Nytt UK - FPGA Design Services

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FPGA Design and UVM Verification for Space Applications

Design Capabilities

We specialise in the design of IP cores for satellite and radar applications. Our areas of expertise include:

- System control
- Information processing and management

Communication Protocols:

- **Low-speed serial:** UART, I2C, SPI, USB
- **High-speed:** SpaceWire, SpaceFibre, Ethernet, CCSDS
- **Control buses:** CAN, SpaceCAN (adapted)
- **On-chip buses:** AMBA (APB, AHB, AXI)
- Proprietary protocols

Devices

We have designed and integrated FPGA logic for various satellite and radar subsystems:

- **Power systems:** PMUs, sequencing, BMS
- **Data systems:** OBC, storage, handlers
- **Imaging systems:** VIS-NIR, SWIR, camera drivers
- **Communication systems:** Telemetry, downlinks, DPI
- **Control systems:** Attitude, sensors, FDIR
- **Software Integration:** Custom C++ modules, OS level integration, on-SoC architectures for embedded control and data processing

Project Experience

- Sabiamar and Small GEO satellites (INVAP)
- Ground stations and radar gateways (Asterix, Eurocontrol)

Tools & Infrastructure

- **Vendors:** Microchip, Xilinx (Kintex 7, RFSoCs), Altera
- **Languages:** Verilog, VHDL, SystemVerilog (UVM), Bash, Python, Tcl
- **FPGA Toolchains:** Vivado, Libero
- **Simulators:** ModelSim, QuestaSim
- **System verification:** Matlab (control system validation)

Infrastructure:

- GitLab with submodules for IP reuse
- Linux-based automation and scripting, Windows support
- Tools for automatic documentation and diagrams
- Jira for task and progress tracking
- Secure VPN access, encrypted file exchange

Collaboration & Deliverables

Workflow:

1. Requirement review and analysis
2. Proposal development and client approval
3. Design implementation and integration
4. Traceability via GitLab & Jira
5. Verification via basic or UVM-based tests
6. Automated documentation with PASS/FAIL summaries

Security:

- Encrypted communication
- Secure repositories
- Full auditability via git