Technical Documentation

SureSine LVD Adjustment

Low Voltage Disconnect/Reconnect Adjustment

v02

Abstract:

The SureSine 300W Inverter comes with two factory default Low Voltage Disconnect/Reconnect pairs. One pair of values is customizable. To customize these values, a PC must be used to reprogram the inverter. This document explains the proper procedure.

What's Needed:

- The SureSine MODBUS Specification (optional).
- A Windows application called ModScan32 (available for download online).
- A Morningstar PC Meterbus Adapter (model: MSC) with included RJ-11 cable.
- Windows Calculator Application (the calculator accessory that comes with Windows).

STEP 1: Download and Run the ModScan32 Application

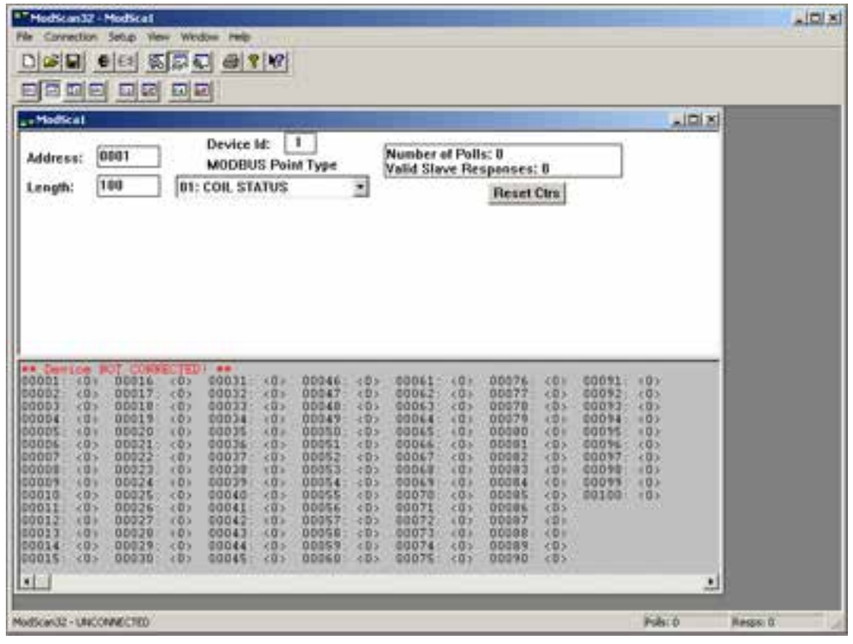
A) Go to: http://www.win-tech.com/html/demos.htm

B) Click on ModScan32.zip to download the application.

C) When the download is finished, extract the .zip file to your Desktop.

D) Run the application by opening ModScan32.exe.

IMPORTANT: ModScan32 can be used for free during the trial period. To enable the trial, simply leave the Registration Access Code blank when prompted by the program.



STEP 2: Prepare SureSine Inverter for Programming

A) With the SureSine powered off (no battery connected), make sure DIP Switch #4 is UP. This configures the unit to talk the MODBUS protocol.

B) Connect the PC to the serial (9 pin) input of the PC MeterBus Adapter (model: MSC) using a direct serial connection or a USB/Serial adapter. Use the serial cable provided with the MSC adapter.

C) Connect the MSC MeterBus output (RJ-11) to the METER port on the SureSine inverter using the RJ-11 cable provided with the MSC adapter. Make sure the cable is pushed in all the way to the METER port until you hear a 'click'.

D) Power up the SureSine by connecting a battery. You will see at least the STATUS LED illuminate.

STEP 3: Configure the Data Collection Window of ModScan32

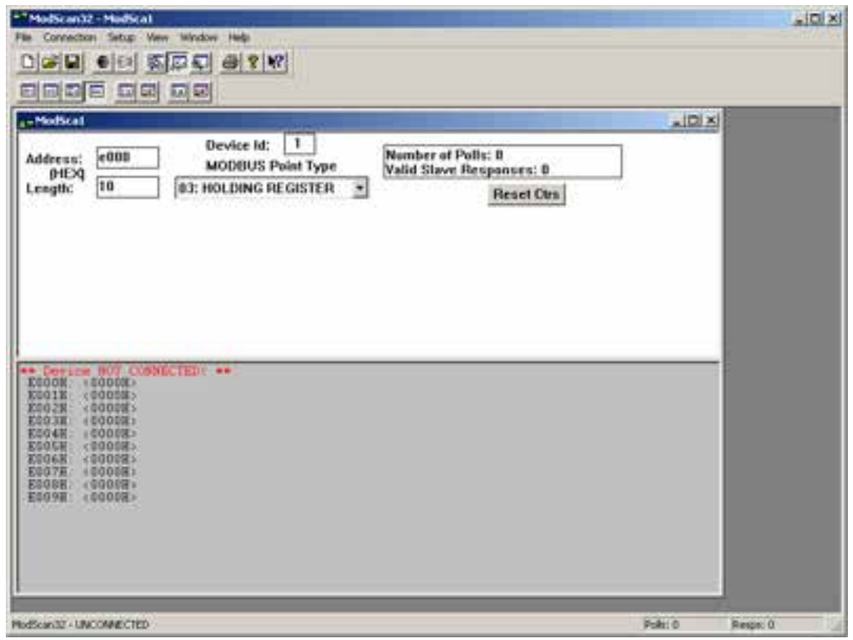
A) Go to Setup menu > Display Options and choose 'Hex'.

B) Go back to Setup menu > Display Options and choose 'Hex Addresses'.

C) Change the following fields in the ModSca1 window:

Address:	**E001**
Length:	**10**
Device Id:	**(leave as 1)**
MODBUS Point Type:	**03: Holding Register**

The ModScan32 application should now look like this:



STEP 4: Calculate the LVD/R Register Values for the Desired LVD and LVDR Setpoints

A) Determine the desired LVD voltage (Example: 10.0V, the lowest safe value to use)

IMPORTANT: Do not choose a voltage of less than 10.0V. The inverter will not operate reliably below 10.0V.

B) Multiply this number by 2^16 (Example: 10.0V * 2^16 = 655360)

C) Divide the result by 16.92 (Example: 655360 / 16.92 = 38732.86)

D) Open the Windows Calculator (if you haven't already been using it for the above calculations) and go to View menu > Programmer.

E) Select the 'Dec' radio button (this puts the calculator into 'decimal' notation).

F) Enter the number calculated in (*C)* above (Example: 38732.86).

G) Select the 'Hex' radio button (this converts the number you just entered into 'hexidecimal' notation). ***Write this number down for later!*** (Example: 38732.86 dec = 974C hex)

H) Repeat the calculations in (A) through (G) using the desired LVD reconnect voltage. ***Write the result down for later!*** (Example: 11.5V LVD reconnect = ADFE hex)

I) Repeat the calculations in (A) through (G) using the desired LVD Beeper Warning set point. Write the result down for later! (Example: 10.3V LVD reconnect = 9BD7 hex)

STEP 5: Connect to the SureSine

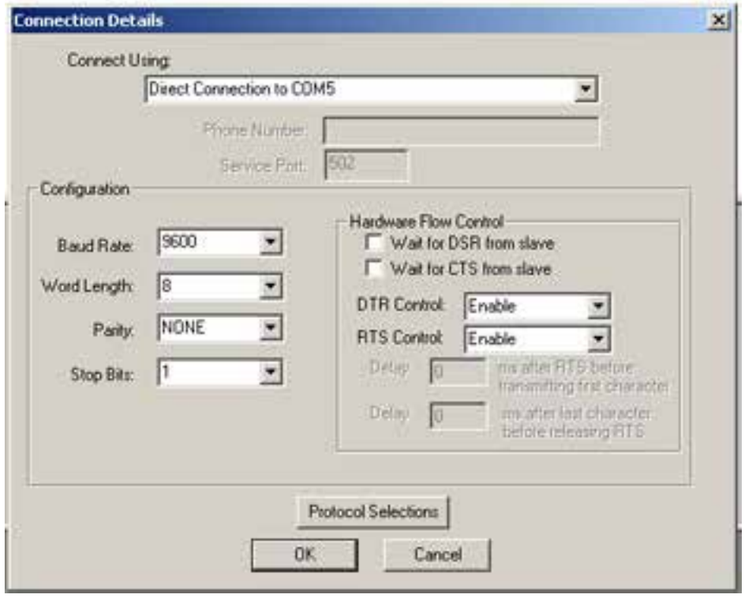
A) Go to Connection menu > Connect. A 'Connection Details' window will appear. Choose the COM port being used to communicate with the controller from the dropdown box.
Note: If using a direct serial connection, the COM port will likely be COM1 or COM2. If using a USB/Serial adapter, the COM port may be something very different. You can verify the COM port number when using a USB/Serial adapter by going to the Windows Device Manager.

B) Set the following parameters:

Baud Rate:	9600
Word Length:	8
Parity:	NONE
Stop Bits:	1
Wait for DSR from slave:	Unchecked
Wait for CTS from slave:	Unchecked
DTR Control:	Enable
RTS Control:	Enable

IMPORTANT: Before accepting these parameters by clicking OK, make sure you have the two HEX values calculated from STEP 4 handy. If you are using the Trial Version, once you click OK, ModScan32 will only allow you to run the program for approximately 3min before requiring you to restart the program. This is more than enough time to reprogram the unit so long as you have your HEX values handy.

The ModScan32 Connection Details window should now look like this:



C) Click OK.

STEP 6: Program the SureSine with the Desired LVD Value

A) Go to Setup menu > Extended and choose User Msg. A window will appear named 'User Defined Command String'. This is the window used to send reprogramming commands to the SureSine. We will now program the *LVD setpoint*.

B) Enter the following data:

Show Data in:	**HEX**
Slave Address:	**01** ***(this is the default MODBUS address for the SI)***
Function:	**06** ***(this is the MODBUS 'Write' function)***
Send Data:	**E0,04,XX,XX** ***(where XX,XX is the HEX value found in STEP 4 for the desired LVD setpoint) (Example: E0,04,97,4C)***

C) Click Send.

CONGRATULATIONS! The desired LVD voltage setpoint has now been updated.

STEP 7: Program the SureSine with the Desired LVD Reconnect Value

A) Go to Setup menu > Extended and choose User Msg. A window will appear named 'User Defined Command String'. We will now program the *LVD reconnect setpoint*.

B) Enter the following data:

Show Data in:	**HEX**
Slave Address:	**01** ***(this is the default MODBUS address for the SI)***
Function:	**06** ***(this is the MODBUS 'Write' function)***
Send Data:	**E0,05,XX,XX** ***(where XX,XX is the HEX value found in STEP 4 for the desired LVD reconnect setpoint) (Example: E0,05,AD,FE)***

C) Click Send.

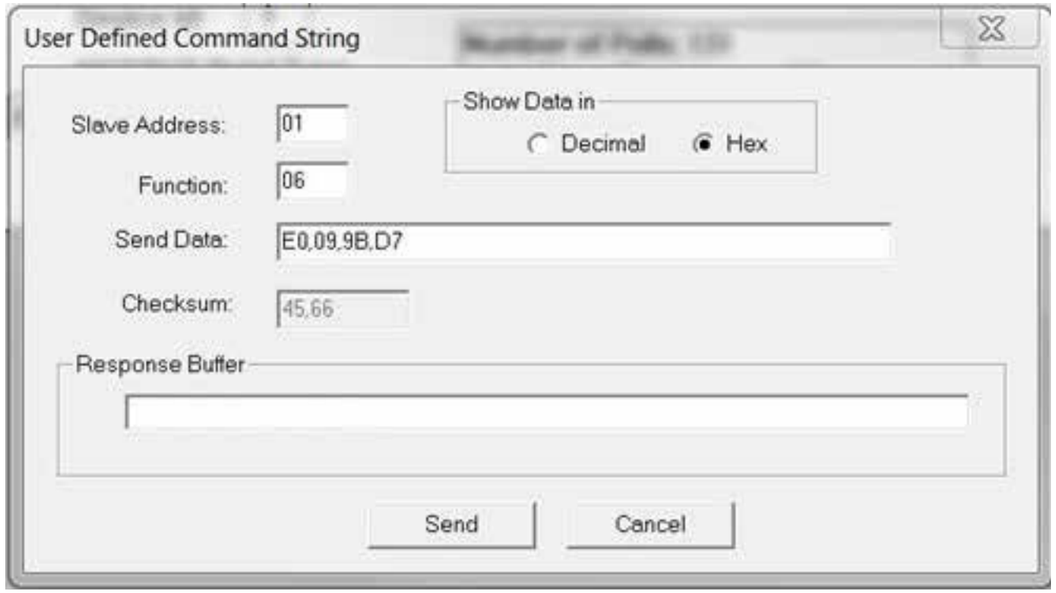
CONGRATULATIONS! The desired LVD reconnect voltage setpoint has now been updated.

STEP 8: Program the SureSine with the Desired LVD Beeper Warning Value

Note: LVD Beeper Warning value by default is 0.3V above the LVD value. This value must be custom programed as well to retain the audible warning. The custom value can be calculated using the same Scaling calculations seen above in STEP 4.

A) Go to Setup menu > Extended and choose User Msg. A window will appear named 'User Defined Command String'. We will now program the LVD Beeper Warning set point.

B) Enter the following data: Show Data in: HEX Slave Address: 01 (this is the default MODBUS address for the SI) Function: 06 (this is the MODBUS 'Write' function) Send Data: E0,09,XX,XX (where XX,XX is the HEX value found in STEP 4 for the desired LVD Beeper Warning set point) (Example: E0,09,9B,D7)



C) Click Send.

CONGRATULATIONS! The desired LVD Beeper Warning setpoint has now been updated.

STEP 9: Final Steps

A) You will notice that the previously green STATUS LED on the inverter now shows red. This indicates that a settings change has been made and a reboot is required for the desired settings to take effect.

B) Remove battery power from the SureSine inverter.

C) Make sure DIP Switch #2 is in the UP position (this tells the inverter to use the newly programmed LVD/R setpoints).

D) Reconnect the battery to the inverter.

E) ***DONE***. Your new settings are now active.

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