

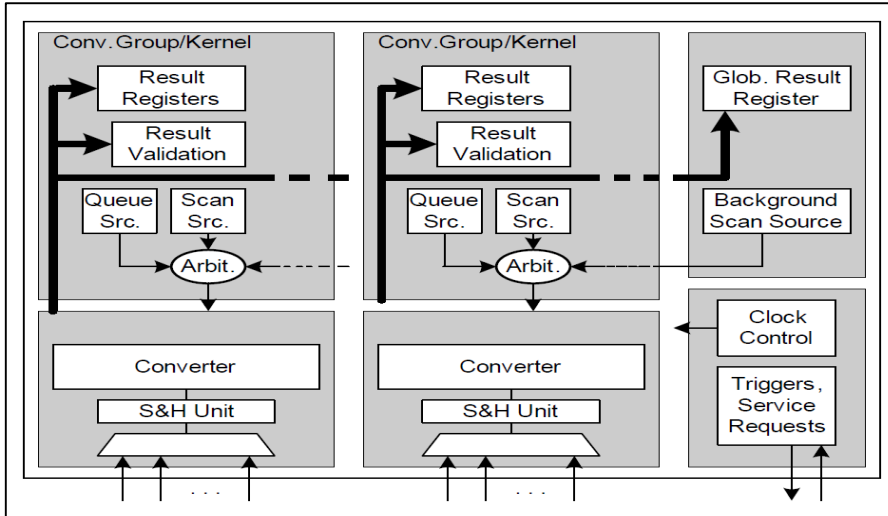
VADC

Versatile Analog-to-Digital Converter

AURIX™ Microcontroller Training
V1.0 2019-03



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Highlights

- > Up to 11 independent converters with up to 8 analog input channels each
- > Conversion time below 1 μ s 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

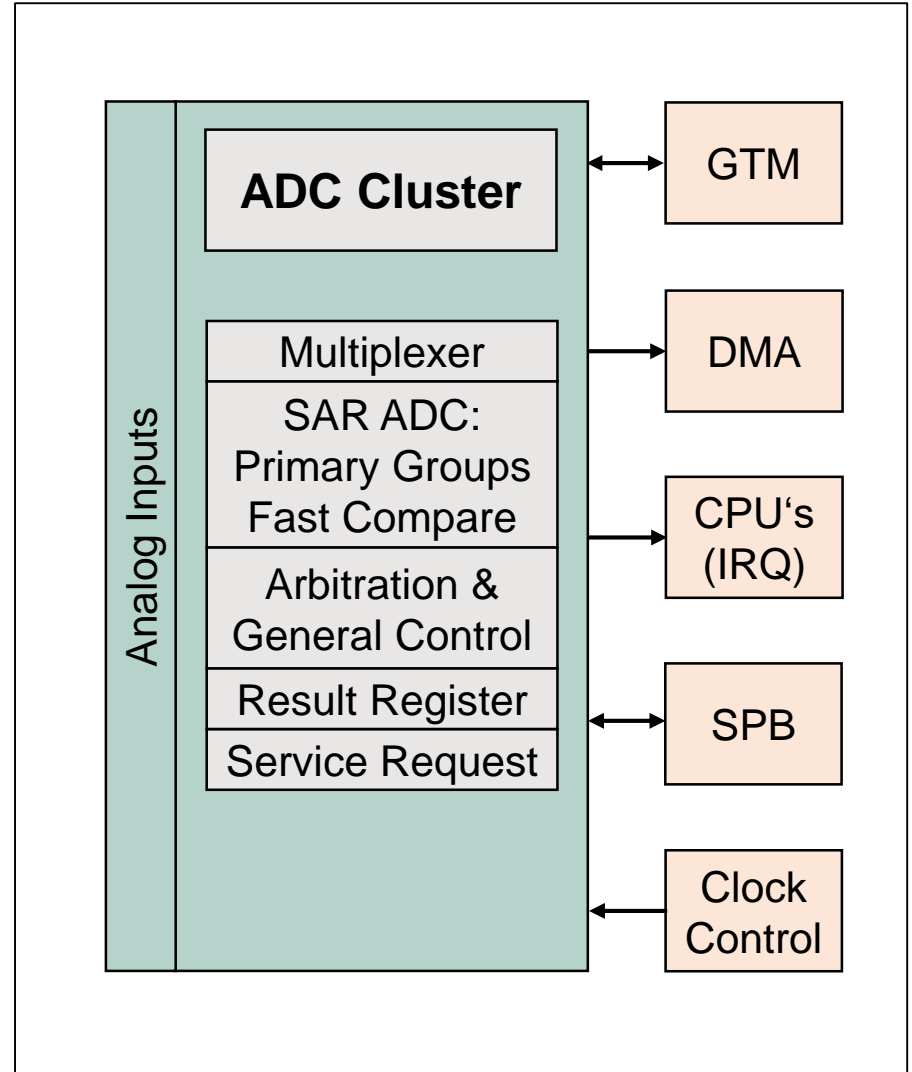
Flexible source selection and arbitration

- › 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

Powerful conversion result handling

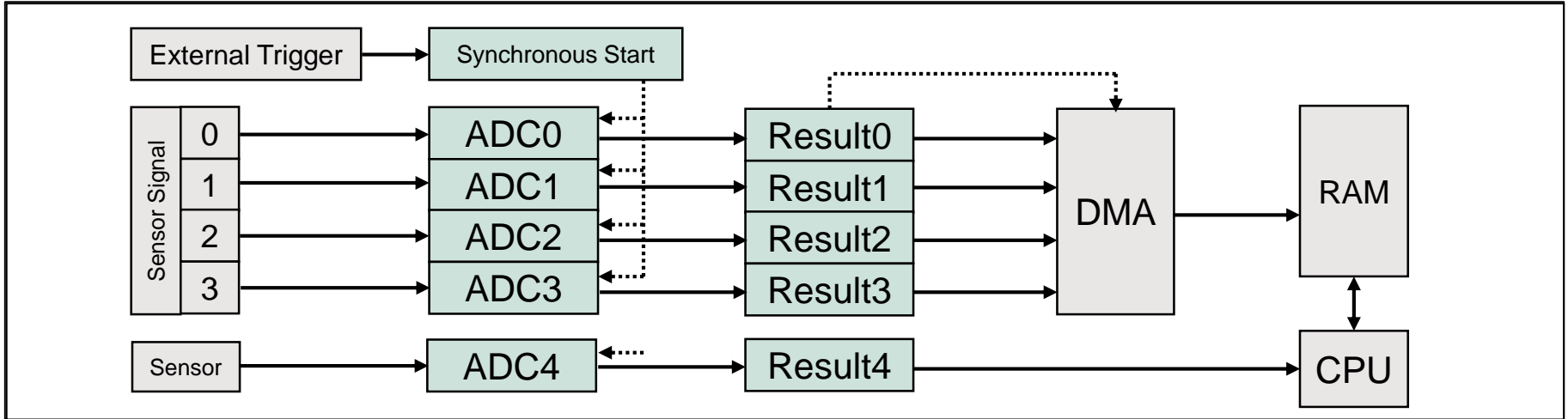
- › Selectable result width of 8/10/12 bits
- › Fast Compare Mode compares result register content directly with input signal
- › Storage of conversion results to user-configurable registers
- › Configurable limit checking against programmable border values
- › Data alignment according to result width 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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