Configuring the Stack ST8961 VS Module when used in conjunction with a Stack ST81xx series display.

Your Stack ST8961 VS module allows you to synchronize, overlay, and record data available on your Stack system network onto a video file on your camcorder. These videos may be played back on a television or imported into DataPro for view alongside your recorded data to aid with driver and vehicle development. In the information that follows, we will take you step by step through the process necessary to configure your system features utilizing DataPro Designer. Note: This document assumes that you have already installed the Stack hardware in your vehicle per the included instructions and that you have downloaded the latest version of DataPro software and have entered any required DataPro authorization PIN codes for the hardware that you will be using.

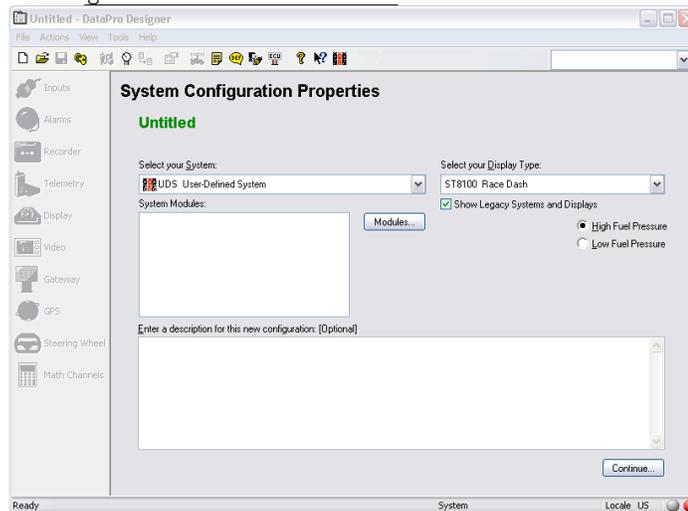1.) Open DataPro Designer by double clicking the Designer icon on your PC desktop (pictured below).

2.) Once Designer is open, you will be presented with a new window that appears similar to the one shown in the image below. Click the box next to the text 'Show Legacy System and Displays' on the right hand side of the screen. A green check mark should appear to confirm your selection.
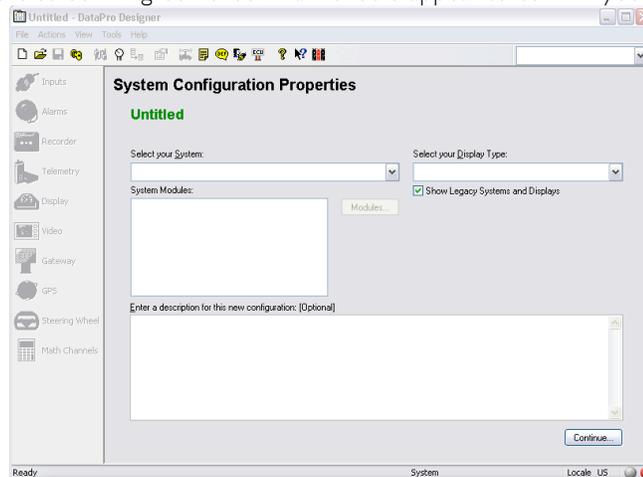
3.) Now click the drop down menu below 'Select you System.' Scroll down the listings to the bottom of this menu looking for the heading 'User-Defined System.' Click the entry 'UDS User-Defined System' to select this option. Your screen should now appear as the image below.
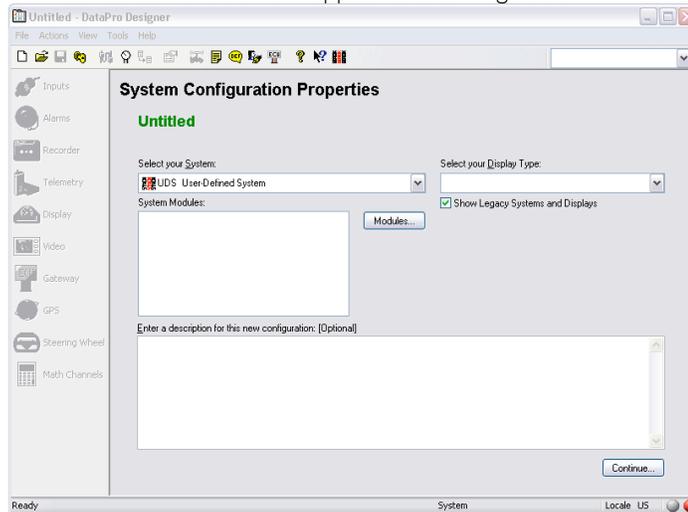

4.) In this example, our VS module is connected to an ST8100 series display which will share its sensor information with the VS module via the Stack network. To configure this option, click the drop down menu under 'Select your Display Type.' Scroll down this menu until you reach the 'Race Dash' heading. If you have an older display which utilizes twin terminal VDO pressure sensors or you know that your display was built before 2005, click the 'ST8100' entry to make your selection. If your ST81xx display has the solid state stainless steel pressure sensors or you know it was built after 2005, please click the 'ST8100 (2005)' entry to make your selection. If you are uncertain as to which display type you have, please contact Stack or your local dealer for assistance. In this case, our system is utilizing an earlier ST8100 display, so we have selected 'ST8100'. If you are also selecting this display type, make sure that you also select the correct fuel pressure setting (High Fuel Pressure for fuel injected engines, and Low Fuel Pressure for carbureted engines). Your screen should now appear similar to the image below.

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5.) Next, click the button labeled 'Modules' in the middle of the Designer window. Scroll down the newly opened menu until you reach the 'Video Modules' heading. Click the entry labeled 'VS 11 i/p' to activate the check box next to it selecting the VS module as part of your system. If your system is equipped with additional Stack modules, please also select them at this time. For this example we are only equipping the VS module. Your screen should appear as the image below.
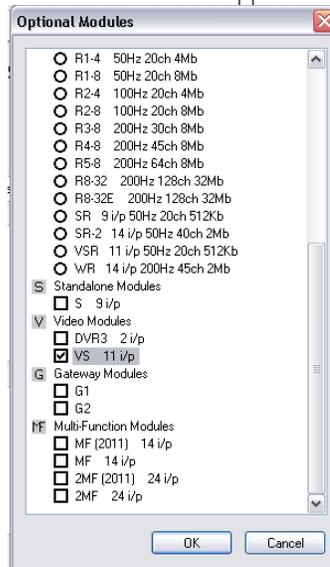

6.) Next click the 'OK' button at the bottom of this window to confirm your selection. Your screen should appear similar to the image below.
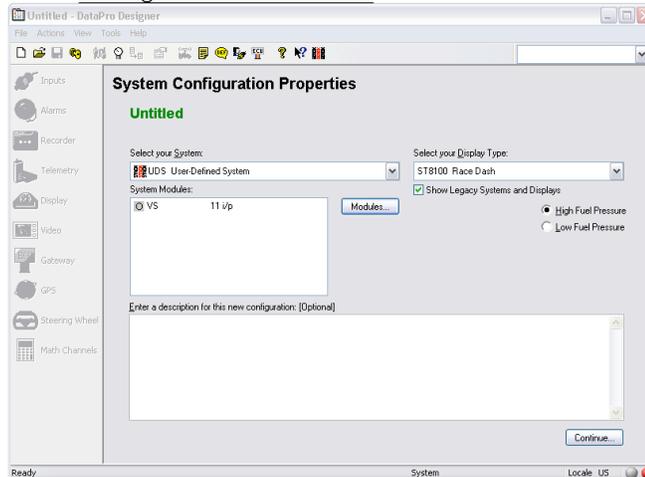
7.) At this point you may enter additional descriptive notes for this setup in the field below 'Enter a description for this new configuration (Optional). This is not a configuration requirement, but can be useful when trying to differentiate between varying system setups for different vehicles, tracks, etc. Once you are satisfied with the notes entered in this location, click the 'Continue' button at the bottom of the screen to move to the next portion of your system setup.

8.) You should now be looking at a screen like the image shown below. This is showing you the available inputs that can be sent to other devices on your Stack network from your ST8100 display. If all the boxes are unchecked, then the system will use all of the channels shown as the default source of information for your video data. You may disable any of these features (typically in favor of sensors connected to the input harness for your VS module) by clicking the boxes next to the entry. A check mark will appear next to each disabled channel. For the purposes of this example, we will be checking the box for 'Lat_G' to disable the display's Lateral G sensor in favor of the superior G sensor equipped in the VS Module. For quick reference: Batt = Vehicle Battery Voltage as applied to the display wiring loom, ESPD = Engine RPM, FUELP = Fuel Pressure, Lat_G = Lateral G sensor (if equipped), OILP = Oil Pressure, OILT = Oil Temperature, WSPD = Wheel Speed, WTMP = Water Temperature.
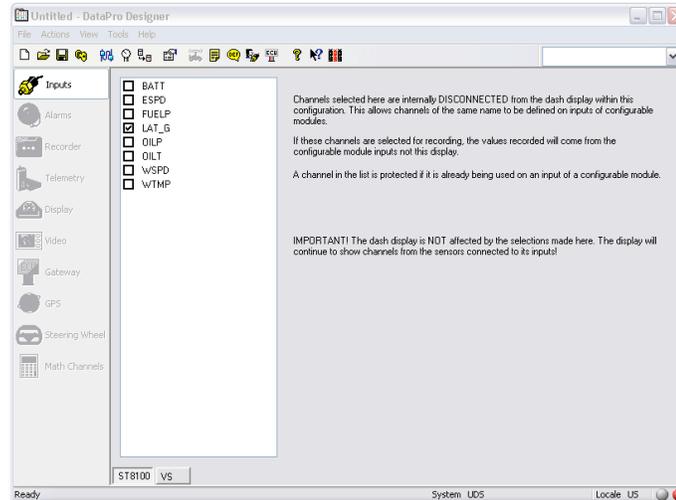

9.) Once you are happy with the selections made above, click the button labeled 'VS' at the bottom of the screen to continue on setting up your VS module.

10.) You should now be looking at a screen like the one shown below. This is the 'Inputs' setup function for your VS module. If you have connected additional sensors to the input harness of your module, please consult your notes for what sensors you have connected to what harness labels in order to configure the system to interpret their data appropriately. Once you have your installation notes in front of you, utilize the tabs on the left side of the screen to navigate to the different sensor types available. The arrow buttons to the right of the tabs may be clicked to allow you to view more available options. For the purposes of this example we show you how to enable the internal G sensors on your VS module. This step is important for the proper calibration of these sensors. During this step, note the orientation of the arrows displayed in boxes G2 and G1 on your screen. Compare these to the images of the vehicle from the Internal G sensor tab and match the orientation of the arrow shown next to the car. When you have determined the correct option, click and drag the image of the vehicle into the box to make your selection. In this example, the module was placed on the floor pan of the vehicle with the connectors facing the front of the car. Your installation may vary. The 'Advanced' button for each box provides access to additional features such as enabling high or low peak capture, and enabling a Moving Average Filter, used to smooth noisy data in real time. The higher the point setting on the filter when this feature is enabled, the smoother (less noisy) your data becomes, but the risk of missing critical high and low points due to the filtering becomes greater. We recommend that beginning system users leave Moving Average Filters disabled. When complete your selections should appear similar to the image below.

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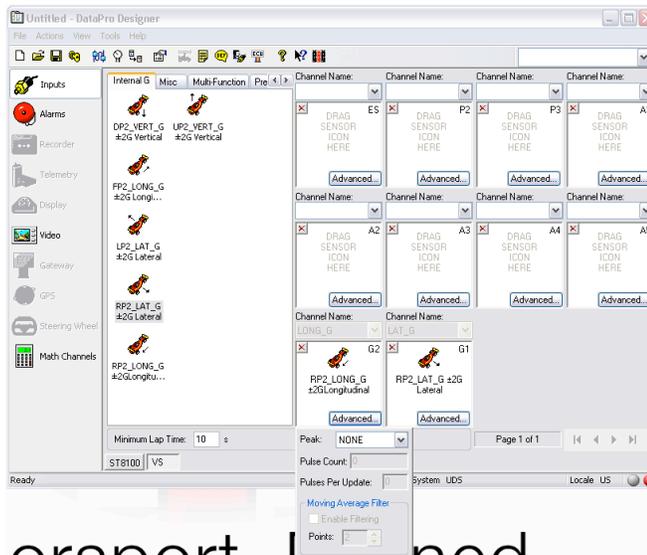
Note 1: If you are utilizing additional sensor inputs, follow the steps outlined above to match the sensor to the correct channel box / wiring loom label. Once the sensor is placed, click the Channel Name drop down menu above the location and select an appropriate identifier / name from the options provided. The ES channel may only accept Engine RPM data, the P2 and P3 channels may accept pulse sensor data such as additional clutch, shaft, or wheelspeed sensors. A1-A5 may accept 0-5V analog voltage sensors such as pressure, temperature, or position / travel sensors (i.e. suspension, throttle, steering, etc.)

Note 2: When utilizing a VS module with a fixed configuration display like an ST8100, the sensor data processed by the VS module will only be available for review on the video and cannot be shown on the display module itself.

11.) Alarms. Once you have completed your Input selections. Click the 'Alarms' button on the left side of your screen. Your screen should now appear similar to the image below. This screen it utilized to create alarm conditions that you would like to have displayed on the video data processed by your VS module. Please note that settings here have no impact on the alarms displayed on your ST8100 display which will be programmed separately through the switch set for that device. You may wish to consult and take notes from the display settings for the ST8100 in order to re-produce them here so that they may be duplicated on your video.
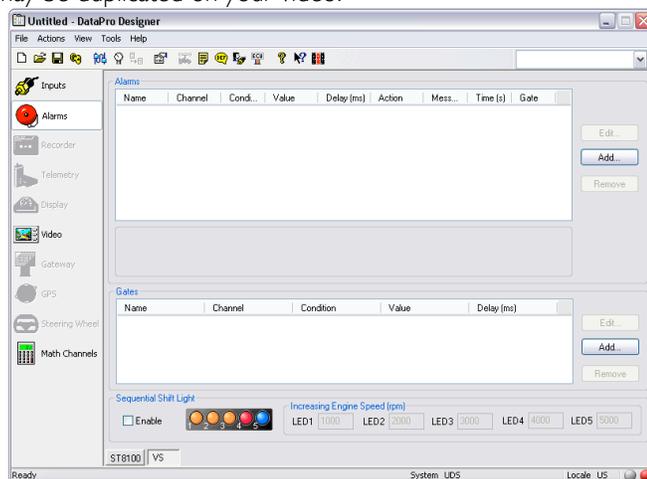
12.) To create a new Alarm, click the 'Add' button to the left of the alarms field on the screen. A new window similar to the image below will appear. Use the drop down menus to select the channel name for the input to have an alarm, the condition at which the alarm will occur (above or below)

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and the value at which the condition will trigger the alarm. Action delay is the time in milliseconds that the condition must occur before the alarm is displayed (useful for preventing false triggers, but recommended to be left blank by beginning users). Actions allows you to select from various triggers that your system may enable based upon the condition. Display Message provides a visual text alert when the alarm occurs. Message display time allows you to set a pre-determined time in seconds for the alarm message to be displayed before it disappears. If you leave the Message Display Time field empty, the Alarm Message will appear until the condition is ended or it is manually cleared by driver input. For the purposes of our example, we have created an alarm that will provide an on screen video message whenever the engine RPM of our vehicle is above 8,750 RPM.
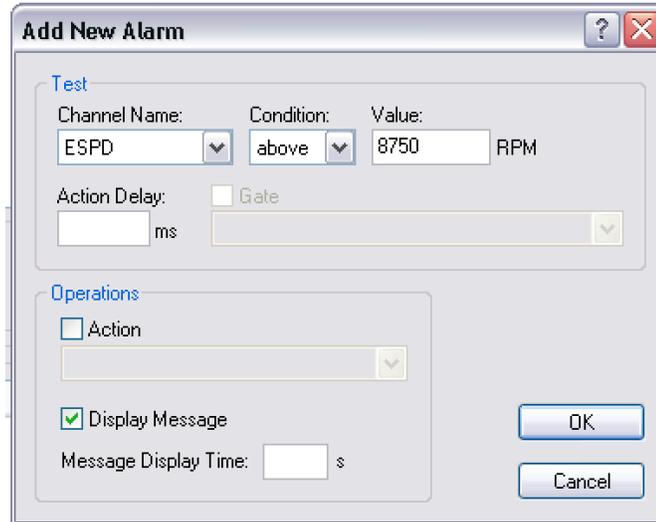
13.) Gates: The gate feature allows you to create additional condition statements for alarms to trigger. For example, if you have a low oil pressure alarm set, you may not want to see it displayed when the engine is not running. Creating a Gate for ESPD above 1,000 RPM and adding it to your oil pressure alarm, would prevent this situation as the system would now check for two conditions to be true, oil pressure below your set value AND engine RPM above 1,000 before an alarm would be triggered. This feature is set up similarly to the process above, begun by clicking the 'Add' button to the right of the Gates field in the window. Once a Gate has been created, it may be applied to an existing alarm by first selecting the desired alarm to which the gate will be applied and then clicking the 'Edit' button. Once you have completed the steps above, locate your CAN-USB download and configuration cable/device. Connect it to an appropriate USB port on your laptop and also to the download jack on the network cable on your Stack system. Ensure that power is switched on to the Stack system and that your computer has recognized the CAN-USB device (typically indicated by an audible chime and pop up message from your computer).

14.) Once you are satisfied with your Alarm and Gate settings, click the Video button on the left hand side of your screen to move on to the next portion of your VS module setup. You should now be looking at a screen similar to the image below.
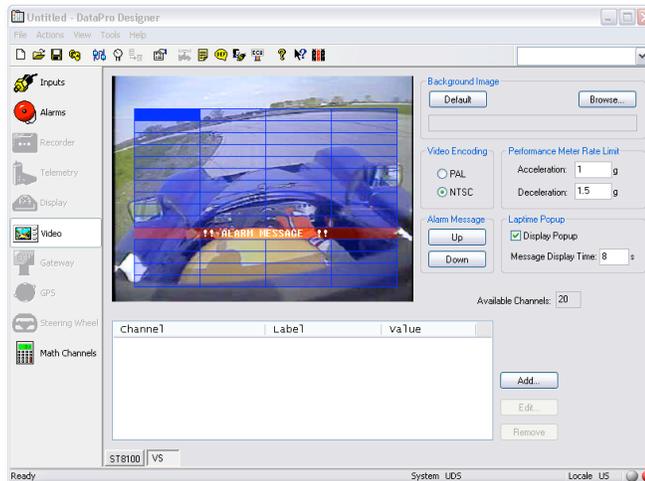
15.) Video Setup:

   a. **Background Image:** Designer supplies a default image to provide an indication of where your selected data overlay items will appear relative to the camera picture. For a more personalized setup, you may elect to take an image from the camera location on the vehicle and import that using the 'Browse' button. Please note that the image must be saved as a bitmap (.bmp) to be utilized in this way.

   b. **Video Encoding:** This setting configures the screen resolution requirements of your Stack VS module to match the video recording to and display equipment that you are using. **!It is vital that your system settings here match your hardware! Failure to select the correct setting here can cause a variety of picture, resolution and recorded video issues.** If you are utilizing this system with video equipment in North America, please select NTSC. Users utilizing European video equipment should select PAL. If you are uncertain of which type of equipment you may have, please consult Stack or your local dealer for assistance before proceeding with your configuration.

   c. **Performance Meter Rate Limit:** Adjusting these values allows advanced users to fine tune their Predicted Lap Timing data. It is recommended that beginning users do not modify these settings.

   d. **Alarm Message:** Clicking the 'Up' and 'Down' buttons here will correspondingly adjust the '!! Alarm Message!!' display banner one position on the screen space. Use this feature to adjust where you would like active alarm messages to appear on your video data picture.

   e. **Laptime Popup:** When 'Display Popup' is checked your completed lap time will appear on screen following a beacon trigger on your Stack system lap time receiver. The default time for the message to be displayed is 8 seconds. You may alter this by typing a new value in the 'Message Display Time' field.

   f. **Video Overlay Data:** Select and arrange your desired on screen data for your video overlay utilizing the software tools detailed below. You may place up to 20 data channels in overlay on your video picture. The 'Available Channels' space in the video configuration window in Designer will count down as you make your selection to help you keep track of how many display parameters you have remaining.

      i. **Add:** To add a new data overlay channel, click the 'Add' button on the bottom right hand side of your screen. This will open a new window which should appear similar to the image shown below. Utilize the Channel drop down menu to select the channel that you would like to display. You will then be prompted to the 'Label' field to make any alterations to the characters that will be listed on screen to help you identify the data. We recommend utilizing the default settings, but some users will desire to alter these descriptors to account for personal

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preference and language differences. Once you are happy with the selections, click the 'OK' button on the window to confirm your choices. The newly selected Data Overlay text will appear in the top left corner of the onscreen image. You may click and drag this block to another desired screen location. Note: Designer will not allow you to place the data outside the grid shown, or over the top of the alarm message banner. To create another data overlay message, click on the desired open space within the image grid to highlight the block and duplicate the steps detailed above. To swap the spaces of two pieces of data, simply click and drag one to the position of the other and Designer will exchange their locations.

ii. **Edit:** To make alterations to either the data overlaid in a particular section of the image grid or to the data label of that entry, first select the item to be modified by clicking it to highlight your selection. Once the item is selected, click the Edit button to either change the piece of information shown in that location or to alter the Label characters shown with that data.

iii. **Remove:** To remove a data overlay message from your video image grid, first select the item to be removed by clicking it to highlight your selection. Once selected, click the Remove button to confirm your choice.

16.) Once you are satisfied with your configuration selections for Inputs, Alarms, and Video as detailed above, it is time to save your work. To do so you may either click File in the upper left hand corner of your screen and then 'Save As' to name your configuration or you may click the Disk icon in the upper left hand corner of the screen.
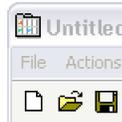
17.) Once you have completed the steps above, locate your CAN-USB download and configuration cable. Connect it to an appropriate USB port on your laptop and also to the download jack on the network cable on your Stack system. Ensure that power is switched on to the Stack system and that your computer has recognized the CAN-USB device. You are now ready to upload your configuration. You may either click Actions and then select Upload from the Actions menu, or simply click the blue icon at the top of the screen depicting a linked cable connection. Click the Start button on the Upload window (pictured below) to begin the process. Notification will be provided upon a successful upload verified with Green boxes filled in next to each major step. Once the upload is completed, DataPro and your system hardware are now ready for datalogging and analysis work!

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