

Smart Ground-i Detector

Smart Ground-i Detector (SGiD) is micro controller based grounding device that effectively controls and dissipates static charge with vehicle identification feature.

- Vehicle identification using unique ID technology
- Easy connection to vehicles with rugged plug & socket arrangement & spiral cable
- Ensures that clamps are connected through vehicle only and not through fix structure
- Detects resistance in the earth loop and monitors earth potential
- Ensures low resistance in the earth pit
- The vehicle ID number can be transmitted over remote computer via redundant serial ports
- Advanced ID bypass feature eliminates un-auth. system bypass
- Used in Terminal Automation as well as used in wide range of applications like Process, Chemical, Petrochemical, Pharmaceutical and Paint Industries



The problem of static electricity in hazardous atmospheres is ever present in many sectors of processing industries. Due to physical movement, some materials generate high degree of static charge; at times it is in kilovolts. Insulating materials like rubber tyres, paints, gaskets and seals do not offer sufficient low resistance path to safely dissipate any static charge generated to earth. When this happens, high level of charge may accumulate on the isolated part, posing the risk of energetic static discharges. If this occurs in hazardous atmosphere there is a chance of occurrence of explosion, fire, or ignition of hazardous material.

An Earthing Relay is used along with suitable earthing clamps to ground the vehicle. If the grounding is done effectively, the static charges are immediately discharged through ground loop and earth pit. However due to increased resistance within the loop and earth pit, the grounding, physically looks perfect, may not be effective enough to allow these charges discharged through the path. Majority of earthing relay designs are based on continuity principle therefore allows several ohms. The situation would be even worse when the earthing clamp is connected on gantry structure and not connected on the tank-truck.

Smart Ground-i Detector solves the aforesaid problem by ensuring that clamps from the tank-truck earth and Earthing relay are connected through tank-truck only and not through any gantry structure. It ensures this using unique earth stud and socket arrangement. Its unique ID key technology provides ability to read truck's unique ID number, which can be transmitted to a remote computer via redundant serial ports available in the unit.

The SGiD also ensures that a low resistance connection is made from the tank-truck through paint or rust to the reference ground point. It also monitors potential level of the tanker body and only when this potential is confirmed to be at the same potential level as that of the reference ground level, and vehicle's ID number is verified, the instrument generates interlock output to permit loading or unloading operations. Throughout the fueling operation, the instrument monitors the development of the static charge on the body of the vehicle and ensures that the condition remains safe till the loading is completed.

By comparing the unique vehicle identification number with the terminal automation system's pre-programmed database, the terminal may automatically verify information such as contract and insurance status, vapor tightness certification, number of compartments and other vehicle information. This eliminates the time and expense of manual documentation review and inspection.

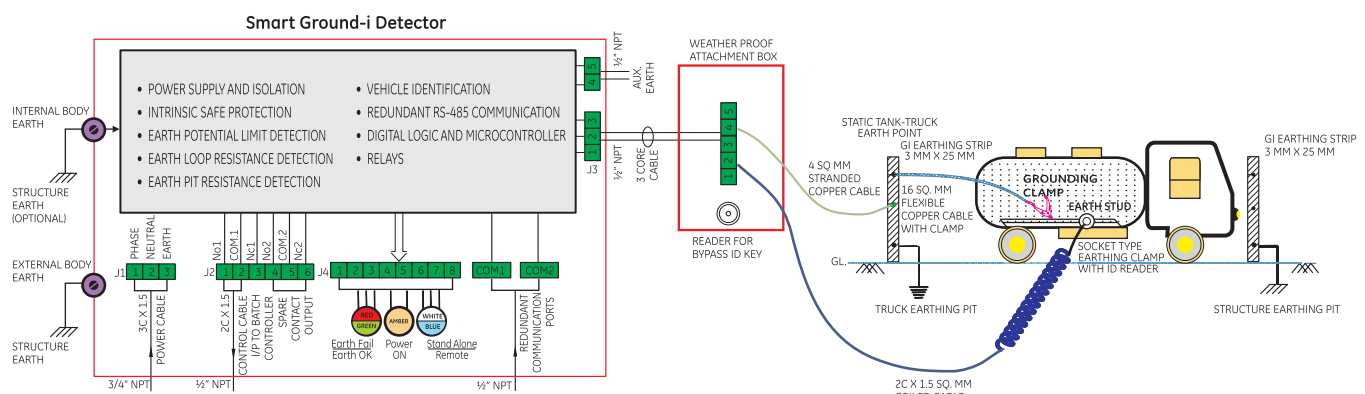
Two sets of interlock outputs in the form of potential free relay contacts as standard are available to connect to the batch controller, which immediately stops loading operation under the un-safe condition. The potential free contact may be interlocked with pumps, valves, PLC, alarms, etc. Using a bi-color LED indicator lamp available on the front cover, Earthing OK (Green Indication) or Defective Earth (Red Indication) status is displayed. Another bi-color lamp displays the unit's operating mode as either Stand Alone (White Indication) or Remote mode (Blue Indication). Auxillary earth input is also provided to monitor earthing of auxillary devices.



Specifications:

Model	Smart Ground-i Detector
Detection Principle	(a) Detects resistance in the earth loop and in the earth pit (b) Monitors earth potential limit value (c) Ensures that clamps from tank-truck earth and earthing relay are connected through tank-truck only and not through gantry structure (d) ID key technology provides ability to read truck's unique ID number
Operating Mode	(a) StandAlone : Operates independently (b) Remote : Remote host is connected
ID Verification Mode	(a) Any : Operates against presence of any valid ID (b) Loaded ID : ID key is verified against those stored in the memory (c) Remote verification : ID is sent for remote verification. Lamp & Relay action is under host control (d) Disabled ID : Earthing relay without ID function
Indicating Lamps	Three Nos. LED Cluster lamps <ul style="list-style-type: none"> • Red (Earth Fail) / Green (Earth OK) • Amber (Power ON) • White (StandAlone) / Blue (Remote)
ResponseTime	< 100 ms
Area Classification	Intrinsic Safe : Ex ia, Zone 1, Div 1&2, Group IIA, IIB Flame Proof : Ex d, Zone 1, Div 1&2, Group IIA, IIB
Temperature Class	T6
Ingress Protection	IP 65
Environment Conditions	Op. Temp: 0 to 60°C Storage Temp: -10 to 70°C Humidity: 95% at 25°C (Non-condensing)
Supply Voltage	230VAC ±10% / 115VAC ±10%, 10W, 50 Hz & 60 Hz ±3 Hz
Output Characteristics	Potential free 2-change over relay, Contact rating 230V, 5A, 100 VA (AC) / 230V, 5A, 100Watt (DC)
Body	Flameproof Cast Aluminum LM6
Mechanical Dimensions	283mm (H) x 215mm(W) x 177mm(D) (Mounting holes provided at 130 x 240mm apart)
Clamp Type	Socket type earthing clamp & Earth stud with optional dust protection

Block Schematic and Typical Connections



imagination at work

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