# USER MANUAL

# Z204



MI002072

# Seneca Z-PC Line module: **Z204**

The Z204 module measures the alternate and/or continue input voltage value and converts it to a current (0..20 mA) or voltage (0..10 V) programmable output signal, proportional to the RMS (Root Mean Square) input value.

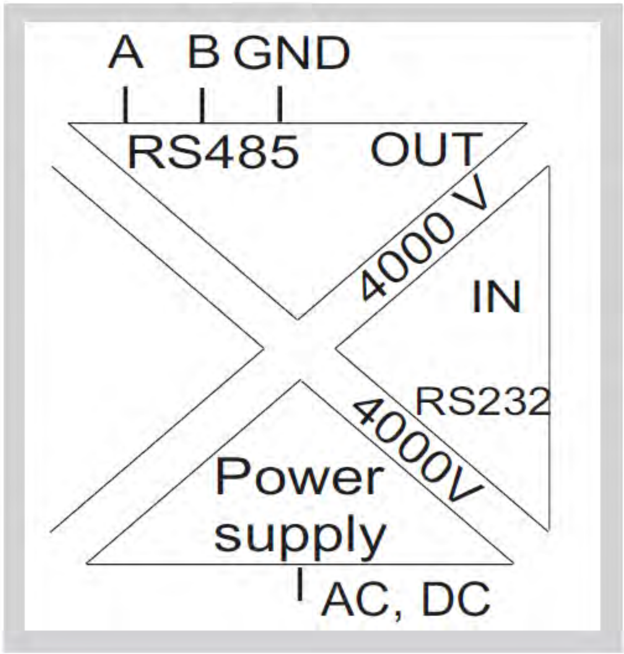
## *General characteristics*

- Input voltage up to 1200 V (DC scale) and 850 V RMS (AC scale), which scale can be selected by Dipswitches and the configuration have to be downloaded on the Z204 by software (Easy, Z-NET).
- If the screw terminals mode is selected «analog output», output can be turned between: current (0..20 mA, programmable) or voltage (0..10 V, programmable).
- High precision: input class is 0.5, outputs class is 0.1.
- Input frequency range: DC..30 Hz-300 Hz.
- 4000 V galvanic isolation between voltage input and the other terminals.
- 1500 V isolation between the output terminals and the power supply terminals.
- Power ON, fail, RS485 Tx, RS485 Rx: indications by the LED panel

## *Features*

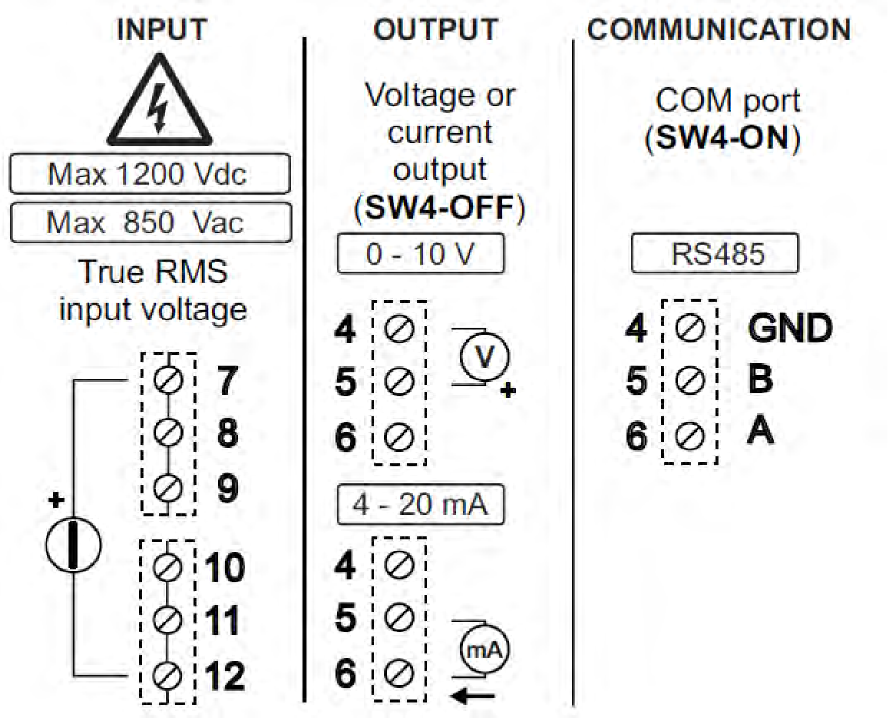
| | |
|---|---|
| **Power supply** | 10..40 VDC (free polarity) or 19..28 VAC 50..60 Hz.<br>Insulation toward the output terminals: 1500 V.<br>Insulation toward the input: 4000 V |
| **Consumption** | <1 W at 24Vdc. |
| **Voltage input** | Continue voltage 0..1200 Vdc; alternate voltage 0..850 Vac<br>Input impedance: 800 kohm.<br>Frequency: DC..30 Hz-300 Hz.<br>Precision class: 0.5. |
| **Passband** | At 1 kHz, error is 1.5% |
| **Current output** | Range: 0..20 mA can be selected via DIP-switch.<br>Maximum load resistance: 500 ohm.<br>Precision class: 0.1 |
| **Voltage output** | Range: 0..10 V can be selected via DIP-switch.<br>Minimum load resistance: 1 kohm.<br>Precision class: 0.1 |
| **Thermal stability** | 100 ppm/K. |
| **Response time** | For a stepped variation: 1 s from 10 to 90%. |
| **Operating temperature** | Operating temperature: -20..65 °C, storage temperature: -20..85 °C humidity 30..90% at 40°C non-condensing. |
| **LED signals** | Power ON (green), fail (yellow), Rx/Tx (red). |
| **Protection** | IP20. |
| **Weight, dimensions** | 140 g, 100 x 112 x 17.5 mm. |
| **Overvoltage class** | II, up to 600 Vrms;<br>I, up to 1000 Vrms.<br>For higher voltage / class values, an overvoltage limitation (external to the device) is necessary. |

| | |
|---|---|
| **Conform to CE standards** | EN61000-6-4 (2007) (electromagnetic emission, industrial environment)<br>EN61000-6-2 (2006) (electromagnetic immunity, industrial environment)<br>EN61010-1 (safety)<br>All the circuits must be provided with double isolation against circuits under dangerous voltage. The power supply transformer must comply with EN60742 standards for isolation transformers and safety transformers. |




The power supply transformer necessary to supply the module must comply with EN60742 (Isolated transformers and safety transformers requirements). To protect the power supply, it is recommended to install a fuse.

## *Connections*




Connect the pole «+» of voltage input, indifferently, to one of the screw terminals 7, 8, 9 (equipotentials).

Connect the pole «-» of voltage input, indifferently, to one of the screw terminals 10, 11, 12 (equipotentials).

## *Dip-switches table*

In the following tables: box without circle means Dip-Switch=0 (OFF state); box with circle means Dip-Switch=1 (ON state).

**SW1 – INPUT SCALE**

| 1 | 2 | Meaning |
|---|---|---|
| | | DC scale: 0..150 Vdc; AC scale: 0..100 Vac |
| ● | | DC scale: 0..500 Vdc; AC scale: 0..350 Vac |
| | ● | DC scale: 0..850 Vdc; AC scale: 0..600 Vac |
| ● | ● | DC scale: 0..1200 Vdc; AC scale: 0..850 Vac |

**SW2 - BAUDRATE**

| 1 | 2 | Meaning |
|---|---|---|
| | | Baud-rate=9600 Baud |
| | ● | Baud-rate=19200 Baud |
| ● | | Baud-rate=38400 Baud |
| ● | ● | Baud-rate=57600 Baud |

**SW2 - ADDRESS**

| 3 | 4 | 5 | 6 | 7 | 8 | Meaning |
|---|---|---|---|---|---|---|
| | | | | | | **Address and Baud-Rate are acquired from memory(EEPROM)** |
| | | | | | ● | Address=1 |
| | | | | ● | | Address=2 |
| | | | | ● | ● | Address=3 |
| | | | ● | | | Address=4 |
| X | X | X | X | X | X | …………………… |
| ● | ● | ● | ● | ● | ● | Address=63 |

**SW3 - RS485 TERMINATOR**

| 1 | Meaning |
|---|---|
| | RS485 terminator disabled |
| ● | RS485 terminator enabled |

**SW4 – OUTPUT MODALITY FOR SCREW TERMINALS 4 – 5 - 6**

| 1 | Meaning |
|---|---|
| | Analog output 0..10 V (voltage), 0..20 mA (current) |
| ● | RS 485 communication |

The Z204 module is factory configured with 1000 Vdc full scale.

To change the input start scale / stop scale, set the Dip-Switch SW1 as shown in the previous table and configure the Z204 module using the software (Easy, Z-NET).

To obtain the best resolution, configure the Dip-Switch SW1 selecting the lower input scale (between the four scales in the previous table) including the new stop scale. Example: if the software-configured new full scale is 680 Vdc, set the Dip-Switch SW1-1=»0», SW1-2=»1» (corresponding to 0-850 Vdc).

# *RS 485 register table*

| Name | Range | Interpretation of register | R/W | Default | Address |
|---|---|---|---|---|---|
| MachineID | / | Word | R | | 40001 |
| | Id_Code (Module ID) | | | 0x4900 | |
| FWREV | / | Word | R | | 40002 |
| | Firmware Code | | | | |
| Baudrate | / | Word | R/W | | 40003 |
| | Baud-rate for RS485 (baud-rate of module/node if parameters are configurated by memory modality): 0=4800; 1=9600; 2=19200; 3=38400; 4=57600; 5=115200; 6=1200; 7=2400 | | | 38400 | |
| Scale and outset | | Word | RW | | 40004 |
| | Input scale setting is bit[1,0]:<br>0=DC scale is 0-150Vdc, AC scale is 0-100 Vac<br>1=DC scale is 0-500Vdc, AC scale is 0-350 Vac<br>2=DC scale is 0-850Vdc, AC scale is 0-600 Vac<br>3=DC scale is 0-1200Vdc, AC scale is 0-850 Vac<br><br>Output signal type is bit[2]:<br>0=output is current; 1=output is voltage | | | Bit [1,0]=3<br>Bit 2 = 0 | |
| Delay | | Word | R/W | | 40005 |
| | Delay for RS485 (delay of communication response): from 0x0000=0 (no delay) to 0xFFFF=65535 | | | 0 | |
| Address and Parity | Address: from 0x01=1 to 0xFF=255 | MSB, LSB | R/W | | 40006 |
| | Address for RS485 (address of module/node if parameters are configurated by memory modality) | | | 1 | Bit [15:8] |
| | Parity for RS485: 0=there isn't; 1=odd; 2=even | | | 0 | Bit [7:0] |
| Input start | | Word | R/W | | 40007 |
| | Input start scale (in V/10) | | | 0 | |
| Input stop | | Word | R/W | | 40008 |
| | Input stop scale (in V/10) | | | 10000 (=1000 V) | |
| Out start scale (if current) | | Word | R/W | | 40009 |
| | Output start scale, for current (in uA) | | | 4000 | |
| Out stop scale (if current) | | Word | R/W | | 40010 |
| | Output stop scale, for current (in uA) | | | 20000 | |

| | | | | | |
|---|---|---|---|---|---|
| Out start scale (if voltage) | | Word | R/W | | 40011 |
| | Output start scale, for voltage (in mV) | | | 0 | |
| Out stop scale (if voltage) | | Word | R/W | | 40012 |
| | Output stop scale, for voltage (in mV) | | | 10000 | |
| Status | | Bit | R | | 40045 |
| | Error status register, bit[0]=1: flash setting error; bit[1]=1: flash tarature error | | | | |
| V RMS | | Word | R | | 40046 |
| | Input voltage RMS value, in V/10 (example: 10000=1000 VRMS) | | | | |
| V RMS float | | Floating point | R | | 40047(MSB) 40048(LSB) |
| | Input voltage VRMS value | | | | |
| Command | | Word | R/W | | 40050 |
| | To reset, write 0xC1A0 (49568 decimal) in this register | | | | |

## *LEDs for signalling*

In the front-side panel there are 4 LEDs and their state refers to important operating conditions of the module.

| LED | LED status | Meaning |
|---|---|---|
| PWR | ON | The module is power on |
| ERR | ON | Internal error |
| RX | ON | Data are being received through the RS485 communication port |
| TX | ON | Data are being transmitted through the RS485 communication port |

## *Easy-SETUP*

To configure the Seneca Z-PC Line modules, it is possible to use Easy-SETUP software, Free-downloadable from the www.seneca.it.