PUSopen®

Reliable and Secure Software Communication for Space

With easy deployment and efficiency of communication in mind, two well-established space communications standards ECSS and CCSDS were implemented in PUSopen®. Parts of the established standards were selected to provide on-board and space-to-ground software communication functionality, which integrates smoothly with your application.

PUSopen® tools helps you to easily configure communication features and to quickly achieve initial communication capability. 12G Professional Services provides optional training and assistance with design, integration and support of the PUSopen® solution for your mission.

FEATURES AND BENEFITS

Scalable, secure and easy to use on-board and space-to-ground communication.

- **CCSDS communication.** PUSopen® has been designed to fit both on-board (system-to-system) and space-to-ground communication scenarios. Standardized built-in adressing capabilities of the CCSDS protocols allow packets and frames to be targeted for on-board or on-ground subsystems.

- **ECSS Telemetry and Telecommands.** Standardized ECSS PUS services are implemented as the top layer of the PUSopen® stack. PUS services help you to easily send periodic and on-demand reports with on-board telemetry and events. APIs for custom-formatted telemetry are also available. Pre-defined ECSS and custom-defined services can be targeted by telecommands and associated data.

- **Security.** Protect your space-to-ground and on-board communication links with AES-128 encryption. Encryption keys are defined, configured and owned by the customer.

- **Easy integration with on-board hardware and databuses.** Selected public interfaces of the PUSopen® stack can be used in the Interrupt Service Routines (ISR) commonly used for serial communication. Dedicated layers of the stack allow easy integration with mission-specific databuses.

- **Bareboard and RTOS integration.** There are no specific hardware or Operating System requirements to deploy and run PUSopen® communication stack. Both, bareboard and multitasking deployment scenarios are possible.

- **Data traffic prioritization.** Achieve prioritized data communication by configuring synchronous and asynchronous Virtual Channels Services with defined priority for each channel. Support mission execution and control by priorized on-board telemetry, large data downlink and events reporting.

- **Extensibility.** Implement additional software services bound to telecommands and telemetry as required by the special needs of your mission. Use the PUSopen® tools to create new software services as required by your mission.

DEPLOY INITIAL SOLUTION FASTER WITH LESS EFFORT

Use ready-made PUSopen® template solutions for selected target platforms to reach initial communication capability quickly. With the idea of easy deployment, the PUSopen® is packaged into a single software library, which can be easily configured and linked with your on-board and ground software.

The flight part of the PUSopen® is deployable to wide variety of target platforms including Intel, ARM and MSP targets.

12G CUSTOMER SUPPORT AND TRAINING

PUSopen® development is backed by around-the-clock customer support ready to resolve deployment challenges and requirements set by your mission. We provide Introduction sessions and training for developers, integrators and mission support. PUSopen® product documentation and website contain manuals and examples to speed-up initial deployment and to provide API and integration instructions.

Visit www.12gfs.com/support for more information about PUSopen® support.

EDITIONS AND LICENSING

Targeting both, small mission teams and medium/large system developers, PUSopen® is licensed on the per-mission basis. By "mission" we mean one physical satellite device with all its CPUs and ground station. If you plan to use the stack on satellite constellation or you are large ground service provider, please contact us for further information.

	PUSopen® Demo	PUSopen® Pro
PUS services	Selected services	✔
Space Packet Services	✔	✔
Packets Synchronization	✔	✔
Frames and Virtual Channels	-	✔
Security	-	✔
Documentation	Tutorials	✔
Configuration Tools	-	✔
Support and Updates	-	1 year included
Initial Introduction	-	✔

PUSopen® Pro Edition is targeting full mission life-cycle support, with initial year of support included in the purchase of the product. Online and offline (hosted) set of tools and documentation is provided to support design, development and validation.

HOW TO TRY AND PURCHASE

Visit www.12gfs.com/pusopen for trial, pricing, sales contact and information about Professional Services provided by our experienced team. To talk to one of our sales representatives call +46 70 180 90 91 or write to contact@12gfs.com.

12G Flight Systems Sweden AB is developer of the high-reliability software. Our solutions are designed with full mission life-cycle in mind to provide you with the professional service at each step of the mission.