

Flexible Silencer Production

The automation of a production line for exhaust systems enables Turck to demonstrate the flexibility of its BL20 multiprotocol gateway in conjunction with the IO-Link-capable TBIL hubs

The creation of a new production line for exhaust systems, or more specifically silencers, presents automation engineers with a wide range of different challenges: Firstly, the harsh industrial environment with the presence of welding sparks and electromagnetic interference, and secondly, the production requirement to bring together different individual products harmoniously to form a complete solution. In order to meet these requirements, one of the leading manufacturers of exhaust systems chose Turck's BL20 modular I/O system in order to provide a highly flexible I/O solution. The customer fitted out a completely new factory in Turkey with Turck's multiprotocol gateways, which can operate in Profinet, EtherNet/IP and Modbus TCP networks. The production lines in this factory make large silencers for trucks and buses. The system integrator Teknodrom Robotik ve Otomasyon was responsible for the installation and integration of the entire automation solution. The company has a great deal of experience in the automation of systems in harsh environments, such as those found in the automotive industry.

Teknodrom spoke to Turck about the sensor and I/O requirements for the new production line already

in the design phase. With 50 years of experience in sensors, fieldbus and connection technology for harsh industrial plant environments, Turck was not only able to provide the application know-how, but also product solutions that bring the customer several benefits. These include, for example, new technologies like multiprotocol, fast startup and IO-Link.

A special feature of the new production line is the fact that fieldbus systems have to communicate with different controllers – an ideal application field for Turck's BL20 modular IP20 I/O system. The multiprotocol gateways, which speak the three Ethernet protocols and feature the necessary I/O slices, enable the BL20 system to bring different types of signal to the controller and also link different valve blocks of the production line. The end customer particularly appreciates the simplicity of the BL20 modular system, as well as the easy maintenance and diagnostics it allows.

IO-Link ensures efficient production

The user benefits enormously from the flexibility that IO-Link provides for the requirements of this system. For an increasing number of users, this communication standard has become an attractive



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way of providing transparent access from the controller to the sensor.

In this project, Teknodrom Robotik ve Otomasyon was able to fully utilize Turck's complete IO-Link portfolio in order to put together a tailored I/O solution for its customer. Turck's BL20-4IOL gateways with IO-Link master modules and the IO-Link-capable IP67-TBIL I/O hubs bring up to 16 switching signals from the field to the control cabinet via a single four-wire cable. The TBIL functions as an IO-Link slave, bringing 16 binary signals to the IO-Link master on the BL20 gateway. This not only considerably reduces the wiring effort required but also the possibility of wiring errors. Passive junctions with large multi-pole cables are often used as an alternative solution. However, as each wire of this type of cable has to be connected at the gateway or controller at its specific terminal, this solution is not only time consuming but also expensive. Finally, the considerable amount of documentation required makes the task more difficult.

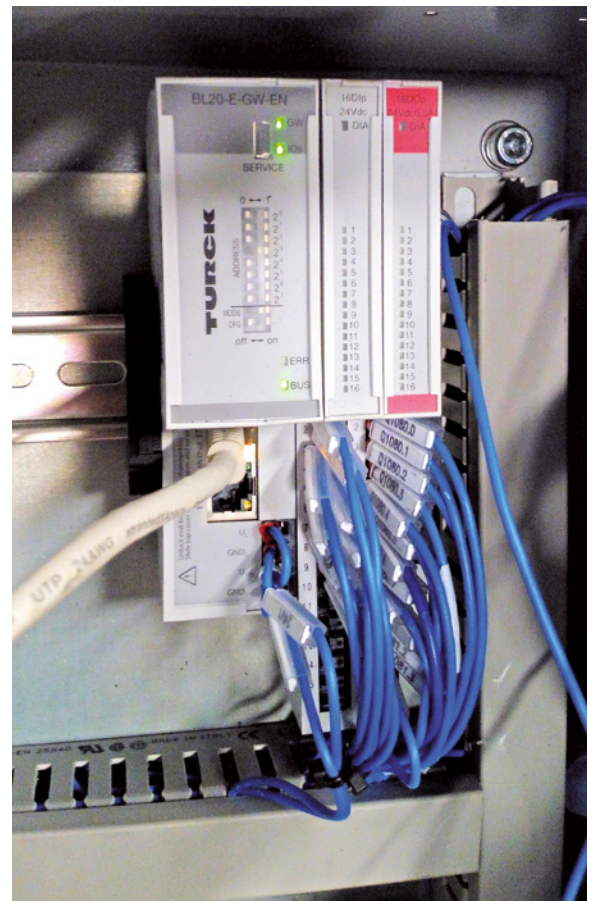
Another benefit of IO-Link in the production line becomes apparent when different tools are changed: "The clamping devices for the products have to be changed frequently in the plant. The IO-Link modules

for BL20 offer here a high level of flexibility. During the installation, we can quite simply adapt the BL20 system and add more signals or reduce them. With every additional expansion or upgrading of the plant we benefit from this flexibility," says Selim Çağatay, the

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The Turkish system integrator Teknodrom Robotik ve Otomasyon is planning and implementing the construction of a production line in Turkey for one of the leading manufacturers of exhaust systems. The greatest challenge in the project was to provide the required level of flexibility for the line, which needed a variable, particularly robust and EMI resistant automation technology due to the welding applications in place. In its search for a supplier, the company came across Turck with its extensive portfolio of sensors, connection technology and I/O systems, which could easily meet the demanding requirements involved, not only due to the I/O-Link functionality provided.

The right Turck offering: With IO-Link, multiprotocol Ethernet and I/Os for a large number of inputs and outputs, the integrator was able to provide the customer with a tailored solution



control technician responsible at the system integrator. Besides the input signals, the actuator signals to the valve blocks also have to be transferred to the BL20 system via IO-Link. A single interface therefore collects all IP20 I/Os, the IP67 sensor signals from the field and the IP67 actuator signals to the valve blocks. The Teknodrom engineers praised this feature in particular: "The ability to connect several different modules (valve blocks and block I/O modules) from a single point is a major benefit of the Turck I/O solution."

Efficiency through decentralized IP67 I/Os

Production lines for MIG (metal inert gas) welding require an extremely robust connection and sensor technology due to the high level of electromagnetic pollution. In view of the fact that errors in the connection technology can be avoided best of all by reducing the number of connection lines, a smart IO-Link solution is significantly simpler, faster and more economical to implement than multiprotocol cable systems. It also makes a major contribution to quality assurance. All signals are collected via Turck's TBIL IP67 IO hubs and then forwarded to the BL20 system via a

single four-wire line. IO-Link master and multiprotocol gateway handle the additional communication with the controllers via Ethernet. Thanks to the digital IO-Link transmission, the user can save on the expense of shielded cables and other EMC measures. The Turck solution also saves considerable installation costs and is also easier to maintain.

"Thanks to this compact and flexible solution with a good price performance ratio, we believe we have found the best solution for the customer," Selim Çağatay explains the decision to choose BL20 with IO-Link as standard for the new silencer production.

Flexible solution for the automotive industry

For users wishing to fully exploit the possibilities of IO-Link, Turck offers one of the most extensive IO-Link portfolios in the world – starting with a host of sensors, cables, inductive couplers and I/O hubs, right through to programmable fieldbus and Ethernet solutions. Turck customers not only benefit from the comprehensive offering for IO-Link and the company's many years of experience in the automation of automotive production lines, but also from a host of application specific sensor and fieldbus solutions for this sector. With Turck multiprotocol, the company has developed a technology that combines the three globally used Ethernet protocols (Profinet, EtherNet/IP and Modbus TCP) in a single device, both with IP20 protection as well as IP67 – as a modular system or also as compact block I/Os.

»For us it was very important to install a flexible structure. I think we have managed to do this with the Turck solution.«

Selim Çağatay | Teknodrom Robotik ve Otomasyon

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