

Marine GPS Receiver

MODEL: MR-700M

MTK MT3339 Chip GPS Marine Receiver with Full Waterproof
Garmin compatible Marine GPS Receiver



Key Feature:

- MTK high Sensitivity sokution MT3339
- Very Fast TTFF
- Up to 10Hz update rate
- Standard and NMEA-0183 output
- User selectable baud rate
- Capable of SBAS (WAAS,EGNOS,MSAS)
- Support AGPS
- Support 66 channel gps

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 1575.42Mhz, C/A code(SPS), Support 66 channels (22 Tracking, 66 Acquisition)
Update rate		1Hz Default , up to 10Hz
Accuracy Sensitivity	Position	3M (2D RMS)
	SBAS	2.5m (depends on accuracy of correction data)
	Tracking Cold start	-162dBm, up to -165dBm (with external LNA) -143.5dBm, up to -148dBm (with external LNA)
Acquisition	Cold start	32s (typical) without AGPS <15s (typical) with AGPS (hybrid ephemeris prediction)
	Hot start (Open Sky)	< 1s (typical)
	Hot start (Indoor)	< 30s
Reacquisition		100 ms typical (signal reacquisition)
Dynamics	Altitude	18000m max.
	Velocity	515 m/sec.

BJTEK Navigation Inc.	Vibration	4G max.	https://www.bjnav.com/
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		9V ~ 70V DC	
Power Consumption		<100mA	
Protocol		NMEA-0183 v3.01 baud rate default 4800	
Signal level		RS-232(standard),USB & RS-422 optional	
NMEA Message		GGA, GLL, GSA, GSV, RMC, and VTG	
EMI filter		Rejects power line interference	
Power cable		UL 2464/24Awg , 15M-OPEN	
Enclosure		High impact, corrosion-proof polycarbonate resin	
Connector		45CM-7PIN(M)	
Dimensions	GPS Locator	90.5mm(Dia.) × 108.5mm(H)	
	Mounting Base	70mm(W) × 41.5mm(H)	
Weight		200 grams	
Standard Mounting		Concinnity and Solid design	

* This specification is subject to change without prior notice

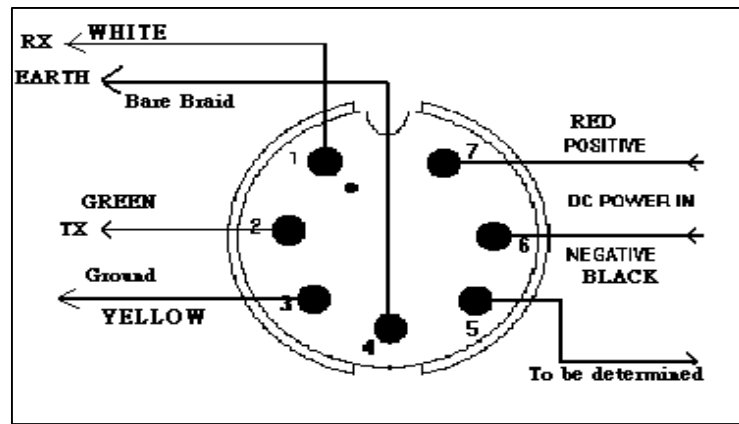
User selectable datum *Pole mount to 1"-14 UNS threaded mast



RS232 I/O Connection

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

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



剥捻线 (7C+编织) 27±3 3±1 热缩套管: Ø6.0X20L (黑色) 15000±500 20±2 编织网套热缩套管: Ø2.0X24L (黑色) 7P母頭組裝式 黑色O-ring PIN7紅 PIN1白 PIN6黑 PIN2綠 PIN3黃 PIN5藍 PIN4編織網 正视图

接線圖

7P膠殼	顏色	COLOR
PIN1	白色	WHITE
PIN2	綠色	GREEN
PIN3	黃色	YELLOW
PIN4	編織網	BARE COPPER BRAI
PIN5	藍色	BLUE
PIN6	黑色	BLACK
PIN7	紅色	RED

NOTES:

1. WIRE:UL 2464 24AWG/7C(紅黃綠白黑紫藍)+ 箔鋁+編織網(4/16/0.10) OD:6.0±0.1MM 外被黑色半霧面
2. 7PIN 航空接頭 母頭焊接組裝式(六件式)
3. 熱縮套管Ø6.0X20L+Ø2.0X24L黑色

UNIT SCALE PROJECTION DRAWN BY CHECKED APPROVED TOLERANCE PARTS NO. DWG. NO. REV. MM NOT 曾雪軍 2013.01.04 7P防水母頭 CABLE A3

Software interface

5.1 NMEA output message

Table 5.1-1 NMEA output message

NMEA record	Description
GGA	Global positioning system fixed data
GLL	Geographic position - latitude/longitude
GSA	GNSS DOP and active satellites
GSV	GNSS satellites in view
RMC	Recommended minimum specific GNSS data
VTG	Course over ground and ground speed

- **GGA--- Global Positioning System Fixed Data**

Table 5.1-2 contains the values for the following example:

```
$GPGGA,053740.000,2503.6319,N,12136.0099,E,1,08,1.1,63.8,M,15.2,M,,0000*64
```

Table 5.1-2 GGA Data Format

Name	Example	Units	Description
Message ID	\$GPGGA		GGA protocol header
UTC Time	053740.000		hhmmss.sss
Latitude	2503.6319		ddmm.mmmm
N/S indicator	N		N=north or S=south
Longitude	12136.0099		dddmm.mmmm
E/W Indicator	E		E=east or W=west
Position Fix Indicator	1		See Table 5.1-3
Satellites Used	08		Range 0 to 12
HDOP	1.1		Horizontal Dilution of Precision
MSL Altitude	63.8	meters	
Units	M	meters	
Geoid Separation	15.2	meters	
Units	M	meters	
Age of Diff. Corr.		second	Null fields when DGPS is not used
Diff. Ref. Station ID	0000		
Checksum	*64		

Table 5.1-3 Position Fix Indicators

Value	Description
0	Fix not available or invalid
1	GPS SPS Mode, fix valid
2	Differential GPS, SPS Mode, fix valid
3-5	Not supported
6	Dead Reckoning Mode, fix valid

● **GLL--- Geographic Position – Latitude/Longitude**

Table 5.1-4 contains the values for the following example:

\$GPGLL,2503.6319,N,12136.0099,E,053740.000,A,A*52

Table 5.1-4 GLL Data Format

Name	Example	Units	Description
Message ID	\$GPGLL		GLL protocol header
Latitude	2503.6319		ddmm.mmmm
N/S indicator	N		N=north or S=south
Longitude	12136.0099		dddmm.mmmm
E/W indicator	E		E=east or W=west
UTC Time	053740.000		hhmmss.sss
Status	A		A=data valid or V=data not valid
Mode	A		A=autonomous, D=DGPS, E=DR
Checksum	*52		
<CR> <LF>			End of message termination

● **GSA---GNSS DOP and Active Satellites**

Table 5.1-5 contains the values for the following example:

\$GPGSA,A,3,24,07,17,11,28,08,20,04,....,2.0,1.1,1.7*35

Table 5.1-5 GSA Data Format

Name	Example	Units	Description
Message ID	\$GPGSA		GSA protocol header
Mode 1	A		See Table 5.1-6
Mode 2	3		See Table 5.1-7
ID of satellite used	24		Sv on Channel 1
ID of satellite used	07		Sv on Channel 2
....		

PDOP	2.0		Sv on Channel 12
HDOP	1.1		Position Dilution of Precision
VDOP	1.7		Horizontal Dilution of Precision
Checksum	*35		Vertical Dilution of Precision
<CR> <LF>			End of message termination

Table 5.1-6 Mode 1

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

Table 5.1-7 Mode 2

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

● GSV---GNSS Satellites in View

Table 5.1-8 contains the values for the following example:

```
$GPGSV,3,1,12,28,81,285,42,24,67,302,46,31,54,354,,20,51,077,46*73
```

```
$GPGSV,3,2,12,17,41,328,45,07,32,315,45,04,31,250,40,11,25,046,41*75
```

```
$GPGSV,3,3,12,08,22,214,38,27,08,190,16,19,05,092,33,23,04,127,*7B
```

Table 5.1-8 GSV Data Format

Name	Example	Units	Description
Message ID	\$GPGSV		GSV protocol header
Total number of messages ¹	3		Range 1 to 3
Message number ¹	1		Range 1 to 3
Satellites in view	12		
Satellite ID	28		Channel 1 (Range 01 to 32)
Elevation	81	degrees	Channel 1 (Range 00 to 90)
Azimuth	285	degrees	Channel 1 (Range 000 to 359)
SNR (C/No)	42	dB-Hz	Channel 1 (Range 00 to 99, null when not tracking)
Satellite ID	20		Channel 4 (Range 01 to 32)
Elevation	51	degrees	Channel 4 (Range 00 to 90)
Azimuth	077	degrees	Channel 4 (Range 000 to 359)
SNR (C/No)	46	dB-Hz	Channel 4 (Range 00 to 99, null when not tracking)
Checksum	*73		
<CR> <LF>			End of message termination

● **RMC---Recommended Minimum Specific GNSS Data**

Table 5.1-9 contains the values for the following example:

\$GPRMC,053740.000,A,2503.6319,N,12136.0099,E,2.69,79.65,100106,,,A*53

Table 5.1-9 RMC Data Format

Name	Example	Units	Description
Message ID	\$GPRMC		RMC protocol header
UTC Time	053740.000		hhmmss.sss
Status	A		A=data valid or V=data not valid
Latitude	2503.6319		ddmm.mmmm
N/S Indicator	N		N=north or S=south
Longitude	12136.0099		dddmm.mmmm
E/W Indicator	E		E=east or W=west
Speed over ground	2.69	knots	True
Course over ground	79.65	degrees	
Date	100106		ddmmyy
Magnetic variation		degrees	
Variation sense			E=east or W=west (Not shown)
Mode	A		A=autonomous, D=DGPS, E=DR
Checksum	*53		
<CR> <LF>			End of message termination

● **VTG---Course Over Ground and Ground Speed**

Table 5.1-10 contains the values for the following example:

\$GPVTG,79.65,T,M,2.69,N,5.0,K,A*38

Table 5.1-10 VTG Data Format

Name	Example	Units	Description
Message ID	\$GPVTG		VTG protocol header
Course over ground	79.65	degrees	Measured heading
Reference	T		True
Course over ground		degrees	Measured heading
Reference	M		Magnetic
Speed over ground	2.69	knots	Measured speed
Units	N		Knots
Speed over ground	5.0	km/hr	Measured speed
Units	K		Kilometer per hour

Mode	A		A=autonomous, D=DGPS, E=DR
Checksum	*38		
<CR> <LF>			End of message termination

5.2 Proprietary NMEA input message

Please refer to MTK proprietary message.