Digitalization of processes with the Leica Zeno FLX100 Smart Antenna

Simple and accurate capture in the field

Utility and communications companies are often frustrated by the lack of a quick, simple way to capture and verify precise location data in the field – one that enables exchange and synchronization with production systems and does not require specialist survey training and equipment.

While simple field capture methods exist, none provides precise positional information and seamless transfer of data between field and office systems (e.g., GPS/GNSS sensors built into smartphones and tablets, stereoscopic 3D measurement methods, and/or dedicated field capture apps.

> **The new Leica Zeno FLX100 GNSS antenna opens new possibilities for precise field data capture and verification.**

The Leica Zeno FLX100 provides simple, streamlined workflows using consumer mobile devices and any software that accepts GNSS feeds. Using the Leica Zeno FLX100 smart antenna with Hexagon mobile tools (HxGN® NetWorks Core | Mobile and GTViewer) enables direct exchange with the central G/Technology system without intermediate formats and processing steps.

The Leica Zeno FLX100 is simple to connect and use with existing tablets and smartphones, removing the capital costs and maintenance overhead of specialized mobile hardware.

The Leica Zeno Connect utility enables simple setup and immediate use, handling communication between the FLX100 antenna and software installed on a mobile device (tablet, smartphone, laptop), including configuration for differential, real-time correction. A toolbar running in the foreground of users' mobile applications provides valuable information on accuracy of measurements, available satellites, and current position.

Simple, flexible use: The Leica FLX100 smart antenna can be connected and used immediately with existing Android and Windows tablets and smartphones.

Expediting precise asset capture and activation for new connections

Networks add hundreds of service connections every year, triggered by network extensions, new development areas, renovation, and other projects. In the past, new connections were always documented by the network operator, but today the task is increasingly outsourced to service providers.

New customer connections can require multiple jobs with handoffs between functional teams. This creates challenges coordinating tasks and the flow of information to ensure efficient operation, timely activation of service, and the maintenance of accurate, up to date records. For example, a backlog and slow data exchange can mean contractors responsible for documenting as-built assets only visit a site after trenches have been backfilled, missing the opportunity to record accurate positions of underground assets. Multiple complex handoffs can also delay activating services, impacting customer satisfaction and time-to-revenue.

That‘s why network operators need simpler data exchange and capture tools to expedite accurate recording of new service connections.

Combining the Leica Zeno FLX100 with Hexagon mobile solutions provides a simple way for any user to capture precise location data without specialist surveying training or equipment.

The solution’s simplicity and precision remove the additional costs for separate teams to document connections. Instead, the task can be quickly completed by installers (e.g., electricians or communications engineers) who are already on site using their own mobile devices (e.g., tablets and smartphones). It also avoids the need to coordinate and reconcile jobs and data, which eliminates management overhead, as well as delays, sources of error, and inconsistencies in networks records.

Advantages:

- **Complete, precise, and reliable as-built records for new connections**
- **Efficient workflows that reduce delay and overhead from separate installation and survey tasks**
- **Expedited activation of new services**

Combining Hexagon's mobile solutions with the FLX100 offers the possibility to check existing data in the field with regard to its position and correct it if necessary.

Verifying, correcting, and enhancing positional data

Utility network records commonly include data from different sources. Positional data captured from surveys will be precise and reliable, unlike other capture methods. This is often due to legacy sources, including data converted from paper records and legacy data transferred to the GIS without checking positional accuracy, and/or poorly managed data supplied by contractors.

Imprecise and/or unreliable positional accuracy limits how widely and effectively network records can be used for automation, planning, and operations. Avoiding damage to water and gas lines during construction is an obvious operational example of the critical importance of maintaining accurate and reliable positional data.

Hexagon's mobile solutions enable customers to inspect infrastructure assets.

Combining these tools with the Leica Zeno FLX100 enables the same personnel to check and, when needed, correct the positional accuracy of asset records directly in the field.

Inspection and correction of positional accuracy is simple when assets are visible, but harder for underground utilities. Determining precise position can also be more critical when, for example, automated planning information is created for construction activities. Expensive excavation may be necessary when areas of plans are flagged as "position imprecise."

The Leica Zeno FLX100 allows engineers to use their tablets and smartphones to carry out ad hoc inspection and positional correction any time (e.g., when a trench is opened for repair work).

Advantages:

- **Increase positional accuracy and reliability of network records**
- **Provide efficient and cost-effective data verification**
- **Conduct inspection and adhoc verification when any opportunity arises**

The combined use with the Leica Zeno FLX 100 antenna provides higher and more reliable accuracy and safety.

Inspecting gas networks

To ensure safety, gas networks must be regularly inspected for leaks. The routes of transmission networks are patrolled by helicopter and will, in the future, be patrolled by more effective drones. Urban pipelines, however, require on-site inspections often performed by contracted workers using positional data in records provided by the network operator.

With conventional tools, data is transferred via an exchange format, which the contractor imports into a mobile device. Toughbooks are often the standard, even though they are expensive to purchase and administer. Following the inspection, results (route tracks, leaks, and test reports) are returned to the network operator to process.

In contrast, Hexagon‘s mobile solutions simplify workflows and administration, and provide more complete and reliable records.

Simplified mobile hardware, administration, and use: Contractors can use consumer tablets and smartphones, which are cheaper to purchase and administer. Modern smartphones and tablets are robust (and can be ruggedized with additional protection if needed) and tablets with larger screens provide a less expensive and easier-to-handle alternative to laptops.

Fast, easy access: Users can easily download project data via the internet and immediately use it without conversion. Reports can be uploaded upon completion.

Create more complete and reliable inspection records: Satellite positioning (e.g., GPS/GNSS) is needed for inspections because the energy provider/network operator and service providers must comply with their documentation and verification obligations. Contractors must be able to demonstrate they have checked the specified area for contract and invoicing requirements. The supplier/operator must also provide the regulatory authority (e.g., the German Federal Network Agency) evidence that inspection obligations have been met.

Although centimeter-level positional accuracy is not required for this work, GPS/GNSS sensors built into consumer mobile devices still cause problems. While they have the potential to provide positions to within 5-10m, the locational accuracy is not consistent, meaning collected coordinates could contain deviations from their true position.

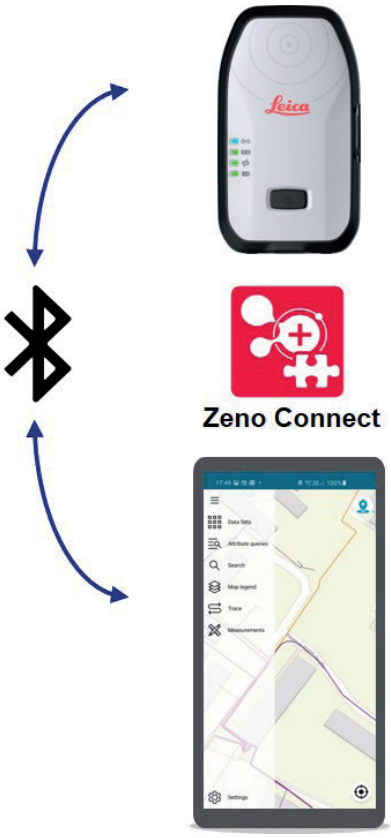
Using Hexagon mobile solutions with the Leica Zeno FLX100 antenna, contractors and operators can capture more accurate, complete, and reliable positional records than is possible using the GPS installed in mobile devices.

Advantages:

- **Simplify data exchange between contractor and operator**
- **Simplify mobile hardware and administration**
- **Increase the reliability and completeness of inspection records**

Leica Zeno FLX100

Compact, accurate, and lightweight smart antenna



Simple to use

1. Switch on FLX100
2. Install Zeno Connect from PlayStore
3. Pair FLX100 in Zeno Connect
4. Optional: Configure RTK
5. Work with high accuracy in HxGN NetWorks Core | Mobile

You can use the Leica Zeno FLX100 flexibly on a pole for maximum precision or with your smartphone or tablet on the handheld tray for best mobility.

Maximum flexibility and accuracy

The Leica Zeno FLX100 smart antenna captures spatial data in a simple and flexible way, allowing you the freedom to work how you want.

A universal handheld tray enables you to pair the FLX100 with your own smartphone or tablet. For higher accuracy data capture, just use a survey pole leveraging HxGN SmartNet RTK technology.

Leica offers a universal handheld mount to secure the FLX100 to any smartphone or tablet, and a plumb rod for even higher lateral accuracy and consistent elevation values.

- **GIS data collection made easy:** Simplify your workflows and unfold new ways of working.
- **Centimeter accuracy compact GNSS:** Real multifrequency tracking with accuracy <2 cm* horizontal (2D) accuracy in an ultra-portable housing.
- **Use any Android or Windows mobile device:** The FLX100 is compatible with devices running Windows or Android.
- **Rugged, made for tough worksites:** Be ready to face the toughest conditions. The FLX100 is protected against water, dust, and drops from 1.2 meters.

Using the Leica Zeno FLX100 with Hexagon's mobile software offers many possibilities to streamline work processes while enhancing data quality and reducing backlog.

* with good GNSS conditions and mounting on the pole

Leica Zeno FLX100 Smart Antenna at a glance

GNSS TECHNOLOGY	
Horizontal real-time accuracy	RTK (Multi-frequency): 2cm + 1ppm*
Vertical real-time accuracy	RTK (Multi-frequency): 3cm + 1ppm*
Post-processing accuracy static mode	Horizontal: 2cm + 1ppm* Vertical: 3cm + 1ppm*
Satellite signal tracking	• GPS (L1 C/A, L2C) • Glonass (L1OF, L2OF) • BeiDou (B1I, B2I) • Galileo (E1B/C, E5b) • QZSS (L1C/A, L2C) • SBAS: enabled through future firmware update
Number of channels	184 channels
Update rate	Up to 10 Hz (0.10 sec)
Supported operating systems	• Android • Windows
Real-time protocols	RTCM 3.0, RTCM 3.1, RTCM 3.2, RTCM 3.3, RTCM MSM
GNSS initialization	• **Cold Start: 24s** • **Reaquisition: 2s**
User interface	On/Off key Status indicator (LED): satellite tracking, corrections, Bluetooth® communication and battery power
Communication port	Bluetooth® LE 4.2

POWER MANAGEMENT	
Battery	Internal (3.8 V / 6120 mAh)
Battery charging time	4 hours to full charge
Power	DC 5V/2A
Operating time	>20 hours

PHYSICAL SPECIFICATIONS	
Weight and dimensions	313g, 136 mm x 78 mm x 30.5 mm
Proof against water, sand, and dust	IP67
Operating/storage temperature range	• Operating: –40 to 65°C • Storage: –40 to 80°C
Humidity	Rarely and slightly condensing. ISO 9022-12-04 (+65°C, 92%, 62h)
Drop	1.2m
Vibration	Withstands strong vibration. ISO 9022-36-05 (10-55 Hz / ±0.15 mm / 5 cycles)

* Measurement precision under good to favourable conditions. Accuracy and reliability depend upon various factors including number of available satellites, geometry, proximity to base station, multipath effects, ionospheric conditions, etc

Contact us to learn more **go.hexagonsi.com/ go.hexagonsi.com/learn-more-FLX100**

Hexagon is a global leader in sensor, software and autonomous solutions. We are putting data to work to boost efficiency, productivity and quality across industrial, manufacturing, infrastructure, safety and mobility applications. Our technologies are shaping urban and production ecosystems to become increasingly connected and autonomous — ensuring a scalable, sustainable future.

Hexagon's Safety & Infrastructure division provides software for smart and safe cities, improving the performance, efficiency and resilience of vital services.

Hexagon (Nasdaq Stockholm: HEXA B) has approximately 21,000 employees in 50 countries and net sales of approximately 3.9bn EUR. Learn more at hexagon.com and follow us @HexagonAB.