



HECG100 Handheld 12-lead ECG Simulator

Seamless raw data playback, ultra-fast test launches, and EMC-ready design for accelerated design verification

• Raw Data Playback

- store custom raw data in a detachable micro SD card for playback



• Automated Quick Testing

- customize test sequences for automated testing while reducing the effort of repetitive setups — no coding required

• Advanced ECG and Add-on Signals

- unlock a database of 32 arrhythmias and a full suite of DC offset, noise, pacing, and respiration simulation without overspending ⁽¹⁾

• Quick Test Launch

- from boot to custom test sequences in seconds

• EMI & EMS Compatible

- ability to undergo compliance testing in EMC environments ⁽²⁾



• Enhanced ESD-protected Electrode Terminals

- with ESD protection up to 8 kV (contact) and 15 kV (air), the electrode terminals ensure uninterrupted testing

• Long Battery Life

- deliver 8 hours of operation and up to 12 hours of uninterrupted testing in power-saving mode

• Impact Resistant

- pass the free fall test as per IEC 60068-2-31

• USB Charging

- flexible charging via power adapter or computer connection ^{(3) (4)}

Note: (1) The DC offset, noise, pacing, and respiration simulated signals can only be superimposed on waveforms configured through the ECG function.

(2) EMI compliance: Class A, Class B; EMS compliance: Class A, Class B. Additionally, the HECG100 includes the CAL20110 waveform as required by IEC 60601-2-25 for electromagnetic compatibility testing.

(3) USB Power Delivery (USB PD) support is required on both the power adapter and computer to enable this feature.

(4) For optimal charging performance, please use the USB cable provided with the HECG100.

Specifications

• Technical Specifications

Parameters	Specifications
Heart rate accuracy	±1%
Amplitude accuracy	±2%
Frequency / pulse repetition rate accuracy	±1%
Pulse duration accuracy (excluding pacing)	±0.5ms
ECG duration accuracy	±0.5ms
Pacing pulse width accuracy	±5µs
Pacing pulse amplitude accuracy, range	±2mV pulse: ±0.3% >2mV pulse: ±10%
Pacing pulse characteristics	Rise/fall time 5µs Overshoot <1% Settling time <1%
Capacitor tolerance	±5%
Sample rate	10kHz ± 0.05%
RCA output amplitude range	ECG electrode output x1000, max 10V
RCA output amplitude accuracy	±1% for amplitudes of 0.5Vpp or higher
Lead output ratio	Reference lead (lead II) in a certain ratio (calculated in percentage). Lead I: 70 (if RA=100, LA=170) Lead II: 100 (LL=200) Lead III: 30 (CT=(100+170+200)/3=156.7) Lead V1: 24 (V1=24+156.7=180.7) Lead V2: 48 (V2=204.7) Lead V3: 100 (V3=256.7) Lead V4: 120 (V4=276.7) Lead V5: 112 (V5=268.7) Lead V6: 80 (V6=236.7)
Total harmonic distortion	5%
Signal noise ratio	≥60dB
DC offset	Setting ±1% (fixed, may include up to 50µVpp noise)
Respiration Simulation Accuracy	
Impedance baseline	±5%
Impedance variations ($\Delta \Omega$)	±(5% of setting) + 0.05Ω

• Signal Type

Parameters	Specifications	
ECG waveform	Heart rate	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 120, 140, 160, 180, 200, 220, 240, 260, 280, 300BPM
	Amplitude	0.1, 0.5, 1, 2, 3, 4, 5mVpp
	ST deviation	-0.6 - 0.6mV
Sine	Frequency	0.1, 0.5, 0.67, 1, 2, 5, 10, 20, 40, 50, 60, 100, 150, 200Hz
	Amplitude	0.1, 0.5, 1, 2, 3, 4, 5mVpp
Triangle	Frequency	1, 2Hz
	Amplitude	0.5, 1, 2mVpp
Square	Frequency	0.125, 1, 2Hz
	Amplitude	0.1, 0.5, 1, 2, 3, 4, 5mVpp
Rectangle pulse	Frequency	30, 60, 120BPM
	Pulse width	40, 60, 100, 200ms
Triangle pulse	Amplitude	0.1, 0.5, 1, 2, 3, 4, 5mV
	Frequency	30, 60, 120BPM
	Pulse width	40, 60, 100, 200ms
Triangle pulse	Amplitude	0.1, 0.5, 1, 2, 3, 4, 5mV
	Frequency	30, 60, 120BPM
	Pulse width	40, 60, 100, 200ms

• Signal Add-on

Parameters	Specifications	
DC offset	±300, ±500, ±1000mV	
Pacing	Amplitude	1, 2, 5, 10, 20, 50, 100mV
	Duration	0.1, 0.5, 1.0, 1.5, 2.0, 3ms
	Pacing rate	Synchronization
Drift test	Triangle wave (0.1Hz, 4mVpp)	
Noise	Main noise	50Hz, 60Hz, White noise
	Amplitude	1, 2, 5, 10mVpp
	Frequency	15, 20, 30, 40BrPM
Respiration	Baseline	500Ω, 1000Ω, 1500Ω
	Ratio (inspiration:expiration)	1:1
	Variation	1Ω, 2Ω, 5Ω
Play raw data	Apnea	12s, 22s, 32s, continuous, off
	Sample rate	Maximum: 10kHz (able to play repeatedly)

• General Specifications

Items	Specifications
Temperature	Operating: 10°C - 40°C (50°F - 104°F) Storage: 0°C - 50°C (32°F - 122°F)
Humidity	10% - 90% non-condensing
Altitude	Up to 2000m
Communications	USB Type-C connector
Power	5V DC
Battery charger	5V, 1A
Battery life	12 hours (continuous testing in power-saving mode)
Mechanical	Housing: ABS Plastic Size (L x W x H): 18.0 x 12.8 x 5.5cm Weight: 950g
Data capacity	32GB micro SD card

• EMC Specifications

Items	Specifications	
FCC	EMC P15B	
CE	<ul style="list-style-type: none"> EMC EN61326-1 ESD 8kV (contact), 15kV(air) EMI Class A, Class B Safety IEC/EN61010-1:2010 + A1:2016; Pollution degree 2 61010-2-030:201 	
Test Items		
Test Items	Names	
IEC 60601-1-2:2014/A1:2020	IEC 61000-4-2	Electrostatic discharge
	IEC 61000-4-3	Radiated RF electromagnetic fields
	IEC 61000-4-6	Conducted RF
	IEC 61000-4-8	Rated power frequency magnetic fields

Note: (1) The HECG100 can operate alongside the DUT in the EMC test environment during the four IEC 60601-1-2:2014/A1:2020 electromagnetic compatibility tests listed above.
 (2) Operate HECG100 in battery-powered mode for these four EMC compliance tests with the DUT.
 (3) It is recommended to wrap the connection cables between HECG100 and DUT with foil to reduce noise interference.

Ordering Information

• HECG100 Test System

Part No.	Description	Quantity
100-EC00007	Model No.: HECG100 Model Name: Handheld 12-lead ECG Simulator	1

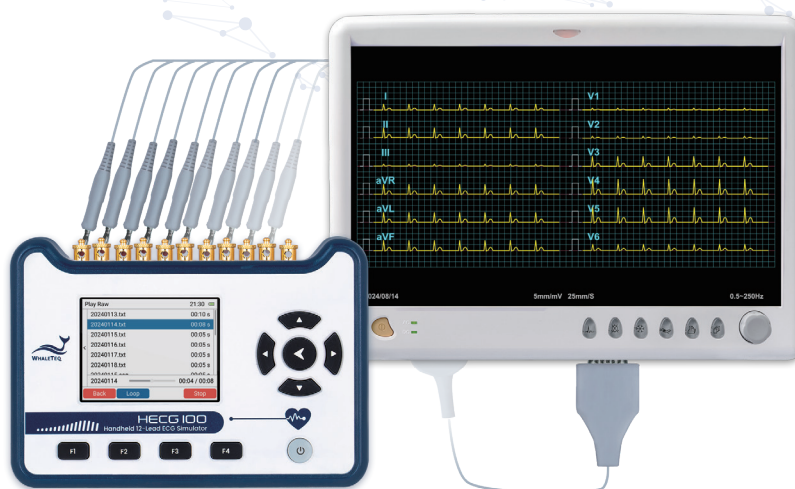
• Optional Accessories

Part No.	Description	Quantity
5HA-EC1N001	RCA male to BNC cable (60cm) (black)	1
5HA-EC1N002	USB Type-C to Type-C cable (male to male) (44cm) (black)	1
S71-0201011	32GB micro SDHC card	1

• Optional Calibration Service and Warranty Extension

Part No.	Description
YY0007	Model No.: C3 Provides (3) years of calibration service coverage. WhaleTeq equipment can be calibrated to original performance on the basis of (1) year interval.
YY0008	Model No.: R3 Extends the limited warranty from (1) year to (3) years.

Diagram



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more information

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