

KiSprint

Type 9693A...

Multicomponent force measurement for sprint starts

KiSprint is a comprehensive system to analyze, compare and improve sprint starts. The system includes force measurement, high-speed video capturing, speed measurement and software to analyze and compare different athletes or 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 adjustable 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 and allows 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 delivers instant feedback of the sprint start performance of an athlete. The feedback includes kinetic data, speed development, optical feedback and parameters that are performance relevant. All data is displayed in one screen and easy to understand.

The start pistol provides the starting signal to the athlete and triggers data acquisition. Right after the attempt coaches and athletes get a complete analysis of the start performance based on objective data. The system assists coaches in the analysis and correction of their athletes' 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 (application area)	F_x, F_y	kN -2.5/2.5
	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	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.

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

System overview

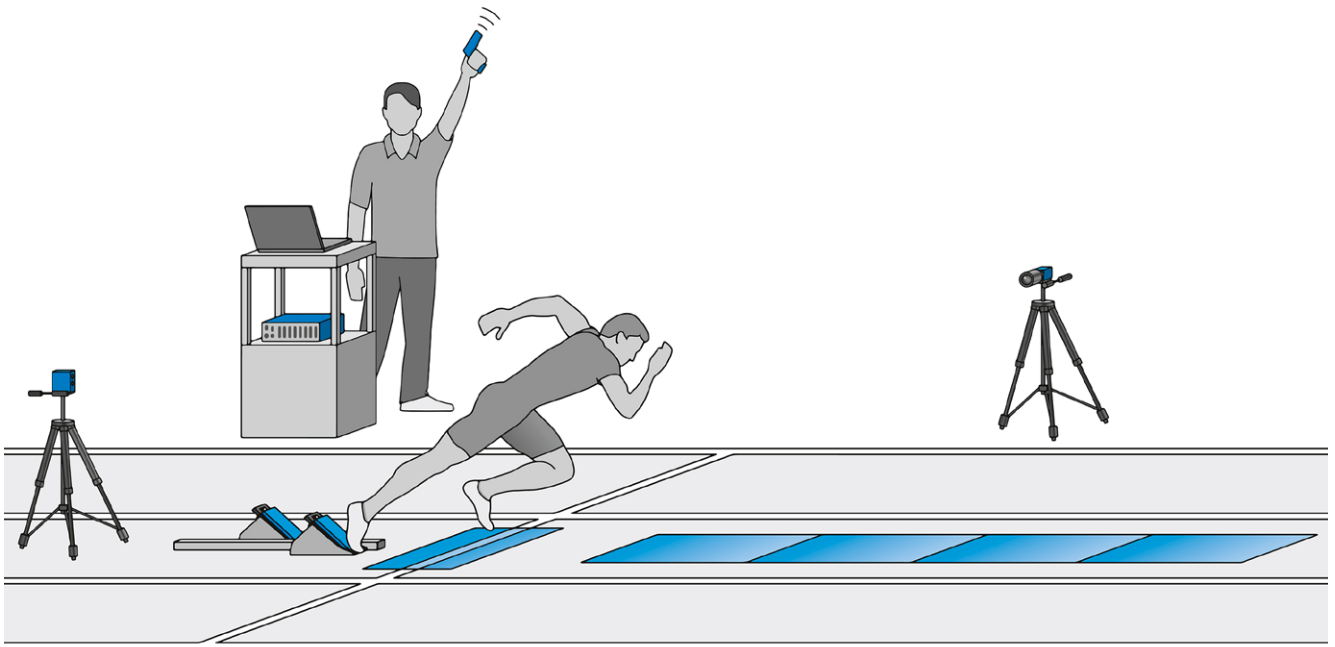
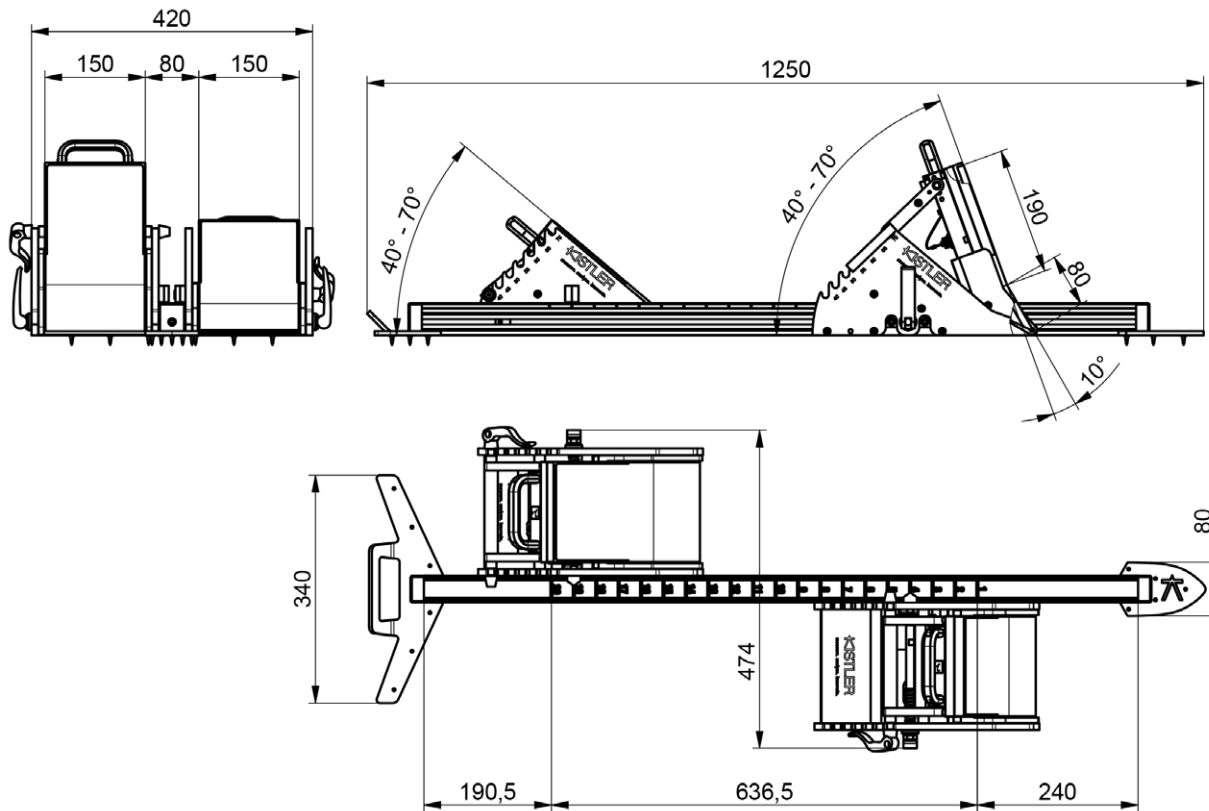
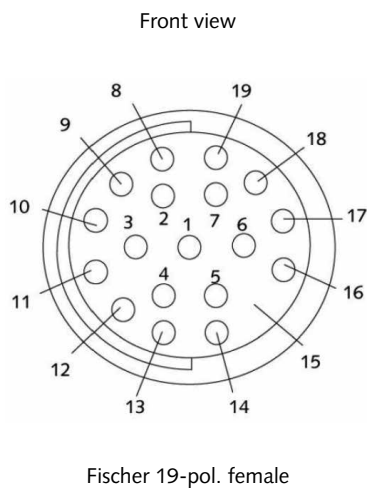


Fig. 1: KiSprint with optional force plates for hand force measurement and step analysis

Dimensions



Pin assignment starting block



Type 9693A1 and 55161419

1	Exct. GND
2	n.c.
3	n.c.
4	n.c.
5	n.c.
6	Operate
7	Control GND
8	n.c.
9	F _{z2+3}
10	F _{z1}
11	F _{y1+2+3}
12	F _{x1+2+3}
13	n.c.
14	Signal GND
15	n.c.
16	A (Range x, y, z)
17	B (Range x, y, z)
18	n.c.
19	Exct. +10 ... 30 VDC

Type 9693A2 and 55161420

1	Exct. GND
2	F _{z2}
3	F _{z3}
4	n.c.
5	n.c.
6	Operate
7	Control GND
8	n.c.
9	n.c.
10	F _{z1}
11	F _{y1+2+3}
12	F _{x1+2+3}
13	A' (Range z2, z3)
14	Signal GND
15	n.c.
16	A (Range x, y, z1)
17	B (Range x, y, z1)
18	B' (Range z2, z3)
19	Exct. +10 ... 30 VDC

Software

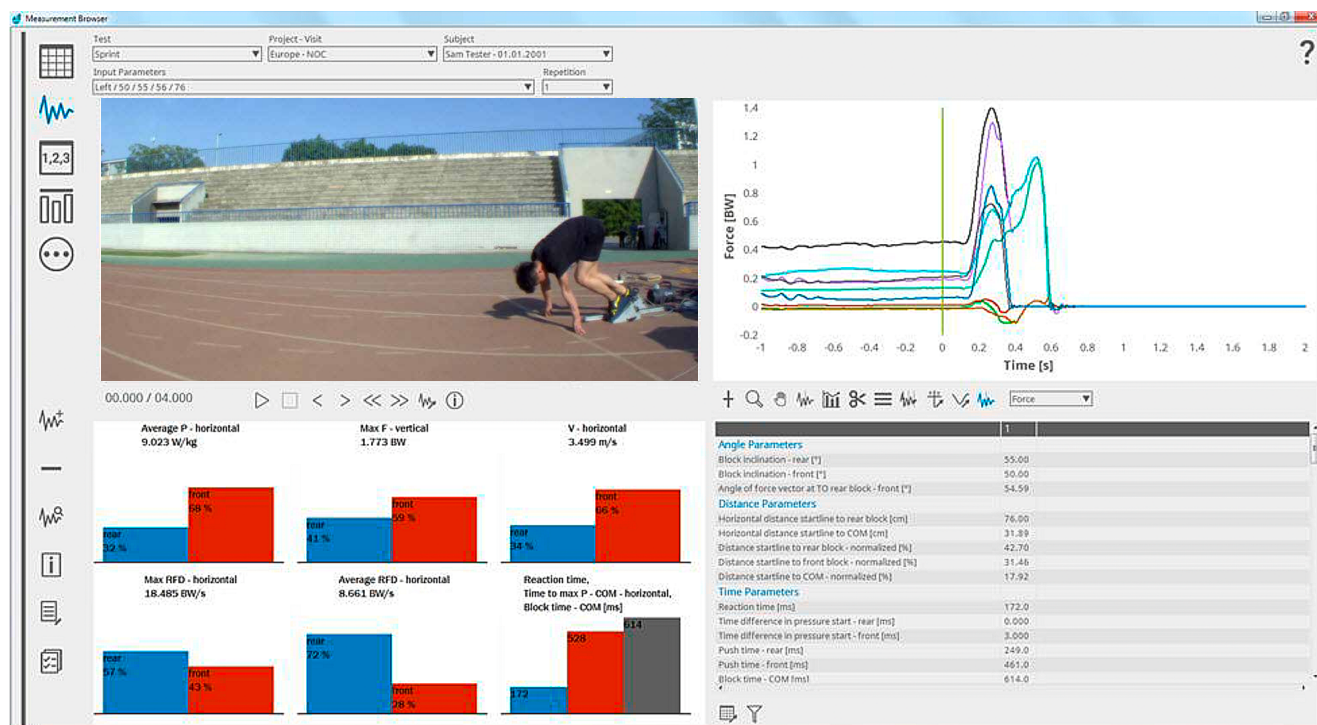


Fig. 2: Example: Signal view of KiSprint Software with video, force-time curves, graphical representation and list of parameters

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
- Measuring tape, 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
- Force plate for step analysis, 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 to DAQ Type 5695B... **Type 1700A105A10/ASP**