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Flaircomm Microelectronics, Inc.

FLC-WNP019
Datasheet

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Release Record

Version	Date	Descriptions
V0.1	MAR 18,2022	Initial Release
V0.2	JUL 20,2022	1.Modify the product picture and dimension diagram, modify the hardware block diagram 2.Modified the description of some hardware antennas 3.Modify basic technical parameters
V0.3	MAR 8,2023	1.Modify product pictures and dimensions 2.Refine the basic plan parameters 3.Modify ordering information

Contents

TABLES AND FIGURES

1.   Introduction

    WNP019 is a module that supplies power to BMS(Battery Managerment System) to obtain BMS battery monitoring data, data is uploaded to the server and cloud platform through the mobile 4G network to play the role of data collection and monitoring.

    The device serves as a channel for BMS detection and communication, and is used for message sending and remote monitoring between the BMS and the TSP(Telematics Service Platform). The main tasks of the system include establishing a session channel with the TSP, reporting BMU messages, and controlling and processing the response TSP.

    The following FLC-WNP019-RMS20 is referred to as WNP019.

2.   Composition And Dimension

2.1   Composition

number	component	quantity
1	host	1
2	4G Built-in antenna	1

Table 1:Product component

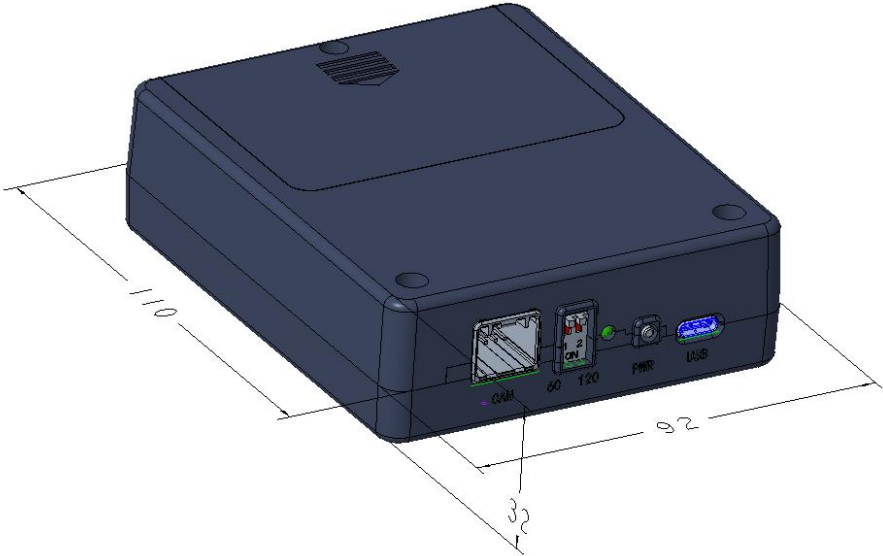**Figure 1 :WNP019 Appearance drawing**

2.2 Dimensional

Figure 2：Equipment size drawing

3. Hardware introduction

3.1.1 Power supply

The power supply is 3.6V from a removable battery. The power supply comes in two parts.

Primary power supply: part of the power supply increases the voltage to 12V through the DC-DC circuit to supply the BMS for use through the Can port. The other part is converted into 4V output voltage for LTE module through DC-DC circuit.

Secondary power supply: 4V is converted into 5V and 3.3V through DC-DC circuit and LDO circuit for subsequent circuit use.

3.1.2 Interface

1. The type of connection port between Can port and BMS is MX34R08HF4T to realize Can communication with MCU.

2. Battery interface: Designed to detachable battery interface, easy to replace the battery.

3.1.3 Antenna

The antenna part is designed as a built-in antenna

Antenna: IPEX plus FPC antenna in this body to form the internal antenna scheme.

3.1.4 Communication Design

The communication part is divided into MCU and MPU:

MCU part: including the standard Can interface, multi-channel UART interface and other rich pin resources can be extended in many aspects. And MPU part through the serial port data transmission.

MPU part: MPU realizes basic communication data transmission through Cat.1. Cat.1 has more cost advantages and can be seamlessly connected to the existing LTE network without targeted network update. Cat.1 module supports over the air upgrade interface: LTE, GSM/GPRS/EDGE. LGA package, all metal shield design, multi – channel UART interface, SPI interface.

4. Function description

Software system architecture as shown in the following figure, WEB display function is completed in the management background server, Kafka forwarding function (only reserved).
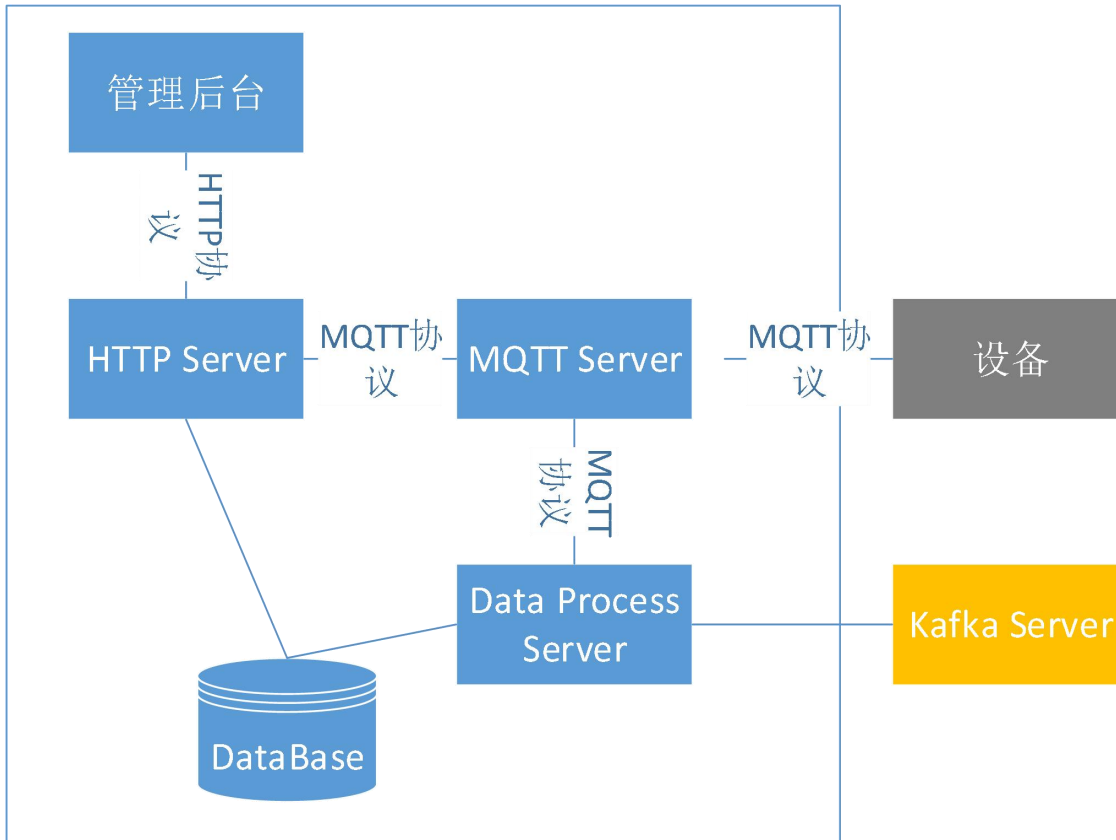
Figure 4：WNP019 System diagram

4.1 Product Function

4.1.1 **Product management**

1. Product certification online management:
(1)Terminal registration, authentication and authentication, terminal online;

2. Product data acquisition control management
(1)Periodically wake up data (battery status and alarm data) reporting, control peripheral sleep wake up;
(2)Provides the parameter management function, including server domain name/port, information reporting frequency, and collection frequency.

(3)It has the function of data transmission, reporting the voltage, temperature and alarm value of a single battery, including the function of uploading data in the recording area;
(4)With equipment self-test and fault report function;
(5)With terminal network time synchronization function;

For other management functions, the developer should provide design suggestions that meet the scenarios and are easy for customers to use.

4.1.2 Monitoring and warning

When the terminal is working, it is necessary to monitor the working status of the terminal. The following status should be monitored and reported in real time (further supplement based on the actual scenario requirements) :
(1)Fault situation of communication module, including SIM card status, network signal strength, communication link status, etc.
(2)CAN communication link fault.
(3)Storage data area fault status.

4.1.3 Upgrade function

Firmware update function requirements include:
(1)Support for remote firmware updates
(2)Can support breakpoint resume.

4.2 Monitoring platform

4.2.1 Battery pack status monitoring

1. Battery status overview is displayed
2. Voltage monitoring: maximum and minimum voltage of a single cell and a single battery.
3. Temperature monitoring: unit temperature, maximum and minimum temperature of a single battery.

4.2.2 Battery alarm management

1. Set the voltage and battery temperature threshold on the webui.
2. Threshold alarm: When the voltage (such as overvoltage and undervoltage) or temperature of a single unit exceeds the threshold, a red message is displayed on the webui or a dedicated alarm page is displayed.
3. Other alarms: Displays alarm signals specified by CATL.

4.2.3 Warehouse management

1. Warehousing management: Shelf number is bound to CAT1 terminal.
2. Example Query the shelf number of the battery for which the alarm is generated.
3. Current warehouse shelf condition.

4.2.4 Remote management

One is terminal information management:

(1)Terminal registration, authentication and authentication;

(2)Manage and maintain the corresponding relationship between terminal and shelf number;

The second is terminal control management:

(1)With the control of remote command, remote reset, storage data area clear, firmware upgrade and other control functions.

(2)Provides the parameter management function, including the server domain name/port, working mode, information reporting frequency, and collection frequency.

(3)With equipment self-check and fault report display function.

For other management functions, the developer should provide design suggestions that meet the scenarios and are easy for customers to use.

4.2.5 Status monitoring and alarm

When working, you need to monitor the working status of the terminal. The following status should be monitored and reported in real time (further supplement based on the actual scenario requirements) :

(1)Communication module faults, including SIM card status, network signal strength, and communication link status.

(2)CAN communication link fault.

(3)Storage data area fault status.

(4)Device online status detection and display.

4.2.6 Remote upgrade management

Firmware update requirements for CAT1 terminals include:

(1)Support for GPRS remote firmware updates.

(2)Can support breakpoint resume.

5. Interface description

The external interface of the host adopts the MX34R08HF4T socket of JAE for power output and CAN bus communication.

Interface pins are defined as follows:

PIN	Symbol	Description
1	NC1	The user must hover
2	BAT+	Output power supply positive pole
3	REF-	The user must hover
4	CANH	CAN network height
5	BAT-	Negative terminal of output power supply
6	NC2	The user must hover
7	NC3	The user must hover
8	CANL	CAN network low

Table 2 :WNP019 pin definition

6. General Specification

Technical specification		
Power		
Power Supply Voltage	3.6V	
Average working current	150mA	
Maximum working current	1.2A	
LTE		
Frequency band	GSM:GSM850/PCS1900 LTE-FDD B2/4/5/7/12/13/17/25/26 LTE-TDD B38/40/41	
Maximum transmitting power	GSM	GSM850	30dBm±2dB
		DCS1900	32dBm±2dB
	LTE	LTE	23.0dBm±3dB
Receiving sensitivity		GSM850	-104.5dBm
		PCS1900	-107.1dBm
		FDD LTE Band 2	-94.5dBm
		FDD LTE Band 4	-94.0dBm
		FDD LTE Band 5	-95.6dBm
		FDD LTE Band 7	-92.3dBm
		FDD LTE Band 12	-93.2dBm
		FDD LTE Band 13	-93.4dBm
		FDD LTE Band 17	-93.2dBm
		FDD LTE Band 25	-93.0dBm
		FDD LTE Band 26	-93.9dBm
		TDD LTE Band 38	-95.0dBm
		TDD LTE Band 40	-97.8dBm
		TDD LTE Band 41	-94.4dBm
Antenna SWR	<3.0	
Antenna Efficiency	>30%	
Antenna Characteristic Impedance	50 ohm	
CAN		
CAN_H	ISO11898-2:2003, ISO11898-5:2007	
CAN_L	ISO11898-2:2003, ISO11898-5:2007	
Terminal resistance	Optional	
Temperature		
Operating temperature	-20 ℃ ～ + 70 ℃	
Storage temperature	-40 ℃ ～ + 85 ℃	
Humidity		
Working humidity	20%~90%RH	

Size and Weight	
Size（L×W×H）	110*92*32mm
Weight	TBD

7. Ordering Information

Number	Customer PN	Product model	CANTerminal resistance	CAN Baudrate	M2M IC SIM Area
1		FLC-WNP019-RMS20	optional	250kbps/500kbps	North America
2					
3					
4					
5					
6					
7					

Table 3:Ordering Information

FCC Statement

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.

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

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 important announcement

Important Note:

Radiation Exposure Statement

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

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