

- when it has to be right



Leica Geosystems Certificate Land Area Measurement **GOLD**

Testing Laboratory STS 0549: Classification of geodetic (GNSS) instruments to measure Land Parcel Areas according to the European Union Commission Regulation as stated in this certificate.

Product	Leica Zeno FLX100 plus	Certificate No.	LAM_TC22_0024_29092022
Article No.	958981	Date	Sept. 29, 2022
Serial No.	ZF10P662200099	Order No.	-
Equipment No.	-	PO No.	-
Antenna	Integrated Smart Antenna FLX100 pl.	Issued by	Accredited Calibration Lab STS 0549 at Leica Geosystems AG 9435 Heerbrugg Switzerland
Controller	Leica Zeno Tab 2, Android		
Software	Zeno Mobile v3.6 FLX100-FW		
Meas Mode	RTK L1+L2 with DIE2 Ref.Station, Vertex Avg. 5 sec. per Pt.	Ordered by	- - -
Parameter Setting	Elevation mask=10°, max.PDOP=n/a, Min. number of satellites=4		
Status	after inspection	Customer	Hexagon Geosystems Heinrich-Wild Strasse CH- 9435 Heerbrugg

Compliance

The Certificate **GOLD** with measurement values is issued by the Accredited Calibration Laboratory **STS 0549**. The accreditation (STS 0549) is in accordance with the standard ISO/IEC 17025 and is granted by the Swiss Accreditation Service (SAS). The Swiss Accreditation Service is a member of the International Laboratory Accreditation Cooperation (ILAC) and signatory of the Mutual Recognition Agreement (MRA) which assures international acceptance of the calibration certificates.

The test equipment used is traceable to national standards or to recognized procedures. This is established by our Quality Management System, audited by SAS (Swiss Accreditation Service) according to ISO/IEC 17025.

Certificate

We hereby certify that the product described has been tested with the following result:

Avg. Buffer Width : 0.01m ±0.01m*)
Product Class 5 : <0.50m

Product suited for area measurement of land parcels according to COMMISSION REGULATIONS (EC) as stated in this document: the Buffer width of a suitable product must be <1.25m, recommended is <0.75m.



Leica Geosystems AG

Alexander MacDonald
Area Testing Laboratory Surveying

Sept.30, 2022

Wolfgang Hardeger
Head of Accredited Laboratories

Certificate No. LAM_TC22_0024_29092022
Swiss Accreditation STS 0549
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Test Procedure and EU Commission Regulations

6 parcels between 0.2ha and 1.8ha and of different shape are marked on the ground. Each parcel is measured 36 times (9 sets for each parcel and 4 runs per set at different conditions to reproduce typical situations of the real world). 36 areas are computed and analyzed for each parcel, which finally results in the average buffer width.

The reported results and the certification of the product refers to its suitability for area measurement of parcels as described in the EU regulations and the JRC (Joint and Research Center) documents:

- [20] **COMMISSION REGULATION (EU) No 1306/2013** (agricultural policy...), 17.Dec.2013
- [21] **COMMISSION DELEGATED REGULATION (EU) No 640/2014**, 11.March, 2014
Note: this is the amendment to [20] 1306/2013 and clause (1) first page states that this regulation replaces the former regulations for on the spot checks from 1122/2009
- [22] **COMMISSION IMPLEMENTING REGULATION (EU) No 809/2014**, 17. July 2014
Note: this is the implementation regulation to [20] 1306/2013
- [23] Guidance for **ON-THE-SPOT CHECKS DSCG2014/32** ACCORDING TO ART. 24, 25, 26, 27, 30, 31, 34, 35, 36, 37, 38, 39, 40, 41 OF REGULATION (EU) NO 809/2014. **Claim Year 2015**
Note: the evaluation of the buffer tolerance of a GNSS instrument and the instrument certification is based on the principles and procedures described in chapter 5 in this document.
Note: This document replaces JRC IPSC/G03/P/SKA D (2006)(5834), DG JRC – Ispra
- [11] **JRC IPSC/G03/P/SKA/asi D(2007)(8307) Area measurement validation scheme**
Note: This document contains the details of the GNSS instrument validation procedure and data analysis
- [13] **ISO 5725-2** is used for the data analysis according to the area measurement validation scheme: basic methods for the determination of repeatability and reproducibility of a standard measurement method.
- [14] **ISO 5725-4** is used for the data analysis according to the area measurement validation scheme: basic methods for the determination of the trueness of a standard measurement method.

The product is classified depending on the experimentally determined reproducibility limit at 95% confidence level, expressed as buffer width:

Class (0): buffer width ≥ 1.50 m, exceeding the maximum value imposed by EU Regulation

Class (1): buffer width < 1.50 m

Class (2): buffer width < 1.25 m (limit)

Class (3): buffer width < 1.00 m

Class (4): buffer width < 0.75 m (recommended)

Class (5): buffer width < 0.50 m (best)

Measurement Uncertainty

*) The above reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k = 2$, which for normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with EA-4/02.