

Document: **User Manual**

Product: **Smart Access BLE**

Model: **BNCM**

Date: **14. Oct. 2021**

Number of pages: **7**

|              | Name:   | Department:       | Phone: | Date:      | Sign: |
|--------------|---------|-------------------|--------|------------|-------|
| Author:      | Peng Yu | VNI CE HW SHA WLC |        | 14/10/2021 |       |
| 1. Check:    |         |                   |        |            |       |
| Responsible: |         |                   |        |            |       |



## Content

|          |  |          |
|----------|--|----------|
| 1.1      | VERSIONS LIST .....                                | 2        |
| 1.2      | RELATED DOCUMENTS.....                             | 2        |
| 1.3      | ABBREVIATION REGISTER .....                        | 2        |
| <b>2</b> | <b>SCOPE OF DOCUMENT .....</b>                     | <b>4</b> |
| <b>3</b> | <b>SYSTEM OVERVIEW .....</b>                       | <b>4</b> |
| 3.1      | SHORT DESCRIPTION OF SMART ACCESS BLE SYSTEM ..... | 4        |
| <b>4</b> | <b>MECHANICAL DESIGN .....</b>                     | <b>5</b> |
| 4.1      | CAR MOUNTING POSITION.....                         | 5        |
| <b>5</b> | <b>DESCRIPTION OF BLE SYSTEM .....</b>             | <b>5</b> |
| 5.1      | WIRELESS SERVICES:.....                            | 5        |
| 5.2      | INTERFACES: .....                                  | 5        |
| 5.3      | INTERNAL ANTENNAS: .....                           | 5        |
| <b>6</b> | <b>WIRELESS SERVICES TECHNICAL DATA.....</b>       | <b>6</b> |
| 6.1      | BLE TECHNICAL DATA.....                            | 6        |
| <b>7</b> | <b>USA STATEMENT.....</b>                          | <b>7</b> |

|  |             |            |
|--|-------------|------------|
| Author: <b>PENG YU</b>                 | USER MANUAL |            |
| Version: 0.1 Smart access BLE<br>File: |             | Page 3 / 7 |

## 2 Scope of Document

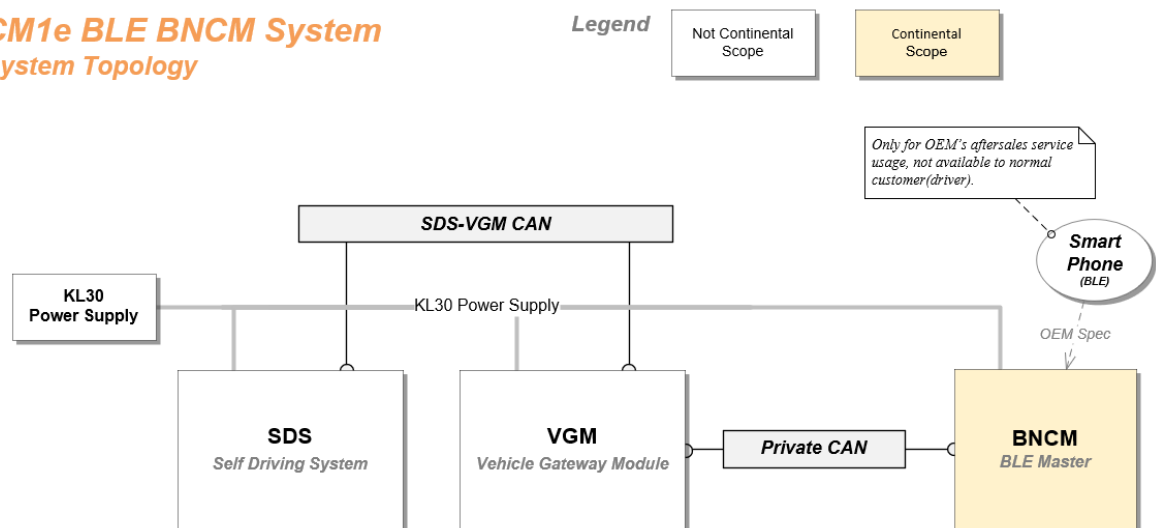
The aim of this document is to provide a short overview on the Smart access BLE system and to describe the BLE module in order to support the homologation activities.

## 3 SYSTEM OVERVIEW

### 3.1 Short Description of smart access BLE system

The BLE system includes a master node (Master). The main node is connected to the body network via the CAN bus. The master node establishes a secure data connection with the mobile phone, authenticates the user's mobile phone identity and digital key, and receives remote control signals from the mobile phone. The master node receives BLE connection RSSI from BLE chip, then locates the position of the mobile phone relative to the car through the positioning algorithm.

#### CM1e BLE BNCM System System Topology



|                               |             |            |
|-------------------------------|-------------|------------|
| Author: <b>PENG YU</b>        | USER MANUAL |            |
| Version: 0.1 Smart access BLE |             |            |
| File:                         |             | Page 4 / 7 |

## 4 Mechanical design

### 4.1 Car mounting position

- › The mounting location is inside the compartment

## 5 Description of BLE system

The master node performs BLE advertising, the user's mobile phone discovers the master node of the vehicle through BLE Scanning in the close range of the vehicle, and establishes the data link with the master node through a secure connection, and establishes the bonding with the master node. Then the mobile APP can start the BLE digital key functions..

In specific scenario, the master node calculates the location of the mobile phone according to the BLE connection RSSI values derived from BLE chip.

### 5.1 Wireless services:

- BLE

### 5.2 Interfaces:

- CAN

### 5.3 internal Antennas:

- One BLE ant.

There are no connectors for external antennas.

Antennas are integrated into the module.

|  |             |            |
|--|-------------|------------|
| Author: PENG YU                        | USER MANUAL |            |
| Version: 0.1 Smart access BLE<br>File: |             | Page 5 / 7 |

## 6 Wireless services technical data

### 6.1 BLE technical data

|   |   |
|---|---|
| <b>Wireless service:</b>                                | <b>BLE (Bluetooth Low Energy)</b>                   |
| <b>Frequency bands / range:</b>                         | 2400-2483.5MHz                                      |
| <b>Data Rate:</b>                                       | 1Mbps   |
| <b>Electrical output power (conducted into 50 Ohm):</b> | 2.0dBm  |
| <b>Modulations:</b>                                     | GFSK  |
| <b>Number of channels:</b>                              | 40  |
| <b>Channel (occupied) bandwidth:</b>                    | 2 MHz   |
| <b>Antenna name:</b>                                    | PCB loop Antenna                                    |
| <b>Antenna type:</b>                                    | Direct feed (main PCB)                              |
| <b>Antenna gain (efficiency, gain incl. losses):</b>    | antenna efficiency max.:<br>2400-2483.5MHz: -5.2 dB |

| Bluetooth Low Energy |          |    |          |    |          |    |          |
|----------------------|----------|----|----------|----|----------|----|----------|
| Ch                   | Fre(MHz) | Ch | Fre(MHz) | Ch | Fre(MHz) | Ch | Fre(MHz) |
| 0                    | 2402     | 10 | 2422     | 20 | 2442     | 30 | 2462     |
| 1                    | 2404     | 11 | 2424     | 21 | 2444     | 31 | 2464     |
| 2                    | 2406     | 12 | 2426     | 22 | 2446     | 32 | 2466     |
| 3                    | 2408     | 13 | 2428     | 23 | 2448     | 33 | 2468     |
| 4                    | 2410     | 14 | 2430     | 24 | 2450     | 34 | 2470     |
| 5                    | 2412     | 15 | 2432     | 25 | 2452     | 35 | 2472     |
| 6                    | 2414     | 16 | 2434     | 26 | 2454     | 36 | 2474     |
| 7                    | 2416     | 17 | 2436     | 27 | 2456     | 37 | 2476     |
| 8                    | 2418     | 18 | 2438     | 28 | 2458     | 38 | 2478     |
| 9                    | 2420     | 19 | 2440     | 29 | 2460     | 39 | 2480     |

|  |             |            |
|--|-------------|------------|
| Author: <b>PENG YU</b>                 | USER MANUAL |            |
| Version: 0.1 Smart access BLE<br>File: |             | Page 6 / 7 |

---

## 7 USA Statement

Product name: Smart Access BLE System  
Model: BNCM  
FCC ID: KR5BNCM

### FCC Compliance 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. 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 Caution:

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

This device complies with FCC radiation exposure limits set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 20cm (8 inches) during normal operation.

---

END OF DOCUMENT

---

|  |             |            |
|--|-------------|------------|
| Author: PENG YU                        | USER MANUAL |            |
| Version: 0.1 Smart access BLE<br>File: |             | Page 7 / 7 |