

# Leica MobileMatrix

## The Evolution of Mobile GIS



# Leica MobileMatriX

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**Leica MobileMatriX is a software solution for the interactive processing, visualization and maintenance of survey data directly in the field. Leica MobileMatriX, based on the latest ArcGIS™ technology from ESRI®, has been developed for seamless dataflow between the field and the office. It was designed specifically for the needs of surveyors and GIS professionals.**

Being able to perform quality control in the field eliminates the expense of site revisits. Leica MobileMatriX is an evolution in mobile GIS technology – Leica MobileMatriX transforms your GIS into a Multi-Sensor GIS. It provides a seamless interface between field data collection and the office GIS database, helping to ensure

that management decisions are based upon the most accurate and up-to-date information. You can set up the software to check-out data from your enterprise database even when you are not at your desk. Similarly, you don't have to return to the office to upload your field work – simply connect over the internet to your network server or FTP site and send your update. Together with multiple surveying sensors (GPS, TPS and Level), Leica MobileMatriX provides a complete field-to-finish solution for maintaining your GIS.



### Applications

#### Federal Government

- Defense Mapping
- Transportation Planning
- Environmental Monitoring
- Emergency Management
- Agricultural Mapping

#### State & Local Government

- Public Works
- Cadastre/Land Records
- Emergency Management
- Public Safety
- Transportation Planning

#### Utility

- Asset Management
- Water Distribution Mapping
- Wastewater Collection Mapping
- Stormwater Management
- Incident Management

#### Energy

- Natural Gas Pipelines
- Electric Transmission Lines
- Resource Exploration
- Mining





## Benefits

### **Survey Data Management – More Than One Coordinate**

Leica MobileMatriX stores all computed and imported coordinates with their quality information in the Geodatabase and allows the user to decide which coordinate to use. This eliminates losing old information and permits continuous navigation through computations.

### **Computation Network Analyst**

Leica MobileMatriX creates and stores its dependencies between computations, points and measurements, which allows the user to easily trace the computation network.

### **Seamless Dataflow and Easy Data Exchange**

All survey data measured in the field is automatically stored into the ESRI Geodatabase format, eliminating the need for data conversion when moving data between Leica MobileMatriX and ESRI's ArcGIS applications. To ensure maximum compatibility with all systems, Leica MobileMatriX allows the user to interact with data from different sources, like CAD systems, Shapefiles and Raster Data.

### **Unrivalled Data Collection Methods**

Survey Features offer an easy way to map geodatabase feature classes. When surveying with Leica MobileMatriX, a survey feature will be created for each real-world object

that is measured. Leica MobileMatriX fills the gap between surveying and GIS by using survey points to position the vertices that define the geometry of feature class objects.

### **Multiple Feature Editing**

Creating more than one feature with just one measurement ensures economic field practices. This editing concept uses one survey point to extend or create multiple features with different thematic meanings. The flexibility of multiple feature editing enables the user to perform complex surveying actions with immediate visual feedback for quality and completeness control. The result is a dataset that is topologically correct.



# Leica MobileMatriX

## A Multi-Sensor GIS

Leica MobileMatriX is the first mobile GIS that gives you the freedom to incorporate multiple surveying instruments for accurately maintaining your geodatabase. Leica MobileMatriX uses precision measurements from GPS sensors, total stations, digital levels and laser rangefinders to capture and update feature classes. Survey processing functions are available in the field, and thus data acquisition and revision cycles are significantly simplified. You get the benefits of real-time visualization and quality control, multiple feature editing and the ability to update TINs and DEMs with survey measurements. Leica MobileMatriX – a Multi-Sensor GIS.



### Powerful Survey and Stakeout Computations in Leica MobileMatriX

Computations are the driving force behind survey data processing; all field measurements are computed and stored in the geodatabase.

A number of different computation

methods for processing survey measurements are available:

- Tacheometry
- Resection
- Free Station
- Survey Traverse
- Stakeout

XML reporting for computations provide an easy and flexible tool for customizing reports. Leica MobileMatriX also includes easy-to-use COGO tools that are visually interactive with feature classes and measurements in the map display. COGO computations are stored as measurements with the geodatabase. Some of the available COGO tools are:

- Delta XY, Direction/Distance and Deflection Angle
- Fillet Curve and Circular Curve
- Intersection computations

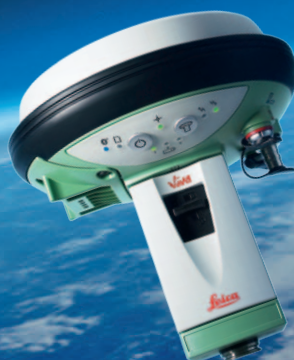
### TPS

Leica MobileMatriX ensures an easy-to-use interface to work with Total Stations. Leica MobileMatriX supports the full range of Leica Total Stations: Viva TS11/TA15, FlexLine, TPS1200, 1100, 1000, 800, 700, 400, 300 and Builder.



### GNSS

Leica MobileMatriX fully supports Leica GNSS sensors, as well as any third party GPS that is NMEA compliant. Furthermore, Leica MobileMatriX utilizes Geoid Models to calculate orthometric heights from GPS ellipsoidal heights – even when using NMEA messages.



### Zeno SmartAntenna

Leica MobileMatriX supports the use of the GG02plus. Simply connect the Leica Zeno Smart-Antenna with your CS25 tablet computer with its internal 3G module and you have light-weight, full functional GNSS/GIS rover. This results in a light-weight, cable-free GNSS RTK Rover combined with a mobile GIS.

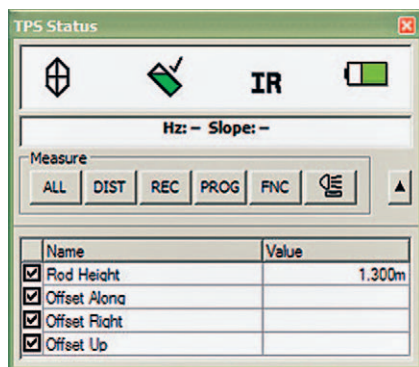




### Wireless Sensor Communication Between Sensor and TabletPC

Instead of cables to connect the TabletPC with the sensor, wireless communication like a *Bluetooth®* (or Radio) connection between the TabletPC and sensor is also possible.

### Leica Familiarity and Sensor Configuration



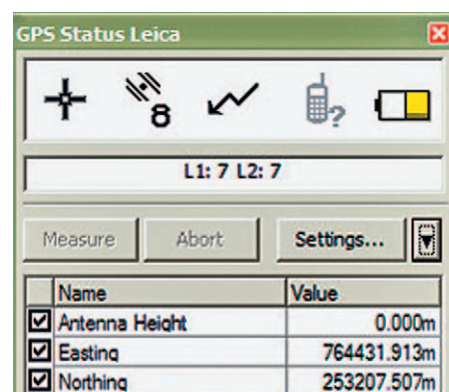
### Leica MobileMatriX as a TPS Datalogger

All of the powerful tools associated with the TPS instrument are also available in Leica MobileMatriX. Such tools include Imaging, ATR, PowerSearch, steering the TPS instrument using a virtual joystick, eccentric measurements, moving the instrument to a specific map location, flash the current Hz Angle and much more. Decide yourself if you want to call the measurement at the TPS or in Leica MobileMatriX. With this functionality you can use Leica MobileMatriX either at the instrument or at the pole for one-man surveying.

### Leica MobileMatriX as a GPS Datalogger

Using GNSS, a window displays status information from the GNSS sensor

(position/height and quality information, DOP values, UTC time, ...). The current GPS location can be optionally displayed on the map and hence provides real-time location information relative to mapped features. Additional quality information like Float or Fixed solution is stored with the computed coordinates. Along with these functions, many other features also exist.



## Digital Level

Reliable 3D modeling in a GIS begins with accurate Z coordinates. For this purpose, Leica MobileMatriX can interface with digital levels to establish or update features with accurate height information. Height Modernization is the transformation of feature positions with accurate and reliable heights from GPS sensors in conjunction with high precision leveling techniques.



## Laser Rangefinders

Leica MobileMatriX supports the Vectronix Vector IV, the Leica LaserRangefinder, the Leica DISTO. Laser rangefinders are an excellent complement to a GPS sensor for measuring hidden points or recording interior measurements.



### Revision and Updates

Revising or updating an existing map or database using traditional survey workflows is well known to be time consuming. Most areas have been surveyed beyond 80% and only need periodic updates. With Leica MobileMatriX, the user can automate the check-out of data from the enterprise database, make the necessary edits with new survey measurements, and then automate the check-in of updates to reconcile with the enterprise. This significantly reduces the amount of office time needed to maintain the database.



# Leica MobileMatriX

## Field to Finish

Traditionally, surveyors rely on sketches, measurements and feature codes produced by field crews to create maps and models of topographic and man-made features found on a project site. Back in the office, surveyors will re-create the site using the details from the field sketches and processed data.

If there are problems with a survey, a revisit of the site may be necessary to rectify them. If the field work is interpreted incorrectly, the situation may become even worse, opening the door for claims of professional liability. Leica MobileMatriX uniquely addresses these concerns with real-time drafting and quality control while in the field. Leica MobileMatriX quickly and accurately draws, symbolizes and connects features in the map display from real-time

survey measurements. Since there is no need to post-process the field work, and the user can see the final product on screen, there should be no need for expensive site revisits. You “see” what you survey.



### Layout – Tools for Creating and Printing Maps

The work of a surveyor does not end after completing the fieldwork – the fieldwork must be documented. This documentation is often conducted by means of creating a map. Leica MobileMatriX contains Layout functions specifically for carrying out the task of map creation. It includes standard and customizable elements like Legends, North arrows and Scale Bars. An extensive range of drawing tools is available to modify the extents of the drawing as well as the support of graphic images for creating specialized and custom maps.

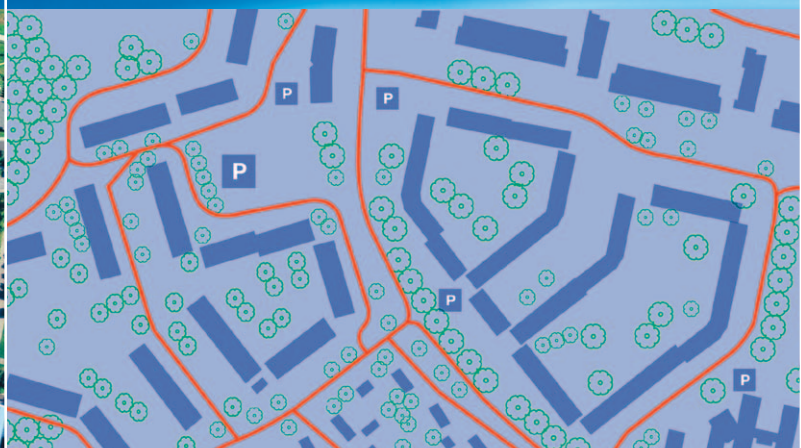
## Real World

- Feature oriented recording of field data (points, lines and polygons with flexible attributes)
- Direct interaction of features in the map display
- Representation of real-world features in layer structure

## Mobile GIS

Mobile GIS is the expansion of a geographic information system (GIS) from the office into the field. For field crews it is important that the GIS is used as a silent partner, ArcGIS can be used like a drawing board in its simplest case. A Mobile GIS enables field crews to capture, store, update, manipulate, analyze, and display geographic and surveying information. Mobile GIS integrates the following technologies:

- Surveying technologies (GNSS, TPS, Level, Laser Rangefinder)
- Wireless communications
- A local version of the enterprise database
- Field-2-Finish





### Replacement of the Classical Field Book

Much of today's field data is inventoried via paper forms, maps and aerial photos. This increases the potential for poor quality service to clients, low productivity, long update processes in the office, redundancy and difficult handling in bad weather conditions. With Leica MobileMatriX surveyors continue to take maps or orthophotos in the field, but in digital form, as background maps in Leica MobileMatriX. You can still compare location information directly in the field and do completeness checks with your existing data. This functionality provides significantly enhanced usability for surveyors to make their daily work easier.



### System Requirements

#### Minimum system requirements for Leica MobileMatriX

- Processor: Intel Core Duo, Pentium 4 or the Atom processor in Leica CS25
- CPU Speed: 1.6 GHz recommended or higher
- RAM: 2 GB
- DVD-Rom drive & 1 USB interface
- Free Disk Space: minimum 2.4 GB

#### Operating System:

- Microsoft Windows 2000 – Service Pack 3
- Microsoft XP (32-bit)
- Microsoft 7 (32-bit)
- Microsoft Internet Explorer 6.0 (or higher)

### Sensors and Computations

To meet future challenges, there is a demand for systems that offer a seamless processing cycle for spatial data. This workflow integrates field data capture, processing and management, as well as distribution and visualization.

- Seamless data flow integrates surveying and GIS
- Control of sensors for TPS, GNSS and Level Computation algorithms within the GIS

### Field Data Collection

Leica Geosystems' mobile GIS solution allows you to utilize surveying sensors for the accurate determination of feature, asset and inventory locations. An accurate inventory of all assets is the backbone of most data management systems (fire hydrants, pipeline valves, boundaries, etc...). Finally there is software that completely integrates field data collection with the enterprise GIS; you can document the geographic location of any asset or feature directly in the field.



Whether you have to map the location of a power pole, the run of a pipeline or the area of a farm; whether you are downtown or out in the country; whether you want to collect new features, or update and maintain the data from your Geographic Information System: For collecting, verifying and updating geographic data, Leica Geosystems offers the right solution – with seamless data exchange between field system and office, for GIS workflow, no matter which software performs your daily work.

When the data really counts, Leica Geosystems offers the right combination of hardware and software: Field-proven tough sensors use up-to-date technologies, such as terrestrial data collection with satellite navigation, Total Stations, distance measurement tools, rangefinders or levels. And the wide range of software solutions for field and office usage is compatible, scalable and flexible. For accuracy and reliability where and whenever you need it.

### When it has to be right.

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about our TQM program.

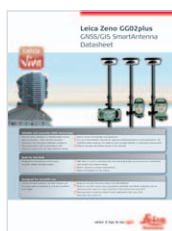
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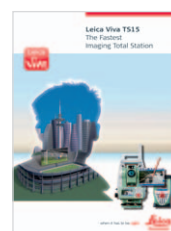
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Datasheet



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