GE HealthCare

CASE™

Cardiac Assessment System for Exercise Testing

Signal processing

ST measurements – Resting	ST amplitudes, slope
ST measurements – Stress	ST amplitudes, slope, integral, index, ST/HR slope, ST/HR loops, ST/HR
E, J and post-J point	Manual or computer selected
Signal processing technique	Incremental median updating using HEART Exercise program
Baseline Correction	ADS
Artifact/Baseline correction	ADS or Finite Residual Filter (FRF) algorithm
QRS detection and analysis	Based on automatic or manual lead selection
Arrhythmia detection	Automatic arrhythmia detection, detection documentation and annotation
Full disclosure ECG	Up to 60 minutes of Full disclosure with event review both during and post acquisition
Reanalysis – Resting	Re-analyze after manual correction of median beats and measurements
Reanalysis – Stress	Post-test medians measurements from E, J, post-J point selections
ECG analysis	Marquette™ 12SL ECG Analysis Program for Adult and Pediatric (optional)
Computerized measurements	15-lead analysis includes measurements of user-selectable additional 3 leads
Additional ECG function	Vectorcardiography
Heart rate meter	30 to 300 BPM ± 10% or 5 BPM, whichever is greater. Heart rates outside this range will not be displayed.
Pre-acquisition	Provides 10 seconds of instantaneous acquisition

Communications/storage

ECG data formats	GE HealthCare Hi-Fidelity ECG, XML
MUSE™	MUSE Cardiology Information System Compatible (v7 or later) with bi-directional orders and ADT support
MUSE Web	Compatible for retrieval view and printing of MUSE system data
Data export	PDF export of final reports (auto export and custom file name); PDF export of Full Disclosure data; Microsoft® Word export of configured reports; XML or Microsoft Excel® export of specified data
EMR connectivity	Other EMRs through MUSE Cardiology Information System (v8 or later) or GDT/BDT Interface
Database	Encrypted SQL Database for both data at rest and data in-transit
DICOM	Secure & Bidirectional, DICOM modality worklist/orders

Data acquisition (via CAM Connect 14)

Lead system	15 lead
Technology	Type CF, Defibrillation-Proof Defibrillation protection: Per IEC 60601-2-25
Dynamic range	AC differential ± 5 mV, DC offset ± 300 mV
Common Mode Rejection	>130 dB (>100 dB with AC filter disabled)
Input Impedance	>10MΩ @ 10 Hz, defibrillator protected
Patient leakage	<10 µA
Analog to digital conversion	Bandwidth: DC to 500 Hz; Digital over sampling rate: 512 ksps 24-bit analog to digital conversion resolution

Down sampled ECG waveform	Bandwidth: 0.04 to 150 Hz; Sample rate: 2 ksps; Resolution: 1.22 µV
Input to ECG analysis	Bandwidth: 0.04, 0.56 ZPD to 150 Hz; Sample rate: 500 sps; Resolution: 5 µV/LSB
Pacemaker waveform	Bandwidth: 23.5 Hz to 10.5 kHz; Sample rate: 75 ksps; Resolution: 11.8 µV
Pace detection	Duration: 0.2 ms to 2.2 ms Amplitude: 2 mV to 700 mV Separation: 1 ms or greater
Quality indicators	Real-time Hookup Advisor with LED lead quality indicators
Remote control	ECG acquisition button
Ingress Protection level	IP×4
Noise	<15 µV (-3 dB) bandwidth
High pass filter	0.04
Additional report filters	20, 40, 100, 150 Hz (selectable)
Line filter	50.0 or 60.0 Hz notch filter (selectable)
QRS trigger	TTL synchronization output

Wireless data acquisition (via GEH ECG 1200)

Acquisition unit

Lead system	Standard 12 Lead
Patient leads	Detachable 10 lead wires conform to AAMI
Defibrillation protection	Protected against 360J discharge
Patient leakage current	< 10 uA
Input impedance	> 10 MOhm
CMMR	> 90 dB
Frequency range	0.05–150Hz
Dynamic range	+/- 2.4V
Resolution	24 bits (0.286 uV/LSB)
Sample rate internal	8000
Sample rate recording	500
Lead OFF detection	Yes
Communication	Digital RF 2400–2483 MHz, 0.4 mW, conform to FCC Part 15.249
Battery	Size AA x 2, Alkaline or NiMH
Operation time	Up to 40 hours with Alkaline batteries
Dimensions and weight	Size: 140 x 95 x 50 mm Weight: 350 g
Safety standards	IEC 60601-1, 60601-1-2, 60601-2-25
Classification	Type-CF, Internally powered
Pace detection	Sampling rate: 500 sps
Additional report filters	20, 40, 100, 150 Hz (selectable)
Battery indicator on HOST	0%- 100% (at a gap of 20%)

Receiver

ECG Out	0.5 to 150 Hz (Bandwidth-3 db)
ECG Out gain	1000
ECG Out sample rate	500
TTL trigger width	16–128 ms
TTL trigger delay	<11 ms (delay from R-wave)
Interface	USB 2.0 compliant
Communication	USB 2.0 Full Speed Digital RF, 2400–2483.5 MHz, 0.4 mW, conform to FCC part 15.249
Power: USB 5V	100 mA max at 5 V input
Dimensions and weight	Weight: 80 g Size: 100 x 54 x 30 mm

Environmental

Operating temp. range	10 to 40° C
Storage temp. range	-20 to 60° C
Relative humidity	10 to 95 % (non-condensing)

Physical specifications

Fixed Height Trolley	Height (approx): 130 cm (51 in) Width (approx): 62 cm (24 in) Depth (approx): 89 cm (35 in) Weight: 62 kg (136.69 lbs) without monitor and KISS pump
Height Adjustable Trolley	Height (approx): 130–145 cm (51–57 in) Width (approx): 62 cm (24 in) Depth (approx): 89 cm (35 in) Weight: 72 kg (158.7 lbs) without monitor and KISS pump
Interfaces included	Acquisition module Dedicated stress keypad (USB) Keyboard (USB) and Mouse (USB/Wireless) Built-in thermal printer (USB) 9 USB ports

	Full Duplex IEEE 802.3 10 Base-T, 100 BaseTX and 1000 BaseT compatible through RJ45, MUSE compatible
	2 Serial ports (COM 1-2); treadmill, BP, ergometer, SpO_2
	1 Analog (only for Wireless GEH-ECG 1200)
	1 TTL (trigger) output; analog ergometer, camera synch., etc.
	2 DP interfaces for monitor
Display type	LCD (flat panel display)
Display resolution	LCD – 1680 x 1050
Display size	56 cm (22 in) diagonal
Operating System	Windows 10 IoT Enterprise LTSC 2019

Environmental – power requirements

Power supply	AC operation only
Operating voltage range	100–120 VAC, 47–63 Hz, 2.8 A 200–240 VAC, 47–63 Hz, 1.4 A
Power consumption	350 W max (1200 BTU/h) <250 W normal (850 BTU/h) <30 W standby (100 BTU/h)

Environmental – operating requirements

Operating temp. range	10 to 40° C
Storage temp. range	-20 to 60° C
Relative humidity	10 to 95% RH non-condensing
Storage/transport conditions	-40 to +70° C (-40 to 158° F)* 15 to 95 % RH non-condensing 500 to 1060 hPa
Temperature	10 to 40° C (+50 to 104° F)
Humidity	20 to 95% RH non-condensing
Pressure	700 to w1060 hPa

Display type

Monitored leads	12, 15 – Resting; 3, 6, 12, 15 – Stress
Displayed leads	Number on screen 3, 6, 12 or 15
Display format	4 x 2.5, 4 x 2.5 + 1 rhythm, 2 x 6, 6 rhythm, 3 rhythm – Resting 4 x 2.5 + 1 rhythm, 2 x 6, 6 rhythm, 3 rhythm, 3 rhythm + medians, 3 rhythm + trend – Stress
Display speeds	25, 50 mm/s
Display sensitivity/gain	2.5, 5, 10, 20, 40 mm/mV – Resting 2.5, 5, 10, 20 mm/mV – Stress

Writer type

Technology	Integrated, thermal dot array
Writer speed	5, 12.5, 25, and 50 mm/s
Number of traces	3, 6, 12, or 15 (user selectedable)
Sensitivity/gain	2.5, 5, 10, 20 mm/mV, and 10/5 mm/mV split gain
Speed accuracy	5, 12.5 mm/s at ± 5% 25, 50 mm/s at ± 2%
Amplitude accuracy	± 5%
Horizontal resolution	40 dots/mm at 25 mm/s
Verticle resolution	8 dots/mm
Paper type	Z-fold thermal with pre-printed grid and perforation
Paper size	215 x 280 mm (8.5 x 11 in) (modified letter) 210 x 297.5 mm (8.27 x 11.7 in) (A4)
Paper tray capacity	Holds up to 300 sheets
Paper collection capacity	30 sheets (in paper collection tray)

Analog Out via Analog Connect external device

Analog output	2 channels (Imaging sync)
Communication and power indicator	LED
Interface	DB9 female Connector
Dimensions and weight	Size: 90 x 70 x 30 mm Weight: <100gms

* Paper discoloration may occur at higher temperatures

1 Marquette 12SL ECG Analysis Program Physician's Guide, 2032056592-002 Revision B. 2015, GE HealthCare: Milwaukee, WI

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