

iRBG-1

Radio Beacon for Target Localization with integrated GNSS Receiver

iMAR's iRBG-1 is a miniaturized, autonomous operating, light weight device, which is mounted on its carrier ("the target") and which allows to detect its position via the integrated GNSS receiver and to transmit it with the also integrated radio modem over up to 20 km to a control station or to another moving or static operated target or vehicle.

- light weight (117 grams with GNSS antenna)
- position accuracy 2 m (standard), other TBD
- up to 20 km distance transmission capability under suitable conditions
- data rate 10 Hz @ < 50 byte / paket
- size approx. 42 x 24 x 50 mm³, weight approx. 100 g
- battery capacity about 7 hrs operation
- temperature range -20...+50 °C operational, 0...45 °C charging via USB connector; IP41
- no operational license required in Germany
- data transmission: position, velocity, status
- interface available to iMAR's INS/GNSS systems
- easy to use: Simple and fast installation and operation

The iRBG-1 is designed to track aerial targets on a test range or objects on a proving ground. It is used to provide fast, accurate position information, e.g. to support collision avoidance or other localization and tracking applications.



Carriers (examples):



Technical Data of iRBG-1:

Position accuracy:	2 m CEP position measurement
Velocity range:	up to 515 m/s regarding GNSS based sensing (without any export control)
Data rate:	up to 10 Hz for position, velocity and status
Interface to host computer:	UART RS422 at central station;
Battery based operation:	up to 7 hrs; battery charging via USB-Mini, type A/B, 5 V / 1 A
Communication:	up to 20 km under sufficient conditions (open line of sight) between Mobile Device and Host Computer Interface
Radio Frequencies:	Operation allowed free of license in Germany
Mass:	< 120 grams incl. antenna (as option also version with 13 hrs operational time and about 220 grams available)
Size:	approx. 42 x 24 x 50 mm ³
Options:	- version with 13 hrs operation: about 55 x 24 x 80 mm ³ . - larger enclosure with integrated INS/GNSS/ODO attitude/heading&navigation system on request.

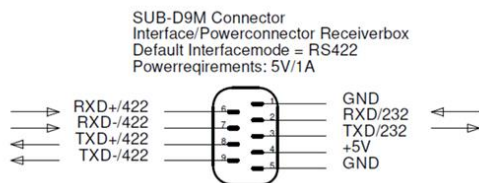
iMAR Navigation GmbH • Im Reihersbruch 3 • D-66386 St. Ingbert / Germany
Phone: +49-(0)-6894-9657-0 • Fax: +49-(0)-6894-9657-22
www.imar-navigation.de • sales@imar-navigation.de



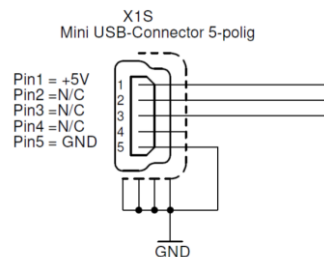
iRBG-1-HCI (Host Computer Interface)



iRBG-1-MD (Mobile Device)



Connector Position Beacon
Charger Requirements
USB 5V 1A; Connector USB-Mini Typ A/B



The Mobile Device provides an USB interface for battery charging (5 V, 1 A) and configuration.

The Host Computer Interface provides a SubD-9 connector with UART RS422 interface and power supply input. The data output is a dedicated message, the packet definition is given on the following page.

- Radio Module to communicate with the Mobile Device
- Power Supply: 5 V DC / 1 A
- Communication Port: UART RS422, 115'200 Bd
- Communication Protocol: dedicated packet structure as defined below
- Communication Message: Position (Lon/Lat/Alt), standard deviation of position, time, status, number of satellites in use, field strength of radio transmission
- Data Rate: 10 Hz, unidirectional from iRBG-1-MD (Mobile Device) to iRBG-1-HCI (Host Computer Interface)



The following paket is transmitted at 10 Hz data rate from iRBG-1-MD to iRBG-1-HCI:

	Field	Field Name	Data Description	Unit	Scale Factor	Datatype	Default Value
HEADER	1	sync	Synchronisation byte	---	---	uint8_t	0x02
	2	command	Command byte	---	---	uint8_t	0x81
	3	length	Packet Length; Payload + 3 bytes; from net_id to field_strength	---	---	uint8_t	0x1B
	4	net_id	Senders Network ID	---	---	uint8_t	0x00
	5	address	Senders Address	---	---	uint8_t	0x00
PAYLOAD	6	msg_id	Message ID of Payload	---	---	uint8_t	0x00
	7	reserved	Reserved field for further use	---	---	uint8_t[3]	0x00 0x00 0x00
	8	status	Status byte; bit[0] = GNSS solution invalid	---	---	uint8_t	---
	9	sats_used	Number of satellites used for GNSS solution	---	---	uint8_t	---
	10	accuracy	3D Position accuracy of solution $\sqrt{(\text{horizontal_part}^2 + \text{vertical_part}^2)}$	cm	---	uint16_t	---
	11	itow	GPS time of week of the navigation epoch	ms	---	uint32_t	---
	12	latitude	Latitude value	deg	1e-7	int32_t	---
	13	longitude	Longitude value	deg	1e-7	int32_t	---
	14	height	Height value (WGS84 ellipsoid)	mm	---	int32_t	---
	FOOTER	15	field_strength	RSSI value given in two's complement notation	---	---	uint8_t
16		cs	Checksum is a XOR conjunction of all previous bytes	---	---	uint8_t	---

Example Stream 02811B00000000000000109B02F059770C5A995E1DCF6E44049ADD0400F213

