

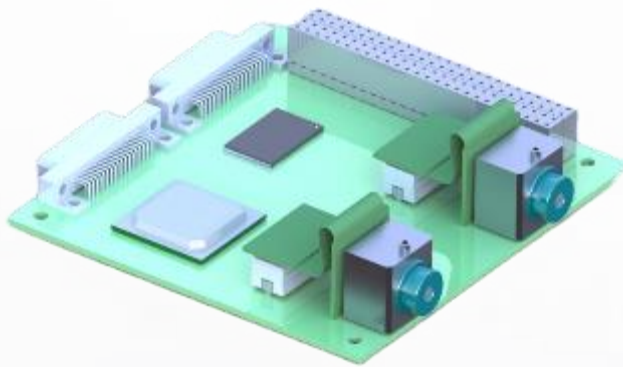


NUSCIS

Multi-application, multi-sensor compact SmallSat and CubeSat-compatible camera for Low Earth Orbit missions

Introduction

XCAM Nuscis is a range of compact SmallSat and CubeSat-compatible space imager products offering un-paralleled flexibility in space imaging systems design. The modular architecture of Nuscis, supporting many different sensor-types (CMOS, CCD and EM-CCD) and opto-mechanical solutions, means that it can be easily customised to support a whole range different SmallSat and CubeSat imaging applications for example: Earth observation, remote sensing, space situational awareness, rendezvous and docking and in-orbit servicing.



CAD rendering of the Nuscis Imager Controller Board (ICB) in standard two-sensor configuration

Nuscis Imager Controller Board (ICB)

The heart of XCAM Nuscis is the Nuscis Imager Controller Board (ICB) which is a complete single-board imaging solution. Supporting several different families of TRL8/9 CMOS imaging sensors, the ICB can operate up to two CMOS sensors in a low-profile PC104 1/4U format and low <5W power footprint. The ICB has on-board data processing capability and telemetry, telecommanding and data transfer are handled through various common data interfaces.

TRL4 Q3 2023



TRL6 EM Q3 2024

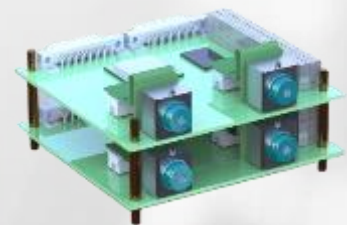
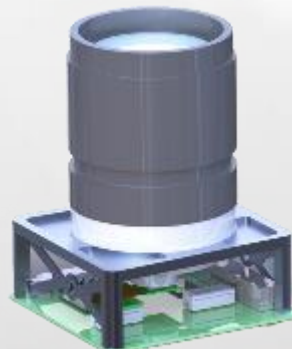
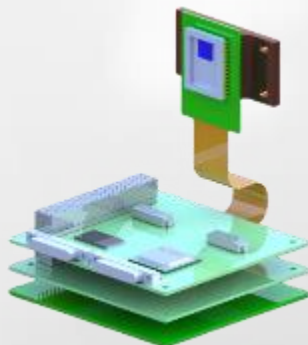


TRL8 FM Q1 2025

XCAM Nuscis Custom Solutions

The design ethos behind XCAM Nuscis is to create a modular architecture that enables the widest range of possible applications. From an optomechanical perspective, imaging system designers can choose to integrate their chosen sensors with a wide range of optical solutions due to the flexible nature of the sensor/ICB interface. From an electro-optical perspective, imaging system designers can choose a wide range of sensor options (CCDs, EM-CCDs and CMOS) that are integrated with the ICB using auxiliary daughterboard and headboard solutions that can also include sensor temperature control.

Design concepts incorporating XCAM Nuscis. Scientific CCD-based camera system (left), Earth observation CubeSat camera (middle), multi-sensor camera system utilising two stacked Nuscis ICBs (right)



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XCAM Ltd.
2 Stone Circle Road
Northampton
NN3 8RF
UK

Tel: +44 (0)1604 673700
Fax: +44 (0)1604 671584
Web: www.xcam.co.uk
Email: sales@xcam.co.uk



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Nuscis Imager Controller Board Specifications

Parameter	Specifications
Dimensions	9.5 x 9.1 x 2.7 cm
Format	PC104 1/4U
Mass	From 70 g depending on configuration
Peak power consumption	5W
Power interface	5V
Operating temperature	-30 to +65 °C
Survival temperature	-40 to +85 °C
Data compression	Yes
On board memory	Various options available (ask for details)
Data interfaces	Various options available (ask for details)
Supported sensors (single board solution)	Up to 2 sensors (ask for details)
Supported sensors (via daughterboard solution)	Larger format CMOS sensor support (ask for details) CCD and EM-CCD sensor support (ask for details)
Design lifetime	3yrs LEO

Nuscis Imager Controller Board Standard Sensor Options

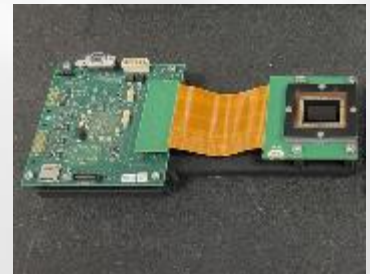
CMOS Sensor Options				
Format	1.3 MP, 5/4 ratio	4.2 MP, 1/1 ratio	4.2 MP, 1/1 ratio	9.4 MP
Types	RGB, Mono	Mono	RGB, Mono, NIR	Mono
Pixels	1280 x 1024	2048 x 2048	2048 x 2048	4096 x 2300
Size	5.3 µm	10 µm	5.5 µm	4.6 µm
Bit depth	10 bit	10/12 bit	10 bit	10/12 bit
Wavelength	400-680 nm (QE>50%)	Contact XCAM	450-700 nm (QE>50%)	400-825nm (QE>50%)



Dual-CMOS



CCD with temperature controller



9.4 MP CMOS

- Engineering models of CCD and CMOS variants delivered to customers Q2 2024
- Radiation testing on CCD and CMOS variants complete Q4 2024
- On board radiation measurement provided with continuous diagnostics and radiation mitigation measures undertaken
- Flight models of CCD and CMOS variants scheduled for delivery in Q1 2025