

Mars International has assisted manufacturers of variable speed pumps by providing design and manufacturing services for the digital controllers, display panels and wireless remotes. Our engineering expertise in control board design, software development, and mechanical design, coupled with our sophisticated global manufacturing network benefits suppliers of variable speed pumps to both the Pool & Spa and HVAC industries.

These industries are changing to variable speed pumps due to the efficiencies this new technology offers with reduced energy consumption thereby saving operating cost. The digital programmability allows systems integrators and users to customize the operation of the pumps to the specific needs of the environment. In an HVAC application, it can respond to changes in the heating load. In a pool or spa, motor speed can be customized and fine-tuned for ideal filtration and cleaning intervals.

Mars International's breadth of experience to support these product developments includes the following:

Key Control / Wireless Expertise

- **PID control loops**
- **Outdoor reset control**
- **μProcessors / μControllers**
 - Microchip, ST Micro, Atmel, Elan, ARM
- **RF and IR communications**
 - Z-Wave, Zigbee, WiFi (802.x)

Key Manufacturing Capabilities

- **Printed circuit board assembly**
- **Molded plastics**
 - Enclosures, buttons, switches, etc.
- **Precision metals**
 - Casings, machined parts, etc.
- **Electro-mechanical assembly**

Key Development Capabilities

- **Control board design**
- **Printed circuit board layout**
- **Optimized embedded controller software**
- **RF communication protocols**
- **Test procedure definition**
- **Tooling design and construction**
- **Molding simulation and analysis**
- **UL and FCC pre-certification**

Contact Mars International to discuss our services and benefit from our expertise with variable speed pump designs.