

# Exposed Payload Hosting Unit (XPHU)



## Overview

The XPHU is an external versatile platform capable to host multiple payloads exposed to deep space and to interface them to the spacecraft.

The unit comprises a mechanical structure for payload accommodation and housing of the avionics and harnessing, a Power Conditioning & Distribution Unit (CDHU) and a Command & Data Handling Unit (CDHU) designed to support a large variety of payload communication interfaces and protocols.

## Mechanical Structure

The Mechanical Structure provides a mounting plate for payloads and is designed for manipulation through robotic means for attachment to the spacecraft body using a SORI or HOTDOCK Standard Interconnects.

## PCDU

The PCDU receives power at 120V and distributes it to the CDHU and the hosted payloads. The PCDU main features comprise:

- Input over/under voltage protection circuit
- Over temperature protection circuit
- Input Filter for impedance matching
- Inrush current limitation (together with the input LCL switch) and EMI filtering
- All outputs manual and remote switchable

- Internal housekeeping functions for all output voltages, currents and two internal temperatures active control

Designed around DC/DC conversion blocks providing several regulated voltages, typically:

- 15.0 VDC
- 5.0 VDC
- 3.3 VDC Low Dropout Voltage Regulators (LDO)

and 11 active switches/monitors.

Power Range: [30W-140 W].

## CDHU

Dual PCB architecture (MCU and FPGA):

- Custom PCB based on GR712RC (LEON3)
- 2 core LEON3-FT 32-bit processors
- 100 DMIPS

CPU Memory:

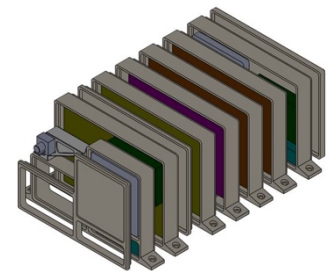
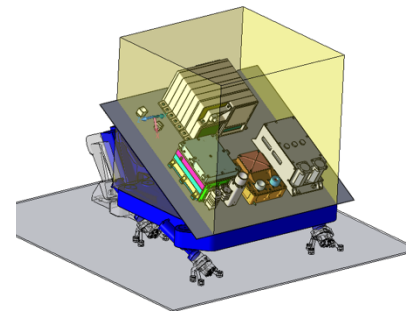
- 64 KB PROM
- 2 MB MRAM (1 MB write protected)
- 2 x 128 MB SDRAM
- Possibility to add NAND memory

Local Storage Memory:

- 4 GB NAND Flash

Real Time Operating System:

- RTEMS + NASA cFS/cFE
- VxWorks or Build-root Linux (in option)



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## Payload Interfaces

Standard Interfaces provided:

- MIL-1553
- SpaceWire
- CAN
- TT-BC-01
- LVDS/UART

## Spacecraft Interfaces

- Ethernet (Best Effort)
- TTEthernet (in option)

## XPHU Services

The XPHU provides the following operational services:

- Polling of Instruments & Sensors
- Centralizing collected data
- Aggregation/Archiving
- Local storage
- PCPU Monitor & Control
- CCSDS Telemetry & Telecommand Engine
- NTP and Time Stamp service
- TCP/IP stack

## Product Roadmap

Initially designed for PPE of the Deep Space Gateway, this versatile XPHU can readily support LEO and GEO missions.

## Applications

The XPHU is adapted to LEO stations, In-Orbit Servicing with in orbit installation or swapping of external payload by robotic means.

## APPLICATIONS

- Exposed Payloads Accommodation and Servicing
- Remote Terminal Unit (RTU)

## SERVICES AVAILABLE

- Custom data acquisition and processing
- Unit support
- Unit customisation

For more information please visit:

<https://www.spaceapplications.com/>

or contact us:

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## OTHER SERVICES

- Mobility / Rover Operations
- Traverse planning & Execution
- Space Weather Services
- Robotics operations
- Mission / System Simulator

## ABOUT SPACE APPLICATIONS SERVICES

Space Applications Services NV/SA is an independent Belgian company founded in 1987, with a subsidiary in Houston, USA.

Our aim is to research and develop innovative systems, solutions and products and provide services to the aerospace and security markets and related industries. Our activities cover manned and unmanned spacecraft, launch/re-entry vehicles, control centres, robotics and a wide range of information systems.



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