

Dupline® Profibus-DP Gateway Type G 3891 0020



- 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 sup-

pliers). 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 0020 230

Type: Dupline®
Type no.
Supply

Type Selection

Supply

Ordering no.

115/230 VAC

G 3891 0020 230

Input/Output Specifications

PROFIBUS-DP

Pin assignment

A
B
RTS
+5V
GND

Baudrate
Cable length

Up-date time (128 digital I/O)

Dielectric voltage
PROFIBUS-DP Dupline®
PROFIBUS-DP ID-no.
GSD-file

Dupline

Output voltage
Output current
Short-circuit protection Yes
Output impedance
Sequence time
8 digital I/O
128 digital I/O
AnaLink value update time
8 signals
128 signals

RS 485
9-pole female SUB-D
Pin 8
Pin 3
Pin 4
Pin 6
Pin 5
Auto detection
100 m @ 12 MBaud
200 m @ 1.5 MBaud
1200 m @ 93.75 kBaud
Typ. 200 µs at 12 MBaud
Typ. 1.6 ms at 1.5 MBaud

≥ 4 kVAC (rms)
6590
GDUP6590.GSD

8.2 V
≤ 100 mA
≤ 15 Ω
15.2 ms
132.3 ms

3.9 s
33.8 s

Adjustments

2 x 10 pos. rotary switch
1 x 16 pos. rotary switchNo.
DIP-switch 1
DIP-switch 2
DIP-switch 3
DIP-switch 4

Approvals

PROFIBUS operability

Conformity

CE

PROFIBUS Slave Address
Range 02 to 99
Dupline® channels
8 .. 128 in steps of 8
Dupline® mode (Normal/Split I/O)
Dupline® data transfer mode
Analog protocol
Not used

PNO
(Profibus Nutzer Organisation)

EMC Industrial Environment

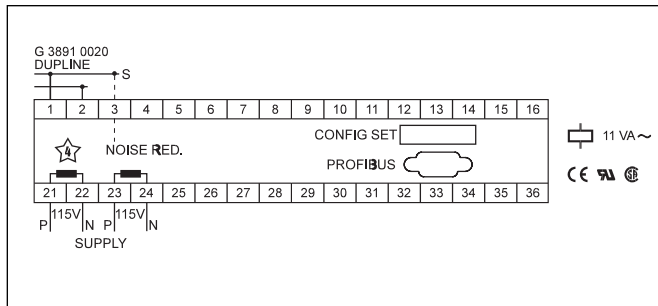
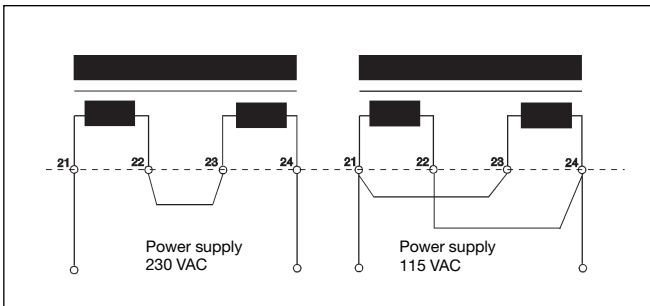
General Specifications

Power ON delay	< 2.5 s until start of Dupline carrier. < 40 s until correct reading of AnaLink values
Indication for	
Supply ON	LED, green
Dupline® carrier	LED, yellow
Fault	LED, red
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	4 kV
230	2.5 kV
115	
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 compati-

bility 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 con-

nected 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 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

Mode of Operation (cont.)

to the same Dupline®-address can operate independently.

1 x DIP-switch for selection of **Dupline® Data Transfer Mode**. If "Sequence-wise" is selected, the transfer of data between Dupline® and PROFIBUS-DP only takes place inbetween Dupline® I/O scan-sequences. This means that the Dupline® I/O-data transmitted on PROFIBUS-DP will always originate from the same I/O scan-sequence. This mode must be selected if bit-combinations representing e.g. analog values are transmitted on Dupline®. If "Bit-wise" is selected, then the transfer of data between Dupline® and PROFIBUS-DP takes place continuously on-line with the Dupline® I/O scan-sequences. In this way, the data-transfer speed between Dupline® and PROFIBUS-DP is optimized. The "Bit-wise" mode should be selected if no bit-combinations representing analog values are transmitted on Dupline®.

Note: It is allowed to use AnaLink sensors/transmitters

in "Bit-wise" mode, since the AnaLink values are not transmitted as bit-combinations.

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.

Dupline® Input Data

A part of the Gateway input-processor reads all the 128 Dupline®-channels as digital inputs (16 bytes) and another part reads all the 128 Dupline®-channels as analog inputs. If the AnaLink analog protocol is selected, 128 analog input-bytes will be available, since it takes one byte to represent one AnaLink value. If the multiplex analog protocol is selected, 224 analog input-bytes will be

available, since it takes two bytes to represent one of the up to 112 multiplex values.

All digital and analog inputs can be transmitted on PROFIBUS-DP. Since the user knows which channels are used as digital and which channels are used as analog, he also knows where to find the meaningful data on PROFIBUS-DP. If e.g. an AnaLink temperature sensor is coded for channel B5, the temperature value must be read in the AnaLink data-area. The status of channel B5 can also be read in the digital data-area, but the data will not be meaningful.

A part of the PROFIBUS-DP **Master configuration** is to define how many input-bytes the Master shall receive from each slave-module in the system. If e.g. no analog transmitters are connected to a Gateway, it can be defined that only the 16 bytes containing digital data shall be transmitted. In this way, the transmission of the analog input-bytes without meaningful information is avoided.

In the first table below, it is defined how to read the digital status of the individual Dupline®-channels on PROFIBUS-DP. The digital input-data are always transmitted as the first 16 bytes (byte-addresses 0..F). The number of analog input-bytes depends on the selected protocol (AnaLink: 128 bytes, multiplex: 224 bytes), but they are always located from byte-address 10_h and upwards. The AnaLink values are represented as simple 8-bit values with 0 corresponding to the lowest value and FF_h corresponding to the highest value. The multiplex values are represented as 16-bit "sign and magnitude"-values. The most significant bit defines the sign (0:+, 1:-) while the remaining 15 bits defines the magnitude (0..32768).

The second and third table below define how to read the analog Dupline® values on PROFIBUS-DP when respectively AnaLink or multiplex protocol is selected.

Byte 0.. 0F_h Digital input data

Byte address	Dupline Group	Bit	Channel Number
0	A	7	A1
1	B	6	B2
2	C	5	C3
3	D	4	D4
4	E	3	E5
•	•	•	•
•	•	•	•
D	N	2	N6
E	O	1	O7
F	P	0	P8

Byte 10.. 8F_h Analog input data, AnaLink selected

Byte address	Channel Numbers
10.. 17	A1.. A8
18.. 1F	B1.. B8
20.. 27	C1.. C8
28.. 2F	D1.. D8
30.. 37	E1.. E8
•	•
•	•
78.. 7F	N1.. N8
80.. 87	O1.. O8
88.. 8F	P1.. P8

Byte 10.. EF_h Analog input data, multiplex selected

Byte address	Channel Numbers	Multiplex address
10.. 11	C.. D	0
12.. 13	C.. D	1
•	•	•
2C.. 2D	C.. D	E
2E.. 2F	C.. D	F
30.. 31	E.. F	0
•	•	•
4E.. 4F	E.. F	F
•	•	•
EE.. EF	O.. P	F

Mode of Operation (cont.)

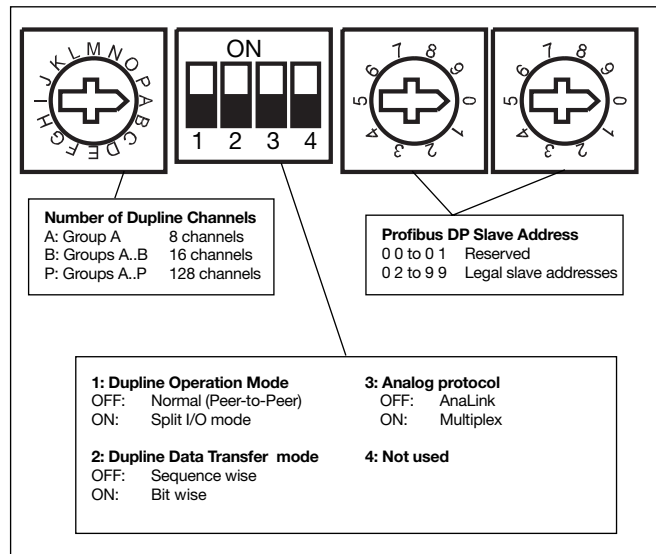
Dupline output data

The digital outputs of the Dupline channels can be controlled through 16 PROFIBUS-DP output-bytes. In the table below, it is defined how to control the digital status of the individual Dupline channels.

Byte 0.. F_n Digital output data

Byte address	Dupline Group	Bit	Channel Number
0	A	7	A1
1	B	6	B2
2	C	5	C3
3	D	4	D4
4	E	3	E5
•	•	•	•
•	•	•	•
D	N	2	N6
E	O	1	O7
F	P	0	P8

Switch Settings



Pin Assignment

