LSC Series Load Shedding Controller

Stand Alone Programmable Load Management Controllers

The LSC-04, 08 & 12 are standalone load shedding controllers designed to work with any 1 or 3-phase generator and a broad range of connected load types controlled by dry contacts. The controller can be set for 2 different configurations as follows: normally open mode is selected when set up=N.C.=OFF. This mode is designed to work with loads that use a normally open state for control purposes like normally open contactors and control circuits like low voltage HVAC control wires. The normally closed mode is selected when set up N.C.=ON This mode is designed to work with normally closed devices like open frame normally closed relays. All LSC Controller outputs can now be set independently for NO or NC configuration.

Theory of operation

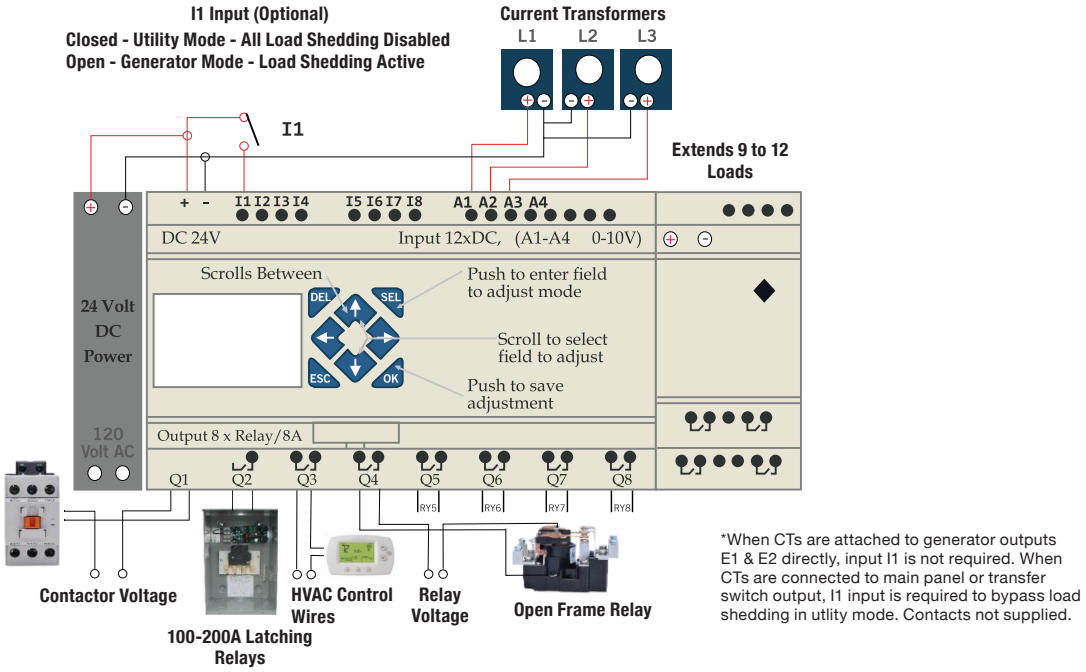
Operation: The internal program runs at power up. After startup all LSC Controller dry contacts will revert to the load shedding state turning connected loads 0-PF, normally open configuration will open controller dry contacts and normally closed configuration will close controller dry contacts All relays will remain in their active state (load disconnected) for the duration of the delay shed period set by DR01.

After DR0l times out the program will look at the value of Gen Full Load (DR02) to determine the maximum amps available. A comparator circuit will look at the anticipated load of Relay1 (DR03) and the Gen Actual Cur reading, (this will always be determined by the higher of the 1-3 CT inputs).

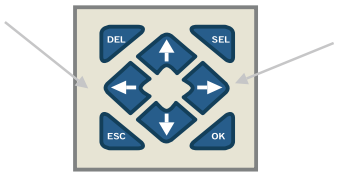
When capacity is available Relay1 will revert to the normal state and tum the load on. after the load is restored the program will pause for the number of seconds set by input setting stabilize time (DR0A). After the delay period the program will compare the GenActual Cur reading, with Gen Full Load (DR02) and the anticipated load of Relay2 (DR04), if the comparator program determined capacity is available, Relay2 will revert to its normal state turning on load 2. This sequence is repeated for relays 3-4, 3-8 or 3-12 depending on the controller model installed. When the anticipated load would exceed the generator capacity the load will not tum on and the program will stop at that load until capacity is available.

Any time the load exceeds 90% of Gen Full Load (DR02) the relays will begin to shed the loads from highest number relay (lowest Priority) to lowest number relay (relay 1 highest priority). The LSC-04 will shed relays 4, 3, 2, 1 individually until the overload is removed. The LSC-08 will shed in groups of two loads 8 & 7, 6 & 5, 4 & 3 and 2 & 1 until the overload is removed and the LSC-12 will shed in groups of three 12, 11, 10 then ~,8, 7 then 6, 5, 4 then 3, 2, 1, until the overload is no longer present.

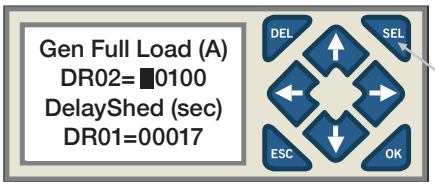
The program will then repeat the process restoring and removing loads based on the load priority and the available capacity of the generator.



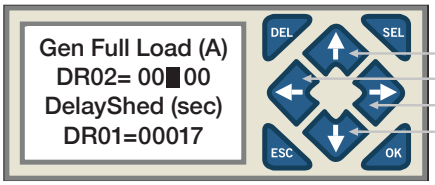
Adjusting the Controller Variable Inputs Using the Front Panel Buttons (All Versions)



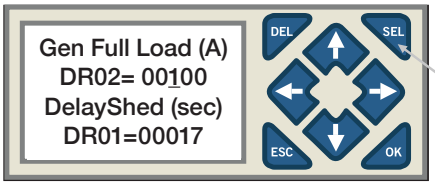
Left and Right Arrow Key: The left arrow key is used to scroll through all screens. Scroll to the screen you want to adjust and use the following key sequences to make the required adjustments. Note: hold button for 1-2 seconds to advance to the next screen.



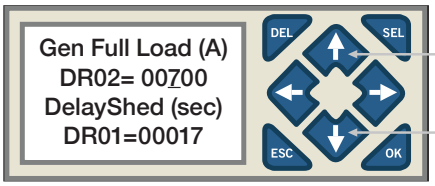
Entering the Programming Mode: The select key is used to enter the programming mode on any screen. After pressing the SEL key a flashing block cursor will appear.



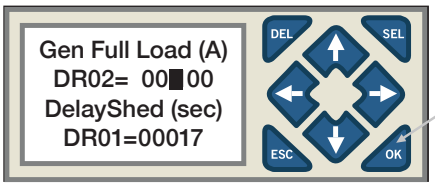
Move Cursor to the Desired Adjustment: Use the up, down, left and right keys to position the cursor on the digit to be adjusted.



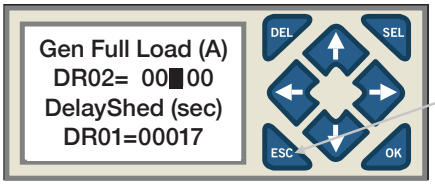
Push the Select Key Again: Press the select key again to enter the adjustment mode. The flashing block cursor will change to a flashing under-score.



Adjust Value with Up-Down Keys: Use the up, down keys to adjust the value of the setting. You can scroll left and right to adjust multiple digits in the same adjustment field.

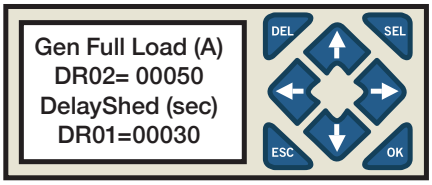


Press the OK Key to Save: Use the OK Key to save the adjustments made.

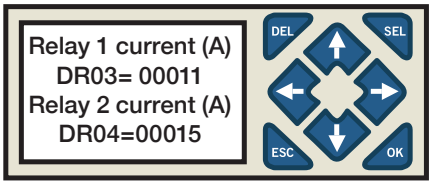


Press The ESC Key To Exit Programming Mode: Use ESC Key to exit the programming mode to enable scrolling between adjustment windows.

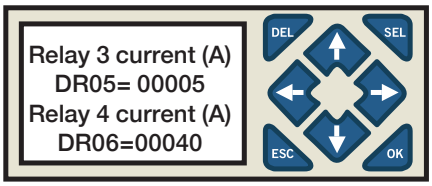
Programming Screens - LSC-04 Four Channel



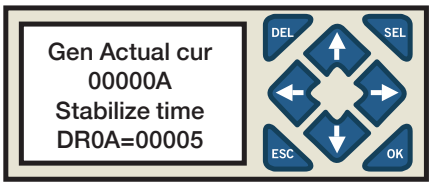
Screen 01
Generator Full Load DR02: Adjust to generators maximum amperage output in whole Amps. Adjust for standard running amps not In-Rush current.
DelayShed DR01: Delay period in seconds from the generator start up until the 1st load will be considered for restoration.



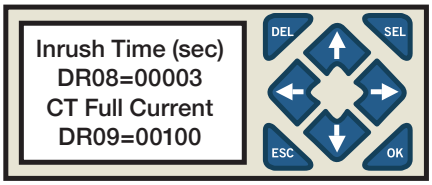
Screen 02
Relay #1 Current DR03: Adjust to the estimated maximum amperage in whole amps for load #1.
Relay #2 Current DR04: Adjust to the estimated maximum amperage draw in whole amps for load #2.



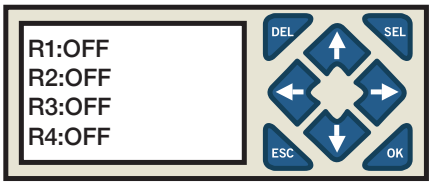
Screen 03
Relay #3 Current DR05: Adjust to the estimated maximum amperage draw in whole amps for load #3.
Relay #4 Current DR06: Adjust to the estimated maximum amperage draw in whole amps for load #4.



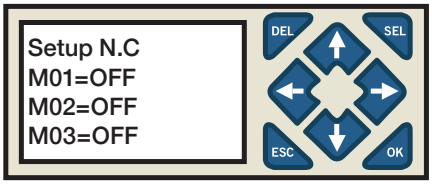
Screen 04
Actual Real-Time Amps: Generator amp load as measured by the controllers highest reading on either CT.
Stabilize Time: Adjust the time delay time in seconds between the individual turn on of Relays 2-4.



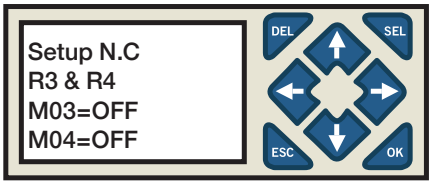
Screen 05
Generator Inrush Delay DR08: Adjust allowable InRush delay time before load shedding will occur. Start at 3 seconds and adjust if needed.
CT Full Current DR09: For CTs with a 0-10VDC output set DR09 to maximum current rating of CT. For CTs with 0-5VDC output set DR09 to two times the value of the maximum current rating of the CT selected. Confirm calibration by placing an AMP probe on the generator feeds and comparing the reading to **"Gen Actual Cur"** reading.



Screen 06
Real Time State of relays 1-4 (Fixed reading, not adjustable).

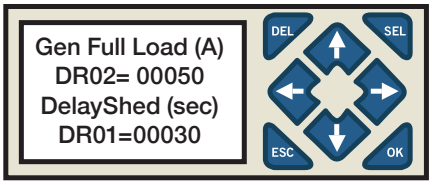


Screen 07
Normally Open/Normally Closed Setup Relay 1 & 2: See NO/NC setup procedures on page 8.

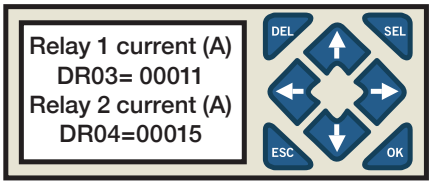


Screen 08
Normally Open/Normally Closed Setup Relay 3 & 4: See NO /NC setup procedures on page 8.

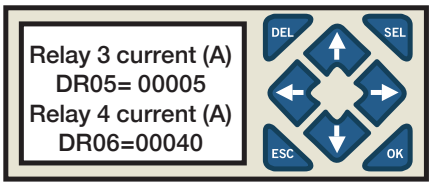
Programming Screens - LSC-08 Eight Channel



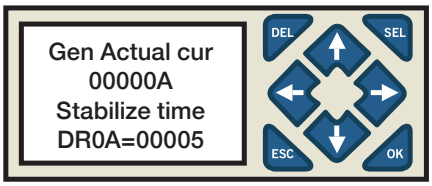
Screen 01
Generator Full Load DR02: Adjust to generators maximum amperage output in whole Amps. Adjust for standard running amps not In-Rush current.
DelayShed DR01: Delay period in seconds from the generator start up until the 1st load will be considered for restoration.



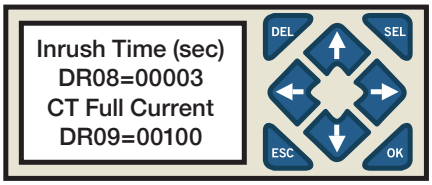
Screen 02
Relay #1 Current DR03: Adjust to the estimated maximum amperage in whole amps for load #1.
Relay #2 Current DR04: Adjust to the estimated maximum amperage draw in whole amps for load #2.



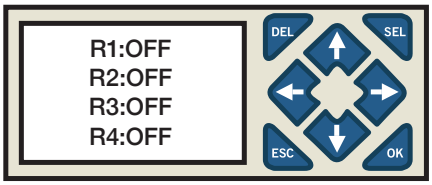
Screen 03
Relay #3 Current DR05: Adjust to the estimated maximum amperage draw in whole amps for load #3.
Relay #4 Current DR06: Adjust to the estimated maximum amperage draw in whole amps for load #4.



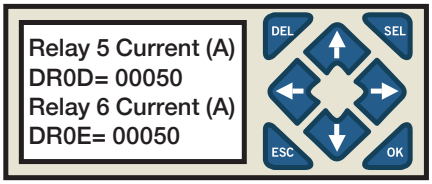
Screen 04
Actual Real-Time Amps: Generator amp load as measured by the controllers highest reading on either CT.
Stabilize Time: Adjust the time delay time in seconds between the individual turn on of Relays 2-4.



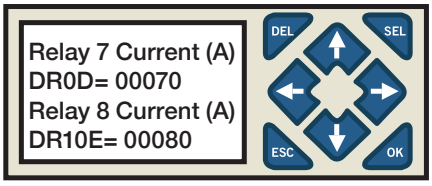
Screen 05
Generator Inrush Delay DR08: Adjust allowable InRush delay time before load shedding will occur. Start at 3 seconds and adjust if needed.
CT Full Current DR09: For CTs with a 0-10VDC output set DR09 to maximum current rating of CT. For CTs with 0-5VDC output set DR09 to two times the value of the maximum current rating of the CT selected. Confirm calibration by placing an AMP probe on the generator feeds and comparing the reading to **"Gen Actual Cur"** reading.



Screen 06
Real Time State of relays 1-4 (Fixed reading, not adjustable).

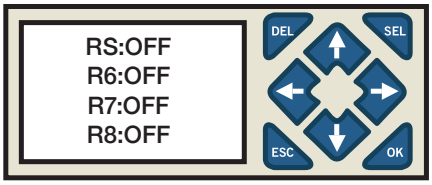


Screen 07
Relay #5 Current DR05: Adjust to the estimated maximum amperage draw in whole amps for load #5.
Relay #6 , Current DR06: Adjust to the estimated maximum amperage draw in whole amps for load #6.

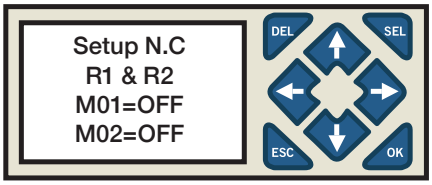


Screen 08
Relay #7 Current DR05: Adjust to the estimated maximum amperage draw in whole amps for load #7.
Relay #8 Current DR06: Adjust to the estimated maximum amperage draw in whole amps for load #8.

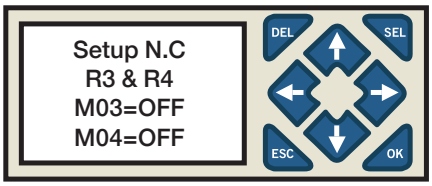
Programming Screens - LSC-08 Eight Channel *continued*



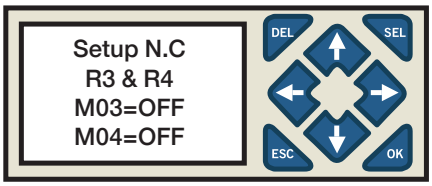
Screen 07
Real Time State of relays 5-8 (Fixed reading, not adjustable)



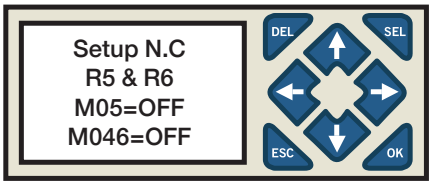
Screen 08
Normally Open/Normally Closed Setup Relay 1 & 2: See NO/NC setup procedures on page 8.



Screen 09
Normally Open/Normally Closed Setup Relay 3 & 4: See NO/NC setup procedures on page 8.

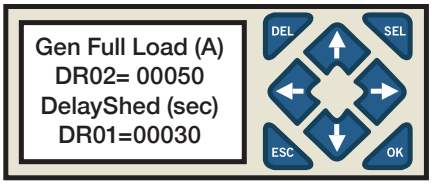


Screen 10
Normally Open/Normally Closed Setup Relay 5 & 6: See NO/NC setup procedures on page 8.

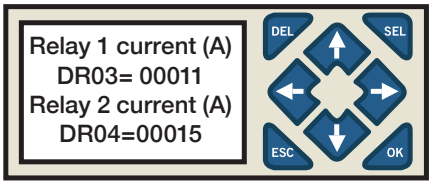


Screen 11
Normally Open/Normally Closed Setup Relay 7 & 8: See NO/NC setup procedures on page 8.

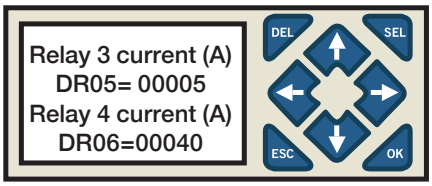
Programming Screens - LSC-12 Twelve Channel



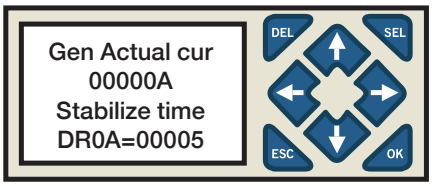
Screen 01
Generator Full Load DR02: Adjust to generators maximum amperage output in whole Amps. Adjust for standard running amps not In-Rush current.
DelayShed DR01: Delay period in seconds from the generator start up until the 1st load will be considered for restoration.



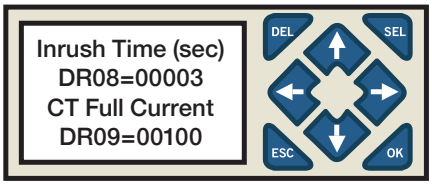
Screen 02
Relay #1 Current DR03: Adjust to the estimated maximum amperage in whole amps for load #1.
Relay #2 Current DR04: Adjust to the estimated maximum amperage draw in whole amps for load #2.



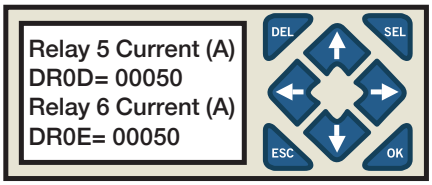
Screen 03
Relay #3 Current DR05: Adjust to the estimated maximum amperage draw in whole amps for load #3.
Relay #4 Current DR06: Adjust to the estimated maximum amperage draw in whole amps for load #4.



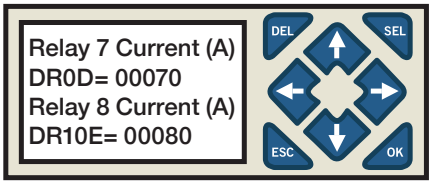
Screen 04
Actual Real-Time Amps: Generator amp load as measured by the controllers highest reading on either CT.
Stabilize Time: Adjust the time delay time in seconds between the individual turn on of Relays 2-4.



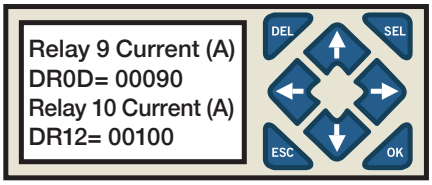
Screen 05
Generator Inrush Delay DR08: Adjust allowable InRush delay time before load shedding will occur. Start at 3 seconds and adjust if needed.
CT Full Current DR09: For CTs with a 0-10VDC output set DR09 to maximum current rating of CT. For CTs with 0-5VDC output set DR09 to two times the value of the maximum current rating of the CT selected. Confirm calibration by placing an AMP probe on the generator feeds and comparing the reading to **"Gen Actual Cur"** reading.



Screen 06
Relay #5 Current DR0D: Adjust to the estimated maximum amperage draw in whole amps for load #5.
Relay #6 , Current DR0E: Adjust to the estimated maximum amperage draw in whole amps for load #6.

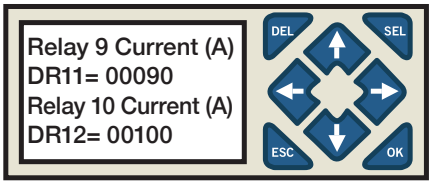


Screen 07
Relay #5 Current DR0F: Adjust to the estimated maximum amperage draw in whole amps for load #7.
Relay #6 , Current DR10: Adjust to the estimated maximum amperage draw in whole amps for load #8.

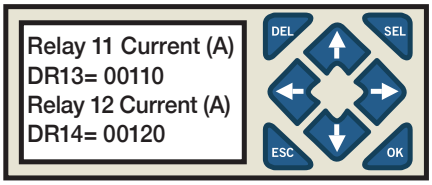


Screen 08
Relay #7 Current DR05: Adjust to the estimated maximum amperage draw in whole amps for load #9.
Relay #8 Current DR06: Adjust to the estimated maximum amperage draw in whole amps for load #10.

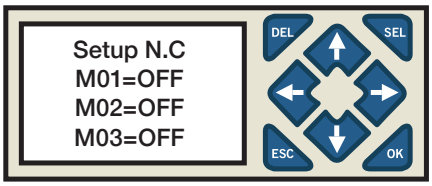
Programming Screens - LSC-12 Twelve Channel *continued*



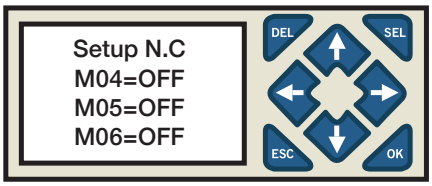
Screen 07
Relay #9 Current DR11: Adjust to the estimated maximum amperage draw in whole amps for load #9.
Relay #10 Current DR12: Adjust to the estimated maximum amperage draw in whole amps for load #10.



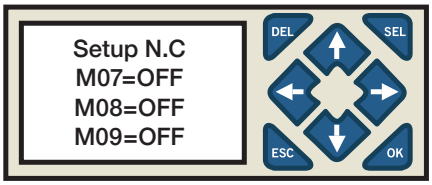
Screen 08
Relay #11 Current DR13: Adjust to the estimated maximum amperage draw in whole amps for load #11.
Relay #12 Current DR14: Adjust to the estimated maximum amperage draw in whole amps for load #12.



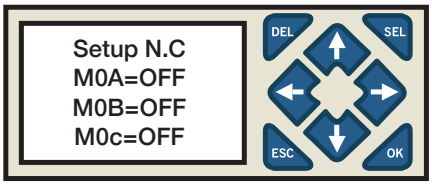
Screen 08
Normally Open/Normally Closed Setup Relay 1, 2 & 3: See NO/NC setup procedures on page 8 for additional information.



Screen 08
Normally Open/Normally Closed Setup Relay 4, 5 & 6: See NO/NC setup procedures on page 8 for additional information.



Screen 08
Normally Open/Normally Closed Setup Relay 7, 8 & 9: See NO/NC setup procedures on page 8 for additional information.



Screen 08
Normally Open/Normally Closed Setup Relay 10, 11 & 12: See NO/NC setup. Note MOA = 10, MOB = Load 11 and MOC = Load 12 see procedures on page 8 for additional information.

Normally - Open & Normally-Closed Function Description

The LSC 4, 8 &12 relay controllers now provide an option to individually select NO or NC dry-contact outputs for each relay. There are three or four additional screens (depending on model) for setting the required output.

Control Signal Explanations

Normally Closed Mode: When the normally closed mode is used the assumption is a normally closed relay will be used. this will require the relay contacts on the lsc controller to remain open under normal (non-load shedding state) and closed when load shedding. All LSC relays that are set for set up N.C = ON, Will close the contacts at power-up to disconnect the load attached and open the LSC Controller contacts to connect the load.

Normally OPEN Mode: When the normally open mode is used the assumption is a normally open contactor or HV AC circuit will be controlled. This will require the relay contacts on the LSC controller to remain closed under normal (non-load shedding state) and open when load shedding. All LSC relays that are set for N.C OFF, will open the dry contacts on the LSC controller at power-up to disconnect the loads and will close the contacts on the LSC controller to restore the load.