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VME Scaler/Counter

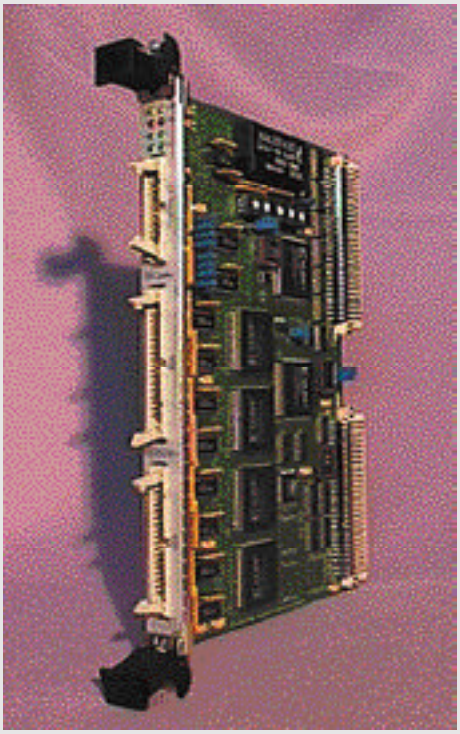
SIS GmbH
VME

SIS3800 Short Description

The SIS3800 is the classical particle physics counter firmware implementation on the base of the SIS38xx/3600 base board. It combines high packing density with fast counting and an appropriate channel depth. The scaler is a single width 6U VME card, no non standard voltages are required. The unit comes with a 20 pin header connector for the control section and two 34 pin headers for the counters (ECL and flat cable TTL version) or with 8 LEMO connectors for the control section and 32 LEMOs for the counter section (NIM and LEMO TTL version) .
Applications of the SIS3800 comprise the cost effective monitoring of counting rates of detectors, as well as the digitisation of pulses generated by voltage to frequency converters. Other members of the same family of boards are the SIS3801 multi channel scaler, the SIS3802 prescaler and the SIS3803/3804, which are the 16 and 8 channel versions of the unit.

SIS3800 Features

- 32 Channels
- 32-bit channel depth
- Up to 200 MHz count rate
- ECL/NIM/TTL versions
- Flat cable/LEMO versions
- Shadow registers
- Read on the fly
- Overflow interrupt generation
- Software/hardware count enable
- Software count enable mask
- Software/hardware clear
- Software/hardware latch shadow
- Broadcast addressing
- Internal test
- Reference Pulser Capability
- Firmware Upgrade Flexibility



SIS3800 Flat Cable Version

Board Design

Up to six XILINX FPGAs act as the working horses of the SIS3600/380x family. One handles the VME interface, one the control section and the other one to four are loaded with the actual counter mechanism from a FLASHPROM.

Scaler Inputs

On flat cable units (ECL/TTL) the inputs are connected via two 34 pin headers, 32 LEMO connectors (NIM/TTL) are used with the LEMO option. A maximum count rate of 200 MHz is possible with ECL and NIM versions, 100 MHz with TTL units. The input termination can be removed in the ECL case to allow for daisy chaining with TDCs e.g..

Control In/Outputs

The control inputs are either equipped with a 20 pin header or 8 LEMO connectors. All 8 lines of the control section are configured as inputs in the SIS3800 version 1 design, different assignments are possible via the input mode register. It is possible to assign count enable and clear in groups of 8 channels e.g.. The termination of the control signals can be disabled to allow for daisy chaining of several modules.

SIS3800 32 channel 32-bit 200 MHz VME scaler/counter

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VME Properties

The unit is in compliance with the VME standard, it supports the following VME features:

- A16/A32 D16/D32/BLT32 (CBLT prepared)
- Base address settable via 5 rotary switches
- VME access LED (VIPA LED set)
- VME64x connectors
- VME64xP geographical addressing prepared
- VME64xP hot swap prepared

Read on the fly

The validity of the lowest 6 bits is not given in a read on the fly, i.e. the result is accurate modulo 64, however the counter design is made in a fashion, that no counts are lost during readout. Accuracy to one count can be achieved with the SIS3801 multi channel scaler.

Power Consumption

5V 3A typical, 5 A maximum (i.e. P < 25W)

Additional SIS3801 Features

The SIS3801 is the first SIS multiscaler implementation. The unit has also 32 channels and allows decoupling of scaler data latching and the actual readout over the VME bus via an on board FIFO. The extended possibilities include:

- 64 K FIFO (256 K optional)
- 32-bit or 24-bit design (with two user bits)
- 48-bit clearing and non clearing design under preparation
- 4 control outputs
- Software or external advance time slice
- Minimum dwell time below four microseconds

SIS VME Module Overview

The SIS VME Scaler/Pulser Family				
SIS3800	32 channel	200 MHz	32-bit	Scaler/Counter
SIS3801	32 channel	200 MHz	32-bit	Multi Channel Scaler
SIS3802	8 channel	50 MHz	32-bit	Prescaler/Divider
SIS3803	16 channel	200 MHz	32-bit	Scaler/Counter
SIS3804	8 channel	200 MHz	32-bit	Scaler/Counter
SIS3805	32 channel	200 MHz	48-bit	Multi Channel Scaler
SIS3806	8 channel	200 MHz	32-bit	Multi Channel Scaler
SIS3807	4 channel			Pulse Generator
SIS3808	32 channel		20-bit	Deadtimed Multiscaler
SIS3809	4 channel			Interrupter/FLIPFLOP
SIS3810	16 channel			Pulse Length Counter
Other SIS VME Modules				
SIS3500	16 channel			Leading Edge Discriminator
SIS3600			32-bit	Strobed/Coincidence Multi Event Latch
SIS3900				VME/VSB VSB/VME Interface

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