

Mennen Medical Arrhythmia Detection Algorithm (MADA™)

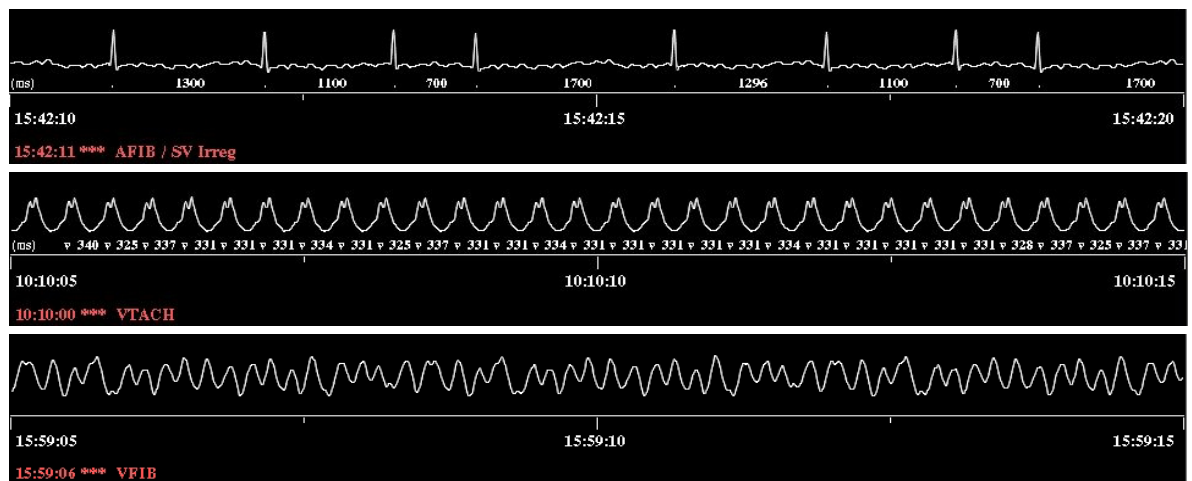
A highly accurate cutting edge solution to integrate arrhythmia detection features to your devices

Once more, Mennen Medical makes available its leading and wide experience in the Patient Monitoring ECG field, now offering a powerful and highly accurate OEM solution for the incorporation of arrhythmia detection features to external devices and applications. Providing an efficient code for the signal processing and interpretation of the ECG waveform.

MADA™ Key features:

- Highly accurate
- Real time output
- Beat classification
- Artifact detection
- Dual channel
- Counting of Supra-Ventricular and Ventricular beats
- Arrhythmia detection and alarm messages
- Ventricular Fibrillation Detection Algorithm

It provides highly accurate QRS detection, feature extraction, beat classification, and rhythm evaluation.



MADA™ is based on a proprietary method™ for detection of the QRS complex, the “Feature extraction method of morphology analysis”, where each QRS is measured and compared to the previous beat’s characteristics in order to determine the predominant normal morphology for any given ECG waveform and to establish the patient’s “ECG Family”.

Thus, the algorithm is capable of recognizing when the normal sinus rhythm has changed due to such causes as a shift in patient position, and will recognize the new rhythm as the dominant normal. This fast-learning capability also permits simultaneous analysis of multiple patients’ QRS’s complexes, assigning morphology labels to each beat, beat-by-beat.

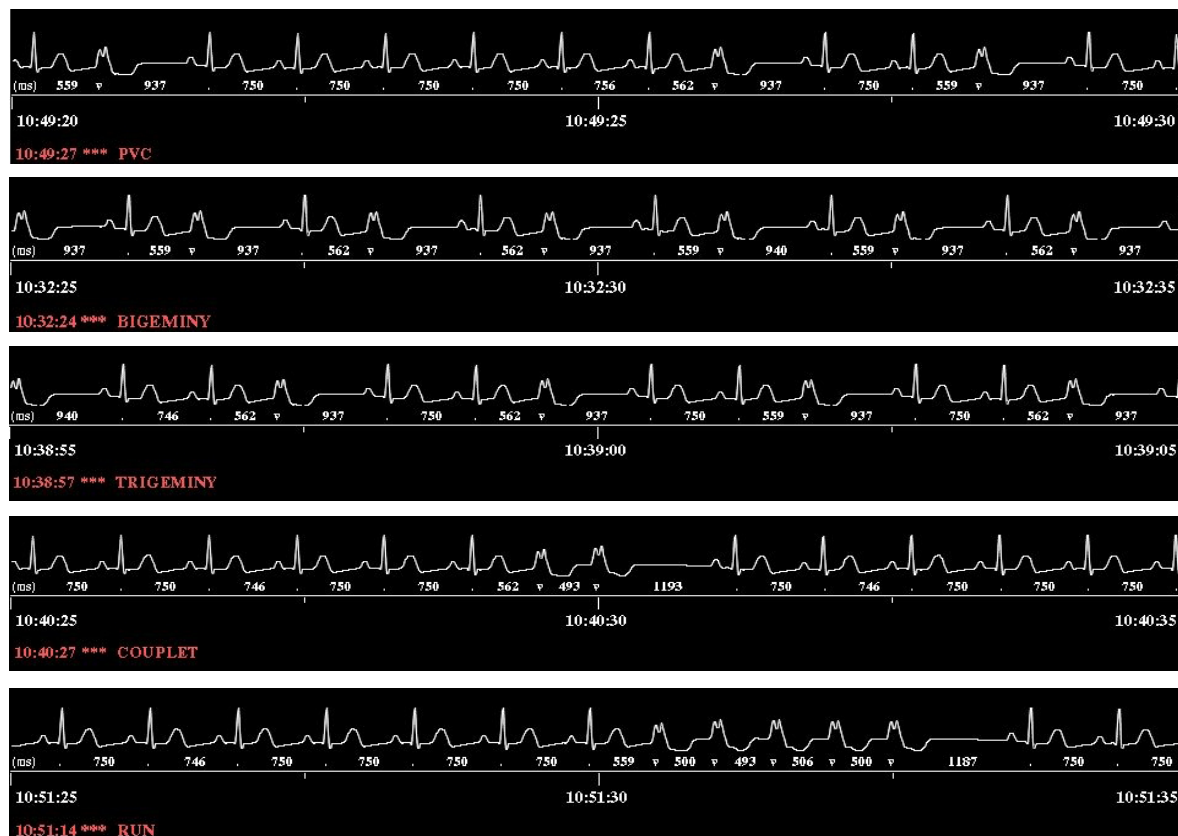
The Arrhythmia Detection Algorithm is primarily oriented to the detection of ventricular ectopic beats. These ectopic beats are separated from normal QRS complexes using a comprehensive set of discriminated criteria based on measured QRS morphology features and the ratio of timing between beats.

In addition, the algorithm evaluates ECG rhythm to ensure immediate recognition of such events as Ventricular Tachycardia (VT); Ventricular Fibrillation (VF) and Asystole.

The use of Dual channel arrhythmia algorithm provides additional quality to the arrhythmia detection, by comparing the beat classification in both channels.

The MADA™ Arrhythmia detection algorithm has a quality analysis technique to define and automatically suspend artifacts when such characteristics are present in the ECG signal.

Each detected QRS complex is marked as: Normal; Ventricular or Borderline; or Abnormal.



Various Arrhythmias detected by MADA™:

- Asystole
- Ventricular Fibrillation - VFIB
- Ventricular Tachycardia - V-Tach
- Ventricular Complexes
 - o PVC (Premature Ventricular Contraction)
 - o Bigeminy
 - o Trigeminy
 - o RUN
 - o Idioventricular Rhythm
 - o Couplets of PVC's
 - o Triplets of PVC's
 - o Multi-Focal PVC's
 - o Interpolated PVC
 - o R on T
- Sinus Bradycardia
- Sinus Tachycardia
- Premature Atrial Contraction
- Supraventricular Tachycardia
- Atrial Fibrillation/Supraventricular Irregular Rhythm
- Pause