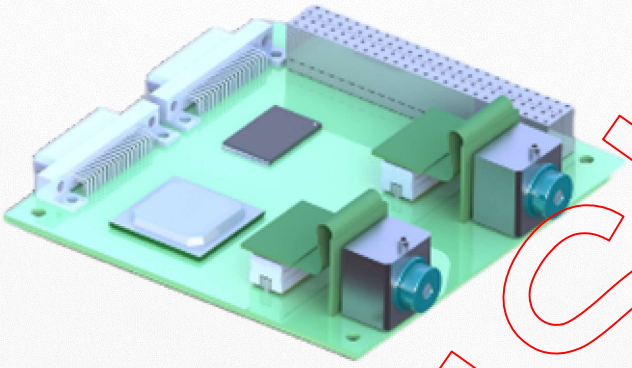
NUSCIS

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)

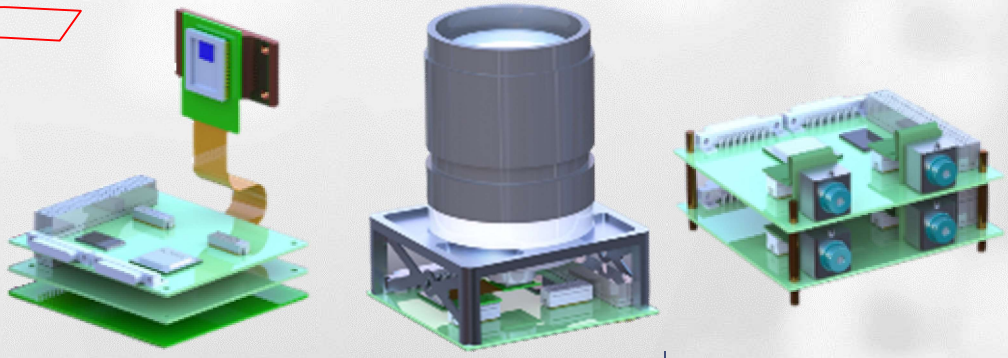
The heart of XCAM Nuscis is the Nuscis Imager Controller Board (ICB) which is a complete single-board imaging solution. Supporting several different families of TRL8/9 CMOS imaging sensors, the ICB can operate up to two CMOS sensors in a low-profile PC104 1/4U format and low <5W power footprint. The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

TRL4 Q4 2022 → **TRL6 EM Q1 2024** → **TRL8 FM Q3 2024**

Low cost XCAM Nuscis Custom Solutions

The design ethos behind XCAM Nuscis is to create a modular architecture that enables the widest range of possible applications at a low price point. 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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MKPU-XCAM-MS-00047vC

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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	< 160 g
Peak power consumption	5W
Power interface	5V, 3.3V
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 2off CMOS sensor types detailed below
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	2.0 MP, 4/3 ratio	4.2 MP, 1/1 ratio
Types	RGB, Mono	RGB, Mono	RGB, Mono, NIR
Pixels	1280 x 1024	1600 x 1200	2024 x 2048
Size	5.3 µm	4.5 µm	5.5 µm
Bit depth	10 bit	10 bit	10 or 12 bit
Wavelength	400-800 nm (QE>50%)	400-650 nm (QE>50%)	450-750 nm (QE>50%)