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DIAGNOSTIC MEDICAL EQUIPMENT

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Body speaks -
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EMG systems

Computer Electroneuromyographs for neuromuscular system examination by registering muscle and peripheral nerves potentials

Computer electromyograph DX M-TEST ONE allows you to register up to 8 EMG channels according to the chosen examination method. In this case, the order and set of methods used in the examination of the patient is determined by the doctor arbitrarily, in accordance with pathology.



Available methods

Surface EMG

- Interferential myography
- Exteroceptive supression
- Mastication test
- Electronystagmogram

Evoked potentials

- Brainstem auditory EP
- Long-latency auditory EP
- Cognitive EP (P300)
- CNV
- Flash visual EP
- Pattern visual EP
- Short-latency somato-sensory EP
- Vegetative dermal evoked potentials



Stimulation EMG

- Motor NCV
- Sensory NCV (orthodromic method)
- Sensory NCV (antidromic method)
- F-wave
- H-reflex
- Blink reflex
- Magnetic stimulation
- External sync
- Muscle motor response (M-response)
- Motor inching
- Repetative stimulation script
- M-response decrement
- Tetanic contraction

Needle EMG

- Spontaneous activity
- Motor unit potential
- Turn-amplitude analysis



DX M-TEST line of electromyographs includes six models depending on the channels - 2/4/8 and the availability to complete the set with EP:

DX M-TEST ONE-2, DX M-TEST ONE-2 EP,

DX M-TEST ONE-4, DX M-TEST ONE-4 EP,

DX M-TEST ONE-8, DX M-TEST ONE-8 EP.

Registration of surface and needle EMG, recording with current stimulation, including automatic repetitive stimulation, is available.

The modern compact design combines an EMG amplifier, current stimulator, and photophonostimulator in one housing. Portable and lightweight. A well thought out set of controls for quick diagnostic information is located on the front panel. To provide the user a better experience with the device there are LED indicators that display the changing parameter.

Myographs comply with European safety requirements.

A single connector standard allows the use of compatible cables from other manufacturers.

Additionally, the M-TEST ONE is equipped with a mobile stand or a special desktop bracket, which makes the whole working process very comfortable. To reduce interference from the power grid, in difficult working conditions, it is possible to use the Power Bank.

Technical specification

Number of EMG channels	2,4,8
Registration range of the input signal EMG	10 ...60,000 μ V
Input impedance, no less	100 Mom
Noise level	1 μ kV
Sampling rate	16 000 Hz
Frequency range	from 0.2 Hz to 3,5 kHz
Time constant of low-pass filters, not less than	1,6 s
Common mode rejection ratio at 50 Hz, at least	110 dB
Current stimulation impulse magnitude	1 - 100 mA
Current stimulus duration	0,01 – 2 ms

M-TEST

1. Surface myography x 2. NCV motor 3. NCV motor 4. NCV motor 5. NCV motor 6. NCV motor 7. NCV motor 8. NCV sensory 9. NCV sensory 10. NCV sensory 11. F-wave

Epoch(s) 5

1ch: s.n. Musculocutaneous, m. Biceps brachii, (CS-C6)

0 100 200 300 400 500 600 700

Interferential

N	Ampl. max, μV	Ampl. mean, μV
1	71	
2	542	116.5
3	95	
4	393	90
5	100	41
6	624	132

Freq. mean, 1/s

166.5

93.5

55.4

122.8

Tremor

N	Ampl. mean, μV	Discharge freq. mean, 1/s
1		
2	182	1.0
3		
4	90	1.8
5	41	0.4
6	152	0.6

s.n. Musculocutaneous, m. Biceps brachii, (CS-C6)

0.5 mV/cm

50 ms/cm

HF 50 Hz

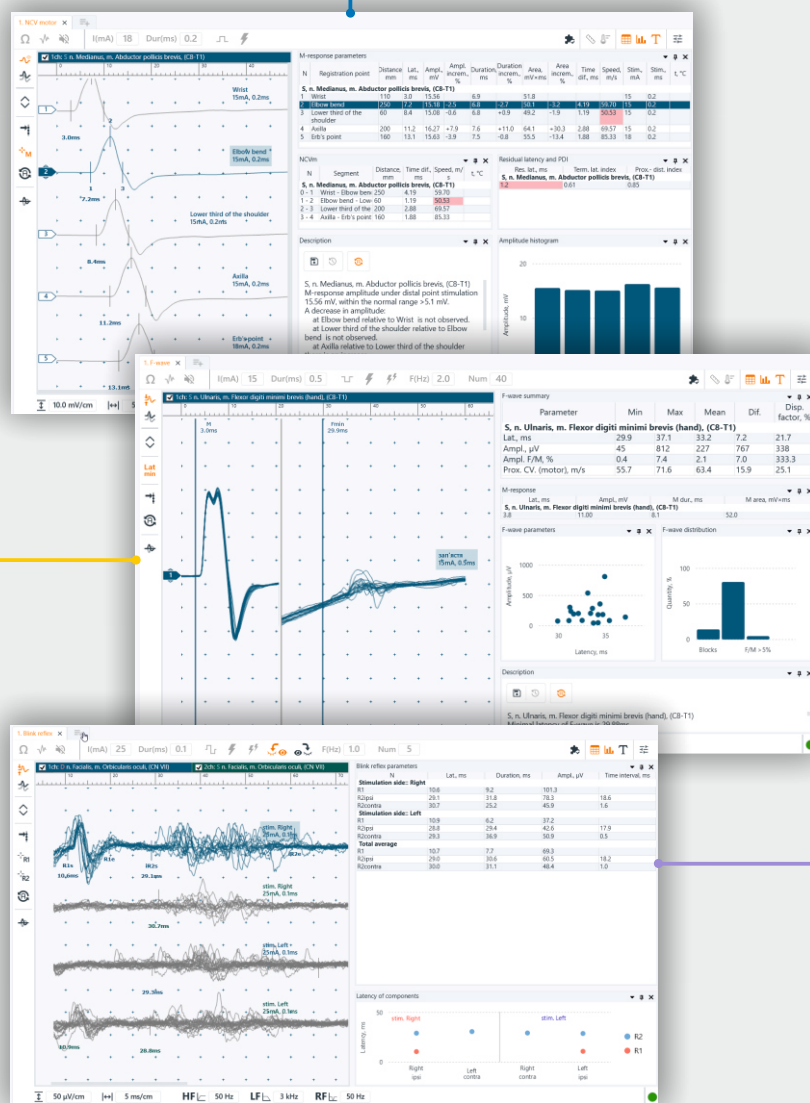
LF 5 kHz

RF 50 Hz

Main parameters of the **surface EMG**: frequency of the total electrical activity of the muscles, maximum signal amplitude, average signal amplitude.

For prosthetic dentistry, an additional analysis of the mastication test is provided.

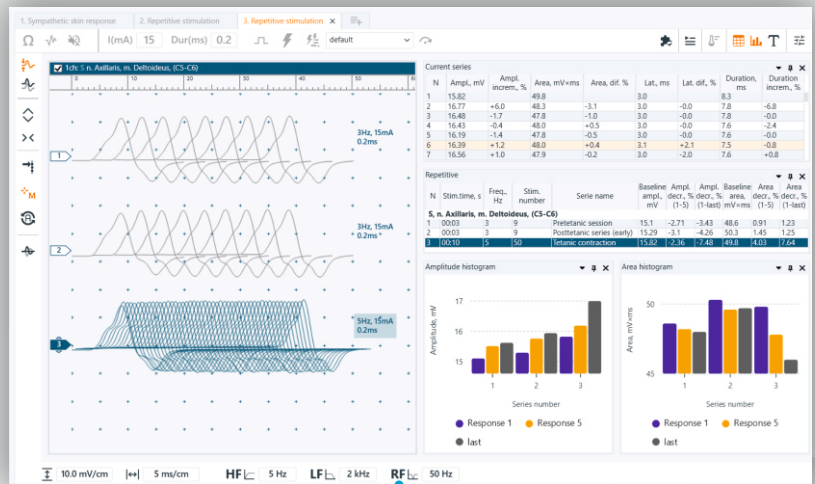
In the examination of pain, the examination of exteroceptive suppression of voluntary muscle activity is used.



The use of current stimulation provides the highest accuracy in the study of nerve conduction. Muscle response or electrical activity is measured by means of the current stimulus of the precise duration and amplitude. Either the early responses (M-response) and late responses (F-wave, blink reflex, H-reflex) allows to determine the level and location of the lesion of the peripheral neuro-motor apparatus. Separately, sensory and motor fibers can be assessed by measurement of the sensory and motor NCV. Therefore, this group includes the main methods applied in the differential analysis of neuromuscular diseases.

A special type of analysis of responses to stimulation is an analysis using **repetitive stimulation**. A decrement test is performed to evaluate the reliability of neuromuscular transmission.

Tetanic contraction and pharmacological loaded test can be used to detect myasthenia gravis and Lambert-Eaton myasthenic syndrome.



Needle EMG

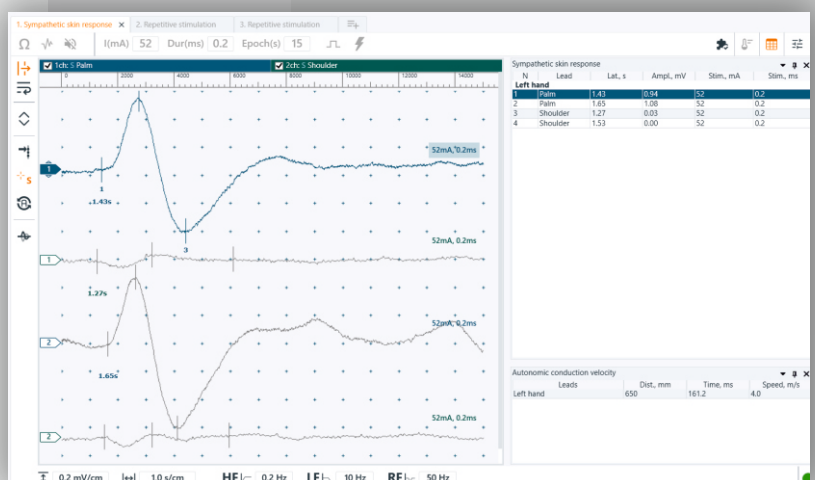
Needle electromyography (**local EMG**) examines the functional state of the muscles at rest and under arbitrary stress. Specific findings are seen in primary muscle diseases that are different from those seen in nerve diseases. According to the results of a comprehensive ENMG study, it clarifies the level of damage to the peripheral neuromotor apparatus, the nature, severity and prevalence of the pathological process, and in the repeated studies - the effectiveness of the therapy.



Evoked potentials

The techniques for recording evoked potentials are significantly different from other studies conducted as part of the EMG. They solve specific problems. Visual evoked potential can be used to confirm damage to the visual pathway and auditory evoked potentials to trace the signal generated by a sound through the ascending auditory pathway. This EP types can be sensitive to dysfunctions that may not be found with just physical examinations or MRI.

Somatosensory Evoked Potentials are often used in neuromonitoring to assess the function of a patient's spinal cord during surgery. **Galvanic skin response** is an indicator of the autonomic nervous system.





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BRAINTEST

M-TEST

RHEOTEST