



## **GPS- EVAL-BOARD**

### **Description**

Version 1.00

## Contents

<b>0</b>	<b>INTRODUCTION .....</b>	<b>2</b>
0.1	USED ABBREVIATIONS .....	2
0.2	RELATED DOCUMENTS .....	2
0.3	REGISTERED TRADE MARKS .....	2
<b>1</b>	<b>SECURITY .....</b>	<b>3</b>
1.1	GENERAL INFORMATION .....	3
1.2	RESTRICTED USE .....	3
1.3	CHILDREN .....	3
1.4	ANTENNA CARE AND REPLACEMENT .....	3
1.5	DRIVING .....	4
1.6	ELECTRONIC DEVICES .....	4
1.7	MEDICAL ELECTRONIC EQUIPMENT .....	4
1.8	AIRCRAFT .....	4
1.9	BLASTING AREAS .....	4
1.10	POTENTIALLY EXPLOSIVE ATMOSPHERES .....	5
1.11	NON-IONISING RADIATION .....	5
<b>2</b>	<b>SAFETY STANDARDS .....</b>	<b>6</b>
<b>3</b>	<b>EVALUATION BOARD–HARDWARE .....</b>	<b>7</b>
3.1	TECHNICAL DATA .....	7
3.2	FUNCTIONAL OVERVIEW .....	7
3.2.1	Make it work .....	7
3.2.2	Switches on the Eval-Board .....	7
3.2.3	LED's on the Eval-Board .....	8
3.2.4	Test points at the EVAL BOARD .....	8
<b>4</b>	<b>EVAL-BOARD WITH GPS-RECEIVER OPX-ST .....</b>	<b>9</b>
<b>5</b>	<b>EVAL-BOARD BOTTOM-SIDE (RS232 DB 15 FEMALE) .....</b>	<b>10</b>
<b>6</b>	<b>EVAL-BOARD TOP-SIDE .....</b>	<b>11</b>
<b>7</b>	<b>CONNECT –CABLE FOR RS232 .....</b>	<b>12</b>

### Version history

Version number	Author	Changes
1.00	JSSC	Initial version

## 0 Introduction

This manual contains information about the OPANIEL GPS evaluation board.

**Information furnished herein by OPANIEL is believed to be accurate and reliable. However, no responsibility is assumed for its use. Also the information contained herein is subject to change without notice.**

**Users are advised to proceed quickly to the "Security" chapter and read the hints carefully.**

### 0.1 Used abbreviations

GPS Global Positioning System

### 0.2 Related documents

SiRF:

SiRFmessages.pdf

Input/Output Messages for GPSReceivers with SiRFstarIIe-chip-set

SiRFDemo.pdf

SiRFDemo Software description

SiRFDemo3.36.exe

Real time monitoring and configuration Software

On the homepage of OPANIEL: [www.opaniel.com](http://www.opaniel.com) in the section: [GPS](#)

### 0.3 Registered trade marks

**Windows** and **Hyperterminal** are registered trade marks of Microsoft Corporation.

# 1 Security

This chapter contains important information for the safe and reliable use of the GPS receiver. Please read this chapter carefully before starting to use the GPS receiver.

## 1.1 General information

The Global Positioning System uses satellite navigation, an entirely new concept in navigation. GPS has become established in many areas, for example, in civil aviation or deep-sea shipping. It is making deep inroads in vehicle manufacturing and before long everyone of us will use it this way or another.

The GPS system is operated by the government of the United States of America, which also has sole responsibility for the accuracy and maintenance of the system. The system is constantly being improved and may entail modifications effecting the accuracy and performance of the GPS equipment.

## 1.2 Restricted use

Certain restrictions on the use of the GPS receiver may have to be observed on board a plane, in hospitals, public places or government institutions, laboratories etc. Follow these instructions.

## 1.3 Children

Do not allow children to play with the GPS Eval-Board and receiver. It is not a toy and children could hurt themselves or others. The GPS Eval-Board and receiver consists of many small parts which can come loose and could be swallowed by small children. Thoughtless handling can damage the GPS Eval-Board and receiver.

## 1.4 Antenna care and replacement

Do not use the GPS-receiver with a damaged antenna. If a damaged antenna comes into contact with the skin, a minor burn may result. Replace a damaged antenna immediately. Consult your manual to see if you may change the antenna yourself. If so, use only a manufacturer-approved antenna. Otherwise, have your antenna repaired by a qualified technician.

Use only the supplied or approved antenna. Unauthorized antennas, modifications or attachments could damage the modem and may contravene local RF emission regulations or invalidate type approval.

## 1.5 Driving

Check the laws and regulations on the use of GPS Eval-Board and receiver in the area where you drive. Always obey them. Also, when using your modem while driving, please: give full attention to driving, pull off the road and park before making or answering a call if driving conditions so require. When applications are prepared for mobile use they should fulfill road-safety instructions of the current law!

## 1.6 Electronic devices

Most electronic equipment, for example in hospitals and motor vehicles is shielded from RF energy. However RF energy may affect some malfunctioning or improperly shielded electronic equipment.

### VEHICLE ELECTRONIC EQUIPMENT

Check your vehicle manufacturer's representative to determine if any on board electronic equipment is adequately shielded from RF energy.

## 1.7 Medical electronic equipment

Consult the manufacturer of any personal medical devices (such as pacemakers, hearing aids, etc.) to determine if they are adequately shielded from external RF energy.

Turn your GPS Eval-Board and receiver **OFF** in health care facilities when any regulations posted in the area instruct you to do so. Hospitals or health care facilities may be using RF monitoring equipment.

## 1.8 Aircraft

Turn your GPS Eval-Board and receiver **OFF** before boarding any aircraft.

Use it on the ground only with crew permission.

Do not use in the air.

To prevent possible interference with aircraft systems, Federal Aviation Administration (FAA) regulations require you to have permission from a crew member to use your GPS Eval-Board and receiver while the plane is on the ground. To prevent interference with GPS, local RF regulations prohibit using your GPS Eval-Board and receiver whilst airborne.

## 1.9 Blasting areas

To avoid interfering with blasting operations, turn your unit **OFF** when in a «blasting area» or in areas posted: «turn off two-way radio». Construction crew often use remote control RF devices to set off explosives.

## 1.10 Potentially explosive atmospheres

Turn your GPS Eval-Board and receiver **OFF** when in any area with a potentially explosive atmosphere. It is rare, but your modem or its accessories could generate sparks. Sparks in such areas could cause an explosion or fire resulting in bodily injury or even death.

Areas with a potentially explosive atmosphere are often, but not always, clearly marked. They include fuelling areas such as petrol stations; below decks on boats; fuel or chemical transfer or storage facilities; and areas where the air contains chemicals or particles, such as grain, dust, or metal powders.

Do not transport or store flammable gas, liquid, or explosives, in the compartment of your vehicle which contains your modem or accessories.

Before using your modem in a vehicle powered by liquefied petroleum gas (such as propane or butane) ensure that the vehicle complies with the relevant fire and safety regulations of the country in which the vehicle is to be used.

## 1.11 Non-ionising radiation

As with other mobile radio transmitting equipment , users are advised that for satisfactory operation and for the safety of personnel, it is recommended that no part of the human body be allowed to come too close to the antenna during operation of the equipment.

The radio equipment shall be connected to the antenna via a non-radiating 50 Ohm coaxial cable.

The antenna shall be mounted in such a position that no part of the human body will normally rest close to any part of the antenna. It is also recommended to use the equipment not close to medical devices as for example hearing aids and pacemakers.

## 2 Safety standards

The GPS receiver meets the safety standards for RF receivers and the standards and recommendations for the protection of public exposure to RF electromagnetic energy established by government bodies and professional organizations, such as directives of the European Community, Directorate General V in matters of radio frequency electromagnetic energy.

## 3 EVALUATION BOARD–Hardware

### 3.1 Technical data

- Dimensions: 83,87 x 60,43 x 38,00 mm (B x W x H)
- Power supply: 5 V DC
- Current consumption: - Eval-Board without GPS- receiver max 8 mA (at 5 V DC).  
- with OPX-ST max 73 mA (OPX-ST operate in continues mode) (at 5 V DC).
  
- Operating temperature: -40 to +85°C
- 2 x 10 (2 mm) pin connector for GPS-receiver OPX-ST / OPX-SH
- Serial port (15 pin connector) for GPS Port 1/Port 2
- LED – Power
- LED – TMARK
- Switch for Bootselect (for Firmware-update)
- Switch for V<sup>Batt</sup> (Buffer for internal RAM)
- Switch for external Antenna – Power (5 V)
- reset- button

### 3.2 Functional overview

The EVAL-BOARD provides the power supply of the connected GPS modules and carries a level adaptation for controlling the serial interfaces. It is used to convert the serial data to V24 level and supply the power. It has two connectors at the front side. One of them is a 15-pin plug-socket for terminal connection of GPS serial port 1/serial ports 2. The last one is the power connector.

#### 3.2.1 Make it work

By connecting the power the Eval-Board will switched ON automatically. It runs well when the LED-Power flashes. Connect the GPS-receiver antenna and place it in a position outside where it can "see" enough satellites.

Connect the special serial cable to the 15-pole connector of the Eval-Board and the other side called GPS-Port A to COM1 or COM2 port of the PC (depending on which COM is available). Now you can see GPS sentences through the SiRFdemo3.3.exe witch is available on the enclosed CD.

By using an active antenna witch connected at the EVAL-BOARD you have to switch ON the ANT (5 V) (see page 13).

The better way to see GPS position on your PC is to start "SiRFdemo.exe".

The SiRFdemo Software is available on the OPANIEL Website for free download

#### 3.2.2 Switches on the Eval-Board

- 1. Ant 5 V** Switch for external Antenna- Power (5 V).
- 2. Vbatt** Buffer for internal RAM
- 3. Bootselect** In order to programing the flash of the GPS- receiver this switch has to be set on position ON e.g. for updating a new firmware.

### **3.2.3 LED's on the Eval-Board**

There are two LED's on the EVAL-BOARD top-side.

#### **The red LED**

- Power- LED for Vcc (3,3 V)

#### **The green LED**

- 1 PPS Time Mark Output (not available in Trickle –Power- Mode)

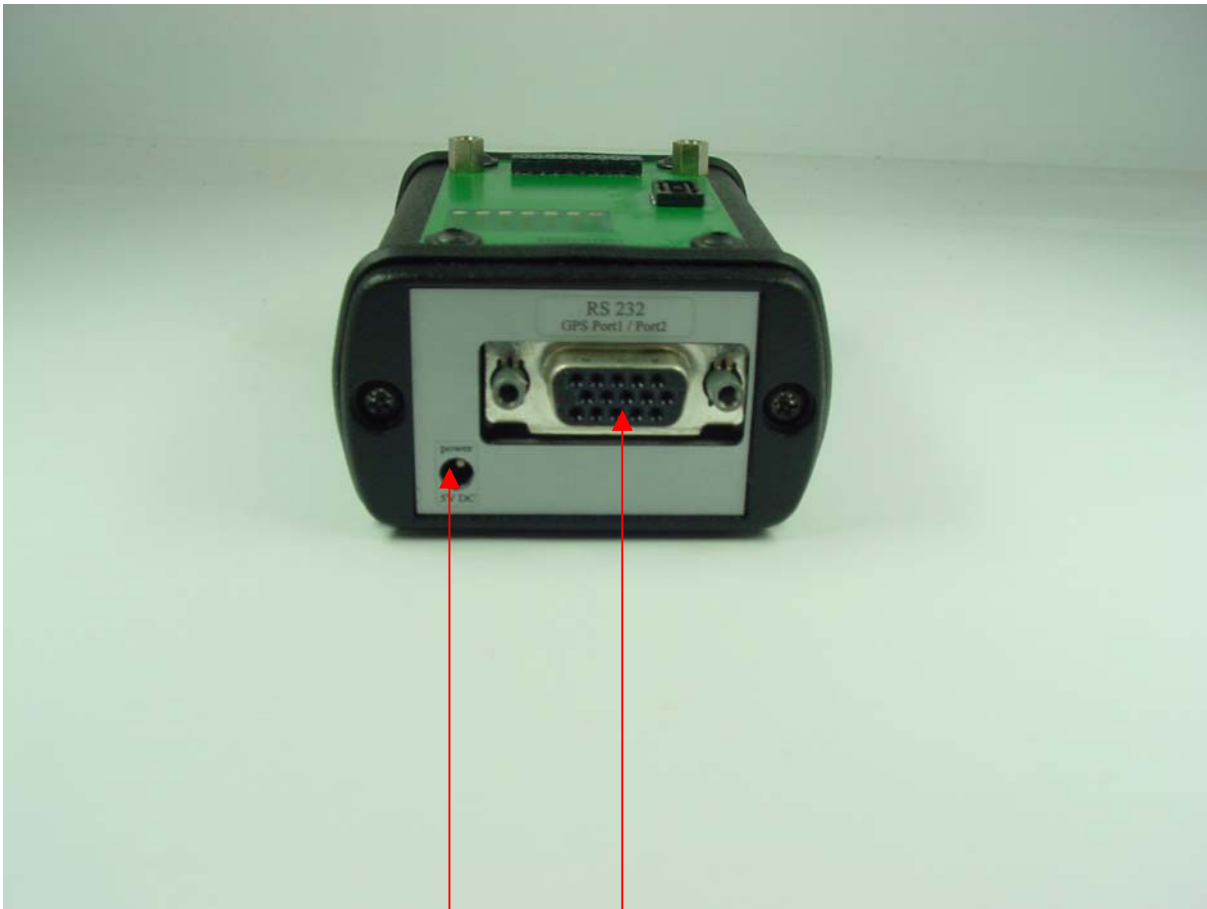
### **3.2.4 Test points at the EVAL BOARD**

The GPS-EVAL BOARD has test points for the 5 GPIO`s of the GPS Receiver. These are needed, if user-specific software programmes on the GPS Receiver. (Supported is only the official SiRF-software and not user-specific software)

### 4 Eval-Board with GPS-receiver OPX-ST



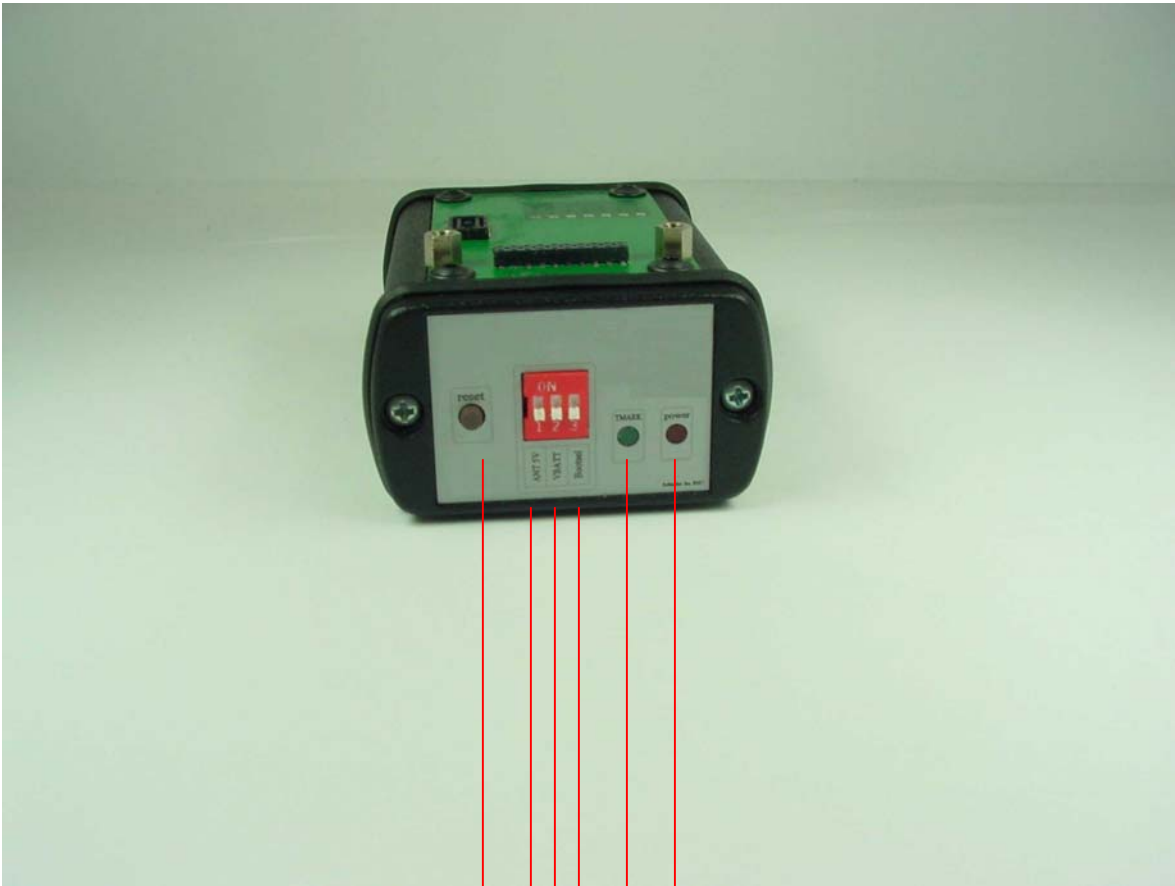
## 5 Eval-Board Bottom-side (RS232 DB 15 female)



RS232 (DB 15 female) GPS Port 1 and Port 2

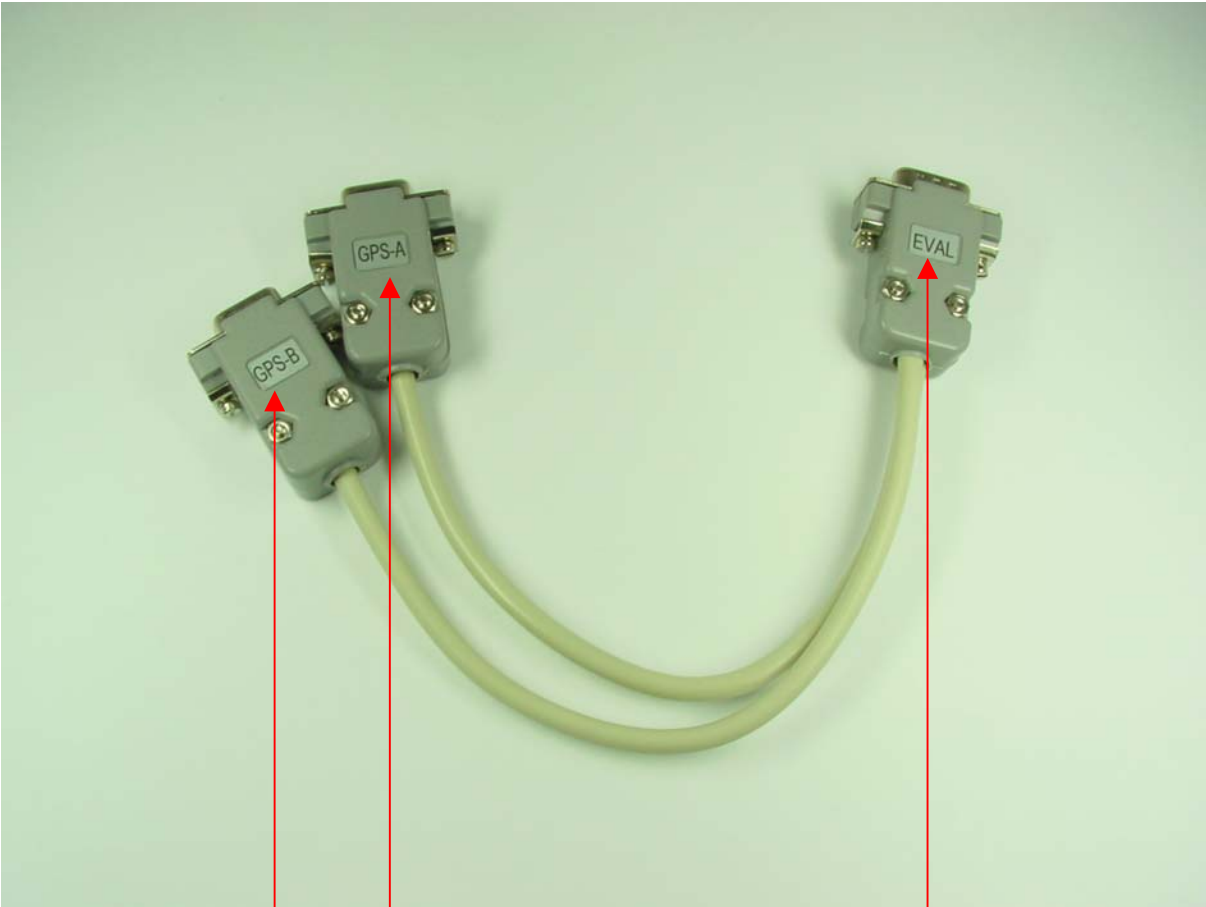
Power +5 V DC with Power Supply  
FRIVO FW 7238/05

## 6 Eval-Board Top-side



- LED - Power
- LED - TMAX
- Switch for Bootselect (for Firmware-update)
- Switch for  $V_{\text{batt}}$  (Buffer for internal RAM)
- Switch for external Antenna – Power (5 V)
- reset- button

# 7 Connect –cable for RS232



Port A (Port 1) DB 9

Port B (Port 2) DB 9

Eval (RS232 DB 15 male)