BTS **SMART-DX**

High-precision optoelectronic system for the biomechanical motion analysis

High Performances **4 Megapixel - 500 Hz**

BTS Bioengineering

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BTS SMART-DX is the 4th generation high-precision optoelectronic systems that confirms BTS world leadership in the development of advanced motion analysis solutions.

A new standard for innovative motion analysis

With SMART-DX, BTS offers researchers and doctors a new set of high definition systems improving their investigation ability.
These features make the SMART-DX line able to satisfy any analysis requirements, even under the most critical conditions.

Each versions is based on new-designed digital video cameras featuring high sensitive sensors with innovative and functional illuminators.
The high radiation power, combined with the camera high resolution (up to 4 Megapixels), increase the working volume and make this device able to capture extremely rapid and imperceptible movements.

BTS SMART-DX represents an evolutionary leap in the development of multifactorial motion analysis, now made even more accurate, integrated, fast and more productive.
The system integrates, synchronizes and manages in real time all kinematic, kinetic, electromyographic and video data originated by the connected devices (such as force platforms, electromyographs, treadmills, etc..).

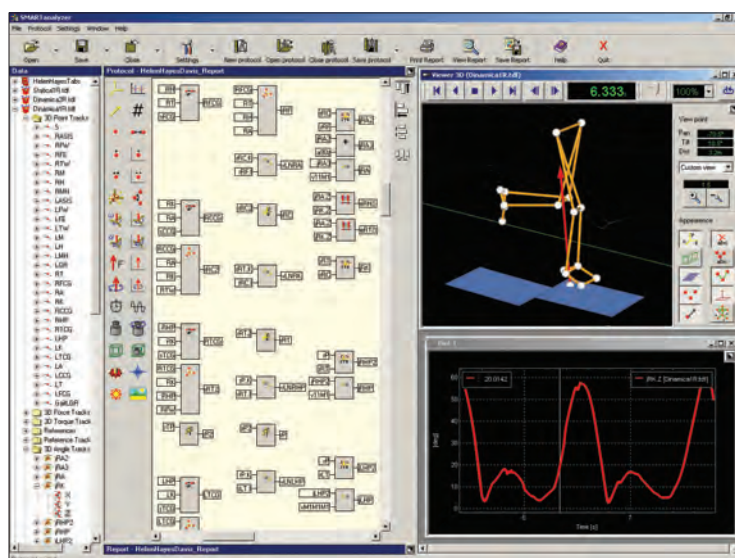**Designed for the biomechanical motion analysis**

The system is equipped with BTS SMART-Suite, a module-based software for the data capturing and visualization.

Alternatively the following software are available in option:

BTS SMART-Analyzer.
Advanced software for multifactorial motion analysis. It allows for the protocols customization through an innovative object-based interface. Reports can be designed as required and can be printed out, exported or shared over the internet.

BTS SMART-Performance.
The best tool for sport movements analysis. It helps to better investigate and improve athletes' performances, by optimizing their trainings and preventing injuries. It includes predefined analysis protocols for different sports (i.e. football, golf, cycling, tennis and baseball).

BTS SMART-Clinic.
This solution is devoted to clinical assessment. Based on protocols validated by the international scientific community, it is a powerful tool for total body analysis or single body districts evaluations.

Technical features of the system:

Speed and accuracy
- Accurate marker identification
- High frequency acquisition up to 2000 Hz
- Resolution up to 2048x2048 pixels
- Real Time processing

Quick and easy calibration
- Requires less than 180 secs
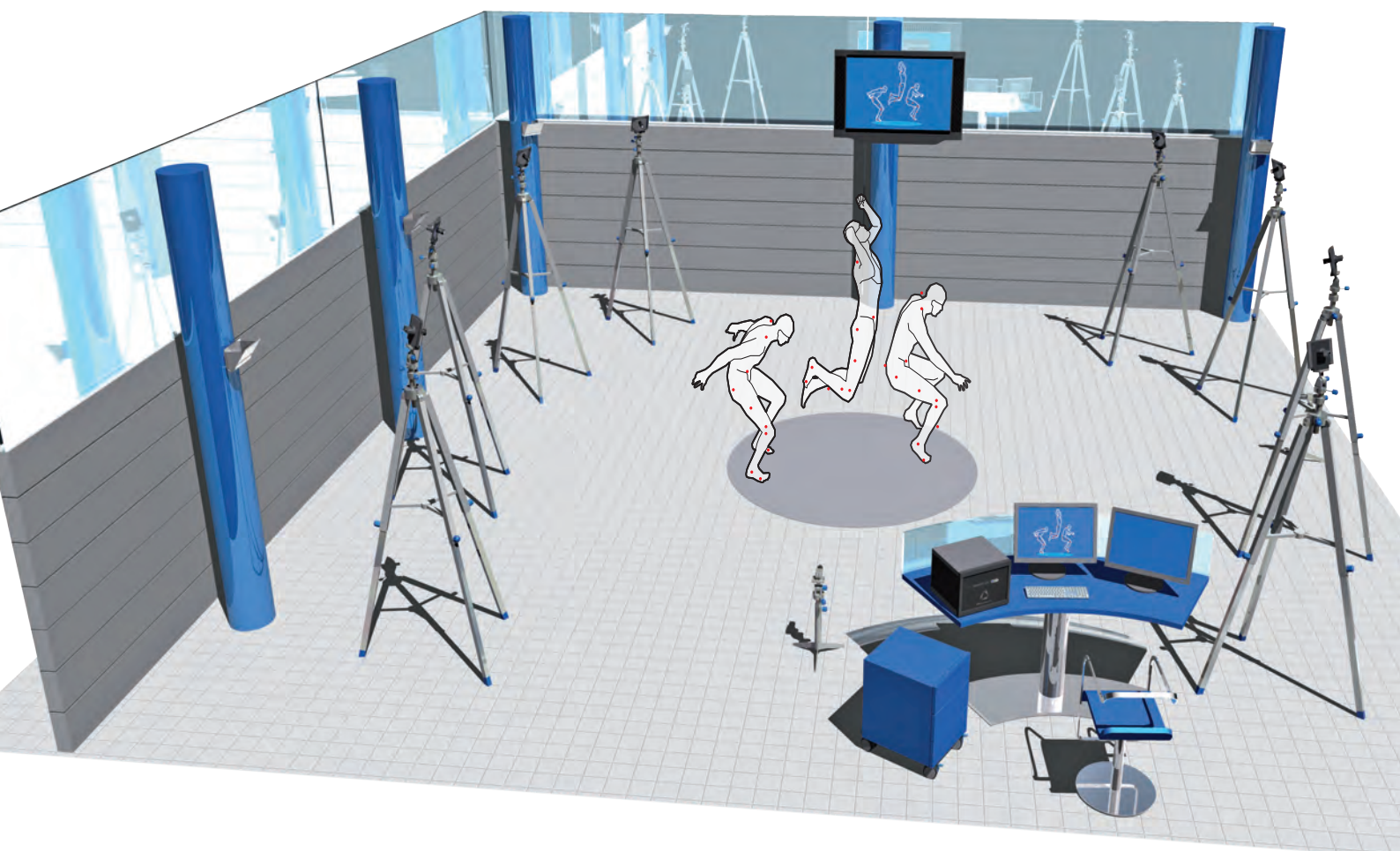- Multivolume (work also with obstacles)

Use in critical light conditions
- Any loss of precision and accuracy
- Automatic elimination of any reflections
- Can be installed outdoor

Data synchronisation and integration
- A single datastation for data acquisition, processing and analysis of different analogical and digital devices
- All the kinematic, kinetic, EMG and video data acquired are synchronised even in the event of long-lasting acquisitions.

Development tool
For integration with third party systems: BTS SDK for access to 3D data in real time, trigger events management, external synchronisation clock management, kit for isokinetic dynamometers.

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BTS SMART-DX is available in 5 different versions with different performances designed to meet the differing motion analysis demands. All models use the new IR high-efficiency illuminator with a wide range of action.

BTS SMART-DX 100
Compact, portable system that makes motion analysis easy and flexible, as it can be carried out directly in the rehabilitation gymnasium and on the training field. Ideal for use in assessing individual body districts and focal movements.

BTS SMART-DX 400, 700 and 6000
Extremely versatile systems that are well able to meet all analysis laboratory demands, both in routine use, typical of the clinical field, and in experimental use under the scope of sport and research.

BTS SMART-DX 7000
An extremely high performance system designed for laboratories needing maximum performance for the analysis of complex, very fast movements that require large spaces for execution and multiple simultaneous body segmental assessments.

TECHNICAL SPECIFICATIONS *

	BTS SMART-DX 100	BTS SMART-DX 400	BTS SMART-DX 700	BTS SMART-DX 6000	BTS SMART-DX 7000
Infrared Digital Cameras	Up to 4 TVCs for each datastation	Up to 16 TVCs for each datastation	Up to 16 TVCs for each datastation	Up to 16 TVCs for each datastation	Up to 16 TVCs for each datastation
Multiple workstations connection capability	Yes	Yes	Yes	Yes	Yes
Sensor resolution	640x480 (0,3Mpixel)	1366x768 (1Mpixel)	1500x1000 (1,5Mpixel)	2048x1088 (2,2Mpixel)	2048x2048 (4Mpixel)
Acquisition frequency at maximum resolution	140fps	100fps	250fps	340fps	500fps
Maximum acquisition frequency	280fps	300fps	1000fps	2000fps	2000fps
Accuracy	<0,2mm on a volume 2x2x2m	<0,3mm on a volume 4x3x3m	<0,1mm on a volume 4x3x3m	<0,1mm on a volume 4x3x3m	<0,1mm on a volume 6x6x3m
Preprocessing	-	on Cameras	on Cameras	on Cameras	on Cameras
Preview	Full frame	Full frame	Full frame	Full frame	Full frame
LED illuminator wavelength	850nm	850nm	850nm	850nm	850nm
Number of markers detected simultaneously	Unlimited	Unlimited	Unlimited	Unlimited	Unlimited
Data transmission technology	Gigabit Ethernet	Gigabit Ethernet	Gigabit Ethernet	Gigabit Ethernet	Gigabit Ethernet
TVC power	Directly supplied by the Datastation	Directly supplied by the Datastation	Directly supplied by the Datastation	Directly supplied by the Datastation	Directly supplied by the Datastation
Lenses	Interchangeable C-mount	Interchangeable C-mount	Interchangeable C-mount	Interchangeable C-mount	Interchangeable C-mount
Case	Slim	High Profile	High Profile	High Profile	High Profile
Analog acquisition board	I-PORT EXPANDER	32-80	32-80	32-80	32-80
Passive and retro reflecting markers	Ø from 3 to 20 mm	Ø from 3 to 20 mm	Ø from 3 to 20 mm	Ø from 3 to 20 mm	Ø from 3 to 20 mm
Preinstalled software **	BTS SMART-Suite	BTS SMART-Suite	BTS SMART-Suite	BTS SMART-Suite	BTS SMART-Suite

**For all models: BTS SMART-Analyzer, BTS SMART-Clinic and BTS SMART-Performance softwares are available in option.

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BTS BIOENGINEERING CORP.
147 PRINCE STREET - SUITE 11
11201 BROOKLYN NY USA
INFO: +1 347 204 7027
HELPDESK:+1 646 575 0426

BTS S.P.A.
VIALE FORLANINI 40
20024 GARBAGNATE MILANESE MI ITALY
TEL. +39 02.366.490.00
FAX +39 02.366.490.24

BTS COMMERCIAL PARTNER NETWORK

WWW.BTSBIOENGINEERING.COM
SALES@BTSBIOENGINEERING.COM

SMART-DX-1113UK