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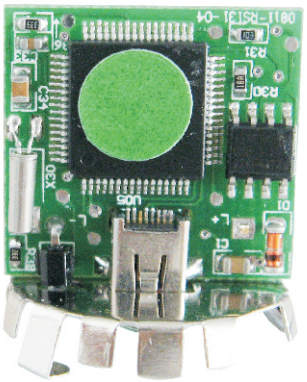
SENSE Sense the world

Digital Transmitter OEM Module SE21D



Only 21.7mm*20.8mm

- Small size, simple mounting
- Popular sensors acceptable
- Economical price, high accuracy
- Long-term stability
- Excellent EMC performance
- USB Programming interface

The SE21D is a very small size, only 21.7mm *20.8mm .

The SE21D is suitable for various sensors and converts input signals into 4 to 20 mA analogue output signal.

The SE21D can be programmed via two buttons on the PCB. Following parameters can be adjusted: zero, span, restore data and so on.

Reserved display interface, may connect 5-wire LCD for locale display.

Inside temperature sensor of PCB could be directly used for the temperature error compensation.

The SE21D is protected against miswiring and transient overvoltages.

Performance

Wide voltage supply range
9-45VDC
Self stability and filter setup
Improve transmitter stability
Freely linearity and temperature compensation
Min. 2 points, max 11 points
Self-learning function
Acceptability 1.5mV-4.8V signal input
Popular sensors acceptable
E.g. Pressure, differential, load cell,
magnetic float ball, strain gauge etc.
Backup and restore data
Convenient for using on the locale
Excellent EMC performance
Suitable for harsh conditions

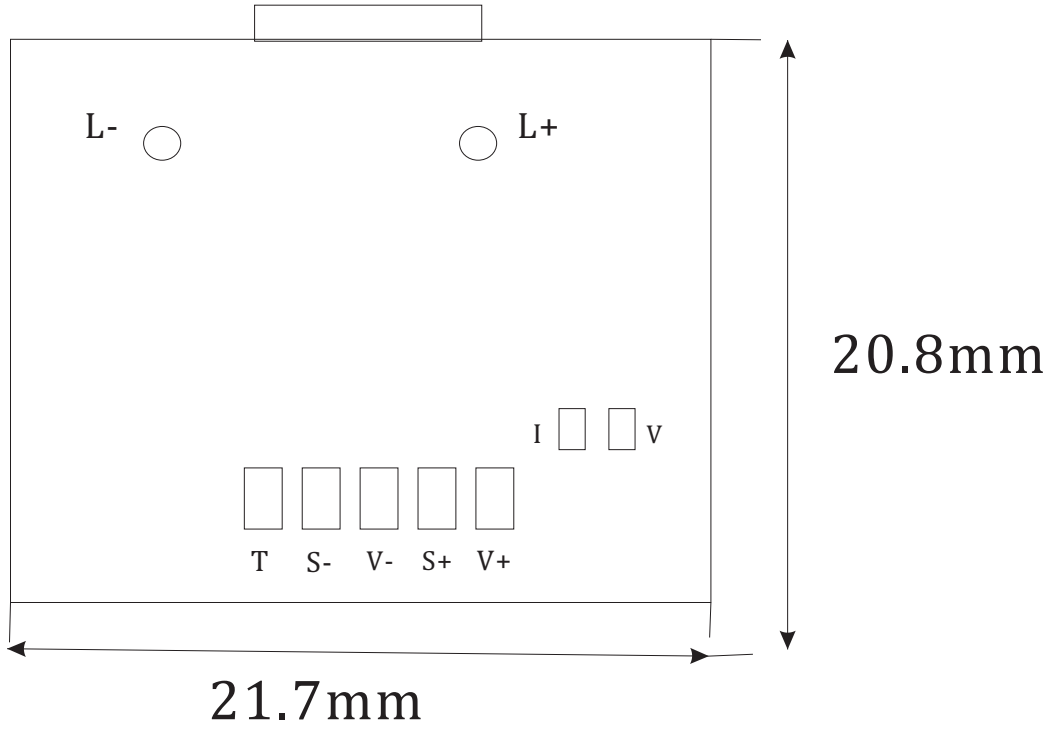
Application areas

The SE21D may be used for a wide variety of measure sensor:
-pressure sensors
-differential sensors
-load cells
-magnetic field sensors
-strain gauge
-resistor of 2/3/4 wires

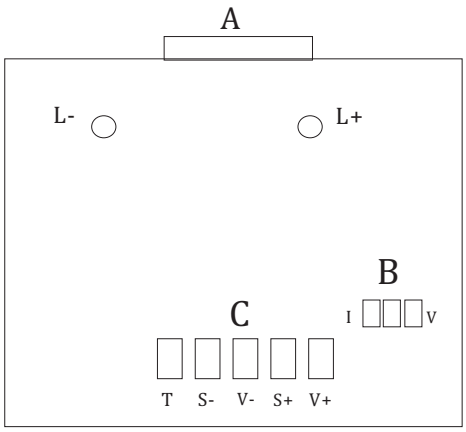
Technical data

Power supply (polarity protected)		
Supply voltage		9-45 VDC
Input		
2-wire sensor		Such as:2-wire resistor, magnetic float ball, magnetic rotating pole, etc
3-wire sensor		Such as:3-wire resistor, E+H Ceracore II, E+H Ceracore M, etc
4-wire sensor		Such as:4-wire resistor, all bridge sensor, etc
mV		Such as: external voltage, etc
Sensor supply		Constant voltage: 5 V, Constant Current: 0.2...2.0 mA
Output signal		
2-wire-system		4...20 mA with superimposed communication signal for HART protocol
Underranging		Linear drop to 3.6 mA
Overranging		Linear rise to 22.8 mA
Load		max.($V_{power\ supply}$-12 V)/0.02 A
Perform ance		
Accuracy	10:1	<0.05%
	20:1	<0.075%
	40:1	<0.1%
	100:1	<0.25%
Long term stability		⩽0.05%/year
Switch on delay		⩽5s
Response time		⩽200 ms (setting damping time 0)
Load influence		Negligible
Power supply influence		Negligible
Self stability configuration		0 to 2%
Filter configurating		0 to 160 uA

Application conditions	
Ambient, operation and storage	-40-85℃
Ingress protection	IP 00
Temperate influence	< 0.05%/10℃
Short-circuit protection	Permanent
Reverse polarity protection	No damage, but also no function
Ex-protection	EEx ia II C T4- CT6
Electromagnetic compatibility(EMC)	Interference immunity and interference emission according to GB/T17626.2-1998), compliance with IEC 61000-4-3:1995.
Others	
Weight	Approx. 3.25 g
Dimensions	



Electrical Connection



A: USB programming interface:

B: Sensor power select:

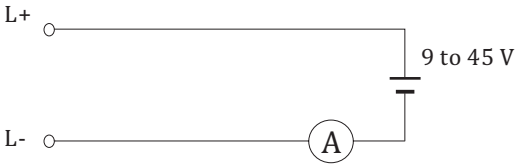
Constant voltage: Left open right close

Constant current: Left close right open

C:Sensor connection

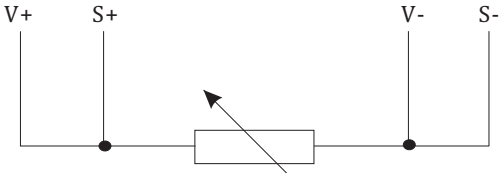
V+ sensor power
S+ signal output
V- sensor power
S- signal output
T temperature signal

A. Power supply



How to connect a Sensor [1]

A) 2-wire connection

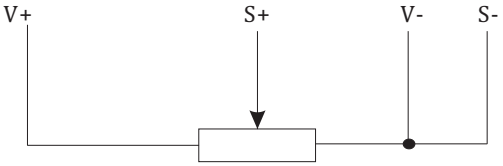


For 2-w ire resistor, magnetic rotating pole and magnetic float ball, etc.
For example:

Type	Sensor supply	Max. Resistance	Sensor power	Recommend
Magnetic float ball 2-wire resistor	Constant current	10 Ω to 22.5 K Ω	I × Rmax. ≤ 4.5 V	I × Rmax. ≤ 2 V

Application: max. Sensor Resistance 5 K Ω , may choose 0.2 to 0.8 mA (Sensor power), 0.2 to 0.4 mA is recommended.

B) 3-wire connection

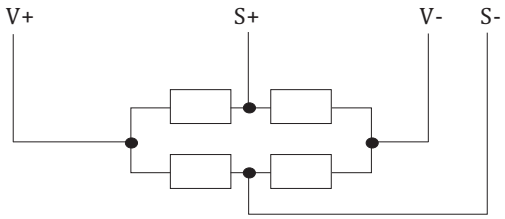


For 3-wire resistor, E+H Ceracore II, E+H Ceracore M, etc.
For example:

Type	Sensor supply	Max. Resistance	Sensor power	Recommend
3-wire resistor	Constant current Constant voltage	10 Ω to 22.5 K Ω		
E+H Ceracore II E+H Ceracore M	Constant voltage		5 V	5 V

Application:3-wire resistor:10 K Ω , 5 V(constant voltage) is chosen; 2 K Ω choose 1.6 mA(constant current).

C) 4-wire connection

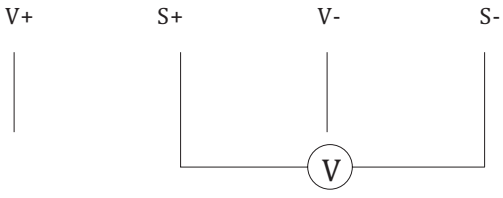


For 4-wire resistor, all of bridge sensors, etc.
For example:

Type	Sensor supply	Max. Input Resistance	Sensor power
4-wire resistor	Constant current Constant voltage	10 Ω to 22.5 K Ω	
Silicon	Constant current constant voltage	≤5.6K Ω ≥5.6K Ω	0.8 mA 5 V
ME501/ME505/ ME 651 thick film	Constant voltage		5 V
Load cell Strain gauge	Constant current	1 K Ω or 2 K Ω	1.6 mA
Silicon on sapphire	Constant current Constant voltage	2.2 K Ω 10 K Ω	0.8 mA 5 V

Application: Load cell and Strain gauge, max. Input resistance 350 Ω , 1.6 mA or 2.0 mA (sensor power) is chosen.; max. Input resistance 700 to 1000 Ω , 1.6 mA or 2.0 mA is chosen.

D) connection of external voltage



Type	Sensor supply	Input Range	Max. Input range
mV	Constant current Constant voltage	-4500 mV to 4500 mV	4800 mV

[1] SENSE may provide more solutions for sensor application. Further versions are possible on request.

How to do temperature compensation

A) Constant voltage for sensors

Because of temperature sensor inside PCB, you can directly do temperature compensation.

B) Constant current for sensors

The temperature compensation can be made using either of the following two methods.

1) directly temperature compensation

2) take out of 100KΩ and temperature diode(D30, R41 on PCB), then V+ and T is short circuit.

Operation

The SE21D can be adjusted via USB programming interface , PC with HARTTran software or PDA.

All parameters can be adjusted, monitored with USB-talker and HartTran(software) via PC, note-book or PDA.

Ordering code SE21D

Output
2 4...20mA/2-wire
C Customer

Display
N Without display
L 5-wire LCD display
C Customer

EMI
0 Without filter board
1 Filter board

Electronic preamplifier [1]
0 Without electronic preamplifier board
1 Electronic preamplifier board

Sensor input (**JS**)
A Standard factory configuration constant voltage
1 Left open right close (constant voltage)
2 Left close right open (constant current)

Sensor signal (**JD**)
A Standard factory configuration short current
1 Short current (single signal)
2 Open (double signals)

SE21D	2	N	1	0	A	A	← For example

1. With optional Metal Capacitive sensors, the electronic preamplifier board is necessary.