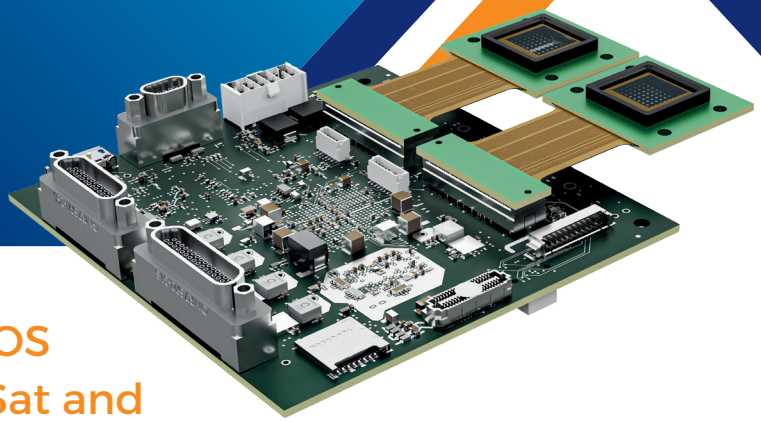
XCAM SCIENTIFIC

SPACE CAMERAS

NuSCIS

Space Camera System



A multi-application, CCD/CMOS multi-sensor compact SmallSat and CubeSat compatible camera system

XCAM Scientific's **NuSCIS** is a range of compact camera systems aimed at SmallSat, MicroSat, and CubeSat missions, offering **un-paralleled flexibility in space imaging systems design**, and utilising *NewSpace* principles to bring modularity and high performance into an affordable camera solution.

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 wide range of different SmallSat and CubeSat imaging applications for example:

- **Earth Observation and Remote Sensing**
  monitoring environmental changes, assessing natural disasters, and collecting data for climate studies.
- **Space Situational Awareness (SSA)**
  aiding in tracking and monitoring space debris, satellites, and other objects in Earth's orbit. Enables rendezvous and proximity operations.
- **In-orbit Serving and Manufacturing**
  facilitates satellite assembly, repair, and upgrading by providing high-resolution imaging for precise operations.
- **Landers and Rovers**
  covering wavelength ranges from x-ray, EUV, UV visible and near-IR.

Combining on-board processing and real-time decision capabilities with low mass, power and volume requirements, NuSCIS offers a **cost-effective, rapid-deployment solution** for space imaging missions.

Features & Benefits

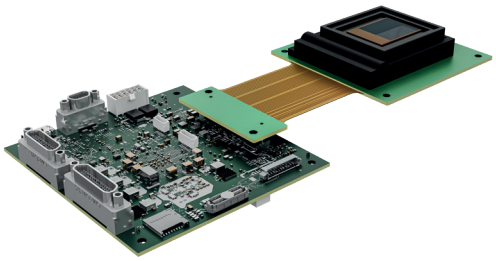
- **Modular Architecture**
  designed with flexibility in mind, NuSCIS supports various sensor types and opto-mechanical solutions, allowing for easy customisation to meet specific mission requirements.
- **Sensor Compatibility**
  supports multiple sensor families including Teledyne, AMS Osram, and Fairchild.
- **Low Power Consumption**
  operates with a low power footprint of less than 5W, making it suitable for power-constrained missions.
- **On-board Data Processing**
  improves spatial and energy resolution by adjusting the detector orientation to the x-ray beam.
- **Temperature Control**
  optional auxiliary boards can include sensor temperature control, ensuring optimal performance of imaging sensors.
- **Imager Controller Board (ICB)**
  is a complete single-board imaging solution that can operate up to two CMOS sensors in a low-profile PC104 1/4U format. Onboard data processing capability handles telemetry, telecommanding, and data transfer through common data interfaces.

NuSCIS Imager Controller Board

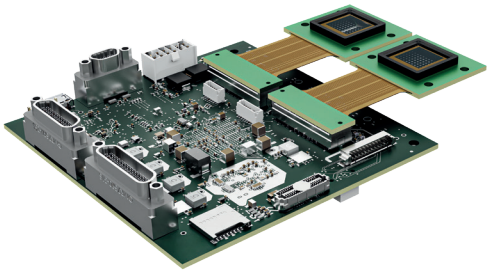
At the core of the NuSCIS platform is the Imager Controller Board (ICB) - a compact, low-power, single-board solution that supports multiple families of TRL8/9 CMOS sensors.

The ICB can operate up to two sensors within a PC104 1/4U form factor and provides onboard data processing along with standard interfaces for telemetry, telecommand, and data transfer.

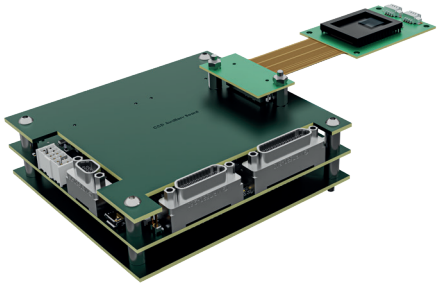
The sensor/ICB interface supports a wide range of optical configurations, while auxiliary daughterboards and headboards allow additional electro-optical capabilities such as thermal management. This flexible architecture enables mission designers to adapt the system to specialised applications for a fully tailored solution.



NuSCIS CIS120



NuSCIS CMV4000



NuSCIS CCD97

Key Specifications

NuSCIS Imager Control Board (ICB) Specifications	
Dimensions	9.5 x 9.1 x 2.7 cm
Format	PC104 1/4U
Mass	From 100 g depending on configuration
Peak Power Consumption	4 W
Power Interface	5 V
Operating Temperature	-30°C to +65°C
Survival Temperature	-40°C to +85°C
Data Compression	Yes
On-board Memory	Various options available
Command Interfaces	CAN-Bus (lab or space use) USB (lab testing only)
Data Interfaces (current)	SpaceWire (lab or space use) USB (lab testing only)
Command Protocol	Python to API or CubeSat Protocol (CSP-2 or CSP-1)
Radiation	Qualified for space environment, latch-up mitigation
Design Lifetime	3 years LEO

Standard 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%)	400-825 nm (QE >50%)

Sensor Compatibility

NuSCIS Space Camera System supports multiple sensor families including:

High performance imaging
- Teledyne e2v Ruby
- Teledyne e2v Sapphire
- Teledyne e2v CIS120

RGB, monochromatic, and near-IR imaging
- AMS Osram CMOSIS CMV2000
- AMS Osram CMOSIS CMV4000

High performance low-light imaging
- Fairchild Imaging HWK4123

MKPU-XCAM-DS-00047-vE

T: +44 (0)1604 673 700
E: sales@xcamscientific.com
Part of Tibidabo Scientific Industries
www.xcamscientific.com