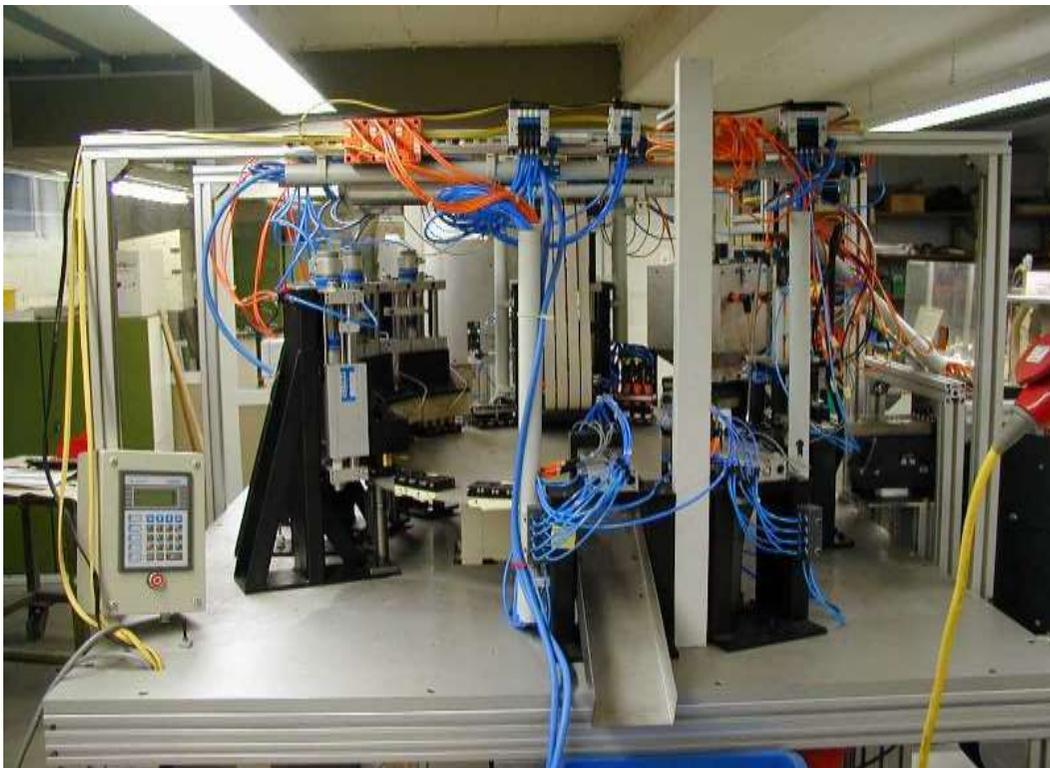




# Project:

## Injection moulding plant

### Capsule filling station with rotary system



in  
plant technology

## AS-Interface automates capsule filling station with rotary system

In 1999 a fully automatic capsule filling station with rotary system was installed at the company Sanner in Bernsheim. As the machine was to be installed with as little wiring as possible, only an intelligent wiring system was possible. Furthermore, the machine was to be controlled directly via this system. Thus AS-Interface (AS-i) was chosen due to its simple handling.



Photo 1: View of the storage container

### Controller concept

The controller concept of the plant is based on the field bus system AS-Interface which can be visualised and operated by means of a multi-line operating display. All system signals are detected via the profiled AS-i two-wire cable (AS-i flat cable) and processed via the AS-i controller (central control unit with 1 or 2 AS-i masters). The masters in the AS-i controller ensure the communication of the controller with the AS-i slaves (I/O modules and AS-i system solutions) which are distributed in the whole plant. AS-Interface also ensures the power supply of sensors and actuators. The supply and monitoring/control is either carried out via the AS-i I/O modules or via the AS-i slaves integrated into the system solutions (e.g. AS-i AirBoxes, AS-i valve islands, AS-i proximity switches, etc.). The profiled AS-i two-wire cable ensures fast and reverse-polarity-protected wiring of the system and can thus contribute to a considerable extent to cost reduction during the installation of the plant.

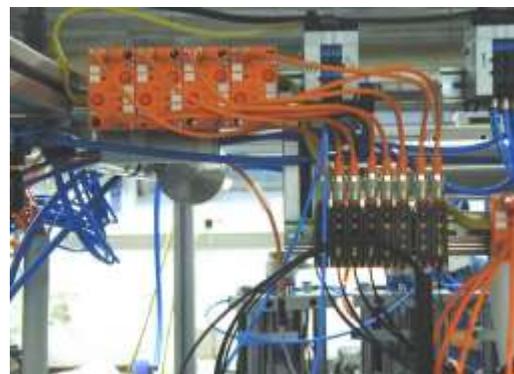


Photo 2: Fibre-optic amplifier connected to AS-i input modules (4DI)

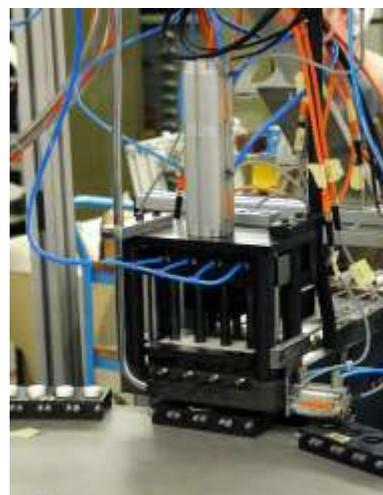


Photo 3: Detection of pneumatic cylinders by means of magnetic cylinder switches

## Monitoring of the filling material

Capacitive proximity switches type KG5002 from ifm were fitted with a metal probe and installed for the monitoring of the capsule filling. The metal probe serves as antenna which transmits information about the presence of the medium to the sensor. This procedure was used because there was not enough space in the capsules to enable direct monitoring via the sensor.

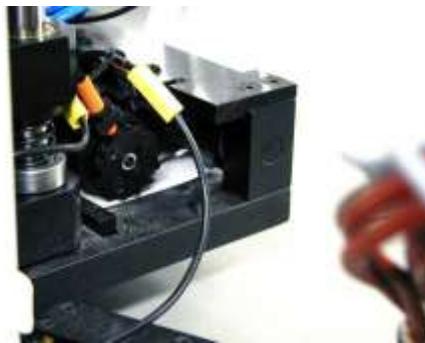


Photo 4: Capacitive proximity switches with probe

## Feed monitoring



Inductive proximity switches type IE5099 from ifm were installed on the cam wheels of the drive to monitor the rotational movement of the material strip.



They transmit the pulses via AS-i modules to the controller which evaluates them by means of the pulse sequence as rotational movement. Thus the speed of the movement can be measured as well via the program of the AS-I controller.

Photo 5: Inductive proximity switch for feed monitoring

## Detection of pneumatic cylinders

Easy-to-mount magnetic cylinder switches type MK5019 from ifm transmit position feedback of the pneumatic cylinders via AS-i I/O modules to the controller (the AS-i controller) for further processing.



Photo 6: Detection of pneumatic cylinders by means of magnetic cylinder switches

## Control cabinet with PT100 module



As can be seen in photo 7, the installation in the control cabinet has been reduced to a minimum. Only 5 AS-i control cabinet modules (4DI/4DO on the lowest DIN rail) for binary signals and a PT100 input module (4 inputs, next to the 24VDC power supply) for temperature measurement are located in the control cabinet next to the controller (ifm type AC1024, with 2 RS232C interfaces). All further inputs and outputs are detected via AS-i I/O modules and AS-i system solutions in the field.

**Photo 7: Control cabinet with AS-i controller, power supplies, I/O modules and PT100 module**

## Display for operating the plant

In order to operate the plant in a very simple way an operating display of the company EXOR, Wuppertal, was installed. Functions of the plant can be controlled with this multi-line display by menu navigation. Functions, variables and constants can be manually operated, modified and displayed. Error messages are displayed as text which is freely selectable. The operating displays of the company EXOR can be obtained from ifm electronic gmbh.



**Photo 8: Operating display of the company EXOR, Wuppertal**

## Conclusion

Due to the use of the intelligent wiring system (field bus system) AS-Interface (AS-i) the wiring in this plant could be reduced by approx. 40%. The simple handling and diagnosis reduced the commissioning time considerably. Modular design and a profiled AS-i flat cable enable fast and simple extension of the plant at any time without having to modify the control cabinet --> simply AS-i!



**Photo 8: The finished product: The filled capsules**

**Companies involved:**

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**We would like to express our thanks to  
*the company Sanner and Mr Christ*  
for the good cooperation.**

**The following ifm branch office was in charge of the project:**

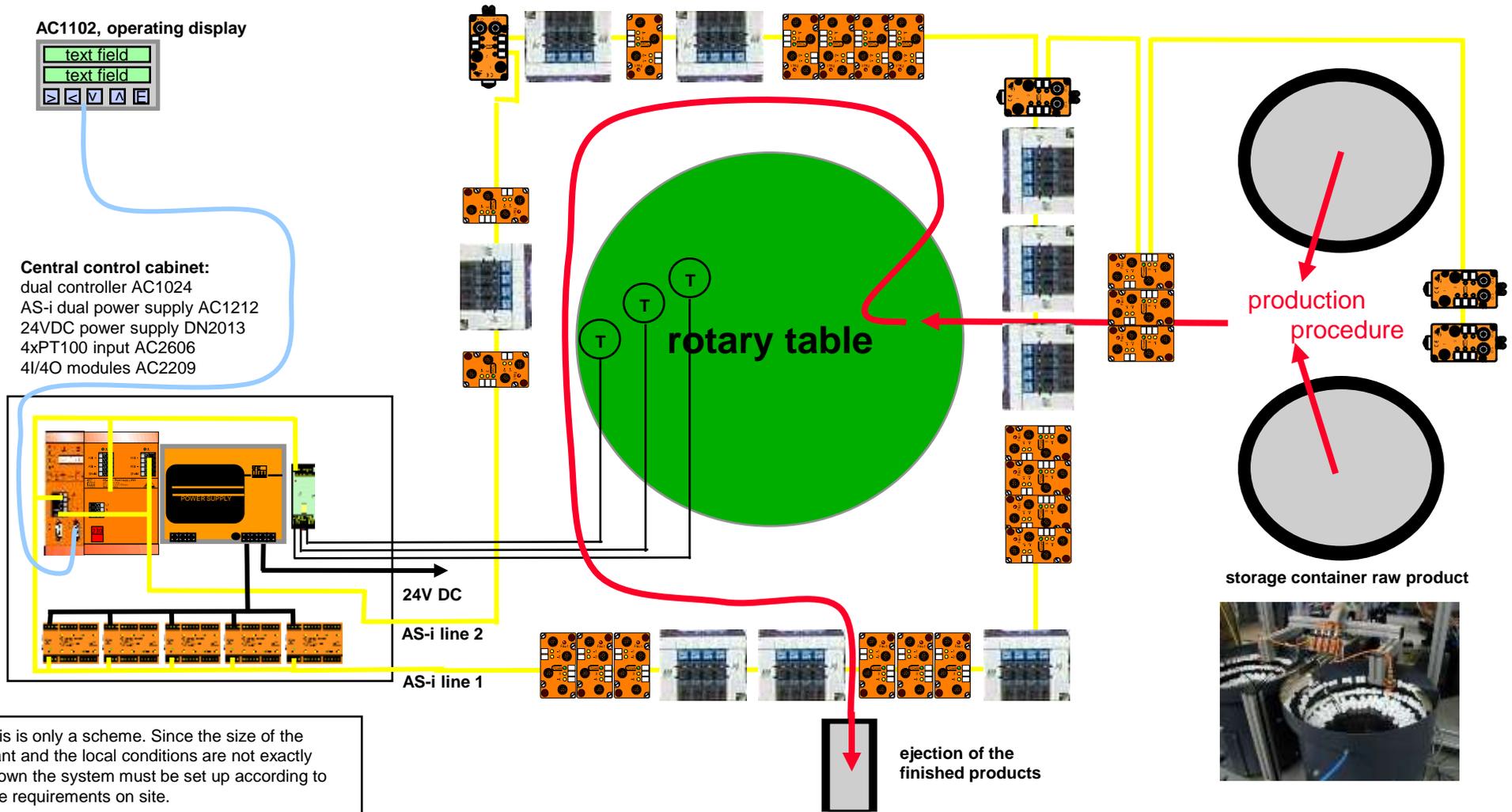
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# Project scheme capsule filling station with rotary system



**ifm electronic gmbh**  
**essen**  
 Environmental Technology  
 and Building System Autom.

Project: **Capsule filling station  
 with rotary system**



Plan: **Intelligent wiring system  
 AS-Interface**

Date:  
 Created by: **KIE - me**  
 Plan no.: **SC\_MaB\_1.ppt**