HMS

CASE STUDY: INDUSTRIAL PLASMA PROCESSES

HMS solution:	CANopen stack and CANopen gateway
Country:	Germany
Company:	relyon plasma GmbH
In short:	Plasma products from relyon plasma are equipped with a CANopen interface realized with an IXXAT stack. In combination with Anybus gateways for CANopen they can be embedded into any fieldbus environment.

CANopen

The effects

✓ Flexible bus interface for any target market

✓ Cost-efficient interface hardware

✓ Open CANopen standard protocol

„With HMS gateways, it is a cinch to embed our plasma plants into any fieldbus environment and have them communicate very reliably with the primary FIS (Factory Information System)."

Dominik Burger, Manager R & D, relyon plasma GmbH

Industrial plasma processes – modular configuration

Requirements for ease of integration of plasma products used for surface treatment have increased steadily. Various communication standards have been established at the international level. At the same time, customers in the packaging or automotive supply industries demand a cost-efficient and robust standard solution that can be integrated into any specific plant technology. For this reason relyon plasma implemented a CANopen slave interface using the IXXAT stack. When combined with Anybus X-gateway CANopen (master), relyon plasma can be used with any system configuration.

Application

Atmospheric plasma is one of the most efficient methods for treatment of materials to create ideal conditions for subsequent processes such as glueing, laminating or varnishing. Product quality is improved while increasing throughput and without using additional primers. Another important topic is the germ-reducing effect of plasma in the pharmaceutical industry and in food engineering.

An electric discharge can generate an intense atmospheric plasma jet in air streaming out of a nozzle. At relyon plasma we use high-frequency pulses from a high voltage source and a nozzle designed specifically for this purpose.

Embedded into the system for excellent communication

Robust communication is essential for reliably controlling this type of high-performance system. Using a CAN bus, several plasma channels, temperature and pressure sensors as well as mass flow controllers can be connected in a production plant such as those used in the packaging industry. The CAN bus offers up to 127 addresses per node and delivers transfer rates up to 1 Mbit/s with 40 m or 500 kbit/s with 100 m cable length. Communication via CAN is outstanding in terms of tolerating electromagnetic interference.

Cross-vendor standard

In modern production plants, self-contained isolated solutions or analogue control system interfaces have long since ceased to be "state-of-the-art".

Secure communication as a redundant system to the emergency-stop circuit is extremely helpful, not least for meeting the required performance level, risk classification according to ISO 13849 standard. The relyon high voltage source is capable of deactivating the active high voltage by way of a hard-wired emergency-stop circuit and the CAN interface.

In either case, communication and status monitoring continues without interruption.

The plasma system must be embedded securely into the primary control system design. To be sure, communication standards differ based on industry, region or type of plant control system used.

Although the open communication protocols DeviceNet or CANopen based on CAN are available, they are not supported by all control system solutions. For this reason relyon plasma thought it was important to ensure that the plasma solution can be integrated without problems into the respective plant network technology anywhere in the global market.

In no time at all it was possible to implement a wide range of solutions for integration, starting with a simple laboratory system controlled via CAN/USB module directly with a laptop, through to a fully automated production plant with central control system and continuous transfer of all process parameters to the factory information system.
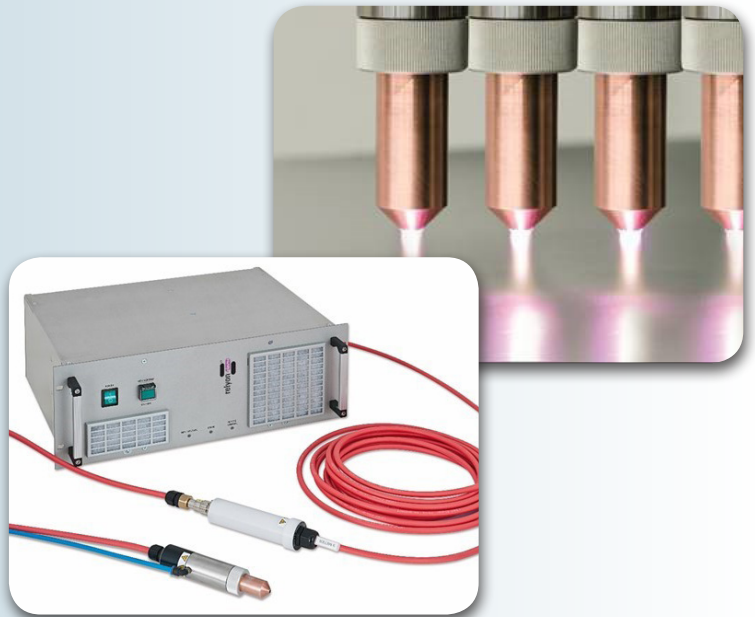
The project from the perspective of the customer

„The support from HMS made implementing our fundamental decision to design our products in line with the CANopen standard a much smoother process. Many process-oriented sensors for temperature, pressure or mass flow are aligned with this robust standard. With Anybus X-gateways for CANopen from HMS, it is a cinch to embed our plasma plants into any fieldbus environment and have them communicate very reliably with the primary FIS (Factory Information System). Noise due to a rough environment is now a thing of the past," so Dominik Burger, Manager R&D, relyon plasma GmbH.

For more information about plasma products go to
www.relyon-plasma.com

Top image
Multi-channel process: 5 plasma generators (type PN3) in compressed-air operation

Bottom image
PS2000 high voltage supply with PB3 plasma generator and 10 m drag-chain-compatible HV cable (red) and compressed air connection (blue). CAN bus interface (CANopen slave).

Advantages for customers

- ✓ Open CANopen standard protocol
- ✓ Cost-efficient interface hardware
- ✓ Flexible embedding into preferred bus system for any target market
- ✓ Low mix of own products
- ✓ Secure system technology

For more information go to www.anybus.de and www.ixxat.de

Anybus X-gateways are used when the goal is to integrate CANopen field devices into primary fieldbus or industrial Ethernet networks: for instance into PROFIBUS, PROFINET, EtherCAT, DeviceNet, EtherNet/IP etc. The Anybus X-gateway is mostly used as the CANopen-master (manager) but is also capable of CANopen-slave functionality. The **IXXAT CANopen protocol software** allows for easy implementation of CANopen functionality directly on customer hardware. The software includes all necessary functions for realizing CANopen-slave or simple CANopen-master devices as per CANopen specification CiA 301.