DYNAGEN™

Dynagen 200

User Manual

9M02-9247-A200-EN

CONNECT. CONTROL. PROTECT.

Revision History

VERSION	DATE	NOTES
A	05/2024	Initial Release

Contents

1 Introduction

1.1 Overview

The Dynagen 200 controller is the next generation of DynaGen's tried and true engine control solutions, which are designed to provide complete control, protection, and engine instrumentation for both manually and electronic governed engines. The controller is easily configured using either the front controller buttons or our Customizer Software.
The Dynagen 200 controller is ideally suited for both constant and variable speed applications where reliability is critical, such as mobile/stationary generators, irrigation pumps, sewage lift stations, and so on.
The display is designed for visibility in all lighting conditions, housed in a durable IP67-rated enclosure, and equipped with a bright LED that signal faults, warnings, emission-related alerts, and autostart activation.
This controller is highly adaptable with 3 digital inputs, 3 analog sensors, 3 digital outputs, and real-time clock. There is an advanced and versatile Event Manager for configuring numerous start/stop scenarios and output activation. Additionally, an analog sensor enables a cruise control feature that adjusts engine speed to maintain or reach a set parameter.
All diagnostic and emissions-related messages from the ECU or connected devices are clearly displayed. Operators should be familiar with the engine manufacturer's ECU and related icons to appropriately respond to emissions compliance, service, and diagnostic messages. The controller also incorporates QR-Assist* technology, which generates a QR code linked to diagnostic trouble codes for quick access to troubleshooting steps and detailed diagnostic information.

1.2 Features and Functions

- SAE J1939 CANbus Protocol
- RPM via J1939, Magnetic Pickup or Generator
- Speed control offset for electronic engines
- AutoStart on low battery and other sensors
- Maintenance counter
- Event Log
- IP67 (sealed against water ingress)
- Single hole mounting for simple installation
- Passcode protected
- Automatic shutdowns and warnings
- Momentary Start/Stop inputs
- Pre-heat and many other configurable timers
- Accepts common senders (VDO, Datcon, S&W)
- Custom senders configurable with Customizer Software

1.3 Displays

- Engine Temperature
- Oil Pressure
- Fuel Level
- J1939 DTCs + Custom Text
- J1939 Parameters
- Engine Speed
- Battery Voltage
- Custom Senders
- Auxiliary Sensors
- Real Time Clock
- Engine Hours
- Time to Maintenance
- Warnings and Failures
- And many more

2 Specifications

The Dynagen 200 controller was rigorously tested to ensure durability, reliability and functionality. With the operator and equipment in mind, precautions were taken in the design process to ensure minimization of unavoidable risks associated with both environmental and operational hazards.

The following specifications are a brief summary of the general functionality and the standards to which the controller has been tested. For complete details on the testing performed, please contact Cattron at www.cattron.com/contact.

2.1 Testing Specification

DC Transients:

- Meets SAE J1113 Pulse 1(B/C)
- Meets SAE J1113 Pulse 2A
- Meets SAE J1113 Pulse 2B
- Meets SAE J1113 Pulse 3A and 3B
- Meets SAE J1113 Pulse 4
- Meets SAE J1113 Pulse 5A

ESD SAE J1113:

- Direct Discharge (Powered) - Meets SAE J1113-13, Figure B1, Severity Level 4
- Direct Discharge (Un-Powered) - Meets SAE J1113-13, Figure B1, Severity Level 4
- Air Gap Discharge (Powered) - Meets SAE J1113-13, Figure B1, Severity Level 4
- Air Gap Discharge (Un-Powered) - Meets SAE J1113-13, Figure B1, Severity Level 4

Environmental:

- Thermal Cycling (SAE J1455)

Mechanical (SAE J1455):

- Impact UL
- Harness Swing SAE J1455
- Unpackaged Drop SAE J1455, UL

Vibration (SAE J1455):

- Swept Sine, 3-axis with 2hr, 0.06” to 10g Dwell @ four highest resonances
- Cattron Accelerated 5-year life test, Proprietary composite profile: 20 G_{rms}, Range: 30 Hz - 2000 Hz

2.2 Battery Supply

Parameter	Specification
Range	5.5 VDC - 38 VDC
Cranking Dropout to 0 VDC	50 ms
Reverse Battery Protection	Yes
Power Consumption	0.54 W (0% backlight) - 1.8 W (100% backlight)

2.3 Display

Parameter	Specification
Number of Buttons	6
Backlight	Yes
Operating Temperature (with backlight)	-4 to +158 °F (-20 to +70 °C)

2.4 I/O

Parameter	Specification
Switched Inputs	
Number of Switched Inputs	3
Software Configurable	Yes – Switch to GND, Switch to VBAT, Switch Open and Switch Close
Minimum Trigger Delay	<100 ms
Analog Inputs	
Number of Analog Inputs	3
High Impedance Low Impedance Software Configurable	1 x 0-5000ohm 1 x 0-240ohm 1 x 0-5 VDC, 4-20 mA, 0-240ohm, 0-5000ohm
Transient Protection	Up to 60 VDC
Starter Battery Measurement	Yes
Accuracy	+/-2%
Switched Outputs	
Number of Switched Outputs	3
Type	High Side Switches
Maximum Current per Channel	1 A

Parameter	Specification
Logic Level Drive Capable	Yes

2.5 Speed Sensing

Options	Specification
J1939 Bus	Protocol over CAN for Electronic Engines
Magnetic Pickup	50-15000 Hz
Generator Voltage	300 VRMS MAX
Tachometer	5-400 Hz

2.6 Communications Ports

Parameter	Specification
CANbus	
Number of Ports	1
Software Configurable Internal Resistor	Yes – 120 Ω
RS485	
Number of Ports	1
Software Configurable Internal Resistor	Yes – 120 Ω
USB	
Number of Ports	1

2.7 Mechanical

Parameter	Specification
Dimensions (W x H x D)	4” (102 mm) x 4” (102 mm) x 2”(51mm)
Cut-out Size	Circular 2 1/8” (54mm) diameter
Sealed Enclosure	Yes – IP65
Sealed to Controller	Yes – IP67
Connectors	1 x 6 Pin (DT06-6S) 1 x 18 Pin (DT16-18SA)

2.8 Other Features and Specifications

Parameter	Specification
Real Time Clock	Yes – with 5 year backup battery
Custom Branding	Yes – Gasket color and custom label under LCD

3 Installation

Generator systems contain high voltage circuitry, and precautions should be taken to protect against electrical shock. Failing to power down and lock out equipment can cause damage, injury or death.

	WARNING WIRING OF THIS CONTROLLER SHOULD BE PERFORMED BY QUALIFIED ELECTRICIANS AND TECHNICIANS ONLY.

	AVERTISSEMENT LE CÂBLAGE DE CE CONTRÔLEUR NE DOIT ÊTRE EFFECTUÉ QUE PAR DES ÉLECTRICIENS ET TECHNICIENS QUALIFIÉS.

	CAUTION HIGH VOLTAGE MAY BE PRESENT AT THE CONTROLLER.

	ATTENTION UNE HAUTE TENSION PEUT ETRE PRESENTE AU NIVEAU DU CONTROLEUR.

The following general electrical safety precautions should be followed:

- Do a thorough inspection of the area before performing any maintenance
- Keep fluids away from electrical equipment
- Unplug connectors by pulling on the plug and not on the cord
- Use fuses where appropriate
- Ensure all equipment is properly grounded
- Provide support to wires to prevent stress on terminals

	CAUTION TO ENSURE PROPER AND SAFE OPERATION, CAUTION MUST BE TAKEN AT THE INSTALLATION SITE TO MAKE SURE IT IS FREE FROM EXCESSIVE MOISTURE, FLUCTUATING TEMPERATURE, DUST AND CORROSIVE MATERIALS.

	ATTENTION POUR GARANTIR UN FONCTIONNEMENT CORRECT ET SUR, IL FAUT PRENDRE DES PRECAUTIONS SUR LE SITE D'INSTALLATION POUR S'ASSURER QU'IL SOIT EXEMPT D'HUMIDITE EXCESSIVE, DE FLUCTUATIONS DE TEMPERATURE, DE POUSSIERE, ET DE MATERIAUX CORROSIFS.

Choose a mounting surface with the least amount of vibration, from 1/16” (1.6 mm) to 1/4” (6.35 mm) thick. The mounting surface should not be any more than 1/4” (6.35 mm) thick.

3.1 General Wiring Notes

The following important wiring guidelines should be followed:

- Use a minimum of 18 AWG wire for all connections
- Battery Positive and Battery Negative connections on the controller should be run directly to the positive and negative terminals on the battery to prevent voltage drops from negatively impacting the controller
- Limit the wire length to 60 ft (18.3 m) to any I/O on the controller (e.g., Switched Input, Switched Outputs, AC Sensing and Analog Inputs)

The Dynagen 200 contains a protection for the I/O and internals from transients on the main battery. If I/O is connected to other batteries or power supplies, those I/O must contain their own voltage transient protection. Otherwise, the I/O and/or controller can be damaged if the transient exceeds the maximum rated voltage of the I/O. A device that provides this kind of protection is known as a TVS or a varistor.

- Fusing:
  - A fuse should be placed in line with the battery positive wire going to the controller power; a 10 A fuse is suggested
- For noisy environments, some guidelines are as follows:
  - Replace speed sensing wires with twisted pair from the sensor to the controller
  - Consider using isolated sensors (i.e., two terminal) and use twisted pair wiring to connect from the engine to the controller

When possible, the following enclosure guidelines should be followed:
See Figure 5 for an illustration of a typical wiring configuration. This is a guide only; individual applications will differ.
The controller dimensions are shown in Figure 2.

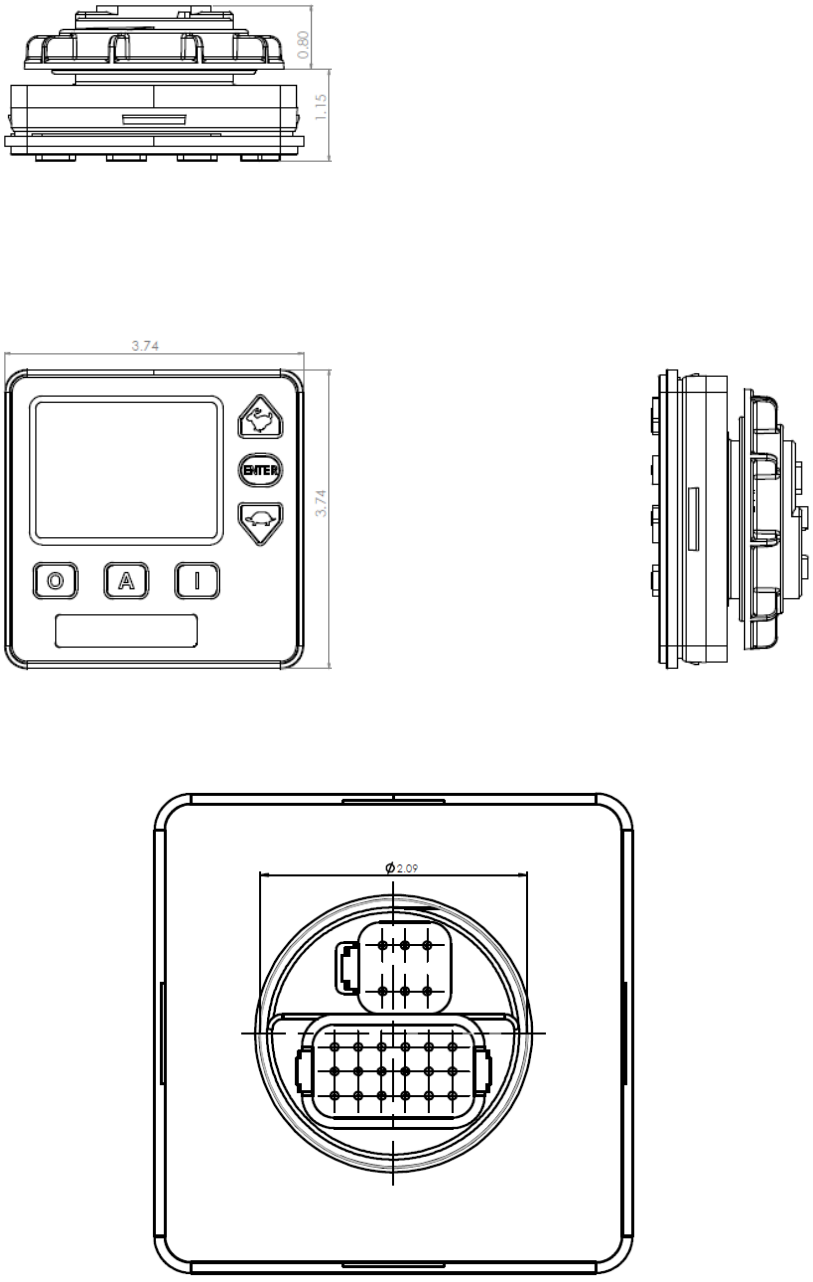
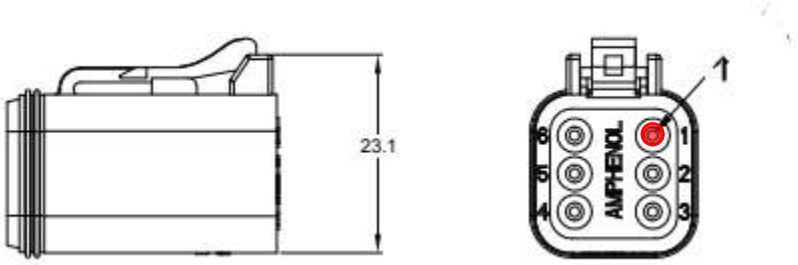
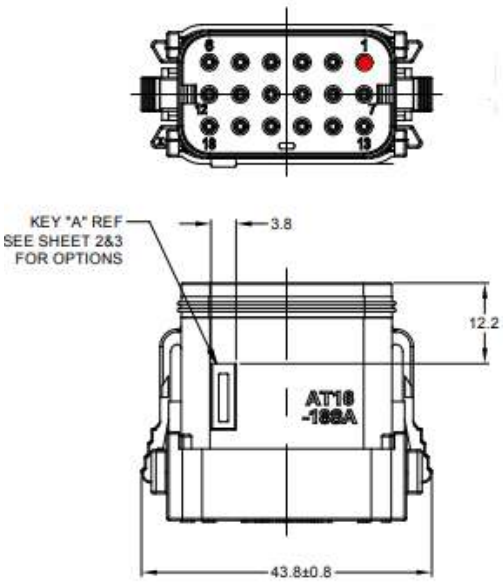


Figure 1: Controller Dimensions

3.2 Terminal Descriptions



Terminal	Name	Description (**BOLD** = Default configuration)
J1-1	VBAT	Battery Positive (attached directly to the battery (+) terminal)
J1-2	CAN-H	CAN High
J1-3	CAN-L	CAN Low
J1-4	Switched Input 1	Switched Input
J1-5	Analog In 1	Analog Input (Hi-Impedance/**Coolant**)
J1-6	Ground	Battery Negative (attached directly to the battery (-) terminal)



Terminal	Name	Description (**BOLD** = Default configuration)
J2-1	VBAT	Optional if J1-1 is connected to VBAT
J2-2	Ground	Battery Negative (attached directly to the battery (-) terminal)
J2-3	RS485A	MOD Bus (Non-Isolated)
J2-4	RS485B	MOD Bus (Non-Isolated)
J2-5	Switched Input 2	Switched Input
J2-6	Switched Input 3	Switched Input
J2-7	Switched Output 1	Switched Output
J2-8	Analog In 2	Analog Input (Low-Impedance/**Fuel Level**)
J2-9	Analog in 3	Analog Input (0-5VDC / **4-20mA** / Low-Impedance / High-Impedance / Switch to Ground)
J2-10	RS485 Ground	MOD Bus
J2-11	USB-VBUS	USB 5V
J2-12	USB-P	USB Positive
J2-13	Switched Output 2	Switched Output
J2-14	Switched Output 3	Switched Output
J2-15	RPM Ground	Speed Source Common
J2-16	RPM Input	Speed Source Connection
J2-17	USB-GND	USB Ground
J2-18	USB-N	USB Negative

4 Typical Wiring

Figure 5 represents a typical wiring scenario for the TOUGH Series PRO controller. The following considerations apply.

4.1 Speed Sensing

- Input is to be used for a magnetic pickup (MPU) sensor, alternator or tachometer output
- Speed sensing wires are not required when using the AC Voltage wiring harness
- The polarity of the inputs does not matter
- Use twisted pair shielded cable; leave one side of shield unterminated
- If using an MPU:
  - A shielded MPU is recommended
  - One side of the magnetic pickup also must be connected to ground in addition to the controller

4.2 CANbus (J1939) and Modbus (RS485) Connections

- A 120 Ω impedance twisted pair cable is required
  - Examples are Belden 9841 (single twisted pair) and Belden 7895A (two twisted pair)
- RS485 requires an extra wire or twisted pair in the cable for RS485 common
- To prevent noise from affecting controller operations, bring the shielded cable within at least 6 inches of the terminal; closer to 3 inches is recommended
- Terminate the bus on each end with a 120 Ω resistor. For the controller side, the internal resistor can be used instead by enabling it in the Customizer Software or the display menu
- Ground the shield on one end; leave the other end unconnected

4.3 Sensors and I/O

- If using non-isolated (one-wire) sensors, connect sensor common to battery negative. Make connection at the same point the main ground connection is made
- If sensor readings are unstable, it may be necessary to provide a dedicated ground path from the ground node of an individual sensor to the controller ground
- Ensure correct relay selection for system, i.e., 12 V coils for a 12 V system, and 24 V coils for a 24 V system

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Note: Custom Sender tables are required for the auxiliary sender to work with these examples. See the Auxiliary Sensors section for more information on Custom Sender Tables.

Example: Sometimes it is required to measure voltages outside the 0-5 V range allowed by the controller. To do this you must use a voltage divider with appropriate scaling resistors. The equation to calculate the resistor values is as follows:
$V_{OUT} = (R1/(R1+R2)) \times V_{IN}$ Where: $V_{OUT} = 5$ V
V_{IN} = Maximum Voltage to Read
R1 = Common Resistor Value > 10 kΩ
R2 = Calculated Resistor Value (select closest common resistor value)

Figure 7 shows the typical wiring of a voltage divider. The resistors' values have been selected to allow the controller to read up to 36 V from an external battery bank.

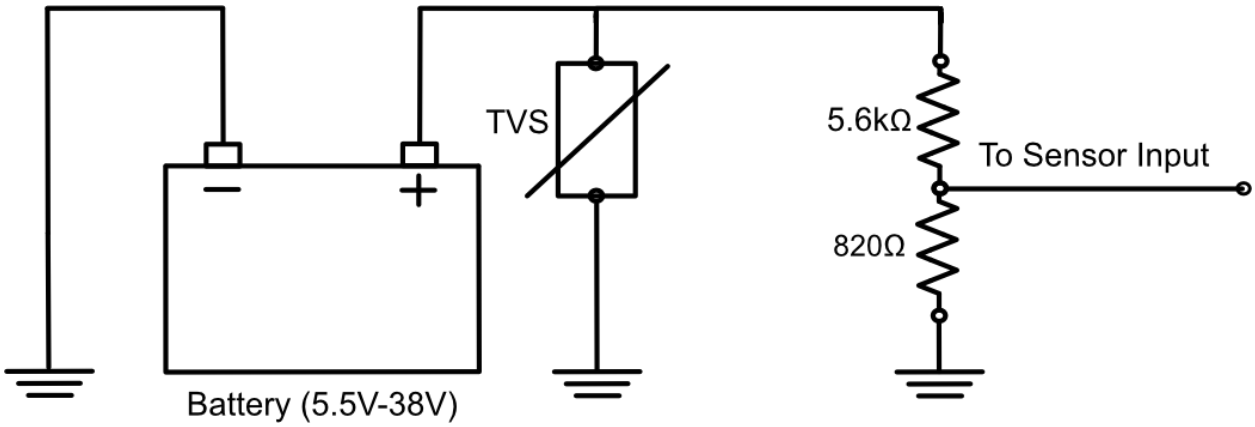


Figure 2: Universal Sensor Wiring Example

⚠	CAUTION A TVS (I.E., VARISTOR) IS REQUIRED IF THE BATTERY IS DIFFERENT THAN THE BATTERY FROM WHICH THE CONTROLLER IS POWERED. IN THIS CASE, THE CONTROLLER'S TVS CANNOT PROTECT THE SENSOR INPUT FROM TRANSIENTS.

⚠	ATTENTION UN TVS (VARISTANCE) EST NECESSAIRE SI LA BATTERIE EST DIFFERENTE DE CELLE QUI ALIMENTE LE CONTROLEUR. DANS CE CAS, LE TVS DU CONTROLEUR NE PEUT PAS PROTEGER L'ENTREE CAPTEUR CONTRE LES TRANSITOIRES.

4.4 CANbus Wiring

The following table outlines some items that must be taken into consideration when connecting to a CANbus engine.

Consideration	Description
Bus Termination	Each end of the bus must be terminated from CAN H to CAN L with 120 Ω +/- 10 Ω resistors. The resistor must be able to handle at least 400 mW of power dissipation. With the TOUGH Series PRO, this can be accomplished with an external resistor termination at the controller, or by simply enabling the internal resistor in the menu, as follows: Menu > Advanced Setting > Communications > J1939 CANbus – Internal 120 Ω Resistor > Enable
Cable Selection	A twisted pair 120 Ω impedance cable is required for communications. For better protection, a shielded twisted pair cable is recommended. Examples include the following: • Belden 9841 - Shielded cable with one twisted pair, 24 AWG • Belden 7895A - Shielded cable with two twisted pair, 20 AWG For short runs of 5 ft or less, regular 18 AWG wiring can often be run.
Shielding	If using a shielded cable, the shield must be connected to ground on one end of the bus only. This prevents loss of data from electromagnetic interference.
Termination at the Controller	The twisted pair cable must terminate no farther than six inches from the controller's CAN (J1939) connector. Three inches is ideal.

For detailed information about J1939 settings and functions, please use the J1939 Reference Manual. The manual can be found at www.cattron.com.
Typical communications writing is shown in Figure 8.

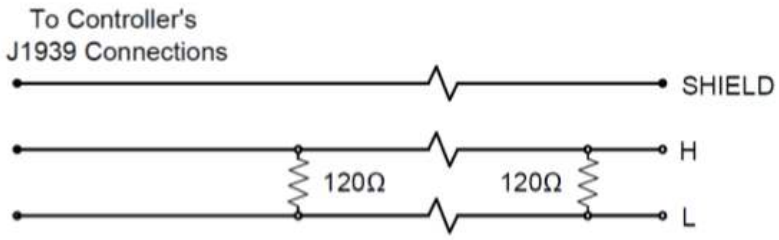


Figure 3: Communications Wiring

4.5 Modbus Wiring

The following table outlines some items that must be taken into consideration when connecting a Modbus system.

Consideration	Description
Bus Termination	Each end of the bus must be terminated from A to B with 120 Ω +/- 10 Ω resistors. The resistor must be able to handle at least 400 mW of power dissipation. With the TOUGH Series PRO, this can be accomplished with an external resistor termination at the controller, or by simply enabling the internal resistor in the menu, as follows: Menu > Advanced Setting > Communications > Modbus Network > Modbus Internal 120 Ω Resistor > Enable
Cable Selection	Shielded twisted pair 120 Ω impedance cable is required for communications. Shield drain wire is NOT to be used for the RS485 common. The cable must have one twisted pair for A and B and a separate wire or twisted pair for the common. An example is Belden 7895A, a two twisted pair, 20 AWG, where the second pair can be used for the RS485 common.
Distance (Power and Ground)	If running power and ground from the battery of your system to a remote device, use the following guidelines for the gauge of the power and ground wires. • Up to 450 ft (137.2 m) – 22AWG • Up to 700 ft (213.4 m) – 20AWG • Up to 1125 ft (342.9 m) – 18AWG • Up to 1800 ft (548.6 m) – 16AWG • Up to 2800 ft (853.4 m) – 14AWG
Termination at the Controller	The above cable must terminate no farther than six inches from the controller's RS485 (Modbus) connector. Three inches is ideal.

For detailed information about the Modbus registers and their interpretations, please use the Modbus Reference Manual. The manual can be found at www.cattron.com.

4.6 ECM Wiring

It is common practice to use the fuel output to trigger the ECM key input to enable the ECM before cranking. Figure 9 shows an example of wiring this configuration. For some ECMs to function, they must be powered/enabled for a certain period before cranking to allow time for the ECM to boot up. There are two ways to provide this time:

- Set a preheat time or increase the preheat time to allow a longer time for the ECM to boot up before cranking; the fuel output turns on at the start of preheat
- Enable the Auto Power ECM setting in the Communications > CANbus (J1939) menu, which will cause the fuel output to turn on in Auto Mode and stay on

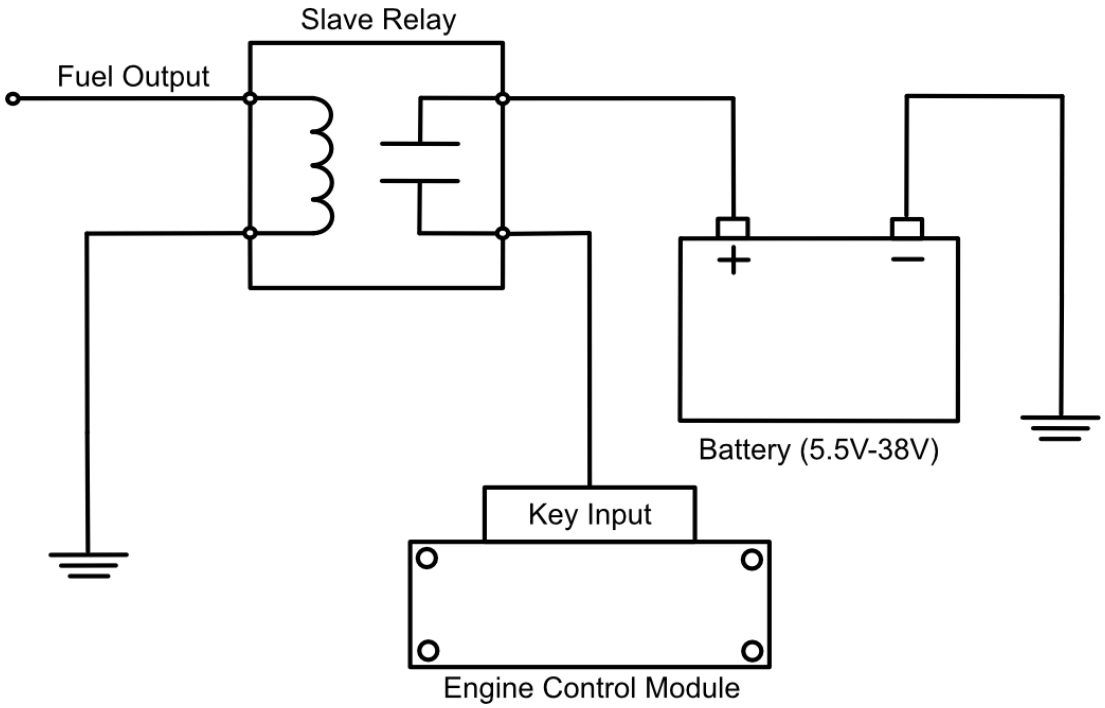
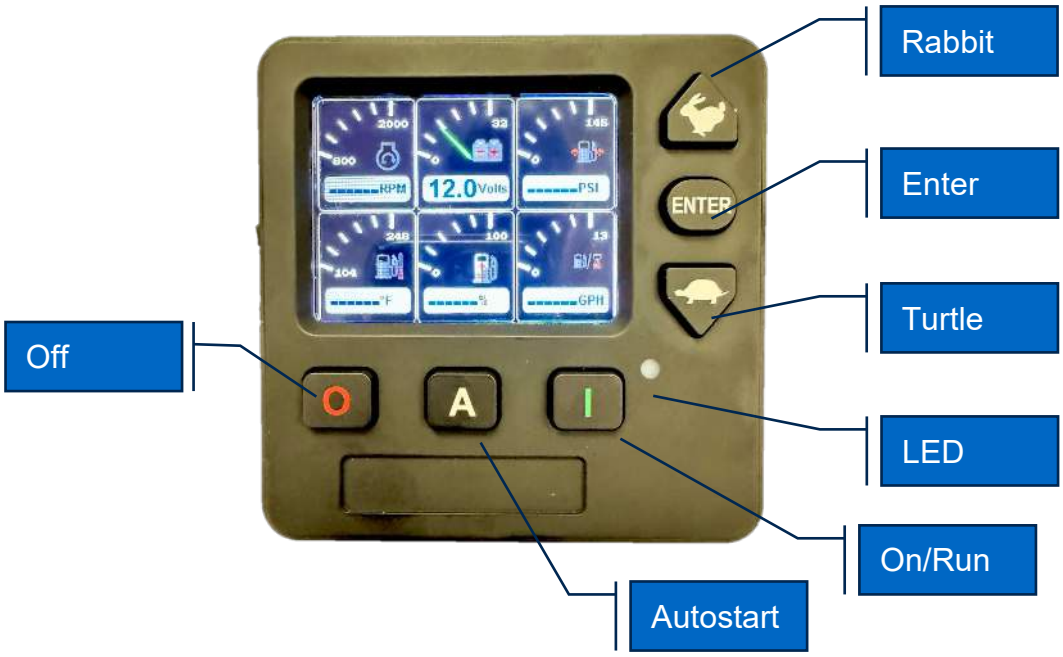


Figure 4: ECM Wiring

5 Using the Controller

The Dynagen 200 controller's LCD display is the primary source of information from the controller. It allows the user to view and monitor the status of sensors and other engine peripherals. This automotive-grade display adheres to the TOUGH Series rugged standards by maintaining functionality to -20 °C throughout use and -40 °C with the backlight active. Figure 11 illustrates the controls used to navigate and change the on-screen information and subsequently use the controller.

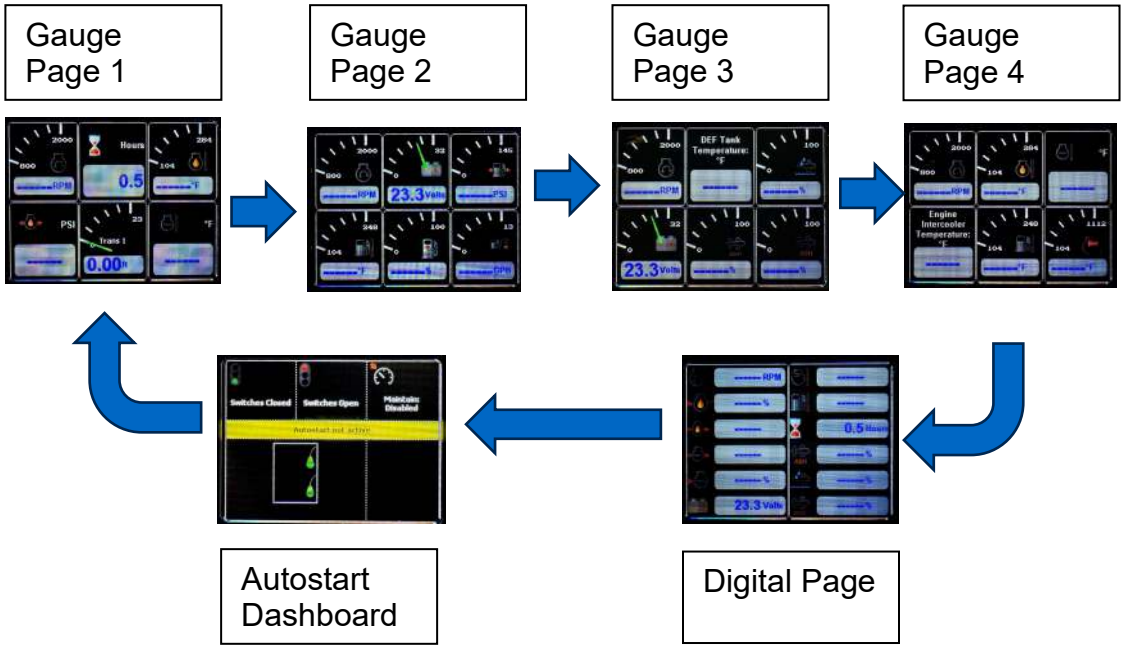
5.1 Front Controller and Buttons



5.2 Analog Gauge pages, Digital Gauge page, & Autostart Dashboard

There are four independently configurable pages of analog gauges. Each page has 6 configurable analog gauges. Pressing and releasing the ENTER button will toggle thru the four pages. After the fourth analog gauge page, pressing and releasing the ENTER button will advance to the Digital Gauge Page, which shows the values of 12 different parameters. Pressing and releasing the ENTER button again will show the Autostart Dashboard, which

shows the current Autostart configuration; start and stoop events and condition, as well as the Maintain function and status. Finally, pressing and releasing the ENTER button while the Autostart Dashboard is showing will rotate the display back to the first analog gauge page.



All 24 gauges may be configured to create an application-specific view of the data. With Tech or Admin level access, the four pages of gauges can be configured using the following menu: **Display → Gauges → Quad Gauge Pages**.

5.3 Autostart Dashboards

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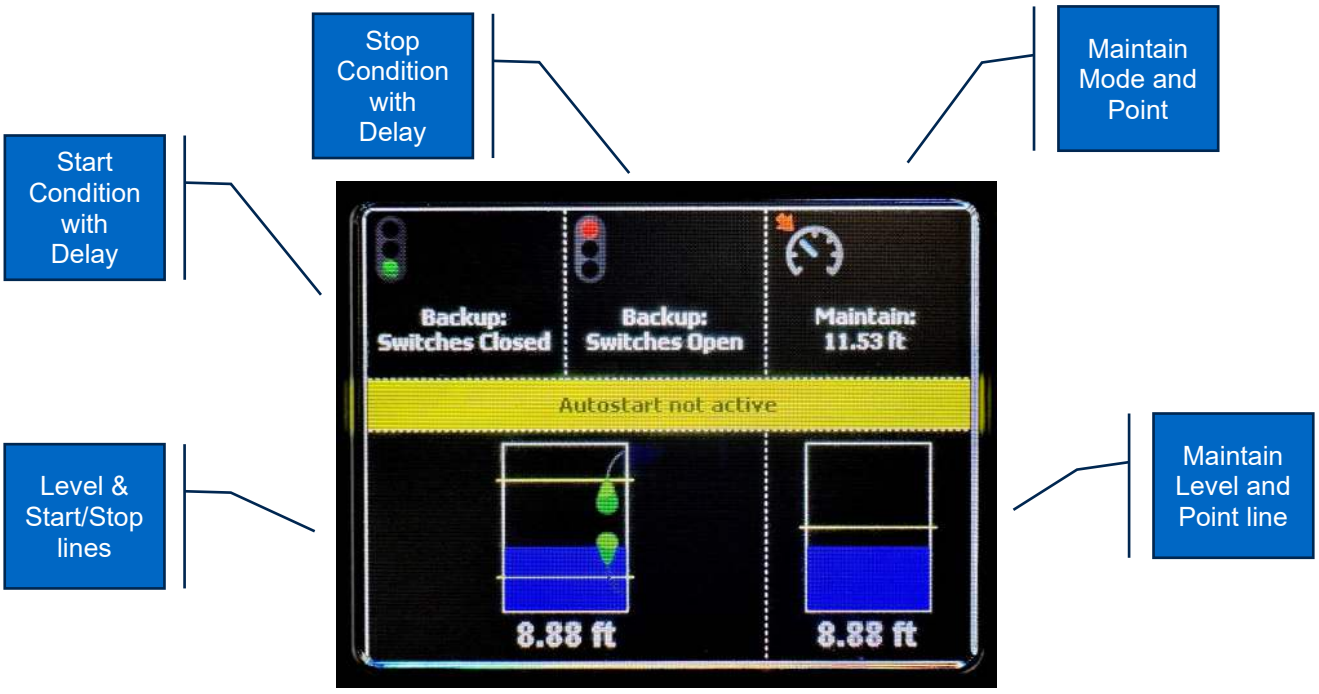


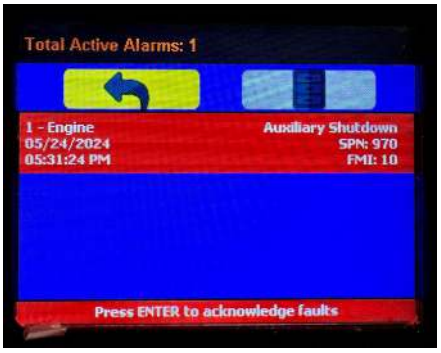
5.4 Active Alarms

When an active alarm is received, a popup window is overlaid on the current screen. The popup includes a plain language description in addition to the standard SPN/FMI (Suspect Parameter Number/Failure Mode Indicator) pair defined by the SAE J1939 standard. Additionally, if enabled, the beeper sounds as an audible cue.

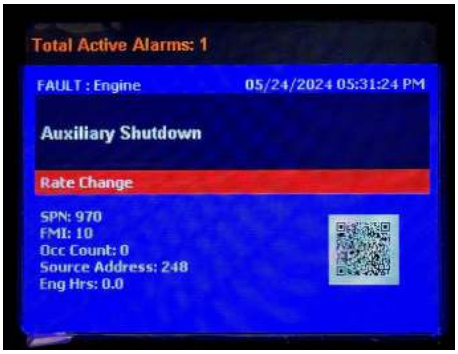
Note: Standard J1939 abbreviations are used for alarms, as follows:
MS = Most Severe
MOD = Moderately Severe
LS = Least Severe

5.5 Alarm List

The Alarm List is accessed by pressing the ENTER button while an alarm popup is displayed. Alarms not yet acknowledged are shown in white text on a red background, while acknowledged alarms are shown in white on black. The list also indicates when the alarm occurred if engine hours are available. The most recent alarm is displayed at the top of the list.

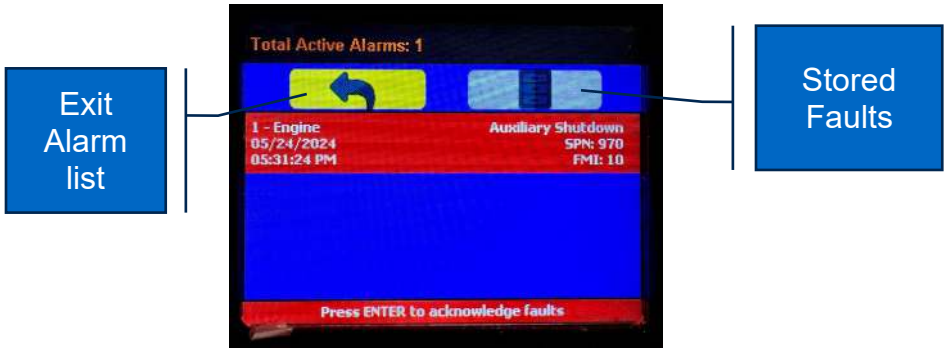


The list can be scrolled using the RABBIT and TURTLE buttons and alarms acknowledged by pressing the ENTER button, which will bring up the Alarm details. In the bottom right, is a QR-code that if scanned will take the user to the QR-Assist website for more details on the alarm (see QR-Assist section).



Stored Faults can be displayed by using the RABBIT and TURTLE buttons to highlight the Stored Faults icon and pressing Enter. The list is show all the controller-generated faults. The controller will also send a request to retrieve the ECU stored faults and list those as well. Alarm messages in the list are automatically removed when the alarm has not been received for a few seconds.

The Alarm List can be closed by using the RABBIT and TURTLE buttons to highlight the Exit icon.

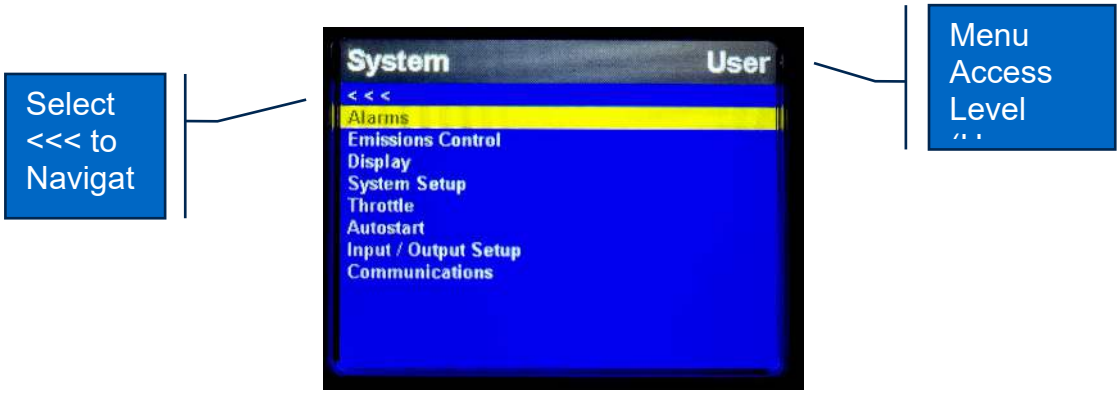


5.6 Service Timers

The controller 16 service timers to alert the operator of required maintenance. The time interval for each timer can be adjusted in increments of 10 hours. A popup message is displayed after completion of the display's self-test if a timer (or timers) has expired, alerting the user that service is required. The message is displayed on each power-up until the elapsed timer is disabled or reset. The service timers can have their respective names customized to monitor engine and machine-related parameters. All 16 service timers can be monitored via wireless telemetry.

5.7 Menus

The menu pages can be accessed by pressing and holding the ENTER button. The top-level menu page will then appear. Once in the menu, the RABBIT and TURTLE buttons are used to navigate up and down thru the menus, respectively. The ENTER button is used to select a menu item. On every menu at the top is the <<< item. Selecting the <<< will navigate back thru the menus and ultimately out to the last displayed gauge page or Autostart Dashboard. As a shortcut, the ENTER button can also be held down to back up one menu level.



5.7.1 Entering Numerical Values

To enter numerical values such as Minimum RPM, a popup window will appear.

Use the RABBIT and TURTLE buttons to navigate to the desired digit to be changed, then press ENTER.

A + and – will appear above the digit being changed. Use the RABBIT and TURTLE buttons to increment or decrement the digit. Press the ENTER button to accept the new value. When all done, use the RABBIT and TURTLE buttons to highlight the  to accept the change.

5.7.2 Menu Tree

5.7.3 Access Levels

The available menu items are dependent upon the current access level. The current access level is shown in the upper right corner while in the menus. The DYNAGEN 200 supports up to three independent PINs that are configurable. The standard configuration has the following PINs settings:

- User = 1000
- Tech = 1111
- Admin = 2222
- Menu PIN Required = OFF

5.7.3.1 Elevate Access Level

When the controller is turned on, the access level reverts to the User level. To gain access to the Tech or Admin levels, use the Elevate Access Level menu, as follows: Configuration → System → PIN Settings → Elevate Access Level.

The controller will prompt for a PIN input. User, Tech or Admin level access will be granted based on which PIN is entered. For example, if the Tech level PIN is entered, Tech level access will be granted, and similarly if Admin or User level PINs are entered. If the entered PIN does not match User, Tech or Admin, then “Incorrect PIN” is displayed, and the access level reverts to User.

Once elevated, the access level stays in effect until the controller is turned off or the display times out (see display Power Timeout).

5.7.3.2 PIN Change

PINs can be changed via the Menu as follows: Configuration → System → PIN Settings → PIN change.
The PIN that is changed is the PIN for the current access level. For example, at the User level, only the User PIN can be changed. To change the Tech PIN, use the Elevate Access Level menu and enter the correct Tech PIN. Then go to the PIN Change menu to change the Tech PIN.

5.7.3.3 Menu PIN Required OFF

- Accessing the menu is allowed with no PIN input required
- Only User access level items are displayed
- Use the Elevate Access Level menu to access the Tech or Admin menu items

5.7.3.4 Menu PIN Required ON

PIN is required to access the menu

- User, Tech or Admin level access will be granted based on which PIN is entered. If the PIN does not match the User, Tech or Admin PIN, then the controller will display “Invalid PIN”

Once an access level is granted, that level is retained until the key is turned off or the display times out (see display Power Timeout).

When the key is turned back to the ON position, the access level reverts to User and follows the Menu PIN Required setting.

6 Manual Operation

Use the following steps for manual operation:

1. Ensure that the Auxiliary Engine Stop (if fitted) is not activated.
2. Turn the key switch to the run position (if fitted)
3. Press and hold the ON/RUN button.
4. Release the button when engine or electric motor starts.

6.1 Throttle Control

The ECU determines how the engine responds to the throttle requests and will not allow the engine speed to fall below the ECU minimum RPM or go above the ECU maximum RPM. The ECU minimum and maximum RPM values are determined by the ECU “payload” and typically require the engine manufacturer’s configuration tool to adjust them. The ECU will honor RPM requests that are above the ECU’s minimum RPM as well as RPM requests that are below the ECU’s maximum RPM.
Therefore, to avoid confusion, it is best not to set the controller’s Minimum Requested RPM below the ECU’s minimum RPM or set the controller’s Maximum Requested RPM above the ECU’s maximum RPM.

For example, the controller’s Minimum Requested RPM is set to 800 RPM, yet the ECU payload defines the engine minimum speed to be 900 RPM. In this case, the engine will not run at 800 RPM despite the controller requesting a lower engine speed. The ECU will ignore all RPM requests that are below 900 RPM, resulting in a minimum speed of 900 RPM.

6.2 Ramp Throttle

The standard Ramp Throttle uses the rabbit and turtle buttons to adjust the requested engine or motor speed. All throttle requests are sent directly to the engine using CAN throttle control or over Modbus to the VFD

Note: Throttle control requires CAN throttling to be enabled in the ECU. CAN throttling is also known as Torque Speed Control or TSC1.

When first started, the requested engine or motor speed is Idle RPM.

- Pressing and releasing the rabbit icon increases the speed by the switch/rotary increment value (default = 50 RPM)
- Pressing and holding the rabbit icon causes the speed to increase (ramp) until the maximum speed is achieved
- Pressing and releasing the turtle icon decreases the speed by the switch increment value (default = 50 RPM)
- Pressing and holding the turtle icon causes the speed to decrease (ramp) until the minimum speed is achieved

- The Dynagen 200 will smoothly ramp the RPM up and down using the Max RPM change / s value (default = 500). This value can be changed in the **Throttle → Switch/Rotary → Max Change / s** menu.

6.3 Stopping the Engine

To stop the engine or motor, simply press the “OFF” button. The speed will be reduced in a control fashion and then the engine or motor will be stopped. Pressing the button for more than 3 seconds will cause the engine or motor to be stopped immediately. Do not use the Auxiliary Stop (if fitted) or the key switch to stop the engine or motor under normal conditions.

7 Autostart Operation

7.1 Prerequisites

The Dynagen 200 is capable of starting and stopping the engine based on external triggers and/or timed schedules.

Note: It is important to note that the engine or motor may start without warning or notice.

The controller is equipped with an Autostart warning alarm.

- It is SOLELY the responsibility of the owner/installer/operator to provide warning labels, visible warnings and audible warnings to notify the operator of an impending start-up
- ALWAYS use lock-out/tag-out procedures prior to performing ANY service or configuration operations
- DO NOT configure operator programmable features while the controller is in “AUTO” mode (green Autostart light is illuminated)

7.2 Enabling Autostart

To place the controller in Autostart mode, turn the key switch (if fitted) clockwise to the ON position and press the AUTO button. The Autostart Dashboard will indicate that Autostart is active. CAN bus values will show “- - -” since the ECU is not energized at this time. The display will power down after two minutes to reduce battery drain but the Autostart is still active. The power-down time can be adjusted through the Display menu with an Admin level access. When the selected start condition occurs, the controller will power up and attempt to start the engine after sounding the Autostart warning alarm. When the engine has successfully started, the controller will control the speed following the configurable throttle control profile (see the Ramp Profile section). The flexible throttle profile includes various speeds and times for a variety of scenarios. When a stop condition exists, the controller will reduce the speed as per the throttle profile and stop the engine. If the configured start condition returns before the shutdown process is complete, the engine will not stop but rather will return to the required speed.

	WARNING
	AUTOMATIC START/STOP WARNING! WHEN THE AUTOSTART MODE IS ACTIVE AND A START CONDITION EXISTS, THE CONTROLLER WILL START IMMEDIATELY! DO NOT CONFIGURE THE CONTROLLER WHEN THE AUTOSTART MODE IS ACTIVE! ALWAYS USE LOCK-OUT/TAG-OUT PROCEDURES WHEN SERVICING AUTOSTART EQUIPMENT!

7.3 Autostart Menu

The DYNAGEN 200 has two switch inputs for use as Autostart inputs. The transducer input can also be selected to control a start/stop set point.

7.4 Behavior

The following links to videos show how to set up the controller for sample applications:
Click here to view Dual Float Empty.
Click here to view Transducer with Backup Switches.

7.4.1 Configuring Operation

Configuring Autostart begins with selecting the desired behavior. The two choices are as follows:

1. High to low, examples:
   - High water level to low water level
   - High pressure to low pressure
   - High temperature to low temperature
2. Low to high, examples:
   - Low water level to high water level
   - Low pressure to high pressure
   - Low temperature to high temperature

7.4.2 Configuring Start and Stop Events

The next step is to define the start and stop events. The choices are as follows:

- Single switch
- Cycle Run
  - Start upon entering Autostart modes
  - Stops after x minutes
  - Restarts after y minutes
- 2-State, Single Switch
  - Manually started and stopped
  - Switched input toggles between idle (open) and Intermediate RPM (closed)
- Remote Control
  - Start and stop via switch
  - Throttle up and down via two other switches
  - Single start/stop
- Dual switch
  - Start and stop via dual (high and low) switches
- Transducer
  - Start and stop via transducer level
    - Transducer with backup switches
      - Start and stop via transducer level

  - Switches as backup start and stop if there is a transducer failure
- Scheduler
- Timed run
  - Manually started
  - Automatically stopped by countdown timer
  - Can maintain a level while running

The following table describes the Start/Stop events when behavior operation is set to “High to Low” (switches/floats are normally open):

Start/Stop Events	Engine or Motor Starts When	Engine or Motor Stops When
Single Switch	SW1 is closed	SW1 is open
Dual Switch	SW1 and SW2 are both closed	SW1 and SW2 are both open
Transducer	Input is above high set point	Input is below low set point
Transducer with Backup Switches	Input is above high set point; Dual Switch mode if Transducer fault is detected	Input is below low set point; Dual Switch mode if Transducer fault is detected
Scheduler	Date and Time occurs	Date and Time occurs
Timed Run	Autostart switch pressed	Timer expires

The following table describes the Start/Stop events when behavior operation is set to “Low to High” (switches/floats are normally open):

Start/Stop Events	Engine or Motor Starts When	Engine or Motor Stops When
Single Switch	SW1 is open	SW1 is closed
Dual Switch	SW1 and SW2 are both open	SW1 and SW2 are both closed
Transducer	Input is below low set point	Input is above high set point
Transducer with Backup Switches	Input is below low set point; Dual Switch mode if Transducer fault is detected	Input is above high set point; Dual Switch mode if Transducer fault is detected
Scheduler	Date and Time occurs	Date and Time occurs
Timed Run	Autostart switch pressed	Timer expires

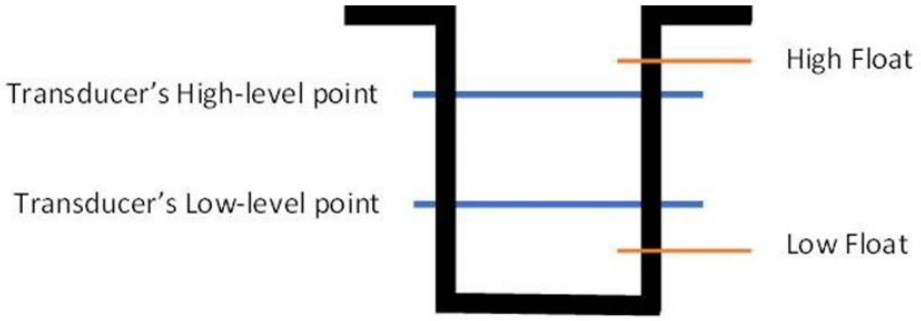
7.4.2.1.1 Transducer Fault Detection using Backup Switches

When configured and equipped with transducer and back up switches, the controller will use the transducer to determine the primary start and stop events. The switches are used to detect transducer faults; when a fault is detected, the controller will automatically adjust to use the switches to detect the start and stop events. The controller will alert to the fault, but normal operation will continue with the exception that the switches will be used instead of the faulty transducer.

For proper operation and fault detection, the switches must be configured such that the high-switch opens/closes at a level above the transducer’s high-level point and the low-switch

opens/closes at a level below the transducer's low-level point, as illustrated in the fluid pumping example diagram below.

As an example, consider the following situation. When pumping fluid, the setup should be like the following diagram. Typically, floats function as an Open switch when not floating and a Closed switch when floating.



Faults

Transducer Level	Low-Level Switch	High-Level Switch	Result
Above Low-Level Point	Open	—	Transducer is within normal operating range, but value is incorrect (too high) because low-level float should be closed
Below High-Level Point	—	Closed	Transducer is within normal operating range, but value is incorrect (too low) because high-level float is closed
Out of Range (Low)	—	—	Transducer value is below the normal operating range (severe)
Out of Range (High)	—	—	Transducer value is above the normal operating range (severe)

7.4.3 Configuring the Transducer

With a transducer connected, the DYNAGEN 200 can be configured to throttle the engine or motor to maintain a specific transducer level much like a car's cruise control. If this cruise control feature is desired, the Maintain Transducer Level should be set to Enabled.

The other choice is to Disable the Maintain Transducer Level, which follows the Ramp Profile described in the Ramp Profile section.

The transducer's cruise control function can be independently set to either Low to High or High to Low.

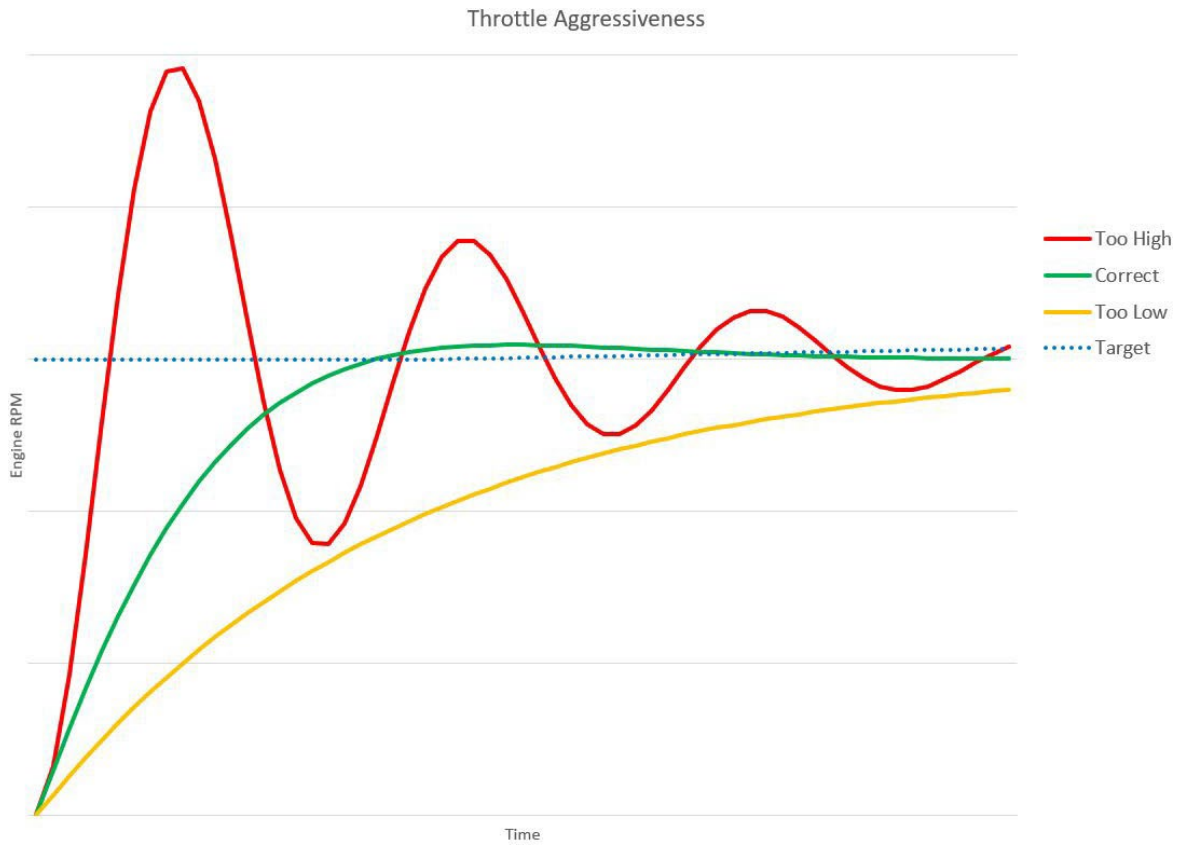
Function	Throttles Up When	Throttle Down When
Low to High	Input is below the target point	Input is above the target point
High to Low	Input is above the target point	Input is below the target point

To see or change the transducer target point, go to the **Autostart → Maintain Transducer Level → Target Point** menu.

Some applications are slow to respond to throttle changes while others are fast. An analogy is a car's cruise control and how the car reacts going downhill or uphill. Going downhill, a car will quickly speed up when just a little more throttle is applied. In this case, the throttle adjustment should be less aggressive. On the other hand, a car going uphill will speed up slowly and therefore needs more aggressive throttling. To adjust how quickly the control controller ramps the throttle up or down for a particular application, go to the Autostart → Behavior → Maintain Transducer Level → Throttle Aggressiveness menu. The higher the number, the more aggressive or quicker the control controller ramps the throttle up or down to maintain the level.

When adjusting the Throttle Aggressiveness, it is best to understand how responsive the system is to changes. Like the analogy of the car going downhill, a small water tank with a large pump is an example of a system that will respond quickly to changes when throttling the water level. Alternatively, a large tank with a small pump will respond more slowly.

The following figure demonstrates the responsiveness of a system to adjustments in Throttle Aggressiveness. A fast-responding system will need a lower aggressiveness value. Otherwise, the RPMs will overshoot and undershoot the target value as depicted in the graph by the red "Too High" throttle aggressiveness line. Ideally, the RPM should quickly ramp up and home in on a small RPM range to maintain the target value as depicted in the graph by the green "Correct" throttle aggressiveness line. However, if the gain is set too low, the RPM may never get to the proper range to maintain the target value as depicted in the graph by the yellow "Too Low" throttle aggressiveness line. The full screen Throttling Line Graph (see the Throttling section) can be utilized to observe the behavior to determine if the throttling aggressiveness is correct.



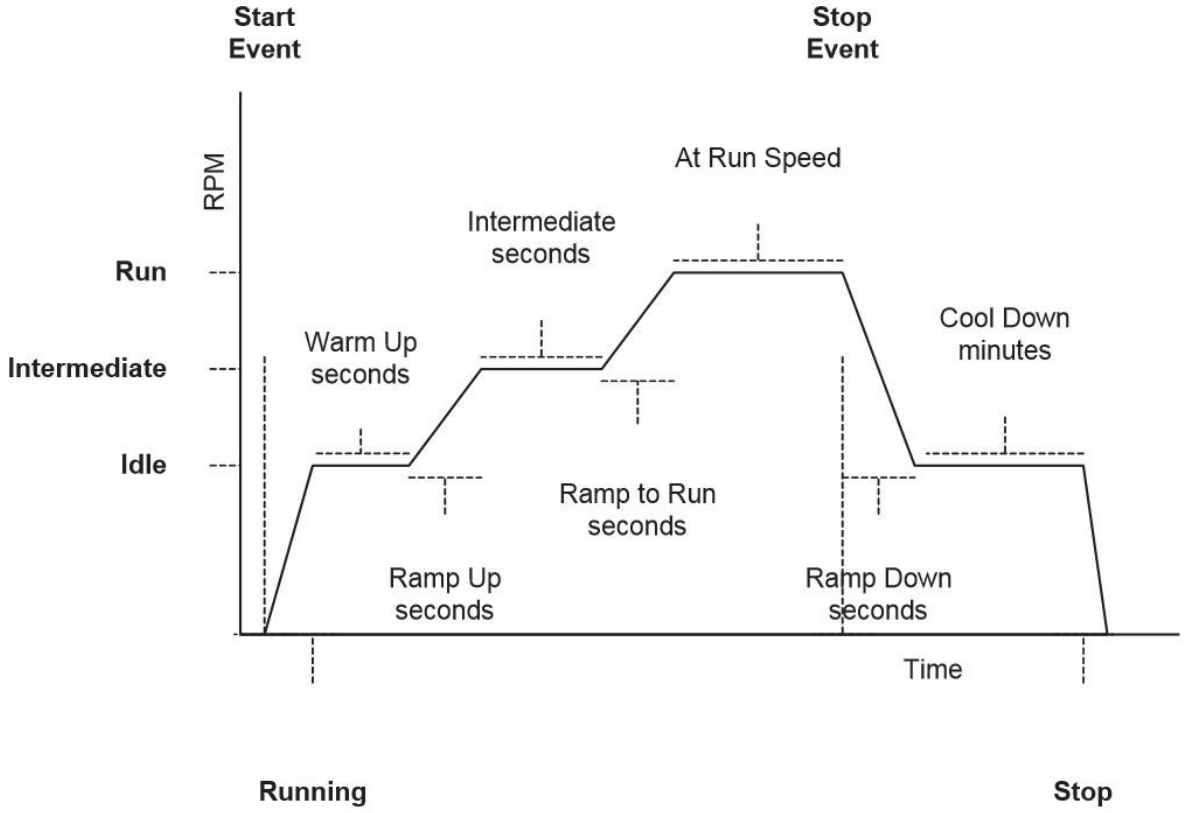
7.4.4 Configuring Start and Stop Delays

In situations where start or stop conditions may be met briefly, repeated start/stop cycles should be avoided. Two settings allow a delay to be added before a specific input condition is recognized. An example of such use is where a float switch is installed in choppy water. The float switch may repeatedly open and close based on the water's surface waves. Rather than repeated start and stop cycles, it is better to wait for the float switch to be continuously closed for a specified duration before the start or stop event is declared.

The Start and Stop Delays can be configured by going to the **Autostart → Behavior → Start Delay or Stop Delay** menu.

7.4.5 Ramp Profile

The Auto ramp profile allows the use of configurable warm up and cool down profiles to help protect the equipment and other assets such as plumbing, or to ensure proper ramp up and down of pressure or flow. An example is shown below.



7.4.6 Configuring RPM and Time Profile Settings

Setting	Description
Idle RPM	Selects the RPM that the control system will request for idle speed. If the engine or motor is started, it will always begin running at Idle speed.
Intermediate RPM	Selects the RPM that the control system will request for intermediate speed. Intermediate speed is a specific speed point at which the engine or motor will pause during the ramping up cycle. The intermediate speed can be used to prime a pump or charge lines.
Run RPM	Selects the RPM that the control system will request for run speed. The run speed is the normal operating speed. If the Maintain Transducer Level "cruise control" is enabled, the control controller will dynamically throttle the engine or motor to maintain the level using the Run RPM as the max.
Warm Up Time	The time (in seconds) the engine or motor will stay at the Idle RPM after starting.
Ramp to Intermediate Time	The time (in seconds) the engine or motor will take to ramp from the Idle RPM to the Intermediate RPM.
Intermediate Time	The time (in seconds) the engine or motor will stay at the Intermediate RPM.
Ramp to Run Time	The time (in seconds) the engine or motor will take to ramp from the Intermediate RPM to the Run RPM. If the Maintain Transducer Level is enabled, the controller will not ramp to the Run RPM but will start throttling the engine or motor to maintain the level.
Ramp to Cooldown Time	The time (in seconds) the engine or motor will take to ramp from the Run RPM to the Cooldown RPM.
Cooldown Time	The time (in minutes) the engine or motor will stay at the Cooldown RPM before shutting down engine or motor

Instead of a time-based system, the ramp profile can wait for an event to occur before Ramping to Run. These events can be one of the following, for example:

- Pump is primed

7.5 Transducers

The transducers can be configured for Autostart levels, scaled values, units of measure for setup and display, calibration, warning, and fault levels.

7.5.1 Autostart Triggers

The low and high Autostart trigger levels can be set via the Autostart → Transducer → Autostart Triggers menu.

7.5.2 Setup

There are a few parameters that must be configured for proper operation of the transducer. These configurations can be set via the Autostart → Transducer → Setup menu.

- Type and Range
  - 4 mA Scaled Value
    - Value in setup units represented by a 4-mA reading
  - 20 mA Scaled Value
    - Value in setup units represented by a 20-mA reading
  - Setup Units
    - Units used to setup the 4 mA and 20 mA scaled values
  - Display Units
    - Units that are displayed on the gauges
  - Calibration Zero Offset
    - Offset to calibrate the 4-mA value (plus or minus 5%)
- Low Warning Alarm
  - Value in display units that will generate a Low warning
- Low Shutdown Alarm
  - Value in display units that will generate a Low shutdown
- High Warning Alarm
  - Value in display units that will generate a High warning
- High Shutdown Alarm
  - Value in display units that will generate a High shutdown

7.6 Scheduler

Setting the “Start/Stop with” to be “Scheduler Only” causes the engine or motor to be started and stopped based on the schedule defined by the Autostart → Behavior → Start/Stop with → Scheduler Only menu.

Next, set the Scheduler Method to Override by going to the Autostart → Scheduler → Method menu. Using the Override method will override any Autostart settings.

The Scheduler mode starts and stops the engine or motor based on time and date. Up to 16 unique scheduled run cycles can be configured offering multiple run cycles per day, and those run cycles can differ depending on the day of the week.

The Scheduler has another method called Allowed Times. Unlike the Override method, this method marries the Autostart setting with the Scheduler, allowing the AutoStart to only occur during the allowed times. For example, with this method the controller can be configured to only AutoStart on Mondays, Wednesdays, and Fridays between the times of 12:00 p.m. and 3:00 p.m. Up to 16 unique allowed times can be configured.

7.7 Timed Run

The Timed Run mode allows for a manually initiated start with the stop event being automatically triggered based on running time. This mode allows the operator to walk away from a running system knowing that it will automatically stop after a predetermined amount of time. There are no automatic restarts in this mode. All starts are manually initiated by pressing the Autostart switch.

7.8 Auto Battery Recharge

The DYNAGEN 200 can be configured to monitor the battery and crank up the engine to recharge the battery once the battery voltage falls to a configured level. To enable and configure this feature with Tech or Admin level access, navigate to **Autostart→ Auto Battery Recharge**

- Auto Battery Enabled
  - Off/On
- Recharge Run Speed
  - The speed that the engine will run at during the recharging
- Enable Delay (m)
  - How long the battery must be at or below the voltage threshold before the recharging is started
- Recharge Time (m)
  - How long the engine runs to recharge the battery
- Delay Between Recharge (m)
  - How long to wait between recharge cycles
- Low Battery Threshold (V)
  - The battery voltage the battery must be at or below to start a recharge

7.9 Auto Antifreeze

The DYNAGEN 200 can be configured to periodically run to prevent fluid in the system pipes from freezing. To enable and configure this feature with Tech or Admin level access, navigate to **Autostart→ Auto Antifreeze**

- Auto Antifreeze Enabled
  - Off/On
- Antifreeze Run Speed
  - The speed that the engine or motor will run to prevent fluid from freezing
- Antifreeze Delay (m)
  - How long to wait between antifreeze cycles
- Antifreeze Run time (m)
  - How long the engine or motor will run to prevent fluid from freezing

CANplus Control
The DYNAGEN 200 has expanded throttle capabilities, which provides users with more options to control electronically governed engines, electrical motors, or mechanically governed engines when equipped with the Cattron Throttle Actuator.

CANplus Control Throttling Options:

- Dynamic Throttling*
- Pause at Run speed*
- Throttle by Maintain Point*
- Controlled Off
- Linear Throttling
- Auto/Manual mode Toggle
- Momentary Rabbit/Turtle Keys
- Auto ramp
- Autostart
- Auto throttle Maintain Point

7.10 Dynamic Throttling

Configurable throttle increments for up to 10 rpm ranges

Click here for a video showing Setup and Demonstration on another CANplus controller or go to https://youtu.be/uhce0nqn8xM

7.11 Pause at Run speed

at Run Speed Single press and hold to ramp to the configurable run RPM and pause to allow throttling adjustments from that point

Click here for a video showing Setup and Demonstration on another CANplus controller or go to https://youtu.be/j6WimkphzsY

7.12 Throttle by Maintain Point

Throttle by Maintain Point Live adjustments of the maintain point using the rabbit and turtle buttons

Click here for a video showing Setup and Demonstration on another CANplus controller or go to https://youtu.be/MSitdFR5pkU

7.13 Controlled Off

Controlled Off Single click to ramp the engine or motor down automatically and smoothly to idle and shut it off

Pressing the OFF button for 3 seconds, will cause the engine or motor to immediately shutdown

Click here for a video showing Setup and Demonstration on another CANplus controller or go to https://youtu.be/-vGmPeS2mdc

7.14 Linear Throttling

Linear Throttling Allows an external device to control the throttle using a 4-20 mA input

Click here for a video showing Setup and Demonstration on another CANplus controller or go to https://youtu.be/3HILfk1TSV8

7.15 Auto/Manual mode Toggle

Auto/Manual Mode Toggle allows switching between modes without shutdown the engine or motor

7.16 Momentary Rabbit/Turtle Keys

Momentary Rabbit/Turtle Keys Throttle adjustment via momentary rocker switch

7.17 Autoramp

Autoramp Configurable seven-stage RPM profile

7.18 Autostart

Configurable start and stop events for AutoStart switch inputs, 4-20 mA transducer (level, pressure, flow, etc.), 24x7 schedule run and countdown-to-off timer

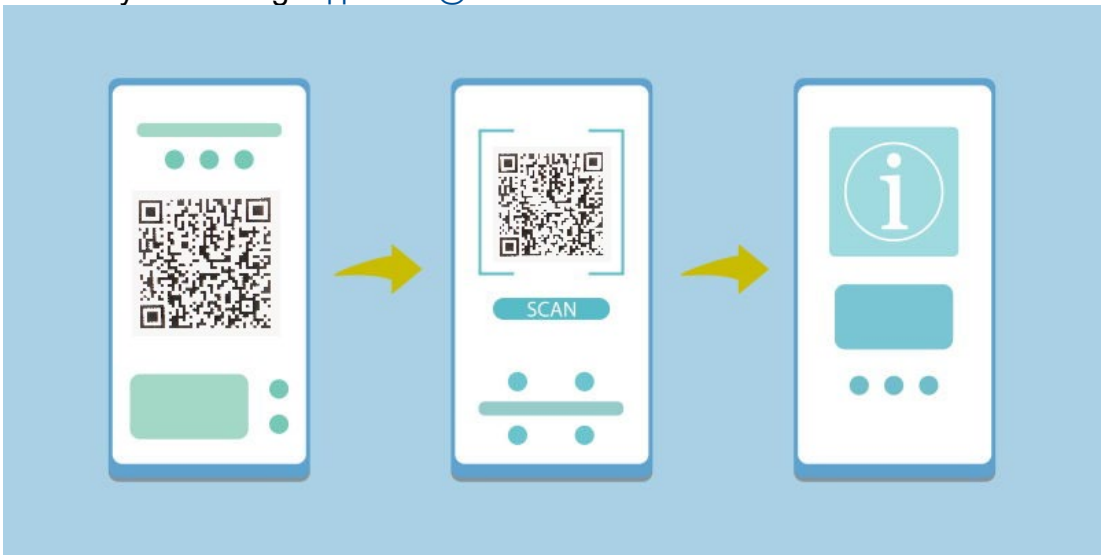
7.19 Autothrottle Maintain Point

Configurable 4-20 mA transducer and pulse flow meter target values to dynamically throttle the engine or motor to maintain a level

8 QR-Assist™*

The DYNAGEN 200 has built-in QR-Assist technology that dynamically generates a diagnostic QR-Code that is tied to diagnostic trouble codes for the Controller, Engine, VFD, Pump, or Machine. In addition to the trouble code itself, the dynamically generate QR Codes also contain valuable details about the machine at the time the trouble code occurs. Scanning this code with a typical smart phone automatically links to RemoteIQ QR-Assist website, which displays the details of the issue along with helpful trouble-shooting steps. Scan the code below for an example or Click here for a video showing Setup and Demonstration on another controller or go to https://youtu.be/00rD_Q8CWag

Some SPN/FMI combinations are proprietary codes. SPN/FMI combinations can easily be added by contacting support.lofa@cattron.com.



9 Configuration and Manufacturing Info

The DYNAGEN 200 has been preloaded with factory default configurations, or optionally a custom OEM-specific configuration, to ensure easy start-up and commissioning. To support the diversity of applications, the control controller is easily configured on demand. Accessing configurable settings can be accomplished in three ways:

- Display Menu
- Customizer Software Suite using a USB-A to USB-A cable or a USB drive

When finished with exporting or importing configurations, remove the USB drive and reinstall the dirt and dust rubber plug.

9.1 Display Menu

Most commonly accessible parameters can be changed onsite or in a facility by navigating the display using the soft keys to find the appropriate menu page and data field. The available menu items are dependent upon the current access level (see the Menu Tree section for available menu items). Easy to follow menu navigation diagrams are located throughout the user manual and accompany each section which describes a configurable operation or setting.

9.2 Customizer Software Suite

In situations where multiple units must be reconfigured, or in the case of a single unit which requires complete reconfiguration, using the Customizer Software Suite, which is proprietary configuration software, is highly recommended. The software suite is meticulously maintained and regularly updated. These free updates include software enhancements and new functionality, and they ensure compatibility with evolving technologies. Please see the Resources section at www.cattron.com/DYNAGEN 200.

With this kit, a controller's configuration can be read from the controller or written to the controller via CAN bus. During read or write operations, the controller must be the only CAN bus device. Using the included adapter harness ensures proper operation during configuration read or writes.

9.3 Customizer Software Suite and a USB Drive

The DYNAGEN 200 introduces the ability to import and export configurations using a USB drive. The controller's USB port is located on the front of the controller under the key switch. It is recommended that the dirt and dust rubber plug be inserted into the USB port when this port is not in use. Additionally, the port can be used to charge a phone if desired.

Install the USB drive in the controller's USB port. The current configuration can be exported by going to the **System** → **Export Config.** menu. To import a new configuration, the menu

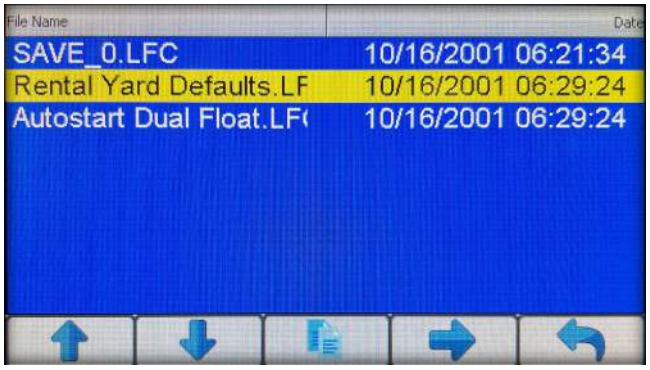
access level must be at the Tech or Admin level (see the Access Levels section). A new configuration is imported by going to the **System → Import Config.** menu. New configuration changes take effect immediately. Therefore, the engine should not be running when importing a new configuration.

9.4 Saved Configurations

The DYNAGEN 200 can save up to 10 configurations. Any of these configurations can be loaded to be the operational configuration. Changing and importing configurations requires a Tech or Admin level PIN (see the Access Levels section).

9.4.1 Import Configurations for Storage

Use the Customizer software to create the desired configurations and save them to a USB drive. Place the drive in the controller's USB port and with Tech or Admin level access, navigate to **System → Import Configurations.** Use the display buttons to select the file to copy to the controller's storage. Pressing the middle display button  will copy the file to the controller's storage. Repeat for any other files



9.4.2 Loading a Saved Configuration to be the Operational configuration

To make a saved configuration be the operational configuration, navigate to **System → Saved Configurations.** Use the display buttons to select the desired file. Pressing the middle display button  will make that configuration the controller's operational configuration.

9.5 Manufacturer Info

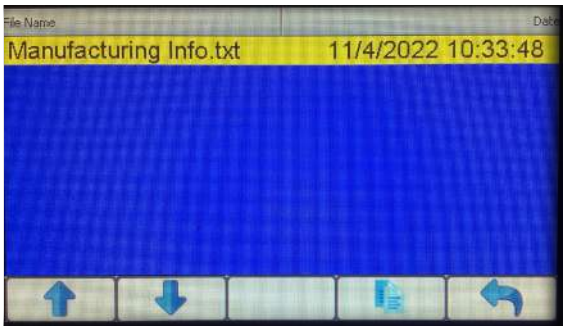
The DYNAGEN 200 can store additional manufacturing information. Importing Manufacturer information requires an Admin level PIN (see the Access Levels section).

9.5.1 Creating the Manufacturer Info file

Create a plain text file using a PC save it to a USB drive. The text in the file is limited to 4098 characters.

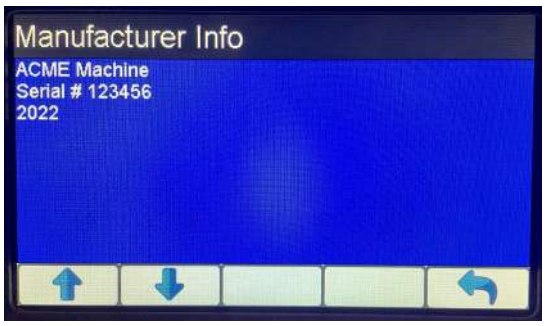
9.5.2 Importing the Manufacturer Info file

Place the drive in the controller's USB port and with Admin level access, navigate to **System → Import Manufacturer Info.** Use the display buttons to select the file to copy to the controller's storage. Pressing the 4th display button  will copy the file to the controller's storage. Repeat for any other files



9.5.3 Viewing the Manufacturer Info

The stored Manufacturer Info can be displayed with all access levels by navigating to **System → Manufacturer Info**



10 Firmware Update

The DYNAGEN 200 utilizes a USB drive and its USB front USB port to update the application firmware.

10.1 Updating via USB Drive

10.1.1 Preparation

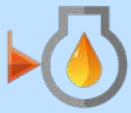
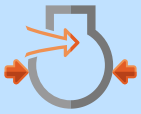
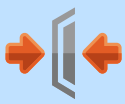
Copy the update file into the root directory of an empty USB stick, which has been formatted with FAT32.

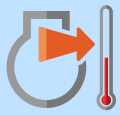
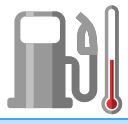
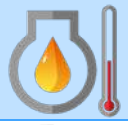
10.1.2 Procedure

Verify that the unit is turned on. Insert the USB Stick into the USB Port of the unit and navigate to the System → Configurations & Updates menu. The controller will show the available update files that are currently on the drive. After selecting the appropriate file, the update process will begin. There will be on-screen information during the update process. The update process may take a few minutes to complete.

11 Icons Glossary

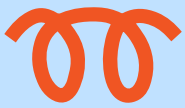
11.1 Gauge Icons

Icon	SPN	Description
	94	Fuel Pressure
	96	Fuel Level
	98	Engine Oil Level
	100	Engine Oil Pressure
	106	Inlet Air Pressure
	109	Engine Coolant Pressure
	110	Engine Coolant Temperature
	111	Engine Coolant Level
	123	Clutch Pressure
	127	Transmission Oil Pressure

Icon	SPN	Description
	168	Battery Voltage
	172	Inlet Air Temperature
	173	Exhaust Gas Temperature
	174	Fuel Temperature
	175	Engine Oil Temperature
	177	Transmission Oil Temperature
	183	Fuel Consumption Rate
	190	Engine Speed
	247	Total Engine Hours
	1761	SCR Fluid Level
	3719	Soot Percentage
	3720	Ash Percentage

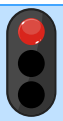
11.2 Status Gauge Icons

NOTE: Not all engine templates use the icons on this page. Icon requirements are defined by the engine manufacture.

Icon	Description
	Preheat Active / Wait to Start
	Regeneration Needed
	Low SCR Fluid
	High Exhaust Temperatures Active
	Regeneration Inhibited by Panel or other reasons
	Regeneration Needed - Most Severe
	Regeneration Needed - Least Severe
	Aftertreatment Fault - Lease Severe
	Aftertreatment Fault - Intermediate Severe
	Aftertreatment Fault - Most Severe
	Engine Derate Active

Icon	Description
	Stop Engine
	Check Engine

11.3 Autostart Dashboard Icons

Icon	Description
	AutoStart - AutoStart Switch Active
	AutoStart - AutoStart Switch Inactive
	AutoStart - Maintain Throttle Mode
	AutoStart - Start Event Requirements
	AutoStart - Stop Event Requirements

11.4 Menu Icons

Icon	Description
	Action - Acknowledge Alarms
	Action - Enter Submenu
	Action - Exit Current Menu
	Action - Request Stored Alarms
	Navigation - Alarms Page
	Navigation - Database Viewer
	Navigation - Emissions Menu
	Navigation - Select Gauge Page / Rotate Gauge Pages
	Navigation - Settings Menu