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[Home](#) » [Spireon](#) » **Spireon SIMBA-G Wireless Communication Device User Manual** 

**Contents** [ [hide](#) ]

- [1 Spireon SIMBA-G Wireless Communication Device](#)
- [2 INTRODUCTION](#)
- [3 Hardware Design](#)
- [4 Test Method](#)
- [5 FCC Statement](#)
- [6 FAQ](#)
- [7 Documents / Resources](#)
  - [7.1 References](#)



## **Spireon SIMBA-G Wireless Communication Device**

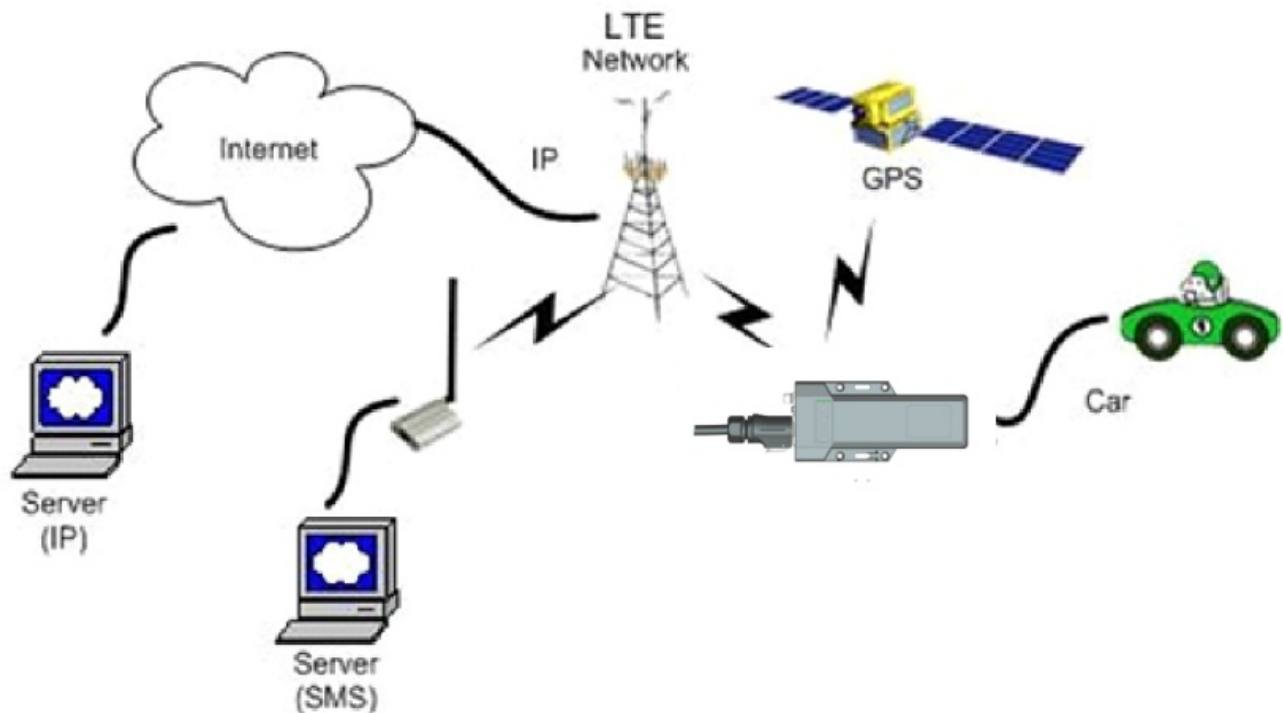


## INTRODUCTION

The device comes pre-configured from the factory. It is ready to use. The SIMBA appears to a user or a server application as an endpoint device. It can be queried, updated, and configured either through a serial connection, over an air IP connection, or through SMS messaging. The SIMBA presents itself over these connections as an enhanced cellular modem with attached functional elements. These elements include:

- GPS location engine
- Accelerometer
- Input/outputs dedicated for ignition, relay, buzzer, and general purpose
- Serial UART port
- Timers
- Watchdog lockup protection
- Power management
- Event reporting
- Voltage monitoring

Access to these elements and a general-purpose interface is done through an extended AT command set. Configuration parameters are stored to flash memory and are automatically used on the next power-up event. For more details, please reference the AT Command document.



## Hardware Design

### Basic Hardware

Items	Requirement
Cellular Modem	Based on the Quectel EC21-A Module
Cellular Network Interface	Support for LTE B2, B4, B12 WCDMA B2 B4 B5

<b>Frequency</b>	<p>B2:TX (1850–1910) MHZ RX (1930–1990) MHZ</p> <p>B4:TX (1710–1755) MHZ RX (2110–2155) MHZ</p> <p>B12:TX (699–716) MHZ RX (729–746) MHZ WC</p> <p>DMA B2:1900MHz</p> <p>WCDMA B4:1700MHz</p> <p>WCDMA B5:850MHz</p>
<b>Cellular Antenna</b>	Internal single antenna
<b>GPS Antenna</b>	Dedicate high high-performance ceramic antenna
<b>UIM requirement</b>	Support 4FF SIM Interrupt Mode No Support Hot Plug/Unplug
<b>Battery Monitor</b>	Internal analog input
<b>Built-in battery manager</b>	Yes
<b>Interface</b>	Debug UART
	12V DC Input 1A current , Ground
	Relay Drive (Open Drain, 500mA current)
	Dedicated Output for buzzer control
	Ignition Input
	GPIO
<b>Dedicate Timers</b>	Yes
<b>Watchdog</b>	External HW via MCU
<b>Motion Detect</b>	Supported GPS/G-Sensor

<b>LED</b>	3 LED Supported  1- RED; 1- Green;1-Orange
<b>Battery</b>	built in battery 4400mAH Lion
<b>Working Time</b>	6 months
<b>Power switch</b>	No
<b>Power Cable color</b>	4 or 6 colors
<b>Power Cable connector type</b>	12-pin connector+5pin
<b>Power Consumption</b>	< 5Watts

The SIMBA provides support for specialized hardware features through extended AT commands. The features supported include the following:

### **Accelerometer**

- The accelerometer can be used for motion detection and driver behavior monitoring.

### **Remote Update**

- The SIMBA supports OTA field upgrades of the resident application. An over-the-air FTP connection is made over an IP connection.
- A replacement file is then transferred from a server to the SIMBA, and that file replaces the previous application image.

### **Power Modes**

The SIMBA device supports several power modes that are set by AT commands. In full power mode, the GPS is active, and the cellular subsystem will maintain a persistent cellular connection whenever service is available. IP connection is maintained according to the configuration of the device. The device can be put in low power mode whenever it runs on a backup battery or if the external battery is low, or if it is not moving. In low

power mode, the GPS is not running, and the LEDs are off. The device would return to full power whenever an event occurs that triggers a report. Those events include:

- Periodic report
- GPIO change
- IP change
- Battery threshold
- Heartbeat
- Watchdog
- Power-up
- Ignition
- Trip start and stop

Any hardware or software reset will return the device to full power mode.

## Test Method

### Hardware

Test Item	Description
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<b>Baseband Function Test</b>	<ul style="list-style-type: none"> <li>• Power Input Test</li> <li>• Power Consumption and Current Test</li> <li>• Heat Dissipation Test</li> <li>• UART Stability Test</li> <li>• GPIO Level Test</li> <li>• LED Stability Test</li> <li>• Drop Down Test</li> <li>• ESD Test</li> <li>• High/Low Temperature Test</li> <li>• Humidity Test</li> </ul>
<b>RF Test</b>	<ul style="list-style-type: none"> <li>• RF Performance Test</li> <li>• GPS Performance Test</li> <li>• Antenna Performance Test</li> </ul>

## Software Test

### Test Environment Construct

Message Test environment

- USB dongle and PC as a message server
- Send a message to SIMBA

### UDP Test environment

- Connect the dongle to the PC and create a dial-up as ip server

- SIMBA creates an IP connection to the server

## **UART Test environment**

- Connect SIMBA to the PC with a COM serial cable
- Open the Terminal tool and send a command
- The response can be shown in the terminal window

## **FCC Statement**

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 under the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a partic deou lpaarr 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 to 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.

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

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for

compliance could void the user's authority to operate the equipment.

## **FCC RF Radiation Exposure Statement**

- This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.
- To comply with FCC RF Exposure compliance requirements, this grant is applicable only to Mobile Configurations.
- The antennas used for the transmitter must be installed to provide a separation distance of at least 20cm from all persons and must not be colocated or operating in conjunction with any other antenna or transmitter.

## **Canada Regulations:**

This device complies with Industry Canada's licence-exempt RSSs. Operation is subject to the following two conditions:

1. This device may not cause interference, and
2. This device must accept any interference, including interference that may cause undesired operation of the device.


## **Caution**

- This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

## **FAQ**

- **Q:** Can I update the device remotely?
- **A:** Yes, the SIMBA supports OTA field upgrades of the resident application.
- **Q:** What are the connectivity options for configuring the device?
- **A:** The device can be configured through a serial connection, over-the-air IP connection, or SMS messaging.

## **Documents / Resources**

	<a href="#">Spireon SIMBA-G Wireless Communication Device [pdf]</a> User Manual FLF4L, O9YFLF4L, SIMBA-G Wireless Communication Device, SIMBA-G , Wireless Communication Device, Communication Device, Device
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## References

- [User Manual](#)

Spireon  
Communication Device, device, FLF4L, O9YFLF4L, SIMBA-G, SIMBA-G Wireless Communication Device, Spireon, Wireless Communication Device

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