

Solutions for the Medical Equipment Market

Low-Power, Mixed-Signal, High-Reliability FPGAs

Key Benefits of Actel FPGAs

- Actel's industry-leading, low-power IGLOO® FPGAs extend battery life.
- Mixed-signal Fusion FPGAs provide the highest level of integration.
- Actel's highly reliable FPGAs are ideal for system critical applications.
- Actel's single-chip implementation and small-footprint packages (as small as 3x3 mm) reduce board space and overall system cost.

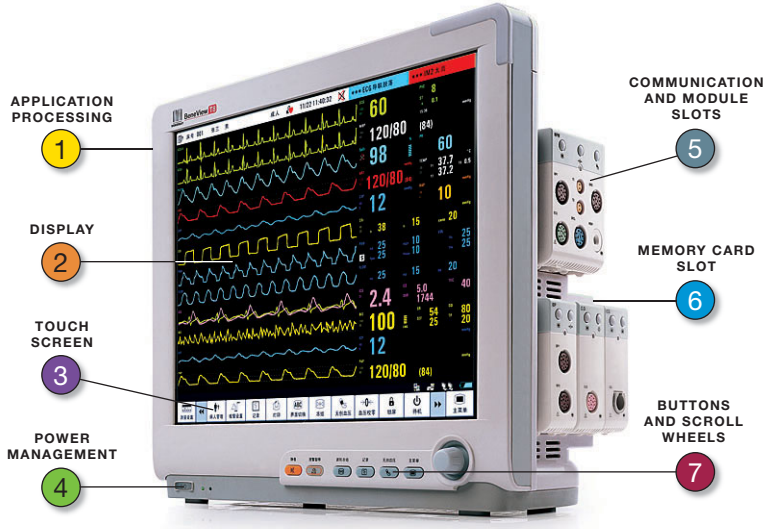
Increasing healthcare costs, the prevalence of chronic diseases, and aging populations are creating tremendous demand for portable and reliable medical devices to improve global healthcare in all three segments of the medical device market: home-based applications, clinical and diagnostic applications, and imaging.

Many medical devices are microprocessor-based, electromechanical machines that use a common set of building blocks: power control and temperature management; a user interface that includes a keypad, LCD monitor and audio control; flash or EEPROM for data logging; and device interfaces for connections to other machines. The changing features and requirements, complex functionality in a small footprint, low power, high accuracy, and

reliable operation make medical devices an excellent fit for reprogrammable nonvolatile semiconductor technologies.

Flash-based, low-power IGLOO FPGAs and mixed-signal Fusion FPGAs are uniquely suited to these applications because of their inherent low power, high reliability, and high levels of integration. These advantages help medical devices meet battery specifications, reduce design footprints, minimize heat dissipation, and ensure reliable operation.





Actel FPGA Usage in Medical Applications

1 APPLICATION PROCESSING

LOW-POWER OPERATION and CONTROL

ARM® Cortex™-M1-enabled Fusion, IGLOO, and ProASIC®3 FPGAs allow higher integration and optimal balance between size, cost, and performance.

2 DISPLAY LCD, LEDS

Display and imaging interfaces can be implemented using Actel's low-power FPGAs which enables interaction with multiple types of LCDs by changing only the FPGA configuration.

3 TOUCH SCREEN

A single Fusion mixed-signal FPGA integrates sensing and reacting functions for touch screen commands.

4 POWER MANAGEMENT

SYSTEM POWER CONTROL, POWER SEQUENCING

Fusion mixed-signal FPGAs efficiently manage system power by controlling and monitoring power rails and powering down unused functions. IGLOO and ProASIC3 FPGAs can supervise and control the system and look

for a user stimulus while other devices are powered down. This enables the device to consume minimal power and operate with a low-frequency clock.

5 COMMUNICATION AND MODULE SLOTS

WIRELESS, WIRED INTERFACES and CONFIGURATION

The ability to support multiple communication interface standards, such as FireWire, WiFi, Ethernet, USB, and Bluetooth, makes Actel FPGAs suitable for the diverse communication needs of medical devices.

6 MEMORY CARD SLOT

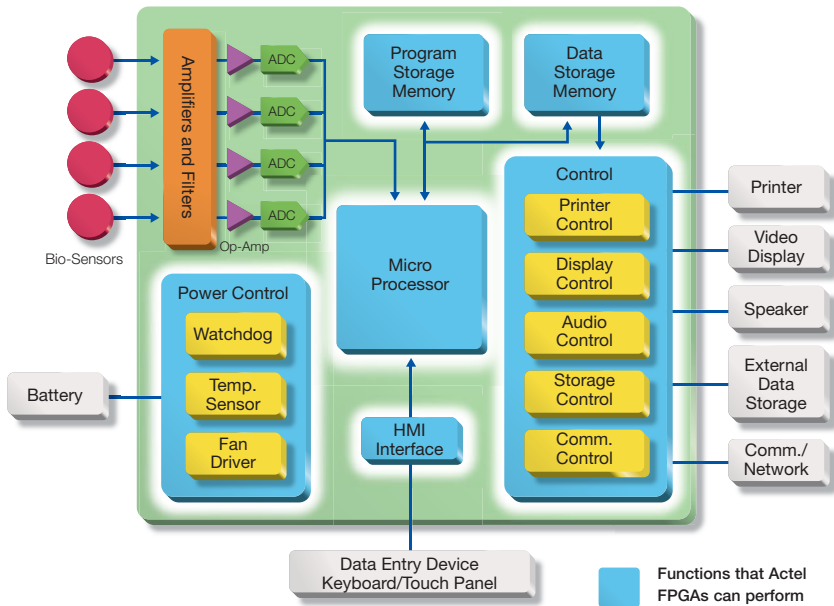
INTERFACE to MULTIPLE STANDARDS

Actel and its partners offer multiple validated and proven IP cores for quick and easy integration of storage interfaces on flash FPGAs.

7 BUTTONS, SCROLL WHEELS

Different and ever-changing human interface support can easily be achieved using proven IP cores from Actel. Implementing the interface on IGLOO FPGAs reduces time-to-market and enables you to customize the end product to meet specific customer needs.

Patient Monitor Block Diagram



IGLOO devices, the industry leader in low power (as low as 2 μw), offering a broad packaging portfolio, including packages as small as 3x3 mm, are an ideal choice for the ultra-low power, high-reliability demands of medical devices. ProASIC3 devices offer a balance between performance and power. These low power devices can be used for Human Machine Interface functions and controls, communication and external storage control, and power control functions, while embedding the microprocessor. Fusion, the mixed-signal FPGA, is uniquely able to perform not only all the functionality mentioned above, but also the system and thermal management, motor/pump sense and control, touch screen control, and data logging functions using embedded nonvolatile memory. All on a low-power, highly reliable flash-based technology.

Actel is the leader in low power and mixed-signal FPGAs and offers the most comprehensive portfolio of system and power management solutions. Power Matters. Learn more at www.actel.com.



Actel Corporation
2061 Sterlin Court
Mountain View, CA
94043-4655 USA
PHONE 650.318.4200
FAX 650.318.4600

Actel Europe Ltd.
River Court, Meadows Business Park
Station Approach, Blackwater
Camberley Surrey GU17 9AB
United Kingdom
PHONE +44 (0) 1276 609 300
FAX +44 (0) 1276 607 540

Actel Japan
EXOS Ebisu Building 4F
1-24-14 Ebisu Shibuya-ku
Tokyo 150, Japan
PHONE +81 03.3445.7671
FAX +81 03.3445.7668
WEB <http://jp.actel.com>

Actel Hong Kong
Room 2107, China Resources Building
26 Harbour Road
Wanchai, Hong Kong
PHONE +852 2185 6460
FAX +852 2185 6488
WEB www.actel.com.cn