

AURORA Technologies Ltd.

Company Profile

GENERAL INFORMATION

Founded in 1996

Managing Director Dr. Ron Gal-Ezer

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MAIN BUSINESS AREAS

Software and Hardware Design, Development and Deployment of

- Embedded Microcontroller Design and Development, with expertise in Very Low Power embedded electronics.
- RFID Systems, including Active RFID tags and sensors.
- Low Power Wireless modules, including Zigbee, customized RF transceiver units for ISM band applications (433MHz., 2.4GHz, etc.).
- Smart Card (contact and contactless), Magnetic and Credit Card Applications including Prepaid, Loyalty Club and Membership Systems.
- Electronic Payment and Transaction Based Applications, including database and communication servers.
- Distributed and Centralized Data Acquisition, Monitoring and Control Systems and Applications.
- Time and Attendance, Personal ID and Access Control Systems.
- Building and Peripheral Access Control.
- Telephone, Cellular and RF Accessories and Applications
- Smart House Applications.
- Communications and Database Servers and Applications.

ABOUT THE COMPANY

Aurora Technologies Ltd is a software and hardware developer and systems integrator. The company is privately owned, and has been operating since 1996. Aurora offers comprehensive solutions for project development from initial analysis, specification and definition to final product and production documentation. The company capabilities and experience encompass hardware and software system engineering, hardware design, development, prototyping, production and testing and software development.

The highly qualified professional team which lead Aurora have developed hands-on expertise in a wide and varied range of electronic and computer related disciplines. These include control systems, data acquisition and manipulation, cellular and conventional telephony applications, intrinsically safe systems, distributed computation and control, medical instrumentation, industrial systems, avionic as well as commercial systems and more. Our software history includes real-time control and communications in both PC and micro-controller environments, data acquisition accumulation and processing, database servers and information processing, data protection and encryption and many other custom applications.

Aurora has developed specialized expertise in several complimentary disciplines, including:

- Design and Development of Embedded Microcontroller units and systems, especially in Low Power environments. In particular, we have considerable hands on experience with the Texas Instruments MSP430 family of products, as detailed below. These have been implemented in a wide assortment of applications, including medical, industrial, telephony, RFID, smart card and other implementations. Aurora also has considerable hands on experience with various embedded controllers from Mitsubishi, Renesas/Hitachi, Silicon Laboratories, Xemics (Semtech) and others.
- Design, Development and deployment of Electronic Payment, Loyalty and other distributed transaction systems, including smart card and magnetic card based applications, dedicated software solutions in Point of Sale units, secure communications, Communication and Database server applications and system administration and control.

Aurora Technologies has the following general capabilities:

- System Engineering, involving multidisciplinary project leadership and design, including all facets of hardware and software development.
- Firmware (hardware and software) design for various embedded microcontrollers, including real-time, communications and control applications.
- Software design for PC based applications. We also provide complete software support packages for data communications, data collection, data bases and process control, provided on PC based platforms in Microsoft Windows environments.
- Software application design and implementation on third party terminals, including Lipman, Ingenico, Schlumberger/Axalto, Thyron and others.
- Hardware design and development, including analog and digital circuitry, microprocessor and computer based systems and interfacing. Our capabilities include system analysis, circuit design, provision of prototype and preproduction models, testing and full documentation.
- Integration of various third party hardware and software elements with our own into final systems.
- Complete System Design and Integration, including multiport communication servers, database servers and application clients.

The following disciplines serve as the backbone of professional capabilities and proficiencies integral to Aurora:

1. Smart Card and magnetic card systems including distributed transactional systems, Back-Office and clearing house applications. These are applied for collection and processing of data representing transactions, payments, voucher distribution and authentication, magnetic and smart card payment operations, merchandise, sales and stock management, ticketing in transportation, utility payment, etc. These systems typically include a communications module, a database and relevant administration applications.
2. Embedded CPU and Controller design and development for third parties. The company has designed numerous projects that included hardware and software design and applying controllers from various manufacturers, including Motorola, Intel, Mitsubishi, Hitachi, Texas Instruments, Dallas, Atmel, Microchip and others.
3. Low power applications. Hardware and firmware design of modules that consume extremely low power. Modules frequently combine CPU, communications and non-volatile memory with dedicated software applications.
4. Customized active RFID modules.
5. Cellular and landline telephony modules and applications. These include development of circuits for landline telephony and integration of cellular modems and circuitry for cellular audio and data transfer and control.
6. Distributed systems: these typically include a network of widely distributed (Point of Sale and data collection) terminals that communicate with a central communication server and database server. The system can support various applications, including financial transactions, prepaid based systems, time and attendance and task management, distributed sensors for monitoring and control applications, systems for public transportation fare collection, etc. These systems incorporate diverse means of communications, including real-time and online, batch communications, offline communications, etc. Secure communication disciplines (including encryption methods) are supported and applied where relevant.

OUTLINE OF FIRMWARE BASED DESIGNS

Aurora Technologies is a Texas Instruments Third party developer and consultant (see <http://focus.ti.com/general/docs/thirdparty/companydetailaction.tsp?supplierId=907>).

Aurora has carried out numerous projects that were based on the Texas Instruments MSP430 family of products. Microcontrollers of this family that we have designed with include the MSP430F1121, MSP430F1111, MSP430F147, MSP430F149, MSP430F1611 and MSP430F427.

The following is a skeleton list of applications we have developed, implementing various members of the MSP430 family of products:

- 1) Medical application for a mobile unit for remote measuring of lung and pulmonary related parameters of patients, including telemedical features for transmitting measured data to medical facilities.
- 2) Telephony apparatus for PSTN Least Cost Routing and microswitch functionalities. The unit is powered by the telephone line, requiring only up to 10 μ A in On-Hook conditions, thus eliminating the need for an external power supply.
- 3) Telephony communication module for interfacing PSTN and DTMF signaling between remote clients and a host PC.
- 4) Medical application for high weld current control, integrating thermal sensing and high current control (up to 30 A.) disciplines.
- 5) Industrial Multi-Controller Automatic Test Unit for testing a complex Industrial Control apparatus. The Tester included an array of 16 MSP430 microcontrollers, each of which carried out its own dedicated tasks, as well as inter-controller coordinated, complex testing functionalities. The tests included analog, digital, throughput and timing disciplines. The microcontrollers were integrated into a local communications network for coordinated test routines, and to a host computer for uploading parameters and downloading test results.
- 6) Active RF Sensor and Transponder for Veterinary purposes. This module was designed for very low power consumption, effecting a battery life of 5 years. It was implanted in livestock for lifespan monitoring and observation. The module included analog, digital and MSP430 based circuitry for sampling thermal, acoustic and other phenomena, analyzing the results and transmitting results via an RF channel (of our own design, employing TI/Chipcon transceiver ICs) to a host transceiver.
- 7) Host RF Transceiver for interfacing between active RF sensors and RFID modules and a Host PC. The Transceiver transmitted commands and operational parameters to the client module, and received accumulated measured and calculated data. The communication channel involved a proprietary protocol, including anti-collision support.
- 8) Industrial application for testing eggs. This unit carries out various physical tests on eggs (yolk and white color, viscosity, etc.) to determine their quality. The unit incorporates LCD display, keyboard, controlled and mechanized movement of the tray, a variety of sensors and analytic algorithms.
- 9) Medical device (battery operated) for automatic injection of medication.
- 10) Industrial, 2.4GHz. RF link and controller for control of CNC measurement device (2 modules).
- 11) Zigbee based low power wireless sensor – Development and Test Board.
- 12) Zigbee based, low power wireless sensor.
- 13) Battery operated Medical Implant including RF link and controller.

DETAILS OF PRODUCTS AND PROFESSIONAL DISCIPLINES

The following are products that have been designed and developed by Aurora for distribution and placement on the international market.

1. A prepaid Airtime Distribution system. This system replaces the "scratch cards" used for purchasing air time for cellular and international phone calls. The integral system eliminates the need for these cards, including their production, distribution and storing. The system has many additional advantages, including a considerable savings in operational expenses involved in the sale of airtime, complete visibility and control of the detailed financial, performance and stock status and eliminating the risks of theft, fraud and physical danger to the personnel handling the cards today.
2. A smart card system targeted for Vacation Resorts and Leisure Cruise Liners. The system offers a convenient, reliable and highly secure cashless environment for payment at all service satellites within the resort (pool, bars, restaurants, etc.). It also deals with the issue of the limitation of means of payment by the guests after checkout, by introducing a stored value purse (electronic purse) on the same card. This introduces a source of revenue for the resort that is currently not taken advantage of.
3. Smart Meal Ticketing - a system level package that replaces paper meal vouchers with personal smart cards. The system is supported with a comprehensive and flexible means of both prepaid and postpaid payment for meals, contracts between the food outlets and various companies whose employees apply the personal smart cards, etc. It also includes reports of use and debit or credits of the food suppliers on the one hand and the participating companies on the other.
4. A Stored Value (e-purse) system for use by company employees which offers payment by both salary deduction and prepayment.
5. The Call-4-Line system. This system includes a mini telephone switch that converts cellular based international airtime costs to landline based services. This results in considerable cost reduction benefits, taking advantage of the tariff differences between these two types of service providers. The system includes the MR-1 module, an electronic device, issued and assigned personally to the User(s), and the call4line web site. Users of the Call-4-line system will save up to 80% of the charges incurred by international cellular telephones.

KEY PERSONNEL

Dr. Ron J. Gal-Ezer

Managing Director

Dr. Gal-Ezer holds a Ph.D. in Electrical and Computer Engineering from the University of Southern California (U.S.C.), Los Angeles, California, and an M.Sc. in Industrial Management from the Technion in Haifa, Israel. In the past, Dr. Gal-Ezer was Electronic Systems Engineer on the Boeing 757/767 program and served as Director of Engineering for several Hi-tech companies in Israel. His achievements include numerous projects in design, development and project management of avionic systems, computer based office equipment, commercial systems, medical instrumentation, petrochemical instrumentation, technological education systems, cellular and landline telephony systems, integration of smart cards in university campuses and public transportation and various digital and analog control systems. He specializes in design and engineering of smart card applications, commercial distributed transactional systems and communication intensive systems. Dr. Gal-Ezer also currently serves as the senior technical advisor on smart cards and Fare Collection for the Israel Ministry of Transportation

Didi Avram

Technical Manager

Mr. Avram holds a B.Sc. in Electrical Engineering from the Technion in Haifa, Israel. He has been responsible for hardware and software development of real time industrial control, data acquisition and management systems, including design and development of Power Plant control systems for the Israel Electric Company.

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