DEWETRON POWER ANALYZER FOR ELECTRICAL MOTORS AND DRIVE SYSTEMS

DEWETRON

- **> New approaches in hardware and software technology**
- **> Modularity and adaptability**
- **> High-performance Power Analyzer meets dynamic demands**
- **> Selection of the right measuring range vs. greatest possible dynamics**
- **> Dynamic and precise high voltage inputs**
- **> Avoiding wiring errors and time-saving configuration**

FURTHER INFORMATION?

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DEWE2-PA7

Today‘s requirements regarding the efficiency and dynamics of electrical motors and electric drive trains require precise, highly dynamic measurement of currents and voltages as well as online efficiency determination and calculation of power parameters. Especially during the development of electrical components, motors, drive trains or complete vehicles, raw data must be stored for further analyses of the power parameters. Cost constraints, limited resources and innovative companies emerging as new competitors in the OEM market increase the pressure on decision-makers and users.

In response to these pressures innovative, time-saving and variable-use measuring technology is demanded. Conventional power meters and traditional user interfaces have become limited in their ability to meet the demand of the everchanging technology.

This white paper describes typical problems, solutions and user advantages in electrical power analysis that are achieved with new approaches in hardware and software technology. Technology that contributes to resolving today‘s challenges in terms of efficiency, precision, cost and time requirements.

1. MODULARITY AND ADAPTABILITY

Electrical motors with 6 or 9 phases are now state of the art and are increasingly used in highly efficient electric drive trains. A holistic analysis of the drive train is no longer possible with a conventional power analyzer. Expensive synchronization, costly extensions, additional costs for software licenses, and calibration are the consequences of continuing to use traditional methods of power analysis. With the DEWE2-PA7, DEWETRON offers a high-performance Power Analyzer that meets the dynamic demands of development engineers and measurement technicians. Up to 12 power channels with precision accuracy, power calculation of up to 9-phase systems, online power calculation of several power groups (DC and AC) as well as the synchronous and complete detection of mechanical parameters and environmental parameters (e.g. speed, torque, temperature) enable the analysis of electric motors, batteries, inverters, entire drive trains or complete vehicles with a single Power Analyzer. The DEWE2-PA7 can replace several systems by perform their tasks with unparalleled modularity and flexibility. A single system reduces the time for training and commissioning, reduces costs for the regular calibration of the measurement technology and software licenses, can save valuable development time and ensures reliable data in a single file format („Single point of Truth“).

Figure 1: DEWE2-PA7, highest modularity, flexibility and channel density

2. SELECTION OF THE RIGHT MEASURING RANGE VS. GREATEST POSSIBLE DYNAMICS

During the development and testing of electric machines, various tests are undertaken to determine robustness, performance and efficiency. In this testing process, drive trains are powered up under various scenarios and evaluated via performance indicators. With conventional power measurement systems, a sufficiently broad measurement range must be chosen, which at lower load leads to a lower accuracy or for individual load points the configuration must be adjusted which in turn increases the time required for the configuration causing the test rig to be blocked for an unnecessarily long period.

With the dynamic, precise high voltage inputs of DEWETRON, only one measuring range, from several volts up to 2000 volts is necessary. This eliminates the need to adjust the measuring range. This also avoids errors and reduces the time required to configure the „right“ measuring range. In addition, the disadvantages of a measuring range changeover (transition range, no continuous measurement data) are eliminated.

You can also find useful information on our YouTube-Channel.

3. AVOIDING WIRING ERRORS AND TIME-SAVING CONFIGURATION

As the complexity of the test or test structure increases, the possibility of potential wiring failures and „misconfigurations“ is also increased, which can lead to unusable data, a repetition of the measurement and thus to uncalculated costs. DEWETRON's Oxygen measurement software with Power Analysis functionality enable an intuitive, logical grouping of the individual electrical systems in so-called power groups, flexible assignment of physical inputs and assignment to various predefined Circuit variants. For fast plausibility, performance parameters are already visualized in the configuration to detect wiring faults before the actual measurement. Thus, faults can be identified early and quickly and resolved in the software configuration without changing the physical voltage and current inputs.

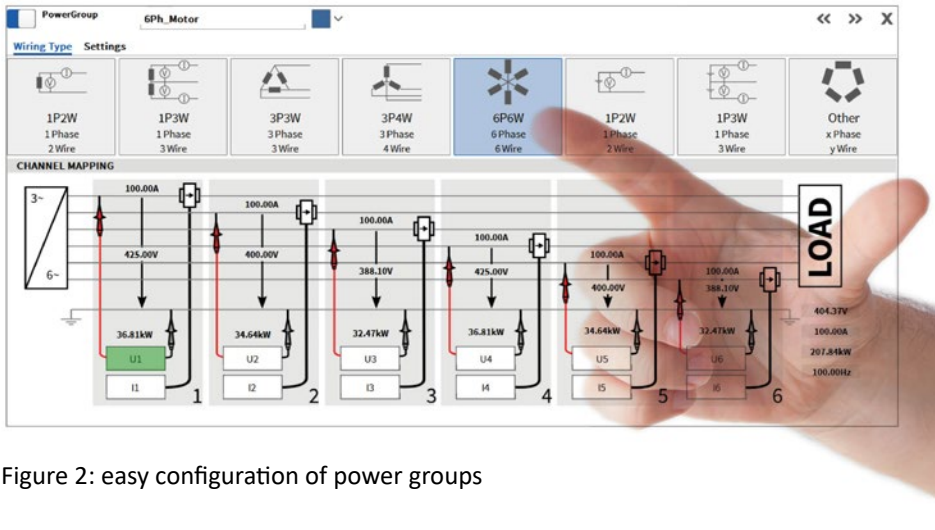

Figure 2: easy configuration of power groups

THE DEWETRON SOLUTION

With the DEWE2-PA7 Power Analyzer and the DEWE2-series measurement systems, DEWETRON offers professionals high-performance, easy-to-use „tools“ with an intuitive operating concept, simple configuration and precision accuracy. No matter whether it is used in the laboratory or fully integrated into test benches or automation systems, the DEWE2-PA7 convinces with its flexibility, simple configuration and setup as well as with smart interfaces and protocols (e.g. XCP oe, SCPI oe, EtherCAT) that ensure the intuitive operation, remote control, or even the automation of test procedures. Whether testing one or several electrical motors, batteries, or inverters, the DEWE2-PA7 is the Power Analyzer for electrical/mechanical efficiency determination of todays and tomorrow's electrical drive trains.

Benefits

> Poly-phase power analysis up to 9-phase in a single Power Analyzer (usually only 3-phase power calculation or over laborious postprocessing)
> Online DC and AC power calculation (up to 1/10 of the sampling rate for the basic oscillation) for several power groups simultaneously (typically max. 900Hz for fundamental)
> Online efficiency and performance determination up to 12 power channels in a power measurement system (4-6 for conventional systems)
> Variable synchronization sources (usually fixed assignment of a synchronization source)
Gapless recording of the raw data (usually only the possibility to create snapshots)
> Stand alone and fully integrated Power Analyzer (various chassis for mobile applications as well)
> State of the art interfaces and protocols (e.g. XCP oe, Asam. mdf, SCPI OE) for easy integration and remote control

Savings

> Replacement of 2-3 stock systems (data logger, power scope, transient recorders, watt), a data source, a data format („Single Point of Truth“)
> Significant reduction of costs for training, calibration, maintenance, software licenses (only one system, one software for the analysis of a drive train)
> Considerable time savings due to simple configuration and operation, release of resources for other important tasks
> Increasing efficiency, reducing losses through accurate, reliable and traceable performance analysis
> Simple time-saving integration into automation systems with modern interfaces and protocols

THE EXPERT

CHRISTOPH WIEDNER

Christoph Wiedner is Chief Product Officer and a power measurement professional at DEWETRON. He studied Electrical Engineering and Information Technology and proceeded to working as an Application Expert in Electrical Power Analysis. Passionate about innovative products and solutions for high performance measurement instruments, the move to sales and product management was a perfect fit. He is responsible for the product line and the management of the product portfolio for measurement solutions for customers in industries such as Energy/ Energy generation and Transformation, Renewables and E-Mobility. He is interested in agile and independent working structures and methods to get jobs done swiftly and efficiently.

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