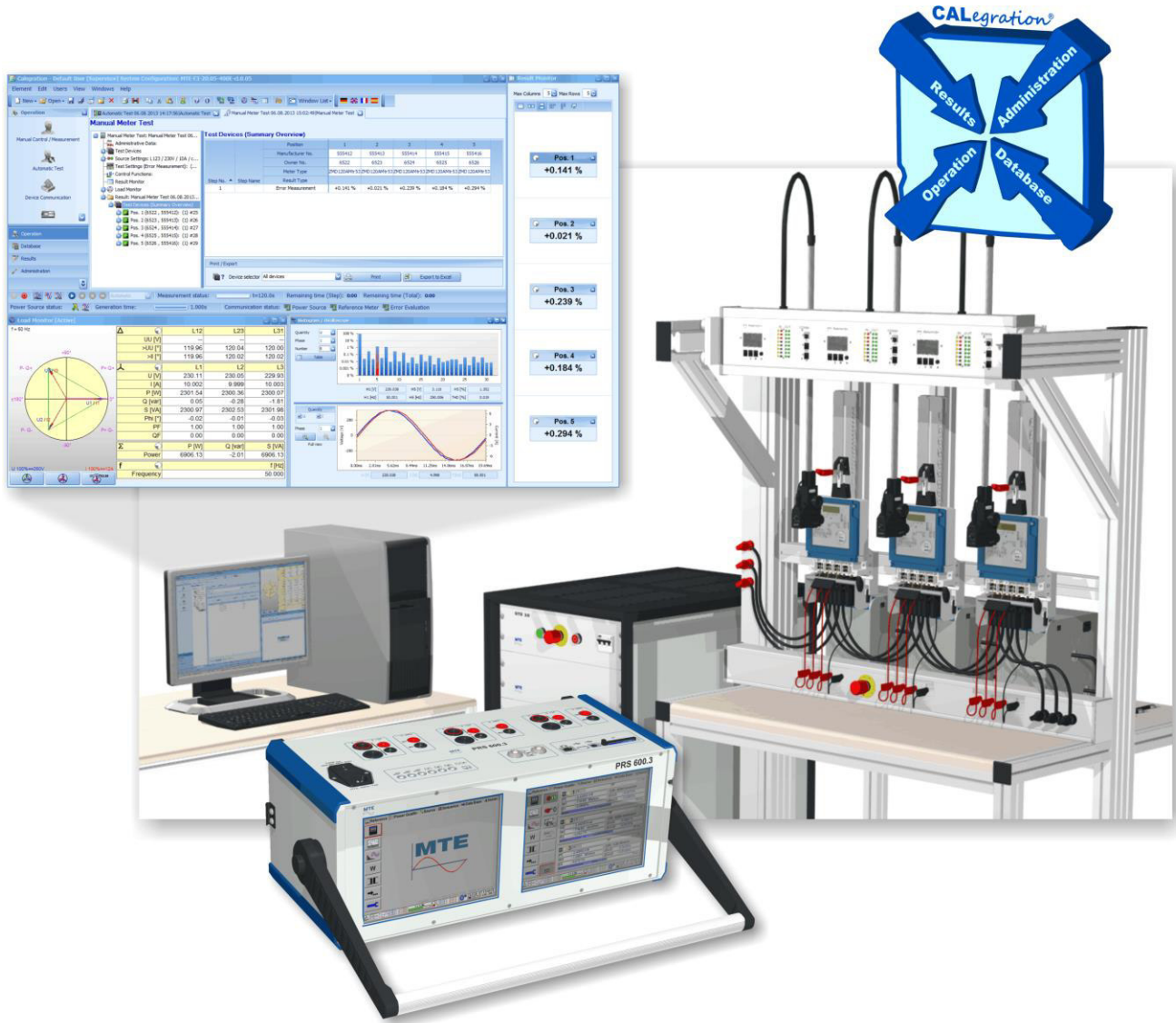# MTE Meter Test Equipment

CALegration®

All-in-one Software Package

CALegration® is an all-in-one software package designed to operate MTE´s portable and stationary test equipment product lines with the same software and on a common database. It bundles the functionalities and advantages in a new and comprehensive software solution.

The philosophy of CALegration® is to inte--grate all basic test elements (administration, database, operation, results) into one single software and to use it with both MTE´s portable and stationary test devices.

While testing with CALegration®, the results are stored in a centralized SQL based database giving the user the flexibility to access the data wherever they are testing: On-site (portable test equipment), in the laboratory or in the meter production plant (stationary equipment).

Moreover, CALegration® provides the user with its database a complete history and overview of all tested meters, giving the opportunity to track the meters respectively their test results over its full life cycle.

Covering all requirements of the modern meter testing environment, CALegration® provides the flexibility to easily incorporate future meter testing requirements as well.

Tests can be carried out for simple or highly complex meters (smart meters) in accordance with customer requirements and national / international test and calibration regulations (e.g. PTB, IEC, BS, ANSI).

Portable applications | Stationary applications
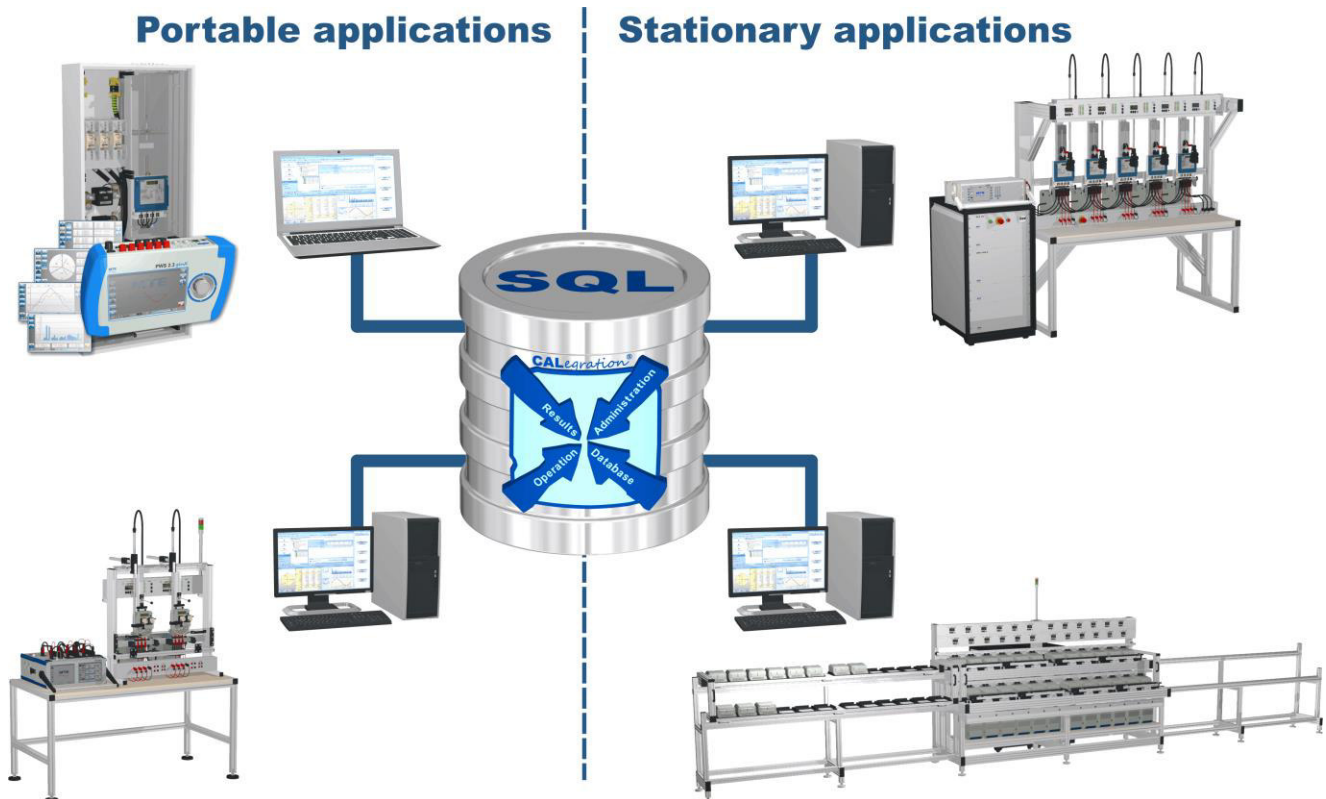
Key advantages of CALegration®

- **Reduced complexity** due to an all-in-one software for the entire MTE product portfolio
- **User-friendly operations** and clearly arranged user interface making the system easy understandable, also to operators with limited computer knowledge
- **SQL based database** with stable access, organized backups, extended database size and server installation support
- **Full database interchange** between portable devices and CALegration® with control of portable functions by external PC
- **Flexible access** to database and **fast storage and interchange** of new testing data packages
- **Fully-automatic test sequences** for meter testing with clearly laid out database structure
- **Manual control module** for testing various individual functions such as meter test, recording of load values, detection of installation errors and many more

- Prepared for **power quality testing** and analysis functions according to IEC 62586, EN 50160 and IEC 61000-4-30 Class A for specific MTE devices
- Transparent evaluation and presentation of results, **statistics and schematic diagrams** of all relevant values in an individual created protocol
- **Modular system** allows the integration of customer specified applications
- Suitable for use with **various hardware combinations**
- **Data export** in standard format (e.g. MS Excel)
- Operator interface available in **several languages** and in different **color profiles**

CALegration® combines the various functional modules required in modern stationary and portable test devices, with a common and consistent user interface.


The modular system allows the control of various hardware units with a common software platform. Functions for laboratory or on-site measurement are provided together with the ability to test highly complex modern meters (smart meters) with integral tariff devices.

For any test equipment, test sequence or meter type, CALegration® is structured along the following basic test elements:
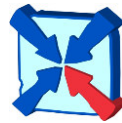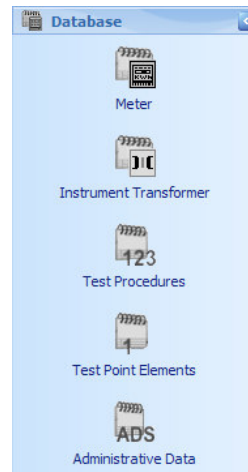
Administration
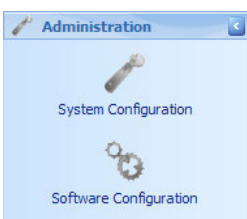
With the **Software Configuration** the user interface can be adapted individually to the specific customer requirements, access levels and rights of a particular user. On the basis of User Profiles the interface of the software can be customized (Software Profile, Color Profile) and task-oriented user rights and access levels (Tester, Supervisor, Service) can be assigned to a user.

In the **System Configuration** the user himself can adapt CALegration® to the actual test system. The test system devices (e.g. reference meter, power source, error evaluation system, handheld) are configured here and can be combined and saved as various system configurations (e.g. portable reference meters up to complex full automatic test systems). A demo system configuration is also included for training purposes.

Database

The **Meter** and **Meter Type** definition function is used to define and administrate any kind of meters. The meter type definition contains the electrical and functional definitions of meters under test (connection values, meter constants registers etc.). The type definitions can further be called up and allocated to the meter stock / inventory of the customer (meter name, manufacturer number etc.). By setting up new **Administrative Data (ADS)** such as e.g. contact details of energy customers, also client information can be added to the meter stock. **Instrument Transformers** can be defined and called out for testing on-site installations. With CALegration® various **Test Procedures** can be defined. A test procedure or test sequence describes the order and content of different **Test Point Elements** in a whole procedure. For each test step the desired Source Settings (current, voltage, phase angle, frequency etc.), Test Settings (e.g. error measurement) and Control Functions (e.g. automatic meter readout) can be specified.

Operation

After defining the settings and basic parameters, the actual testing can be executed.

The **Manual Control / Measurement** module allows a simple quick check of the installation on-site (e.g. Manual Meter Test, Manual CT / PT Burden and Ratio Measurements, Manual Source Control) without the necessity to integrate these test procedures into a full test sequence.

For instance, CALegration® shows the user at CT Burden Measurement a schematic diagram and all relevant settings and results readout from the portable test device.
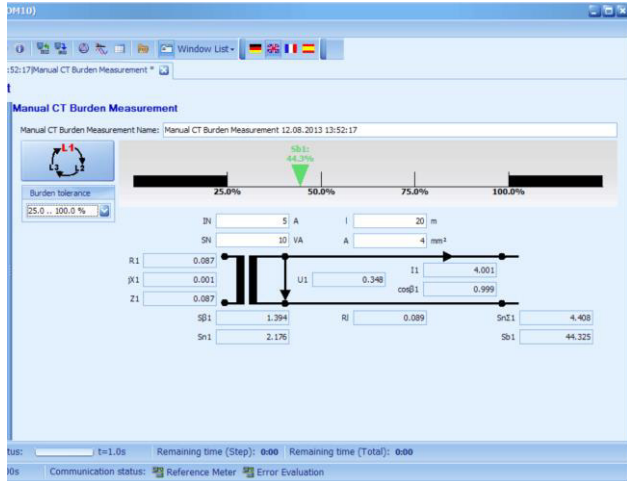
With the **Device Communication** CALegration® allows the user to readout measurement results stored in portable test devices or to preload database elements (Administrative Data, Meters, Instrument Transformers, Test Procedures, Test Point Elements) into the test devices.

By undertaking an **Automatic Test** the user allocates to each active measurement position a meter type and selects a test procedure. Subsequently the user will comfortably be guided through the test. It is possible to display simultaneously the actual test values, wave forms and results in their own windows using large, good visible and configurable fonts.
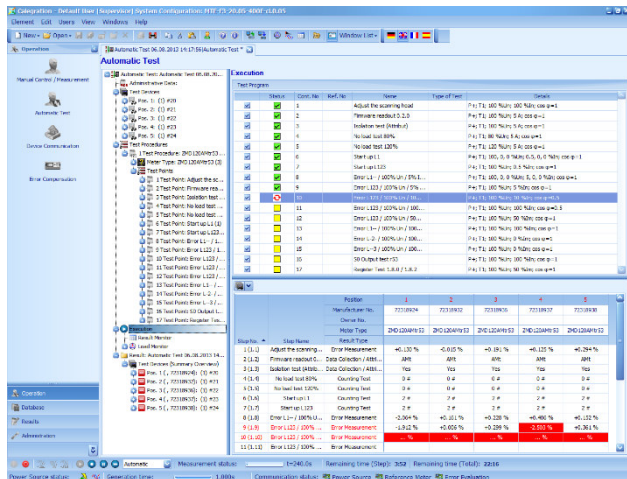

Results

After executing an Automatic Test or a Manual Control / Measurement all saved results are centralized on the SQL database and available for further data processing, such as creating an individual detailed test report or export to MS Excel tables. This is particularly useful for new meter evaluation, long running problem meter analysis and duplicating field conditions.

The CALegration® **Report Designer** enables the user to create and define their own protocol masks (calibration certificates, pass / fail reports, statistical reports, customer reports etc). With its flexibility to add on logos, diagrams and text fields (e.g. for signatures), the Report Designer meets individual and different requirements. Furthermore, on the basis of the SQL database, full result histories and protocols of meter types or particular meters can be generated and stored.
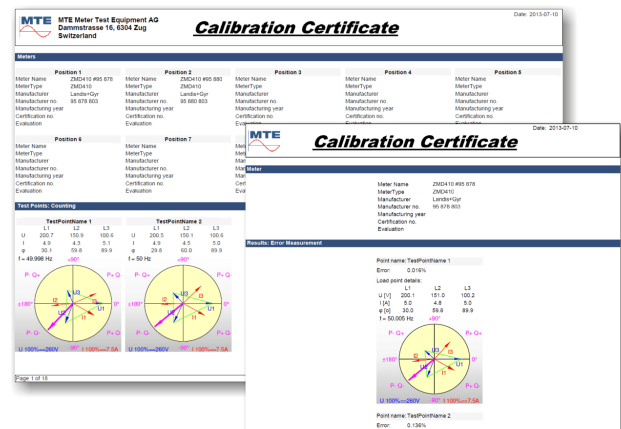
Optional software modules

- Tariff device communication / dlms
- Reference meter testing
- Tariff device testing with pulse transmitter
- Error compensation
- Sample test modules
- Archiving databases
- Generation of ripple control signals
- Generation of special test signals and wave shapes according to IEC 62052-11 and IEC 62053-11/-21/-22
- Generation of harmonics

Customer specified adaptations

MTE provides customer specified modules which can be integrated into the standard software for fully automatic calibration of modern meters (smart meters). MTE also supports the integration of alternative communication protocols for tariff devices.