ShenZhen CASTELWireless Telecommunications CO.,LTD.

SAT802 Product User Manual for Iridium/GPRS Dual mode communication terminal

Warning!

1. This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) This device must accept any interference received, including interference that may cause undesired operation.

2. Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

3. Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.

—Increase the separation between the equipment and receiver.

—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

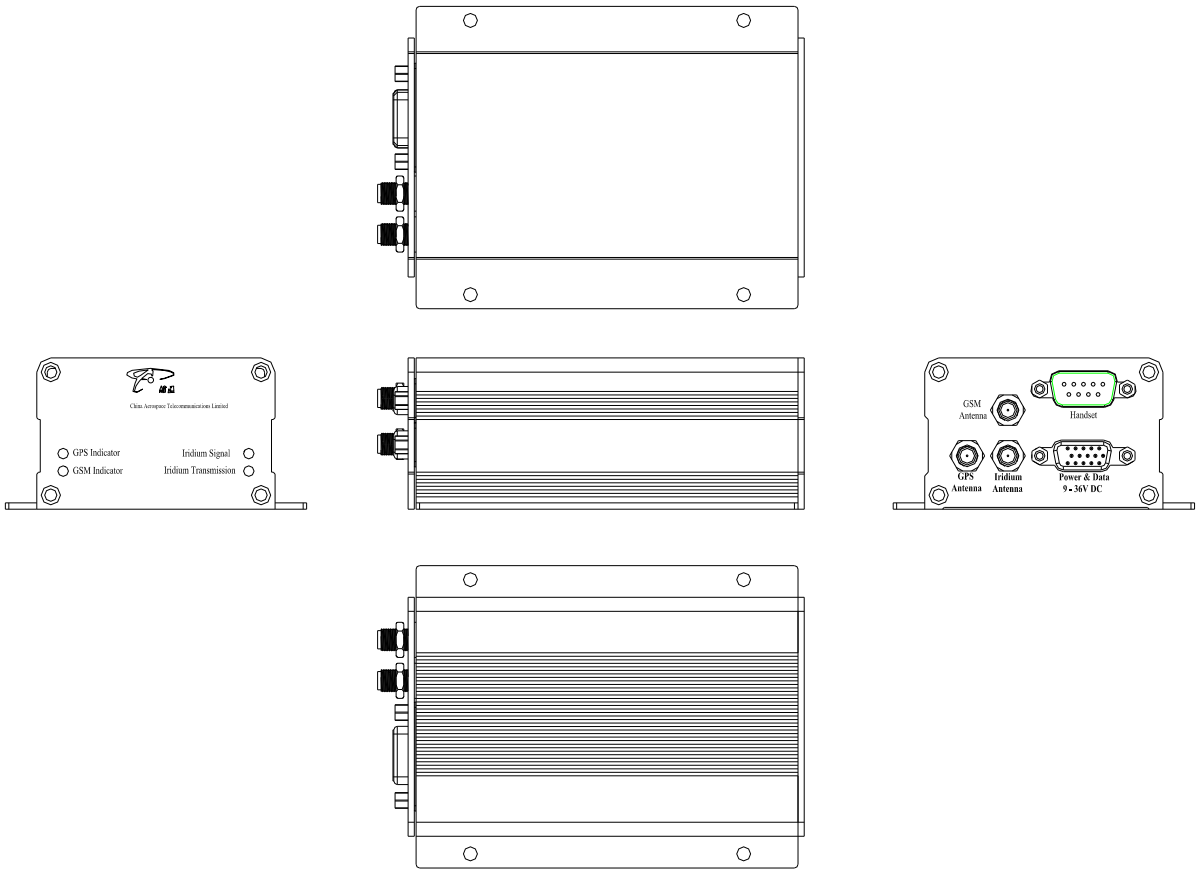
—Consult the dealer or an experienced radio/TV technician for help.

4. This equipment complies with FCC radiation exposure limits set forth for uncontrolled environment .This equipment should be installed and operated with minimum distance 20cm between the radiator& your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

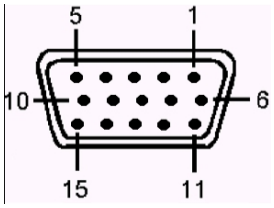
1 Definition

1.1 Hardware interface

SAT802 host provides five external interfaces, that's Power supply & Data transmission interface, Handset interface, Iridium antenna interface, GSM antenna interface and GPS antenna interface as shown below.



1.1.1 Definition of power supply & data transmission interface

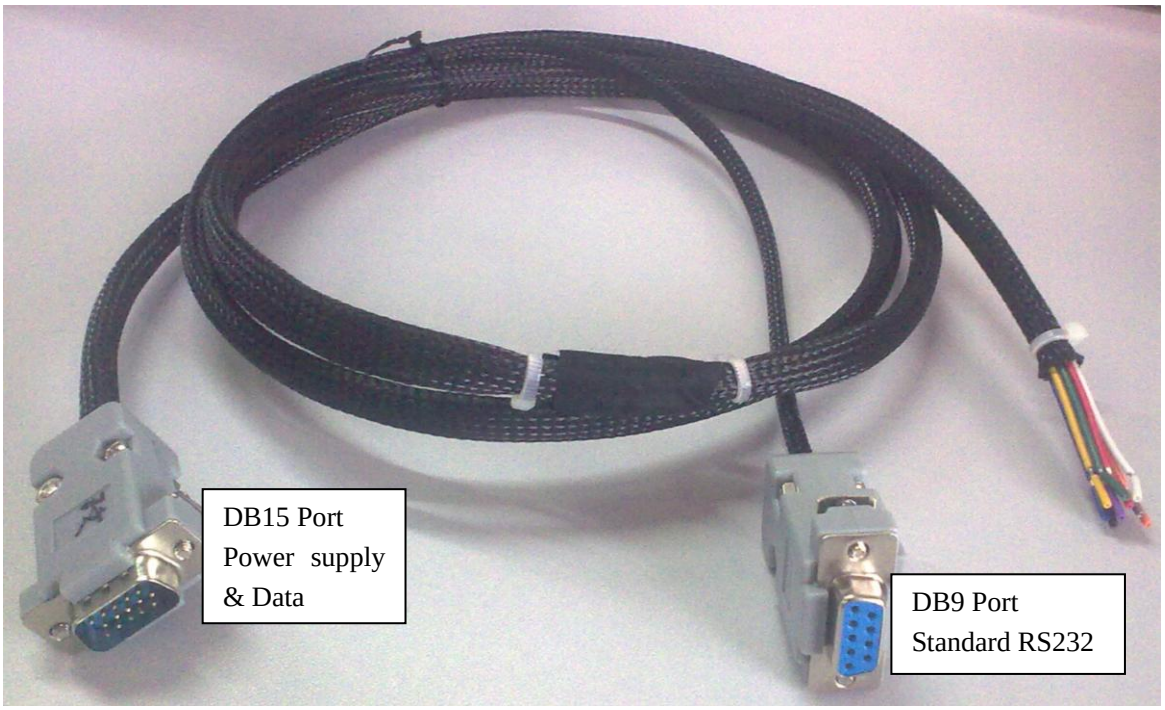


Pin	color	Signal Name	Direction	Description	Remark
Pin 1	Red	Power	IN	Power Input	Range：9 -- 36V DC
Pin 2	Orange/black	ISO_GND	-	Isolated Ground	
Pin 3	DB9 Port of Multi-function cable	TXD	OUT	Transmit	Standard RS232, Able to connect to other devices Which have RS232
Pin 4		RXD	IN	Receive	
Pin 5		Signal Ground	-	Ground	

					interface. Baud rate: 8N1, 9600bps。
Pin 6	Black	Ground	-	Ground	
Pin 7	Orange	ISO_VIN	IN	Isolated VIN	
Pin 8	Yellow	ISO_GND	-	Isolated Ground	
Pin 9	Green	GPIO1	I/O	The state of this bit can be configured as either an input or an output. The input bit can be configured either for voltage input or for grounding input. The output bit can be configured for a power-up initial state of either high or ground.	
Pin 10	Blue	GPIO2	I/O	The state of this bit can be configured as either an input or an output. The input bit can be configured either for voltage input or for grounding input. The output bit can be configured for a power-up initial state of either high or ground.	
Pin 11	Purple	GPIO3	I/O	The state of this bit can be configured as either an input or an output. The input bit can be configured either for voltage input or for grounding input. The output bit can be configured for a power-up initial state of either high or ground.	
Pin 12	Gray	GPIO4	I/O	The state of this bit can be configured as either an input or an output. The input bit can be configured either for voltage input or for grounding input. The output bit can be configured for a power-up initial state of either high or ground.	
Pin 13	White	GPIO5	I/O	The state of this bit can be configured as either an input or an output. The input bit can be configured either for voltage input or for grounding input. The output bit can be configured for a power-up initial state of either high or ground.	
Pin 14	Pink	ISO_GND	-	Isolated Ground	
Pin 15	Brown	Idle	OUT	TBD	TTL 0 -- 5V

		Indicator			

1.1.2 Multi-function cable



To make user connect the device easily, there is a set of cable provided with the device. One side of the cable connects “Power & Data”port of the device. Thereare two types of signal at the other side, power parts and RS-232 femaleconnector.

In power parts, Red is for +ve 9-33VDC input and black is for power ground.

Please make sure positive pole of your power connected with the red wire,otherwise the device will be damaged!

2 Functions

2.1 Device initialization

After host powers up, four indicators will fully light for 1 second, then fully turn off. Later, terminal starts to initialization process.

If GPS module works well, after GPS has valid positioning, "GPS indicator" will start blinking.

Meanwhile, GSM initialization begins. If initialization is successful, "GSM indicator" lights, then dial to centre server. After a successful connection, "GSM indicator" starts blinking.

When GSM initialization finished, system will run Iridium module's initialization. If successful, "Iridium network" indicator starts blinking.

2.2 Parameter settings

Device should set parameters before use. You can set parameters through setting tool via device's RS232 standard serial port which also has data transparent transmission function.

Detailed setting commands see "User Communication Protocol" part in Auxiliary《SAT802 Communication Protocol.pdf》.

2.3 Working mechanism of data transparent transmission

Any data not being above-mentioned parameter format that terminal serial port received will be considered as "user transparent transmission data", and according to channel status, data will be sent to its destination by GPRS data link or Iridium SBD.

Bytes interval in the data packet of "user transparent transmission data" should not be larger than 0.5 second and the length of each data packet should not be larger than 336 bytes. When large amounts of data need to be transmitted, data will be divided into packets.

Data transmission between terminals has a data length limit with a maximum of 266 bytes.

As a response, after sending "user transparent transmission data", device then sends a "SEND OK" message to external data device via serial port. After external data device receives this response, it prepares to send next data packet.

In dual-mode communication, GPRS channel has priority. If condition meets < login failed or heartbeat confirmation failed, reboot GPRS link connection, if failed, wait 30 seconds, then again, if still failed after three times>, it will automatically switch to Iridium SBD communication channel. In Iridium SBD communication channel mode, system still keep booting GPRS link connection until connecting successfully, if connected, communication mode turns to GPRS communication channel.

2.4 LED indicator for working status

2.4.1 GSM status

Blinking: GPRS network login success.

Always light: Do not login to GPRS network yet.

Turn off: sleep status, GSM does not work or GSM fault.

2.4.2 GPS status

Blinking: GPS positioned successfully.

Always light: searching signal.

Turn off: sleep status, GPS does not work or GPS fault.

2.4.3 Iridium network

Blinking: Iridium is in network service status.

Always light: Iridium is not in network service status.

Turn off: sleep status, Iridium does not work or Iridium fault.

2.4.4 Iridium sending status

Blinking: Iridium is receiving or sending data.

3 Installation Guide

3.1 Installation of SIM card

Insert the SIM card before installation of the main unit. Operation steps of which are as follows:

1) Open the side plate of the main unit with screw driver.

2) Insert the SIM cards by directing it at the card seat.

3) Fix the side plate to the main unit, fasten the screw and secure it.

3.2 Placement of SAT802 main unit

The location for placement of the SAT802 main unit should be determined in advance. The location should allow anti-humidity, avoidance of high-temperature area, and be far away from magnetic field and other sensitive electronic equipment.

3.3 Installation of GPS antenna

GPS antenna must not be installed under metal baffle plate because it can hinder receipt of GPS signals, thus affecting the normal monitoring and positioning of the SAT802 main unit. Try to install GPS antenna as horizontally as possible. Place the convex upward, and its included angle with the ground must not exceed 15 degrees. Besides, it must be fixed

securely.

3.4 Installation of GSM antenna

The GSM antenna will transmit RF (radio frequency) signal, in order to avoid interfering with the unit's equipment, the GSM antenna should be placed far from the main unit and the multifunction cable.

3.5 Installation of Iridium antenna

Iridium antenna must not be installed under metal baffle plate because it can hinder transmission and receipt of satellite signals. Try to install Iridium antenna as horizontally as possible. Place the antenna upward without high buildings nearby and its included angle with the ground must not exceed 15 degrees. Besides, it must be fixed securely and far from GSM antenna. It is recommended that the distance between Iridium antenna and GSM antenna should be no less than 1.5m.

Warning!: Any change of the GPS, GSM and Iridium antennas' feedback cable may affect the normal working of the SAT802.