

Lime CCU-23中控规格书

Lime CCU-23 Central control specification

Version: V1.4

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文档历史 Document History

Revision History

版本 Version	日期 Date	作者 Author	变更表述 Description
1.0	2023-07-20	Roger & Evan	初始版本 Initial
1.1	2023-11-9	Cato & Evan & Jasper	硬件 V1.2 改版信息更新 Update for HW V1.2
1.2	2024-03-26	Cato & Jasper	更新重量，标签，充电温度范围 Update for weight, labels, backup battery charging temperature range.
1.3	2024-04-16	Gavin	更新 LTE 模组信息 Update LTE module information
1.4	2024-08-13	Cato	增加声明信息 Increase the Statement

目录 Content

文档历史 Document History	- 2 -
Revision History	- 2 -
目录 Content.....	- 3 -
1 产品简介 Product Introduction	- 4 -
1.1 4G/3G 数传功能-4G/3G Data Transmission Function.....	- 4 -
1.2 GPS 定位功能/GPS Function	- 4 -
1.3 WIFI 功能/WIFI Function	- 5 -
1.4 BT 功能/BT Function	- 5 -
1.4.1 2.4.1 FC20 Module.....	- 5 -
1.4.2 2.4.2 FR3036D	- 5 -
1.5 Audio 功能/Audio Function	- 5 -
1.6 CAN 功能/CAN Function	- 6 -
1.7 IMU 功能/IMU Function	- 6 -
1.8 5V 输出功能/5V Output Function.....	- 6 -
2 CCU 说明/CCU Instruction	- 6 -
2.1 基本属性 Basic Parameter.....	- 6 -
2.2 电源 Power	- 6 -
2.3 中控接口 Control Interface.....	- 7 -
2.3.1 中控接线定义图 Control Wire Definition Diagram.....	- 7 -
2.3.2 中控接口实物图 Control Interface Image	- 7 -
2.3.3 中控接口定义表 Control Interface Description	- 8 -
2.4 中控开机方法 CCU Startup Method	- 8 -
2.5 环境温度特性 Ambient Temperature Characteristics	- 9 -
2.6 CCU23 整机标签（示意图）CCU23 Device Label Picture.....	- 9 -
2.7 认证信息（通讯模块）Certification Information(Module).....	- 9 -
3 声明/ Statement.....	- 10 -
3.1 加拿大工业部声明 Industry Canada Statement.....	- 10 -
3.2 FCC 声明 FCC Statement	- 10 -

1 产品简介 Product Introduction

Lime CCU-23 滑板车中控，支持 4G&WiFi 数传，蓝牙互联，短信业务等功能；该 CCU 带加速度计及陀螺仪传感器，支持大功率音频外放，(GNSS Box)支持 GPS 定位功能；此 CCU 留有 UART 口，CANBUS 接口等；

Lime CCU-23 scooter central control unit supports 4G & WIFI data transmission, Bluetooth connectivity, SMS services, and other functions. The CCU is equipped with an accelerometer and gyroscope sensor, supports high-power audio output, and has GPS positioning functionality base on GNSS Box. This CCU also has UART and CANBUS interfaces, etc.

关键功能 Key Function

1.1 4G/3G 数传功能-4G/3G Data Transmission Function

工作频率 Operating Frequency:

LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B12/B13/B18/B19/B20/B25/B26/B28

LTE-TDD: B38/B39/B40/B41

WCDMA: B1/B2/B4/B5/B6/B8/B19

可选贴 eSIM or 4FF SIM Connector

Optional eSIM or 4FF SIM Connector

1.2 GPS 定位功能/GPS Function

L1 + L5 Dual-Band GPS, 1m/CEP, 50 %, 24 hours static, -130 dBm, more than 6 SVs, >2Hz Include inertial navigation

外置 GNSS 模块和天线，方便整车布装；

External GNSS module and antenna for easy vehicle installation.

使用 LC29H GNSS 模块，35*35mm 陶瓷天线；

Using LC29H GNSS module and 35*35mm ceramic antenna.

1.3 WIFI 功能/WIFI Function

FC20 Module WIFI

Support WIFI5 (802.11 a/b/g/n/ac) 2.4G&5G

Support 150Mbps of rates bandwidth

工作频率 Operating Frequency:

特征 Feature	频率（单位：GHz） Frequency (unit: GHz)
2.4 GHz Wi-Fi	2.412~2.472
5 GHz Wi-Fi	5.180~5.825

1.4 BT 功能/BT Function

1.4.1 2.4.1 FC20 Module

Support BR/EDR/BLE 5.0

工作频率 Operating Frequency:

特征 Feature	频率（单位：GHz） Frequency (unit: GHz)
BLE	2.402~2.480

1.4.2 2.4.2 FR3036D

FR3036D BT 功能为可选

FR3036D Bluetooth function is optional

Supports BR /EDR/BLE 5.3

工作频率 **Operating Frequency:**

特征 Feature	频率（单位：GHz） Frequency (unit: GHz)
BLE	2.402~2.480

1.5 Audio 功能/Audio Function

支持 44.1K 分辨率，2W 喇叭外放

Support 44.1K resolution, 2W speaker external playback.

1.6 CAN 功能/CAN Function

支持全速 250kbps 波特率，用于整车控制和数据传输

Support 250kbps baud rate at full speed. Used for vehicle control and data transmission.

1.7 IMU 功能/IMU Function

基于传感器数据，可以做用户行为模式分析。

Based on sensor data, user behavior pattern analysis can be done.

1.8 5V 输出功能/5V Output Function

Output=5V/2A $\pm 6\%$

用于给屏幕、电子锁和 GNSS 模块供电

Output=5V/2A $\pm 6\%$

Used to power screens, electronic locks and GNSS modules.

2 CCU 说明/CCU Instruction

2.1 基本属性 Basic Parameter

LTE Module: EG21G-GF

Modem: MDM9207

Flash: 4Gb+2Gb

RAM: 2Gb

尺寸 Size: 128.2x56.5x27.55MM

重量 Weight: 115g

2.2 电源 Power

额定输入 Rated Input: DC 42V / DC 54V

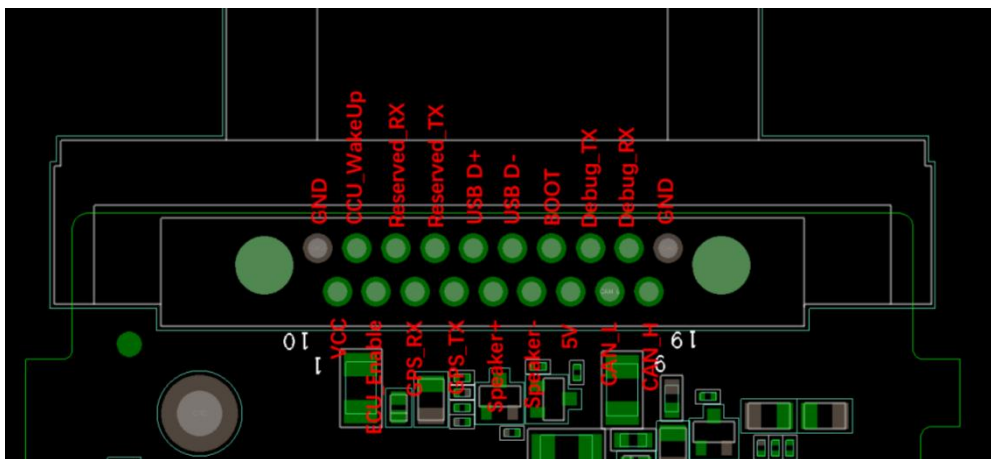
工作电压范围 Operating Voltage Range: DC 28V-75V

额定输出 Rated Output: 5V/2A $\pm 6\%$

备用电池 Backup Battery: 3.3V~4.2V ; 1140mAh@ 0.2C (240 mA) discharge; 4C DisCharge

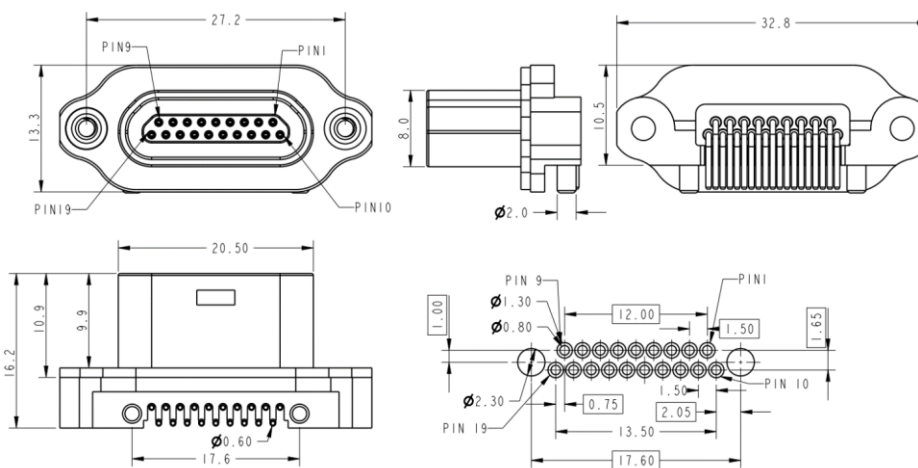
2.3 中控接口 Control Interface

2.3.1 中控接线定义图 Control Wire Definition Diagram



TOP

2.3.2 中控接口实物图 Control Interface Image



2.3.3 中控接口定义表 Control Interface Description

序号 NO.	定义 Definition	电压 Voltage	备注 Remark	接口 Interface
1	VCC	28V-75V	Power Input	ECU
2	ECU Enable	4.2V	User for Turn on ECU	
3	GPS RX	3.3V	Communicate with GNSS Module	GNSS
4	GPS TX	3.3V		
5	Speaker+	—	Audio	External Speaker
6	Speaker-	—		
7	5V	2A	Power Output	LOCK/Display
8	CAN-L	—	CAN BUS used for data transmission	
9	CAN-H	—		
10	GND			
11	CCU WakeUp		pull down this pin to Power-On CCU	ECU
12	Reserved RX	5V	Communicate with Display	
13	Reserved TX			
14	USB D+	—	USB for EG21-G download & debug	Debug
15	USB D-	—		
16	Boot	—	pull down this pin to enter emergency download mode	
17	Debug-TX	3.3V	UART for EG21-G debug	Debug
18	Debug-RX	3.3V		
19	GND	—		

2.4 中控开机方法 CCU Startup Method

通过把控制器13PIN接口线材的CCU WakeUp拉低 2秒后放开，即可开机。

First, Pull down the CCU WakeUp of the controller's 13-pin interface, hold it for 2 seconds, and then release it. After that, the CCU can startup.

2.5 环境温度特性 Ambient Temperature Characteristics

存储温度 Storage Temperature: $-40^{\circ}\text{C}\sim 85^{\circ}\text{C}$

工作温度 Operating Temperature: $-20^{\circ}\text{C}\sim 60^{\circ}\text{C}$

备用电池充电温度 Backup battery charging temperature:

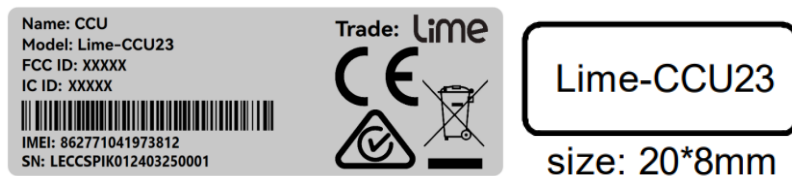
低温充电阈值 Low-temperature charging threshold: $0\pm 2^{\circ}\text{C}$

高温充电阈值 High-temperature charging threshold: $45\pm 2^{\circ}\text{C}$

注：备用电池充电温度指的是备用电池本体 NTC 电阻的温度。

Note: The charging temperature of the backup battery refers to the temperature of the NTC resistance of the backup battery body.

2.6 CCU23 整机标签（示意图） CCU23 Device Label Picture



2.7 认证信息（通讯模块） Certification Information(Module)

- CE（欧洲 Europe）
- FCC（北美 North America）

3 声明/ Statement

3.1 加拿大工业部声明 Industry Canada Statement

- Caution:

1) The device for operation in the band 5150–5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems;

DFS (Dynamic Frequency Selection) products that operate in the bands 5250- 5350 MHz, 5470-5600MHz, and 5650-5725MHz.

Avertissement:

1) Le dispositif fonctionnant dans la bande 5150-5250 MHz est réservé uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux;

Les produits utilisant la technique d'atténuation DFS (sélection dynamique des fréquences) sur les bandes 5250- 5350 MHz, 5470-5600MHz et 5650-5725MHz.

3.2 FCC 声明 FCC Statement

FCC Statement

15.19

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

15.21

Note: The grantee is not responsible for any changes or modifications not expressly approved by the party responsible for compliance. Such modifications could void the user's authority to operate the equipment.

15.105(b)

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.

ISED Compliance

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

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

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

- 1. L'appareil ne doit pas produire de brouillage;*
- 2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.*

This device complies with FCC radiation exposure limits set forth for an uncontrolled rolled environment. This device should be installed and operated with a minimum distance of 20cm between the radiator and your body.

This equipment complies with RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator and your body.

French Version:

Pour se conformer aux exigences de conformité CNR 102 RF exposition, une distance de séparation d'au moins 20 cm doit être maintenue entre l'antenne de cet appareil et toutes les personnes.