VADC
Versatile Analog-to-Digital Converter

AURIX™ Microcontroller Training
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VADC
Versatile Analog-to-Digital Converter

Highlights
› Up to 11 independent converters with up to 8 analog input channels each
› Conversion time below 1 μs is possible
› Flexible source selection and arbitration
› Powerful result handling

Key Features
› Flexible source selection and arbitration
› Powerful conversion result handling

Customer Benefits
› Programmable arbitration and conversion sequence
› Different trigger source selection
› Independent result registers with selectable FIR/IIR filter
› Fast Compare Mode
Flexible source selection and arbitration

› Programmable arbitrary conversion sequence (single or repeated)
› Configurable auto scan conversion (single or repeated) on each converter
› Configurable auto scan conversion (single or repeated) in the background (all converters)
› Conversions triggered by software, timer events, or external events
› Cancel-inject-restart mode for reduced conversion delay on priority channels
› External analog multiplexer control, including adjusted sample time and scan support
› Conversion speed and sample time adjustable to adapt to sensors and reference
VADC
Powerful conversion result handling

› Selectable result width of 8/10/12 bits
› Fast Compare Mode compares result register content directly with input signal
› Storage of conversion results to user-configurable registers
› Configurable limit checking against programmable border values
› Data alignment according to result width and endianness
› Wait-for-Read mode to avoid loss of data
› Data rate reduction through adding a selectable number of conversion results
› Result event generation
› Data reduction or anti-aliasing filtering. FIR/IIR filter with selectable coefficients
The analog inputs are connected to a cluster of Analog/Digital Converters which convert analog input values (voltages) to discrete digital values.

Each converter of the ADC cluster can operate independent of the others.

The results of each channel can be stored in a dedicated channel-specific result register or in a group-specific result register.

A background converter can be configured.
Application example
Synchronized conversions

Overview

› Synchronized Conversions for parallel sampling
› Result handling via DMA (Direct Memory Access)

Advantages

› Several independent ADC kernels can be synchronized for simultaneous measurements of analog input channels
› Synchronization for parallel conversions ensures that the sample phases of the related channels start simultaneously
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