

# PAS 8000

Device for generation of resilient waves

System for non-destructive plates testing in phased array technology



## DESCRIPTION

SHM and NDT technologies (Structural Health Monitoring, Non-Destructive Testing) are known for many years. They are used for non-destructive testing of a state of materials with the use of high-frequency resilient waves. The experiments are realised with the use of piezo elements acting both as actuators and sensors. Special driving of several exciting elements enables to form the beam - signal that is transmitted directionally (process of beamforming). Basing on the response of the examined object it is possible to determine the status of the structure.

The device PAS 8000 is the system for beamforming and collection of the response of the tested object. The array of piezo elements, that are driven with defined delays, generates the wave in particular, needed shape (parallel, a lined or perpendicular to the linear pattern of piezo elements or round for circular array). The technology is based on the interference technology, where generated waves superpose and create the main front wave. From the tested object's response the conclusions about the state of the object may be drawn - whether it has any external or internal damage, or - it is just sound. At the end of the experiment the measured data are sent via the USB interface to the PC and, after pre-processing, can be displayed and analyzed in the MatLab® environment.

The PAS module contains up to 8 power stages that can generate the excitation signals with pre-set parameters separately. This is the response for the need of phased array and beamforming experiments. Measuring modules (PAQ) may be equipped with 8 or 16 channels for the acquisition of the structure's response. Modular construction of the system enables to choose the quantity of the equipment included in the set (generating and measuring) correspondingly to the requirements of the user.

## FUNCTIONALITY

- modular design allows the system to adjust the quantity of used channels (transmitting and measuring) to the need/application
- synchronous measurements of connected devices
- selectable master-device that triggers the slave-ones
- user-friendly interface allows the operator to set the parameters of every power stage separately
- „continuous” (with unit or sub-unit step) adjustment of the values of frequency, number of periods, delay of generated excitation and interval between measurements within the range of values for each parameter
- free choice of active power stages (piezo actuators) and measuring channels (piezo sensors)
- free choice of active piezo sensors with the possibility of turning off all measuring elements (the „just excite” mode)
- ability of quick review of the measured data and storing the whole measurement session on the hard drive
- possibility of adjustment of the device to continuous exciting mode

## APPLICATIONS

- detection of outside defects of the tested objects (scratches, fractures)
- non-destructing testing of structures - weld inspections and detection of internal damages (cracks, fractures, gas bubbles, delaminations)

