

产品说明书

制造商：树根互联股份有限公司

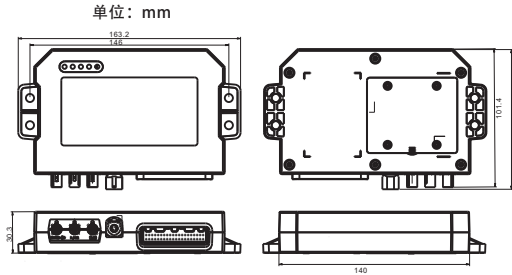
地址：广州市海珠区华洲路190号8栋

1. 产品概述

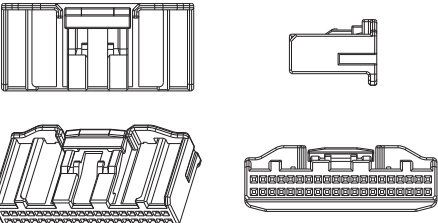
本产品为针对当前工程机械、运输车队以及设备分时租赁等移动设备和离散工业节点，提供的一款高防护、低功耗、多功能车载VBOX平台产品。

2.整机规格

2.1 外形尺寸



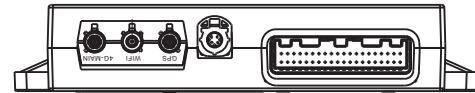
2.2 工业连接器



品牌：TE 型号：1318389-1 线径：20#AWG

3. 产品接口

3.1 接口图



3.1 接口说明

3.2.1 USB接口

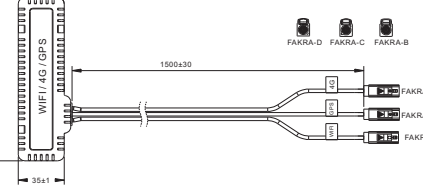


3.2.2 指示灯



名称	颜色	定义说明	闪烁	常亮	常灭
1 (4G)	绿色	4G状态灯	连接中	4G网络正常	4G网络异常
2 (CAN)	绿色	CAN状态灯	总线有数据传输	无	总线无数据传输
3 (GPS)	绿色	GPS状态灯	连接中	GPS定位正常	GPS无线异常
4 (WIFI)	绿色	WIFI状态灯	/	WIFI已连接	WIFI未连接
5 (PWR)	红色	系统指示灯	与OpenIO SPI 连接建立	正常	电源异常或系统异常

3.2.3 天线



序号	项目	说明
1	天线	GPS+4G+WIFI 三合一有源天线
2	长度	1.5米 (标配) /3米/5米
3	增益	GPS(28±3dB); 4G(-0.95 ~ 2.84dBi)
4	阻抗	50Ω

3.2.4 主接口



管脚号	定义	车辆连接	说明
1	BUS_ACC	ON/H	通电开关
2	DI_IN_01	充电唤醒	高电平有效 (禁止启动自动补电)
3	GND	地	车载充电电源负极
4	DI_IN_02	开关量2	
5	DO_24V_PWM_02	驱动输出2/PWM1	DC24V电流0.5A
6	DO_24V_PWM_03	驱动输出3/PWM2	DC24V电流0.5A
7	DI_IN_03	开关量3	
8	AI_V_ADC_07	模拟量输入1 (温度传感器)	
9	DO_24V_04	驱动输出4	DC24V电流0.5A
10	AI_V_ADC_08	模拟量输入2 (温度传感器)	
11	DI_PWM_04	开关量4/脉冲捕获, 正反转转速, 外接传感器转速脚, 兼容D输入	
12	DI_IN_05	开关量5	
13	DO_24V_05	驱动输出5	DC24V电流0.5A
14	RS232_RX1	RS232_RX	
15	MX2_N	以太网端子第6脚	
16	MX1_N	以太网端子第2脚	
17	CAN3_H	CAN3	符合 CAN2.0B 规范, 选配CAN唤醒
18	CAN2_L	ICAN-L	CAN2, 符合 CAN2.0B 规范, 选配CAN唤醒
19	CAN1_H	PCAN-H	CAN1, 符合 CAN2.0B 规范, 选配CAN唤醒
20	VBAT+	常电	车载常电电源正极

21	AI_V_ADC_01		模拟量输入1 (温度传感器)
22	DI_WKUP_06		开关量6, 充电信号, 高唤醒
23	DI_IN_07	锁钥1	开关量7
24	GND		ADC接地
25	AI_V_ADC_02		模拟量输入2 (温度传感器)
26	AI_V_ADC_03		模拟量输入3 (温度传感器)
27	AI_V_ADC_04		模拟量输入4 (温度传感器)
28	AI_V_ADC_05		模拟量输入5 (温度传感器)
29	AI_V_ADC_06		模拟量输入6 (温度传感器)
30	DI_IN_08	气缸松开反馈	开关量8
31	DI_PWM_09	连接器到位反馈	开关量9/脉冲捕获, 正反转信号, 外接传感器信号脚, 兼容D输入
32	DI_IN_10		开关量10
33	DO_24V_06	VC40	12V/24V可输出
34	RS232_TX1	RS232_TX	RS232_TX
35	MX2_P		以太网端子第3脚
36	MX1_P		以太网端子第1脚
37	CAN3_L		CAN3, 符合 CAN2.0B 规范, 选配CAN唤醒
38	CAN2_H	ICAN-H	CAN2, 符合 CAN2.0B 规范, 选配CAN唤醒
39	CAN1_L	PCAN-L	CAN1, 符合 CAN2.0B 规范, 选配CAN唤醒
40	VBAT-	GND	车载常电电源负极

四、功能清单

功能名称	标识符	描述
时间与日期	时间/日期	可提供车辆所在地时间与日期 (精确到毫秒)
	自动校时	可自动校时, 使24小时内时间误差在±55内
	授时	从云平台, 获取时间并授时
定位服务	GNSS	通过CAN网络, 对ECU授时 (需要车厂协议支持)
	天线检测	支持GPS/BD定位; 首次定位时间≤32s; 定位精度≤2.5m (CEP50)
	定位精度	支持GPS天线断线检测和天线保护
网络通信	运行轨迹	水平定位精度: < 2.5 m CEP50
	网络通信	过滤算法去除无效数据, 不良数据, 使运行轨迹准确
通信	网络通信	LTE FDD: B1/ B2/ B3/ B4/ B5/ B7/ B8/ B12/B13/ B18/ B19/ B20/ B25/ B26/ B28
	网络通信	TD-LTE: B38/ B39/ B40/ B41
	网络通信	WCDMA: B1/ B2/ B4/ B5/ B8/ B6/ B19
通信	网络通信	GSM: 850/900/1800/1900MHz
	网络通信	支持全球通信
通信	网络通信	支持4G LTE 802.11 b/g/n标准
通信	网络通信	工作模式AP/STA
通信	网络通信	以太网 (选配) 1路百兆以太网 RJ45接口

五、软件规格

- 支持基于CAN2.0B的车控制器工况数据采集。
- 支持通过云平台进行车载控制器指令下发。
- 支持数据传输断线续传, 本地数据存储。
- 支持远程OTA升级, 本地U盘升级。
- 支持GPS位置信息采集。
- 支持驾驶行为分析。

六、随机附件

名称	数量	单位	备注
V-BOX主机	1	台	标配
主机电源&信号连接端子线	1	条	选配
LTE+GPS+WIFI 天线	1	条	三合一
包装盒	1	套	标配

七、认证



Model: LN1526-DC-T-BAT-GL

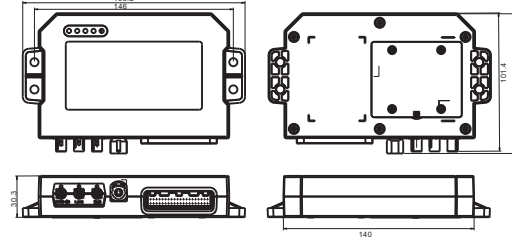
1.Description

This product is a high-protection, low-power consumption, and multifunctional vehicle-mounted VBOX platform designed for current construction machinery, transportation fleets, and equipment rental for the sharing economy, as well as for mobile devices and discrete industrial nodes.

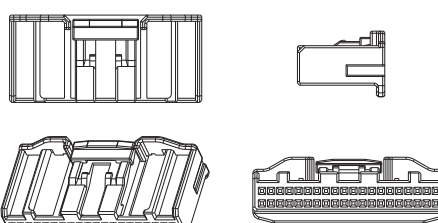
2.Specifications

2.1 Dimensions

unit: mm



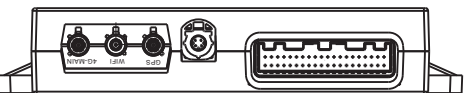
2.2 Connector (Optional)



Brand: TE Type: 1318389-1 Wire: 20#AWG

3.Interface

3.1 Interface diagram



3.2 Interface description

3.2.1 USB interface

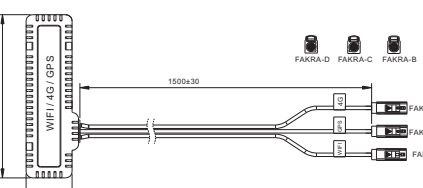


3.2.2 Indicator light



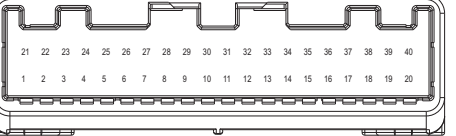
Num	Color	Definition	Flashing	Steady	Off
1 (4G)	Green	4G Status Indicator	Flashing	4G network is normal	4G network is abnormal
2 (CAN)	Green	CAN Status Indicator	Flashing	None	None
3 (GPS)	Green	GPS Status Indicator	Flashing	GPS positioning is normal	GPS positioning is abnormal
4 (WIFI)	Green	WIFI Status Indicator	Flashing	WIFI is connected	WIFI is not connected
5 (PWR)	Red	System Status Indicator	Flashing	System is running normally	Power or system is abnormal

3.2.3 antenna



Number	Item	Explanation
1	Antenna	Active GPS, 4G, and WIFI triple antenna in one
2	Length	1.5m (standard) /3m/5m
3	Gain	GPS (28±3dB); 4G (-0.95 ~ 2.84dBi)
4	Impedance	50 Ω

3.2.4 main interface



NUM	Define	Terminal Connection	Description
1	BUS_ACC	ON power	Turn-on switch
2	DI_IN_01	Charging wake-up	High level effective (Prohibition of starting auto charging)
3	GND	Ground	Car constant power supply negative
4	DI_IN_02	Switch 2	
5	DO_24V_PWM_02	Drive output 2/PWM1	DC24V current 0.5A
6	DO_24V_PWM_03	Drive output 3/PWM2	DC24V current 0.5A
7	DI_IN_03	Switch 3	
8	AI_V_ADC_07	Analogue input 7 (temperature sensor)	
9	DO_24V_04	Drive output 4	DC24V current 0.5A
10	AI_V_ADC_08	Analogue input 8 (temperature sensor)	
11	DI_PWM_04	Switch 4/Pulse capture, Forward and reverse speed, External sensor speed foot, Compatible with DI input	
12	DI_IN_05	Switch 5	
13	DO_24V_05	Drive output 5	DC24V current 0.5A
14	RS232_RX1	RS232_RX	
15	MX2_N	Ethernet terminal pin 6	
16	MX1_N	Ethernet terminal pin 2	
17	CAN3_H	CAN3, Complies with CAN2.0B specification, Optional CAN wake-up	
18	CAN2_L	ICAN-L	CAN2, Complies with CAN2.0B specification, Optional CAN wake-up
19	CAN1_H	PCAN-H	CAN1, Complies with CAN2.0B specification, Optional CAN wake-up
20	VBAT+	Constant electric power	Car constant power supply positive

21	AI_V_ADC_01	Analog input 1 (temperature sensor)	
22	DI_WKUP_06	Switch 6, Charging signal, High wake-up	
23	DI_IN_07	Lock 1	Switch 7
24	GND	ADC ground	
25	AI_V_ADC_02	Analog input 2 (temperature sensor)	
26	AI_V_ADC_03	Analog input 3 (temperature sensor)	
27	AI_V_ADC_04	Analog input 4 (temperature sensor)	
28	AI_V_ADC_05	Analog input 5 (temperature sensor)	
29	AI_V_ADC_06	Analog input 6 (temperature sensor)	
30	DI_IN_08	Cylinder release feedback	Switch 8
31	DI_PWM_09	Connector in place feedback	Switch 9/Pulse capture, Forward and reverse signal, External sensor signal flow, Compatible with DI_inpp1
32	DI_IN_10	Switch 10	
33	DO_24V_06	VC40	12V/24V controllable output
34	RS232_TX1	RS232_TX	RS232_TX
35	MX2_P	Ethernet terminal pin 3	
36	MX1_P	Ethernet terminal pin 1	
37	CAN3_L	CAN3, Complies with CAN2.0B specification, Optional CAN wake-up	
38	CAN2_H	ICAN-H	CAN2, Complies with CAN2.0B specification, Optional CAN wake-up
39	CAN1_L	PCAN-L	CAN1, Complies with CAN2.0B specification, Optional CAN wake-up
40	VBAT-	GND	Car constant power supply negative

4.Feature list

Function	Definition	Description
Time and Date	Time and Date	Provide local time and date of the vehicle (accurate up to milliseconds)
	Automatic Calibration	Can automatically calibrate the time, ensuring that the time error is within ±55 within 24 hours
	Time synchronization	Obtains time from cloud platform and synchronizes it
Location Service	Location Service	Can synchronize time with ECU through CAN network (requires support for factory protocol).
	Antenna Detection	Supports GPS/BDSS, first positioning time <32s, positioning accuracy <2.5m (CEP50)
	Running Track	Supports GPS antenna disconnection detection and antenna protection.
Network Communication	Network Communication	Horizontal positioning accuracy: <2.5m CEP50.
	Network Communication	Filter algorithm removes invalid and poor data to ensure accurate running track.
	Network Communication	Supports global communication.
Communication	Network Communication	LTE FDD: B1/ B2/ B3/ B4/ B5/ B7/ B8/ B12/B13/ B18/ B19/ B20/ B25/ B26/ B28
	Network Communication	TD-LTE: B38/ B39/ B40/ B41
	Network Communication	WCDMA: B1/ B2/ B4/ B5/ B8/ B6/ B19
Self-Check	Self-Check	Supports 4G LTE 802.11 b/g/n standards.
	Self-Check	Supports IEEE 802.11b/g/n standards.
	Self-Check	Supports IEEE 802.11b/g/n standards.

5.Software

- Support the data acquisition of vehicle controller based on CAN2.0B.
- Support the instruction distribution of controller through cloud platform.
- Support data transmission, continuous transmission, local data storage.
- Support remote OTA upgrade, local USB disk upgrade.
- Support GPS position information collection.
- Support Driving behavior analysis.

6.Element

Name	Quantity	Unit	Note
V-BOX mainframe	1	set	Standard
Terminal power & signal connection terminal wire	1	piece	Optional
LTE+GPS+WIFI Antenna	1	piece	Three-in-one
Package box	1	set	Standard

7.Certificate



ISED RSS warning

This device complies with Innovation, Science and Economic Development Canada licence-exempt RSS standard (s). 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.

Le présent appareil est conforme aux CNR d'Innovation, la science et le 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, et
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

ISED Radiation Exposure Statement:

This equipment complies with ISED RF radiation exposure limits set forth for an uncontrolled environment.

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 minimum distance 20cm between the radiator & your body. Cet appareil est

conforme aux limites d'exposition de rayonnement RF ISED établies pour un environnement non contrôlé.

Cet émetteur ne doit pas être co-implanté ou fonctionner en conjonction avec toute autre antenne ou transmetteur.

Cet équipement doit être installé et utilisé avec une distance minimale de 20cm entre le radiateur & votre corps.

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

Tous les changements ou modifications non expressément approuvée par le responsable de la conformité pourrait vider l'utilisateur est habilité à exploiter l'équipement.

- (1) This device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

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

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.

FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

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 minimum distance 20cm between the radiator & your body.