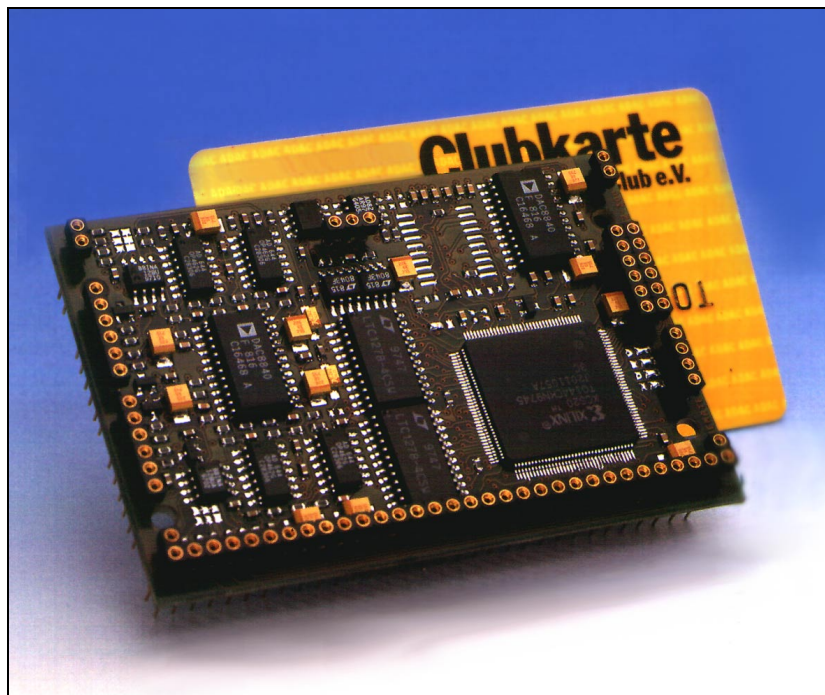




ADS12-300
ADS12-300-LV
12bit Data Acquisition System



Technical Data Sheet V 2.5

1 Overview

The ADS12-300 is small size data acquisition board, providing up to four fully independent and complete analog input channels and two analog output channels. The ADS12-300 has an 5 Volt digital interface to controllers/processors, the ADS12-300-LV is the version for 3.3 Volt systems.

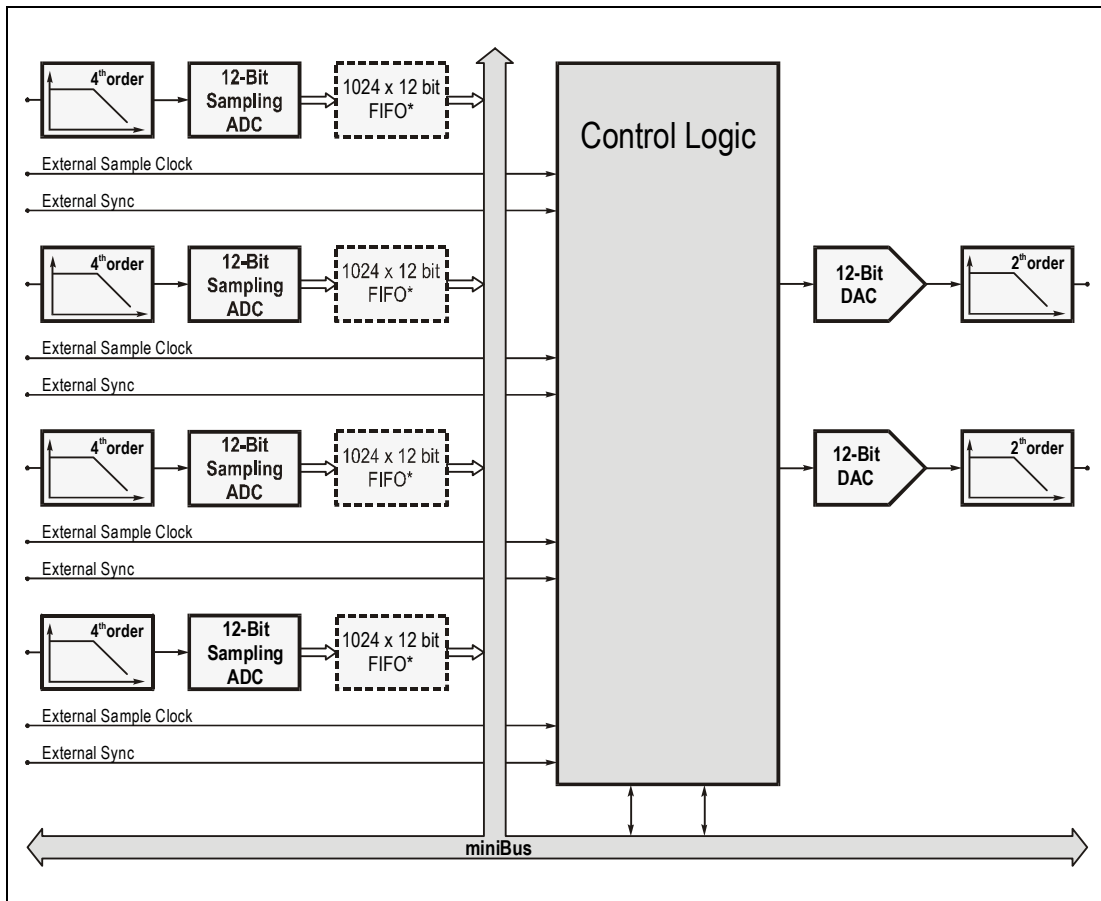


Figure 1 Functional Block Diagram of ADS12-300 (* optional FIFO's by Special Order)

Analog Inputs

The ADS12-300 has up to 4 differential inputs. Solder jumpers can be used to set the input voltage range 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 Butterworth characteristics. The cut-off frequency of the input filter can be set by the software within the range from 1 kHz to 150 kHz. These filters are *time-continuous filters*.

Analog inputs digitized to 12 bits at sample rates up to 300 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 or data are stored automatically in the optional FIFO. Both FIFO flags, full and empty flag, can be queried through a status register. Additionally the flags can be linked to an interrupt line of the interface by programming a control register.

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 two analog output channels with maximum update rates of 250 kHz. A two-pole low-pass filter with Butterworth characteristics is provided as a reconstruction filter for each of the 12-bit D/A converter lines. The cut-off frequency can be set by the software within the range from 1 kHz to 150kHz.

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 miniKit and D.Module Series without additional hardware, as well as simple integration with other processors/controllers.

Software

C and 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 (optional ±2.5 V, ±5 V via solder jumper)
Input impedance:	35 kΩ
Cut-off frequencies:	1 kHz - 150 kHz
Outputs:	2 single ended outputs
Output voltage range:	±2.5 V
Output current:	max. 20 mA
Power supply	+5 V (±5%) / typ. 90 mA (without load of the analog outputs)* -5 V (±5%) / typ. 60 mA (without load of the analog outputs)*

Table 1 Analog Specifications of ADS12-300 (for a module with 2 analog inputs and 2 analog outputs at time of running converters)

1.2 Digital Specifications

Number of A/D converters:	4 (one ADC for each channel)
Converter resolution	12 bit
Sampling rate:	305 Hz - 294 kHz internal clock, programmable for each channel 0 Hz - 300 kHz external clock
Extern signals:	external sample clock for each channel external synchronizing signal for each channel
Data storage:	optional 1024-sample FIFO ¹
Interrupt generation:	conversion ready signal of each channel (standard) or FIFO full and empty flags of each channel ¹
Interrupt destination:	IRQA, IRQB of miniBus
Interface:	miniBus
Addressing:	Module address via solder jumpers (8 different module addresses are possible) Module uses 5 consecutive addresses
Power supply ADS12-300:	+5 V (±5%), typ. 50 mA
Power supply ADS12-300-LV:	+3.3 V (±5%), typ. 40 mA

Table 2 Digital Specifications of ADS12-300 (¹ Special Order)

1.3 Special Order / Options

- 4 x 1024 Sample FIFOs
- components in industrial temperature range
- function libraries for DSP56xxx, TMS320C3x, TMS320C6xxx and ADSP210xx

1.4 Mechanical Dimensions

All dimensions in mm.

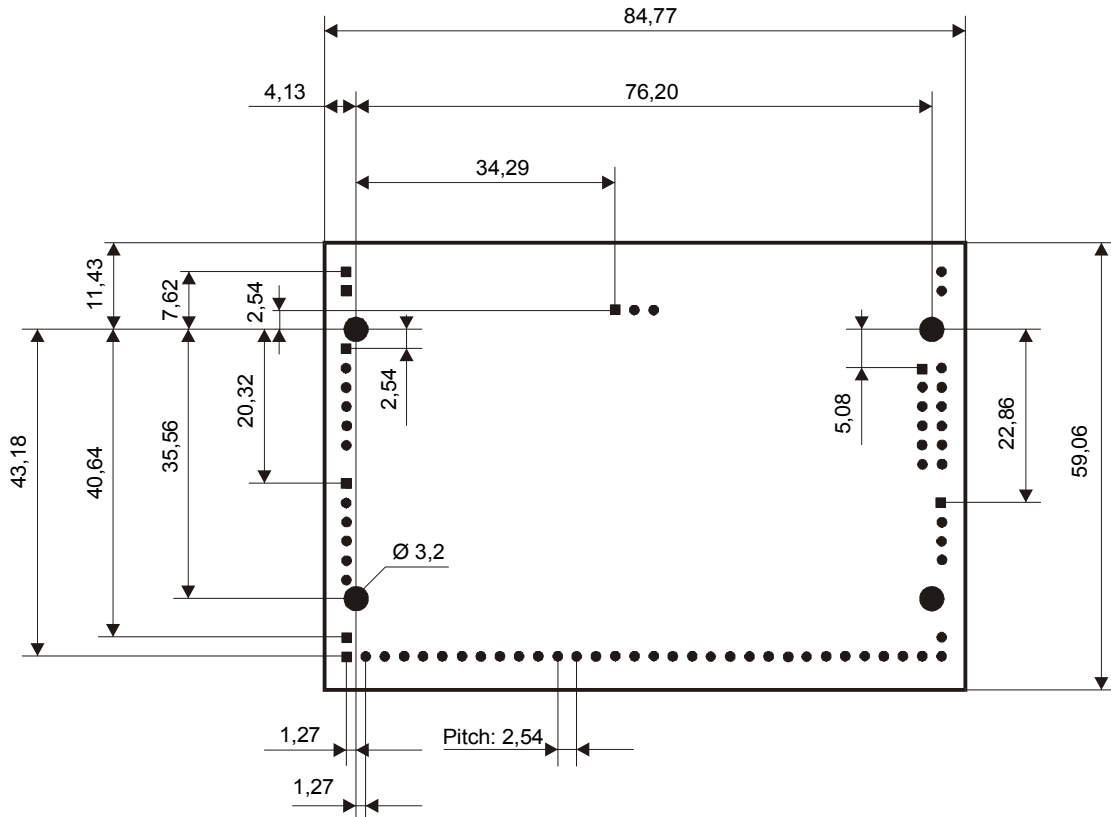


Figure 2 Dimensions of the ADS12-300

1.5 Terminal Pins

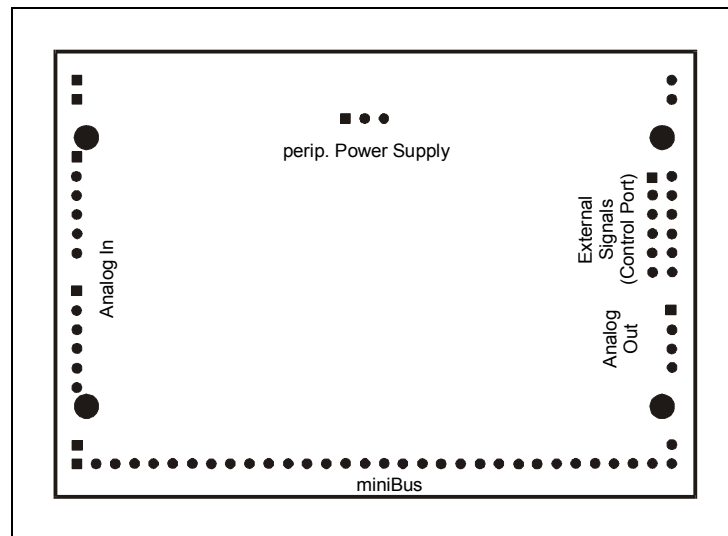


Figure 3 Terminal Pins and Solder Terminals

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SEMATEC
System Engineering & Marine Technology GmbH
D-18107 Elmenhorst, Gewerbeallee 12
GERMANY

Phone	+49 381 54 84 70
FAX	+49 381 54 84 770
e-mail	contact@sematec.com
e-mail (sales office)	sales@sematec.com
e-mail (technical support)	support@sematec.com
Internet	www.sematec.com