

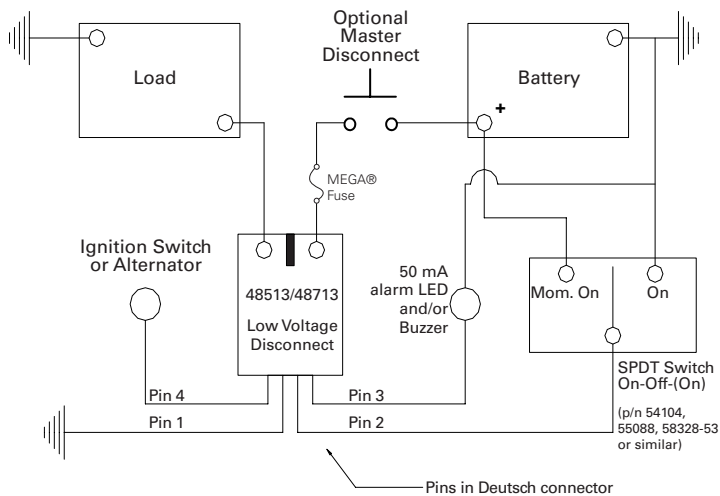
# Installation Instructions

## Compact Low Voltage Disconnect Switch

Part Number: 48513, 48513-01 & 48713



### Connection Schematic



### General Specifications

Environmental:	-40°C to 85°C. SAE J1455 & J1113 Electronics sealed to IP67 Ignition-proof to ISO 8846
Electrical:	100A at 85°C 125A at 60°C Operating Voltage 9-32V 1mA max quiescent current
Disconnect:	12V - Less than 12.1V for 2 minutes 24V - Less than 24.2V for 2 minutes. Factory programmable. Accuracy $\pm 100\text{mV}$
Connect:	12V - More than 13.0V for 10 seconds 24V - More than 26.0V for 10 seconds Factory programmable. Accuracy $\pm 100\text{mV}$
Alarm:	Active low, 50mA Activates 1 minute before disconnect.
Dimensions:	Overall height is 3.1" (79mm) See drawing below. Dimensions in inches (mm)

### Installation

**Caution:** Do not mount device in a location where it will be exposed to a direct heat source, moisture or salt spray.

Mount device in a location where there is air circulation. Under normal operating conditions this device may run hot. Use caution when handling.

**Note:** All connections to pins 1-4 should be made using a 12804 harness connector or a Deutsch DT06-4S connector.

1. Disconnect the battery or power supply or switch it off with the master disconnect switch before installation. All connections to pins should be made with the connector.
2. Connect Pin 1 to ground.
3. Connect LVD "Load+" stud to accessory loads using appropriate heavy gauge cable.
4. Optional connections:
  - To use the manual feature, Connect Pin 2 "Manual Override" to a center common post of a SPDT {On – Off – Mom. On} switch. Connect the side that is active in the Mom. On position to battery voltage. Attach the side that is active in the stable On to ground
  - To use the alarm feature, connect Pin 3 "Alarm" to a audio/visual alarm (voltage rating appropriate for your system) or relay that draws less than 250mA. Connect the other side of the alarm device to Ground.
  - To use the ignition countdown timer feature, Connect Pin 4 "IGN" to the ignition switch (usually to the run position).
  - Unused locations in the connector should be filled with plugs provided.
5. Connect LVD "Battery+" stud to the battery positive terminal (or battery positive terminal block) using appropriate heavy gauge cable and proper fusing (not to exceed product rating).

**NOTE:** If a master disconnect switch is used, the LVD should be installed "after" the master disconnect, such that the master disconnect switch can be used to shut off power to the LVD.

6. Reconnect the battery or power supply.



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### Normal Operation Summary

- When the unit is powered up it goes into auto-detect mode, determines if it is in a 12V or 24V system, and sets the parameters for operation.
- When the voltage is above 13.0V/26.0V for 10 seconds, the LVD will automatically connect the loads to the battery.
- When the voltage drops below 12.1/24.2V for 60 seconds, the Alarm will signal, warning the user that the loads are about to be disconnected.
- The user has the option to override the imminent disconnect by applying battery voltage to the manual pin.
- After 60 seconds of the alarm, the loads and the alarm will be disconnected.
- The alarm can be audio, visual or both.
- Connecting the manual pin to ground will force the unit to stay shut down as long as that pin is connected to ground
- The 48513/48713 also has an optional key off timer disconnect feature. For this feature to work, the ignition pin of the 48513/48713 (pin 4) must be connected to a keyed ignition source. If it is connected and the ignition key is switched off while the LVD's output is on, the 48513/48713 starts a 15 minute timer. If the battery voltage remains above the disconnect threshold while the timer is active, the output will remain on for 15 minutes and then disconnect the load. If the battery voltage should drop below the disconnect threshold for one minute before the timer expires, the alarm will sound for one minute and then disconnect the load. If ignition terminal is connected and the battery voltage drops below the disconnect threshold for one minute while the key is on, the loads will not disconnect but the alarm will pulse..

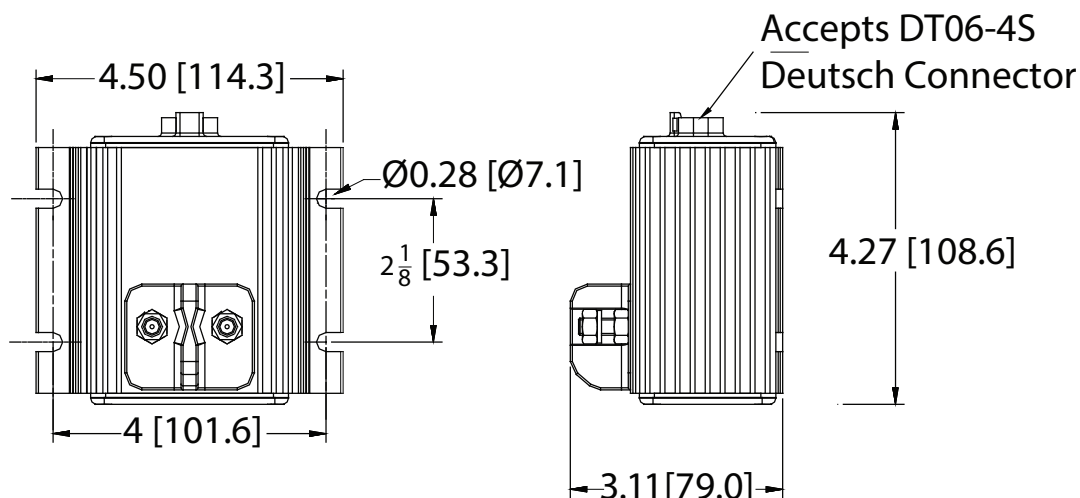
### Additional Operating Details

**Under/Over Voltage** - After the LVD initializes, if the voltage falls below the low cut off value (7V/16V) or above the overvoltage cut off value (18V/36V) the unit will disconnect the loads until the voltage returns to the acceptable range. If the device is out of voltage range the Manual feature is disabled.

**Connection Check** - Upon power-up, the LVD initially checks to ensure proper cabling, specifically the Battery+ and Load connections. If improper cabling is detected, the LVD will activate the alarm continuously (no pulse) until the user corrects the cabling. If the load energizes immediately when Battery+ is connected and stays on no matter the voltage or the position of the manual switch, check the B+ and Load connections to make sure they are connected to the correct terminals.

**Manual Override** - When the user uses a switch to connect the Manual pin (Pin 2) to battery voltage for 1 second, it forces the unit to stay connected for 15 minutes, and then it returns to automatic mode (Alarm snooze).

**Overcurrent Shutoff** - When the output current exceeds the preset threshold of ~135A for 3 seconds, the loads are disconnected and the alarm is activated. A reset can be accomplished by connecting the manual pin to battery voltage (manual override). If a switch is not used, similar to a Type II circuit breaker, power must physically be removed from the unit (at the Battery, at the 48513/48713 battery terminal or by master disconnect switch) to reset the unit and begin operating. Investigate and eliminate the cause of the overcurrent as repeated extreme overcurrent may damage the unit.



Specifications, descriptions and illustrative material in this literature are as accurate as known at the time of publication, but are subject to changes without notice. Visit [littelfuse.com](http://littelfuse.com) for the most up-to-date technical information.