

# SSC100 FC-AL Embedded Controller Product Brief



## Overview

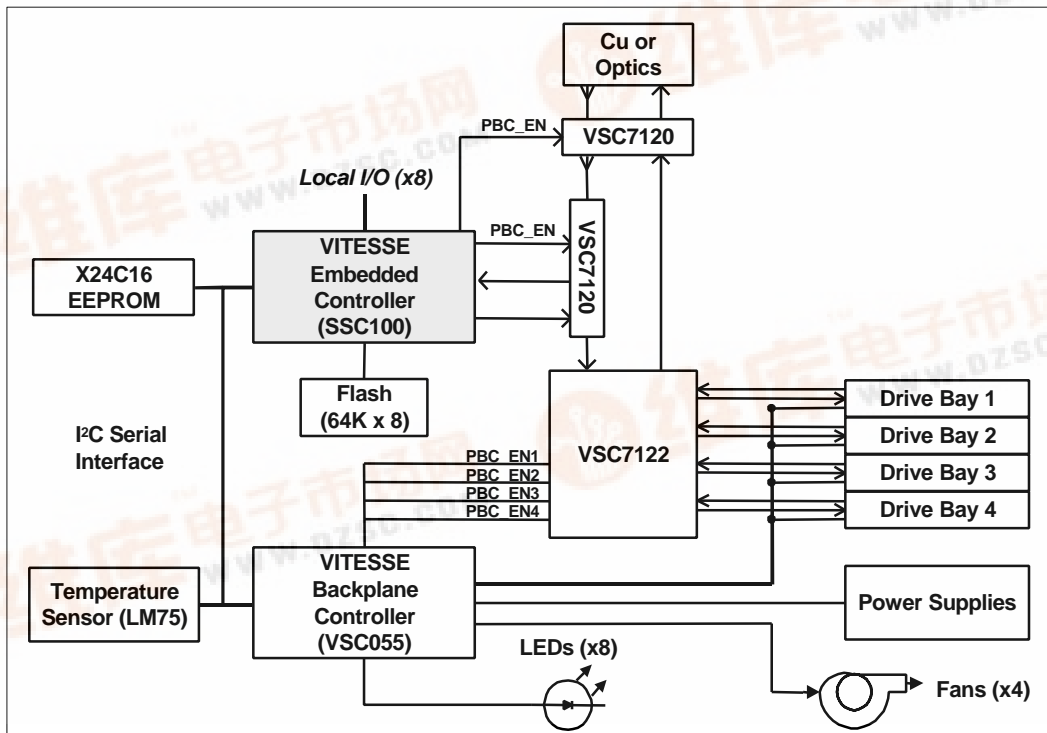
The SSC100 is a Fibre Channel NL\_Port integrated circuit tailored for embedded control applications. When used in conjunction with Vitesse's SSC050 or VSC055 Backplane Controller, the two devices create a chip set solution, which scales to meet system designer's requirements for in-band FC-AL enclosure management. The SSC100 allows system designers to take advantage of the connectivity benefits of Fibre Channel such as cable distance and addressing when designing systems dependent on remote embedded control. An embedded 53Mhz, 32-bit RISC processor provides a processing platform for monitoring and control firmware. The SSC100 includes three, I<sup>2</sup>C serial interface bus master controllers, which allow system designers to use cost effective, off-the-shelf instrumentation and control devices. Two UARTs assist firmware development and out-of-band communication.

## Device Features

- Integrated 1Gb/s Serial Transceiver
- Three I<sup>2</sup>C Serial Interface Controllers
- 32-bit, 53Mhz RISC CPU w/debug port
- Private Loop Direct Attach Profile
- IPMI 1.0 Compatible
- RS-232 Monitor Port
- Four External 1MB Address Ranges
- External Flash and/or SRAM (60ns to 250ns)
- Internal 4KB SRAM
- Eight Programmable General Purpose I/Os
- 100 PQFP Package

## Software Development Kit Features

- Modular architecture to support migration to other I/O technologies and protocols.
- Extensive peripheral device library
- Sample Personality Module source code



Application for a Single Loop, Single Controller with Four Drives

## Applications

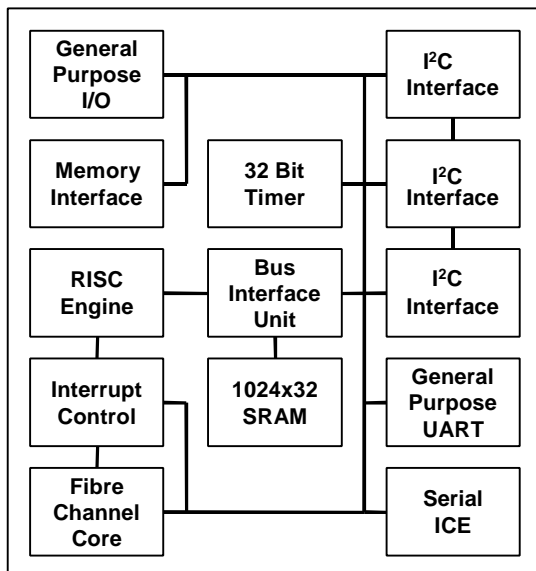
The SSC100 is ideal for remote monitoring and control applications such as FC-AL storage enclosure management. The SSC100 may be used to implement a complete SCSI Enclosure Services (SES) or SAF-TE solution in Fibre Channel JBODs, RAID subsystems and servers. The embedded firmware capabilities of the SSC100 allow storage system architects to differentiate their products via firmware. Software Development Kit (SDK) is provided by Vitesse to accelerate the development of firmware Personality Modules. Multiple SSC100s may be used in fully redundant, dual loop applications with the use of a flexible heartbeat mechanism.

## Architecture

System Level Integration (SLI) techniques were used to create a complete system on a chip. The SSC100 integrates a RISC embedded processor, high performance Fibre Channel protocol engine, a gigahertz transceiver and memory to create an embedded system for enclosure management.

The SSC100 includes three, I<sup>2</sup>C serial interface bus master controllers. These controllers may be used to interface to off-the-shelf instrumentation and control devices commonly used in environmental monitoring and management applications such as Vitesse's SSC050/055 Backplane Controller.

The SSC100 requires off chip memory for firmware code storage. Most applications will use flash memory devices for non-volatile storage. Static RAM may be added for higher performance applications. The SSC100 has four external chip selects each with a one-megabyte address range.



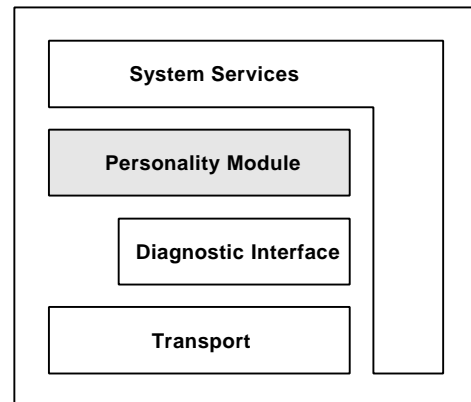
**SSC100 Block Diagram**

Two RS-232 serial ports provide assist firmware debug. One port is dedicated to in circuit emulation for the embedded processor. The second port implements a XMODEM connection for additional debug and firmware download. Firmware downloads are also supported via Fibre Channel.

## Software

The software designed to execute on the SSC100 determines the characteristics of the overall enclosure management solution. Most enclosure management applications will be unique to a customer's individual product. The SSC100 firmware architecture uses a Personality Module with captures the unique functionality required by a particular application. Vitesse provides a Software Development Kit (SDK) to customers to assist their development of their Personality Module.

The SDK includes software to implement a FC transport and SES diagnostic environment. In addition, the SDK also includes a System Services module with provides APIs to the peripheral functionality (interrupts, timers etc.) in the SSC100. The System Services also includes driver libraries for popular I<sup>2</sup>C devices such as National's LM75.



**SDK Firmware Block Diagram**

For More Information:

[www.vitesse.com](http://www.vitesse.com)

email: [prodinfo@vitesse.com](mailto:prodinfo@vitesse.com)

TEL: 1-800-VITESSE FAX: 805/987-5896

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