MAINTENANCE HANDBOOK ON

INTEGRATED PASSENGER INFORMATION SYSTEM

(Train Indication, Coach Guidance and PC Based Announcement System)

CAMTECH/S/PROJ/10-11/HB/IPIS
December 2010

Indian Railways
Centre for Advanced Maintenance Technology

MAHARAJPUR, GWALIOR – 474 005
Information to passenger related to status of reservation, train enquiry is provided by means of Interactive Voice Response System (IVRS), Display Boards, and Announcing Systems etc. All these system have been integrated into one system called Integrated Passenger System (IPIS). This system provides a single control and common data entry for all systems.

CAMTECH has prepared this handbook for information and guidance of field staff involved in upkeep of equipment related to this system.

This handbook not only describes maintenance but care has also been taken to explain basic construction, installation, trouble shooting and operation of the system.

I am sure that this handbook will go a long way in helping the staff for reliable and trouble free service of these equipments.

CAMTECH/ GWALIOR
Date: 16.05.2011
(S.C.Singhal)
Executive Director
PREFACE

CAMTECH is continuously putting efforts to develop documents and upgrade the information for installation and maintenance practices on various S&T equipments & gears, in this process a handbook is prepared for installation & maintenance of Integrated Passenger Information System to increase the reliability of it’s working with a better way of maintenance by disseminating knowledge to maintainers and useful knowledge for officers and supervisors.

The failure of Integrated Passenger Information System being a vital passenger amenity is not tolerable and it requires well maintenance. This handbook covers the installation guide lines and knowledge for preventive maintenance and specially failure prone area of the system. This handbook is targeted for increasing the knowledge of field officials and has been designed so that it’s contents does not supersede any existing provisions laid down in the “Telecommunication Manual” or approved guide lines by Railway Board or RDSO or by CSTEs in their zonal Railways. However in case of any dispute in the contents of this book to the instructions laid down as in above may be followed. We are sincerely thankful to RDSO/Lucknow, RDSO approved firms in the field, Railway officers and field personnel, who helped us in preparing this handbook.

In view of technological up-gradation and learning being a continuous process particularly in the field of IT, you may feel free for giving any suggestions. If so required for addition/modification to the contents of this hand book, please write us, we will be highly thankful for kind contribution and these will be further used for the sake of knowledge and guide lines for all Indian Railways with our new version or re-prints developed by this centre in future.

CAMTECH/GWALIOR
DATE: 16.05.2011

JAGMOHAN RAM
DIRECTOR (S&T)
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INTEGRATED PASSENGER INFORMATION SYSTEM
(Train Indication, Coach Guidance and PC Based Announcement System)
एकीकृत यात्री सूचना प्रणाली
(ट्रेन संकेत, कोच मार्गदर्शन और पीसी आधारित घोषणा प्रणाली)

1. **Introduction**

The systems which provide train related informations to the passengers are known as **Passenger Information Systems** for example public address systems on the railway platforms, Interactive voice response systems (IVRS), CCTVs, Display boards, call centers, Internet etc. The **Integrated Passenger Information System (IPIS)** provides a single control system and data entry system for different types display boards available on entire railway station.

This handbook covers technical requirements of PC based announcement system for announcing train information to passengers, electronic display boards & coach guidance display boards for displaying train information to passengers with the feature of networking and operation from a centralized place according to specification number RDSO/SPN/TC/61/2012. Rev 03. A simple figure showing IPIS working is shown below:

2. **System Description**

The Integrated Passenger Information System consists of following:

- Two control consoles in redundant mode loaded with software
- Data Communication Hub (MDCH & PDCH)
- Display boards of different sizes (AGDB, SLDB, MLDB & CGDB)
- CCTV
- PC based Announcement system
A simple connection diagram of an IPIS system is shown below:

Figure: IPIS connection diagram
2.1 Control Console Unit (CCU) (कंसोल इकाई (सीसीयू))

- This system has the provision of fully redundant console unit in case of failure of the first control console unit; the second control console unit becomes operative. There is continuous data synchronization between these two operator consoles through a LAN link.
- The main and standby Control Console Units comprises standard PCs of reputed brand having minimum configuration as mentioned below:
  - Pentium – IV or equivalent processor (2 GHz or higher).
  - 512 MB SD RAM.
  - 80 GB HDD.
  - CD ROM.
  - 19” Color LCD Monitor.
  - Two VGA adaptors. One for the monitor and second with video output to provide display on CCTV automatically.
  - 101 Key board.
  - Optical USB mouse.
  - One parallel port.
  - Multi port serial card (At least four serial communication ports)
  - UPS with minimum 1 hour battery backup.
  - Windows XP or higher version
  - Ethernet card
  - Sound card with speakers and microphones.

- Change over of video & audio signals from one control console unit to another is through a manual switch for redundancy. This switch have two input ports for video signals coming from two control console units and one output port that goes to the CCTV network. It also have two audio ports coming from two control console units and one output port that goes to the audio announcement network.
- The control system is so designed as to work public announcement system and the farthest indicator satisfactorily.
- Control Console Unit provides PC based voice announcement.
- All control systems are housed in a standard cabinet made of CRCA sheet of minimum 18 SWG thickness. The cabinet is rust free & with proper earthing arrangement.
- Keyboards & Monitors are placed inside the cabinet at appropriate height for easy and comfortable operation.
- ON/OFF button for switching on & off the control console units is provided separately. Pressing this button system becomes switch on with auto running of software. Again pressing this button it closes program without corrupting data and switch off the system.
- The audio output for announcement from control console unit is interfaced with the existing public address system.
- Suitable hardware & software are provided in the system for taking data & required information from automatic train information system like train charting server, NTES, CDAS etc. for displaying train information on various types of display boards, coach guidance systems and for making announcement, if specified by the purchaser (optional).
2.2 Data Communication HUB (DCH) डेटा संचार हब (डीसीएच)

2.2.1 Main Data Communication HUB (MDCH) मुख्य डेटा संचार हब (एमडीसीएच)

- The Main Data Communication Hub routes the signals coming from the either of the two console units to the destinations namely platform hubs, Arrival/Departure Train Information Display Boards and Coach Guidance Display Boards.
- Main Data Communication HUB have minimum 2 serial ports for display information coming from the two console units and at least 16 serial output ports for driving various types of display boards or platform HUBs.
- The MDCH is operated by 230 Volts AC mains and have LED indications for monitoring the communication health of the display boards and Platform Data Communication Hubs. The LED glows red when link is failed and green when link is OK.
- The serial port connection to the coach guidance display boards along a line is daisy chained and in case of a failure (like power down) of a unit, the extension of communication link is not be affected. Also in case of removal of any coach display board for repair, the input and output connectors is mate-able to extend the communication link.
- The main Hub is able to integrate any display board or platform HUB and get its response. With this, communication health (connectivity) of each display unit or platform HUB is available in the control center and one can quickly diagnose the problem in case of faults.
- Each output port of the MDCH is able to drive either one multiline display board or At-a-glance display board or single line display board or platform Hub or preferably 4 numbers of coach guidance display boards.
- In case of failure of any port of MDCH, the spare port can be used immediately and the system starts functioning with minimum down time.

2.2.2 Platform Data Communication Hub (PDCH) जलेटफ़ॉर्म डेटा संचार हब (पीडीसीएच)

- The Platform Data communication Hub (PDCH) routes the data coming from the MDCH to the various type display boards including coach guidance boards.
- PDCH have provision of two serial ports for interfacing to Main data communication HUB (one port as a spare) and at least 16 serial output ports for driving various types of display boards.
- The PDCH should be preferably installed on each platform at the halfway length of the platform, to drive the various display boards.
- Both MDCH and PDCH are interchangeable.
2.3 Display Boards डिस्प्ले बोर्ड

Trains information display system is one of the most useful passenger amenities at railway stations. It helps the passengers to know all information about trains such as arrival/departure timings, present status, platform numbers of arriving/leaving, formation of train etc.

2.3.1 Train Arrival/Departure Display Boards (TADDB)

These display boards can be further classified in following three types

i) Multi Line Display Board (MLDB)
ii) At a Glance Display Board (AGDB)
iii) Single Line Display Board (SLDB)

Multi Line Display Board (MLDB) बहु लाइन डिस्प्ले बोर्ड (एमएलडीबी)

These can be either single face or double face display boards and are provided at the main entrance points of railway stations and some times on important platforms. Display size can be minimum 2 lines to maximum 10 lines. It provides information of arriving and departing of all the trains in following format:

<table>
<thead>
<tr>
<th>Train no</th>
<th>Train Name</th>
<th>Expected Time</th>
<th>ARR/DEPT</th>
<th>Platform No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>12625</td>
<td>KERALA EXPRESS</td>
<td>08.30</td>
<td>A</td>
<td>2</td>
</tr>
<tr>
<td>12617</td>
<td>MANGALA EXPRESS</td>
<td>08.55</td>
<td>A</td>
<td>3</td>
</tr>
<tr>
<td>12002</td>
<td>SHATABDI EXPRESS</td>
<td>09.31</td>
<td>A</td>
<td>1</td>
</tr>
<tr>
<td>12138</td>
<td>PUNJAB MAIL</td>
<td>10.40</td>
<td>A</td>
<td>1</td>
</tr>
</tbody>
</table>
At a Glance Display Board एक नज़र डिस्प्ले बोर्ड

These are single face Display Boards used to provide complete information about a single train at a time. The information is displayed in three lines. First line displays train number, train name, train arrival/departure time and the platform number similar to MLDB/SLDB. The second and third lines display train formation of that particular train starting from engine as given below:

<table>
<thead>
<tr>
<th>Train no</th>
<th>Train Name</th>
<th>Expected Time</th>
<th>ARR/DEPT</th>
<th>Platform No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>12625</td>
<td>KERALA EXPRESS</td>
<td>08.30</td>
<td>A</td>
<td>2</td>
</tr>
<tr>
<td>ENG G</td>
<td>S1 S2 S3 S4 A1 A2 B1 B2 B3 B4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B5 B6 S5 S7 S8 S9 S10 S11 S12 G</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Single Line Display Board एकल पंक्ति डिस्प्ले बोर्ड

It is also called platform display board. Generally it is a double face display board provided on all platforms. It displays informations of a train which is about to arrive or depart from the platform on which it is provided.

<table>
<thead>
<tr>
<th>Train no</th>
<th>Train Name</th>
<th>Expected Time</th>
<th>ARR/DEPT</th>
<th>Platform No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>12625</td>
<td>KERALA EXPRESS</td>
<td>08.30</td>
<td>A</td>
<td>2</td>
</tr>
</tbody>
</table>
2.3.2 Coach Guidance Display Boards (CGDB)
कोच मार्गदर्शन डिस्प्ले बोर्ड (सीजीडीबी)

These boards are provided along the length of a platform for the purpose of giving individual coach position information of a train which is about to arrive on that platform. CGDBs are small size double faced display boards. These display boards are interfaced to the control console through appropriate hub. It displays only 5 character/numeric at a time for display of following:

<table>
<thead>
<tr>
<th>Train No.</th>
<th>Coach No.</th>
<th>Station Name</th>
<th>Railway Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>12002</td>
<td>C5</td>
<td>GWL</td>
<td>NCR</td>
</tr>
</tbody>
</table>

2.4 Close Circuit Television (CCTV) Display
बंद परिपथ दूरदर्शन (सीसीटीवी) डिस्प्ले

- The CCTV monitors display the train information similar to that displayed by a LED display board.
- Each control console unit is having video output.
- The input to the CCTV will be selected by manual redundancy switch.
- The CCTV monitors are either LCD or LED monitor.

A photograph of close circuit television monitor showing train informations is given below:
2.6 Power Supply

- Power supply: 230V AC 50Hz single phase with over voltage, under voltage & short circuit protection.
- Working range voltage: 160V-270V AC (Tolerance ± 10 V)
- Power supply units will be operated at 50% load of maximum working capacity.
- PVC insulated flexible 3 core x 2.5 sq mm multi strand power cables provided for each of the display boards confirm to specification no. IS:694:1990 or confirmed to 1995 or latest.
- Class-C protection is provided for Main and At a Glance display board. CGDB, SLDB/MLDB. MDCH & PDCH.

3. Software Features

3.1 Announcement System software Features

- The voice messages are stored in digital format using at least 16 bit analog to digital and digital to analog converter card. The system is fully programmed for the announcement of all type of passenger carrying trains through key board.
- Repeat announcement is made by taking the cursor to location and a stroke of key without affecting other operation. However, calling an announcement repeatedly due to repeated pressing of keys is not allowed until the called announcement is finished successfully or paused by the operator.
- The system is user friendly to the maximum extent so that addition and alterations can be done by the staff easily.
- The system provide selection mechanism for the announcement messages, language of announcement i.e. local, Hindi, English or all three or short announcement in all the three languages. The announcement is delivered fluent and professional enough to avoid unnatural pauses in between two pieces of voice are delivered.
- There is one window for each special announcement like courtesy, emergency messages, scratch pad recording and play back, microphone on line etc. The relevant window is taken to front of all other windows, by pressing GUI button on the main window. On pressing ‘ESC’ key it go back to main window. The details of information being announced are displayed on the monitor screen.
- To operate and alter the information on one screen itself is possible.
- It is possible to select and play out courtesy slogans, to play out any of the prerecorded music which can be started or interrupted by the touch of a single button.
- Mainly there are three types of announcements; one for train arriving on platform, one for train arrived on platform and one for train departing from platform in all languages. All these types of announcement can be changed to new platform number in case predetermined platform number is changed. Provision is made for the operator to send out announcement related to train number, platform numbers, and arrival/departure just by keying in the train number, platform number and delays/right time information for any of the following cases.
a) Late arrival of trains.
b) Platform numbers of arriving or arrived trains and changed in platform numbers.
c) Right time arrival of trains.
d) Departure of trains at scheduled or unscheduled time. It is also possible to announce that trains is expected shortly or terminated or regulated and present status of the train.
e) Cancellation of train
f) Route Diversion of train

3.2 Train Arrival/Departure Information Entry Software Features

- It configures through software the selection of display in local language, English and Hindi.
- It selects through menu configuration the display of information with various effects viz Typing, Scrolling, flashing & Curtain effects.
- It increases running speed of display in running mode.
- It can be possible to add, modify delete, modifying timings of existing trains in the master data base in Hindi, English & Local language.
- The entry into Master Data Base is password protected with changing facility. It is also possible to add on new trains.
- The operator can be able to make train message by typing only train number and modification to timing and platform nos.
- Hot key can be used for transferring data from PC to various Boards.
- The information displayed at various boards can be selected automatically related to those boards only based on the platform number.
- While deleting or modifying any train entry on the monitor, the software is prompt user for transferring data, so that the information at board always matches with monitor information.
- The modified information can be saved as soon as it is transferred to the board, so that in case of power failure when the PC is switched “ON” again, the last transferred information appears again.
- The data transferred to the board can be saved in a file on date basis and can be possible to view or print the data of desired date. The data older than 15 days is sent to the backup and in the backup, it is maintained for another 30 days.
- Software provides pictorial representation of the tasks through ICONS.
- Various ICONS represents the applications which can be used by click of mouse.
- Buttons with corresponding pop-up labels are available for the user to perform tasks. The user has to just click his mouse on the button and the corresponding task will be completed.
- Command Buttons: This button is clicked to perform a command.
- Check Box: Check Box is to be clicked to turn a particular feature ON/OFF. When the check box is selected a tick mark should appear inside the box.
- Scroll bars and list bars are also available.
- Communication health status of display boards and communication hubs is available on the PC.
The Software has the facility to take the data of arrival/departure of trains from train charting server. Necessary data and protocols are to be provided by the train charting software developer. This feature is optional.

The Software have provision to receive the data like train coach position from control office computer or any other designated location, platform number nomination from control panel or station master's computer. All these data are integrated for making announcement and to be displayed on train arrival/departure display boards and coach guidance system. However, there is a provision to enter coach position and platform number in software.

The software has provision to configure the number of lines present in the multiline display board.

There is a provision to display the status of train like late, rescheduled, cancelled, diverted, indefinite late etc. In case of reschedule of train, reschedule time and “reschedule” text can be displayed alternatively in arrival/departure field of display board.

Display on the arrival/departure train information display boards are preferably in the following format.

i) For example, Expected Time is taken as “05:30 Hrs” & platform number as “02”.

ii) For the types “Running Right Time”, “Running Late” & “Rescheduled”, platform number is optional. For the rest, it is mandatory.

iii) For the type “Rescheduled”, two separate display texts containing “Reschedule” & expected departure time are displayed alternatively with configurable duration.

3.3 Coach Guidance Software Features कोच मार्गदर्शन सॉफ्टवेयर की विशेषताएं

The software has preloaded information of all the trains arriving at station or departing from station with coach composition. When the train is likely to arrive at station or depart from the station, the concerned operator is required to enter the train number and coach position i.e., from ENGINE to GUARD Brake Van are displayed in editing mode.

On the corresponding platform the train coach positions details are displayed on the individual display boards (double faced), which are installed for each coach respectively across the platform. Informations are displayed at reasonable time interval.

The display cycle is configurable from the control console with respect to display of coach position & train number.

It is possible to display data on Coach Guidance Display Boards in English & Hindi.

It is possible to add, modify & delete coach composition of trains in the master database.

The entry into Master Data Base is password protected. It shall also be possible to add new trains.

The operator can enter details by typing only train number and modification to coach nos.

Hot key is used for transferring data from PC to various Boards.

The information displayed at various boards is selected automatically related to those boards only based on the platform number.
• While deleting or modifying any train entry on the monitor, the software is prompt user for transferring data, so that the information at board always matches with monitor information.
• The modified information can be saved as soon as it is transferred to the board, so that in case of power failure when the PC is switched “ON” again, the last transferred information appears again.
• The position of the coaches as entered by the operator is displayed in the coach guidance display board.
• Communication health status of displays is available on the PC.

4. Installation

In this chapter, installation processor and connection diagrams of IPIS system manufactured by M/s Surya electronics, Hyderabad are given. It may differ from products of other manufacturers.

4.1 Hardware Installation

• IPIS system should be preferably installed in dust free and air conditioning environment to improve the reliability of the system.
• Install two control console units consisting of two sets of CPUs, key boards, LCD color monitors, UPSs along with Ethernet switch, changeover switch and other accessories, in cabinet of suitable dimension as per RDSO specification.
• Suitable ventilation should be provided from both sides and rear of cabinet so that possibility of dust accumulation inside the cabinet is minimized.
• Keyboards & Monitors should be placed inside the cabinet at appropriate height for easy and comfortable operation.
• Other equipments, which are placed inside the cabinet, shall also be easily accessible for maintenance.
• Install Main Data Communication HUBs & Platform Data Communication HUBs at suitable place.
• Connect MDCH to CCU through RS 232 cable.
• Connect PDCH to MDCH through RS485 straight cable.
• Connect MLDB, PDCH & AGDB to MDCH via RS485 cross cable.
• Connect PDB, CDGB & AGDB to PDCH via RS485.
• Power ON all the Display Boards and data communication HUBs.

Note: Before switching ON the system, ensure that earthing is done properly. Voltage difference between earth to neutral should not be exceeding to 6 volt.

4.2 Software Installation

• Control console unit is installed with IPIS user interface software along with user friendly operations.
• Install appropriate graphic driver software for video application.
• Copy IPIS database in C drive with IPIS as folder name.
• Install regional language packs to support indic languages.
- Configure both PCs in network mode and share the IPIS folder to work in sharing mode.
- Feed input as the train names and station names with respect to the respective stations informations in English, Hindi and regional languages.
- Check audio of all three languages i.e. English, Hindi and regional languages.
- Configure display boards and HUBs in NETWORK configurations in IPIS application software.

4.3 Connection Diagrams कनेक्शन आरेख

Some connection diagrams are showing below:

4.3.1 RS 232 D Sub Wiring Diagram Straight Connections (Connections between CPU & MDCH) RS 232 डी उप वायरिंग आरेख सीधा कनेक्शन (सीपीयू और एमडीसीएच के बीच कनेक्शन)

4.3.2 RS 485 D SUB Wiring Diagram Straight Connections (Connections between MDCH & PDCH) RS 485 डी उप वायरिंग आरेख सीधा कनेक्शन (एमडीसीएच और पीडीसीएच के बीच कनेक्शन)
4.3.3 Nine Pin Sub-Connector (Female) नौ पिन उप कनेक्टर (फीमेल)

4.3.4 RS 485 Straight Connection RS 485 सीधा कनेक्शन
4.3.5 RS 485 Cross Connection RS 485 क्रॉस कनेक्शन

![RS 485 Cross Connection Diagram](image)

4.3.6 LED Display Structure एलईडी डिस्प्ले संरचना

Provided GRIDS for LEDs for uniform intensity thereby eliminating patches on the display.

Bending of LEDs is also eliminated.
4.3.7 Wiring Diagram for Coach Guidance Display System कोच मार्गदर्शन डिस्प्ले प्रणाली का वायरिंग आरेख

WIRING DIAGRAM FOR COACH GUIDENCE DISPLAY BOARDS
4.3.8 Switching Arrangement

ROTARY SWITCH
FOR AUDIO VIDEO
SELECTION (PC1 & PC2)

AUDIO CABLE
CPU-1

VIDEO CABLE
CPU-2

TO SPEAKERS

MECHANICAL
SWITCH PCB

TO CCTV

VIDEO CABLE
CPU-1

AUDIO CABLE
CPU-2

SWITCHING ARRANGEMENTS
4.3.9 Connection Diagrams of Control Circuit Units

नियंत्रण परिपथ इकाई का कनेक्शन आरेख
4.3.10 Inter Connection for Coach Guidance Display Board

```
INPUT                             OUTPUT                   INPUT

1  2  3  4  5

6  7  8  9

JUNCTION BOXE                     JUNCTION BOXE             DB 9 FEMALE CONNECTOR
FOR PDCH OUTPUT CROSS CONNECTIONS
```
5. **System Operation प्रणाली संचालन**

The Integrated Passenger Information System is built around data, audio and video network. The data network is based on RS-485 and the display boards, AGDB, CGDB, PDB and MLDB, connected to this network through MDCH/PDCH in point to point and multi-drop mode. In this chapter only a brief description of Integrated Passenger Information System manufactured by M/s Surya Electronics Hyderabad is given. For detail, User Guide of the manufacturer may be referred.

**Main login screen appears as shown below:**

![Main login screen](image-url)
IPIS – login screen appears as shown below. Enter User Name & Password in the Respective Fields and press OK

IPIS menu bar consists of:

- Settings
- Configurations
- Help
- Login / Logout

In the main login screen there are seven tabs as follows:

- Online trains
- Messages
- Reports
- Link Status
- Intensity Setting
- Communication Status
- TV Messages
5.1 Online Trains ऑनलाइन रेल गाड़ियाँ

To display the Train information on the TADDB (Train Arrival Departure Display Boards), select the online Trains TAB from the IPIS main screen. Following screen will appear:

<table>
<thead>
<tr>
<th>S NO</th>
<th>TRAIN NO</th>
<th>TRAIN NAME</th>
<th>SCH ARR</th>
<th>SCH DEP</th>
<th>A/D</th>
<th>TRAIN STATUS</th>
<th>LATE</th>
<th>EXP ARR</th>
<th>EXP DEP</th>
<th>PF NO</th>
<th>TADDB</th>
<th>CGDB</th>
<th>... ANNOUNCE</th>
</tr>
</thead>
</table>

The online Trains screen consists of:

• Train Number,
• Train Names,
• Scheduled Arrival (SCH ARR),
• Scheduled Departure (SCH DEP),
• Arrival / Departure (A/D),
• Train Status,
• Late,
• Expected Arrival (EXP ARR),
• Expected Departure (EXPDEP),
• Platform Number (PF No),
• TADDB,
• CGDB,
• Edit,
• Announce.

5.1.1 Train Number ट्रेन संख्या

The train numbers of different trains are displayed in a sequence. And these has a feature of changing train numbers by using scrolling button, so that it will be easy for the user to handle this.

5.1.2 Train Name ट्रेन नाम

The names of different trains are displayed according to the train numbers using the particular station database.
5.1.3 Scheduled Arrival (Sch Arr) परिणामित आगमन

The arrival time of a train, according to the train no is displayed. The row is filled according to the arrival time or departure time. If a train is coming within 15 minutes, then the train no, train name, Arrival time, are displayed in that particular row.

ON LINE TRAINS Screen
5.1.4 Scheduled Departure (Sch Dep) परिगणित प्रस्थान

The Departure time of a train, according to the train no’s are displayed. The row is filled according to the arrival time or departure time. If a train is going within 15 minutes, then the train no, train name, Arrival time, … are displayed in that particular row.

5.1.5 Arrival /Departure (A/D) आगमन / प्रस्थान

Arrival or Departure condition of a train is done by selecting (A/D), A is selected for Arrival & D is selected for Departure according to the master data base of a particular station.

5.1.6 Train Status ट्रेन स्थिति

The train status items are enabled, if (A/D) is selected. If A/D is not selected then the items for train Status are not enabled. If Arrival (A) is selected from the column (A/D) then for that row, the below train status messages can be selected according the train condition.

- **ARRIVING ON**
  
  If the train is coming to the platform then this message should be selected.

- **ARRIVED ON**
  
  If the train came/already in the Platform then this condition to be selected.

- **RUNNING ON TIME**
  
  If the train is running on time, without late, even though the platform number is known or unknown, this condition should be selected.

- **EXPECTED SHORTLY**
  
  If the train is going to come within few minutes, this condition can be selected.

- **RUNNING LATE**
  
  For the train running late, we select, RUNNING LATE. Now only the late column is enabled, then specify the late time in “HH: MM” format, so that the passengers can understand late timing of the train.

- **INDEFINITE LATE**
  
  If the train is late for unknown time, this condition should be selected.
CANCELLED

If the train is cancelled, due to some reasons, this condition should be selected. If Departure (D) is selected from the column (A/D) then for that row, the below train status messages can be selected according the train condition.

READY TO LEAVE

If the train is going to leave from the platform, this condition should be selected.

ON PLATFORM

If the train is on the platform, this condition should be selected.

HAS LEFT

If the train has left, from the platform, this condition should be selected.

SCHEDULED DEPARTURE

If the train is coming according to the scheduled time, this condition should be selected.

RESCHEDULED

If the train is late, and the train timings are rescheduled, this condition is selected.

DIVERTED ROUTE

Due to some reasons, if the train is going through another route, this condition is selected.

TERMINATED

Due to some reasons, if the train is terminated at any station, this option should selected. The station is selected by selecting either station code or station name.

REGULATED

This condition is used for changing the Expected Dep and also Exp Arr time so that the user can change the timings of that particular train.

PLATFORM CHANGE

If there is change in the platform Number, or if a train is coming to a different platform rather the regular one, then this condition should be selected. We have to select any of the train status, to send the information to the different display boards.
5.1.7 Late Time देर से समय

If the train Status selected as “RUNNING LATE” or “INDEFINITE LATE” or “RESH SCHEDULED” or “REGULATED”, then only the option “Late” is enabled. It should be in the format of “HH: MM”. “HH” is for num of hours, it should be less than 12 hours, if greater than 12 is given then it shows an error message. “MM” for num of minutes, it should be less than 60 minutes, if greater than 60 are given, then it shows an error message. If the late time is selected for Arrival type (A) then the expected Arrival time and expected departure time changes according to the late time respectively.

5.1.8 Expected Arrival अपेक्षित आगमन

This condition is used for present expected arrival time with regarding late time etc. If Sch Arr time is “10:05”, if late time is “00:10”, if “A” is selected then expected Arr time is “10:15”.

5.1.9 Expected Departure अपेक्षित प्रस्थान

This condition is used for present Expected Departure time with regarding late time etc. If Sch Dep time is “10:05”, if late time is “00:10”, if “D” is selected then Exp Dep time is “10:15”.

5.1.10 Platform Number प्लेटफॉर्म संख्या

If the train is coming to the platform or leaving from the platform, then a platform no is selected from the list of platforms given designated according the particular station.

5.1.11 TADDB टी ए डी डी बी

To send the train information to MLDB, PDB and AGDB, first check the online-trains in column, then select TADDB button. As shown in the screen of “ON LINE TRAIN” given above, click the TADDB button, so that those train information is sent to MLDB, AGDB and PDB. If the serial port is busy then it waits for sometime after the serial port frees, then it will send the data to MLDB, AGDB and PDB.

If the train comes on a different platform, the Platform number can be changed by changing the particular row, of “PF No” column (column no 11) and sent to the display boards. After sending the information, if the train is left, then we can uncheck that particular row, if we uncheck the particular row, then we can send the default messages for PDB, AGDB and MLDB.
5.1.12 CGDB Edit सी जी डी बी संपादित

If this button is pressed, then the train coaches of that particular train number of that row are displayed in a form. The form is as shown below:

Here there are 26 coaches; if the train has 24 coaches then only 24 coaches information is shown.

"<<" this button shows that if we want to shift the coaches to the left then this can be used one position is moved to right., then the remaining are moved accordingly.

">>" this button shows that if we wants to shift the coaches to the right, then this can be used. One position is moved to left, the remaining all are moved respectively.

"Reverse", if this is selected then the coach positions are reversed i.e., ENG will come in 26 position S1 in 25..., and also this has one feature that is when we selected Arrival in A/D then automatically the coach composition will be in a order as u observed in above, if we selected Departure in A/D then the coach composition will be in reverse order as the train is leaving from the station.

5.1.13 CGDB Display सी जी डी बी डिस्पले

This is a check box, if the trains coach’s information to be send to AGDB, CGDB, CCTV, then this condition should be selected. To send the coach information to CGDB and AGDB, first check the trains in TADDB, and then only the CGDB button will work. Check the required CGS column i.e., trains, so that those train information is sent to CGS and AGDB. If the serial port is busy then it waits for sometime after the serial port frees, then it will send the data to CGS, CCTV and AGDB.

5.1.14 Announce घोषणा

To announce the train information, Select

Main Screen ---------->Online trains --------> announce symbol button
Check the messages for which the announcement to be made in the Announce Column of the Main Screen. Press announce button, the messages are announced, some conditions to be followed:

a. Select the train type, whether the train is Arriving (A) or Departing (D) from the station.

b. Select the Train Status, according to the train status, the messages are announced.

c. If the train Status is “RUNNING LATE” then late time should be specified i.e., if train is late by 30 minutes then for that train, in late column write as 00:30. If late time is not selected, announce button will not enabled.

d. Check the Announce column.

e. If the same information is to be repeated for 3 times, in announcement panel, select 3 and then press announce button.

f. To stop the announcement, which is already running, then press “Stop” button, then the voice is immediately stopped.

g. To pause the running announcement, press pause. The pause is activated in red colour so that after required time we can play it again.

5.1.15 Delete हटाना

To delete a particular train from the list displayed in the main form. Press the Delete button then it asks you [CONFIRM YES/NO] if we selected yes then immediately it delete that particular train information in MAIN IPIS FORM or ONLINE TRAINS.

5.1.16 Special Announcement विशेष घोषणा

To announce the special messages, Select Special Announcement in Main IPIS window. Press the Special Announcement button, then a form is displayed. Select the Messages for announcement, check the column Message Check (column no 3) then press announce button, the announcement is made from the order top to bottom, to stop the announcement press “Stop” button. This announcement is made in 3 Languages, English Hindi and Regional Languages simultaneously. To add a new voice message, press “Add New Message” button, a new screen opens as shown below:
To add a new voice message press Add button, assign an unique message ID and message name and attach the voice file, for which the voice is already recorded for respective message (recorded voice).

Special English Message path should be stored in this path:
C:\IPIS\voice\special_messages\English

Special Regional Message path should be stored in this path:
C:\IPIS\voice\special_messages\Regional

Special Hindi Message path should be stored in this path:
C:\IPIS\voice\special_messages\Hindi

For English Message Path, browse the file name, for which the message was recorded in English language.

For Regional Message Path, browse the file name, for which the message was recorded in regional language.

For Hindi Message Path, browse the file name, for which the message was recorded in Hindi language.

**Save**

Press the save button, the message is stored in the master database.

**Delete**

To delete a message, then press “Delete” button, the message is deleted.

**Exit**

To exit from the form, press Exit button

**5.1.17 Video वीडियो**

To display the train Information in Televisions, it create automatically when we send train information to MLDB,PDB, AGDB boards by selecting TADDB simultaneously, it sends the coach information to the CCTV when we press CGDB button only.

**5.1.18 Link Status लिंक स्थिति**

The Link Status, shows the working status of display boards regarding with MDCH and PDCH, If there is any failure in the display boards then the link status button shows Red colour or otherwise shows Green colour.

**5.1.19 TADDB Display टीएडीडीबी डिस्प्ले**
To send the trains information, selected by TADDB check boxes to the corresponding display boards, press the TADDB button, so that the information is send to the corresponding display boards of MLDB, PDB.

5.1.20 CGDB Display सीजीडीबी डिस्प्ले

To send the trains coach information, selected by CGDB check boxes to the corresponding display boards, press the CGDB button, so that the information is send to the corresponding display boards of AGDB, CGDB.

5.1.21 Add Train (Data base) ट्रेन जोड़ें (डाटा बेस)

To add the train for the list displayed in the main form. Scroll the train number in (column 2) so that list of trains can be viewed regarding with the master data base of particular station. When we scrolled (column 2) with new train number automatically new train will be added.

5.2 Messages संदेश

To send Default messages to PDB and MLDB display boards, this option is used.
Main Screen ---------->Messages (2nd Tab)

The Default Messages which were there in the database is displayed when Messages is selected. To send a message to PDB select a message (Message check column no 4) from the displayed messages and then select a Platform number, for a group of PDB’s i.e., Names and Addresses of that platform number is displayed in the Names and Address combo boxes and then press Display, the default message is sent to the list of PDB display boards, which are mentioned in the combo box of Address.

To send a message to MLDB select a message (Message check column no 4) from the displayed messages and then select a Name or an Address and then press Display.

In English, Hindi and Regional Language’s we can send Messages. Then the messages were displayed on the PDB or MLDB Boards. To add a new message or to delete the old message, press “Add Message” button in the above form. A new form is opened as shown below:
5.3 Reports

To see the reports of Log information, Port Configuration, train Information Select Main Screen ------> Reports (3rd tab)

When "Log" option is selected (select the radio button Log), then the screen appears as shown below:
Link Status लिंक स्थिति

Link status screen gives the information about the display boards connectivity. Click display button to display the status of the display boards connected.

Green colour indication states that the health of the particular DB is OK. Red colour indication states that the particular DB communication link is not OK.

5.4 Intensity Settings तीव्रता समयोजन

We can change the intensity setting of display boards for particular time duration.
5.6 Communication Status संचार की स्थिति

Communication status is used to check whether the boards are working properly or not. These operations are performed for diagnosis:

- Link Check
- Set Configuration
- Get Configuration
- Soft Reset
- Clear reset

**Link check लिंक चेक**

Link Check can be performed for HUB’S and Display Boards, depending upon the option selected. If MDCH is selected then MDCH Link Check is performed as shown in the below figure.

Link check will perform the checking whether physically all connections are working properly or not. If there is any failure, then it will show the error message. All the messages are displayed right side of the panel in the form. The Packet information send to the boards, if the packet received successfully or not, Display board system link is Ok.
or not, if it is in reset State or if the system is with the default values or not, all these information is checked and displayed in the white portion area.

It will check the COM port, and all the links

If PDCH is selected, then Platform No should be selected, then if it is shared with any other platform, then that shared platform no is displayed in the shared platform no field. The name and address of that platform is displayed in the name and address fields respectively, then press the link check button then for that particular platform and for that particular address link checking is performed and the details are displayed.

**Link check – Display Boards**

![Link check display boards diagram]

Select respective Display boards

SELECT Name

CLICK Link Check

AFTER LINK CHECK IS COMPLETED, PRESS SOFT RESET FOR RESETTING THE HUB
5.7 TV Messages टीवी संदेश

To display the messages in the TV screen, select Display on TV check box.

To display the text on Header & footer of TV screen edit in the respective fields.
5.8 Settings समायोजन

In setting we can change the COM port and BAUD rate values, display board settings,
These operation are performed here

- COM Port
- Display Boards
- Online Train Display Interval
- Station Code
- Station details
- Voice

COM Port Settings

To change the COM Port settings and Baud rate settings,
Select
Main Screen ----------> Settings ----------> COM Port

![COM Port Setting](image_url)

- SELECT THE PORT
- SELECT BAUDRATE
- CLICK SAVE & EXIT
5.9 Configuration विन्यास

Font, Network, HUB Configuration, Languages, Train, Train Status Messages, User

To select the Language Name, Font size, Font Name, Font Type Select Main Screen ——> Configuration ——> Font

To change the Font size, Font Name, Font Type Click select Font from Font screen.

Font Type: It can be Regular or Bold or Italic (Regular is default).
Font size: It can be 8, 10, and 12 (10 is default)
Configuration - Network विन्यास - नेटवर्क

Network has the complete details of display boards regarding address, switching delay, multi-cast address, board name etc. And the figure is shown below,

Select: Main Menu -----> Configuration -----> Network
Network configuration has, 2 HUBS and 4 display Boards
HUBS are 1: MDCH, 2: PDCH
Display Boards are 1: MLDB 2: AGDB 3: PDB 4: CGS
CCU, MDCH, PDCH, MLDB, AGDB, PDB and CGS have Unique Address and the address should be in the range of 1 to 255 in decimal.
CCU Address must be either 253 or 254 (0xFD or 0xFE)
MDCH Address must be in the range of 1 to 239 (0x01 – 0xEF)
There are 16 Ports for MDCH.
Each Port can connect 4 Systems.
CONFIGURATION – HUB CONFIGURATION GET MDCH

विन्यास-हब कॉन्फ़िगरेशन प्राप्त एमडीसीएच

It is the form of port configuration of HUB.
Select “Main Screen___Configuration____Hub Configuration, select MDCH/PDCH

MDCH/PDCH “Get” Configuration. एमडीसीएच / पीडीसीएच "प्राप्त" कॉन्फ़िगरेशन।

MDCH/PDCH Address and MDCH/PDCH Name is Displayed in the text boxes respectively.

- System Status message is displayed. Port numbers are displayed in the first column from 1 to 16. Port Type (Single System or Multi System) connected to that port is displayed.
- No of IDs connected to that port is displayed in the third column.
- ID1 is the address of MDCH/PDCH. ID2, ID3..... are the addresses of the display boards that are connected to that port.
- It can be viewed but cannot modify.
- Press Exit button to close the form.
Configuration – Train Information विन्यास-ट्रेन जानकारी

To add or edit or delete the train information i.e., Train No, Train Name, Arrival time, Departure Time...
Select
Main Screen ------> Configuration ------> Train

The form looks like the one given below

It has 6 options to be selected

1 Add
2 Edit
3 Save
4 Delete
5 Cancel
6 Exit

Coach Guidance System कोच मार्गदर्शन प्रणाली

Train coaches' details can be provided by pressing the CGS button, If CGS button is pressed then a form is opened as shown below.
Provide the caches information as shown in the above figure in each text box, then press “Ok” button, it will close the form and go to train_config form.

If “Clear” button is pressed then the data in the text boxes are empty. If “Exit” button is pressed, then the old data is there, it will not save the data which was modified and exits from this form and directed to the train_config form. After adding all the data, press “Save” button in the “Train_config” form. The Train information is stored in the database and the form fields are disabled.

6. Maintenance अनुरक्षण

- LAN connection should be maintained properly so that redundant mode will work properly.
- Hi-tech connectors (for data communications) and power connector’s cable should be connected properly.
- DB-9 connectors which are connected to hi-tech connectors and control card connectors should be connected properly.
- Data cables (flat ribbon cables) which are connecting from control card to LED drive card should be properly connected otherwise there will be flicker in the display.
- VGA adopter should be properly maintained so that the video information will be clear.
- Mechanical switch should be properly maintained which is used for audio and video.

7. Troubleshooting समस्या निवारण

In this chapter trouble shooting for IPIS system of M/s Surya Electronics, Hyderabad is given. It may differ for other manufacturers product.

For troubleshooting of IPIS step by step test procedure shall be followed so that the IPIS application software provides quick remedy for the possible faults.
Before proceeding with the process ensure that the connectivity of cables are proper.

**Possible Faults संभावित दोष**

7.1. **No data displayed on any of the connected display boards.**

- Check for the CCU PC is in switched on.
- Make sure all the connected HUBs and display boards are powered on and the connectivity is in good condition. 
- Check for the communication link between CCU and MDCH. If the link check is failed follows the below steps.
  
  i. Check for the PC com port option in the IPIS application software Main screen→settings → com port. Select the appropriate com port and baud rate (57600). Select the save button. If the port is OK it will return “com port configuration successful”. Proceed with link check else continue with troubleshooting.
  
  ii. Connect to the other ports provided with the CCU PC (PC has 4 serial ports)
  
  iii. Connect for RS 232 cable is properly plugged with CCFU and MDCH port.
  
  iv. If the cable is plugged in, check for the continuity of the RS232 cable. Found defective replace the cable and follow step (I).
  
  v. Check for communication link between CCU, MDCH and PDCH.
  
  vi. Check for the cable (RS485, straight cable) connectivity between MDCH and PDCH
  
  vii. Check for the continuity of RS 485 cable. Found defective replace the cable and proceed with link check.
  
  viii. If the problem still exists follow the below step
  
  ix. Replace the HUB or call for service help.

7.2. **No data displayed on MDLB (multi line display board)**

- Check for communication link between MDCH and MDLB
- Check for RS485 (cross connection cable) cable continuity if found defective replaced with new cable or rectify the connections and proceed with link check.
- If the problem persists connect the RS 485 cable to another RS 485 port in MDCH. MDCH provided with 16 RS485 ports.
- If the problem still exists follow the below steps.
- Check the SMPS output is 5VDC and also assure 5VDC power is supplied to all the drive cards and control cards.
- Check for the MDLB control cards unique address and the address assigned in the network configuration wizard in IPIS application software. If found addresses mismatch assign the correct address and proceed with link check.
- If the problem still persists replace the control card or call or assistance.

**Note:** refer hardware manual for address settings.
7.3 No data displayed on AGDB (At a glance display board)

- Check for communication link MDCH and AGDB
- Check for the RS 485 (cross connection cable) cable continuity if found defective replace with new cable or rectify the connections and proceed with link check.
- If the problem persists, connect the RS485 cable to another RS485 port in MDCH. MDCH is provided with 16 RS485 ports.
- If the problem still exists follow the below steps:
  - Check the SMPS output is 5VDC and also assure 5VDC power is supplied to all the drive cards, control cards.
  - Check for AGDB controls cards unique address and the address assigned in the network configuration wizard in IPIS application software. If found address mismatch, assign the correct address and proceed with link check.
  - If the problem still persists replace the control card or call for assistance.

Note: refer hardware manual for address setting.

7.4 No data displayed on PDB (platform display board)

- Check for communication link PDCH and PDB
- Check for the RS 485 (cross connection cable) cable continuity if found defective replace with new cable or rectify the connections and proceed with link check.
- If the problem persists, connect the RS485 cable to another RS485 port in PDCH. PDCH is provided with 16 RS485 ports.
- If the problem still exists follow the below steps:
  - Check the SMPS output is 5VDC and also assure 5VDC power is supplied to all the drive cards, control cards.
  - Check for PDB control cards multicast address and the same in IPIS network configuration wizard.
  - Check the PDB control cards unique address and the address assigned in the network configuration wizard in IPIS application software. If found address mismatch assign the correct address and proceed with link check.
  - The problem still persists replace the control card or call for assistance.

Note: refer hardware manual for address settings.

7.5 No data displayed on CGDB (Coach guidance display board)

- Check for communication link PDCH and CGDB
- CGDBs are connected in a multi drop connection. Check for the RS 485 (cross connection cable) cable continuity in all the CGDBs connected if found defective replace with new cable or rectify the connections and proceed with link check.
• If the problem persists, connection RS485 cable to another RS485 port in PDCH is provided with 16 RS485 ports.
• If the problem still exists follow the below steps:
• Check the SMPS output is 5VDC and also assure 5VDC power is supplied to all the drive cards, control cards.
• Check the CGDB control cards, multi cast address settings.
• Check for CGDB controls cards unique address and the address assigned in the network configuration wizard in IPIS application software. If found address mismatch, assign the correct address and proceed with link check.
• The problem still persists replace the control card or call for assistance.

Note: refer hardware manual for address settings.

7.6 Data displayed on some connected CGDB

- Check for RS485 cable connectivity
- Check the SMPS output is 5VDC and also assure 5VDC power is supplied to all the drive cards, control cards.
- Check the CGDB control cards, multi cast address settings.
- Check for CGDB controls cards unique address and the address assigned in the network configuration wizard in IPIS application software. If found address mismatch, assign the correct address and proceed with link check.
- The problem still persists replace the control card or call for assistance.

7.7 Train Data displayed on some CGDB and default data on all CGDB connected Train

- Check the CGDB control cards, multi cast address settings.
- Check for CGDB controls cards unique address and the address assigned in the network configuration wizard in IPIS application software. If found address mismatch, assign the correct address and proceed with link check.
- The problem still persists replace the control card or call for assistance.

7.8 Identical Data displayed on CGDB (this problem arises when the CGDBs address are identical)

- Check the SMPS output is 5VDC and also assure 5VDC power is supplied to all the drive cards, control cards.
- Check for CGDB controls cards unique address and the address assigned in the network configuration wizard in IPIS application software. If found address mismatch, assign the correct address and proceed with link check.
- The problem still persists replace the control card or call for assistance.

7.9 Haze, flicker, dull on some part of display, display boards not glowing

- Check the SMPS output is 5VDC and also assure 5VDC power is supplied to all the drive cards, control cards.
- Assure all the power connectors are intact.
- If the problem still persists, follow the steps given below.
- Replace the drive cards or call for assistance

7.10 No LCD display

- Power on LCD TV
- Ensure the video cable is properly connected.
- Ensure the manual change over switch on CCU is set to the PC in operation.
- Make sure the CCTV option in IPIS application software is selected.
- Open the graphic card application from windows main menu or right click on the desktop screen and select graphic card application.
- Select for multiple screens and follows the onscreen instructions.
- If the problem persists call for assistance.

7.11 No voice

- Check for the speakers
- Ensure the audio cable is properly connected
- Ensure the manual change over switch on CCU is set to the PC in operation
- Make sure the play option in IPIS application software is selected.
- Volume level in PC is selected to the desired level

8. Do’s & Don’ts करें और मत करें

8.1 Do’s देखें

- For QUIT operation of the system, first close the software then windows and then switch off the computer.
- Always try to diagnose the fault and observe the behavior of the failure
- Always try to isolate the problem, weather it is with the computer, cable, speakers or PA system
- Avoid any dust on keyboard, mouse and CPU unit
- Avoid any loose contacts or connections.
- Avoid stretching of cables, especially of keyboard, mouse and speakers.
- Check the voltage difference between neutral of AC mains and earth should not be exceed to 5 volts or as per instructions issued by the railway time to time.
- Check the earth of AC supply it shall not be exceed to 3 ohm or as per instructions issued by the railway time to time.

8.2 Don’ts मत देखें

- Do not switch off the computer directly.
- Do not make any connections or solder operation during power ON.
- Do not allow any loose connections.