



## Locata

### Positioning Re-Invented

Locata has invented completely new positioning technology. It creates terrestrial networks which function as a “local ground-based replica” of GPS. There is no other technology that can do this.

A terrestrial LocataNet can work seamlessly with GPS satellites to improve reliability for modern industrial, commercial, government and consumer applications where GPS is erratic, jammed or unavailable. More importantly, for the first time Locata also enables “satellite-free GPS”– something which was previously considered impossible. A local GPS-style positioning system, which is completely independent of the satellites, is now a reality.

This is *the* breakthrough that foreshadows a world where centimeter-level accuracy will be locally available, anywhere, indoors or out. Read on to discover the game-changing consequences which flow from Locata’s invention of “a Local Positioning System”.

### Position, Navigation and Time

Today the Global Positioning System is, by almost any criterion, ubiquitous. It impacts everything from the largest scale military and industrial deployments, to helping you find the closest coffee shop with your cell phone. Governments, industry, consumers and researchers have all come to depend on easy access to positioning, and are constantly coming up with new ways to build on this capability. Yet it hasn’t always been that way, and more importantly, *modern applications are now stretching satellite-based GPS technology to its limits.*

GPS is the cornerstone of PNT – Position, Navigation and Time. Forty years ago the U.S. government invented a method to deliver PNT via a constellation of satellites which rely on atomic clocks for their timing – the system we today call GPS. Given these three P-N-T elements, you can precisely locate, automate or direct anything you desire. The beauty of GPS is ubiquity. It is the Gold Standard which has taught the whole world the immense value of positioning.

Nevertheless, GPS has several evident shortcomings for modern users:

- the extremely weak space-based signal is very easy to block, intentionally or accidentally;
- a user has no control over how many satellite signals are “in view” for an application, which can seriously effect accuracy and reliability - with GPS you get what you get;
- most countries have no local control - you can only run a GPS system if you have the ability to pay for, launch and then maintain a constellation of more than 24 satellites in space;
- it’s incredibly hard to change - history shows it takes 20+ years to establish a satellite constellation in the first place, and a further 20 or more years if you wish to “modernize it”;
- GPS was never designed to work indoors or in urban areas – precisely where modern apps need it the most.

As a result, GPS signals are either unreliable or non-existent for mobile apps in an increasing number of settings – from crowded downtowns to industrial automation settings to anywhere indoors.

So, despite its prominence and importance, there is a growing realization that GPS now faces some *uncomfortable truths*:

- the reliability, accuracy and availability essential for modern mobile apps cannot be delivered by space-based technology alone, no matter how many satellites are put into the sky;
- given the time scales and costs associated with launching satellite constellations, it is clear that *space-based systems simply cannot evolve fast enough* to keep up with the hyper-fast development of today’s personal mobile devices.

Combine these factors with the world’s growing dependence on totally reliable positioning data, and something just has to change.

What the world needs now is a complementary positioning technology that can supplement GPS locally where required, or completely replace it where necessary. The solution must work as well as GPS, which means it must enable the precise determination of Position, Navigation and Time. Further, it must be readily deployed, easily embedded and perfectly integrated into what the world knows as "GPS". The combined systems must enable new capabilities for the increasing number of industrial, commercial, strategic, government and mobile consumer positioning apps.

That solution is Locata positioning technology.

### GPS 2.0 has arrived

Locata has developed the world's first LPS, a ground-based Local Positioning System that complements or replaces GPS, locally. Locata calls this new combination of *satellite+terrestrial* systems "GPS 2.0". As the name implies, it's an advance in the technology which will power the next-generation development of positioning applications and solutions. It's all based on Locata's invention of a completely new way to enable PNT – done *without* satellites, *without* atomic clocks. This is a profound and disruptive change for the industry.

LocataNets are a local network of radio transmitters that can be deployed to cover any space - literally from a small specific area to a large local region, from a single room to thousands of square kilometers. Locata's powerful local signals can fill the gaps in GPS satellite coverage to give unwavering accuracy, reliability and redundancy. Or they can add completely independent signals which operate like GPS in areas where positioning via GPS is currently impossible. LocataNets do not need satellites, so they create a totally new concept – state, corporate or private ownership and control of local GPS networks. Locata now allows any entity... *mine, construction site, port, warehouse, airport, strategic asset - and ultimately entire cities...* to decide for themselves the level of positioning they need to deploy, **under their local control**. Positioning that will deliver amazing reliability with total autonomy. In short: positioning can now become a true local utility, independently owned and operated. **Your own GPS.**

Locata transceivers, called LocataLites, create a revolutionary nanosecond-accurate TimeLoc™ synchronization – the core requirement for the "recreation of GPS functions" on the ground. LocataLites are currently designed to transmit in the freely available 2.4GHz ISM band – better known globally as the WiFi spectrum – which avoids licensing concerns and vastly simplifies the roll out, integration and management of a network. However, LocataLites can be readily modified to transmit at almost any power or any frequency a customer may need for their apps, promising a flexibility which is simply impossible with a space-based system. A LocataNet which is suitably designed and installed gives unprecedented accuracy and reliability, indoors or out.



**A LocataLite - the unique device that "creates GPS on the ground"**

Today real-world industrial, commercial and military users are already benefiting from Locata's centimeter-accurate positioning. LocataNets are

currently running in settings ranging from small warehouses to open-cut mines to wide-area aircraft approach and landing systems, deployed in densities ranging from a few meters to tens of kilometers between LocataLites. Within each LocataNet an unlimited number of receivers can use the system, in exactly the same way as GPS. In another world first, in September 2011 Locata will unveil new technology which delivers high-accuracy GPS-style positioning *indoors* for warehouse and machine automation and, in the future, for mobile phones. (Locata has already begun to demonstrate this breakthrough technology to partners under NDA.)

Locata's enabling technology is now being licensed for worldwide delivery and deployment through qualified integration partners. Early adopters such as Leica Geosystems (the world's largest supplier of

measurement hardware and software) have already developed it for uses like fleet management in demanding open-cut mining applications. Locata is currently under “sole-source” contract to the U.S. Air Force (the entity that *created* GPS) to provide high-accuracy positioning when GPS is intentionally jammed across a vast 6,500 square kilometer area of the White Sands Missile Range in New Mexico. In May 2011, Locata received more high profile global endorsement when Australia presented Locata to ICAO (the International Civil Aviation Organization, the UN body charged with regulating global aircraft navigation and safety) as a “standardization candidate” for Alternate PNT – in other words, a local aircraft navigation “backup for GPS”. Many other companies are working on Locata development under NDA.

### **The Third Embedded Constellation**

Today, there are only two existing satellite constellations - America’s GPS and Russia’s GLONASS. The European Union (Galileo) and China (Compass) are also trying to develop their own satellite constellations. Locata is designed to work independently of these satellite systems, or be embedded in chipsets right alongside them, in order to supply **a Local Constellation**.

This new capability is set to both disrupt the positioning industry and simultaneously generate huge new opportunities. Locata will power development of new generations of positioning apps as it shrinks to cheaper ASIC chips, enabling a previously inconceivable level of performance for mobile and personal devices. Locata already has a technology roadmap in place to evolve “all the way to an iPhone” over the next few years. It’s a revolution in the making.

Locata will unveil its Local Positioning System solution at the Institute of Navigation Conference in Portland in September 2011. This launch marks the arrival of a critical new technology that will enable the future of high-accuracy radiopositioning in settings that lack reliable or functional GPS.

**Positioning will never be the same again.**

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