

METAL SHARK[®]-2 COMBI

For textile and paper inspection

METAL SHARK®-2 COMBI

System Introduction

The METAL SHARK®-2 COMBI is a metal detection system based on latest digital technologies. It is used for inspection of web sheets to detect smallest magnetic and non-magnetic metal particles.

The metal detector is constructed as a multi-segment-sensor, with sensor plates underneath or above the inspected web. The total detection zone of the detector is thus divided into several single zones, each of them being about 365 mm (14.4") width (other width available). The sensor is available for various inspection widths, such as 1,000 – 7,000 mm (3.3 – 23 ft).

Metal Detection Levels:

Due to extremely high sensitivities of the single segments, minute particles of metal are detected across the entire width. Detection levels at 5 mm above the sensor facings:

- Ferrous sphere 0.5 mm
- Magnetic stainless steel sphere 0.6 mm
- Non Ferrous sphere 0.7 mm
- Non magnetic stainless steel sphere 0.9 mm



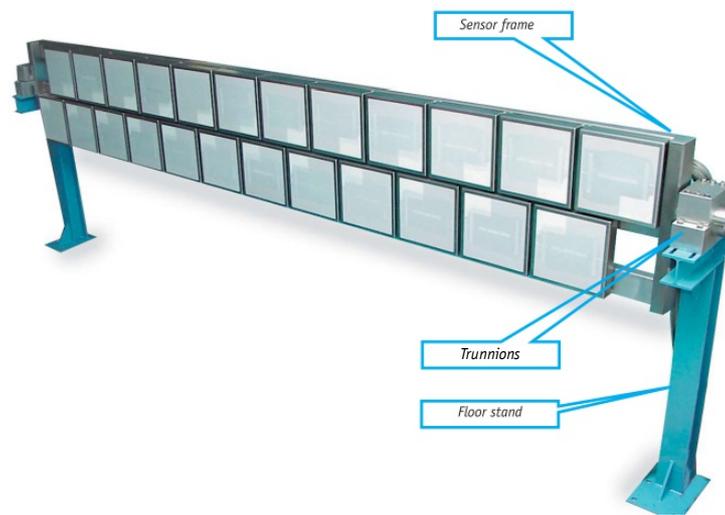
Segmented Sensor



Controller

Segmented Sensor

The sensor frame sits in two solid aluminium trunnions. Those trunnions allow to precisely adjust the sensor facings in parallel with the product flow. The trunnions are mounted on top of the floor stands. The stands are also part of the scope of supply.



Application examples



METAL SHARK®-2 COMBI

COMBI Controller: How to operate the system

The METAL SHARK®-2 COMBI is operated from a Windows PC which runs the SHARKNET®-2 software. The SHARKNET®-2 software networks all sensor segments under a clean operator surface. The metal detection results are online shown in the SHARKNET®-2. All operational data are collected into a SQL database. Automated screen or paper based metal detection reports for any period of time are included.

The SHARKNET®-2 software has an intuitive graphical user interface. Additional SHARKNET®-2 literature is available.

Available data with each metal event: Signal amplitude (mV), Segment number, X-position, Date/Time. Any 3rd party software can read these data from the SQL database.



METAL SHARK®-2 COMBI

What makes this metal detector so unique?

About Cassel

In 1994 Cassel was the first metal detector company using a DSP Digital Signal Processor. In 2001 Cassel was again the pioneer using a DDS Direct Digital Synthesizer. This evolved today into a unique fully digital metal detector with significant advantages against those metal detectors with a digital user interface but with most of the signal path still being analog.

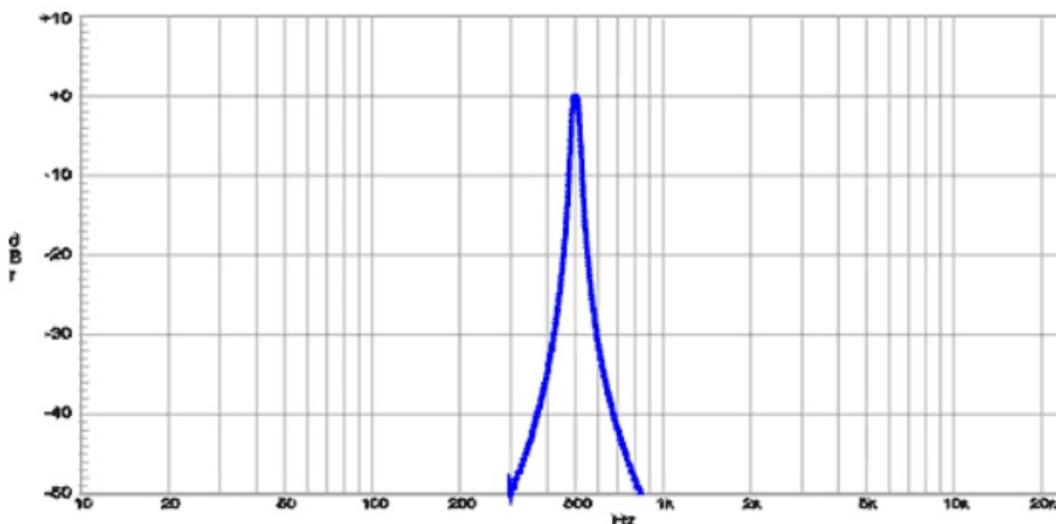
Fully digital with 100% auto calibration = Stability and Low maintenance

All Cassel sensor segments do have the exact same electronic boards. Each board is fully digital and 100% self calibrating. There is not a single hand-soldered calibration resistor or potentiometer. A pcb board replacement is done by a local electrician within minutes. All boards are interchangeable among all segments. The only required tools for a board replacement are a screwdriver and a spanner.

The auto self calibration includes the receiver coil balance. Other metal detectors require an annual calibration service where the manufacturer re-calibrates the receiver coil balance. The METAL SHARK®-2 COMBI does not need this service because the receiver balance is continuously traced and kept in a perfect balance.

Full metal sensitivity over a broad speed range

All signal filters are digital. The computer controlled bandpass filter always sets for exactly the current product speed. Thus allows a very narrow bandpass filtering and excellent noise immunity.



METAL SHARK[®]-2 COMBI

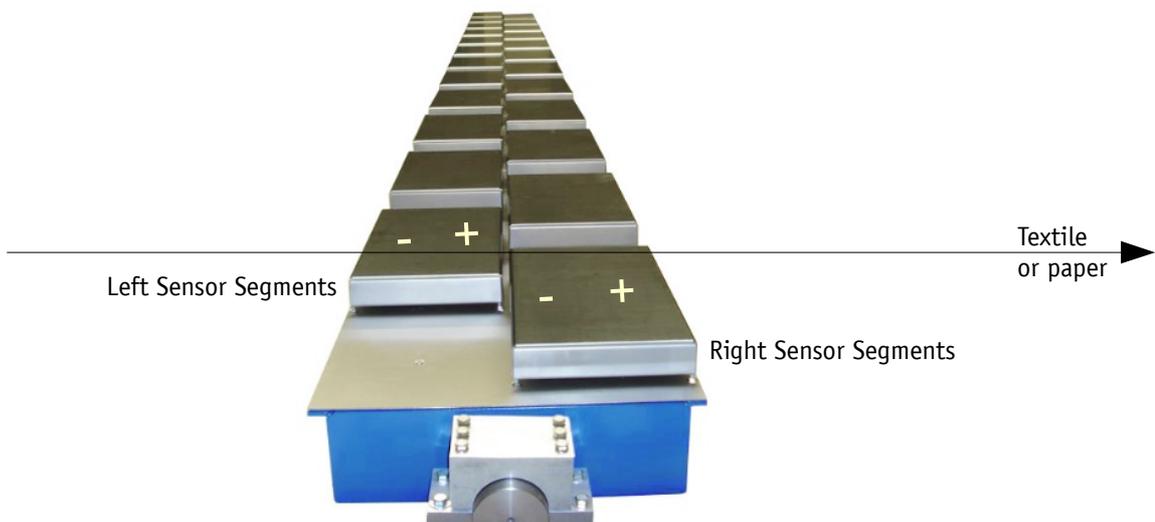
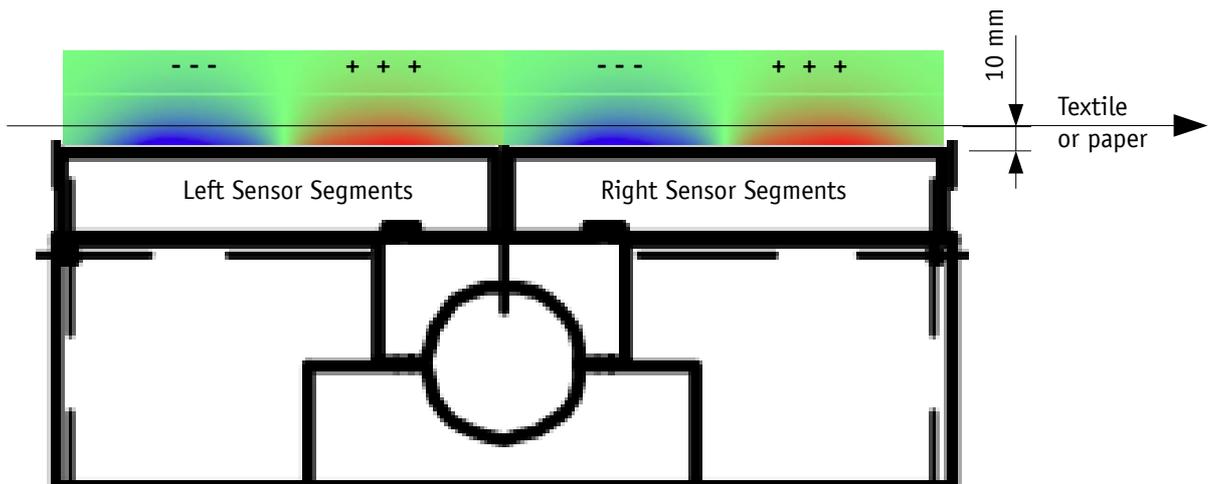
What makes this metal detector so unique?

Balanced receiver coils = High sensitivity at low noise

Each sensor segment has its own set of a transmitter and a balanced receiver coil. This configuration significantly reduces any electromagnetic noise eg from VFD drives.

The balanced receiver coils compensate most of the noise, cause one half of the receiver generates a plus signal and the other half generates the same signal as a minus.

Blue and red clouds = Sensitivity of the receiver coils



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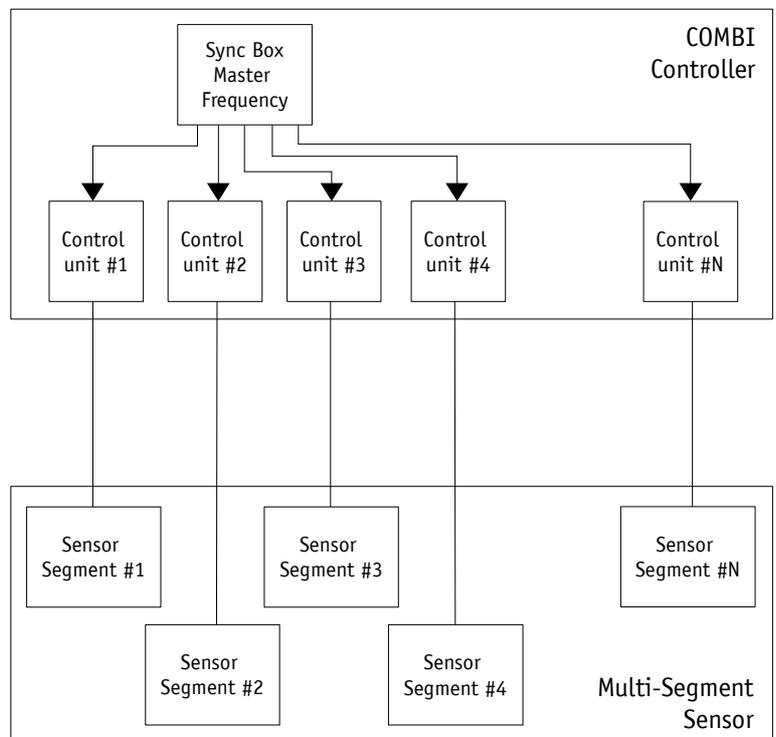
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Same frequency with all sensor segments (!)

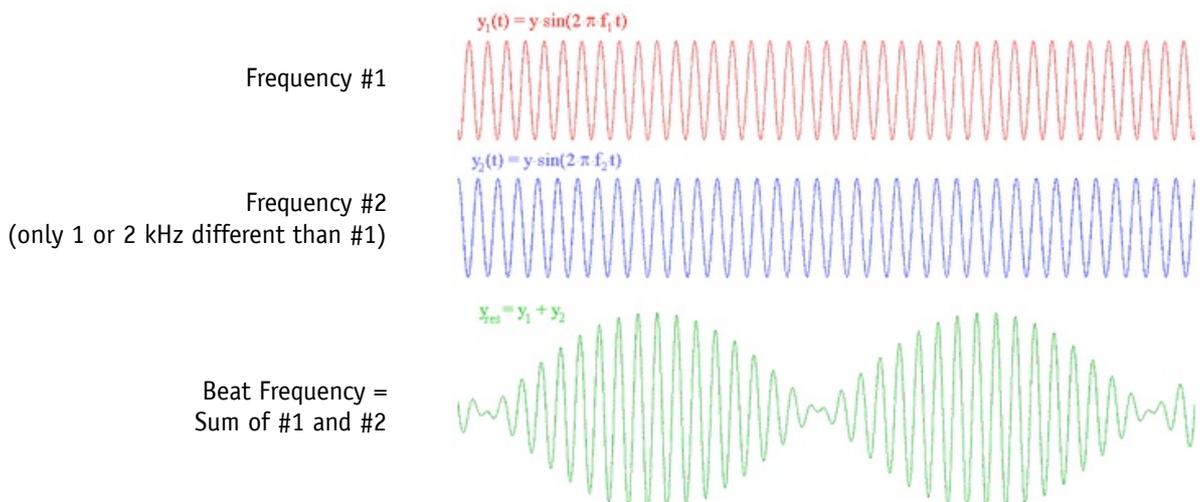
The Cassel Sync Box feeds the same master frequency to each segment. The master frequency origins for all segments from the same source.

Therefore all segments operate exactly at the same frequency at any time, with no relative drift at all between sensors, no matter of any temperature changes or aging.

As a result is the operation rock solid stable. From day 1 over the entire lifetime of 10 years and beyond.



Competitor sensors with multiple frequencies have the danger of being unstable (false trips) due to beat frequencies. The beat frequency results from the sum of two very similar frequencies. Note: Even crystal oscillators show a small frequency drift over temperature and time, which will result in large variations of the beat frequency.



Beat Frequency =
Sum of #1 and #2

METAL SHARK®-2 COMBI

METAL SHARK®-2 COMBI – Technical Data

Sensing width

Available 1,000 – 7,000 mm

Metal sensitivity

@ 5 mm above sensing faces

Ferrous 0,5 mm ø

Magnetic stainless steel 0,6 mm ø

Non ferrous 0,7 mm ø

Non magnetic stainless steel 0,9 mm ø

Out Signals

Metal alarm (dry contact)

Error alarm (dry contact)

Features

Run indicator (green lamp)

Error indicator (red lamp)

Powerfull cabinet cooling fans

Automatic circuit breaker 16A

Overvoltage surge protection AC

Mains filter (electromagnetic interference filter)

Mains switch

Ethernet network link

SQL Database, stores all historical operation data and events and metal detections

Ambient temperature

-10 ... +40° C

Degree of Protection

IP54

Sensor link cables

11 m

Electronics

METAL SHARK®-2 controller (*)

Latest digital technology (DSP, DDS)

Digital dynamic filters

Digital balance control

Digital frequency control

Self monitoring of all functions

PowerDrive circuit

EMI Spectrum Analyser

User Interface

SHARKNET®-2 software (*)

Keyboard and 15" color screen

Windows Professional and SHARKNET®-2

Password protection

Product memory for 120 products

Product teach manager

(*)

Refer to individual datasheets for detailed features of METAL SHARK®-2 controller and SHARKNET®-2 software.



METAL SHARK® GF



METAL SHARK® Conveyor



METAL SHARK®-2



XRAY SHARK® XBD10



XRAY XPB® Scanner for boards and webs

Cassel - Your Global Partner



Cassel Messtechnik GmbH (Germany) – Headquarters and main production site

Located near Hannover, Germany, Cassel manufactures approximately 1.000 inspection systems annually. Nearly 80 percent of Cassel equipment is exported to the European Union, United States, Southeast Asia, Australia, South Africa and South America. Cassel supplies equipment to a number of industries, including food, plastics, pharmaceuticals, textiles, forestry and mining. Multiple Fortune 500 companies are among Cassel's satisfied customers. Cassel equipment can be found in the production lines of many global and respected brands.



Cord Cassel
Managing Director of Cassel Messtechnik GmbH

Customers receive valuable worldwide service and support wherever their product inspection systems may be located. Over 50 representative offices located around the globe provide service performed by factory-trained technicians.

Since 1994, Cassel Messtechnik GmbH (Cassel) has led the industry in the design and build of metal detection, checkweigher and x-ray inspection systems for industrial applications. Cassel systems protect valuable production machinery against damage caused by undiscovered metal parts. Another area in which Cassel succeeds is Quality control in the consumer goods industry. Cassel strives to supply quality and high performance at a reasonable price.