OHB System AG Carsten Siemers, 29.10.2014 8th ESA Workshop on Avionics, Data, Control and Software Systems - ADCSS 2014





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Standardisation of PF/PL IF OHB Point of View

Agenda



- Applications of OHB S/Cs and resulting requirements for PF/PL interfaces
- Current PF/PL interface architectures
- Future PF/PL interface architectures
- Conclusion



Navigation Medium Earth Orbit

Telecommunication

Geostationary Orbit

Earth Observation



	Telecom	Navigation	Earth Observation
Number of discrete Interfaces	<2500	<250	<250
Number of thermal control lines	<500	<200	<200
Approx. data rates for payload monitoring & control (PF <-> PL)	50 - 200kBit/s	20 - 50kBit/s	20 - 50kBit/s
Approx. data rates for payload mission data (PL <-> Downlink)	-	-	MB/s – GB/s
Approx. payload mass memory size	-	-	Gbits - TBits



Current PF/PL Interface Architectures

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- Early design definition
 - Number of interfaces
 - Harness Routing / accomodation
- Harness
 - High number of long lines
 - High mass
 - Complex cabling
- Integration / Replaceability
 - Single P/L IF Unit with high number of connectors
- Testability
 - Payload units only testable together with large P/L IF unit
- Adaptation to different mission needs
 - Similar discrete interfaces in different missions
 - Number of interfaces very different



- Reduce dependencies between units
 - Implementation of smaller P/L IF units
- Reduce harness
 - Accommodation of P/L IF units near P/L units
- Simplify adaptations of architecture
 - > Increase scalability with implementation of flexible standard units



Future PF/PL Interface Architectures

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- Typically low/medium requirements for payload control
- Onboard Computer as control unit
 - Commanding of distributed P/L IF units
 - Time distribution via sync signals (synchronization by ground and/or GNSS)
 - Fault detection and isolation of payload equipment (recovery by ground)
 - Scheduling of payload operations (time triggered commands)
 - Payload data control (mass memory access, downlink)
 - Thermal control (independent thermal control in case S/C is off)
 ...
- Additional instrument control units (ICU) for high control requirements
 - Communication via MIL-STD-1553B Bus







- Reduce dependencies between units
 - Simplification of integration and test
 - Improved replaceability
- Reduce harness



- Mainly data interfaces between payload and platform
- Reduced harness mass and complexity
- Simplify adaptation of architecture

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Improved scalability and flexibility

> Optimized schedule & costs

OHB System AG Carsten Siemers, 29.10.2014 Carsten.Siemers@ohb.de



Thank you for your attention! Any questions?

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