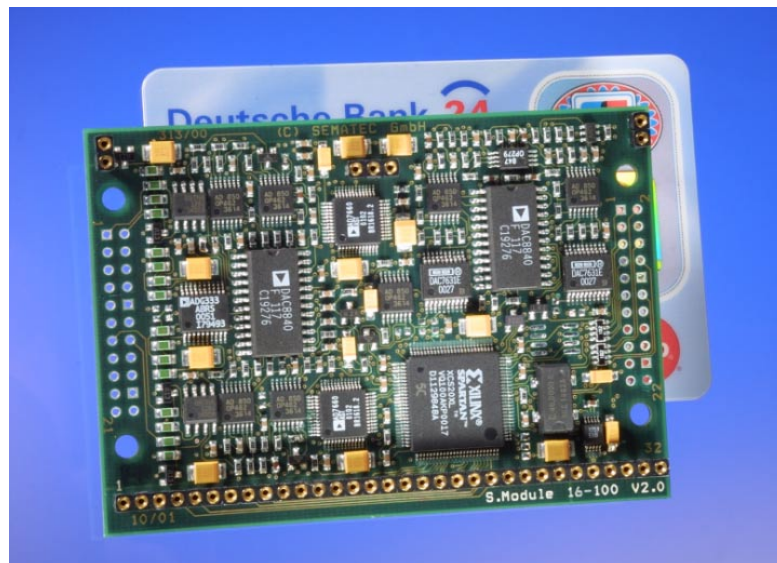




S.Module 16-100

16-Bit Data Acquisition System



Technical Data Sheet V 1.3

1 Overview

The S.Module 16-100 is small size data acquisition board, providing up to four fully independent and complete analog input channels and up to four analog output channels. The S.Module 16-100 has an 3.3 Volt digital interface (CMOS) to controllers/processors. All interface lines are 5 V-tolerant.

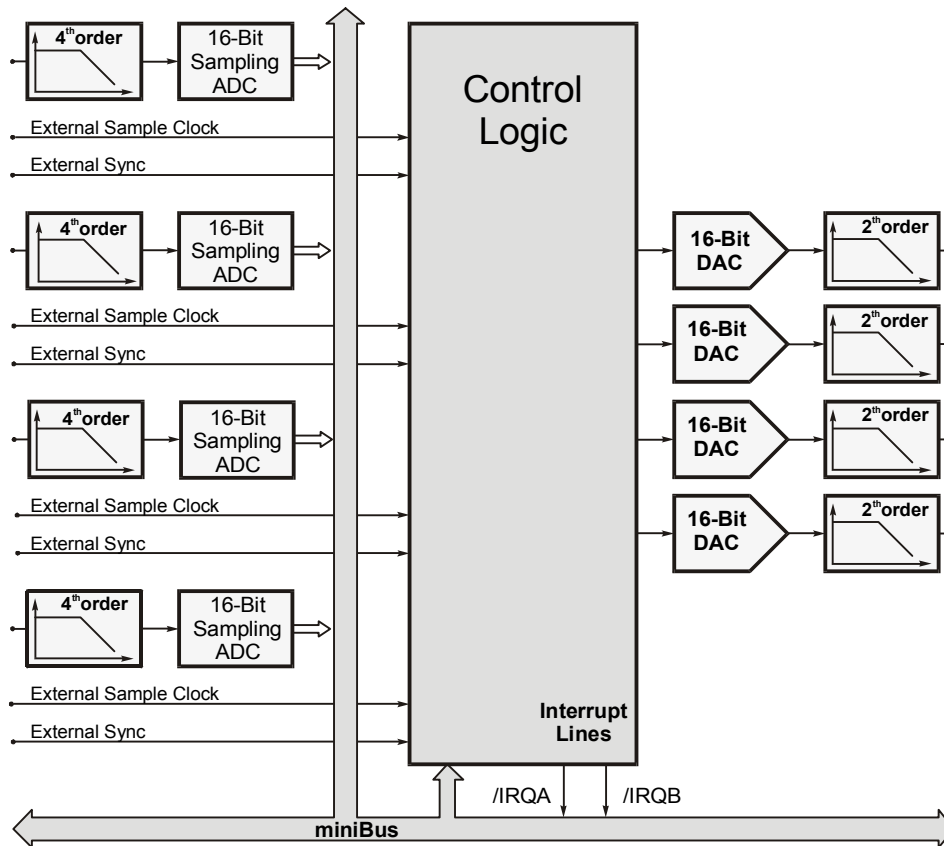


Figure 1 Functional Block Diagram of S.Module 16-100

Analog Inputs

The S.Module 16-100 has up to 4 differential inputs. The input voltage range can be set by software to ± 10.0 V, ± 5.0 V or ± 2.5 V. All input channels are protected against electro static discharge and overload up to 1.5 kV.

The filter of each channel is of 4th order and has nearly Butterworth characteristics. The cut-off frequency of the input filter can be set by the software within the range from 400 Hz to 50 kHz. These filters are *time-continuous filters*.

Analog inputs digitized to 16 bits at sample rates up to 100 kHz per channel. The A/D conversion can be triggered by either an internal sample rate generator or by external clock. After end of conversion an interrupt can be generated and data are stored automatically in a latch.

Because every channel is a complete data acquisition system several synchronous and asynchronous operation modes are available:

- up to four channels can be used for synchronous, exact parallel sampling,
- all channels can be worked fully independently,
- different forms of mixed synchronous and asynchronous operation modes are possible.

Analog Outputs

The module also includes up to four analog output channels with maximum update rates of 100 kHz.

A two-pole low-pass filter with nearly Butterworth characteristics is provided as a reconstruction filter for each of the 16-bit D/A converter lines. The cut-off frequency can be set by the software within the range from 400 Hz to 50kHz.

miniBus Interface

The module is fully compatible with the miniBus interface. This interface contains only a 16 bit data and a 6 bit address bus, an I/O enable, a read, a write and two interrupt lines. This enables simple connection of signal processing boards in the S.Module and D.Module Series without additional hardware, as well as simple integration with other processors/controllers.

Software

C and/or assembly language libraries in source code form are available to facilitate the rapid integration of the module in specific applications.

1.1 Analog Specifications

Inputs:	4 differential ended analog inputs
Input voltage range:	± 10 V, ± 2.5 V, ± 5 V programmable by software
Input impedance:	35 k Ω
Cut-off frequencies:	400 Hz - 50 kHz
Outputs:	4 single ended outputs
Output voltage range:	± 2.5 V
Output current:	max. 20 mA
Power supply	+5 V ($\pm 5\%$) / typ. 220 mA (without load of the analog outputs)* -5 V ($\pm 5\%$) / typ. 190 mA (without load of the analog outputs)*

Table 1 Analog Specifications of S.Module 16-100 (for a module with 4 analog inputs and 4 analog outputs at time of running converters)

1.2 Digital Specifications

Number of A/D converters:	4 (one ADC for each channel)
Converter resolution	16 bit
Sampling rate:	152,6 Hz - 100 kHz internal clock, programmable for each channel 0 Hz - 100 kHz external clock
Extern signals:	external sample clock for each channel external synchronizing signal for each channel
Interrupt generation:	conversion ready signal of each channel (standard)
Interrupt destination:	/IRQA, /IRQB of miniBus
Interface:	miniBus: 16 bit data, 6 addresses, I/O select, read, write, 2 interrupts
Addressing:	Module address via solder jumpers (8 different module addresses are possible) Module uses 8 consecutive addresses
Power supply S.Module 16-100:	+3.3 ... +5 V ($\pm 5\%$), typ. 45 mA @ 3.3 V, 30 mA @ 5V

Table 2 Digital Specifications of S.Module 16-100

1.3 Special Order / Options

- function libraries for DSP56xxx , TMS320C3x, TMS320C6xxx and ADSP210xx

1.4 Mechanical Dimensions

All dimensions in mm.

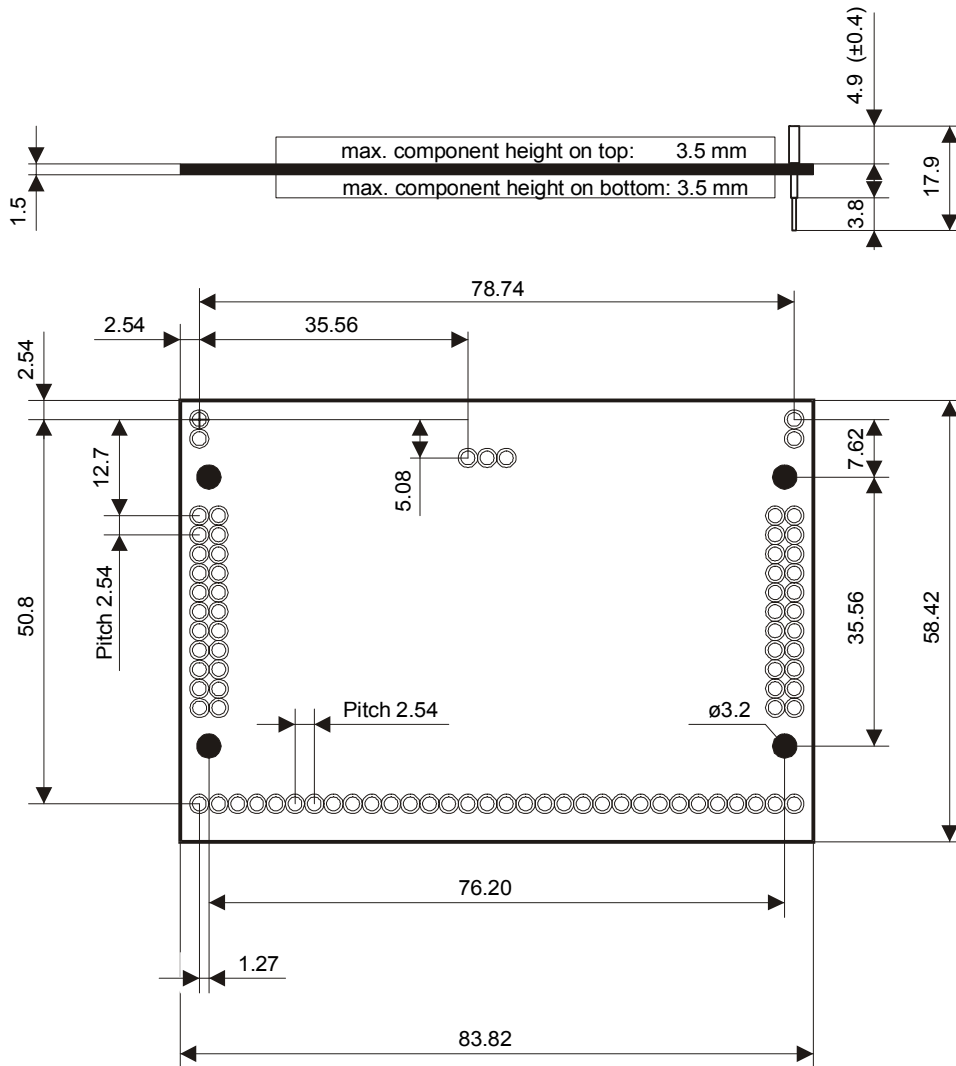


Figure 2 Dimensions of the S.Module 16-100

1.5 Terminal Pins

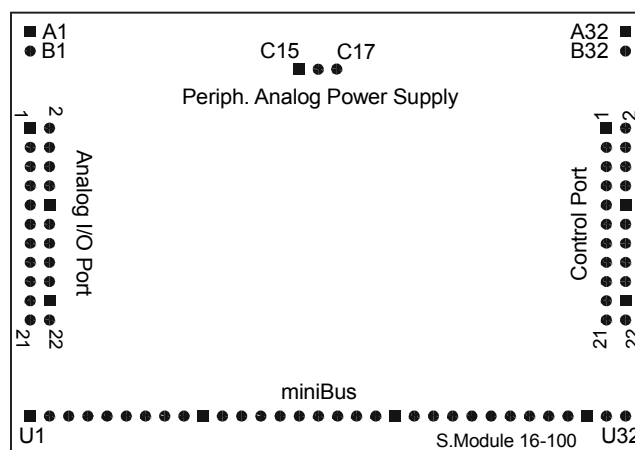


Figure 3 Terminal Pins and Solder Terminals

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- We highly recommend reading this manual before using the S.Module 16-100.

Warnings

- Before the voltage supply switched on, it must be ensured that the A/D converter system S.Module 16-100 and the processor/DSP module are correctly connected.
- Switch off all power to S.Module 16-100 before connecting or disconnecting digital interface. Failure to do so could damage the board.

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