

Research In Motion

RIM eCall Solution



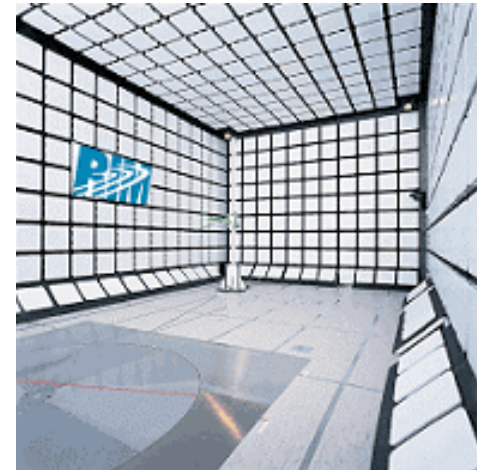
About Research In Motion - Overview

- Leading designer, manufacturer and marketer of innovative wireless solutions
- Provides platforms and solutions for seamless access to time-sensitive information including email, phone, text messaging, instant messaging, Internet and intranet-based applications
- RIM technology enables third party developers and manufacturers to enhance their products and services with wireless connectivity
- Portfolio of award-winning products, services and embedded technologies includes:
 - BlackBerry® wireless platform
 - Software and hardware licensing agreements
 - BlackBerry smartphone product line
 - Software development tools
- Founded in 1984 and based in Waterloo, Ontario, Canada with offices in North America, Central America, Europe and Asia Pacific
- Listed on the NASDAQ Stock Market (NASDAQ: RIMM) and the Toronto Stock Exchange (TSX: RIM)



The Wireless Leader

- **First wireless data developer in North America – 1988**
- **World's largest wireless design group dedicated to wireless data innovation**
- **Dedicated focus on wireless research and development**
 - R&D Expenditures of \$127.8 million (Q1 FY09)
- **Excellence in wireless product manufacturing**
 - Best of breed, dedicated Surface Mount Technology (SMT) manufacturing process
 - 240,000 square foot manufacturing facility for new product introductions and volume manufacturing strategically located within close proximity to the Company's primary research and development facilities and labs
 - Flexible volume manufacturing capacity and global distribution through outsourcing partnership with leading global electronic manufacturing service providers
 - National quality award winner



The Wireless Leader *(continued...)*

- **Strong Financials**
 - Revenue of \$2.24 billion (Q1 FY09)
 - Assets of \$5.86 billion (Q1 FY09)
 - Cash and cash equivalents, short and long term investments of \$2.08 billion (Q1 FY09)
- **Leader in the wireless enterprise market**
 - Over 16 million total subscriber base (Q1 FY09)
- **Global Presence**
 - BlackBerry is available on over 375 carriers and channels in 140 countries around the world (Q1 FY09)
- **Wireless technology built to work across multiple network topologies**
 - GSM™/GPRS, EDGE, UMTS, HSDPA
 - CDMA2000 1X and EVDO
 - Wi-Fi 802.11a/b/g
- **Product portfolio focused solely on wireless**



Technical Overview of RIM eCall solution (1 of 2)

- Key features of the eCall modem scheme are its ability to adapt to varying channel conditions and transmit the MSD reliably from the IVS to the PSAP
- Two different modulation schemes are used.
 - High rate – raw bit rate of 533 bps
 - Low rate - raw bit rate of 266.5 bps
- The design relies on a rateless code (A random linear fountain code) for getting the data to the PSAP reliably in channel error conditions
- The rateless encoded packets are transmitted in bursts with CRC error detection. Packets are 18 bits in length
- Three different transmission schemes are used
 - High - 4 packets per burst, High rate modulation, 24 bit CRC
 - Mid - 2 packets per burst, Low rate modulation, 12 bit CRC
 - Low - 1 packet per burst, Low rate modulation, 12 bit CRC



Technical Overview of RIM eCall solution (2 of 2)

- The entire MSD is protected with a 32 bit CRC
- The PSAP trigger is extremely robust to false detection. The PSAP alternates sending a 96 bit pseudorandom with the high rate transmission scheme and a 48 bit pseudorandom sequence with the mid rate transmission scheme. 8 pseudorandom sequences of either transmission must be received correctly.
- The PSAP trigger also informs the IVS about channel conditions. If 2 or more sequences of the 8 are from the high rate then the IVS will initiate sending with the high rate. Otherwise the mid rate will be used
- The algorithm adapts from high to mid to low rate transmission based on the channel conditions



Cost of implementing RIM solution for the PSAP

- Average complexity over the 26 channel conditions tested in 3gpp (some very harsh with approximately 8% frame erasures) is approximately 3x CTM complexity
- CTM is low complexity – approximately 1/6th to 1/5th the complexity of the AMR speech codec
- Much much less than the 20x CTM complexity recommendation of 3gpp
- The algorithm is adaptive, yet for all transmission modes the basic receiver structure remains the same – this results in a flexible design with low complexity



Compatibility with existing PSAPs

- The MSD is sent when a PSAP upgraded for eCall sends a “trigger” signal to the IVS
- A non-upgraded PSAP will not send the trigger
- Therefore the IVS will not attempt to send the MSD and the call will be a normal emergency call
- There is no incompatibility with existing PSAPs

Cost of implementing RIM solution for the IVS

- Average complexity over the 26 channel conditions tested in 3gpp (some very harsh with approximately 8% frame erasures) is approximately 3x CTM complexity
- CTM is low complexity – approximately 1/6th to 1/5th the complexity of the AMR speech codec
- Much much less than the 10x CTM complexity recommendation of 3gpp
- The algorithm is adaptive, yet for all transmission modes the basic receiver structure remains the same – this results in a flexible design with low complexity
- RIM's IVS eCall module can be easily implemented on commonly used processors such as, for example, ARM9,ARM11,XScale,MSA, StarCore, etc.



RIM eCall Licensing Statement

- In the event RIM has patents essential to implement its eCall modem and its modem is adopted by the industry, then RIM will license its eCall modem essential patents Royalty Free to companies in the industry who do not assert their patents against RIM or against RIM through its customers



Testing and deployment

- **ANSI C code for RIM's IVS and PSAP modules for eCall are ready for testing and deployment now. It has already been tested in the 3gpp SA4 eCall candidate competition**