



PECoS VCA

Description

The PECoS Model VCA is an advanced digital controller for Engine Control and Monitoring applications. This device gives precise engine speed control with an abundant amount of external control features. This allows the PECoS VCA to accommodate a wide range of control systems and to adapt to new requirements.

This robust controller provides an economical means to process analog and switched input signals to control actuators and relays in providing control for various engine setups. The PECoS Model VCA is capable of preventing engine over temperature, low oil pressure, as well as many other fault conditions. The controller is able to self check for faulty sensors or actuators, report faults and correct or compensate for minor faults. The PECoS Model VCA is field programmable and provides flexibility for customization and installation.

The following contains all the features and data that are available in this package. PG can

customize this controller and its software to fit the needs of your application.

Features

Control Side:

Engine speed and acceleration control

Auto-Start and shutdown

Overspeed Protection

Fault monitoring and status indication

Variable speed operation

Sealed water proof enclosure and connector

12/24 volt DC power

Reverse polarity protected*

PID actuator control loop

Up to 8 analog inputs (4 dedicated)

Up to 5 digital inputs (3 dedicated)

Up to 6 auxiliary outputs (4 dedicated)

2 Software configurable FLEX I/O port

Software programmable speed sensor (magnetic pick-up, ignition, hall effect)

2 additional speed inputs

Actuator controls

RS-232 communication

5 VDC output for sensor power

CAN Bus with J1939 protocol

2 Digital to Analog outputs

Control Wiring

Pin No.	Pin Name	Type	Description
J2-A01	CGND	Protection Ground	Chassis ground
J2-B01	FLEX5	Configurable	Flexible reconfigurable I/O port
J2-C01	FLEX6	Configurable	Flexible reconfigurable I/O port
J2-D01	V+5 OUT	Output Supply	5 Volt sensor supply
J2-E01	ANALOG 1	Analog	Analog input
J2-F01	CANH	CAN	CAN bus high port
J2-G01	GOV RET (ANALOG7)	Governor	Actuator control return, optional analog input
J2-H01	GOV PWM(ANALOG8)	Governor	Actuator control power, optional analog input
J2-J01	POWER	Power	DC power to controller
J2-K01	POWER	Power	DC power to controller
J2-A02	AUX 1	Output	Grounding 3 Amp auxiliary output
J2-B02	AUX 2	Output	Grounding 3 Amp auxiliary output
J2-C02	DAC 1	Digital to Analog	Analog Output
J2-D02	ANALOG 2	Analog	Analog input
J2-E02	ANALOG 3	Analog	Analog input
J2-F02	CANL	CAN	CAN bus low port
J2-G02	IN 1	Input	Discrete input battery triggered
J2-H02	IN 2	Input	Discrete input battery triggered
J2-J02	SCI TX	Serial	Serial out RS-232 capable (DB-9 pin 2)
J2-K02	IN 3	Input	Discrete input ground triggered (Fault input)
J2-A03	TACH1+ (AUX3)	Speed signal	Tachometer speed signal in, optional Aux output
J2-B03	TACH2+ (AUX4)	Speed signal	Tachometer speed signal in, optional Aux output
J2-C03	DAC 2	Digital to Analog	Analog Output
J2-D03	ANALOG 4	Analog	Analog input
J2-E03	AGND	Ground	Analog signal ground/return
J2-F03	SS+	Speed signal	Engine speed signal out
J2-G03	SS-	Speed signal	Engine speed signal return (if needed)
J2-H03	SCI RX	Serial	Serial in RS-232 capable (DB-9 pin 3)
J2-J03	GND	Ground	Controller ground
J2-K03	GND	Ground	Controller ground

Control Pin Layout

	A	B	C	D	E	F	G	H	J	K
01	Chassis	FLEX5	FLEX6	V+5 out	ANALOG 1	CANH	GOV RET	GOV PWM	POWER	POWER
02	AUX 1	AUX 2	DAC1	ANALOG 2	ANALOG 3	CANL	IN1	IN2	SCI TX	IN3
03	TACH1	TACH2	DAC2	ANALOG 4	AGND	SS+	SS-	SCI RX	GND	GND



Specifications

Mechanical

Operating temp	-40 to 85°C -40 to 185°F
Weight	1lb
Vibration	6 G, 40 to 2000 Hz 8 hours per axis
Sealing	IP65, 66, 67, 69K

Control

Inputs

Power supply	8-30 VDC
Analog Input Range	0-20 VDC (40V max)
Digital	0-Battery VDC
Flex	Same as analog/digital
Speed sensor	+/-100 V AC/DC 0-15 kHz

Outputs

Aux current max	100mA or 3A
Flex	Same as aux
5V rail max current	100mA
Governor peak current	6A
Bidirectional Drive	10A continuous 15-20A peak

Communication

RS-232	57600 baud 8 data bits No parity 1 stop bit No flow control
CAN bus	J-1939 protocol Up to 1M baud Custom commands

Detailed Specification

Power

Spec	Description	Range
Voltage	Voltage to controller reverse polarity protected	8 to 30 Volts
Power	Power consumption of device	RF Standby: 1.4mA (typ) Main: 80mA (14.5v, typ)
5V Rail	5 volt source for power sensors or other peripherals. Short circuit protected.	Output Voltage - 5V Max Current - 100mA

Inputs and Outputs

Item	#	Description	Specs
Discrete Inputs	7	There are two discrete inputs which may be triggered by battery voltage and one which is triggered by grounding and is typically used as a fault input.	2 - switch to battery 1 - switch to ground 4- Flex inputs
Analog Inputs	8	Analog input capable of providing source as well if needed to power certain sensors. Thresholds may be set to trigger certain actions based on readings. Use AGND for reference to analog inputs.	Max Voltage – 36V Full Scale – 0 to 20V 4 – Dedicated 4 – Flex inputs
Auxiliary Outputs	8	Low-side controller output. May be sunk to ground on a given condition or input. Short circuit, overload, and over temperature protected.	Max Current – 100mA/3A 4 – Dedicated 4 – Flex outputs
Flex I/O	4	Flex I/O ports may be configured as an auxiliary output, analog input, or discrete input. These ports are reconfigurable by software and have the same features as mentioned above	Same as: Analog, Aux, Discrete above
Governor Control	1	Pulsed signal output typically used to control an actuator. Software short circuit and overload protected.	Max Current Draw – 6A Short Circuit protected
Speed Sensor	3	Speed signal input which may be used to measure engine speed from multiple sources such as a magnetic pickup, ignition source, or transformer.	Max Voltage - ±100 AC/DC Max frequency - 15 kHz

Communications

Type	#	Description	Settings/Defaults
RS-232	1	Used to interface to a PC or other peripheral. The serial port is typically used to show data coming from the controller and may also be used to reprogram the device in the field.	57.6K baud (or Auto) 8 data bits No parity/flow control 1 stop bit
CAN Bus	1	The CAN bus is used to communicate to other devices on the bus using the J-1939 standard protocol. Custom commands and actions may be added by PG if needed.	Customizable J-1939 Protocol Up to 1MHz

*Reverse Polarity Protection:

Auxiliary output / Flex as output: The flex and auxiliary output devices will activate during application of reverse polarity. If the connected load contains a flyback diode, a series diode is required for reverse polarity protection.

Flex pins: When used as analog or discrete inputs: if the flex pins are or may be connected to a +DC power source through less than a 20Ω circuit, the circuit should incorporate a series diode (1 amp such as 1N4001) in series from the power source. It is permissible to use one diode to source protected power to all flex input circuits.

+5 VDC output: This should not be connected to a +DC power source through any external components.

All other pins are fully protected against application of reverse polarity and will not draw excessive current.

Wiring

Basic Application:

