INTELLIGENT BATTERY GUARD
INSTALLATION & OPERATION MANUAL

**Please read this manual before operating your Battery Guard
Read the owner's manual carefully before mounting the LV1051HD!**

The new Battery Guard LV1051HD (hereafter called LV1051HD) is an intelligent, watertight, Battery Guard with accessory connections for a ON/OFF switch, Alarm buzzer or relay. The unit has two bolts as connection for the Input+ and the Output+ to guarantee low losses. Other connections, like the minus and the accessories, are made by a 4-pole 6.3mm fast on connector. A blue LED shows the status (ON/OFF). In program- mode it shows the program position. The LV1051HD has an 'Automatic Board system Detection'; the LV1051HD detects which battery voltage (12 or 24V) is used.

This does not need to be programmed manually. There is a choice out of 10 on/off thresholds voltage programs, for both 12V and 24V, which can be programmed in a simple way. The LV1051HD uses very little current. In the OFF mode or when in undervoltage the LV1051HD uses just 2mA or less.

Installation
The installation of the LV1051HD has to be done by qualified personnel. Working on a battery voltage is not without danger. Use wires of sufficient diameter and connectors of good quality. All connections have to be done via a fuse of the right value. See for a guiding principle for the wire diameter the separate chapter.
Attention! Live wires should never make contact with the case of the LV1051HD or the vehicle. Wrong connection could damage the electronic circuit. Mount the LV1051HD on a cooling (metal) surface, so it can dissipate the generated heat. Do not mount it near a combustible or heat sensitive materials. Mount it as close as possible to the battery (max. 50cm). This is the only way to exactly guard the voltage of the battery.
Wait with connecting the equipment until the LV1051HD is fully programmed. Use a 1.5mm2 wire for the minus connection which is connected to the battery via a fuse of 1A. No other equipment should use this wire. Working with batteries is dangerous. Fitting and use of the Battery Guard (LV1051HD) takes place at the user's risk.

Programming
To start the program mode a connection should be made between the Input+ and the Program Input.
The LED will start flashing. The number of flashes represents the program-position (see table) it is in. As soon as the desired program-position is reached the connection, between the Input+ and the Program Input, should be removed. To confirm the programmed position the LED will repeat the number of flashes. If it is not the right position, the previous steps have to be repeated. A change in position 11 or 12 has to be programmed separately. The programmed positions will be remembered, even if the battery connection has been removed. After completing the programming, the equipment can be connected.

ATTENTION! First remove the battery-connection, connect the equipment to the Output+ and then reconnect the battery.
Default program-position is position 1 and 11. See program table. Remote ON/OFF

There is a possibility to connect a switch to the LV1051HD's OFF connection. If the OFF connection is connected to the Minus, the LV1051HD will shut down the connected equipment after about 1 second. If the connection is removed, the equipment will be started up again after about 1 second. The current through the switch is almost nothing, so a small switch can be used.

Alarm-output
A buzzer can be connected to the alarm-output. The buzzer/alarm will be activated at undervoltage after about 12 seconds. When there is no change in this situation the LV1051HD will shut down the equipment about 90 seconds later. The buzzer/alarm will also be stopped. Because at overvoltage (16V/32V) the equipment can be damaged, the LV1051HD will shut down the equipment immediately and the alarm-output will pulsate. This way you can hear the difference between an undervoltage and an overvoltage alarm. A second application of this output is with the use of a relay. In this application the LV1051HD should be programmed in program-position 12 (default is position 11). This way the relay will be activated at alarm and when it reaches the upper voltage threshold it will be deactivated again. This way the relay can be used to activate a charger or alternator.

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Wire diameter
Use at least the following wire diameters for the bolt connection:
LV1051HD minimal 10mm²
In difficult environments it is advised to use larger diameters.

Specification:
• Autodetect 12 of 24V Battery voltage
8-20V -> 12V mode
20-35V -> 24V mode
10 programmable voltage thresholds

• Overvoltage shut down
> 16V (12V mode)
> 32V (24V mode)
Current in use ~ 4mA
Current in OFF position or under- or
over-voltage position ~ 2mA

• Maximum Load (shut down current)
LV1051HD: ~ 40A / 45A
Shut down at overload after 5 sec.
(after 1 minute start up)

• Connections
ON/OFF switch
Alarm buzzer or relay
Current Watch current sensor

• Voltage drop LV1051HD: ~ 0,0875 @35A
Voltage tolerance ~2%
Current output tolerance +/- 20%
Watertight IP66

The LV1051HD will shut down after about 5 seconds when overloaded.
After about 60 seconds the LV1051HD will start
up again.

Position 1 & 11 Default positions
Normal alarm: Alarm output activated at alarm; deactivated after 1 minute.
Relay function: Alarm output activated at alarm; deactivated at overvoltage
threshold.
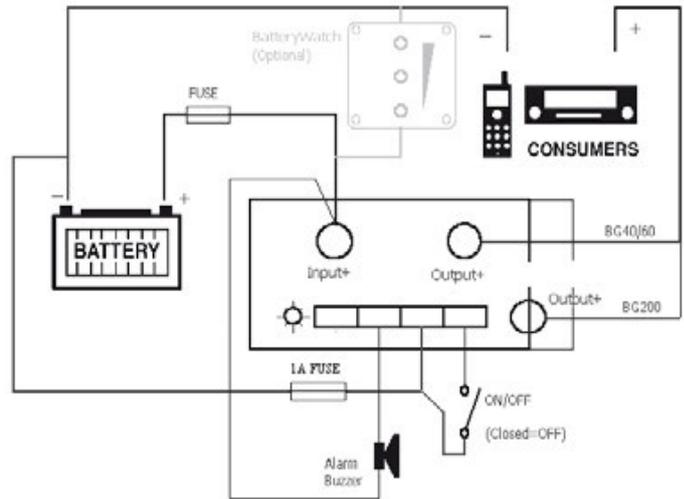
Programming tabel

12 Volt mode		
Untervoltage Treshold		Uppervoltage Treshold
Position 1	10,5V	12V
Position 2	10,0V	11,5V
Position 3	9,5V	11,5V
Position 4	11,25V	13,25V
Position 5	11,5V	13,8V
Position 6	10,5V	12,8V
Position 7	11,5V	12,8V
Position 8	11,8V	12,8V
Position 9	12,0V	13V
Position 10	10,0V	13,2V
Position 11		
Position 12		

24 Volt mode		
Untervoltage Treshold		Uppervoltage Treshold
Position 1	21,0V	24V
Position 2	20,0V	23,0V
Position 3	19,0V	23,0V
Position 4	22,5V	26,5V
Position 5	23,0V	27,6V
Position 6	21,0V	25,6V
Position 7	23,5V	25,6V
Position 8	23,6V	25,6V
Position 9	24,0V	26V
Position 10	20,0V	26,4V
Position 11 Normal Alarm		
Position 12 Relayfunctie		