontal Resolution	640 pixels
Vertical Resolution	480 pixels
Pixel Pitch	17 $\mu$ m
Array Diagonal	13.6 mm
Conversion Bit Depth	16 bits
NEDT	<500mK with F/2 lens and 300K target temperature
Frame Rate, Native Format	12 fps

Power	
Supply Voltage	5V (4.5 to 5.35V)
Power, Idle	0.8 W
Power, Imaging	2 W

Thermal	
Operating Temperature	-30 to +40 °C
Protoflight Qualification	-40 to +55 °C
Non-Operating Temperature	-45 to +70 °C
Temperature Sensing	Internal ISL71590 available for readout on J1

Survivability	
Radiation Design Environment	5 years GEO standard, up to 15 years GEO optional
Predicted MTTF	4.6 million hours
NASA TRL	9



ECAM-IR3A NFOV (left) and WFOV (right) with ECAM-DVR4



ECAM-IR3A with WFOV optics

### Features

- Compact thermal-IR camera
- Available with mechanical shutter (IR3S)
- Standardized ECAM interface

### Programmability

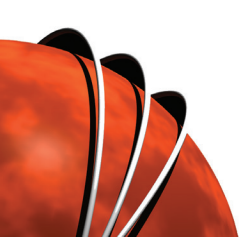
- Sensor Clock Rate
- Gain
- Integration
- Region of Interest
- Test Pattern

### Applications

- Space situational awareness (SSA)
- Rendezvous and proximity operations (RPO)
- Mission extension and inspection services
- Planetary science

Optics			
Effective Focal Length	F/#	FOV (V° x H°)	Bandpass
WFOV, 13 mm	F/1.7	36 x 48	8-12 $\mu$ m
MFOV, 19.3 mm	F/1.5	25 x 32	8-12 $\mu$ m
NFOV, 39 mm	F/2.0	12 x 16	8-12 $\mu$ m
VNFOV, 102.8 mm	F/2.0	4.5 x 6	8-12 $\mu$ m

Digital	
Internal Memory	64 byte SpW Rx FIFO 512 byte SpW Tx FIFO No Frame Buffer
Digital Processing	None
Data Interface	SpaceWire (Single Port) 100 Mbit/s

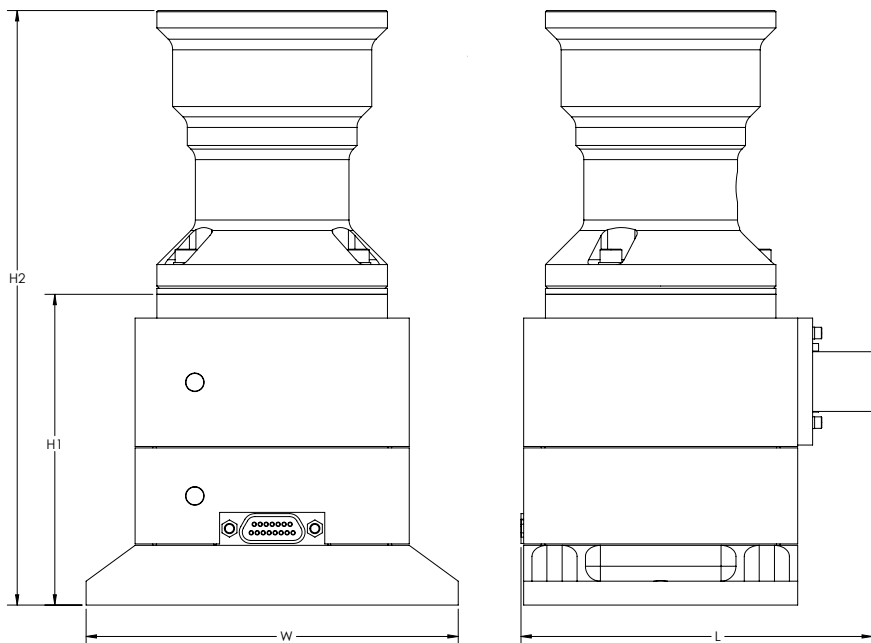


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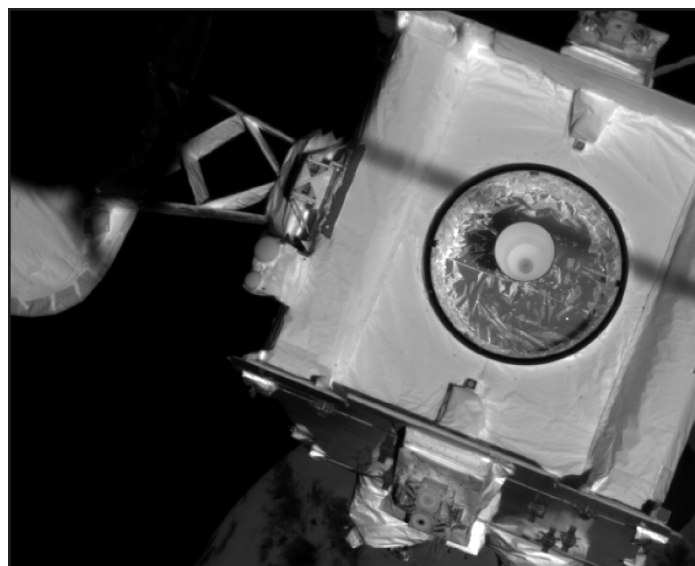
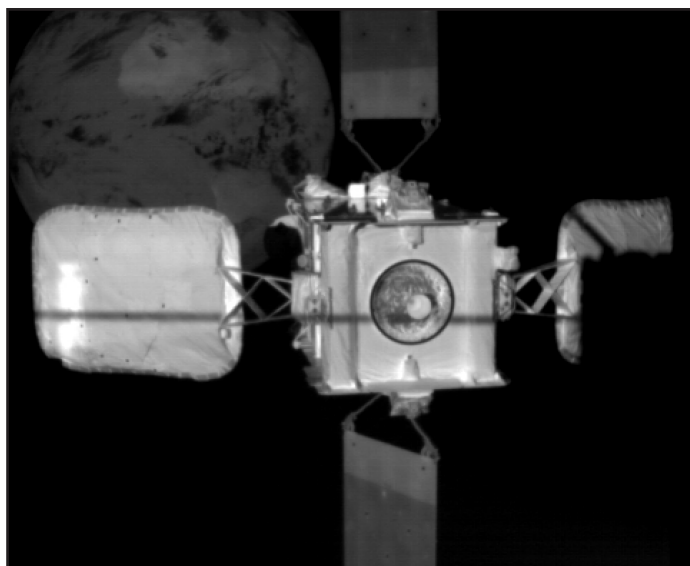
## ECAM-IR3A

Dimensional Envelope



### Mechanical/Interfaces

Mass w/NFOV optics, no baffle	525 g
Dimensional Envelope w/NFOV optics, no baffle	L: 75 mm W: 80 mm H1: 67 mm H2: 124 mm
Connectors	J1: Micro-D, 15-Socket ECAM Pinout



ECAM-IR3A View of IS-901 satellite from Mission Extension Vehicle-1  
Image Credit: SpaceLogistics LLC/MEV-2 Program

**Quality:** AS9100D:2016 Compliant  
**DUNS Number:** 62-680-9032  
**CAGE Code:** OR9V5  
**NAICS Codes:** 333314, 333316, 334511, 336419, 541690, 541715

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