



Optical Measuring Systems

CAMERA CLUSTER SYSTEMS (CCS)

Slit Strip Width Measuring System

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SHORTENED THROUGHPUT TIMES, REDUCTION IN COSTS

Production costs and dimensional accuracy are the most important criteria for successful operation of your slitting lines. You can increase your competitiveness by shortening throughput times and reducing scrap rates. The quality of your products must be of the highest order.

Safety First

Tight space conditions and the difficult access to production equipment that come with them harbour a high risk of injury when measuring slit strips manually.

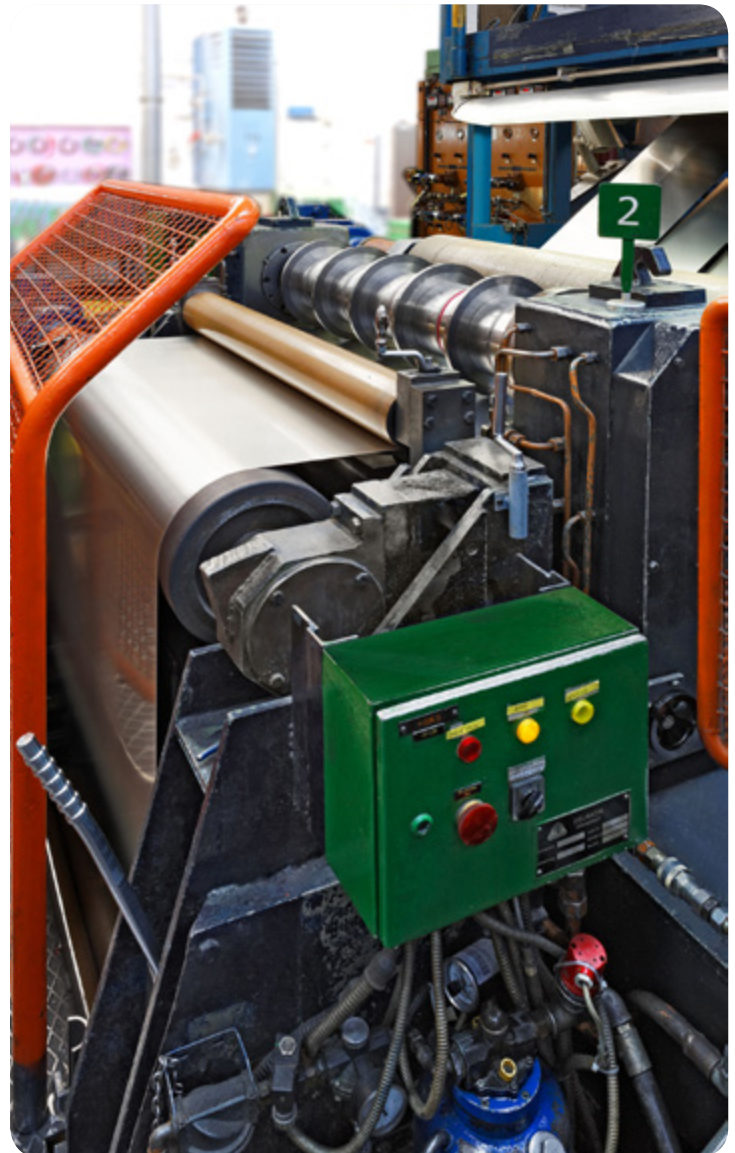
The times when you had to measure these strips manually in your slitting lines and the inherent inaccuracy of these measurements are now a thing of the past.

Or do you still have to stop production to carry out measurement with traversing camera systems?

The Decisive Difference!

Our Camera Cluster Systems, which are unique throughout the world, reduce the time needed for measurement and data processing to a few fractions of a second. The systems deliver *extremely accurate* measuring results not only when the line is stationary, but also continuously along the complete length of the coil while the strip is running. Transgressions of width tolerance ranges are detected immediately during production and indicated.

Your end customers are given quality reports on every single strip delivered – 100% *quality assurance* is ensured.



Our optional quality data management system, MEVInet-Q, saves the measured data and the production and order data continuously, thereby enabling order tracking and verification at every point in time.



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Modular, Light, Compact – Installation in the Smallest Space

The space available in your slitting lines for measuring equipment is often limited. The system should therefore be *easy to install* and later calibration monitoring of measuring equipment must be easy to perform.

A gauge basically consists of two components – a camera unit beam and a backlight unit beam. Thanks to *modular construction*, it is trouble-free possible to covering every strip width.

Another deciding pro:

The compact design usually enables integration of the measuring system in existing production lines without further modifications. The measuring beams are usually fastened to fixed O-frames or to existing parts of the line.

Long Service Life, Highest Precision Even Under Difficult Environments

The LED technology used in the backlight unit beams guarantees operation of the measuring systems over years without replacement of components. Optical filters *eliminate the influences of extraneous light almost completely*.

The measuring system is equipped with an *automatic dirt detection system* that warns your operating personnel in good time before measuring errors occur. The intelligent backlight is equipped with an Ethernet interface; physical LED ageing processes can be compensated.

Air wipe systems are implemented at locations where there is a high risk of soiling e.g. by felt or metal residues to ensure smooth operation of the system.

Traversing Cameras are Unsuitable

Traversing cameras can only be used when the material is stationary. The slit strip width can therefore only be measured in spot checks, mostly only at the start and end of a coil. A traversing measuring system needs valuable time to traverse across the complete width of the strip. These systems therefore conflict starkly with your wish to reduce downtimes.

Our Camera Cluster System reduces the measuring process to a fraction of a second and enables full and *continuous* measurement of slit strip width over the complete length of the strip during production. Every change in width caused by a defective knife is detected immediately.

You resent the higher investment costs and regular maintenance work that come with traversing cameras?

NOT WITH US! We do *not use any moving parts* in the transmitter and receiver beams of our Camera Cluster Systems.

Thanks to the innovative Camera Cluster Technology, 50 cameras are used per 1000 mm inspection length to perform the measuring tasks.



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IMPORTANT DECISION CRITERIA:

Conventional Multi-Camera Systems Have Many Disadvantages

- Very costly
- High computing power for data processing
- High amount of cabling
- High space requirement above the strip
- Standard solutions difficult to implement

The Solution: Camera Cluster Systems from IMS

Our Camera Cluster Systems use mini cameras known from many everyday applications such as rear view cameras in the automotive industry. Due to mass production, they are so cheap nowadays that they can also be used economically in measuring systems.

High-performance FPGAs see to fast embedded image processing. Computers with high computing power are not needed.



- ✓ Shortened throughput times, reduced scrap rates
- ✓ Product quality at the highest level
- ✓ Quality reports on every single strip delivered – 100 % quality assurance is ensured
- ✓ Complete measuring and data processing in a few fractions of a second
- ✓ Full and continuous measurement of slit strip width over the complete length of the strip during production
- ✓ Measuring results of extremely high accuracy continuously along the complete length of the coil
- ✓ Installation in the smallest of spaces
- ✓ Long service life and highest precision





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Your Challenges:	Our Solution for You:
<input type="radio"/> High investment costs due to use of conventional camera systems	<input checked="" type="checkbox"/> Camera Cluster Systems use hundreds of mini cameras that can be deployed in measuring systems economically
<input type="radio"/> High setup times caused by, among others, manual slit strip width measurement	<input checked="" type="checkbox"/> Measurement and data processing in milliseconds
<input type="radio"/> Unreliable manual measurement of slit strip width with calliper gauges	<input checked="" type="checkbox"/> High resolution and slit strip width accuracy Fifty cameras are used per metre inspection length
<input type="radio"/> Difficult access for manual measurements High risk of injury	<input checked="" type="checkbox"/> Fully automatic measurement of slit strip width No manual operation at the measuring system necessary
<input type="radio"/> Measuring errors due to extraneous light influences	<input checked="" type="checkbox"/> Optical filters eliminate the influences of extraneous light almost completely
<input type="radio"/> High maintenance costs from use of fluorescent lamps	<input checked="" type="checkbox"/> High lifetime of the LED modules
<input type="radio"/> Physical ageing processes of the light sources	<input checked="" type="checkbox"/> Intelligent light source with light intensity control
<input type="radio"/> Restricted space particularly in existing production lines	<input checked="" type="checkbox"/> High number of cameras enables small strip spacing Very compact and light construction enables simple integration in existing production lines
<input type="radio"/> Failure of measuring equipment due to dirt	<input checked="" type="checkbox"/> Automatic dirt detection and warning Air wipe systems are implemented at locations where there is a high risk of soiling
<input type="radio"/> High maintenance costs due to traversing camera systems	<input checked="" type="checkbox"/> Camera Cluster Systems require no maintenance



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Performance Data of the Slit Strip Width Measuring System

Measuring accuracy	better than $\pm 0,05$ mm (2σ)
Sampling rate	to 28 kHz
Location	after separation
Min. distance between two individual slit strips	from 1 mm (strip thickness dependent)
Distance between material and camera unit	235 mm
Distance between material and backlight	125 mm
Strip width	not limited
Strip thickness	not limited
Strip speed	not limited