

# Programmable converter for analog signals

## TYPE: CNL35L

**LOREME**

### • 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

### • Up to 4 relay outputs

### • Low response time: 35 ms

### • Measure display (10 000 pts)

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

### • Pluggable terminal blocks

### • Universal power supply 20....265Vac-dc

### • SIL2 option hardware



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
- Frequency
- Strain gauge
- PT100 2, 3, 4 wires
- Thermocouple type : B, E, J, K, R, S, T, N, W3, W5, ...
- other thermocouple or sensors on request: Cu10, Balco 500, ...
- Resistance
- Potentiometer
- Namur sensor
- Ni100
- Ni1000
- PT1000 2 wires

##### 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 Leds for status relays indication

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

- 1 or 2 isolated analog outputs individually configurable in current : 0 ... 4 ... 20 mA or voltage : 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 2.5mm<sup>2</sup>
- 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: (hardware)

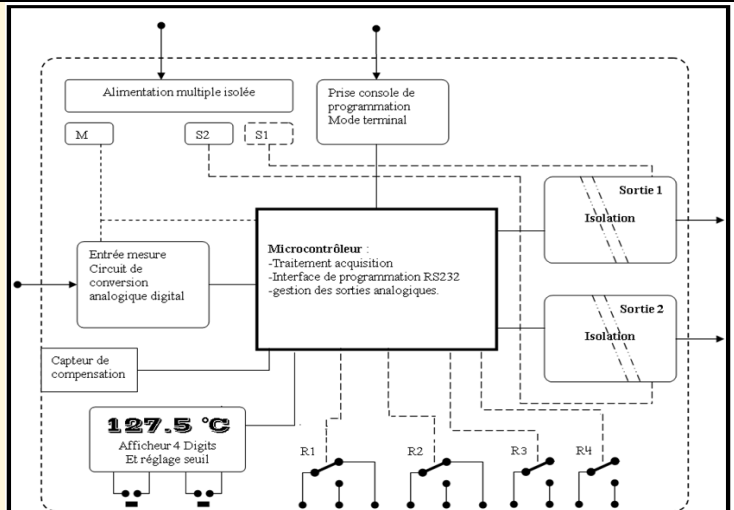
component type B , HFT = 0

$\lambda f = 239 \text{ fit}$  , 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:

|                |                                             |
|----------------|---------------------------------------------|
| <b>CNL35L:</b> | 1 analog output                             |
| <b>options</b> |                                             |
| <b>/A:</b>     | + 4 digits display + Push buttons           |
| <b>/S2:</b>    | 2 analogical outputs (CNL35L and CNL35P)    |
| <b>/R1:</b>    | +1 relay (changeover contact)               |
| <b>/R2:</b>    | +2 relays (changeover contact)              |
| <b>/R3:</b>    | +3 relays (NO contact only)                 |
| <b>/R4:</b>    | +4 relays (NO contact only)                 |
| <b>-DC:</b>    | Relays with switching capacity: 6Adc, 30Vdc |
| <b>/SIL2:</b>  | SIL2 version hardware                       |

| INPUT<br>(resolution :14 bits process ,16 bits temperature ; reference 5 ppm) |                              |                |
|-------------------------------------------------------------------------------|------------------------------|----------------|
| Type                                                                          | Range                        | Accuracy       |
| <b>voltage (Low level)</b>                                                    | -250 to 2000mVdc             | +/- 40 $\mu$ V |
| Input impedance                                                               | 1 MOhms                      | to +/-1 mV     |
| <i>(on two input ranges: 250mV and 2000 mV)</i>                               |                              |                |
| <b>Differential voltage</b>                                                   | -50 to +50mVdc               | +/- 10 $\mu$ V |
| Input impedance                                                               | 1 MOhms                      |                |
| <b>voltage (High level)</b>                                                   | -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>                                 |                              |                |
| <b>Current</b>                                                                | -4mA to 40 mA                | +/- 0.01 mA    |
| Input impedance                                                               | 50 Ohms                      |                |
| <b>Resistance</b> 2, 3 wires                                                  | 0 / 3000 Ohms                | +/- 0.2 Ohms   |
| <b>PT1000</b> 2 wires                                                         | -200.....550 °C              | +/- 0.3 °C     |
| <b>Ni1000</b> 2 wires                                                         | -50.....200 °C               | +/- 0.3 °C     |
| Measure current                                                               | < 100 $\mu$ A                |                |
| <b>PT100</b> 2, 3 wires                                                       | -260.....800 °C              | +/- 0.3 °C     |
| <b>PT100</b> 4 wires                                                          | -260.....800 °C              | +/- 0.1 °C     |
| <b>Ni100</b> 2, 3 wires                                                       | -50.....200 °C               | +/- 0.3 °C     |
| Measure current                                                               | < 650 $\mu$ A                |                |
| <b>Thermocouples :</b>                                                        |                              |                |
| 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 <math>\mu</math>A.</i>  |                              |                |
| <b>Frequency / tachymeter</b>                                                 | 0.25Hz ..... 350KHz          | +/- 0.2 %      |
| <b>Duty cycle</b>                                                             | 50 Hz.....5KHz               | +/- 0.2 %      |
| Input impedance                                                               | >100 kOhms                   |                |
| Measure amplitude                                                             | 3V~ ... 100 V~ peak to peak. |                |
| <i>with automatic suppression of the DC component</i>                         |                              |                |
| <i>all type of sensor : NPN ,PNP, NAMUR .....</i>                             |                              |                |

**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       |
|----------------------------------------------------------------------|---------------------------------|----------------|
| <b>Current</b> S1 and S2                                             | 0 ... 4 ... 20 mA               | +/- 20 $\mu$ A |
| Permissive load:                                                     | 0 ... 850 Ohms                  |                |
| <b>Voltage</b> S1 and S2                                             | 0 ... 10 V                      | +/- 10 mV      |
| Impedance output:                                                    | 500 Ohms ( internal shunt 0.1%) |                |
| <i>or one bipolar output -10V...+10V (by coupling the 2 outputs)</i> |                                 |                |
| Programmable response time:                                          |                                 |                |
| process input                                                        | 35 ms to 60 s                   |                |
| temperature input                                                    | 100 ms to 60 s                  |                |

**RELAY (CNL35L /R and DNL35L/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<br>EN 61000-6-2 |                         | Emission standard for industrial environments<br>EN 61000-6-4 |
|---------------------------------------------------------------|-------------------------|---------------------------------------------------------------|
| EN 61000-4-2 ESD                                              | EN 61000-4-8 AC MF      | EN 55011                                                      |
| EN 61000-4-3 RF                                               | EN 61000-4-9 pulse MF   | group 1<br>class A                                            |
| 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:**