ifm electronic

Conveyor control solution

ifm electronic – close to you!

Summary

For a long time the mining industry has recognised the need for an effective conveyor control solution; both overland and underground for mineral processing and material handling purposes in general. The requirement for the system is to be robust, easy to handle/fault find, cost effective and with the ability to go over long distances as these conveyors can cover a vast area.

ifm efector's solution to the above is based on Actuator Sensor Interface (AS-i) as this solution positively fulfils all the rigorous requirements of a conveyor control solution in the mining industry; not only communicating with all the digital and analogue inputs such as belt drift and rip switches but also with all the safe inputs such as E-stops, lanyards (rope pull switches).

AS-i is easy

AS-i is an open standard, with more than 280 members in the association, with ifm being one of the more prominent members. Being an open standard allows the AS-i solution to be one of the most flexible and unique control system/smart wiring solutions. The flexibility of the system allows AS-i to communicate with most of the fieldbus interfaces such as Profibus, EtherNet/IP, Profinet, Modbus, CAN Open and DeviceNet. AS-i in the control hierarchy sits at the bottom communicating with all the sensors and actuators then passing all the relevant information to the higher order fieldbus system.

Since everything is available off the shelf using the standard M12 and M8 connection points - no termination is required in the field, which significantly reduces installation time, documentation and further cost of the overall system. As a matter of fact, with

many cost comparisons done it is proven that the total cost of the system can be reduced by 30 to 40% when AS-i is used as a conveyor control solution.

The essential system components for the system are: master, AS-i decoupled power supply, slaves and AS-i cables. The master is responsible for the communication to the higher level fieldbus system and also required for the communication with the slaves (which are in turn connected to the sensors in the field). It has a full-coloured display and also allows for remote diagnosis and setup of the system. The AS-i power supply not only provides power for all the inputs in the field but also does data decoupling. The other system component is the AS-i cable, which has a special profile and allows for easy installation of the system. Many different types of cable material are available in the same profile. For the conveyor control solution, it is recommended that TPE cable is used. The modules are addressed using an addressing tool, and connection to the cable is done through insulation displacement technology (vampire connections).

The diagnostic information of the system is displayed at three points:

1) On the programmable logic controller (PLC) as the data is mapped across from the master to the PLC via the fieldbus system.
2) On the AS-i master's screen.
3) Locally on the slave module.

On a long conveyor this helps reduce the maintenance cost as you will not only get information about a short-circuit on a sensor or a faulty slave module, but also information about which safety device has been tripped or activated.

AS-i system summary

AS-i can cater for a maximum of 62 digital slaves, 31 safety or analogue slaves or a combination of digital, safety and analogue slaves. Each digital slave can cater for a maximum of 4 inputs and 4 outputs whereas a safety slave can connect to 1 or 2 safe devices depending on the safety integrity level (SIL) and category (CAT) rating requirement for the system. AS-i as a conveyor control solution can achieve maximum safety rating of SIL 3; all the equipment has been certified by TÜV and BIA.

The maximum scan time of all the digital inputs and outputs of a fully populated AS-i network is between 5 and 10 ms. Since safety can be put on the same network, there is the guarantee that all the safety slaves will be scanned within a maximum of a 5 ms time period (when maximum number of slaves are connected).

The conveyor control solution system on offer can go to maximum length of 1 km. If longer than a 1 km network is required then multiple networks are required, which can be connected together using a fieldbus system. Although the line topology is very common in the conveyor industry, there are no restrictions in creating a star, tree or ring topologies.

Conclusion

The AS-i system as a conveyor control solution fulfils all the needs of the ever demanding mining industry catering for both safe and non-safe devices with multiple installations successfully working around the world.

ifm efector – close to you!

Visit our website

www.ifm.com/za

ifm efector pty ltd
Melbourne - Head Office
Phone 1300 365 088
Fax 1300 365 070

Branches:
Adelaide
Sydney
Perth
Brisbane
Launceston

sales.au@ifm.com
www.ifm.com/au

ifm electronic – close to you!

Overview
ifm product range

Position sensors

Sensors for motion control

Industrial imaging

Safety technology

Process sensors

Industrial communication

Identification systems

Condition monitoring systems

Systems for mobile machines

Connection technology

Accessories