



DEWETRON



AEROSPACE

SOLUTION GUIDE

DEWETRON – WE SET STANDARDS

DEWETRON is the market-leading producer of universal test and measurement systems. DEWETRON's great strengths are in supplying complete systems that are immediately ready for use while also being quickly customizable to the unique needs of the test environment.

DEWETRON has more than 25 years of expertise in measurement engineering and technology. The PC-based systems are suitable for mobile use, modular in design and can therefore be extended as desired. DEWETRON systems are compatible with all common sensors available on the market. Together with our powerful measurement amplifiers, DEWETRON systems will guarantee you accurate, immediate results from your test series.

DEWETRON A SUCCESS STORY

DEWETRON was established in 1989 as a purveyor of PC components and measuring instruments. At that time the market for PC based measuring systems was just emerging and being identified as a promising segment with great potential for growth.

In response to the potential, DEWETRON expanded into producing its own measurement systems and measurement software. As the test and measurement market evolved so did DEWETRON,

introducing the concept of "modular logic". The modular approach to test and measurement combines application specific systems with customer specific requirements to create a high level of quality in a short time. Customization was a part of DEWETRON's philosophy long before it became an industry standard.

For 25 years DEWETRON has set new standards for test and measurement systems. Today, customers from more than 25 countries worldwide rely on our prod-

ucts for precision measurement recording and analysis. DEWETRON is certified in accordance with ISO 9001:2015 and ISO 14001:2015. Environmental and quality management is more than just a statutory obligation for us – it is an integral part of all our business processes. We continually strive to combine innovation and business success with strict quality standards and rigorous quality processes. It is for this reason that we are recognized as a reliable partner.



INDUSTRIAL



AUTOMOTIVE



AEROSPACE



ENERGY & POWER ANALYSIS



TRANSPORTATION

PROJECT PLANNING AND CONSULTING

DEWETRON systems provide the complete technical solution to test and measurement projects and DEWETRON employees provide a wide range of project planning and data management expertise. As your project partner we are always available to answer questions related to initial project planning, post implementation data management and technical support whenever you need it.

QUALITY

Total Quality Management starts with an understanding of what is important to ensure the success of our customers. Our commitment to quality begins with defined technical specifications and continues through product development, delivery and on to the support and service of our products. DEWETRON is ISO 9001:2015 and ISO 14001:2015 certified. Environmental and Quality Management are more than compliance, they are an integral part of our operation. All DEWETRON products are tested at our Environmental Test Facility in Graz, Austria before being delivered.

WORLDWIDE SUPPORT

In the world of test and measurement, testing time is often short so there is no room for downtime. Knowing this, DEWETRON provides prompt, efficient technical support worldwide. With 150 employees working in over 25 countries technical and sales support is always available and has been for more than 25 years. Our support success is measured by over 20,000 DEWETRON systems and 300,000 measurement channels in continuous use in the worldwide Automotive, Aerospace, Energy & Power Analysis, and Transportation markets.

CALIBRATION

DEWETRON maintains two high tech calibration labs: one at the worldwide headquarters in Austria and the other one at the DEWETRON USA headquarters in Rhode Island. Both calibration labs employ the Fluke 5500 series calibrator and the Agilent 3458 multimeter. METCAL calibration software automates nearly every process for precision calibration. Additionally to the standard calibration, we offer accredited calibration according to EN ISO/IEC 17025.

DEWETRON CUSTOMERS

There are more than 20,000 DEWETRON measuring systems and over 300,000 measuring channels in use in well known companies worldwide:

AIRBUS, AUDI, BOEING, BOMBARDIER, BRIDGESTONE, BMW, CONTINENTAL, DEUTSCHE BAHN, ELECTRO SUISSE, EADS, FERRARI, FIAT, FORD, FRAUNHOFER INSTITUTE, GOODYEAR, HARLEY DAVIDSON, HYUNDAI, HELICOPTER INSTITUTE CHINA, IVECO, JOHNSON & JOHNSON, KENNEDY SPACE CENTER, LUFTHANSA, MAGNA STEYR, MAN, MERCEDES BENZ, METRO MADRID, NEW YORK SUBWAY, NISSAN, NASA, NOKIA, OMV, PANASONIC, PIRELLI, PORSCHE, RENAULT, ROLLS ROYCE, SIEMENS, SHANGHAI GM, TOYOTA, UNIVERSITY OF VIENNA, US AIR FORCE EDWARDS FLIGHT TEST CENTER, US NAVY, VOLVO, VW, VOEST, YAMAHA AND MANY MORE.

OUR STRENGTHS FOR YOUR SUCCESS

DEWETRON is a leading global supplier in the field of power measurement. This position is largely shaped by five essential strengths which ensures our customers receive only state-of-the-art products.



CUSTOMIZED



MODULAR



COMPETENT



COMMITTED



APPROVED

CUSTOMIZED

We go the extra mile!
We provide solutions, which simply fit the bill:
Our manifold technologies and modular systems allow us to customize your measurement system to your requirements enabling you to maintain a competitive edge.

MODULAR

Fast. Flexible. Future-proof.
A DEWETRON measurement system is modular in design, which means that components are easily exchanged, customizing the system for additional measurements whenever and wherever necessary. Use one system and adapt it to many different tasks in your work environment. This kind of flexibility guarantees sustainability and investment security.

COMPETENT

Your challenge is our challenge!
DEWETRON is the preferred contact for measurement engineering in several industries. Our strength lies in customizing solutions with the unique DEWETRON technology. More than 25 years of experience, market knowledge as well as continuous research and development have led to the singular DEWETRON expertise.

COMMITTED

Partnership at eye level.
The perfect solution for customer's sophisticated requirements requires a partnership in order to achieve a mutual understanding of technical specifications that ensures the success of our customers' tests. Choosing DEWETRON means having a partner by your side who accompanies you every step of your way.

APPROVED

Our customers' accomplishments are our best reference.
DEWETRON quality is certified in compliance with ISO9001/ISO14001. More than 25 years of experience, innovation and collaboration have awarded DEWETRON the trust and respect of the global market.



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MANY TASKS WITH ONE MEASUREMENT TECHNOLOGY

SYNCHRONOUS INPUT SIGNALS



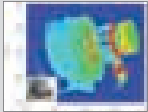
ANALOG INPUTS

Voltage, current, strain, acceleration, temperature, force, pressure, ...



COUNTER

Rotational vibration. Rotary encoder, linear encoder, RPM angle measurement, frequency, duty cycle, period, are only a few examples for counter measurements.



VIDEO

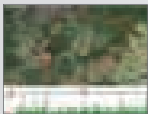
Synchronous video input for web cam, thermo cam and high-speed cameras. It can be also synchronous merged into your measurement afterwards.



ARINC-429, MIL-STD-1553

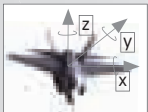
Enables data recording from aircraft's ARINC-429 or MIL-1553 buses.

Also supports transmitting messages.



GPS, IRIG, ABSOLUTE TIMING

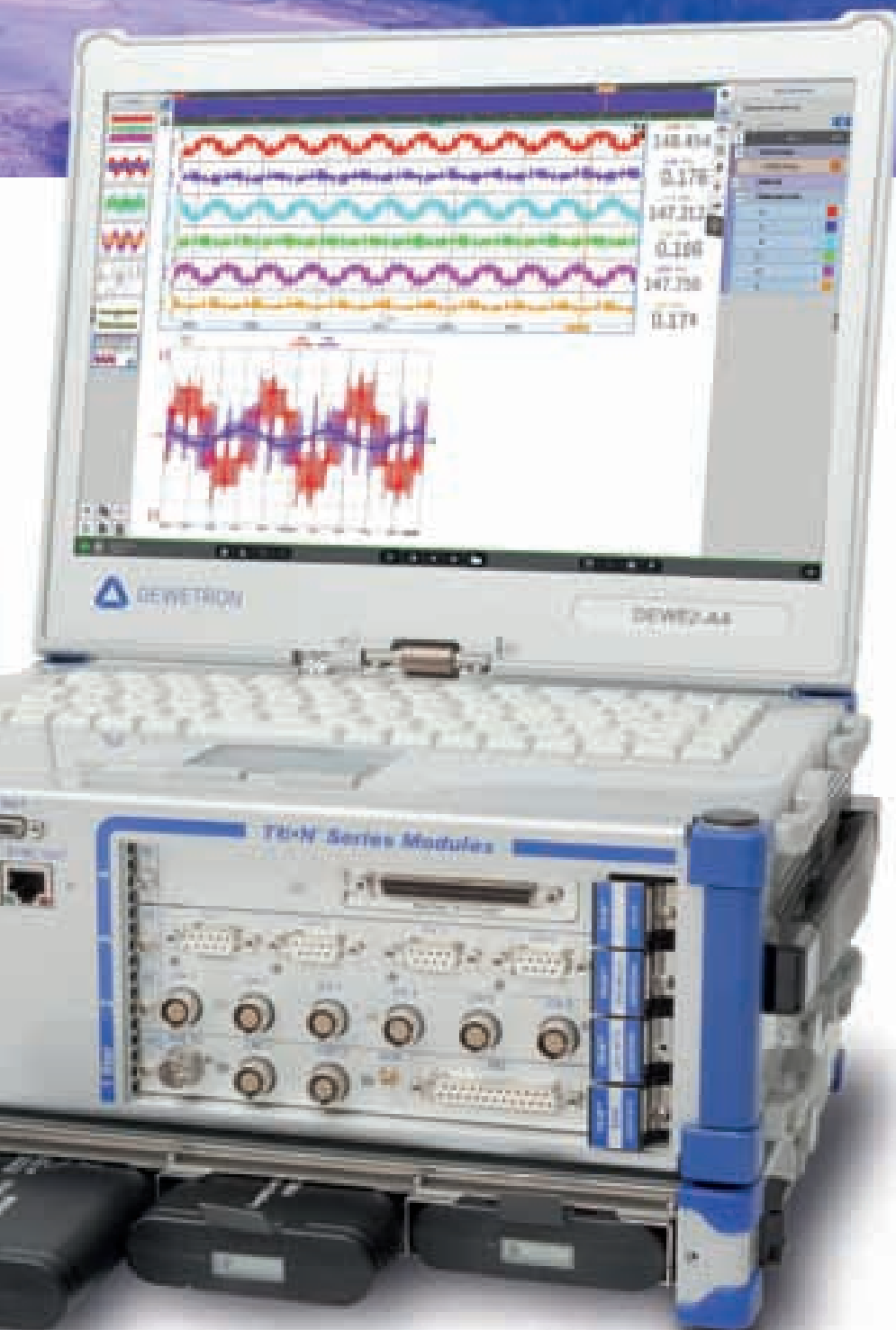
For basic positioning: NMEA GPS interface. For getting precise velocity information: GPS receivers from Ashtech, Topcon, Novatel or Javad. GPS export to Google® Earth®.



INERTIAL DATA

To measure movements of the bodywork when accelerating, braking, negotiating curves, on impact or on overturning.





SYSTEM ARCHITECTURE

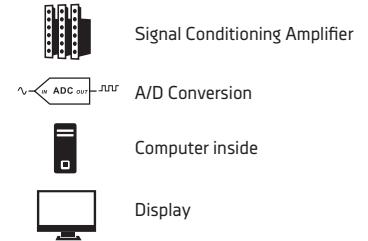
The centre of DEWETRON data acquisition system (no matter if 8 channel or 1000 channels are required) are the DEWE2 (TRION) platforms. All of those platforms can record various analog input signals. No matter, if strain gauge, an accelerations sensor, or a voltage or current input is required, the multipurpose amplifier can handle almost all.

USER EXCHANGEABLE MODULES

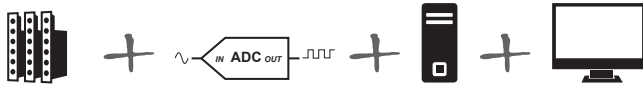
All TRION™ amplifier modules can be changed within a few seconds. Modules in different sampling speed and resolution can be used in one chassis. Use isolated and differential inputs at the same time.



SYSTEM OVERVIEW



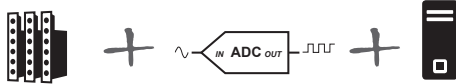
ALL-IN-ONE



- > Built-in display
- > Most compact and flexible configuration
- > Powerful PC inside for fast online displays and analysis
- > Most convenient for mobile applications



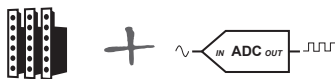
MAINFRAME



- > Powerful PC inside for fast online displays and analysis
- > Can be used with external display
- > Very popular for applications where the instrument is installed in a poorly accessible place for the user



FRONT-END



- > High-speed data transfer
- > To be used with an external computer
- > Expansion for All-in-one or Mainframe instruments
- > Multiple units can be daisy-chained



SIGNAL CONDITIONING



- > Stand-alone signal conditioning
- > Front-ends for existing recorders, A/D boards ...
- > Channel expansion for DEWETRON instruments



ENGINE TEST

The typical environment for engine testing is in control rooms or on ground tests.

Due to redundant power supplies, DEWETRON instruments like the DEWE2-M13 provide high reliability for expensive test cases.

TYPICAL INPUTS

- > Voltage
- > Temperature
- > RPM
- > Strain
- > Pressure
- > Force
- > Vibrations
- > Fuel flow

TYPICAL TESTS

- > Run-up and run-down
- > Steady speed engine profiles
- > Load tests
- > Fuel consumption
- > Sound
- > Vibration

YOUR BENEFITS

- > High reliability for expensive test cases with redundant power supplies
- > Up to 128 static temperature channels additionally
- > Synchronized video capabilities



DEWE2-M13

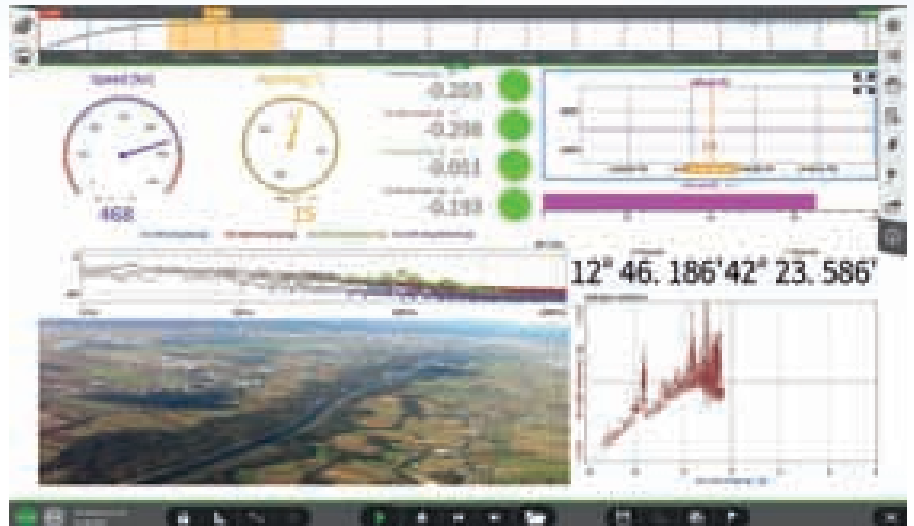
FLIGHT TEST



All objects are tested under normal flight conditions (during in-flight operation).

TYPICAL INPUTS

- > Voltage
- > Temperature
- > RPM
- > Strain
- > Vibrations
- > Fuel flow
- > ARINC 429
- > MIL-STD-1553
- > CAN bus



YOUR BENEFITS

Fully automated test routines can be performed as well as operator supervised operation. Due to highest vibration ratings and superior ruggedness, our instruments are predestined for in flight testing. Distributed measurement locations combined into one synchronised data file.

BATTERY POWER

Battery powered measurement acts totally independently from the airplane's on board system, thus giving 100 % reliable measurement results. Hot-swappable batteries for continuous operation without an external power source for hours.



TORSIONAL AND ROTATIONAL VIBRATION

Rotating machines and engines are sources of rotational and torsional vibration. Rotational vibration is a result of the change in shaft speed during one revolution and torsional vibration is due to angular twist in the shaft or drive train which may cause fatigue.

So you will observe: vibration, force, strain, voltage, current, power, CAN data and rotational and torsional vibration with only one instrument at the same time.

YOUR BENEFITS

- > Time domain measurement
- > Angle based view
- > Additional to all other functions (analog, CAN, GPS, video, ...)
- > Configurable display
- > Direct sensor connection
- > 80 MHz time base
- > High resolution ± 0.03 rpm
 ± 2 mdeg@12000 rpm



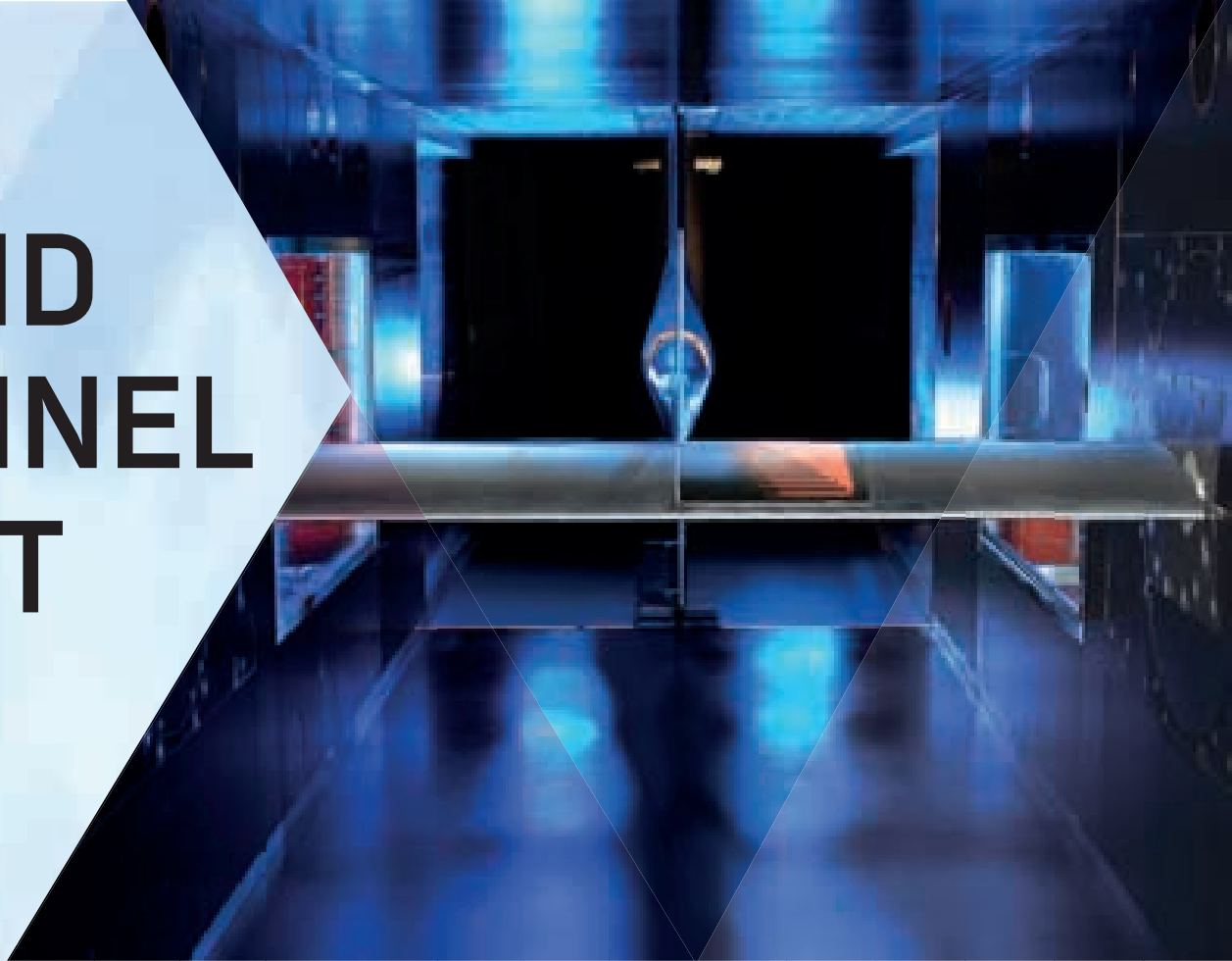
SETUP

For rotational vibration measurement one rpm sensor is used to determine the rpm deviation and for torsional vibration there is one at each end of the power train. DEWETRON supports a wide range of different sensors e.g. encoder, pickup, RIE-360/720 and many others. All these are connected directly to a counter input of the DEWETRON system. Each counter input provides a power supply, three differential inputs with selectable trigger level compatible with all sensor outputs. A ready to use template makes it easy to setup the measurement within a few minutes. Digital input filters, a sensor database and a reference curve eliminates sensor errors.

OUTPUT CHANNELS

- > Reference angle [deg]
- > RPM [rpm]
- > Rotational angle [deg]
- > Rotational velocity [deg/s]
- > Rotational acceleration [w/s]
- > Torsion angle [deg]
- > Torsion velocity

WIND TUNNEL TEST



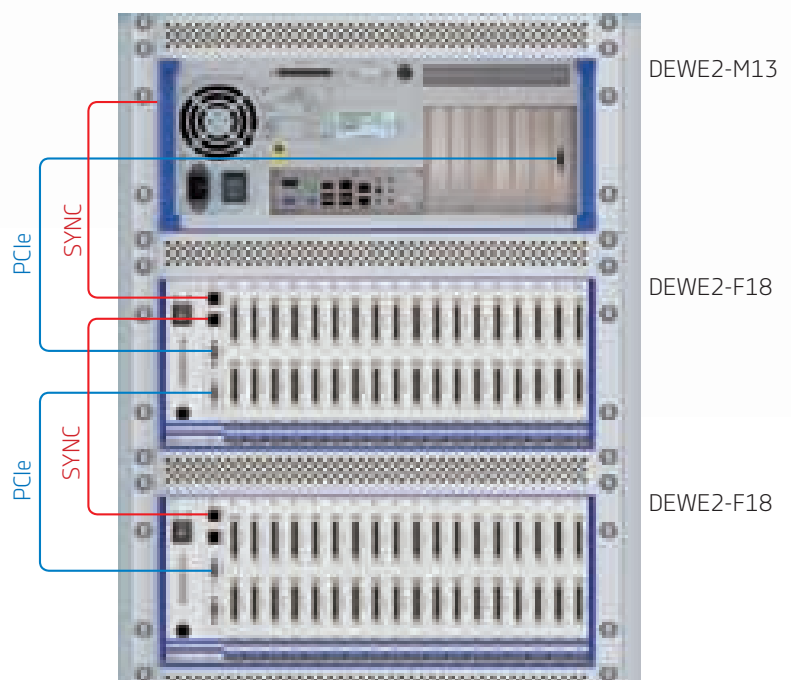
Models of proposed aircraft, engines or components are aerodynamically tested using a variety of sensors options.

TYPICAL INPUTS

- > Acceleration
- > Pressure
- > Load
- > Displacement
- > Torque
- > Tilt angle
- > Temperature

YOUR BENEFITS

Fully scalable systems provide variable input configurations for 100s or 1000s channels of accelerometers (IEPE) or strain gauges (bridge input) totally synced to further analog, digital or video inputs.



MAINTEN- ANCE & REPAIR

Maintenance and repair are typically done in the airplane hangar. Especially portable measurement instruments with infrared camera are a big advantage in this environment.



TYPICAL TESTS

Various systems according to maintenance schedule (power, engine, hydraulics, aviation, ...)

BATTERY POWER

Battery powered measurement acts totally independently from the airplane's on board system, thus giving 100 % reliable measurement results. Hot-swappable batteries for continuous operation without an external power source for hours.

YOUR BENEFITS

- > Battery power
- > Portable system
- > Multiple input types
- > Infrared camera support (FLIR)
- > Same features and software on every type of system

INFRARED

ANALOG
DIGITAL
CAN
COUNTER
VIDEO



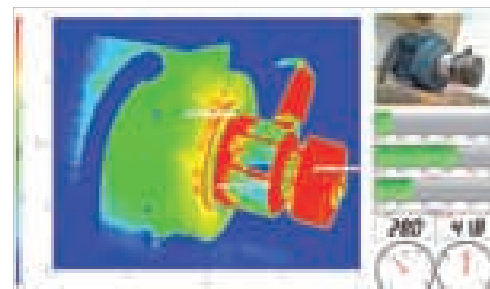
DEWE2-A4 or any other DEWETRON system

+



Infrared camera

=



Mixed signal recording with IR

SAFETY EQUIPMENT TEST

Testing safety equipment such as evacuation slide inflation or emergency exits is very important because this can save lives. With this in mind, all of our products go through a tough product qualification phase, before they are approved for the market.

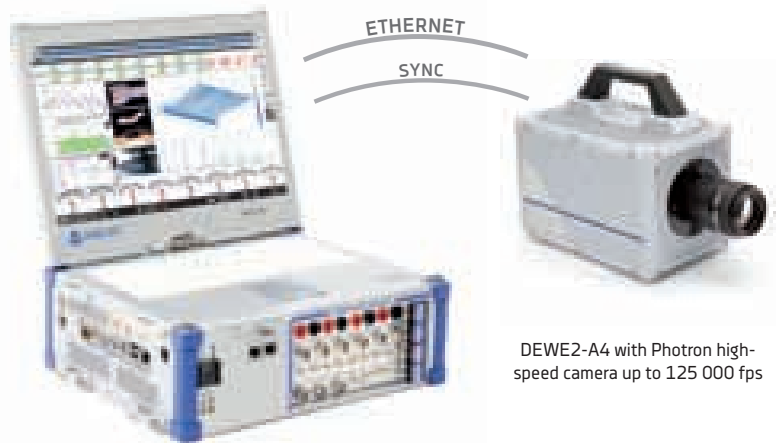


YOUR BENEFITS

- > High speed data acquisition (up to 50 MS/ch)
- > Fully synchronized high speed video (up to 125 000 fps)

PRODUCT QUALIFICATION

During their lifecycle DEWETRON products are exposed to numerous environmental influences, which could directly or indirectly affect function, life span and reliability. With our methods of quality control, we can assure that all our products comply with customer requirements and reliably fulfill their function over the long term.



DEWE2-A4 with Photron high-speed camera up to 125 000 fps



COMPONENT TEST

In laboratory environment component testing is monitored by our fully scalable systems, 1000s of synchronous measurement channels are possible, including high-precision counter and video input. In case of fault trigger, alarm outs are used to stop test procedures or inform test operator via email or text message.

YOUR BENEFITS

Networked measurement data availability throughout the whole testing facility, data analysis with license-free software.

DATABASE STORING

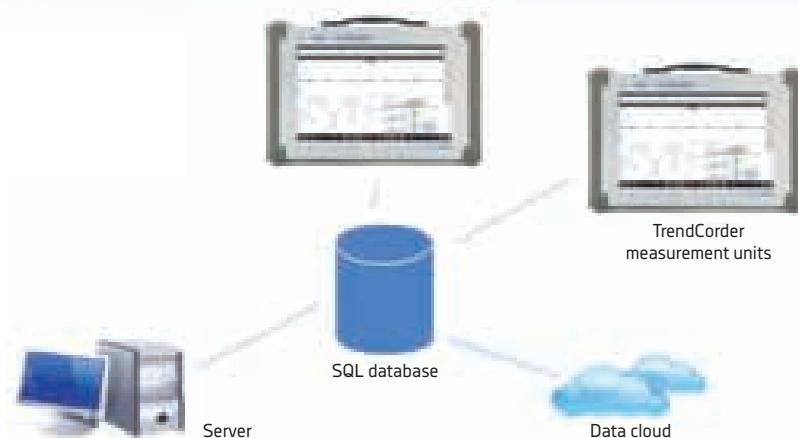
All test series data can be directly stored into SQL database or transferred via FTP protocol.

TYPICAL TESTS

Avionics, servo motors and actuators, INU (inertial navigation units), power supplies, valves, landing gear mechanics, generators

INDIVIDUAL REPORTING

There are plenty of options how to easily create your test reports. Stay within OXYGEN to print reports directly. Use your common office software tools (e.g. Excel) or export to common 3rd party analysis software, like MATLAB. Popular analysis platforms, like FlexPro and FAMOS, open OXYGEN files directly.



SYSTEM INTEGRATION LAB

Major systems of a spacecraft or aircraft are connected and functioning under simulated loads.



YOUR BENEFITS

- > Fully synchronized +ARINC 429 / MIL1553 input and output
- > Alarm out to support test operator
- > No programming required - out of the box operation

TYPICAL INPUTS

- > Voltage
- > Current
- > Temperature
- > RPM
- > Strain
- > Pressure
- > Force
- > Vibrations
- > Fuel flow

DISTRIBUTED & SYNCHRONIZED

TRIONet measurement instruments are the perfect solution for distributed, networked measurement tasks like in a system integration lab.



TACTICAL AND LAND VEHICLE TEST

Today's state of the art of tactical wheeled vehicles incorporate highly sophisticated electrical, power, and hydraulic systems, including hundreds of CAN BUS parameters plus location tracking via GPS and networked communication.



YOUR BENEFITS

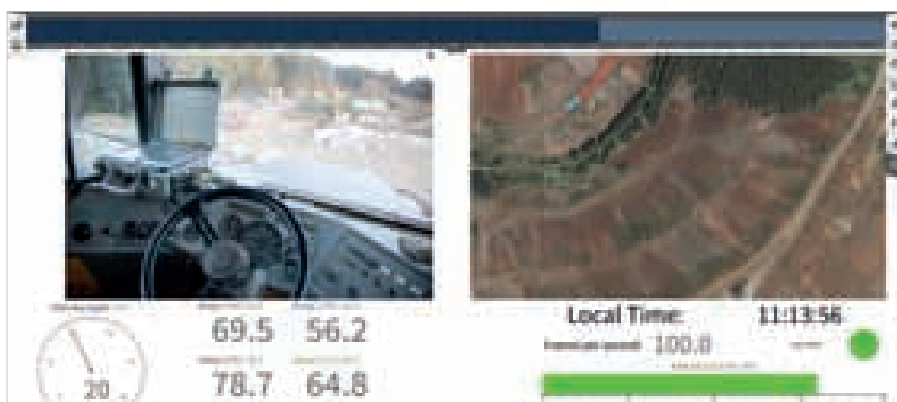
- > Compact and rugged (SSD hard-drives, MIL-STD-810F construction)
- > Synchronized CAN
- > Video (low-light, infrared)
- > Networked sync and data transfer
- > High-speed data acquisition (up to 50 MS/ch)

TYPICAL INPUTS

- > Voltage
- > Acceleration
- > Temperature
- > Strain
- > CAN
- > GPS
- > Video

DATA SAFETY

The safety of the (in most cases) strictly confidential measurement results is supported via removable data storage.



Typical screenshot with OXYGEN measurement software



Data safety with removable storage

STRUCTURAL TEST



Fully scalable measurement systems are a big advantage for testing any structure.

▼ YOUR BENEFITS

- > Fully scalable systems (same features and software on portable and rack systems)
- > Online statistic functions, such as rainflow analysis for fatigue testing
- > Modal calculations directly available in measurement software
- > Export modal measurement data into Me Scope, MATLAB,...

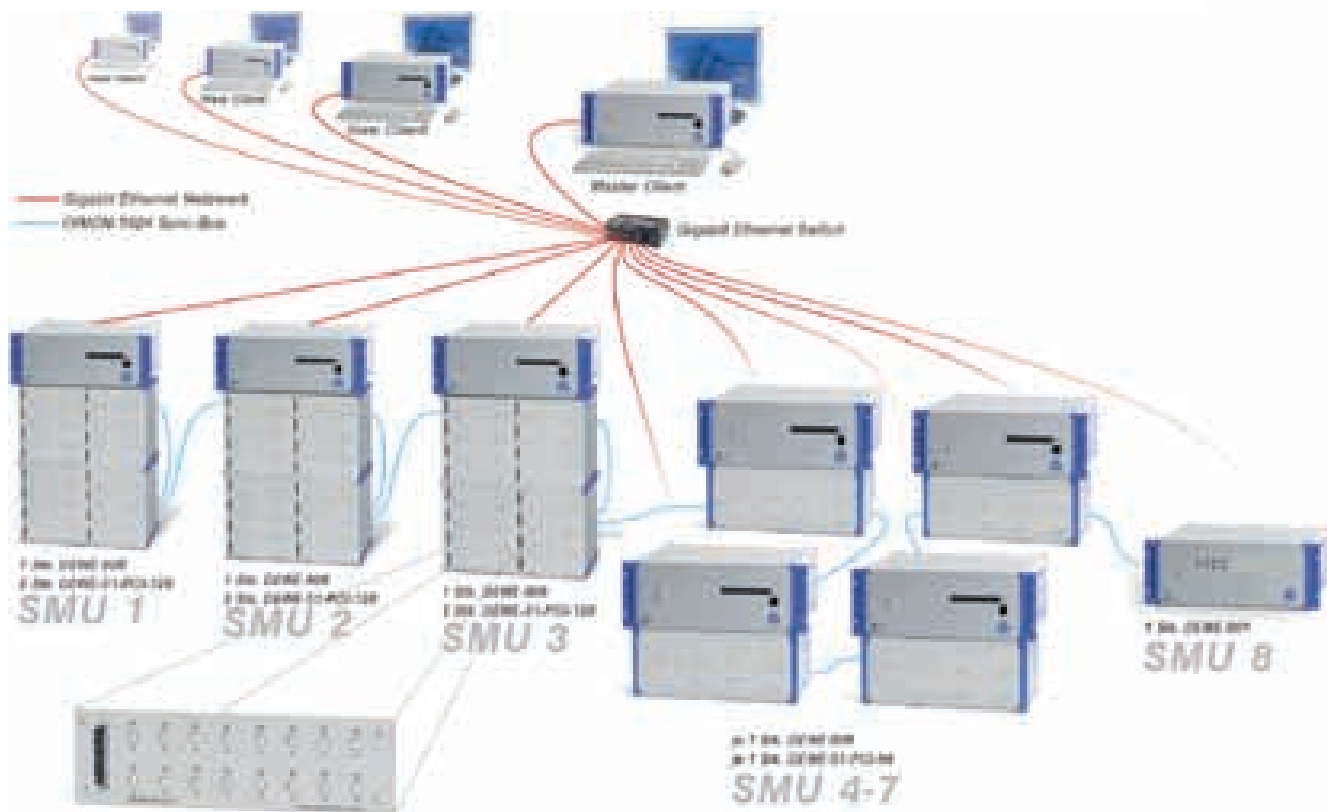
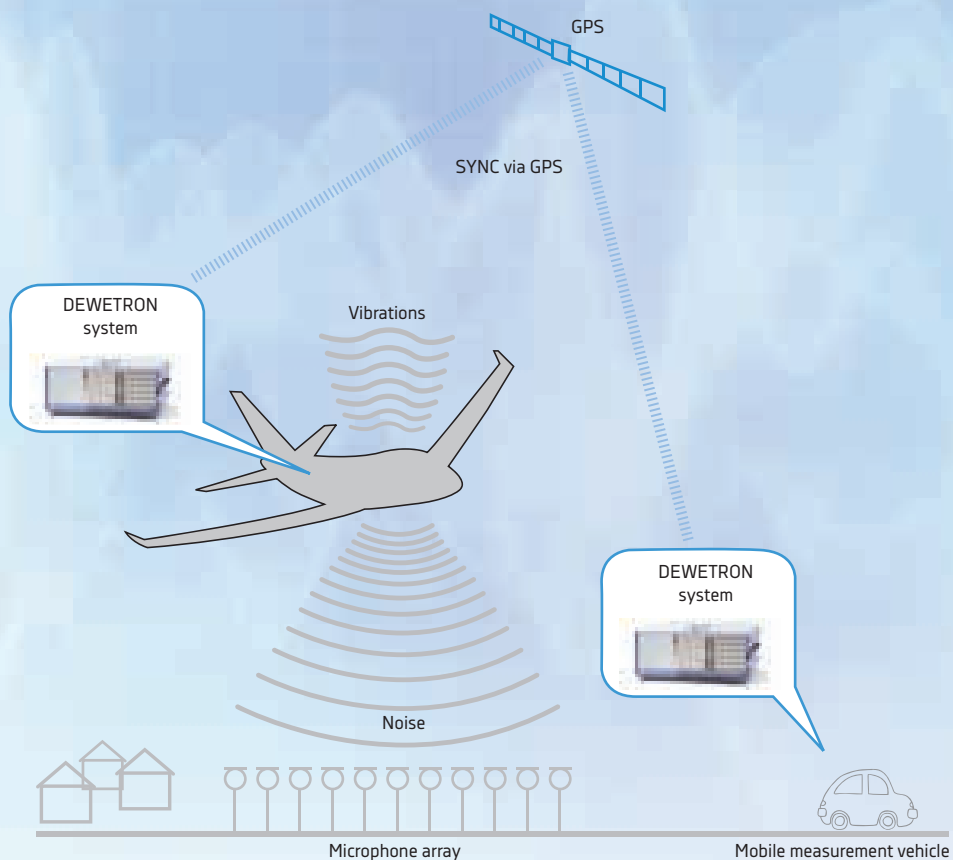
▼ TYPICAL TESTS

- > Strain
- > Shock
- > Vibration
- > Modal analysis



NOISE ORIGIN

Fully synchronized measurements inside an aircraft and on the ground are performed to determine the origin of noise, noise distribution and sources.



CABIN COMFORT

The typical environment for cabin comfort tests are directly in ready to fly aircrafts.



YOUR BENEFITS

- > Fully synchronization
- > Up to 128 external static temperature channels

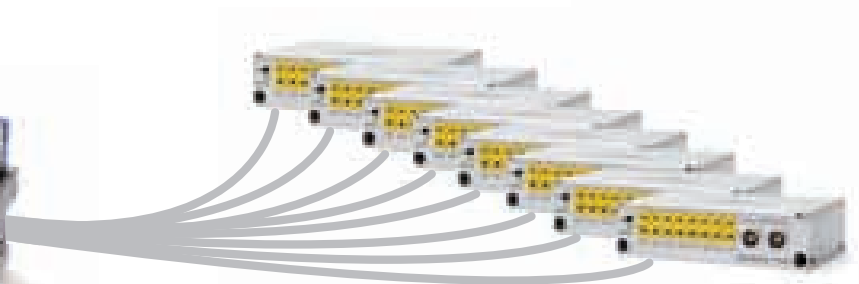
TYPICAL TESTS

- > Temperature measurements
- > Air conditioning
- > Cabin noise

TEMPERATURE MEASUREMENT VIA EPAD MODULES

EPAD2 modules are 24 bit multi-channel AD converters that provide the data via RS-485 interface.

With 12 Hz sampling rate and 350 V galvanic isolation. For EPAD2 series there is an interface module - EPAD2-USB- which converts the RS485 data to USB. DEWETRON systems have an EPAD2 interface, for simply connecting EPAD2 modules as static channel expansion by a single cable.



DEWE2-M4 with EPAD modules with 64 (8x8) channels for temperature measurement

ORDER TRACKING

DEWETRON provides a powerful and very easy to use order tracking module for fast and efficient results. The data and the rpm information is recorded simultaneously in time domain and re-sampled in the order tracking module. Therefore we can show narrow band FFT, waterfall spectra, and still keep all other convenient functions in time domain.



YOUR BENEFITS

- > Dedicated re-sampling method for sharp order separation
- > Measurement in time domain to keep all benefits
- > 2D, 3D waterfall in order or frequency domain
- > Amplitude, phase extraction
- > Recalculation in post processing
- > Phase synchronous rpm input with 12.5 ns resolution

ANALYSIS

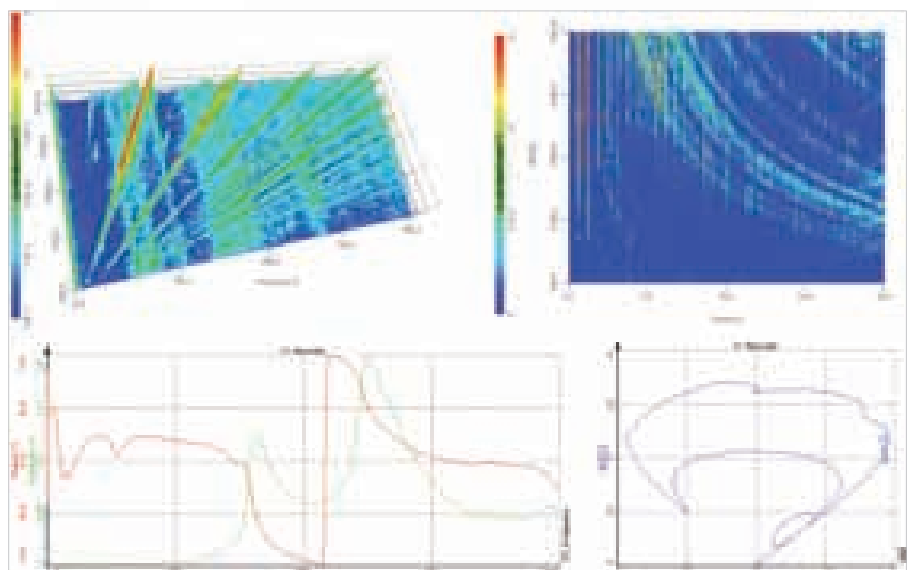
In the easy to use analyze screens data could be shown and analyzed in many different ways. So you could draw orders or narrow band FFT in 2D and 3D waterfall diagrams. Either displayed with time history or rpm. Specific orders or phase information could be recorded over time, rpm or any other physical value. All analysis screens could be arranged in a convenient way.

Amplitude or phase is shown over rpm, RE- IM- Part displayed in XY diagram to observe resonant frequencies.

VIBRATION AND RPM

Order tracking requires two signals, the vibration signal and the rpm information. The measurement is done in time domain, and all the order related channels are calculated out of these time signals. A fast state of the art re-sampling method

produces the results online. Run-ups, coast-down or both are possible online. Time based data recording enables recalculation even in post processing. Narrow band FFT, CPB spectrum and order tracking information could be shown at the same test run, saving time.



BALLISTIC TEST

A typical configuration for ammunition testing is containing of either one, two or three pressure sensors in the test barrel.

YOUR BENEFITS

- > Isolation amplifiers with 2 MHz bandwidth (voltage, bridge, IEPE)
- > AC, DC or battery powered
- > High accuracy, 16 bit resolution
- > Fast sampling, 5 or 10 MS/s per channel
- > Powerful Intel i7 CPU
- > 100 or 200 MB/s stream to disk
- > High speed camera support
- > Triggered measurement or continuous storing

TEST SETUP

For pressure measurement in the barrel minimum one, or up to three quartz sensor for ballistic pressure are used. DEWETRON supports a wide range of different sensors and other signal inputs such as firing pin acceleration, target control systems (Light screens), Microphones for rate of fire measurement or high-speed cameras can be easily integrated into the system. The configuration can be adopted to the current needs and above all can be easily configured for other measurement in the field or in the laboratory.

ADDITIONAL SENSOR INPUT

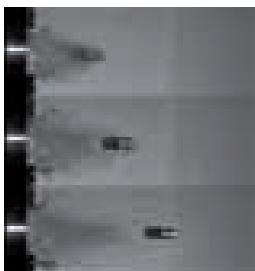
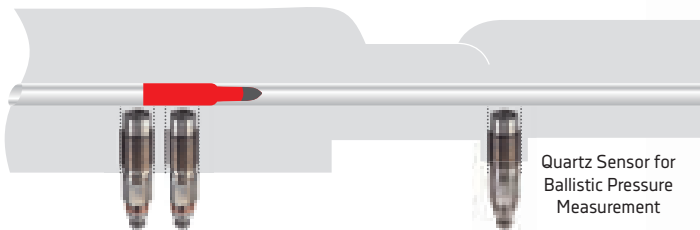
Additional sensor input to the pressure sensors are no problem. It might be required for extended test requirements, such as:

- > Firing pin accelerometers
- > Light barriers
- > Photo cells
- > Microphones
- > High speed thermocouple sensors
- > Anemometer, weather station

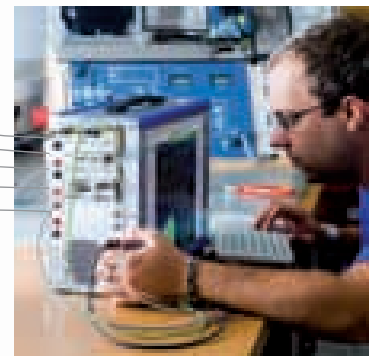
Weather station
wind speed/direction
barometric pressure
ambient temperature



Quartz Sensor for
Ballistic Pressure
Measurement



High Speed video camera



Measurement instrument with
direct sensor input

OXYGEN



DATA ACQUISITION & ANALYSIS SOFTWARE

Measure, store, view and analyze your measurement data with maximum efficiency. The 64-bit technology and unique multi-touch user interface will inspire you.

EFFICIENCY & PERFORMANCE

- > Easy-to-use and intuitive
- > Efficient workflow that minimizes the time between set-up and reporting
- > High performance through 64-bit technology

MULTI-TOUCH & MOUSE

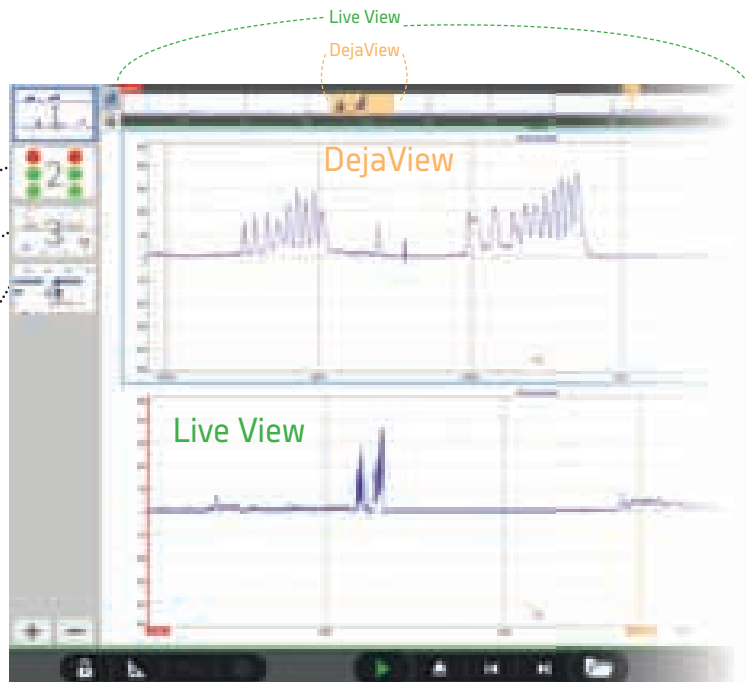
Get the best of two worlds: Efficient setup using the mouse and keyboard in the office or pure multi-touch operation in the field.

ANALYZE WHILE RECORDING

DejaView allows you to view and analyze all data from the start of the test, while data is still being recorded – an especially useful feature for long term testing.
Live View: Live data is still visible at the same time on a different recorder, on the same or on a different screen.

MULTIPLE MEASUREMENT SCREENS

Organize your instruments on multiple screens for a good overview and immediate analysis.



Look back in time and analyze with **DejaView** while data is still recorded and displayed in **Live View**

▼

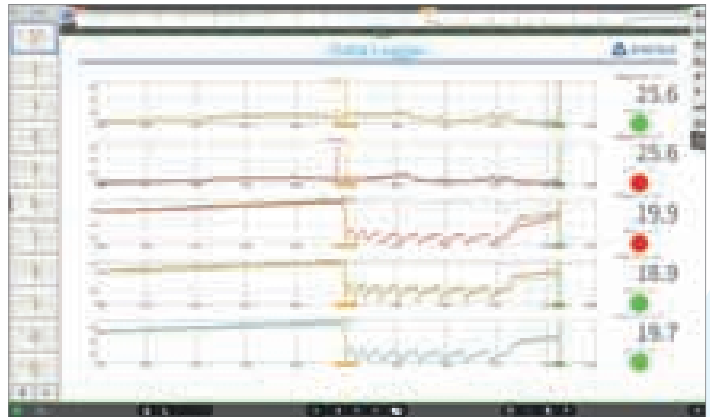
LOGGING & RECORDING

Freely define your measurement screen(s), up to hundreds of channels. Keep track on all your data by using multiple measuring screens.

Use trigger functions to immediately capture any anomaly in the data.

Record any input over a long time:

- > Voltage, current
- > Temperature
- > Pressure
- > Acceleration
- > Strain gauge
- > And many more

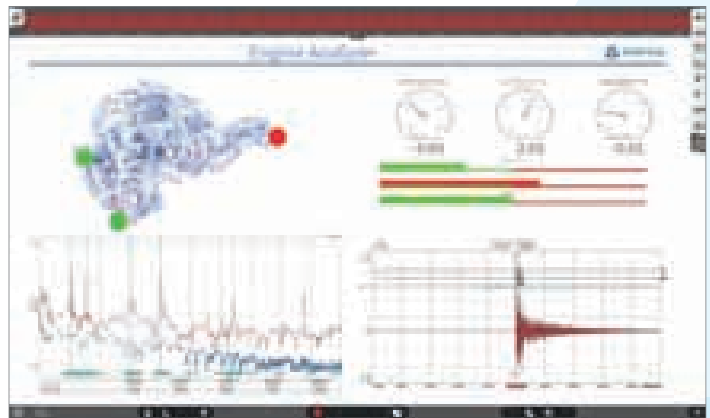


▼

VIEWING & ANALYZING

Multiple precision measurement systems and analysis functions increase the value of your measurements:

- > Scope
- > FFT
- > Statistic functions
- > Logic-, trigonometric functions
- > E-Power calculation (efficiency measurement)
- > XY chart
- > And many more



▼

ADVANCED APPLICATIONS

Use GPS/IRIG to synchronize your distributed measurement systems (e.g. in two different trains).

- > IRIG/GPS
- > DI/DO
- > Counter
- > Video (USB and GigE)
- > CAN
- > And many more



▼

INDIVIDUAL REPORTING

There are plenty of options how to easily create your test reports. Stay within OXYGEN to print reports directly. Use your common office software tools (e.g. Excel) or export to common 3rd party analysis software, like MATLAB.

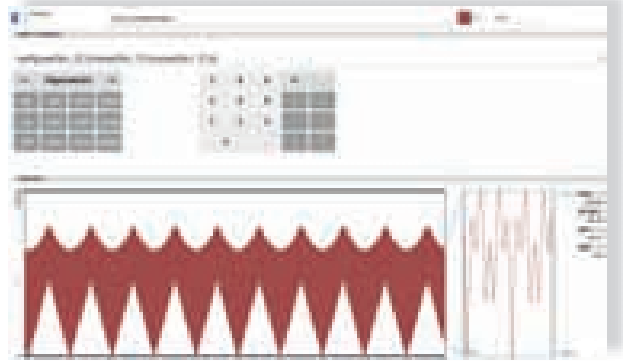
Popular analysis platforms, like FlexPro and FAMOS, open OXYGEN files directly.



ONLINE AND OFFLINE MATH

Create mathematical operations either before the measurement in your setup file or after the measurement during analysis in your data file.

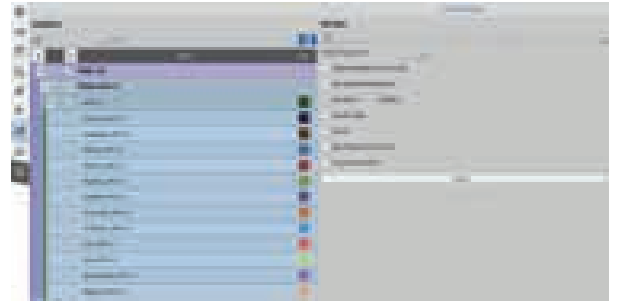
- > Wide range of mathematical calculations including logical operators and trigonometric functions
- > Statistics module
- > IIR-filter (low pass, high pass, integrator, differentiator)



DATA EXPORT

OXYGEN supports data export into a wide range of data formats to ensure post-processing with 3rd party software packages. Supported export formats: txt, csv, mdf4, MATLAB®, Excel®

Moreover, a DLL is available to import OXYGEN dmd data files natively into 3rd party software packages.



OXYGEN NET

OXYGEN NET combines multiple DEWE2 devices connected to the same network to one entire measurement system.

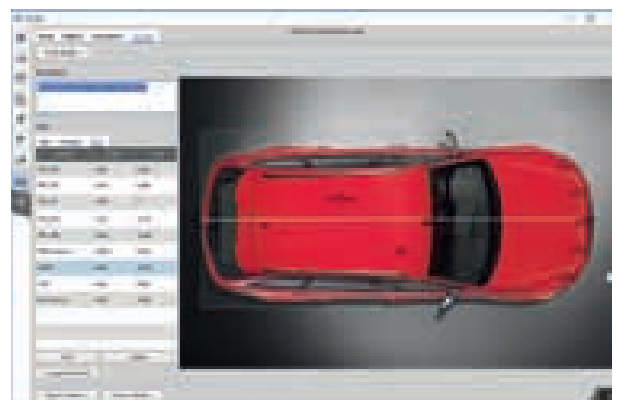
- > Synchronized data acquisition and recording
- > Synchronization via integrated SYNC-CLOCK™-Technology
- > Redundant data storing
- > More than 1.000 channels at high sample rates
- > Distributed measurement



OXY-OPT-ADAS

OXYGEN Automotive complimentary features set new standards for the time saving acquisition of multiple gyro systems and the calculation and visualization of position between moving and stationary objects for ADAS testing.

- > Creation of complex 2-dimensional shapes (e.g. the vehicle silhouette)
- > Automatically create POIs (Points Of Interest) for NCAP-AEB testing or add your own POIs
- > Visualization of objects on OSM (Open-Street-Maps) or satellite pictures
- > Visualization of previously recorded routes (KML import)



POWER ANALYSIS



WITH OXYGEN

POWER CALCULATION FEATURE OF SOFTWARE OXYGEN

OXYGEN with Power option seamlessly integrates data being transmitted through multiple, totally synchronized signals into calculations for power analysis.

MULTI POWER ANALYZER

OXYGEN with Power option turns your DEWETRON system into a **MIXED SIGNAL POWER ANALYZER** for the simultaneous calculation of several power groups with up to 7 phases. Power instruments can be easily arranged using drag & drop pre-defined schematics and state-of-the-art multi-touch technology. All important values for your analysis are clearly displayed and in the right form.

HARMONIC ANALYSIS

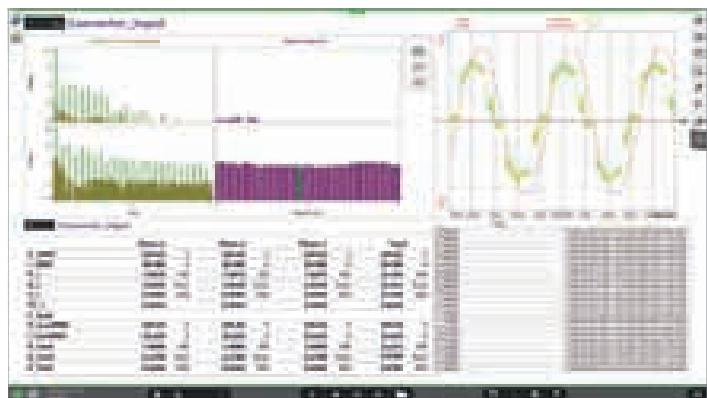
Harmonic analysis at its best! We include all relevant harmonic/interharmonic and higher frequency parts in one chart. OXYGEN with Power option makes it easy to keep the focus on what you are interested in. The simultaneous display of voltage and current makes it easy to analyze the behavior of electrical motors, drives and other electrical components.

TESTBED INTEGRATION

OXYGEN's smart interface technology makes it easy to integrate a **MIXED SIGNAL POWER ANALYZER** into automation systems and test bed environments. Smart interface technology guarantees reliable data transmission, easy to use remote control/configuration by using TCP/IP based protocols in compliance with standardized (e.g. ASAM) protocols and file formats.

FEATURES OF POWER ANALYSIS SOFTWARE

- > Simple power group creation
- > Predefined schematics for 1 to 7 phase power groups
- > Several power groups with different frequencies and variable sync sources
- > Dedicated power instrument with overview table, vector scope and harmonics
- > Calculation of flicker and flicker emission
- > Total and fundamental values of voltage, current and power
- > Fundamental frequency support from 0.2 Hz to 1500 Hz or DC
- > Gapless calculation
- > Update rate down to 10 ms

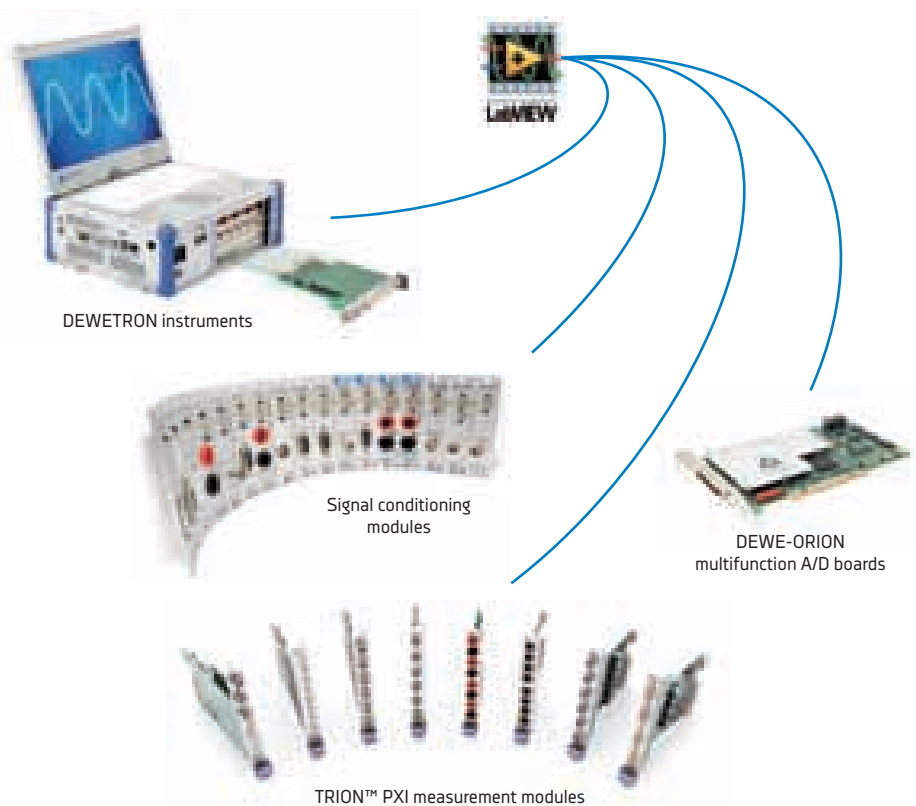


LABVIEW™ LIBRARY



FOR GRAPHICAL PROGRAMMING

LabVIEW™ is a visual programming platform that allows engineers and scientists the flexibility to build programs specific to unique data acquisition requirements and measurement systems. It offers unprecedented integration with existing legacy software, IP, and hardware while capitalizing on the latest computing technologies. LabVIEW™ provides tools to resolve the challenges of today and tomorrow. LabVIEW™ software is ideal for any measurement or control system. Integrating all the tools that engineers and scientists need to build a wide range of applications in dramatically less time, LabVIEW™ is a development environment for problem solving, accelerated productivity, and continuous innovation. Through the DEWETRON website, we offer a comprehensive LabVIEW™ driver library that supports all DEWETRON systems and components, .



LINUX SUPPORT

DEWETRON TRION™ modules can run in a Linux environment (CentOS, Ubuntu and compatible distributions). Like all LabVIEW™ code, the DEWETRON LabVIEW™ libraries are platform independent and can be used with Linux as well.

SAMPLE VIRTUAL INSTRUMENTS

To expedite the development process you use the ready-to-use functions and example programs.



LOW LEVEL VIRTUAL INSTRUMENTS

Using low level VIs you can create your own project from scratch. Use VIs to access every single feature of the multifunction ADC board, including, but not limited to sample rate, input ranges, AI channels, digital I/O, counter, onboard RS-485 interface, and CAN bus interface.

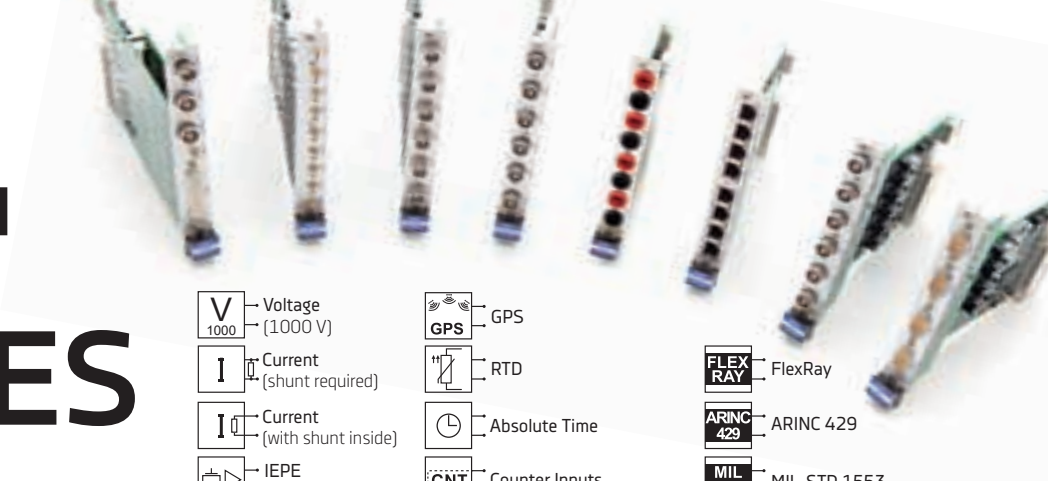


DEWETRON CONNECTOR

The DEWETRON Connector is an abstraction layer for the DEWETRON hardware. Use the ready to use GUI for configuring all DEWETRON inputs and skip programming at the board level. Programming on the Connector level is as easy as calling functions like init, start, read, stop and quit. This saves valuable development time and minimizes the risk of programming errors.



TRION™ MODULES



- Voltage (1000 V)
- Current (shunt required)
- Current (with shunt inside)
- IEPE (vibration)
- Bridge (strain gage)
- Potentiometer
- GPS
- RTD
- Absolute Time
- Counter Inputs
- CAN
- Modular Smart Interfaces (e.g. for thermocouple)
- FlexRay
- ARINC 429
- MIL-STD 1553
- Analog Output
- Digital I/O

- > User exchangeable modules for signal conditioning
- > Simultaneous sampling for DEWE2 product series
- > Separate ADC on each channel

ANALOG MODULES		CHANNELS	SAMPLE RATE PER CH.	RESOLUTION	ISOLATION	CONNECTOR TYPES
TRION-2402-MULTI		4 or 8	204.8 kS/s	24 bit	yes	DSUB, LEMO 0B
TRION-1620-ACC		6	2 MS/s 1 MS/s	16 bit 24 bit	yes	BNC
TRION-1620-LV		6	2 MS/s 1 MS/s	16 bit 24 bit	yes	BNC, LEMO 1B
TRION-2402-V		4 or 8	204.8 kS/s	24 bit	yes	Safety banana
TRION-1603-LV		6	250 kS/s	16 bit	yes	BNC, LEMO 1B
TRION-2402-dSTG		6 or 8	204.8 kS/s	24 bit	-	RJ-45, DSUB, LEMO 1B, LEMO 0B
TRION-2402-dACC		6 or 8	204.8 kS/s	24 bit	-	SMB, BNC
TRION-1810-HV		4	1 MS/s	18 bit	yes	Safety banana

MULTI-FUNCTION MODULES		CHANNELS	SAMPLE RATE PER CHANNEL	RESOLUTION	ISOLATION	INPUT TYPES
TRION-1802-dLV		16 or 32	200 kS/s 100 kS/s	18 bit 24 bit	-	DSUB
TRION-1600-dLV		16 or 32	20 kS/s	16 bit	-	DSUB

DIGITAL MODULES		CHANNELS	SAMPLE RATE PER CHANNEL	RESOLUTION	ISOLATION	INPUT TYPES
TRION-CNT		6 to 18	800 kS/s	80 MHz	yes	DI, CNT
TRION-DI-48		48	2 MS/s	-	yes	DI
TRION-BASE		1 to 8	2 MS/s	80 MHz	-	DIO, CNT, SYNC, AUX
TRION-VGPS		1 GPS	100 Hz	0.01 km/h <10 cm	-	GPS antenna, IRIG In / Out, DIO, CNT, SYNC, AUX
TRION-TIMING		1 to 8	2 MS/s	80 MHz	-	GPS antenna, IRIG In / Out, DIO, CNT, SYNC, AUX



TRION-CB16-B

Banana socket connector panel for TRION-1802-dLV or TRION-1600-dLV



DEDICATED MODULES		00101111010001	CHANNELS	SAMPLE RATE PER CHANNEL	RESOLUTION	ISOLATION	CONNECTOR TYPES
TRION-CAN			2 or 4	-	-	yes	DSUB
TRION-FLEXRAY			1	-	-	-	DSUB
TRION-A429 / TRION-M1553 / TRION-MA4			4 to 30 1 to 4 9 to 13	-	-	-	SCSI-3
TRION-1628-AO-2			Update rate max. 2.8 MS/s	1 MS/s	16 bit	-	BNC
TRION-1820-POWER			8 (4 U / 4 I)	2 MS/s	≥ 18 bit	yes	Safety banana, DSUB

TRION-1820-POWER-4

The TRION-1820-POWER-4 has 4 highly flexible current inputs. The 4 slots can be populated with three different direct current measurement modules or with a SUBD-9 module to connect almost any kind of current transducer. Alternatively, this connector can also be used to measure any auxiliary ±10 V signal (e.g. such as windspeed or water flow).



	Voltage Input U1, U2, U3, U4	Current Input I1, I2, I3, I4			
		20 A module	2 A module	0.2 A module	Clamp input module
Range	1000 V (±2000 V _{PEAK})	20 A (± 40 A _{PEAK})	2 A (± 4 A _{PEAK})	0.2 A (± 0.4 A _{PEAK})	5 V (± 10 V _{PEAK}) NOT ISOLATED!
Accuracy					
DC	±0.02 % of reading ±0.02 % of range	±0.05 % of reading ±0.05 % of range			±0.02 % of reading ±0.02 % of range
45 Hz to 1 kHz	±0.02 % of reading ±0.01 % of range	±0.02 % of reading ±0.01 % of range			
1 kHz to 10 kHz	1-5 kHz: ±0.1 % of reading ±0.05 % of range 5-10 kHz: ±0.3 % of reading ±0.05 % of range	±0.1 % of reading ±0.05 % of range			
10 kHz to 50 kHz	±0.5 % of reading ±0.1 % of range	±0.3 % of reading ±0.1 % of range			
Safety	CAT IV 600 V / CAT III 1000 V	CAT II 600 V, unfused			Depending on connected clamp
Bandwidth	5 MHz	400 kHz			150 kHz
Connector	Safety banana	Safety banana sockets (male)			DSUB-9
Instantaneous max. allowable input	4000 V _{PEAK} or 3000 V _{RMS} (1s)	50 A _{PEAK} or 40 A _{RMS} (1 s)	10 A _{PEAK} or 5 A _{RMS} (1 s)	2 A _{PEAK} or 1 A _{RMS} (1 s)	-
Continuous max. allowable input	2000 V _{RMS}	20 A _{RMS}	3 A _{RMS}	0.4 A _{RMS}	-
Input resistance	5 MΩ; 2 pF	2 mΩ	50 mΩ	500 mΩ	-

HIGH-SPEED & DYNAMIC AMPLIFIERS



HIGH-SPEED HSI AMPLIFIERS

- > Isolated single channel modules
- > Bandwidth up to 300 kHz
- > Isolation up to 1.8 kV_{RMS}
- > Configuration via RS-485 interface

DYNAMIC AMPLIFIERS

- > Isolated single channel modules
- > High bandwidth up to 2 MHz
- > Selectable filters and multiple ranges
- > Analog signal output (± 5 V)

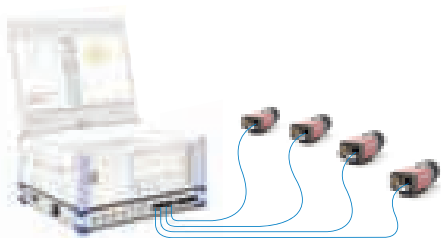
	V	I	IEPE	CHARGE	BRIDGE	INDUCTIVE SENSORS	POTENTIOMETER	THERMOCOUPLE	CAPACITY	FREQUENCY	CURRENT OUTPUT	TEDS SUPPORT
DAPQ-STG	✓		✓ (MSI)	✓ (MSI)	✓		✓	✓ (MSI)				✓
DAQP-MULTI	✓	✓			✓		✓	✓				✓
DAQP-HV	✓											
DAQP-LV	✓	✓	✓ (MSI)	✓ (MSI)			✓ (MSI)					✓
DAQN-AIN	✓											
DAQP-LA-B		✓										
DAQP-LA-B-S1		✓										
DAQP-CFB2					✓	✓			✓			
DAQP-ACC-A			✓									
DAQP-CHARGE-A			✓	✓								
DAQP-CHARGE-B				✓								
DAQP-THERM								✓				
DAQP-FREQ-A										✓		
DAQN-V-OUT											✓	
HSI-STG	✓		✓ (MSI)	✓ (MSI)	✓		✓	✓ (MSI)				✓
HSI-HV	✓											
HSI-LV	✓	✓	✓ (MSI)				✓ (MSI)					✓

MSI = Modular Smart Interface are add-ons for DAQP and HSI Amplifiers to expand their measurement functionality.

ACCESSORIES

CAMERAS

USB and Ethernet cameras;
Split-box for supplying and connecting
Ethernet cameras



MOBILE DISPLAY

External multi-touch display for mobile
applications



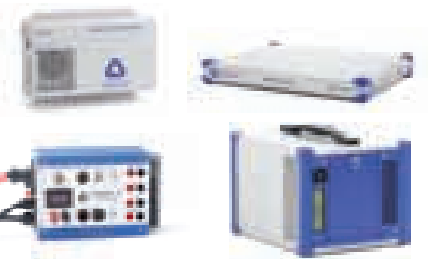
CARRYING CASES

Carrying cases and transportation systems
are available for all systems



POWER SUPPLY SOLUTIONS

Power supplies, battery and distribution
boxes



CURRENT TRANSDUCERS

Several solutions for current measurement
from simple shunts to current clamps and
high-precision zero flux transducers



ENCODER

Encoders for combustion analysis and
torsional and rotational vibration
applications



SERVICES

DEWETRON provides several services ad-
ditional to the standard one-year system
warranty and technical first level support.

Customize your measurement system with
an array of supplemental services, bundled
into a contract designed for your needs.
Choose from the following.





- > Advanced support
- > DEWETRON Academy
- > Warranty extension
- > System activation
- > Metrological service
- > Calibration & Accredited calibration
according to ISO 17025
- > Maintenance & Repair services
- > System upgrade




EPAD2 / CPAD2



- > Extremely rugged and flexible mounting
- > 24 bit A/D converter per channel, 12 Hz sampling rate
- > Channel to channel/system isolation
- > EPAD: RS-485 interface / CPAD: CAN interface
- > Stackable and lockable

MODULE	INPUT TYPE	INPUT RANGES	ISOLATION	SPECIAL
EPAD2/CPAD2-TH8-x 	Dedicated modules for type J, K, T Universal module for types K, J, T, E, R, S, B, N, C, U	According to thermocouple type	350 V _{DC} (channel to channel and channel to BUS, power and chassis)	Overvoltage protection: 15 V _{DC}
EPAD2/CPAD2-V8 	8 isolated voltage input channels	Physical input range: ±50 V Software selectable: ±100 mV, ±500 mV, ±1 V, ±2.5 V, ±5 V, ±10 V	350 V _{DC} (channel to channel and channel to BUS, power and chassis)	Overvoltage protection: 350 V _{DC}
EPAD2/CPAD2-RTD8 	8 isolated Resistance Temperature Detector channels	Resistor: 0 to 999.99 Ω RTD: PT100(385), PT200 (385), PT500(385), PT1000 (385), PT2000(385), PT100 (3961)	350 V _{DC} (channel to channel and channel to BUS, power and chassis)	Overvoltage protection: 15 V _{DC}
EPAD2/CPAD2-LA8 	8 isolated current inputs	0 to 20 mA, ±20 mA, ±30 mA	350 V _{DC} (channel to channel and channel to BUS, power and chassis)	Overcurrent protection: 70 mA cont.
EPAD2-USB	USB-interface module for EPAD2	n/a	-	-

MODULE	OUTPUT TYPE	OUTPUT RANGES	ISOLATION	SPECIAL
EPAD2-AO4 	4 voltage or current output channels	±10 V; ±5 V; 0 to 5 V; 0 to 10 V; 0 to 20 mA; 4 to 20 mA	350 V _{DC} (channel to BUS, power and chassis)	-


* CPAD = CAN-bus interface

* EPAD = RS-485 interface

CPAD3

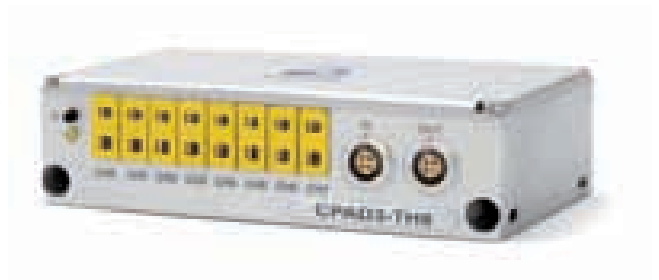
MODULES FOR SLOW MEASUREMENTS

- > 100 Hz sampling rate
- > High isolation 1500 V
- > ADC per channel
- > CAN interface
- > -40...+85°C operating temperature (option)

MODULE	INPUT TYPE	INPUT RANGES	ISOLATION	SPECIAL
CPAD3-TH8-x	Dedicated modules for type J, K, T Universal module for types K, J, T, E, R, S, B, N, C, U	According to thermocouple type	1500 V _{DC} (channel to channel and channel to BUS, power and chassis)	Overvoltage protection: 15 V _{DC}
CPAD3-V8 	8 isolated voltage input channels	Physical input range: ±50 V Software selectable: ±100 mV, ±500 mV, ±1 V, ±2.5 V, ±5 V, ±10 V	1500 V _{DC} (channel to channel and channel to BUS, power and chassis)	Overvoltage protection: 350 V _{DC}

CPAD3-TH8-X

- > Intelligent amplifier with integrated A/D conversion
- > CAN interface
- > 8 input channels for thermocouples
- > Available thermocouple types:
 - > CPAD3-TH8-x: K, J, T standard type
 - > CPAD3-TH8-UNIVERSAL: K, J, T, E, R, S, B, N, C, U



CPAD3-V8

- > Intelligent amplifier with integrated A/D conversion
- > CAN interface
- > 8 isolated voltage input channels



WHY DEWETRON?

SYNC-CLOCK™ TECHNOLOGY

The quality of synchronized measurement is guaranteed by SYNC-CLOCK™ technology. With SYNC-CLOCK™ technology, analog, digital, GPS, counter, CAN-bus, ARINC and video as well as major sensor systems like Kistler RoadDyn® wheel force sensors or the GeneSys ADMA INS/GPS system are re-recorded synchronously during measurement.



COUNTER

DEWETRON advanced counters based on the TRION™ platform support various sensors for many applications. Linear encoders, angle encoders, flow sensors and tachometer probes are only a few examples if velocity or displacement are demanded in addition to your analog data. The unique oversampling technology provides a linear or angle based displacement channel. In comparison to ordinary counters, the resolution and, therefore, the phase accuracy, is tremendously increased. Each counter provides a displacement (mm, deg,...) and a velocity channel (mm/s, rpm,...). Both are required for angle based analyses, including rotational and torsional vibration.



HIGHEST PRECISION

TRION™ series modules easily integrate with all similar products on the market.



SCALABLE AND MODULAR

Expand from a few channels to many and connect many systems without compromising the simultaneous data sampling of all channels.



USER EXCHANGEABLE MODULES

TRION™ amplifier modules can be changed in seconds. Modules with different sampling speed and resolution can be used in one chassis. Use isolated and differential inputs at the same time.



GLOBAL SUPPORT

Our engineers are in 25 countries around the world to support you with their knowledge and expertise. We offer maintenance, upgrades, ISO certified system calibrations and also customer training!

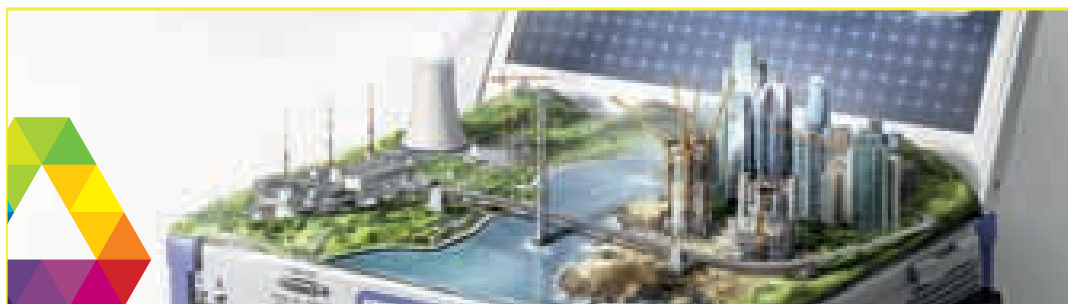


SOLUTIONS

YOUR MEASUREMENT APPLICATION ON OUR PRODUCTS

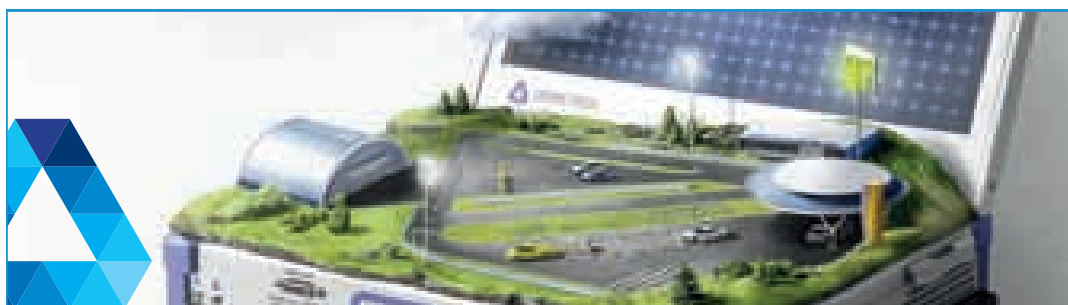
INDUSTRIAL

MIXED SIGNAL RECORDER, DYNAMIC SIGNAL ANALYZER, BALANCING, STROBE CAM, ORDER TRACKING, MODAL ANALYSIS, TORSIONAL & ROTATIONAL VIBRATION, TRANSIENT RECORDER, DISTRIBUTED SYSTEMS, AND MANY MORE



AUTOMOTIVE

COMBUSTION ANALYSIS, HYBRID TESTING, MEASURING BATTERIES, FUNCTIONAL SAFETY, ROAD LOAD DATA, BASIC BRAKE TEST, VEHICLE DYNAMICS, ADAPTIVE CRUISE CONTROL, TORSIONAL & ROTATIONAL VIBRATION, E-MOBILITY, RACE CAR, AND MANY MORE



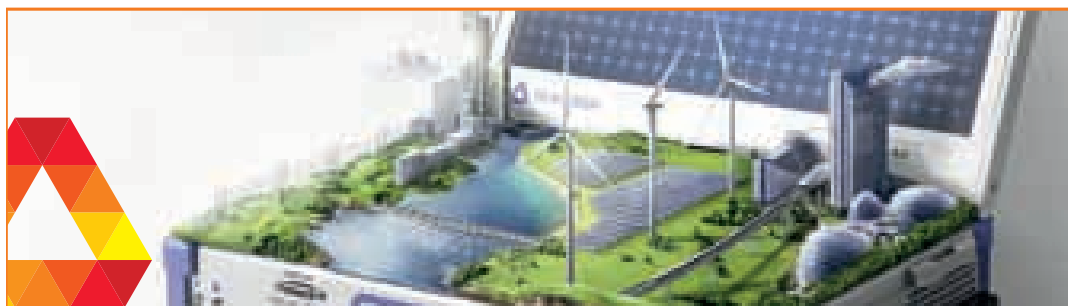
AEROSPACE

FLIGHT TEST, ENGINE TEST, WIND TUNNEL TEST, MAINTENANCE, COMPONENT TEST, SYSTEM INTEGRATION LAB, NOISE AND VIBRATION, TACTICAL OR LAND VEHICLE, STRUCTURAL TEST, PCM TELEMETRY, MODAL TEST, AND MANY MORE



ENERGY & POWER ANALYSIS

POWER ANALYSIS, 3 TO 9-PHASE SYSTEMS, TEST BENCH, SOLAR INVERTERS, REAL DRIVE TEST, E-MOBILITY, FREQUENCY CONVERTER, POWER QUALITY ANALYSIS, MONITORING, GRID COMPATIBILITY, POWER CONVERTER TEST, AND MANY MORE



TRANSPORTATION

NOISE ORIGIN, CURRENT COLLECTOR TEST ON TRAINS, POWER SUPPLY OF RAILWAY SYSTEMS, BATTERY MEASUREMENT, TORSIONAL & ROTATIONAL VIBRATION, DISTRIBUTED MEASUREMENTS, MIXED SIGNAL RECORDING, AND MANY MORE





AEROSPACE



DEWETRON



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Web: www.dewetron.com



ABOUT DEWETRON

DEWETRON is an Austrian manufacturer of precision Test & Measurement systems designed to help our customers make the world more predictable, efficient and safe. Our strengths lie in customized solutions that are immediately ready for use while also being quickly adaptable to the changing needs of the test environment and sophisticated technology of the Energy, Automotive, Transportation and Aerospace industries. More than 25 years of experience and innovation have awarded DEWETRON the trust and respect of the global market. There are more

than 20,000 DEWETRON measurement systems and over 300,000 measurement channels in use in well-known companies worldwide. Choosing DEWETRON means, having a partner by your side who accompanies you every step of the way.

DEWETRON employs over 150 people in 25 countries and is part of the TKH Group, a global corporation, that specializes in the development and supply of innovative solutions worldwide. DEWETRON quality is certified in compliance with ISO9001 and ISO14001.