Title: DIBOX Measurement system

The DiBOX is a system that monitors and diagnoses machines. It helps to prevent machines from failing by detecting damage early on before major problems arise.

This solution makes it possible to evaluate the technical condition of machines in general, as well as to detect them at an early stage, such as:

• Imbalance and eccentricity,
•Misalignment
• Damage to rolling and plain bearings and their housings
• instability of the oil film,
• Cavitation,
• Clamping of loose and cracked machine parts,
• Damage to gears and belts,
• Damage to turbines and fans,
• electrical damage to motors,
• Critical speeds, resonances.

The device offers you:

1. A simple application only as a display of vibration signals from accelerometers or other analogue sensor signals
2. A complex monitoring and diagnostic system, by determining the vibration parameters and recording the temporal vibration signals in an internal 8GB memory and forwarding them to external databases for analysis.

The device is compatible with:

1. Accelerometers (absolute oscillation)
2. Eddy current or laser displacement sensors (relative vibrations, 0-20V)
3. Sensors with analogue output (0-20mA, 0-20V)
4. Speed sensor (encoder) (0-24V)

It can handle the following parameters:

- Vibration signal
- Temperatures (Temp. sensors built into the vibration sensor)
- Speed

- Switch on drive
- Oil levels
- Pressure values
- Temperature values (via converter)

The measurement data can be transferred to external systems with the following interfaces:

1. Digital interfaces:
   - Ethernet
   - Modbus TCP
   - ATCMESbus – Protokoll (optional)

2. Relay outputs:
   - 4 NC Contact
3. Analog Outputs
   - 4 active current outputs 4-20mA

The current measurement results are shown on the device display.
The measuring device processes the sensor signal and analyzes it internally in real time.
If the stored limit values are exceeded, a warning is reported on the display or an alarm is reported via the interface. The display is updated and displayed every two seconds.

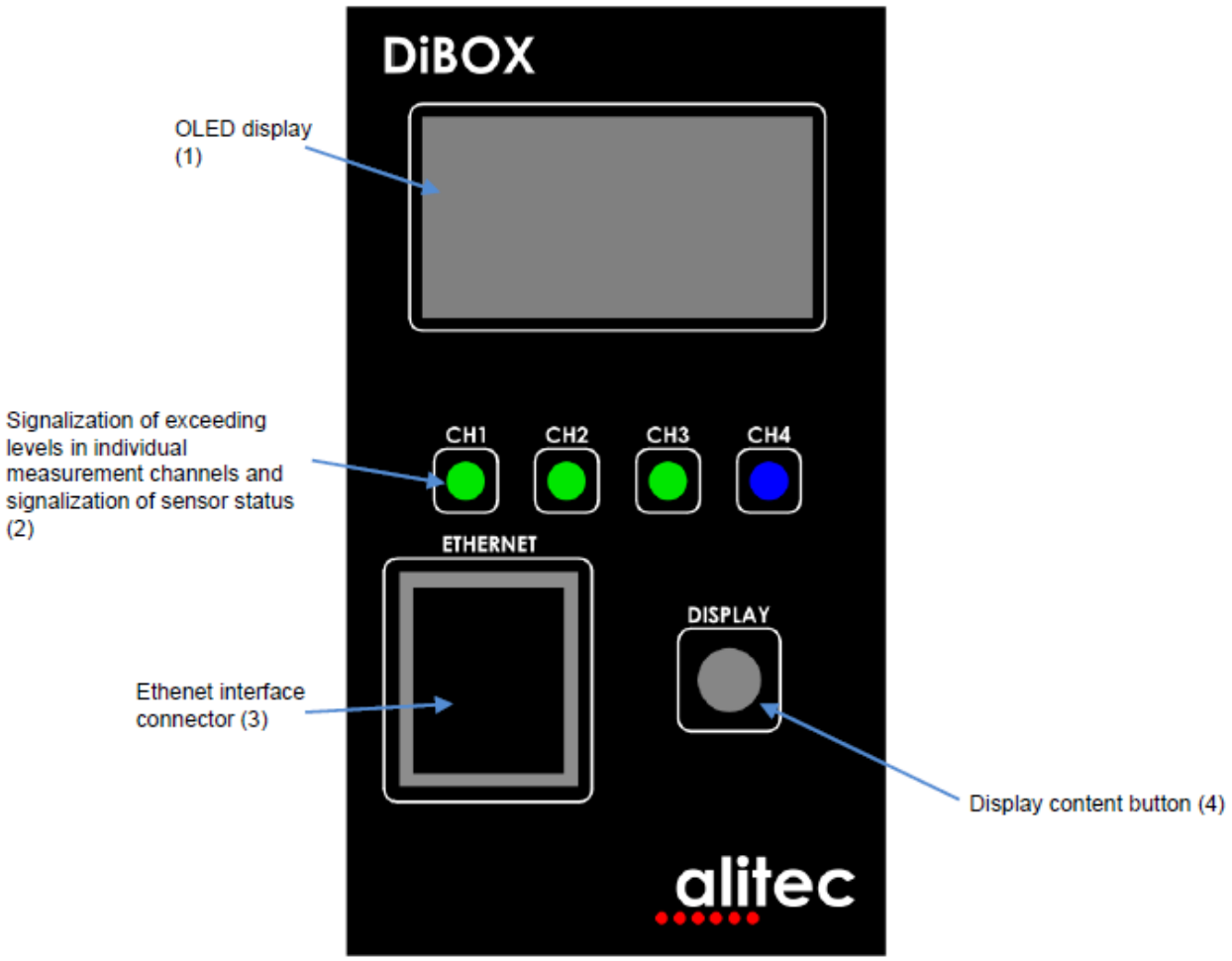
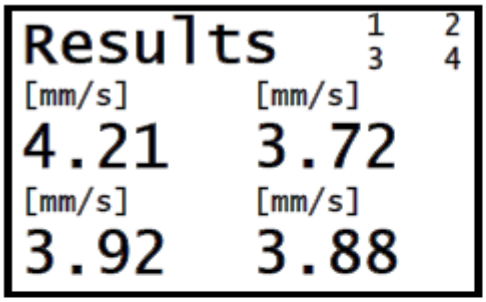


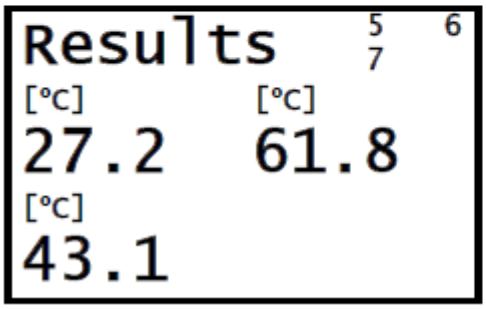
Figure 1. Front panel view of DiBOX



Results screen, numbers of analyses presented

Results of analyses 1 and 2

Results of analyses 3 and 4



Results screen, numbers of analyses presented

Results of analyses 5 and 6

Results of analysis 7 (analysis 8 not active)

The built-in, configurable relay module can turn on the alarm transmitter with a user-defined delay, shut down the monitored machine, or provide the digital signal to the higher-level system.
Each device has a built-in web server that allows it to be configured without the need to purchase additional software.

The integration of various process parameters allows the monitoring of machines operating under variable loads. The optionally available integrated data memory with 8GB serves as buffer memory and protects against data loss, which is necessary for further evaluation with the VIDIA diagnostic program, for example.

In multi-channel systems, the ATCSync interface ensures that all measuring instruments are synchronized and that their data can be acquired simultaneously. This allows the data between different elements of a monitored object to be analyzed and checked, such as how vibrations are influenced by the position of the measuring axis.

Scope of delivery as an example of the DiBox 3522 safety monitor:

- 4 dynamic DC inputs for sensors (sensor condition monitoring), single measuring range
- 4 static DC inputs for temperature and process parameters
- 3 digital inputs, Ethernet 100Base-Tx interface, MODBUS TCP
- 8 AD converters: 4x24Bit (65.5 kHz) and 4x14Bit (1 kHz)

- OLED display (results, alarms, configuration)
- 3 threshold alarms for each of the 24 analyses, alarm delay, alarm memory
- Integrated web server for configuring analyses, alarms and interfaces
- Module with 4 configurable relays (device status, threshold of any analysis exceedance)
- NC, Switching signal 24 VDC 1A
- 4 analog outputs 0..20 mA, galvanically isolated, freely configurable (common ground for all outputs)

Optionally available software:

ViMEADAQ; VIDIA; mVIDIA; API; Drivers for LabView;

The stored information enables the following with the VIDIA software:

- Creating trends
- Changes in diagnostic parameters
- Evaluation of the technical condition of components over time
- Event Diagnostics
- Etc.