Signal converter	SK 1A-1S1D2RS	Analog - HTL / RS422, SSI, RS232 / RS485



The SK 1A-1S1D2RS is a universal converter for analog input signals from ±10 V or 0/4 ... 20 mA. This module converts analog signals in a digital format (frequency, position or angular position). The output format can be an incremental signal or an absolute value in SSI format.
In addition, the result of the conversion can be read via a serial RS232 or RS485 interface or via a USB port.

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



Characteristics

- Motor potentiometer function.
- Analog input suitable for voltage, current or potentiometer operation.
- Output operating modes: frequency generator, motor potentiometer, position or angle sensor or measurement data acquisition.
- Programmable characteristic U/f curve and possibility of generating repetitive frequency sweeps.
- Frequency output (HTL or TTL, max. 1 MHz) proportional to the input signal.
- Incremental encoder output and SSI interface for displaying a position or an angular position.
- Incremental direction information A, B depending on the input signal and on the programmed conversion range.
- USB programming interface and serial interface (RS232 / RS485).
- Programmable zero pulse (0, /0).

Benefits

- Digitization of analog signals.
- Rescaling of analog signals.

Order no.

Signal converter	**8.SK.1A-1S1D2RS**	*Scope of delivery* - Signal converter - Manual

Connection technology		Order no.
Cordset, pre-assembled	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 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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Technical data

Electrical characteristics

Power supply	12 ... 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
Conformity and standards	
EMC guideline 2014/30/EU	EN 61000-6-2, EN 61000-6-3, EN 61000-6-4
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

Analog inputs X4

Voltage input	-10 ... +10 V / 0 ... 10 V
internal resistance	Ri ≈ 120 kOhm
Current input	0 ... 20 mA / 4 ... 20 mA
internal resistance	Ri ≈ 100 Ohm
Resolution	14 bit (±13 bit)
Accuracy input	0.1 %
Update time	100 µs (corresponding to 10,000 measured values per second)
Max. input frequency	1 kHz (for 10 sampling points)
VREF for external potentiometer	approx. 4.8 V (±0.1 %)
internal resistance	Ri ≈ 240 Ohm
Type of connection	screw terminal, 1.5 mm²

Control inputs X5

Number	4
Charakteristik	PNP, active high
Signal level HTL	LOW = 0 ... 3 V HIGH = 10 ... 30 V
Internal resistance	Ri ≈ 1.5 kOhm
Input current	approx. 2 mA
Min. pulse duration	1 msec (5 µs at Cont.1, if [HW-Z reference] ≠ 0)
Type of connection	screw terminal, 1.5 mm²

Incremental outputs X3

Signal level HTL	5 ... 30 V (according to external power supply)
TTL / RS422	4 V (no external power supply required)
Tracks	A, /A, B, /B, 0, /0
Frequency range	0.01 Hz ... 1 MHz
Output current	max. 30 mA (per channel)
Output stage	Push-Pull
Reaction time	< 260 µs
Fastest possible position change	1 Increment / µs
Protective circuit	short-circuit proof
Type of connection	screw terminal, 1.5 mm²

SSI interface X4 + X5

Function	simulation of an SSI absolute encoder
Standard	compliant with SSI standard, 10 ... 25 bits, binary or Gray (supports only single transmission – no multiple transmission)
Clock (input)	TTL differential / RS485 [Clk+], [Clk-]
Data (output)	TTL differential / RS485 [Dat+], [Dat-]
Termination	not available in the device
SSI baud rate	max. 1 MHz
Type of connection	screw terminal, 1.5 mm²

Serial interface X2

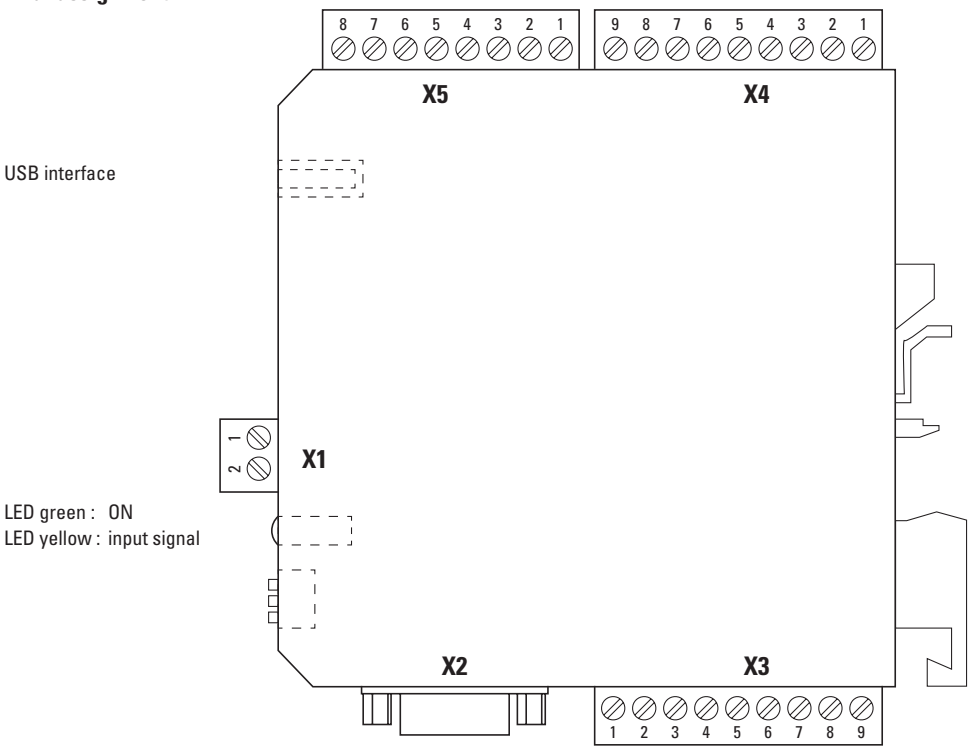
Format	RS232 or RS485 (2-wire or 4-wire)
Baud rate	600, 1200, 2400, 9600 (default), 19200, 38400, 56000, 57600, 76800 and 115200
Type of connection	Sub-D female contacts, 9-pin

USB interface

Version	USB 2.0
Type of connection	via USB port, connector type A

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Terminal assignment



Interface	Function	Screw terminal, 2-pin		
Connection X1	Power supply	Signal:	0 V	+V
		Pin:	2	1

Interface	Function	Screw terminal, 9-pin								
Connection X4	Analog input	Signal:	0 V	I in-	I in+	V in-	V in+	AGND	Ref	–	–
		Pin:	1	2	3	4	5	6	7	8	9

Interface	Function	Screw terminal, 9 / 8-pin					
Connection X4, X5	SSI output	Signal:	0 V	Data-	Data+	Clk-	Clk+
		Pin X5:	1	2	3	–	–
		Pin X4:	–	–	–	9	8

Interface	Function	Screw terminal, 8-pin							
Connection X5	Control input	Signal:	0 V	Contr1	Contr2	Contr3	Contr4	–	–	–
		Pin:	4	5	6	7	8	1	2	3

Interface	Function	Screw terminal, 9-pin								
Connection X3	Incremental output HTL / TTL	Signal:	0 V	A	$\overline{A}$	B	$\overline{B}$	0	$\overline{0}$	Com+	0 V
		Pin:	1	7	6	5	4	3	2	8	9

Interface	Function	Sub-D female contacts, 9-pin								
Connection X2	Serial interface RS232 / RS485	Signal:	0V	R-	R+	RxD	T-	TxD	T+	–	–
		Pin:	5	1	6	2	7	3	8	4	9

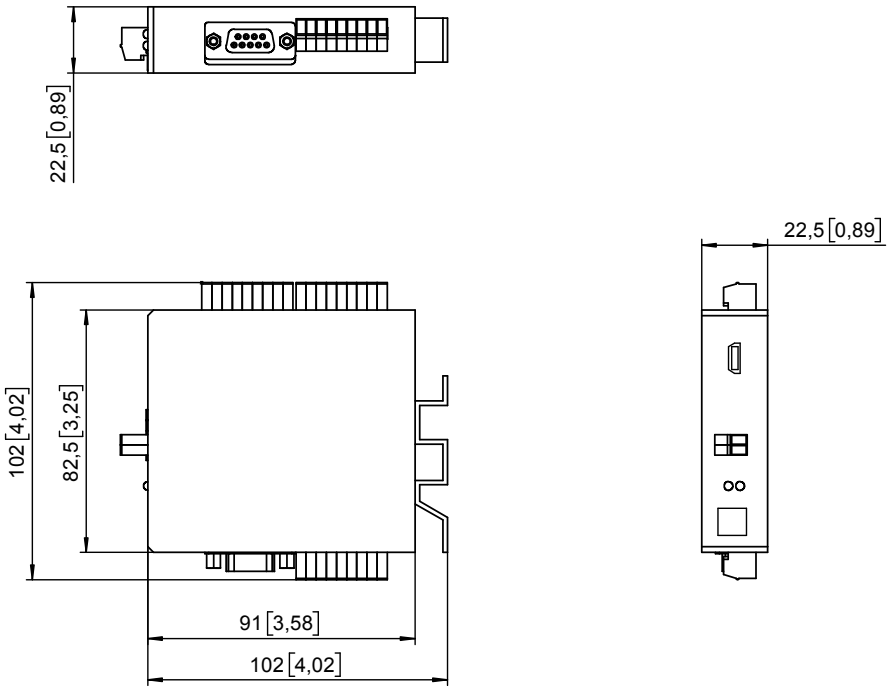
+V :	Power supply	Data+, Data- :	Data +/- (SSI)	Com+ :	Common voltage input
0 V :	Encoder power supply ground GND (0 V)	Clk+, Clk- :	Clock +/- (SSI)	R-, R+	Receive +/- (RS485)
I_{in} :	Analog input current	Contr 1 ... 4 :	Control inputs	RxD	Receive (RS232)
V_{in} :	Analog input voltage	A, $\overline{A}$:	Incremental output channel A (Cosine)	T-, T+	Transmit +/- (RS485)
AGND:	Analog GND (0 V)	B, $\overline{B}$:	Incremental output channel B (Sine)	TxD	Transmit (RS232)
Ref :	Reference voltage (4.8 V)	0, $\overline{0}$:	Reference signal		

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Dimensions

Dimensions in mm [inch]



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