



**CARDIOLOGY  
& SPIROMETRY**



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Based on many years of standing experience in manufacturing, design and sale of safe and reliable equipment, BTL offers full range of non-invasive cardiology products.

- ◇ 1, 3, 6 and 12-channel electrocardiographs
- ◇ Stress test systems
- ◇ ECG Holter monitors
- ◇ Ambulatory blood pressure monitors
- ◇ Spirometers

The BTL cardiology products stand out for their fast and easy operation, top parameters, modern functional design and reliability. Reflecting the latest trends in cardiology and providing an excellent price/performance ratio, the BTL units are an ideal investment for medical professionals.

The product line contributes to our goal: manufacturing highly competitive products and providing excellent customer care support to our customers world-wide.

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ECG



STRESS



HOLTER



ABPM



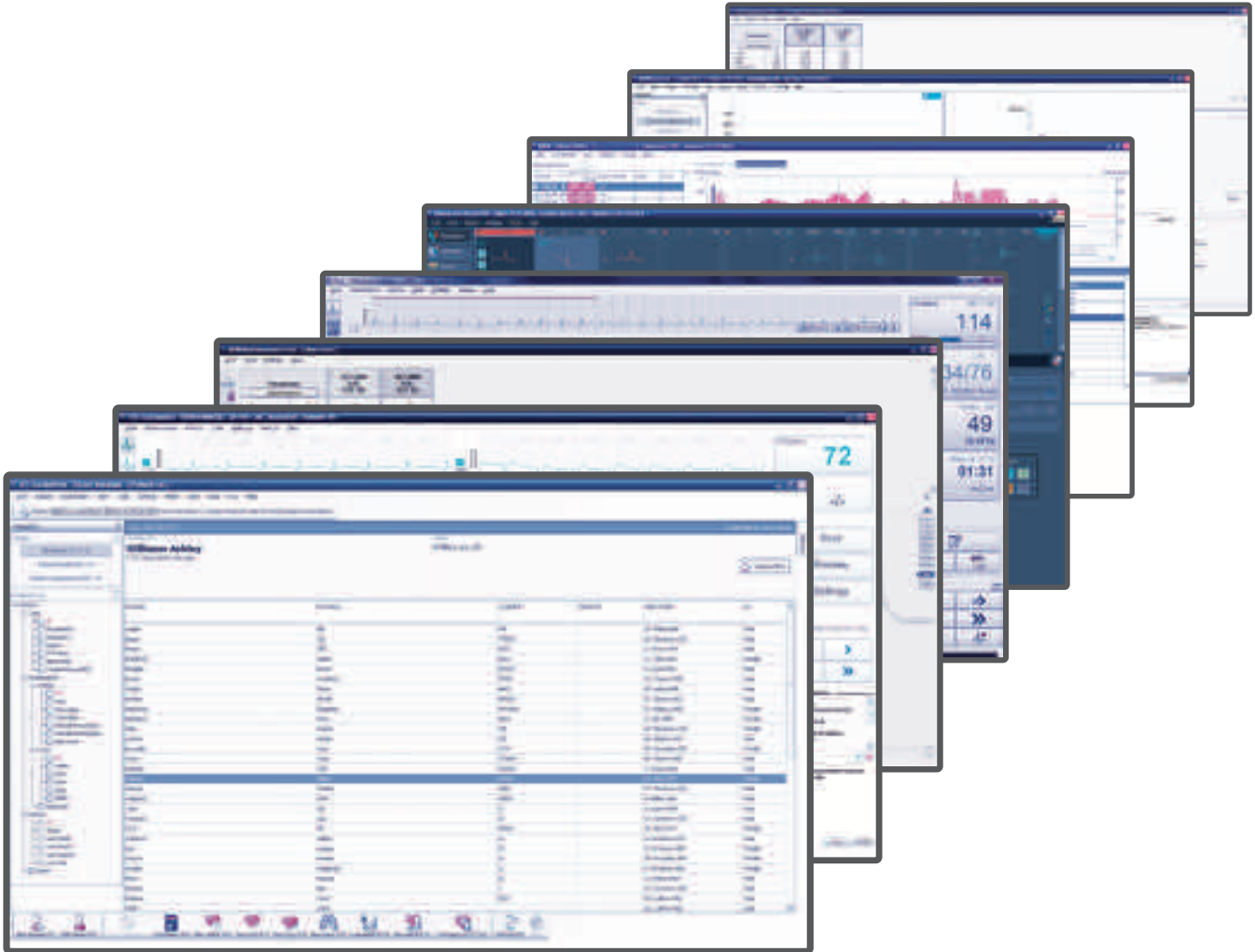
SPIRO

**COMPLETE  
SOLUTION  
FOR CARDIOLOGY  
OFFICE**

# CARDIOPOINT

## BTL CARDIOPOINT

### UNIFIED CARDIOLOGY PLATFORM



The BTL CardioPoint is a versatile software solution integrating ECG, Stress test, Holter, ABPM and Spirometry into one unified platform with one patient database and the same logic of controls for each module. The software has fully customizable interface, and its layout and worksteps can be easily adapted. The operator is allowed to arbitrarily add or move tables, ECG strips and other windows. Fast and intuitive work is ensured by ergonomically

optimized user interface with shortened mouse tracks and hotkeys. Colour schemes are designed for both dark and light ambience. The BTL CardioPoint can be used as a stand alone cardiology system, or it can be seamlessly integrated to an existing ambulatory or hospital system. The BTL CardioPoint is the software that adapts to the user, and not the user to the software.

#### MAIN FEATURES & ADVANTAGES

- ◇ Unified platform for all examinations
- ◇ Fully customizable user interface
- ◇ Fast and intuitive work
- ◇ Product lifetime updates
- ◇ Configurable report profiles
- ◇ Optimized colour schemes & controls
- ◇ Integration to clinic environment
- ◇ GDT and NETWORKING interface
- ◇ Superior measurement quality

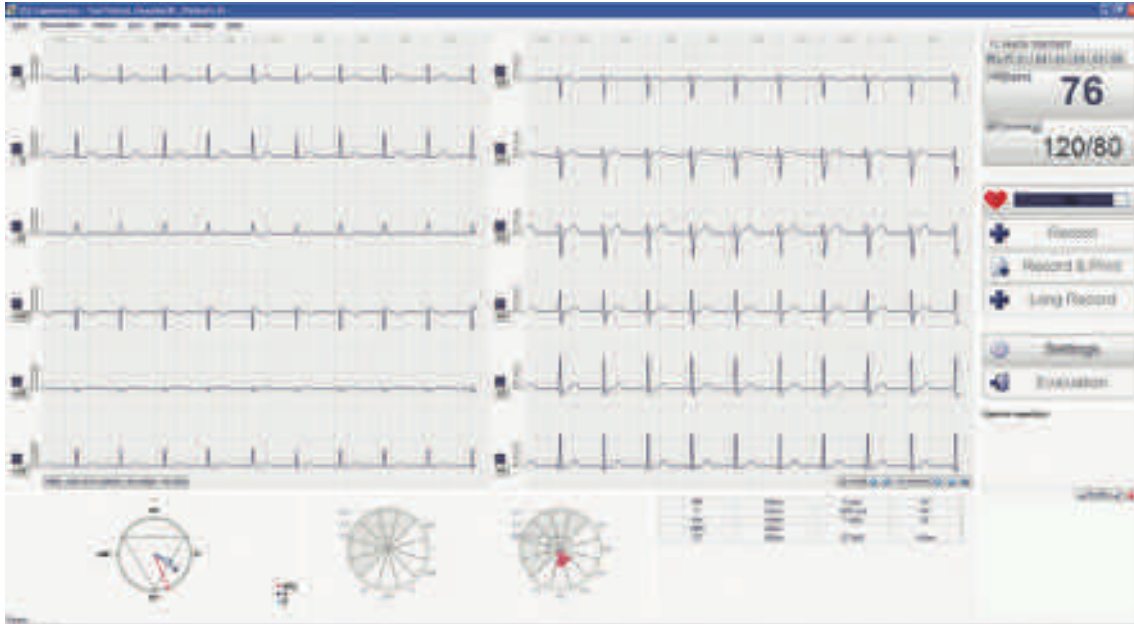
#### SOFTWARE MODULES

- ◇ ECG
- ◇ Stress test
- ◇ Holter
- ◇ ABPM
- ◇ Spirometry



## BTL CARDIPOINT ECG

### ECG PROFESSIONALLY AND QUICKLY



The BTL CardioPoint ECG software makes a great addition to any BTL ECG, especially for users who prefer to work with a computer. It acquires the signal online, performs automatic analysis and allows the user to create and modify final reports. The operator can add the previously recorded ECG waveforms for easy sharing and comparison. Its simple operation makes it perfect for use in high-traffic facilities, such as emergency rooms.

#### ECG PROFESSIONALLY AND QUICKLY

- ◇ 12-channel ECG recording
- ◇ Fast & easy operation
- ◇ Emergency ECG quick launch
- ◇ Long ECG for rhythm monitoring
- ◇ Editable diagnostics
- ◇ Automatic text interpretation
- ◇ Advanced diagnostic tools for ST and QT analysis
- ◇ ECG waveforms comparisons



STANDARD PART OF THE SET IS DESKTOP ECG



#### BTL CARDIPOINT ECG OVERVIEW

The software is offered in two editions:

	C300	C600
Emergency ECG quicklaunch	○	○
Long ECG monitoring	○	○
Einthoven/Cabrera ECG display	○	○
Electrode application indicator	○	○
Automatic ECG measurements	○	○
Caliper for manual measurements	○	○
Automatic text interpretation		○
QT module		○
ST maps		○
ECG waveforms comparator		○
Vectorcardiogram (VCG)		○







## BTL-08 L-LINE

### A4 PRINTOUT AND LARGE TOUCH SCREEN

The L-Line 12-channel ECGs are professional electrocardiographs designed especially for cardiology departments and clinics. The BTL L-Line devices feature modern design, functionality, and easy operation. The large colour touch screen, high-quality printouts and the possibility to combine them with the BTL Spirometry module make this model stand out among its peer.

#### KEY FEATURES

- ◇ 8.4" (LC models) and
- ◇ 5.7" (LT models) large colour touchscreen
- ◇ A4 print (LC Plus & LT Plus models) on Z-fold thermal paper
- ◇ Battery or mains power options

#### FUNCTIONALITY

- ◇ Auto-adaptive filters for outstanding signal quality
- ◇ Loose leads indicator
- ◇ Auto, manual and user-defined profiles
- ◇ Alpha-numeric keyboard
- ◇ 100 µs / 40 kHz pacemaker detection function

#### CONNECTIONS & UPGRADES

- ◇ LAN&WiFi communication upgrade
- ◇ Connection to BTL CardioPoint PC software
- ◇ Direct USB connection to external printer
- ◇ Possibility to combine with the
- ◇ Optional Quickels Decapus vacuum electrode system
- ◇ Diagnostics upgrade (includes analysis and text interpretation)
- ◇ Paediatric interpretation according to patient's age



**BTL-08 LC & LC Plus**  
12-CHANNEL ECG WITH 8.4" COLOUR TOUCH SCREEN



**BTL-08 LT & LT Plus**  
12-CHANNEL ECG WITH 5.7" COLOUR TOUCH SCREEN



# ECG

## BTL-08 M-LINE

### ADVANCED FEATURES IN A COMPACT DESIGN

The BTL-08 MT Plus ECGs have all of the advanced features of the L-Line models embedded in a smaller, lightweight design. This ECG system has been designed for a broad spectrum of users. Colour touch screen, high-quality printouts and the spirometry option make it a powerful, yet easily-operated device.

BTL-08 MD models are clearly distinguished by the alphanumeric keyboard allowing simple and comfortable entry of patients' data. The display shows one selected ECG channel together with all the important information about selected profile and applied filters. Future diagnostics module upgrade is also available.

#### KEY FEATURES

- ◇ 5.7" colour touch-screen (MT Plus model), 1-channel LCD display (MD, MD3 models)
- ◇ 112 mm printouts
- ◇ Battery or mains power options

#### FUNCTIONALITY

- ◇ Auto-adaptive filters for outstanding signal quality (MT Plus model)
- ◇ Loose leads indicator
- ◇ Auto, manual and user-defined profiles
- ◇ Alpha-numeric keyboard
- ◇ 100 µs / 40 kHz pacemaker detection function

#### CONNECTIONS & UPGRADES

- ◇ LAN&WiFi communication upgrade
- ◇ Connection to CardioPoint PC Software
- ◇ Direct USB connection to external printer (MT Plus model)
- ◇ Possibility to combine with the Spirometry Module (MT Plus model)
- ◇ Optional Quickels Decapus vacuum electrode system
- ◇ Diagnostics upgrade (includes analysis and text interpretation)
- ◇ Paediatric interpretation according to patient's age



**BTL-08 MT Plus**  
12-CHANNEL ECG WITH 5.7" COLOUR TOUCH SCREEN



**BTL-08 MD/MD3 ECG**  
3 & 12-CHANNEL ECG WITH GRAPHIC DISPLAY



## BTL-08 S-LINE

### LIGHTWEIGHT AND PORTABLE

The BTL-08 S-Line ECGs are known for their portability and long-term operation in battery mode. The LCD screen displays one selected channel and other information such as paper speed and amplitude.

The user's comfort is ensured by the one-touch operation and the easy-to-use menu.

The BTL-08 SD1 ECG is the simplified version of the SD3 model. It features the same lightweight design making it highly portable. The 1-channel LCD display allows checking the signal quality and applied settings (profile, filters).

This SD1 is upgradable to the SD3 model, making it connectable to the BTL CardioPoint software.

#### KEY FEATURES

- ◇ 1-channel LCD display
- ◇ 58mm printouts
- ◇ Battery or mains power options
- ◇ Portability

#### FUNCTIONALITY

- ◇ Loose leads indicator
- ◇ Auto, manual and user-defined profiles
- ◇ Alpha-numeric keyboard
- ◇ 100  $\mu$ s / 40 kHz pacemaker detection function

#### CONNECTIONS & UPGRADES

- ◇ Connection to BTL CardioPoint software (except for the SD1 model)
- ◇ Vacuum electrode system connection
- ◇ Diagnostics upgrade (includes analysis and text interpretation)



**BTL-08 SD3 & SD6**  
3 & 6-CHANNEL ECG WITH GRAPHIC DISPLAY



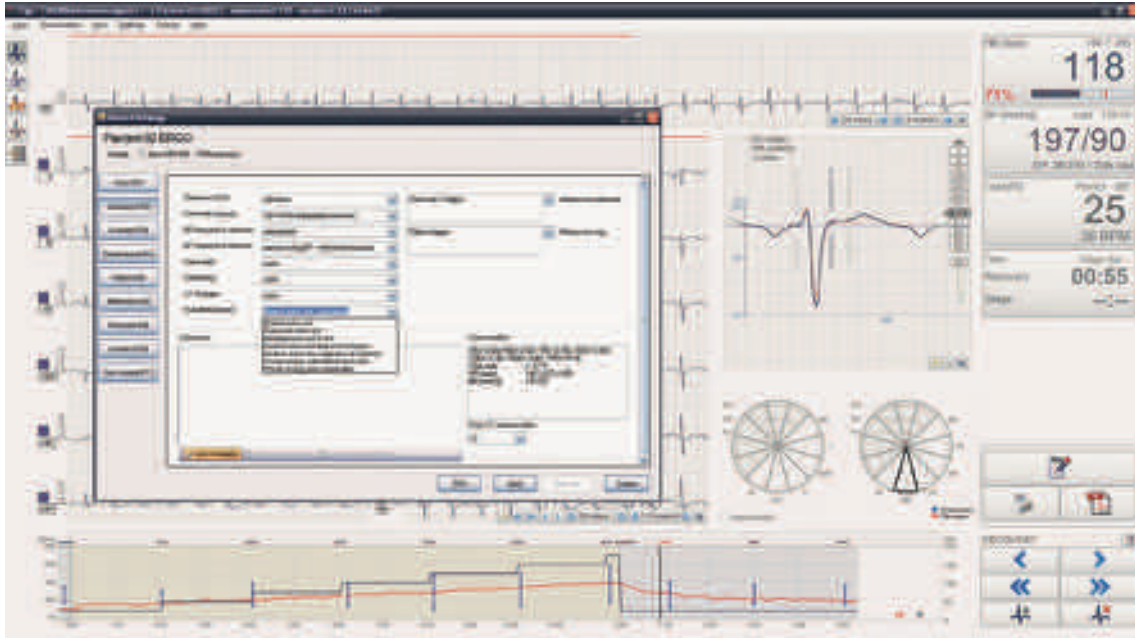
**BTL-08 SD1**  
1-CHANNEL ECG WITH GRAPHIC DISPLAY



# STRESS TEST

## BTL CARDIOPOINT

### PERFORM THE STRESS TEST EASILY



The BTL Cardio Point Stress test is a new generation of advanced computer-based stress test systems. The QT module, the diagnostic score evaluation and the predicted load calculations are just three examples of its modern features.

Intuitive and easy-to-use operation makes the system ideal for everyday use in hospitals and cardiology clinics. The system is compatible with many selected ergometry bikes and treadmills from world-leading manufacturers.

#### PERFORMING THE STRESS-TEST EASILY

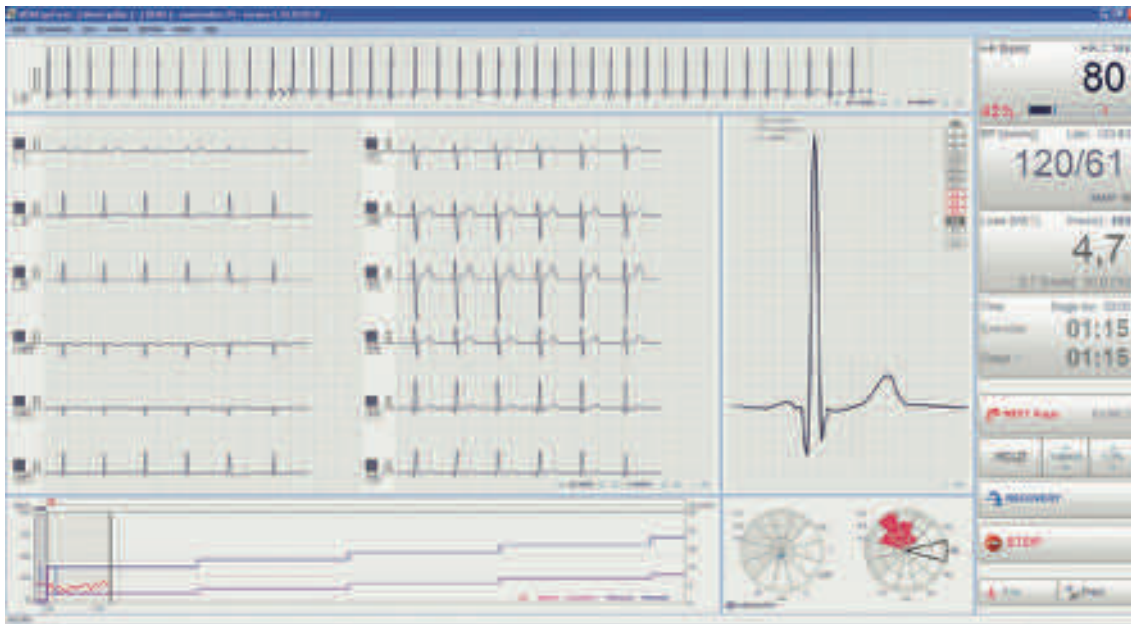
- ◇ The software is part of the BTL CardioPoint
- ◇ 12-channel ECG full-disclosure recording
- ◇ Advanced tools for ST segment monitoring
- ◇ Support of automatic BP and SPO2 measurement
- ◇ Online arrhythmia detection and analysis
- ◇ Automatic maximum load prediction
- ◇ Risk scoring for CAD probability
- ◇ QT module for evaluating the risk of sudden cardiac death
- ◇ Optional Quickels Decapus vacuum electrode system
- ◇ Compatible with all BTL ECGs\*
- ◇ Compatible with variety of medical treadmills and ergometers

\*except SD1 model



BTL-08 SD3 & SD6  
3 & 6-CHANNEL ECG WITH GRAPHIC DISPLAY





BTL CardioPoint Stress test  
MAIN MONITORING SCREEN

**ARRHYTHMIA DETECTION & ANALYSIS**

The BTL CardioPoint Stress test detects ventricular and supraventricular arrhythmias in form of isolated beats, sequences (couplets, triplets and runs) and alternating arrhythmias (bigeminias and trigeminias). Each time an arrhythmia appears in the signal, an alarm mark is displayed.

**AUTOMATIC BLOOD PRESSURE & SPO2 MEASUREMENT**

In order to maximize the user's comfort, the BTL CardioPoint Stress test supports automatic blood pressure measurement. In the event a Suntech Tango M2 or a compatible bike with BP option is connected, the blood pressure measurement is performed completely automatically. Besides blood pressure, the SPO2 measurement can be performed completely automatically as well.

**ST MAPS**

As the ST-segment analysis gives highly valuable information about patient's heart condition, it is a matter of high importance to have effective supportive tools for its clear observation. Besides the traditional averaged beat display and ST trend graph, the BTL CardioPoint Stress test offers the ST map component – a graphic tool displaying a spatial orientation of ST deviations. The ST maps are sorted in Cabrera manner according to spatial orientation of horizontal and vertical heart plane. They are the only way to validate mirrored ST elevation.

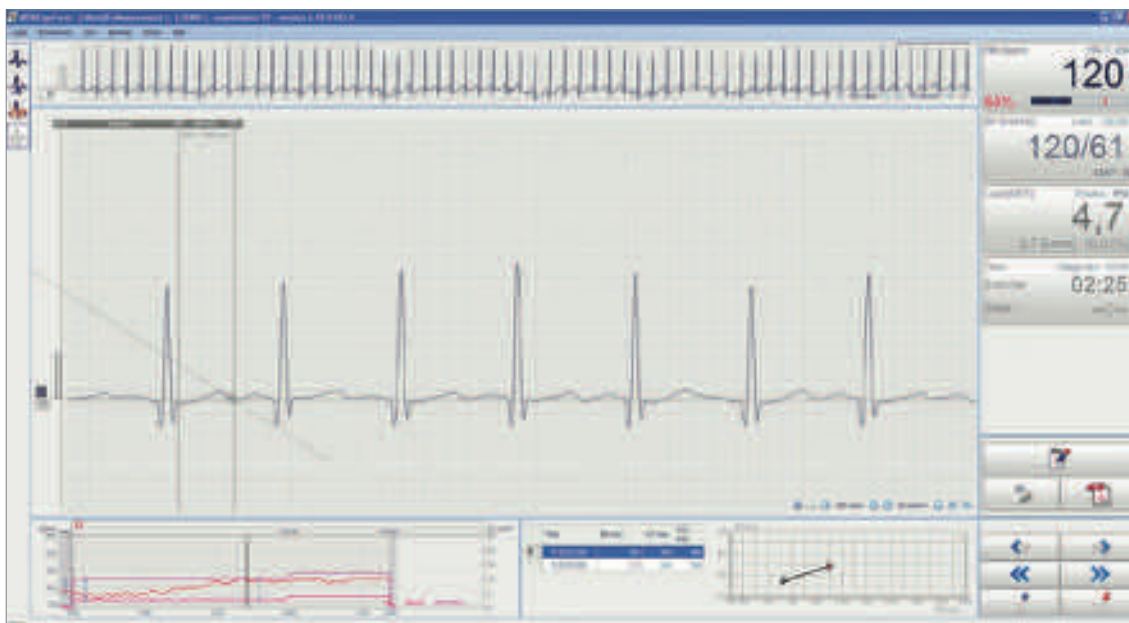


BTL Treadmill  
MOTORIZED STRESS TEST TREADMILL

**TREADMILLS & ERGOMETERS**

The BTL CardioPoint Stress test successfully communicates with all selected treadmill and ergometer models. Treadmills: RAM, Lode, HP Cosmos, Trackmaster. Ergometers: Ergoline, Lode, Monark, Kettler, Seca





BTL CardioPoint Stress test  
QT MODULE SCREEN

#### QT MODULE

The QT module is a unique tool evaluating the patient's risk of sudden death caused by Long QT syndrome. The results are displayed in the form of curve whose shape and location indicates the survival probability of the patient. The tangent method is a method specifically suitable for QT measurement with higher heart rates when there is no clear return to baseline.

#### RISK SCORING

The risk scoring tool uses the examination results to predict patient's mortality and define the risk of CAD (coronary arterial disease). Thus, it helps decide which further examinations the patient should undergo.

#### MAXIMUM LOAD PREDICTION

The software automatically predicts patient's maximum load. It is possible to select among 8 formulas that can be used for the prediction calculation depending on the patient's specific condition.

#### BTL CARDIOPPOINT STRESS TEST OVERVIEW

The software is offered in two basic editions:

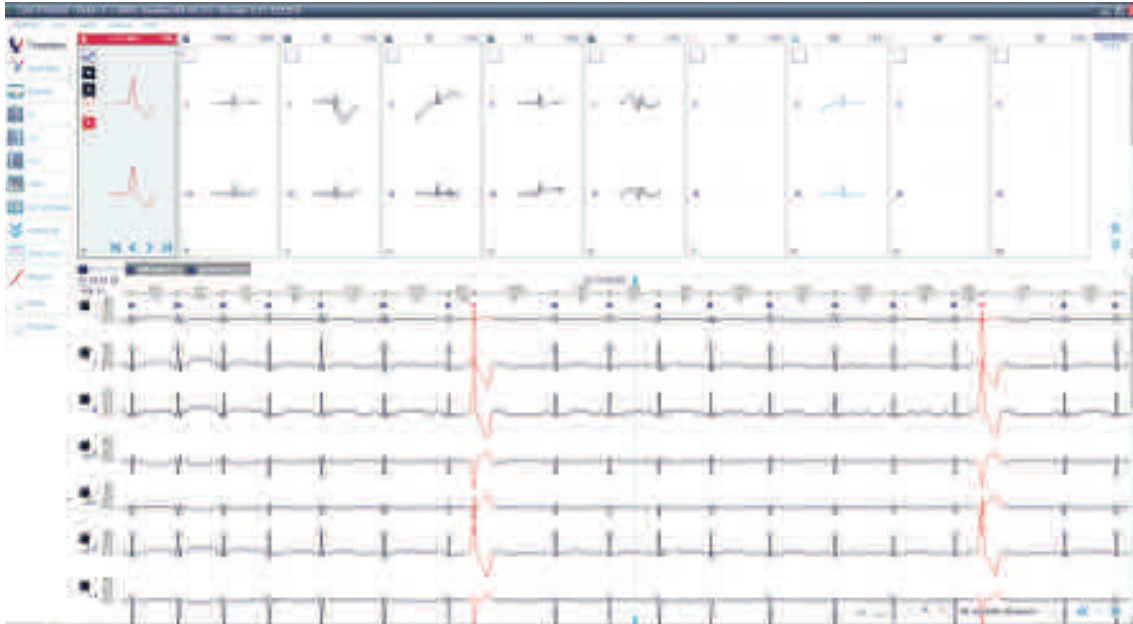
	E300	E600
Automatic BP measurement support	<input type="radio"/>	<input type="radio"/>
ST settings - J point position modification	<input type="radio"/>	<input type="radio"/>
Stress-test protocol editor	<input type="radio"/>	<input type="radio"/>
Trends of HR, ST, BP and load	<input type="radio"/>	<input type="radio"/>
Automatic & manual load control	<input type="radio"/>	<input type="radio"/>
Electrode application indicator	<input type="radio"/>	<input type="radio"/>
Profile creation		<input type="radio"/>
Signal freeze & review		<input type="radio"/>
QT module		<input type="radio"/>
Arrhythmia detection & analysis		<input type="radio"/>
Risk scoring		<input type="radio"/>
ST maps		<input type="radio"/>
Maximum load prediction		<input type="radio"/>
Instant ramp		<input type="radio"/>
Caliper for manual measurements		<input type="radio"/>
Relief map		<input type="radio"/>



87L-08 Heiler

# HOLTER

## BTL CARDIOPOINT OUTSTANDING SIGNAL QUALITY INTUITIVE USER INTERFACE



BTL-08 Holter is the first 24-bit Holter system in the world. Its excellent signal quality, which is comparable to high-end desktop ECGs provides the best possible platform for the examination.

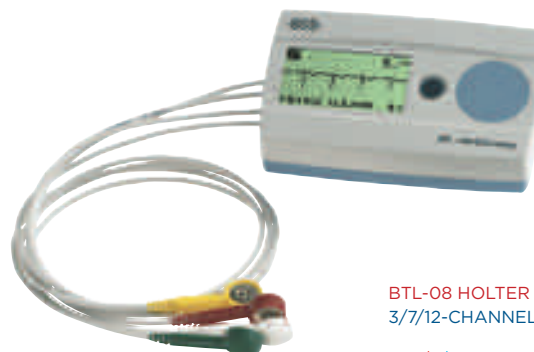
The operator has the option to record 3, 7 or 12 channels of ECG waveform and select the record length up to 7 days. The physician has an option to change all presets from the user interface modification to the way how to start a new record. Setup freedom enables total system adjustment to the individual user needs.

### COMFORTABLE & PROFESSIONAL MONITORING

- ◇ 3/7/12-channel ECG recording
- ◇ Up to seven days of recording
- ◇ Signal quality equivalent to high-end desktop ECG
- ◇ 24 bit recording
- ◇ USB, SD card and wireless computer connection
- ◇ 100  $\mu$ s / 40 kHz pacemaker detection function
- ◇ Built-in microphone for voice recording
- ◇ LCD display for the signal quality check

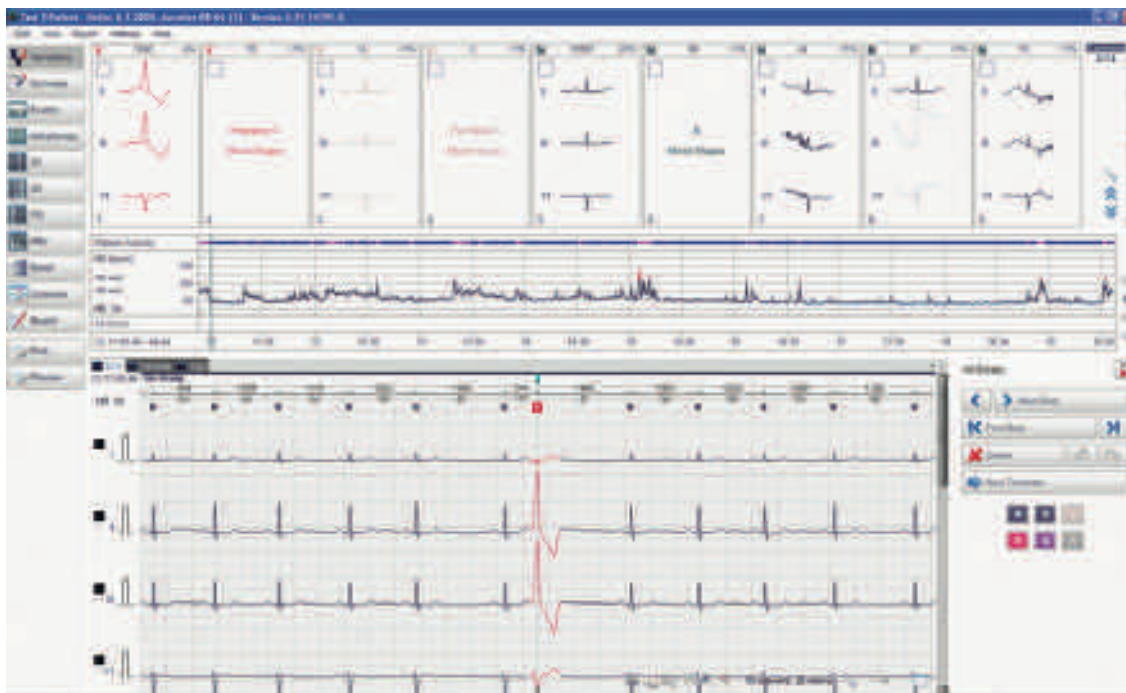
### ADVANCED DIAGNOSTIC TOOLS

- ◇ Multilevel templates
- ◇ Advanced rhythm analysis
- ◇ ST, PQ, QT and HRV analysis
- ◇ Pacemaker analysis
- ◇ Patient activity monitor
- ◇ Unique undo feature
- ◇ Relief & Waterfall tools for fast rhythm & morphology changes detection



**BTL-08 HOLTER**  
3/7/12-CHANNEL ECG HOLTER MONITOR





BTL CardioPoint Holter  
TEMPLATE SCREEN

### 3/7/12-CHANNEL MONITORING FOR UP TO 7 DAYS

The 12-channels offer the most comprehensive means of finding and tracking complex cardiac issues. The 7-channel monitoring started a new approach to Holter examinations and its popularity stems mainly from the fact only five leads have to be used. The 3-channel recording is suitable for the classic, simplified Holter ECG. Moreover, the BTL Holter allows the signal monitoring for up to seven days, which is especially helpful when nonpersistent arrhythmias are expected to occur.

### TEMPLATE ANALYSIS

The BTL CardioPoint software not only sorts the heart-beats according to their morphology, but it also identifies whether the beats within a template are homogenous or not. A homogenous template only consists of beats having the same shape, while the non-homogenous one may involve many types of heartbeats of various shapes. The non-homogenous templates are then identified with the label Mixed Shapes and usually require the physician's special attention. The same approach is applied to morphology analysis.

### PATIENT ACTIVITY MONITOR

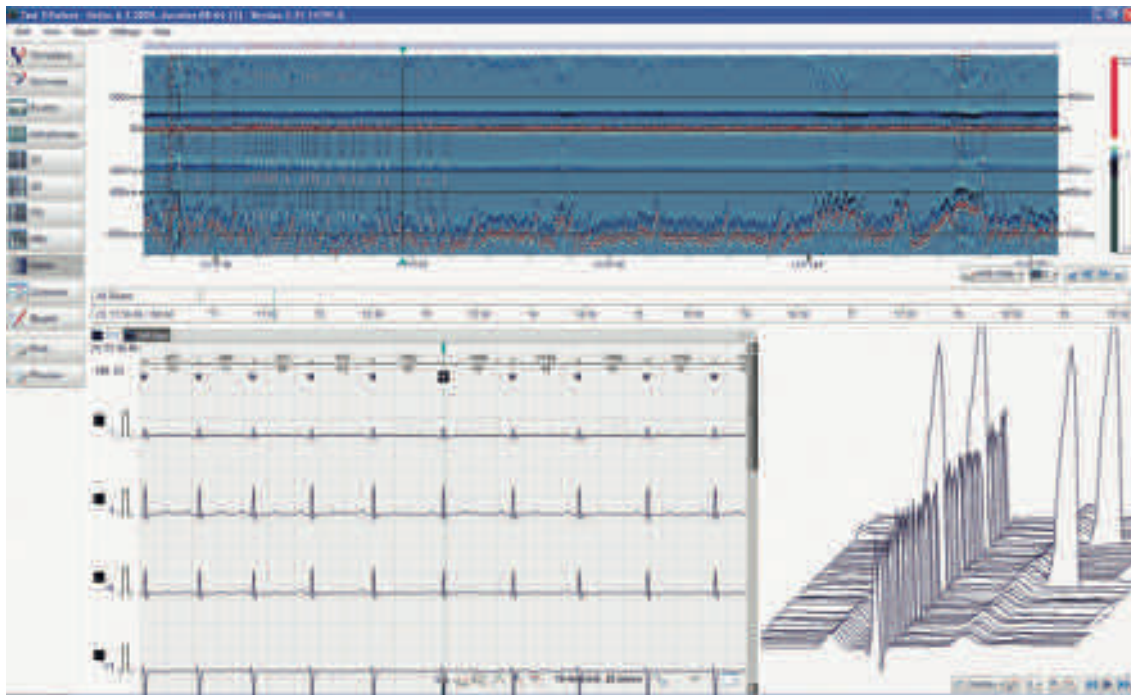
Each BTL Holter recorder has a built-in motion sensor that allows the user to see exactly which time periods the patient was performing some physically-demanding activities. As a result, the graph of patient's activity can be directly correlated with the graph of patient's heart rate and other graphs as well.

## ECG HOLTER FEATURES & TECHNICAL DETAILS OVERVIEW

There are three Holter recorders - 3-channel, 3/7-channel and finally 3/7/12-channel

	3-ch	3/7-ch	3/7/12-ch
Number of channels	3	3/7	3/7/12
Recording time	1-2 days	1-7 days	1-7 days
Patient cable	5 lead	5 lead	5/10 lead
Signal quality check	USB, SD card	USB, SD card, BT	USB, SD card, BT
LCD screen resolution	128 × 64 dots	128 × 64 dots	128 × 64 dots
Storage capacity	2 GB	2 GB	2 GB
Sampling Frequency / Resolution	8 × 2000 Hz / 24 bit		
Pacemaker detection	100 μs / Dedicated circuit with 40000 Hz detection function		
Frequency Range	0.049 Hz-220 Hz		
Digital resolution	1.52 μV		
Maximum electrode potential	± 393 mV DC		
Dynamic Range	66 mV <sub>pp</sub>		
Common mode rejection (with digital filter)	> 100 dB (> 115 dB)		
Batteries alkaline	2 × AA 1.5 V or 2 × Ni-Cd or 2 × NiMH 1.2 V		
Dimensions	102 × 62 × 24 mm (4 × 2.44 × 0.94 inches)		
Weight	106 g (3.7 oz)		





**BTL CardioPoint Holter**  
RELIEF SCREEN

**RELIEF & WATERFALL**

The Relief and Waterfall images provides a simplified, yet complex, look at an ECG signal. This unique tool allows a physician to immediately visually analyse all the irregularities that are not typically visible when using traditional methods for ECG signal analysis. The main purpose of both tools is to easily detect Atrial Fibrillation/Flutter and ST segment changes; both are very efficient in revealing other pathologies. The usage of relief tool may significantly speed up the holter record analysis.

**ADVANCED PACEMAKER ANALYSIS**

The software offers a clear overview of all paced heartbeats. Furthermore, it provides a physician with the advanced analysis (such as fail to capture, or fail to sense) Thus, it can be used to check the pacemaker functionality.

**PQ ANALYSIS**

PQ analysis is a special tool to analyze the P-Wave characteristics. It indicates ECG strips with possible appearance of AV conduction blocks.

**BTL CARDIOPPOINT HOLTER OVERVIEW**

The software is offered in three editions:

	H100	H300	H600
Multilevel templates	○	○	○
Rhythm analysis	○	○	○
Graphical event split			○
Pacemaker detection		○	○
Pacemaker analysis			○
HRV tabular evaluation	○	○	○
HRV trends		○	○
ST tabular evaluation	○	○	○
ST trends		○	○
QT, QTc tabular evaluation		○	○
QT, QTc trends		○	○
QT/RR and QT/HR graphs			○
PQ tabular evaluation			○
PQ trends			○
PQ/RR and PQ/HR graphs			○
Patient activity monitor			○
Waterfall			○
Relief map			○
Poincaré			○
Tachogram			○
PSD Graph			○

2.25

°C/°F

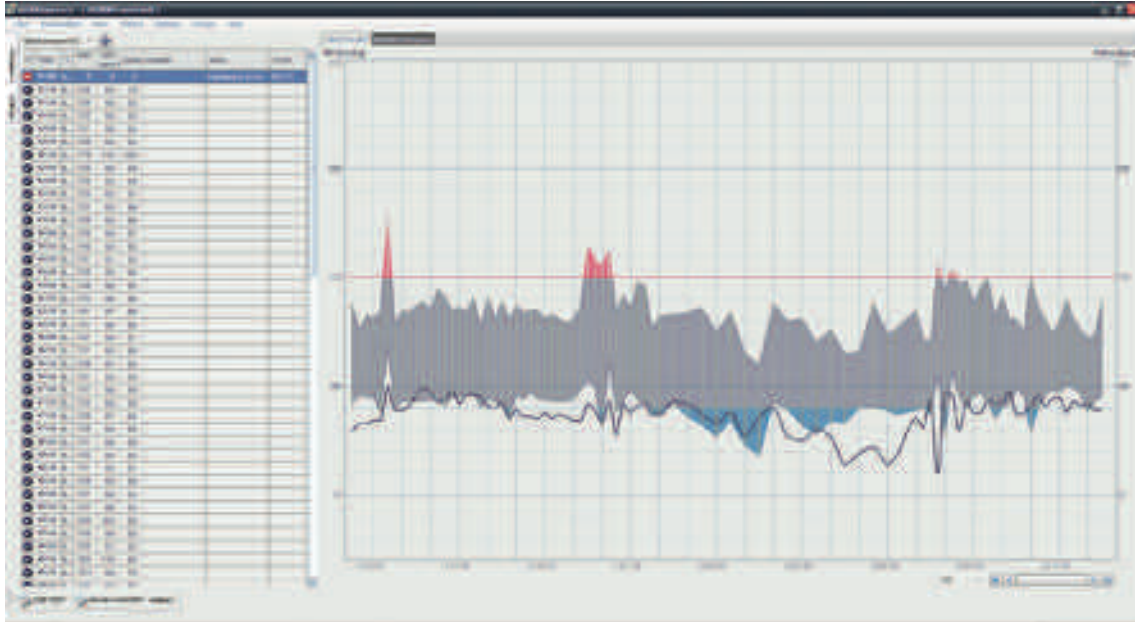




# AMBULATORY BP

## BTL CARDIOPOINT

### COMFORTABLE AND PRECISE BLOOD PRESSURE MONITORING



The CardioPoint ABPM is among the world's most popular blood pressure monitoring devices. Quite simply, it meets all the present specifications for professional monitoring. It has a lightweight recorder, silent operation, and comes with easy-to-use software. Furthermore, precise blood pressure measurement is guaranteed by the proprietary stepwise deflation measuring method.

#### COMFORTABLE & PRECISE BLOOD PRESSURE MONITORING

- ◇ 24, 27, 48 & 51-hour monitoring
- ◇ BTL's stepwise deflation technology - precise measurement results
- ◇ Lightweight recorder
- ◇ Silent operation
- ◇ Large LCD display
- ◇ Complies with BHS and AAMI standards
- ◇ Automatic BP interpretation according to AHA, NICE and NHFA



BTL-08 ABPM  
AMBULATORY BP MONITOR



#### ABPM FEATURES & TECHNICAL DETAILS OVERVIEW

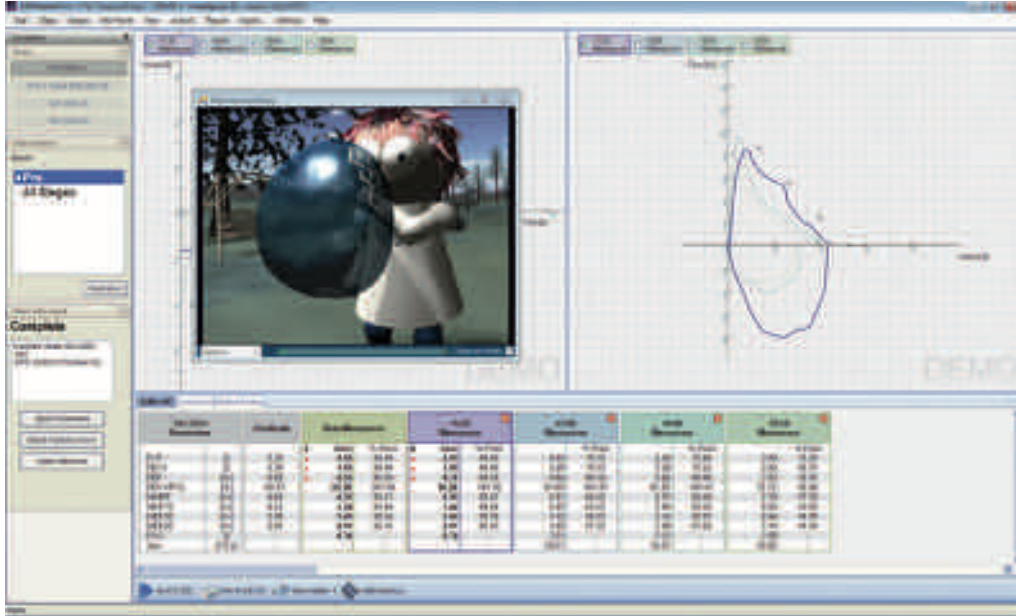
Blood pressure monitoring periods	24, 27, 48, 51 hours
Measurement method	Oscillometric stepwise deflation
Memory capacity	600 measurements
Accuracy	$\pm 3$ mm Hg or 2 % of measured value
Applicable cuffs	Small, standard and large sizes
Data transfer to computer	Via optical cable
Batteries (Rechargeable or alkaline)	AA, 2 $\times$ 1.5 V
Dimensions	98 $\times$ 69 $\times$ 29mm
Weight	190g without batteries
Standards	BHS, AAMI



# SPIROMETRY

## BTL CARDIOPOINT & DESKTOP SPIRO

### FAST OPERATION AT MINIMUM RUNNING COSTS



BTL CardioPoint Spiro  
FVC EXAMINATION WITH PAEDIATRIC ENCOURAGEMENT

#### PROFESSIONAL PNEUMOTACHOGRAPH

The BTL Spirometry is a modern, compact and ergonomically shaped spirometry solution for non-invasive pulmonary function testing according to the ATS/ERS 2005 guidelines. Minimal operational costs are ensured by reusable sensor that can be easily disinfected or sterilized. The unit features fidelity built-in sensors for automatic BTPS correction. Powerful diagnostics with over 50 measured parameters can significantly streamline daily routine. Interpreting changes in follow-up spirometry is very useful for occupational health. The solution is perfect for paediatric examinations, due to the paediatric predictions, Aex measurement and vivid 3D encouragement animations. The BTL Pneumotachograph can be used with a dedicated

spirometry unit, and results can be viewed on large colour touch screen display, or on your PC in the BTL CardioPoint software. The report can be printed out by the hi-resolution thermal printer or by an external USB printer. Those features allow the operator to customize the BTL Spirometry according to their needs.

#### CARDIOPOINT SPIROMETRY

- ◇ Spirometry trends for multiple parameters
- ◇ Configurable reports
- ◇ Customizable user interface
- ◇ Examination backup
- ◇ Network operation
- ◇ Paediatric encouragement animations

#### DESKTOP SPIROMETER

- ◇ Portable
- ◇ Large colour touch screen display
- ◇ Hi-Res thermal printer
- ◇ External USB printer
- ◇ Built-in accumulator
- ◇ Possibility to connect to external printer

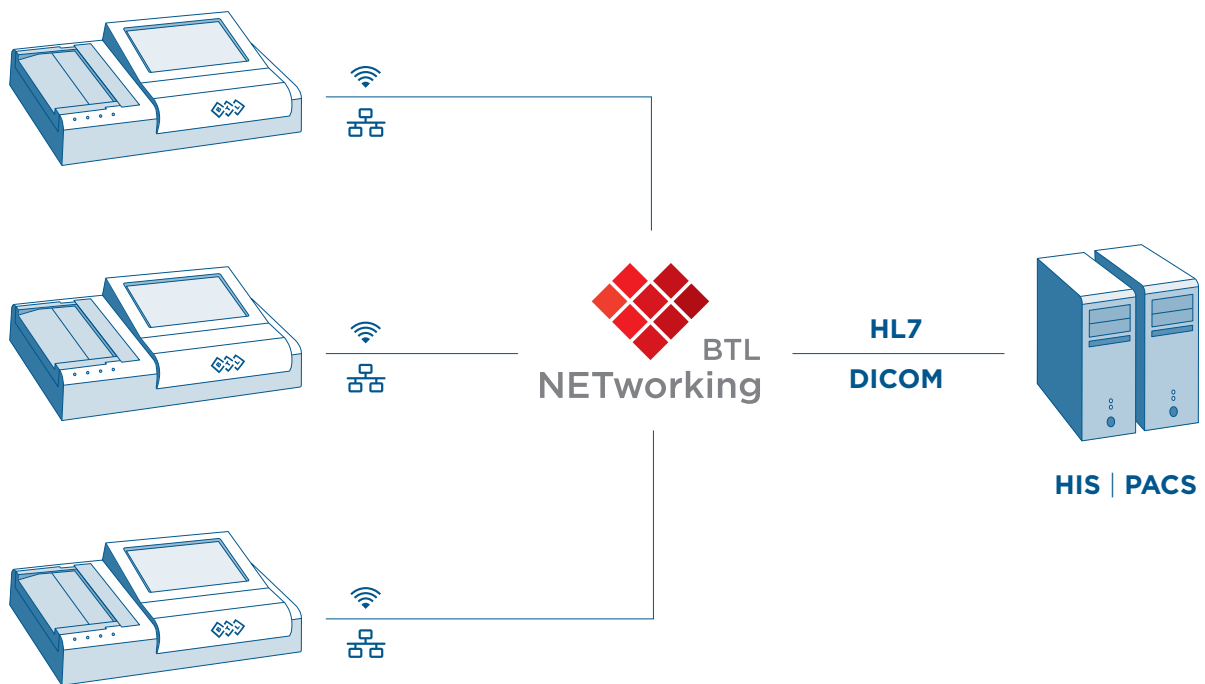


BTL-08 SPIRO PRO  
DESKTOP SPIROMETER WITH PNEUMOTACHOGRAPH

# NETWORKING

## PAPERLESS SOLUTION

### LAN OR WI-FI CONNECTION TO HOSPITAL INFORMATION SYSTEM



The healthcare industry's increased use of the electronic medical records has turned hospital networks and standardized archiving into important components in a patient treatment. The BTL NETWORKING is the digital solution for the hospital environment workflow and allows all the necessary operations needed to archive and retrieve data. It provides both wired and wireless connection to the Hospital Information System. Via

healthcare standards HL7 and DICOM/PACS, the BTL NETWORKING allows fully automatic ECG archiving for an instant, anytime and anywhere access. For easy implementation into the wide range of hospital information systems, the examination records can be also exported in PDF, XML or JPG formats. The BTL NETWORKING solution significantly improves examination workflow and helps to faster and more effectively care about patients.

#### MAIN FEATURES & BENEFITS

- ◇ Automatic archiving
- ◇ Instant anytime and anywhere access
- ◇ Correct patients identification
- ◇ Wireless communication
- ◇ HL7 / DICOM / PACS
- ◇ PDF, JPG, XML export
- ◇ Improving workflow
- ◇ Saving personnel time
- ◇ Increasing effectivity
- ◇ Reducing archiving costs
- ◇ All CardioPoint modalities supported

	BTL-08 Spiro Pro (BTL CardioPoint Spiro)	BTL-08 Spiro
<b>EXTERNAL UNIT</b>		
Display	colour LCD touch screen	colour LCD touch screen
Dimensions of display (mm)	118 × 89	118 × 89
Screen resolution (dots)	640 × 480	640 × 480
Keyboard	combined alphanumeric and functional, touch screen buttons	
Interface	RS232, USB	RS232, USB
Dimensions (mm)	330 × 270 × 74	330 × 270 × 74
Weight Approx. (kg)	3.2	3.2

<b>PRINTER</b>		
Paper width (mm)	112 / A4 trough USB	
Paper type	roll / A4 – office paper	
Printer type	thermal / external laser or ink. printer	
Printer resolution (dpi)	200 / 500 in Y / X axis	

<b>MEASUREMENT PARAMETER</b>		
BTPS correction	automatic	
Inspire / Expire	yes / yes	
Forced spirometry	FVC, Best FVC, FEV0.75, FEV1, Best FEV1, FEV3, FEV6, PEF, FEV0.75/FVC, FEV1/, FVC, FEV3/FVC, FEV6/FVC, FEV0.75/SVC, FEV1/SVC, FEV3/SVC, FEV6/SVC, PIF, FIVC, FIV1, MEF75, MEF50, MEF25, FEF75, FEF50, FEF25, MMEF, FET25, FET50, MIF75, MIF50, MIF25, PEFT, FIF50, FEF50/FIF50, FEF50/SVC, FEV0.75/ FEV6, FEV1/ FEV6, FIV1/FIVC, VEXT, Lung age BTL CardioPoint Spiro: Aex, FEV075/VC, FEV1/VC, FEV3/VC, FEV6/VC, FEF25-75, FEF50/VC, VEXT, T0/PEF, T200/PEF, VEXT/FVC	FVC, Best FVC, FEV1, Best FEV1, PEF, FEV1/FVC, FEV6/FVC, FIVC, FIV1, PIF, MEF75, MEF50, MEF25, Lung age
PRE/POST broncho-challenge test	yes	–
Relaxed spirometry	SVC, ERV, IRV, TV, IC, IVC	–
Maximum voluntary ventilation	MVV, MVVf, MRF	–
Predictive values	ECCS/ERS 1993, ECCS 1983, NHANES III, Knudson 1983, Knudson 1976, Roca 1986, CRAPO 1981, ITS, Perreira – Brazil, LAM, Gore 1995, Zapletal 1977; applicable for BTL-08 SpiroPro: GLI 2012, Hou Shu 1990, Jia Ju-cai 1990, Sun Bin 1990, Liu Shi-Wan 1990, Liu Guo-Hua 1990, Zhu Xi 1990, Ip 2006, Wu 1961, Polgar 1979, Wang Yang 2013	
Stored records	999	999
User defined profiles	unlimited	120
Interpretation	Enright, ATS, BTS, Gold	
Child Incentive	yes	yes

<b>TECHNICAL SPECIFICATIONS</b>		
Flow range (litres/s)	16 l/s (inspire/expire)	
Accuracy (50 ml/s to 16 l/s)	± 3 % or 50 ml (whichever is greater)	
Volume ranges (litres)	0.025 to 8 litres	
Accuracy (0.025 to 8 l)	± 5% or 50 ml (whichever is greater)	
Flow resistance	< 79 Pa / l/s	

<b>BTPS CORRECTION</b>		
Temperature sensor	+ 10 °C to + 40 °C	
Accuracy	± 2 %	
Relative humidity sensor	0 to 100 % RH	
Accuracy	± 4 % for 25 °C, 30–80 % RH	
Mains supply	115 V / 230 V, 50–60 Hz, 40 VA	
Accumulator capacity	90 minutes	
Charging time	10 hours (if completely discharged)	
ADC resolution	15 bits	
Sampling frequency	1000 Hz	

## BTL-08 LC Plus

## BTL-08 LC

## BTL-08 LT Plus

## BTL-08 LT

## EXTERNAL UNIT

Display	colour touch screen 8.4"	colour touch screen 8.4"	colour touch screen 5.7"	colour touch screen 5.7"
Dimensions of display (mm)	171 × 128	171 × 128	118 × 89	118 × 89
Screen resolution (dots)	640 × 480	640 × 480	640 × 480	640 × 480
Keyboard	combined alphanumeric and functional, touch screen buttons			
Electrode contact control	indication of contact of each electrode			
Interface	RS 232, USB, LAN (optional), WiFi (optional)	RS 232, USB, LAN (optional), WiFi (optional)	RS 232, USB, LAN (optional), WiFi (optional)	RS 232, USB, LAN (optional), WiFi (optional)
Dimensions (mm)	407 × 312 × 146	407 × 312 × 125	407 × 312 × 146	407 × 312 × 125
Weight Approx. (kg)	5.9	5.7	5.9	5.7

## PRINTER

Paper width (mm)	210	210	210	210
Paper type	roll, fax, A5 z-folded, A4 z-folded / A4-office paper	roll, fax, A5 z-folded / A4-office paper	roll, fax, A5 z-folded, A4 z-folded / A4-office paper	roll, fax, A5 z-folded / A4-office paper
Print type	thermal / external laser or ink. printer			
Paper speed (mm/s)	5, 10, 25, 50	5, 10, 25, 50	5, 10, 25, 50	5, 10, 25, 50

## SIGNAL PROCESSING

Number of channels	12	12	12	12
Number of leads	12	12	12	12
Displayed leads	3, 6, 12	3, 6, 12	3, 6, 12	3, 6, 12
Printed leads	3, 4, 6, 12, 3×4+1, 3×4+2, 3×4+3, 4×3+1, 6×2+1, 6×2+2	3, 4, 6, 12, 3×4+1, 3×4+2, 3×4+3, 4×3+1, 6×2+1, 6×2+2	3, 4, 6, 12, 3×4+1, 3×4+2, 3×4+3, 4×3+1, 6×2+1, 6×2+2	3, 4, 6, 12, 3×4+1, 3×4+2, 3×4+3, 4×3+1, 6×2+1, 6×2+2
Transmission in automatic mode	real-time, synchronic	real-time, synchronic	real-time, synchronic	real-time, synchronic
Pacemaker detection	yes (dedicated circuit)	yes (dedicated circuit)	yes (dedicated circuit)	yes (dedicated circuit)
Sensitivity (mm/mV)	2.5, 5, 10, 20	2.5, 5, 10, 20	2.5, 5, 10, 20	2.5, 5, 10, 20
Stored records (10-sec long strips)	250 (minimum) 400 (typical)	250 (minimum) 400 (typical)	250 (minimum) 400 (typical)	250 (minimum) 400 (typical)
Long ECG recording 1 lead / 2 leads (min)	10/10	10/10	10/10	10/10

## DIGITAL FILTERS

Adaptable mains filter (Hz)	50–60	50–60	50–60	50–60
Muscle tremor filters (Hz)	35, 25	35, 25	35, 25	35, 25
Baseline filters (Hz)	0.05 (3.2 s), 0.11 (1.5 s), 0.25 (0.6 s), 0.50 (0.3 s), 1.50 (0.1 s), splines			
Automatic	auto-adaptive	auto-adaptive	auto-adaptive	auto-adaptive

## USER-DEFINED PROFILES

No. of profiles for auto. and man. mode	unlimited	unlimited	unlimited	unlimited
No. of profiles for long ECG recording	unlimited	unlimited	unlimited	unlimited

## SUMMARY OF AVAILABLE OPTIONS

Extension of channels	–	–	–	–
Diagnostics (includes: averaging, analysis, text interpretation)	optional	optional	optional	optional
PC connection with software BTL CardioPoint-ECG	optional	optional	optional	optional
Ergometry with software BTL CardioPoint-Ergo	optional	optional	optional	optional
WiFi & LAN communication with PC	optional	optional	optional	optional

## TECHNICAL SPECIFICATIONS

Mains supply	100 V–230 V, 50–60 Hz
Frequency response	0.05 Hz–170 Hz
Digital resolution	3.9 µV
A/D conversion	13 bits
Sampling frequency ECG	2000 Hz
Pacemaker detection	100 µs / Dedicated circuit with 40000 Hz detection function
Dynamic range	15.9 mV
Polarisation voltage	± 400 mV
Max. consistent voltage	± 5 V
Input impedance	> 20 MOhm
Common mode rejection	> 100 dB
Accumulator capacity	automat: up to 50 prints manual: up to 35 minutes of printing signal monitoring: up to 120 minutes
Charging time	approx. 4–6 hours (if completely discharged)



	BTL-08 MT Plus	BTL-08 MD3/MD	BTL-08 SD6	BTL-08 SD1/SD3
<b>EXTERNAL UNIT</b>				
Display	colour touch screen 5.7"	graphic display	graphic display	graphic display
Dimensions of display (mm)	118 × 89	70 × 36	70 × 36	70 × 36
Screen resolution (dots)	640 × 480	128 × 64	128 × 64	128 × 64
Keyboard	combined alphanumeric and functional touch screen buttons	combined alphanumeric and functional	combined alphanumeric and functional	combined alphanumeric and functional
Electrode contact control	indication of contact of each electrode			
Interface	RS 232, USB, LAN (optional), WiFi (optional)	RS232, USB reduction	RS232, USB reduction	RS232, USB reduction
Dimensions (mm)	330 × 270 × 74	330 × 270 × 74	276 × 168 × 74	276 × 168 × 74
Weight Approx. (kg)	3.2	3.2	2	2

<b>PRINTER</b>				
Paper width (mm)	112	112	58	58
Paper type	roll / A4-office paper	roll	roll	roll
Print type	thermal / external laser or ink printer	thermal	thermal	thermal
Paper speed (mm/s)	5, 10, 25, 50	5, 10, 25, 50	5, 10, 25, 50	5, 10, 25, 50

<b>SIGNAL PROCESSING</b>				
Number of channels	3, 6, 12	3/6, 12	3, 6	1/3
Number of leads	12	12	12	12
Displayed leads	3, 6, 12	1	1	1
Printed leads	3, 4, 6, 12, 3×4+1, 3×4+2, 3×4+3, 4×3+1, 6×2+1, 6×2+2	3/3, 6, 12	1, 3, 6	1/1, 3
Transmission in automatic mode	real-time, synchronic	real-time, synchronic	real-time, synchronic	real-time, synchronic
Pacemaker detection	yes	yes	yes	yes
Sensitivity (mm/mV)	2.5, 5, 10, 20	2.5, 5, 10, 20	2.5, 5, 10, 20	2.5, 5, 10, 20
Stored records (10-sec long strips)	250 (minimum) 400 (typical)	—/15	6	6
Long ECG recording 1 lead / 2 leads (min)	10/10	9/no	9/no	9/no

<b>DIGITAL FILTERS</b>				
Adaptable mains filter (Hz)	50–60	50–60	50–60	50–60
Muscle tremor filters (Hz)	35, 25	35, 25	35, 25	35, 25
Baseline filters (Hz)	0.05 (3.2 s), 0.11 (1.5 s), 0.25 (0.6 s), 0.50 (0.3 s), 1.50 (0.1 s), splines	0.05 (3.2 s), 0.11 (1.5 s), 0.25 (0.6 s), 0.50 (0.3 s), 1.50 (0.1 s)	0.05 (3.2 s), 0.11 (1.5 s), 0.25 (0.6 s), 0.50 (0.3 s), 1.50 (0.1 s)	0.05 (3.2 s), 0.11 (1.5 s), 0.25 (0.6 s), 0.50 (0.3 s), 1.50 (0.1 s)
Automatic	auto-adaptive	—	—	—

<b>USER-DEFINED PROFILES</b>				
No. of profiles for auto. and man. mode	unlimited	1/5	3	3
No. of profiles for long ECG recording	unlimited	—/5	3	3

<b>SUMMARY OF AVAILABLE OPTIONS</b>				
Extension of channels	—	3-12 / —	—	1-3-6 / 3-6
Diagnostics (includes: averaging, analysis, text interpretation)	optional	optional	optional	—/optional
PC connection with software BTL CardioPoint-ECG	optional	optional	optional	—/optional
Ergometry with software BTL CardioPoint-Ergo	optional	optional	optional	—/optional

	BTL-08 M-line	BTL-08 S-line
<b>TECHNICAL SPECIFICATIONS</b>		
Mains supply	115 V/230 V, 50–60 Hz	115 V/230 V, 50–60 Hz
Frequency response	0.05 Hz–170 Hz	0.05 Hz–150 Hz
Digital resolution	3.9 µV	3.9 µV
A/D conversion	13 bits	13 bits
Sampling frequency ECG	2000 Hz	2000 Hz
Pacemaker detection	100 µs / Dedicated circuit with 40000 Hz detection function	100 µs / Dedicated circuit with 40000 Hz detection function
Dynamic range	15.9 mV	15.9 mV
Polarisation voltage	± 400 mV	± 400 mV
Max. consistent voltage	± 5 V	± 5 V
Input impedance	> 20 MOhm	> 20 MOhm
Common mode rejection	> 98 dB	> 100 dB
Accumulator capacity	automat: up to 30 prints manual: up to 30min of printing signal monitoring: up to 90min (MT Plus), up to 75min (MD, MD3)	automat: up to 30 prints manual: up to 35min of printing signal monitoring: up to 75min
Charging time	max. 4-6 hours (if completely discharged)	max. 3 hours (if completely discharged)

