

# **USER MANUAL**

## **Near Field Communication Reader**

### **NFC 3.0**

## 1. System Description

Continental Near Field Communication Reader is developed for automotive applications under the name NFC 3.0 which includes the following function:

- NFC: Near Field Communication

The NFC 3.0 module and its implementation inside the vehicle is depicted in Fig. 1. Its assembly instruction is done by professional workers. Therefore, the product cannot be moved or switched to another position by the end user.



*Fig. 1: NFC 3.0 module and its implementation inside the vehicle*

## System overview

NFC 3.0 product is an NFC reader used for establishing a communication with adequate devices at a frequency of 13.56MHz. This communication realized between a base station unit and a mobile device is based on near field magnetic induction between transmitter and receiver coils.

Base station comprises two main functional units, namely a power conversion unit and a Communications & Control unit for delivering, controlling and regulating the transferred power.

Mobile device comprises a power pick up unit and a communications & control unit for achieving power requirements and establishing an active NFC communication.

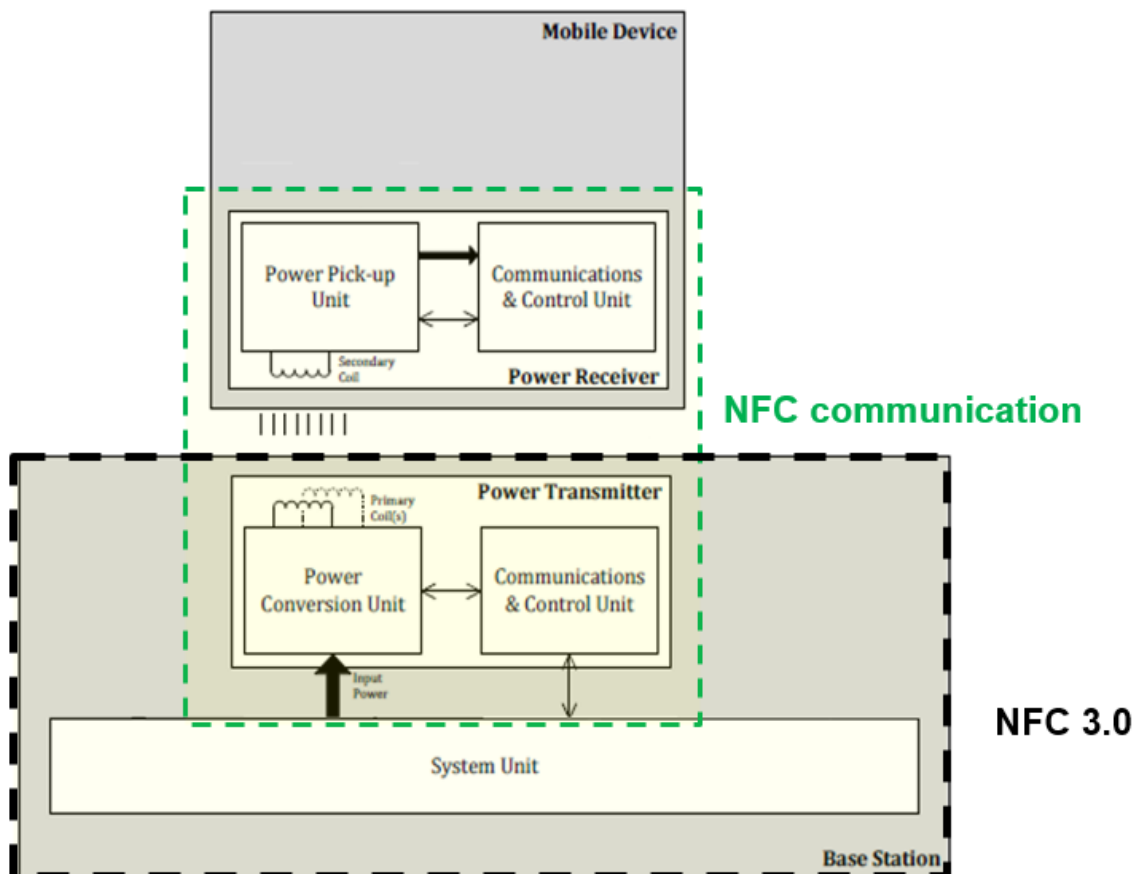
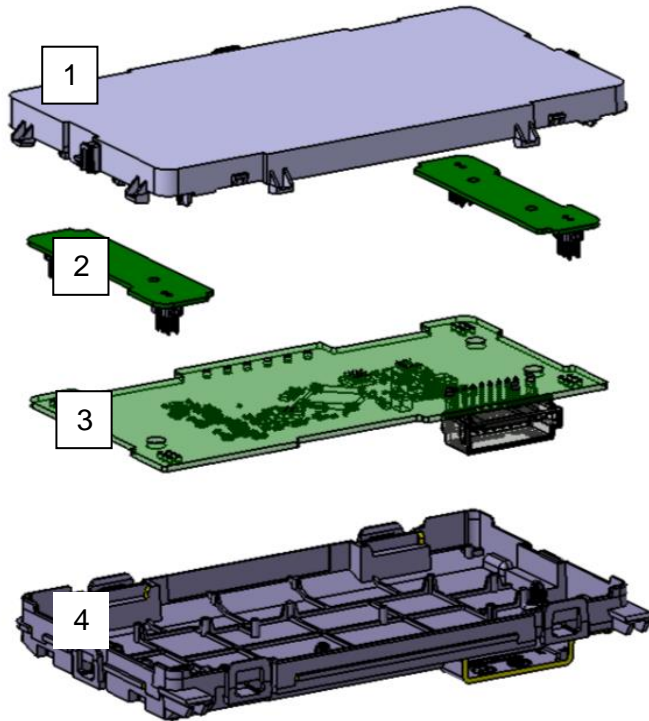


Fig. 2: NFC Wireless power transfer structure

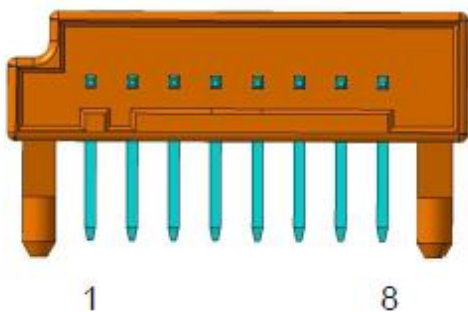
## 2. Near Field Communication Reader description

The NFC 3.0 is mainly composed of 4 parts as depicted in Fig.3:



*Fig. 3: NFC 3.0 split view*

1. Top housing
2. Antenna PCB
3. Main PCB with 8 ways connector



*Fig. 4 Connector diagram*

Pin No.	Function	Type	Description
1	<b>VBAT</b>	Supply	General supply battery connection
2	<b>NC</b>	Not used	Not used
3	<b>CAN_H</b>	Communication	CAN communication high signal
4	<b>CAN_L</b>	Communication	CAN communication low signal
5	<b>NC</b>	Not used	Not used
6	<b>GND_BAT</b>	Supply	General supply GND connection
7	<b>NC</b>	Not used	Not used
8	<b>NC</b>	Not used	Not used

Fig. 5 Connector pin description

#### 4. Bottom Housing

A picture of a serial production part is shown in Fig. 6:



Fig. 6: Serial product NFC 3.0. (a) top view and (b) side view.

### 3. NFC architecture

The NFC 3.0 integrates only one NFC transceiver emitting at a frequency of 13.56MHz. It is connected via switches to a Main NFC antenna and two side NFC antenna (Side 1 and Side 2).

#### 3.1 Product parameters

Below in table 1, the technical parameters of the NFC 3.0 product are specified:

Parameters	Values
Supply voltage	12V battery
Voltage supply range	8V < Vbat < 16V
Max. power consumption	6W
Product Operating temperature range	-40°C < Temp < 85°C
Max. Current consumption	250 mA
Vehicle fuse protection	7.5 A
Product Weight	104 g
Dimensions (X/Y/Z in mm)	139/80/17.5 (25 at Power supply connector)

Table 1: Product parameters of NFC 3.0

### 3.2 NFC technical parameters

Below in table 2, the technical parameters of the NFC feature of NFC 3.0:

Parameters	Values
Carrier frequency	13.56 MHz
Modulation type	Amplitude Shift Keying (ASK)
Data rate max.	848 kbps
NFC chipset brand	NXP Semiconductors
NFC chipset model number	NCF3340EHN
Max H field @10m (@13.56MHz)	1.5 dB $\mu$ A/m
Max output power (EIRP)	2.32 $\mu$ W

Table 2: NFC technical parameters of NFC 3.0

### 3.3 NFC antenna

The NFC block is composed of three antennas: Main, Side1 and Side 2 antenna.

The electrical parameters of the NFC antenna are listed in the following tables:

#### Main NFC antenna:

Parameters	Values
Antenna type	Planar printed coil on PCB
Number of turns	3
Antenna size	110mm x 62 mm
Antenna Gain (dBi) @ 13.56MHz	-44.2

Table 3: Main NFC antenna technical parameters

#### Side 1 NFC antenna:

Parameters	Values
Antenna type	Planar printed coil on PCB
Number of turns	3
Antenna size	60mm x 13.8mm x 10mm
Antenna Gain (dBi) @ 13.56MHz	-57.07

Table 4: Side 1 NFC antenna technical parameters

#### Side 2 NFC antenna:

Parameters	Values
Antenna type	Planar printed coil on PCB
Number of turns	3
Antenna size	60mm x 13.8mm x 10mm
Antenna Gain (dBi) @ 13.56MHz	-58.58

Table 5: Side 2 NFC antenna technical parameters

## 4 Variants and versions of “NFC 3.0”

**4.1 NFC 3.0:** includes NFC function with only one version as described below:



Ref	NFC	Top View	Bottom View
NFC 3.0	Yes		

Table 6: NFC 3.0 overview

## 5. LABEL CONTENT

### BRAZIL



### CANADA

This device complies with part 15 of the FCC Rules and Industry Canada license-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.

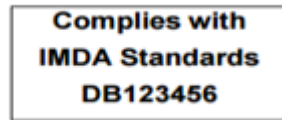
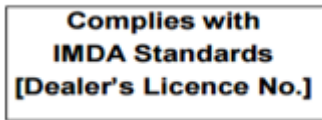
Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

### MEXICO

La operación de este equipo está sujeta a las siguientes dos condiciones:

- (1) es posible que este equipo o dispositivo no cause interferencia perjudicial y
- (2) este equipo o dispositivo debe aceptar cualquier interferencia, incluyendo la que pueda causar su operación no deseada.

## SINGAPORE



## SOUTH AFRICA



## TAIWAN

Taiwan regulatory information(NCC)

低功率電波輻射性電機管理辦法

第十二條 經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

Article 12

Without permission granted by the NCC, any company, enterprise, or user is not allowed to change frequency, enhance transmitting power or alter original characteristic as well as performance to a approved low power radio-frequency devices.

第十四條 低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。

前項合法通信，指依電信法規定作業之無線電通信。

低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

Article 14

The low power radio-frequency devices shall not influence aircraft security and interfere legal communications; If found, the user shall cease operating immediately until no interference is achieved.

The said legal communications means radio communications is operated in compliance with the Telecommunications Act.

The low power radio-frequency devices must be susceptible with the interference from legal communications or ISM radio wave radiated devices.

## USA

"This device complies with part 15 of the FCC Rules and Industry Canada license-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."





FCC § 15.21 Information to user

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

RF Exposure Requirements

To comply with FCC RF exposure compliance requirements, the device must be installed to provide a separation distance of at least 20 cm from all persons.