

To provide insight for enhancing wealth

Since 1985



Efftronics system pvt. Ltd ISO 9001:2015 20000813 QM15



Approved by RDSO Govt. of. India Ministry of Railways "R&D"

Recognized by DSIR Govt. of. India





"We shall provide information technology products/services that exceed customer expectations in their functionality, usability, reliability, performance, adaptability and supportability to achieve market leadership and continual improvement of business performance"

Building End-End Smart IoT Solutions

Embedded Systems & Application Software

700+ People





OUR DEVELOPMENT PROCESS

Design Thinking









DESIGN CAPABILITIES

Proven Expertise In Building end-to-end IoT Solutions





MANUFACTURING

Planning and Scheduling and Tracking of orders through ERP



- PRODUCTION: 15,000 -SFT AREA 100 -MEMBERS
- Following standard processes like IPC & J-STD
- Detailed planning and scheduling and tracking of orders through ERP
- Implementation of seamless tracking and tracing of material, components and products
- Just in time Supply Chain
- Chain Process to optimize time, cost and improve quality
- Automated Testers
- > 5S Implementation



Foot Print

12000+

Product deployments

9000+ Locations



120+ Service Centers

Deployment in Railways

Products	India	Srilanka	Bangladesh
Signaling Data Loggers	10785	26	1
Networks	192	1	1
PHMU	770	-	-
BHMS	78	-	-
Electronic Block Instrument	45	-	-



CUSTOMER SUPPORT





IT- DRIVING BUSINESS

3

1

Enterprise Resource Planning

- Complete Order Tracking
- Financial Management
- Products BOMs &
 Configuration Management
- Vendor Evaluation
- Just In Time Procurement
- Inventory & Tracking
- Finished Products Tracking
- Integration with Mobility/Mail Alert

Order Management System

2

- Auto Integration With ERI
- Optimized Sale Orders

Execution Planner

Inventory Projection Tool

Cash Flow

Regular Reports Other Reports Sales Advenution Sales

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Control of Inflow and

Outflow of Cash

- Visualize Future Incoming
 - and Outgoing of Cash
- Mobile Integration



Time Attendance Management System

5

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Customer Relationship Management

 Leads to Quotation Integration
 Integration with ERP
 Mobile and Web Platform
 Analytics



R&D Project Planner

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Human Resources (RIGHT PEOPLE FOR RIGHT JOB)

• Running M. Sc. (IoT) Course for Krishna University,

M. TECH. (IoT) for JNTU Anantapur

- MOUs with 15+ Engineering and science colleges for faculty and student development programs
- Continuous learning program for employees
- Activity based learning
- Collaboration with AP Skill Development Centre & MSME





YOUR ONE-STOP DESTINATION FOR END-TO-END SMART SOLUTIONS



under Harsh Indian Environment Conditions







Indigenously Designed, Built, Deployed and Maintaining one of India's Largest IoT Network for Indian Railways

6+ Million Things of Railway Signaling System Connected To 200+ Command Control Centers

across the country



Generated Everyday





Smart Signaling- To Prevent Failures & Improve Operations 🚠

10812 **Data Loggers** & RTUS

770 Pont Machine Monitoring

Predictive Maintenance System • Predicts the failures much ahead by real time analysis of point machine voltages and currents

· Capture all relay status and analogue

parameters in the relay room.

for signalling System

IoT Edge System · Works as a black box for Railway Yard

· Improves MTTR and MTBF of system

45 Integrated Power Supply Monitoring

78

45

Block

Instruments

805

Safety Point

Alarm Units

Remote Condition Monitoring

 Provides remote condition monitoring of various power supplies with in railway yard Identified faulty module in power distribution and informs the railway personnel

Predictive Maintenance System Predicts the failures much ahead by real time

- analysis of battery parameters
- Extends the battery bank life and guarantees backup

SIL-4 Certified

20/03 Architecture

- Complies to European CENELEC standards
- · First in INDIA to develop the product and get approval

Prescriptive Solution

Eliminates accidents at railroad points through prescriptive alert to station master

S/Ws Failure Analysis System

200 Control

- · Real-time simulation of yard Predictive Maintenance of railway assets MIS Reports Centers
 - Network Management





Data Loggers



Black Box for Railway Station

MONITORS...







Smart Railway Signalling



Predictive Train Operations



Multi Monitor Simulation Networked Data loggers in Vijayawada Division Control Office



Tracking



Charting



Prediction



Remote Condition Monitoring









Solution Approach



Captures

Digital (Relay Status - Controlling, Contactor & Detection) and Analog (Operating & Detection Voltages and Current) parameters

Sends the captured information to central place

Analyzes and identifies permanent way-related and signaling & safety faults as they are emerging using AI and ML

> Predictive Maintenance is initiated at right time before any faults occur / Trouble shooting can be more easily integrated into day-to-day operations





Spectrum of Analytics Capabilities



Point Machine Monitoring







Feed end and Relay end Currents



Point Current Signature



Point Operations Report



0.5

1

0

1.5

Current Signature Analysis





2.5

2

Point Machine Monitoring



Identifying failure with Current Signature Analysis of point motors





More current at locking time due to spring



Obstruction in Point Motor





Battery Health Monitoring System



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Signal lamp Health Monitoring Unit





SHMU monitors signal lamp current and alerts the user in case of abnormality. These alerts are used for predictive maintenance – by which number of failures can be reduced. Also used to reduce the duration of signal failure









2. Data can be seen in local PC and Test room CMU.

3. Important alarms can be sent as SMS and overall status can be sent to OEM by automatically from Test room.





SMS escalation for Failures





- Immediate advice / recommendation on failures as they emerge
- Early warning of system degradation before its eventually leads to failure
- Enable maintenance staff to have prior knowledge about root cause of failure before attending a site
- Improved maintenance planning with proper statistical data
- 24/7 monitoring and notifications in case of failures / warnings



Higher Availability



Lower Operating Costs



Increased Reliability



Increased Efficiency



Improved Safety





System Integrity Test



Software & Hardware development & implementation for System Integrity Test as per Table of Control /Route Control Chart.

Conducted at 48 stations

Identified 975 defects of design & implementation of interlocking







It runs on the already

available CMU PC

This is a software product – one software for each CMU is required

- By wiring potential free contacts of ELD to data logger and identifying the relays
 - \checkmark Which power the conductors
 - Which are powered by the conductors
- External defective cable pair
 responsible for earth fault can be
 identified by CMU alarms software



Command Control Centers



> Data Synchronisaton between all stake holders of the system







Data archiving, Reports, Escalation

Fail Safe System









Long Visibility

Energy Saving



2-way LED stencil route indicator



A - Markers



4-way LED stencil route indicator



Route indicator



Single digit Route indicator



Double digit Route indicator



Shunt Signals



Calling on

Maintenance Free

SIL-4 Certified

Ouality & Reliability



Electronics Block Instrument







Passenger Information Systems



Integrated Passenger Information System





Platform Clocks with GPS Synchronization





CUSTOMERS



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THANK YOU



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