



### Product Introduction

# Debut<sup>®</sup> MINI (2G/4G/5G)

MINI (2G/4G/5G) is a solar-driven GPS-Cellular-ACC tracker suitable for backpack deployment.

## BASIC SPECIFICATIONS

MODEL	MINI 2G / 4G / 5G	
Appearance	Standard/Lite version 	M1 version 
<b>Housing</b>	PC injection molding	Nylon 3D-printed
<b>Color</b>	Light brown	White
<b>Weight</b>	<ul style="list-style-type: none"> <li>- MINI 2G standard/lite: 6.3/5.8±0.1g</li> <li>- MINI 4G standard: 6.4±0.1g</li> <li>- MINI 5G standard: 5.8±0.1g</li> </ul>	<ul style="list-style-type: none"> <li>- MINI 2G M1: 5.1±0.1g</li> <li>- MINI 4G M1: 5.8±0.1g</li> <li>- MINI 5G M1: 5.2±0.1g</li> </ul>
<b>Dimensions (LWD, antenna excluded)</b>	20.6 mm × 20.6 mm × 11.5 mm	20.5mm x 18mm x 10.5mm
<b>Antenna</b>	External, titanium alloy with protective coating	
<b>Battery</b>	30 mAh lithium polymer rechargeable battery, with under-and-over-charging protection	
<b>Battery Life</b>	Over 300 GPS positions under optimal GPS satellite view at 5-minute interval	
<b>Solar Type</b>	GaAs solar unit (30% efficiency) with good performance under weak light	
<b>GPS Module</b>	Precision: CEP (50%) 5m Maximum update rate: 10 Hz	
<b>Working Temperature</b>	-10°C~60°C (good for cold winter as close to animal body)	
<b>Waterproof</b>	IP 68 (The water-proof standard of the M1 version is 10cm underwater for 2 hours.)	
<b>Firmware Upgrade</b>	Remotely via network, or instantly via INTELINK	
<b>Working Schedule</b>	Remotely via network, or instantly via INTELINK	
<b>Global Roaming</b>	Support	
<b>SMS Function</b>	Support (upon request)	
<b>Data Storage</b>	Logged data will be stored in memory if network is unavailable. <ul style="list-style-type: none"> <li>- Flash memory: 16 MB</li> <li>- Regular data storage: 460 days at default setting (1h GPS+1h ENV+10 min BHV)</li> <li>- BOOST data storage: 280,000 pieces</li> <li>- ACC data storage: 28,700 pieces</li> </ul>	

## DATA TYPES

- GPS: longitude, latitude, altitude, geoid height, course, satellite quantity
- ENV: voltage, light intensity, temperature
- BHV: ODBA (overall dynamic body acceleration)
- ACC: x/y/z acceleration data (upon request)
- BSS: longitude, latitude, altitude (alternative locating method for extreme situation)

## TRANSMISSION MODULE

### ■ MINI 2G

Band	Uplink (MHz)	Downlink (MHz)	Output Power (dBm)
<b>GSM850</b>	824.2 ~ 848.8	869.2 ~ 893.8	33
<b>EGSM900</b>	880.2 ~ 914.8	925.2 ~ 959.8	33
<b>DCS1800</b>	1710.2 ~ 1784.8	1805.2 ~ 1879.8	30
<b>PCS1900</b>	1850.2 ~ 1909.8	1930.2 ~ 1989.8	30

Maximum uplink/downlink data rate: 85.6 Kbps/85.6 Kbps

### ■ MINI 4G

Band	Uplink (MHz)	Downlink(MHz)	Output Power(dBm)
<b>LTE-FDD B1</b>	1920 ~1980	2110 ~2170	23 dBm±2.7 dB
<b>LTE-FDD B3</b>	1710 ~1785	1805 ~1880	23 dBm±2.8 dB
<b>LTE-FDD B5</b>	869 ~ 894	824 ~ 849	23 dBm±2.9 dB
<b>LTE-FDD B8</b>	880 ~915	925 ~960	23 dBm±2.10 dB

Maximum uplink/downlink data rate: 5Mbps/10Mbps

### ■ MINI 5G

MINI 5G supports both NB-IoT and LTE-M (or called eMTC) frequency bands. We will activate selected bands for devices to be used in different regions. Below lists all the bands that are supported.

NB-IoT bands:

<b>Band</b>	<b>Duplex mode</b>	<b>f (MHz)</b>	<b>Uplink (MHz)</b>	<b>Downlink (MHz)</b>	<b>UL/DL Bandwidth (MHz)</b>	<b>Duplex spacing (MHz)</b>	<b>Channel bandwidths (kHz)</b>
<b>B1</b>	HD-FDD	2100	1920-1980	2110-2170	60	<b>190</b>	180(/200)
<b>B2</b>	HD-FDD	1900	1850-1910	1930-1990	60	<b>80</b>	180(/200)
<b>B3</b>	HD-FDD	1800	1710-1785	1805-1880	75	<b>95</b>	180(/200)
<b>B4</b>	HD-FDD	1700	1710 -1755	2110 -2155	45	<b>400</b>	180(/200)
<b>B5</b>	HD-FDD	850	824-849	869-894	25	<b>45</b>	180(/200)
<b>B8</b>	HD-FDD	900	880-915	925-960	25	<b>45</b>	180(/200)
<b>B11</b>	HD-FDD	1500	1427.9-1447.9	1475.9-1495.9	20	<b>48</b>	180(/200)
<b>B12</b>	HD-FDD	700	699-716	729-746	17	<b>30</b>	180(/200)
<b>B13</b>	HD-FDD	700	777-787	746-756	10	<b>31</b>	180(/200)
<b>B14</b>	HD-FDD	700	788-798	758-768	10	<b>30</b>	180(/200)
<b>B17</b>	HD-FDD	700	704-716	734-746	12	<b>30</b>	180(/200)
<b>B18</b>	HD-FDD	800	815-830	860-875	15	<b>45</b>	180(/200)
<b>B19</b>	HD-FDD	800	830-845	875-890	15	<b>45</b>	180(/200)
<b>B20</b>	HD-FDD	800	832-862	791-821	30	<b>41</b>	180(/200)
<b>B25</b>	HD-FDD	1900	1850-1915	1930-1995	65	<b>80</b>	180(/200)
<b>B26</b>	HD-FDD	850	814-849	859-894	35	<b>45</b>	180(/200)
<b>B28</b>	HD-FDD	700	703-748	758-803	45	<b>55</b>	180(/200)
<b>B31</b>	HD-FDD	450	452.5-457.5	462.5-467.5	5	<b>10</b>	180(/200)
<b>B66</b>	HD-FDD	1700	1710-1780	2110-2200	70/90	<b>400</b>	180(/200)

LTE-M (eMTC) bands:

<b>Band</b>	<b>Duplex mode</b>	<b>f(MHz)</b>	<b>Uplink (MHz)</b>	<b>Downlink (MHz)</b>	<b>UL/DL Bandwidth (MHz)</b>	<b>Duplex spacing (MHz)</b>	<b>Channel bandwidths (MHz)</b>
<b>B1</b>	HD-FDD	2100	1920-1980	2110-2170	60	<b>190</b>	1.08(/1.4)
<b>B2</b>	HD-FDD	1900	1850-1910	1930-1990	60	<b>80</b>	1.08(/1.4)
<b>B3</b>	HD-FDD	1800	1710-1785	1805-1880	75	<b>95</b>	1.08(/1.4)
<b>B4</b>	HD-FDD	1700	1710 -1755	2110 -2155	45	<b>400</b>	1.08(/1.4)
<b>B5</b>	HD-FDD	850	824-849	869-894	25	<b>45</b>	1.08(/1.4)
<b>B8</b>	HD-FDD	900	880-915	925-960	25	<b>45</b>	1.08(/1.4)
<b>B11</b>	HD-FDD	1500	1427.9-1447.9	1475.9-1495.9	20	<b>48</b>	1.08(/1.4)
<b>B12</b>	HD-FDD	700	699-716	729-746	17	<b>30</b>	1.08(/1.4)
<b>B13</b>	HD-FDD	700	777-787	746-756	10	<b>31</b>	1.08(/1.4)

<b>B14</b>	HD-FDD	700	788-798	758-768	10	<b>30</b>	1.08(/1.4)
<b>B17</b>	HD-FDD	700	704-716	734-746	12	<b>30</b>	1.08(/1.4)
<b>B18</b>	HD-FDD	800	815-830	860-875	15	<b>45</b>	1.08(/1.4)
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<b>B20</b>	HD-FDD	800	832-862	791-821	30	<b>41</b>	1.08(/1.4)
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<b>B31</b>	HD-FDD	450	452.5-457.5	462.5-467.5	5	<b>10</b>	1.08(/1.4)
<b>B66</b>	HD-FDD	1700	1710-1780	2110-2200	70/90	<b>400</b>	1.08(/1.4)

Maximum output power: 23 dBm

## DATA COLLECTION & TRANSMISSION SETTING

### ■ Regular-Interval Mode

- GPS interval: 5 min ~1 day
- ENV interval: 5 min ~1 day
- ODBA interval: 10 min/30 min
- ACC interval: 25 Hz, 3 seconds in every 10 min (by default)
- Transmission interval: 5 min ~1 day

(Contact us if other settings are required.)

### ■ On-Time Mode

- Transmission: Up to three times at fixed hours per day (such as 13:00/14:00/18:00)
- GPS/ENV/BHV: Regular-interval model or on-time model follow each transmission

### ■ Sleep Mode

This mode is to deactivate certain type of data collection for:

- a certain period (from minutes to months)
- a regular period each day (up to 16 hours)

## INTELLIGENT FREQUENCY OPTIMIZATION & FLIGHT DETECTION (BOOST)

The BOOST function intelligently increases data collection & transmission frequency when the

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charging condition is good or the bird is flying. The default setting is as below:

- Frequency Optimization: every 10 min/1 min
- Flight Detection: every 20 sec

With BOOST, the device portrays detailed movement tracks without manual intervention and avoids the possibility of battery drain due to radical settings in bad weather.