Automated moisture measurement
Measuring systems for bulk goods

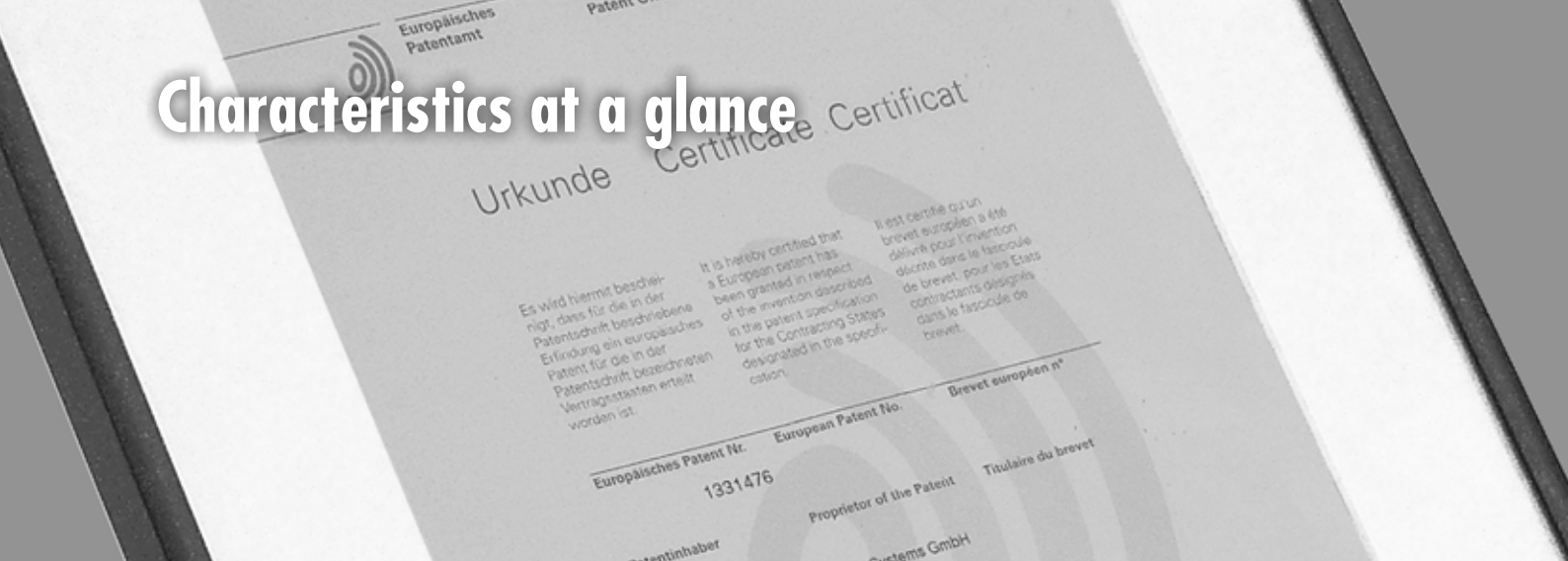Döscher

MoistureScan
MoistureScan XT
MoistureScan EX
MoistureScan Cer

MoistureScan series

MoistureScan series

Microwave-based measurement technology

- Very precise and fast measurement
- Monitoring of the core and surface moisture
- Method ensuring long-term stability
- Measurement independent of the density, weight, color, and surface of the product

Optimized process

- Automated process control
- Current information on process control
- Fast and early detection of faults

Simple handling

- Measurement can be tracked on a monitor
- Very simple calibration
- Extensive options for evaluation
- Online support

Effects on your production

The devices of the MoistureScan series
- prevent costly production downtimes
- permit faster achievement of product quality
- minimize waste
- reduce costs due to complaints
- optimize use of personnel
- reduce energy costs

Special features of the device versions

MoistureScan XT
- Designed for extreme temperature conditions
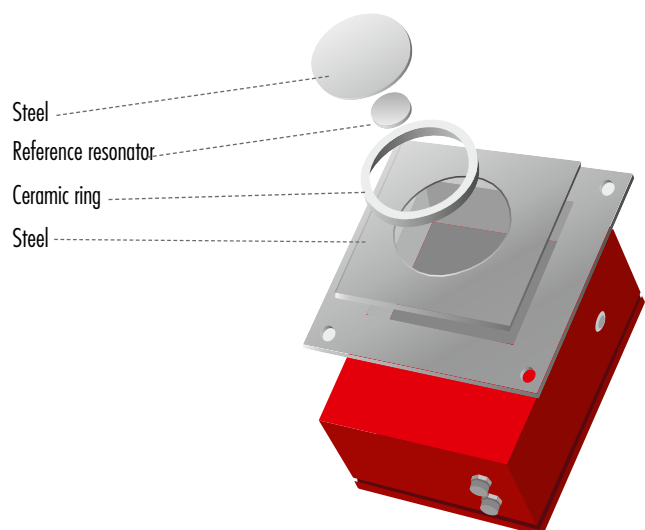- Reliable performance monitoring of dryers, presses, and roasters

MoistureScan EX
- Designed for areas subject to explosion hazards (Ex zone 20)

MoistureScan CER
- Sensor head for abrasive products, such as sand

The sensor design patented by us is made entirely of ceramics and metal. The sensor is soldered and not glued and is therefore extraordinarily thermally stable.

Steel
Reference resonator
Ceramic ring
Steel

Areas of application

- Bulk goods

Monitoring directly in the product flow

The MoistureScan series is suitable for a wide range of different bulk goods. The measuring head with a patented sensor structure can be flexibly integrated into the product flow. The MoistureScan provides the necessary data for optimized process control.

The 2-Parameter Microwave Resonance method used by Döscher Microwave Systems permits measurements independently of the material density, filling level and color.

MoistureScan
- continuously monitors the water content over the entire production process
- determines the moisture parameter quickly and reliably

Further characteristics
- minimum calibration effort without previous knowledge
- high measuring accuracy
- high reproducibility
- high long-term stability
- patented reference resonator
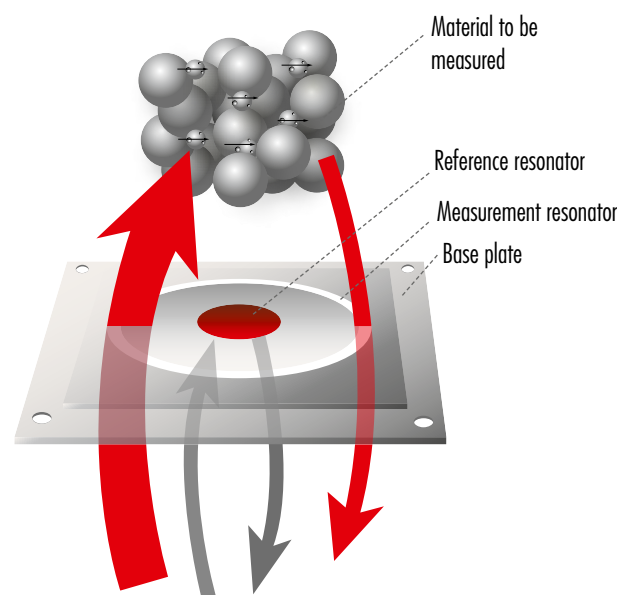
The reference resonator

Use of the patented reference resonator permits very good long-term stability (for its method of operation, see diagram on the right). Regular reference measurement of the sensor head, which is not possible in a continuous production process, is not required.

Non-wearing, precise, for extreme conditions

The sensor surfaces are insensitive to dirt and maintenance-free. The MoistureScan XT and MoistureScan EX versions of the series are designed for extreme temperature conditions or for areas subject to explosion hazards. Further special features of the series: The coated sensor head of the MoistureScan CER is especially resistant to abrasive substances.

Sensor tailored to your needs

The measuring head that is integrated directly into the product flow depends on your product and on your specific production conditions. We will find the perfect solution in a personal discussion on your site.

Material to be measured

Reference resonator

Measurement resonator

Base plate

For varied conditions of use

MoistureScan

Continuous in-process moisture measurement

Fast and reliable inline definition of the relevant process parameters is essential to optimum production. And the process parameter moisture is important in many areas of industry.
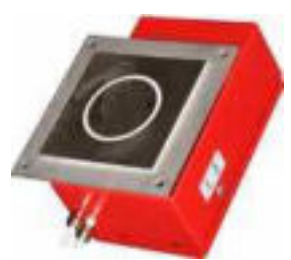
- **The task:**
  Precise and fast measurement of the product moisture during the process in order to monitor and control the production process. This ensures high product quality.

- **The solution:**
  The integrated moisture measuring system MoistureScan continuously measures the moisture of the product irrespective of density and sends the measurement results to the process control system.
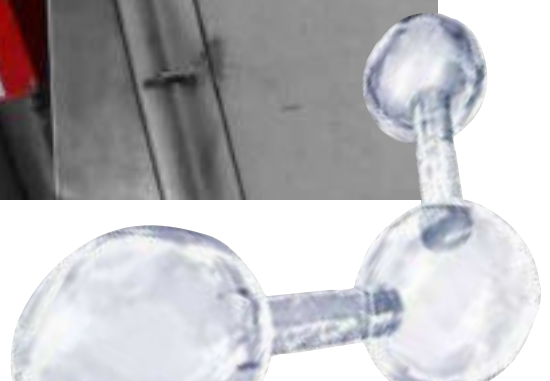
MoistureScan XT

For temperatures up to 140 °C

In some production processes, temperatures of more than 100 °C occur at the outlet of a dryer, behind a press or in a roasting oven. The sensor of the MS XT withstands temperatures of up to 140 °C.

- **The task:**
  A customer would like to measure the product moisture at the dryer outlet. The temperatures there fluctuate between 70 and 130 °C. The customer would like to improve the production process with precise measurement of the moisture up to almost 100 °C at this point to enhance the quality of the product and save energy.

- **The solution:**
  Thanks to its components made of steel and ceramics, the patented design of the MoistureScan sensor from Döscher Microwave Systems permits temperatures up to 140 °C.

MoistureScan EX

Explosion-protected for Ex zone 20

MoistureScan EX meets all safety requirements that are prescribed by law for equipment intended for use in potentially explosive atmospheres.

- **The task:**
  A manufacturer of fruit gums relies on fast moisture measurement in the process for conditioning the corn starch used. Corn starch is explosive and all plant sections containing the product are classified as zone 20.

- **The solution:**
  MoistureScan EX is equipped with a sensor surface on the product side that is suitable for installation in potentially explosive atmospheres. The measuring head is approved for use in zone 20. The other components of the measuring device are designed for zone 22.
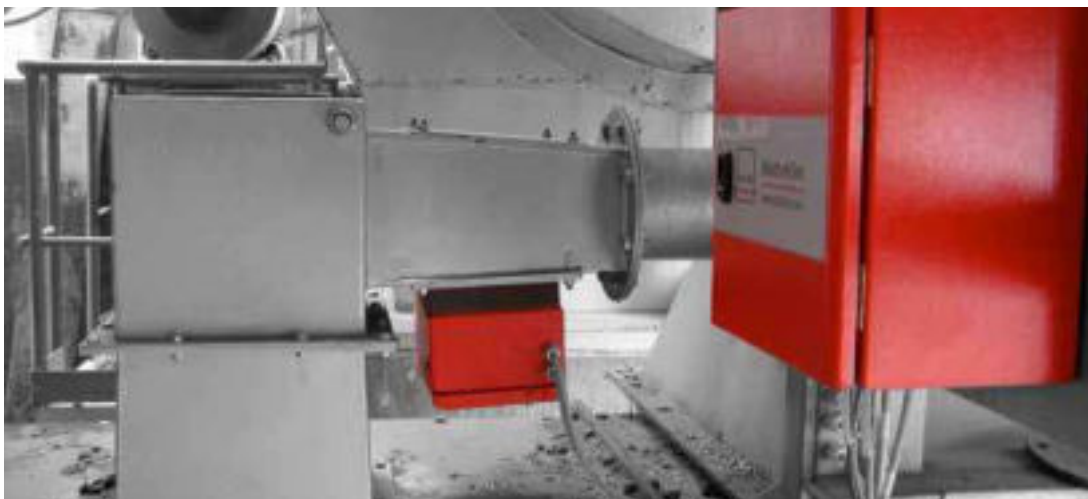
MoistureScan CER

Ceramics provide permanent protection from wear

A further special solution for a production process under challenging conditions.

- **The task:**
  A customer processes very abrasive materials and the product also contains quartz sand. The sensor head must withstand this extreme stress over a long period.

- **The solution:**
  The parts of the sensor head that make contact with the product are made of ceramic material. The required high level of protection against wear is ensured.
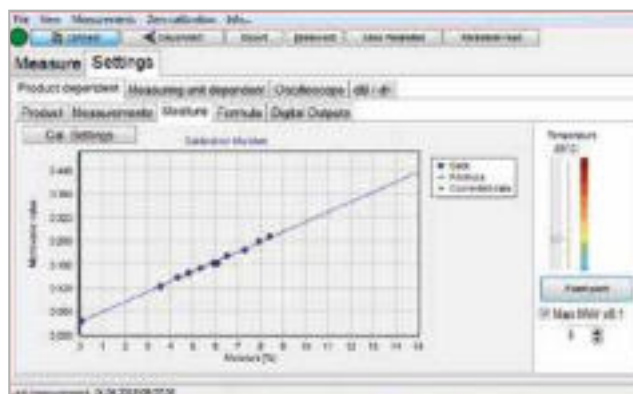
Software

The devices of the MoistureScan series are operated with intuitive software. All the work steps you require are simple to perform. The measurement results are displayed clearly.

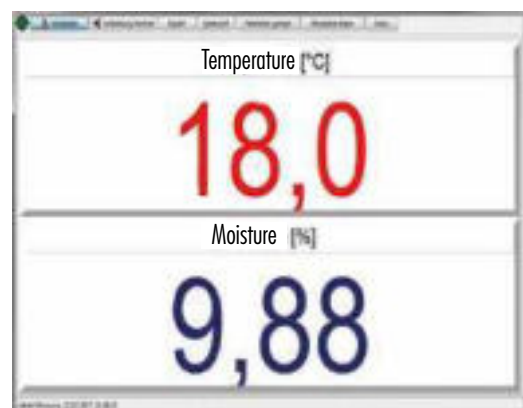Calibration can be performed simply and displayed graphically.

Moisture

Measurements
- Continuous measurement of the product moisture
- Measurement data administration/ archiving intervals/ moisture thresholds for alarm functions

Visualization and data export
- Graphical display of water content [%] and temperature [°C]
- Setting of display parameters
- Data export from the current day's data set

Calibration

System configuration

Settings
- Languages
  [German, English, French, Spanish, Portuguese, Turkish, Russian, Polish, Chinese, Romanian]
- Analog and digital inputs/outputs, limit values
- Measurement parameters

Calibration
- Recording of reference measurement points
- Calculation and storage of calibrations

Measurement value display

Hardware

The measuring system is optionally supplied with a workstation on which the software, along with further tools (e.g. the latest remote servicing software), is installed. The link to the sensor head is established using a serial interface RS422 or the network [TCP/IP].
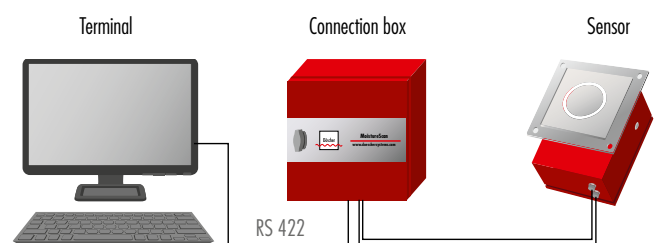
The computer of the MoistureScan consists of an amply dimensioned hard disk, a CD/ DVD drive, USB 2.0 interfaces, an integrated network connection LAN] [RJ45], and further modern equipment. Windows® XP Prof. and later can be used as the operating system

Online support

After installation, we start by calibrating the device together with you, we check its function, and we instruct you on a few necessary details. If you need help again later, you can obtain support quickly, even online if you wish, which is fast, inexpensive and environmentally friendly. From Hamburg, we can check the function of the measuring device over the Internet and perform corrections in direct interaction with you. The highest level of security is maintained during this procedure. You decide whether you want this function and you enable it. The integrated LAN connection can be used for remote servicing. We will also gladly help you on site.
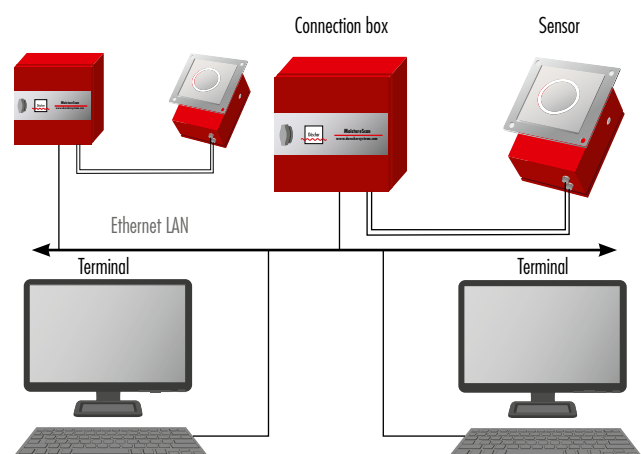
MoistureScan with Product

RS422 connection set

Terminal   Connection box   Sensor

RS 422

Direct link over RS422

COM server connection

Connection box   Sensor

Ethernet LAN

Terminal   Terminal

Direct link over Ethernet LAN

Basic information is provided in the form of a manual. We support you with online support. We are happy to answer any detailed and specific questions.

Technical data

Series	MoistureScan	XT	EX	CER
Measuring range:	depends on the product			
Repeatability:	depends on the product properties			
Number of measurements:	up to 4000 measurements per second, average values calculated by the software			
Power supply:	24 VDC			
Ambient temperature:	0 - 40°C			
Max. number of different products in a plant:	32			
Grain size:	< 3 cm			
Data storage:	hard disk			
Max. number of measurement data items:	depends on the hard disk size			
Interface:				
- serial:	RS422 interface for connecting the operating terminal			
- analog:	2 x inputs: 4 - 20 mA 2 x outputs: 4 - 20 mA for moisture and temperature			
- digital:	2 x inputs and outputs			
Dimensions and weights:				
- of the sensor head:	180 mm x 180 mm x 300 mm 7,2 kg	180 mm x 180 mm x 300 mm 7,2 kg	200 mm x 180 mm x 230 mm 6,5 kg	180 mm x 180 mm x 300 mm 7,2 kg
- of the connection box:	Size: 300 mm x 300 mm x 200 mm Weight: 5,5 kg			
Product temperature:	0 - 70 °C	0 - 140°C	Temperature range as agreed	0 - 70 °C
Product characteristics:	-	High product temperature	explosive	abrasive

Because we are continuously improving the MoistureScan series, we reserve the right to make changes.
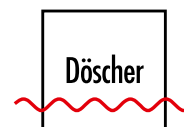
You can find out more about this measurement technology with this QR code.
You will also find information on the measurement technology on our web site, short code: **https://tinyurl.com/doescher-measure**

Automated moisture measurement

Measuring systems for web materials

Döscher

VenScan
VenScanXL
VenScanXXL
TriScan

VenScan series

VenScan-series

Microwave-based measurement technology

- Measurement irrespective of density and grammage
- Very precise and fast measurement
- Method ensuring long-term stability
- No dependence on product color and surface of the product
- Measures the core and surface moisture
- Contactless

Optimized process

- Automated process control
- Current information on process control
- Fast and early detection of faults
- 100% control
- Less waste

Simple handling

- Measurement can be tracked on a monitor
- Very simple calibration
- Extensive options for evaluation
- Online support

Effects on your production

The devices of the VenScan series
- prevent costly production downtimes
- permit faster achievement of product quality
- minimize waste
- reduce costs due to complaints
- optimize use of personnel
- reduce energy costs

Special features of the device versions

VenScan
- up to max. 10 mm material thickness

VenScan XL
- up to max. 40 mm material thickness

VenScan XXL
- up to max. 100 mm material thickness

TriScan
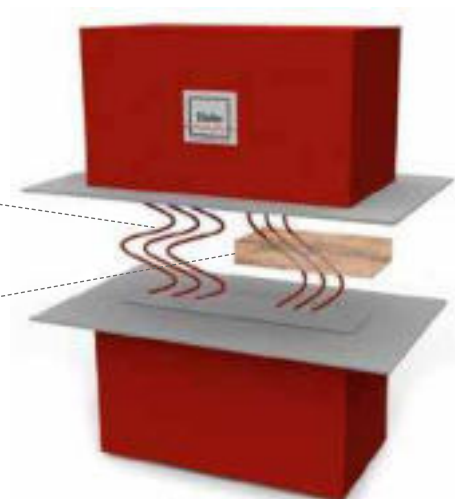- Measurement of the product at 3 points simultaneously

Contactless measurement throughout the material right into the core and irrespective of the color.
Maintenance-free and safe use without safety approvals.

VenScan

Microwave

Product

Areas of application

- Foils
- Paper
- Cardboard
- Veneer
- Solid wood
- Engineered wood materials
- Textiles
- Flat materials, e.g. wooden boards
- Web materials, e.g. paper webs

Monitoring directly in the product flow

The measuring system VenScan is particularly suitable for web and flat materials. It can be flexibly integrated into the production process for these materials, where it continuously measures the water content and optionally the grammage of the product.
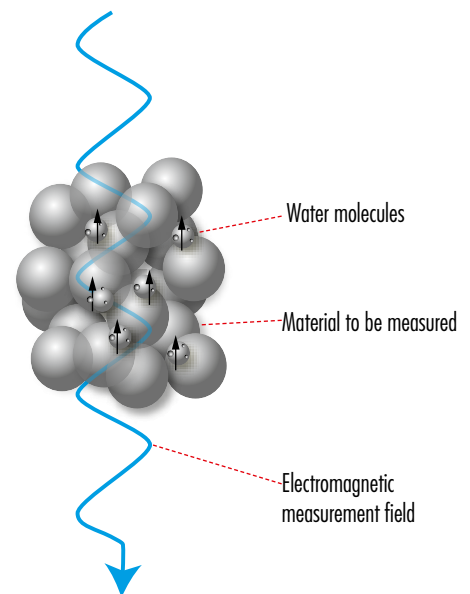The angewandte 2-ParameterMicrowave Resonance method used by Döscher Microwave Systems permits measurements independently of the material density, filling level and color.

VenScan
- continuously monitors the water content over the entire production process
- determines the moisture parameter quickly and reliably

Further characteristics
- minimum calibration effort without previous knowledge
- high measuring accuracy
- reproducibility
- high long-term stability

Non-wearing, precise, and long-term stability

The sensor surfaces are insensitive to dirt and maintenance-free.

Further special features of the series:
Contactless measurement over the entire material right into the core.
Radiation level so low that no special safety rules have to be complied with.

VenScan device tailored to your needs

The VenScan sensor that is integrated directly into the product flow depends on your product and on your specific production conditions. We will find the perfect solution in a personal discussion on your site.

Water molecules

Material to be measured

Electromagnetic measurement field

VenScan

Automated moisture measurement of veneers and laminates

The VenScan measuring system can be flexibly integrated into the production process, where it continuously measures the moisture and optionally the grammage in materials with a maximum thickness **10 mm**.

- **The task:**
  Precise contactless and fast measurement of the product moisture during the process in order to monitor and control the production process. This ensures high product quality.

- **The solution:**
  Contactless measurement of the surface and core moisture is performed within fractions of a second irrespective of the density of the material. Any fluctuations in the grammage and material thickness have no effect on the measurement result.

VenScan XL

Automated moisture measurement of solid wood and parquet

Due to its low installation and calibration effort, this measuring system made by Döscher can be quickly and easily integrated into the production process, providing accurate measurement results.

- **The task:**
  A customer would like to measure the product moisture of a wood material that has a product thickness of 40 mm.

- **The solution:**
  Besides solid wood and engineered wood, the VenScan XL measuring system also reliably measures the moisture and grammage in a range of other materials. Possible fields of application range from ceiling boards through soundproofing mats to various types of engineered wood.
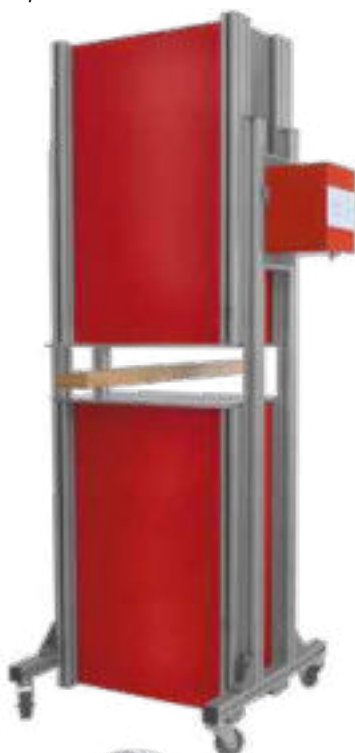
VenScan XXL

Automated moisture measurement in solid wood

The VenScan XXL measuring system has been developed for large material thicknesses. The moisture in materials up to 100 mm thick is determined contactlessly and continuously.

- **The task:**
  A manufacturer of solid wood with a thickness of up to 100 mm relies on fast moisture measurement during further processing.

- **The solution:**
  Both in speed and precision, the VenScan XXL is equal in every way to its smaller counterparts. Here, too, the production process is immediately supplied with up-to-date and precise moisture measured values, irrespective of the density of the material.

TriScan

Automated moisture measurement at three positions

The TriScan system is an example of the wide range of special solutions that Döscher Microwave Systems offers its customers:

- **The task:**
  A customer requires a further special solution for a production process under challenging conditions. Measurement at three points in the material is required.

- **The solution:**
  With the TriScan, moisture measurement can be performed in three parallel webs of a large-surface board. Each of the three sensors outputs a moisture, temperature, and grammage profile of each board section. At the end of the board, each measuring head outputs the statistical values of the web it has measured. In this way, it is not only possible to control the process individually but also to provide full documentation of the production and of the different drying behavior over the width of the product.
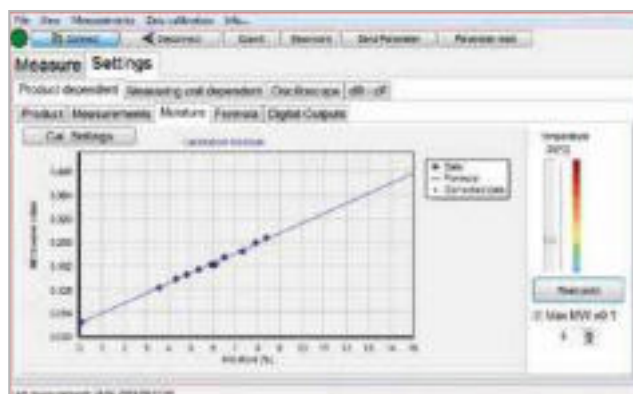
Software

The devices of the VenScan series are operated with intuitive software.
All the work steps you require are simple to perform. The measurement results are displayed clearly.

Calibration can be performed simply and displayed graphically.

Calibration

System configuration

Settings
- Languages
  [German, English, French, Spanish, Portuguese, Turkish, Russian, Polish, Chinese, Romanian]
- Analog and digital inputs/outputs, limit values
- Measurement parameters

Calibration
- Recording of reference measurement points
- Calculation and storage of calibrations

Moisture

Measurements
- Continuous measurement of the product moisture
- Measurement data administration/ trend display/
  moisture thresholds for alarm functions

Visualization and data export
- Graphical display of water content [%] and temperature [°C]
- Setting of display parameters
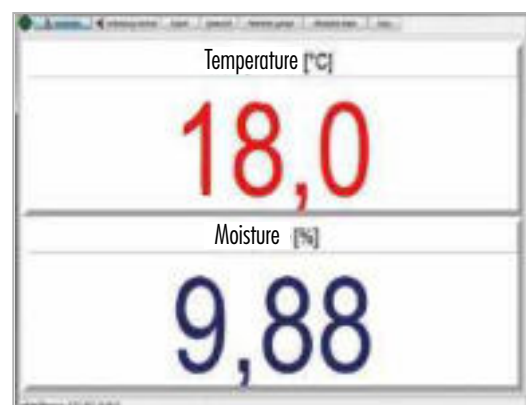- Data export from the current day's data set

Measurement value display

Hardware

The measuring system is optionally supplied with a workstation on which the software, along with further tools (e.g. the latest remote servicing software), is installed. The link to the sensor head is established using a serial interface RS422 or the network [TCP/IP].

The computer of the MoistureScan consists of an amply dimensioned hard disk, a CD/ DVD drive, USB 2.0 interfaces, an integrated network connection LAN [RJ45], and further modern equipment. Windows® XP Prof. and later can be used as the operating system.

Terminal Connection box
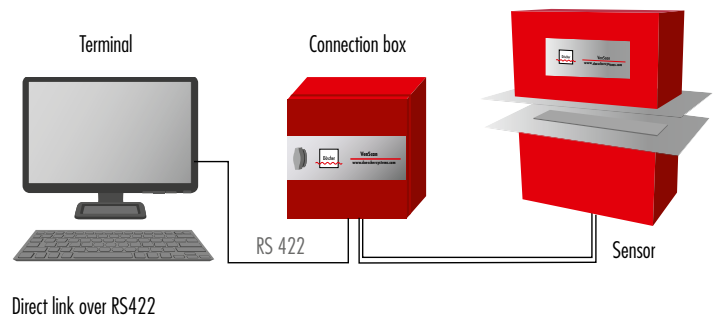
RS 422 Sensor

Direct link over RS422

Online support

After installation, we start by calibrating the device together with you, we check its function, and we instruct you on a few necessary details. If you need help again later, you can obtain support quickly, even online if you wish, which is fast, inexpensive and environmentally friendly.
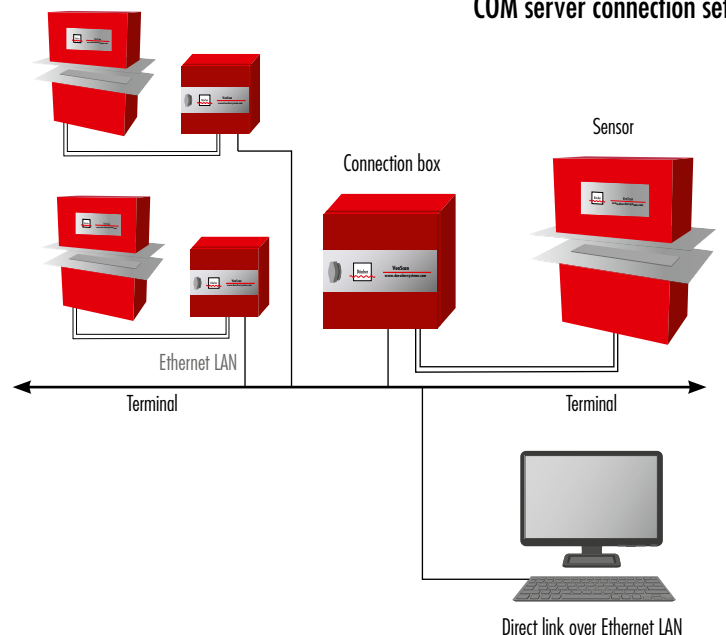
From Hamburg, we can check the function of the measuring device over the Internet and perform corrections in direct interaction with you. The highest level of security is maintained during this procedure. You decide whether you want this function and you enable it. The integrated LAN connection can be used for remote servicing. We will also gladly help you on site.

Sensor

Connection box

Ethernet LAN

Terminal Terminal

Direct link over Ethernet LAN

VenScan with Product

Basic information is provided in the form of a manual. We support you with online support. We are happy to answer any detailed and specific questions.

Technical data

Series	VenScan	XL	XXL	TriScan
Measuring range:	depends on the product			
Repeatability:	1% of the limit of the selected measuring range			
Number of measurements:	up to 1000 measurements per second, average values calculated by the software			
Power supply::	24 VDC			
Ambient temperature:	0 - 40°C			
Max. number of different products in a plant:	32			
Data storage:	hard disk			
Max. number of measurement data items:	depends on the hard disk size			
Product thickness:	< 10 mm	< 40 mm	< 100 mm	< 40 mm
Interface:				
- serial:	RS422 interface for connecting the operating terminal			
- analog:	2 x inputs: 4 - 20 mA 2 x outputs: 4 - 20 mA for moisture and temperature			
- digital:	4x inputs- und 3x outputs			
DIMENSIONS AND WEIGHTS:				
- of the sensor head:	250 mm x 250 mm x 500 mm	300 mm x 310 mm x 655 mm	450 mm x 600 mm x 1930 mm	individual
- of the connection box:	Size: 300 mm x 300 mm x 200 mm Weight: 5,5 kg			
Product temperature max.:	90 °C	90°C	90°C	90 °C

Because we are continuously improving the VenScan series, we reserve the right to make changes.

You can find out more about the measurement technology with this QR code.
You will also find information on the measurement technology on our web site, short code: **https://tinyurl.com/doescher-measure**