Technogym®

Mifare Reader

User / Integration Manual

Revision History

Release	Date	Description	Author
1.0	20/12/2011	Initial release	Alessandro Cevoli

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1 General overview

The TGS Mifare Reader is an accessory of Technogym Equipments that let them to identify, read and write an RFID transponder, named Technogym Wellness System Keys, in a contactless way.
Technogym Wellness System Keys are Mifare transponders customized with a private password to access data inside it.
By means of the system made by "TGS Mifare Reader" + "Technogym Wellness System Keys" each equipment may identify the user, propose its specific training and save a log of the training executed on the equipment.

2 Description

The TGS Mifare Reader is made by 2 boards inside a plastic housing that may change depending of the equipment where the TGS Mifare Reader must fit.
The TGS Mifare Reader may be connected to the host by means of a cable that allows:
- Device powering;
- Data communication (the host SW drives the TGS Mifare Reader managing the reading of the RFID transponder).

The module antenna is a PCB antenna type and is embedded into the module itself.
2 LEDs communicate powering and read/write communication.

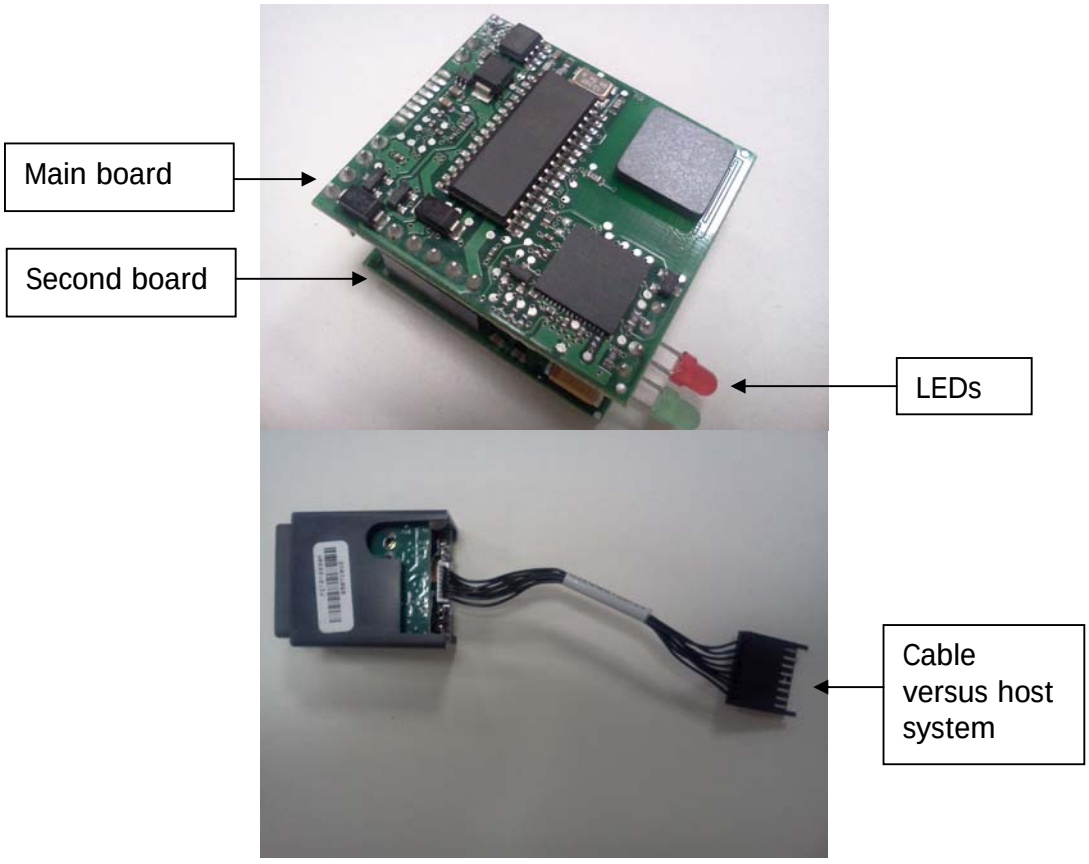
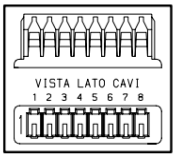


Fig. 1 – Pictures of Mifare Reader

3 Communication and connector

Connector of TGS Mifare Reader has the following signals and pinout:

Picoblade Molex on the device (on board) 	Description	AMP modu II (on adapting cable)
1	+12Vdc	1
2	TX out	8
3	RX in	7
4	RTS out	2
5	CTS in	6
6	Relè out	5
7	N.C.	4
8	GND	3

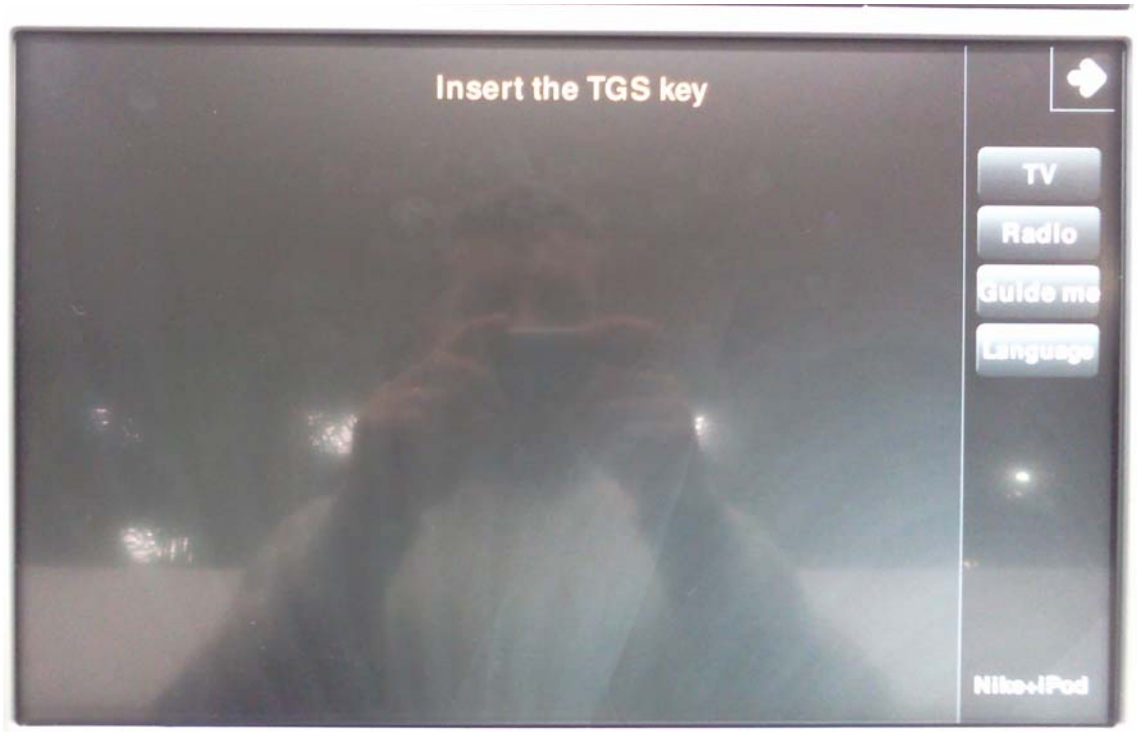
Data communication is standard RS232 with next parameters:

- Baud rate: 9600 or 38400bps (self recognizing);
- Data bits: 8;
- Parity: None;
- Stop Bit: 1;

Over this serial communication Technogym has developed a proprietary communication protocol implemented on every host that may be connected to this device.
The SW driver for the TGS Mifare Reader is developed by Technogym an integrated into Operating System of the HOST.

4 Operational functionality

At the beginning the User Interface ask for the Technogym Wellness System Keys for enabling the unit.


Insert the TGS key
TV
Radio
Guide me
Language
Nike+iPod

After the Technogym Wellness System Keys is read and the end user recognized, the access to the unit is granted.

5 Developing tools

For developing purpose a DOS tool (TgsKeManager.exe) can be used to verify the basic functionalities of a TGS Mifare Reader connected to a serial port of a PC in the following package:

TgsKeyManager.exe

In the follow the command list supported by the SW Tool:

- *Check key*: check if any Technogym Wellness System Keys is present in the working range of the Mifare Reader;
- *Check key (extended)*: like the previous command, but it returns more information about the transponder (tipology and size);
- *Set baud rate*: force the serial RS232 baud rate 9600bps or 38400bps;
- *Turn on red LED*: turns the red LED on;
- *Turn off red LED*: turns the red LED off;
- *Read key at address*: read 16 bytes from the memory of the transponder inside a Wellness System Key;
- *Write key at address*: writes 16 bytes in the memory of the transponder inside a Wellness System Key;
- *Fast read at address*: read up to 2064 bytes from the memory of the transponder inside a Wellness System Key;
- *Fast write at address*: writes up to 2064 bytes in the memory of the transponder inside a Wellness System Key;
- *Ask UID*: get the Unique Identifier Number of the Mifare transponder;
- *Ask dimension*: get the size in bytes of memory reserved with the private Technogym password;
- *Format Standard key*: reserves a size of 2064 bytes with a private Technogym password;
- *Format custom key*: reserves a custom size in bytes with a private Technogym password;
- *Reset key*: writes passwords and access bits at the factory default values;
- *Alloc sector*: reserves a specific sector of memory with private Technogym password;
- *Dealloc sector*: frees a specific sector of memory with factory default values
- *Check sector usage*: checks if any sectors are locked with password or not;
- *Proxy command*: get data stored from a specific address of Technogym reserved memory;
- *Extended proxy command*: get data stored from specific addresses of Technogym reserved memory;

The graphic user interface of this tool is shown in the fig. 2

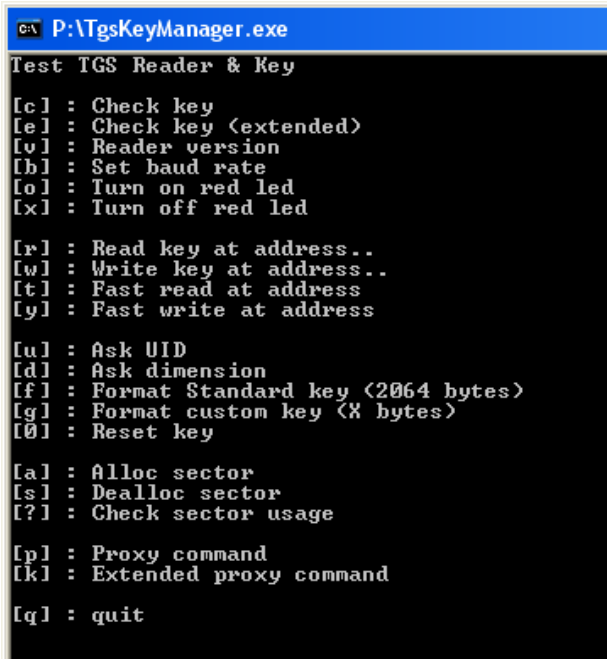


Fig. 2 – TgsKeyManager tool

6 Installation

Each equipment has a specific upgrade kit to upgrade it with TGS Mifare Reader, please refer to the specific equipment service manual to get the right part number with the right housing and the right installation procedure.

Some hosts need to enable the communication with TGS Mifare Reader, so please refer to the equipment manual to let it works.

7 FCC / Industry Canada (IC) Statements

FCC § 15.19 Labelling requirements

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

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.

When integrating the module into end products, the end product label shall be marked in the following way:

Contains FCC ID:
Contains IC:

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.