User Manual

Thank you for purchasing our product!

Product Description

The 2hire box 2.0 enables vehicle connectivity and, with the support of the 2hire Adapter API layer, allows the exchange of data and commands with software platforms. The use of the 2hire box 2.0 can range from simple data reading in telematics to the creation of digital services dedicated to vehicles for the fleet sector (e.g. rentals, car sharing, etc.).

Use Case: Vehicle Monitoring
By installing a 2hire box 2.0 on a vehicle, you enable the transmission of data such as:

- Position
- Fuel level
- Odometer
- Speed

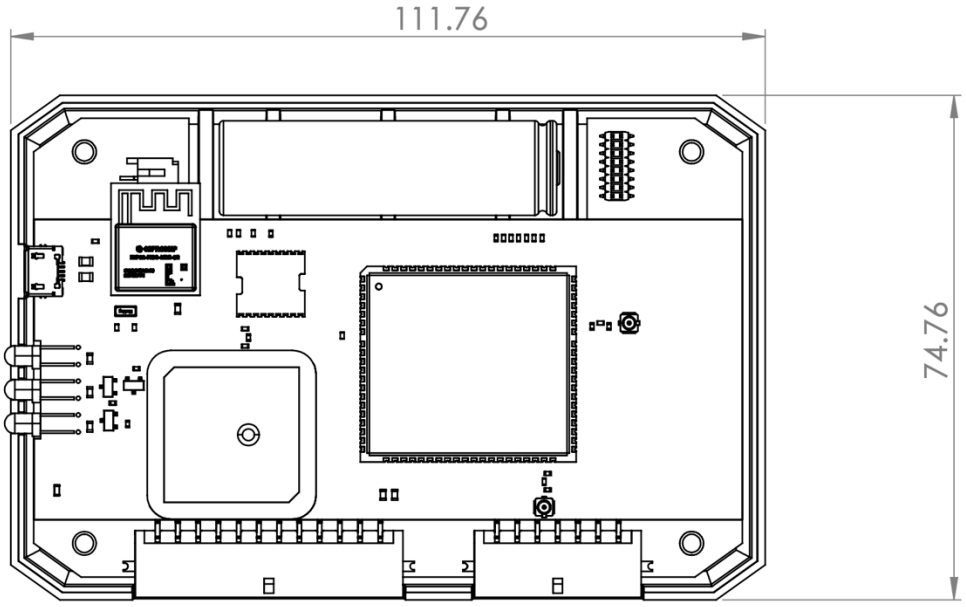
This allows monitoring the fleet's vehicle status to provide customer support services or enhance the user experience by integrating vehicle data into check-in and check-out processes (e.g. fuel consumption verification, rental price calculation based on kilometers traveled, etc.).

Use Case: Digital Access
Besides the monitoring of a vehicle, as explained in the Vehicle Monitoring use case, the 2hire box 2.0 can enable the digital access on the vehicle it is installed in. Utilizing vehicle data reading and the ability to execute commands such as doors unlocking and locking and vehicle immobilization, mobility companies can offer contactless vehicle access services, such as 24/7 rentals or free-floating car-sharing services.

Installation Process
As of October 2023, the 2hire box 2.0 is compatible with 500+ models from several vehicle manufacturers. To get the installation manual for your vehicle, please send an email with your request to support@2hire.io.

To access the documentation of 2hire's connectivity layer and start using your 2hire box 2.0, visit our website https://developer.2hire.io.

Technical Specifications



Mechanical Dimensions

Width (mm)	111
Length (mm)	74
Height (mm)	25
Weight (g)	142 g.

External Power Supply

Minimum Voltage	10V
Nominal Voltage	12V
Maximum Voltage	18V
Overvoltage Protection	20 V
Reverse Polarity Protection	✓

Processor

Architecture	ARM Cortex M33
Flash	1MByte
RAM	256 KByte
Crypto UNIT	✓

Battery

Battery Type	Li-ion
Number of Cells	1
Nominal Voltage	3.7V
Capacity	800 mAh

LTE Communication

Supported Frequencies	
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
GSM	B2/B3/B5/B8
Output Power:	
GSM850	Class 4 (33 dBm ±2 dB)

Supported Frequencies	
EGSM900	Class 4 (33 dBm ±2 dB)
DCS1800	Class 1 (30 dBm ±2 dB)
PCS1900	Class 1 (30 dBm ±2 dB)
GSM850 8-PSK	Class E2 (27 dBm ±3 dB)
EGSM900 8-PSK	Class E2 (27 dBm ±3 dB)
DCS1800 8-PSK	Class E2 (26 dBm ±3 dB)
PCS1900 8-PSK	Class E2 (26 dBm ±3 dB)
WCDMA	Class 3 (24 dBm +1/-3 dB)
LTE-FDD	Class 3 (23 dBm ±2 dB)
LTE-TDD	Class 3 (23 dBm ±2 dB)

GNSS

Supported Constellations	GPS / GLONASS / BDS / Galileo / QZSS
Maximum Update Frequency	10Hz
Position Accuracy	2M
Sensitivity	
Tracking	-166dBm
Reacquisition	-158dBm
Cold Starts	-147dBm
Time-To-First Fix	
Cold starts	30s
Warm start	25s
Hotstarts	1s

Bluetooth

Bluetooth Type	BLE, Bluetooth 5
RF Transmit Power	0 dBm
Gain Control Step	33 dB
RF Power Control Range	Min -27 dBm Max 18 dBm

IMU

Number of Axes	6
Accelerometer Scale	±2/±4/±8/±16 g
Gyroscope Scale	±125/±250/±500/±1000/±2000 dps
Minimum Data Output Frequency	1.6 Hz
Maximum Data Output Frequency	6664 Hz

Internal Memory

Capacity	128 MByte
Memory Type	NAND
ECC Support	✓

External Connections

CAN	2
RS485	1
Relay	4
Digital input	3
Digital output	3
Micro USB 2.0 High-Speed	1

Relay

Relay Type	Solid State
Max Voltage	60V
Max Pass-Through Current	500mA

Digital Output

Max Pass-Through Current	2A
Possibile States	GND, VIN, High-Z

CAN

Supported Standard	ISO 11898-1 (CAN 2.0A/CAN 2.0B)
Maximum Number of Mailboxes	32
Controllable Software Resistance 120ohm Support	✓

Power Consumption

Typical	23 mAh
Idle	17 mAh
In Motion	45 mAh

Software Versions

BS	2.7.22
HW	1.8
BLE	1.4
Quectel EG21-G	EG21GGBR07A11M1G_30.200.30.200
SIM65M	B02V02SIM65M_11

Certification

- RED Article 3.1 (a): Health and Safety of the User
  - ETSI EN 62368-1: 2014 +AC: 2015 Safety
  - ETSI EN 62233: 2008 +AC: 2008 Human exposure for household appliances
- RED Article 3.1 (b): Electromagnetic compatibility – GPS / GSM / UMTS / LTE / Bluetooth
  - ETSI EN 301 489-52 V1.2.1_Specific conditions for Cellular Communication
  - ETSI EN 301 489-19 V2.2.1_EMC - Receive Only Mobile Earth Stations (ROMES)
  - ETSI EN 301 489-7 V1.3.1 EMC (GSM and DCS)
  - ETSI EN 301 489-24 V1.5.1_EMC IMT-2000 CDMA Direct Spread (UTRA and E-UTRA)
  - ETSI EN 301 489-17 v3.2.4_EMC Broadband Data Transmission Systems
- RED Article 3.2: Effective use of spectrum allocated – GPS / GSM / UMTS / LTE / Bluetooth
  - ETSI EN 301 908-13 V13.1.1 Evolved Universal Terrestrial Radio Access (E-UTRA)
  - ETSI EN 303 413 V1.2.1_GNSS receivers
  - ETSI EN 301 511 V12.5.1_GSM essential requirements art. 3.2
  - ETSI EN 301 908-2 V13.1.1 - CDMA Direct Spread (UTRA FDD)
  - ETSI EN 300 328 v2.2.2 Equipment operating in the 2,4 GHz band.
- RoHS Directive 2011/65/EU
  - ETSI EN 63000: 2018 RoHS documental assesment
- UNECE R10 Rev.6

FCC Certification

This device model 2hire box 2.0 contains:

- FCC ID: **2BDMD-2HBM2**
- FCC ID: **XMR201906EG21G**

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.

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.

This product complies with FCC and ISED radiation exposure limits set forth for an uncontrolled environment. The antenna should be installed and operated with minimum distance of 22 cm between the radiator and your body.
This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter except in accordance with FCC multi-transmitter product procedures.

Product Disposal

The crossed-out box symbol on the label indicates that electrical and electronic equipment (EEE) at the end of its useful life must be collected separately from other waste. Do not dispose of EEE as mixed municipal waste; instead, proceed with separate waste collection. The EEE retrieval or collection systems are regulated by applicable law. Retrieval can be done by the distributor, or there may be a free collection if the requirements of Directive 2012/19/EU are met. In any case, it is necessary to contribute to the reuse, recycling, and other forms of EEE recovery.

Attention! Improper disposal of electrical and electronic equipment (EEE) or part thereof and/or the possible presence of hazardous substances in EEE can have harmful effects on the environment and human health.

Product Standards

2hire box 2.0 is a device that interfaces with the vehicle through the OBD2 port. Pay close attention during installation; in case of doubts, consult qualified personnel.

The use of 2hire box 2.0 is recommended only with models from our catalog. Use with an unknown model will result in device deactivation as a safety measure until reinserted into a designated vehicle.

Upon first activation, it is advisable to keep the vehicle outdoors, where Cellular signal reception is good, to allow 2hire box 2.0 to connect to the server for auto-configuration and obtain a fix on GPS satellites.

The device is not waterproof; store and use it in appropriate conditions.

Refrain from opening the 2hire box 2.0 case, as this could damage the electronics and void the warranty.

Improper use of the device is the owner's responsibility.

2hire is not responsible for damages caused by improper installation and use of the device.

The connectivity is not available in the following countries:

- Abkhazia
- American Samoa
- Angola
- Bouvet Island
- British Indian Ocean Territory
- Cook Islands
- Djibouti
- Eritrea
- Falkland Islands
- Federated States of Micronesia
- Kiribati
- Maldives
- Marshall Islands
- Niger
- Niue
- Norfolk Island
- North Korea
- Palau
- Republic of the Congo
- Saint Helena
- Saint Pierre and Miquelon
- San Marino
- Solomon Islands
- Somalia
- Syria
- São Tomé and Príncipe
- Tokelau
- Turkmenistan
- Tuvalu
- Wallis and Futuna
- Yemen
- Åland Islands

WARNINGS

The device is not waterproof; store and use it in appropriate conditions.

Improper use of the device is under the responsibility of the owner.

2hire is not responsible for damages caused by improper installation and use of the device.