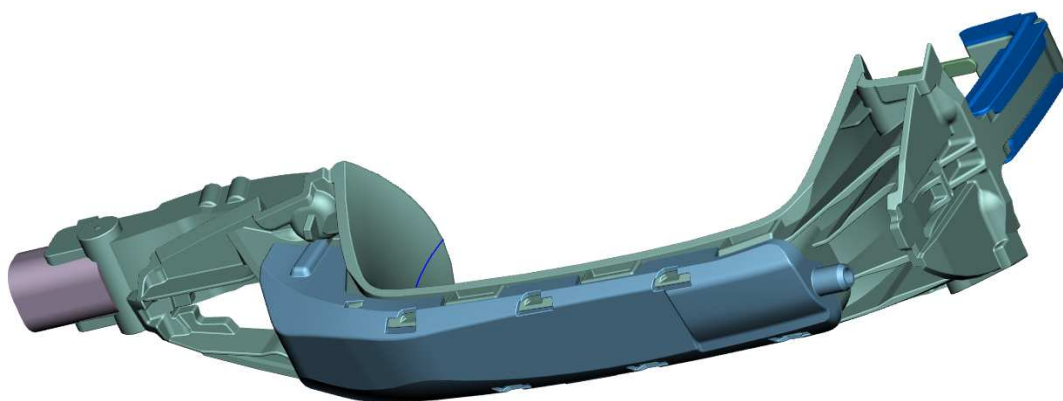




# **Technical Description and User's Manual of the Door-Handle with NFC**

**Model: NFCTGSAU380R**



## **Contents**

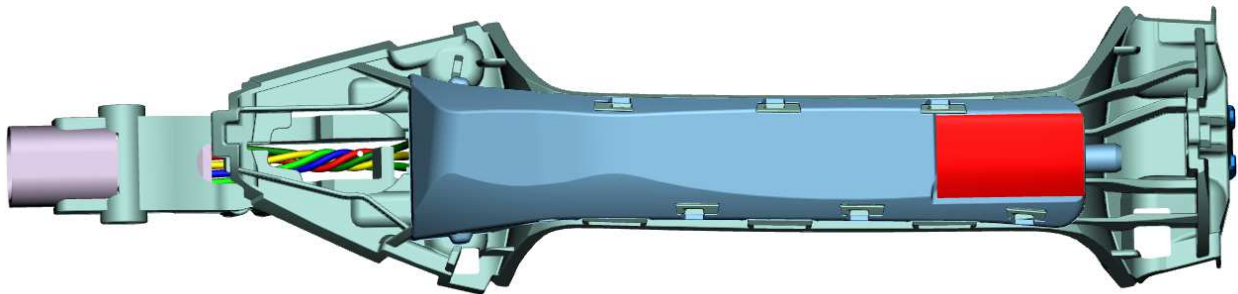


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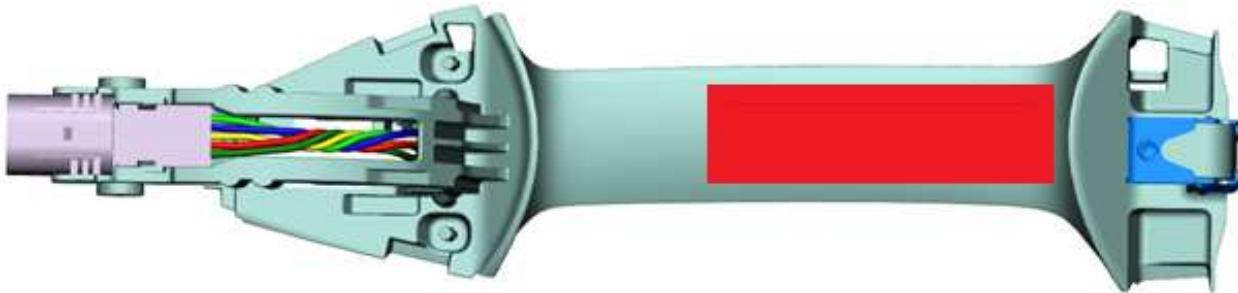
## 1 General description of the door-handle

The NFC-Reader NFCTGS is also equipped with two Capacitive sensors that enables authorized users to lock or unlock the car by using the sensors or with the released NFC-Device for the vehicle.

### 1.1 Lock sensor

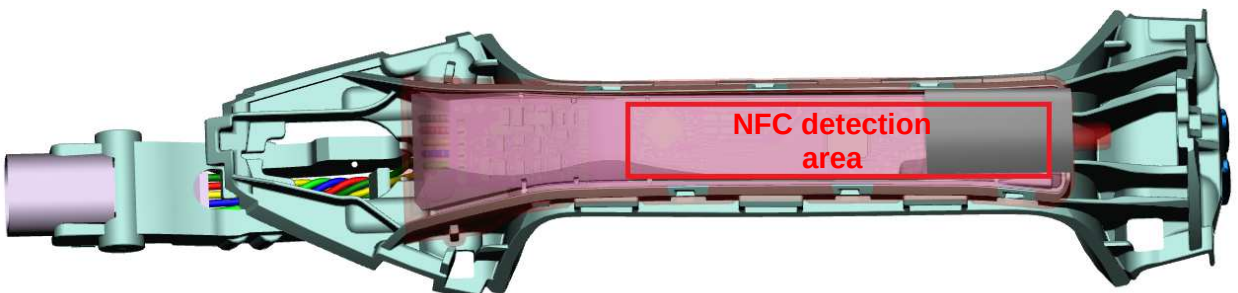


### 1.2 Unlock sensor



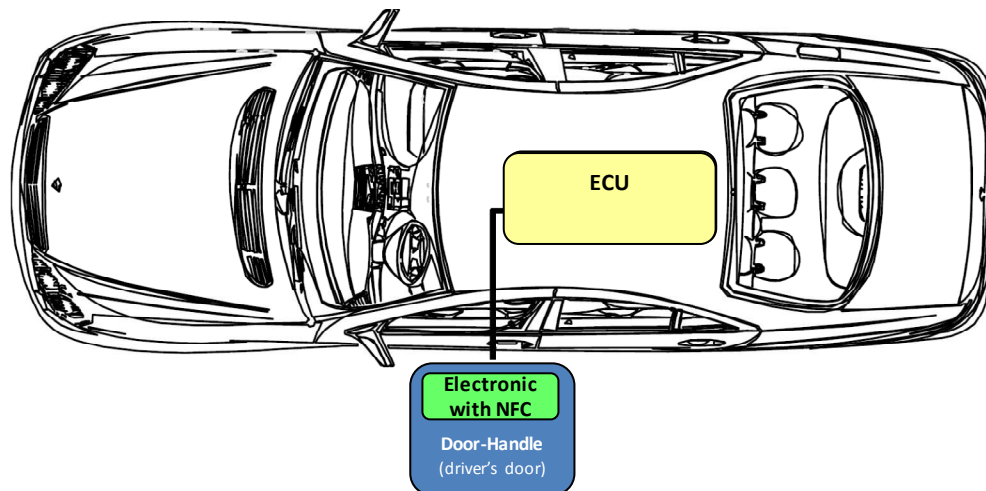
### 1.3 NFC-Reader:

When an NFC-Device approaches to the NFC-Antenna, the door handle sends a signal to the electronic control unit to initiate the authorisation sequence.

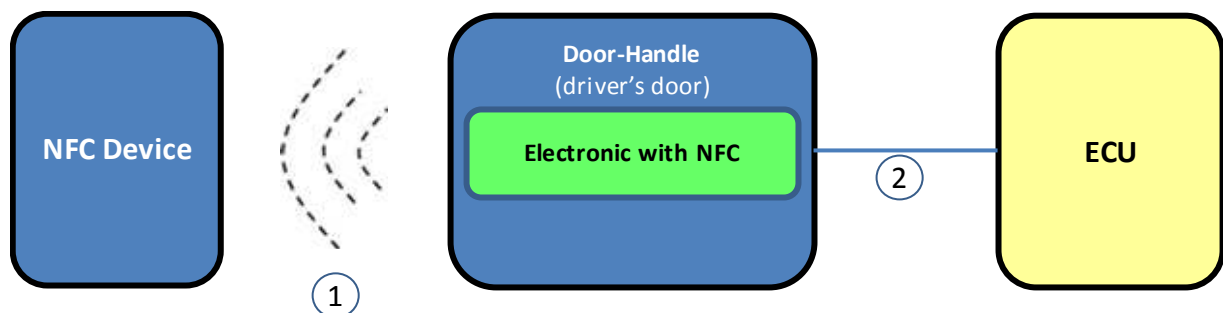


## 1.4 Communication Interfaces

Following picture shows a simplified diagram of the system.



The door-handle communicates with the Electronic Control Unit (ECU) by using one-wire interface and with the NFC-Device by using Near Field Communication.



### Communication with the NFC-Device ①

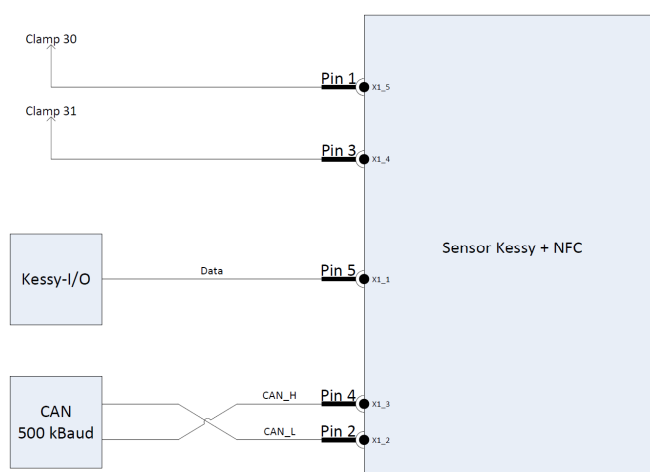
Near Field Communication between the door-handle and the NFC-Device.

### Communication with the ECU ②

Bidirectional communication with the ECU during the NFC-authorisation sequence



## 2.1 External connections





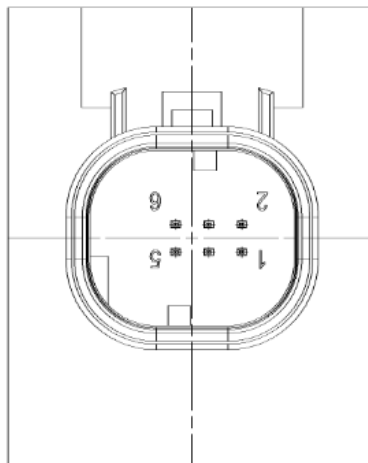
## 3 Technical data

### 3.1 Electrical characteristics

#### 3.1.1 Operating voltages

- |                                |                                                  |
|--------------------------------|--------------------------------------------------|
| - Operating voltage range:     | $+U_{bat} = 9V \pm 2\%$ to $16V \pm 2\%$ DC      |
| - NFC operating voltage range: | $+U_{bat} = 8V \pm 2\%$ to $16V \pm 2\%$ DC      |
| - CAN operating voltage range: | $6,5V \pm 2\% \leq +U_{bat} \leq 18V \pm 2\%$ DC |
| - Test voltage for EOL:        | $+U_{bat} = 12V \pm 2\%$ DC                      |

#### 3.1.2 Connector definition



#### 3.1.3 Pinning and Functional description

The Kessy + NFC module has the following connector pins:

- Pin 1 = clamp 30 (+Ubat)
- Pin 2 = CAN Low
- Pin 3 = clamp 31 (GND)
- Pin 4 = CAN High
- Pin 5 = Kessy-I/O (+Ubat & Data)



## 3.2 General NFC specification

|                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Standards:              | ISO 14443-A<br>ISO 14443-B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Communication role:     | Proximity Coupling Device (PCD)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Anti-collision support: | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Communication range:    | ≤ 3cm approx. (dependent on Proximity Integrated Circuit Card (PICC))                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Type of NFC antenna:    | PCB Loop antenna                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| NFC Frequency rate:     | 13,56 MHz ± 7 kHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Data rate:              | 106 kb/s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Type of modulation:     | ISO 14443-A → Load modulation OOK<br>ISO 14443-B → Load modulation AM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Test Modes              | <p><b>NFC Field-On:</b> The Door-Handle produces a high frequency electromagnetic field (13,56 MHz)</p> <p><b>NFC-A Frames:</b> The Door-Handle produces frames of high frequency electromagnetic field (13,56 MHz) and modulates its amplitude according to ISO 14443-A in order to transmit data. The Inter-frame space is 5ms</p> <p><b>NFC-B Frames:</b> The Door-Handle produces frames of high frequency electromagnetic field (13,56 MHz) and modulates its amplitude ISO 14443-B in order to transmit data. The Inter-frame space is 5ms</p> |



## 4 Declaration of Conformity, product Label

### 4.1 Radio equipment authorization to FCC in USA

**FCC ID: YGONFCTGSAU380R**

The transmitter will be supplied as an original equipment device to the car manufacturer.

According to 47 CFR 15.19 (labelling requirements) the car manufacturer will print the following text in the appropriate User's Manual of the car:

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.

Usually this is followed by the following FCC caution:

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

### 4.2 Radio equipment authorization to RSS-210 in Canada

**IC: 4008C-TGSAU380R**

The transmitter will be supplied as an original equipment device to the car manufacturer.

According to RSS-210 (labelling requirements) the car manufacturer will print the following text in the appropriate User's Manual of the car:

This device complies with Industry Canada licence-exempt RSS standard(s). 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.

Le présent appareil est conforme aux CNR d'Industrie 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.

Usually this is followed by the following RSS caution:

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



## 4.3 Location of product label

The labelling with radio certification marks, the product model and the manufacturer logo, country code and control identification data can be found at the door-handle.

Position of the labelling for radio certification:

