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PCS 8-CHANNEL EGT MODULE USER GUIDE v2.0

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1 Introduction

1.1 Included Components

1 - EGT Manual
1 - Wiring Harness

If any of the above items are missing or replacement parts are needed, please contact Powertrain Control Solutions.

1.2   System Overview
The Exhaust Gas Temperature (EGT) module measures and transmits data from k-type thermocouples. The module transmits the data using the PCS Controller Area Network (CAN) protocol at 500 kbps. Once transmitted, the data is available for viewing and logging with the D200 Dash Logger.

2   Installation

2.1 Mounting
The EGT module is not fully sealed from harsh environments. The module should be mounted close enough to the probe for easy installation, but far enough from the exhaust system so that it is not damaged from excessive heat. The module should be secured to the vehicle using the two bolt holes in the case.

2.2 Wiring
The EGT module pin out and wire color description is listed in Table 1.

Pin	Function	Wire Color
1	Power	Red
2	Ground	Black
3	CAN High	White/Red
4	CAN Low	White/Black
5	Not Used	No Wire
6	Not Used	No Wire
7	Not Used	No Wire
8	Not Used	No Wire

Table 1: Pinout and Wire Color

2.2.1   Power and Ground
The EGT module requires a switched 6 to 24 volts DC connected to Pin 1 for operation. The power should turn on and off with the ignition switch. The module draws 0.05 Amps of current and should be fused accordingly. A clean ground should be connected to Pin 2.

2.2.2   Communication
The EGT module transmits data to the D200 using the Controller Area Network (CAN). CAN is a two wire connection that can be used to connect a series of devices together. PCS CAN devices use a connector system to provide an easy means for connecting new devices to CAN without cutting or splicing wires. The four components to the PCS CAN connector system are listed on the following page.

- Device Connector
- Tee Connector
- Extension Cable
- Terminating Resistor Plug

The Device Connector is on the harness of the device, such as the D200 or the EGT module. This connector has an orange key in the connector and can only plug into one of the three ports on the Tee Connector.

The Tee Connector has three ports on it. One is keyed for a device (the orange key), while the other two ports are used for the Extension Cable or the Terminating Resistor Plug (both with black keys).

The Extension cable is twelve inches in length and has a black keyed connection on each end.

The Terminating Resistor Plug is a necessity. It looks like a connector with no wires coming out of it. It is keyed black and can be inserted in two of the three ports of the Tee Connector. A CAN network should have one terminating resistor plug on each end of the bus for a total of two resistors.

NOTE: CAN communication will NOT WORK if Terminating Resistor Plugs are not used.

NOTE: Orange or black keys may be in connectors with black or gray housings. The key color can be seen by looking at the end of the connector that is inserted into the Tee.

2.2.3   Building a New CAN Network
If this is a new CAN network, then the purchase of the CAN Master Connection Kit (Part# CON-5500) is required. This kit includes two Tee Connectors, two Terminating Resistor Plugs, and one Extension Cable. These are all of the components necessary to connect a D200 to an EGT module. This kit will only have to be purchased once. As new items are added to the CAN network, only the CAN Add-on Connection Kit is required. The connections are shown in
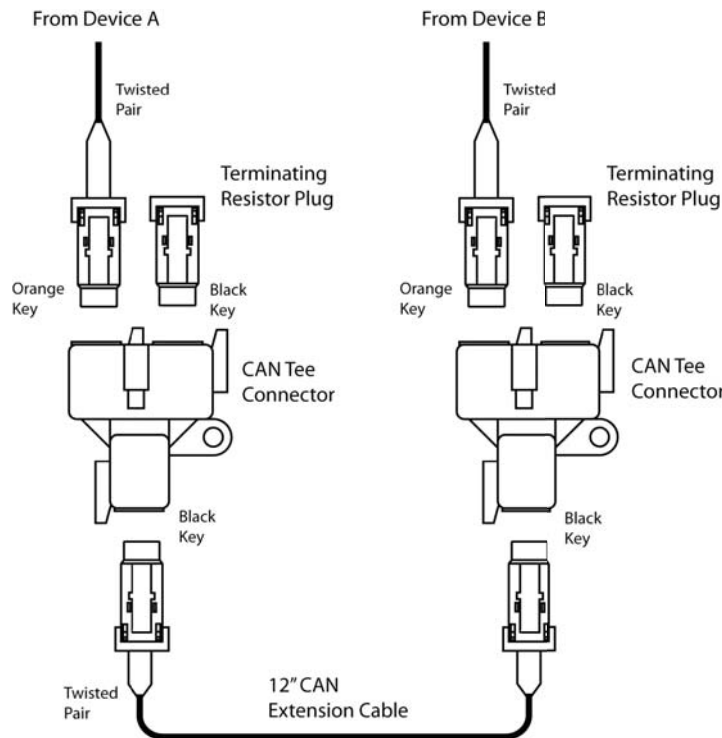**Figure 1**.

Figure 1: Two Device CAN Network

2.2.4   Adding the EGT Module to an Existing CAN Network

If this is not the first CAN device connected to the D200, and the CAN Master Connection Kit is already installed, then only the CAN Add-on Connection Kit (Part #CON-5501) is required. This kit includes a Tee Connector and one Extension Cable. The connections are shown in Figure 2. Simply remove one of the Terminating Resistor Plugs, and insert the Extension Cable. Connect the other end of the Extension Cable to the new Tee Connector. Insert the Termination Resistor Plug into the other black keyed port on the new Tee and insert the EGT module's orange keyed device connector into the remaining port on the Tee.
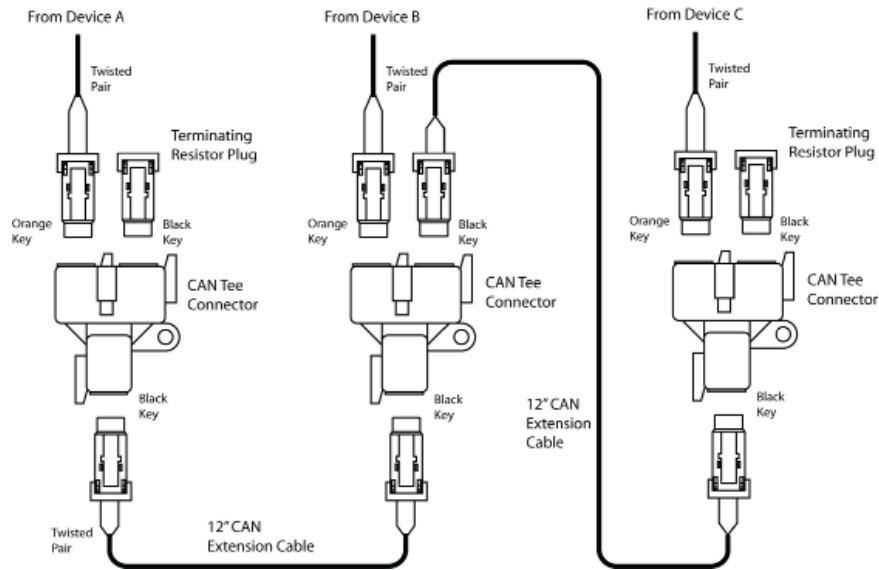

Figure 2: Three Device CAN Network

3   D200 Monitoring and Logging

3.1   Setup
The EGT module must be enabled on the D200. From the D200's Main Menu, press **Communications** then **CAN-A** and select **EGT A** or **EGT B**. If there is only one EGT module on the CAN bus, then it will be EGT A.

3.2   Dual EGT Module Configuration
Two EGT modules can be connected to the D200 for monitoring and logging up to 16 EGT channels. The modules must be configured as EGT A and EGT B. EGT A monitors channels 1-8 and calculates averages 1-4. EGT B monitors channels 9-16 and calculates averages 5-8. When a new EGT module is purchased, it will be programmed as EGT A. If only one module is going to be used on the CAN bus, then no further configuration is required. If two modules are going to be used, one of the modules must be configured as EGT B. This is done by the customer using a D200 following the procedure shown in Section 3.2.1.

3.2.1   Changing the Address of an EGT Module

To change an EGT module from EGT A to EGT B or vice versa, connect the module to configure to the CAN bus. Power on the D200 and the EGT module. Only the EGT module that needs to be configured should be connected at this time. From the D200's Main Menu, press **Communications** then **CAN-A** and select both **EGT A** and **EGT B**. Then select the **Properties** button at the bottom of the page. On the Properties page, under the title EGT Properties, the current status of EGT A and EGT B is listed. If communication is not detected check the CAN wiring and make sure the EGT module has power and ground. If both EGT modules are detected, disconnect the EGT module not requiring an address change.

Select the button in the center of the screen labeled **Set EGT A - B**. The Change EGT ID screen will load. It will list the status of each EGT module. Select the Change ID button. If the button is not shown, follow the on-screen instructions to diagnose the problem. After touching the button, turn the EGT module off and back on. This can be done by simply unplugging the EGT module. When the EGT module is turned back on, it will be configured for the other EGT module. This procedure will only have to be performed once as the settings are saved even if the power is disconnected from the module. If the module needs to be reconfigured back to the original address, simply repeat this process.

3.3   Monitoring

To select the EGT data to monitor, return to the Main Menu and select **Monitor Settings** then **Set Display Data** then **EGT A** or **EGT B**. This menu shows all the data options from the EGT module. EGT A contains labels EGT1 through EGT8 which correspond to input channels 1 through 8 as numbered on the EGT module. The labels **AEGT1** through **AEGT4** are averages of channels on EGT A. EGT B contains labels **EGT9** through **EGT16** which correspond to input channels 1 through 8 as numbered on the EGT module. The labels **AEGT5** through **AEGT8** are averages of channels on EGT B. Select the desired data. The selections will be saved when **Back** is touched.

3.3.1   Channel Averages

Each EGT module has four averages that can be configured to average selected channels. For example, an average could be configured using channels 1, 3, 5, and 7 to have a "Bank 1 Average". To configure the averages press **Communications** from the D200's Main Menu, then **CAN-A** and select **Properties**. The EGT module must be turned on and connected for this procedure. If the module is not connected, the D200 will display **EGT communication not detected**. When the module is connected, it will display the current firmware version and a button labeled **Set EGT Avg**. Press this button to set the EGT averages. The EGT average screen lists four columns; one for each average.

The heading on each column, such as **AEGT1** is the average. The channels listed below can be selected to include them in the average. To select a channel, touch it. When it is selected, the circle next to the label will be filled in. To unselect a channel, touch it again.

The D200 has two monitor screens to monitor the EGT data; Tach Slider and Digital Gauges, and Analog Gauges. To change the view, select the More from any Monitor screen and select **Select View**.

3.3.2   Tach Slider and Digital Guages
The EGT data can be viewed on any of the six digital displays on the bottom half of the screen. To change the assignment of a digital display touch it and select the desired data item.

3.3.3   Analog Guages and List
The EGT data can be viewed on the list. There is not an analog gauge for high temperature so it will not be an option for any of the gauges. The EGT data will be present in the list as long as the data has been selected as described in Section 3.3.

3.3.4   Troubleshooting
The D200 will display 0 degrees Celsius (32 deg F) on all EGT channels if it does not detect communication from the EGT module. This will be caused by either no power and ground to the EGT module, or incorrect CAN bus wiring. Verify 6 to 24 volts DC at Pin 1 of the EGT module and ground at Pin 2. Also verify the CAN bus is connected as described in Section Section 2.2.2. One of the common mistakes is to omit the termination resistor plugs from the network. CAN communication will not work without the termination resistor plugs.

The D200 will display greater than 910 degrees Celsius (1670 deg F) on any channel that does not haven a probe connected to it. Verify the probe is connected and if possible try a new probe.

3.4   Logging

To enable the data logging on the D200, the EGT communication on the CAN bus must be enabled as described in Section 3.1.

From the Main Menu, select *Data Log Settings* then *Sources* then *Comm Inputs*. Select the loggingrate associated with the EGT device. Logging rates are selectable up to 100 times per second. The **X** next to the number means times per second. A setting of 0x means the EGT will not be logged.