---------- Original ----------

From: "Colin Mackintosh" <colmackintosh@appsen.com.au>;
Date: Mon, Dec 23, 2019 05:59 AM
To: "崴啲諾言"<l2785207@qq.com>;
Cc: "Bruce R. Mason (private)"<BruceRobertMason@hotmail.com>;
Subject: :question about 'Kistler Performance Analysis System - Swimming'

Hi Lin,

You asked my colleague, Bruce, about how to interpret the ad….csv files produced by kPass. You need a copy of kPassSetup.csv for this. Open it with Notepad rather than Excel. It has setup up information for each forceplate with a date. For example:

$forceplateFrontBlock, 20180423

For ad_180426160533.csv (the trial done on 26/4/2018 at 16:05) use the setup information with the date prior to that trial.

Each line contains 32 voltages from the a/d converter. kPassSetup.csv contains the column mappings. They are:

Front plate	Column
z1	4
z2	5

z3	6
z4	7
grabz12	0
grabx12	1
y14	2
y23	3

Rear plate

z1	12
z2	13
z3	14
z4	15
N/A	8
N/A	9
y14	10
y23	11

Turnplate

z1	20
z2	21

z3	22
z4	23
x12	16
x34	17
y14	18
y23	19

Start gun

31

To convert to Newtons:

1. Subtract the offset at the top of each column
2. Multiply voltage by 1000 then divide by the “sensitivity” in column D, E F or G which is in mV/N.
3. Sensitivity column is determined by RangeZ and RangeXY for that forceplate which is defined in kPassSetup.csv.

For example:

$forceplateFrontBlock 20180423 following parameters are for the front forceplate on the starting block

filter	10				cutoff freq for software filter of forceplate raw data (10=10Hz, 0=no filtering)		
rangeZ	2				Amplifier range 4=multiply x 1; 3=x5; 2;=x10; 1=x20		
rangeXY	3				Amplifier range 4=multiply x 1; 3=x5; 2;=x10; 1=x20		
angle	10.2				Angle in degrees of the plate with respect to the water		
plateLength	411				length in mm along block from pool		
plateWidth	520						
plateToWater	720				Distance of leading edge of plate to the water		
backstrokeBarToTopOfPlate	197				Middle of backstroke bar to top front of block		
az0	-41				mm Distance surface of forceplate from x,y plane (used in COP)		
a	235				mm Distance axis of sensor from y axis		
b	159.5				mm Distance of axis of sensor from x axis		
z1	4	1	2	3.611			20
z2	5	1	2	3.611			20
z3	6	1	2	3.611			20
z4	7	1	2	3.611			20
grabz12	0	2	3.889	8			40
grabx12	1	2	1.842	8			40
y14	2	2	3.861	8			40
y23	3	2	3.861	8			40

Force [N] for z1 = ((Force [Volts] – Force[V] offset)/3.611)*1000

This is the vertical force on the forceplate. kPass would normally adjust this for the angle of the forceplate of 10.2 degrees. 3.611 is used because rangeZ is 2, and the sensitivity columns are 4,3,2,1 (1,2,3.3611,20 in the above example).

For y, which is down the pool, the sensitivity 3.861 would be used because rangeXY is 3.

grabBar z is up and x is down the pool. For some sites you will see grabxV also – this is used for grab x when the swimmer uses the vertical grab bars instead of the horizontal bar.

A few people have asked about this, so maybe in the future we should add an export function to convert ad files to Newtons. What do you think?

Cheers,

Col

Colin Mackintosh

Appsen Pty Ltd

528 Hawks Head Road,

Brogo. NSW. 2550

Australia

+61 409836342