

euro_holter

High-resolution Holter system

TECHNICAL OVERVIEW



LUMED

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Features and performance of euro_holter

LUMED euro_holter is a modern Holter system, for the complete and extended management of high-resolution recordings.

The system is compatible with the hardware listed here below:

- ✓ euro_holter 3view 3-channel recorder
- ✓ euro_holter 12view 12-channel recorder

The main features of euro_holter include:

- ✓ setup of 3- and 12-channel recordings, 24 or 48 hours long
- ✓ setup of 3-channel recordings 7 days long, with no quality loss
- ✓ Data display and automatic analysis of the recording, according to the User preferences
- ✓ To highlight strips or any relevant part of the recording
- ✓ Easy and intuitive commands and icons, with textual descriptions
- ✓ Free report composition and automatic referral
- ✓ Print preview, showing also the total amount of pages to be printed
- ✓ Data storage
- ✓ Input & Output interfaces towards external systems, like as ADT, according to the Standard GDT protocol
- ✓ PDF export
- ✓ In the workflow, management recordings are handled according to the specific status: not yet analyzed, printed etc.
- ✓ Backup of older examinations
- ✓ Archive compression: the raw data are removed and only the report is kept in-line

Quality control and traceability:

- ✓ Overall recording quality is monitored and reported
- ✓ Recorders demographic with custom fields
- ✓ On-display signal check

ECG display:

- ✓ Morphology
 - ✓ Template (superimposed individual beats of the selected Template)
 - ✓ Individual beats of the selected Template
- ✓ Diagnostic strip
 - ✓ 3-channel recordings
 - ✓ Single channel
 - ✓ 2-channels
 - ✓ 3-channels
 - ✓ 12-channels recordings
 - ✓ 3-channels
 - ✓ 6x2 channels
 - ✓ 12-channels
 - ✓ Custom channels, from 1 to 12
 - ✓ 6, 7, 9-channels according to the recording mode
 - ✓ User can
 - ✓ set the gain of each channel. Available values: 0, 2.5, 5, 10, 20, 40 mm/mV
 - ✓ invert the polarity of each channel
 - ✓ revers arm leads, in case of wrong electrodes placement
 - ✓ Diagnostic ECG display also shows the portion of ECG contained into a printed page, both Landscape and Portrait mode
- ✓ Full Disclosure
 - ✓ 1 to 12-channels
 - ✓ Strip length selectable, from 14 to 35 secs

The clinical features of euro_holter include:

- ✓ QRS detection
- ✓ Morphological analysis of QRS complexes and labeling according to the standard reference: Normal, Supraventricular, Ventricular, Paced, Artifact, Questionable
- ✓ Template analysis
- ✓ Detection and classification of Ventricular events: Ectopic Beat, Bigeminy, Trigeminy, Couple, Tachycardia, Run
- ✓ Detection and classification of Supra-ventricular events: Ectopic Beat, Bigeminy, Trigeminy, Couple, Run

- ✓ Detection and classification of other events: Bradycardia, Tachycardia, R-on-T, Pause, Asystolia
- ✓ Maximum Heart-rate, Minimum Heart-rate
- ✓ Enhanced ST analysis
- ✓ Pacemaker analysis
- ✓ Referral notes with custom phrases and terms

Pacemaker analysis:

- ✓ The following pacing modes are available:
 - ✓ AAO
 - ✓ AAT
 - ✓ AAI
 - ✓ VOO
 - ✓ VVT
 - ✓ VVI
 - ✓ VAT
 - ✓ VDD
 - ✓ DOO
 - ✓ DVI
 - ✓ DDD
 - ✓ DDDR
- ✓ Pacemaker analysis includes the following tools:
 - ✓ Template analysis – paced beats morphology
 - ✓ Distribution and ECG strip for Atrial paced, Ventricular paced, Dual pacing,

Optional analysis tools:

- ✓ HRT Heart-Rate Turbulence
- ✓ TWA T-Wave Alternans
- ✓ DCA Heart-Rate Deceleration Capacity
- ✓ QT / QTc and Dispersion Analysis
- ✓ SAP Sleep Apnoea Analysis
- ✓ VectorCardiogram
- ✓ VLP Very Low Potential / SAECG Analysis

Signal filtering:

- ✓ Digital linear-phase, zero-distortion filters
- ✓ 50 or 60 Hz notch filter
- ✓ EMG low-pass filter
- ✓ Anti-Drift filter for baseline wandering

Several data review methods available:

- ✓ Templates
- ✓ Event
- ✓ Strip (custom format)
- ✓ Full Disclosure (custom format)
- ✓ Progressive Zoom Trend
- ✓ RR Scatter-plot
- ✓ Whole recording trend and 1-hour trend
- ✓ Context long strip

Referral & printout

- ✓ Summary
- ✓ Hourly table
- ✓ Free-text referral
- ✓ Global trend view
- ✓ Event strip overview
- ✓ Automatic notes, user editable
- ✓ Referral notes with custom phrases and terms
- ✓ Last-minute report modification

- ✓ Print preview
- ✓ Direct printout

Languages

- ✓ Italiano
- ✓ English
- ✓ Español
- ✓ Français
- ✓ Deutsch
- ✓ Portuguese
- ✓ Polski
- ✓ Русский

Hardware & Software requirements

- ✓ Operating System: Windows XP SP3 (not recommended because no longer supported by Microsoft), Windows 7, Windows 8.1 (no Windows 8), Windows 10 (no Millennium, no Vista, no Windows 8)
- ✓ CPU: $\geq 1.8\text{GHz}$ (Pentium Dual core 2.93GHz suggested)
- ✓ RAM: $\geq 1\text{GB}$ (2GB DDR3 suggested)
- ✓ HDD: $\geq 10\text{GB}$ (SATA 320GB 7200 rpm suggested)
- ✓ Monitor: 1280x900 (23" 1920x1080 suggested)
- ✓ Printer: 600 dpi 2MB (laser 600 dpi, RAM $\geq 2\text{MB}$ suggested)

Available configurations for euro_holter SW3/12

	Professional	Clinical
Multi-language system	X	X
Automated work-flow management	X	X
Intuitive User-friendly Graphic User Interface	X	X
Channel per recording	2, 3 or 12	2, 3 or 12
Standard recording duration	24 or 48 hours	24 or 48 hours
Multiday recording (up to 7 days, lossless)		X
Custom data view	X	X
Whole recording storage	X	X
Manual editing of events	X	X
Digital filters: EMG, 50/60Hz & Anti-Drift	X	X
Zoom ECG	X	X
On-screen ECG Measurements	X	X
Automatic referral	X	X
Custom report, including manual events	X	X
GDT import / export channel	X	X
Shared archive	X	X
Template analysis	X	X
Rhythm analysis	X	X
Custom Event labels	X	X
Enhanced ST analysis	X	X
Detection and analysis of Pacemaker spikes	X	X
Histogram view of events	X	X
ECG full-disclosure view	X	X
Analysis of Atrial Fibrillation and Flutter	X	X
Time-domain HRV	X	X
Frequency-domain HRV	X	X
HRT Heart-rate Turbulence		X
TWA T-Wave Alternans		X
QT/QTc and dispersion Analysis		X
SAP Sleep Apnoea Analysis		X
Vectorcardiogram		X
VLP-SAEKG		X
DC Heart-Rate Deceleration Capacity		X
Interactive report analysis	X	X
Print preview	X	X
Demographics: recorders, Doctors and Technicians	X	X
Archive backup and off-line storage	X	X
Archive sharing	X	X
Recording quality and performances monitoring	X	X

