

Electrical & Electronic Components

- Electronic Monitoring Equipment
- Engine Controls & Information Systems
- Electrical Components



Electronic Monitoring Systems

Flowminders

Flowminder Value System

The Flowminder "Value" System incorporates several features in one compact design. The weatherproof case utilizes large, super bright LEDs. Uniform design allows for ease of installation with virtually no maintenance. Magnetic switches are used for all calibration sequences.

The Flowminder "Value" system combines flow indication with our rugged fire service pressure gauge. This combination gives the familiar look of a pressure gauge while having the advantage of flow in GPM or liters. The Flowminder "Value" System is available with color coded inserts for ease of identification

FEATURES

- Analog style 2.5" or 3.5" pressure gauge
- Large, bright, easy-to-read flow digits
- Read total at the touch of a button (Optional)
- Color coded bezel inserts
- Paddle wheel transmitter

Part Number	Description
FVS	Flowminder Value System
102088	Total Flow Button (only 1 per truck)
102714	Flow Transmitter

Customer to specify insert color, gauge, pressure range, dial color and cable length.



Total Flow Button (optional)



Flow Transmitter (P/N 102714)

Insert Colors

- Black
- Blue
- Red
- Yellow
- White
- Silver
- Green
- Orange
- Burgundy
- Brown
- Gray
- Beige
- Lime
- Pink
- Purple
- Light Blue

Flowminder and Flowminder Super Systems

The combination of the Flowminder display and digital pressure gauge allows the operator to constantly read both flow and pressure. The digital pressure gauge utilizes a Class 1 pressure transducer that eliminates the possibility of frozen gauge sensing lines

FEATURES

- Read total flow at the touch of a button (optional)
- Automatic clearing of totals when power is turned off
- Paddle wheel transmitter
- Compact design frees up pump panel space
- Large, super-bright, easy to read digits
- Easy to calibrate
- Eliminates gauge sensing lines

Part Number	Description
FMS	Flowminder Single Display
PSIS	Digital Pressure Gauge Single
FMD	Flowminder Dual Display*
PSID	Digital Pressure Gauge Dual*
102088	Total Flow Button (only 1 per truck)
102714	Flow Transmitter



Flow Transmitter (P/N 102714)



Total Flow Button (optional)



P/N 111663



P/N 111667

*Single Transmitter/Transducer

Flowminder Mounts

The variety of Class 1 Flowminder Mounts offer more flexibility in mounting than any other flowmeter.



Saddle Clamp

Weld Size	Part #
2"	4842010
2.5"	4843010
3"	4844010
4"	4846010



Valve Flange

Pipe Size	Hale & Akron
2"	112404
2.5"	112405
3"	112406
4"	102969



Weld Boss

Stainless Steel	Carbon Steel	Aluminum
SFM	309020	309010

Cap for Weld Boss P/N: 1846992

Officer Digital Clock & Officer Speedometer



Digital Clock

Shows time in 12 or 24 hour modes. Environmentally sealed and can be mounted in the cab or outside.

P/N 102498

FEATURES

- 12 or 24 hour time
- Large, easy-to-read weather-proof digital display

Part Number	Description
DC	Digital Clock



Officer Speedometer

Gives officers the ability to monitor vehicle speed.

P/N 102498

FEATURES

- Compatible with Allison World Transmission or pulse generators
- Large, easy-to-read weatherproof digital display
- MPH or KPH

Part Number	Description
SPD	Officer Speedometer

Loadminder

The Loadminder calculates and displays the current low level load in a simple, easy-to-read LED display that instantly adjusts as the ladder angle, extension or live load changes. As the loading increases, so does the number of bars that are illuminated on the display. When the maximum low-level loading approaches (as determined by the aerial manufacturer and calibrated at the factory) the display will begin to flash. A slight (50 - 100 lbs) additional load will cause the audible alarm to sound which will alert an operator to an overload condition.

FEATURES

- Easy to read LED display
- Flashes when approaching low level maximum load
- Weather proof display and transducer
- Audible alarm with output for activating auxiliary strobe or other warning systems

Part Number	Description
LMS	Loadminder Single Display System
LMD	Loadminder Dual Display System
102606	Transducer - 7500 PSI



P/N 111653

Note: System includes display, pressure transducer, horn, silence button and cable.

Engine Controls & Info Systems

TPG/Twister/Vernier Throttle

TPG & TPG+ Total Pressure Governors

Class 1's new Total Pressure Governor is compact and ergonomically designed with improved features and capabilities.

Features

- Audible alarm output
- Easy set-up and configuration
- Large, easy-to-read alpha-numeric display
- 12V and 24V compatible
- Analog engine control of J1939 CAN control for improved resolution and response.
- Improved ergonomic tactile feedback buttons
- Totally integrated instruments including battery voltage, temperature, oil pressure, and RPM
- Integrated engine information reduces required pump panel space
- Programmable presets

Part Number	Description
117690	TPG Total Pressure Governor Kit
119650	TPG+ Total Pressure Governor Plus Kit
117155	TPG Governor
118710	TPG+ Governor
117666	Harness, TPG CAN Control
118453	Harness, TPG + CAN Control
117683	Harness, TPG/TPG+ Analog Control Option
113557	TPG/TPG+ Transducer, 300 PSI
117179	TPG/TGP+ Transducer, 700 PSI



Twister

Class 1 Twister is a vernier style throttle for controlling the speed of the fire truck engine used to operate the pump.

FEATURES

- Analog engine control (0.5 to 4.2 VDC)
- CAN engine control (J-1939 C.A.N.)
- POC state is always IDLE
- Interlocked for safety
- CW or CCW Operation
- Visual indicators for interlock status, active engine control, and diagnostics
- 12V and 24V compatible

Part Number	Description
TWIST-A	Twister Kit with ANALOG control
TWIST-C	Twister Kit with CAN control
119971	Twister with ANALOG control
119970	Twister with CAN control
120430	Harness, Twister with ANALOG control
120431	Harness, Twister with CAN control



Vernier Throttle

Class 1's throttle control systems are designed to provide variable engine speed adjustments in electronically controlled engines from a remote location. Class 1 offers remote throttle controls for Detroit Diesel™, Cummins™, Caterpillar®, International™, VMAC3 and Mercedes MBE4000 and MBE900 electronic engines.

Part Number	Description
100076	Detroit Diesel Series
101558 (Includes Adapter)	For Cummins (Interact Systems) ISB, ISC and ISM electronic engines For VMAC 3 For Mercedes MBE400 and MBE900
103103	Adapter only
EXEC200#8424	For Caterpillar 3126-C-X
EXEC200#8425	Interface only for Caterpillar



#103103 Adapter to be used with 100076 Vernier Throttle for Cummins IS series engines and International electronic engine.



Interface module for Caterpillar engine



Vernier Throttle, 100076

ENFO III & ENFO IV

For Any Electronic Engine

Provides the pump operator with engine RPM, oil pressure, engine temperature and electrical system voltage. The ENFO IV utilizes the SAE J-1939 data bus for engine information on engines that support the J-1939 protocol. The ENFO III utilizes the SAE J-1587 BUS for engine information.

FEATURES

- Engine RPM display
- System voltage display and alarm
- Engine oil pressure display and alarm
- Engine temperature display and alarm
- Meets NFPA 1901 requirements



ENFO IV



ENFO III

Part Number	Description
102652	ENFO III (English)
102721	ENFO III (Metric)
102826	30" mating pigtail for ENFO III
108661	ENFO IV
110346	Mating pigtail for ENFO IV

Captain Pressure Governor

For Most Electronic Diesel Engines

Class 1 Captain Pressure Governor ("Captain") is designed to control the engine fuel to maintain a desired pump pressure or engine speed setting along with displaying diagnostic information. The "Captain" has a pre-set button for selecting a predetermined pressure or RPM and an emergency return to idle button. The "Captain" will work with most electronic diesel engines via an electrical control signal to the engine control module.

FEATURES

- Super bright alpha-numeric display for excellent visibility in any light
- Govern pressure or RPM for stationary engine/pump control in almost any emergency situation
- Pre-select pressure or RPM levels
- Environmentally sealed
- Compact, durable design, no moving parts
- System includes display, transducer and wire kit



Part Number	Description
105244	Captain Pressure Governor Kit
107396	Captain Pressure Governor Display Only
100581	Transducer
106340	Transducer Pigtail
105247	Harness (Display to Transducer)

Sun Guard

Class 1 Sun Guard is specially designed to make important pump panel controls easier to read in bright sunlight. Easy to mount, it does not need screws or brackets. Simply loosen the screws on the control and slide the guard over the control. Durable steel construction in black matte. Flips up to read controls; lays flat when not in use.

Part Number	Description
107882	TPG, Captain Pressure Governor, ENFO III, Engine Status Center
107881	Electronic fire Commander, TPG+



Electronic Monitoring Systems

Intelli-Tank™ Level Gauges

Tank Level Gauges

ITL-40 Tank Level Indicator

NEW



The Class 1 ITL-40 Tank Level Indicator accurately displays liquid volume for both water and foam tanks. Each ITL-40 has a super bright LED display easily viewable from 180 degrees with a visual indicator at nine (9) precise levels.

- Level indication easily discernible from a distance at varying angles and lighting conditions.
- Robust system with minimal installation and no scheduled maintenance.
- A wide variety of LED color and label offerings.
- Compatible with other Class 1 tank level indicators and driver modules (using serial or C.A.N. communications).
- Similar look to the "Total Pressure Governor" and "TPG Plus" for a cohesive pump panel appearance.
- Unsurpassed diagnostics (using built in "text" based information).
- Custom "Marquee Style" boot sequences available.
- 12V and 24V compatible

Part Number	Description
ITL-40M	Multi-color kit for Water
ITLF-40M	Multi-color kit for Foam
102162	Transducer

Additional colors and kits are available. Please contact Class 1 Customer Service

Zero Pressure Vacuum Vents



Zero Pressure Vacuum Vents

Zero Pressure Vacuum Vents are designed to be used on sealed foam tanks. This allows use of our standard tank level system on any size configuration or type of tank.

Part Number	Description
107540	Bolt-On
107470	Weld-On
107585	MNPT Thread

4-Light ITL Tank Level Indicator

ITL Tank Level Indicators with ITL-40 Bezel



The Intelli-Tank™ displays feature wide angle viewing and red LED's for high visibility even in direct sunlight. The affordable design utilizes Class 1's proven pressure transducer approach to provide nine (9) accurate levels of indication.

Bezels have the same panel cut-out pattern as the ITL-40. (See page 13)

FEATURES

- Low Tank Level visual and audible indication
- Calibrates to any size/shape tank
- Uses industrial pressure transducer instead of probes
- Built-in self diagnostics
- Rocker switch cab displays
- One wire link allows for unlimited displays
- Programmable night dimming feature
- Ultra-bright LED's provide nine (9) levels of indication
- Water and Foam models available with multi colored bezels
- Remote light tank-level driver module available
- Nine (9) levels of indication
- 12V and 24V compatible

Part Number	Description
ITL-4L	Intelli-Tank System for Water
ITLF-4L	Intelli-Tank System for Foam
119395	Tank Level, 12V
119396	Tank Level, 24V
119199	Water label (blue)
119200	Foam Label (red)
119201	Foam Label (green)
102162	Pressure Transducer, 5 PSI
102219	Transducer adapter brushing, 3/4 to 1/4 NPT
106690	Harness, Master (10 ft transducer length)
106691	Harness, Remote (Pigtail)

Contact Class 1 for retrofit kits on other style tank-level gauges.

Intelli-Tank™ Level Gauges

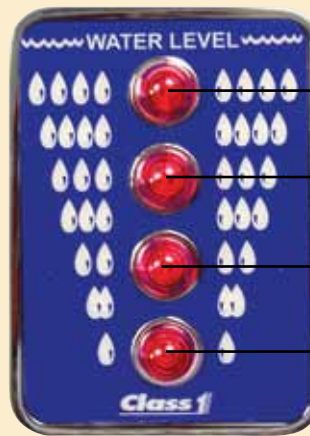
ITL Tank Level Indicators

The Intelli-Tank™ displays feature wide angle viewing and ultra-bright LED's for high visibility even in direct sunlight. The affordable design utilizes Class 1's proven pressure transducer approach to provide nine (9) accurate levels of indication.

FEATURES

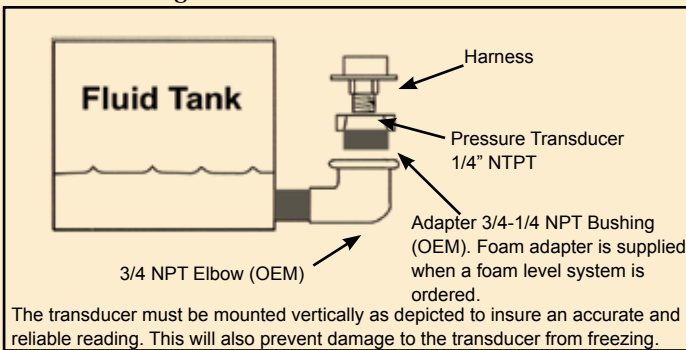
- Low Tank Level visual and audible indication
- Calibrates to any size/shape tank
- Uses industrial pressure transducer instead of probes
- Built-in self diagnostics
- Rocker switch cab displays
- One wire link allows for unlimited displays
- Programmable night dimming feature
- Ultra-bright LED's provide nine (9) levels of indication
- Water and Foam models available
- Remote light tank-level driver module available

Part Number	Description
ITL	Intelli-Tank System for Water Kit
ITL	Intelli-Tank System for Foam Kit
113739	4 Light Display Only 12V
114378	4 Light Display Only 24V
106280	Water Tag
106281	Foam Tag
106282	Foam A Tag
106283	Foam B Tag
102162	Pressure Transducer, 5 PSI
102219	Transducer adapter brushing 3/4" to 1/4" NPT
106690	Harness, Master (10 ft. transducer length)
106691	Harness Remote (Pigtail) Driver Module



- Full (Steady on)
- 7/8 (Flashing)
- 3/4 (Steady on)
- 5/8 (Flashing)
- 1/2 (Steady on)
- 3/8 (Flashing)
- 1/4 (Steady on)
- 1/8 (Flashing)
- EMPTY (All Flashing)

Tank Level Gauge Transducer Installation



Mini Remote Dash Indicator

Class 1's remote dash indicator no longer requires the installation of the remote driver module. This display receives its signal directly from the Master Tank Level Display.

*Remote Dash Indicator
(rocker switch size)*



4 Light Remote Driver Module

Class 1 Remote Dash Indicator and Remote Driver Modules work with all Class 1 Tank Level Gauges.



Our remote driver module works in conjunction with the Master Tank Level display to provide power to operate your large externally mounted tank level indication lights. This module provides 7.5 amps per output (x4) and mimics the function of the Master Tank Level Display.

Part Number	Description
112124	Mini Remote Dash Indicator
106877	4 Light Remote Driver Module
106691	Harness, Remote Driver Module Pigtail

Intelli-Tank™ Level Gauges

Electronic Monitoring Systems

Airminder & Oxygen Minder

Class 1 Airminder is an air warning system for aerials, aerial platforms, air trucks and C.F.R. vehicles keeps firefighters informed of the percentage of air remaining in a breathing air system from 100% capacity down to zero. A low warning flashes at 25% of maximum air bottle capacity and a 90 dB audible warning sounds at 20% of capacity. The audible alarm can be manually silenced but the visual warning will continue to flash until the air system is filled above the 25% level.

Class 1 Oxygen Minder is a warning system for your new or existing vehicles which provides an attention getting LED display for an "at-a-glance" update of existing oxygen supply levels. The Oxygen Minder display provides a visual warning at 25% oxygen remaining and at 20% an audible alarm sounds to let you know that your oxygen has reached a critically low level. The audible alarm can be manually silenced but the visual warning will continue to flash until the oxygen is replenished.

AIR MINDER FEATURES

- Flashing display at 25% of capacity
- Audible alarm at 20%
- Weather-proof display
- Alarm silence button
- 90 DBA horn

OXYGEN MINDER FEATURES

- Display flashes at 25% oxygen level
- Audible alarm at 20%
- Weather proof display



P/N 111655



P/N 111654

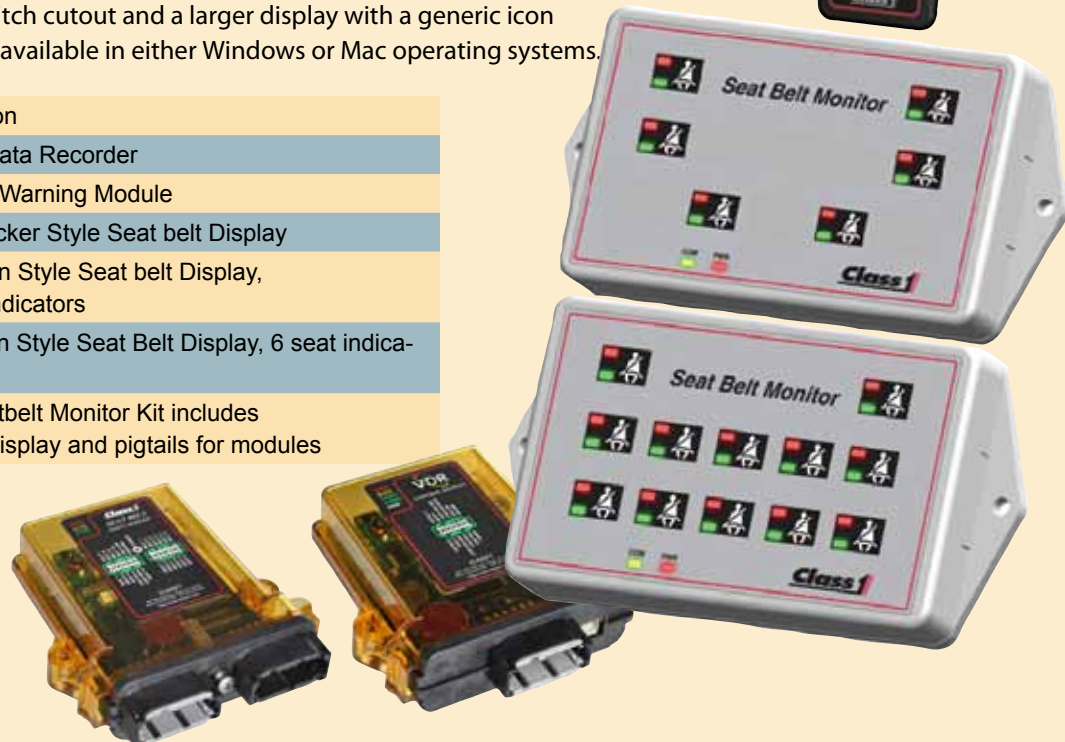
Part Number	Description
AMS	Airminder Single Display System*
AMD	Airminder Dual Display System*
OMS	Oxygen Minder Single Display System*
OMD	Oxygen Minder Dual Display System*
102606	Transducer - 7500 PSI

**Note: System includes display, pressure transducer, horn, silence button and cable.*

Vehicle Data Recorder (VDR)

Class 1 Vehicle Data Recorder meets 1901-2009. The VDR modules provides for two inputs, one power and one ground (master warning and park brake) and two outputs of opposite polarity (seat belt/system warnings). The seat belt warning visual display is available with a standard switch cutout and a larger display with a generic icon layout for 12 seats. Software is available in either Windows or Mac operating systems.

Part Number	Description
119914	Vehicle Data Recorder
118093	Seat belt Warning Module
118620	Small Rocker Style Seat belt Display
118551	Large Icon Style Seat belt Display, 12 seat indicators
119375	Large icon Style Seat Belt Display, 6 seat indicators
120308	VDR/Seatbelt Monitor Kit includes 118620 Display and pigtails for modules



Engine Status Center

For Any Electronic Engine — Engine Information at a Glance

Easy access to engine information is critical in an emergency situation. Class 1's Engine Status Center (ESC) provides a single display that puts critical engine information in one easy-to-read unit. Eliminates looking all over the pump panel for individual engine gauges. Visual and audible alarms can alert operators when monitored functions are at critical levels. Pump hours, engine hours, and user defined hours are easily retrieved through menu selection.

FEATURES

- Engine RPM display
- System voltage display and alarm (HI and LO alarms)
- Engine oil pressure display and alarm
- Engine temperature display and alarm (oil or coolant)
- Alarm set points can be preset for custom installation
- Alarm silence feature
- SAE - J1587 BUS
- Engine status
- English or metric display
- Hourmeters for engine, PTO, and "user" time
- Service interval timer
- "Incident" timer
- Custom message display
- Load manager status
- Tank level information

Part Number	Description
101847	Engine Status Center
101975	Mating Pigtail



Total System Manager

The Total System Manager (TSM) is the most versatile electronic system manager available. This fully programmable device is designed to exceed NFPA requirements.

FEATURES

- Main battery monitoring
- Auxiliary battery monitoring
- Electrical load shedding & Electrical load sequencing
- Reverse polarity/short circuit protection
- Sixteen available outputs
- Priorities can be set for individual loads
- Each load can be tied to response and/or scene mode
- Each load can be configured to the ignition or master warning switch
- Dedicated output for a fast idle function
- Low voltage alarm output for main battery (NFPA 1901)
- Low voltage alarm output for auxiliary battery
- User selectable "variable trip" output
- Selectable 10.5 to 15 VDC

Part Number	Description
101490	Total System Manager (Positive Outputs)
101540	Total System Manager (Ground Outputs)
101750	Total System Manager (24VDC system)
101538	Mating Pigtail Connector
101536	Mating Connector/Pin Kit



Dashboard display

Interlock Master Module

The Interlock Master Module incorporates the necessary circuitry and components for handling any vehicle interlocking requirements.

FEATURES

- Standardizes PTO and driveline interlocks
- Adaptable to all chassis, pump, and transmission applications
- Overload circuit protected
- Interlock status indicators
- Visual diagnostics
- Meets NFPA 1901 requirements

Part Number	Description
100713	Interlock Master Module



System Manager & Electrical

Electrical System Manager

The Class 1 Electric System Manager is a precision device which monitors the electrical system and controls electrical loads. Unlike devices which act simply as a series of voltage switches, the Class 1 System Manager continuously monitors and stores information about the state of the electrical system.

FEATURES

- Load sequencing and shedding
- Will monitor both main and isolated battery banks
- Fast idle activation output
- Over-voltage indicator
- Flashing warning for low voltage and battery discharge
- Dashboard Status Display
- Optional Built-In Relays — Eight relays and quick connect terminals provide for easy retrofit installations into older apparatus



Dashboard display

Part Number	Description
105228	Electrical System Manager (polarity selectable outputs)
105586	Electrical System Manager (built in relays)

Low Voltage Monitors

FEATURES

- Low voltage detection — low voltage detection point is 11.8 volts (per NFPA)
- Built-in delay — built-in 2 minute delay. The alarm will only come on if the system voltage has decreased to a low level eliminating transients from activating the device
- Turn off voltage — once activated, the voltage monitor relay will not deactivate until the voltage has increased by 1 volt above activation point. This eliminates rapid cycling or relay chattering
- Environmentally sealed
- Relay contacts — relay contacts are capable of handling 10 AMPS for driving alarms or solenoids
- LED status indicators



Voltage Monitor with Buzzer

Part Number	Description
100480	Low voltage Monitor
100545	Low voltage Monitor w/Built in Buzzer

Power Distribution Relay Boards

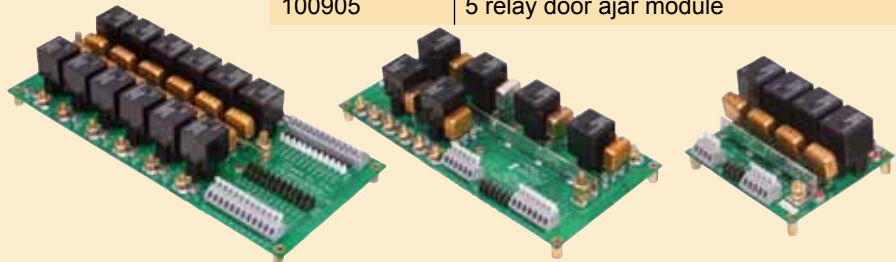
Our power distribution boards contain independently switching relays with selectable input polarity. The relays can be connected in either their normally open or normally closed positions. They are protected by 20 AMP breakers.

SPECIAL NOTE: The 9 relay power distribution board contains two general purpose relays with 10 AMP breakers.

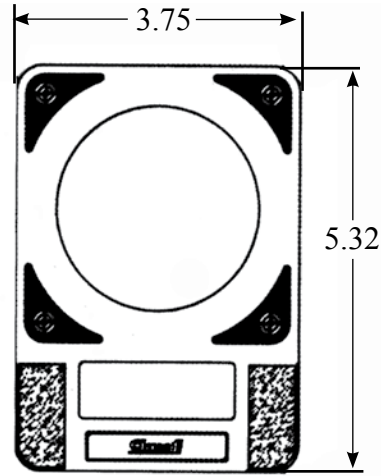
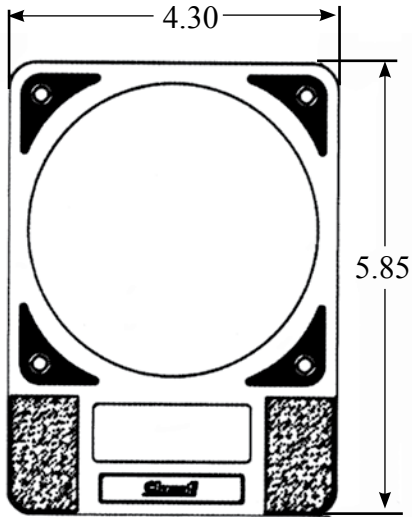
FEATURES

- Fully adaptable to any system
- Standard, heavy duty components
- User friendly
- Visual diagnostics
- Load management inputs

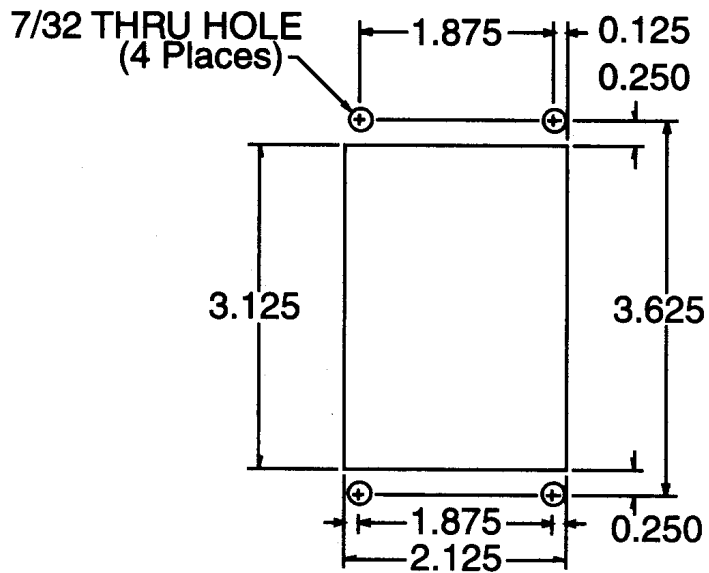
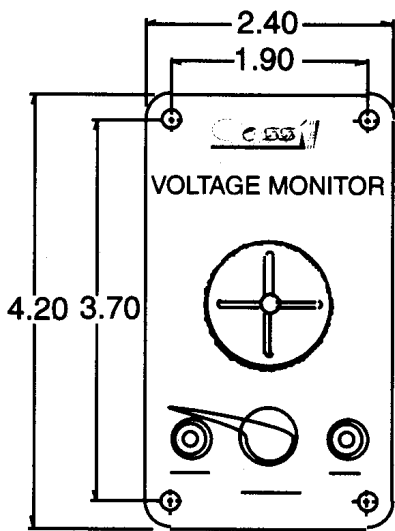
Part Number	Description
100719	3 Relay marker turn module (with enclosure)
100687	4 Relay board
100759	4 Relay board (with enclosure)
101343	6 relay board
100455	9 relay board
100921	9 relay board (with enclosure)
100715	12 relay board
100718	12 relay board (with enclosure)
100471	Auxiliary function board
100905	5 relay door ajar module



Flowminder Value System

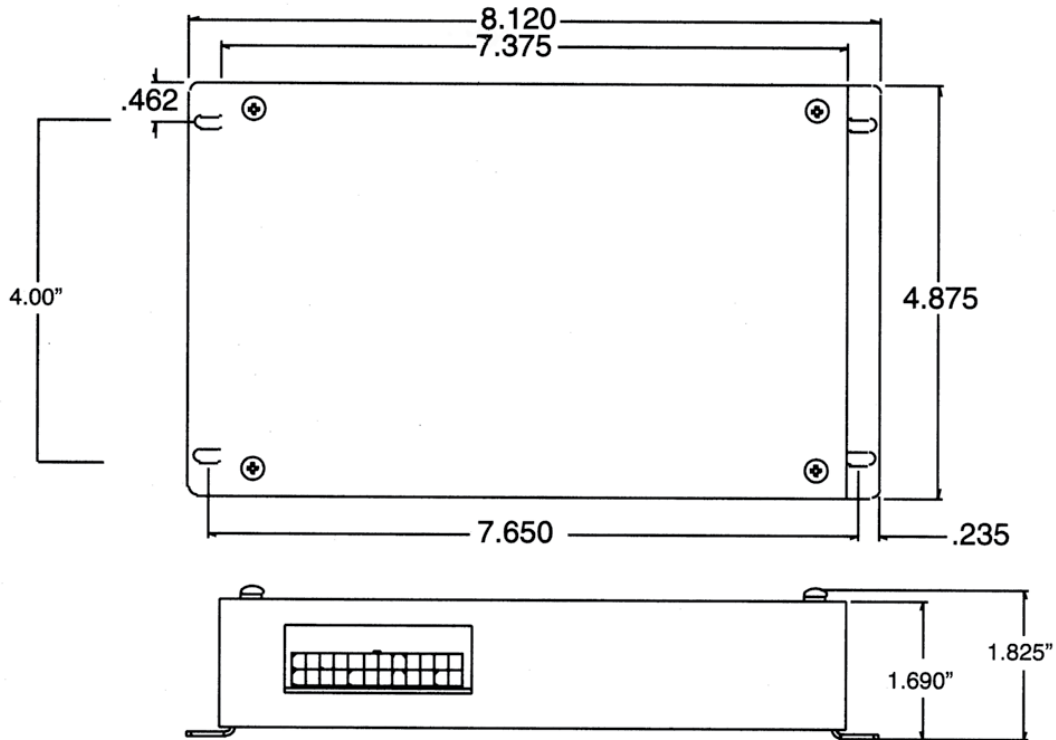


Voltage Monitor

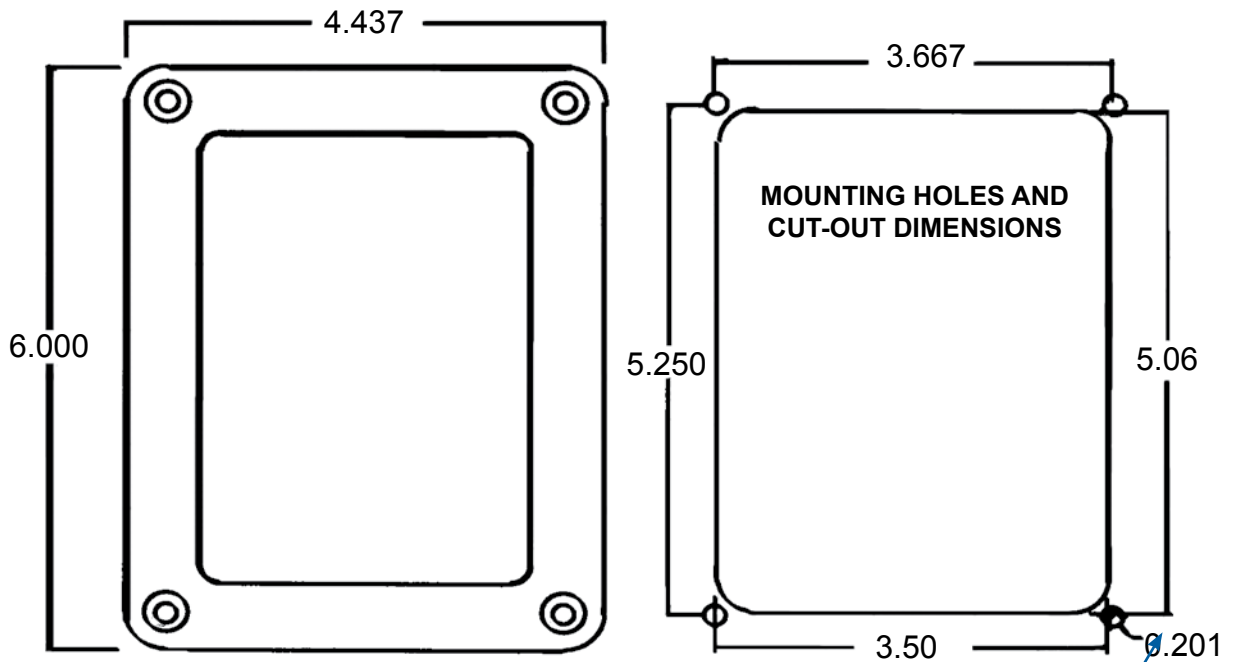


Electronics/Electrical Systems

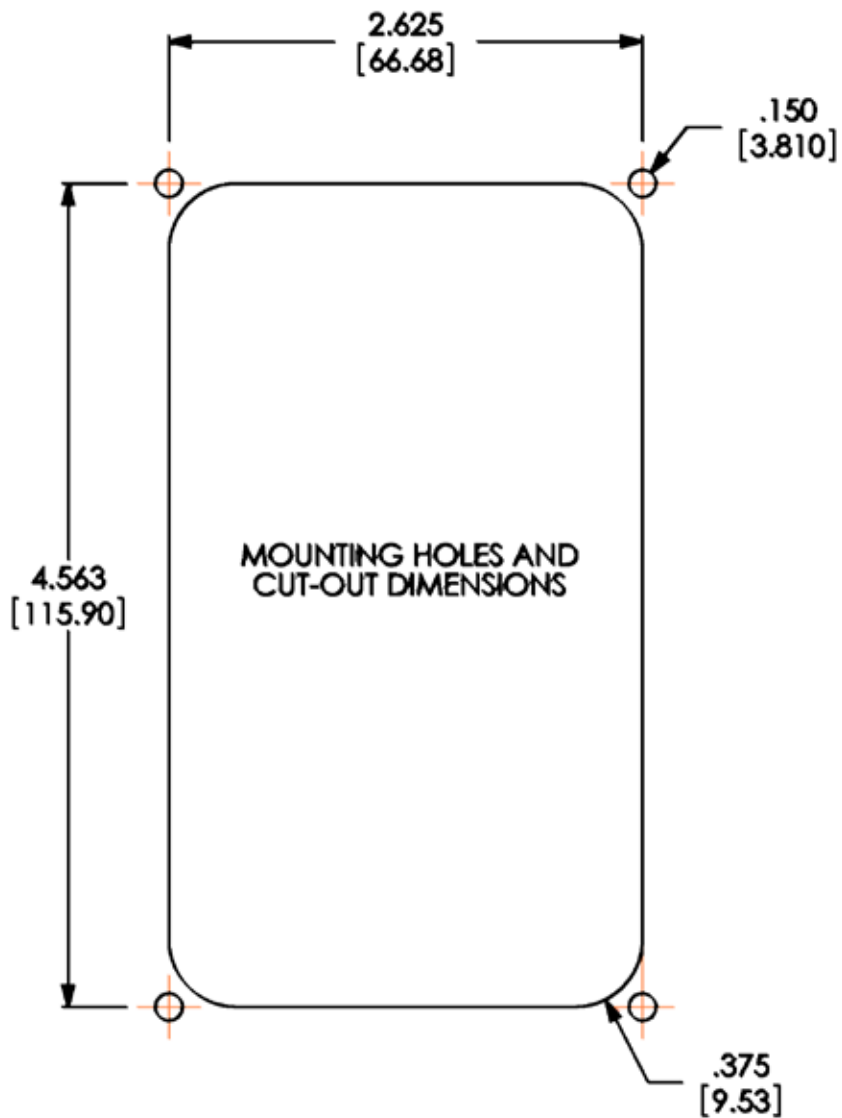
Total System Manager



TPG, Engine Status Center, Pressure Governor, ENFO III



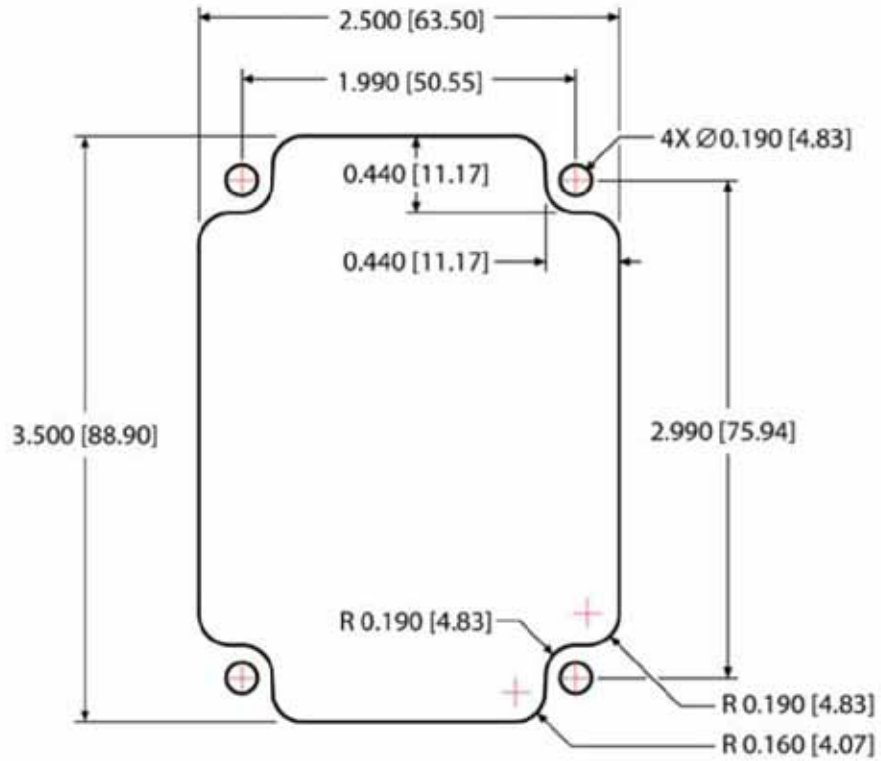
ITL-4 Tank Level, 4 Light Tank Level with ITL-40 Bezel



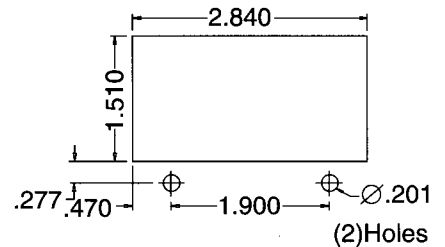
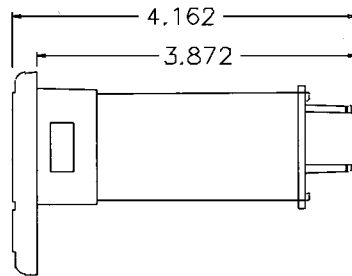
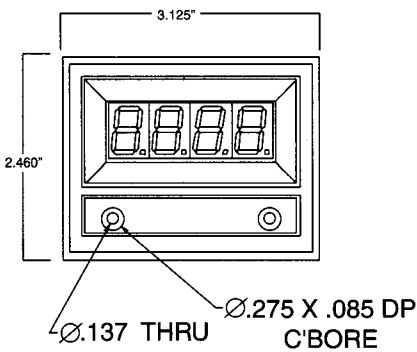
Electronics/Electrical Systems

Standard ITL System

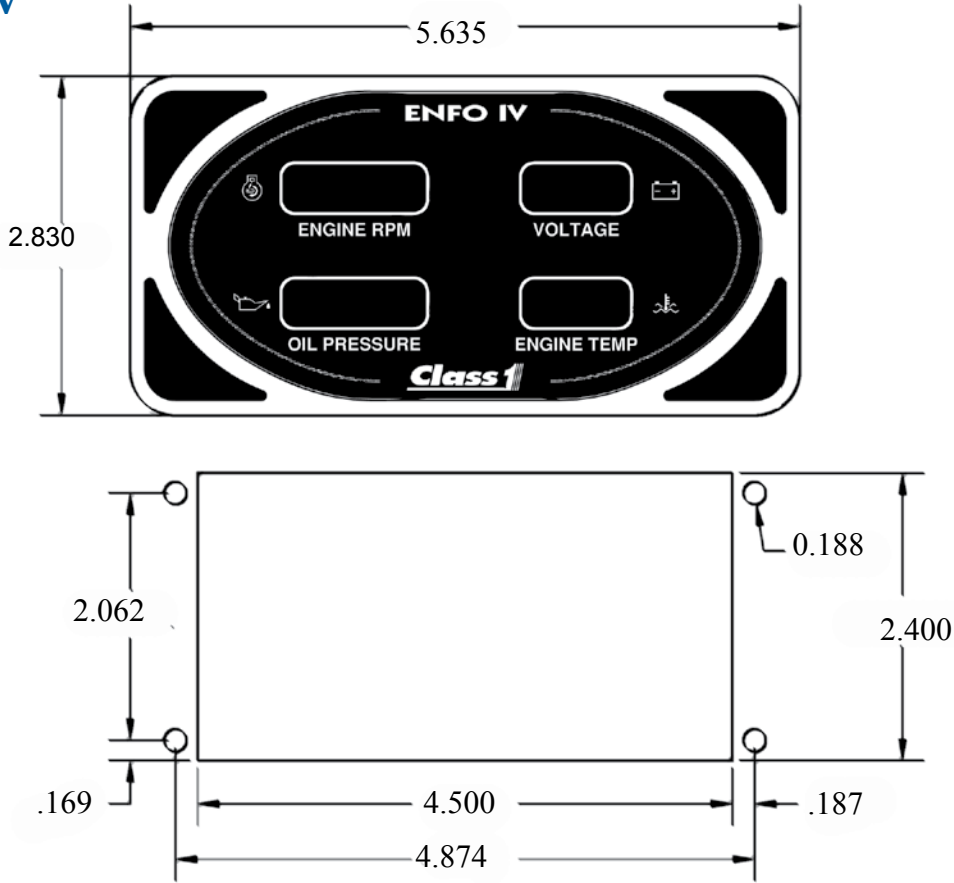
For P/N 113769, 114378



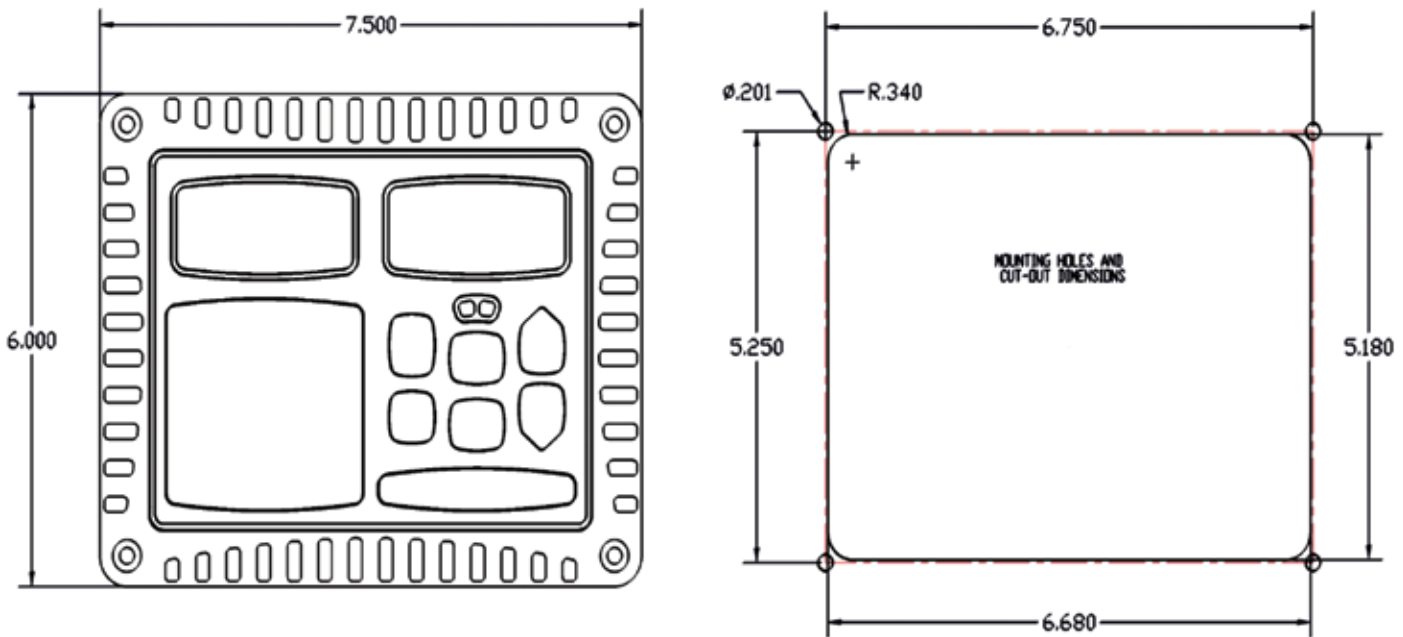
SSD Display — Flowminder/Airminder/Oxyminder/Loadminder/Tank Level



ENFO IV



TPG Plus



Electronics/Electrical Systems

Specifications

Instructions: Insert the following paragraphs into your specifications to ensure that your new apparatus is equipped with Class 1 components

TOTAL PRESSURE GOVERNOR PLUS (TPG+)

Apparatus shall be equipped with a Class1 "Total Pressure Governor Plus" (TPG+) that is connected to the Engine Control Module (ECM) mounted on the engine. The "TPG+" will operate as a pressure sensor (regulating) governor (PSG) utilizing the engine's J1939 data for optimal resolution and response when supported by the engine manufacturer. If J-1939 engine control is not supported, then analog remote throttle control shall be provided by the "TPG+". The "TPG+" shall function as a Master Pump Discharge and Intake Gauge.

The TPG+ shall utilize control algorithms that minimize pressure spikes during low or erratic water supply situations. The "TPG+" shall be backwards compatible to any engine that supplies J1939 RPM, Temperature and Oil Pressure information providing the ability to maintain a consistent fleet fire-fighting capability and reduce operator cross training and confusion.

The "TPG+" shall have the ability to use either a 300 PSI or a 600 PSI discharge pressure transducer and a 300 PSI intake pressure transducer. PSG system diagnostics shall be built in and accessible by technicians. Programmable presets for RPM and Pressure settings shall be easily configurable. The straightforward menu structure shall allow the "TPG+" configuration to match existing apparatus operation as closely as possible.

The "TPG+" shall also include indication of engine RPM, system voltage, engine oil pressure and engine/transmission temperature with audible alarm output for all. The "TPG+" uses the J1939 data bus for engine information, requiring no additional sensors to be installed. The TPG+ shall monitor and display pump and engine hours. The "TPG+" shall use J1939 broadcast warnings for the alarm as a standard and allow the "user" to select warning values if "SOP's" dictate.

TOTAL PRESSURE GOVERNOR (TPG)

Apparatus shall be equipped with a Class1 "Total Pressure Governor" (TPG) that is connected to the Electronic Control Module (ECM) mounted on the engine. The "TPG" will operate as a pressure sensor (regulating) governor (PSG) utilizing the engine's J1939 data for optimal resolution and response when supported by the engine manufacturer. If J-1939 engine control is not supported, then analog remote throttle control shall be provided by the TPG.

The TPG shall utilize control algorithms that minimize pressure spikes during low or erratic water supply situations. The TPG shall be backwards compatible to any engine that supplies J1939 RPM, Temperature and Oil Pressure information providing the ability to maintain a consistent fleet fire-fighting capability and reduce operator cross training and confusion.

The TPG shall have the ability to use either a 300 PSI or a 600 PSI transducer for best operation. PSG system diagnostics shall be built in and accessible by technicians. Programmable presets for RPM and Pressure settings shall be easily configurable. The straightforward menu structure shall allow the "TPG" configuration to match existing apparatus operation as closely as possible.

The "TPG" shall also include indication of engine RPM, system voltage, engine oil pressure and engine temperature with audible alarm output for all. The "TPG" uses the J1939 data bus for engine information, requiring no additional sensors to be installed. The TPG shall use J1939 broadcast warnings for the alarm as a standard and allow the "user" to select warning values if "SOP's" dictate.

CLASS 1 "CAPTAIN"

Specifications for fire apparatus pump/engine controller to be used when the apparatus is equipped with any major electronic engine.

ENGINE/PUMP CONTROLLER

This apparatus shall be equipped with a Class 1 "Captain" engine/pump governor/throttle system that is connected directly to the Electronic Control Module (ECM) mounted on the engine. The "Captain" is to operate as a pressure sensor (regulating) governor (PSG).

A special preset feature shall permit a predetermined pressure or RPM to be set. The preset pressure or RPM will be displayed on the message display of the "Captain".

ITL-40 TANK LEVEL GAUGE

The apparatus shall be equipped with a Class1 "ITL-40" Tank Level Gauge for indicating water or foam level. The Tank Level Gauge shall indicate the liquid level or volume on an easy to read LED display and show increments of 1/8 of a tank.

Each tank level gauge system shall include:

- 1) A pressure transducer that is mounted on the outside of the tank in an easily accessible area. Sealed foam tanks will require zero pressure vacuum vents.
- 2) A super bright LED display viewable from 180 degrees with a visual indication at nine accurate levels.
- 3) A set of weather resistant connectors to connect to the digital display, to the pressure transducer and to the apparatus power. Additional (slave) displays (if requested) are to be easily integrated and will receive data from the same source as the Master Display. No additional transducers shall be required.
- 4) The system shall include the ability to display "text messages"
- 5) The system shall include built-in diagnostic capabilities.

ENFO III

The apparatus shall be equipped with the Class 1 ENFO III Engine Information Display for the pump panel. The ENFO III shall provide engine RPM, system voltage display and alarm, engine oil pressure display and alarm, and engine temperature display and alarm. The ENFO III is available in either English or Metric and uses the SAE J-1587 data bus for its information and does not require any additional sensors to be mounted.

ENFO IV

The apparatus shall be equipped with the Class 1 ENFO IV Engine Information Display for the pump panel. The ENFO IV shall provide engine RPM, system voltage display and alarm, engine oil pressure display and alarm, and engine temperature display and alarm. The display will alternate between actual data and either "LO" or "HI" as appropriate when parameter is out of limits.

The ENFO IV is available in either English or Metric and uses the SAE J-1939 data bus for its information and does not require any additional sensors to be mounted.

The ENFO IV performs a self diagnostic on each power ON cycle and displays the results in the information windows. The ENFO IV is available with a "sensor module" if a retrofit is desired for fleet consistency.

ENGINE STATUS CENTER

The apparatus shall be equipped with a Class 1 Engine Status Center (ESC) for providing engine information and critical warnings. The ESC shall be a weatherproof display with super-bright digits.

The ESC shall continuously display engine RPM, oil pressure, temperature, and voltage along with providing critical warnings. The warning levels for low oil pressure, high engine temperature, low voltage, and high voltage shall be independently programmable. The ESC shall provide visual warnings and an output for controlling an audible warning when alarm levels are reached. The ESC shall also have a message center that displays engine hours, pto hours, incident time, user defined hours, service time, low fuel warning, and user defined warnings.

FLOWMINDER

INSTRUMENTATION: Flow Meters

The apparatus shall be equipped with a Class 1 Flowminder on each discharge line to give the pump operator or engineer an indication of actual volume of water in gallons per minute being discharged through each line and the total volume of water that has flowed through each line.

Each Flowminder system shall consist of:

- A weatherproof digital flow display with super-bright digits at least 1/2" high. The display shall read actual flow and switch to total flow when a button is depressed and held.
- A flow transmitter mounted in the discharge line piping between the pump and the discharge outlet. The transmitter shall consist of a weather resistant black anodized housing with brass wetted parts with a durable paddle wheel. The only part inserted into the water flow path shall be the paddle wheel.
- A set of connecting cables to connect the digital display to the flow transmitter and to the apparatus power.
- Machined mounting hardware to hold the transmitter in the correct position in the discharge line shall be provided and placed in strict accordance with the Class 1 monitoring requirements as stated in the Operation and Instruction Manual.
- The flowmeter shall be checked & calibrated prior to delivery of the apparatus.

Electronics/Electrical Systems

Specifications

FLOWMINDER SYSTEM

(Digital Flow and Analog Pressure Gauge)

INSTRUMENTATION: Flow and Pressure Meters

The apparatus shall be equipped with a Class I Flowminder Value System on each discharge line to give the pump operator or engineer an indication of actual volume of water (in gallons per minute) being discharged through each line and the actual line pressure. The Flowminder Value System shall also show total flow when a button is depressed and held.

Each Flowminder Value System shall consist of:

- A color coded bezel with digital display and mechanical pressure gauge on the pump panel. The flow display shall be weatherproof with super-bright digits at least 1/2" high. The pressure display shall be a liquid filled, mechanical gauge with Sub-Z freeze protection.
- A flow transmitter mounted in the discharge line piping between the pump and the discharge outlet. The only part inserted into the water flow path shall be the paddle wheel.
- A set of connecting cables to connect the digital display to the flow transmitter and to the apparatus power.
- Machined mounting hardware to hold the transmitter in the correct position in the discharge line shall be provided and placed in strict accordance with the Class 1 monitoring requirements as stated in the Operation and Instruction Manual.
- The flowmeter shall be checked & calibrated prior to delivery of the apparatus.

VEHICLE DATA RECORDER (VDR) AND SEAT BELT WARNING SYSTEM (SBW)

Apparatus shall be equipped with a Class1 "Vehicle Data Recorder and Seat Belt Warning System" (VDR/SBW) that is connected to the power train CAN (Controller Area Network) bus consisting of transmission (TCM), engine control (ECM) and anti-lock brake (ABS) modules mounted on the apparatus. The VDR/SBW will function per NFPA 1901-2009 sections 4.11 (Vehicle Data Recorder) utilizing the power train's J1939 data and 14.1.3.10 (Seat Belt Warning) using the Class1 "Seat Belt Input Module" for seat occupied and belt status information.

The SBW system shall have the ability to use either normally open (NO) or normally closed (NC) switches (user selectable by "dip switches" at ground potential) for operation. A choice of two different visual displays for Seat Belt Warning shall be available.

The VDR data shall be downloadable by USB cable to a computer using either Microsoft™ or Apple™ Operating Systems using Class 1/ O.E.M. supplied reporting software.

VOLTAGE MONITOR

The apparatus pump panel shall be equipped with a Class 1 Low Voltage Monitor to monitor the electrical system voltage.

The Low Voltage Monitor shall mount on the pump panel and include a bright green LED to indicate a good voltage level and a bright red LED to indicate a low voltage level. The low voltage monitor shall also contain a 90 dba buzzer that sounds when the voltage falls below 11.9 volts for more than 2 minutes and a silence button that will reset the buzzer for 2 minutes.

The Low Voltage Monitor shall be installed in strict accordance with the installation instructions supplied by Class 1.

AIR MINDER

INSTRUMENTATION:

Breathing Air Level and Warning System

The apparatus shall be equipped with a Class I Air Minder mounted (specify location), to give the engineer/firefighter visible indication of the air remaining in the breathing air system, plus to offer visual and audible warning when the level becomes too low.

The Air Minder system shall include:

- A weatherproof, pressure transducer mounted in the air line between the air bottles and the high pressure regulator.
- A remote display mounted on the (specify location). This display shall consist of a weatherproof housing with a black non-reflective bezel and a bright red LED readout (readable in sunlight), scaled 0 to 100, and labeled "% Air Remaining". The display shall incorporate a low pressure warning circuit, which causes the display to flash when 20% maximum air bottle capacity remains in the air system and sounds an audible alarm when the remaining air level drops to 10% of maximum air bottle capacity.
- Appropriate wires and connectors to hook up the display to the pressure transducer and to the vehicle's 12-14 volt electrical system.
- An audible horn mounted near the display.
- An automatic low pressure switch mounted near the display which will turn off the power to the Air Minder warning horn when the supply line pressure drops below 5 PSI.

OXYGEN MINDER

The Oxygen Minder system shall include:

- An indicating pressure transmitter gauge to be mounted on the high pressure side of the on-board oxygen bottle regulator. The gauge range is to be 0 to 3000 PSI. The gauge dial is to be 2 inch, with black markings on a white background and shall include the words "use no oil" printed in red. The gauge shall have been cleaned for oxygen service prior to installation.
- The remote display shall be a durable housing containing a bright red LED vertical scale reading 0-100. The scale shall be labeled "% Oxygen Remaining".
- Appropriate wires and connectors to hook up the display to the pressure transmitter/gauge on the regulator and to the vehicle's 12-14 volt electrical system. The vertical LED % scale on the display shall indicate the relative amount of oxygen remaining in the tank. As oxygen is used, the bars will remain lit. At this point, the remainder of the scale will begin to flash as a low level visual warning. At 10% pre-set bottle capacity, two bars will remain lit, the balance of the scale will flash, and an audible alarm will sound.

LOADMINDER

INSTRUMENTATION: Low Level Overload Warning System

The apparatus shall be equipped with a Class 1 Loadminder mounted (specify location) for monitoring load level on an aerial device proportionate to the maximum-rated low elevation load of the device as determined by the apparatus manufacturer. The Loadminder calculates the current load and displays it on a simple, easy to read digital display. The display instantly adjusts to changes in ladder angles, extension or live load.

The Loadminder system shall include:

- A rectangular shaped digital display (specify location). The display shall be weatherproof with super bright digits at least 1/2" high. The display shall be scaled 0-100% and color coded to show safe and unsafe operating conditions.
- A pressure transducer installed in the hydraulic system. The pressure transducer is to have an accuracy of +/-3%.
- Appropriate wires and connectors to hook up the display to the pressure transducer and to the vehicle's 12-14 volt electrical system.
- An audible horn mounted near the display.

ELECTRICAL SYSTEM MANAGER

The apparatus shall be equipped with a Class 1 Electrical System Manager (ESM) for performing electrical load management. The ESM shall be capable of controlling up to (7) loads according to the voltages which are present.

The ESM shall monitor both main and isolated battery banks and indicate low voltage independently when voltage drops below 11.8 volts for more than 2 minutes. The ESM will sequence loads on and off at exact intervals when the master switch is toggled. The ESM will shed loads when voltage drops below corresponding shed point for 30 seconds. An output shall activate to indicate over-voltage when battery voltage is over 14.5 volts. A fast idle output shall activate when voltage drops below 12.3 volts for more than 1 minute and the appropriate interlocks are in place.

TOTAL SYSTEM MANAGER

The apparatus shall be equipped with a Class 1 Total System Manager (TSM) for performing electrical load management. The TSM shall have 16 programmable outputs to supply warning and load switching requirements.

Outputs 1-12 shall be independently programmable to activate during the scene mode, the response mode, or both. These outputs can also be programmed to activate with the ignition or master warning switch, or to sequence and shed along with the priority. Output 13 shall be designated to activate a fast idle system. Output 14 shall provide a low voltage warning for an isolated battery. Output 15 is a user configurable output and shall be programmable for activating between 10.5 and 15 volts. Output 16 shall provide a low voltage alarm that activates at the NFPA required 11.8 volts.

The TSM shall have a digital display to indicate system voltage in normal operation mode and also indicate the output configuration during programming mode.

The TSM shall be protected against reverse polarity and shorted outputs and be enclosed in a metal enclosure to enhance EMI/RFI protection.



Class 1®
607 NW 27th Avenue • Ocala, FL 34475
Phone: 352.629.5020 • Fax: 352.629.2902 • 800.533.3569
www.class1.com

Hale Products Inc.
A Unit of IDEX Corporation
700 Spring Mill Avenue • Conshohocken, PA 19428
Phone: 610.825.6300 • Fax: 610.825.6440 • 800.220.4253
www.haleproducts.com

Copyright 2009, Class 1, Rev. 3 6/2010 Note: Class 1 cannot assume responsibility for product failure resulting from improper maintenance or operation. Class 1 is responsible only to the limits stated in the product warranty. Product information contained in this material is subject to change without notice.