



# Black Oak Engineering, LLC

Brooklyn, NY, USA

(347) 467-0912

blackoakeng.com

## Capabilities Statement

- Custom electronics design and manufacture.
- Analog, wired and wireless communications, controls, digital, embedded, power.
- Electro-optic and electro-mechanical systems.
- PCBs, rapid prototypes, turnkey, installations.
- Software development. Embedded / firmware, Microsoft Windows.
- We serve the needs of industry, government, and university.
- Cost-effective, easy to work with, communicative.
- Hundreds of successful projects since 2003.
- Offices in New York City and Philadelphia.

### *Core Competencies*

- Analog design. Audio. Low power, low noise, high precision, high voltage.
- Battery charging and management for various chemistries.
- Communication systems. Bluetooth / BLE, CAN, CANopen, Ethernet, GPS, IOT, IrDA, LIN, LTE, M2M, MIDI, Modbus, RS-232/485, TCP/IP, USB, WiFi / 802.11.
- Control systems. PID, motion, process, state variable, temperature.
- Design from concept to finished product. Agile product development, Minimum Viable Products. Rapid prototyping and manufacturing. Turnaround within weeks in many cases.
- Digital Signal Processing (DSP).
- Electro-optics. Cameras, detectors, filters, lasers, LEDs, mirrors, opto-mechanical, Peltiers. Infrared, MWIR, NDIR, PMTs, SPADs, TDLs, ultraviolet. Raman and other spectroscopy.
- Embedded firmware. 8051 variants, ARM Cortex, Atmel, Microchip PIC (all), TI. DSP, FPGAs, SBCs, 8/16/32 bit, Raspberry Pi.
- Mechanical design, 3-D parametric modeling. Heat flow, vibration analysis.
- Microchip Design Partner & Platinum-level Master.
- Microsoft Development Partner.
- Motors and motion control, including steppers, servo, DC, BLDC, encoders, multi-axis, sensorless.
- Printed circuit boards (PCBs). Layout, procurement, fabrication, assembly, test.
- Programming. C / C++ / C#, Matlab, Python. Mobile, Linux, & MS Windows. FreeRTOS & Zephyr.
- Ruggedized, Mil-Spec design. For extreme environments, including arctic, CEMS, dust, maritime, military, railroad, remote installations.
- Scientific instruments.
- Sensors: acceleration / vibration, air pollution, conductivity, flow, force, gas, humidity, impedance, light, magnetic, pH, pressure, proximity, temperature.
- Standards: CE mark, CSA, FM, Mil Spec, NEC, NFPA, TÜV, UL, US FDA, US PTO.
- Switching power supplies. Various topologies. Custom magnetics.
- Ultrasonics. NDT, flow measurement, transducers.

“it just works...”

### Point of Contact

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### Some recent large projects

- Stack-mounted zirconium oxygen sensor. Rugged, LED readout, 4-20 mA out.
- UV LED threat simulator, dsPIC33, CAN / CANopen.
- Camera / display for Abrams M1 tank, visible & LWIR, servo motor pan.
- PCR controller. Microfluidic, Peltier, optical filters, photodetectors.
- NASA. Ultra low humidity measurement instrument. Windows interface software.
- Home Depot. Configurable network of HVAC controllers. PIC32, RS-485, WiFi.
- Acoustic contact pickup & amplifier. Precision audio, battery powered. CE tested.
- Fluidic mixing controller. High voltage piezo motors, USB.
- Offline switching 100W power supply with UPS & Fire Access protocol. UL spec.
- US Army & USMC. Several varieties of Mil-Spec miniature IOT data acquisition modules with BLE.
- Fire alarm control panel. ARM Cortex. LTE comms.
- Portable automotive ethanol breathalyzer / interlock. ARM Cortex. Configurable to local regulations.
- Precision rotary solenoid valve control for HPLC, stepper motor. CE tested.



### Associations

Analog Devices, Digi-Key Design Partner, IEEE Instrumentation Society, Linear Tech, Microchip Platinum Design Partner, Microsoft Developer Network, Nordic Semi, Power Integrations, ST Micro, Texas Instruments, Xilinx.



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