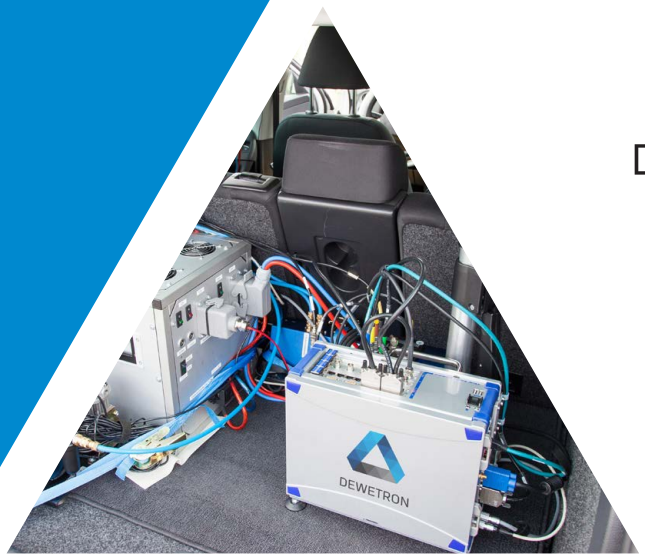
Anritsu GROUP COMPANY

DEWETRON

CERTIFIED CMMC 2.0 LEVEL 2





AUTOMOTIVE

VEHICLE ANALYSIS







MANY TASKS WITH ONE ME

With DEWETRON you can easily do many measurement tasks with only one measurement system.

Powertrain efficiency, NVH test, temperature test, energy flow test, pedal mapping, heat balance and brake test – these are just a few examples where DEWETRON systems are successfully used.

Certain tests can only be carried out under real driving conditions, while others are only possible on a test bench. Our DC-powered and battery-operated instruments are designed for in-vehicle testing under real driving conditions. However, all our systems can also be used for bench testing. User-exchangeable TRION3 modules enable the user to configure the system according to their test needs, from a few channels to hundreds.

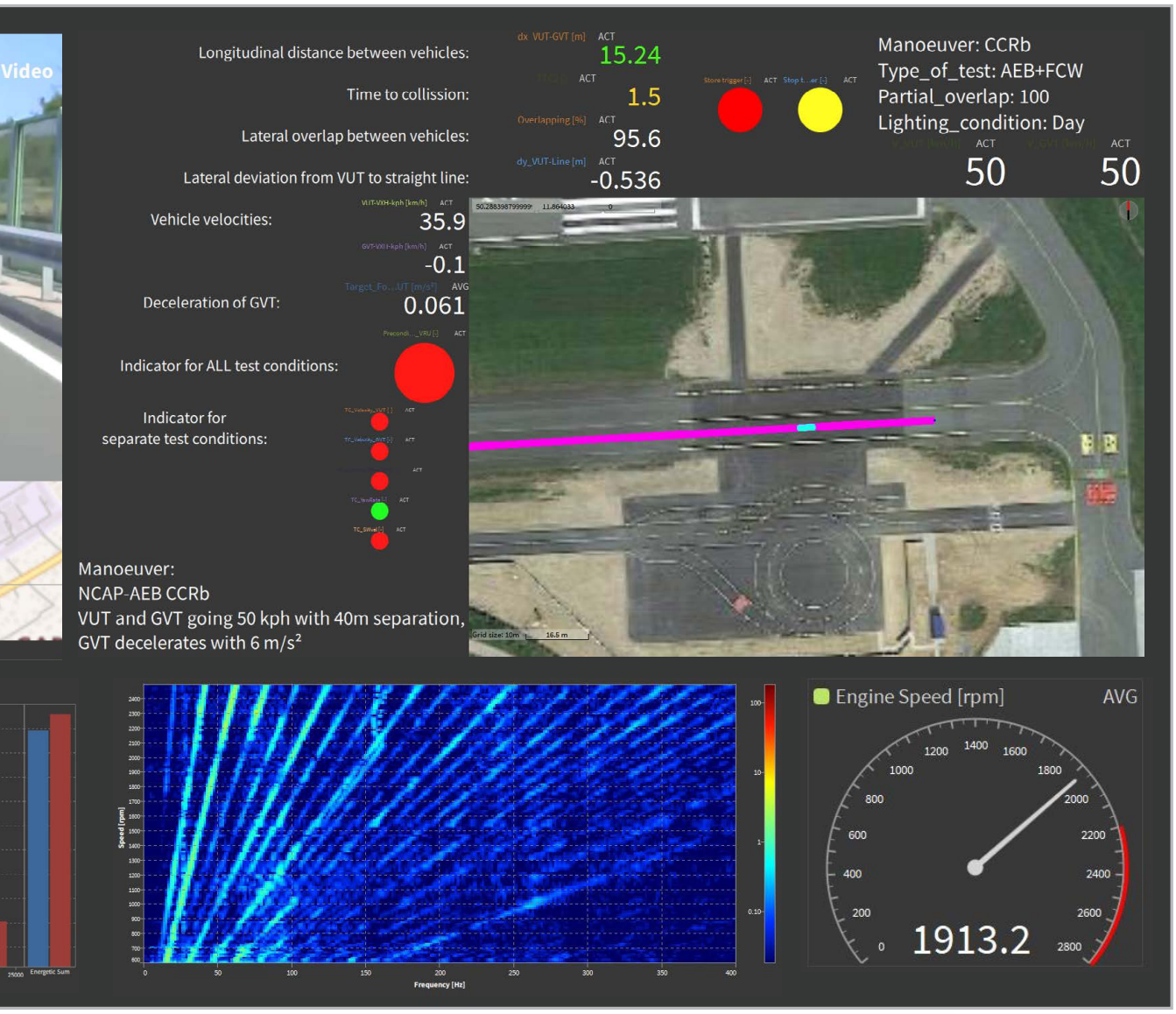


ASUREMENT TECHNOLOGY

The included OXYGEN measurement software offers all the features you need to carry out your measurement tasks and get a complete picture of your test object.

Power analysis along with dozens of temperature channels (Pt100, thermocouples), expandable with acceleration, sound, RPM, bridge and strain channels, CAN, GPS, inertial platforms (IMUs) and video are only a few examples.

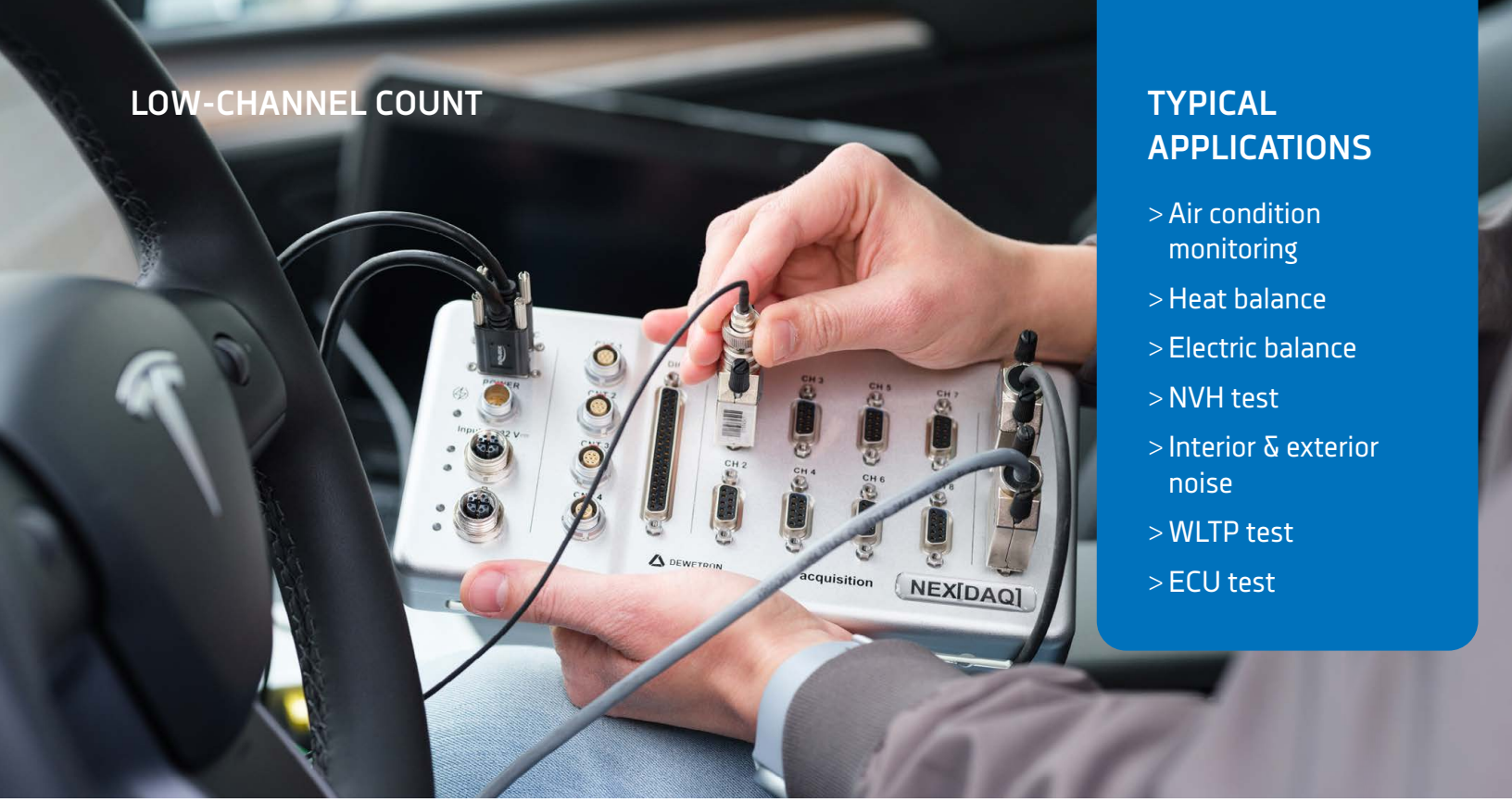
Analysis functions, e.g. real-time efficiency map, order analysis, Birds Eye, sound level, FFT and octave analysis are available during or after recording.











TYPICAL APPLICATIONS

> Air condition monitoring
> Heat balance
> Electric balance
> NVH test
> Interior & exterior noise
> WLTP test
> ECU test

SMALL & COMPACT

An annoying noise? Vibrations on the steering wheel, seat, sun visor or wipers while driving or idling? To identify the cause of the problem, some sensors such as accelerometers, microphones or modal hammers and a CAN or CAN FD interface are required.

For these typical low-channel-count applications the NEX[DAQ] and the TRIONet3 are the ideal instruments of your choice. In these cases, the DAQ system is usually connected to your computer via a USB3 or LAN interface and powered by the vehicle supply (12 V) or a power bank, and both instruments offer these possibilities.

While the NEX[DAQ] is a device with a fixed channel configuration and inputs, the TRIONet3 is a flexible device that can be equipped with modules from our TRION3 series for maximum flexibility. With a TRION3-1820-MULTI module, the TRIONet3 is used for NVH applications, while a TRION3-1810M-POWER module turns the TRIONet3 into the world's smallest mobile power analyzer.



RECOMMENDED SYSTEMS

NEX[DAQ]



> Compact with fixed versatile inputs
  > 2x CAN-FD
  > 8x analog inputs
  > 8x DI, 4 x DO
  > 12x counter
> Very rugged, fanless and waterproof
> DC supply (power bank supply possible)

TRIONet3



> Up to 16 analog channels
> Perfectly distributable and stackable
> USB3 and LAN connectivity, DC power supply
> External battery pack for independent power supply



TYPICAL APPLICATIONS

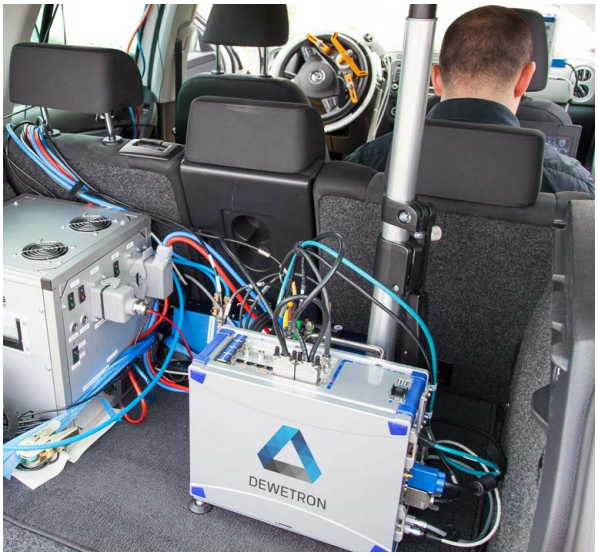
> Ride and handling
> Steering test
> Dynamic test
> Energy test
> ADAS
> Tire & traction tests

ROAD TESTING

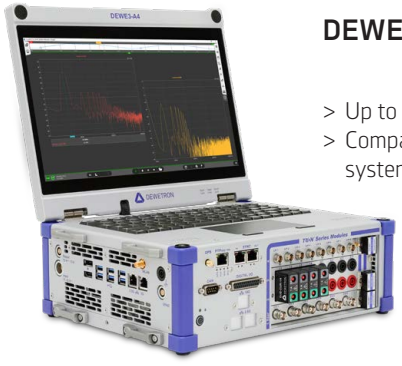
DEWETRON systems are not only designed for harsh testing environments and offer all kinds of inputs, they also enable users to "get the picture".

In the OXYGEN software a camera is just another sensor and it is no problem to connect multiple cameras. Thus, you can monitor several things such as all wheels, the front view and the driver by 6 high-resolution videos directly inside the measurement screen.





RECOMMENDED SYSTEMS



DEWE3-A4

> Up to 32 channels
> Compact all-in-one system with touchscreen

DEWE3-M8s

> Up to 64 analog channels
> 2 separate power inputs for mutual power supply backup
> Optional internal UPS





TYPICAL APPLICATIONS

> Energy flow for driving
> Energy flow for charging
> Temperature rise of powertrain
> Air conditioning test
> LV node energy consumption
> Control strategy

POWERTRAIN EFFICIENCY

Powertrain efficiency is vital for optimizing vehicle performance and reducing energy consumption. DEWETRON provides accurate power measurements to assess efficiency, identify areas for improvement and drive progress in sustainable transportation.



POWERTRAIN

CAN CHANNELS

> TORQUE
> SPEED



DEWETRON SYSTEM

ANALOG CHANNELS

> CURRENT
> VOLTAGE



ON-BOARD SENSORS

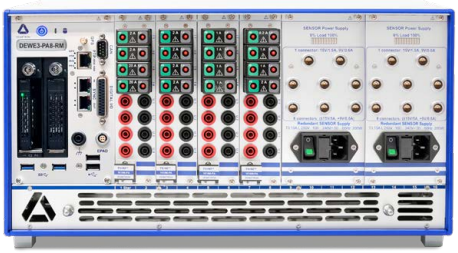
RECOMMENDED SYSTEMS

DEWE3-PA8

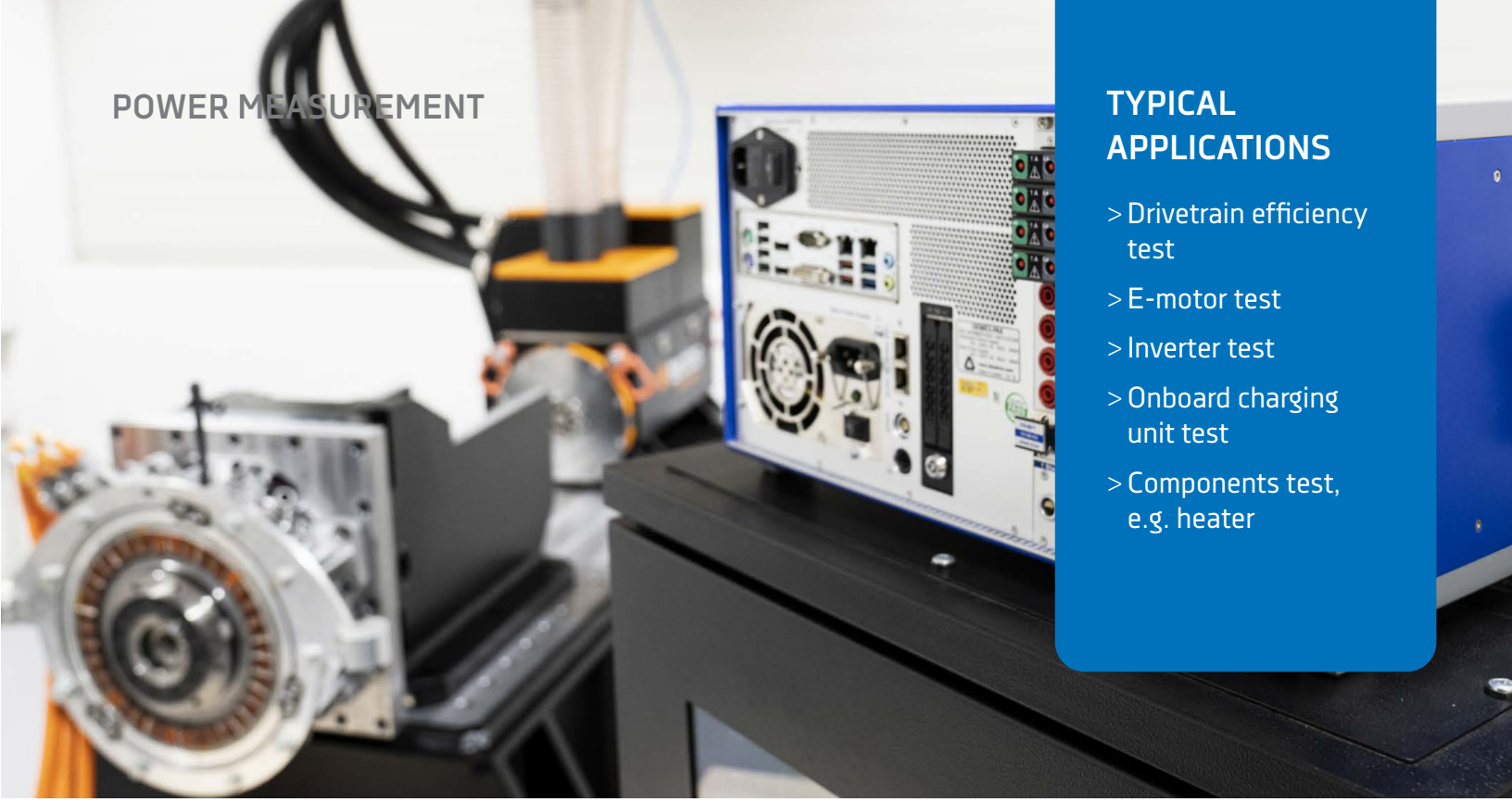


> Up to 64 analog channels
> Up to 16 different power phases

DEWE3-PA8-RM



> Up to 64 analog channels
> 19" rack-mount, ideal for test stand



TYPICAL APPLICATIONS

> Drivetrain efficiency test

> E-motor test

> Inverter test

> Onboard charging unit test

> Components test, e.g. heater

POWER ANALYSIS

Build the power analyzer you need with our dedicated power modules.
With our modular system you can build the perfect power analyzer for your needs.

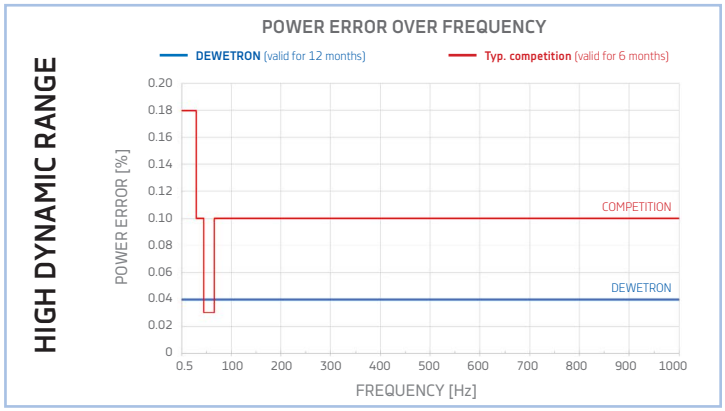
EVERY DEWETRON SYSTEM CAN BE A POWER ANALYZER

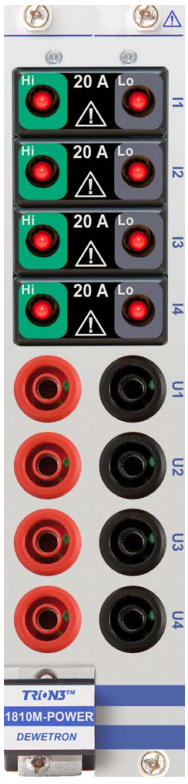
1. **CHASSIS**
   Choose between a small, possibly even battery-powered chassis for mobile applications or a 19-inch rack-mountable.

2. **POWER MODULE**
   Plug in the power modules of your choice, e.g. 1 MS/s or up to 10MS/s – optionally add further inputs such as CAN, analog etc.

3. **SOFTWARE**
   Select software options based on your analysis needs.

Best of all: Each power module saves its calibration data.
Thus, swapping power modules into different chassis is also possible.



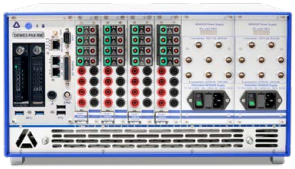




THE **SMALLEST**
POWER ANALYZER



THE **ALL-IN-ONE**
POWER ANALYZER



THE **STATIONARY**
POWER ANALYZER



BATTERY-POWERED

THE **PORTABLE**
POWER ANALYZER

CONFIGURE YOUR INDIVIDUAL VEHICLE TEST SYSTEM

Choose from our range of chassis and various TRION3 modules and configure the OXYGEN software according to your needs. TRION3 signal conditioning modules measure analog signals from any sensor absolute synchronously. Enjoy maximum flexibility with these user-exchangeable modules with dedicated A/D converters on each channel and anti-aliasing filters.

CHASSIS



DEWE3

DIFFERENT CHASSIS LIKE ALL-IN-ONES WITH DISPLAY, FRONT-ENDS, 19" RACK-MOUNTS...

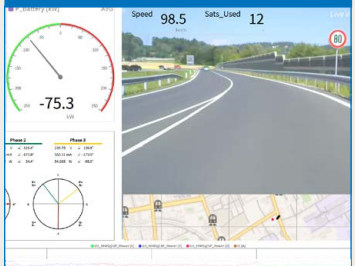
MODULES



TRION3

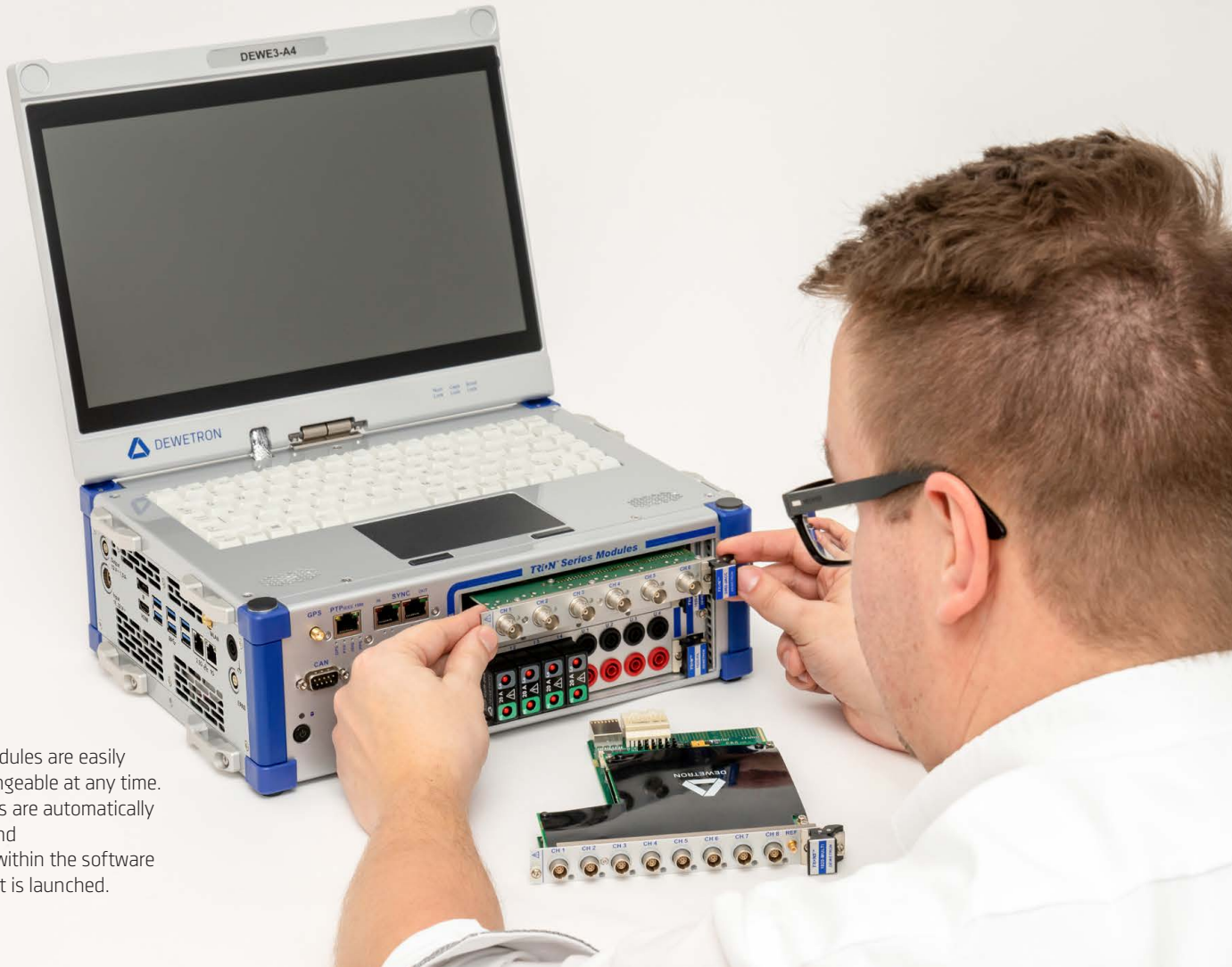
USER-EXCHANGEABLE TRION3 MODULES FOR ALL INPUT SIGNALS, UP TO 10 MS/S

SOFTWARE



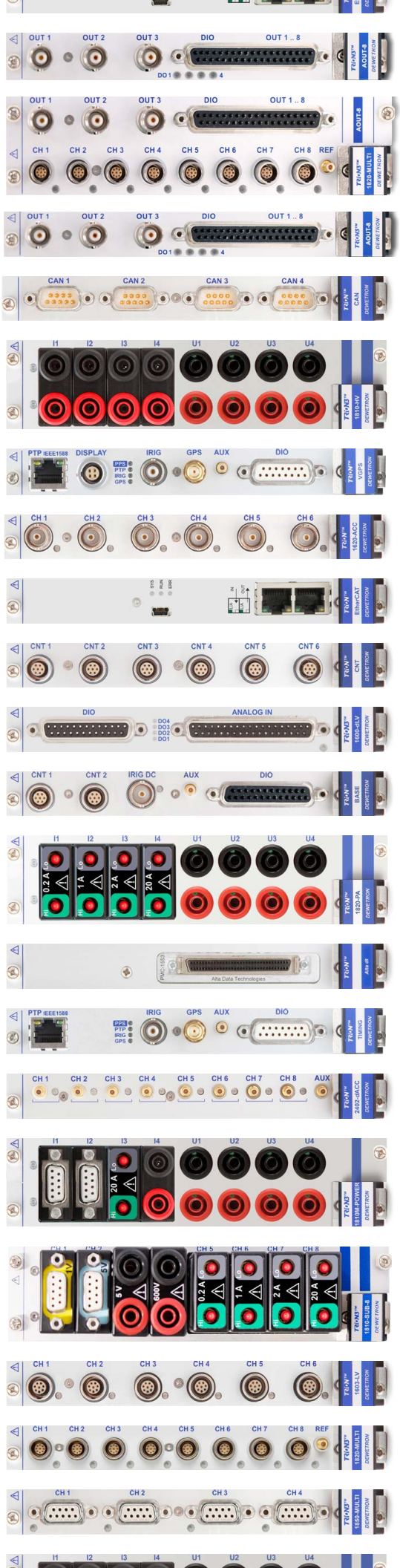
OXYGEN

OXYGEN MEASUREMENT SOFTWARE: POWER ANALYSIS, ORDER ANALYSIS, FFT...



TRION3 modules are easily user-exchangeable at any time. The modules are automatically identified and configured within the software as soon as it is launched.

CHOOSE YOUR ANALOG SIGNAL INPUT MODULES



PROCESSED SIGNALS

IN 100 % SYNC

Our power analyzers are also mixed-signal recorders, that means you only need ONE system for all inputs:
electrical data, mechanical data, vehicle bus data, video, sound, positioning data, etc.

- VOLTAGE
- CURRENT
- POWER
- THERMO-COUPLES
- POTENTIO-METER
- RTD
- IEPE© (VIBRATION)
- BRIDGE
- CHARGE
- COUNTER
- VIDEO
- SOUND
- GPS SYNC
- IRIG SYNC
- PTP SYNC
- PPS SYNC
- IMU
- LVDT
- DIGITAL INPUT
- DIGITAL I/O
- ANALOG OUTPUT
- FLEXRAY
- CAN-BUS
- CAN-BUS
- SCPI
- XCP
- ETHERCAT

ADDITIONAL EQUIPMENT

Whether you need to test a vehicle on the road or on the dyno, you might need additional equipment. Here is an overview of some popular add-ons and accessories.

RUGGED LOW-SPEED CHANNEL EXPANSIONS





Our extra rugged XR series modules are low-speed analog input modules that output their data on CAN bus or RS-485. They offer high IP protection classes and an extended operating temperature range. You can also use them as a channel expansion for any DEWETRON instrument. There are versions for thermocouple, voltage, current or resistance temperature measurements.

> Fully isolated:
  channel to channel and channel to bus, power and chassis
> RS-485 or CAN interface (user selectable)
> Up to 200 Hz sampling rate
> -20 °C to +70 °C operating temperature

MOBILE POWER SUPPLY



For mobile applications we provide a battery charger and system power supply with 3 hot-swappable batteries.

TRANSPORTATION CASES



We offer special sturdy carrying cases for the safe transport of all our measurement systems.

CURRENT TRANSDUCERS & CLAMPS

DEWETRON offers several solutions for current measurement from simple shunts to current clamps and high-precision zero flux transducers. There are versions for pure AC current which do not need any power supply and versions for DC and AC current which can be supplied from the DEWETRON instrument.







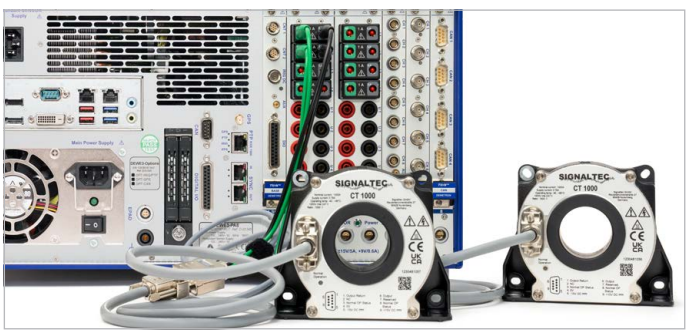
	DIRECT INPUT TRION-POWER-SUB				ZERO-FLUX THROUGH HOLE						CLAMPS				FLEXIBLE	
Name	TRION-POWER-SUB-CUR-x				CT-100	CT-200	CT-400	CT-500	CT-1000	CT-2000	CT684xA				SE-CUR-LFR-x	
Range [A_{RMS}]	0.2	1	2	20	100	200	400	500	1000	2000	20	200	500	1000	4200	42000
Accuracy [%]	0.03				<0.02						<0.5				<2.0	
Bandwidth [kHz]	300				2000	1100	800	520	440	140	2000	700	200	100	600	
AC	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DC	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–
Diameter [mm]	–	–	–	–	28	28	28	38	38	70	20	20	20	50	85	210
External supply required	No				Yes, provided by DEWETRON instrument											
Sub-module recommendation	–				SUB-CUR-02A			SUB-CUR-1A or SUB-dLV-1V with shunt adapter (for highest bandwidth)			SUB-dLV-5V for high bandwidth or SUB-dLV (clamp input) for medium bandwidth					
Application	Accurate measurements of low current, where current path can be opened.				Accurate measurements of high current, where current path can be opened. Typically efficiency tests, R&D...						Measurements of high current, where current path cannot be opened. Typically e-mobility.				High AC current measurements, where current path cannot be openend. Typ. steel industry, melting oven...	

TRANSDUCER SUPPLY BOX



For some data acquisition systems, we offer a current transducer box to power up to 8 current transducers directly from your DEWETRON DAQ system.

INTEGRATED TRANSDUCER POWER SUPPLY



The integrated, redundant transducer power supply enables you to relinquish an additional supply box and connect the transducers directly to the power analyzer. Sensors requiring ±15 V or +9 V supply voltage can be powered directly. Therefore, sensors such as zero-flux transducers do not need an extra power supply.

OXYGEN MEASUREMENT SOFTWARE

With the OXYGEN all-in-one software, data acquisition, recording, calculation, visualization and analysis has never been easier. Use only one software for all applications. Also for 3rd party components.



DATA ACQUISITION

Synchronous and continuous acquisition of data from several sources: analog, digital, encoder, counter, CAN, SCPI, Ethernet, video, GPS and many more.

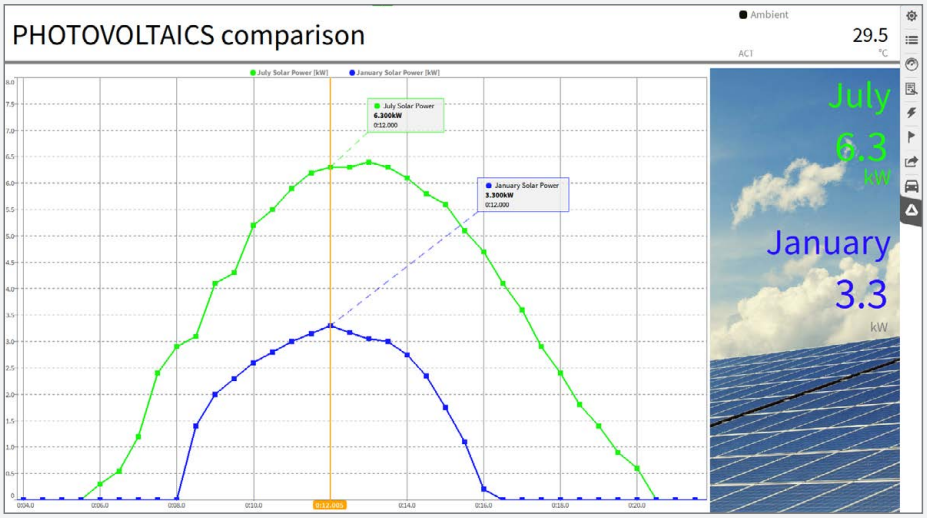
> Analog data with up to 10 MS/s
> Digital and encoder data with automatic RPM and angle calculation
> CAN(-FD) decoding via *.dbc including J1939 Compatible with Vector VN-series
> Ethernet receiver for external sensors (opt.)
> Video data from USB or GigE-camera
> Precision GPS position data via TRION3, GeneSys ADMA or OxTS RT series
> Plugin to request and decode OBD2 parameters



RECORDING

Store all your acquired data in one data file with a simple touch on the record button. You can achieve data rates of up to 1 GB/s and you never have to worry about loosing any data. Furthermore, review your data during recording with the DejaView function.

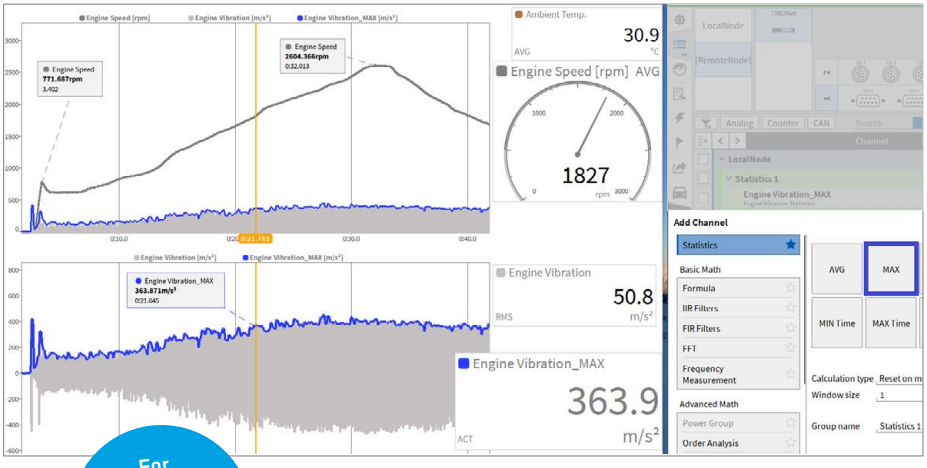
> File-split option for generating a new file after an amount of time or event occurrence
> Channel-wise sample rate selection
> Channel-specific storing options for waveform and statistics data recording
> Adjustable playback speed from 1/1000x to 1000x



ANALYSIS AND POST-PROCESSING

The real work often begins after the live measurement. To complete this workflow, OXYGEN also supports post-processing and analysis of the recorded data.

> Use many of the math and calculation (also incl. FFT) features to refine your measurement results
> Create new visualizations and measurement screens
> Quickly navigate through the data with well-known gestures and intuitive zoom and scrolling mechanisms
> Export data to complete your workflow



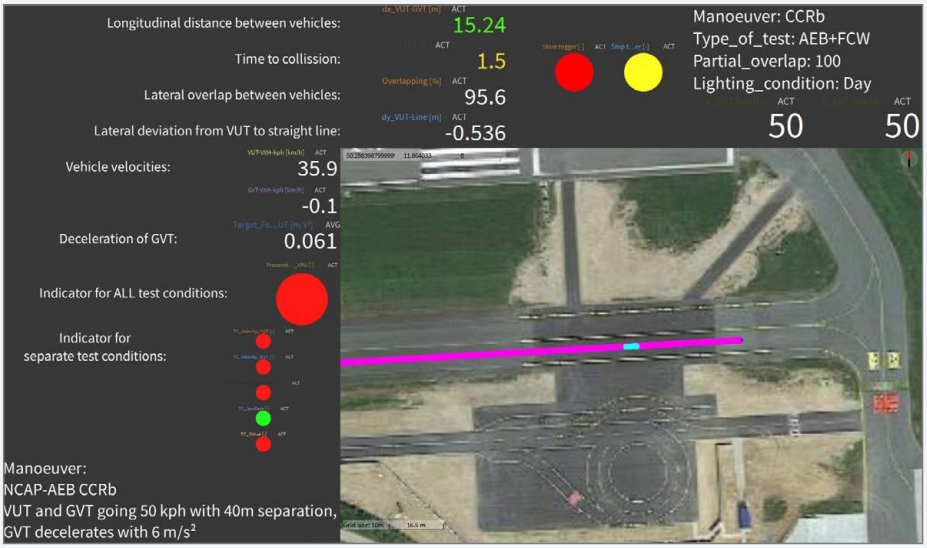
For post-processing, you do NOT need an OXYGEN license

... WE HAVE MORE SOFTWARE FEATURES THAN PAGES. CONTACT US FOR FURTHER INFORMATION.

BIRD'S EYE

The OXYGEN Bird's Eye plugin is the state-of-the-art software plugin to visualize the testing environment of your (ADAS) test within the software.
Based on the acquired IMU data, the position and movement of all involved objects are updated online. Using the shape editor, a realistic contour of each involved object (i.e. VUT, GVT) can be created for precise distance calculations between test objects.

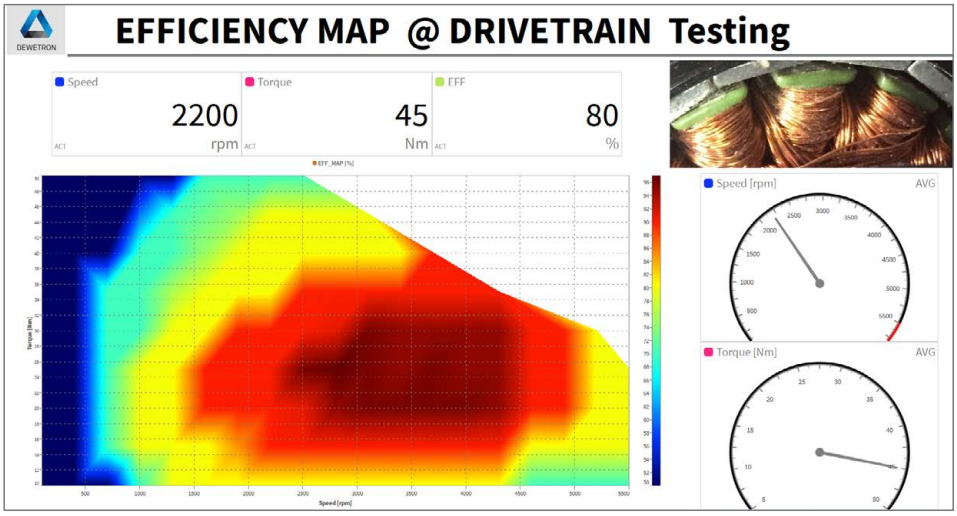
> Creation of complex 2-dimensional realistic vehicle shapes incl. automatic and EURO NCAP-conform POI-assignment
> Online distance calculations between all involved objects
> Proving ground and test setup visualization from the Bird's Eye view



EFFICIENCY MAPS

The matrix sampler is the solution for visualizing the efficiency of your electric drivetrain at different load steps or running speeds online. Create the calculation module directly in your power group. The efficiency map of the drivetrain will be filled up during the measurement.

> Possibility to refill single measurement points without overwriting the whole matrix
> Easy-to-use and intuitive operation
> Several trigger options to fill the map with data
> Freely definable matrix size
> Assignment of any channel to X-, Y- and Z-axes for visualizing any 3-dimensional signal dependencies



POWER ANALYSIS

Turn your DEWETRON measurement device into a fully-featured power analyzer:

> Analysis of 1–9 phase power systems (1P2W, 2V2A, 3P3W, 3P4W, 2x 3P3W, ...)
> Several power systems are logically summarized into power groups
> Gapless cycle-by-cycle calc. no blind spots
> Unique fundamental frequency detection with delay compensation for highest accuracy and reliability
> BASIC: vol., curr., RMS, AVG, fundamental & symmetrical components, active/reactive/apparent power total & fundamental, energy
> ADVANCED: harmonics (IEC 61000-4-7), flicker (IEC 61000-4-15), flicker emission (IEC 61400-21) and mechanical power/efficiency
> EXPERT: rolling calculation meets FGW-TG3



SOUND LEVEL

The sound level plugin provides online determination of the time-dependent sound pressure level, the energy equivalent sound pressure level, freely definable statistical sound pressure levels and many more. This plugin turns your DEWETRON device into the ideal solution for analyzing the acoustical emission of machines, for determining the spatial and statistical sound pressure level distribution in buildings and for long-term noise monitoring.

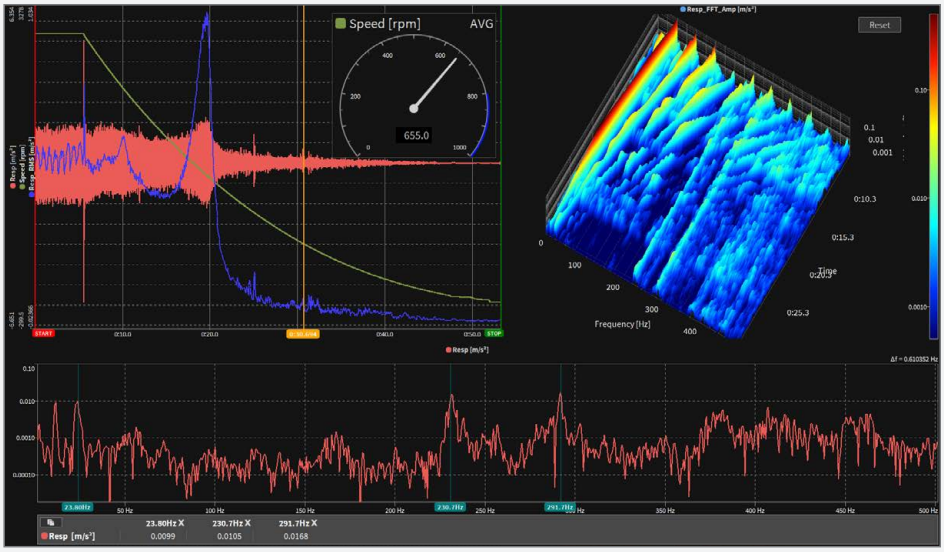
> A-, B-, C-, D- and Z-frequency weighting (according to DIN EN 61672-1)
> Fast, slow and impulse time weighting (according to IEC 651)
> Reference level for air (20 µPa) and water (1 µPa)
> Overall and interval logging
> Audio replay feature



FFT ANALYSIS

Experience top-tier frequency domain analysis with OXYGEN's flexible and user-friendly FFT Analysis. Benefit from powerful instruments and math calculations to tackle any task:

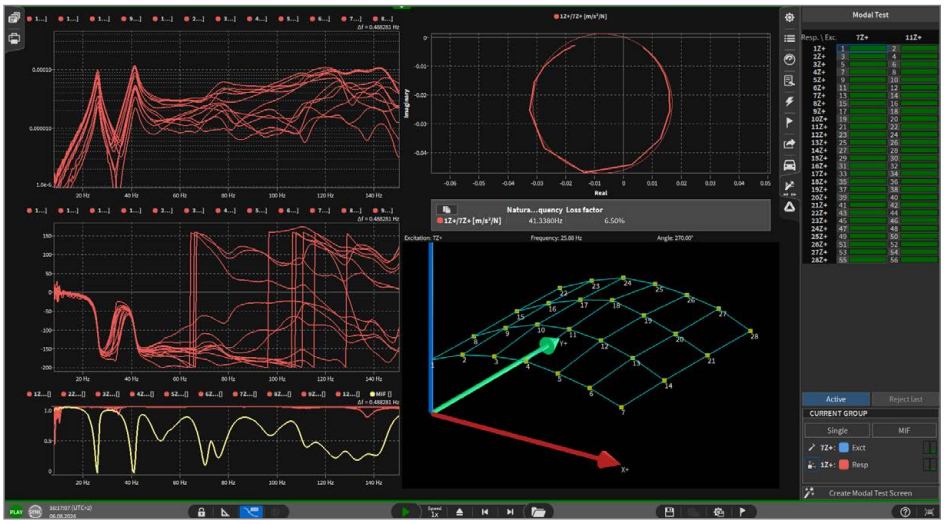
> Freely selectable (not only 2N) number of input samples or line resolution.
> Optional zero-padding for enhanced line resolution.
> Various windowing and scaling types selectable.
> Reference curves to visualize thresholds and warnings in the frequency domain.
> STFT to visualize spectral changes in time.
> Various 2- and 3-dimensional visualization and analysis options.



MODAL TEST

With OXYGEN's Modal Test option you can analyze the frequency characteristics of a mechanical structure to determine resonances, damping characteristics and more.

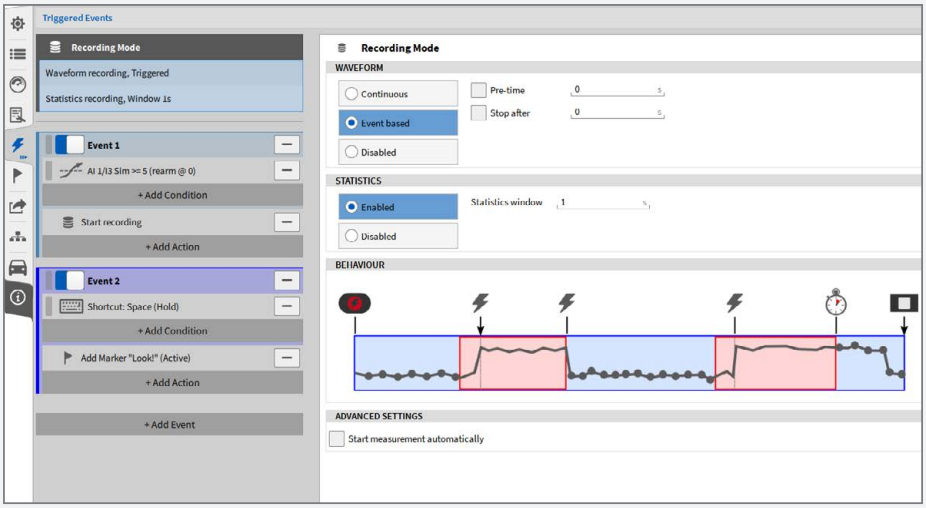
> DUT excitement via modal hammer
> SISO & SIMO tests with moving hammer and moving sensor
> Calculation of
  > Complex transfer function
  > Coherence of several hits
  > Mode indicator function
> Various interactive visualization options
> Data export into *.uff and other formats for post processing
> Modal shape animation
> SDOF circle fit



TRIGGER & EVENTS

The powerful trigger and event system makes it easy for you to record data in case of events, create markers, set a digital output or make a snapshot of the actual measured data. Create different events, each consisting of one or more trigger conditions and one or more actions.

> Many different trigger conditions: signal level (positive/negative edge, window) with optional rearm level, keyboard or time
> Powerful actions like start/stop of recording, set an alarm with optional digital output, set a marker with pre-defined text or make a snapshot of the actual measured data.



VIDEO INPUT

Cameras are implemented as additional sensors in OXYGEN, so you really get the "complete picture" of your measurement task.
Applications start with very simple video documentation (measurement setup, weather, environment, etc.) with a cheap webcam and extend to really complex tasks with up to 8 cameras, whose individual frames are perfectly synchronized with all other data (e.g. analog, CAN, counters, GPS...).

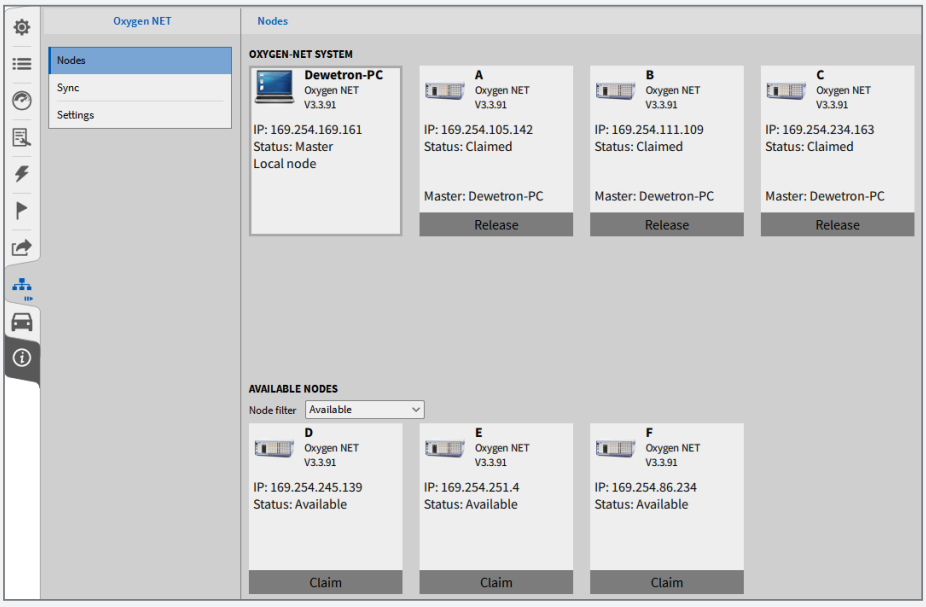
> USB webcams
> Synchronized USB and GigE cams, up to 289 fps
> High-speed cams, up to 100.000 fps (post sync)



OXYGEN-NET

Many applications require more than one measurement device, sometimes even at different locations. OXYGEN-NET makes it possible, to sum up all devices to one virtual measurement device. You only need a reliable network connection, and you can simply claim all available nodes and operate it from the main device.

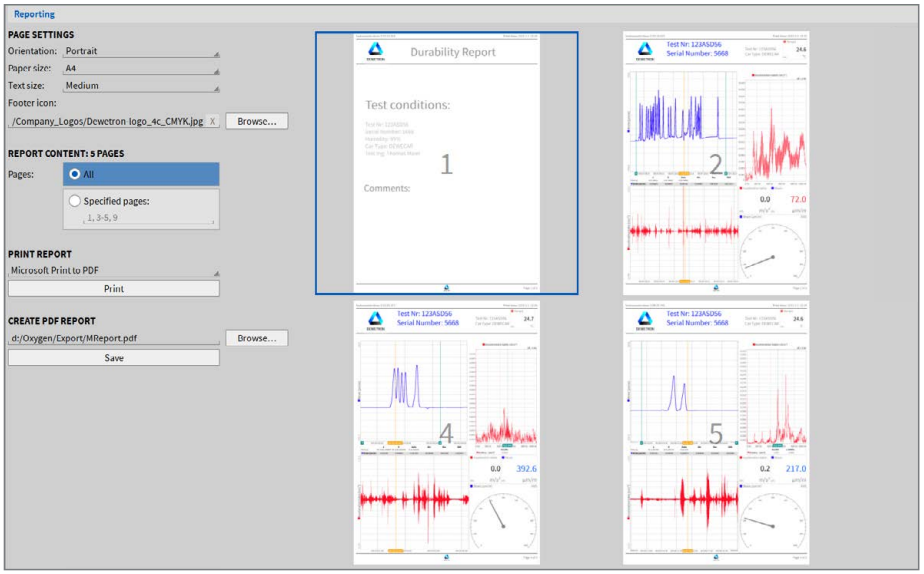
> Create one big virtual device with several remote nodes (measurement cloud)
> No complicated settings needed, simply claim and remove nodes with one click
> Works with absolute time synchronization as well as with TRION-SYNC-BUS
> Remote and local data storage possible for redundancy
> Multiple Master clients and redundant Master clients supported



REPORTING

Use OXYGEN for your whole measurement work-flow. From acquiring data to post-processing and finally reporting the data.

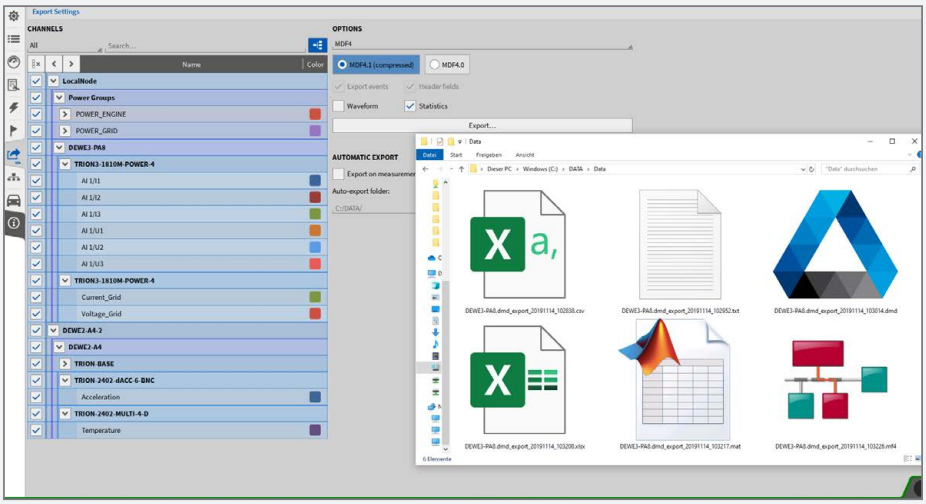
> Create separate reporting pages (in addition to the measurment screens) with typical printing layouts
> Duplicate a measurement screen or create new pages with a simple click
> Use all instruments and visualizations also in the reporting pages
> Separate time-cursor on each page available to report different time snippets in one report
> Directly print or save to pdf
> Export your measurement to a video



EXPORT

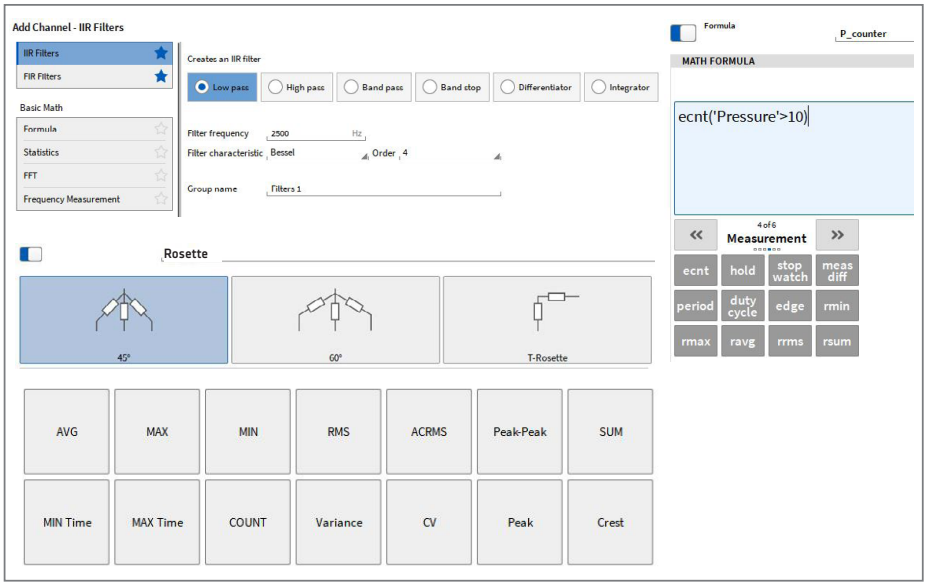
If you need to use another analysis software for further data processing, we offer data export for the most common applications and formats.

> Universal formats: CSV and TXT with selectable delimiter and timestamp format
> Advanced formats: Excel, MATLAB, ASAM MDF4, DIAdem, DSPCon, DynaWorks, IMC Famos 2, HDF5, MTS RPC III, NetCFD, NI TDMS, Universal File Format 58, Wave
> Select channels and/or time-range of the exported data
> Optional automatic export at measurement end



MATH AND CALCULATION

> FORMULA: For arithmetic and more advanced calculations (trigonometric, logical and measurement functions)
> STATISTIC: Block-wise, Triggered and Overall-statistics to calculate statistic values, e.g. AVG, RMS, MIN and MAX, PP...
> FILTER High, low, bandpass and bandstop IIR-filter and FIR-filter up to the 10th order
> DMS-ROSETTE calculation module for 45°, 60°, and 90° setups
> PSOPHOMETRIC ANALYSIS for railway and telecommunication applications
> FFT spectra overlap, peak hold and pin extraction
> INTEGRATION / DERIVATION with optional signal filter



... WE HAVE MORE SOFTWARE FEATURES THAN PAGES. CONTACT US FOR FURTHER INFORMATION.

ACCREDITED CALIBRATION
ACCORDING TO ISO 17025

Ensure the continued integrity of the measurement data by annually calibrating your system. DEWETRON is proud to be ISO 9001:2015 and ISO 14001:2015 certified and offers calibration service according to ISO 17025 or NIST standard.

In addition to the standard calibration service, we offer an upgrade to an accredited calibration with EN ISO/IEC 17025 or NIST. The accredited calibration service is applicable to individual systems and devices. This calibration also includes necessary adjustments without additional costs. Our specially trained team performs the calibration and ensures the high quality.



ACCREDITED SCOPE

- V 1000 AC ≂ — **VOLTAGE (AC)**
- I 20 AC ≂ — **CURRENT (AC)**
- P 20 k AC ≂ — **ACTIVE POWER (AC)** up to 850 Hz fundamental frequency
- V 1000 DC ⎓ — **VOLTAGE (DC)**
- I 20 DC ⎓ — **CURRENT (DC)**
- P 20 k DC ⎓ — **POWER (DC)**
- K, J, T — **TEMPERATURE SIMULATION (DC)**
- Pt100 Pt200 Pt500 Pt1000 — **TEMPERATURE SIMULATION (RTD)**
- 1 M DC ⎓ — **RESISTANCE (DC)**

TEST STAND INTEGRATION



Leading test stand manufacturers rely on the measurement data from DEWETRON when it comes to reliable testing of important and critical components. Our various interfaces guarantee you a simple integration.

TEST STAND INTERFACES IN OXYGEN

Smart interface technology makes it easy to integrate DEWETRON power analyzers and measurement instruments into various test stand automation systems, such as PAtools® from NI. Depending on the system architecture of the test stand, DEWETRON systems are equipped with the right interface to ensure reliable data transmission, easy to use remote control and remote configuration, e.g. through TCP/IP-based protocols.

EtherCAT
INTERFACE

Typ. 100 ch
Typ. 500 S/s per channel

Data transfer & remote control

SCPI
OVER ETHERNET

Typ. 100 ch
Up to 10 kS/s per channel

Data transfer & advanced remote control

XCP
OVER ETHERNET

Typ. 20 ch
Up to 2 MS/s per channel

Interface to CANape and INCA

CAN
CAN-FD

Typ. 20 ch
Typ. 100 S/s per channel

DATA STREAM
OVER ETHERNET

Typ. >100 ch
Up to 2 MS/s per channel

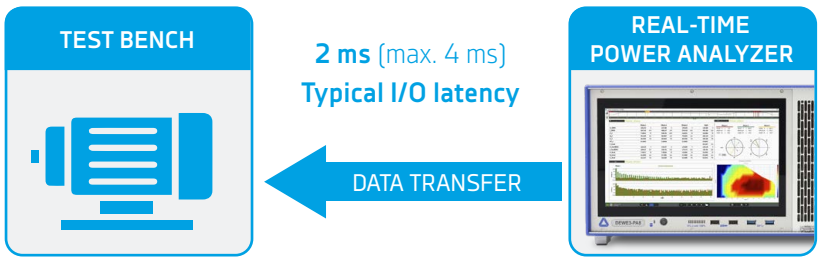
DMD
READER

Libary to import recorded data
in 3rd party software

DEDICATED REAL-TIME POWER ANALYSIS SOLUTION

DEWETRON offers a dedicated solution for latency critical tests and applications to turn your DEWE3 system into a real-time Power Analyzer

- > Calculation of cycle-by-cycle power values
- > Data output interface: Ethernet UDP or EtherCAT slave
- > Data output rate: 1 kHz
- > Typical I/O latency: 2 ms (max: 4 ms)

















ABOUT DEWETRON

DEWETRON is a manufacturer of precision test and measurement systems and part of the globally operating Anritsu Group. Our reliable measurement data help customers worldwide make processes more predictable, efficient, and safer.

Our strength lies in customized measurement solutions: ready to use right away while remaining flexible to adapt to dynamic testing requirements in the energy, automotive, transportation, and aerospace industries.

More than 35 years of experience and innovation have made DEWETRON a trusted partner in the global test and measurement market.

More than 25,000 DEWETRON measurement systems and over 400,000 measurement channels are in continuous use at leading companies worldwide.

DEWETRON's quality is certified according to ISO 9001 and ISO 14001.
The high integrity of the measurement data is guaranteed by our own accredited calibration lab according to ISO 17025.

THE MEASURABLE DIFFERENCE.

Get to know our
GLOBAL OFFICES

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