AEM Performance Electronics
2205 W 126th Street, Unit A
Hawthorne, CA 90250

Phone (8am-5pm M-F PST): 310-484-2322
Fax: 310-484-0152
sales@aemelectronics.com
tech@aemelectronics.com

# AEM
# CAN Logger
# Installation Manual

# 30-8409

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# Introduction

The AEM CAN Logger is the ideal CAN data logger for virtually all forms of racing and motorsports because it installs easily and works with all AEMnet enabled, and third party CAN devices.

# Information

## Revision History

| Revision | Date | Change Description |
|---|---|---|
| A | 2024.05.30 | Initial Release |

## Reference Files and Documents

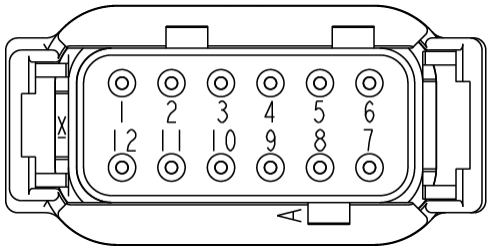
| File Name | Location |
|---|---|
| AEM EV Tesla Inverter Control Board CAN Protocol | AEM LDU ICB 30-8402 CAN Protocol |
| AEM PDU-8 20200616 | AEM PDU-8 CAN Protocol |
| AEM CCU Charger DCDC | AEM CCU CAN Protocol |
| AEM VCU CAN3 Transmit VCU275 | AEM VCU275 CAN Protocol |
| AEM VCU CAN3 Transmit VCU200 | AEM VCU200 CAN Protocol |
| AEM VCU CAN3 Transmit VCU300 | AEM VCU300 CAN Protocol |
| AEM BMS-18 | AEM BMS-18 CAN Protocol |
| AEM 22 Channel CAN Module | |
| AEM 6 Channel CAN Module | |
| AEM EGT CAN Module | |

## Hardware Overview

| Parameter | Value |
|---|---|
| Input Voltage | 5V to 18V, over voltage shutdown and reverse polarity protection |
| Current Consumption | ÷ 50mA at 12V |
| Logging Memory | Supplied memory stick, FAT32 formatted. |
| Maximum supported size | 32 GB |
| Logging Speed | Configurable up to 1KHz |
| Total Logging Throughput | Depends on the quality of the USB memory stick but typically is greater than 50Kbyte/s |
| Log Enable Switch | 1 |

| | |
|---|---|
| CAN | 2 x CAN2.0B, independently configurable bit rate and message reception |
| RTC | Battery Backed |
| Connector | DTM12 |
| Size | 55mm x 55mm x 11mm, not including connector |
| Weight | ~70g, 2.5oz |
| Operating Temperature | -40C to +85C |
| Casing | Injection molded with integral DTM connector |
| Weatherproof | IP67+, Solid Potted |
| Diagnostic LEDs | 1 Tri-color LED on bottom of unit |
| Diagnostic Information | Status message sent continuously on CAN |

## Hardware Pinout




| CAN Logger | | |
|---|---|---|
| Pin # | Pin Function | Pin Notes |
| 1 | SW 12 VDC | Switched +12 VDC |
| 2 | Ground | 12 VDC Ground |
| 3 | CAN1 H | CAN1 High |
| 4 | CAN1 L | CAN1 Low |
| 5 | CAN2 H | CAN2 High |
| 6 | CAN2 L | CAN2 Low |
| 7 | USB P | USB Data + |
| 8 | USB N | USB Data - |
| 9 | USB VCC | USB +5V DC |
| 10 | USB GND | USB Ground |

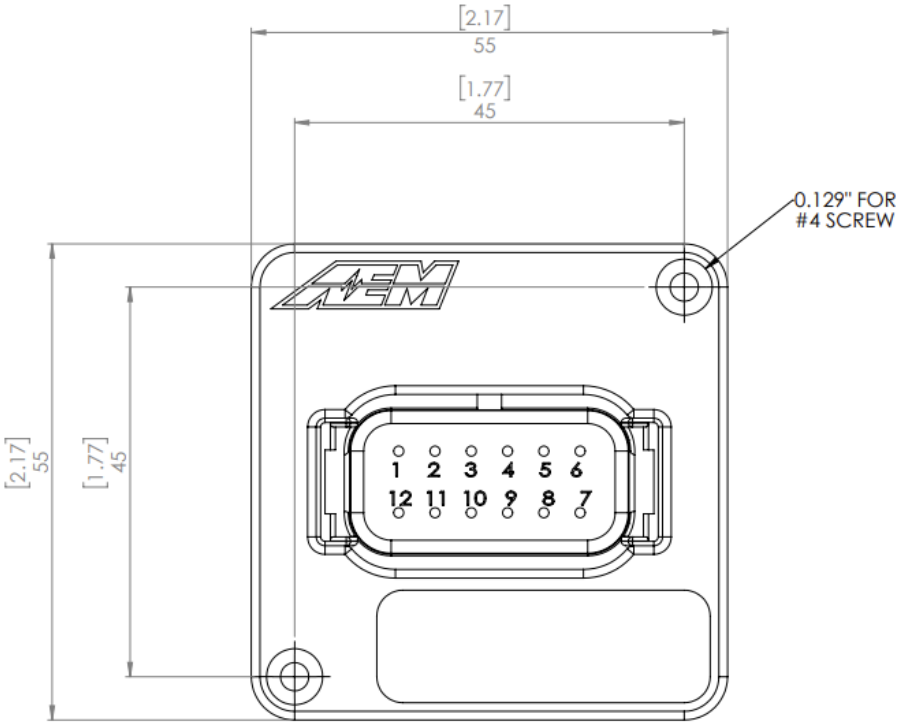
| | | |
|---|---|---|
| 11 | Log Enable In | |
| 12 | Log Enable Out | |

# CAN Logger

## Installation

### Mounting

The CAN Logger Module may be mounted within the vehicle using hook-and-loop fastener (not included) or bolted (#4 screws included) to a suitable structure; a mounting/drill diagram is provided below. The module is weather-resistant (IP67) but is preferably mounted in a cool, dry area such as the driver compartment.




### Wiring

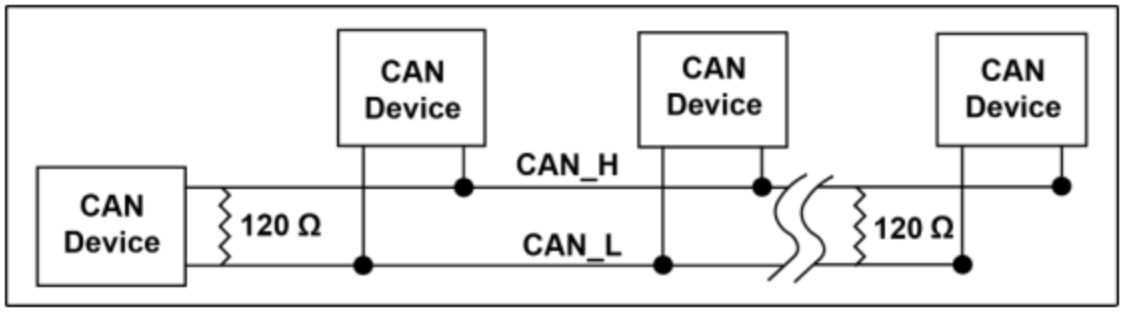
- The AEM CAN logger should only be powered through the dedicated switched power and power ground pins.
- Route wiring away from sources of noise such as alternators, ignition components, or other high power/frequency wiring

- Twisted pair wire is required for the CAN signals, no less than 1 twist per inch.
- The logger is also not internally terminated for a CAN network. Please verify your CAN networks are terminated on both ends with 120 ohm resistors.
- A supplied logging enable and disable switch is provided and should be located in a place near the steering wheel for easy enabling.

## AEMNet Network

Refer to the following guidelines when adding CAN devices.

- Twisted wire is required with > 1 twist per inch.
- AEMnet buses must be properly terminated. Termination resistors are 120 Ohms each, two total, located at the physical ends of the bus wires.




**Bus Termination**

All CAN networks must be terminated to have an equivalent of approximately 60 Ohms of resistance. Generally, this means a 120 Ohm resistor connected in parallel to AEMnet+/AEMnet- (or CANH/CANL0 at both physical ends of the bus run.

**Termination Resistors**

| Device | Configuration |
|---|---|
| 30-2226, 6 channel CAN Sensor Module | No Resistor |
| 30-2224, CAN EGT Module | No Resistor |
| 30-2212, 22 channel CAN Sensor Module | Jumper selectable |
| 30-560X & 30-570X CAN Dash | Software selectable, enabled by default |
| 30-03XX X-Series Gauges | No Resistor |
| 30-0310 X-Series Wideband Inline Controller | No Resistor |
| 30-8405 EV CCU Combined Charging Unit | No Resistor |
| 30-8401X EV Sealed BMS Units | No Resistor |

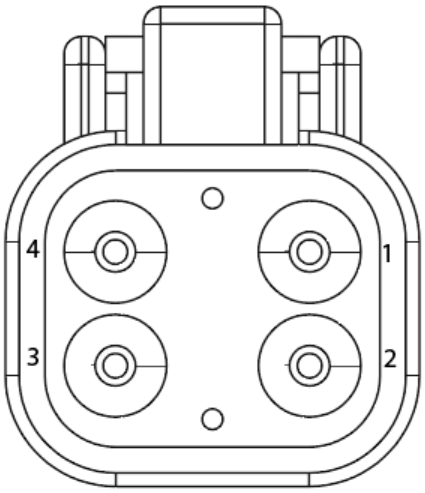
| | |
|---|---|
| 30-8407/30-8408 EV Unsealed BMS units | No Resistor |
| 30-8300 PDU-8 | No Resistor |
| 30-8001 EV VCU275 | CAN2 and CAN3 Terminated Internally |
| 30-8100 EV VCU300 | CAN2 Terminated Internally, CAN3 Not Terminated Internally |

The following Deutsch DTM 4-pin termination plugs are available

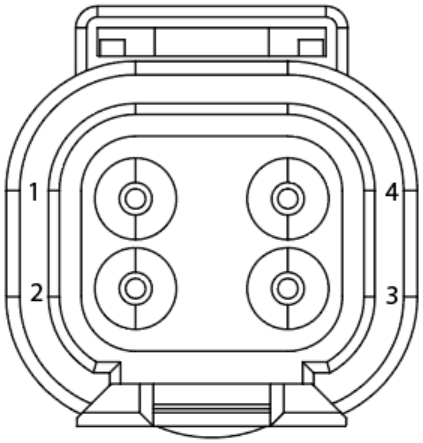
| PN | Description |
|---|---|
| 35-3440-F | AEMNet Termination Plug, Female |
| 35-3440-M | AEMNet Termination Plug, Male |

**AEM Bus Connections**

AEM uses 4 pin connectors to connect to AEMnet bus networks. We suggest using our pinout when creating your own harnesses.



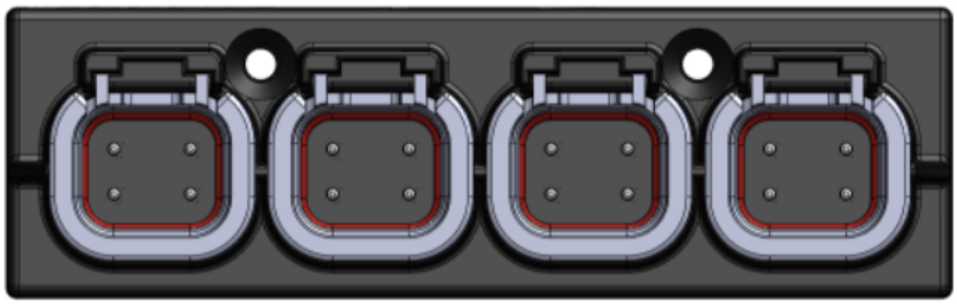

AEMnet CAN Pinout
1 - CANH (+)
2 - CANL (-)
3 - Power (+12 VDC)
4 - Ground (-)




AEM PN: 35-2624
4 Pin DTM Plug Connector

AEM PN: 35-2625
4 Pin DTM Receptacle Connector

AEM PN: 30-2225
AEMnet Hub



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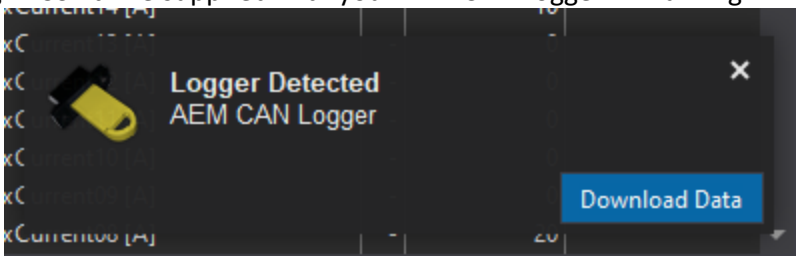
## Setting Up your USB Drive

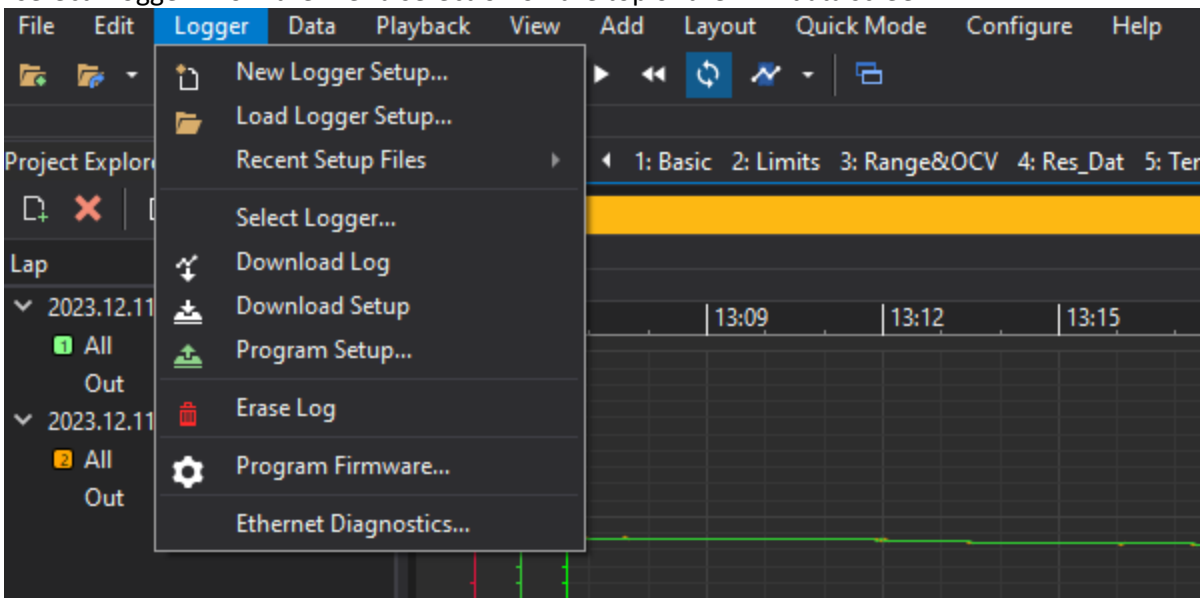
All AEM CAN loggers are shipped with 32GB USB drives. To setup your USB drive, connect your AEM CAN logger using the supplied harness, then insert your USB drive into the USB A connection. Once this is complete power up the CAN logger, setup files will then be written the the USB drive. Power off the CAN logger and remove the USB Drive from the harness.

## AEMdata Setup

1. Download and install the most current version of AEMdata from www.aemelectronics.com.
2. Open AEMdata Software.
3. Plug in USB drive supplied with your AEM CAN Logger. A warning will pop up at the bottom right hand part of your screen.




4. Then select "Logger" from the menu selection on the top of the AEMdata screen.




5. Then select "New Logger Setup..." by clicking on it.

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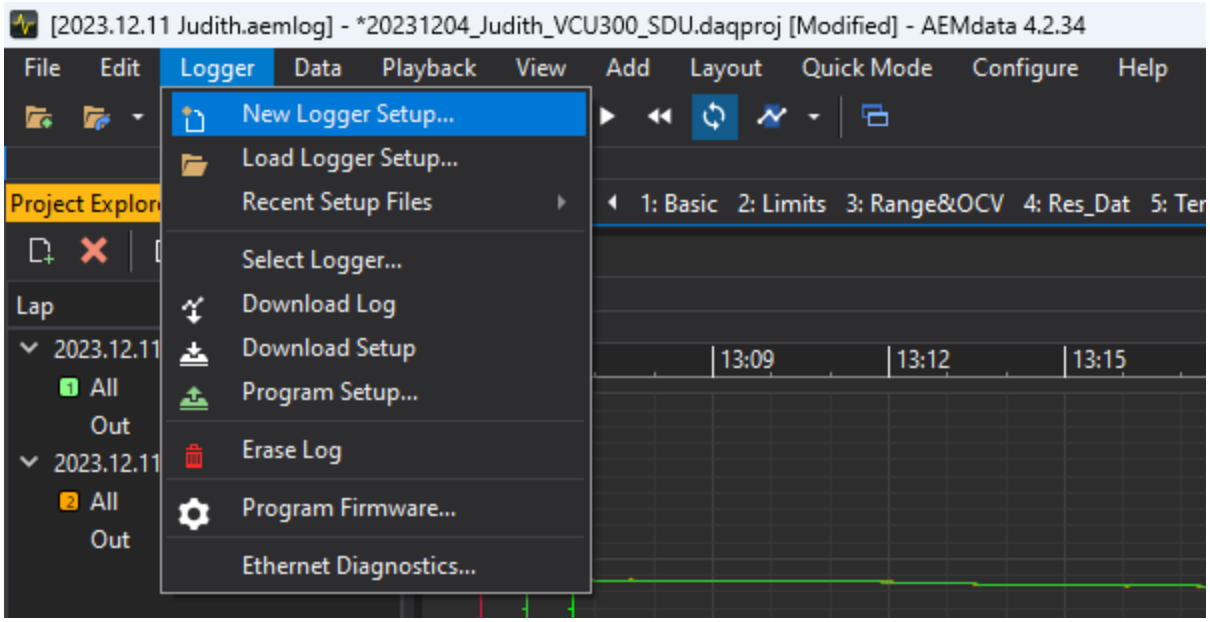
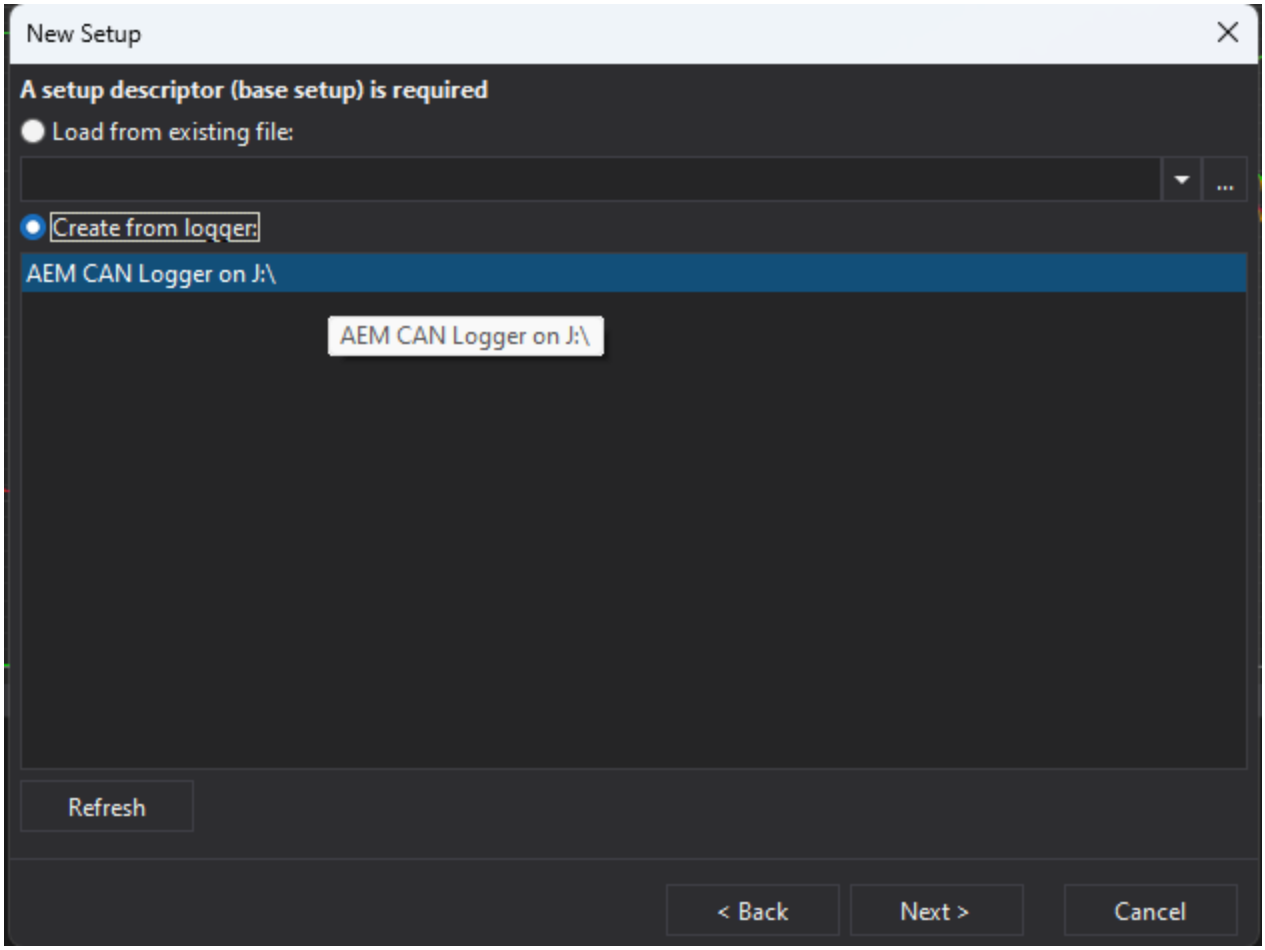



6. A New Setup window will pop up, select the Create from Logger, and then select which logger you would like to setup. Then click next.




7. The Setup Editor window will then pop up.

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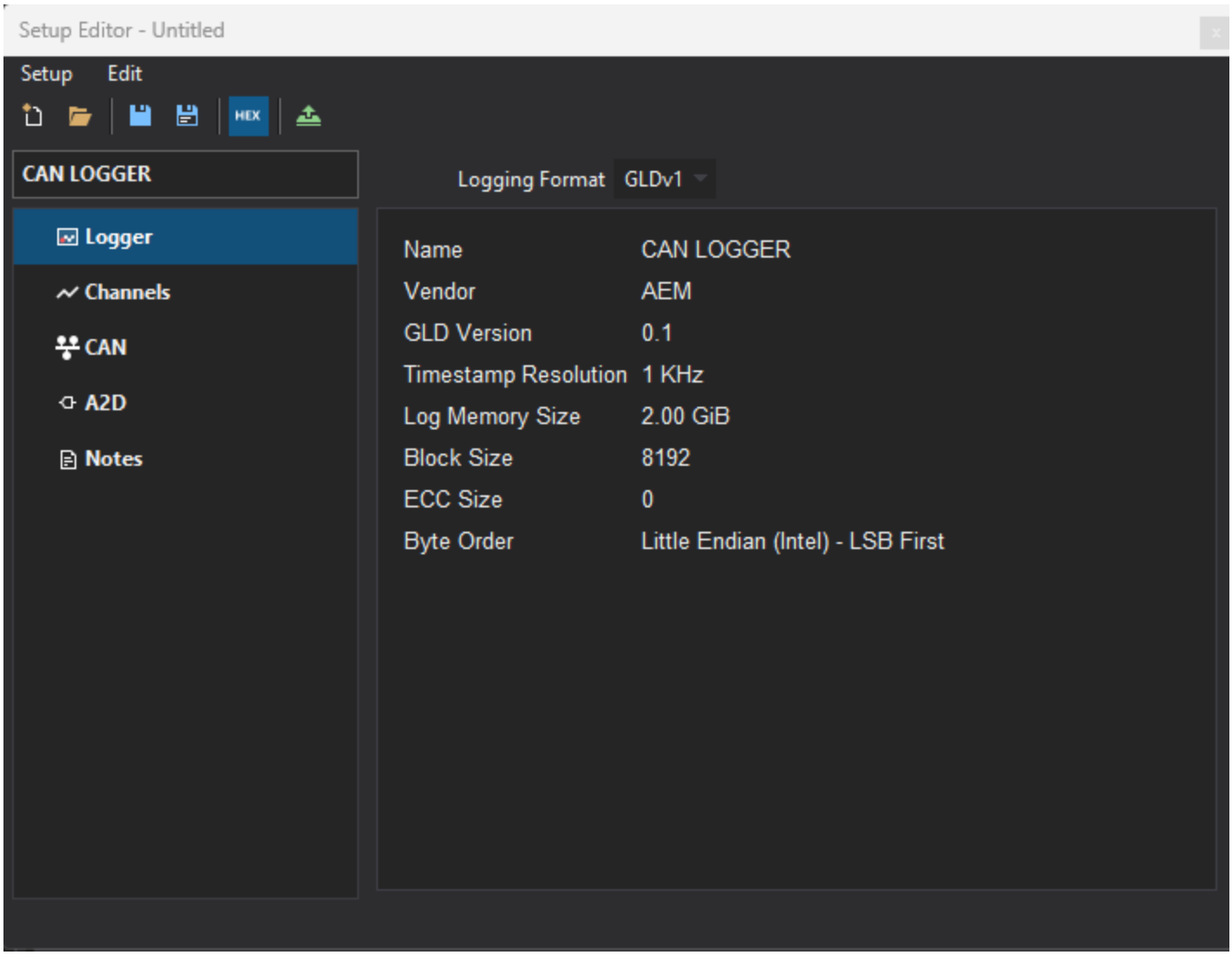


8. Select the CAN selection on the right side of the Setup Editor window. Then select which CAN channel you would like to setup.

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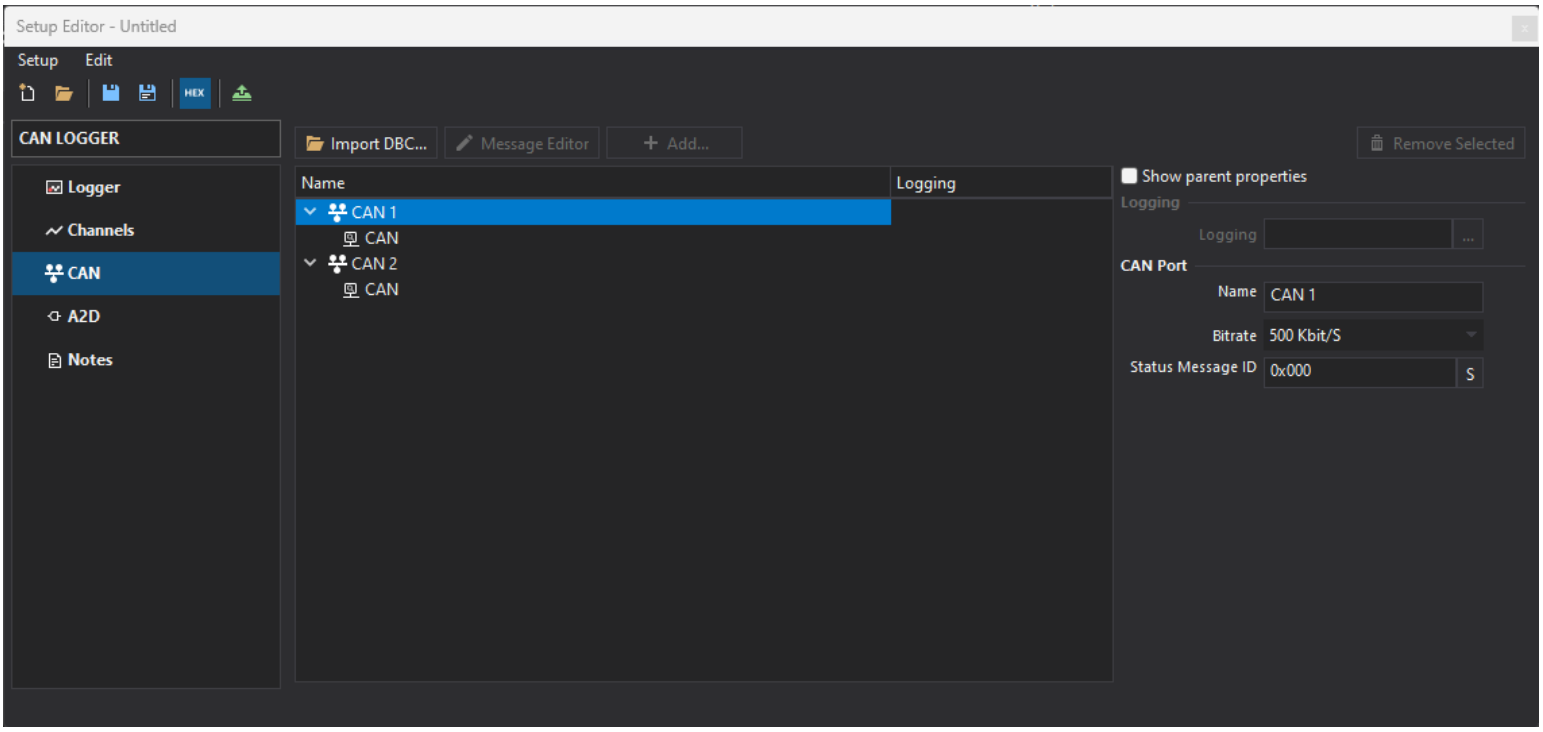
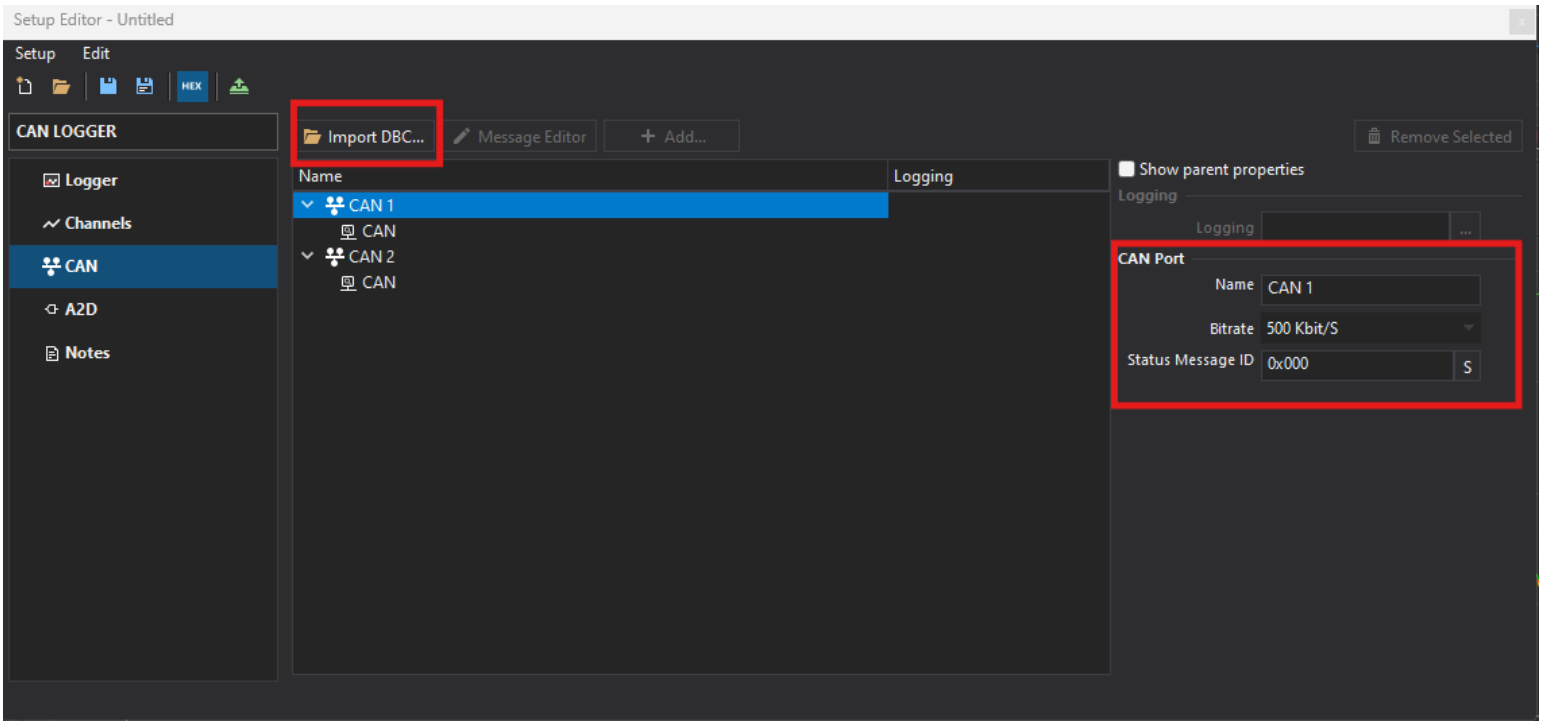



9. 'Click on the "Import DBC..." button to select the CAN DBC file you would like to import. Also, be sure to update the Bitrate to the correct selection for your CAN network.




10. Once the DBC file is uploaded you may select which message IDs to import or which Signals you would like to import. Once you have made your selections you can click "OK".

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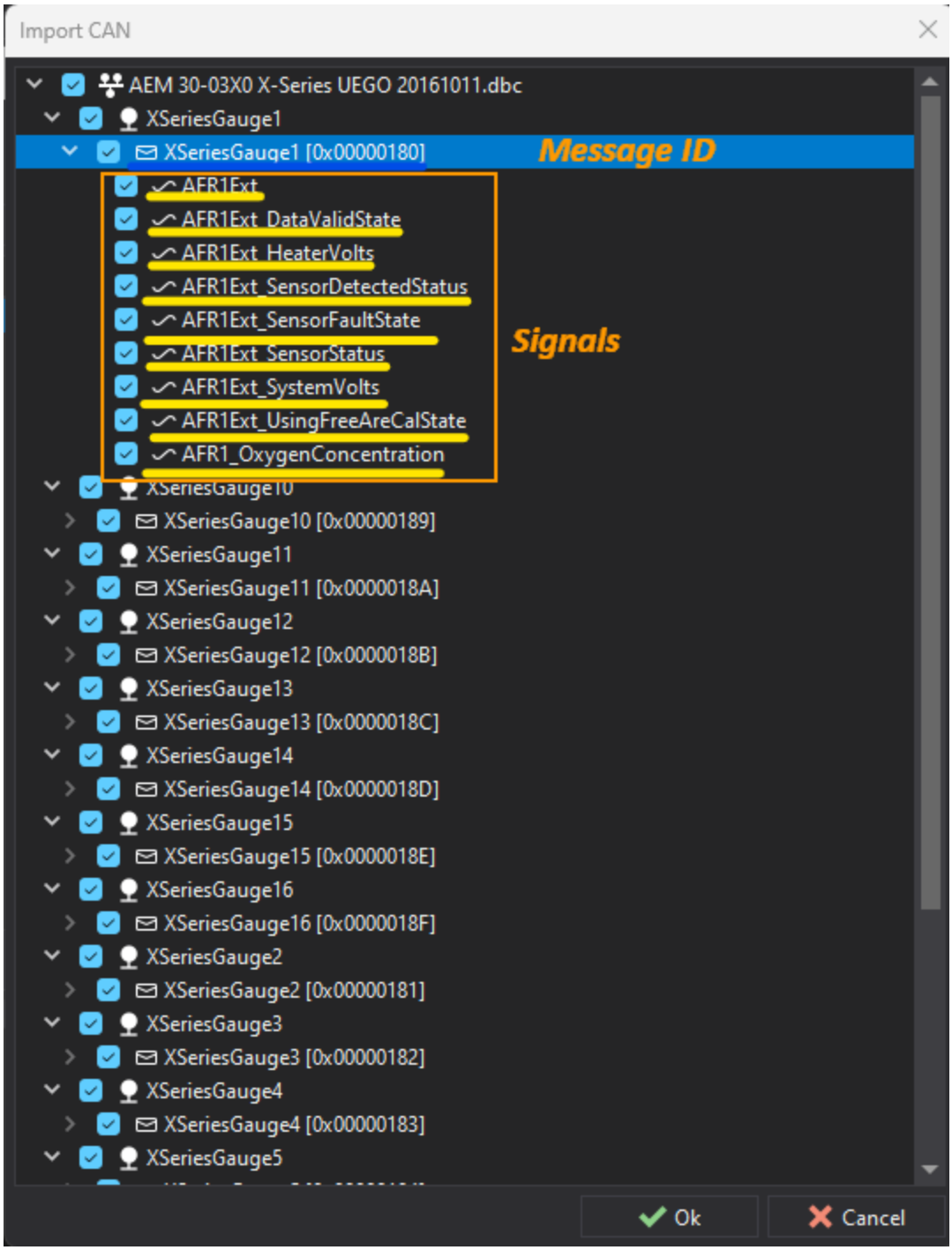


11. After the DBC file is loaded, the message IDs and signals that were selected will appear as shown below.

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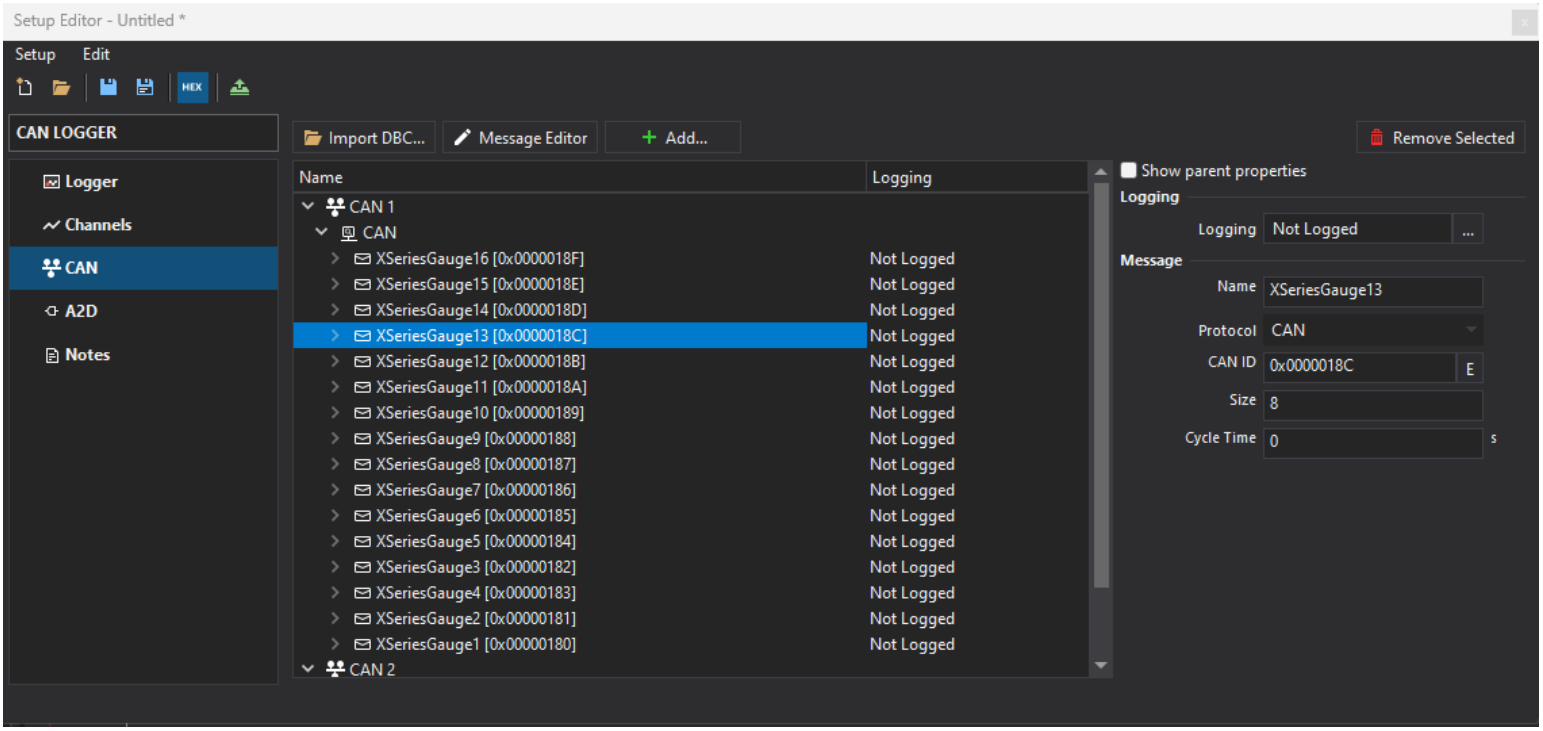
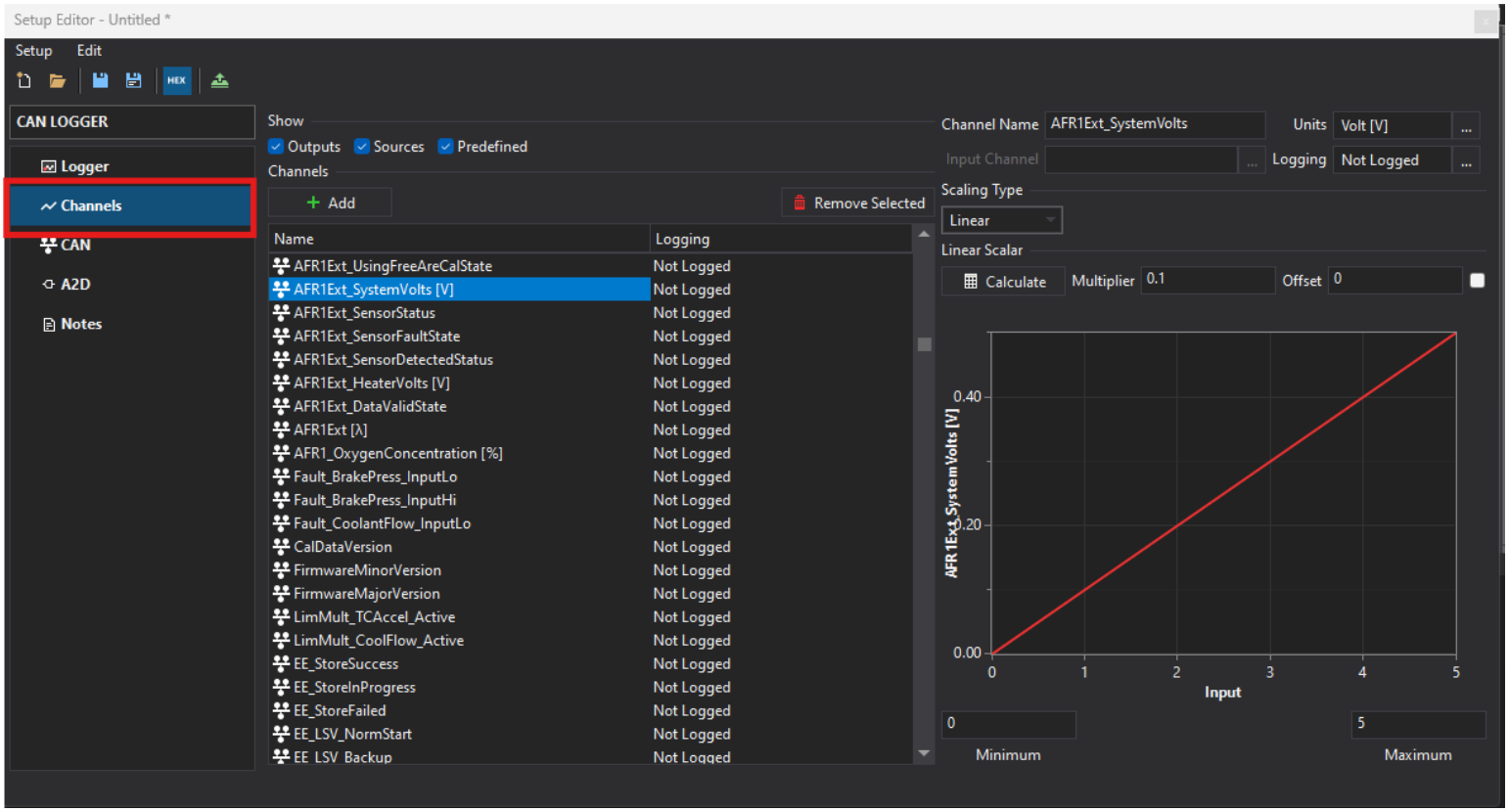



12. Next, click on the Channels button. This will display all channels regardless of which CAN channel (1 or 2)the signal is on.




13. Click on the channel name to enable the property editor to the right. The variables that are shown on the right can be modified for your specific application, such as scaling, offsets, multipliers, units, etc.

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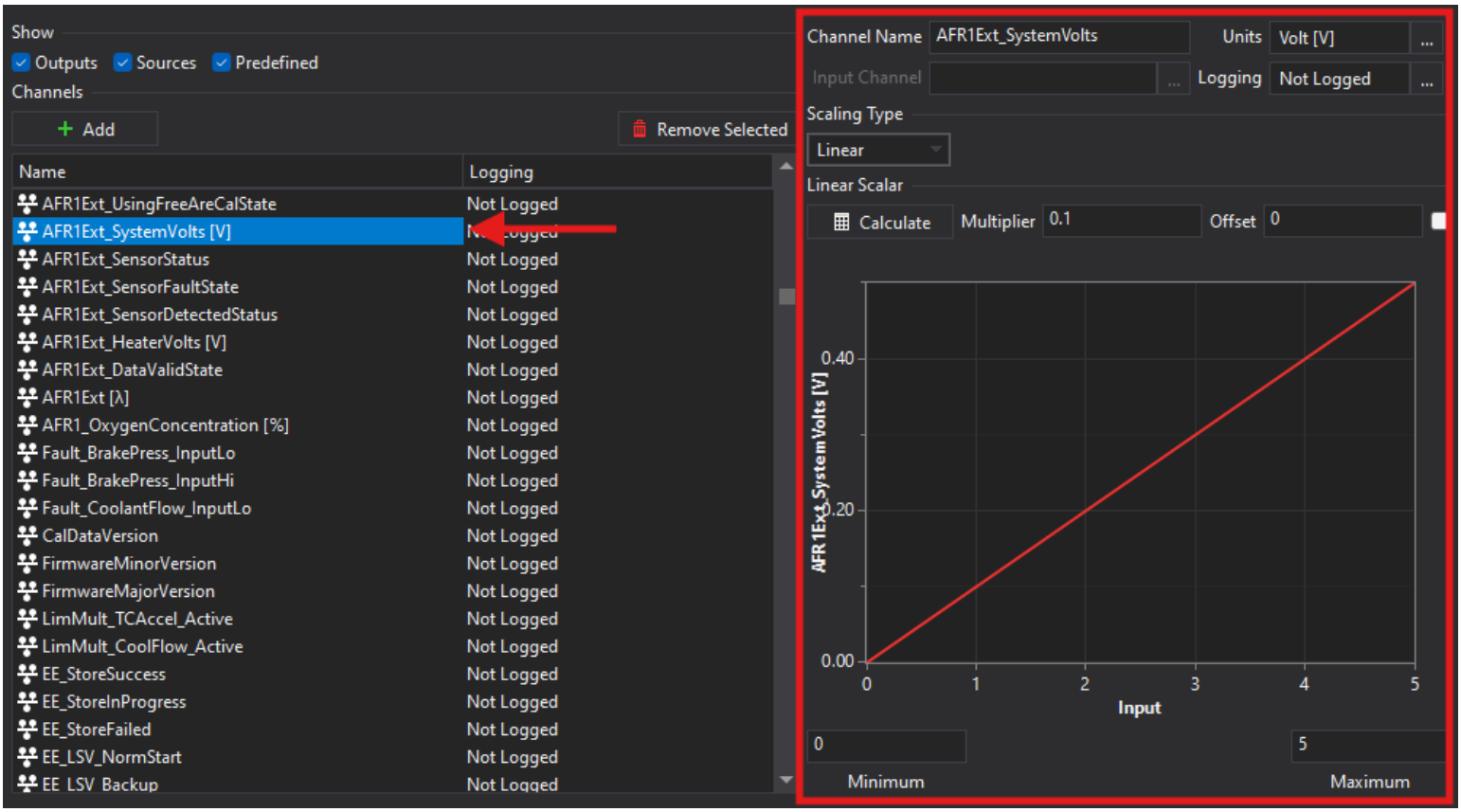
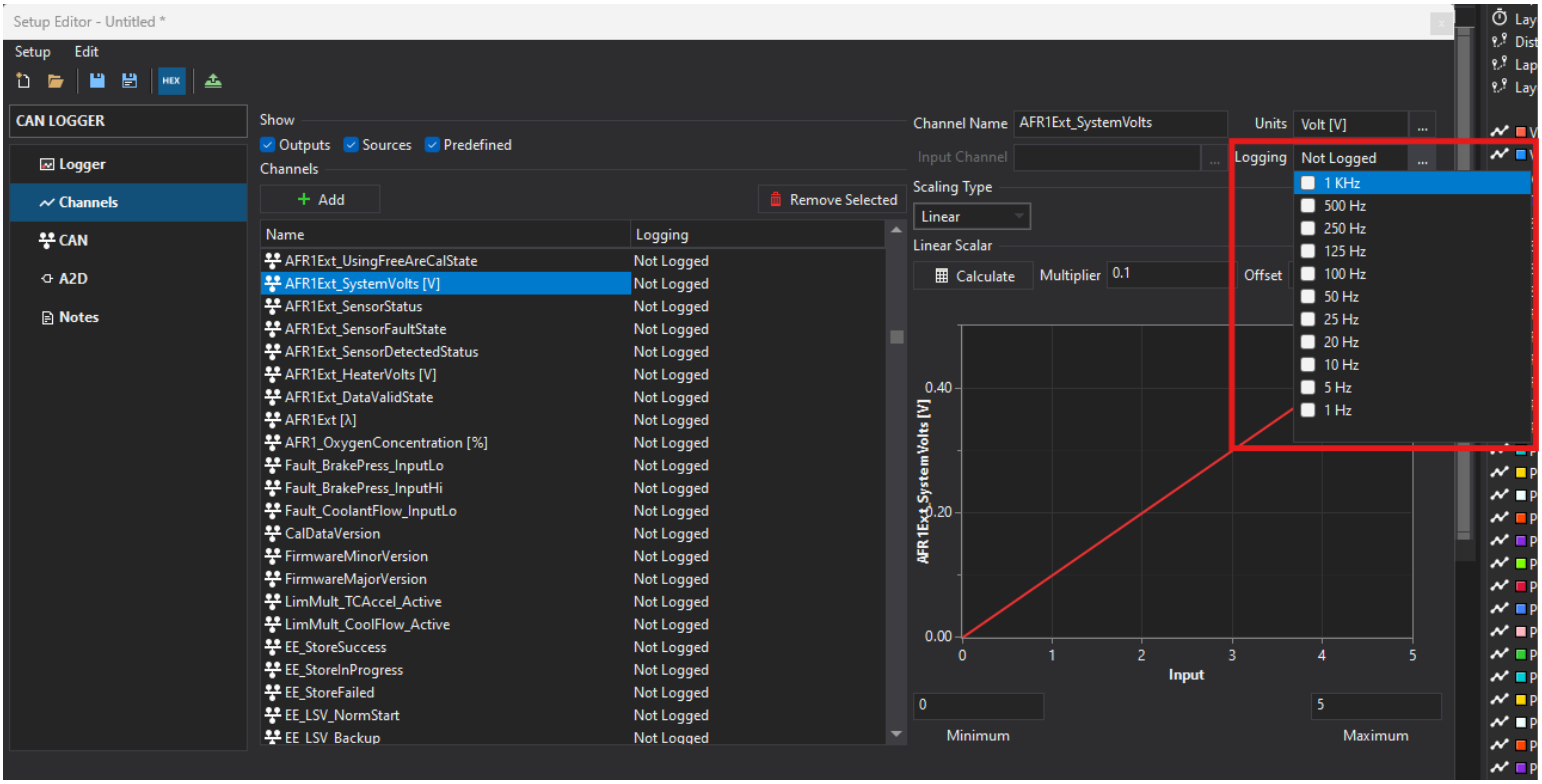



14. Once the properties are set you can enable logging and the logging rate.




15. The A2D button allows you to log internal device measurements for troubleshooting the unit itself, but are not required to be logged under normal operating function.

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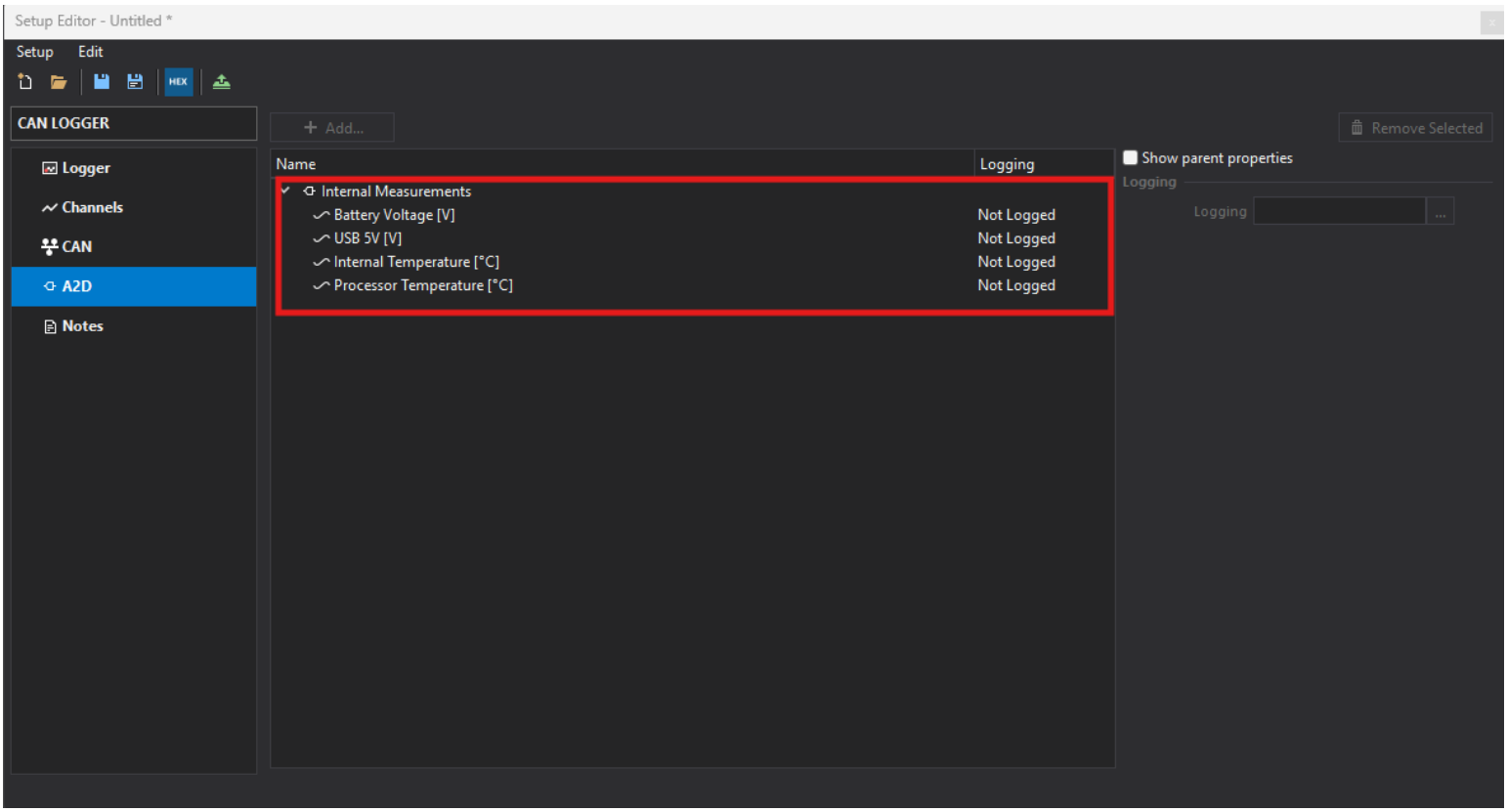
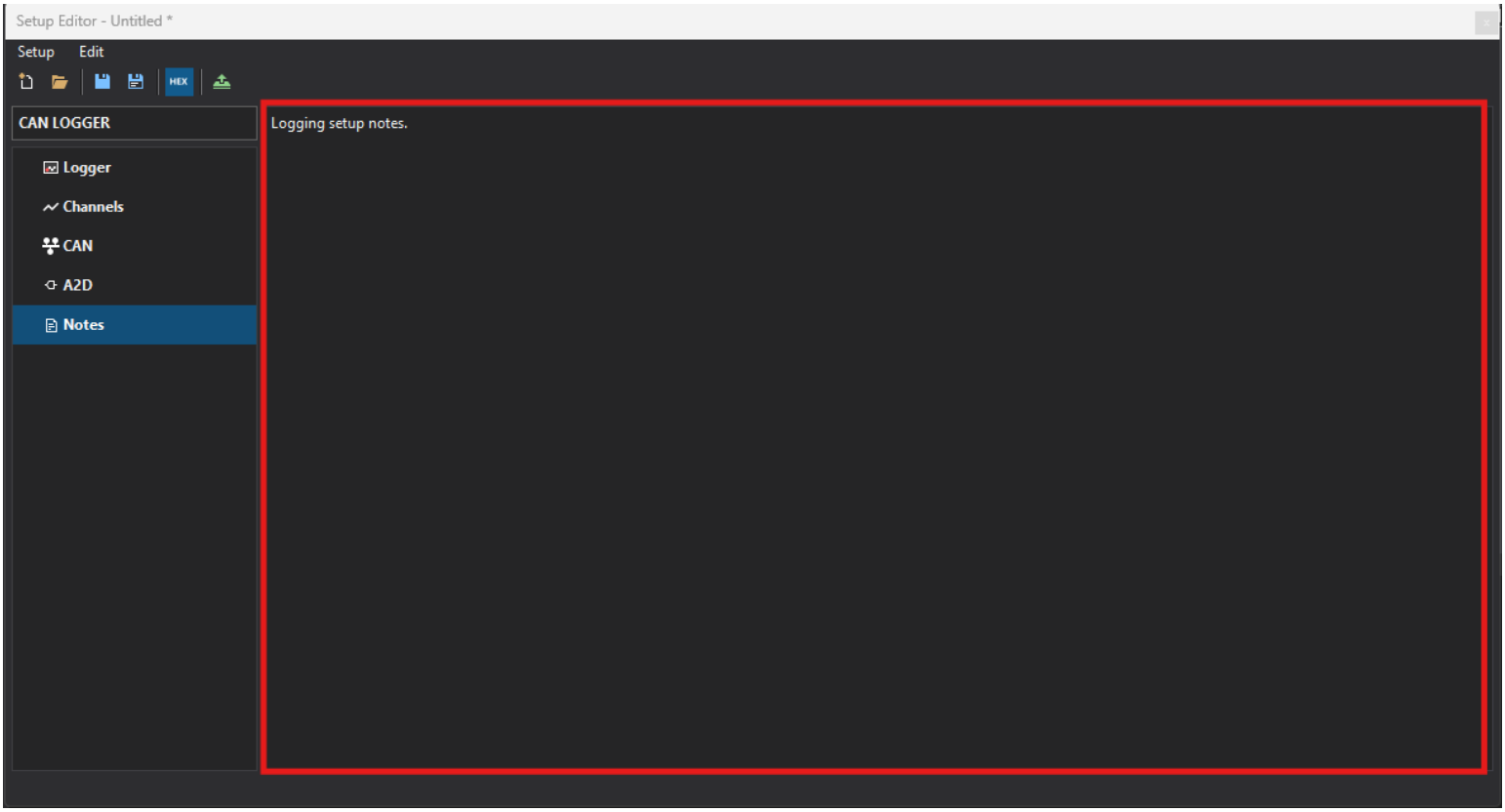



16. The Notes button enables a text window to the right that allows you to input notes for your logging setup. These notes only pertain to the log setup itself not for individual logs, those notes are stored in the log file.



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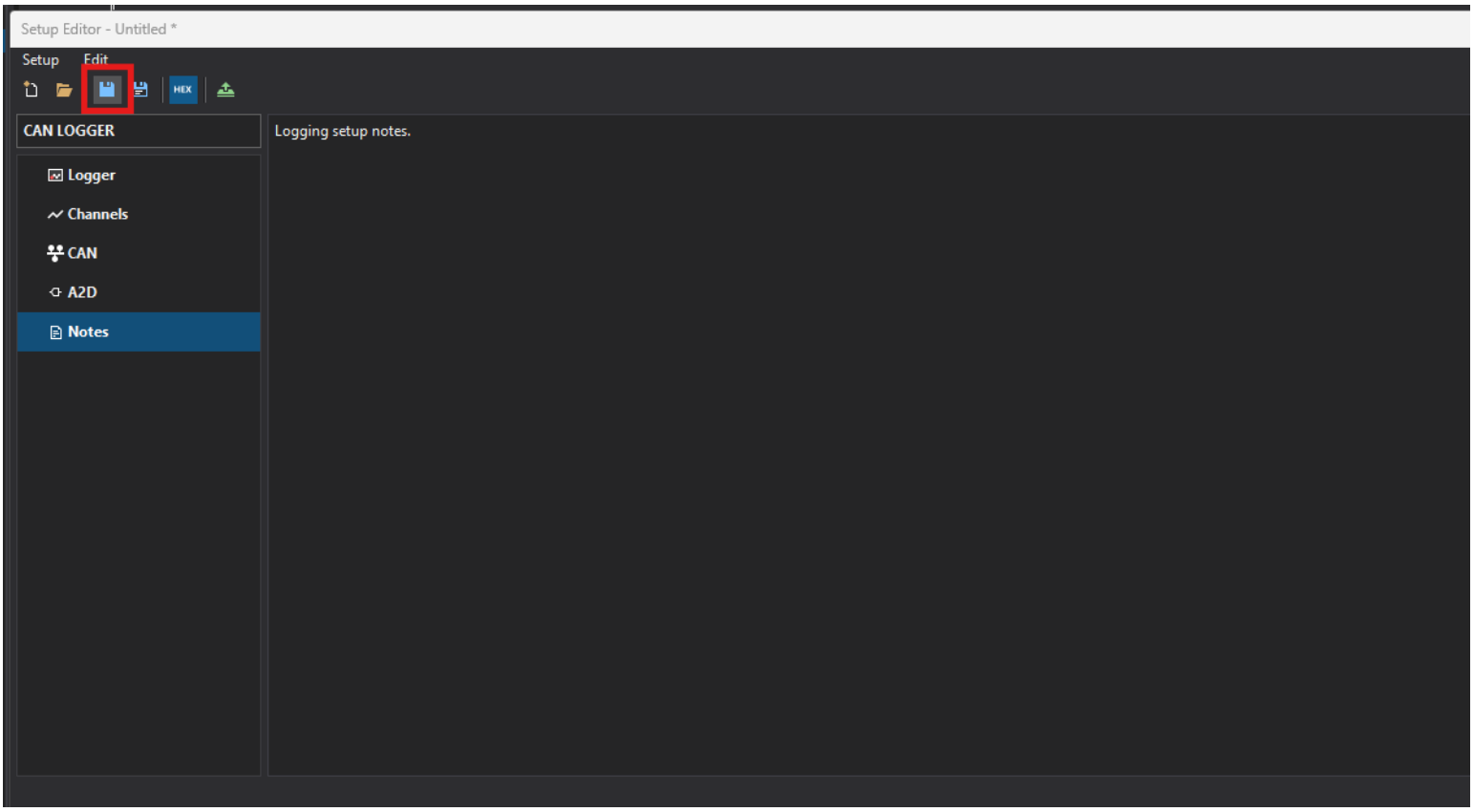
17. Once all of your selections and properties have been set, it is time to save the setup by pressing the save button outlined in red below.




18. It's preferred that you save your setup files in the setups folder within the AEMdata folder structure.

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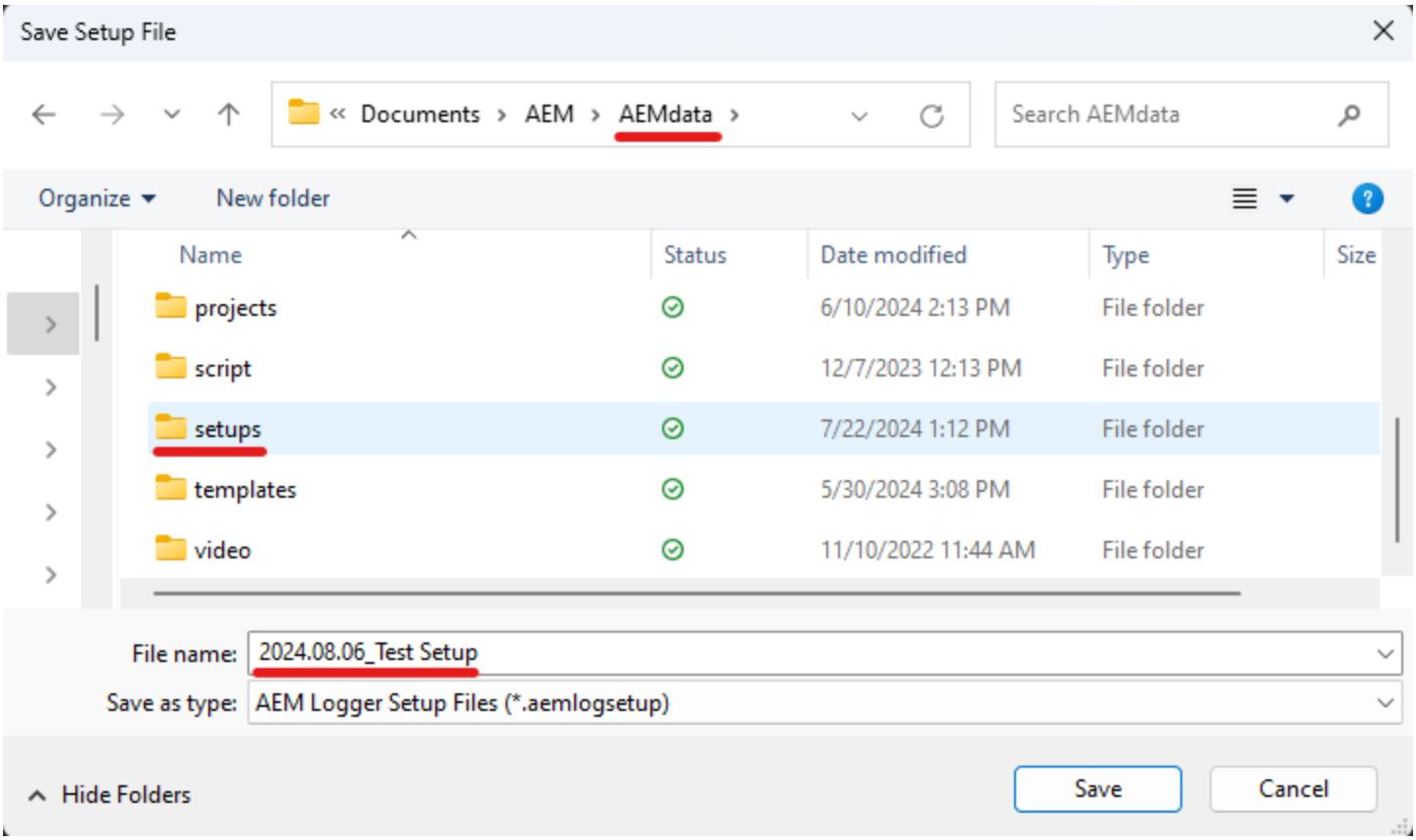


19. After you save the setup file, it is not time to program the logger USB drive by clicking the program button.

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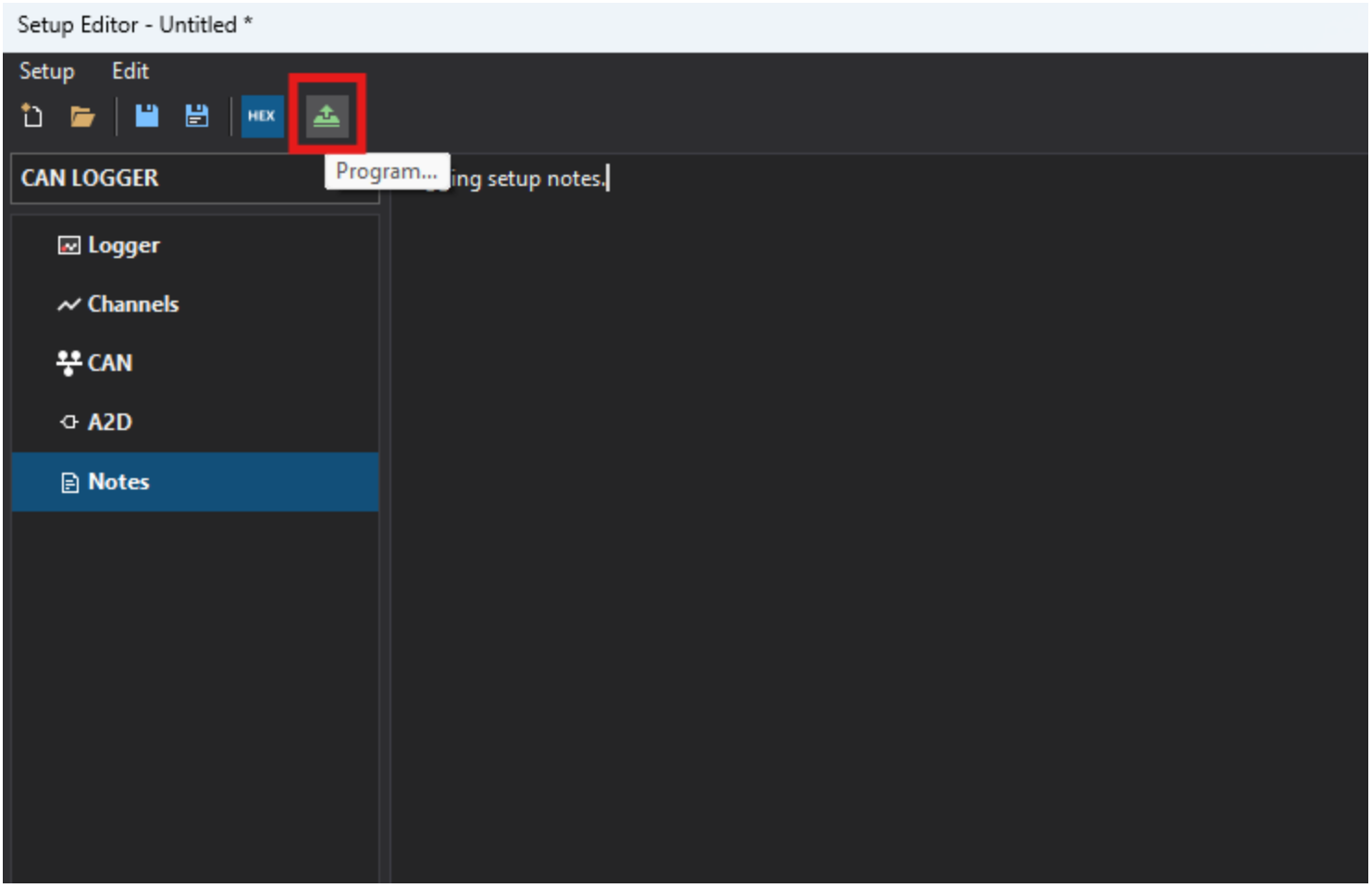
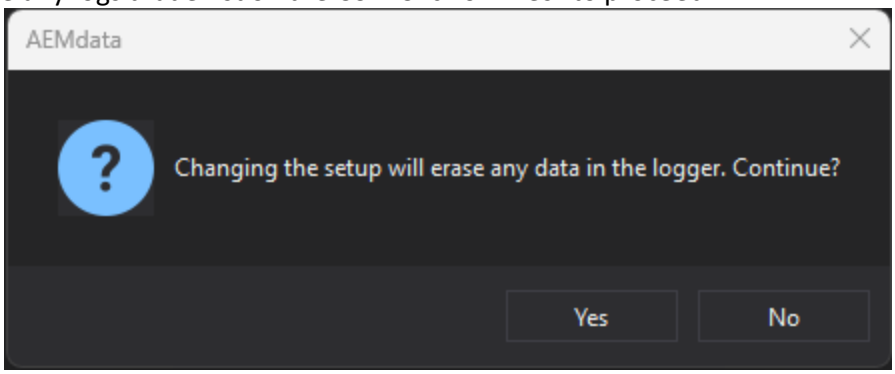
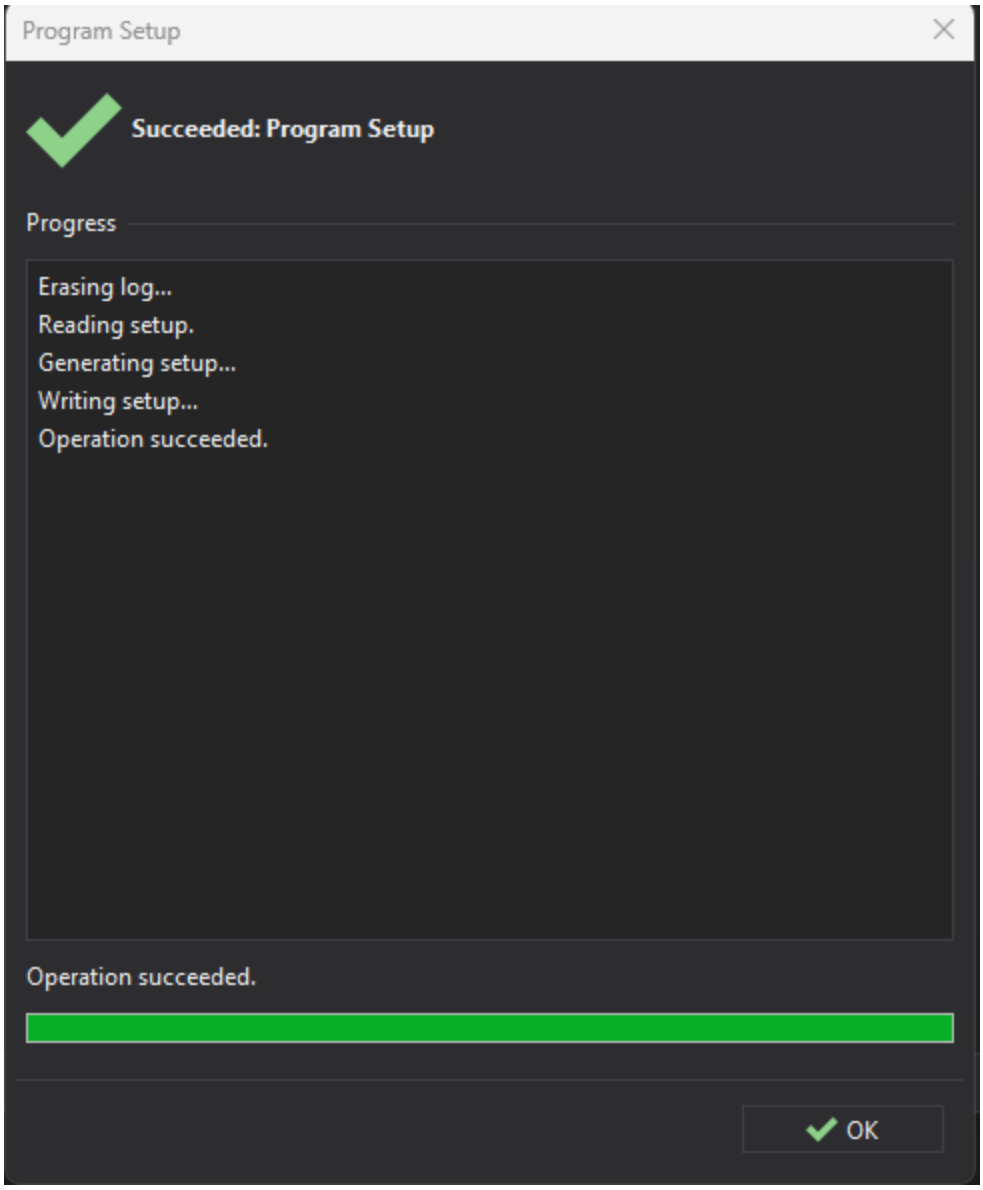



20. A question window will pop up validating whether you would like to send the setup to the USB, when you do that it will erase any logs that exist on the USB. Click on "Yes" to proceed.




21. A status window will pop up that will go through 4 steps and a confirmation that the setup was programmed to the USB drive. Once it is successful, click "OK".




22. Next you will need to eject the USB drive from the computer, and install it in the AEM CAN logger harness.

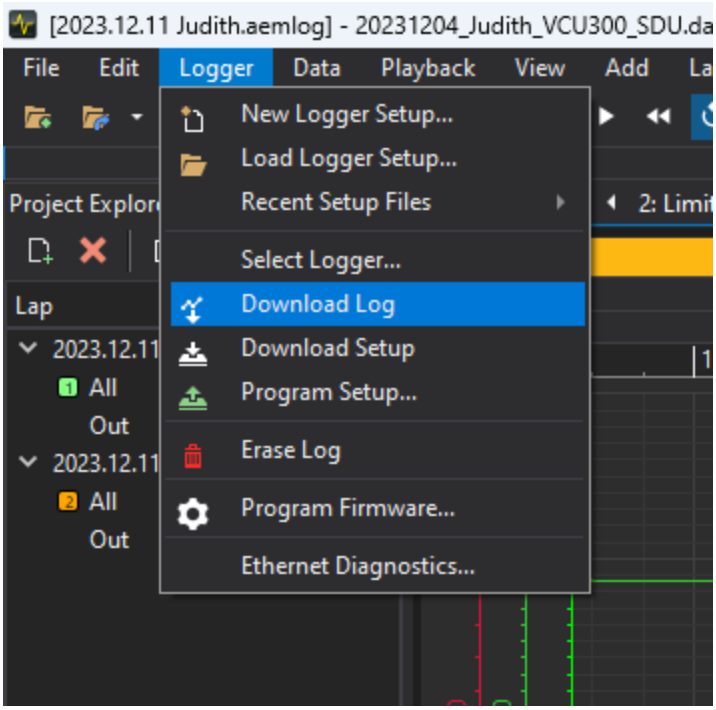
## Status LED

Once the logger in powered up and a configured USB drive is installed in the CAN logger harness, then the light at the bottom of the logger should be green. Pressing the log enable button will then make the green light flash to let you know you are logging.

| Color | Flash Type | Meaning |
|---|---|---|
| Magenta | Solid | Not Receiving CAN |
| Magenta | Flashing | No Setup |
| Green | Solid | Receiving CAN, but logging conditions have not been met. |
| Green | Slow Flash | Logging |
| Red | Solid | No Memory Stick |

| | | |
|---|---|---|
| Red | Flashing | Memory Stick Full and Loop Logging not enabled |

## Reading Logs




## File Extensions

Below are some important file extensions to understand when working with AEMdata and your AEM CAN Logger.

| File Extensions | Descriptions |
|---|---|
| .aemlogsetup | Log setup file |
| .aemcls | Log setup file, format adjusted for storage on the USB flash drive. |
| .aemlog | Log File |
| .aemcan | AEM Encrypted CAN DBC Setup Files |
| .dbc | CAN DBC Setup File |
| .bin | Firmware |

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# Warranty

AEM Performance Electronics 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 the date of the original purchase. Products that fail within this 12-month warranty period will be repaired or replaced when determined by us that the product failed due to defects in material or workmanship. This warranty is limited to the repair or replacement of the AEM Electronics part. This warranty applies only to the original purchaser of the 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 performed by the user on any AEM Electronics products voids this warranty.

In no event shall this warranty exceed the original purchase price of the AEM Electronics part nor shall AEM Electronics be responsible for special, incidental or consequential damages or cost incurred due to the failure of this product.

AEM Electronics disclaims any liability for consequential damages due to breach of any written or implied warranty on all of its products.

Warranty returns will only be accepted by AEM Electronics when accompanied by a valid Return Merchandise Authorization (RMA) number and a dated proof of purchase. The product must be received by AEM Electronics within 30 days of the date the RMA is issued. Warranty claims to AEM Electronics must be shipped to us prepaid (we recommend a shipping service with package tracking capability). Once your package is received by our warranty and repairs department you will be notified and provided with updates.

## PROCEDURES FOR ISSUANCE OF A RETURN MERCHANDISE AUTHORIZATION (RMA) NUMBER

Please note that before AEM Electronics can issue an RMA for any product, it is first necessary for the installer or enduser to contact our technical support team to discuss the problem. Most issues can be resolved over the phone. Under no circumstances should a system be returned, or an RMA requested before our support team is contacted. This will ensure that if an RMA is needed that our team is able to track your product through the warranty process.

You can reach our Tech Support Team for support on all AEM Electronics performance products by phone at 1-800-423-0046. To contact us by email for engine management systems, email us at emstech@aemelectronics.com. For all other products, email us at gen.tech@aemelectronics.com.

AEM Electronics will not be responsible for products that are installed incorrectly, installed in a non-approved application, misused, or tampered with. In the case of AEM Electronics Fuel Pumps, incorrect polarity (+&- wires crossed) will not be warranted. Proper fuel filtration before and after the fuel pump is essential to fuel pump life. Any pump returned with contamination will not be warranted.

## PRODUCTS OUTSIDE OF WARRANTY PERIOD

Any AEM Electronics product, excluding discontinued products, 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 Electronics parts. Parts used in the repair of AEM Electronics components will be extra. AEM Electronics will provide an estimate of repairs and must receive written or electronic authorization from you before repairs are made to a product.