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KiSprint

Type 9693A...

Multicomponent force measurement for sprint starts

KiSprint is a portable and comprehensive system to analyze, compare and improve sprint starts. The system enables the measurement and analysis of groud reaction forces, high-speed video and speed of different athletes and trials. KiSprint acquires data and transfers this into reliable parameters for scientists, coaches and athletes.

- Portable system for indoor and outdoor use
- Easy setup
- Simple adjustment of footplate angle and position
- Software translates data into reliable performance parameters and contains a comparison mode

Description

The instrumented starting blocks record 3-dimensional forces for each leg separately. Angle and position of the footplate are easy to adjust and the footplate is in accordance with the competition blocks. The instrumented starting block is attached to the ground with spikes. A high-speed video camera is capturing the first meters of the sprint start. A laser distance measuring device captures the distance of the athlete over time. The device targets the lumbar region of the athlete which allows a continuous measurement of the speed over the whole acceleration phase. In addition, split times are available for any distance. The data acquisition is triggered by an electronic start pistol. Setup of the system is quick and simple and the operation is easy and intuitive.

Applications

KiSprint provides an instant and complete analysis of the sprint start performance of an athlete based on objective data. The analysis including kinetic data, speed development, optical feedback and parameters that are performance relevant. All data is displayed in one screen and is easy to understand.
The system assists coaches in the analysis and optimization of their athletes' sprint start technique.

Technical data

Starting blocks with built-in charge amplifier

Dimensions of the footplate		mm	273x150 mm
Measuring range	F_x, F_y	kN	−1.25 … 1.25
	F_z	kN	−2.5 … 2.5
Overload	F_x, F_y	kN	−2.5/2.5
(application area)	F_z	kN	−3.5/3.5
Linearity	%FSO		<±0.5
Hysteresis	%FSO		<1.0
Footplate angles		°	40, 45, 50, 55, 60, 65, 70
Footplate design			replaceable
Horizontal adjustment			continuous
Operating temperature range			0 … 60
Degree of protection (EN 60529)			IP65
Weight		kg	29.2
Calibrated range 2	F_x, F_y	kN	0 … 0.625
	F_z	kN	0 … 1.25
Calibrated range 3	F_x, F_y	kN	0 … 1.25
	F_z	kN	0 … 2.5
Supply voltage		V	10 … 30
Supply current		mA	≈45
Output voltage		V	0 … ±5
Output current		mA	0 … ±2
Control inputs (optocoupler)		V	5 … 45
		mA	0.4 … 4.4
Distance of surface of force plate from x-, y-plane	az0	mm	−36

[1] The geometrical distance of the sensors is not equal to the metrological distance due to the mounting of the force plate. The metrological distance must be used for COP calculation.

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Technical data (continuation)

System

Acquisition rate	Force plate, Laser	Hz	1 000
	Camera	fps	100
Measuring distance for laser	Default	m	0–30
	On request	m	0–100
Trigger method	Camera, force plate, laser		Hardware synchronized
Trigger for start signal			Electronic gun
Connecting to PC			1x USB, 1x Ethernet
Weight overall	Trolley 1 kg		36
	Trolley 2 kg		20

PC Requirements

- OS: Windows 10 (for desktop)
- CPU: Intel core i7 with at least 2 GHz
- Memory: 16 GB RAM
- Hard drive: SSD with at least 10 GB free space
- Screen resolution: 1920 x 1080 pixels
- 2 USB ports
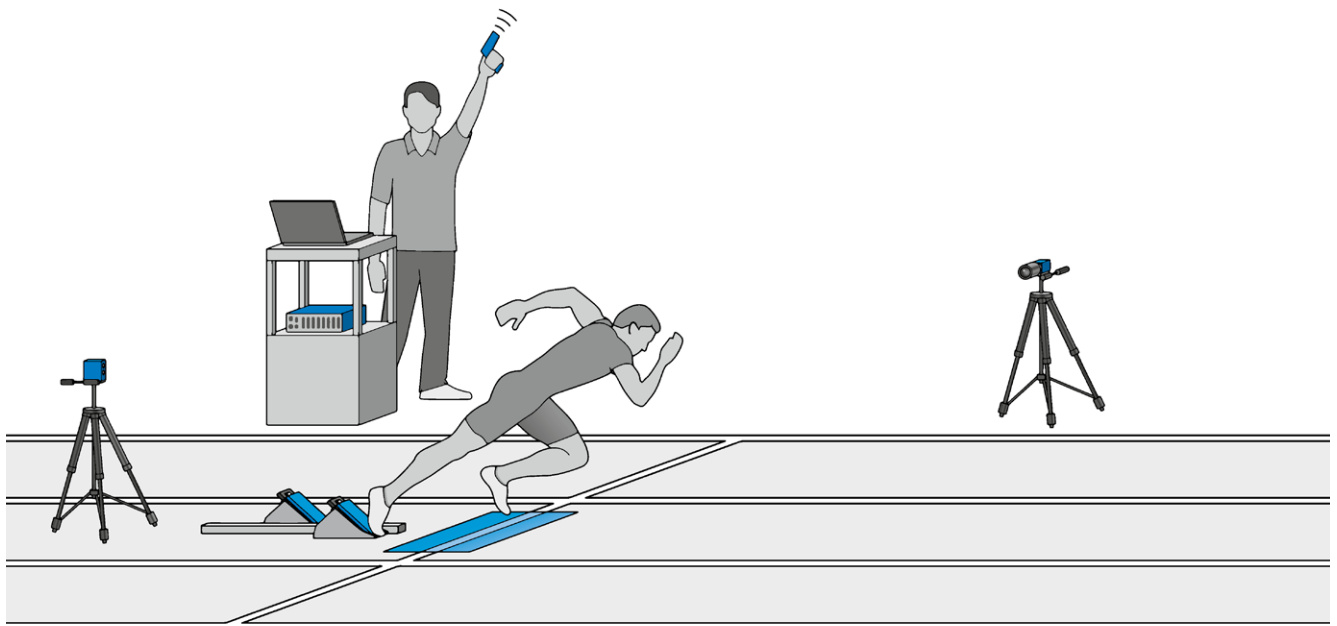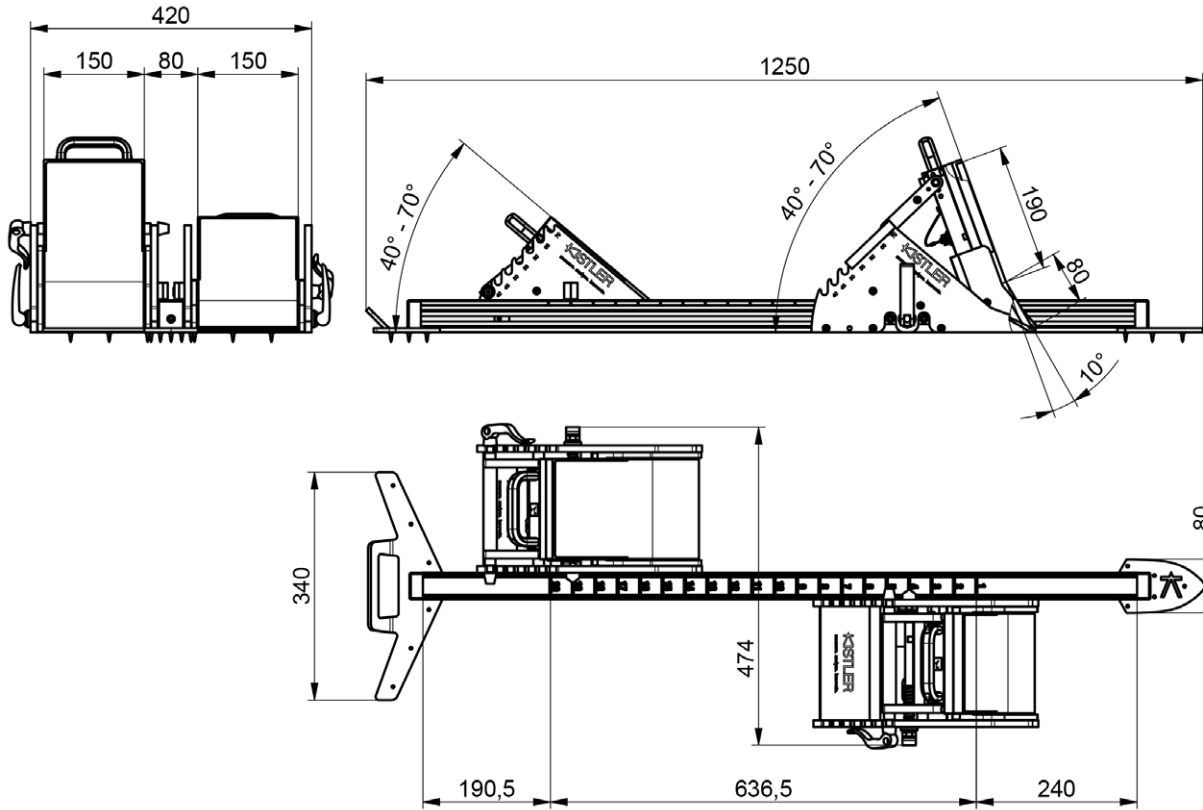- Gigabit ethernet port with jumbo packets support

System overview

Fig. 1: KiSprint with optional force plate for hand force measurement
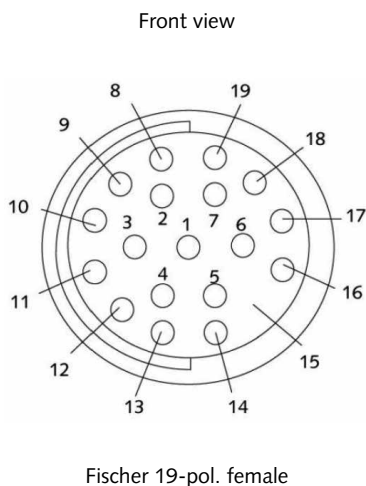
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Dimensions

Pin assignment starting block

Front view

Fischer 19-pol. female

	Type 9693A1 and 55161419		Type 9693A2 and 55161420
1	Exct. GND	1	Exct. GND
2	n.c.	2	F_{z2}
3	n.c.	3	F_{z3}
4	n.c.	4	n.c.
5	n.c.	5	n.c.
6	Operate	6	Operate
7	Control GND	7	Control GND
8	n.c.	8	n.c.
9	F_{z2+3}	9	n.c.
10	F_{z1}	10	Fz1
11	F_{y1+2+3}	11	F_{y1+2+3}
12	F_{x1+2+3}	12	F_{x1+2+3}
13	n.c.	13	A' (Range z2, z3)
14	Signal GND	14	Signal GND
15	n.c.	15	n.c.
16	A (Range x, y, z)	16	A (Range x, y, z1)
17	B (Range x, y, z)	17	B (Range x, y, z1)
18	n.c.	18	B' (Range z2, z3)
19	Exct. +10 ... 30 VDC	19	Exct. +10 ... 30 VDC

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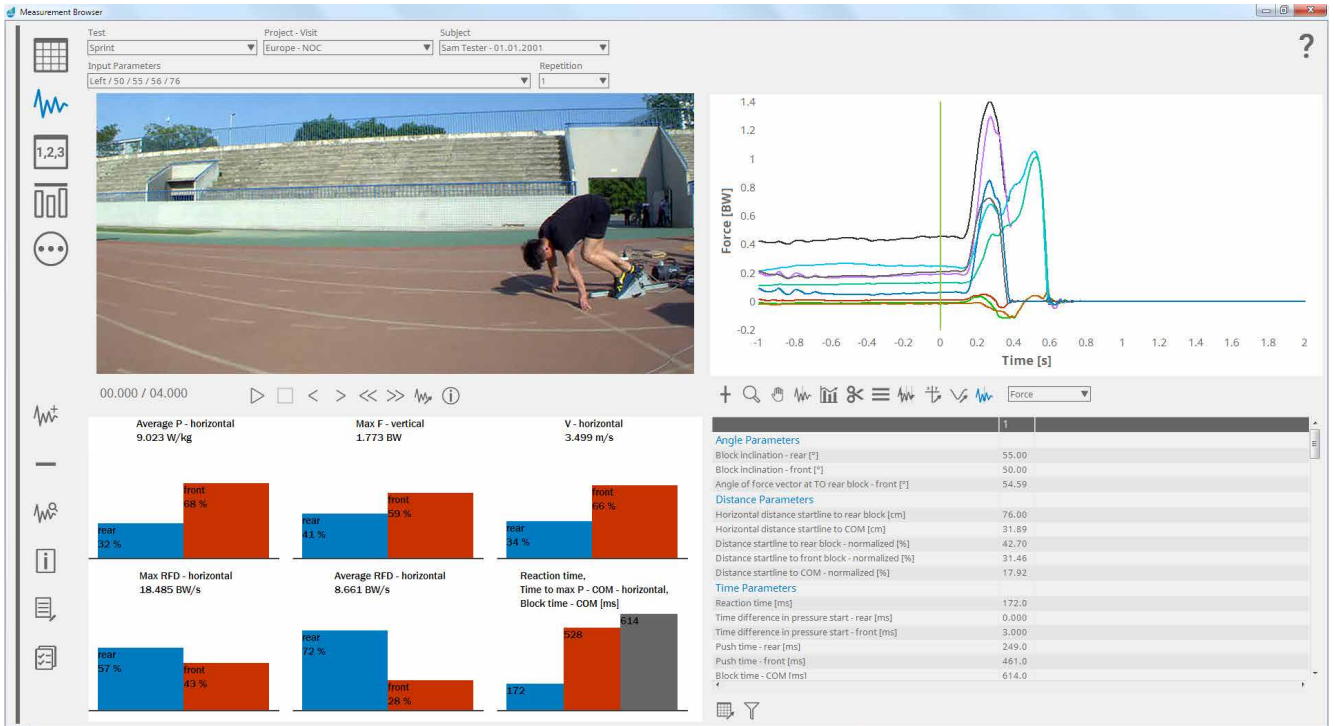
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Software

Fig. 2: Example: Signal view of KiSprint Software with video, force-time curves, graphical representation and list of parameters

Included accessories
- KiSprint Software
- Data acquisition system
- Gigabit Ethernet camera with lens
- Laser distance measurement device
- Electronic start gun with speaker
- Tripods for camera and laser
- Connection cables for camera, 10 m
- Connection cable for laser, 1.5 m
- Connection cables for starting block, 2 m
- Connection cables for electronic start gun, 3 m
- Spikes, 9 mm
- Spikes key
- Carrying case for starting block
- Carrying case for system equipment

Optional accessories
- Force plate for hand force measurement (analysis included in software), Type 9287CAQ01
- Different cable length on request

Ordering key

Type 9693A ☐

KiSprint with 4-comp. starting block	1
KiSprint with 5-comp. starting block	2

Ordering key starting block only
- 4-comp. starting block   **Type 55161419**
- 5-comp. starting block   **Type 55161420**
- Connecting cable starting block   **Type 1700A105A10/ASP** to DAQ Type 5695B…

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