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30 Years of Precise Innovations

Applied Precision s.r.o.

Products

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Meter Test Equipment - ELMA

ELMA

AUTOMATED METER CALIBRATION AND TESTING

- Meter Production Automation
- High Production Efficiency
- Customized Design
- Pneumatic Quick Connection
- Smart Meter Compatible
- Complex Software Solutions
- Accuracy up to 0.01%

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ELMA – Production Type

Fully Automated Meter Calibration and Testing

- Meter Producers
- Horizontal Meter Placement

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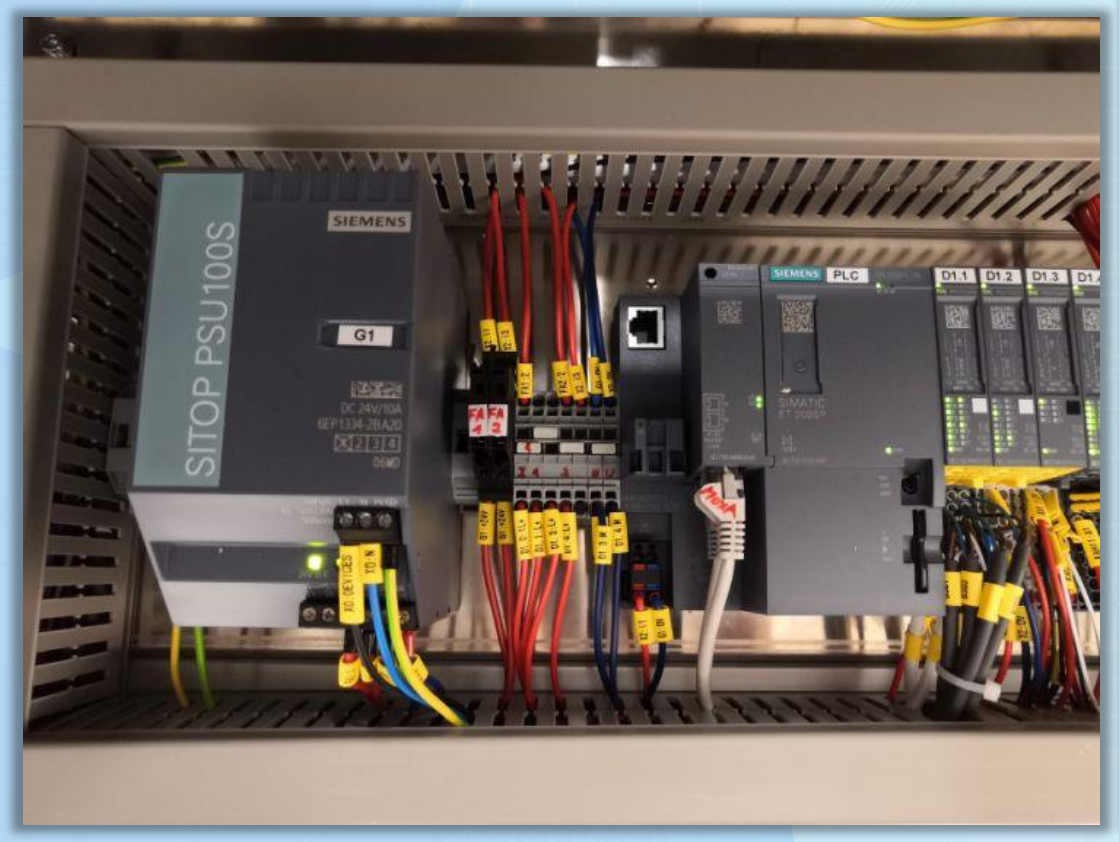
ELMA – Production Type

Fully Automated Meter Calibration and Testing

- Safety and Control Integration (Siemens PLC)
- Supervising by SW “Manager”



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ELMA – Production Type

20 positions – three-phase system

video: http://www.appliedp.com/download/video/Elma20-Horizontal-Manual.mov

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ELMA – Production Type

20 positions – three-phase system

video: http://www.youtube.com/watch?v=RuRPNsgOyCI

20 positions – single-phase system

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ELMA – Production Type

24 positions – three-phase system – swap side

video: http://www.appliedp.com/download/video/elma24-horizontal-swapside.mp4

ELMA – Standard Type – Fixed

5 positions

10 positions

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ELMA – Standard Type – Fixed

20 positions – double side

20 positions – single side

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ELMA – Standard Type - Mobile

40 positions

Power Source

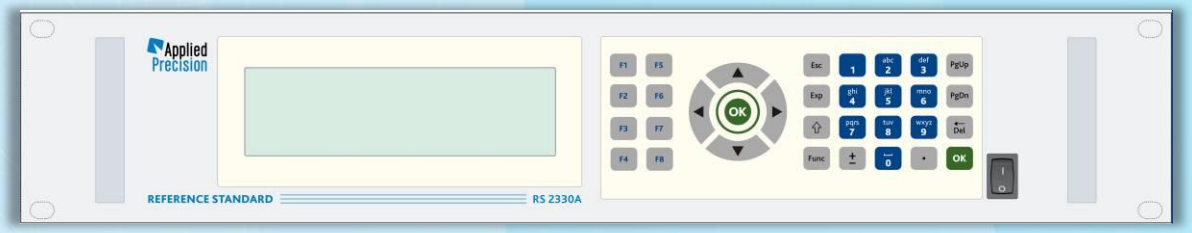
- Generates and delivers precision high power voltage and current signals for high volume calibration and testing of electricity meters and measuring devices
- Modular design enables simple customization
- Signal generation based on digital synthesis of the signal waveform up to 100th harmonic
- Power Quality Signals
- Ripple Control
- High efficiency power output stages offer extremely high fidelity and noise-free output.
- Switch mode output stage efficiency better than 85%
- 19’’ Rack System
- RS 232 (IEEE 488 optional) with SCPI compatible programming protocol
- Output protection

Power Source - Specifications

- RMS Voltage: 30 V – 300 V (500 V - optional)
- RMS Current: 1mA – 120 A (240 A - optional)
- Output Power: 100, 300, 600, 1000, 1500, 2000, 2500 VA
- Phase Angle: 0° - 360°
- Frequency Range: 40 – 70 Hz
- Stability: 0.005 %
- Distortion Factor: <0.3 %
- Accuracy: 0.20 %
  0.05 %
  0.02 %
  0.01 %

Reference Standard RS 2x30

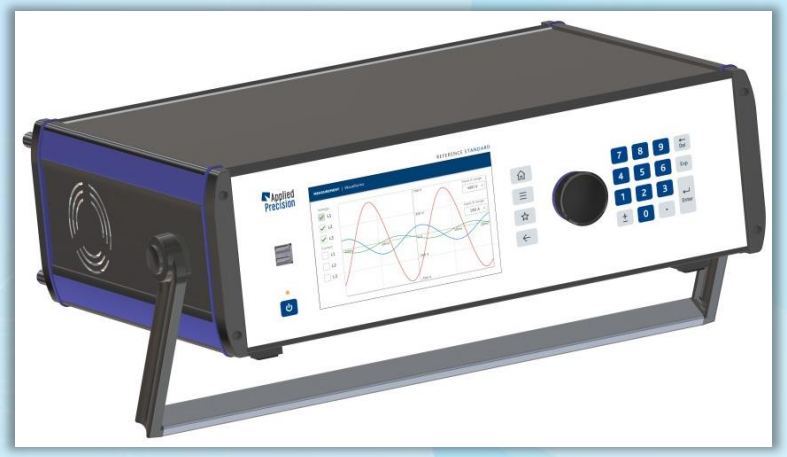
- Precision meter of electrical power and electrical energy
- Single-phase or three-phase, with display and keyboard
- Precision classes: 0.05, 0.02, 0.01
- 24-bit A/D precision conversion, FFT
- Programmable output impulses, 4 independent impulse outputs, 1 impulse input
- Remote control
- Measured quantities
  - Power, energy - active, reactive, apparent
  - Voltage, current, phase, frequency, distortion
  - harmonic content
- Meter Testing
- Energy Dosage Control



Reference Standard RS 3330

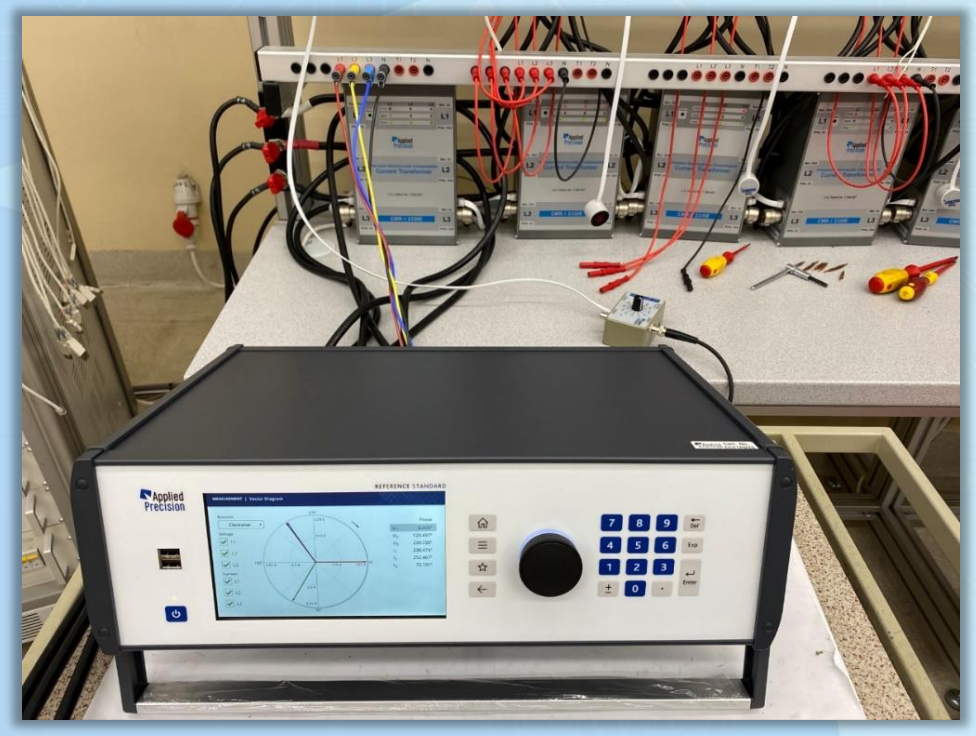
- 7” color touch display (with multi-touch function)
- Accuracy:
  - Model RS 3330S ... 0.01 %
  - Model RS 3330E ... 0.02 %
- Wide Measuring Range: 0.1 mA – 120 A, 0.1 V – 600 V
- Voltage and Current Inputs CAT IV 300 V / CAT III 600 V
- Bandwidth: 10 kHz
- Sampling rate: 24-bit 125000 samples/second
- Harmonics and interharmonics up to 200th harmonic
- Internal Processing up to 1024th harmonic

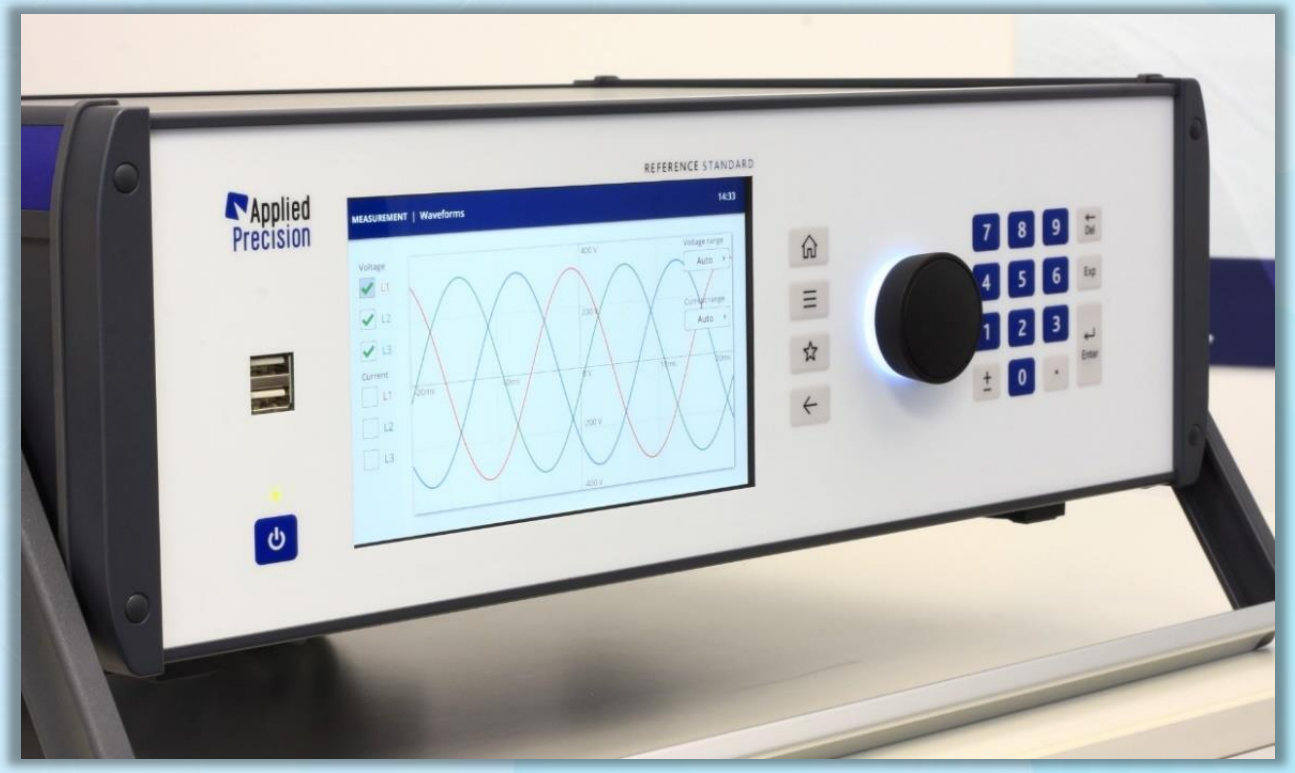
- 4 independent frequency inputs
- 4 independent frequency outputs (programmable), up to 4 MHz
- Ethernet connection, remote control, data exchange
- Power Quality Measurement According to IEC 61000-4-30



Reference Standard RS 3330

- Full Compatibility with ELMA Systems
- Standalone Version
- Use Case:
  - Primary Reference of Power and Energy
  - Meter Test Equipment Periodic Verification (“Weekly Maintenance”)
  - Power Quality Meters Verification





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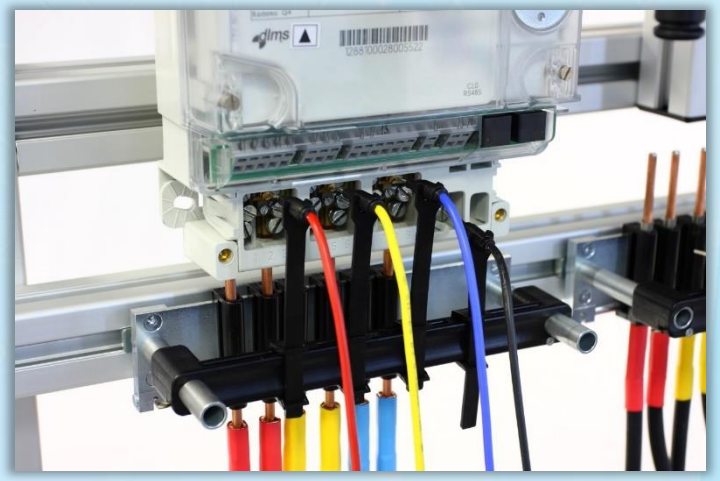
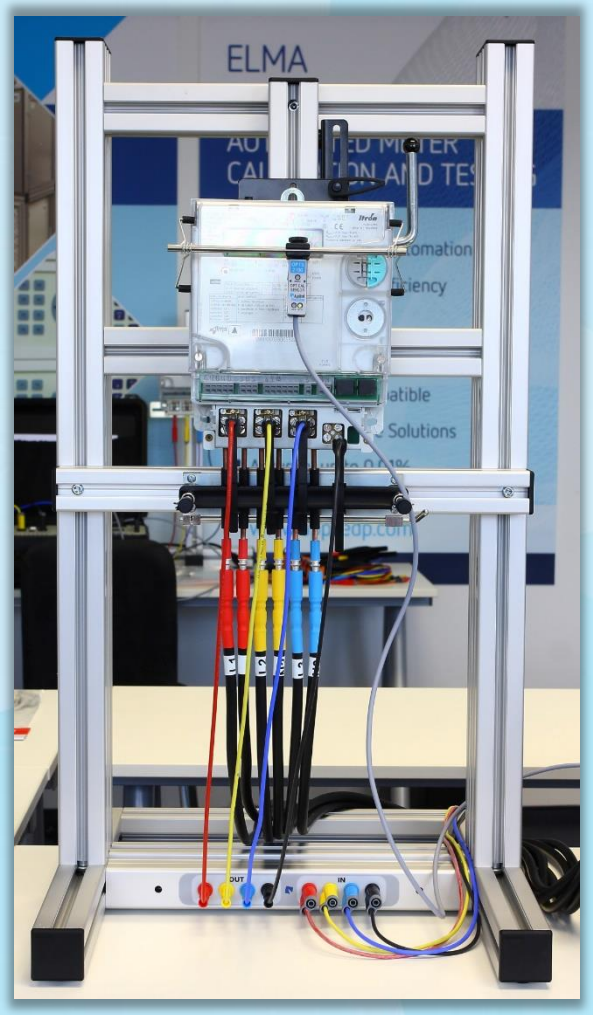
Meter Handling System

- Fixed system – static stands
- Mobile system – fixed racks, mobile stands
- Modular design
- Quick connection for voltage, current and auxiliary contacts
- Single-phase or poly-phase quick connection mechanism
- Universal system – for any type of meter
- Customer specific design on demand
- Stands with Precision Electronically Compensated Transformers - simultaneous testing of meters with interconnected voltage and current circuits



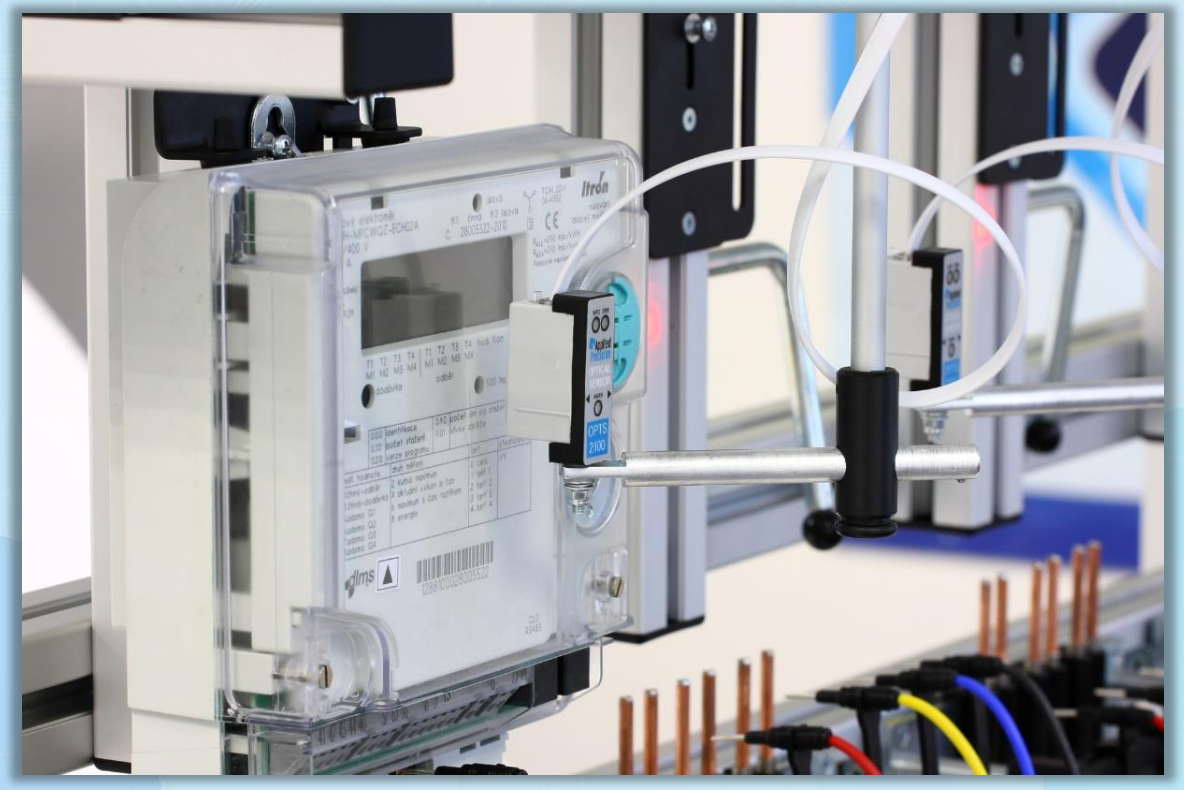


Local Evaluation Unit OPS

- Evaluation of meter error
  - static meters
  - inductive meters
- 4 inputs
  - LED/Disc sensing
  - LED/Disc sensing (reactive energy)
  - SO – meter impulse output sensing
  - BNC Input (20 kHz / 2 MHz)
- Local microcomputer
- Local control buttons
- Built-in dividers for evaluation of high constants meter up to 2.5kHz

Local Evaluation Unit OPS - Accessories

- Enhanced Optical Sensor OPTS 2100
- Optical Communication Head OPTH 1000 / OPTH 2000
  - Supports simultaneous meter data exchange
  - EDEX compatible
  - USB compatible



Precision Electronically Compensated (PEC) Current Transformer

- Common Mode Rejecter for testing meters with interconnected current and voltage circuits (I-P links)
- Universal, small sized electronically controlled precision current transformer
- Serial remote control for Load Monitoring, Protection Circuits and Load Bypass
- Current ratio defined by primary and secondary coil via number of respective turns.
- Internal electronics assures exact primary and secondary ampere-turns equality
- Negligible additional power loss - no power increase is needed for closed link capability
- Universally applicable standalone unit with easy implementation to any existing test bench system
- Patented

PEC Current Transformer - Specifications

- Max. Amplitude Error: 0.05 % , 0.02 %, 0.01 %
- Max. Phase Error: 0.03°, 0.01°, 0.005°
- Max. Output Power:
  - 1 x 50 VA (CMR-I 2130)
  - 2 x 50 VA (CMR-I 2230)
  - 3 x 50 VA (CMR-I 2330)
- Output / Input Voltage Ratio: user defined
  (1:1 for single wire circuit)
- Dynamics: > 100 000
  (240 A : 1 mA for single wire)
- Frequency Range: 45 – 65 Hz
- Power Supply: optional adapter PSCI 1220A
- Internal Power Consumption: < 2 VA
- Protection: Overload, Open Circuit

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Control Software ELMA

- Dedicated for electricity meter testing and calibration
- Controls all modules, data acquisition, evaluation, output documents generation, archiving, analysing
- User friendly programs for Microsoft Windows 10 / 11
- Network support in distributed systems, client/server architecture with central database
- Multilingual user interface with predefined and user definable dictionaries enables immediate national and regional implementation
- Simple switch of display from global characteristics of the process to detailed results on any meter
- Simple input of meter parameters, user defined tests, sequences, addresses and user friendly operations with respective databases
- User defined test limits with support of IEC standards and local regulations
- Graphic representation of measurement results, deviations and curves
- Output documents generation by usage of templates in Microsoft Word or Fast Report
- Support of mobile terminals for manual or barcode data acquisition
- Harmonic content definition in measuring power signals
- Simultaneous (parallel) data exchange with meters (EDEX)

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Portable Devices

WORKING STANDARD

ON SITE METER TESTING

- New Handy Design with 5.7" Display
- Integrated Voltage Input 600V CAT IV
- Electricity Meter Error Evaluation
- Dial Test, Maximum Demand Test
- Meter Data Readout
- Transformer Test
- Accuracy up to 0.02%

PORTABLE TEST EQUIPMENT

METER TESTING ANYWHERE

- Source and Reference in One Package
- Single Position Meter Test System
- Current Phantom Load
- Harmonics and Ripple Control
- Complex Software Compatibility
- Wireless Control from Android Device
- Accuracy up to 0.02%

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Working Standard

- Handy and Lightweight Design with 5.7” Color Display
- Integrated Voltage Input 300 V CAT IV / 600 V CAT III
- Integrated Power Supply Function from Measured Circuit
- Two Universal Inputs for Voltage and Current Probes for Power or CT / VT Ratio, Phase and Burden measurement
- Accuracy Classes 0.2, 0.1, 0.05
- Color Graphic Display and Alphanumerical Keypad
- USB Connectivity with PC
- Enhanced Optical Scanning Head
- Optical Interface for Local Data Exchange with Smart Meters According to IEC 62056-21

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Working Standard

- High Capacity Memory for Configuration and Data Storage
- LED and TTL Impulse Outputs with Programmable Meter Constant or Frequency
- Vector Diagram and Signal Shape Display (Oscilloscope Mode)
- Harmonics Analysis in Tabular and Graphical Format
- Database System for Tested Meters and Measured Results with Search Capabilities Fast Synchronization of Measured Data and Configuration with PC
- PC Software for MS Windows
- Configurable User Interface (Regional and Functional Modifications)
- Transport Case with High Protection Degree

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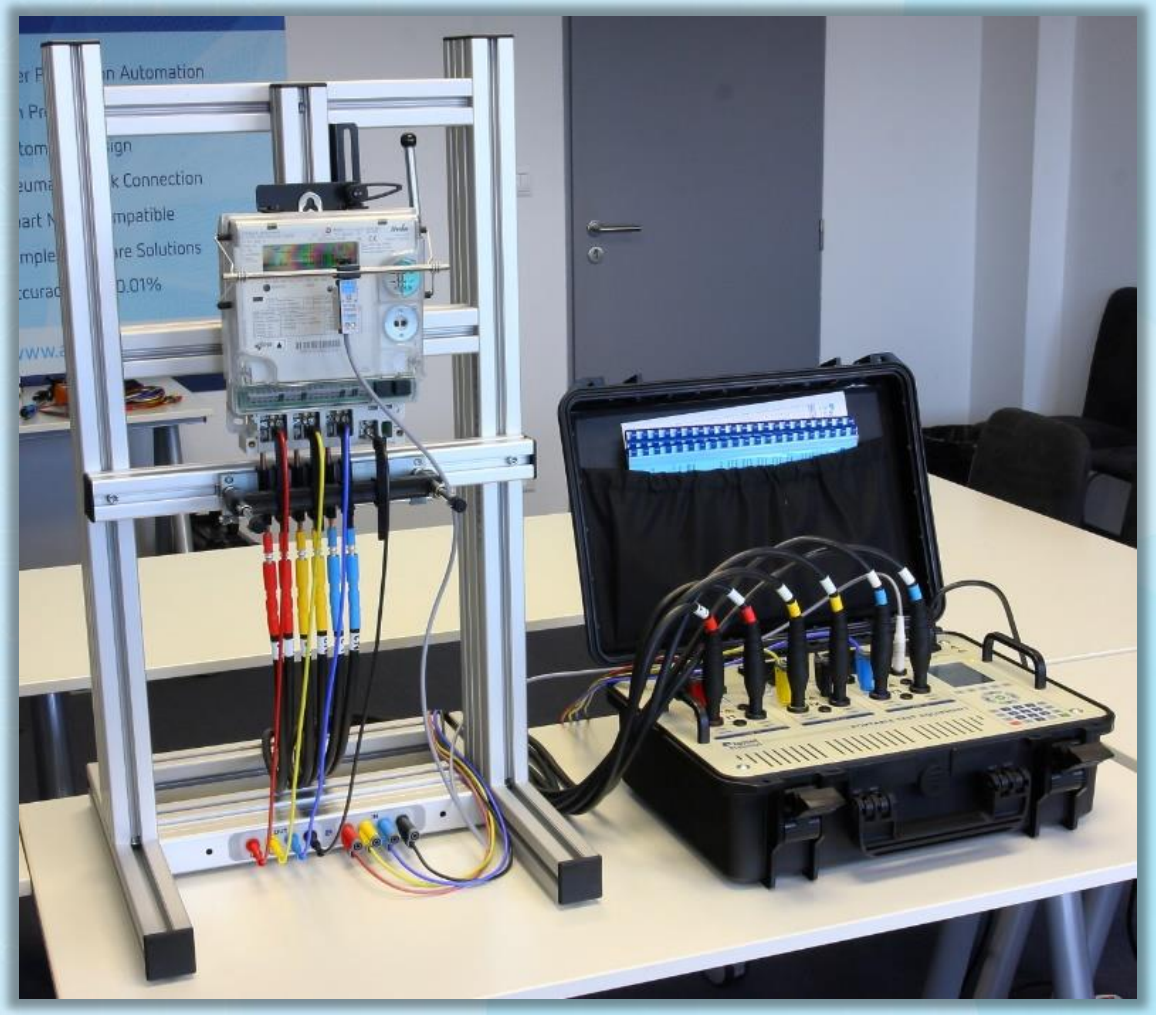
Portable Test Equipment

- The Portable Test Equipment consists of an integrated three-phase current and voltage source and a three-phase electronic reference standard of accuracy class 0.05% or 0.02%
- Laboratory and on-site meter measurements
- Easy evaluation of meters under precise load conditions, using the built-in compact current and voltage source
- Testing of meters with closed I-P links
- Automatic operation with predefined load points without the need for an external computer
- Each source channel can be programmed with user defined harmonic content or standardized signal test shape
- Each source channel can be modulated with programmable Ripple control telegram
- Independent generation of single or three-phase loading conditions for testing, calibration and verification of meters
- Active, reactive and apparent energy measurement for three phase, 3 or 4-wire, systems with integrated error calculator and pulse output

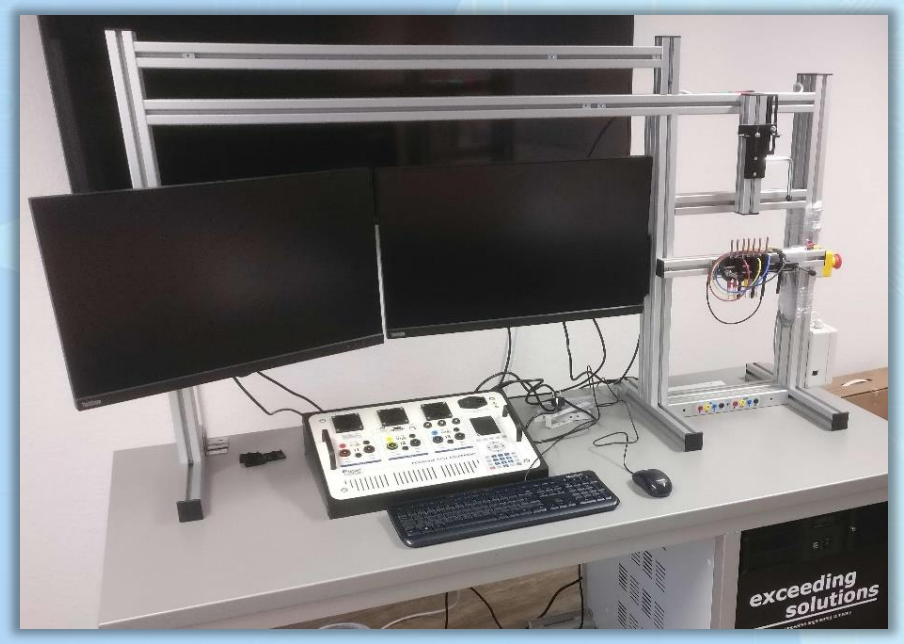
Portable Test Equipment - Specifications

- Output Voltage: 3 V – 300 V / 30VA max.
- Current Output: 1mA – 120 A / 60VA max.
- Phase Angle : 0 .. 360 °
- Frequency Range: 40 – 70 Hz
- Optical scanner – sensing LED or disc
- Snap switch, impulse input
- Compatible with external voltage and current probes
- USB / RS-232 communication
- OS Windows based PC software for data transfer and presentation
- Supplied with transportable case



PTE – Small Meter Test Systems

- Combined usage of internal current source and external voltage measurement – phantom load
- Small meter test systems from 1 to 4 positions
- Integration of PTE to table worktop



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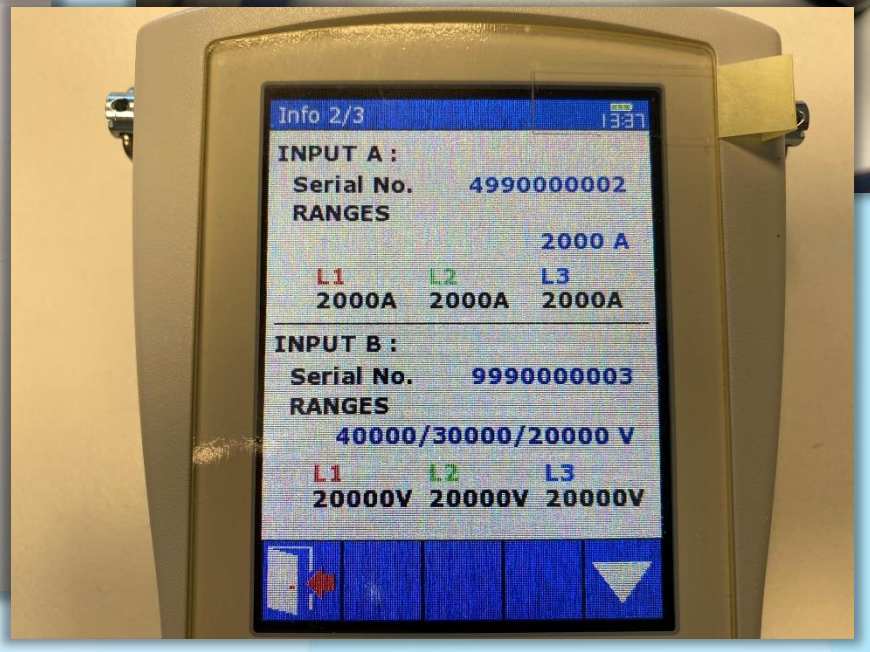
USeGate – Universal Sensor Gate



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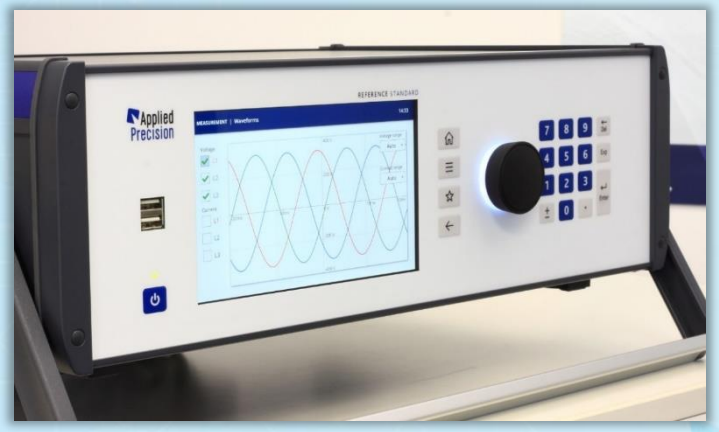
Ecosystem of Applied Precision



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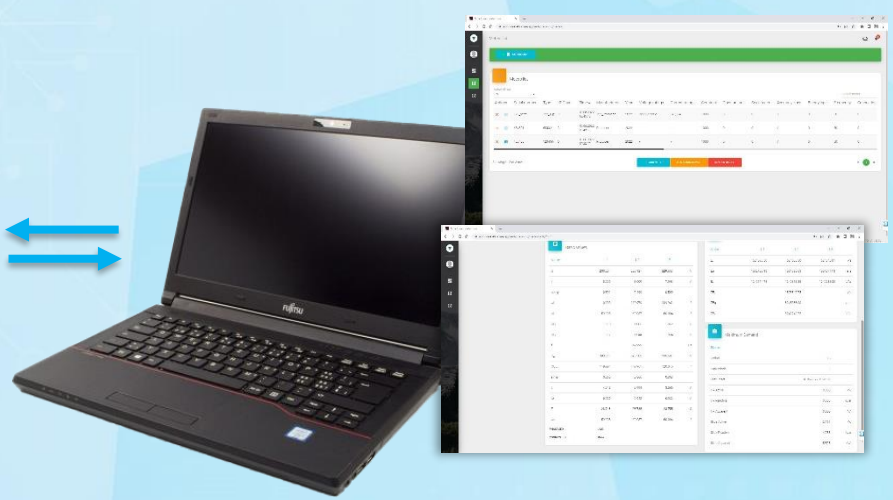
AP Cloud



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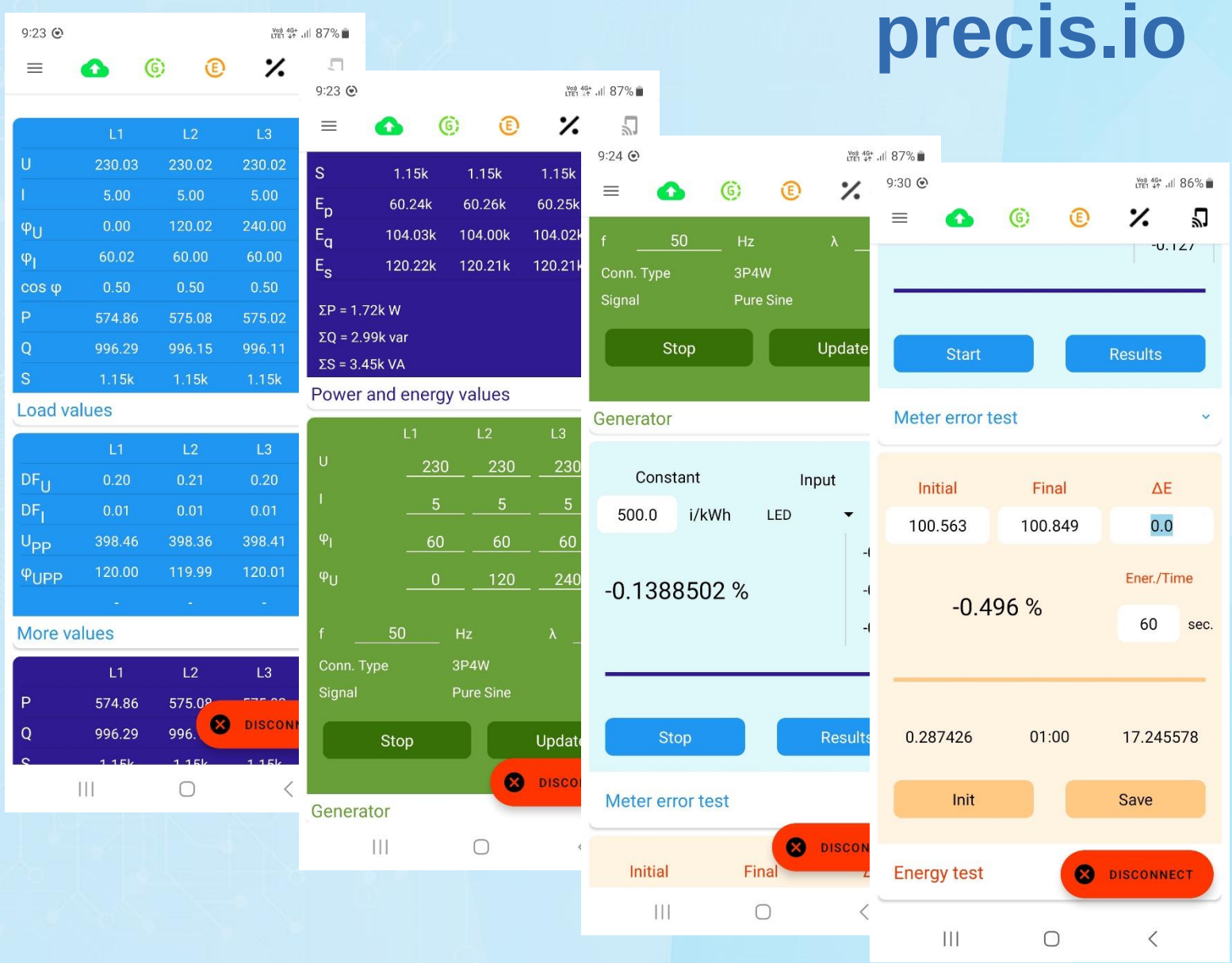
- New Version of Android app.
- New Graphical Tiles:
  - Vector Diagram
  - Harmonics
  - Signal Shapes
- Meter Database
- Communication with AP Cloud



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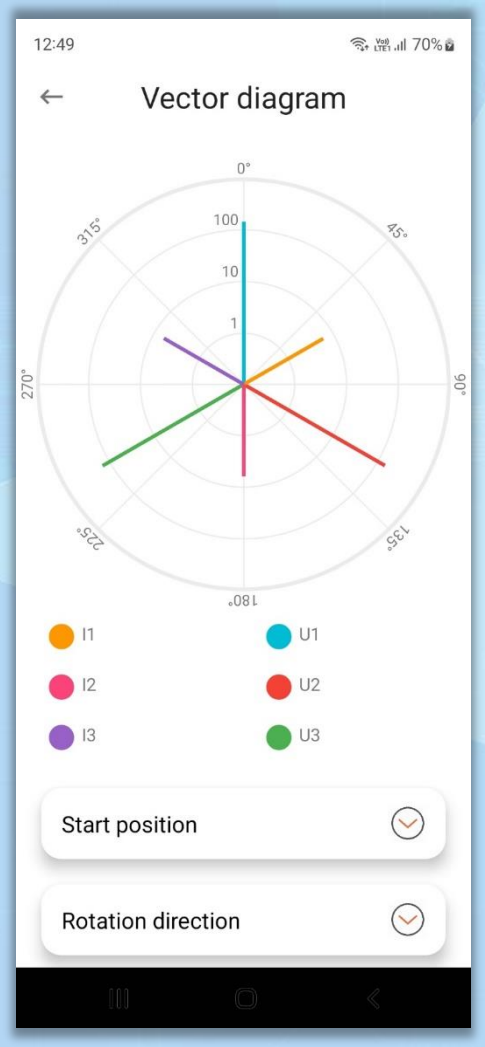

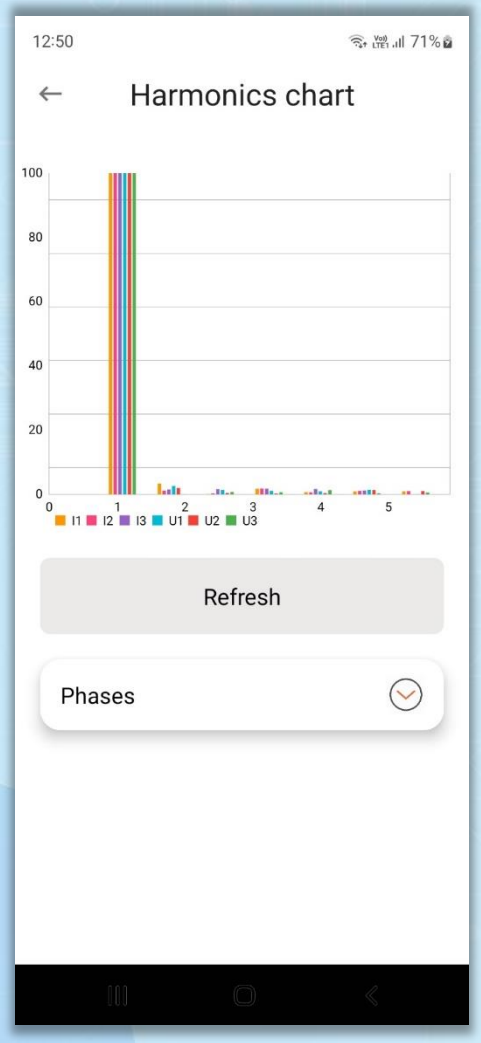

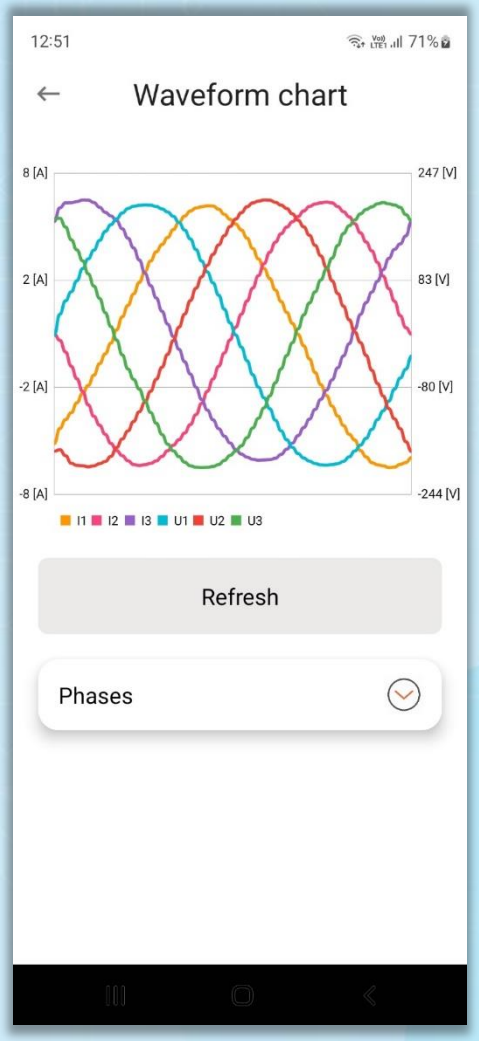

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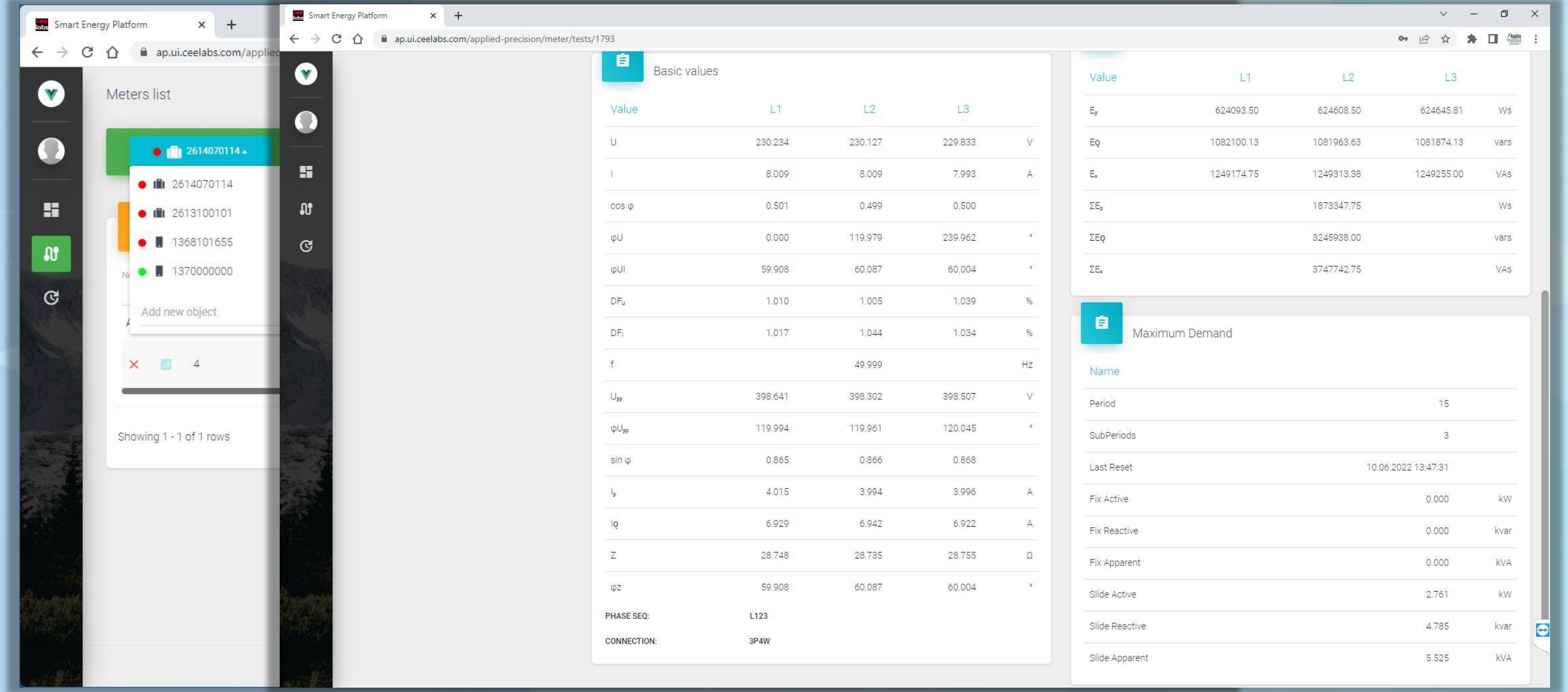
AP Cloud



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