

# DIN RAIL CONVERTERS

## K-line: compact converters only 6,2 mm width

GALVANIC ISOLATION, 3 WAY

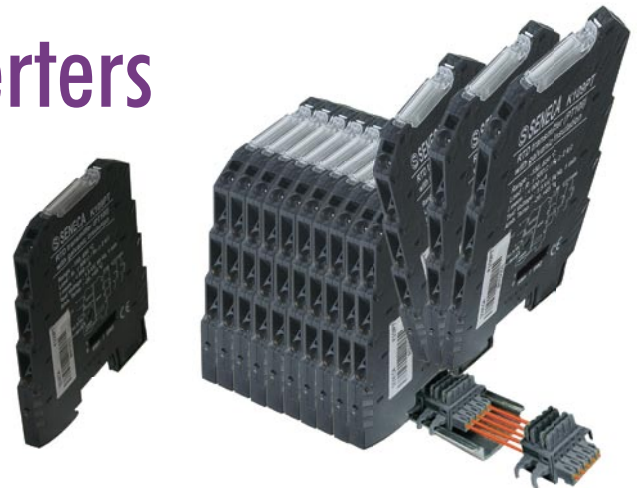
TEMPERATURE CONVERSION

ANALOGUE CONVERSION

SERIAL CONVERSION: RS232/485/USB

SUPPLY BUS-SYSTEM

- 14/16 bit resolution measure converter
- Precision class 0.1%
- 3 ways isolation
- Tiny dimensions (102,5 x 93,1 x 6,2 mm)
- Spring cage terminal block and/or DIN connection system
- Power bridging terminal - DIN rail bus connector
- Easy installation and maintenance
- Parameters setup via DIP Switches
- Low power consumption
- Digital separation of input signal
- Protection circuit against output overcurrent



### POWER SUPPLY

K-Line signal conditioners can be powered in different ways: by the spring-cage terminal block (24 VDC direct from power supply) or by SMART SUPPLY system (bus connector system).

SMART SUPPLY system is based on expandable K-BUS connector. Up to 16 devices, the distribution of power supply is possible connecting a single device at voltage source, as whole consumption doesn't exceed 400 mA.

Over 16 and up to 75 devices, with maximum current consumption of 1,6 A ( $\pm 21$  mA per module), needed K-SUPPLY module that offers overvoltage protection on-board.

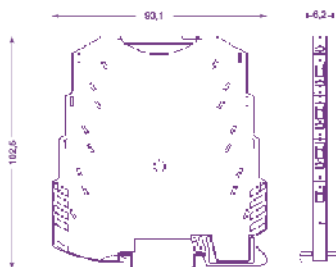
Redundant: 2 inputs, 1 output supply 24Vdc.



### TYPES

PRODUCT	DESCRIPTION
K109PT	Pt100 converter
K109PT1000	Pt1000 converter
K109PT-HPC	High Precision Pt100 converter
K120RTD	Loop powered Pt100, Ni100 converter
K109TC	Thermocouple converter with settable treshold
K109UI	Galvanic isolator - voltage/current converter
K109LV	Low voltage converter (25mV-2V)
K109S	Galvanic isolator with power for 2-wire transducer
K107A	RS485/RS485 serial repeater
K107B	RS232/RS485 serial converter
K107USB	RS485/USB converter
K-SUPPLY	Power supply module with surge protection

### DIMENSIONS







### GENERAL INFORMATION

Power supply range	19,2..30 VDC
Bridge voltage supply	Bus connectors (K-BUS) can be snapped onto 35 mm DIN guide rail according to EN 670175
Power on side terminals	Yes
Hot swapping	Yes
Max current consumption	21..25 mA (24 VDC)
Consumption without load @25°C	7,5 mA
Max power consumption	500 mOhm
A/D conversion	14 bit
Rejection	50 or 60 Hz (programmable)
Settings	DIP Switch
Filter	Insertable
Dimensions	93,1 x 6,2 x 102,5 mm
Isolation	1,5 KV (50 Hz, 1 min)
Isolation technique	Digital (octocoupler)
Processing	Floating point 32 bit
Colour	Black
Case material	PBT
Weight	45 g
Operating temperature	-20.. +65°C
Storage temperature	-40.. +85°C
Humidity	10..90%RH
Connection	Clamp terminals and/or bus
Protection class	IP 20
Conformity	CE, EN 50081-2, EN 50082-2, EN 610101-1, EN 60742

# SENSOR DATA





# K-LINE: COMPACT CONVERTERS

## TECHNICAL SPECIFICATIONS: CONVERTERS FOR RESISTANCE SENSORS

	K109PT	K109PT1000	K109PT-HPC	K120RTD
				
	Pt100 converter	Pt1000 converter	Pt100 high-precision converter	Pt100, Ni100 loop powered converter
	3 ways galvanic isolator converting Pt100 temperature in standard current/voltage signal	3 ways galvanic isolator converting Pt1000 temperature in standard current/voltage signal	3 ways galvanic isolator converting Pt100 temperature (200..+160°C) in standard current/voltage signal	Loop powered (5..30 Vdc) transmitter converting Pt100, Ni100 in standard current/voltage signal (no isolation)
<b>GENERAL DATA</b>				
Channels	1 input, 1 output	1 input, 1 output	1 input, 1 output	1 input, 1 output
Precision	0,1%	0,1%	0,1%	0,1%
Thermal drift	< 100 ppm/K	< 120 ppm/K	< 120 ppm/K	< 100 ppm/K
LED	Alarm/Fault	Alarm/Fault	Alarm/Fault	Alarm/Fault Dip-Switch error
Power supply	19,2..30Vdc	19,2..30Vdc	19,2..30Vdc	Loop powered (5..30 Vdc)
Isolation	1,5 kV (50Hz, 1 min)	1,5 kV (50Hz, 1 min)	1,5 kV (50Hz, 1 min)	-
Dimensions	93,1 x 6,2 x 102,5 mm	93,1 x 6,2 x 102,5 mm	93,1 x 6,2 x 102,5 mm	93,1 x 6,2 x 102,5 mm
Special functions	<ul style="list-style-type: none"> <li>Programmable fault and cut-off</li> <li>Insertable filter</li> </ul>	<ul style="list-style-type: none"> <li>Programmable fault and cut-off</li> <li>Insertable filter</li> </ul>	<ul style="list-style-type: none"> <li>Programmable fault and cut-off</li> <li>Insertable filter</li> </ul>	RTD type/ connection, filter, measure range, fault, output inversion and overrange
<b>INPUT DATA</b>				
Type	<b>Pt100</b> <ul style="list-style-type: none"> <li>Pt100 (IEC 751 / EN60751-ITS90)</li> <li>Range -150..+150°C</li> <li>Minimum span 50°C</li> <li>Power on transmitter 900 µA</li> <li>Connection technique 2,3,4 wires</li> <li>Max conductor resistance 20 Ohm</li> </ul>	<b>Pt1000</b> <ul style="list-style-type: none"> <li>Pt1000 (IEC 751 / EN60751-ITS90)</li> <li>Range -200..+210°C</li> <li>Minimum span 30°C</li> <li>Power on transmitter 350 µA</li> <li>Connection technique 2,3,4 wires</li> <li>Max conductor resistance 50 Ohm</li> </ul>	<b>Pt100</b> <ul style="list-style-type: none"> <li>Pt100 (IEC 751 / EN60751-ITS90)</li> <li>Range -200..+160°C</li> <li>Minimum span 20°C</li> <li>Power on transmitter 900 µA</li> <li>Connection technique 2,3,4 wires</li> <li>Max conductor resistance 20 Ohm</li> </ul>	<b>Pt100</b> <ul style="list-style-type: none"> <li>Pt100 (IEC 751 / EN60751-ITS90)</li> <li>Range -200..+650°C</li> <li>Minimum span 20°C</li> <li>Connection technique 2,3,4 wires</li> </ul> <b>Ni100</b> <ul style="list-style-type: none"> <li>Range -60..+250°C</li> <li>Minimum span 20°C</li> <li>Connection technique 2,3,4 wires</li> </ul>
<b>OUTPUT DATA</b>				
Voltage	<ul style="list-style-type: none"> <li>Range: 0..10/ 10..0/ 0..5/ 1..5V</li> <li>Max voltage: overrange 10,25 V; fault 10,5V, available 12 V</li> <li>Min load resistance 2 kOhm</li> </ul>	<ul style="list-style-type: none"> <li>Range: 0..10/ 10..0/ 0..5/ 1..5V</li> <li>Max voltage: overrange 10,25 V; fault 10,5V, available 12 V</li> <li>Min load resistance 2 kOhm</li> </ul>	<ul style="list-style-type: none"> <li>Range: 0..10/ 10..0/ 0..5/ 1..5V</li> <li>Max available voltage: 12V</li> <li>Min load resistance 2 kOhm</li> </ul>	
Current	<ul style="list-style-type: none"> <li>Range: 4..20/ 20..4/ 0..20/ 20..0 mA</li> <li>Max current: overrange 20,5 mA; fault 21 mA, protection 25 mA</li> <li>Max load resistance: 500 Ohm</li> <li>Protection: 25 mA</li> </ul>	<ul style="list-style-type: none"> <li>Range: 4..20/ 20..4/ 0..20/ 20..0 mA</li> <li>Max current: overrange 20,5 mA; fault 21 mA, protection 25 mA</li> <li>Max load resistance: 500 Ohm</li> <li>Protection: 25 mA</li> </ul>	<ul style="list-style-type: none"> <li>Range: 4..20/ 20..4/ 0..20/ 20..0 mA</li> <li>Max current (protection): 25 mA</li> <li>Max load resistance: 500 Ohm</li> </ul>	<ul style="list-style-type: none"> <li>Range: 4..20/ 20..4 mA (2 wires)</li> <li>Load resistance 1k</li> <li>Resolution 0,5 µA (15 bit + sign)</li> <li>Max current (protection): 30 mA</li> </ul>
Response time (10-90%)	<ul style="list-style-type: none"> <li>&lt;50 ms (without filter)</li> <li>&lt;200 ms (with filter)</li> </ul>	<ul style="list-style-type: none"> <li>&lt;50 ms (without filter)</li> <li>&lt;200 ms (with filter)</li> </ul>	<ul style="list-style-type: none"> <li>&lt;50 ms (without filter)</li> <li>&lt;200 ms (with filter)</li> </ul>	<ul style="list-style-type: none"> <li>&lt;220 ms (without filter)</li> <li>&lt;620 ms (with filter)</li> </ul>
DA conversion - resolution	1 mV, 2 µA	1 mV, 2 µA	1 mV, 2 µA	1 mV, 2 µA





# K-LINE: COMPACT CONVERTERS

## TECHNICAL SPECIFICATIONS: CONVERTERS FOR V-MA INPUT

	K109TC	K109IU	K109S	K109LV
				
	<b>Thermocouple converter with settable threshold</b>	<b>Galvanic isolator analogue converter</b>	<b>V/I converter with power for 2 wire transducer</b>	<b>Current shunt/ V-I converter</b>
	3 ways galvanic isolator for thermocouple input. Settable active output, auxiliary switching relay output, for alarm output	3 ways galvanic isolator for industrial signal conversion. Passive input and active output.	3 ways galvanic isolator for voltage or current conversion. Active output and floating power supply.	3 ways galvanic isolator for the conversion of a current shunt value into a current or voltage output
<b>GENERAL DATA</b>				
Channels	1 input, 2 outputs	1 input, 1 output	1 input, 1 output	1 input, 1 output
Precision/ Transmission error (max)	0,1%	0,1%	0,1%	0,1%
Thermal drift	< 120 ppm/K	< 120 ppm/K	< 120 ppm/K	< 120 ppm/K
LED	<ul style="list-style-type: none"> <li>Alarm/Fault</li> <li>Alarm setting</li> <li>Static relay output status</li> </ul>	Alarm/Fault	Alarm/Fault	Alarm/Fault
Power supply	19,2..30Vdc	19,2..30Vdc	19,2..30Vdc	19,2..30Vdc
Isolation	1,5 kV (50Hz, 1 min)	1,5 kV (50Hz, 1 min)	1,5 kV (50Hz, 1 min)	1,5 kV (50Hz, 1 min)
Dimensions	93,1 x 6,2 x 102,5 mm	93,1 x 6,2 x 102,5 mm	93,1 x 6,2 x 102,5 mm	93,1 x 6,2 x 102,5 mm
Special functions	<ul style="list-style-type: none"> <li>Programmable fault and cut off</li> <li>Insertable filter</li> <li>Settable rejection 50-60 Hz</li> </ul>	<ul style="list-style-type: none"> <li>Square root extraction</li> <li>Tank standard linearisation</li> <li>Signal inversion</li> <li>Programmable cut-off</li> <li>Programmable scales on demand</li> </ul>	<ul style="list-style-type: none"> <li>Square root extraction</li> <li>Tank standard linearisation</li> <li>Signal inversion</li> <li>Programmable cut-off</li> <li>Auxiliary power supply on 3 terminal blocks 17..20V, max current 25mA</li> </ul>	<ul style="list-style-type: none"> <li>Programmable fault and cut off</li> <li>Insertable filter</li> <li>Settable rejection 50-60 Hz</li> </ul>
<b>INPUT DATA</b>				
Type	<b>Thermocouple</b> <ul style="list-style-type: none"> <li>Type: J, K, E, N, S, R, B, T (standard ITS-90)</li> <li>Temperature range minimum span 100°C</li> <li>Impedance: 10 M Ohm</li> <li>Cold junction (semiconductor, ADC 13 bit, precision 1,4°C reading upgrade 10s)</li> </ul>	<b>Voltage</b> <ul style="list-style-type: none"> <li>Range: 0..10/ 10..0 / 0..5/ 1..5V; 0..15 / 0..30 V reversed</li> <li>Impedance: 110 kOhm (10V), 325 kOhm (30V)</li> </ul> <b>Current</b> <ul style="list-style-type: none"> <li>Range: 0..20 / 4..20 mA</li> <li>Impedance: 35 Ohm</li> </ul>	<b>Voltage</b> <ul style="list-style-type: none"> <li>Range: 0..10/ 10..0 / 0..5/ 1..5V</li> <li>Impedance: 110 kOhm</li> </ul> <b>Current</b> <ul style="list-style-type: none"> <li>Range: 0..20 / 4..20 mA</li> <li>Impedance: 35 Ohm</li> </ul>	<b>Voltage</b> <ul style="list-style-type: none"> <li>Programmable scales: from <math>\pm 25</math>mV to <math>\pm 2000</math> mV</li> </ul>
Absolute value	Max voltage $\pm 32$ V	<ul style="list-style-type: none"> <li>Max voltage <math>\pm 32</math>V</li> <li>Current clamp self powered: 400mOhm</li> </ul>	<ul style="list-style-type: none"> <li>Max voltage <math>\pm 30</math>V</li> <li>Current clamp self powered: 400mOhm</li> </ul>	
<b>OUTPUT DATA</b>				
Voltage	<ul style="list-style-type: none"> <li>Range: 0..10/ 10..0/ 0..5/ 1..5V</li> <li>Min load resistance 2 kOhm</li> </ul>	<ul style="list-style-type: none"> <li>Range: 0..10/ 10..0/ 0..5/ 1..5V</li> <li>Min load resistance 2 kOhm</li> </ul>	<ul style="list-style-type: none"> <li>Range: 0..10/ 10..0/ 0..5/ 1..5V</li> <li>Min load resistance 2 kOhm</li> </ul>	<ul style="list-style-type: none"> <li>Range: 0..10/ 10..0/ 0..5/ 1..5V</li> <li>Min load resistance 2 kOhm</li> </ul>
Current	<ul style="list-style-type: none"> <li>Range: 4..20/ 20..4/ 0..20/ 20..0 mA</li> <li>Max load resistance: 500 Ohm</li> </ul>	<ul style="list-style-type: none"> <li>Range: 4..20/ 20..4/ 0..20/ 20..0 mA</li> <li>Max load resistance: 500 Ohm</li> <li>Protection: 25 mA</li> </ul>	<ul style="list-style-type: none"> <li>Range: 4..20/ 20..4/ 0..20/ 20..0 mA</li> <li>Max load resistance: 500 Ohm</li> <li>Protection: 25 mA</li> </ul>	<ul style="list-style-type: none"> <li>Range: 4..20/ 20..4/ 0..20/ 20..0 mA</li> <li>Max load resistance: 500 Ohm</li> <li>Protection: 25 mA</li> </ul>
Static relay auxiliary output	<ul style="list-style-type: none"> <li>Nominal voltage: 24 VAC/VDC</li> <li>Current: 60 mA</li> <li>Overvoltage protection: 50 V</li> <li>Settable alarm threshold, hysteresis</li> </ul>			
Response time (10-90%)	<40 ms (without filter) <88 ms (with filter)	<40 ms (without filter) <88 ms (with filter)	<40 ms (without filter) <40/88 ms (with filter)	<25 ms (without filter) <55 ms (with filter)
DA conversion - resolution	1 mV, 2 $\mu$ A	1 mV, 2 $\mu$ A	1 mV, 2 $\mu$ A	

# K-LINE: COMPACT CONVERTERS

## TECHNICAL SPECIFICATIONS: CONVERTERS FOR RS485/RS232

	K107A	K107A	K107USB	K-SUPPLY
				
	<b>RS485/RS232 serial repeater</b>	<b>Galvanic isolator analogue converter</b>	<b>RS485/USB asynchronous serial converter</b>	<b>Power supply for K-line modules</b>
	RS485 serial isolator, 3 ways isolation, automatic flow control	3 ways galvanic isolator for industrial signal conversion. Passive input and active output.	RS485/USB serial converter with specific drivers. Isolated RS485/USB interface	Redundant power supply module with overvoltages protection and differential mode filter
<b>GENERAL DATA</b>				
Channels	1 input, 1 output	1 input, 1 output	1 input, 1 output	2 inputs, 1 output
LED	<ul style="list-style-type: none"> <li>Power ON</li> <li>Data OK</li> <li>Inverted connection</li> </ul>	<ul style="list-style-type: none"> <li>Power ON</li> <li>Data OK</li> <li>Inverted connection</li> </ul>	<ul style="list-style-type: none"> <li>Power ON</li> <li>RS485 Rx</li> <li>Rs485 Tx</li> </ul>	<ul style="list-style-type: none"> <li>Input 1 switch on treshold</li> <li>Input 1 switch on treshold</li> <li>Alternate/inverted polarity of inputs</li> </ul>
Power supply	19,2..30Vdc	19,2..30Vdc	By USB port of the PC	
Isolation	1,5 kV (50Hz, 1 min)	1,5 kV (50Hz, 1 min)	1.500V (USB/RS485)	
Dimensions	93,1 x 6,2 x 102,5 mm	93,1 x 6,2 x 102,5 mm	93,1 x 6,2 x 102,5 mm	93,1 x 6,2 x 102,5 mm
Special functions	<ul style="list-style-type: none"> <li>Timing automatic handshake</li> <li>Baud rate: 1.200..115.200 bps</li> <li>Terminal</li> <li>Flow communication stop</li> </ul>	<ul style="list-style-type: none"> <li>Timing automatic handshake</li> <li>Baud rate: 1.200..115.200 bps</li> <li>Terminal</li> <li>Flow communication stop</li> </ul>	<ul style="list-style-type: none"> <li>Compliance to USB 1.1 and 2.0</li> <li>Plug&amp;play for WIN98, 2000 &amp; XP</li> <li>Multiple connection on the same PC</li> <li>CD driver</li> </ul>	<ul style="list-style-type: none"> <li>Differential mode filter</li> <li>Integrated protection against overvoltages</li> <li>Connection with redundant power supply, to several bus and parallel inputs</li> </ul>
<b>INPUT DATA</b>				
Type	<b>Serial</b> <ul style="list-style-type: none"> <li>Half duplex (31 nodes, terminal, protection up to 30 Vdc)</li> </ul>	<b>Serial</b> <ul style="list-style-type: none"> <li>RS232B, protection up to 30 Vdc</li> </ul>	<b>Serial</b> <ul style="list-style-type: none"> <li>USB interface, USB standard 1.0/2.0 compliance, USB A and Mini USB connectors</li> </ul>	<b>Power supply</b> <ul style="list-style-type: none"> <li>2 inputs with shared negative terminal</li> <li>pass-through each input can be accessed by 2 pairs of terminals</li> <li>Max current per terminal: 4A</li> <li>Positive inputs protected by an external fuse of recommended sizing</li> </ul>
<b>OUTPUT DATA</b>				
Serial	<b>Serial</b> <ul style="list-style-type: none"> <li>Half duplex (31 nodes, terminal, protection up to 30 Vdc)</li> </ul>	<b>Serial</b> <ul style="list-style-type: none"> <li>Half duplex (31 nodes, terminal, protection up to 30 Vdc)</li> </ul>	<b>Serial</b> <ul style="list-style-type: none"> <li>RS485, max 31 nodes, spring-cage terminal block</li> </ul>	<b>Power supply</b> <ul style="list-style-type: none"> <li>Max voltage drop: 300 mV</li> </ul>

