PECoS Model DC

Description

The PECoS DC is an easy to use, small, yet robust 32-bit digital engine controller. This device will give you precise control as well as a multitude of programmable features in a small package. The serial RS-232 interface allows the user to customize this controller to their needs for many engine control applications. Gain, speed and other calibrations can be done via four reconfigurable pots mounted on the controller. There is a speed sensor input for monitoring and controlling engine speed. This PECoS DC also includes two auxiliary connections for monitoring or driving any needed control peripherals. An option is available using these auxiliary connections as a CAN bus; allowing this controller to communicate using the J-1939 standard protocol.

The PECoS DC can be used as shipped and calibrated to the engine via the onboard pots. The user may also tune and adjust the controller for more precise control via a serial communication link using our custom user interface.

The following contains all the features and data that are available in this package. PG will customize this controller and its software to fit the needs of your application.

Features

12/24 Volt DC power

Reverse polarity protected

All pins short circuit protected

Configurable PID actuator control loop

Speed sensor (e.g. magnetic pick-up, ignition)

Overspeed and underspeed control

Auto-Start capability

Warm-up speed and time

RS-232 communication

2 configurable auxiliary connections

4 reconfigurable pots for adjustments

Up to 4 adjustable set speeds

Drive-By-Wire (DBW)

LED fault/status indicator

Optional CAN interface using auxiliary pins

Customizable J-1939 protocol for CAN interface

Precision Governors, LLC
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Specifications

Mechanical

Operating Temp	-40 to 85°C -40 to 185°F
Serial Connectors	4-pin Connector
Header Connectors	8-pin Screw Terminal

Inputs

Power Supply	8-30 VDC
Speed Sensor	+/-100 V AC/DC 15 kHz max
Analog	0-20V
Discrete	0-30V pull-down

Outputs

Governor	6A continuous Short circuit protected
Discrete	1A open drain

Communication

RS-232	57.6K baud 8 data bits No parity 1 stop bit No flow control
CAN	J-1939 protocol Up to 1M baud Custom commands

Data

Pin Out

Pin	Function	Description
#1	GROUND	Controller Ground
#2	POWER	Controller Power +12/24V (Reverse Polarity Protected)
#3	ACTUATOR +	Actuator Control Wire Positive
#4	ACTUATOR -	Actuator Control Wire Negative
#5	MAG PICK UP +	Speed Sensor Positive
#6	MAG PICK UP -	Speed Sensor Negative
#7	AUX 2 (CAN H)	Configurable Auxiliary Connector or Optional CAN Interface High Pin
#8	AUX 1 (CAN L)	Configurable Auxiliary Connector or Optional CAN Interface Low Pin
Serial 1	COM TX	RS-232 Transmission Wire (DB-9 pin 2)
Serial 2	COM RX	RS-232 Receive Wire (DB-9 pin 3)
Serial 3	COM GND	RS-232 Ground Wire (DB-9 pin 5)
Serial 4	Not Used	Test Use Only

Calibrations

Parameter	Description
Proportional	Response time
Integral	Steady state error
Derivative	Stability adjustment
Gain	Master gain response
Ramp-up	Engine speed rate of change up
Ramp-down	Engine speed rate of change down
Set Speed Max	Max settable speed via pot
Set Speed Min	Min settable speed via pot

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Warm-up %	Percent of set speed for engine warm-up
Warm-up Time	Warm up time
Pulses per Rev	Pulse per engine revolution
Min Pulses per Update	Pulses till next speed calculation
Overspeed %	Shutdown max speed
Overspeed Time	Time till overspeed trips
Underspeed %	Shutdown min speed
Underspeed Time	Time till underspeed trips
Underspeed Run Time	Seconds after start when under speed checked

NOTE: 2 separate calibrations can be saved and loaded

Pot Configurations

Index	Setting	Description
1 (Pot 1)	Speed 1	Speed when discrete inputs are all off
2	Speed 2	Speed when discrete input 1 is on
3	Speed 3	Speed when discrete input 2 is on
4	Speed 4	Speed when inputs 1 and 2 are both on
5	DBW MIN	Speed to run at the lowest input voltage
6	DBW MAX	Speed to run at this highest input voltage
7	DBW V at Min	Low voltage for comparison
8	DBW V at Max	High voltage for comparison
9	kp	Proportional gain
10 (Pot 4)	kd	Derivative gain
11 (Pot 3)	ki	Integral gain
12 (Pot 2)	Gain	Master gain
13	Kp St 2	Stage 2 proportional. RAW speed based
14	Kp	Current feedback proportional gain

NOTE: Pots can be configured for a user specified range and are adjustable linearly or logarithmically. Default settings are in parenthesis.

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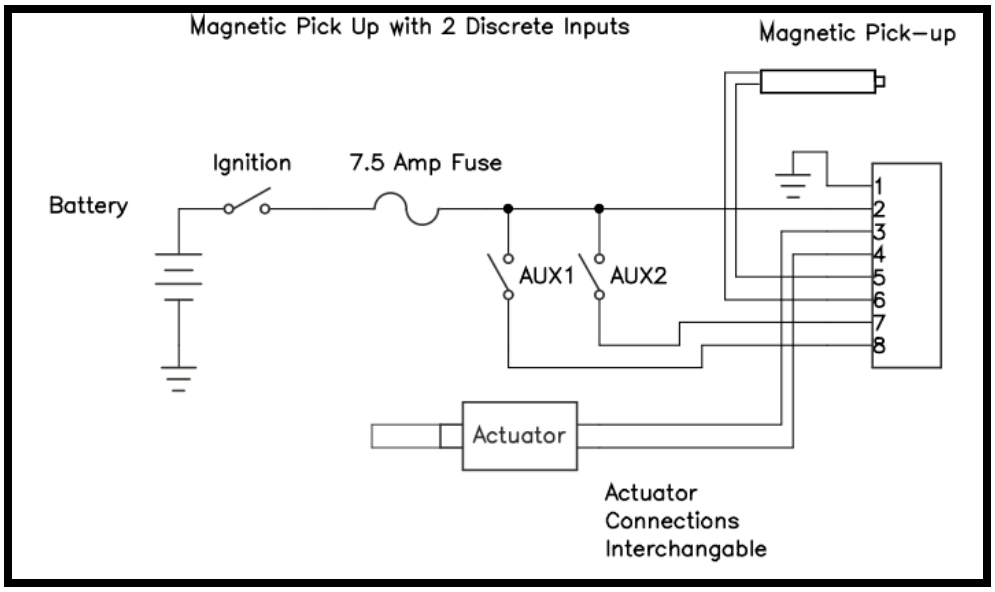

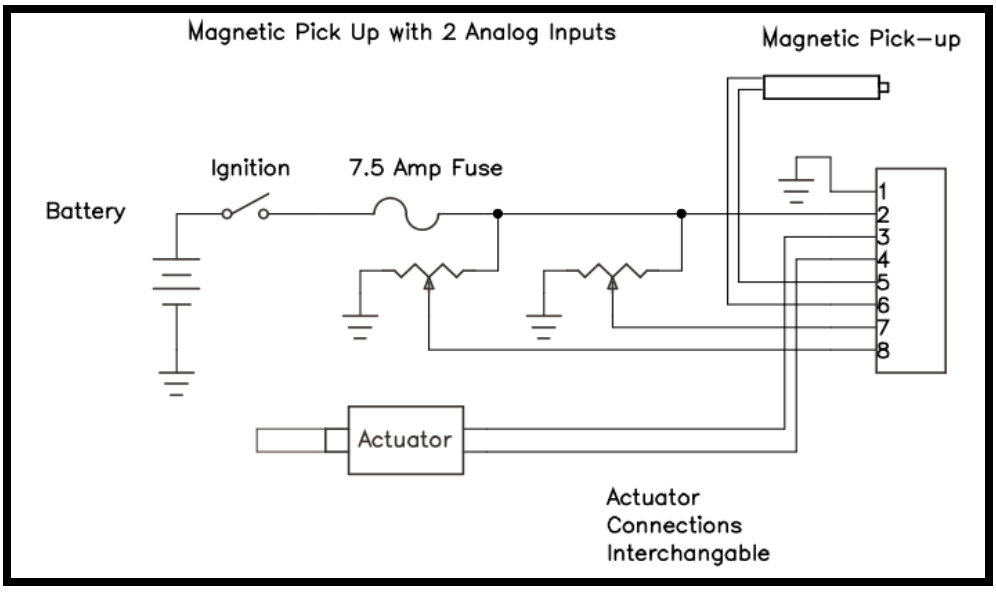

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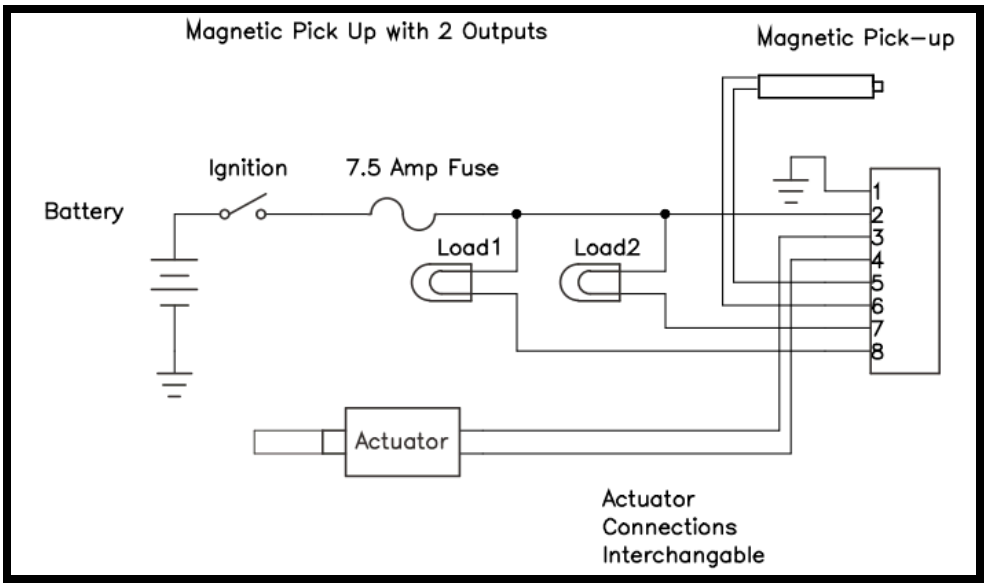

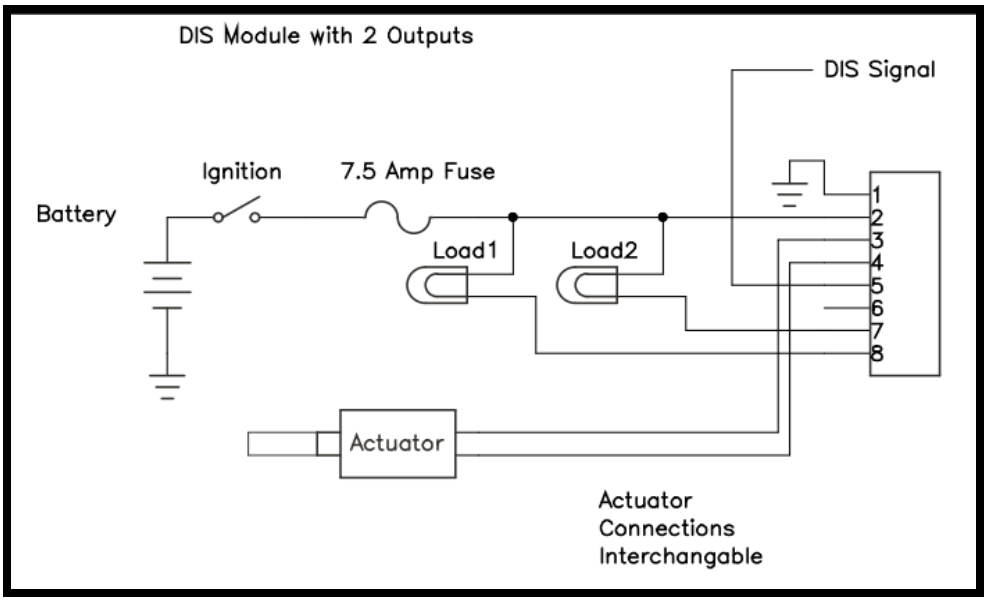

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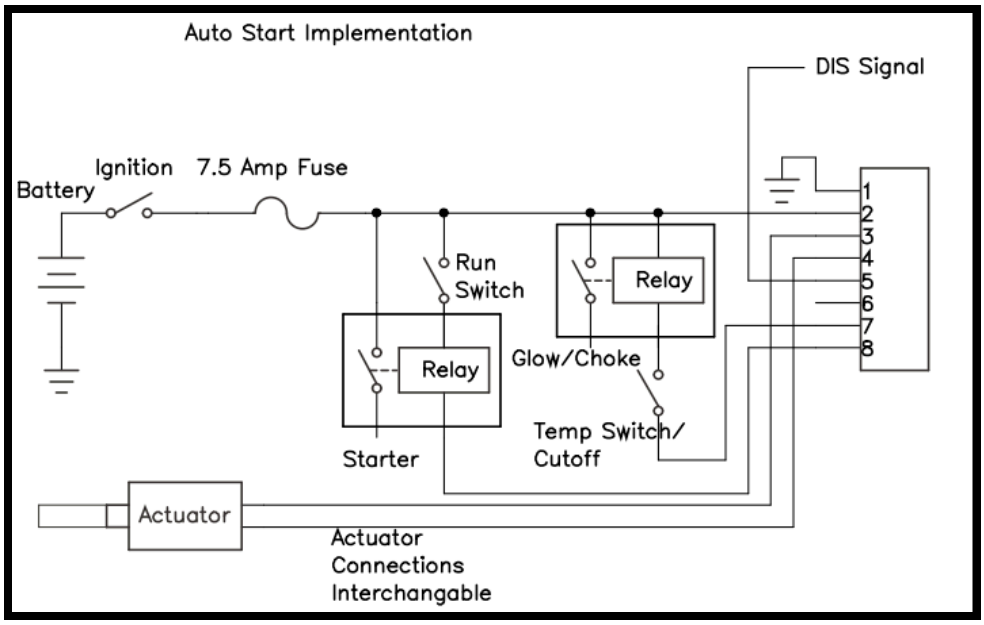

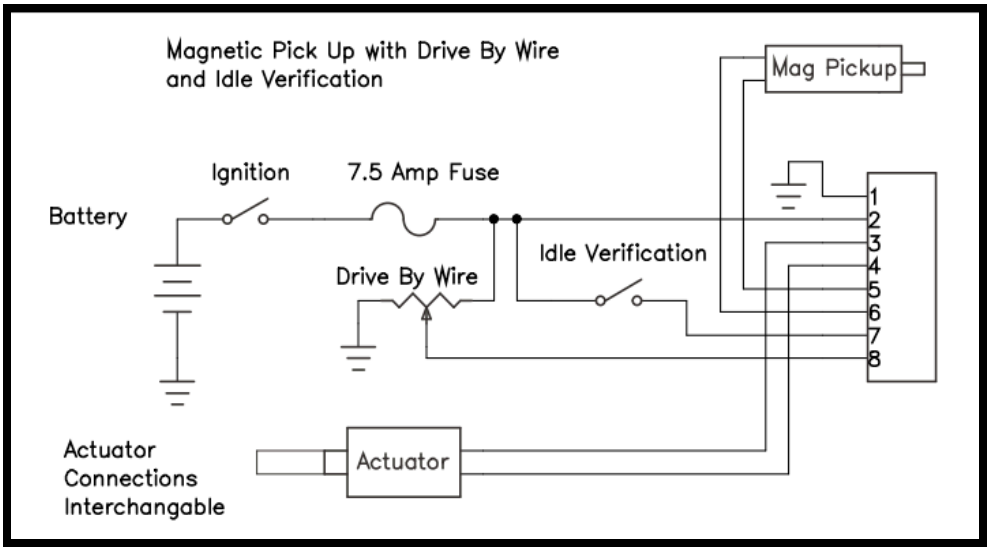

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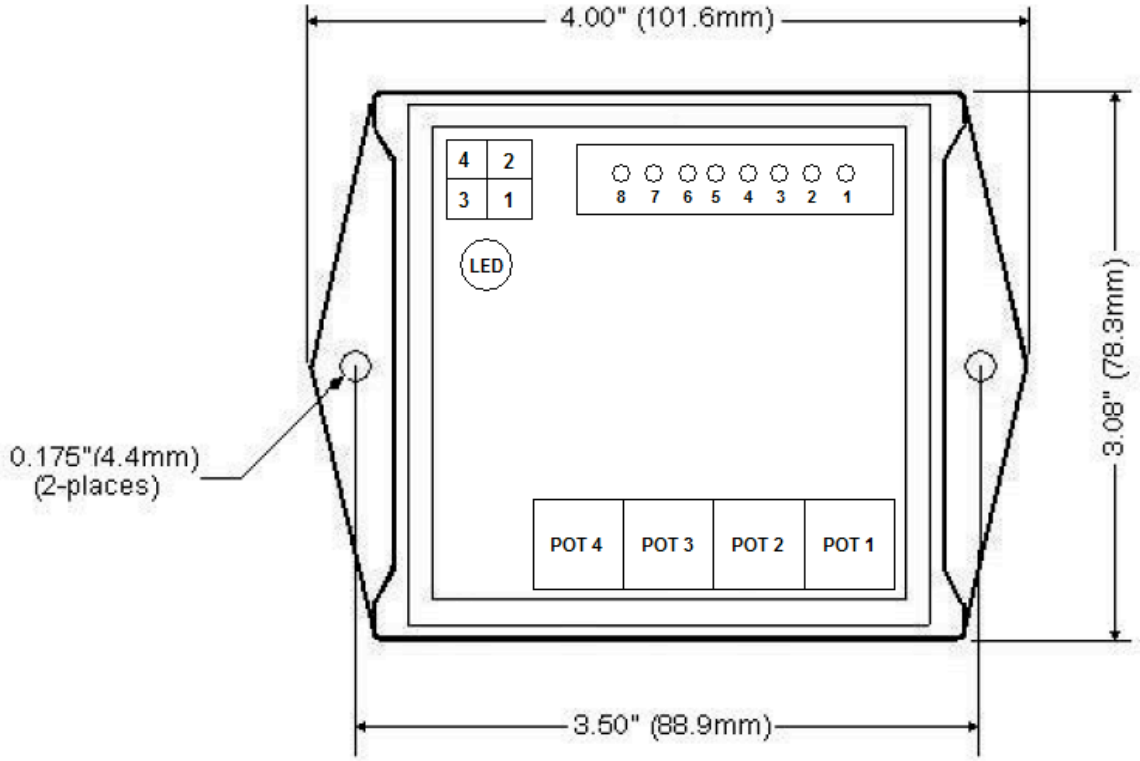
Dimensions



Reference

Part Number:
9700-AA – 0000 –A08

- AA: Hardware Configuration (Aux1, Aux2)
- 0000: Potentiometer Configuration (Pot1, Pot2, Pot3, Pot4)
- A08: Connector

Hardware Configuration

Pins	A	B	C	D	E
Pin 7 (Aux2)	CAN High	Analog Input	Digital Input	On/Off Output	Bi-Directional
Pin 8 (Aux 1)	CAN Low	Analog Input	Digital Input	On/Off Output	Bi-Directional

Potentiometer Config

Pot	0	1	2
Pot1	None	Single Turn	20 Turn
Pot2	None	Single Turn	20 Turn
Pot3	None	Single Turn	20 Turn
Pot4	None	Single Turn	20 Turn

Connector Type

Code	Connector
A06	Terminal Strip 6 Contact
A08	Terminal Strip 8 Contact
B06	Header 6 Position
B08	Header 8 Position