



REMOTE MONITORING AND MANAGEMENT OF LOCOMOTIVES AND TRAINS

**BY
G RAMESH
SSE/DSL/MLY**

INTRODUCTION

- **REMMLOT (REMOTE MONITORING AND MANAGEMENT OF LOCOMOTIVES AND TRAINS)** is a system that provides online information about locomotive health and performance, which improves effective operation and maintenance of locomotive. This in turn improves the availability of locomotive in field.

INTRODUCTION

REMMLOT is divided into two parts :

- **LRMS** (Locomotive Remote monitoring system) is an on-board equipment fitted in the locomotive for communicating to a centralized server using GSM/CDMA services.
- **LTMS** (Locomotive and Train Management System) is a software that collects the data from LRMS, processes it and displays in the website.

INTRODUCTION

- **COE** (Control Office Equipment) is used to monitor the locomotives and analyse the data. This shall be installed at diesel loco sheds, power controller office at the divisional control office and zonal power controller office.

Advantages of

REMMLOT

- Effective monitoring of the Locomotive from any where in the world.
- Improves planning and effective use of Locomotives.
- Online Locomotive fault diagnosis and locomotive performance monitoring from loco shed engineer's desk.
- In case of minor equipment failures or if there are any small corrections required during travel, technical support can be provided from Locomotive Maintenance Desk to loco pilot.
- Advance service and spares plan and necessary technical support from equipment vendors to reduce locomotive down time.
- SMS and Email Alerts – If configured alerts are logged into locomotive, an alert message is sent to user through SMS and Email.
- Live locomotive condition and location will be shown in SADS (Situation Awareness Display System) using Geofencing technique.

LOCOMOTIVE REMOTE MONITORING SYSTEM (LRMS)

- ***Introduction:***
- LRMS is an on-board embedded equipment designed to acquire the real time data from Microprocessor based Control System (MBCS) and stores the data in flash memory.
- LRMS system is designed to have direct data transfer to central server (using static IP address) using TCP/ IP protocol through GSM/ CDMA communication channels. LRMS has inbuilt GPS module to acquire the position information. LRMS sends the position information of locomotive along with health, faults, counters and operator data.

LOCOMOTIVE REMOTE MONITORING SYSTEM (LRMS)

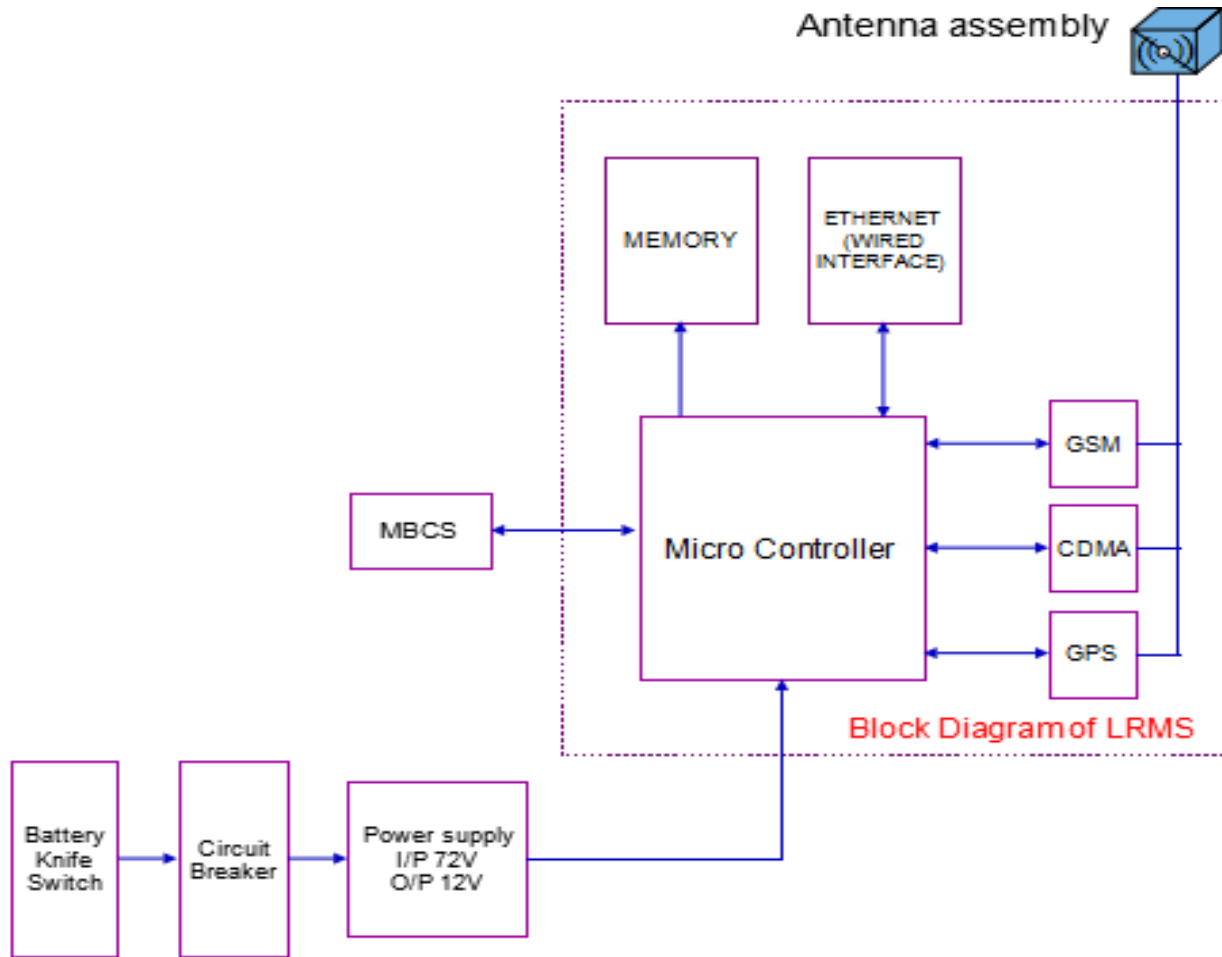


Fig 2.1 Block diagram of LRMS

Modules/ Sub assemblies :

The major modules/ sub assemblies are:

- LRMS Circuit Breaker



- MRM Power Supply unit



- Antenna Assembly



- LRMS module:
it is provided in MEP console

LOCOMOTIVE TRAIN MANAGEMENT SYSTEM (LTMS)

- LTMS is central server customized for REMMLOT application to handle LRMS communication services, data decoding, data base management services, Web services as Internet portal to access logged data by authorized users, data backup management services, total fleet management functions and alerts generation module for automatic E-mail generation to all configured users.
- Locomotive position is displayed on map and all data (short term, long term, fault with data-pack, life time data) can be accessed using locomotive number as a unique identification.
- Analysis and presentation module is developed for the analysis of locomotive data in graphical format.
- SMS and Emails are provided to concern shed/ division/ zonal people whenever configured fault is logged in the locomotive.

LOGIN / LOGOUT

- To browse the LTMS go thru “www.loconet.in”



Home | About Us | Contact Us

REMMLOT, a network oriented system connecting microprocessor based diesel electric locomotives in the field with centralized server based management system through CDMA/GSM network communication & GPS.

Remmlot Mainly consists of LTMS (Locomotive & Train Management system) and LRMS (Locomotive Remote Monitoring System). LTMS is a centralized server hosted on the internet for Indian Railways and is a 24 x 7 service provider accessed via a static IP address.

Generates reports like health status, fault status, datanork, event reminder data, life

LOG IN

User Name
superuser

Password

Log In

LOGIN / LOGOUT

- Login page provides access to the Locomotive data with a valid User Name and Password entered by the user.
- There are three types of users:
 - Super user
 - Supervisor
 - Operator
- The Super user has the access to all the available Zones and Sheds.
- The Supervisor has the access to all the available Sheds of a particular Zone.
- The Operator has the access only to one particular Shed of a particular Zone.
- On completion of work, the user can LOGOUT from the Loconet site. The Logout option appears on every screen of the Loconet site. So the user has an advantage of logging out from any of the screen in which he is working.

MAIN OPTIONS

Fleet

Locomotive

UserSettings

Locostatus Settings

FLEET : Fleet module displays the information of all Locomotive status for selected zone and selected shed.

LOCOMOTIVE : Locomotive module displays the reports of selected locomotive.

USER SETTINGS : This module helps the user to change the password, configure the alerts for selected locos and view the configured alert report.

LOCO STATUS SETTINGS : This module is used to configure the information by the user. Like, ALF settings screen helps to configure ALF parameters, PC settings screen helps to configure PC parameters and Log book screen helps to configure Logbook parameters related to a particular Loco.

FLEET:

- Fleet report displays the information of all Locomotive status for selected zone and selected shed. The reports under this module are:
- Fleet Summary
- Fleet Health Data
- Fleet Health Parameters
- Fleet Faults
- Fleet fault frequency
- Fleet Alerts
- Fleet List
- Fleet Day wise report
- Fleet power control
- Fleet ALF report
- Fleet APU • Fleet Operator data.

LOCOMOTIVE:

- Locomotive report is used to display the reports of selected zone, selected shed and loco number for selected dates. It includes:
 - Loco Summary
 - Loco Health
 - Loco Faults
 - Life Time Counters
 - Event Recorder SHM
 - Event Recorder LGM
 - SSIP Data
 - Fuel Data
 - APU data
 - Operator data
 - APM report

User Settings:

- User Settings include:
- User Settings Password Settings
- User Settings Alerts
- User settings Alerts list
- User settings TDMS download

Loco Status settings:

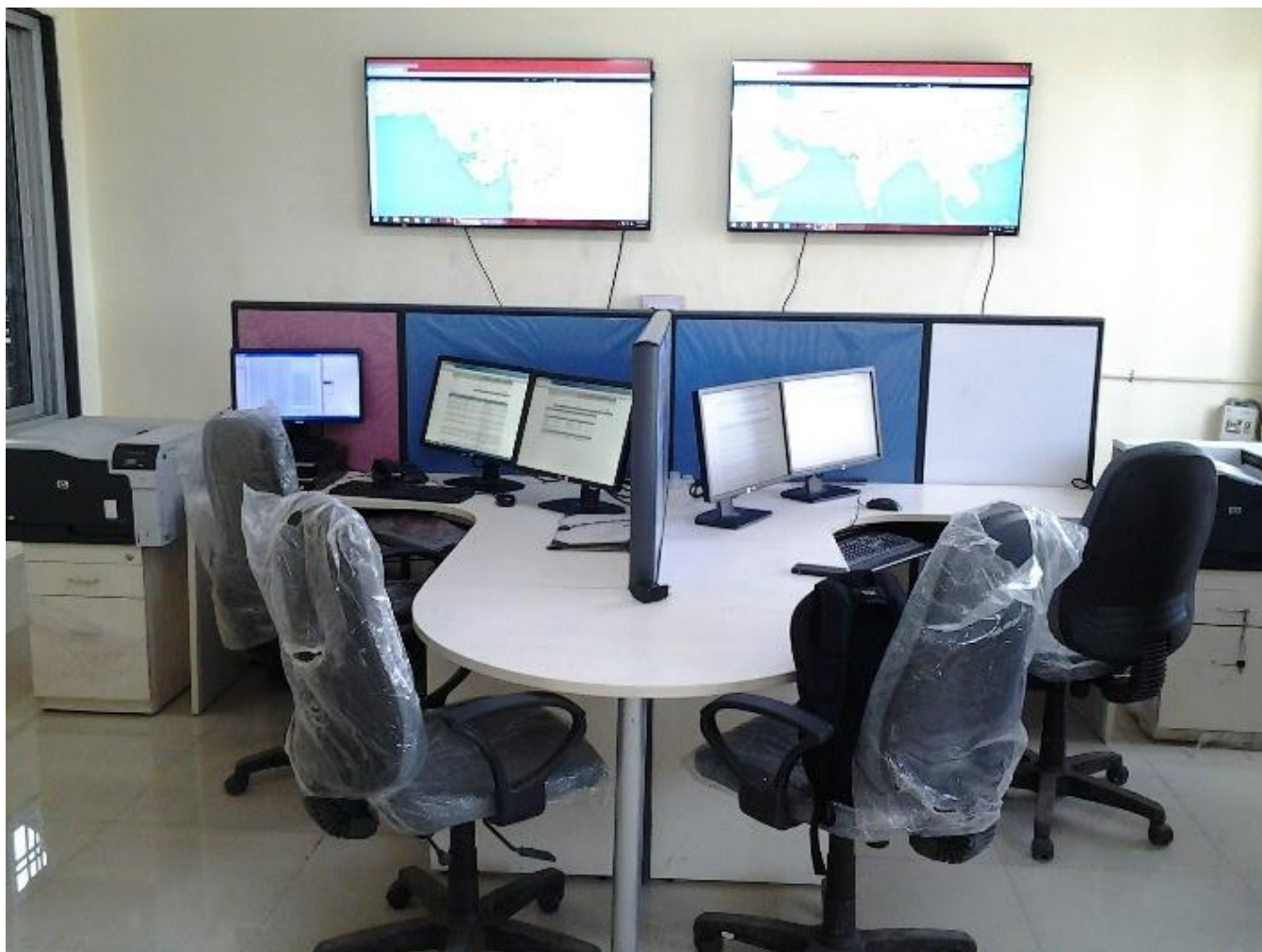
- Loco status Settings include:
- ALF Settings
- Power control settings
- Log book

Analysis and Presentation Reports:

- Reports
- Data visualization
- Canned Visualization

CONTROL OFFICE EQUIPMENT (COE)

- Control office equipment systems are installed at diesel loco sheds, power controller's office at divisional control office and zonal power controller's office.
- Control office equipment is mainly used to monitor the locomotives live status and analyze the data.
- Control Office equipment consists of:
 - 1.SADS
 - 2.DAWS
 - 3.Pre-wired modular work station
 - 4.Communication Rack
 - 5.Power Conditioning Equipment




- **SADS:**

Situation Awareness Display System (SADS) is a 55 inch LED display provided to know the status of all locomotives equipped with REMMLOT as icons on the map of India.

- **DAWS:**

Data Analysis Work Station (DAWS) is a high end PC to analyze the locomotive data.

- 
- IDLE
 - DEAD
 - NO COMMUNICATION
 - CRITICAL ALERT
 - APU
 - ALL OK



THANK YOU