

INSTALLATION GUIDE

LVD^{MC}

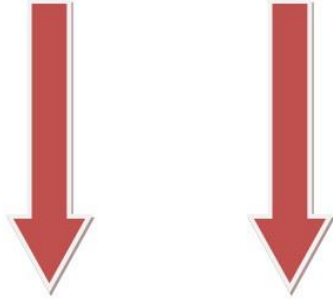
Voltage monitoring module



IMPORTANT

Before proceeding with the system installation,
Be sure to have carefully read and understood all instructions provided in this guide.

WARNING



IMPORTANT

This document provides all necessary instructions for the adequate and secure installation of your **LVD^{MC}** system

Before proceeding with the installation or configuration of the **LVD^{MC}** system, the technician installer must have read and understood the instructions provided in this guide.

This document includes important indications to prevent serious injuries both to the technician installer and to the users.

The **LVD^{MC}** system made by Zone Technologie Électronique Inc. is fully programmable (all settings are flexible).

TABLE OF CONTENTS

General description	1
Essential connection	1
Technical specifications	1
Installation	2
Warning.....	2
Mechanical installation	2
Electrical installation.....	2
Programming	3
Deactivation voltage	3
Maximum Delay without ignition	3
Maximum Deactivation Delay	4
Electrical Diagrams	5

GENERAL DESCRIPTION

The **LVD^{MC}** module protect against battery discharge below the programmable setpoint by deactivating the accessories connect to it.

Besides the voltage monitoring this module can work as a Timer, allowing to limit the operation time after ignition shutdown.

ESSENTIAL CONNECTIONS

Since it may have several accessories connected to the **LVD^{MC}** module, it is primordial to ensure that critical connections are properly done.

Important connections to check:

- Ground connection (black wire) of the **LVD^{MC}** module;
- Power supply (+12V and negative on the power connector);
- Ignition signal (+12 V signal).

TECHNICAL SPECIFICATIONS

Supply voltage: 7 to 16VDC

Operating temperature: -40°C to 75°C (-40°F to 167°F)

Supply current: - All outputs OFF: 1,6mA
(14V supply voltage) - All outputs ON (no load) 6mA

Output current (each): maximum 20A

Voltage setpoint: 8 to 15V
- Increments of: 0,1V
- Precision: $\pm 0,05V$

Timer: 15 minutes to 63 hours
- Increments of: 15 minutes
- Precision: ± 10 seconds / 15 minutes

Outputs: - Load (for screw connector): 15A
- Load (for bolt and nut): 75A
- PC OUT: 1,5A

“PC Output” operation:

- Always 12V, unless a low voltage is detected.
- GND if a low voltage is detected.

NOTE1: The voltage must stay below the setpoint for 1 minute before the PC Output shutdown.

NOTE2: The “PC OUTPUT” will shut down at last 1 minute before the “LOAD” output (check the Programming section for details).

INSTALLATION

LVD^{MC} MODULE

WARNING

Pay attention to the safety and installation instructions in this guide to prevent damage to the unit or vehicle as well as serious injuries to anyone working on the vehicle, occupants or you.

The installation technician should have a good understanding of vehicular electrical and electronic systems to perform a compliant and safe installation.

To make this product works with maximum efficiency, protect all electrical and mechanical components according to standards.

Once the installation is completed, make sure the proper functioning of the system and all accessories in the vehicle.

MECANICAL INSTALLATION

Installation of the module

During the installation, be sure that the module cannot be damaged because of unsafely objects being in the vehicle and that the chosen location won't be subject to bad weather.

CAUTION: The module must be installed in the vehicle passenger compartment or in a waterproof case.

ELECTRICAL INSTALLATION

Make all the necessities connections so that the system and its components will be functioning. Install all the electric protection (fuse, breaker, fuse wire) on the power cord as close as possible of the alimentation source. All wires going through a partition must be protected by a rubber or plastic grommet.

Be sure to follow all instructions included in this guide.

CAUTION: Before installation, disconnect the negative of the vehicle's battery. Failure to follow the recommendations found in this guide could result in fire or injury.

Please wait until all electrical connections are completed and checked before reconnecting the battery negative

Power for the module (battery, ignition, negative)

1. Connect the 12V wire (#8AWG or appropriate gauge to the total output current) to the "+12V BATT" bolt on the module and the other extremity to the positive born of the battery. You must protect this connection with a breaker or fuse close to the battery. (Use an adequate protection for the type and current of the total load.).
2. Search in the fuse-box for an ignition active signal and connect a red #18AWG wire for the Ignition signal of the module. Protect the connection with a 3A fuse installed as close as possible of the fuse-box.
3. Connect the GROUND wire to the vehicle chassis or other ground source. Please remove any paint or other finishing to allow a proper ground connection.

PROGRAMMING

DEACTIVATION VOLTAGE

This operation allows you to select the minimum operation voltage. If the voltage goes below this setpoint the “LOAD” output will shut down. Please check the deactivation delay section to select the proper shutdown time.

The selection of the minimum voltage is done by the dipswitches inside the module. Please remove the cover to access the dipswitches.

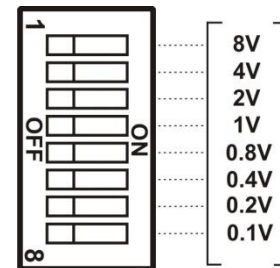
NOTE: The LED2 must be OFF.

Each switch adds its voltage to the minimum voltage.

Check the picture on the right for the value of each switch.

E.g.: For a deactivation voltage of 11,8V, you must find a combination of switches that will give you a total of 11,8V.

$$\begin{array}{rcl} \rightarrow \text{switch \#1} & = & 8 \text{ V} \\ \text{switch \#3} & = & 2 \text{ V} \\ \text{switch \#4} & = & 1 \text{ V} \\ \text{switch \#5} & = & 0,8 \text{ V} \\ \hline & = & 11,8 \text{ V} \end{array}$$



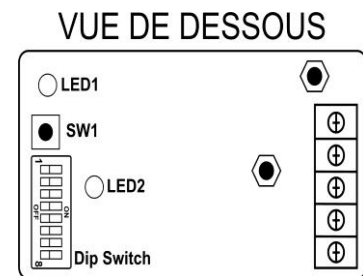
MAXIMUM DELAY WHITOUT IGNITION:

This operation allows you to set the “timer” mode.

Once the ignition signal is no longer present the “LOAD” output will remain active for the period selected.

Default value = 0 minutes.

Note: The deactivation voltage function has priority over the timer. The output will shutdown if a low voltage is detected even if there still time.

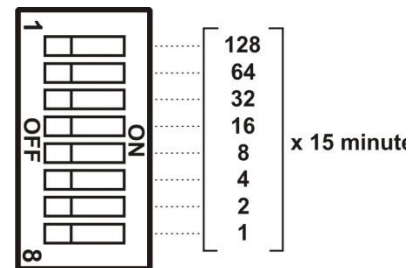


Programming procedure:

- 1) Turn OFF the vehicle's ignition;
- 2) Push and hold the “SW1” button until the LED2 turn ON. (5 seconds);
- 3) Select the delay with the 8 switches.
 - Increments of 15 minutes;
 - Multiply the value of each switch by the 15-minute increment and add the time of each switch to get the total time.

Ex: For a total delay of 3 hours and 15 minutes:

- Convert the hours to minutes:
 $\rightarrow 3h15 = 195 \text{ minutes}$
- Divide the total minutes by the 15-minute base time:
 $\rightarrow 195 \div 15 \text{ minutes} = 13$
- Find the switch combination for this value:
 $\rightarrow \begin{array}{rcl} \text{switch \#5} & = & 8 \\ \text{switch \#6} & = & 4 \\ \text{switch \#8} & = & 1 \\ \hline & = & 13 \end{array}$



- 4) Push “SW1” to save the value. The LED2 will turn OFF;
- 5) Reconfigure switches for the proper Deactivation Voltage (check the “Deactivation Voltage” section for details);
- 6) Active the vehicle's ignition and check if the LED1 is blinking fast. Otherwise restart the procedure.

MAXIMUM DEACTIVATION DELAY:

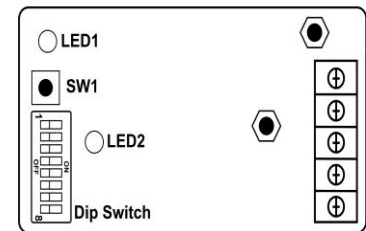
This procedure allows you to select the time before shutdown once the voltage is below the setpoint. The minimum delay is 2 minutes.

The module will shutdown the “PC OUTPUT” if the voltage remains below the setpoint for 1 minute.

A second delay for the “LOAD OUTPUT” is configurable from 1 to 128minutes.

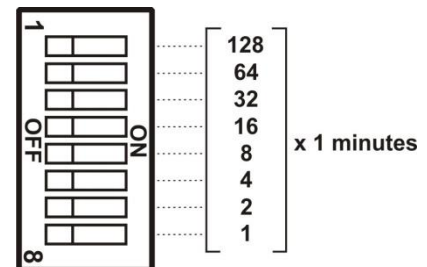
Default value = 6 minutes. (6 minutes after the “PC OUTPUT”, total time of 7 minutes)

VUE DE DESSOUS



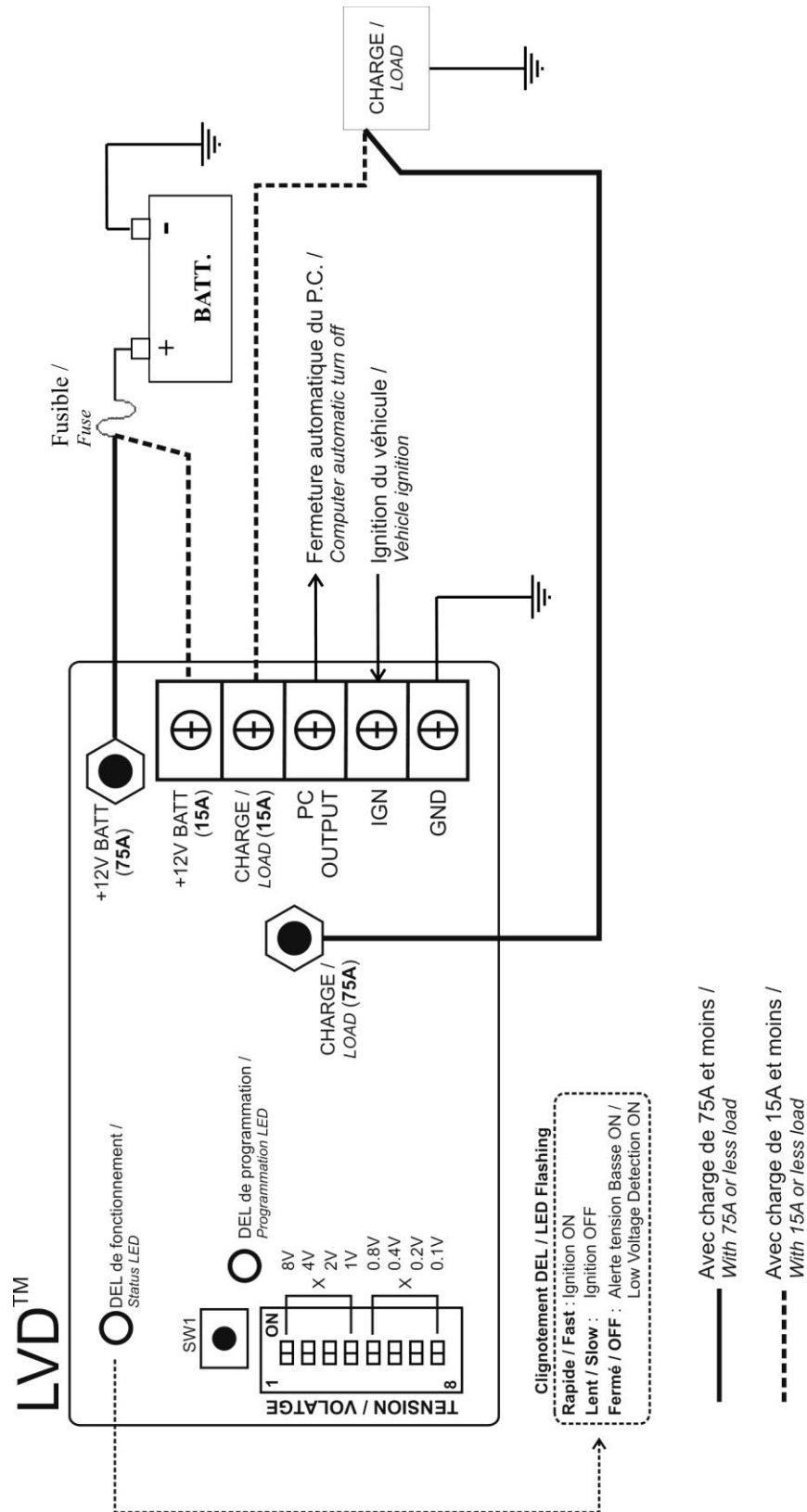
Programming procedure:

- 1) Turn OFF the vehicle`s ignition and remove the power of the module;
- 2) Turn OFF all Dip switches (1 to 8);
- 3) Push and hold the SW1 button;
- 4) Turn ON the vehicle`s ignition (keep holding the SW1);
- 5) Connect the power to the module;
- 6) Wait for the LED2 to blink;
- 7) Release SW1;
(LED2 will blink 5 times. LED 1 will start to blink after the 5th blink)
- 8) Turn OFF the vehicle`s ignition.
- 9) Push SW1 2 times:
 - LED1 and LED2 will turn OFF;
- 10) Push SW1 another time;
 - LED 2 will turn ON
 - If LED2 does not turn ON restart the procedure.
- 11) With LED2 ON select the new time.
The minimum time 1 minute after the “PC OUTPUT”.
Add the time of each switch to get the desired time.



- 12) Push SW1 to save the value;
- 13) Remove the power for 5 seconds.
- 14) Reconnect the power.
- 15) Reconfigure the switches for the proper Deactivation Voltage.

ELECTRICAL DIAGRAMS



[illegible]

Limited Warranty

Zone Technologie Électronique Inc. guarantees every component that it produces for a period of 24 months starting on the date of the purchase or of the delivery. The products of Zone Technologie Électronique Inc are verified, inspected and recognize as exempt of any fabrication default.

If a product is found to be defective during the warranty period of 24 months, the product will be repaired or replace at the workshop of the Zone Technologie Électronique Inc. society.

All installation, using or modification of the Zone Technologie Électronique Inc. products which is not recommended by the manufacturer leads to a voiding of the actual warranty.

Zone Technologie Électronique Inc. can't be held liable for the damages or charges that arise because of misuse, a careless maneuver or any others attempts to repair or for any reparations made by a third party. No other warranty, written or verbal, then the one from Zone Technologie Électronique Inc. will be recognized.

Zone Technologie Électronique Inc also has the right to repair or replace any defective product to its sole discretion. Zone Technologie Électronique Inc can't be held liable for the charges that arise during the installation or the removal of a product that requires maintenance and/or repairing.

It is expressly specified that we shall be committed by no other warranty (express or tacit) of intrinsic quality, marketable quality or capacity in a particular use.

For any information, please don't hesitate to communicate with us.
Phone number: 450-572-1476 • 1-866-362-9663 • Fax: 450-572-0898

Zone Technologie Électronique Inc. reserves the right to bring changes to this document and/or product included, without notice, and this at any moment.

Zone Technologie Électronique Inc. can't be held liable regarding any possible mistakes and/or omissions in this document

ZONE

Technologie Électronique Inc.

Toll free :	1 866 362-9663
Phone :	450 572-1476
Technical support	Extension #205
Administration	Extension #221
Fax :	450 572-0898

9000, boul. Industriel, Chambly (Québec) J3L 4X3