

General Specifications Leica GPS Survey Systems

including

the GS14 Performance SmartAntenna and Leica Flexline TS02plus

A. GS14 Performance SmartAntenna – GPS Systems / Leica CS20 Field Controller with EVR 10 - GPS Software / GPS Training with IMS Point Cloud Software Training

1. (4) 6008450 - **GS14 Performance SmartAntenna** – GPS GLONASS, 3.75G Modem & UHF Tx/Rx
(See Attachment A for a more detailed specification)
2. (4) 767791 - **GAD109, Transition Adapter** from external antenna connector of a GS14/15 SmartAntenna to standard TNC connector.
3. (4) 667243 - **GAT2, Gainflex radio antenna**, frequency range 435-470MHz.
4. (4) 752292 - **GLS30, Telescopic Carbon GNSS Pole** with 5/8" screw. Snap locks at 1.80m and 2.00m. Includes circular bubble
5. (8) 772806 - **GEB212, Lithium Ion battery**, 7.4V / 2.6Ah, chargeable
6. (4) 799187 - **GKL341 Charger Prof 5000**. Charges up to 4 batteries, including power cable.
7. (4) 823164 - **CS20 Field Controller** Ruggedized WinEC7 field controller with full 5" WVGA touch display, 2 GB eMMC Flash Memory, 1 GB SDRAM, SD card slot, 5MP camera and LED flash, Includes internal Bluetooth WLAN module, QWERTY keypad, stylus.
(See Attachment B for a more detailed specification)
8. (8) 799190 - **GEB331, Battery Li-Ion** 11.1V/2800mAh
9. (4) 807157- **GHT66, Holder** attaching a CS20 with a GHT63 clamp to a pole.
10. (4) 767880 - **GHT63, Clamp arrangement** for attaching the GHT62 holder to all poles.
11. (4) 817052 - **GVP720, Hard container for SmartAntenna**, CS field controller and accessories for a Rover setup
12. (4) 8243396 **Evidence Recorder** GNSS/GPS Bundle (EVR + GPS Module)
13. (4) 6003711-**3 year Viva GNSS (GS10/14/15/25) Bronze Customer Care Package** ("CCP") consisting of:

- Three (3) year Software Maintenance- Shall ensure that the product is kept up-to-date with the latest firmware and core application releases to maximize productivity.
- Three (3) year Customer Support- Shall include Telephone Access to experienced, trained professionals who will work with you to solve problems that arise. This service can be used for operational problems, instrument configuration issues and general advice about your equipment or software upgrades. In addition, access to our online support and service, enables you to log support requests 24 hours per day.
- Two (2) year Extended Warranty- All Leica Geosystems Surveying instruments come with a one-year warranty. Labor and spare parts shall be fully covered for up to three (3) years after date of purchase
- Local Benefits- Access to Each Sales Office enhances local resources, delivery networks, local language and knowledge of local methods of working with Leica instruments.

14. (8) 6009642-**Three (3) year CS20 Field Controller Bronze CCP** consisting of:

- Three (3) year Software Maintenance- Shall ensure that the product is kept up-to-date with the latest firmware and core application releases to maximize productivity.
- Three (3) year Customer Support- Shall include Telephone Access to experienced, trained professionals who will work with you to solve problems that arise. This service can be used for operational problems, instrument configuration issues and general advice about your equipment or software upgrades. In addition, access to our online support and service, enables you to log support requests 24 hours per day.
- Two (2) year Extended Warranty- All Leica Geosystems Surveying instruments come with a one-year warranty. Labor and spare parts shall be fully covered for up to three (3) years after date of purchase.
- Local Benefits- Access to Each Sales Office enhances local resources, delivery networks, local language and knowledge of local methods of working with Leica instruments.

15. (1) **Certified MapScenes (IMS) Adv. & PointCloud Training / Leica GPS System Training** 40 Hour Course

- Must be Accreditation Commission for Traffic Accident Reconstruction (“ACTAR”) Accredited Training)
- Must include 24 hour, 7 days a days a week phone support
- Training must be conducted on-site by an ACTAR accredited trainer
- All travel must be included at no additional cost.

B. Leica TS 02 Plus, 7" R500-Total Station Packages / Leica CS20 Field Controller Packages with (EVR 10) Software / Certified Total Station with EVR & Basic IMS Training

1. (4) Leica TSO2 Plus, 7" R500-Reflectorless Total Station, complete with: TSO2 Plus, 7" R500 Total Station, 1 Keyboard, with laser plummet, onboard memory, carrying case containing screwdriver, shade-adjusting pins, hex key & rain cover. Bluetooth unit with USB port. TPS400 User Manual, English / CD-ROM TPS User Documentation GDF111 BASIC Tribrach, w/o plummet, Red & Green (2) -GEB 211, Lithium-Ion batteries, 2Ah, rechargeable GKL211-Charger BASIC, for Li_Ion batteries GEB221 & GEB 211 car adapter cable & adapter included

(See Attachment C for a more detailed specification)

2. (4) 6003077 -3 yr TS02/06/09 (plus) Bronze CCP, consisting of:
 - Three (3) year Software Maintenance- Shall ensure that the product is kept up-to-date with the latest firmware and core application releases to maximize productivity.
 - Three (3) year Customer Support- Shall include Telephone Access to experienced, trained professionals who will work with you to solve problems that arise. This service can be used for operational problems, instrument configuration issues and general advice about your equipment or software upgrades. In addition, access to our online support and service, enables you to log support requests 24 hours per day.
 - Two (2) year Extended Warranty- All Leica Geosystems Surveying instruments come with a one-year warranty. Labor and spare parts shall be fully covered for up to three (3) years after date of purchase.
 - Local Benefits- Access to Each Sales Office enhances local resources, delivery networks, local language and knowledge of local methods of working with Leica instruments.
3. (4) 823164 - CS20 Field Controller Ruggedized WinEC7 field controller with full 5" WVGA touch display, 2 GB eMMC Flash Memory, 1 GB SDRAM, SD card slot, 5MP camera and LED flash, Includes internal Bluetooth WLAN module, QWERTY keypad, stylus including
 - (4) 8243394 Evidence Recorder 10 (Core Software)
 - (4) Tripod Brackets for Data Collector
 - (4) Trauma Carrying Bag
 - (4) Nomad to Leica Cable
4. (4) Tripod (wood & fiberglass) (Including free carrying bag & steel tape)
5. (4) Seco tripod stabilizer and heads up level for prism poles

6. (4) 12' Pole with Bipod thumb releases
7. (4) GPR111, Economical all in one prism (with holder, prism, target plate)
8. (4) 360 Data Turntable Holder
9. (4) Seco Strobe Prism & Seco / 6416-00-BLK & Holder Plate
10. (1) Certified MapScenes (IMS) Software & Total Station Training & EVR 10 Software 40 Hour Course -
 - Must be Accreditation Commission for Traffic Accident Reconstruction ("ACTAR") Accredited Training)
 - Must include 24 hour, 7 days a days a week phone support
 - Training must be conducted on-site by an ACTAR accredited trainer
 - All travel must be included at no additional cost.

Leica Viva GS14

Data sheet



Engaging software

The Leica Viva GS14 GNSS smart antenna is accompanied with the revolutionary Captivate software, turning complex data into the most realistic and workable 3D models. With easy-to-use apps and familiar touch technology, all forms of measured and design data can be viewed in all dimensions. Leica Captivate spans industries and applications with little more than a simple swipe, regardless of whether you work with GNSS, total stations or both.



Infinitely bridging the field to the office

Leica Geo Office imports and combines data from your GNSS, total station and level instruments for one final and accurate result. Processing has never been made easier when all your instruments work in tandem to produce precise and actionable information.

ACC»

Customer care is only a click away

Through Active Customer Care (ACC), a global network of experienced professionals is only a click away to expertly guide you through any problem. Eliminate delays with superior technical service, finish jobs faster with excellent consultancy support, and avoid costly site revisits with online service to send and receive data directly from the field. Control your costs with a tailored Customer Care Package, giving you peace of mind you're covered anywhere, anytime.

Leica Viva GS14

GNSS PERFORMANCE

GNSS technology	Leica SmartTrack	Advanced four constellation tracking
Number of channels		120 (up to 60 satellites simultaneously on two frequencies) / 500+ ¹
Signal tracking		GPS (L1, L2, L2C), Glonass (L1, L2), BeiDou (B1, B2), Galileo QZSS ² , SBAS (WAAS, EGNOS, MSAS, CAGAN)

MEASUREMENT PERFORMANCE & ACCURACY³

RTK technology	Leica SmartCheck Network RTK Time for initialization	Continuous check of RTK solution, reliability 99.99% VRS, FKP, iMAX, MAC (RTCM SC 104) Typically 4s
Code differential	DGPS / RTCM	Typically 25cm
Real-time kinematic	Single baseline (< 30km) Network RTK	Hz 8mm + 1ppm / V 15mm + 1ppm Hz 8mm + 0.5ppm / V 15mm + 0.5ppm
Post processing	Static (phase) with long observations Static and rapid static (phase)	Hz 3mm + 0.1ppm / V 3.5mm + 0.4ppm Hz 3mm + 0.5ppm / V 5mm + 0.5ppm

COMMUNICATIONS

Communication ports	Lemo Bluetooth®	USB and RS232 serial Bluetooth® v2.00 + EDR, class 2
Communication protocols	RTK data protocols NMEA output	Leica, Leica 4G, CMR, CMR+, RTCM 2.2, 2.3, 3.0, 3.1, 3.2 MSM NMEA 0183 V 4.00 and Leica proprietary
Built-in data links	3.75G GSM / UMTS / CDMA phone modem Radio modem	Fully integrated, internal antenna Fully integrated, receive and transmit, external antenna 403 - 470 MHz, 1 W output power
External data links		GSM / GPRS / UMTS / CDMA and UHF / VHF modem

GENERAL

User interface	Buttons and LEDs Web server	On/Off and Function button, 7 status LEDs Full status information and configuration options
Data recording	Storage Data type and recording rate	Removable microSD card, 1 GB Leica GNSS raw data and RINEX data at up to 20 Hz
Power management	Internal power supply External power supply Operation time ⁴	Exchangeable Li-Ion battery (2.6 Ah / 7.4 V) Nominal 12 V DC, range 10.5 - 28 V DC 7 h receiving RTK data with internal UHF radio 5 h transmitting RTK data with internal UHF radio (1W) 6 h receiving / transmitting RTK data with internal modem
Weight and Dimensions	Weight Diameter x Height	0.93kg (GS14) / 2.90kg standard RTK rover setup on pole 190mm x 90mm
Environmental	Temperature Drop Proof against water, sand and dust Vibration Humidity Functional shock	-40 to 65°C operating, -40 to 80°C storage Withstands topple over from a 2m survey pole onto hard surfaces IP68 (IEC60529 / MIL STD 810G 506.5 I / MIL STD 810G 510.5 I / MIL STD 810G 512.5 I) Withstands strong vibration (ISO9022-36-08 / MIL STD 810G 514.6 Cat.24) 100% (ISO9022-13-06 / ISO9022-12-04 / MIL STD 810G 507.5 I) 40g / 15 to 23 msec (MIL STD 810G 516.6 I)

LEICA GS14 GNSS SMARTANTENNA	Single Frequency	Performance	Professional	Professional with BeiDou	Unlimited ¹
SUPPORTED GNSS SYSTEMS					
GPS L2 / GLONASS / Galileo / BeiDou	• / • / • / x	✓ / • / • / x	✓ / ✓ / ✓ / x	✓ / ✓ / ✓ / ✓	✓ / ✓ / ✓ / ✓
RTK PERFORMANCE					
DGPS/RTCM, RTK Unlimited, Network RTK	•	✓	✓	✓	✓
POSITION UPDATE & DATA RECORDING					
5 Hz / 20 Hz positioning	✓ / •	✓ / ✓	✓ / ✓	✓ / ✓	✓ / ✓
Raw data / RINEX data logging	✓ / •	✓ / •	✓ / ✓	✓ / ✓	✓ / ✓
NMEA out	•	•	✓	✓	✓
ADDITIONAL FEATURES					
RTK reference station functionality	•	✓	✓	✓	✓
3.75G Phone / UHF Radio (receive & transmit) modem	✓ / •	✓ / •	✓ / •	✓ / ✓	✓ / ✓
			✓ Standard	• Optional	x Not available

¹ The Unlimited series includes a future upgrade to 500+ channels.

² Support of QZSS is incorporated and will be provided through future firmware upgrade.

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³ Measurement precision, accuracy, reliability and time for initialization are dependent upon various factors including number of satellites, observation time, atmospheric conditions, multipath etc. Figures quoted assume normal to favorable conditions. A full BeiDou and Galileo constellation will further increase measurement performance and accuracy.

⁴ Might vary with temperature, age of battery, transmit power of data link device.

Leica Captivate Data sheet



Dominant performance through seamless integration

The next generation of Leica Nova and Viva measuring instruments become the world's first self-learning total stations and MultiStation with Leica Captivate. Transforming the Leica Viva GNSS experience, this engaging software joins ultimate GNSS receiver innovation with an industry-first 3D user immersion. Leica Captivate modernizes the Leica Nova scanning experience, for the first time merging the overlay of measured points, 3D models and point clouds into a single view.



Infinitely bridging the field to the office

While Leica Captivate captures and models data in the field, Leica Infinity processes the information back in the office. A smooth data transfer ensures the project stays on track. Leica Captivate and Leica Infinity work in conjunction to join previous survey data and edit projects faster and more efficiently.

ACC»

Customer care is only a click away

Through Active Customer Care (ACC), a global network of experienced professionals is only a click away to expertly guide you through any problem. Eliminate delays with superior technical service, finish jobs faster with excellent consultancy support, and avoid costly site revisits with online service to send and receive data directly from the field. Control your costs with a tailored Customer Care Package, giving you peace of mind you're covered anywhere, anytime.

Leica CS20 & CS35



Leica CS20



Leica CS35

SYSTEM SPECIFICATIONS

Operating system	Windows EC7	Windows 8.1 Pro
Processor	TI OMAP4430 1GHz Dual-core ARM® Cortex™-A9 MPCore™	Intel® Core™ i5-4310U vPro™ (2,0 GHz, 3 MB Intel® Smart Cache)
Memory (RAM)	1 GB	4 GB DDR3L SDRAM
Internal storage (Max)	2 GB	128 GB SSD
Screen size (Diagonal) & orientation (Primary)	5" (127mm), Landscape	10.1" (257mm), Landscape
Screen resolution & type	800 x 480 WVGA, Color TFT	1920 x 1200 WUXGA, Color TFT
Weight (including battery)	1095g	1100g
Size (length x width x depth)	284mm x 150mm x 49mm	270mm x 188mm x 19mm
Batteries	11.1V, 2.8Ah Li-Ion	10.8V, 4100mAh Li-Ion
Battery life	8 hours	8 hours

ENVIRONMENTAL SPECIFICATIONS

Dust / Water resistance	IP68	IP65
Shock resistance	1.2m (4 ft) / MIL-STD-810F, Method 514.5 – Cat24	1.8m MIL-STD-810G
Operation temperature	-30°C to +60°C	-10°C to + 50°C
Storage temperature	-40°C to 80°C	-20°C to + 60°C
Military standard (MIL.-STD)	810F	810G

CONNECTIVITY

SD/SDHC	✓	✗
USB client	✓	✗
USB host	✓	1 x USB 3.0 & 1 x USB 2.0
Serial RS232	✓	✗
Power jack	✓	✓
Audio jack	✗	✓
Integrated Bluetooth®	✓	✓
Integrated WLAN	✓	✓
Integrated modem	✓	✓
Robotic total station compatible	✓	✓

USER INTERFACE

Touch screen	✓	✓
On screen keyboard	✓	✓
Keypad type	QWERTY keypad	Pop up keypad
Number of keys	67	7

INTEGRATED PERIPHERALS

Camera	5 megapixel	Rear: 5 megapixel Front: HD-Video with 720 pixel (Images 1.3 megapixel)
Flash	✓	✓
Compass	✓	✗
Accelerometer	✓	✓
Gyro	✓	✗
DISTO™	✓	✗
Expansion pack	✓	✗

✓ Standard ✗ Not Available

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Leica Geosystems AG
Heerbrugg, Switzerland

www.leica-geosystems.com

- when it has to be **right**

Leica
Geosystems

Attachment C

Leica FlexLine TS02plus

Best-In-Class Precision



- when it has to be **right**

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Leica FlexLine plus

Proven Specifications, Reliable Instruments



Angle Measurement (Hz, V)		
Accuracy ¹⁾	3" (1 mgon) / 5" (1.5 mgon) 7" (2 mgon)	✓
Method	Absolute, continuous, diametrical: at all models	✓
Display resolution	0.1" / 0.1 mgon / 0.01 mil	✓
Compensation	Quadruple Axis compensation: at all models	✓
Compensator Setting Accuracy	1" / 1.5" / 2"	✓
Compensator range	0.07 gon	✓
Endless Drives	Smooth movements with no delayed response time	✓



Distance Measurement with Reflector		
Range ²⁾ Round prism (Leica GPR1)	3.500 m	✓
Range ²⁾ Reflective tape (60 mm x 60 mm)	250m > 500 m ⁸⁾	✓
Accuracy ³⁾	Precise+: 1.5 mm+2.0 ppm Precise Fast: 3.0 mm+2.0 ppm Tracking: 3.0 mm+2.0 ppm	✓
Typical Measurement time ⁴⁾	2.0 s	✓
Measurement time while in «Precise+» mode:	2.4 s	✓



Distance Measurement without Reflector ⁷⁾		
Range ⁵⁾ PinPoint R500	500 m	○
Accuracy ³⁾	2 mm+2 ppm	✓
Laser dot size	At 30 m: approx. 7 x 10 mm At 50 m: approx. 8 x 20 mm	✓



Data storage / Communication		
Internal memory	Max.: 24'000 fixpoints, Max.: 13'500 measurements	✓
Interfaces	Serial (Baudrate up to 115'200)	✓
Data formats	GSI / DXF / LandXML / CSV / user definable ASCII formats	✓



Telescope		
Magnification / Resolving power	30 x / 3"	✓
Field of View	1° 30' (1.66 gon) 2.7 m at 100 m	✓
Focusing range	1.7 m to infinity	✓
Reticle	Illuminated, 10 brightness levels	✓



Keyboard and Display		
Keyboard and Display	Simple Alpha-numerical keyboard with high resolution Black & White display, Graphics, 160 x 288 pixels, display illuminated, 5 brightness levels	✓
Position	Face I, Face II	✓○



Operating System		
Windows CE	5.0 Core	✓



Laserplummet		
Type	Laser point, 5 brightness levels	✓
Centering accuracy	1.5 mm at 1.5 m	✓



Battery		
Type	Lithium-Ion	✓
Operating time ⁶⁾	approx. 30 hours	✓
Battery charging time	2.3 hours	✓



Weight		
TS including GEB211 and tribrach	5.1 kg	✓



Environmental		
Temperature range (operation)	-20° C to +50° C (-4° F to +122° F)	✓
	Arctic Version -35° C to 50° C (-31° F to +122° F)	○
Dust / Water (IEC 60529) Humidity	IP55, 95%, non condensing	✓



Leica Flexfield plus Onboard Software		
Included Application Programs: Survey; Stake Out; Station Setup including: Resection, Local Resection, Helmert Resection, Orientation (Angles & Coordinates), Height Transfer; Area (Plan & Surface); DTM Volume calculation; Tie Distance (MLM); Remote Height; Hidden Point; Backsight Check; Offset; Reference Line;		✓
Extra Application Programs: Reference Arc; Reference Plane; COGO; Road 2D		○



Theft protection		
mySecurity, PIN/PUK Code		✓✓

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Model Comparison: Configurations & Options of Manual Total Stations

	TS02plus	TS06plus	TS09plus	Viva TS11
1" angular accuracy	-	○	○	○
Enhanced measurement accuracy to prism	1.5 mm + 2 ppm	1.5 mm + 2 ppm	1.5 mm + 2 ppm	1.0 mm + 1.5 ppm
Reflectorless measurement range	500 m option	500 m included/1000 m option	500 m included/1000 m option	500 m included/1000 m option
Display with graphics and display illumination	Black & White high resolution	Black & White high resolution	Q-VGA Color & Touch	Full-VGA Color & Touch
Full alpha-numerical keyboard with function keys	-	✓	✓	✓
Second Keyboard	○	○	○	○
Keyboard illumination	-	-	✓	✓
Electronic Guide Light	-	○	✓	✓
USB Type A and mini B	-	✓	✓	✓
Bluetooth® Wireless	-	✓	✓	✓
SD Card	-	-	-	✓
Imaging capability	-	-	-	○
SmartStation GNSS capability	-	-	-	○
Onboard software (package content)	FlexField plus (standard)	FlexField plus (advanced)	FlexField plus (full)	SmartWorx Viva (pro)

Legend:

- 1) Standard deviation ISO-17123-3
- 2) Overcast, no haze, visibility about 40 km;
no heat shimmer.
- 3) Standard deviation ISO-17123-4
- 4) Prism Precise Fast mode

- 5) Under optimal conditions on Kodak
Grey Card (90% reflective). Maximum range
varies with atmospheric conditions, target
reflectivity and surface structure.
- 6) Single Measurement every 30 second at 25° C. Battery time
may be shorter if battery is not new. Internal battery GEB222.
- 7) Reflectorless measurement time may vary according to
measuring objects, observation situations and
environmental conditions.
- 8) with R500 option using Non-prism mode

- ✓ Included
- Option
- Not available



**Total Quality Management –
our commitment to total
customer satisfaction.**

Distance meter:
(PinPoint R500):
Laser class 3R in accordance
with IEC 60825-1 resp.
EN 60825-1

Distance meter:
(Prism Mode)
Laser class 1 in accordance
with IEC 60825-1 resp.
EN 60825-1

Laser plummet:
Laser class 2 in accordance
with IEC 60825-1 resp.
EN 60825-1

Cover picture:
Los Angeles skyline

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