

Technical Specifications

Leica GS08plus SmartAntenna

CS10 / CS15 Field Controller

Operating System	Microsoft Windows CE 6.0
Processor	Freescape iMX31 533 MHz ARM Core with 512 MB DDR SDRAM
Display	8.9 cm (3.5") 640 x 480 pixel (VGA) colour touch screen, sunlight-readable, backlight
Keyboard	CS10: 26 keys, numeric keypad / CS15: 65 keys, alpha-numeric keypad
Data storage	1 GB internal flash, SD-card slot, CF-card Type I / II slot, USB connector port
Audio	Integrated sealed speaker and microphone
Camera	Integrated 2 Megapixel fixed focus camera
Wireless connectivity	Bluetooth® 2.0 Class 2, Wireless LAN 802.11b/g (option), high speed broadband 3.5G GSM & UMTS (option), UHF radio module (option)
Application Software	Leica SmartWorx Viva LT
Standard Software	Internet Explorer Mobile, File Explorer, Word Mobile, Windows Media Player, Camera Software, Online Help

GS08plus SmartAntenna

GNSS technology	Leica SmartTrack technology: - Advanced measurement engine - Jamming resistant measurements - High precision pulse aperture multipath correlator for pseudorange measurements
No. of channels	120 channels
Satellite signals tracking	GPS: L1, L2, L2C (C/A, P, C Code) GLONASS: L1, L2 (C/A, P narrow Code) SBAS: WAAS, EGNOS, GAGAN, MSAS
User interface	On / Off key, Satellite tracking, Bluetooth® communication & battery power LED status indicators
Communication ports	Bluetooth® 2.0 Class 2, 8-pin Lemo combined USB / power port
Field controller connection	By Bluetooth® or with GEV237 Lemo plug cable

Accuracy (rms) and Reliability¹

RTK static mode	Horizontal: 5 mm + 0.5 ppm Vertical: 10 mm + 0.5 ppm Compliant to ISO17123-8 standard
RTK moving mode	Horizontal: 10 mm + 1 ppm Vertical: 20 mm + 1 ppm
Post processing static mode	Horizontal: 3 mm + 0.5 ppm Vertical: 6 mm + 0.5 ppm
Reliability	Better than 99.9 % using Leica SmartCheck technology
Time for initialisation	Typically 6 sec ²
Position latency	Typically 0.02 sec

Real-time Kinematic Specifications

RTK data formats	Leica proprietary formats (Leica, Leica 4G), CMR+, RTCM2.x, RTCM3.x, full support of RTCM 3.1 transformation message
Position update rate	1 Hz standard, Optional 5 Hz (0.2 sec)
Network positioning	VRS, FKP, iMAX, MAX, nearest station
RTK base station (option)	Transmit RTCM3 RTK data at 1 Hz (1 sec)

Physical Specifications

Weight of pole setup	2.60 kg for complete rover setup, including batteries and telescopic pole
Temperature, operating	CS: -30°C to +60°C, GS08plus: -40°C to +65°C, compliance with ISO9022-10-08, ISO9022-11-special, MIL STD 810G Method 502.5 II, MIL STD 810G Method 501.5 II
Temperature, storage	-40°C to +80°C, compliance with ISO9022-10-08, ISO9022-11-special, MIL STD 810G Method 502.5 I, MIL STD 810G Method 501.5 I
Humidity	100 %, compliance with ISO9022-13-06, ISO9022-12-04 and MIL STD 810G Method 507.5 I
Sealed against water, sand and dust	IP67 (CS) / IP68 (GS08plus) according IEC60529 and MIL STD 810G Method 506.5 I, MIL STD 810G Method 510.5 I and MIL STD 810G Method 512.5 I Protected against blowing rain and dust Protected against temporary submersion into water: Max. depth 1.0 m (CS) / 1.4 m (GS08plus)
Vibration	Withstands vibration during operating, compliance with ISO9022-36-05 and MIL STD 810G Method 514.6-Cat.24
Drops	Withstands 1 m drop onto hard surface
Topple over	Withstands topple over from a 2 m survey pole onto hard surface
Functional shock	40 g / 15 to 23 msec, compliance with MIL STD 810G Method 516.6 I No loss of lock to satellite signals when used on a pole setup and submitted to pole bumps up to 100 mm

Power Management

Supply voltage	Nominal 12V DC, Range 10.5 – 28V DC
Internal power supply	Removable & rechargeable Li-Ion battery, 2.6 Ah / 7.4 V (1x in CS and 1x in GS08plus)
Operation time	10 hours GNSS only, 7 hours GNSS RTK ³
Battery charging	2 hours with GKL211 charger or with GEV235 field controller power supply

¹ Measurement precision, accuracy and reliability are dependent upon various factors including number of satellites, geometry, obstructions, observation time, ephemeris accuracy, ionospheric conditions, multipath etc. Figures quoted assume normal to favourable conditions. GPS and GLONASS can increase performance and accuracy by up to 30% relative to GPS only.

² May vary due to atmospheric conditions, multipath, obstructions, signal geometry and number of tracked signals.

³ May vary with temperature, battery age and power of RTK of data link device.

GSSI SIR-4000 RADAR

A portable, digital Subsurface Interface Radar System designed for a broad range of environmental, geotechnical, geological and engineering applications.



The SIR® 4000 is GSSI's first high-performance GPR data acquisition system designed to operate with analog and digital antennas. This evolutionary step allows true versatility and flexibility by supporting a wide range of users, beginner to advanced, in numerous applications.

The SIR 4000 incorporates advanced display modes and filtering capabilities for 'in-the-field' processing and imaging. Fully integrated, the system provides a simple user interface, plug-and-play GPS integration, and WiFi enabled data transfer capabilities.

The SIR-4000 is compatible with all GSSI antennae; frequencies range from 20MHz to 2.5GHz, thus facilitating a broad range of applications.

System	
Antenna Support	Compatible with all GSSI antennas
Number of Channels	Records data from 1 single-frequency antenna or 1 dual-frequency antenna
Data Storage	32 GB
Display	Enhanced 10.4" LED display with internal high brightness, Active matrix 1024 x 768 resolution and 32-bit color
GPS	Data logged internally
Display Modes	Linescan, Linescan plus O-scope, Wiggle trace Full 3D, 256 color bins are used to represent the amplitude and polarity of the signal
Data Acquisition	
Data Format	RADAN™ (.dzt)
Output Data Format	32-bit
Scan Interval	User-selectable, up to 400 scans/sec
Number of Samples per Scan	256, 512, 1024, 2048, 4096, 8192, 16384
Operating Modes	Continuous (time) or survey wheel (distance triggered) or point mode
Time Range	0-20,000 nanoseconds full scale, user-selectable Gain: manual adjustment from -42 to +126 dB Number of segments in gain curve is user-selectable from 1 to 8
Standard Real-Time Filters	Infinite Impulse Response (IIR) - Low and High Pass, vertical and horizontal Finite Impulse Response (FIR) - Low and High Pass, vertical and horizontal
Advanced Real-Time Filters	Migration, Surface Position Tracking, Signal Noise Floor Tracking, Adaptive Background Removal
Automatic System Setups	Storage of an unlimited number of system setup files for different survey conditions and/or antenna deployment configurations
Automatic Antenna Recognition	Automatic recognition of Smart Antennas to allow maximum compliant transmit rate
Languages	
	English, Chinese, Japanese, French
Operating	
Operating Temperature	-20°C to 40°C external (-4°F to 104°F)
Battery	Inspired Energy Ni2040ED, 3 hour runtime*
Transmit Rate	Up to 800 KHz (International), US/Canada and CE rates depend on antenna model
Input/Output	
Available Ports	Antenna inputs analog and digital (one at a time), DC power input, Serial RS232 (GPS port), Accessory connector, HDMI video output, Ethernet to PC, USB 2.0 port, mini USB
WiFi	802.11B/G
Ethernet	RJ45 100BT Ethernet
USB Host	USB host with external keyboard support, USB flash drive support and USB HUB support
Mechanical	
Dimensions	14x10x2.75 in (36x25x7 cm)
Weight	10 lbs (4.53 kg) with battery
Relative Humidity	<95% non-condensing
Storage Temperature	-40°C to 60°C (-40°F to 140°F)

**GSSI SIR 4000
RADAR
SPECIFICATIONS**

