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Display Panel Standard

DPS70 Configuration Tool

User Guide

ENGINEERING YOUR SUCCESS.

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Contents

Revision History

The following table provides an overview of the changes made to this document over the course of its publication history.

Rev #	Description of Change	Author	Date
01	Initial release	Rick Yorke	Jan. 15, 2019
02	Added diagrams and edits	Norm Benes	Feb. 28, 2019
03	Manual Formatted for Release	RH Blake	March 26, 2019
04	Edits based on Initial Review	RH Blake	April 12, 2019
05	Edits based on 2nd Review	RH Blake	May 6, 2019
06	Edits based on 3rd review; Section Numbers Added, Removal of CAN Bus 3 References	RH Blake	May 7, 2019
07	Update Revision Table and Publish	Ken Larsen	May 31 2019
08	Added font details to language support section	Kirk Lola	July 7, 2020

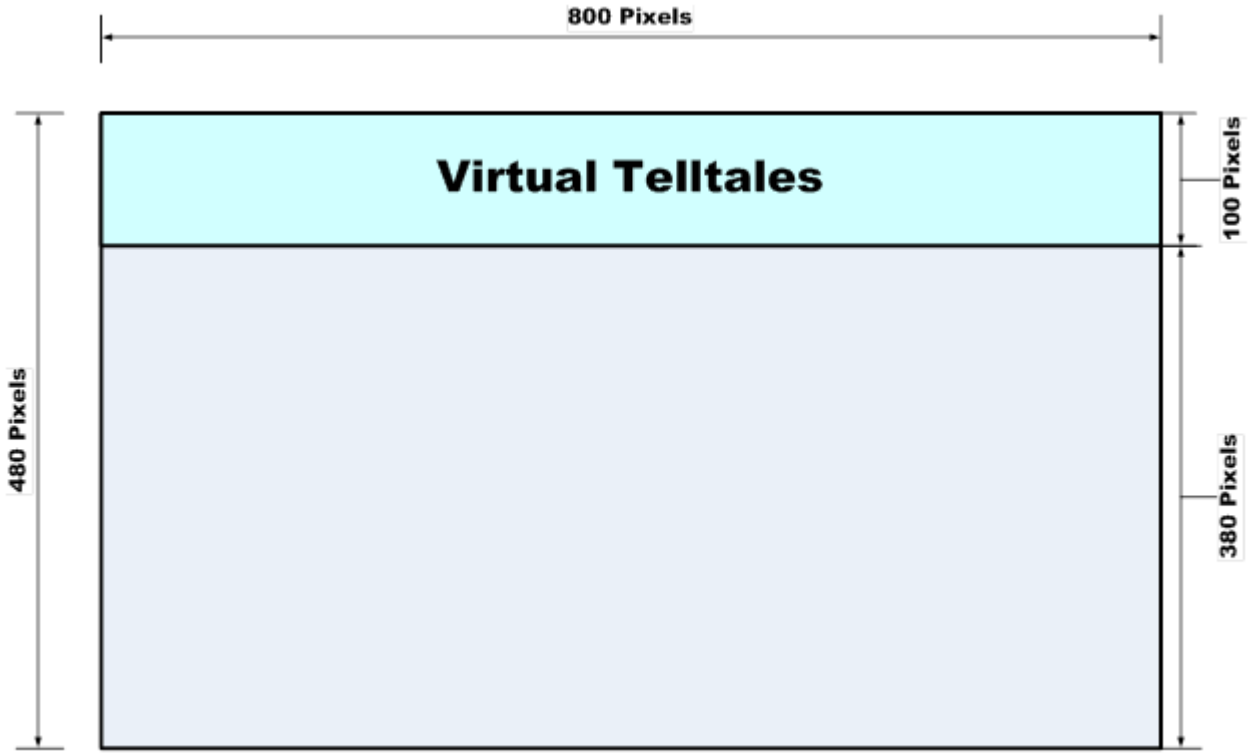
1. Overview

This document explains to future developers, including the future you, all the necessary steps to follow in order to build a particular configuration.

The DPS70 Configuration Tool uses an Excel 2016 spreadsheet as a template for all the features that are user configurable on the DPS70 cluster. The output of the DPS70 Configuration Tool is a compressed tar file.

The template, configuration tool and application are version sensitive. The correct version of template must be used with the correct configuration tool. Information on what version of template is to be used with a configuration tool can be found in the tools Help – About. Further to this, the application is expecting a specific version of configuration file.

1.1 Screen Details



1.2 References

DPS70 Softward Releases

Date	NeRP 1020627	Configuration Tool 1020695	Spreadsheet	Passwords 1020634/ 1020635	Language Files
Aug 29, 2017	V6.01 Build 1	V6.0.3.1	V6.0.3.1	V1.0.0.2	Language Files
Sept 5, 2017	V6.02 Build 1	V6.2.0.0	V6.2.0.0	V1.0.0.2	Language Files
Sept 21, 2017	V6.03 Build 2	V6.3.0.0	V6.3.0.0	V1.0.0.2	Language Files
Dec 21, 2017	V6.03 Build 3	V6.3.0.1	V6.3.0.1	V1.0.0.2	Language Files
Mar 21, 2018	V6.03 Build 4	V6.3.0.1	V6.3.0.1	V1.0.0.2	Language Files
Apr 23, 2018	V6.04 Build 1	V6.4.0.1	V6.4.0.0	V1.0.0.2	Language Files
Oct 30, 2018	V7.00 Build 2	V7.0.0.0	V7.0.0.0	V1.0.0.3	Language Files
Dec 10, 2018	V7.01 Build 1	V7.0.1.0	V7.0.1.0	V1.0.0.2	Language Files
Jan 9, 2019	V7.01 Build 2	V7.0.1.0	V7.0.1.0	V1.0.0.2	Language Files

DPS70 Release Notes

NeRP – New Release Procedure

NeRP Release	Description
V6.01 Build 1	**Release case 40545** • Case 40846: resolved fixed TT buzzer issues • Case 40726: resolved TPMS icon color issue • Case 40760: The brake wear and TPMS status screen icons are gray when the status messages are in timeout. • Case 40770: resolved an issue where, if an active DTC's Occurrence count changes, the fault icon goes from red to yellow. • Case 40782: changed all tach-o-link text to event logger.
V6.02 Build 1	**Release case 42059** • Case 41684: Added support for TPMS SPN 257 • Changed the dialog strings that inform the user if the install was successful or failed. • Case 42058: make the odometer value available for request on the CAN bus (PGN 0xFEE0).

V6.03 Build 2	**Release case 42188** • Allow the user to customize the bar graphs with images for the gauge background and the bar foreground (including warnings and errors). • Allow the user to enter in no major ticks. • Allow the user to make the bar's background transparent. • Changed the rate limit for virtual gauges from 500 ms to 250 ms to allow a smoother gauge movement. • Resolved an issue on the driver message screen where, if you have an item forced on the screen currently, and then (in the same CAN message) turn it off and turn on another item, the new item will not come up as forced.
V6.03 Build 3	**Release case 45009** • Resolve an issue where CAN 2 baud rate reverts to 250 kbps on a application update. • Cameras controlled via the Video Control 1 and 2 (old reverse and doors open signals) no longer reverse the video view. • Resolved an issue with the VMM-sourced brake wear values. They were mixed up when TPMS was added. • For the PC tool, fixed bug where SA required for VMM-based brake wear. • Cameras controlled by the SOBx messages now update on change of any of the signals. Note that the changes in the spreadsheet are minor and the new template is not needed for the new PC tool.
V6.03 Build 4	**Case 36851** • Resolved an issue where the main Linux app would crash when processing the ladder logic file. The issue turned out to be the libUxpServices update in the last release.
V6.04 Build 1	**Case 47339** • Allow the OEM to customize the brake wear value (used to be only % remaining). • Allow the OEM to customize the J1939 source addresses and CAN bus that each module on the faults screen. • Added the odometer value to log files.

V7.00 Build 1	**Case 49053** • Added support for the Bendix ADAS (Advanced driver-assistance system) system. • Allow virtual gauges to be stack-able (control the height and y-position via the configuration tool). • Delay a startup check to allow more time for processing larger Ladder Logic files. • Allow special virtual telltales to be configurable (Timeouts and DLA Enabled). • Recover when a Ladder Logic file isn't processed properly.
V7.00 Build 2	**Case 46866** • Added a UART timeout to the LPC so that if the transmit timeout, the UART is reset.
V7.01 Build 1	**Case 52813** • Tweaks to ADAS messages • Moved following distance menu item to PinPad screen so driver has easy access. • Resolved issue with co-processor where is would stop sending UART messages to the iMx. Note: Reverted back to older version of password manager (undoing the changes for V7.00 Build 1) since the following distance is no longer under password control (it is always available on the PinPad screen)
V7.01 Build 2	**Case 53135** • ADAS: Resolved issue with stationary object warning not occurring if the following distance was non-0xFF. • ADAS: resolved issue with braking overuse reminder not being shown at the top of the ADAS area. • ADAS: Always prefer seconds to impact, no matter the units. Fallback to feet when no seconds are provided.

2. Computer Setup

To build a configuration, the computer must have the Microsoft Excel 2016 and the Configuration Tool 1020695.exe.

Please see Reference 1.1 for which Configuration Tool 1020695 Version_Vx_x_x_x to use with which NeRP Release.

NOTE: The final output file which will be a TAR.GZ extension, has to be loaded onto a USB Thumb Drive in the Root Directory as the DPS70 does not support Folders.

3. Version Number (Excel tab)

On the “Version Number” tab, you will enter a major, minor and build number.

- Enter Major Version number as a whole number between 0 and 99
- Enter Minor Version number as a whole number between 0 and 99
- Enter Build Number as a whole number between 0 and 255

This number is displayed in the “Version Displayed Preview” cell.
These details will show up on the Software Screen Details.

Major Version	Minor Version	Build Number	Version Displayed Preview
			I/O Config SAMPLE DPS-70_V7000 #.0# Build #

“If the configuration is loaded and acceptable to the application the “Version Displayed Preview” above will be valid. The characters between I/O Config and the Major Version number (# in this case) will be the first 21 characters of the name you give the spreadsheet when you save it (not including the period and filename extension).”

The Configuration Tool is checked by another Tool “1020695_VX_X_X_X”
This Tool will check the integrity of the Configuration Tool and notify the developer of any issues/discrepancies.

Example:

Major Version	Minor Version	Build Number	Version Displayed Preview
99	99	255	I/O Config Save As Name Here 99.99 Build 255

“The Version Displayed Preview is created when the spreadsheet is loaded,
Typical order of operation is:

- Template File is provided
- Rename and Save Template
- Edit Major, Minor and Build Number Versions

If you save it with a new name, you will have to close and re-open the spreadsheet to see the updated name in the preview or change a Major, Minor or Build number to something else and back to refresh the Version Displayed Preview.

4. General Settings (Excel tab)

4.1. Model Source Address

Module Source Address
0x17

This controls which Source Address the VSF file can be downloaded to. This pertains to the Left Side (Physical Gauges) of the cluster. The Left Side of the cluster fixed to Claims Source Address 23 (0x17) on both CAN 1 and CAN 2. If a VSF file is provided, the use of the Flashloader Tool would be required as the front end interface.

4.2. CAN Bus Baud Rate

CAN Bus	Bus Speed (bits/s)
1	250000
2	250000

This selects the Bus Speed (baud rate) for each of the CAN buses. CAN bus 1 is fixed.

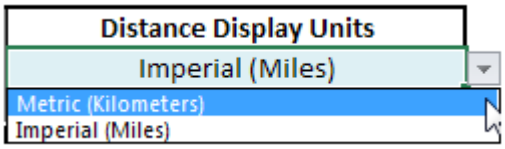
4.3. Screen Background Color

Screen Background Color

Screen Background Color; Enter the HTML color code for this color. The entry can be a hexadecimal value of 6 digits that range from 000000 to FFFFFF (000000 = Black). If left blank, the default color that will be used is 202020. For more information on HTML Color Codes, please visit *www.html-color-codes.info*.

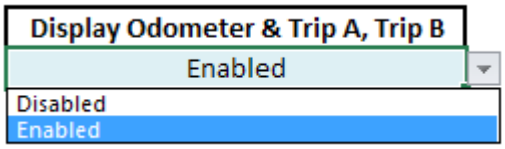
NOTE: when selecting a Screen Background Color, it is recommended to use a darker background as the text is washed out with a lighter background color.

4.4. Distance Display Units



Through the drop down, select which units (Metric – Kilometers or Imperial – Miles) are to be displayed.

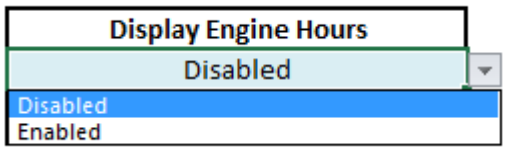
4.5. Display Odometer & Trip A, Trip B



This allows you to enable or disable displaying the Odometer along with both Trip A and Trip B.

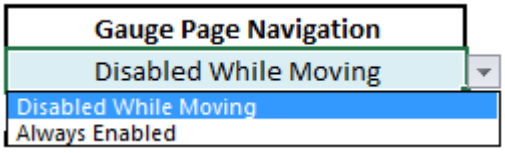
NOTE: The Odometer Value is calculated by the DPS70. It is based on the Cruise Control/ Vehicle Speed (CCVS) PGN 65265 (0xFEF1) Message. The Odometer Value can be requested by any device on the CAN Bus. The Request must be made to PGN 65248 (0xFEE0). To request the Odometer Value from CAN 1, direct the request at Source Address 0xEF. To request the Odometer Value from CAN 2, direct the request at Source Address 0xED.

4.6. Display Engine Hours



This allows you to enable or disable visibility of the Engine Hours on the display. The Engine Hours is a CAN Messages, PGN 65253 (0xFEE5) that is requested from the Engine at an interval once every 30 seconds.

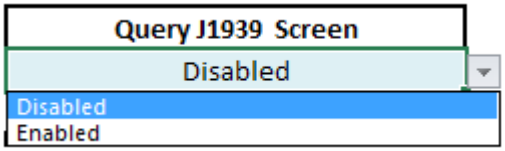
4.7. Gauge Page Navigation



This feature allows the operator to navigate to other screens and they are limited to Gauge Pages and the Driver Messages Center screens. Options are; if enabled the operator can navigate at any time, if disabled it is limited to only when the vehicle is at a standstill.

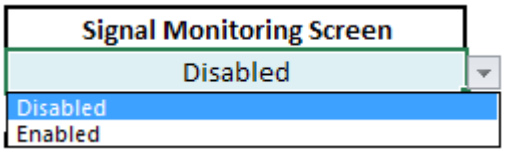
Recommendation is Disabled as you don't want the operator reaching through the steering wheel to navigate while the vehicle is motion.

4.8. Query J1939 Screen



This Enables/Disables an Icon within the Service Menu. The Query J1939 Icon allows a Service Person to query all the J1939 devices on a specific CAN bus. This gives the Service Person the ability to see who is all present on the CAN Bus.

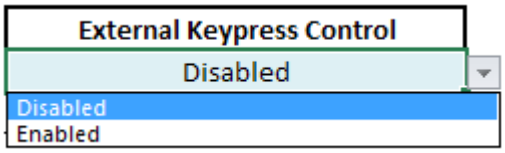
4.9. Signal Monitoring Screen



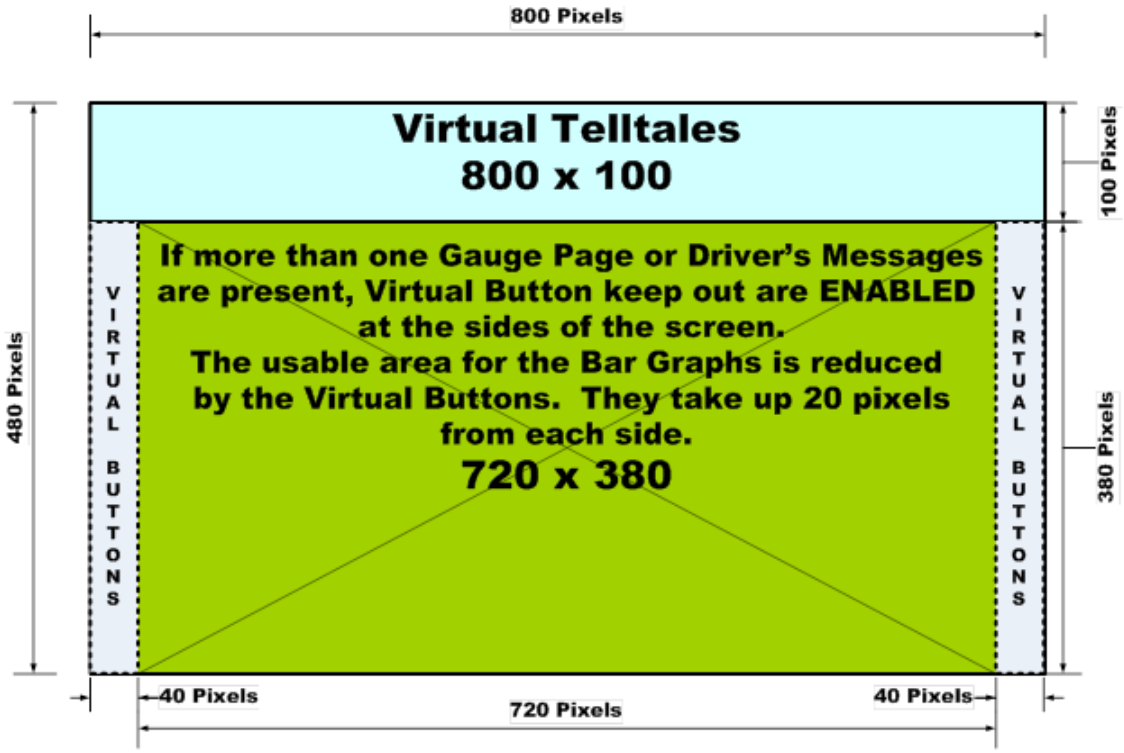
This Enables/Disables an Icon within the Service Menu. PLEASE NOTE: In order to use the Signal Monitoring Screen, a Vector CANalyzer DBC is required to call up the Signals from. A Vector CANalyzer DBC enables a Service Person to view PGNs/SPNs definitions in Real Time on the screen.

To add one or multiple Vector DBC Files, refer to Database heading.

4.10. External Keypress Control



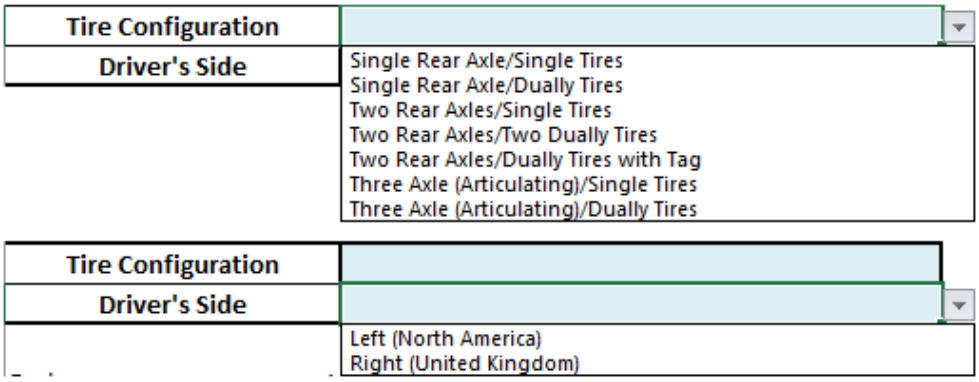
The External Keypress Control is a feature that is tied to when you have multiple Gauge Pages and/or information on the Driver Messages Center screens. If more than one Gauge Page is active or Driver Messages are present, Arrows in the Virtual Buttons area will be visible.



The External Keypress Control is tied to Physical Buttons in a more convenient / remote location. They work the same way as the Virtual Button do on the screen, to be able to navigate to the next/previous screen, however, it is done without the need to reach through the steering wheel.

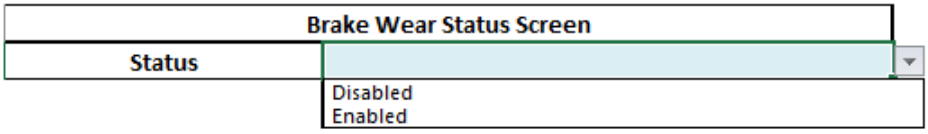
Refer to the VMM Tab in the DPS70 Config Tool – External Button to see how it is set up as a CAN Messages.

4.11. Tire Configuration / Driver's Side

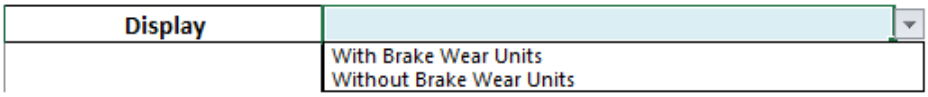


The Tire Configuration and Driver's Side menus are related to one another. These set up the vehicle's Tire/Axle Configuration and Driver's seating position. As an example, the Tire Configuration sets up how many Tires there are per axle. The Driver's Side is to define what the Driver's seating position is, Left or Right Hand Drive. With these 2 details set, this is then used create a picture of what the bus looks like from a top down view in the Brake Wear Status and TPMS Status Screens.

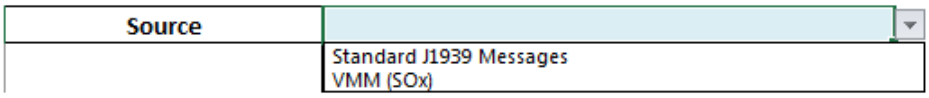
4.12. Brake Wear Status Screen



Enables/Disables the Brake Wear Status Screen



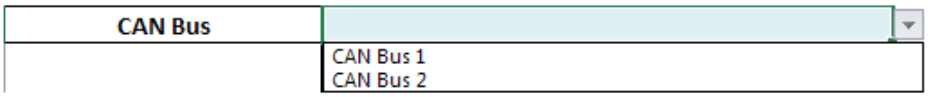
Select With/Without Brake Wear Units



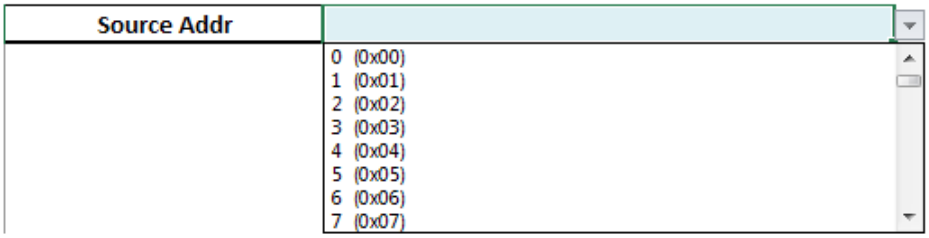
Select where the messages originate from, Standard J1939 Messages or VMM (SOx). Standard J1939 Message use PGN 65196 (0x00FEAC).

VMM (Sox) Messages are sent from the Master VMM Module as SOC2 -SOC7 Messages. Refer to the VMM Tab in the DPS70 Configuration Tool for more details.

If using the Standard J1939 Messages, you need to specify what the Source Addr is.



Select which CAN Bus the Brake Wear Messages are being received on.



Select the Source Address of the Brake Wear Controller

NOTE: If the Source is set to VMM (SOx), leave this drop down blank.

Brake Wear Units	%
Brake Wear Multiplier	1.0000
Num Decimal Points	0

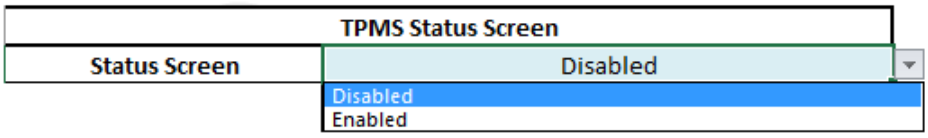
This section pertains to Units and the math behind the units to scale them.
The Brake Wear Units can be a Symbols or Text or variations of the 2. Examples would be; you can display; Percent, %, /32nd

The Brake Wear Multiplier is used for scaling of the units. Example, if /32nd are the units. Assuming for this example, Rotors are not included. Brake Pads are 2 inches thick. 32/32nd is equal to 1 inch. As we have 2 inches of Brake Pads, the multiplier would be set to 2 giving an equation of 2 x 32nd for a result of 64/32nd

The Num Decimal Point provides how much resolution you want displayed with a maximum of 2 decimal points.

4.13. Tire Pressure Monitoring System - TPMS

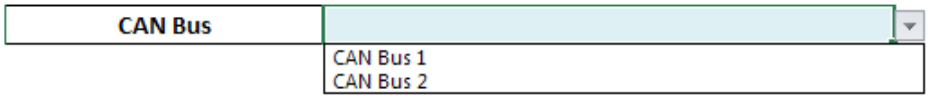
4.14. TPMS Status Screen



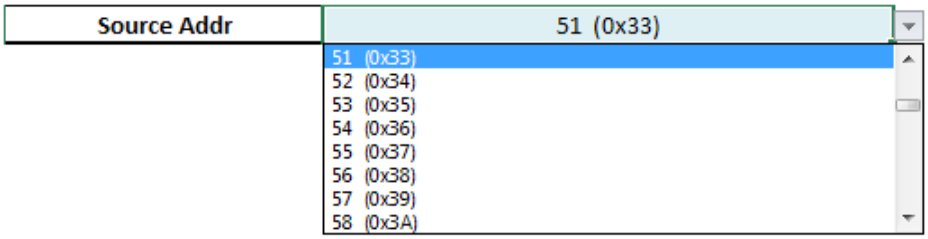
Enables/Disables the TPMS Status Screen. By default, this is set to Disabled.

Temp. (°C) Yellow	
Temperature (°C) Red	

The Yellow and Red Temperatures are the set point of when you want to trigger a warning/alarm to the operator. These values must be entered in Celsius as SPN 242 sends this value is in Celsius. Mismatching units would have undesirable results.

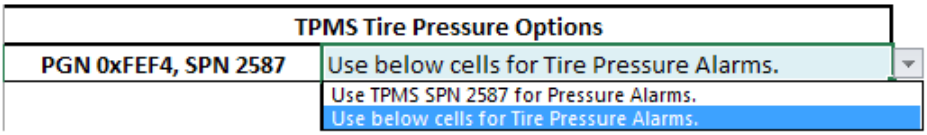


Select which CAN Bus the TPMS Status Messages will come from.



The Source Address is set to the default of 51 (0x33) and PGN 65268 (0xFEF4). Through the drop down menu, you can change the Source Address.

4.15. TPMS Tire Pressure Options



Enables the support of TPMS SPN 2587 for Pressure Alarms or if the TPMS System doesn't support it, the OEM can define the trigger points.

If the System support TPMS SPN 2587 for Tire Pressure Alarms this means that the Tire Pressure Monitoring System has the Trigger Points built into itself and there is no need for outside intervention. The table below shows how SPN 2587 sees these and pushes them up to the Operator.

Signal indicating the pressure level of the tire. The levels defined represent different pressure conditions of the tire:

000 Extreme over pressure –
The tire pressure is at a level where the safety of the vehicle may be jeopardized.

001 Over pressure –
The tire pressure is higher than the pressure defined by the vehicle or tire manufacturer.

010 No warning pressure –
The tire pressure is within the thresholds defined by the vehicle or tire manufacturer.

011 Under pressure –
The tire pressure is lower than the pressure defined by the vehicle or tire manufacturer.

100 Extreme under pressure –
The tire pressure is at a level where the safety of the vehicle may be jeopardized.

101 Not defined

110 Error indicator

111 Not available

If the system doesn't support TPMS SPN 2587 for Tire Pressure Alarms, then the Trigger Points must be set manually. The Pressure Alarm points are read from SPN 241- Tire Pressure, this is sent in kilopascals (kPa)

Target Pressure (kPa)	
Pressure % Yellow Warning	
Pressure % Red Critical	

Target Pressure (kPa) is the normal expected Pressure of the Tires.

Pressure % Yellow Warning will trigger an alarm when it is greater by the +/- % set in the Target Pressure.

Pressure % Red Critical will trigger an alarm when it is greater by the +/- % set in the Target Pressure.

Example, if the Target Pressure (kPa) is 5000 and Pressure % Yellow Warning is set to 10% and Pressure % Red Critical is set to 20%.

The Yellow Warning will go active when the Target Pressure is 4500 or less kPa and 5500 or more kPa.

The Red Critical will go active when the Target Pressure is 4000 or less kPa and 6000 or more kPa.

4.16. TPMS Status Screen Units to Display to End User

TPMS Status Screen Units to Display to End User	
Pressure Units	

Bar
kPa
PSI

Select the Pressure Units that will be displayed on the screen.
The conversion of units is handled by the DPS70.

Temperature Units	

Celsius
Fahrenheit

Select the Temperature Units that will be displayed on the screen.
The conversion of units is handled by the DPS70.

4.17. Driver Messages Center Fault and Diagnostic Screen Settings

Engine Faults	
Icon/Driver Message	Disabled
Allow Clearing of Faults	Disabled
CAN Bus	CAN Bus 2
Source Addr	0 (0x00)

Transmission Faults	
Icon/Driver Message	Disabled
Allow Clearing of Faults	Disabled
CAN Bus	CAN Bus 2
Source Addr	3 (0x03)

ABS Faults	
Icon/Driver Message	Disabled
Allow Clearing of Faults	Disabled
CAN Bus	CAN Bus 2
Source Addr	11 (0x0B)

Fan Drive Faults	
Icon/Driver Message	Disabled
Allow Clearing of Faults	Disabled
CAN Bus	CAN Bus 2
Source Addr	78 (0x4E)

Voltage Regulator Faults	
Icon/Driver Message	Disabled
Allow Clearing of Faults	Disabled
CAN Bus	CAN Bus 1
Source Addr	26 (0x1A)

HVAC Faults	
Icon/Driver Message	Disabled
Allow Clearing of Faults	Disabled
CAN Bus	CAN Bus 1
Source Addr	25 (0x19)

Event Logger Faults	
Icon/Driver Message	Disabled
Allow Clearing of Faults	Disabled
CAN Bus	CAN Bus 1
Source Addr	238 (0xEE)

If Brake Wear Faults screen is enabled, the Brake Wear Source, CAN bus and SA must be defined in the Brake Wear Status Screen above.

Brake Wear Faults	
Icon/Driver Message	Disabled
Allow Clearing of Faults	Disabled

If TPMS Fault screen is enabled, the TPMS CAN bus must be defined in the TPMS Status Screen above.

TPMS Faults	
Icon/Driver Message	Disabled
Allow Clearing of Faults	Disabled

If “ADAS equipped” is set to “No” these fault screen settings will be ignored.

ADAS - (Radar) Faults	
Icon/Driver Message	Disabled
Allow Clearing of Faults	Disabled

If “ADAS equipped” is set to “No” these fault screen settings will be ignored.

ADAS - (Camera) Faults	
Icon/Driver Message	Disabled
Allow Clearing of Faults	Disabled

Each of these Devices may be on the CAN Bus (es). The setup for each is the same but unique to that Device. All Devices are set to Disabled by default. This is where the OEM defines what they have on the system.

NOTE: The Brake Wear Faults, TPMS Faults, ADAS – (Radar) Faults and ADAS –(Camera) Faults are a bit unique as, if you enable them here but not Enabled in their primary locations of the Configuration File, you will get a compile error.

Using the Engine Faults as an example.

Enabling the Engine Fault – Icon/Driver Message, this will populate the corresponding Icon on the Diagnostic and Diagnostic Faults Screens.

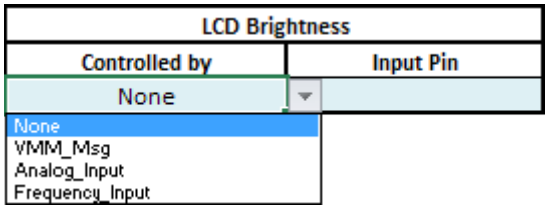
Enabling the Engine Fault – Allow Clearing of Faults, this will populate the Trash Can Icon in the Diagnostic Faults Screen in the related Engine Icon. This Icon is to Clear/ Erase Diagnostic Messages (DM1s and DM2s).

The CAN Bus and Source Addr values are defaults to what SAE J1939 Specification references. These can be changed.

CAN Bus – Select which CAN Bus the signal is coming in on

Source Addr – Select the Devices Source Address

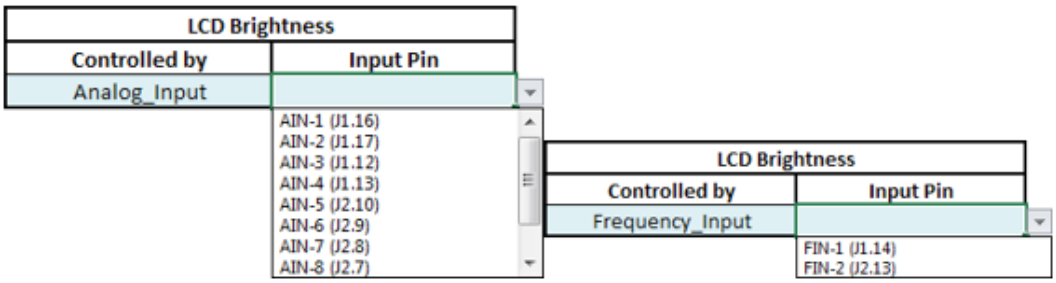
4.18. LCD Brightness



Select what will control the LCD Brightness.

Selecting None will keep the LCD Brightness at 100% anytime the DPS70 is powered up.

Selecting VMM_Msg will enabled you to control the LCD Brightness through the VMM SOC9 at 1%/bit with a range from 0 to 100%.



When and Analog of Frequency Input selection is used, you'll also have to select and input.

4.19. Cruise Control/Vehicle Speed (CCVS)

PGN 65265 (CCVS)	
CAN Bus	CAN Bus 1
Source Addr	0 (0x00)
Timeout (ms)	2500

This configures the message settings for the vehicle speed and is required for the odometer to function. If this message is not correctly configured, a "J1939 COMM TIMEOUT" message will be shown on the display.

4.20. Electronic Engine Control 1 (EEC1)

PGN 61444 (EEC1)	
CAN Bus	CAN Bus 1
Source Addr	0 (0x00)
Timeout (ms)	2500

This configures the message settings for the engine control and is required for the odometer to function. If this message is not correctly configured, a "J1939 COMM TIMEOUT" message will be shown on the display.

4.21. Dash Display 1

PGN 65276 (DD1)	
Transmit	Disabled

This setting enables or disables the fuel level 1 signal (SPN 96).

See the VMM tab in the configuration spreadsheet.

Fuel Level 1	1	Byte 6	SOC11	0.4%/bit 0% offset. Range 0..250 This value is...

4.22. Database

Directory

DBC Directory Pathname	

Enter the path to the directory which contains the database file. If a database file(s) will not be referenced, this field can be left blank. If pasting the path into the cell of the configuration spreadsheet, highlight the colored cell, press F2, and then paste the information into the cell. Optionally, you can paste the information directly into the formula bar.

An example path is: C:\CANalyzer\database

Database filename

	DBC Filename
CAN Bus 1	
CAN Bus 2	

For each CAN bus field, enter the filename of the database file (.dbc) that specifies the signals that are to appear in the DPS70's "Signal Monitoring" screen. The field(s) can be left blank if there is not an associated database file for that CAN bus. The database file name must include the extension.

An example filename is: database_CAN1.dbc

You can enter 1 database for all 2 CAN Buses however in the "Signal Monitoring" screen they would be clumped together in the selections. Or the suggested method would be if the databases are specific to each CAN Bus. This breaks them down specific to each.

4.23. Image Setup

Image Directory Pathname	
Splash Screen Image Filename	
OEM Logo Image Filename	
Engine Image Normal Filename	
Engine Image Pressed Filename	
Engine Image Disabled Filename	

In the "Image Directory Pathname", enter the path to the directory which contains the image file(s).

An example path is: C:\DPS70\images

NOTE: The RAW Data File Requirements are:

RAW data file with 800x480 resolution and signed 16-bpp data. It's a linear stream of bytes that correspond to pixels from 0 to 383,999, top-left to lower-right. The pixel format is 5:6:5 RGB. A Windows program called "Irfanview" is capable of opening them, but it then immediately extends them to a 24-bit colorspace, which means it can't resave them in a suitable fashion for the DPS70

The remaining fields will contain the filename of the image to be display.

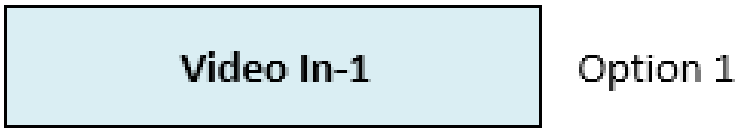
- The "Splash Screen Image Filename" must be a RAW image (.raw extension).
- The remaining image types must be PNG files (.png extension).
- To use the default "Engine Image", leave the "Engine Image..."cells blank

If defining "Engine Image", the dimensions must be 110pixels by 100pixels and fit within the button circle which has a radius of 37 pixels.

- For the Engine Image, the Image will be the same for all 3 functions but the hue will be different to signify whether it is Grayed out, Normal or when Pressed. A Graphical Designer may be required to achieve the look intended.

4.24. Video Control Signal Setup

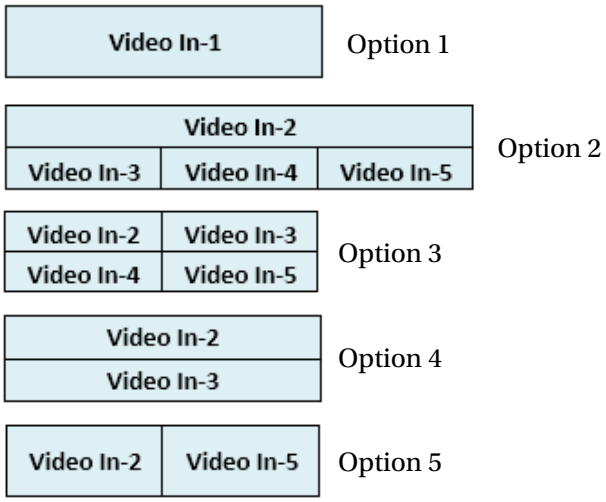
Video Control Signal



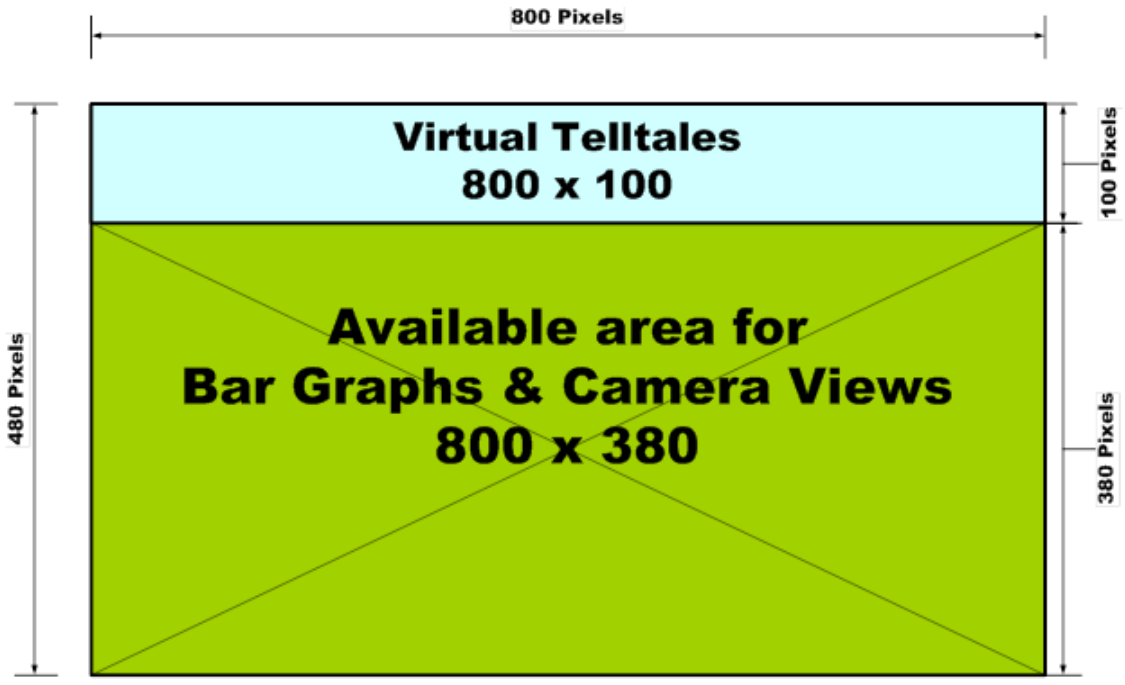
The Video Control Signals have a Priority associated with them. If you use the VMM SOB values (CAN Messages) that takes priority over Video Control Signals 1 and 2. The VMM SOB values are primarily used when you have 5 discrete Cameras connected to the DPS70 and the Camera View change due a function that is associated with them.

For DVR/NVR System that use the DPS70 as a Monitor only, Video Control Signal 1 and/or 2 are all that is required. The DVR/NVR System handles all the Video Signals that are displayed on the DPS70.

4.25. Video Layout



The LCD screen area is 480 x 800 pixels. The top 100 pixels are allocated to the Tell Tales/Odometer. The remaining area of 380 x 800 (in Green) is left for the Video Signals to be displayed on.



4.26. Language Setup

Directory

Language Files Directory Pathname	

Enter the path to the directory which contains the language file(s). This field can be left blank if language support will not be used. If pasting the path into the cell of the configuration spreadsheet, highlight the colored cell, press F2, and then paste the information into the cell. Optionally, you can paste the information directly into the formula bar.

An example path is: C:\Languages

Language Support

Language Names List	
.qm Filename IDs List	

In the “Names List” cell, list the languages to be supported, separated by a comma. The first language listed is the “default” language.

Note that not all languages are supported in the DPS70. Only languages that can be represented in the following fonts are supported.

DejaVuSans.ttf
DejaVuSans-Bold.ttf
DejaVuSans-BoldOblique.ttf
DejaVuSansMono.ttf
DejaVuSansMono-Bold.ttf
DejaVuSansMono-BoldOblique.ttf
DejaVuSansMono-Oblique.ttf
DejaVuSerif.ttf
DejaVuSerif-Bold.ttf
DejaVuSerif-BoldOblique.ttf
DejaVuSerif-Oblique.ttf

Example list: English, Français, Español

The cell “.qm Filename IDs list” references a portion of the filename as the “ID”. The filenames must be in the format “username_en.qm”. The filename “ID” is the characters that follow the underscore, up to the period. In this example, the ID is “en”.

Example filenames: english_en.qm french_fr.qm spanish_es.qm

From the example filenames, the following “.qm Filename IDs List” would be created: en, fr, es

5. J1939 Routing Table

The J1939 Routing Table is used to pass CAN Messages between CAN Buses.
By default there are no CAN Messages defined.

J1939 Routing Criteria
1 - PGN Only

- Enter the numbers as whole numbers or hex (0x00) values.
- Select a route by clicking in the “Route(s)” cell and then on the dropdown arrow that appears.
- Select J1939 Routing Criteria from the dropdown list (this defines the criteria used by the router for the entire table).
- Do not change any values that are not in colored cells.

Routing criteria options are:

1. PGN only
2. PGN and source address
3. Priority, PGN and source address
4. Message ID

With options 1 to 3 selected, the table will appear as follows.

Pri/PGN/SA	Priority	PGN	Source Address	Route(s)	Optional Comments

With option 4 selected, the table will appear as follows.

Msg ID	Priority	PDU-F/PDU-S	Source Address	Route(s)	Optional Comments

6. 11 Bit Routing Table

The 11 Bit Routing Table is to define which Messages are passed between CAN Buses. By default, no Messages are passed.

Std. CAN ID	11 Bit ID	Route(s)	Optional Comments

1. Enter the 11bit ID values as integers or hex (0x00) values.
2. Select a route by clicking in the “Route(s)” cell and then on the dropdown arrow that appears.
3. Do not change any values that are not in colored cells.

7. Buzzer Tones

7.1. Tone Setup

The buzzer tones tab provides the ability to define 4 different audible tones. The duration, frequency and volume can be defined for 2 periods, which will form the duration of the tone.

Tones generated are indicated by “Period 1” time (in milliseconds) at “Period 1” frequency and “Period 1” volume followed by a tone at “Period 2” frequency and “Period 2” volume for “Period 2” time.

The buzzer tones are referenced by the “Physical Telltales” tab. The tone column in that tab allows the user to select the tone (A, B, C or D) and if this is a single or repeating tone. The single tone executes “Period1” and “Period2” and then stops. Repeating cycles between “Period1” and “Period2” until the enable condition is removed.

		Period 1			Period 2		
		Time	Freq	Volume	Time	Freq	Volume
Highest Priority	Tone A	1,000	1,000	Low	1,000	1,000	Low
|	Tone B	1,000	1,000	Low	1,000	1,000	Low
|	Tone C	1,000	1,000	Low	1,000	1,000	Low
Lowest Priority	Tone D	1,000	1,000	Low	1,000	1,000	Low

- Enter the Period 1 and Period 2 Time values in milliseconds as a whole number between 100 and 65535.
- Enter the Period 1 and Period 2 Frequency values in Hertz as a whole number between 1000 and 5000.
- Select the Period 1 and Period 2 Volume values by clicking in the cell and using the drop down list.
- Cells that do not have a blue background cannot be edited. Volume Control

The buzzer volume can be controlled by setting the desired duty cycle values for the various volume levels. The range is 0.1 to 75.0 % duty cycle. The Low/High is for Tone A through D and the SOA1 buzzer control. Telltales can also be tied to Tone A through D. The Tone, if associated to a Telltale, is active whenever the associated Tell Tale is active.

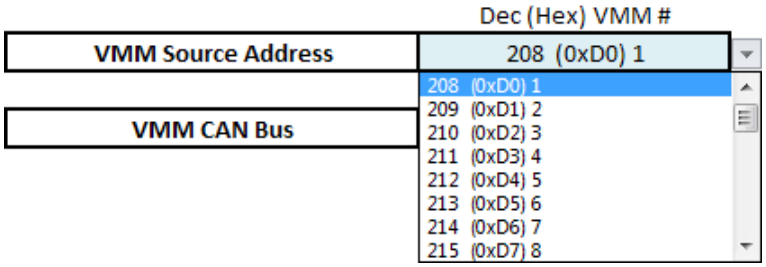
The “Buzzer Click” is for the turn signals/hazards.

	Duty Cycle
Low	1.0
High	2.0
Buzzer Click	50.0

8. VMM

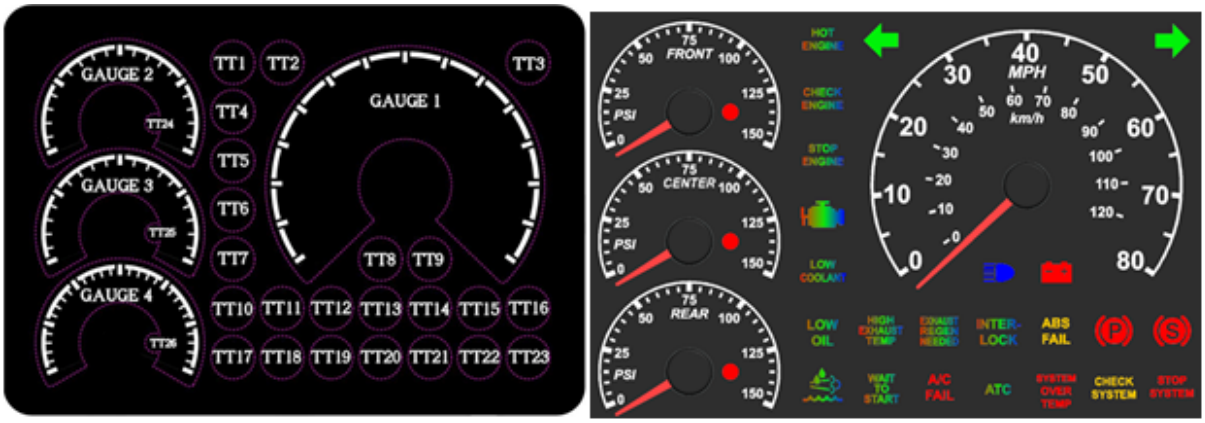
The only selectable item on the “VMM” tab is the VMM’s source address. This determines which VMM will be controlling the telltales.

Select the VMM Source Address by clicking in the cell and using the drop down list to select the appropriate VMM source address. By default the VMM Source Address is 208 (0xD0) 1. This must be changed if this is not the Master Module for the DPS70.



The VMM CAN Bus and remainder of the cells are locked. Some cells may have a drop down list, but the values are not selectable. The orange colored cells are editable, an optional comment can be added or changed in these cells. The information is there as a reference.

9. Physical Telltales



Physical location of Telltales

26 LEDs total

- 6 LEDs are RGB with feedback on them in accordance to the California Air Resource Board (CARB) requirements for Emissions. The following Telltales have feedback; TT1, TT4, TT5, TT6, TT17 and TT18.
- 6 LEDs are RGB with no special functions
- 2 LEDs are Green with no special functions
- 2 LEDs are Amber with no special functions
- 6 LEDs are Red with no special functions
- 1 LED is Blue with no special functions
- 3 LEDs are required for Gauge warnings

Red/Green/Blue (RGB) color options are:

1) Red
2) Green
3) Blue
4) Pink
5) Cyan
6) Magenta
7) Amber

9.1. Telltale Brightness

	Controlled by	Input Pin
Telltale Brightness	VMM Msg	

To set which input will control the brightness level of the telltales, first select the type of input (VMM Msg, Analog or Frequency) from the “Controlled by” cell. You will then be able to select the input from a drop down menu in the “Input Pin” cell.

If “Telltale Brightness” is left defaulted to “VMM Msg”, the VMM with its source address defined on the “VMM” tab will control the telltale duty cycle using a 0xEF00 message. The first byte will be set to 0x82 and the second byte will contain the duty cycle value. The scaling of byte 2 is 1%/ bit, 0 offset, and a range from 0-100.

For example, PGN 0xEF00 with data 0x82 0x32 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF will set the telltale duty cycle to 50%

Be aware that telltales 1, 4, 5, 6, 17, and 18 will always, when active, be at 100% brightness. The brightness control does not affect these telltales.

9.2. Telltale Setup

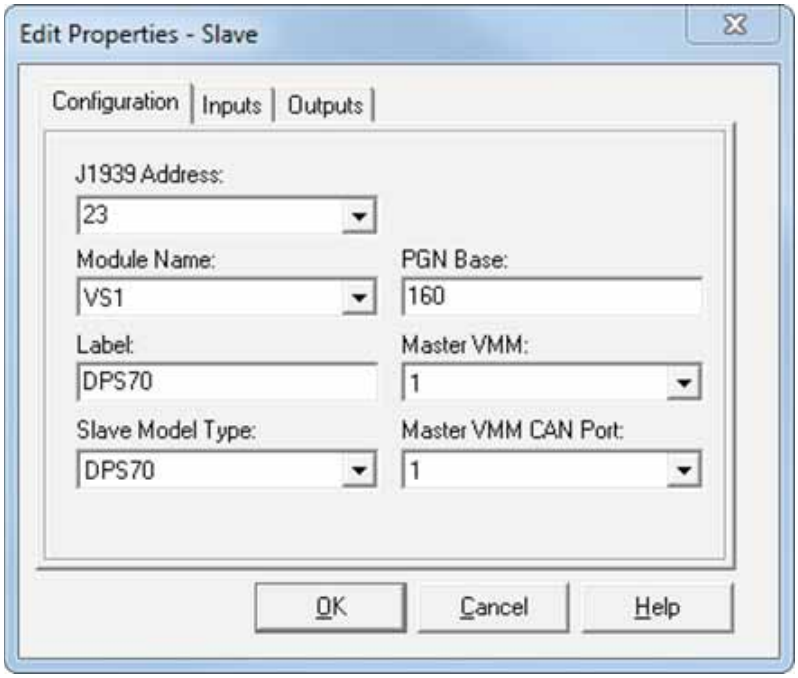
Tell Tail	VMM Msg	Description	Color	Controlled by	LED On State	Input Pin	AIN Threshold	DM1 Bus	DM1 SA	DM1 Entity	DM1 SPN	DM1 FMI	Tone
1	T1-1		1 - Red	VMM_Msg	1 - High								0 - None
2	T1-2		0 - Green	VMM_Msg	1 - High								11 - Click on hazzards & signals
3	T1-3		0 - Green	VMM_Msg	1 - High								11 - Click on hazzards & signals

The color, control, active state, and audible tone (when telltale active) can be defined. The telltale rows which have a grey filled cell in the “Color” column are fixed colors and can’t be changed or deleted from the cell.

To configure a telltale.

9.2.1 DPS70 Slave item details related to VMMS Software / Telltales

The DPS70 requires it to be configured as a VMM Slave as defined below.



J1939 Address: Set to 23 (0x17)

Module Name: This field tells the Slave name (VS#), select VS1

Label: This field provides the user with a text field to enter a custom label for the slave

Slave Model Type: Set to DPS70

PGN Base: Set to 160 (0xA0) or leave blank (default to 160 (0xA0))

Master VMM: Specifies the VMM to which this slave is directly connected. Only one VMM can control the DPS70.

Master VMM CAN Port: Specifies the VMM CAN port to which this slave is directly connected (default: CAN1)

9.2.2 Special (RGB) LED Function

Certain Telltales that have some special function LEDs. Telltales TT 1-1, TT 1-4, TT 1-5, TT 1-17 and TT 1-18 have Current Feedback. This is a requirement California Air Resource Board (CARB) has set. Details can be found in the link below.

https://www.arb.ca.gov/regact/2009/hdobd09/fsor.pdf

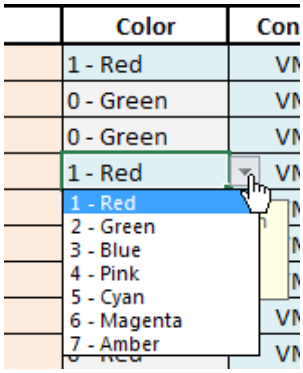
The SIAx is what the VMM (Master to the DPS70) uses to determine if the LED is ON and checks the Current Feedback. As an example:

In accordance to the CARB regulations, if TT 1-1 is Wait to Start LED and it fails to illuminate when commanded, this would send a SPN back to the Engine as a fault which would trigger the Malfunction Indicator Light (MIL).

Below is a list of the VMMS Slave Names (SIAx) reference to Function (LED Sense) and Telltales (Position)

Input (Type A)	Function	Telltale	State
SIA12	LED Sense 1	TT 1-1 Red LED	0 - LED Off; 1 - LED On
SIA13	LED Sense 2	TT 1-1 Green LED	0 - LED Off; 1 - LED On
SIA14	LED Sense 3	TT 1-1 Blue LED	0 - LED Off; 1 - LED On
SIA15	LED Sense 4	TT 1-4 Blue LED	0 - LED Off; 1 - LED On
SIA16	LED Sense 5	TT 1-4 Green LED	0 - LED Off; 1 - LED On
SIA17	LED Sense 6	TT 1-4 Red LED	0 - LED Off; 1 - LED On
SIA18	LED Sense 7	TT 1-5 Red LED	0 - LED Off; 1 - LED On
SIA19	LED Sense 8	TT 1-5 Green LED	0 - LED Off; 1 - LED On
SIA20	LED Sense 9	TT 1-5 Blue LED	0 - LED Off; 1 - LED On
SIA21	LED Sense 10	TT 1-6 Blue LED	0 - LED Off; 1 - LED On
SIA22	LED Sense 11	TT 1-6 Green LED	0 - LED Off; 1 - LED On
SIA23	LED Sense 12	TT 1-6 Red LED	0 - LED Off; 1 - LED On
SIA24	LED Sense 13	TT 1- 17 Red LED	0 - LED Off; 1 - LED On
SIA25	LED Sense 14	TT 1-17 Green LED	0 - LED Off; 1 - LED On
SIA26	LED Sense 15	TT 1-17 Blue LED	0 - LED Off; 1 - LED On
SIA27	LED Sense 16	TT 1-18 Blue LED	0 - LED Off; 1 - LED On
SIA28	LED Sense 17	TT 1-18 Green LED	0 - LED Off; 1 - LED On
SIA29	LED Sense 18	TT 1-18 Blue LED	0 - LED Off; 1 - LED On

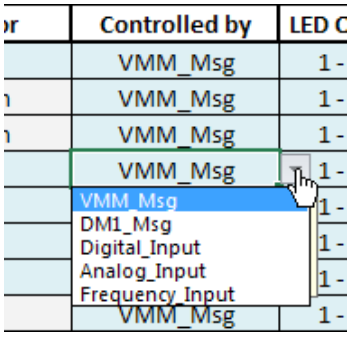
9.2.3 Select the desired color from the “Color” pull down menu.



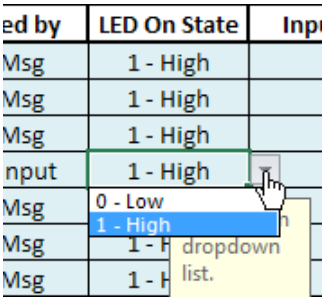
9.2.4 Select the source which will control the telltale from the “Controlled by” cell. The options are listed in a pull-down menu.

If the following “Controlled By” object is selected:

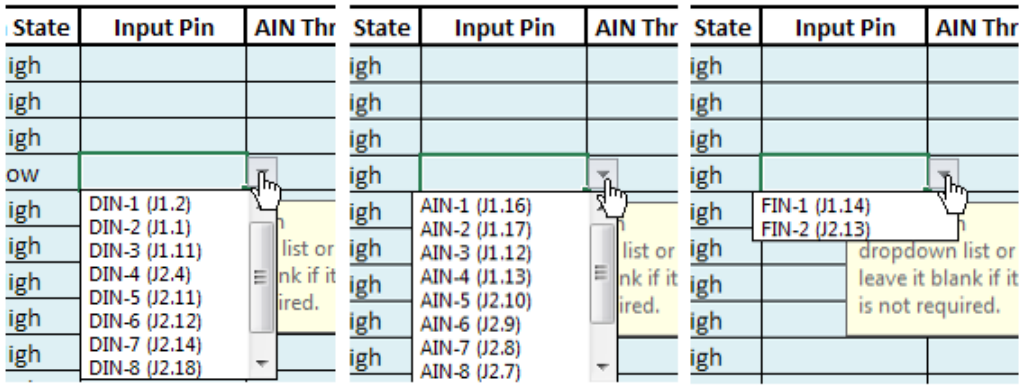
- **a)** VMM Msg – requires you to set Sections 9.2.5 and 9.2.9 if you add a Tone to the condition
- **b)** DM1 Msg – requires you to set Sections 9.2.5, 9.2.8 a through e and 9.2.9 if you add a Tone to the condition
- **c)** Digital Input – requires you to set Sections 9.2.5, 9.2.6 and 9.2.9 if you add a Tone to the condition
- **d)** Analog Input – requires you to set Section 9.2.5, 9.2.6, 9.2.7 and 9.2.9 if you add a Tone to the condition
- **e)** Frequency Input – requires you to set Sections 9.2.5, 9.2.6, and 9.2.9 if you add a Tone to the condition



9.2.5 Select the active state from the “LED On State” drop down list.



9.2.6 Select the “Input Pin” from the drop down list. The available options are dependent on the selection made in the “Controlled by” cell.

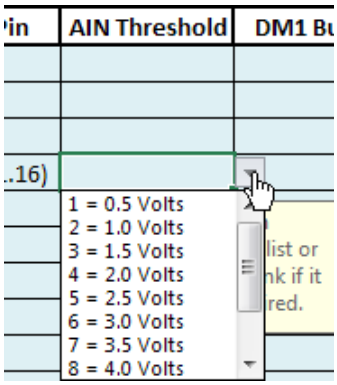


Digital Input Analog Input Frequency Input

Digital and Frequency Inputs don’t require any additional configuration.

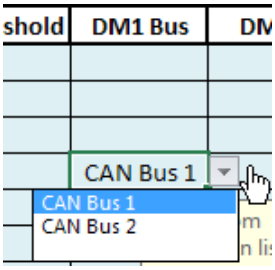
When using a frequency input, it is treated as a digital input. If a frequency is applied to this input, it can cause the telltale to flicker/flash depending on the applied frequency.

9.2.7 Analog Input, you must select the Threshold Voltage to trigger on from the “AIN Threshold” Column.

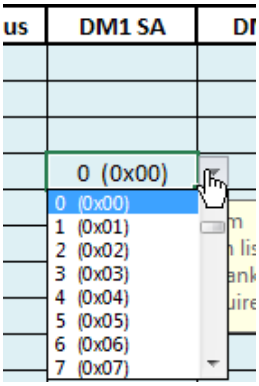


9.2.8 DM1 Message controls a:

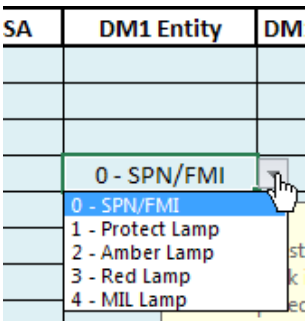
a. select which CAN bus the DMI messages will come from in the “DM1 Bus” drop down list.



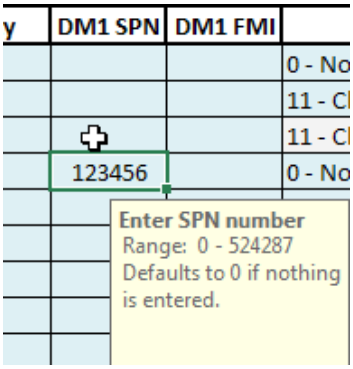
b. select the source address for DMI messages from the “DM1 SA” drop down list.



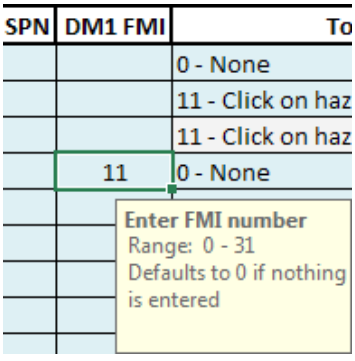
c. select the controlling entity (lamp control or SPN/FMI) from the "DM1 Entity" drop down list.



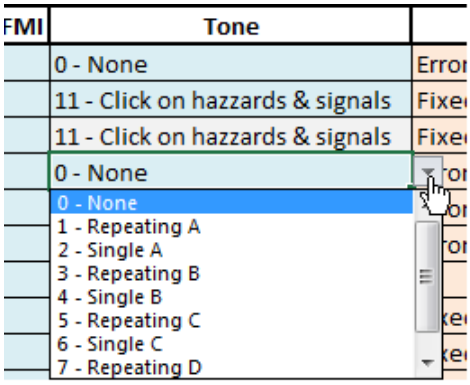
d. enter the SPN, when applicable; range value from 0 to 524287, for the "DM1 SPN" Column.



e. enter the FMI number, when applicable, in the "DM1 FMI" Column.

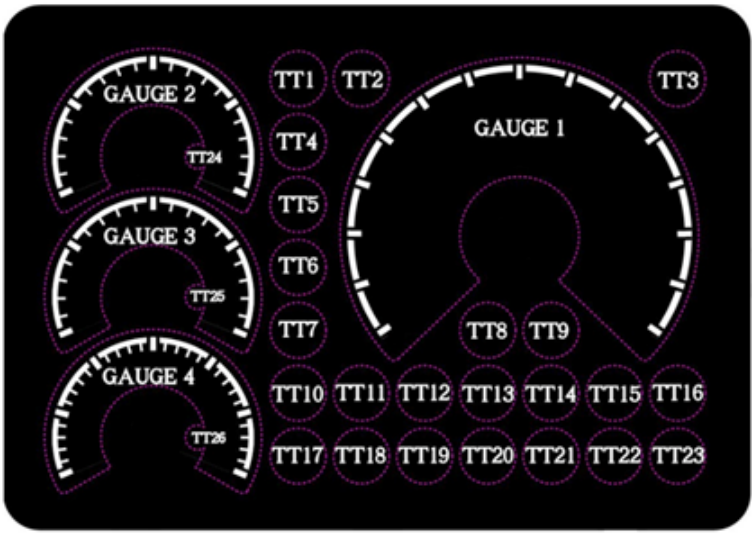


9.2.9 Tone, you have the option of selecting the type of buzzer tone to be emitted when the telltale is active from the drop down list. Note: telltales (T1-2, T1-3) are intended for use as turn / hazard indicators. For this reason, the “Tone” of T1-3 is linked to the setting of T1-2.



These Repeating A thru D and Single A thru D relate to the Buzzer Tones and their Priorities. D being the Lowest Priority and A being the Highest Priority. Reference Section 7.1 for Buzzer Tone Details

10. Physical Gauges



Physical Gauges

Physical Gauges are Gauge 1, 2, 3 and 4. This section pertains to these items.

To setup the physical gauges, details on the SPN is required. The SPN's offset (typically used with a temperature related SPN) and the SPN resolution are required. These values will be used in the calculation to determine the desired full scale value.

For example, SPN 190 (engine speed) has a resolution of 0.125rpm per bit with an offset of 0.

SPN 84 (wheel based vehicle speed) has a resolution of 1/256 km/h per bit with an offset of 0

								Gain Factors		
Gauge	Source	PGN/SPN	CAN Bus	Source Address	Response Speed	Degrees	Signal Offset	Numerator	Denominator 1	Denominator 2
1	VMM_MSG				Fast	250	0	1	1	1
2	VMM_MSG				Fast	225	0	1	1	1
3	VMM_MSG				Fast	225	0	1	1	1
4	VMM_MSG				Fast	225	0	1	1	1

To setup the analog gauges:

1. Select the desired signal source from the “Source” drop down list.
2. If the selected source is:

   - VMM_MSG
     1. Leave the “PGN/SPN” cell blank (delete the contents if necessary).
     2. Leave the “CAN Bus” cell blank (delete the contents if necessary).
     3. Leave the “Source Address” cell blank (delete the contents if necessary).

   - PGN_SPN
     1. Select the desired message from the “PGN/SPN” cell’s drop down list.
     2. Select the appropriate CAN bus from the “CAN Bus” cell’s drop down menu.
     3. Select the appropriate source address from the “Source Address” cell’s drop down menu.

3. Select the Response Speed of the gauge using the drop down list.
4. Enter the full-scale sweep of the gauge in number of degrees.
   NOTE: The default sweep values are 250, 225, 225, 255. Angles can only change if a new overlay is requested that will change the sweep angles. The new angles would be provided to the customer in conjunction with the new overlays.
5. Enter the “Offset” value for the range of the gauge. This value sets the minimum gauge value versus the actual minimum signal value. For example, SPN 110 (engine coolant temperature) has a temperature range of -40°C to 210°C with a resolution of 1°C/bit. If the desired minimum of the gauge is 60°C, the offset value used is 100 [60°C - (-40°C) = 100]. If the resolution had been 0.5°C /bit, then the offset would be 200. The needle will sit at its zero-degree mark until a temperature value greater than 60°C is received.
6. Enter the “Gain Factors” for the signal that drives the gauge.
   - Numerator
   - Denominator 1
   - Denominator 2

   To determine the values to use, you must consider that a full-scale sweep (100% with 0.1% resolution) will have a result of 1000 in the following equation. You must also ensure that the product of the equation does not exceed 4,294,967,295.

$$1000 = \frac{(\text{raw signal} + \text{raw offset}) \bullet \text{Numerator}}{\textit{Denominator 1}} \bullet \frac{1}{\textit{Denominator 2}}$$

Using wheel based vehicle speed as an example, the maximum signal value is 250.996km/h. The maximum gauge value, for example, is 140km/h. There will be no offset as the gauge range will be 0-140 and the minimum signal value is 0. The resolution of SPN 84 (Wheel-Based Vehicle Speed) is 1/256 km/h per bit.
The raw signal value for 140km/h is 140*256=358400

140km/h = Raw * (1/256km/h)

Raw = 140km/h / (1/256km/h)

Raw = 140 * 256

Raw = 35840

One approach for a range of 0 – 140 is to determine the 1km/h step. The gauge step for 1km/h will be 1/140 = 0.00714285. To get a useable integer value with a high resolution, multiply (and round the result) by 1,000,000 to get an integer value of 7143.

When these values (35840 and 7143) are populated into the “Gauge Offset and Gain Factor Result Calculator” fields “Example Input Signal Value” and “Multiply by Numerator” respectively (place a 1 in the denominator fields), you will get an “Example Result” of 256,005,120. The example result must be equal to 1000 or as close as possible without going over. “Denominator 1” can be set to 256 and “Denominator 2” to 1000. This will produce an “Example Result” of 1000.

See the example in section 10.1.

7. Select which signal will be used to control the brightness of the gauge backlights from the drop down list. If using VMM_Msg see “Physical Gauge Backlight Duty Cycle” on the
8. Select the input pin for controlling gauge backlight brightness (when applicable) from the drop down list.

Example

The following is an example of a more complicated signal using both the offset and gain factors. The offset and gain values will be determined for use in the "Gauge Offset and Gain Factor Result Calculator"

Using SPN 101 (Engine Crankcase Pressure), with a range of -250kPa to 251.99kPa, an offset of -250kPa, and a resolution of 1/128kPa per bit. These values are from SAE document 1939DA

With a min gauge value of -100kPa and a max gauge value of 200kPa, determine the gauges offset as a raw signal value. This integer value will be used in the "Offset" field. Do not confuse this with the offset defined in the SPN definition.

(SPN offset - (min gauge value)) / SPN resolution = raw signal
(-250 - (-100kPa)) / (1/128kPa) = raw signal
-150*128 = -19200

Determine the raw signal value for the max gauge value.

With a max gauge value of 200kPa, convert this to an equivalent raw signal value. You will need to account for the SPN offset to correctly calculate the raw signal value.
(|SPN offset| + max gauge value) / SPN resolution = Raw signal
(|-250kPa| + 200kPa) / (1/128kPa) = Raw signal
450*128 = 57600

Determine the step size for a gauge range of -100kPa to 200kPa

|min gauge value| + max gauge value = range
|-100| + 200 = 300kPa range
1/300 = 0.00285714 gauge step/kPa

Multiply this step value, and round, to produce a large integer value. This integer value will be used in the "Numerator" field.

0.00333333 • 10,000,000 = 333333

To help determine possible denominator values, use the "Gauge Offset and Gain Factor Result Calculator". Populate the first three fields with the previously determined values.

"Example Input Signal Value" = 57600
"Offset" = -19200
"Numerator" = 33333

Example

Input Signal Value	Offset	Numerator	Denominator 1	Denominator 2	Example Result
57600	-19200	33,333	1	1	1,279,987,200

The goal is to have the “Example Result” equal 1000. A value of 127,998 can be used in the Denominator 1 field, and 10 in the Denominator 2 field. This will produce a result of 1000 and provide a high resolution for the calculation of other needle positions.

Example

Input Signal Value	Offset	Numerator	Denominator 1	Denominator 2	Example Result
57600	-19200	33,333	127,998	10	1,000

With the calculator now setup, the “Example Input Signal Value” can be changed to test the needle positioning calculation. For example, verify the 0, ¼, ½, and ¾ needle positions will indicate the correct gauge value. With the gauge range being -100kPa to 200kPa, the 4 position values will be -100kPa, -25kPa, 50kPa, and 125 kPa.

Determine the Raw signal values for these positions, and place in the calculator to confirm the results are 0, 250, 500, and 750 respectively.

(250 +(-100)) • 128=19200

Example

Input Signal Value	Offset	Numerator	Denominator 1	Denominator 2	Example Result
19200	-19200	33,333	127,998	10	0

(250+(-25)) • 128=28800

Example

Input Signal Value	Offset	Numerator	Denominator 1	Denominator 2	Example Result
28800	-19200	33,333	127,998	10	250

(250+50) • 128=38400

Example

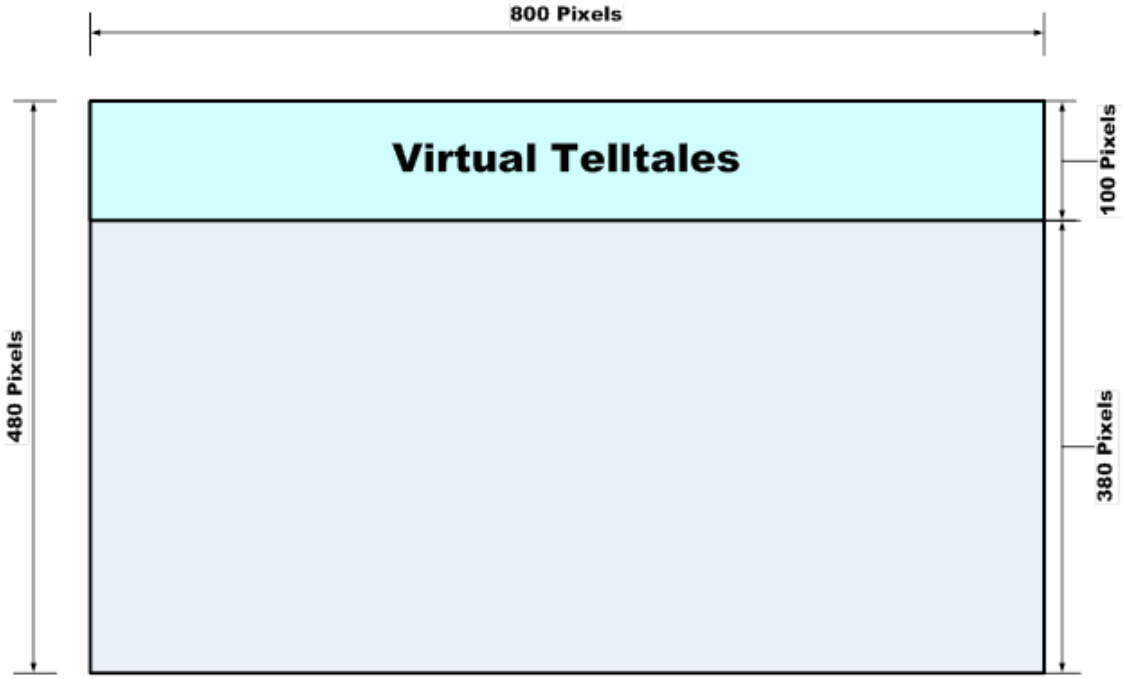
Input Signal Value	Offset	Numerator	Denominator 1	Denominator 2	Example Result
38400	-19200	33,333	127,998	10	500

(250+125) • 128=48000

Example

Input Signal Value	Offset	Numerator	Denominator 1	Denominator 2	Example Result
48000	-19200	33,333	127,998	10	750

11. Virtual Telltales



Virtual Telltales

Setup of virtual telltales. There are two telltale types available, Icon and Text. The type of telltale determines which setup cells are referenced. If the type is text, the filename and pathname cells are ignored. In the case of the type being icon, the text cell is ignored.

If the telltale type is an icon:

- Enter the pathname of the directory containing the icon files into the “Telltale Icon Directory Pathname” cell. For example, “C:\my_folder\icons”.
- Enter the icons filename and include the extension. The icon must be a png. An example of a filename entered in this field is “my_icon.png”.
- The dimensions for the png are 97 pixels by 47 pixels (WxH).

If the telltale type is text:

- Enter the text for the virtual telltale. Each line can contain a maximum of 9 characters and there is a maximum of 3 lines. The number of characters in a line can be affected by the character’s width.

- If using translations, use the translated strings reference in the cell, not the actual string. For example, ".TLS.1" should be placed in the appropriate Telltale Text cell to reference the desired text.

Telltale Text and Color are not used in all cases but Control and Buzzer Tone are, as noted below.

Select the color for the telltale by clicking in the cell and using the drop down list. (The Color will be the screen background color if the telltale type is "Icon" and the cell is blank)

If using language files, see information regarding language string identifiers for the virtual telltales on the General Settings worksheet. Virtual Telltales; Telltale_Text - use .TLS.n where n is a number from 1 to 100. Note that these translations can be found in the TellTaleIndicator module.

Select the VMM or gauge warning/alarm signal that will control the telltale by clicking in the cell and using the drop down list. If this is left blank the telltale will not work.

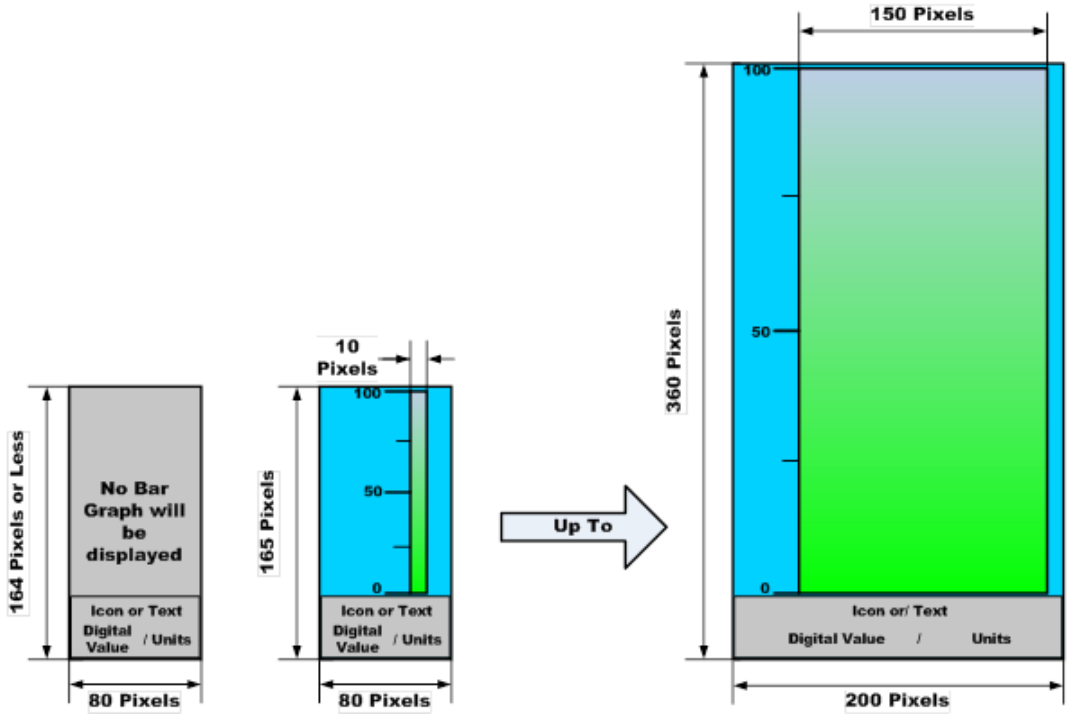
Select the buzzer tone for the telltale by clicking in the cell and using the drop down list. If this is left blank the telltale will not work.

Fixed locations for telltales will cause that telltale to only be displayed in one specific LOCATION on the top row. If any telltales are defined as fixed, the whole top row will be reserved for fixed Telltales.

If more than one Telltale is set to the same Fixed Location, and multiple telltales are commanded to be on at once, the Telltale with the lowest control number will be the telltale to turn on (i.e. T2-1 will turn on over T2-2 or T3-1).

Do not change any values that are not in colored cells.

12. Gauge Pages



12.1. Icon Directory

When using selecting “icon” in the Identifier/Type field, you must provide a path in the Gauge Identifier Icon/Image Directory Pathname cell. This field can be left blank if all Identifier Types are “text”.

Gauge Identifier Icon/Image Directory Pathname	

12.2. Widget Bar

The Widget bar is a fixed selection of “Vertical Bar”. The cell field is gray to indicate that this value can be copied, but is not intended to be changed.

Widget	Vertical Bar

12.3. Identifier

The Identifier is the method of indicating what the gauge represents. This can either be an icon or text identifier.

Type

Select the type (icon or text) from the pulldown. Ensure the “Directory Pathname” is provided if an icon is used (see 12.1).

Location

Select the location from the pulldown. The options are above or below. This will place the icon/text above or below the vertical bar.

Name

Enter the desired gauge name in the Name field. A maximum of 45 characters. In the case of the gauge using an icon type, enter the filename. Include the “png” extension. For example, mygauge.png.

Identifier	
Type	
Location	
Name	

12.4. Numeric Value

The Numeric Value is a numeric representation of the value indicated by the gauge bar.

Visible

Select a “Visible” option (yes/no) from the pulldown.

Units

Enter the desired units as a text string, to a maximum of 20 characters.

# of Decimal Points

Enter the desired number of decimal points. The accepted range is from 0 to 2 decimal points.

Numeric Value	
Visible	
Units	
# of Decimal Points	

12.5. Gauge Attributes

The Gauge Attributes defines the appearance and location of the gauge.

Major Ticks
Enter the number of Major Ticks. The range is from 0 to 11 ticks and must be an integer value. The tick marks are labeled with the value range that is entered in the Tick Value cells.

Minor Ticks
Enter the number of Minor Ticks. The range is from 0 to 9 ticks and must be an integer value. These ticks are shorter than the major ticks and are not labeled.

Highest Tick Value
Enter an integer value for the Highest Tick Value.

Lowest Tick Value
Enter an integer value for the Lowest Tick Value.

Tick Value Decimal Points
Enter an integer value of Tick Value Decimal Points (range from 0 to 1).

X Position
Enter an integer value (in pixels) for the X Position. The top left corner of the gauge is the reference point and the range is from 0 to 700. The maximum value that can be used is dependent on the gauge width and the number of gauges being defined (see graphical representation).

Y Position
Enter an integer value (in pixels) for the Y Position. The top left corner of the gauge is the reference point and the range is from 100 to 380.

Gauge Width
Enter an integer value (in pixels) for the Gauge Width. The range is from 80 to 200 pixels.

Gauge Height
Enter an integer value (in pixels) for the Gauge Height. The range is from 80 to 360 pixels. If the Type is image, a minimum of 165 pixels is required to display the bar. You must account for the value that will be entered into the Bar Top Margin cell. For example, with a Bar Top Margin value of 100 pixels, the minimum gauge height required to display the bar is 265 pixels.

Maximum Bar Width
Enter an integer value (in pixels) for Maximum Bar Width. The bar will fill the available space when the maximum value of 150 pixels is used. If desired, the width can be limited by entering a value in the range of 10 to 150 pixels.

Gauge Background Color/Image
Select a color from the pulldown, or enter the desired images file name with the png extension. For example, “myimage.png”. If selecting a color, the available colors are defined in the Custom Colors cells located towards the bottom of the Gauge Page sheet.

Bar Top Margin (image only)

If an image is being used as a background (defined in Gauge Background Color/ Image), it may be necessary to set a top margin to achieve the desired visual result. By default, the gauge bar and ticks use the top of the gauge height as a top limit. If the background image being used has a border at the top, it will not be desirable to have the gauge bar limit set to the top of the gauge height. By setting a Bar Top Margin, an offset from the top of the gauge height is created.
If the image has a top boarder 20 pixels wide, a bar top margin of 20 pixels should be used. When the gauge bar is full scale, it will stop 20 pixels below the top of the gauge height.

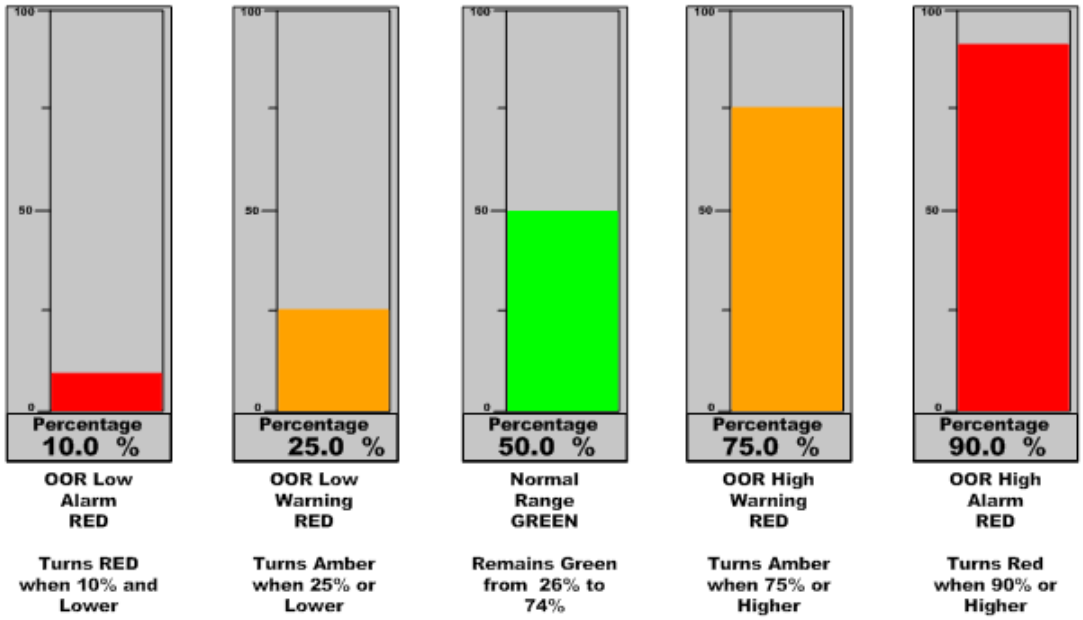
The range for the top margin is from 0 to 100 pixels.

Bar Background Color

Select the desired bar background color from the pulldown menu.
The available colors are defined in the Custom Colors cells located towards the bottom of the Gauge Page sheet.

Gauge Attributes	
Number of Major Ticks	
Number of Minor Ticks	
Highest Tick Value	
Lowest Tick Value	
Tick Value Decimal Points	
X Position	
Y Position	100
Gauge Width	
Gauge Height	360
Maximum Bar Width	
Gauge Background Color/Image	
Bar Top Margin (image only)	
Bar Background Color	

12.6. Out Of Range (OOR) Warnings and Alarms



In the example above, the Out Of Range (OOR) Warnings and Alarms change the Bar Graph Color from Green which is normal to Amber to Red based on the Threshold value. The Bar Graph Color will change to the previous Color once the Hysteresis value has been met. In the example above, if Red, it will change to Amber, if Amber it will change to Green.

12.7. OOR High Alarm (GP1-1_HA)

The OOR (Out Of Range) High Alarm configures the gauge bar to apply the Bar Color/Image setting when the defined threshold is reached. It will hold this configuration setting until the value drops below the threshold minus hysteresis value.

Enabled

Select the enabled value (yes/no) from pulldown.

Bar Color/Image

Select color from the pulldown or enter the images file name with png extension. For example, “myimage.png”. If a color is selected, the available colors are defined in the Custom Colors cells located towards the bottom of the Gauge Page sheet.

Threshold

Enter the desired threshold value. When the gauge value is equal to or greater than this value, the defined bar color/image will be applied.

Hysteresis

Enter a value for hysteresis. This value is used with the threshold value to determine when the high alarm is disabled (threshold – hysteresis = OFF).

OOR High Alarm (GP1-1_HA)	
Enabled	
Bar Color/Image	
Threshold	
Hysteresis	

12.8. OOR High Warning (GP1-1_HW)

The OOR (Out Of Range) High Warning configures the gauge bar to apply the Bar Color/Image setting when the defined threshold is reached. It will hold this configuration setting until the value drops below the threshold minus hysteresis value.

Enabled

Select the enabled value (yes/no) from pulldown.

Bar Color/Image

Select color from the pulldown or enter the images file name with png extension. For example, “myimage.png”. If a color is selected, the available colors are defined in the Custom Colors cells located towards the bottom of the Gauge Page sheet.

Threshold

Enter the desired threshold value. When the gauge value is equal to or greater than this value, the defined bar color/image will be applied.

Hysteresis

Enter a value for hysteresis. This value is used with the threshold value to determine when the high alarm is disabled (threshold – hysteresis = OFF).

OOR High Warning (GP1-1_HW)	
Enabled	
Bar Color/Image	
Threshold	
Hysteresis	

12.9. Normal Range

The normal range configures the color of the gauge bar when warning/alarm conditions are not meet.

Bar Color/Image

Select color from the pulldown or enter the images file name with png extension. For example, “myimage.png”. If a color is selected, the available colors are defined in the Custom Colors cells located towards the bottom
of the Gauge Page sheet.

Normal Range	
Bar Color/Image	

12.10. OOR Low Warning (GP1-1_LW)

The OOR (Out Of Range) Low Warning configures the gauge bar to apply the Bar Color/ Image setting when the defined threshold is reached. It will hold this configuration setting until the value rises above the threshold plus hysteresis.

Enabled

Select the enabled value (yes/no) from pulldown.

Bar Color/Image

Select color from the pulldown or enter the images file name with png extension. For example, “myimage.png”. If a color is selected, the available colors are defined in the Custom Colors cells located towards the bottom
of the Gauge Page sheet.

Threshold

Enter the desired threshold value. When the gauge value is equal to or less than this value, the defined bar color/image will be applied.

Hysteresis

Enter a value for hysteresis. This value is used with the threshold value to determine when the Low Warning is disabled (threshold + hysteresis = OFF).

OOR Low Warning (GP1-1_LW)	
Enabled	
Bar Color/Image	
Threshold	
Hysteresis	

12.11. OOR Low Alarm (GP1-1_LA)

The OOR (Out Of Range) Low Alarm configures the gauge bar to apply the Bar Color/ Image setting when the defined threshold is reached. It will hold this configuration setting until the value rises above the threshold plus hysteresis.

Enabled

Select the enabled value (yes/no) from pulldown.

Bar Color/Image

Select color from the pulldown or enter the images file name with png extension. For example, "myimage.png". If a color is selected, the available colors are defined in the Custom Colors cells located towards the bottom of the Gauge Page sheet.

Threshold

Enter the desired threshold value. When the gauge value is equal to or less than this value, the defined bar color/image will be applied.

Hysteresis

Enter a value for hysteresis. This value is used with the threshold value to determine when the high alarm is disabled (threshold + hysteresis = OFF).

OOR Low Alarm (GP1-1_LA)	
Enabled	
Bar Color/Image	
Threshold	
Hysteresis	

12.12. Custom Colors

Enter an HTML color code for each of the 7 desired colors. The entry is in hexadecimal from 000000 to FFFFFF. For example, black would be entered into the cell as FFFFFF.

It should be noted that medium gray (7F7F7F) is used as a foreground color when signal data is not received. It is recommended to not use this color.

Custom Colors	
Color 1	
Color 2	
Color 3	
Color 4	
Color 5	
Color 6	
Color 7	

12.13. Control Signal

The control signal defines the signal which will drive the gauge position in the column this field is located.

Source

Select the source from the pulldown menu (CAN, VMM or Cluster signal)

Factor

Enter the Factor value (referred to as resolution in J1939 documentation). This value should be the same as what has been entered in the signals definition in a DBC file. For example, PGN 65276, SPN 169 (Cargo Ambient Temperature) is defined as having a resolution of 0.03125°C/bit. The value entered in the factor cell would be 0.03125.

Offset

Enter the offset value. This value should be the same as what has been entered in the signals definition in a DBC file. For example, Cargo Ambient Temperature is defined as having an offset of -273°C. The value entered in the factor cell would be -273.

Averaging Time

Enter a value, in milliseconds, for averaging time. This will generate a moving average using the samples collected during that period. This is intended for use with signals such as a fuel level, where it is desirable to filter out 'slosh' of the fuel.

Control Signal	
Source	
Factor	
Offset	
Averaging Time	

12.14. CAN Signal

The CAN signal defines the signal which will be used, if selected as the Control Signal source, to drive the gauge position in the column this field is located.

CAN bus
Select the CAN bus from the pulldown menu (CAN bus1 or CAN bus2)

Source Address
Select the desired source address from the pulldown menu.

PGN
Enter the desired PGN, in either decimal or hexadecimal. For hexadecimal values, precede the value with 0x (for example, 0x00 for an engine source address)

Length (Bits)
Enter the bit length of the selected PGN. This value should be the same as what has been entered for the message definition in a DBC file.

Start Bit
Enter the start bit value of the desired SPN. This value should be the same as what has been entered for the signal definition in a DBC file.

12.15. VMM Signal

The VMM signal defines the signal which will be used, if selected as the Control Signal source, to drive the gauge position in the column this field is located.

Source Address
Select the desired VMM source address from the pulldown menu.

Signal
Select the desired VMM signal (analog input or flag) from the pulldown menu.

VMM Signal	
Source Address	
Signal	

12.16. Cluster Signal

The Cluster signal defines the signal which will be used, if selected as the Control Signal source, to drive the gauge position in the column this field is located.

Analog Input
Select the desired cluster signal (analog input) from the pulldown menu.

Cluster Signal	
Analog Input	

13. Driver Message Center

The Driver Message Center will display messages which are defined in this worksheet. The messages are displayed when either a DTC or VMM telltale signal associated with the message is active.

If any descriptions are set, a description field will show up on the Driver Message screen. Any description in the “Diagnostic screen Description” will show up in the menu system’s fault screen.

When the active faults screen is enabled, it’s scroll order is after the last gauge page that is defined.

If multi-language support is desired, use .FLT.n (n=1..500) see General Settings Worksheet.

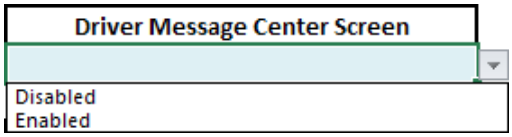
A row must have valid entries for the Module, SPN, FMI and at least one description field to be processed.

A module must be enabled in the General Settings worksheet to show up in the Driver Message Center.

The default for “Buzzer Tone when activated” is “0 - None”, “Auto Display when activated” is “Do Not Force Display” and “Use Driver Description in Diagnostic Description” is “No”.

If multiple items with different “Auto Display when activated” times are displayed at the same time, the max time of these faults will be used.

Driver Message Center Screen



Auto Scroll Speed

Auto Scroll Speed (seconds to display each page)

Enter the time, in seconds, that the page of message(s) will be displayed on screen. This setting is used to handle cases where there are too many messages to be displayed on a single screen the touch is disabled due to the vehicle moving. The range is 0-1000 seconds

If set to 0 Seconds, nothing will be displayed on the screen.

Any value greater than 0 will be display one page of Driver Message Center Messages and then change to the next page of Messages until it has cycled through all of them.

There is also a permanent setting in the Auto Display when Activated drop down that will display that messages on the screen constantly.

13.1. DTC table (Left-Most Table)

Module
From the pull-down menu, select the module that is to be monitored. The module of interest must be configured correctly in the General Setting Worksheet. This is where the devices source address, CAN bus and enabling are configured for use in the message center.

SPN
Enter the SPN, in decimal or hexadecimal, of the DTC (diagnostic trouble code).

FMI
Enter the FMI, in decimal or hexadecimal, of the FMI (failure mode indicator).

Buzzer Tone when activated
From the pull down, select the desired buzzer tone. The options are none, repeat or single. See the Buzzer worksheet for the different tone configurations (A,B,C and D). By default, the buzzer tone is set to none.

Auto Display when activated
From the pull down, select the duration that the message will be visible.
By default, this is set to “do not force”.

Driver Message Center Description

Enter the desired fault description. Long descriptions may be truncated when displayed. To indicate a line break, use <br/>. For example, “my string
is long” will appear as:

my string
is long

To support multi-language support, use .FLT.n (where n is a number from 1 to 500). See the language setup section for more details.

Diagnostic Screen Description

Enter the desired fault description. Long descriptions may be truncated when displayed. To indicate a line break, use <br/>. For example, “my string
is long” will appear as:

my string
is long

To support multi-language support, use .FLT.n (where n is a number from 1 to 500). See the language setup section for more details.

Module	SPN	FMI	Buzzer Tone when activated	Auto Display when activated	Driver Message Center Description	Diagnostic Screen Description	Use Driver Description in Diagnostic Description

13.2. DTC Message Setup

Control

From the pull-down menu, select the desired VMM telltale that will trigger the driver message.

Module Text

To use a text description of the module, enter the text in this cell. If an image is to be used, leave this cell empty (do not populate both module text and module image cells). If both the text and image cells are left empty, a default message of “Driver Message” will be displayed. Long descriptions may be truncated when displayed. To indicate a line break, use <br/>. For example, “my string
is long” will appear as:

my string
is long

To support multi-language support, use .MSG.n (where n is a number from 1 to 500). See the language setup section for more details.

Module Image

To use a module image, enter the desired image name. If a module text description is to be used, leave this cell empty (do not populate both module text and module image cells).

Buzzer Tone when activated

From the pull down, select the desired buzzer tone. The options are none, repeat or single. See the Buzzer worksheet for the different tone configurations (A, B, C and D). By default, the buzzer tone is set to none.

Auto Display when activated

From the pull down, select the duration that the message will be visible. By default, this is set to “do not force”.

Driver Message Text

If a text message is desired, enter the desired fault description. If an image is to be used, leave this cell empty (do not populate both module text and module image cells). Long descriptions may be truncated when displayed. To indicate a line break, use <br/>. For example, “my string
is long” will appear as:

my string
is long

To support multi-language support, use .MSG.n (where n is a number from 1 to 500). See the language setup section for more details.

Driver Message Image

If an image is desired, enter the image name in this cell.

Control	Module Text	Module Image	Buzzer Tone when activated	Auto Display when activated	Driver Message Text	Driver Message Image

14. Digital Gauge

14.1 Enable Digital Gauge

The Digital Gauge will not be visible when disabled. From the pulldown menu, select Enabled or Disabled.

Digital Gauge	Disabled

14.2. Identifier

In the Name field, enter a text string (maximum of 20 characters) to identify the gauge. If using language files, use the language string identifiers .DGLS.n, where n is a number from 1 to 2. The translations can be found in the Odometer module.

Identifier	
Type	Text
Name	

14.3. Numeric Value

In the Units field, enter a text string (maximum of 20 characters).
In the Decimal Points field, enter a whole number (from 0 to 2) to indicate the number of decimal points to be displayed.

Numeric Value	
Units	
# of Decimal Points	

14.4. OOR High Alarm (DG-1_HA)

The OOR (Out Of Range) High Alarm sets the virtual telltale to active when the defined threshold is reached. It will hold the signal active until the value drops below the threshold minus hysteresis value.

Enabled
Select the enabled value (yes/no) from pulldown.

Threshold
Enter the desired threshold value. When the gauge value is equal to or greater than this value, the virtual telltale signal will be set active.

Hysteresis
Enter a value for hysteresis. This value is used with the threshold value to determine when the high alarm is disabled (threshold – hysteresis = OFF).

OOR High Alarm (DG-1_HA)	
Enabled	
Threshold	
Hysteresis	

14.5. OOR High Warning (DG-1_HW)

The OOR (Out Of Range) High Warning sets the virtual telltale to active when the defined threshold is reached. It will hold the signal active until the value drops below the threshold minus hysteresis value.

Enabled
Select the enabled value (yes/no) from pulldown.

Threshold
Enter the desired threshold value. When the gauge value is equal to or greater than this value, the virtual telltale signal will be set active.

Hysteresis
Enter a value for hysteresis. This value is used with the threshold value to determine when the high alarm is disabled (threshold – hysteresis = OFF).

OOR High Warning (DG-1_HW)	
Enabled	
Threshold	
Hysteresis	

14.6. OOR Low Warning (DG-1_LW)

The OOR (Out Of Range) Low Warning sets the virtual telltale to active when the defined threshold is reached. It will hold the signal active until the value rises above the threshold plus hysteresis value.

Enabled
Select the enabled value (yes/no) from pulldown.

Threshold
Enter the desired threshold value. When the gauge value is equal to or less than this value, the virtual telltale signal will be set active.

Hysteresis
Enter a value for hysteresis. This value is used with the threshold value to determine when the high alarm is disabled (threshold + hysteresis = OFF).

OOR Low Warning (DG-1_LW)	
Enabled	
Threshold	
Hysteresis	

14.7. OOR Low Alarm (DG-1_LA)

The OOR (Out Of Range) Low Alarm sets the virtual telltale to active when the defined threshold is reached. It will hold the signal active until the value rises above the threshold plus hysteresis value.

Enabled
Select the enabled value (yes/no) from pulldown.

Threshold
Enter the desired threshold value. When the gauge value is equal to or less than this value, the virtual telltale signal will be set active.

Hysteresis
Enter a value for hysteresis. This value is used with the threshold value to determine when the high alarm is disabled (threshold + hysteresis = OFF).

OOR Low Alarm (DG-1_LA)	
Enabled	
Threshold	
Hysteresis	

14.8. Control Signal

The control signal defines the signal which will drive the digital gauge needle position.

Source

Select the source from the pulldown menu (CAN, VMM or Cluster signal)

Factor

Enter the Factor value (referred to as resolution in J1939 documentation). This value should be the same as what has been entered in the signals definition in a DBC file. For example, PGN 65276, SPN 169 (Cargo Ambient Temperature) is defined as having a resolution of 0.03125°C/bit. The value entered in the factor cell would be 0.03125.

Offset

Enter the offset value. This value should be the same as what has been entered in the signals definition in a DBC file. For example, Cargo Ambient Temperature is defined as having an offset of -273°C. The value entered in the factor cell would be -273.

Averaging Time

Enter a value, in milliseconds, for averaging time. This will generate a moving average using the samples collected during that period. This is intended for use with signals such as a fuel level, where it is desirable to filter out 'slosh' of the fuel. To disable averaging, enter a 0. The range for averaging time is 0–65535. Units is milliseconds e.g., 65535 mS.

Control Signal	
Source	
Factor	
Offset	
Averaging Time	

14.9. CAN Signal

The CAN signal defines the signal which will be used, if selected as the Control Signal source, to drive the digital gauge needle position.

CAN bus
Select the CAN bus from the pulldown menu (CAN bus1 or CAN bus2)

Source Address
Select the desired source address from the pulldown menu.

PGN
Enter the desired PGN, in either decimal or hexadecimal. For hexadecimal values, precede the value with 0x (for example, 0x00 for an engine source address).

Length (Bits)
Enter the bit length of the selected PGN. This value should be the same as what has been entered for the message definition in a DBC file.

Start Bit
Enter the start bit value of the desired SPN. This value should be the same as what has been entered for the signal definition in a DBC file.

CAN Signal	
CAN Bus	
Source Address	
PGN	
Length (Bits)	
Start Bit	

14.10. VMM Signal

The VMM signal defines the signal which will be used, if selected as the Control Signal source, to drive the digital gauge needle position.

Source Address
Select the desired VMM source address from the pulldown menu.

Signal
Select the desired VMM signal (analog input or flag) from the pulldown menu.

VMM Signal	
Source Address	
Signal	

14.11. Cluster Signal

The Cluster signal defines the signal which will be used, if selected as the Control Signal source, to drive the digital gauge needle position.

Analog Input

Select the desired cluster signal (analog input) from the pulldown menu.

Cluster Signal	
Analog Input	

15. Advanced Driver-Assistance System (ADAS)

15.1. ADAS Equipped

From the pulldown menu, select whether the vehicle is equipped with ADAS (yes or no).

ADAS Equipped	No

15.2. Distance Display Units

The units displayed are based on the units selected in the general settings worksheet. To change the units, this is done on the General Setting Tab under the Distance Display Units (Metric - Kilometers / Imperial - Miles).

Minimum volume

Enter the Minimum Volume values as a real number between 0.1 and 2.0 (0.1%/bit). To disable volume adjustment set this to the same value as the Maximum Volume.

Maximum Volume

Enter the Maximum Volume values as a real number between 0.1 and 2.0 (0.1%/bit).

Following Distance Adjust

Select the default value from the pulldown menu for the Following Distance

Distance Display Units	Imperial (Miles)
Minimum Volume	0.1
Maximum Volume	0.5
Following Distance Adjust (Default)	Normal

15.3. Dialog Display Timeout

Enter the time, in seconds, for the duration of time to display a fault message. The range is 3 to 10 seconds.

Dialog Display Timeout	3

15.4. Audible Tones

There are eight conditions which will generate an audible tone. These tones are enabled by the Bendix Wingman Fusion system. Refer to the Bendix Wingman Fusion documentation to understand when these tones will be enabled.

- *Driver Intervention Req'd / Braking*
- *Driver Intervention Req'd*
- *Following Distance Level 1*
- *Following Distance Level 2*
- *Following Distance Level 3*
- *Lane Departure Warning*
- *Overspeed*
- *Wingman Fault*

Configure each of the warning conditions to have the desired audible tone. There is an optional comment section, which is not shown below.

Freq

Enter the desired buzzer output frequency, as a whole number, between 900 and 5000 (Hertz).

For the On/Off settings, a zero in a cell means that state will be ignored. For continuous tones set the two Off states and 2nd On state to zero.

On

Enter the On period for the tone, as a whole number, between 15 and 65535 (milliseconds).

Off

Enter the Off period for the tone, as a whole number, between 15 and 65535 (milliseconds).

Repeating

From the pulldown menu, select whether or not the various tones for each condition are repeating.

Adjustable Volume

From the pulldown menu, select whether or not the various tones for each condition can have the volume adjusted by the driver.

Optional Comments

Enter an optional comment (this column is not shown below but is available in the configuration spreadsheet).

Audible Tones	Freq	On	Off	On	Off	Repeating	Adjustable Volume
Driver Intervention Req'd / Braking	1427	1000	0	0	0	Yes	No
Driver Intervention Req'd	1378	1000	0	0	0	Yes	No
Following Distance Level 1	980	150	150	150	150	Yes	Yes
Following Distance Level 2	980	250	250	250	250	Yes	Yes
Following Distance Level 3	980	500	500	500	500	Yes	Yes
Lane Departure Warning	2813	75	75	75	75	Yes	Yes
Overspeed	2892	65	75	65	315	Yes	Yes
Wingman Fault	980	1000	1000	0	0	No	Yes

15.5. ADAS Area Location

The ADAS screen can be shown on any of the three gauge. Each gauge page has its own configuration and has the same options as shown below. Gauge Page 1 is shown as an example.

Appears on Gauge Page 1

To have the ADAS shown on the gauge page. select yes or no from the pulldown menu.

X Position

Enter the X position as a whole number, from 0-400 pixels. When positioning, consider the desired width of the ADAS screen.

Y Position

Enter the Y position as a whole number, from 100-240 pixels. When positioning, consider the desired height of the ADAS screen.

Width

Enter the width as a whole number, from 400-800 pixels.

Height

Enter the height as a whole number, from 275-360 pixels.

ADAS Area Location & Size on Gauge Page 1	
Appears on Gauge Page 1	No
X Position	
Y Position	
Width	
Height	

15.6. ACC/CMS (Radar)

CAN bus

From the drop down menu, select the appropriate CAN bus (CAN bus1 or CAN bus2).

Source Address

From the drop down menu, select the appropriate Source Address.

Diag Menu Name

Enter the appropriate diagnostic menu name.

ACC/CMS (Radar)	
CAN Bus	CAN Bus 2
Source Address	42 (0x2A)
Diag Menu Name	CMS Radar

15.7. LDW/TSR (Camera)

CAN bus

From the drop down menu, select the appropriate CAN bus (CAN bus1 or CAN bus2).

Source Address

From the drop down menu, select the appropriate Source Address.

Diag Menu Name

Enter the appropriate diagnostic menu name.

LDW/TSR (Camera)	
CAN Bus	CAN Bus 2
Source Address	232 (0xE8)
Diag Menu Name	LDW Camera

15.8. Volume Adjust

From the pulldown menu select the method for volume adjustment (CAN message or touch screen).

Volume Adjust By	CAN Message

15.9. Volume Adjust CAN Parameters

If the source for volume adjustment is via CAN message, configure the CAN signal parameters.

CAN bus
From the drop down menu, select the appropriate CAN bus (CAN bus1 or CAN bus2).

Source Address
From the drop down menu, select the appropriate Source Address.

PGN
Enter the PGN number, either as a whole number or a hexadecimal value. If entering as a hexadecimal value include the prefix 0x (for example 0x00).

CAN Msg Timeout
Enter the desired timeout in milliseconds (range is 0-10000).

Vol up Bit Offset
Enter the Vol Vp SPN's bit offset (start bit). This value should be the same as the value defined in a DBC file.

Vol Up Length (Bits)
Enter the Vol Up SPN's bit length. This value should be the same as the value defined in a DBC file.

Vol Dn Bit Offset
Enter the Vol Dn SPN's bit offset (start bit). This value should be the same as the value defined in a DBC file.

Vol Dn Length (Bits)
Enter the Vol Dn SPN's bit length. This value should be the same as the value defined in a DBC file.

Mode Bit Offset
Enter the Mode SPN's bit offset (start bit). This value should be the same as the value defined in a DBC file.

Mode Length (Bits)
Enter the Mode SPN's bit length. This value should be the same as the value defined in a DBC file.

Mode Timeout

The Mode timeout indicates the amount of time the mode switch must be active before the volume control switches are enabled. Enter the desired timeout in seconds (range is 0-5). If the Mode switch will not be used, enter a value of 0.

Volume Adjust CAN Parameters	
CAN Bus	CAN Bus 1
Source Address	77 (0x4D)
PGN	0xFF34
CAN Msg Timeout	2,500
Vol Up Bit Offset	22
Vol Up Length (Bits)	2
Vol Dn Bit Offset	26
Vol Dn Length (Bits)	2
Mode Bit Offset	30
Mode Length (Bits)	2
Mode Timeout	1

15.10. ADAS Image Setup

For each of the images, enter the file name in the appropriate cell. The images must be PNG (.png extension).

Image Directory Pathname

In the “Image Directory Pathname”, enter the path to the directory which contains the image file(s).

An example path is: C:\DPS70\images

Image Directory Pathname	
Cruise Control Set image	
Default Centre image	
Forward Vehicle no error	
Forward Vehicle lvl3	
Forward Vehicle lvl2	
Forward Vehicle lvl1	
Alert Icon	
Warning Icon	
Left Lane (no departure)	
Left Lane (departure)	
Right Lane (no departure)	
Right Lane (departure)	
System Logo Screen image	
Following Distance Adjust Far	
Following Distance Adjust Normal	
Following Distance Adjust Short	
Following Distance Adjust Shortest	
Stationary Object Alert	

16. Appendix

16.1. Connectors and Pinouts

16.2. J1 – Gray Connector

Pin	Signal	Description
1	DIGITAL_2	DIGITAL INPUT 2
2	DIGITAL_1	DIGITAL INPUT 1
3	CAN_SHIELD_2	CAN SHIELD 2
4	CANL_2	CAN LOW 2
5	CANH_2	CAN HIGH 2
6	CAN_SHIELD_1	CAN SHIELD 1
7	CANL_1	CAN LOW 1
8	CANH_1	CAN HIGH 1
9	GROUND	GROUND
10	VBATT	SUPPLY VOLTAGE
11	DIGITAL_3	DIGITAL INPUT 3
12	ANALOG_3	ANALOG 3
13	ANALOG_4	ANALOG 4
14	DIGITAL_FIN_1	FREQUENCY 1/DIGITAL 10
15	SNSR_GND	SENSOR GROUND
16	ANALOG_1	ANALOG 1
17	ANALOG_2	ANALOG 2
18	HSO_1	HIGH SIDE OUTPUT (HSO) 1
19	HSO_2	HIGH SIDE OUTPUT (HSO) 2
20	VBATT	SUPPLY VOLTAGE

16.3. J2 – Black Connector

Pin	Signal	Description
1	NC	NOT CONNECTED
2	NC	NOT CONNECTED
3	CAN_SHIELD_3	CAN SHIELD 3
4	DIGITAL_4	DIGITAL INPUT 4
5	ANALOG_10	ANALOG 10
6	ANALOG_9	ANALOG 9
7	ANALOG_8	ANALOG 8
8	ANALOG_7	ANALOG 7
9	ANALOG_6	ANALOG 6
10	ANALOG_5	ANALOG 5
11	DIGITAL_5	DIGITAL 5
12	DIGITAL_6	DIGITAL 6
13	DIGITAL_FIN_2	FREQUENCY 2/DIGITAL 11
14	DIGITAL_7	DIGITAL 7
15	GROUND	RS232 GROUND
16	RS232_RX	RS232 RX
17	RS232_TX	RS232 TX
18	DIGITAL_8	DIGITAL INPUT 8
19	DIGITAL_9	DIGITAL INPUT 9
20	+5V_OUT	EXTERNAL SENSOR SUPPLY

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loginrec.h
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17.8. Zlib

zlib.h -- interface of the 'zlib' general purpose compression library version 1.2.8, April 28th, 2013

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The data format used by the zlib library is described by RFCs (Request for Comments) 1950 to 1952 in the files http://tools.ietf.org/html/rfc1950 (zlib format), rfc1951 (deflate format) and rfc1952 (gzip format).

17.9. LGPL-2.1

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