SOLID STATE MASS MEMORIES
SEMM512

TECHNICAL PREVIEW 0C- DECEMBER 2009

Description

The SEMM512 offers data storage solution. The main objective of this Mass Memory is to acquire and store data from scientific equipment and return the data during the transition zone of visibility to a TMHD or a TMTHD.
This data flow is controlled by a computer:
• Data acquisition: in record mode the size of the packets must be 238 bytes or multiple of 238 bytes.
• Data retention
• Data retrieval: in play mode the size of the packets must be 238 bytes or multiple of 238 bytes.

The SEMM512 makes no interpretation of the stored data.

FEATURES

- Based on Flash EEPROM technology
- High capacity from 512 Gbits by module
- ITAR FREE
- Very low consumption: 4 Watts max
- Interfaces : Space Wire, 8 bits parallel LVDS, RS422
- Maximum total ionizing dose : up to 20kRad (TBC)
- Used as a single board memory or coupled
- Data rate : 158Mbps max
- Dimensions (in millimeters) : 220 x 115,5 x 22
- -40°C to +60°C operation
- -55°C to +125°C storage

Design

The SEMM512 is a control block called MCU (Memory Control Unit) and a memory block called MBU (Memory Back-up Unit). The first role is to interface the MBU with its environment (payload computer, instrument, TMHD or TMTHD) and manage the mass memories. The second is the memory block used for data retention.

To store data for long periods and for their retention even in the absence of power supply, the design is based on the recent Flash EEPROM technology.

The MBU is built with 16 NAND-Flash EEPROMs which give a capacity of 512 Gb. These components are divided into memory blocks, themselves consisting of 64 pages. Some blocks may be defective. The SEMM512 is able to detect and dynamically manage defective blocks, so realizing the high-reliability required in embedded systems.

Miscellaneous

The SEMM512 may be coupled with a 1553 bus through a MODBUS module associated with a processor board and a converter board. These modules are manufacturing by STEEL ELECTRONIQUE. For CPU board and Converter board many possibilities are offered.

The SEMM512 may be extended to two or more modules to increase its capacity.

For further details contact us.

Interfaces

Name	Type	Data rate
E1	8 bits // LVDS	158 Mbps max
E1P = E1 redund. or	8 bits // LVDS	158 Mbps max
E1P = SPW	Spacewire	TBD
E2/S2/TMTC	RS 422	Oslink 5, 10 or 20 Mbps or UART (TBD)
S1 (TMHD or TMTHD)	8 bits // LVDS	158 Mbps max (TMTHD)
Oslink_Backplane	RS 422	5, 10 or 20 Mbps
PacketWire	serial RS 422	40 Mbps max

Using SEMM512

➢ " Stand Alone" mode

It means that the SEMM512 consists of a module which may be physically independent from the computer.
• Data replay is transmitted to TMHD or TMTHD using S1 and/or to the computer using E2/S2/TMTC or Space Wire.
• Data record comes from one or more equipments connected to the SEMM using E1, E2/S2/TMTC, E1P or SPW.
In both cases the selection is made by the computer itself through a remote control.
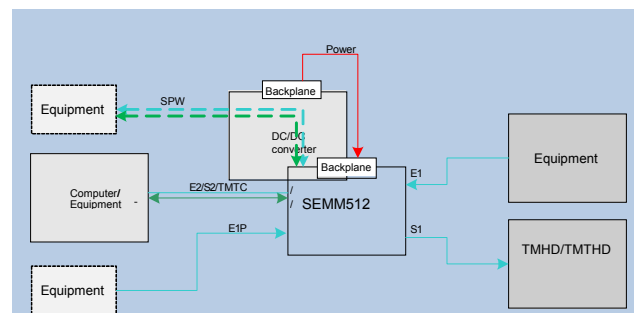
➢ " Integrated" mode

It means that the SEMM512 consists of a module which is integrated into the computer.
• Data replay is transmitted to TMHD or TMTHD connected to S1, to computer with OSLink_Backplane and to E2/S2/TMTC.
• Data record may come from one or more equipments connected to the SEMM using E1, E2/S2/TMTC, E1P or SPW, from the computer with OSLink_Backplane or PACKETWIRE.

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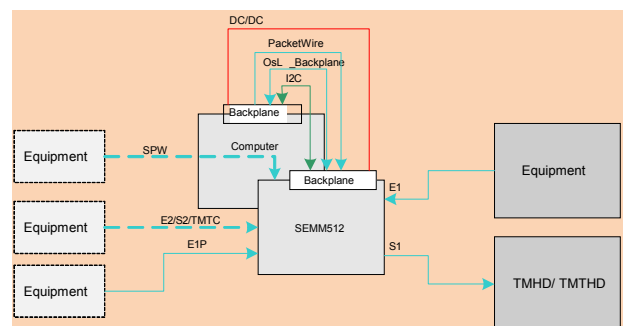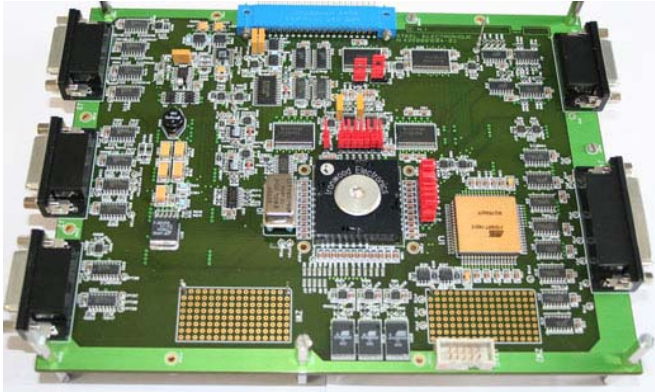
SEMM prototype based on ACTEL FPGA ProAsic 3E

MECHANICAL SPECIFICATION

The SEMM512 is a single module whose dimensions are compatible with other modules stacked for MYRIADE On Board Computer. 220mm x 115.5mm x 22mm. This module consists of a belt with mechanical brackets. The belt has 5 connectors:

- 1 Hypertac connector (62 contacts)
- 3 SUBHD26 connectors for E1, E1P et E2/S2/TMTC
- 1 SUBHD44 for S1

Two versions are available, with or without brackets, depending on using.

ORDERING PART NUMBER

	SEMM512	**x**	**- x**	**/ y**
Base Model				
Using type		S, M		
Using mode			SA, IN	
Quality model				EM, FM

S (single board), M (multiple boards)

SA (stand alone), IN (integrated)

EM (engineering model), FM* (flight model)

*for FM contact us

EXAMPLE 1: SEMM512S-IN/FM
A single flight model used in "integrated mode"

EXAMPLE 2: SEMM512M-SA/EM
An engineering model coupled with one (or more) SEMM EM used in "stand alone" mode