

Universal programmable converter for analog signals

TYPE: CNL35L and Threshold Detector DNL35L



- **Wide range of process and temperature analog inputs**

voltage, current, sensor power supply, resistance, potentiometer, frequency, duty cycle, strain gauge, Thermocouples, PT100 3wires and 4 wires, PT1000, Ni100, Ni1000

- **1 or 2 isolated analog outputs**

(version without analog outputs "threshold relay" ref.: DNL35L)

- **Up to 4 relay outputs**

- **Low response time: 35 ms**

- **Measure display (10 000 pts)**

(programmable in front face or by USB-RS232 cable)

- **Pluggable terminal blocks**

- **Universal power supply 20....265Vac-dc**

- **SIL2 option** according to IEC 61508



The CNL35L is the programmable converter with the widest choice of inputs and calculation functions of the market, which can be equipped with two isolated analog outputs, four alarm relays and a 4-digits display.

DESCRIPTION:

Inputs:

- Current with or without sensor power supply.
- Voltage
 - Resistance
 - Potentiometer
- Frequency
 - Namur sensor
 - Duty cycle
- Strain gauge
 - Ni100
 - Ni1000
- PT100 2, 3, 4 wires
 - PT1000 2 wires
- Thermocouple type : B,E,J,K,R,S,T,N,W3,W5,...
other thermocouple or sensors on request: Cu10, Balco 500....

Calculation functions:

- square root extraction, absolute value, exponential function ($A \cdot e^{B \cdot \text{measure}}$), ...
- special linearization on 26 points.
- for PT100 input: configurable polynomial linearization.

Front face:

- 1 green Led for power presence
- 4 digits alphanumeric dot matrix Led display (option /A)
- 2 push buttons for alarm threshold adjustment and device configuration (option/A)
- 4 red Led for status relays indication

Outputs: (not present on DNL35L, threshold relay only)

- 1 or 2 isolated analog outputs individually configurable in current or voltage: 0 ... 4 ... 20 mA or 0...1...5...10 V;
- +/- 10 V when the 2 outputs are associated.
- adjustable response time and security value for each output

Relays:

- Up to 4 relay (2 changeover contacts + 2 NO).
- Usable in alarm, TOR regulation, sensor breaking or input loop breaking detection.
- Threshold, direction, hysteresis and delay individually adjustable on each relay (activation and release delays).

Feature:

- 23 mm width case, DIN rail mounting (symmetrical)
- IP20 Protection rating
- Pluggable screw terminal blocks, max 2.5mm²
- Hinged front face (access to buttons and RS232 link)
- Conformal coating

Security and reliability

- high disturbances immunity, greater than CE marking requirement.
- saving of the configuration parameters in FLASH, safety of data holding > 40 years,
- firmware update via serial link,
- watchdog supervising the program process,
- 3 ways galvanic isolation input / outputs / power supply,
- neutralization of ambient effects due to input circuit self-calibration.

Configuration:

The CNL35L can be configured with the front face (if /A option) or via the serial RS232 link (jack 3.5mm) (USB to jack cable supplied separately).

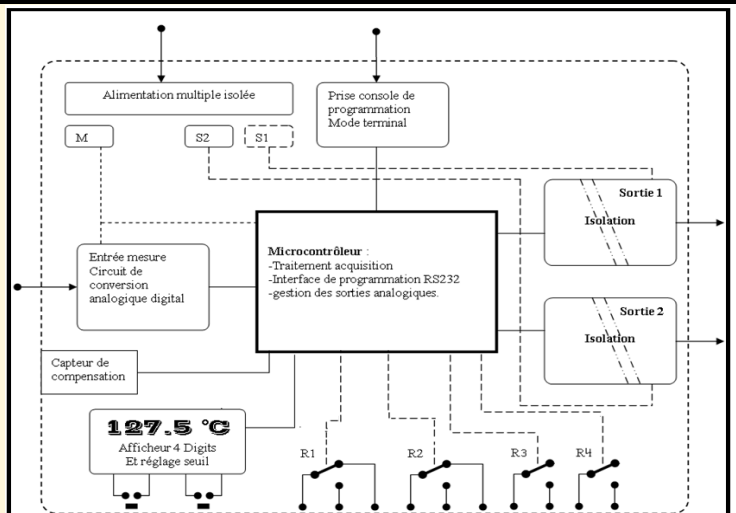
Warning: the RS232 link is not isolated from inputs

Functional security data:

component type B , HFT = 0
 $\lambda \cdot f = 239 \text{ fit}$, DC = 87.8 % , PFH : 16 à 21 fit
 SFF = 93.3 % (converter with 2 analog outputs)
 SFF = 90.8 % (2 analog outputs and 4 relays)



Synoptic:



Version and order code:

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- | | |
|----------------------|---|
| CNL35L: | 1 analog output |
| CNL35P: | process version without temperature |
| optional /S2: | 2 analog outputs |
| /R1: | +1 relay |
| /R2: | +2 relays |
| /R3: | +3 relays |
| /R4: | +4 relays |
| -DC: | Relays with switching capacity: 6Adc, 30Vdc |
| /A: | 4 digits display + Push buttons |
| /SIL2: | SIL2 version in accordance to IEC 61508 |

All options are cumulative.

INPUT		
(resolution : 14 bits process , 16 bits temperature ; reference 5 ppm)		
Type	Range	Accuracy
voltage (Low level)	-250 to 2000mVdc	+/- 40 µV
Input impedance	1 MOhms	to +/-1 mV
<i>(on two input ranges: 250mV and 2000 mV)</i>		
Differential voltage	-50 to +50mVdc	+/- 10 µV
Input impedance	1 MOhms	
voltage (High level)	-25 to 200Vdc	+/- 0.02 V
Input impedance	500 kOhms	to +/-0.8 V
<i>(on two input ranges : 25 V and 200 V)</i>		
Current	-4mA to 40 mA	+/- 0.01 mA
Input impedance	50 Ohms	
Resistance 2, 3 wires	0 / 3000 Ohms	+/- 0.2 Ohms
PT1000 2 wires	-200.....550 °C	+/- 0.3 °C
Ni1000 2 wires	-50.....200 °C	+/- 0.3 °C
Measure current	< 100 µA	
PT100 2, 3 wires	-260.....800 °C	+/- 0.3 °C
PT100 4 wires	-260.....800 °C	+/- 0.1 °C
Ni100 2, 3 wires	-50.....200 °C	+/- 0.3 °C
Measure current	< 650 µA	
Thermocouples :		
Tc B	+200.....1800 °C	+/- 2 °C
Tc E	-250.....1000 °C	+/- 0.3 °C
Tc J	-200.....600 °C	+/- 0.4 °C
Tc K	-200.....1500 °C	+/- 0.5 °C
Tc R	0.....1750 °C	+/- 1.5 °C
Tc S	0.....1600 °C	+/- 1.5 °C
Tc T	-250.....400 °C	+/- 0.4 °C
Tc N	-250.....1500 °C	+/- 0.5 °C
TC W3	0.....2300 °C	+/- 2 °C
TC W5	0.....2300 °C	+/- 2 °C
T° compensation	-10 / 60 °C	+/- 0.2 °C
<i>current of thermocouple breakdown detection = 0.25 µA.</i>		
Frequency / tachymeter	0.25Hz 350KHz	+/- 0.2 %
Duty cycle	50 Hz.....5KHz	+/- 0.2 %
Input impedance	>100 kOhms	
Measure amplitude	3V~ ... 100 V~ peak to peak.	
with automatic suppression of the DC component		
all type of sensor : NPN ,PNP, NAMUR		

AUXILIARY	
Sensor power supply	22 V regulated +/- 5% (50mA)
Potentiometer reference	5 V regulated +/- 0.15% (20mA)

POWER SUPPLY	
Universal: (2 versions: standard and low voltage, not polarised)	
standard:	20....to.....265 Vac/dc
low voltage:	9 Vdc....to.....30 Vdc.
consumption	< 3 VA

ANALOG OUTPUT (14 bits resolution)		
Type	Range	Accuracy
Current S1 and S2	0 ... 4 ... 20 mA	+/- 20 µA
Permissible load:	0 ... 850 Ohms	
Voltage S1 and S2	0 ... 10 V	+/- 10 mV
Impedance output:	500 Ohms (internal shunt 0.1%)	
or one bipolar output -10V...+10V (by coupling the 2 outputs)		
Programmable response time:		
process input	from 35 ms to 60 s	
temperature input	from 100 ms to 60 s	

RELAY (CNL35 /R)	
Switching power	250VAC , 6A (1500 VA)
ENVIRONMENT	
Operating temperature	-20 to +60 °C
Storage temperature	-25 to +85 °C
Temperature drift	< 20 PPM / °C
Humidity	85 % (not condensing)
Weight	~ 160 g
Protection rating	IP20
Dielectric strength	1500 Vrms continuous 2500 Vrms 1 minute

Shock IEC 60068-2-27 (operating)	15 G / 11 ms
Bump IEC 60068-2-29 (transportation)	40 G / 6 ms
Vibration IEC 60068-2-6 (operating)	1 G / 10 - 150 Hz
Vibration CEI 60068-2-6 (transportation)	2 G / 10 - 150 Hz

MTBF (MIL HDBK 217F)	> 4 000 000 Hrs @ 25°C
life time	200 000 Hrs @ 30°C
life time	80 000 Hrs @ 45°C

Electromagnetic compatibility 2014/30/UE / Low Voltage Directive 2014/35/UE		
Immunity standard for industrial environments EN 61000-6-2		Emission standard for industrial environments EN 61000-6-4
EN 61000-4-2 ESD	EN 61000-4-8 AC MF	EN 55011 group 1 class A
EN 61000-4-3 RF	EN 61000-4-9 pulse MF	
EN 61000-4-4 EFT	EN 61000-4-11 AC dips	
EN 61000-4-5 CWG	EN 61000-4-12 ring wave	
EN 61000-4-6 RF	EN 61000-4-29 DC dips	



WIRING AND OUTLINE DIMENSIONS:

