Embedded systems development
Services

embedded systems development:

+ project estimation, research and technical specification writing
+ project planning, project management, risk management
+ architecture development
+ algorithms development
+ hardware platform design
+ software and firmware development
+ design and development of device body
+ prototyping, manufacturing readiness
Works: 10GB FAST / FIX hardware decoder

Embedded software hardware messages decoder FAST / FIX developed based on FPGA, designed for the use on server platforms and allows to reduce FAST / FIX messages decoding time compared to software solutions. This system is used for the conduct of high-speed trading on the stock exchange and is implemented on FPGA BOARD STRATIX IV XP4S530LP-20G hardware platform.

Implemented protocols in accordance with the requirements of:

Works: BSP eCos 3.0.

BSP RTOS eCos 3.0 was developed for AT91SAM9x25 and Xilinx Microblaze platforms. There are drivers for networks, NAND FLASH memory drivers were implemented to integrate with FIS RedBoot. PROFINET stack of SIEMENS was ported.
Works: processor modules

AX-SOM-BF609 - Analog Devices ADSP-BF609 based for video & audio data processing systems development, with specialized algorithms of the digital signals processing.

AX-SOM-XC7Z020 – Xilinx XC7Z020 based, two-core ARM® Cortex-A9, 7th generation FPGA.
AXSY-SOM-SAMA5D3x – Atmel SAMA5D3x based for the devices with minimum power consumption and extended peripherals.

AX-SOM-CL335x – processor module for handheld devices based on TI Sitara AM335x.

MTAX-SOM-AM335x – TI Sitara AM335x based, supported industrial protocols EtherCAT, Profinet, Modbus RTU, Modbus TCP, CanOpen, Ethernet, Powerlink, Sercos.
Works: other typical examples

DSP algorithms for automatic sorting;
machine vision optical control system;
VoIP gateway;
GSM gateway;
protected portable computers;
LED-RGB Screen Controller;
telemetry controllers & humidity indicators;
ASICs test modules;
optical photodetectors metrological
installation plate quality control system;
etc.
About us

AXONIM Devices offers services of embedded systems development. Highly skilled engineering teams perform whole development projects starting from scratch suggested by our customer and future devices architecture, functional and structural models design.

We prepare full design documentation for the manufacture of the embedded solution and design documentation. Our specialists purchase components, produce printed circuit boards (PCB), perform the assembly (PCBA), and test the assembled prototype.

Having strong background in embedded systems design our developers execute all required tasks within development cycle: circuit design, design of PCB, firmware development and design, FPGA, porting and adapting operating systems on a given platform, BSP and driver development, application development, and operator interface or user application development, digital signal processing, algorithms design, prototyping, manufacture support.
Qualifications

Member of TI Design Network, expertise at ARM-Based Processor Platforms, Digital Signal Processors, Microcontrollers (MCU), OMAP Applications Processors, Wireless Connectivity

AXONIM is an accredited partner of Intel Corp. in the design of devices based on Intel processors

Participant of 3rd party developers program. Analog Devices highly appreciate our abilities in software and electronics development.

AXONIM is member of EtherCAT Technology Group. The EtherCAT protocol is used for hard and soft real-time requirements in automation technology, in test and measurement and many other applications.
Selected customers
Development teams: scientific research software development

**Development languages:** C/C++, Delphi, SQL, PSQL, HTML, LUA, R, Bash, VB.NET, Java, Python, C#, Pascal, PL-1, Fortran, Basic, Asm, PHP.

**SDK, IDE tools:** Qt Creator, NetBeans, QT Qwt, Android SDK.

**Platform/Hardware:** x86, Sparc-V8/V9.

**OS:** Windows, Debian, Sun Solaris, Linux, Ubuntu, Linux mint, Android.

**More:** Mathematical modeling of physical processes; Phased array antennas, radars; Feedback systems, Robust control systems.

**Modeling:** Matlab (m-files, script files): Control System Toolbox, Robust Control Toolbox, System Identification Toolbox, Phased Array System Toolbox.

XML, JSON, Oracle, MS SQL, Google API, Mathematica, Mathcad, Qt, Gtk, Shell.
Development teams: hardware development and prototyping

**Digital circuits:** Xilinx FPGA (Spartan-6, Virtex-6, Artix-7, Zynq-7000, Kintex-7), Xilinx CPLD, MCU (MSP430), DSP (C6000), DDR3, Flash (parallel, serial), Synthesizer, Ethernet PHY (10/100/1000), Gigabit Switches, SFP, QSFP.

**Analog circuits. Mixed-signal circuits:** ADC, DAC, DDS.

**Standards:** ATCA (Carrier, RTM, AMC), mTCA (AMC, MCH, backplane), FMC, PCI, CompactPCI, VPX.

**PCB:** Double-sided boards; Multi-layer boards; High-Speed Design; High-Density Design; Grid Arrays (BGA); Rigid, Rigid-Flex, Flex Designs, Differential pairs; Impedance control; Mezzanine boards; Analog circuits routing (LF, HF, LNA, Power); Circuit simulation (Micro-Cap); Analog circuits: precision, low-noise, high-speed. Power amplifiers. RF circuits. Circuits with high-impedance isolation of working part: ECG, EEG.

**Modeling:** Mathematical (Mathcad). Electromagnetic: microstrip and strip structures (ANSYS HFSS, AWR MWO); antennas and antenna arrays (ANSYS HFSS); Radar cross-section (RCS) calculation of simple objects (ANSYS HFSS); Power integrity, DC voltage drop (ANSYS SIwave); Circuit simulation (Micro-Cap, OrCAD PSpice).

**Embedded firmware development** (Xilinx PPC, Microblaze, STM32, PIC); Device Prototyping (Double-sided boards); PCB assembling (Surface mount, through-hole, mixed technology); Device testing and debugging; Script Development (Altium designer); Library management; PCB Manufacturing Preparation; PCB Manufacturing support; embedded firmware development (Xilinx PPC, Microblaze, STM32, PIC).
Development teams: FPGA design

**Development languages:** VHDL, Verilog, C/C++, bash, Python, Tcl/Tk, C#, Java, JS, HTML, CSS, SQL, PHP.

**SDK, IDE tools:** Xilinx ISE, Xilinx SDK, Xilinx Vivado, ModelSim, MPLAB, MatLAB, Altera Quartus, TI CCS, CodeVisionAVR, AVRStudio, Keil, VisualStudio, Qt Creator, Proteus, Atmel Studio.

**Platform/Hardware:**

**FPGA:** CPLD, Virtex-4, Virtex-5, Virtex-6, Spartan-6, Kintex-7, Virtex-7, Cyclone-4, Stratix-4, Stratix-5.

**Interfaces and Cores:** DAC, ADC, PCI, PCIe, DDR, FLASH, GPIO, Ethernet, SPI, I2C, UART, AXI, Xilinx MGT, JESD204, Avalon, Altera HSSI, OBSAI, AURORA, 1-wire, EEPROM, USB.

**OS:** Windows, Linux, FreeRTOS, OSA, XilKernel.
Development teams: real time subsystem development

**Development languages:** C/C++, Assembler (x86:IA32, EM64T, ARM), Fortran, Algol, MS VBasic, Delphi, SQL, C#, HTML, Java, PHP, JavaScript, CSS, Ruby.

**SDK, IDE tools:** Qt Creator, NetBeans, Visual Studio.

**Platform/Hardware:** x86, Sparc-V8/V9, PowerPC, MicroBlaze, ARM.

**OS:** Linux, Sun Solaris, QNX, BSD, Unix, Ubuntu, SymbianOS, Android, Windows.

**More:** Kernel Development (system, drivers), Network Development (TCP-IP, SNMP, NTP, UDP), Real Time, GDB, DBX, XML, InterBase, FireBird, SQLite, Qt, JSON, .NET, ASP.NET, WPF, OpenGL, VCL, GTK, SQLite, YII-framework, Xonotic, Google API, Qt-Installer, Q-Test, Three.js, Zlib, MS SQL, Microsoft LINQ, ASP.NET, MVC, Entity Framework, Postgre SQL, MY SQL, Spring, Hibernate, JSP, JSF, Servlet.
Development teams: embedded software development

**Development languages:** C/C++, Python, TCL, ASM, PHP, SQL, HTML, Javascript, CSS, Delphi, Object Pascal, Rust, Prolog, Java, PL/I, REXX, Perl.

**SDK, IDE tools:** Xilinx SDK, AVRStudio, Vivado SDK, Altera Quartus, IAR(MSP430, AVR, STM8, ARM), Eclipse, Keil, CoIIDE, MPLAB, MPLAB X, TI CCS, Embarcadero RAD-Studio XE, QT Creator, Zend Studio, Mikroelektronika, Codeblocks, QNX Momentics, CodeVision AVR, MikroC, CrossCore Embedded Studio, VisualDSP++, Kdevelop, VIM, MS Visual Studio, IntelliJ IDEA.

**Platform/Hardware:** x86, ARM7/9/11, QorIQ P2020, PIC, AVR32, Renesas, Xilinx Microblaze, Xilinx PPC, Xilinx Cortex-A9(ZynQ), Altera NIOS II, dsPIC33Fj, STM8, STM32 Cortex-M3, TI Cortex-M4, MSP430, LPC22/32(NXP), RENESAS, TI DSP (C6000), Blackfin Processors, SHARC Processors, DSP (NM6403), Raspberry Pi, SPARC, LEON3, MCS-51.


**OS:** XilKernel, FreeRTOS, uOS, OSA, CoOS, Linux, RL-RTX, FreeRTOS, uCOS-II, QNX, RTX Kernel, VDK, μC/OS, Windows, OS-9000, OS/2, eCos RTOS, RTEMS, uClinux, GNU/Linux, bare-metal, qemu, SWIG, Contiki.
Development teams: custom software development

**Development languages:** C/C++, Java, Bash-script, SQL, R, VBA, Pascal, Fortran, SQL, Doxygen, ASM Intel, Delphi, CSS3, HTML5, Python, C#, SASS, LESS, JavaScript, Asm 51, VBScript, Autolt Script, PHP, ActionScript 3.0, Visual Basic, F#, SCPI, XAML, PowerShell, Lazarus, Lisp, Lua, LinQ.


**Platform/Hardware:** x86, Sparc-V8/V9, ARM, Arduino, ESP8266, Atmega-382p.

**Interfaces and Cores:** Ethernet, UART, TCP/IP, USB, VISA, custom user IP protocols.

**OS:** Unix, Linux, Sun Solaris, Windows, Android, Ubuntu, ASPLinux, Cygwin, Windows Server (Active Directory, Domain, Remote Desktop), RouterOS (MikroTik).

**More:** Doxygen, OpenGL, QT, JSON, PostgreSQL, Jenkins, Diclonius, Firebird, Joomla, PyCharm, MySql, wxWidgets, XML, .Net, MVC, Scrum, Angular 2, ASP.NET, EntityFramework, InterBase, Testing, GDB, MultiThreading, MSSQL, SQLite, makefile, Distributed application, JQuery, WMI, MSI, DEB, Network, Codeigniter3, Oracle, pgAdmin, VMware, VirtualBox, BCL, WinForms, WPF, MVC, WebAPI, Mono, Qt 4/5, Boost, ODB, WinAPI, VirtualBox, IPC, IronPython, PyQt, RabbitMQ, WCF, NAT, Proxy, OpenVPN, Hyper-V, ProxmoxVE, Blender, Zbrush, Graphic Engines (Unreal Engine, Cry Engine, Unyty 3D, Leadwerks Engine), Firebird, Django, SharpDX.
Development teams: mechanical development and prototyping

**SDK, IDE tools:** SolidWorks, SolidWorks Electrical, Altium Designer, T-Flex, AutoCAD.

**Platform/Hardware:** AdvancedTCA, MicroTCA, CompactPCI.

**More:** Design of electrical and electronics circuits, electrical wiring for electrical cabinets and electronic devices. Calculation of cooling systems for electronic devices. Calculation and design of welded structures. 3D modeling of electronic components. Development of drawings of electrical circuits and cables. Calculation and design of mechanical units and CNC machines as well as their installation and adjustment. PCP design. Electric installation.
Development teams: PLC software development

**Development languages:** IEC 61131-3 (ST, FBD, LD), SFC, Heidenhain (PLC), VBS, VBA, Qbasic, Java, C/C++, SQL, objective-C 2.0, JavaScript, HTML, CSS.


**Platform/Hardware:** System CNC: Sinumerik, Mitsubishi, Heidenhain, Fagor and other.

Drives: Simodrive, Sinamics.

**Controllers PLC:** Siemens, Mitsubishi, Wago, FX1N, FX3U, МКП, Owen.

**Interfaces:** Ethernet, RS232, RS485, ProfiBus, Profibus-DP, MPI, ProfiNET, ModBus, TCP/IP, custom user IP protocols, Modbus TCP/RTU.

**OS:** Windows, DOS, Heres, Linux, Solaris, Ubuntu, Android, OC2000.

**More:** Microsoft SQL Server, XML/XSL/XSLT, QT, wxWidgets, MySQL, PostgreSQL, SQLite, OGRE, VMware Workstation, Joomla!, Doxygen, QT, Ncurses, PostgreSQL, Open Office, Virtual Box, Industrial automation systems.
CONTACT

AXONIM-Baltic UAB
Ateities str. 21C, Vilnius, Lithuania
Tel.: +375-17-265-69-00
Email: info@axonim.com
www.axonim.com