



## DuplineSafe

# Fieldbus

# Fieldbus DuplineSafe bus

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 significantly reduced.



## Keep up production and make your plant safer

### Immediate and precise diagnostics

The status of the safety switches can e.g. be monitored from 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

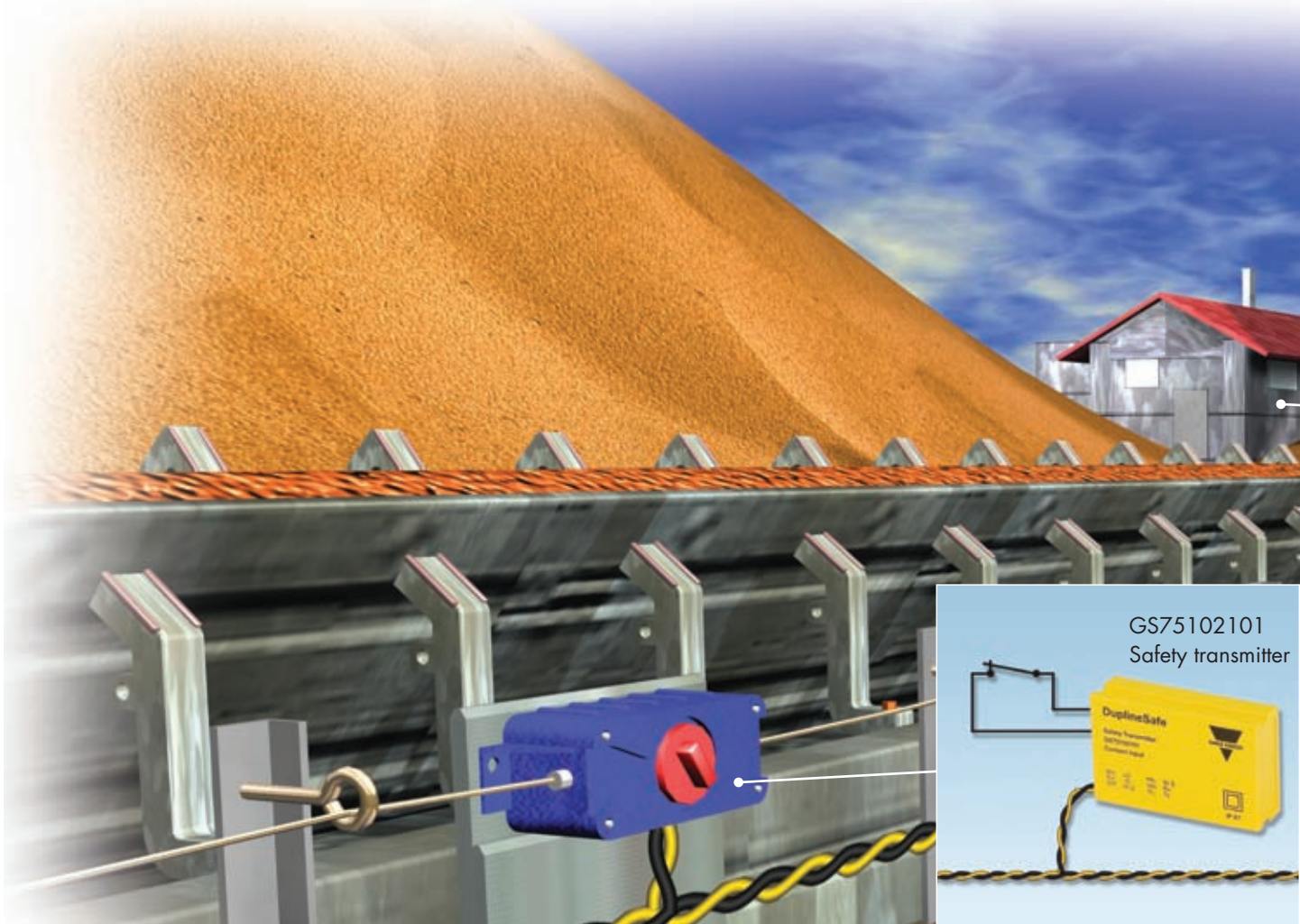
Easy to interlink safety switches from different machines so that any E-stop will activate multiple safety relays.

### 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

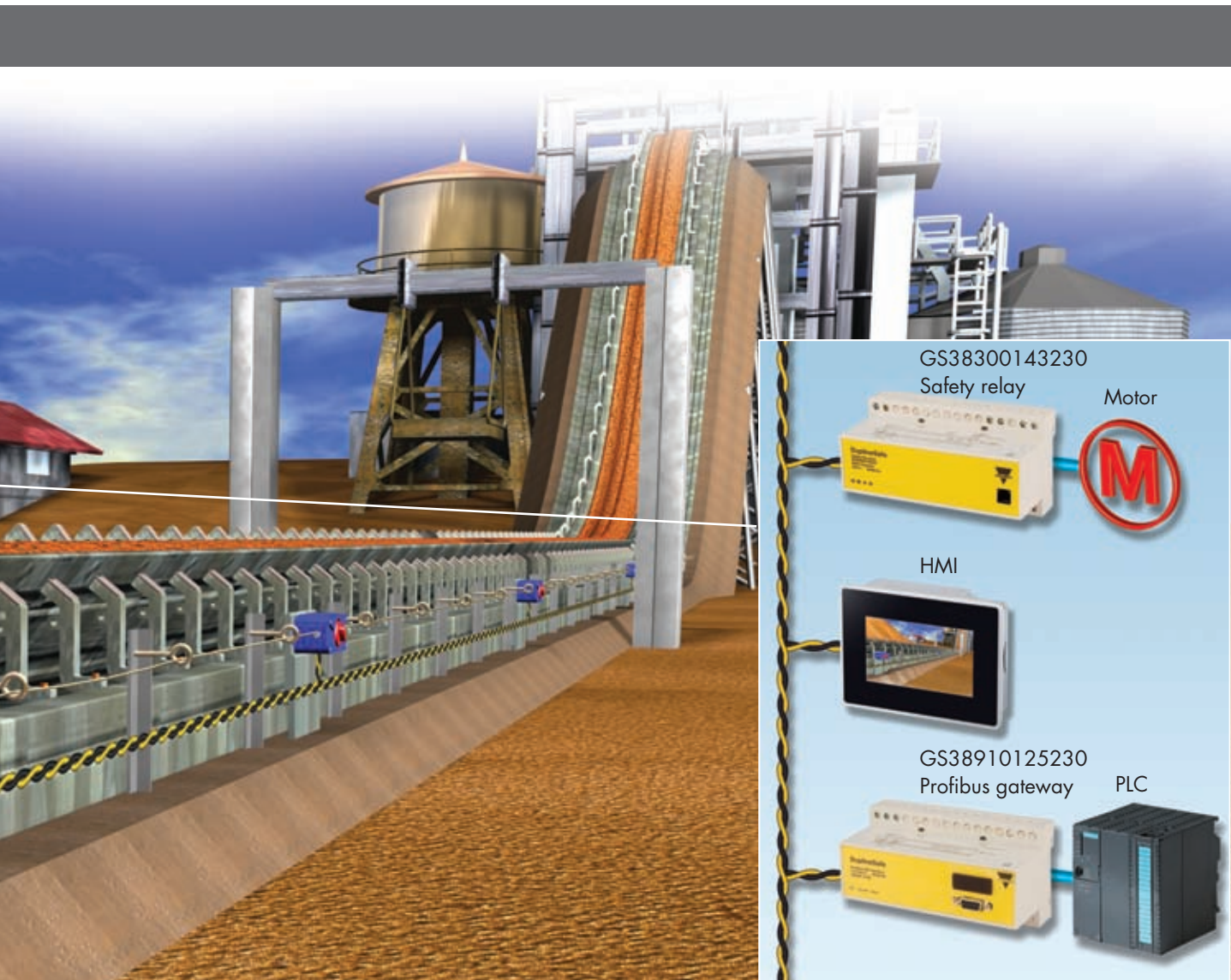


Along bulk material conveyors in mines, tunnels, cement factories etc. there are several emergency stop switches connected to a pull-wire, enabling the workers to stop the belt at any point in case of an emergency situation or a fault on the belt. In order to reduce costly downtime of the belt, it is 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

## OUR SALES NETWORK IN EUROPE

**AUSTRIA** - Carlo Gavazzi GmbH  
Ketzergasse 374, A-1230 Wien  
Tel: +43 1 888 4112  
Fax: +43 1 889 10 53  
office@carlogavazzi.at

**BELGIUM** - Carlo Gavazzi NV/SA  
Mechelsesteenweg 311, B-1800 Vilvoorde  
Tel: +32 2 257 4120  
Fax: +32 2 257 41 25  
sales@carlogavazzi.be

**DENMARK** - Carlo Gavazzi Handel A/S  
Over Hadstenvej 40, DK-8370 Hadsten  
Tel: +45 89 60 6100  
Fax: +45 86 98 15 30  
handel@gavazzi.dk

**FINLAND** - Carlo Gavazzi OY AB  
Petaksentie 2-4, FI-00661 Helsinki  
Tel: +358 9 756 2000  
Fax: +358 9 756 20010  
myynti@gavazzi.fi

**FRANCE** - Carlo Gavazzi Sarl  
Zac de Paris Nord II, 69, rue de la Belle  
Etoile, F-95956 Roissy CDG Cedex  
Tel: +33 1 49 38 98 60  
Fax: +33 1 48 63 27 43  
french.team@carlogavazzi.fr

**GERMANY** - Carlo Gavazzi GmbH  
Pfnorsir. 10-14  
D-64293 Darmstadt  
Tel: +49 6151 81000  
Fax: +49 6151 81 00 40  
info@gavazzi.de

**GREAT BRITAIN** - Carlo Gavazzi UK Ltd  
7 Springlakes Industrial Estate,  
Deadbrook Lane, Hants GU12 4UH,  
GB-Aldershot  
Tel: +44 1 252 339600  
Fax: +44 1 252 326 799  
sales@carlogavazzi.co.uk

**ITALY** - Carlo Gavazzi SpA  
Via Milano 13, I-20020 Lainate  
Tel: +39 02 931 761  
Fax: +39 02 931 763 01  
info@gavazziacbu.it

**NETHERLANDS** - Carlo Gavazzi BV  
Wijkermeerweg 23,  
NL-1948 NT Beverwijk  
Tel: +31 251 22 9345  
Fax: +31 251 22 60 55  
info@carlogavazzi.nl

**NORWAY** - Carlo Gavazzi AS  
Melkeveien 13, N-3919 Porsgrunn  
Tel: +47 35 93 0800  
Fax: +47 35 93 08 01  
post@gavazzi.no

**PORTUGAL** - Carlo Gavazzi Lda  
Rua dos Jerónimos 38-B,  
P-1400-212 Lisboa  
Tel: +351 21 361 7060  
Fax: +351 21 362 13 73  
carlogavazzi@carlogavazzi.pt

**SPAIN** - Carlo Gavazzi SA  
Avda. Iparraguirre, 80-82,  
E-48940 Leioa (Bizkaia)  
Tel: +34 94 480 4037  
Fax: +34 94 480 10 61  
gavazzi@gavazzi.es

**SWEDEN** - Carlo Gavazzi AB  
V:a Kyrkogatan 1,  
S-652 24 Karlstad  
Tel: +46 54 85 1125  
Fax: +46 54 85 11 77  
info@carlogavazzi.se

**SWITZERLAND** - Carlo Gavazzi AG  
Verkauf Schweiz/Vente Suisse  
Sumpfstrasse 32,  
CH-6312 Steinhausen  
Tel: +41 41 747 4535  
Fax: +41 41 740 45 40  
info@carlogavazzi.ch

## OUR SALES NETWORK IN AMERICA

**USA** - Carlo Gavazzi Inc.  
750 Hastings Lane,  
Buffalo Grove, IL 60089, USA  
Tel: +1 847 465 6100  
Fax: +1 847 465 7373  
sales@carlogavazzi.com

**CANADA** - Carlo Gavazzi Inc.  
2660 Meadowvale Boulevard,  
Mississauga, ON L5N 6M6, Canada  
Tel: +1 905 542 0979  
Fax: +1 905 542 22 48  
gavazzi@carlogavazzi.com

**MEXICO** - Carlo Gavazzi Mexico S.A. de C.V.  
Calle La Montaña no. 28, Fracc. Los Pastores  
Naucalpan de Juárez, EDOMEX CP 53340  
Tel & Fax: +52.55.5373.7042  
mexicosales@carlogavazzi.com

**BRAZIL** - Carlo Gavazzi Automação Ltda.  
Avenida Brig. Luís Antônio, 3067  
B. J. Paulista CEP 01401-000 São Paulo  
Tel: +55 11 3052 0832  
Fax: +55 11 3057 1753  
info@carlogavazzi.com.br

## OUR SALES NETWORK IN ASIA AND PACIFIC

**SINGAPORE** - Carlo Gavazzi Automation  
Singapore Pte. Ltd.  
61 Tai Seng Avenue  
#05-06 UE Print Media Hub  
Singapore 534167  
Tel: +65 67 466 990  
Fax: +65 67 461 980  
info@carlogavazzi.com.sg

**MALAYSIA** - Carlo Gavazzi Automation  
(M) SDN. BHD.  
D12-06-G, Block D12,  
Pusat Perdagangan Dana 1,  
Jalan PJU 1A/46, 47301 Petaling Jaya,  
Selangor, Malaysia.  
Tel: +60 3 7842 7299  
Fax: +60 3 7842 7399  
sales@gavazzi-asia.com

**CHINA** - Carlo Gavazzi Automation  
(China) Co. Ltd.  
Unit 2308, 23/F.,  
News Building, Block 1, 1002  
Middle Shennan Zhong Road,  
Shenzhen, China  
Tel: +86 755 83699500  
Fax: +86 755 83699300  
sales@carlogavazzi.cn

**HONG KONG** - Carlo Gavazzi  
Automation Hong Kong Ltd.  
Unit 3 12/F Crown Industrial Bldg.,  
106 How Ming St., Kwun Tong,  
Kowloon, Hong Kong  
Tel: +852 23041228  
Fax: +852 23443689

## OUR COMPETENCE CENTRES AND PRODUCTION SITES

Carlo Gavazzi Industri A/S  
Hadsten - **DENMARK**

Carlo Gavazzi Ltd  
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Kaunas - **LITHUANIA**

Carlo Gavazzi Automation  
(Kunshan) Co., Ltd.  
Kunshan - **CHINA**

## HEADQUARTERS

Carlo Gavazzi Automation SpA  
Via Milano, 13 - I-20020  
Lainate (MI) - **ITALY**  
Tel: +39 02 931 761  
info@gavazziautomation.com



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