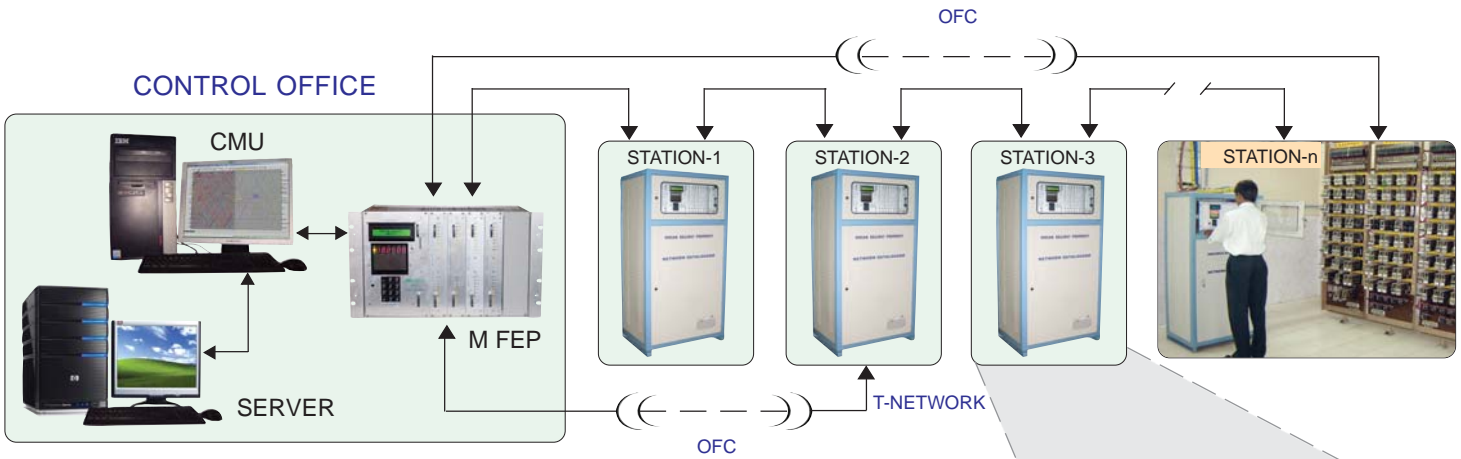


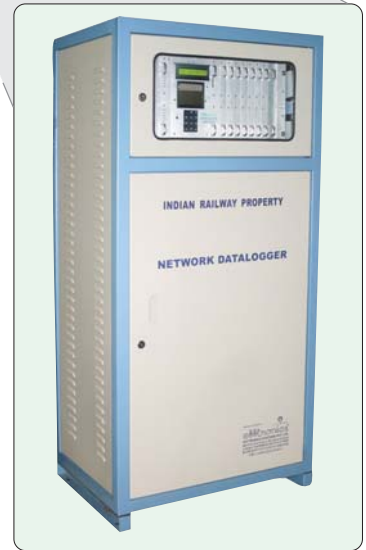
**RDSO Specification: IRS: S: 99 / 2006**

*Data logger system is helpful in monitoring Railway Signal Control and Interlocking relays in order to verify their operation, diagnose faults and in maintenance. Data logger logs the change of status of relays & voltages of analog channels connected to it and transmits event information to the central place to generate various exceptions, reports and other information by application software.*

## DATA LOGGERS IN NETWORK



- ❖ Data logger is placed in the relay room of a station. The relays reflect the status of all assets present in the station yard. Data logger monitors the relay status and records the change of the asset status.
- ❖ Each data logger has multiple sets of data output ports for communicating the recorded information to the Central/ Local Fault Analyzing System (FAS).
- ❖ Data loggers in each Station present in a division will be connected to Front End Processor located in the Head Quarters through OFC and communicate the recorded information of each station to Head Quarters in Common Protocol ( approved by RDSO as per IRS:S:99/2006 ).
- ❖ FEP communicates this recorded information of the Network to Central Monitoring Software called NMDL (Network Management Data Logger) through data output port of FEP. The software analyzes the information related to the assets operation for reporting the occurrence of faults in their operation, simulation of online train movement in the stations etc. Data backup can be done in both CMU and Server present in the Head Quarters for further analysis.



**DATA LOGGER**

## DATA LOGGER

- ❖ Embedded system built on Motorola 68000 Micro processor.
- ❖ Minimum 512 - Maximum 4096 opto isolated digital inputs.
- ❖ Minimum 32 - Maximum 96 individually isolated voltages.
- ❖ Nonvolatile data storage in Flash RAM.
- ❖ Data backup of Ten (10) lakhs of events.
- ❖ Eight (8) serial ports for data network.
- ❖ Dot matrix printer interfacing for online/ offline data printing.
- ❖ Efficient network protocol to effect higher data rate (57.6Kbps).
- ❖ In-built dual modem for network.
- ❖ LCD, 7-Segment LED & Keyboard for user interface.
- ❖ Audio Visual alarms on Exceptions and faults.
- ❖ Control of potential free relay control from central place.

# DATA LOGGER SYSTEM

## FRONT END PROCESSOR



- ❖ Buffers data in between Central Monitoring Unit and Data logger Network.
- ❖ Receives Network data though Eight(8) serial ports and transfers out the data to Two(2) computer ports.
- ❖ Data buffering of Ten(10) lakhs of events.
- ❖ Software filter for redundant data.

## REMOTE TERMINAL UNIT

- ❖ RTU is a mini data logger suitable for Auto sections.
- ❖ Maximum 64 opto isolated digital input @ 16milli sec sampling.
- ❖ Maximum 32 individually isolated voltage channels @ 1 sec.
- ❖ Nonvolatile data storage of One(1) lakh events in Flash RAM.
- ❖ Two(2) serial ports for data network with in-built dual modem.
- ❖ Efficient network protocol to effect higher data rate (57.6Kbps).



# NETWORK MANAGEMENT OF DATA LOGGER (NMDL)

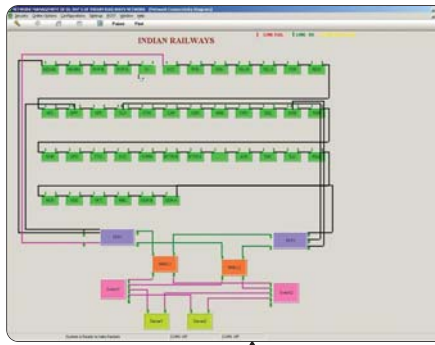
Network Management of Data Loggers ( NMDL ) is a software

- ❖ To Receive data from Data logger network.
- ❖ To Record station wise status of Signaling Relays and Power Supplies.
- ❖ To Analyse the status changes with reference to the intended sequence of operations.

Online Faults Pop Up Screen

Client Name	Message	Occured Time	Involved Signals/Time	Clear
PEDEVARAP...	30 TRIP SPEED OF THE TR...	04/12/2000 15:48:05:791	530 UNCLRP 15:42:35:562...	1
PEDEVARAP...	20ATPMD ML SPEED OF THE...	04/12/2000 15:48:08:841	20 NAWANPCLP 00:00:00 2...	1
PEDEVARAP...	19RTFMD ML SPEED OF THE...	04/12/2000 15:48:02:672	19 NAWANPCLP 00:00:00 1...	1
GUJARA...	58BT TRIP ML SPEED OF TR...	04/12/2000 15:47:27:781	10 NAWANPCLP 00:00:00 58B...	1
PEDEVARAP...	18RTFMD ML SPEED OF THE TR...	04/12/2000 15:48:42:656	18 NAWANPCLP 15:46:17:31 U...	1
KSRIRINA CAN...	148BT UNCR Button Relay St...	04/12/2000 15:48:45:781	148BT UNCR BT 15:48:35...	1
KSRIRINA CAN...	576 GMR Button Relay Stack...	04/12/2000 15:48:45:781	576 GMR GMRUP 15:48...	1
KSRIRINA CAN...	UNCR Button Relay Stack Up	04/12/2000 15:49:07:594	UNCRDOWN 15:48:57:125 2	2
KSRIRINA CAN...	UNCR Button Relay Stack Up	04/12/2000 15:49:07:594	UNCRDOWN 15:48:57:122 2	2
KSRIRINA CAN...	UNCR Button Relay Stack Up	04/12/2000 15:48:45:781	UNCRDOWN 15:48:35:297	1
KSRIRINA CAN...	UNCR Button Relay Stack Up	04/12/2000 15:49:07:594	UNCRDOWN 15:48:57:422	1
PEDEVARAP...	15BTMD ML SPEED OF THE TR...	04/12/2000 15:48:02:656	12 NAWANPCLP 00:00:00 1...	1
GUJARA...	19BT TRIP ML SPEED OF ...	04/12/2000 15:47:54:359	19 NAWANPCLP 00:00:00 19B...	1
GUJARA...	19BT TRIP ML SPEED OF ...	04/12/2000 15:47:54:359	17 NAWANPCLP 00:00:00 19B...	1
PEDEVARAP...	15ATPMD ML SPEED OF THE TR...	04/12/2000 15:48:02:656	15 NAWANPCLP 00:00:00 1...	1
PEDEVARAP...	2720 TRIP SPEED OF THE TR...	04/12/2000 15:48:58:570	10PSTLRIP 00:00:00 2720 ...	1
KSRIRINA CAN...	84T UNCR BUTT ON RELAY ST...	04/12/2000 15:49:07:594	84T UNCR BT 15:48:57:469 1	1
KSRIRINA CAN...	54 GMR BUTT ON RELAY ST...	04/12/2000 15:49:07:594	54 GMR BT 15:48:57:572 1	1
GUJARA...	27AT TRIP ML SPEED OF ...	04/12/2000 15:48:17:219	27 NAWANPCLP 15:31:35:67...	1
KARJURALA...	576 CR SIGNAL BOBBING	04/12/2000 15:49:02:175	576 CR PCLP 15:49:02:17...	1
GUJARA...	19BT TRIP ML SPEED OF ...	04/12/2000 15:48:03:689	19 NAWANPCLP 00:00:00 19B...	1
KUCA DULI CA...	34BTTR TRUCK CIRCUIT FA...	04/12/2000 15:50:16:719	34 NAWANPCLP 00:00:00 35 N...	1
GUJARA...	10 NAWANPCLP SIGNAL...	04/12/2000 15:49:35:0	10 NAWANPCLP 15:49:13:734 ...	1
KSRIRINA CAN...	118RTFMD ML SPEED OF TR...	04/12/2000 15:54:35:639	118 NAWANPCLP 15:49:00...	1

Supervisory System



Online / Offline Simulation



Online Unusual Incidences

Asset Status

Sl. No.	Element	Message	Event Occurred	Event Cleared
1	M	13ATPMDOWN 09:56:32:109	13AT Down Unusually	23/04/2000 11:36:25:353
2	M	13ATPMDOWN 09:57:13:62	13AT Down Unusually	23/04/2000 10:10:17:016
3	M	20PMDOWN 10:00:10:484	20F Down Unusually	23/04/2000 10:10:21:297
4	F	120PMDOWN 10:20:16:675	PN 120B Subbing	23/04/2000 10:20:16:675
5	M	32PMDOWN 10:28:14:781	32F Down Unusually	23/04/2000 10:30:20:000
6	L	706PMDOWN 11:20:02:708	706PMDOWN 11:20:02:708	23/04/2000 11:30:16:986
7	M	12PMDOWN 11:26:484	12F Down Unusually	23/04/2000 11:30:20:000
8	F	112PMDOWN 11:28:11:122	FF 01 Sig.Panning at Danger	23/04/2000 11:39:15:629
9	M	20PMDOWN 11:51:03:312	20F Down Unusually	23/04/2000 12:01:06:463
10	F	01PMDOWN 12:05:28:533	FF 01 Sig.Panning at Danger	23/04/2000 12:16:20:336
11	M	112PMDOWN 12:30:20:208	112F Down Unusually	23/04/2000 12:47:33:312
12	M	20PMDOWN 12:34:42:641	20F Down Unusually	23/04/2000 12:44:43:000
13	F	120PMDOWN 13:21:30:703	120PMDOWN 13:21:30:703	23/04/2000 13:24:13:420
14	F	120PMDOWN 13:25:12:172	120PMDOWN 13:25:12:172	23/04/2000 13:24:13:420

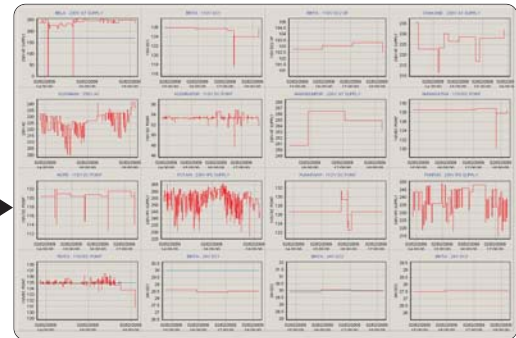
Faults Daily Report



Network Status



Data Base Server



Voltage Graphs

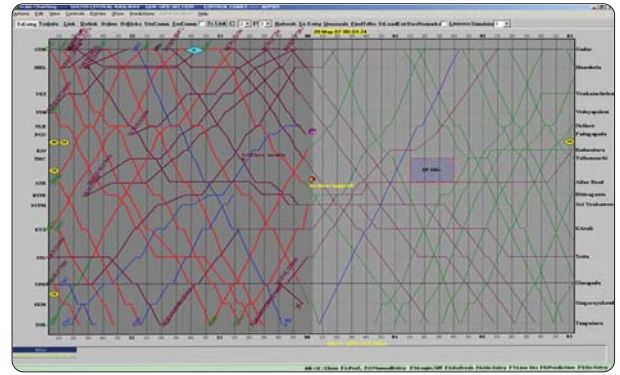
## FEATURES

- ❖ On-line Asset-Failure Alarms.
- ❖ Online Yard Simulation.
- ❖ Asset Lifetime Alerting.
- ❖ Auto SMS of Asset Failure.
- ❖ Log of events Reports.
- ❖ Supervisory System for easy Maintenance of Data logger Network.
- ❖ Power Supply variations as Graphs.
- ❖ Offline Yard Simulation.
- ❖ Summary Report of Asset Failures.
- ❖ Auto Mailing Facility of Asset-Failure Reports.

# DATA LOGGER SYSTEM

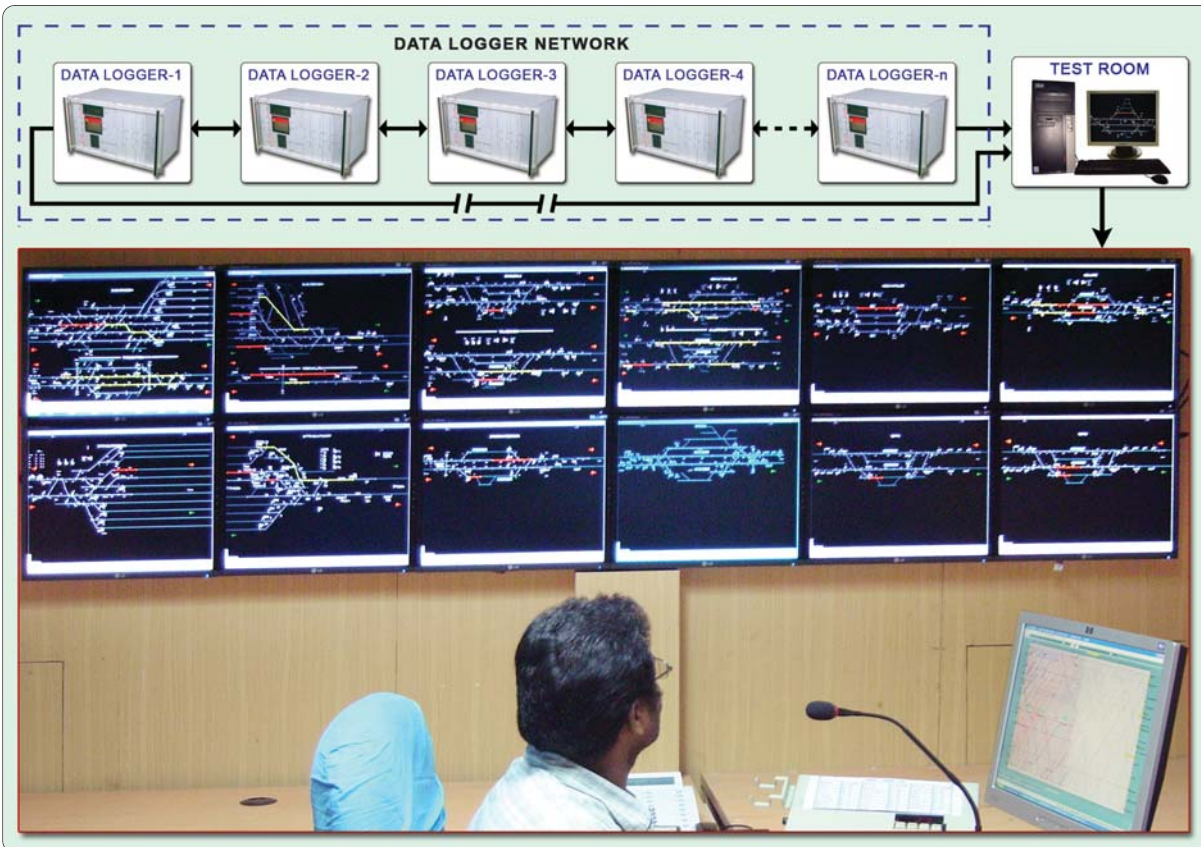
## TRAIN CHARTING

- ❖ Application software for automated train charting on Distance vs Time.
- ❖ Online charting with data from NMDL.
- ❖ Dual display monitor.
- ❖ Tagging of the train at the entry into section.
- ❖ Tracking of train by its logical movement by routes.
- ❖ Plotting of movement on Station (distance) vs Time.
- ❖ Prediction of train punctuality position.
- ❖ Punctuality loss highlighted in different colour.
- ❖ Master chart super-imposition with current chart.
- ❖ Line occupation of stations in different window.
- ❖ User added comments on chart.
- ❖ Customised printing options.
- ❖ Block time exceeding alarm.



## REAL TIME STATION MONITORING SYSTEM

*Real Time Station Monitoring System is a software for the utility of a Train Traffic Controller. It provides Real time Station wise Yard Simulation.*



VIJAYAWADA SECTION CONTROLLER'S ROOM

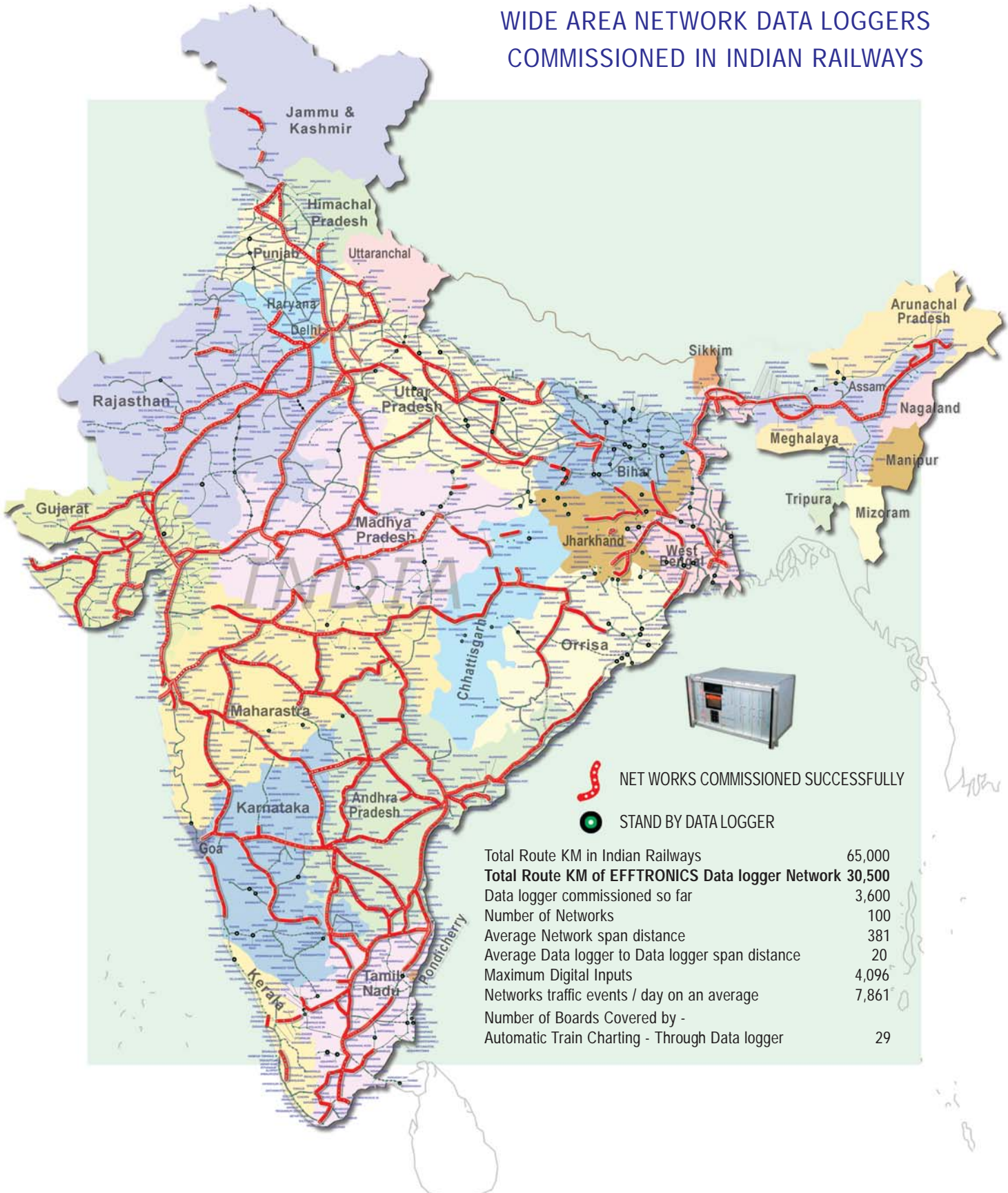
## FEATURES



- ❖ Displays Online Station Mimic (Tracks, Signals, Points, LC Gates etc)
- ❖ Displays Route Set & Release indication.
- ❖ Displays Online Train Movement.
- ❖ Enables Remote monitoring of the same through LAN / WAN

## BENEFITS

- ❖ Controller can have real time Line occupancy information of all stations in his control section.
- ❖ Remote Online viewing by Divisional Officers to improve productivity of blocks.
- ❖ Crisis management from the control office made easy as the field status is readily available for the Crisis Management Group.

## WIDE AREA NETWORK DATA LOGGERS COMMISSIONED IN INDIAN RAILWAYS



-  NET WORKS COMMISSIONED SUCCESSFULLY
-  STAND BY DATA LOGGER

Total Route KM in Indian Railways	65,000
<b>Total Route KM of EFFTRONICS Data logger Network</b>	<b>30,500</b>
Data logger commissioned so far	3,600
Number of Networks	100
Average Network span distance	381
Average Data logger to Data logger span distance	20
Maximum Digital Inputs	4,096
Networks traffic events / day on an average	7,861
Number of Boards Covered by -	
Automatic Train Charting - Through Data logger	29



**'R & D'**  
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Approved by  
**RDSO**  
Govt. of INDIA  
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Railways



**EFFTRONICS SYSTEMS PVT. LTD.**  
40-15-9, Brundavan Colony, Vijayawada-520 010, A.P., INDIA  
☎ : +91(866) 2466675, 2493375    Fax: +91(866)2474097  
E-mail: info@efftronics.com    Visit us: www.efftronics.com