

# GLP2-MODULAR

Universal safety, function and high-voltage tester



# GLP2-MODULAR

## customized for special testing tasks

The GLP2-MODULAR serves to test the safety and function of electrical products of all kinds. Innovative technologies are the key features of this tester.

One highlight of this tester is the extreme modularity. 30 different test methods that can be integrated into the tester are the basis for perfect individual solutions. Tailored to your every need. For anything on top, we offer alternatives.

Thanks to a great number of intelligent functions, the tester covers all application fields of modern safety and function testing technology. It is ideally suited for production, laboratories, test bays, quality assurance, automation and more.

With a flexible generation of test plans, test-job-data input, result storage, allocation of serial numbers, freely configurable label printing, barcode functions and many other features this tester meets all your requirements. Owing to a number of interfaces to the modern IT world, the integration into high-profile manufacturing processes has almost no limits.

For many companies, increasing energy efficiency is an essential goal in terms of cost savings and environmental awareness. We see it as our responsibility to support them by providing sustainable and environmentally-friendly testing technology. For „clean“ results!

Our engineers always strive to use state-of-the-art testing technology, thus increasing efficiency and performance. To live up to this ambition, we were the first to design user-friendly testing technology with touch displays.

Smart, intuitive operation is the top priority for SCHLEICH. The SCHLEICH Technology Package proves this once again. It is all about

good and minimalist operator prompting. Our aim is information that can be captured at a glance and in a flash. No more, no less.

Ergonomically optimized workplaces help to increase the performance to a high degree! It should be fun to work with the testers and they must be convenient to handle.

SCHLEICH offers safety and function testing technology that inspires.

- > ALL-IN-ONE standard
- > SCHLEICH MODULAR CONCEPT
- > standards-compliant safety testing
- > Extensive function tests
- > communication with your IT
- > straightforward operation



### KEY FACTS

- more than 30 test methods – integrable into one device
- for all safety tests required worldwide
- for 1-phase and 3-phase function tests
- fully-automatic test-method switch-over
- semi-automatic and fully-automatic tests
- automatic good/bad comparison
- long-term analyses over hours, days or weeks
- intuitive operation via touch screen
- input via mouse and keyboard possible
- with test-plan and test-result database
- scanning of any type of barcodes
- port for label printer
- integration into your computer network
- integration into your IT-world
- interfaces for automation

# Fields of application

## Manual test stations

The GLP2-MODULAR is ready to perform your measurements. Owing to the unique manual mode, all test methods integrated in the GLP2-MODULAR can be applied directly. A test-plan setting is not necessary. You only need to select the desired test method and start the test.

Complex testers often provide several connections to the DUT. Via the touch screen, the test method can be applied to the connections of the DUT with just one click.

Similar to a multimeter, the GLP2-MODULAR continuously displays the latest measured values of the test. You can instantly evaluate your DUT in all detail.



## Semi-automatic test stations

For typical testing within production, the tests are carried out manually via test probes and/or fully automatically. Especially for this type of application, the GLP2-MODULAR offers ideal features and convenient operator prompting.

If required, the GLP2-MODULAR will directly print labels on one or more external printers, after the test has been completed.

In addition, you can store a great number of order data at any time. The data is stored and printed on the SCHLEICH standard protocol in addition to the test results.



## Fully-automatic test stations

Integrated into a fully-automatic production line, the tests are performed fully-automatically without manual intervention. The GLP2-MODULAR is usually operated in one of the following two modes:

### Mode 1:

The GLP2-MODULAR is entirely remote-controlled by a system control. The higher-level control system defines all test parameters or selects the test sequence stored in the test system. The contacting and all mechanical procedures are carried out by the system control. The system control starts the tester, as soon as it has prepared the test. After the test has been completed, the GLP2-MODULAR transfers the test results to the system control.

### Mode 2:

The GLP2-MODULAR or an additional PLC controls all mechanical procedures in a test cell. In addition, the tester communicates with a system control or with an MES-system.



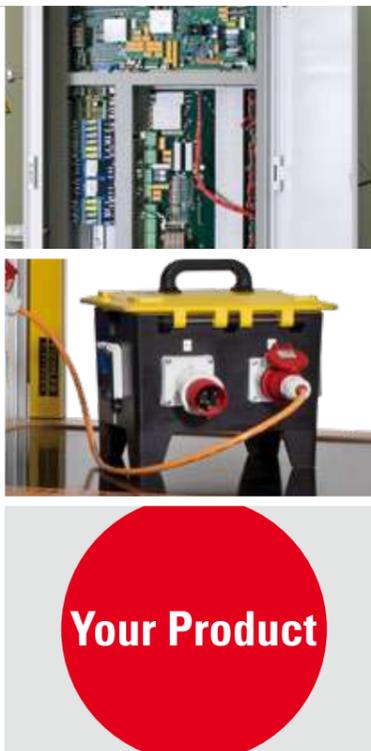
# Test solutions for versatile applications

Electrical engineering requires a great number of different applications – the GLP2-MODULAR adapts to this challenge. With enormous flexibility it is suitable for the most diverse tasks of safety and function testing.

You can configure hardware and software features. This gives you a test system tailored to your requirements and within budget.

- > automotive
- > railway technology
- > battery testing
- > electrical devices
- > electric mobility
- > electronic modules
- > household appliances
- > industrial electronics
- > communication electronics
- > consumer electronics
- > lighting industry
- > aviation industry
- > medical engineering
- > motor engineering
- > transformers
- > traffic engineering
- > materials testing

...



# A deep look into electrical products

The test system GLP2-MODULAR combines all test methods in one unit. This allows to test electrical products for all possible faults with only one test run.

The interaction of the individual test methods with our award-winning innovations assures the quality of your production.

safety tests

function tests

PE/GB-resistance

insulation resistance

high-voltage strength

dielectric strength

residual voltage

clearance and creepage distance

partial discharge

leakage current

medical leakage current

touch current

enclosure leakage current

load

inductance, capacitance

resistance



**DUT**

current

voltage

power

reactive power

single-phase

three-phase

three-phase current

battery charge

wiring, reversed polarity

brightness

speed

temperature

pressure

leak-tightness

LED-test

camera

# GLP2-MODULAR features

## Workflow



# The basis

## starting point for everything

The basic module comes without test methods.

The basic module provides the entire digital technology, the display and the measurement technology. It is the foundation for combining a great variety of safety and function test methods.

The intuitive operation allows a rapid generation of test plans. You can generate test plans based on individual test steps in no time at all. The overall test process consists of the combination of all test steps. Your product is thus tested test step by test step. Each test step consists of any desired test method with pre-settable test parameters such as set value, limit value, test time, etc.

We consistently rely on well-known and proven Microsoft® technologies. As they are familiar to most users through private and business use, the operation of the tester is quite simple.

A user-friendly and well-readable display guarantees a safe use of the tester. Your staff will learn how to use the tester intuitively and fast. During the test, the display is reduced to the essentials; only relevant data are shown.



Made in Germany

- > fully-automatic test process
- > intuitive creation of test plans
- > flexible modularity
- > complex processes made easy
- > comprehensive test management

# Basic equipment

### Function and technology

- large, capacitive touch screen
- clear screen display without information overload
- Microsoft® Windows operating system
- high-level processing of test plans
- integrated plausibility checks for all parameters
- fast and precise measurement technology
- vast configuration options
- script editor for maximum flexibility
- secure storage of test plans and test results
- storage locally or in the network
- monitoring of switching cycles according to industry 4.0
- remote maintenance and calibration
- many different languages

### Communication

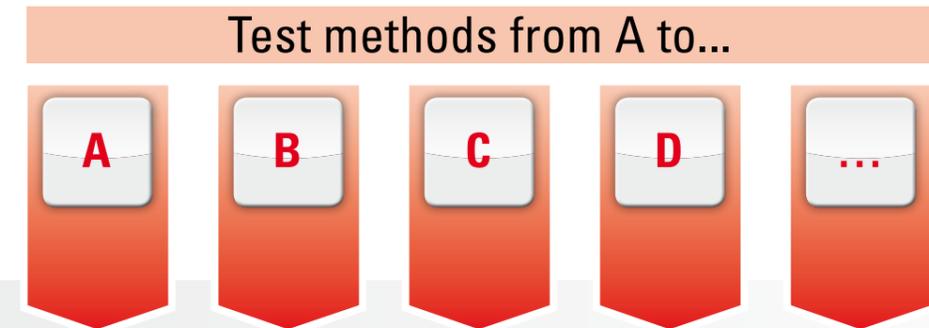
- USB-interfaces on front and rear panel
- RS232 and LAN/Ethernet automation interface
- digital I/O-interface
- result outputs for GO and NO GO
- interfaces for barcode scanner and label printer
- CAN-bus

Optional automation interfaces:

- EtherCAT
- PROFIBUS
- PROFINET
- and more ...

### Safety

- start input
- dual-circuit safety inputs according to EN50191
- designed for performance level "e"
- connection for external dual-circuit Emergency Stop
- connections for warning and result lamps
- safety and warning messages



# SCHLEICH MODULAR CONCEPT

individual test systems made to measure

- > unlimited number of test connections
- > flexible enclosure concept
- > single or multiple stations

SMC  
 SCHLEICH MODULAR CONCEPT

Nr.	Bezeichnung	Beding./Istwert	Sollw./Istwert	Bewertung
1	Gehäuseprüfung durchgeführt			
2	PE an Gehäuse	10A 10.5A	0.500Ω 0.0270Ω	
3	PE am Reflektor	10A 10.5A	0.500Ω 0.0270Ω	
4	Isolationsprüfung LN/PE	500V 504V	2.0MΩ 5.1GΩ	
5	Funktion Leistung 100%	230V 230V	16.0W 16.6W	
6	Dimmfunktion 10%		10% 10%	
7	Leistungsprüfung Dimm 10%	230V 230V	3.5W 3.6W	
8	Dimmfunktion 80%		80% 80%	
9	Leistungsprüfung Dimm 80%	230V 230V	13.5W 13.6W	
<b>Betriebsbereit, warte auf Prüfstart</b>		132	90	37.3s
Kemox 29-47-2-B		Peter Griese	486-KI-890-17	
Prüfplan laden		Prüfer	Auftrags eingabe	

PE/GB-resistance  
  
 mΩ

Insulation resistance  
  
 kV GΩ

High voltage AC  
  
 kV mA A

High voltage DC  
  
 kV mA GΩ

Short circuit  
  
 L N

Function 1-phase AC  
  
 A ~

Function 3-phase AC  
  
 A ~

Function DC  
  
 A =

Leakage current 1-phase  
  
 mA μA

Leakage current 3-phase  
  
 mA μA

Substitute-leakage current  
mA μA

RCD

Continuity  
Ω

Resistance  
Ω

High voltage AC/DC hot  
kV mA A

Residual voltage  
V

Capacitance  
μF

Inductance  
H

Analog measurements  
V

Mathematical checks  
 $\int_a^b (f(x))^2 dx$

Arc detection

Polarization

Visual inspection

Special tests

Mechanical testing

Based on the SCHLEICH MODULAR CONCEPT, GLP2-MODULAR test systems offer a great number of different options to combine individual safety and function test methods. The required test methods are defined by your individual testing task. You can select them from a large pool of test options.

Only one or a multitude of test methods – the configuration is determined by you! Your GLP2-MODULAR could, for example, be configured as a special high-voltage tester with many test outputs. For more complex testing tasks, you may need a combination of all possible test methods.

The SCHLEICH MODULAR CONCEPT of the GLP2-MODULAR test systems allows you to compose exactly the tester you need. You can do this not only by incorporating various individual testers in an oversized test rack, but also by integrating all tests into a compact modular enclosure. The size of the enclosure is defined by the type and scope of the individual tests.

The flexibility of GLP2-MODULAR test systems is reflected not only in the enclosure, but also in the number and arrangement of the connections of the tester. With 19"-containers and especially with

industrial 19"-cabinets, the test connections can be placed on all sides of the tester. This enables us to cope with all spatial requirements.

Each tester benefits from the experience of thousands of systems already made. At SCHLEICH, this experience is implemented consistently, with passion and without compromise.

This is „customer based technology“.

# SCHLEICH MODULAR CONCEPT

typical configurations

## Basis

- system technology
- Windows® operating system
- touch screen
- measurement technology
- test software

## Modular Configuration

### Test methods



### Test-method switch-over



High-voltage sockets at the front



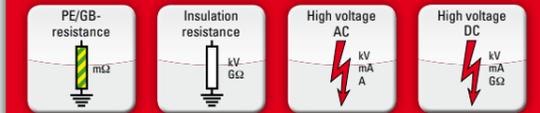
SCHLEICH provides tailor-made testers according to your specifications.

## Basis

- system technology
- Windows® operating system
- touch screen
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- test software

## Modular Configuration

### Test methods



### Function 1-/3-phase AC



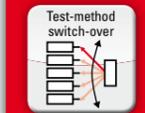
### Leakage current 3-phase



### Continuity



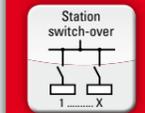
### Test-method switch-over



### Matrix



### 2-way station switch-over



### Mechatronics

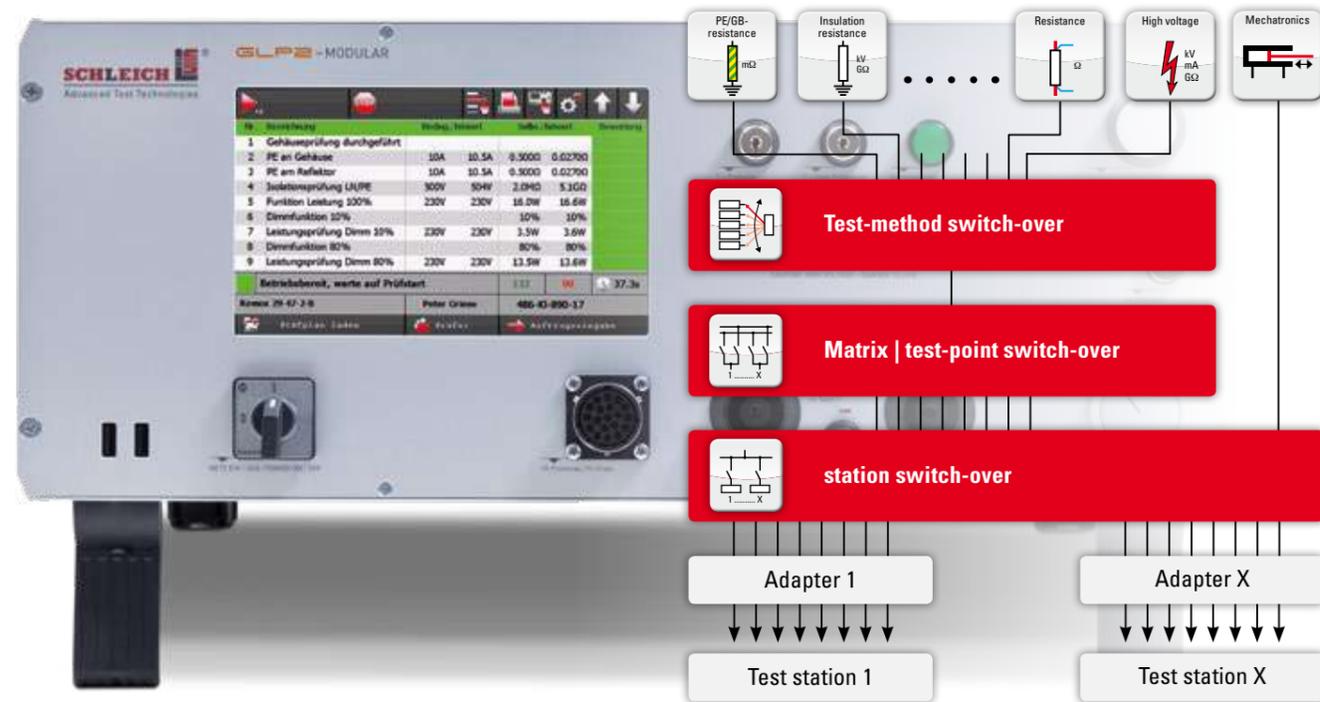


Industrial connector at the rear panel



SCHLEICH provides tailor-made testers according to your specifications.

# Test-method switch-over and mechatronics



Testing technology made by SCHLEICH has proven itself thousands of times in day-to-day use. It is one of the most reliable products on the market and offers high value through outstanding performance and accuracy.

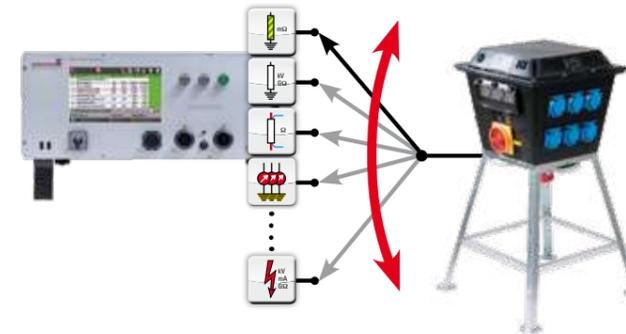
To save time, the DUT can be connected by means of a contacting adapter. The tester performs the intended tests fully automatically – no manual intervention required. This is realized with the SCHLEICH-typical automatic test method switch-over.

For DUTs with several test points, it is more economical to connect all test points to the tester right away. The tester will perform all tests fully automatically between all connection points. This procedure reduces the required clock rate and thus the costs for testing. For switching over between the individual test points, we use flexible switch-over matrixes.

In order to keep the time required for connecting a DUT with many test points to a minimum, we often realize dual- or multiple-station systems. While testing in one station, the other stations are loaded or unloaded.

Even with complex and extensive tests you can thus achieve very economical results.

## Test-method switch-over



Depending on the type and extent of the test methods, we offer a wide range of individual switch-overs. They allow to switch over between the test methods quickly and automatically.

As the voltage differences between the test methods can be very high, safety is the top priority for switch-overs. A resistance test with 3 V is connected to the DUT just as reliably as a high-voltage test with 6000 V. This protects your personnel and the DUT. Without compromise! For the production of switch-overs and matrixes we, therefore, only use tried and tested, high-quality components from our own production or from well-known suppliers.

## Matrix | test-point switch-over



We offer the matching relay matrix for almost any task. Matrixes differ in the number of connections and the level of the test voltage to be connected. A matrix must be able to connect 6000 V just as safely and reliably as millivolt signals. Our engineers have developed the matrixes exactly for this purpose. Matrixes are designed for two- and four-wire applications. They can be arranged in series in order to increase the number of connections. Matrixes with more than 100 connection points are commonplace.

For matrixes, the same applies as for test-method switch-overs: We use only top-quality materials.

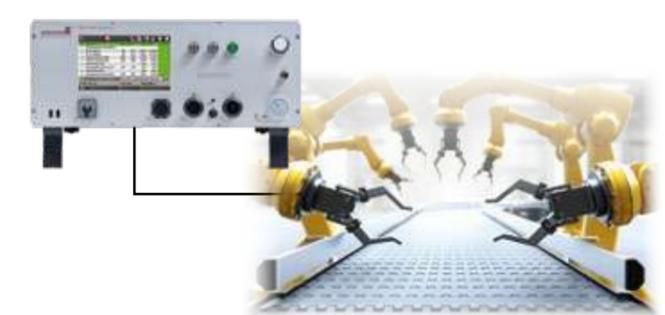
## Station switch-over



Station switch-overs can be an economical alternative to using two or more individual testers. It goes without saying that they also have to meet our highest safety requirements. While testing in one station, the other stations are loaded or unloaded. The operator inevitably touches the terminals and connection leads. Electrical hazards may occur if terminals and connection leads are touched. For this reason, the test leads going to the stations where no test is in progress, must be disconnected securely. SCHLEICH station switch-overs operate according to standards and are equipped with the latest safety technology.

**Operator protection is one of the key features of our testers – following the general principle: “Safety first”! Only circuits with dual isolating contacts and approved monitoring relays are used. If required, all test leads from the DUT are connected to ground and discharged.**

## Mechatronics | script control



Just like the hardware, the software of our testers also comes with a very high level of flexibility. Thanks to the integrated script commands, you can incorporate PLC-functions into the tester. You can query inputs, set outputs and create logical links – just like with a PLC.

The economic advantage lies in the direct control of operational mechatronic sequences. You can control valves, query limit switches, evaluate test values and much more. I.e. the tester can generate additional operational sequences before, during and after the test. This is ideal, if you intend to work with your own test set-ups or for integration into an automatic production line.

# Enclosure size defined by your individual requirements

Owing to their compact design, our testers offer a multitude of test features in one single enclosure. Combining the test methods in accordance with the SCHLEICH MODULAR CONCEPT, therefore, includes a modular enclosure principle.

Depending on your requirements, your application can be accommodated in a compact table-top unit, a 19"-built-in unit, a 19"-container or a 19"-industrial cabinet. We use enclosure components from renowned German manufacturers as well as components from our own production to guarantee a safe and stable integration of the testing technology.

The modular enclosure concept will give you a cost-effective and professional overall solution.

We aim at realizing the most economical solution for your task and the most flexible solution for your work processes.



19"-table-top unit 4 RU

19"-table-top unit 8 RU

19"-table-top unit 12 RU

19"-container 12 RU

The basis for our range of enclosures is a solid industrial aluminum enclosure. The devices are equipped with tilt feet. Table-top enclosures can later be modified for integration into a 19"-cabinet.

The container enclosure is used for testers that are equipped with large and heavy transformers or large relay-switching matrixes. At the sides, the container has ergonomically positioned recessed grips. They are delivered with castors or as table-top units.



19"-panel-mounting device 4 RU

19"-panel-mounting device 8 RU

19"-panel-mounting device 12 RU

These testers come with the typical installation kit for integration into a 19" control cabinet.



19"-container 16 RU

19"-container 25 RU

19"-container 34 RU

19"-industrial cabinet

The industrial cabinet is used for testers that are equipped with large and heavy transformers or very large relay-switching matrixes.

This enclosure variant is the largest of this range. The cabinet has a fixed height, but the width is variable in a 600-mm grid.

# Test methods

## PE/GB-resistance



The PE/GB-conductor is checked with an electronically regulated, constant test current. The tester calculates the PE/GB-resistance on the basis of the voltage drop at the PE/GB-conductor and the flowing current. It must not exceed the maximum resistance defined in the standards. By means of a test probe (to be ordered separately), the operator contacts the PE/GB-connections of the DUT to be tested one after the other. Alternatively, this is realized via the matrix with an automatic switch-over between the test points.



Resistance test	with four-wire method
Test voltage	6 V, 12 V or 18 V or according to your requirements
Test current from 1 to...	10 A, 30 A, 50 A, 75 A, 100 A or according to your requirements, in 1-A steps
Frequency	50 Hz, 60 Hz or DC
Test time	0.1 – 180 s
Automatic start of test upon contact with test probe	-
Test points	manual test probe ↔ any test points or between matrix connections

## Insulation resistance cold or hot



The insulation is tested with electronically regulated, constant test voltage. The tester calculates the insulation resistance by means of the voltage drop and the flowing current. The insulation resistance must not be lower than the minimum resistance defined in the standards. It can be measured between all electrical conductors (devices of protection class I) and between the electrical conductors to insulated enclosure components (devices of protection class II). The operator contacts the enclosure components to be tested with the test probe one after the other. As an alternative, you have an automatic switch-over between the test points via the matrix. After the test, the DUT is always discharged.

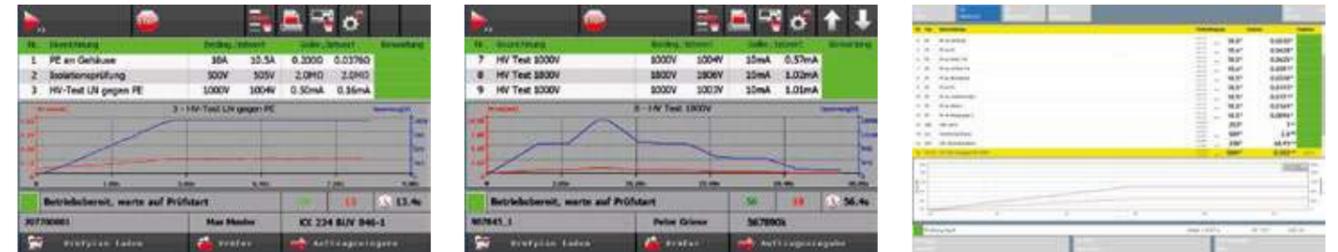


Measuring range	100 kΩ - 10 GΩ or according to your requirements
Test voltage $V_{DC}$ partly potential-free up to...	1000 V, 1500 V, 6000 V, 10000 V, 15000 V or according to your requirements
Ramp time	0.1 – 60 s
Test time	0.1 – 600 s
Test current	max. 3 mA with safety-current limitation
Test points	L+N ↔ PE, L ↔ PE, N ↔ PE, L ↔ N, L ↔ test probe, N ↔ test probe, L+N ↔ test probe or between any test points and groups of test points via the matrix

## High voltage with AC hot or cold



The dielectric strength is tested with high voltage. During the test, the test current must not exceed a specified maximum value. If the current exceeds the maximum value, the test is automatically cancelled. After the test, the DUT is always discharged.



	with safety-current limitation	without safety-current limitation
Test voltage $V_{eff}$ potential-free from 0 to...	1000 V, 1500 V, 3000 V, 6000 V or according to your requirements	1000 V, 1500 V, 3000 V, 6000 V, 8000 V, 10000 V, 12000 V, 15000 V, 20000 V, 25000 V, 30000 V, 35000 V, 40000 V, 50000 V, 60000 V, 75000 V, 80000 V, 100000 V or according to your requirements
True-RMS measurement $V_{TRMS}$	•	•
Peak-value measurement $\hat{V}$	•	•
Frequency of the high voltage	50 Hz or 60 Hz (like power supply)	50 Hz or 60 Hz (like power supply)
Ramp time	without and 0.1 s – 24 h	without and 0.1 s – 24 h
Test time	without and 0.1 s – 200 h	without and 0.1 s – 200 h
Test current $I_{eff}$	max. 3 mA	from max. 100 mA up to max. 5 A or according to your requirements
True-RMS measurement $I_{TRMS}$	•	•
Peak-value measurement $\hat{I}$	•	•
Apparent, active and reactive-current evaluation	•	•
Discharge monitoring	•	• or optional
Burning	•	• depending on output power
Power	max. 25 VA	from 500 VA to 50 kVA
Test points	L+N ↔ PE, test probes or between any test points or groups of test points via the matrix	L+N ↔ PE, test probes or between any test points or groups of test points via the matrix

# Test methods

## High voltage with DC hot or cold



The insulation is tested with electronically regulated, constant high voltage. During the test, the test current must not exceed a specified maximum value. If the current exceeds the maximum value, the test is automatically cancelled. After the test, the DUT is always discharged.



## Leakage current 1-phase to 3-phase



The leakage-current test is performed during the function test. It is checked, whether the leakage current of the leads L+N to PE (earth-leakage current) or to insulated enclosure parts (enclosure-leakage current) is not too high. The leakage current must not exceed the maximum current defined in the standards. To check the enclosure-leakage current, the operator contacts the enclosure parts to be tested one after the other by means of the test probe.



	with safety-current limitation	without safety-current limitation
Test voltage $V_{DC}$ partly potential-free from 0 to...	500 V, 1000 V, 2000 V, 4000 V, 6000 V, 8000 V, 10000 V, 12000 V, 15000 V, 20000 V, 25000 V, 30000 V, 35000 V, 40000 V, 50000 V or according to your requirements	500 V, 1000 V, 2000 V, 4000 V, 6000 V, 8000 V, 10000 V, 12000 V, 15000 V, 20000 V, 25000 V, 30000 V, 35000 V, 40000 V, 50000 V, 100000 V or according to your requirements
Mean-value measurement $V_{AVG}$	•	•
Peak-value measurement $\hat{V}$	•	•
Electronic high-voltage generator	•	•
Residual ripple (ohmic full load)	depending on the power of the HV-source between $\pm 0.1$ V and $\pm 15$ V	depending on the power of the HV-source
Ramp time	without and 0.1 s – 24 h	without and 0.1 s – 24 h
Test time	without and 0.1 s – 200 h	without and 0.1 s – 200 h
Test current $I_{DC}$	max. 10 mA or according to your requirements	max. 100 mA
Mean-value measurement $I_{AVG}$	•	•
Peak-value measurement $\hat{I}$	•	•
Energy	max. 180 mJ	depending on the high-voltage source
Discharge monitoring	•	•
Burning	•	• depending on output power
Test points	L+N ↔ PE, test probes or between any test points or groups of test points via the matrix	L+N ↔ PE, test probes or between any test points or groups of test points via the matrix

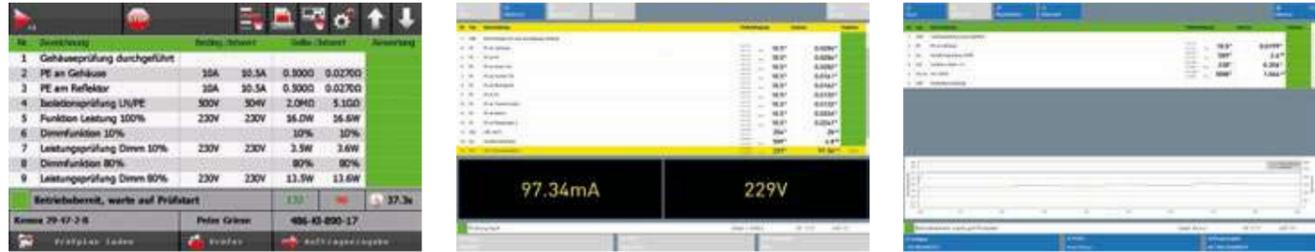
Test voltage	test voltage of the function test
Resolution	0.1 V
Leakage current $I_{eff}$	max. 30 mA
Measuring ranges	5 with autorange
Resolution	1 $\mu$ A
Accuracy	1.5 % of measured value + 1 $\mu$ A
Current measurement	$I_{TRMS}$ , $\hat{I}$ , $I_{DC}$ -component, $I_{AC}$ -component
Standards	EN 60990, EN 60601
Measuring circuits	3 MDs for EN 60990, 1 MD for EN 60601
Operating modes	A1, A2, B
Frequency measurement of leakage current up to...	max. 500 Hz or max. 1 MHz
Overcurrent protection	•
Test points	L+N ↔ PE, L+N ↔ test probe or between any test points via the matrix

# Test methods

## Function 1-phase to 3-phase



The function of your DUT is checked under operating voltage based on the current consumption, the  $\cos \varphi$  and/or the power consumption of the DUT. You can specify set values and  $\pm$ tolerances for each measured value. If the measured electrical value is within tolerance, the test result is GO (OK).



Test voltage $V_{eff}$ 1-phase	110 V, 230 V, 0 – 230 V, 0 – 260 V or according to your requirements with or without potential separation
Test voltage $V_{eff}$ 3-phase	400 V, 0 – 400 V, 0 – 450 V or according to your requirements with or without potential separation
Test current 1-phase up to...	5 A, 10 A, 16 A, 32 A, 40 A, 50 A, 63 A, 100 A or according to your requirements
Test current 3-phase up to...	2 A, 5 A, 10 A, 16 A, 32 A, 40 A, 63 A, 100 A or according to your requirements
True-RMS measurement $V_{TRMS}$	•
Frequency of test voltage	50 Hz or 60 Hz
True-RMS measurement $I_{TRMS}$	•
Apparent-, active- and reactive-current evaluation	•
Cos $\varphi$ measurement	0 – 1
Test time	0.1 s – 200 h
Short-circuit measurement before and during the test	•
Overcurrent protection	•

# Automatic test process

The standard GLP2-MODULAR uses the streamlined Windows®-Embedded software. You always have a good overview of all relevant test results. The clear display of the test process allows to work in a structured and very efficient manner.

In automatic mode, the tests are performed semi- or fully automatically. The tests are performed fully automatically step by step between all test points connected to the DUT.

If, for example, the operator has to contact individual test points at the DUT with a test probe, there is an interruption in connection with a message, which will stay as long as the task has been completed. After this, the test continues fully automatically. The test results are evaluated automatically and displayed in a clear manner.

The test process can be adapted by simply adding or removing test steps. I.e. the test sequence can be optimally adapted to varying requirements. Each test step can be individually configured with test parameters.

The comprehensive integrated user management ensures that only authorized persons can make such changes.

## Input

To edit test steps, you only need to open them. The test parameters can be changed and the test process can be adapted to the test task easily. All entries are monitored by the automatic plausibility check. It is not necessary to work with a test-plan editor. You can click the question-mark button to display informative explanations regarding the respective test parameter.

The test parameters are displayed to each operator, but only authorized persons can change them.

Nr.	Bezeichnung	Beding./Istwert		Sollw./Istwert		Bewertung
1	Gehäuseprüfung durchgeführt					
2	PE an Gehäuse	10A	10.5A	0.500Ω	0.0270Ω	
3	PE am Reflektor	10A	10.5A	0.500Ω	0.0270Ω	
4	Isolationsprüfung LN/PE	500V	504V	2.0MΩ	5.1GΩ	
5	Funktion Leistung 100%	230V	230V	16.0W	16.6W	
6	Dimmfunktion 10%			10%	10%	
7	Leistungsprüfung Dimm 10%	230V	230V	3.5W	3.6W	
8	Dimmfunktion 80%			80%	80%	
9	Leistungsprüfung Dimm 80%	230V	230V	13.5W	13.6W	
Betriebsbereit, warte auf Prüfstart				132	90	37.3s
Kemox 29-47-2-B		Peter Griese		486-KI-890-17		
Prüfplan laden		Prüfer		Auftragseingabe		

Parameter	Wert
Bezeichnung	PE am Reflektor
Prüfmodus	Widerstand
Max. Sollwert	0.500Ω
Min. Sollwert	0.000Ω
Prüfzeit	1.0s
Kontaktierzeit	0.2s
Prüfstrom	10A
Prüfspannung	12V
Art des Ablaufs	Stopp vor Prüfung

## KEY FACTS

- intuitive operation
- clear display
- display on standard PC-monitor if required
- testing without special know-how
- input of test parameters without test-plan editor
- plausibility check of all entries
- integrated help texts for each test parameter
- mouse and PC-keyboard optionally available
- individualization through scripts
- storage of test plans and results in the company network
- extensive configuration options
- integrated user and rights management
- free lifetime updates for your GLP2

## Data

The GLP2 stores test plans and test results either locally or in the company network on a shared network drive. We recommend to network the testers. This has the following advantages:

- All testers in the network operate with the same test plans.
- All testers use the same specifications.
- Owing to the central storage for all test systems in a global network, you can easily ensure the quality of your products worldwide. Regardless of your location.
- test plans can be viewed and edited at PC workstations independently of the tester

## Scripts

The scripting language provides an easy-to-understand and very powerful tool for customizing and adapting the GLP2. This has the following advantages:

- individual adaptations by the user
- process control like with a PLC
- adaptation to complex barcode contents
- and more...

# Automatic test process

## composed of partial test plans

Nr.	Bezeichnung	Beding./Istwert		Sollw./Istwert		Bewertung
1	Gehäuseprüfung durchgeführt					
2	PE an Gehäuse	10A	10.5A	0.500Ω	0.0270Ω	
3	PE am Reflektor	10A	10.5A	0.500Ω	0.0270Ω	
4	Isolationsprüfung LN/PE	500V	504V	2.0MΩ	5.1GΩ	
5	Funktion Leistung 100%	230V	230V	16.0W	16.6W	
6	Dimmfunktion 10%			10%	10%	
7	Leistungsprüfung Dimm 10%	230V	230V	3.5W	3.6W	
8	Dimmfunktion 80%			80%	80%	
9	Leistungsprüfung Dimm 80%	230V	230V	13.5W	13.6W	
Betriebsbereit, warte auf Prüfstart		132	90	37.3s		
Kemox 29-47-2-B		Peter Griese		486-KI-890-17		
Prüfplan laden		Prüfer		Auftragseingabe		

### Partial test plan 1

2	PE an Gehäuse	10A	0.500Ω
3	PE am Reflektor	10A	0.500Ω

### Partial test plan 2

4	Isolationsprüfung LN/PE	500V	2.0MΩ
---	-------------------------	------	-------

### Partial test plan 3

5	Funktion Leistung 100%	230V	16.0W
6	Dimmfunktion 10%		10%
7	Leistungsprüfung Dimm 10%	230V	3.5W
8	Dimmfunktion 80%		80%
9	Leistungsprüfung Dimm 80%	230V	13.5W

A test plan consists of an arbitrary number of individual test steps, which are executed one after the other.

In many applications, the procedure is such that the set-up person creates a test plan for each DUT. As the integrated editor efficiently supports the test-plan generation, this can be done in a very fast manner. You will save even more time, if you can copy existing test plans and simply adapt them to a new DUT.

However, there are limits to creating one test plan for each DUT. For example, a luminaire manufacturer that produces thousands of "apparently" different luminaires. With the classic approach described above, he would also have to create thousands of test plans. The administration and maintenance costs for this would be extremely high.

However, individual luminaire groups often only differ only in color or other mechanical characteristics. The electrical properties are identical. Here it makes sense to create one test plan for each luminaire group. This reduces the number of different test plans considerably. To do this, you can maintain an administration table in the GLP2. This table contains all DUTs to which you assign the corresponding test plan.

You can go a large step further, though. In many test plans, you will find identical, recurring test-step sequences.

Taking the example of the luminaire manufacturer, an analysis of the test plans shows that, for example, the PE/GB-resistance test typically consist of 1 to 5 test steps. It would, therefore, be sufficient to create and maintain only 5 test plans for the PE/GB-resistance test. The first test plan includes one PE test step, the second test plan two PE test steps, etc. These 5 test plans are stored in the GLP2 as partial test plans. I.e. partial test plans are part of an overall test plan. Let's refer to this as the master test plan.

The master test plan is composed of any number of individual test steps and partial test plans. The partial test plans are linked to the master test plan. This reduces the administrative effort even further. As you often only have to maintain the contents of the partial test plans, the maintenance effort is also reduced to a great extent. The highlight is that the master test plans linked to the partial test plans are maintained in parallel, provided they have previously been released according to the dual-control principle.

The test steps contained in partial test plans can not be edited in the master test plan. For editing a partial test plan, it first needs to be loaded.

The diagram shows a sample test plan consisting of a test step and several partial test plans. It only serves as an example. The GLP2-MODULAR can combine test plans with any number of individual test steps with any number of partial test plans. The sequence of test steps within a partial test plan, however, cannot be changed – unless you load the partial test plan and then edit it.

### Explanation of the example:

Test step 1 is an individual test step in the test plan.

Test steps 2 and 3 consist of a partial test plan. The partial test plan consists of two PE/GB-resistance test steps.

Test step 4 consists of a partial test plan. The partial test plan consists of an insulation-resistance test step.

Test steps 5 to 9 consist of a partial test plan. The partial test plan consists of five function test steps.

### KEY FACTS

- significantly less maintenance effort
- reduction of maintenance costs
- less complex test plans
- much more transparent test plans

# Traceability

The GLP2-MODULAR can store labels and other additional information of the DUT together with the test results.

By marking components, modules and final products with a unique number, you receive clear information about the entire manufacturing process should there be variations in quality. Traceability enables you to react to production problems in a targeted manner.



1D/2D

## KEY FACTS

- integration into the industry 4.0 environment
- free configuration of the information to be scanned
- free configuration of additional order data to be saved
- storage of the traceability data
  - in the tester or on the network drive
  - in an ERP- or MES-system

# Marking and labeling

After completing the test, it is normally necessary to label or mark the DUT.

The marking process is performed automatically after the test, so that no manual intervention is required.

The test system GLP2-MODULAR has the following interfaces to control marking or labeling devices:

- Ethernet
- USB
- RS232

The GLP2-MODULAR can also load and print various layout data. The layout can be specified by a higher-level ERP-system.

The following markings or labelings are possible:

- good/bad marking with a prick punch
- good/bad marking with a color-marking system
- laser marking of the serial number after completing a test
- label printing incl. test contents and serial number
- name-plate printing
- printing of NO-GO labels
- label printing for the packaging material
- ...

## Laser marking

Laser marking is very durable and allows permanent marking of nearly all types of materials.



## KEY FACTS

- durable and resistant
- high contrast
- wear-free
- no consumable materials

## Label printing

Thermal-transfer label printers are used to mark DUTs after successfully completing a test. The printer creates labels, which are attached to the product, e.g. as name plates.

The printer comes with a label-design program. With this software, you can give the labels an individual design. The tester uses placeholders to add the desired variables automatically after the test has been completed.



The logos shown are registered trademarks of the respective companies.

## KEY FACTS

- universal application owing to a wide range of label material
- very simple integration into the test process
- straightforward operation

# Manual measurement

The GLP2-MODULAR allows to use all integrated test methods individually – as if you had a separate tester for each test method.

For using the unique manual mode, no test plan is required. The operator simply selects the desired test method and starts the tester.

The most important test values are displayed in large characters. The other settings are also represented in a clear manner. This function is unique. It is ideal for testing in laboratories or at repair stations.

- > direct measurement without test plan
- > informative and clearly structured
- > ideal for laboratory and repair



PE/GB-resistance



Insulation resistance



High-voltage AC/DC



Function



## The manual mode:

Select the desired test method and start the measurement. In order to stop, you cancel the measurement. However, there is no comparison with limit values. Instead, the measured values and defined test conditions are displayed continuously.

The test parameters can be adjusted via the touch screen while the measurement is in progress. This is a great advantage, because your DUT is continuously exposed to the test condition. You can test it thoroughly and stress it as long as you want.

Not only the test conditions such as test voltage and test current can be changed. The displayed actual values and their physical units can also be switched over to match the desired evaluation.

Testers with several test connections can connect the test methods to the available test connections just like with the automatic test process. This is perfect, because the manual measurement can be performed between any desired test connections. The test connections are conveniently selected via the touch screen. The integrated relay matrix is used for the switch-over.

# Technology Package

## GLP2-MODULAR meets Windows 10®



By extending the GLP2 with the Technology Package, you can avail yourself of the extensive features of Windows 10®. The information is displayed on an external touch monitor. The screen layout is responsive to the monitor resolution.

The user interface is even more intuitive and well structured. A powerful Windows 10® PC is used to increase the performance. You have the option to use your own PC or to purchase a SCHLEICH-PC.

### KEY FACTS

- A PLUS for technology
- PLUS: Microsoft® Windows 10 operating system
- PLUS: powerful picture-in-picture test-plan processing
- PLUS: Drag & Drop test-plan processing
- PLUS: release of the test plans following the dual-control principle
- PLUS: dynamically generated revision-proof test plans
- PLUS: even better overview
- PLUS: even more informative
- PLUS: even more data is displayed in a graphical format
- PLUS: even larger touch buttons
- PLUS: even more automation interfaces
- PLUS: even more IT-interfaces

## Device layouts



Features	Standard Device	Technology Package
PC software editor&printer	on separate PC	integrated
Integrated Windows® Embedded PC	●	—
Separate Windows10® PC, provided by SCHLEICH	—	optional
Separate Windows10® PC, provided by customer	—	●
Quick PC exchange	—	●
CPU-cores	1	min. 4
Integrated touch screen	7"	—
Screen resolution	800 x 480	size scales automatically
Capacitive touch	●	depending on external monitor
Multi-touch technology	—	●
Operation by swiping	—	●
Network-capable	●	●
Integration into a domain	—	●
WLAN	only with special components	●
PC-mouse connectable	●	●
PC-keyboard connectable	●	●
PC-monitor connectable	●	●
PC-touch monitor connectable	—	—
Protocol printer connectable	HCPL printer	standard PC printer
Installation of third-party software for testing tasks	—	●
Automatic online updates via the Internet	—	●
Test-plan-revision management	—	●
Storage in SQL-database	—	optional
ERP-system communication	—	optional
SAP®-communication	—	optional
MES-communication	—	optional
Visual inspection with camera(s)	—	optional

# Technology Package

## user interface

The well-proven test hardware and the accurate test technology are identical to the standard device. The Technology Package is an upgrade for the operation.

With the Windows 10® PC, the large touch screen and all the technical features this gives you, the user interface is more informative and user-friendly than ever before. Our engineers have been consistently using the full scope of the Windows 10® operating system. The result is a clear and straightforward presentation.

In addition to the functions provided by the standard software, we integrated a revision of the test plans including a comprehensive test-plan-history management. New or modified test plans are released following the dual-control principle. Test plans are released by a supervisor and not by the creator of the test plan.

### Input

When editing test steps, all test parameters are displayed on the right side of the screen. You can see all settings of the test step at once. By clicking the test step on the left conveniently and fast, you have all the necessary information displayed on the right.

All entries are monitored with the automatic plausibility check. Detailed information can be displayed for each test parameter.

The test parameters are displayed to each operator. However, only authorized persons can change them.

### Data

The GLP2 saves test plans and test results either locally or on a shared network drive. The data is stored in files. As it brings considerable advantages, we recommend to network your testers.

With the Technology Package you have the option to use an MS-SQL database for storing in the network.

Nr.	Typ	Beschreibung	Prüfbedingung	Grenzen	Ergebnis
1	SPR	Gehäuseprüfung durchgeführt			
2	FE	FE an Gehäuse	max 12.4 min 12.4	10.5 <sup>A</sup>	0.0405 <sup>D</sup>
3	FE	FE am Reflektor	max 12.4 min 12.4	10.5 <sup>A</sup>	0.0524 <sup>D</sup>
4	iso	Isolationsprüfung L+N gegen PE	max 500 min 500	500 <sup>V</sup>	1.1 <sup>GO</sup>
5	FKT	Funktion Leistung 100%	max 230 min 230	230 <sup>V</sup>	16.7 <sup>W</sup>
6	LST	Dimmfunktion 10%			10 <sup>%</sup>
7	FKT	Leistungsprüfung Dimm 10%	max 230 min 230	230 <sup>V</sup>	3.5 <sup>W</sup>
8	LST	Dimmfunktion 80%			80 <sup>%</sup>
9	FKT	Leistungsprüfung Dimm 80%	max 230 min 230	230 <sup>V</sup>	13.6 <sup>W</sup>
10	LST	Lichtfarbe LED 2700K			100 <sup>%</sup>
11	LST	Kameratest: Helligkeit aller LED			100 <sup>%</sup>
12	SPR	Prüfetikett befestigt			

Nr.	Typ	Beschreibung	Messwert
1	SPR	Gehäuseprüfung durchgeführt	
2	FE	FE an Gehäuse	0.0405 <sup>D</sup>
3	FE	FE am Reflektor	0.0524 <sup>D</sup>
4	iso	Isolationsprüfung L+N gegen PE	1.1 <sup>GO</sup>
5	FKT	Funktion Leistung 100%	16.7 <sup>W</sup>
6	LST	Dimmfunktion 10%	10 <sup>%</sup>
7	FKT	Leistungsprüfung Dimm 10%	3.5 <sup>W</sup>
8	LST	Dimmfunktion 80%	80 <sup>%</sup>
9	FKT	Leistungsprüfung Dimm 80%	13.6 <sup>W</sup>
10	LST	Lichtfarbe LED 2700K	100 <sup>%</sup>
11	LST	Kameratest: Helligkeit aller LED	100 <sup>%</sup>
12	SPR	Prüfetikett befestigt	

### Scripts

The scripting language provides an easy-to-understand and very powerful tool for customizing and adapting the GLP2. This has the following advantages:

- customizable by the user
- process control like with a PLC
- adaptation to complex barcode contents

# editor&printer

## PC-software

### Editing test plans

Test plans are often created directly at the tester. With editor&printer, you can manage, edit and save the test plans also on a PC.

The advantage of creating the test plans on a PC is that it doesn't affect the ongoing production and that the testers are available for operation. The software interface on the PC is similar to the display on the tester. Therefore, the operation is almost the same and can be learnt easily.

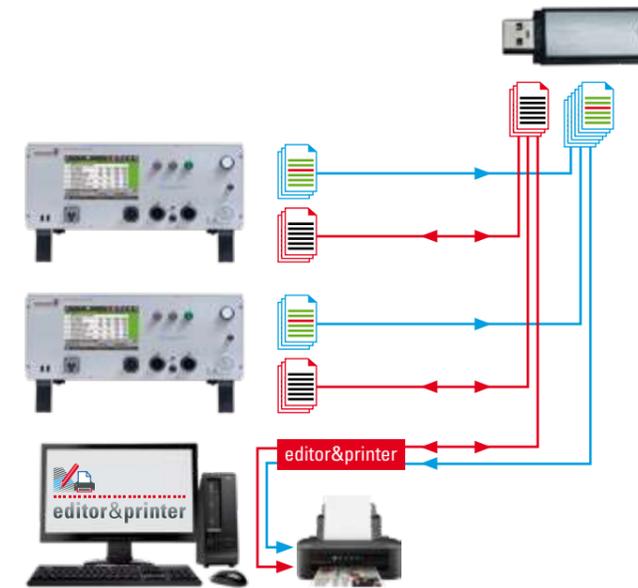


### Printing test results

With this software you can create and print test protocols in a very comfortable manner. You import the test results, filter them according to the tests to be printed and create a detailed and well-structured protocol.

There are two applications for the software:

Data exchange via USB flash drive | offline operation



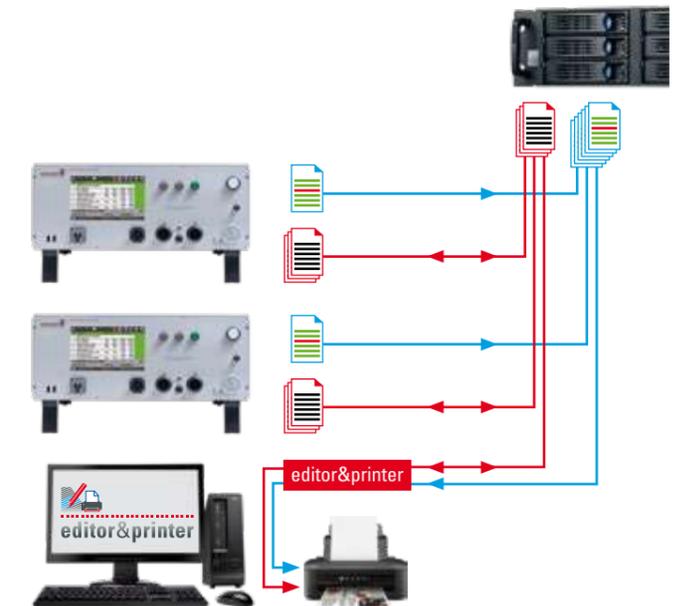
The test plans edited with the editor&printer software on the PC are exported to a USB flash drive. Now, the flash drive is inserted into a USB-port of the tester. The tester will then automatically load new and/or adapted test plans into the internal database.

If you are using a number of identical testers, you can always update them one after the other.

As an alternative, the test plans can still be created and edited via the tester. In order for them to be identical to those on the PC, you can import them to the PC by using a flash drive.

Note: see also page 52

Data exchange via network | online operation



This guarantees an optimum application of the testers in your computer network. Test plans and test results are stored on a shared network drive.

The network eliminates the need to import test plans via the flash drive. Both, test plans adapted directly with the editor&printer software and test plans adapted at the tester are automatically saved on the central PC.

Network operation guarantees an optimum ISO-9001-compliant production.

Note: see also page 53

### KEY FACTS

- editor – editing test plans on a PC instead of via the tester
- editing test plans of individual or networked testers
- data transfer between tester and PC via USB flash drive or automatically in your computer network
- test-plan-revision management
- integrated user management
- creation of test plans with additional test-plan release
- printing individual test plans
- printer – searching, viewing and printing in a clearly-structured and informative test report
- exporting of test results to EXCEL® and OpenOffice®

 These files contain all test results  
 These files contain all test plans

# editor&printer

## PC-software

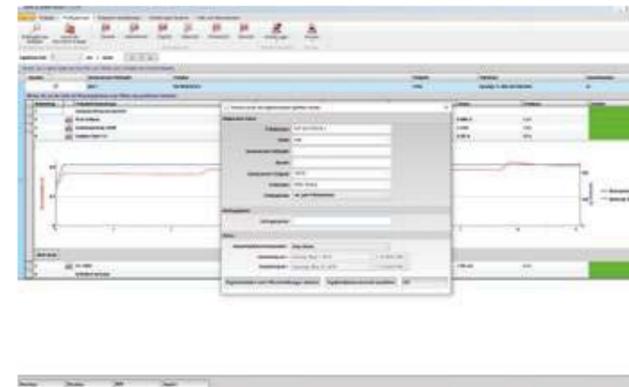
Printing test protocols offline or online

editor&printer is an excellent tool for printing test results. Not only the test plans, but also the test results are stored via flash drive or directly in the network.

You can filter the test results stored on the PC according to various criteria. editor&printer lists the filtered tests in a clear overview. From this list, you can select either all or individual tests.

Now, you can directly print these tests, display them in a preview, print them in PDF-format or export them to an EXCEL file.

The protocols are printed in a short or long format and with a selection of different languages. Individualize the test protocol with your company data and logo.



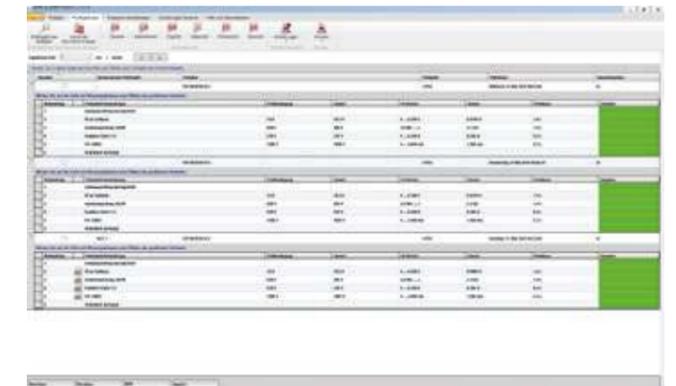
Search/filter test results by various criteria



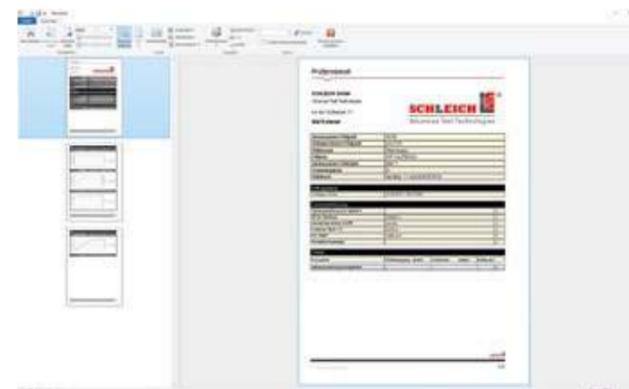
Test results including the time course of the test values of one test step



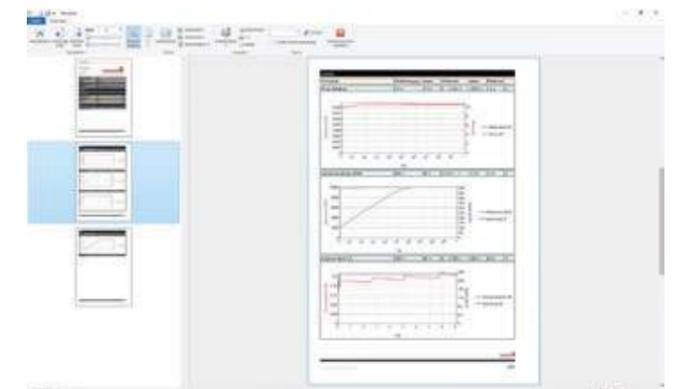
Test results including the time course of the test values of two test steps



Test results of several DUTs tested with the same test plan



Preview of a test protocol: front page



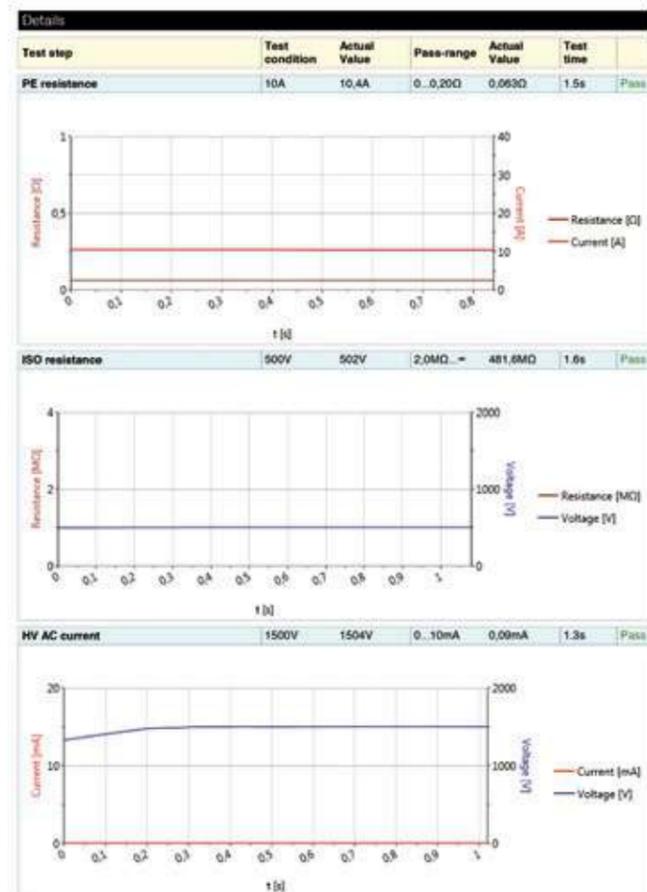
Preview of a test protocol: subsequent page with test results

### Test protocol

Sample Company  
Sample Street 89  
12345 Sample City

Your logo

Serialnumber Tester	10661
Name of operator	Jack Hamilton
Test program	EK18 full load sequence
Serialnumber Test Object	20141027#3
Total result	Pass
Test date	27 October 2014
<b>Order data</b>	
Job number	ENZ359BES
Part number	EK185
<b>Summary</b>	
PE resistance	0.0630
ISO resistance	481.6MΩ
HV AC current	0.09mA
Short circuit	>9999.90
Current consumption	9.239A
LKC EN60601	9μA



# analyzer PC-software



## Statistical evaluation of test results

GLP2-MODULAR testers store the test results either inside the device or externally at a central storage location in a network. The storage format corresponds to the widely used CSV-format. Test results in CSV-format can be opened and analyzed with EXCEL®.

For a more easy and elegant way to display the test results and evaluate them statistically, you can use the analyzer software.

The analyzer software is based on a fast SQL-database, into which the results stored by the testers are imported. The data can be statistically analyzed and visualized by various criteria. It goes without saying that you can print a test protocol of the executed analyses.

Online or offline – analyzer opens up new dimensions.

### Searching test results and printing

To be able to search for results, the test results must have been saved together with the serial number of your DUT. A search is only possible if the test results can be clearly identified in the database.

Owing to the powerful SQL-database, after entering the serial number to be searched for in the analyzer software, you receive the test results in no time at all. In addition to the individual test results, the default values used for the tests are displayed.

The test results can be printed conventionally on paper or in PDF-format. We will provide you with printing templates. Individualize the test protocol with your company data and logo? No problem! By exchanging the header and the logo, you can easily adapt the printing templates to the corporate design of your company.

### Statistical analysis

An analysis summarizes the test results in a way that you get an overview of the quality of your production.

You can use filters to limit the number of test results to be analyzed:

- specified time period by date from...to
- specified time period by time from...to
- specified time period by calendar week from...to
- serial numbers from...to
- test-plan definition
- order data
- individual testers
- tester groups

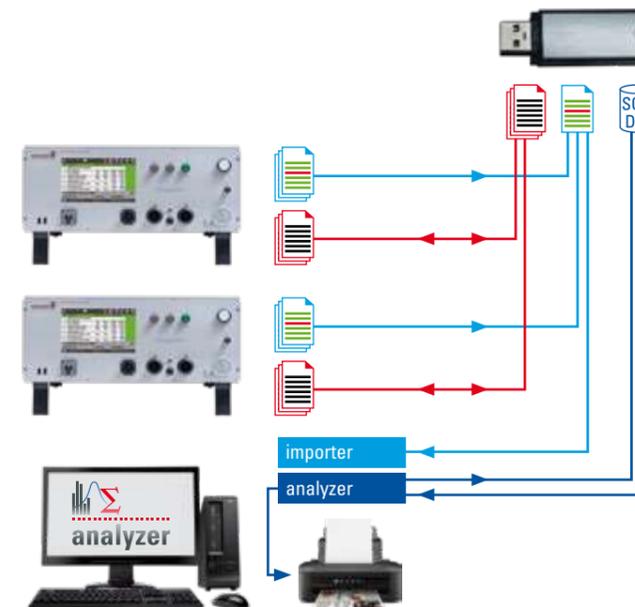
After entering the filter values, you receive the statistical analysis promptly. You can easily save the configuration of different filter combinations as templates under a freely definable name. By calling up a filter template and entering the filter values, an analysis of the test results is created automatically.

Typical analyses:

- trend development
- Pareto analysis
- first pass yield
- quantity analysis
- distribution
- statistics: min., max., standard deviation, variance, average, ...

The statistical analyses can be printed conventionally on paper or electronically in PDF-format. We will provide you with printing templates, which you can individualize by exchanging the header and the logo.

### Data import via USB flash drive | offline operation

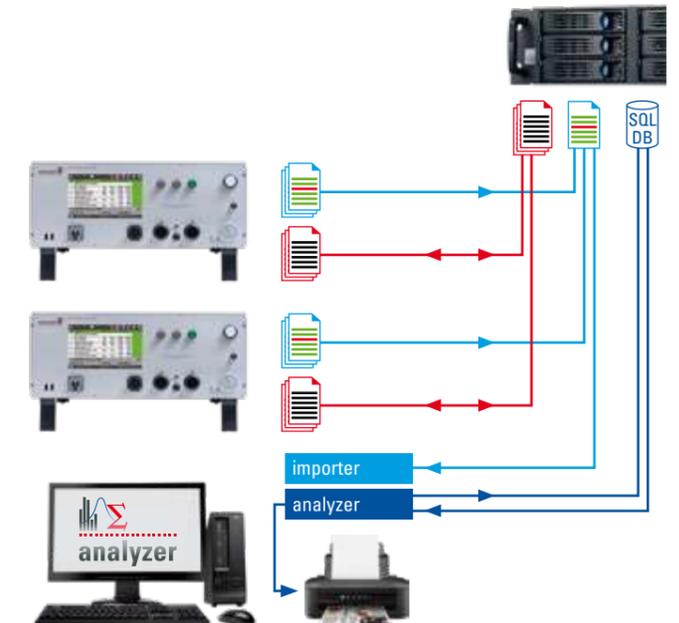


With non-networked devices, you export the test results of the individual devices to a USB flash drive. The GLP2-MODULAR provides a command for this purpose. At the PC, analyzer imports the data from the USB flash drive and stores them in the database. Now, you can perform the desired evaluations.

### KEY FACTS

- storage of test results on a PC
- fast and efficient Microsoft® SQL Express database
- database for one or more GLP2-MODULAR testers
- statistical evaluations with graphic presentations
- easy integration of your logo into the print-outs
- printing of test results in customizable protocol templates
- printing of test results in Excel® protocol templates
- printing of statistical values in customizable protocol templates
- printing of statistical values in Excel® protocol templates

### Data import via network | online operation



Under optimum conditions, the testers are integrated in a computer network. However, a network only makes sense if the data are also stored centrally on a shared network drive.

The PC with the analyzer software is also integrated in this network. The analyzer software permanently checks, whether new test results from the individual testers have been stored on the memory PC in CSV-format. If yes, the analyzer software automatically imports this data into the database.

In online mode, the analyzer software permanently determines and displays the statistical results of the ongoing production. You are permanently informed about the quality of your production and always have an overview of GOs, NO GOs and the number of pieces of individual testers, tester groups and your complete production.

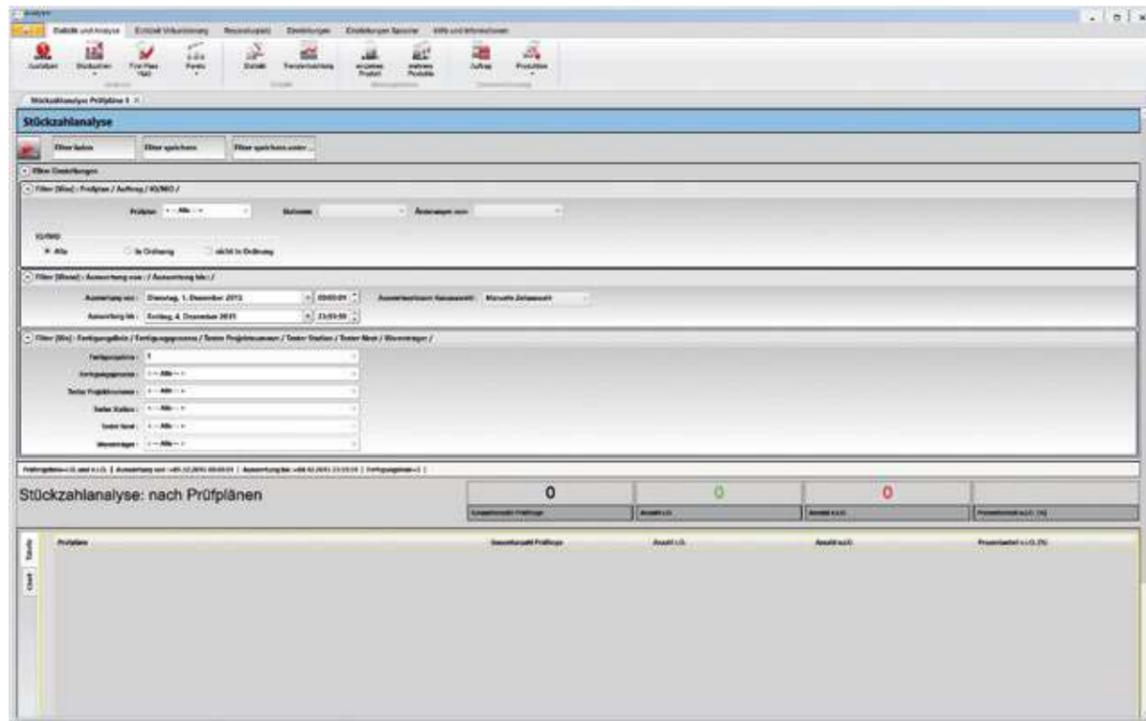
This is perfect online monitoring!

**Note:** see also pages 55-56

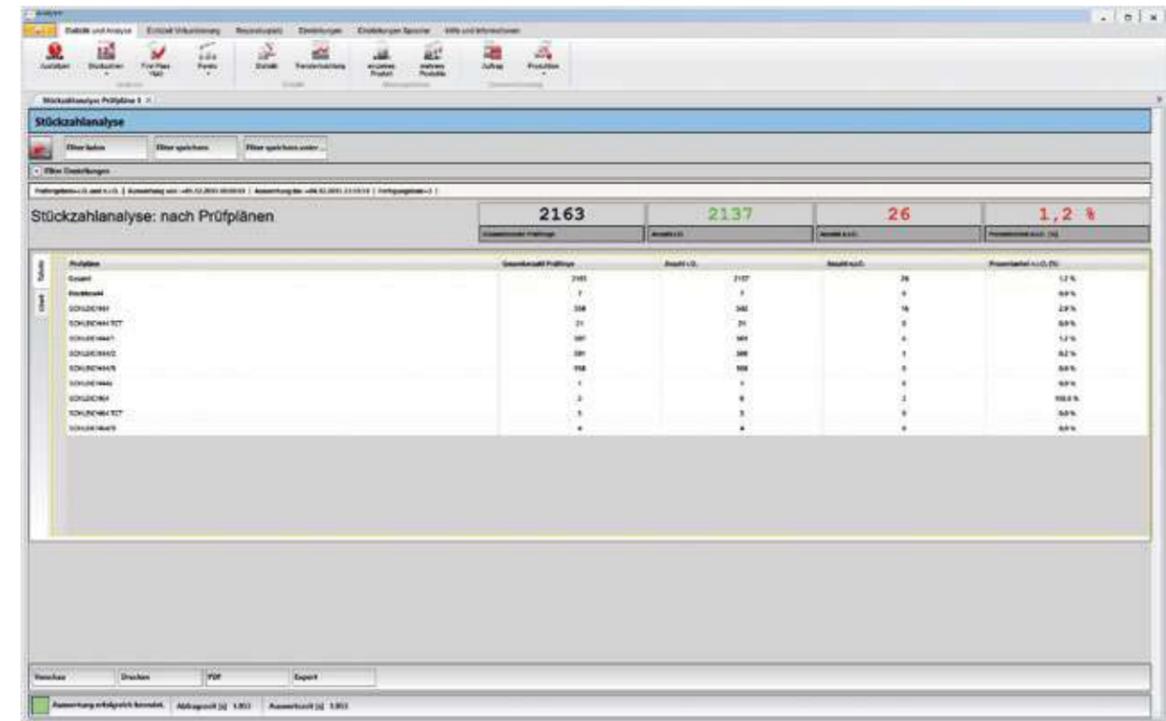
-  These files contain all test results
-  These files contain all test plans
-  SQL-database with test results

# analyzer

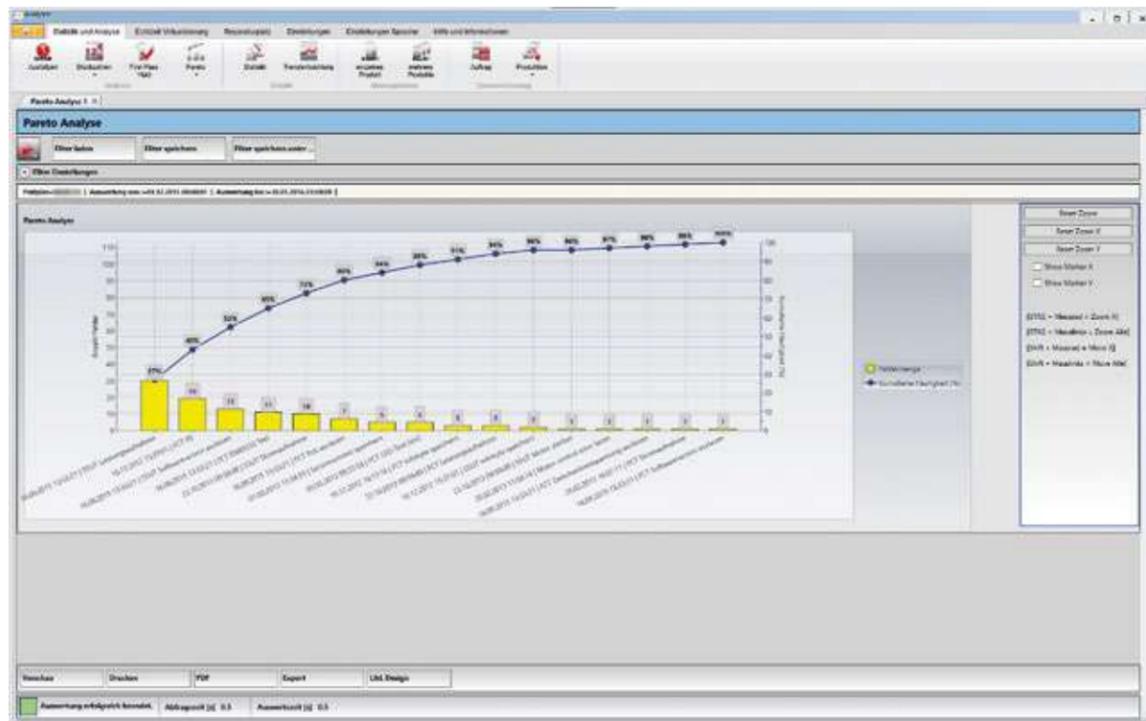
## examples of evaluation



With the help of various filter criteria, test results are searched for in the database.



The quantity analysis provides information on the GO / NO GO result numbers.



The Pareto diagram graphically shows the most common causes of errors. Based on this information, you can determine the correct order of priorities for the required measures.



The trend analysis shows the course of the test values in relation to the set value and the upper and lower limits.

# The GLP2-MODULAR in a network

Test plans and test results are stored either locally or on a central network drive. This guarantees high security for your data and an optimum data exchange of the test plans between different test systems.

Even with the basic configuration, the GLP2-MODULAR can be operated in a network. This feature is the ideal platform to collect, manage, analyze and distribute information. The GLP2-MODULAR together with the Technology Package can also be integrated into a complex company domain.

The test plans and test results are stored in a secure, reliable file system on a shared network drive.

GLP2-MODULAR test systems with Technology Package can also be networked with ERP-, PPC-, MES- and CAQ-systems. For this purpose we offer well-proven, configurable solutions.



## KEY FACTS

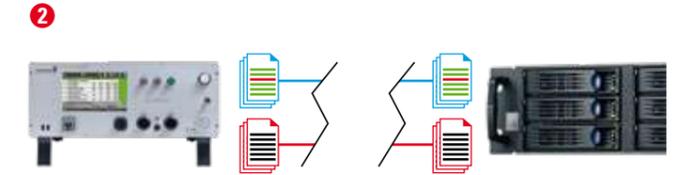
- central storage of test plans
- local processing of test plans in the GLP2
- central processing of test plans with the editor&printer PC-software independent of the tester
- central storage of test results
- evaluation of test results at workstations
- ideal remote-maintenance features with the Technology Package

## Network failure

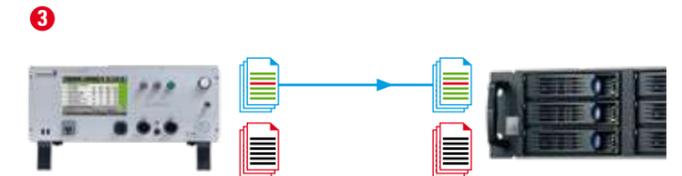
1 Each tester directly stores the test results on the network drive. In order to be able to continue to work locally in the event of a network failure, the test plans in the tester are synchronized with the network drive.



2 In the event of a network failure, the local test plans are used and the test results are stored locally in the tester.



3 If, after restarting the tester, the network drive is available again, the tester automatically transfers the temporarily stored test results to the network drive..



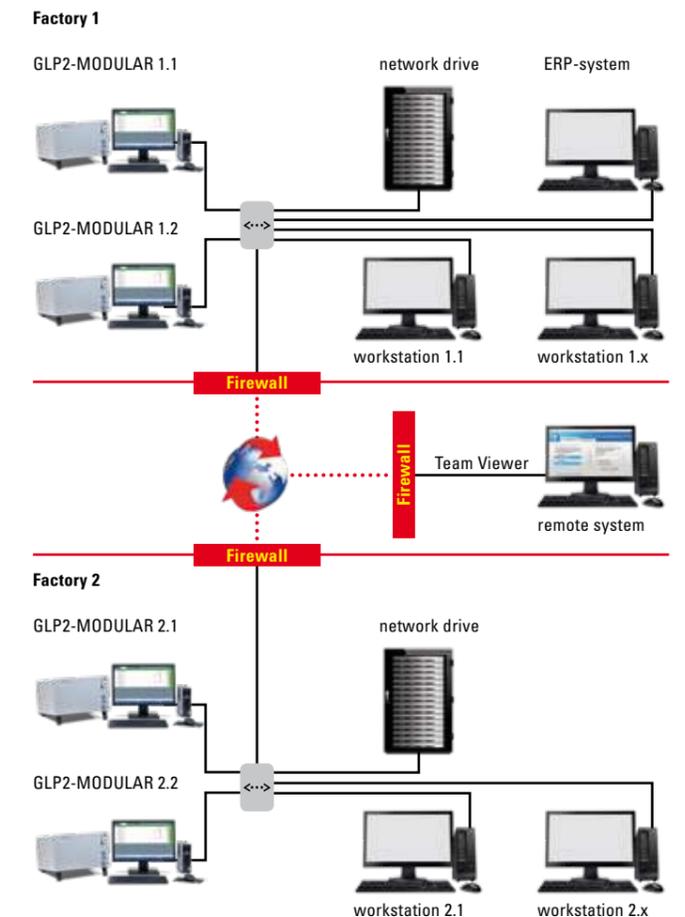
## Complex global network for testers with Technology Package

The testers can be operated in highly complex network topologies. You can install an unlimited number of testers at various locations around the world and connect them to the central network drive. Our extensive experience with the global networking of testers guarantees that you can always maintain the same product quality regardless of the production site. This puts an end to problems in connection with the versioning of test plans.

It goes without saying that all work in connection with test plans, printing, labels and statistics can also be carried out at the individual testers. In order not to disrupt the production process within networked systems, you can use separate workstations. Therefore, the editor&printer or analyzer software can be installed on different workstations.

Label templates can also be saved centrally on the network drive. The tester loads the matching template for the respective test plan and prints the labels after the test. Owing to the central storage on the network drive, you can be sure that all connected testers use the same label template.

If remote maintenance is required, we can temporarily dial into your network and directly access the tester in question. Our technician can directly see the screen content of the corresponding tester. Only after release from your side, we would also have access to mouse and keyboard. These features allow us to give you qualified support. Remote maintenance is, of course, only possible after you have granted us access.



# Data storage

## Backup and archiving

For data backup, all data are copied to a USB flash drive.

The operator starts the process manually.

The tester is a user in your computer network. It connects to the network drive provided for sharing. The communication is based on the standard TCP/IP-protocol.

For data backup, all data are copied to the network drive.

The operator starts the process manually.

## Saving test results on a PC via USB flash drive

All test results stored in the tester are exported to a USB flash drive. After that there are no test results left in the tester. Now, the stored test results can be copied from the flash drive to any desired PC.

The operator starts the process manually.

- This file contains all device settings
- These files contain all test results
- These files contain all test plans

## Synchronizing test plans and saving test results

An arbitrary number of testers is used within your production. You go from tester to tester and exchange the data by means of a USB flash drive.

All test plans stored in the tester are synchronized with the test plans stored on the USB flash drive. The following rule applies: the test plan with the most recent processing date overwrites the older test plan.

All test results stored in the tester are exported to the USB flash drive. Afterwards, there are no test results left in the tester.

The operator starts the process manually.

An arbitrary number of testers are incorporated in your computer network. They connect to the network drive provided for sharing. The communication is based on the standard TCP/IP-protocol.

After switching-on, all test plans stored in the testers are synchronized with the test plans stored on the network drive. The following rule applies: the test plan with the most recent processing date overwrites the older test plan. Test plans changed at a tester are directly stored on the network drive.

After a test, the test results are directly stored on the network drive. Testers that didn't have a network connection before, automatically export all test results stored in the tester to the network drive. After that there are no test results left in the testers.

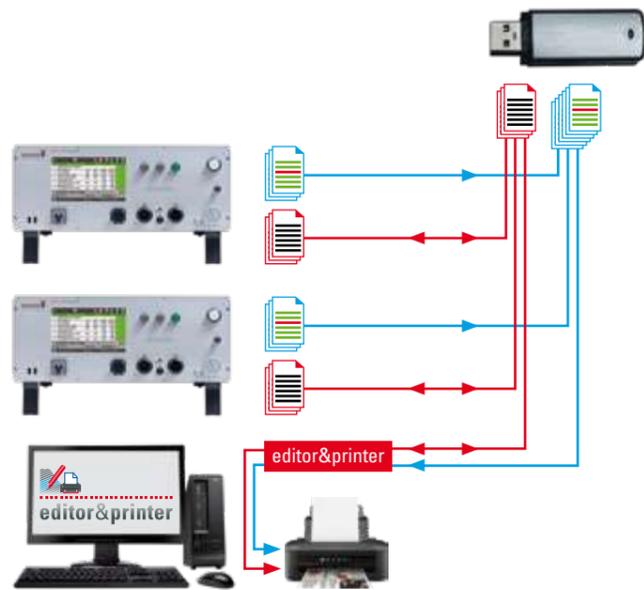
This is a fully-automatic process running "in the background".

If the network connection between a tester and the network drive is interrupted, the tester will continue to work with the locally stored test plans. The test results are temporarily stored locally. If, after switching the tester on, the network is available again, the synchronization and storage described above are performed automatically.

**Note:** see also page 25

# Data storage

Synchronizing test plans and editing them in the network | saving and printing test results



An arbitrary number of testers is used within your production. You go from tester to tester and to the PC in order to exchange the data by means of a USB flash drive. The PC is equipped with the SCHLEICH-editor&printer software.

## Testers



All test plans stored in the tester are synchronized with the test plans stored on the USB flash drive. The following rule applies: the test plan with the most recent processing date overwrites the older test plan.



All test results stored in the tester are exported to the USB flash drive. After that there are no test results left in the tester.

The operator starts the process manually.

## editor&printer software



Test plans can be edited on a PC and printed for documentation purposes.



Test results can be printed from a PC for documentation purposes.

-  These files contain all test results
-  These files contain all test plans

An arbitrary number of testers are incorporated in your computer network. They connect to the network drive provided for sharing. The communication is based on the standard TCP/IP-protocol.

The SCHLEICH-editor&printer software is installed on an arbitrary number of PCs.

## Testers



After switching on, all test plans stored in the testers are synchronized with the test plans stored on the network drive. The following rule applies: the test plan with the most recent processing date overwrites the older test plan. Test plans changed at a tester are directly stored on the network drive.

**Technology Package:** revision management with revision and re-release of new/revised test plans following the dual-control principle. With integrated traceability of changed test parameters over the entire test-plan history.



After a test, the test results are directly stored on the network drive. Testers that didn't have a network connection before, automatically export all test results stored in the tester to the network drive. After that there are no test results left in the testers.

This is a fully-automatic process running "in the background".

If the network connection between a tester and the network drive is interrupted, the tester will continue to work with the locally stored test plans. The test results are temporarily stored locally. If, after switching the tester on, the network is available again, the synchronization and storage described above are performed automatically.

**Note:** see also page 25

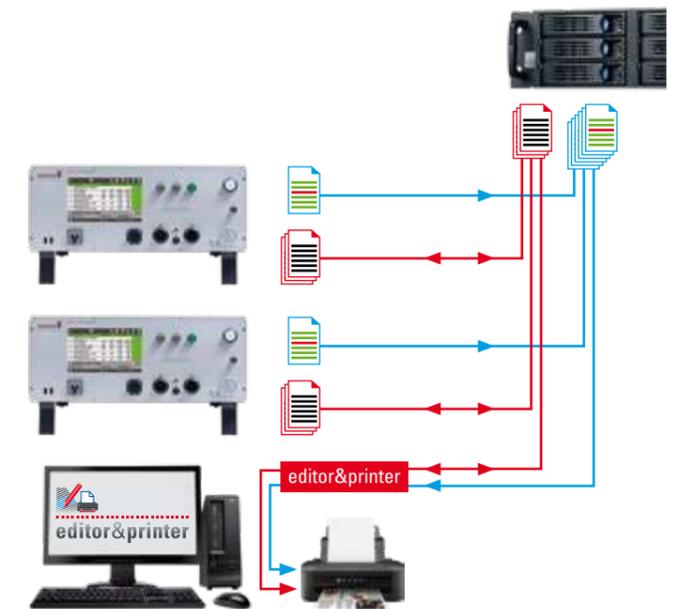
## editor&printer software



Test plans can be edited on a PC and printed for documentation purposes.

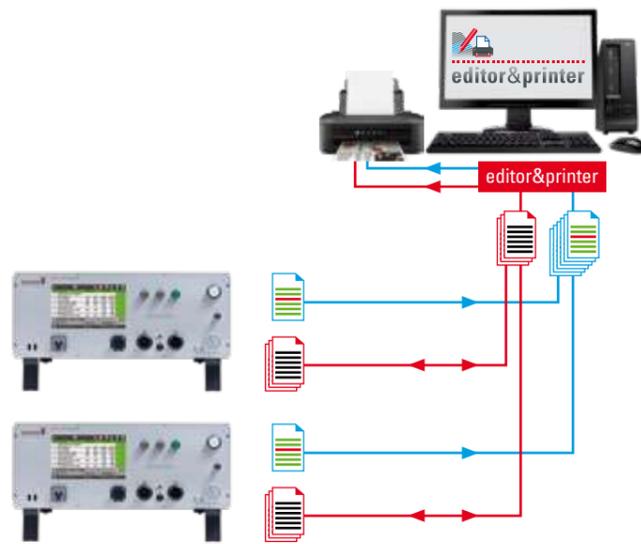


Test results can be printed from a PC for documentation purposes.



# Data storage

Synchronizing test plans and editing them in the network | saving and printing test results



An arbitrary number of testers are incorporated in your computer network. They connect to the PC-drive via network share. The communication is based on the standard TCP/IP-protocol.

The SCHLEICH-editor&printer software is installed on the PC.

## Testers



After switching on, all test plans stored in the testers are synchronized with the test plans stored on the network drive. The following rule applies: the test plan with the most recent processing date overwrites the older test plan. Test plans changed at a tester are directly stored on the network drive.

**Technology Package:** revision management with revision and release of new/revised test plans following the dual-control principle. With integrated traceability of changed test parameters over the entire test-plan history.



After a test, the test results are directly stored on the network drive. Testers that didn't have a network connection before, automatically export all test results stored in the tester to the network drive. After that there are no test results left in the testers.

This is a fully-automatic process running "in the background".

If the network connection between a tester and the network drive is interrupted, the tester will continue to work with the locally stored test plans. The test results are temporarily stored locally. If, after switching the tester on, the network is available again, the synchronization and storage described above are performed automatically.

**Note:** see also page 25

## editor&printer software



Test plans can be edited on a PC and printed for documentation purposes.



Test results can be printed from a PC for documentation purposes.

-  These files contain all test results
-  These files contain all test plans
-  SQL-database with test results

Synchronizing test plans and editing them in the network | saving, printing and statistically analyzing test results

An arbitrary number of testers are incorporated in your computer network. They connect to the network drive provided for sharing. The communication is based on the standard TCP/IP-protocol.

The SCHLEICH-editor&printer software is installed on an arbitrary number of PCs. On one PC, the SCHLEICH-analyzer software and the additional "importer" software are installed. On an arbitrary number of further PCs, the SCHLEICH-analyzer software is installed.

## Testers



After switching on, all test plans stored in the testers are synchronized with the test plans stored on the network drive. The following rule applies: the test plan with the most recent processing date overwrites the older test plan. Test plans changed at a tester are directly stored on the network drive.

**Technology Package:** revision management with revision and release of new/revised test plans following the dual-control principle. With integrated traceability of changed test parameters over the entire test-plan history.



After a test, the test results are directly stored on the network drive. Testers that didn't have a network connection before, automatically export all test results stored in the tester to the network drive. After that there are no test results left in the testers.

This is a fully-automatic process running "in the background".

If the network connection between a tester and the network drive is interrupted, the tester will continue to work with the locally stored test plans. The test results are temporarily stored locally. If, after switching the tester on, the network is available again, the synchronization and storage described above are performed automatically.

## editor&printer software

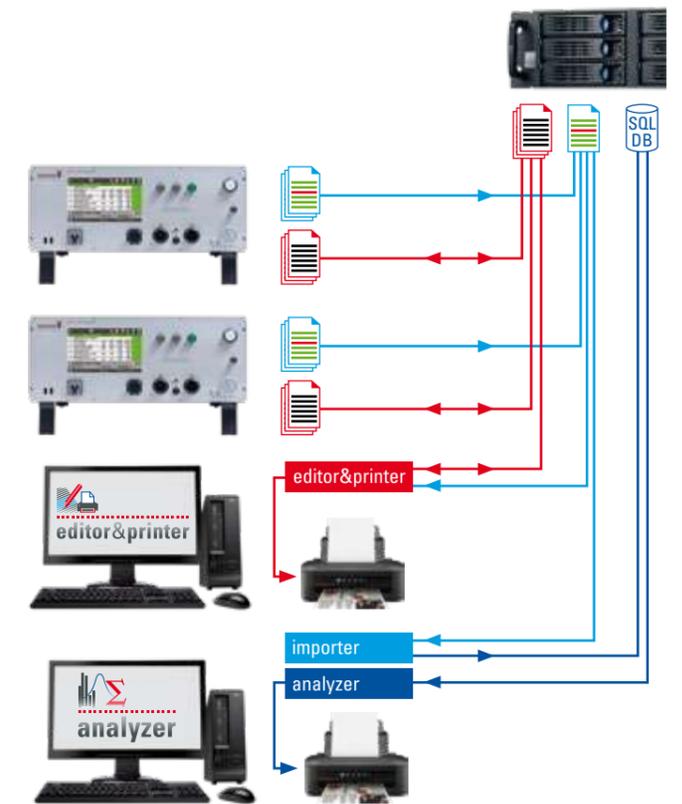


Test plans can be edited on a PC and printed for documentation purposes.

## analyzer software and importer software



A test result stored on the network drive is directly imported by the importer software, converted for the SQL-database and stored in the SQL-database. After that there are no test results left on the network drive.



Based on the test results stored in the SQL-database, the analyzer software calculates statistical characteristics and statistical diagrams.



For documentation purposes, individual test results, statistical characteristics and statistical diagrams can be printed from a PC.

## analyzer software



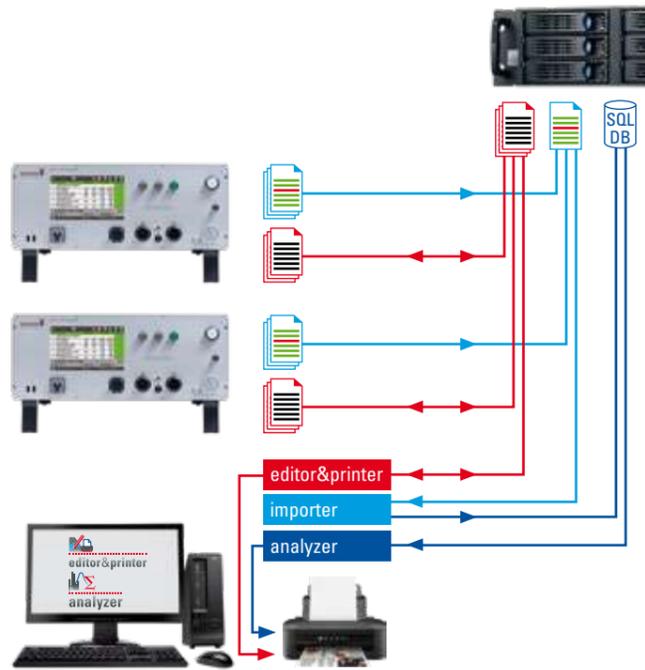
Based on the test results stored in the SQL-database, the analyzer software calculates statistical characteristics and statistical diagrams.



For documentation purposes, individual test results, statistical characteristics and statistical diagrams can be printed from a PC.

# Data storage

Synchronizing test plans and editing them in the network | saving, printing and statistically analyzing test results



This is a fully-automatic process running "in the background".

If the network connection between a tester and the network drive is interrupted, the tester will continue to work with the locally stored test plans. The test results are temporarily stored locally. If, after switching the tester on, the network is available again, the synchronization and storage described above are performed automatically.

**Note:** see also page 25

## editor&printer software



Test plans can be edited on a PC and printed for documentation purposes.

## analyzer software with importer software



A test result stored on the network drive is directly imported by the importer software, converted for the SQL-database and stored in the SQL-database. After that there are no test results left on the network drive.



Based on the test results stored in the SQL-database, the analyzer software calculates statistical characteristics and statistical diagrams.



For documentation purposes, individual test results, statistical characteristics and statistical diagrams can be printed from a PC.

## analyzer software without importer software



Based on the test results stored in the SQL-database, the analyzer software calculates statistical characteristics and statistical diagrams.



For documentation purposes, individual test results, statistical characteristics and statistical diagrams can be printed from a PC.

- These files contain all test results
- These files contain all test plans
- SQL-database with test results

An arbitrary number of testers are incorporated in your computer network. They connect to the network drive provided for sharing. The communication is based on the standard TCP/IP-protocol.

The SCHLEICH-editor&printer software, the SCHLEICH-analyzer software and the SCHLEICH-importer software are installed on the PC. On an arbitrary number of further PCs, the SCHLEICH-editor&printer software is installed. On an arbitrary number of further PCs, the SCHLEICH-analyzer software is installed.

## Testers



After switching on, all test plans stored in the testers are synchronized with the test plans stored on the network drive. The following rule applies: the test plan with the most recent processing date overwrites the older test plan. Test plans changed at a tester are directly stored on the network drive.

**Technology Package:** revision management with revision and release of new/revised test plans following the dual-control principle. With integrated traceability of changed test parameters over the entire test-plan history.



After a test, the test results are directly stored on the network drive. Testers that didn't have a network connection before, automatically export all test results stored in the tester to the network drive. After that there are no test results left in the testers.

# Automation

## fully-automatic test systems for production

The GLP2-MODULAR is ideal for integration into automatic production. Automation is a particular strength of SCHLEICH, thanks to the corporate structure.

In addition to software, electronics and system engineering, automation also incorporates mechanics and mechatronics. These services are provided by our mechanical-design department, our CNC-machining centers and the mechanical-assembly department.

## KEY FACTS

- integration in production lines
- communication with a PLC
- SCHLEICH provides:
  - turnkey test systems and production lines
  - automatic testers with rotary table
  - automatic testers with robots
  - test adapters



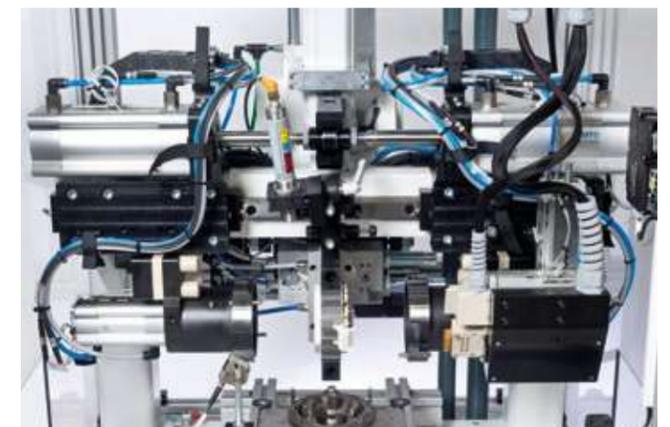
Photo: Schmersal Gruppe

## GLP2-MODULAR integrated into your existing automation system

You want to integrate the GLP2-MODULAR into your automatic production system. For this purpose, the tester can be completely remote controlled via interfaces by a PLC. If required, you can transfer test plans and test parameters to the tester. The system returns the individual test results (GO / NO GO) in any required number.

## GLP2-MODULAR integrated in a SCHLEICH test system

SCHLEICH provides test systems consisting of the tester, the contacting unit for the DUT and the complete mechanical automation – turnkey solutions from a single source. All automation components are developed, designed, manufactured, assembled and commissioned in-house at SCHLEICH. In addition to testing, the GLP2-MODULAR is often used to control the automation processes. For higher levels of automation, a PLC is used as an alternative. We fully meet our customer's requirements – resulting in solutions matching the respective task in all detail.



# Data exchange within automation

The GLP2-MODULAR is ideally suited to be integrated into automatic systems. It offers an enormous variety of interfaces for communication with highly complex automation systems.

Typical requirements:

- control of complete processes and components
  - processing of inputs, sensors, scanners, RFID-readers, ...
  - setting of outputs, e.g. for cylinders, ...
  - control of motors and drives, ...
- exchanging start, stop and result signals
- direct communication with a PLC-control
- bidirectional communication
  - receiving test plans and test parameters
  - sending test results indicating GO or NO GO in any number
  - transmission of raw data
- communication with robots, cameras, ...

Our configurable standard-software modules take care of these tasks, reducing the effort required to integrate the GLP2-MODULAR into automation systems to a minimum.

Especially by upgrading the GLP2-MODULAR with the Technology Package, you get access to nearly all automation interfaces.



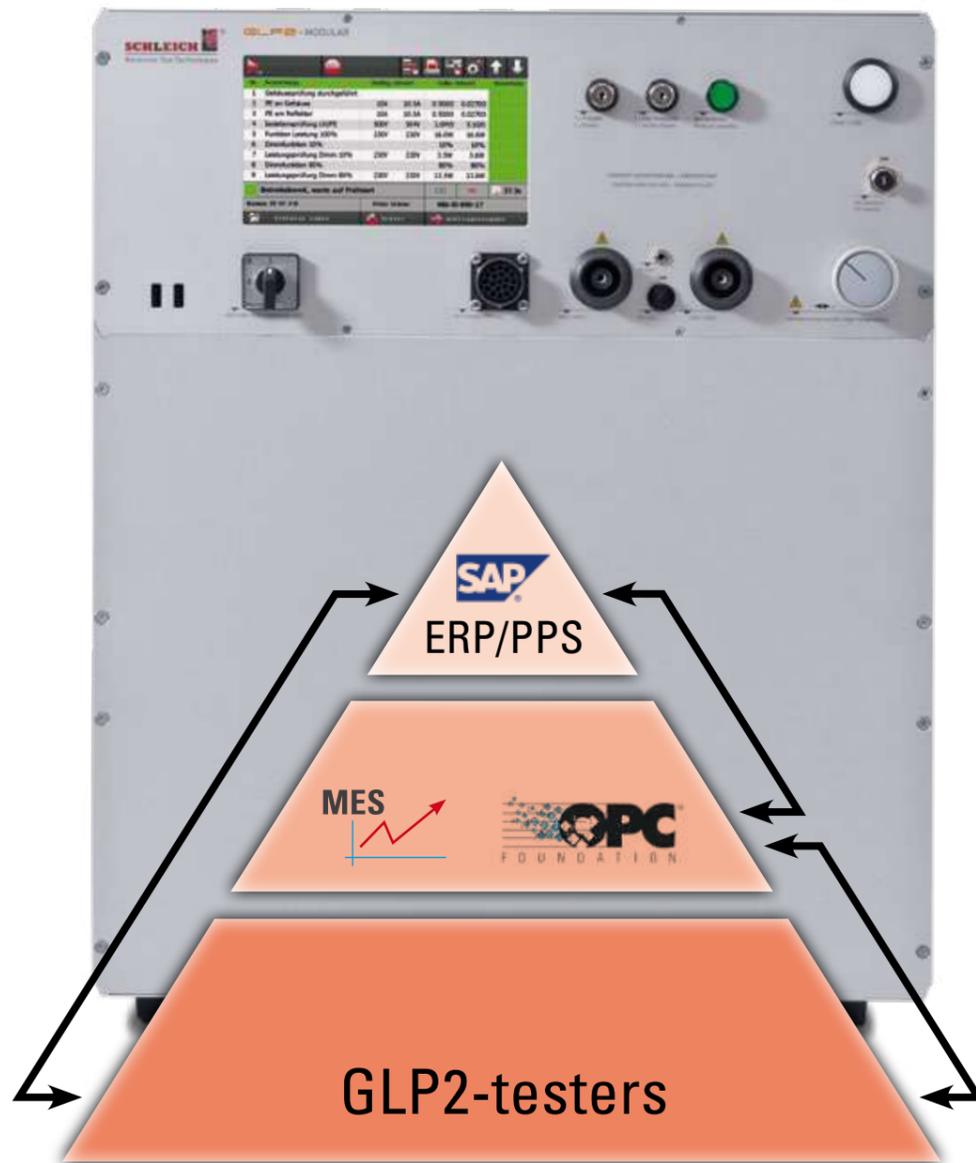
## KEY FACTS

- digital input/output interfaces
- various interfaces directly to a PC
- interfaces using fieldbuses
- interfaces using industrial Ethernet systems



The logos shown are registered trademarks of the respective companies.

# Data exchange with IT-systems



## KEY FACTS

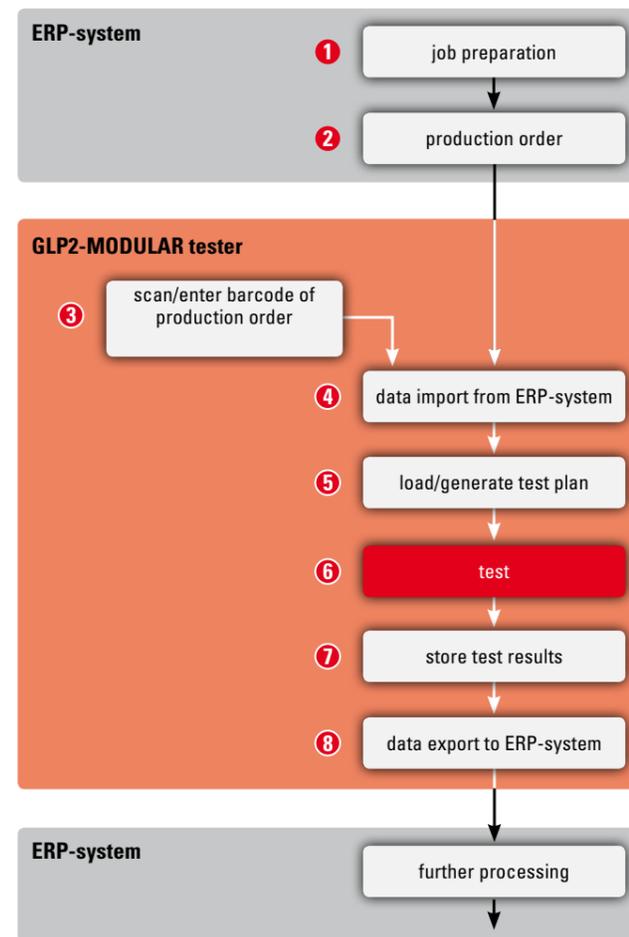
- decentralized test-data management
- bidirectional communication with
  - ERP-systems
  - MES-systems
- configurable tools for
  - data import
  - data export
  - ...

The data exchange between the GLP2-MODULAR and other IT-systems is effected with well-proven solutions.

Typical applications:

- importing production orders from ERP-systems
- automatic dynamic creation of test plans from production orders and parts lists
- automatic dynamic creation of test plans from compound sub-test plans
- automatic generation of serial numbers from production-order data
- reporting results to ERP-systems
- receiving label data for label printing
- communication with special systems of the automotive industry

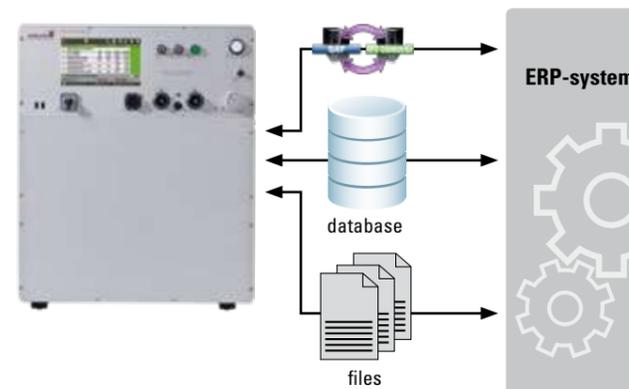
MES = Manufacturing Execution System



## Example of a workflow

- 1 The sales order is entered into the ERP-system.
- 2 The ERP-system creates a production order and adds data required by the tester.  
For example:
  - name of test plan
  - serial numbers
  - label information
  - article characteristics
 The GLP2-MODULAR can access this data directly or indirectly. For example, SAP uses an RFC-.NET Connector for direct access. For indirect access, the ERP-system stores the information either in a separate database or in special files in the network.
- 3 At the test station, the operator scans the number of the production order from the working papers. This can be done, for example, by using a barcode.
- 4 The GLP2-MODULAR now imports the information relevant for the test on the basis of the production order.
- 5 The GLP2-MODULAR loads the test plan automatically. The test plan may consist of several partial test plans, depending on the parts-list information from the ERP-system.  
  
The ERP-system transfers further test parameters and tolerances, which are used in the corresponding test steps of the test plan. This way, you get an automatically generated test plan that exactly matches the production order without the operator having to make any entries.

## Typical communication channels



- 6 The test is performed.
- 7 The GLP2-MODULAR stores the test results either locally or in the network.  
Labels can be printed automatically. The test results and, if required, data from the ERP-system are added to the label.
- 8 Finally, ready messages, test results, date/time, operator name, quantities and much more are reported back to the ERP- or MES-system in order to create further evaluations and analyses.

The logos shown are registered trademarks of the respective companies.

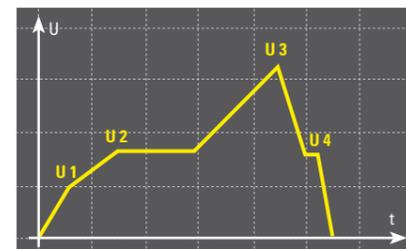
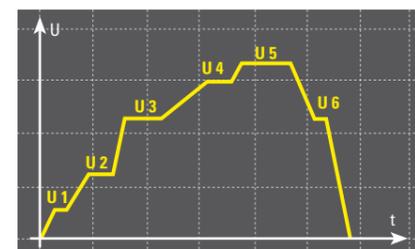
# High-voltage testers

Test voltage from 1 kV to 100 kV | Test current from 3 mA to 5 A

The GLP2-MODULAR comes with the most comprehensive range of high-voltage testers currently on the market. Regardless of whether you want to combine AC, AC with rectification, DC with highly-stable output voltage or AC plus DC in one unit.

High-voltage testers are used to test electrical insulation resistance and voltage proof (clearance and leakage path) of electrical components and modules of all kinds.

These testers are perfectly suited for fast, uncomplicated testing within production or in laboratories. The tests can be performed either manually with safety test probes or automatically.



High-voltage test with voltage profiles

## The testers have three operating modes

- Manual tests without time lapse. Switch-off only in case of overcurrent, e.g. caused by an electric breakdown.
- Testing with programmed time sequences and various monitoring functions.
- Localization of insulation faults through "burning".

## There are two types of high-voltage adjustment

- **Automatic voltage adjustment**  
In automatic mode, the tester automatically sets the voltage to the value specified in the test plan or automatically generates a freely programmable voltage profile.
- **Manual voltage adjustment**  
In manual mode, the voltage is set with the rotary knob on the front panel of the device.

We offer a variety of test probes to match your application. To use the tester in laboratories, automatic production lines or test set-ups, our product range comprises the respective high-voltage cables and contacting units.

The safest method for high-voltage testing is using a test cage. SCHLEICH provides test cages for a wide range of tasks in a variety of different designs and sizes. You can either use our standard test cages or, for special requirements, customized test cages designed especially for you.

## KEY FACTS

- high-voltage testers AC
- high-voltage testers AC and DC
- high-voltage testers DC
- extremely low residual ripple with DC high voltage
- insulation resistances for DC high voltage up to 10 TΩ
- high voltage with acceleration and deceleration ramps
- high voltage with voltage profiles
- step-voltage measurement
- rapid switch-off in case of electric breakdown
- display of the measured values in a diagram
- three HV-modes: manual, automatic with time lapse and burning
- DUT connection check / open-circuit detection (4-wire method)
- minimum-current monitoring
- voltage-free contacting with special test probes
- zero-voltage switch-on to protect the DUT
- manual high-voltage adjustment via rotary knob
- electronic high-voltage control with high-speed ramps
- long-term measurements over hours, days or weeks
- storing of individual long-term test values
- high-voltage matrix for switching-over between individual test points
- matrix from 1 kV to 50 kV AC
- two-circuit safety inputs, two-hand start
- safety circuits with force-guided safety relays
- VDE-0104-compliant start-up sequence



# Luminaire testing

SCHLEICH supplies test systems for intermediate and final testing of all types of luminaires covering the entire luminaire production process. From testing complete luminaires to individual LED-modules, you get all test methods for safety and quality testing from a single source.

From compact safety testers to complex test benches with cameras or robots, SCHLEICH is your partner of choice. Manufacturers of all kinds of luminaires worldwide rely on our testing technology.

In addition to reliable testing technology and MES data exchange (Manufacturing Execution System), the focus is more and more on the international networking of testing and database systems, such as SAP®.



## Interface communication

- interface communication directly via the tester without external PC
- DALI
- DSI
- analog
- touch/DIM
- DMX
- NFC
- and more ...

## Safety testing

- PE/GB-resistance between line terminal and arbitrary enclosure parts
- insulation resistance at L1, N and PE or L1, L2, L3, N and PE
- insulation resistance between line terminals and interface ports
- high-voltage test with AC, e.g. for UL, if required
- high-voltage test with DC for LED-modules, if required
- leakage-current test, if required
- conforming to all standards commonly used worldwide

## Function test

- current-consumption measurement starting with 1 mA
- power-consumption measurement starting with 1 watt

## Continuity test

- continuity test of the wiring and of the dimming leads

## Evaluations with camera

- intensity of individual LEDs
- luminous color of individual LEDs
- inspection of reflectors and diffusers

## Parameterizing the ECGs

- parameter transfer to the ECG for configuration
- importing information from the ECG
- parameterizing ECGs from a variety of manufacturers
- operator prompting with images and text
- flashing the ECG

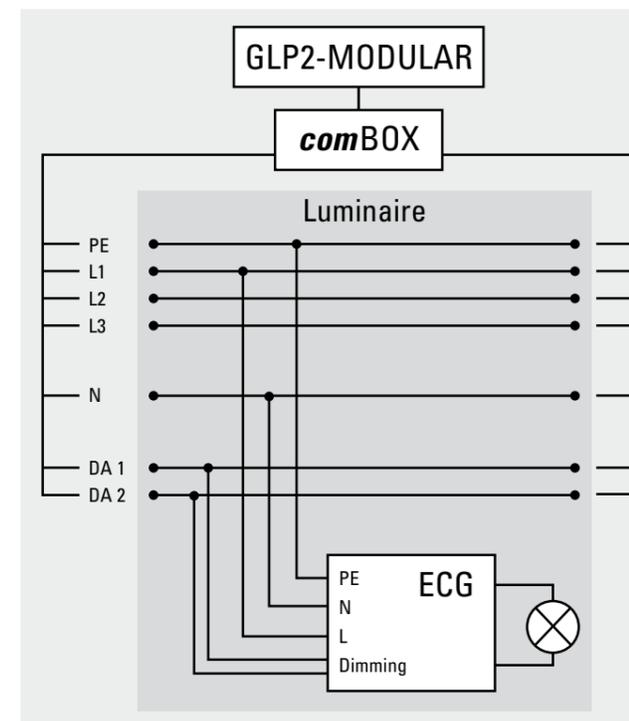
## Integration into your IT

- central generation of test plans
- central test-plan management
- central storage of test plans
- reading and storing serial numbers
- integration of barcode/DataMatrix scanners
- label printing for luminaires and packaging
- central storage of test results
- statistical analyses
- communication with your ERP-system (e.g. SAP, Microsoft Dynamics, proALPHA, ...)
- management of test jobs
- importing parts lists and information from the ERP-system
- reporting of test results to the ERP-system
- communication with your MES-system

## comBOX for luminaire testing

For convenient connection and quick testing of luminaires, we provide **comBOXES**. These intelligent connection modules contain both, the typical contacting for the luminaire and an integrated control system.

All **comBOXES** provide the terminals for the 5 mains connections and the 2 dimmer connections. Inside the box, the single-phase voltage of the function test is automatically connected to either L1, L2 or L3. Using various bus protocols, the two connections DA 1 and DA 2 are used for communication with the ECG.



There are three different types of **comBOXES**:

Variants 1 and 2 also include an optional 7-pole continuity test. The through-wiring of the luminaire with up to 7 cores is tested for interruption and polarity reversal.

Variant 1 also offers operating buttons and LEDs for signal display. The LEDs indicate the status of communication with the ECG. The 3 buttons can be used to control the test process.

The three different versions of **comBOXES** are made for testers with or without integrated high-voltage test.



Connections for variant 1: L1, L2, L3, N, DA1, DA2, DG7, signals



Connections for variant 2: L1, L2, L3, N, DA1, DA2, DG7



Connections for variant 3: L1, L2, L3, N, DA1, DA2

## KEY FACTS

- dimming and RGB/RGBW-test
- parameterization of ECGs
- 7-core through-wiring

# Application example

## manual test station for luminaires



For luminaire testing, the main focus is on safety testing, which requires the PE/GB-resistance and the insulation-resistance test. If required, you can also perform a high-voltage test.

Unlike conventional luminaires, modern LED-lamps require more than the regular function test. In addition to measuring the current and the power, it may also be necessary to parameterize at the ECG.

As LED-lamps consist of many individual LEDs, a visual inspection is required, which can be performed either manually or automatically by means of a camera.

In modern production, the traceability of test results is becoming increasingly important. Barcodes or data-matrix codes with various information are read with a scanner and reported back to the MES/ERP-system.



The illustrations show a typical application within production, using a GLP2 with Technology Package and external PC.

### KEY FACTS

- operator prompting
- LED-test
- data scanner
- parameterization with NFC
- label printer

# Application example

## fully-automatic, robot-controlled luminaire-testing station



An increasing number of price-sensitive products are produced in automatic manufacturing cells. The illustration shows a manufacturing cell with a central robot and 4 processing/test stations.

Production is carried out by the robot, which performs various jobs. A central tester performs intermediate tests at individual workstations.

After the production of the luminaire has been completed, the final test is performed. For this purpose, the GLP2 performs all safety, function and quality tests fully automatically. To check the quality of the LED-modules, which often shine very brightly, cameras with various lenses and aperture settings are used. This is the only way to detect differences in brightness and color between different LEDs.

### KEY FACTS

- manufacturing cell with robot
- communication between PLC, robot and tester
- cameras for visual inspection
- GLP2-MODULAR with Technology Package

# Application example

## test system for vehicle charging cables

The photo shows only the test cover of the test system. The illustrated test cover is based on our model 10.

The connection adapters for the charging cables are integrated in the test cover. Exchanging the test adapters is supported by a pneumatic device and, therefore, doesn't require much effort.

### KEY FACTS

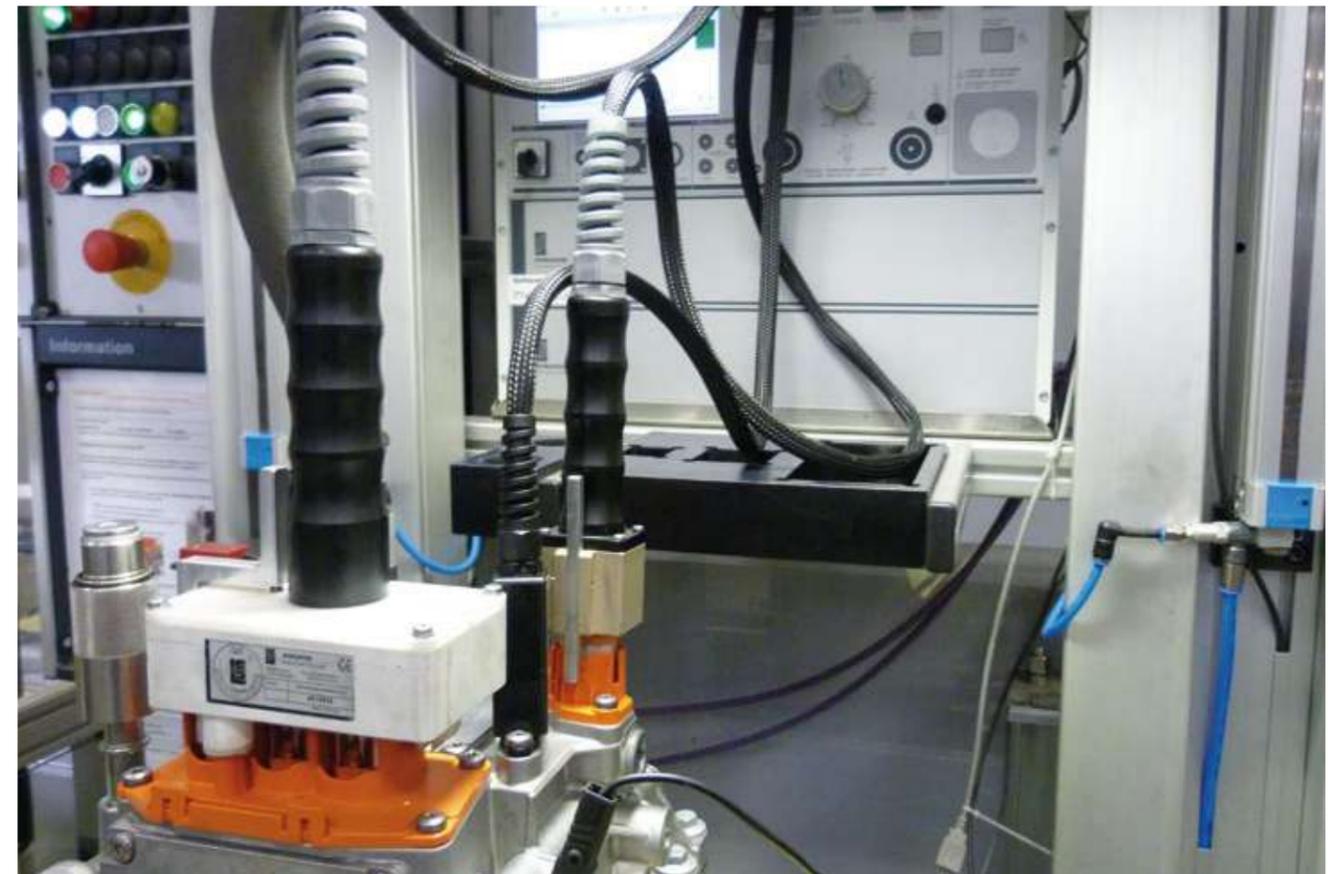
- high-voltage strength between the leads
- pole reversal of the leads
- lead resistance
- quick exchange of adapters
- adapters for all common plugs/sockets



Click here  
  
 for product video!

# Application example

## test system for hybrid motors



Hybrid motors in electric vehicles are often operated with voltages similar to those of the three-phase power system. They are, therefore, subject to the relevant safety regulations.

The test is performed between the motor frame, the winding connections, the interlock contacts, the temperature sensors and the encoder/resolver.

In addition to the complete test system, SCHLEICH provides contacting units designed with 2-wire or 4-wire method.



### KEY FACTS

- 4-wire measurement for extremely low winding resistances
- high-precision resistance-temperature compensation
- 4-wire measurement for extremely low frame-transition resistances
- insulation-resistance measurement between all test connections
- high-voltage test between all test connections
- complete set of contacting adapters

# Application example

## test system for micro stators



The illustration shows a test system completely designed, manufactured and delivered turnkey by SCHLEICH.

The DUTs are placed in test fixtures on product carriers. Thanks to its enormous flexibility and powerful scripting language, the GLP2-MODULAR also controls the conveyor system and the test cell with X-, Y- and Z-axis. An additional PLC is not required.

### KEY FACTS

- high voltage
- insulation resistance
- resistance
- inductance
- current consumption
- delivery of complete test systems
- integrated multi-axis system

The fully-automatic process consists of the following steps:

- transfer of the product carrier into the test cell
- lifting the DUT off the product carrier and placing it in the test adapter with the 3-axis system
- automatic contacting with monitoring
- testing
- if GO
  - printing the name plate with automatic attachment of the label
  - returning the DUT automatically to the product carrier and depositing it in the fixture
- if NO GO
  - automatic transfer of the DUT on a NO-GO product carrier and depositing it in a free fixture
  - repetition of the procedure until all DUTs on the product carrier have been tested
- discharging the product carrier and transfer of the next product carrier into the test cell

# Application example

## test system for tubular motors



The illustrated automatic test system serves to perform the complete function and safety test of tubular motors. This type of motor can be found in roller blinds and venetian blinds. The application requires a low shaft speed, which is realized via an integrated gear.

Both, the electrical parameters and the mechanical parameters need to be checked.

The most important electrical parameters are electrical safety and voltage, current and the power during the motor-function test.

The most important mechanical parameters are torque and speed. To test these parameters, a load machine controlled by the tester is integrated into the test bench.

As tubular motors are operated in both directions of rotation, both directions will be checked by the test system.

The mechanical adaptation of the shaft is fully automatic.



### KEY FACTS

- torque measurement
- torque-limiter test
- current-consumption measurement
- variable power supply
- label printer for name plates with serial number, etc.
- light curtain

# Application example

## test system for electronic modules



The illustrated tester is used for electrical safety testing of electronic modules. For testing, the modules are placed in a fixture. The test adapter is equipped with a downholder and a mounting plate with integrated spring contacts. The spring contacts are used for electrical contacting of the DUT and for connection to the tester. By closing the test cover, the DUT is pressed against the spring contacts.

Via a relay-switch-over matrix, the test methods integrated in the tester are automatically connected to the spring contacts in the test adapter. The matrix is so flexible that the test can be performed between any spring contacts or groups of spring contacts. From test step to test step, you can program everything as desired.

[Click here](#)  
  
 for product video!

### KEY FACTS

- test adapter with spring contacts
- test cover with touch guard
- insulation and high-voltage test
- contacting with 2-wire or 4-wire method
- high-current contacts for PE/GB-resistance test

# Application example

## test system for power distributors

Power distributors often have a multitude of connection options, integrated fuses and residual-current circuit breakers.

All connections of the power distributor are connected to the test bench via adapter cables. With hundreds of test steps, the test is performed fully automatically between all connections in an extremely short test time.

### KEY FACTS

- dual station
- safe separation of all inactive test connections
- protection via three-sided light curtain
- protection against accidental contact via rapid switch-off and discharge
- operator prompts, e.g. for RCCB and fuse testing
- automatic switch-over between the test methods
- extensive relay matrix for selecting the test connections



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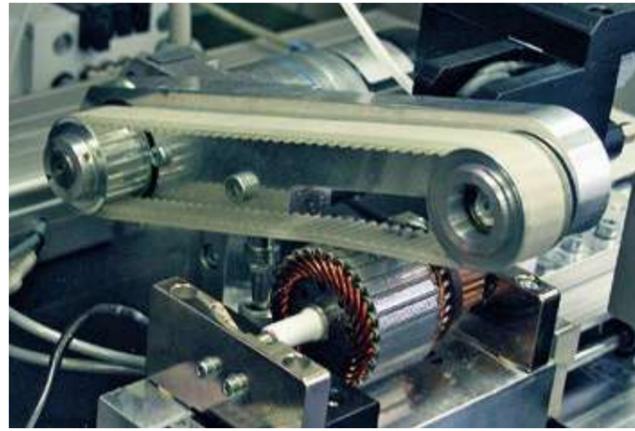
# Application example

## test system for testing armatures



This test system is used for testing automotive armatures. For non-contact testing, a measurement probe developed by SCHLEICH is used. It is not necessary to contact the collector bars. The measurement probe couples signals into the armature and simultaneously receives the reaction to it. Based on this information, the armature is evaluated fully automatically.

For testing, the armature needs to rotate. For this purpose, the speed-controlled belt drive is used.



The entire measurement technology is integrated in a touch-proof test cover. The GLP2-MODULAR controls the entire process and performs the measurement automatically.

### KEY FACTS

- non-contact inductance measurement
- turn-to-turn fault analysis
- bar-to-bar fault analysis
- automatic turning of the armature
- automatic positioning of the armature at the fault location
- centralized test-result storage

# Application example

## test system for stoves



In this example, electric or gas stoves are tested in a test area secured by a light curtain. Due to the size of the working area, a large additional monitor is connected to the GLP2 for better viewing.

In addition to performing safety and function tests, the GLP2 also controls a leak tester. For safety reasons, leak tests on gas cookers are mandatory to ensure that gas lines, control switches and valves do not leak.

The test results of the leak test (GO / NO GO) are stored together with the electrical test results in any required number. For later statistical evaluations, test reports or the processing of complaints, all set values and actual values of a tested stove are kept.

# Application example

## high-voltage testing of rail vehicles

Rail vehicles come with extensive high-voltage equipment.

One of the most important components is the 1-phase voltage tapping from the contact wire by means of a pick-up shoe. The pick-up and the voltage distribution in the rail vehicle is galvanically isolated from powered and unpowered vehicles by means of appropriate isolating elements.

All these isolating elements have to undergo high-voltage tests. For this purpose, a concept incorporating a mobile high-voltage tester and a telescope-like extendable mast is available.

The entire concept is consistently oriented towards operator safety. This includes the operation via a two-hand start.



### KEY FACTS

- mobile high-voltage tester
- integrated variable and high-voltage transformer
- contacting units of all kinds
- starting systems for one-hand or two-hand operation

# Application example

## test system for rail vehicles

Mobile tester for function and high-voltage testing of heating systems in passenger cars and dining cars.

The mobile tester simulates the railcar. Instead of the railcar, the mobile tester is connected to the vehicle to be tested. The tester connects the test voltages to the electric train supply (ETS).



### KEY FACTS

- high-voltage test up to 6 kV AC, 200 mA
- function test AC up to 1500 V, 50 kVA continuous power
- function test AC up to 1500 V, 78 kVA short-time power
- function test DC up to 4000 V, 70 kW continuous power
- function test DC up to 4000 V, 110 kW short-time power
- manual and automatic test mode
- safety features
- safety check of the ground connection to the train
- safety check of the ETS whether it is voltage-free
- two-hand start
- external Emergency Stop on a mobile stand
- tow bar with locking brake
- protection class IP44
- cable magazines for all connections
- storage of all results



# Another word for "Made in Germany": SCHLEICH



Nearly all components of our testers are manufactured in our large-scale production facilities at our company location in Hemer.

Electronic PCBs like measurement cards are made with an ultra-modern in-line-SMD-placement system, which assures the stable quality of our products.



Modern high-end processors in our testers process the test tasks in a fast, precise and reliable manner. With state-of-the-art CNC-machines, we design and manufacture a wide range of accessory components such as test covers, contacting units, workpiece carriers with DUT-holders or robot gripping tools as well as complete automatic production lines.

# Service without limits. We are there for you – wherever you are.



First-class customer service is our top priority. From detailed consulting during the planning phase to training and After-Sales-Service – we will support you during the entire process.

In training sessions adapted to your requirements, our technicians will teach you the necessary know-how allowing you to avail yourself of the functional variety of our testers to the full extent. Should there be questions or technical problems, our technical support team will assist you by phone, on-line or on-site in a fast and reliable manner. Constant software updates and extensions make sure that you can always work with state-of-the-art test software. The periodic calibration of test equipment is an essential precondition for quality assurance. We calibrate your test equipment according to standards – on site or via remote maintenance. It goes without saying that our calibration standards are traceable to national and international standards.

Our Service Centers provide you with worldwide support – in a committed, competent and reliable manner.

# Whatever you want to test... ...SCHLEICH has the solution!

SCHLEICH is a leading system provider in the area of electrical safety and function testing. Owing to our extensive range of products, we can provide you with testers, test systems and complete production lines for almost every test task.

Decades of experience, listening to our customers and matching their requirements. Facing individual tasks with technical creativity and realizing them in a team of highly skilled engineers and designers. This is what we do. This is SCHLEICH.

Every single one of our more than 140 employees works on guaranteeing and optimizing the high quality standard of our testers each and every day. Our customers, our sales team, our motivated engineers and manufacturing staff – with endless curiosity, new ideas and continuous optimizations they are part of the innovation process.



# Sales and Service Centers



# Expect more!

Whatever you want to test, SCHLEICH has the solution! SCHLEICH GmbH are a leading provider in the fields of electrical safety- and function-testing technology as well as motor- and winding-testing technology. Founded more than 50 years ago, the owner-managed company is now present in over 40 countries around the world.

## Electrical safety- and function testers



## Testers for electric motors and windings



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