DEWETRON

ENERGY & POWER ANALYSIS

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 it's 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 products for precision measurement recording and analysis. DEWETRON is certified in accordance with ISO 9001:2008 and ISO 14001:2009. 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

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.

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 9001:2008 and ISO 1401:2009 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.

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

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.

CUSTOMIZED

MODULAR

COMPETENT

COMMITTED

APPROVED

TABLE OF CONTENT

THREE VALUABLE SOLUTIONS FOR OUR CUSTOMERS

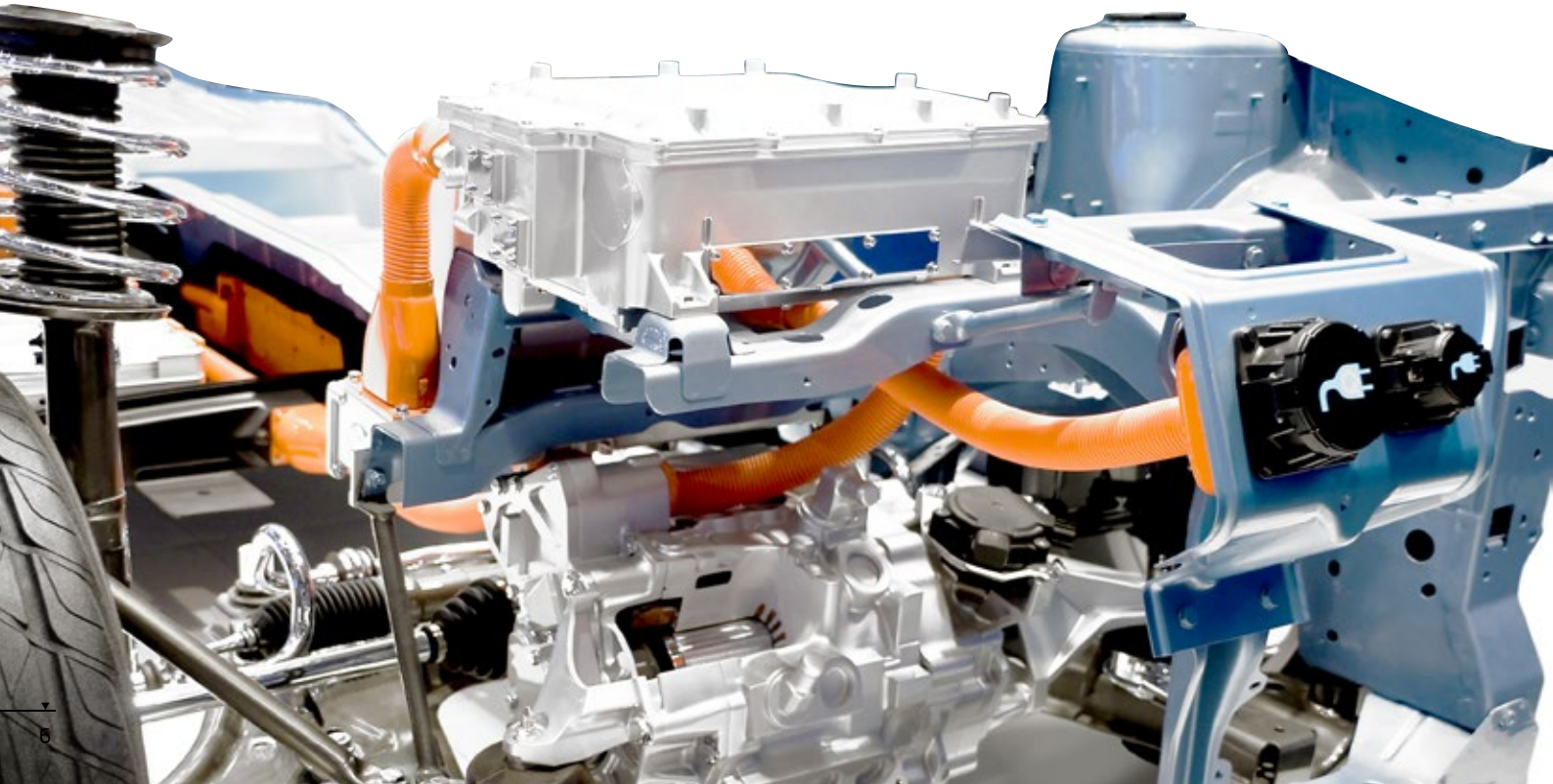
POWER ANALYSIS

DEWETRON Power Analysis is the ideal solution for research and development, certifications as well as pre-production tests and startup procedures.

DEWETRON solutions allow mobile or stationary broadband power analysis through distributed measurement technology. Highly accurate measurement solutions are achieved through synchronous data acquisition and online performance calculation of various power groups with different configurations, which means that all parameters are being calculated online and displayed live.

YOUR BENEFITS

> Precision and synchronous calculation of several power groups
> Fast and gapless power calculation
> Determination of efficiency and loses
> Recording of dynamic processes
> Synchronous sampling up to 2 MS/s/ch
> High-speed isolated inputs
> Analysis of rotation speed and torque
> Observation of the rotary field
> Additional data: pressure, temperature, vibration, strain and CAN data



POWER QUALITY ANALYSIS

Power Quality Analysis demands reliable and accurate data acquisition and the calculation of parameters in compliance with EN50160 and other standards of the energy sector. DEWETRON's distributed measurement technology answers that demand with stationary or mobile solutions.

Additionally, our test and measurement solutions provide you with automated reports and assessments if necessary. Disturbance records makes it possible to monitor energy grids and environmental parameters such as temperature or humidity, simultaneously. Several interfaces guarantee a flexible retrieval of stored data.

YOUR BENEFITS

> Power Quality Analysis
> Harmonics up to 1000th, incl. range of 2-9 kHz (up to 150 kHz)
> Interharmonics
> Flicker, flicker emissions
> Symmetrical components
> RVC
> Variable frequencies (16.7 Hz, 25 Hz, 50/60 Hz,...)

COMPLIED WITH STANDARDS

> IEC61000-4-7 und IEC61000-4-15
> IEC61000-4-30 Class A
> EN50160
> EN61000-3-X, EN61000-2-4
> etc.

CONSULTING

DEWETRON is more than a competent partner for Power Analyzer and Power Quality Analyzer solutions. With our knowledge and experience, we ensure precise, reliable data and data analysis for your unique needs. We will consult with you to find the right solution for your complex application and make it simple.

Our specialists take care of your data, data storage and measurement solutions. With DEWETRON you have the right partner for your success.

YOUR BENEFITS

> Consulting service
  > Project assistance
  > Finding the right solution
> Training and academy program
  > DEWETRON helps you to operate high-precision measurement solutions to fulfill your daily work
  > Application and product training
> Maintenance for your measurement solution
  > Hardware, software and data maintenance
  > System calibration
  > General hardware maintenance
  > High-quality individual guidance
> Measurement and data analysis
  > Measurement service
  > Loan systems and equipment
  > Customized reports & data analysis
  > Customized export and calculation tools

SYSTEM OVERVIEW

DEWE2-PA7

DEWE2-PA7	CHARACTERISTICS
Type	Turnkey high precision, mixed signal power analyzer
Basic accuracy	0.01 %[1]
Simultaneous sampling rate	2 MHz/s per channel (18 bit)[1]
Bandwidth	5 MHz[1]
Power channels	up to 12
Display	9“ multi-touch
Power supply for sensors	8 internal 9 V / ±15 V
Wiring types	1P2W, 1P3W, 3P3W, 3P4W, 6P6W up to 9P

[1] With TRION-1820-POWER-4 and direct current input

DEWE2-A4L

DEWE2-A4L	CHARACTERISTICS
Type	Portable high precision, mixed signal power analyzer/power quality analyzer
Basic accuracy	0.01 %[1]
Simultaneous sampling rate	2 MHz/s per channel (18 bit)[1]
Bandwidth	5 MHz[1]
Power channels	up to 8
Display	15.4“ multi-touch
Power supply for sensors	External 9 V / ±15 V
Wiring types	1P2W, 1P3W, 3P3W, 3P4W, 6P6W

[1] With TRION-1820-POWER-4 and direct current input

DEWE2-A4/M4

DEWE2-A4/M4	CHARACTERISTICS
Type	Portable/ rack mounted high precision, mixed signal power analyzer/power quality analyzer
Basic accuracy	0.01 %[1]
Simultaneous sampling rate	2 MHz/s per channel (18 bit)[1]
Bandwidth	5 MHz[1]
Power channels	up to 8
Display	13“ TFT wide-screen, DEWE2-M4 NA
Power supply for sensors	External 9 V / ±15 V
Wiring types	1P2W, 1P3W, 3P3W, 3P4W, 6P6W

[1] With TRION-1820-POWER-4 and direct current input

DEWE2-A13

DEWE2-A13	CHARACTERISTICS
Type	Portable high precision, mixed signal power analyzer/power quality analyzer
Basic accuracy	0.01 %[1]
Simultaneous sampling rate	2 MHz/s per channel (18 bit)[1]
Bandwidth	5 MHz[1]
Power channels	up to 24
Display	17" full HD
Power supply for sensors	External 9 V / ±15 V
Wiring types	1P2W, 1P3W, 3P3W, 3P4W, 6P6W up to 9P

[1] With TRION-1820-POWER-4 and direct current input

DEWE2-M13

DEWE2-M13	CHARACTERISTICS
Type	Rack mounted high precision, mixed signal power analyzer
Basic accuracy	0.01 %[1]
Simultaneous sampling rate	2 MHz/s per channel (18 bit)[1]
Bandwidth	5 MHz[1]
Power channels	up to 24
Display	NA
Power supply for sensors	External 9 V / ±15 V
Wiring types	1P2W, 1P3W, 3P3W, 3P4W, 6P6W up to 9P

[1] With TRION-1820-POWER-4 and direct current input

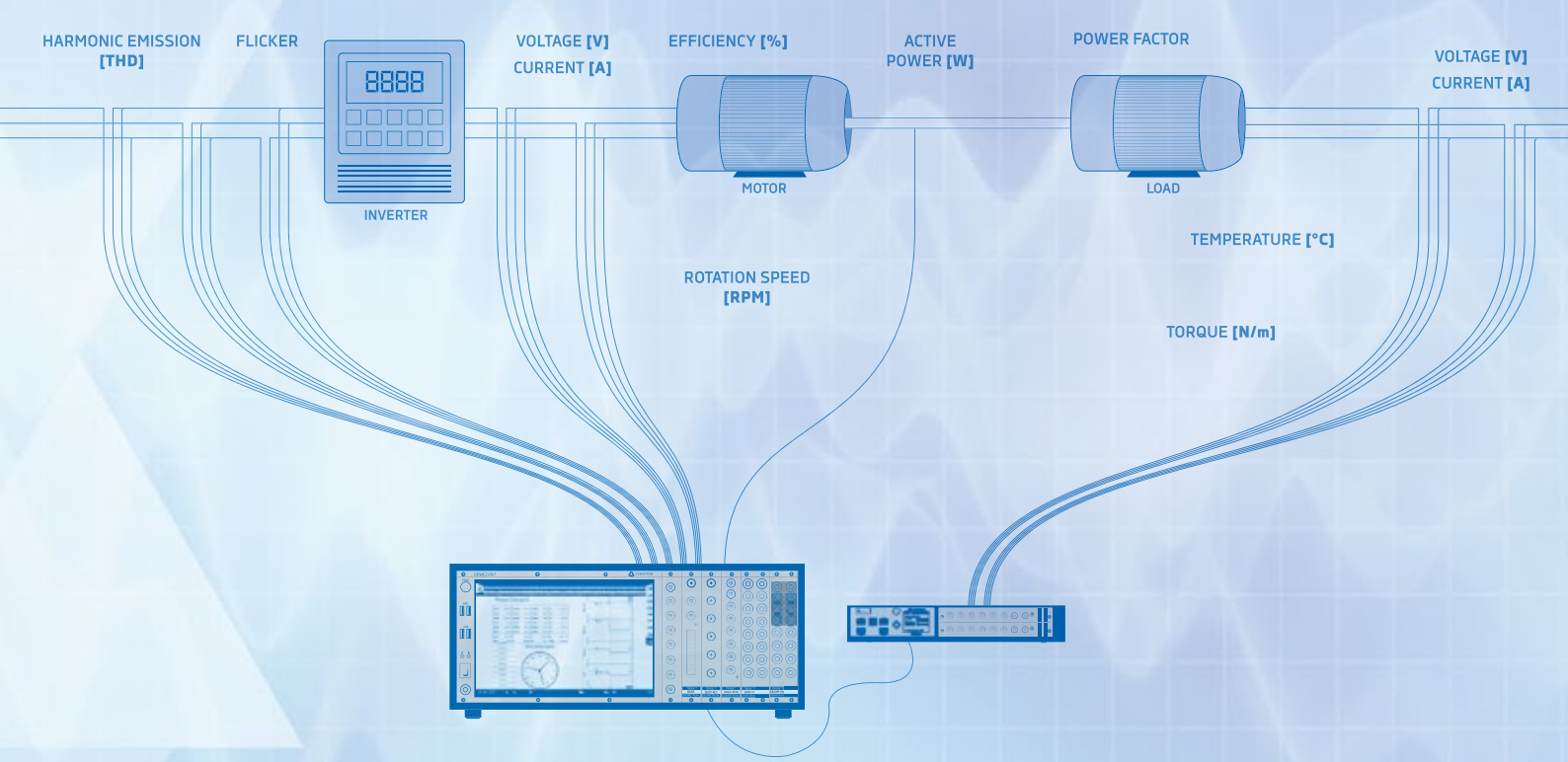
DEWE2-TRIONET

DEWE2-TRIONET	CHARACTERISTICS
Type	Smart, stackable frontend for distributed power analysis
Basic accuracy	0.01 %[1]
Simultaneous sampling rate	2 MHz/s per channel (18 bit)[1]
Bandwidth	5 MHz[1]
Power channels	4
Display	NA
Power supply for sensors	External 9 V / ±15 V
Wiring types	1P2W, 1P3W, 3P3W, 3P4W

[1] With TRION-1820-POWER-4 and direct current input

SOLUTION EXAMPLES

POWER ANALYSIS SOLUTIONS



TEST BENCH

DEWETRON's modular measurement solutions are the right tools for developing and testing drive trains, electrical engines, motors and inverters as well as electric & hybrid vehicles on a test bench.

YOUR BENEFITS

- > Precision and synchronous calculation of several power groups
- > Fundamental frequency support from 0.2 Hz to 1/10 acquisition rate or DC
- > Determination of efficiency and loses
- > Recording of dynamic processes
- > Synchronous sampling up to 2 MS/s/ch
- > Isolated high-speed modules
- > Analysis of rotation speed and torque
- > Observation of the rotary field
- > Additional data: pressure, temperature, vibration, strain, CAN-data

Because of the flexible and modular product concept, it is possible to analyze efficiency, electrical and mechanical power, temperature, torque rotation speed and much more with a single DEWETRON Power Analyzer.

POWER ANALYZER

DEWETRON's measurement solutions effortlessly analyze efficiency and losses during different drive cycles, calculate the power factor of the electrical engine during acceleration or analyze the battery behavior at different temperatures. Different interfaces and inputs provide for the capture of CAN-data, video, vibration, rotation speed, and torque simultaneously and synchronously. Sampling rate up to 2 MS/s/ch and bandwidth up to 2 MHz in combination with broadband and high accuracy transducers guarantee accurate and precise data. Plugins such as Combustion Analyzer or Power allow our customers to analyze and test hybrid cars with one DEWETRON Power Analyzer. The modular product concept allows configuring systems with up to 12 power faces in one system. With optional racks and expansions, it is possible to configure the perfect measurement solution for your test bench application. The software OXYGEN with Power option guarantees highly accurate data on a stable, modern and expandable platform. The easy to use software with auto-configuration helps you to save time and get your work done. DEWETRON's solutions are professional tools for professionals in R&D, certification and test.

TYPICAL DEWETRON SOLUTION

> 1 x DEWE2-PA7, mixed signal power analyzer
  > Power analysis and efficiency determination of inverter and motor
> 1 x TRIONet, smart synchronized frontend for channel expansion
  > Power analysis of load
> 3 x TRION-POWER-1820-POWER-4
  > 3 x HV inputs inverter input
  > 3 x HV inputs inverter output (motor)
  > 3 x HV inputs load
> 6 x TRION-POWER-SUB-CUR-2A, for current measurement via ZeroFlux transducer
> 6 x PA-IT-700-S-BUNDLE, ZeroFlux transducers for up to 700A_{RMS}
> 3 x TRION-POWER-SUB-dLV, low voltage input for current measurement via clamp
> 3 x SE-CUR-CLAMP-500-DC, high precision AC/DC current clamp
> 1 x DW2-CLAMP-DC-POWER-8, optional external power supply for 8 transducers/probes
> 1 x TRION-BASE, counter/encoder input
> 1 x TRION-CAN-2, 2 CAN interfaces
> 1 x EPAD2-TH8-x, dedicated temperature module
> 1 x OXYGEN-OPT-POWER-ADV, option for harmonic, flicker analysis
> 1 x OXYGEN-OPT-SCPI, remote control interface for DEWETRON power analyzer
> 1 x OXYGEN-OPT-CAN-OUT, CAN out option for DEWETRON power analyzer

TRIONet

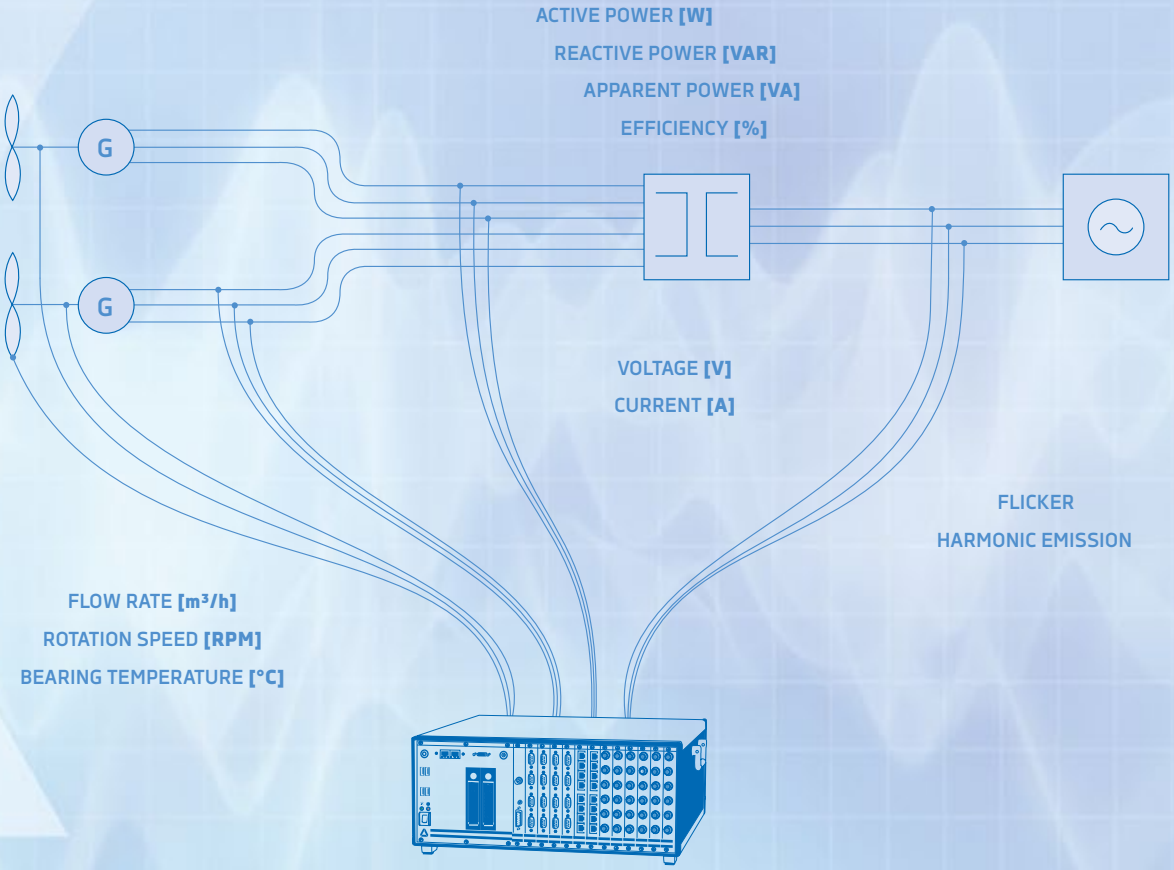
DEWE2-PA7

RESULTS

> Online power calculation for two 3-phase power groups
> DC power calculation for battery power, air-conditioner and heater
> Efficiency calculation for drive train, calculation of losses
> Calculation of mechanical power
> Analysis of efficiency, PF and losses
> Analysis of temperature influence

MEASURED AND CALCULATED VALUES

P, Q, S, PF, losses, efficiency, energy consumption, during drive cycles, CAN-data, wheel speed, torque, temperature of batteries, efficiency of charger during charging, wheel pressure and many more.



HYDRO ELECTRIC POWER PLANTS

Hydroelectricity is the production of electrical power through the use of the gravitational force of falling or flowing water. It is the most widely used form of renewable energy.

YOUR BENEFITS

- Measurement of electrical power, energy and efficiency
- Online calculation of power quality parameters
- Observation of rotary field
- Recording of dynamic processes
- Long-term monitoring
- Measurement of water flow, torque, rotation speed, temperature and vibration

Hydroelectric power plants have been in operation for many years. In answer to the need for monitoring power parameters such as active, reactive, apparent power and THD we provide modular and flexible solutions for long term monitoring and precise power analysis.
The DEWETRON Power Quality Analyzer combines the functionality of a Power Analyzer and a data logger.

POWER ANALYZER

A DEWETRON Power Analyzer is the right solution for a wide range of measurement tasks to ensure that the hydroelectric power plant is generating the maximum of electrical power and to prove the quality of generated energy.
Even for maintenance and testing of turbines, generators or transformers a DEWETRON solutions helps to increase the reliability and durability of the power plant.

Distributed systems with up to 128 channels per system, synchronous acquisition of electrical and physical parameters, online power calculation for several power groups, long-term monitoring and online analysis are the benefits for our customers. DEWETRON's modular product concept provides for the expansion of existing solutions to continually operate, monitor, test and maintain complex renewable power plants.

TYPICAL DEWETRON SOLUTION

- 1 x DEWE2-M13, rack mounted mixed signal Power Analyzer
  - Power analysis and efficiency determination of generators and transformers
- 3 x TRION-2402-V-8
  - 3 x HV inputs generator/turbine 1
  - 3 x HV inputs generator/turbine 2
  - 3 x HV inputs transformer output
- 9 x SE-CUR-SHUNT-07, direct current inputs up to 7 A_{RMS}
- 1 x TRION-BASE, counter/encoder input for rotation speed, torque measurement and analysis of mechanical power
- 1 x TRION-1620-ACC-6-BNC, acceleration and vibration analysis
- 1 x EPAD2-TH8-x, dedicated temperature module
- 1 x OXYGEN-OPT-POWER-ADV, option for harmonic, flicker analysis
- 1 x OXYGEN-OPT-SCPI, remote control interface for DEWETRON power analyzer

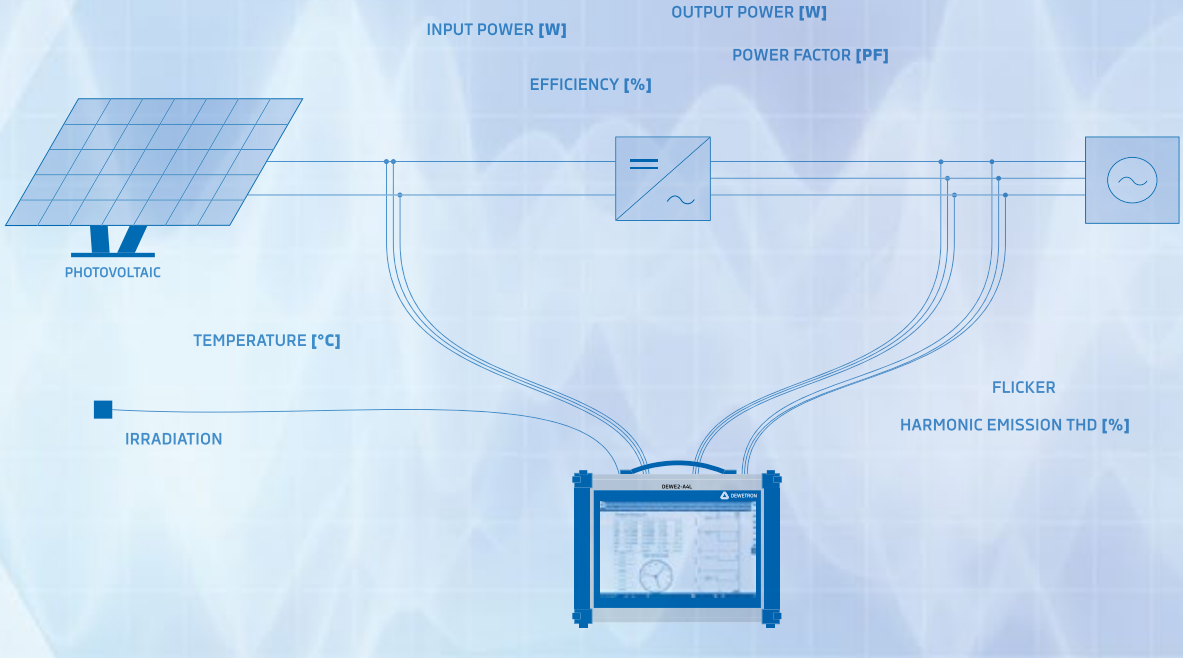
DEWE2-M13

RESULTS

- Combination of electrical and mechanical values conjunct in one device
- High acquisition for efficiency calculation
- Synchronous online power calculation
- Calculation of additional parameters online with math library
- Analysis of events in the system
- Synchronization of measured and calculated values

MEASURED AND CALCULATED VALUES

Power Quality parameters such as flicker, harmonics, THD and symmetrical components, active, reactive, apparent power, efficiency, vibration, bearing temperature, flow speed and structural parameters.



4-PHASE SYSTEMS SOLAR INVERTERS

Renewable power plants, especially solar power plants, are becoming more and more common all over the world and help us to ensure a power supply with green energy. DEWETRON's modular test and measurement systems are the right solution to analyze the performance of the solar power plant and to assure power quality.

YOUR BENEFITS

> DC and AC power calculation
> Online efficiency determination of inverter, solar power plant
> Synchronized measurement of environmental parameters
> GPS synchronization for distributed power analysis
> Support of any sensors
> Customized reports and reports according to standards

DEWETRON offers synchronized, distributed solutions to analyze behavior during an eclipse or passing clouds.

POWER ANALYZER

DEWETRON's modular, portable and fixed installed Power Analyzers are the ideal solution for DC and AC measurements on a solar power plant and furthermore to capture environmental parameters like irradiance or temperature simultaneously and synchronized. It is possible to calculate up to 4 power groups within a single system and to analyze the efficiency of the inverter, the power quality on the grid connection point and the performance of the entire solar power plant.
For distributed measurements over several grid connection points and solar power plants, DEWETRON offers synchronized distributed solutions to analyze the behavior during an eclipse or passing clouds. Flexible, customized reports and reporting tools complete the DEWETRON solution.

TYPICAL DEWETRON SOLUTION

> 1 x DEWE2-A4L, portable mixed signal Power Analyzer/advanced Power Quality Analyzer
  > Power analysis and efficiency determination of solar inverter
> 1 x TRION-1820-POWER-4
  > 1 x HV input solar inverter
  > 3 x HV output solar inverter
> 4 x TRION-POWER-SUB-dLV, low voltage input for current measurement via clamp
> 4 x SE-CUR-CLAMP-500-DC, high precision AC/DC current clamp
  > 1 x current input solar inverter
  > 3 x currents output solar inverter
> 1 x DW2-CLAMP-DC-POWER-8, optional external power supply for 8 transducers/probes
> 1 x TRION-1603-LV-6-BNC, 6 low voltage inputs for irradiance sensors
> 1 x EPAD2-TH8-x, dedicated temperature module
> 1 x OXYGEN-OPT-POWER-ADV, option for harmonic, flicker analysis

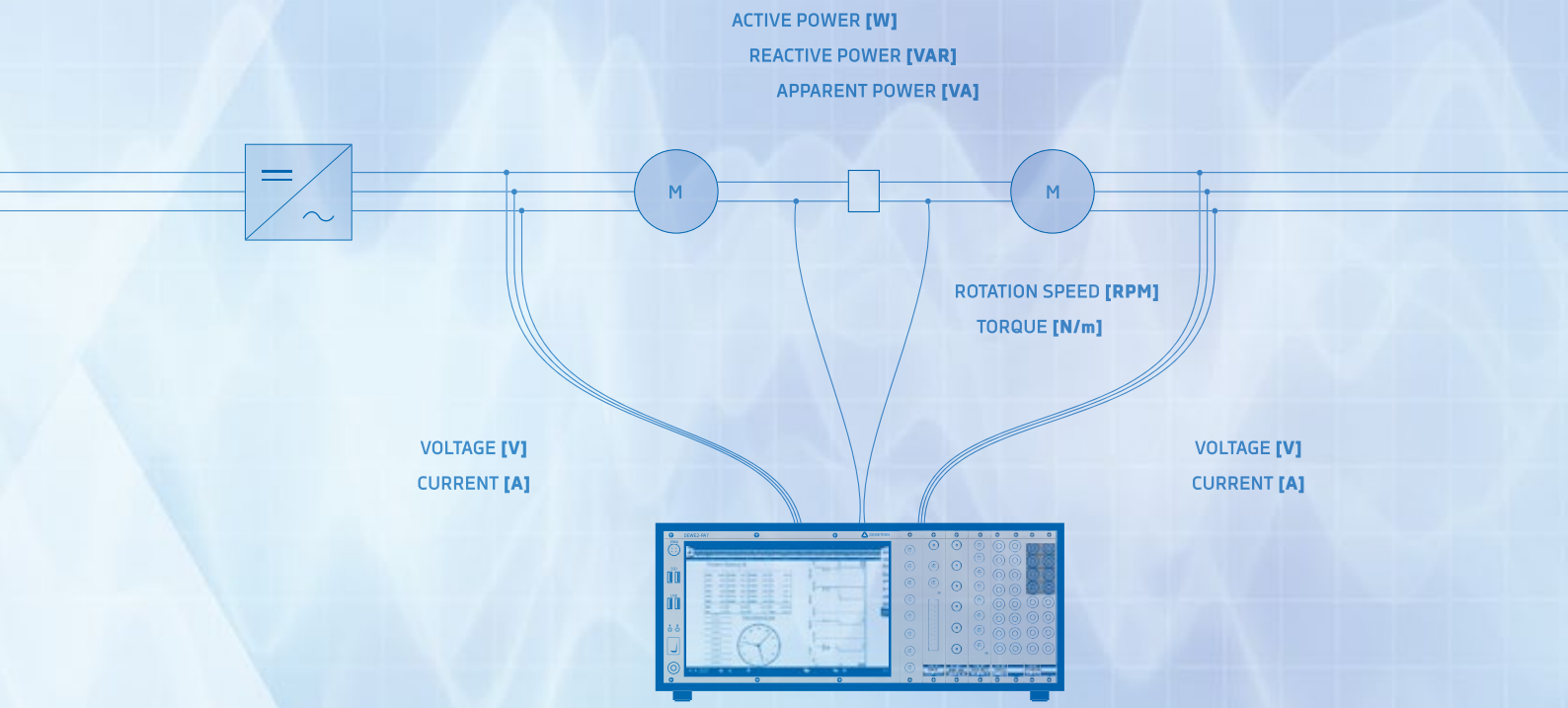
DEWE2-A4L

RESULTS

> Synchronized measurement of DC and AC power
> High accuracy power calculation for several power groups
> Synchronous acquisition of additional parameters and signals
> Synchronized measurement of distributed solar power plants
> Customized reports and reports according to standards

MEASURED AND CALCULATED VALUES

Active, reactive and apparent power, harmonic emission, interharmonic emission, higher frequencies, flicker emission, efficiency, power factor, irradiance, temperature, ...



MOTOR EFFICIENCY TEST

Electrical DC and AC motors, synchronous or induction, are widespread throughout small and large scale industries with many different applications. Today the primary goal is to increase the efficiency and performance of electrical motors and to identify specific losses.

YOUR BENEFITS

- Synchronous power and efficiency calculation for two motors
- Online Efficiency and performance determination
- High accuracy power calculation even for variable frequencies and DC
- High dynamic frequency range
- Customized reports and reports according to international standards

DEWETRON Power Analyzers are the professional solution for motor efficiency tests.

POWER ANALYZER

To determine the efficiency of electrical motors and to do measurements and analysis according to national and international standards, there is the need for high performance and accurate measurement solutions. DEWETRON's Power Analyzers are multichannel solutions for you motor testing. Synchronous acquisition of all input channels, high accuracy power calculation for several motors (DC and AC) and the possibility to capture environmental parameters are just a few benefits of the DEWETRON Power Analyzer. With the modular product concept a single DEWETRON solution is able to precisely capture electrical parameters, mechanical parameters, and environmental parameters absolutely synchronously, without any additional device.

TYPICAL DEWETRON SOLUTION

- 1 x DEWE2-PA7, mixed signal Power Analyzer
  - Power analysis and efficiency determination of motors
- 2 x TRION-POWER-1820-POWER-4
  - 3 x HV inputs motor 1
  - 3 x HV inputs motor 2
- 6 x TRION-POWER-SUB-CUR-2A, for current measurement via ZeroFlux transducer
- 6 x PA-IT-1000-S-BUNDLE, ZeroFlux transducers for up to 1000 A_{RMS}
  - 3 x current motor 1
  - 3 x current motor 2
- 1 x TRION-BASE, counter/encoder inputs for rotation speed and torque measurement
- 1 x TRION-CAN-2, 2 CAN interfaces
- 1 x EPAD2-TH8-x, dedicated temperature module for analysis of bearing and winding temperature
- 1 x OXYGEN-OPT-POWER-ADV, option for harmonic, flicker analysis
- 1 x OXYGEN-OPT-SCPI, remote control interface for DEWETRON Power Analyzer
- 1 x OXYGEN-OPT-CAN-OUT, CAN out option for DEWETRON Power Analyzer

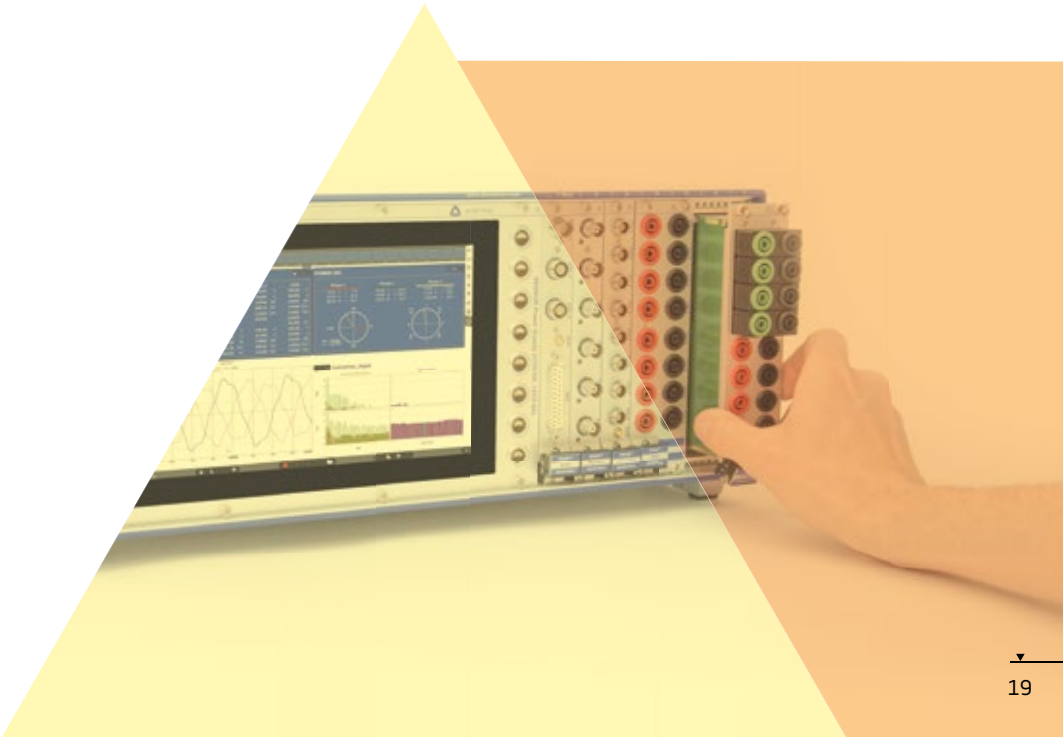
DEWE2-PA7

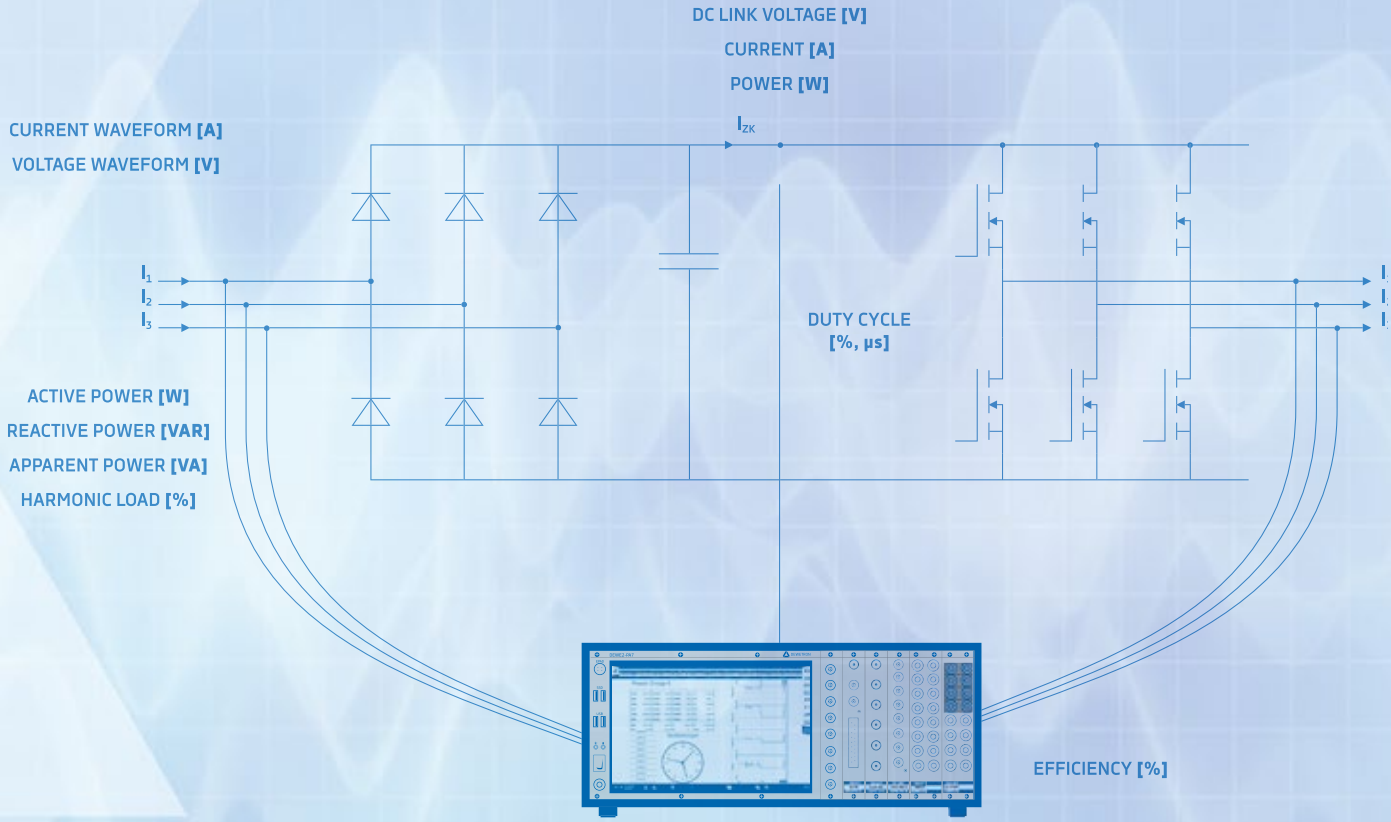
RESULTS

- Simultaneous analysis of two 3-phase AC power systems
- Different speed, from low to high rpm
- High accurate power analysis with different fundamental frequencies
- Online calculation of efficiency and losses
- Motor efficiency test according to 60034-2-1

MEASURED AND CALCULATED VALUES

Voltages and currents of 2 electrical motors, P, Q, S, PF, efficiency, losses, rotation speed and torque, winding and bearing temperature, ...





POWER CONVERTER TEST

Power converters are used today in all industries for motor drives from several watts to megawatt. These converters provide for the control of voltage magnitude, frequency and phase to power a dynamic load with a wide speed and torque range. Perfectly adjusted speed and torque allows for maximum efficiency and minimum energy consumption.

YOUR BENEFITS

- Simultaneous analysis of multi-power systems
  - 3-phase AC
  - 1-phase DC
- Efficiency analysis
  - Fundamental component calculation
- Dynamic performance evaluation
- Analysis of power quality on grid-side
- Waveform recording for pulse pattern analysis

DEWETRON's turnkey software OXYGEN with the Power option guarantees high dynamic, high performance and accurate power analysis.

POWER ANALYZER

DEWETRON's Power Analyzer provides for the highly accurate, simultaneous analysis of two three-phase AC and a one-phase DC power lines within a single instrument. Portable battery powered and fixed installed solutions allows our customers to analyze converters through the development process and during the commissioning processes in the field. Wide bandwidth, high-voltage and low-voltage inputs in combination with TRION-POWER boards up to 2 MS/s/ch and our turnkey OXYGEN software with Power option guarantees high dynamic, high performance and accurate power analysis. DEWETRON is your solution to determine static and dynamic efficiency, coil losses, power quality of the grid side and the analysis of the waveform's pulse pattern.

TYPICAL DEWETRON SOLUTION

> 1 x DEWE2-PA7, high precision mixed signal Power Analyzer
  > Power analysis and efficiency determination of power converter
> 2 x TRION-POWER-1820-POWER-4
  > 3 x HV inputs converter input
  > 3 x HV inputs converter output
  > 1 x DC link
> 7 x TRION-POWER-SUB-CUR-2A, for current measurement via ZeroFlux transducer
> 7 x PA-IT-1000-S-BUNDLE, ZeroFlux transducers for up to 1000 A_{RMS}
> 1 x TRION-CAN-2, 2 CAN interfaces
> 1 x OXYGEN-OPT-POWER-ADV, option for harmonic, flicker analysis
> 1 x OXYGEN-OPT-SCPI, remote control interface for DEWETRON Power Analyzer
> 1 x OXYGEN-OPT-CAN-OUT, CAN out option for DEWETRON Power Analyzer

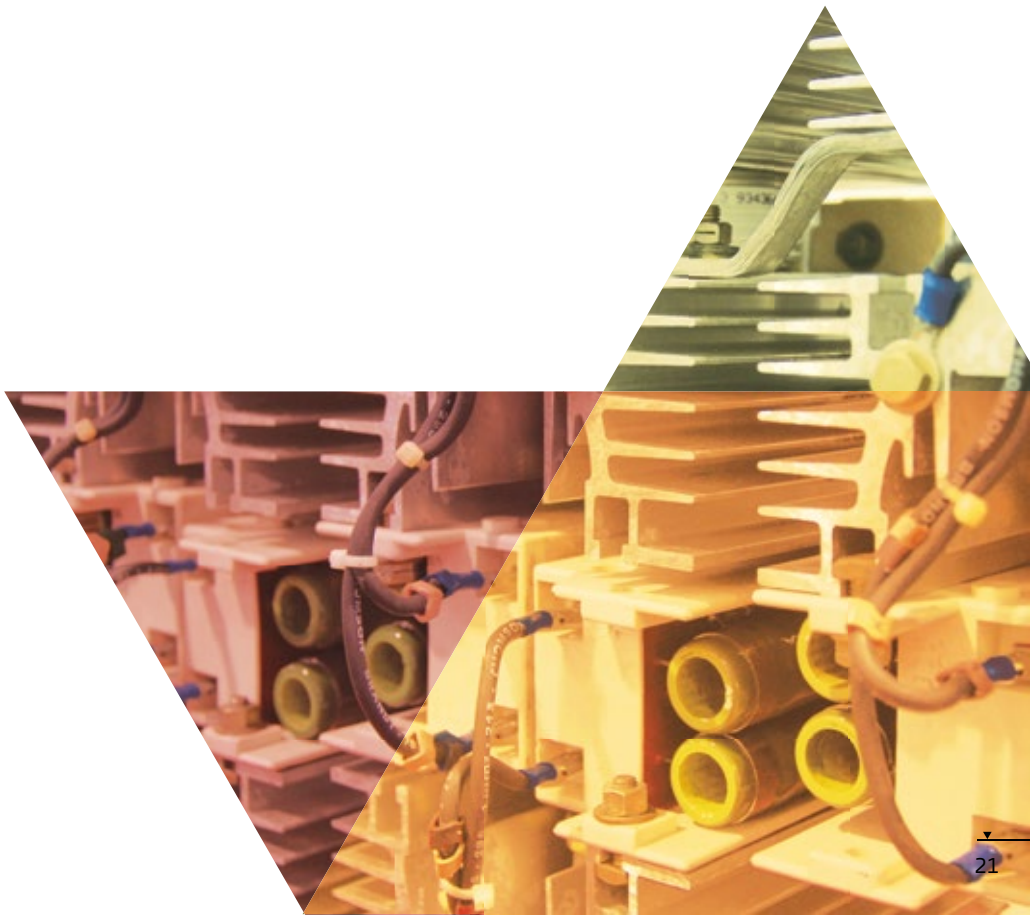
DEWE2-PA7

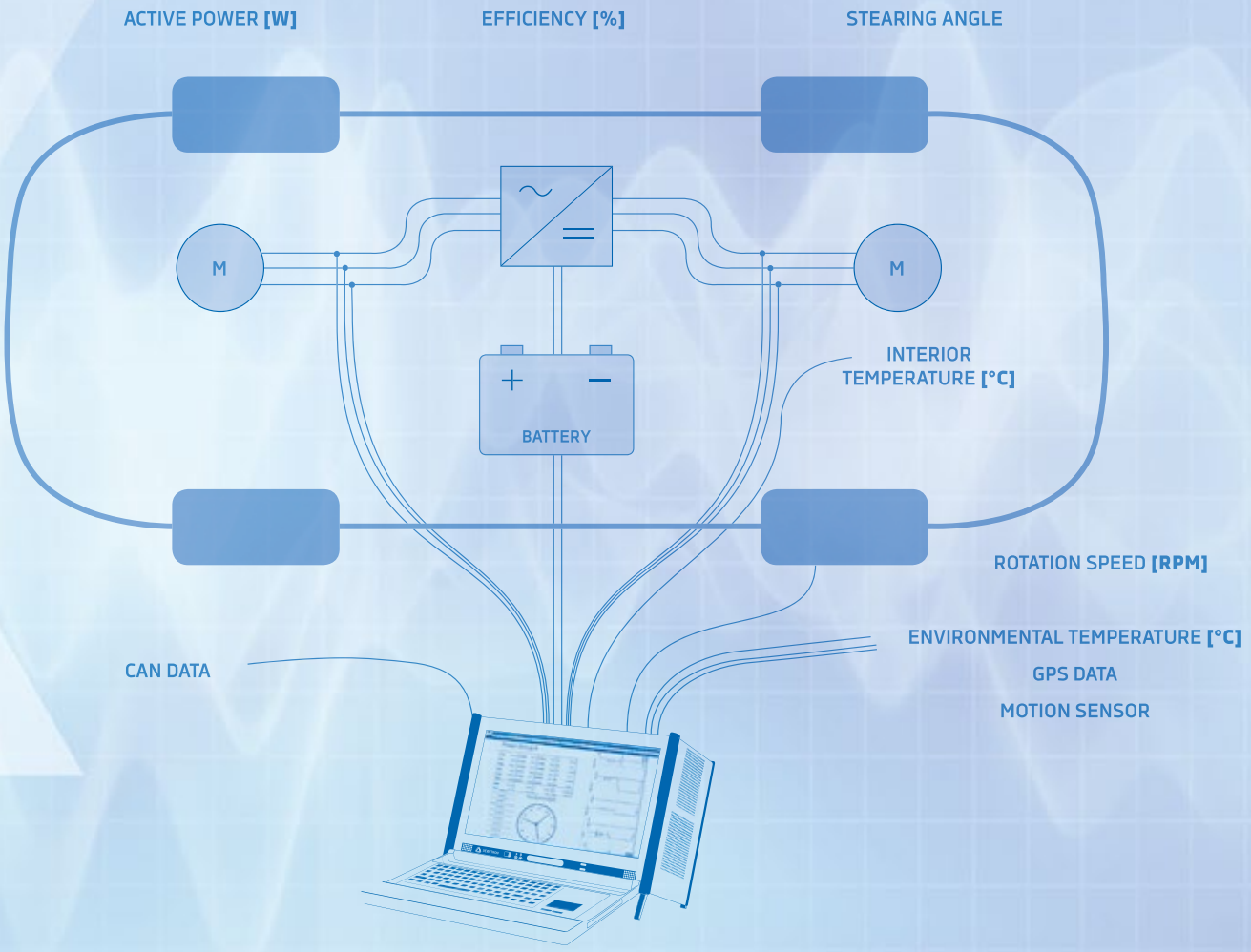
MEASURED AND CALCULATED VALUES

Voltages and currents of two three-phase AC and a single-phase DC system, P, Q, S, PF, efficiency, losses, fundamentals, frequency...

RESULTS

> Simultaneous analysis of two 3-phase AC and a single-phase DC power system
> Synchronized measurement on grid side and load
> High accurate power analysis with different fundamental frequencies
> Online calculation of efficiency and losses
> Waveform recording for pulse pattern analysis





E-MOBILITY

Battery powered vehicles are becoming more and more common on our roads and in our lives. DEWETRON is your competent partner to analyze, test and verify e-bikes, e-scooters and other electric vehicles during real-time drive tests.

YOUR BENEFITS

- Portable and flexible battery powered Power Analyzer
- High precision and synchronous calculation of several power groups
- Determination of efficiency and loses during real drive and charging
- Recording of dynamic processes
- Synchronous sampling up to 2 MS/S/ch
- High-speed isolated amplifiers
- Additional data: pressure, temperature, vibration, strain and CAN-bus data

DEWETRON Power Analyzers are the professional solution for R&D as well as test and certification during real-time drive testing.

POWER ANALYZER

To determine the efficiency of electrical motors and to conduct measurements and analysis according to national and international standards, there is a need for accurate, high performance measurement solutions. DEWETRON's Power Analyzers are multichannel solutions for motor testing. Synchronous acquisition of all input channels, high accuracy power calculation for several motors (DC and AC) and the possibility to capture environmental parameters are just a few benefits of the DEWETRON Power Analyzer. With the modular product concept a single DEWETRON solution is able to precisely capture electrical parameters, mechanical parameters, and environmental parameters absolutely synchronously, without any additional devices.

TYPICAL DEWETRON SOLUTION

- 1 x DEWE2-A13, portable battery powered mixed signal Power Analyzer
  - Drive train test and efficiency analysis
- 2 x TRION-POWER-1820-POWER-4
  - 3 x HV inputs motor 1
  - 3 x HV inputs motor 2
  - 1 x HV input battery
- 7 x TRION-POWER-SUB-CUR-2A, for current measurement via ZeroFlux transducer
- 7 x PA-IT-1000-S-BUNDLE, ZeroFlux transducers for up to 1000 A_{RMS}
  - 3 x current motor 1
  - 3 x current motor 2
  - 1 x current battery
- Optional 7 x TRION-POWER-SUB-dLV, 7 low voltage inputs for clamps
- Optional 7 x SE-CUR-CLAMP-500-DC, high precision current clamp 500 A_{RMS}
- 1 x TRION-BASE, counter/encoder onputs for rotations speed and torque measurement
- 1 x TRION-CAN-2, 2 CAN interfaces
- 1 x TRION-VGPS-100, position, speed and displacement measurement
- 1 x EPAD2-TH8-x, dedicated temperature module for analysis of bearing and winding temperature
- 1 x DW2-PS-BAT, internal battery power supply

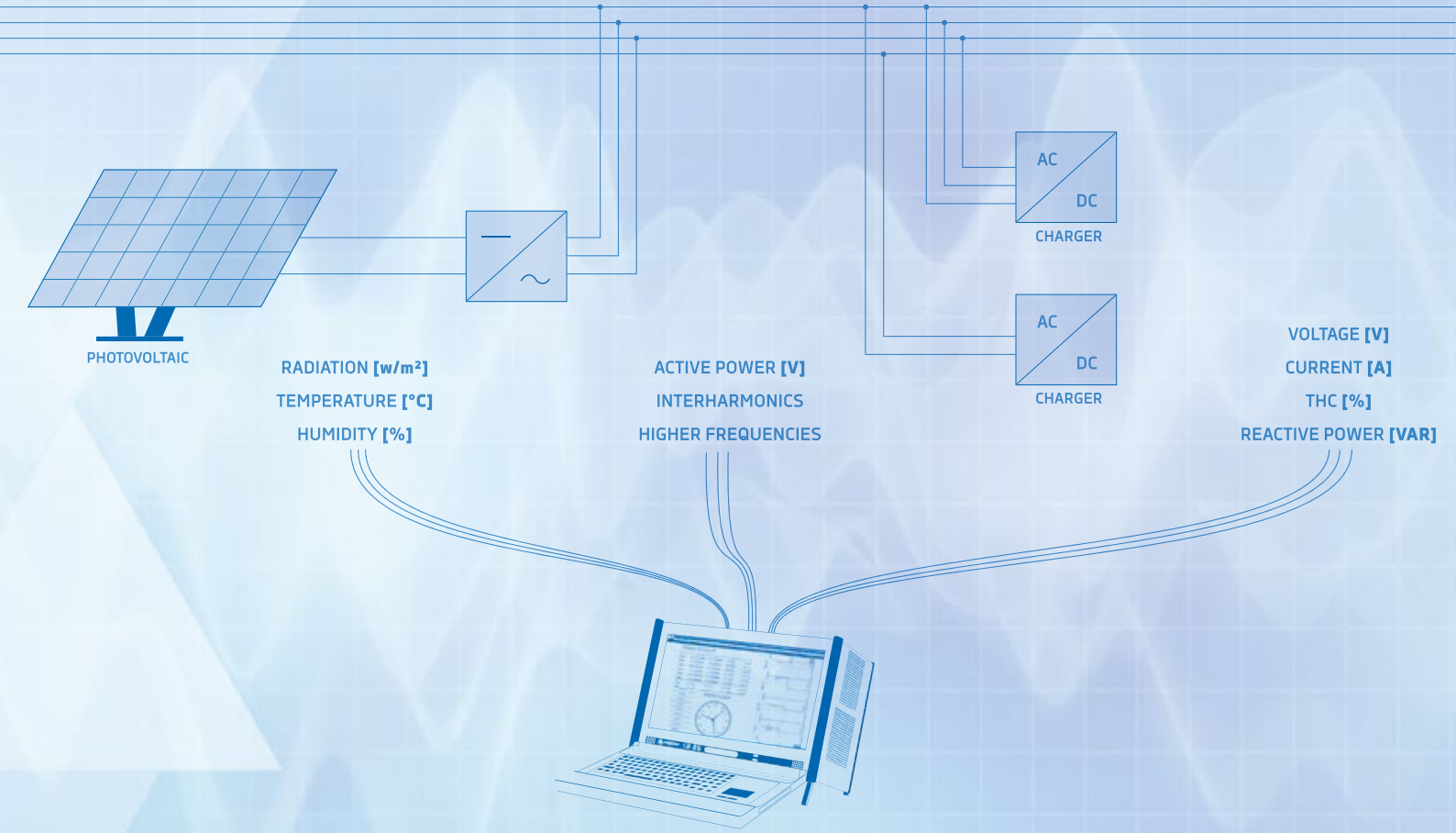
DEWE2-A13

RESULTS

- Online power calculation for two 3-phase power groups
- DC power calculation for battery power, air-conditioner and heater
- Efficiency calculation for drive train during real drive cycles
- Calculation of mechanical power
- Capture of distance, up and downhill drive
- Analysis of efficiency, PF and losses
- Analysis of temperature influence

MEASURED AND CALCULATED VALUES

Active power, reactive and apparent power, power factor, mechanical power, losses and efficiency, dynamical car parameters, speed, torque, rotation speed and many more.



E-MOBILITY CHARGING STATIONS

With one DEWETRON system, a one phase and a three phase EV-charging system connected with a photovoltaic system, can be tested.

YOUR BENEFITS

> Multi channel battery powered Power Analyzer
> Up to 2 MS/s/ch acquisition rate, 5 MHz bandwidth
> Analysis of harmonics and interharmonics for several power groups
> Standard reporting and customized reports

The number of electric vehicles is constantly rising. Therefore, multiple charging stations are required at numerous locations. With this configuration, the harmonic emissions could lead into further problems.

POWER ANALYZER

Due to the increasing number of charging stations in cities and in private usage, it is more and more important to prove the grid compatibility of charging stations and the power quality of the grid. Today super chargers are working with charging capacities up to 150 kW. Therefore, it is necessary to use wide range and accurate current transducers and intelligent measurement solutions for reliable data.

With DEWETRON's Power Analyzer, it is possible to measure and report power quality parameters, cell health and the capacity of the batteries within on powerful measurement instrument.
DEWETRON's Power Analyzers are the right tools to analyze the grid, to prove the compatibility of chargers and to establish a stable charging infrastructure.

TYPICAL DEWETRON SOLUTION

- 1 x DEWE2-A13 or DEWE2-A4L, portable all-in-one mixed signal Power Analyzer
  - Power analysis and efficiency determination of inverter/converter and charger
- 2 x TRION-2402-V-8
  - 3 x HV 3-phase charger
  - 1 x HV 1-phase charger
  - 1 x HV input solar inverter
- 4 x SE-CUR-CLAMP-500-DC, high precision AC/DC current clamp up to 500 A_{RMS}
  - 3 x 3-phase charger
  - 1 x solar inverter
- 1 x SE-CUR-CLAMP-200-DC, high precision AC/DC current clamp up to 200 A_{RMS}
  - 1 x 1-phase charger
- 1 x DW2-CLAMP-DC-POWER-8, optional external power supply for 8 transducers/probes
- 1 x OXYGEN-OPT-POWER-ADV, option for harmonic, flicker analysis

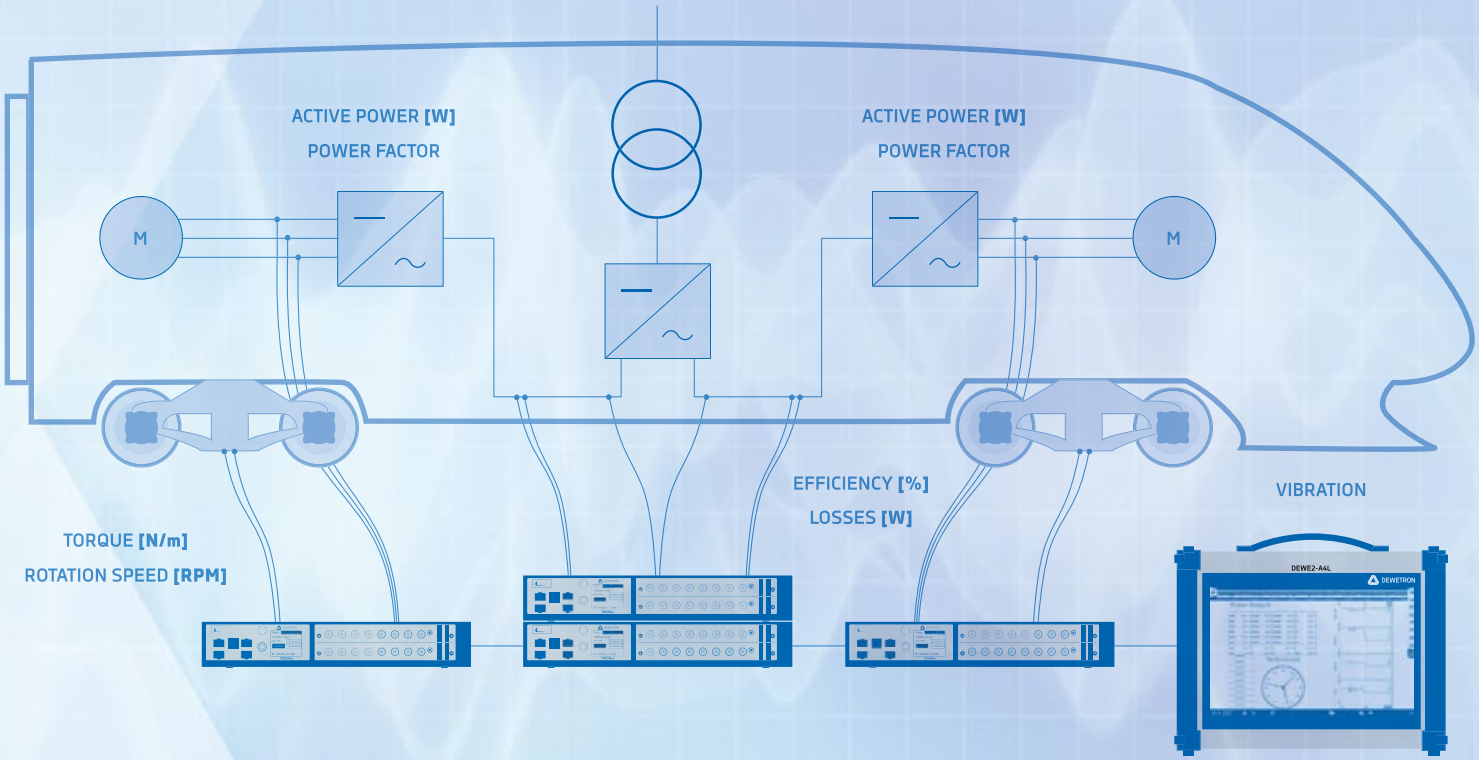
DEWE2-A13

RESULTS

- Synchronized measurement and calculation of three-phase power parameters and DC power
- Online calculation of power quality parameters
- Capture peak electric loads
- Synchronous CAN data during charging process

MEASURED AND CALCULATED VALUES

- Voltages, currents of the grid, charger and battery
- Power quality parameters such as THD, flicker and symmetrical components
- Active, reactive, apparent power
- Harmonics and interharmonics
- Charging time and efficiency of charger
- CAN data of the e-vehicle



ELECTRICAL VEHICLES FOR TRANSPORTATION

The increasing volume of traffic, especially in the city and the need to reduce CO2 emission is today the primary reason to promote public transportation. Electrical buses, subways and trains contribute to less city traffic, reduce emissions and drive with renewable energy independent of fossil fuels.

YOUR BENEFITS

- Synchronized measurement of several traction motors
- Simultaneous analysis of multi-power systems (AC and DC motors/converters)
- Efficiency analysis of motors and converters
- Simultaneous acquisition of structural and mechanical parameters
- Synchronized video recording
- Position tracking and speed measurement
- Ride and comfort testing
- Analysis of power quality on the grid-side

DEWETRON offers the right solution for online power, efficiency calculation and for analyzing mechanical parameters.

POWER ANALYZER

DEWETRON's distributed and synchronized solutions makes it easy to test electric trains and buses in real driving applications and on a test bench. Even for testing electrical trains or electrical buses with several traction motors DEWETRON offers the right solution for online power, efficiency calculation and for analyzing mechanical parameters like torque, rotation speed, vibration or environmental parameters such as temperature even for wide spread measurement points. High sample rates, broadband filters, high performance power calculation and additional inputs for CAN and counter turn the DEWETRON solution to the right tool for testing electrical vehicles.

TYPICAL DEWETRON SOLUTION FOR 4 TRACTION MOTORS

> 9 x TRIONet
> 4 x TRION-2402-V
> 4 x TRION-1603-LV
> 1 x TRION-CAN
> 1 x TRION-VGPS
> 1 x TRION-ACC
> 16 x Power supply for clamps and transducers, ±15 V and 9 V
> 4 x PA-LF-310-S-BUNDLE
> 12 x PA-LF-1010-S-BUNDLE, hall transducers up to 1000 A_{RMS}
> Different interfaces and export formats
> Measurement software OXYGEN with power option

TRIONet in synchronization

MEASURED AND CALCULATED VALUES

Voltages and currents of several AC power groups and single-phase DC system, P, Q, S, PF, efficiency, losses, fundamentals, frequency, Power Quality parameters of the grid (even for 16.7 Hz and 25 h Hz), speed, torque, rotation speed, video, vibration of traction system,...

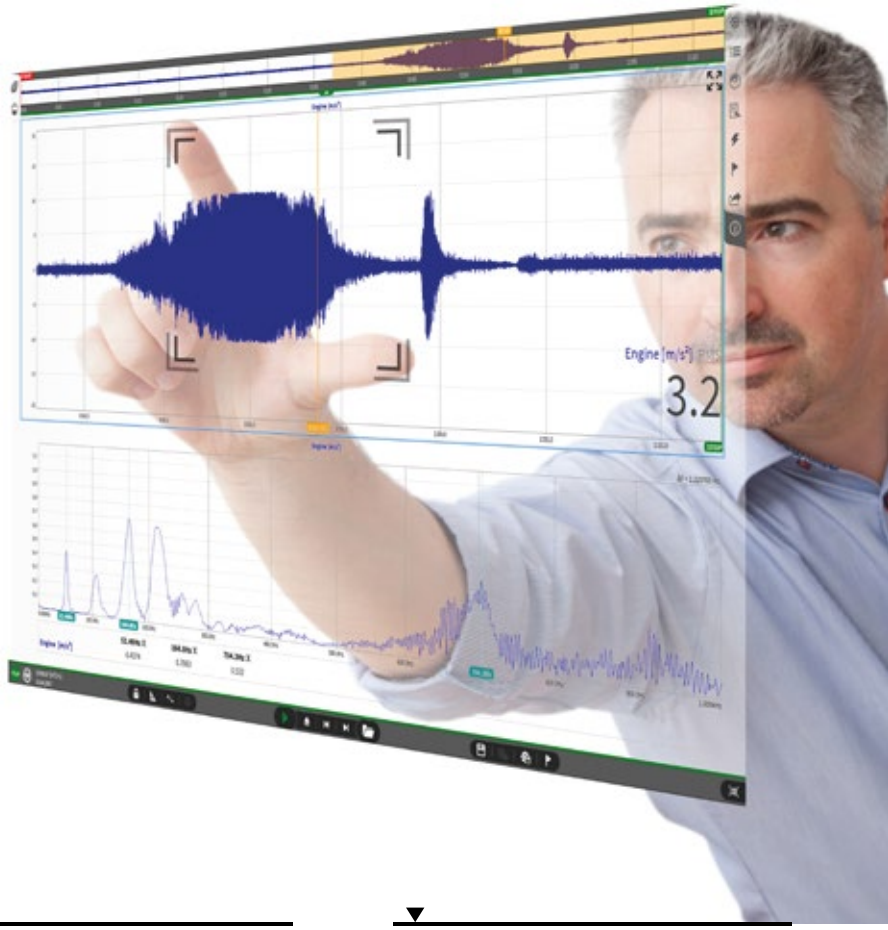
RESULTS

> Simultaneous analysis of several traction motors, transformers and batteries
> Efficiency calculation of AC/AC and DC/AC converters
> Synchronized measurement of mechanical and environmental parameters
> Power Quality parameters of train grids, even for special frequencies
> High accurate power analysis with different fundamental frequencies
> Online calculation of efficiency and losses

SOFTWARE

OXYGEN

Our state-of-the-art software, OXYGEN, ensures synchronous data acquisition from different data sources, where all measurement data is displayed live while being stored time-synchronously.



KEY FEATURES

> Synchronous acquisition of any sensor data (video, analog, encoder, bus, ...)
> Highest performance, gap-free acquisitions (up to 305 MB/s = 160 MS/s)
> DejaView – Look back in time while still recording
> World class user experience – pioneering multi-touch gesture based operation in measurement technology
> Utmost robustness in our data acquisition core as a result of fully decoupled visualization and user-interaction modules
> Totally customizable instrument screens, even during recording

EASY TO USE

Because it is so easy to use, you can concentrate on your application. The basic version provides all parameters for successful analysis of electrical engines and power converters.

MODULAR WITH GUARANTEE FOR THE FUTURE

OXYGEN is the modular software of your DEWETRON measurement instruments with a guarantee for the future - we continuously advance its development for perpetually new devices, ever-new features and use cases!

LONG-TERM MEASUREMENTS

With the innovative DejaView feature, you can analyze the recorded data during the measurement – without gaps from the first to the last second!
In addition, OXYGEN not only offers an extremely intuitive user interface, similar to the most basic smartphone apps, but also the completely new and unique DejaView feature: the possibility to view recorded data while continuing the recording process.

MULTITOUCH OR DRAG & DROP

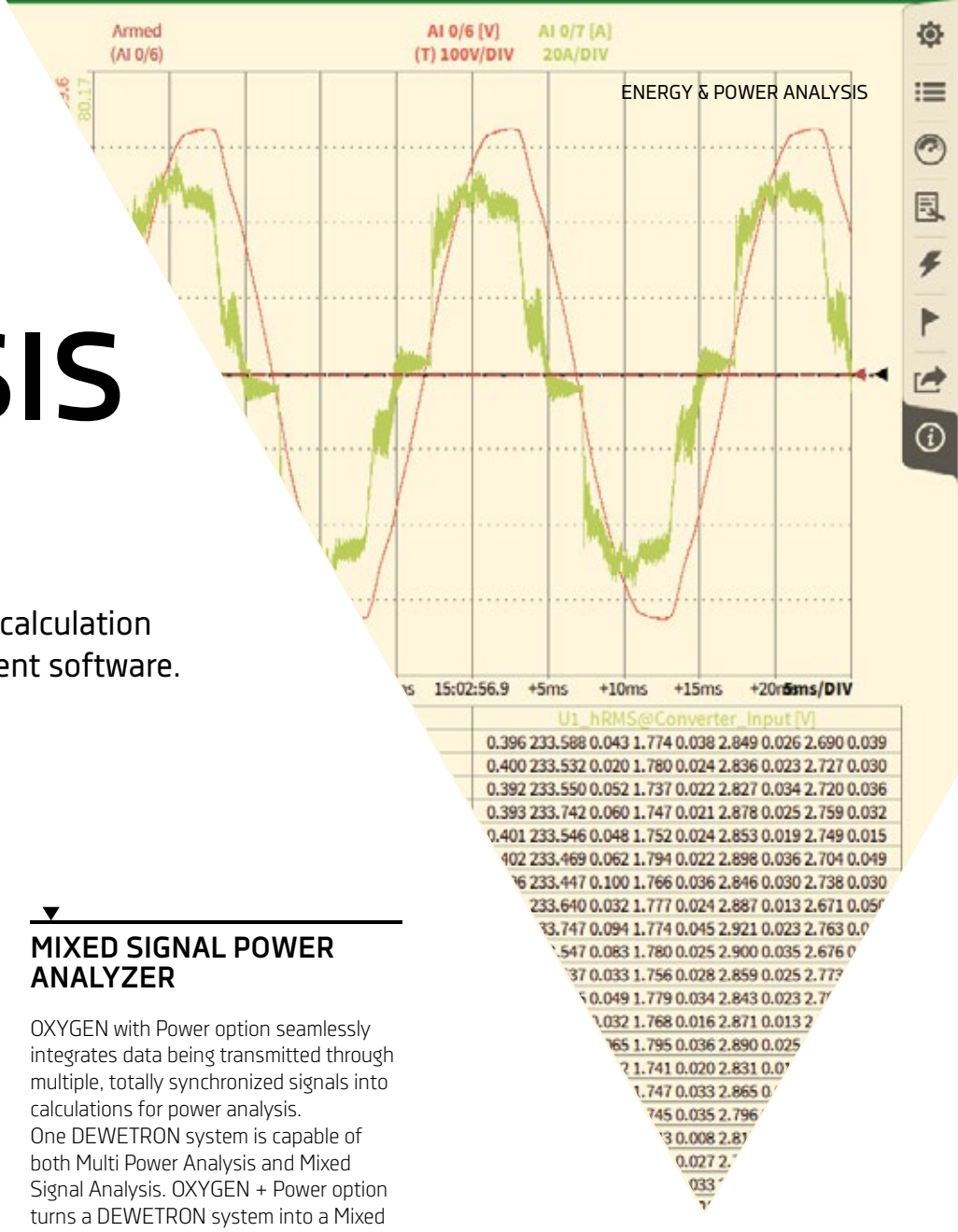
Our software OXYGEN exceeds all concepts of user-friendliness and sets new standards of usability. Our technology provides a conventional multi-touch functionality and supports gestures such as “pinch to zoom” or “flick”, zooming in DejaView as well as drag & drop by means of mouse control for the quickest possible navigation of volumes of data.

LIVE VIEW

OXYGEN software guarantees synchronous data processing from a multitude of different sources and all data are displayed live in the process, while the synchronous recording process is still running. OXYGEN is the perfect tool to manage large volumes of data.
With OXYGEN, it is as easy as ever before to display and analyze large volumes of data ... live!

POWER ANALYSIS

WITH OXYGEN



The Power option is the power calculation feature of OXYGEN measurement software.

KEY FEATURES

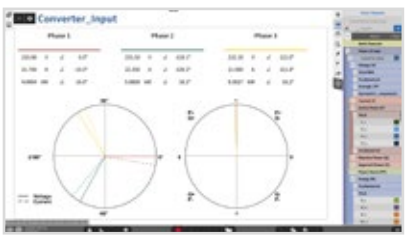
> Simply choose a schematic and drag'n'drop the desired voltage and current inputs channels
> Several power groups with different frequencies and variable sync sources
> 1-9 phases for each power group
> Direct preview of the measured values in the schematic
> Dedicated power instrument with overview table, vector scope and harmonics
> Total and fundamental values of voltage, current and power
> Fundamental frequency support from 0.2 Hz to 1/10 acquisition rate or DC
> Gapless calculation for reliable results
> Update rate down to 1 ms

MIXED SIGNAL POWER ANALYZER

OXYGEN with Power option seamlessly integrates data being transmitted through multiple, totally synchronized signals into calculations for power analysis.
One DEWETRON system is capable of both Multi Power Analysis and Mixed Signal Analysis. OXYGEN + Power option turns a DEWETRON system into a Mixed Signal Power Analyzer capable of analyzing system behavior, static and dynamic efficiency and losses on electric drives, engines, power converters and power electronics.

ADVANTAGES OF OXYGEN

> High dynamic and accuracy
> Fundamentals up to 200 kHz
> "Real" periodic values
> Variable sync sources
> High accuracy, wide range frequency calculation (DC - 1/10 acquisition rate)



APPLICATIONS FOR MULTI SIGNAL POWER ANALYZER

> Electrical motor, generator, inverter and integrated system testing
> Start-up-test of motors and generators, even with variable frequencies up to 200 kHz
> Temperature test of electrical motors, generators and integrated systems
> Efficiency testing of motor, inverters and integrated systems
> Durability test of electrical motors, generators and integrated systems
> Maintenance and repair of electrical motors, generators and integrated systems

GAPLESS RECORDING

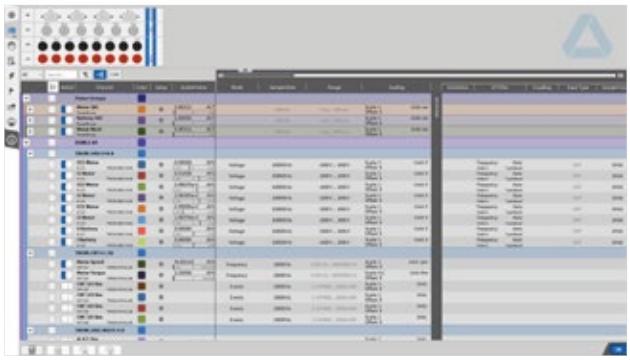
DEWETRON Power Analyzer are the perfect solution for gapless recording of signals like:
> Voltage
> Current
> Environmental temperature
> Bearing temperatures
> Temperature of winding of motors, generators
> Torque
> Rotation speed
> Vibration
> CAN data
> And many more

POWER ANALYSIS

Export data analysis and direct reporting to picture or PDF for presentation and review on many different platforms. The recorder platform is very powerful with its cursors and smart zoom- and pan options. Use many different recorder screens simultaneously with an independent time base to compare the signal at different times.

HARMONIC CHART

Harmonic analysis at its best! We include all relevant harmonic/interharmonic and higher frequency parts in one chart, you don't have to switch between different screens. The simultaneous display of voltage and current makes it very easy to understand the source of harmonic load.



OXYGEN SETUP AND CONFIGURATION

With DEWETRON hard- and software you get a tailor made package. Its modular composition is never difficult to use, because important settings are together in one view. Create individual power groups, add math channels, change input range, use CAN input, and much more. Experience possibillities you never had before.

POWER INSTRUMENTS

It's a Multi Power Analyzer! You can simply “drag'n drop” power analyzer instruments to the screen and arrange them to your needs. The table tab provides an excellent overview of all important values, like frequency, true RMS, fundamental and total aggregated values. Additionally, the vector scope and harmonic tab complete the view of power analysis.

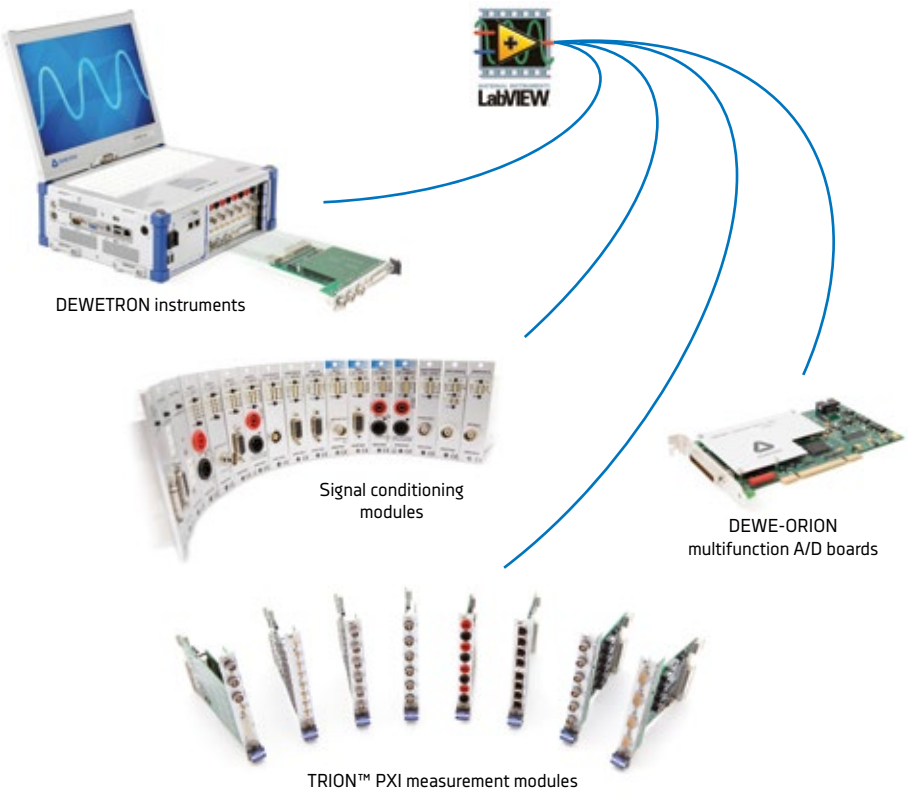
POWER GROUP CONFIGURATION

The setup of a power group is so easy, because it is so smart! You just create it on the fly from the channel list, or “drag'n drop” the channels on the related phase's field. Aquire the parameters you need, aranged in different groups for easy access to individual values.

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, .

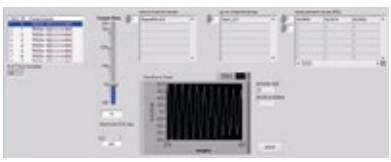


LINUX SUPPORT

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.

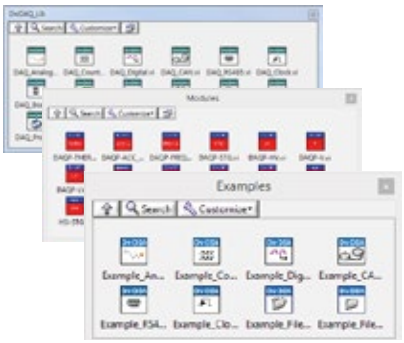
SAMPLE VIRTUAL INSTRUMENTS

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



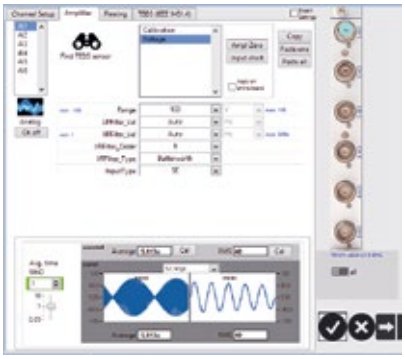
LOW LEVEL VIRTUAL INSTRUMENTS

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.



ADVANCED DATA ANALYSIS

FLEXPRO

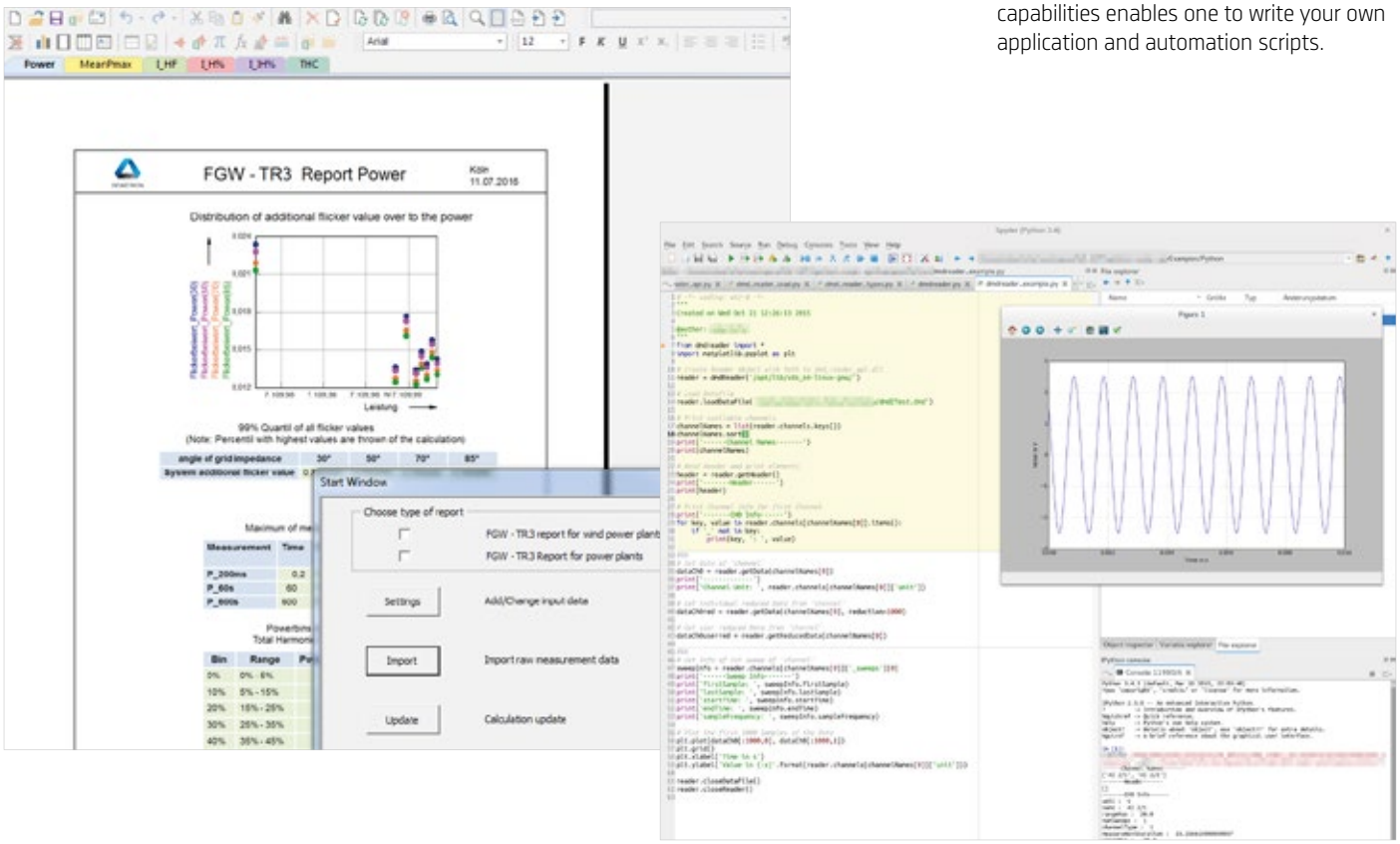
Powerful analysis software with the ease of Excel! The analysis wizard offers visual feedback when changing algorithm parameters and format settings using advanced analyzing tools like spectral analysis, order tracking, acoustics and many more. Beyond that, each analyzing tool is freely definable by using scripting functions. Just like that, analyzing data is simple and flexible.

MATLAB

The reader API-DLL provided by DEWETRON can be simply used in MATLAB scripts to load data from the DEWETRON data files into an array or object. This gives you the power to automate your analysis, even with large volumes of data.
The powerful API is flexible, load all or only specific channels, user defined time span or all the metadata. With the built-in MATLAB functions, you can analyze every aspect of the recorded signal and generate vibrant plots.

PYTHON

The reader API-DLL can also be used within a Python environment, under a Windows or a Linux//Unix system without any additional costs. With an almost infinite number of packages available for each aspect of data analysis, there are no limits to your application. The popular Numpy and Scipy packages makes it very easy, to manage large datasets. With Matplotlib you can develop vivid plots for printing or reporting. The recommended environment for a simple and easy start is ANACONDA from CONTINUUM analytics, which provides all necessary packages and a powerful IDE.
The rich set of standard programming capabilities enables one to write your own application and automation scripts.



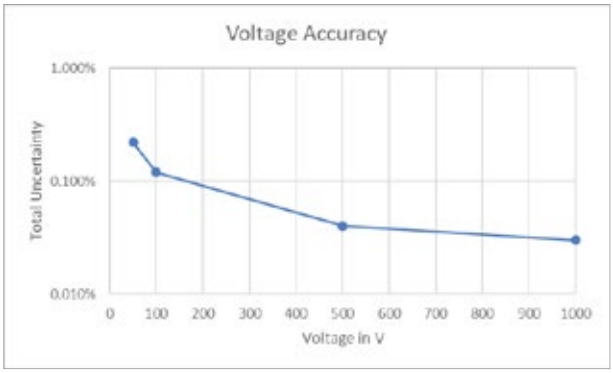
ACCURACY EXAMPLE OF TYPICAL APPLICATIONS

POWER ACCURACY

POWER INPUT SPECIFICATIONS	
Accuracy DC	0.07 % of rdg. + 0.005 % of rng
Accuracy 45 Hz - 1 kHz	0.02 % of rdg. + 0.005 % of rng
Accuracy 1 kHz - 10 kHz	0.1 % of rdg. + 0.01 % of rng
Accuracy 10 kHz - 50 kHz	0.4 % of rdg. + 0.02 % of rng

RANGE 1000 V

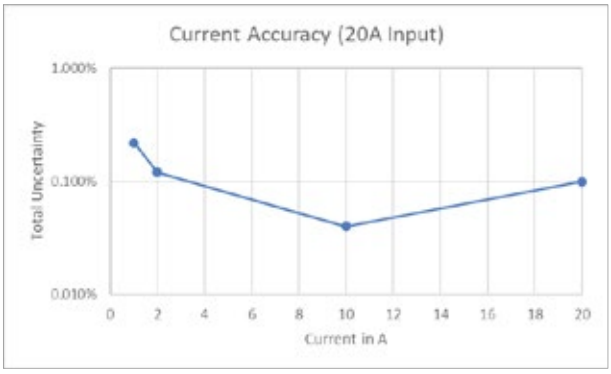
VOLTAGE INPUT SPECIFICATIONS	
Range	1000 V (Crest Factor 2)
Accuracy DC	0.05 % of rdg. + 0.05 % of rng
Accuracy 45 Hz - 1 kHz	0.02 % of rdg. + 0.01 % of rng
Accuracy 1 kHz - 10 kHz	0.1 % of rdg. + 0.05 % of rng
Accuracy 10 kHz - 50 kHz	0.3 % of rdg. + 0.1 % of rng



RANGE 20 A

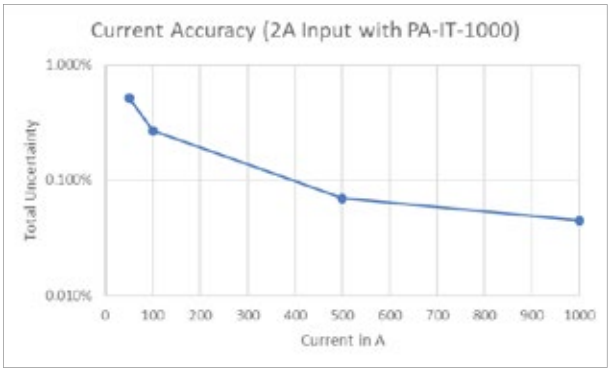
CURRENT INPUT SPECIFICATIONS	
Range	20 A (Crest Factor 2)
Accuracy DC	0.05 % of rdg. + 0.05 % of rng
Accuracy 45 Hz - 1 kHz	0.02 % of rdg. + 0.01 % of rng
Accuracy 1 kHz - 10 kHz	0.1 % of rdg. + 0.05 % of rng
Accuracy 10 kHz - 50 kHz	0.3 % of rdg. + 0.1 % of rng

*0.03 % of rdg. + 0.03 % of rng. if current exceeds 10 A_{RMS}



RANGE 1000 A

CURRENT INPUT SPECIFICATIONS	
Range	2 A (Crest Factor 2) + PA-IT-1000
Accuracy DC	0.05 % of rdg. + 0.055 % of rng
Accuracy 45 Hz - 1 kHz	0.02 % of rdg. + 0.015 % of rng
Accuracy 1 kHz - 10 kHz	0.1 % of rdg. + 0.06 % of rng
Accuracy 10 kHz - 50 kHz	0.3 % of rdg. + 0.15 % of rng



HARDWARE

SENSORS

TECHNOLOGY / TYPE	NAME	DYNAMIC RANGE GROUP	MEASUREMENT RANGE [A]	NOMINAL RMS [A]	BANDWIDTH [kHZ]	SUPPLY VOLTAGE [V]	SUPPLY OPTION CLAMP DC POWER	READING ERROR % (TYPICALLY)	RANGE ERROR % (TYPICALLY)	OUTPUT SIGNAL	OUTPUT CONNECTOR	MAX. PHASE SHIFT AT 50HZ (NOMINAL CURRENT) [DEG.]	COMPATIBLE WITH SHUNT ADAPTER PA-XX-BR1
THROUGH HOLE (AC/DC)	PA-IT-65-S	A	85	60	800	±15	✓	0.002	0.025	Current	D-SUB-9	0.01	✓
	PA-IT-205-S	A	283	200	1000	±15	✓	0.001	0.008	Current	D-SUB-9	0.01	✓
	PA-IT-405-S	A	566	400	300	±15	✓	0.001	0.004	Current	D-SUB-9	0.01	✓
	PA-IT-700-S	A	1050	700	100	±15	✓	0.001	0.005	Current	D-SUB-9	0.01	✓
	PA-IT-700-SB	A	700	495	100	±15	✓	0.008	0.006	Voltage	D-SUB-9	0.01	
	PA-IT-1000-S	A	1500	1000	500	±15	✓	0.001	0.005	Current	D-SUB-9	0.015	✓
	PA-CTS-2000I	A	2828	2000	300	100 - 240		0.001	0.005	Current	Proprietary	0.02	
	PA-CTS-5000I	A	7071	5000	80	100 - 240		0.001	0.005	Current	Proprietary	0.02	
	PA-CTS-2000U	A	2828	2000	300	100 - 240		0.001	0.005	Voltage	Proprietary	0.02	
	PA-CTS-5000U	A	7071	5000	80	100 - 240		0.001	0.005	Voltage	Proprietary	0.02	
	PA-LF-310-S	A	500	300	100	±15	✓	0.15	0.05	Current	Molex 4-pin	0.2	✓
	PA-LF-1010-S	A	1800	1000	200	±15	✓	0.15	0.05	Current	Molex 4-pin	0.2	✓
CLAMP (AC/DC)	SE-CUR-CLAMP-150-DC	B	300	150	100	±15	✓	0.3	0.05	Voltage	D-SUB-9	0.5	
	SE-CUR-CLAMP-200-DC	A	570	200	500	±15	✓	0.3	0.01	Voltage	D-SUB-9	0.1	
	SE-CUR-CLAMP-500-DC	A	720	500	200	±15	✓	0.3	0.01	Voltage	D-SUB-9	0.1	
	SE-CUR-CLAMP-1000-DC-S	A	1700	1000	20	±15	✓	0.3	0.01	Voltage	D-SUB-9	0.1	
	SE-CUR-CLAMP-1800-DC	B	1800	1000	20	+9		0.8	0.1	Voltage	D-SUB-9	0.7	
	SE-CUR-CLAMP-1000-DC	C	1400	1000	10	+9		2.5	0.5	Voltage	BP	1.5	
OTHER (AC/DC)	SE-CUR-HALL-06	B	85*	20	300	±9		0.4	0.05	Voltage	D-SUB-9	0.2	
	SE-CUR-SHUNT-05	A	15**	5	300	-		0.1	-	Voltage	BP	<0.1	
	SE-CUR-SHUNT-06	A	60**	20	200	-		0.1	-	Voltage	BP	<0.1	
	SE-CUR-SHUNT-07	A	15**	7	500	-		0.1	-	Voltage	BP	<0.1	
	PA-xx-BR1	A	1	1	300	-		0.05	-	Voltage	D-SUB-9	<0.1	
COIL / CLAMP (AC)	PQA-CLAMP-5	B	10	5	10	-		0.4	0.1	Voltage	6+E/D-SUB-9	0.5	
	PQA-CLAMP-10	C	15	10	10	-		0.9	0.1	Voltage	6+E/D-SUB-9	3	
	PQA-CLAMP-20	C	300	200	10	-		0.9	0.1	Voltage	6+E/D-SUB-9	2.5	
	PQA-CLAMP-1000	B	1500	1000	5	-		0.3	0.01	Current	6+E	0.7	
	SE-CUR-LFR-4200	A	6000	4200	1000	+9V(+15V)	✓	0.25	0.05	Voltage	BNC/BP	0.25	
	SE-CUR-LFR-42K	A	60000	42000	1000	+9V(+15V)	✓	0.25	0.05	Voltage	BNC/BP	0.18	
	SE-CUR-A110-3000	A	5000	3000	20	+5V(+9V)	✓	0.9	0.1	Voltage	BP	1	
	SE-CUR-A110-30K	A	50000	10000	20	+5V(+9V)	✓	0.9	0.1	Voltage	BP	1	
	PQA-FLEX-300	A	15000	10000	300	-		0.2	0.1	Voltage	6+E/D-SUB-9	1	

*max. 1 s
**max. 100 ms
The use of all current transducers is recommended in at least 1 % of nominal range for dynamic range group A, 5 % for group B and 10 % for group C
Customized connectors available on request

SIGNAL CONDITIONING

DEWETRON high precision TRION™ signal conditioning modules are available for any analog sensor, from any vendor.

Simultaneous sampling **TRION™ MODULES** are the heart and soul of the DEWE2 series of data acquisition systems. TRION™ modules combine the power of simultaneous sampling 24 bit ADC technology with advanced DEWETRON Signal Conditioning - in one convenient module that plugs right into your DEWE2 platform.

CPAD3 SERIES are multichannel modules and combine analog signal conditioning and A/D converter in an extreme rugged box. Each of the 8 measurement channels has an own A/D converter with 100 Hz sampling rate.

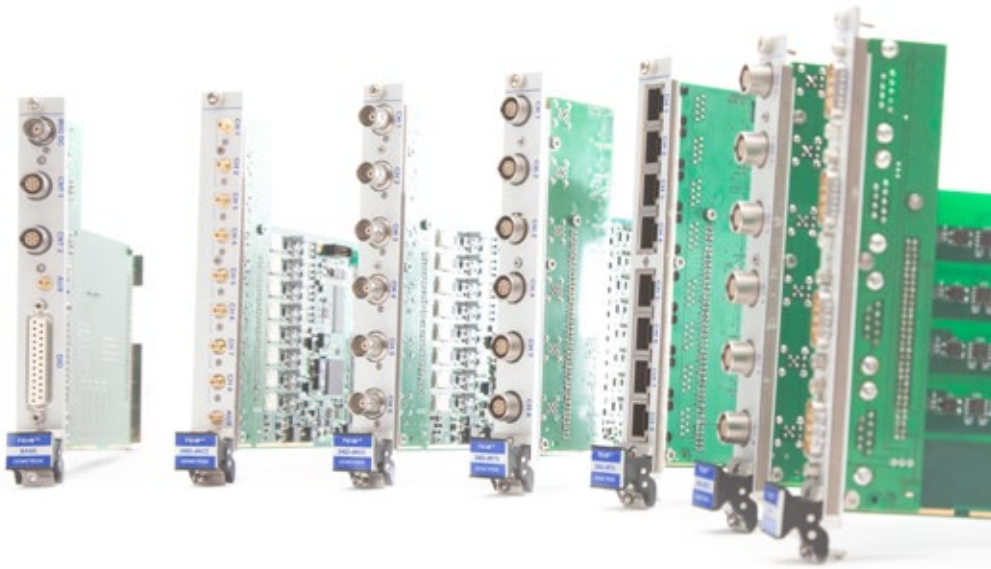
CPAD2 MODULES provide the measurement data via high-speed CAN, the same as CPAD3 series. But in comparison to CPAD3, they have a 24 bit A/D converter with 12 Hz sampling rate and offer 350 V galvanic isolation.

EPAD2 modules provide the data via RS-485 interface. Also 24 bit A/D conversion, 12 Hz sampling rate and 350 V galvanic isolation.

- Voltage
- Voltage (1000 V)
- Current
- Current (shunt required)
- Current (shunt inside)
- Current output
- Charge
- IEPE
- Bridge
- Potentiometer
- RTD
- Thermocouple
- Capacity
- Frequency
- Inductive sensors
- Absolute time
- GPS
- SuperCounter inputs
- Modular Smart Interfaces
- Digital input
- CAN-bus
- Flexray
- ARINC-429
- MIL-STD-1553
- Digital in- & output
- Analog output

TRION™ MODULES

> Simultaneous sampling for DEWE2 series
> Separate ADC on each channel
> User exchangeable modules



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 sockets
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

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

DEDICATED MODULES	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 MODULE

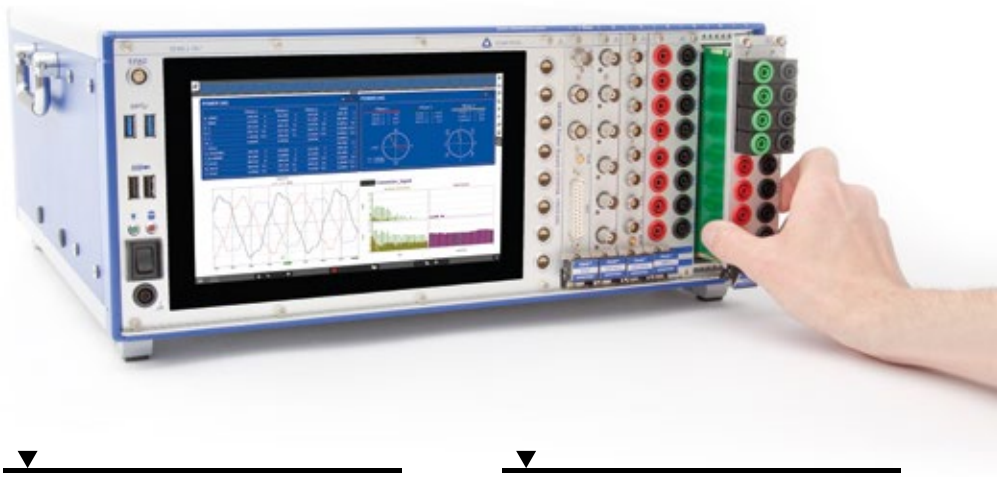
Turn any DEWETRON data acquisition system into a Power Analyzer with the TRION-1820-POWER-4 module.

TRION-1820-POWER-4

> Modular module design (customizable current inputs)
> 18 bit resolution
> Up to 2 MS/s sampling rate

DEWE2-PA7

THE WAY OF TOMORROW'S POWER ANALYSIS



MULTI POWER ANALYZER

A DEWETRON DEWE2-PA7 is the solution for analysis of several motors, converters or complete drive trains simultaneously. Up to 12 power channels and the capability for calculation of power parameters even for polyphase motors (up to 9 phases) turns the DEWE2-PA7 into a multi power analyzer.

MIXED SIGNAL RECORDER

Waveform data, mixed signal and power analysis? A DEWE2-PA7 combines both. Reliable gapless recording of any analog or digital signal and high performance power calculation of several power groups simultaneously. Up to 2 MS/s/ch and high dynamic range guarantees data integrity.

TESTBED INTEGRATION

Smart interface technology makes it easy to integrate a DEWE2-PA7 into automation systems and test bed environments while it is guaranteeing reliable data transmission, easy to use remote control and remote configuration through TCP/IP based Protocols in compliance with standardized protocols (e.g. ASAM) and file formats.

CPAD3 MODULES

> 100 Hz sampling rate
> High isolation 1500 V
> ADC per channel

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 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}

EPAD2/CPAD2 MODULES

> Extremely rugged and flexible mounting
> 24 bit A/D converter per channel, 12 Hz sampling rate
> Channel to channel/system isolation

MODULE OVERVIEW	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 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)	-

CONFIGURATION EXAMPLES

DEWE2-PA7

1. Display
2. Slots for TRION™ modules
3. Power supply transducers
4. EPAD connector
5. USB 3.0

DEWE2-PA7	
Dynamic analog input channels	7 Slots for TRION™ for up to 12 Power Channels
TRION-1820-POWER-4	
Voltage Input	1000 V (±2000 V_{PEAK})
Direct current input	up to 20 A (±40 A_{PEAK})
Transducer, clamp input	5 V (±10 V_{PEAK})
Bandwidth	> 5 MHz
Typical accuracy	45 to 1 kHz ±0.02 % of reading ±0.01 of range
Typical power accuracy	45 to 1 kHz ±0.02 % of reading ±0.02 % of range (with direct current input)
Dynamic channel expansion	Ethernet, TRIONet
Quasi-static channel expansion	EPAD2 interface connector, CPAD2/3 via TRION-CAN
A/D conversion	
Sampling method	Simultaneous
Sampling rate	2 MS/s per channel
Resolution	18 bit
Digital I/O and counters	
Digital I/O, TTL level	8 via TRION-BASE
Counters or digital inputs, TTL level	2 advanced counter via TRION-BASE
Synchronization	IRIG code B, DC I/O via TRION-BASE
Options	CAN, CAN-OUT, SCPI, XCP, Video, etc.
Optional sensors	Zero flux transducer, hall/flux compensated clamps, flexcoils, shunts
Sensor supply	8 internal power supply for DEWETRON sensors and probes, 9 V / ±15 V
Main system	
Hard disk	1 TB HDD dedicated for data storage, 120 GB SSD for operating system and application software
Data throughput	Typ. 80 MB/s
Power supply	(max.) 95 to 264 V_{AC}
Display	9" multi-touch screen
Processor	Intel® Core™ i7
RAM	16 GB
Ethernet	2x 10/100/1000 BaseT
USB	8
LAN	2
Operating system	Microsoft® WINDOWS® 10
Dimensions (W x D x H)	441 x 427 x 177mm (17.4 x 16.8 x 7 in.)
Weight w/o TRION™ modules	Typ. 13 kg (28.6 lb.)
Environmental specifications	
Operating temperature	0 to +50 °C, down to -20 °C with prewarmed unit
Storage temperature	-20 to +70 °C
Humidity	10 to 80 % non cond., 5 to 95 % rel. humidity
Max. altitude	up to 2000 m (6560 ft)
Sine vibration (EN 60068-2-6)	Acceleration 20 m/s², freq. 10 Hz - 150 Hz, sweep 1 oct/min, 20 cycles
Shock (EN 60028-2-27)	Acceleration 15 g, pulse length 11ms, pulse form half sine, 3 pumps/direction, 6 directions
Random vibration (EN 60721-3-2)	Class 2M3 (spectral acceleration density 3 m²/s³, frequency range 10 Hz - 200 Hz, duration 30 min/direction)
Applications	
Test bench	yes
Hydro electrical power plants	yes
4-phase systems solar inverters	yes
Motor efficiency	yes
Power converter	yes
E-Mobility and charging infrastructure	yes

DEWE2-A4L

1. Display
2. Slots for TRION™ modules
3. LAN, USB, DVI interface

	DEWE2-A4L	
Dynamic analog input channels	4 Slots for TRION™ for up to 8 power channels	
	TRION-1820-POWER-4	**TRION-2402-V-8**
Voltage input	1000 V (±2000 V_{PEAK})	up to 500 V (±1000 V_{PEAK})
Direct current input	up to 20 A (±40 A_{PEAK})	up to 7 A (±15 A_{PEAK})
Transducer, clamp input	5 V (±10 V_{PEAK})	from ±300 mV
Bandwidth	> 5 MHz	77 kHz
Typical accuracy	45 to 1 kHz ±0.02 % of reading ±0.01 of range	DC to 1 kHz ±0.02 % of reading ±0.02 of Range ±3 mV
Typical power accuracy	45 to 1 kHz ±0.02 % of reading ±0.02 % of range (TRION-1820-POWER-4 with direct current input)	
Dynamic channel expansion	Ehternet, TRIONet	
Quasi-static channel expansion	EPAD2 interface connector, CPAD2/3 via TRION-CAN	
A/D conversion		
Sampling method	Simultaneous	
Sampling rate	2 MS/s per channel	204,8 kS/s per channel
Resolution	18 bit	24 bit
Digital I/O and counters		
Digital I/O, TTL level	8 via TRION-BASE	
Counters or digital inputs, TTL level	2 advanced counter via TRION-BASE	
Synchronization	IRIG code B, DC I/O via TRION-BASE	
Options	CAN, CAN-OUT, SCPI, XCP, Video, etc.	
Optional sensors	Zero flux transducer, hall/flux compensated clamps, flexcoils, shunts	
Sensor supply	External power supply for DEWETRON sensors and probes, 9 V / ±15 V	
Main system		
Hard disk	1 TB HDD dedicated for data storage (480 GB SSD) 120 GB SSD for operating system and application software, both in a single removable drive bay	
Data throughput	Typ. 80 MB/s	
Power supply	(max.) 95 to 264 V_{AC} ,optional external UPS	
Display	15.4“ multi-touch wide-screen	
Processor	Intel® Core™ i5 or i7	
RAM	8 to 16 GB	
Ethernet	2x 10/100/1000 BaseT	
USB	6	
LAN	2	
Operating system	Microsoft® WINDOWS® 10	
Dimensions (W x D x H)	463 x 129 x 318 mm (18.2 x 5.1 x 12.5 in.)	
Weight incl. TRION™ modules	Typ. 8.5 kg (18.7 lb.)	
Environmental specifications		
Operating temperature	0 to +50 °C, down to -20 °C with prewarmed unit	
Storage temperature	-20 to +70 °C	
Humidity	10 to 80 % non cond., 5 to 95 % rel. humidity	
Max. Altitude	3000 m (10000 ft)	
Sine vibration (EN 60068-2-6)	Acceleration 20 m/s², freq. 10 Hz - 150 Hz, sweep 1 oct/min, 20 cycles	
Shock (EN 60028-2-27)	Acceleration 15 g, duration 11ms, pulse form half sine, 3 pumps/direction, 6 directions	
Random vibration (EN 60721-3-2)	Class 2M3 (spectral acceleration density 3 m²/s³, frequency range 10 Hz-200 Hz, duration 30 min/direction)	
Applications		
Test bench	yes	
Hydro electrical power plants	yes	
4-phase systems solar converters	yes	
Motor efficiency test	yes	
Power converter test	yes	
Electrical vehicle for transportation	yes	
E-Mobility and charging infrastructure	yes	

DEWE2-A4 / DEWE2-M4

1. Display
2. Slots for TRION™ modules
3. Power supply sensors via TRION™ modules
4. Sync input/output
5. LAN, USB, DVI interface

DEWE2-A4 / DEWE2-M4		
Dynamic analog input channels	4 slots for TRION™ series modules for up to 8 power channels	
	TRION-1820-POWER-4	**TRION-2402-V-8**
Voltage input	1000 V (±2000 V_{PEAK})	up to 500 V (±1000 V_{PEAK})
Direct current input	up to 20 A (±40 A_{PEAK})	up to 7 A (±15 A_{PEAK})
Transducer, clamp input	5 V (±10 V_{PEAK})	from ±300 mV
Bandwidth	> 5 MHz	77 kHz
Typical accuracy	45 to 1 kHz ±0.02 % of reading ±0.01 of range	DC to 1 kHz ±0.02 % of reading ±0.02 of range ±3 mV
Typical power accuracy	45 to 1 kHz ±0.02 % of reading ±0.02 % of range (TRION-1820-POWER-4 with direct current input)	
Dynamic channel expansion	Ehternet, TRIONet	
Quasi-static channel expansion	EPAD2 interface connector, CPAD2/3 via TRION-CAN	
A/D conversion		
Sampling method	Simultaneous	
Sampling rate	2 MS/s per channel	204,8 kS/s per channel
Resolution	18 bit	24 bit
Digital I/O and counters		
Digital I/O, TTL level	8 via TRION-BASE	
Counters or digital inputs, TTL level	2 advanced counter via TRION-BASE	
Synchronization	IRIG code B, DC I/O via TRION-BASE	
Options	CAN, CAN-OUT, SCPI, XCP, Video, etc.	
Optional sensors	Zero flux transducer, hall/flux compensated clamps, flexcoils, shunts	
Sensor supply	External power supply for DEWETRON sensors and probes, 9 V / ±15 V	
Main system	**DEWE2-A4**	**DEWE2-M4**
Hard disk	256 GB SSD (1 TB SSD)	
Data throughput	Typ. 90 MB/s	
Power supply	11 to 32 V_{DC} (external AC power supply included), optional internal buffer battery and external UPS	
Display	13" TFT wide-screen (optional touch display)	NA
Processor	Intel® Core™ i7	
RAM	8 to 16 GB	
Ethernet	2x 10/100/1000 BaseT	
USB	4	
LAN/WLAN	1/with external antenna	
Operating system	Microsoft® WINDOWS® 10	
Dimensions (W x H x D)	317 x 252 x 128 mm (12.5 x 9.9 x 5 in.)	317 x 252 x 108 mm (12.5 x 9.9 x 4.3 in.)
Weight w/o TRION™ modules	Typ. 5.9 kg (13 lb.)	Typ. 3.9 kg (8.6 lb.)
Environmental specifications		
Operating temperature	0 to +50 °C, down to -20 °C with prewarmed unit	
Storage temperature	-20 to +70 °C	
Humidity	10 to 80 % non cond., 5 to 95 % rel. humidity	
Max. altitude	4000 m (13123 ft)	
Sine vibration (EN 60068-2-6)	Acceleration 20 m/s², freq. 10 Hz - 150 Hz, sweep 1 oct/min, 20 cycles	
Shock (EN 60028-2-27)	Acceleration 15 g, duration 11ms, pulse form half sine, 3 pumps/direction, 6 directions	
Random vibration (EN 60721-3-2)	Class 2M3 (spectral acceleration density 3 m²/s³, frequency range 10 Hz-200 Hz, duration 30 min/direction)	
Applications		
Test bench	yes	
Hydro electrical power plants	yes	
4-phase systems solar inverters	yes	
Motor efficiency	yes	
Power converter	yes	
E-Mobility and charging infrastructure	yes	
Electrical vehicle for transportation	yes	

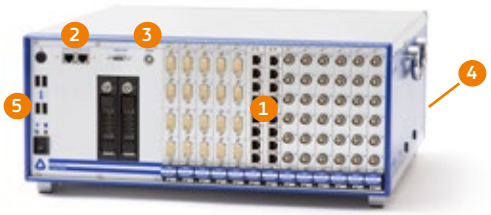
DEWE2-A13

1. Display
2. Slots for TRION™ modules
3. LAN, USB, DVI interface
4. USB

DEWE2-A13		
Dynamic analog input channels	4 Slots for TRION™ Series modules for up to 8 power channels	
	TRION-1820-POWER-4	**TRION-2402-V-8**
Voltage input	1000 V (±2000 V_{PEAK})	up to 500 V(±1000 V_{PEAK})
Direct current input	up to 20 A (±40 A_{PEAK})	up to 7 A (±15 A_{PEAK})
Transducer, clamp input	5 V (±10 V_{PEAK})	from ±300 mV
Bandwidth	> 5 MHz	77 kHz
Typical accuracy	45 to 1 kHz ±0.02 % of reading ±0.01 of range	DC to 1 kHz ±0.02 % of reading ±0.02 of range ±3 mV
Typical power accuracy	45 to 1 kHz ±0.02 % of reading ±0.02 % of range (TRION-1820-POWER-4 with direct current input)	
Dynamic channel expansion	Ehternet, TRIONet	
Quasi-static channel expansion	EPAD2 interface connector, CPAD2/3 via TRION-CAN	
A/D conversion		
Sampling method	Simultaneous	
Sampling rate	2 MS/s per channel	204,8 kS/s per channel
Resolution	18 bit	24 bit
Digital I/O and counters		
Digital I/O, TTL level	8 via TRION-BASE	
Counters or digital inputs, TTL level	2 advanced counter via TRION-BASE	
Synchronization	IRIG code B, DC I/O via TRION-BASE	
Options	CAN, CAN-OUT, SCPI, XCP, Video, etc.	
Optional sensors	Zero flux transducer, hall/flux compensated clamps, flexcoils, shunts	
Sensor supply	External power supply for DEWETRON sensors and probes, 9 V / ±15 V	
Main system		
Hard disk	1 TB HDD dedicated for data storage (4 TB HDD) 120 GB SSD for operating system and application software, both in a single removable drive bay	
Data throughput	Typ. 80 MB/s	
Power supply	(max.) 90 to 264 V_{AC}, optional 18 to 21 VDC isolated DC input (max. 18 to 24 VDC); external AC power supply + 3 batteries	
Display	17“ Full HD	
Processor	Intel® Core™ i7	
RAM	8 to 16 GB	
Ethernet	2x 10/100/1000 BaseT	
USB	7	
LAN	2	
Operating system	Microsoft® WINDOWS® 10	
Dimensions (W x D x H)	450 x 246 x 303 mm (17.7 x 9.7 x 11.9 in.)	
Weight incl. TRION™ modules	Typ. 15 kg (33 lb.)	
Environmental specifications		
Operating temperature	0 to +50 °C, down to -20 °C with prewarmed unit	
Storage temperature	-20 to +70 °C	
Humidity	10 to 80 % non cond., 5 to 95 % rel. humidity	
Max. Altitude	up to 2000 m (6560 ft)	
Sine vibration (EN 60068-2-6)	Acceleration 20 m/s², freq. 10 Hz - 150 Hz, sweep 1 oct/min, 20 cycles	
Shock (EN 60028-2-27)	Acceleration 30 g, duration 11ms, pulse form half sine, 3 pumps/direction, 6 directions	
Random vibration (EN 60721-3-2)	Class 2M2 (spectral acceleration density 1 m²/s³, frequency range 10 Hz-200 Hz, duration 30 min/direction)	
Applications		
Test bench	yes	
Hydro electrical power plants	yes	
4-phase systems solar inverters	yes	
Motor efficiency	yes	
Power converter	yes	
E-Mobility and charging infrastructure	yes	

DEWE2-M13

1. Slots for TRION™ modules
2. Sync
3. EPAD
4. LAN, USB, DVI interface
5. USB



DEWE2-M13		
Dynamic analog input channels	13 Slots for TRION™ series modules for up to 24 power channels	
	TRION-1820-POWER-4	**TRION-2402-V-8**
Voltage input	1000 V (±2000 V_{PEAK})	up to 500 V (±1000 V_{PEAK})
Direct current input	up to 20 A (±40 A_{PEAK})	up to 7 A (±15 A_{PEAK})
Transducer, clamp input	5 V (±10 V_{PEAK})	from ±300 mV
Bandwidth	> 5 MHz	77 kHz
Typical accuracy	45 to 1 kHz ±0.02 % of reading ±0.01 of range	DC to 1 kHz ±0.02 % of reading ±0.02 of range ±3 mV
Typical power accuracy	45 to 1 kHz ±0.02 % of reading ±0.02 % of range (TRION-1820-POWER-4 with direct current input)	
Dynamic channel expansion	Ehternet, TRIONet	
Quasi-static channel expansion	EPAD2 interface connector, CPAD2/3 via TRION-CAN	
A/D conversion		
Sampling method	Simultaneous	
Sampling rate	2 MS/s per channel	204,8 kS/s per channel
Resolution	18 bit	24 bit
Digital I/O and counters		
Digital I/O, TTL level	8 via TRION-BASE	
Counters or digital inputs, TTL level	2 advanced counter via TRION-BASE	
Synchronization	IRIG code B, DC I/O via TRION-BASE	
Options	CAN, CAN-OUT, SCPI, XCP, Video, etc.	
Optional sensors	Zero flux transducer, hall/flux compensated clamps, flexcoils, shunts	
Sensor supply	External power supply for DEWETRON sensors and probes, 9 V / ±15 V	
Main system		
Hard disk	1 TB HDD (otional 4 TB) dedicated for data storage, 120 GB SSD for operating system and application software	
Data throughput	Typ. 80 MB/s	
Power supply	(max.) 95 to 264 V_{AC}	
Display	NA	
Processor	Intel® Core™ i7	
RAM	8 or 16 GB	
Ethernet	2x 10/100/1000 BaseT	
USB	8	
LAN	2	
Operating system	Microsoft® WINDOWS® 10	
Dimensions (W x D x H)	441 x 427 x 177 mm (17.4 x 16.8 x 7 in.)	
Weight w/o TRION™ modules	Typ. 13 kg (28.6 lb.)	
Environmental specifications		
Operating temperature	0 to +50 °C, down to -20 °C with prewarmed unit	
Storage temperature	-20 to +70 °C	
Humidity	10 to 80 % non cond., 5 to 95 % rel. humidity	
Max. altitude	up to 2000 m (6560 ft)	
Sine vibration (EN 60068-2-6)	Acceleration 20 m/s², freq. 10 Hz - 150 Hz, sweep 1 oct/min, 20 cycles	
Shock (EN 60028-2-27)	Acceleration 15 g, duration 11ms, pulse form half sine, 3 pumps/direction, 6 directions	
Random vibration (EN 60721-3-2)	Class 2M2 (spectral acceleration density 1 m²/s³, frequency range 10 Hz-200 Hz, duration 30 min/direction)	
Applications		
Test bench	yes	
Hydro electrical power plants	yes	
4-phase systems solar inverters	yes	
Motor efficiency	yes	
Power converter	yes	
E-Mobility and charging infrastructure	yes	

TRIONet

1. Display for status information
2. Slots for TRION™ modules
3. Sync input/output
4. 2x Gbit Ethernet
5. USB 3.0

	TRIONet	
Slots for TRION™ modules [1]	2	
Quasi-static channel expansion	CPAD via TRION-CAN or TRION-MULTI (no EPAD)	
	TRION-1820-POWER-4	**TRION-2402-V-8**
Voltage input	1000 V (±2000 V_{PEAK})	up to 500 V (±1000 V_{PEAK})
Direct current input	up to 20 A (±40 A_{PEAK})	up to 7 A (±15 A_{PEAK})
Transducer, clamp input	5 V (±10 V_{PEAK})	from ±300 mV
Bandwidth	> 5 MHz	77 kHz
Typical accuracy	45 to 1 kHz ±0.02 % of reading ±0.01 of range	DC to 1 kHz ±0.02 % of reading ±0.02 of range ±3 mV
Typical power accuracy	45 to 1 kHz ±0.02 % of reading ±0.02 % of range (TRION-1820-POWER-4 with direct current input)	
Dynamic channel expansion	Ehternet, TRIONet	
Quasi-static channel expansion	EPAD2 interface connector, CPAD2/3 via TRION-CAN	
A/D conversion		
Sampling method	Simultaneous	
Sampling rate	2 MS/s per channel	204,8 kS/s per channel
Resolution	18 bit	24 bit
Main system [2]		
LAN	2 x 10/100/1000BASE-TX Gigabit Ethernet	
LAN configuration	DHCP or Static IP	
USB	USB 2.0; USB 3.0	
Synchronization	TRION-SYNC-Bus up to 100 m between nodes	
System bandwidth	90 MB/s with one connected TRIONet (up to 50 MB/s with more than one)	
Display	Status display with touch-screen	
Cooling	2 temperature controlled ultra silent fans	
Supported operating systems	Windows 7; Windows 10	
Supported interfaces	USB 3.0; USB 2.0; 10/100/1000BASE-TX Gigabit Ethernet	
Isolated power supply (max)	10 to 32 V_{DC} (9 to 36 V_{DC})	
Power consumption	Without modules 15 W, totally equipped max. 55 W	
External power supply (included)	100 to 240 V ~50 to 60 Hz / 65 W	
Dimensions (W x D x H)	320 x 205 x 55 mm (12.6 x 8 x 2.2 in.)	
Weight	Typ. 1.9 kg (4.2 lb.) without modules	
Environmental specifications		
Operating temperature	-20 °C to +60 °C (with pre-warmed unit)	
Storage temperature	-20 to +70 °C	
Humidity	10 to 90 % non cond., 5 to 95 % rel. humidity	
Max. altitude	3000 m (9840 ft)	
Sine vibration (EN 60068-2-6)	20 m/s²	
Shock (EN 60028-2-27)	30 g	
Random vibration (EN 60721-3-2)	Class 2M3	

1) Unsupported modules: TRION-FLEXRAY; TRION-A429; TRION-M1553; TRION-MA4; TRION-1628-AO-2
2) Depends on the system configuration

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 additional 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

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

ENERGY & POWER ANALYSIS

DEWETRON

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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.