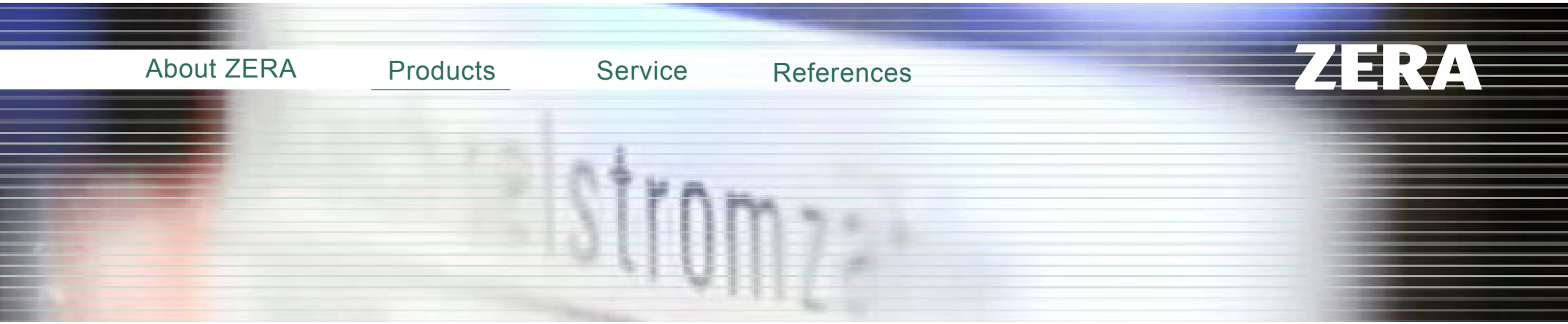
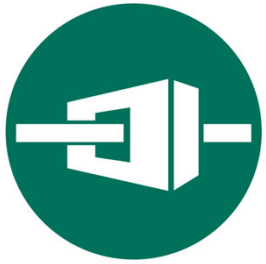
ZERA

Precision starts with us

ZERA



Meter Test Systems

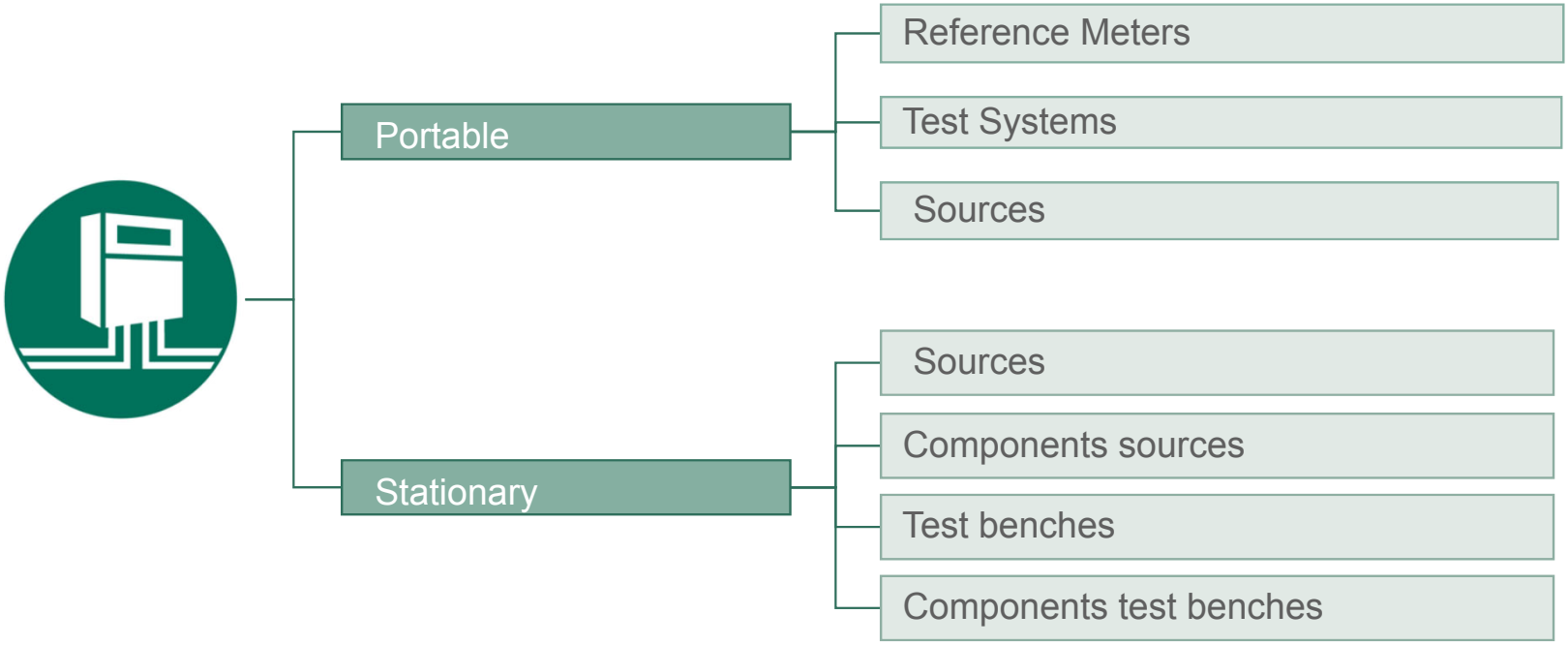


Instrument Transformer Test Systems

Precision Laboratory Systems

Software

Product Overview Meter Test Systems



Testing of energy meters

MTx0
Reference Meter
Class 0.1

MT3x0
Reference Meter
Class 0.1 (0.05)

MT310s2
Reference Meter
Class 0.1

MT3000
Reference Meter
Class 0.02 (0.05)

MTx0 Reference Meter

Accuracy class
- MT10: 0.2 (single-phase)
- MT30: 0.2 (three-phase)

Main functions
- Current measurement via AC current clamps up to 30000 A
- Voltage measurement up to 300 V
- Actual value, vector, curve display
- Harmonics up to 40th
- Error measurement

Scope of application
On-site measurement with system load

Specials
- Supply via external power supply unit or via internal rechargeable battery (optional)
- Selective measurement (optional)
- Also available as CAT IV device

MT3x0 Reference Meter

Accuracy class
- MT310: 0.1
- MT320: 0.05

Scope of application
On-site measurement with system load

Main functions
- Direct measurement up to 12 A / 300 V
- Current measurement via AC current clamps up to 30000 A
- Actual value, vector, curve display
- Harmonics up to 40th
- Error measurement

Specials
- Burden measurement for CT / VT
- I-transformer testing (optional)
- Selective measurement (optional)
- Energy dosage (optional)
- Also available as CAT IV device

MT310s2 Reference Meter

Accuracy class
0.1

Main functions
- Direct measurement up to 12 A / 300 V
- CAT IV
- Current measurement via AC current clamps up to 300 A
- Actual value, vector, curve display
- Harmonics up to 40th
- Error measurement

Scope of application
On-site measurement with system load

Specials
- Supply via mains plug or test voltage (adapter plug)
- Non-sensitive against interferences (e.g. 150 kHz)
- Additional channels for measuring $U_{(PE-PN)}$ or I_N
- Burden measurement for CT/VT
- I-transformer testing
- Selective power measurement
- Hardware can be extended modularly

MT36x Reference Meter

Accuracy class
- MT360: 0.1
- MT365: 0.05

Scope of application
On-site measurement with system load

Main functions
- Direct measurement up to 12 A / 300 V
- Current measurement via AC current clamps up to 30000 A
- Actual value, vector, curve display
- Harmonics up to 40th
- Error measurement

Specials
- Burden measurement for CT / VT
- U/I-transformer testing
- Selective measurement
- Energy dosage
- Automatic measurement (optional - only if a ZERA source is connected)
- Also available as CAT IV device

MT3000 Reference Meter

Accuracy class
- MT3301/3305: 0.02
- MT3302/3307: 0.05

Main functions
- Direct measurement (depending on integrated module)
  MT3301/3302 bis 12 A / 300 V
  MT3305/3307 bis 120 A / 600 V
- Current measurement via AC current clamps up to 30000 A
- Actual value, vector, curve display
- Harmonics up to 40th
- Error measurement

Scope of application
On-site measurement with system load

Specials
- Burden measurement for CT / VT
- U/I-transformer testing
- Selective measurement
- Energy dosage
- Automatic measurement (optional - only if a ZERA source is connected)
- Accuracy class depends on the integrated module

Generation of current and voltage

MT400
Current source

12 A

MT500
Current and
voltage source
12 A / 300 V

MT551
Current and
voltage source
120 A / 500 V

MT400 Current Source

Generation
12 A

Main functions
- Current generation up to 12 A
- Voltage supply via available voltage from the grid

Scope of application
Simulation of load while testing meter installations on-site

MT500 Current and Voltage Source

Generation
12 A / 300 V

Main functions
- Current generation up to 12 A
- Voltage generation up to 300 V

Scope of application
Simulation of load while testing meter installations on-site

Specials
Simulation of load by adjustable currents, voltages and angles

MT551 Current and Voltage Source

Generation
120 A / 500 V

Main functions
- Current generation up to 120 A
- Voltage generation up to 500 V

Scope of application
Simulation of load while testing meter installations on-site

Specials
- Touch screen
- Programmable wave form generation for voltage and current
- Generation (optional) of harmonics in current and voltage up to the 40th

Test and generation in one device

MT68x
Three-phase Test System
Class 0.1 (0.05)
100 A

MT68xs
Single-phase Test System
Class 0.1 (0.05)
120 A

MT78x
Three-phase Test System
Class 0.1 (0.05)
120 A / 500 V

MT68xs Test System

Accuracy class
- MT680s: 0.1
- MT686s: 0.05

Generation
120 A

Main functions
- Generation up to 120 A
- Direct measurement up to 120 A / 500 V
- Actual values, vector and curve display
- Harmonics up to 40th in the current
- Error measurement

Scope of application
On-site measurement with load simulation

Specials
- Selective measurement (optional)
- Energy dosage
- Automatic measurement
- Touch screen
- Compact design

MT68x Test System

Accuracy class
- MT681: 0.1
- MT686: 0.05

Generation
100 A

Main functions
- Generation and direct measurement up to 100 A / 300 V (mains)
- Current measurement (only via special current clamps) up to 30000 A
- Actual value, vector, curve display
- Error measurement

Scope of application
On-site measurement with load simulation

Specials
- Selective measurement (optional)
- Energy dosage
- Automatic measurement

MT78x Test System

Accuracy class
- MT781: 0.1
- MT786: 0.05

Generation
120 A / 500 V

Main functions
- Generation and direct measurement up to 120 A / 500 V
- Current measurement (only via special current clamps) up to 30000 A
- Actual values, vector and curve display
- Error measurement

Scope of application
On-site measurement with load simulation

Specials
- Selective measurement (optional)
- Energy dosage
- Automatic measurement
- Generation of harmonics in current and voltage up to 40th (optional)

Testing of energy meters

Sources
200 VA up to 5600 VA
Class 0.1 up to 0.005

Source components
Single components
for individual sources

Test benches
1 up to 40 test positions
Single- or three-phase

Test bench components
Single components
for individual test benches

Generation of test values

MTS140
U: 1 x 1500 VA
I: 1 x 1500 VA
Class 0.02 up to 0.005

MTS310
U: 3 x 500 VA
I: 3 x 600 VA
Class 0.02 up to 0.005

MTS320
U: 3 x 500 VA
I: 3 x 2000 VA
Class 0.02 up to 0.005

MTS340
U: 3 x 1500 VA
I: 3 x 2000 VA
Class 0.02 up to 0.005

Portable
Stationary

MTS140 Source System

Main functions
- Generation of test values for max. 40 test positions

Scope of application
- Usage in ZERA Meter Test Systems

Design
48,26 cm (19“) cabinet

Accuracy class
0.02

Output power voltage
1 x 1500 VA

Test voltage (P-N)
40 ... 480 V (AC)

Output power current
1 x 1500 VA @120 A

Test current
0 … 120 A (AC)

MTS310 Source System

Main functions
- Generation of test values for max. 10 test positions
- Suitable for usage of ICT at 5 test positions

Scope of application
- Usage in ZERA Meter Test Systems

Design
48,26 cm (19“) cabinet

Accuracy class
0.005 up to 0.02

Output power voltage
3 x 500 VA

Test voltage (P-N)
40 ... 320 V (AC/DC)

Output power current
3 x 600 VA @ 120 A

Test current
0 … 120 A (AC) (up to 320 A via ICT)

Specials
Optional supply of 10 test positions including ICT with current amplifiers VI222

MTS320 Source System

Main functions
- Generation of test values for max. 20 test positions

Scope of application
- Usage in ZERA Meter Test Systems

Design
48,26 cm (19“) cabinet

Accuracy class
0.02

Output power voltage
3 x 500 VA

Test voltage (P-N)
40 ... 320 V (AC/DC)

Output power current
3 x 2000 VA*

Test current
0 … 160 A

Specials
*higher output power on request

MTS340 Source System

Main functions
- Generation of test values for max. 40 test positions

Scope of application
- Usage in ZERA Meter Test Systems

Design
48,26 cm (19“) cabinet

Accuracy class
0.02

Output power voltage
3 x 1500 VA

Test voltage (P-N)
40 ... 480 V (AC/DC)

Output power current
3 x 2000 VA*

Test current
0 … 160 A

Specials
*higher output power on request

MTS380 Source System

Main functions
- Generation of test values for max. 40 test positions

Scope of application
- Usage in ZERA Meter Test Systems

Design
48,26 cm (19“) cabinet

Accuracy class
0.02

Output power voltage
3 x 1500 VA

Test voltage (P-N)
40 ... 480 V (AC)

Output power current
3 x 5600 VA*

Test current
0 … 120 A (AC)

Specials
*higher output power on request

Source Components – Controlling, Testing

FG301
Frequency Generator
Central unit of the
test value generation

EPZ303-08
Reference Meter
Class 0.02

COM3003
Comparator/Reference Meter
Class 0.008

COM5003
Comparator/Reference Meter
Class 0.005

Source Components – Generation

VI20x
Current Amplifier
2000 VA / 2800 VA
160 A / 120 A (AC)

VU211
Voltage Amplifier
1000 VA / 1500 VA
480 V (AC)

VU221
Voltage Amplifier
500 VA
320 V (AC and DC)

VUI301
Current and Voltage Amplifier
Single-phase
320 V (AC), 30 VA
120 A (DC up to 12 A), 200 VA

Portable
Stationary

Test Benches

Single-Position Test Bench
1 test position

Multi-Position Test Bench
5, 10, 20 or 40 test positions
different designs

Special Systems
5, 10, 20 or 40 test positions
different suspensions
for scanning heads

Portable
Stationary

Standard Test Benches

Main functions
- Single-/three-phase meter testing including data management

Scope of application
Combined with a source system for example of the MTS series these test benches are used to as a single- or three-phase Meter Test System

Specials
Extendable individually by modular design

Test positions
1 up to 40

Accuracy class
0.005 up to 0.02

Semi-Automatic Test System – Quality Assurance

Hauptfunktionen
- Quality testing of energy meters
- Testing of metrology

Design
- Integrated source system
- Compact design

Specials
- Manual assembling
- Pneumatic meter-specific contacting
- Automatic positioning of the scanning heads
- Customized test procedures

Test positions
- 1 up to 20

Semi-Automatic Test System – Functional Meter Test

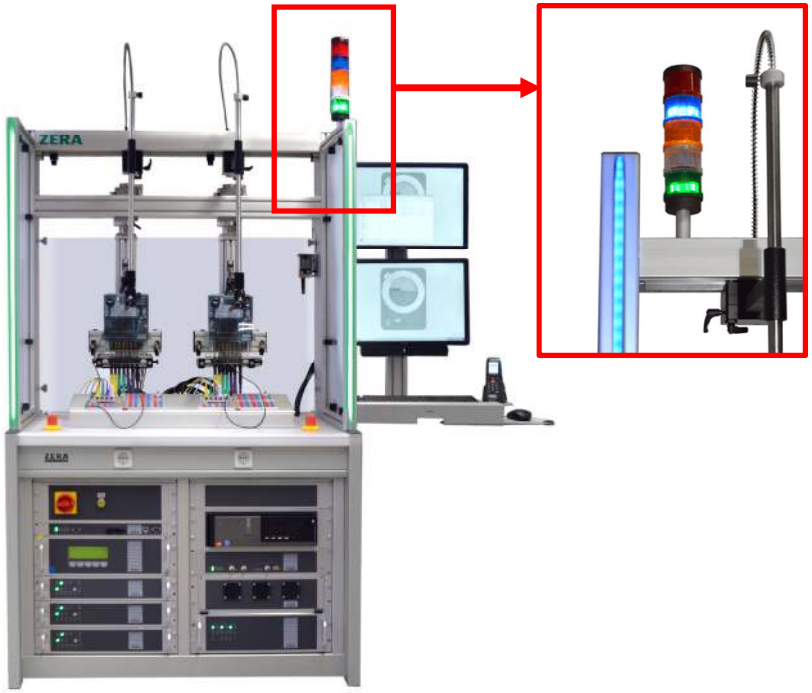
Main functions
- Function test of energy meters
- Communication test of PLC, NFC, RF, BLE, IR
- General test as display check and voltage drop
- Anti-Tampering, sabotage protection:
  - Testing of the electro-magnetic sensors, motion sensor, switch for terminal cover

Design
- Compact design

Specialsassembling
- Manual
- Pneumatic meter-specific contacting
- Implementation of customized test procedures

Test positions
- 1 up to 9

Testing of Energy Meters – Special Designs



Main functions
- Complete range of available functionalities
- Smart metering data communication testing

Design
- Compact design on request

Specials
- Light barrier for safe operation
- Moveable meter rack
- Quick connecting devices
- Integrated source on request
- Stated measurement uncertainty in WinSAM

Specials
- Scanner for QR-codes, datamatrix codes etc.
- Integrated DELL-PC
- Side table for keypad
- Recessed roller system for flexible placement of the system

Test positions
- 1 bis 40

Test Bench Components — Measuring Parts

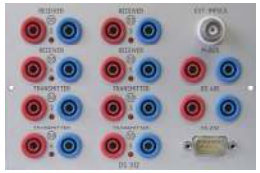
DS421
Multi-position Error Calculator

DSA400
LCD display unit

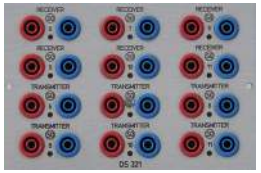
SES330
Measurement interface

Test Bench Components — Measuring Parts

DS301
Error calculator
Error display



DS312
Error calculator
Enhancement unit



DS321
Error calculator
Enhancement unit

STM6000 series, Testing of Smart Meters

Main functions

- Testing of metrology and data communication
- Suitable for testing Smart Meters and more

Scope of application

- Usage in stationary ZERA Meter Test Systems
- One module is required per test position/meter

Specials

- Modular design of the hardware
- Individual equipment
- Smart Meter Gateway testing
- Analysis of data communication
- Encrypted communication
- Adjustable light intensity for communication

Interfaces

RS232, RS485, RF, 20mA, PLC, M-Bus, IR, ZigBee etc.

Communication tests

DLMS / COSEM, TLS, HDLC, IEC 62056-21, SML / COSEM etc.

STM6000 Base module

Main functions
- Base module for testing of metrology and communication
- Suitable for Smart Meter testing

Scope of application
- Usage in stationary ZERA Meter Test Systems
- One module is required per test position/meter
- Voltage supply occurs via CR2020 resp. STR6000

Specials
- Display, colour capable, for indication of information e. g. measurement deviation
- Ethernet 3 x
- Scanning head input external 2 x
- Scanning head input internal
- Pulse input BNC
- Push-button

System for connecting:
- STM62xx, max. 7 x
- S0 transmitters STM63x0, max. 12 x
- S0 receivers STM64x0, max. 12 x

STM6100 Test voltage module

Main functions

- Auxiliary circuit and test voltage module for testing of metrology
- Suitable for Smart Meter testing

Scope of application

- Usage in stationary ZERA Meter Test Systems
- One module is required per test position/meter

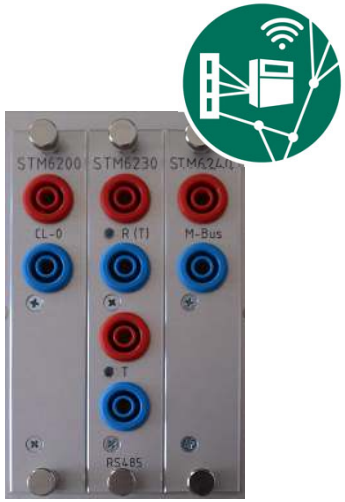
Specials

- Voltage switch-off
- Phase colours: yellow, green, violet and white
- Optionally other phase colours are available

System for connecting

- Test voltage UL1, UL2, UL3 and UN
- Relay circuits R1-R6 and N0-NC
- Auxiliary voltage U_{AUX} 2x

STM6200 … STM6260 Communication modules



Main functions

- Extension module for testing of communication
- Suitable for Smart Meter testing

Scope of application

- Usage in stationary ZERA Meter Test Systems
- One module is required per test position/meter
- Max. 6 modules can be used per test position/meter

Specials

- Extension module for STM6000 for communication via interface:
  - CL0 resp. 20 mA
  - M-Bus
  - IR (infrared scanning head TK117)
  - RS485 (operation mode 2-wire or 4-wire)
  - RS232
  - EDL
  - Sym²

STM6290 Communication module for Basiszähler

Main functions

- Extension module for testing of communication
- Suitable for Smart Meter testing

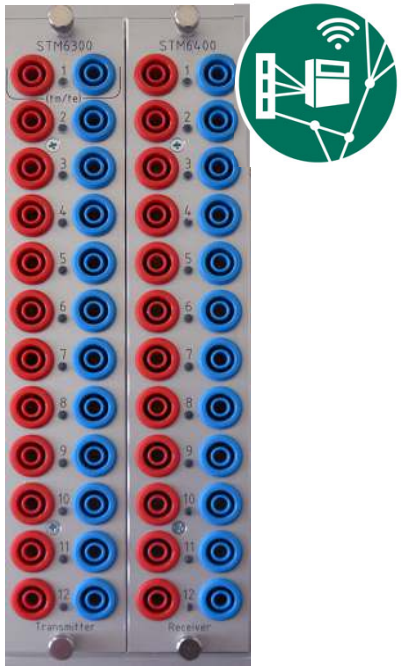
Scope of application

- Usage in stationary ZERA Meter Test Systems
- One module is required per test position/meter

Specials

- Extension module for STM6000 for testing of communication of Basiszähler (electrical energy meter) according to FNN:
  - LMN wired 2x
  - LMN via IR/TK2020-00 1x
  - INFO via IR/TK2020-02 1x
  - 300 up to 921.600 Baud

STM63xx/64xx Transmitter /Receiver module



Main functions

- Extension module for testing of metrology
- Connection of the pulse output/-input from the meter

Scope of application

- Usage in stationary ZERA Meter Test Systems
- One module is required per test position/meter

Specials

- Extension module for STM6000
- Metrological output (STM63xx): Transmitter 12 x, 8 x or 4 x
- Pulse input (STM64xx): Receiver 12 x, 8 x or 4 x

TK2020-02 Infrared scanning head

Main functions

- Data communication with EDL meter and Basiszähler (electrical energy meter) to FNN requirement specification LMN
- Meter operation via light impulses (torch)
- Reading via INFO interface
- Measurement of the irradiation intensity during data reception
- Selectable irradiation intensity during transmission
- Wavelengths of 850 nm, 890 nm or 940 nm during transmission

Scope of application

- Connection via STM6000
- Only usable at EDL meter and Basiszähler (electrical energy meter)

Specials

- There are different types resp. interface, cable length and communication available.

Current and Voltage Transformers

MSVT
Multi-Secondary Voltage Transformer for galvanic isolation of the voltage of single-phase meters

ICT130
Isolated Current Transformers
Max. current range **120 A 1:1**

ICT123/ICT128
Isolated Current Transformers
Max. current range **240 A 1:1/1:2**
Burden measurement/Breaker test

Current Transformers

ICT125 / ICT126
Isolated Current Transformers
Max. current range **160 A 1:2 / 1:1**
Burden measurement / Breaker test

ICT127
Isolated Current Transformers
Max. current range **120 A 1:1 / 10:1**
Burden measurement / Breaker test

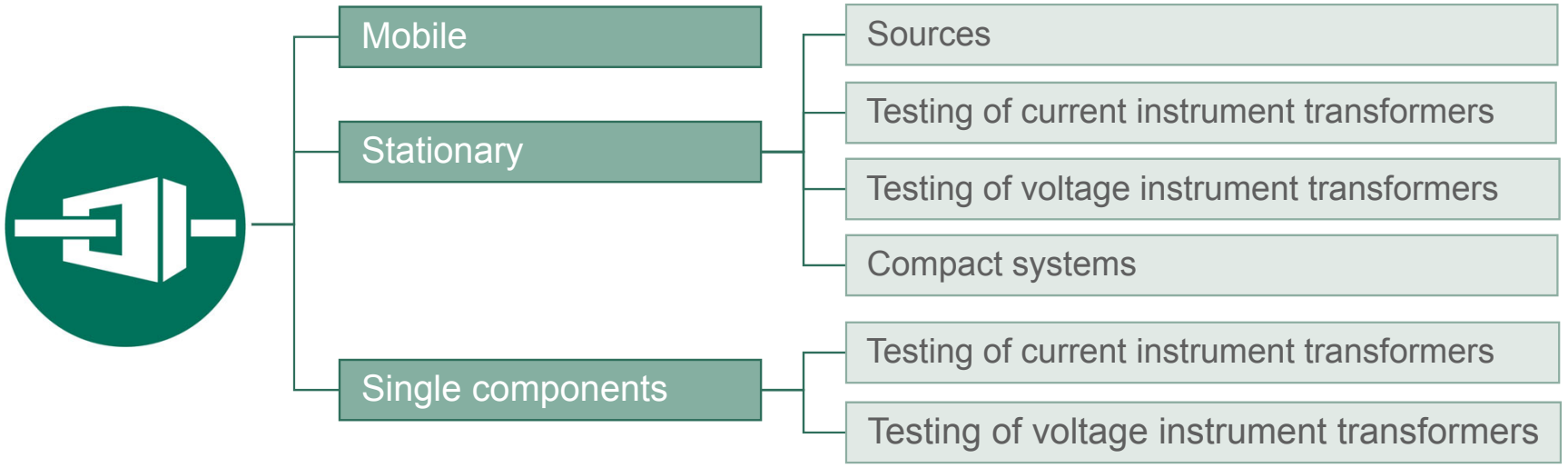
Test Bench Components — Mechanical parts

Basic scanning head suspension
Folding mechanism adjustable in all directions

Standard scanning head suspension
Ball-bearing mount suspension with quick height adjustment and fine adjustment

Rotating meter racks
Meter racks for
2 or 3 connection options
Quick and reliable positioning of different meter types

Product Overview Instrument Transformer Test Systems



VRT – Voltage Regulating Transformer

Output voltage
0 V … 400 V
(according to SCM / HVT)

Frequency
Mains frequency

Main functions
- **V**oltage **R**egulating **T**ransformer
- Supply of voltage or current transformer with a variable voltage for testing of CT or VT

Scope of application
- Manual control
- Testing of instrument transformers
- Using the mains frequency

Design
48,26 cm (19“) cabinet
1-4 fields

Mobile/Stationary
Single components

EVRMU – Electronic Voltage Regulating & Measuring Unit

Output voltage
0 V … 400 V
(according to SCM / HVT)

Frequency
50 Hz / 60 Hz

Main functions
- Electronic Voltage Regulating and Measuring Unit
- Supply of voltage or current transformer with a variable voltage for testing of CT or VT
- Control via PC

Scope of application
- Automatic control
- Testing of instrument transformers with 50 Hz / 60 Hz

Mobile/Stationary

Single components

SCM – Standard Current Module

Nominal current
Max. 10.000 A // 1 A / 5 A (CT)

Main functions
- Generation of test current

Components
- Combination of High Current Transformer (HCT) and Standard Current Transformer (SCT)

Scope of application
- Testing of current transformers (CT)

Specials
- Cost-effective, space-saving and minimal inductive losses by combining two units (HCT and SCT)
- Time-saving due to one-off connection

HVT – High Voltage Transformer

Maximum voltage
500 kV

Main functions
- Generation of high voltage

Scope of application
- Testing of voltage transformers
- In combination with a Standard Voltage Transformer SVT, the HVT is used for accuracy testing of VT
- As a single unit the HVT can only be used for insulation testing

SVT – Standard Voltage Transformer

Nominal voltage
max. 500 kV / √3 kV (VT)

Main functions
- Usage as reference

Scope of application
- Testing voltage transformers with single and double-pole connections

Complete Systems for CT & VT testing

ITTS compact
Compact CT Test System
Generation: 10 kVA

ITTS (CT, 32 kVA)
CT Test System
Generation: 32 kVA

ITTS (CT, VT, 16 kVA)
CT and VT Test System
Generation: 16 kVA

Mobile/Stationary
Single components

Testing of Current Instrument Transformers

WM1000I
Current transformer measuring bridge
for conventional CTs

WM3000I
Current transformer measuring bridge
for all types of CTs

ESCB100
Electronic compensated Standard Current Burden
Fixed burden steps
Manual CT testing

ESCB200
Electronic compensated Standard Current Burden
Free selectable burden steps
Manual & automatic CT testing

Mobile/Stationary
Single components

Testing of Voltage Instrument Transformers

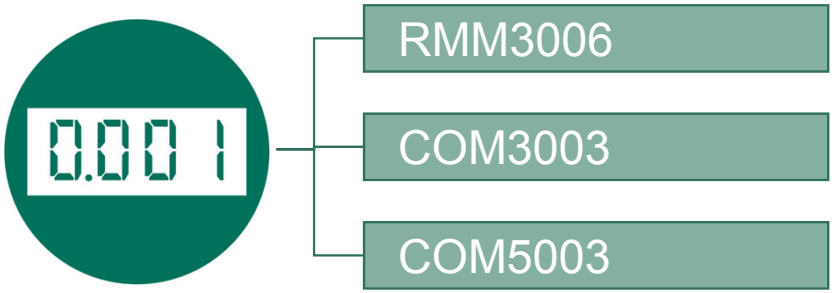
WM1000U
Voltage transformer measuring bridge
for conventional VTs

WM3000U
Voltage transformer measuring bridge
for all types of VTs

ESVB100
Electronic compensated Standard Voltage Burden
Fixed burden steps
Manual VT testing

ESVB200
Electronic compensated Standard Voltage Burden
Free selectable burden steps
Manual & automatic VT testing

Product Overview Precision Laboratory Systems



Test Equipment for Laboratories and Metrological Institutes

RMM3006
Reference Multimeter
Class 0.02

COM3003
Comparator
Class 0.008

COM5003
Comparator
Class 0.005

RMM3006 Referenz Multimeter

Phases
3

Voltage measurement
10 V … 480 V

Current measurement
1 mA … 160 A

Accuracy class
0.02

Scope of application
Application as reference standard for metrological institutes or as transfer standard for test laboratories of power utilities and electricity meter manufacturers

Main functions
- Testing of current and voltage test devices as well as single- or polyphase power and energy testing systems
- Actual values
- Meter accuracy testing
- Energy comparison measurement

Specials
- Measurement of DC components
- High accuracy, independent from measurement mode

COM3003 Comparator

Phases
3

Voltage measurement
30 V … 500 V

Reference voltage ranges
1 V DC, 10 V DC

Current measurement
1 mA … 160 A

Accuracy class
0.008

Scope of application
Application as primary standard for metrological institutes and test laboratories

Main functions
- Testing of current and voltage test devices as well as single- or polyphase power and energy testing systems
- Actual value, vectorial and curve display
- Harmonic, error and reference measurement

Specials
- Using of DC-capable current transformers
- Automatic measuring range selection
- Verification and direct traceability of measuring accuracy by connection of DC- and frequency standard devices

COM5003 Comparator

Phases
3

Voltage measurement
100 mV … 600 V

Reference voltage ranges
10 V DC

Current measurement
0.5 mA … 160 A (AC)

Main functions

- Testing of current and voltage test devices as well as single- or polyphase power and energy testing systems
- Actual values, vectorial and curve display
- Harmonic, error and reference measurement
- Easy implementation of further measuring tasks

COM5003 Comparator

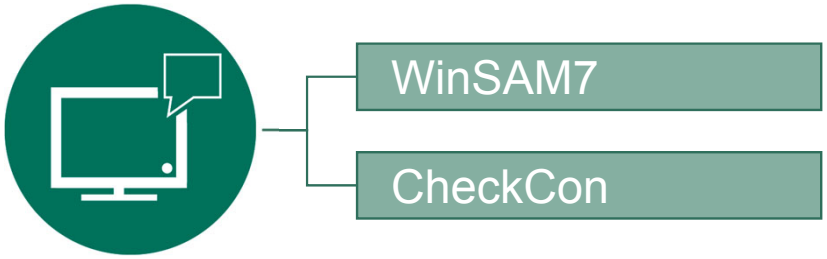
Specials

- Simultaneous energy measurement in four measurement modes
- Power measurement at alternating energy direction
- Simultaneous error measurement with up to four pulses of DUT
- Active impedance compensation at currents ≤100 mA
- Operation via capacitive touchscreen
- Traceability of measurement accuracy by connection of DC- and frequency standard
- Remote control

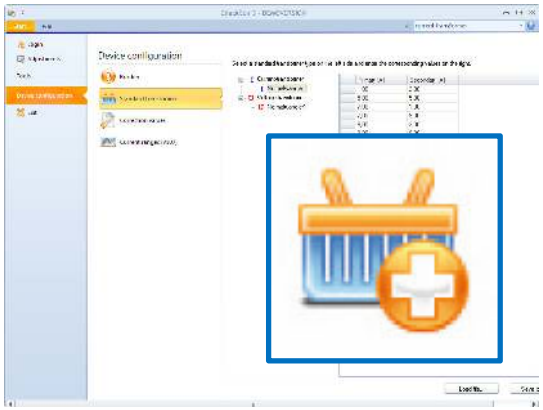
Scope of application

Application as primary standard for metrological institutes and test laboratories

Product Overview Software



WinSAM7
Software for Meter Testing
Controlling and testing of
Meter Test Systems



CheckCon3
Software for Instrument
Transformer Testing
Control of Instrument Transformer
Test Systems

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