Automated LVD Connection & Setup

Documentation Revision 1

Products models: MXSL15/16 series.

LVD (Low Volts Disconnect) Functions

The MXSL15/16 latch-type contactor installed between the battery and the load to monitor the battery voltage. If the battery goes lower than the shutoff-setting value, the contact will open to disconnect the battery from all loads including the contactor's control circuit itself. It also monitors another setting value which is alarm voltage to flash the LED and let the users know the battery is lower than the alarm value.

Because the batteries are made from many different manufactures and many different voltage levels to indicate a low, the users have to setup the unit for what voltage level they need for their batteries.

The two settings, alarm and shutoff:

The alarm flashes the LED at connector pin 5. If LED is not used simple leave it unconnected. If the LED already installed, set the LED mode to 0 will disable the alarm flashing or set alarm volts to lower than shutoff volts. When the unit shuts off before alarm, the alarm will never have a change to activate.

When shutoff is activated, it will shut down by open the contact. There is a delay time before the contact shutoff. This delay time is changeable from 0 to 255 seconds. When delay countdown to open the contact, LED flashes twice and repeat faster than the alarm flashing rate. The shutoff flashing LED can also be turned off by changing the LED mode to 0.

Beside automated-shutoff, a manual input at pin 6 can turn off the contact in case of an emergency or the users want to shutoff manually when seeing the alarm LED flashing. Leave pin 6 unconnected if no need for manual turn-off.

After the unit shuts itself off at low volts, users can push the start button to turn on the contactor for starting the engine. Because it is low-volts, the countdown to open the contact starts immediately after start-button is pushed (make sure to set the delay time long enough for your needs). When the battery volts still high while cranking the engine, the voltage could dip lower than shutoff-setting and countdown also starts. In either case, the delay time will allow users to start the engine and recharge the battery.

Installation

Follow this connection diagram.
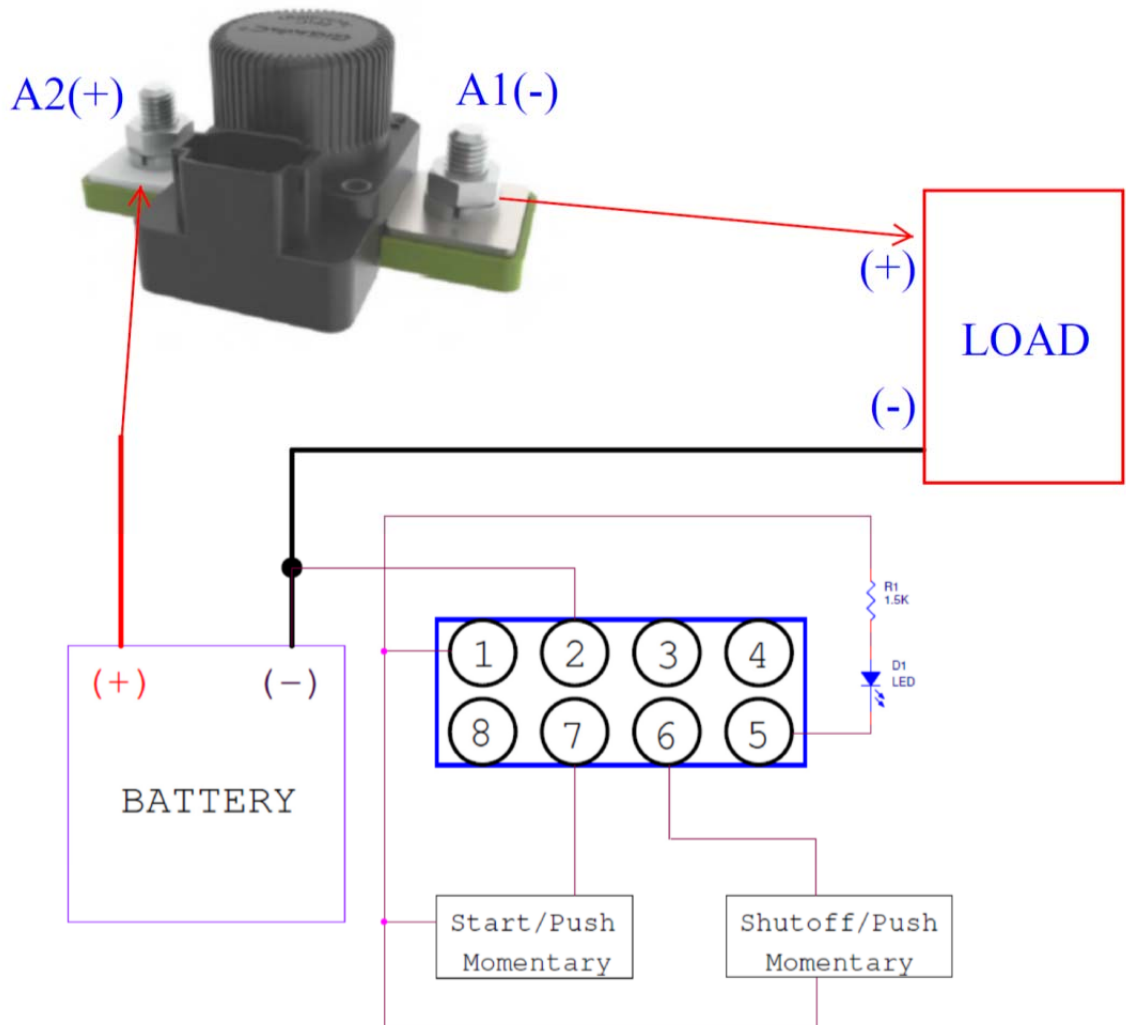
Note:

1. Pin 1 of the connector is internally connected to A2 (+) for easy wiring in a bundle.
2. The shutoff-switch and the LED connect to pin 1 (picture above); the power (+) will always presents at the shutoff-switch and the LED.
3. Other option is to move from pin1 to A1 (-) or LOAD (+). This will have no voltage presents at the shutoff-switch and LED when the contact is opened.
4. Always connect start switch to pin1 or A2 (+) and pin 7.
5. Pin 5 can drive the LED up to 50mA max.

The contactors are opened by default. However, during transportation, the contacts could close unexpectedly. When completing the installation, if the contact is opened, the users need to push the start button to close the contact to begin its operations. If the contact was closed unexpectedly after installed, it will start its operation immediately. However, the contact closed from vibration or movement usually not fully engage. If this happens, push the manually-open button or lower the input voltage (battery voltage can't be adjusted, use an adjustable power supply) to open the contact then push start-button to make sure the closing is properly making contact.

Note: push to start requires at least 75ms of holding time for the coil to have sufficient energy to close the contact. Push to shutoff will need about 200ms for the unit to filter out accidental-touches or noise-triggers.

Electrical Parameters

- Voltage input to connector pin7 and terminal A2 (+) is limited by the coil voltage rating (typically 33V max). If over this limit could cause permanent damage to the control circuit.
- Pin1 is internally connected to the terminal A2 (+).
- Pin 2 is common (GND).
- Input at pin 6 to manual-shutoff the contact requires a minimum of 3V to maximum of coil voltage rating.
- Pin 5 is LED driver, capable of drive up to 50mA.
- A1 (-) terminal connects to the LOAD also provide power to the contactor control circuit after the contact closed.

Setup Connection

This unit needs to be properly configured before install on the vehicle. Configuration interface uses UART similar to RS232, but the voltage level is 0V to 5V. An USB to UART adapter is required to make connection between this unit and the computer. COM port from the PC or USB to RS232 will not work because RS232 operates at +/-12V.
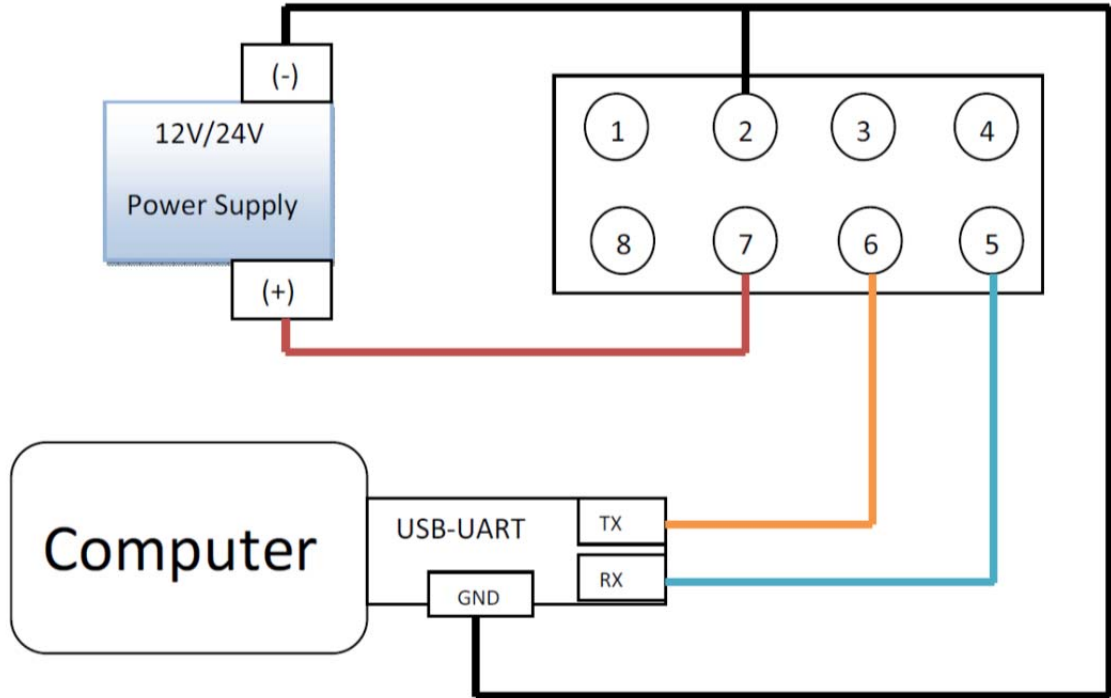
## _Removed setup cable before deployment_

Setup Instruction

The dumb-terminal style application-software-programs or serial communication programs are widely available from the internet. Obtain a software-program install on the computer, run the program and set baud rate to 9600, 8 data bits, no parity, 1 stop bit and no hardware flow control. Follow the setup procedure to bring the unit into a setup mode. The contactor's setup mode is only available at first power-up.

When power first applies to this unit, it will send out "GIGAVAC MXSL15/16" to announce its presents and wait for 5millisecond to look for "LVD" characters from the serial port. If an "L" is received, it will delay 2 seconds each for the next 2 characters 'V' and 'D'.

Setup Procedures:

1. Set the communication program parameters as mentioned above.
2. Select COM port on the software-program to points to the connected unit.
3. Hit [Caps Lock] on the keyboard.
4. While hold 'L' key to repeatedly sending out an "L" on the COM port every 3ms (see note for setup 3ms repeat-rate).
5. Turn on the contactor power.
6. When "GIGAVAC MXSL15/16" appears on the screen, release the "L" key right away.
7. Enter 'VD" within 2 seconds. If you entered 'V' within 2 seconds, you have 2 more seconds to enter the 'D' character.

Note: be sure to setup the communication program to repeat the characters every 3 milliseconds. Here is an example of the HyperTerminal settings. If using different program see user-guide for setup.
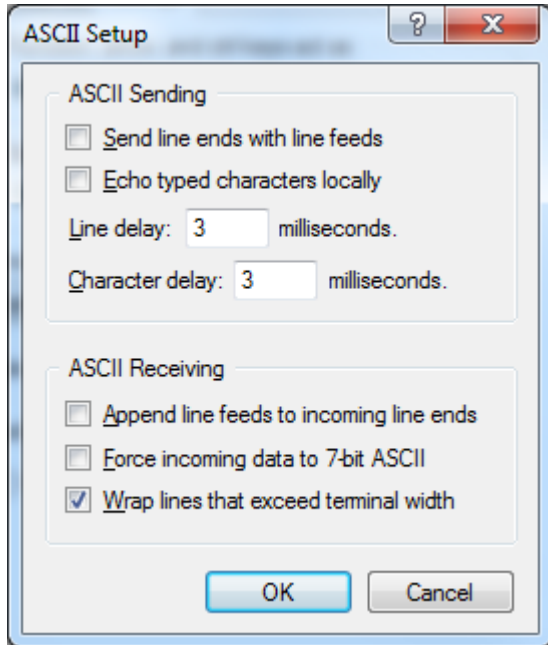
The setup command format:

Available Command Characters: '?', 'S', 'A', 'D' and 'L'.

   A command is terminated by an <enter>. Each command needs to have a number between the command character and the <enter> except the '?' command that needs no number. A space or a comma after a command character is optional.

Command details:

'?': read back: see what had been entered to the memory & show firmware version.
'S': shutoff voltage, when the battery voltage falls below this value, the unit will shut itself off with a delay in seconds based on the 'D' command.
'A': alarm voltage, when the battery voltage falls below this value, the LED is activated.
'D': delay time in seconds, when shutoff is activated, the time to delay before the contactor shutoff. Maximum delay is 255 seconds.
'L': LED mode, when the alarm or shutoff is activated, the LED flashes or stays off depend on this value.

ommands parameters:

Enter the 'S' or 'A' voltage value multiply by 100 result in an integer value of 4 characters. Example: to enter 12.35V, the value to enter is 1235. The analog to digital convert resolution is about 30mV/count. Enter the value in 10mV increment allows you to fine tune a few counts on the ADC in order to achieve optimal voltage value.
Enter the 'D' value exactly as the delay time in seconds.
Enter 'L' value from 0 to 3. 0=LED off for both shutoff and alarm. 1=LED-flash for alarm only. 2=LED flash for shutoff only. 3=LED flash for both alarm and shutoff.

To verify the data that had been entered correctly, send '?' command and hit <enter> to read back the values, make sure the contents are what you intended.

   Another way to setup is to download "MXSL15/16 (LVD) Configurator" software-program from GIGAVAC website. This program will provide graphical user interface to do the setting easier.

Install the program with folder option:

The folder option is the location where the executable file will be located.
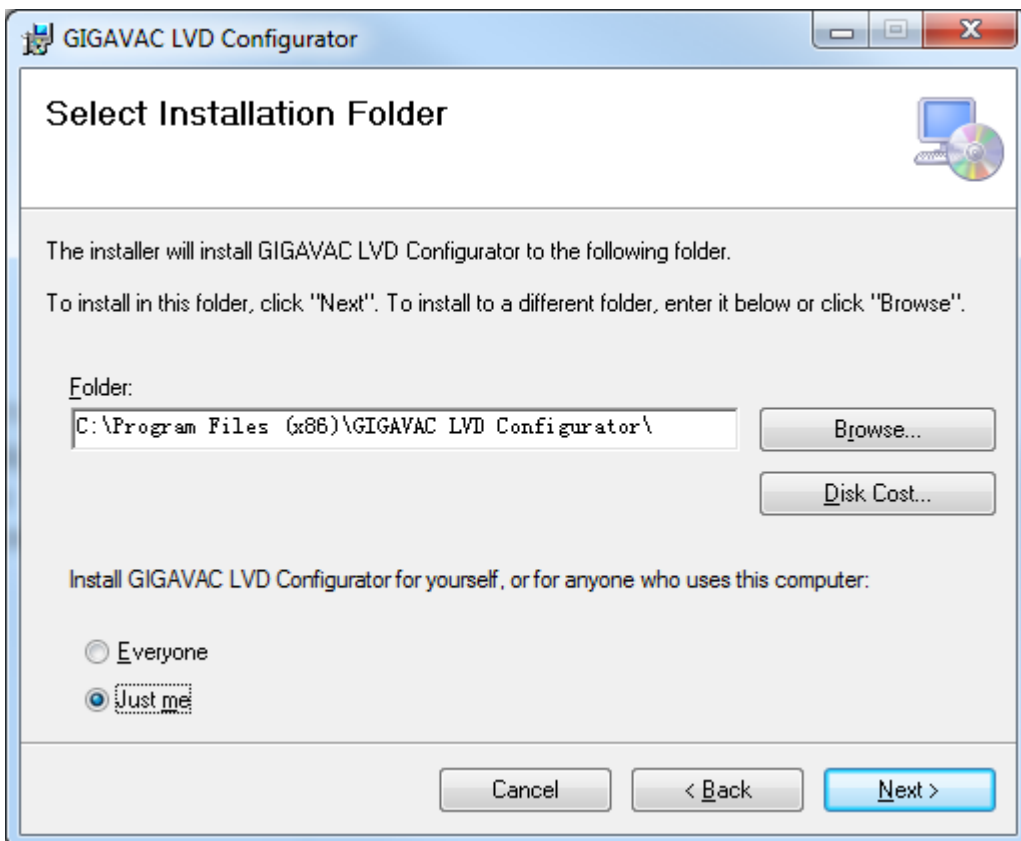
Program User Interface

"MXSL15/16 (LVD) Configurator" Users-Guide:

1. Use the setup connection diagram.
2. Select the COM port that connects to the contactor.
3. Click [Search MXSL] button.
4. Turn on the contactor power.
5. After seeing a result on the "Response Message" text box.
6. Select a command from the combo dropdown box.
7. Enter a value in [# Here], but no need to enter value for the '?' command.
8. Click [GO] button.

To verify the data that had been entered correctly, select '?' command to read back the values, make sure the contents are what you intended.

After setup is done, remove the COM cable before install the unit on the vehicle.

Thank you for using GIGAVAC products.

Revisions:

Rev. 1: initial completion.