One solution, two functions

Inductive sensors: extremely robust and easy to mount

As a manufacturer of special machines, the MD Automatisierung GmbH (MDA) can't do without sensor technology. In particular convinced of the well-planned comprehensive solution, the company decided to use inductive sensors from ipf electronic while developing a special machine for laser marking of automobile headlights.

Company MDA located in Molln, Oberösterreich, has developed special solutions for the automotive and steel industry for more than 16 years, especially in the area of automation. Among the customers there are well-known manufacturers, e.g. DaimlerChrysler, for which the company realized a dryer plant, through which the ready glued bodyshells move for the adhesive's setting process. Further examples are robot systems for lacquering the inside and outside of car bodies for BMW or currently a highly automated sorting facility for steel profiles for the special profile plant from Voest Alpine Krems. Furthermore, MDA focuses on the development of special machines for laser marking.

Laser marks headlights

"The latest project was about the realization of a laser marking machine for our sales partner MLS located in Vienna, who is specialized on high-qualified product marking via lasers. With this solution, car headlights should be marked," explains Mario Damianitsch, owner and Managing Director of MD Automatisierung. The machine is semi-automated, as the parts are manually positioned in standardized parts carriers on a rotary table. Designed as a universal solution, the parts carriers can also be changed so that diverse headlights can be marked.

Precise marking via high-accuracy axes

An integral part of this special machine is a high-precision X, Y, Z portal for positioning or moving the marking laser that is driven by servomotors. Thanks to a special optic, labeling fields of up to 200 x 200mm can be covered without having to move the laser. Using the three portal axes, even labeling fields of up to 500 x 500mm can be realized. In addition, the solution also enables marking or a laser removal of areas in sectors of the headlights that are very difficult to reach. For referencing of the portal axes as well as their end position query, MDA needed a robust sensor solution, which could be installed quickly and easily.

Have come to appreciate good service

Mario Damianitsch explains why he decided in favor of ipf electronic in this connection: "Visiting one of my clients, I came into contact with the sensor provider for the first time. There I met Thomas Wally, the responsible application specialist for Austria from ipf electronic, who presented to me the product portfolio. Over time, I have always come to appreciate the very good personal care of the specialist and therefore contacted him when I was looking for the right sensor technology for a laser marking machine."

Particularly robust, wear-free solution

"Appropriate" for this application means sensors of type IM120120. These devices belong to a very wide range of inductive sensors with standard switching distances. One feature is their encapsulated electronics in a robust metal housing, which is thus perfectly protected against shocks. These sensors are therefore much more resistant to mechanical stress compared to plastic proximity switches and can be used at ambient temperatures of -25°C to +70°C. In addition, they work completely wear-free due to the contactless object detection.

Six sensors assume dual function

A total of six sensors was required for the portal axes of the laser marking machine. Mario Damianitsch specifies the tasks that these devices should fulfill: "After each start-up of the machine, the X, Y and Z axes are referenced. To do this, the three axes are moved until an inductive sensor switches on a specific axis. If this is the case, the servomotors equipped with incremental encoders will rotate until they reach their zero point. In this way, the portal system can be referenced very accurately each time the machine is switched on. If this task, for which only one sensor per axis is necessary, is completed, the devices are switched to end position function. For this purpose, the three additional sensors are used. Thus, the devices fulfill a dual function."

The end position function is used to avoid mechanical damage to the machine when moving the portal axes during the laser marking process. According to statements of Mario Damianitsch, reasons for these mechanical damages can be malfunctions such as the failure of a servomotor. "It is also conceivable that in the course of revision work, an axis is decoupled and then not coupled correctly again. In that case, there is also the risk of a collision. If such an error occurs, the machine will be stopped immediately by the signal from the triggering sensor," says Damianitsch.

Simple and easy attachment to the profile

However, the sensors alone were not the only reason why MDA decided on this solution, as the managing dircetor reports: "I was particularly impressed by the fastening solution that ipf electronic provides as an accessory for the inductive sensors. They are easily and absolutely securely mounted to the profiles with aluminum clamps. This was a decisive advantage for us, because we already got the CAD data from the sensor supplier in advance and thus had no additional effort in the construction of the machine."

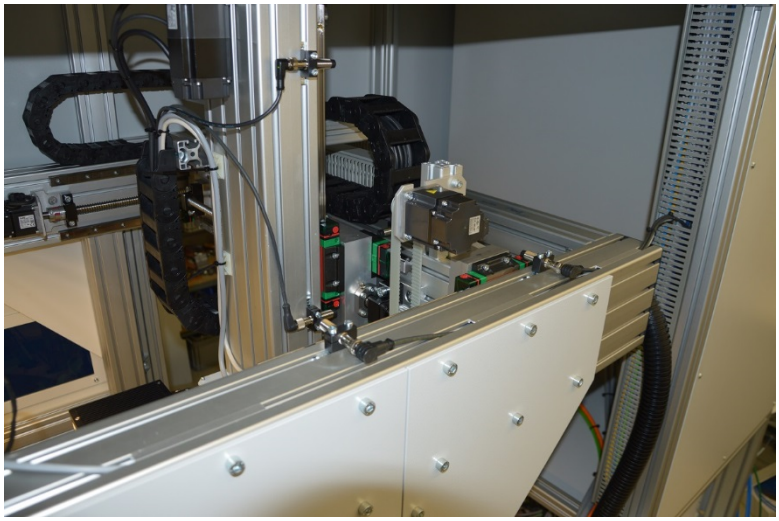

Image caption ipf_app_MD_Automation_01.jpg: Dual function: Two IM120120 inductive sensors from ipf electronic were installed on the profiles of the three motion axes for referencing and end position control.

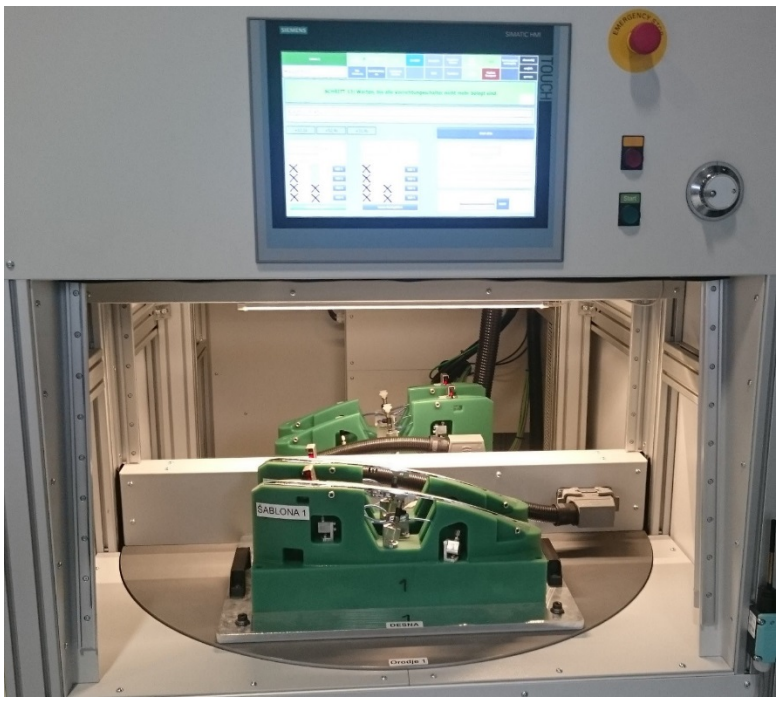

Image caption ipf_app_MD_Automation_02.jpg: Car headlights are lasered with the laser marking machine. Standardized parts carriers take up the headlights from a rotary table, which the laser labels after turning the table by 180°.

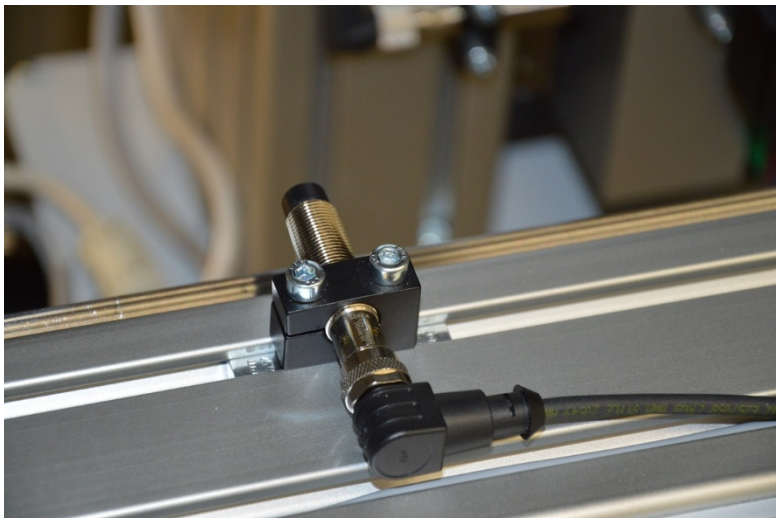

Image caption ipf_app_MD_Automation_03.jpg: The mounting clamp AY000032 made of aluminum, which is available as an accessory, ensures an easy mounting of the sensors on the profiles.

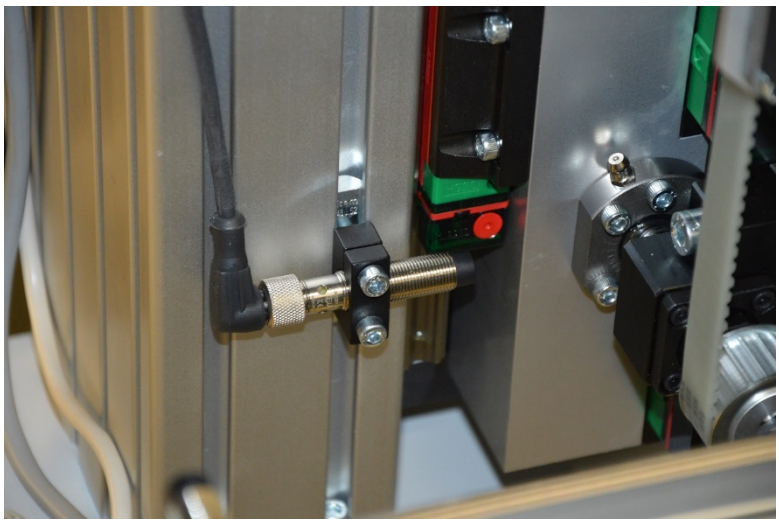

Image caption ipf_app_MD_Automation_04.jpg: A feature of the IM120120 is the encapsulated electronics in a robust metal housing (protection class IP67) to protect it against shocks.

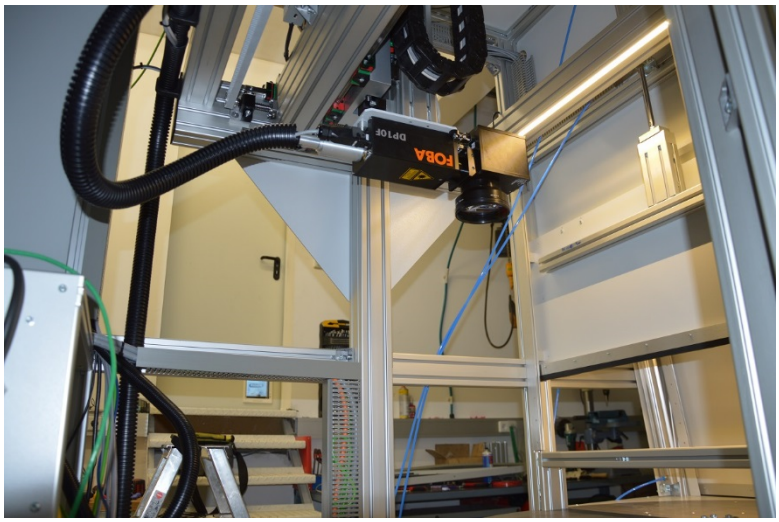

Image caption ipf_app_MD_Automation_05.jpg: Due to a special optic, labeling fields up to 200 x 200mm can be covered without having to move the sensor.

Image caption ipf_app_MD_Automation_06.jpg: Mario Damianitsch, owner and Managing Director of MD Automatisierung.