

Input: V, mA, RTD, Potentiometer, Thermocouple
Output: 4-20 mA

- Only 6.2 mm Wide
- Universal Input to 4-20 mA Output
- 4-20 mA Loop Powered
- PC Configuration
- Full 2-Way Isolation

Applications

- Convert Common Signals to a PLC Input for Control and/or Validation
- Interface Sensors with Panel Meters, PLCs, Recorders, Data Acq., DCS, & SCADA Systems

Description

The K121 is a universal converter able to manage all analog signals (mA, mV, V, Pt100, Pt1000, Pt500, Ni100, T/Cs, Ohm) and convert/isolate it to a 4-20mA loop-powered signal.

Input and output are completely configurable via the free PC program. The output mode (normal/inverted), scale over-range, output fault, sensor fault action are selectable. 2-way galvanic input-output isolation ensures the integrity of your signals.

The compact 0.25" wide size saves considerable panel space.

Specifications

Input

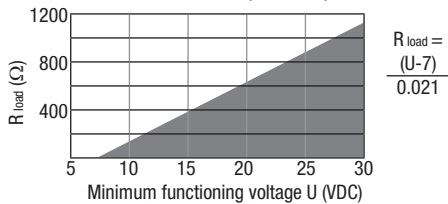
Voltage: -150 mV to +150 mV, Input imp.: 10 MΩ
 -30 V to +30V, Input imp.: 200 KΩ
Current: -24 mA to 24 mA, Input imp.: 40 Ω
RTD: Pt100, Pt500, Pt1000, Ni100
 2, 3, 4 or wire
 Excitation current: 375 μA
 Maximum cable resistance: 25 Ω
 Cable resistance influence: 0.003 Ω/Ω

Thermocouple: Type J, K, T, E, R, S, B, N
 10 MΩ input impedance
 CJC: -40 to 65°C, ±1.5°C, settable
 Settable upscale/downscale burnout

Potentiometer: 500 Ω to 10 KΩ
 Resistance: 1750 Ω

2, 3, 4 or wire
 10 MΩ input impedance

Custom: User-defined input curve using Easy Setup software. Insert data points or upload from file.



Output

4-20 mA, sinking (passive) output powered by 7-30 VDC loop
 1 kΩ @ 28 VDC, 21 mA
 Over-range output: + 2.5% of end scale, -2.5% of start scale
 Fault output: + 5% of end scale, -5% of start scale
 Current output protection: ~30 mA

Accuracy

±0.1% of span
 Thermal drift: <100 ppm/K, 30 ppm typical
 Output resolution error 2 μA (>13 bit)

Response Time

140 ms typ. for voltage and current, <620 ms for other inputs

Sensor Test Current

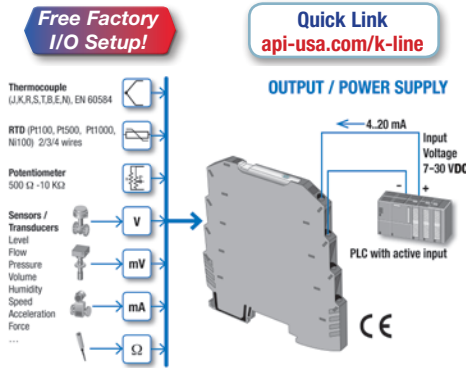
<50 nA

Configuration

EASY Setup LP PC software

Isolation

Two-way galvanic isolation: input, output
 1500 V_{RMS} 1 minute isolation



Narrow 0.25" Width



Best Accuracy



Long MTBF



Easy PC Setup

Ambient Conditions

-20°C to +65°C operating
 -20°C to +85°C storage
 30 to 90% RH at 40°C non-condensing

Connections

24 to 14 AWG wire size stripped 5/16"
 Spring clamp terminals

Housing

IP 20, requires installation in panel or enclosure
 Mount vertically to a standard 35 mm DIN rail
 1.7 ounces (50 grams)

Power

7 to 30 VDC via output loop
 <660 mW

Dimensions

2.5" H x 0.25" W x 4" D (93.1 x 6.2 x 102.5 mm)

CE Standards

EN61000-6-4/2002 (Electromagnetic emission, industrial environment)
 EN61000-6-2/2006 (Electromagnetic immunity, industrial environment)

EN61010-1/2001 (safety). All circuits must be isolated from the other circuits under dangerous voltage with double isolation. The power supply transformer must comply with EN60742 "Isolated transformers and safety transformers".

ATEX Standards

ATEX 2014/34/UE according to European standards:
 EN 60079-0:2012/A11:2013
 EN 60079-15:2010
 EN 60079-31:2014

Accessories and Software



EASY USB
 USB to UART TTL converter

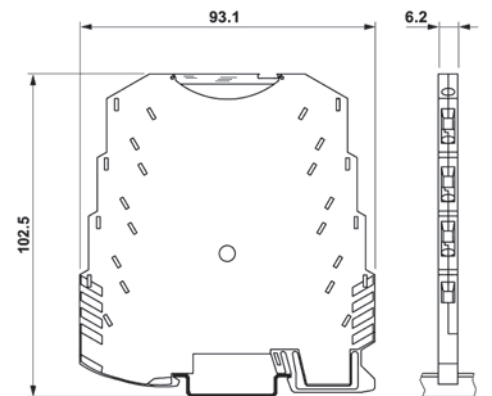


EASY LP
 Free programming software
 see www.seneca.it/en

K LINE



Actual Size



Call 1-800-942-0315 to place your order!

Model	Description
K121	Universal input transmitter. User configurable V, mA, RTD, potentiometer, T/C. 4-20 mA output. 7-30 VDC loop powered.
K121-420	Universal input transmitter pre-set for 4-20 mA input and 4-20 mA output. 7-30 VDC loop powered.
EASY USB	USB to UART TTL converter required to set up the K121 and other programmable models*

*Include your sensor specifications with your order and API can set up your K121 for free.

Other 6 mm Transmitters

K109TC	Thermocouple to DC transmitter
K109PT	100 Ohm RTD to DC
K109UI	DC to DC isolator/converter
K107A	RS485 - RS485 serial amplifier/isolator
K107B	RS232 - RS485 serial isolator/converter
K107USB	USB - RS485 isolator/converter

Precautions

WARNING! All wiring must be performed by a qualified electrician or instrumentation engineer. See diagram for terminal designations and wiring examples. Consult factory for assistance.

WARNING! Avoid shock hazards! Turn signal input, output, and power off before connecting or disconnecting wiring, or removing or installing module.

Précautions

ATTENTION! Tout le câblage doit être effectué par un électricien ou ingénieur en instrumentation qualifié. Voir le diagramme pour désignations des bornes et des exemples de câblage. Consulter l'usine pour assistance.

ATTENTION! Éviter les risques de choc! Fermez le signal d'entrée, le signal de sortie et l'alimentation électrique avant de connecter ou de déconnecter le câblage, ou de retirer ou d'installer le module.

Software Configuration

The Easy USB or the S117P1 kit is required for programming the K121. Install the included setup CD or go to seneca.it/en/ and search for "Easy Setup" to download the latest version of the Easy LP program. Follow the interface kit instructions and the software installation prompts.

The software allows configuration and saving of all K121 parameters. Parameters can be saved to your PC allowing multiple modules to be identically programmed. The software also allows custom linearization of inputs.

The K121 can be programmed before installation and does not need external power during programming. Connect the K121 to your PC using the Easy USB or S117P1 kit, start the software, and select K121.

The following parameters can be programmed. Not all are available, depending on sensor type chosen.

- User defined tag number
- Sensor type: T/C, RTD, pot., mV, V, mA, resistance, custom
- Number of RTD or potentiometer wires: 2, 3, 4
- Unit of measure
- Offset
- Start of scale
- End of scale
- T/C internal temperature compensation: CJC on or off
- Detect broken sensor
- Normal or inverted output
- Out-of-range: 2.5% over-range accepted, 5% over is fault
- RTD/TC upscale or downscale burnout
- Output filtering seconds: Off, 1, 2, 5, 10, 30, 60
- Save configuration to file
- Send configuration to device
- Show configuration report

Output Signal Limit / Fault or Over-Range		
Output limit	Over-range $\pm 2.5\%$	Malfunction $\pm 5\%$
20 mA	20.4 mA	21 mA
4 mA	3.6 mA	<3.4 mA

Input Type	Range	Min. Span	Resolution
J	-210 to 1200°C	50 °C	5 μ V
K	-200 to 1372°C	50 °C	5 μ V
R	-50 to 1768°C	100 °C	5 μ V
S	-50 to 1768°C	100 °C	5 μ V
T	-200 to 400°C	50 °C	5 μ V
B	0 to 1820°C	100 °C	5 μ V
E	-200 to 1000°C	50 °C	5 μ V
N	-200 to 1300°C	50 °C	5 μ V
Ni100	-60 to 250°C	20 °C	6 m Ω
Pt100	-200 to 650°C	20 °C	6 m Ω
Pt500	-200 to 650°C	20 °C	28 m Ω
Pt1000	-200 to 200°C	20 °C	28 m Ω
mV	-150 to 150 mV	2.5 mV	5 μ V
V	-30 to 30 VDC	0.5 V	~1 mV
mA	-24 to 24 mA	0.5 mA	~1 μ A
Potent. Ω	500 to 10,000 Ω	10 %	28 m Ω
Resist. Ω	0 to 400 Ω	10 Ω	6 m Ω
Resist. Ω	0 to 1760 Ω	10 Ω	6 m Ω

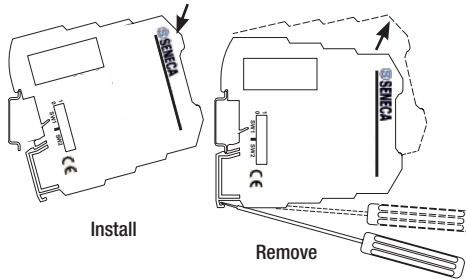
Installation and Removal

The housing clips to a standard 35 mm DIN rail and requires installation in a protective enclosure. Install module in a vertical orientation and position in the lower part of the panel away from heat sources or objects that may block air flow.

1. Tilt the front of module upward and clip the upper mount to the top edge of the DIN rail.
2. Push front of module downward until lower mount snaps in place.

To Remove: Avoid shock hazards! Turn input, output, and power off before removing module.

1. Use small screwdriver to pry to lower clip away from the DIN rail.
2. Tilt the front of module upward to remove.



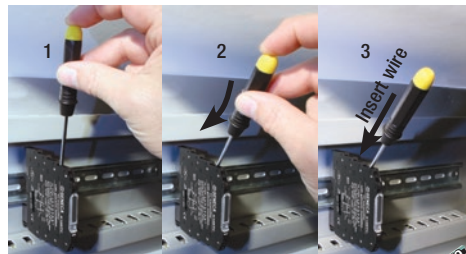
Electrical Connections

See the wiring diagrams at right. Polarity must be observed for wiring connections. If the output does not function, check wiring and polarity. The use of shielded wire is recommended for signal connections.

Inserting Wires

Use a flat blade screwdriver with a blade about 1/8" W to depress wiring spring clip for each connection.

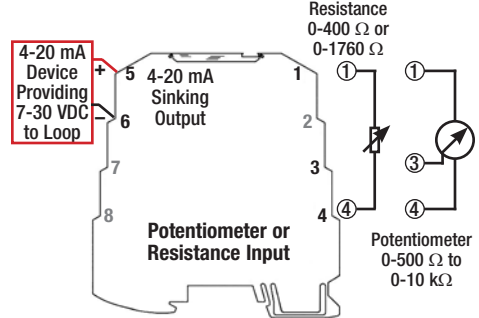
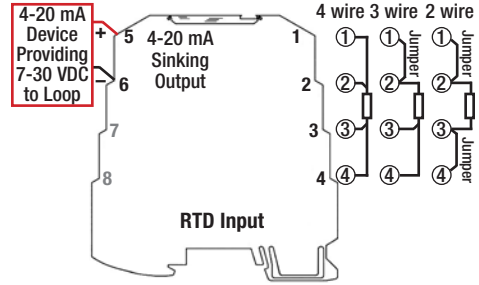
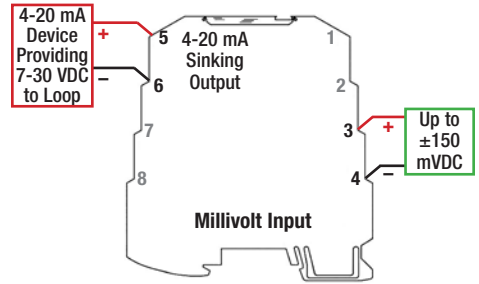
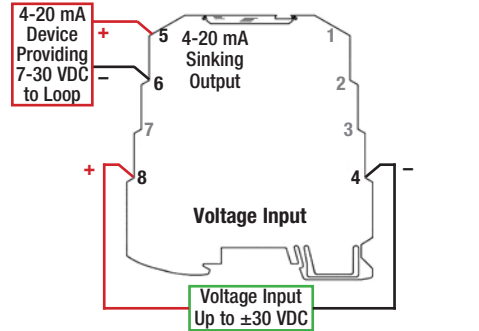
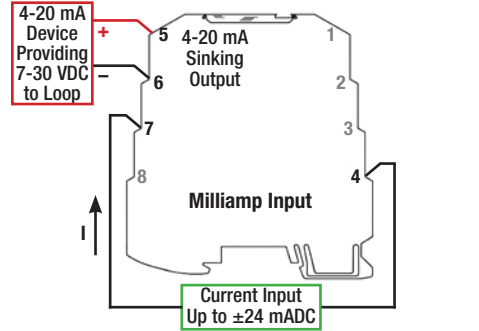
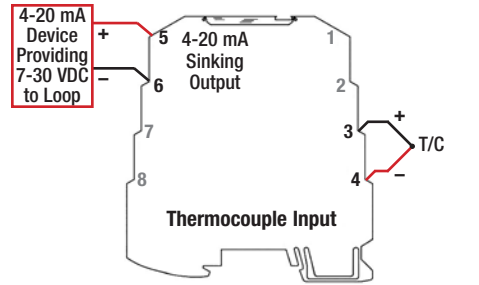
1. Insert screwdriver at a nearly vertical angle into the square opening next to desired round terminal. Make sure the screwdriver goes under the spring clip and not into the clip opening.
2. Push the screwdriver down and in, (or up and in for lower terminals). The wire clip moves up exposing the opening in the round terminal opening.
3. Insert wire into round terminal hole, then remove the screwdriver and make sure wire is secure.



Output and power from the 4-20 mA loop

The 4-20 mA output must be connected to a device that provides power to the 4-20 mA loop. This provides power to operate the K121. Acceptable voltage is 7 to 30 VDC.

Note: in order to reduce the module's heat dissipation, we recommend using a load of more than 250 Ω .



API maintains a constant effort to upgrade and improve its products. Specifications are subject to change without notice. Consult factory for your specific requirements.