

# SENS Setup Utility

For SENS MicroGenius® and MicroCab™ Products



**CONFIGURE CHARGERS/SYSTEMS  
WITH CUSTOM SETTINGS**

## Operation Manual

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Installation or service questions?  
Call SENS between 8 a.m. and 5 p.m. (Mountain Time),  
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## 1 DESCRIPTION

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Use the *SENS Setup Utility* to configure MicroGenius® 2 and later MicroGenius products as well as MicroCab™ with custom settings. Custom configuration enables an OEM or specially qualified distributor or packager to update firmware or customize output voltage, alarms, temperature compensation, boost time limit, current limit settings, Modbus communications and more.

All chargers/systems equipped with a front panel keypad require the *SENS Setup Utility* only to configure alarm relay assignments and update firmware. All other settings are adjustable using the keypad.

The *SENS Setup Utility* software operates on a Windows 7 or newer PC with a USB port.

## 2 SETUP

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### 2.1. Copy Files

The *SENS Setup Utility* software (including this user manual) is provided on the SENS website ([www.sens-usa.com](http://www.sens-usa.com)) in the “Download Center.” Copy all downloaded files to a Windows 7 or newer PC.

### 2.2. Install Utility

Install the *SENS Setup Utility* by double-clicking the *SENS Setup Utility* installer file.

### 2.3. Install USB Driver

If not automatically installed, install the USB driver located at C:\Program Files (x86)\Stored Energy Systems\SENS Setup Utility\DriverSetup (or similar link depending on computer). See Appendix A for instructions to install driver.

### 2.4. Connect SENSbus Adapter

Communication between a computer and the charger/system using the *SENS Setup Utility* requires connection of the SENSbus Adapter. Connect the provided USB cable from the USB port on a PC to the SENSbus Adapter port labeled “USB.” Connect the provided network cable from the SENSbus Adapter RJ-45 port labeled “SENSbus” to the RJ-45 connector on the charger/system (see specific product user manual for connection location). Note – the *SENS Setup Utility* must be closed in order for Modbus communications to operate.

### 2.5. Remove Jumpers —for stand-alone chargers without keypads only

When configuring a stand-alone charger (charger without a keypad and not part of a system), remove all output configuration jumpers from the main circuit board to enable PROGRAM MODE. In PROGRAM MODE the charger output is determined by values programmed in the charger using the *SENS Setup Utility*. If the charger has not been previously programmed, removing all jumpers will result in an error state until programming is complete.

### 2.6. Connect Charger/System

Launch the *SENS Setup Utility*. See Figure 1 for an example of the main screen shown upon opening the utility. The utility will automatically find a connected SENSbus Adapter and begin communicating with a charger/system. If a SENSbus Adapter is not connected to the *SENS Setup Utility* an option exists to simulate a connection. Simulating a connection allows saving custom settings files to load to a charger/system at a later date.

### 3 OPERATING INSTRUCTIONS

#### 3.1. Programmable Parameters

Use the *SENS Setup Utility* to program the parameters listed in Table 1. The charger/system will immediately begin using custom programmed values upon saving to the charger/system. See specific product user manual for parameter definitions.

**NOTE:** For stand-alone charger without keypad, user must remove circuit board output jumpers to enable programmed parameters. SENS recommends retaining the jumpers to return to factory defaults if desired.

**Table 1 – Programmable Parameters**

| Parameter                  | Utility Menu             | Adjustment Range/Details   |
|----------------------------|--------------------------|--|
| Battery Type               | Battery (System) /Basic  | Select FLA (flooded lead-acid), NICD (nickel-cadmium), VRLA (valve regulated lead-acid), AGM (absorbed glass mat), ultracapacitor or power supply. Select “Custom” to fully customize a unique battery type.   |
| Number of Cells            | Battery (System) /Basic  | Number of cells times volts per cell must not exceed other limits  |
| Float Voltage              | Battery (System) /Basic  | 8-34V, must be greater than 60% of Boost setting. Option to configure as volts/cell or total voltage.  |
| Boost voltage              | Battery (System) /Basic  | 8-34V, must be same or higher than Float, must not be greater than 166% of Float setting   |
| Temp Compensation slope    | Battery (System) /Basic  | 0 to -0.30%/°C   |
| Auto Boost Timeout*        | Battery (System) /Basic  | 1-100 hours  |
| Auto Boost Delay           | Battery (System) /Basic  | 0-5 minutes  |
| Current Limit *            | Battery (System) /Basic  | 25-100% of rated output current  |
| Channel Current Rating     | Battery (System) /Basic  | Set to maximum desired charger/system current for selected channel. Settings lower than maximum available installed charger current will limit current to enable redundancy, e.g. if two 15A modules are included in a system, set to 15A for N+1 redundancy. Settings greater than maximum available installed charger current will result in setup errors. Set to 0 to turn off redundancy and to remove setup checks for missing charger modules. |
| Batt Discharge Voltage     | Battery (System) /Alarms | Must be between Low DC setting and 98% of Float setting or Eco-Float setting when HELIX is active. Option to configure as volts/cell or total voltage.   |
| Low DC Voltage             | Battery (System) /Alarms | Must be greater than End Discharge setting and less than Battery Discharging setting. Option to configure as volts/cell or total voltage.  |
| Batt End Discharge Voltage | Battery (System) /Alarms | Must be less than Low DC setting. Option to configure as volts/cell or total voltage.  |
| Low Crank Voltage          | Battery (System) /Alarms | 6V to 98% of Float setting, must be at least 2% less than Float setting. Option to configure as volts/cell or total voltage.   |

| Parameter                 | Utility Menu                     | Adjustment Range/Details   |
|---------------------------|----------------------------------|--|
| Low Current Alarm         | Battery (System) /Alarms         | 0-50% of nominal current in amps, zero indicates alarm is disabled   |
| High DC Voltage           | Battery (System) /Alarms         | 8-35V, must be greater than Boost setting by 2% of Float setting, must be less than 40% higher than Boost setting. Option to configure as volts/cell or total voltage. |
| Over Voltage Shutdown     | Battery (System) /Alarms         | 8-35V, must be greater than High DC setting. Option to configure as volts/cell or total voltage.   |
| Alarm Delay *             | Battery (System) /Alarms         | 5-60 seconds   |
| Periodic Boost Interval** | Battery (System) /Periodic Boost | 1-180 days, available on select products only  |
| Periodic Boost Duration** | Battery (System) /Periodic Boost | 1-100 hours  |
| Battery Check Voltage     | Battery (System) /Battery Check  | Must be greater than Battery End Discharge setting and less than 98% of Float setting. Option to configure as volts/cell or total voltage.                             |
| Check Interval            | Battery (System) /Battery Check  | 1-90 days, zero indicates battery check is disabled  |
| Check Duration            | Battery (System) /Battery Check  | 1-60 minutes   |
| Commission Voltage**      | Battery (System) /Commission     | Float voltage to 34V, must be greater than or equal to Float setting   |
| Commission Current**      | Battery (System) /Commission     | 5-100% of nominal current in amps  |
| Commission Duration**     | Battery (System) /Commission     | 1-120 hours, zero indicates commissioning is disabled  |
| ECU Instance *            | Unit/J1939                       | 0-7  |
| Vehicle System Instance * | Unit/J1939                       | 0-15   |
| Function Instance *       | Unit/J1939                       | 0-31   |
| Address *                 | Unit/J1939                       | 1-250, dynamically assigned as necessary   |
| Industry Group *          | Unit/J1939                       | 0-7  |
| BCH Default *             | Unit/J1939                       | 1 or 2, zero indicates J1939 is disabled (could be due to removed BCH/ADDR jumper on circuit board)  |
| Message Delay             | Unit/J1939                       | 0-60 seconds, 0 or 1 sends a message every 1 second  |
| Baud Rate *               | Unit/MODBUS                      | 57.6 Kbps maximum  |
| Parity *                  | Unit/MODBUS                      | None, even or odd  |
| Mode *                    | Unit/MODBUS                      | RTU, ASCII or TCP/IP (available on select products only)   |
| Slave Address *           | Unit/MODBUS                      | 1-255, zero disables MODBUS  |
| Turn On Delay *           | Unit/MODBUS                      | 0-20,000 microseconds  |
| Turn Off Delay *          | Unit/MODBUS                      | 0-20,000 microseconds  |
| ASCII Timeout *           | Unit/MODBUS                      | 0-7 seconds  |

\*Setting adjustment will affect stand-alone charger regardless of whether charger jumpers are in place or not. Example: changing the current limit percentage will lower the current in all modes including the programmed mode, jumper defaults, and factory default mode.

\*\*Update firmware on chargers with Power PCA revision 1.5.0 or lower to enable configuration of Periodic Boost and Commissioning.

### 3.2. Utility Overview

Units communicating with the *SENS Setup Utility* are displayed along the left side of the utility under *Charger System Setup*. Stand-alone chargers (charger without a keypad and not part of a system) are displayed individually when multiple chargers are connected in parallel. Click on a specific unit icon in the list to configure that unit. Menus for various categories of configuration are displayed across the top. Click a menu heading to display settings under each menu.

Figure 1 – Main Screen

**Configurable Units** →

**Assign modules to outputs** →

**Settings Status** →

**Menus** →

**Save/Restore Settings, Load Firmware** →

**SENS SETUP UTILITY**

**Charger System Setup** Unit: **Battery (System)**

**Output:** A B C D **Default**

Basic Alarms Periodic Boost Battery Check Commis: ▶

**Program Battery Setpoints**

Battery Type: FLA SET DEFAULTS

Number of Cells: 12

Settings:  Use Auto-Boost  Use HELIX

Settings are OK

| Sys Status                        | System Summary              | System Controls                         |
|-----------------------------------|-----------------------------|---|
| Voltage (V): 25.58 V              | Total Energy: 369289.17 WHr | REFRESH FROM SYS UPDATE SYSTEM FIRMWARE |
| Current (A): 0.2 A                | Avg Power: 1445.68 W        | GET FACTORY DEFAULTS SAVE SNAPSHOT      |
| Power (W): 5 W                    | Display Rev: 1.8.49         | SAVE BATTERY SETTINGS TO UNITS          |
| AC Voltage (V): 116 Vac           | Power Rev: 1.7.0            |   |
| Battery Temperature (°C): 48.1 °C |                             |   |
| Charger Mode: Float               |                             |   |

Version: 2.1.0 DLL Version: 2.0.2

### 3.3. Assign Modules

For each item listed in *Charger System Setup* assign charger modules to a specific output. Assign each module to output A, B, C or D when modules are used in a system (e.g. MicroGenius 2 chargers used as modules in MicroCab or S2/S4 charger systems). Assign module to *Default* when charger is not part of a system.

### 3.4. Settings Status

The Setting Status bar indicates that settings are incorrect, in conflict with each other or acceptable. Specific information regarding setting errors is displayed.

### 3.5. Unit/System Controls

Save/restore settings or load firmware updates.

#### 3.5.1. Refresh From Unit/Sys

Load/populate the *SENS Setup Utility* with values from the connected unit(s).

#### 3.5.2. Update System Firmware

Load firmware to all devices in a system (e.g. all power and optional alarms/communications accessory circuit boards) at once.

#### 3.5.3. Get Factory Defaults

Load/populate the *SENS Setup Utility* with default values originally configured in the unit at the SENS factory. Press the *SAVE SETTINGS TO UNIT/ SAVE BATTERY SETTINGS TO UNITS* button to save settings to the unit. The unit will immediately begin using factory default values.

**3.5.4. Load From File**

Load/populate the *SENS Setup Utility* with settings from a file stored on the PC. Saved settings files will have a “.uGSet” file extension. Use this option to deploy custom settings to a fleet of chargers/systems.

**3.5.5. Save To File**

Save settings displayed in the *SENS Setup Utility* to a file for later use. Saved settings files will have a .uGSet file extension. Use this option to create and deploy settings to a fleet of chargers/systems.

**3.5.6. Save Settings To Unit/Save Battery Settings to Units**

Save values displayed in the *SENS Setup Utility* to the unit(s).

**3.5.7. Save Snapshot**

Save a “snapshot” of unit/system configuration for troubleshooting purposes. Provide the snapshot file to SENS Customer Service for help in solving issues.

**3.6. Battery (System) Menu**

Configure settings related to battery type and output charging behavior. Configuration changes made in this section will affect all units in a system of units. Submenus exist to configure basic settings, boost behavior, battery check and battery commissioning. In the *Basic* menu, select defaults based on the battery type selected by pressing the *SET DEFAULTS* button. See Table 1 for adjustment details. Press the *SAVE BATTERY SETTINGS TO UNITS* button under *SYSTEM CONTROLS* to save settings to the unit(s). Units will immediately begin using custom programmed values (remove jumpers from stand-alone chargers without keypads to enable PROGRAM MODE for setting changes to take affect).

**3.6.1. Alarms Menu**

Configure alarm setpoints and initiate the Crank Analyzer. See Table 1 for adjustment details. See specific product user manual for alarm definitions.

**3.6.1.1. Crank Analyzer**

Press the *CRANK ANALYZER* button to open the analyzer window. The Crank Analyzer is used with genset applications and displays the number of engine cranks detected as well as the total number of cranks where the battery voltage was lower than the configured *Low Crank Voltage* threshold (see *Alarms* menu to configure *Low Crank Voltage* and *Low Crank Alarm Delay* alarm settings). Details for the previous four engine crank events and a graph displaying battery voltage over time are displayed in the Crank Analyzer.

Press the *RESET CRANK DETECTION* to reset all crank data and a Low Crank alarm. Data is typically reset after replacing batteries. Press the *RESET CRANK ALARM* to only reset a Low Crank alarm and keep crank data. The Low Crank alarm may also be reset by removing and replacing both AC and DC power to the unit.

**3.7. Unit Menu**

Configure settings related to alarm relay assignments, communications and Customer Service support. Configuration changes made in this section will affect only the unit selected in the *CHARGER SYSTEM SETUP* menu. Press the *SAVE SETTINGS TO UNIT* button under *UNIT CONTROLS* to save settings to the unit. The unit will immediately begin using custom programmed values (remove jumpers from stand-alone chargers without keypads to enable PROGRAM MODE for setting changes to take affect).

**3.7.1. Relays Menu**

Revise factory default relay assignments by custom assigning alarms to relays when Form-C contact relays are included with charger/system. Assign an alarm to a relay by checking the box under the desired relay.

Rather than custom configuration, select default relay assignments based on target application

using the *Default Setting* drop-down menu and by pressing the *SET DEFAULTS* button.

The *Display* checkbox enables/disables displaying an alarm on the optional LCD if included.

### 3.7.2. J1939 Menu

Configure J1939 (CANbus) communications values. Select the *Use Extended Functions* checkbox to enable receiving extended J1939 data from the unit at the J1939 master. See Table 1 for adjustment details and product user manual for a list of commands.

### 3.7.3. MODBUS Menu

Configure MODBUS communications values. See Table 1 for adjustment details and the product user manual for additional setup details.

### 3.7.4. Service Menu

Access Customer Service and support related settings. Under the *SERVICE* menu, click on a specific device under the *Device(s) in Unit* list to display further menu items. Click on menu headings to access device status, display active alarms, update firmware, test alarm relays, force the unit to restart or run the Crank Analyzer (see section 3.6.1.1).

#### 3.7.4.1. Update Firmware

Select to update unit firmware. Updated firmware “.SENSF” files are available on the SENS website ([www.sens-usa.com/support/download-center/](http://www.sens-usa.com/support/download-center/)). Firmware is separated into one file for each device (e.g. one file each for the power and optional alarms/communications accessory circuit boards) and firmware is updated independently for each device using this menu. To update firmware to all devices at once, press the *UPDATE SYSTEM FIRMWARE* button from the main *Battery (System)* screen. To update independently, under the *SERVICE* menu, click on a specific device under the *Device(s) in Unit* list and then press the *UPDATE FIRMWARE* button under the *TOOLS* menu. Select the appropriate “.SENSF” firmware file and wait for firmware update to complete. Repeat steps to update firmware on other devices.

#### 3.7.4.2. Relay Test

For units equipped with the alarms/communications circuit board, select the *Relay Test* menu to force alarm relays into open or closed states to ensure the relays are operating.

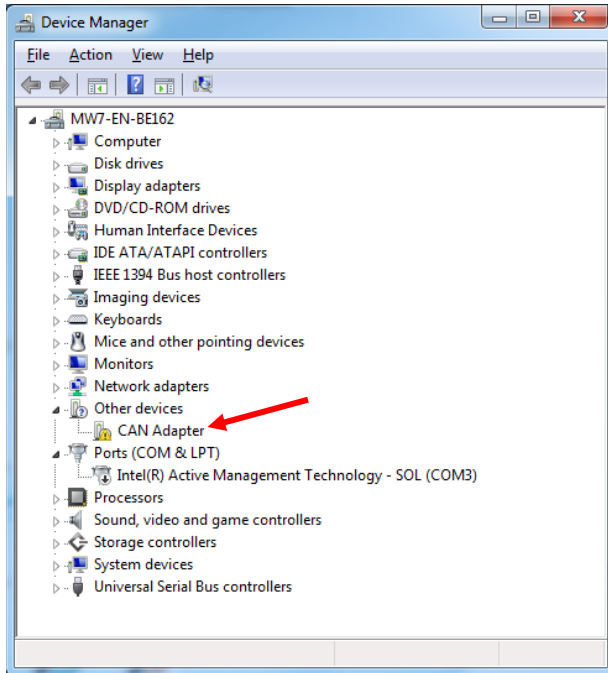
#### 3.7.4.3. Switch to Unit or System Display

For units equipped with the alarms/communications circuit board, select *SWITCH TO UNIT DISPLAY* or *SWITCH TO SYSTEM DISPLAY* under the *TOOLS* menu to toggle between displaying single unit or system (for a system with multiple chargers) values on the unit’s LCD.

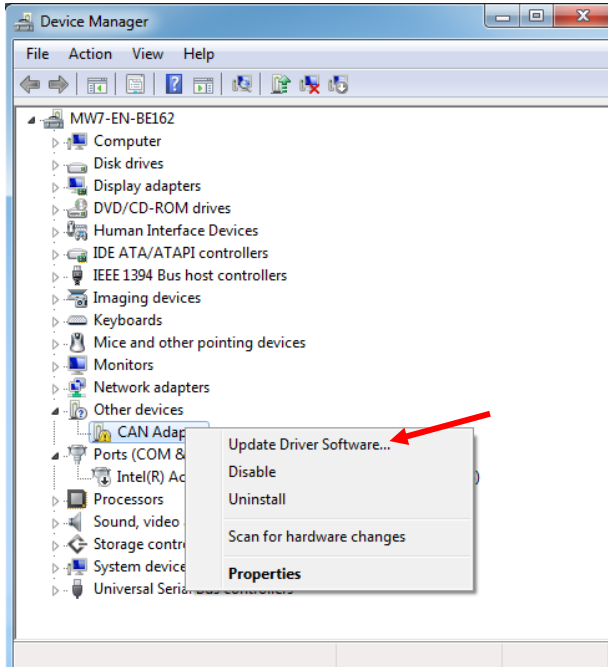


## APPENDIX A – INSTALLING USB DRIVER

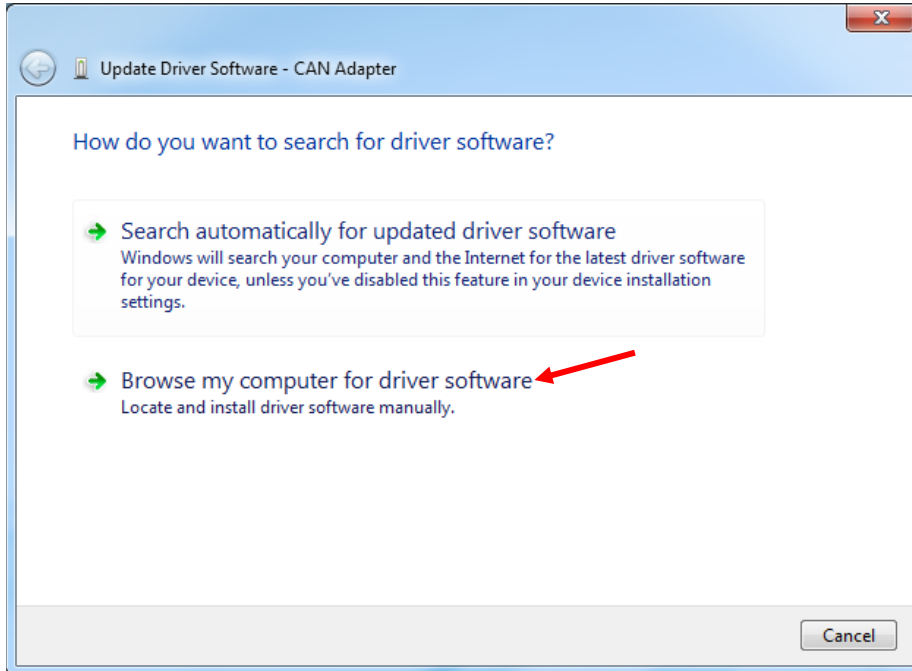
1. Open computer Device Manager to view devices. Note the “CAN Adapter” device.



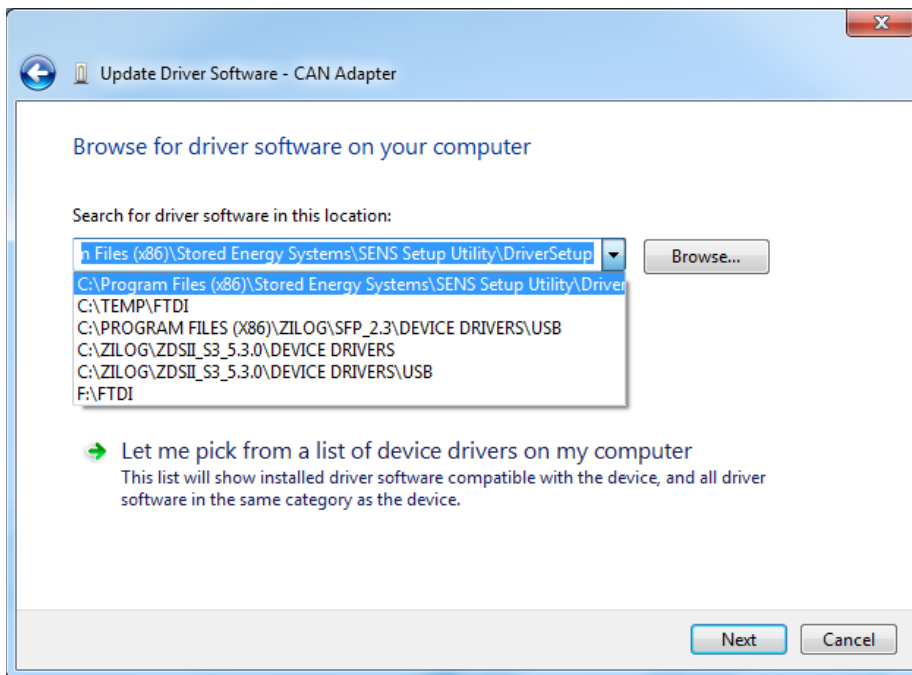
2. Right-click on “CAN Adapter” and select to “Update Driver Software...”



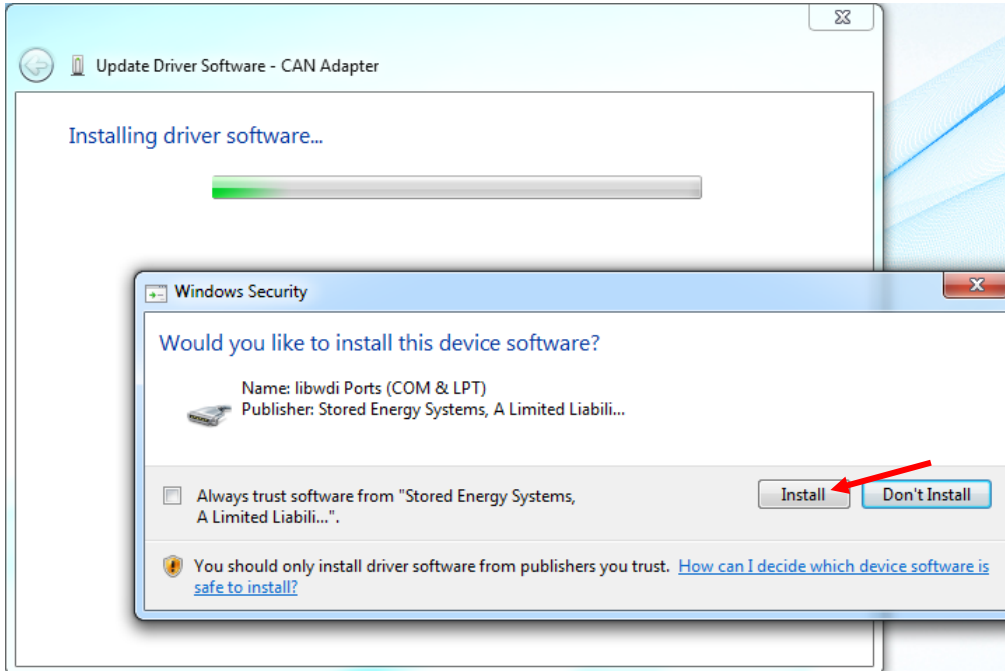
3. Select to browse for driver software.



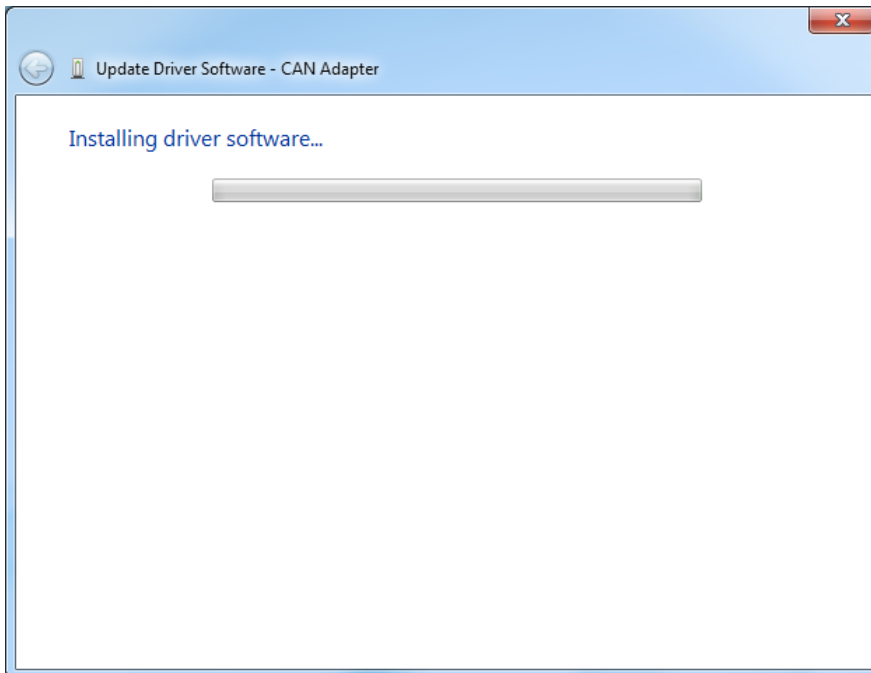
4. Select the "DriverSetup" folder at "C:\Program Files (x86)\Stored Energy Systems\SENS Setup Utility\DriverSetup."



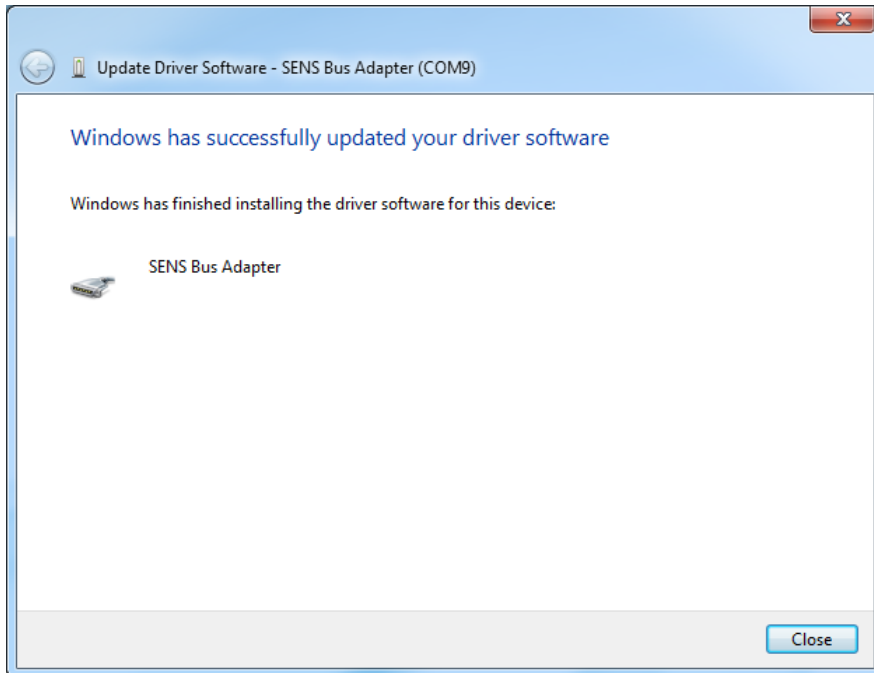
5. Select to install the device software.



6. Wait for installation to complete.



## 7. Verify successful installation.



## 8. Note device successfully installed.

