

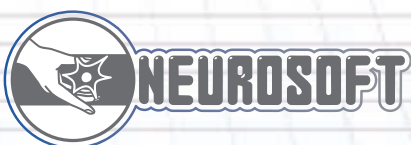
# VNS-Micro

Vegetotester – Digital Instruments for Autonomic Nervous System Study



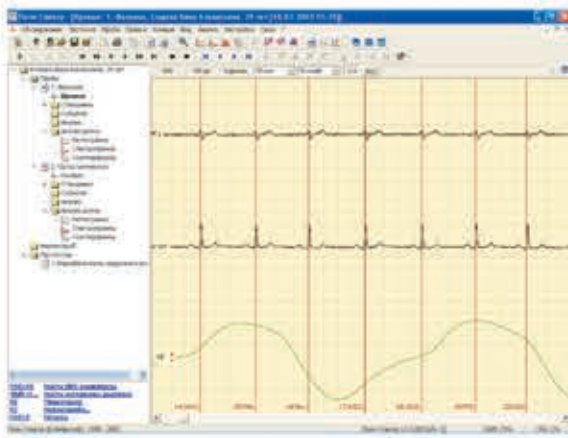
Nowadays vegetotesters manufactured by **Neurosoft** Company provide the real opportunity to the practicing physicians to make a complex study of the autonomic nervous system with the use of such techniques as:

- Heart rate variability analysis (HRV) at rest according to the International standard ("Heart Rate Variability Standards of Measurement, Physiological Interpretation, and Clinical Use", 1996)
- Heart rate variability analysis at orthostatic test performing (determination of the orthostatic test autonomic provision)
- Diagnostics of diabetic and alcoholic neuropathy with the use of the cardiovascular reflex tests recommended on the conference in San-Antonio (1998) (standard battery of tests according to D. Ewing).
- Cross-analysis of the heart rate variability and breath rate variability allowing to assess the level of these systems synchronization



Medical Diagnostic Equipment Development and Manufacture

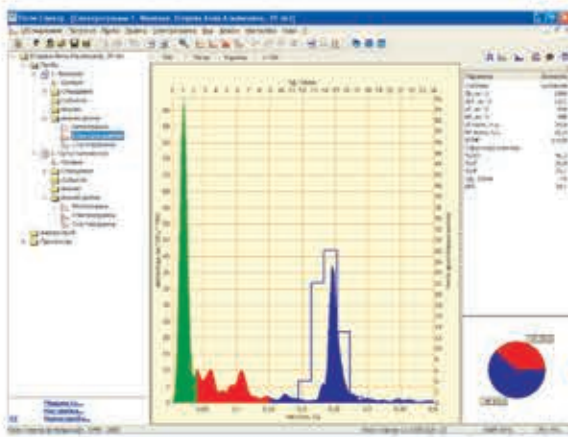
# Software Features



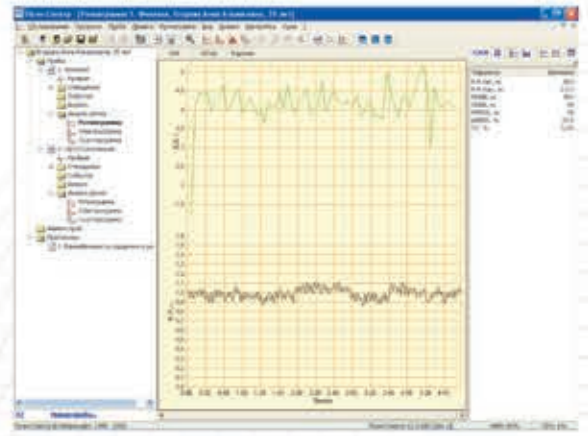
1. Electrocardiogram with QRS markers and calculated R-R intervals, pneumogram with markers at the start of each breath cycle and calculated "breath-breath" intervals.



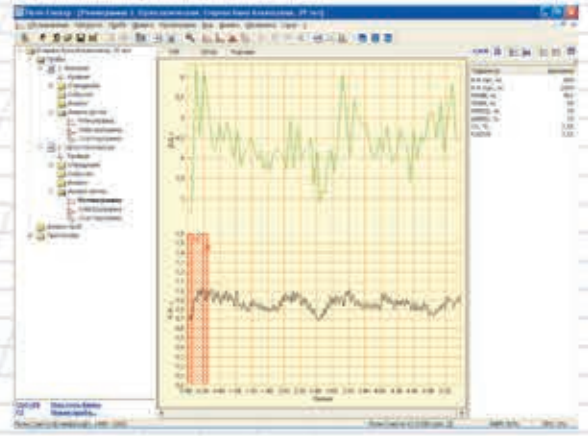
3. Checkup report of HRV analysis.



2. Spectrogram is a graphic chart that shows the dependence of rhythmogram oscillations amplitude on their frequency. Frequency ranges are differently colored: the dark blue area is proportional to the parasympathetic regulation power; the red area is proportional to the sympathetic regulation power. The breath rhythmogram (i.e. the green line) is a representation of breath rate variability.

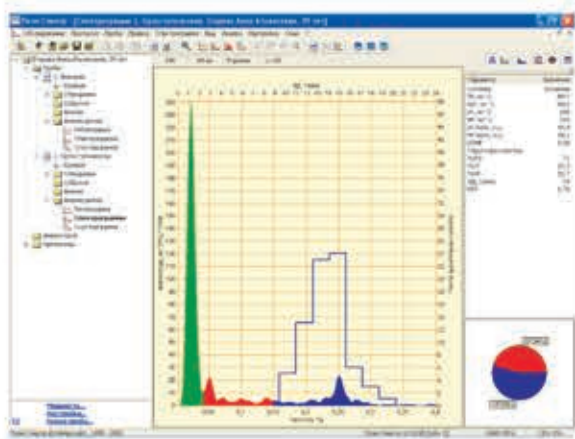


4. Rhythmogram is a graphic chart that shows the dependence of R-R interval duration on time. Rhythmogram oscillations are the result of the regulation systems influence on heart (HRV in particular). The green diagram is the breath rhythmogram, which represents the breath rate dynamics.

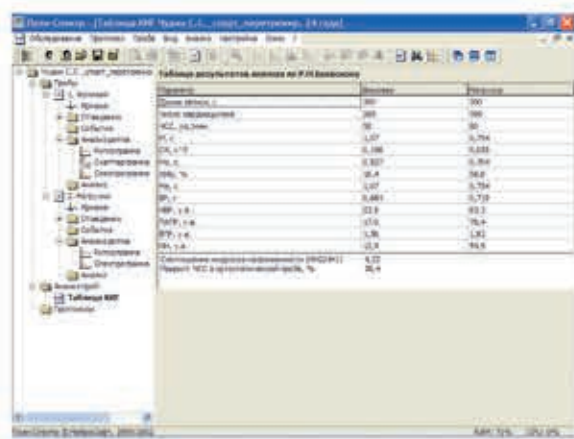


5. Orthostatic test rhythmogram. The wave appearing in the first 30 sec is the vagus reaction.

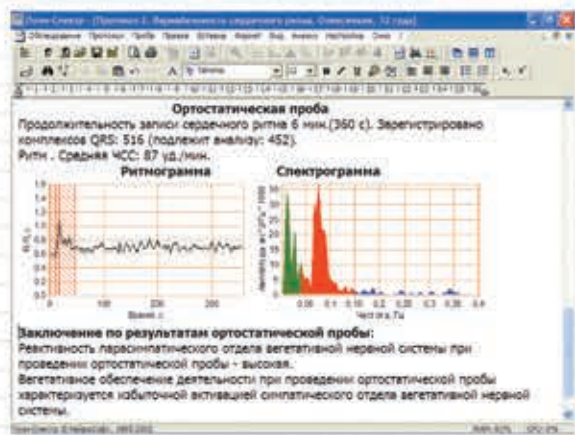




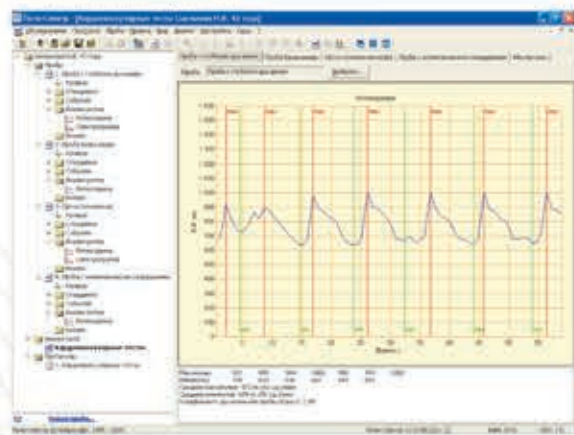
6. Orthostatic test spectrogram. Here one may clearly observe sympathetic response – the red area increase.



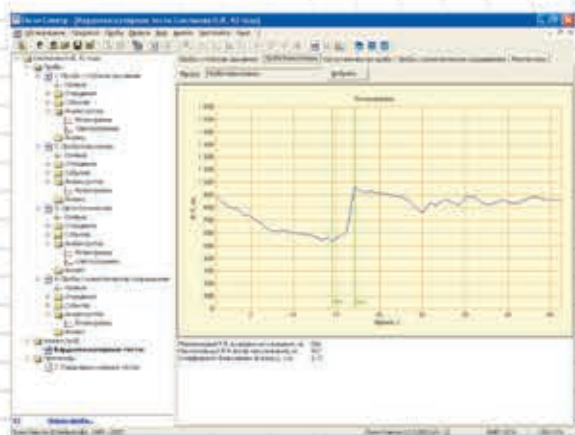
9. The results table of the heart rate analysis by the technique "variational pulsometry" or "cardiointervalography" according to R.M. Baevsky is a technique which is widely used in Russian Federation.



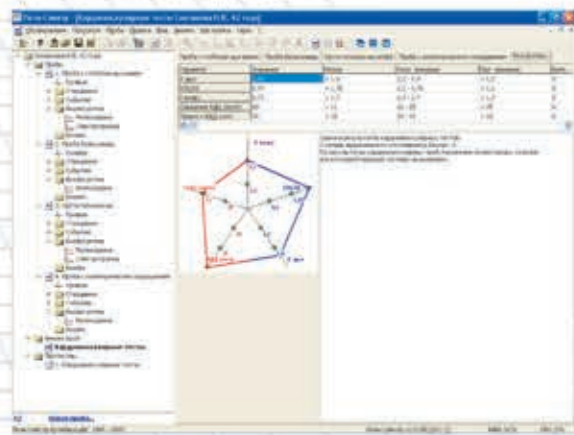
7. Checkup report of HRV analysis by orthostatic test results.



10. Rhythmogram of deep breath testing. The heart rate modulation by breath is clearly seen. The leading role in this process belongs to the vagus.



8. Valsalva maneuver rhythmogram.



11. Interpretation of the cardiovascular tests results.

# Features

## Advantages of VNS-Micro

- **VNS-Micro** provides the simultaneous study of heart rate and breath rate and also the performing of cross-analysis of heart rate (HRV) and breath rate variability (BRV). The availability of the breath sensor gives the possibility to perform correctly the results interpretation of patients with the rare breath rhythm and the children

## Cardiovascular Reflex Tests by D. Ewing is a "Golden Standard" of ANS Assessment

Vegetotester from **Neurosoft** Company implements the cardiovascular reflex tests battery by D. Ewing which, in spite of the long existence, remains the "golden standard" of ANS assessment, in particular for the patients suffering from diabetic and toxic autonomic neuropathy.

The software provides the representation of the complex assessment in points with the graphical and text interpretation.

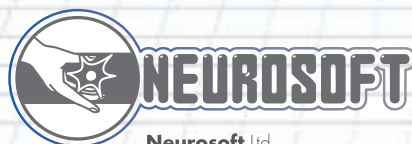
The delivery set for the cardiovascular reflex test performing includes the following:

- Tonometer
- Special system with manometer and valve allowing to perform the continuous exhalation with the specified resistance
- Set of mouthpieces
- Handgrip dynamometer for the test with the isometric voltage



## Delivery Set

- Electronic unit
- Patient cable for **VNS-Micro**
- Reusable limb clamp ECG electrode – 4 pcs.
- Breath sensor with cable – 2 pcs.
- Set of equipment for cardiovascular reflex tests:
  - Tonometer
  - Manometer with attachment for Valsalva maneuver
  - Mouthpiece – 20 pcs.
  - Handgrip dynamometer
- Electrode gel (bottle with dispenser 250 g)
- Software
- Technical manual
- User manual
- Transportation bag



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