maximatecc

Advanced Cluster PCTool maxAI

Installation and Operation Manual

Rev M 3/12/2021

Table of Contents

Scope and Use of This Manual

…provide the reader with enough background information to understand the overall installation and operation of the maxAI 430i configuration software…

The intent of this manual is to provide the reader with all of the information required to install and operate the maxAI 430i configuration software.
The user is expected to have a basic knowledge of the vehicle's operating parameters normally displayed on an instrument cluster, such as engine RPM, vehicle speed, engine temperature, transmission temperature, engine oil pressure, transmission oil pressure, etc.

maxAI 430i Configuration Software allows the user to configure the maxAI 430i display via a user friendly, easy to operate PC interface. The software allows the user to modify and configure up to 5 screens with a maximum of 5 parameters per screen.

Once configuration is set on the software, the new configuration is transferred to the display by way of PCAN connection.

Installation Instructions

System Requirements

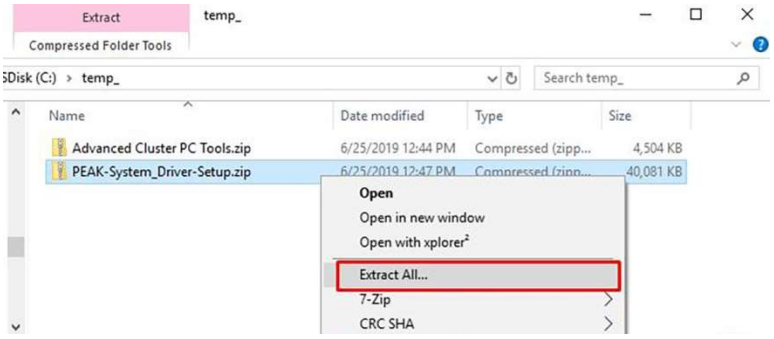
Component	Recommended	Minimum
Processor	Intel Compatible (x86) >2GHz >2 Cores	Intel Compatible (x86) >1GHz >2Cores
Memory(RAM)	8G	4GB
Hard drive capacity	>100GB	Defined by OS minimum
USB	2.0 or 3.0	1.1
Operating System	Windows 10 (>Version 1709)	

Advanced Cluster PCTool maxAI Installation

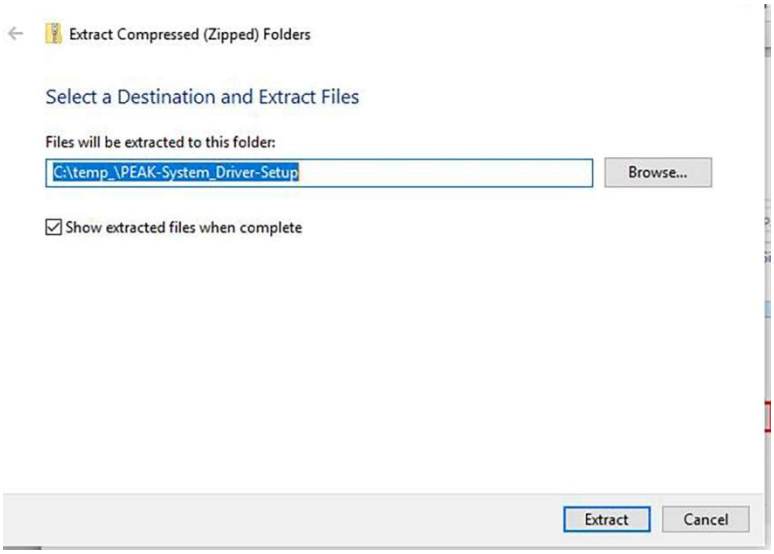
Peak CAN drivers installation

Peak CAN drivers can be downloaded from the following address : https://www.peak-system.com/quick/DrvSetup

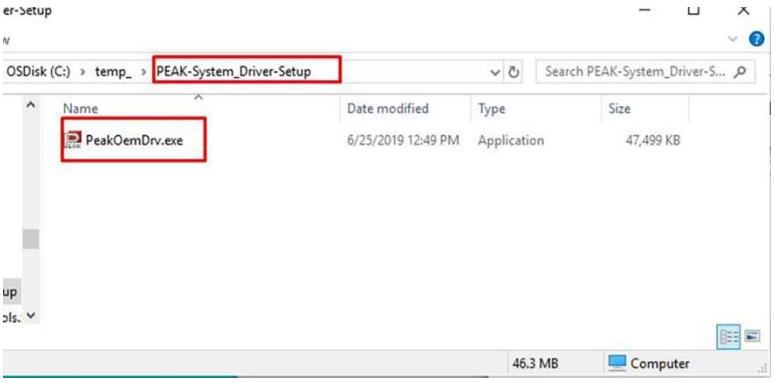
Store the Peak CAN driver software to your PC (C:\temp)



Once the driver file is saved to your PC, right click on **PEAK-System_Driver-Setup.zip** and select **Extract All** to begin installation.



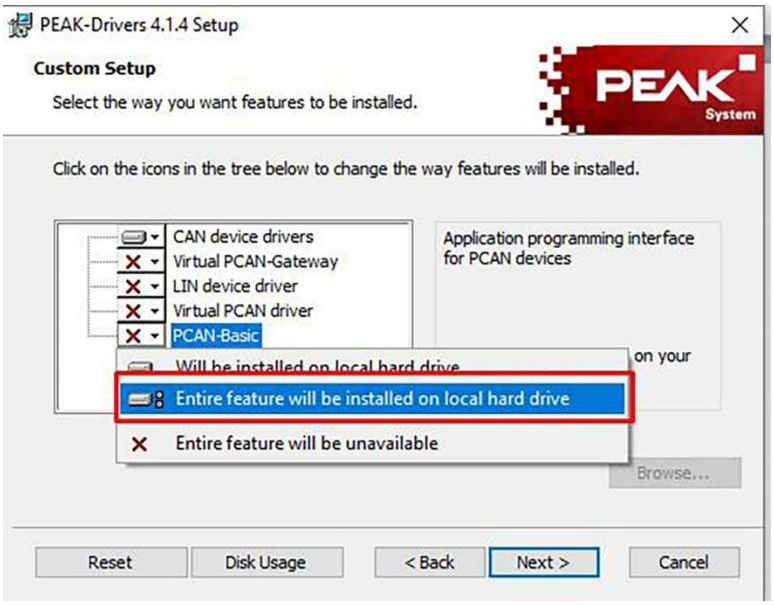
Select destination folder and click **Extract**.



Once extracted, double click on the file **PeakOemDrv.exe**.

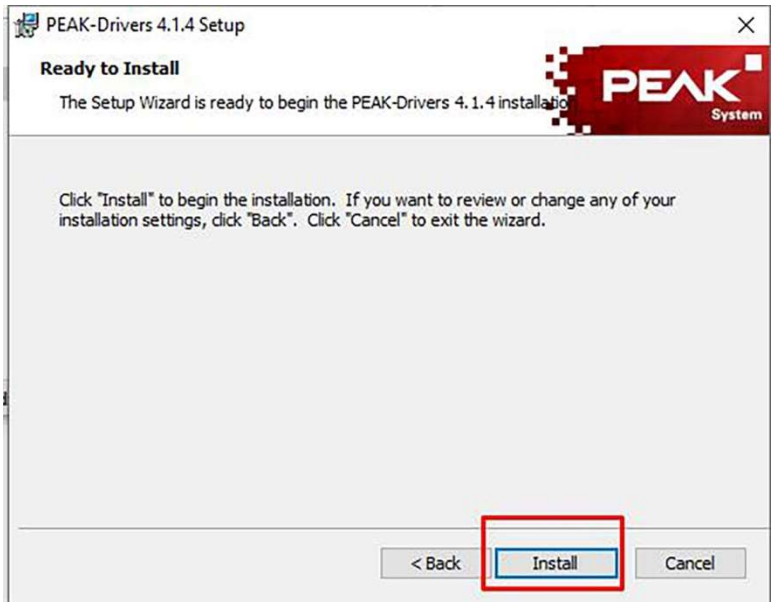
The PEAK-Drivers setup Wizard will open. Click **Next** to continue.

Select **I accept** and click **Next**.



Right click on **PCAN-Basic** and select **Entire feature will be installed on local hard drive**.

Click **Next**.



Click **Install**.

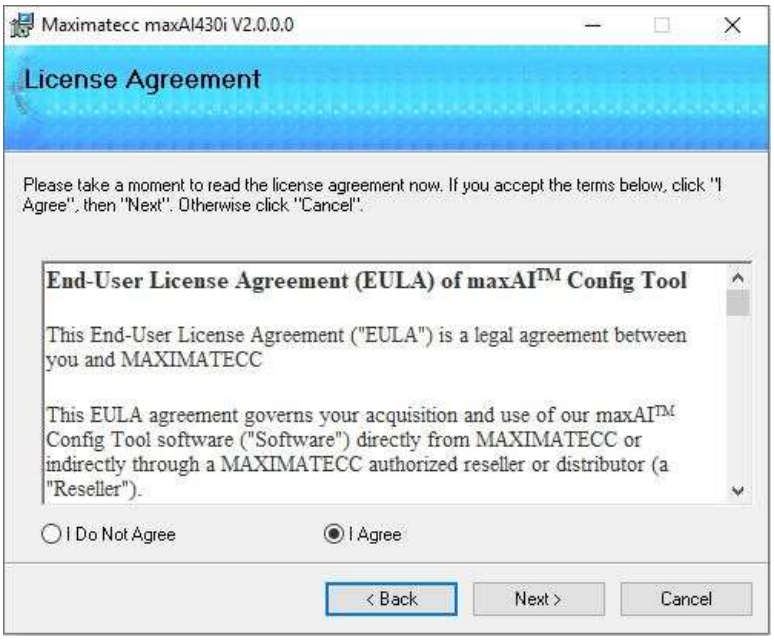
Click **Finish**.

Important step: with admin privileges, connect your PeakCAN hardware on all the USB ports of the computer (connect to the port, wait until driver detects the HW, disconnect and repeat). This is to ensure that the hardware is detected correctly and that it will work when admin privileges are removed.

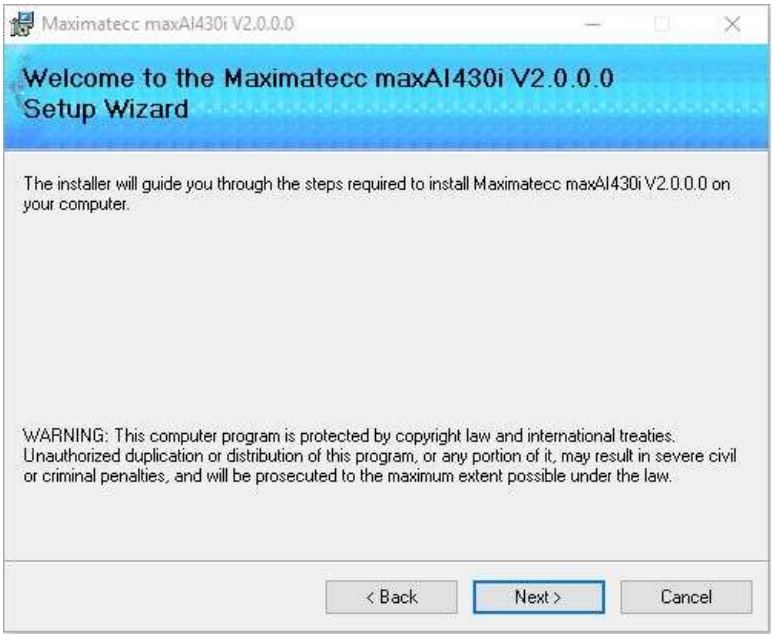
Advanced Cluster maxAI PCTool Installation

Once the drivers are ready, click on the Advanced Cluster maxAI PCTool installer

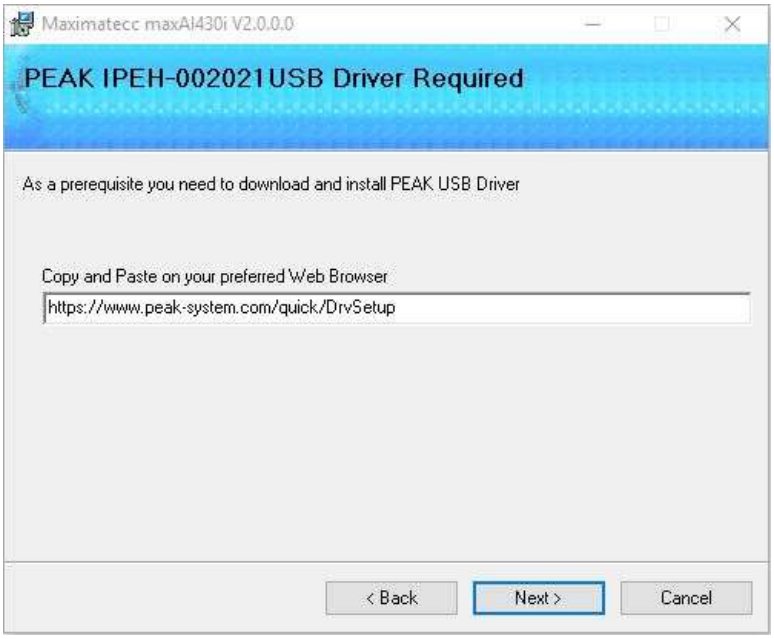
Click **Next**.



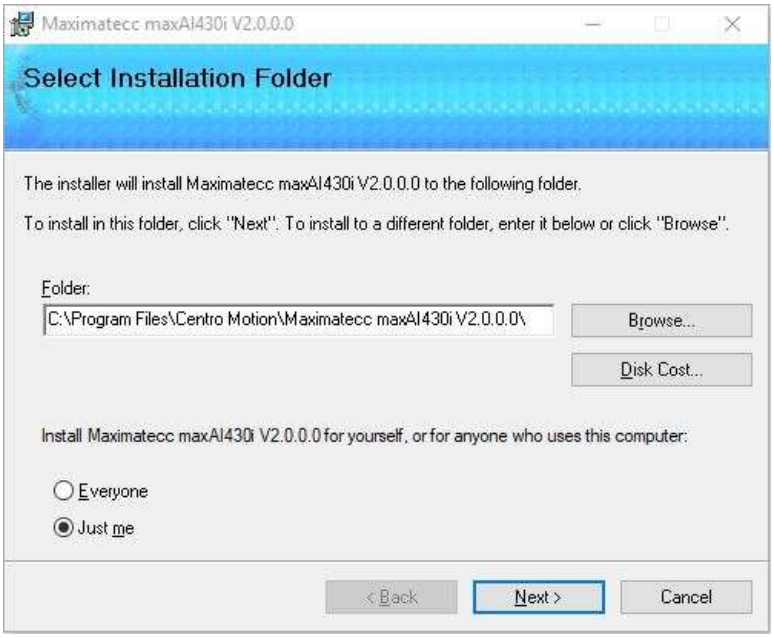
Select **I agree** and click **Next**.



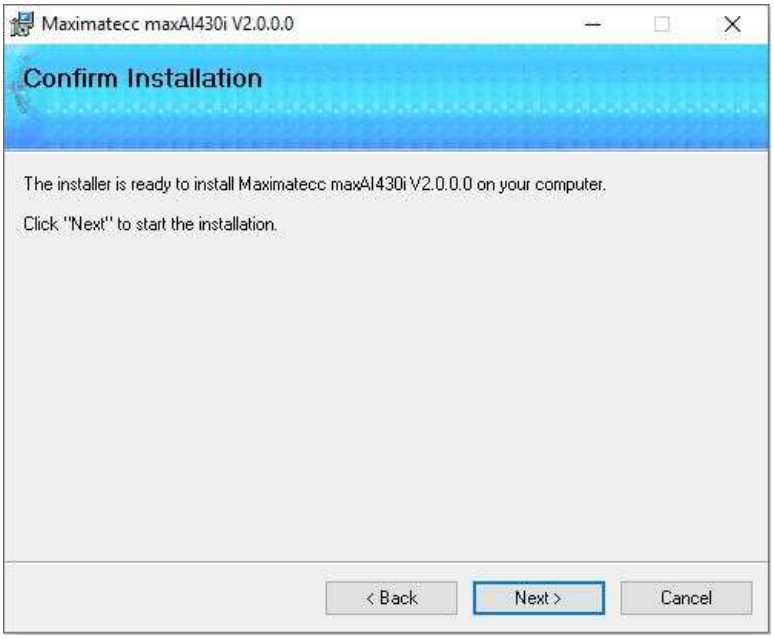
Click **Next**.



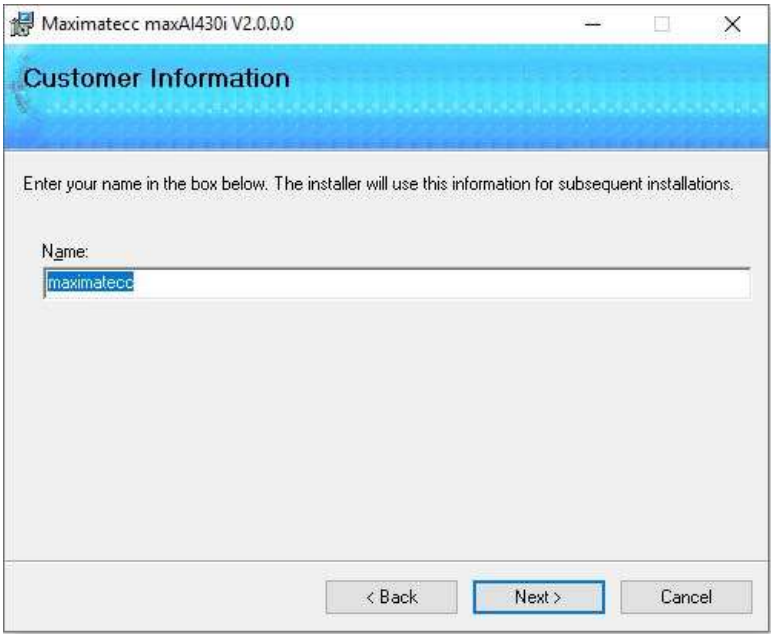
The Configuration Tools installer will remind you that the Peak CAN driver is required. Click **Next**.



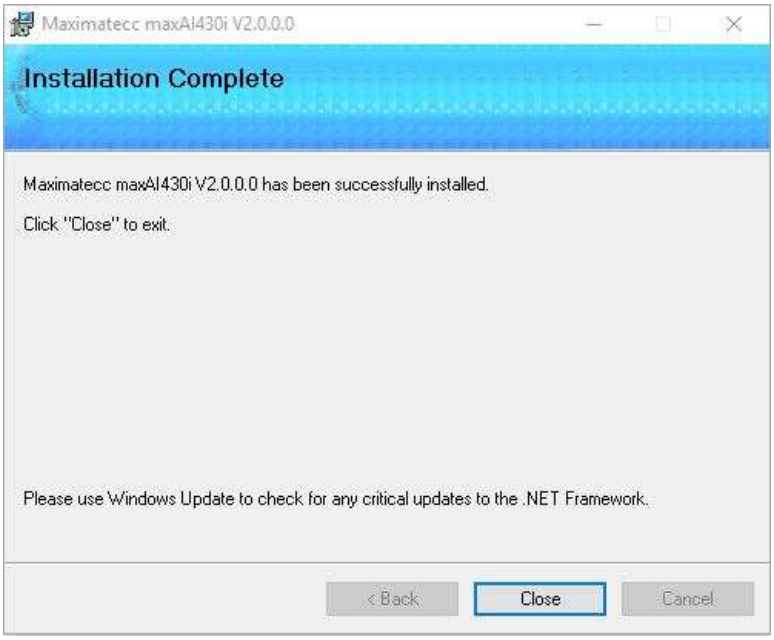
The installer will choose a default folder location. Click on **Browse** if you wish to choose an alternate location. Select the users that will have access to the software by selecting **Everyone** or **Just me**. Click **Next** to continue.



Click **Next**.



Enter your name into the box, then click **Next**.



When progress has finished, click **Close** to complete installation.

Go to folder where the software was installed and double click the **Advanced Cluster PCTool maxAI430i** file or click the icon installed on the PC PC to open the software application.

Getting Started

Required Hardware

The Configuration Software speaks to the maxAI 430i display via PCAN and adapter cable. In addition to the maxAI 430i display, the following items are required for display configuration.

maxAI430 CAN Only Model:
Connect PC→USB/PCAN→Adapter Harness/Power Supply→maxAI 430i display.Connect

For all other maxAI models, including newer 430i models:
Connect PC→USB→maxAI Display
Connect Power Supply→maxAI Display

PC with Software

Peak CAN Adapter

Adapter Harness/Power Supply

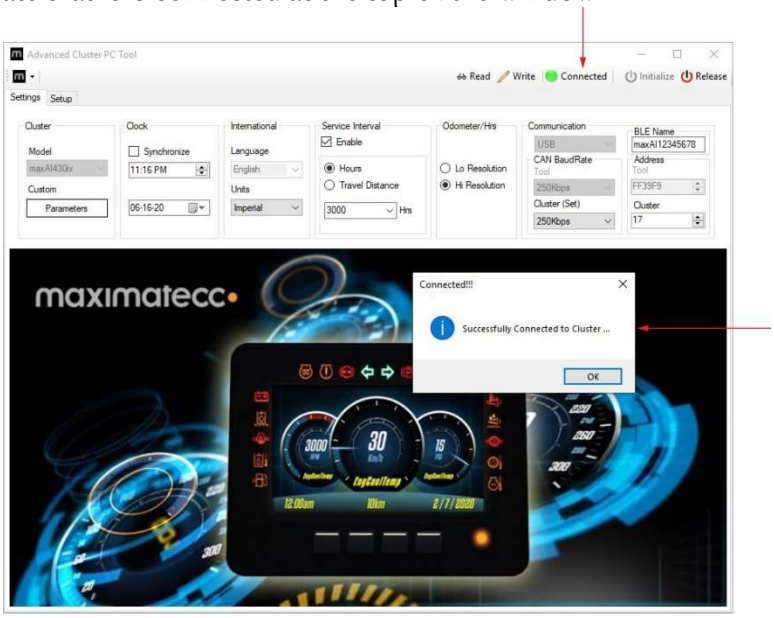
USB Cable

Communication
Connecting with USB

After connecting all hardware with a USB cable and opening the Advanced Cluster PC Tool, establish USB communication by first selecting the model being connected and then selecting **USB** under **Communications**.

Once the appropriate selections are made, select **Initialize** at the top of the window.

Once communication is established, a pop up will confirm successful connection to the device and the Config Tool will indicate that it is connected at the top of the window.



Connecting with Bluetooth

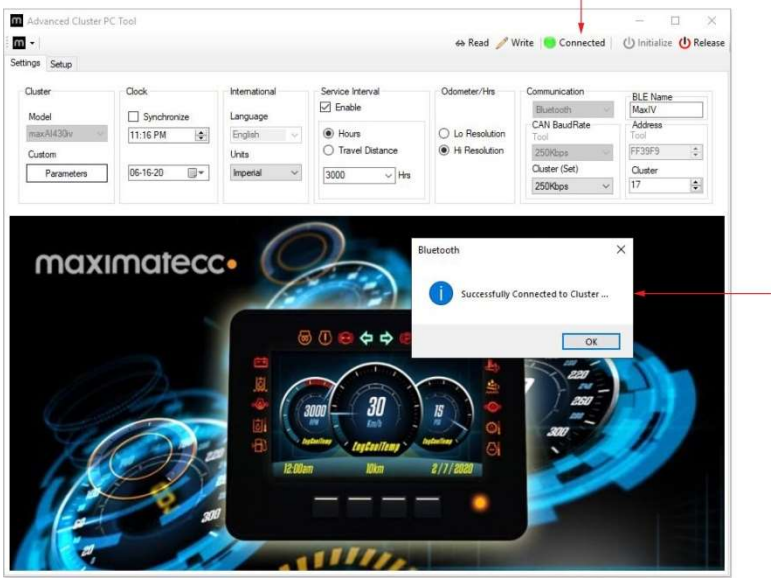
Before making a Bluetooth connection, you may wish to change the maxAI Bluetooth name of the device.
Prior to changing the name, connect the maxAI via USB (refer to Connecting with USB section) . The name can be changed at **BLE Name** parameter.

Once the **BLE Name** is filled in, select **Write** to set the new Bluetooth name of the device.

To connect via Bluetooth, select the **Model** under **Cluster** section and then select **Bluetooth** under **Communication**.

Once the appropriate selections are made select **Initialize** at the top of the window.

Once communication is established, a pop up will confirm successful connection to the device. The Advanced Cluster PC Tool will indicate that it is connected at the upper right area of the window.



Advanced Cluster PC Tool Navigation

The configuration Software is broken down into 2 tabs with options or sub tabs under each item as follows:

1. Settings
    a. Cluster
        - Model
        - Custom Parameters
    b. Clock
        - Synchronize
        - Time
        - Date
    c. International
        - Language (can be added at customer request)
        - Units
    d. Service Interval
        - Enable
        - Hours
        - Travel Distance
    e. Odometer/Hours
        - Low Resolution
        - High Resolution
        - Frequency
            - Input
            - PPM
            - Hours RTC
    f. Communication
        - USB / Bluetooth / CAN
        - Baud Rate Tool
        - Baud Rate Cluster
2. Setup
    a. Configure Display
        - Splash
        - Screen 1-Screen 5
            - Cluster Layout
                - Digital
                - Analog
                - 3 Gauge
                - Single
                - Screen Common Configuration
            - Enable
            - Trans Gear position
            - Lost Comm Display
            - Conf Screen Timeout

- Light Sensor Switch Theme

b. Inputs
   - Digital
   - Resistance
   - Voltage
   - Frequency
   - Current

c. Gauge Sources
   - Source
   - Display LO-Limit
   - Display HI-Limit

d. Warning Lights
   - Source
   - Threshold-Lo
   - Threshold-Hi
   - K-Hysteresis
   - Enable

e. Output
   - Type
   - Activated by

f. Cluster Config
   - PC File
   - Cluster Write
   - Firmware

Setting Up Display Configuration

Settings tab

The **Settings** tab will allow you to set basic display functions.

Cluster menu allows to view and adjust communication parameters for each specific model.

Clock menu allows to set time and date. This can be manually set by using the up/down arrows for time and the calendar drop down for date. The time and date can also be automatically set to the PC values by selecting **Synchronize** option.

International menu allows to change the measurement system units. The available options are **Imperial**, **Metric KPa**, and **Metric Bar**. English language is the only available option for this and previous versions.

Service Interval menu allows to set service time intervals for **Hours** or **Travel Distance** options. To enable this feature, select **Enable** and set the time or distance interval value from the drop-down menu.

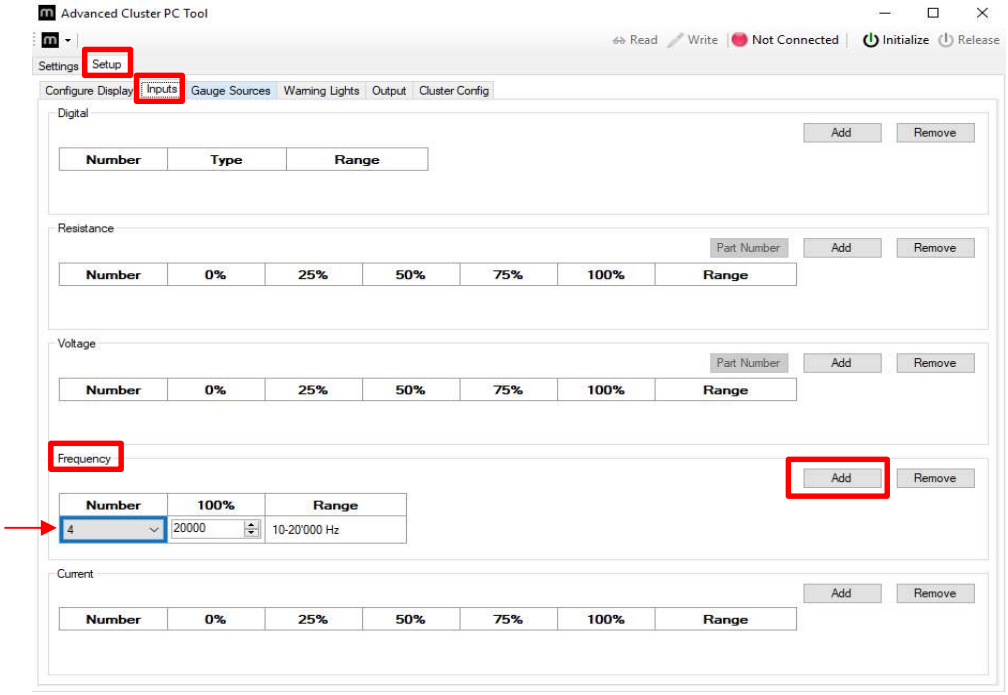
Odometer/Hrs menu configures how the odometer will calculate the distance traveled by the vehicle.

The **Odometer** can be configured:

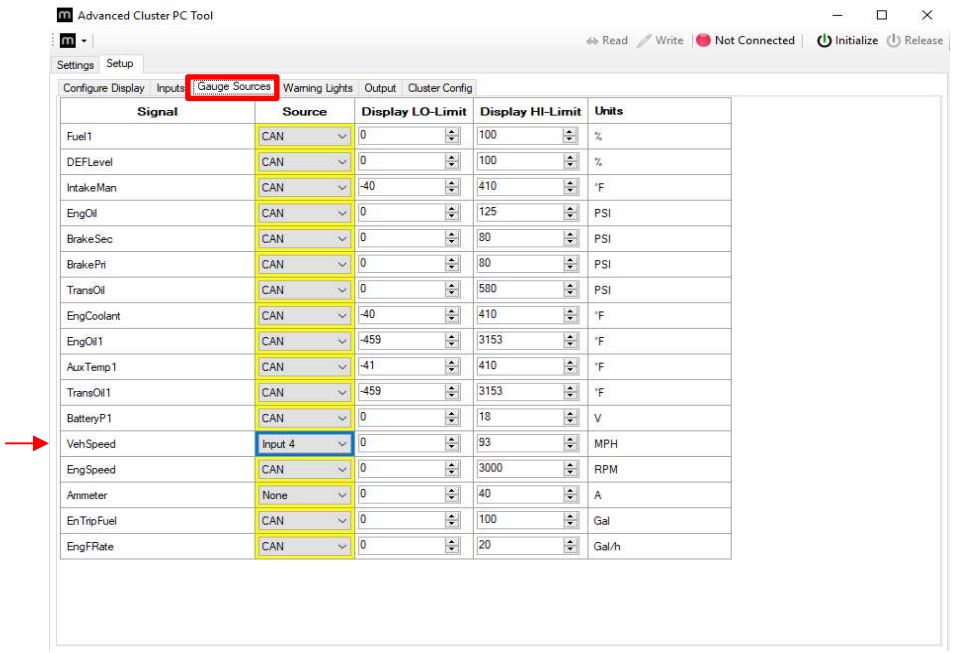
- To be received via CAN input message by selecting one of the following options at **Input** parameter:
    - High Resolution

- Low Resolution

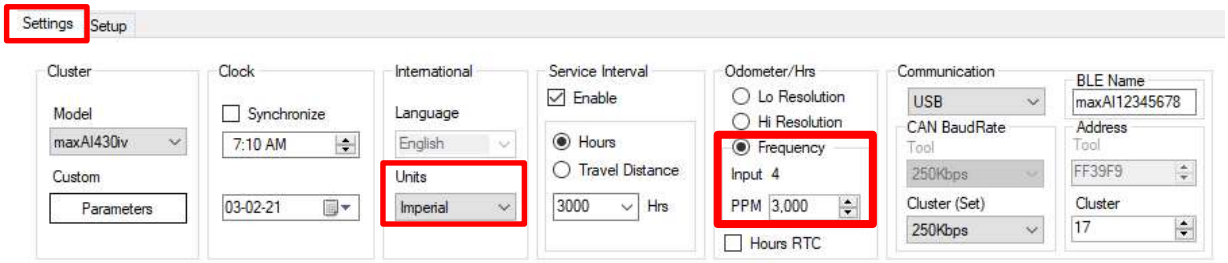
- As an analog input signal detecting pulses per mile (PPM) or pulses per kilometer (PPK) by selecting **Frequency** option. To do this, the next steps must be followed:
  - Tab **Setup** → Tab **Inputs** → section "**Frequency**" → Click "**Add**" button and select **Number 4** in drop-down menu (Analog input #4 is the only one available for this feature).



  - Go to Tab "**Gauge Sources**" and select Source: "**Input 4**" for Signal "**VehSpeed**".



- Next, go to Tab "**Settings**" and select "**Frequency**" under "**Odometer/Hrs**" menu.
- Finally, type in **PPM** or **PPK** value. To switch between PPM and PPK, select the appropriate "**Units**" (Imperial / Metric KPa / Metric Bar) under **International** menu. Supported range of operation is from 3,000 PPM (1,864 PPK) to 100,000 PPM (62,137 PPK).
  IMPORTANT: Input #3 will be disabled under this scenario.



The Hours meter can be configured:

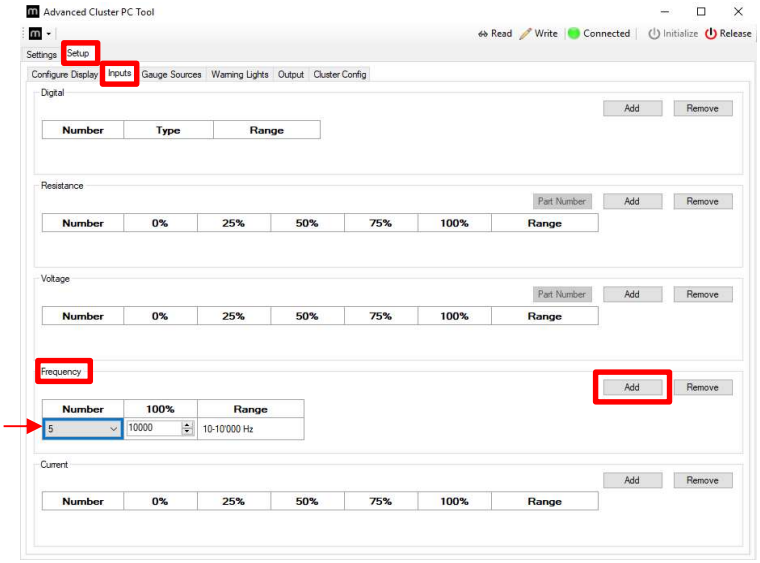
- To be received via CAN input message (default):
  - SPN 247
- To be calculated using the maxAI internal Real Time Clock module when **Hours RTC** checkbox is selected.

Communication menu allows to select the Baud Rate for the maxAI. Be sure to select the same baud rate for the Advanced Cluster PC Tool and the maxAI cluster.

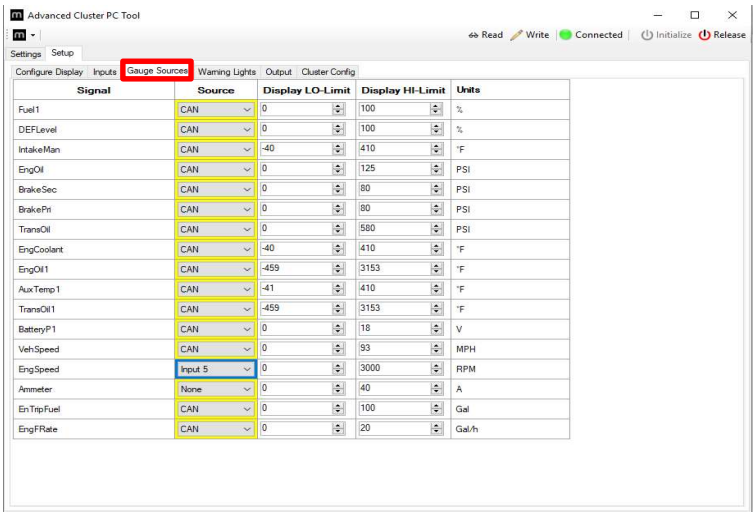
Tachometer Configuration

The Tachometer can be configured:

- To be received via CAN input message
  - High Resolution
  - Low Resolution
- As an analog input signal. To do this, the next steps must be followed:
  - Tab **Setup** → Tab **Inputs** → section "**Frequency**" → Click "**Add**" button and select **Number 5** in drop-down menu (Analog input #5 is the only port available for this feature).



  - Go to Tab "**Gauge Sources**" and select Source: "**Input 5**" for Signal "**EngSpeed**".

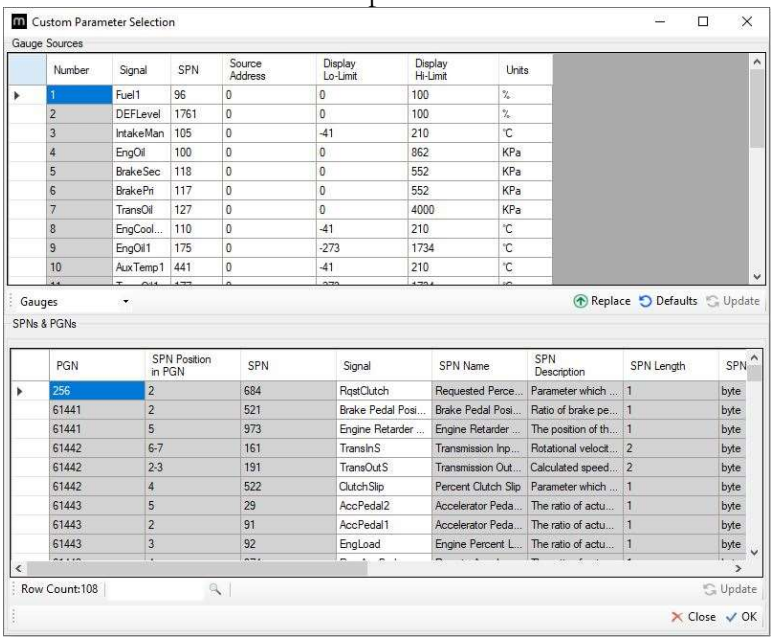


Custom Parameters Button

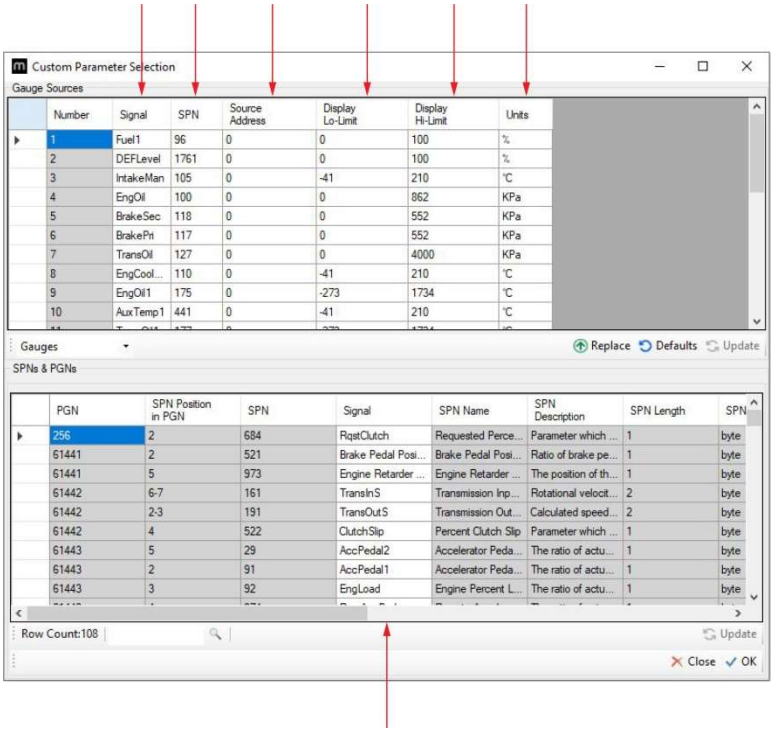
The **Parameters** section is used to select the J1939 messages that will be configured to the maxAI.

At Settings tab, click on the **Parameters** button.

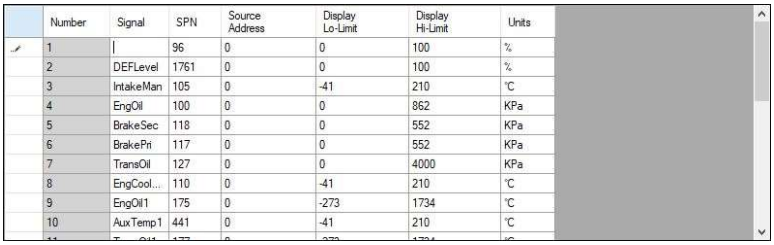
The **Custom Parameters Selection** window will open.



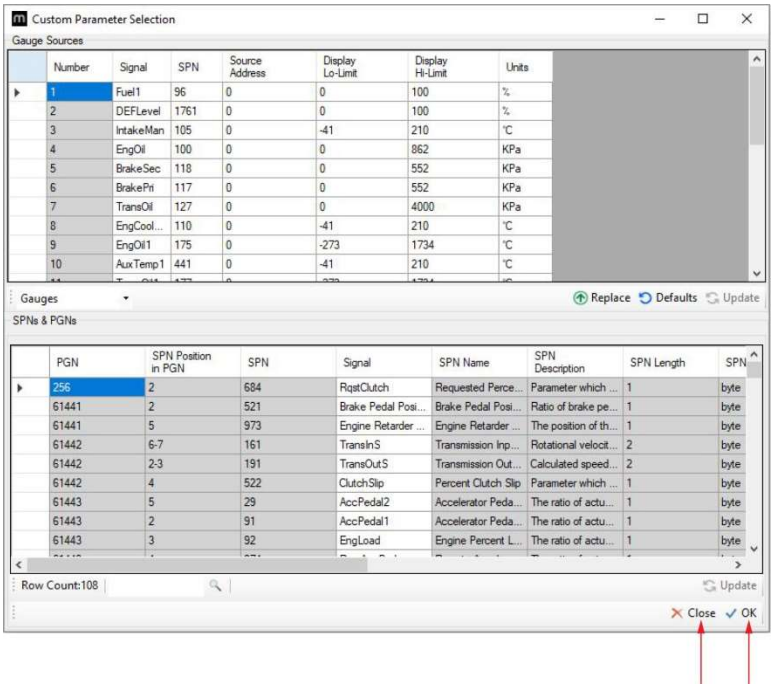
The grey shaded cells cannot be changed, but all white cells can be adjusted to user preferences.



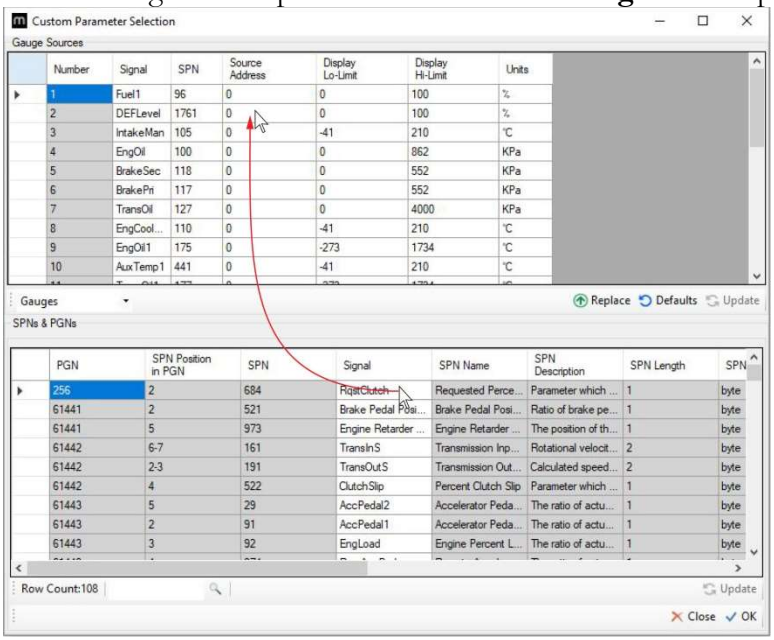
To change a value, select the parameter by double clicking on it and then typing the new value. All values shall be of 10 characters or less.



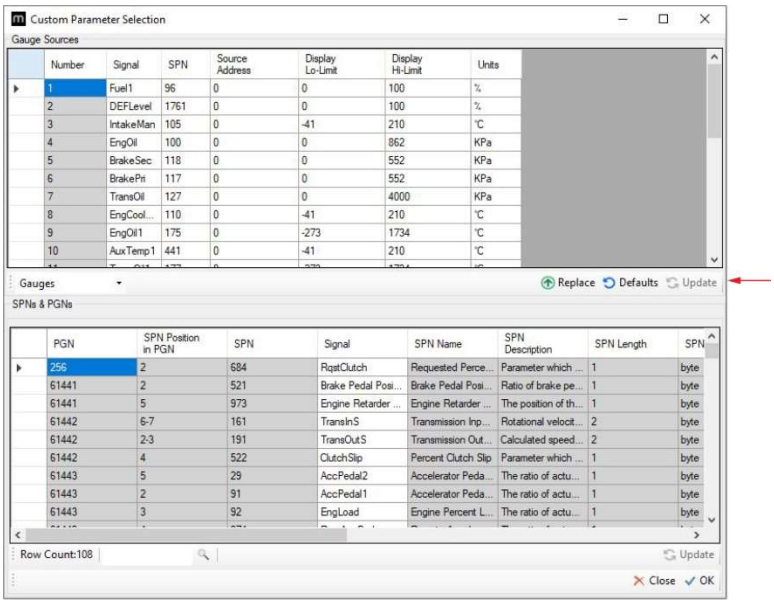
Once all the parameters are set, select **Update** and accept the changes. To exit the window, click on **OK** to set the changes or **Close** to cancel them.



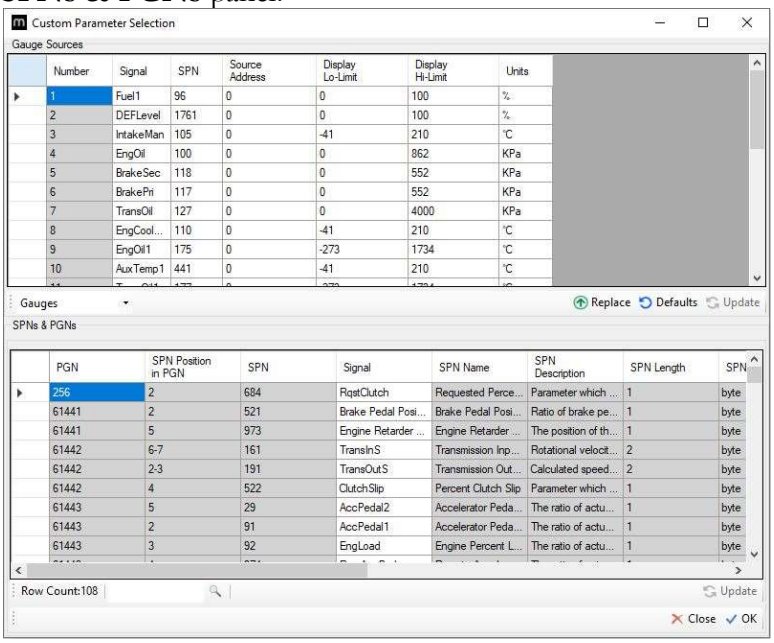
Gauge Sources information can also be updated by dragging the preferred SPN & PGN data from the **SPNs & PNGs** panel to the Gauge Source position desired in the **Gauge Source** panel.



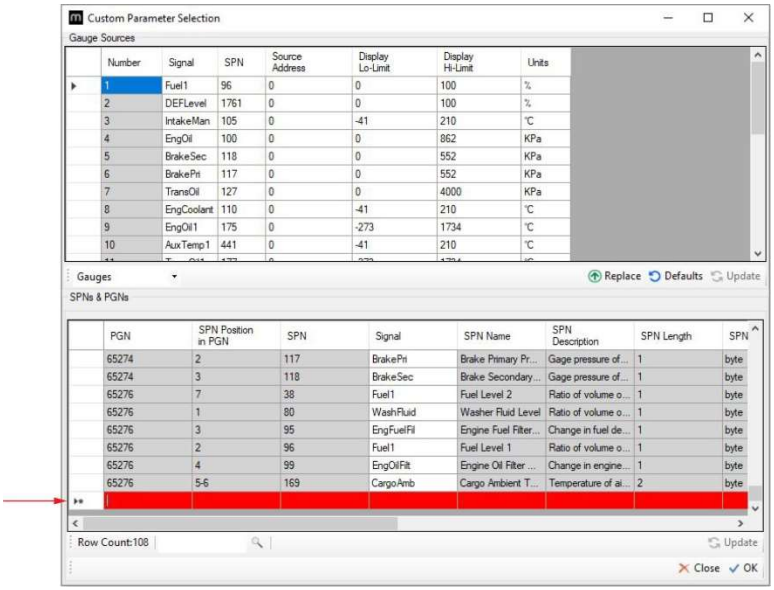
Other shortcuts can be done using the parameter shortcut buttons.



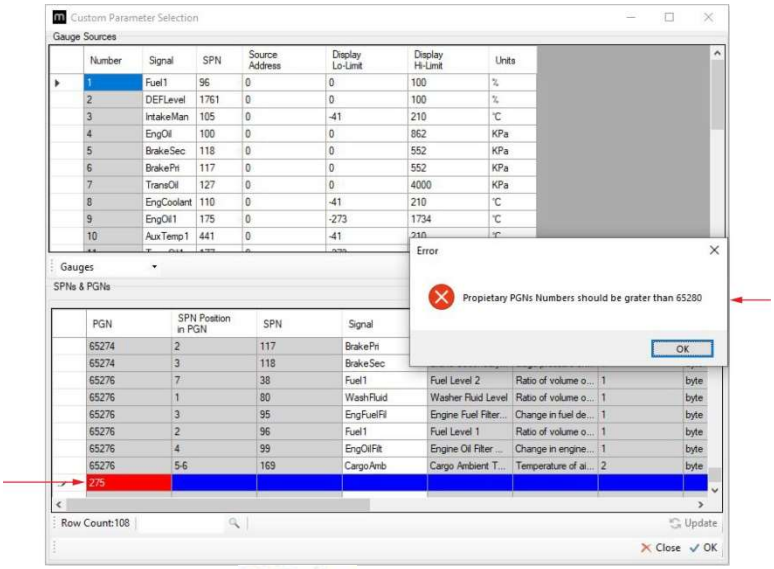
To replace a signal in the **Gauge Sources** panel with one from the **SPNs & PGNs** panel using the buttons, first select the gauge number to be replaced in the **Gauge Sources** panel and then select the desired row from the **SPNs & PGNs** panel.



Other custom PGNs can be defined by scrolling to the bottom of **SPNs & PGNs** panel where a blank row is available. Each cell in this new PGN row shall be filled out prior to saving it.

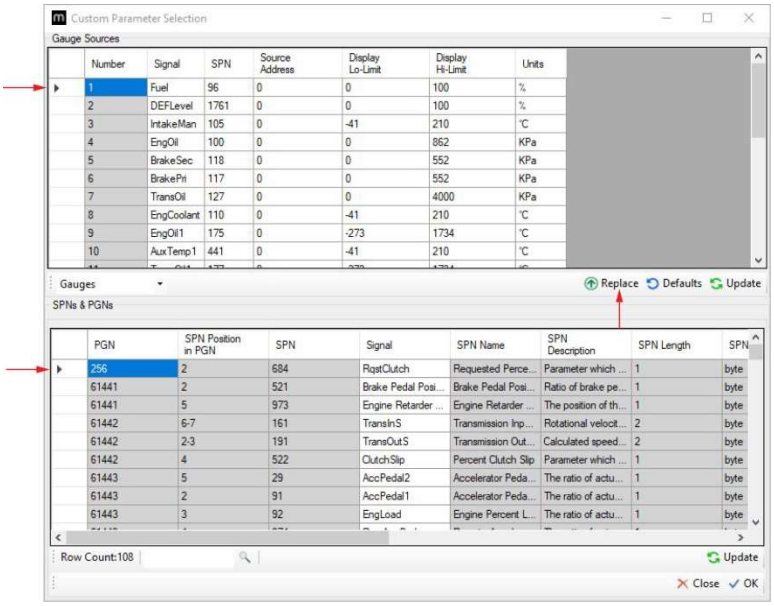


Custom PGNs must be greater than 65280. If a lower number is selected, a notification will pop-up and the PGN will change to 65280.



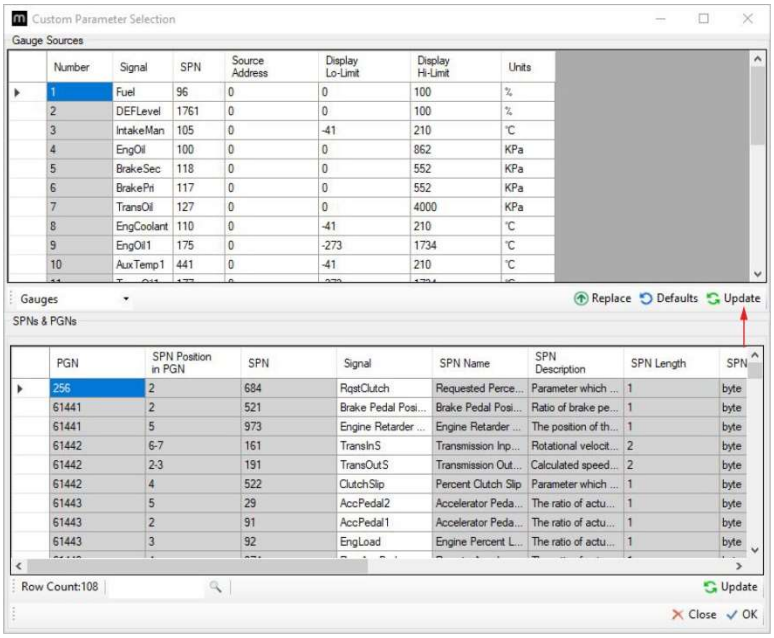
When the selections are made, select the Replace button and the selection will be replaced in the **Gauge Sources** panel.

If changes are made by accident and you wish to revert to default settings, select the Defaults button to reset parameters to factory default settings.

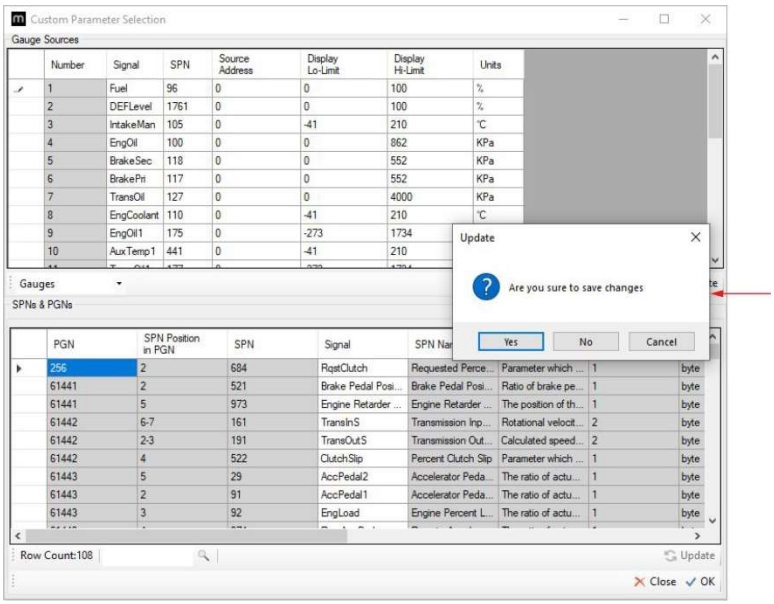


Once all the parameters are changed to desired settings, select the 

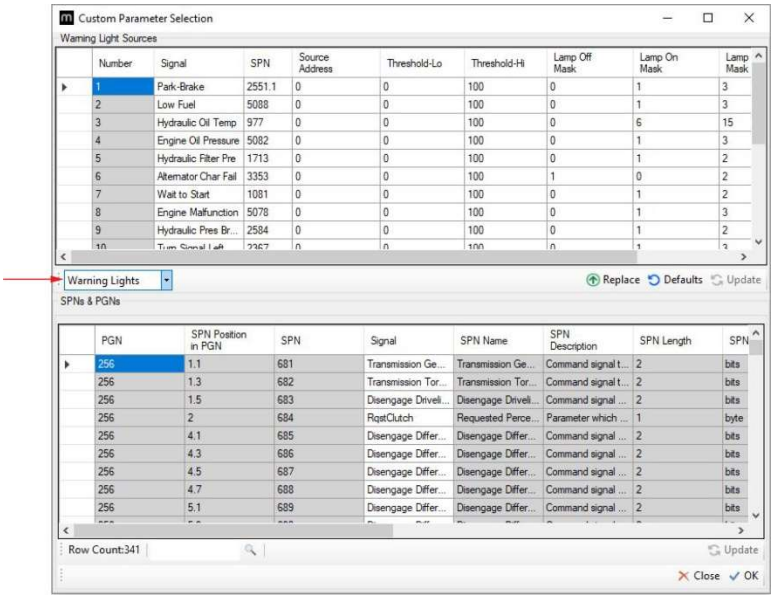
button to save the settings.



You will be asked to confirm that you wish to save changes. Select **YES** to apply changes. Selecting **NO** will allowing you to continue editing without removing all existing changes. Selecting **CANCEL** will revert all changes and cancel editing.



On models with icons (maxAI 430i and maxAI 430iv), the warning lights can also be configured here by selecting **Warning Lights** at the drop-down menu of the **Parameters** tab (left center area) as indicated in the illustration below. Up to 20 warning lights can be configured by following the same process described for the gauges.

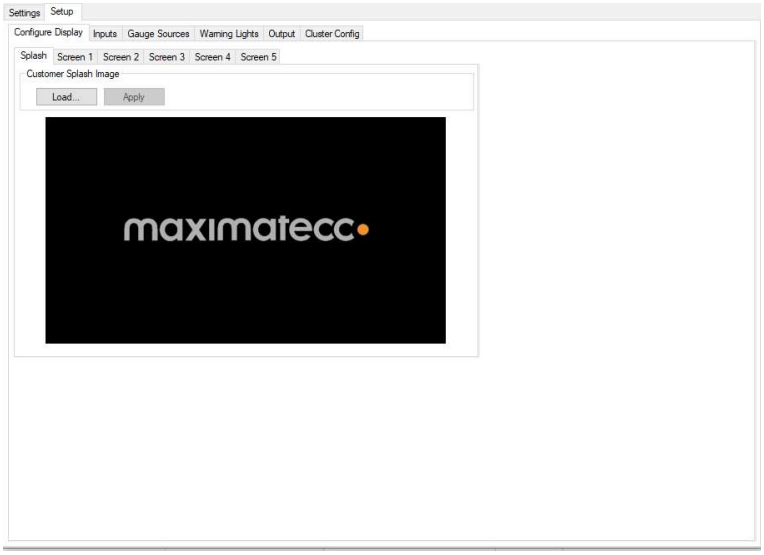


Setup tab

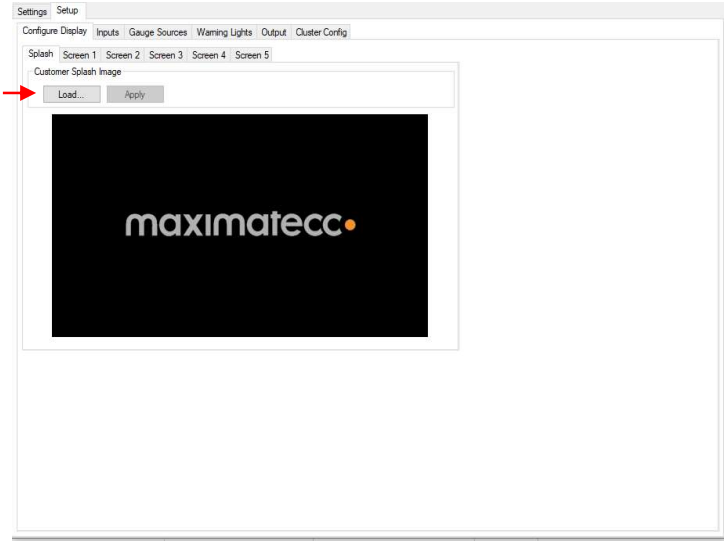
The **Setup** tab will allow you to set your instrumentation parameters including number of screens, cluster layout for each screen, analog inputs, instrumentation sources and limits, warning light sources and limits, and output, as well as open and save configurations and read or write configurations to and from the maxAI 430i.

Tab 1 "Configure Display"

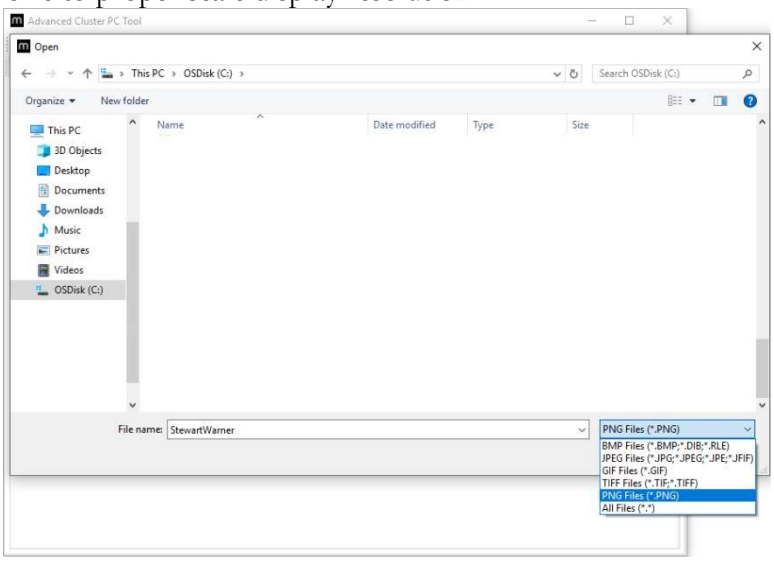
Select **Splash** tab.



To change the cluster splash screen, select the **Load** button.

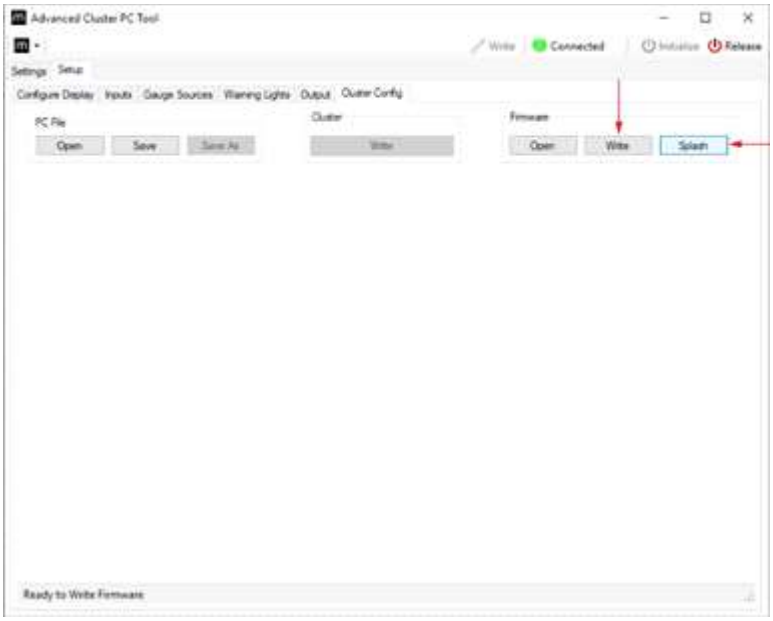


Select the file to be used for the new splash screen. For best results, choose an image that is sized to 480 x 272. All other sizes will be automatically adjusted to shrink to this size, this adjustment may distort resulting image, in case of image not appeal to customer needs, source file will need to be edited by an external tool to adjust size to proper scale display resolution.

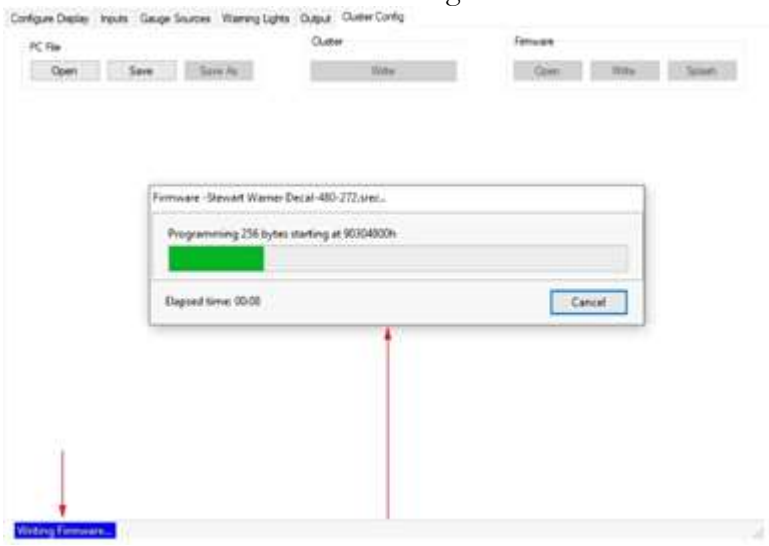


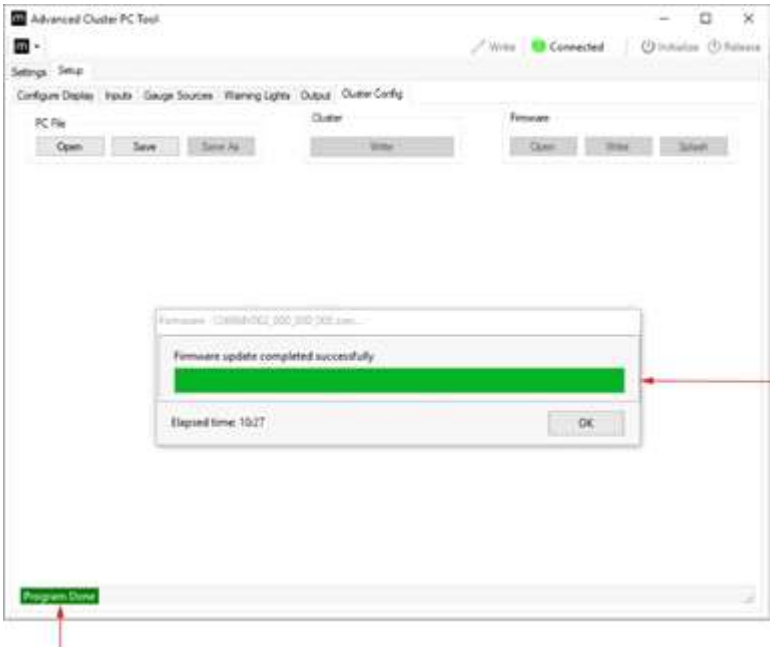
Once the new image is selected, it will show up on the screen. At this point, the new splash screen will be ready to write to the display.

To set the new splash screen image, click **Apply** button, other way you can select Config Cluster tab. Select the **Splash** button, under the **Firmware** group, to write the new splash screen to the display.



The progress bar will indicate the new information is being written.

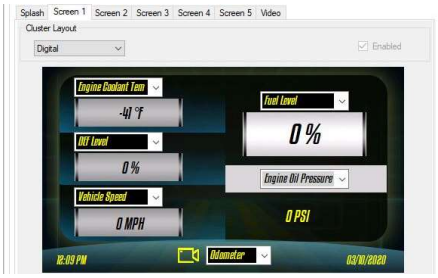




Cluster Layout Screens

Up to 5 screens can be set on the display. Each screen can be configured to one of four different layouts. Instrumentation is than set based on the layout options as follows:

maxAI 430i (CAN)

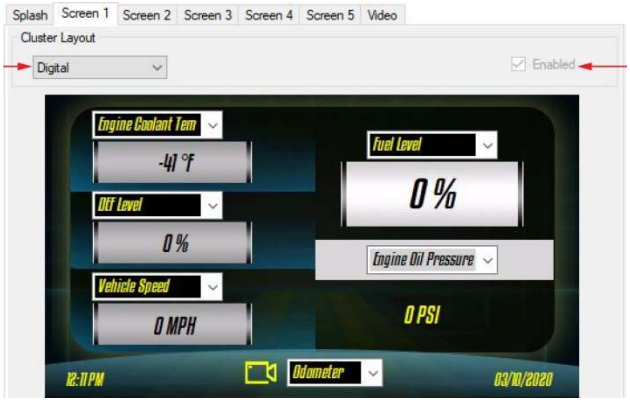


maxAI 430v

DIGITAL

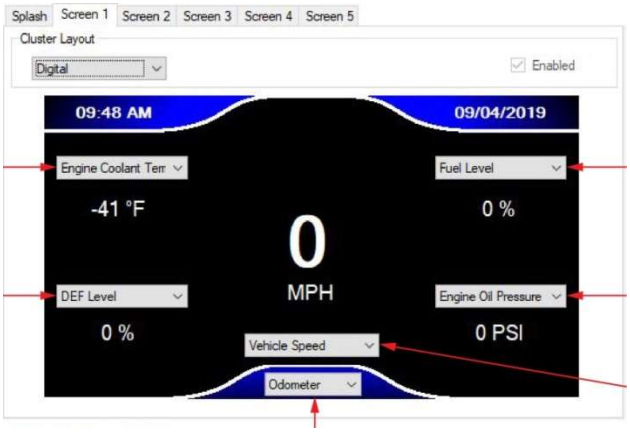
Select **Digital** from **Cluster Layout** drop down menu and select **Enabled** to enable the screen selection.

maxAI 430i (CAN)

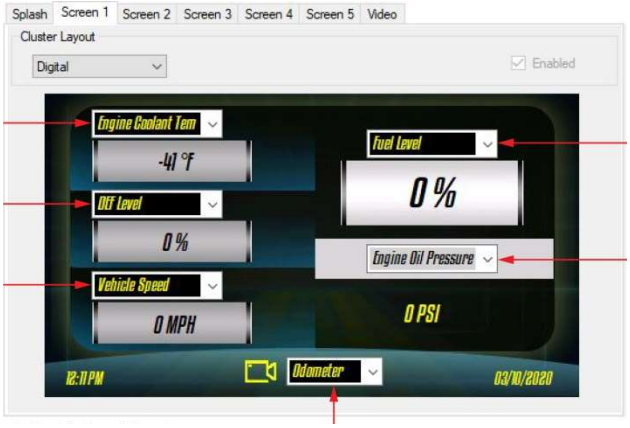


maxAI 430

Choose instrument type from drop down associated with each instrument location.



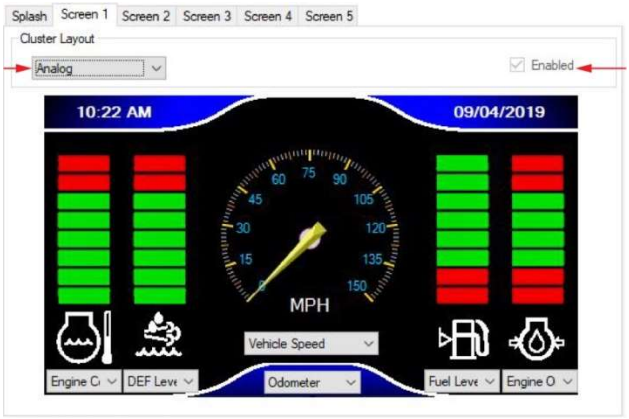
maxAI 430i (CAN)



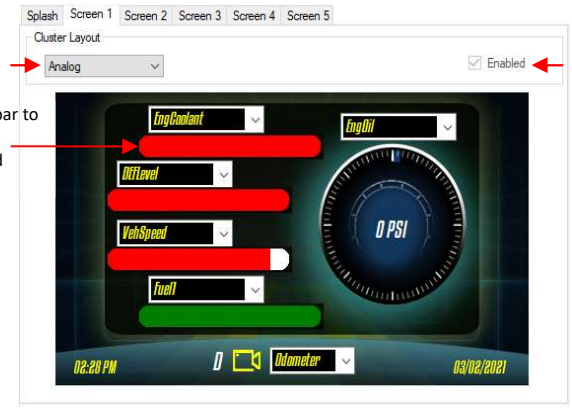
maxAI 430

ANALOG

Select Analog from Cluster Layout drop down menu and select Enabled to enable the screen selection. For maxAI 430 model, click on the bar gauges to set color threshold limits.



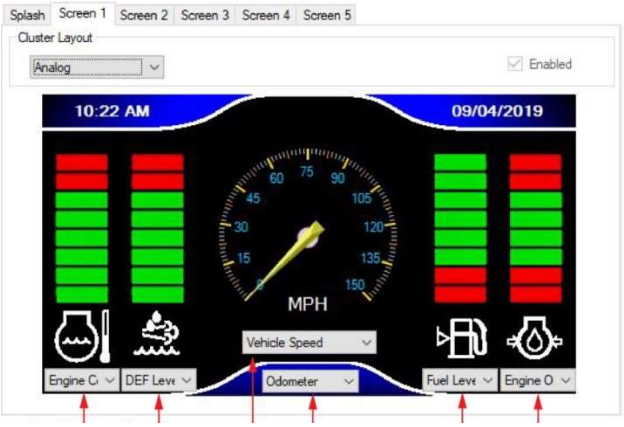
maxAI 430i (CAN)



maxAI 430

Click on bar to set color threshold limits

Choose instrument type from drop down associated with each instrument location.

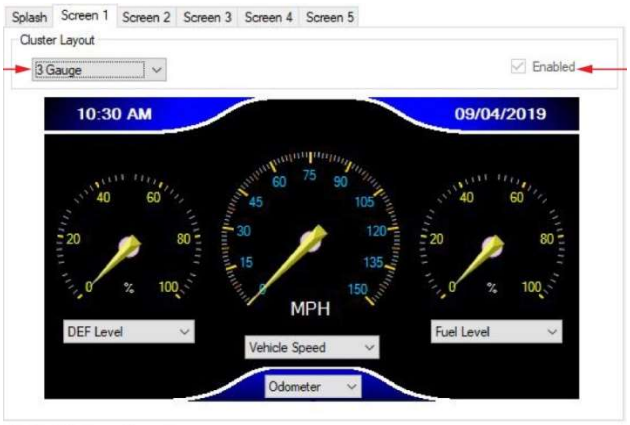


maxAI 430i (CAN)

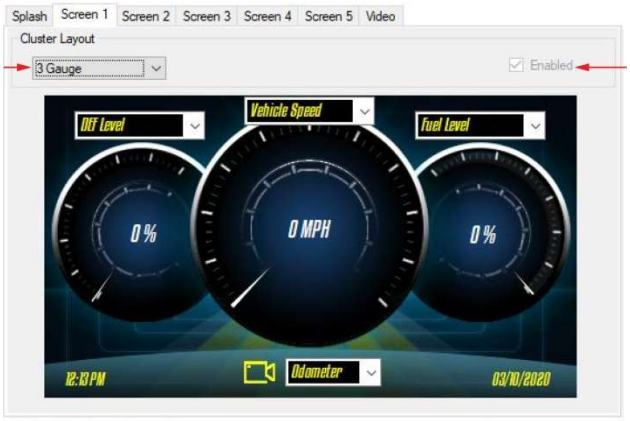
maxAI 430

3 GAUGE

Select 3 Gauge from Cluster Layout drop down menu and select Enabled to enable the screen selection.

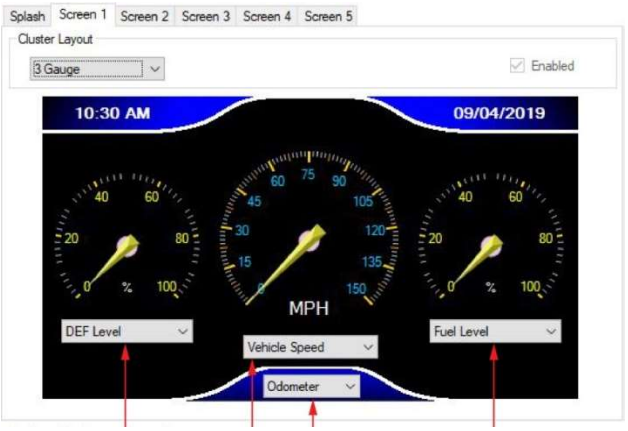


maxAI 430i (CAN)

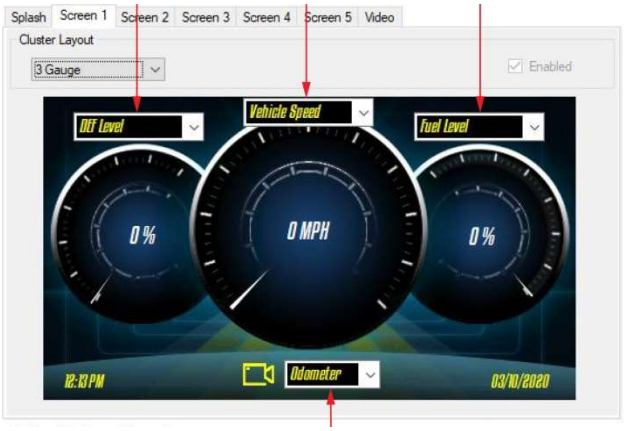


maxAI 430

Choose instrument type from drop down associated with each instrument location.



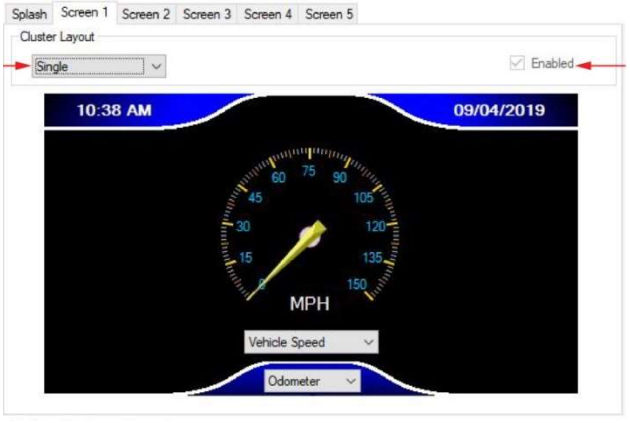
maxAI 430i (CAN)



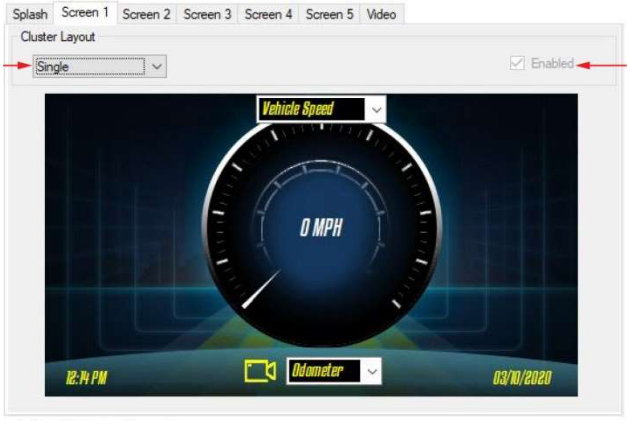
maxAI 430

SINGLE

Select Single from Cluster Layout drop down menu and select Enabled to enable the screen selection.



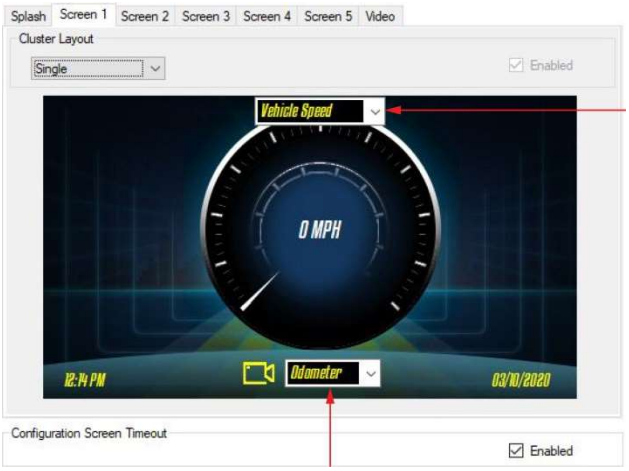
maxAI 430i (CAN)



maxAI 430

Choose instrument type from drop down associated with each instrument location.

maxAI 430i (CAN)



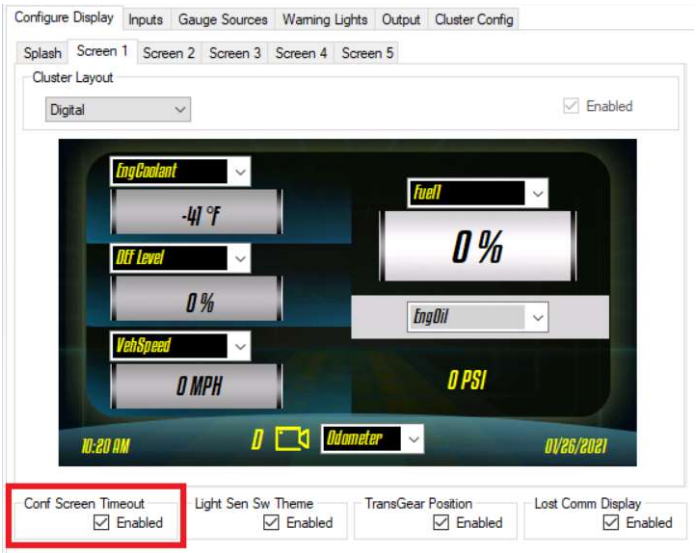
maxAI 430

Screen common configuration

All the available screens have common options:
NOTE: *The screen features below are available for the MAXAI430 USB version*

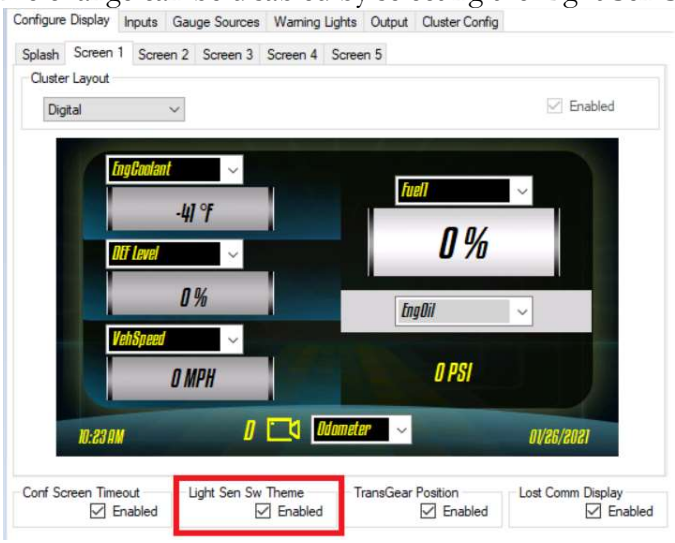
Configuration screen timeout:

The screen timeout can be enabled after selecting the Conf Screen Timeout checkbox.



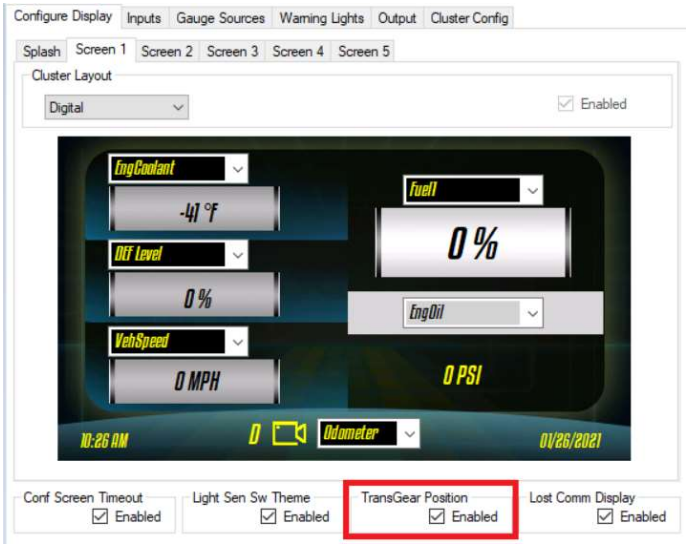
Light sensor control:

The light sensor color theme change can be disabled by selecting the Light Sen Sw Theme checkbox.



Transmission gear position:

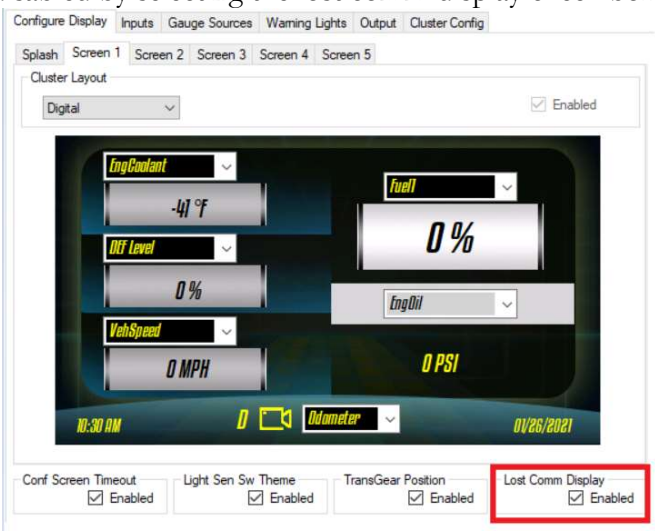
The cluster can be configured to display the transmission gear (current gear). This option can be enabled by selecting the "TransGear Position" check box, once this option is enabled the display will show the gear information at the bottom of the screen by using the current gear J1939 SPN 523 from the transmission source address (0x03).



Transmission gear will be displayed at the bottom-center area of the screen

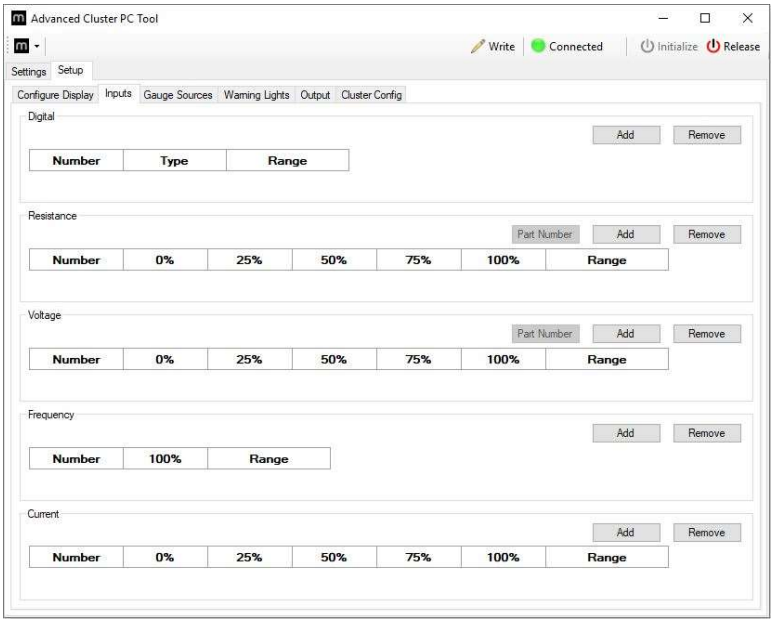
Lost communication display:

The cluster can detect the CAN communication loss, as this feature it's not required for all the users this option can be enabled or disabled by selecting the lost comm display check box.

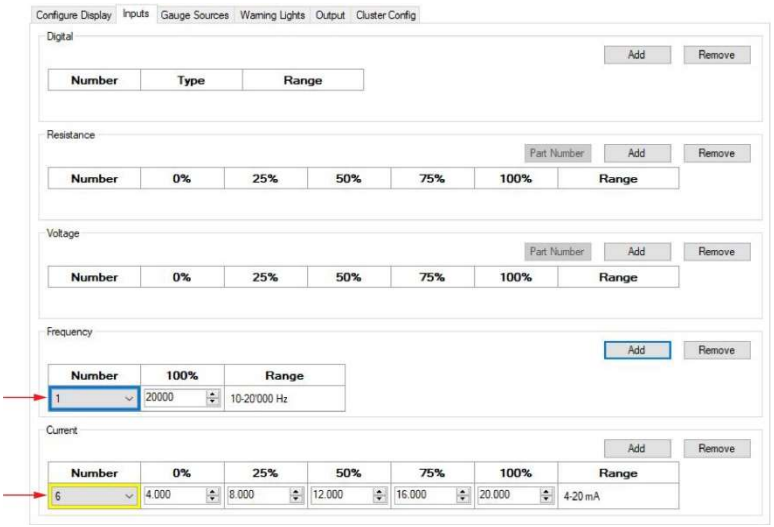


Tab 2 "Inputs"

Inputs can be designated and configured for non J1939 inputs. Current software allows for Digital, Resistance, Voltage, Frequency and Current inputs to be configure.

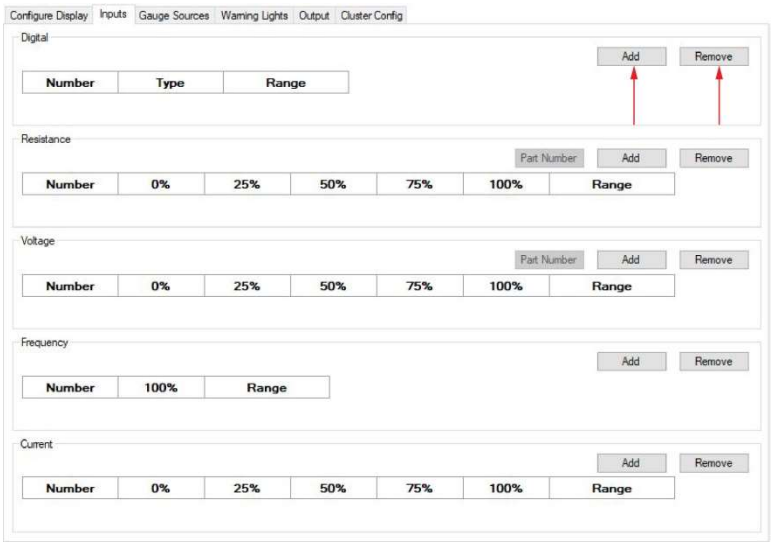


Drop down menus will have either a bold blue or bold yellow outline. The bold blue outline indicates multiple options available. The bold yellow outline indicates only one option is available.

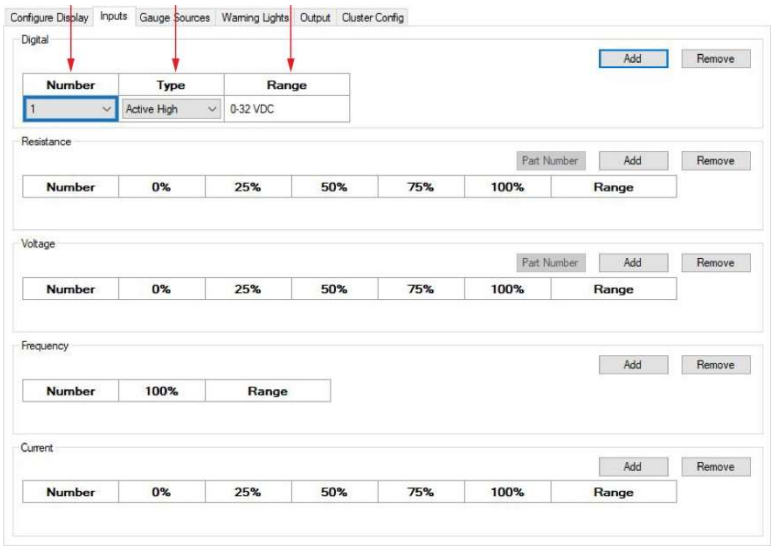


Adding/Removing Digital Input

To add the digital inputs, click on Add. If you wish to remove a digital input, simply click on Remove.

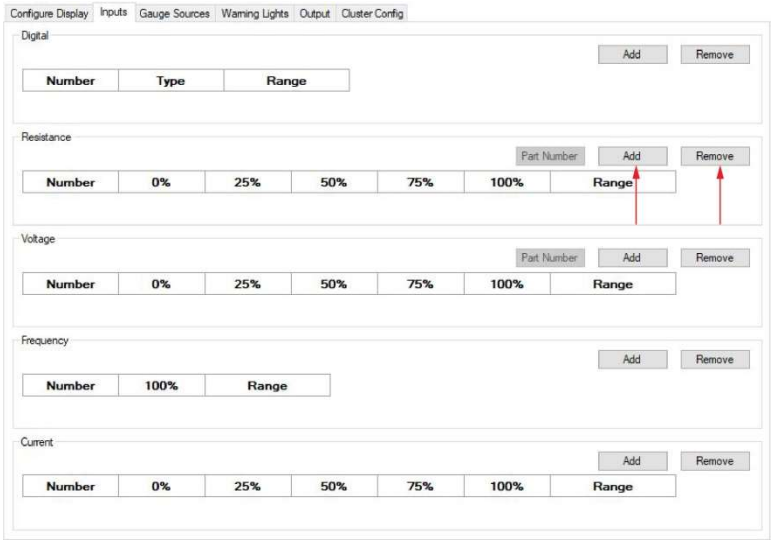


Once the digital input is added, select the input number to apply it to, then set the voltage that the input will turn on and off.

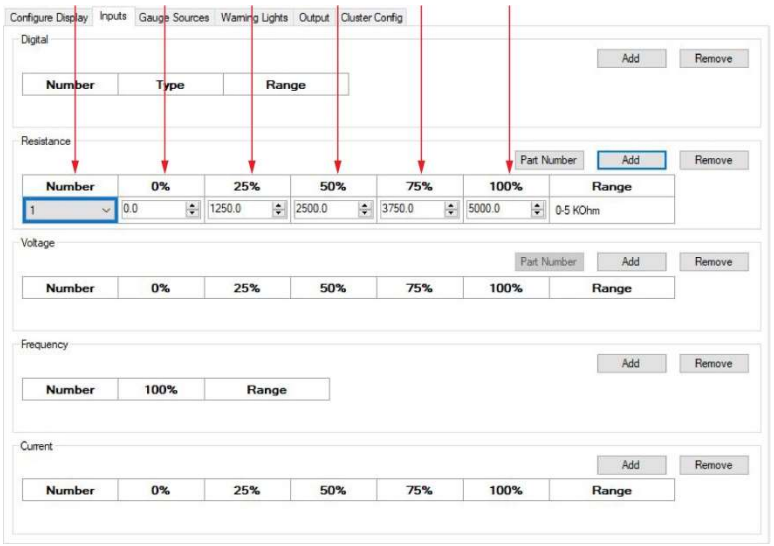


Adding/Removing Resistance Inputs

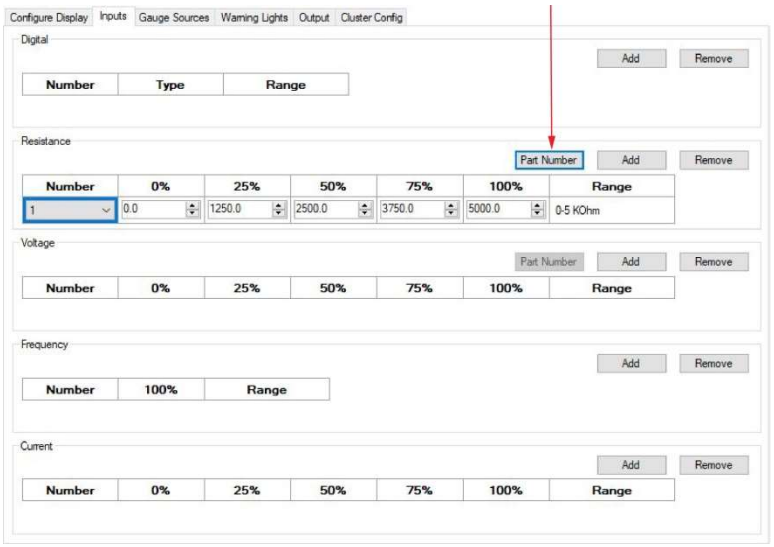
To add resistance inputs, click on Add. If you wish to remove a resistance input, simply click on Remove.



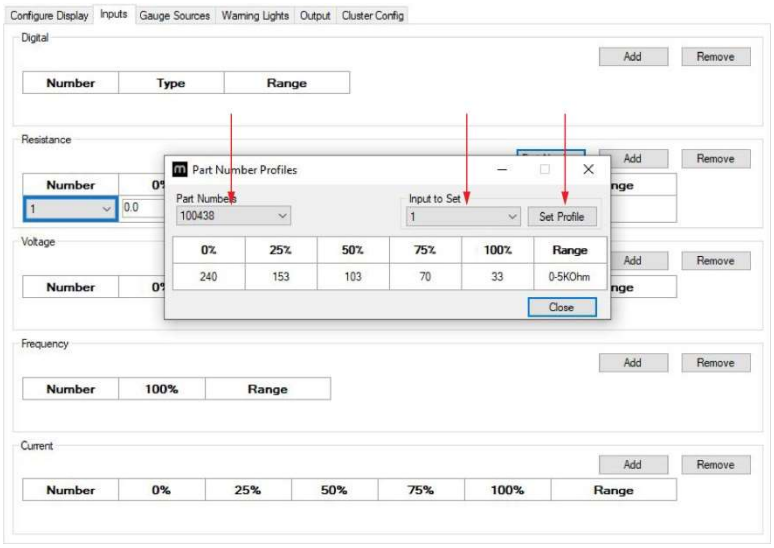
For each resistance input added, select the input number to apply it to, then set the resistance value at 0%, 25%, 50%, 75%, and 100%.



Resistance input can be selected by part number when using a Datcon sending unit. To set the input by part number, select Part Number.

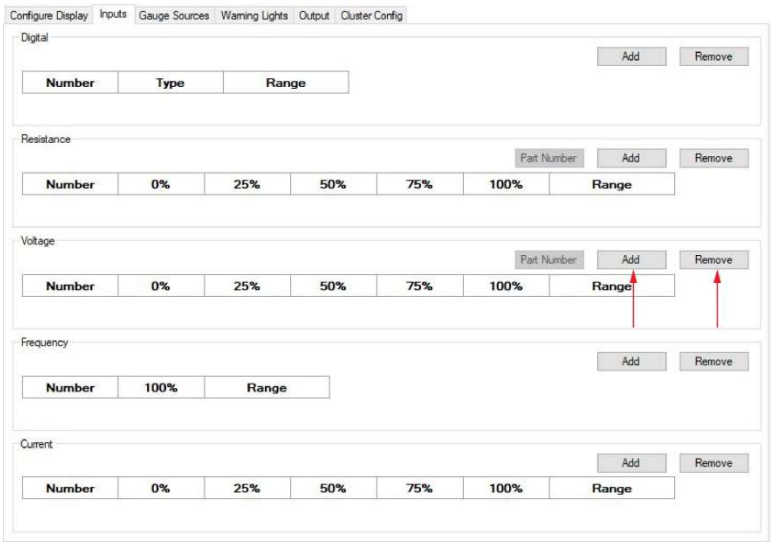


Select the part number from the Part Number drop down, then select the input number from the Input to Set drop down. Once both options are selected, select Set Profile.

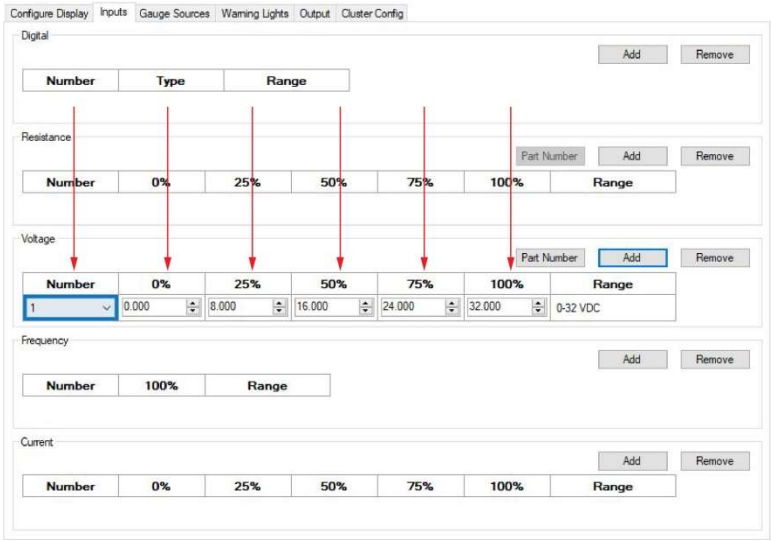


Adding/Removing Voltage Inputs

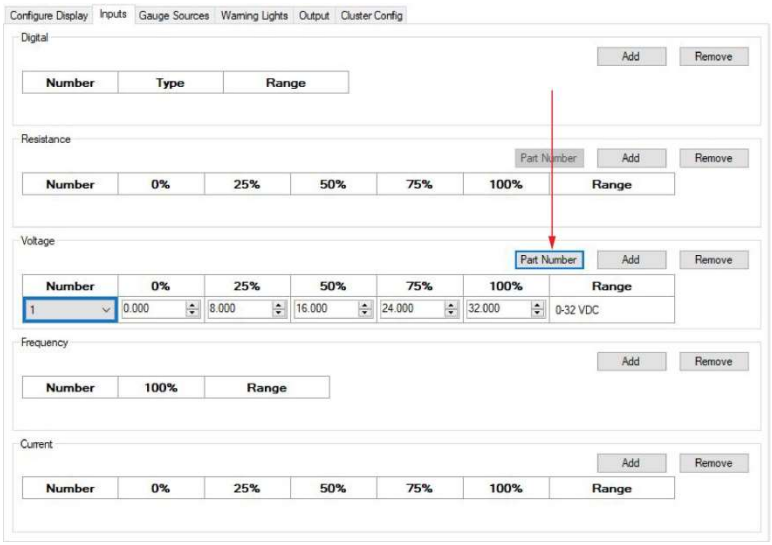
To add voltage inputs, click on **Add**. If you wish to remove a voltage input, simply click on **Remove**.



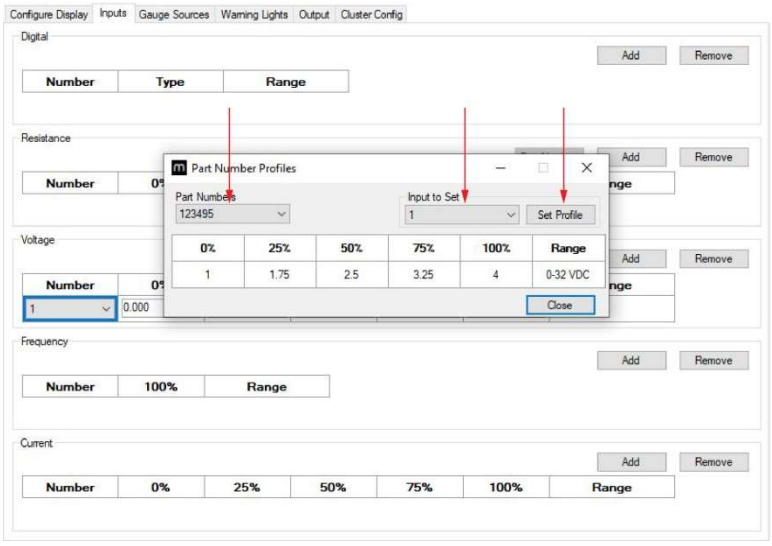
For each voltage input added, select the input number to apply it to, then set the voltage value at 0%, 25%, 50%, 75%, and 100%.



Voltage input can be selected by part number when using a Datcon sending unit. To set the input by part number, select **Part Number**.

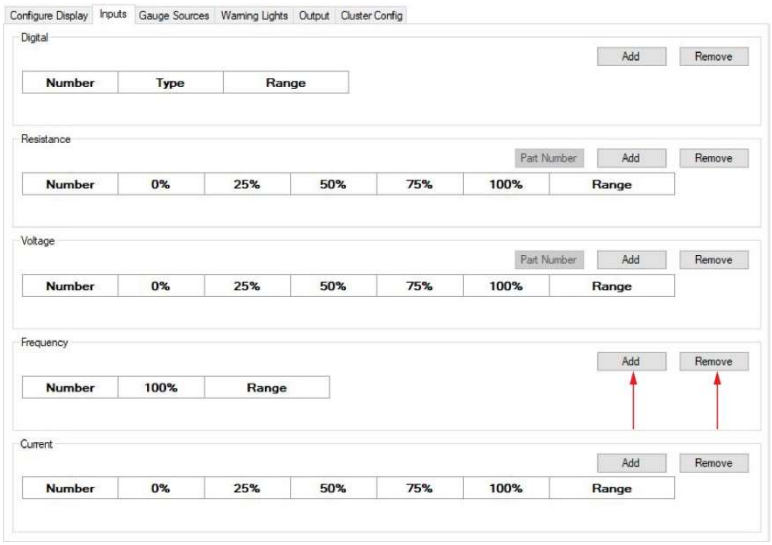


Select the part number from the **Part Number** drop down, then select the input number from the **Input to Set** drop down. Once both options are selected, select **Set Profile**.

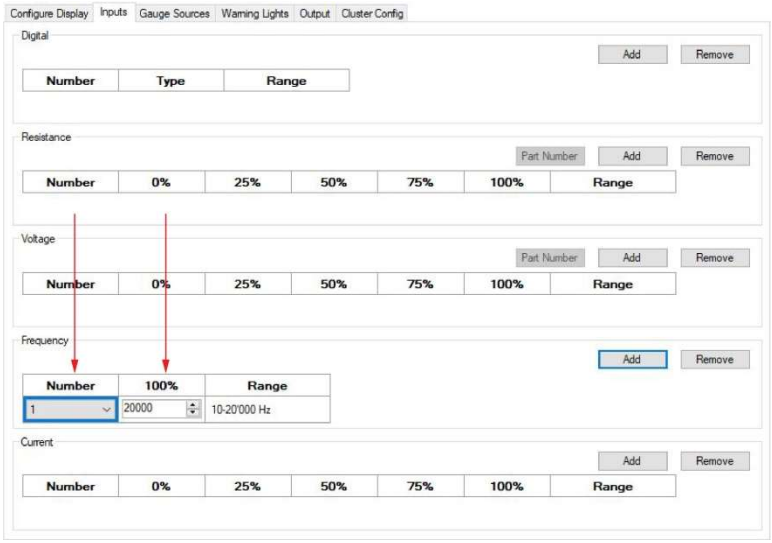


Adding/Removing Frequency Inputs

To add frequency inputs, click on **Add**. If you wish to remove a frequency input, simply click on **Remove**.

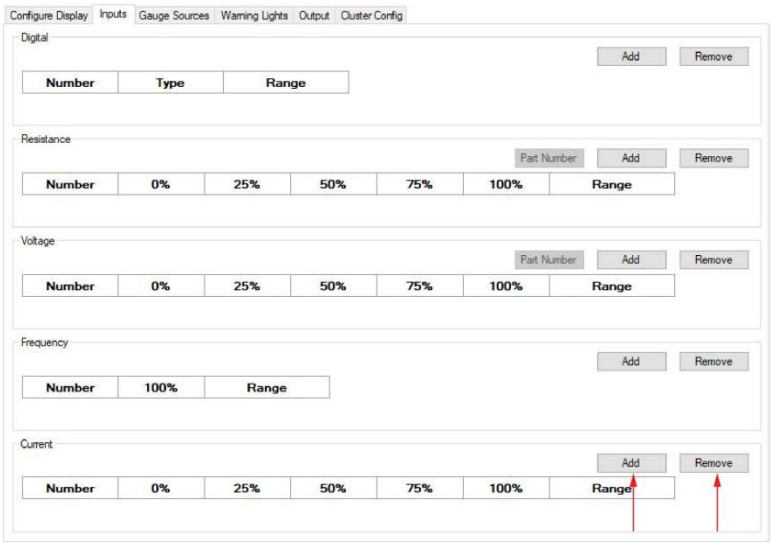


For each frequency input added, select the input number to apply it to, then set the max frequency value.

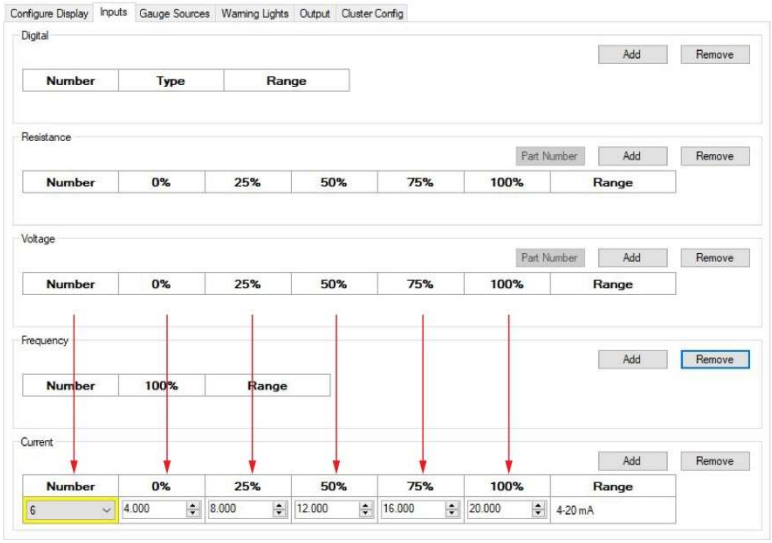


Adding/Removing Current Input

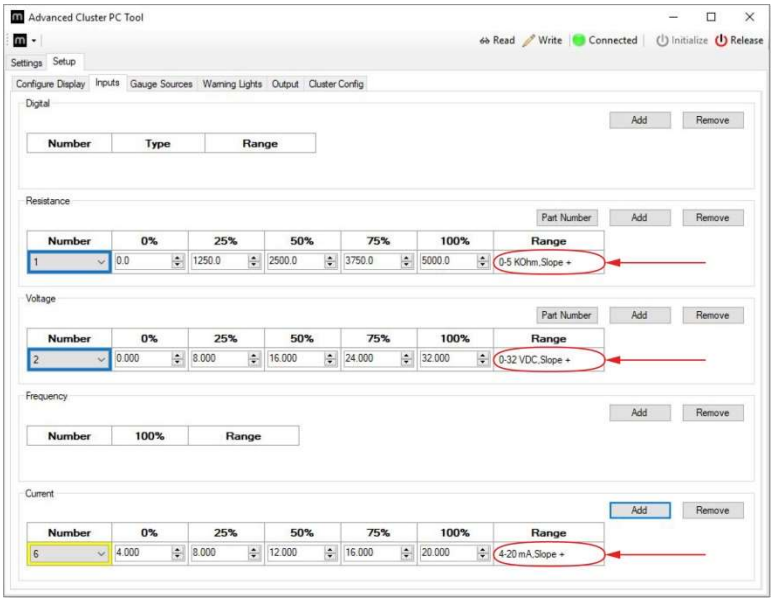
To add current input, click on **Add**. If you wish to remove a current input, simply click on **Remove**.



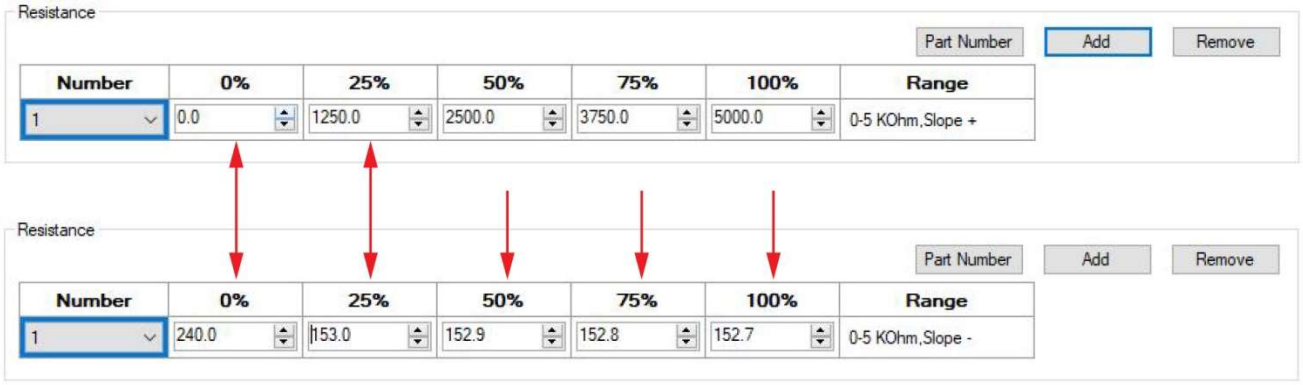
Current input is not selectable as it will always be input 6. Set the current value at 0%, 25%, 50%, 75%, and 100%.



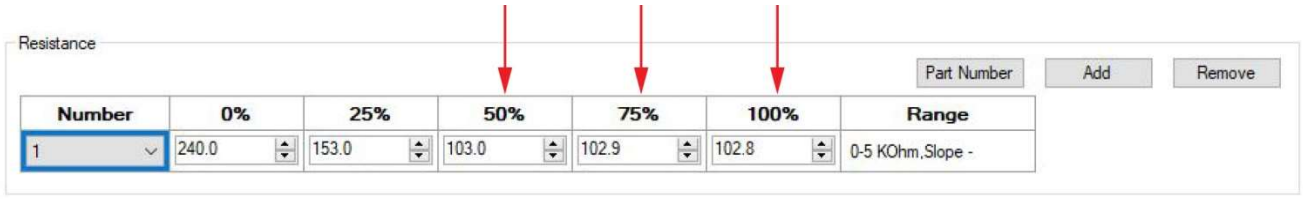
When setting up **Resistance**, **Voltage**, and **Current** inputs, the allowable range and current slope of the curve is indicated under **Range**. The slope information will automatically change when the values are adjusted.



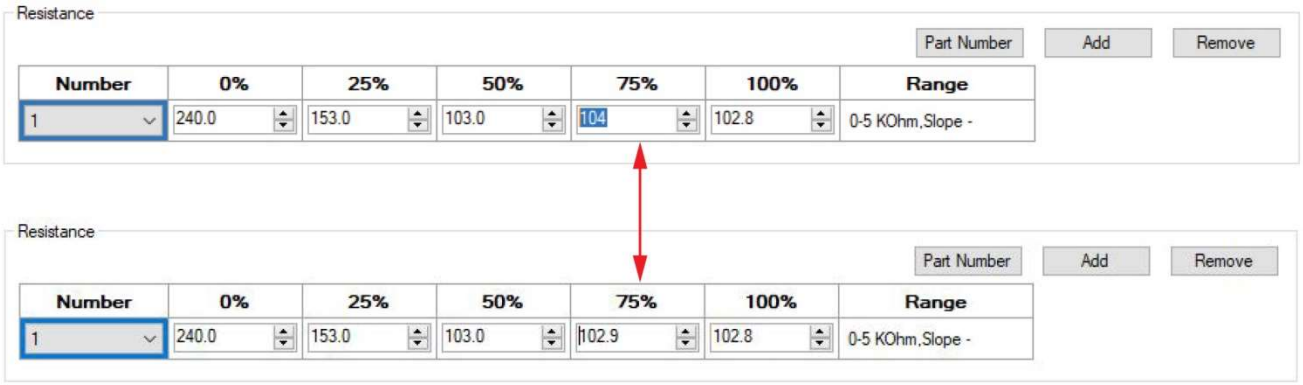
The first two values set the slope for the curve. Subsiquent values will automatically change to the next value in order of the curve, respectively.



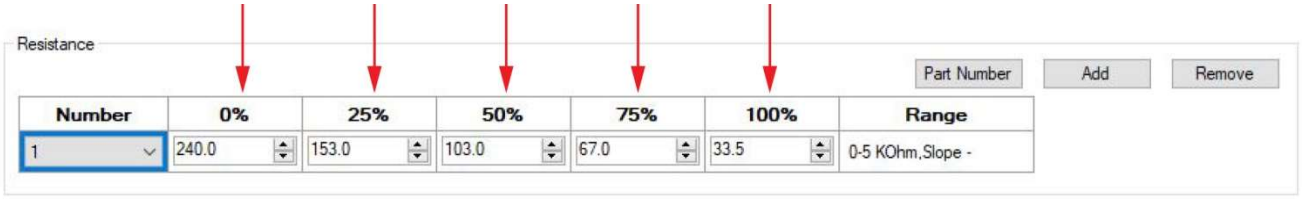
Each time the next value is updated, each subsiquent value will continue to adjust to match the slope set from the first two values.



If a value is attempted to be entered that does not align with the current slope set by the first two values, it will not be accepted, and the value will revert to the next value in line with the current slope.

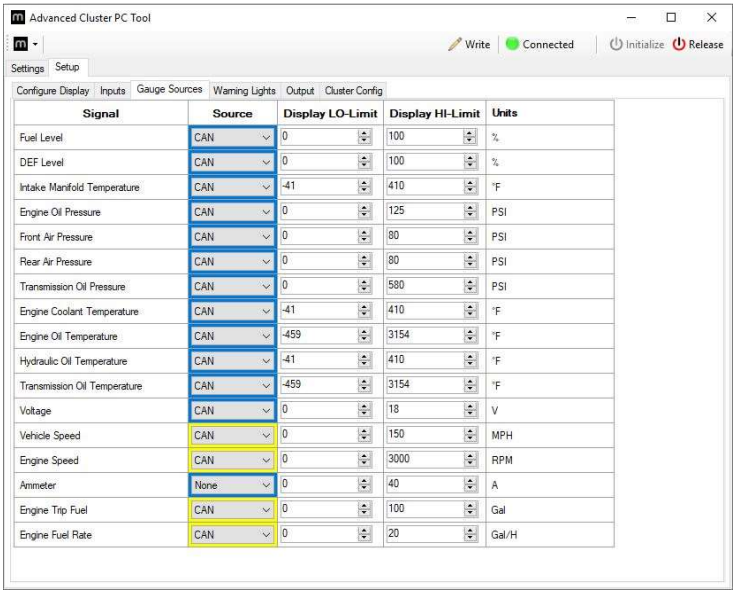


Once all fields are filled with the proper values, the input is ready to be written to the maxAI. The example, shown above, is of a 240-33.5Ω fuel sender.



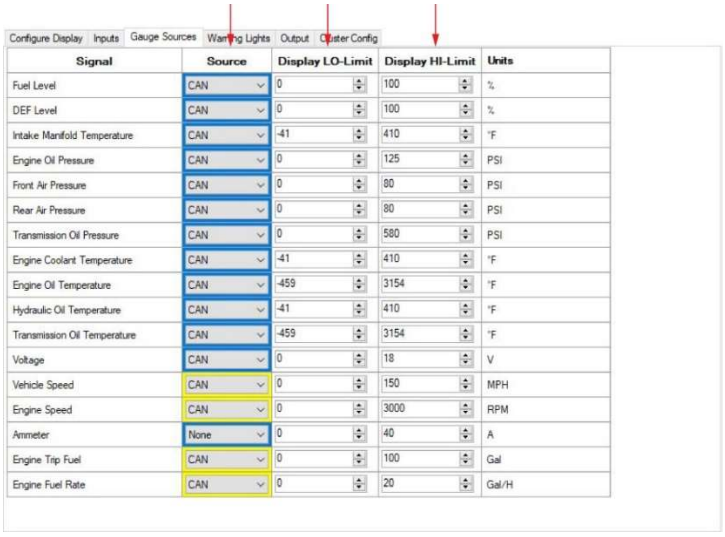
Tab 3 "Gauge Sources"

Each instrument setup under the **Configure Display** tab will require a signal source. This source will be selected under the **Gauge Source** tab. Some instruments, such as **Engine Trip Fuel** and **Engine Fuel Rate** are driven by CAN signal only. These instruments, along with instruments on the list that were not configured to a screen, will not allow source selection. The **Lo-Limit** and **Hi-Limit** to be displayed must also be set under this tab.



Signal	Source	Display LO-Limit	Display HI-Limit	Units
Fuel Level	CAN	0	100	%
DEF Level	CAN	0	100	%
Intake Manifold Temperature	CAN	-41	410	°F
Engine Oil Pressure	CAN	0	125	PSI
Front Air Pressure	CAN	0	80	PSI
Rear Air Pressure	CAN	0	80	PSI
Transmission Oil Pressure	CAN	0	580	PSI
Engine Coolant Temperature	CAN	-41	410	°F
Engine Oil Temperature	CAN	-459	3154	°F
Hydraulic Oil Temperature	CAN	-41	410	°F
Transmission Oil Temperature	CAN	-459	3154	°F
Voltage	CAN	0	18	V
Vehicle Speed	CAN	0	150	MPH
Engine Speed	CAN	0	3000	RPM
Ammeter	None	0	40	A
Engine Trip Fuel	CAN	0	100	Gal
Engine Fuel Rate	CAN	0	20	Gal/H

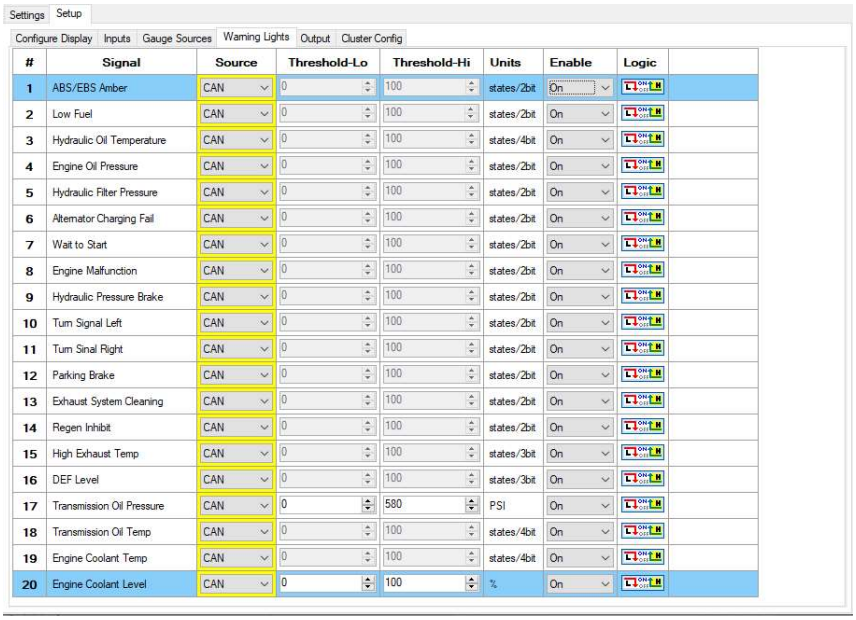
For each instrument selected, select the signal source. This can be CAN signal or one of the input signals set up under the **Inputs** tab. Once the source is selected, set the **Display Lo-Limit** and **Display Hi-Limit** to be shown on each instrument.



Signal	Source	Display LO-Limit	Display HI-Limit	Units
Fuel Level	CAN	0	100	%
DEF Level	CAN	0	100	%
Intake Manifold Temperature	CAN	-41	410	°F
Engine Oil Pressure	CAN	0	125	PSI
Front Air Pressure	CAN	0	80	PSI
Rear Air Pressure	CAN	0	80	PSI
Transmission Oil Pressure	CAN	0	580	PSI
Engine Coolant Temperature	CAN	-41	410	°F
Engine Oil Temperature	CAN	-459	3154	°F
Hydraulic Oil Temperature	CAN	-41	410	°F
Transmission Oil Temperature	CAN	-459	3154	°F
Voltage	CAN	0	18	V
Vehicle Speed	CAN	0	150	MPH
Engine Speed	CAN	0	3000	RPM
Ammeter	None	0	40	A
Engine Trip Fuel	CAN	0	100	Gal
Engine Fuel Rate	CAN	0	20	Gal/H

Tab 4 “Warning Lights”

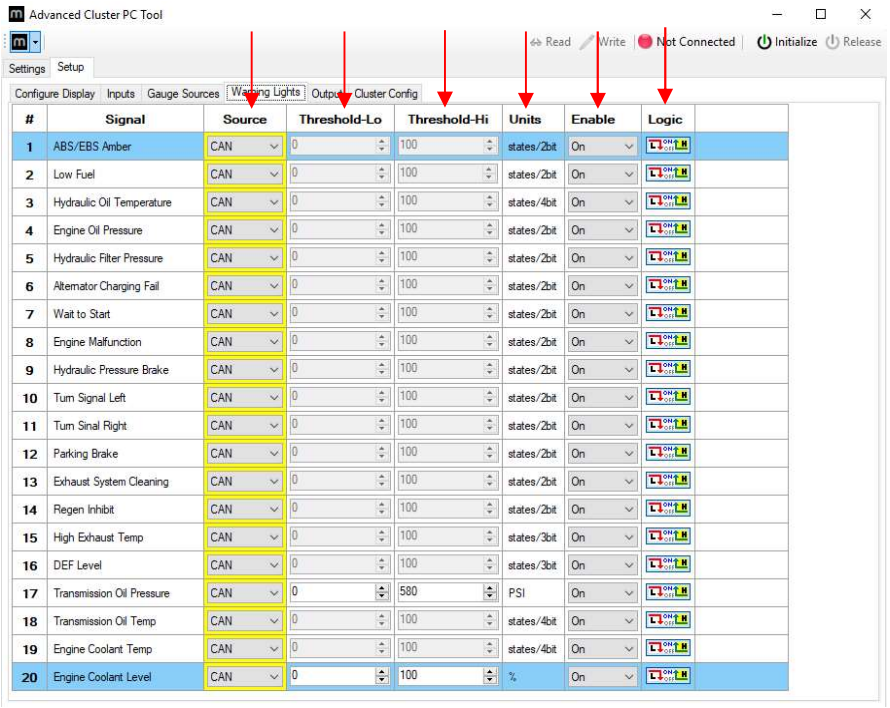
The maxAI 430i and maxAI 430iv are equipped with 20 individual telltale LED warning lights. Similar to the gauge source, warning light signal source will be selected under the **Warning Lights** tab. When units type permits adjustment limits numeric input controls will become **enabled** so it's possible to defined light to respond on desired threshold limits. on regards to lamp 1 and lamp 20, (blue background) those are available depending on customer selected lens layer, standard lens includes 18 icons.



#	Signal	Source	Threshold-Lo	Threshold-Hi	Units	Enable	Logic
1	ABS/EBS Amber	CAN	0	100	states/2bit	On	
2	Low Fuel	CAN	0	100	states/2bit	On	
3	Hydraulic Oil Temperature	CAN	0	100	states/4bit	On	
4	Engine Oil Pressure	CAN	0	100	states/2bit	On	
5	Hydraulic Filter Pressure	CAN	0	100	states/2bit	On	
6	Alternator Charging Fail	CAN	0	100	states/2bit	On	
7	Wait to Start	CAN	0	100	states/2bit	On	
8	Engine Malfunction	CAN	0	100	states/2bit	On	
9	Hydraulic Pressure Brake	CAN	0	100	states/2bit	On	
10	Turn Signal Left	CAN	0	100	states/2bit	On	
11	Turn Sinal Right	CAN	0	100	states/2bit	On	
12	Parking Brake	CAN	0	100	states/2bit	On	
13	Exhaust System Cleaning	CAN	0	100	states/2bit	On	
14	Regen Inhibit	CAN	0	100	states/2bit	On	
15	High Exhaust Temp	CAN	0	100	states/3bit	On	
16	DEF Level	CAN	0	100	states/3bit	On	
17	Transmission Oil Pressure	CAN	0	580	PSI	On	
18	Transmission Oil Temp	CAN	0	100	states/4bit	On	
19	Engine Coolant Temp	CAN	0	100	states/4bit	On	
20	Engine Coolant Level	CAN	0	100	%	On	

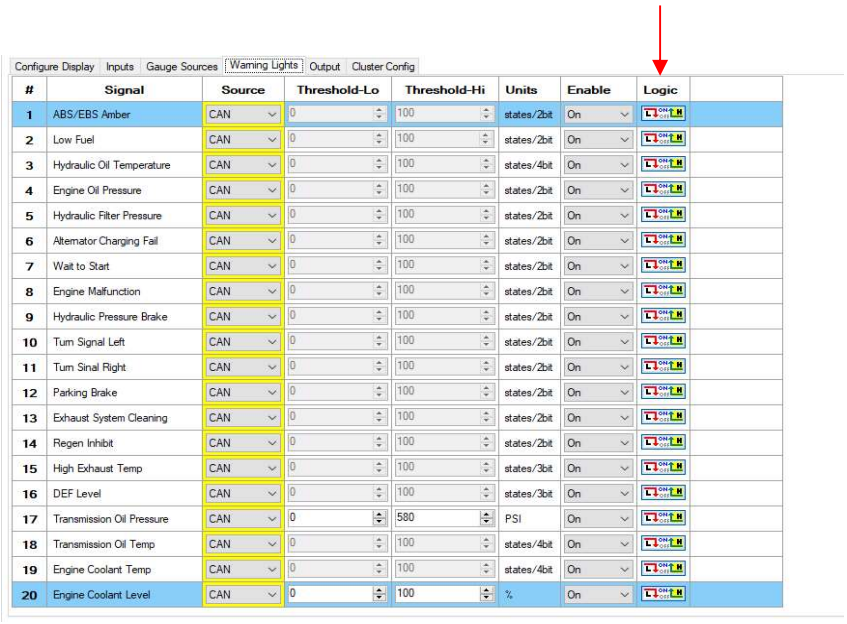
For each warning light, select the signal source. This can be CAN signal or one of the input signals set up under the **Inputs** tab. Once the source is selected you can select limits when units are scalar measured types, status types disable numeric input controls for Threshold limits since ECU resolves when to turn tell tales lights on/off.

- **Threshold-Lo** and **Threshold-Hi** limits to switch lamp when input value reached on this value.
- **Enable** drop box control to select warning light functionality
  - **On** → Light to respond according to signal input
  - **Off** → Light remains off all times "disabled"
  - **On Ign Off** → Light respond to input signal even when ignition is off
- **Logic** button define each lamp behavior as follows:
  - **Threshold-Lo to turn On and Threshold-Hi to turn Off**
  - **Threshold-Lo to turn Off and Threshold-Hi to turn On**



#	Signal	Source	Threshold-Lo	Threshold-Hi	Units	Enable	Logic
1	ABS/EBS Amber	CAN	0	100	states/2bit	On	
2	Low Fuel	CAN	0	100	states/2bit	On	
3	Hydraulic Oil Temperature	CAN	0	100	states/4bit	On	
4	Engine Oil Pressure	CAN	0	100	states/2bit	On	
5	Hydraulic Filter Pressure	CAN	0	100	states/2bit	On	
6	Alternator Charging Fail	CAN	0	100	states/2bit	On	
7	Wait to Start	CAN	0	100	states/2bit	On	
8	Engine Malfunction	CAN	0	100	states/2bit	On	
9	Hydraulic Pressure Brake	CAN	0	100	states/2bit	On	
10	Turn Signal Left	CAN	0	100	states/2bit	On	
11	Turn Sinal Right	CAN	0	100	states/2bit	On	
12	Parking Brake	CAN	0	100	states/2bit	On	
13	Exhaust System Cleaning	CAN	0	100	states/2bit	On	
14	Regen Inhibit	CAN	0	100	states/2bit	On	
15	High Exhaust Temp	CAN	0	100	states/3bit	On	
16	DEF Level	CAN	0	100	states/3bit	On	
17	Transmission Oil Pressure	CAN	0	580	PSI	On	
18	Transmission Oil Temp	CAN	0	100	states/4bit	On	
19	Engine Coolant Temp	CAN	0	100	states/4bit	On	
20	Engine Coolant Level	CAN	0	100	%	On	

The logic function determines how the threshold values will function. **Logic High**  means that the warning light will turn on when the value reaches the high threshold while ascending. The warning light will not turn off until the value reaches the low threshold while descending. Alternately, **Logic Low**  means that the warning light will turn on when the value reaches the low threshold while descending. The warning light will not turn off until the value reaches the high threshold while ascending.



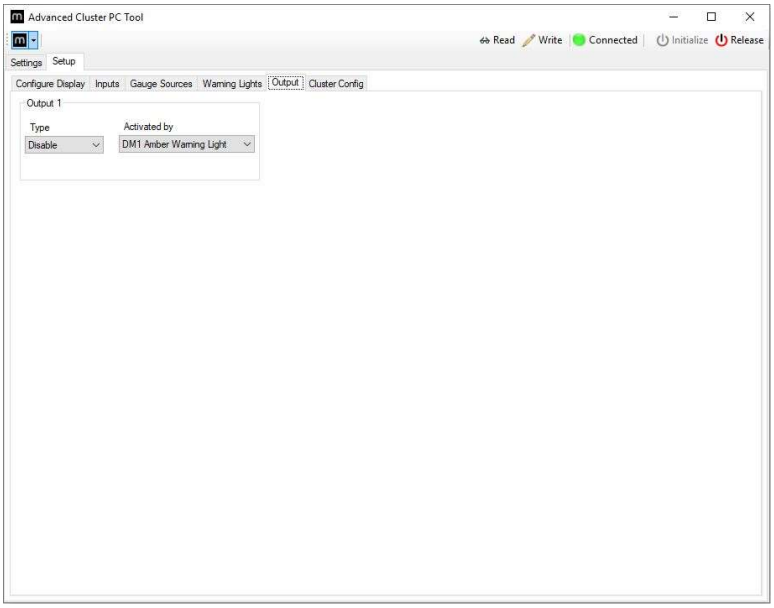
#	Signal	Source	Threshold-Lo	Threshold-Hi	Units	Enable	Logic
1	ABS/EBS Amber	CAN	0	100	states/2bit	On	
2	Low Fuel	CAN	0	100	states/2bit	On	
3	Hydraulic Oil Temperature	CAN	0	100	states/4bit	On	
4	Engine Oil Pressure	CAN	0	100	states/2bit	On	
5	Hydraulic Filter Pressure	CAN	0	100	states/2bit	On	
6	Alternator Charging Fail	CAN	0	100	states/2bit	On	
7	Wait to Start	CAN	0	100	states/2bit	On	
8	Engine Malfunction	CAN	0	100	states/2bit	On	
9	Hydraulic Pressure Brake	CAN	0	100	states/2bit	On	
10	Turn Signal Left	CAN	0	100	states/2bit	On	
11	Turn Sinal Right	CAN	0	100	states/2bit	On	
12	Parking Brake	CAN	0	100	states/2bit	On	
13	Exhaust System Cleaning	CAN	0	100	states/2bit	On	
14	Regen Inhibit	CAN	0	100	states/2bit	On	
15	High Exhaust Temp	CAN	0	100	states/3bit	On	
16	DEF Level	CAN	0	100	states/3bit	On	
17	Transmission Oil Pressure	CAN	0	580	PSI	On	
18	Transmission Oil Temp	CAN	0	100	states/4bit	On	
19	Engine Coolant Temp	CAN	0	100	states/4bit	On	
20	Engine Coolant Level	CAN	0	100	%	On	

Example:

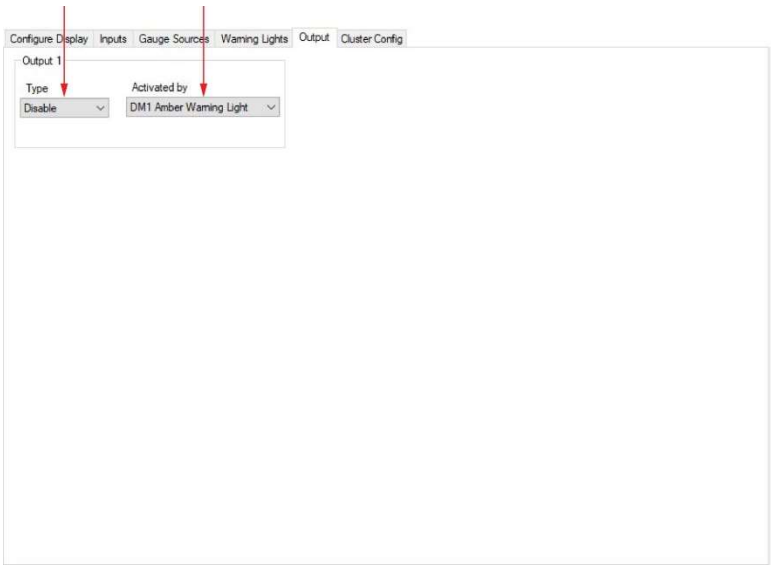
If you wish to set the oil pressure warning light to turn on when the oil pressure goes below 10 PSI, select **Logic Low**  and set **Threshold-Lo** to 10 PSI. The warning light will only come on when oil pressure drops below this value. **Threshold-Hi** is also necessary to set. Once the oil pressure goes back up, the light will not turn back off until the pressure exceeds the value set in **Threshold-Hi.** If this value is set to 15 PSI, the oil pressure warning light will remain on until the oil pressure exceeds 15 PSI.

Tab 5 "Output"

The maxAI 430i is equipped with one digital output. This output can be disabled or set to **Low Side** (switch to ground) or **High Side** (switch to battery**.)** The output is triggered by the CAN **DM1 Amber Warning Light**, **DM1 Stop Light**, or **Either.**

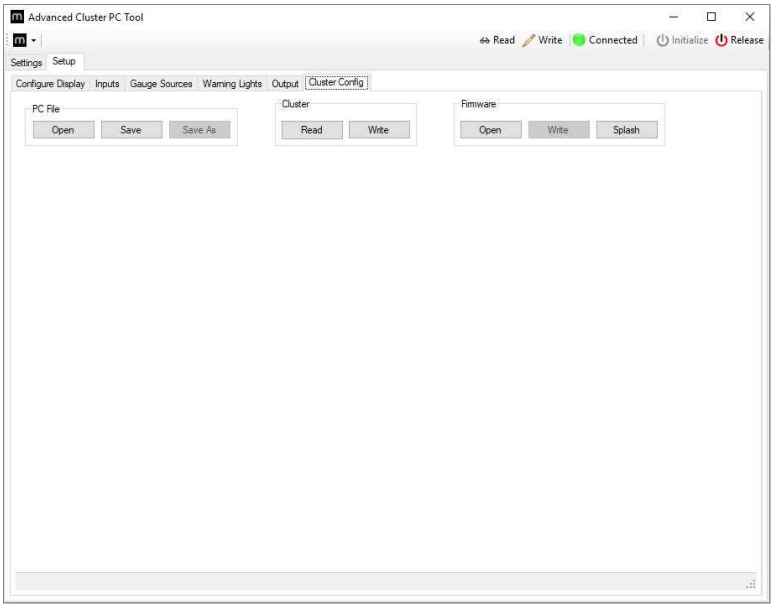


Select the output type and activation type for the digital output.



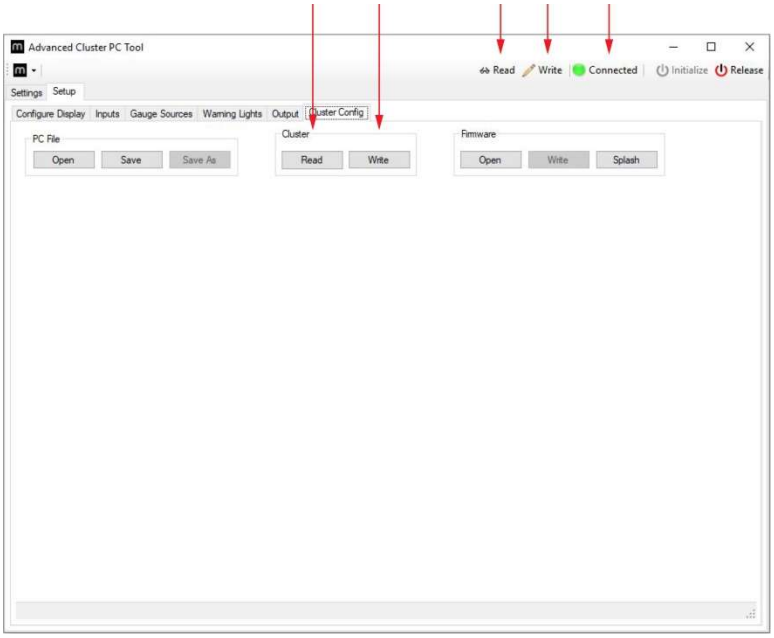
Tab 6 "Cluster Config"

The **Cluster Config** tab allows the user to write the configuration to the maxAI 430. This tab also allows the user to load previously saved configurations, or save the existing configuration for future access.



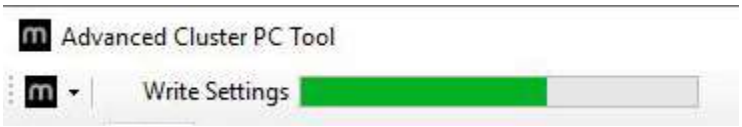
Reading/Writing Cluster Configuration

Before reading or writing the configuration to the maxAI 430 display, confirm that Configuration Software is connected to the maxAI 430 display by looking for a green light at the top of the screen. Once connection is confirmed, click on the **Read** button to read the current cluster configuration or **Write** button to write the new configuration to the cluster. When the configuration transfer begins, the progress will be indicated at the upper left-hand corner of the screen. Writing can also be performed from any screen by selecting **Write** on the bar at the top of the screen.

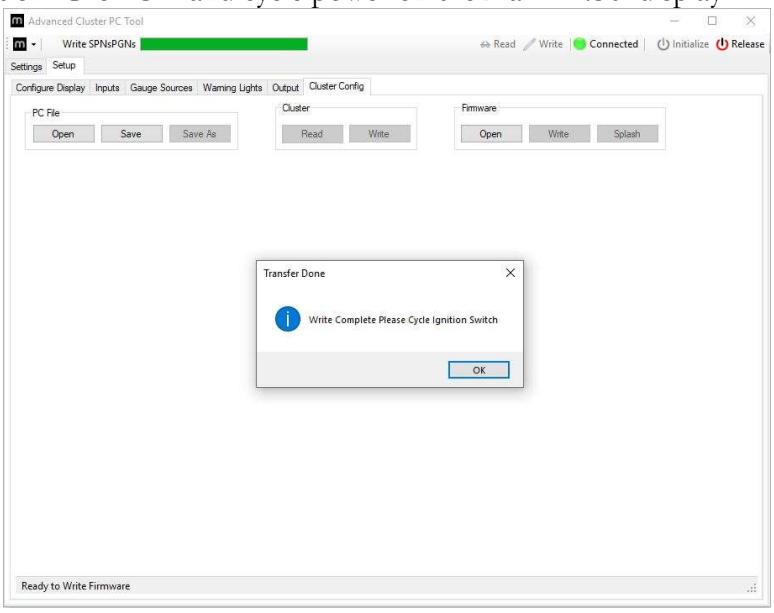


Read Settings indicator.

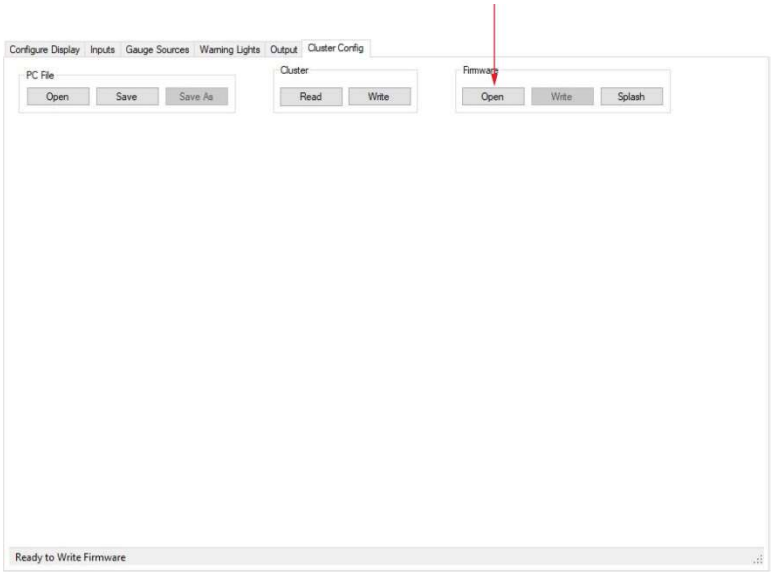
Write Settings indicator .



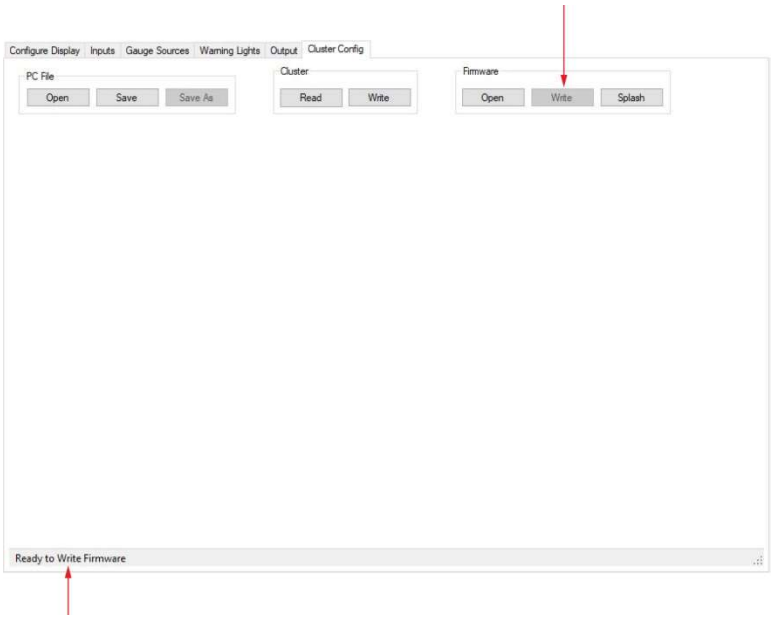
Once the transfer is complete, the Configuration Software will indicate completion with a pop up screen indicating the completion. Click OK and cycle power on the maxAI 430i display.



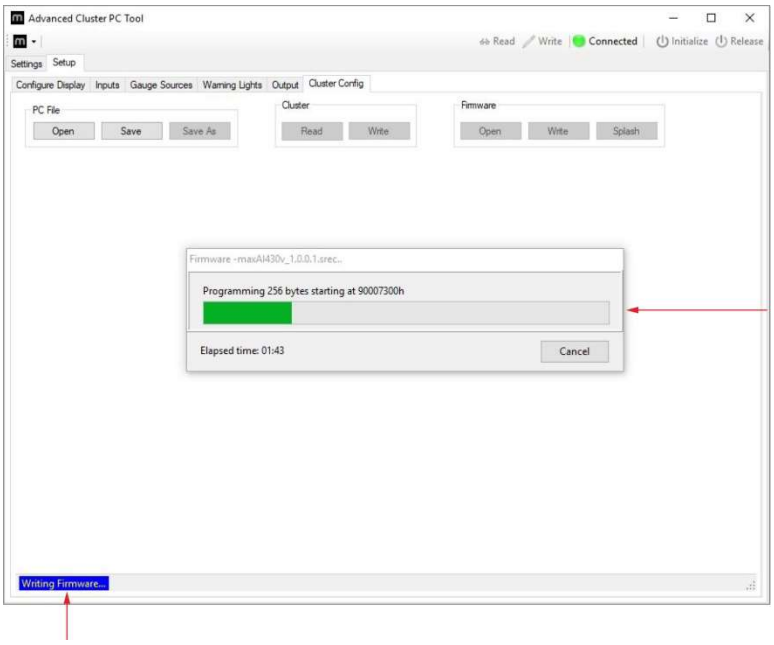
Updating Cluster Firmware



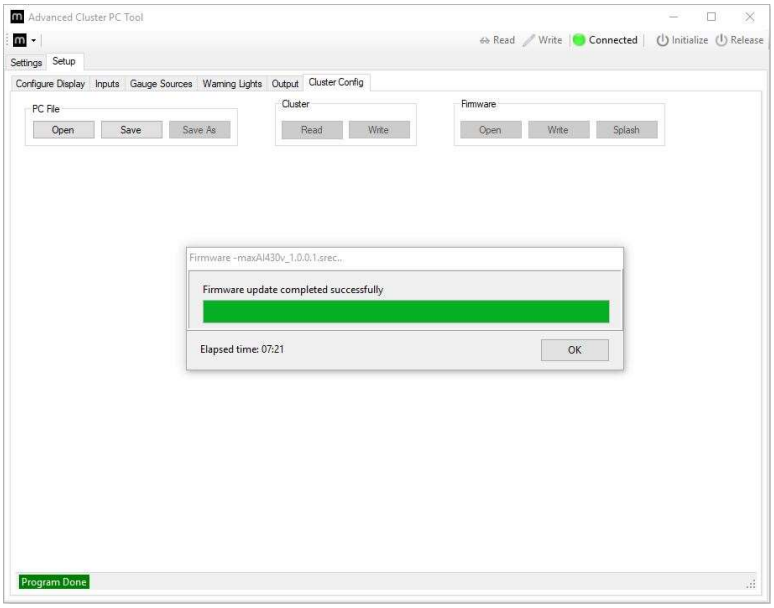
The maxAI 430i firmware can be updated through the **Cluster Config** tab. To update the firmware, select Open and select the firmware file located on an accessible drive.



Once the firmware is selected, it will indicate that the firmware is ready to write in the lower left corner. Select **Write** to begin writing the firmware.



The write process will begin, and progress shown on the progress bar.



Once the firmware is finished writing to the cluster, select **OK** to exit the firmware update.

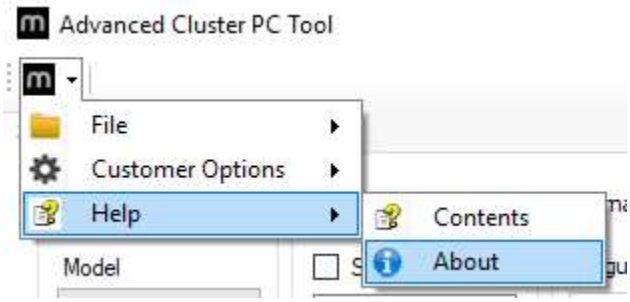
Compatibility Verification

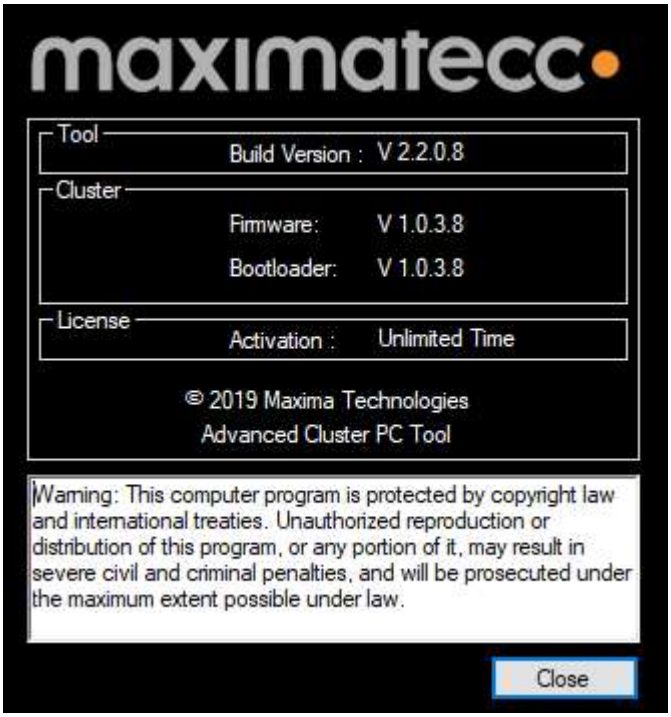
During the Initialization process (when the user clicks on button "Initialize" of the PC Tool), the software will perform a compatibility check to make sure that the PC Tool software version is compatible with the software of the maxAI product.

In case of incompatibility, the PC Tool will display a pop-up message communicating this information to the user and providing instructions to correct this situation.

Software Version

To identify the software version of your PC Tool, click on  button and select **Help → About**





Supported PGNs

The following chart indicates the current list of available PGNs to be set in the Parameters. Functionality is based on broadcast on the CAN bus.

PGN	SPN	SPN Name	Units
256	2985	Transmission Shift Selector Display Mode Switch	states/2bit
256	4255	Transmission Requested Launch Gear	states/4bit
256	681	Transmission Gear Shift Inhibit Request	states/2bit
256	682	Transmission Torque Converter Lockup Request	states/2bit
256	683	Disengage Driveline Request	states/2bit
256	684	Requested Percent Clutch Slip	%
256	685	Disengage Differential Lock Request - Front Axle 1	states/2bit
256	686	Disengage Differential Lock Request - Front Axle 2	states/2bit
256	687	Disengage Differential Lock Request - Rear Axle 1	states/2bit
256	688	Disengage Differential Lock Request - Rear Axle 2	states/2bit
256	689	Disengage Differential Lock Request - Central	states/2bit
256	690	Disengage Differential Lock Request - Central Front	states/2bit
256	691	Disengage Differential Lock Request - Central Rear	states/2bit
256	1852	Transmission Mode 1	states/2bit
256	1853	Transmission Mode 2	states/2bit
256	1854	Transmission Mode 3	states/2bit
256	1855	Transmission Mode 4	states/2bit
256	4242	Transmission Reverse Gear Shift Inhibit Request	states/2bit
256	4246	Transmission Mode 5	states/2bit
256	4247	Transmission Mode 6	states/2bit
256	4248	Transmission Mode 7	states/2bit
256	4249	Transmission Mode 8	states/2bit

PGN	SPN	SPN Name	Units
256	5762	Transmission Load Reduction Inhibit Request	states/2bit
256	7695	Transmission Auto-Neutral (Manual Return) Request	states/2bit
61442	161	Transmission Input Shaft Speed	rpm
61442	191	Transmission Output Shaft Speed	rpm
61442	522	Percent Clutch Slip	%
61442	560	Transmission Driveline Engaged	states/2bit
61442	574	Transmission Shift In Process	states/2bit
61442	4816	Transmission Torque Converter Lockup Transition in Process	states/2bit
61442	573	Transmission Torque Converter Lockup Engaged	states/2bit
61442	606	Engine Momentary Overspeed Enable	states/2bit
61442	607	Progressive Shift Disable	states/2bit
61442	5015	Momentary Engine Maximum Power Enable	states/2bit
61443	29	Accelerator Pedal Position 2	%
61443	91	Accelerator Pedal Position 1	%
61443	558	Accelerator Pedal 1 Low Idle Switch	states/2bit
61443	559	Accelerator Pedal Kickdown Switch	states/2bit
61443	974	Remote Accelerator Pedal Position	%
61443	2970	Accelerator Pedal 2 Low Idle Switch	states/2bit
61443	3357	Actual Maximum Available Engine - Percent Torque	%
61443	5398	Estimated Pumping - Percent Torque	%
61443	92	Engine Percent Load At Current Speed	%
61443	1437	Road Speed Limit Status	states/2bit

PGN	SPN	SPN Name	Units
61443	2979	Vehicle Acceleration Rate Limit Status	states/2bit
61443	5021	Momentary Engine Maximum Power Enable Feedback	states/2bit
61443	5399	DPF Thermal Management Active	states/2bit
61443	5400	SCR Thermal Management Active	states/2bit
61444	190	Engine Speed	rpm
61444	512	Driver's Demand Engine - Percent Torque	%
61444	513	Actual Engine - Percent Torque	%
61444	899	Engine Torque Mode	states/4bit
61444	2432	Engine Demand – Percent Torque	%
61444	4154	Actual Engine - Percent Torque (Fractional)	%
61444	1675	Engine Starter Mode	states/4bit
61445	526	Transmission Actual Gear Ratio	Ratio
61448	1762	Hydraulic Pressure	kPa
61448	1764	Engine Hydraulic Pressure Governor Switch	states/2bit
61448	2599	Fire Apparatus Pump Engagement	states/2bit
61448	6702	Fire Apparatus Okay To Pump Interlock	states/2bit
61448	6703	Hydraulic Pressure Governor Increase Switch	states/2bit
61448	6704	Hydraulic Pressure Governor Decrease Switch	states/2bit
61448	6705	Hydraulic Pressure Governor Idle Switch	states/2bit
61448	6706	Hydraulic Pressure Governor Preset Switch	states/2bit
61448	6707	Hydraulic Intake Pressure	MPa
61448	6708	Hydraulic Discharge Pressure Set Point	kPa

PGN	SPN	SPN Name	Units
61448	1763	Engine Hydraulic Pressure Governor Mode Indicator	states/2bit
61709	6885	Engine Fuel Valve 2 Differential Pressure	kPa
64774	1847	Hill Holder Lamp Command	states/2bit
64774	5087	Vehicle Battery Voltage Low Lamp Command	states/2bit
64774	5088	Vehicle Fuel Level Low Lamp Command	states/2bit
64774	5089	Vehicle Air Pressure Low Lamp Command	states/2bit
64774	5090	Vehicle HVAC Recirculation Lamp Command	states/2bit
64774	5091	Vehicle Battery Charging Lamp Command	states/2bit
64775	3987	Compression Brake Enable Switch Indicator Lamp Command	states/2bit
64775	5077	Engine Protect Lamp Command	states/2bit
64775	5078	Engine Amber Warning Lamp Command	states/2bit
64775	5079	Engine Red Stop Lamp Command	states/2bit
64775	5080	OBD Malfunction Indicator Lamp Command	states/2bit
64775	5081	Engine Brake Active Lamp Command	states/2bit
64775	5082	Engine Oil Pressure Low Lamp Command	states/2bit
64775	5083	Engine Coolant Temperature High Lamp Command	states/2bit
64775	5084	Engine Coolant Level Low Lamp Command	states/2bit
64775	5085	Engine Idle Management Active Lamp Command	states/2bit
64775	5086	Engine Air Filter Restriction Lamp Command	states/2bit
64775	5469	Engine Fuel Filter Restricted Lamp Command	states/2bit
64775	6205	Engine Control Module 1 Ready for Use Lamp Command	states/2bit
64775	6206	Engine Control Module 2 Ready for Use Lamp Command	states/2bit

PGN	SPN	SPN Name	Units
64775	6207	Engine Control Module 3 Ready for Use Lamp Command	states/2bit
64775	6709	Engine Speed High Lamp Command	states/2bit
64775	6710	Engine Speed Very High Lamp Command	states/2bit
64775	6899	Vehicle Acceleration Rate Limit Lamp Command	states/2bit
64891	3719	Aftertreatment 1 Diesel Particulate Filter Soot Load Percent	%
64891	3720	Aftertreatment 1 Diesel Particulate Filter Ash Load Percent	%
64891	5466	Aftertreatment 1 Diesel Particulate Filter Soot Load Regeneration Threshold	%
64892	3711	Diesel Particulate Filter Active Regeneration Inhibited Due to Low Exhaust Temperature	states/2bit
64892	3715	Diesel Particulate Filter Active Regeneration Inhibited Due to Permanent System Lockout	states/2bit
64892	3697	Diesel Particulate Filter Lamp Command	states/3bit
64892	3698	Exhaust System High Temperature Lamp Command	states/3bit
64892	3699	Aftertreatment Diesel Particulate Filter Passive Regeneration Status	states/2bit
64892	3700	Aftertreatment Diesel Particulate Filter Active Regeneration Status	states/2bit
64892	3701	Aftertreatment Diesel Particulate Filter Status	states/3bit
64892	3702	Diesel Particulate Filter Active Regeneration Inhibited Status	states/2bit
64892	3703	Diesel Particulate Filter Active Regeneration Inhibited Due to Inhibit Switch	states/2bit
64892	3704	Diesel Particulate Filter Active Regeneration Inhibited Due to Clutch Disengaged	states/2bit
64892	3705	Diesel Particulate Filter Active Regeneration Inhibited Due to Service Brake Active	states/2bit
64892	3706	Diesel Particulate Filter Active Regeneration Inhibited Due to PTO Active	states/2bit
64892	3707	Diesel Particulate Filter Active Regeneration Inhibited Due to Accelerator Pedal Off Idle	states/2bit
64892	3708	Diesel Particulate Filter Active Regeneration Inhibited Due to Out of Neutral	states/2bit
64892	3709	Diesel Particulate Filter Active Regeneration Inhibited Due to Vehicle Speed Above Allowed Speed	states/2bit

PGN	SPN	SPN Name	Units
64892	3710	Diesel Particulate Filter Active Regeneration Inhibited Due to Parking Brake Not Set	states/2bit
64892	3712	Diesel Particulate Filter Active Regeneration Inhibited Due to System Fault Active	states/2bit
64892	3713	Diesel Particulate Filter Active Regeneration Inhibited Due to System Timeout	states/2bit
64892	3714	Diesel Particulate Filter Active Regeneration Inhibited Due to Temporary System Lockout	states/2bit
64892	3716	Diesel Particulate Filter Active Regeneration Inhibited Due to Engine Not Warmed Up	states/2bit
64892	3717	Diesel Particulate Filter Active Regeneration Inhibited Due to Vehicle Speed Below Allowed Speed	states/2bit
64892	3718	Diesel Particulate Filter Automatic Active Regeneration Initiation Configuration	states/2bit
64892	3750	Aftertreatment 1 Diesel Particulate Filter Conditions Not Met for Active Regeneration	states/2bit
64892	4175	Diesel Particulate Filter Active Regeneration Forced Status	states/3bit
64892	5504	Hydrocarbon Doser Purging Enable	states/2bit
64892	5629	Diesel Particulate Filter Active Regeneration Inhibited Due to Low Exhaust Pressure	states/2bit
64892	8857	Diesel Particulate Filter Active Regeneration Availability Status	states/2bit
64947	3245	Aftertreatment 1 Exhaust Temperature 3	°C
64947	3246	Aftertreatment 1 Diesel Particulate Filter Outlet Temperature	°C
64948	3241	Aftertreatment 1 Exhaust Temperature 1	°C
64948	3242	Aftertreatment 1 Diesel Particulate Filter Intake Temperature	°C
64998	2580	Hydraulic Brake Pressure Circuit 1	kPa
64998	2581	Hydraulic Brake Pressure Circuit 2	kPa
64998	2582	Hydraulic Brake Pressure Supply State Circuit 1	states/2bit
64998	2583	Hydraulic Brake Pressure Supply State Circuit 2	states/2bit
64998	2584	Hydraulic Brake Pressure Warning State Circuit 1	states/2bit
64998	2585	Hydraulic Brake Pressure Warning State Circuit 2	states/2bit

PGN	SPN	SPN Name	Units
64998	2931	Hydraulic Brake Fluid Level Switch	states/2bit
64998	2930	Hydraulic Brake System Audible Warning Command	states/2bit
65089	2347	High Beam Head Light Command	states/2bit
65089	2349	Low Beam Head Light Command	states/2bit
65089	2351	Alternate Beam Head Light Command	states/2bit
65089	2353	Tractor Front Low Mounted Work Lights Command	states/2bit
65089	2355	Tractor Front High Mounted Work Lights Command	states/2bit
65089	2357	Tractor Underside Mounted Work Lights Command	states/2bit
65089	2359	Tractor Rear Low Mounted Work Lights Command	states/2bit
65089	2361	Tractor Rear High Mounted Work Lights Command	states/2bit
65089	2363	Tractor Side Low Mounted Work Lights Command	states/2bit
65089	2365	Tractor Side High Mounted Work Lights Command	states/2bit
65089	2367	Left Turn Signal Lights Command	states/2bit
65089	2369	Right Turn Signal Lights Command	states/2bit
65089	2371	Left Stop Light Command	states/2bit
65089	2373	Right Stop Light Command	states/2bit
65089	2375	Center Stop Light Command	states/2bit
65089	2377	Tractor Marker Light Command	states/2bit
65089	2379	Implement Marker Light Command	states/2bit
65089	2381	Tractor Clearance Light Command	states/2bit
65089	2383	Implement Clearance Light Command	states/2bit
65089	2385	Rotating Beacon Light Command	states/2bit

PGN	SPN	SPN Name	Units
65089	2387	Tractor Front Fog Lights Command	states/2bit
65089	2389	Rear Fog Light Command	states/2bit
65089	2391	Back Up Light and Alarm Horn Command	states/2bit
65089	2393	Lighting Data Request Command	states/2bit
65089	2395	Implement OEM Option 1 Light Command	states/2bit
65089	2397	Implement OEM Option 2 Light Command	states/2bit
65089	2399	Implement Left Facing Work Light Command	states/2bit
65089	2401	Implement Right Forward Work Light Command	states/2bit
65089	2403	Running Light Command	states/2bit
65089	2405	Implement Rear Work Light Command	states/2bit
65089	2406	Implement Right Facing Work Light Command	states/2bit
65089	2597	Implement Left Forward Work Light Command	states/2bit
65110	1761	Aftertreatment 1 Diesel Exhaust Fluid Tank Volume	%
65110	3031	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature 1	°C
65110	3363	Aftertreatment 1 Diesel Exhaust Fluid Tank Heater	%
65110	3517	Aftertreatment 1 Diesel Exhaust Fluid Tank Level	mm
65110	5245	Aftertreatment Diesel Exhaust Fluid Tank Low Level Indicator	states/3bit
65110	5246	Aftertreatment SCR Operator Inducement Severity	states/3bit
65128	1638	Hydraulic Temperature	°C
65128	1713	Hydraulic Oil Filter Restriction Switch	states/2bit
65128	1857	Winch Oil Pressure Switch	states/2bit
65128	2602	Hydraulic Oil Level	%

PGN	SPN	SPN Name	Units
65159	1433	Engine Desired Ignition Timing 1	deg
65159	1434	Engine Desired Ignition Timing 2	deg
65159	1435	Engine Desired Ignition Timing 3	deg
65159	1436	Engine Actual Ignition Timing	deg
65164	354	Relative Humidity	%
65164	441	Auxiliary Temperature 1	°C
65164	442	Auxiliary Temperature 2	°C
65164	1387	Auxiliary Pressure #1	kPa
65164	1388	Auxiliary Pressure #2	kPa
65164	3087	Auxiliary Level	mm
65213	1639	Fan Speed	rpm
65213	4211	Hydraulic Fan Motor Pressure	kPa
65213	975	Engine Fan 1 Estimated Percent Speed	%
65213	977	Fan Drive State	states/4bit
65213	4212	Fan Drive Bypass Command Status	%
65237	589	Alternator Speed	rpm
65237	3353	Alternator 1 Status	states/2bit
65237	3354	Alternator 2 Status	states/2bit
65237	3355	Alternator 3 Status	states/2bit
65237	3356	Alternator 4 Status	states/2bit
65248	244	Trip Distance	km
65248	245	Total Vehicle Distance	km

PGN	SPN	SPN Name	Units
65252	591	Engine Idle Shutdown Timer Function	states/2bit
65252	605	Refrigerant High Pressure Switch	states/2bit
65252	875	Refrigerant Low Pressure Switch	states/2bit
65252	985	A/C High Pressure Fan Switch	states/2bit
65252	2812	Engine Overspeed Test	states/2bit
65252	2815	Engine Alarm Acknowledge	states/2bit
65252	8159	Engine Oil Pressure Switch	states/2bit
65252	590	Engine Idle Shutdown Timer State	states/2bit
65252	592	Engine Idle Shutdown Timer Override	states/2bit
65252	593	Engine Idle Shutdown has Shutdown Engine	states/2bit
65252	594	Engine Idle Shutdown Driver Alert Mode	states/2bit
65252	1081	Engine Wait to Start Lamp	states/2bit
65252	1107	Engine Protection System Timer State	states/2bit
65252	1108	Engine Protection System Timer Override	states/2bit
65252	1109	Engine Protection System Approaching Shutdown	states/2bit
65252	1110	Engine Protection System has Shutdown Engine	states/2bit
65252	1111	Engine Protection System Configuration	states/2bit
65252	2813	Engine Air Shutoff Command Status	states/2bit
65252	2814	Engine Alarm Output Command Status	states/2bit
65252	3667	Engine Air Shutoff Status	states/2bit
65252	5404	PTO Shutdown has Shutdown Engine	states/2bit
65252	5566	Coolant Level Engine Protection Shutdown Status	states/2bit

PGN	SPN	SPN Name	Units
65253	249	Engine Total Revolutions	r
65257	182	Engine Trip Fuel	l
65257	250	Engine Total Fuel Used	l
65262	52	Engine Intercooler Temperature	°C
65262	110	Engine Coolant Temperature	°C
65262	174	Engine Fuel 1 Temperature 1	°C
65262	175	Engine Oil Temperature 1	°C
65262	176	Engine Turbocharger 1 Oil Temperature	°C
65262	1134	Engine Charge Air Cooler Thermostat Opening	%
65263	22	Engine Extended Crankcase Blow-by Pressure	kPa
65263	94	Engine Fuel Delivery Pressure	kPa
65263	98	Engine Oil Level	%
65263	100	Engine Oil Pressure	kPa
65263	101	Engine Crankcase Pressure 1	kPa
65263	109	Engine Coolant Pressure 1	kPa
65263	111	Engine Coolant Level 1	%
65265	69	Two Speed Axle Switch	states/2bit
65265	70	Parking Brake Switch	states/2bit
65265	84	Wheel-Based Vehicle Speed	km/h
65265	86	Cruise Control Set Speed	km/h
65265	595	Cruise Control Active	states/2bit
65265	596	Cruise Control Enable Switch	states/2bit

PGN	SPN	SPN Name	Units
65265	597	Brake Switch	states/2bit
65265	598	Clutch Switch	states/2bit
65265	599	Cruise Control Set Switch	states/2bit
65265	600	Cruise Control Coast (Decelerate) Switch	states/2bit
65265	601	Cruise Control Resume Switch	states/2bit
65265	602	Cruise Control Accelerate Switch	states/2bit
65265	966	Engine Diagnostic Test Mode Switch	states/2bit
65265	967	Engine Idle Decrement Switch	states/2bit
65265	968	Engine Idle Increment Switch	states/2bit
65265	1237	Engine Shutdown Override Switch	states/2bit
65265	1633	Cruise Control Pause Switch	states/2bit
65265	527	Cruise Control States	states/3bit
65265	3807	Park Brake Release Inhibit Request	states/2bit
65266	51	Engine Throttle Valve 1 Position 1	%
65266	183	Engine Fuel Rate	l/h
65266	184	Engine Instantaneous Fuel Economy	km/L
65266	185	Engine Average Fuel Economy	km/L
65266	3673	Engine Throttle Valve 2 Position	%
65269	79	Road Surface Temperature	°C
65269	108	Barometric Pressure	kPa
65269	170	Cab Interior Temperature	°C
65269	171	Ambient Air Temperature	°C

PGN	SPN	SPN Name	Units
65269	172	Engine Intake 1 Air Temperature	°C
65270	81	Aftertreatment 1 Diesel Particulate Filter Intake Pressure (use SPN 3609)	kPa
65270	102	Engine Intake Manifold #1 Pressure	kPa
65270	105	Engine Intake Manifold 1 Temperature	°C
65270	106	Engine Intake Air Pressure	kPa
65270	107	Engine Air Filter 1 Differential Pressure	kPa
65270	112	Engine Coolant Filter Differential Pressure	kPa
65270	173	Engine Exhaust Temperature	°C
65271	114	SLI Battery 1 Net Current	A
65271	115	Alternator Current	A
65271	158	Key Switch Battery Potential	V
65271	167	Charging System Potential (Voltage)	V
65271	168	Battery Potential / Power Input 1	V
65272	123	Clutch Pressure	kPa
65272	124	Transmission Oil Level 1	%
65272	126	Transmission Filter Differential Pressure	kPa
65272	127	Transmission Oil Pressure	kPa
65272	177	Transmission Oil Temperature 1	°C
65272	3027	Transmission Oil Level 1 High / Low	l
65272	3028	Transmission Oil Level 1 Countdown Timer	states/4bit
65272	3026	Transmission Oil Level 1 Measurement Status	states/4bit
65274	116	Brake Application Pressure	kPa

PGN	SPN	SPN Name	Units
65274	117	Brake Primary Pressure	kPa
65274	118	Brake Secondary Pressure	kPa
65274	619	Parking Brake Actuator	states/2bit
65274	3808	Park Brake Release Inhibit Status	states/2bit
65274	3557	Parking Brake Red Warning Signal	states/2bit
65276	38	Fuel Level 2	%
65276	80	Washer Fluid Level	%
65276	95	Engine Fuel Filter Differential Pressure	kPa
65276	96	Fuel Level 1	%
65276	99	Engine Oil Filter Differential Pressure	kPa
65276	169	Cargo Ambient Temperature	°C
65276	7471	Engine Oil Filter Differential Pressure (Extended Range)	kPa

Gauge Abbreviations

Abbreviation	Gauge Type
Fuel1	Fuel Level
DEF Level	DEF Level
IntakeMan	Engine Intake Manifold Temperature
EngOil	Engine Oil Pressure
BrakeSec	Secondary Brake Pressure
BrakePri	Primary Brake Pressure
TransOil	Transmission Oil Pressure
EngCoolant	Engine Coolant Temperature
EngOil1	Engine Oil Temperature
AuxTemp1	
TransOil1	Transmission Oil Temperature
BatteryP1	Battery Voltage
VehSpeed	Vehicle Speed
EngSpeed	Engine Speed (RPM)
Ammeter	Ammeter
EnTripFuel	Trip Fuel Consumption
EngFRate	Current Fuel Economy

Troubleshooting Guide

- How to reset Cluster to Factory Defaults?

  Tool starts on factory defaults, to reset cluster to factory defaults connect to cluster then write configuration to cluster.

- During transfer configuration Tool is showing a popup message “USB Communication Failure During Configuration Transfer”:

  1. Check correct cable connection during transferring.
  2. Cycle power to maxAI Cluster

- During Flashing process Tool is displaying a popup message “Cluster does not respond command to enter bootloader”:

  1. Cluster is ready and waiting to receive firmware update, from previous suspended update task.
  2. Cluster is not confirming “Enter Bootloader Command” reset Cluster to then retry.
  3. Cluster cleared key and is entering to a corrupted application, force to enter bootloader by holding down the front keypad buttons and then at the same time cycling power to ignition switch to ON Position.

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