

NanoBalancer

Fine Balancing System with precise Laser Ablation



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Laser System corrects smallest Imbalances

The fine balancing system NanoBalancer corrects smallest imbalances of rotating work pieces with laser ablation. The removal of material is performed either statically after the measurement or dynamically during the rotation of the work piece. Typical examples are impellers for technical or medical applications, air-driven turbines or small rotors of miniature motors.

Automated non-contact Ablation

The measurement unit determines the imbalance, the amount of mass to be removed as well as the corresponding angle relative to a reference position. These values are transmitted to the electronic of NanoBalancer. The amount of mass to be removed is calculated and the automatic process is started. The pulses of the laser hit precisely the position of the rotating work piece where the mass has to be removed.

A control measurement follows. If necessary, another corrective cycle is started until the required result is reached.

During the entire process, the work piece stays on the measurement system. The result is a significant time saving, especially if the ablation takes place while the part is rotating. In this case, the time of the acceleration for a control measurement is saved.

Some balancing processes require static laser ablation. This is possible without any limitation.

NanoBalancer corrects imbalances in one or two planes. The laser beam switches from the first to the second plane within a few milliseconds – a substantial gain in productivity.

NanoBalancer removes very small amounts precisely. Complex shapes of impellers can be processed because of the non-contact process. This allows for a large degree of freedom for designing new impellers in regard to shape and material.

Small pockets to carry balancing weights are no longer necessary. Production costs are reduced.

Various Materials

For impellers made of plastics, a CO₂ laser is the ideal choice. Practically all plastic materials absorb the radiation of 10.6 µm. The glass fibers for enforcement of the work piece are no obstacles. The processing of impellers made of metals requires different laser delivering pulses with substantially higher peak power. Lasers generating pulses in the range of 10 ps are well-suited to remove metals clean and without burrs.



Typical work pieces are impellers for technical or medical equipment, air-driven turbines and small rotors of miniature motors.

Advantages of NanoBalancer

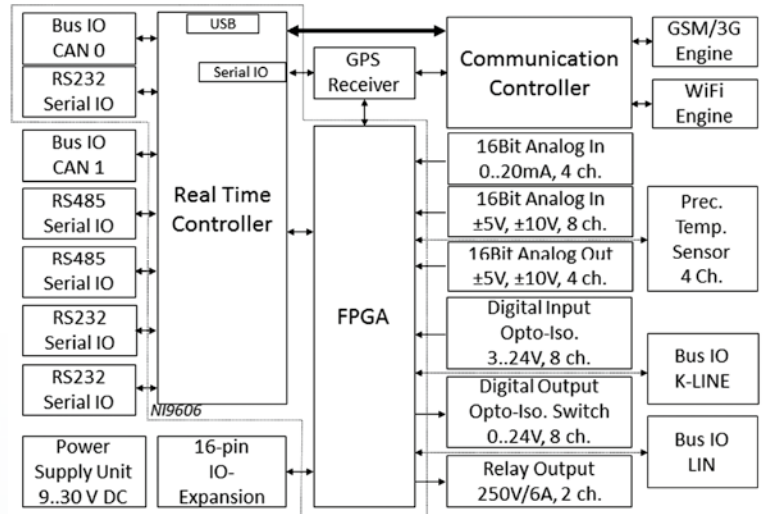
- **Precise ablation for correction of smallest imbalances**
- **Close coupling with measurement unit to determine imbalance**
- **Correction in one or two planes**
- **No additional process steps**
- **Processing of rotors, turbines and impellers made of metal and plastic**
- **Wear- and tear-free ablation process**
- **Integration into production lines**

NanoBalancer in Production Lines

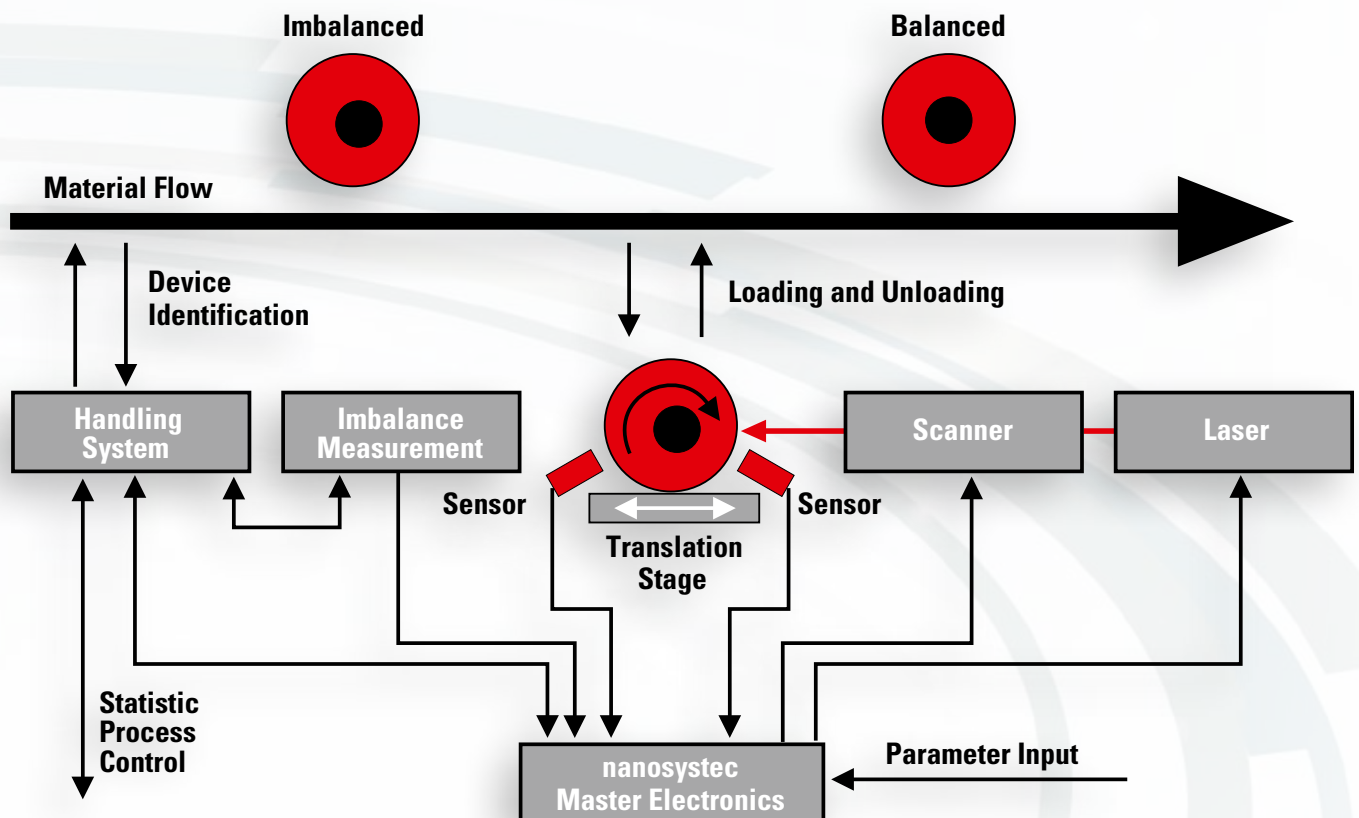
NanoBalancer operates either as a standalone system or it is integrated into production lines. If large volumes need to be treated, the integration of NanoBalancer with automated loading/unloading is ideal. The entire process runs automatically providing highest productivity. In this case, NanoBalancer communicates with all peripheral systems.

When NanoBalancer operates as a standalone system, the precision of the balancing and the flexibility are the primary aspects. Loading/unloading is manually performed while the balancing process runs automatically.

NanoBalancer complies with laser safety class 1 and therefore operates without additional safety measures. Vapors and particles generated by the process are sucked away.



Various interfaces allow the communication with peripheral systems.





Fixtures with quick loading mechanisms support the efficiency of NanoBalancer.

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