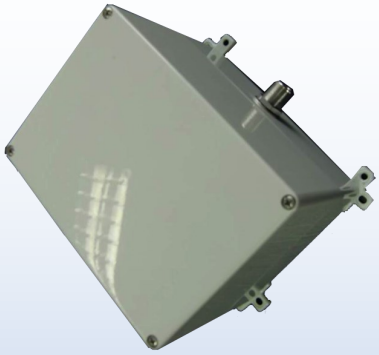
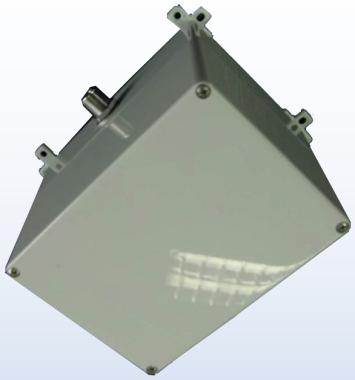
HK9

MORTON CONTROLS
INSTRUMENTATION & PROCESS CONTROL

Microwave spectrometer
Continuous In- Line measurement of density and dry matter





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Description:

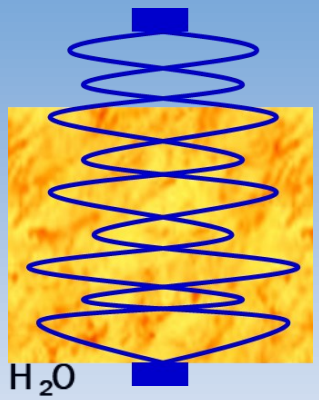
The microwave measurement generate an electromagnetic wave of low energy. This signal is coupled via an antenna into the product (Paper, Tobacco, Sand, etc.).

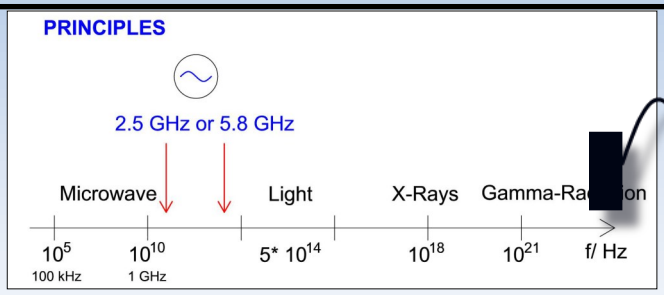
Depending on the dielectric properties of the product the signal propagates in the product. After the signal has passed the product a second antenna receives the signal (Transmission).

Amplitude and phase shift of the received signal are an expression for the water content or dry matter of the product.

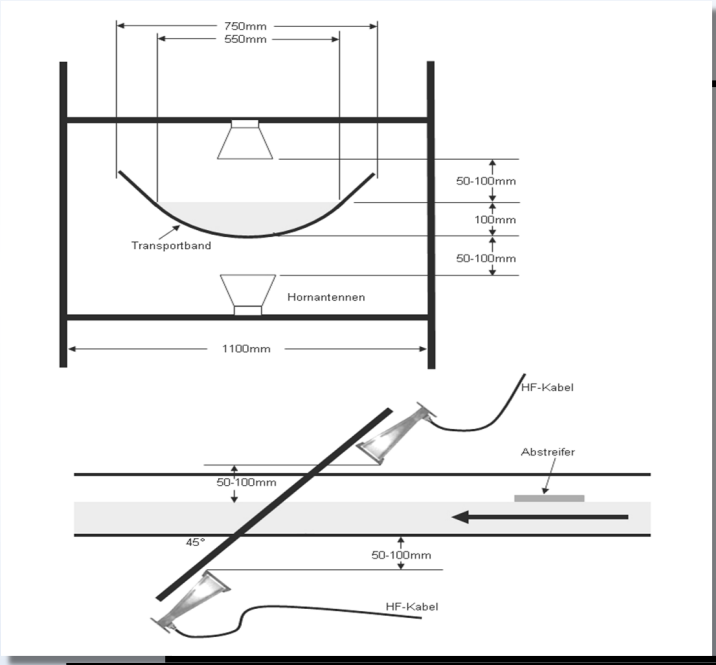
The microwave measurement is very stable and it has a quick response to product changes.

Transmissions signal passes through an in-homogenous product





Conditions for a successful measurement:
The product contains NO METAL between the antennas!



The measurement is contactless, the measured values of the density– and dry- matter content are available as digital and analogue values.

The HK- instrument is applicable in different production processes and in different production lines for continuous In- Line- measurement.

Because of further increasing quality requirements after ISO and EU standards, the industries have an enhanced demand for improved quality control, standardization and In- Line- Trend observation.

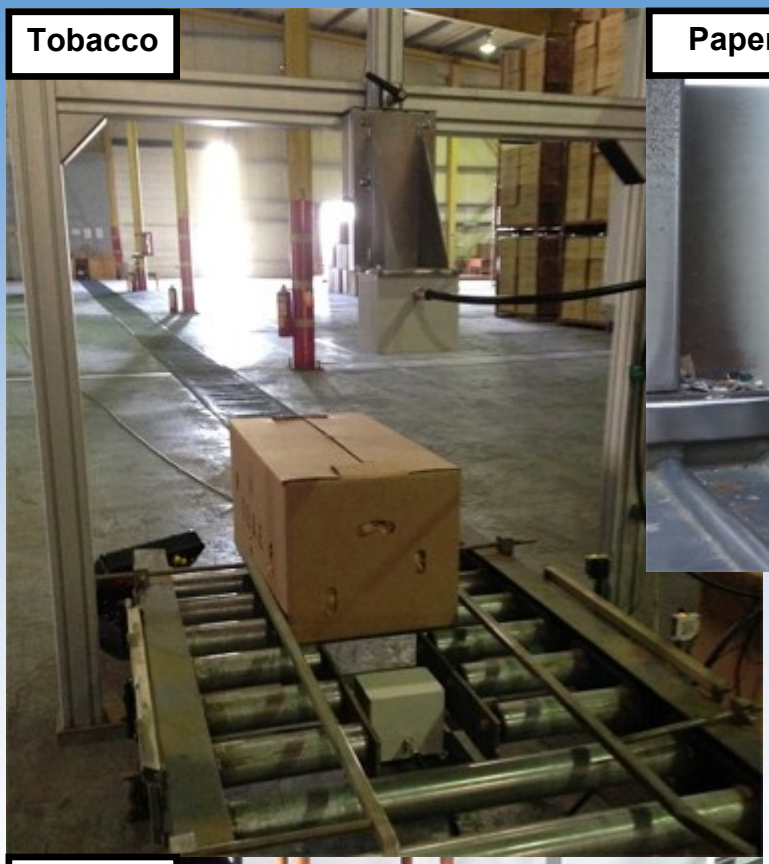
Advantages:

- State-of-the-art microwave technology
- Installation at a difficult accessible place is easy to handle through the modular construction
- Vibrations do not effect the measurement results
- Non- destructive measurement
- Ideal for incoming goods inspection
- Modular design provide robust measurement
- Remote from PC or with separate remote control
- No moving parts

Customer Benefit:

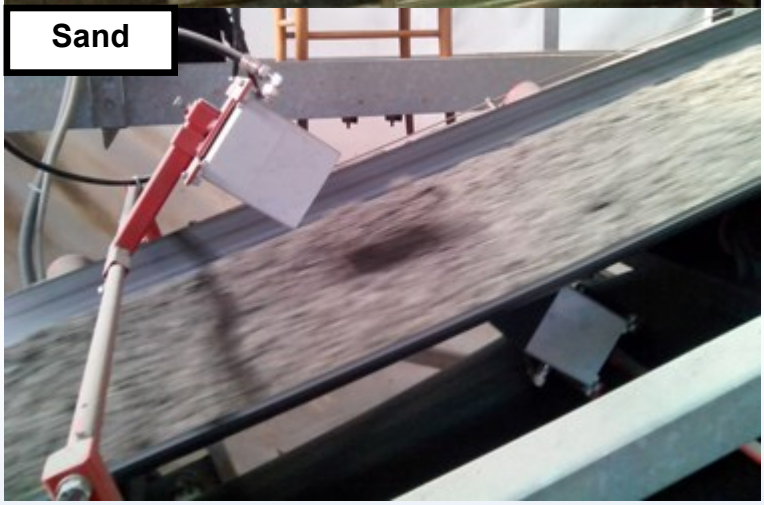
- Real time measurement
- Continuous monitoring over the whole production
- Production with constant and documentable quality
- Early detection of fail production
- Easy calibration through one point calibration
- Calibration at the device, without any software
- Menu in different languages
- Sensitive data are in a protected menu
- After commissioning the user interface can be locked

Tobacco



Paper

Sand



For projecting:

- Belt speed V (must be constant)
- Lowest layer thickness

Real time measurement of:

- Dry matter / Water content
- Density

Calibration Software SPECTER9:

One antenna irradiate the product with electromagnetic waves of different wavelength, the opposite antenna receive the waves. Out of the received electromagnetic waves the board generate a MINI-Spectra.

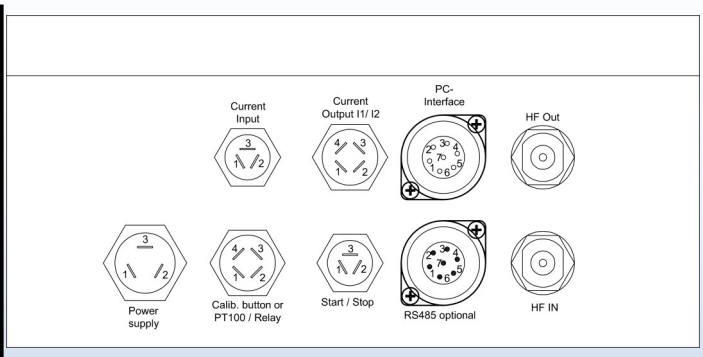
The SPECTER9 software calculates out of the received MINI– Spectra a calibration model.

Due to the open software system, it is possible that our customers can create their own calibration or expand an existing calibration.

Evaluation unit

Technical data evaluation unit HK9:	
Housing:	Aluminum die casting
Size H x W x D:	230 x 200 x 110 mm
Weight:	ca. 5 kg
Protection Type:	IP65 / NEMA 4
Power supply:	100 - 240 V/AC optional 24V/DC – 50/60 Hz – max. 200mA
2 PC-interface:	RS232 or RS485
2 Analog outputs:	0/4 - 20mA / isolated 1500V
1 Analog input:	0/4 - 20mA / isolated 1500V
1 Digital - input:	Start / Stop
1 Relays contact:	max. 5A / 250V
Temperature sensor:	PT 100
PROFI-BUS-DP:	Optional
Environmental temperature:	-20°C - +85°C
Operation:	
Membrane keypad:	6 integrated soft keys
Display:	2 x 24 Sign LCD, LED– backlight

Technical data Vivaldi antennas:	
Housing:	ABS Plastic
Size H x W x D:	160 x 140 x 120 mm
Weight:	ca. 1,5 kg
Protection Type:	IP65 / NEMA 4
Connection:	HF- Cables
Environmental temperature:	-20°C - +85°C
Product temperature:	>0°C - +100°C



Directives:

The HK9 is CE- conform, according to the followings directives:

- EMC directives 2014/30/EU:
  - generic standards EN 61000-6-2
  - generic standards EN 61000-6-4
- Low- voltage directives 2014/35/EU
- RoHS directives 2011/65/EU

Scope of supply:

All HK9 are supplied with antennas, evaluation unit, HF- Cable and software.
At the commissioning, the operating personal gets a device instruction / training.