

design capabilities



PATHWAY
TECHNOLOGIES

Pathway Technologies Inc.

25 Skippack Pike, Suite 203

Ambler, PA 19002

Phone (267) 546 7241

Fax (775) 490 2068

Email sales@pathwaytechnologies.net

<http://www.pathwaytechnologies.net>

ELECTRONICS DESIGN SERVICES

EMBEDDED SYSTEMS

- 8/16/32 bit microcontroller development expertise
- Expertise in the use of sensors, transducers, motor control, displays and communication protocols to design a custom embedded design for your specific needs
- **Freescale, Renesas and Microchip** are our particular areas of expertise
- Microchip's MPLAB C IDE, Freescale's Codewarrior IDE and Renesas HEW tool chains for development work
- Mathworks Real time workshop for Freescale MPC5xx work using model based development from Simulink.
- In house development kits and debuggers available for all three families
- Any level of project development is available to suit your needs:
 - From schematics to multilayer board layouts that can be used as a black box in your systems
 - Complete product level design involving boards, harnesses, enclosure and testing for a turnkey solution

PROGRAMMABLE LOGIC

- We support development for all Xilinx FPGAs and CPLDs
- Full Xilinx tool suite in house include ISE foundation, ChipScope pro, DSP system generator
- Custom IP blocks for customer use - CANopen, RS232, SPI, digital FIR filters and many more DSP and logic cores developed over more than ten years of FPGA development
- System Generator tool suite from Mathworks for DSP code generation from within Simulink - we can use your Simulink models to generate verilog code for FPGAs to run your algorithms

POWER ELECTRONICS

- Brush, Brushless and stepper motor controller designs
 - BLDC sensor-less control expertise
 - Power stage design expertise using both FETs and IGBTs up to 2KW using either discrete or pre-packaged modules
 - Expertise in working with different control architectures like field oriented control and phase advance techniques
 - Experience with numerous motor control chipsets from PMD, Infineon and International Rectifier among others
-

- We can also develop custom motor control code from scratch to fit a processor memory of your choice using our in house IP - which is available for brush, brushless and stepper motors

SENSORS & TRANSDUCERS

- Expertise with selection of proper sensors and transducers for various embedded applications
- Signal conditioning and ADC - DAC signal path expertise for designs up to 1.5GHz bit rates
- MEMS accelerometers, gyroscopes and magnetic field sensors for embedded applications
- Photo multiplier tubes, photo diodes and UV spectrometers for optical measurement and laboratory/pharmaceutical analysis instrumentation

WIRELESS

- Expertise in implementing short and long haul wireless communication links using wireless RS485, RS232 and wireless Ethernet in the ISM band
- Extensive in house IP developed over many years for use in remote sensing applications
- Embedded GPS implementation expertise using chipset vendors like Navsync
- ZigBee application expertise using off-the-shelf modules like xbee

BOARD LEVEL DESIGN SERVICES

- Schematic capture and mixed mode spice simulation using Altium DXP tool chain using either hand drawn system level architecture from you or older schematics that need to be updated or converted
 - Multi-layer board layout with particular emphasis on high speed analog and digital techniques
 - Design techniques for EMC and EMI in high threat areas like automotive designs
 - Design techniques to maximize yield using various surface finishes and via techniques as well as design for testing
 - Conversion of board to mechanical CAD model for use in CAD programs
 - Generation of complete assembly and production files including gerbers, pick&place files, Bills of Materials and assembly notes
-

MECHANICAL DESIGN SERVICES

MACHINE DESIGN

- Extensive experience with multi axes machines used in laboratory and industrial automation fields
- Designs ranging from simple two axis stepper and ball screw driven motion for cost sensitive applications to large machine frames with eight axes of control using linear motors and high accelerations up to 3Gs for high performance systems
- Expertise in selection of motors, slides, bearings and machine frame materials using analytical techniques to maximize performance and minimize cost
- Capability of generating models and drawings in SolidWorks 2008 as well as CAM files for use in CNC systems

ENCLOSURE DESIGN

- We offer this service as a complement to turnkey projects
 - Expertise in SLA, sheet metal and ABS plastics designs
 - Network of quick turn machine shops for evaluating prototypes
 - Expertise in thermal management inside the enclosure using both passive and active cooling
 - Expertise in design of enclosures for EMI/EMC using various shielding techniques
 - Expertise in design of enclosures for high threat environments that meet IP67 standards
-

FIRMWARE DESIGN SERVICES

MICROCONTROLLER FIRMWARE

- C and PicBasic Pro code for Microchip family of 8 and 16 bit controllers
 - SPI, RS232, USB and CAN communication protocols
 - A/D and D/A techniques
 - PWM, Counters and timer implementations
 - Interrupt based design expertise
 - Tiny RTOS implementations
- Model based code using Matlab for MPC5xx processors from Freescale
 - Using real time workshop and codewarrior compiler tool chain
 - Expertise in implementing RTOS solutions for demanding 32 bit applications

FPGA IP

- Verilog IP blocks for use with FPGAs and CPLDs
 - Primarily developed using Xilinx ISE toolchain
 - Communication protocols like RS232, CAN and USB
 - Storage IP blocks
 - Picoblaze IP for embedded microcontroller applications
 - DSP IP
 - All developed using Matlab System Generator tool chain
 - Available IP includes high speed (1.5Gsps) A/D signal path solutions
 - Digital filters, FFT and analysis/storage blocks
-