User Manual

of

Sports Timekeeping Reader

STK-READER-PRO

FCC ID: 2AH4CSTK-READER-PRO

FCC Section 15.19

This device complies with Part15 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 not cause undesired operation.

Information to User (FCC section 15.105)

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the installation manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case you will be required to correct the interference at your own expense

Information to User

The user is cautioned that any changes or modifications not expressly approved by BEEDANCING or authorized representative could void the user's authority to operate the equipment.

CHAPTER 1
Introduction

This *User Manual* provides instructions for installing and operating the STK-READER-PRO.

Photo of STK-READER-PRO

This document is designed for use by the timekeeping system integrators and software developers – those who wish to develop extended systems that take full advantage of the sports timekeeping reader's capabilities.

The following help documents are available,

- ■ *Quick Installation Guide*– a quick start guide for installing and running the Timing PRO Elite.
- ■ *Reader Interface Guide* – an overview of the communication interfaces for Timing PRO Elite.
- ■ *Demo Software Guide*– details installing and operating the Timekeeping Demo Software.
- ■ *Registration Guide* – a quick reference guide to register the sports timekeeping tags.

Sports Timekeeping Reader Overview

STK-READER-PRO is an Dual-Frequency RFID Reader specially designed to read Dual-Frequency Tags. Dual-Frequency Tags includes Shoe Tags、Bib Tags、Power Tags、Multisport Tags.

Shoe Tags:

.Passive (no battery required).

· Mid read range (>0.7m)

· Tag data rate of 128 kbps

· Factory programmed 64 bits ID.

· Waterproof, UV resistant.

· Reliable anti-collision protocol.

· Four holes for lace-up.

· Custom surface printing

· Operating temperature range: -40℃ to +80℃

Big Bib Tags

· 3M adhesive backed

· Long read range (>1.6m).

· Size: 190 mm × 120 mm × 0.6mm

· Weight: 10g

Small Bib Tags

· 3M adhesive backed

· Long read range (>1.4m).

· Size: 110 mm × 110 mm × 0.6mm

· Weight: 7g

Power Tags:

· Two slots for ankle strap or cable tie

· Mid read range (>1.0m).

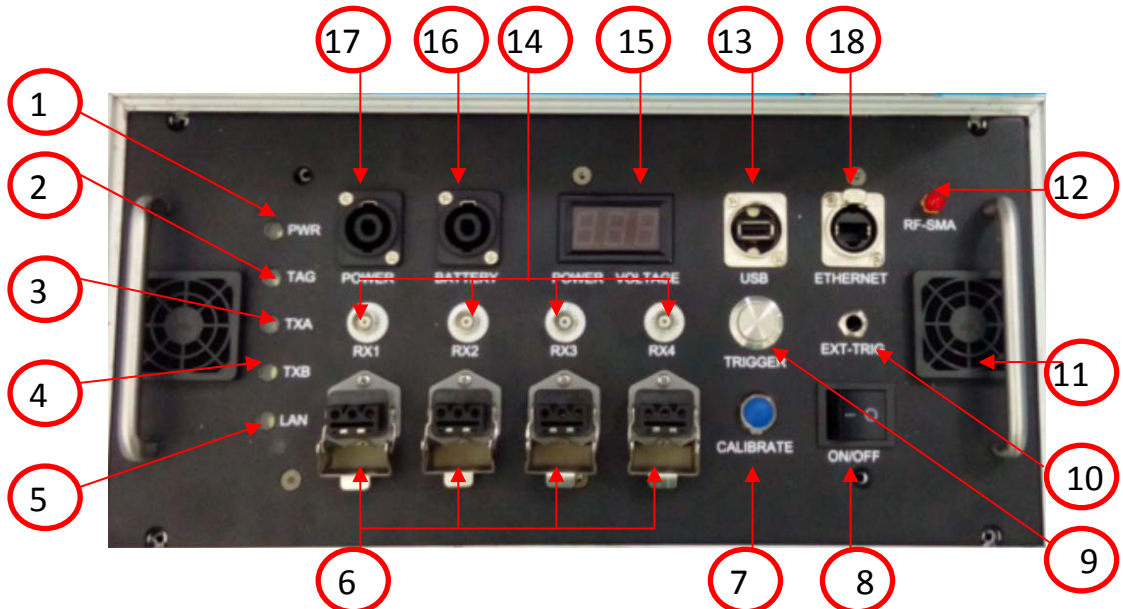· Size: 44 mm × 32 mm × 11mm

· Weight: 20g

Multisport Tags:
 · Two slots for ankle strap or cable tie
 · Mid read range (>0.7m).
 · Size: 44 mm × 32 mm × 11mm
 · Weight: 12g

*All the Tags are made by **BEEDANCING**. They are based on ISO 18000-6C protocol and programmed according to DES algorithm.*

Connected with the Sports Timing Mat, the reader reads contactless all the timekeeping tags that being worn by the runners when they are running across the timing mats.

Reader Panel

The reader panel (shown above) houses the following:

- *1:PWR*-Indicator of ON/Off
- *2:TAG*- Indicator of Valid Read, this indicator flash indicates the amount of bibs passing the timekeeping line
- *3:TXA* - Indicator of Ant Tuning
- *4:TXB*- Indicator of Ant Tuning
- 5: *LAN*- Indicator of Network
- 6:*TX1~TX4*-TX Ports，LF Transmitter.
- *7:CALIBRATE*-Tune Manually Button.
- *8: Power ON/OFF Button*– a self-locking switch which switch on/off the power of the reader.
- *9: Trigger Button* – generate a time stamp.
- *10: Trigger Port* – connect to external trigger button or external beeper.
- 11: Radiator Fan.
- *12: RF-SMA*–Not Used.
- *13*: *USB* –only can be used to mintenance and technical updating, it can not be used for user.
- *14:RX1~RX4*-RX Ports，HF Receiver.
- *15: POWER VOLTACE*- Indicator of DC Voltage, it Indicates the remaining capacity of the battery.
- *16: BATTERY*-battery port, connect to external battery for the

power backup.
- ■ *17: POWER- socket for charging the internal battery.*
- ■ *18. Ethernet port- only can be used to connect a a wireless network card, it can not directly be used to connect a PC.*

Antenna Ports

The Sports Timekeeping Reader has 2 or 4 pcs RX TNC ports and 2 or 4 pcs TX 3-pin terminal ports, which support 2 or 4 pcs Timekeeping RX & TX Antenna Units. TRANSMIT POWER: 62 dBuA/m @ 10 m on axis of one antenna (this is within ETSI EN300-330 limit)

STK-READER-PRO:

STK-READER-ONE:

Specifications

Name	Sports Timekeeping Reader
Model Number	STK-READER-PRO/ONE
Operating Frequency	125KHz Transmit,6.8MHz Receive tag signal
Internal Battery	12V 7.2Ah sealed lead-acid battery
Dimensions	39cm x 38cm x 19cm
Weight	12.8kg/17.5kg
Operating Environment	Operating Temperature: -30 ~+70℃
	Storage Temperature: -40 ~ +80℃
	Operating Humidity: 5% ~ 95% RH
Antenna	wire antenna　　Gain: 0 dBi

CHAPTER 2

Installation and Operation

This chapter provides the installation and operation information.

Charging

The reader is powered by an internal 12V sealed lead-acid battery. If the battery indicator shows the remaining capacity is less than 9V, the reader need to be charged to avoid damaging battery.

As shown in figure below, insert the round plug of the charger into "*Charger*" socket. After a click, the plug will be well locked. The other side of charger is 120V AC plug.

You must switch off the reader while charging. Full charge will cost 3~4 hours.

Connect to Timing Mats

Timing Mats should work together with Sports Timekeeping Reader. Timing Mat has two connectors: LF tag power-up: 3-core cable and Hirschman ST 3-way connector; HF tag return signal: RG58 coaxial cable and BNC connector. As shown in figure below, BNC connector to connect the cable to the reader on the "RX" port.

Timing Mats connection as figure below:

Start-up

Press the "*Power ON/OFF*" button, and then the all Indicators will lighten ascending. After the bleep, the start-up process goes well. Meanwhile the battery indicator shows the current battery capacity.

Trigger

The trigger function could be achieved by "*Trigger button (inserts digital marker into data stream)*" or "External gun-trigger port". Press the trigger button, system will record the time of pressing the button.

CALIBRATE

The system can automatic antenna tuning, and can be manually invoked. Press the "*CALIBRATE Button*", the indicator of Ant Tuning will flash 4 times.

Read Tags

The system can read all kinds of sports timekeeping tags.
Timing mats collect the tag-IDs while participants passing. The tag-IDs are sent to Sports Timekeeping Reader to record their timestamps. All the read data are sent out and saved in the internal memory.
Shoe tags:

Power Tags: Tow slots for ankle strap or cable tie

Bib Tags:3M adhesive backed

Multisport Tags: Tow slots for ankle strap or cable tie