



Installation Instructions for 30-4300 AEM Serial Gauge

WARNING:



This installation is not for the electrically or mechanically challenged! Use this gauge with **EXTREME** caution! If you are uncomfortable with anything about this, please refer the installation to an AEM trained tuning shop or call 800-423-0046 for technical assistance. You should also visit the AEM Performance Electronics Forum at <http://www.aempower.com>

NOTE: AEM holds no responsibility for any engine damage that results from the misuse of this product!

This product is legal in California for racing vehicles only and should never be used on public highways.

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Instruction Part Number: 10-4300 Rev 112205
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Congratulations, the 52MM (2 1/16") AEM Serial Gauge features a three digit LED digital readout with 24 sweeping multi color LED's, and two input buttons. Also included in the box are all the necessary wiring cables and brackets to install and use the gauge. A non-limited fully functional version of Pro Gauge software by AEM is also in the box. The AEM Serial Gauge allows users to monitor up to 19 different parameters. In addition, users can "daisy chain" multiple gauges together using the included harness.

Contents:

- (1) Serial Gauge assembly
- (1) Appearance kit (Silver bezel, silver pin guide, white faceplate)
- (1) Installation kit (Butt connector, 6 pieces)
- (1) Serial Gauge adapter cable
- (1) Serial Gauge flying lead
- (1) Instruction manual
- (1) Pro Gauge by AEM installation CD
- (1) DB9 Female Female adapter cable

Getting Started

NOTE: The Serial Gauge only works with version 1.19 and newer EMS firmware.

Installation

Disconnect the negative (-) battery cable from the battery. Secure the gauge in a suitable mounting panel/pod using the supplied bracket and thumbnuts. Locate the single row 8-pin connector on the adapter harness. Plug the 8-pin connector into the connector on the back of the gauge as shown in Figure 1. Connect the flying lead to the adapter as shown in Figure. 2. Connect the DB9 connector on the flying lead to its mate on the backside of the EMS as shown in Figure 2. Connect the two non-terminated black wires on the flying lead to a known good ground. Connect the non-terminated red wire to a switched +12Vdc source.



Figure 1. 8-pin connector location

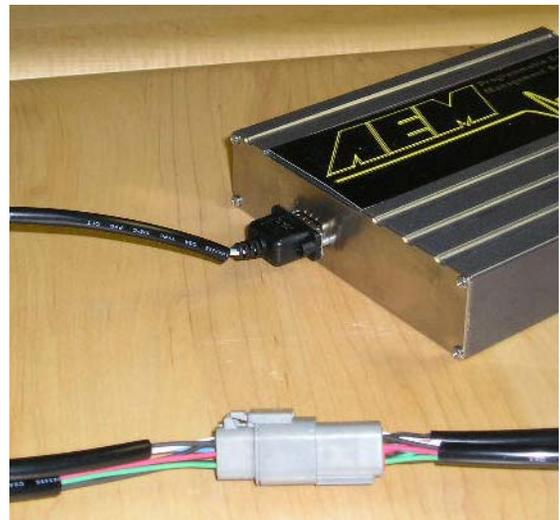


Figure 2. Installation connections

Configuring AEM Pro

Note: The serial gauge will only work with version 1.19 or newer firmware. When connected to the EMS, the firmware version is shown in the blue strip at the top of the screen.

Open AEM Pro and connect to the EMS. Wait for the EMS to finish downloading. Left click on "VIEW" and select the telemetry wizard from the wizards drop down menu, see Figure 3. In the telemetry wizard, left click on "AEM Serial Datastream Gauge:" and click OK, see Figure 4. Close AEM Pro, connect the serial gauge to the EMS, and cycle power to the EMS. The EMS is now configured to output data to the gauge.

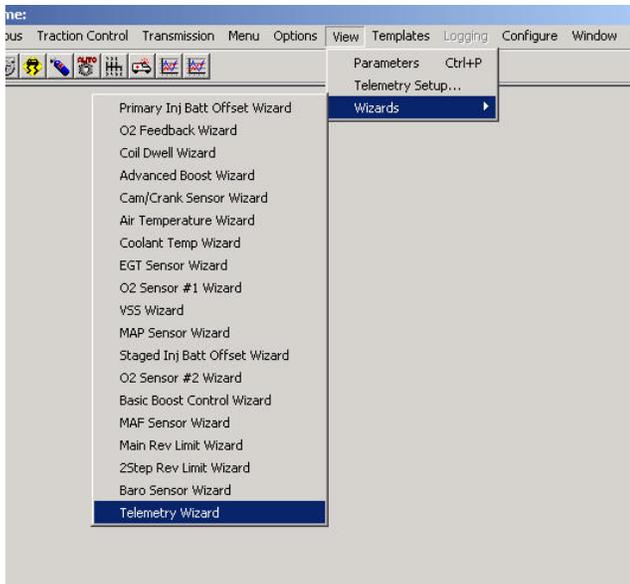


Figure 3. Telemetry wizard

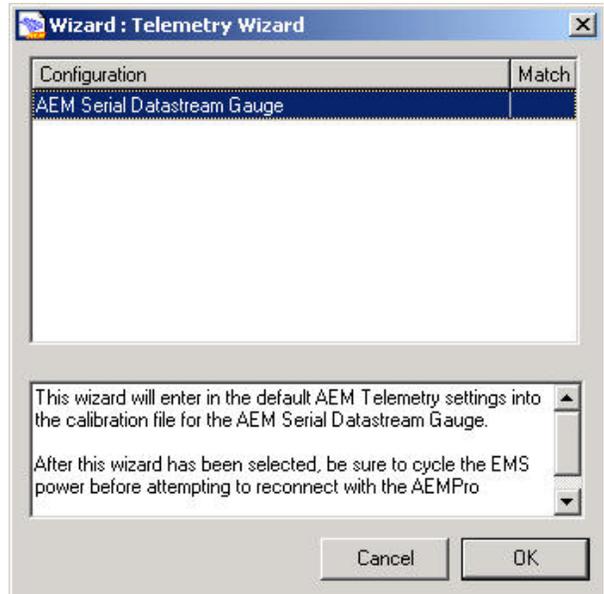


Figure 4. Select AEM Serial Datastream

Using the Gauge:

The gauge comes pre-configured to display engine speed, engine load, throttle, air temp, coolant temp, O2#1, and vehicle speed. The gauge also stores the min and max value for each parameter. The two buttons on the front of the gauge (see Figure 5) allow the user to switch between parameters and view min/max values. The functions for the buttons are listed below.

Right button: Displays next gauge, moves in forward direction

Left button: Displays next gauge, moves in backward direction

Press and hold right button for 2 seconds: Displays max value

Press and hold left button for 2 seconds: Displays min value

Press and hold both buttons for 2 seconds: Clears min/max values for displayed gauge

Press and hold both buttons for 5 seconds: Clears all min/max values



Figure 5. Gauge buttons

Changing the gauge configuration

The AEM Serial gauge comes configured with the black bezel, black pin guide, and the black faceplate. However, a silver bezel, a silver pin guide, and a white faceplate are also included in the gauge kit. To change the faceplate, pin guide, or bezel, orient the gauge so you are looking at the faceplate. Rotate the bezel counter-clockwise to unscrew it from the gauge cup. The bezel, lens, pin guide, rubber spacer, faceplate, diffuser, and anti-glare shield are all removable. Reassemble the gauge as shown in Figure 6. Make sure the small light holes in the faceplate, diffuser, and anti-glare shield line up with the light sensor on the circuit board. Do not over tighten the bezel when reassembling the gauge.



Wire Connections

RED <Power>

Connect to a switched 10-18 volt power source.

BLACK <Ground>

Connect to a clean power ground.

*BROWN <Low Side 1>

Connect to negative side of warning device, 1 amp max.

*ORANGE <Low Side 2>

Connect to negative side of warning device, 1 amp max.

GREEN , <Not Used>

**optional*

Visit the AEM electronics forum for instructions on how to use the Pro Gauge software.

AEM Electronics Warranty

Advanced Engine Management Inc. warrants to the consumer that all AEM Electronics products will be free from defects in material and workmanship for a period of twelve months from date of the original purchase. Products that fail within this 12-month warranty period will be repaired or replaced when determined by AEM that the product failed due to defects in material or workmanship. This warranty is limited to the repair or replacement of the AEM part. In no event shall this warranty exceed the original purchase price of the AEM part nor shall AEM be responsible for special, incidental or consequential damages or cost incurred due to the failure of this product. Warranty claims to AEM must be transportation prepaid and accompanied with dated proof of purchase. This warranty applies only to the original purchaser of product and is non-transferable. All implied warranties shall be limited in duration to the said 12-month warranty period. Improper use or installation, accident, abuse, unauthorized repairs or alterations voids this warranty. AEM disclaims any liability for consequential damages due to breach of any written or implied warranty on all products manufactured by AEM. Warranty returns will only be accepted by AEM when accompanied by a valid Return Merchandise Authorization (RMA) number. Product must be received by AEM within 30 days of the date the RMA is issued.

Please note that before AEM can issue an RMA for any electronic product, it is first necessary for the installer or end user to contact the tech line at 1-800-423-0046 to discuss the problem. Most issues can be resolved over the phone. Under no circumstances should a system be returned or a RMA requested before the above process transpires.

AEM will not be responsible for electronic products that are installed incorrectly, installed in a non approved application, misused, or tampered with.

Any AEM electronics product can be returned for repair if it is out of the warranty period. There is a minimum charge of \$50.00 for inspection and diagnosis of AEM electronic parts. Parts used in the repair of AEM electronic components will be extra. AEM will provide an estimate of repairs and receive written or electronic authorization before repairs are made to the product.



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AEM ProGauge Software

Note: The AEM Serial Gauge is factory pre loaded with “BASE CAL.mdb”, which displays the following parameters:

- Engine Load
- Throttle Position
- Air Temp
- O2 #1
- Vehicle Speed

Connecting to the Gauge

1. Install AEM ProGauge software from provided CD, or check Electronics Forums on WWW.AEMPOWER.COM for latest software.
2. Start with the Serial Gauge powered off.
3. Connect the Serial Gauge to the PC's Serial Port using the Null Modem Cable (female to female, provided).
4. Double click on the “AEM ProGauge” icon on your desktop.
5. Go to File-Open and the select the file named “BASE CAL.mdb”.
(Note: Changes to files are AUTOMATICALLY saved. In order to keep the base cal, it is HIGHLY recommended that you backup the file PRIOR to opening it.)
6. Left click on the Arrow on the Connect Icon (Figure 1) to select appropriate Com Port.
7. Left click on the Connect Icon (Figure 1), a “Connecting to gauge”) window will pop up displaying a status bar (Figure 2).
8. After the “Connecting to gauge” window opens, apply 12Vdc to power up the gauge. See Figure 2.

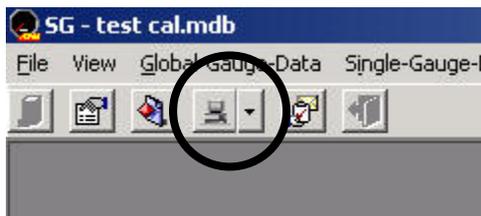


Figure 1. Connect Icon

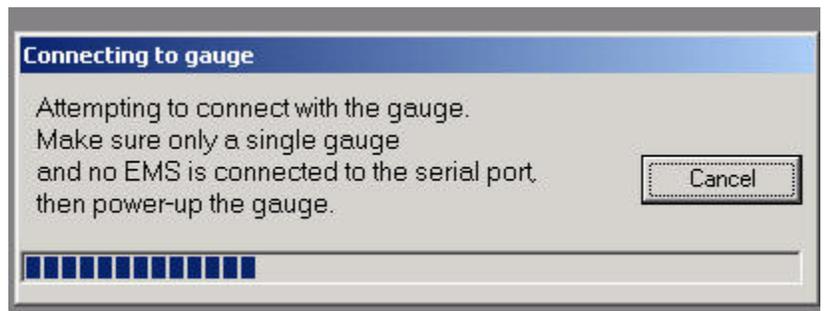


Figure 2. Connecting to Gauge Window



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Changing Displayed Gauges

To change your displayed gauges, select the “Single gauge data” window it is located at the top of the screen, it is usually the window on top. In the bottom left hand of the window there is a “Gauge Order” selection box. The “Gauges” in the “In-use” column are the “Gauges” that are loaded and are active on the Serial Gauge. The gauges in the “Available” column are NOT loaded, therefore cannot be viewed on the Serial Gauge.

To change the active “Gauges”:

1. Click on a “Gauge” in the “Available” selection box.
2. Click on the icon pointing Left or Right to remove or add to the “In-Use” column. “Gauges” in the “In-use” box are ACTIVE and loaded into the Serial Gauge.
3. The order of the “Gauges” in the “In-use” box is representative of how they are loaded into the Serial Gauge Menu. Use the Up and Down icons to arrange the order of the “Gauges”.

In the “Single gauge data” window a variety of other parameters can be set for the each “Gauge”:

The screenshot shows the 'SG - test cal.mdb - [Single gauge data]' window. The main table lists various gauges with their respective settings. Below the table is a 'Gauge Order' dialog box with 'Available' and 'In-use' columns.

Gauge	Low Alarm	High Alarm	Clear Min/Max History on Power-up	Low History Delay mS	High History Delay mS	Jump Priority	Jump-to Delay mS	Jump-back Delay mS	Output1 on	Output1 Condition 1	Output1 Condition 2
1: Engine Load rpm	0	90.0	<input type="checkbox"/>	400	400	OFF	2400	2400	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2: Engine Load Percent	0	100	<input type="checkbox"/>	400	400	OFF	2400	2400	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3: Throttle %	0	100	<input type="checkbox"/>	400	400	OFF	2400	2400	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4: Air Temp degF	---	260	<input type="checkbox"/>	400	400	OFF	2400	2400	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5: Water Temp degF	---	261	<input type="checkbox"/>	400	400	OFF	2400	2400	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6: ADCR 11 Volts	0	5.00	<input type="checkbox"/>	400	400	OFF	2400	2400	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7: ADCR 12 Volts	0	5.00	<input type="checkbox"/>	400	400	OFF	2400	2400	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8: ADCR 14 Volts	0	5.00	<input type="checkbox"/>	400	400	OFF	2400	2400	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9: ADCR 17 Volts	0	5.00	<input type="checkbox"/>	400	400	OFF	2400	2400	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10: ADCR 18	0	5.00	<input type="checkbox"/>	400	400	OFF	2400	2400	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Gauge Order

Available	In-use
1. Engine Load	2. Engine Load
6. ADCR 11	3. Throttle
7. ADCR 12	4. Air Temp
8. ADCR 14	5. Water Temp
9. ADCR 17	14. O2 #1
10. ADCR 18	16. Vehicle Speed
11. ADCR 15	
12. ADCR 16	
13. ADCR 08	

COM1 Needs Updating

Figure 3. Single Gauge Data



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Low Alarm - Alarm is triggered when this value is reached

High Alarm - Alarm is triggered when this value is reached

Clear Min/Max History on Power-up - When Checked, the min and max values for the selected gauge will be cleared when the power is cycled.

Low History Delay - This is the amount of time that a parameter must exceed the existing low value before being recorded as the new low. For example, if your current low value is 32 with the history delay set to 400ms, the new value reached is 31, it must remain at 31 for at least 400ms before it is recorded as the low.

High History Delay - This is the amount of time that a parameter must exceed the existing high value before being recorded as the new high. For example, if your current high value is 32 with the history delay set to 400ms, the new value reached is 33, it must remain at 33 for at least 400ms before it is recorded as the high.

Jump Priority - If Multiple Alarms are triggered at the same time, the gauge with the higher jump priority will display soonest (1 is the highest priority, 20 is the lowest.)

Jump to Delay - The jump to delay controls the amount of time after an alarm is triggered that the parameter will be displayed.

Jump Back Delay - This controls the amount of time that the alarmed gauge will remain displayed after the alarm condition has gone away

Output 1(2) On - When selected the output will be triggered when the gauge is in an alarm state. An example being if you have your alarm set to 32 and you reach this the controller will then turn on the selected output

Output 1(2) Condition 1(2,3,4) - When this option is checked, condition 1 (2,3,4) must be met in addition to the gauge being in alarm before the output is triggered. If more than one is checked then all conditions must be met before the output is triggered. To set your conditions please see the "Global Gauge Data" window.

Signed Value (AEM internal use) - Check this if the data stream is a signed value. Highly recommend that this parameter is not changed.

Lookup table High to Low - Check this box if the values in the lookup table decrease as the item number increases.



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Look-Up Table

To Open the Lookup Table for a gauge, open the single gauge data window, then click on the gray bar all the way to the left as shown in Figure 4. The gauge display name and units can be changed by changing the text in the Gauge Name and Units text boxes.

Changing the displayed name and units

To change the displayed name, open the look up table in the top right hand corner there is a box labeled "Gauge Display Name". Simple click the LED's on and off to display the appropriate name for the corresponding gauge. You can also change units text in the top right hand corner this is only a reference for the user to show what units are being displayed.

Changing the LED Location

To change the dial LED (the location on the sweep) for a specific item, click on the LED then select the drop down menu and pick the LED number.

Changing the LED Color

To change the color of the LED, click on the Color Box, then select the drop down menu and select the color. See Figure 5. The gauge graphic on the right hand side of the lookup table will display the corresponding value and LED for the item selected.

Gauge	Low Alarm	High Alarm	Clear Min/Max History on Power-up	D
1: Engine Load rpm	0	90.0	<input type="checkbox"/>	
2: Engine Load Percent	0	100	<input type="checkbox"/>	
3: Throttle %	0	100	<input type="checkbox"/>	
4: Air Temp degF	---	260	<input type="checkbox"/>	

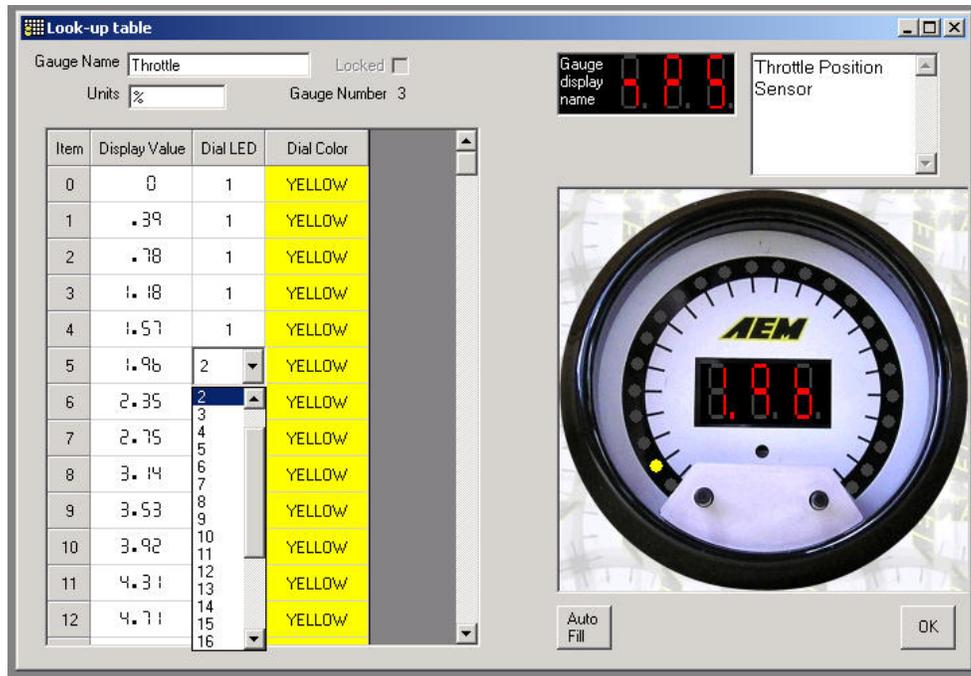
← Gauge Order



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Figure 4. Selecting a look-up table



Auto Fill

The Auto Fill function can be used to make user defined ranges easily programmable. In the look up table click on the Auto Fill icon on the bottom of the table, this will open another window; Enter your start cell number (Item number), stop cell (Item Number) and the start and end values Click Fill Table and the Pro Gauge software will linearly fill the selected values.

For an example we will take the Engine Load PSI gauge and fill it from -14-70 PSI. Open the auto fill table and enter 0-255 for your first value, you will next want too enter -14 and 70 for your other values and click fill table. The table should now be filled with linearly interpolated values from -14 to 70.

Dial Colors and LED's can also be filled in the same manner. Enter the start cell, end cell, and the desired colors for the range. Then enter the range you would like the particular gauge to operate in. If you would like to use the full range of the sweeping dial LED's a start cell of 0 and an end cell of 255 can be used with 1 and 24 as your corresponding led values.

Global Gauge Data

Conditions are based on the gauge displayed in the gauge box. Conditions are activated when the "If..." Statement has been met/ Lo Limit and Hi Limit are the values used in the "If" statement When the Remember Last gauge on Start-up box is checked, the serial gauge displays the same gauge that was selected when the power was turned off. When unchecked it will display the first gauge in order. See Figure 6



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Figure 6. Global Gauge Data

On Delay - This is the amount of time the gauge waits to activate the output after all conditions have been met.

Off Delay - This is the amount of time the gauge waits to turn off of output when one or more of the conditions are no longer met.

Inverted - Output is normally on, output switches off when the conditions are met

Start up Delay - This is the amount of time the gauge waits to display a gauge after being powered on

Testing the gauge

To Begin the Testing procedure, disconnect the gauge from the Pro Gauge software. **NOTE: The gauge must be disconnected from the software before testing The Gauge can be disconnected by clicking the connect icon.** Left click on Tools, and select test. Connect the gauge to the test mode by clicking the connect icon **in the test window.** Start the test mode by clicking on the start icon. The value/byte can be changed by first clicking on the values/byte and selecting a number from the drop down menu. Changes made to values will only be seen on the serial gauge, if the changed value is for the same gauge.



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Gauge	Value	Byte
1: Engine Load rpm	0	0
2: Engine Load Percent	0	0
3: Throttle %	0	0
4: Air Temp degF	32.0	0
5: Water Temp degF	32.0	0
6: ADCR 11 Volts	0	0
7: ADCR 12 Volts	0	0
8: ADCR 14 Volts	0	0
9: ADCR 17 Volts	0	0
10: ADCR 18 Volts	0	0

Figure 7. Test Screen

Updating the Serial Gauge

If the gauge is connected through the software, it will automatically update whenever a change is made to the file. If the gauge is not connected to the software, you will need to manually update the gauge after making changes. To manually update the gauge connect to the software, once the gauge is connected click the update icon. See Figure 8. Whenever the gauge needs updating the term “Needs Updating” will appear in the lower left corner as shown in Figure 9

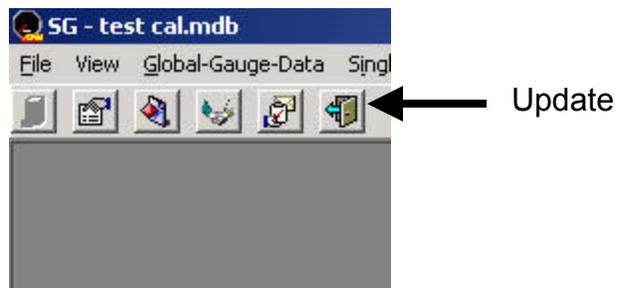


Figure 8. Update Icon



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Figure 9. Gauge Needs Updating

For technical assistance, please call the tech line at 800 423-0046. Or, visit the AEM Electronics forum at www.aempower.com.