Handset Connectivity Technologies

Handset Connectivity Technologies is the fourth consecutive report from Berg Insight analysing the latest trends on the worldwide market for GNSS, Bluetooth, WLAN and NFC technologies in mobile handsets.

This report in the NGT Research Series from Berg Insight provides you with 150 pages of unique business intelligence including 5-year industry forecasts and expert commentary on which to base your business decisions.

This report will allow you to:

- **Benefit** from numerous executive interviews with market leading companies.
- **Learn** about the strategies of the leading chipset and handset vendors.
- **Gain** access to the latest data and statistics about handset shipments.
- **Identify** the opportunities and challenges with integration of multiple connectivity technologies in mobile handsets.
- **Realize** the importance of Assisted-GNSS and hybrid location technologies.
- **Comprehend** how NFC technology in handsets can enable new services.
- **Understand** the drivers and barriers for industry-wide adoption of new technology.
- **Predict** future connectivity design trends and technology developments.

Berg Insight’s NGT Research Series

How will the mobile market evolve in the future? Berg Insight’s Next Generation Technologies Research Series examines the latest advances in mobile technology and the new business opportunities they create. Each title analyses development roadmaps, potential applications and addressable market segments for a technology. Topics currently covered by the series include smartphones, small cells, mobile broadband and short-range handset connectivity.

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Which wireless connectivity technologies will be essential in future handsets?

Global handset shipments grew only 3 percent in 2012 to reach 1.6 billion units. The increase was driven by the popularity of smartphones. Sales of smartphones grew almost 47 percent in 2012 to 690 million units, compared to 470 million units in 2011. Berg Insight estimates that 4.4 billion people, about 62 percent of the world’s population, owned at least one mobile phone at the end of 2012. The global active installed base of smartphones grew to 1.2 billion units, which is about 23 percent of all mobile phones in use. Multiple factors are driving the fast transition to smartphones. Customers put more emphasis on the user experience including support for apps and the web. At the same time, mobile operators have found smartphones to be an important driver of data and app revenues and have therefore been willing to subsidise these handsets. Mobile phone vendors have adopted smartphone operating systems in order to reduce development time and cost for new advanced handset models.

A broad range of wireless connectivity technologies are becoming standard features across more handset segments. Bluetooth can be used to connect headsets, fitness and medical sensors. WLAN can be used for Internet access, peer-to-peer file sharing, or HD video and audio streaming. New standards such as Wi-Fi Passpoint also enable mobile devices to discover and connect to WLAN networks automatically without user intervention. WLAN can thus be used as a cost-effective data offloading solution to handle the rise in data traffic from smartphones. Near Field Communication (NFC) is a standard for short-range wireless, point-to-point communication over distances of about 10 centimetres. When deployed in mobile phones, NFC can be used for countless applications, ranging from information exchange and device pairing, to electronic ticketing and secure contactless payments. The most important driver for GPS integration in handsets today is arguably the interest in location-based services (LBS), although emergency call location mandates are being introduced in several countries. In contrast to emergency call services relying on occasional push to fix positioning, consumer-oriented LBS pose new challenges. Handsets thus need to support services that require both infrequent push to fix updates in addition to continuous position updates – all whilst conserving battery life. The revised emergency call mandates in the US may well require approaches such as using improved hybrid location technologies in all handsets.

GPS technology for handsets has matured, offering much better performance in terms of sensitivity, power consumption, size and price than was possible a few years ago. Support for other global navigation satellite systems (GNSS) such as GLONASS, Compass/Beidou 2 and Galileo will also be added over time. Handsets with GPS/GLONASS receivers have been available since 2011. The first devices compatible with the Chinese Beidou 2 system are expected later in 2013. Using multiple satellite systems concurrently ensures additional visible satellites and incrementally better performance in urban canyons. However, in order to improve indoor performance, hybrid positioning systems are needed. Hybrid positioning systems can fuse data from sensors to provide input to position calculations. Examples include inertial sensors such as accelerometer and gyroscope, as well as compass and pressure sensors. Low data accuracy and high drift obtained from low cost sensors as well as high power consumption, still make dead reckoning for extended periods of time unfeasible. Yet, if periodic calibrations can be made using various network signal measurements, the system performance can be improved and provide valuable augmentation in the form of smother trajectories and bridging of gaps.

The Bluetooth attach rate reached 75 percent across all handset segments in 2012. The attach rate for WLAN connectivity in the smartphone segment grew to 96 percent in 2012, but only reached 4 percent in the featurephone segment. The latest WLAN IEEE 802.11ac standard enabling faster throughput and higher network capacity became available in the first high-end smartphones at the end of Q1-2013. Relatively low additional cost will enable rapid transition from WLAN 802.11n to WLAN 802.11ac in the next couple of years. The attach rate for GPS in handsets grew from 37 percent in 2011 to nearly 47 percent in 2012. GPS connectivity has now become a standard feature on most smartphone models across all air interface standards, as well as in nearly all CDMA featurephones. Adoption of NFC accelerated in 2012 when the top-ten handset vendors released nearly 100 NFC-enabled models. Berg Insight estimates that NFC handset shipments grew 300 percent in 2012 to 140 million units worldwide. Growing at a compound annual growth rate (CAGR) of 48.2 percent, NFC handset shipments are forecasted to reach 1 billion units by 2017.

This report answers the following questions:

- What is the current state of NFC adoption in the handset market?
- What is the roadmap for integration of new WLAN standards in mobile phones?
- What is driving the adoption of GPS technology in GSM/WCDMA handsets?
- What are the benefits with Assisted-GPS, A-GNSS and hybrid location technologies?
- Which features are supported in the latest Bluetooth standard?
- Who are the leading developers of cellular and connectivity chipsets?
- Which connectivity technologies are being adopted by leading handset vendors?
- What impact will new technologies have on the wireless chipset value chain?
- How is the greater diversity of radios affecting wireless chipset and handset design?
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Glossary
About the Author

André Malm is a Senior Analyst with a Masters degree from Chalmers University of Technology. He joined Berg Insight in 2006 and his areas of expertise include location-based services, handset technologies and wireless M2M markets.

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