

This is an ambulatory 12-lead ECG recorder and arrhythmia analyzer. Reveala-12 is hooked up to the patient for 24 hours. ECG data of 12 leads for 24 hours is stored on the SD card inserted into the Reveala unit. Whenever patient feels restless he can record the events, by pressing event button on Reveala unit. When recording is completed, the events if marked and the ECG data of 12 leads are downloaded in PC using data download cable.

## Technical Specifications

### 1. Environmental

Operating Temp	: -5 °C to +50 °C.
Operating & Storage Humidity	: 0 to 95 % non-condensing

### 2. Dimension and Weight

Dimension	: 105 X 65 X 35 mm (LXBXH)
Weight	: 206 gm with battery

### 3. Power supply

Battery	: 2 Duracell MN1500 or equivalent, Alkaline batteries of AA size
Back up time	: 24hrs

### 4. Performance

Language	: English
PC interface	: USB
Storage medium	: In built SD card
Data Download rate	: USB @ 3MBPS
Visual Indications	: Through LED for Bat Low, Memory Full, Recording, Leads Off
Audio indications	: Beep Buzzer- Record start & end : Alarm Buzzer - Leads off
Switch	: Switch - Event mark Slide switch- USB (download)/OFF/ ON (Rec)

### 5. Acquisition

Frequency response	: 0.5 Hz to 35 Hz
Filter	: DSP
Input impedance	: 10 M ohm
Time constant	: > 1.6 sec
A/D conversion	: 8 bit
Noise	: < 20 $\mu$ V <sub>p-p</sub>
Leakage current	: < 10 $\mu$ A

Gain	: 5, 10 & 20 mm/mV selectable.
CMRR	: > 120 dB
Accuracy	: +/- 1 bit
Sampling Frequency	: 100 samples per second simultaneous
Data acquisition	: Simultaneous recording of 12 channels for 24hrs
Printouts	: Printing of marked report with grid On/off facility, Print colour reports

## 6. Minimum PC configuration

- a. Operating system : Windows XP and onwards
- b. Intel Pentium 5, 2.4GHzs onwards.
- c. RAM: minimum 512 MB.
- d. USB : One free USB port to connect Holter
- e. Resolution – 1024 X 768
- f. 15" Monitor

## Detailed features

### 1. Download

- a. Facility to download 12 lead ECG data recorded in SD @100 samples/second to PC using data download cable.

### 2. Full disclosure

- a. Default display of 10 min disclosure of Lead-I
- b. Configurable Disclosure time of 10, 20, 30, 60 Min.
- c. Selection of any of the lead for disclosure.
- d. Editable page start time for full disclosure.
- e. Facility to view next / previous ECG page for the selected disclosure time with Left-Right arrow keys with horizontal scroll bar
- f. Mark page for printing
- g. Facility to zoom selected minute ECG.

### 3. One minute disclosure

- a. Selection of any of the lead for disclosure
- b. View next / previous 1 min. ECG page with Left-Right arrow keys or horizontal scroll bar
- c. Mark page for printing.
- d. Facility to enter comments (up to 70 chars).
- e. Grid or Graph on / off.
- f. Mark noise facility (before and after classification).
- g. Select start beat and channel for classification.
- h. Mark noise

### 4. Start beat and channel selection for analysis

- a. Display of 4 sec ECG data of all 12 lead.
- b. Detection of Normal beat automatically / manually. Automatically selected beat displayed in red color
- c. Selection of any of the lead for analysis.
- d. Gain Increment / Decrement
- e. View next / previous 4 sec ECG data for 12 lead with Left-Right arrow keys or horizontal scroll bar

- f. Facility to invert channel

### 5. Classification

- a. Display of continuous Heart rate trend during Classification
- b. Facility to view 15 templates at a time
- c. View next / previous 15 templates with Left-Right arrow keys or horizontal scroll bar
- d. Facility to rename the selected template
- e. Edit templates during Classification
- f. Analyze data to detect arrhythmias and display trends

### 6. Edit Template

- a. Facility to display 28 similar beats in a template at a time on the screen.
- b. View 4 sec of 12 channel data of all beats one at a time in selected template.
- c. Facility to edit Labels of selected beats in template
- d. View next / previous 28 beats with Left-Right arrow keys or horizontal scroll bar

### 7. Review Screens

- a. Facility to select patient from patient list.
- b. Review screen displays 24 hour trends of following parameters
  - i. HR
  - ii. VE
  - iii. V-Tach
  - iv. SVE
  - v. SVE-Tach
  - vi. ST Levels of 12 lead
  - vii. Bigeminy
  - viii. Trigeminy
  - ix. Bradycardia
  - x. Tachycardia
- c. Following parameters are displayed on review screen
  - i. Min HR bpm with time.
  - ii. Max HR bpm with time.
  - iii. Longest Pause duration with time.
  - iv. Longest Vtach duration with time.
  - v. Longest SVTach duration with time.
  - vi. Longest STEpisode duration with time.
  - vii. Max Delta ST (+/-) in mm for lead with time.
- d. View one minute disclosure of selected events
- e. View one minute disclosure of standard events
- f. View medians and edit fiducial points
- g. View Arrhythmias
- h. View ECG of any minute
- i. View following HRV reports
  - i. RR interval distribution table
  - ii. RR interval distribution histogram
  - iii. Heart rate variability indices
  - iv. PoinCare graph
  - v. Normal RR histogram

### 8. Review mode utilities

- a. Editable marked page list.
- b. Unmark the marked noisy data in review.
- c. Editable patient details
- d. Editable summary report

- e. Editable arrhythmia summary report
- f. Select reports for printing
- g. Save & retrieve saved test from backup

### 9. Reports

- a. Facility to navigate through pages, zoom-in and out in a page in Print preview
- b. Arrhythmia disclosure report
  - i. 8 sec of ECG strip of all 12 leads with arrhythmia in center and in different color (if selected).
  - ii. Arrhythmia label
- c. Arrhythmia summary report
  - i. 24 hrs details at the interval of 1 hr. of Min HR, Max HR, Avg HR, VE, VE Pair, Vtach, Pause, R On T, SVE, SVE Pair, SV Run, Bigeminy, Trigeminy, Bradycardia, Tachycardia, Total analyzed minutes
  - ii. Trends for 24 hrs of HR, VE/Min, VTACH, SVE/Min, SVRun, Bigeminy, Trigeminy, Bradycardia, Tachycardia, Pauses, VE Pair
- d. One minute disclosure report
  - i. 1 min ECG data of selected lead starting from Report date and time with arrhythmia in different color (if selected and if exists) along with event marks (if selected and if exists).
- e. Full disclosure report
  - i. 10, 20, 30, 60 minute disclosure
  - ii. 10 / 20 / 30 / 60 min ECG data of the given lead.
  - iii. Arrhythmia printed in different color if selected
  - iv. Event marks is selected.
- f. Template summary report
  - i. Template label
  - ii. 2 sec ECG data of each template with total number of templates and total number of beats in template
- g. ST-Analysis report
  - i. ST reference beats of all 12 leads with E, J and Post J points
  - ii. Following information about ST levels
    - 1. Total ischemic time
    - 2. Number of episodes between 1 – 2 min, 2 – 5 min, Above 5 min
    - 3. Severity in mm between 1.0 – 1.9, 2.0 – 2.9, Above 3.0
  - iii. Trends of ST levels of all leads for 24 hrs
- h. Summary report
  - i. HRV report
    - i. Normal RR interval distribution table
    - ii. Normal RR interval distribution histogram
    - iii. HR variability table
    - iv. PoinCare Graph

### 10.Settings

- a. Hospital details
- b. Referring Doctor list
- c. Printing details configuration
- d. Email account details
- e. Prematurity of SVE
- f. Arrhythmia labels
- g. Standard comments
- h. Pause time
- i. Download speed

\* Due to our continuous product improvement programme, features can be enhanced.