

- Signal Conditioning from a single strain gauge sensor and from two configurable outputs
- DIN Rail Enclosure TS35
- Power Requirement 10 ÷ 36 Vdc
- Parameter Modification Program
- Correction of Sensor Non-Linearity
- Taring the Signal of Conditioner
- Manual Quick Calibration of Conditioner



PURPOSE

DC powered signal conditioning CL11D module mount on DIN rail is designed to work with the strain gauge load cells, force sensors, torque or pressure sensors. The conditioner is equipped with a single strain gauge sensor input and with two configurable outputs.

The conditioner is controlled by a program whose parameters can be modified by the user (via USB). These parameters are saved in non-volatile EEPROM memory - switching off the supply voltage does not result in the loss of these data. Software procedures analyzing the measured quantities allow for the correction of sensor non-linearity and signaling of exceeding two comparison thresholds.

An additional binary digital input and two buttons can be used for taring the conditioner output signal or for manual, quick conditioner calibration. The housing is a DIN rail enclosure that can be clipped directly to a 35 mm top-hat rail (TS35 EN50022).

SPECIFICATIONS

Power supply for strain gauge sensor	5,0 Vdc ($\pm 0,2$ V) maximal 100 mA
Sensor resistance range	minimum 85 Ω , maximum 2000 Ω
Sensor sensitivity range	0,5 ÷ 3 mV/V
Filter band for sensor signal	1 kHz (standard), 10 kHz (option)
Cable length to the sensor	< 30 meter
Basic sampling rate of the analog-to-digital converter	32 kHz
Conditioner sampling rate and output circuit update rate	from 125 Hz to 32 kHz, for frequencies below 32 kHz the samples are obtained by averaging
Additional averaging	no averaging or from 2 to 100 samples in a sliding time window
Time to establish output signal for a sudden signal change from sensor	0,16ms + 1 amplifier sampling period (for operation without additional averaging)
Analog-to-digital converter resolution	24 bits
Conditioner output	current or voltage
Maximal current range	0÷24 mA or ± 24 mA

Maximal voltage range	$\pm 6\text{ V}$ or $\pm 12\text{ V}$
Digital-to-analog converter resolution	16 bits
Current output ranges	4÷20 mA, $\pm 20\text{ mA}$
Voltage output ranges	$\pm 5\text{ V}$, $\pm 10\text{ V}$
Load resistance	od 10Ω do 500Ω for current output $\geq 1\text{ k}\Omega$ for voltage output
Loading capacity	$< 20\text{ nF}$ for voltage output
Output resistance	$< 50\Omega$ for voltage output $> 50\text{ M}\Omega$ for current output
Output cable length	< 3 meters
Amplitude of the conditioner noise - for a sensor with a sensitivity of 1 mV/V (depending on the sampling frequency of the conditioner)	$\leq 0,058\%$ of output range (for 32 kHz) $\leq 0,056\%$ of output range (for 16 kHz) $\leq 0,046\%$ of output range (for 8 kHz) $\leq 0,037\%$ of output range (for 4 kHz) $\leq 0,028\%$ of output range (for 2 kHz) $\leq 0,020\%$ of output range (for 1 kHz) $\leq 0,014\%$ of output range (for 500 Hz) $\leq 0,012\%$ of output range (for 250 Hz) $\leq 0,009\%$ of output range (for 125 Hz)
Resolution of the conditioner – for a sensor with a sensitivity of 1 mV/V (after taking into account the noise amplitude - depending on the sampling frequency of the conditioner)	≥ 1700 plots (for 32 kHz) ≥ 1750 plots (for 16 kHz) ≥ 2150 plots (for 8 kHz) ≥ 2700 plots (for 4 kHz) ≥ 3550 plots (for 2 kHz) ≥ 5000 plots (for 1 kHz) ≥ 7100 plots (for 500 Hz) ≥ 8300 plots (for 250 Hz) ≥ 11000 plots (for 125 Hz)
Non-linearity (at 300 K)	$< 0,01\%$ (in relation to the output range)
Temperature factor of conditioning	$< 0,1\%/10\text{ K}$ (in relation to the output range)
Temperature factor of signal creep	$< 0,02\%/10\text{ K}$ (in relation to the output range)
Long-term measurement error for the strain gauge sensor	$< 0,010\%/1000\text{ h}$ (in relation to the output range)
Sensor non-linearity correction	up to 40 points
Tarring	from $\pm 0,1\%$ up to $\pm 100\%$ output range
Binary inputs	1 unit – pulled up to the supply voltage of the amplifier through a $6,8\text{ k}\Omega$ resistor
Voltage on open input	similar to the power supply voltage of the amplifier
Low voltage (short circuit)	$< 2,0\text{ V}$
Cable length to the input	< 3 meters
Relay outputs	2 units
Relay output type	C-NO (electronic)
Maximum voltage across the relay	50 Vdc, 50 VAC (amplitude)
Maximum load current	400 mA
Resistance of the relay attached	$< 2,5\ \Omega$
Leakage of the disabled relay	$< 1\ \mu\text{A}$
Relay activation time	$< 2,5\text{ ms}$
Relay off time	$< 0,2\text{ ms}$
Comparison types	high alarm, low alarm, alarm in a range, alarm out of range, high alarm (impulse), low alarm (impulse)

Insulation voltage for relays	200 VAC _{RMS} / 200 Vdc
Link to computer	USB 2.0 – Full Speed
USB socket	microUSB type B
Power voltage	10÷36 VDC
Maximum absorbed power	< 5 W
Isolation voltage between power supply and input circuit	250VAC _{RMS} / 250Vdc
Isolation voltage between power supply and output circuit (and USB)	250VAC _{RMS} / 250Vdc
Isolation voltage between input circuit and output circuit (and USB)	250VAC _{RMS} / 250Vdc
Isolation voltage between ground (DIN rail) and cable screens	200VAC _{RMS} / 200Vdc
Length of the power cord	< 3 meters
Housing	for mounting on DIN TS35 (35 mm)
Housing dimensions	114 mm x 90 mm x 25 mm
Weight	0,24 kg
Operating temperature	253K ÷ 323K (-20°C ÷ +50°C)
Relative humidity	20÷80 %
Protection against humidity	IP40

Depending on the initial configuration, the CL11D conditioners are marked as follows:

CL11D-Wx-Py-Az for following parameters:

x – conditioner output configuration (to be changed by CL11_PARAM):

- 1 – current output with range 4÷20mA
- 2 – current output with range ±20mA
- 3 – current output with range ±5V
- 4 – current output with range ±10V

y – sampling frequency of the conditioner (to be changed by CL11_PARAM):

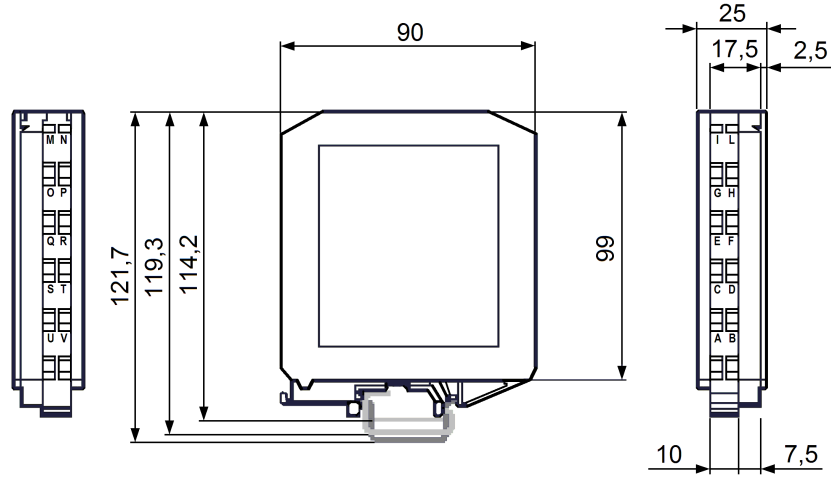
- 1 – 125Hz
- 2 – 250Hz
- 3 – 500Hz
- 4 – 1kHz
- 5 – 2kHz
- 6 – 4kHz (**default**)
- 7 – 8kHz
- 8 – 16kHz
- 9 – 32kHz

z – frequency response of analog input filters:

- 1 – 1kHz (**default**)
- 10 – 10kHz (option)

Additionally, the order should specify the range and sensitivity of the strain gauge which will be attached to the conditioner (if this sensor is not ordered in ZEPWN) and the measured values for the minimum and maximum value of the conditioner output range.

Dimensions of CL11D:



Diagrams of connections to the CL11D conditioner

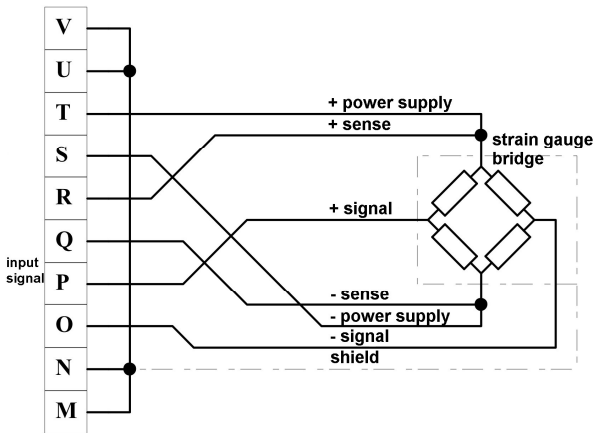


Fig. 3. Connecting a strain gauge with a 6-core cable

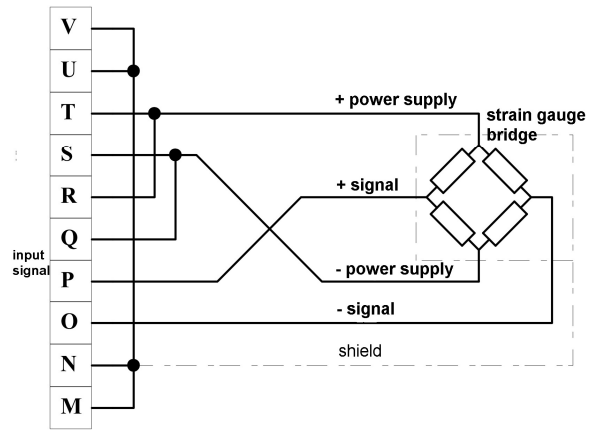


Fig. 4. Connecting a strain gauge - with a 4-core cable

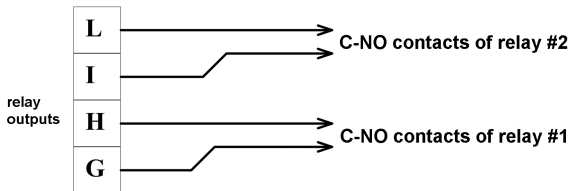


Fig. 5. Connecting to relay outputs

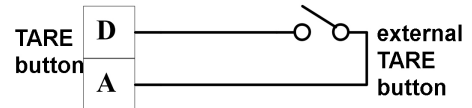


Fig. 6. Connecting an external TARA / AKC button

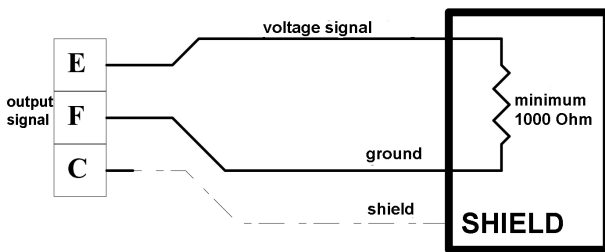


Fig. 7. Connecting to a voltage output

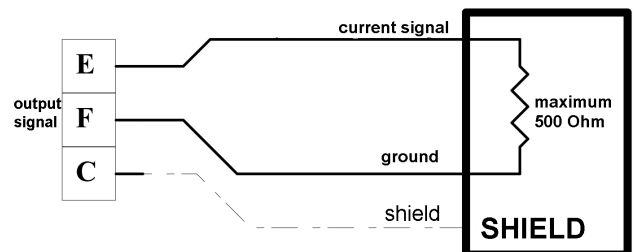


Fig. 8. Connecting to the current output

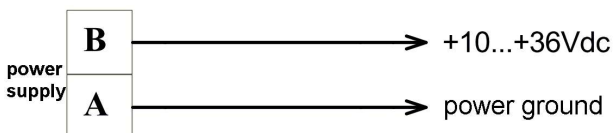


Fig. 9. Connecting the power supply

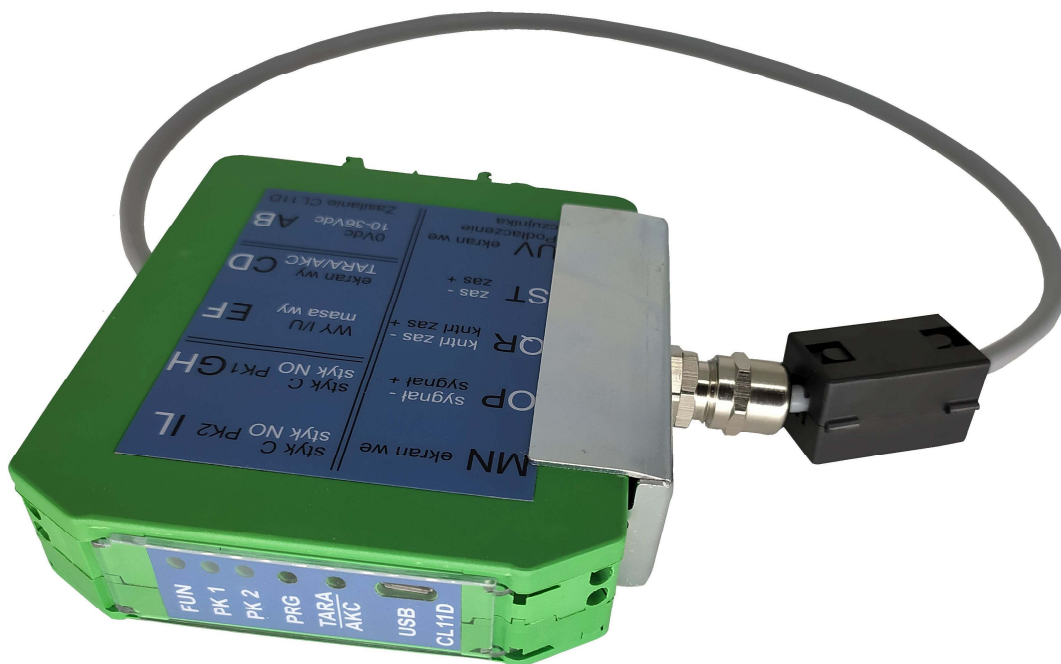
CL11D delivery range

The factory equipment includes:

- | | |
|--|--------|
| 1. CL11D conditioner | 1 unit |
| 2. USB cable | 1 unit |
| 3. Program CL11_PARAM | 1 unit |
| 4. User manual for CL11D and CL11_PARAM program (pdf file) | 1 unit |
| 5. Warranty sheet | 1 unit |

Guarantee of quality

Each manufactured conditioner undergoes a detailed factory technical inspection and is covered by a 24-month manufacturer's warranty.



Sensor connection to the CL11D conditioner with the EMC protection

Manufacturer: _____

ZEPWN sp. z o.o. sp.k., Poland, 05-270 Marki, ul. Kollataja Street 8
tel.004822 7812169, 7712411, e-mail: zepwn@zepwn.com.pl, <http://www.zepwn.com.pl>