AAC CLYDE SPACE

Command & Data Handling

SIRIUS TCM LEON3FT DEVELOPMENT KIT

Designed for advanced satellite missions operating in low earth orbit (LEO). The readily available Sirius TCM Development Kit with LEON3FT delivers 'always-on' reliable operations that work every-time-on-time with precision performance. The solution includes mass memory and telemetry/telecommand functionality, with a focus on high reliability, resiliency and performance. The TCM receives and stores payload data and platform house keeping data while at the same time distributing telecommands and serving mass memory data to the transceiver. Fault tolerance is secured through triple-modular redundancy on FPGA and memory scrubbing.

Sirius spacecraft avionics are modular in design. Modules can be combined to offer redundant configurations, or to simply accommodate mission specific requirements. The Sirius Command and Data Handling system has a standard single string system that consists of an on-board computer (Sirius OBC) and a combined mass memory with CCSDS stack (Sirius TCM). The Sirius TCM is supplied with userfriendly application software for the management of onboard services, facilitating out of the box integration. Our Sirius TCM Development Kit offers dsub/microD connectors in the mechanical structure, which makes it easy to work with and simplifies the connector usage.

PERFORMANCE

With 50 MHz LEON3FT soft processor, RTEMS real-time operating system (RTOS) and 32 GB mass storage capacity delivering high-performance computing. Utilizing SpaceWire onboard the main data bus for high bandwidth and on-board data transfer. The transceiver interface uses CCSDS encoding standards for satellite link services, compatible with leading ground station networks.

RELIABILITY

Sirius TCM solutions have autonomous single event latch-up protection in logic and data storage. Our inbuilt protections are based on over a decade of design heritage guarantee realtime-on-time operations. Designed and qualified for five years in LEO. The development kit is powered through a mains 12V adaptor, eliminating the need for specialised power supplies or other laboratory equipment.

ADAPTABILITY

Easy-to-use interfaces, facilitating the development phase and reducing overall development and project costs. Designed for the most demanding missions, the Sirius TCM comes with S-band and X-band transceiver interfaces and offers the ability to update software on orbit via telecommands. With pulse commands for low level, basic commanding.

TECHNICAL SPECIFICATIONS

General	
Design Life	5 years in LEO
Connectors	Dsub/microD
Processor	32-bit LEON3FT (IEEE-1754 SPARC v8) fault-tolerant processor
Processor Clock	50 MHz
SCET	15.25 µs accuracy
SDRAM	64 MB (post-EDAC)
Instruction Cache	8 kB
Data Cache	8 kB
NVRAM	16 kB (post-EDAC)
Operating Temperature	Room temperature
Nonvolatile System Memory Nand Flash	2 GB (post-EDAC)
Mass Memory Storage	32 GB (post-EDAC)
Power Supply Input	9V to 15V using power supply, 12V wall socket plug included

Dimensions	
Length	230 mm
Width	155 mm
Height	37 mm

Interfaces		
SpaceWire	50 Mbps, RMAP support	2
Serial Ports	RS422 / RS485 UARTs	3
Serial Ports	RS485-only UARTs	2
PSS Interface	RS485 PPS input	1
GPIO	3.3 V logic	12
CCSDS TRX Interface S-band	RS422 level data stream and TRX command and housekeeping	1
CCSDS TRX Interface X-band	LVDS level data stream and both RS422 and LVDS level TRX command and housekeeping	1
CCSDS TRX Umbilical Interface	RS422 level data stream	1
Pulse Command Output	RS422 level CPDU pulse output	12
Debugging	JTAG port for CPU OpenOCD (real-time debug interface) with debug UART	1

To make an enquiry, request a quotation or learn about AAC Clyde Space's other products and services, please contact:
enquiries@aac-clydespace.com

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