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# Operation & Installation Manual

## **PTLOG™270DPF**

### **Engine Exhaust Temperature and Backpressure Alarm and Logger**

### **Revision 1.2**

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# Operation & Installation Manual

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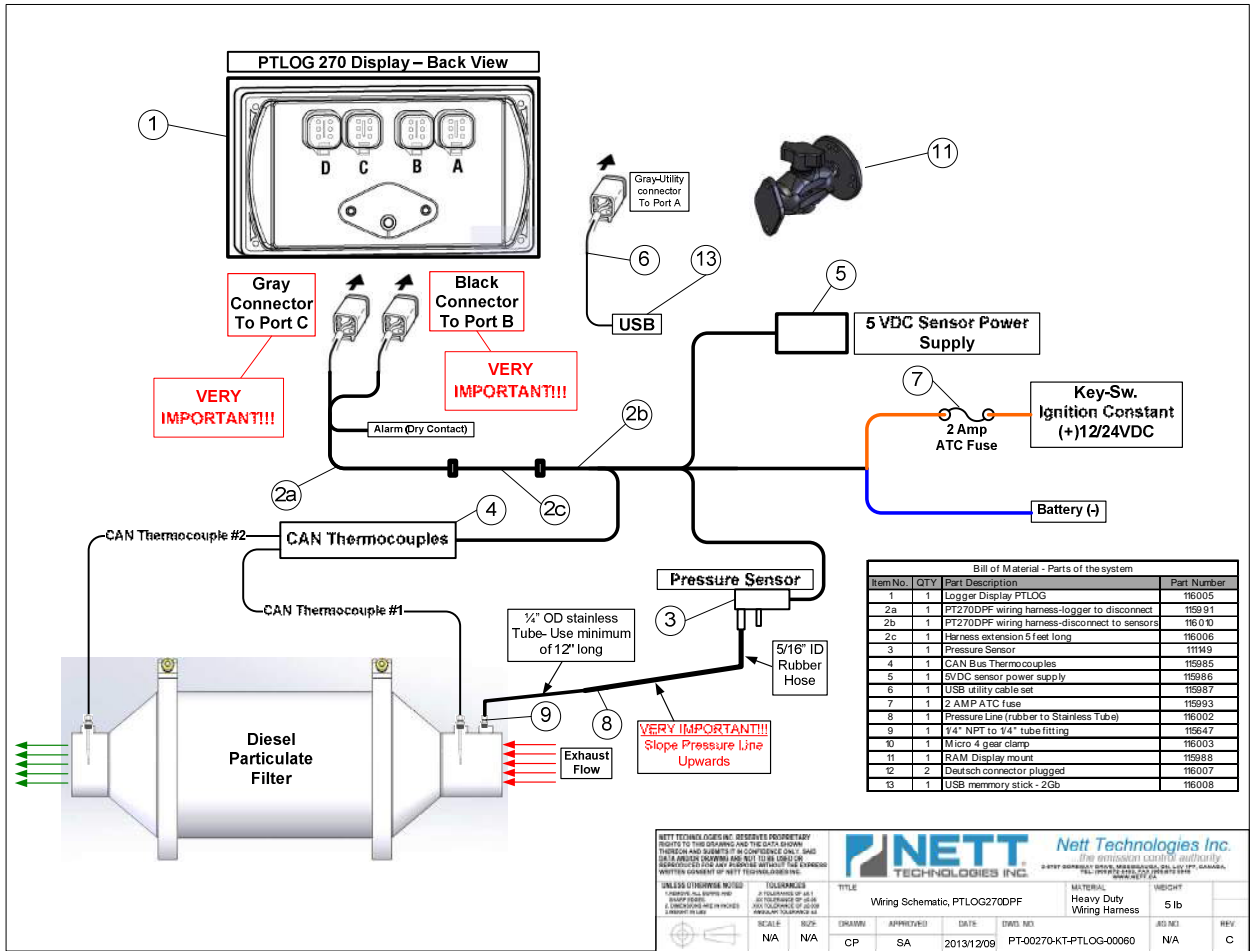
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## System Description & Features

The Nett® PTLOG™270DPF system is an engine exhaust backpressure and diesel particulate filter monitor, alarm and data logging device. It is a valuable tool to alert operators and passive DPF users to plugging problems and providing a method to diagnose errors and faults through logged data and error codes.

The core of the PTLOG™270DPF is a 4.3" (109mm) backlit, daylight visible, color TFT LCD screen with integrated controller using the CAN J1939 standard communication protocol.

As illustrated in the schematic below, the PTLOG™270DPF is capable of logging the DPF inlet, outlet temperatures and backpressure sensor. The system is also able to connect to the engine CAN network (if available) to record engine parameters in order to determine the DPF status under all operating conditions.



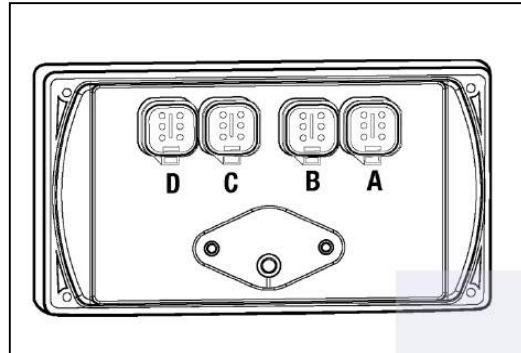
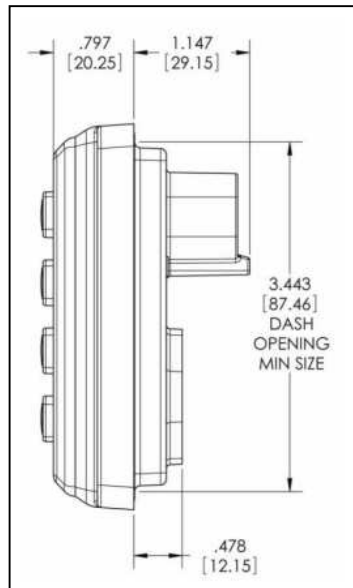
The PTLOG™270DPF is programmed to provide monitoring of DPF performance at all engine dynamic operating conditions. The display will provide information to the operator to schedule DPF cleaning ahead of critical failures to avoid unscheduled machine downtime. All warning and alarm messages are logged with date and time stamp.

The logging unit has 128 Mb (Megabytes) of memory sufficient to log operating and error messages every 5 sec for more than 750 operation hours. The data is easily downloadable via the USB Download Kit part number PT-00270-01-USBDK-00010 (supplied separately) onto a USB memory stick following the simple on screen instructions.

## System Specification

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- Screen size: 4.3 inch TFT color screen for daylight visibility
- Resolution: WQVGA 480 x 272 pixels, 16-bit Color
- Dimensions: 7.4 x 3.8 x 1.94 in. (186.9 x 96.5 x 49.4 mm)
- Protection: IP66 (NEMA 4) front and IP67 (NEMA 6) back
- Case material: Polycarbonate back case
- Power supply: 6 to 35 VDC, reverse polarity and load-dump protected
- Power: 10w full backlight
- Temp Range: -40 to +85°C (Operating) / -40 to +85°C (Storage)
- User input keys: 8 sealed momentary tactile buttons



- Interface: 2x Ports, CAN 2.0B - SAE J1939 standard
- Memory: 128Mbyte - 256 MB Flash Memory  
SD storage (optional)
- Protocols: 2 x CAN 2.0B
- Connections: 4 Deutsch DT IP69K (NEMA PW12) 6-pin connectors
- Vibration: Random vibration, 7.86 G/rms (5-2000 Hz), 3 axis
- Shock: +/- 50G in 3 axis

## System Components and Bill of Material

# Operation & Installation Manual

| Component                    | Part            | QTY | Image   |
|------------------------------|-----------------|-----|---|
| Screen / Controller          | 116005          | 1   |   |
| Dual CAN Temperature Sensor  | 115985          | 1   |    |
| Differential Pressure Sensor | 111149          | 1   |    |
| Universal Mount Kit          | 115985          | 1   |    |
| Stainless Steel Tube         | 116002          | 1   | 1/4" OD x 12"   |
| Rubber Hose                  | 116002          | 2   | 5/16" ID  |
| Fittings & Hose Clamps       | 115647          | LOT |   |
| Harness                      | 115991          | 1   |   |
| Sensors Power Supply         | 115986          | 1   |    |
| Interface / Download Cable   | 115987 / 116008 | 1   |  |

| Bill of Material - Parts of the system |     |   |             |
|--|-----|---|-------------|
| Item No.                               | QTY | Part Description                              | Part Number |
| 1                                      | 1   | Logger Display PTLOG                          | 116005      |
| 2a                                     | 1   | PT270DPF wiring harness-logger to disconnect  | 115991      |
| 2b                                     | 1   | PT270DPF wiring harness-disconnect to sensors | 116010      |
| 2c                                     | 1   | Harness extension 5 feet long                 | 116006      |
| 3                                      | 1   | Pressure Sensor                               | 111149      |
| 4                                      | 1   | CAN Bus Thermocouples                         | 115985      |
| 5                                      | 1   | 5VDC sensor power supply                      | 115986      |
| 6                                      | 1   | USB utility cable set                         | 115987      |
| 7                                      | 1   | 2 AMP ATC fuse                                | 115993      |
| 8                                      | 1   | Pressure Line (rubber to Stainless Tube)      | 116002      |
| 9                                      | 1   | 1/4" NPT to 1/4" tube fitting                 | 115647      |
| 10                                     | 1   | Micro 4 gear clamp                            | 116003      |
| 11                                     | 1   | RAM Display mount                             | 115988      |
| 12                                     | 2   | Deutsch connector plugged                     | 116007      |
| 13                                     | 1   | USB memmory stick - 2Gb                       | 116008      |

## Installation Preparation

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Before beginning the installation or performing any service on the PTLOG™270 kit, the following safety procedures should be followed.



**Before start working on the machine:**

- Verify all PTLOG™270DPF kit components were received and inspect for damage. Notify carrier immediately if any parts are damaged.
- Post a “DO NOT OPERATE” sign in or in front of the operator station.
- Park the machine on a flat level surface and lower all equipment to the ground.
- Stop engine and operate hydraulic controls to relieve hydraulic system pressure.
- Turn battery disconnect switch to OFF or disconnect the battery ground.
- Ensure engine and exhaust components have cooled before handling sensors installation.



Should you require assistance or have any questions during the installation process, please contact a Customer Service Representative at Nett Technologies Inc.

To contact us by phone, call 1-800-361-6388 between 9:00am and 5:00pm EST, Monday to Friday

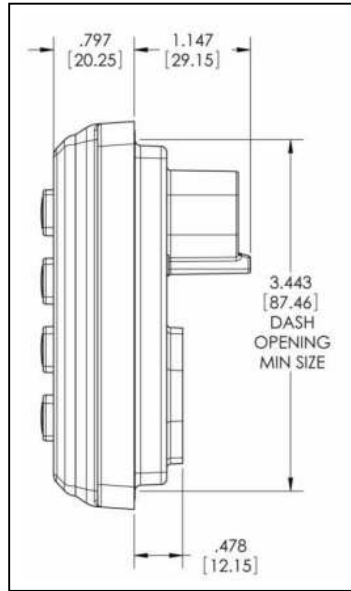
## Installation Instructions

### Step 1: Install the Electronic Control Module

- The PTLOG™270 Screen / Controller should be mounted in a location which is visible to the operator.
- The Screen / Controller unit can be mounted either in the dash board by cutting an opening on the dash front or mounting on the dash by using the Universal Mounting



**Caution:** Avoid Exposure to direct sun and high temperatures that can affect and/or damage the Screen / Controller unit.

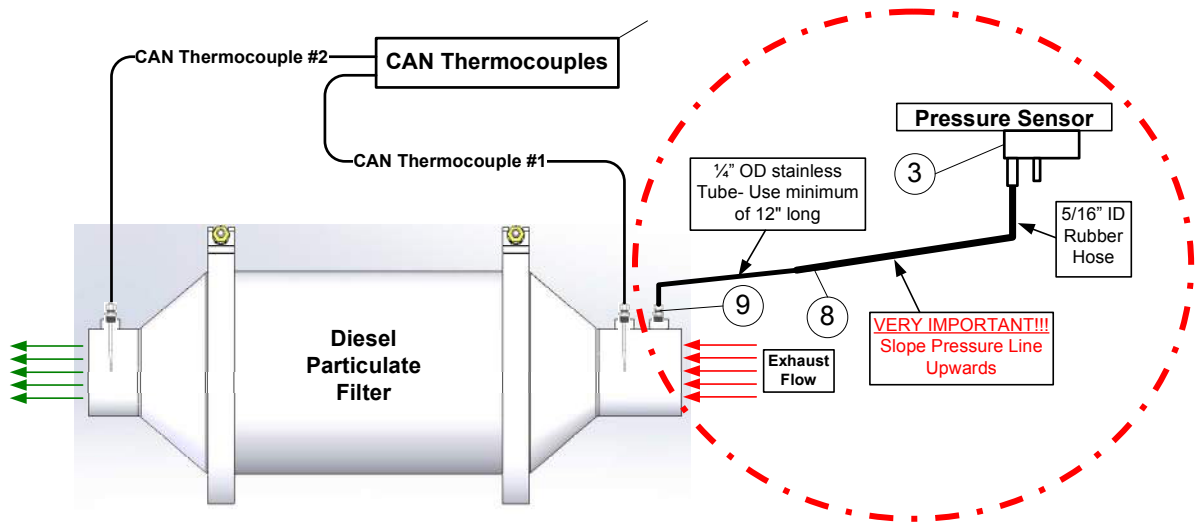


### Step 2: Install the Pressure Line

The pressure line connects the exhaust system backpressure to the pressure sensor. Care should be taken to ensure the stainless steel tube and rubber hose are routed so that they are not looped, kinked or pinched, impeding the pressure signal from reaching the module.

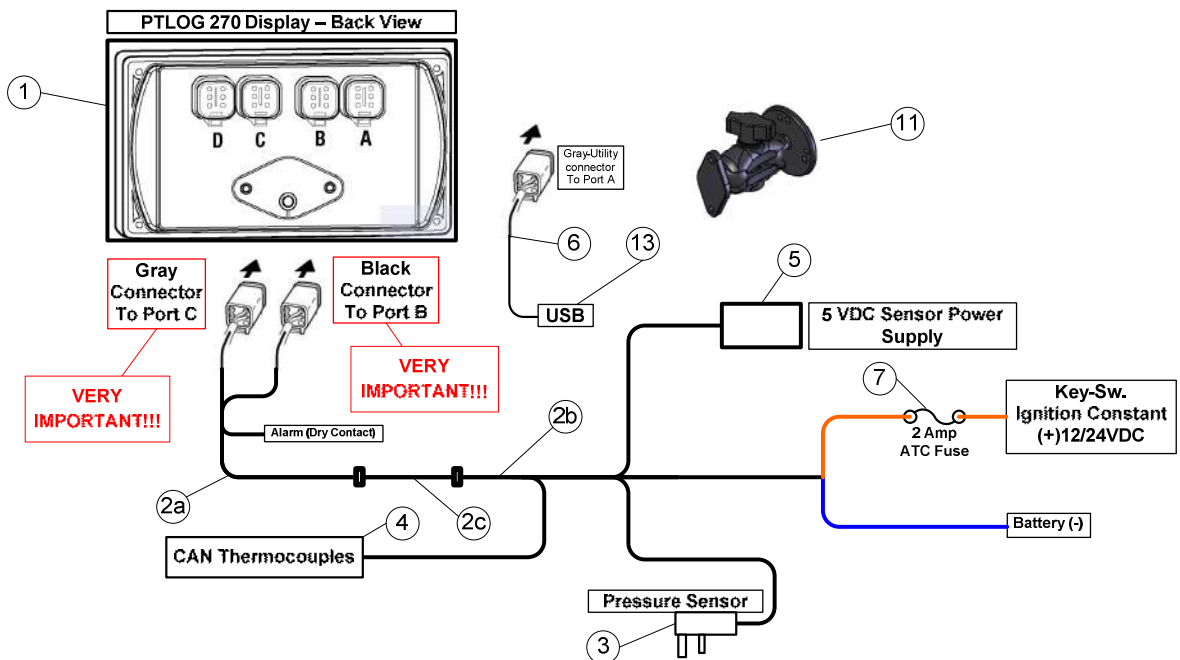
- Mount and rigidly secure the pressure sensor on the frame with its ports **POINTING** down and at a **HIGHER** level than the backpressure port on the exhaust system.
- Connect the stainless steel tube to the backpressure port using coupler. Use a minimum of 12" long stainless steel tube and support it by attaching to the DPF mounting brackets.
- Connect the adequate length of the rubber hose between the open end of the copper tube and the pressure sensor high pressure port (with larger diameter).

**Important Note:** Make sure that the pressure line is straight and is not looped so it allows all the condensations flowing back into the exhaust system.


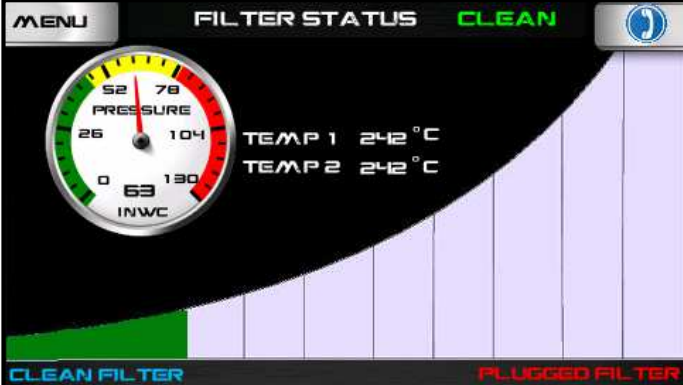



### Step 3: Connect the Wiring

- Run the harness starting from the back of the Screen/Controller past the temperature and pressure sensors and to the battery power. It is recommended to attach the harness to the frame and fire wall avoiding areas in proximity to hot surfaces, heat sources and engine fluids.
- Connect the **GRAY** Connector to **Port C** on the back of Screen/Controller unit.
- Connect the **BLACK** Connector to **Port B** on the back of Screen/Controller unit.
- Connect to pressure sensor.
- Connect to temperature sensors.
- Mount and connect the temperature sensor power supply.
- Connect the red wire to an ignition switched (+12V/+24V DC) power source.
- Connect Blue (-) and Fused Red (+) to Main Power Input.
- Loop and secure Harness extra length away from any vehicle moving part.






| Step | What To Do:  | Screen   |
|------|--|--|
| 1    | When the equipment ignition is turned on for the first time the start up screen appears.   |    |
| 2    | After several seconds, the main screen will appear indicating the DPF status.  |   |
| 3    | <p>Press the "Menu" button to get to the password screen and access to the setup screen:</p> <ul style="list-style-type: none"> <li>In the password screen, the numeric keyboard can be controlled using the "NEXT KEY" and "ACCEPT KEY" buttons.</li> <li>Press the "NEXT KEY" button to advance the empty red square to the desired number. Press the 'ACCEPT KEY' to make the selection.</li> <li>The typed password (eg. 123 shown here) can be reviewed as shown in the figure.</li> <li>After typing the password, the empty red square should be moved to the "DONE" key and the "ACCEPT KEY" selected.</li> <li>If the password is correct, the operator will be directed to the "Service Menu" page, otherwise the typed password is cleared and the operator should enter the password again.</li> </ul> |  |

| Step | What To Do:   | Screen |
|------|---|--------|
| 4    | <p>In the "Service Menu" screen, the operator can interface with the system and perform the setup:</p> <ul style="list-style-type: none"> <li>• Find Part #, S/N &amp; Kit #</li> <li>• Set Date &amp; Time</li> <li>• New &amp; Replacement DPF Log Book</li> <li>• Downloading the data</li> <li>• Nett Technologies settings</li> <li>• Contact information</li> <li>• Filter cleaning logging</li> </ul>  |        |
| 5    | <p>For the initial logger setup, press the "New Filter" button to get to the "New Filter" data screen:</p> <ul style="list-style-type: none"> <li>• Press "Next Item" button; bring down the red arrow to the next item that the operator wants to change.</li> <li>• The "Keyboard ON" and "Keyboard OFF" buttons turn the alpha numerical keyboard on and off.</li> <li>• When the keyboard is turned on, another three buttons of "Next Key", "Previous Key" and "Accept Key" will appear on the display.</li> <li>• The "Next Key" and "Previous Key" buttons change the selected key highlighted with the blue empty square to the next or previous one while the "Accept Key" picks the selected number or letter and enter it into the information string.</li> <li>• "Selecting the "backspace" key on the keyboard will delete the last entered letter or number from the string.</li> </ul> |        |
| 6    | <ul style="list-style-type: none"> <li>• Type the required information (ex: JD544) which can be reviewed below the space key of the keyboard,</li> <li>• Move the blue empty square to the "DONE" key on the keyboard and by pressing the "Accept Key" button, the typed information will be transferred into the blank space in front of the item selected by the red arrow.</li> <li>• At this time the keyboard along with three buttons of "Accept Key", "Next Key" and "Previous Key" are no longer shown.</li> </ul>  |        |

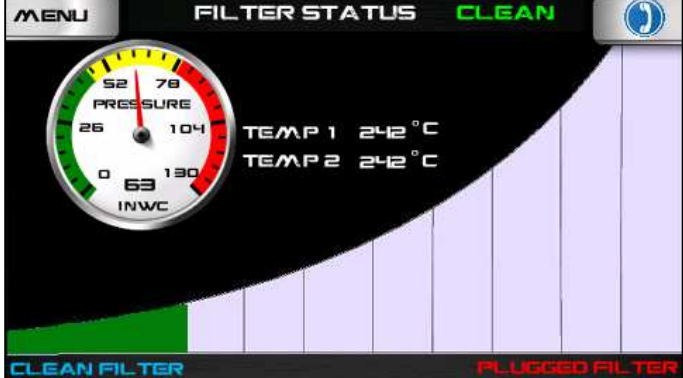

| Step | What To Do:  | Screen |
|------|--|--------|
| 8    | <ul style="list-style-type: none"> <li>A similar procedure should be repeated to fill the rest of the form if required.</li> <li>In order to set the date for a new DPF installation, the “Set Date” button can be used instead of keyboard and the default date is automatically replaced with the current date.</li> </ul>   |        |
| 9    | <ul style="list-style-type: none"> <li>After the initial installation, this screen should be revisited only if the filter is replaced with or if the system is installed on different engine.</li> <li>By pressing the “MENU” button, the operator can leave this page and go to the “SERVICE MENU” page.</li> <li>Another setting which should be performed is Time &amp; Date setting.</li> <li>To do this, press the time and date button in the “Service Menu” page. The “Service Menu” page is replaced with the “Date &amp; Time” page as shown.</li> </ul>  |        |
| 10   | <ul style="list-style-type: none"> <li>Setting of the Year, Month, Day, Hour, Minute and Second can be done using the up and down buttons on the left side of the display.</li> <li>The value of the selected date and time parameter can be changed using the up and down buttons located on the right side of the display.</li> <li>After setting the current date and time, the save button on the upper right corner of the display must be pressed.</li> <li>A message will appear requesting confirmation.</li> <li>Pressing “Menu” will allow the operator to modify the date and time setting again.</li> <li>Pressing the “Enter” button will save the set date and time and reboot the display.</li> </ul> |        |

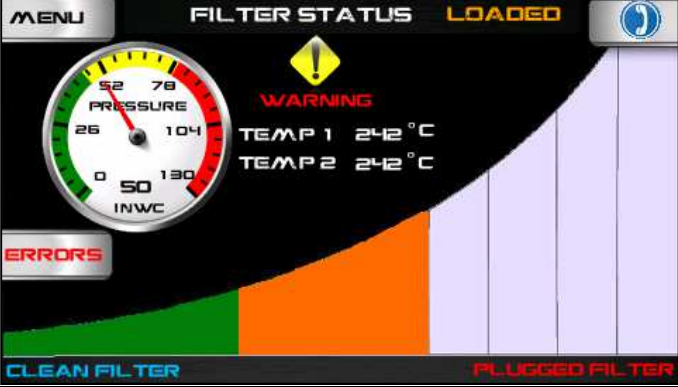


| Step | What To Do:  | Screen   |
|------|--|--|
| 11   | <ul style="list-style-type: none"> <li>Press "Enter" to save the settings. The PTLOG™270 now ready to use and is in operation mode.</li> </ul> |  |



## Operation & Monitoring

The PTLOG™270 continuously monitors the engine backpressure, particulate filter loading and the outlet temperature. The systems logs the filter upstream ( $T_1$ ), downstream ( $T_2$ ) temperatures, exhaust backpressure in inches of water column (in WC) and any errors or warnings that occur during operation. To monitor the temperature a pair of CAN-based thermocouples is used. To monitor the backpressure, an analog pressure sensor is used.

### DPF Operation Monitoring

| Screen Message   | What It Means  |
|--|--|
|  <p>The screenshot shows a 'MENU' button, 'FILTER STATUS' title, and 'CLEAN' status in green. A pressure gauge is on the left with a needle pointing to approximately 52 INWC. To the right, 'TEMP 1 242 °C' and 'TEMP 2 242 °C' are displayed. A bar chart at the bottom shows a green section on the left labeled 'CLEAN FILTER' and a red section on the right labeled 'PLUGGED FILTER'.</p> | <p>The filter is operating in the “green” zone and is within the acceptable backpressure range. It also denotes no errors in the system.</p>   |
|  <p>The screenshot shows a 'WARNING' message in large orange letters. Below it is a yellow exclamation mark icon and the text 'Please schedule for filter cleaning soon.' There is a home button icon in the top left and a back button icon in the top right.</p>  | <p>When the filter soot level reaches a certain point, a “WARNING” message will flash.</p> <p>The operator is requested to schedule filter cleaning. Please refer to your DPF supplier’s cleaning procedure.</p> <p>Press the home button to go back to the main screen.</p> |

| Screen Message  | What It Means   |
|---|---|
|    | <p>Pressing the home button will take you to the normal view for a period of 30 minutes. After that time the message will appear.</p> <p>By pressing the phone button, the manufacturer contact information will be displayed.</p>  |
|   | <p>The operator can always return to the error view by pressing the "ERRORS" button on the HOME screen.</p> <p>If the filter cleaning is not performed, the filter loading continues until the following message appears.</p>   |
|  | <p>When this screen appears, the operator should stop the engine as soon as possible and call for immediate service.</p> <p>Running the engine at this condition may lead to uncontrolled DPF regeneration which could result in a catastrophic filter failure or may damage the engine due to excessive exhaust backpressure. Please refer to DPF manual for DPF servicing procedure.</p> <p>The operator can return to the normal view by pressing home button but the message will repeat after two minutes.</p> |

| Screen Message   | What It Means   |
|--|---|
|  <p>The screenshot shows a black background with a small house icon in the top left and a blue circular icon in the top right. The word "WARNING" is displayed in large orange letters at the top. Below it, the text "Filter overheated!!! Please schedule service soon." is written in orange.</p>  | <p>If during operation, due to abnormal high exhaust temperature (above 560°C), the filter goes into an uncontrolled regeneration situation, the filter could be overheated. This event is detected by PTLOG™270 and the operator is warned with the indicated message.</p> |
|  <p>The screenshot shows a black background with a small house icon in the top left and a blue circular icon in the top right. The word "WARNING" is displayed in large orange letters at the top. Below it, the text "Filter overheated!!! Please schedule service soon." is written in orange, followed by "Filter Damage!!! Stop engine and service immediately." in red. A large red warning triangle with a white exclamation mark is positioned in the bottom left corner.</p> | <p>If the number of uncontrolled regenerations occurs excessively, this warning screen will be displayed.</p>   |

## System Components and Sensors

The PTLOG 270 is also responsible for monitoring the kit sensors, the CAN bus and wiring harness. If the CAN bus has a problem, the following message will appear.



| Screen Message   | What It Means   |
|--|---|
|  <p>The screenshot shows a black background with a red house icon in the top left, a blue bell icon in the top right, and the word "WARNING" in large orange letters at the top. Below this is a yellow gear icon with a red exclamation mark inside a red circle. The text reads: "Temperature Sensor Error !!! Please service Immediately."</p>                             | <p>If any of the exhaust thermocouples read values outside the measurement range (&lt;math&gt;-50\text{ }^{\circ}\text{C}&lt;/math&gt; - &lt;math&gt;+900\text{ }^{\circ}\text{C}&lt;/math&gt;), this warning message is displayed.</p> |
|  <p>The screenshot shows a black background with a red house icon in the top left, a blue bell icon in the top right, and the word "WARNING" in large orange letters at the top. Below this is a yellow gear icon with a red exclamation mark inside a red circle. The text reads: "Filter Downstream Temperature Sensor Problem !! Please call for service Immediately"</p> |   |
|  <p>The screenshot shows a black background with a red house icon in the top left, a blue bell icon in the top right, and the word "WARNING" in large orange letters at the top. Below this is a yellow gear icon with a red exclamation mark inside a red circle. The text reads: "Pressure Sensor Problem !!! Please service Immediately."</p>                            | <p>If the signal from the pressure sensor is out of range, this warning message is displayed.</p>   |







## Troubleshooting


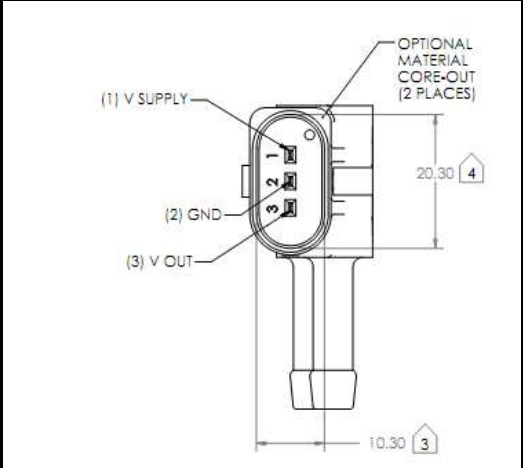

Following procedure are recommended in case any of the error/warning messages described in the previous section pops up.

### DPF Troubleshooting

| Screen Message  | What It Means  |
|---|--|
|   | <p><b>Loaded DPF Warning Message</b></p> <p>If this warning occurs a few months (up to 300 engine hours) after filter installation, please contact Nett Technologies Inc. You will be requested to download the logged data and send it for analysis and investigation.</p> <p>If this warning occurs after 300 hours of DPF operation, schedule the filter for cleaning as soon as possible. For filter cleaning please refer to DPF cleaning manual, which is usually provided by the DPF manufacturer.</p> <p>After DPF cleaning, the operator must go to the “Service Menu” and press the “FILTER CLEANED” button. Press the “DPF WAS JUST CLEANED” button. This will log the DPF cleaning date and also reset all of the errors and alarms.</p> |
|  | <p><b>Plugged DPF Warning Message</b></p> <p>This warning occurs if the loaded DPF warning is ignored for a set time.</p> <p>If this warning appears, the operator should stop the engine as soon as possible (within an hour) and schedule a DPF service. For DPF servicing, please consult the DPF manufacturer/distributor.</p> <p>If the DPF is cleaned, the “DPF WAS JUST CLEANED” button should be pressed.</p>  |

| Screen Message  | What It Means   |
|---|---|
|  <p>The screenshot shows a black background with a house icon in the top left and a speech bubble icon in the top right. The word "WARNING" is displayed in large orange letters. Below it, the text "Filter overheated!!! Please schedule service soon." is written in orange.</p>  | <p><b>Overheated filter warning message</b></p> <p>This message appears when the DPF downstream temperature (T2) exceeds 800°C. This is an indication that an uncontrolled regeneration occurred.</p> <p>Check the DPF filter outlet for any sign of discoloration, melting or soot traces (soot that has passed through the DPF). If soot traces are observed, the DPF must be cleaned or replaced according to the DPF manufacturer guidelines.</p> <p>If the DPF is replaced, the operator must enter the new DPF information as per procedure described in the “Initial Setup” section.</p> |
|  <p>The screenshot shows a black background with a house icon in the top left and a speech bubble icon in the top right. The word "WARNING" is displayed in large orange letters. Below it, the text "Filter overheated!!! Please schedule service soon." is written in orange, followed by "Filter Damage!!! Stop engine and service immediately." in red. A large red warning triangle with a white exclamation mark is positioned in the bottom left corner.</p> | <p><b>Damaged filter warning message:</b></p> <p>This warning appears if multiple occurrences of overheating are detected over time.</p> <p>If this message appears, there is a high possibility of DPF failure. The engine should be stopped as soon as possible.</p> <p>Check the DPF filter outlet for any sign of discoloration, melting or soot traces (soot that has passed through the DPF). If soot traces are observed, the DPF must be cleaned or replaced according to the DPF manufacturer guidelines.</p>  |

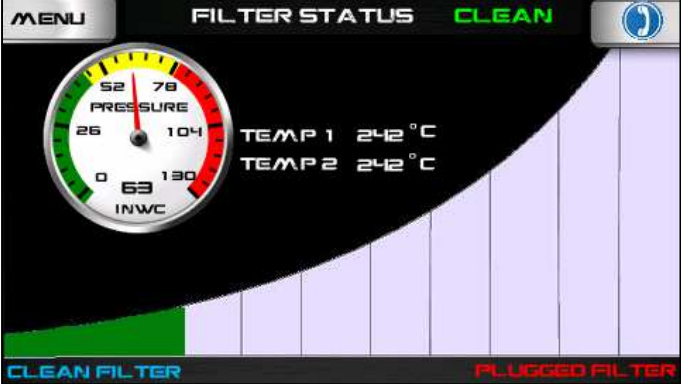
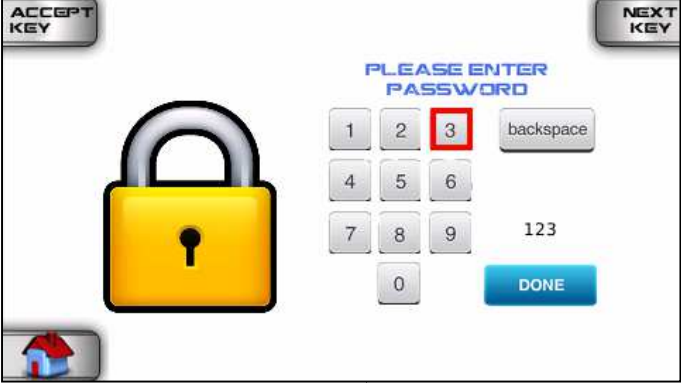


| Screen Message  | Troubleshooting Steps   |
|---|---|
|   | <p><b>CAN-bus Error Message</b></p> <p>The signals for CAN-based thermocouples are not being received.</p> <ul style="list-style-type: none"> <li>• Make sure that all the connectors on the display are properly connected.</li> <li>• Check the thermocouple connectors are not loose.</li> <li>• Check the resistance between CAN-H and CAN-L wires which are connected to pins 2 and 3 of the wiring harness connector which is connected to plug B of the display. This should be done when the thermocouple connector is unplugged from the harness connector. The resistance should be around 120ohm.</li> <li>• If the resistance is &gt;120 ohm. Check the continuity of CAN-H and CAN-L wires from the thermocouples to the display. If there is no problem with wires continuity, a 120 ohm resistance must be placed somewhere in the harness between CAN-H and CAN-L wires and the system must be tested once again after reconnecting the unplugged connectors.</li> <li>• The CAN-based thermocouple has failed and must be replaced.</li> </ul> |
|  | <p><b>Thermocouple Error Message</b></p> <ol style="list-style-type: none"> <li>1. Check thermocouple connections.</li> <li>2. Replace thermocouple.</li> <li>3. If replacement of the thermocouple doesn't correct the problem, please contact Nett Technologies Inc. for further assistance.</li> </ol>   |


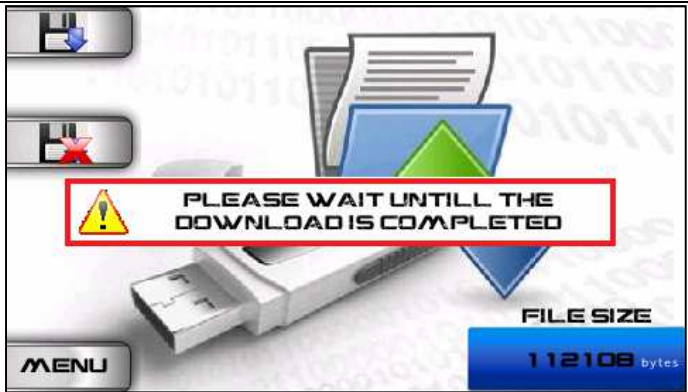


| Screen Message   | Troubleshooting Steps   |
|--|---|
|     | <p><b>Pressure Sensor Error Message</b></p> <ol style="list-style-type: none"> <li>1. Unplug the sensor from the harness</li> <li>2. Measure the voltage between pins 1 and 2.</li> </ol> <p>(Continued on next page)</p>   |
|    | <ol style="list-style-type: none"> <li>3. If the voltage is not within <math>5 \pm 0.05</math> V, then check the voltage regulator.</li> <li>4. The voltage regulator connector (three pin connector) must be unplugged. The voltage between pins 1 and 2 should be between 10 and 32 V.</li> <li>5. If this check is passed, the voltage between pins 1 and 3 must be measured. If the voltage is within <math>5 \pm 0.05</math> V, then the harness is defected, otherwise, the voltage regulator is defected.</li> </ol>                           |
|  | <ol style="list-style-type: none"> <li>6. Check voltage at the pressure sensor connector is within <math>5 \pm 0.05</math>.</li> <li>7. Check continuity of the pressure signal wire by measuring between pin 3 of the pressure sensor connector and pin 5 of plug C of the display. If no continuity, replace the harness.</li> <li>8. If the harness has continuity, replaced the pressure sensor.</li> <li>9. If changing the pressure sensor does not solve the problem, please contact Nett Technologies Inc. for further assistance.</li> </ol> |

## Data Downloading

To download the logged data, follow the steps below.

# Operation & Installation Manual

| Step   | Screen   |
|--|--|
| <p>Press the "MENU" button on the upper left corner of the display while it is in the normal view.</p>   |    |
| <p>Enter the password for the "Setup Menu" page.</p>   |   |
| <p>In the "SETUP MENU" page, press the download button on the upper left corner of the display. This will direct the operator to the download page.</p>  |  |
| <p>In the download page, press the download button on the upper left corner of the display. The operator will be asked to ensure the USB flash memory stick is connected to the USB Harness KIT.</p> |  |

| Step   | Screen   |
|--|--|
|  |    |
| <p>Answering “YES” will start the download procedure. You should wait until the download is complete before removing the USB data stick.</p>   |   |
| <p>After the download is completed, the following message is displayed on the bottom of the screen. You can return to the “SETUP MENU” page by pressing the button on the lower left corner of the display.</p>                    |  |
| <p>If there is a problem with the data download, the following message will appear and the download procedure should be repeated. If the operator cannot download the data contact Nett Technologies for technical assistance.</p> |  |