

Marine GPS Locator

MODEL: MR-700B

Concinnity and Solid design for GPS Marine Locator
with Full Waterproof

Garmin compatible Marine GPS Receiver



MR-700B is Marine GPS receiver. Its excellent performance easily conquers the most difficult tasks. In addition , it provides various functions to meet customers' needs.**MR-700B** It provides marvelous navigation performance under dynamic conditions in areas with limited sky view like urban canyons.

Features

- 16 channel ANTARIS 4 positioning engine
- Ultra high sensitivity to -158 dBm
- Supports DGPS, WAAS, EGNOS and MSAS
- Supports Power saving modes
- 15 μ A backup current
- Ultra low power consumption 39mA

Possible Application:

- Marine Navigation.
- Fleet Management.
- Mileage Management.
- Tracking devices/system.
- Data logging for marine Navigation.
- Mapping devices for PC & Pocket PC.
- Marine Navigation or touring devices.
- AVL and Location-Based service system.

Specifications:

| Specifications | Parameter | Description |
|------------------------------|---------------|---|
| General | | L1 frequency, C/A code(SPS), 16 Independent tracking channel |
| Sensitivity | | -158 dBm (tracking) -148dBm (Acquisition/Reacquisition) |
| Accuracy | Position | 2.5 meters CEP / 2.0 meters CEP |
| | Time | 50 nanosecond rms (1 PPS) |
| Acquisition | Cold start | 45 sec. (typical) |
| | Warm start | 33 sec. (typical) |
| | Hot start | 3.5 sec. (typical) |
| Reacquisition | | 100 ms typical (signal reacquisition) |
| Dynamics | Altitude | 18,000 meters (60,000 Feet) max |
| | Velocity | 515 meters /sec (1000 Knots) max. |
| Operation Temperature | | -40°C to +85°C |
| Storage Temperature | | -45°C to +90°C |
| Operating Humidity | | 0% to 95% RH, non condensing |
| Water Resistance | | 100% waterproof |
| Primary Power | | 7V ~ 40V DC |
| Power Consumption | | 60mA |
| Protocol | | NMEA, UBX (ublox proprietary), RTCM |
| Signal level | | RS-232(standard), & RS-422 optional |
| NMEA Message | | GGA, GLL, GSA, GSV, RMC, and VTG |
| DGPS Capability | | Direct RTCM-SC104 interface |
| EMI filter | | Rejects power line interference |
| Power cable | | UL 2464/26Awg 10M |
| Enclosure | | High impact, corrosion-proof polycarbonate resin |
| Connector | | Open |
| Dimensions | GPS Locator | 90.5mm(Dia.) × 108.5mm(H) |
| | Mounting Base | 70mm(W) × 41.5mm(H) optional FB1 & FB2 & FB3 |
| Weight | | 200 grams |
| Standard Mounting | | Concinnity and Solid design |

* This specification is subject to change without prior notice

User selectable datum *Pole mount to 1"-14 UNS threaded mast

RS232 I/O Connection

| I/O PIN & CABLE | |
|----------------------|--------------|
| Wire | Function |
| White (白) | Receive |
| Green(綠) | Transmit |
| Yellow(黃) | Ground or NG |
| Bare Braid(隔離地線/熱縮黑) | Earth/GND |
| Blue(藍) | 1PPS |
| Purplr(紫) | Ground or NG |
| Black(黑) | Power- |
| Red(紅) | Power+ |

RS422 I/O Connection

| Wire | Function |
|----------------------|-----------------------|
| White (R+) 白 | Differential input + |
| Green (T-) 綠 | Differential output - |
| Yellow (T+) 黃 | Differential output + |
| Purplr (R-) 紫 | Differential input - |
| Blue 藍 | 1PPS |
| Bare Braid(隔離地線/熱縮黑) | Earth/GND |
| Black (-) 黑 | Power- |
| Red (+) 紅 | Power+ |

Output NMEA Messages

Table 3 NMEA-0183 V2.3 Output Messages

| NMEA Sentence | Description |
|---------------|--|
| GGA (default) | Global Positioning System Fixed Data |
| GLL (default) | Geographic Position - Latitude/Longitude |
| GSA (default) | GNSS DOP and Active Satellites |
| GSV (default) | GNSS Satellites in View |
| RMC (default) | Recommended Minimum Specific GNSS data |
| VTG (default) | Course Over Ground and Ground Speed |
| ZDA (default) | Time and Date |

GGA--- Global Positioning System Fixed Data

Table 4 contains the values for the following example:

\$GPGGA,092725.00,4717.11399,N,00833.91590,E,1,8,1.01,499.6,M,48.0,M,,0*5B

Table 4 GGA Data Format

| Name | Example | Units | Description |
|---------------------------------|-------------|--------|---|
| Message ID | \$GPGGA | | GGA protocol header |
| UTC Time | 092725.00 | | hhmmss.ss, Current time |
| Latitude | 4717.11399 | | ddmm.mmmmm, Degrees + minutes |
| N/S Indicator | N | | N=north or S=south |
| Longitude | 00833.91590 | | dddmm.mmmmm, Degrees + minutes |
| E/W Indicator | E | | E=east or W=west |
| Position Fix Indicator | 1 | | See Table 5 |
| Satellites Used | 8 | | Range 0 to 12 |
| HDOP | 1.01 | | Horizontal Dilution of Precision |
| MSL Altitude | 499.6 | m | |
| Units | M | meters | Meters (fixed field) |
| Geoid Separation | 48.0 | m | |
| Units | M | meters | Meters (fixed field) |
| Age of Differential Corrections | | second | Blank (Null) fields when DGPS is not used |
| Diff. Ref. Station ID | 0 | | |
| Checksum | *5B | | |
| <CR> <LF> | | | End of message termination |

Table 5 Position Fix Indicator

| Value | Description |
|-------|----------------------|
| 0 | No fix or invalid |
| 1 | Standard GPS (2D/3D) |
| 2 | Differential GPS |
| 6 | Estimated (DR) Fix |

GLL--- Geographic Position – Latitude/Longitude

Table 6 contains the values for the following example:

\$GPGLL,4717.11364,N,00833.91565,E,092321.00,A,A*60

Table 6 GLL Data Format

| Name | Example | Units | Description |
|---------------|-------------|-------|--|
| Message ID | \$GPGLL | | GLL protocol header |
| Latitude | 4717.11364 | | ddmm.mmmmm, Degrees + minutes |
| N/S Indicator | N | | N=north or S=south |
| Longitude | 00833.91565 | | dddmm.mmmmm, Degrees + minutes |
| E/W Indicator | E | | E=east or W=west |
| UTC Time | 092321.00 | | hhmmss.ss, Current time |
| Status | A | | V = Data Invalid / Receiver Warning, A=Data Valid |
| Status | A | | N=No Fix, A=Autonomous GNSS Fix, D=Differential GNSS Fix, E=Estimated/Dead Reckoning Fix |
| Checksum | *60 | | |
| <CR> <LF> | | | End of message termination |

GSA---GNSS DOP and Active Satellites

Table 7 contains the values for the following example:

\$GPGSA,A,3,23,29,07,08,09,18,26,28,,,,,1.94,1.18,1.54*0D

Table 7 GSA Data Format

| Name | Example | Units | Description |
|---------------------|---------|-------|--|
| Message ID | \$GPGSA | | GSA protocol header |
| Mode 1 (Smode) | A | | See Table 8 |
| Mode 2 (Fix Status) | 3 | | See Table 9 |
| Satellite Used | 23 | | SV on Channel 1 |
| Satellite Used | 29 | | SV on Channel 2 |
| | | | Repeated for each channel |
| Satellite Used | | | Sv on Channel 12 |
| PDOP | 1.94 | | Position Dilution of Precision (00.0 to 99.99) |
| HDOP | 1.18 | | Horizontal Dilution of Precision (00.0 to 99.99) |

| | | | |
|-----------|------|--|--|
| VDOP | 1.54 | | Vertical Dilution of Precision (00.0 to 99.99) |
| Checksum | *0D | | |
| <CR> <LF> | | | End of message termination |

Table 8 Mode 1 (Smode)

| Value | Description |
|-------|---|
| M | Manual- forced to operate in 2D or 3D mode |
| A | Automatic-allowed to automatically switch 2D/3D |

Table 9 Mode 2 (Fix Status)

| Value | Description |
|-------|-------------------|
| 1 | Fix not available |
| 2 | 2D Fix |
| 3 | 3D Fix |

GSV---GNSS Satellites in View

Table 10 contains the values for the following example:

\$GPGSV,3,1,10,23,38,230,44,29,71,156,47,07,29,116,41,08,09,081,36*7F

\$GPGSV,3,2,10,10,07,189,,05,05,220,,09,34,274,42,18,25,309,44*72

\$GPGSV,3,3,10,26,82,187,47,28,43,056,46*77

Table 10 GSV Data Format

| Name | Example | Units | Description |
|--------------------|---------|--------|--|
| Message ID | \$GPGSV | | GSV protocol header |
| Number of Messages | 3 | | Total number of GPGSV messages being output , Range 1 to 3 |
| Message Number | 1 | | Number of this message, Range 1 to 3 |
| Satellites in View | 10 | | |
| Satellite ID | 23 | | SV ID (GPS: 1-32, SBAS 33-64 (33=PRN120)) |
| Elevation | 38 | degree | Maximum 90 |
| Azimuth | 230 | degree | Range 0 to 359 |
| SNR (C/No) | 44 | dBHz | Range 0 to 99, null when not tracking |
| | | | Data of 2nd, 3rd Satellite (same as above) |
| Satellite ID | 29 | | SV ID |
| Elevation | 71 | degree | Maximum 90 |
| Azimuth | 156 | degree | Range 0 to 359 |

| | | | |
|------------|-----|------|---------------------------------------|
| SNR (C/No) | 47 | dBHz | Range 0 to 99, null when not tracking |
| Checksum | *7F | | |
| <CR> <LF> | | | End of message termination |

RMC---Recommended Minimum Specific GNSS Data

Table 11 contains the values for the following example:

\$GPRMC,083559.00,A,4717.11437,N,00833.91522,E,0.004,77.52,091202,,,A*57

Table 11 RMC Data Format

| Name | Example | Units | Description |
|----------------------------------|-------------|---------|--|
| Message ID | \$GPRMC | | RMC protocol header |
| UTC Time | 083559.00 | | hhmmss.ss, Current time |
| Status | A | | A=data valid or V=data not valid |
| Latitude | 4717.11437 | | ddmm.mmmmm, Degrees + minutes |
| N/S Indicator | N | | N=north or S=south |
| Longitude | 00833.91522 | | dddmm.mmmmm, Degrees + minutes |
| E/W Indicator | E | | E=east or W=west |
| Speed | 0.004 | knots | Speed Over Ground |
| COG | 77.52 | degree | Course Over Ground (true) |
| Date | 091202 | | Ddmmyy, Current Date in Day, Month Year format |
| Magnetic Variation | | degrees | E=east or W=west (Not being output by receiver) |
| Magnetic variation E/W indicator | | | Not being output by receiver |
| Mode Indicator | A | | N=No Fix, A=Autonomous GNSS Fix, D=Differential GNSS Fix, E=Estimated/Dead Reckoning Fix |
| Checksum | *53 | | |
| <CR> <LF> | | | End of message termination |

VTG---Course Over Ground and Ground Speed

Table 12 contains the values for the following example:

\$GPVTG,77.52,T,,M,0.004,N,0.008,K,A*06

Table 12 VTG Data Format

| Name | Example | Units | Description |
|------------|---------|---------|---|
| Message ID | \$GPVTG | | VTG protocol header |
| COG | 77.52 | degrees | Course Over Ground (true) |
| | T | | True |
| COG | | degrees | Course Over Ground (maganetic) (Not being output by receiver) |
| | M | | Magnetic |
| Speed | 0.004 | knots | Speed over ground |
| Units | N | | Knots |
| Speed | 0.008 | km/hr | Speed over ground |
| Units | K | | Kilometer per hour |
| Mode | A | | N=No Fix, A=Autonomous GNSS Fix, D=Differential GNSS Fix, E=Estimated/Dead Reckoning Fix |
| Checksum | *0B | | |
| <CR> <LF> | | | End of message termination |

ZDA---Time and Date

Table 13 contains the values for the following example:

\$GPZDA,082710.00,16,09,2002,00,00*64

Table 13 ZDA Data Format

| Name | Example | Units | Description |
|-----------------------|-----------|---------|---|
| Message ID | \$GPZDA | | ZDA protocol header |
| UTC Time | 081727.00 | degrees | hhmmss.ss |
| Day | 16 | | 01 to 31 |
| Month | 09 | | 01 to 12 |
| Year | 2002 | | 4 digit year |
| Local zone hours | 00 | | (Not being output by receiver) (fixed to 00) |
| Local zone minutes | 00 | | (Not being output by receiver) (fixed to 00) |
| Checksum | *64 | | |
| <CR> <LF> | | | End of message termination |