

MEMS Gyros Give Smart Phones New Twist

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Miniature gyroscopes are invading next-generation smart phones to provide new twists on user interfaces, mobile gaming and location-based services. [Handset](#) makers confirmed a report in January from a maker of [MEMS](#)-based gyros that said it had design wins in two smart phones.

"I expect everyone to have them next year," said Jidesh Veeramachaneni, a technical advisor and chief of staff for the design team at Taiwan's HTC that builds a wide range of smart phones. MEMS gyros are "one of the most talked about things when I go to [\[smart phone\]](#) developer conferences," he said.

"People want to come up with new experiences [using gyros], and a lot of it is gaming related—you could do sword fighting games," said the HTC design manager. "Gyros also help provide a better sense of location even indoors, and that's been a big challenge" for location-based services, he added.

Such experiences could be key for [4G](#) handsets using LTE [networks](#) expected to start appearing in 2011, said Bjorn Ekelund, head of ecosystems and research at ST-Ericsson. For example, LTE handsets will enable mobile online gaming for the first time because the new network will reduce latency from as much as 200ms on 3G nets today to as little as 10ms on LTE.

"That's as good as a cable modem," said Ekelund. Online gaming "is not attractive when you have a round trip delay of up 200 milliseconds," he added.

Gyros will also help enable so-called augmented reality apps that LTE handsets hope to run. Some of the apps will provide detailed directions inside buildings such as malls or track the whereabouts of friends using mash-ups of LBS and social networks, said Ekelund.

Gyros will begin to appear in high-end smart phones and other mobile devices later this year, said Satish Menon, an analyst with Forward Concepts. They could appear in the next-generation Apple iPhones which are expected to debut in June and include user interface advances, according to Ben Reitzes of Barclays Capital.

"Current generation smart phones manage with a two- or three-axis accelerometer for auto-rotate and other simple applications like pedometer," said Menon. "However, as you get into more complex applications like a digital compass, image stabilization and rollover detection you need a true [gyroscope](#)," he said.

InvenSense claims it is the largest supplier of MEMS gyroscopes and reported it had two design wins in smart phones.

"I believe Seiko-Epson was the first to supply a gyroscope suitable for mobile devices," said Menon. "STMicro, the global leaders in MEMS accelerometer, has also entered the market as have other traditional accelerometer suppliers including Kionix, Bosch Sensortec, Analog Devices and Freescale, who have either already announced gyroscope products or will soon," he added.

The supply of chips is plentiful and "it's a race to bottom from a cost perspective," said Veeramachaneni of HTC.

Menon estimated MEMS gyro average selling prices at \$3.50, about twice that of the accelerometers they will replace. Others said prices are already below two dollars.

- Rick Merritt
EE Times

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