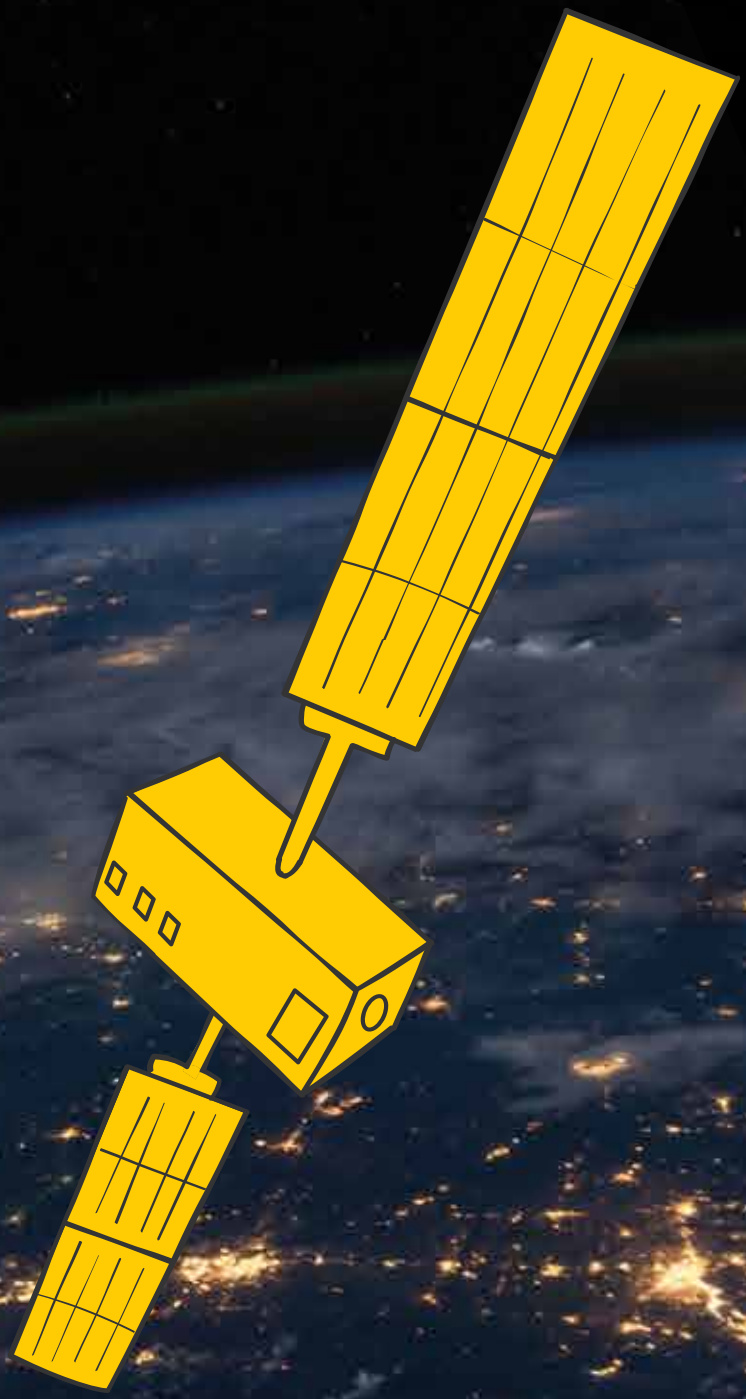
bright ascension

mission ready software



# FLIGHT SOFTWARE DEVELOPMENT KIT

overview

# WHAT IS FLIGHT SOFTWARE DEVELOPMENT KIT?

Flight Software Development Kit (FSDK) is a unique, innovative development environment, designed to create mission-specific flight software using configurable and pre-validated components.

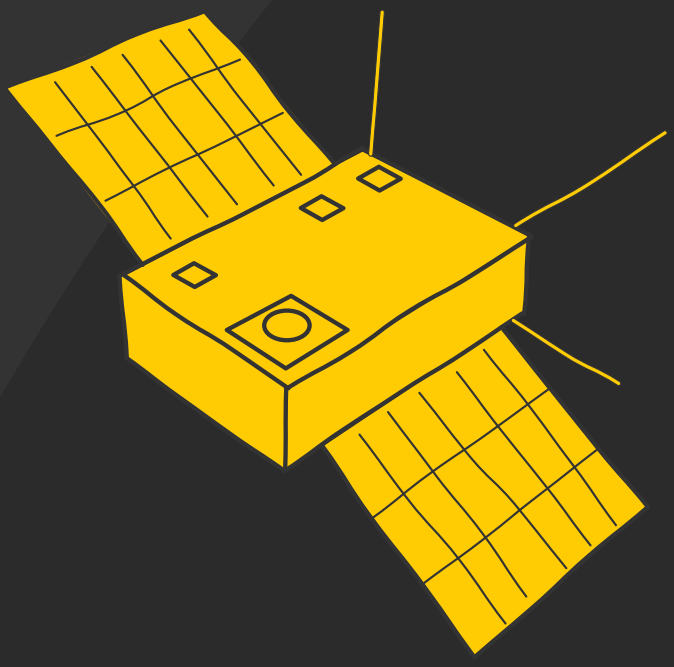
We know that every mission is unique, but most spacecraft perform a number of similar tasks. The key elements of the FSDK are components of two types: a library of pre-validated components that quickly cover basic flight software functionality; and bespoke components for the unique parts of any mission – whether it's a single nano-satellite or a large constellation.

# HAS THE FSDK BEEN TO SPACE?

We are flight-proven.

So far, over 30 spacecraft reached the orbit with our software onboard with many more currently in development. Roughly half of these missions are operated by our Mission Control Software, making full use of the effortless integration with the flight side.

We are proud of our flight heritage. Visit our website for the most up-to-date list of missions we've been involved in.



# HOW DOES IT WORK?

The FSDK comprises three key parts:

- an extensive library of pre-validated components covering all space mission needs, including subsystem, data handling, monitoring, communication, automation and mission components.
- a lightweight framework which allows individual layers to be changed without impacting layers above and below
- tooling to support component development, software integration and testing, which promotes an agile and iterative approach

# EASY INTEGRATION FOR EASY OPERATION

Underpinning every unique flight software built with our development kit is the model-based core technology - creating a machine-readable description of the system that can be used across all life-cycle stages.

Once in operation, our easy-to-use ground-based Mission Control Software automatically reads the entire flight structure with little to no configuration, offering significant improvements in efficiency, automation and cost reduction, even across large systems and constellations.

# 6 REASONS WHY YOUR MISSION NEEDS THE FSDK.

### build faster to launch sooner

Simply use our library of pre-validated software components to quickly cover all your basic functionality and then add your own custom components, unique to your mission.

### design unique missions

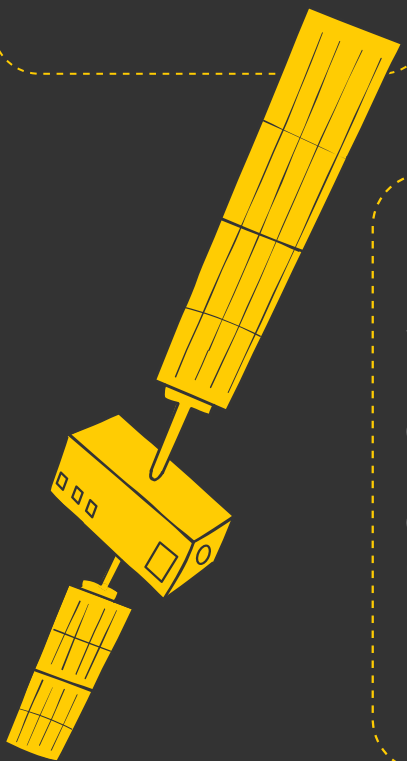
Every spacecraft is different, so our FSDK is designed to create limitless combinations of software components, even for the most unique of missions.

### reduce risk

Our heavily-tested components are pre-validated and come with extensive flight heritage.

### scale up quicker

As your project grows, simply swap your existing components in and out to develop new and larger missions or even constellations.



### get multiple vendors

Use multiple vendors to build the most cost-effective constellations. Simply swap a few components in your existing software to add different hardware to new missions.

### reduce specialist skills

Simplicity and ease of use are critical for your mission to succeed, that's why the FSDK reduces the need for specialist skills. But if you ever feel lost, training and annual support are included.

# SYSTEMS AND PLATFORMS

## onboard computers

- AAC Clyde Space Kryten and Sirius OBCs
- CubeSpace CubeComputer
- GomSpace Nanomind A3200 and Z7000
- ISISPACE iOBC
- INanoAvionics Payload Controller 1.5
- Xiphos Q7 and Q8
- BeagleBone Black OBC
- Many other Linux-based OBCs incl. Raspberry Pi

## operating systems

- Linux
- FreeRTOS
- RTEMS
- Bare metal environment using the built-in cooperative multi-tasking capabilities of the framework

## off-the-shelf subsystems

- AAC Clyde Space Sirius TCM
- ArduCAM Mini 5MP Plus
- Astrodev radios including the Helium and Lithium
- All AAC Clyde Space CubeSat subsystems
- CPUT/F'SATI radios including UHF/VHF and S-band
- GomSpace subsystems, including the SDR
- ISISPACE subsystems, including the UHF/VHF transceiver
- Maryland Aerospace MAI-400
- NearSpace Launch Eyestar Duplex Modem
- Novatel OEM6 GPS
- Orbitonics C3D Imager
- Pumpkin subsystems, incl. power systems
- Satlab SRS3
- Skylabs NANOlink-2
- QinetiQ Q20 HD GPS
- A range of miniaturised sensors and ADCs
- Modems compatible with the ITU-T Rec.V.250 standard

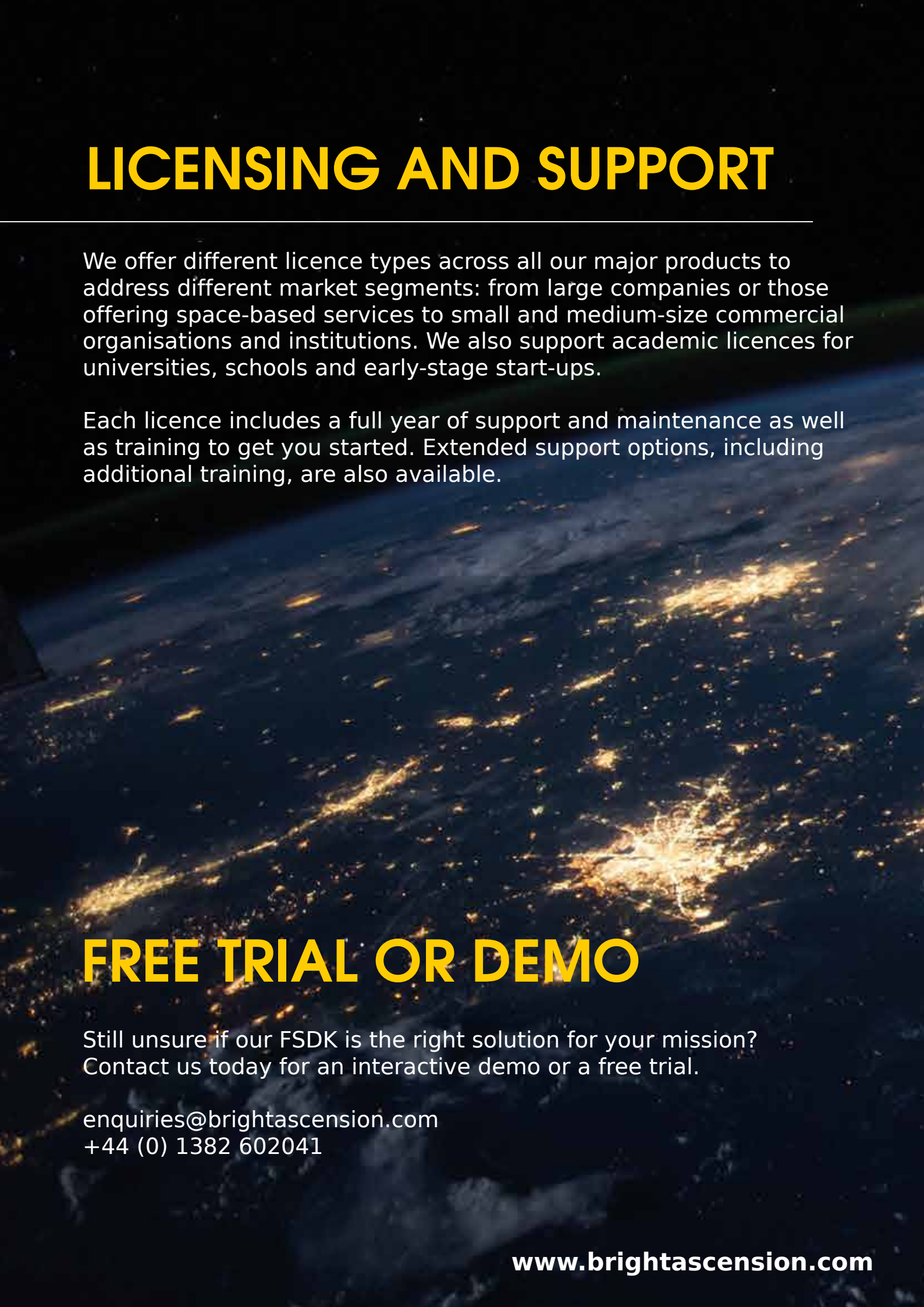
## communications protocols

- ECSS Packet Utilisation Standard (PUS)
- CCSDS Packet Protocol
- CCSDS File Delivery Protocol
- CCSDS Telemetry and Telecommand framing, synchronisation and coding
- CCSDS TM Space Data Link Protocol
- CCSDS TM Synchronization & Channel Coding
- CCSDS TC Space Data Link Protocol
- Simple SHA-1 HMAC authentication
- CCSDS Space Data Link Security
- CubeSat Space Protocol (CSP)
- Generic KISS support
- Many others in development

# LICENSING AND SUPPORT

We offer different licence types across all our major products to address different market segments: from large companies or those offering space-based services to small and medium-size commercial organisations and institutions. We also support academic licences for universities, schools and early-stage start-ups.

Each licence includes a full year of support and maintenance as well as training to get you started. Extended support options, including additional training, are also available.



# FREE TRIAL OR DEMO

Still unsure if our FSDK is the right solution for your mission? Contact us today for an interactive demo or a free trial.

enquiries@brightascension.com
+44 (0) 1382 602041