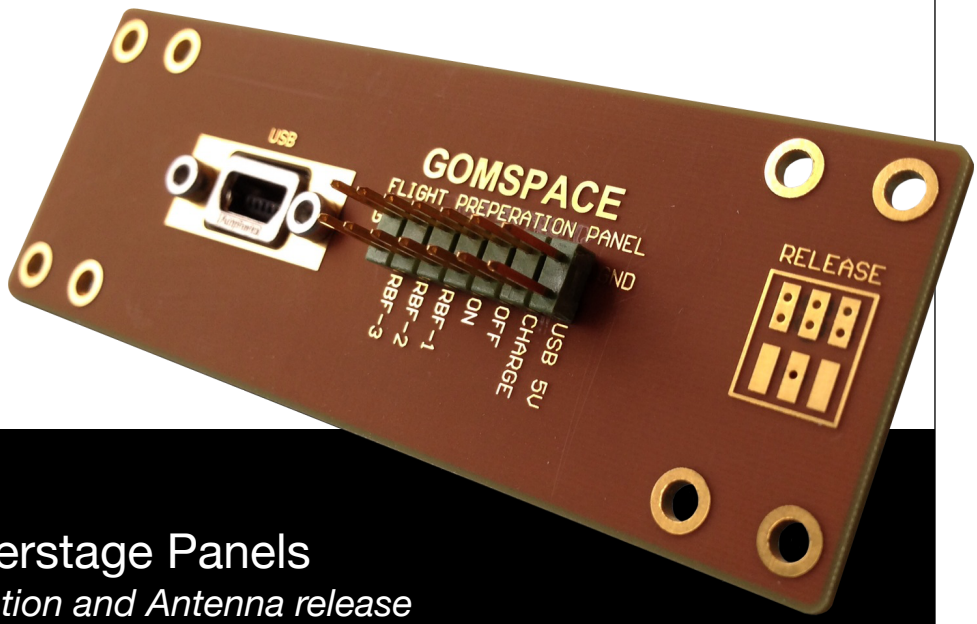
GOMSPACE



GomSpace Interstage Panels

With Flight Preparation and Antenna release

Datasheet

Interstage Panels

Interstage panels for 2U and 3U CubeSats with integrated Flight Preparation Panel and antenna release system.

Feature Overview

- Easy integration with other GomSpace products:
  - NanoHub
  - NanoPower P31U
- Flight Preparation Panel
  - USB interface
  - 3 x Remove Before Flight (RBF) pins
  - Satellite charging interface
  - Kill Switch reset and override
- Antenna release system for GomSpace NanoCom ANT-430 system

Applications

- 2U, 3U CubeSat satellites

Compatibility

- GomSpace products
- Innovative Solutions in Space products

Description

The interstage panels is compatible with the ISIS 2U and 3U CubeSat structure and provides a set of interfaces and functions that are convenient when working with an integrated satellite and also support active deployment of the GomSpace NanoCom ANT-430 antenna system.

They are sold as a set of four panels with the following functions:

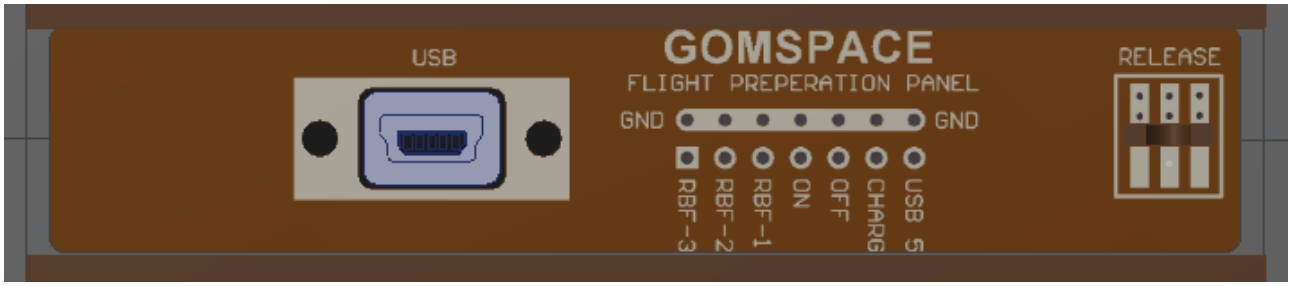
- 2 interstage panels with optional antenna release for *ISIS structure Y sides*
- 1 interstage panels with optional antenna release for *ISIS structure X sides*
- 1 interstage panel with flight preparation interface and optional antenna release for *ISIS structure X side*

Interstage Panel

Interstage panels are designed to fit the mid-section of a ISIS structure with 1U solar panels as shown on the right. An optional antenna release The interstage panels are equipped with a PicoBlade™ connectors used for connections to the antenna release function (the FPP panel further have a PicoBlade™ connector for the flight preparation interface).

Flight Preparation Panel

The outside of the flight preparation panel features a FPP connector (2.54mm header) and a USB connection (Mini-B).



On the inside, a 12-pin horizontal PicoBlade connector allows direct interfacing to the GomSpace NanoHub (or a different subsystem). On the NanoHub the connections are then distributed to the the other systems as necessary like the kill switch to the NanoPower and the USB to the USB2serial converter on NanoHub which provides serial connection to different subsystems.

The table below provides an overview of the internal and external connections of the FFP together with a *suggested* connection of internal pins to subsystems (depending on system configuration).

FPP Connectors			Suggested configuration
Pin number	Internal PicoBlade	Outside FPP Mnemonic	
0	GND	GND / *USB*	To NanoHub FTDI
1	USB 5V	USB 5V / *USB*	To NanoHub FTDI
2	D+	*USB*	To NanoHub FTDI
3	D-	*USB*	To NanoHub FTDI
4	EPS Charge	Charge	Through NanoHub to NanoPower
5	-		
6	-		
7	Kill Switch Reset (OFF)	OFF	Through NanoHub to NanoPower
8	Kill Switch (ON)	ON	Through NanoHub to NanoPower
9	EPS RBF (RBF-1)	RBF-1	Through NanoHub to NanoPower
10	Knife 1 ARM (RBF-2)	RBF-2	To NanoHub
11	Knife 0 ARM (RBF-3)	RBF-3	To NanoHub

The following describes the provided functions and suggested use assuming that the Flight Preparation Panel is interfaced with a standard GomSpace stack that includes a NanoHub and NanoPower systems - similar to the configuration proposed in the above table. However, the flight preparation panel can easily be interface directly to NanoPower directly without a NanoHub.

Charge

The satellite can be charged through the EPS Charge input (5V) or by inserting a USB cable and inserting a jumper over the USB 5V and the EPSCharge input.

USB

The USB connector interfaces to the FTDI usb2serial converter on the NanoHub which then allows 4 serial connections to other subsystems which is very useful when working with an integrated satellite. In a standard GomSpace setup all subsystems have GOSH (Gomspace Shell) which allows a wide range of functions to be executed through the serial interface (See GOSH data sheet for more information)

Kill Switch

The ON is a parallel connection to the actual kill switch of the NanoPower/structure and by shorting it to ground will switch on the satellite. The OFF is connected to the NanoPower kill switch reset and by shorting it to ground will switch off the satellite.

RBF

The RBF-1 is connected to the NanoPower RBF and by shorting it to ground ensures that the satellite can not be switch on. The RBF-2 and RBF-3 are connected to the ARM inputs for the deployment knifes on the NanoHub. By shorting them to ground ensures that no deployment can be attempted.

WARNING: If the RBF-2 or RBF-3 are removed and the satellite is switched on, the NanoHub will attempt to deploy.

Antenna release

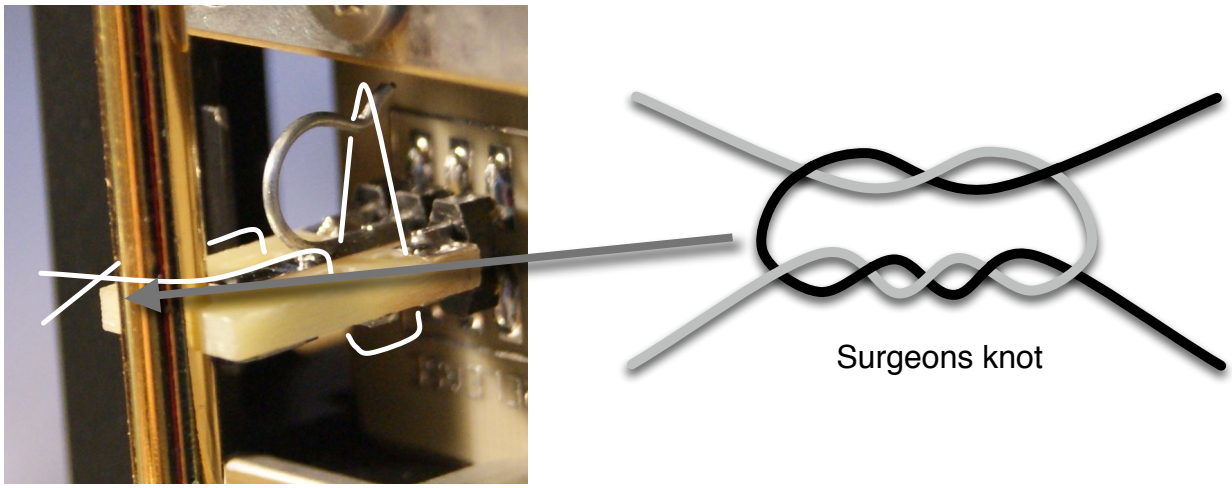
The optional antenna release system is situated on the front of the interstage panels and is interface through a 4-pin PicoBlade connector with the following connections:

Antenna release connector	
Pin number	Usage
0	Burn Resistor 0
1	GND
2	Burn Resistor 1
3	Switch sense (Normally Open)

The antenna release system itself consists of a small PCB with two 20 Ohm burn resistors and a normally-open sense switch. Each burn resistor can be operated independently and the sense switch can be used for detection of successful deployment - these function fits directly with the interface on the NanoHub. The string (wire) used in the stow procedure is thin flexible Dyneema and 5 meters of the wire is provided with the product.

Stow procedure

Use 40 cm burn wire. Insert both ends of wire through the inner holes of the release PCB from the side with the spring. Place loop of wire at hook on spring. Pull both ends over the burn resistors and through the outer two holes. Tie ends around antenna using two surgeon's knot on top of each other.



Please use *Interstage Options Form* to indicated desired options upon ordering - it can be downloaded from www.gomspace.com

Revision History

Revision	Date	Changes
1.0	01/11/2012	Initial Version
1.1	06/11/2012	Added antenna release information
1.2	26/11/2012	Minor textual changes

GomSpace ApS • Niels Jernes Vej 10 • 9220 Aalborg E • Denmark
Tel: +45 9635 6111 • Fax: +45 9635 4599 • Web: www.gomspace.com