

CANSTART



CANstart™ modules provide automatic or manual start/stop control, panel gauge driving, fault indication and auxiliary shutdown protection for ECU-controlled, CANbus SAE J1939 compatible engines.

These compact controllers can be used with pumps, generators and other engine-driven applications. Operator control is through a 4 position keyswitch, and the key is removable only in the Stop/Reset (O) position. Six LEDs and icons indicate engine/ECU status and faults. Two of these LEDs, with associated inputs, indicate auxiliary fault shutdown and charge alternator fail/excitation.

CANstart™ is front-of-panel mounted through a standard square cut-out, and secured at the rear with quick-fit clips. Epoxy-resin case encapsulation gives superior vibration/shock resistance and environmental protection.

Power supply

Operating voltage, steady state: 8 to 32 VDC

Operating voltage, brown out / cranking: 5 VDC minimum

Current consumption: < 100mA

Inputs

All Models:

CANbus: SAE J1939 protocol, switchable 120 Ohm terminating resistor

Auxiliary shutdown (x2): close to negative DC during fault

9640 series:

Auto start & stop (x2): close to/open from positive DC to activate

Outputs (all ratings non-reactive)

Run (ECU), start (crank): positive DC (protected FET), 6A max @ 32 VDC

Alarm: negative DC (open collector transistor), 250mA max @ 32 VDC

Oil pressure gauge: suitable for Murphy, VDO 5 or 10 Bar, Datcon 7 or 10 Bar

Engine temperature gauge: suitable for Murphy, VDO or Datcon

Tachometer: for use with charge alternator driven tachometers

Adjustable settings

Model 9631 and 9641 (variable speed engines)

Overspeed level: 1250 – 2800 RPM (50 RPM increments), or 'off' default setting: 1250 RPM

Physical

Electromagnetic compatibility: 2004/108/EC

Case material: polycarbonate / polyester

Overall dimensions (w x h x d): 96 x 96x 131mm / 3.8 x 3.8 x 5.2 in.

Panel cut-out size: DIN 92 x 92mm / 3.6 x 3.6 in.

Weight: approx 240g / 0.6 lb

Operating temperature: -20 to +75 °C / -4 to +167 °F



CASCADE



The Cascade controller offers automatic start and stop control with easy configuration for a broad number of applications.

This auto-start controller is designed to fit any engine-driven application requiring a simple and robust automatic start and stop sequence. Pumps, compressors, grinders, power units and generators are just a few of the industrial applications for the controller. The Cascade controller is fully compatible with all major engine types. Whether you are running mechanical or J1939 engines, the controller will work with your application. The Cascade CD101 controller can also be used to replace legacy ASM150, ASM160 and ASM170 controllers.

Power input: 9-35VDC continuous - operates during total blackout for 2 seconds minimum.

Power consumption: Sleep Mode (Manual): 1mA typical; Sleep Mode (Automatic): 4mA typical.

Running Mode (Manual): 20mA typical; Running

Mode (Automatic): 24mA typical.

Operating/Storage temperature: -40 to 85°C; (-40 to 185°F).

Humidity: 0-100%, non-condensing.

Housing: UV stabilized black polycarbonate and epoxy encapsulation. Weather tight and includes sealing gasket to keep moisture and debris out of enclosure. Properly mounted controller will maintain NEMA4 / IP65 rating of enclosure.

Vibration: Rated to 6G.

Impact: Rated to 10G.

Inputs: Dedicated digital inputs for low oil pressure, high engine temperature, remote start, DC charge fail/Alternator fail. Two aux inputs are configurable for multiple functions.

Outputs: 7 – 4 auxiliary, configurable (1A DC protected). 3 dedicated outputs for Crank, Fuel/ECU, Alternator excitation.

Crank attempts: 3, 5, 10, Continuous.

Crank Rest: 5-60 seconds, adjustable.

Shutdown lockout time delay: 5, 10, 15, 20, 25, 30 seconds.

Crank disconnect speed setting: Field settable 0-9999 RPM (16-60Hz AC freq input).

Overspeed/underspeed trip point setting: ± 5 to 50% of nominal.

Speed sensing inputs: Magnetic pickup (5-120VAC RMS / 0-10 kHz) & AC frequency (30-600VAC RMS / 16-80 Hz).

CANbus interface: Directly reads engine speed, & engine status data* from SAE-J1939 enabled engines.

MODbus interface: In J1939 applications drives PVA series analog gages.

*Engine status data limited to low oil pressure, high engine temperature, "Wait to start" status, Warning & Fault lamp information, and communication error.





The EMS PRO is a flexible all-in-one customizable unit that meets the needs of engine-driven pumping equipment applications.

The EMS PRO is a dedicated microprocessor-based, single-engine controller. It offers field-adjustable operating parameters that can be changed without the need for a computer. It is also able to support both mechanical and J1939 electronic engines. The EMS PRO has selectable auto start/stop features with several throttling options. The auto start/stop options (single contact, floats, momentary, transducer and clock) are available at the touch of a button. The transducer start/stop option includes three settings: pressure, level and temperature. In addition, there are many performance-enhancing features, all of which are available through an operator interface that is easy to learn and use.

Operating Voltage: 8 VDC minimum to 32 VDC maximum

Environmental

Operating Temperature: -40° to 80°C (-40° to 176°F)

Storage Temperature: -40° to 80°C (-40° to 176°F)

Environmental Sealing: IP66

Relative Humidity: 95%RH @ 60°C

Standby Current:

(@ 12VDC) 220mA

(@ 24VDC) 255mA

CAN Bus: SAE J1939 compliant

Enclosure: Polycarbonate NEMA 4 (UL Certified)

Inputs:

Analog Inputs: (12) designated via program; sender/ground digital, 4 -20mA, 0-5 VDC.

Digital Inputs: (8) high/low

Frequency: 1 optically-isolated input for speed reference, magnetic pick-up.(2VAC-50VAC RMS)

Fuel Sender Input: 33 Ohm full, 240 Ohm empty

Outputs:

Digital Outputs: (3) FET B+ (rated at 1A)

Relays: 1 SPDT and 8 SPST 5 Amp pilot relays

User Interface: (8) button membrane switch

Connectors: 21pin and 31pin Deutsch HDP20 Series

Mounting: 4 isolated .75 inch rubber shock mounts

Shipping Weight: 11 Lb. (5 kg.)

Shipping Dimensions (all models): 15 x 15 x 11 in. (381 x 381 x 279.4 mm)

EMS PRO LITE



The EMS Pro Lite is a customizable pump controller designed specifically for dewatering and irrigation applications.

This versatile unit supports both mechanical and J1939 electronic engines, thus eliminating the need to stock multiple controllers. A step ahead, the EMS Pro Lite is Tier 4 and Stage IIIB/IV ready. This includes displaying the current urea level % on the LCD.

A microprocessor-based controller, the EMS Pro Lite's operating parameters are field adjustable without the need for a computer. However, the EMS Pro Lite can be modified for use with a remote modem or in a SCADA system with MODBUS* RTU protocols on either an RS232 or RS485 port. The robust EMS Pro Lite is engineered for 12 VDC systems (8 VDC minimum to 14.4 VDC maximum) and a wide operating temperature.

Operating Voltage: 8 VDC Minimum to 14.4 VDC Maximum

Operating Temperature: -40° to 80°C (-40° to 176°F)

Relative Humidity: 95%RH @ 60°F (140°C)

Storage Temperature: -40° to 80°C (-40° to 176°F)

Enclosure: Polycarbonate NEMA 4 (UL/cUL listed)

Environmental Sealing: IP65

Shipping Weight: 7 lb. (3.2 hg)

Shipping Dimensions: 12" x 12" x 10" (304.8 x 304.8 x 254 mm)

Analog Inputs: 6 Analog Inputs designed via program; sender/ground digital 4-20mA, 0-5 VDC.

Digital Inputs: 4 Digital Inputs High/Low (Both Battery+ and ground are detected as active inputs.
An inactive input floats at approximately 1/2 B.

Frequency: 1 optically isolated input for speed reference, magnetic pick-up, (2VAC-50VAC RMS, 30-10kHz)

Fuel Sender Input: 33 Ohm full, 240 Ohm empty

Analog Output: 4-20mA or .4 to 4.2VDC (used for .4 – 4.2V throttling)

Digital Outputs: 6 Digital Outputs; 3 FET B+ (rated at 1A), 3 Open Collector sink-to-ground 100 mA
(one of these is used to pilot a relay).

Communications: RS485, RS232, CAN J1939, CAN 2.0B ports



KEYSTART



Keystart control modules provide manual start/stop and automatic fault protection for generators, pumps and other engine-driven applications.

Outputs allow control of engine fuel (energized to run), starter motor and preheat. The Keystart also has an alarm output for remote or audible warning of faults. Six LEDs and icons indicate engine status and faults. Four switch inputs (closing to negative on fault) enable automatic shutdown on engine low oil pressure, high coolant temperature and auxiliary faults. Model 9621 has a fully adjustable engine overspeed shut-down feature, configurable for either generator AC or magnetic pickup speed signals. Charge alternator excitation and a charge fail warning LED are standard.

Power Supply

Operating voltage, steady state: 7 to 30VDC

Operating voltage, brown out/cranking: 5VDC minimum

Current consumption: <100mA

Inputs

Fault switch inputs: close to negative DC during fault

Generator AC input (model 9621 only): 70 - 270 VAC rms, <50 to >60 Hz nominal

Magnetic pickup input (model 9621 only): 3.5 - 21 VAC rms, <2000 to >6500 Hz nominal

Outputs (all ratings non-reactive)

Run (fuel): positive DC, NO relay contacts, 10A max @ 24VDC

Start (crank): positive DC, keyswitch contacts, 10A max @ 24VDC

Alarm: negative DC (open collector transistor), 300 mA max

Speed calibration: to suit 0-1mA, 75 Ohm meter, output=0.75mA at rated engine speed.

Adjustable settings

Preheat timer: 0 or 10 secs, default = 0 secs

Fault override timer: 2 to 20 secs (VR1), default = 10 secs

Overspeed trip level (model 9621 only): 100 to 130% (VR3) of nominal calibrated speed, default = 110% (of 50 or 60 Hz)

Physical

Case material: polycarbonate / polyester

Overall dimensions: (w x h x d): 3.8 x 3.8 x 3.7 in. (96 x 96 x 95 mm)

Panel cut-out size: DIN 3.6 x 3.6 in. (92 x 92 mm)

Weight: approx 0.7 lb. / 300g

Operating temperature: -31° to 131°F / -35° to 55°C

Electromagnetic compatibility: EN55022, class B



MURPHY CONNECT TELEMATICS UNIT



The Murphy CONNECT telematics unit provides dependable communication power to PowerCore® controllers and panels with simple plug-and-play installation.

With Murphy CONNECT's cloud-based dashboard, engine owners can reduce costs, prevent downtime and optimize efficiency with intelligent analytics, real-time alerts and warnings directly from their computer or mobile device with an easy-to-use web portal. Built for the elements, the Murphy CONNECT telematics unit is equipped with rugged protection against freezing temperatures, extreme heat, moisture and dust. LTE cell technology provides worryfree data networking and allows you to stay connected from any location.

Electrical

Operating Voltage: 9-36 VDC, reverse polarity protected

Max Voltage: -40 to +60 VDC

Power Consumption:

12 VDC:

Transmitting: 265mA

Idle: 135mA

Off: 0.5mA (Using IGN to turn off)

On: ~175mA Average

24 VDC:

Transmitting: 135mA

Idle: 90mA

Off: 0.5mA (Using IGN to turn off)

On: ~115mA Average

Communications:

CAN: (1) J1939 (Future use)

RS485: Modbus RTU

Wi-Fi: 2.4GHz 802.11 b/g/n (Troubleshooting)

Cellular: LTE

GPS Location Services

Connection: Amphenol AT06-08S

Inputs (1):

Digital: (Future use) [Shared with digital output]

Outputs (1):

Digital: (Future use) [Shared with digital input], protected

Environmental:

Operating Temperature: -30°C to +80°C (-22°F to +176°F)

Storage Temperature: -30°C to +80°C (-22°F to +176°F)

Protection: IP67

Vibration: Random vibration, 8.17 gRMS (5-2000 Hz), in 3 axes

Specification was met without the use of rubber isolation mounts

Shock:

25g in 3 axes
Specification was met without the use of rubber isolation mounts



POWERCORE MPC-10



Murphy's PowerCore MPC-10 is a configurable, all-purpose controller perfect for rental and fleet applications.

This powerful controller is a general controller for mechanical or electronic engine applications needing manual/auto start and manual/auto throttling. It supports J1939 CAN protocols for electronically governed engines as well as I/O for mechanical engines for fault and safety shutdowns. MPC-10 boasts three levels of menu security, perfect for rental fleet protection, which can easily be set with the configuration tool. It is designed for all weather environments and is also available as the ML 1000-4X panel solution. The menu structure is incredibly user-friendly, with the ability to change many parameters and settings from the face without the need of a PC tool, if desired. The MPC-10 can also be remotely automated and monitored using the Murphy CONNECT telematics unit.

Display: 2.7" WQVGA Monochrome HR-TFT 400x240

Keypad: 11 Tactile Feedback Buttons

LEDs: (1) Red, Shutdown, (1) Amber, Warning, (1) Green, Auto Mode or Running Loaded State

Outputs:

(3) Relays: 10A, SPDT, Form C (30 VDC @ 10A max.), 40A max aggregate @ 85C

(2) Low-side (1A)

(2) High-side (1A)

(1) Dedicated Alternator Excite (provides Charge Fail Fault if unable to excite alternator)

Inputs:

(5) Digital, configurable (high/low)

(3) Analog, configurable (4-20mA, 0-5V, resistive)

(1) Frequency, supporting Magnetic pickup (30Hz - 10kHz, 2.0VAC-120VAC) and Engine Alternator (30Hz - 10kHz, 4.5 VRMS - 90 VRMS)

Communications:

(1) CAN J1939

(1) RS485, MODBUS RTU

(1) USB 2.0B for Programming

Total Current Consumption: Power on in stopped state; 117 mA at 12 VDC. Power on in standby mode; 52 mA at 12 VDC.

Cranking Power Holdup: 0 VDC up to 50mS (also good for brownout/blackout instances)

Dimensions: 167.09mm (L) x 133.29mm (H) x 64.81mm (W)

Mass: 1lb. 1oz.

Operating Temperature: -40°C to +85°C (-40°F to 185°F)

Storage Temperature: -40°C to +85°C (-40°F to 185°F)

EMI/RFI: SAE J1113

Shock: ± 50G in axes

Vibration: Random, 7.86 Grms (5-2000Hz), 3 axes

Sealing: IP67 front and back, IP66 Panel Seal with Gasket

Case: Polycarbonate/ABS

Mating Connector: Deutsch Wedge Lock W12S-P012:

Gray DT06-12SA-P012

Black DT06-12SB-P012

Green DT06-12SC-P012

USB 6 pin

Shipping Weight: 2lbs. 7.1 oz. (1.11 kg)

Shipping Dimensions: 8 x 8 x 5-11/16 in. (204 x 204 x 127 mm)

Languages: English, Spanish, German, French, Italian



POWERCORE MPC-20



Murphy's PowerCore MPC-20 is a powerful, all-purpose industrial controller designed to work in the harshest environments on most any engine-driven application.

Targeted for pump and irrigation applications, the MPC-20 is a powerful, fully-sealed IP67-rated all-purpose industrial controller built to withstand harsh environments. Tier 4 / Stage IV ready with auto and manual start, the MPC-20 includes various throttling options and a real-time clock. Easily viewable in full-sun conditions, MPC-20 has a large 3.8-inch easy-to-read, monochrome transfective LCD. It is engineered for incredibly easy initial setup and is configurable by the user to meet the most versatile applications, allowing for quick uptime and less headaches on the manufacturing floor or in the field. Although a configuration tool is not required, the easy-to-use PowerVision Configuration Studio® software allows configuration of set points on a PC to save for future loading. The MPC-20 is also available in an ML2000 panel solution and can also be remotely automated and monitored using Murphy CONNECT telematics.

Display: 3.8" Monochrome LCD, Transfective, 320 X 240 QVGA with White Backlight

Keypad: 11 Silicone Tactile Feedback Buttons

LEDs: (1) Red, Shutdown, (1) Amber, Warning, (1) Green, Auto Mode

Outputs:

- (2) 1A Max Low-side
- (2) 2A Max High-side
- (2) 200mA Max 5VDC
- (1) 0-5VDC Analog
- (6) 10A Max Form C Relays

Inputs:

- (8) Analog, Configurable as Resistive, 0-5VDC, 4-20mA or Digital Ground
- (6) Digital, Configurable as Battery or Ground
- (1) Frequency, (2Hz - 10KHz, 3.6VAC-120VAC)

Communications:

- (1) CAN 2.0B, 250 kbps, J1939
- (1) RS485, Modbus RTU
- (1) USB, Programming

Power Input: 8-32VDC, Reverse Polarity & Load Dump Protection

Total Current Consumption: 18W Max without 2 2A High-sides, active, 146W Max with 2 2A Highsides active.

Dimensions: 208.7mm (L) x 189.7mm (W) x 57.5mm (H)

Mass: 0.9kg (2.0lb)

Operating Temperature: -40°C to +85°C (-40°F to 185°F)

Storage Temperature: -40°C to +85°C (-40°F to 185°F)

EMI/RFI: SAE J1113

Shock: 50G in X, Y, Z Axes

Vibration: Random, 7.86 Grms (5-2000Hz), 3 Axes

Sealing: IP67 Complete Controller, IP66 Panel Mount with Gasket (Minimum 14Ga Metal Plate)

Case: Polycarbonate

Mating Connector: Delphi, SICMA 90 Position

Shipping Weight: 2lbs. 7.1 oz (1.11 kg.)

Shipping Dimensions: 9.5 x 9 x 5 in. (241 x 229 x 127 mm.)



POWERCORE TEC-10



Murphy's PowerCore® TEC-10 panel provides full control with easy setup and installation.

A superior turnkey electronic controller, the PowerCore® TEC-10 panel provides full control of your engine including auto start/stop, auto throttling and display of engine parameters along with critical faults from the engine/application. The TEC-10 supports SAE J1939 CAN protocols for electronically governed engines as well as analog sensors on mechanical engines for fault and safety warnings/shutdowns. The TEC-10 can also be remotely automated and monitored using the Murphy CONNECT telematics unit.

Interface

Display :

Monochrome HR-TFT

2.7 in./ 68 mm, WQVGA (400 x 240 pixels)

Languages: English, Spanish, German, French, Italian

(3) LEDs : green (mode), yellow (warning) and red (shutdown)

Operator controls :

(11) Raised silicone keypads, tactile feedback

(1) Rotary switch, power on/off

(1) Push-switch (red), engine stop

Power Supply:

Operating Voltage : 8-32 VDC, reverse battery polarity and load dump protected

Cranking Power Holdup : 0 VDC up to 50 mS (also good for brownout/blackout instances)

Current consumption : Power on in stopped state; 117 mA at 12 VDC. Power on in standby mode; 52 mA at 12 VDC.

Inputs (9):

(5) Digital, configurable (active on High, Low, Open)

(3) Analog, configurable (4-20 mA, 0-5V, resistive or digital ground)

(1) Frequency, supporting: Magnetic pickup (30 Hz - 10 kHz, 2.0 VAC-120 VAC) and Engine Alternator (30 Hz - 10 kHz, 4.5 VRMS - 90 VRMS)

Outputs (8):

(2) Relay, switched + DC, 10A

(1) Relay, Form C (dry / volt-free), 10A

(2) Low-side FET (- DC), 1A

(2) High-side FET (+DC), 1A

(1) Dedicated Alternator Excitation, + DC, 1A

Communications:

(1) CAN: J1939

(1) RS485: Modbus RTU

Mating Connectors:

21 Position, Deutsch HDP26-24-21SE,

31 Position, Deutsch HDP26-24-31SE

Physical/Environmental:

Enclosure material : Polycarbonate

Dimensions (WxHxD) : 9.59 x 7.34 x 5.20 in. (243.48 x 186.5 x 132.23mm)

Weight : 4 lbs (1.8 kg)

IP rating : IP67

Operating Temperature : -40° to + 85° C (-40° to 185° F)

Storage Temperature : -40 to + 85° C (-40° to 185° F)

Vibration : 7.86 Grms (5-2000 Hz), 3-axis random

Shock : ± 50G, 3-axis

