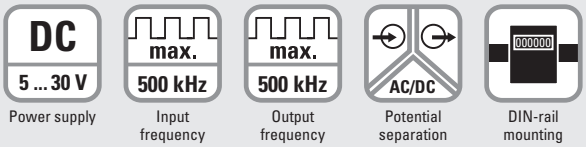
Level converter	PW 1D-1D	HTL, TTL, RS422



The input of this universal level converter, direction decoder and potential isolation amplifier PW 1D-1D accepts as well single-track as double-track incremental encoder signals, which can be implemented as RS422 / TTL or as HTL level (10 ... 30 V). If the signal includes the direction of rotation, this direction can be defined either by a 90° phase shift of channels A and B or by a static direction signal.

The module can be easily and conveniently mounted in a cabinet on a standard DIN rail.



Characteristics

- High frequency range up to 500 kHz.
- Potential isolation amplifier.
- Level converter and direction decoder for incremental encoder signals.
- Signal inputs (A, /A, B, /B, 0, /0) can be set to HTL, TTL or RS422 levels.
- Processes signals with direction, synchronous, asynchronous, as well as single-track signals.
- Signal outputs (A, /A, B, /B, 0, /0), can be set to HTL, TTL or RS422 levels.
- Conversion of an A/B direction information (90°) into a static direction signal and vice-versa.
- Encoder connection either with Sub-D connector or plug-in screw terminals.

Benefits

- Potential separation between sensor and control.
- Level adaptation for old controls with direction signal input.
- Conversion from TTL into HTL and vice versa.
- Voltage level adaptation to the application.

Order no.

Level converter	**8.PW.1D-1D**	*Scope of delivery* - Level converter - Manual

Connection technology		Order no.
Cordset, pre-assembled	Sub-D female contacts, 9-pin, with cable outlet 70° single-ended 2 m [6.56'] PVC cable [1]	**8.0000.6V00.0002.0086**
	Sub-D male contacts, 9-pin, with cable outlet 70° single-ended 2 m [6.56'] PVC cable [1]	**8.0000.6V00.0002.0082**
Connector, self-assembly	Sub-D female contacts, 9-pin, with cable outlet 70°	**8.0000.514B.0000**
	Sub-D male contacts, 9-pin, with cable outlet 70°	**8.0000.514A.0000**

Further accessories can be found in the accessories section or in the accessories area of our website at: www.kuebler.com/accessories.
Additional connectors can be found in the connection technology section or in the connection technology area of our website at: www.kuebler.com/connection_technology.
You will find an overview of our systems and components for Functional Safety and the corresponding software in the safety technology section or under www.kuebler.com/safety.

1) Other lengths available.

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Level converter	PW 1D-1D	HTL, TTL, RS422

Technical data

Electrical characteristics

Power supply	5 ... 30 V DC (residual ripple ≤ 10 % at 24 V DC)
Power consumption (no load)	max. 50 mA
Reverse polarity protection of the power supply	yes
Type of connection	screw terminal, 1.5 mm²
Encoder supply (can only be supplied externally)	voltage can be supplied at the plug strip and picked off on the Sub-D 9-pin input connector
Conformity and standards	
EMC guideline 2014/30/EU	EN 61000-6-2, EN 61000-6-3, EN 6100-6-4
RoHS guideline 2011/65/EU	EN 50581

Mechanical characteristics

Material	housing	plastic
Mounting		35 mm DIN rail (acc. to EN 60715)
Dimensions (W x H x D)		22.5 x 102 x 102 mm [0.89 x 4.02 x 4.02"]
Protection		IP20
Weight		approx. 100 g [3.53 oz]
Working temperature		0°C ... +45°C [+32°F ... +113°F] non condensing
Storage temperature		-25°C ... +70°C [-13°F ... +158°F] non condensing
Failure rate (MTBF in years)		71.48 a continuous operation at 60°C [140°F]

Incremental input X1, X2

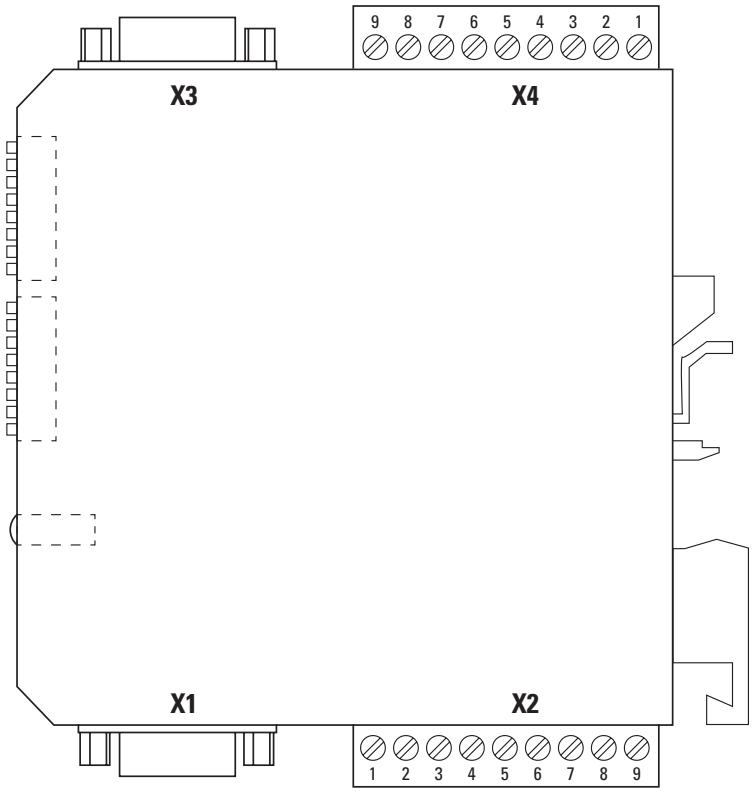
Level (adjustable)		TTL / RS422 (differential voltage > 1 V) or HTL (10 ... 30 V)
Tracks	TTL symmetrical HTL asymmetrical	A, /A, B, /B, 0, /0 A, B, 0
Frequency	TTL symmetrical HTL asymmetrical	max. 500 kHz max. 300 kHz (HTL)
Internal resistance		Ri ≈ 10 kOhm
Type of connection		screw terminals, 1.5 mm² Sub-D male contacts, 9-pin

Incremental output X3, X4

Level	approx. 2 V lower than input voltage
Tracks	A, /A, B, /B, 0, /0
Output current	max. 30 mA (per channel)
Output stage	Push-Pull
Signal propagation time	approx. 600 ns
Type of connection	screw terminals, 1.5 mm² Sub-D female contacts, 9-pin

Level converter	PW 1D-1D	HTL, TTL, RS422

Terminal assignment



Interface	Function	Screw terminal, 9-pin									
		Signal:	0 V	+V	A	$\overline{A}$	B	$\overline{B}$	0	$\overline{0}$	⏚
Connection X2	Input TTL / RS422	Pin :	9	8	7	6	5	4	3	2	1
	Input HTL	Pin :	9	8	7	–	5	–	3	–	1

Interface	Function	Sub-D male contacts, 9-pin									
		Signal:	0 V	+V	A	$\overline{A}$	B	$\overline{B}$	0	$\overline{0}$	–
Connection X1	Input TTL / RS422	Pin :	5	4	3	2	1	9	7	6	8
	Input HTL	Pin :	5	4	3	–	1	–	7	–	8

Interface	Function	Screw terminal, 9-pin									
		Signal:	GND	V_{in}	A	$\overline{A}$	B	$\overline{B}$	0	$\overline{0}$	⏚
Connection X4	Output TTL / RS422	Pin :	1	2	3	4	5	6	7	8	9
	Output HTL	Pin :	1	2	3	–	5	–	7	–	9

Interface	Function	Sub-D female contacts, 9-pin									
		Signal:	GND	V_{in}	A	$\overline{A}$	B	$\overline{B}$	0	$\overline{0}$	–
Connection X3	Output TTL / RS422	Pin :	5	4	3	2	1	9	7	6	8
	Output HTL	Pin :	5	4	3	–	1	–	7	–	8

+V : Power supply encoder
0 V : Encoder power supply ground GND1 (0 V)
V_{in} : Power supply level converter
GND : Level converter power supply ground (0V)
A, $\overline{A}$: Incremental output channel A (Cosine)
B, $\overline{B}$: Incremental output channel B (Sine)
0, $\overline{0}$: Reference signal

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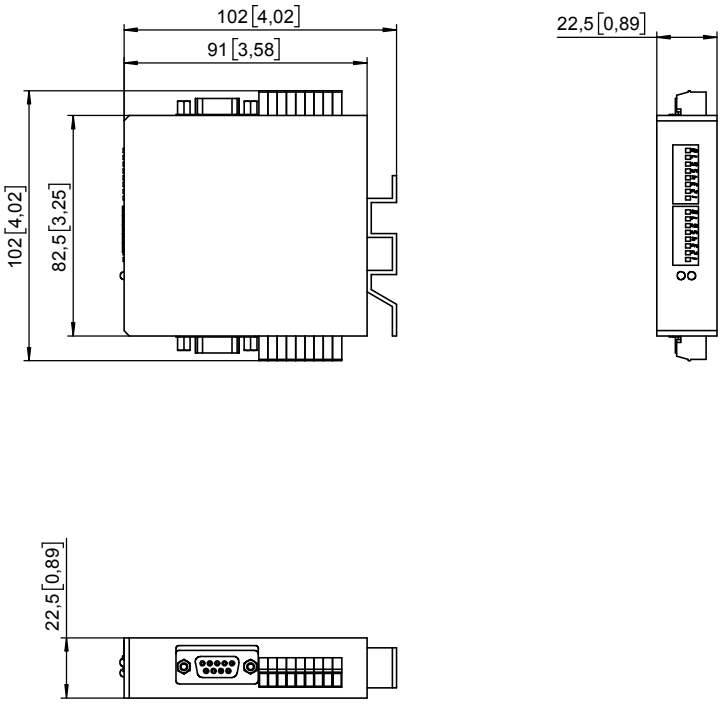
Level converter	PW 1D-1D	HTL, TTL, RS422

Dimensions

Dimensions in mm [inch]



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