REICHL UND PARTNER

Answer fax

Yes, I am interested in the innovative products from SCHILLER. Please send me more information about:

Resting ECG:
- ❑ CARDIOVIT AT-1
- ❑ CARDIOVIT AT-1 smartprint
- ❑ CARDIOVIT AT-101
- ❑ CARDIOVIT AT-2
- ❑ CARDIOVIT AT-2 plus

Exercise ECG (Multitasking Systems):
- ❑ CARDIOVIT AT-10 plus
- ❑ CardioLaptop® AT-110
- ❑ CardioLaptop® PT-160
- ❑ CARDIOVIT AT-102
- ❑ CARDIOVIT CS-200
- ❑ CARDIOVIT AT-104 PC
- ❑ CARDIOVIT AT/SP-10
- ❑ Ergometry

Spirometry:
- ❑ SPIROVIT SP-1
- ❑ SPIROVIT SP-2
- ❑ CS-200 Ergo-Spiro
- ❑ PC Spirometry

Monitoring:
- ❑ ARGUS PRO System
- ❑ PHYSIOGARD TM/CS 910
- ❑ Pulse Oximeter OX-2
- ❑ MRI Compatible Monitoring
- ❑ ARGUS LCM Monitor

Defibrillators/Monitoring:
- ❑ FRED® (First Responder External Defibrillator)
- ❑ FRED® easy
- ❑ FRED® easyport
- ❑ DEFIGARD (1002, 3002 IH, 6002)

- ❑ **Holter ECG** MT-101/200
- ❑ **Telemedicine:** MT-120/220 and AT-4 TELE
- ❑ SEMA-200 **Data Management System**
- ❑ BR-102 **Blood Pressure Recorder**
- ❑ MS-3 **Pocket ECG**
- ❑ VAC-100 **Vacuum Electrode System**
- ❑ ECG & Spiro **Accessories**

Name: _____

Hospital: _____

Position: _____

Address: _____

_____

Phone (daytime): _____

Fax: _____

e-mail: _____

Resting ECG
Exercise Testing
Vector Cardiography

SEMA

Late Potential Analysis
QT Dispersion

Spirometry
Ergospirometry

Holter ECG

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12/03

Part no.: 2.500222

Your specialist:

SCHILLER

www.schiller.ch

The Art of Diagnostics

Headquarters: SCHILLER AG, Altgasse 68, CH-6341 Baar, Switzerland, Tel.: +41 41 766 42 42, Fax: +41 41 761 08 80, e-mail: sales@schiller.ch

CARDIOVIT CS-200

Simply exceeds your expectations:

- Resting ECG
- Exercise ECG
- 24-h Holter ECG
- Spirometry
- Ergospirometry

SCHILLER

www.schiller.ch

The Art of Diagnostics

Success through Innovation!

CARDIOVIT CS-200

The CARDIOVIT CS-200 is a multitasking system solution, combining proven diagnostic capabilities with the modern computer technology and the most widely accepted user-interface.

The CARDIOVIT CS-200 is the key to complete diagnostic services, including:

- 12-channel Resting ECG
- Automatic ECG measurements and interpretation (adult and pediatric)
- Vector Cardiography
- Pacemaker measurement
- QT Dispersion
- 12-channel fulldisclosure Exercise ECG, with ST monitoring and rhythm monitoring
- 24-h ECG Holter
- Fully integrated data management system
- Connection to network systems
- Resting rhythm recording
- Analysis of Ventricular Late Potentials
- Spirometry
- Ergospirometry

The open system architecture allows the implementation of new programs, future system expansion and network integration.

Hardware Details

CD-ROM drive: an easy way to update the system software DVD RAM Drive (optional).

Full-size keyboard with integrated trackball and diskette drive.

Direct function keys provide single button operation for immediate ECG printouts.

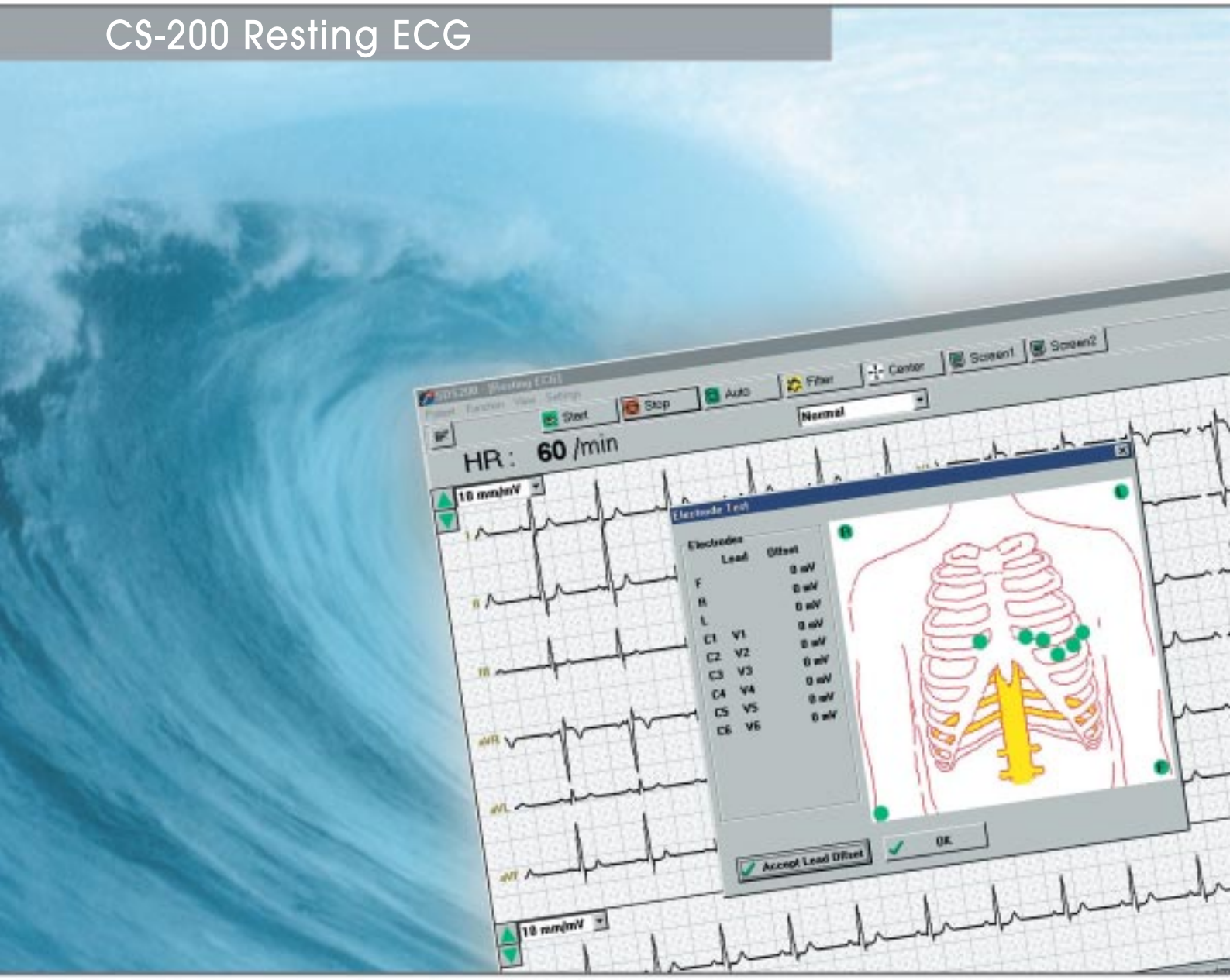
Integrated thermal printer or external printer of your choice.

Filter

- SCHILLER Powerline Filter (SPF): Distortion-free suppression of superimposed 50 or 60 Hz sinusoidal interferences by adaptive digital filtering
- SCHILLER Smoothing Filter (SSF) / SCHILLER Myogram Filter (SMF-muscle tremor filter): 25 Hz/35 Hz low pass smoothing filter to suppress muscle tremor and high-frequency noise, without bothering the QRS complex
- SCHILLER Baseline Stabilizer (SBS): Filter to suppress or greatly reduce baseline fluctuations without changing the measurement values (for Resting and Exercise ECGs)

The innovative ECG System for the Diagnostic Professional!

CS-200 Resting ECG



Good Lead Quality saves Time

The exceptionally high digital sampling rate (2000 samples per second) recognizes every nuance of an ECG for maximum accuracy.

The CARDIOVIT CS-200 produces perfect ECG recordings every time by utilizing SCHILLER's unique filter technology and electrode hook-up test.

Connect with the Future

The CARDIOVIT CS-200 can be integrated directly into a user network through standard technologies allowing for central archiving and data access from various locations.

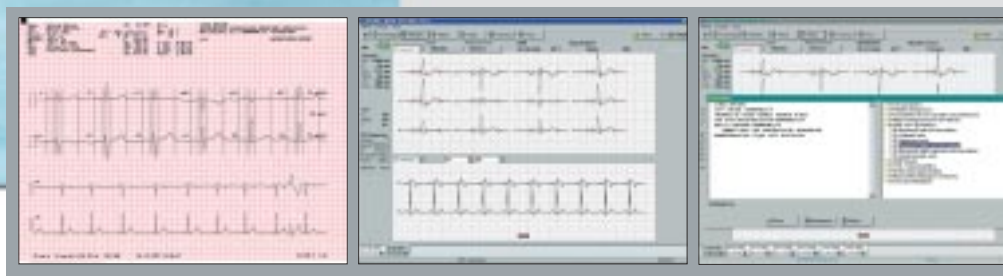
Ready to go at all Times

The integrated back-up battery guarantees basic system operation during power failures or in emergency situations. Automatic ECG recording and real-time printouts are available without delay.

The CARDIOVIT CS-200 diagnostic workstation combines proven ECG diagnostic performance with the most advanced computer technology available.

- **Built-in, full page thermal printer**
- **Real-time ECG recording**
- **Integrated data management system SEMA-200**
- **Windows™ user-interface**
- **Network capabilities**

The unique modularity of the CARDIOVIT CS-200 allows physicians to configure the system to meet their individual needs for professional diagnostics. In addition to resting ECG, the CARDIOVIT CS-200 may be utilized to perform exercise testing and Holter monitoring with the highest level of user comfort and reliability.



The CARDIOVIT CS-200's built-in thermal printer records 3, 6, or 12 channels simultaneously in real-time. The outstanding print resolution and wide selection of print formats make each report truly impressive.

Reports may even be generated on the optional laser printer using plain paper. Each CARDIOVIT CS-200 comes with automatic measurements for all 12 standard leads.

The optional interpretation program generates automatic adult and pediatric interpretation statements. Interpretative statements can easily be edited before printing or archiving. Global measurements points can also be edited.

Exercise Testing
for the Professional!

CS-200 Exercise Testing

View after exercise

Thermo printout

Averaged QRS complex

Access the World of PC Technology

An electrocardiograph with the properties of a personal computer!

- Large color screen with XGA resolution for paperless operation
- Windows™ operating system
- Data management solution SEMA-200 for archiving and management of data
- Open system architecture for networking
- Common printer interfaces for documentation on standard (A4) paper
- Selection of built-in storage solutions (hard disk, diskette, CD-R/RW (option) etc.)
- Integration with existing management and information systems

The CARDIOVIT CS-200 – the exemplary Exercise Testing Solution

The CARDIOVIT CS-200's exercise testing module fully demonstrates the system's capabilities. The large, color display provides clear monitoring throughout the entire test. Vital information at-a-glance for maximum patient safety and test reliability. Printouts are generated at pre-programmed intervals or at the simple push of a button.

The CARDIOVIT CS-200 exercise testing system combines SCHILLER's proven ECG know-how with today's most modern, state-of-the-art personal computer innovations.

Covering the full Spectrum of Electrocardiography

The CARDIOVIT CS-200 offers the performance of a conventional exercise testing system:

- **Built-in, full-size thermal printer for immediate real-time printouts**
- **No start-up delay – instant ECG reports at the push of a button**
- **Quick recording and printouts of ECGs**
- **Precise ECG measurements**
- **RS-232 and parallel interfaces**
- **Emergency ECG**

***) Option: Blood Pressure Measurement**

BP-200 is a non-invasive Stress Test Blood Pressure Monitor, designed to automatically measure and display a patient's systolic and diastolic pressures at preset intervals, or upon demand of the operator.

The Convenience of automated Exercise Testing

The CARDIOVTI CS-200 controls a selection of peripheral equipment (ergometers, NIBP devices and treadmills) through integrated interface protocols. Standard, and user defined exercise protocols are stored. These can be changed according to the situation and individual preferences as desired. Manual intervention to modify an ongoing protocol is possible at any time. From the beginning, the exercise test runs automatically so the user is able to fully concentrate on the patient without distraction.

Continuous ST Analysis

The EXEC analysis program computes continuous ST measurement for all 12 leads.

High Level of Recording Quality when it counts

Use of multiple digital filters, such as SBS SCHILLER Baseline Stabilizer or SSF SCHILLER Smoothing Filter, reduces muscle artifact and baseline wander without changing the tracing fidelity.

ECG Memory

All exercise tests are stored in the form of a detailed final protocol. The complete test is stored. The CARDIOVIT CS-200 provides tools for posttest diagnostics, measurements and/or documentation of the recordings.

Managing Information

SEMA-200 Data Management

Patient record | Serial comparison | Search

Simple to operate and learn

SEMA-200 is designed for daily use. Symbols, accessible by mouse, enable for quick learning and intuitive operation.

Data Collection

SEMA-200 is installed directly onto the CARDIOVIT CS-200 workstation. Data can also be transmitted from any SCHILLER product equiped with a communication interface.

Data Management

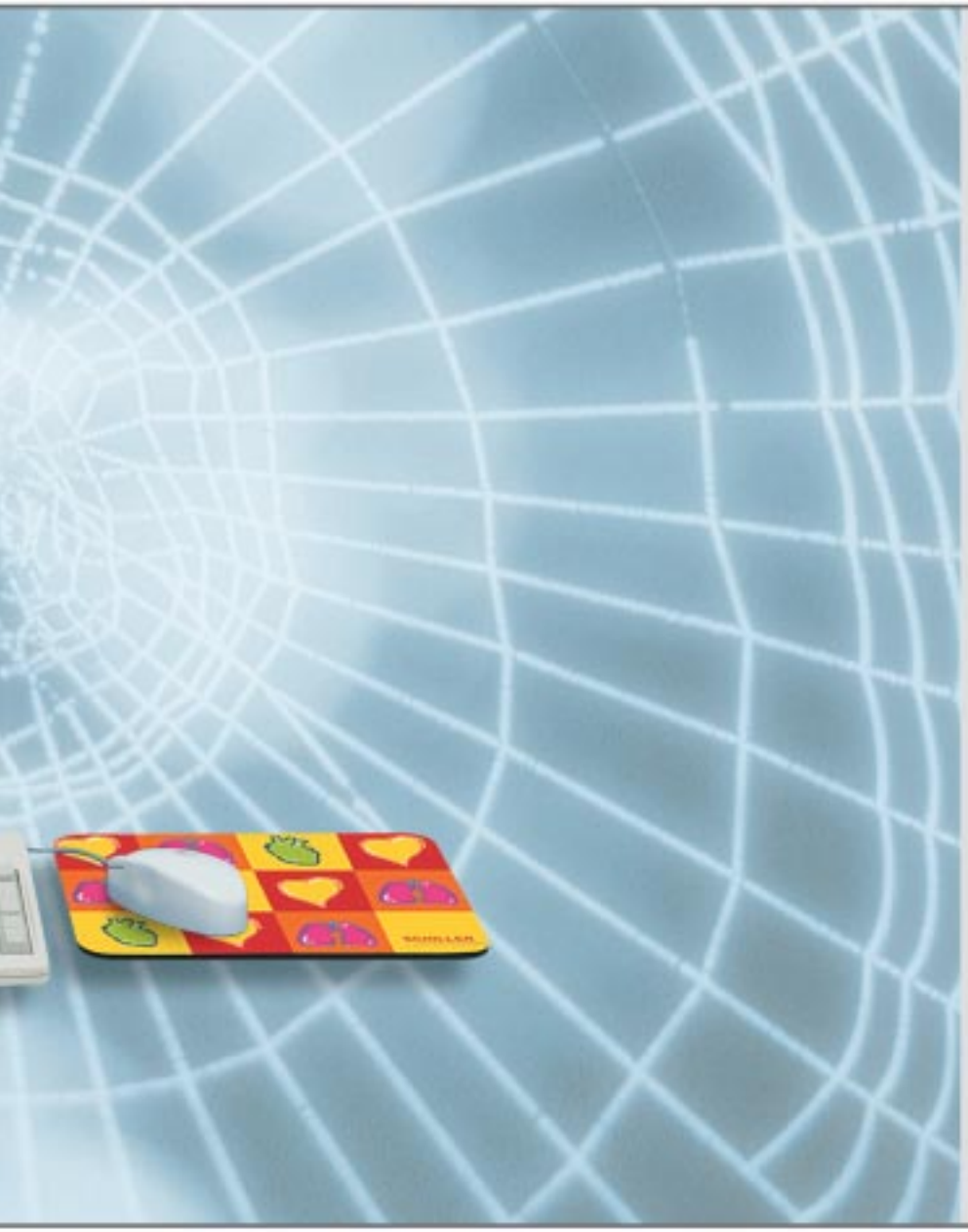
Collected test data can easily be managed by patient name or ID, type of recording, including date and time or administrative status (validated, printed, sent, archived etc.).

Serial Test Comparison

Multiple tests of the same patient can be compared side by side, an ideal tool for monitoring patient history or the effectiveness of therapy. Resting ECG only!

Archiving

SEMA-200 stores acquired data forever and in any quantity. The program's compatibility with almost any current PC storage techno-



SCHILLER's SEMA-200 data management program provides comprehensive management of diagnostic data from:

- **Resting ECG**
- **Exercise Testing**
- **QT Dispersion**
- **Spirometry**
- **Ergospirometry**
- **Analysis of Ventricular Late Potentials**
- **Vector Cardiography**
- **Holter ECG**

The program contains the following functions:

- **Validation with comprehensive editing tools**
- **Serial comparison**
- **Batch processing**
- **Archiving**
- **Network connection/integration**
- **Data communication (option with SEMACOM)**
- **Import/export for HIS integration**

SEMA-200 is a Windows™ NT/2000/xp compatible application and may be run on the CARDIOVT CS-200 workstation, in a network or a stand-alone personal computer.

logy makes it extremely flexible to fit a specific need. Storage on the internal hard disk or removable storage systems (optical disk, cartridge etc.) is possible.

Networking

SEMA-200 fits seamlessly into networks providing access to data from different sites. Passwords and access limitations protect the unauthorized manipulation of stored information. SEMA-200 runs on all current PC-based network solutions.

Data Transmission

SEMA-200 communicates via direct cable or telephone modem to all SCHILLER equipment via the RS-232 interface. Data files can also be sent via the Internet.

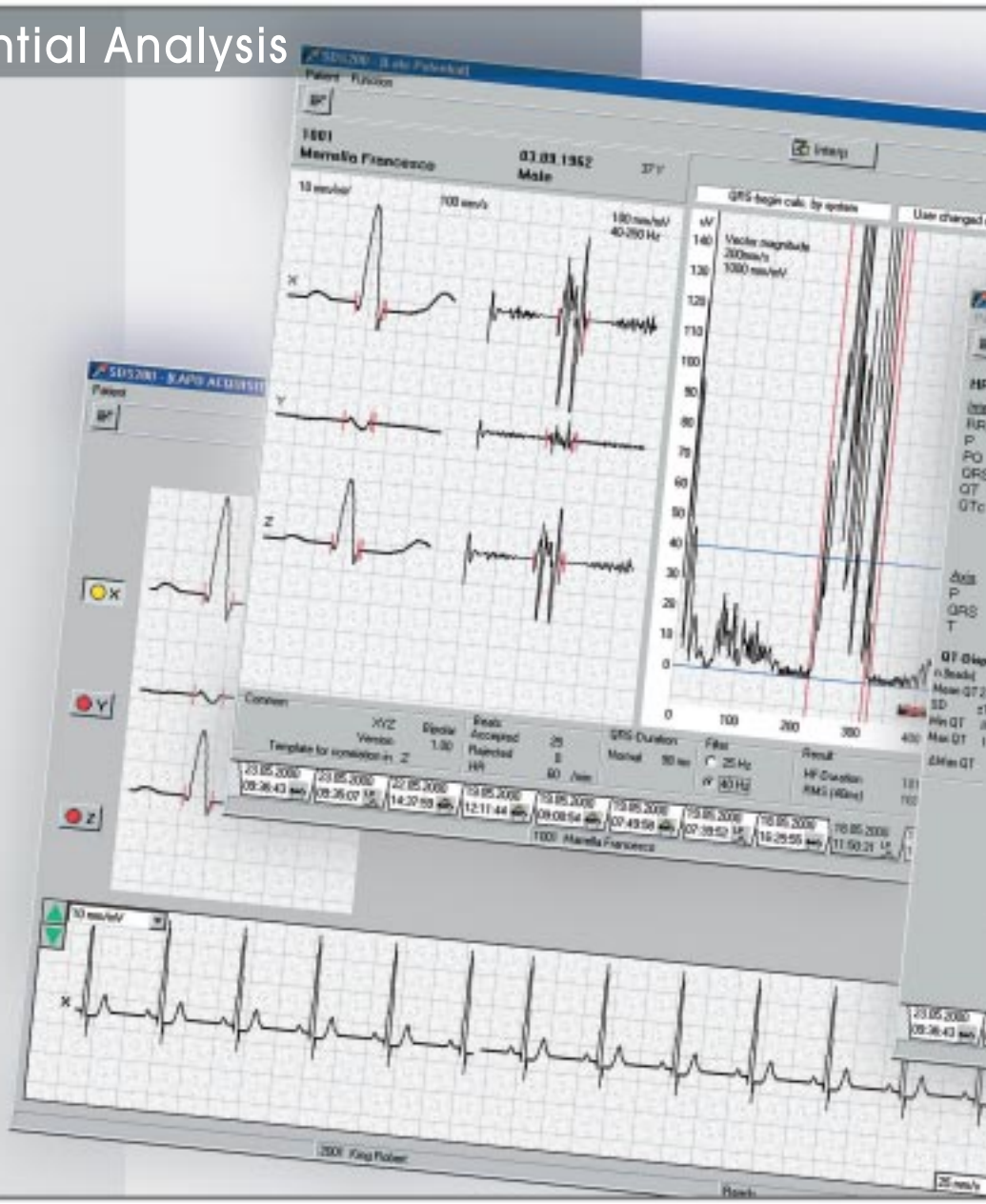
Open System Architecture

SEMA-200 is ready to be integrated into existing information systems.

Estimating Arrhythmic Risk!

CS-200 Late Potential Analysis

- **Recognise Ventricular Late Potentials thanks to signal averaging and high pass filtering**
- **Gain time thanks to straightforward measurement data recording; a single key stroke suffices**
- **Comprehensive and clear evaluation within the shortest possible time**
- **QRS start and end of vector amplitude can be edited on-screen**
- **The optimum reference ECG lead for signal averaging can be defined automatically or can be selected by the user**



Particularly for patients who have suffered a myocardial infarction, micro-potentials after the QRS complex indicate a higher risk of sudden cardiac death. The existence of Ventricular Late Potentials indicates an arrhythmic substrate that can cause re-entry circuits and may result in potentially lethal arrhythmia.

With the SCHILLER Late Potential analysis, it is possible to measure in Frank or in bipolar leads. The analysis is made within the time domain.

Signal averaging* on a selectable quantity of heartbeats improves the signal/noise ratio. Together with a matured **high-pass filter technique*** it enables recognition of the Ventricular Late Potentials.

The following **parameters*** are determined automatically:

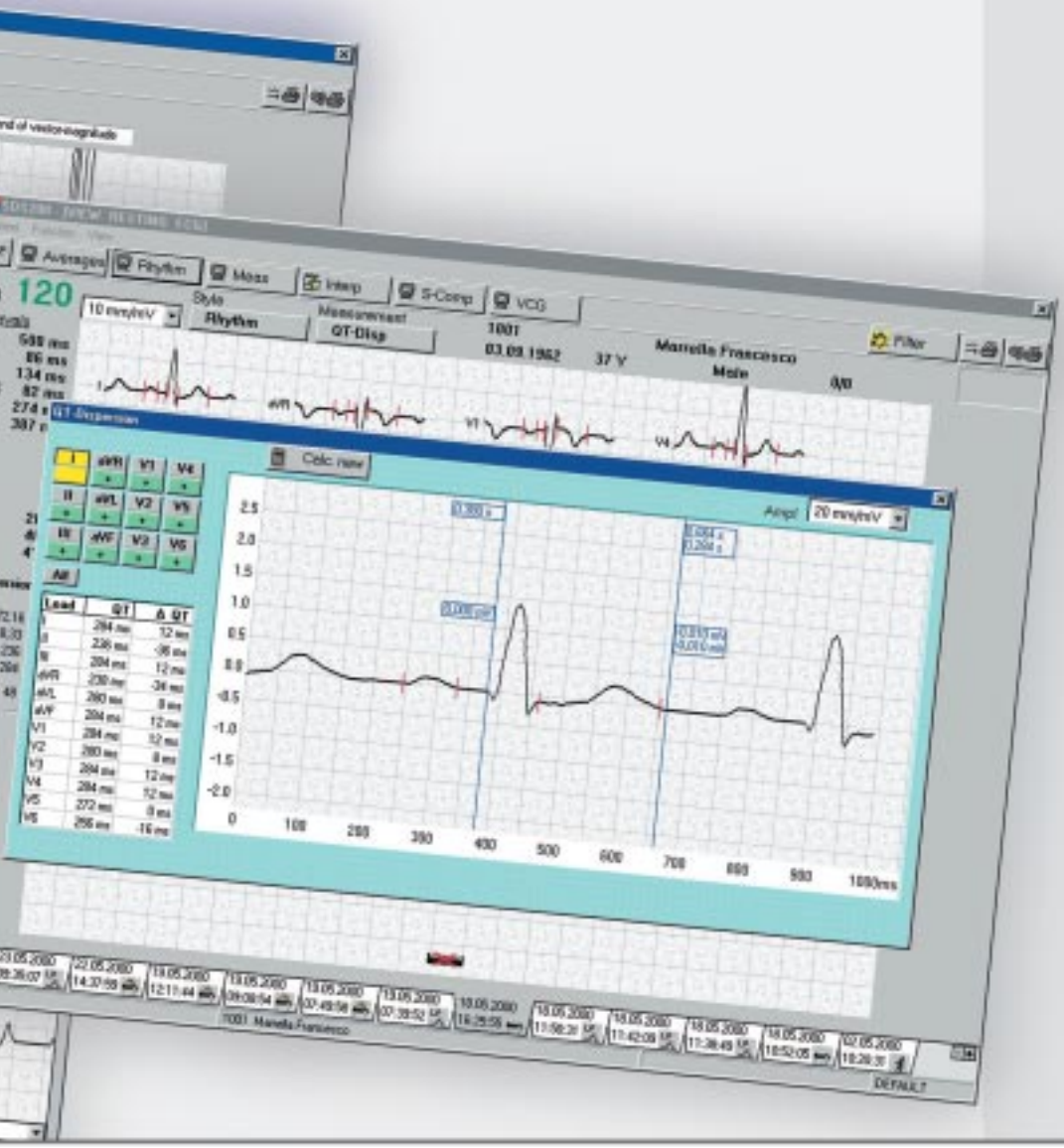
- High frequency QRS interval
- The RMS value of the last 40 msec.
- The portion of vector amplitudes below 40 µV (LAS: low amplitude signal)

The limit values of these parameters identify whether or not a patient has Ventricular Late Potentials and are given in the acronyms of the interpretation.*

* The SCHILLER Late Potential analysis conforms to standards issued by the Task Force Committee of the European Society of Cardiology, the American Heart Association and the American College of Cardiology, in accordance with the publication entitled "Standards for Analysis of Ventricular Late Potentials Using High-Resolution or Signal-Averaged Electrocardiography", G. Breithard, M.E. Cain, N. El-Sherif, N. Flowers, V. Hombach, M. Janse, M.B. Simson, G. Steinbeck. JACC 1991; Vol. 17 (5): 999–1006

Non-invasive Method for Identifying the Risk of Lethal Arrhythmia!

CS-200 QT Dispersion



Using the CARDIOVIT CS-200 or other SCHILLER ECG machines and the SEMA-200 diagnostic systems, it is possible to determine the spatial QT dispersion in the resting ECG. The software calculates the QT interval in each ECG lead.

The average of the QT intervals and the standard deviation of all QT intervals are calculated from the mean value.
In addition, the minimum and maximum QT intervals and the lead in which they occur are specified.

The program also calculates the difference of the QT interval in each lead to the calculated average QT interval (ΔQT). And finally, the difference between the maximum and minimum QT interval is also analysed as Δmax QT. This is considered as particular indicator for QT dispersion.

The QT times can be corrected manually for all leads.

QT dispersion indicates how inhomogeneous the ventricular repolarisation is. The greater the QT dispersion, the more inhomogeneous the ventricular repolarisation is and the greater the risk for a sudden cardiac death of the patient.

QT dispersion analysis can be used as a further non-invasive method – in addition to Late Potential analysis and heart rate variability – for patients with an increased risk of life-threatening arrhythmia.

Recognise the non-invasive risk indicators of increased arrhythmic risk using the Late Potential analysis and QT dispersion analysis programs obtainable from SCHILLER – both can be run on the CARDIOVIT CS-200. Examine heart rate variability using the 24-hour MT-101/200 ECG analysis system.

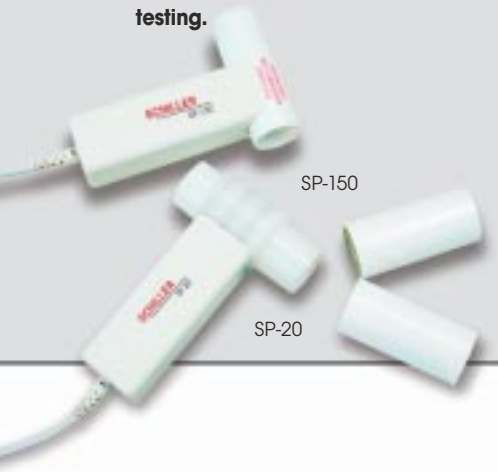
The Innovative Diagnostic System!

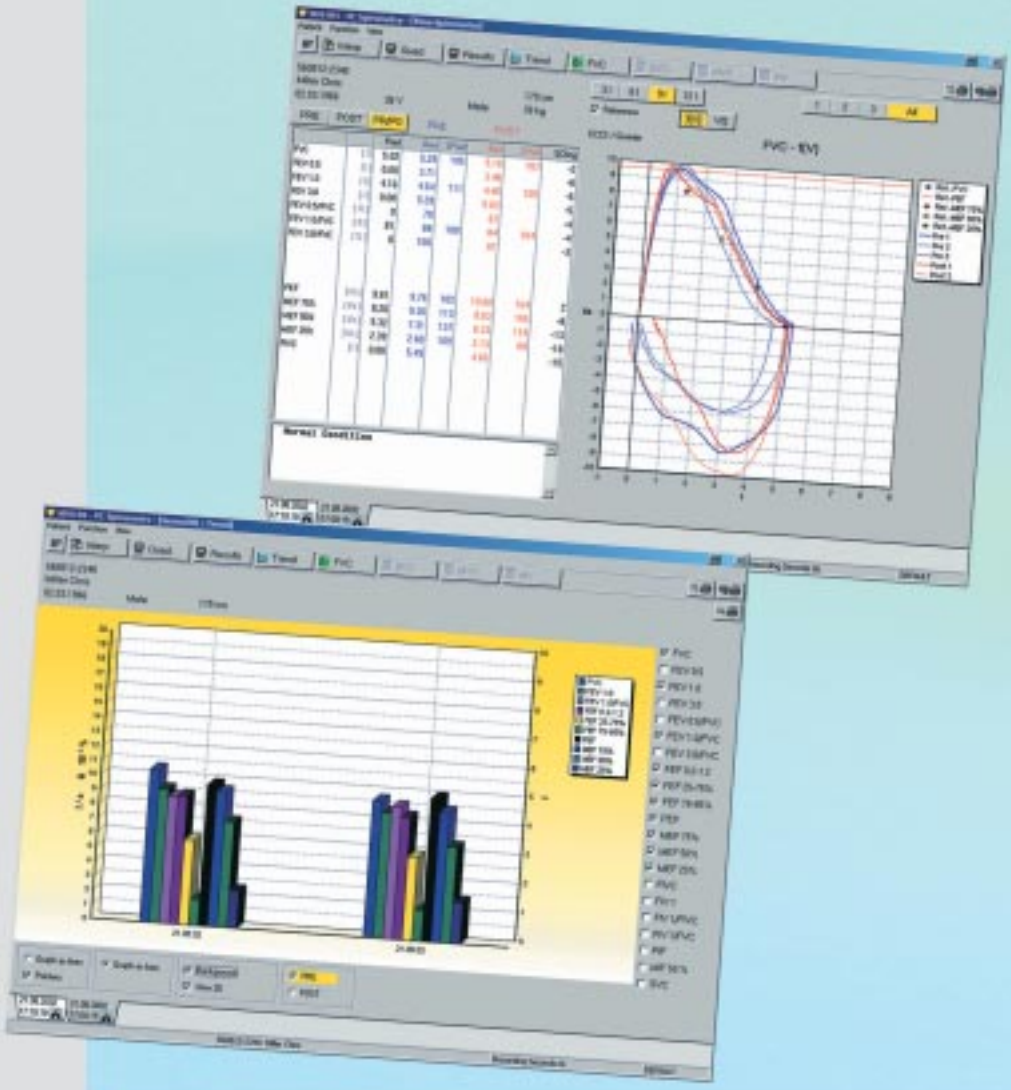
CS-200 Spirometry

In addition to:

- **12-channel Resting ECG**
- **12-channel Exercise ECG**
- **24-hour Holter ECG**
- **QT dispersion**
- **Vector Cardiography**
- **Late Potential analysis**
- **Integrated data management for all the above examinations**
- **The diagnostic station CARDIOVIT CS-200 now also offers pulmonary function testing as an option. This new possibility completes the clinical requirements of non-invasive diagnostic.**

As always, SCHILLER uses the latest technology to simplify pulmonary function testing.





Comprehensive Pulmonary Function Testing

Four measurement programs for inspiratory and expiratory tests are available: FVC, SVC, MVV and MV, with nominal/actual differences calculated automatically and pre/post medication comparisons to aid diagnostics.

Easy Operation

One button push starts the tests. Tests can be carried as many times as desired with the results clearly displayed on the large monitor. The flow volume trace is shown in real time and in color.

Storage and Printing

Pulmonary function data is saved using the on-board data management SEMA-200; all previous examinations are easily accessed and viewed on the monitor.

Interpretation/Diagnosis

The software gives diagnosis indications when requested. You can select firm terminology from a data bank (acronyms) and extend it with your own text.

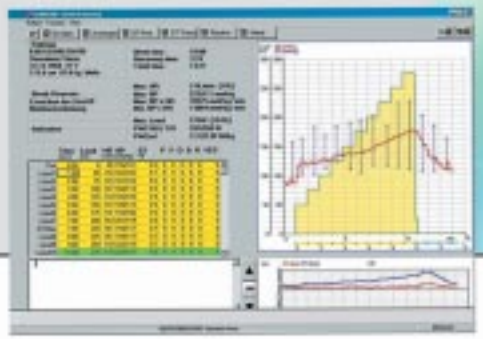
Long-Term Comparisons/Trends

When a series of recordings from one patient is available, trend traces can be shown.

CS-200 Ergo-Spiro

All in one:

- **Simultaneous presentation of 12 ECG and spirometry flow curves with possibility to compare all parameters**
- **Real Breath-by-Breath gas determination of metabolic and hemodynamic parameters during rest and exercise tests**
- **Bi-directional flow sensor insensitive to moisture**
- **Two monitors for the testing system**
- **Limit monitoring of any parameter with alarm functions**
- **Automatic control of ergometer, using configurable profiles**
- **Compact system**
- **Economical, as all accessories are sterilizable and reusable**
- **Network ability of CARDIOVIT CS-200 Ergo-Spiro**



A Multitude of Functions – all in one Device!

The CARDIOVIT CS-200 Ergo-Spiro from SCHILLER: The complete function analysis of heart, lung, blood circulation and metabolism. With this all areas of cardiopulmonary diagnostics are covered. Whether for cardiology, pneumology, sports and industrial medicine, this multifunctional exercise testing system is the solution for every need.

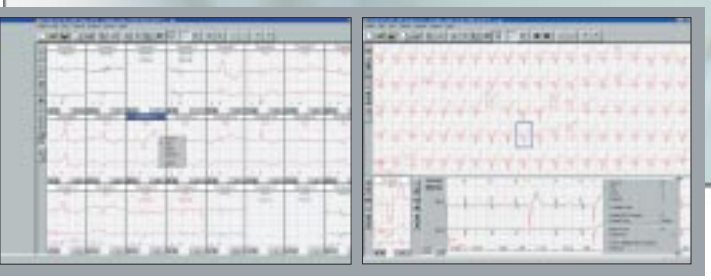
Breath-by-Breath Analysis!

Every breath and every heartbeat is analyzed according to the individually set parameters and shown on the monitors in real time. With its monitor the one-of-a-kind CARDIOVIT CS-200 Ergo-Spiro allows the direct visual comparison of ergospirometrical and ECG data! Various interfaces warrant perfect data exchange of the saved values to Patient Data Management Systems (PDMS).

Template Matching in the MT-101/200 long-term ECG System

MICROVIT MT-101/200 Holter System

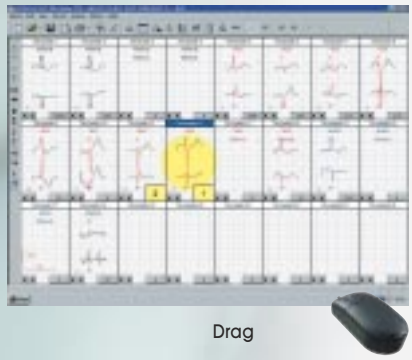
Original size



The MT-200 program classifies automatically and with very high reliability 20 different ventricular and supraventricular events (couplets, triplets, bigeminy, trigeminous, absolute arrhythmia, tachycardia etc.). During template matching QRS complexes with the same shape are automatically grouped in a pattern template by the MT-200 program.

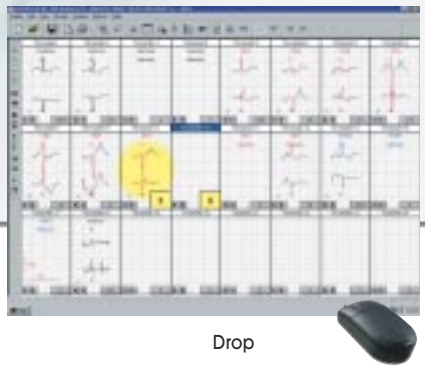
The program altogether forms, up to 12 "normal" templates, 1 "artefact" template, up to 300 different ventricular extrasystole or "VES" templates and up to 12 different supraventricular extrasystole or "SVES" templates, thereby providing you with a comprehensive summary of the heart's various stimulation types (spreads of stimulus).

With a click of the mouse you can examine the individual beats in the template. Reclassification of whole templates and individual QRS complexes is very simple: press the right mouse-button and select "Normal", "VES", "SVES", "Artefact" or "Delete" from the menu.



Drag

Draw



Drop

The SCHILLER MT-101/200 long-term ECG system has decisive advantages such as:

- **Direct testing of ECG signal quality from the PC before recording starts**
- **The exceptionally small and light MT-101 Holter recorder**
- **WINDOWS™ NT/2000/xp-based MT-200 analysis software (state of the art)**
- **Summary showing trend in ST and heart-rate**

The SCHILLER MT-101/200 long-term ECG system includes the following options:

- **Analysis of 2 channels in different combinations**
- **ST Analysis**
- **Template Matching**
- **HR Trend overview**
- **HR Variability**
- **Pacemaker Templates**
- **Reclassification in less than 2 seconds with 'drag&drop' function**

Important:

You do not need previous PC experience in order to use the SCHILLER MT-200 analysis program.

'Drag&Drop' Function

You can combine one whole template with another: click on it, move to the appropriate target-template with the mouse-button depressed (drag) and release (drop). By this means the whole template is re-classified in two seconds; event analysis is modified automatically.

CARDIOVIT CS-200

Technical Data:

System:

Dimension: 60 x 62 x 153 cm

Weight: 71 kg

Monitor: Size: 15" TFT LCD (17" optional)

Operator interface:
- Standard alphanumeric PC keyboard with built-in trackball
- Mouse
- Direct function keys for Start/Stop/MAN/AUTO-ECG

Power requirements: 115/230 V (nominal), 50/60 Hz

Power consumption: Max. 80 VA

Battery:
Built-in uninterruptable power supply (UPS) provides at least 3 minutes of back-up power to system and printer (without monitor) in the event of power failure.

Operating system: WINDOWS™ XP, Pentium CPU

Storage medium:
- Hard disk
- 3.5" diskette drive, 1.44 Mbytes
- CD-ROM

Hardware Options:

- CD-R/RW (optional)
- Laser or inkjet printer
- ECG cable arm
- Electrode vacuum system
- Treadmill, ergometer or reclining ergometer
- BP-200 blood pressure device

All hardware options may be added at any time and are easily retrofitted.

Printing:

Chart paper:
Thermoreactive, z-fold, width: A4, approx. 60 m, ready-to-file

Printing process:
Built-in high resolution thermal printer, 8 dots/mm - amplitude axis, 40 dots/mm - time axis, @ 25 mm/sec.

Paper speed: 5 / 10 / 12.5 / 25 / 50 mm/sec. (manual printout)

Sensitivity:
5 / 10 / 20 mm/mV, automatic or manual selection

Print format: 6/12 channel printout optimally shown on a width of A4 (200 mm), automatic baseline adjustment

Channels: 12

External printer (optional): Printout on plain paper with laser or inkjet printer

Frequency response: 0.05 – 150 Hz (IEC/AHA)

Safety Standards:

Specifications: Patient input: Fully floating and isolated, defibrillation protected (only with original SCHILLER patient cable)

Safety Standards: IEC/EN 60601-1, UL 60601-1; C22.2 No. 601.1-M90, IEC/EN 60601-2-25, IEC/EN 60601-1-2 (EMC)

Protection Class: I according to IEC/EN 60601-1 (with internal power supply)

Applied Part: CF according IEC/EN 60601-1

Conformity: CE according Directive 93/42/EEC (Medical Devices)

Classification: IIa according Directive 93/92/EEC

Environmental conditions:
- Temperature, operating: 10° to 40° C
- Temperature, storage: -10° to 50° C
- Relative humidity, operating: 25 to 95 % (non-condensing)
- Pressure, operating: 700 to 1060 hPa

Resting ECG:

- Simultaneous acquisition of all 8 active electrode signals from 12 leads
- Sampling frequency: 4000 Hz
- Pacemaker detection: ≥ ± 2 mV/≥ 0.1 msec.
- Emergency ECG
- Resting rhythm with event marking
- QT dispersion
- Review and re-measurement of all stored data

Options:
- Automatic interpretation
- Vector Cardiography
- Late Potential analysis (time domaine)

Exercise ECG:

- Arrhythmia detection and review
- Standard and free programmable exercise protocols for bicycles and treadmills
- Automatic NIBP measurement
- Enlarged QRS complex with superimposed reference beat selectable for each lead
- Real time continuous ST analysis, amplitude and slope graphic
- Online ST measurement adjustment
- Re-analyse possibility of complete exercise test with ST, HR and NIBP trend graphic
- Borg scale, symptoms, end point criteria tables
- Emergency ECG any time possible

Options:
- Full disclosure rhythm review

Filter:

SPF SCHILLER Powerline Frequency Filter: Distortion-free suppression of superimposed 50 or 60 Hz sinusoidal interferences by adaptive digital filtering

SSF SCHILLER Smoothing Filter, SMF SCHILLER Myogram Filter (muscle tremor filter): 25 Hz/35 Hz low pass smoothing filter to suppress muscle tremor and high-frequency noise, without bothering the QRS complex

SBS SCHILLER Baseline Stabilizer: Filter to suppress or greatly reduce baseline fluctuations without changing the measurement values (for Resting and Exercise ECGs)

BP-200 Blood Pressure Measurement (Option):

Measurement Technique: Primary – 3-Dimensional K-sound Analysis for stress test measurements. Secondary – Oscillometry with smooth linear deflation for resting measurements

Interfacing Capabilities: ECG and RS-232 interface for SCHILLER ECG stress test systems

R-Wave Source: Primary – digital/analog signal from external ECG source. Secondary – the optional BP-200 patient cable with V2, V6, ground configuration

Measurement Range:
Systolic: 10 – 300 mmHg
Diastolic: 10 – 300 mmHg
Heart rate: 0 – 240 BPM

Accuracy: Meets ANSI/AAMI SP10-1992

Sampling Intervals: On command from ECG stress test system, manual or automatic sample periods from 1 minute to 60 minute intervals

Alarms: Onscreen message and audio alarm tone for user defined ranges

Power: External supply + 12VDC output @ 2 Amps.

Dimensions: Size: 22.8 cm x 15.9 cm x 9.7 cm (9.0" x 6.3" x 4.1")
Weight: 1.2 kg (42.6 oz)

Standards: IEC 601-1, UL 2601, CAN/CSA C22.2 601.1

Accessories: 1 x Adult Cuff, 10 x Mic Pads & Cuff Anchor Pads, 2 x Cuff Anchor Clips and Wrist Straps

Manufactured by: SunTech Medical Instrument, Inc., Raleigh, NC, USA

SEMA-200:

- Comprehensive management of diagnostic data of resting ECG, exercise ECG, spirometry, ergo-spirometry, 24-h ECG Holter, QT dispersion, LAPO
- Importing possibility via floppy disc, network or RS-232 interface
- Validation of interpretation, measurement values and patient data
- Serial comparison of resting ECG data and curves on the screen
- Support of the standard for ECG: SCP (Standard Communications Protocol for Electrocardiography)

Technical Data:

Spirometry:

Measured values:

FVC: FVC, $FEV_{0.5}$, $FEV_{1.0}$, $FEV_{3.0}$, $FEV_{0.5}$/FVC, $FEV_{1.0}$/FVC, $FEV_{3.0}$/FVC, $FEF_{0.2\text{-}1.2}$, $FEF_{25\text{-}75\%}$, $FEF_{75\text{-}85\%}$, PEF, $MEF_{75\%}$, $MEF_{50\%}$, $MEF_{24\%}$, FIVC, $FIV_{1.0}$, $FIV_{1.0}$/FIVC, FIV_{10}/FVC, PIF, $MIF_{50\%}$

SVC: SVC, ERV, IRV, TV

MV: MV, RR, TV

MVV: MVV, RR, TV

Presentation:

- Flow/volume loop
- Volume/time graph
- Measurement values table
- Trend display at >1 recording per patient
- Interpretation quadrant

Prediction equation:

Adults: ECCS, Austria, Crapo, Morris, Knudson, Knudson 76, Polgar, Berglund, Finland, India, Composite

Children: Quanier & Tammeling, Austria, India, Knudson, Knudson 76, Polgar

Extrapolated predicted values

Comparison: Pre/post medication possible

Standards compliance: ATS, ATS 94, OSHA, NIOSH

SPIROVIT SP-150 Pneumotach flowsensor for pulmonary function testing with disposable mouthpiece:

Dimensions: 118 x 36 x 28 mm; approx. 120 g

Measuring method: Pneumotachometer

Measuring accuracy: According to ATS standards < 3 %

Flow impedance: < 0.2 mbar* s/l at 12 l/s

SPIROVIT SP-20 Pneumotach flowsensor for pulmonary function testing with reusable mouthpiece:

Dimensions: 125 x 36 x 28 mm, approx. 160 g

Measuring method, measuring ranges, measuring accuracy, flow impedance same as SP-150.

Basic unit:

- CS-200 Spirometry program with 4 PC based measurement programs for inspiratory and expiratory pulmonary function tests
- 1 pneumotach sensor (choice of SP-150 for disposable or SP-20 for reusable mouthpieces)
- Accessories: 2 noseclips and either 1 pack of disposable plastic mouthpieces (for SP-150) or 1 pack of disposable filters (for SP-20)
- 1 operating manual

Hardware option: Calibration syringe, P/N 2.100027

Ergo-Spirometry:

Technical Description Gas Analyzer:

Dimensions (integrated into CS-200): 15 x 15 x 15 cm (l x h x w)

Weight: 2.35 kg

Power supply: 100 – 240 V, 50/60 Hz

Safety Class: VDE II, safety insulated, Class BF

Measurement Methods:

Breath-by-breath gas analysis

Flow volume processing according to ECCS or ATS

Amount of gas adjusted with STPD

Environmental sensors:

- Flow sensor insensitive to moisture: 0 to ± 17 l/sec., resolution 10 ml
- Temperature: 0 to 50° C
- Barometer pressure: 600 to 1050 mBar (measurement range: -100 to 3500 m above sea level)

Flow measurement (patented diaphragm spiroceptor):

Bi-directional pneumotacho flow sensor insensitive to moisture
Measurement range 0 to ± 17 l/sec., max. deviation ± 2.5 %, volume range 0 to 300 l, resolution 10 ml/sec.

Gas analyzer

O_2 chemical cell:

Measurement range: 0 to 100 % O_2
Measurement accuracy: Better than ± 0.1 %
Response time: < 80 msec. (10 to 90 %)

Ultra sound density method analyzer CO_2:

Measurement range: 0 to 17.5 % CO_2
Measurement accuracy: Better than ± 0.1 %
Response time: < 80 msec. (10 to 90 %)

Fully automatic zero alignment and calibration of the gas analyzers at minimal gas consumption

Automatic measurement of ambient conditions

Manual entry of blood gas values (lactate etc.)

Software:

Operation system: Windows™ 98

Parameters: METS, VT, VE, fR, VO_2, VCO_2, RQ, VE/V, VO_2-, VCO_2-equivalents, O_2-pulse, VD/VT, FEO_2, $FECO_2$ as well as secondary parameters

Automatic determination of the anaerobic threshold after V-slope, CO_2 excess or RQ=1

Scaling optimization for the diagrams

Editing possibility for all basic parameters

Export/import function with standardized protocols for integration into HIS

Operating Conditions:

Ambient temperature: Between 10 and 40° C

Relative humidity: Between 30 and 90 %

Atmospheric pressure: Between 900 and 1060 hPa

The PowerCube produced by Ganshorn Medizin Electronic GmbH, Niederlauer, Germany, has been integrated into the CARDIOVIT CS-200 Ergo-Spiro device. It fully complies with SCHILLER's view on quality.

24-h ECG Holter MT-101/200:

ECG acquisition:

ECG amplifier:

- Galvanically isolated: 5.5 kVDC
- Input impedance: > 10 MΩ
- Maximum electrode potential: ± 300 mVDC
- Common mode rejection: > 80 dB
- Dynamic range: ± 5.12 mVAC
- Frequency response: 0.05 – 150 Hz (-3 dB)
- Digital resolution: 2.5 µV, 12 bit
- Sampling frequency: 500 or 1000 Hz
- Time constant: = 3.2 sec.
- Pacemaker detection: ± 2..200 mV / 0.1..2 msec.

Patient cable:

- 2-lead: 4 electrodes
- 3-lead: 6 electrodes

Recorder:

Dimensions: 94 x 61 x 20 mm, approx. 110 g (including battery)

Data recording: Simultaneous 2- or 3-channel recording, differential

Power consumption: ~ 95 mW (recording)

Battery:

- 1 pc. AA alkaline 1.5 V (Energizer or equivalent)
- Rechargeable accumulator, 1 x AA NiMH with 1.2 V and capacity ≥ 2000 mAh

Storage medium: 64 MB SD Memory Card

Data transmission from MT-101: With integrated USB interface or removable SD card

Software features MT-200:

- Save in PDF-Format (Portable Document Format)
- E-Mail-Function
- Multiple analysis
- Connection to the SCHILLER SEMA-200 Data Management System
- HR trend
- ST analysis (option)
- HR variability (option)
- Template matching (option)
- Pacemaker templates (option)
- P-wave detection (option)
- Artefact detection (option)

All technical data is subject to changes aiming to continuous innovations.