Austrian Aerospace

SpaceWire Router (SPROUT) ASIC Features and Status

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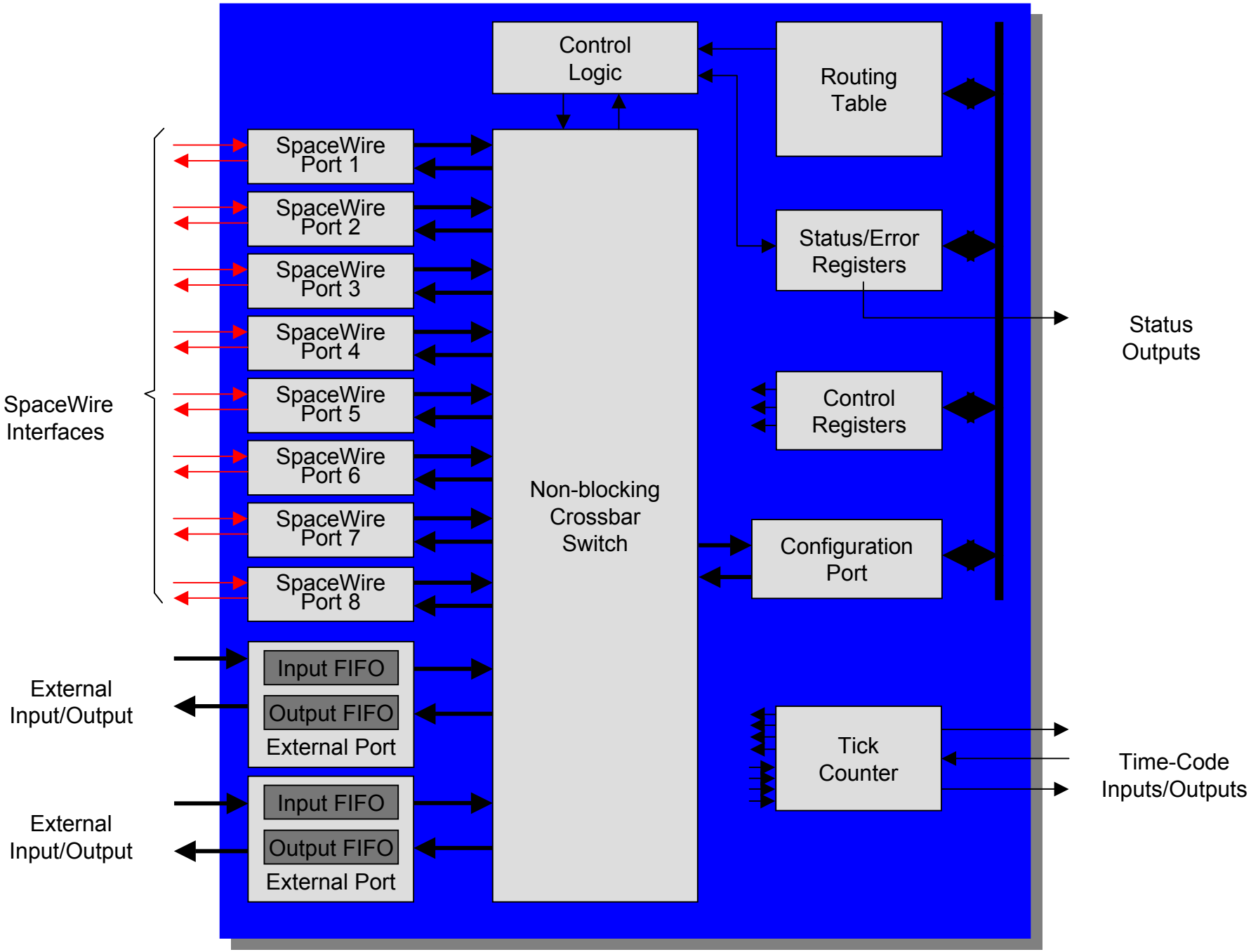
SPROUT ASIC Features (1)

- Fully SpaceWire compliant
- Eight SpaceWire ports
- Two External (Parallel) ports
- Time-code interface
  - Receiving time-codes
  - Generating time-codes
- Cascadable

SPROUT ASIC Features (2)

- Internal configuration port
  - Accessible through SpaceWire or External ports
  - Logical address routing table
  - Control registers
  - Status registers
- External pins for status/error monitoring
- External pins for start-up configuration


Control Logic
Routing Table
SpaceWire Port 1
SpaceWire Port 2
SpaceWire Port 3
SpaceWire Port 4
SpaceWire Port 5
SpaceWire Port 6
SpaceWire Port 7
SpaceWire Port 8
Status/Error Registers
Status Outputs
SpaceWire Interfaces
Control Registers
Non-blocking Crossbar Switch
Configuration Port
Input FIFO
Output FIFO
External Port
External Input/Output
Input FIFO
Output FIFO
External Port
External Input/Output
Tick Counter
Time-Code Inputs/Outputs

SPROUT ASIC Performance (1)

- ASIC Technology
  - Implementation in Atmel MH1RT gate array
  - 0.35 µm CMOS process
  - Radiation tolerance 100 krad(Si)
  - SEU free cells up to 100 MeV cm2 / mg for all memory except a few timing critical cells in the SpaceWire interfaces
  - Latch-up immunity up to 100 MeV cm2 / mg
- Performance
  - SpaceWire interface baud-rate 200 Mbits/s
  - LVDS drivers/receivers with cold-sparing capability integrated on-chip
  - Internal PLL with configurable output frequency to generate the SpaceWire transmitter clocks

SPROUT ASIC Performance (2)

- Electrical Parameters
  - 4.5 W power with all links at maximum data rate
  - Single 3.3 V supply voltage
  - Operating temperature from -55 ºC to +125 ºC
  - Single 30 MHz clock needed
- Package
  - 196 pin ceramic Quad Flat Pack 25 mil pin spacing

SPROUT ASIC Status

- FPGA Testing has been completed successfully
- SpaceWire protocol (RMAP) compatibility needs to be added
- First ASIC Prototypes are expected end of 2005
- Available directly from ATMEL as an Application Specific Standard Product
- Technical support from Star Dundee (UK)