



WIND RIVER SOLUTION ACCELERATOR FOR ANDROID, MEDICAL

Android has become one of the leading mobile operating systems through its openness, highly customizable features, robust ecosystem, and growing application availability. For device manufacturers, original equipment manufacturers (OEMs), original design manufacturers (ODMs), and operators, harnessing the power of Android for mobile devices of all kinds can be both rewarding and very challenging. The rapid technology release cycles and the growing competitive pressure make it difficult to meet time-to-market windows, add differentiating functionality, ensure user experience and quality, and control development costs. Wind River understands these challenges and is dedicated to helping our customers build leading-edge Android-based products in this dynamic and competitive environment. Wind River's support continues beyond the design and implementation stages, providing critical bug fixes, updates, and enhancements throughout the life of a medical device.

Wind River Solution Accelerators for Android are commercial add-on software modules optimized for the Android operating system. Solution Accelerators are tested and validated applications and middleware components that are combined with specialized innovation design, consulting, industrial standard compliance, and comprehensive life cycle services. OEMs, ODMs, and service providers can utilize Solution Accelerators to quickly build their own android products, solutions, or services and add branding, personalization, and innovation to fill the gap between the Android Open Source Project and real-market requirements.

BENEFITS

As ready and well-tested software components, Wind River Solution Accelerators for Android bring financial benefits to our customers by reducing engineering costs during each project phase:

1. **Project startup phase:** Less technical evaluation and skills acquisition is required.
2. **Development phase:** Effort is reduced for testing frameworks, license management, and refactoring.
3. **Maintenance phase:** Effort is reduced for refactoring and regression testing.

Wind River Solution Accelerators are categorized and packaged by functions. Currently, three Solution Accelerator packs are defined. Each is a standalone product; however, multiple packs can be combined:

- Wind River Solution Accelerator for Android, Medical
- Wind River Solution Accelerator for Android, User Experience
- Wind River Solution Accelerator for Android, Connectivity

In addition, Wind River offers Wind River Platform for Android, a fully compliant commercial software platform, and Wind River Framework for Automated Software Testing, a meta-test framework that automates software and system tests and their results for mobile Linux devices, as part of our solutions for mobile devices.

HEALTH AND WELLNESS MANAGEMENT SOLUTION

A report by Parks Associates estimates that revenue from digital health technology and services will exceed \$5.7 billion in 2015 in the United States alone, compared with \$1.7 billion in 2010. Wind River Solution Accelerator for Android, Medical implements a system of interoperable personal connected health solutions on top of Android, following the guidelines from Continua Health Alliance. It provides the opportunity for device manufactures and service providers to efficiently build and deliver a truly personalized, compliant health and wellness management solution at controllable cost and accelerated time-to-market.

The trends of rapidly aging population and growing chronic diseases in large parts of the world have put a strain on health and social-related services. Adopting new technology to deliver more efficient services to more people in the ease of their own homes has become almost inevitable. With location awareness, convenience, mobility, and improving capabilities, smartphones and tablets are playing more and more important roles in this growing personal health-care industry.

People use their smartphones or tablets that are connected to medical sensors to monitor multiple chronic conditions and report to health-care professionals through the Internet or text messages. This provides a level of cooperation and interaction between patients and doctors that has not existed before. The Continua Health Alliance, a group of health-care and technology companies, provides design guidelines and a product certification program in this area to promote the growth of the personal health management market.

KEY FEATURES

IEEE 11073 Stack Support

IEEE 11073 is the first open standard that “addresses a need for an openly defined, independent standard for converting the information profile (of personal health devices) into an interoperable transmission format so the information can be exchanged to and from personal telemedicine devices and computer engines.” The Continua Health Alliance specifies to use IEEE 11073 as the format for information exchange between personal health devices such as scales, blood pressure monitors, and blood glucose monitors.

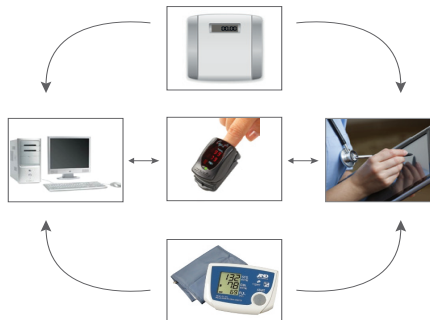


Figure 1: Information exchange between devices

Compliant devices, whether they are smartphones, personal computers, tablet computers, personal health appliances, or set-top boxes, can readily exchange information with each other. This standard is incorporated into Wind River Solution Accelerator for Android, Medical and allows all devices running it to communicate seamlessly with each other, delivering patient health information quickly to where it is needed.

Wind River Solution Accelerator for Android, Medical supports the IEEE 11073 stack and can work with 11073-104xx sensor devices including the following:

- IEEE 11073-10404 pulse oximeter
- IEEE 11073-10406 heart rate monitor (pulse)
- IEEE 11073-10407 blood pressure monitor
- IEEE 11073-10408 thermometer
- IEEE 11073-10415 weighing scale
- IEEE 11073-10417 glucose meter
- IEEE 11073-10441 cardiovascular (including fitness) monitor
- IEEE 11073-10442 strength (including fitness) monitor
- IEEE 11073-10471 activity data monitor
- IEEE 11073-10472 medication monitor

Devices List		
Temperature		☆
Cholesterol		☆
Blood Pressure		★
Oximeter		★
Weight		★
Respiration		☆

Figure 2: Wind River Solution Accelerator for Android, Medical supports multiple sensors

Bluetooth Health Device Profile Support

While IEEE 11073 defines the exchange data format, the Continua Health Alliance adopted Bluetooth Health Device Profile (HDP) as the wireless transmission protocol between devices. Typically, Bluetooth implementations have been based on Bluetooth Serial Port Profile (SPP) and manufacturer-specific proprietary implementations and protocols. As a result, different implementations have had a poor level of interoperability with each other. The Bluetooth SIG formed the Medical Device Working Group with the goal of developing an interoperable Bluetooth profile for medical sensors and collecting devices. The result is the Multichannel Adaptation Protocol (MCAP) and the HDP, both of which were adopted in 2008.

Together with MCAP, HDP provides the following:

- Control channel connection/disconnection
- Data link creation (reliable or streaming)
- Data link deletion
- Data link abort
- Data link reconnection
- Data transmission (one or more data links)
- High resolution clock synchronization

With the convenience and maturity of the Bluetooth HDP, many Continua-certified devices support this interface today. Wind River Solution Accelerator for Android, Medical integrates a full implementation of HDP, providing the interoperability between Android devices and medical sensors.

Full-Function Application

To show the capability and the usage of the Continua-compliant stack, Wind River includes a well-designed application that provides the following functions:

- Medical sensor management
- Real-time measurement data display
- Historical data storage and reports
- Data sharing through Internet or text messages

Customers can quickly build their own customized solution based on this application.

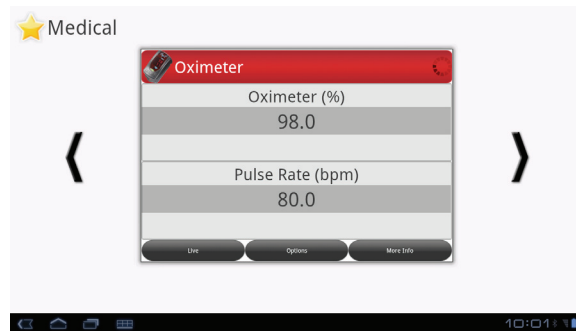


Figure 3: Medical application, pulse oximeter

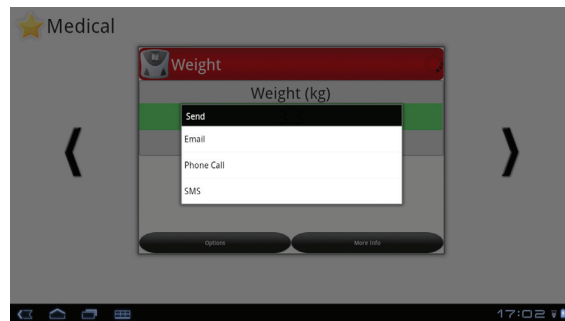


Figure 4: Medical application, information sharing

Software Compliance

Because medical software deals with people's health and lives, compliance with software standards is of paramount importance. Wind River Solution Accelerator for Android, Medical maintains compliance to standards and is tested against those standards. All requirements trace to software implementation and code, as well as test cases. We provide all the evidence to help our customers get their products certified efficiently.

To learn more, visit <http://windriver.com/solutions/mobile-handsets/>. To have a representative contact you, call 800-545-9463 or write to inquiries@windriver.com.

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