



Data sheet



Adash 4101T vibration analysers

Application:

- Diagnosics of bearings, lubrication and mechanical defects of machines – unbalance, misalignment...
- Diagnosics of ventilators, pumps, gearboxes, engines, turbines, machine tools...
- Diagnosics of low-speed machines – paper machines, rolling mills, transport mechanisms...
- Operating machine balancing
- Check-out of products

Characteristics:

- A possibility to connect acceleration, velocity sensors
an optical phase probe, a measuring transformer
- ICP feeding of the connected sensor, AC input for general measurement
- TTL trigger for the synchronization of measurement, machine speed measurement
- Averaging of static and dynamic data measurement - maximum 64
- Measurement of TRUE-RMS and TRUE-PEAK values, *Crest* and *Kurtosis* factors
Acc in g ($g = 9.81 \text{ m/s}^2$) in band 0.8 Hz to 16 kHz
Vel in mm/s (in/s) in band 10 Hz to 1000 Hz, signal integrated
DISP in μm (mils) in band 10 Hz to 1000 Hz, signal double-integrated
HFD in g ($g = 9.81 \text{ m/s}^2$) in band 5 Hz to 16 kHz
- FFT analysis 101 to 801 lines, order analysis of 10 harmonics
- Time signal analysis
- Operating single or two plane balancing
- Data collector – route mode of measurement, data memory 1024 kB
- Analyser – user setting of parameters between measurements
- Backlighted graphic LCD display
- Power supply 4 x AA accumulators or alkaline cells
- RS 232 interface for communication with the user software
- User software A4000 Download, DDS 2007, DDS 2000, MDS 5.00



Introduction:

The Adash 4101T instrument is a portable, fully digital data collector and vibration analyser with the possibility of on-line and route measurements. It is intended for identification of bearing condition, lubrication and mechanical defects of the whole machine. It enables to apply diagnostics at the level of measurement overall values, FFT analyses and time signal measurement. Its equipment enables not only detection of occurring defects but also their detailed analysis and precise

specification. It can also be used for single and two plane machine balancing. The analyser is characteristic by its very easy operation. If used with the DDS 2007 database and expert system, it is suitable for both experienced users and beginners. Also is possible to use simple A4000Download software. If used with the MDS 5.00 user software, it enables to evaluation the machine deflection shapes.

Diagnostics of Bearings and Lubrication:

For this diagnostics, the Adash 4101T instrument offers HF methods and Crest and Kurtosis factor measurement.

The measurement of *HF* parameter is the basic method for the analysis of antifriction bearings. It is based on the fact that, in case of an incipient defect, the emitted energy of vibrations increases in higher frequencies (kHz levels). This parameter is also very sensitive to lubrication failures. The analyser enables to measure TRUE-RMS

and TRUE-PEAK values, time signal and signal spectrum in frequency bands HF and Acc (vide the Technical Specification on the final page).

The **Crest** factor is a very sensitive measurement parameter in case of bearing mechanical damages, which are detected already in a very early stage. This method is fully independent on the bearing type and on the shaft speed.

The **Kurtosis** factor represents, compared to other methods of bearing condition analysis, a statistic method.

Diagnostics of Mechanical Defects:

The Adash 4101T analyser is completed with all necessary tools for the diagnostics of mechanical machine defects. It enables a timely detection of unbalance and misalignment, looseness, cavitation and resonance problems. These basic defects along with bearing failures represent the absolute majority of operating problems. The analyser is completed with efficient methods of signal processing so that each type of defect may be verified in several ways, which ensures a high reliability of detection.



The analyser enables to measure TRUE-RMS and TRUE-PEAK values, time signal and the signal spectrum of velocity in frequency bands (vide the Technical Specification on the final page).

An efficient method is the order analysis, providing an array of amplitude and phase values in speed frequency and its harmonics.

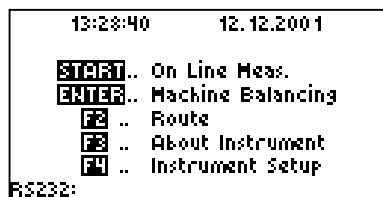
Operating Balancing:

The operating balancing is the best manner of machine balancing. It is not necessary to disassemble the rotor, the whole machine being balanced in such conditions under which it is going to work. The Adash 4101T analysers represent optimal combination of characteristics since they enable the diagnostics of operating failures after the removal of which the final machine balancing is carried out. The balancing module allows to perform single or two plane machine balancing, without having to use a test mass. A special wizard leads the user through the whole process of balancing. The module includes software for the calculation of mass division (e.g. on ventilator blades).

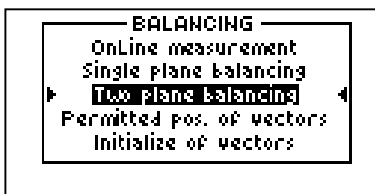


Analyser control:

The instrument is controlled by selecting menus that appear on the display. From the analyser main menu is activated the requested function by pressing the relative button.



In the selection menu is first selected the requested function and validate by pressing the Enter key.



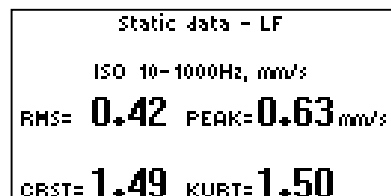
Signal Path Selection:

The analyser, prior to starting measurement, offers the user to select one of four signal paths (vide the Technical Specification on the final page).

For the diagnostics of bearing condition, mainly HF and Acc paths are used; for the diagnostics of mechanical failures mainly Vel and DISP paths are used.

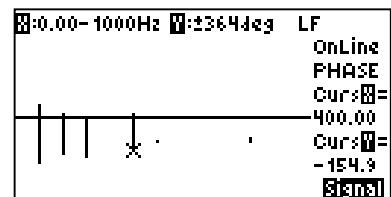
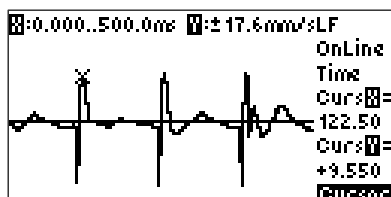
Signal Static Parameters:

For each signal path four most important static parameters can be evaluated from a single measurement: TRUE-RMS and TRUE-PEAK values and Crest and Kurtosis factors.



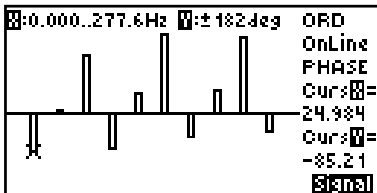
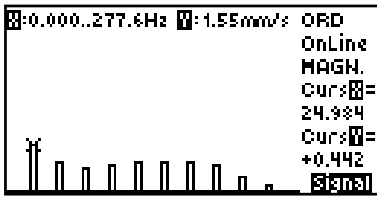
Time Signal and Signal Spectrum:

The displayed time signal and signal spectrum can be moved on the analyser screen, its appropriate resolution in both the measured coordinates can be selected and the cursor can be set to the requested signal point or spectrum line. Coordinates on the cursor position can immediately be read from the screen. If measurement is externally synchronized, for instance by tachoprobe impulses, the final spectrum will be complex.



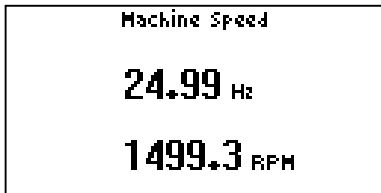
Order Analysis:

The measurement results are, like in case of the complex spectrum, presented to the array of amplitudes and phases, but measured at the speed frequency and its harmonics.



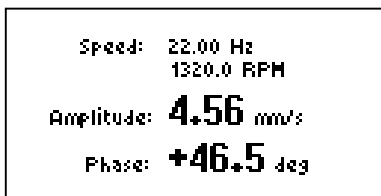
Machine Speed Measurement:

After connecting a tachoprobe, the machine speed in CPS and RPM can be measured on-line.

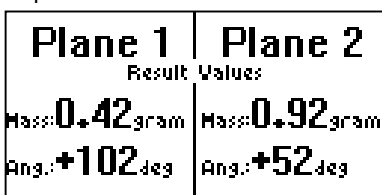


Machine Balancing:

The single or two plane operating balancing of machines is possible. Prior to any balancing, on-line measurement can be carried out to machine stability condition check.

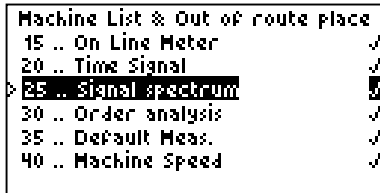


The process of balancing can be suspended any time. The performed measurements and calculations remain stored in the analyser memory also after it is switched off. After switching the analyser on again, the process of balancing will continue from the place where it was suspended for the last time.



Storing of Results:

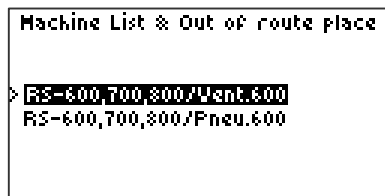
If the measurement result appears on the analyser screen, measured data may be stored in the instrument memory. Measurement results thus stored can be exported via the RS 232 serial interface from the instrument memory to the database of the Adash DDS 2007 expert system, where they are archived and available for comfort analyses. If the processing of measurement results is sufficient in a text format, data can be exported from the instrument memory using a simpler program Adash 4000 DL.



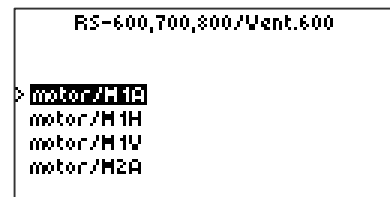
Route Measurements:

Using the DDS 2007 database system, a list of route measurements can be created and transferred, any time via the RS 232 serial interface, to the analyser memory, including the referential values of individual measurements. The list of route measurements has three levels.

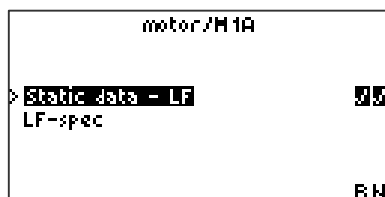
The highest level of route measurements is the *machine* item.



Each machine item consists of a list of *measuring points*.



Each measuring point item consists of a list of measurements, required in the measuring point of the selected machine.



Within the route measurement, individual measurements or the whole set of measurements within the selected measuring point can be started. The measured data are immediately stored in the analyser memory and later exported, via the serial interface, to the DDS 2007 system database.

Technical Specification:

Inputs:	INPUT for vibration sensor (ICP power supply) or for AC input ± 3 V TRIG for trigger impulses, machine speed (3 - 5 V) RS 232 for optical tachoprobe, connector of communication interface with the user software
Interface:	RS 232 for communication with the user software
Sensor:	accelerometer with ICP power supply, nominal sensitivity 10, 50, 100, 500 mV/g or user setting
Signal ranges:	Acc 0.01 – 30 g PEAK(sensor 100 mV/g) Vel 0.01 – 4000 mm/s PEAK (sensor 100 mV/g) DISP 0.5 - 10000 μ m P-P (sensor 100 mV/g) HFD 0.01 - 30 g PEAK (sensor 100 mV/g)
Signal paths:	Acc in g ($g = 9.81 \text{ m/s}^2$) in band 0.8 Hz to 16 kHz Vel in mm/s (in/s) in band 10 Hz to 1000 Hz, signal integrated DISP in μ m (mils) in band 10 to 1000 Hz, signal double-integrated HFD in g ($g = 9.81 \text{ m/s}^2$) in band 5 to 16 kHz
Balancing:	velocity in mm/s in band 10 to 200 Hz (600 to 12,000 RPM), signal integrated
Measured data:	values TRUE-RMS, TRUE-PEAK, Crest and Kurtosis factors, machine speed measurement of time signal, signal spectrum and order analysis operating single and two plane machine balancing
Measurement:	in route off route hand-configured
Route:	max. 4096 records tree structure: machine - measurement place - measurements 1MB memory (c. 1000 spectras with 400 lines) measurement place name - max. 64 characters reference value
Limit values:	reference value, Alarm and Alert limits are available in DDS software
Display unit:	metric/inch
Averaging:	maximum 64
Trigger:	auto (internal), manually (key), external signal
Display:	backlighted graphic LCD
Data memory:	1024 kB
Power supply:	4 x alkaline cells 1.5 V or accumulators 1.2 V (AA size)
Temperature:	-20 - +65 °C
Size:	223 x 105 x 40 mm
Weight:	approx. 500 g
Protection:	IP 55

Order Information:

The fully equipped measuring set Adash 4101T PRO includes:

- Adash 4101T vibration analyser
- analyser user's manual
- vibration sensor
- coiled cable for connection of the vibration sensor
- magnetic clamp for the vibration sensor
- optical or laser tachoprobe
- digital scales (for balancing)
- CD-ROM with the user SW (A4000 DL, DDS 2007, MDS 5.00 – as per order)
- RS 232 serial connection cable with Canon 9 terminals for communication with the user SW
- user SW manual
- 4 x accumulators AA 1.2 V
- battery charger with user's manual
- leather protective cover for the analyser
- transport bag with a strap