

CONFIGURATION HANDBOOK

**DSL35LCC**



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Download manual at : [www.loreme.fr](http://www.loreme.fr)

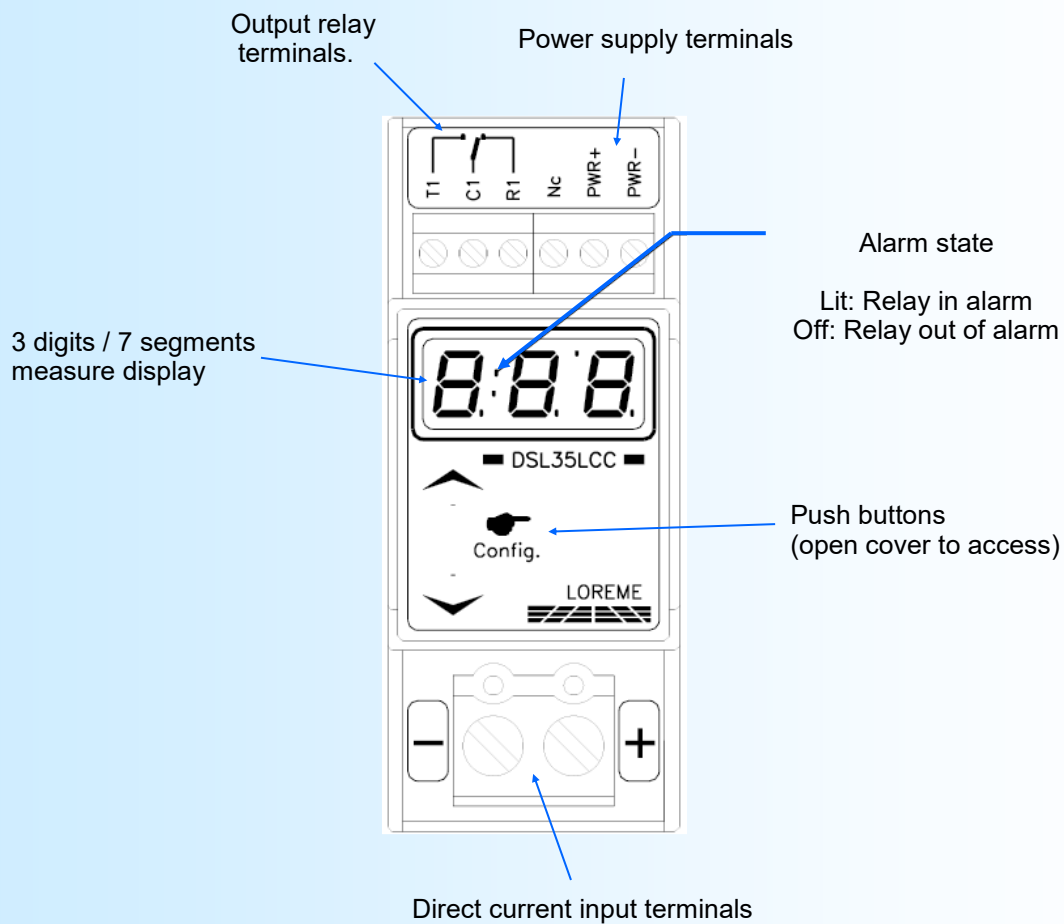
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## Device Presentation

The DSL35LCC(HALL) threshold relay for DC or AC (-TRMS option) currents is designed for monitoring and protection applications. With the HALL version, the remote split-core Hall current sensors offer an easy, reliable and non intrusive integration. The front face permits to display the actual current measurement and to configure the device parameters. It can be used in threshold detection mode or in inverse-time thermal protection mode.

The technical data sheet can be downloaded here: [http://www.loreme.fr/fichtech/DSL35LCC\\_eng.pdf](http://www.loreme.fr/fichtech/DSL35LCC_eng.pdf)

### USER INTERFACE



### Push buttons functions

- ▲ / ■ Configuration access or <YES> button or value increasing button.
- ▼ <NO> button or value decreasing button.

## Configuration

### Visualization

On power on, the DSL35LCC(-HALL) displays the current measurement directly on the front panel.

The message "Hi " is displayed if the current is above 999 A or the message "Lo " if the current is less than -99 A (display capacity exceeding).

### Note:

*On a DSL35LCC-HALL, if the Hall sensor is absent or there is a broken link, the input saturates downwards and the current measurement is about -2.5 times the sensor caliber (eg -50 A for a 20 A sensor, -125 A for a 50 A sensor).*

### Configuration

The device is fully configurable by the push buttons on the front panel. It is thus possible to modify the parameters of the alarm relay (threshold, hysteresis, ON / OFF delays, type of detection) and the measurement parameters (filter measurement, absolute value function). Access to the configuration is done by pressing the top button ( ). The device momentarily displays a revision number of the form '1-6'. The left digit corresponds to the Hardware revision and the right digit corresponds to the Software revision of the device.

#### 1) Locked access

By default, the access is free. But if the access is locked by a password (only configurable in terminal mode), the user will have to enter a 3 digits code as follows:

- Use the ▲ button to change de value and the ▼ button to validate the digit.
- 0- The display flashes during entry.
- 01-
- 012

**Err** Message displayed in case of a wrong password. The device returns to measure mode.

#### 2) Relay configuration

The device displays the message 'rEL'. Pressing the ▲ button permit to access the relay parameters configuration.

The ▼ button permits to go to the next rubric.

The relays parameters are:

- Operating mode.
- Threshold.
- Hysteresis.
- Delays.
- Threshold type detection, high or low.

#### 2.1) Operating mode

The relay can be used in two different modes of operation:

- The threshold detection mode (alarm).
- A simplified inverse time thermal protection mode.

In threshold detection mode, the configurable parameters are:

- Threshold, hysteresis, ON / OFF delays and type of detection.

In thermal protection mode, the configurable parameters are:

- Threshold, hysteresis, ON / OFF delays.

The thermal protection works as follows:

- If the measured current exceeds the threshold, the device lowers the trip delay (ON) value according to the table given in the appendix ([see p13](#)). The output relay is deactivated after the new delay (C1-T1 open, C1-R1 closed)
- If the current falls below the threshold minus the hysteresis, the output relay is activated after the OFF delay (C1-T1 closed, C1-R1 open).

The device displays the message 'Mod'. Pressing the ▲ button permit to access the mode configuration. The ▼ button permits to go to the next rubric.

# Configuration

The actual configured mode is displayed. In threshold detection the message 'ALr' is displayed and in thermal protection mode the message 'Pth' is displayed.

Pressing the ▲ button permit to validate the displayed choice.  
 Pressing the ▼ button permit to change the displayed choice.

## 2.2) Threshold

The device displays the message 'thr', pressing the ▲ button permit to access the adjustment. Pressing button ▼ permit to skip the adjustment and continue with the next rubric. In adjustment mode, the actual threshold is displayed and the ▲, ▼ permits to increment or decrement it. The display is flashing during the adjustment. The value is automatically validated after 4 seconds if no key is pressed.

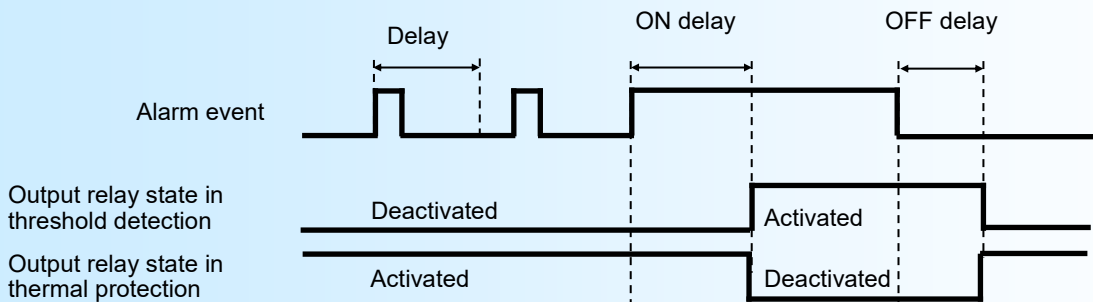
## 2.3) Hysteresis (dead band)

The device displays the message 'db', pressing the ▲ button permit to access the adjustment. Pressing button ▼ permit to skip the adjustment and continue with the next rubric. In adjustment mode, the actual hysteresis is displayed and the ▲, ▼ permits to increment or decrement it. The display is flashing during the adjustment. The value is automatically validated after 4 seconds if no key is pressed. The hysteresis is adjustable from 0 to 20 A.

## 2.4) ON & OFF delays

The **ON delay** value, which is configurable from 0 s to 999 s (in increments of 0.1 s from 0 to 99.9 s), determines the time beyond which the alarm is activated after an event occurs.

The **OFF delay** value, which can be configured from 0 s to 999 s (in increments of 0.1 s from 0 to 99.9 s), determines the time after which the alarm is deactivated after the disappearance of an event.



### 2.4.1) ON delay (trip delay) configuration

The device displays the message 'don', pressing the ▲ button permit to access the adjustment. Pressing button ▼ permit to skip the adjustment and continue with the next rubric. In adjustment mode, the actual ON delay is displayed and the ▲, ▼ permits to increment or decrement it. The display is flashing during the adjustment. The value is automatically validated after 4 seconds if no key is pressed.

### 2.4.2) OFF delay configuration

The device displays the message 'dof', pressing the ▲ button permit to access the adjustment. Pressing button ▼ permit to skip the adjustment and continue with the next rubric. In adjustment mode, the actual OFF delay is displayed and the ▲, ▼ permits to increment or decrement it. The display is flashing during the adjustment. The value is automatically validated after 4 seconds if no key is pressed.

## 2.5) Threshold detection type (only in threshold detection mode)

It is possible to choose the detection type with this parameter.  
 The **threshold detection** works in this manner:

- **High threshold** detection:
  - . The output relay is activated when measure goes above threshold,
  - . The output relay is deactivated when measure goes below threshold minus hysteresis.
- **Low threshold** detection:
  - . The output relay is activated when measure goes below threshold,
  - . The output relay is deactivated when measure goes above threshold plus hysteresis.

The detection configuration possibilities are:

- High threshold detection, with displayed message 'AHi'.
- Low threshold detection, with displayed message 'ALo'.

Pressing the ▲ button permit to validate the displayed choice.

Pressing the ▼ button permit to change the displayed choice.

### 3) Measure configuration

The device displays the message 'MES'. Pressing the ▲ button permit to access the measure parameters configuration. The ▼ button permits to leave the configuration and the configured parameters are memorized in an internal non-volatile memory and the message 'End' is displayed.

Two parameters can be configured: Measurement filter and the absolute value function.

The usefulness of the measurement filter parameter depends on the type of device:

- On a standard version, it allows the smoothing of an unstable or fluctuating DC current. Its value sets the response time of the device and it is adjustable from 0 s to 60.0 s, in steps off 0.01 s from 0 to 9.99 s and 0.1 s beyond.
- On a TRMS version, the filter value corresponds to the integration time of the TRMS measurement and thus also the response time of the device. This parameter is used by the calculation function of the true RMS value. The larger it is, the more stable the measurement (low residual ripple), but with a slow response time. The smaller it is, the less stable the measurement is but with a fast response time. It is adjustable from 0.1 s to 60.0 s.

The Absolute value function applies the absolute value to the DC current measurement on a standard version.

#### 3.1) Measure filter configuration

The device displays the message 'FLt', pressing the ▲ button permit to access the adjustment. Pressing button ▼ permit to skip the adjustment and continue with the next rubric. In adjustment mode, the actual measure filter value is displayed and the ▲, ▼ permits to increment or decrement it. The display is flashing during the adjustment. The value is automatically validated after 4 seconds if no key is pressed.

#### 3.2) Absolute value function configuration

The device displays the message 'Abs', pressing the ▲ button permit to activate the function, pressing the ▼ button permit to deactivate it.

After this last choice, the configured parameters are memorized in internal non-volatile memory and the message 'End' is displayed.

#### Notes:

- *If there is no action on the buttons for a delay longer than 30 seconds, the device leaves automatically the configuration mode and returns in measure mode without memorizing the new configured parameters.*
- *If the user does not complete the configuration process until the 'End' message, the reconfigured parameters will not be saved.*
- *The default factories parameters are:*
  - Standard version (DC only):*
    - \* *High threshold detection, threshold = 0.7 \* measurement caliber, hysteresis = caliber / 50, ON and OFF delays = 10 s.*
    - \* *Measuring filter = 0.50 s, absolute value function not active, front panel configuration access is free.*
  - TRMS version (AC+DC)*
    - \* *High threshold detection, threshold = 0.7 \* measurement caliber, hysteresis = caliber / 50, ON and OFF delays = 1 s.*
    - \* *Measure integration filter = 1 s, front panel configuration access is free.*

## RS232 link setting

The device can be configured or updated in terminal mode via an RS232 link.

### Step 1: Driver installation for USB / RS232 adapter



- download driver at [www.loreme.fr](http://www.loreme.fr):  
[http://www.loreme.fr/aff\\_produits.asp?rubid=53&langue=fr](http://www.loreme.fr/aff_produits.asp?rubid=53&langue=fr)
- Click on executable file to install the driver,
- Plug the cable on a USB port, Windows install a new serial communication port **COMx** (x >= 4).

**Note :**

The use of the cable on another USB port don't generates a new communication port. Use of another adapter generates another communication port number (COMx) and requires the reconfiguration of the HyperTerminal.

### Step 2: Setting of terminal emulation software (PC with Windows).

**1** The terminal emulation software for PC « HyperTerminal » is resident in windows up to XP version. For later versions, it is downloadable on : [www.loreme.fr](http://www.loreme.fr) in **download part** ( <http://www.loreme.fr/HyperTerm/htpe63.exe> )  
=> Run the downloaded software to install it.

**2** Start a "hyper Terminal" connection :  
- Click on **"START"** button  
Up to XP version  
- Go to **"Programs \ Accessories \ Communication \ Hyper Terminal"**  
- Click on **"Hypertrm.exe"**  
Or if the software was downloaded  
- Go to **"All programs \ HyperTerminal Private Edition"**  
- Click on **"HyperTerminal Private Edition"**

**3** Enter name for the new connection


**4** Choose the communication port related to the adapter.

**5**

Choose:  
- 9600 bauds  
- 8 DATA bits  
- no parity  
- 1 stop bit  
- **XON/XOFF**

**6** The PC is now in terminal mode, connect it to the device by plugging the RS232 cable. The measure is now displayed on the terminal. To access configuration, press 'C' key.

**7** When leaving Hyper terminal, the following window will appear. By saving, the terminal session will start with the same configuration.

Thus, the shortcut  **LOREME.ht** will permit to communicate with all LOREME devices.

**Note:** to modify the parameters of terminal mode whereas this one is already started, it is necessary, after having carried out the modifications, to close the terminal and to open it again so that the modifications are effective.





### 2.3) Relay parameters

<b>RELAIS?</b> (O-N)	Relay parameters configuration access. 'O' to access, 'N' to skip.
<b>DETECTION DE SEUIL?</b> (O-N) OUI	Choice of operating mode: threshold detection (DETECTION DE SEUIL) or thermal protection (PROTECTION THERMIQUE).
<b>SEUIL HAUT?</b> (O-N) OUI	Threshold type selection, high (HAUT) or low (BAS).
<b>SEUIL</b> 35.0 A	Threshold setting.
<b>HYSTERESIS</b> 1.0 A	Hysteresis setting.
<b>RETARD ON</b> 10.0 s	ON delay setting.
<b>RETARD OFF</b> 10.0 s	OFF delay setting.

### 2.4) Measure parameters

<b>MESURE?</b> (O-N)	Measure parameters configuration access. 'O' to access, 'N' to skip.
<b>FILTRE MESURE</b> 0.50 s	Measure filter setting (from 0 s or 0.1 s it TRMS measure to 60.0 s).
<b>VALEUR ABSOLUE?</b> (O-N) NON	Absolute value activation/deactivation (only on standard version).

### 2.5) Front face configuration access protection

<b>CONFIGURATION ACCES FACE AVANT?</b> (O-N)	
<b>ACCES PAR MOT DE PASSE?</b> (O-N) OUI	'O' to activate the password. 'N' to deactivate the password (free access).
<b>MOT DE PASSE?</b> ---	Enter of the 3 password digits with simultaneous display.

### 2.6) End of configuration

<b>OK!</b>	Message indicating the correct memorization of the parameters. Return to measure mode
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## FIRMWARE update

To access to the firmware update function, you must first open an HyperTerminal session on a PC, connect the device to the PC with the RS232 link cable and then power on the device.

The following character is send to the terminal:

> <————— The device sends this character then it waits the « F » key during 0.5 s.

If the user has pressed the « F » key in the allowed time, the following message is displayed in the HyperTerminal windows:

### FIRMWARE LOADER Rev0 READY TO TRANSFER...

The device is now in the firmware load mode and is waiting for the firmware file. This file is provide by LOREME and contain the firmware code in Intel HEX format.

Select the « Transfer », « Send a text file ... » in the HyperTerminal menu.  
Select the directory and open the file. The HyperTerminal program begins to send the file to the device.

### FIRMWARE LOADER Rev0 READY TO TRANSFER

\*\*\*\*\* <————— The star characters appears to show the progress of the uploading.

At the end, the message « **PROGRAMMING OK !** » is display if no errors occurs. Otherwise, these following message could be displayed:

- **SERIAL COM ERROR !**      Error during receipt.
- **SERIAL TIMEOUT !**      Waiting time of receipt elapsed (60 s).
- **PROGRAMMING FAILED !**    Programming error in the internal flash memory.

#### **Attention**

*If an error occurs during the programming process, it is necessary to start again the whole procedure.  
A bad programming leads to an inoperative device.*

## EMC Consideration

### **1) Introduction**

To meet its policy concerning EMC, based on the Community directives **2014/30/EU** & **2014/35/EU**, the LOREME company takes into account the standards relative to this directives from the very start of the conception of each product.

The set of tests performed on the devices, designed to work in an industrial environment, are made in accordance with **IEC 61000-6-4** and **IEC 61000-6-2** standards in order to establish the EU declaration of conformity. The devices being in certain typical configurations during the tests, it is impossible to guarantee the results in every possible configurations. To ensure optimum operation of each device, it would be judicious to comply with several recommendations of use.

### **2) Recommendations of use**

#### **2.1 ) General remarks**

- Comply with the recommendations of assembly indicated in the technical data sheet (direction of assembly, spacing between the devices, ...).
- Comply with the recommendations of use indicated in the technical data sheet (temperature range, protection index).
- Avoid dust and excessive humidity, corrosive gas, considerable sources of heat.
- Avoid disturbed environments and disruptive phenomena or elements.
- If possible, group together the instrumentation devices in a zone separated from the power and relay circuits.
- Avoid the direct proximity with considerable power distance switches, contactors, relays, thyristor power groups, ...
- Do not get closer within fifty centimeters of a device with a transmitter (walkie-talkie) of a power of 5 W, because the latter can create a field with an intensity higher than 10 V/M for a distance fewer than 50 cm.

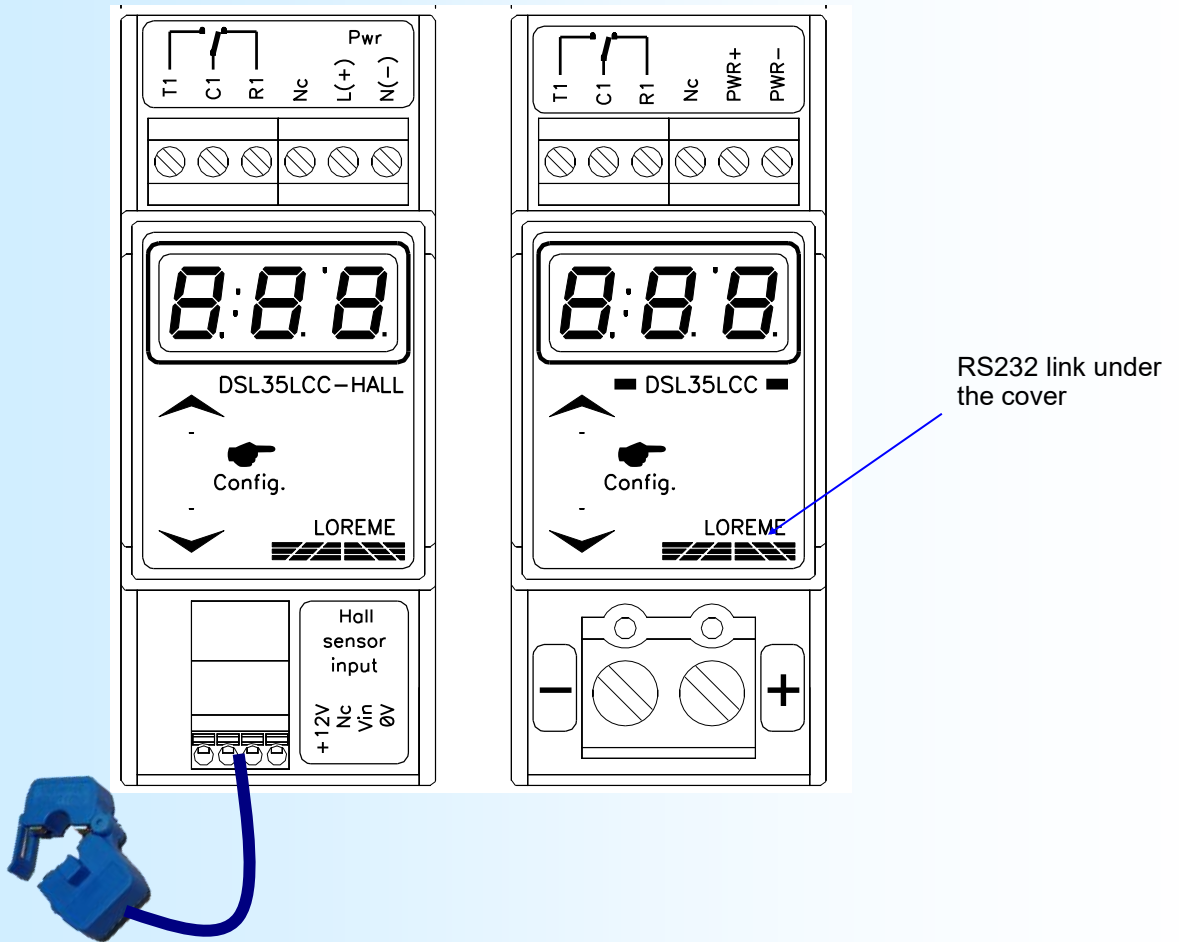
#### **2.2 ) Power supply**

- Comply with the features indicated in the technical sheet (power supply voltage, frequency, allowance of the values, stability, variations ...).
- It is better that the power supply should come from a system with section switches equipped with fuses for the instrumentation element and that the power supply line be the most direct possible from the section switch.
- Avoid using this power supply for the control of relays, of contactors, of electrogates, ...
- If the switching of thyristor statical groups, of engines, of speed variator, ... causes strong interferences on the power supply circuit, it would be necessary to put an insulation transformer especially intended for instrumentation linking the screen to earth.
- It is also important that the installation should have a good earth system and it is better that the voltage in relation to the neutral should not exceed 1V, and the resistance be inferior to 6 ohms.
- If the installation is near high frequency generators or installations of arc welding, it is better to put suitable section filters.

#### **2.3 ) Inputs / Outputs**

- In harsh conditions, it is advisable to use sheathed and twisted cables whose ground braid will be linked to the earth at a single point.
- It is advisable to separate the input / output lines from the power supply lines in order to avoid the coupling phenomena.
- It is also advisable to limit the lengths of data cables as much as possible.

# Wiring



- Power supply: **PWR+, PWR-** terminals.
- Direct current input: **+** & **-** terminals.  
(DSL35LCC)
- Relay: terminal T1 (work), terminal R1 (rest), terminal C1 (common).
- RS232 link: 3 points connector under the cover

## Appendix

### 1) Relay trip delay lowering table in thermal protection mode

Input current in % of threshold	% of trip delay	Example with a trip delay of 60 s
100	100	60 s
125	100	60 s
150	100	60 s
175	33,333	20 s
200	11,666	7 s
225	8,333	5 s
250	2,5	1,5 s
270	1,666	1 s
300	0	0