

# Meter Test Equipment



## Portable Test Equipment

## Portable meter testing

Single- and three-phase portable test devices from MTE are available over the complete range of accuracy classes for use in on-site testing or in laboratories.

They are light in weight and its user friendly operation layouts, design and menu-driven software make the devices easy to operate.

MTE follows the latest technologies and trends while carefully combining and embedding new features with well proved and tested operating principles and requirements in the field or laboratory.

MTE's portable test equipment is your reliable and solid partner for the on-site or lab testing of

different kind of meters and multiple applications:

- Revenue protection by periodic accuracy checks of installed meters and their installations
- Identification of wiring and other system errors
- Reduction of non-technical losses by detection of tampering, energy theft etc.
- Handling of customer's complaints

For such of relevant applications MTE offers a broad range of different devices which vary in their complexity and accuracy class. However they all follow and fulfill the following values and principals:





In 2013 MTE set new standards by introducing its product generation genX and launching the portable working standard PWS 2.3 genX.

The genX user interface convinces with a modern look, easy handling and offers all kind of state-of-the-art functions such as USB interface or integrated SD card.

Moreover the genX concept pays attention to innovations such as offering WLAN (webserver) based remote controlling or device integrated user manuals to its customers.

These key advantages, unique features and positive feedback from the market motivates MTE to roll-out the new generation steadily over the entire product portfolio.

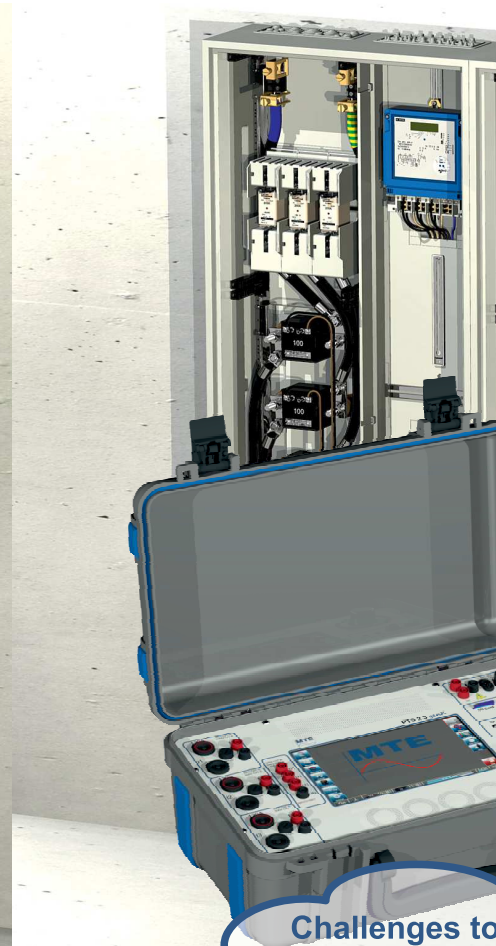
## Application overview

Portable meter test equipment from MTE can be used in all kind of laboratory and field applications. Thanks to its comprehensive product portfolio MTE provides their users with dedicated, innovativ devices for specific challenges. Over the last 25 years MTE has supplied thousands of portabels to different customers such as utilities, service companies, industries and meter manufacturers.



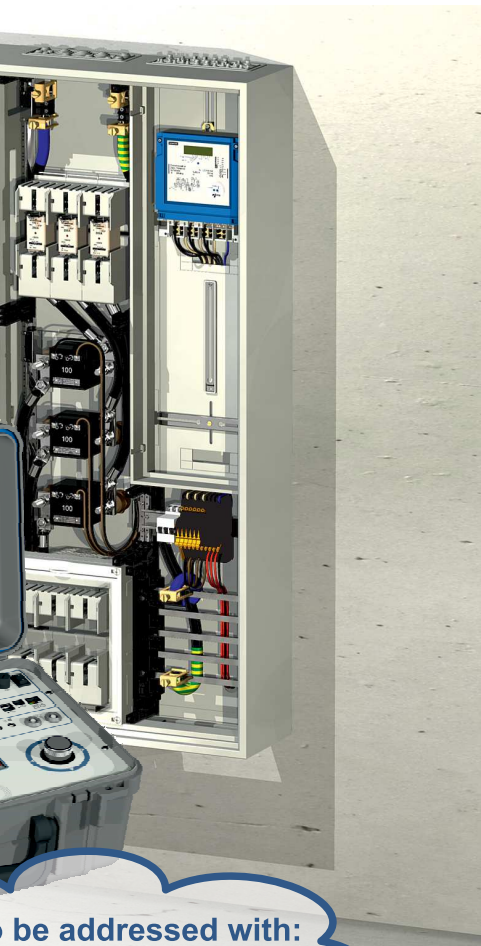
### Challenges to be addressed with:

- Poor meter quality
- Damaged, inaccurate meters
- Tampering
- Energy theft



### Challenges to

- Mistakes in m connection
- Changing CT
- Tampering
- Energy theft



to be addressed with:  
meter and CT/PT

ratio



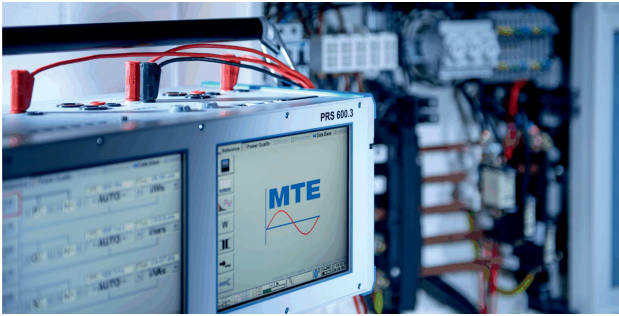
Challenges to be addressed with:

- Verification of accuracy and stability
- Simulation of different values
- Longtime testing

### Advantages of MTE's solutions for Portable Test Equipment

- Comprehensive range of products for various applications and challenges
- Proven and compact design, light in weight
- Easy handling, user friendly operation layouts and menu-driven software
- Modern, innovative features and different communication connection possibilities
- Long-lasting experience and application know-how from thousands of supplies to hundreds of different customers worldwide

# Portable meter test equipment



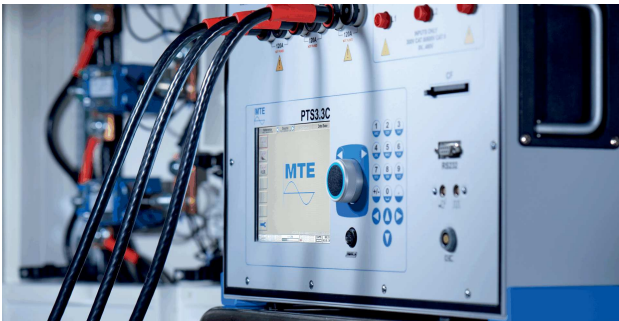
## Portable reference standards

Comprehensive and innovative range of reference standards, single- or three-phase, available in class 0.2 up to 0.005. Ideal devices for the overall investigation for testing electricity meters and their installations on-site.



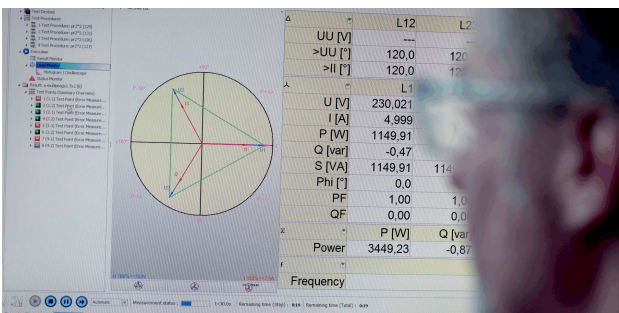
## Portable power sources

Reliable and stable three-phase current or current and voltage sources allowing in-depth testing over the complete range.



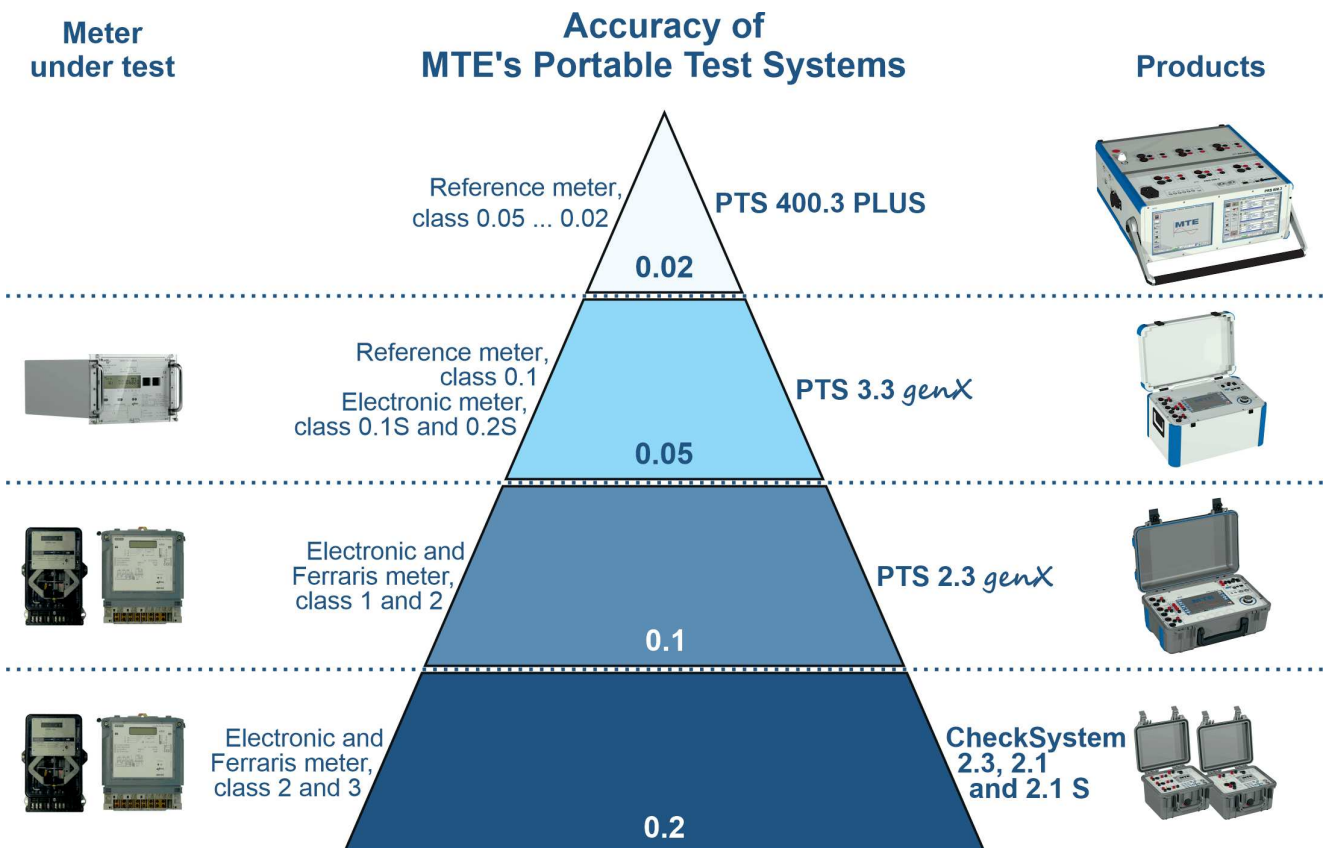
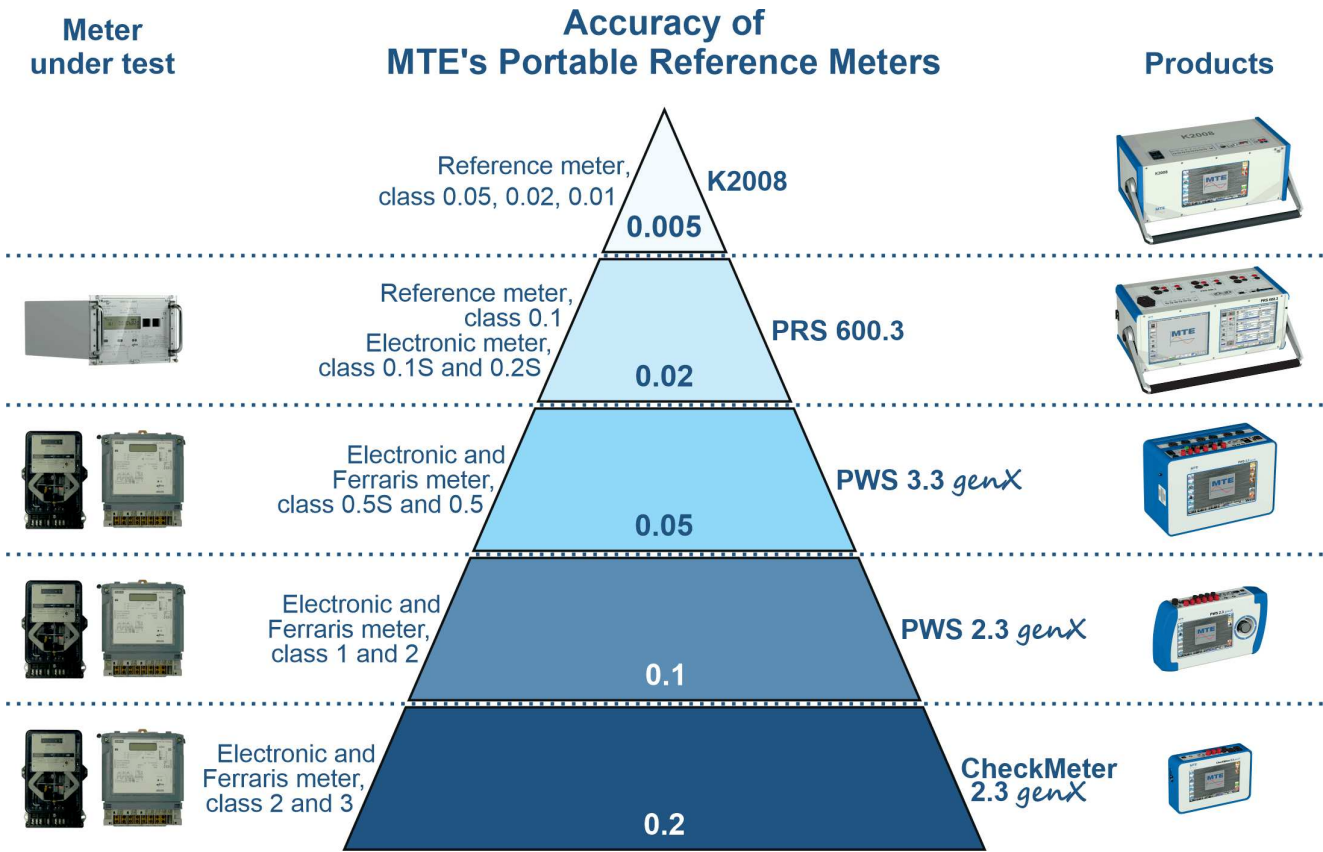
## Portable test systems

Comprehensive portfolio of single- and three-phase meter test systems in class 0.2 up to 0.02 with current or current and voltage sources in different versions.



## Software

CAlegration® is an all-in-one software package 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 comprehensive software solution.



## Portable reference standards



K2008, Three-phase comparator, accuracy class 0.005

### K2008 Comparator

K2008 is a three-phase comparator of accuracy class 0.005 (50ppm) with direct voltage and current inputs. It has been designed for universal laboratory and test applications and is intended for checking and the calibration of reference standards for electrical power and energy. In addition, it can be integrated into meter or reference standard test systems of highest accuracy.

The superior accuracy of the K2008 will be ensured by a combination of measures such as the use of 24bit A/D converter technology, a Sharc DSP and a measuring range concept adapted to typical test points of most recognized national metrological institutes.



PRS 600.3, Portable reference standard, accuracy class 0.02

### PRS 600.3 Portable reference standard

The PRS 600.3 is a combination of a three-phase portable reference standard of accuracy class 0.02 and an IEC 61000-4-30 class A compatible Power Quality Analyzer with 3 voltage and 3 current channels. The device is equipped with two 8.4" colour TFT VGA displays based on touch screen operation. The reference standard is used to test single- and three-phase meters, instrument transformers and installations on-site.

The power quality analyzer is used to resolve disputes at contractual applications, for statistical surveys, including EN 50160 reporting, and for online troubleshooting of different kind of power quality problems.



CALPORT 300, Portable reference standard and instrument transformer test system, accuracy class 0.05

### CALPORT 300 Portable reference standard and instrument transformer test system

The CALPORT 300 is a portable reference standard of accuracy class 0.05 for the comprehensive investigation of all components of a modern metering installation.

The functions provided in the CALPORT 300 for six current inputs, and the ability to accommodate flexible current clamps up to 3000 A, allows simultaneous measurements to be made on both primary and secondary currents in CT-connected metering systems. These functions therefore permits a thorough check of the complete metering setup.





PWS 3.3 *genX*, Portable working standard, accuracy class 0.05

### PWS 3.3 *genX* Portable working standard

The PWS 3.3 *genX* is a combination of a Portable Working Standard of accuracy class 0.05 and an IEC 61000-4-30 Class A compatible Power Quality Analyzer with 4 voltage (U1, U2, U3, UN, UPE) and 4 current channels (direct: I1, I2, I3 and via clamp-on CT: IN/IPE Neutral current/ Protection Earth current).

The modular concept of the PWS 3.3 *genX* allows the extension of the direct current measurement range from 12 A up to 120 A and the adding of a battery pack keeps the device running in the event of interruptions in the supply voltage during Power Quality recording or when supply from measuring voltage or mains is not possible.

### Option

In combination with the PWS 3.3 *genX* Portable Working Standard the eMOB I-200.1 DC test adapter enables a comprehensive on-site test of DC charging stations for electric vehicles.

The eMOB I-200.1 DC test adapter is equipped with a CCS Type 2 inlet (IEC 62196-3) to plug-in and lock the cable of the charging station and on the other side with a charging cable with CCS plug for the electric vehicle.



## Portable standard meters



PWS 2.3 *genX*, Portable working standard, accuracy class 0.1



### **PWS 2.3 *genX* Portable working standard**

The PWS 2.3 *genX* Portable Working Standard is a three-phase portable electronic meter test unit of accuracy class 0.1, used for testing single- and three-phase electricity meters on-site. The PWS 2.3 *genX* allows checking of all meter installation parameters and associated circuits.

The unit with its 7" (800 x 600 pixels) TFT touch screen colour display can be used either with a direct connection in the range of 1 mA ... 12 A, or by using a UCT 120.3 set of 3 active 120 A error compensated clamp-on CT's (included in the standard accessories set) in the range 10 mA ... 120 A.

### **Option**

In combination with the PWS 2.3 *genX* Portable Working Standard, the eMOB I-32.3 AC can be connected to many AC charging stations for electric vehicles to retrieve all relevant performance data, thus realizing a test system of accuracy class 0.1 and making it possible to test the installed energy meter and determine the existing power loss.



CheckMeter 2.3 *genX*, Portable standard meter, accuracy class 0.2

### **CheckMeter 2.3 *genX* Portable standard meter**

The CheckMeter 2.3 *genX* Portable standard meter is a three-phase electronic meter test unit of accuracy class 0.2, used for testing single- and three-phase electricity meters on-site.

An UCT 120.3 set of 3 active error compensated clamp-on CT's in the range 10 mA ... 120 A is included in the standard accessories. The CheckMeter 2.3 *genX* can be upgraded to class 0.1, if the optional UCT I.3-12A input box for direct current connection is used.

### **Option – single phase application only**

CheckMeter 2.3 *genX* with activated single-phase user interface and single-phase UCT 120.1 clamp-on CT 120 A only.



CheckSource 2.3, Three-phase current source

### CheckSource 2.3 Current source

The CheckSource 2.3 is a **three-phase current source** for currents up to 6 A. The test currents are generated with the same frequency and a user-defined phase shift to the voltages applied to the voltage inputs (phantom load). Alternatively the test currents can also be generated with a user defined frequency.

In addition, with a portable working standard, such as for example a PWS 2.3 genX it is an effective combination for the on-site testing of meters and installations (e.g. error measurement at defined load conditions).



PPS 3.3 *genX*, Three-phase current and voltage source

### PPS 3.3 *genX* Portable power source

The PPS 3.3 *genX* is a powerful and portable **three-phase current and voltage source**. All test values are generated absolutely synthetically with a high degree of accuracy and stability.

Compact in size, relatively light and equipped with latest communication interfaces, the PPS 3.3 *genX* is the ideal companion for on-site testing.



PPS 400.3-120 A, Three-phase current and voltage source

### PPS 400.3 Portable power source

The PPS 400.3 is a powerful and portable **three-phase current and voltage source**. All test values are generated absolutely synthetically with a high degree of accuracy and stability.

Following the different demands of customers, this source is available in two versions, for the supply of transformer meters with a maximum current up to 12 A as well as wider range source up to 120 A.

The PPS 400.3 portable power source may be used as enhancement of the reference standard PRS 600.3 (PTS 400.3 PLUS) as well as independently. The control software automatically recognizes the model. It may therefore immediately be taken into operation, and automatic measurement of a load curve of the meter may start.

## Portable test systems with voltage and current source



PTS 400.3 PLUS, Three-phase test system, accuracy class 0.02

### PTS 400.3 PLUS Portable test system

The portable, fully automatic test system PTS 400.3 PLUS consist of two separate modules. The highly accurate reference standard PRS 600.3 of accuracy class 0.02 and the programmable power source PPS 400.3, available in two versions of up to 12 A or 120 A. The reference standard PRS 600.3 may be simply and quickly connected with the power source module PPS 400.3 thereby producing a portable test system with 1 up to 3 measurement positions. Operation of the system may begin immediately after connecting both modules.

In this combination, the reference standard and source are controlled via blue-tooth.

Due to the extended power quality analyzer functions of the reference standard PRS 600.3, the test system can also be used to resolve disputes at contractual applications, for statistical surveys, including EN 50160 reporting, and for online troubleshooting of different kind of power quality problems.



PTS 3.3 *genX*, Three-phase test system, accuracy class 0.05

### PTS 3.3 *genX* Portable test system

The PTS 3.3 *genX* portable test system consists of an integrated **three-phase current and voltage source** and a three-phase electronic reference standard of accuracy class 0.05. Characteristic features of the PTS 3.3 *genX* are its wide measuring range, high accuracy and high tolerance to unwanted external influences.

The PTS 3.3 *genX* allows the overall testing of meters and metering installations plus analysis of the local mains conditions.



PTS 2.3 *genX*, Three-phase test system, accuracy class 0.1



CheckSystem 2.3, Portable test system, accuracy class 0.2



CheckSystem 2.1, Portable test system, accuracy class 0.2  
CheckSystem 2.1, S Portable test system, accuracy class 0.05

## PTS 2.3 *genX* Portable test system

The PTS 2.3 *genX* portable test system consists of an integrated **three-phase current source** and a three-phase electronic reference standard of accuracy class 0.1. Characteristic features of the PTS 2.3 *genX* are its wide measuring range, high accuracy and high tolerance to unwanted external influences.

The PTS 2.3 *genX* allows the overall testing of meters and metering installations plus analysis of the local mains conditions.

## CheckSystem 2.3 Portable test system

The CheckSystem 2.3 portable test system consists of an integrated three-phase electronic reference standard of accuracy class 0.2 and a **three-phase current source** up to 16 A.

The CheckSystem 2.3 allows the monitoring of meter installations as well as analysis of the local mains conditions.

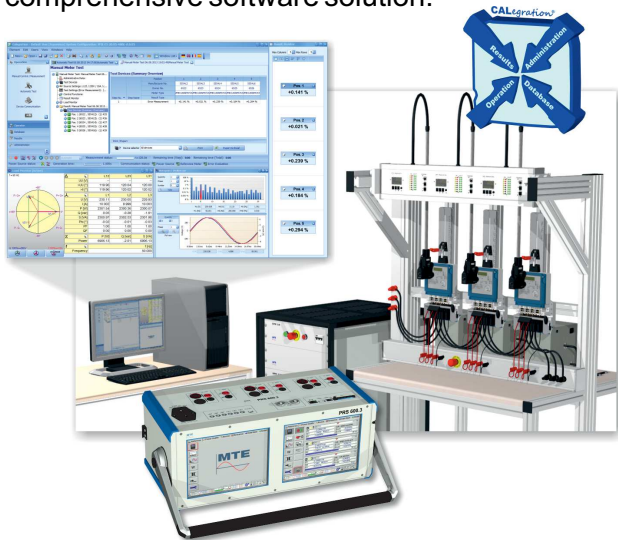
## CheckSystem 2.1 / 2.1 S Portable test systems

The CheckSystem 2.1 portable test system consists of an integrated single-phase electronic reference standard of accuracy class 0.2 and a **single-phase current source** up to 120 A.

With a single-phase electronic reference standard of accuracy class 0.05 and an integrated **single-phase current source** up to 120 A, the CheckSystem 2.1 S offers its users an even wider voltage measuring range (up to 480 V), high accuracy and high tolerance to unwanted external influences.

# Software package CALegration®

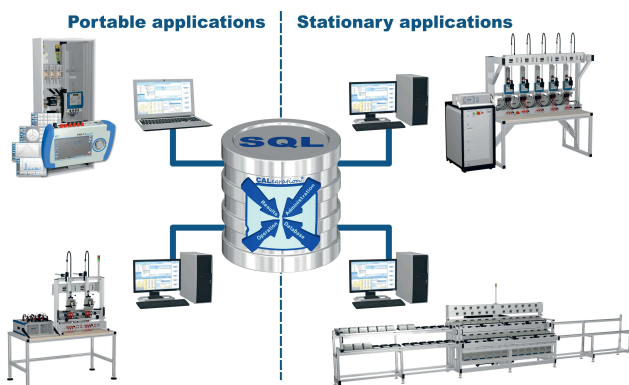
**CALegration®** is an all-in-one software package designed to operate MTE's portable and stationary test equipment product lines with the same software and on a common data-base. It bundles the functionalities and advantages in a new and comprehensive software solution.



The philosophy of CALegration® is to integrate all basic test elements (administration, database, operation, results) into one single software and to use it with both MTE's portable 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 (smart) meters in accordance with customer requirements and national / international test and calibration regulations (e.g. PTB, IEC, BS, ANSI).

## 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 and IEC 61000-4-30 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**



### Scanning Heads

The SH 2003 and SH 11 photoelectric scanning heads are suitable for scanning the marks of mechanical rotating disc meters or the detection of light emitting diodes (LED's) of electronic meters plus simulated pulses on LCD displays (SH 11). Mode of operation is selectable via a switch.



### Scanning Head Supports

The SCD 2003 scanning head support is for on-site meter testing with the SH 2003 photoelectric scanning head.

The TVU 7.2 scanning head support is for on-site meter testing with the SH 11 photoelectric scanning head.



### Impulse interface adapter

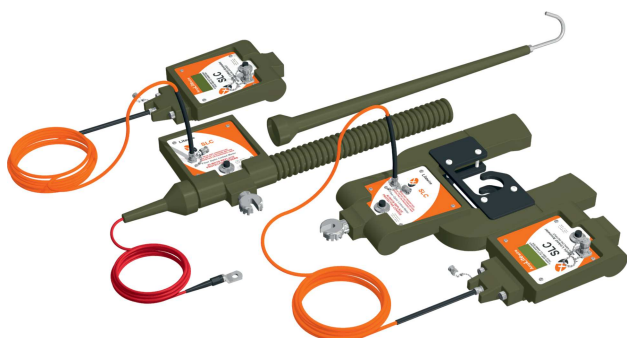
The IMP-IF1 impulse interface adapter is suitable to interface MTE reference standards with meters having retransmitting contacts, open-collector transistor outputs or true S0-outputs to allow full testing of meters with these types of outputs interfaces.



### Precision Current Clamps

Various clamp-on CTs for MTE's portable test equipment are available:

- Error compensated current clamps for 120 A
- Precision current clamps for 1000 A
- Flexible current transformers FLEX 3000 up to 3000 A



### Primary LiteWire Sensors

High voltage current and voltage sensors up to 2000 A and 40 kV

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**The following MTE leaflets are available:**

Overviews:	Company Portrait / Portable Test Equipment / Stationary Meter Test Systems Automatic Test Systems / Transformer Monitoring / E-Mobility Testing
Comparator:	K2008
Portable Reference Standards:	PRS 600.3 / CALPORT 300
Portable Working Standards:	PWS 3.3 <i>genX</i> / PWS 2.3 <i>genX</i>
Portable Standards:	CheckMeter 2.3 <i>genX</i>
Portable Test Systems:	PTS 400.3 PLUS / PTS 3.3 <i>genX</i> / PTS 2.3 <i>genX</i> CheckSystem 2.3 / CheckSystem 2.1 / CheckSystem 2.1 S
Portable Power Sources:	PPS 400.3 / PPS 3.3 <i>genX</i> / CheckSource 2.3
Software:	CALegration®

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# **MTE Meter Test Equipment**

## **MTE Meter Test Equipment AG**

Landis + Gyr-Strasse 1  
P.O. Box 7550  
CH-6302 Zug, Switzerland  
Phone: +41-41 508 39 39  
Internet: [www.mte.ch](http://www.mte.ch)  
e-mail: [info@mte.ch](mailto:info@mte.ch)

## **EMH Energie-Messtechnik GmbH**

Vor dem Hassel 2  
D-21438 Brackel, Germany  
Phone: +49-4185 58 57 0  
Fax: +49-4185 58 57 68  
Internet: [www.emh.eu](http://www.emh.eu)  
e-mail: [info@emh.de](mailto:info@emh.de)

## **MTE India Private Ltd.**

Commercial Unit - 118 & 119, First Floor  
Plot No. 10, Aggarwal City Square, District Centre,  
Mangalam Place, Rohini Sector-3, Delhi 110085, India  
Phone: +91-11 40218105  
E-Mail: [info@mteindia.in](mailto:info@mteindia.in)

## **EMH Energie-Messtechnik (Beijing) Co. Ltd.**

Section 305, Building 2, Ke-Ji-Yuan  
Nr.1 Shangdi-Si-Jie, Shangdi-Information-Industry-Base  
Haidian District  
Beijing 100 085, P.R. China  
Phone: +86-10 629 81 227  
Mobile: +86-139 0 103 6875  
Fax: +86-10 629 88 689  
e-mail: [guo@emh.com.cn](mailto:guo@emh.com.cn)

## **MTE Meter Test Equipment (UK) Ltd**

4 Oval View  
Woodley Stockport  
Cheshire SK6 1JW, United Kingdom  
Phone: +44-161 406 9604  
Fax: +44-161 406 9605  
e-mail: [info@mte.uk.net](mailto:info@mte.uk.net)



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### **MTE Meter Test Equipment AG**

 Landis + Gyr-Strasse 1 • P.O. Box 7550 • 6302 Zug • Switzerland  
Phone +41-41 508 39 39 • Internet [www.mte.ch](http://www.mte.ch)

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