ifm electronic

Conveyor Control Solution

ifm electronic – close to you!

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In the mining industry there are lots of raw material conveyors to transport the raw material from underground facilities to the processing plant. The mineral bearing rock has to be moved over a long distance via robust conveyor systems. These conveyors can be longer than 2 km and have to be very flexible due to changing's in the locations of the mining fields. Ifm electronic developed a conveyor control system which allows connection of all the stations of a conveyor system eg. rope switches, emergency stop switches, belt alignment switches, temperature sensors, speed sensors, start-up alarms etc. The conveyor control system is called AS-i (Actuator Sensor Interface)

The Actuator Sensor Interface is a hot-pluggable alternative to conventional wiring technologies that is easy to use and easy to extend. Speed, reduction of installation, plant and maintenance costs, and high availability are features of this manufacturer-independent interface system. The AS-Interface is ideally suited for the robust transmission of small quantities of data under rugged industrial conditions. It has proven itself and has become accepted as the standard for the networking of sensors and actuators in many application areas for economic amongst other reasons. The two-core cable for data and energy transmission, the connection in the clamping technology, the mapping in the PLC as I/O component assembly, and extensive diagnostic possibilities lead to significant savings in project planning, installation, documentation, maintenance, and downtime in the case of failures.

The AS-Interface is designed for the lowest level of the automation hierarchy where it offers an easy, reliable, and fast transfer with optimal price-performance ratio. Higher-level systems such as Profibus DP, EtherNet IP, Modbus, DeviceNet or CANopen are connected via gateways. Decentralised solutions relieve the control system. Depending on the extent of the setup, this permits cycle times of typically 2 ms for one AS-Interface branch. The system can be flexibly extended, may be commissioned in partial areas only, reduces the communication on higher-level field buses and offers an increased failure resistance through autonomous sub-areas.

The AS-Interface shadow logo designates devices that have been certified by the independent AS-Interface test centre. This permits simultaneous problem-free operation of devices from different manufacturers on one AS-Interface branch.

The heart of the system is the AS-Interface master or the AS-Interface gateway with respective diagnostic possibilities. Current PLC or PC software solutions can continue to be used as the AS-Interface acts like an I/O card in a downward direction. The devices control and monitor the data exchange with the modules and/or AS-Interface sensors/actuators according to the master-slave principle. Viewed from the primary field bus, the gateway acts as slave participant with up to 248 bits of input and 186 bits of output data (V 2.1). Power is supplied via AS-Interface power supply units with data decoupling. Bus-terminators or tuners and repeaters permit line extension beyond 100 m.

For this purpose, the repeater separates the primary and secondary side electrically to achieve increased safety in case of a short circuit. An unlimited amount of repeaters may be operated in star configuration but no more than two in sequence. Together with the repeater, a further AS-interface power supply unit must be used to provide power to the additional AS-Interface circuit.
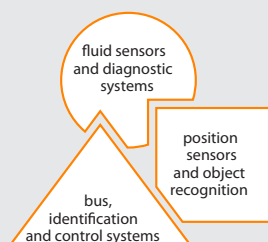
Slaves are available in many designs, binary or analogue, for use in the field, either in a switch cabinet or in the terminal box. For the EX areas, solutions with ATEX approval are also available.

With a manual address-programming device, individual modules can be addressed/configured easily at the desk or directly on site. However, it is also possible to address an entire AS-Interface branch via the AS-Interface master.

Based on the same technology and the same protocol, safety-oriented components such as rope switches, emergency-stop devices, opto-electronic protective devices and safety guard interlocking devices can also be integrated. This only requires the installation of one safety monitor and some safe slaves on the branch.

A mixed operation of both safe and nonsafe AS-interface slaves is possible without problems. The safety monitor monitors the data communication on the AS-Interface line. For the safe slaves, dynamic code sequences (8x4-bit data sequence) that are stored in each slave are transmitted. These are "learned" by the safety monitor during commissioning. During operation, the safety monitor compares the expected with the actual sequence in each cycle and carries out a safe shut-down within 40 ms if there are any deviations, e.g., as a result of device failure, communication problems or the like. The time for re-activation is 100 ms. Safe field and switch cabinet modules are available as slaves, including intelligent safety sensors and safety command devices with AS-Interface chip. The system can be used up to control system category 4 according to EN 954-1 or up to SIL 3 according to IEC 61508 and may be used for stop category 0 and 1 according to EN60204-1.

The conveyor control system consist of the AS-i master, AS-i power supply, the safety monitor/relay device, AS-i cable and various I/O modules (safe and non-safe). The main benefits and features of ifm electronics conveyor control system is a safe control system that is cost effective, which allows for fast and flexible expansion and status of rope pull switches and emergency stop switches are displayed locally by the AS-i master display and also remotely in the PLC and on SCADA.
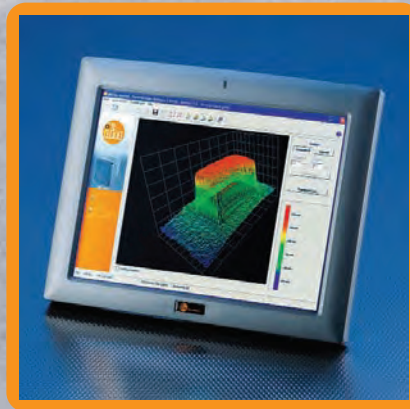
fluid sensors and diagnostic systems

position sensors and object recognition

bus, identification and control systems

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efector octavis

Online Vibration Diagnostics

efector duolis

E2D400 Panel PC

PROFI BUS

AS-i Gateways with ultra short transfer times

AS-i INTERFACE

The central control components of the AS-i network

efector600

Pt100/ Pt1000
Bolt-on sensors

ecomat300

ClassicLine: Quickly and
reliably ready for operation
due to quick mounting

ecomat300

Safety Rope Switch solution
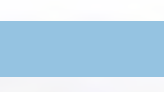for conveying automation

ecomat200

Belt Speed Monitoring

ecomat300

ifm's NEW safety rope emergency stop switch

The products

Type	Descrip ion	Order no.
	Safe rope pull emergency stop switch, dual hand type, no LED	**ZB0050**
	Safe rope pull emergency stop switch, dual hand type, bi-colour LED	**ZB0051**
	Safe rope pull emergency stop switch, left hand type, bi-colour LED	**ZB0052**
	Safe rope pull emergency stop switch, right hand type, bi-colour LED	**ZB0053**

Technical data

Safety contacts	4 NC
Auxiliary contacts	2 NO
Termination clamp up to	2.5 mm^2
max. switching voltage	240 V
max. rope span	125 m
Opterating temperature [°C]	-25 ... +80
Cover	yellow

Accessories

Type	Description	Order n
	Rope Tension Kit, Stainless Steel, 5m	**ZB0054**
	Rope Tension Kit, Stainless Steel, 10m	**ZB0055**
	Rope Tension Kit, Stainless Steel, 20m	**ZB0056**
	Rope Tension Kit, Stainless Steel, 50m	**ZB0057**
	Rope Tension Kit, Stainless Steel, 80m	**ZB0058**
	Rope Tension Kit, Stainless Steel, 100m	**ZB0059**
	Rope Tension Kit, Stainless Steel, 126m	**ZB0060**
	Safety Spring, Stainless Steel	**ZB0061**
	Universal Pulley, Stainless Steel, Reversing the direction of the rope	**ZB0062**
	Safe AS-i pcb, connection of mechanical contacts and LED components	**E7015S**
	Adapter plug, straight, M20 to M12 connector	**E11295**
	Cable gland M20 x 1.5	**E21010**

Application

The safety rope emergency stop switch is used to provide safety-related switching statuses where large danger areas have to be secured and housings or covers are not possible.

Typical applications are conveyor systems and rotating machines and large danger areas.

The safety rope emergency stop switch meets the requirements of EN ISO 13850, IEC / EN 60947-5-1 and IEC / EN 60947-5-5.

The safety rope emergency stop switch can be used in applications up to performance level e according to EN ISO 13849-1.

Function

Pulling the tensioned rope, rope breakage or impact on the E-stop cause activation of the switching function of the safety rope emergency stop switch.

There is a window on the switch via which the correct rope tension can be monitored during setting and maintenance. Setting, troubleshooting and maintenance are made much easier.

After activation of the E-stop function a latching mechanism maintains the E-stop command until it is unlocked manually by pressing the blue reset button. Before resetting the E-stop signal the cause of the activation has to be determined. Reset is only possible with correct rope tension (position indication in middle position).

ecomat300

Third-generation communicator

AS-i gateways with ultra short transfer times.

▲ **Colour display for clear diagnosis and set-up.**

▲ **AS-i double address recognition.**

▲ **Earth fault monitor.**

▲ **Profinet switch with 2 ports and certification according to Conformance Class B.**

▲ **Profibus DP interface with certified DPV0 and DPV1 functionality.**

The bus at a glance

The new ifm gateways are the fast connection from AS-i to Profibus, Profinet and Ethernet/IP. Thanks to a colour display and web interface, the status of all AS-i slaves is recognizable at a single glance. The quick set-up menu and intuitive handling facilitate installation and diagnosis. In addition, the web interface allows full remote access.

Three types of voltage supply

The flexible voltage supply ensures a low-cost integration into your application. The units can be operated via AS-ipower supplies, DC power supplies, or a combination of both. It is also allowed to supply several AS-i networks via a single power supply.

The products

Description	Order no.
AS-i Profinet gateway 1 AS-i master with M4 profile	AC1401
AS-i Profinet gateway 2 AS-i masters with M4 profile	AC1402
AS-i Profibus gateway 1 AS-i master with M4 profile	AC1411
AS-i Profibus gateway 2 AS-i masters with M4 profile	AC1412
AS-i data decoupling, can be mounted on AS-i Profinet gateway	AC1250
AS-i Ethernet / IP gateway 1 AS-i master with M4 profile	AC1421
AS-i Ethernet / IP gateway 2 AS-i masters with M4 profile	AC1422

Locations in Australia

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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

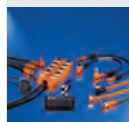**Process sensors**

**Industrial
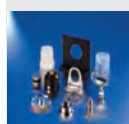communication**

Identification systems

**Condition monitoring
systems**

**Systems for
mobile machines**

Connection technology

Accessories