Leica Spider Infrastructure HW Solutions

Introducing: Leica GR30 & GR50

Reliable solutions for today and tomorrow

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- when it has to be right

Leica Geosystems

Leica Spider – Integrated Solutions

Introducing: Leica GR30 & GR50

Outline

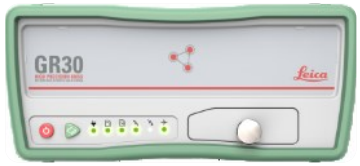
- Introducing Leica GR30 & GR50
- Overview about Key Values
- Close-Up on few selected features
- Value Propositions

Leica Spider Infrastructure HW Solutions

Leica GR30 & GR50 GNSS Reference Servers

Product Range Summary

- **Future Proof 555 channel GNSS SmartTrack+ capability:**
  GPS – GLONASS – Galileo – BeiDou – QZSS – SBAS



- **Leica GR30 – Standard Network RTK System**
- "Plug & Play": Intelligent & Easy to Use
- Includes all essentials for reliable high performance service

- **Leica GR50 – High-end universal GNSS "Server" System**
- More than just a "receiver" – for highest demands
- Flexible & redundant communication and power solutions
- Two variants: Bluetooth - or - WLAN

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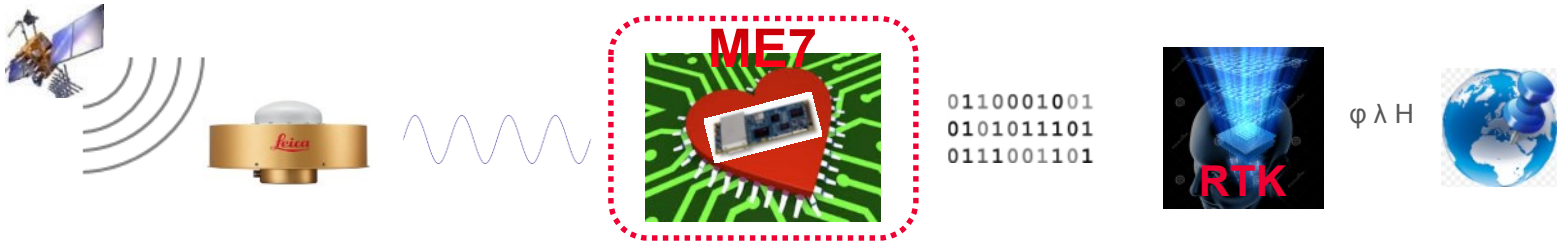
Leica GR30 & GR50 GNSS Reference Servers

Overview Key Values

The GNSS data value chain:



New: Innovative GNSS measurement engine generation 7 (ME7)

- Latest generation GNSS measurement engine with **555** channels on a single ASIC
- Up to 260 satellites and independent tracking of all signals per satellite
- Industry leading Pulse Aperture Correlator (PAC) multipath mitigation and advanced interference rejection technology for superior quality measurements
- Very low noise GNSS carrier phase measurements, typically < 0.5mm
- Software upgradable for future signals as they become available

Leica GR30 & GR50 GNSS Reference Servers

Overview Key Values

Key Value			
Smart Logging & Clean up: Up to 12 sessions (MDB, RINEX V2/3, NMEA)	✓	✓	✓
Up to 32 GB internal & FTP push	✓	✓	✓
Smart Streaming: Data rates up to 50Hz logging & streaming	✓	✓	✓
20 data streams (10 RTK) with multiple user connections	✓	✓	✓
Full Ntrip Server / Caster / Client support	✓	✓	✓

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Leica GR30 & GR50 GNSS Reference Servers

Overview Key Values

Key Value		Bluetooth	WLAN
Smart Communication:			
Serial, Ethernet, USB Client & Slot-In devices	✓	✓	✓
USB Host (e.g. for external disk)	✗	✓	✓
WLAN	✗	✗	✓
Bluetooth	✗	✓	✗
Mobile Internet	✓	✓	✓
Backup Comms management & Residential Gateway	✓	✓	✓

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Leica GR30 & GR50 GNSS Reference Servers

Overview Key Values

Key Value		Bluetooth	WLAN
Smart Power Concept:			
Dual-External power supply & Power Fail recovery	✓	✓	✓
Comprehensive management of power input levels and power source priority	✗	✓	✓
Integrated rechargable and removable battery	✗	✓	✓
Power over Ethernet	✗	✓	✓
Low power consumption	<3.5W	<3.1W	<3.1W

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Leica GR30 & GR50 GNSS Reference Servers

Features - Close up

Integration of all HW/SW components

All ports integrated

& conveniently accessible

Integrated GSM/GPRS/3G/UMTS

Internet connection sharing (Routing)

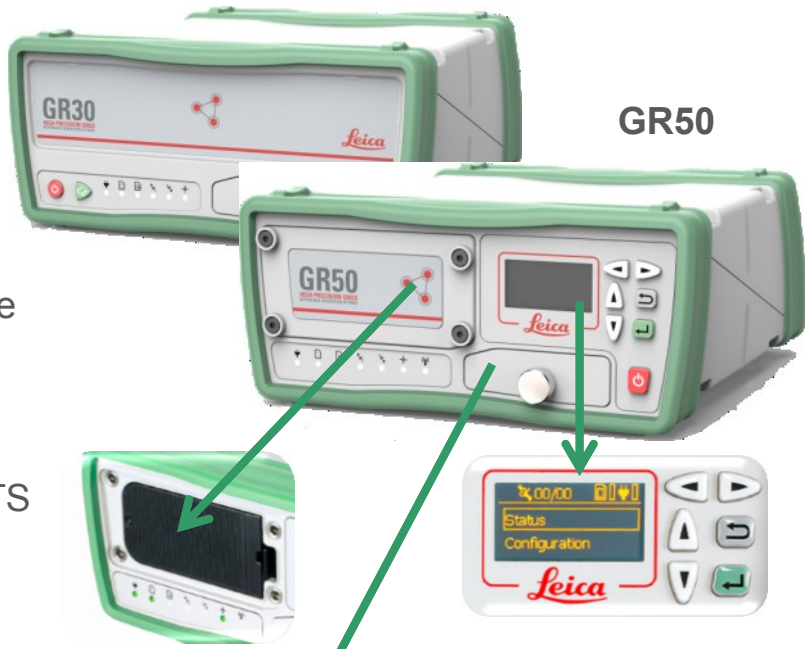
Automatic **backup** communication to Spider

1

Active Spider connection via NTRIP

GR30

GR50



Flexible concepts:

- Logging
- Power supply
- Operation

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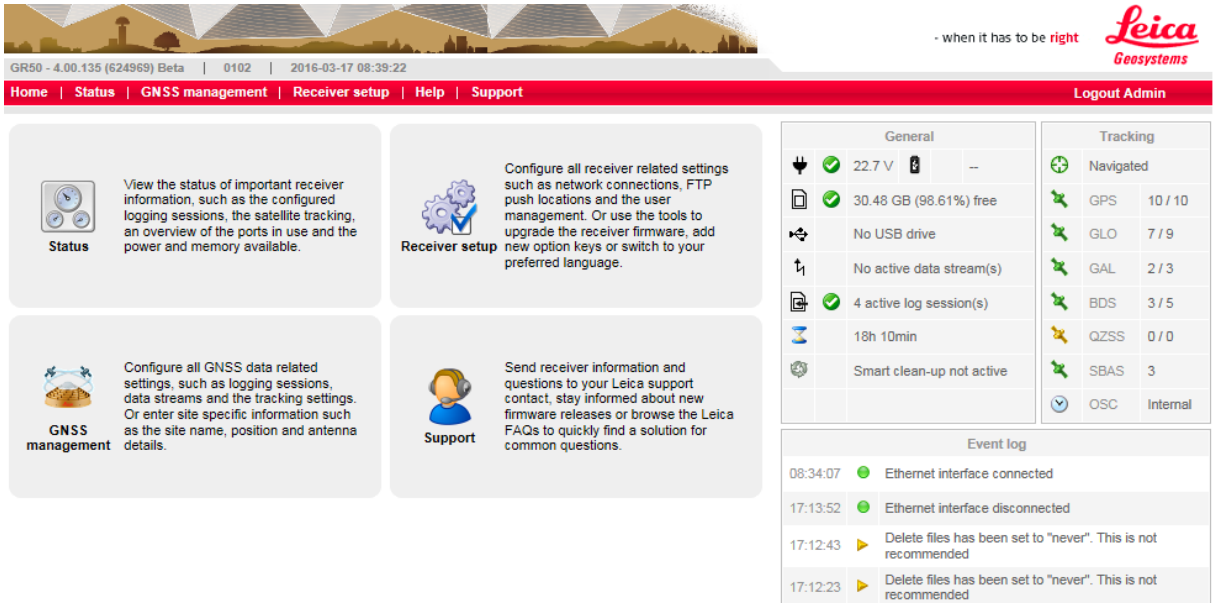
Leica GR30 & GR50 GNSS Reference Servers

Features - Close up

Keeping it Simple ... ´Plug & Play´ connectivity

- **Connect via Ethernet / LAN:**
  Open Web Browser >> Type Hostname >> Login >> START - That´s it!
- **Connect via USB connection to a PC:**
  Open Web Browser >> Type 192.168.254.2 >> Login >> START - That´s it!



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Leica GR30 & GR50 GNSS Reference Servers

Features - Close up

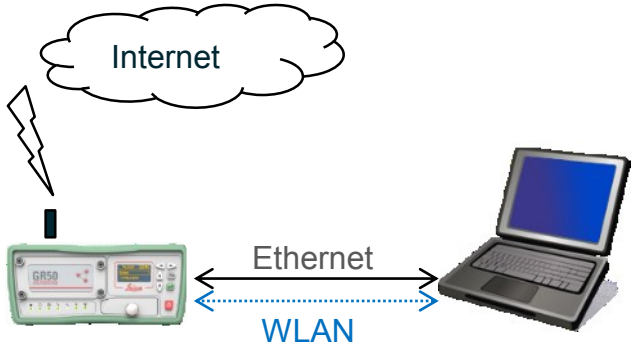
Internet Connection Sharing / Residential Gateway

- The GR-Server acts as a gateway to the internet for attached devices
- WAN: interface to access the internet (Mobile internet, Ethernet, WLAN)
- LAN: interface to which other device is connected (Ethernet, WLAN)

Receiver setup

Residential gateway

Gateway management	
Activate	☑ When activated, DHCP will be disabled for LAN interface and static IP address will be used.
WAN interface	Mobile internet
LAN interface	Ethernet
LAN interface IP address	192.168.0.3
LAN network IP address range	192.168.0.1 - 192.168.0.254



Example:
WAN interface: Mobile internet
LAN interface: Ethernet or WLAN

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Leica GR30 & GR50 GNSS Reference Servers

Features - Close up

Comprehensive backup communication

- Define gateway priority
- Switches between available gateways if default gateway stops working
- WLAN will also be used, if available and configured

Receiver setup

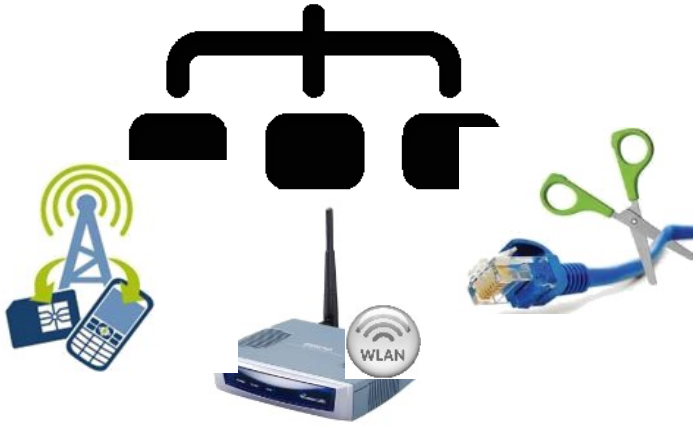
Network connections

General	Ethernet	Mobile internet	WLAN

Hostname	
Receiver hostname	GR1830026

Default gateway	
Priority	Ethernet Mobile internet WLAN

Backup Communication	
Enable	☑



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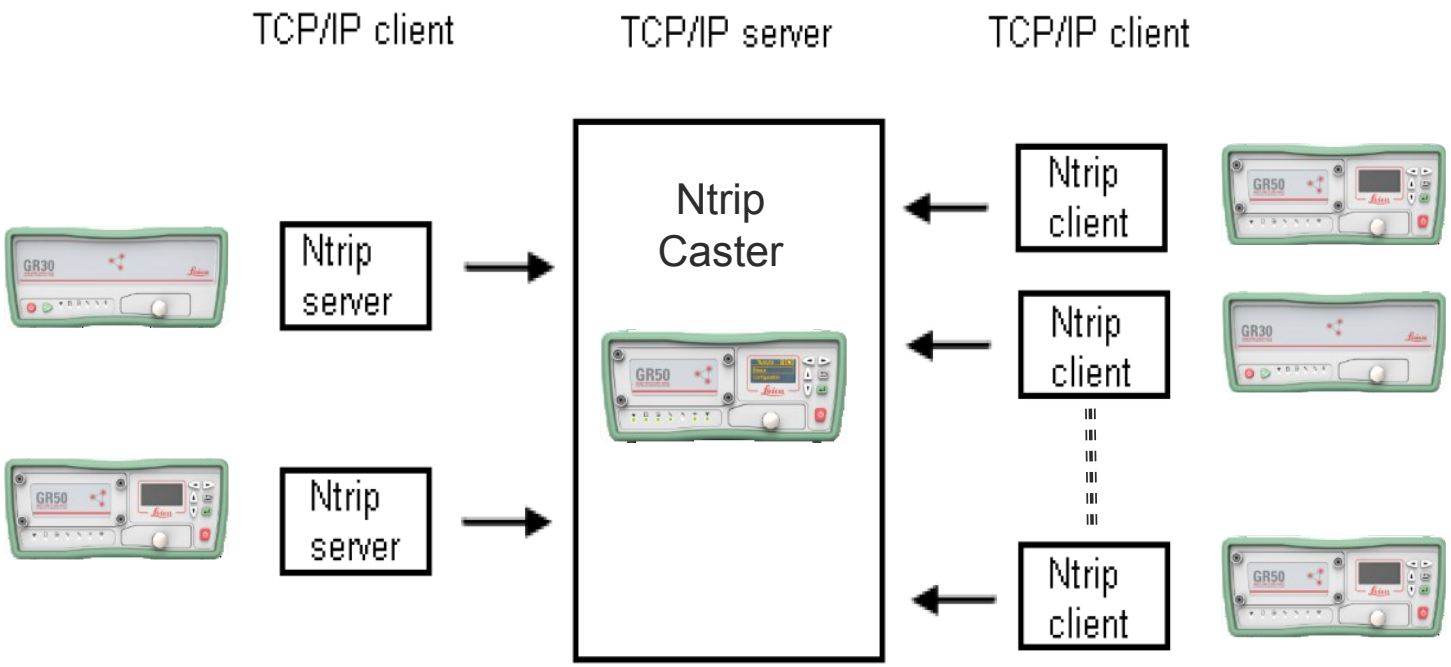
Features - Close up

Ntrip Caster Functionality

- The GR receivers can act as full comprehensive Ntrip caster



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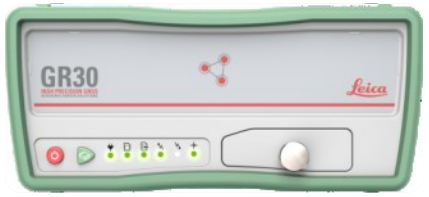
Leica GR30 & GR50 GNSS Reference Servers

Features - Close up

Automatic Firmware download and installation

- **At predefined times**
- **From:**
  - Public Leica Geosystems web server
  - or Local intranet FTP server
- **Firmware file zipped ➔ small size ➔ fast transfer**
- **Benefits:**
  - ➔ Minimized administration effort
  - ➔ Controlled maintenance



Automatic firmware upgrade	
Download automatically	☑
Download from	Leica Geosystems
Install automatically	☑
Install	○ after automatic download ● same day after upload/download at 18:00

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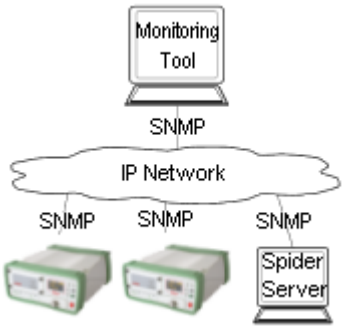
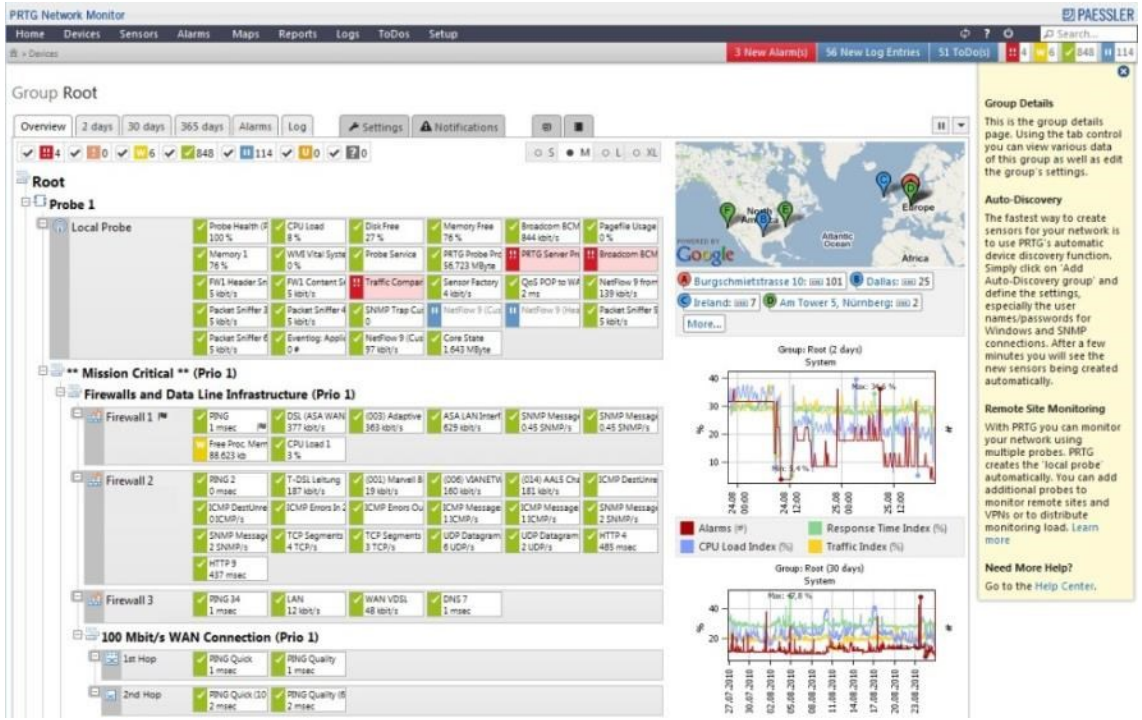
Leica GR30 & GR50 GNSS Reference Servers

Features - Close up

SNMP

- Simple Network Management Protocol (SNMP)
- Existing IT “Tool”
- Allows continuous and rapid IT infrastructure monitoring of all devices in an IT network
- Routers/Switches/Servers/…
- SNMP is a protocol for finding out the status of a device or service





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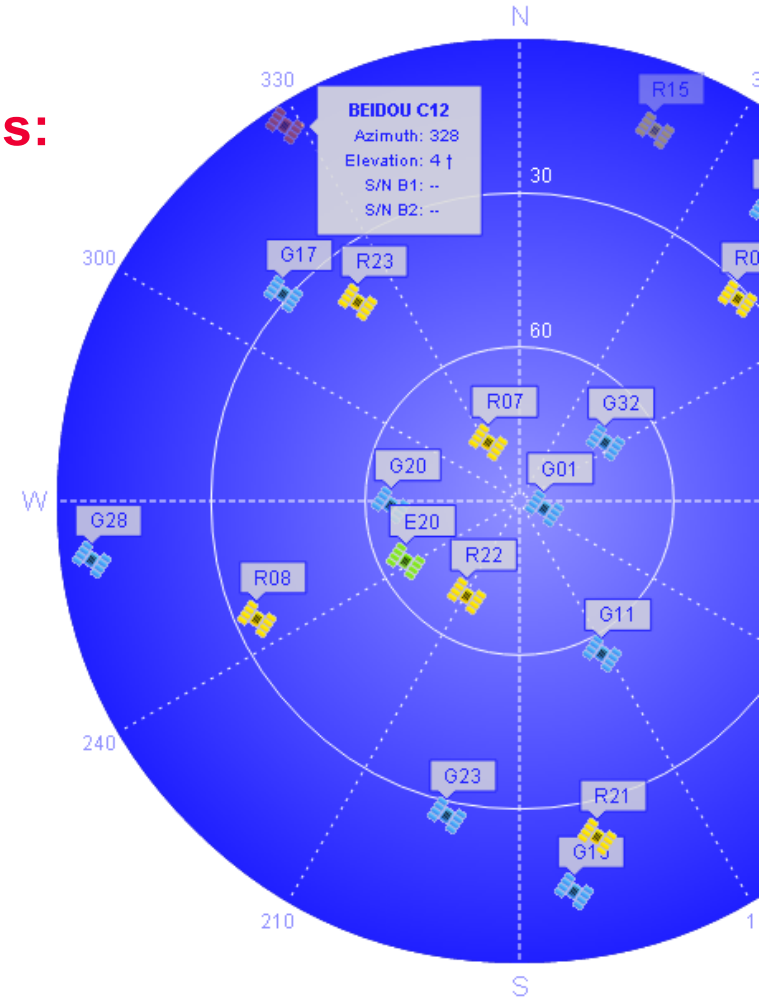
Leica GR30 & GR50 GNSS Reference Servers

Features - Close up

… more GNSS Satellite Systems & Signals:

- GPS, GLO, GAL, BDS, QZSS, SBAS
- Logging
  MDB, RINEX 2 / 3.01 / 3.02 / Hatanaka, NMEA
- Raw Data Streaming
  OWI LB2, BINEX, RTCM MSM



Status

Tracking

General	GPS	GLONASS	GALILEO
			Information
Date of GPS almanac	2016-03-21 19:56:48		
Date of GLONASS almanac	2016-03-19 08:10:56		
Date of GALILEO almanac	2016-03-19 10:30:00		
Date of BEIDOU almanac	2016-03-18 12:18:22		
Date of QZSS almanac	2016-03-20 12:05:20		
Time signal	Internal		

Tracking	
Navigated	
GPS	7 / 8
GLO	8 / 8
GAL	2 / 2
BDS	8 / 11
QZSS	1 / 0
SBAS	3
OSC	Internal

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Leica GR30 & GR50 GNSS Reference Servers

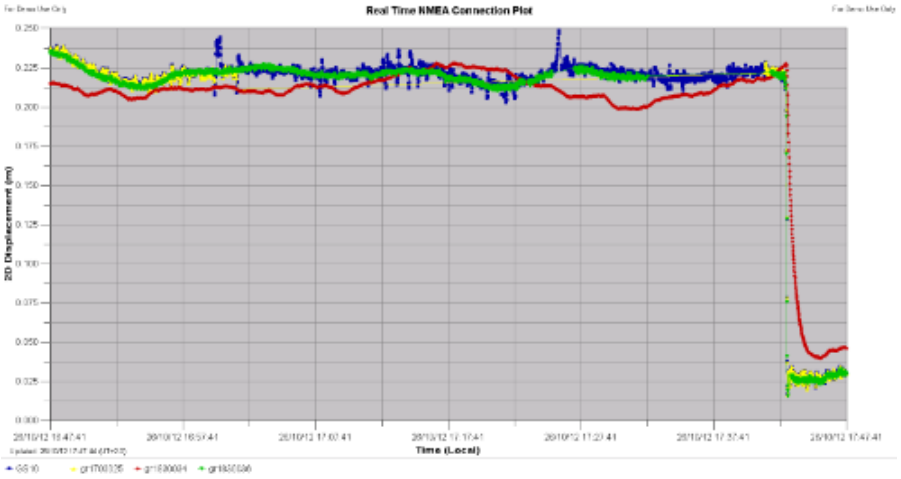
Features - Close up

Site Monitor with tailored RT-positioning modes:

- "**Reference Station**" to monitor the stability of a pillar
- "**Monitoring**" to monitor dams, bridges, landslides
- "**Network RTK**" to compute positions as on a rover

Monitoring & notifications: e.g. SpiderQC or RTKMon

➔ NMEA RT Positioning



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Leica GR30 & GR50 GNSS Reference Servers

VADASE- Velocity and Displacement Engine

VADASE – What is it?

Velocity And Displacement Autonomous Solution Engine

- **Autonomously** detecting fast movements in real time
- The world's first autonomous GNSS monitoring solution onboard a stand-alone receiver
- New Algorithm onboard **Leica GR30/GR50** receivers

GR30

GR50

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Leica GR30 & GR50 GNSS Reference Servers

VADASE- Velocity and Displacement Engine

VADASE – What is it?

Velocity And Displacement Autonomous Solution Engine

Purpose Detection of fast relative movement in real time

Method Velocity information from single-difference GNSS observations & derived displacement

Benefits Fully autonomous - No reference data or correction services required

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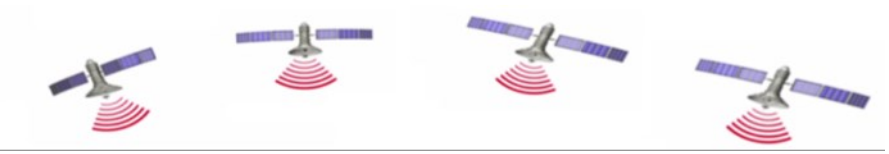
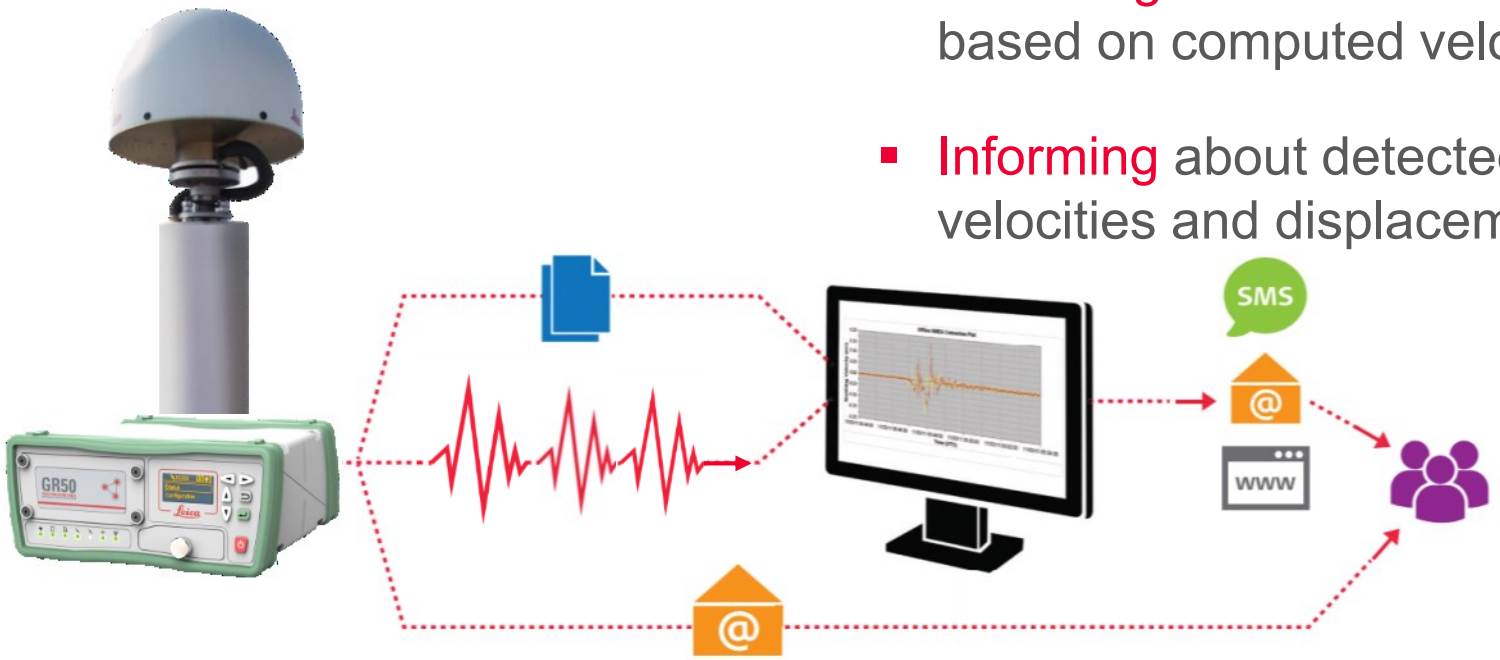
VADASE- Velocity and Displacement Engine

VADASE – How does it work?



- Real time - Instantaneous
- Using only satellite broadcasted information -> autonomous
- Detecting fast movements based on computed velocities
- Informing about detected velocities and displacements



Leica GR30 & GR50 GNSS Reference Servers

Sales Variants

- **Two common sales variants:**
  - **"Baseline":** Base-variant with 555 channels with **GPS & GLONASS** constellation, **Multi-frequency** (L1, L2P/L2C, L5). Additional options to be added as needed.
  - **"Highline":** **Full GNSS** constellation & **multi-frequency** **Plus Server Package**: RINEX, FTP push, Multi-client & Ntrip caster. Further additional options can added as needed.

Leica GR serie GNSS Reference Servers

Build your system – with the Reference Server

With its *Modular* design and *Scalability*

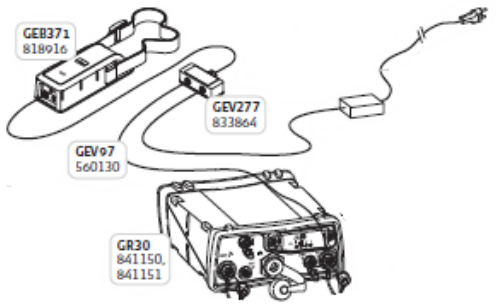
- The GR30/50 can be **upgraded** in the future **when you need it**.
- New signals coming – update firmware or exchange the tracking engine (GR10/25), not the whole system
- Need more memory – add larger SD card or USB hard disk or flash disk
- Need new communications – add new slot-in or external devices
- Need different power sources – on GR50 use any of the 4 sources and manage them

Leica GR30 & GR50 GNSS Reference Servers

Solving Power Supply Issues

Keeping your reference station running 24/7 is critical

- Being a high end GNSS receiver with four power sources, the GR50 has a very low power consumption at 3.1 Watts typically
  - Two external power ports via a single Lemo port and Y cable
  - Internal battery and charger
  - Power over Ethernet (PoE)
- With the GR50 internal battery, both raw data logging and communication backup is fully integrated. No need for additional separate UPS device.
  - Raw Data Logging Only : Up to 27 hours
  - Raw Data Logging and GPRS streaming : Up to 22 hours
- Or use GR30 with external re-chargable GEB371 as UPS (>48h
- GR50 with Configurable power management
  - Define power on – power off voltage limits
  - Select primary and secondary source



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Leica GR30 & GR50 GNSS Reference Servers

Solving Communication Issues

The GR50 has all the communications you need – all integrated and managed

- Ethernet (ruggedized - IP67 even when in use)
- USB client / host
- Slot in/external devices (Radio/GSM/GPRS/UMTS)
- Serial RS232 (Lemo)
- Bluetooth (GR50 BT only)
- WLAN (GR50 WLAN only)

Streaming	Web Interface
✓	✓
✓	✓
✓	✓ GPRS/UMTS
✓	⊖
✓	✓
✓	✓

External VSAT/BGAN can also be used:

- GR30/GR50 has low bandwidth web interface configuration mode

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Leica GR30 & GR50 GNSS Reference Servers
Complemented by excellent GNSS Antennas

SPIDER

GPS – GLONASS – Galileo – BeiDou – QZSS – SBAS – L-Band

AR25 – The Scientific

- Scientific 3D choke ring antenna for tasks demanding the best low elevation tracking
- “Dorne & Margoline” Antenna Element

AR20 – The High-End Standard

- High end choke ring with unmatched multipath rejection, excellent phase center characteristics and very low noise – 3D inside design
- The standard antenna for RTK Networks

AR10 – The Economic Standard

- Near choke ring level performance compact antenna with integrated robust UV resistant radome

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Leica GR30 & GR50 GNSS Reference Servers
Summary

Key Benefits:

- Don’t think receiver – Think reference server
- Future proof state of the art GNSS measurement engine technology
- Easy to use and install ´Plug & Play´ GNSS Reference Station
- Reliable performance today as well as tomorrow
- Modular – when Flexibility and Adaptability matter

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Leica Spider – Integrated Solutions

Integrated Product Suite

Leica GNSS Software:

- GNSS Spider
- SpiderQC
- SpiderWeb
- Spider Business Center

GNSS Antennas:

- Leica AR10
- :0
- :5

Leica Services:

- CrossCheck
- SmartNet powered by Leica Geosystems

erver:

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SPIDER

THANK YOU FOR YOUR ATTENTION!

The best answers combine the smartest solutions

The Leica Spider family of products provide all you need for smart solutions.
From single base stations to comprehensive infrastructure RTK networks.

GNSS Networks and Reference Stations

Smart Solutions from Leica Geosystems

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