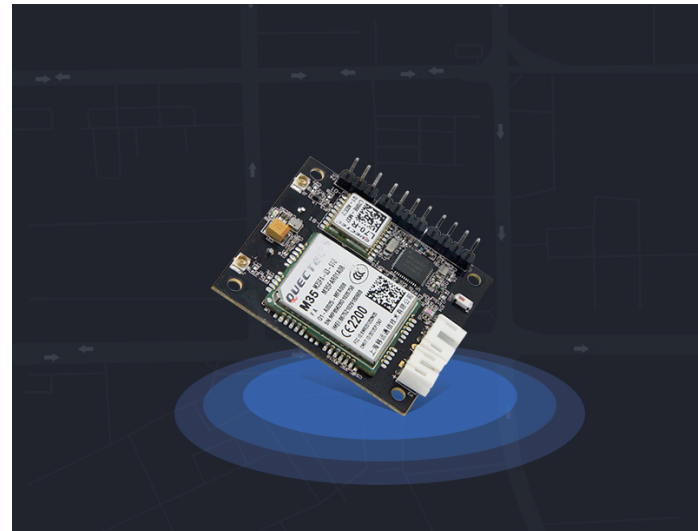# RAK8211-G iTracker Module

A versatile developer board aimed at aiding in quick prototypes using GPRS

- Combined with GPS+GPRS (M35) and BLE Functions
- USB port with serial access
- LiPo battery charger and USB charger
- User can customize key definitions in the module

iTracker RAK8211–G is versatile developer board aimed at aiding in quick prototypes using GPRS. The board includes a vast array of connectivity options (GPRS, BLE 5.0 and GPS) and sensors like an accelerometer, a light sensor and a barometric sensor. At the heart of the module is the venerable Nordic NRF52832 BLE processor. The GPRS connectivity is provided by the Quectel M35 module. The iTracker module is Arduino friendly and can be programmed using the IDE.

The board also provides SWD interface for programming the NRF52832 core. The combination of BLE and NB–IoT provides flexible low power consumption development along with myriad of application option ranging from telemetry to live tracking and environment sensing.

Applications
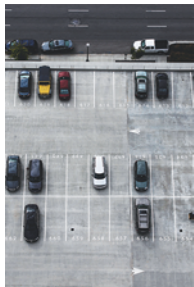
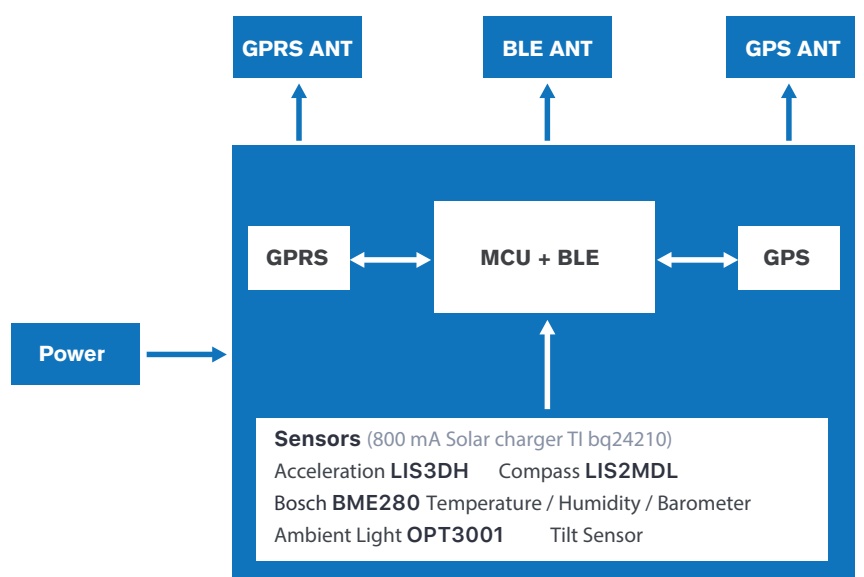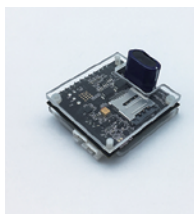|						
Vehicle tracking / fleet transportation management	Safety monitoring of old / young children	Animal protection and animal husbandry management	Loss of assets / personnel positioning	Home Security	Street Light control	Factory Automation

Parameters

Module Name	RAK8211–G
Dimension	43mm x 38mm x 18 mm
Interface	Digital I/O,Analog input
GSM/EDGE	850/900/1800/1900MHz
Antenna Type	External antenna
Operating temperature	−40°C to +85°C
Storage temperature	−40°C to +85°C
Power Supply	3.5V~18V

Sturdy Casing

System Block Diagram

GPRS ANT   **BLE ANT**   **GPS ANT**

GPRS   **MCU + BLE**   **GPS**

Power

Sensors (800 mA Solar charger TI bq24210)
Acceleration **LIS3DH**   Compass **LIS2MDL**
Bosch **BME280** Temperature / Humidity / Barometer
Ambient Light **OPT3001**   Tilt Sensor

▮ Integrated Multiple Sensors

Acceleration LIS3DH

Compass LIS2MDL

Bosch BME280 Temperature / Humidity/Barometer

Ambient Light OPT3001

Tilt Sensor

▮ Cloud

M35 + GPS +Bluetooth 5 + Sensor

Real-time Database Authentication

Persistent Storage

Web hosting

multi-client synchronization

New York
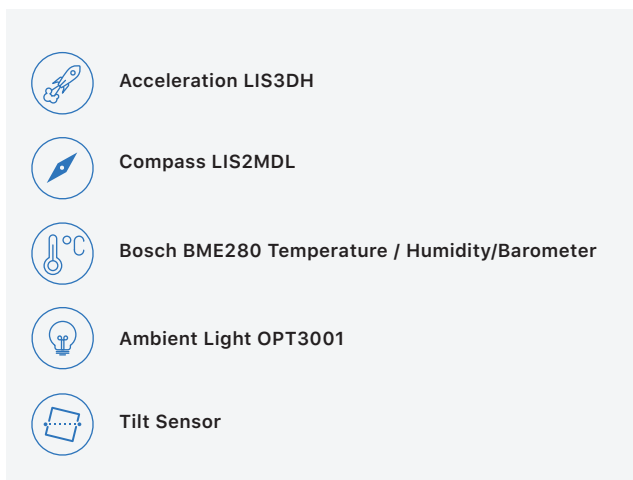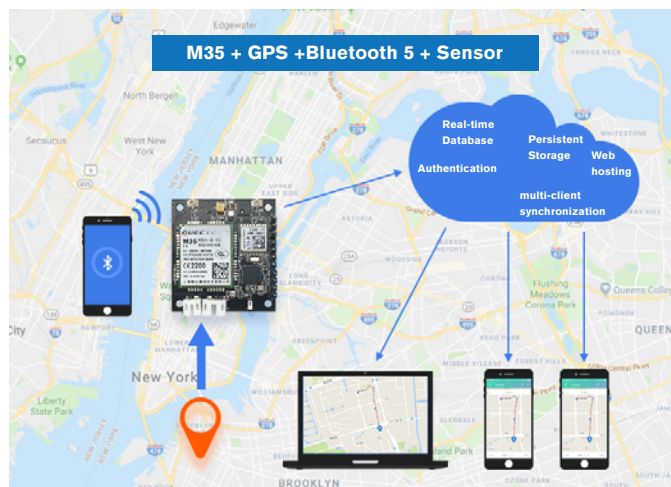
▮ Bluetooth Effective Distance
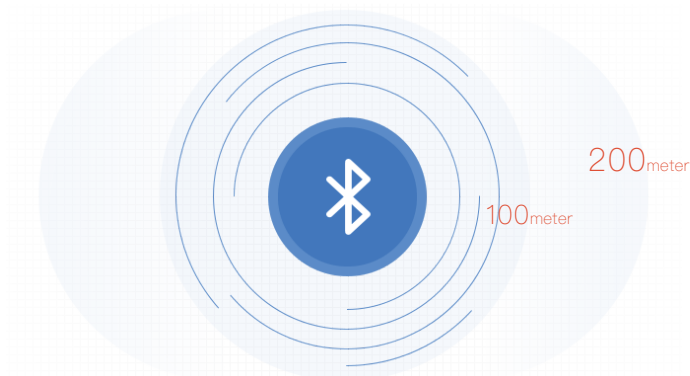
200meter

100meter
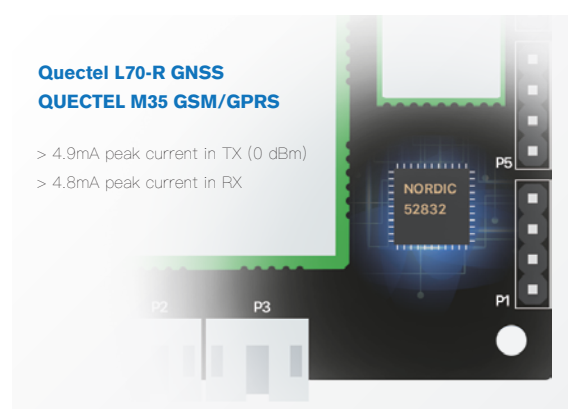
In real Testing, the Bluetooth with 0dbm,
the distance is over 100 meter,
The bluetooth with 4dbm, the distance is over 200 meter

▮ NOrdic NRF52832 MCU

Quectel L70-R GNSS
QUECTEL M35 GSM/GPRS

> 4.9mA peak current in TX (0 dBm)
> 4.8mA peak current in RX

NORDIC 52832

P5

P1

P2   P3

▮ Solar Charger and Li-battery Charger

Support 800mA Sloar charger TI bq24210

BQ24210
TEXAS INSTRUMENTS

Built in solar and lipo charger circuit

bq24210 800-mA
Single-Input
Single-Cell Li-Ion Battery Solar Charger

▮ GPS Specification

Feature	Description
L1 Band Receiver	Channel:22(Tracking) / 66(Acquisition)C/A Code
Horizontal Position Accuracy	Autonomous: <2.5m CEP
Velocity Accuracy	Without Aid: <0.1m/s
Acceleration Accuracy	Without Aid: <0.1m/s²
Timing Accuracy	1PPS Out: 10ns
Reacquisition Time	<1s
TTFF@–130dBm with EASy™	Cold Start: <1s
	Warm Start: <5s
	Hot Start: <1s
Sensitivity	Acquisition: –148dBm
	Tracking: –165dBm
	Reacquisition: –160dBm
Dynamic Performance	Maximum Altitude: Max. 18000m
	Maximum Velocity: Max. 515m/s
	Maximum Acceleration: 4G
Protocols	NMEA 0183
	PMTK

▮ GPRS Specification

Feature	Description
GSM/EDGE	850/900/1800/1900MHz
GPRS Level 12	MAX Downstream 85.6kbps MAX Upstream 85.6kbps
PBCCH Encoding Mode	CS 1, 2, 3, 4
Message	Send and receive point to point SMS Cellular broadcast message Text and PDU mode
Audio Processing Mechanism	Echo cancellation Echo suppression Noise suppression
Speech Coding Mode	HR FR EFR AMR
Output Power	Class 4 (2W @850/900MHz) Class 1 (1W @1800/1900MHz)
Power	1.3mA @DRX=5 1.2mA @DRX=9
Protocol	PP/TCP/UDP/FTP/HTTP /SMTP/MUX