AUTOMATIC ENGINE START/STOP [AES]

System Datasheet

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INTEGRAL
CONTROL SYSTEMS LTD.

Automatic Engine Start/Stop – AES

Reduce your locomotive fuel consumption and engine emissions with Integral AES engine idle limiting technology. The AES is a standalone locomotive automatic engine start/stop (AESS) idle limiting control solution.

Key Benefits

- **Decreased Fuel Costs:** By reducing unnecessary idling, locomotives consume less fuel, leading to significant cost savings *
- **Reduced Engine Maintenance Costs:** Less idling means less wear and tear on the engine, which can lower maintenance expenses *
- **Extended Engine Life:** Minimizing idle time helps prolong the lifespan of locomotive engines *
- **Improved Operator Well-Being:** Reducing idling decreases noise levels, creating a more comfortable environment for operators *
- **Lower Emissions:** Integral AES idle reduction technology help cut down emissions of harmful pollutants such as nitrogen oxides (NOx), carbon monoxide (CO) and particulate matter (PM), contributing to better air quality **
- **Enhanced Community Relations:** Lower emissions and noise levels can improve relationships with communities near rail yards and tracks *
- **Ready for Rugged Rail Service:** Designed to EN50155 and MIL-STD compliance.
- **AAR AESS Standard S-5502 Support:** Built-in support for the American Association of Railroads (AAR) standard for AESS S-5502 (2011.)

* epa.gov, ** nepis.epa.gov

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Specifications

Power Management

- Nominal supply input 72Vdc with ultra-wide transient range 16.8Vdc-160Vdc
- Isolated EN50155 rated internal power supply
- Reverse bias protection/overvoltage protection/undervoltage protection

Environmental

- Operating ambient temperature: -40℃ to 70℃
- Cooling: integrated forced air
- Shock and vibration: MIL-STD-810G

Mechanical

- Dimensions: ~ 10” (W) x 10” (H) x 6” (D)
- Weight fully loaded: ~20lbs

Locomotive Interface

- 2x isolated RS232
- 1x isolated CAN2.0A/B, J1939 protocol supported
- 10x 4-20mA independently isolated current loop inputs
- 1x isolated USB-A 2.0 port
- 4Gb non-volatile FLASH memory storage
- 1x EEPROM parameter storage
- 32x 74Vdc:24Vdc dual mode digital inputs, organized in groups of 8
- 16x 74Vdc:24Vdc dual mode digital outputs; 6x outputs settable for PWM control

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AES Idle Limiting Solution Kits

- **AES-K001 AESS Locomotive Materials Kit:** relays, contactors, magnet valves, hoses, fittings, rack assist pump-motor, terminal boards, blocking diodes and check valves required to complete the electro-mechanical control of the engine and engine governor for automatic engine start and stop.

- **AES-K002 AESS Engine Control Module (ECM) Materials Kit:** ECM module, audible sirens, pressure sensors, temperature sensors, current sensors, voltage sensors, LED indicator / switch panels, warning labels and operating firmware required to complete the electronic automatic engine start/stop control system functionality.

AES Extended Idle Limiting Functionality

- Automatic Load shedding control
- Automatic restart ground relay reset
- Engine protection device (EPD) start override
- Governor Low oil switch (LOS) start override
- Governor rack-assist pump support
- Enable and load shed reset panels
- Optional in-cab maintenance display
- Self-maintenance I/O test
- High idle control
- Low idle control
- RCL coordination
- Integrated data logging
- Communication expansion support
- Optional AAR S-5502 support
- In-cab status indicator panels
- Adjustable operational parameters

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Why work with Integral Control Systems?

- We are customer driven; your success is our primary mission.
- Decades of locomotive control experience; we're ready to solve your toughest project challenges.
- We are experts in locomotive propulsion and traction control; from conventional EMD and GE alternator fed units to DC link AC and DC traction solutions.
- We are innovative and experienced in empowering disruptive, industry leading railway technology development; from multiengine gensets to battery and battery-hydrogen hybrid locomotives.