di-GPS® Mini 3-MTK series digital images GPS receiver

Users Guide

Ver 1.1

Please visit our website **www.di-gps.com** for the latest version of the user guide

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Introduction

Thank you for purchasing di-GPS Mini 3-MTK series GPS receiver. di-GPS Mini 3-MTK series GPS receiver (digital images GPS) is specially designed for a DSLR (Digital Single-lens reflex) camera. It provides real time position (latitude, longitude, elevation) and the precise time (UTC time) information to your DSLR camera. It records the locations to each digital image file so that you will never forget the exact location where you took the pictures.

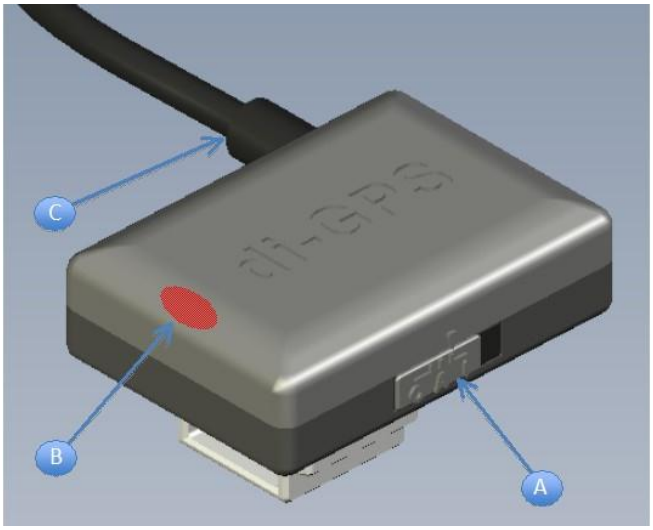
di-GPS Mini 3-MTK series GPS receiver has a built with the latest MT3329 GPS engine. It supports up to 66 channels of satellite searching with -165dBm sensitivity. di-GPS Mini 3-MTK series GPS receiver repeated the last fixed position when no GPS signal is available or the unit is out of GPS coverage with real UTC date/time.

di-GPS Mini 3-MTK series GPS receiver allows you to save your present location data to your digital image file. Its State-Of-The-Art technology provides extremely fast TTFF (Time-To-First-Fix), unrivaled high sensitivity and superior performance in virtually any outdoor environment. di-GPS Mini 3-MTK series GPS receiver can work in a place where GPS was not possible before : in the woods, under very heavy foliage, canyons, terrain obstructions, in cities with densely populated high-rise buildings and even inside a train or a car, with no external antenna required. It is designed to meet the rigorous demands of today's digital photographers.

Warning / Precaution for Use

- Keep out of reach of children. This device contains small parts that may pose a choking hazard. Consult a physician immediately if a child swallows any part of this device.
- Under no circumstances should you attempt to disassemble the product and repair it yourself. Doing so may result in electric shock or product malfunction. Should the product break open as the result of a fall or other accident, send the unit to Dawn Technology Limited for inspection. For more information, please visit our web site at www.di-gps.com.
- Do not handle with wet hands or immerse in or expose to water or rain. Failure to observe this precaution could result in fire or electric shock.
- Do not use in the presence of flammable gas. Failure to observe this precaution could result in explosion or fire.
- Do not expose to flame or excessive heat.
- Do not expose to high temperatures.
- Do not leave the device in a closed vehicle under the sun or in other areas subject to extremely high temperatures. Failure to observe this precaution could result in fire or in damage to the casing or internal parts.
- Turn off immediately in the event of malfunction. Should you notice smoke or an unusual smell coming from this device, remove the 10 pins connector immediately and send the unit to Dawn Technology Limited for inspection. For more information, please visit our web site at www.di-gps.com.

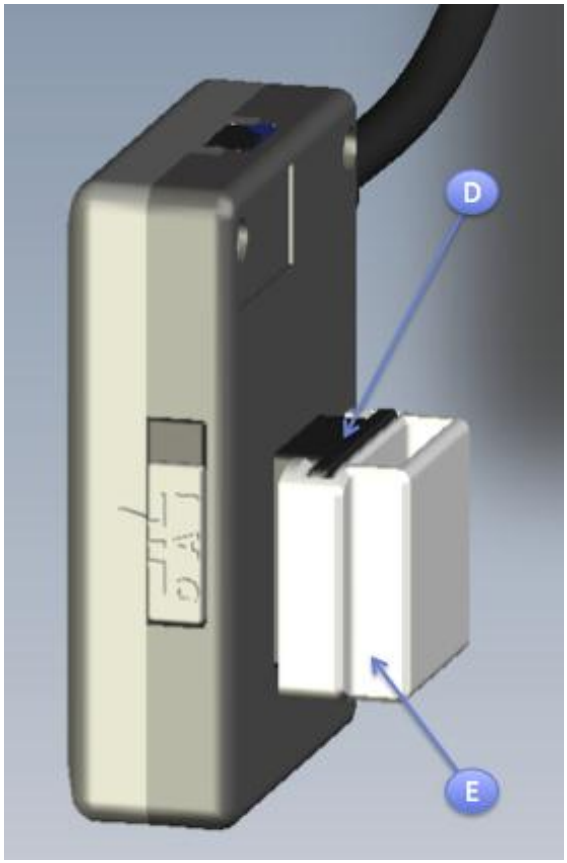
Part Names *of di-GPS Mini 3-MTK series GPS receiver*



A – Power Mode Switch

B – Status LED

C – Cable to DSLR camera



D – Flash Accessory Shoe Mount

E – Camera Strap Mount

Connector Cable *of di-GPS Mini 3-MTK series GPS receiver*

di-GPS Mini 3-MTK series GPS receiver in three different models:

1. di-GPS Mini 3-MTK-S3

   with circular 10 pin connector for D2HS, D2X, D2XS, D200, D3, D3X, D3S, D300, D300S and D700


2. di-GPS Mini 3-MTK-S9

   with "L" shape rectangular 10pin connector for D90


3. di-GPS Mini 3-MTK-S5

   with "L" shape rectangular 10pin connector for D5000, D3100, D7000


How to mount *di-GPS Mini 3-MTK series GPS receiver* to the camera

di-GPS Mini 3-MTK series GPS receiver provides two mounting methods.

It can be mounted on the flash accessory shoe or attached to the camera strap.

Diagram 1 : di-GPS Mini 3-MTK mounted on the flash accessory shoe

Diagram 2 : di-GPS Mini 3-MTK attached to the camera strap with strap mount accessory

How to connect *di-GPS Mini 3-MTK series GPS receiver* to Camera Body

Connect the DSLR camera and di-GPS Mini 3-MTK series GPS receiver as described below.

1. Turn off the camera.
2. Remove the cap from the 10 pin remote terminal on the camera body.
3. Connect di-GPS Mini 3-MTK series GPS receiver to the camera's 10 pin remote terminal with 10 pin connector. Do not use any extension cord. For exact cable connector of different models, please refer to Page 6 – Connector Cable of *di-GPS Mini 3-MTK series GPS receiver*.
4. Switch the power mode to "On" or "Auto".
5. Turn the camera on.
6. If di-GPS Mini 3-MTK series GPS receiver is properly connected, the camera will display a blinking icon on the top control panel. It means the GPS receiver is searching for a signal. The icon will stop blinking once signal has been established and the receiver is ready for supplying the current position.
7. di-GPS® Mini 3-MTK series GPS receiver will automatically detect the connection of the camera. It cannot be turned on when the camera is not connected whatever the power mode switch is set to "On" or "Auto". Both "On" and "Auto" mode only function when the camera is properly connected.
8. Each satellite broadcasts a digital message that contains two types of information. One type is ephemeris data, which includes the assigned serial number of the satellite, the status of the satellite (healthy or faulty), the current date and time. The second type is almanac data and includes precise orbital position of every satellite in the system.

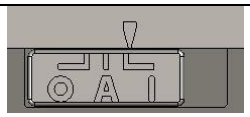
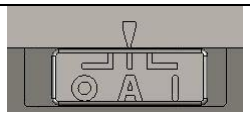
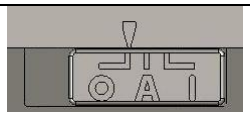
   At the initial stage, di-GPS Mini 3-MTK series GPS receiver needs all these data for the position fixed. It usually takes a minute to few minutes to receive all data. An open sky outdoor environment will enable faster acquisition process. It will take a longer time at a weak signal environment. Once di-GPS Mini 3-MTK series GPS receiver locks to the

satellites, it will take a few seconds for reacquisition even at weak signal environment.

Note

- di-GPS® Mini 3-MTK series GPS receiver cannot be turned on when the camera are not connected.
- Please refer to user manual of your DSLR for more information on taking photographs with a GPS receiver.
- Be sure to turn off your camera before disconnecting di-GPS® Mini 3-MTK series GPS receiver. Do not connect or disconnect di-GPS® Mini 3-MTK series GPS receiver while the camera is on. Failure to observe this precaution could cause a malfunction of the camera.
- Do not carry the camera by di-GPS® Mini 3-MTK series GPS receiver or subject the camera or cord to physical shocks while the cord is connected. Failure to observe this precaution could result in physical damage of the cord.
- Re-place the caps on the camera when the terminals are not in use.

Power Mode Switch

Power Mode	DESCRIPTION
 On	di-GPS® continuously searches/locks to the satellites. It sends current GPS location to the camera when locked to satellites. If no fix available, it sends the last GPS position data in the memory to the camera until the new fix available.
 AUTO	***When metering system active:*** di-GPS® turns on automatically and starts to search satellites. It immediately sends the last fix in the memory to camera. It sends the current GPS position to camera once new fix available. ***When metering system inactive:*** di-GPS® turns off automatically.
 Off	di-GPS® in off state.

Status LED indicator *for di-GPS® Mini 3-MTK series GPS receiver* fix or not fix

When the camera establishes communication with di-GPS®, a GPS icon will be displayed in the LCD panel of the camera.

Status LED	GPS icon	Description
 Flashing	 Flashing Icon	**No fix, Signal searching** Internal memory empty or Invalid date/time. No GPS data will be recorded in the photos.
 Flashing	 Icon Steady	**No fix, Signal searching** di-GPS® continuously sends the last fix in the memory with current UTC date/time to the camera until new fix available. The last fixed GPS position will be recorded to the photos.
 Steady On	 Icon Steady	**Fix available** di-GPS® continuously sends the current GPS position to the camera.

LED on di-GPS® Mini 3-MTK series GPS receiver only represents the status of di-GPS® Mini 3-MTK series GPS receiver, but not the reception of GPS data to the DSLR camera.

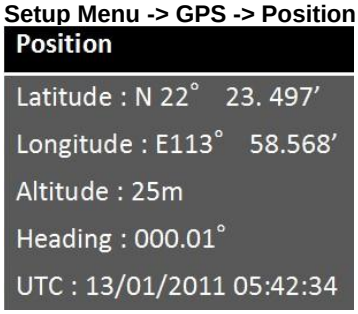
GPS data are only recorded when GPS icon displayed on the top of LCD panel of DSLR camera. Please make sure that GPS icon is displayed before shooting.

Satellites in view

di-GPS® Mini 3-MTK series GPS receiver uses the second decimal place (000.0x, 0.0x) in the heading to represent the satellites in view (satellites used).

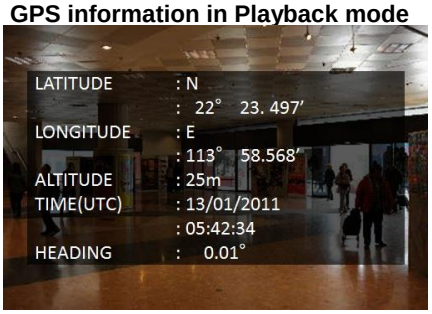
second decimal place	Description
1	No satellites in view. Repeats the last position in memory.
3	3 satellites in view
4	4 satellites in view
5	5 satellites in view
6	6 satellites in view
7	7 satellites in view
8	8 satellites in view
9	9 or more satellites in view

Setup Menu -> GPS -> Position



Heading: 000.01°

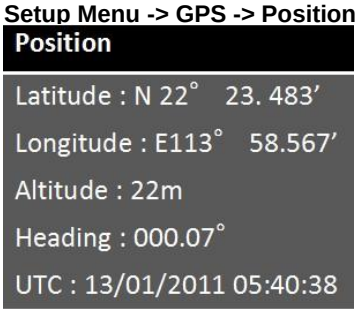
GPS information in Playback mode



HEADING: 0.01°

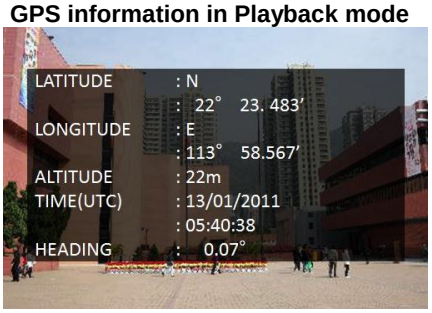
Value of the second decimal place in heading = 1
Indicates that no satellites in view and no fix available. The reported position is read from internal memory.

Setup Menu -> GPS -> Position



Heading: 000.07°

GPS information in Playback mode



HEADING: 0.07°

Value of the second decimal place in heading = 7
Indicates that 7 satellites in view. The reported position is calculated in real time.

Last Fix Repeat (“LFR”)

di-GPS® Mini 3-MTK series GPS receiver continuously reports the last fix when the GPS signal is lost or the unit is out of the GPS coverage. With this new function, di-GPS® Mini 3-MTK series GPS receiver is able to provide the last fixed GPS data with current UTC date/time to the DSLR camera even if there is no GPS signal, for example inside buildings.

During initialization, di-GPS® Mini 3-MTK series GPS receiver needs to obtain a first fix before the LFR works properly. Once the GPS unit has a good position fix, the GPS will continuously report the last fix with current UTC date/time if the GPS signal is lost or the unit is out of GPS coverage. Once the new fix available, the GPS unit will immediately report the updated GPS position to the camera.

After a power reset (power off….on), di-GPS® Mini 3-MTK series GPS receiver reads the last GPS position in internal memory. If there is no GPS data in the internal memory or the internal clock is out of battery, di-GPS® Mini 3-MTK series receiver will report no fix available. The camera’s GPS icon will flash and no GPS data will be recorded. The GPS unit will report the last recorded GPS data in the internal memory with current UTC date/time after power reset. The last good fix will be recorded in each photo until a new fix available.

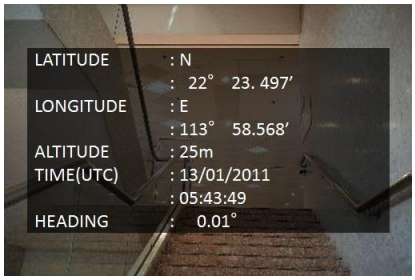


Photo A

Photo B

Photo C

Photos A, B, C were shot in three different indoor locations with no satellites in view. Last position in the memory repeated (HEADING: 0.01) with a CURRENT UTC time.

Specifications

General
Chipset MTK MT3329
Frequency L1, 1575.42 MHz
C/A code 1.023 MHz chip rate
Channels 66 channel all-in-view tracking
Sensitivity -148dBm (Cold Start), -165 dBm tracking

Accuracy (Open Sky)
Position 10 meters, 2D RMS
5 meters, 2D RMS, WAAS enabled
Velocity 0.1 m/s
Time 1us synchronized to GPS time

Datum
WGS-84

Acquisition Time (Open sky, stationary requirements)
Reacquisition Less then 1 sec., average
Hot start 1 sec., average
Warm start 34 sec., average
Cold start 45 sec., average

Dynamic Conditions
Altitude: Maximum 18,000m
Velocity: Maximum 515m/s
Acceleration: Maximum 4G

Power Source
Powered from DSLR camera via 10 pin connector cable
Power consumption 48mA @ acquisition, 37mA @ tracking

Protocol
Baud rate 4,800 bps
Output message NMEA 0183

Interface
Nikon10 pin connector direct connect to Nikon DSLR cameras.

Physical Characteristics
Dimension 48mm*34mm*14mm
Weight: 50g
Operating Temperature -10°C to +45°C
Operating Humidity: 5% to 90%, No Condensing

* Specifications are subject to change without any notice.

Warranty

- Dawn Technology Limited guarantees its product, which is determined to be defective or faulty materials and workmanship, for a period of one year after the date of purchase. During the one-year warranty, Dawn Technology will repair or replace the product free of charges. Please keep your original invoice as proof of purchase.
- Customers who have products covered under the warranty are required to contact Dawn Technology Limited by e-mail for troubleshooting issues before returning product.
- Customer should responsible for shipping and insurance charges for returning the product to Dawn Technology Limited.
- Charges will be imposed for repair product, which is out of warranty coverage or invalid warranty.
- The guarantee is not valid if defect is due to damage caused by incorrect use, poor maintenance or if alterations or repairs have been carried out by persons not authorized by Dawn Technology Limited.
- For the device to be used correctly, the user should strictly adhere to all instructions included in the user guide and should abstain from any actions or uses that are described as undesired or which are warned against in the user guide.

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