RIF

Radar interface

AURIX™ TC3xx Microcontroller Training
V1.0 2020-06

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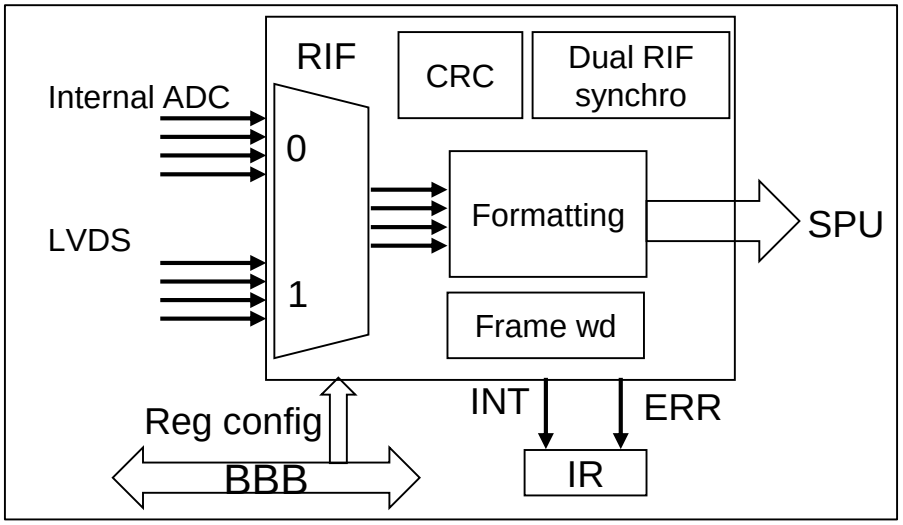
RIF
Radar Interface



Highlights

- The RIF is responsible for the interface between the Radar ADC (Internal or External) and an SPU module
- The RIF handles formatting the incoming data so it matches the SPU RIF input format
- The RIF can assert a safe communication with external ADC and SPU

Key Features

- Input selection
- Data formatting
- Safety features

Customer Benefits

- Compatibility with many MMIC and not only Infineon products
- Wide range of data formats can be used
- Enabling ASIL-B radar processing

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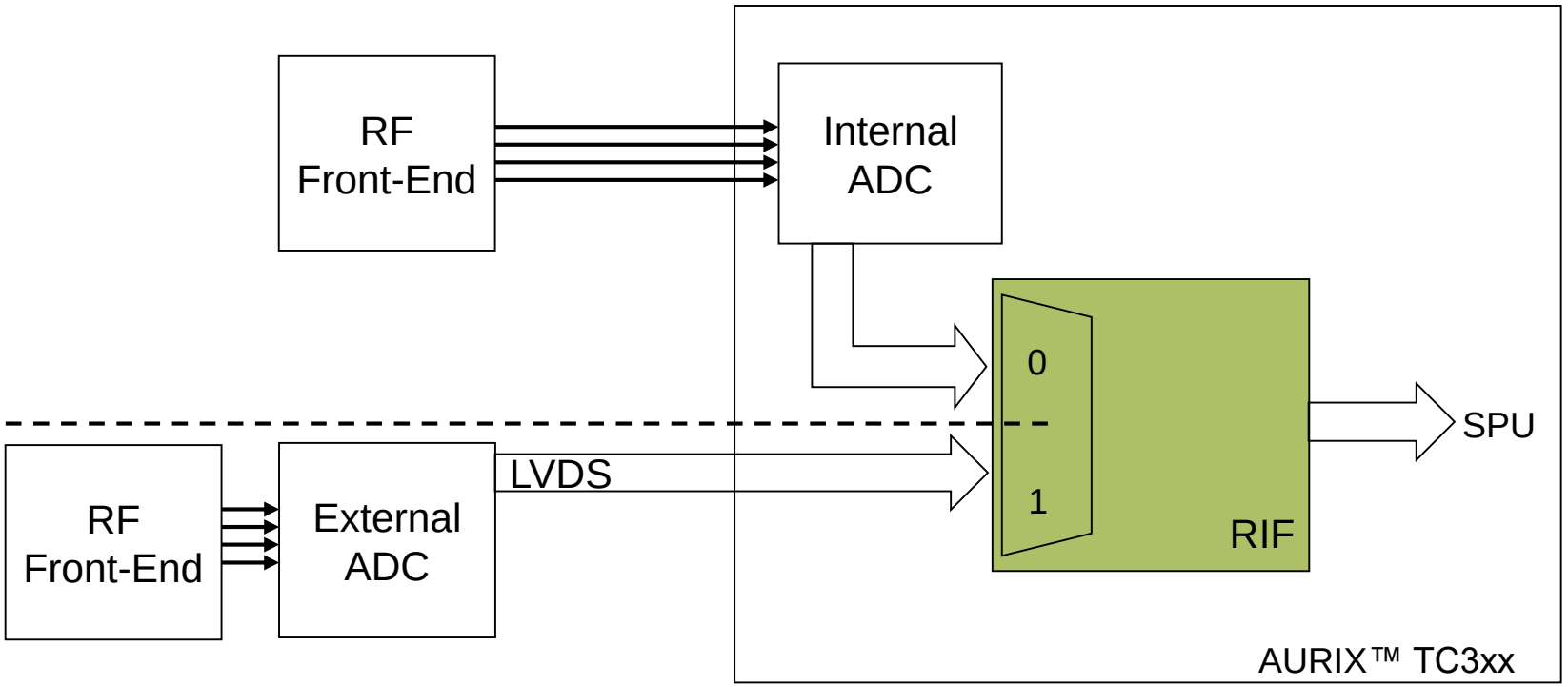
RIF
Input selection

- The RIF can retrieve the data from up to 4 channels
- The data can come either from internal ADC **or** external ADC via LVDS lines



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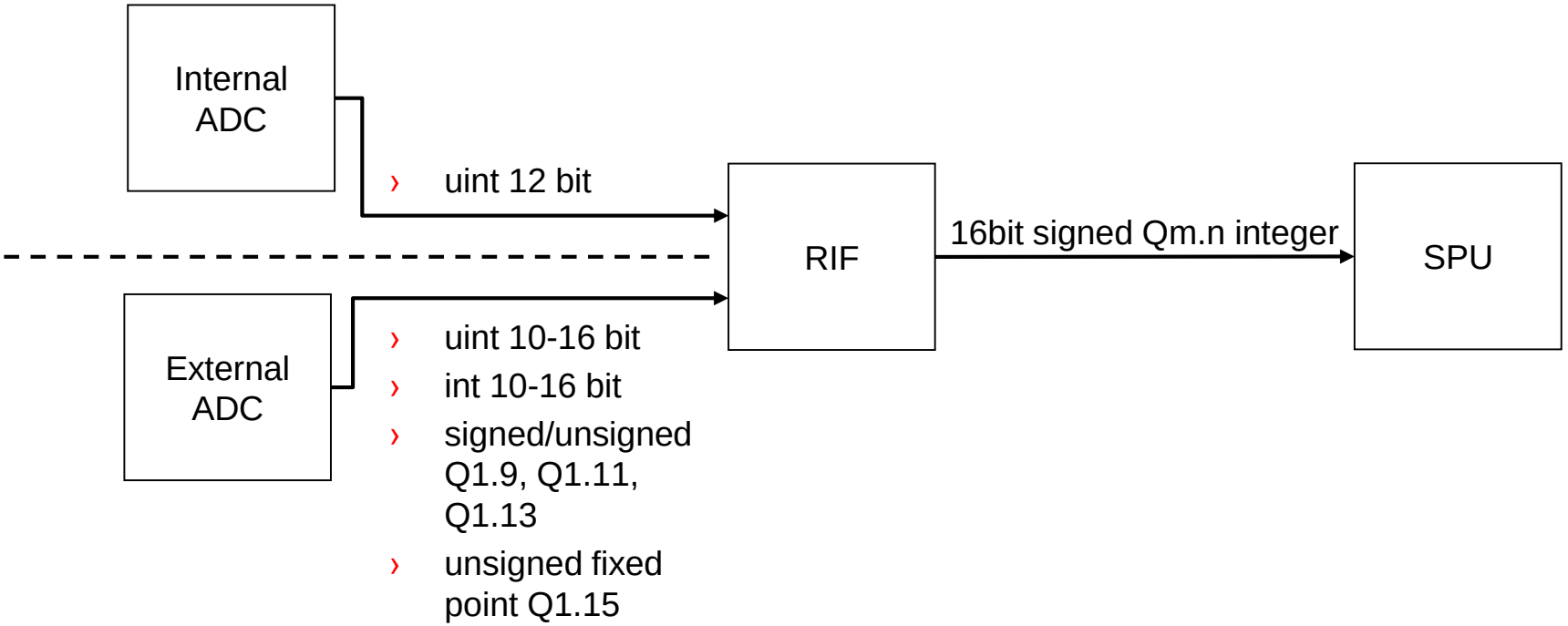
RIF
Data formatting

- SPU expects 16bit signed Qm.n integers as an input from the RIF, which are delivered to the SPU in 32bit packet
- On the other hand, the RIF accepts a wider range of formats and is responsible for adjusting the direction (lsb/msb), data length (16 bits) and format of the incoming ADC data so it fits the SPU RIF input format



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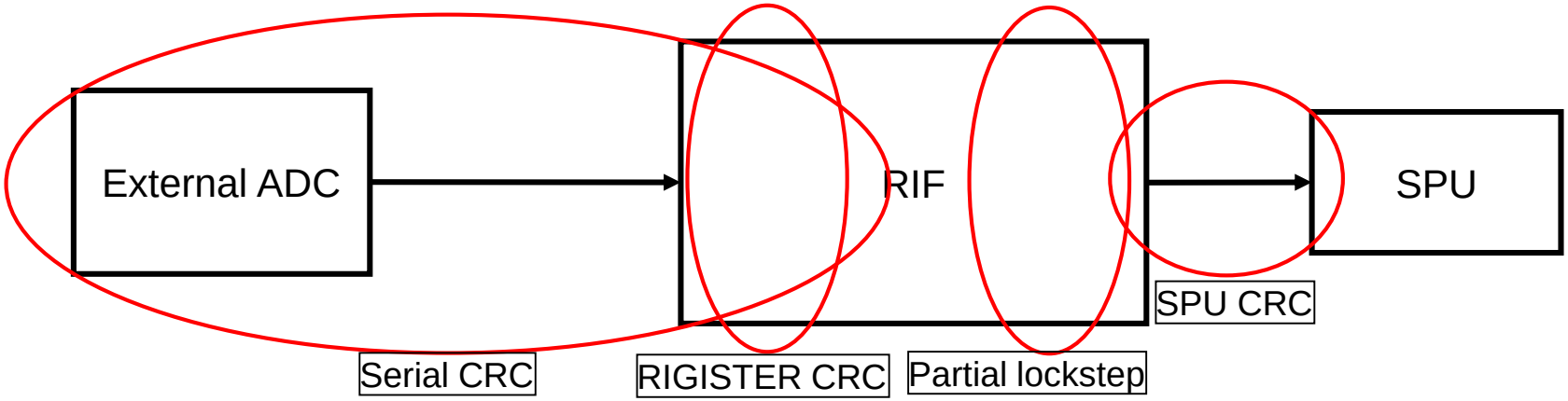
RIF
Safety features

- In order to enable up to ASIL-B safety requirements, the RIF implements several safety features:
  - For external ADC: the possibility to add a CRC check at the end of every ramp
  - Safety critical configuration register can be CRC checked
  - CRC check can be added to the output data of the RIF in order to assert safe communication with the SPU
  - Partial Lockstep: certain safety critical sub-blocks are duplicated to create redundancy. If enabled, an alarm can be raised in case of mismatch



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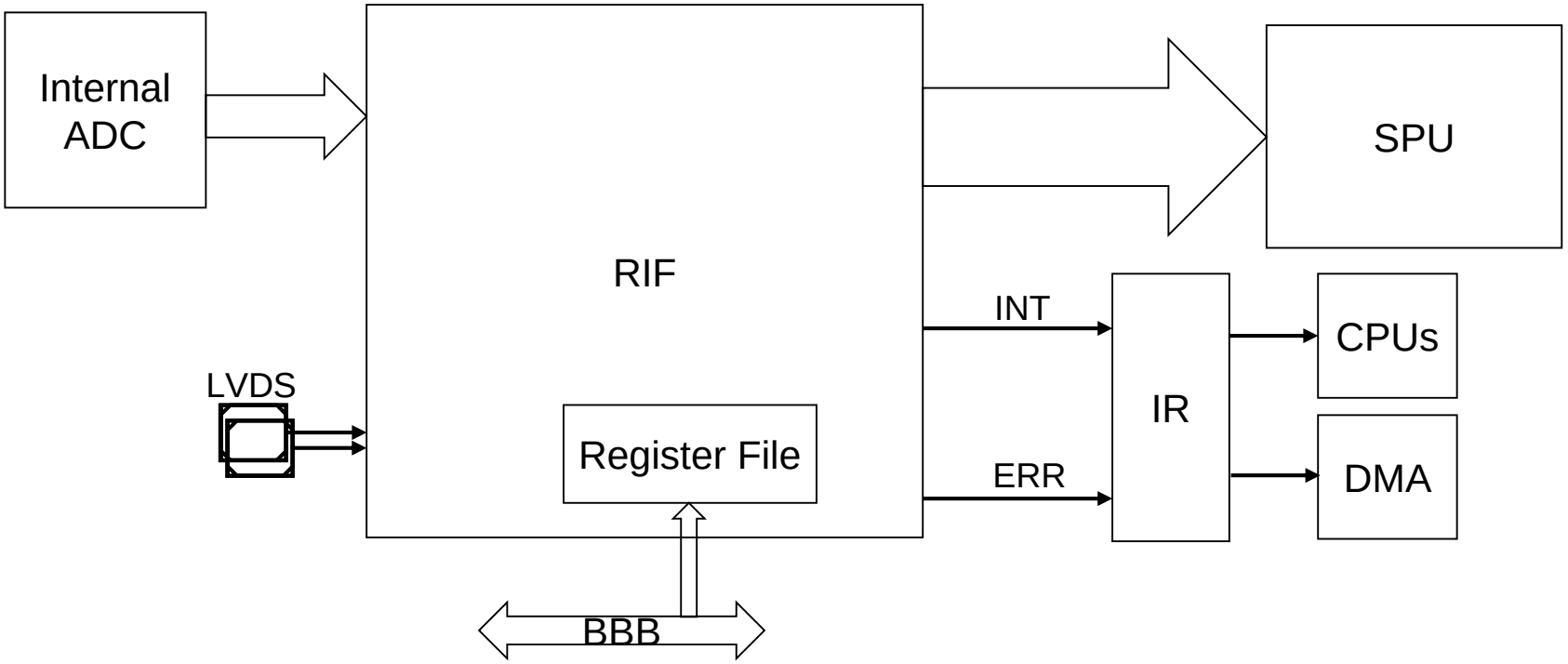
RIF
System integration

- The RIF is connected to the internal ADC, the LVDS pad and the SPU in order to enable ADC data transfers
- The RIF is capable of communicating events and errors to the application via several Interrupt and Error lines through the Interrupt router



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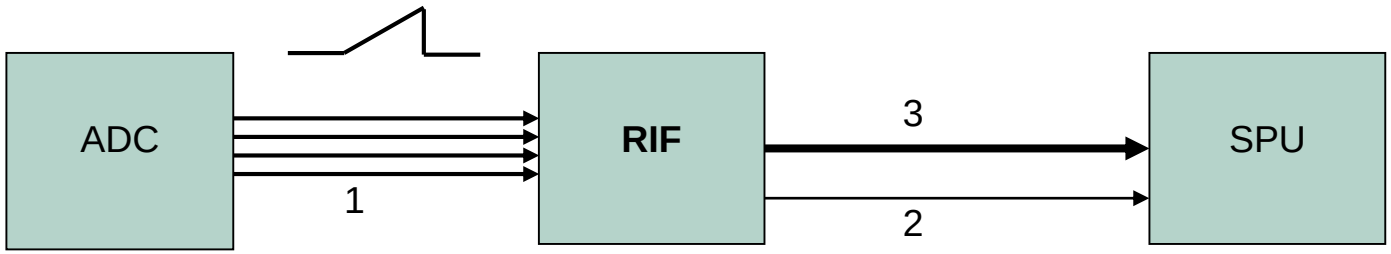
Application example
Radar frame reception

› In this example, the RIF is programmed to receive a frame from 4 channels



1. Receiving a complete frame from 4 channels
2. Signaling a frame is ready to be transmitted
3. Transmit the formatted frame in 32bit packets to the SPU

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