

### **GeoMax GNSS**

### Zenith35 Pro Series

### Product Presentation

V 3.0





#### **GeoMax Zenith35 Pro Series** Table of Contents

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## Zenith35 Pro GNSS Receiver







### GeoMax Zenith35 Pro Fully future-proof

The Zenith35 Pro is fully future proof due to...

- ...the integrated Wi-Fi<sup>®</sup> module which allows remote access and configuration!
- ...the support of all satellite systems and latest frequencies GPS L5, BeiDou B3, Galileo E5/6; Glonass L3
- ...the capability to select your preferred RTK mode «Safe» or «Extra Safe»
- ...DynDNS-technology to remotely configure and connect up to 10 Zenith35 Pro`s Rovers with via GMS to the base
- new
- ...incorporated Tilt&Go functionality
  - e-bubble
  - Quality documentation
  - Measuring inaccessible points









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### BeiDou

### Overview

#### What is BeiDou?

BeiDou is the Chinese GNSS system

(previously known as Compass), equivalent to GLONASS, GPS and Galileo

#### What benefit do I have through BeiDou?

BeiDou has already a significant number of satellites launched. Initially only geostationary satellites, located over the China, were launched, so mostly China & South East Asia benefitted from BeiDou.

However since 2015 BeiDou has a global coverage and China continuously launches additional satellites, from which the rest of the world also benefits by providing additional positioning information, especially under hard measurement conditions.

#### What is the future of BeiDou?

It is planned that until 2020 35 BeiDou satellites are in orbit

- $\rightarrow$  5 geostationary satellites
- $\rightarrow$  30 non geostationary orbit satellites











### Galileo

### Overview

#### What is Galileo?

Galileo is the European GNSS system, equivalent to GPS, GLONASS and BeiDou.

#### What benefit do I have through Galileo?

In general the benefit is the same as with the other GNSS system – additional positioning information, especially under hard measurement conditions.

- $\rightarrow$  12 satellites already in operation
- → 2 satellites launched on May 23<sup>rd</sup> 2016

#### What is the future of Galileo?

- → 2 more satellite launches in 2016
- $\rightarrow$  1<sup>st</sup> services offered by end of 2016
- $\rightarrow$  2018: 26 satellites in space; fully operational
- $\rightarrow$  2020: all 30 satellites in space (final stage)









#### GeoMax Zenith35 Pro GPS L5

#### What is GPS L5-frequency and what is its benefit?

- The newly introduced L5-frequency band at 1176.45 MHz was added in the process of GPS modernization.
- Designed to meet demanding requirements for safety-of-life transportation and other high-performance applications



- The third GPS frequency L5 increases receiving robustness and provides higher availability and accuracy mainly by a stronger signal, improved ionospheric correction, signal redundancy, interference rejection and improved signal accuracy.
- L5 is available at the moment on 10 satellites (Type Block IIF: G25, G01,G24,G27,G30,G06,G09,G03,G26,G08)
- Full constellation of 24 GPS satellites broadcasting L5 (and all legacy signals) will be in orbit by 2024.
- To the new SBAS generation (Space Segment) belongs the evolution to dual-frequency L1/L5 transponders.



#### **GeoMax Zenith35 Pro** SBAS-Overview

#### What is SBAS?

SBAS is a **S**atellite **B**ased **A**ugmentation **S**ystem transmitting differential corrections from geo-stationary satellites to improve the positioning accuracy of GNSS receivers.

#### What benefit do I have through SBAS?

When using SBAS corrections, DGPS position fix can be obtained with a stand alone GNSS receiver. An accuracy of <25cm can be achieved without needing an own base station setup. This accuracy is suitable for many applications such as with forestry, precision farming, oil & minerals exploration and vehicle fleet management.



### Zenith35 Pro Tilt&GO (TAG)



- Integrated **Tilt** sensors to determine **inclination** of pole
- Integrated Compass to determine the direction of tilted pole

Based on those information, the receiver can calculate the point coordinates compensating the tilted pole

- Measurement routine seamlessly integrated into the field software.
- Depending from the task two possible modes:
  - TAG Single tilt of up to 15 °
  - TAG Dual tilt of up to 30°





### Zenith35 Pro TAG Single & TAG Dual

#### TAG Single - when the highest efficiency is needed

Measure points with pole tilted up to 15° with only one press of a button. Perfectly suited for all your standard tasks, such as topographical surveys & stakeouts







### Zenith35 Pro TAG Single & TAG Dual

**TAG Dual** - *when working under difficult situations* Independent from discrepancies caused by metal objects (or those generating magnetic fields). With pole tilt up to 30°.







#### Zenith35 Pro TAG Benefits

- Efficiency increase:
  - Measure inaccessible points → Time saving since no cumbersome offset measurements required
  - Measure up to 30% faster since levelling time is eliminated.



#### Quality increase

- Less error prone since integrated alert if exceeding a predefined centring accuracy
- Higher accuracy since focusing on e-bubble on controller, instead of switching eyes between the analogue bubble and the display.
- Document the quality of your measurements by storing the pole`s tilt value of each measured point. → 100% traceability.





#### Zenith35 Pro RTK-Quality Mode

- The newly introduced "ExtraSafe Mode" significantly improves the reliability by 10% and reduces the availability by 40% under critical conditions.
- Under <u>normal measurement conditions</u> the extra safe mode impact on the <u>time to fix is</u> <u>about 2-3 sec.</u>
- The mode can be set in the WebManager & in the field software (if supported)





Zenith35 Z3515	0601005	Status Info	Settings	Formatting	Updates	Data Management
Sensor Settings <del>•</del>	Satellite Set	tings •				
W	/orking Mode	Static •	RTK Rover (	RTK Base		
RTK	Data Source	◯ UHF . ● (	GSM/GPRS 🤅	) External 🔘 I	Bluetooth	
Antenna H	leight to ARP	1.888		m		
RTK	Quality Mode	🔘 Normal 🧕	Extra Safe R	тк		
		Normal		тк		

### GeoMax Zenith35 Pro Compact & Rugged

#### Compact:

- Same weight as Zenith25
- Compact size 6% Volume (compared to Zenith25)



#### Rugged:

GeoMax instruments are built to withstand the toughest conditions.

The Zenith35 Pro has been designed and tested to be dust-proof and fully protected against water jets.





#### GeoMax Zenith35 Pro Compact & Rugged

Rugged:

**Operating temperature** 

Can be operated from  $-40^{\circ}C + 65^{\circ}C$ 

#### Vibration resistant:

Withstands strong vibrations according to MIL-STD-810G, method 514.6E-I

Shock resistant

Withstands a 2 m (6.6 ft) pole topple over onto hard surface

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### GeoMax Zenith35 Pro Compact & Rugged

Zenith35 Pro has been designed for maximal robustness to withstand even a 2 m topple over and strong vibrations



#### GeoMax Zenith35 Pro Web User Interface

#### The GeoMax WebManager

- The integrated Wi-Fi®module the Zenith35 Pro allows the connection to the internet
- The GeoMax WebManager is a web-based Configuration Tool
  - ✓ Easy to access and to use
  - ✓ Driver- and wireless
  - ✓ Compatible with all convenient browser and OS such as IE (>8),



- ✓ Access via any Wi-Fi<sup>®</sup> enabled device
- ✓ Access from everywhere and completely independent on your location





#### GeoMax Zenith35 Pro GeoMax WebManager

How to access and start...

🗋 Zenith35	Web UI	1		-		
← ⇒ C	192.168.10.1					
Zer	nith35 Z3515060	1003	Status Info	Settings	Formatting	U
	Sensor Settings -	Satellit	e Settings -			

Step	Description
1.	Turn on the Zenith35 instrument.
2.	Make sure your Wi-Fi on your PC/mobile device is turned on. Search for available connections.
3.	When the instrument is found, connect it to your PC/mobile device.
4.	As soon as the connection is established, start the web browser. Enter into the address bar the IP http://192.168.10.1. A login-window pops up.
5.	<ul> <li>Enter user name and password. The default values are:</li> <li>User name: admin</li> <li>Password: password</li> </ul>
6.	After a successful login the info start screen of the Z35WebManager will appear and the instru- ment can be accessed.



### GeoMax Zenith35 Pro GeoMax WebManager

The WebManager's functionalities...

C Zenith35 Web UI ×		-		
← → C 🗋 192.168.10.1				F 🚖 E
Zenith35 Z35150601003 Sta	atus Info Settings	Formatting	Updates Data Management	English
Sensor Settings - Satellite Set	tings -			
Working Mode	Static RTK Rover	RTK Base		
RTK Data Source	○ UHF ● GSM/GPRS	External	Eurotian	Description
			Function	Description
Automatic Startup	● NO ○ YES		Hardware Information	To view the current status of the GNSS instrument as well as the instru- ment firmware.
Correction Format	DTCM2		Position/link Information	To view the current position and link setting.
Base ID	RTCW5		Satellite settings	To view all currently available satellites and the option to enable or disable each satellite and each satellite system.
	U		Sensor settings	To view and configure the sensor and data link.
PDOP Threshold	99.0	[1-99]	Format sensor	To format the memory, reset to factory settings, backup data or restart the instrument.
Base Position	Over Unknown Point	Over Known F	<sup>2</sup> License key file	To upload license key files. Refer to "Upload key".
			Firmware file	To upload instrument, UHF and ME firmware. Refer to "Sensor firmware"
Antenna Height to ARP	0	mm	Language file	To upload language files.
			Antenna file	To upload base antenna calibration values to the instrument.
Raw Data Logging	Enable		Data Download	To download raw data files from instrument or the microSD card in DAT or RINEX format. Refer to "Data download".
Method	P2P	T		



### GeoMax Zenith35 Pro DynDNS-Technology

The implemented DynDNS technology provides the following use-cases:

- WebManager can be remotely accessed enabling...
  - to remotely monitor the status of the unit
  - to remotely reconfigure the unit
  - to remotely download raw data
  - to remotely access the unit and provide 1<sup>st</sup> level support
- Multiple GSM rover connection: Up to 10 Rovers can be connected to one base



### GeoMax Zenith35 Pro DynDNS-Technology

#### How does DynDNS work?

How to find my specific Zenith35 Pro "on" the Internet if its IP address is always changing?
 MyZ35 = 123.456.78.9



 DnyDNS-technology will assign a "static" hostname to the specific Zenith35 Pro receiver, so it can be found anytime easily, although its current IP address is not known. This technology allows you to access the Zenith35 Pro from any location via internet.



### GeoMax Zenith35 Pro DynDNS-Technology

#### How to use this technology?

- Currently supported providers for Zenith35 Pro are
  - → dyndns.com
  - ➔ no-ip.com



- You need to register at one of these provider
- Costs per year approx. 40 USD (depending on provider)
- Free trials possible (depending on provider)
- Up to 10 rovers can access and receive correction data from 1 base station
- Number of rovers depending on the location, network quality, number of users in cell,...



#### **GeoMax Zenith35 Pro** UHF Radio

- Integrated UHF Radio Satel M3-TR4
- Latest Radio technology provided by SATEL
- 16 programmable frequencies
- Support of Forward Error Correction (FEC) for maximum reliability
- Password protected settings to ensure legal conformity
- Support of 7 protocols for maximum flexibility
  - SATEL
  - SATEL 4 FSK
  - SATEL8 FSK
  - PCC-4FSK
  - PCC-GMSK
  - TrimTalk (T)
  - TrimTalk (P)







#### Zenith35 Pro Series Interfaces & Ports





### Zenith35 Pro Series Step 1: Receiver Configuration options









# Zenith35 Pro Specs





### Zenith35 Pro GNSS receiver

#### **Specs**

#### Satellite System & Signals

Channels		555, multi frequency		
RTK technology		NovAtel Advance ™		
GPS		L1, L2, L2C, L5		
GLONASS		L1, L2, L3*		
BeiDou		B1, B2, B3**		
Galileo		E1, E5a, E5b, AltBOC, E6**		
SBASS/QZSS***		EGNOS, WAAS, MSAS, GAGAN		
Positioning rate		20 Hz		
Accuracy****				
Static	Hz	3 mm + 0.5 ppm		
	V	5 mm + 0.5 ppm		
Static long Hz		3 mm + 0.1 ppm		
	V	3.5 mm + 0.4 ppm		
Kinematic Hz		8 mm + 1 ppm		
	V	15 mm + 1 ppm		

\* Glonass L3 will be provided through future firmware upgrade. \*\* Believe to comply. Subject to ICD description availability.

\*\*\* Support of QZSS is incorporated and will be provided through future firmware upgrade when QZSS will be operational.

\*\*\*\* Measurement accuracy and reliability are dependent on various factors including satellite geometry, obstructions, observation time, ionospheric conditions, multipath, etc.

### Zenith35 Pro GNSS receiver

#### **Specs**

#### Communication

GSM/GPRS module	Quad-Band GSM & Penta-Band UMTS 800 / 850 / 900 / 1900 / 2100 MHz			
UHF Module	500mW/ 1000 mW transceiver, 403 – 473 MHz			
Bluetooth	Device class II			
WiFi	incorporated			
Physical ports	Lemo 7 pin USB/Serial/ 2x TNC			
Power				
Internal battery	Li-ion, 3.4 Ah, 11.1 V			
Operating time	Static 8.5 h / GSM 6.25 h			
External power	9 - 18 V			



### Zenith35 Pro GNSS receiver

#### **Specs**

#### **Physical Specs**

Dimensions	Height 131 mm, d=161 mm
Weight	1.17 kg w/o battery
Operating temperature	-40°C - +65°C
Protection class	IP68 dust & waterproof
Humidity	100%, condensing
Vibration	MIL-STD-810G, method 514.6E-I
Shock	Withstands 2 m drop onto hard surface



## Zenith35 Pro Options





### GeoMax Zenith35 Pro Options

- 847647 **BeiDou** option, enables tracking of BeiDou satellites with a Zenith35 Pro GNSS receiver
- 847648 **Galileo** option, enables tracking of Galileo satellites with a Zenith35 Pro GNSS receiver
- Note Previously offered 20Hz and GPS L5 option are included on Zenith35 Pro.
- 832481 Zenith35 TAG Compass Calibration tool (included in Zenith35 Pro TAG package)
- Note Existing Zenith35 TAG receivers can be upgraded to the TAG single mode by firmware upgrade and purchasing of this compass calibration tool.







# GeoMax Geo Office

#### GeoMax Geo Office



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#### **GeoMax Geo Office** Office Software

- Support for GeoMax GNSS and TPS instruments
- Basic tools for data preparation, data up- and download, codelist management
- Project management to import raw data, visualize data, quality control and basic editing
- GNSS processing support for GeoMax sensors, RINEX Import/Export, Coordinate system management and datum transformations to convert between WGS84 and Local Grid
- Network Adjustment (combined GPS and TPS)
- Exports to ASCII





# Datalogger & Field Software





### GeoMax Zenith35 Pro Datalogger - Full Flexibility

Choose you preferred datalogger or tablet



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### **GeoMax Zenith35 Pro** Field Software - Full Connectivity

Choose you preferred field software







For detailed product information,

please refer to the specific product presentations





# Zenith35 Pro Packages





#### GeoMax Zenith35 Pro Packages

included

optional

Not available

Art.No	6011330	6011331	6011332	6011333	
	Flex Rover	TAG Rover	Flex. Base	Ext.Radio Base	
GSM-UHF					
TAG (Tilt&Go)					
Compass Calibr. Tool					
GPS&GLONASS					
BeiDou					
Galileo					
20 Hz					
Multi frequency					
Accessory Kit					
Charger& Battery	2 Batteries				
Datalogger					
Field Software					
Pole + holder					
Ext. Radio					
Tribrach/Carrier/Tape					





# Zenith35 Pro Promotion Material





#### **GeoMax Zenith35 Pro Promotion Material**

- 4 page brochure
- Poster
- Image Library
- FAQ