COBHAM

The most important thing we build is trust


ADVANCED ELECTRONIC SOLUTIONS | AVIATION SERVICES | COMMUNICATIONS AND CONNECTIVITY | MISSION SYSTEMS

# Cobham Gaisler
# GR740, GR718 and GRESB

## Cobham Semiconductor Solutions
## October 12, 2016

Presenter: Christian Sayer, FAE

ADCSS, 10th ESA workshop on Avionics, Data, Control and Software Systems
18-20 October 2016

# Cobham Gaisler AB

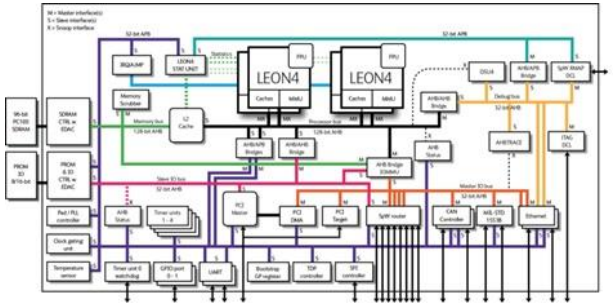
## Company presentation

- Located in Gothenburg, Sweden
- Fully owned subsidiary of Cobham plc
- Management team with 50 years combined experience in the space sector:
  - Sandi Habinc: General Manager
  - Per Danielsson: Senior Advisor
  - Jan Andersson: Director of Engineering
  - Arne Samuelsson: Proposal/Program Manager
- 23 employees with expertise within electronics, ASIC and software design
- Complete design facilities in-house for ASIC, FPGA and software design
- 63.8 MSEK / 8.8 M$ turnover in CY2015

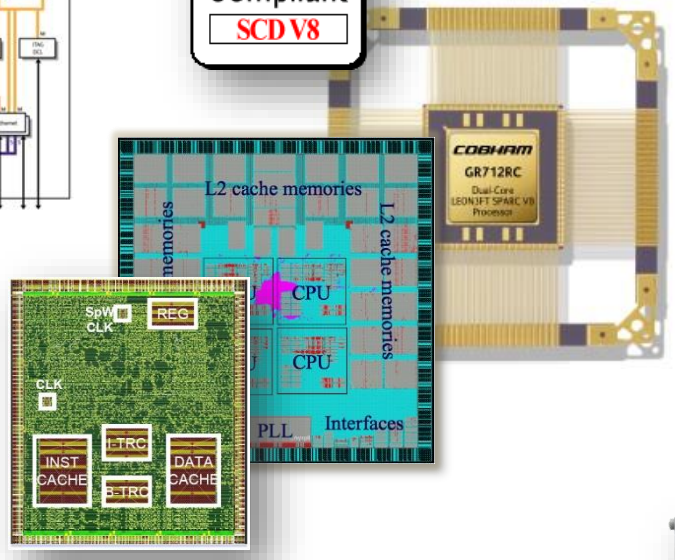
# Cobham Gaisler Processor Solutions

## One-Stop-Shop

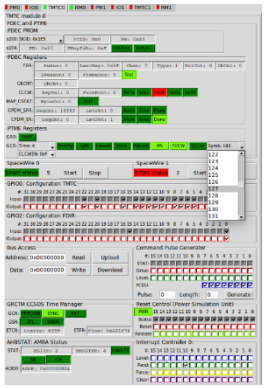
### Synthesizable IP Core Library




SPARC Compliant SCD V8

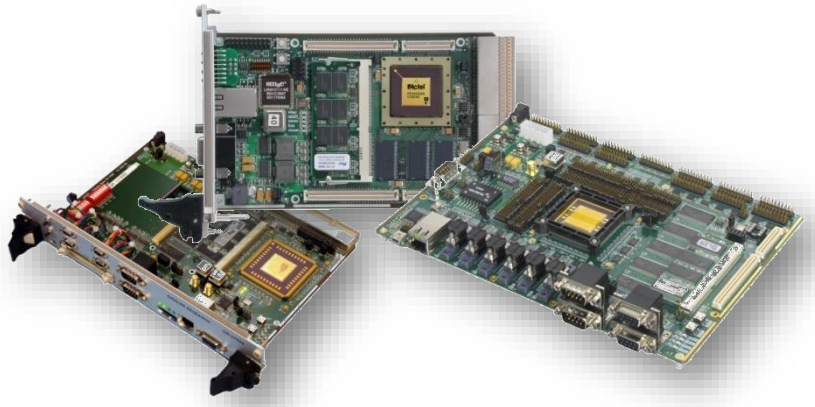



### Simulators, Debuggers, Operating Systems, Compilers



### FT FPGA Processors


### Development Boards



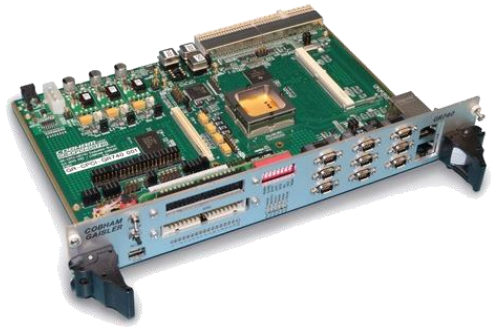
### FT LEON3/LEON4 Processor Parts

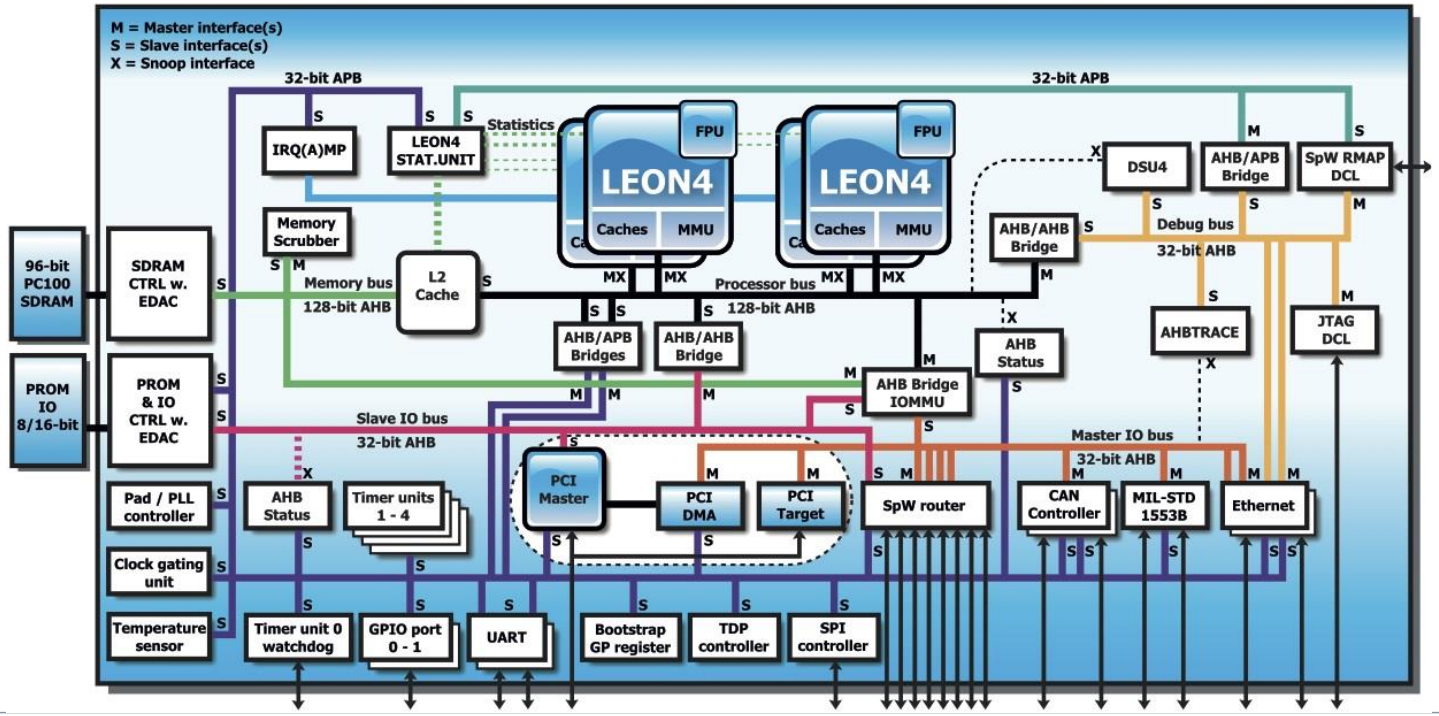
### System Testbeds

# GR740 – Quad-Core LEON4FT Processor

## Overview

- 250 MHz quad-core LEON4FT rad-tolerant SPARC processor
- ESA Next Generation Microprocessor activity
- LGA625 / CGA625 package
- ST 65nm bulk CMOS process
- Prototype parts and evaluation boards available




- SDRAM
- 2 MiB L2 cache
- PCI
- 8 port SpaceWire router
- CAN
- 1553
- Gbit Ethernet

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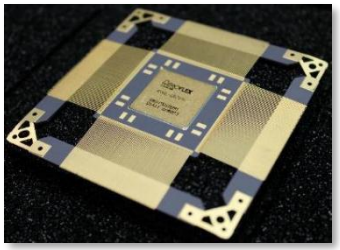
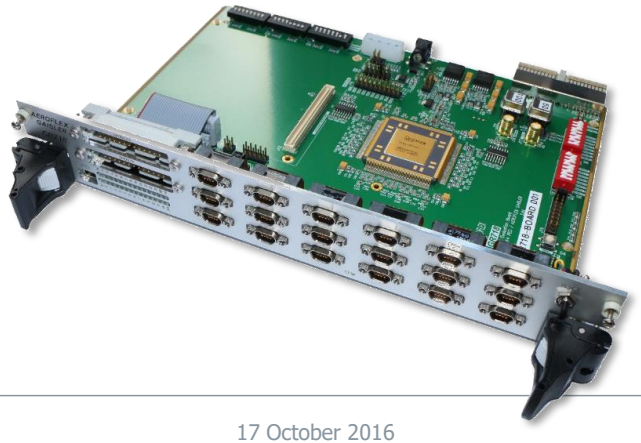
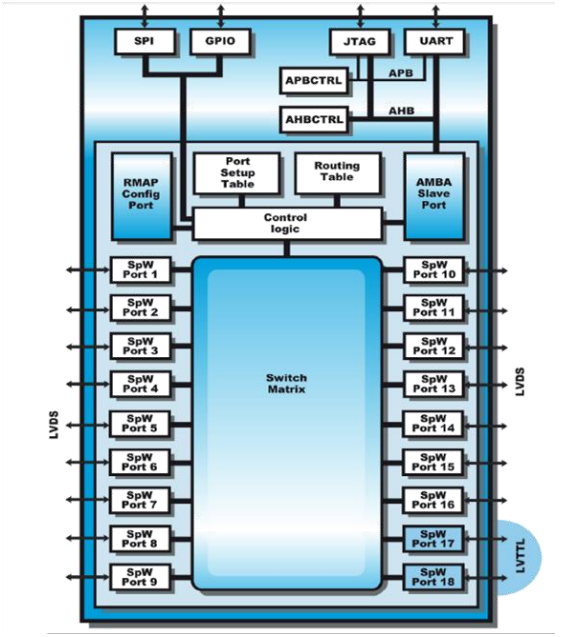
# GR718 – 18-port SpaceWire Router

- 180 nm UMC / DARE180+ radiation tolerant library
- Link speed: 200 Mbps



- 18 external SpaceWire ports
  - 16 on-chip LVDS transceivers
  - 2 LVTTL to off-chip LVDS transceivers
- TID: up to 300 krad (Si)
- SEL: $LET_{TH}$ > 118 MeV-cm$^2$/mg
- Package CQFP256





# GRESB: Ethernet – SpaceWire bridge

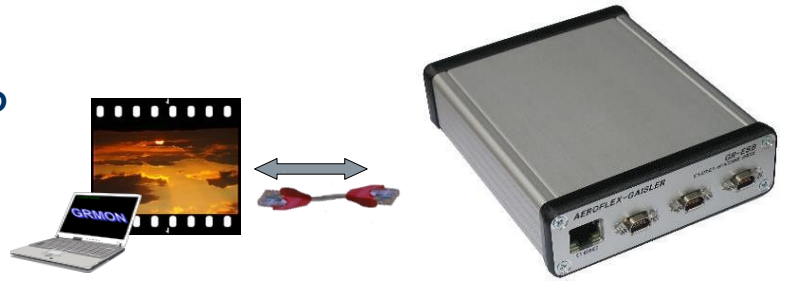
- GRESB Ethernet – SpaceWire bridge:
  - Allows workstation transmission and reception of SpaceWire and CAN data
  - No drivers, communication using TCP sockets
  - Allows remote operation via internet
  - Remote debugging of LEON systems using RMAP
  - 3 SpaceWire links with routing capability
  - 1 CAN link
  - GRESB2 with 10/100/1000 Mbit Ethernet

# Demo: GR740, GR718 and GRESB

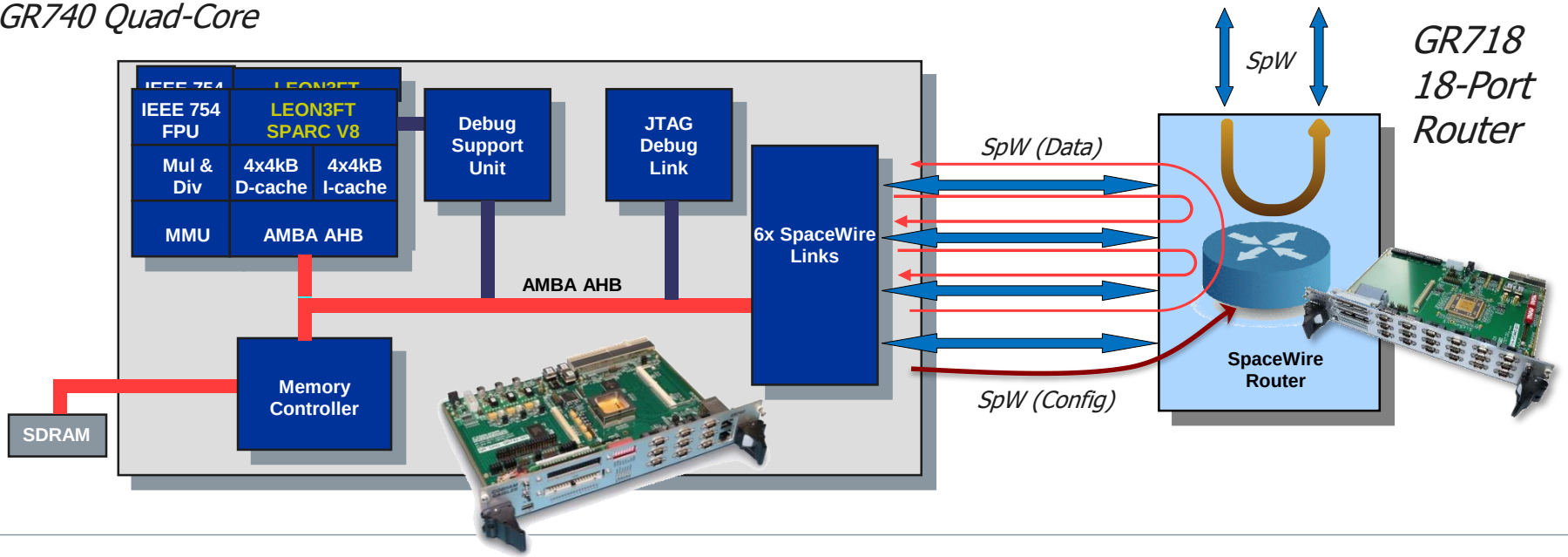
| CPU clock | SPW clock | SPW Packet size | OS/driver |
|---|---|---|---|
| 48 MHz | 200 Mhz | 1 kbyte | RTEMS |

- CPU 1: Handle SpW packets looping through three links
- CPU 2: Configure Router through RMAP packets

- Video streaming through GR-ESB Spacewire-Ethernet bridge




*GR740 Quad-Core*



# Thank you for your attention!

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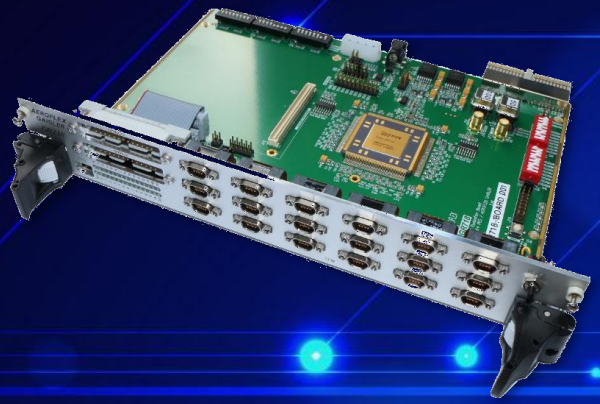


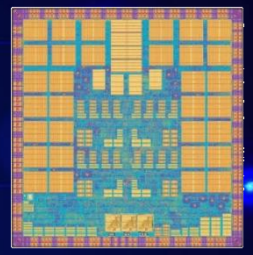


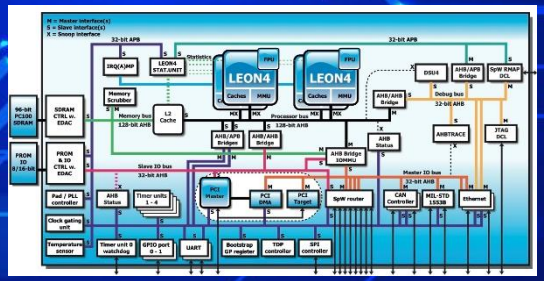


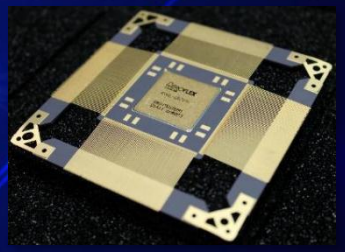

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