



GLOBAL DISPLAY SOLUTIONS

## MAN10454 Rev.00

Description	User Manual - NFC 12V board
GDS Part No.	BRD01793 - 0WQ00484AC
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This technical literature is subject to change without notice.  
Please contact GDS or its representative before designing your product based on this specification

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## 1. FCC Notice (U.S. Only)

### FCC Class B

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the manufacturer's instruction manual, may cause interference with radio and television reception. 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.

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.

**NOTICE:** The FCC regulations provide that changes or modifications not expressly approved by Global Display Solutions SpA could void your authority to operate this equipment.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference with radio or television reception, which can be determined by turning the equipment off and on, you are encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Relocate the system with respect to the receiver.
- Move the system away from the receiver.
- Plug the system into a different outlet so that the system and the receiver are on different branch circuits.

If necessary, consult a representative of Technogym SpA or an experienced radio/television technician for additional suggestions.

The following information is provided on the device or devices covered in this document in compliance with the FCC regulations:

- Product name: NFC 12V board
- Model number: BRD01793 - 0WQ00484AC
- Company name: Global Display Solutions SpA

## 2. Safety Instructions

The NFC 12V board is a Mifare/NFC reader module of the Technogym Devices Technogym Device (Equipment Cardio, Trainer point or Class Reader).

Read the Safety Instruction carefully and keep it for use later.

Beware of all warning and instruction signs marked on the NFC 12V board.

Ensure that the ambient temperature around the module is between +5°C and +50 °C (with relative humidity between 5% and 85%).

## 3. NFC compatibility

The NFC module will be compatible with the following handsets with respect to the development phases:

### Phase 1:

- Samsung GALAXY NEXUS GT-i9250
- Samsung MINI 2 S6500 NFC

### Phase 2:

- Google NEXUS S
- Blackberry CURVE 9360
- Blackberry BOLD 9900
- Samsung GALAXY SII I9100 NFC
- Nokia 700

This list may be subject to future changes according to new devices released on the market in the coming months. For a complete list of devices which integrate NFC please refer to:

<http://www.nfcworld.com/nfc-phones-list/>

<http://www.paywiththis.com/>

<http://www.nfc.cc/nfc-phones/>

#### 4. Mechanical dimensions

The NFC 12V board shows the following mechanical dimensions:

Quote	MAX Dimension
PBC_W	86mm
PCB_L	51mm
PCB_H	1.6mm
Ant_W	56 mm
Ant_L	40mm

The electronic board has all components on one side only and the connectors must be of type SMT.

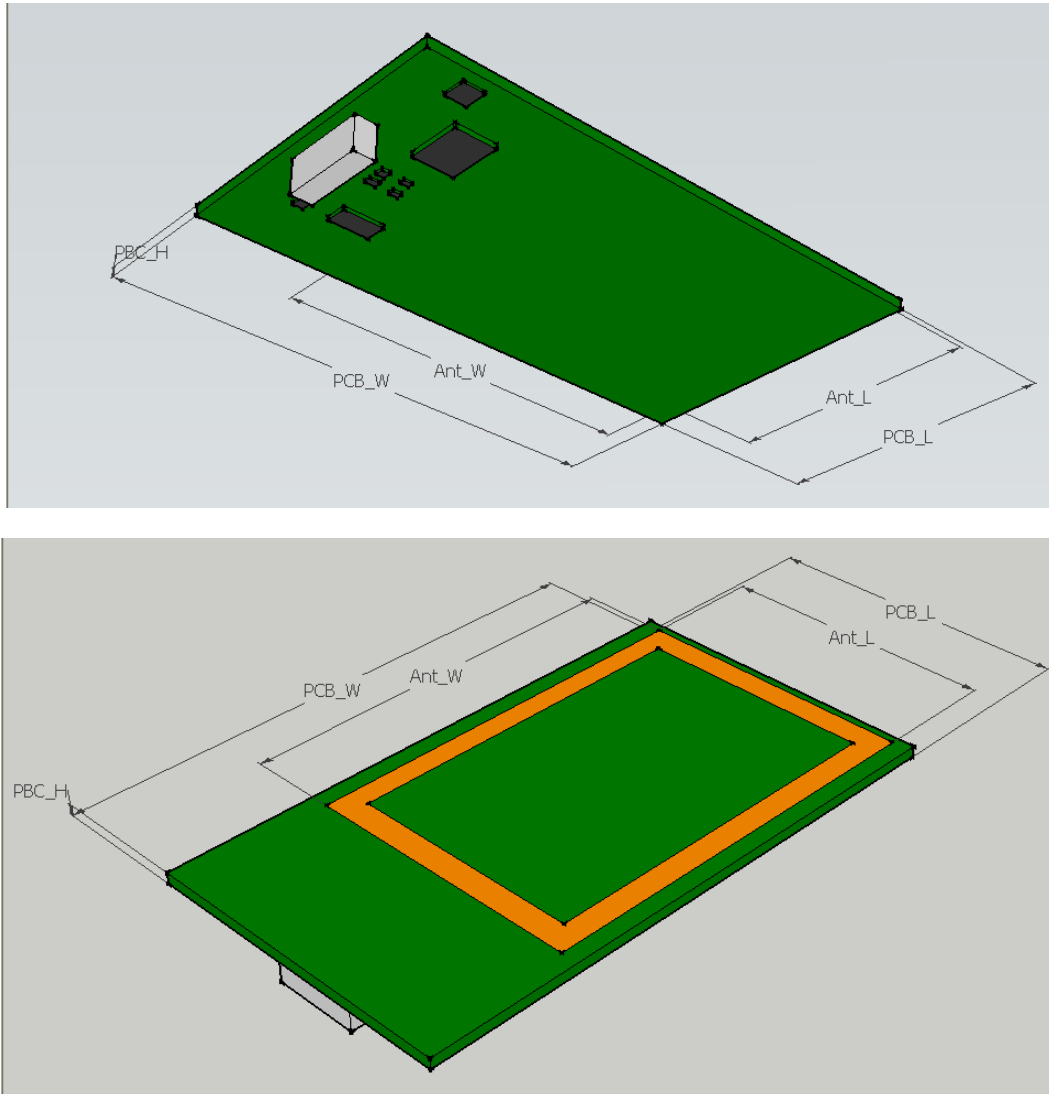


Figure 1 NFC 12V board mechanical dimensions

## 5. Connections

The NFC 12V board has the main connector (Picoblade Molex SMT - 53398-087) with reference J9.

Pin	Function	Description
1	+12Vdc	Power Supply
2	RS232_TX	Serial Data Out
3	RS232_RX	Serial Data In
4	RTS out	RTS out
5	CTS in	CTS in
6	Relè out	Relè out
7	NC	NC
8	GND	Ground

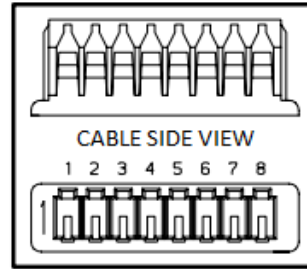


Figure 2 J9 connector details

The J2 connection (Picoblade Molex SMT - 53398-0471) is used to connect the optional Remote Mifare Board with this pinout:

Pin	Function	Description
1	+3.3Vdc	Power Supply
2	GND	Ground
3	UART_TX	Serial Data Out
4	UART_RX	Serial Data In

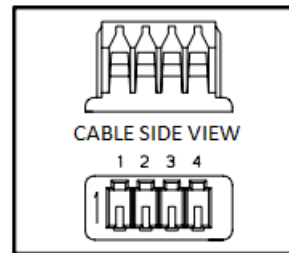


Figure 3: J2 connector details

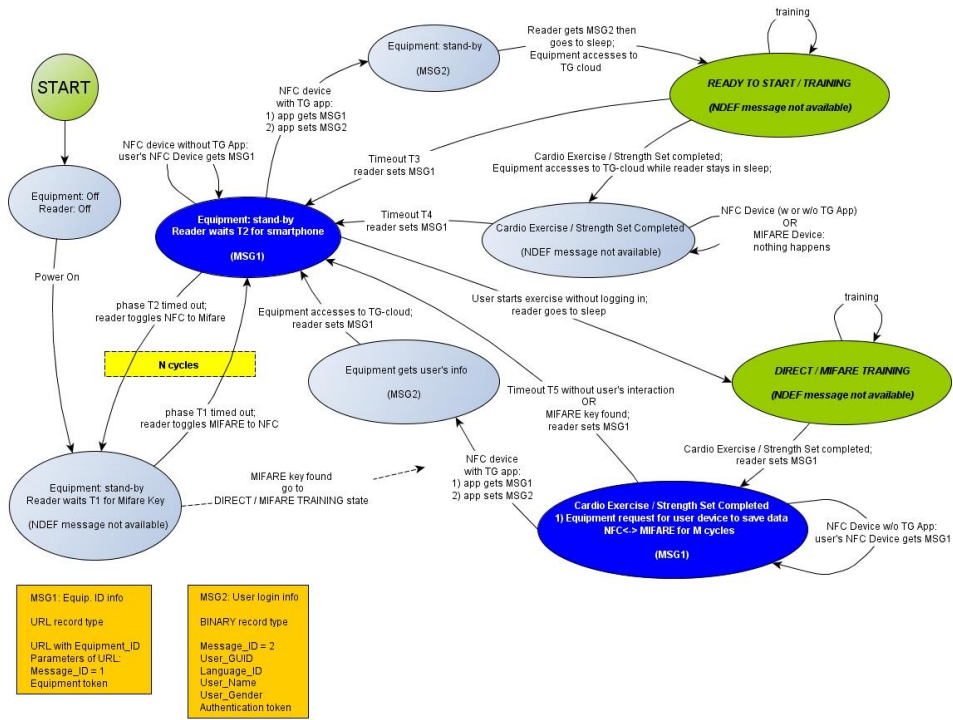
## 6. Operating mode

The NFC 12V board operates with both user keys based on Mifare protocol (TGS Mifare and MyWellness key) and NFC smartphones. The minimum reading distance with NFC devices must be at least 15 mm.

In the case of interaction with user key based on Mifare protocol, the board traces its operating states, based on the use of fitness equipment by the athlete (eg, running a year) and through some parameters collected from the user keys.

When the board reads a smartphone NFC, the data exchange between them is minimized, thanks to a NFC application, installed in the smartphone (installed as prerequisite), which supports most of the data management.

## Equipment connected: reader state machine



## Equipment not connected: reader state machine

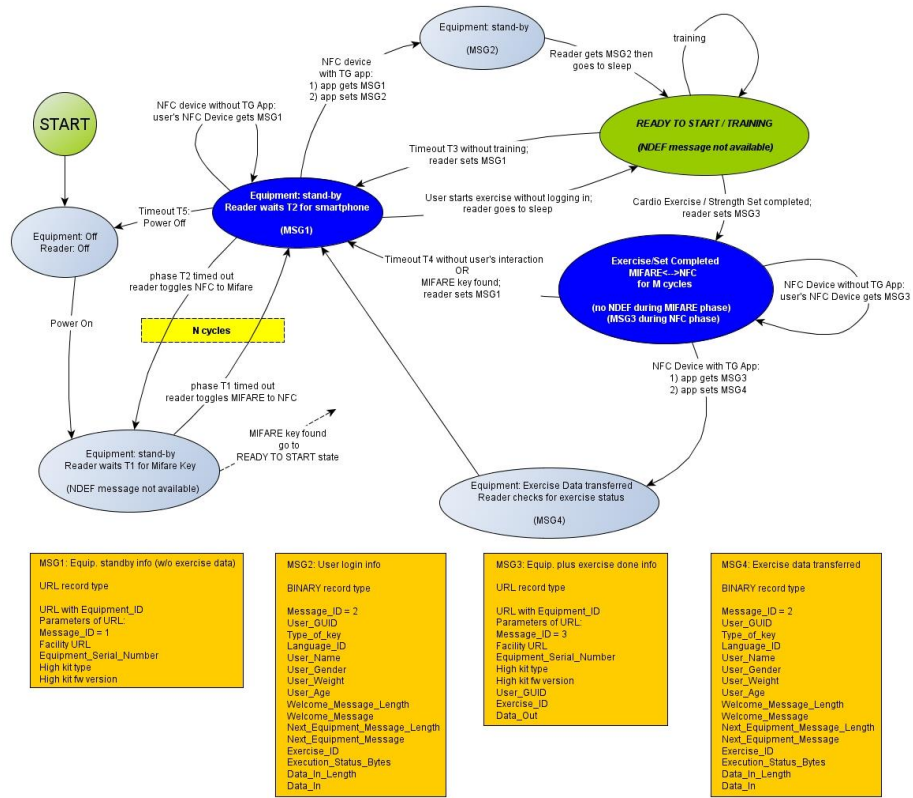


Figure 4 NFC 12V board state diagram with and without equipment connected

## 7. Labelling

The NFC 12V board has labeling showing FCC ID code, GDS SpA board code and Technogym SpA codes.



Figure 5 NFC 12V board labelling (option 1)



Figure 6 NFC 12V board labelling (option2)

Using a permanently affixed label, the modular transmitter is labelled with its own FCC identification number, and, if the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module.

This exterior label can use wording such as the following:

**“Contains Transmitter Module FCC ID: XZRBRD01793 or contains FCC ID: XZRBRD01793”.**

Any similar wording that expresses the same meaning may be used.