

## DuplineSafe

# Fieldbuses

# Fieldbus

## DuplineSafe

DuplineSafe is based on the Dupline® fieldbus, a system that has been used in more than 120,000 installations worldwide in the harshest industrial environments. Dupline® is particularly known for its reliability, simplicity and ability to transmit signals over long distances – all of which are features required in safety-related systems.

The trend is clear – big advantages can be achieved using bus communication in safety related systems. Compared to the traditional serial wiring of NC safety switches, the diagnostics is vastly improved. The immediate indication of causes for production stops makes it possible to reduce downtime significantly, especially on large machines and plants. Furthermore, a bus solution is safer, because the risk of undetected bridges over NC safety contacts is considerably reduced.



## Keep up production and make your plant safer

### Immediate and precise diagnostics

The status of the safety switches can be monitored from e.g. a HMI or LED mimic panel, providing fast and precise diagnostics. The signals can also be monitored from a PLC or PC, for example by using the DuplineSafe Profibus-DP gateway or the Modbus interface. Machine stops can be fixed faster leading to increased production efficiency.

### Up to 5 km transmission distance without repeater

No need for special network modules or special handling when long distances are involved. This is one of the main reasons for DuplineSafe being the leading Safety Bus system worldwide for long conveyors in mines, tunnels, cement factories, power plants, harbours, stone mills etc.

### Bus-powered input modules

The DuplineSafe input modules are bus-powered - hence no power supply is required at the E-stops.

### Easy to design, install and expand

The DuplineSafe system is easy to design, install and commission. The wiring of the twisted pair cable is uncomplicated and flexible with the possibility to use existing cables. If a conveyor belt needs to be extended, it is easy to install additional input modules.

### Multiple safety relays can read the same inputs

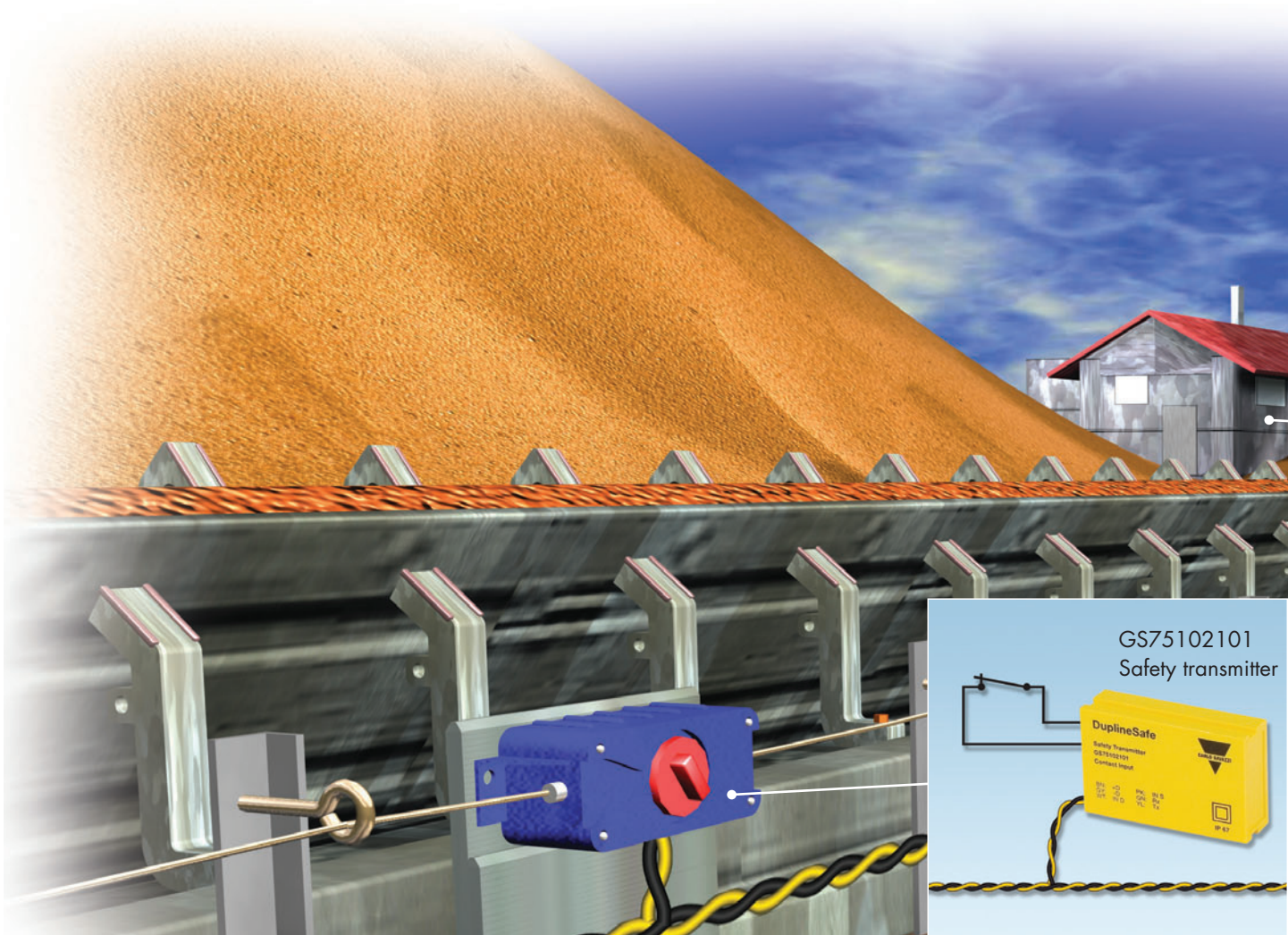
Easy to interlink safety switches from different machines so that any E-stop will activate multiple safety relays.

### TÜV-approved

DuplineSafe is approved by TÜV Rheinland Group according to the latest safety standards IEC/EN61508-SIL3, IEC/EN62061-SIL3 and ISO/EN 13849-1 PL e.

# TÜV

## Emergency stops on conveyors

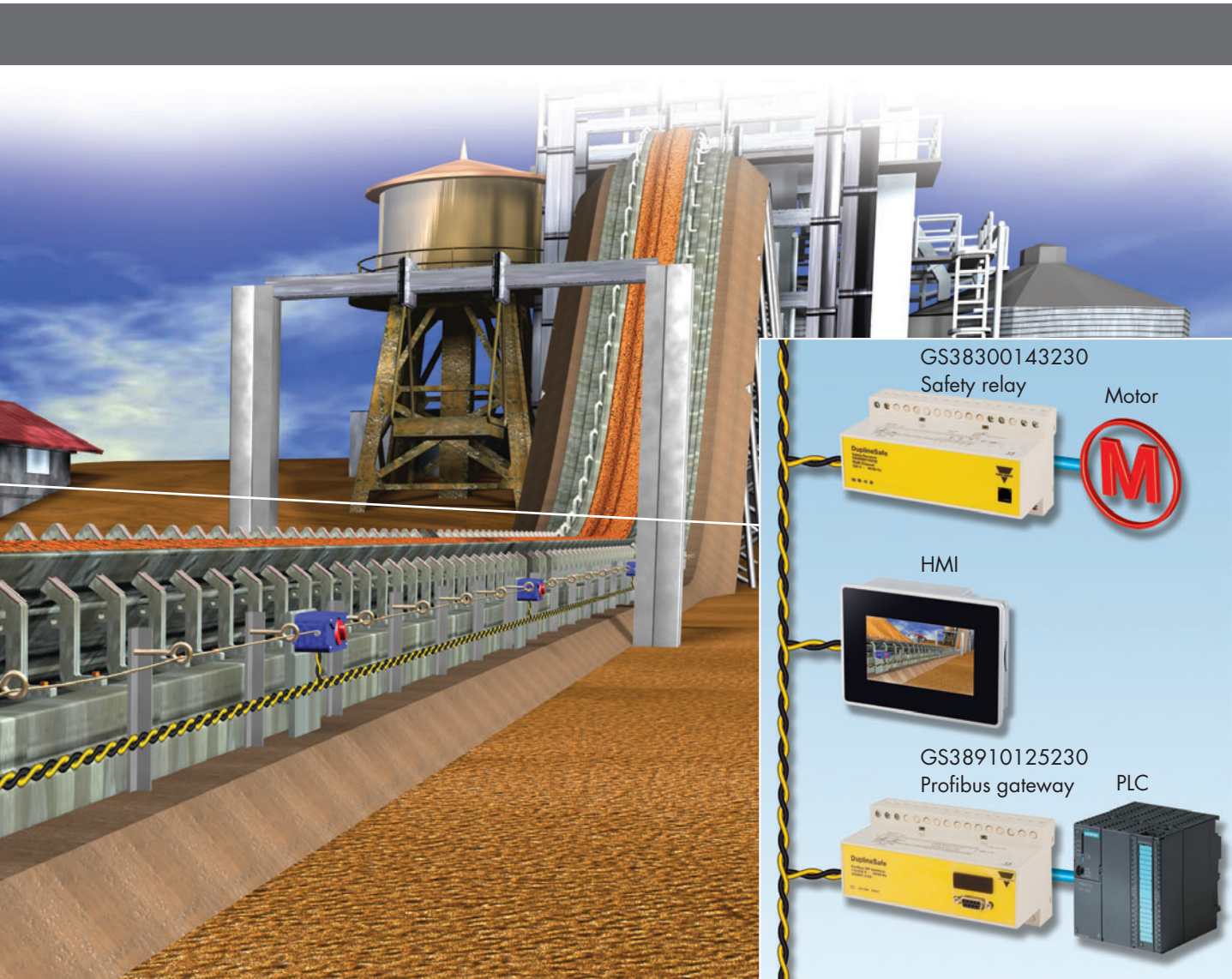


Along bulk material conveyors in mines, tunnels, cement factories etc. there are several emergency stop switches connected to a pull-wire, enabling the workers to stop the belt at any point in case of an emergency situation or a fault on the belt. In order to reduce costly downtime of the belt, it is important that the location and nature of the problem is identified as fast as possible. The traditional wiring solution with serial connection of all the safety switches does not provide this diagnostics, it merely stops the belt. Parallel wiring can provide the diagnostics, but it is a difficult and costly solution, since a 3-5 km conveyor may have more than 50 switches installed. With

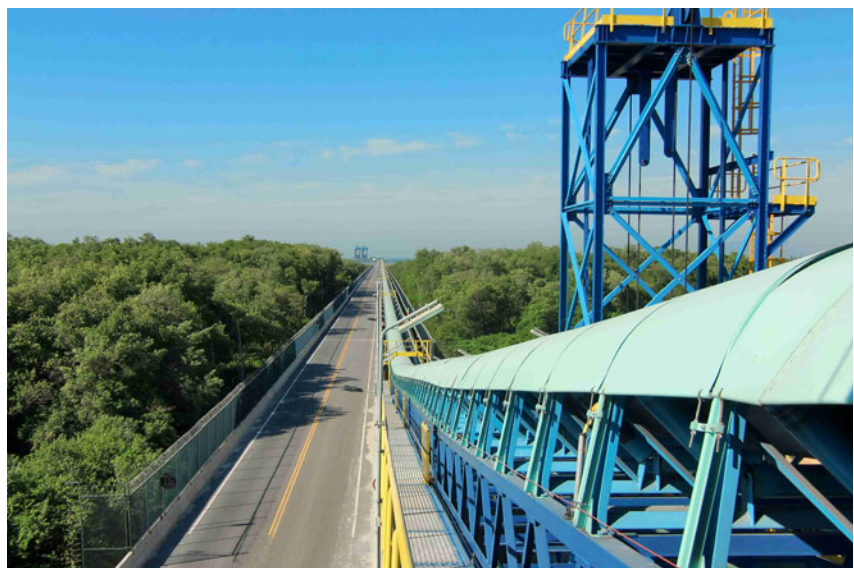
DuplineSafe, however, a simple, flexible and cost-effective solution can be implemented.

A single two-wire bus cable is pulled along the conveyor. At each pull-wire safety switch, a small DuplineSafe input module is connected to the two bus wires and to the NC contact set of the safety switch. The input module continuously transmits the status of the safety switch in a dynamic way using the DuplineSafe address assigned to the module. The power supply for the input module is derived from the two-wire bus, hence no local power supply is required. If the belt needs





to be extended, it is easy to install additional input modules. In the machine room, a DuplineSafe relay output module is continuously monitoring the bus and the status of all the safety switches. If one of the safety switches is activated, or if a bus fault is detected, the output module will deactivate its safety relay and thereby stop the belt. The status of the safety switches can be monitored from an HMI or LED mimic panel, providing fast and precise diagnostics. The signals can also be monitored from a PLC or PC, for example by using the DuplineSafe Profibus-DP Gateway.



**GS38300143230**
**DuplineSafe - Safety relay output module**


- Approved by TÜV Rheinland Group according to IEC/EN 61508-SIL3, IEC/EN 62061-SIL3 and ISO/EN 13849-1 PL e
- Monitors up to 63 safety input modules
- Automatic or manual restart
- Status output for external equipment
- Easy configuration and testing with handheld programming tool
- For mounting on DIN-rail (EN50022)
- 230 VAC power supply
- cULus approved

**GS38910125230**
**DuplineSafe - Profibus-DP gateway**


- Makes DuplineSafe diagnostics available on Profibus-DP
- Profibus-DP slave according to EN50170
- Useful for interfacing to PLCs and PCs
- Several gateways can be connected to the same bus
- For mounting on DIN-rail (EN50022)
- 230 VAC power supply
- cULus approved

**GS75102101**
**DuplineSafe - Input module**


- Approved by TÜV Rheinland Group according to IEC/EN 61508-SIL3, IEC/EN 62061-SIL3 and ISO/EN 13849-1 PL e
- Powered by the bus
- Single input for potential free safety contacts (NC)
- Easy coding and testing with handheld programming tool
- Small dimensions (57,5 x 36,0 x 16,4 mm) for decentralized installation at the actual location of the safety switch
- IP67 rating
- cULus approved

**GS73800080**
**DuplineSafe - Handheld programming and test tool**


- Used for address coding of GS75102101 and configuration of GS38300143230
- Can be connected at any point on the bus to read out status of all safety signals
- Easy-to-use
- Battery-powered

**GSTI 50**
**DuplineSafe - Modbus RS485 gateway**


- Enables monitoring of safety signals from text displays, touchscreens, PLCs and PCs
- Small dimension housing for mounting directly at text display
- Several GSTI50s can be connected to the same bus
- Power supply from bus and text display
- cULus approved

**GS349x0000**
**DuplineSafe - Optical converter**


- DuplineSafe - Optical converter
- Converts DuplineSafe for transmission on optical fibre
- Runs on optical multimode fibre pairs (50/125, 62.5/125)
- ST type connector
- Up to 5 km optical transmission distance with 62.5/125 fibre
- For mounting on DIN-rail (EN50022)
- AC power supply
- cULus approved

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