

GPS for Smart Fieldmeter® Digital

GPS-R

Users Manual





1. Description of GPS Position Receiver (GPS-R)

GPS-R identifies the exact user location and performs internal position logging together with stored field strength information and time date stamp. Position data are logged to a removable memory card of **Smart Fieldmeter® Digital (SFD)** and later they can be downloaded to a PC as text file or visualized on the map for future reference.

GPS-R has its GPS antenna module mounted on the top of metal enclosure that contains GPS signal converter and power supply with long lasting battery, power switch and low battery indicator. Such design ensures long GPS operating time without draining the SFD battery.

GPS-R module is mounted to the bottom panel of the SFD and is connected to SFD serial port with 2.5 mm audio type connector.

Software for **GPS-R** position logging and PC streaming is installed in RFP-05. Map visualization of data points requires third party mapping software (see section below).

In order to visualize the location points on the map - connect SFD to PC and play back the location of all points where you logged the testing data.

In other words, the SFD, with **GPS-R** location data stored on memory card, becomes the GPS emulator, therefore - it can operate with most mapping software packages designed for the regular GPS devices operating under the same communication protocol.

2. GPS-R Kit

- **GPS-R** (included) doesn't require any additional components to record the GPS data to a memory card of RFP-05.
- **ODLK-01** (RFP-05 PC Link Kit) is required for RFP-05 to be connected to a computer.
- The GPS location data, then, can be read to a PC together with field strength data (as text file) by using the Hyperterminal® software (supplied free with all Windows®, including XP).
- For PC that doesn't have the RS232 serial port, the optional RS232/USB adapter is required.
- For viewing the GPS location data on the map or movement trail, the optional mapping software is required (see below).

3. GPS-R Specification

- **Receiver:** 20 channel satellite tracking.
- **Frequency:** 1,575.42 MHz.
- **Position Accuracy:** 10 meters.
- **Start: Hot/Cold:** 1/40 sec.
- **Geodesic system:** WGS-84.
- **Protocol:** NMEA 0183 (SiRF Binary).
- **Update rate:** 1 sec.
- **Battery (user replaceable):** 4xAA Alkaline.
- **Operating Time:** 50 hours.
- **Receiver status and low battery Indicators.**
- **Environmental:** -10°C ~ 50°C.
- **Dimensions:** 4.94"x2.75"x1.27"
- **Weight (with battery):** 0.5 lb.

4. RFP-05 GPS Setup

First, make sure that GPS-R is turned on (orange LED is ON), 2.5 mm cable connector is firmly inserted into SFD PC Link jack and SFD has the **GPS mode enabled**.

To put RFP-5 into GPS Enable mode, perform the following settings:

<MENU> brings to the screen the **Main Menu**.
<↓> Select **Setup**.
<ENTER> brings to the screen the **Setup Menu**.
<↓> Select **DSP/Key**.
<ENTER> brings to the screen the **Dsp/Key SetupMenu**.
<↓> Select **GPS**.
<→> Select **En (Enable)**.
<MENU> brings to the screen the **Main Menu**.
<NORD> brings the **Normal display**.

In Measurement screen then, you should see the letters "**GPS**" just above the display reading numbers.

To start data logging:

<MENU> brings to the screen the **Main Menu**.
<↓> Select **Log Control**.
<Mode> allows you to select the logging time interval from 1 sec to 30 min (GPS has 1 sec. min.).
<→><↑><↓> keys allow you to change the file name and assign maximum number of data points.
<LOG> turns the logging on.

SFD records the GPS data every time when it records the field strength data. These can be always checked on PC by reading the corresponding LOG file (plug memory card into card reader connected to a PC. Read the text file).

5. GPS-R Hardware Setup

The GPS-R module comes with metal bracket not connected to the enclosure.

To put GPS-R into operating position, use two included screws and connect the bracket to the GPS-R top panel. Then, remove two upper screws from the SFD bottom panel and attach the GPS-R bracket to it - see the picture of the whole assembly above.

Finally, plug the 2.5 mm connector into PC Link jack.

When GPS-R unit is turned on the orange LED will turn on and after 1-3 sec. the red LED, located at the circumference of the GPS antenna module, will turn on too.

It may take some time, about 40 sec. (first time - it may take longer) for GPS to "fix" on the 3-4 satellites necessary to calculate the exact location. During this search mode the red LED will be steady on. After GPS has fixed on its satellites and location of the unit is calculated - the red LED will start blinking, indicating that valid location data are being streamed out.

If after a few minutes no blinking is noted - this means that signal is too weak and unit should be repositioned for better reception. There are a few simple rules:

- Best signal is typically outside.
- The dome of the antenna is better looking straight up.
- Keep unit away from the metal objects (they will screw the measured field too).
- Do not cover the GPS antenna with your hands.

6. GPS-R Battery

The GPS-R uses 4 primary alkaline cells of AA type. The battery voltage is monitored by the orange LED when power switch is in ON position. When battery voltage is in the range 4.5-6.4V (normal operation) the LED is ON. When battery voltage drops below about 4.3-4.5V, LED gradually dims, indicating the need to replace the battery. Typical GPS-R power consumption is in the range of 40-45mA, therefore, fresh high quality set of alkaline cells will operate more than 50 hours.

To replace the GPS-R cells, unscrew four screws at the bottom of the unit, lift the bottom cover and pull out the battery holder and replace the batteries, keeping the right polarity (!). Reinstall battery holder and close the bottom cover.

It is possible to use AA rechargeable cells but battery life may be shorter due to the variances of the battery capacity and typically lower cell nominal voltage (1.2V versus 1.5V).

7. Data Playback

In order to connect the GPS-R to a PC you need the ODLK-01 unit (see the ODLK-01 Users Manual). You can always verify that GPS data were recorded together with field strength data by playing them back:

Run HyperTerminal® by selecting:

<START> <All Programs><Accessories><Communications><HyperTerminal>.

Ignore the HyperTerminal warning by pushing <OK>.

Print the session name <ABC>.

Ignore the HyperTerminal warning by pushing <OK>.

Select your COM port number (typically, COM1 or COM3).

<OK>.

Select the serial port communication parameters:

Bits per second: 4800.

Data Bits: 8.

Parity: None.

Stop Bits: 1.

Flow Control: None.

<OK>.

Configure the data display by selecting:

<File><Properties><Settings><ASCII> and

check "Append line feeds to incoming line ends"

<OK><OK>.

In Main Menu select "Read File".

By using the <←><→><↑><↓> arrow keys select the proper LOG file name and press <Read>.

You will see the file detailed information.

Now press <↑> point by point or keep it pressed: SFD will send to PC and display all stored data, containing forth field and location data.

8. Examples of mapping software

GPS-R when reading the stored file with GPS data in it behaves itself like virtual GPS. Therefore, most of the software packages that operate with **NMEA 0183 (SiRF Binary)** communication protocol should "understand" and display the GPS-R data stream.

We verified that operation with two popular software packages: Microsoft® Streets and Trips and Google Maps. These software products are compatible with GPS-R protocol at the moment of this Users Manual creation, but we cannot guarantee that in the future. Other packages may be perfectly working too.

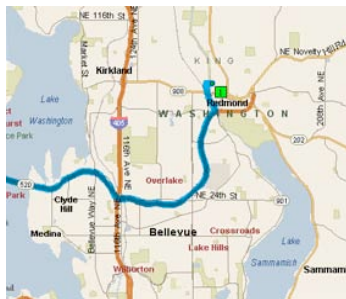
The main important piece of information, that any software needs to get, is - the serial port number (like COM3 or COM10, etc.). This number is either found by software automatically (when it detects the GPS stream while you are pushing the <↑> button when reading the LOG file) or you need to select it from the list of ports.

Even if you use the USB/RS232 converter to connect the ODLK-01 to your PC USB port, there is a COM port number (depending from which USB slot is used).

For details of the PC software operation, please, refer to the corresponding manuals.

Due to the constant changes in software and PC operating systems we cannot ensure that the particular software will work on your PC. Please, contact the software vendors for support.

When functioning, the mapping software will show the trail of your location points where measurements of the field strength took place. You can then assign the notes to each location point - the name of the place, the field strength, descriptions, etc.



9. Limited Warranty

The manufacturer (EMC Test Design, LLC) warrants the product to be free from defects in material and workmanship under normal use and service for the period of 1 (one) year from the date of purchase. This warranty extends only to the original buyer or end use customer of a manufacturer-authorized distributor.

Manufacturer's warranty obligation is limited, at manufacturer's option, to refund of the purchase price, or free of charge repair or replacement of a defective product, which is returned to an authorized distributor or manufacturer within the warranty period.

Manufacturer authorized distributors have no authority to extend the warranty on behalf of the manufacturer.

To obtain the warranty service, contact your authorized distributor. Buyer pays for the insured shipping of the unit to be returned or serviced. Manufacturer doesn't assume any risk for damage in transit. Following the warranty repair, the product will be returned to the buyer, transportation prepaid.

If manufacturer determines that the failure was caused by misuse, negligence, accident or abnormal condition of operation and handling, manufacturer will provide an estimate of the repair costs and obtain authorization before commencing the work. Following repair, the product will be returned to the buyer, transportation prepaid, after customer has paid for the repair and return transportation charges.

This warranty is purchaser's sole and exclusive remedy and is in lieu of all other warranties, expressed or implied, including but not limited to any implied warranty or merchantability or fitness for a particular purpose.

EMC Test Design, LLC shall not be liable for any special, indirect, incidental or consequential damages or losses, including loss of data, whether arising from breach of warranty or based on contract, tort, reliance or any other theory.

The limitations and exclusions of the warranty may not be applicable to every buyer depending on the laws of the land of residence.

Buyer has the rights to return the unit within 14 (fourteen) days from the date of purchase using the insured prepaid carrier, in mint condition in undamaged original package with all accessories and documentation for replacement or refund. In case of refund the restocking fee of \$10% will be charged.

10. Technical Support

To purchase the additional units, accessories, get technical support or warranty service; buyer should contact the authorized distributor or manufacturer by e-mail (preferred), or phone. Check our web site www.emctd.com for the most up to date information.

Buyer should supply the following information:

- Buyer's name, company name and contact information.
- Distributor's name, and contact information.
- Date of purchase.
- Serial numbers of the meter and probe.
- Accurate description of the issues.

Your answers will be used in full confidentiality with only one purpose – to make the GPS-R for Smart Fieldmeter® Digital better.

11. EC Declaration of Conformity



We, the undersigned:

EMC Test Design, LLC
P.O. Box. 600532, Newton, MA 02460, USA

certify and declare, that the following apparatus:

Description:	GPS Position Receiver
Brand:	GPS for Smart Fieldmeter® Digital
Identification:	Model GPS-R (OEM: BU-353/BR-355)
Manufacturer:	Globalsat Technology Corporation

conforms with the essential requirements of the EMC Directives: **89/336EEC** amended by **92/31/EEC** and **93/68/EEC** based on the following specifications applied:

EU Harmonized Standards:	EN55024
specifically:	EN55022
	IEC 61000-4-2
	EN 61000-4-3

and with requirements of the **Low Voltage Directive 2006/95/EC**, based on the following specifications applied:

EU Harmonized Standard:	EN 61010-1: 2001
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and therefore, complies with the essential requirements and provisions of the EMC Directive. The technical documentation is kept at the following address:



SGS Taiwan Ltd. EMC Services.
134 Wu Kung Road, WuKu Industrial Zone,
Taipei County, Taiwan 248
Tel. +886-2-2299-3279

December 04, 2009

A handwritten signature in black ink, appearing to be 'D. Chen', written over a horizontal line.

12. About EMC Test Design, LLC

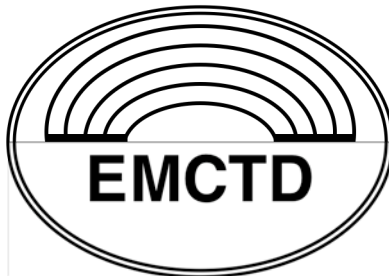
EMC Test Design, LLC is a company created and driven by group of professionals with background in RF, Analog and Digital Electronics with particular expertise in EMC instrumentation. Our field strength monitoring products are designed for EMC/RF professionals as tools for RF safety, regulatory and EMC applications. We served the EMC/RF testing needs of our customers since 1992.

The most known product [Smart Fieldmeter®](#) has been in production since 2004 and it is an instrument of choice of EMC and RF professionals all over the world. It has been recognized as "best field strength monitor for the money" and we are proud of it.

The latest product addition is [Smart Fieldmeter® Digital](#). This instrument was designed as a response to our customer requests for state of the art field strength monitor with flexible and expandable architecture for demanding applications but still with convenience and simplicity. We designed [Smart Fieldmeter® Digital](#) to be not only the "best field strength monitor for the money" but simply - "The Best".

[GPS Position Receiver](#), model [GPS-R](#) is our new valuable accessory to [Smart Fieldmeter® Digital](#).

[Smart Fieldmeter® Digital](#) is designed and manufactured in Boston, MA.
Our office is located in Newton, MA, USA.



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