EN

Z109REG$_2$-H
UNIVERSAL CONVERTER WITH GALVANIC SEPARATION

GENERAL CHARACTERISTICS

- Universal input: voltage, current, thermocouples, thermoresistences, potentiometer, rheostat.
- Sensor powered by 2-wire technique: 20 Vcc stabilised, 20mA max with short-circuit protection.
- Measurement and re-transmission on isolated analog output, with voltage and current output .
- DIP-switch for selecting: type of input, START-END, output mode (zero elevation, scale inversion), output voltage type (mA or V).
- Front panel indicating: power on, off scale or setting error, alarm status.
- Relay (spst) output, programmable through PC.
- STROBE input to activate the analog output on PLC command (alternatively to alarm contact).
- Facility for programming the following with a PC: beginning and end scale, additional input types, square root extraction, filter, burn-out etc.
- Insulation between supply and output or input: 3750 Vac.
- Insulation between output and input: 1500 Vac.

TECHNICAL SPECIFICATIONS

Power supply:	85-265 Vdc or Vac 50-400 Hz, max 2.5 W; 1.6W @ 220Vac with 20mA output.
Voltage input:	Bipolar from 75 mV up to 20 V in 9 scales, input impedance 1 MΩ, resolution max 15 bit + sign.
Current input:	Bipolar up to 20 mA, input impedance ~50 Ω, resolution: 1μA.
Thermoresistance (RTD) input PT100, PT500, PT1000, NI100, KTY81, KTY84 and NTC.	2, 3 or 4 wires measurement, energising current 0.56 mA, resolution 0.1 °C, automatic detection of cable interruption or RTD. Resistive value for NTC: < 25 kΩ. KTY81, KTY84 an NTC may be set only via software.
Thermocouple input:	Type J,K,R,S,T,B,E,N; resolution: 2.5 μV, automatic detection of TC interruption, input impedance >5 MΩ
Rheostat input:	Full scale min 500 Ω, max 25 kΩ.
Potentiometer input:	Excitation voltage 300 mV, input impedance > 5 MΩ, potentiometer value from 500 Ω to 10 kΩ (with the aid of a parallel resistence equal to 500 Ω).
Sampling frequency:	Variable from 240 sps with 11 bits resolution + sign to 15 sps with 15 bits + sign resolution (typical values).

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Response Time:	35 ms with 11 bits resolution, 140 ms with 16 bits resolution (measurement of voltage, current, potentiometer).			
Output:	Generated Current 0..20 / 4..20 mA, max load resistance 600 Ω Voltage 0..5 V / 0..10 V / 1..5 V / 2..10 V, min load resistance 2 kΩ Resolution: 2.5 μA / 1.25 mV.			
Relay output (spst) :	Capacity : 1 A - 30 Vdc/Vac			
Environmental conditions:	Temperature: -20 - +60°C, Humidity min: 30%, max: 90% a 40°C non condensing (also see section ***Installation instructions***).			
Errors referred to max measuring range:	Calibration Error	Thermal Coefficient	Linearity error	Others
Input for voltage/current:	0.1%	0.01%/°K	0.05%	EMI(4): <1%
Input for thermocouple J,K,E,T,N:	0.1%	0.01%/°K	0.2 °C	+ (2) EMI: <1%
Input for thermocouple R,S:	0.1%	0.01%/°K	0.5 °C	+ (2) EMI: <1%
Input for thermocouple B (5):	0.1%	0.01%/°K	1.5 °C	+ (2) EMI: <1%
Cold junction compens.:	2°C in ambient range 0 to 50°C.			
Potentiometer/resistor :	0.1%	0.01%/°K	0.1%	EMI (4):<1%
Input for thermoresistance (6):	0.1%	0.01%/°K	t > 0°C 0.02% t < 0°C 0.05%	(1) EMI: <1%
Voltage output (3):	0.3%	0.01%/°K	0.01%	
Data Memory	EEPROM for all configuration data; storage time: 40 years.			
Standards CE	EN61000-6-4 / 2007 (electromagnetic emission, industrial environment) EN61000-6-2 / 2006 (electromagnetic immunity, industrial environment) EN61010-1/2001 (safety)			

(1) Influence of cable resistance 0.005%/Ω max 20 Ω.
(2) Influence of cable resistance 0.1 μV/Ω.
(3) Values to be added to the errors of the selected input.
(4) EMI: electromagnetic interferences.
(5) Output zero if t < 400 °C.
(6) All the values have to be calculated on the resistive value.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

SELECTION: INPUT / MEASURING SCALE

The type of input is selected by setting the SW1 dip-switch group at the side of the module.
Every type of input is matched to a certain number of scale beginnings and ends values which can be selected with the SW2 group.
The table below lists possible START and END values according to the type of input selected.

N.B.: DIP-switches must be set while the module is powered down, otherwise, the module may be damaged.

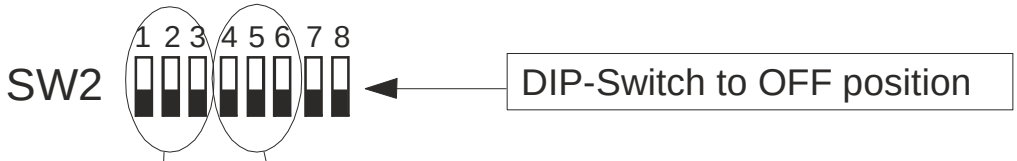
SW1: INPUT TYPE

INPUT TYPE (1 2 3 4)	
	V
	Ω/ Rheostat
	mA
	NI100
	PT100
	PT500
	PT1000
	Tc J

INPUT TYPE (1 2 3 4)	
	Tc K
	Tc R
	Tc S
	Tc T
	Tc B
	Tc E
	Tc N
	Potentiometer

SW2 : START and END

START (1 2 3)	END (4 5 6)
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8



		Voltage		Resistance / Rheostat		Current		Potentiometer	
		START	END	START	END	START	END	START	END
	1	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)
	2	0 V	100 mV	0 Ω	1 kΩ	0 mA	1 mA	0 %	40 %
	3	400 mV	200 mV	0.5 kΩ	2 kΩ	1 mA	2 mA	10 %	50 %
	4	1 V	500 mV	1 kΩ	3 kΩ	4 mA	3 mA	20 %	60 %
	5	2 V	1 V	2 kΩ	5 kΩ	-1 mA	4 mA	30 %	70 %
	6	-5 V	5 V	5 kΩ	10 kΩ	-5 mA	5 mA	40 %	80 %
	7	-10 V	10 V	10 kΩ	15 kΩ	-10 mA	10 mA	50 %	90 %
	8	-20 V	20 V	15 kΩ	25 kΩ	-20 mA	20 mA	60 %	100 %

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

		NI100 (RTD)		PT100 (RTD)		PT500 (RTD)		PT1000 (RTD)	
		START	END	START	END	START	END	START	END
	1	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)
	2	-50 °C	20 °C	-200°C	50°C	-200 °C	0 °C	-200 °C	0 °C
	3	-30 °C	40 °C	-100°C	100°C	-100 °C	50 °C	-100 °C	50 °C
	4	-20 °C	50 °C	-50°C	200°C	-50 °C	100 °C	-50 °C	100 °C
	5	0 °C	80 °C	0°C	300°C	0 °C	150 °C	0 °C	150 °C
	6	20 °C	100°C	50°C	400°C	50 °C	200 °C	50 °C	200 °C
	7	30 °C	150 °C	100°C	500°C	100 °C	300 °C	100 °C	300 °C
	8	50 °C	200 °C	200°C	600°C	150 °C	400 °C	200 °C	400 °C

		Thermocouple J		Thermocouple K		Thermocouple R		Thermocouple S	
		START	END	START	END	START	END	START	END
	1	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)
	2	-200°C	100°C	-200°C	200°C	0°C	400°C	0°C	400°C
	3	-100°C	200°C	-100°C	400°C	100°C	600°C	100°C	600°C
	4	0°C	300°C	0°C	600°C	200°C	800°C	200°C	800°C
	5	100°C	400°C	100°C	800°C	300°C	1000°C	300°C	1000°C
	6	200°C	500°C	200°C	1000°C	400°C	1200°C	400°C	1200°C
	7	300°C	800°C	300°C	1200°C	600°C	1400°C	600°C	1400°C
	8	500°C	1000°C	500°C	1300°C	800°C	1750°C	800°C	1750°C

		Thermocouple T		Thermocouple B		Thermocouple E		Thermocouple N	
		START	END	START	END	START	END	START	END
	1	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)
	2	-200°C	50°C	0°C	500°C	-200°C	50°C	-200°C	200°C
	3	-100°C	100°C	500°C	600°C	-100°C	100°C	-100°C	400°C
	4	-50°C	150°C	600°C	800°C	0°C	200°C	0°C	600°C
	5	0°C	200°C	700°C	1000°C	100°C	300°C	100°C	800°C
	6	50°C	250°C	800°C	1200°C	150°C	400°C	200°C	1000°C
	7	100°C	300°C	1000°C	1500°C	200°C	600°C	300°C	1200°C
	8	150°C	400°C	1200°C	1800°C	400°C	800°C	500°C	1300°C

(*) START or END are set in the memory with the PC or with the programming push-buttons

N.B.: DIP-switches must be set while the module is powered down, otherwise, the module may be damaged.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

SETTING START AND END AT WILL

The START and END push-buttons under the SW2 DIP-switch group allow to set the beginning and end scale at will within the scale pre-set through the dip-switches. To obtain this facility it is necessary to use a suitable signal generator, able to furnish the desidered values of beginning and end scale.
The procedure is following:

1. Set through dip-switches the type of input, START and END measurement which include the required beginning and end values.
2. Power up the module.
3. Supply a calibrator or simulator of the signal you wish to measure and re-transmit.
4. Set the required START value on the calibrator (or other instrument).
5. Press the START push-button for at least 3 sec. The green LED on the front panel flashes to indicate the value has been stored.
6. Repeat points 4 and 5 for the required END value.
7. Cut power to the module and set to OFF position the dip-switches of group SW2, correspondent to the settings of START and END values.

The module is now configured for the required start and end scale. To re-program it (e.g. for a different type of input) repeat the whole procedure.

SELECTING OUTPUT

DIP-switches numbers 7 and 8 of the SW2 group enable you to set the output with or without zero elevation, or as a normal or reversed output.
The SW3 DIP-switch group enables you to select the output type.

N.B.: DIP-switches must be set while the module is powered down, avoiding electrostatic discharges, otherwise the module may be damaged.

SW2

OUTPUT MODE	
7	0..20mA / 0..10V
	4..20mA / 2..10V
8	NORMAL
	REVERSED

SW3

OUTPUT	
1 2	Voltage
	Current

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

SETTING WITH A PC

By using a PC and ZSETUP2 software, it is possible to set other normally fixed parameters in addition to start and end scale:

- ✍Additional input types.Digital filter (normally disabled);
- ✍Square root extraction (normally disabled);
- ✍Negative burn-out (normally positive);
- ✍Alarm(normally set as error signalling;
- ✍Start and end scale of the analog output;
- ✍Value of the analog output in case of error;
- ✍Rejection programmable for 50 or 60 Hz mains frequency (normally set to 50 Hz);
- ✍Sampling frequency/resolution (normally set to 15 sps/16 bit);
- ✍3 or 4 wires measure for thermal resistance (normally set to 3 wires);
- ✍Action of the digital output alarm in case of fault;

Instructions for setting and for the connection cable are supplied with the software (to be requested as an accessory item).

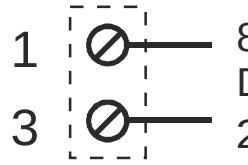
LED Indication on the front

Green LED	Meaning
Flashing (freq: 1 Flash./sec)	Out Range, Burn Out or Internal fault
Flashing (freq ≈ 2 Flash./sec)	Error on dip-switches setting
Steady ON	Indicates the presence of power supply

Yellow LED	Meaning
Steady ON	Alarm Signalling (relay contact opened)
OFF	No Alarm (relay contact closed)

ELECTRICAL CONNECTIONS

POWER SUPPLY



85 - 265 V ≂
DC/ AC 50 - 400Hz
2,5 W Max

Power supply voltage must be in the range 85 to 265V either DC (at any polarity) or AC 50-400Hz; also see section ***INSTALLATION INSTRUCTIONS.***

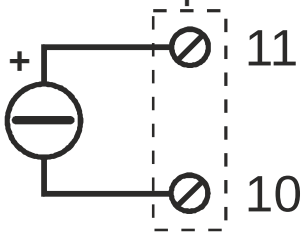
The upper limits must not be exceeded, to avoid serious damage to the module.

Protect the power supply source against possible damage of the module by using a fuse of suitable size.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

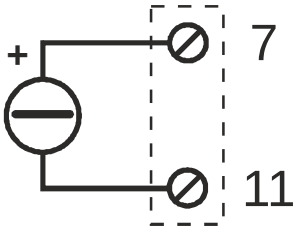
CURRENT INPUT

mA input



The loop is powered by the sensor

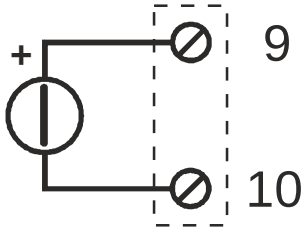
mA input (2 wires)



The loop is powered by the module

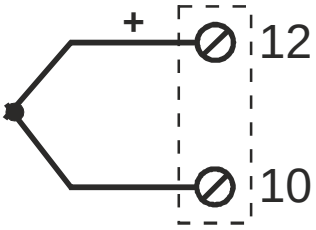
VOLTAGE INPUT

V input > 300 mV



THERMOCOUPLE INPUT

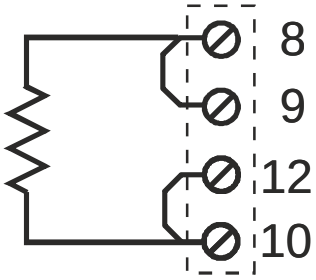
mV/TC input



THERMORESISTANCE INPUT

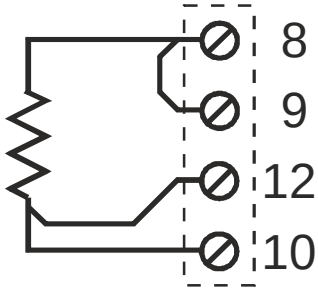
NTC, KTY81, KTY84

RTD 2 wires

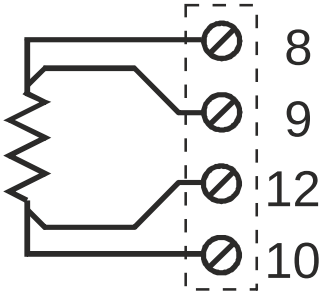


PT100, NI100, PT500, PT1000

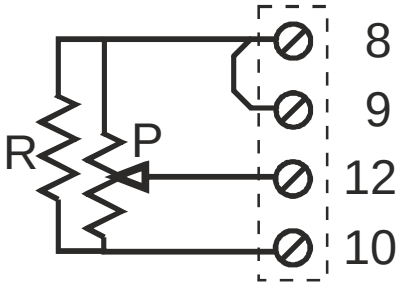
RTD 3 wires

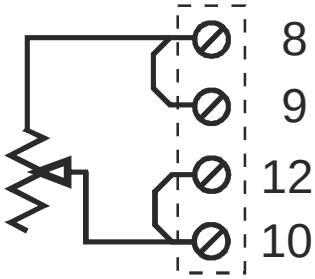


RTD 4 wires



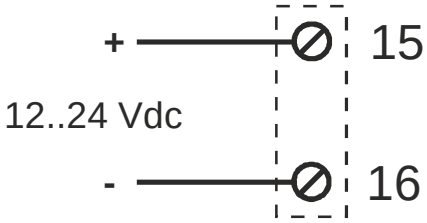
POTENTIOMETER/RHEOSTAT INPUT





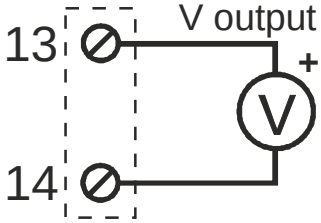
With resistance R=500 Ω (not provided), P= 500 Ω ÷ 100 kΩ

STROBE INPUT (7)

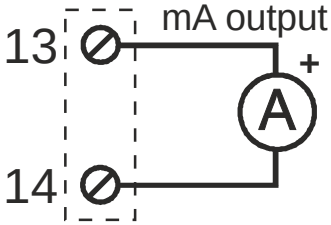


RE-TRANSMITTED OUTPUT

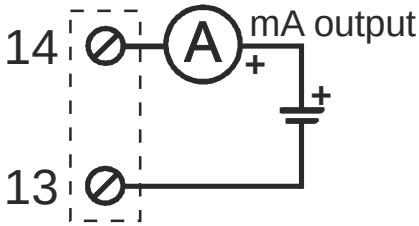
Voltage



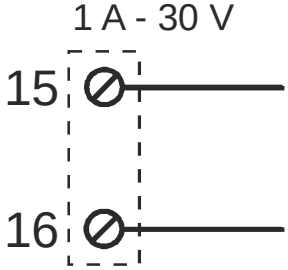
Generated Current (8)



External Power Supply Current (9)



RELAY OUTPUT (10)



(7) As alternative to the relay output. It is isolated from the other circuits and enables the current analog output. It may be used to multiplex a PLC input on n Z109REG$_2$-H. To enable it see ***SETTINGS THROUGH INTERNAL BRIDGES***.

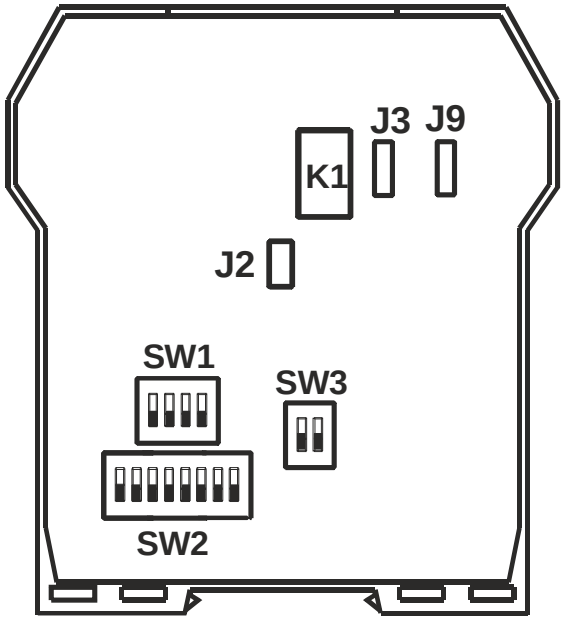
(8) Active Output (powered) to connect to passive inputs.

(9) Unpowered passive output to be connected to active inputs. To enable it, see ***SETTINGS THROUGH INTERNAL BRIDGES***.

(10) As alternative to STROBE input; relay contact normally closed, opened in event of alarm.

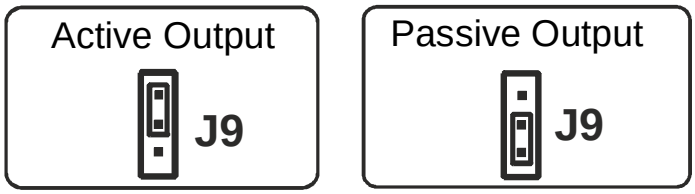
LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

INTERNAL BRIDGES POSITION

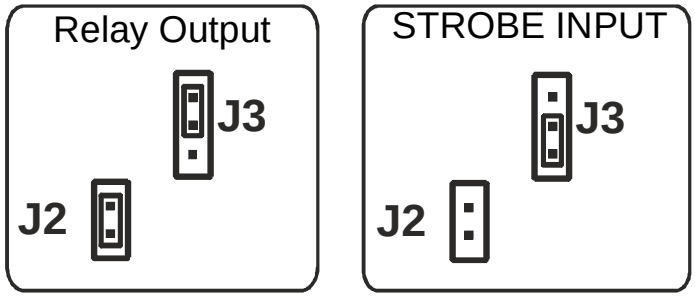


SETTINGS THROUGH INTERNAL BRIDGES

ACTIVE / PASSIVE OUTPUT



RELAY OUTPUT / STROBE INPUT



INSTALLATION INSTRUCTIONS

The module was designed for fitting to guide DIN 46277, in a vertical position.
For optimum operation and long life, make sure adequate ventilation is provided for the module/s, avoiding placing raceways or other objects which could obstruct the ventilation grilles. Do not install the modules above appliances generating heat we advise you to install in the lower part of the panel.

SEVERE OPERATING CONDITIONS:

Severe operating conditions are as follows:

- *Power supply of the sensor at input.*
- *Use of the output on generated current.*

When modules are installed side by side, it may **be necessary to separate them by at least 5 mm** in the following cases:

- If panel temperature exceeds 45°C and at least one of the severe operating conditions exists.
- If panel temperature exceeds 35°C and both the severe operating conditions exist.

ELECTRICAL CONNECTIONS

We advise you to use shielded cables for connecting signals. The shield must be connected to an earth wire used specifically for instrumentation. Moreover, it is good practice to avoid routing conductors near power appliances such as inverters, motors, induction ovens, etc.

This document is property of SENECA srl. Duplication and reprodution are forbidden, if not authorized. Contents of the present documentation refers to products and technologies described in it. All technical data contained in the document may be modified without prior notice Content of this documentation is subject to periodical revision.

CERTIFICATE N. 9115.SENE - REGISTRATION NUMBER IT-827
azienda con sistema di gestione per la qualità certificato
ISO 9001:2008

SENECA s.r.l.
Via Austria, 26 - 35127 - PADOVA - ITALY
Tel. +39.049.8705355 - 8705359 - Fax +39.049.8706287
e-mail: info@seneca.it - www.seneca.it

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000