

MAiNNAV International Corp.

11F, 293-1, Sec. 1, Zhongshan Rd., Banqiao City, Taipei 220, Taiwan, R.O.C. Tel:+886 2 8953-6616

Web:www.mainnav.com E-mail:info@mainnav.com Fax:+886 2 8951-8531

MG-550S manual



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MG-550S Manual

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.OVERVIEW

Mainnav's **MG-550S** GPS Receiver provides you various applications such as car navigation, marine navigation, mapping, surveying, security, agriculture and so on. It communicates with device (such as PocketPC or notebook) via compatible dual-channel through TTL and saves satellite data by built-in backup memory. Low power consumption technology enables **MG-550S** and your device to save more operating power. Furthermore, **MG-550S** can track up to 20 satellites at a time, re-acquire satellite signals in 100ms and update position data every second. Trickle-Power allows the unit to operate a fraction of the time, and Push-to-Fix permits user to have a quicker position fix even though the receiver stays off.

2. Product Features

The MG-550S provides a host of features that make it easy for integration and use

- 1) Fast acquisition: 20 parallel satellites acquisition
- 2) Advanced GPS chip: SiRF Star III
- 3) Fast TTFF: 200,000 effective correlators for fast TTFF at low signal levels
- 4) Built-in WAAS/EGNOS (Optional model for WAAS/EGNOS covered area) for accurate positioning result.
- 5) Quick Host start: Built-in rechargeable Lithium battery for backup ephemeris for quick hot start.
- 6) Support MNEA 0183V2.2 data protocol.
- 7) User initialization is not required.
- 8) A rechargeable battery sustains internal clock and memory.
- 9) Built-in Magnets for using on top of the car.
- 10) Water proof (1 meter) design for all weather.
- 11) Optional communication levels, TTL meet ordinary application and new fashions of connecting PDA with TTL output.

3. SPECIFICATIONS

Key future

Frequency L1, 1575.42 MHz

C/A Code 1.023 MHz chip rate

Channels 20

Sensitivity Acquisition: -144~ -149 dBm Tracking: -155~ -160dBm

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SiRF star III LP chip

Physical Dimension

1. Size: 57.5(W) x43(D) x 16(H) (mm)
2. Weight: 40g

Environmental Characteristics

- 1) Operating temperature: -40°C to +85°C(internal temperature).
- 2) Storage temperature: -45°C to +100°C.

Electrical Characteristics

- 1) Input voltage: +3.3 ~ 5.5 VDC without accessories.
- 2) Backup power: 3V Rechargeable Lithium cell battery, up to 230 hours (9.6 days) discharge.

GPS Performance

Acquisition :	20 satellites parallel
Tracks up to	12 satellites
Reacquisition :	0.1 sec., averaged
Snap Start:	3 sec, averaged
Hot start	6 sec., averaged
Warm start	38 sec., averaged
Cold start	42 sec., averaged
Position accuracy	(A) Non DGPS (Differential GPS) Position <10 M at 2D RMS Velocity 0.1 meters/second, with SA off Time 1 microsecond synchronized GPS time (B) DGPS (Differential GPS) Position 1 ~ 5 meter, typical Velocity 0.05 meter/second, typical
Dynamic Conditions	Altitude 18,000 meters (60,000 feet) max Velocity 515 meters / second (1000 knots) max Acceleration 4 G, max Jerk 20 meters/second, max

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Interfaces

- 1) Dual channel TTL compatible level, with user selectable baud rate (9600 default, 19200, 38400).
- 2) NMEA 0183 Version 2.2 ASCII output (GPGGA, GPGLL, GPGSA, GPGSV, GPRMC, GPVTG).
- 3) Real-time Differential Correction input (RTCM SC-104 message types 1, 5 and 9).
- 4) SiRF protocol.

Environmental Characteristics

- 3) Operating temperature: -40°C to +85°C(internal temperature).
- 4) Storage temperature: -45°C to +100°C.

Electrical Characteristics

- 3) Input voltage: +3.3 ~ 5.5 VDC without accessories.
- 4) Backup power: 3V Rechargeable Lithium cell battery, up to 230 hours (9.6 days) discharge.

4. Warranty

Mainnav values your business and always attempts to provide you greatest of service.

Our product warranty is to be free from defects in material and workmanship during the warranty period. If the product confirms to be defective in material within one year, **Mainnav** will be repair or replace the product.

All of our Products are warranted for one year, and accessory is warranted for six months. (Note: battery is warranted for 3 months). One way freightage is responsible for the customer.

The warranty does not cover:

1. Any product of serial number has been defaced modified or removed.
2. Damage, deterioration or malfunction resulting from accident, misuse, water or other acts of nature. Failure to follow instructions supplied with the product.

For Mainnav products sold outside of Taiwan, please contact your dealer (distributor) directly for warranty service.

5. NMEA Output Message

5.1 NMEA Record Description

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GPGGA Global positioning system fixed data GPGLL Geographic position: latitude/longitude GPGSA GNSS DOP and active satellites GPGSV GNSS satellites in view GPRMC Recommended minimum specific GNSS data GPVTG Course over ground and ground speed

5.2. Global Positioning System Fix Data (GGA) Table 5-2 contains the values for the following example

\$GPGGA,161229.487,3723.2475,N,12158.3416,W,1,07,1.0,9.0,M, , , ,0000*18 Table

5-2 GGA Data Format Name Example Units Description

Message ID \$GPGGA GGA protocol header UTC Time 161229.487 hhmmss.sss
 Latitude 3723.2475 ddmm.mmmm N/S Indicator N N=north or S=south Longitude
 12158.3416 dddmm.mmmm E/W Indicator W E=east or W=west Position Fix Indicator
 1 See Table 5-3 Satellites Used 07 Range 0 to 12 HDOP 1.0 Horizontal Dilution of
 Precision MSL Altitude 9.0 Meters

Name Example Units Description

Units M Meters Geoid Separation Meters Units M Meters Age of Diff. Corr.
 second Null fields when DGPS is not used Diff. Ref. Station ID 0000 Checksum
 *18 <CR> <LF> End of message termination

Position Fix Indicator Value Description

0 0 Fix not available or invalid 1 GPS SPS Mode, fix valid 2 Differential GPS, SPS
 Mode, fix valid 3
 GPS PPS Mode, fix valid

5.3. Geographic Position with Latitude/Longitude (GLL) Table 5-3 contains the values for the following example.

\$GPGLL,3723.2475,N,12158.3416,W,161229.487,A*2C Table

5-4 GLL Data Name Example Units Description

Message ID \$GPGLL GLL protocol header Latitude 3723.2475 ddmm.mmmm N/S

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Indicator N N/S Indicator N N=north or S=south Longitude 12158.3416
dddmm.mmmm E/W Indicator W E=east or W=west UTC Position 161229.487
hhmmss.sss Status A A=data valid or V=data not valid Checksum *2C <CR> <LF>
End of message termination

5.4. GNSS DOP and Active Satellites (GSA) Table 5-4 contains the values for the following example.

\$GPGSA,A,3,07,02,26,27,09,04,15, , , , , ,1.8,1.0,1.5*33 Table 5-5

GSA Data Format	Name	Example	Units	Description
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Message ID	\$GPGSA	GSA protocol header	Mode 1	A	See Table 5-6	Mode 2	3	See Table 5-7										
Satellite Used(1)	07	Sv on Channel 1	Satellite Used(1)	02	Sv on Channel 2	Satellite Used	Sv on Channel 12	PDOP	1.8	Position Dilution of Precision	HDOP	1.0	Horizontal Dilution of Precision	VDOP	1.5	Vertical Dilution of Precision	Checksum	*33
<CR> <LF> End of message termination																		

Name Example Units Description

Message ID	\$GPRMC	RMC protocol header	UTC Time	161229.487	hhmmss.sss	Status	A	A=data valid or V=data not valid	Latitude	3723.2475	ddmm.mmmm	N/S	Indicator	N	N=north or S=south	Longitude	12158.3416	dddmm.mmmm	E/W	Indicator	W	E=east or W=west	Speed	Over 0.13	knots	Ground Course	Over 309.62	degrees	True Ground	Date 120598	ddmmyy	Magnetic	degrees	E=east or W=west	Variation(1)	Checksum	*10	<CR> <LF> End of message termination
NOTE: SiRF Technology Inc. does not support magnetic declination. All “course over ground” data are geodetic WGS84 directions.																																						

5.5 Course over Ground and Ground Speed (VTG) Table 5-10 contains the values for the following example.

\$GPVTG,309.62,T, ,M,0.13,N,0.2,K*6E