

EPTS Performance Test Report

July 1st, 2019

Realtrack Wimbu Pro LPS

This report details the performance test carried out in accordance with the test protocol for Electronic & Performance Tracking Systems

FIFA[®]

Product details

Manufacturer	Realtrack
Product Name	Wimupro LPS
Serial number	
Firmware version	8.5
EPTS Type	LPS

Test details

Date	22nd November 2018
Location	Barcelona Mini Estadi
Submission deadline met	1 hour post testing
Number of antennas (LPS)	8
Certification Expiry Date	11/02/2021
Age of participants	Under 13

Fulfilment of test requirements

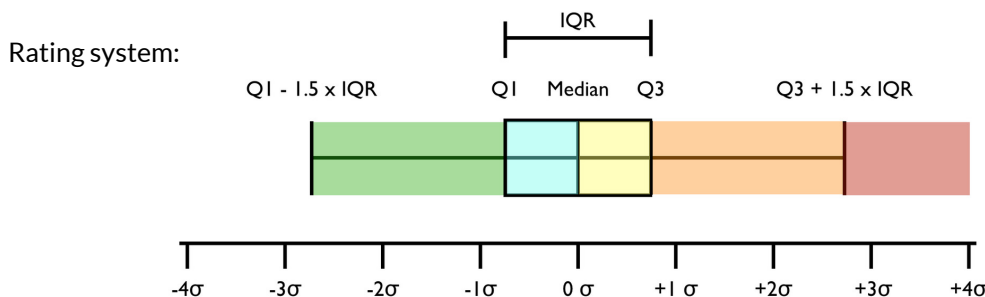
Test block	Capture & Submission
Circuit	√
2 v 2 Game	√
3 v 3 Game	√
5 v 5 Game	√
Full Pitch Coverage	√

Data processing

Process	Comments
Data export	No issues noted - csv file format provided for each player
Time stamp	Inconsistent 55 to 56 Hz timestamp provided. required linear interpolation to 50 Hz, smoothed with 5-point moving average then downsampled to 10 Hz
File matching	Velocity values lagged behind XY coordinates by ~3000 data points (i.e., 5 mins at 10 Hz). Required manual calculation of velocity from XY coordinates, then synchronisation of XY and velocity values.

Analysis interpretation

Measure	Definition
Root mean square difference (RMSD)	A commonly used measure of accuracy based on the sample standard deviation (σ) of the differences between the manufacturer and Vicon system. A large sample of RMSD values from GPS, LPS & Optical manufacturers comparisons were used to set the ranking criteria.
Data points	Varies depending on the quality of Vicon capture, as only the highest quality data is used for compared with Vicon comparative purposes.



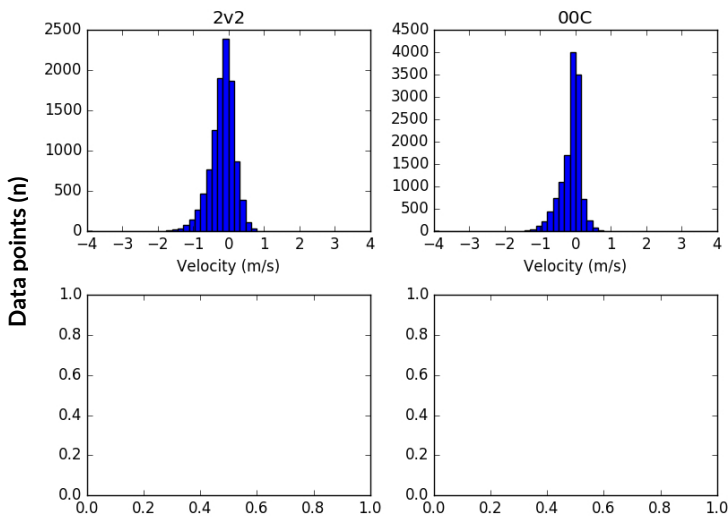
Rating by FIFA Velocity Band

	0-7 km/h	7-15 km/h	15-20 km/h	20-25 km/h	25+ km/h
Velocity RMSD (m/s)					N/A*
Position RMSD (m)					N/A*

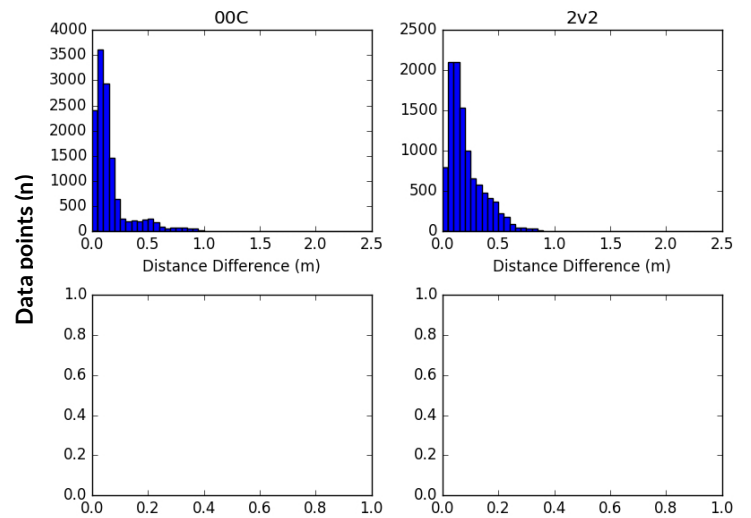
Legend	Well-above	Above	Standard	Below	Well-below

*N/A : No comparison available due to velocities not being achieved by participants

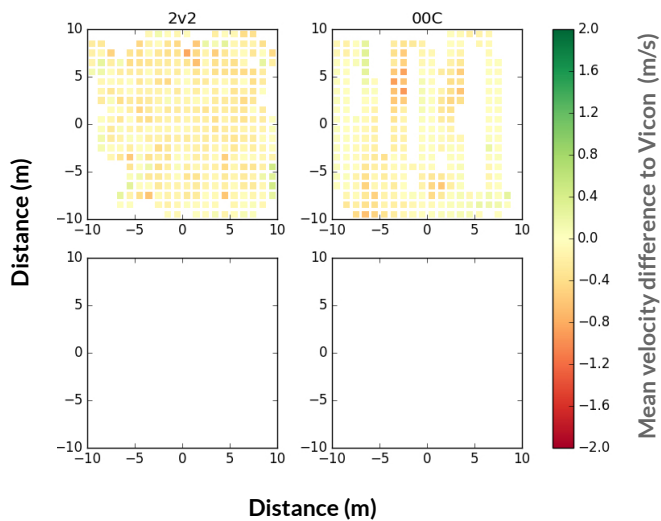
Histogram of Velocity Differences (m/s)



Histogram of Position Differences (m)



Mean velocity difference to Vicon (m/s)



Mean position difference to Vicon (m)

