

Model: TK-1722 GPS Receiver

USER'S GUIDE

uN3010 Single-Chip GPS Receiver Series



The objective of The TK-1722 User's Guide is to help users to understand the properties of TK-1722 thoroughly and, therefore, obtain the maximum performance from the module easily. This document describes and provides useful information of the TK-1722 GPS module, which includes the functions of pins on the module, configuration setting and utility. It guides users to understand the capability of the module and helps to successfully integrate the TK-1722 into users' GPS systems.

Each chapter is one of the pieces for the module and carries its own purpose.

Title: TK-1722

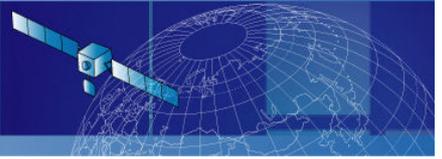
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All specifications subject to change without prior notice.



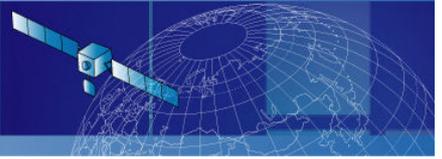


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Chapter 1 Introduction

TK-1722 is a high-sensitivity GPS receiver module of low cost. With built-in and high-gain LNA and filter, the GPS engine board of low power consumption and 20 channels is best suitable for GPS-enabled handheld or AVL applications. Its compact size factor and SMT type pads allow for automatic assembly and soldering.

TK-1722 is designed to be applied as part of integrated system, which includes but not limited to PND (Personal Navigation Device), PVT (Position-Velocity-Time) system, GPS-mouse, GPS Bluetooth Receiver and complex wireless applications such as systems with GSM or GPRS transmission-enabled tracking devices. The TK-1722 GPS module is the best candidate for systems that requires stable performance, excellent start-up time, high sensitivity, low power consumption, positioning accuracy and/or compact size for placement.

Should you have any technical enquiry, please feel free to contact us.

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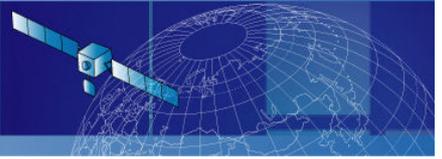
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Please prepare the following information as much as possible that may help us to answer your question as soon as possible:

1. Simple description of your application
2. Specifications of the antenna that is connected to the module;
3. Description of failure including the environment where the module was used by text and/or figures;
4. Contact information: name, address, phone number, and e-mail address.

All specifications subject to change without prior notice.





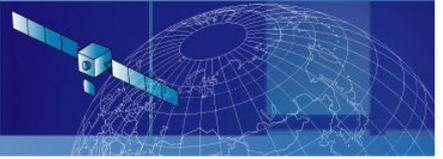
1.1 Specifications

TK-1722

PHYSICAL CONSTRUCTION		PERFORMANCE	
Dimension	L22.4 x W17.0 x H2.9 mm	Sensitivity	-159dbm
Weight	3 gram	Receiver architecture	20 parallel channels
Receiving frequency	1575.42MHZ; C/A code	Start-up time	Hot start < 2 sec
Mounting	SMT type with 28 stamp holes (surface mount pads)		Warm start 30 sec
Construction	Full EMI shielding		Cold start 38 sec
ENVIRONMENTAL CONDITIONS		Position accuracy	Autonomous 3.0 m
Temperature	Operating: -30 ~ +85 °C	Velocity	<515 m/s
	Storage: -40 ~ +85 °C	Altitude	<18,000 m
COMMUNICATION		Update Rate	1 Hz
Protocol	NMEA0184 V3.00, RTCM	Power Supply	3.3V +- 5%
Signal level	UART @ 3.3V	Current Consumption	Acquisition: 53 mA
INTERFACE CAPABILITY			Tracking
Output Sentences	Standard	9600 bps (default) & 4800/9600/38400/57600/115200 bps are adjustable	
	Option		

All specifications subject to change without prior notice.





Chapter 2 Pin Assignment

2.1 Pin Assignment

Figure 2.1 shows the pin definitions of TK-1722. Table 2.1 describes the corresponding definitions for pins.

1	TX_B	TIME PULSE	28
2	RX_B	NC	27
3	TX_A	NC	26
4	RX_A	NC	25
5	NC	NC	24
6	VCC	GPI08	23
7	GND	GPI07	22
8	V1.8	GPI03	21
9	NC	NC	20
10	RESET	VANT	19
11	VBAT	VCC_RF	18
12	BOOT	RFGND	17
13	GND	RFIN	16
14	GND	RFGND	15

Figure 2.1 TK-1722 Pin definitions

Pin	Name	Type	Description
1	TX_B	O	CMOS level asynchronous output for UART B
2	RX_B	I	CMOS level asynchronous input for UART B
3	TX_A	O	CMOS level asynchronous output for UART A
4	RX_A	I	CMOS level asynchronous input for UART A PULL HIGH is required (please refer to p.6 for reference design)
5	NC		None
6	VCC	P	Main power input (3.0 –3.6VDC)
7	GND	P	Ground
8	V1.8		1.8V DC Output
9	NC		None
10	RESET	I	Keep floating (System Reset, active low)
11	VBAT	P	Backup Battery Input (1.8 ~ 3.6VDC)
12	BOOT	I	Keep floating (For internal manufacturing use)
13	GND	P	Ground
14	GND	P	Ground
15	RFGND	RF	RF ground
16	RFIN	RF	RF input

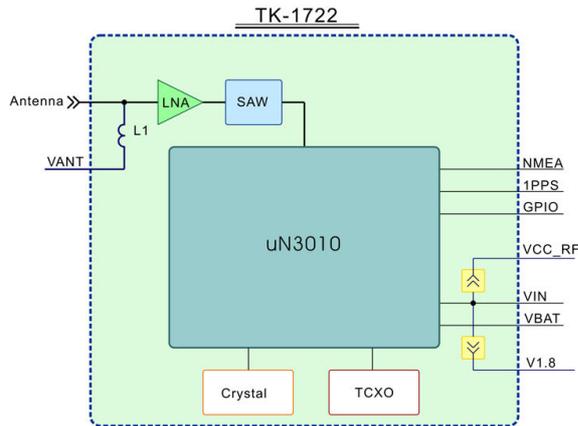
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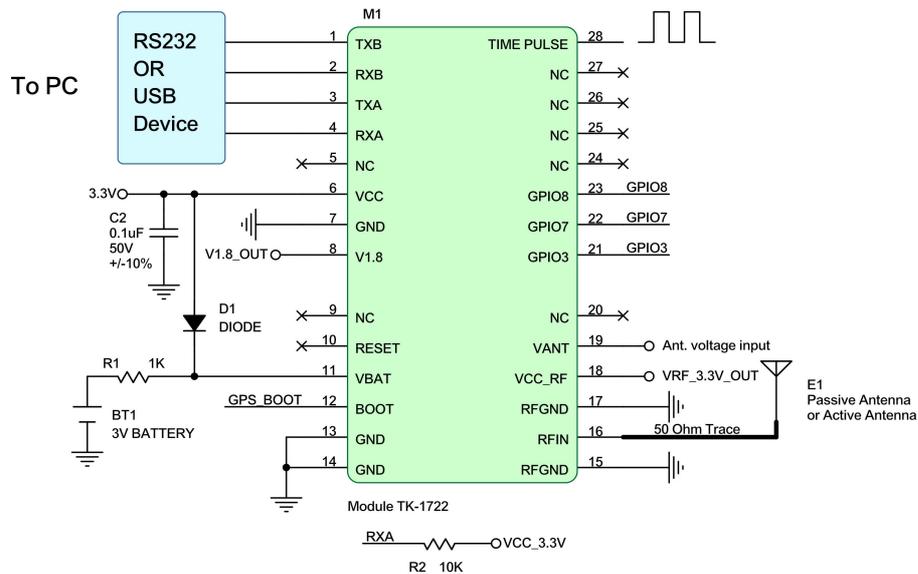


17	RFGND	RF	RF ground
18	VCC_RF	P	2.9VDC Output
19	VANT	P	External active antenna power input (3.0 –3.3VDC)
20	NC		None
21	GPIO3		GPIO
22	GPIO7		GPIO
23	GPIO8		GPIO
24	NC		None
25	NC		None
26	NC		None
27	NC		None
28	TIME PULSE	O	1 PPS output

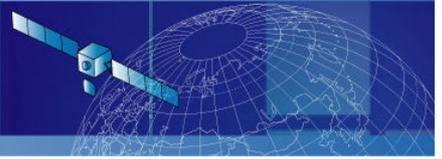
2.2 Block Diagram



2.3 Reference Design



All specifications subject to change without prior notice.



Chapter 3 Operating GPS Utility

GPS Locator Utility V2.90 is the latest utility for configuring the GPS settings of SANAV GPS receivers. The application software can be found in the CD (TK-1722\Utility\Setup) and the password is in License.txt. Double click on the Setup.exe and follow the installation procedures. Below shows the instructions of how to use this software, with the assumption that you have successfully installed GPS Locator Utility.

3.1 Connecting Com Port

Select “Com port” in the Port Setting → Select “Baud rate” → Select “TK Series” in the Command Setting → Click on “Connect”.

The screenshot shows the GPS Locator Utility 2.90 interface. The 'PortSetting' dialog box is the central focus, with the following settings:

- Port Setting:** Comm port: COM1, Baud rate: 4800.
- Command Setting:** Antaris 4, SV3301, SIRF III, TK Series.

Annotations in the image include:

- A red arrow pointing to 'COM1' with the text 'Select correct Com port'.
- A green arrow pointing to '4800' with the text 'Select Com Port'.
- A red arrow pointing to 'TK Series' with the text 'Select TK Series'.

All specifications subject to change without prior notice.



3.2 User Setting (NMEA Output)

Select GPS output sentences you need in the “NMEA Output” → Select “Baud rate” → Check the figure of “RS-232 Bandwidth” → Click on “Set”.

The indicator of the “RS-232 Bandwidth” should not exceed 100%.

The screenshot shows the 'User Setting' window of the GPS Locator Utility 2.90. The 'NMEA Output' section has several checkboxes: GGA, GLL, GSA, GSV, RMC, VTG, ZDA, and DTM. The 'Port Setting' section shows 'Baud Rate' set to 4800 and 'RS-232 Bandwidth' at 106.7%. A red box highlights the NMEA checkboxes with the text 'Select GPS output sentences'. A green box highlights the 'Baud Rate' dropdown with the text 'Select baud rate'. A red box highlights the 'RS-232 Bandwidth' value with the text 'Notice the figure'. Other windows visible include 'Map View', 'Tracking View', 'Channel Signal Level View', 'Terminal View', and 'Measured Navigation Message View'.

All specifications subject to change without prior notice.





3.3 User Setting (Restart)

Restarting the unit by selecting and setting the restart modes.

Select among “Restart” modes → Click on “Set”.

Select “Restart”

Select restart settings

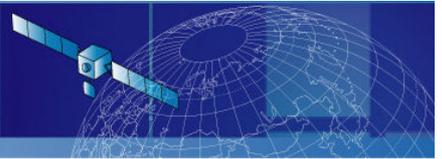
Channel	1	2	3	4	5	6	7	8
SV Number	27	25	07	19	13	16	23	06
Elevation	21	51	31	78	36	26	35	44
Azimuth	321	321	322	298	269	065	228	033
SN Ratio	40	44	41	44	44	42	42	43
Used in Position	0	X	X	X	X	X	X	X

```

$GPRMC,074622.000,A,2457.8108,N,12125.5391,E,0.0,0.0,0.15
$GPGSV,3,1,12,27,21,321,40,25,51,321,44,07,30,322,41,19,78,2
$GPGSV,3,2,12,13,36,269,44,16,27,065,42,23,35,228,42,06,44,0
$GPGSV,3,3,12,03,57,021,45,31,10,137,38,11,18,196,40,42,54,1
$GPGGA,074623.000,2457.8108,N,12125.5391,E,1.12,0.9,96.02
$GPRMC,074623.000,A,2457.8108,N,12125.5391,E,0.0,0.0,0.15
$GPGSV,3,1,12,27,21,321,40,25,51,321,44,07,30,322,41,19,78,2
$GPGSV,3,2,12,13,36,269,44,16,27,065,42,23,35,228,42,06,44,0
$GPGSV,3,3,12,03,57,021,45,31,10,137,38,11,18,196,40,42,54,1
$GPGGA,074624.000,2457.8108,N,12125.5391,E,1.12,0.9,96.02
$GPGSA,A,3,03,06,07,11,13,16,19,23,25,27,31,42,1,9.0,9.1,6.3C
$GPRMC,074624.000,A,2457.8108,N,12125.5391,E,0.0,0.0,0.15
$GPGSV,3,1,12,27,21,321,40,25,51,321,44,07,30,322,41,19,78,2
$GPGSV,3,2,12,13,36,269,44,16,26,065,42,23,35,228,42,06,44,0
$GPGSV,3,3,12,03,56,022,45,31,10,137,38,11,18,196,40,42,54,1
    
```

GPS Information	
UTC Date :	19/08/08
UTC Time :	07:46:24.000
Lat :	2457.8108
Lon :	12125.5391
Alt :	96.02
SVs(Used/All) :	12 / 12
Mode :	3D Mode
PDOP :	0.9
Speed :	0.0
True Course :	000.0
DGPS ID :	0
GPS Quality :	GPS SPS Mode, fix valid

All specifications subject to change without prior notice.



3.5 Tracking View

This window shows the points that the GPS receiver fixed.

User can change the scale by clicking on “Zoom in” or “Zoom out”.

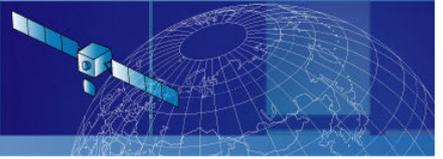
The screenshot displays the GPS Locator Utility 2.90 interface with several windows open:

- Map View:** Shows a circular plot with concentric circles and radial lines, representing a range and bearing plot.
- User Setting:** Contains NMEA Output settings (GGA, GLL, GSA, GSV, DTM) and Port Setting (Baud Rate: 4800, RS-232 Bandwidth: 106.7%).
- Tracking View:** Shows a zoomed-in version of the map plot. A red box highlights the "Zoom in" and "Zoom out" buttons with the text: "Click on 'Zoom in/Zoom out' to change the scale".
- Channel Signal Level View:** A table showing signal strength for 8 channels.
- Terminal View:** Displays raw NMEA data strings.
- Measured Navigation Message View:** Shows GPS information including UTC Date, Time, Lat, Lon, Alt, SVs, Mode, PDOP, Speed, True Course, DGPS ID, and GPS Quality.

Channel	1	2	3	4	5	6	7	8
SV Number	27	25	07	19	13	16	23	06
Elevation	21	51	30	78	36	27	35	44
Azimuth	321	321	322	297	269	065	228	033
SN Ratio	40	44	41	44	42	42	44	43
Used in Position	0	X	X	X	X	X	X	X

UTC Date :	19/08/08
UTC Time :	07:46:04.000
Lat :	2457.8108
Lon :	12125.5391
Alt :	96.02
SVs(Used/All) :	12 / 12
Mode :	3D Mode
PDOP :	0.9
Speed :	0.0
True Course :	000.0
DGPS ID :	0
GPS Quality :	GPS SPS Mode, fix valid

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Ch 4 Available NMEA Messages

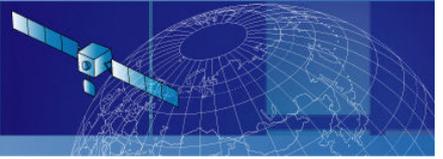
4.1 NMEA Output Messages

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
ZDA	Data and Time (Optional)

(Update rate is 1 Hz)

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Chapter 5 Limited Warranty

This unit can be used as part of navigational aids, and is not intended to replace other means of navigation or aids. San Jose Technology, Inc. warrants this GPS receiver and accessories to be free of defect for a period of 12 months from the date of original purchase.

THIS WARRANTY APPLIES ONLY TO ORIGINAL PURCHASE.

In any event of a product defect while in normal usage, San Jose Technology, Inc. will replace or repair the defective product at no charge to the original the original purchaser for parts and labor. However, San Jose Technology, Inc. reserves the right of determination to replace or repair the defective product.

The replacement or repaired product will be warranted for a total of 90 days from the date of return shipment, or for the remaining balance of the original warranty, whichever is longer.

PURCHASER DUTIES

The purchaser must return defective unit postpaid, with the proof of original purchase and a return address to:

San Jose Technology, Inc.

11F., No.2, Sec. 4, Jhongyang Rd., Tucheng City, Taipei County, Taiwan

Tel: +886-2-2269-4456

Fax: +886-2-2269-445

Website: <http://www.sanav.com>

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