Sensitive 2/2018
The magazine for non contact measurement gauges

ASTECH

Dear readers,

The ASTECH-team is very happy to present you the latest edition of our *Sensitive*, with news about our speed and length measuring devices VLM, our CROMLAVIEW® color sensors and our laser distance measurement sensors LDM.

Over the past months, we have been working in close co-operation with the Salzgitter Flachstahl GmbH, our partner and customer. Our aim was to generate a skin pass measurement, by using our speed and length measuring device VLM500. This has successfully been accomplished. On the following pages you will find our system solution for the calculation of skin pass- and extension ratios, and its integration into a skin pass mill.
In addition to the news about the system solution for calculation the skin pass level and extension ratio, information about the color sensor portfolio, with news on the optimal use of Profinet interfaces, as well as the market launch of the laser distance measurement sensor LDS10, can be found on the following pages.

We hope you enjoy reading our *Sensitive*
Your ASTECH-team

In this edition

VLM500-DG

System solution to calculate the skin pass level and the extension ratio

For the first time ASTECH presents an integrated system solution to measure and calculate the skin pass level and the extension ratio – important parameters to control rolling mills in the steel or non-iron industry. The basic VLM500-DG system is a master-slave combination, consisting of two velocity measuring gauges from the ASTECH VLM500 series. This system communicates the measured skin pass level to a programmable controller via Profinet or EtherNet/IP.

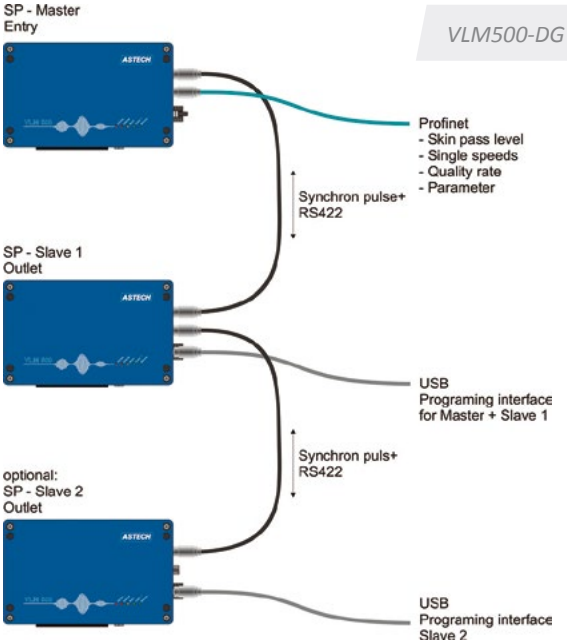
Measuring the skin pass level for flat steel

Steel is a key component in the value chain and the starting material in diverse industries. Steel strip, being used for molded and pressed parts in automotive industries, demands high quality standards. Special rolling mills create particular surface topologies and homogeneities and specific mechanical characteristics. The rising demands for low tolerances in these fields require an exact control of the skin pass mill. Therefore, the skin pass level needs to be measured continuously with low latency and has to be adapted to the dynamic of the strip movement in real-time. A reliable velocity and length measurement is the key for controlling the rollers to mill at exact skin pass levels.

A longtime customer and partner of ASTECH, was looking for a dedicated system to measure the skin pass level of cold flat steel in their galvanizing line. Their previous skin pass level control was based on velocity measurements, done by rotary encoders. On start-up this system required at least 2-3 meters steel strip until first usable measurements were available. Thus, it took 2-3 meters first to calculate and control the skin pass level. This was not satisfying for them. Even if it was possible to setup the rolls with 40 ms latency, it was not realizable at this speed due to the high latency of the rotary encoder based measuring system. ASTECH, with their longtime experience in the field of measuring skin pass levels, seemed to be the perfect partner for this project.

Length-based synchronization

Together with our steel producing customer, a new alternative approach to determine the skin pass level was developed. All previous solutions developed at ASTECH were primarily based on a time-synchronous measurement of velocities of two VLM gauges. The synchronization was



VLM500-DG wiring

implemented by sending a single clock signal, generated by the mill controller to both gauges which sent their measured velocities back in a time-synchronous manner. By taking the clock frequency into account, length differences from both velocities and finally the skin pass level were calculated using the formula $SP = (\Delta L_O - \Delta L_E) / \Delta L_O$. One of the main drawbacks of this approach is the fact that fluctuations of the velocity between the synchronization points were not taken into account. In contrast, the VLM500-DG system determines the skin pass level from an internal length measurement algorithm which considers all and even the smallest velocity fluctuations.

The VLM500-DG system consists of one master and one or two slave VLM500 gauges. The master controls the

measurement and skin pass level calculation. Based on the dynamics of the skin pass mill, the master can be programmed with just a few parameters. For this purpose the well-known PC program VLMTool may be used. The most important parameter is the so called update length. It determines the distance in meters between recalculation and update of the skin pass level. Cyclically, after this distance, the master triggers the slaves which send their measured distances back to the master. Based on the update length and the distances measured by the slaves the master calculates and updates the skin pass level. Master and slaves are physically interconnected by a dedicated data cable.

Communication over Profinet

The integration of the VLM500-DG system into the mill control is done via Profinet. As discussed in the previous section, the measurements are updated cyclically based on the distance programmed by the update length. The master delivers not only the skin pass level but also the velocities and the current measurement quality of all VLM500. In addition, error codes and status information are communicated to the mill controller. A control byte allows to start and to stop the skin pass level calculation. This could be relevant during maintenance or steel strip change. The VLM-DG system also extents the VLM fault management by monitoring the internal communication between the master and the slaves. Furthermore, plausibility tests continuously check the measured update lengths. If necessary, the system can be delivered with EtherNet/IP instead of Profinet.

All-in-one solution

Very often, a skin pass mill is combined with a downstream tension leveler which improves the flatness of the material by reducing tensions accumulated during skin passing. An additional slave VLM connected to the first slave allows for calculating the extension ratio to control the tension leveler. For this purpose only a few parameters in the master VLM need to be adapted. After that the VLM500-DG system provides all information about the mass flow to control the whole rolling mill.

ASTECH offers with the VLM500-DG a custom-tailored solution that does not require any additional components for intercommunication or calculation. Instead, it delivers what the customer would expect from such a system – preprocessed measurement values for the skin pass level and the draw ratio to control its rolling mill.

LDS10A available

With the LDS10A, the entry model of the LDM series is available from now on. As announced some time ago the new device offers an infrared LED, based on distance detection up to 40 m. The LDS10A is based on the technology of the Canadian company LeddarTech and consists of self-developed ICs and advanced signal processing algorithms.

Although the LDS10A provides an attractive price-performance-ratio, the user can rely on the well-known robustness and reliability of all ASTECH products. The sensor is made with an IP67 certified housing and a solid connector in standard format M12.

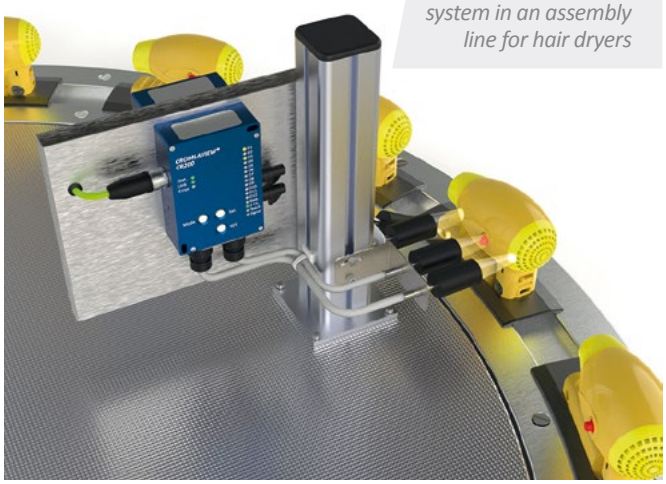
Additional information about the LDS10A can be found on the product website under *www.astech.de*.

Inquiries can be put by email to *sales@astech.de*.

Time is money – fast color sensor integration through Profinet connection

Ever shorter product life cycles, of consumer goods, require a time reduction to design and build appropriate testing equipment for production lines. Sensor technology that offers standard industrial interfaces, significantly supports this reduction.

An illustrative example for this is the implementation of the Profinet-equipped CROMLAVIEW® CR200PN color sensor, into a hair dryer assembly line. As hairdryers are offered in various color combinations, the correct assembly of the different colored housing parts has to be ensured. In the process, two two-channel CROMLAVIEW® CR200PN acquire a total of four measuring points, as they transfer the color values present in the L* a* b* color space via their Profinet interfaces to a programmable logic controller (Siemens S7). The color values are checked for plausibility during a so-called recipe management, where upcoming errors are detected. By standardizing the transmission, the data integration of the sensors is accomplished within no time. In addition to the color values, status information and a live counter can be evaluated. The live counter signals that the respective sensor is still working properly.



Color inspection system in an assembly line for hair dryers

As one of the results, the implementation time as well as a possible replacement of the sensor (if necessary) is significantly shortened. In case an exchange is needed, the sensor is ready for its use after a simple white balance.

Further available fieldbus interfaces, in addition to Profinet, are for example: Profibus, Ethernet as well as EtherNet/IP. The latter one was originally developed by Allen Bradley / Rockwell Automation and is mainly in use on the American market.

The chopper-sensors are ambient light independent. Due to the close set-up of measuring sports, beating effects might occur. For this reason, the chopper frequency of the sensor LEDs and their phasing are synchronized. For this purpose, one sensor is defined as a master, by outputting the LED clock signal on a switching output. The slave sensor takes this over for its LED via a trigger input. By doing so, a mutual shielding of the measuring spots can be omitted.

Internes

Contact

ASTECH Angewandte Sensortechnik GmbH
Schonenfahrerstr. 5, 18057 Rostock, GERMANY
Phone: +49 381 44073-0
Fax: +49 381 44073-20
sensitive@astech.de

www.astech.de

Simply scan the QR Code to open our website and gain information about ASTECH and our products.

Editor: ASTECH Angewandte Sensortechnik GmbH, Schonenfahrerstr. 5, 18057 Rostock
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