EC-2-3-12H Holter ECG System
Technical specification

LABTECH
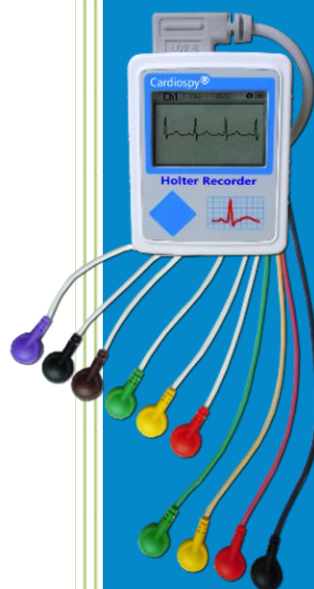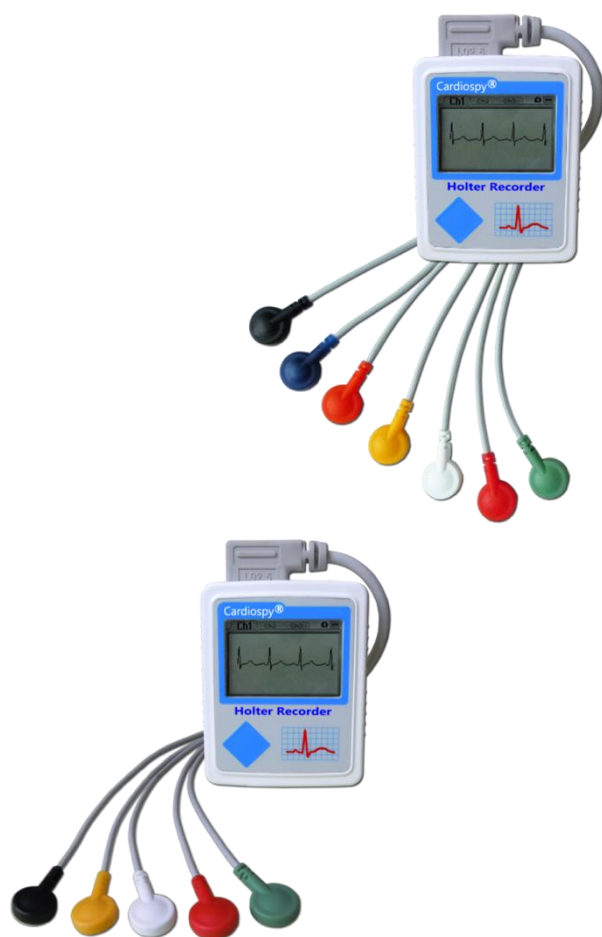
TECHNICAL SPECIFICATIONS OF DIFFERENT HOLTER SYSTEMS			
Type of Holter Recorders	EC-2H	EC-3H	EC-12H
Bipolar ECG Channels	1, 2	1, 2, 3	1, 2, 3
Other ECG Channels	-	+PM, Nehb	+PM Standard 12 CH, Nehb
Respiration	-	Yes	Yes
Number of snap type Leads	3, 5	3, 4, 5, 7	3, 4, 5, 7, 10
Recording duration maximum (without battery changing)	48h	48h	24h
The battery can be changed during recording	Yes		
Recording duration maximum (with battery changing)	336h		
Dynamic Bandwidth	±20 mV		
DC Offset Range	±600 mV		
Frequency Response maximum	0.05 Hz … 150Hz		
Sampling Rate	125 Hz, 250 Hz, 500 Hz, 1000 Hz		
Recording Rate	125 Hz, 250 Hz, 500 Hz, 1000 Hz		
Common Mode Rejection Ratio	120dB		
A/D Resolution	16 bit		
Input impedance	>100 MΩ		
Power Source	1x1.2 V AAA NiMH (or 1x1.5 V AAA alkaline)		
Battery Life	min. 24 h, up to 48 h using a high-capacity battery		
Storage Card Capacity	built-in 8GB (microSD)		
Internal Voltage (max)	3.3 V		
Display	LCD (Grey Scale 160x100 pixels)		
Movement detection-3D	Yes		
Patient Event button	Yes		
Monitoring ECG	On PC via Bluetooth and on LCD as well		
Reading Record	via USB cable		
International Protection Rating Against Water: IPX0	Yes		
Size	53 x 67.5 x 18.5 mm		
Weight	~ 50 g		

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BASIC FUNCTIONS OF SOFTWARE

DATABASE FUNCTIONS

• Common database for all Labtech system	• Record recycle bin function	• Search records
• Acquire Patient ID from barcode reader	• System log	• Local database, Network database: Microsoft SQL Server database, SQLite database
• Acquire Patient ID using magnetic card reader	• Filter records	• Different date format
• Medical record for patients	• Import – export records	• Password protected software starting
• Access control	• Import – export records by date	

BASIC FUNCTIONS

• Automatic update	• Normal and MSI install	• Full screen mode
• HIS integrations: GDT, DICOM MODALITY WORKLIST, Cardiospy SDK	• Two display mode	• Cubios HRV export
• FTP integration	• Email function	• AHA / IEC electrode placement

PRINT AND EXPORT FUNCTIONS

• Report printing and exporting	• Automatic print	• Selectable reports
• Color and Black and white reports	• Contrast settings	• Resizable resolution
• Customizable company logo	• Automatic diagnosis	• Custom report
• Adjustable paper speed and amplitude	• Import /Export settings	• Export ECG data to CSV, SCP, Dat format
• Export QRS data	• Export N-N intervals	• Export R-R intervals

HOLTER SOFTWARE FUNCTIONS

• Make new record using PC or recorder display	• Raw ECG visualization after reading to PC	• Visualization of evaluated record on PC
• Store the Indication and medication of the patient	• Awake, Asleep and special time	• Smoothing, baseline, mains filters
• Event Viewer	• Colour-coded event marking	• ST level/ST slope diagrams
• QT – QTc – QT% diagrams	• QRS – PQ diagrams	• Atrial fibrillation and atrial flutter screen
• Battery status	• Noise detection and editor	• Lead off warnings
• Detailed ECG Visualization	• QRS Detection	• Adjustable parameters for analysis
• HR and ST Graphs	• Arrhythmia Analysis (N,S,V)	• Full ECG Visualization
• Measuring possibility on the ECG	• Insert and delete QRS	• Rename QRS
• Mark noisy intervals	• Delete single/group events	• Patient event view
• Sleep apnea detection		

ADDITIONAL FUNCTIONS OF DIFFERENT HOLTER SYSTEMS

	EC-2H	EC-3H	EC-12H
P-wave detection	+	+	+
Motion Detection	+	+	+
QRS Template Classification	+	+	+
QT Analysis	+	+	+
HRV Time Domain	+	+	+
AV block I-II-III Analysis	+	+	+
Atrial Fibrillation & Flutter Analyis		+	+
HRV Frequency Domain		+	+
Pacemaker Analysis		+	+
Vector cardiography		+	+
T Alternant			+
HR Turbulence Analysis			+
Respiration		+	+

SOFTWARE MINIMUM CONFIGURATION

Processor	minimum: Intel® Core™ i3 recommended: Intel® Core™ i5 or better (Sandy Bridge or newer architecture)
RAM	minimum: 4 GB; recommended: 8 GB
Graphics card	DirectX 10 compatible, min. 128 MB video memory
Display	minimum: min. 1280x800 resolution recommended: 22" monitor 1920 x 1080 resolution (Full HD)
HDD	500 GB (SATA II or newer recommended)
Interface	1 USB port for the EC-2H/3H/12H/ABP recorder 1 USB port for the USB-02 key 1 USB port for the printer
Printer	Laser (printing speed: 15-20 page/min, color printer recommended)
Operating system	Windows 7, Windows 8, Windows 8.1, Windows 10 (32-bit or 64-bit versions)

*Windows XP is no longer supported by Microsoft. Labtech provides only limited support for previously installed systems.

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ECG Holter System

Cardiospy® User Manual

ForEC-2H; EC-3H; EC-12H; EC-3H/ABP recorder

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Quality certifications

The CE mark indicates that the product meets the essential requirements of European Council Directive 93/42/EEC concerning medical devices.

Labtech Ltd. also operates a quality system certified to ISO 13485:2016. Made in Hungary by Labtech Ltd.

We wish you success in the use of our ECG Holter System!

Release date: 26-06-2012
Revision date: 22-02-2021
Version number: v8

If you have any questions, ideas, partnership suggestions please contact us.

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2 Preparations for using the Holter System

> *NOTE:* BEFORE STARTING TO USE THE HOLTER SYSTEM YOU ARE EXPECTED TO FOLLOW LABTECH LTD.'S **INSTALLATION AND UPDATE GUIDE,** WHICH PROVIDES GUIDANCE ON THE INSTALLATION OF THE SYSTEM.

2.1 List of accessories for EC-2H; EC-3H; EC-12H *

Please check the listed units and accessories before installing the ECG Holter System

Code No.	Specification	Qa.	EC-2H	EC-3H	EC-12H	Picture
CAS-00000-01	Case for holding the systems	1	x	x	x	
ACC-0SWCD-01	CD with installation software	1	x	x	x	
DEV-0USBB-02	USB-02 Bluetooth interface unit	1	x	x	x	
DEV-02HLC-05	EC-2H ECG Holter Recorder	1	x			
DEV-03HLC-05	EC-3H ECG Holter Recorder	1		x		
DEV-	EC-12H ECG	1			x	

Code No.	Specification	Qa.	EC-2H	EC-3H	EC-12H	Picture
12HLC-05	Holter recorder					
BAG-0012H-01	Recorder bag (EC-2-3-12H V5, attachable to patient's waistbelt)	1	x	x	x	
BAG-0012H-02	Recorder bag (EC-2-3-12H V5, attachable to patient's neck)	1	x	x	x	
CHA-0002X-01	Battery charger MINI	1	x	x	x	
BAT-00000-01	1.2V Rechargeable batteries (AAA)	2	x	x	x	
CAB-00L02-06	2 CH bipolar patient cable (HDMI-Snap, 45cm)	1	x			

Code No.	Specification	Qa.	EC-2H	EC-3H	EC-12H	Picture
CAB-00L03-06	3 CH bipolar patient cable (HDMI-Snap, 45cm)	1		x		
CAB-00L12-05	12 CH standard patient cable (HDMI-Snap connector)	1			x	
CAB-00LNE-06	NEHB patient cable (HDMI-Snap, 45cm)	1			x	
CAB-00USB-01	Extension cable for USB-02	1	x	x	x	
CAB-00REC-05	Data transfer cable (USB A - HDMI)	1	x	x	x	
USR-00000-01	Installation and Update Guide	1	x	x	x	
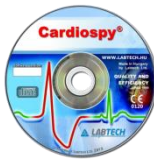
Code No.	Specification	Qa.	EC-2H	EC-3H	EC-12H	Picture
USR-00000-02	User manual for Holter recorders	1	x	x	x	
ELE-00000-01	Single-use electrodes (1 pack / 30 pcs)	1	x	x	x	

NOTE: PLEASE REFER TO THE CODE NUMBER ABOVE WHEN PLACING AN ORDER.

*The manufacturer reserves the right to change prices at any time.

**The accessories highlighted in grey in the chart will be given as accessories for the recorders as well.

2.2   List of accessories for EC-3H/ABP

Code No.	Specification	Qa.	EC-3H/ABP	Picture
CAS-00ABP-01	Case for holding the recorder and accessories	1	x	
ACC-0SWCD-01	CD with installation software	1	x	

Code No.	Specification	Qa.	EC-3H/ABP	Picture
DEV-0USBB-02	USB-02/B Bluetooth Interface Unit (monitoring and evaluation)	1	x	
DEV-3HABP-05	EC-3H/ABP ECG and ABPM Recorder	1	x	
BAG-3HABP-02	Recorder bag (EC-ABP V5, EC-3H/ABP V5, attachable to patient's waistbelt)	1	x	
CHA-0004X-01	Battery charger MAXI	1	x	
BAT-00000-02	1.2V Rechargeable batteries (AA)	4	x	
CAB-00L03-06	3 CH bipolar patient cable (HDMI-Snap, 45cm)	1	x	

Code No.	Specification	Qa.	EC-3H/ABP	Picture
CAB-00USB-01	Extension cable for USB-02	1	x	
CAB-00REC-05	Data transfer cable (USB A - HDMI)	1	x	
USR-00000-01	Installation and Update Guide	1	x	
USR-00000-02	User manual for Holter recorders	1	x	
ELE-00000-01	Single-use electrodes (1 pack / 30 pcs)	1	x	
ELE-00000-02	Single-use electrodes for cuff fixing	1	x	
BEL-00000-01	Waist belt	1	x	

Code No.	Specification	Qa.	EC-3H/ABP	Picture
CUF-00LOC-31	BP cuff, Adult (23-33cm)	1	x	

*The manufacturer reserves the right to change prices at any time.

**The accessories highlighted in grey in the chart will be given as accessories for the recorders as well.

NOTE: PLEASE REFER TO THE CODE NUMBER ABOVE WHEN PLACING AN ORDER.

2.3   Principles of Operation

Holter monitoring is a tool in the evaluation of patients with symptoms of various forms of heart disease, or in situations where the physician suspects cardiac pathology in the absence of symptoms. Symptoms such as lightheadedness, palpitations, or fainting may be caused by disturbances in the electrical signals that control the heart muscle contractions. These disturbances can be random, spontaneous, sleep-related, emotion- or stress-induced.

Holter monitoring is an ideal test because the patient assumes normal daily activities, increasing the likelihood that he or she will experience the precise situations that can trigger symptoms or cardiac events. This allows correlation of any rhythm problems or abnormalities with activities and/or symptoms. In the opposite sense, Holter monitoring can also be used to "rule out" cardiac causes of patients' symptoms.