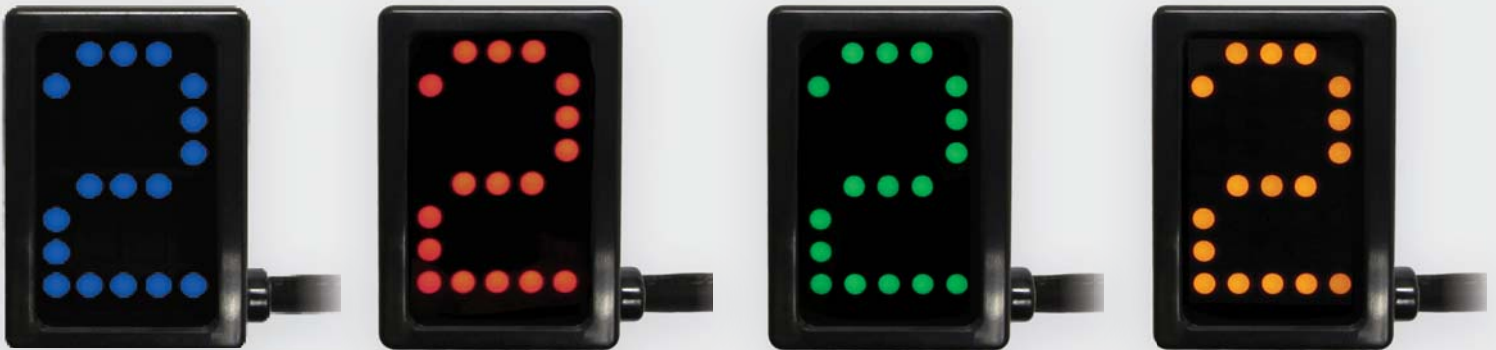**POWERTRAIN CONTROL SOLUTIONS**
Engineering the future of driveline control.

PCS GEAR INDICATOR USER'S GUIDE

Overview

The PCS GDS-2000 Gear Indicator scans your vehicle's CAN bus and displays current gear data allowing you to monitor the actual current gear used by the transmission. The data is displayed on a 5x8 LED dot-matrix display housed in a rugged plastic enclosure. The LED display brightness automatically adjusts to match surrounding ambient light levels. The GDS-2000 module automatically enters a low-power standby mode when no activity is detected on your vehicle's CAN bus ensuring low battery drain when not in use.

Dimensions

• 1.4"W x 2.0" H

Features

• Displays current gear selected in transmission
• 4 CAN Formats Supported

  • PCS TCU "Current Gear" @ 500kbps
  • PCS D200 Dashlogger "CGER" @ 500kbps
  • GMLAN "Commanded Gear" @ 500kbps
  • J1939 SPN-524 "Selected Gear" @ 250kbps

• Autoscans to determine CAN standard used on vehicle. No user setup is required
• 5x8 LED matrix used to display characters P, N, R, 1, 2, 3, 5, 6, 7, 8
• Display brightness automatically adjusts to match ambient light levels
• Power, Ground, CANH, and CANL are the only neccessary connections.

	MAX	STANDBY
12V Current Draw	80mA	9mA
24V Current Draw	50mA	8mA

Operation

The GDS-2000 has three modes: Scanning, Display, and Standby.

Scanning Mode

When power is first applied, the GDS-2000 will scan to determine the CAN standard used on your vehicle. During *"Scanning Mode"*, a vertical line will sweep back and forth on the display indicating that the GDS-2000 is actively scanning the CAN bus. Once the GDS-2000 has determined what CAN standard is used on your vehicle it enters *"Display Mode."* If the GDS-2000 scans for 30 seconds without detecting CAN activity, the unit will stop scanning and enter **"*Standby Mode.*"**

Display Mode

In *"Display Mode"* the GDS-2000 will interpret the supported CAN messages and display current gear using characters P, N, R, 1, 2, 3, 4, 5, 6, 7, 8. If the supported messages on the CAN bus are no longer detected, the GDS-2000 will enter *"Standby Mode."*

Standby Mode

When power is present but no CAN activity is detected, the GDS-2000 enters *"Standby Mode."* The GDS-2000 will remain in *"Standby Mode"* until it detects the supported messages on the CAN bus. *"Display Mode"* will resume when the CAN messages resume. *"Standby Mode"* ensures low battery drain for users who operate on constant power instead of switched power.

Installation
The GDS-2000 requires only Power, Ground, CANH and CANL for operation.

Power Connection:
The GDS-2000 is rated for use on 8-36VDC. Power can be constant or switched. If the GDS-2000 is operated on switched power (Option Connector or Custom Switched-Power Install), it will enter *"Scanning Mode"* and display the scanning animation every time the vehicle is keyed on. If the GDS-2000 is operated on constant power (OBDII or Custom Constant-Power Install), it will enter *"Scanning Mode"* and display the scanning animation only the first time power is applied. After that it will switch between *"Display Mode"* when CAN activity is detected and *"Standby Mode"* when CAN activity is not detected.

CAN Connection:
If the GDS-2000 is added to a vehicle that is already equipped with two or more operational modules on its CAN bus, no extra steps are necessary. The GDS-2000 can be connected directly to the CAN bus.

If the GDS-2000 is used in a new installation with only one other CAN module, the CAN bus must be terminated with a 120-ohm resistor. If there is no resistor terminating the bus, errors will be generated and the CAN devices will not communicate. Powertrain Control Solutions offers a *"CAN Master Connection Kit"* (part # CON-5500) for users who need to add a termination resistor to their CAN bus.

Wiring

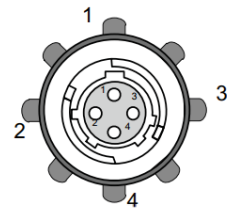## Unterminated Wiring

C1 GEAR INDICATOR INTERNAL HANRESS

COLOR	CIRCUIT FUNCTION
RED	POWER
BLACK	GROUND
WHITE	CAN HIGH
GREEN	CAN LOW

Option Connector Wiring

C1 GEAR INDICATOR INTERNAL HANRESS

PIN	CIRCUIT FUNCTION	COLOR	TCU POS.
1	+12V SW	RED	
2	GND	BLACK	
3	CAN HIGH	WHITE	
4	CAN LOW	GREEN	

OBDII Connector Wiring

OBDII Connector

PIN	CIRCUIT FUNCION	COLOR	CONNECTS TO
1	NC	NC	NC
2	NC	NC	NC
3	NC	NC	NC
4	GND	BLACK	
5	SIG GND	BLACK	
6	CAN HIGH	WHITE	
7	NC	NC	NC
8	NC	NC	NC
9	NC	NC	NC
10	NC	NC	NC
11	NC	NC	NC
12	NC	NC	NC
13	NC	NC	NC
14	CAN LOW	GREEN	
15	NC	NC	NC
16	+12V BATT	RED	
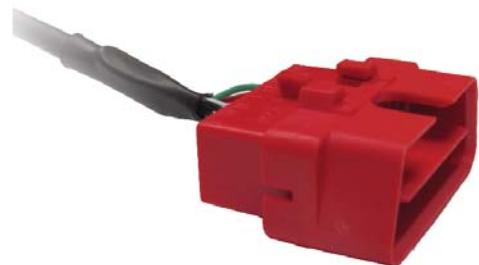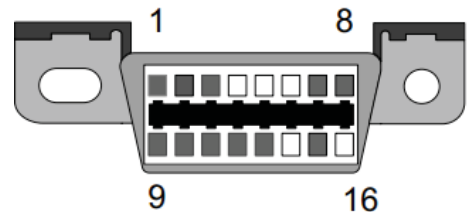
Troubleshooting

Here are some of the common problem scenarios. If you encounter trouble beyond what is covered here, please call 1(804)-227-3023 for further assistance.

When I power up my GDS-2000, it scans for 30 seconds and then the screen goes blank. It never enters Display Mode…"

Suspect trouble with CAN Bus. The GDS-2000 is not detecting the supported CAN messages. Either the messages are not being transmitted, or the CAN bus itself is disconnected or otherwise not working properly.

"My GDS-2000 keeps going back and forth between Standby Mode and Display Mode…"

Suspect trouble with CAN Bus. Here, power is present, the GDS-2000 has made it through Scanning Mode and identified the CAN format once. However – the CAN messages are being received by the GDS-2000 intermittently.

> Check that the CANH and CANL wires are properly connected.

> Check that the CAN bus is properly terminated with a 120-ohm CAN termination resistor.

> Check that all CAN devices on the bus are operating at the same speed.

> Check that the supported messages are actually being transmitted.

"My GDS-2000 keeps going back and forth between Display Mode and Scanning Mode…"

Suspect trouble with power and ground connections. The GDS-2000 only enters Scanning Mode on power up.

> Check that the GDS-2000 power and ground wires are making good connection.

> Check harness power and ground wiring that feeds the GDS-2000.

> Check battery voltage.

"My GDS-2000 is working, but the screen brightness is too dim…"

Suspect trouble with ambient light sensor located at lower left-hand corner of display.

> Check and make sure light sensor is not obscured by objects in front of it.

> If necessary, relocate GDS-2000 to an evenly lighted area of dash.