Biometrics Ltd

UNIQUE SOLUTIONS FOR CLINICAL AND RESEARCH APPLICATIONS

MOVEMENT ANALYSIS

EMG

DATA ACQUISITION &
SYNCHRONIZATION

Biometrics Ltd

Biometrics Ltd is a world leader in the design, manufacture and distribution of technologically advanced sensors, instruments and software for the demanding needs in biomedical and engineering research, and educational settings. Markets include medical, ergonomic, biomechanics, sport science, pharmaceutical and veterinary science.

Instrumentation Comparison Chart

	DataLOG	DataLINK	K800
	page 3 & 4	page 5 & 6	page 7
Data Acquisition	Bluetooth and /or Micro SD	USB	
Real-time data display	Bluetooth & LCD	USB	LCD
Real-time Analysis Software	via Bluetooth	via USB	
Channels	up to 24	up to 24	unlimited
Gain	Programmable	Programmable	Fixed
Outputs			
to Biometrics analysis software	●	●	
ASCII file	●	●	
Analogue out to other hardware		●	●
via DLL to other software	●	●	
INPUTS ACCEPTED			
Analogue			
EMG	●	●	●
Goniometers	●	●	●
Accelerometers	●	●	●
Dynamometers	●	●	●
Pinchmeters	●	●	●
MyoMeter	●	●	●
ForcePlates	●	●	●
Force sensors	●	●	●
Load Cells	●	●	●
general single ended voltages	●	●	●
general differential voltages	●	●	●
Digital			
Contact switches	●	●	●
Event Marker	●	●	●
Remote Start/Stop (TTL in)	●	●	
Remote Start/Stop (TTL out)	●		

CONTENTS

INSTRUMENTATION

INSTRUMENTATION

SOFTWARE

SOFTWARE

SENSORS

SENSORS

Biometrics Ltd's range of Data Acquisition Systems collect both analogue and digital data from a wide range of sensors and are available in laboratory and portable configurations. Specific systems include precision instrumentation and sensors for Data acquisition of movement analysis and state-of-the-art surface EMG.

A key benefit of Biometrics Ltd systems is that they are designed to readily interface to most video based motion capture systems and other data acquisition instrumentation. This allows for surface EMG and goniometry data to be synchronized and simultaneously collected. During discussions of your specific system requirements please request this option.

All Biometrics Ltd sensors

- connect to Biometrics Ltd
- connect to instrumentation not manufactured by Biometrics Ltd

Biometrics Ltd general purpose instrumentation can receive inputs from

- Biometrics Ltd analogue & digital sensors
- Sensors not manufactured by Biometrics Ltd

Instrumentation outputs (not all instruments have all outputs)

- To Biometrics Ltd Analysis software
- Via Dynamic Link Library directly to third party software
- ASCII file to import into third party software
- Via analogue output cable for direct input into other instrumentation

Biometrics Ltd can provide anything from a single goniometer or EMG sensor to connect to your own data collection system through to complete data acquisition solutions with sensors, instrumentation, and analysis software.

Global customers include: thousands of leading corporations, hospitals, research organizations and universities, North American, European and Asian car manufacturers, aerospace, NASA: where Biometrics' technology is used exclusively for movement studies in the Human Performance Laboratory of the International Space Station.

DataLOG

- Latest Generation Fully Programmable Portable Data Acquisition System
- State of the art Bluetooth® wireless technology
- Up to 24 Independent Programmable channels
- Up to 20 KHz / channel (160 KHz total per DataLOG)
- Real time data display & analysis
- Auto data back-up using Micro SD card
- DLL (Dynamic Link Library)
- Readily synchronize with 3rd party systems

The DataLOG MWX8 is the latest in data acquisition technology developed to meet the needs of researchers for portable data collection and ambulatory monitoring in human performance, medical research, industrial ergonomics, gait laboratories, sports science, and educational settings. The small, lightweight, battery operated unit incorporates a joystick, colour graphics LCD, Micro SD card interface, and a real-time wireless Bluetooth link to a PC.

Weighing 60% less than previous devices, at 129g, the **DataLOG MWX8** can be worn on the arm or leg in addition to the traditional belt/waist placement. This miniaturized technology is by far the most powerful portable data acquisition device available.

DataLOG is a general purpose, programmable Data Acquisition Unit allowing the user to collect both analogue and digital data from a wide range of sensors.

All Biometrics Ltd sensors readily connect to the **DataLOG** including:-

- Single and twin axis Goniometers & Torsiometers
- Surface EMG Active Probes
- Accelerometers
- Contact switches & Event markers
- ForcePlates
- MyoMeter
- Hand Dynamometer & Pinchmeter

The 8 channel front end amplifier and sensor power supply are programmable enabling the researcher to also connect a wide range of custom transducers including:-

- General Load cells
- Strain gauge devices
- Single ended voltage inputs
- Differential voltage inputs
- Temperature probes
- Flow metres
- Microphones

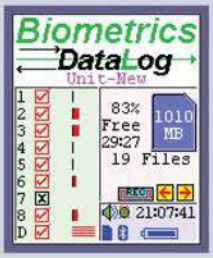
During all stages of the design and development process, attention has been given to the Bluetooth® wireless link, with the end result of reliable real time data transfer and display. In addition, the data is automatically backed up to the Micro SD card providing complete peace of mind.

Data recording options include:-

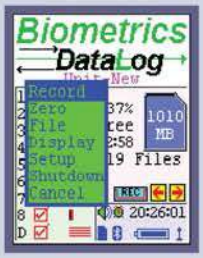
- display and analyse real time within the PC via Bluetooth®
- store on the PC and auto-back-up to the Micro SD Card
- store data to the Micro SD card for later download
- transfer data real time using the Dynamic Link Library into 3rd party programs using tools such as Microsoft Visual Basic or Visual C++
- store as ASCII or as a standard Sound Wave file for passing into other applications such as Microsoft Excel or Cool Edit
- display real time on the Graphics Display as a digital readout in engineering units, or as a bar chart, or as adjustable audible alarms

After configuring from the PC, many operations are carried out by using the **DataLOG's** LCD menu system and navigation joystick.

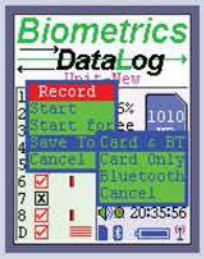
Main screen:



Main menu:



Record menu:



Configuration:

Engineering Values:

Channel titles:

SPECIFICATIONS

Synchronization options for 16 or 24 channels

For applications requiring greater than 8 analogue or 4 digital channels, the start record function of multiple DataLOGs may readily be implemented from a single key press from the host PC, with the data being saved as a single file of up to 24 channels of analogue data and 12 channels of digital data.

The **DataLOG** comes with all the hardware and software necessary to configure the unit and acquire the data to the PC and MicroSD card.

DataLOG add-ons are detailed elsewhere in this brochure:

DataLOG accessories: page 8
Event markers, synchronization cables, trigger in/out cables, foot switches, and more.

Biometrics Analysis Software: pages 9 & 10
Compatible with Windows 8 & 10 (32 & 64 bit versions)

Sensors: pages 11 - 18
Goniometers, Torsiometers, EMG, Accelerometers, Hand Dynamometer, Pinchmeter, MyoMeter, and ForcePlate

The **Portable Systems** are comprehensive packages of sensors and instrumentation for static & dynamic measurements in clinical settings, research centres, or any remote location such as a workplace.

Additional product details are on our website
www.biometricsltd.com/datalog

Please contact us to discuss your specific application or questions.

DataLOG Model No. MWX8

Dimensions	104 x 62 x 22 mm
Mass	129g
Battery type	2 x Lithium AA
Battery life	5 - 20 hours nominal depending on sensor type & quantity
Analogue channels	8
Digital channels	4
Memory internal	Micro SD card
Bluetooth® Adaptor	Microsoft Bluetooth® stack compatible
Front end ADC	14 bit giving +/- 4000 counts resolution

General analogue channels may be single ended or differential input depending on front end plug wiring configuration.

HARDWARE GAIN RANGE OPTIONS

	Max Input	Resolution
	± 1 mV	0.244 µV
	± 3 mV	0.732 µV
	± 10 mV	2.44 µV
	± 30 mV	7.32 µV
	± 100 mV	24.4 µV
	± 300 mV	73.2 µV
	± 1 V	0.244 mV
	± 3 V	0.732 mV
	± 6V	1.464 mV

Recording mode (3 options)	record to Bluetooth® & Micro SD card record to Micro SD card only record to Bluetooth® only

range of sampling frequency per channel 1, 2, 5, 10, 20, 50, 100, 200, 500, 1000, 1250, 2000, 2500, 5000, 10000, 20000 Hz
(note – Bluetooth is used for monitoring only at the higher sampling rates)

Power supply per channel	adjustable 0 to 4.6 Vdc
Current supply per channel	≤ 20mA
Accuracy	better than +/- 0.5% full scale
Maximum common mode	1.2 V

BANDWIDTH

INPUT RANGE	BANDWIDTH
1mV and 3mV	DC to 1KHz (+0 dB / -3dB)
10mV to 3V	DC to 10KHz (+0 dB / -3dB)

an automatic anti-alias digital filter: approximately –3dB at 0.45 x sampling rate and a maximum attenuation of -13dB above 0.8 x sampling rate

TYPICAL PC SYSTEM REQUIREMENTS

Processor	Single or Multi core 2.8GHz minimum
RAM	1GB minimum
Operating platform	Windows 8 & Windows 10 (32 & 64 bit)
USB port 2.0	2
Graphic card	128MB graphics RAM
Bluetooth® adaptor	Class I 100m range Version 2.1 + EDR Microsoft Bluetooth® stack compatible

CABLES

TYPE NUMBER	LENGTH (mm)	DESCRIPTION
J500	500	Connection of Goniometers & Torsiometers
J1000	1000	Connection of Goniometers & Torsiometers
J1500	1500	Connection of Goniometers & Torsiometers
D1500	1500	Connection of general sensors
H2000	2000	Connection of MyoMeter, Dynamometer, Pinchmeter & ForcePlates

DataLINK

- On Line Data Collection
- Real-time Display & Analysis
- Readily Synchronized with other Systems
- 8, 16 or 24 analogue channels

DataLINK is a general purpose programmable data acquisition unit allowing the user to collect data from a wide range of both analogue & digital sensors. Individual channels are programmed from within the management software including settings for gain, sampling frequency, off-set and sensor power supply. The **DataLINK** readily connects to the PC via a USB port, and up to 40 KHz of data per **DataLINK** is collected. Multiple DataLINKs may be used to collect up to 24 analogue channels and 12 digital channels of data.

DataLINK is specifically designed to provide maximum versatility for data acquisition and data synchronization in laboratory settings.

Inputs:

- Collect both analogue and digital data from a wide range of sensors including Biometrics' active EMG sensors, Goniometers, Accelerometers (from +/- 1G up to +/- 1000G), Hand Dynamometers, Pinchmeters, MyoMeters, ForcePlates, and Contact Switches
- Collect data from other general sensor inputs including load cells, strain gauges, microphones, potentiometers, temperature probes and flow meters. **DataLINK** accommodates both differential voltage inputs and single ended voltage inputs.

Outputs:

- To the computer via the USB connection
  - Into Biometrics Ltd real-time Display & Analysis software
  - Save as an ASCII file for import into your own software post data collection
  - Transfer data real-time directly to 3rd party software using the DLL (Dynamic Link Library)
- Real-time data transfer directly to other hardware
  - Using the R2000i Analogue Output cable allowing the DataLINK to be interfaced to virtually any analogue data recording device or video motion capture system
- Other synchronization options
  - Trigger the **DataLINK** record start/stop via TTL signal sent from other instruments (i.e. DataLINK set up as slave)
  - Event marker with LED for optical synchronization with video systems

DataLINK comes with all the hardware and software necessary to configure the unit and acquire the data to the PC.

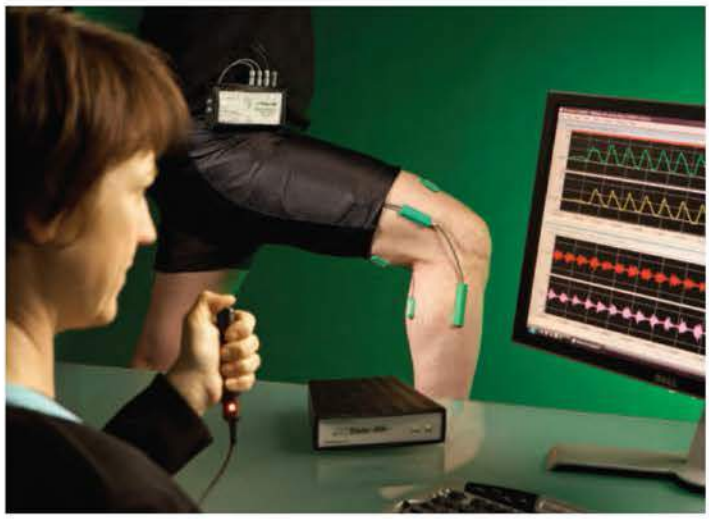
DataLINK add-ons are detailed elsewhere within this brochure:

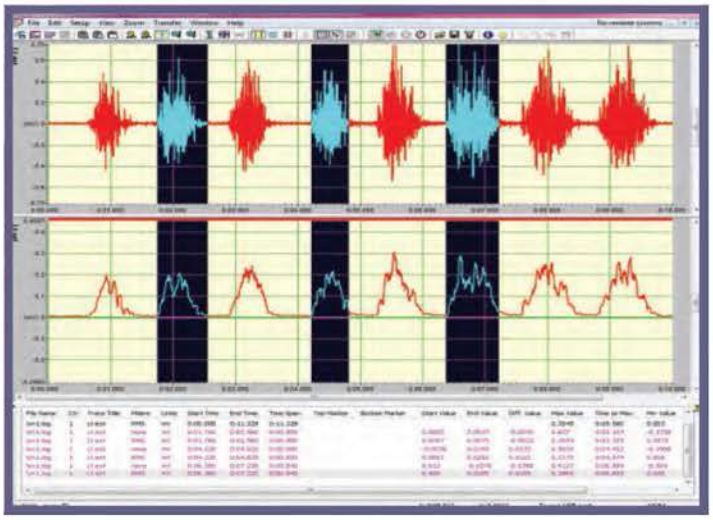
DataLINK accessories: page 8
Event markers, synchronization cables, trigger in cables, foot switches, and more.

Biometrics Analysis Software: pages 9 & 10
Compatible with Windows 8 and 10 (32 and 64 bit versions) . A comprehensive tool for Goniometer, EMG and associated sensor analysis. The most commonly used data analysis is included: Velocity, Acceleration, Average, Rectify, RMS, EMG Work Done, Integration, Mean Frequency, Median Frequency, Power Spectrum Frequency.

Sensors: pages 11 - 18
Goniometers, Torsiometers, EMG, Accelerometers, Hand Dynamometer, Pinchmeter, MyoMeter, and ForcePlates

SPECIFICATIONS





Above: Sample screen showing raw EMG data and the same data with RMS filter applied. Data collected using Biometrics SX230-1000 EMG, DataLINK, and Biometrics Analysis Software.

The **Laboratory Systems** are comprehensive packages of sensors and instrumentation for static & dynamic measurements in clinical settings, research centres, or any remote location such as a workplace.

- **LS800** Goniometer System
- **LS850** EMG System
- **LS900** Goniometer & EMG System

Additional product details are on our website **www.biometricsltd.com/datalink**

Please contact us to discuss your specific application or questions.

DataLINK Model No. DLK900

Analogue channels	8
Digital channels	5

MECHANICAL

Subject Unit

Subject Unit	130 x 65 x 25 mm
Dimensions	178 x 170 x 50 mm
Mass	195g

Base Unit

Dimensions	178 x 170 x 50 mm
Mass	395g

ELECTRICAL

Mains powered rated continuous or powered via USB port.	
Microprocessor controlled programmable gain amplifiers	
ADC	13 bit giving +/- 4000 counts
Communication with host PC	USB
Communication from Subject unit to Base unit via RS485	

General analogue channels may be single ended or differential dependent on front end plug wiring configuration.

Hardware Gain range options	Gain	Max Input	Resolution
	x 1000	± 1 mV	0.244 µV
	x 300	± 3 mV	0.732 µV
	x 100	± 10 mV	2.44 µV
	x 30	± 30 mV	7.32 µV
	x 10	± 100 mV	24.4 µV
	x 3	± 300 mV	73.2 µV
	x 1	± 1 V	0.244 mV
	x 0.3	± 3 V	0.732 mV

Range of Sampling frequency per analogue channel	10, 20, 50, 100, 200, 500, 1000, 2500, 5000 Hz (maximum 40 KHz sequential)
Bandwidth	+0 / -1dB up to 2.5 KHz
Power supply per channel	0 to 4,950 mV dc
Current supply per channel	< 20 mA.
Accuracy	better than ± 0.75 % full scale.
Data interface	USB or analogue output via DACs contained in base unit.

Analogue Output Sensitivity

Count Equivalent	Analogue Output Equivalent	Goniometer Angle
+ 4000	+4.0 Vdc	+180 °
0	+2.0 Vdc	0 °
- 4000	+0.0 Vdc	- 180 °

CABLES

TYPE NUMBER	LENGTH (mm)	DESCRIPTION
D1500	1500	Connection of general sensors to DataLINK.
J500	500	Connection of Goniometers & Torsiometers to DataLINK
J1000	1000	Connection of Goniometers & Torsiometers to DataLINK
J1500	1500	Connection of Goniometers & Torsiometers to DataLINK
R7000	7000	RS485 cable from Subject Unit to Base Unit
USB1800	1800	USB cable from Base unit to PC
R2000I	2000	Optional analogue and digital output cable
H2000	2000	Connection of Pinchmeter, Dynamometer, Myometer & ForcePlates

TYPICAL SYSTEM REQUIREMENTS

Processor	Single or Multi Core 2.8GHz minimum
RAM	1GB minimum
Operating Platform	Windows 8 & 10 (32 & 64 bit)
USB port 2.0	2
Graphics card	128 MB graphics RAM

K800 AMPLIFIER SYSTEM

A modern microprocessor controlled general purpose amplifier system for collecting signals from a variety of sensors in a format which may be readily connected to proprietary display and recording systems including A/D cards.

- Easy to use general purpose precision amplifier
- 8 analogue channels
- 5 digital channels
- +5V built in sensor power supply
- Accepts all Biometrics Ltd sensors
- Accepts other sensors including load cells
- Real time display for all channels in engineering units
- RS422 digital data transfer from Subject Unit to Base Unit

The **K800** provides a user friendly method of connecting both Biometrics Ltd sensors and 3rd party sensors to your own data acquisition system, video motion capture system, or other instrumentation. Multiple K800 may simultaneously be used to collect as many channels as required. Although the K800 functions as a general purpose DC amplifier, the hardware is primarily digital circuitry, giving a design with the greatest accuracy, negligible drift, and the greatest immunity to noise.

The **K800** precision amplifier is designed to provide the researcher with complete ease of use. Any combination of sensors may be connected to the small Subject Unit which contains 8 instrumentation amplifiers and power supply responsible for energizing the sensors, converting all the inputs to digital signals and sampling the data. The signals are converted to digital signals as early as practical to minimise artefacts, and the data is transferred from the Subject Unit to the Base Unit via a 6 meter digital RS422 data transfer cable. The Base Unit converts the signals back to analogue for output via a single cable to proprietary A/D systems.

All Biometrics Ltd sensors are easily connected with the amplified output standardised in the range +0 to +4 Vdc. Alternatively, static readings may be displayed for each channel utilising the LCD (liquid crystal display). The LCD and 2 button switches act as the interface to configure the individual channels for the type of sensor attached. This enables any combination of sensors to be attached.

The sensors are categorised into 2 groups:-

- Differential output bridge type sensors including:

  Biometrics' Goniometers, Torsiometers, Hand Dynamometer, Pinchmeter, and ForcePlates

- Single ended high level sensors including:

  Biometrics' sEMG pre amplifier, 3 axis accelerometers

SPECIFICATIONS

Model K800

ELECTRICAL	
analogue channels	8
digital channels	5
Subject Unit	microprocessor controlled
Base Unit	microprocessor controlled
Communication from Subject unit to Base unit via RS485	
General analogue channels may be single ended high level or differential bridge type dependent on front end plug wiring configuration.	
Input voltage differential bridge mode	+/- 12mV
Input voltage single ended high level mode	+/- 3.5V
Output (full scale)	Analogue +0.0 to +4.0 V
Analogue channel input impedance	1M Ohm
Power supply per channel	+ 5.0 V dc
Power supply per channel tolerance	± 1 %.
Accuracy	better than ± 0.5 % full scale
Maximum Common Mode	+3.5v to -2.5v.
Bandwidth General	5 KHz

MECHANICAL	**Subject Unit**	**Base Unit**
Dimensions	100 x 50 x 25 mm	178 x 170 x 50 mm
Mass	140g	480g

Examples of other differential type sensors include strain gauge based devices such as load cells and certain flow meters. A differential bridge type sensor may be connected providing it can be powered by +5 Vdc and the output is in the range of +/- 12 mV.

Examples of other single ended high level sensors include potentiometers. A single ended high level sensor may be connected providing it can be powered by +5 Vdc and the output is in the range of +/- 3.5 V.

For all 8 analogue channels the **K800** recognises automatically whether a differential bridge type sensor or single ended high level sensor is connected. The **K800** also has 5 digital channel inputs which are used for contact switches and event markers.

ACCESSORIES




DataLOG

Event Markers - These useful accessories allow time marks to be registered in the recorded data. The events are marked for the duration of the time the switch is pressed:

- **IS3 -** A 1.8 meter cable with a suitable connector at one end to connect to the DataLOG, and a hand held switch at the other.
- **IS3LED –** same as above with LED in the hand held switch which illuminates when the switch is pressed for visualization on video recordings
- **IS3Pedal -** A 2 meter cable with a suitable connector at one end to connect to the DataLOG, and a foot switch at the other. This allows events to be marked while leaving both hands free.

Force Switch Assembly FS4 - An assembly of 4 Force Sensing Resistor Sensors (FSRs) each on 1.2 meters of cable which are readily connected to the DataLOG via one connector for use as switches to indicate contact e.g. heel and toe strike or palmer contact. The sensors are thin and robust and are usually placed inside the subject's shoe or glove for convenience.

Synchronization Cable SYNC5 - For remote start / stop by a TTL signal sent to 3rd party hardware systems to synchronize data collection from both sources (ie. DataLOG is the master). The SYNC5 is a 3 metre cable with a connector at one end to connect to the digital input socket of the DataLOG and 2 flying wires at the other end. Alternatively, this cable may be specified with any connector of choice.

Synchronization Cable SYNC1 - For remote start / stop by a TTL signal {i.e. the ability to switch a signal line from logic 1 (+5V) to logic 0 (+0)} sent from other hardware systems to synchronize data collection from multiple sources (ie. DataLOG is a slave). The SYNC1 is a 3 metre cable with a connector at one end to connect to the digital input socket of the DataLOG and 2 flying wires at the other end. Alternatively, this cable may be specified with any connector of choice.

Optical Synchronization, Record Start/Stop

- **IS4LED** - Same as an IS3LED, but will activate the start or stop recording and illuminate a LED for visualization on video recordings
- **IS5LED** - Attached to the top of the DataLOG unit and will illuminate when a recording starts or stops.

DataLINK

Event Marker IS2 - A 1.8 metre cable with a suitable connector at one end to connect to the DataLINK Subject Unit, and a hand held switch on the other. This allows time marks to be superimposed on the recorded data and enables the operator to highlight specific events during data collection.

Optical Synchronization, Record Start/Stop IS2LED - As above but with a LED built into the hand held switch for use to activate start recording for precise synchronization with camera based motion analysis systems.

Force Switch Assembly FS4 - An assembly of 4 Force Sensing Resistor Sensors (FSRs) each on 1.2 meters of cable which are readily connected to the DataLINK via one connector for use as switches to indicate contact e.g. heel and toe strike or palmer contact.

Analogue Output Cable R2000i - real-time continuous output of the 8 analogue and 5 digital inputs allowing connection to a wide range of analogue data recording systems.

Analogue Output Cable with BNC connectors R2000iBNC - The optional cable R2000iBNC has 8 BNC connectors for connection to a range of proprietary AD boards. This allows real-time analogue data transfer of up to 8 channels per DataLINK unit directly into other hardware for synchronization with other inputs - for example integrating surface EMG measurements collected by the DataLINK into video motion capture systems.

Synchronization Cable SYNC1 - For remote start / stop by a TTL signal sent from other hardware systems {i.e. the ability to switch a signal line from logic 1 (+5V) to logic 0 (+0)} to synchronize data collection from multiple sources. The SYNC1 is a 2 metre cable with a connector at one end to connect to the digital input socket of the DataLINK and 2 flying wires at the other end. Alternatively, this cable may be specified with any connector of choice.

Synchronization Cable SYNC1BNC - A synchronisation cable with a BNC connector fitted for interfacing to certain 3rd party systems such as Qualisys or Vicon. Connector chassis is wired as common or ground. **NOTE:-** ***Please contact Biometrics Ltd or the 3rd party equipment manufacturer for specific instructions before this cable is used.***

K800

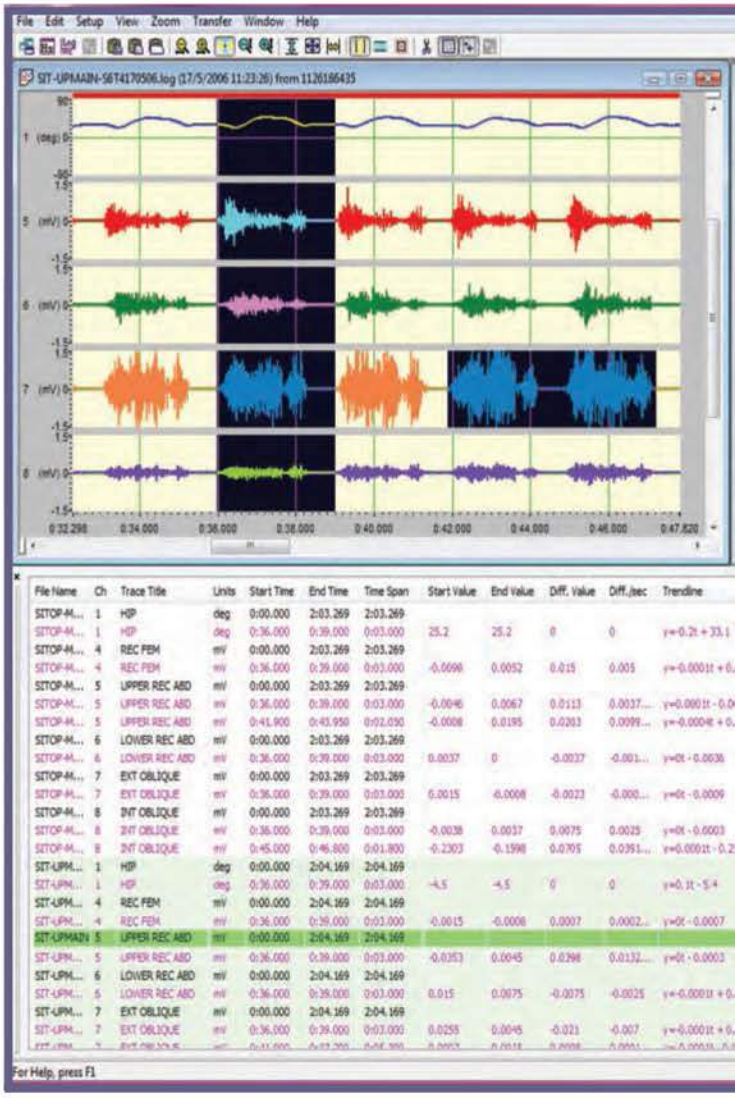
Event Marker IS3 - A 1.8 metre cable with a suitable connector at one end to connect to the K800 Subject Unit, and a hand held switch on the other. This allows time marks to be added to the recorded data and enables the operator to highlight specific events during data collection.

Force Switch Assembly FS4 - An assembly of 4 Force Sensing Resistor Sensors (FSRs) each on 1.2 meters of cable which are readily connected to the K800 via one connector for use as switches to indicate contact e.g. heel and toe strike or palmer contact.

Analogue Output Cable with BNC connectors R2000iBNC - 8 BNC connectors for connection to a range of proprietary AD boards can be added to the standard R2000i cable supplied with the K800.

SOFTWARE - BIOMETRICS V10 ANALYSIS SOFTWARE

The **Biometrics Analysis Software** is a comprehensive tool for EMG, Goniometer and associated sensor analysis including real-time data analysis as the data is collected.



Major key features:

The **Expanded Results Table** shows all results of all channels simultaneously. Multiple traces/graphs/windows from a single file or from multiple files may be compared. The spreadsheet style table displays the following data for each trace:

- File Name
- Channel (trace number)
- Trace Title
- Filters used
- Scientific Units
- Start time in hours:minutes:seconds.mS
- End time in hours:minutes:seconds.mS
- Time Span
- Top marker (if applied) in engineering units
- Bottom Marker (if applied) in engineering units
- Difference Marker
- Over Excursions – number of excursions over the Top marker. The minimum time above the marker to count as an excursion is set by the user with a default value of 0.1 seconds
- Under Excursions – number of excursions below the Bottom marker. The minimum time below the marker to count as an excursion is set by the user with a default value of 0.1 seconds
- Start Value for time markers (if applied)
- End Value for time markers (if applied)
- Difference/sec for the marked time
- Trend – calculated using Linear Regression Analysis
- Maximum Value
- Time to Maximum
- Minimum Value
- Time to Minimum
- Mean Value
- Repetitions

The **Expanded Results Table** may be copied to the clipboard and pasted into other applications, such as MS Excel, for further analysis and printing of results.

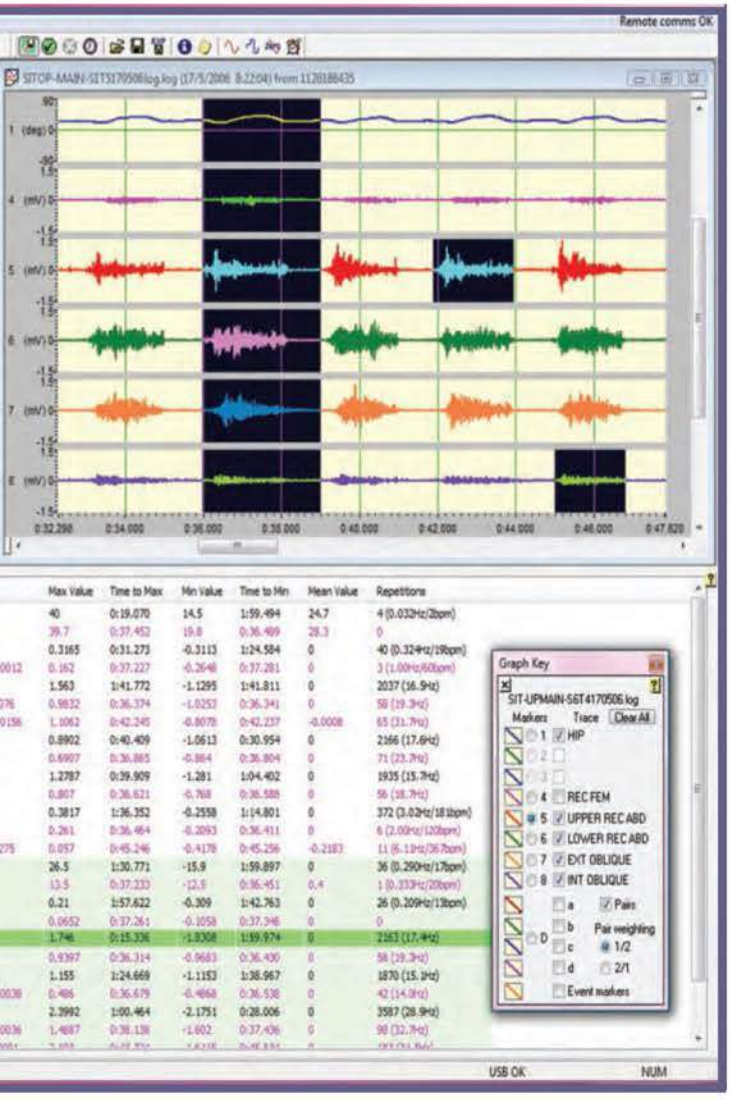
Create and save **Workspaces.** A Workspace is the complete appearance of the application along with the settings used within the program.

Workspaces includes:

- The position and size of all windows
- The names of all open data files
- The position, size and appearance of all application toolbars and tool windows
- Application preferences and options
- All markers and filters
- All zoom and scroll settings

Multiple workspaces may be saved, allowing all filters, markers, multiple data files, etc to be saved at various stages of analysis. In addition, when the application is closed, the current complete workspace is automatically saved in a file called “Workspace when last closed” allowing the user to resume work from the same point by simply opening that workspace.

The workspace **with the associated data files** may be saved as a ZIP file facilitating electronic mailing of the data analysis results. This feature allows, for example, a student to send research results to their advisor/professor or easy co-ordination of data transfer between sites in multi-site studies.



The B**iometrics Analysis Software** includes the Management Software to configure, operate, and analyze data from **DataLOG** and **DataLINK**.

Other features include:

1. Open an unlimited number of data files with the option to track the time axis across all files allowing display and analysis for a large number of channels.

2. Waveform display in multiple windows and formats with full zoom, scroll, and area marking facilities, option to split, tile and cascade windows.

3. Waveforms within the same window may be viewed overlaid or as separate traces. Easily toggle between the two views with a simple keystroke.

4. Engineering units with custom scaling ability on all traces independently.

5. Each recorded file is data and time stamped.

6. Full trace management (change line width, colour, background colour, etc.)

7. Ability to set an unlimited number of vertical cursors (time markers) to a single trace, all traces in a window, and across multiple windows giving total flexibility. All values are shown simultaneously in the expanded results table.

- All vertical cursors may be altered via expanded results table by typing in time values to 0.001S giving maximum control.
- All horizontal cursors may be altered via expanded results table by typing in Y value to 0.01 giving maximum control.

8. Filters

- Up to six filters may be applied to each trace
- A memory store & recall (2 memory settings) for the filters set to a channel to easily be applied to any other channel. These memory settings are kept stored indefinitely until changed by the user

Filters include:

- Rectify
- Integrate
- EMG Work Done
- Average
- Offset
- LPF 1st Order
- RMS
- Scale
- Acceleration
- Velocity
- Mean Frequency
- Median Frequency

9. Versatile Data Export for import into other applications for further analysis

- ASCII export of raw data
- ASCII export traces in engineering units
- ASCII export traces after filters have been applied
- Wave file format

10. Expanded ability to include text notes with data files

11. Power Spectrum Graph

12. X-Y graphs

13. FFT high pass filters: remove DC, remove very low frequencies

14. FFT window functions: Rectangle/Flat top, Hamming, Blackmann Opt, Blackmann standard, Blackmann Opt, Hann.

15. Inputs & Alarms - The analogue and digital inputs are displayed in engineering units during data acquisition. Audible & visible high and/or low alarms may be set to any or all of the channels.

16. Data Export- Saved data can be exported in a variety of formats for importation into other applications.

17. Comprehensive **Help** menu that may be used as a tutorial for both the hardware and software operations.

Compatible Operating Systems:

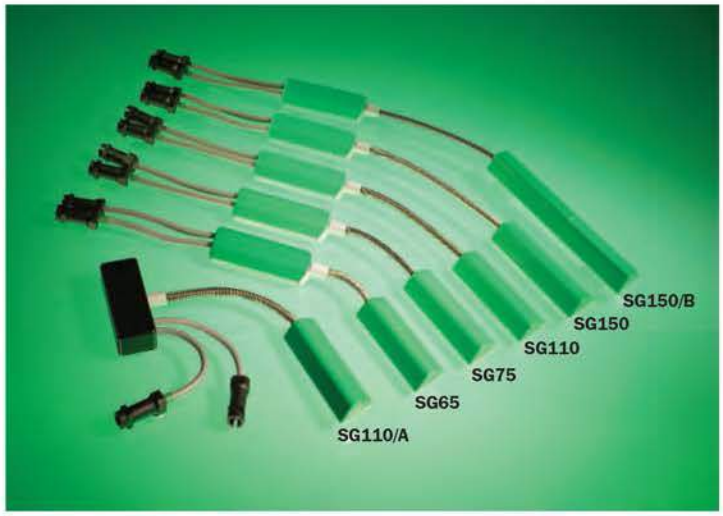
DataLOG: Windows 8 & 10 (32 & 64 bit)

DataLINK: Windows 8 & 10 (32 & 64 bit)

Please contact us for current computer specifications.

ANGLE SENSORS

Biometrics Ltd is the world leader in the design and manufacture of sensors for dynamic movement analysis. For more than 20 years, the Biometrics electrogoniometer has been the proven standard for measurement in fields such as Biomechanics, Ergonomics, Gait Analysis, Sports Science, and Clinical settings. Published research using the Biometrics Ltd sensors and instrumentation is listed on our website under the Publications link –
www.biometricsltd.com/publications.htm

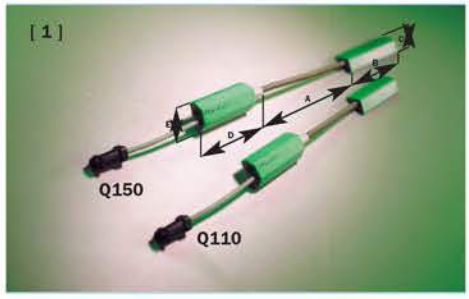


The comprehensive range of Biometrics' goniometers and torsiometers are ideal for quick, accurate measurements of joint movement in multiple planes. Extremely robust, lightweight and flexible, the sensors can be comfortably worn undetected under clothing, without hindering the actual joint movement of the subject.

All Biometrics Ltd sensors and instruments provide maximum flexibility for data synchronization. The Biometrics Ltd goniometers and torsiometers are used worldwide and designed to easily interface not only to all of the Biometrics Ltd instruments and software, but also to instruments from other manufacturers or to your own data acquisition system. Please contact us for full technical information.

The "SG" series twin axis goniometers and "Q" series single axis torsiometers provide excellent mechanical integrity and electrical performance.

Biometrics' sensors are sold separately or as part of complete measurement systems. Available systems include instrumentation for static angle readout, dynamic on line data acquisition in 8, 16, or 24 channel configurations, or fully portable wireless data collection.



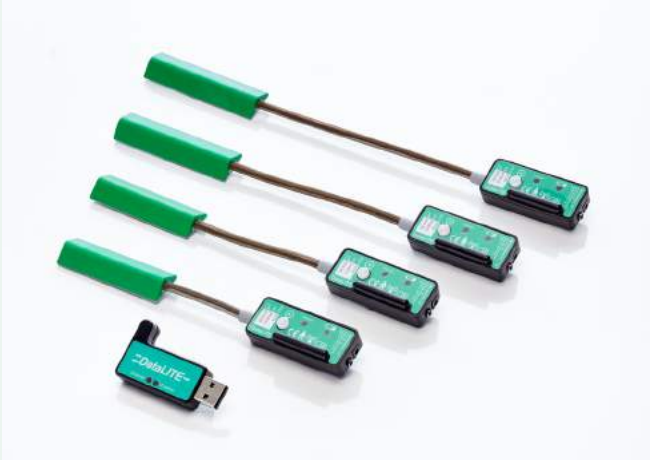
Data Display and Analysis

The Analysis software for **DataLOG** & **DataLINK** provides the following statistical analysis for all goniometric data including:-

Angular displacements, velocities and accelerations; Min, max, mean, repetitions, number of events over or under a set threshold, percentage time spent in and out of set limits, time to max, time to min etc. (refer to pages 9 & 10 for details)

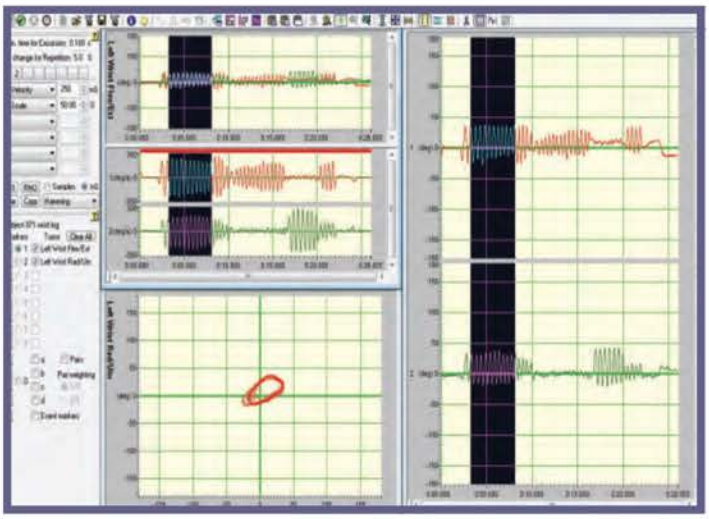
Wireless DataLITE Electrogoniometers Available

Using the same thechnology as our world standard Electrogoniometer for dynamic joint angular measurements - DataLITE wireless Goniometers incorporate a wireless transmitter to send data to the computer for display, analysis and transfer to custom applications in real-time.



www.biometricsltd.com/wireless-sensors

SPECIFICATIONS



Above: Sample screen showing wrist movement captured using SG65 Goniometer and DataLOG. Using the Biometrics Ltd Analysis Software – the x-y angle-angle plot shows the circumduction movement of the wrist during the highlighted time interval. The velocity during the same time interval has also been calculated by applying the Velocity filter.

Goniometers/Torsiometers

JOINT	SENSOR	MEASURED OUTPUT
wrist	SG65	flexion/extension, radial/ulnar deviation
wrist (large)	SG75	flexion/extension, radial/ulnar deviation
forearm	Q150	pronation/supination
elbow	SG110	flexion/extension
ankle	SG110 or SG110/A	dorsiflexion/plantarflexion, inversion/eversion
knee	SG150	flexion/extension
hip	SG150	flexion/extension, abduction/adduction
back	SG150/B	flexion/extension/lateral flexion
neck	SG110	flexion/extension, lateral flexion
neck	Q110	axial rotation
finger DIP, PIP, MCP	F35	flexion/extension

Transducer type	strain gauge
Life[1]	600,000 cycles typical
Accuracy	± 2° measured over a range of ± 90°
Repeatability	1° measured over a range of 90°
Operating temperature range	+10°C to +50°C
Temperature zero drift	≤ 0.15 degrees angle / °C

[1]Life test results have been collected by cycling the sensors through movements that would happen during everyday use. For example, placing a sensor on an adult elbow and moving from the neutral position to maximum flexion and back to the neutral position, the unit will function for typically 600,000 cycles.

SPECIFICATIONS (refer to figure [1])

	SG65	SG75	SG110	SG110/A	SG150	SG150/B	Q110	Q150	F35
Number of Channels	2	2	2	2	2	2	1	1	1
A Max.	65	75	110	110	150	150	110	165	35
A Min.	30	30	70	70	96	50	70	115	30
B	55	60	60	60	70	120	60	70	18
C	18	18	18	18	18	18	18	18	8
D	54	54	54	18	54	54	54	54	15
E	18	18	18	54	18	18	18	18	8
Weight (g)	22	23	24	28	25	28	24	25	8

Dimension mm

In general, there are no fixed rules governing which size of sensor is most suitable for a specific joint; this depends on the size of the subject. The sensor must be capable of reaching across the joint so that the two end blocks can be mounted where least movement occurs between the skin and underlying skeletal structure. In certain circumstances more than one size of sensor will be appropriate.

TWIN AXIS GONIOMETERS SG65, SG75, SG110, SG110A, SG150, SG150B

The "SG" series twin axis goniometers simultaneously measure angles in up to two planes of movement. For example, a single goniometer on the wrist will dynamically measure both Flexion/Extension and Redial/Ulnar deviation. When using a twin axis goniometer on a single axis joint, only one of the output channels is used.

SINGLE AXIS GONIOMETER F35

Biometrics' goniometer F35 measures angles in one plane. This small goniometer is designed to measure flexion/extension of finger and toe joints.

SINGLE AXIS TORSIOMETERS Q110 AND Q150

Biometrics Ltd "Q" series single axis torsiometers are designed for measurement of rotations in one plane, e.g. forearm pronation/supination or neck axial rotation. If the torsiometer is bent nominally in planes X-X or Y-Y the output remains constant. All torsiometers function in the same way, the difference being physical size.

ACCESSORIES:

J series leads - designed to connect the goniometers and torsiometers to Biometrics Ltd instruments (DataLOG, DataLINK, K800, or ADU301). Available in 3 sizes – **J500** (500mm), **J1000** (1m), and **J1500** (1.5m), one lead per channel is used – for example using an SG150 goniometer on the hip, two J leads would be needed, one for the flexion/extension channel, the other for the abduction/adduction channel.

T10 Goniometer tape - double sided medical tape for attaching Biometrics Ltd electrogoniometers and torsiometers. Hypoallergenic and latex free. Ten rolls per pack, each roll is 3/4" x 6 yds (19mm x 5.5m). Also used for attaching other sensors such as accelerometers to the skin or other surface.

EMG SENSORS & SYSTEMS

Biometrics Ltd **EMG** sensors & systems have been extensively researched & developed over a number of years incorporating the latest design principles & technologies. The result is a versatile, state of the art range of EMG products which are reliable, accurate and easy to use.

SX230-1000 EMG Sensor

The **SX230-1000** sensor is an active probe manufactured by Biometrics Ltd providing excellent quality of signal and ease of use. Unique to the design is the amplifier's Input Impedance of > 10,000,000 M Ohms. What this means in practice is that little or no skin preparation and no conducting gels are required, yet the quality of the recorded signal is absolutely superb for both static and dynamic applications.

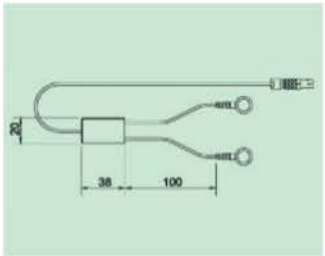
Versatile - Depending on user requirements - the SX230 Active Probes readily connects to the *NEW* Bluetooth **DataLOG** or the tethered **DataLINK** or the tethered General Amplifier **K800**.

All 3 instruments may be used to:-

- Display & record EMG only
- Integrate EMG with any or all other Biometrics Ltd sensors within this brochure
- Readily synchronize EMG data with third party systems such as
  - video motion capture such as Vicon, Qualysis, and Peak Performance
  - 3D ForcePlate systems such as Kistler and AMTI
  - Data collection systems such as National Instruments A-D cards

SX230FW EMG Amplifier

For applications where variable inter-electrode distance is desired - the **SX230FW** EMG Amplifier has the same superb signal pickup of the **SX230.** Instead of the integral electrodes of the **SX230**, the **SX230FW** has two flying wire leads for use with any reusable or disposable SEMG electrode incorporating a 4 mm snap. The maximum inter-electrode distance is 170 mm and the minimum distance is dependent upon the size of the electrodes used.



Biometrics Ltd EMG sensors, instrumentation, and software are designed with maximum versatility in mind:

- up to 32 channels of EMG data display, collection, and analysis
- adjustable sensitivity with full scales of 0-3mV, 0-1mV, or 0-300μV
- user selectable sampling frequency set per channel up to 20kHz per channel, with total sequential sampling frequency of 160KHz per **DataLOG**.
- easily combine EMG data with other sensors such as goniometers and forceplates – Biometrics Ltd instruments are general purpose devices with each channel individually configurable for a variety of sensors
- collect data real-time to the computer (or other data acquisition system) or store on Micro SD cards for later download & analysis
- comprehensive Analysis software with real-time display and analysis
- easily synchronize EMG data with other systems/software
  - input and output triggers for record start/stop
  - event markers for optical synchronization
  - analogue output cable to send data real-time as it is collected to other systems:
  - DLL dynamic link library streams data real time as it is collected to third party software, for example LabView or video motion analysis system software
- differential sensor with the highest input impedance in the industry minimizes noise to signal ratio providing superb signal detection
- integral electrodes with fixed inter-electrode distance give consistent high quality results
- set high and/or low thresholds per channel with audible and visual alarms for biofeedback

SPECIFICATIONS

Active Probe SX230-1000

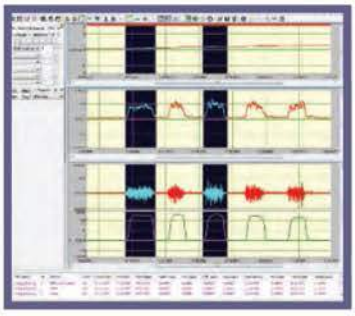
Electrodes	integral dry reusable
Gain	1000 (100 also available)
Bandwidth	20 Hz – 460 Hz
Noise	< 5 µV
Input Impedance	> 10,000,000 M Ohms
Supply Voltage	+3.50 to +10.0 Vdc
CMRR @ 60 Hz (dB)	> 96 dB (typically 110dB)
Cable	highly flexible grade, length 1.25 m (custom lengths on request)
Plug	direct connection to DataLOG, DataLINK or K800
Mass	5 g (excluding cable & plug)
Electrostatic Discharge Circuit	protected
Additional Bandwidths	5 Hz - 490 Hz, 5 Hz - 1000 Hz

Active Probe SX230FW

Electrodes	Two 4mm snap connectors on 100mm wires use with reusable or disposable SEMG electrodes with 4mm snap
Gain	1000 (100 also available)
Bandwidth	20 Hz – 460 Hz
Noise	< 5 µV
Input Impedance	> 10,000,000 M Ohms
Supply Voltage	+3.50 to +10.0 Vdc
CMRR @ 60 Hz (dB)	> 96 dB (typically 110dB)
Cable	highly flexible grade, length 1.25 m (custom lengths on request)
Plug	direct connection to DataLOG , DataLINK or K800
Mass	12 g (excluding cable & plug)
Electrostatic Discharge Circuit	protected

Software

The Biometrics Analysis Software, is a comprehensive tool for EMG and associated sensor analysis. The most commonly used EMG data analysis is included: Rectify, RMS, EMG Work Done, Integration, Mean Frequency, Median Frequency, Power Spectrum Frequency. See pages 9 & 10 for more information on Biometrics Ltd Analysis software.



The graphs display above:

- **EMG work done filter applied (combination of Rectification & Integration)**
- **RMS filter applied**
- **Raw EMG data (no filters applied) and Grip data**

Applications

- Symmetry studies during gait
- Timing data in Biomechanics
- Work done & fatigue studies
- Work environment and tool design
- Sports Science
- Neuro Rehabilitation
- Education
- Veterinary Science

Accessories

Ground Reference Leads

R306: connection to disposable electrodes using a 2mm spring plug

R606: use with reusable or disposable SEMG electrodes with 4mm snap

Application Tape T350 used with **SX230-1000**: Double sided medical grade, Die cut for ease of application. (350 pieces per pack)

SEN3001 Surface EMG Electrodes used with **SX230FW:** Single patient/subject use. Multiple reapplications. (20 packs of 6 electrodes)

Systems

Portable Systems

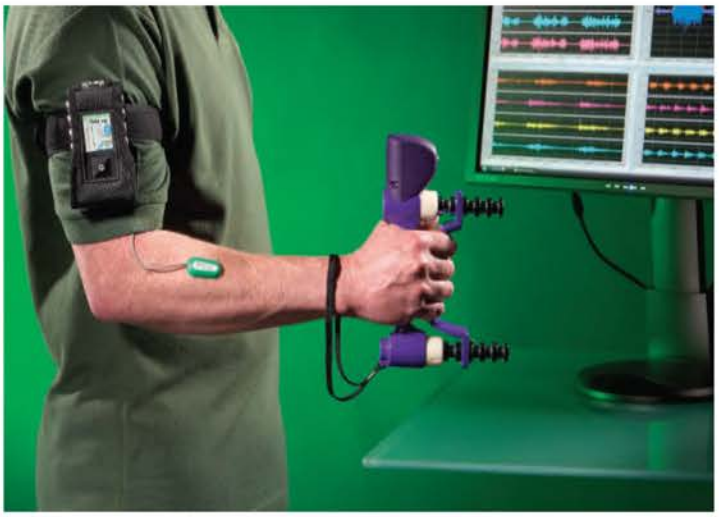
The Portable EMG Systems are comprehensive packages of sensors and instrumentation for static and dynamic measurements in a research centre, or at any remote location such as an office or factory workplace or a sports facility.

Laboratory Systems

The Laboratory EMG Systems are powerful data acquisition tools. The usefulness of real time display of parameters such as EMG, joint angle, and force is emphasized. The combination of DataLINK with the most often requested Biometrics' sensors in either basic or enhanced configurations provides for a wide range of studies.

GRIP/PINCH

The Biometrics Ltd **Dynamometer** and **Pinchmeter** have been developed to provide precise scientific strength measurements in research and clinical settings. Applications include: bilateral strength testing for symmetry, pharmacological studies, work evaluations, clinical research, muscle strength/muscle fatigue monitoring, sustained grip and pinch testing.



Strength measurements from the P200 Pinchmeter and G200 Dynamometer can readily be synchronized with data from other sensors such as EMG and goniometers connected to the DataLOG, DataLINK, and K800. Acquired data can be compared using the Biometrics Analysis Software or exported for analysis in other software.

Dynamometer G200

The Biometrics Ltd Hand Dynamometer utilises precision load cell technology to increase the sensitivity and accuracy of measurement of even very low grip strength. By using the industry standard Jamar design exterior researchers can compare with standardised normative data.

Pinchmeter P200

The unique electronic pinchmeter has a low profile design that enables the researcher to accurately quantify pinch strength at closer to end range than any other device.

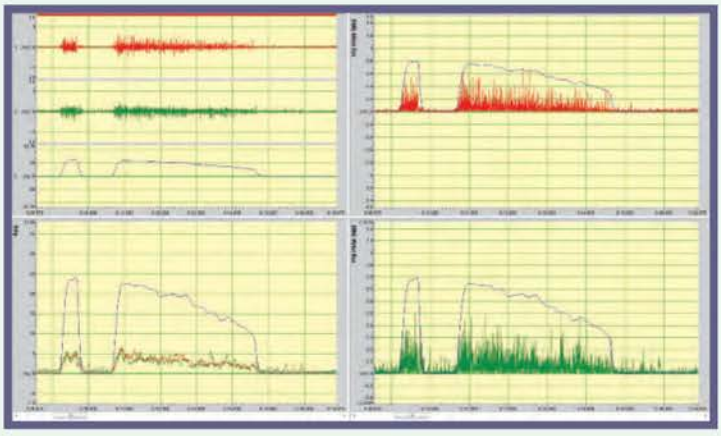
SPECIFICATIONS

Dynamometer G200

Dimensions	standard Jamar configuration
Mass	550 g
Accuracy	better than 1% RL
Rated Load (RL)	0 to 90 Kg or 0 to 200 lb
Cable	Direct connection to DataLOG, DataLINK and K800 using cable type no. H2000
Calibrated and designed to work in compression only	

Pinchmeter P200

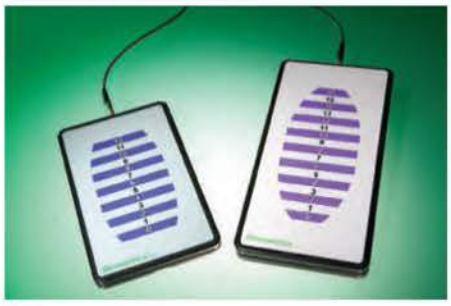
Dimensions	diameter 45 X 6 mm
Mass	65 g
Accuracy	1%
Rated Load (RL)	0 to 22.5 Kg or 0 to 50 lb
Cable	Direct connection to DataLOG, DataLINK and K800 using cable type no. H2000
Calibrated and designed to work in compression only	



Right: Graphs showing extensor and flexor EMG during sustained grip testing of a normal subject. Note the upper left traces are raw data and NO filtering has been applied to reduce artefacts. Data collected using DataLOG MWX8, EMG sensor SX230 and hand dynamometer G200 and analysed using Biometrics Analysis Software. In the two right graphs, the rectify filter was applied to the EMG data and in the lower left graph the RMS filter was applied with filter constant of 50mS.

FORCEPLATES

The Biometrics Ltd range of ForcePlates are focused to the needs of the researcher providing high precision, versatility and ease of use. Direct connection to the Bluetooth **DataLOG**, the tethered **DataLINK** or the tethered General Amplifier **K800** enables data capture and analysis of vertical component of reaction force in a wide variety of applications.








2 models:-
ForcePlate FP3 – 100 Kg full scale output
ForcePlate FP4 – 250 Kg full scale output

Each ForcePlate consists of a sandwich of 2 uniform precision metal plates, with 4 load cells mounted between them. The vertical component of the total reaction force is measured independent of where it is applied over the surface of the plates.

The relative light weight and small geometry of the plates aids in a wide range of upper & lower limb applications. The ForcePlates measure as little as the touch of a finger through to full standing weight bearing. Multiple ForcePlates can be used to increase the data collection options. Use of two ForcePlates provides easy measurement of bilateral upper or lower limb weight distribution. Combining 4 ForcePlates allows continuous dynamic measurement of anterior/posterior and mediolateral weight distribution.

The optional Base Frame allows the position of the ForcePlates to be varied to accommodate different stance widths – from paediatrics to adults.

The modularity of the ForcePlates provides maximum versatility of applications such as:

- Upper extremity – unilateral or bilateral
- Seated balance
  - On the chair/wheelchair seat
  - Under the chair legs
  - Under wheelchair wheels
- Lower extremity
  - Unilateral
  - Bilateral
  - Single axis
    - Mediolateral (Left/right)
    - Anterior/posterior (Front/back)
  - Multi-axial
    - Simultaneous Mediolateral (Left/right) and Anterior/posterior (Front/back)
    - Sit to stand – use 2 ForcePlates on the seat and 2 or 4 on the floor
- Incorporation into other equipment – for example
  - into stair steps to measure weight bearing during stair climbing

SPECIFICATIONS

ForcePlates

	FP3	FP4
Dimensions	200x125x14mm	250 x 125 x 22 mm
Mass	790 g	1560 g
Rated load (RL)	0 to 100 Kg	0 to 250 Kg
Safe Overload	150% of RL (without change of parameters)	
Accuracy	± 0.5%	
Max. Supply voltage (Vs)	10.0 Vdc	
Sensitivity	15.0 mV/ RL at 10.0 Vs	
Strain gauge technology		
Capable of operation in any attitude		
Direct connection to DataLOG, DataLINK or K800 using cable type no. H2000		

Base Frame

	BF8	BF10
Overall Dimensions	740 x 600 x 20 mm	740 x 600 x 20 mm
Mass	10Kg	10kg

Used with Biometrics Ltd instrumentation – **DataLOG**, **DataLINK,** or **K800** – the output from the **FP3** & **FP4** can readily be combined with EMG, joint goniometry movement data, or other sensor inputs into one simple system.

Both the FP3 & FP4 connect to the DataLOG, DataLINK, or K800 using the H2000 cable. The Biometrics Ltd ForcePlates can be connected to various 3rd party instrumentation. Please contact us for full technical information.

ACCELEROMETERS

Accelerometer measurements are used in a variety of applications such as industrial vibration (both human and machine), medical (for example tremor studies), and sports medicine & sports performance.

Accelerometers - 3 axes

2 models:-
ACL300 range +/- 10G
S3-1000G-HA range +/- 1000G

Biometrics Ltd accelerometers provide a complete ready to go solution for measurements of acceleration in 3 axes

- 3 independent axes, X, Y, Z
- variable full scale measuring range (adjusted within **DataLOG** or **DataLINK** management software, 100%, 30% or 10% of full scale)
- 3 levels of adjustable frequency response
- 8th order anti-aliasing filter on each channel with user selectable corner frequencies
- Electronic calibration adjustments giving high stability under vibration and over time
- Signal conditioning electronics housed in a separate small enclosure allowing for miniaturization of the accelerometer probe

By simply plugging either accelerometer model into the Biometrics' **DataLOG**, **DataLINK** or **K800** instruments, accelerations may be displayed & analysed in units of G or m/s2 .

The small lightweight "active" head may be mounted practically anywhere using double sided adhesive tape, or held securely in place using a mechanical clamp for higher loading.

There is no need to calibrate either model as this is done during manufacture. They are ready to go giving accurate readings for both static and dynamic applications.

SPECIFICATIONS

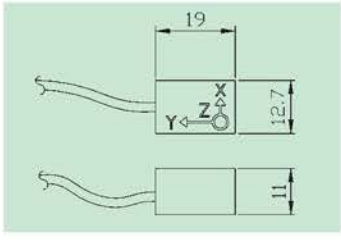
Model	ACL300	S3-1000G-HA
Range	+/- 10G	+/- 1000G
Mass	5g	8g
Dimensions	19 x 13 x 11 mm (L x D x H)	14 x 13 x 14 mm
Case material	anodised aluminium	Titanium alloy
Supply voltage	+4.50 to +5.50 Vdc	+4.50 to +5.50 Vdc
Sensitivity	± 100mV / G	± 1mV / G
Cross talk	< 5%	< 5%
Accuracy	better than ± 2 % full scale	better than ± 2 % full scale
Bandwidth	DC to 100, 500, 1000 Hz	DC to 312, 625, 1250, 2500, 5000 Hz
filter	8 pole, 8th order 1.2 Elliptic.	8 pole, 8th order 1.2 Elliptic.
Shock survival	500 G	5000 G

Bandwidth Limiting (cut-off) Filters

The accelerometers are fitted with an 8th order 1.2 elliptic filter with user selectable cut-off frequencies. This provides the optimum compromise between pass-band ripple and roll-off steepness; 60 dB of rejection is achieved at 1.2 times the selected corner frequency. The filter has 3 values, which are selected by positioning a simple switch within the accelerometer interface unit.

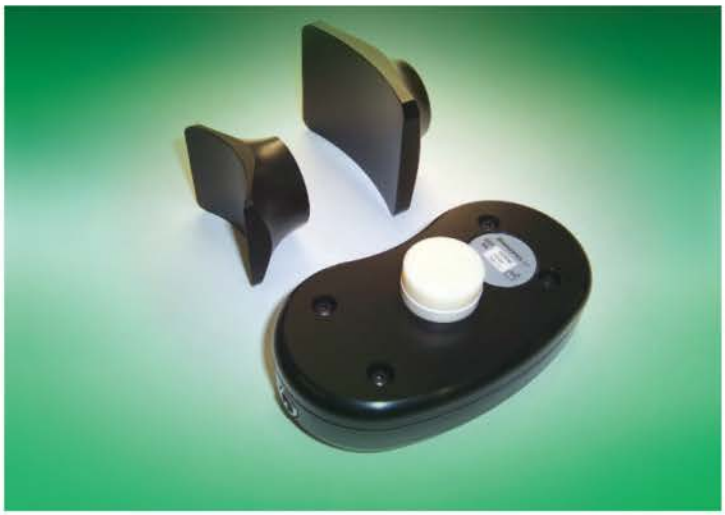
The following table shows the possible set corner frequencies and the recommended sampling frequency set within the DataLINK or DataLOG to avoid anti aliasing according to the Nyquist Sampling Theorem.

Model no.	Bandwidth	Recommended Sampling Frequency per channel of DataLINK or DataLOG
ACL300	DC to 100 Hz	200 Hz
	DC to 500 Hz	1000 Hz
	DC to 1000 Hz	2500 Hz
S3-1000G-HA	DC to 312 Hz	1000 Hz
	DC to 625 Hz	1250 Hz
	DC to 1250 Hz	2500 Hz
	DC to 2500 Hz	5000 Hz
	DC to 5000 Hz	10000 Hz



MYOMETER M550

The **M550 MyoMeter** quantifies the force used during Manual Muscle Testing for the evaluation of the function and strength of individual muscles and muscle groups based on effective performance of a movement in relation to the forces of gravity and manual resistance.



The accurate data obtained provides both researchers and clinicians with an objective measure for a variety of applications such as identifying deficits in muscle force, monitoring changes due to treatments in rehabilitation settings, and pharmacological studies (e.g. use of botulinum toxin for reduction of spasticity in stroke and cerebral palsy).

The **M550 MyoMeter** is held by the examiner with the curved anvil placed against the body part to be tested. The limb is stabilized and held in the desired starting position. The patient is instructed to hold the limb in position and resist the force applied by the examiner. The examiner applies force gradually until the limb is depressed. The force required to move the limb is referred to as the "breaking force".

The **M550 MyoMeter** is supplied with two anvils:

1 x general purpose (small)
1 x general purpose (large)

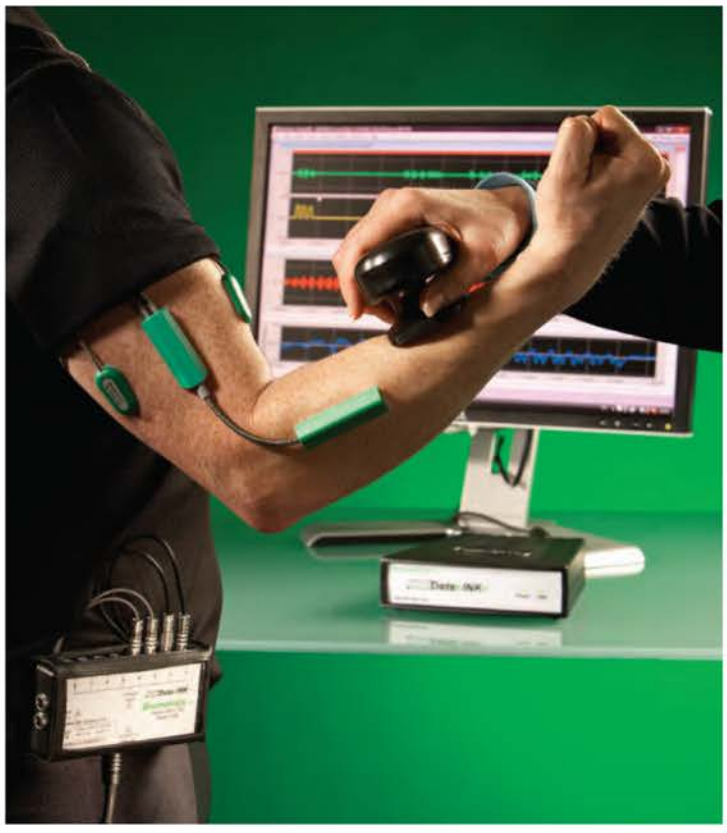
The device is focused to the needs of the researcher with high precision yet ease of use in mind. Designed for general research applications in the fields of medicine, industrial ergonomics and sports science, the **M550** when combined with the versatility of the Biometrics' **DataLINK** or **DataLOG** data acquisition systems makes an ideal research and teaching tool.

By connecting the **M550 MyoMeter** to the **DataLOG** or the **DataLINK** and using the management & analysis software, force may be displayed and analysed in units of N, Kg or lb and readily synchronized with data from other sensors. The **M550** may also be connected to the general purpose amplifier **K800** for direct connection to 3rd party instruments such as A/D cards.

SPECIFICATIONS

M550 MyoMeter

Dimensions	115 x 65 x 32 mm
Mass	250 g
Accuracy	better than 1% RL
Rated Load (RL)	0 to 50 Kg
Calibrated and designed to work in compression only.	
Anvils	1 small, 1 large
Cable	Direct connection to DataLOG, DataLINK and K800 using cable type no. H2000



Biometrics Ltd products are used world-wide in a variety of research applications including:-

- Medical
- Pharmaceutical
- Ergonomic
- Bioengineering
- Veterinary
- Sports science
- General industrial design
- Automotive crash testing

Medical uses include:-

- Orthopaedics
- Podiatry
- Physiotherapy
- Gait analysis
- Neurology
- Paediatrics

Minimum Computer Requirements:

Please contact us for the most current computer specifications.

All the enclosed information is correct at the time of printing. Biometrics Ltd reserves the right to amend any specification without notice.

Biometrics Ltd manufactures variations of DataLOG and DataLINK (sensors and instruments) for Data Acquisition which are CE marked medical devices in Europe, independently certified to Safety Standard of the International Electrotechnical Commission IEC 60601-1:2005 + A1:2012 and BS EN 60601-1:2006 + A1:2013, conforming to the European Medical Device Directive 93/42/EEC as amended by Directive 2007/47/EC, conforming to the council Directive relating to Electromagnetic Compatibility by the application of BS EN 60601-1-2. Other variations are available as non medical devices.

Biometrics Ltd K800 Amplifier is independently certified to Safety Standard of the International Electrotechnical Commission IEC 60601-1:1988 including Amendments 1 & 2, EN 60601-1:1990 including Amendments A1, A2 & A13, BS 5724-1:1989 including Amendments 1, 2 & 3 and conform to the council Directive relating to Electromagnetic Compatibility by the application of BS EN 60601-1-2. However, in Europe, as the K800 Amplifier does not conform to the European Medical Device Directive 93/42/EEC as amended by Directive 2007/47/EC. It is not considered a medical device and is not for medical measurement purposes, or for use in the treatment and diagnosis of disease.

Biometrics Ltd maintains to the highest standard a Quality Management System that is independently accredited to ISO 13485:2016. The scope of the system includes the design, development, manufacture, sales, installation and service of computerized physiological data capture, evaluation documentation and exercise systems.

ISO 13485:2016
Certificate no: GB05/66471

Biometrics Ltd

UNIQUE SOLUTIONS FOR CLINICAL AND RESEARCH APPLICATIONS

Units 25-26
Nine Mile Point Ind. Est.
Newport
NP11 7HZ
United Kingdom
Tel: +44 1495200800
Fax: +441495200806

PO Box 340
Ladysmith, VA
22501
USA
Tel: +1 8044482520
Fax: +1 8044480021

North American toll free:
800 5436698

Email:
sales@biometricsltd.com
Web: www.biometricsltd.com