Electronics & Software

KISTLER
measure. analyze. innovate.

DAQ System with BioWare® 4.0   **Type 5691A1**

Data Acquisition and Analysis System for Biomechanics

Data acquisition system for connecting and controlling two multicomponent force plates with integral charge amplifiers. The system is connected to a USB 2.0 port of the PC and operated with the included software BioWare 4.0.

- Easy of installation with USB 2.0
- Remote control of integral charge amplifiers
- Powerful data acquisition and signal processing
- Versatile data analysis and filters
- External and internal trigger

Description

The DAQ system with BioWare 4.0 consists of a connecting box for one or two Kistler multicomponent force plates and one integral 16-bit A/D converter to digitize the plates' analog output signals. The system is connected to a USB 2.0 port of the PC. The integral charge amplifiers of the connected Kistler force plates are supplied via the connecting box and controlled by means of the supplied software (measuring range and reset/operate).

Application

The Type 5691A1 with BioWare 4.0 is designed specifically to fully exploit the capabilities of Kistler's piezoelectric force plates in biomechanics applications. The 16-bit resolution of the measurement signals and high sampling rate of up to 17 kS/s in conjunction with Kistler force plates allow a very wide range of applications. The system as a whole is therefore equally ideal for measuring highly dynamic processes, very small measurands and slow phenomena. The additional options of acquiring any analog signals rather than just those from force plates, and external triggering with pre- and post-trigger capability, underscore the versatility of the system for use in basic research, sports science, gait analysis, neurology, ergonomics, etc., etc.

Technical Data

General Data

Dimensions	mm	208x65x250
Total weight	kg	2,05
Operating temperature range	°C	0 ... 50

Power Supply Voltage

Power supply	VDC	11 ... 15
Power consumption	VA	6

A/D-Converter

Number of channels			16
Resolution (per channel)	Bit		16
Input voltage range (software selectable)	V		±1, ±2, ±5, ±10
Sampling rate (software selectable)	S/s		0,6 ... 50 000
	max. @ 2 channels	kS/s	50
1 Force plate	max. @ 8 channels	kS/s	17
2 Force plates	max. @ 16 channels	kS/s	9,5

Connections

USB 2.0

USB In (uplink, to the PC)	USB Type B, female
USB Out (downlink, free)	USB Type A, female

Force Plate 1/2		D-Sub37, male
Input voltage (max.)	V	±15

External Trigger			BNC neg.
Input voltage			
Pull-Up resistance 10 kΩ to ±5 V			
	max.	VDC	12
	high or input open	VDC	>3,6
	low	VDC	<0,6
Trigger mode	standard		rising edge
	software selectable		falling edge

Conforms to the CE safety standards (73/23/EG) for electrical equipment and systems:
EN 60601-1:2005, EN 61010-1:2001
and the EMC standards (89/336/EG):
EN 60601-1:2005 (EN 55022 Class B), EN 61000-6-3:2004 (EN 55022 Class B), EN 61000-6-4:2001 (EN 55011 Class B), EN 60601-1:2005, EN 61000-6-1:2001, EN 61000-6-2:2005

5691A_000-633e-09.08

KISTLER

measure. analyze. innovate.

BioWare®

BioWare software is the engine behind the force plate system. It collects data from the force plates, converts the trials into useful information and plots the results. The force plates and charge amplifiers are fully remote controlled by BioWare thus making the system extremely flexible and easy-to-use.

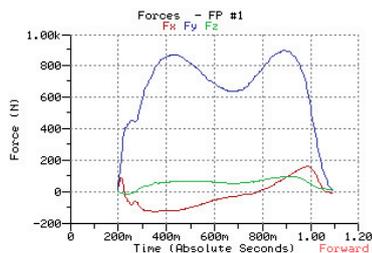BioWare provides several performance specific evaluations.

Parameters of Gait

Fig. 1:   Ground reaction forces (GRF)
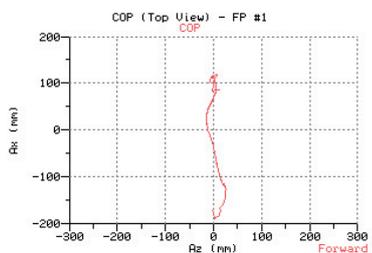
Fig. 2:   Center of pressure (COP)
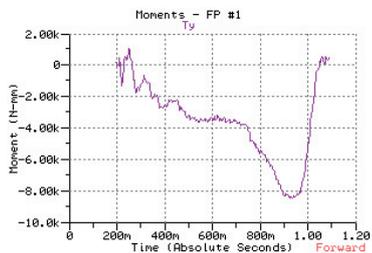
Fig. 3:   Frictional torque T_z

Fig. 4:   Force vector

Parameters of Countermovement Jump CMJ

Fig. 5:   Jump force
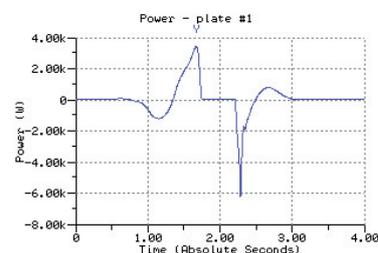
Fig. 6:   Power
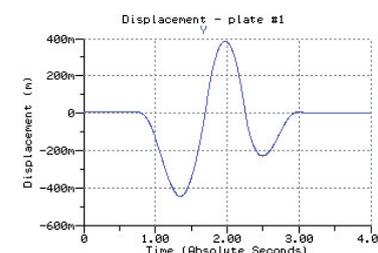
Fig. 7:   Jump height (COM)

Fig. 8:   Force gradient (Explosivity)

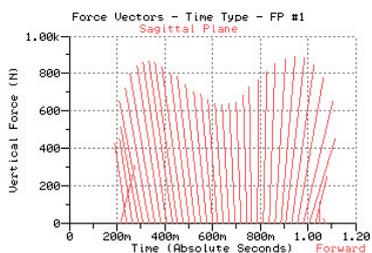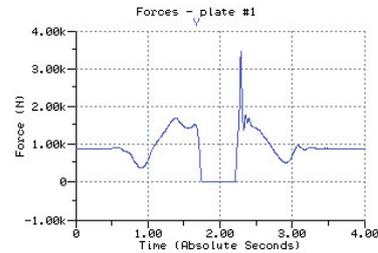## Other functions

- Coefficient of friction (COF)
- Frequency analysis, statistics, digital filters
- Full Windows® functionality
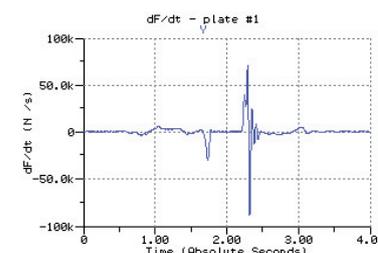
Other parameters

- Acceleration, velocity and displacement of the center of mass (COM)
- Work, energy, impulse
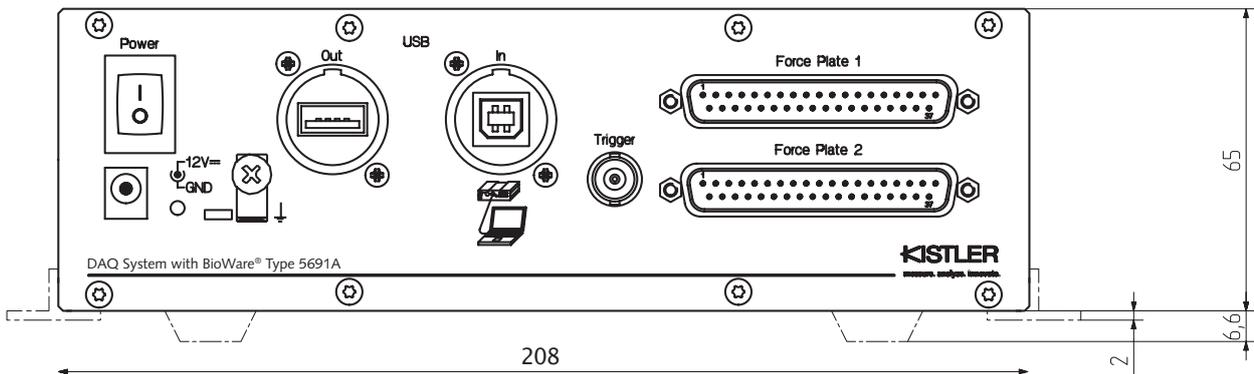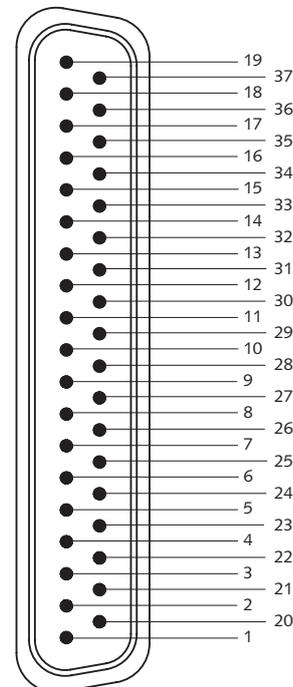- Statistics, digital filters

5691A_000-633e-09.08

KISTLER

measure. analyze. innovate.

Dimensions

Fig. 9:   DAQ system with BioWare Type 5691A

Pin Allocation D-Sub37, male (Force Plate 1/2)

				Force Plate 1	Force Plate 2
1	Exct. +12 VDC	20	Data IO5 (reserve)		
2	n.c.	21	Data IO6 (reserve)		
3	n.c.	22	B Range Select Group I		
4	A Range Select Group I	23	Operate/NotReset		
5	n.c.	24	Data IO7 (reserve)		
6	n.c.	25	n.c.		
7	Exct. GND	26	n.c.		
8	n.c.	27	B' Range Select Group II		
9	A' Range Select Group II	28	Control GND		
10	n.c.	29	Control GND		
11	Signal GND	–	**Force Plate 1**	**Force Plate 2**	
12	Signal GND	30	CH8 (Fz4)	CH16 (Fz4)	
13	Signal GND	31	CH7 (Fz3)	CH15 (Fz3)	
14	Signal GND	32	CH6 (Fz2)	CH14 (Fz2)	
15	Signal GND	33	CH5 (Fz1)	CH13 (Fz1)	
16	Signal GND	34	CH4 (Fy23)	CH12 (Fy23)	
17	Signal GND	35	CH3 (Fy14)	CH11 (Fy14)	
18	Signal GND	36	CH2 (Fx34)	CH10 (Fx34)	
19	Signal GND	37	CH1 (Fx12)	CH9 (Fx12)	

Typical Measuring Chain

Force Plate with charge amplifier Type 9286BA	Connection cable Type 1759A…	DAQ system (USB 2.0) Type 5691A1	Laptop (provided by user) with BioWare
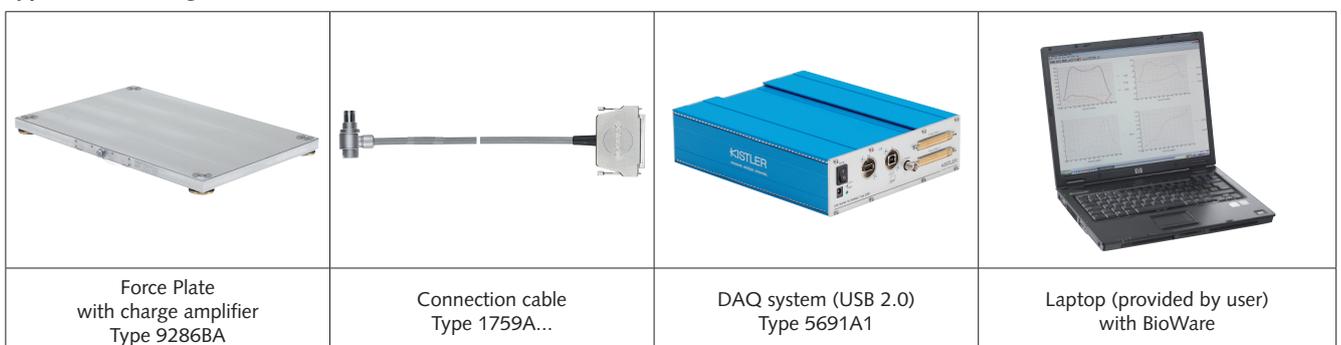
Fig. 10:   Configuration of a typical measuring chain with Kistler DAQ system with BioWare®

KISTLER

measure. analyze. innovate.

DAQ-System with BioWare Version 4.0   Type 5691A1
Data Acquisition and Analysis Tool for Biomechanics
**USB 2.0, for max. 2 Force Plates, with built-in
charge amplifier**
- USB 2.0 DAQ system with BioWare Type 5691A
  (16 channels, 16 bit)
- BioWare software

System Requirements
- Microsoft Windows® 2000 (SP3), or Windows XP operating
  system
- Intel Pentium III class processor (500 MHz or higher rec-
  ommended)
- 512 MB of RAM
- Video Display set to at least 800x600, 256 colors, small
  fonts selectet
- Min 125 MB of free disk space
- Microsoft compatible mouse
- Windows Installer Version 1.1 or later
- Adobe® Acrobat® Reader®
- 1 free USB 2.0 port

Included Accessories	Type/Art. No.
• USB 2.0 connecting cable, length 2 m	–
• Universal AC/DC adapter, 100 ... 240 V~ 12 VDC	5.510.276
• Self-adhesive base, black, 20,5x7,6 mm	5.211.368
• BioWare software CD-ROM	2812A-04-2
• HASP licence key (USB)	–
• Instruction manual	2812A_002-312

Optional Accessories	Type/Art. No.
• Connection cable for	
– Force platforms w/ integr. amplifier (straight connector)	1758A...
– Force platforms w/ integr. amplifier (angle connector)	1759A...
– External charge amplifier Type 9865E...	1769A1
– External control unit Type 5233A2	1500B5
– Analog signals (8x BNC pos.)	1500A67
• Mounting kit consisting of 2 brackets and 4 screws	7.511.339

Ordering Code
• DAQ system with BioWare 4.0	**Type 5691A1**