



# Intelligent Battery Guard

**LV1052**

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**Please read this manual before operating your Battery Guard**

**Read the owners manual carefully before installing the LV1052!**

Features

- ◆ Auto 12 V/24 V detection
- ◆ Adjustable undervoltage
- ◆ High switching current
- ◆ Adjustable reset voltage
- ◆ Bistable relay
- ◆ Extremely low operating current

Purpose

Protecting a battery against overvoltage, undervoltage and exhaustive discharge with the lowest possible quiescent current.

Installation

- Follow the following steps and the connection diagram when connecting the LV1052.
1.

Connect the apparatus to be controlled to T2.
2. (optional).

Connect a switch that switches to negative to the Remote input.
3. (optional).

Connect a lamp to the status / alarm output.
4. (optional).

Connect a pulse switch that switches to the battery plus terminal to the Start input.
5.

Connect the battery plus terminal to T1.
6.

Connect the battery plus terminal to A1.
7.

Connect the minus terminal of the LV1052 to the minus terminal of the battery via a 5 A fuse.

Warnings:

- ◆ The product may only be connected by qualified electricians who are fully aware of the requirements for working with high battery voltages.
- ◆ The use of poor quality connection materials and/or excessively thin cables may result in damage to the product. (see Technical data → Cable diameter for the correct sizes)
- ◆ Short circuits between the plus and the minus terminals of the battery can cause serious damage to the system.
- ◆ Always use fuses.
- ◆ Do not locate the LV1052 close to highly flammable materials.
- ◆ Fit the LV1052 in a cool and dry place.

Operation

All voltages stated in this user's manual are applicable to a 12 V system. The voltage values for both the 12 V and the 24 V systems can be seen in Table 1 and Table 2.

During connection

Before the LV1052 is put into operation, it must first determine whether a 12 V or a 24 V system is connected. Therefore after connection there will be a one second delay before an action is undertaken. The relay will be switched on next if the supply voltage is between the set undervoltage and overvoltage levels. If this is not the case the relay will switch off. For the factory settings and a 12 V system, the relay will be switched on if the voltage lies between 10.5 V and 16.0 V. If this is not the case the relay will be switched off.

Excessively high voltage

The relay will switch off if the voltage exceeds 16.0 V for a period of 1 second. The relay will not switch on again until the voltage drops under 15.6 V for a period of 1 second. Once the relay switches off so does the LED.

	over	reset
12V	16.0V	15.6V
24V	32.0V	31.2V

Table 1: Overvoltage.

Undervoltage

As soon as the voltage drops below the set undervoltage level for a period of 5 seconds, the LV1052 LED will start to flash. This is to indicate that the relay will switch off later if the situation does not change. Should the voltage rise above the undervoltage level once again, the LED lights up normally and the device begins to check the voltage once more. If the voltage remains under the set level the relay will switch off after 70 seconds. The LED will also switch off. After detecting undervoltage the relay will only switch on again once the voltage has risen above the reset value for a period of 5 seconds. At the same time the LED lights up again.

Switching on manually

- If the LV1052 has switched off after detecting undervoltage, it can be switched on manually. There are two ways this can be done:
1. Pressing the button for a short period will switch on the relay after a period of 1 second.

2. If the START input is connected to the input voltage the relay switches on immediately.
- Following one of the above operations the LV1052 will function normally again, which means if at that moment the voltage is still below the undervoltage value, the device will switch off again after a short period.

Switching off remotely

Connecting the remote input to earth will switch off the LV1052. From the moment that this connection with the negative terminal is broken the LV1052 will be switched off for at least 1 second. When the voltage drops below the overvoltage level it will switch on again. See "Excessively high voltage" for the operation of the LV1052 if the voltage level is above the overvoltage level.

LED

The LED lights up the moment the relay is switched on and goes out when the relay is switched off. The LED will only flash if undervoltage is detected (see "Undervoltage").

Programming

The user can set at which undervoltage and overvoltage values the LV1052 should react. The 10 available options can be seen in Table 2 (where position 4 is the default setting). The programming mode is activated the moment that the program button is pressed until the LED begins to flash. The button should be released as soon as the LED begins to flash. The user should now repeatedly press the button until the position that must be programmed is reached. After this the LV1052 will display the mode being programmed. Finally the relay will switch on again unless the voltage is higher than the overvoltage value.

**Example:** The user wishes to set an undervoltage of 11.5 V and an overvoltage of 12.8 V. This is row 7 in Table 2. Therefore the user should press the button 7 times to reach this position. If the user waits 4 seconds after this the LV1052 checks and indicates the set position again, i.e. the LED will flash another 7 times.

All settings that are made are memorised by the LV1052 if it is de-energised.

#	12V		24V	
	under	reset	under	reset
1	9.5V	11.5V	19.0V	23.0V
2	10.0V	11.5V	20.0V	23.0V
3	10.0V	13.2V	20.0V	26.4V
4*	10.5V	12.0V	21.0V	24.0V
5	10.5V	12.8V	21.0V	25.6V
6	11.25V	13.25V	22.5V	26.5V
7	11.5V	12.8V	23.0V	25.6V
8	11.5V	13.8V	23.0V	27.6V
9	11.8V	12.8V	23.6V	25.6V
10	12.8V	13.2V	25.6V	26.8V

\*) factory settings

Table 2: Programmable undervoltage and reset voltage values.

## Weight & dimensions

Weight		370 g
Dimensions	L*W*H	120*82*57 mm
Mounting holes	Ø	5 mm
Terminal strip contacts	L*W*H Ø	18*19*2 mm 8 mm

## Cable diameters

Flange connectors (T1 & T2)	minimum Ø	50 mm <sup>2</sup>
Faston connectors	minimum Ø	1.5 mm <sup>2</sup>

## Electronic information

Autodetect 12 V or 24 V system	12 V mode 24 V mode	8 V t/m 19 V 19 V t/m 35 V
Current consumption	Active Passive	3 mA 2 mA
Inrush current (100ms)	12 V mode 24 V mode	2.6 A 5.0 A
Switching current	Continuous Peak	250 A 1500 A

## Connection diagram

