



Model 10A
ECG Simulator

Model 20A
ECG / Arrhythmia Simulator

Operating Manual

Model 10A / 20A *Patient Simulators* Operating Manual

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UNPACKING INSTRUCTIONS:

Package Contents:

Patient Simulator
Battery: 9V type 1604
Operating Manual

The Model 10A and 20A Patient Simulators are powered by a 9V alkaline battery (included). To install the battery, see section 2.1 of this Manual.

To order this manual, use Part Number 6100-450

Revision History		
Revision	Description	Date
B	- 5 Year Warranty - Update Corporate Address	2011-Jul-21
C	- Update Corporate Address	2014-Dec-09

Copyright

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Unpacking and Inspection

Follow standard receiving practices upon receipt of the instrument. Check the shipping carton for damage. If damage is found, stop unpacking the instrument. Notify the freight carrier and ask for an agent to be present while the instrument is unpacked. There are no special unpacking instructions, but be careful not to damage the instrument when unpacking it. Inspect the instrument for physical damage such as bent or broken parts, dents, or scratches.

Claims

Our routine method of shipment is via common carrier. Upon delivery, if physical damage is found, retain all packing materials in their original condition and contact the carrier immediately to file a claim.

If the instrument is delivered in good physical condition but does not operate within specifications, or if there are any other problems not caused by shipping damage, please contact your local sales representative or DSI immediately.

Standard Terms and Conditions

Refunds & Credits

Please note only serialized products (products labelled with a distinct serial number) and accessories are eligible for partial refund and/or credit. Non-serialized parts and accessory items (cables, carrying cases, auxiliary modules, etc.) are not eligible for return or refund. In order to receive a partial refund/credit, the product must not have been damaged, and must be returned complete (meaning all manuals, cables, accessories, etc.) within 90 days of original purchase and in “as new” and resalable condition. The *Return Procedure* must be followed.

Return Procedure

Every product returned for refund/credit must be accompanied by a Return Material Authorization (RMA) number, obtained from DSI Customer Service. All items being returned must be sent prepaid (freight, duty, brokerage, and taxes) to our factory location.

Restocking Charges

Products returned within 30 days of original purchase are subject to a minimum restocking fee of 15%. Products returned in excess of 30 days after purchase, but prior to 90 days, are subject to a minimum restocking fee of 20%. Additional charges for damage and/or missing parts and accessories will be applied to all returns. Products which are not in “as new” and resalable condition, are not eligible for credit return and will be returned to the customer at their expense.

Certification

This instrument was thoroughly tested and inspected and found to meet DSI’s manufacturing specifications when it was shipped from the factory. Calibration measurements are traceable to the National Research Council of Canada (NRC). Devices for which there are no NRC calibration standards are measured against in-house performance standards using accepted test procedures.

Warranty

Warranty and Product Support

DSI warrants this instrument to be free from defects in materials and workmanship under normal use and service for two (5) years from the date of original purchase. During the warranty period DSI will, at our option, either repair or replace a product that proves to be defective at no charge; provided you return the product (shipping, duty, brokerage and taxes prepaid) to DSI. Any and all transportation charges incurred are the responsibility of the purchaser and are not included within this warranty.

This warranty extends only to the original purchaser and does not cover damage from abuse, neglect, accident or misuse or as the result of service or modification by other than DSI. IN NO EVENT SHALL DSI BE LIABLE FOR CONSEQUENTIAL DAMAGES.

No warranty shall apply when damage is caused by any of the following:

- Damage in transit or when moving the instrument,
- Accident, alteration, abuse or misuse of the instrument,
- Fire, water damage, theft, war, riot, hostility, acts of God, such as hurricanes, floods, etc.

Only serialized products (those items bearing a distinct serial number tag) and their accessory items are covered under this warranty. PHYSICAL DAMAGE CAUSED BY MISUSE OR PHYSICAL ABUSE IS NOT COVERED UNDER THE WARRANTY. Items such as cables and non-serialized modules are not covered under this warranty.

This warranty gives you specific legal rights and you may have other rights, which vary from province to province, state to state, or country to country. This warranty is limited to repairing the instrument to DSI's specifications.

When you return an instrument to DSI for service, or repair, we recommend shipment using the original shipping foam and container. If the original packing materials are not available, we recommend the following guide for repackaging:

- Use a double-walled carton of sufficient strength for the weight being shipped.
- Use heavy paper or cardboard to protect all instrument surfaces. Use non-abrasive material around all projecting parts.
- Use at least four inches of tightly packed, industrial-approved, shock-absorbent material all around the instrument.

DSI will not be responsible for lost shipments or instruments received in damaged condition due to improper packaging or handling. All warranty claim shipments must be made on a prepaid basis (freight, duty, brokerage, and taxes). No returns will be accepted without a Return Materials Authorization ("RMA") number. Please contact DSI at 1-800-667-6557 to obtain an RMA number and receive help with shipping/customs documentation.

Warranty Disclaimer

Should you elect to have your instrument serviced by someone other than DSI, please be advised that the original warranty covering your product becomes void when the tamper-resistant Quality Seal is removed or broken without proper factory authorization. We strongly recommend, therefore, that you send your instrument to DSI for service, especially during the original warranty period.

In all cases, breaking the tamper-resistant Quality Seal should be avoided at all cost, as this seal is the key to your original instrument warranty. In the event that the seal must be broken to gain internal access to the instrument (e.g., in the case of a customer-installed firmware upgrade), you must first contact DSI at 1-800-667-6557. You will be required to provide us with the serial number for your instrument as well as a valid reason for breaking the Quality Seal. You should break this seal only after you have received factory authorization. Do not break the Quality Seal before you have contacted us! Following these steps will help ensure that you will retain the original warranty on your instrument without interruption.

WARNING

Unauthorized user modifications or application beyond the published specifications may result in electrical shock hazards or improper operation. DSI will not be responsible for any injuries sustained due to unauthorized equipment modifications.

DSI DISCLAIMS ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR APPLICATION.

THIS PRODUCT CONTAINS NO USER-SERVICEABLE COMPONENTS. UNAUTHORIZED REMOVAL OF THE INSTRUMENT COVER SHALL VOID THIS AND ALL OTHER EXPRESSED OR IMPLIED WARRANTIES.

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MODEL 10A / 20A OPERATING MANUAL

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1. OVERVIEW

1.1 Models 10A and 20A

Compact and lightweight, the Datrend Systems Model 10A and 20A patient simulators are designed to test patient monitors and telemetry systems, anywhere a quick ECG or arrhythmia simulation is needed. The versatile 6-lead configuration provides an additional pre-cordial lead and allows you to check reference leads without the need for a full 12 lead layout. This unique V6 lead allows some monitors to simulate any of the other precordial leads (V6 - V9) without losing the signal from the standard five lead setup.

1.1.1 Lead Interface:

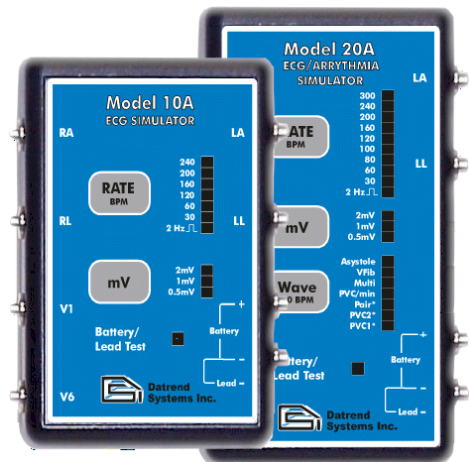
RA, RL, LA, LL, V1, V6, Battery +, Battery - (also used for lead continuity), Lead terminal.

1.1.2 User Interface:

ON/OFF slide switch is located at the top of the unit.

The keypad includes Rate (bpm) and mV (amplitude) keys which allow the user to scroll through the ECG rate and mV settings to the desired waveform and amplitude.

The Model 20 also includes a Wave (arrhythmia) button to scroll through a series of seven Arrhythmia waveforms at a rate of 80 bpm.



1.2 Specifications

	<u>Model 10A</u>	<u>Model 20A</u>
Rates: (bpm)	30, 60, 120, 160, 200, and 240	30, 60, 80, 100, 120, 160, 200, 240, and 300
Performance wave:	2 Hz Square wave	2 Hz Square wave
Amplitude Selections:	0.5, 1 and 2 mV	0.5, 1 and 2 mV
Arrhythmias:	N/A	PVC1, PVC2, Pair PVC, PVC 1 & 2 ongoing, Multifocal PVCs, Ventricular Fibrillation and Asystole
Battery Test:	Single LED (OK @ 7.5 VDC)	Single LED (OK @ 7.5 VDC)
Lead Continuity:	Single LED	Single LED
Power:	9V battery (included)	9V battery (included)
Dimensions:	3.5 x 2.5 x 1.06 in. 8.89 x 6.35 x 2.69 cm	4.25 x 2.5 x 1.06 in 10.8 x 6.35 x 2.69 cm
Weight:	4.94 oz. 140 g.	5.29 oz. 150 g.
Default Settings:	1 mV 60 bpm	1 mV 80 bpm (Arrhythmia - PVC1)

2. OPERATION

2.1 Battery Installation

The Model 10A and 20A are both powered by a standard 9V alkaline battery (9V Type 1604). The 9V battery is included with the unit, but is not installed as shipped from the factory. Follow these instructions to install or replace the battery:

- 2.1.1 Ensure the power is switched OFF.
- 2.1.2 Locate the battery compartment on the rear of the instrument. Open the battery door by pressing on the door and simultaneously pushing the door outwards.
- 2.1.3 Observe polarity of the battery snap connections. Install or exchange the battery with 9V type 1604.
- 2.1.4 Switch the power ON to confirm the instrument is operational.
- 2.1.5 Switch the unit OFF, place the battery in the compartment, and replace the battery compartment door.

2.2 Battery Test

This test is conducted identically on the 10A and 20A simulators.

With the power switch turned on (the default rate and amplitude settings will be flashing on the LEDs of the unit), touch the appropriate terminals of a standard 9V battery to the battery test terminals. If the battery has a charge of 7.5 VDC or more, the Battery / Lead Test LED will illuminate. Ensure that the polarity is correct - a battery placed in reverse polarity will not illuminate the LED.



2.3 Lead Test

This test is conducted identically on the 10A and 20A simulators.

With the power switch turned on (the default rate and amplitude settings will be flashing on the LEDs of the unit), insert a pin type ECG lead into the terminal located at the bottom of the unit, under the Lead- indicator on the label, and attach the lead snap to the Battery/Lead (-) terminal. If there is continuity between the lead pin and lead snap, the Battery / Lead Test LED will illuminate.

Safety type ECG leads may require an adapter to connect to the female terminal of the Simulator.

2.4 Performance Testing

In terms of operation, ECG and performance wave tests are conducted identically on the 10A and 20A simulators.

2.4.1 ECG Testing:

Attach patient snap leads to the appropriate terminals of the Simulator and power the Simulator ON. The default waveform should be displayed on the Patient Monitoring Device (PMD).

Pressing the RATE button a single time will cycle the rate upward to the next setting. Pressing the RATE button repeatedly will cycle through the rates until released at the desired setting.

Pressing the mV button will cycle the amplitude upward to the next setting.

Selecting the 2 Hz waveform will display a 2 Hz square wave. The ECG monitor may display a rate of 120 or 240 bpm, depending on the rate detection electronics in the monitor.

2.4.2 Arrhythmia Testing (Model 20A Only):

Attach patient snap leads and power up as described above.

To activate an arrhythmia waveform from the ECG mode, press the WAVE button once. The 20A will go to PVC1* as the initial default setting. Arrhythmias PVC1*, PVC2* and Pair* provide normal sinus rhythm (NSR) at 80 bpm. If the WAVE button is pressed once on any of these settings, with at least one second between presses, a PVC will be injected within approximately three seconds.

The PVC/min and Multi settings will provide (a) random number of PVC1's per minute or (b) random PVC1 then PVC2 waveforms, respectively.

To change the arrhythmia setting, press the WAVE button repeatedly at a rate of approximately twice per second. The first press will confirm the current selection (the appropriate LED will illuminate) with each successive press changing to the next arrhythmia selection.

2.4.3 Sample Waveforms:

Lead II (RA, LA, LL [ref.]):



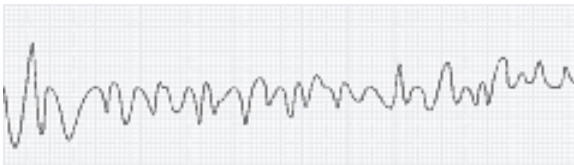
Normal Sinus Rhythm



PVC1



PVC2



Ventricular Fibrillation



Asystole

Depending upon the monitoring equipment under test, the appearance of the waveform may differ slightly from the figures, above.

3. CALIBRATION

Datrend Patient Simulators (Models 10A and 20A) may be returned for calibration on a bi-annual basis if there is concern over the 1mV calibration square wave. This the only adjustable value in the device.

If calibration or repair service is required, contact Datrend Customer Service to determine the authorized service facility nearest your location and to obtain an RMA number. In North America: 1-800-667-6557; Outside North America: (604) 291-7747; or e-Mail: customerservice@datrend.com

NOTES

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