Analog signal converters, Serial data converters
Product group picture

Analog signal converters, Serial data converters
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Analog signal converters, serial data converters

Analog signal converters, Serial data converters
Overview

Applications for analog signal processing and correct solution using CC-E and CC-U converters

Nearly every process includes a control system that receives data by means of analog signals and then evaluates the data and sets the respective parameters correspondingly.
When transmitting analog signals numerous problems may arise which can disturb or even block an ideal behavior of the process.
Below we have listed some processing problems together with the respective solutions to solve these problems:

Signal conversion

Sometimes the available signals cannot be processed by the controller or the actuator. In this case, signal converters are required to convert the input signal (or different input signals) to the desired output signal.

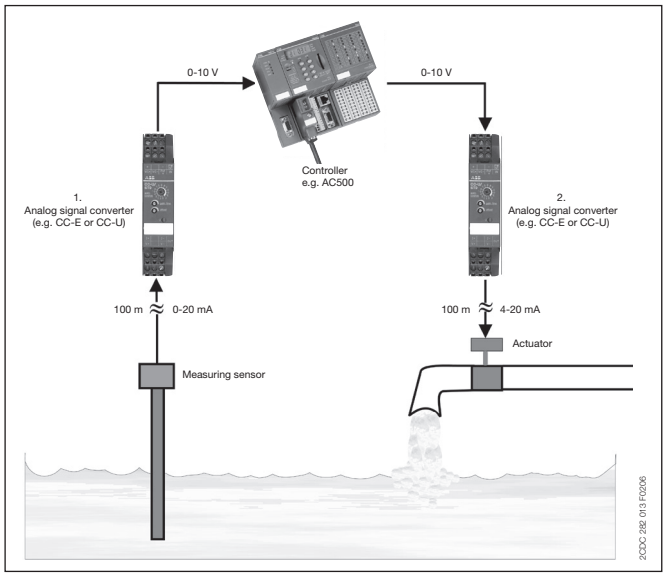
Signal amplification

If long lines or high burdens have to be operated, it may be necessary to amplify the signal. CC analog signal converters require only low input power and provide high output power. Thus, there are no restrictions for the converter's position on the line, i.e. it can be used

– for signal refreshing (1) at the end of the line (low input power)
– or for signal amplification (2) at the beginning of the line (high output power).

Signal filtering

Particularly on long lines or in rough industrial environments the signals are exposed to high electromagnetic interferences. The frequency of the coupled interference signals may be in the range of the common mains frequency (50 Hz) or even much higher (in case of frequency converters). According to the specific requirements, analog signal converters are available which provide reliable suppression of those interferences by means of an input low-pass filter.



Signal separation

– Protection against overvoltage
The increased use of micro-electronics make controls much more sensitive against overvoltages, resulting from lightning discharges or switching processes. Suppression diodes are incorporated in the input of the CC analog signal converters which enable the converters to arrest overvoltages with low energy level (resulting from switching processes) by themselves. The products furthermore provide electrical isolation between input, output and supply circuit for protection of the controller connected to the output.

– Protection against ground loops
If components are used which refer to ground, the measuring signals can be falsified by a so-called ground loop. In this case, certain parts of the signal are transmitted via earth and not via the analog transmission line, thus causing incorrect evaluation of the signal. The electrical isolation between the input and the output disconnects these ground loops and thus enables correct signal transmission.

■ existing
▲ existing for some devices
▫ pending

Approvals		CC-E/STD	CC-E I/I	CC-U/STD	CC-U/STDR	CC-E/RTD	CC-U/RTD	CC-U/RTDR	CC-E/TC	CC-U/TC	CC-U/TCR	CC-E/I	CC-E I_{AC}/ILPO	CC-U/I	CC-U/V
	UL 508, CAN/CSA C22.2 No.14	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	UL 1604 (Class I, Div 2, hazardous locations), CAN/CSA C22.2 No.213	▲		■		▲	■		▲	■		▲		■	■
	CB scheme				■			■			■				
	CCC				■			■			■				
Marks															
CE	CE	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	C-Tick	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Analog signal converters, Serial data converters
Overview

In the field of industrial data transmission, various processes of data transmission and interfaces are used today. Already existing systems need to be updated or connected to new devices for continuity of process. When new communication functions are not build-in, ABB propose a range of converters to be able to use from the standard RS232 or RS485, to the Ethernet open products or the Optical Fiber.
Ethernet communication is now one of the main features need in open communication, ABB propose the e-ILPH to connect the serial devices to the web world.

Uses

Adaptation
The use of converters allows the connection of two devices using different interfaces. To add new equipment to existing installations.

Electrical Isolation
To protect sensitive equipment it is sometimes necessary to use converters which allow electrical isolation.

To cross a disturbed environment
Some interfaces are more sensitive to noise. Electrically, it is preferable, in some cases, to change the interface or support.

Type of connection	Immunity to noise
RS232	Low
RS422	High
RS485	High
CL	High
OF	Very high
Ethernet	High

Multipoint connections
Some equipments are only designed to communicate in RS232 point to point connection. To communicate with several devices it is then necessary to use converters RS232 to RS422, RS485, CL or OF to reach multipoint mode.

Type of connection	Connection
RS232	Point to point
RS422	12 points
RS485	32 points
CL	5-6 points
OF	32 points
Ethernet	Point to point or multipoint

Increase in the transmission and amplification distances of the signals
Every connection has its own limits, to increase the communication distances you only have to change the type of link (converter) or amplify the signal (Repeater) using an ILPH.

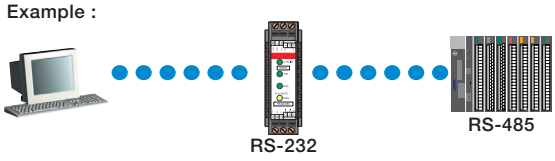
Type of connection	Max. distances [1]
RS232	15 m
RS422	1.2km
RS485	1.2km
CL	300-500m
OF	4 km
Ethernet	100 m with CAT5 cable

[1] Depending on transmission speed

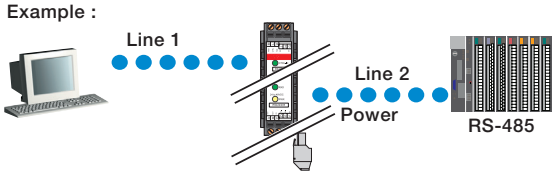
"World Wide" communication
Communication is more and more used with Ethernet support. The interests are to have a distant access, to use an already existing network and to upload information and data on a supervisor or a computer. The conversions from serial to Ethernet protocol are used to connect local network to Ethernet.

Protocol conversion
Modbus is one of the main protocols used in the industrial networks. The creation of Modbus/TCP allows an adapted access to the Ethernet network. So, the conversion between these 2 protocols is necessary.

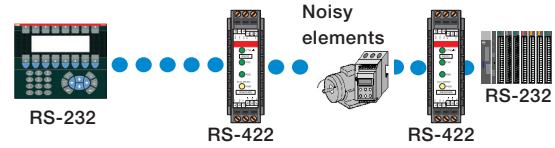
Example :



Example :



Example :



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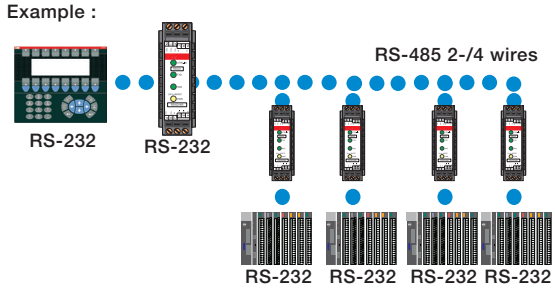
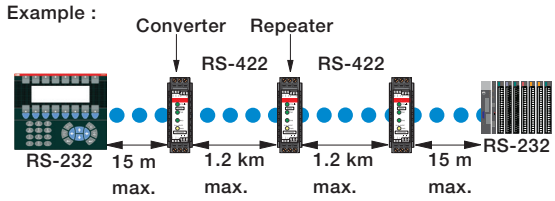


Example :



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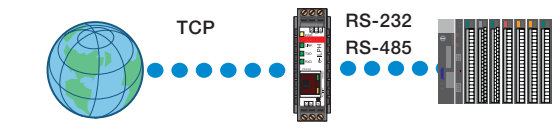
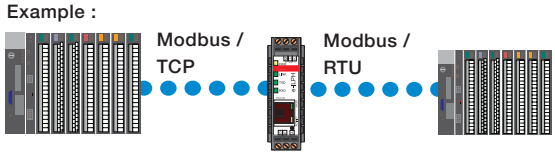


Example :



Analog signal converters - CC-E range
Product group picture

Analog signal converters - CC-E range
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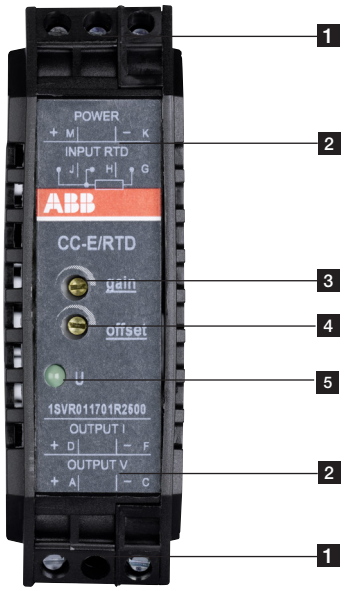
Analog signal converters - CC-E range

Analog signal converters - CC-E range
Benefits and advantages



1 **Terminals M, K, J, H, G**
2 **Terminal explanation**
3 **Adjustment of gain**
4 **Adjustment of offset**
5 **Indication of operational states**
U - control supply voltage applied

CC-E range
- Universally configurable devices and single-function devices
- Adjustment and operating elements on the front side
- Safe operation by electrical 3-way isolation
- Unambiguous and clear connecting terminal markings

Conversion, measurement and separation of
- Standard signals (0-5 V, 0-10 V, 0-20 mA, 4-20 mA)
- Temperature signals of RTD sensors (PT 100)
- Thermocouple signals (types J and K)
- Current measurement signals (0-5 A, 0-20 A AC/DC)

Characteristics of single-function devices
- No adjustment or balancing necessary.

Characteristics of universal devices
- The required input and output ranges can be configured by means of directly accessible DIP switches positioned on the side
- Gain adjustment of ±5 % by means of an adjustment potentiometer on the front-side
- Offset adjustment of ±5 % by means of adjustment potentiometers on the front-side

CC-E/STD analog signal converter with 3-way electrical isolation
- 2 universally configurable devices (type CC-E/STD)
- 2x10 single-function devices
- "Plug and Work", no adjustment of single-function devices required

CC-E/RTD temperature signal converter for RTD sensors, linearized with 3-way electrical isolation
- 2 universally configurable devices (type CC-E/RTD)
- 2x12 single-function devices
- Plug and Work", no adjustment of single-function devices required
- Temperature signal converter for PT100 sensors
- 2- or 3-wire connection

CC-E/TC analog signal converter for thermocouple signals of the types J and K with 3-way electrical isolation
- 2 universally configurable devices (type CC-E/TC)
- 2x6 single-function devices
- "Plug and Work", no adjustment of single-function devices required
- Integrated cold-junction compensation

CC-E/I measuring converter for current signals 0-5 A, 0-20 A, AC/DC with 3-way electrical isolation
- 2 universally configurable devices (type CC-E/I)
- 2x6 single-function devices
- "Plug and Work", no adjustment of single-function devices required

CC-E I_{AC}/ILPO measuring converter without auxiliary power for sinusoidal currents 0-1 A, 0-5 A, output 4-20 mA
- Measuring converter for sinusoidal currents (0-1 A, 0-5 A)
- Measuring range selection by front-face sliding switch
- 4-20 mA output current in proportion to input current
- no additional power supply required

Loop-powered current/current isolator without external power supply for analog current signals of 0-20 mA and 4-20 mA
- Electrical isolation between input and output
- Very low internal voltage drop ≤ 2.5 V
- Available with one or two independent channels
- Width only 18 mm (1 and 2 channels)

Analog signal converters - CC-E range
Ordering details - Standard signal converters

CC-E/I

CC-E V/V

CC-E I/I-2

Ordering details - Standard signal converters

Supply voltage range	Input signal	Output signal	Type	Order code	Price 1 pce	Weight (1 pce) kg (lb)
24 V DC	0-5 V, 0-10 V, 0-20 mA, 4-20 mA	0-5 V, 0-10 V, 0-20 mA, 4-20 mA	CC-E/STD[1]	1SVR011700R0000		0.088 (0.194)
	0-10 V	0-10 V	CC-E V/V	1SVR011710R2100		0.083 (0.183)
		0-20 mA	CC-E V/I	1SVR011711R1600		0.084 (0.185)
		4-20 mA	CC-E V/I	1SVR011712R1700		0.084 (0.187)
	0-20 mA	0-10 V	CC-E I/V	1SVR011713R1000		0.082 (0.181)
		0-20 mA	CC-E I/I	1SVR011714R1100		0.084 (0.187)
		4-20 mA	CC-E I/I	1SVR011715R1200		0.084 (0.185)
	4-20 mA	0-10 V	CC-E I/V	1SVR011716R1300		0.084 (0.185)
		0-20 mA	CC-E I/I	1SVR011717R1400		
		4-20 mA	CC-E I/I	1SVR011718R2500		0.084 (0.187)
	-10...+10 V	-10...+10 V	CC-E V/V	1SVR011719R2600		0.082 (0.181)
110-240 V AC	0-5 V, 0-10 V, 0-20 mA, 4-20 mA	0-5 V, 0-10 V, 0-20 mA, 4-20 mA	CC-E/STD	1SVR011705R2100		0.090 (0.198)
	0-10 V	0-10 V	CC-E V/V	1SVR011720R2300		0.096 (0.212)
		0-20 mA	CC-E V/I	1SVR011721R1000		0.087 (0.192)
		4-20 mA	CC-E V/I	1SVR011722R1100		0.091 (0.200)
	0-20 mA	0-10 V	CC-E V/V	1SVR011723R1200		0.091 (0.200)
		0-20 mA	CC-E I/I	1SVR011724R1300		0.088 (0.194)
		4-20 mA	CC-E I/I	1SVR011725R1400		
	4-20 mA	0-10 V	CC-E V/V	1SVR011726R1500		0.096 (0.212)
		0-20 mA	CC-E I/I	1SVR011727R1600		0.087 (0.192)
		4-20 mA	CC-E I/I	1SVR011728R2700		0.088 (0.194)
loop powered	-10...+10 V	-10...+10 V	CC-E V/V	1SVR011729R2000		0.086 (0.190)
	0-20 mA, 4-20 mA	0-20 mA, 4-20 mA	CC-E I/I-1[2]	1SVR010200R1600		0.038 (0.084)
			CC-E I/I-2[2]	1SVR010201R0300		0.044 (0.097)

[1] UL 1604 Class I, Div.2 (universal device)
[2] CC-E-I/I-1 has 1 channel, CC-E-I/I-2 has 2 channels

Analog signal converters - CC-E range
Ordering details - RTD converters

CC-E/RTD

4

Ordering details - RTD converters

Supply voltage range	Input signal	Output signal	Type	Order code	Price 1 pce	Weight (1 pce) kg (lb)
24 V DC	refer to table	0-10 V, 0-20 mA, 4-20 mA	CC-E/RTD[1)]	1SVR011701R2500		0.091 (0.200)
	PT100 0...100 °C	0-10 V	CC-E RTD/V	1SVR011730R2500		0.084 (0.185)
		0-20 mA	CC-E RTD/I	1SVR011731R1200		0.086 (0.190)
		4-20 mA	CC-E RTD/I	1SVR011732R1300		
	PT100 -50...+50 °C	0-10 V	CC-E RTD/V	1SVR011733R1400		0.083 (0.183)
		0-20 mA	CC-E RTD/I	1SVR011734R1500		0.084 (0.185)
		4-20 mA	CC-E RTD/I	1SVR011735R1600		0.084 (0.187)
	PT100 0...300 °C	0-10 V	CC-E RTD/V	1SVR011736R1700		0.084 (0.185)
		0-20 mA	CC-E RTD/I	1SVR011737R1000		0.084 (0.187)
		4-20 mA	CC-E RTD/I	1SVR011738R2100		0.101
	PT100 -50...+250 °C	0-10 V	CC-E RTD/V	1SVR011739R2200		0.084 (0.185)
		0-20 mA	CC-E RTD/I	1SVR011740R0700		0.084 (0.187)
		4-20 mA	CC-E RTD/I	1SVR011741R2400		
110-240 V AC	refer to table	0-10 V, 0-20 mA, 4-20 mA	CC-E/RTD	1SVR011706R2200		0.093 (0.205)
	PT100 0...100 °C	0-10 V	CC-E RTD/V	1SVR011788R2400		0.086 (0.190)
		0-20 mA	CC-E RTD/I	1SVR011789R2500		0.088 (0.194)
		4-20 mA	CC-E RTD/I	1SVR011790R2200		0.089 (0.196)
	PT100 -50...+50 °C	0-10 V	CC-E RTD/V	1SVR011791R1700		0.087 (0.192)
		0-20 mA	CC-E RTD/I	1SVR011792R1000		0.089 (0.196)
		4-20 mA	CC-E RTD/I	1SVR011793R1100		
	PT100 0...300 °C	0-10 V	CC-E RTD/V	1SVR011794R1200		0.087 (0.192)
		0-20 mA	CC-E RTD/I	1SVR011795R1300		0.089 (0.196)
		4-20 mA	CC-E RTD/I	1SVR011796R1400		
	PT100 -50...+250 °C	0-10 V	CC-E RTD/V	1SVR011797R1500		0.086 (0.190)
		0-20 mA	CC-E RTD/I	1SVR011798R2600		0.089 (0.196)
		4-20 mA	CC-E RTD/I	1SVR011799R2700		0.088 (0.194)

[1)] B 1604 Class I, Div.2 (universal device)

Analog signal converters - CC-E range
Ordering details - Thermocouple converters

CC-E TC

Ordering details - Thermocouple Converters

Supply voltage range	Input signal	Output signal	Type	Order code	Price 1 pce	Weight (1 pce) kg (lb)
24 V DC	thermocouple types J and K	0-10 V, 0-20 mA, 4-20 mA	CC-E/TC[1)]	1SVR011702R2600		0.089 (0.196)
	type J 0...600 °C	0-10 V	CC-E TC/V	1SVR011750R0100		0.087 (0.192)
		0-20 mA	CC-E TC/I	1SVR011751R2600		0.084 (0.187)
		4-20 mA	CC-E TC/I	1SVR011752R2700		0.102
	type K 0...1000 °C	0-10 V	CC-E TC/V	1SVR011753R2000		0.084 (0.185)
		0-20 mA	CC-E TC/I	1SVR011754R2100		
		4-20 mA	CC-E TC/I	1SVR011755R2200		0.086 (0.190)
110-240 V AC	thermocouple types J and K	0-10 V, 0-20 mA, 4-20 mA	CC-E/TC	1SVR011707R2300		0.088 (0.194)
	type J 0...600 °C	0-10 V	CC-E TC/V	1SVR011760R0300		0.084 (0.187)
		0-20 mA	CC-E TC/I	1SVR011761R2000		0.088 (0.194)
		4-20 mA	CC-E TC/I	1SVR011762R2100		0.1 (0.220)
	type K 0...1000 °C	0-10 V	CC-E TC/V	1SVR011763R2200		0.086 (0.190)
		0-20 mA	CC-E TC/I	1SVR011764R2300		0.088 (0.194)
		4-20 mA	CC-E TC/I	1SVR011765R2400		0.086 (0.190)

[1)] B 1604 Class I, Div.2 (universal device)

Analog signal converters - CC-E range
Ordering details - Measuring converters

CC-E IAC/ILPO

4

Ordering details - Measuring Converters

Supply voltage range	Input signal	Output signal	Type	Order code	Price 1 pce	Weight (1 pce) kg (lb)
24 V DC	0-5 A, 0-20 A, AC/DC	0-10 V, 0-20 mA, 4-20 mA	CC-E/I[1]	1SVR011703R2700		0.096 (0.212)
	0-5 A, 0-20 A, AC	0-10 V	CC-E I_{AC}/V	1SVR011770R0500		0.090 (0.198)
		0-20 mA	CC-E I_{AC}/I	1SVR011771R2200		0.092 (0.203)
		4-20 mA	CC-E I_{AC}/I	1SVR011772R2300		
	0-5 A, 0-20 A, DC	0-10 V	CC-E I_{DC}/V	1SVR011773R2400		0.092 (0.207)
		0-20 mA	CC-E I_{DC}/I	1SVR011774R2500		0.091 (0.200)
		4-20 mA	CC-E I_{DC}/I	1SVR011775R2600		0.093 (0.205)
110-240 V AC	0-5 A, 0-20 A, AC/DC	0-10 V, 0-20 mA, 4-20 mA	CC-E/I	1SVR011708R0400		0.099 (0.218)
	0-5 A, 0-20 A, AC	0-10 V	CC-E I_{AC}/V	1SVR011780R1100		0.092 (0.203)
		0-20 mA	CC-E I_{AC}/I	1SVR011781R0600		0.092 (0.207)
		4-20 mA	CC-E I_{AC}/I	1SVR011782R0700		0.095 (0.209)
	0-5 A, 0-20 A, DC	0-10 V	CC-E I_{DC}/V	1SVR011783R0000		0.093 (0.205)
		0-20 mA	CC-E I_{DC}/I	1SVR011784R0100		0.095 (0.209)
		4-20 mA	CC-E I_{DC}/I	1SVR011785R1100		
loop powered	0-1 A, 0-5 A, AC	4-20 mA	CC-E I_{AC}/ILPO[2]	1SVR010203R0500		0.052 (0.115)

[1] cULus 1604 Class I, Div.2 (universal device)
[2] for sinusoidal currents

Analog signal converters - CC-E range
DIP switch settings, Dimensional drawings

CC-E/STD, CC-E x/x (universal devices)

Input	Output	Switch 1	2	3	4	5	6	7	8
0...5 V	0...5 V			■	■	■	■	■	
	0...10 V			■	■		■	■	
	0...20 mA			■	■		■	■	
	4...20 mA			■	■		■		■
0...10 V	0...5 V			■	■	■		■	
	0...10 V			■	■	■	■	■	
	0...20 mA			■	■	■	■	■	
	4...20 mA			■	■	■	■		■
0...20 mA	0...5 V	■			■			■	
	0...10 V	■			■		■	■	
	0...20 mA	■			■		■	■	
	4...20 mA	■			■		■		■
4...20 mA	0...5 V	■	■					■	
	0...10 V	■	■				■	■	
	0...20 mA	■	■				■	■	
	4...20 mA	■			■		■	■	

2CDC 282 001 F0204

Legend
■ ON
OFF

2CDC 282 002 F0204

CC-E/RTD

Input	Output	Switch 1	2	3	4	5	6
0...100 °C	0...10 V						■
	0-20 mA						■
	4-20 mA					■	
0...300 °C	0-10 V			■			■
	0-20 mA			■			■
	4-20 mA			■		■	
0...500 °C	0-10 V		■	■			■
	0-20 mA		■	■			■
	4-20 mA		■	■		■	
-50...+50 °C	0-10 V	■					■
	0-20 mA	■					■
	4-20 mA	■				■	
-50...+250 °C	0-10 V	■		■			■
	0-20 mA	■		■			■
	4-20 mA	■		■		■	
-50...+450 °C	0-10 V	■	■	■			■
	0-20 mA	■	■	■			■
	4-20 mA	■	■	■		■	
High fail safe					■		
Low fail safe							

2CDC 282 006 F0208

Legend
■ ON
OFF
no influence

2CDC 282 003 F0204

CC-E/TC

Input	Output	Switch 1	2	3	4	5	6
TC-J: 0...600 °C	0...10 V		■	■			■
	0...20 mA		■	■			■
	4...20 mA		■	■		■	
TC-K: 0...1000 °C	0...10 V	■					■
	0...20 mA	■					■
	4...20 mA	■				■	
High fail safe					■		
Low fail safe							

2CDC 282 007 F0208

Legend
■ ON
OFF
no influence

2CDC 282 003 F0204

CC-E/I

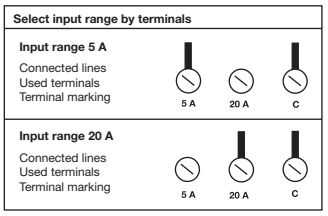
Input	Output	Switch 1	2	3	4	5	6
I - DC I - AC	0...10 V	■					
I - DC I - AC	0...20 mA	■					
I - DC I - AC	4...20 mA	■	■	■			

2CDC 282 005 F0208

Legend
■ ON
OFF

2CDC 282 002 F0204

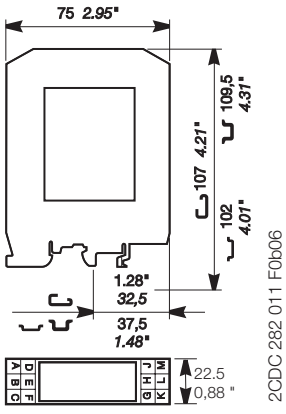
Input range selection - CC-E/I



2CDC 282 011 F0204

Dimensional drawings

CC-E/x



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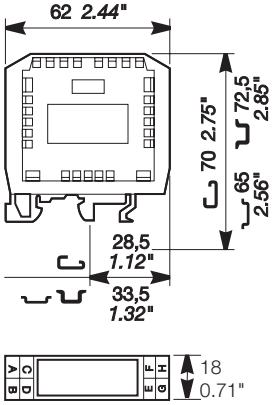
CC-E I_{AC}/ILPO, CC-E I/I



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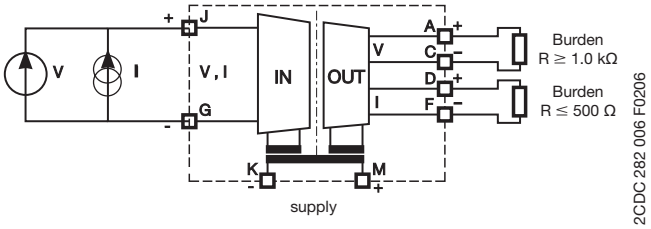
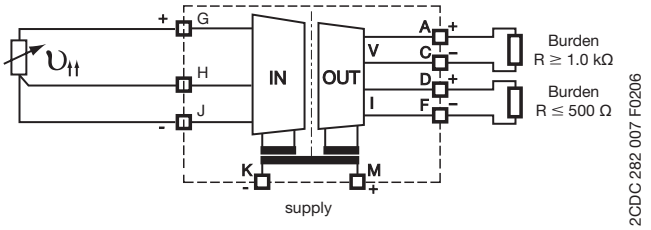
Analog signal converters - CC-E range
Wiring instructions

CC-E/STD, CC-E x/x (universal devices)

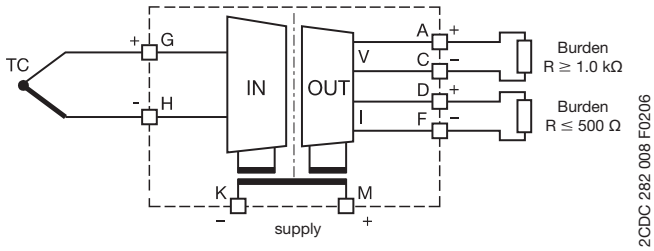


CC-E/RTD

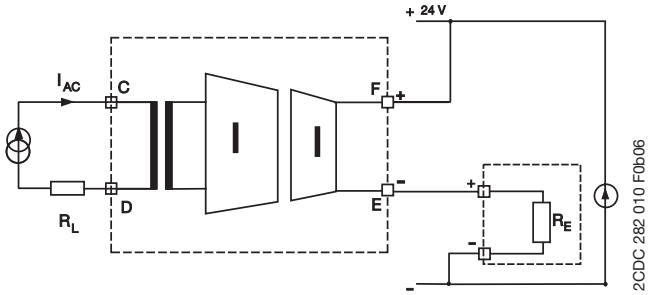


4

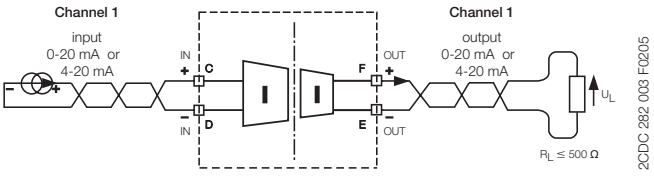
CC-E/TC



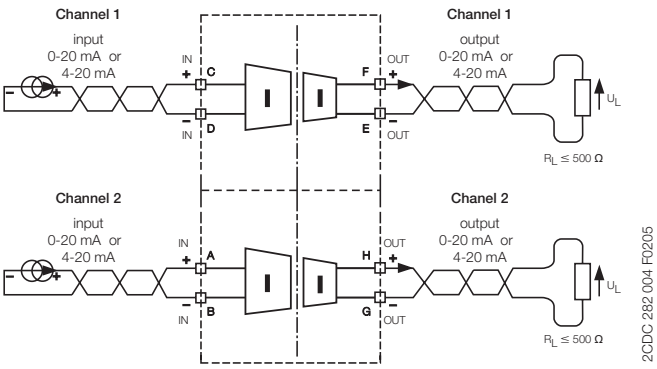
CC-E I_{AC}/ILPO



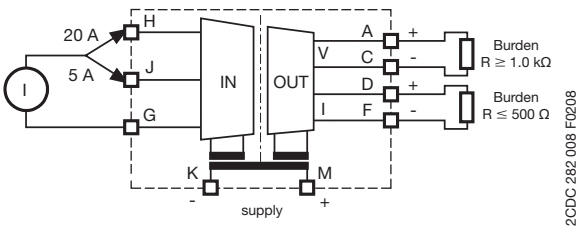
CC-E I/I-1



CC-E I/I-2



CC-E I/I



Analog signal converters - CC-E range
Technical data

Type		CC-E/STD / CC-E x/x		CC-E/RTD [3]	CC-E/TC
Input circuits - Analog inputs	**J-G-H**	**Current**	**Voltage**	**Temperature sensors**	**Thermocouples (IEC 584-1 and 2)**
Input signal		Standard signals		PT100	TC.K, TC.J
Rated input range		0...20 mA / 4...20 mA	0...5 V / 0...10 V / -10...+10 V	-50...+500 °C	TC.K: 0...1000 °C, TC.J: 0...600 °C
Limitation of input signals		+55 mA	± 11 V		
Influence of line resistance		-		< 0.01 %/Ω	< 0.5 % / 100 Ω
Gain adjustment range		± 5 % (universal devices)			
Offset adjustment range		± 5 % (universal devices)			
Input impedance		50 Ω	1 MΩ	-	-
Suppression at 50 Hz		-		-	> 35 dB
Common-mode rejection		-		100 dB	
Output circuits - Analog outputs	**D-F, A-C**	**Current**			**Voltage**
Output signal		0-20 mA, 4-20 mA			0-5 V, 0-10 V
Output burden		≤ 500 Ω			≥1.0 KΩ
Accuracy [1]		± 0.5 % of full-scale			
Residual ripple		< 0.5 %			
Response time		200 µs		10 ms	
Transmission frequency		2 kHz		80 Hz	2 Hz (up to -3 dB)
Reaction to input circuit interruption				High fail safe: Output voltage > 115 % of measuring range [2] Low fail safe: Output voltage < -0.6 V, output current = 0 mA	
Supply circuits	**K-M**	**DC versions**			**AC versions**
Supply voltage		24 V DC			110-240 V AC - 50/60 Hz
Supply voltage tolerance		-15...+15 %			-15...+10 %
Power consumption		1.5 W typ.			1.5 VA typ.
Indication of operational states					
Rated control supply voltage U_S		U: green LED			
General data					
Ambient temperature rangeoperation / storage		0...+60 °C / -20...+80 °C			
Temperature coefficient		± 500 ppm/°C			
Degree of protection (DIN 40050)		IP20			
Mounting position		ventilation slots on top and bottom			
Mounting		DIN rail (IEC/EN 60715), snap-on mounting			
Electrical connection					
Wire size	rigid	0.2-4 mm² (24-12 AWG)			
	fine-strand with(out) wire end ferrule	0.2-2.5 mm² (24-14 AWG)			
Stripping length		7 mm (0.28 inch)			
Tightening torque		0.5 Nm (4.4 lb.in)			
Electromagnetic compatibility					
Interference immunity		EN 61000-6-2			
electrostatic discharge (ESD)	IEC/EN 61000-4-2	Level 3 (±6 kV / ±8 kV)			
electromagnetic field(HF radiation resistance)	IEC/EN 61000-4-3	10 V/m			
fast transients (Burst)	IEC/EN 61000-4-4	Level 3 (±2 kV / 5 kH)			
powerful impulses (Surge)	IEC/EN 61000-4-5	±2 kV / ±1 kV			
HF line emission	IEC/EN 61000-4-6	10 V			
Interference emission	EN 61000-6-4	Class B			
Isolation data					
Test voltage between all isolated circuits		2.5 kV AC			
Rated insulation voltage		-		-	-

[1] Includes non-linearity and factory setting, influenced by supply voltage and output load.
[2] Only -/RTD and -/TC: Single-function devices respond with Low fail safe to input signal interruptions.
[3] When connecting a 2-wire sensor, the terminals J and H have to be jumpered.

Approvals on page 4/4.

Analog signal converters - CC-E range
Technical data

Type		CC-E I/I-1 / CC-E I/I-2
Input circuits - Analog inputs		**Current**
Input current I_{IN}		0-20 mA, 4-20 mA
Min. input current		< 100 µA
Max. input current		50 mA[1] (V_{IN} < 18 V)
Input voltage U_{IN}		< 2.5 V + (I_{IN} x R_L)
Input voltage drop U_i		< 2.5 V (20 mA, RL = 0 Ω)
Max. input voltage		18 V[1] (I_{IN} < 50 mA)
Output circuits		
Output current I_{OUT}		0-20 mA, 4-20 mA
Output load R_L		0-500 Ω
Output voltage U_{OUT}		I_{OUT} x RL
Residual ripple		< 20 mV_{pp} (500 Ω, 20 mA)
Response time (0-100 %)		< 15 ms (0-500 Ω, 20 mA), < 5 ms (500 q, 20 mA, 25 °C)
Accuracy		≤ 0.1 % of full-scale (20 mA)
Load influence (0-500 Ω)		≤ ±0.05 % / 100 Ω, ≤ -0.1 % / 100 Ω (25 °C)
General data		
Width of the enclosure		18 mm
Weight	1 channel	approx. 0.037 kg (0.082 (0.181) lb)
	2 channel	approx. 0.044 (0.097) kg (0.097 lb)
Mounting position		any
Degree of protection	enclosure / terminals	IP20 / IP20
Ambient temperature range	operation / storage	-25...+60 °C / -40...+85 °C
Temperature coefficient		< ±50 ppm / °C
Mounting		DIN rail (IEC/EN 60715)
Electrical connection		
Wire size	rigid	0.2-4 mm^2 (24-12 AWG)
	fine-strand with(out) wire end ferrule	0.2-2.5 mm^2 (24-14 AWG)
Stripping length		7 mm (0,28 inch)
Tightening torque		0.5 Nm (4.4 lb.in)
Standards		
Product standard		EN 50178
Low Voltage Directive		2006/95/EC
EMC Directive		2004/108/EC
Electromagnetic compatibility		
Interference immunity		EN 61000-6-2
electrostatic discharge (ESD)	EN 61000-4-2	Level 3 (±6 kV / ±8 kV)
electromagnetic field (HF radiation resistance)	EN 61000-4-3	10 V/m
fast transients (Burst)	EN 61000-4-4	Level 3 (±2 kV / 5 kH)
powerful impulses (Surge)	EN 61000-4-5	±2 kV / ±1 kV
HF line emission	EN 61000-4-6	10 V
magnetic fields	EN 61000-4-8	30 A/m
Interference emission		EN 61000-6-4
Radiated noise	EN 55011	Class B
Operational reliability (EN 68-2-6)		4 g
Mechanical resistance (EN 68-2-6)		10 g
Environmental testing (IEC 68-2-30 Db)		24 h cycle, 55 °C, 93 % rel., 96 h
Isolation data		
Insulation voltage input / output		500 V_{eff} / 50 Hz
Insulation voltage between channels		5 kV_{eff} / 50 Hz (device with 2 channels)
Pollution category		2
Overvoltage category		II

[1] The input parameters have to be limited to the indicated maximum values.

Approvals on page 4/4.

Analog signal converters - CC-E range
Technical data

Type		CC-E/I		CC-E I_{AC}/ILPO
		J-G-H		C-D
Input circuits - Analog inputs		AC current	DC current	2 meas. ranges selectable
Rated input range		0-5 A / 0-20 A	0-5 A / 0-20 A	0-1 A / 0-5 A / sinusoidal
Measuring frequency				50/60 Hz
Overload capacity of inputs	input range 1	10 x I_{Nom} (50 A) for max. 1 s		10 x I_{Nom} (50 A) for max. 2 s
	input range 2	10 x I_{Nom} (200 A) for max. 1 s		10 x I_{Nom} (200 A) for max. 2 s
Gain adjustment range		±5 % (universal devices)		-
Offset adjustment range		±5 % (universal devices)		-
Input impedance / resistance		5A : 65 mΩ	20 A : 2.5 mΩ	5 mΩ
Output circuits - Analog outputs		D-F Current	A-C Voltage	F-E passive current output in proportion to input current
Output signal		0-20 mA / 4-20 mA	0-10 V	4-20 mA
Output burden / load		≤ 500 Ω	≥ 1.0 Ω	12 V DC: 150 Ω, 24 V DC: 750 Ω 30 V DC: 1050 Ω
Accuracy [1]		± 2 % of full-scale		
Offset adjustment range		±5 % (universal device)		± 5 %
Gain adjustment range		±5 % (universal device)		± 20 %
Residual ripple		< 0.5 %		
Response time		0.5 s		0.6 s
Transmission frequency		DC or 50/60 Hz		AC: 50/60 Hz
Reaction to input circuit interruption		Low fail safe: output voltage < 200 mV, output current < 400 µA		-
Supply circuits	**K-M**	DC versions	AC versions	
Supply voltage		24 V DC	110-240 V AC 50/60 Hz	12-30 V DC
Supply voltage tolerance		-15...+15 %	-15...+10 %	-
Power consumption		typ 1.5 W	typ 1.5 VA	-
Indication of operational states				
Supply voltage		U: green LED		-
General data				
Ambient temperature rangeoperation / storage		0...+60 °C / -20...+80 °C		-20...+60 °C / -40...+80 °C
Temperature coefficient		± 500 ppm/°C		300 ppm/°C
Degree of protection (DIN 40050)		IP20		
Mounting position		ventilation slots on top and bottom		
Mounting		DIN rail (IEC/EN 60715), snap-on mounting		
Electrical connection				
Wire size	rigid	0.2-4 mm² (24-12 AWG)		
	fine-strand with(out) wire end ferrule	0.2-2.5 mm² (24-14 AWG)		
Stripping length		7 mm (0.28 inch)		
Tightening torque		0.5 Nm (4.4 lb.in)		
Electromagnetic compatibility				
Interference immunity		EN 61000-6-2		
electrostatic discharge (ESD)	IEC/EN 61000-4-2	Level 3 (±6 kV / ±8 kV)		
electromagnetic field (HF radiation resistance)	IEC/EN 61000-4-3	10 V/m		
fast transients (Burst)	IEC/EN 61000-4-4	Level 3 (±2 kV / 5 kH)		
powerful impulses (Surge)	IEC/EN 61000-4-5	±2 kV / ±1 kV		
HF line emission	IEC/EN 61000-4-6	10 V		
Interference emission	EN 61000-6-4	Class B		
Isolation data				
Test voltage (between all isolated circuits)		2.5 kV AC		
Rated insulation voltage		-		250 V AC

[1] Includes non-linearity and factory setting, influenced by supply voltage and output load.

Approvals on page 4/4.

Analog signal converters - CC-U range
Product group picture

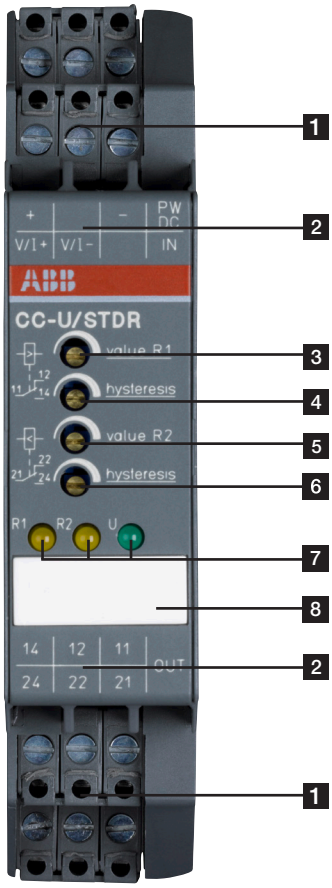
Analog signal converters - CC-U range
Table of contents

Analog signal converters - CC-U range
Overview

CC-U range
– 8 different standard signal outputs on one device
– Input and output side universally configurable
– Also available with 2 threshold relay outputs
– Adjustment and operating elements on the front side
– Safe operation by electrical 3-way isolation
– Plug-in connecting terminals, unambiguously and clearly marked

Conversion, measurement and separation of
– Standard signals
– Signals of RTD sensors (PT10, PT100, PT1000)
– Thermocouple signals
– TRMS values of currents and voltages

Characteristics
– The required input and output ranges can be configured for all devices by means of directly accessible DIP switches positioned on the side.
– Due to the wide input range of the gain and offset stages all input signals between the minimum and the maximum input value can be universally converted to all common output signals.
– Devices for DC or AC (50/60 Hz) supply available.



1 Terminals +, V/I+, V/I-, PW DC, IN, -
2 Terminal explanation
3 Adjustment of resistance value R1
4 Adjustment of hysteresis
5 Adjustment of resistance value R2
6 Adjustment of hysteresis
7 Indication of operational states
R1 yellow LED - resistance value R1
R2 yellow LED - resistance value R2
U green LED - supply voltage

8 Marker label

Analog signal converters - CC-U range
Overview

CC-U/STD universal signal converter with 3-way electrical isolation
- More than 120 configurations possible
- Configurable output signal response on input voltage signal interruption (low fail safe / high fail safe)
- Adjustment and operating elements on the front
- Short-circuit proof signal outputs
- Plug-i connecting terminals for inputs, outputs and supply
- Very fast signal transmission enables use in control systems

CC-U/STDR universal signal converter for standard signals, with 2 threshold relay outputs and with 3-way electrical isolation
- Standard signal converter with 7 setting ranges
- 2 threshold relay outputs with one c/o contact each (threshold and respective hysteresis can be adjusted independently from each other)
- Open-circuit or closed-circuit principle configurable by means of a DIP switch
- 2 yellow LEDs for clear status indication of the output relays
- Plug-in connecting terminals for inputs, outputs and supply

CC-U/RTD universal signal converter for PT10, PT100, PT1000 temperature sensors (acc. to IEC 751 and JIS C 16041), linearized with 3-way electrical isolation)
- Configurable output signal response on input signal interruption (low / high fail safe)
- Adjustment and operating elements on the front-side
- Short-circuit proof signal outputs
- Plug-in connecting terminals for inputs, outputs and supply
- 2- or 3-wire connection

[1] Japanese standard

CC-U/RTDR universal signal converter for temperature and resistance signals, with 2 threshold relay outputs and 3-way electrical isolation
- Temperature signal converter for PT100 signals (5 ranges up to 800 °C) and variable resistances from 0-380 Ω
- 2 threshold relay outputs with one c/o contact each (threshold and respective hysteresis can be adjusted independently from each other)
- Open-circuit or closed-circuit principle configurable by means of a DIP switch
- 2 yellow LEDs for clear status indication of the output relays
- Plug-in connecting terminals for inputs, outputs and supply
- 2- or 3-wire connection

CC-U/TC universal signal converter for thermocouples with 3-way electrical isolation
- Temperature signal converter for thermo-couples of the types K, J, T, S, E, N, R, B
- Continuously adjustable voltage signal input 0-10 mV and 0-50 mV
- Differential temperature meas. possible (see wiring instructions page 4/17)
- Configurable output signal response on input signal interruption (low fail safe / high fail safe)
- Adjustment and operating elements on the front-side
- Short-circuit proof signal outputs
- Plug-in connecting terminals for inputs, outputs and supply
- Cold-junction compensation selectable

CC-U/TCR universal signal converter for thermocouples, with 2 threshold relay outputs and 3-way electrical isolation
- Temperature signal converter for thermocouples of the types K, J, T, S
- 2 threshold relay outputs with one change-over contact each (threshold and respective hysteresis can be adjusted independently from each other)
- Open-circuit or closed-circuit principle configurable by means of a DIP switch
- 2 yellow LEDs for clear status indication of the output relays
- Plug-in connecting terminals for inputs, outputs and supply
- Integrated cold-junction compensation

CC-U/V universal measuring converter for RMS values of 0-600 V, with 3-way electrical isolation
- RMS converter for voltage signals up to 600 V of any wave form (DC, DC with superimposed AC components, pure sinusoidal, triangular, phase-angle controlled, etc. in a measuring range of 0-600 Hz)
- Adjustment and operating elements on the front
- Short-circuit proof signal outputs
- Plug-in connecting terminals for inputs, outputs and supply

CC-U/I universal measuring converter for RMS values of 0-1 A and 0-5 A, with 3-way electrical isolation
- RMS converter for current signals up to 1 A and up to 5 A of any wave form (DC, DC with superimposed AC components, pure sinusoidal, triangular, phase-angle controlled, etc. in a measuring range of 0-600 Hz)
- Adjustment and operating elements on the front
- Short-circuit proof signal outputs
- Plug-in connecting terminals for inputs, outputs and supply

Analog signal converters - CC-U range
Ordering details


2CDC 281 003 F0003

CC-U/STDR

Ordering details - Standard Signal Converters

Supply voltage range	Input signal	Output signal	Type	Order code	Price 1 pce	Weight (1 pce) kg (lb)
24-48 V DC, 24 V AC	refer to table	refer to table	CC-U/STD	1SVR040000R1700		0.125 (0.276)
110-240 V AC, 100-300 V DC				1SVR040001R0400		0.126 (0.278)
24-48 V DC, 24 V AC		2 c/o	CC-U/ STDR[1]	1SVR040010R0000		0.142 (0.313)
110-240 V AC, 100-300 V DC				1SVR040011R2500		


2CDC 281 005 F0003

CC-U/RTD

Ordering details - RTD Converters

Supply voltage range	Input signal	Output signal	Type	Order code	Price 1 pce	Weight (1 pce) kg (lb)
24-48 V DC, 24 V AC	refer to table	refer to table	CC-U/RTD	1SVR040002R0500		0.126 (0.278)
110-240 V AC, 100-300 V DC				1SVR040003R0600		0.128 (0.282)
24-48 V DC, 24 V AC		2 c/o	CC-U/RTDR[1]	1SVR040012R2600		0.146 (0.322)
110-240 V AC, 100-300 V DC				1SVR040013R2700		0.148 (0.326)


2CDC 281 008 F0003

CC-U/TC

Ordering details - Thermocouple Converters

Supply voltage range	Input signal	Output signal	Type	Order code	Price 1 pce	Weight (1 pce) kg (lb)
24-48 V DC, 24 V AC	refer to table	refer to table	CC-U/TC	1SVR040004R0700		0.130 (0.287)
110-240 V AC, 100-300 V DC				1SVR040005R0000		0.128 (0.282)
24-48 V DC, 24 V AC		2 c/o	CC-U/TCR[1]	1SVR040014R2000		0.145 (0.320)
110-240 V AC, 100-300 V DC				1SVR040015R2100		


2CDC 281 012 F0003

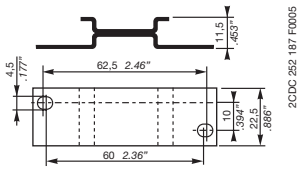
CC-U/I

Ordering details - Measuring Converters

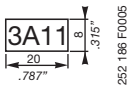
Supply voltage range	Input signal	Output signal	Type	Order code	Price 1 pce	Weight (1 pce) kg (lb)
24-48 V DC, 24 V AC	refer to table	refer to table	CC-U/I[2]	1SVR040006R0100		0.128 (0.282)
110-240 V AC, 100-300 V DC				1SVR040007R0200		0.127 (0.280)
24-48 V DC, 24 V AC			CC-U/V[3]	1SVR040008R1300		0.128 (0.282)
110-240 V AC, 100-300 V DC				1SVR040009R1400		

[1] with relay output
[2] for current RMS values
[3] for voltage RMS values

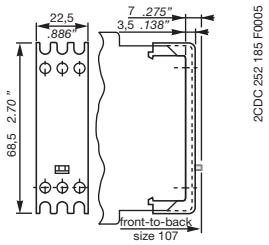
Analog signal converters - CC-U range
Ordering details - Accessories



ADP.01



MAR.01



Sealable cover - COV.01

Ordering details - Accessories

For type	Width in mm	Type	Order code	Price	Pkg qty	Weight (1 pce) g (oz)
CC-U	22.5	ADP.01	1SVR430029R0100		1	18.4 (0.65)
CC-U		MAR.01	1SVR366017R0100		10	0.19 (0.007)
CC-U	22.5	COV.01	1SVR430005R0100		1	5.2 (0.18)

Analog signal converters - CC-U range
DIP switch settings

CC-U/STD

Input	Switch 1								Gain	Coarse Type
	1	2	3	4	5	6	7	8		
Potentiometer	■								0	0
0...50 mV									A...D	C
0...100 mV									4...5	5
0...250 mV									0...1	1
0...500 mV	■								7...9	8
0...1 V	■								3...4	3
0...2.5 V	■								0	0
0...5 V		■							5...7	6
0...10 V		■							2	2
1...5 V		■		■	■				7...9	8
2... 10 V		■		■	■				2...4	3
-10...+10 V		■	■		■				0	0
0...125 mV									3...4	3
0...8 V		■							3...4	3
-22.5...+22.5 mV			■		■				B...F	D
-11...+11 V		■	■		■				0	0
2.5...7.5 V		■			■				5...7	6
3.33...9.99 V		■			■				3...4	4
10...0 V		■	■						2	2
100...0 mV			■						4...5	5
0...1 mA	■								A...D	B
0...20 mA	■	■							2...4	3
4...20 mA	■	■			■	■			4...5	4
10...50 mA	■	■			■	■			0...1	1
20...4 mA	■	■		■	■				4...5	4
20...0 mA	■	■		■					4...2	3
-0.45...+0.45 mA	■			■		■			B...F	D
-55...+55 mA	■		■	■		■			4...6	5
High fail safe *)							■		-	-
Low faile safe *)								■	-	-
No fail safe *)									-	-

2CDC 282 019 F0203

*) Detection of input voltage signal interruptions:
If the input signal circuit is interrupted, the output signal changes to the adjusted minimum value (low fail safe) or maximum value (high fail safe).
If "No fail safe" is configured, input signal interruptions are not detected.

Output	Switch 2					
	1	2	3	4	5	6
0...5 V			■		■	
0...10 V					■	
1...5 V	■	■	■		■	
2...10 V	■	■	■			
-10...+10 V				■		
-5...+5 V				■	■	
-10...0 V				■	■	
-5...0 V				■	■	■
0...6.66 V		■				■
-10...+3.33 V		■		■		
-5...+1.66 V		■		■	■	
0...8 V		■	■			
0...4 V		■	■			■
-10...-2 V		■	■	■		
-5...-1 V		■	■	■		■
1.25...6.25 V	■			■		■
-7.5...+2.5 V	■			■	■	
-3.75...+1.25 V	■			■	■	■
1.66...8.33 V	■	■				■
-6.66...+6.66 V	■	■			■	
-3.33...+3.33 V	■	■			■	■
-8...0 V	■	■	■	■		
-4...0 V	■	■	■	■	■	■
0...1 mA						■
0...20 mA						■	■
4...20 mA	■	■	■			■
0...10 mA			■		■	■
0...0.5 mA			■		■	
0...13.33 mA			■		■	■
0...666 µA			■		■	
0...16 mA			■	■		■
0...800 µA			■	■		
0...8 mA			■	■	■	■
0...400 µA			■	■	■	
2.5...12.5 mA	■		■		■	■
125...625 µA	■		■		■	
3.33...16.66 mA	■	■	■		■	■
166...833 µA	■	■	■		■	
0.2...1 mA	■	■	■	■		
2...10 mA	■	■	■	■	■	■
100...500 µA	■	■	■	■	■	

2CDC 282 020 F0203

Legend
■ ON
OFF
no influence

2CDC 282 003 F0204

CC-U/STDR with relay output

Input	Switch					
	1	2	3	4	5	6
0...10 V						
0...5 V	■					
0...1 V		■				
-10...+10 V			■			
1...5 V	■				■	
0...20 mA		■		■		
4...20 mA		■		■	■	
Output						
Closed-circuit principle						■
Open-circuit principle						

2CDC 282 005 F0204

Legend
■ ON
OFF
no influence

2CDC 282 003 F0204

CC-U/RTD

Input		Switch 1						Switch 2						Gain
Type	Range	1	2	3	4	5	6	1	2	3	4	5	6	Coarse
PT10	0...500 °C	■							■		■			F
	0...550 °C	■							■		■			E
	0...600 °C	■							■		■			D
	0...650 °C	■							■					C
	0...700 °C	■							■					B
	0...750 °C	■							■					A
	0...800 °C	■							■					9
	0...850 °C	■							■					8
PT100	0...50 °C		■					■			■			F
	0...60 °C		■					■			■			E
	0...70 °C		■					■			■			B
	0...80 °C		■					■			■			A
	0...90 °C		■					■			■			9
	0...100 °C		■					■			■			8
	0...200 °C		■					■			■			3
	0...300 °C		■					■			■			2
	0...400 °C		■					■			■			1
	0...500 °C		■					■			■			0
PT1000	0...10 °C			■										8
	0...20 °C			■										3
	0...30 °C			■										2
	0...40 °C			■										1
	0...50 °C			■										0
	0...60 °C			■										0
Low fail safe *)													■	-
High fail safe *)														-

2CDC 282 023 F0203

*) Detection of input signal interruptions:
If the input signal circuit is interrupted, the output signal changes to the adjusted minimum value (low fail safe) or maximum value (high fail safe).

Output	Switch 3					
	1	2	3	4	5	6
0...5 V			■		■	
0...10 V					■	
1...5 V	■	■	■		■	
2...10 V	■	■	■			
-10...+10 V				■		
-5...+5 V				■	■	
-10...0 V			■	■		
-5...0 V			■	■	■	
0...6.66 V	■				■	
-10...+3.33 V		■		■		
-5...+1.66 V		■		■	■	
0...8 V		■	■			
0...4 V		■	■			■
-10...-2 V		■	■	■		
-5...-1 V		■	■	■		■
1.25...6.25 V	■			■		■
-7.5...+2.5 V	■			■	■	
-3.75...+1.25 V	■			■	■	■
1.66...8.33 V	■	■				■
-6.66...+6.66 V	■	■			■	
-3.33...+3.33 V	■	■			■	■
-8...0 V	■	■	■	■		
-4...0 V	■	■	■	■	■	■
0...1 mA						■
0...20 mA						■	■
4...20 mA	■	■	■			■
0...10 mA			■		■	■
0...0.5 mA			■		■	
0...13.33 mA			■		■	■
0...666 µA			■		■	
0...16 mA			■	■		■
0...800 µA			■	■		
0...8 mA			■	■	■	■
0...400 µA			■	■	■	
2.5...12.5 mA	■		■		■	■
125...625 µA	■		■		■	
3.33...16.66 mA	■	■	■		■	■
166...833 µA	■	■	■		■	
0.2...1 mA	■	■	■	■		
2...10 mA	■	■	■	■	■	■
100...500 µA	■	■	■	■	■	

2CDC 282 024 F0203

Legend
■ ON
OFF
no influence

2CDC 282 003 F0204

CC-U/RTDR with relay output

Input PT100	Switch					
	1	2	3	4	5	6
0...100 °C	■					
0...200 °C		■				
0...400 °C			■			
0...600 °C				■		
0...800 °C					■	
Output						
Closed-circuit principle						■
Open-circuit principle						

2CDC 282 007 F0204

Legend
■ ON
OFF
no influence

2CDC 282 003 F0204

Analog signal converters - CC-U range
DIP switch settings

CC-U/V

Output	Switch 1	2	3	4	5	6
0...5 V			■		■	
0...10 V					■	
1...5 V	■	■	■		■	
2...10 V	■	■	■			
-10...+10 V				■		
-5...+5 V				■	■	
-10...0 V			■	■		
-5...0 V			■	■	■	
0...6.66 V	■				■	
-10...+3.33 V	■				■	
-5...+1.66 V	■			■	■	
0...8 V	■	■				
0...4 V	■	■			■	
-10...-2 V	■	■	■			
-5...-1 V	■	■	■		■	
1.25...6.25 V	■		■		■	
-7.5...+2.5 V	■		■	■		
-3.75...+1.25 V	■		■	■	■	
1.66...8.33 V	■	■			■	
-6.66...+6.66 V	■	■		■		
-3.33...+3.33 V	■	■		■	■	
-8...0 V	■	■	■	■		
-4...0 V	■	■	■	■	■	
0...1 mA					■	
0...20 mA					■	■
4...20 mA	■	■	■		■	■
0...10 mA			■		■	
0...0.5 mA			■		■	■
0...13.33 mA	■				■	■
0...666 µA	■				■	
0...16 mA	■	■				■
0...800 µA	■	■				
0...8 mA	■	■			■	■
0...400 µA	■	■			■	
2.5...12.5 mA	■		■		■	■
125...625 µA	■		■		■	
3.33...16.66 mA	■	■			■	■
166...833 µA	■	■			■	
0.2...1 mA	■	■	■			
2...10 mA	■	■	■		■	■
100...500 µA	■	■	■		■	

2CDC 282 029 F0203

Legend
■ ON
OFF
no influence

2CDC 282 003 F0204

CC-U/TC

Output	Switch 3	1	2	3	4	5	6
0...5 V				■		■	
0...10 V						■	
1...5 V		■	■	■		■	
2...10 V		■	■	■			
-10...+10 V					■		
-5...+5 V					■	■	
-10...0 V				■	■		
-5...0 V				■	■	■	
0...6.66 V		■				■	
-10...+3.33 V		■			■		
-5...+1.66 V		■			■	■	
0...8 V		■	■				
0...4 V		■	■			■	
-10...-2 V		■	■	■			
-5...-1 V		■	■	■		■	
1.25...6.25 V		■		■		■	
-7.5...+2.5 V		■		■	■		
-3.75...+1.25 V		■		■	■	■	
1.66...8.33 V		■	■			■	
-6.66...+6.66 V		■	■		■		
-3.33...+3.33 V		■	■		■	■	
-8...0 V		■	■	■	■		
-4...0 V		■	■	■	■	■	
0...1 mA						■	
0...20 mA						■	■
4...20 mA		■	■	■			■
0...10 mA				■		■	
0...0.5 mA				■		■	■
0...13.33 mA			■			■	■
0...666 µA			■			■	
0...16 mA			■	■			■
0...800 µA			■	■			
0...8 mA			■	■		■	■
0...400 µA			■	■		■	
2.5...12.5 mA		■		■		■	■
125...625 µA		■		■		■	
3.33...16.66 mA		■	■			■	■
166...833 µA		■	■			■	
0.2...1 mA		■	■	■			
2...10 mA		■	■	■		■	■
100...500 µA		■	■	■		■	

2CDC 282 017 F0208

Legend
■ ON
OFF
no influence

2CDC 282 003 F0204

Input Type	Range	Switch 1	1	2	3	4	5	6	Switch 2	1	2	3	4	5	6
K	0-100...900 °C		■		■					■	■				
	0-250...1350 °C		■		■					■	■			■	
J	0-100...750 °C		■							■	■				
T	0-100...400 °C			■	■					■	■	■			
	-150-0...400 °C			■	■					■	■	■	■		
S	0-250...1550 °C		■	■		■	■			■					
E	0-100...700 °C									■	■				
	0-200...1000 °C									■	■			■	
N	0-100...650 °C		■			■				■	■				
	0-200...1300 °C		■			■				■	■			■	
R	0-250...1350 °C		■	■	■	■	■			■					
	0-450...1700 °C		■	■	■	■	■			■	■			■	
B	0-700...1750 °C		■	■	■	■	■			■	■				
mV	0-2...10 mV		■	■	■	■	■								
	0-10...50 mV														
Low fail safe *)															■
High fail safe *)															

2CDC 282 010 F0204

*) Detection of input signal interruptions:
If the input signal circuit is interrupted, the output signal changes to the adjusted minimum value (low fail safe) or maximum value (high fail safe).

CC-U/I

Output	Switch 1	2	3	4	5	6
0...5 V			■		■	
0...10 V					■	
1...5 V	■	■	■		■	
2...10 V	■	■	■			
-10...+10 V				■		
-5...+5 V				■	■	
-10...0 V			■	■		
-5...0 V			■	■	■	
0...6.66 V		■			■	
-10...+3.33 V		■			■	
-5...+1.66 V		■		■	■	
0...8 V		■	■			
0...4 V		■	■		■	
-10...-2 V		■	■	■		
-5...-1 V		■	■	■	■	
1.25...6.25 V	■		■		■	
-7.5...+2.5 V	■		■	■		
-3.75...+1.25 V	■		■	■	■	
1.66...8.33 V	■	■			■	
-6.66...+6.66 V	■	■		■		
-3.33...+3.33 V	■	■		■	■	
-8...0 V	■	■	■	■		
-4...0 V	■	■	■	■	■	
0...1 mA					■	
0...20 mA					■	■
4...20 mA	■	■	■			■
0...10 mA			■		■	■
0...0.5 mA			■		■	
0...13.33 mA		■			■	■
0...666 µA		■			■	
0...16 mA		■	■			■
0...800 µA		■	■			
0...8 mA		■	■		■	■
0...400 µA		■	■		■	
2.5...12.5 mA	■		■		■	■
125...625 µA	■		■		■	
3.33...16.66 mA	■	■			■	■
166...833 µA	■	■			■	
0.2...1 mA	■	■	■			
2...10 mA	■	■	■		■	■
100...500 µA	■	■	■		■	

2CDC 282 029 F0203

Legend
■ ON
OFF
no influence

2CDC 282 003 F0204

CC-U/TCR with relay output

Input Type	Range	Switch 1	2	3	4	5	6
J	0...240 °C				■		
	0...480 °C			■	■		
	0...1200 °C						
K	0...250 °C	■			■		
	0...500 °C	■		■	■		
	0...1350 °C	■					
T	-150...+120 °C	■			■	■	
	0...220 °C	■			■		
	0...400 °C	■		■	■		
S	0...210 °C		■		■		
	0...380 °C		■	■	■		
	0...860 °C		■				
	0...1550 °C		■	■			
Output							
Closed-circuit principle							■
Open-circuit principle							

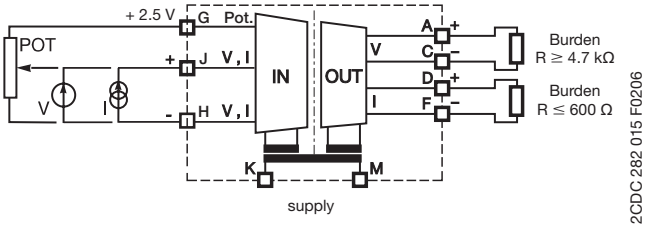
2CDC 282 004 F0204

Legend
■ ON
OFF
no influence

2CDC 282 003 F0204

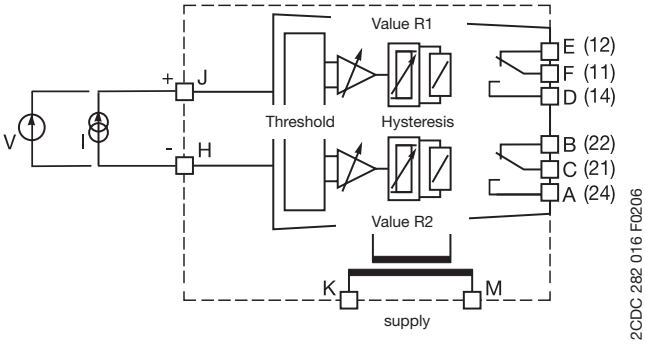
Analog signal converters - CC-U range
Wiring instructions

CC-U/STD



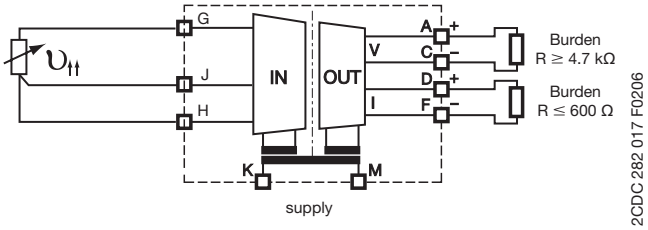
2CDC 282 015 F0206

CC-U/STDR with relay output



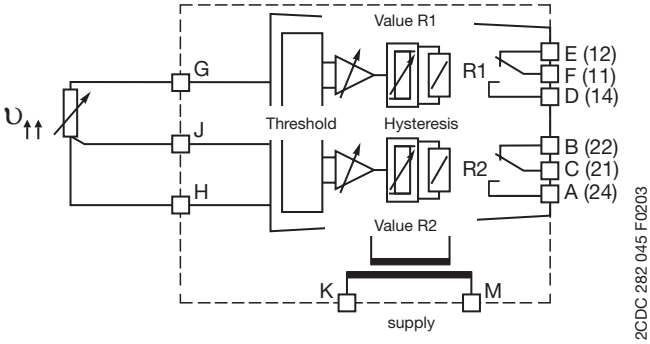
2CDC 282 016 F0206

CC-U/RTD



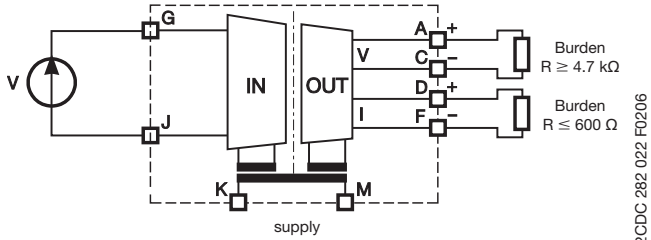
2CDC 282 017 F0206

CC-U/RTDR with relay output



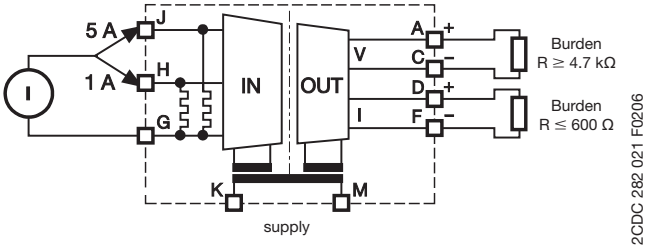
2CDC 282 045 F0203

CC-U/V



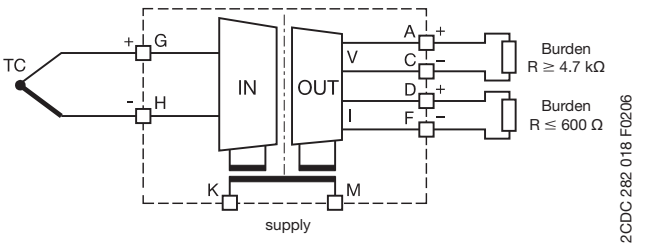
2CDC 282 022 F0206

CC-U/I

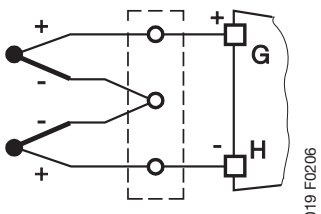


2CDC 282 021 F0206

CC-U/TC



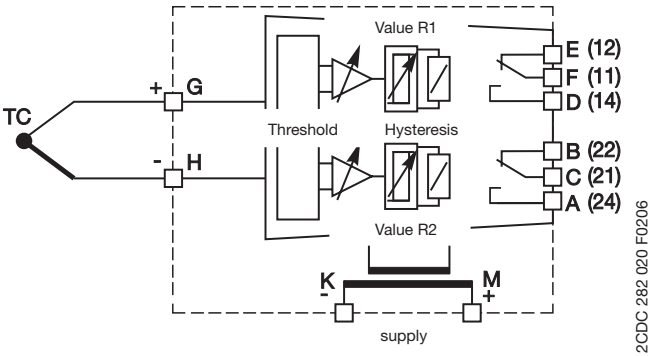
2CDC 282 018 F0206



2CDC 282 019 F0206

without cold-junction compensation:
switch SW2.2 = OFF

CC-U/TCR with relay output

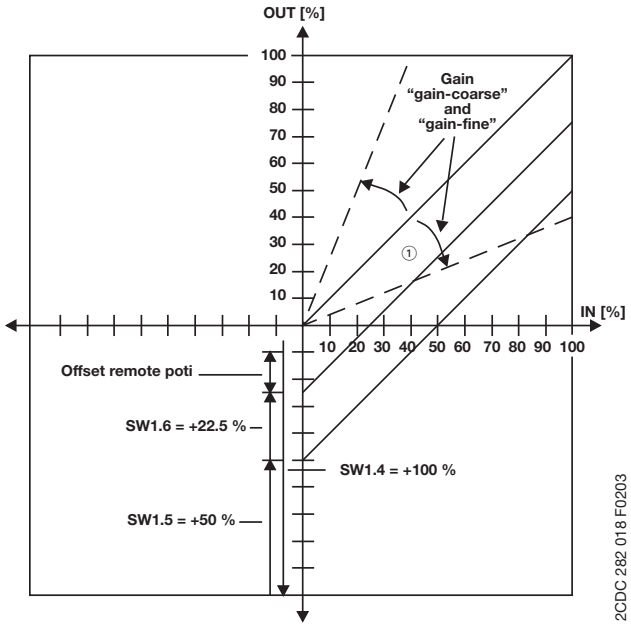


2CDC 282 020 F0206

Analog signal converters - CC-U range
Technical information

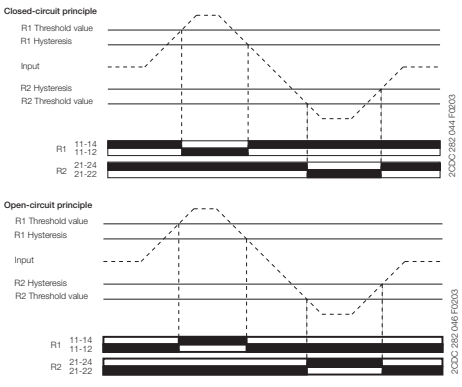
CC-U/STD

Adjustment range



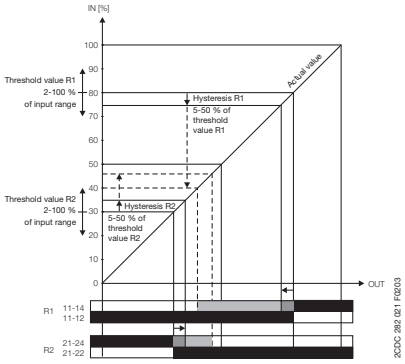
CC-U/STDR with relay output

Function diagrams



Switching points

Switching points of the output relay depending on the input range, configuration open-circuit principle

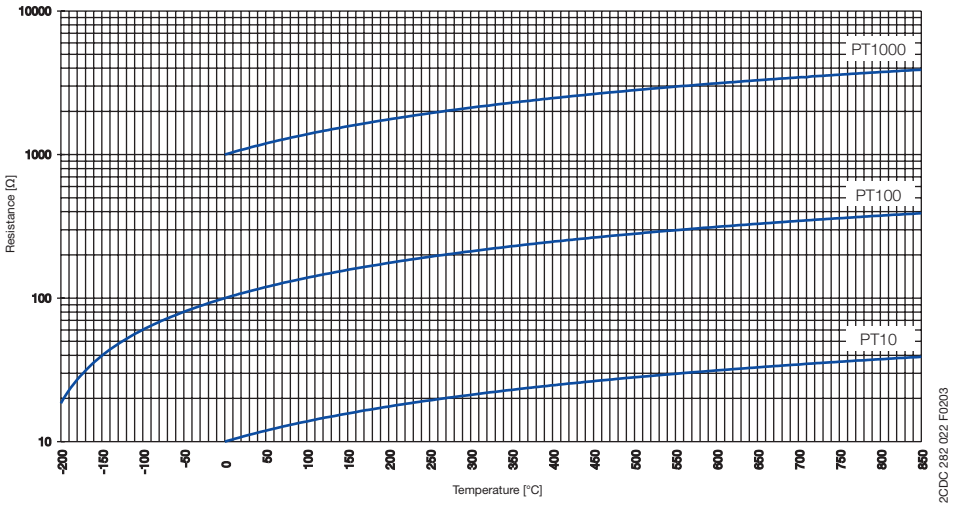


Analog signal converters - CC-U range
Technical information

CC-U/RTD

Characteristic curves

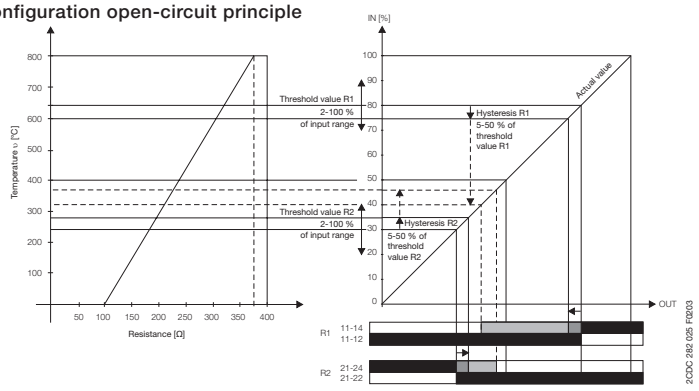
Resistance of PT10, PT100 and PT1000 sensors depending on the temperature



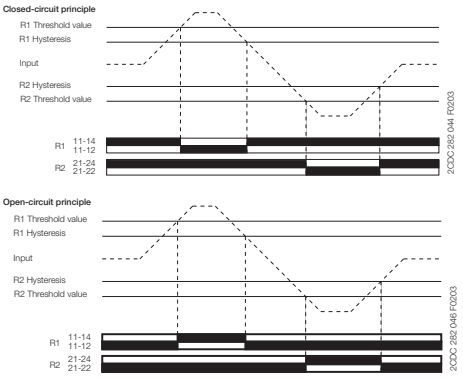
CC-U/RTDR with relay output

Switching points

Switching points of the output relay depending on the input range, configuration open-circuit principle



Function diagrams



CC-U/V

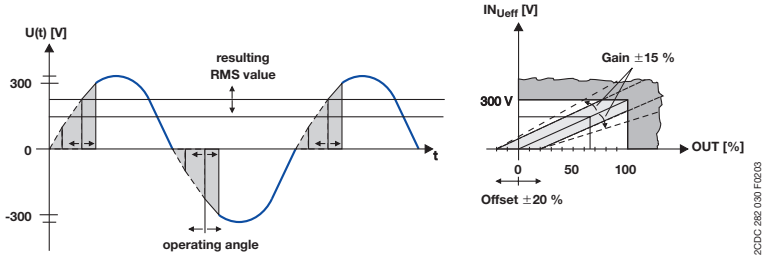
Input range selection

Selecting input range by front-face rotary switch	Switch position
0...100 V	1
0...150 V	2
0...250 V	3
0...300 V	4
0...400 V	5
0...450 V	6
0...550 V	7
0...600 V	8

2CDC 282 012 F0204

Example of application

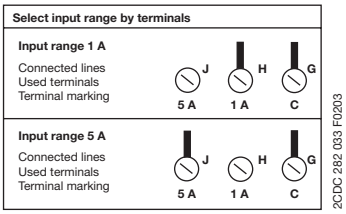
RMS measurement and conversion of a phase-angle controlled voltage signal L1 = 230 V



Analog signal converters - CC-U range
Technical information

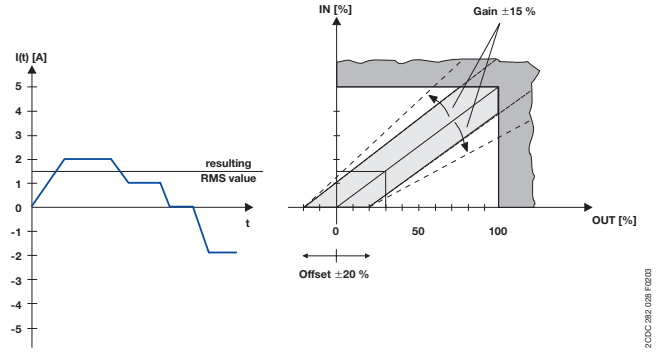
CC-U/I

Input range selection



Example of application

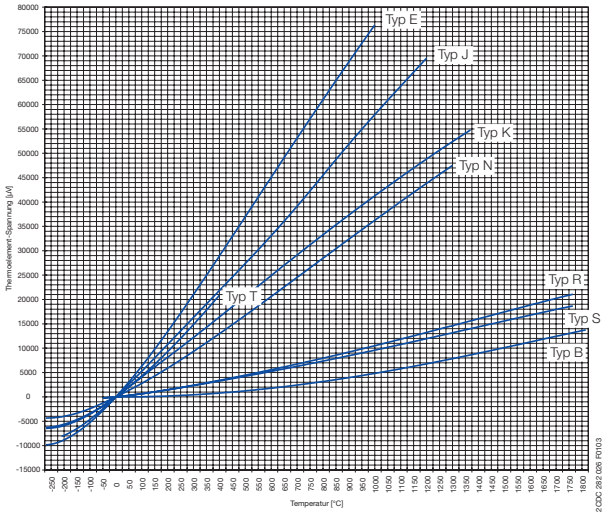
RMS measurement and conversion of a current signal



CC-U/TC

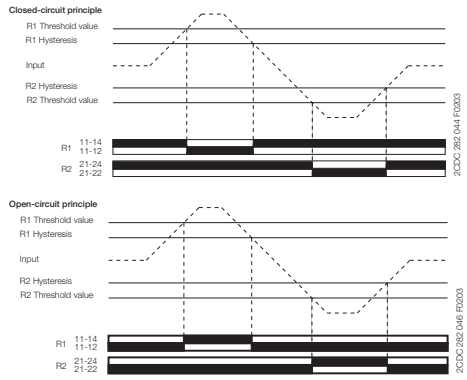
Characteristic curve

Thermocouple voltages depending on the temperature



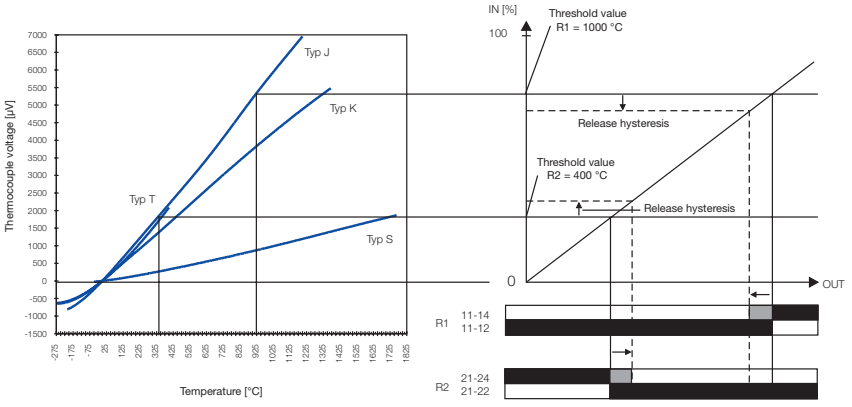
CC-U/TCR with relay output

Function diagrams



Switching points

Switching points of the output relay depending on the input range, configuration open-circuit principle



Analog signal converters - CC-U range
Technical data

Type		CC-U/STD			CC-U/RTD [3]	CC-U/TC
Input circuits - Analog inputs	**J-G-H**	**Current**	**Voltage**	**Potentio-meter**	**Temperature sen-sors**	**Thermocouples (IEC 584-1 and 2)**
Input signal		0-20 mA 4-20 mA 10-50 mA 0-1 mA	0-100 mV 0-1 V 0-5 V 1-5 V 0-10 V 2-10 V ± 10 V	470 Ω -1 MΩ [2]	PT10, PT100, PT1000 (IEL 751 and JICC 1604)	TC.K TC.J TC.T TC.S TC.E TC.N TC.R TC.B
Limitation of input signals		± 55 mA	± 11 V		-	-
Rated input range		-	-	-	Max. temperature adjustable: 6-60 °C for PT1000 50-500 °C for PT100 500-850 °C for PT10	refer to temperature specs. of individual thermocouples
Influence of line resistance		-	-	-	0.015 °C/Ω	< 0.01 % / 100 Ω
Gain adjustment range (universal devices)		0.9-110 mA	45 mV - 22 V	-	see DIP switch settings	
Offset adjustment range (universal devices)		-137.5...+62.5 %			± 5 %	± 10 %
Input impedance		for different ranges			-	-
without detection of input signal interruption		51 Ω	6 MΩ	3 GΩ	-	-
with detection of input signal interruption		51 Ω	3.5 MΩ	9.5 GΩ	-	-
Suppression at 50 Hz		-	-	-	-	> 40 dB
Common-mode rejection		-	-	-	120 dB	105 dB
Output circuits - Analog outputs	**D-F, A-C**	**Current**				**Voltage**
Output signal		0-20 mA, 4-20 mA				0-5 V, 1-5 V, 0-10 V, 2-10 V, ± 10 V
Output burden		≤ 600 Ω				≥ 4.7 KΩ
Accuracy [1]		±0.1 % of full-scale			±0.2 % of full-scale	±0.1 % of full-scale
Residual ripple		-			< 0.15 %	-
Response time		200 µs			10 ms	200 ms
Transmission frequency		1 kHz			80 Hz	2 Hz (to -3 dB)
Supply circuits	**K-M**	**DC versions**				**AC versions**
Rated supply voltage		24-48 V DC				110-240 V AC
Supply voltage range		24-48 V DC / 24 V AC				110-240 V AC / 100-300 V DC
Supply voltage tolerance		DC: -15...+15 %				AC: -15...+10 %
Rated frequency		0 Hz or 50/60 Hz				
Power consumption		2 W at 24 V DC				4.5 VA at 230 V AC
Indication of operational states						
Supply voltage		U: green LED				
General data						
Ambient temperature rangeoperation / storage		-20...+60 °C / -40...+80 °C				
Temperature coefficient		±150 ppm/°C			±250 ppm/°C	±200 ppm/°C at min. offset ±400 ppm/°C at max. offset
Mounting position		any				
Mounting		DIN rail (IEC/EN 60715), snap-on mounting / screw mounting with adapter				
Electrical connection						
Wire size	rigid	plug-connector with screw terminals 0.2-2.5 mm² (24-12 AWG)				
	fine-strand with(out) wire end ferrule	plug-connector with screw terminals 0.2-2.5 mm² (24-12 AWG)				
Stripping length		7 mm (0.28 inch)				
Tightening torque		0.4 Nm (3.5 ib.in)				
Electromagnetic compatibility						
Interference immunity		EN 61000-6-2				
electrostatic discharge (ESD)	IEC/EN 61000-4-2	Level 3 (±6 kV / ±8 kV)				
electromagnetic field (HF radiation resistance)	IEC/EN 61000-4-3	10 V/m				
fast transients (Burst)	IEC/EN 61000-4-4	Level 3 (±2 kV / 5 kH)				
powerful impulses (Surge)	IEC/EN 61000-4-5	±2 kV / ±1 kV				
HF line emission	IEC/EN 61000-4-6	10 V				
Interference emission	EN 61000-6-4	Class B				
Isolation data						
Isolation test (between all isolated circuits)		1.5 kV				
Test voltage (between all isolated circuits)		1.5 kV / 50 Hz				

[1] Includes non-linearity and factory setting, influenced by supply voltage and output load.
[2] Detection of an input signal break (fail safe) and resistance > 10 kΩ results in a linearity of ±0.2 %.
[3] When connecting a 2-wire sensor, the terminals J and H have to be jumpered.

Approvals on page 4/4.

Analog signal converters - CC-U range
Technical data

Type			CC-U/STDR		CC-U/RTDR [1]	CC-U/TCR
Input circuits - Analog inputs		**J-H**	**Current**	**Voltage**	**Temperature sensors**	**Thermocouples (IEC 584-1 and 2)**
Measuring signal / input range			0-20 mA 4-20 mA	0-1 V / 1-5 V 0-10 / ±10 V	PT100	TC.K, TC.J TC.T, TC.S
Input resistance			approx. 50 Ω	approx. 1.5 MΩ		
Adjustable threshold			2-100 % of selected input range			
Adjustable hysteresis			5-50 % of threshold			
Repeat accuracy (constant parameters)			±0.5 % of full-scale			
Output circuits - Relay outputs		**E-D-F, B-C-A**	**Relay, 2 c/o contacts**			
Rated switching voltage			250 V AC			
Rated switching current	AC-12 (resistive) 230 V		4 A			
	AC-15 (inductive) 230 V		3 A			
	DC-12 (resistive) 24 V		4 A			
	DC-13 (inductive) 24 V		2 A			
AC rating (UL 508)	Utilization category (Control Circuit Rating Code)		B 300			
	max. rated operational voltage		300 V AC			
	max. continuous thermal current at B 300		5 A			
	max. making/breaking apparent power at B 300		3600/360 VA			
Minimum switching voltage			12 V			
Minimum switching current / power			10 mA / 0.6 VA (W)			
Response time			10 ms			
Mechanical lifetime			30 x 10^6 switching cycles			
Electrical lifetime	at AC-12, 230 V, 4 A		0.1 Mio. switching cycles			
Supply circuits		**K-M**	**DC versions**		**AC versions**	
Rated supply voltage			24-48 V DC		110-240 V AC	
Supply voltage range			24-48 V DC / 24 V AC		110-240 V AC / 100-300 V DC	
Supply voltage tolerance			DC: -15...+15 %		AC: -15...+10 %	
Rated frequency			0 Hz or 50/60 Hz			
Power consumption			2 W at 24 V DC		4.5 VA at 230 V AC	
Indication of operational states						
Supply voltage			U: green LED			
1st / 2nd output relay energized			R1: yellow LED / R2: yellow LED			
General data						
Ambient temperature range	operation / storage		-20...+60 °C / -40...+80 °C			
Temperature coefficient			±300 ppm/°C			
Mounting position			any			
Mounting			DIN rail (IEC/EN 60715), snap-on mounting / screw mounting with adapter			
Electrical connection						
Wire size	rigid		plug-connector with screw terminals 0.2-2.5 mm^2 (24-12 AWG)			
	fine-strand with(out) wire end ferrule		plug-connector with screw terminals 0.2-2.5 mm^2 (24-12 AWG)			
Stripping length			7 mm (0.28 inch)			
Tightening torque			0.4 Nm (3.5 ib.in)			
Electromagnetic compatibility						
Interference immunity			EN 61000-6-2			
electrostatic discharge (ESD)	IEC/EN 61000-4-2		Level 3 (±6 kV / ±8 kV)			
electromagnetic field (HF radiation resistance)	IEC/EN 61000-4-3		10 V/m			
fast transients (Burst)	IEC/EN 61000-4-4		Level 3 (±2 kV / 5 kH)			
powerful impulses (Surge)	IEC/EN 61000-4-5		±2 kV / ±1 kV			
HF line emission	IEC/EN 61000-4-6		10 V			
Interference emission	EN 61000-6-4		Class B			
Isolation data						
Insulation voltage (between all isolated circuits)			2.5 kV			
Test voltage (between all isolated circuits)			2.5 kV			

[1] When connecting a 2-wire sensor, the terminals J and H have to be jumpered.

Approvals on page 4/4.

Analog signal converters - CC-U range
Technical data

Type		CC-U/I	CC-U/V
Input circuits - Analog inputs	**J-G-H**	**any current signals, RMS measurement**	**any voltage signals, RMS measurement**
Rated input range		0-1 A 0-5 A	0-100 V, 0-150V, 0-250 V 0-300 V, 0-400 V, 0-450 V 0-550 V, 0-600 V
Measuring frequency		0-600 Hz	
Overload capacity of inputs	input range 1	10 x I_{Nom} (10 A) for max. 2 s	-
	input range 2	10 x I_{Nom} (50 A) for max. 2 s	-
Gain adjustment range		±15 %	
Offset adjustment range		±20 %	
Input impedance / resistance		1A: 60 mΩ, 5 A: 12 mΩ	> 800 kΩ
Output circuits - Analog outputs	**D-F, A-C**	**Current**	**Voltage**
Output signal		0-20 mA, 4-20 mA	0-5 V, 1-5 V, 0-10 V, 2-10 V, ± 10 V
Output load		≤ 600 Ω	≥ 4.7 KΩ
Accuracy[1)]		±0.5 % of full-scale	
Temperature coefficient		±250 ppm/°C max.	±300 ppm/°C max.
Residual ripple		< 0.15 %	
Response time		150 ms	
Supply circuits	**K-M**	**DC versions**	**AC versions**
Rated supply voltage		24-48 V DC	110-240 V AC
Supply voltage range		24-48 V DC, 24 V AC	110-240 V AC, 100-300 V DC
Supply voltage tolerance		DC: -15...+15 %	AC: -15...+10 %
Rated frequency		0 Hz or 50/60 Hz	
Power consumption		2 W at 24 V DC	4.5 VA at 230 V AC
Indication of operational states			
Supply voltage		U: green LED	
General data			
Ambient temperature range	operation / storage	-20...+60 °C / -40...+80 °C	
Mounting position		any	
Mounting		DIN rail (IEC/EN 60715), snap-on mounting / screw mounting with adapter	
Electrical connection			
Wire size	rigid	plug-connector with screw terminals 0.2-2.5 mm2 (24-12 AWG)	
	fine-strand with(out) wire end ferrule	plug-connector with screw terminals 0.2-2.5 mm2 (24-12 AWG)	
Stripping length		7 mm (0.28 inch)	
Tightening torque		0.4 Nm (3.5 lb.in)	
Standards			
Product standard		-	
Low Voltage directive		2006/95/EC	
EMC directive		2004/108/EC	
RoHS directive		2011/65/EC	
Electromagnetic compatibility			
Interference immunity		EN 61000-6-2	
electrostatic discharge (ESD)	IEC/EN 61000-4-2	Level 3 (±6 kV / ±8 kV)	
electromagnetic field (HF radiation resistance)	IEC/EN 61000-4-3	10 V/m	
fast transients (Burst)	IEC/EN 61000-4-4	Level 3 (±2 kV / 5 kH)	
powerful impulses (Surge)	IEC/EN 61000-4-5	±2 kV / ±1 kV	
HF line emission	IEC/EN 61000-4-6	10 V	
Interference emission	EN 61000-6-4	Class B	
Isolation data			
Insulation voltage (between all isolated circuits)		1.5 kV	
Test voltage (between all isolated circuits)		1.5 kV / 50 Hz	

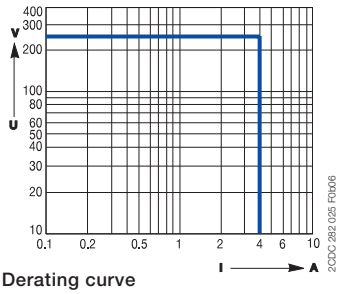
[1)] Includes non-linearity and factory setting, influenced by supply voltage and output load.

Approvals on page 4/4.

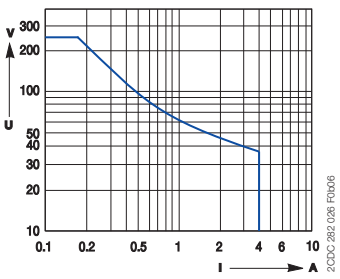
Analog signal converters - CC-U range
Technical diagr., Connection diagr., Dimensional drawings

Technical diagrams
Load limit curves CC-U/xxR

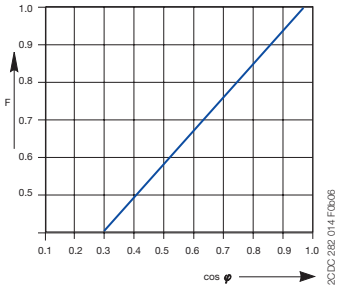
Resistive AC load



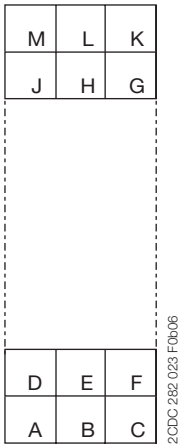
Resistive DC load



Derating curve

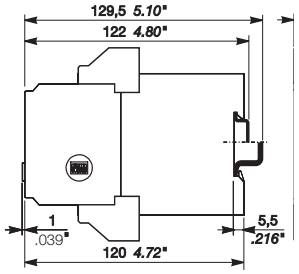


Connection diagram CC-U/x
Width 22.5 mm (0.89 in)



Dimensional drawings Dimensions in mm and inches

CC-U/x , CC-U/xR



Serial data converters
Product picture

4

Serial data converters
Table of contents

Serial data converters
Benefits and advantages

ILPH RS 232 - 485 / Ethernet
- Electrical isolation between power supply and input/output
- RS232 on SUBD 9 points or screw connectors
- RS485 on removable screw connectors
- Ethernet 10/100 Mbit/s, RJ45 connector
- Power supply 10-34 VDC and 10-24 VAC
- Possible to have a redundant 10-34 VDC power supply
- Economic with low consumption
- Up to 100m with CAT5 cable without Hub or Switch
- Good EMC characteristics
- Up to 2 Modbus®\TCP Masters

Available modes:
- Modbus®\TCP to Modbus® RTU
- Transparent Client or Server mode
- SMTP mode (Mail mode)

Standards: TPC/IP, TELNET, DHCP, FTP
- Specifics functions in Modbus® protocol:
- Concentrator (Asynchronous mode) up to 1200 words
- AC31 programming
  Modbus® Easy Net mode : this mode could be used to exchange data without a Modbus®/TCP master. The data are logged in a table and could be distributed to one or all the others e-ILPH participants on Ethernet.

ILPH RS 232 / RS 422 - 485
- Electrical isolation between power supply and input/output
- RS 485 switch on 2 or 4 wires
- Baudrate up to 38.4 kbit/s
- Transmission distance up to 1200 m
- RS 485 1 or 2 pair handling
- Usable in "noisy" environments
- 24...48 V DC and 115...230 V AC power supply
- CE marked

ILPH RS 422 - 485 / RS 422 - 485
Electrical isolated connection between an RS 422-485 (1 or 2 pairs) and an RS 422 485 (1 or 2 pairs) serial link. It amplifies the signal beyond the 1200 m limit distance of the RS 422-485 and only needs a minimum of 1.5 character delay time to switch off the RS 485 drivers.
- Electrical isolation between power supply/output and input/output
- Baudrate up to 500 kbit/s (up to 200 m)
- Transmission distance up to 1200m at 38.4 kbit/s
- Usable in "noisy" environments
- 2/4 wires automatic handling
- 24 V DC power supply
- CE marked

ILPH RS 232 / RS 422 - 485
RS 232 to RS 422-485 serial link with or without electrical isolation
- Baudrate up to 38.4 kbit/s
- Transmission distance up to 1200 m
- RS 485 1 or 2 pair handling
- Usable in "noisy" environments
- 24 V DC power supply
- CE marked

ILPH RS 485 / FO
Converter for RS 485 (1 pair) to optical fiber serial link glass.
- Electrical isolation between power supply and input/output
- Baud rate up to 1.5 Mbit/s
- Transmission distance up to 4 km
- Usable in "very noisy" environments
- 20...42 V AC/DC power supply
- CE marked

ILPH RS 232 / CL
Electrical isolated Converter for RS 232 to current loop serial link.
- Electrical isolation between power supply/current loop and RS 232/current loop
- Active/Passive 0...20 mA / 4...20 mA selectable
  Positive or negative logic selectable
- Baudrate up to 38.4 kbit/s
- Transmission distance up to 1200 m
- Usable in "noisy" environments
- 24 V DC power supply
- CE marked

ILPH RS 232 / RS 232
3 way electrical isolator between RS 232 serial interface and another RS 232 serial interface.
- Ensures triple insulation between the 2 serial interfaces and between each and power supply
- Baudrate up to 19.2 kbit/s (up to 64 kbit/s depending on cable)
- Transmission distance up to 15 m
- Can be used in "noisy" environments
- Power supply from 24...48 V DC and 115...230 V AC CE marking

ILPH RS 232 / FO
- Converter for RS 232 to fiber optical serial link glass.
- Electrical isolation between power supply and input/output
- Baud rate up to 115.2 kbit/s
- Transmission distance up to 4 km
- Usable in "very noisy" environments
- 20...42 V AC/DC power supply
- CE marked

ILPH CL / RS 422 - 485
Electrical isolated converter for current loop to RS 422-485 (1 or 2 pairs) serial link.
- Electrical isolation between power supply/current loop and RS 422-485/current loop
- Active/passive 0...20 mA / 4...20 mA selectable
  Positive or negative logic selectable
- Baudrate up to 38.4 kbit/s (up to 2400 m)
  Transmission distance up to 2400 m (1200 m RS 485 and 1200 m current loop)
- Usable in "noisy" environments
- 24 V DC power supply
- CE marked

Serial data converters
Selection table

	RS 232	RS 422 / RS 485	CL	FO-S	Ethernet	24 V DC	24-48 V DC	110-240 V AC	24-42 V AC/DC	10-34 VDC, 10-24 VAC	Insulation IN=Input PS=Power supply Out=Output Wi=Without insulation	Part numbers
RS 232	■						■				In-Ps-Out	1SNA 684 234 R2000
		■				■					Wi	1SNA 684 231 R2500
		■				■					In-Out	1SNA 684 233 R2700
		■					■				In-Ps-Out	1SNA 684 333 R2300
		■						■			In-Ps-Out	1SNA 684 334 R2400
			■			■					In-Out	1SNA 684 202 R0100
				■					■		In-Ps-Out	1SNA 684 236 R2200
RS 422/RS485		■				■					In-Out	1SNA 684 212 R2200
			■			■					In-Out	1SNA 684 232 R2600
RS 485				■					■		In-Ps-Out	1SNA 684 246 R0400
RS 232 / RS 485					■					■	In-Ps-Out	1SNA 684 252 R0200

RS 232 - EIA-232 / V.24 / V.28
- Point-to-point connection
- Max. 15 m transmission distance
- Rate up to 19.2 kbit/s
- Full-duplex

RS 422 - EIA-422 / V.11
- Point-to-point connection
- (1 Transmitter - 10 Receivers)
- Differential voltage transmission
- Full-duplex
- Up to 1200 m/ 10 Mbit/s
- Good EMC characteristics

Current loop(TTY)
- Point-to-point / multi-point connection
- Active or passive current loop
- Full-duplex
- Up to 1200 m/19.2 kBit/s
- Good EMC characteristics

RS 485 - ISO/IEC/EIA-485
- Multi-point connection up to 32 units
- Differential voltage transmission
- Half-duplex on 1 pair
- Full-duplex on 2 pairs
- Up to 1200 m / 10 Mbit/s
- Good EMC characteristics

Optical fiber interface
- Point-to-point connection
- Full-duplex
- From 40 m up to 4km transmission distance
- Excellent EMC characteristics

Ethernet Interface
- Point to point connexion or multipoint connection.
- Up to 100 m using CAT5 cable without Hub or Switch
- 10/100 Mbit/s
- Good EMC characteristics

Serial data converters
Ordering details

ILPH RS 232-RS 485 / Ethernet

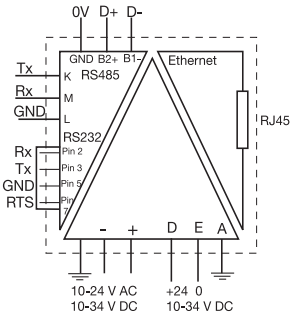
ILPH RS 232 / RS 422-485

Ordering details

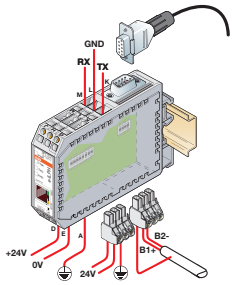
Description	Type	Order code	Price	Weight (1 pce) kg (lb)
Serial data converter e-ILPH	ILPH RS 232-RS 485 / Ethernet	1SNA684252R0200		0.12 (0.265)
Serial link interface without electrical isolation	ILPH RS 232 / RS 422-485	1SNA684231R2500		0.1 (0.220)
Serial link interface with electrical isolation	ILPH RS 232 / RS 422-485	1SNA684233R2700		0.1 (0.220)
Serial link interface 3 way electrical isolation	ILPH RS 232 / RS 422-485 (24-48 V DC power supply)	1SNA684333R2300		0.1 (0.220)
	ILPH RS 232 / RS 422-485 (115-230 V AC power supply)	1SNA684334R2400		
Serial link interface 3 way electrical isolation	ILPH RS 232 / RS 232 (24-48 V DC power supply)	1SNA684234R2000		0.1 (0.220)
	ILPH RS 232 / RS 232 (115-230 V AC power supply)	1SNA684234R0200		
Serial link interface with electrical isolation	ILPH RS 422 - 485 / RS 422 - 485 (24 V DC power supply)	1SNA684212R2200		0.1 (0.220)
Serial link interface 3 way electrical isolation	ILPH RS 232 / FO-S (24...42 V AC/DC power supply)	1SNA684236R2200		0.15 (0.331)
Serial link interface 3 way electrical isolation	ILPH RS 485 / FO-S (24...42 V AC/DC power supply)	1SNA684246R0400		0.15 (0.331)
Serial link interface with electrical isoaltion	ILPH BdC /RS 422 - 485 (24 V DC power supply)	1SNA684232R2600		0.1 (0.220)
Serial link interface with electrical isolation	ILPH RS 232 (24 V DC power supply)	1SNA684202R0100		0.1 (0.220)

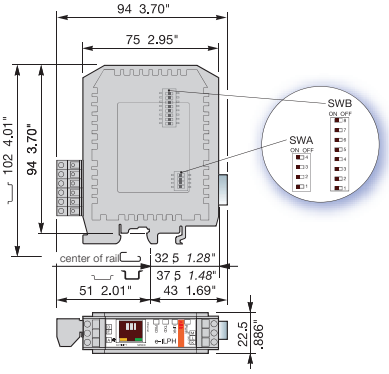
Serial data converters
Technical information

ILPH RS 232 - 485 Ethernet
1SNA684252R0200

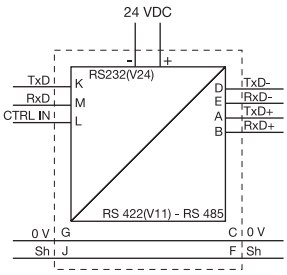


SubD9 connector
pin 2 = RX
pin 3 = TX
pin 5 = GND
pin 7 = RTS

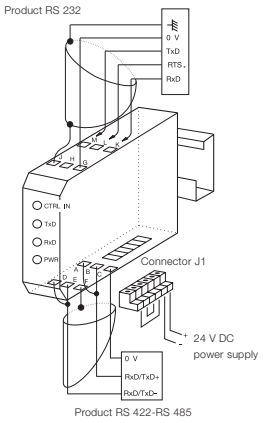




ILPH RS 232 / RS 422-485 (without isolation)
1SNA684231R2500

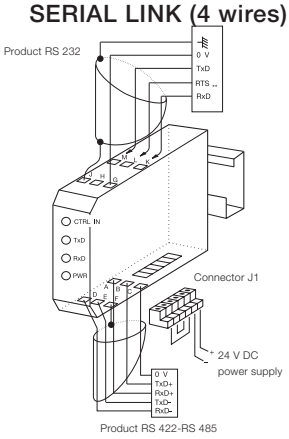


RS 422 - RS 485 SERIAL LINK (2 wires)

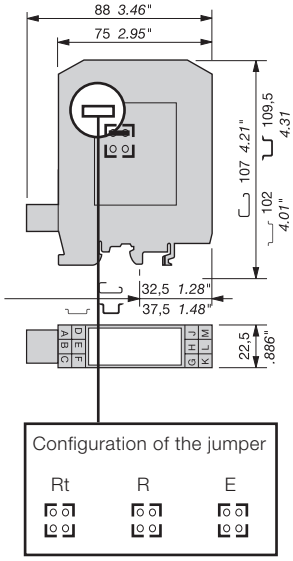


*CAUTION:
When the RTS Signal is not activated, M terminal (RxD ILPH) has to be connected to L terminal (CTRL IN).

RS 422 - RS 485 SERIAL LINK (4 wires)



** CAUTION :
To be connected to 2 wired RS 485 only (not possible for 4 wired RS 422).
When the RTS Signal is not activated, M terminal (RxD ILPH) has to be connected to L terminal (CTRL IN).



RS 485 LINK ON ONE PAIR

without isolation	R		R ON/ OFF	Jumper R in position RON/OFF
	E		E ON/ OFF	Jumper E in position EON/OFF

The Receiver and the Transmitter are activated alternately (never at the same time) depending on the status of the CTRL IN signal.

CTRL IN STATUS	ACTION ON RS 485
0 logic (+3V ≤ U ≤ +25V)	Transmitter active / Receiver inactive
1 logic (-25V ≤ U ≤ -3V)	Transmitter inactive / Receiver active
High impedance	Transmitter inactive / Receiver active

NOTE : For RS 232 products running the RTS (REQUEST TO SEND) signal, connect RTS to CTRL IN. Otherwise, connect M (RxD ILPH) to L (CTRL IN).

POLARIZATION OF THE RS 422 - RS 485 LINE

The line must always be polarized.
The ILPH is used to polarize the reception channel :

Connection by 1 wire	P+ (J1.1) with 5V (J1.4)
Connection by 1 wire	P- (J1.2) with 0V (J1.3)

RS 485 LINK ON TWO PAIRS

without isolation	R		R ON	Jumper R in position RON
	E		E ON/ OFF	Jumper E in position EON/OFF

Receiver permanently active
Transmitter controlled by the signal CTRL IN (see table for Transmitter operation as a function of CTRL IN)

RS422 LINK ON TWO PAIRS

without isolation	R		R ON	Jumper R in position RON
	E		E ON	Jumper E in position EON

The Transmitter and Receiver are both permanently active.

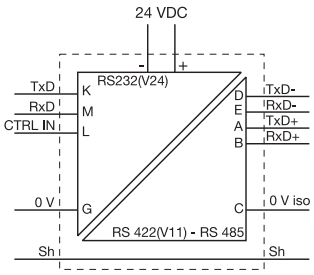
ADAPTING THE RS 422 - RS 485 LINE

The line must always be adapted to the level of the reception channel of each subscriber forming the end of the bus. The ILPH is used to adapt the reception channel by setting the jumper Rt correctly :

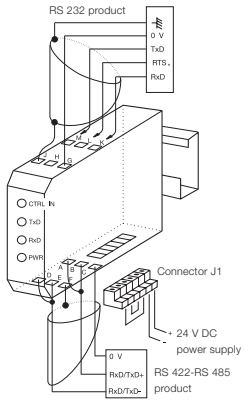
Rt		* Line adaptation, Rt = 120 Ω (general case)
		* Line adaptation, Rt = 220 Ω
		* No line adaptation, Rt = ∝

Serial data converters
Technical information

ILPH RS 232 / RS 422-485 (with isolation)
1SNA684233R2700

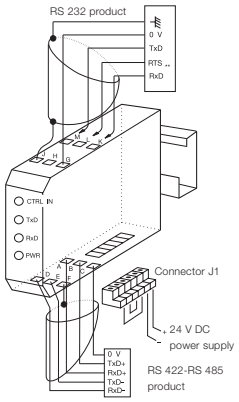


RS 422 - RS 485 WIRE SERIAL LINKS

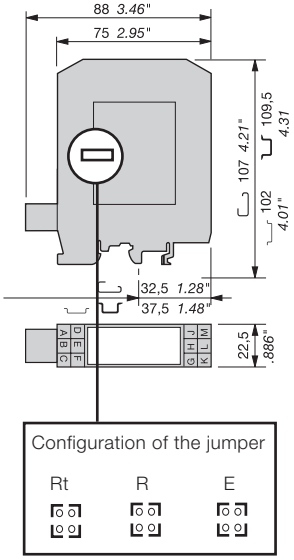


* **CAUTION** :
If the RTS signal is not generated, connect M (RxD ILPH) to L (CTRL IN).

RS 422 - RS 485 WIRE SERIAL LINKS



** **CAUTION** :
Only to be connected for RS 485 two pairs (of no use for RS 422 two pairs).
If the RTS signal is not generated, connect M (RxD ILPH) to L (CTRL IN).



RS 485 LINK ON ONE PAIR

Isolated	R		R ON/ OFF	Jumper R in position RON/OFF
	E		E ON/ OFF	Jumper E in position EON/OFF

The Receiver and the Transmitter are activated alternately (never at the same time) depending on the status of the CTRL IN signal.

CTRL IN STATUS	ACTION ON RS 485
0 logic (+3 V ≤ U ≤ +25 V)	Transmitter active / Receiver inactive
1 logic (-25 V ≤ U ≤ -3V)	Transmitter inactive / Receiver active
High impedance	Transmitter inactive / Receiver active

NOTE : For RS 232 products running the RTS (REQUEST TO SEND) signal, connect RTS to CTRL IN. Otherwise, connect M (RxD I LPH) to L (CTRL IN).

POLARIZATION OF THE RS 422 - RS 485 LINE

The line must always be polarized.
The ILPH is used to polarize the reception channel :

Connection by 1 wire	P+ (J1.1) with 5V (J1.4)
Connection by 1 wire	P- (J1.2) with 0V (J1.3)

RS 485 LINK ON TWO PAIRS

Isolated	R		R ON	Jumper R in position RON
	E		E ON/ OFF	Jumper E in position EON/ OFF

Receiver permanently active
Transmitter controlled by the signal CTRL IN (see table for Transmitter operation as a function of CTRL IN)

RS422 LINK ON TWO PAIRS

Isolated	R		R ON	Jumper R in position RON
	E		E ON	Jumper E in position EON

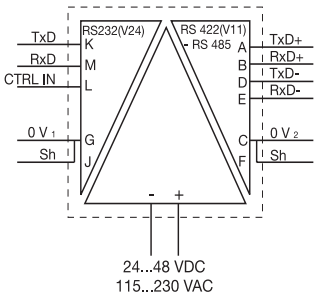
The Transmitter and Receiver are both permanently active.

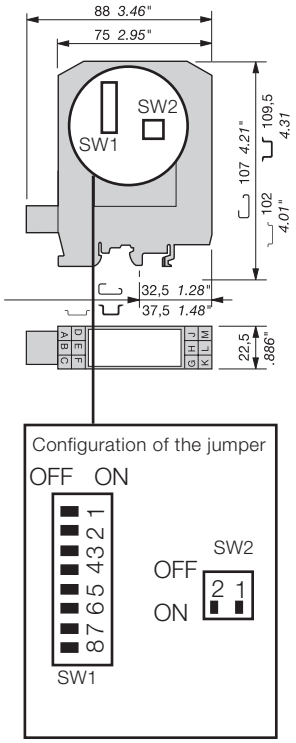
ADAPTING THE RS 422 - RS 485 LINE

The line must always be adapted to the level of t he reception channel of each subscriber forming the end of the bus. The ILPH is used to adapt the reception channel by setting the jumper Rt correctly :

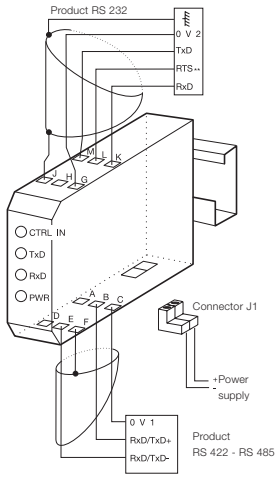
Rt		* Line adaptation, Rt = 120 Ω (general case)
		* Line adaptation, Rt = 220 Ω
		* No line adaptation, Rt = ∝

ILPH RS 232 / RS 422 - 485 (eletrical isolated)
1SNA684333R2300, 1SNA684334R2400





RS 422 - RS 485
2 WIRE SERIAL LINK



***CAUTION :**
When the RTS signal is not generated, set SW2-1 in position ON.

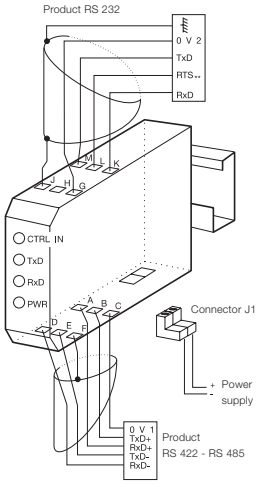
RS 485 LINK ON ONE PAIR
Set SW1-1, SW1-3, SW1-6, SW1-7 and SW1-8 to position ON. The receiver and the transmitter are activated alternately (never at the same time), depending on the status of the CTRL IN signal.

CTRL IN STATUS	Action on RS 485
0 Logic (3 V ≤ U ≤ + 25 V)	Transmitter active / Receiver inactive
1 Logic (-25 V ≤ U ≤ -3 V)	Transmitter inactive / Receiver active
High impedance	Transmitter inactive / Receiver active

CAUTION : For RS 232 products running the RTS signal (REQUEST TO SEND), connect RTS to CTRL IN.
Otherwise, set SW2-1 to position ON.

RS 485 LINK ON TWO PAIRS
Set SW1-1, SW1-3, SW1-7 in position OFF.
Set SW1-6, SW1-8 in position ON.
The receiver is permanently active.
The transmitter is controlled by the signal CTRL IN (see table for transmitter operation as a fonction of CTRL IN).

RS 422 - RS 485
4 WIRE SERIAL LINKS



****CAUTION :**
Only to be connected for RS 485 two pairs (of no use for RS 422 two pairs).
If the RTS signal is not generated, set SW2-1 in position ON.

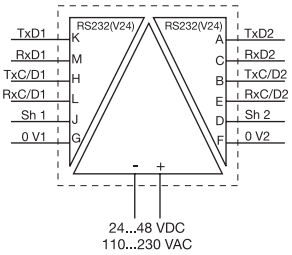
RS 422 LINK ON TWO PAIRS
Set SW1-1, SW1-3, SW1-7 and SW1-8 in position OFF.
Set SW1-6 in position ON.
Transmitter and receiver are both permanently active.

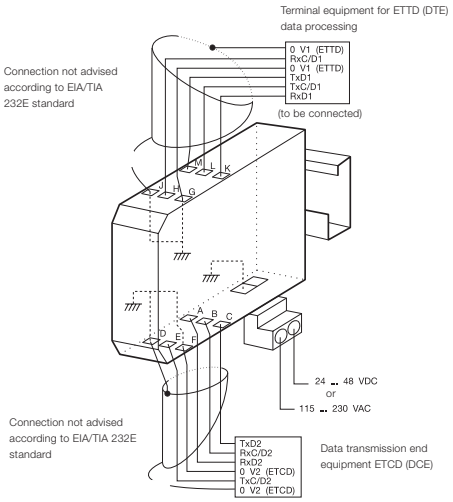
POLARIZATION OF THE RS 422 - RS 485 LINE
The line must always be polarized.
The ILPH is used to polarize the reception channel.
Set SW1-4 and SW1-5 in position ON.

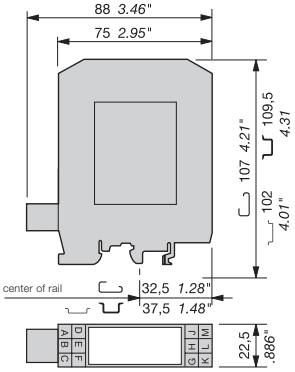
ADAPTING THE RS 422 - RS 485 LINE
The line must always be adapted to the level of the reception channel of each subscriber forming the end of the bus.
The ILPH is used to adapt the reception channel by setting the jumper SW1-2 correctly :
SW1-2 in position ON ⇒ line adaptation
Rt = 120 Ω (standard)
SW1-2 in position OFF ⇒ no line adaptation
Rt = ∝

Serial data converters
Technical information

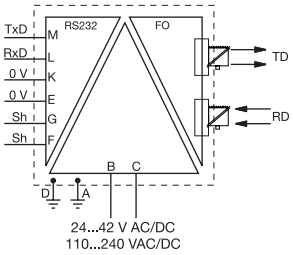
ILPH RS 232 / RS 232 (eletrical isolated)
1SNA684234R2000, 1SNA684244R0200

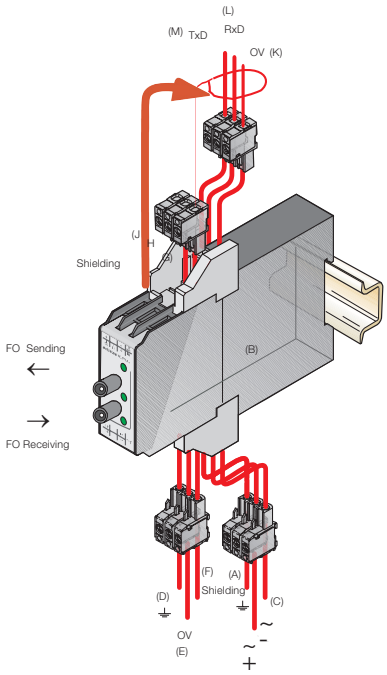


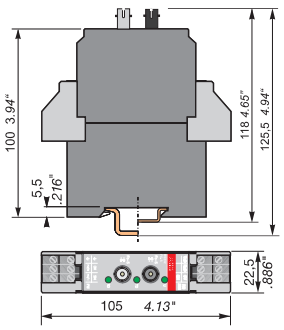




ILPH RS 232 / FO
1SNA684236R2200

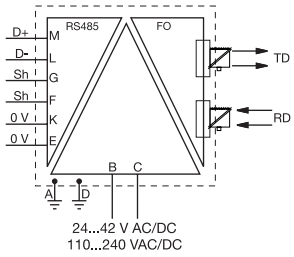


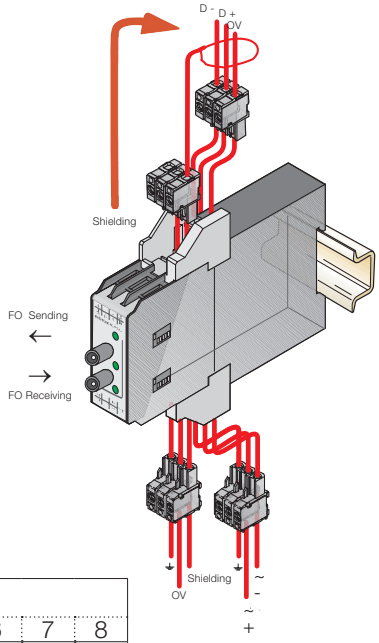


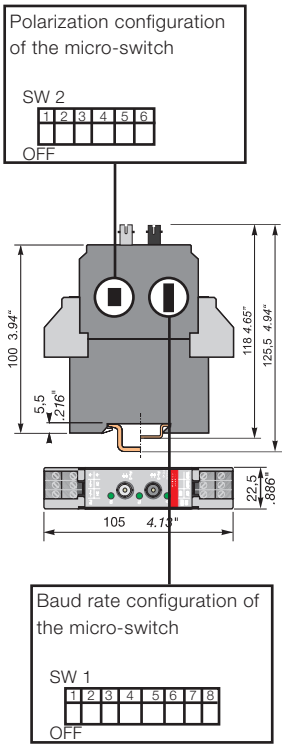


Serial data converters
Technical information

ILPH RS 485 / FO
1SNA684246R0400







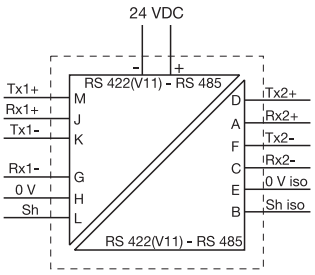
Baud rate:
SW1 DIP switch configuration

Baudrate bit/s	SW 1							
	1	2	3	4	5	6	7	8
1500000		■		■	■			
500000	■		■		■			
375000	■	■				■		
187500	■		■		■	■		
136000		■				■		
115200		■	■		■	■		
93750	■	■	■	■			■	
75000	■		■	■		■	■	
57600			■	■	■	■	■	
38400			■		■	■		
19200	■		■			■	■	
9600		■					■	
4800		■	■	■	■	■		■
300			■					■

End-of-line resistor, polarization:
SW2 DIP switch configuration

Baudrate bit/s	SW 2					
	1	2	3	4	5	6
Polarization		■	■			
EOL 60 ohm				■	■	■
EOL 120 ohm					■	■
EOL 180 ohm				■	■	
EOL 240 ohm					■	
EOL indefinite						

ILPH RS 422 - 485 / RS 422 / - 485
1SNA684212R2200

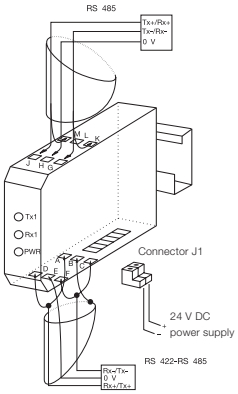


	INT 1	INT 2	INT 3	INT 4
BAUD RATE	1234	1234	1234	123456
FULL DUPLEX	0000	0000	XXX1	XXX101
500 Kb/s	1111	1111	XXX0	XXX000
187.5 Kb/s	1111	1110	XXX0	XXX000
93.75 Kb/s	1111	1100	XXX0	XXX000
38.4 Kb/s	1111	1000	XXX0	XXX000
19.2 Kb/s	1111	0000	XXX0	XXX000
9.6 Kb/s	1110	0000	XXX0	XXX000
4.8 Kb/s	1100	0000	XXX0	XXX000
2.4 Kb/s	1000	0000	XXX0	XXX000
1.2 Kb/s	0000	0000	XXX0	XXX000

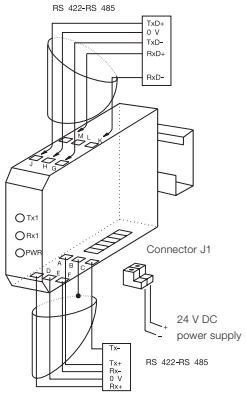
N_U = not used
X = zero

1 = contact closed
0 = contact open (aus) (off)

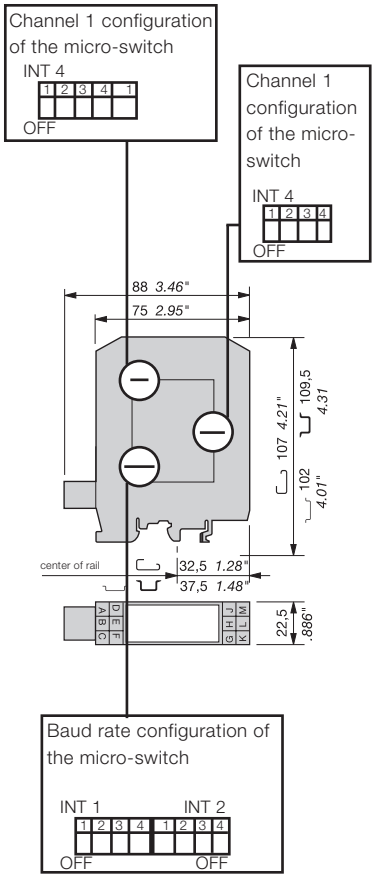
RS 422 - RS 485 2 wire serial link



RS 422 - RS 485 4 wire serial link



Caution :
The transmission channels of both RS 422 - RS 485 serial link interfaces always have to be independently polarized.



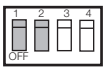
RS 422 - RS 485 DRIVERS CONTROL

The RS 422 - RS 485 Drivers Control (transmitters and receivers) makes the ILPH easy to use. The control of the 2 channels is completely automatic ; you only have to configure the baud rate needed. The minimum turn off delay is about 1.5 character/ time from 27 µs to 10 ms depending on the baud rate selected.

POLARIZATION OF THE RS 422 - RS 485 CONNECTIONS

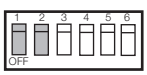
The connections must always be polarized. The ILPH is used to polarize the reception channels:

INT 3



INT 3.1
INT 3.2
} "ON", polarizes the reception channel Rx2

INT 4

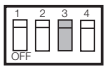


INT 4.1
INT 4.2
} "ON", polarizes the reception channel Rx1

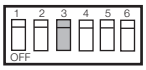
ADAPTING THE RS 422 - RS 485 CONNECTIONS

The connections must always be adjusted to the level of the reception channel of each subscriber forming the end of the bus. The ILPH is used to adjust the reception channel by setting the micro-switch INT 3.3 and INT 4.3.

INT 3



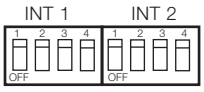
INT 4



INT 3.3 and INT 4.3 "ON" 120 Ω set adjustment

BAUD RATE

By using the 8 micro-switches inside the box.



Permits to define up to 8 transmission speeds and to select the Full Duplex operation mode (RS 422 / RS 422) in addition with the INT 3.4 INT 4.4 and INT 4.5 micro switches.

Serial data converters
Technical information

ILPH CL / RS 422 - 485
1SNA684232R2600

LINE AMPLIFIER CONFIGURATION

Configuration of amplifiers of the RS 422 - RS 485 (Receiver, Transmitter) line provides greater flexibility of use.The various configurations can be selected using the 2 jumpers (R INT2, E INT1) located inside the box.

RS 485 LINK ON ONE PAIR

R INT2 R ON — R ON/OFF Jumper R in position R ON/OFF
E INT3 — E ON/OFF Jumper E in position E ON/OFF

The Receiver and the Transmitter are activated alternately (never at the same time) depending on the status of the Current Loop Reception signal.

RS 485 LINK ON TWO PAIRS

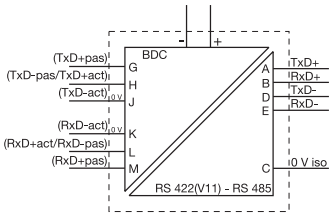
R INT2 R ON — R ON Jumper R in position R ON
E INT3 E ON / OFF — E ON/OFF Jumper E in position E ON/OFF

Receiver permanently active. Transmitter controlled by the Current Loop Reception signal.

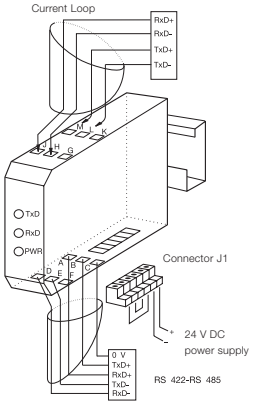
RS 422 LINK ON TWO PAIRS

R INT2 R ON — R ON Jumper R in position R ON
E INT3 E ON — E ON Jumper E in position E ON

The Receiver and the Transmitter are both permanently active.

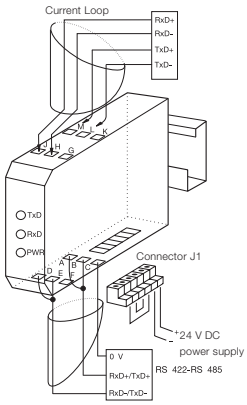


RS 422 - RS 485 4 wire serial link



Note :
The TxD channel of the RS 422 - RS 485 link must be polarized independently too.

RS 422 - RS 485 2 wire serial link



CONNECTIONS

Example of connection with a CL (current Loop) product, Transmission (TxD) in active mode and Reception (RxD) in passive mode.
Then, the ILPH must be configured and connected Reception (RxD) in passive mode and Transmission (TxD) in active mode.
Note : For any other configuration, see schematic diagram or front sticker of the product.

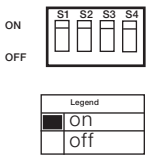
POLARIZATION OF THE RS 422 - RS 485 LINE

The line must always be polarized. The ILPH is used to polarize the reception channel :
Connection by 1 wire P+ (J1.1) with 5 Viso (J1.4)
Connection by 1 wire P- (J1.2) with 0 Viso (J1.3)

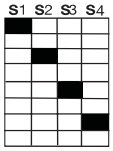
ADAPTING THE RS 422 - RS 485 LINE

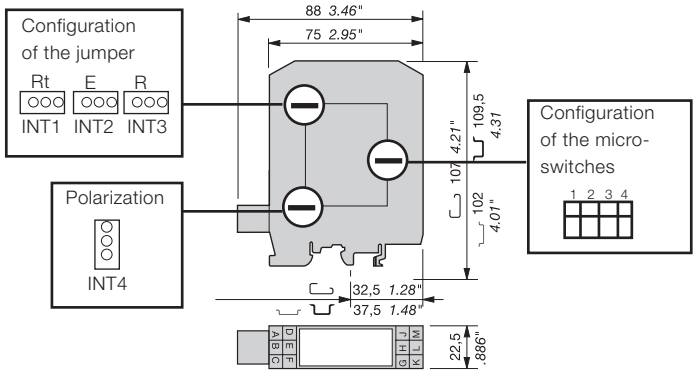
The line must always be adapted to the level of the reception channel of each subscriber forming the end of the bus. The ILPH is used to adapt the reception channel by setting the jumper Rt correctly :

Rt INT1 — * Line adaptation, Rt = 120 Ω (Standard)
Rt INT1 — * No line adaptation, Rt = ∞



Transmission (TxD) active
Transmission(TxD) passive
Reception (RxD) active
Reception (RxD) passive
4...20 mA Signal
0...20 mA Signal
Signal logic 1 = 20 mA
Signal logic 0 = 20 mA





POLARIZATION

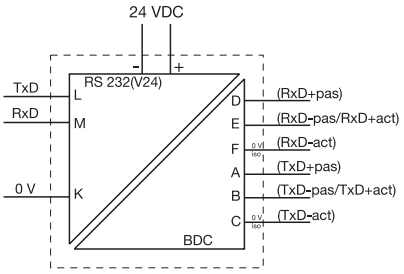
The polarization can be configured using the INT4 jumper.

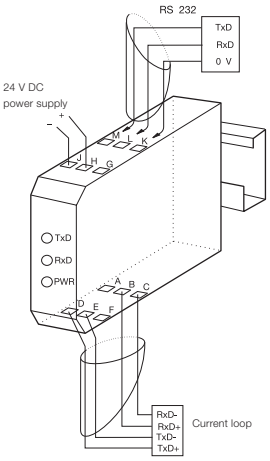
INT4 Protection ON

INT4 Protection OFF, used if power supply at minimum value (21.6 V).

Serial data converters
Technical information

ILPH RS 232 / CL
1SNA684202R0100





CONNECTIONS

Example of connection with a CL (Current Loop) product, Transmission (TxD) in active mode and Reception (RxD) in passive mode. Then, the ILPH must be configured and connected Reception (RxD) in passive mode and Transmission (TxD) in active mode.

CAUTION: For any other configuration, see schematic diagram or front sticker of the product.

CONFIGURATION

The various configurations can be selected using the 4 micro-switches located inside the box.

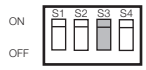
OPERATING MODE ACTIVE OR PASSIVE

The Current Loop's Transmission and Reception can be independently in active or passive mode.
Select operating mode using **S1** and **S2**.

S1 Transmission(TxD) ON = Active / OFF = Passive
S2 Reception (RxD) ON = Active / OFF = Passive

SIGNAL LEVEL

Select signal level 4-20 mA or 0-20 mA. This selection is made using micro-switch S3



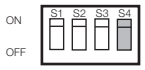
S3 ON = 4-20 mA / OFF = 0-20 mA

Caution : It is not possible to select a 4-20 mA signal when the Reception is in active mode.

LOGIC LEVEL

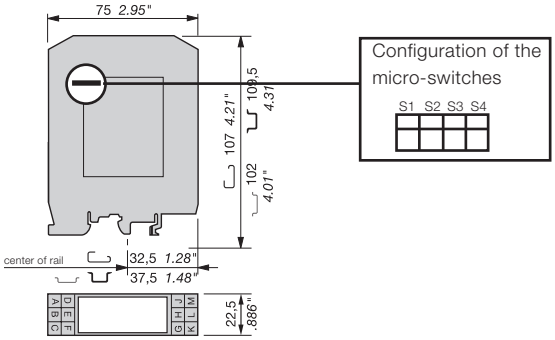
Configuration: Positive logic (0 Logic = 20 mA)
or negative logic (1 Logic = 20 mA)

using micro-switch S4



S4 ON = (1 = 20 mA) / OFF = (0 = 20 mA)

ILPH RS 232 / CL



Serial data converters
Technical data

Technical data
Data at T_a = 25 °C and rated values, unless otherwise indicated

	ILPH RS 232 - 485 / Ethernet
Power supply 1	
Voltage	10...34 V DC, 10...24 V AC
Voltage tolerance	-10%, +10%
Consumption	2 W max
Connections	coding screw removable connector 0 to 2.5 mm² (22-14 AWG)
Power supply 2	
Voltage	10...34 V DC
Voltage tolerance	-10%, +10%
Consumption	2 W max
Connections	screw connector (AWG 20)
Serial link 1: RS 232	EIA RS 232
Overvoltage protection	integrated
Baud rate / Transmission distance	max. 115.2 kbits/s / max. 15 m
Connections	2.5 mm² screw connector (AWG 20) or male SubD 9 points
Serial link 2: RS 485	EIA RS 485
Voltage	integrated
Line polarization	integrated
End line resistance	integrated
Baud rate / Transmission distance	max. 115.2 kbits/s / max. 1200 m
Connections	coding screw removable connector 0 to 2.5 mm² (22-14 AWG)
Ethernet link	
Overvoltage protection	integrated
Baud rate / Transmission distance	10-100 Mbits/s / max. 100 m without Hub or Switch with CAT5 cable
Connections	RJ45 connector
Traffic indication	
Voltage	1 yellow LED
Status of signal	3 green LED (RxD, TxD, LINK), 2 amber or green LED (Speed, Activity)
EMC behavior	
Electrostatic discharge	EN 61000-4-2
Radiated electromagnetic field	EN 61000-4-3
Burst	EN 61000-4-4
Surge	EN 61000-4-5
Electromagnetic compatibility	EN 55022
Other characteristics	
Electrical isolation between serial link / power supply / Ethernet link	750 VDC / 1500 VAC
Configuration of the operating mode	using internal switches or/and software (TELNET or HYPERTERMINAL)
Operating temperature	0°C ... +60°C
Storage temperature	-20°C ... +70°C
Mounting	any required
DIN rail fixing (EN 50002)	snap-on mounting
Wire size	2.5 mm² / stranded with ferrule, 4 mm² solid
Dimensions (WxDxH)	94 x 22.5 x 100 mm
Weight	120 g

Serial data converters
Technical data

Technical data

Data at T_a = 25 °C and rated values, unless otherwise indicated

	ILPH RS 232 / RS 422 - 485 (without isolation)
Power supply	polarized
Voltage	24 V DC
Voltage tolerance	8.5...28 V DC
Supply current	100 mA max
Connections	removable screw connectors (AWG 20)
Serial link 1: RS 232	EIA RS 232 C / CCITT V24 V28
Overvoltage protection	integrated (transil 8 kV 1.2/50 µs)
Baud rate / Transmission distance	max. 38.4 kbits/s / max. 1200 m
Connections	2.5 mm² screw connectors (AWG 20)
Serial link 2: RS 422-485	EIA RS 485 and EIA RS 422 / CCITT V11
Overvoltage protection	integrated (transil 8 kV 1.2/50 µs)
Baud rate / Transmission distance	max. 38.4 kbits / max. 1200 m
Connections	2.5 mm² screw connectors (AWG 20)
Traffic indication	
Voltage	1 yellow LED
Connections	2 green LED (RxD, TxD)
EMC behavior	
Electrostatic discharge	EN 61000-4-2 level 3 6/8 kV
Radiated electromagnetic field	EN 61000-4-3 level 310 V/m
Burst	EN 61000-4-4 level 3 1 kV
Electromagnetic compatibility	EN 55022 class B
Other characteristics	
Electrical isolation between serial link / power supply / Ethernet link	no
Configuration of the operating mode	using internal jumper
Operating temperature	0°C ... +50°C
Storage temperature	-25°C ... +80°C
Mounting	any required
DIN rail fixing (EN 50002)	snap-on mounting
Wire size	2.5 mm² / stranded with ferrule, 4 mm² solid
Dimensions (WxDxH)	88 x 22.5 x 100 mm
Weight	100 g

Serial data converters
Technical data

Technical data

Data at T_a = 25 °C and rated values, unless otherwise indicated

	ILPH RS 232 / RS 422 - 485 (isolated)
Power supply	polarized
Voltage	24 V DC
Voltage tolerance	8.5...28 V DC
Supply current	100 mA max
Connections	Removable screw connectors (Omniconnect)
Serial link 1: RS 232	EIA RS 232 C / CCITT V24 V28
Overvoltage protection	integrated (transil 8 kV 1.2/50µs)
Baud rate / Transmission distance	max. 38.4 kbits/s / max. 15 m
Connections	2.5 mm² screw connectors (AWG 20)
Serial link 2: RS 422-485	EIA RS 485 and EIA RS 422 / CCITT V11
Overvoltage protection	integrated (transil 8 kV 1.2/50 µs)
Baud rate / Transmission distance	max. 38.4 kbits / max. 1200 m
Connections	2.5 mm² screw connectors (AWG 20)
Traffic indication	
Voltage	1 yellow LED
Connections	3 green LED (RxD, TxD and CTRL-IN)
EMC behavior	
Electrostatic discharge	EN 61000-4-2 level 3 6/8 kV
Radiated electromagnetic field	EN 61000-4-3 level 310 V/m
Burst	EN 61000-4-4 level 3 1 kV
Electromagnetic compatibility	EN 55022 class B
Other characteristics	
Electrical isolation between serial link / power supply / Ethernet link	500 V DC
Configuration of the operating mode	using internal jumper
Operating temperature	0°C ... +50°C
Storage temperature	-25°C ... +80°C
Mounting	any required
DIN rail fixing (EN 50002)	snap-on mounting
Wire size	2.5 mm² / stranded with ferrule, 4 mm² solid
Dimensions (WxDxH)	88 x 22.5 x 100 mm
Weight	100 g

Serial data converters
Technical data

Technical data

Data at T_a = 25 °C and rated values, unless otherwise indicated

	ILPH RS 232 / RS 422 - 485 (3 way electrical isolated)	
Power supply	Polarization for DC model	
Voltage	24...48 V DC	115...230 V AC (50/60 Hz)
Voltage tolerance	-15% ... +20%	-15% ... +15%
Supply current	24 V DC<110 mA, 48 V DC<55 mA, 115 V AC<40 mA, 230 V DC<26 mA	
Supply power	~ 3 W	~ 3 VA
Connections	Removable screw connector (Omniconnect)	
Serial link 1: RS 232	EA / TIA RS 232 new revision / CCITT V24 V28	
Overvoltage protection	integrated (transil 8 kV 1.2/50 µs)	
Baud rate / Transmission distance	max. 19,2 kbits/s / max. 15 m / 2500 pF	
Connections	2.5 mm² screw (AWG 20)	
Serial link 2: RS 422-485	EIA / TIA RS 232 new revision / CCITT V24 V28	
Overvoltage protection	integrated (transil 8 kV 1.2/50µs)	
Baud rate / Transmission distance	max. 19.2 kbits/s / max. 15 m	
Connections	2.5 mm² screw (AWG 20)	
Traffic indication		
Voltage	1 yellow LED	
Connections	4 green LED (RxD, RxC/D, TxD, TxC/D)	
EMC behavior		
Electrostatic discharge	EN 61000-4-2 level 3 6/8 kV	
Radiated electromagnetic field	EN 61000-4-3 level 3 10 V/m	
Burst	EN 61000-4-4 level 3 1 kV	
Electromagnetic compatibility	EN 55022 class B	
Other characteristics		
Electrical isolation between RS 232 / Power supply / RSS 422-RS 485	1,5 kV	
Configuration of the operating mode	No	
Operating temperature	0°C ... +50°C	
Storage temperature	-25°C ... +80°C	
Mounting	any required	
DIN rail fixing (EN 50002)	snap-on mounting	
Wire size	2.5 mm² / stranded with ferrule, 4 mm² solid	
Dimensions (WxDxH)	88 x 22,5 x 100 mm	
Weight	100 g	

Serial data converters
Technical data

Technical data
Data at T_a = 25 °C and rated values, unless otherwise indicated

	ILPH RS 232 / RS 232	
Power supply	DC model polarized	
Voltage	24...48 V DC	115...230 V AC (50/60Hz)
Voltage tolerance	-15%...+20%	-15%...+15%
Supply current	24 V DC<155 mA;48 V DC<77 mA;110 V AC<40 mA;230 V DC<26 mA	
Supply power	~ 3.15 W	~ 3.15 VA
Connections	Removable screw connector (Omniconnect)	
Interface 1: RS 232	EIA / TIA RS 232 new revision / CCITT V24 V28	
Overvoltage protection	integrated (transil 8 kV 1.2/50 µs)	
Transmission capacity / Transmission distance	max. 19.2 kbits/s / max. 15 m / 2500 pF	
Connections	2.5 mm² screw (AWG 20)	
Interface 2: RS 232	EIA / TIA RS 232 new revision / CCITT V24 V28	
Overvoltage protection	integrated (transil 8 kV 1.2/50 µs)	
Transmission capacity / Transmission distance	max. 19.2 kbits/s / max. 15 m	
Connections	2.5 mm² screw (AWG 20)	
Traffic indication		
Voltage	1 yellow LED	
Connections	4 green LED (RxD, RxC/D, TxD, TxC/D)	
EMC behavior		
Electrostatic discharge	EN 61000-4-2 level 3 6/8 kV	
Radiated electromagnetic field	EN 61000-4-3 level 3 10 V/m	
Burst	EN 61000-4-4 level 3 1 kV	
Electromagnetic compatibility	EN 55022 class B	
Other characteristics		
Electrical isolation between serial link / power supply / Ethernet link	1.5 kV	
Configuration of the operating mode	No	
Operating temperature	0°C ... +50°C	
Storage temperature	-25°C ... +80°C	
Mounting	any required	
DIN rail fixing (EN 50002)	snap-on mounting	
Wire size	2.5 mm² / stranded with ferrule, 4 mm² solid	
Dimensions (WxDxH)	88 x 22.5 x 100 mm	
Weight	100 g	

Serial data converters
Technical data

Technical data
Data at T_a = 25 °C and rated values, unless otherwise indicated

	ILPH RS 422 - 485 / RS 422 - 485
Power supply	DC model polarized
Voltage	24 V DC
Voltage tolerance	+/-15%
Supply current	120 mA max.
Connections	Removable screw connector (Omniconnect)
Interface 1: RS 422-485	EIA / RS 485 and EIA RS 422 / CCITT V11
Overvoltage protection	integrated (transil 8 kV 1.2/50 µs)
RS 485 data switching	Time switching / Time delay transmission/reception 27 µs ...10 ms
Baud rate / Transmission distance	from 1.2 to 500 kbits/s / max. 1200 m up to 38.4 kbit/s
Connections	2.5 mm² screw (AWG 20)
Interface 2: RS 422-485	EIA / RS 485 and EIA RS 422 / CCITT V11
Overvoltage protection	integrated (transil 8 kV 1.2/50 µs)
RS 485 data switching	Time switching / Time delay transmission/reception 27 µs ...10 ms
Baud rate / Transmission distance	from 1.2 to 500 kbits/s / max. 1200 m up to 38.4 kbit/s
Connections	2.5 mm² screw (AWG 20)
Traffic indication	
Voltage	1 yellow LED
Connections	2 green LED (RxD, TxD,)
EMC behavior	
Electrostatic discharge	EN 61000-4-2 level 3 6/8 kV
Radiated electromagnetic field	EN 61000-4-3 level 3 10 V/m
Burst	EN 61000-4-4 level 3 1 kV
Electromagnetic compatibility	EN 55022 class B
Other characteristics	
Electrical isolation between RS 232 / Power supply / RSS 422-RS 485	500 V DC
Configuration of the operating mode	using internal DIP switches
Operating temperature	0°C ... +50°C
Storage temperature	-25°C ... +80°C
Mounting	any required
DIN rail fixing (EN 50002)	snap-on mounting
Wire size	2.5 mm² / stranded with ferrule, 4 mm² solid
Dimensions (WxDxH)	88 x 22.5 x 100 mm
Weight	100 g

Serial data converters
Technical data

Technical data

Data at T_a = 25 °C and rated values, unless otherwise indicated

	ILPH RS 232 / FO	
Power supplies		
Supply voltage	24...42 V AC/DC (50/60 Hz)	110...240 V AC/DC (50/60 Hz)
Voltage tolerance	-15% ... +10%	-15% ... +10%
Connections	Omniconnect pluggable connector	
Interface 1: RS 232	CCITT V.24/DIN 66020- CCITT V.28 DIN 66259-EIA 232 E	
Protection	Integrated (transil 8 kV 1.2/50µs)	
Max. speed / max. distance	Max. 115.2 kbits/s / max. 15 m / 2500 pF	
Connections	Omniconnect pluggable connector	
Fiber optic interface 2	DIN VDE 0888-1	
Type of fiber / Connections	Multimode fiber Glass : ST connector; Plastic : FSMA screw connector	
Wave length	Glass : 820 nm; Plastic : 655 nm	
Max. transmission power	Glass : 50/125 µm : -14.4 db/m; Glass : 62.5/125 µm : -14 db/m; Plastic : 980/1000 µm : -8 db/m	
Max. reception power	Glass : -28 db/m; Plastic : -20 db/m	
Max. speed	Max. 115.2 kbits/s	
Max. distance	Glass : 50/125 µm : 3 km; Glass : 62.5/125 µm : 4 km; Plastic : 980/1000 µm : 40 m	
Status indication		
Power supply / Data exchange	1 green LED / 2 green LEDs (RxD, TxD)	
EMC behavior		
Electrostatic discharge	EN 61000-4-2 Level 3 6/8 kV	
Radiated electromagnetic field	EN 61000-4-3 Level 3 10 V/m	
Burst	EN 61000-4-4 Level 3 1 kV	
Electromagnetic compatibility	EN 55022 Class B	
Other characteristics		
Electrical isolation input / power supply / output	2.5 kV	
Operating temperature	-20°C ... +60°C	
Storage temperature	-40°C ... +85°C	
Mounting	Onto DIN Rail (EN 50002)	
Connections	14 AWG (2.5 mm²) fine stranded / 12 AWG (4 mm²) rigid	
Dimensions (WxDxH)	105 x 22.5 x 112 mm / 4.13 x 0.89 x 4.41"	
Weight	150 g / 0.33 lb	

Serial data converters
Technical data

Technical data
Data at T_a = 25 °C and rated values, unless otherwise indicated

	ILPH RS 485 / FO	
Power supplies		
Supply voltage	24...42 V AC/DC (50/60 Hz)	110...240 V AC/DC (50/60 Hz)
Voltage tolerance	-15% ... +10%	-15% ... +10%
Connections	Omniconnect pluggable connector	
Interface 1: RS 232	ISO / IEC 8482 / DIN 66 259-4; EIA 485	
Protection	Integrated (transil 8 kV 1.2/50µs)	
Max. speed / max. distance	Max. 1.5 Mbits/s / max. 1200 m (38.4 kbit/s)	
Connections	Omniconnect pluggable connector	
Fiber optic interface 2	DIN VDE 0888-1	
Type of fiber / Connections	Multimode fiber Glass : ST connector; Plastic : FSMA screw connector	
Wave length	Glass : 820 nm; Plastic : 655 nm	
Max. transmission power	Glass : 50/125 µm : -14.4 db/m; Glass : 62.5/125 µm : -14 db/m; Plastic : 980/1000 µm : -8 db/m	
Max. reception power	Glass : -28 db/m; Plastic : -20 db/m	
Max. speed	Max. 1.5 Mbits/s	
Max. distance	Glass : 50/125 µm : 3 km; Glass : 62.5/125 µm : 4 km; Plastic : 980/1000 µm : 40 m	
Status indication		
Power supply / Data exchange	1 green LED / 2 green LEDs (RxD, TxD)	
EMC behavior		
Electrostatic discharge	EN 61000-4-2 Level 3 6/8 kV	
Radiated electromagnetic field	EN 61000-4-3 Level 3 10 V/m	
Burst	EN 61000-4-4 Level 3 1 kV	
Electromagnetic compatibility	EN 55022 Class B	
Other characteristics		
Electrical isolation input / power supply / output	2.5 kV	
Operating temperature	-20°C ... +60°C	
Storage temperature	-40°C ... +85°C	
Mounting	Onto DIN Rail	
Connections	14 AWG (2.5mm²) / fine stranded, 12 AWG (4 mm²) rigid	
Dimensions (WxDxH)	105 x 22.5 x 112 mm / 4.13 x 0.89 x 4.41"	
Weight	150 g / 0.33 lb	

Serial data converters
Technical data

Technical data

Data at T_a = 25 °C and rated values, unless otherwise indicated

	ILPH RS 422 - 485 (for current loop)
Power supply	DC model polarized
Voltage	24 V DC
Voltage tolerance	+/-10%
Supply current	120 mA max.
Connections	Removable screw connector (Omniconnect)
Interface 1: Current loop	active/passive 0...20 mA / 4...20 mA, mode is settable
Logic level	0 = 20 mA or 1 = 20 mA, settable
Baud rate / Transmission distance	max. 38.4 kbit/s / max. 1200 m
Connections	2.5 mm² screw (AWG 20)
Serial link 2: RS 422/485	EIA RS 485 and EIA RS 422 / CCITT V 11
Overvoltage protection	integrated (transil 8 kV 1.2/50 µs)
Baud rate / Transmission distance	max. 38.4 kbit/s / max. 1200 m
Connections	2.5 mm² screw (AWG 20)
Traffic indication	
Voltage	1 yellow LED
Status of signal	2 green LED (RxD, TxD)
EMC behavior	
Electrostatic discharge	EN 61000-4-2 level 2 4/4 kV
Radiated electromagnetic field	EN 61000-4-3 level 3 10 V/m
Burst	EN 61000-4-4 level 1 0.5 kV
Electromagnetic compatibility	EN 55022 class B
Other characteristics	
Electrical isolation between input / output and power supply / output	depending on Current Loop (active/passive); 500 V DC (active) / 2000 V DC (passive)
RS 422-485 power supply	500 V DC
Configuration of the operating mode	using internal DIP switches
Operating temperature	0°C ... +50°C
Storage temperature	-25°C ... +80°C
Mounting	any required
DIN rail fixing (EN 50002)	snap-on mounting
Wire size	2.5 mm² / stranded with ferrule, 4 mm² solid
Dimensions (WxDxH)	88 x 22.5 x 100 mm
Weight	100 g

Serial data converters
Technical data

Technical data
Data at T_a = 25 °C and rated values, unless otherwise indicated

	ILPH RS 232 / CL
Power supply	DC model polarized
Voltage	24 V DC
Voltage tolerance	+/-10%
Supply current	120 mA max.
Connections	Removable screw connector (Omniconnect)
Serial link 2: RS 232	EIA RS 232 C / CCITT V 24 V 28
Logic level	integrated (transil 8 kV 1.2/50 µs)
Baud rate / Transmission distance	max. 38.4 kbit/s / max. 15 m
Connections	2.5 mm² screw (AWG 20)
BdC serial link 2: RS 422/485	active/passive 0...20 mA / 4...20 mA mode settable
Overvoltage protection	0=20 mA or 1=20 mA settable
Baud rate / Transmission distance	max. 38.4 kbit/s / max. 1200 m
Connections	2.5 mm² screw (AWG 20)
Traffic indication	
Voltage	1 yellow LED
Status signal	2 green LED (RxD, TxD)
EMC behavior	
Electrostatic discharge	EN 61000-4-2 level 3 6/8 kV
Radiated electromagnetic field	EN 61000-4-3 level 3 10 V/m
Burst	EN 61000-4-4 level 3 1 kV
Electromagnetic compatibility	EN 55022 class B
Other characteristics	
Electrical isolation between Current loop / RS 232	depending on current loop (active/passive) 500 V DC (active) / 2000 V DC (passive)
Electrical isolation between Current loop / power supply	500 V DC (active) / 2000 V DC (passive)
Configuration of the operating mode	using internal DIP switches
Operating temperature	0°C ... +50°C
Storage temperature	-25°C ... +80°C
Mounting	any required
DIN rail fixing (EN 50002)	snap-on mounting
Wire size	2.5 mm² / stranded with ferrule, 4 mm² solid
Dimensions (WxDxH)	88 x 22.5 x 100 mm
Weight	100 g

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