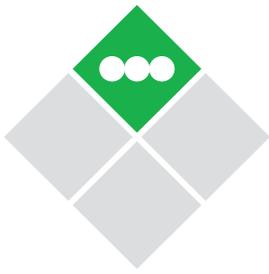




HIGHER PRODUCTIVITY
BY SHORTER REACTION TIMES
IN REMEDYING
PRODUCTION ERRORS



YOUR ENTERPRISE IS GROWING? SO WILL **ModularLine!**

Measurement instruments are a capital-intensive investment. Such investments need to be considered carefully. With ModularLine, FRANK-PTI offers you a product that is perfectly tailored to your needs thus allowing you to take an economical decision. You can start, for example, with three base modules. **The length and design of your testing line can be adapted anytime** and with utmost precision **to your current situation and requirements.**

In other words: if your requirements grow, ModularLine will grow with them. Step by step. What is more, ModularLine instruments offer you many additional benefits. Our profile measurements, for example, are carried out according to internationally valid standards without using correlations. Instead, a defined algorithm is applied to every single measurement method. All measurement instruments of FRANK-PTI have this convincing advantage.

MORE ADVANTAGES OF MODULARLINE:

- Fast individual tests are also possible.
- Self-programmable special test programmes are available for individual evaluations.
- A quicker availability of the measured data facilitates quicker corrections in the production process.
- Time is saved and error sources are reduced through automated workflows.
- All instruments are available in a StandAlone variant.

FOR STANDARDS-COMPLIANT MEASUREMENTS OF



✓ **PAPER**



✓ **BOARD**



✓ **TISSUE**

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PAPER



BOARD

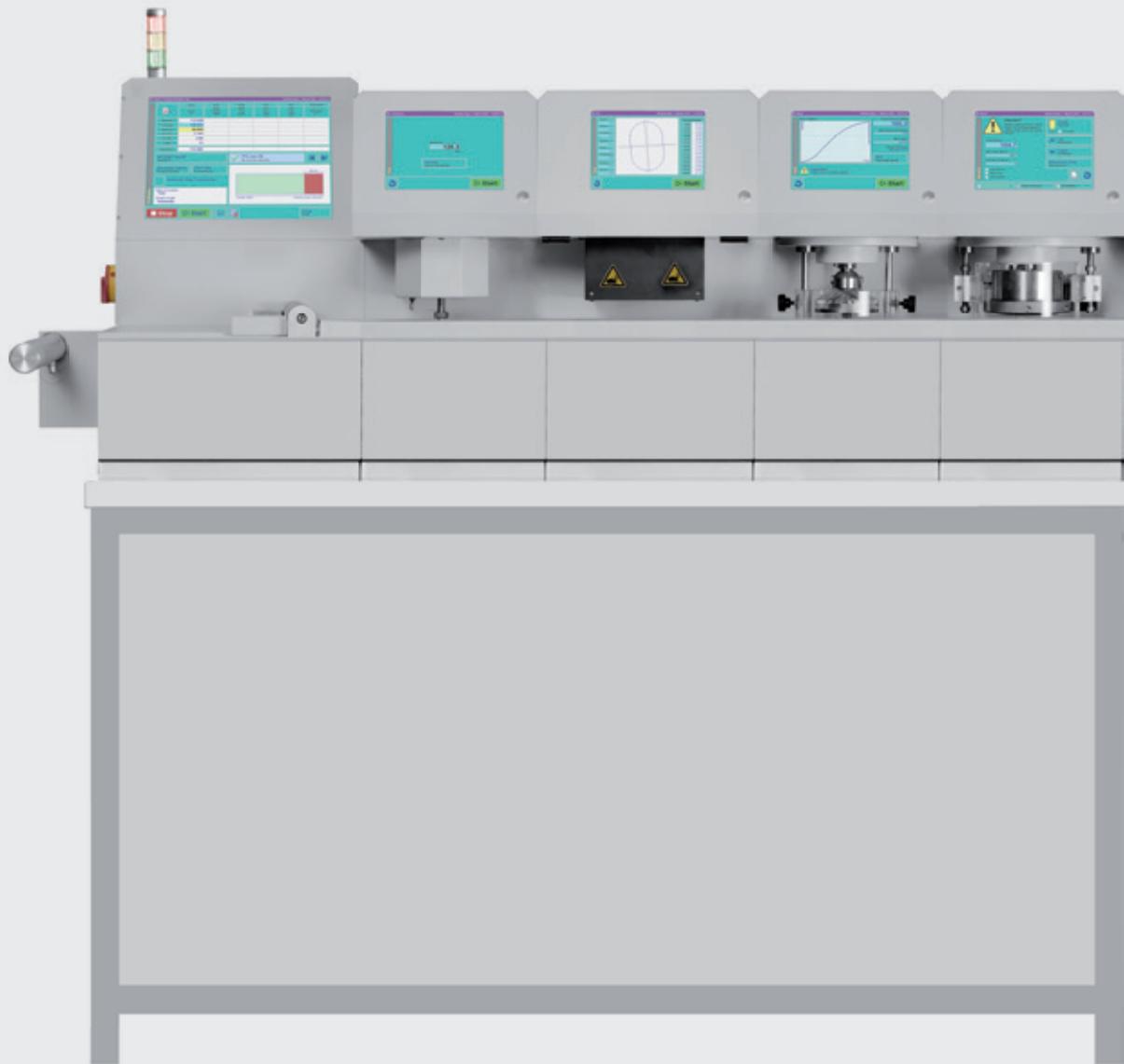


TISSUE



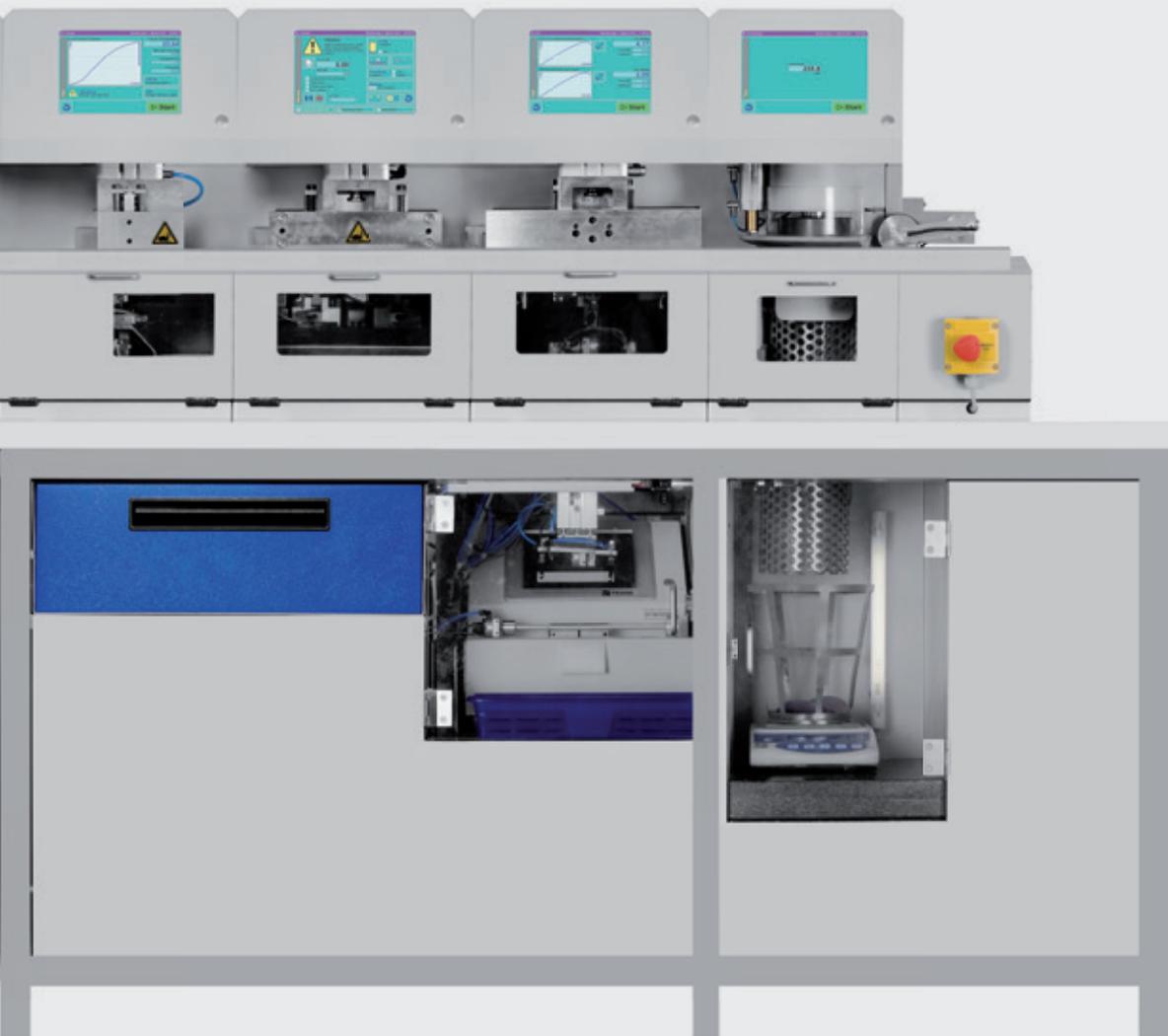
ModularLine

REQUIREMENT-BASED AUTOMATION OF YOUR LABORATORY



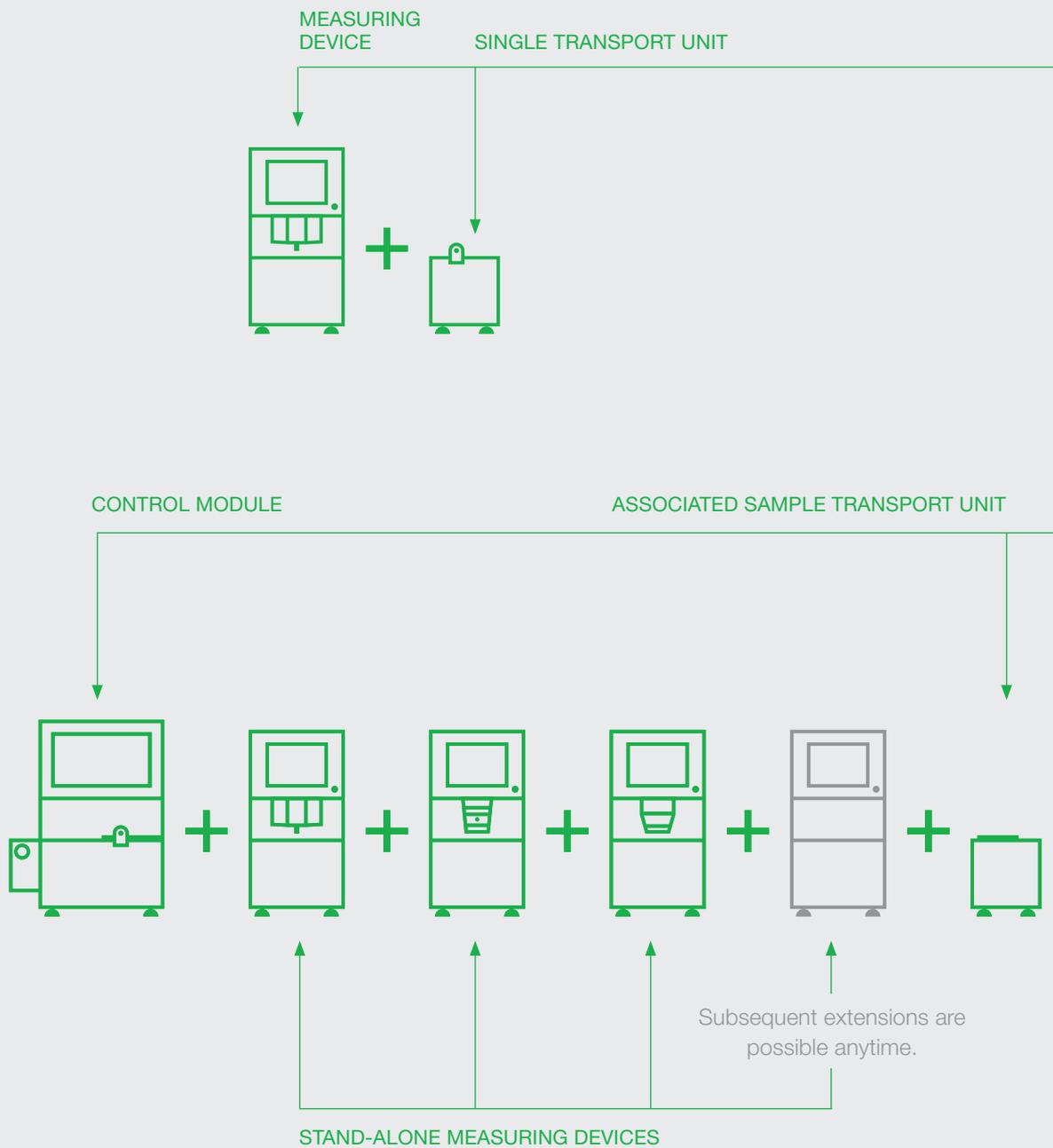
Example of a fully-automated test line with control unit, associated sample transport module and 8 measuring devices on a climatisation table

With its ModularLine FRANK-PTI sets new standards for fully-automated test lines. As the name already indicates, the test lines of FRANK-PTI are modularised, i.e. they consist of independently functioning devices, which are connected, changed or expanded according to your needs. This concept does not only offer the highest possible flexibility for the use of testing devices but also provides you with support when planning requirements-oriented laboratory investments.





THE **ModularLine** PRINCIPLE



The idea behind the ModularLine is simple and convincing: FRANK-PTI connects stand-alone measuring devices in a special ModularLine configuration. By extending the devices with control and transport modules, a **customer-tailored automation** is achieved. In this way optimum solutions are created according to your requirements:

AUTOMATION OF STAND-ALONE DEVICES

BY EXTENSION WITH THE SINGLE TRANSPORT UNIT

This is your **first step to automation**. By extending a stand-alone device with the ModularLine single transport unit (see page 12), the device can carry out a profile test easily and independently. FRANK-PTI recommends extension with the single transport unit for **use with 1 measuring device** (the module can be maximally used with 2 devices).

FULLY-AUTOMATED TEST LINES

BY EXTENSION WITH THE CONTROL MODULE AND ASSOCIATED SAMPLE TRANSPORTATION UNIT

By extending individual measuring devices with a control unit and its associated sample transport device (see page 14), a fully-automated test line is created. The **concept of a modularized line** allows you **to react to changing requirements at any time**. New developments and adaptations to international standards will no longer be a big challenge. Since the number of available testing methods is increasing constantly, quality assurance can be permanently ensured.



We will be pleased to support you as early as in the planning phase of your laboratory. Confide in our long-lasting experience in: drawing up a **master plan**, giving **positioning recommendations** for the laboratory devices, **connections** (water, drainage, electricity, compressed air), **vibration-free** placement areas, consulting of **laboratory furniture** and climatic conditions (normally 23°C / 50% humidity).



ADVANTAGES OF THE ModularLine

MORE MEASURING RESULTS IN SHORTER TIMES

Automated testing leads to more accurate and informative results. This also means that **measurement frequency** is significantly **increased** – you will achieve more measuring results in shorter times. To retain an overview of abundant data, ModularLine offers you **numerous analysis options**, which include:

- Clear statistical analysis of the measured data in ProbeNet or on the testing device
- Data connection to an existing quality management system.

This allows you to quickly and effectively determine informative analysis of the quality of the sample being measured. In contrast to measurements on laboratory devices, ModularLine measures a **complete profile**. The measurement position on the sample is crucial in this process. The comparison of individual test characteristics at exactly the right profile position is decisive to any required adjustment of the production process.

The more precise and informative the analysis, the quicker and more exactly production can be managed. This saves time and efforts and leads to better results.



Test program overview

UNIQUE REPRODUCIBILITY

All ModularLine devices operate according to applicable **international norms and standards**, and their physical dimensions therefore also conform to any stipulated requirements. This means that they not only all provide extremely high quality measurement results, but also provide unique reproducibility in an automated test device.

PROCESS OPTIMISATION

The measurement data can only be transferred directly to an external QM system if the **sample** is unambiguously **identified**. Here too, ModularLine offers numerous options for **optimising process categorisation**.

Data gathering processes can vary considerably across various businesses. This is why our ModularLine concept aims to find a way, using numerous different methods, to integrate itself with the company's process. Sample identification is possible either via inputting numbers and/or a series of characters, such as for example batch numbers or tambour numbers, or by barcode or QR code reading devices.

One of the most advantageous forms of connection to a QM system is via a bidirectional link. The samples that were created during the production process are displayed on the ModularLine monitor control unit. The user simply selects the sample and starts the measurement operation. On completion of all testing, the data is sent back with its associated identification, which can be done automatically if desired. This kind of communication not only significantly reduces preparation time, but also almost completely removes the possibility of mistakes in sample identification of the user. Also, the basis test processes can be loaded with the requirements of individual samples.

INDEPENDENTLY FUNCTIONING TESTING DEVICES

In contrast to comparable systems, ModularLine is not a static testing system. The ModularLine is much more about the **configuration of the measuring devices** at its heart. All testing devices of this configuration are complete, independently functioning measurement devices, which meet the needs of daily laboratory work and can be connected in series if required. Simply extending an individual device with the single transport module makes each device capable of carrying out profile testing independently. Adding a control unit, and the sample transport system that goes with it, creates a highly valuable, fully automated test line from the individual units.

The devices always remain capable of independent operation. This also makes it possible to measure different samples directly at the measuring device, even if it is connected to a test line.



The autonomy of the measuring devices is also maintained within test lines.

USER-FRIENDLINESS BY TOUCHSCREEN

The use of intuitive touchscreen-operated software, both in the stand-alone testing devices and in the control unit, offers the user unique **simplicity of operation** along with **detailed setup options**.

During the development of the software FRANK-PTI great importance was given to **clear structures** and easy to understand, **intuitive control elements**. All the stipulated testing parameters can be loaded to the device as test programs. This allows the user to carry out the actual test in just a few operations. Innovative ideas and customer experience have helped us to continually develop and optimize the software.

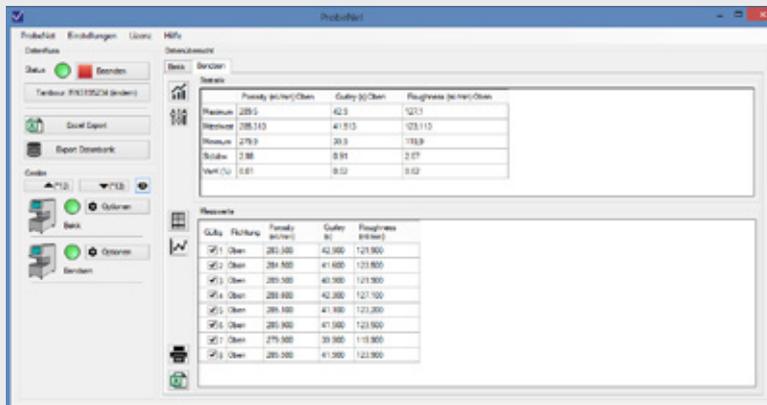


All measuring instruments and control units are equipped with touch screens.

STANDARD INTERFACE TO PROBENET

All ModularLine modules are by default supplied with an interface to ProbeNet (see pages 40 – 43). This means that there are many helpful functions available, like for example:

- After the successful completion of a test program an automatic notification is received.
- The local data saving of the measurement results facilitates an offline operation and a data transfer at a later date.



The screenshot shows the ProbeNet software interface. It features a sidebar on the left with navigation options like 'Datenfluss', 'Einstellungen', and 'Libere'. The main area displays two data tables. The top table, titled 'Messung', has columns for 'Primär (µm/ner)/Ohm', 'Sekundär (µm/ner)/Ohm', and 'Fortschritt (µm/ner)/Ohm'. The bottom table, titled 'Messwerte', has columns for 'Güte', 'Fläche', 'Formzahl', 'Güte', and 'Fortschritt'. Both tables contain numerical data points.

Display of parameters and measurements in ProbeNet



All ModularLine modules are by default supplied with an interface to ProbeNet (see pages 40 – 43).



SINGLE TRANSPORT UNIT

Laboratory automation for up to 2 testing devices



MOST IMPORTANT BENEFITS

- ✓ High-precision sample transport
- ✓ Sample transport speed and periode adjustable
- ✓ Automatic sample detection

PRODUCT DESCRIPTION

ModularLine automation in the laboratory begins with the design of the first device. The ModularLine single transport is a roller transport system that can be mounted and fixed to any ModularLine testing device. The speed and frequency of feed motion can then be set via the test program. This makes an individual measurement device into a fully-fledged profile measurement system. The testing device can still be used as an independent laboratory device.

TEST DESCRIPTION

With the help of the profile sample cutter a 30 cm wide profile sample can be prepared. This is then placed in the sample intake mechanism of the ModularLine single transport. A signal lamp then indicates if the sample is correctly clamped. At the measuring device itself, the corresponding test program is selected and by pushing the start button, the automatic profile test is started. The end of the sample is detected automatically and the test process is ended. The measurement data can then, according to requirements, be analysed and evaluated at the measurement device itself. The data can also be printed or transferred to a QMS to make it available for further processing.

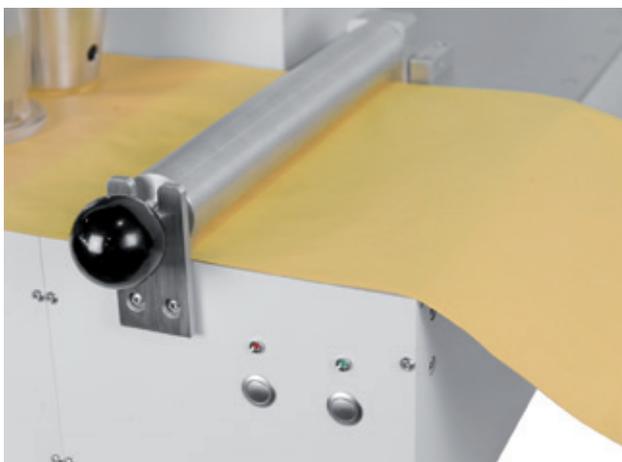
TECHNICAL DATA

DEVICE/INSTRUMENT

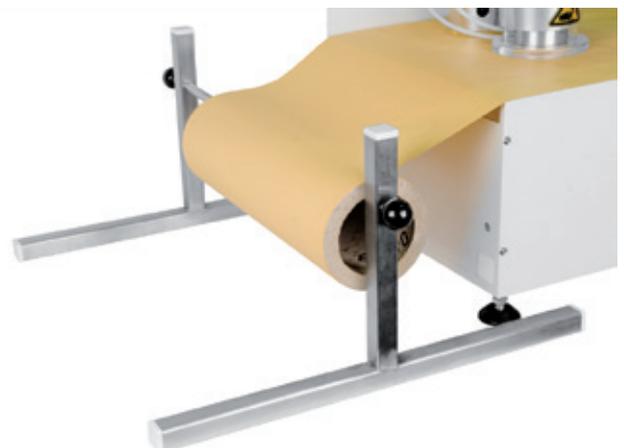
- Easy to use
- Sample width: 30 cm
- High-precision sample transport
- Sample transport speed and period adjustable
- Automatic sample detection

INSTALLATION REQUIREMENTS

Electrical connection	110 – 230 V / 50 – 60 Hz
Water connection	No
Compressed air	No



Inserted sample, end of sample is detected automatically



Flexible sample holder



CONTROL AND TRANSPORT UNIT

Laboratory automation for 2 or more testing devices



MOST IMPORTANT BENEFITS

- ✓ Industry 4.0 – Internet of things
- ✓ Integration into customers QMS/ERP
- ✓ Easy operation via the integrated touch screen
- ✓ High-precision needle-chain transport system
- ✓ Intelligent and flexible sample transport speed
- ✓ Easy to control due to the intuitive designed software

PRODUCT DESCRIPTION

The ModularLine control and transport unit is the heart of an automated testing system. As its name indicates, it regulates the sample feed that transports samples to connected measurement devices and then also takes control of them. This means that individual independent measurement devices form a fully automatic test line for the measurement of profile samples of any type. It doesn't matter if these are cross-section profiles for production control, or long profiles for early detection of faults at the paper machine – with the transport system, which is accurate to within millimetres, almost any testing scenario can be realised, according to requirements. Operation via the integrated touch screen guarantees high levels of comfort.

TEST DESCRIPTION

With the growth in number of connected testing devices, the number of configurations grows accordingly. As with the individual testing devices, the ModularLine control and transport unit is also equipped with a software assistant, which doesn't just help to quickly and clearly implement test requirements, but also loads them so that a complete profile test can be initiated in just a few operations. Especially for production control, this is a real advantage in meeting deadlines.



Insertion of a sample with automatic sample detection

TECHNICAL DATA

DEVICE/INSTRUMENT

- Easy operation via the integrated touch screen
- Sample width: 30 cm
- High-precision needle-chain transport system
- Intelligent and flexible sample transport speed
- Intuitive and straightforward creation of test programs
- Easy to control due to the intuitive designed software
- Bi-directional communication with QMS available
- ProbeNet (see pages 40 – 43) included

INSTALLATION REQUIREMENTS

Electrical connection	400 V / 16 A
Water connection	No
Compressed air	No



User interface



FORMATION TESTER

For:



✓ PAPER



✓ BOARD



✓ TISSUE



MOST IMPORTANT BENEFITS

- ✓ Easy operation via the integrated touch screen
- ✓ Proved algorithm for calculating the formationindex
- ✓ Distribution of the flakesice

PRODUCT DESCRIPTION

Evaluating the formation of a sample often depends on visual inspection by trained employees. In times of increasing measurement frequency and cross-company analysis, the ModularLine formation tester enables speedy, simple and above all objective and informative evaluations, which can also be expressed in numerical form. The formation index is one of the most important sizes determined by this method. If an optical evaluation by laboratory staff is desired later, the device also offers the option of saving the recorded pictures. This also enables manual evaluation to be simply and selectively recorded and documented.

TEST DESCRIPTION

The sample is illuminated by a transmitted light unit using a stroboscope. A CCD camera system records a high-resolution picture of the measurement area, while the intensity of the light is automatically regulated to bring the image to a comparable grey scale level. This allows samples with different grammage and opacity to be directly compared. The materials range from tissue and printing paper, to kraftliner. The distribution of floc sizes into 6 classes and the established algorithm for calculating the formation index provide informative results.

TECHNICAL DATA

DEVICE/INSTRUMENT

- Easy operation via the integrated touch screen
- Measuring range: 5 – 300 g/m² (depending on the opacity)
- Measuring area: 120 x 120 mm
- Resolution: 250 µm
- Measuring speed: 4 pictures per sec
- Proved algorithm for calculating the formationindex
- Distribution of the flake size into 6 classes (1, 2, 3, 6, 10 and 16 mm)

INSTALLATION REQUIREMENTS

Electrical connection	110 – 230 V / 50 – 60 Hz
Water connection	No
Compressed air	No

APPLICABLE STANDARDS

No standards available



Transmitted light with opal glass



Result interface with pictures and comparable values



SONIC SHEET TESTER (SST)

For:



✓ PAPER



✓ BOARD



✓ TISSUE



MOST IMPORTANT BENEFITS

- ✓ Easy to handle, with display of the distortion angle of the reel
- ✓ Display of graphs and single value directly on the touchscreen
- ✓ Measuring time approximately 5 sec per measurement
- ✓ Can be driven with single transport, and also built in a ModularLine

PRODUCT DESCRIPTION

The ModularLine sonic sheet tester is used wherever the characteristics of a material in further processing must be predicted. These range from simple cutting of the material to the final format, through colour printing, to corrugated board production. The raw materials can already be tested during production control for possible difficulties during further processing. This makes it possible to take action right then during ongoing production, and avoid later complaints. Additionally, the angle of maximum tensile stiffness orientation (TSO) provides the possibility of displaying the running characteristics of a paper machine. This allows the optimisation of processes, and the saving of time, energy, and effort.

TEST DESCRIPTION

A measuring head with a diameter of 120 mm is pressed against the sample with a defined pressure. Ultrasound sensors capture the sound waves produced by the transmitter placed opposite. The time taken by the sound to travel directly and indirectly through the sample is the basis of this measurement. Based on this data, an algorithm is used to determine the angle of maximum tensile stiffness, along with the tensile stiffness index, which provides valuable findings on the cohesiveness of the material.

TECHNICAL DATA

DEVICE/INSTRUMENT

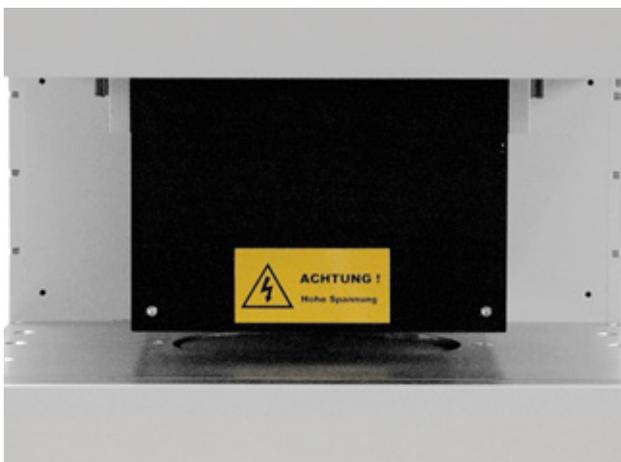
- Easy operation via the integrated touch screen
- Displays the warp angle of the tambour
- Measuring area: \varnothing 120 mm
- 32 measuring angles, each of 11.25°
- Measuring range: 20 – 200 μ s (7.5 bis 0.75 km/s)
- 16 Ultrasonic sensors (8 pair)

INSTALLATION REQUIREMENTS

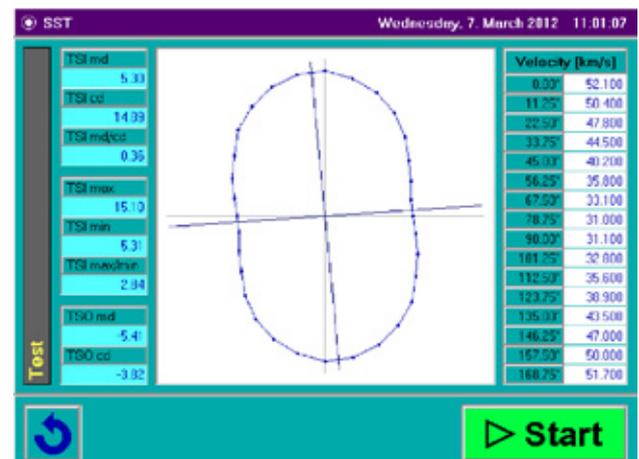
Electrical connection	110 – 230 V / 50 – 60 Hz
Water connection	No
Compressed air	4 – 6 bar

APPLICABLE STANDARDS

No standards available



Lowerable measuring head



Display of results at touch screen



GLOSS METER

For:



✓ PAPER



✓ BOARD



✓ TISSUE



MOST IMPORTANT BENEFITS

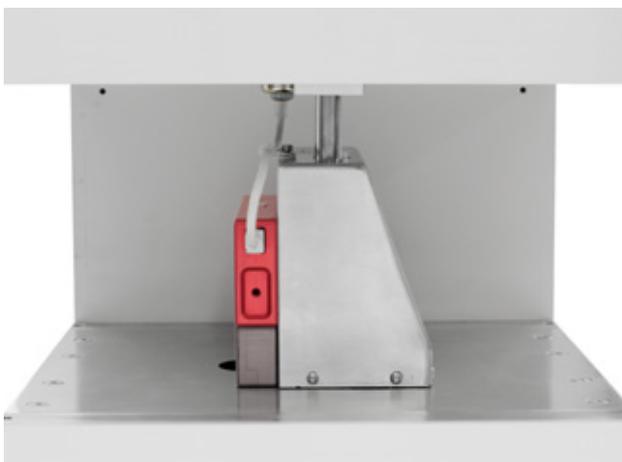
- ✓ **Easy handling with selectable measurement options:**
 - Machine direction (MD) Top/Bottom
 - Cross direction (CD) Top/Bottom
 - MD and CD with automatic rotation
- ✓ **Can be driven with a single transport**

PRODUCT DESCRIPTION

The ModularLine gloss test device is based on the latest LED technology, which appreciably improves the lifespan of the sensors, and shortens measurement times considerably. Therefore the quality of measurements taken this way is significantly improved. There are different configurations of the ModularLine gloss test device available, allowing the implementation of testing according to different applicable regulations. The individual measurement mechanisms are equipped with one or more multi-directional sensors. Depending on the applicable standard, there are numerous different uses for this device.

TEST DESCRIPTION

The measurement head is automatically placed on the sample. The spring-mounted base platen guarantees the flatness of the sample required by the standards for gloss measurement. One second later, the results of the test are collected and the process is ended. When using the gloss test device as part of the ModularLine (*control and transport unit, see page 14*) or together with a Modular-Line single transport system (*see page 12*), it is often one of the fastest test procedures. In this way an entire profile sample can be tested for its gloss characteristics at very high measurement frequency within a short time.



Measuring sensor top side, machine direction

TECHNICAL DATA

DEVICE/INSTRUMENT

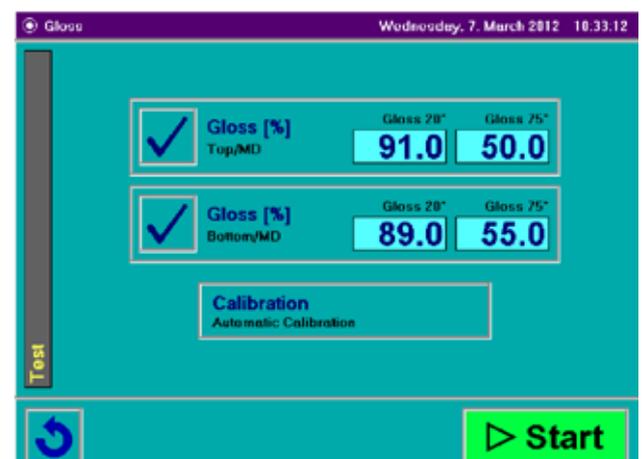
- Easy operation via the integrated touch screen
- Latest LED technology
- 0 – 100 gloss unit (0 – 100%)
- Measuring area: 10 x 15 mm

INSTALLATION REQUIREMENTS

Electrical connection	110 – 230 V / 50 – 60 Hz
Water connection	No
Compressed air	4 – 6 bar

APPLICABLE STANDARDS

- DIN EN 14086
- ISO 8254-1 | -2 | -3
- TAPPI T480, T653



User interface with multi angle sensor



BRIGHTNESS & COLOR METER

For:



✓ PAPER



✓ BOARD



✓ TISSUE



MOST IMPORTANT BENEFITS

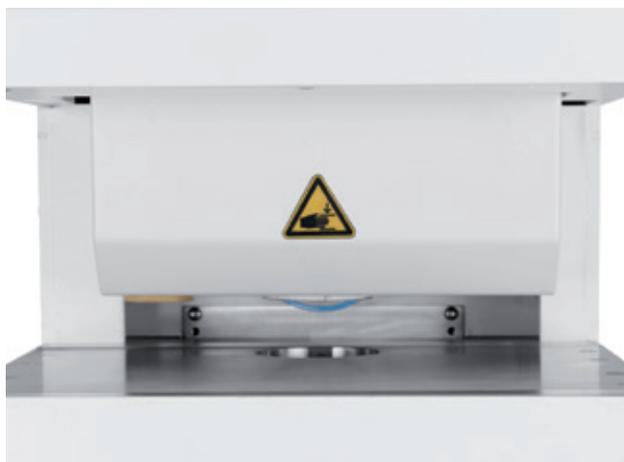
- ✓ Compact device with built-in industrial PC
- ✓ Two-beam spectrophotometer with touchscreen
- ✓ Spectral range: 360 – 740 nm
- ✓ Sphere with $d/0^\circ$ geometry, pulsed xenon flash lamp
- ✓ “WinPaper”-Software, especially designed for the paper industry

PRODUCT DESCRIPTION

The ModularLine brightness and color meter uses a xenon flash technique and a dual beam spectrophotometer. Depending on the applicable standard, various UV levels are available, which can simulate daylight and artificial light. The testing device is extremely precise and stable, and very reliable. Different algorithms can be used to produce a multitude of calculations for every measurement carried out, which can be displayed and further processed if required. The use of an automatic stack changer, in the form of a turn table, emphasises comfort of use for the test device, not only when it is used as part of a ModularLine.

TEST DESCRIPTION

The measuring mechanism of the test device is placed on the sample automatically, and the stack selected for measurement is placed in the correct position by the stack changer. After the measurement, the stack is replaced by the black standard automatically, and a further measurement is carried out. The values determined form the basis for calculating the colour characteristics, brightness and opacity. The stack changer provides six positions, that can optionally be equipped with calibration standards for fully automatic base calibrations and/or with various sample stacks. With the sample punch, available as an extra the individual stack holders can be filled directly, preventing any contamination of the sample stack by user's hands.



Measuring area

TECHNICAL DATA

DEVICE/INSTRUMENT

- Easy operation via the integrated touch screen
- Double-Beam spectrophotometer with d/0°-geometry
- Wavelength range: 360 – 740 nm
- Wavelength pitch: 10 nm
- Reflectance range: 0 – 200%, resolution: 0.01%
- Light source: pulsed xenon lamps
- Measurement area: \varnothing 30 mm
- Measuring with different light sources without recalibration

INSTALLATION REQUIREMENTS

Electrical connection	110 – 230 V, 50/60 Hz
Water connection	No
Compressed air	400 – 600 kPa

APPLICABLE STANDARDS

- DIN 53145 bis 53147, 54500
- ISO 2469, 2470, 2471, 3688, 11475, 11476
- TAPPI T519, T525, T527



Automatic stack changer with six positions



MICROMETER

For:



✓ PAPER



✓ BOARD



✓ TISSUE



MOST IMPORTANT BENEFITS

- ✓ Easy operation via the integrated touch screen
- ✓ High-resolution digital sensor
- ✓ Testing speed adjustable
- ✓ Measuring time adjustable

PRODUCT DESCRIPTION

To determine the single layer thickness of paper, board, textiles and fibrous textile fabric, the ModularLine micrometer is outstanding thanks to its new technology and precision manufactured mechanism. The high definition digital sensor is uniquely capable of providing reproducibility and exactness. The feed system, which is also digitally controlled, allows the lowering of the touch probe with exact and constant speed. Many variants with different touch probes and weights fulfil the requirements of differing test standards for contact pressure. Along with the single layer thickness, the measurement of several layers (e.g. ten layers) is also possible.

TEST DESCRIPTION

The single or multiple layer sample is placed on the measuring area. The start button is pushed and the test sequence is begun. The touch probe travels constantly downward at the set speed and is removed from the transport mechanism there, allowing it to apply the required pressure to the sample, free from outside influence. On elapsing of the period set in the test program, the value is determined and the touch probe travels back to the start position.

TECHNICAL DATA

DEVICE/INSTRUMENT

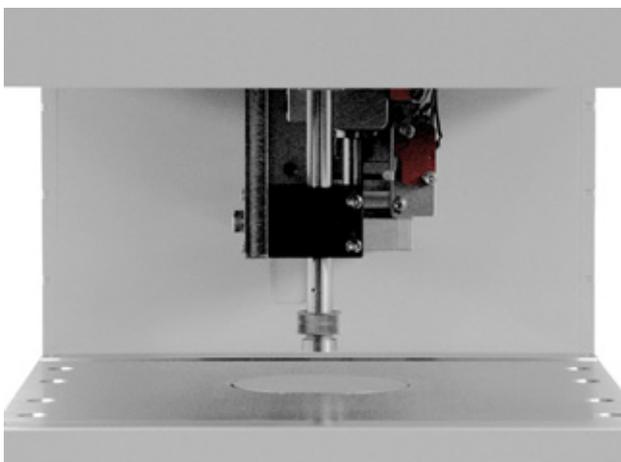
- Easy operation via the integrated touch screen
- High-resolution digital sensor
- Measurement range: 0.5 – 20,000 μm
- Measuring pins depending on model: 2, 10, 20 or 25 cm^2
- Contact pressure depending on model: 0.125 – 20 N/cm^2
- Testing speed adjustable: 0.1 – 6 mm/s
- Measuring time adjustable: 1 – 50 s
- Resolution: $\pm 0.5 \mu\text{m}$ ($\pm 0.1 \mu\text{m}$ on demand)

INSTALLATION REQUIREMENTS

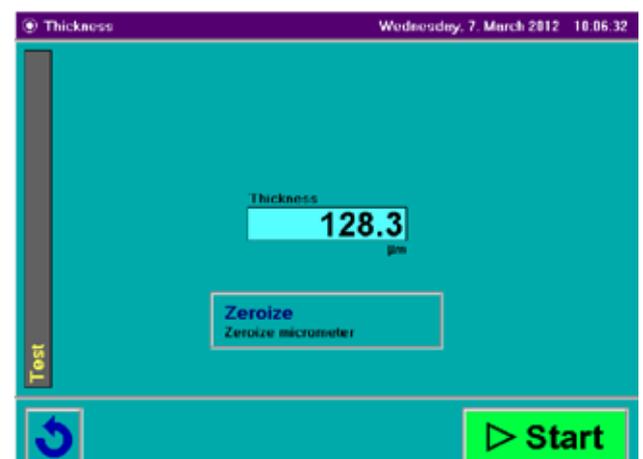
Electrical connection	110 – 230 V, 50/60 Hz
Water connection	No
Compressed air	No

APPLICABLE STANDARDS

DIN EN ISO 534, 12625-3



Measuring pin with 2 cm^2 measuring area



User interface



BEKK SMOOTHNESS TESTER

For:



✓ PAPER



✓ BOARD



MOST IMPORTANT BENEFITS

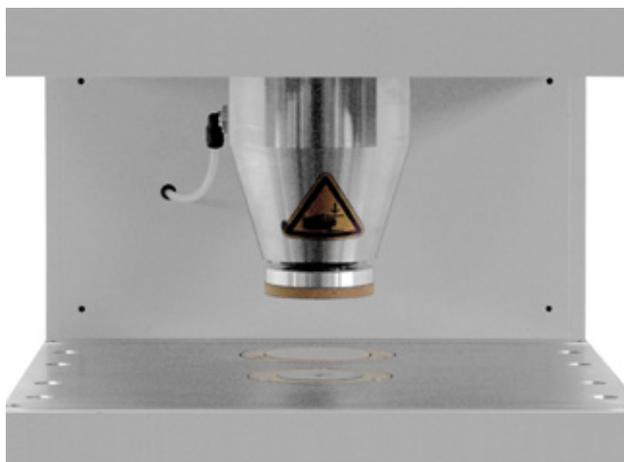
- ✓ 3 volumes selectable (1/1, 1/10, and 1/20)
- ✓ Built-in dead-weight: 10 kg
- ✓ 3 versions available:
 - Standard with one head – bottom side measurement
 - Reversed head – top side measurement
 - 2-head version: simultaneous bottom side and top side measurement

PRODUCT DESCRIPTION

Bekk smoothness testing is an especially informative technique for determining the smoothness of a sample. FRANK-PTI has developed this measurement principle using high grade materials and precision measurement technology, and it has been trusted by the industry for decades. The ModularLine Bekk smoothness testing device delivers outstanding results, and by extending the measurement area, very smooth samples can be tested within a reasonable time. The automatic prediction is available after just 10 seconds, with informative results.

TEST DESCRIPTION

After inserting the sample and the start of the test sequence, the test mechanism lowers. It then presses on a rubber platen, which presses the sample against a glass platen with a defined force. The integrated vacuum pump lowers the pressure in the system to 50.7 kPa. The device then records the amount of time required until the pressure difference with the surroundings is exactly 48.0 kPa. The time measured is given in Bekk seconds. With very smooth samples, the measured volumes can be altered using the software to 1/10 or even 1/20. This reduces the measurement duration to 1/10 or 1/20.



Measuring area

TECHNICAL DATA

DEVICE/INSTRUMENT

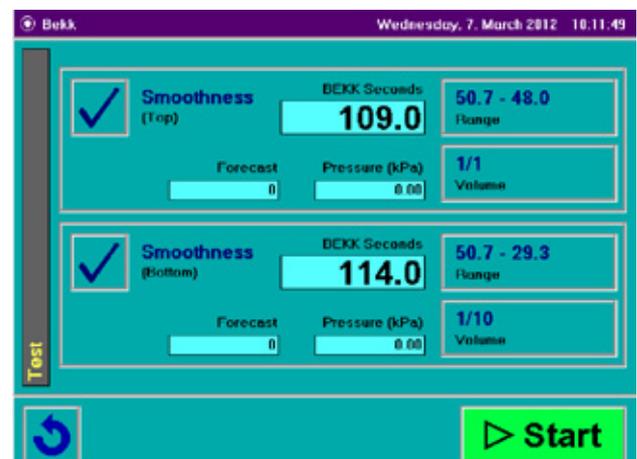
- Easy operation via the integrated touch screen
- Measuring area: 10 cm²
- Accuracy: 0.01 s
- Forecast after 10 s
- Measuring volume: 1/1 (380 ml), 1/10 (38 ml), 1/20 (19 ml)

INSTALLATION REQUIREMENTS

Electrical connection	110 – 230 V / 50 – 60 Hz
Water connection	No
Compressed air	4 – 6 bar

APPLICABLE STANDARDS

- DIN 53107
- ISO 5627
- TAPPI T479



User interface for 2 measuring heads: top and bottom side



PPS-PRINT SURF ROUGHNESS TESTER

For:



✓ PAPER



✓ BOARD



MOST IMPORTANT BENEFITS

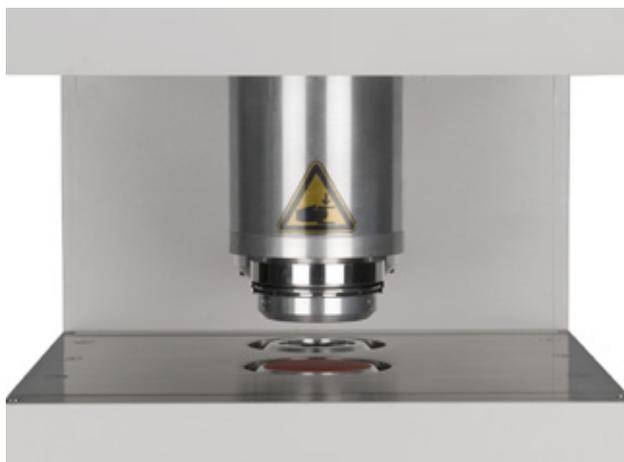
- ✓ **3 versions available:**
 - 1 head, test direction: Topside (standard)
 - Reverse test direction: Bottomside
 - 2 heads: selectable tests from top and bottom side
- ✓ **3 backing pressures selectable: 490, 980, and 1960 kPa**

PRODUCT DESCRIPTION

The print surf method is a technique for determining the surface roughness of coated or calendered papers. It is also used on newsprint paper. The ModularLine PPS roughness measurement device operates, as with other techniques, using the air leak method. It has a very precisely manufactured measurement head as well as outstanding measurement technology. The throughflow is determined using two sensors, guaranteeing reliable and highly accurate measurement results across the entire area. The configuration with two measurement heads allows the upper and lower surface of the sample to be measured at the same time.

TEST DESCRIPTION

The sample is pressed against the measurement head at a defined pressure of 490, 980, or 1960 kPa. A pressure regulation system creates a pressure differential at the measuring mechanism of 19.6 kPa. The throughflow is determined using the integrated sensors. The results are then calculated according to the formula required by the standard. Measurement areas smaller than 1 μ are automatically measured with an additional sensor for limited throughflow. This leads to a significant increase in accuracy and stability of the results, even in small areas.



Measuring area

TECHNICAL DATA

DEVICE/INSTRUMENT

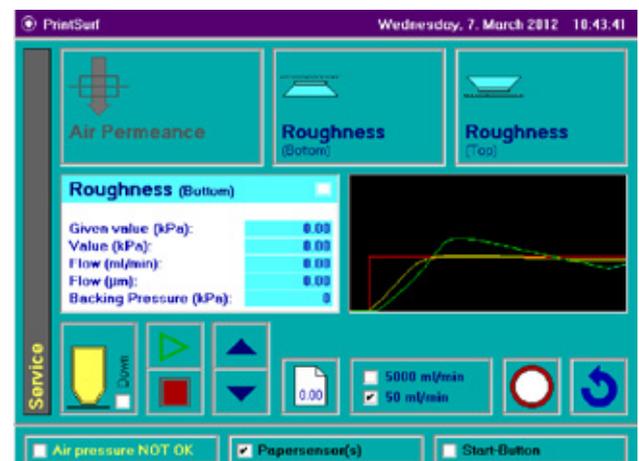
- Easy operation via the integrated touch screen
- Measuring range: 0.5 – 8.0 μ m
- Measuring pressure: 19.6 kPa
- Contact pressure adjustable: 490, 980 or 1,960 kPa
- Special sensor for measurements below the 1 μ limit
- High reproducibility

INSTALLATION REQUIREMENTS

Electrical connection	110 – 230 V / 50 – 60 Hz
Water connection	No
Compressed air	4 – 6 bar

APPLICABLE STANDARDS

- DIN ISO 8791-4
- ISO 8791-1
- TAPPI T555



Service interface for 2 measuring heads: top and bottom side



BENDTSEN

For:



✓ PAPER



✓ BOARD



✓ TISSUE



MOST IMPORTANT BENEFITS

- ✓ **1, 2, or 3 heads are available in one device**
(roughness top, roughness bottom, permeability)
- ✓ **Standard measuring range: 25 – 5000 ml/min**
(other measuring ranges also available, e.g. 1 – 5000 ml/min)
- ✓ **Simultaneous measurement with all 3 measuring heads**
- ✓ **Fully automated measuring cycle, sample is not destroyed**

PRODUCT DESCRIPTION

The Bentsen measurement process is specified both for surface roughness and air permeability. It works according to the air leak method with preset pressure differentials. The ModularLine Bentsen testing device is available in various different variant models. According to configuration, the roughness of the upper surface and/or the lower surface as well as the air permeability can be measured. A device can therefore contain up to three measurement units, with each equipped with a closed measurement and regulation system, and the latest generation of sensors. The results can be displayed in ml/min or $\mu\text{m}/\text{Pa}^*\text{s}$, as required. Calculation according to Gurley, Schopper and Sheffield is also possible.

TEST DESCRIPTION

After inserting the sample and the start of the test sequence, the roughness measurement head is automatically placed on the sample and measurement is started. Automated positioning of the head almost rules out inaccuracies of measurement due to outside influence. Depending on the selected measurement pressure, a pressure difference of 0.74, 1.47 or 2.20 kPa is created and the throughflow between measurement blade and sample is measured. The air permeability is determined using the same technique, where the airflow through the sample is measured. The same selectable pressure regulation bands apply here.



Measuring area

TECHNICAL DATA

DEVICE/INSTRUMENT

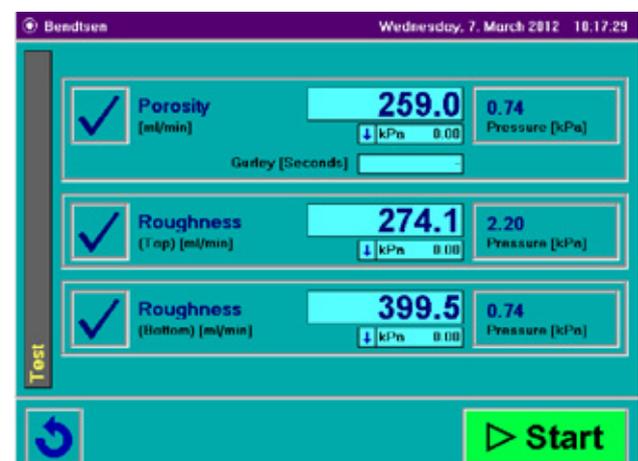
- Easy operation via the integrated touch screen
- Flow: 10 – 5,000 ml/min
- Measuring time adjustable: 1 – 40 sec
- Pressure difference adjustable:
0.74 kPa
1.47 kPa
2.20 kPa

INSTALLATION REQUIREMENTS

Electrical connection	110 – 230 V / 50 – 60 Hz
Water connection	No
Compressed air	4 – 6 bar

APPLICABLE STANDARDS

- DIN 53120-1
- ISO 5636-3, 8791-2



User interface



BURSTING STRENGTH

For:



✓ PAPER



✓ BOARD



✓ TISSUE



MOST IMPORTANT BENEFITS

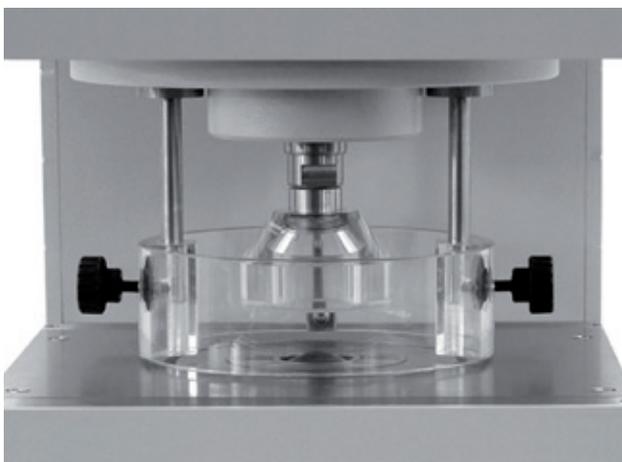
- ✓ Measuring range: 20 – 2,000 kPa
- ✓ Burst tester for paper; also available for board (measuring range for board: 20 – 10,000 kPa)
- ✓ Touchscreen for convenient control
- ✓ Safety protection
- ✓ Also available for inverted tests
- ✓ Display of burst curve, optionally available with BEA (Burst Energy Absorption) value

PRODUCT DESCRIPTION

The procedure for determining burst pressure is different for paper and board. Therefore the ModularLine burst pressure device is also available in two variants. These are different, essentially, in the clamping bell and membrane designed for the procedure being used. The exact construction of the individual components as well as the high-precision measurement and regulation technology give the testing device a unique accuracy. As with all ModularLine testing devices, the burst test device can be used as either an independent laboratory device, and/or as part of a ModularLine. In the standard configuration, the burst pressure is measured from the underside of the sample. According to requirements, a configuration is also available where the measurement is carried out at the upper surface.

TEST DESCRIPTION

The sample for testing is placed in the measurement area. After pressing the start button the clamping bell travels down and fixes the sample. The glycerine, which is located below the membrane, is compressed and in this way the membrane is held continuously against the sample. This bulges, loses cohesion, and eventually bursts. Then the clamping bell travels back to the start position. The burst pressure measured and the energy absorption characteristics are displayed on the touch screen numerically and graphically. If more than one test is carried out, these can be compared statistically and standard deviation can be displayed.



Measuring area with security protection

TECHNICAL DATA

DEVICE/INSTRUMENT

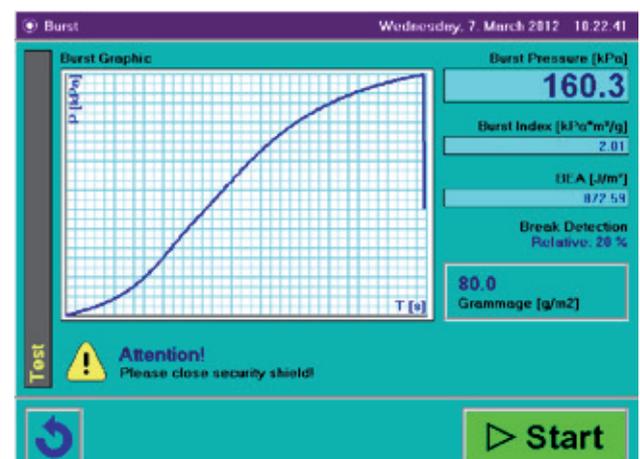
- Easy operation via the integrated touch screen
- Pneumatic sample clamping
- Safety protection around the measuring area
- Measuring area:
Paper: 860 mm²
Board: 780 mm²
- Motor operated hydraulic (glycerine), pressure adjustable:
Paper: 20 – 2,000 kPa
Board: 20 – 10,000 kPa

INSTALLATION REQUIREMENTS

Electrical connection	110 – 230 V, 50 – 60 Hz
Water connection	No
Compressed air	400 – 600 kPa

APPLICABLE STANDARDS

- ISO 2758 (paper) or 2759 (board)



User interface with real time curves and values



TENSILE MD OR CD

For:



✓ PAPER



✓ BOARD



✓ TISSUE



MOST IMPORTANT BENEFITS

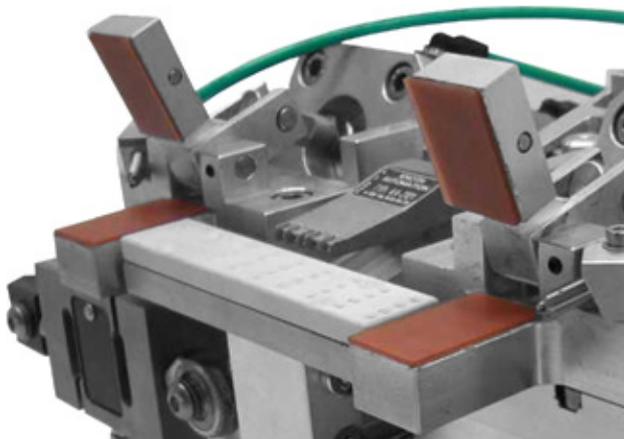
- ✓ Easy operation via the integrated touch screen
- ✓ Pneumatic sample punch and clamping
- ✓ Test speed adjustable: 1 – 120 mm/min
- ✓ Available measuring directions:
 - Cross direction
 - Machine direction

PRODUCT DESCRIPTION

In contrast to other techniques for determining tensile strength, the ModularLine tensile strength test device is a fully-fledged measurement device as specified according to ISO 1924-3. With this device, direct measurements of strain are possible, and require no correction factors. A sample is automatically punched, according to model, in MD or CD at a width of 15 mm. A fully-fledged tensile testing module within the device guarantees standards-compliant testing, with results that can be directly compared with laboratory devices. Therefore, neither correction or correlation is required. Together with a ModularLine single transport (see page 12) or as part of a ModularLine, an informative cross-section profile of the tensile strength of a sample can be easily and fully automatically created.

TEST DESCRIPTION

A strip of 15mm in width is automatically created from the inserted sample using an integrated punch. This strip is then held by a vacuum pump and transported lower. There the jaws of the clamp close and the test procedure begins. The clamp jaws pull the sample so far apart that it rips. After a successful test, the destroyed sample is automatically blown into a refuse container. Along with the process curves recorded, the strain, maximum breaking force, tension length, and tensile strength, among other values, are calculated.



Fully-fledged tensile testing module within the device

TECHNICAL DATA

DEVICE/INSTRUMENT

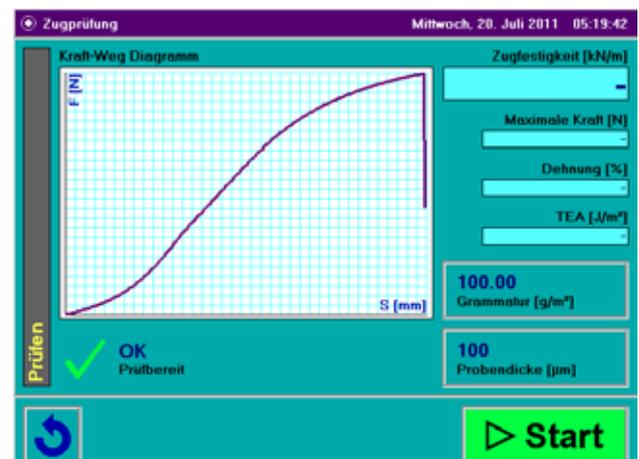
- Easy operation via the integrated touch screen
- Pneumatic sample punch and clamping
- Test speed adjustable: 1 – 120 mm/min
- Available measuring directions:
Cross direction
Machine direction

INSTALLATION REQUIREMENTS

Electrical connection	110 – 230 V / 50 – 60 Hz
Water connection	No
Compressed air	4 – 6 bar

APPLICABLE STANDARDS

- ISO 1924-2 | -3
- TAPPI T494



Service interface



SHORT SPAN COMPRESSION TESTER (SCT)

For:



✓ PAPER



✓ BOARD



✓ TISSUE



MOST IMPORTANT BENEFITS

- ✓ Display of graphs and values on a touchscreen
- ✓ Contact pressure of clamps: 2300 N (adjustable)
- ✓ 500 N force sensor
- ✓ Linear movement of clamps

PRODUCT DESCRIPTION

The ModularLine short span compressive test device consists of a punch mechanism in MD and CD, a transport unit and a fully-fledged short span compression tester, which is integrated within the lower part of the system. This has been in use by our customers for many years as an independent laboratory device. High grade materials and precision processing guarantee the highest measurement accuracy. In the ModularLine model of the SCT, the sample is automatically punched and automatically placed in the SCT test device by a transport mechanism, and measured there. There is therefore no requirement for correction or adjustment, as the actual test is carried out by the standards-compliant device.

TEST DESCRIPTION

The sample to be tested is placed in the measurement area. It is created in the appropriate format by a pneumatic punch, moved to the lower part of the device automatically by a transport mechanism and placed in the fully-fledged short span compressive test device integrated there. The SCT test starts automatically. On obtaining the test results, the sample is automatically thrown into a refuse container. The measurements can be carried out in MD or CD as required.



Fully-fledged short span compression tester

TECHNICAL DATA

DEVICE/INSTRUMENT

- Easy operation via the integrated touch screen
- Clamping pressure and distance adjustable
- Pneumatic clamping of the sample
- Automatic punching of MD- and CD-Samples at the same time
- Testing speed adjustable
- Automatic ratio calculation

INSTALLATION REQUIREMENTS

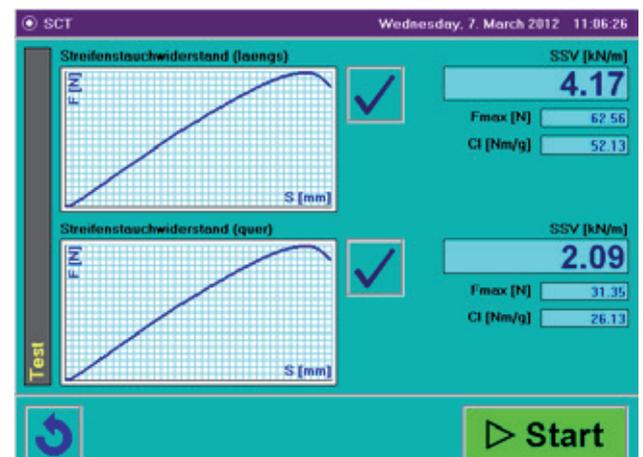
Electrical connection	110 – 230 V, 50/60 Hz
Water connection	No
Compressed air	4 – 6 bar

APPLICABLE STANDARDS

- DIN 54518
- ISO 9895
- TAPPI T826



Special Table required



User interface with real time curves



GRAMMAGE

For:



✓ PAPER



✓ BOARD



✓ TISSUE



MOST IMPORTANT BENEFITS

- ✓ Fully automated punch and scale of the sample
- ✓ Big collecting basket for the samples
- ✓ With high resolution balance

PRODUCT DESCRIPTION

To calculate grammage, the weight of a sample is determined with an accurate scales, and compared to the area. In the ModularLine grammage test device, a round sample with an area of 100 cm² is automatically punched and the weight measured using scales integrated into the table below the test device. High grade materials and precision are always at the forefront during production. This allows both thin paper such as cigarette paper (~12 – 45 g/m²) or board (~150 – 800 g/m²) to be processed without difficulty. This device can also be successfully used on other materials, such as fibreglass mats.

TEST DESCRIPTION

The punch, integrated in the device, creates a round sample with an area of 100 cm². This falls into a container, which is placed on precision scales beneath the device. Immediately after the weighing process, the measurement results are displayed on the touch screen in g/m².

TECHNICAL DATA

DEVICE/INSTRUMENT

- Easy operation via the integrated touch screen
- Measuring area: 100 cm²
- Grammage range: 12 – 800 g/m²
- Pneumatic binder for precise cutting of the sample
- Precision balance built into the lower part of the device

INSTALLATION REQUIREMENTS

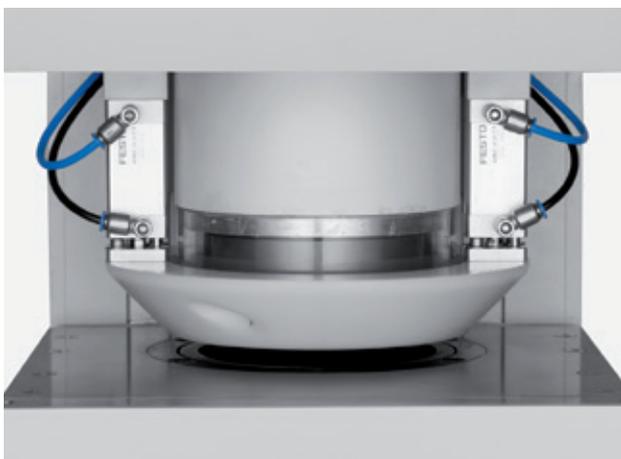
Electrical connection	110 – 230 V, 50/60 Hz
Water connection	No
Compressed air	4 – 6 bar

APPLICABLE STANDARDS

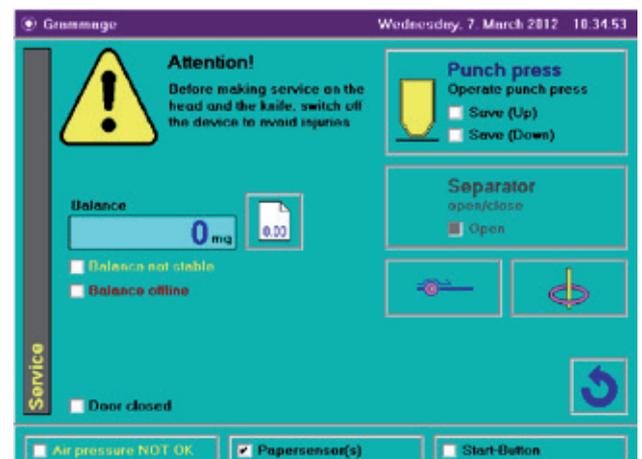
- ISO 536
- TAPPI T410



Special Table required



Punch with binder

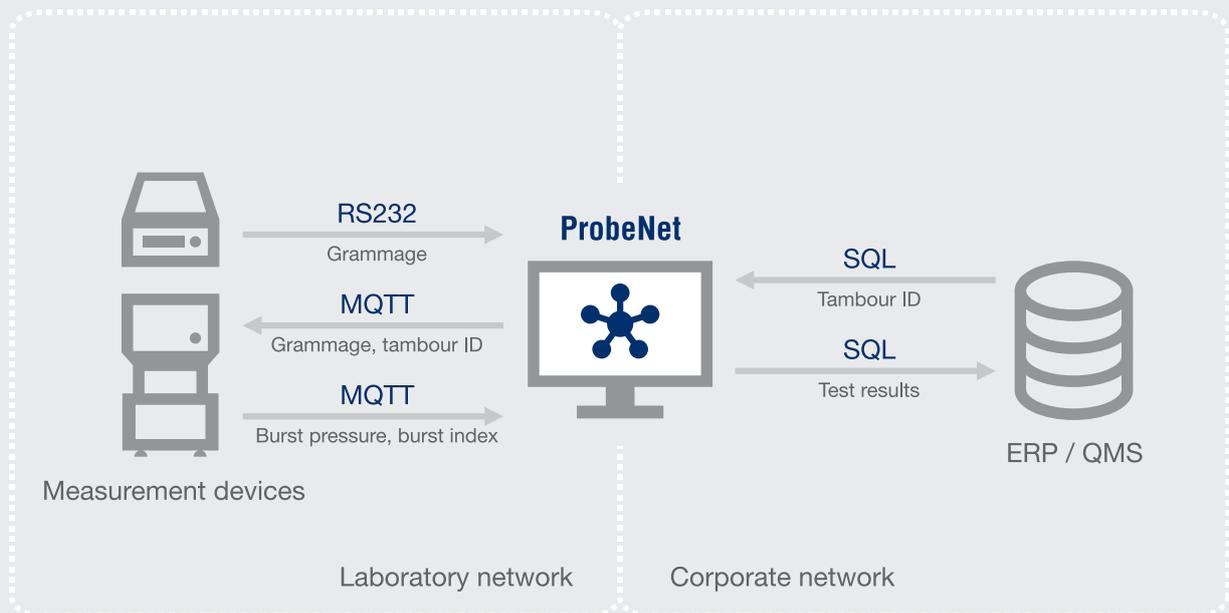


Service interface



PROBENET

Software for collecting, saving and printing of test-results of various laboratory devices.

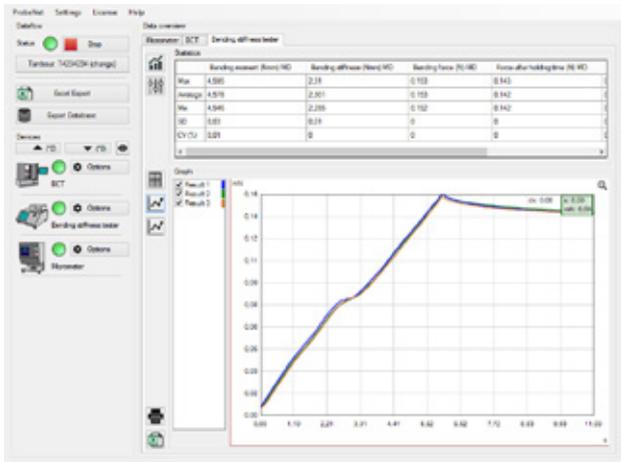


MOST IMPORTANT BENEFITS

- ✓ **Simple operation thanks to a clear interface**
Measurement data from various devices shown in graphs and tables on a central computer
- ✓ **Customer-orientated setting options**
Description of measurement values adaptable according to customer wishes
Conversion of measurement results to other units
- ✓ **Industry 4.0**
Use of MQTT (Message Queue Telemetry Transport) via Ethernet for linking laboratory equipment.

PRODUCT DESCRIPTION

The ProbeNet application by FRANK-PTI is a software for the centralised collection of measurement data from different laboratory measurement equipment on one PC. ProbeNet is very easy to use and presents the measurement results on a well-arranged interface. Individual measurement results and statistics of all devices can be rapidly and clearly summarised in only one area. It is possible to mark results as outliers in the list of individual results and exclude them from the statistics and reports.



Statistics and graphics

Test method	Test speed	Speed unit per force	Angle 1	Angle 2	Angle 3	Hold time	Res. force	Time 1	Time 2
Binding force	5	5	30	0	0	5	0.158	0	0

Test	Direction	Binding moment (Nm)	Binding offset (Nm)	Binding force (N)	Force after holding time (N)	Res. force (%)	Angle hold time (s)
W 1	MC	4.595	2.212	0.153	0.142	0.156	30.001
W 2	MC	4.592	2.208	0.152	0.143	0.156	30.001
W 3	MC	4.546	2.205	0.152	0.142	0.156	30.001
W 4	MC	4.598	2.210	0.152	0.142	0.156	30.001
W 5	MC	4.547	2.208	0.152	0.143	0.156	30.001
W 6	MC	4.546	2.205	0.152	0.142	0.154	30.001

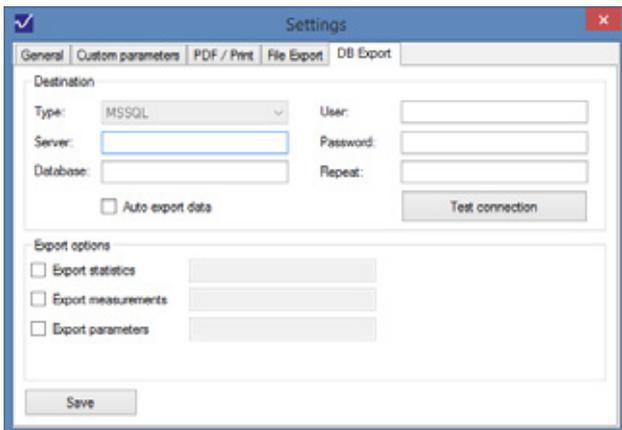
Parameters and measurements

Date	Tambour
2016-05-25 11:00:36	Ta218274
2016-05-25 10:58:26	Ta12213
2016-05-25 10:54:45	Ta13123
2016-05-25 09:00:42	test tambour3

Backup traceability

ProbeNet facilitates a linking of various software systems for data exchange. All relevant data can be exchanged between the systems. Upon request, it is also possible to connect external devices through RS232, MQTT, Ethernet or file import.

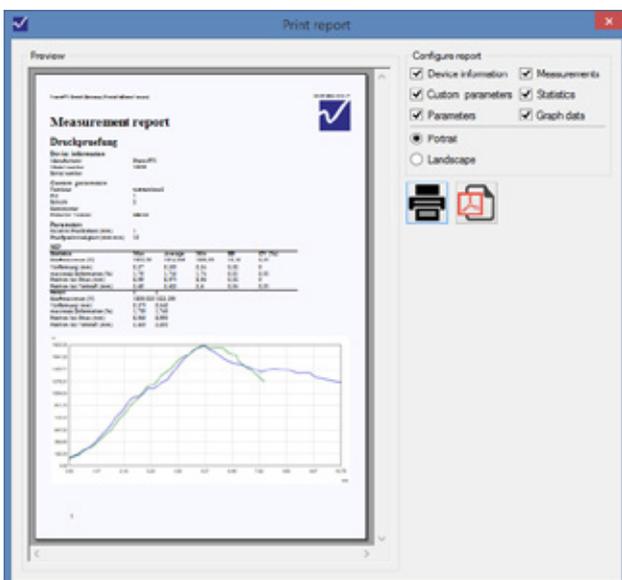
A temporary local data backup guarantees the saving of the received data and offers traceability for up to 4 weeks. The data can comprise test parameters and measurement results but also tambour or batch numbers and climate data (data collection by means of an external climate measurement device, e.g. by FRANK-PTI).



Settings data export

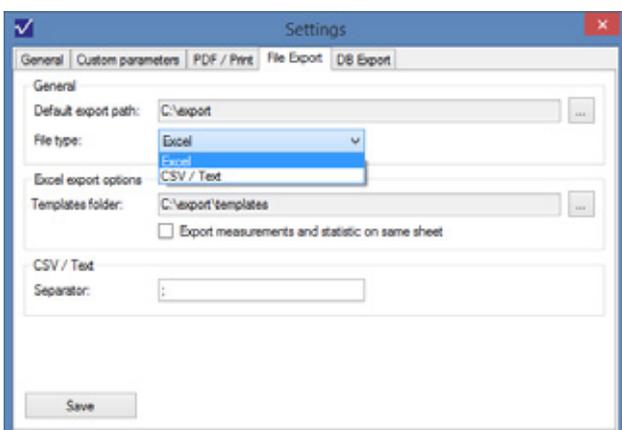
Data exchange is carried out via a local SQL database, which can also be used for data exchange with other data processing programmes within the company. Customers can define the data they want to export, e.g. measurement values and/or test parameters and/or statistics. It is also possible to define whether the data of all linked laboratory equipment or of individual devices should be exported. Furthermore, users can link data (e.g. climate data) to individual test series.

A hard copy of the report can be printed, to document the results, and contains an area for general information about device and measurement process, a listing of individual results, statistics, and a diagram showing the curves. This area can be removed from the report if desired, in order to save space. A company logo can also be added if required.

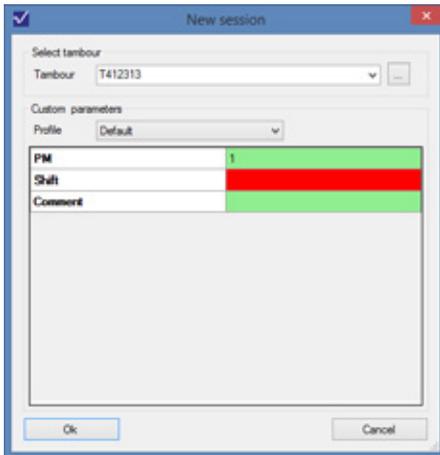


Detailed print report with single values, statistics and curves

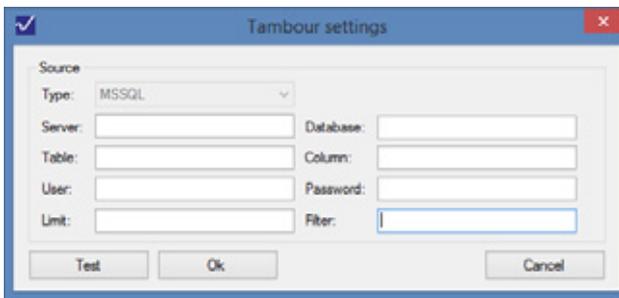
The results can be exported manually or automatically, both in a spreadsheet (e.g. Microsoft Excel), and a machine-readable format for further processing by other systems. The data can either be saved to the computer's hard disk or saved to a network drive.



Settings file export



Entering of user defined parameters



Configuration of user defined parameters



Connected devices
Easy access to
device options and
customisation

USER DEFINED PARAMETERS

To satisfy the demands of various different applications, user-defined parameters can be used to give ProbeNet several profiles. For every test series, the lab worker can optionally select a profile (e.g. customer log, internal log etc.) and data must be entered in the appropriate fields, where it is recorded both as a hard copy report and exported data. To speed data entry, there is an option to keep the latest input and reuse it for the next test series, and can be quickly selected if desired. Fields can also be set as optional or required.

COMPATIBILITY

ProbeNet supports all devices with a data output manufactured and distributed by the PTA Group. If support is not yet available in the program, it can be added if needed. Devices are easily connected, via serial port, USB, or over the network. ProbeNet Mini supports parallel operation of more than one device.

CUSTOMISATION

An individual adaption of descriptions and conversion of measurement values (e.g. from N to kN) is also possible. Furthermore, users can fade out unnecessary measurement values to keep the data overview compact.

EASY SETUP

The initial setup process of ProbeNet takes less than 30 seconds. The application works out of the box and has no dependencies on third party software. In most cases the setup can be completed even without support from the local IT department.

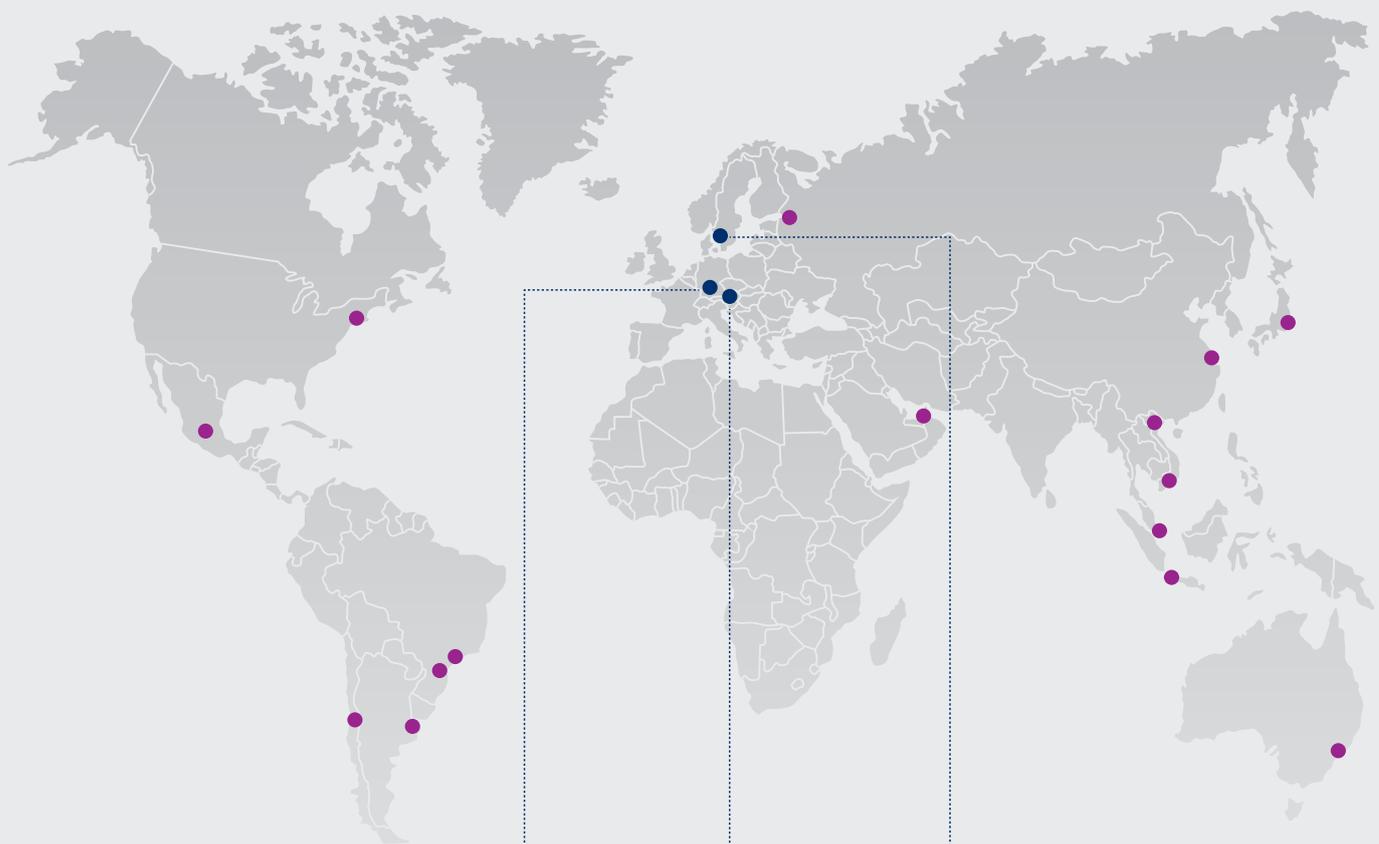
TECHNICAL DATA

SYSTEM REQUIREMENTS

Operating system	Windows XP Professional SP3 or newer
Software	Microsoft DotNet 4.0
Resolution	at least 1280 x 800 pixel
Internal memory	at least 1 GB
Hard drive space	20 MB for the software Local traceability needs additional drive space, depending on use.

AT YOUR DISPOSAL – WORLDWIDE!

Owing to our integration into the globally acting Elof Hansson Company we are able to offer you a worldwide service network and service technicians who speak your language. They will always be on the spot when it comes to maintain, calibrate or repair your instruments.



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