

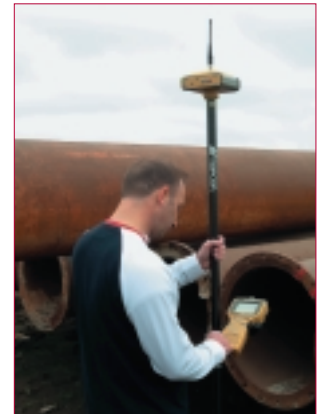


HIPER SERIES

GPS+
RECEIVERS

Hiper, the Top of Pole Solution

The Topcon Hiper Series offers a range of high performance GPS receivers incorporating the very latest technological developments and unique Topcon features. Everything you need to perform GPS work is fully integrated in each model of the HiPer family. Receiver, antenna, power supply and the RTK modem link are all neatly packaged inside the rugged, compact housing of the HiPer. For RTK rover, base station, static survey or stop-and-go, there is always a model to suit your needs and budget.



For a complete Topcon Hiper RTK solution you mount the Hiper on the GPS rover rod and control the operation with the Topcon FC-1000 handheld controller loaded with Topcon TopSURV GPS controller software. The FC-1000 Windows-CE, rugged handheld computer and TopSURV software are the perfect combination offering the power of a state-of-the-art rugged Windows-CE Controller and an integrated surveying software package for both GPS surveying and control of all Topcon total stations.

FC-1000 GPS Controller

The FC-1000 was designed and built by Topcon to our specification to meet the demanding needs of surveyors. The FC-1000 is designed to withstand rugged use in the field being shockproof, waterproof, dustproof and lightweight. In addition to these design features the computing power is second to none, with fast data processing ensuring optimum GPS performance. The standard features of the FC-1000 include:

- 64MB internal memory
- Removable compact flash card, used as external memory
- 2 Com Ports (9-pin serial, 6-pin instrument)
- USB Port
- Re-movable Li-ion batteries, rechargeable in or outside the unit
- Super-fast Hitachi SH7750S Microprocessor
- Easy to use keyboard layout.

TopSURV GPS+ Controller Software

TopSURV is the new Topcon controller software for use with Topcon GPS systems. This Windows-CE software can be installed to FC-1000 and other Windows-CE devices such as Ranger, Recon and Ipaq. The software is easy to use and offers complete functionality for GPS surveying. It has a dropdown menu structure with easy to use screens for GPS set-up and RTK surveying. Functions include:

- GPS status including satellite sky plots and position details
- Base set-up
- Post Processing mode (Static / Kinematic)
- Known point initialization
- Multiple base stations
- RTK Survey points (radio and GSM)
- Point offset measurements
- Stake out with graphical display
- 2 network RTK modes: VRS and FKP
- Roads functionality (optional module)



Hiper - on the pole RTK

Integrated RTK solution

All models of Hiper are available as versions with integrated radio or GSM modem. This reduces the number of external devices, batteries and cables needed to connect them. Everything you need for RTK surveying integrated in one

compact unit and mounted on top of the rover pole. With the Hiper+, even the cable to the controller unit is eliminated, providing a true cable-less solution.



Hiper

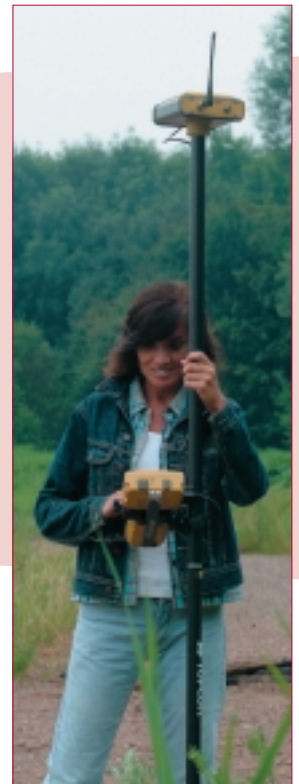
- Compact, lightweight design
- Fully integrated receiver/antenna
- Single frequency static GPS solution
- Easily upgradeable to dual frequency GPS tracking
- Up to 96Mb of memory
- Integrated radio or GSM modem (optional models)
- Battery up to 25 hours

Hiper GGD

- Upgradeable to GPS+GLONASS tracking
- Battery 14 hours RTK

Hiper+

- Bluetooth, cable-less communication
- Center mounted radio antenna
- Upto 1GB of internal memory
- Battery 14 hours RTK



Hiper Outstanding Features

- Internal lithium batteries providing 25 hours operation in static mode. In RTK mode with internal modems, upto 14hours operation.
- Improved 4 light Minter (Minimum user INTERface). Four LED's each with 3 colours to indicate status and simplify operation. LED's to indicate satellite tracking status, data recording, radio transmission and battery status.
- Integrated Microstrip (zero centered) GPS+ antenna.
- Robust, compact aluminium housing, completely waterproof.
- Upto 96 MB of internal memory.

HIPER + Upto 1 GB of internal memory.

HIPER + USB communication port.

HIPER + Advanced performance center mounted Radio antenna to increase radio range without degradation of GPS signals.

HIPER + Integrated Bluetooth technology to communicate with the Bluetooth capable controller such as the Topcon FC-1000 or compaq Ipaq

GPS+; Why Topcon GPS offers more

Dual constellation Tracking

At Topcon, we developed GPS+ by taking the existing GPS system and improving it by adding more usable satellites (Glonass). Anyone who knows GPS knows that the more satellites you can track, the better your system can perform. Don't struggle with the hassle and frustration of not having enough satellites and having to wait for more.

The GLONASS system gives additional satellites to supplement the GPS satellites. At any given time this could be 2 to 5 additional satellites to supplement GPS. In tests, using GPS and GLONASS satellites has been proved to give better performance:

- Initialization times 2 times faster
- 30% increase in the time available to measure
- 60% increase in the places where measurements can be made.

These savings in time and accessibility result in increased GPS performance and productivity.

Hiper GGD and Hiper+ have the capability for Dual Constellation Tracking thanks to the new 112mm GPS+ board developed by Topcon. This has allowed such advanced technology to be packed in the compact housing of the Hiper.

Advanced technology

At its core of the Hiper GPS+ receivers is our **Paradigm chip** featuring 40 universal super channels that can each track all signals of either single frequency GPS, dual frequency GPS, or dual frequency GPS and GLONASS frequencies. With 40 channels we can track up to 20 GPS+ satellites at once. Something none of our competitors can do!

The Paradigm chip incorporates our new innovations in signal processing, **Advanced Multipath Reduction** and **Co-op Tracking**, making Topcon GPS+ the best in the field for under-canopy and low signal strength reception.

Co-op Tracking™

The ability to track satellites, and provide accurate positions is the main criteria for a GPS+ receiver. In today's environment with daily increasing interference factors that occupy our skies (radio & mobile phone communication, electricity power lines etc), the number of disturbance factors increases greatly. To offer the best possible tracking, we have developed the Co-op Tracking™ process (patent pending).

The principle of this process is that all satellites are used to determine the dynamics of both receiver and clock separately. Advantages of this revolutionary approach are:

- Even satellites with weak signals can be tracked and used
- Signals can be utilized even in an environment of high interference
- Cycle slips can be virtually eliminated
- Lost satellites can be re acquired almost instantaneously.

With Dual Constellation Tracking and Co-Op Tracking™, Topcon GPS+ takes your survey to places it's never been before - under canopy, high interference areas and under low elevation angles. Cycle slips will be reduced upto 40 times compared to other standard receivers, and initialization times are quicker then ever before. All this and with the highest possible accuracy. High precision solutions require L2 signal tracking. Co-op Tracking eliminates feeding signals across frequencies, tracking L2 independently for the highest precision.

Post Processing Software

Pinnacle and Topcon Tools

Topcon offers powerful software for planning and post processing. Pinnacle is the advanced package for processing both GPS and GLONASS data seamlessly, as if they came from the same satellite system. It's data management system shields data from inadvertent input while allowing it to be shared with different projects and applications. Pinnacle lets you design your network graphically and identify receiving data "channels" from any media accessible by your computer, such as Internet.

Topcon Tools is a stripped down version of Pinnacle, easy to use and learn.



	HIPER SERIES
DESCRIPTION	40 channel integrated GPS+ receiver/antenna with MINTER interface
TRACKING SPECIFICATIONS	
Tracking channels	L1: 40 L1 GPS. L1+L2: 20 GPS L1+L2 (GD), 20 GPS L1+L2+GLONASS (GGD) (Hiper GGD & Hiper+)
Signals Tracked	L1/L2 C/A and P Code & Carrier and GLONASS
PERFORMANCE	
Specifications	(1 sigma)
Baseline Accuracy	3mm + 0.5ppm for L1 + L2; 5mm + 0.5ppm for L1
RTK (OTF) Accuracy	10mm + 1.0ppm for L1 + L2; 15mm + 1.0ppm for L1
Cold Start	<60 seconds
Warm Start	<10 seconds
Reacquisition	<1 second
POWER SPECIFICATIONS	
Battery	Internal Lithium-Ion batteries plus 1 external power port
Operating Time	14+ hours
External power input	6 to 28 volts DC
Power consumption	Less than 4.2 watts (Hiper w/o modem less than 3.0 Watts)
ENVIRONMENTAL SPECIFICATIONS	
Enclosure	Aluminum extrusion, waterproof
Operating Temperature	-30°C to 60°C
Dimensions	W:159 x H:172 x D:88 mm
Weight	1.65 kg
GPS+ ANTENNA SPECIFICATIONS	
GPS / GLONASS Antenna	Integrated (Hiper GGD & Hiper+)
Antenna Type	Microstrip (Hiper/HiperGGD)/ Center-mount UHF antenna (Hiper+ only)
Ground Plane	Antenna on a flat ground plane
RADIO SPECIFICATIONS	
UHF Radio Modem	Internal Rx or External Tx/Rx
CDPD & GSM Modem	Optional model
WIRELESS COMMUNICATION	
Communication	Bluetooth® version 1.1 comp.**† (Hiper+ only)
I/O	
Communication Ports	4x serial (RS232)
Other I/O Signals	1pps, Event Marker
Status Indicator	4x3-color LEDs (Green, Red, Yellow), two-function keys (MINTER)
Control & Display Unit	External: FC-1000, Ranger, or other
MEMORY & RECORDING	
Internal Memory	96MB (Hiper/HiperGGD). 1 Gbytes (Hiper+ only)
Raw Data Recording	Up to 20 times per second (20Hz)
Data Type	Code and Carrier from L1 and L2, GPS and GLONASS
DATA OUTPUT	
Real time data outputs	RTCM SC104 version 2.1, 2.2, 2.3, CMR, CMR+
ASCII Output	NMEA 0183 version 2.2
Other Outputs	TPS format
Output Rate	Up to 20 times per second (20Hz)

Specifications are subject to change without notice. Performance specifications assume a minimum of 6 GPS or 7 GPS/GLONASS satellites above 15 degrees in elevation and adherence to procedures recommended by TPS in the appropriate manuals. In areas of high multipath, during periods of high PDOP and during periods of high Ionospheric activity performance may be degraded. Robust checking procedures are highly recommended in areas of extreme multipath or under dense foliage.

*Cinderella feature activates full receiver reception at GPS midnight every other Tuesday for 24 hours.

** Bluetooth® type approvals are country specific. Please contact your Topcon representative for more information.

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Other Topcon GPS+ Products



Legacy-E/H

The Legacy-E is developed around a full function Euro card design, which allows use of GPS and/or GLONASS L1 and L1/L2 signals. Legacy-H has dual frequency ability with GPS only.



GPS+ receiver GB-1000

New GPS+ receiver with full GPS and GLONASS capability, internal batteries, LCD display, Ethernet and USB ports, and removable Compact Flash.



PG-A1

The PG-A1 is a precision dual-frequency, dual-constellation antenna featuring precision micro center technology and an integrated ground plane to help eliminate errors caused by multipath. The PG-A1 was designed to accompany the Topcon modular receivers such as the Legacy-E, Legacy-H Odyssey-RS and GB-1000.

More than 70 years of experience

For 70 years, Topcon has been a leading manufacturer in industrial, medical and positioning enhancement tools. This broad experience has created a basis for Topcon's wide product line for basically every positioning need, whether it's for construction or surveying applications.

For the construction industry, Topcon offers a complete range of innovative laser and sonic solutions, including industry leading products for interior, utility, general construction and machine control applications. For surveying applications, Topcon manufactures and supplies a complete range of optical measuring products, from digital and optical levels to theodolites and robotic total stations, and a full line of GPS+ satellite positioning solutions.

Product & Service support

To assure that your Topcon product maintains peak performance, your local Topcon dealer offers factory trained certified service technicians. And just in case service assistance isn't available in your area, our Europe wide network of Topcon offices, offer repair and return service policies second to none.

Innovation, not imitation

During the last decades, Topcon has brought many innovative solutions to the industry, that offer the contractor significant productivity increase and greater ease of use. That's the key to leadership, and the reason Topcon is the world's leading supplier of laser and surveying instruments. Some examples of unique Topcon technologies:

- Waterproof auto level
- The integrated total station, "The Guppy"
- The compact coaxial total station (GTS-1)
- World's First laser with beam scanning technology
- The first waterproof total station
- GreenBeam® visible construction lasers
- Automatic excavator control system
- World's First 3-D machine control (3D- MC™ LPS)
- 5" Grade laser with automatic alignment & remote control
- Horizontal self leveling laser with liquid compensator
- First robotic total station with instant beam lock system (GTS-800A and RC-2)
- First satellite-directed automatic 3D machine control system (3D-MC™ GPS)



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