

# Understanding the Differences in HRV calculation via Dataquest A.R.T. Analysis vs. Ponemah

## Background:

HRV calculation is a method to determine the variation of the heart beats over time. This can be done by interpolating the IBI (inter-beat-interval) to produce a continuous signal, which an FFT can then be applied to extract its frequencies components. The frequencies components are then broken down into bins, which can then be compared to determine the variation of the heart beats over time.

## Differences in calculations:

### 1. IBI derivation

- Dataquest A.R.T. Analysis and Ponemah each have its own ways of marking the ECG or BP waveform to extract the IBI. There will be instances that either of the software platforms will miss a beat or two at the beginning/ending of the signal. This will contribute the amount of data available when applying an FFT to the signal; hence, slight variation in the result will be noticeable.

### 2. Default FFT Windowing Methods\*

	DQ ART Analysis	Ponemah
Windowing Method	Rectangular	Hanning
Overlapping Sub-Series	1	5

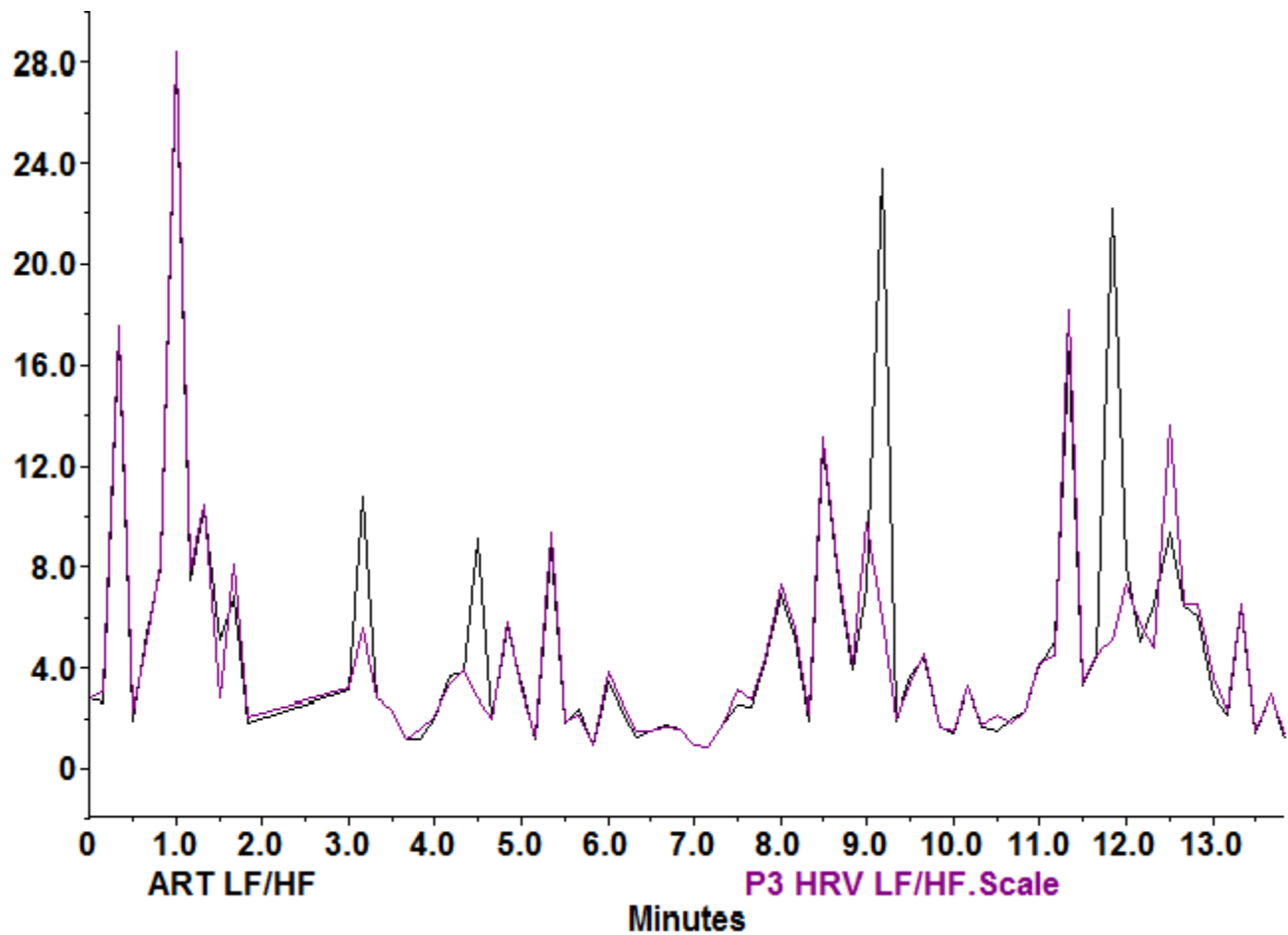
### 3. Scaling Factor

- By default, Dataquest A.R.T. Analysis scales the HRV result by a factor of 2.7. This is due the differences in the algorithms when applying the FFT to the continuous IBI signal.

\* These settings can be modified.

Example when both software platforms use the same calculation method and a scaling of 2.7 in Ponemah:

	DQ ART Analysis	Ponemah
Windowing Method	Hanning	Hanning
Overlapping Sub-Series	5	5
Scaling	1	2.7



- Note that the dataset in the example above was edited so that the beats were marking the same on both platforms. Trying to replicate maybe yield different results.