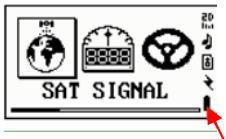
BGT-31 GPS Quick Guide

The BGT-31 GPS unit has several basic features for gathering, transmitting, and logging location derived data, including coordinates, speed and altitude. It does not have advanced "moving map" display functionalities for orientation and navigation. This quick guide provides basic operation info with an overview of functionalities. Refer to full PDF manual on CD or online at http://mannlib.cornell.edu/equipmentandrooms/bgt31_gps.cfm for complete info. Manufacturer info and support is available at http://www.locosystech.com/product.php?zln=en&id=30.

Basic Operation

1. **Turn unit on** by holding down **Power/Esc button**. This button can also be used to **back out of/escape menus** by quickly pressing and releasing.



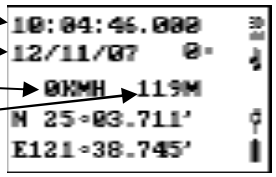
battery indicator

2. **Check power level** by looking at battery indicator icon in lower right corner of screen. If low, before using unit will need to be plugged in for recharge using USB cord and one of the adapters (unit has a built in rechargeable li-ion battery). Fully charged, it can run for up to 46 hours in power saving mode, with backlight off.

3. Use the "**Thumb Stick**" to **navigate** to pages and menus. **Open** pages and menus, and select options by **quickly pressing in and releasing** the thumb stick.

4. After unit is turned on and allowed to initialize, or find satellites outdoors, navigate to **Satellite Signal** page, press Thumb Stick (TS) in quickly to open. Scroll left or right to [GPS FIXED INFO], and select to display. You will be able to view the following:

- Time
- Date
- Speed
- Elevation
- Coordinates



Basic Configuration

Before using the unit to record/transmit data, it should be configured properly depending on needs.

Settings

The Settings page can be used to configure units of measurement, including:

- Time Zone [for NY state, choose *US ETZ*; for Eastern Daylight Savings Time periods, select *+Others*, setting to -4:00 (difference from UTC, or Greenwich Mean Time)
- Unit (e.g. for speed and elevation)
- Time & Date Formats
- Map Datum (WGS 84 by default)
- Position (DD MM SS.S, or Degrees-Minutes-Decimal Seconds by default)

Data and settings for advanced functionalities from Trip Meter, Speed, and Navigation pages may also need to be set or adjusted prior to recording new data. Refer to PDF Manual for more info.

SD Card

Up to 8192 Track and 20480 Data Logging (see section below) points can be logged to internal flash memory at one time. Once the internal memory is full, older data is overwritten with new. You can also record/copy/backup position and speed data (up to 2GB) to a SD or MMC card for later transfer to a computer using a card reader. A 2 GB SD card is included with the unit, and Mann Library has a card reader available for loan at the Circulation desk. Using a SD card to record/transfer data may be preferable for some users, as it does not require installation of the supplied Navilink software (Windows only) to transfer data directly from GPS unit. If you have your own card, it may also be used (if compatible and formatted –see below).

To Use SD Card

1. With **unit off**, open **bottom and insert SD card** until it clicks in. If using your own be aware that not all cards will work/fit, so don't force if tight. Check here http://www.locosystech.com/product.php?zln=en&id=30 for verified cards.

2. **Turn unit on**. You may see a message stating Card Found, Card Unknown, or Unformatted.

3. Navigate to the **Memory Card menu** using the Thumb Stick, and select (press in Thumb Stick).

4. Scroll down to and select **[FORMAT CARD]**. Select Yes.

5. If you wish to **log data automatically/periodically** to the SD card, scroll to and select **[LOG SWITCH]** from Memory Card menu, then select **On** to enable recording data to card.

6. You can **configure** information you want logged from the **[NMEA ITEMS]** option in Memory Card menu. From that menu, you can select (highlight) multiple NMEA 0183 sentence options to write to text (.txt) file. Alternately, you can select SBN (SiRF binary logging) to create higher precision sbn log files for later conversion using Navilink software. For NMEA text files, GGA (Global Positioning System fixed data) provides essential 3D location and accuracy data, GLL (Geographic position) latitude/longitude, and ZDA for date and time.

7. If you wish to copy data to the SD card, use the SAVE TO CARD option from the Waypoints, Tracks and Data Logger pages.

8. Remember **when removing card**, always **turn off unit first**, or select [REMOVE CARD] from Memory Card menu, otherwise the card/data may get corrupted.

Recording Coordinate Data

Waypoints

Waypoints, including xy coordinates, can be recorded manually from any menu using the **Thumb Stick**. Carefully **press TS straight down and hold** in to activate HOLD key functionality. By default, the HOLD key is configured to act as a FAST MARK key, recording current location information as a waypoint (if there is a location fix) to internal flash memory. Each FAST MARK point is automatically named/numbered, with an "M" prefix followed by a number.

Some users may find it preferable to use the **Position Mark** page to record waypoints. Scroll to Position Mark menu then quickly press down and release TS to open menu. This option will also allow you to assign a customized name/number (up to a 6 characters), as well as a waypoint symbol. When done editing symbol and name, press and quickly release power button, then select Yes to save waypoint.

Recorded waypoints can be reviewed/edited from the Waypoint page. Waypoints can also be added to Routes from the Route page. To save waypoints to the SD card, select [SAVE TO CARD] from the Waypoint menu.

Tracks

Tracks, or "bread crumbs" record location and movement over time. Track menu options exist for manually recording via the [MARK] option, or the [INTERVAL] option (time or distance) to automatically record them. The [VIEW] page can display them. [SAVE TO CARD] option will copy existing tracks to SD card. Using the Track options may be particularly useful for recording specific trails or routes traveled.

Routes

Routes can be created from waypoints (max 125 waypoints per route) and saved for navigational purposes. They can be created, edited, deleted and viewed from the Route page.

Data Logging

Data logging is the process of automatically recording coordinate data at specified intervals while traveling. This is especially useful for unattended recording of many points over a long period. The Tracks and Memory Card pages offer options for logging data, as well as the Data Logger page. Logging via the Data Logger or Memory Card menu's can only be done by time interval. The Tracks menu offers time or distance interval options.

Data collected via the Data Logger option are stored in internal flash memory (up to 20480 at one time), but can be copied to the SD card (in sbp format) as needed. The free Navilink software (see below) can be used later to download and/or convert sbp data into other more usable formats such as kml or gpx (e.g. for display in Google Earth or other visualization software).

Geotagging

The data logger may be particularly useful for recording coordinates to be used later for "geotagging" digital files such as photos. Images can then be browsed/found by location using special viewers (including Google Earth) or websites (including Flickr). Several freeware options, including locr (http://www.locr.com/) and GPicSynch (http://code.google.com/p/gpicsync/) exist for embedding coordinate info into the "EXIF" headers of image files, based on synchronization of time stamps. This process essentially reads the time stamps from photos and compares them to the time coordinates/points were recorded in a GPS log file (e.g gpx file), finding the best match. You will need to configure time offset settings to match photo time stamps with UTC (Coordinated Universal Time, or Greenwich Mean Time) time stamps in GPS log data. Software also exists for linking coordinates to other digital files, including audio, such as http://www.robogeo.com/.

Tethering

The BGT-31 GPS has the ability to be used in a "tethered" fashion, streaming coordinate data as it is generated, to a connected computer or PDA. From there data can be recorded and/or displayed within a GIS. This may be particularly useful for those doing field work where both location and other attribute information (e.g. environmental data) is being recorded and mapped.

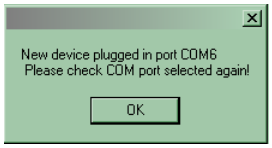
The BGT-31 has both USB and Bluetooth (wireless) tethering capabilities, which may or may not be compatible with your hardware or software. The Bluetooth Pin code for pairing is 0000. The baud rate, parity, data bit, and stop bit settings are 38400, n, 8 and 1 respectively. Read the full BGT-31 manual online or on CD and refer to hardware/software documentation for your system for more info.

Transferring Data

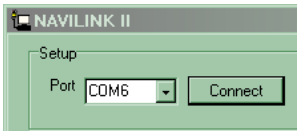
Using USB Drivers and NAViLink Software

Data can not be transferred directly from the internal flash memory of the GPS to a computer without installation of drivers and/or the provided NAViLink software.

1. **Download latest version of USB drivers and Navilink software** from manufacturer (Windows only) at http://www.locosystech.com/support.php?model=GT-31/BGT-31&DL=1&zln=en .
2. **Install drivers and application.**
1. **Launch NAViLinkII** progam. Click OK if warned about putting GPS in NAViLink mode.
2. **Connect GPS** to computer using USB cable.
3. **Turn GPS on**, navigate to **NAVILINK page**, and select (press in TS)
4. You may see a message stating new device plugged in. **Note the port, click OK**.



5. **Select** that **port** from the drop down menu, **click Connect**. If no new device message came up try using the default one displayed, or others until successful connection made.



6. To download
    a. **Data Logger data from GPS** internal drive: Select **Log.data** tab, then **click Read.** The location of the transferred data will be shown in lower pane. Other formats (including kml and gpx) will also be automatically created.
    b. **Waypoints, Routes and Tracks from GPS** internal drive: Select **Navi.data** tab, check appropriate boxes and **click Read.** The location of transferred files will be listed in lower pane.
7. To convert
    a. **Waypoints and Tracks, or Logger Data saved/recorded to SD Card** and previously transferred to computer: Click **Misc tab**, click appropriate **Convert** button, then find location of file. New files, including kml and gpx will be written to same directory.

Using SD Card/Reader

Another method of transferring data from the BGT-31 is to log or copy data to a SD card (see above sections for info), then use a SD card reader to transfer to a computer. **You will not be able to access the SD card data by leaving card in GPS and connecting to a computer.** Mann Library has a multi-format card reader available for loan at the Circulation desk.

To transfer data from card to computer:

- Remove card from GPS (while off), insert card in reader,
- Connect reader to computer,
- Copy files from *GPS_Data* folder to local hard drive.

The txt or sbn files (configured from Settings menu) can then be converted to other formats (e.g. csv, kml or gpx) that can be imported and visualized (e.g. in a GIS).

To convert files copied from SD card:

- The easiest option is using the **Navilink softwar**e, which has an option from the ***Misc* tab, *SD Card Data*** button for converting txt and sbn files.
- Other options include applications which can read/convert NMEA 0183 text files including:
    - NMEA2KMZ (http://homepage2.nifty.com/k8/gps/file/nmea2kmz.htm), (Windows Vista, XP, or 2000) and
    - GPS Utility (http://www.gpsu.co.uk/ -free version limited in the number of points converted).

Converting GPS Data to GIS Format

If you wish to convert gpx or kml files to shapefile for use in a GIS, freeware DNR Garmin http://www.dnr.state.mn.us/mis/gis/tools/arcview/extensions/DNRGarmin/DNRGarmin.html can load and save them as projected shapefiles. Use gpx files to retain/transfer time info to shapefile attribute table.