Dupline® Profibus-DP Gateway
Type G 3891 0021

- **Built-in Dupline® channel generator**
- **PROFIBUS-DP slave according to EN 50 170**
- **Certified by the PNO**
- **PROFIBUS-DP communication speed of up to 12 MBaud**
- **Read/control 128 Dupline® inputs/outputs through PROFIBUS-DP**
- **Split-I/O mode selectable (128 inputs *and* 128 outputs)**
- **Signals from AnaLink sensors available on the DP-network**
- **For mounting on DIN-rail (EN 50 022)**
- **LED indicators for supply, Dupline® carrier and fault**
- **AC power supply**

Product Description

Dupline® Channel Generator with the function of a PROFIBUS-DP slave. This means that the 128 Dupline® I/O's (incl. AnaLink) can be read/controlled by PROFIBUS-DP masters (PLC's, PC interface cards, etc. from various suppliers).

Several Dupline® gateways can be connected to the same PROFIBUS-DP network. The unit is certified by PNO (Profibus Nutzer Organisation) which ensures compatibility and interoperability with other PNO-certified products.

Ordering Key

G 3891 0021 230

Type: Dupline®
Type no.
Supply

Type Selection

Supply	Ordering no.
115/230 VAC	**G 3891 0021 230**

Input/Output Specifications

PROFIBUS-DP		RS 485
		9-pole female SUB-D
Pin assignment	A	Pin 8
	B	Pin 3
	RTS	Pin 4
	+5V	Pin 6
	GND	Pin 5
Baudrate		Auto detection
Cable length		100 m @ 12 MBaud
		200 m @ 1.5 MBaud
		1200 m @ 93.75 kBaud
Up-date time (128 digital I/O)		Typ. 200 µs at 12 MBaud
		Typ. 1.6 ms at 1.5 MBaud
Dielectric voltage		
PROFIBUS-DP Dupline®		≥ 4 kVAC (rms)
PROFIBUS-DP ID-no.		6590
GSD-file		G38_021.gsd
Dupline		
Output voltage		8.2 V
Output current		≤ 100 mA
Short-circuit protection		Yes
Output impedance		≤ 15 Ω
Sequence time		
8 digital I/O		15.2 ms
128 digital I/O		132.3 ms
AnaLink value update time		
8 signals		3.9 s
128 signals		33.8 s

Adjustments		
2 x 10 pos. rotary switch		PROFIBUS Slave Address Range 02 to 99
1 x 16 pos. rotary switch		No. Dupline® channels 8 .. 128 in steps of 8
DIP-switch 1		Dupline® mode (Normal/Split I/O)
DIP-switch 2		Version selection
DIP-switch 3		Analog protocol
DIP-switch 4		Not used
Approvals		
PROFIBUS operability		PNO (Profibus Nutzer Organisation)
Conformity		
CE		EMC Industrial Environment
LED Functions		
Red		
	On	DP-Comm fail
	Flash	DP- Device switch in non-legal position (0,1 or 2)
	Off	DP comm Ok
Yellow		
	On	Dupline carrier Ok
	Off	Dupline internal Powerfail
	Flashing	Dupline Short
Green		
	ON	Supply is on
	OFF	No voltage on the supply terminals

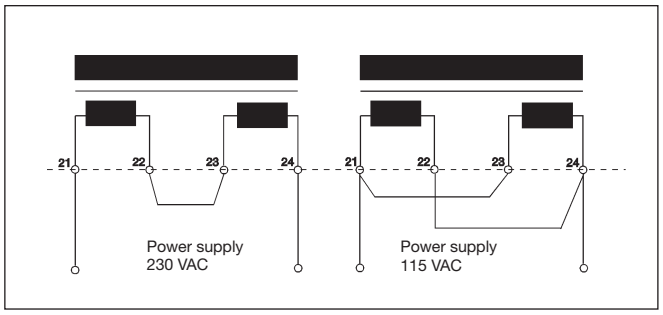
General Specifications

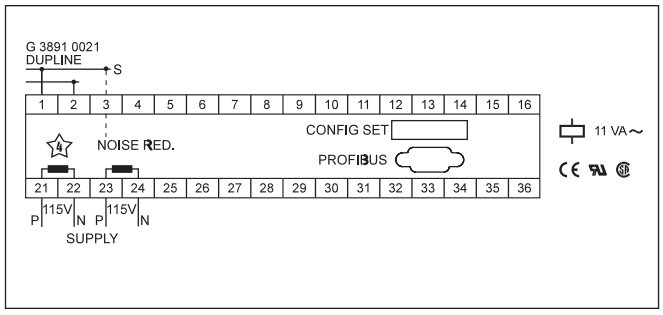
Power ON delay	< 2.5 s until start of Dupline carrier. < 40 s until correct reading of AnaLink values
Environment	
Degree of protection	IP 20
Pollution degree	3 (IEC 60664)
Operating temperature	0° to +50°C (+32° to +122°F)
Storage temperature	-20° to +85°C (-4° to +185°F)
Humidity (non-condensing)	20 to 80% RH
Mechanical resistance	
Shock	15 G (11 ms)
Vibration	2 G (6 to 55 Hz)
Dimensions	
Material	H8-housing
Weight	540 g

Supply Specifications

Power supply	Overvoltage cat. III (IEC 60664)
Rated operational voltage	
through term. 21, 22, 23 & 24	See wiring diagram
230	230 VAC ± 15% (IEC 60038)
115	115 VAC ± 15% (IEC 60038)
Frequency	45 to 65 Hz
Rated operational power	11 VA
Rated impulse withstand voltage 230	4 kV
115	2.5 kV
Dielectric voltage	
Supply - Dupline®	≥ 4 kVAC (rms)
Supply - RS 485	≥ 4 kVAC (rms)

Wiring Diagrams





Mode of Operation

The Dupline® PROFIBUS-DP Gateway is a Dupline channel generator with the function of a PROFIBUS-DP slave according to EN 50 170. This means that the 128 Dupline® I/O's (incl. AnaLink) can be read/ controlled by PROFIBUS-DP masters like PLC's and PC interface-cards from many different suppliers. Several Dupline® gateways can be connected to the same PROFIBUS-DP network and operate together with other PROFIBUS-DP modules like operatorpanels, MMI's, frequency inverters, I/O-modules etc.

The Dupline® PROFIBUS-DP Gateway is approved by the PNO (Profibus Nutzer Organisation) that ensures compatibility with other PNO-certified products.

Configuration Switches
The unit is equipped with the following configuration switches (see also Switch settings):

1 x 16-position rotary-switch for selecting the **Number of Dupline® channels** in the range 8..128 (in steps of 8). The selected letter indicates the last channel group available on Dupline®. If e.g. H is selected, the 64 channels in groups A..H will be available.

2 x 10-position rotary switch for selection of the **PROFIBUS-DP Slave Address** in the range 02..99. (00..01 are reserved). Each module connected to PROFIBUS-DP must have a unique slave address which enables the PROFIBUS-DP Master to access the modules individually.

1 x DIP-switch for selection of **Dupline® Operation Mode.** In "Normal" mode, Dupline® operates as a peer-to-peer system where the channel generator automatically establishes a connection between Dupline®-inputs and Dupline®-outputs which are coded to the same Dupline®-address. If e.g. an input coded for B5 is activated, the output(s) coded for B5 will also be activated.

Consequently, a Dupline®-output can either be activated through the output-data received on PROFIBUS-DP or by an active Dupline® input coded for the same Dupline®-address.
In *"Split I/O"* mode, the

Mode of Operation (cont.)

Dupline-inputs and Dupline®-outputs are treated independently by the channel generator. If e.g. an input coded for B5 is activated, the Gateway will make the information available on PROFIBUS-DP (like in normal mode), but it will not automatically activate the Dupline®-output(s) coded to B5. The Dupline®-outputs are controlled exclusively through the output data received on PROFIBUS-DP.
In this mode, up to 128 Dupline® inputs and 128 Dupline outputs are available, since an input and an output coded to the same Dupline®-address can operate independently.

1 x DIP-switch for selection of Analog Protocol to either AnaLink (8-bit format) or multiplex (16-bit format). The Gateway will only transfer analog values from modules using the selected protocol. If multiplex is selected, the Gateway will automatically perform the required multiplexing on channels A1-A4. Because of this, these 4 channels are not available as outputs when the multiplex protocol is selected.

1 x DIP-switch for version selection
Normally, the version selection is supposed to be in the OFF position, especially when the Gateway is used in new installations and configured with the G38_21.GSD file.
In replacements or expansion of existing installations, this switch may be switched on, in order to make set the Gateway to operate towards the previous GSD version. (Mod-6590.GSD)

Dupline® Input Data
To ease up, the **Profibus Master configuration**, the **G38_021.gsd** file is to be used. This file describes to the Master which I/O data the gateway supports.
All I/O data are selectable through so called modules, each described with its particular function.
Digital Input, Digital output, Analog input and Analog Output. Through this, the individual configuration of the Gateway is quite simplified, as the user only has to select which I/O modules to use. The supported modules may be selected in any order and any combination.

The G38910021 gateway supports one Digital input module, and One Digital output module, corresponding to the 128 channels of input and output data. Furthermore, 56 Multiplexed analog inputs and 56 analog outputs are supported as well, and this is done through additional 7 analog Input modules named "AIn (Mux:CD,0-7/Alink:AB)", "AIn (Mux:CD,8-F/Alink:CD)" ... "AIn (Mux:IJ,0-7/Alink:MN)" and 7 analog output modules named "Aout (Mux:CD,0-7)", "Aout (Mux:CD,8-F)" ... "Aout (Mux:IJ,0-7)".

All modules consist of 16 bytes of data, and the tables below describe the content and the relations to the Dupline data.

If the Dupline® signal is short-circuited, the gateway will set the input status of all channels to OFF, and issue a Diagnostics information to the Profibus master.

Byte *0.. 0Fh* Digital input module

Byte address	Dupline Group	Bit	Channel Number
0	A	7	A1
0	A	6	A2
0	A	5	A3
0	.	.	.
0	A	0	A8
1	B	7	B1
2	C	6	C2
.	.	.	.
E	O	1	O7
F	P	0	P8

Byte *0.. 0Fh* Digital output module

Byte address	Dupline Group	Bit	Channel Number
0	A	7	A1
0	A	6	A2
0	A	5	A3
0	.	.	.
0	A	0	A8
1	B	7	B1
2	C	6	C2
.	.	.	.
E	O	1	O7
F	P	0	P8

Byte *0.. 0Fh* Analog input module, multiplexed

Byte address	Dupline Groups	multiplex address
0,1 (Hi,Lo)	CD	0
2,3	CD	1
4,5	CD	2
6,7	.	.
A,B	.	.
C,D	CD	6
E,F	CD	7

The multiplexed analog values are represented as 16-bit "sign and magnitude" (2 Bytes: Hi,Lo)
The most significant bit defines the sign (0:+, 1:-) while the remaining 15 bits define the magnitude (0..32768).

Byte *0.. 0Fh* Analog input module, AnaLink selected

Byte address	Dupline Groups
0	A1
1	A2
2	A3
.	.
.	.
E	B7
F	C8

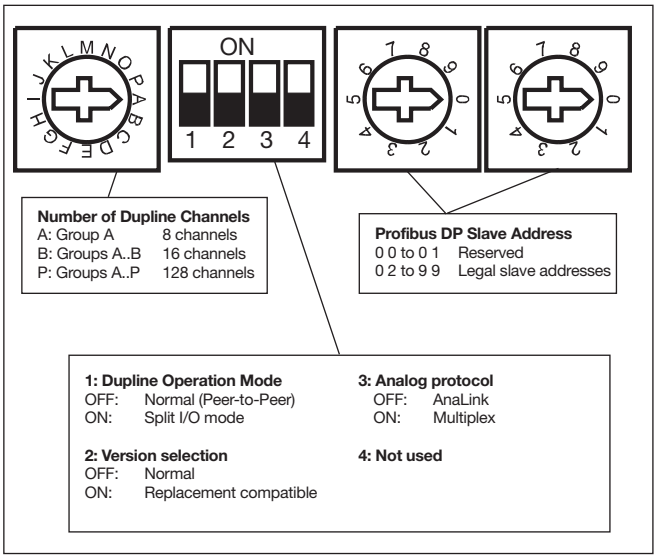
The AnaLink analog values are represented as 8 bit binary value ranging from 0 to 255.

Byte 0.. 0Fh Analog Output module, multiplexed selected

Byte address	Dupline Groups	lultiplex address
0,1 (Hi,Lo)	CD,EF - - OP	0 or 8
2,3	CD,EF - - OP	1 or 9
4,5	CD,EF - - OP	2 or A
6,7	.	.
A,B	.	.
C,D	CD,EF - - OP	6 or E
E,F	CD,EF - - OP	7 or F

The multiplexed analog values are represented as 16-bit "sign and magnitude" (2 Bytes: Hi,Lo)
The most significant bit defines the sign (0:+, 1:-) while the remaining 15 bits define the magnitude (0..32768).

Switch Settings



Pin Assignment

Pin	Signal
3	B
4	RTS
5	GND
6	+5 V
8	A

Dimensions (mm)

H8-housing