Electrical & Electronic Components

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

IDEX CORPORATION

Class 1®

Class 1 Flowminders

Class 1 Flowminders tell you how much you are flowing and what the pressure is at the pump. Knowing the flow required for each line, the pump operator needs only to adjust the governor throttle or discharge gate to maintain optimum fire fighting streams.

Safety and Flowminders Go Together

With Class 1 Flowminders, pump or aerial apparatus operators can read the flow (GPM and LPM) on each line to ensure that just the right amount of water is being pumped through the various discharges.

Too little flow caused by kinks, low pumper pressure or long hose lays may not be recognized, particularly if an automatic nozzle is used and is working properly. The low flows cause the spring to reduce the opening at the nozzle while the pattern looks almost the same.

Too much flow can make maneuvering an attack line difficult. On an aerial discharge, it could cause an over-loaded condition thereby reducing the safety margin of the device.

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)

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

Flow Transmitter

Total Flow Button (optional)

Insert Colors

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

Flowminder System

The Class 1 digital flow meter allows operators to monitor actual flow from a discharge line. The compact design reduces pump panel space requirements while providing large, easy to read digits. Eliminates the need for "rules of thumb" or fire ground hydraulics.

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

Part Number	Description
FMS	Flowminder Single Display
FMD	Flowminder Dual Display
102088	Total Flow Button (only 1 per truck)

Flow Transmitter

Total Flow Button (optional)

Flowminder Super System

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

- Large, bright, easy-to-read digits
- Eliminates gauge sensing lines
- Read total at the touch of a button (optional)

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)

*Single Transmitter/Transducer

Flow Transmitter

Total Flow Button (optional)

Flowminder Value Demonstration Unit

The portable Flowminder Demo Kit is designed to show flow and pressure in a fire steam utilizing various nozzles and hose lengths while providing a hands-on training approach to hydraulics versus complex "textbook based" lectures. This valuable training aid simplifies the fire instructor's task of demonstrating actual fire flows at various pump discharge pressures. The demonstration unit attaches to a short piece of 2.5 hose from the apparatus discharge (or intake) and accurately displays GPM flow as well as discharge pressure of the device.

FEATURES

- Flow transmitter and saddle-clamp mounted on a 2.5" pipe with male x female NST connections
- Weather proof display unit mounted on a stand
- 2.5" pressure gauge with sensing line
- 15 foot cable with battery clips
- Handy foam-lined carrying case

Part Number	Description
102322	Flowminder Demo Kit

Note: Requires fully charged battery (12-14 volts) for proper operation.

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
5"	4845010

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

Officer Digital Clock & Officer Speedometer

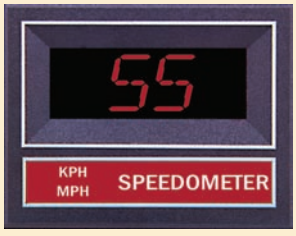
Digital Clock

Gives officers the ability to monitor vehicle speed.

FEATURES

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

Part Number	Description
SPD	Officer Speedometer
DC	Digital Clock



Officer Speedometer

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

FEATURES

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

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

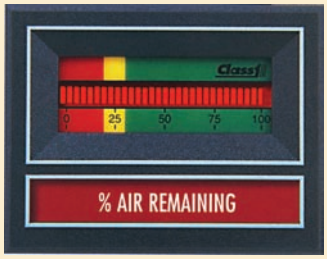
Note: System includes display, pressure transducer, horn, silence button and cable.

Airminder

Breathing 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.

FEATURES

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



Part Number	Description
AMS	Airminder Single Display System
AMD	Airminder Dual Display System

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

Oxygen Minder

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.

FEATURES

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

Part Number	Description
OMS	Oxygen Minder Single Display System
OMD	Oxygen Minder Dual Display System

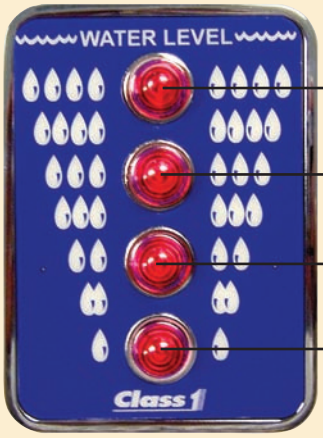
Note: System includes display, pressure transducer, horn, silence button and cable.

Intelli-Tank™ Level Gauges

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



Full (Steady on)
7/8 (Flashing)

3/4 (Steady on)
5/8 (Flashing)

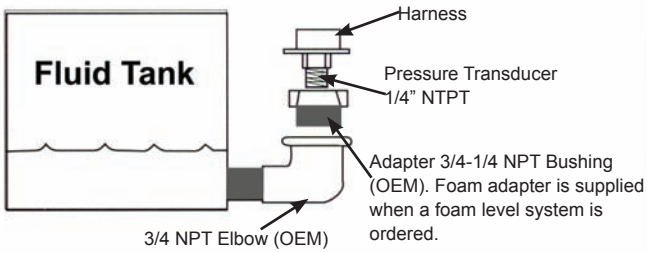
1/2 (Steady on)
3/8 (Flashing)

1/4 (Steady on)
1/8 (Flashing)

EMPTY (All Flashing)

Part Number	Description
ITL	Intelli-Tank System for Water
ITL	Intelli-Tank System for Foam

Tank Level Gauge Transducer Installation



The transducer must be mounted vertically as depicted to insure an accurate and reliable reading. This will also prevent damage to the transducer from freezing.

Remote Dash Indicator

Class 1's new 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.

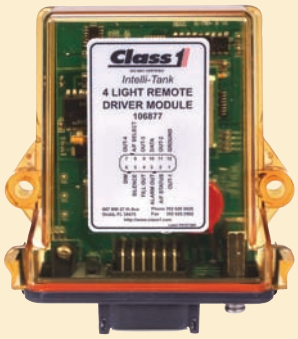
Remote Dash Indicator (rocker switch size)

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.

Remote Driver Module



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
107540	Bolt-On
107470	Weld-On
107585	MNPT Thread

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

Command Master

Class 1 Command Master diplays engine RPM, oil pressure, engine temperature and voltage along with providing critical warnings. The warning levels for oil pressure, high engine temperature, low voltage and high voltage can be independently programmed.

The Command Master has a weatherproof color display. It operates as an engine/pump governor/throttle system that is connected directly to the Electronic Control Module (ECM) mounted on the engine. The Command Master operates as a pressure sensor (regulating) governor (PSG).

Part Number	Description
111085	Command Master
111094	Governor Module
111096	Sensor Module

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

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
- 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

ENFO III and ENFO IV

For Any Electronic Engine

Provides the pump operator with engine RPM, oil pressure, engine temperature and electrical system voltage. The ENFO III utilizes the SAE J-1587 BUS for engine information. The voltage is displayed from the battery. This compact unit contains all required engine audible and visual alarms including the low voltage alarm. The Enfo IV utilizes the SAE J-1939 data bus for engine information on engines that support the J-1939 protocol.

FEATURES

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

Part Number	Description
102652	ENFO III (English)
102721	ENFO III (Metric)
102826	18” matching pigtail for ENFO III
108661	ENFO IV
110346	18” matching pigtail for ENFO IV

Enfo III

Enfo IV

Sun Guard

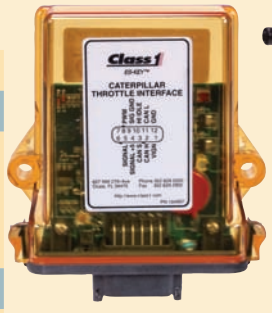
Class 1 sun gaurd is specially designed to make important pump panel controls easier to read in bright sunlight. Easy to mount, it does not need screws or brackets. Simply loosen the screws of the control and slide the guard over the control. Durable steel construction in black matte. Flips up to read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

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

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 (Interactive Systems) ISM, ISC and ISM electronic engines For VMACK 3 For Mercedes MBE400 and MBE900
103103	Adapter only
EXEC200#8424	For Caterpillar 3100, 3116, 3126, 3176, 3406, C10 and C12
EXEC200#8425	Interface only
101558 (Includes Adapter)	For International DT530E and DT466E
103103	Adapter Only



Interface module for Caterpillar engine

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

Venier Throttle, 100076

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
- Dashboard status display

Dashboard display

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
105244	Captain Pressure Governor

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)

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

Engine Interface/Interlock Module

This module combines many of the most common electrical circuits utilized by fire apparatus into a compact fully documented module that can be plugged into a system. It is fully adjustable to any combination utilized by the industry.

FEATURES
- Engine shutdown
- Starter lockout
- Engine fan override
- Transmission interface (electronic)
- Transmission interface (non-electronic)
- OK to pump
- Remote throttle interlock
- Hi-idle interlock
- Remote throttle signal
- Body door ajar
- Cab door ajar

Part Number	Description
101620	Engine Interface/Interlock Module

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

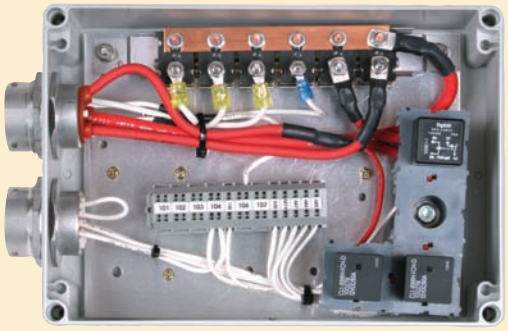
Electrical Sub Panel

The design of the Class 1 body electrical panel applies the systems engineering approach to the fire apparatus body electrical system. It provides the body builder with a standardized platform from which a reliable and repeatable electrical system can be developed. This standardized platform will reduce installation time, increase electrical reliability, increase serviceability and increase customer confidence in the overall apparatus electrical system.

FEATURES
- Wiring meets or exceeds requirements of NFPA apparatus standards
- Environmentally sealed enclosure and connectors
- Flexible design
- Centralized circuitry for right and left body, pump panel, cab and engine

Part Number	Description
100544	Body Electrical Sub Panel

Cab Electrical Panel



The Class 1 Cab Electrical Panel is the central distribution point for the chassis 12 volt DC electrical system. The cab panel is flexible in design and incorporates such circuits as beacons, front warning lights, map lights, spot lights, sirens, etc.

FEATURES
- Environmentally sealed enclosure
- Interfaces with body electrical panel

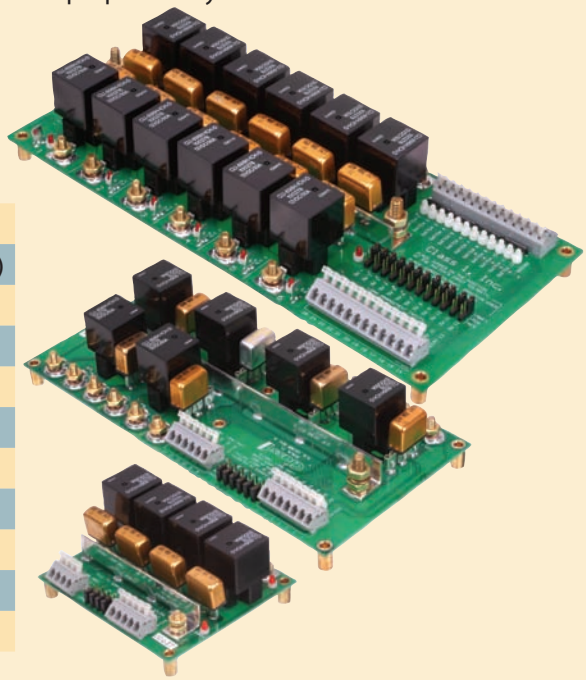
Part Number	Description
100540	Cab Electrical Panel

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.

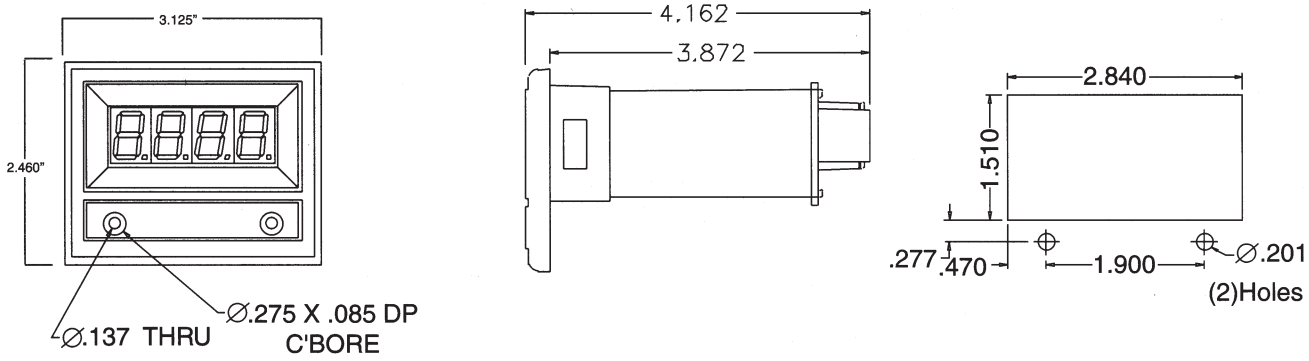
SPECIAL NOTE: The 9 relay power distribution board contains two general purpose relays with 10 AMP breakers.

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

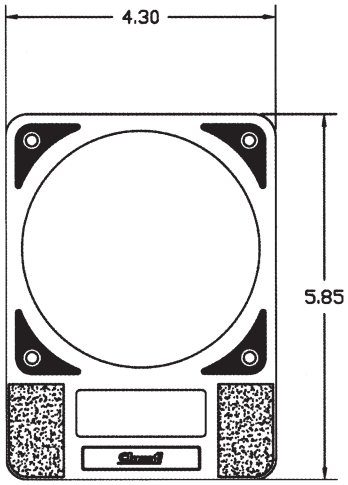


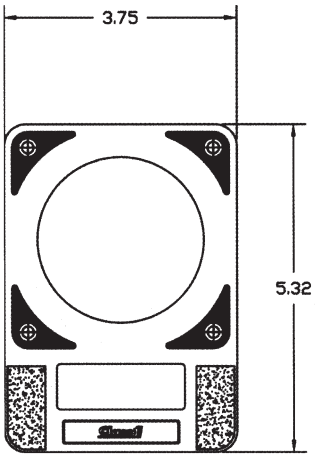
Part Number	Description
100719	3 Relay marker turn module (with enclosure)
100687	4 Relay board
100759	4 Relay board (with enclosure)
101343	6 relay board
100455	9 relay board
100921	9 relay board (with enclosure)
100715	12 relay board
100718	12 relay board (with enclosure)
100471	Auxiliary function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

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



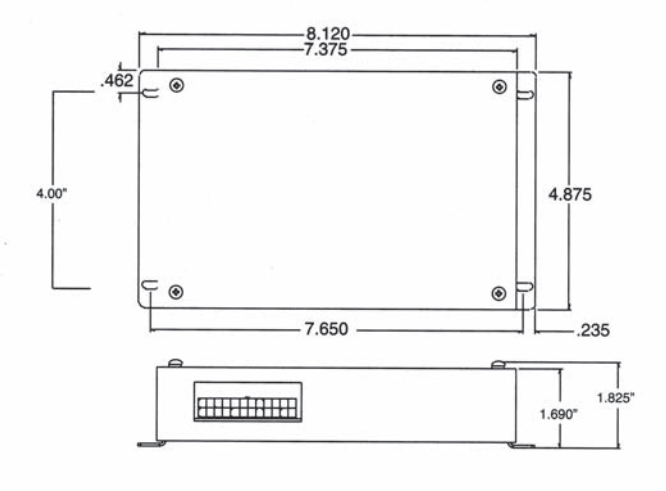
Flowminder Value System



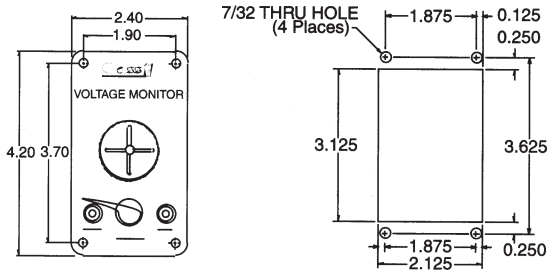


Dimensional Drawings

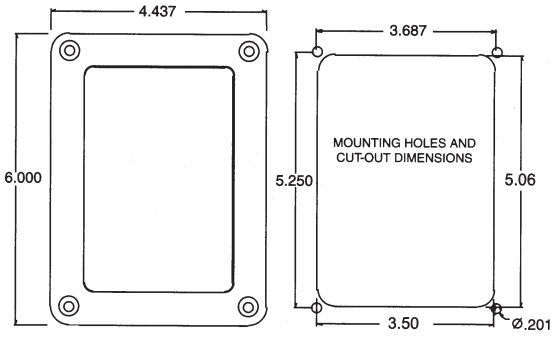
Total System Manager



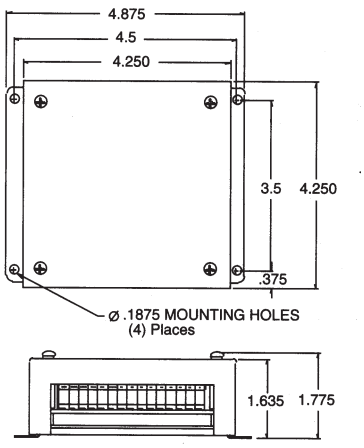
Voltage Monitor



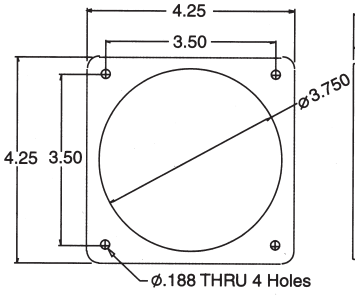
Engine Status Center
Pressure Governor ENFO III



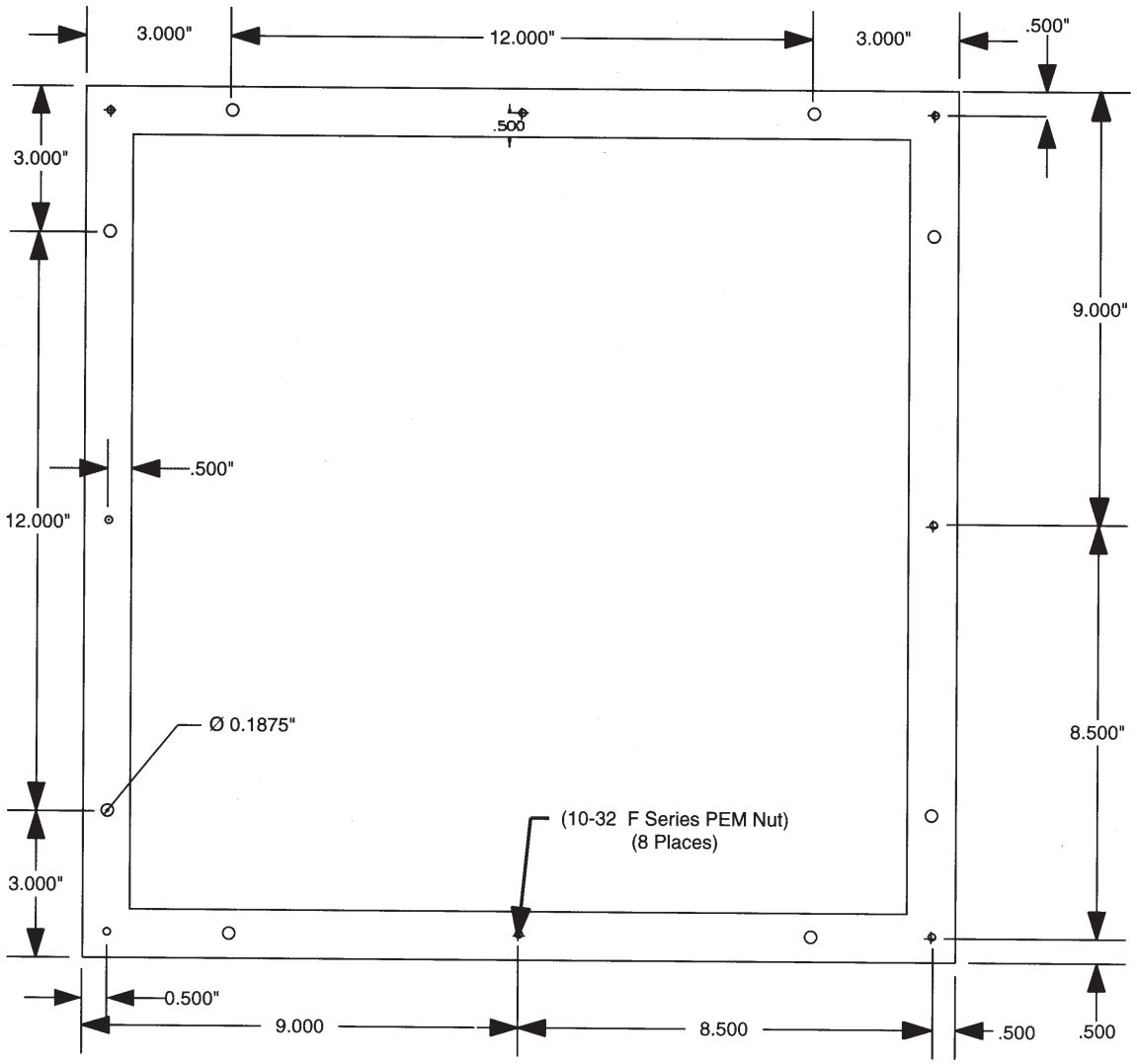
Electrical System Manager



Conventional Style Displays



Body Electrical Sub-Panel



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

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".

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.

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:

1. 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.
2. 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.
3. A set of connecting cables to connect the digital display to the flow transmitter and to the apparatus power.
4. 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.
5. The flowmeter shall be checked & calibrated prior to delivery of the apparatus.

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:

1. 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.
2. 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.
3. A set of connecting cables to connect the digital display to the flow transmitter and to the apparatus power.
4. 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.
5. The flowmeter shall be checked & calibrated prior to delivery of the apparatus.

FLOWMINDER "SUPER' SYSTEM

(Digital Flow Gauge and Digital Pressure Gauge)
INSTRUMENTATION: Flow and Pressure Meters
The apparatus shall be equipped with a Class I Flowminder and a digital pressure gauge 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 shall also show total flow when a button is depressed and held.

Each Flowminder Super system shall consist of:

1. Two digital displays that shall be weatherproof with super-bright digits at least 1/2" high. One display shall be wired to the flow transmitter to show flow and one display shall be wired to the pressure transducer to read pressure. Each display shall be labeled with color coded ID tags.
2. 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.
3. A pressure transducer shall be mounted on each discharge line being monitored. The transducer shall be installed downstream of the discharge valve so as to indicate pressure only when the valve is open.
4. A set of weather resistant connectors to connect the digital displays to the flow transmitter, pressure transducer and to the apparatus power.
5. 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
6. The flowmeter shall be checked and calibrated prior to delivery of the apparatus.

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 l 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:

1. A weatherproof, pressure transducer mounted in the air line between the air bottles and the high pressure regulator.
2. 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.
3. Appropriate wires and connectors to hook up the display to the pressure transducer and to the vehicle's 12-14 volt electrical system.
4. An audible horn mounted near the display.
5. 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:

1. 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.
2. 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".
3. 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:

1. 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.
2. A pressure transducer installed in the hydraulic system. The pressure transducer is to have an accuracy of +/-3%.
3. Appropriate wires and connectors to hook up the display to the pressure transducer and to the vehicle's 12-14 volt electrical system.
4. An audible horn mounted near the display.

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.

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.

Product Warranty

Class 1 warrants that any equipment of our own manufacture (or manufactured for us pursuant to our specifications) found to have defects in material or workmanship during normal use and service will be repaired or replaced (at our option) free of charge provided that written notice of such defect is received by us within two years (three for liquid-filled gauges) after initial shipment. All equipment requiring repair or replacement under this warranty shall be returned prepaid to Class 1. Such returned equipment shall be examined by us and, if found to be defective as a result of materials failure or workmanship, shall be repaired at no charge.

This warranty shall not apply to any equipment which has been tampered with or altered after leaving our control or which has been repaired by anyone except Class 1. Product which has been subjected to misuse, neglect, ,abuse, or improper application will not be covered under this warranty. Misuse or abuse of the equipment or any part thereof shall include, but not limited to, damage by negligence, overpressure, excess voltage and the like. Operating the equipment with or in a corrosive, explosive, or combustible medium (unless equipment is specifically designed for such service) or exposing it to any other conditions or environment of greater severity than that for which the equipment was designed will void this warranty.

This warranty is given and accepted in lieu of all other warranties, expressed or implied, and of all other obligations or liabilities on our part. In no event shall we be liable for breach of warranty beyond the terms stated above or for any consequential damages in a case. Class l's liability in all events is limited to the value of the product involved.

In order to ensure prompt exchange or repair service, please contact Class 1 toll free at 800-533-3569 or via e-mail at class1returns@idexcorp.com to receive a Return Materials Authorization Number (RMA#) prior to returning the items to Class 1. Please mark the RMA# on the outside of all packages. This will enable our receiving department to quickly route the product to the appropriate repair department. Products received by Class 1 without a RMA# may experience service delays or may be returned to the sender for additional information. All returned items should be prepaid by the customer to Class 1.

Class 1® ● A Unit of Hale Products
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