JMV

SIGNAL & TELECOM SOLUTIONS

Explore Smart Innovations Tailored for Indian Railway

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JMV LPS LIMITED

JMV LPS LIMITED

Established in 2008, JMV LPS Limited drives technological innovation and catalyzes transformative change in the industry, creating a safer and advanced future. With cutting-edge manufacturing units covering 0.1 million Sq. Ft. in Delhi NCR, we offer value-added engineering services, computer-aided solution designing, and efficient on-site project execution.

As a reputable vendor with multiple product approvals in Indian Railway Signaling, we boast a strong presence for over 15 years. Our end-to-end approach includes **optimized design solutions,** customized manufacturing, and in-house research at our state-of-the-art **Development Center Cum Testing Lab**, ensuring the **highest quality and innovation.**

WE
RESEARCH
DESIGN
MANUFACTURE

15 YEARS

INDEX

Remote Diagnostic & Predictive Maintenance System for Railway Signaling

Remote Diagnostic & Predictive Maintenance System (RDPMS) is an **IoT based** maintenance system that enables the monitoring, analysis and advance maintenance of various types of signaling devices remotely. It collects **real-time data** from various signaling gears to monitor parameters like temperature, voltage, current, power consumption etc. which is transmitted to **edge computing** via station gateways for **real-time data** analysis by using **AI & Machine Learning algorithms.** The analyzed data is then transferred to a **Central Cloud hub** where the historical trends and real time data patterns are preserved to generate **alert insights.** This predictive maintenance feature of the system sends early **warning signs, alerts or faults** to web server and mobile applications. On the basis of those alerts the maintenance activities and preventive measures can be taken..

DC Track Circuit Health Monitoring

- DC feed end and relay end voltage
- Input Voltage & output current of Track feed battery charger
- Voltage & charging /discharging current of battery.

MSDAC Health Monitoring

- Diagnostic data from Di-agnostic port of Axle counter evaluator shall be captured.
- Current and status of vital relays
- Input Voltage

Earth Resistance Monitoring

- Resistance value
- Live Earthing Status
- Alerts for low resistance values

Battery Bank Health Monitoring

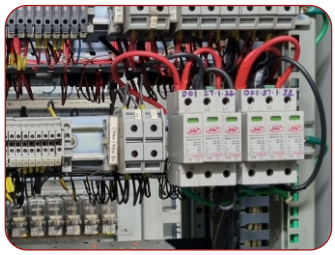
- Overall Voltage and current of 110V battery bank will be monitored.
- Ambient Temperature and humidity

Integrated Power Supply

- Availability of standby input power supplies from Autochangeover system of IPS.
- Health of IPS modules from potential free contacts
- All voltage outputs

Point Machine Health Monitoring

- DC operating Current
- DC operating Voltage
- Vibration



SPD Health Monitoring

- The potential free contacts of SPD devices where available shall be monitored
- Care should be taken to keep sensor wiring from SPD such that (electrically) dirty cable in SPD box is not in parallel to sensor wires

ELD Potential Free Contacts Monitoring

- Status of earth leakage from the ELD to be monitored.

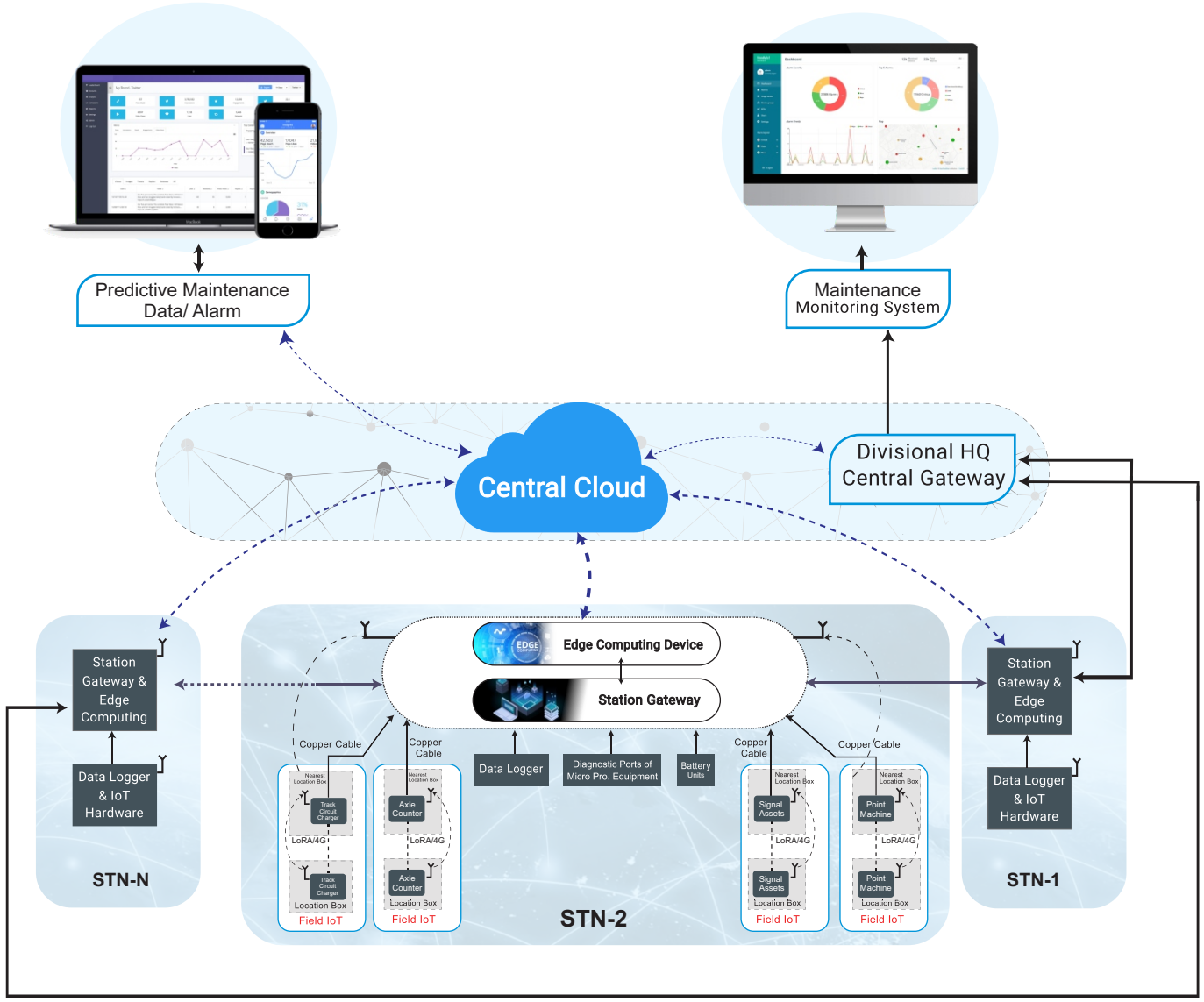
Signal Aspect Health Monitoring

- Status of local signal control/ detection relays at Location boxes.
- AC Current
- DC Current

Control Room Temprature

- Live Operating Parameter status
- Status Monitoring of Control Panels
- Ambient Temperature and Humidity of Control Room

Software & Data Analytics



System Components

Sensors

Gateway

Power Backup

Embedded CPU

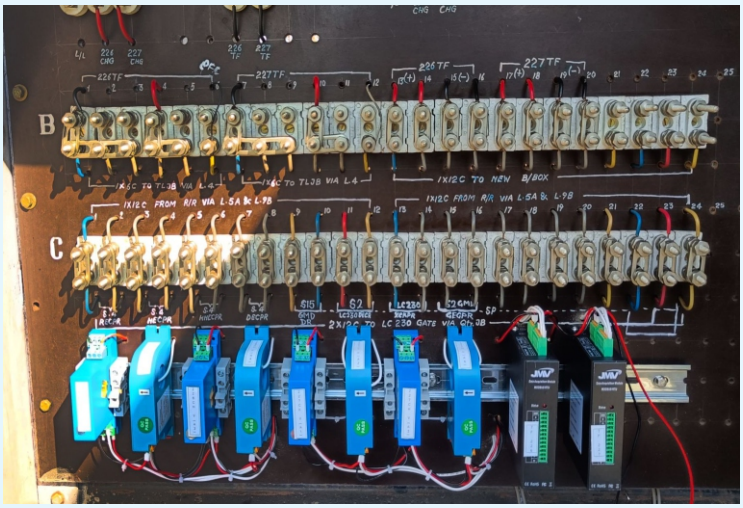
Field Transmission Unit (FTU)

Visual Display Unit

Router for Connectivity

Signal Isolator & SPD

Installation References



Key Benefits of Remote Diagnostic & Predictive Maintenance System

- Extended Equipment Life
- Cost Optimization
- Proactive Maintenance
- Data-Driven Decision Making
- Enhanced Safety
- Early Fault Detection
- Continuous Monitoring
- Historical Performance Analysis
- Increased System Availability
- Efficient Resource Allocation

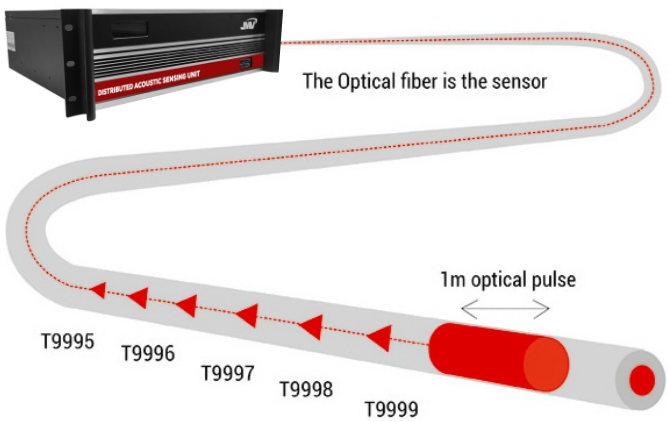
ELEPHANT INTRUSION DETECTION SYSTEM

Ensuring the safety of the ***Track, Wildlife, and Passengers***

Elephant Rakshak **(ER)** employs cutting-edge fiber optic technology known as Distributed Acoustic Sensing (DAS) to enhance elephant safety. It detects acoustic signals along a fiber optic cable, enabling early detection of elephants in the elephant corridors and other events like train detection, digging activities, fiber cuts/losses etc. to enhance the overall railway safety and to protect elephants.

Technology

- The Laser pulses are periodically sent down an optical fiber cable, looking for Backscatter to perform temperature sensing and Rayleigh backscatter for pressure/acoustic sensing.
- The signature of the backscatter changes with change in temperature/acoustic energy.
- The entire length of the optical fiber cable acts like a sensor and every meter act like an independent thermometer/microphone.

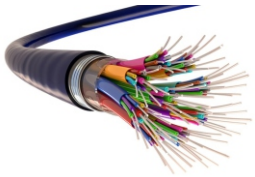


System Components

DAS Unit

Reset Unit

ER Software



Fiber optic cable

ER Loco Pilot Unit (Tablet)

Power Backup

ASM Unit

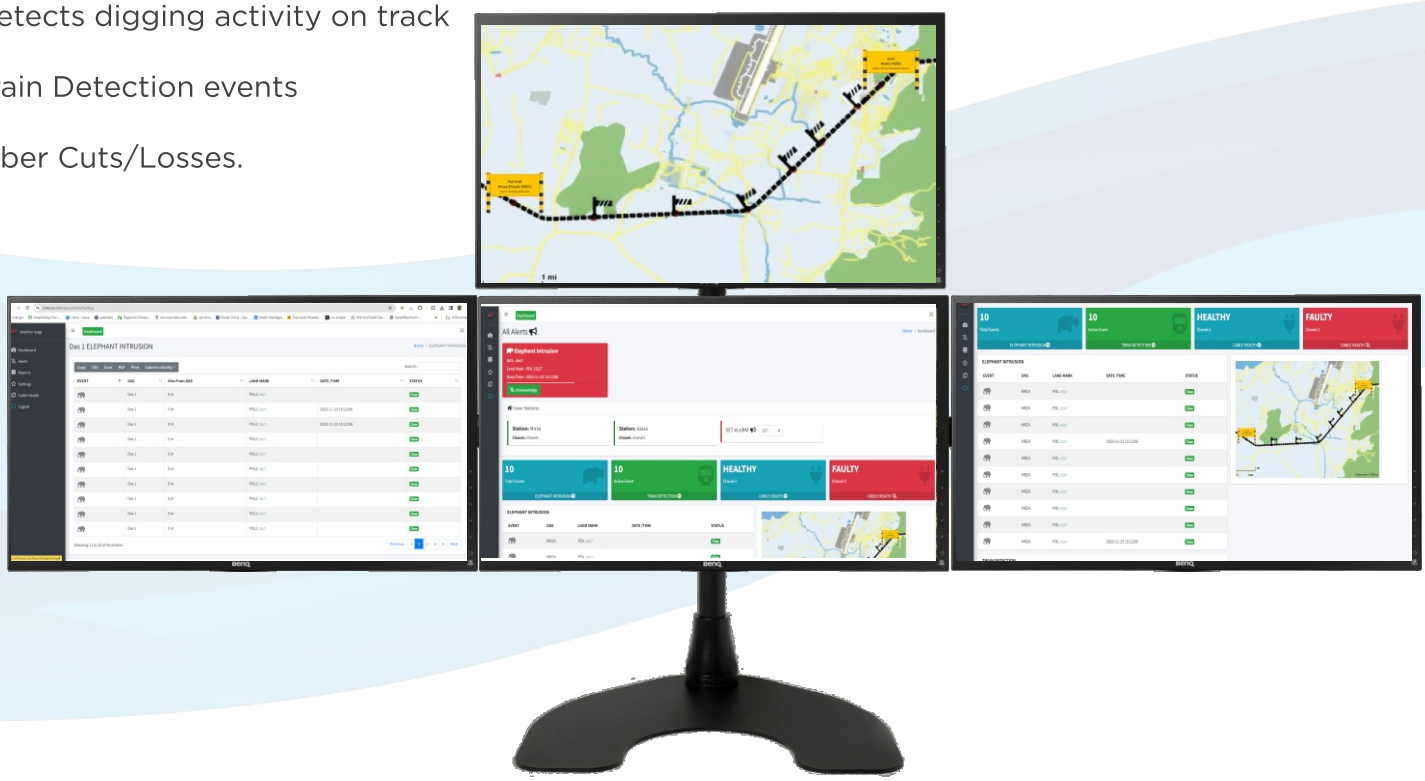
Remote Alarm Unit

IP Based Hooter

Key Features & Solution Range

The Elephant Rakshak features an advanced user friendly, single software platform to show real time:

- Elephant Movement Detection.
- Detects digging activity on track
- Train Detection events
- Fiber Cuts/Losses.



IP-MPLS

Internet Protocol Multi-Protocol Label Switching (IP-MPLS) solutions are specifically designed to enhance data transmission & optimize network routing by utilizing short path labels, resulting in faster data transfer, improved network reliability & simplified management for large-scale networks.

These solutions are built on a Category VI chassis-type router, compliant with TEC-GR 48050 standards, ensuring the system meets high performance and reliability requirements.

To guarantee uninterrupted service, the router features 1+1 or N+1 power supply and fan redundancy, operating in hot-standby mode.

This configuration ensures high availability, preventing network outages by maintaining continuous operation until both the primary and standby power supplies or fans fail. This redundancy mechanism is essential for ensuring that critical operations remain unaffected, even during component failures, providing a robust & reliable infrastructure for large-scale and mission-critical networks.

Key Benefits

- **Supports IP Routing & Network Connections:** Faster performance with hardware-based forwarding.
- **Scalable:** Easily engineered for high-performance and bandwidth optimization.
- **Interconnectivity Growth:** Minimal hardware required for network expansion.
- **Remote Connections:** Enables new connections without additional hardware, cloud-based.
- **WAN Routing:** Service provider-managed, reducing staffing needs.
- **Quality of Service (QoS):** Prioritizes latency-sensitive traffic like VoIP.
- **WAN Protocol:** Efficient for any-to-any connectivity, including voice and video.
- **Service-Level Agreements (SLAs):** Guarantees reliable service delivery.
- **Enhanced Bandwidth:** Supports multiple traffic types.
- **Improved Up-time:** Provides alternative network paths for better availability.
- **Lower Congestion:** Uses alternative paths to reduce network congestion.

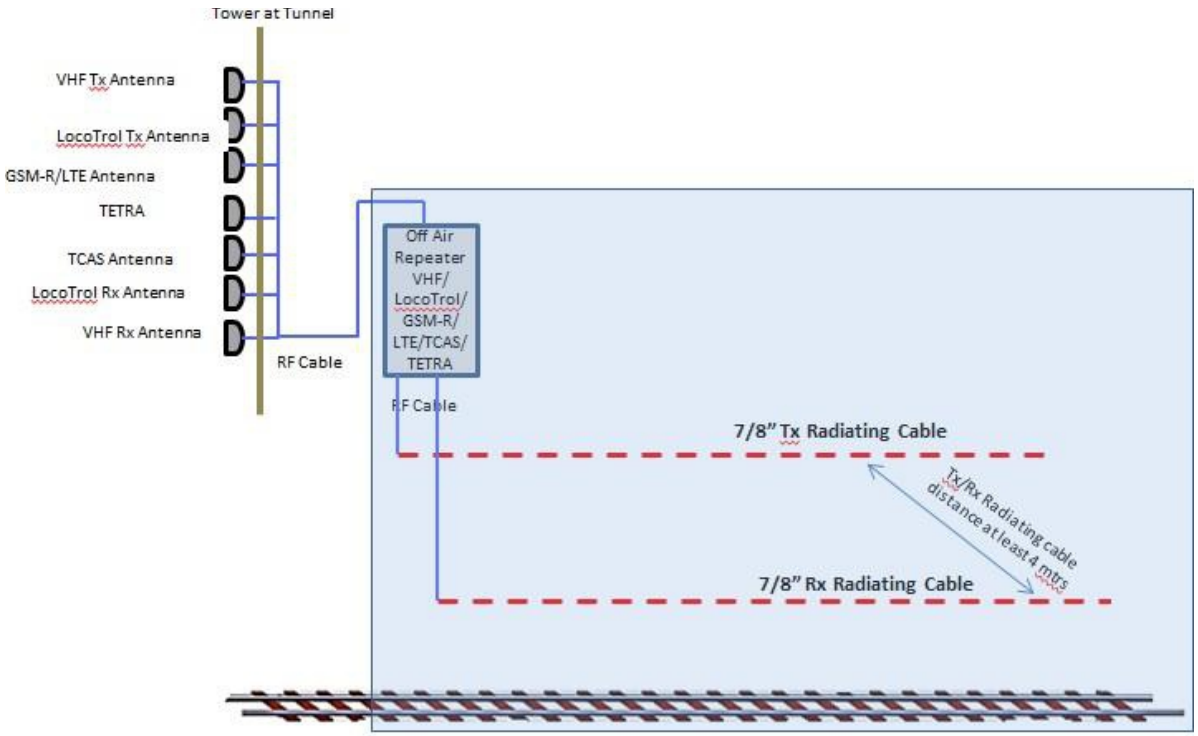
Tunnel Communication

Tunnel Communication is essential for the safety and efficiency of tunnel operations. Effective communication between train crews, stations, and other operational points is crucial, especially in complex environments where thick walls and structures can block radio signals. Investing in advanced tunnel communication solutions ensures strong, continuous communication channels, critical for passenger safety and operational efficiency.

Implementation schemes of Tunnel communication

Tunnel communication for less than 500 mtrs. Lengths

The implementation scheme of Tunnel communications for short length of tunnel i.e. less than 500 meters length is shown in the below figure. Radio frequency may be extended in Leaky Cable throughout the tunnels with the help of Off-Air Channelized Repeater and Antenna installed at tunnel site for VHF Simplex, LocoTrol, GSM-R/LTE, TCAS, TETRA etc. with necessary power supply equipment.

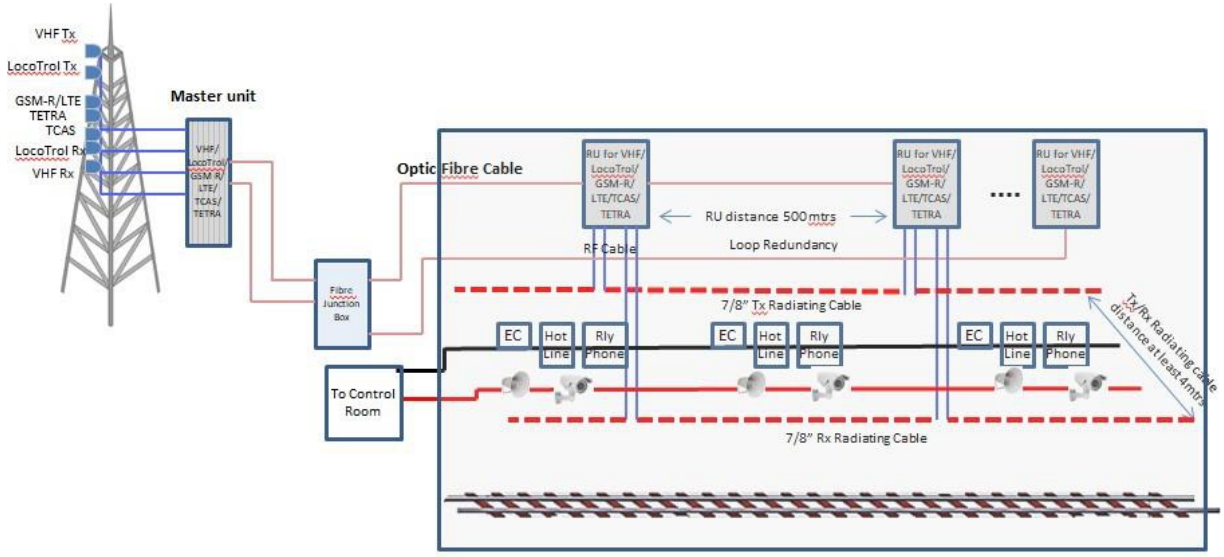


Radio Tower & RF Cable

- Galvanized steel structure of tubular triangular
- Self-supported/ guyed mast
- Maximum height – 10m on single foundation
- Lightening arrestor of copper rod connected from tower top to ground
- Aviation lamp on the top for identification
- GP antennas (Tx & Rx) installed on the radio tower

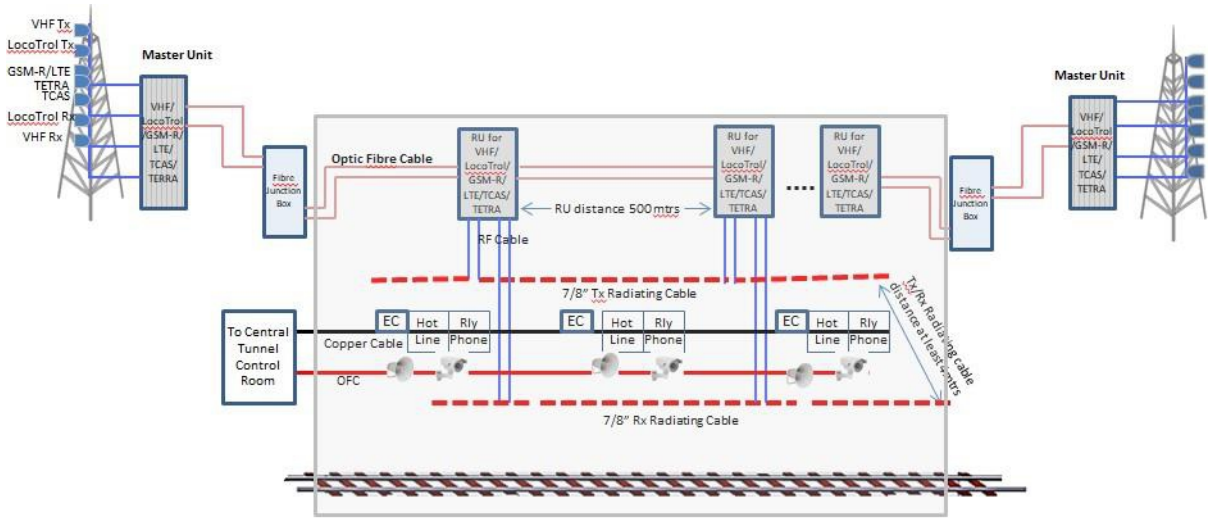
Tunnel communication for more than 500 mtrs. to 5 Km lengths:

The implementation scheme of Tunnel communications for medium size of length of tunnel i.e. more than 500 meters to 5000 meters length or cluster of many nearby small tunnels is shown in the below figure. Radio frequency may be extended in Leaky Cable throughout the tunnels with the help of Master Unit, Optical Remote Unit, Optical Fibre Cable, Fibre Junction Box and necessary power supply equipment. In this type of Tunnel communication, a loop redundancy optical Fibre cable has been applied for failure free communication.



Tunnel communication for more than 5 Km lengths

The implementation scheme of Tunnel communications for long size of length of tunnel i.e. more than 5000 meters or cluster of many nearby small or medium size of tunnels is shown in the below figure. Radio frequency may be extended in Leaky Cable throughout the tunnels with the help of Master Unit, Optical Remote Unit, Optical Fibre Cable, Fibre Junction Box and necessary power supply equipment. In this type of Tunnel communication, a redundancy Master unit has been installed at other side of Tunnels for failure free communication.



Salient Features of the Solution Components

Enhanced Safety

Ensures smoother operations by providing efficient and clear exchanges during emergencies, facilitating coordinated responses and effective assistance, thereby optimizing operational efficiency.

Operational Efficiency

Ensures smoother operations by providing efficient and clear exchanges during emergencies, facilitating coordinated responses and effective assistance, thereby optimizing operational efficiency.

Reliability

Advanced communication systems play a crucial role in ensuring the safe and efficient movement of trains, thereby contributing to the overall reliability of the rail network. It is essential to ensure that communication channels consistently meet the highest standards of safety and efficiency.

High-Speed Data Transmission

Utilize wired communication systems, such as fiber optic cables, to ensure high-speed data transmission with minimal interference.

Wireless Connectivity

Implement wireless communication technologies, including Wi-Fi, Bluetooth, and cellular networks, to provide connectivity to mobile devices and vehicles within the tunnel.

Hybrid Communication Appr oach

Combine both wired and wireless communication technologies to address the unique challenges posed by tunnel environments, such as confined spaces and limited visibility.

Interference Management

Design the communication system to minimize interference from physical obstacles, ensuring reliable and uninterrupted communication for tunnel operations and maintenance activities.

Safety and Efficiency

Ensure that the communication system is well-designed to support safe and efficient operations within tunnels and underground structures, facilitating seamless communication between different points within the tunnel.

Solution Components

Master Unit

The Master Unit is used to convert signals from RF to light when fibre fed repeaters is used at the remote end of the optical link. Master Unit shall be used in more than 500 meters lengths tunnels.

Master Unit system may consist of following sub-system:

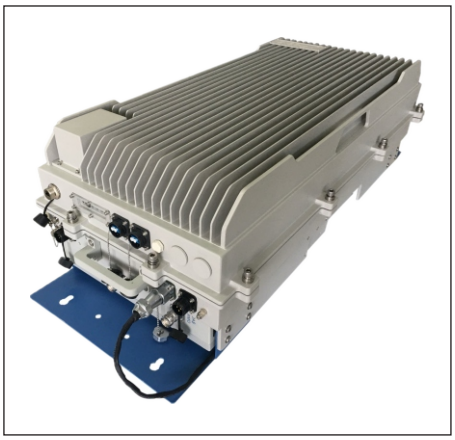
a) Channelized VHF Simplex Off-Air Repeater & VHF Simplex Optical MasterUnit.

b) GSM-R/LTE Off-Air Repeater and GSM-R/LTE Optical Master Unit.

c) Channelized TCAS/ LocoTrol/ TETRA Off-Air Repeater.

Optical Remote Unit

Optical Remote unit is used at the remote end to convert Optical Signal to RF Signal and then transmit it into Leaky cable in the particular area to cover the tunnel for the wireless communication. It is connected to Master Unit. Optical Remote Units to accept for VHF Simplex, LocoTrol, GSM-R/LTE, TETRA and TCAS. Remote unit are Monitored, Controlled and Alarmed Remotely from the Master Unit over Fibre and Remotely using an Ethernet Modem. Optical Remote unit shall be used to provide coverage in more than 500 meters lengths tunnels.

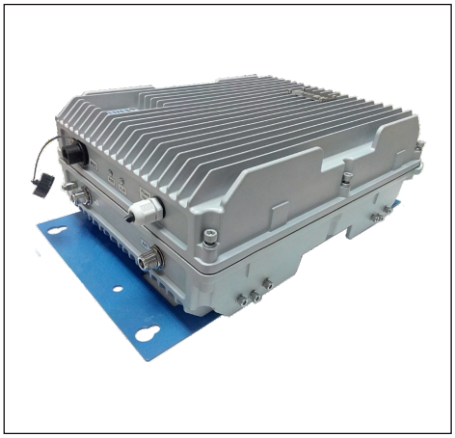


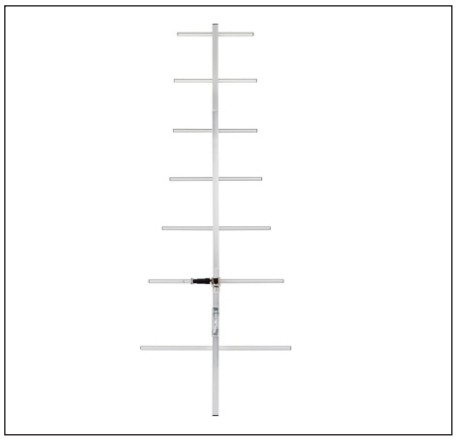
Leaky Cable:

Leaky Cable is a type of RF coaxial cable which has gaps or slots in its outer conductor to allow the radio signal to leak into or out of the cable along its entire length so the cable functioning as extended antennas. It is also called radiating cable. Leaky feeder cable run along with tunnels which emits and receive radio waves. Leaky feeder cables using a foam dielectric, will prevent water entering the cable and running down the cable into amplifiers/devices.

Off-Air Channelized Repeater:

For less than 500 meters Tunnels are to be covered with High Gain Off-Air Channelized Repeaters feeding Dual Radiating Cable Systems. The Repeaters cover VHF Simplex/LocoTrol, GSM-R/LTE, TETRA and TCAS communication per Bore.





Antenna for system:

For Tunnels less than 500 meters, Antenna shall be installed at tunnel site for VHF Simplex, LocoTrol, GSM-R/LTE, TCAS, TETRA etc. For Tunnels more than 500 meters, Antennas shall be installed on a Tower for VHF Simplex, LocoTrol, GSM-R/LTE, TCAS, TETRA etc. The wireless system and tower with antenna to be installed should have the SACFA clearance as applicable.

Antenna arrangement consists of:

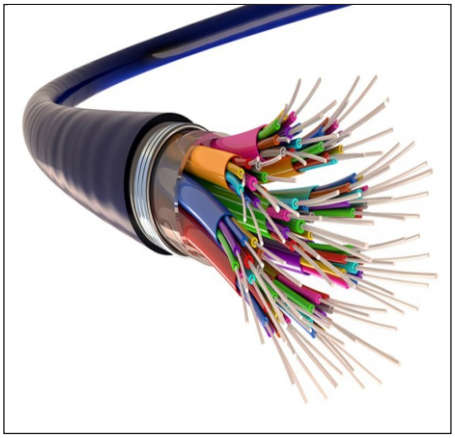
a) RG217 Coaxial cable with proper connectors

b) RF Lightning & Surge Protector

c) Tower at Tunnel for fixing antenna

Optic Fibre cable:

Master Unit at Base station shall be connected to the tunnel optical remote unit through Fibre Junction Box. Video Surveillance System and PA Systems shall also be connected through same Optic Fibre system.



Power supply unit

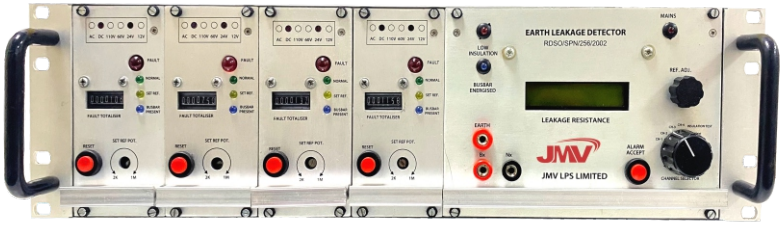
For Tunnel Communication, power supply unit with battery backup (230VAC 50Hz or -48 VDC) for Master Unit, Optical Remote unit/Repeaters should be required.

EARTH LEAKAGE DETECTOR

Earth Leakage Detector is an aid for monitoring the earth faults in signaling cables and circuits which increases the efficiency and reliability of Signaling system.

The arrangement of the system comprises of 4 channels, for use on signaling circuits of **110V AC/DC and/ or 60V/24V/12V DC** as per the requirement.

For less number of channels, dummy plates will be provided similarly for additional requirement add on/ expandable cabinet may be provided. The voltage specified will be provided with **+ 25% and - 10% tolerance.**



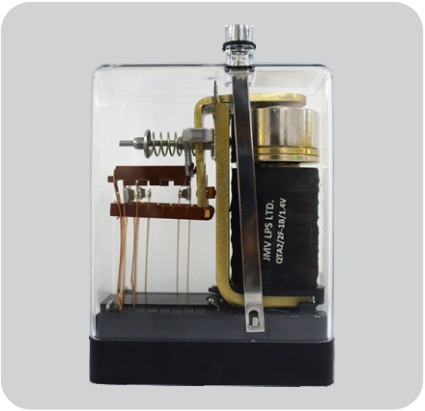
Technical Parameters	
AC Mains	110V AC/ 230V AC, 50Hz
Signaling supply	12V, 24V, 60V or 110V DC/AC as per the requirement
Bus bar voltage	Vary for each channel
Leakage setting range (Fault detection range)	2K-1M
Meter Range	2K-10M
Visual Indication	Normal – Green LED Set Ref – Amber/ Green LED Fault – Red Busbar Present – Green 6 digit counter for recording the fault occurrences
Terminals added	For remote indication, remote buzzer and relay contacts
Size/ dimensions	Fitting into standard 19” rack

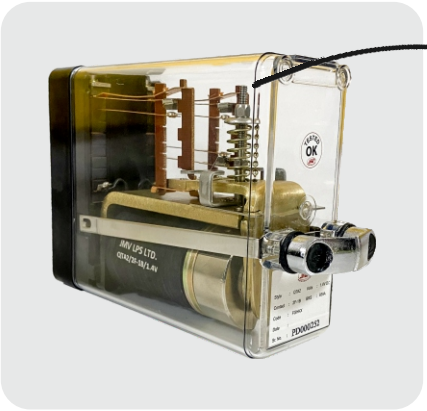
Installation References

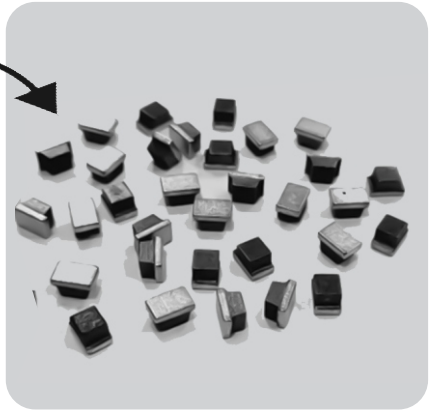
ELECTRO MECHANICAL RELAYS & SIG CONTACTS

For Railway signaling circuit, a wide range of Q series relays are used for many signaling operation such as Route Relay interlocking, automatic signaling systems, point operation, track circuiting etc.

Relay plays a vital role in railway signaling and hence requires **RDSO approval** for each type of relays being used in the system. JMV offers a wide range of application specific and special purpose Q series relays as per the relevant Railway standards.







JMV also offers Silver Impregnated Graphite Contacts which is a key component of Q series Metal to Carbon Contact Relays. Silver impregnated Graphite Contacts combine the best properties of high conducting silver refractory for graphite material base contacts being widely used in Railway signaling relays.

Technical Parameter:

Type	Description	Voltage	Contact
QN1	Non ACI, DC Neutral Line Relay	24 V DC	8F-8B / 12F-4B
QNA1	ACI, DC Neutral Line Relay	24 V DC	8F-8B / 12F-4B
QT2	Non ACI, 9Ω, DC Neutral Track Relay	1.4 V DC	2F-2B
QTA2	ACI, 9Ω, DC Neutral Track Relay	1.4 V DC	2F-1B
QBA1	ACI DC Biased Line Relay	24 V DC	8F-8B
QSPA1	ACI, Slow to Pick up, DC Neutral Line Relay	24 V DC	8F-4B
QN1K	Non ACI, 1000Ω, DC Neutral Line Relay	24 V DC	6F-6B / 4F-4B
QNA1K	ACI, 1000Ω, DC Neutral Line Relay	24 V DC	6F-6B / 4F-4B
QBCA1	ACI, DC Biased Contactor Relay	24 V DC	2HF-4B
QS3	Non ACI, 1000Ω, DC Neutral Line Relay	12 V DC	4F-4B
QNN1	Non ACI, Twin DC Neutral Line Relay	24 V DC	LH 6F-2B / RH 6F-2B
QNNA1	ACI, Twin DC Neutral Line Relay	24 V DC	LH 6F-2B / RH 6F-2B
QL1	DC magnetically latched neutral line Relay	24 V DC	11F - 4B
QBAT	DC biased track Relay	2 V DC	2F-2B
QECX-61	AC Lamp proving relays	110 V AC	4F-4B

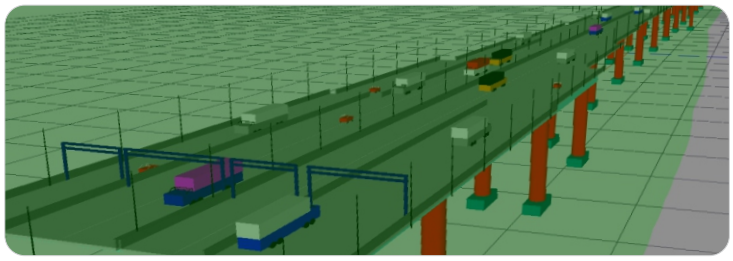
CDEGS SOFTWARE

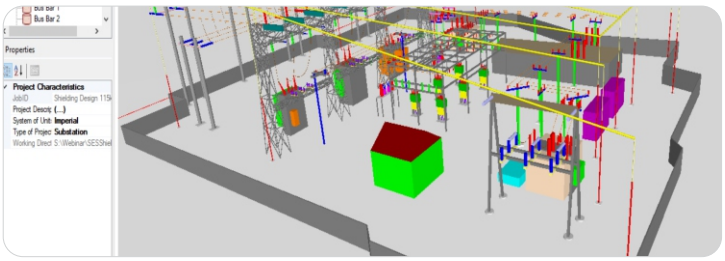
CURRENT DISTRIBUTION, ELECTROMAGNETIC INTERFERENCE, GROUNDING AND SOIL STRUCTURE ANALYSIS

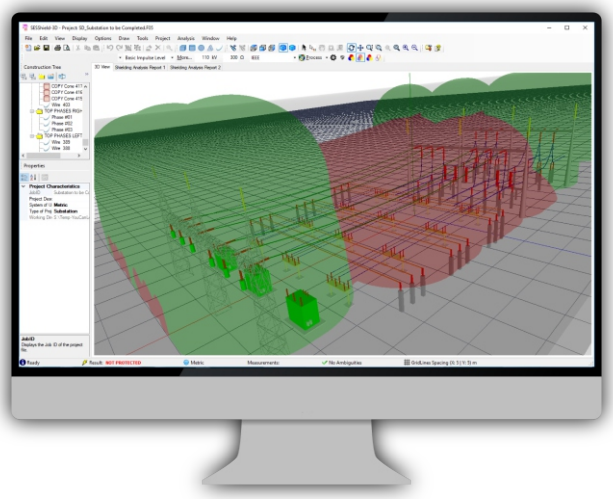
CDEGS is an advance software which makes the designing and validation of design possible and much easier for us. JMV, being a one-stop solution provider, offers you its services of designing with the help of CDEGS only so that you can ensure that you have got the most practical and cost effective solution for your project.

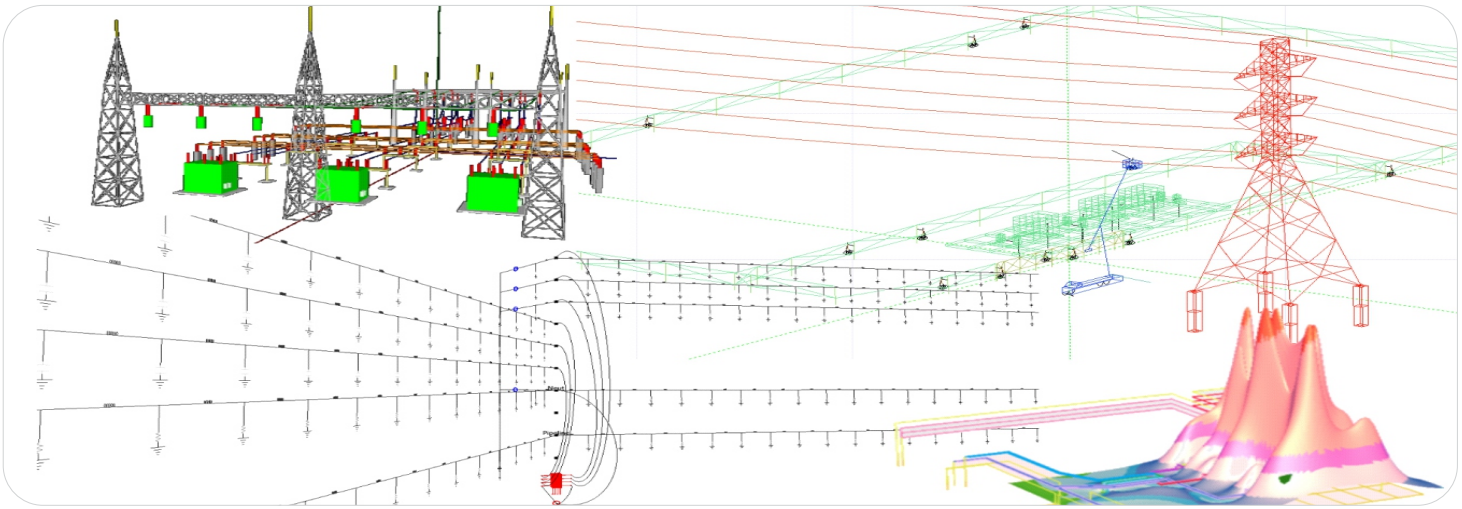
In Railway **CDEGS** is used for Electrical Earthing Design for Substations TSS, etc. LPS Designing and S&T Earthing for Crossing Stations/ Junction Station Building.

Simulation from CDEGS









Features

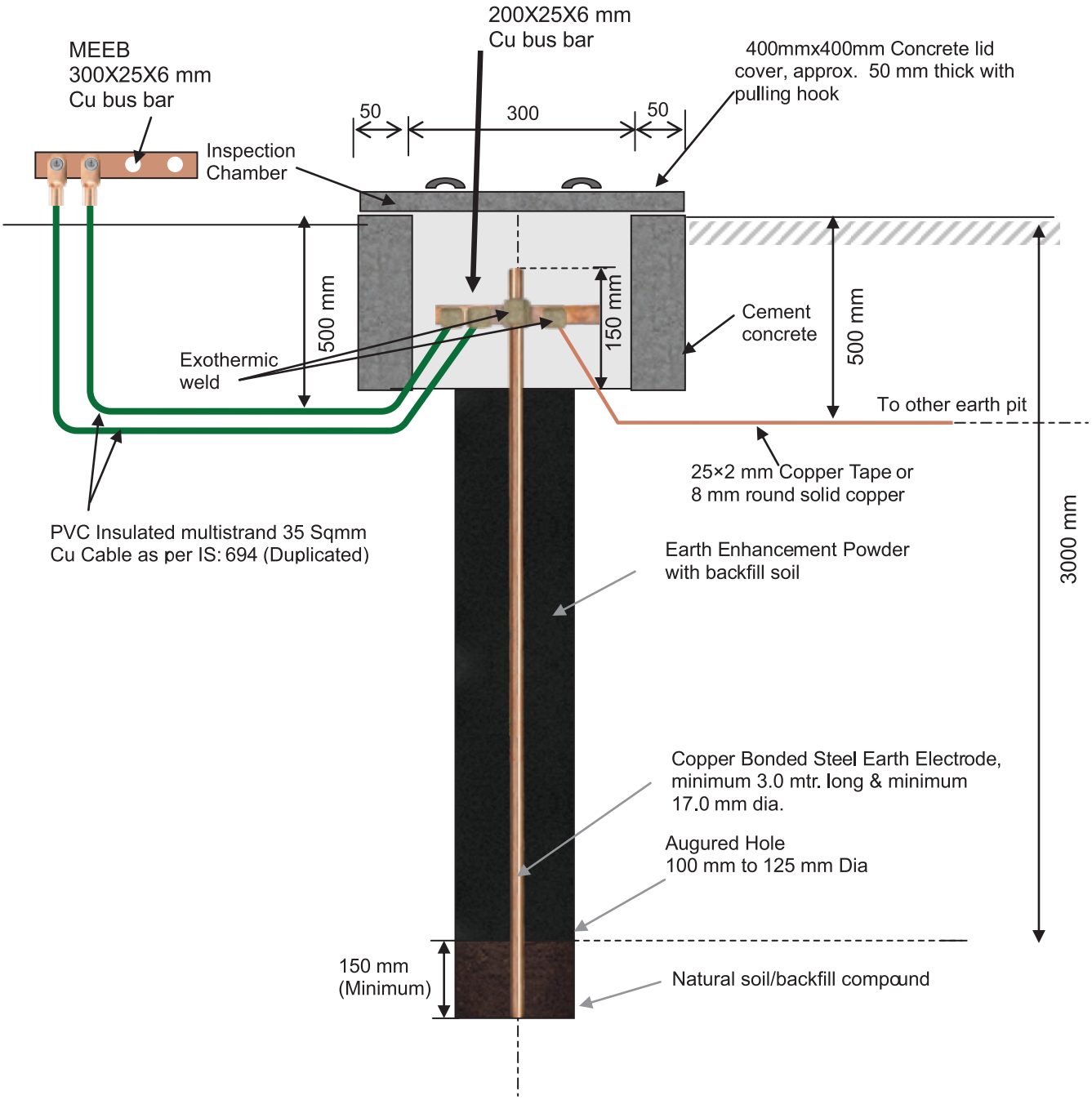
- **Capable of 3D simulation of buildings**
- **Soil Resistivity Analysis & Soil Structure Interpretation**
- **Potential, Touch Potential & Ground Potential Rise**
- **Design validation as per Real Time Simulation**
- **Graphical Representation for Step**
- **Optimized Design**

EARTHING & BONDING SYSTEM

As Per RDSO/SPN/197,VERSION 1.0

JMV is up with superior engineered products which cover Earthing & Bonding Solutions for signaling equipment comprising very sensitive electronic components which are more susceptible to damage due to surges, transients and over voltages being encountered in the system due to lightning, sub-station switching etc. These signaling equipment include Electronic Interlocking, Integrated Power Supply Equipment, Digital Axle Counter, Data Logger etc.

The components of Earthing & Bonding System are Earth Electrode, Earth Enhancement Material, Earth Pit, Equi-potential Earth Busbar, connecting cable & tape/strip and other associated accessories.



RDSO	
Typical installation of earth for S&T Installations	
Drg. No. SDO / RDSO/ E&B/001	Sheet No. 1 of 1

INTEGRATED SOLUTIONS FOR TUNNEL

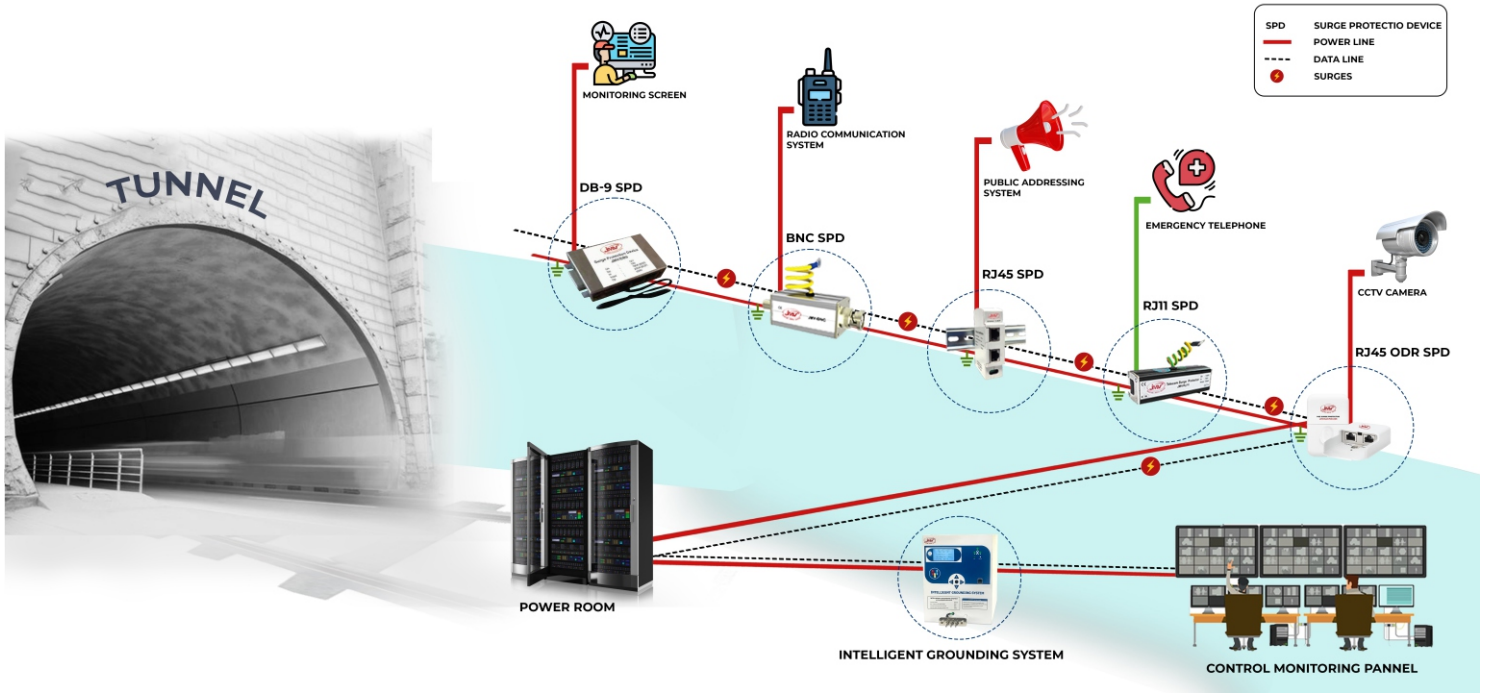
To meet the evolving demands of the railway infrastructure, an integrated earthing system is paramount. By encompassing E&M, S&T, and tunnel structure earthing, this approach ensures a more resilient and adaptive earthing strategy. It aligns with the progressive nature of tunnel construction and supports the seamless integration of advanced technologies, contributing to the overall safety and efficiency of rail tunnel operations in rocky terrains.

The structural reinforcement of tunnel shall be connected with the main earthing conductor laid inside the tunnel all over the length of the tunnel. This main earthing conductor shall be interconnected with the main earthing grids installed at the portal stations of the tunnel.



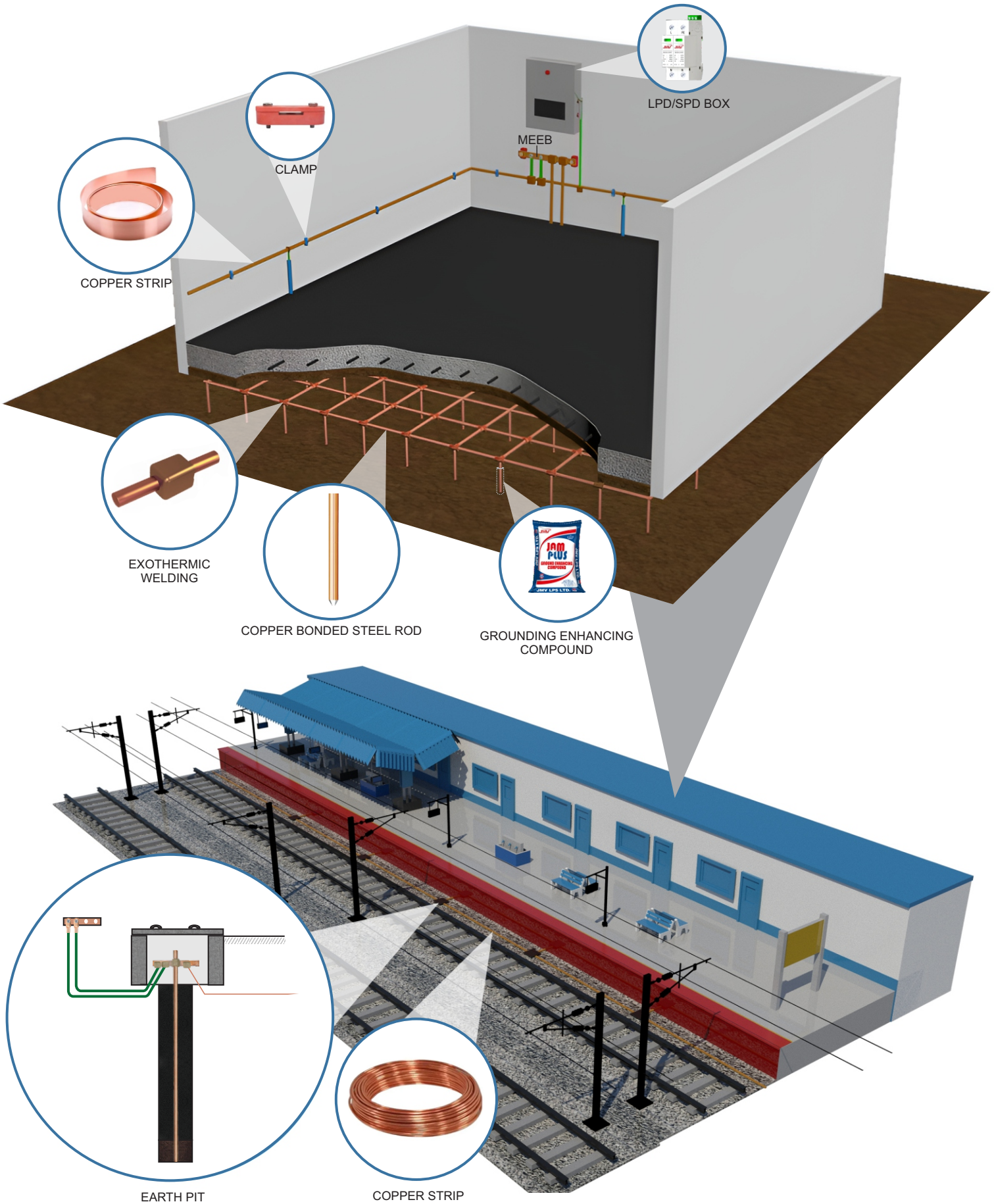

Rail Road Tunnels in India Designed with Integrated Earthing Solutions

- USSBRL Rail Tunnel
- Rishikesh Karan Prayag Rail Link
- Z-Morh Road Tunnel
- Sivok Rang-po Rail Link
- Bhanupali Bilaspur Beri Railway line and many more



INTEGRATED EARTHING

An integrated earthing system combines various earthing components to create a comprehensive and efficient earthing solution. It is an optimized design solution.



COMPONENTS OF INTEGRATED EARTHING

Earth Rods

JMV offers earth rods in pure copper and copper bonded steel materials.

Copper Bonded Steel Rods are most appreciable and highly preferable product known for its ultimate performance with significance of no hidden factor. These low carbon, molecularly bonded mild steel rods are manufactured, inheriting 99.99% pure electrolytic copper coating of minimum 250 microns.

JMV manufactures UL listed copper bonded rods of sizes **12.8 mm, 14 mm, 17 mm, 19 mm, 21 mm, 23 mm, 24 mm, 25 mm, 32 mm, 38 mm diameter** and copper rod of sizes **13 mm, 15 mm, 20 mm, 22 mm, 24 mm 25 mm diameter.**

Length:1.2m, 1.8m, 2m, 2.4m, 3m, 3.5m, 4m, 6m.

These copper/ copper bonded rods are tested by CPRI at various fault currents and also tested by NABL accredited labs as per IEC-62561.

Earth Enhancement Compound

The IEEE 80 and NBC-2016 guidelines highlight the need for artificial soil treatment when multiple rods fail to achieve low earth resistance. RoHS compliant Earth Enhancement Compound, containing 95% carbon, improves grounding systems in high resistivity soil. JMV's product adheres to IEC 62561-7 standard, ensuring quality through rigorous tests.

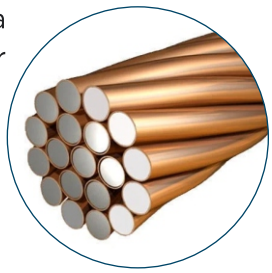
Features

- Offers an effective earth resistance in areas of high soil resistivity
- Does not leach out with time offering corrosion free system
- No scheduled or routine maintenance
- Retains moisture for longer span of time
- Easy to handle as it comes in 10kg and 25 kg bags
- Chemically inert and pollution free

Copper Clad Steel Conductor

Copper Clad Steel (CCS) conductor blends the strength of a steel core with the electrical conductivity of copper on the outer layer.

CCS conductor offers excellent fault current carrying capacity and is a cost-effective alternative to solid copper conductors, with lower scrap value.



Multi strand

Single strand

The electrical conductivity of the conductor determines its ease of formation, malleability, and durability, with **values of 21%, 30%, and 40% IACS.**

These conductors are available in **8 mm, 10 mm, single core and 150 and 170 sq mm stranded formation.**

Exothermic Welding

An exothermic welding system is used for making electrical connections of copper to copper, copper to steel or copper to cast iron for grounding and cathodic applications. An exothermic welded connection shall be suitable for exposure to the elements of direct burial in earth or concrete without degradation over the lifetime of the grounding system."

Features

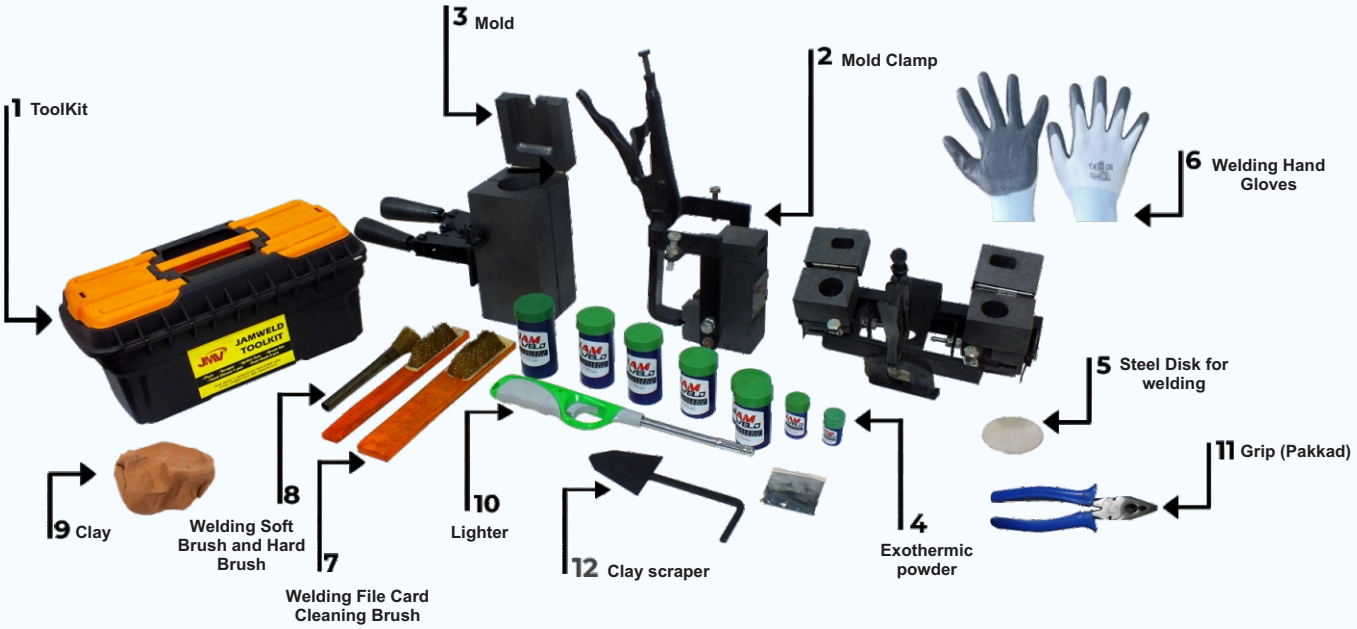
- Exothermic weld connections form a solid bond around the conductors assuring continuity.
- Superior electrical conductivity.
- Easy installation due to absence of external source. Can be installed at any remote location.
- Exothermic bonds have a higher mechanical strength as compared to other forms of welding.

Installation References






Exothermic Welding Kit



Earth Pit Chamber

In conventional earthing systems, heavy and hard to-maintain RCC pit covers are used, but they often get broken due to mishandling. The latest solution is lightweight plastic pit covers, which are easy to maintain and have a high load-bearing capacity (tested at 8 tons by a government NABL accredited lab).

These plastic pit covers are more economical than concrete covers and are already successfully used in **NCRTC & Metro projects.**

Features

Light weight

Durable

Easy to Installation

Strong

Cost-Effective

Lock & key

Installation References

Earthing Accessories

Our comprehensive range of Earthing Accessories, such as Earth Bars with **multiple connection studs, Earth Rods, Sleeving, Clamps, and more,** offers diverse configurations to meet your needs and safeguard electrical devices from potential damage.

DIGITAL GROUNDING SYSTEM

An Earthing Device that need not to be buried under the ground.

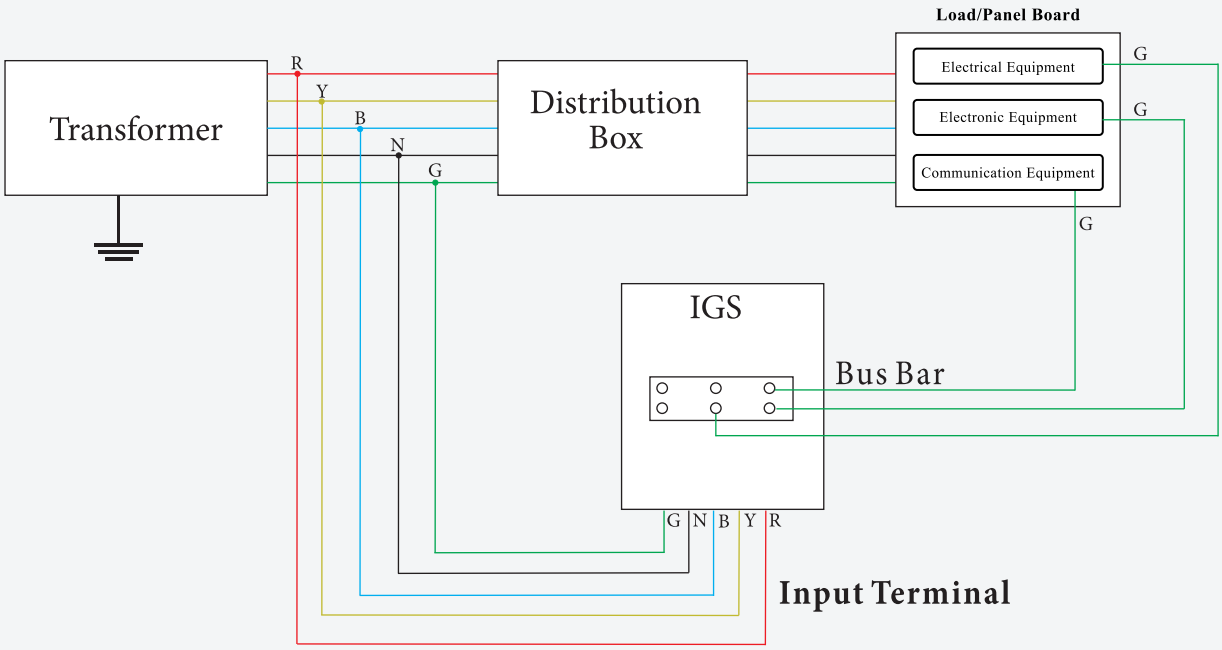
The **DIGITAL GROUNDING SYSTEM (DGS)** is an electronic device that ensures optimal grounding and surge protection for sensitive equipment. With a low impedance ground built-in, and surge protection it eliminates abnormal voltage and induced transients, as well as any static charge, noises, or other electrical anomalies that may affect valuable equipment. By providing a clear bonding potential and equipotential platform, it eliminates the possibility of step voltage damage and ensures a grounding network impedance of less than **1 Volt.**

- **A multi-functional device with Grounding, Surge Protection, Counter & Monitoring features.**
- **Has energy conversion and neutralization functions to convert surges into arc or heat and effectively dissipates them.**
- **A perfect engineering solution for rocky areas, hilly region and confined spaces.**
- **Provides a reliable and low-interference path for grounding and maintains stable potential of 1 Volt**

VARIANTS OF DIGITAL GROUNDING SYSTEM

BLOCK DIAGRAM

The installation of an Intelligent Grounding System is processed along with a power distribution box which filters out the fault current which may enter into the electronic equipment connected in the installation. A generalized connection block diagram for the same is shown below:



Technical Specification

Type	Rack Mount		Wall Mount		Trolley Mount	
	1ϕ	3ϕ	1ϕ	3ϕ	1ϕ	3ϕ
Technical Parameter	100 kA ~ 480 kA, 0.8KV~1.5KV		100 kA ~ 480 kA, 0.8KV~1.5KV		100 kA ~ 480 kA, 0.8KV~1.5KV	
Dimensions	483mmX305mm X132mm		320mmX250mm X130mm		320mmX250mm X130mm	

Applications

- **Communication Systems**
- **Computing Systems**
- **Broadcasting Systems**
- **Signal Control Systems**

Salient Features

- Monitors Line Voltage and Neutral-Earth Voltage
- Detects the presence and absence of earth
- Maintains potential less than 1 Volt between Neutral and Earth
- Saves real time data with date and time
- Data Port to extract the saved data

CLASS A LIGHTNING PROTECTION SYSTEM

As per IS/IEC 62305, National Building Code (NBC 2016) & NFC17-102

At **JMV LPS LTD,** we specialize in providing state-of-the-art lightning protection systems that safeguard your valuable assets, infrastructure, and personnel from the devastating effects of lightning strikes.

With years of experience in the field, our team of experts brings a deep understanding of lightning behavior, electrical engineering, and structural dynamics. This expertise allows us to design, install, and maintain lightning protection systems that minimize the risk of lightning-related damage, downtime, and loss.

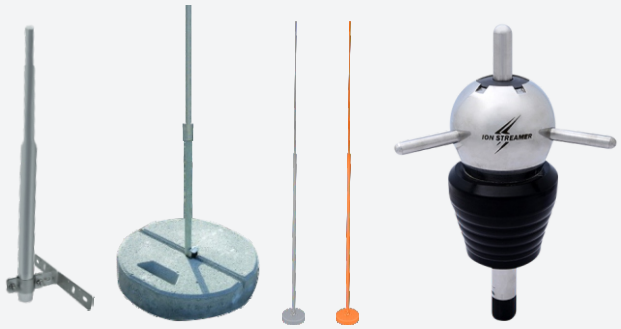
We are committed to adhering to the highest industry standards to ensure the safety, reliability, and effectiveness of our lightning protection systems. Our designs and installations are guided by internationally recognized standards that set the benchmarks for lightning protection practices. Some of the key standards we follow include IS/IEC 62305, NBC 2016, IEC 62561 series, OISD-GDN 180 and NFPA 780.

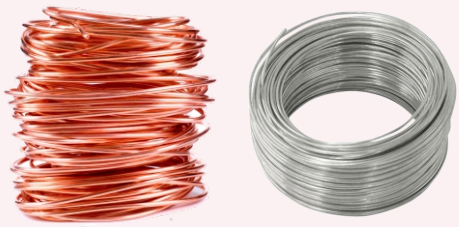
Air Terminal

As per IS/IEC 62305:2010, NF C 17-102

Air terminals, commonly known as lightning rods or strike points, are strategically positioned atop structures to intercept lightning strikes. Crafted from robust and corrosion-resistant materials, air terminals are designed to provide a preferred path for lightning to discharge safely into the ground, minimizing the risk of damage to the structure and its occupants.

The Air terminal rods are available in Aluminium, Copper, Copper Coated Aluminium & Copper Coated Steel, Stainless Steel, GI as per standard IS/ IEC 62305-3 specification. ESE Air Terminal is available in Stainless Steel material as per NF C 17-102.





Conductor

As per IS/IEC 62305:2010,

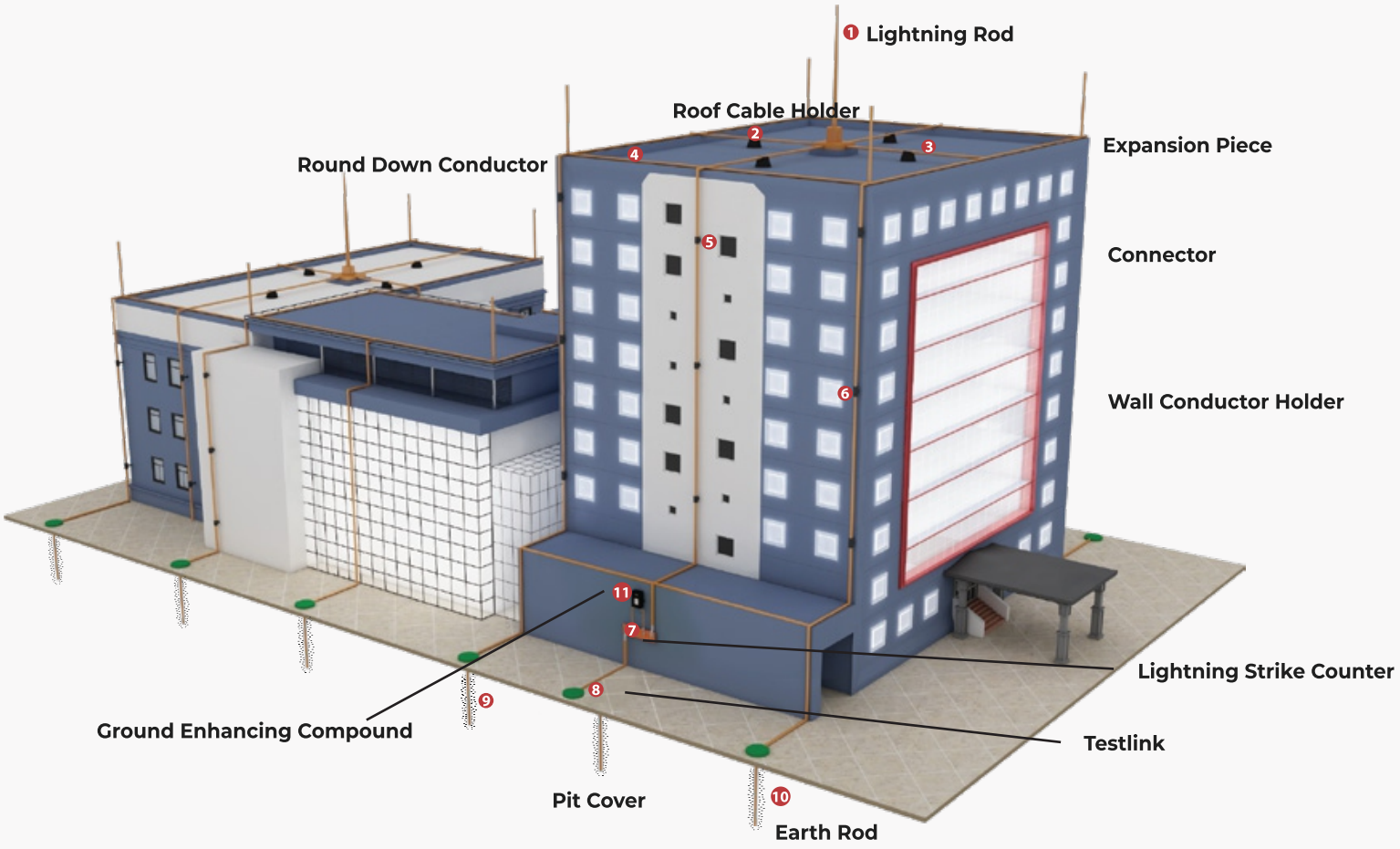
Conductors, also referred to as down conductors, mesh conductors, parapet conductors, ring conductors etc., play a crucial role in guiding the lightning current from the air terminal to the grounding system. Conductors are engineered to efficiently handle the immense electrical energy generated by lightning strikes, ensuring a smooth and controlled path for the lightning discharge.

The Conductors are available in Aluminium, Copper, Copper Coated Aluminium & Copper Coated Steel, Stainless Steel, GI as per standard IS/ IEC 62305-3 specification. For ESEAT, 50 sqmm or 70 sqmm PVC insulated copper cables are generally used as down conductors.

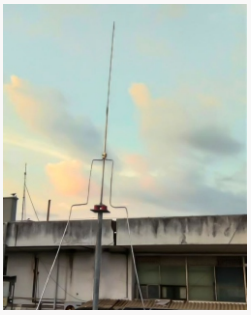
Lightning Protection System Accessories

Installation View of LPS /Class A Protection

as per IS/ IEC 62305



Installation References

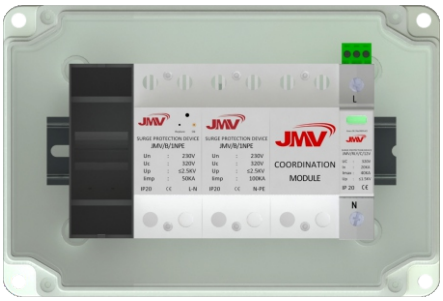


SURGE PROTECTION DEVICES FOR RAILWAY SIGNALING & TELECOM APPLICATIONS

Today Railway is the focal point of mobility and inherent utmost versatile segments to comfort the commodities. Signaling and Control systems are the important and most sensitive part of the Railways.

Disruptions and Damage due to direct and indirect lightning strikes and the consonant surges within the railway systems or to the exposed interlocking equipment and distribution systems is the major concern.

JMV is imparting reliable Surge Protection Solutions to all the prone parts of Railways as per the technical provisions discussed by RDSO/SPN/165/2012 & RDSO/SPN/144/2014 as well as RDSO/SPN/TC/98 &RDSO /SPN/TL/23/99, and in line with IS/IEC 62305, IEC 61643 etc.



Class B&C SPD (JMV/RLY/B&C)

Key Specs: with Coordination Module

For Class B: Un: 230 V AC, Uc: ≥ 255 V AC & Up: ≤ 2.5 kV
For Class C: Un: 230 V AC, Uc: ≥ 300 V AC & Up: ≤1.5 kV

Application: For Stage I Protection, typically installed at the input supply entrance of Integrated Power Supply systems for Railway Signaling

Class B SPD (JMV/RLY/B-230 AC)

Key Specs: with Coordination Module

For Class B: Un: 230 V AC, Uc: 320 V AC & Iimp: 50 kA, 100 kA & Up: ≤2.5 kV

Application: For Power Line Protection at main distribution level against direct lightning surges

Pluggable Class B (JMV/B/1NPE)

Key Specs: Modular; Pluggable
Un: 230 V AC, Uc: 320 V AC, Iimp: 50 kA, 100 kA & Up: ≤ 1.5 kV

Application: For Power Line Protection at main distribution level against direct lightning surges

Progressive Indication SPD (JMV/B+C/1NPE)

Key Specs: Progressive Status Indicator

For Class B: Un: 230 V AC, Uc: 320 V AC, Iimp: 50 kA, 100 kA & Up: ≤ 1.5 kV

Application: For Power Line Protection at main distribution level against direct lightning surges

Class C (JMV/RLY/C-24-60-110V)

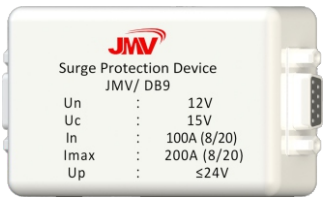
Key Specs: Modular; Pluggable
Un: 12-110 V, Uc: 16-150 V, In:≥10 kA, Imax: ≥40 kA Up: ≤ 0.3-1.5 kV

Application: For protection of track circuits, SMPS battery chargers, axle counters, point machines and other sensitive signaling equipment against low voltage surges at input Power Line equipment level

Coaxial Surge Protector (JMV/BNC/N/UHF)

Key Specs: Un: 12V, In: 10 kA, Imax: 20 kA, Up: ≤ 100 V

Application: For protection of UHF/VHF base antennas, station sets and coaxial cable terminators against transient surges



DB9 Surge Protector (JMV/DBXX)

Key Specs: Un: 12 V, UC: 16 V, In: 2.5 kA, Imax: 5 kA, Up: ≤50 V

Application: For protecting D-sub connector-9, 15 or 25 Pin Serial Communication Systems like monitors, displays, LCDs etc. against transient surges

JMVJRJ45 POE - ODR

Key Specs: Un: 48 V, Uc: 57 V, In: 5 kA, Imax: 10 kA, Up: ≤600 V

Application: For Protecting Outdoor modems, routers, Telecom, CCTV, POE & non POE systems against surges.

JMVJRJ45 POE - IDR

Key Specs: Un: 48 V, Uc: 57 V, In: 5 kA, Imax: 10 kA, Up: ≤600 V

Application: For Ethernet LAN (10 Base-T, 100 Base –Tx), modems, routers, CCTV, POE, non-POE data line surge protection.

JMVJRJ45 POE -4 Port

Key Specs: Un: 48 V, UC: 57 V, In: 5 kA, Imax: 10 kA, Up: ≤600 V

Application: Multiport SPD to safeguard indoor/outdoor POE and non-POE switches against transients.

Class D SPD (JMV/RLY/D-24-230)

Key Specs: Un: 24-230 V, Uc: 33-320 V, In: 5 kA, Imax: 10 kA, Up: ≤0.3-0.5 kV

Application: Safeguards external Power/Signaling/Data lines against transient surges.

Compact Pluggable SPD (JMV/C/XX)

Compact Sized, Single Module, Pluggable SPD

Key Specs: Un: 24-230 V, Uc: 33-320 V, In: 20 kA, Imax: 40 kA, Up: ≤0.5-1.5 kV

Application: For protection of track circuits, SMPS battery chargers, axle counters, point machines and other sensitive signaling equipment against low voltage surges at input Power Line equipment level.

Terminal Block SPD (JMV/TBXX/1PS)

Key Specs: Un: 12-110 V, Uc: 16-150 V, In: 2.5 kA, Imax: 5 kA, Up: ≤0.3-0.5 kV

Application: Terminal block integrated SPD for protecting telecom and signaling equipment against surges.

JMV/RJ11/RJ45 & RJ45 POE

Key Specs: Un: 12 V, Uc: 17 V, In: 2.5 kA, Imax: 5 kA, Up: ≤0.2 kV

Application: For protecting telephone lines, sensitive electronics & signaling equipment against surges

Krone Surge Protector (JMV/LSA10K110)

Key Specs: : Un: 110 V, Uc: 180 V, In: 5 kA, Imax: 10 kA, Up: ≤500 V

Application: For protecting Krone type Signaling & telecom networks against surges.

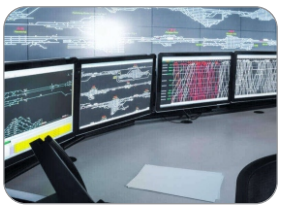
Solution for Surge Protection of Railway Signalling Assets

DC Track Circuit

Point Machine

MSDAC

Signal Aspect



Electronic Interlocking

Integrated Power Supply

CCTV Cameras

VHF Antenna

SPD LIFE TESTER

Surge Protection Device Tester is designed for on-site testing of Surge Protection Devices (SPD). It allows to measure both the varistor voltage that can be validated from the evaluation table. Users can determine the status of these components according to the tester. This device is capable to conduct the testing on any type of SPD. It is a hand held device which is easy to use for the maintenance team to check the efficient life of installed SPD's. It allows to measure Varistor Voltages and Leakage Current of MOV, Spark Over Voltage of GDT and Clamp Voltage of TVS/Zener.

Reference Standard:

This Tester is made with reference to IC 61643 part 11 and part 21.

- IEC 61643 "Surge protective devices connected to low voltage power distribution system" Part 11: Performance requirements and testing methods. Class I and II tests
- IEC 61643 "Surge protective devices connected to telecommunications and signaling networks" Part 21:

WHAT IS THE HEALTH STATUS OF YOUR SPD?

Portable hand held device

Testing the Health of SPD would be Easier now

Long Battery Life

Open and Short Circuit Protection

Automatic testing with robust design

CENTRALIZED MONITORING SYSTEM

Centralized Monitoring System (CMS) is an Embedded System(hardware and software) based equipment used for monitoring of "potential free contacts of SPD's (any voltage, type).The main objective of the device is to monitor real time health status of SPD and driving the data at a central server & represent it on software, thus reduces the human efforts of visiting the sites in periodic intervals.

Features

Mains

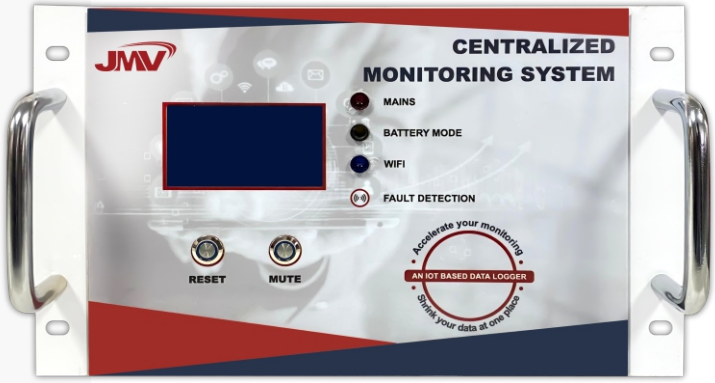
Visual Indication

Battery

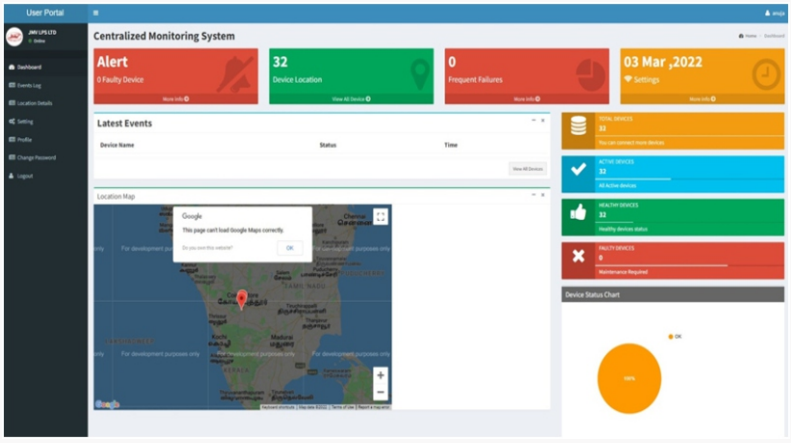
Alarm

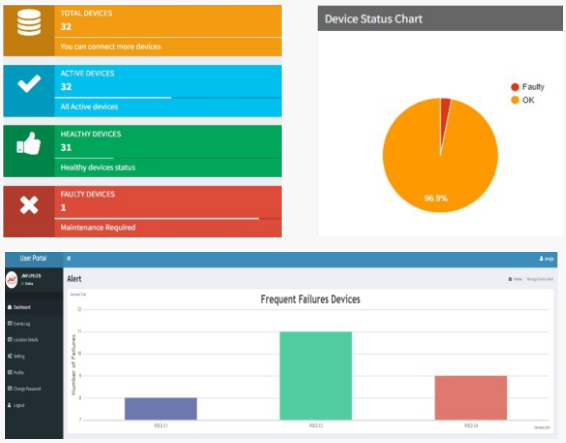
Wifi Connectivity

IOT Platform



Software Dashboard





The Centralized Monitoring System (CMS) is provided with an IoT based platform. The benefits of IoT server are:

1. Making it possible to keep an eye on remotely located devices all the time.
2. The server gets updated with the device status within seconds.
3. Log of events will help you keep updated with the health of your devices.
4. Reduces the efforts of maintaining hand written records as the server is capable of handling events occurred in past three months.
5. The servers gives the data about the devices that receives fault more frequently in a month, devices that have more than 7 failures in one month get stored and represented in form of bar graph.

SMART EARTHING MONITORING SYSTEM

Smart Earthing Monitoring System (SEMS) is an advanced **IoT-based** device which is designed to remotely monitor and evaluate the earth resistance and continuity of the grounding conductor. With the help of SEMS, multiple grounding systems can be monitored simultaneously and the combined data collected from various sensors is sent to a Central **Cloud hub** for real-time data analysis. It provides online alert insights and warnings to the registered users whenever the resistance value goes beyond the registered resistance values. The user can access real-time data either through a web portal or through the mobile application. With its advanced features and real-time measurement capabilities, SEMS ensures the optimal functioning and safety of grounding systems in various applications and scenarios.

Key Features

- Early alerts & notifications to reduce electrical hazards & enhance overall safety.
- Instant access to real-time data reduces hurdles of manual inspections.
- Real-time monitoring & early fault detection reduces system's downtime and repetitive maintenance.

- A single platform to monitor resistance of multiple earthing pits from any location, at any time.
- Simplified data analytics for user-friendly experience.
- Provision to view & print history records of previous data logs.

Web Portal and Mobile Application

The real time data obtained from the site locations is processed and sent to a Central Cloudhub. This real-time data is accessible to the users through the Web Portal and Mobile Application where the user can:

- Monitor the **real-time data values.**
- Check the **alert insights** and **warnings.**

- Set the resistance range for a particular **site location.**
- Check & Print the history records of particular **date and time.**

SIG CONNECTOR

Sig Connector is a **Silicon Gel Based Cable Jointing Kit** . It is the ultimate solution for quick, hassle-free cable joining. Built with self-sealing polymer insulation, this kit guarantees safe electrical connections, effectively preventing hazards. Whether for outdoor, underwater, buried, or armored and unarmored LT cables, this kit handles it all.

Crafted from tough, UV-resistant material, the kit withstands harsh atmospheric conditions. Its silicon gel filling provides superior insulation, blocking water penetration while offering high resistivity and dielectric strength. Plus, it's non-toxic and skin-friendly, ensuring compatibility with all cable components.

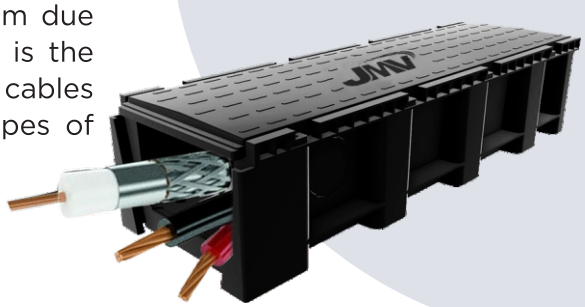
Advantages

- **Cost-Efficiency** : Save on expensive hardware - our kits are cost-effective, reducing the need for location boxes.
- **Space-Saving** : Eliminate bulky location boxes and free up valuable space in tight environments.
- **Quick Installation** : Reduce downtime with faster, less labor-intensive setup.
- **Reliability** : Sealed, durable connections protect against moisture, dust, and temperature extremes.
- **Flexible Placement** : Install it wherever needed-even in hard-to-reach places. Low Maintenance: Built for long-lasting durability, requiring minimal upkeep.

TECHNICAL SPECIFICATION	
Property	**Specification**
Dielectric Strength	23 kV/mm
Voltage Rating	Up to 11 kV
Protection	IP68 (Water tight)
Cross-Linking Temperature	-100°C to 550°C
Fire Retardant	UL 94 V1
Decomposition Resistance	400°C to 2000°C
Termite Resistance	Termite proof
Environmental Stress	No Cracking
Fungus & Chemical Resistance	Fungus and chemical proof
Product Life	25+ years

POLYOLEFIN CABLE DUCT

Polyolefin cable ducts may be very useful for application in sub-urban sections where cable trenching and digging is a severe problem due to space constraints, proximity of other cables and utilities. It is the best ever solution recommended for signal, telecom and electric cables for railways and metro rail to protect the cables from any types of damages due to external factors.



Features

CABLE SAFETY AGAINST JCB EXCAVATION

HIGH LOAD BEARING

FIRE RETARDANT

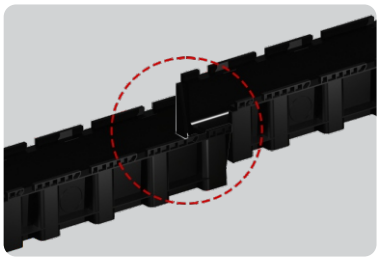
ANTI-RODENT

UV PROTECTION

HIGH DIELECTRIC STRENGTH

LIGHT WEIGHT

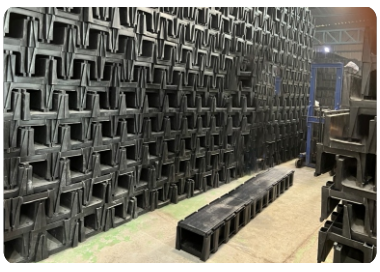
EASY TRANSPORTATION



MALE-FEMALE JOINTS

LOCK & SCREW

EASY INSTALLATION



EASE OF STORAGE

Installations

These multi use cable duct have a wide range of application, It can be installed as per the user requirement.

On The Bridge

Above The Ground

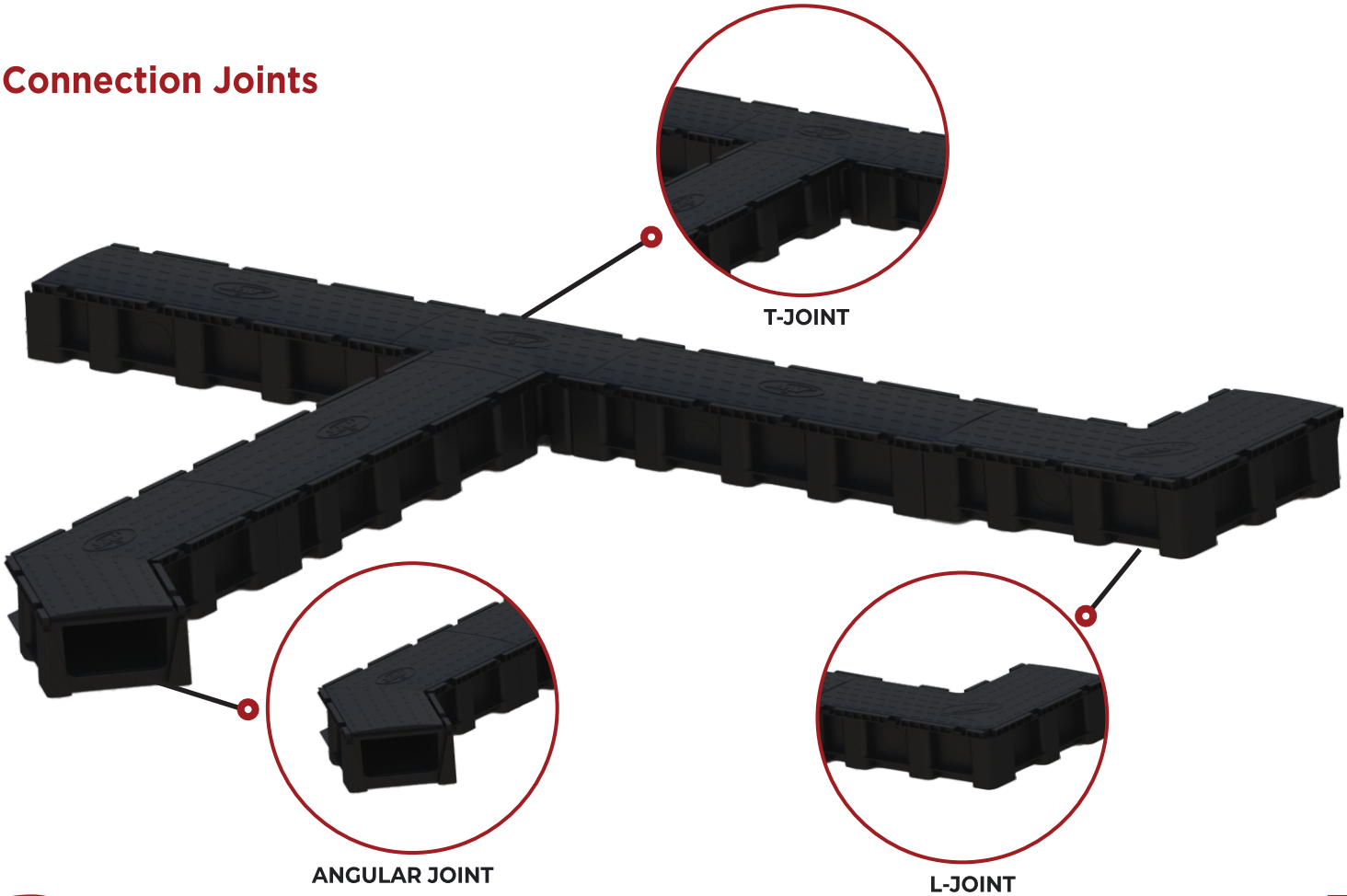
Below The Ground

On The Ground

Specifications/ Standards

The specifications and standards for cable ducts vary depending on the specific application and location, but generally include guidelines for materials, size and fire retardant. These cable ducts are tested as per relevant standards such as IEC 60243, **IS 9000 part 2 & 3, UL 94/DIN 53438 part 2.**

Connection Joints



METALLIC & POLYMER CABLE TRAYS

Cable Tray Systems are used to support cables for power distribution, control and communication in cable management in commercial and industrial application as an alternative to open cabling or conduct system.

Available in Stainless Steel and GI-Materials

METALLIC CABLE TRAY

Our Stainless Steel and Galvanized Iron cable trays for railway signaling are engineered to provide robust cable management solutions that meet the demanding requirements of rail projects. With a focus on signal cable protection, EMC compliance, and railway-specific needs, our cable trays ensure the reliability and longevity of signaling systems in railway infrastructure.

POLYMER CABLE TRAY

Cable trays for railway signaling provide a reliable and corrosion-resistant solution for cable management in railway infrastructure. Designed to uphold signal integrity, offer electrical insulation, and withstand demanding railway environments, our Engineering Plastic cable trays contribute to the efficient and safe operation of railway signaling systems.

Available in ABS and PVC Material

Choose our cable trays to enhance the efficiency and safety of railway signaling operations.

***Note:- Available in different sizes.**

ROPE SCREEN DOOR

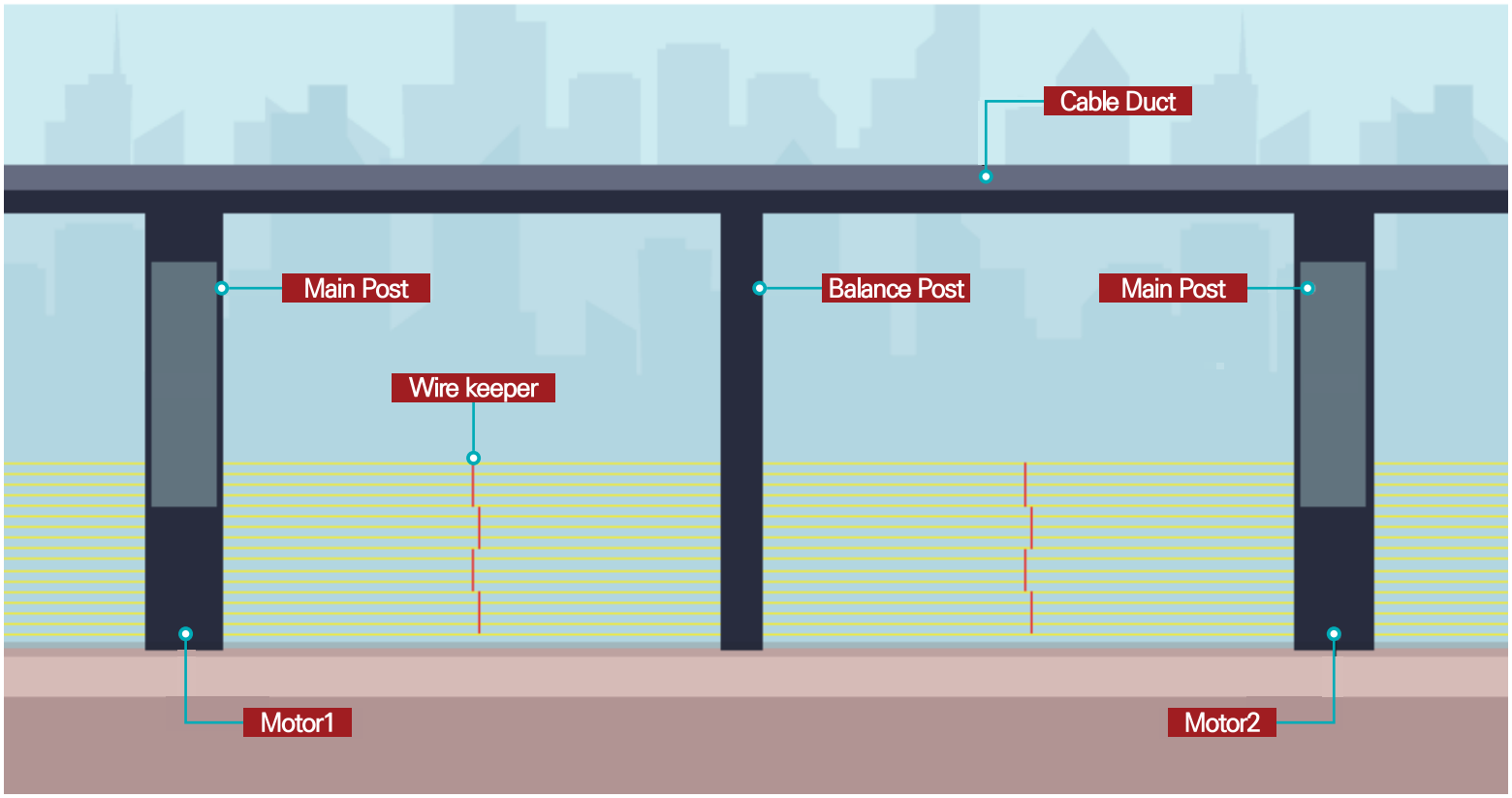
Innovative barriers *to improve the safety on the platforms.*

The Rope Screen Door (RSD) is an innovative platform safety device technology. RSD can be installed in train and subway station platforms.

Its main goal is to enhance passenger safety by allowing access to the tracks only for authorized individuals, thereby optimizing operations for boarding, alighting, and train movement within the platform area. As an integral component of railway systems, the RSD system prioritizes safety, robustness, ease of operation and maintenance, while seamlessly integrating with environmental conditions and station platform structures.

Salient Points

- Highest safety level
- Architectural aesthetic integration
- Passenger platforms protection
- Improves passenger experience in public transport
- Maintains climate change resilience features
- No train schedule interference



▸ 20M per 1Set, ascent / descent movement (2 motors controlling opening / closing procedure)

Technical Features

Advantages of RSD

- Wire Rope's flexibility reduces the risk of extreme injury and minimizes the impact of the structure when an impact is applied.
- No restrictions on train door quantity and train length.
- **Wire Rope structure** is not affected by the typhoon, train wind, etc.
- **Ease of emergency** escape in the power off condition.
- Operational reliability by simple structure 99.99%. (Bulgaria Sofia Metro)
- Easy to identify residual passengers.
- **Low installation and maintenance costs** compared to left and right door open type PSD.

Technical limitations of Left and Right Door type PSD

- In case of emergency conditions, open the screen door or exit through the emergency exit.
- **Not able to install in sections with different types of trains.**
- Unable to respond to a change in the position of the train door.
- **Existing PSD systems require excessive installation and maintenance costs.**
- Weak response to large typhoons, train winds, and other natural disasters.
- **High temperature and heat island phenomenon** of the ground platform occurs when the platform screen door obstructs ventilation in summer.(Greenhouse effect of glass due to the screen dpand upper roof installed on the side of the ground station platform)

CLIENTELE

Indian Railways
Dedicated Freight Corridor
ncrtc national capital region transport corporation
Chennai Metro Rail Limited
Rail Vikas Nigam Limited (A Government of India Enterprise)
RAILTEL
सादर सेवा
NHSRCL National High Speed Rail Corporation Ltd.
AHMEDABAD METRO
DMRC
PUNE METRO
MMRC
LUCKNOW METRO
GMRC
TATA PROJECTS
KEC INTERNATIONAL LIMITED
RITES THE INFRASTRUCTURE PEOPLE
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