



Player Analysis Technology Approval report

STATSports Apex

Test code: PAT-24-031

Serial no: n/a

Software versions:

Desktop: Windows & MacOS – Software Version 4.5.23

iPad: Apple iOS 11.0 or later – Version 2.12

Apple Watch: Apple iOS 13.0 or later – Version 2.19

Firmware version:

4.24_RC3



Issue date: 20 March 2024

Objective: To test and evaluate STATSports Apex Player Analysis Technology according to Rule 31 of the 2024 Rules of Tennis.

Result: Approved

SUMMARY

The STATSports Apex 3.2 Pod is a tracking device worn in the pocket of a specific garment. The pod contains electronic sensors to record the position, speed, acceleration and orientation of a player. Real-time wireless data transfer is possible when the pod is paired to an auxiliary device, such as a tablet/iPad (via the Apex Beacon) or a smartwatch.

Live coaching information available on auxiliary devices include statistics related to distance, speed, load intensity, location and heart rate.

Restrictions on the access by a player to STATSports Apex components during periods when coaching is not and is allowed are as follows:

COMPONENT	NO COACHING	COACHING
STATSports Apex Pod v3.2	Permitted	Permitted
STATSports Vest	Permitted	Permitted
STATSports Heart Rate Monitor	Permitted	Permitted
STATSports Apex Beacon	Permitted	Permitted
Auxiliary device, e.g. tablet, smartwatch	Not permitted	Permitted

MAIN COMPONENTS

The main components of the system are described in table 1 and depicted in Figure 1.

COMPONENT	FUNCTION(S)
STATSports Apex Pod v3.2	Record, store and transmit data
STATSports Vest	Hold Apex Pod
STATSports Heart Rate Monitor	Record and transmit data
STATSports Apex Beacon	Receive and transmit data
STATSports Apex Docking Station	Receive and transmit data
Sonra Apps/Software	Analyse, transmit and communicate (display) data
Auxiliary device, e.g. laptop	Analyse and communicate (display) data

Table 1. Description of the components of the STATSports Apex system.



Figure 1. Components of the Apex system (from left to right): STATSports Apex Pod v3.2; STATSports Vest, STATSports Apex Beacon, auxiliary device (laptop). Not to scale.

DATA CAPTURE AND TRANSMISSION

A STATSports Apex 'pod' (see figure 1) containing electronic sensors (GPS chip, antenna, tri-axial accelerometer, tri-axial magnetometer, tri-axial gyroscope) is inserted into a STATSports Vest worn by the player. The sensors in the pod measure the position, speed, distance, acceleration and impacts of a player. The pod is 84 mm × 43 mm × 19 mm in size, with a mass of 72 g. An optional STATSports heart-rate monitor can also be worn, in addition to the pod, to measure real-time cardiac data.

The Apex 3.2 Pod (figure 2) is started by pressing the button in the centre of the device. The OLED screen on the device contains four icons which display:

- Battery charge level
- GPS satellite connection
- Heart-rate connection
- Wireless signal strength

When used outdoors, the pod automatically begins to search for GPS satellite signals. Green and red LEDs located above the power button flash sequentially, indicating the device is searching. Once enough satellites are acquired, the pod starts recording data and the light above the power button continuously flashes green. All data is recorded on a high capacity 8-GB SD card, allowing for multiple seasons worth of data to be stored on a single unit.



Figure 2. STATSports APEX pod v3.2 power button and status OLEDs.

Data can be transmitted in real-time to auxiliary devices in two ways. The first method uses a STATSports Apex Beacon, located near the playing area, to connect to up to 50 pods via wireless connection. The Beacon can transmit the data live to an auxiliary device to view individual and aggregated data. The second method connects the pod to a smartwatch running the Sonra Live Watch App (figure 3) via Bluetooth.



Figure 3. (left) Sonra Live iPad application and (right) STATSports Sonra Live watch app.

Data is also stored on the pod and can be downloaded to an auxiliary device via a USB cable or the STATSports Apex Docking Station. The pod (and data) is assigned to a pre-registered user account prior to data transfer.

During real-time data transfer, the Sonra Live software processes and visualises data captured and transmitted by the pod. Start times, end times and descriptions of specific activities or drills (e.g. training sessions, matches) can be defined in the app.

Once a session has ended, the data can be transferred to a local device and session statistics can be viewed on the Sonra Desktop software. Raw data can also be downloaded for users to analyse

and process their own metrics. After local download is complete, data can be uploaded securely to the cloud.

COMMENTS

To avoid distraction to players, audible sounds from the Apex pod should be disabled prior to the start of play.

No haptic feedback is provided.

Start/stopping data capture is player-driven. Transmission of data between the pod, vest and auxiliary device is either over a secure wireless, wired or Bluetooth connection. Transmission of real-time data from the pod to auxiliary device is via an encrypted wireless connection. These limit the system's susceptibility to hacking. Users should be aware, no protection is provided over Bluetooth (used to connect to smartwatch).

Data is assigned to a registered user account via proprietary software installed on an auxiliary device, protecting against unauthorised access.

A maximum of eight auxiliary devices can be connected to a pod at any one time.

GPS metrics (location, distance) cannot be recorded when the system is used indoors.

DATA PROCESSING AND COMMUNICATION

The auxiliary device displays coaching information, such as session times, average and peak accelerations and velocities. Coaching information, such as distance travelled and player location heat maps, are accessible using these tools.

A user can nominate a third-party (e.g. a coach) access to their data, subject to that individual having a registered account.

COMMENTS

The pod and vest do not have a means to communicate data collected. An auxiliary device is required for real-time data transfer, processing and communication.

Coaching information is available on the auxiliary device. Therefore, players must not have access to auxiliary devices, e.g. phone, tablet, laptop, or watch when coaching is prohibited.

Auxiliary devices with the capability to collect measurements (e.g. smartwatches) must have independent PAT approval.

ADDITIONAL INFORMATION

Client:

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Date received: 24 January 2024

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Revision number: 0

NOTE Approval does not attempt to, nor does it in fact, establish the accuracy or reliability of data or fidelity of its transmission.