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^{TTE}Avionics Hosting Unit

Avionics housing for up to four 3U cPCI insert cards

Key Benefits

- ✓ Avionics Hosting Unit with integrated power supply and 4x 3U cPCI slots for insert cards
- ✓ End Systems can be accessed via PCI (via backplane) or SpaceWire (externally).
- ✓ Customizable to customer needs due to modular front panel and backplane design
- ✓ Compatible with the ^{TTE}Switch Space 3U cPCI and the ^{TTE}End System Space 3U cPCI
- ✓ Two separate power compartments for increased reliability

The ^{TTE} Avionics Hosting Unit is a 3U cPCI chassis, specifically designed to meet the challenges of harsh space environments. It provides a modular platform for the design of complex distributed systems and applications as well as the processing of critical (rate-constrained, time-triggered) and non-critical Ethernet traffic.

Designed and manufactured by Beyond Gravity Austria

The ^{TTE}Avionics Hosting Unit is designed, qualified and manufactured by Beyond Gravity (formerly RUAG Space), leveraging on an extensive heritage of successful space products.

The ^{TTE}Avionics Hosting Unit allows mounting up to four 3U cPCI cards, connected to a shared backplane. To serve as a stand-alone TTEthernet® Switch (^{TTE}Switching Unit or TSU), the ^{TTE}Avionics Hosting Unit can be equipped with up to four ^{TTE}Switch Space 3U cPCI cards, together providing up to 48 Ethernet ports (24x 1000BASE-T, 24x 100 BASE-TX). It can also be mounted with a single board computer that is connected via backplane to a ^{TTE}End System 3U cPCI card providing access to the TTEthernet network. The remaining two slots can, e.g., be equipped with two ^{TTE}Switch Space 3U cPCI cards. This variant of the ^{TTE}Avionics Hosting Unit is also referred to as Avionics Control Unit or ACU.

Dual DC/DC Power Supply

The ^{TTE}Avionics Hosting Unit is equipped with a dual DC/DC power supply (each one for two slots) that safely transforms a spacecraft bus voltage of 95 - 135 V to the 3.3 V supply voltage (PICMG 2.0 R3.0) required on the cPCI backplane. Each power supply with its two slots forms an electrically independent power compartment confining failure propagation. A discrete power commanding interface (On/Off command) is available for each compartment. Telemetry interfaces for hot spot temperature telemetry, and On/Off status telemetry are available.
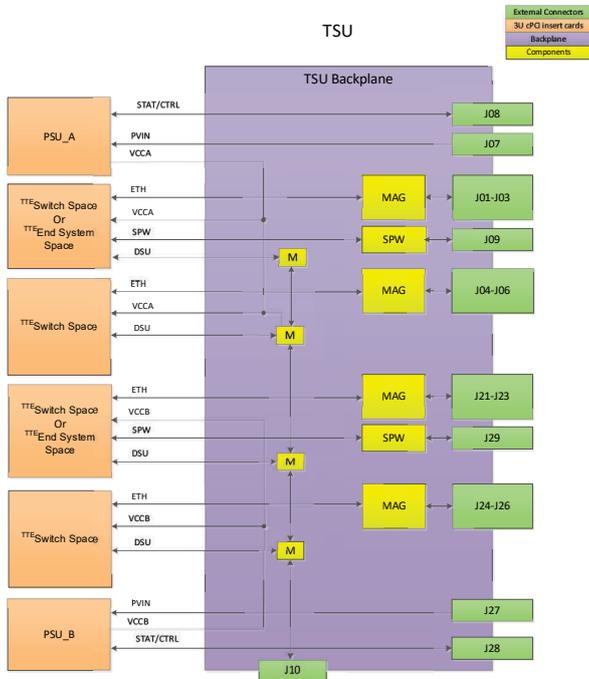

Application Fields

- Human space flight
- Telecommunication
- Earth observation
- Reconnaissance

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Backplane and Integration Concept

The cPCI backplane in the ^{TTE}Avionics Hosting Unit supports the creation of customer-specific functional blocks (e.g. flight computer, stand-alone ^{TTE}Switch, remote terminal unit) out of small modular building blocks in combination with the ^{TTE}End System Space cPCI and ^{TTE}Switch Space 3U cPCI cards.

An exemplary configuration of an Avionics Unit based on TTEthernet 3U cPCI cards is shown in the graphic above. The ^{TTE}Avionics Hosting Unit is designed to allow for the simple development of an application-specific backplane, which is tailored to a specific use-case and system architecture by routing signals in-between P2 connectors and provision for routing signals to external connectors. Interconnections between slots for connector P1 are routed according to the cPCI specification PICMG 2.0 R3.0.

Available Models

- ^{TTE}Avionics Hosting Unit (EDU) (availability dates upon request): Functionally representative model for laboratory use.
- ^{TTE}Avionics Hosting Unit (PROTO) (availability dates upon request): Functionally and electrically fully representative model for laboratory or qualification purposes.
- ^{TTE}Avionics Hosting Unit (FLIGHT) (availability dates upon request): Design qualified and acceptance-tested according to ECSS. Flight-grade model for safety-critical space applications.

Applicable Documents

PICMG 2.0 R3 – compact PCI® specification
S-311-P-822 – NASA specification, connectors, PWB, 2 mm cPCI™ Style
ECSS-Q-ST-60C Rev.2 – ECSS, electrical, electronic and electromechanical (EEE) components
ECSS-E-ST-10-03C – ECSS, testing

Related Products

- ^{TTE}Switch Space 3U cPCI
- ^{TTE}End System Space 3U cPCI
- ^{TTE}Tools

Lifetime	15 years
Environmental	**Vibration (random, all axes, qualification test levels):** 20 – 60 Hz: +3db/oct, 60-1000 Hz: 0.273 g2/Hz, 1000-2000 Hz: -6db/oct **Shock, all axes (qualification test levels):** 20 Hz: 20 g, 1000 Hz: 2000 g, 2000 Hz: 3000 g, 10000 Hz: 3000 g **Temperatures (qualification test levels):** Operational range: -35 °C to +65 °C, storage range: -40 °C to +85 °C **Radiation:** TID for 15 years GEO missions, all components SEL free up to 60 MeV/cm2/mg & SEE tested up to 60 MeV/cm2/mg **EMC** Compliance to MIL-STD-461F CS101, CS114 (Space), CE101-4, CE102 (for 115V)
Power supply	Supply voltage: 95 - 135 V Provides internally: 3.3 V (according to PICMG 2.0 R3) Power consumption: depends on specific configuration
Dimensions	287.6 x 207.7 x 111.6 mm
Mass	Depends on specific configuration (empty 4.8 kg incl. 2x DC/DC)

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