इ रि से ट
पी आई एस प्रयोगशाला
प्रयोग सं : पी आई 1

**I R I S E T**

**PASSENGER INFORMATION SYSTEMS LABORATORY**

**EXPERIMENT NO. PI- 1**

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नाम
Name : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

अनुक्रमांक
Roll No : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

प्राप्त अंक
Marks Awarded :

पाठ्यक्रम
Course : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

दिनांक
Date : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

अनुदेशक का अधाक्षर
Instructor Initial :

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**Experiment No. PI -1**

# Study of Passenger Information System

## System Description:

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 for arriving/leaving, formation etc.

In this lab session we shall study about different types of **LED Display Boards** provided in railway stations for passenger information**.** These display boards are mainly of two types -

1) **TADDB**- Train Arrival/Departure Display Boards
2) **CGDB** -Coach Guidance Display Boards

These display boards have modular construction using PCB modules of **16x48** or **8x48** matrix LEDs and comply with **RDSO specification No. RDSO/SPN/TC/61/2007** which states that the LEDs used in these modules should meet the following specifications.

| | |
|---|---|
| **Type of LED** | **Diffused/ Colorless clear** |
| **Colors** | **Red/ Orange / Green/ Blue** |
| **Viewing Angle** | **Horizontal: 60$^{o}$ (Min.) Vertical: 25$^{o}$ (Min.)** |
| **Size** | **5 mm Oval Radial** |
| **Operating Temperature** | **- 30$^{o}$ C to +85$^{o}$ C** |

**TADDB** - Train Arrival/Departure Display Boards. There are three types of TADDBs as given below.

**(a) MLDB -** Multiline Display Board.

It can be of either **Single-face** or **Double-face display board** and is provided at the main entrance points of railway stations and sometimes on important platforms. It can be of **minimum 5-lines** to **maximum 10 lines** of display sizes. It provides information regarding all the trains arriving at and departing from the station in the format given below.

| Train No | Train Name | Expt. Time | A/ D | PF No |
|---|---|---|---|---|
| 2723 | A.P Express | 06.25 | D | 1 |
| 8645 | East Coast Express | 18.30 | A | 9 |
| 2701 | Hussain Sagar Express | 12.10 | A | 10 |
| 2285 | Duranto Express | 12.30 | D | 1 |
| 2604 | Chennai Express | 16.55 | D | 2 |

**Fig.1.1 -** Display Format of MLDB

**(b) AGDB**- At a Glance Display Board.

This is a **single-face display board** used to provide complete information about a single train at a time. The information is displayed in three lines. First line displays train no, train name, train arrival/departure time and the platform number just the same as it is given in MLDB. The second and third lines display **Train-formation** of that particular train with its detailed coach positions starting from engine.

| Train No | Train Name | Expt. Time | A / D | PF No |
|---|---|---|---|---|
| 7031 | Falaknuma Express | 10.35 | D | 2 |

| ENG | G | S1 | S2 | S3 | A1 | A2 | B1 | B2 | B3 | S4 | S5 | S6 | S7 | S8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S9 | S10 | S11 | S12 | S13 | S14 | G | | | | | | | | |

**Fig.1.2 -** Display Format of AGDB

**(c) SLDB** – Single Line Display Board.

It is also called as Platform Display Board**- PDB** . Generally, it is a **double-face display board** provided on every platform. It displays information of a train which is about to arrive or depart from the platform on which it is provided.

| Train No | Train Name | Expt. Time | A / D | PF No |
|---|---|---|---|---|
| 7035 | Telangana Express | 07.30 | D | 1 |

**Fig.1.3 -** Display Format of PDB

**CGDB**- Coach Guidance Display Board.

CGDB boards are provided along the entire length of a platform for the purpose of giving individual **coach position** information of a train which is about to arrive on to that platform. Every CGDB is a double-face display board and small in size just enough to display only 4 characters/numerals at a time. As shown in fig.1.4 (a) and (b) given below, these display boards are used for displaying-

1. **Train No/ Coach No** - one at a time alternately, when a train is arriving on platform
2. **Station Name / Railway Name** (codes) - by default when there is no train.


(a) Train No/ Coach No. Display (b) Railway/Station Name Display

**Fig. 1.4** Display Format of Coach Guidance Display Board

The following devices are also needed in the PIS network other than the display boards discussed above.

1) **Control Console Unit** (CCU) - It has two PCs located at a central place for feeding data to display boards and also to control the display parameters. RDSO approved IPIS software is installed on both the PCs of CCU to facilitate data entry, editing and network management functions.

2) **Communication Hubs**

   a) **MDCH** - Main Data Communication Hub.

      It receives PI data directly from CCU PCs and passes on the same to PDCH and display boards - MLDB and AGDB.

   b) **PDCH** - Platform Data Communication Hub.
      It is connected to MDCH to receive PI data and send the same to display boards provided on different platforms. This hub is similar to MDCH

In addition to the display system, **audio announcement facility** is also provided in stations for making announcements on different platforms about trains and also about other required information. The following fig.1.5 shows the general connection scheme on a PIS network.

The two PCs of CCU offer redundancy in working to provide interruption-free service even if one of them fails. The PIS network uses the following two types of serial communication standards for transmission of data around the network.

1. RS 232C interface - for communication between CCU computers and MDCH
2. RS 485 interface - for communication between MDCH, PDCH and display boards.

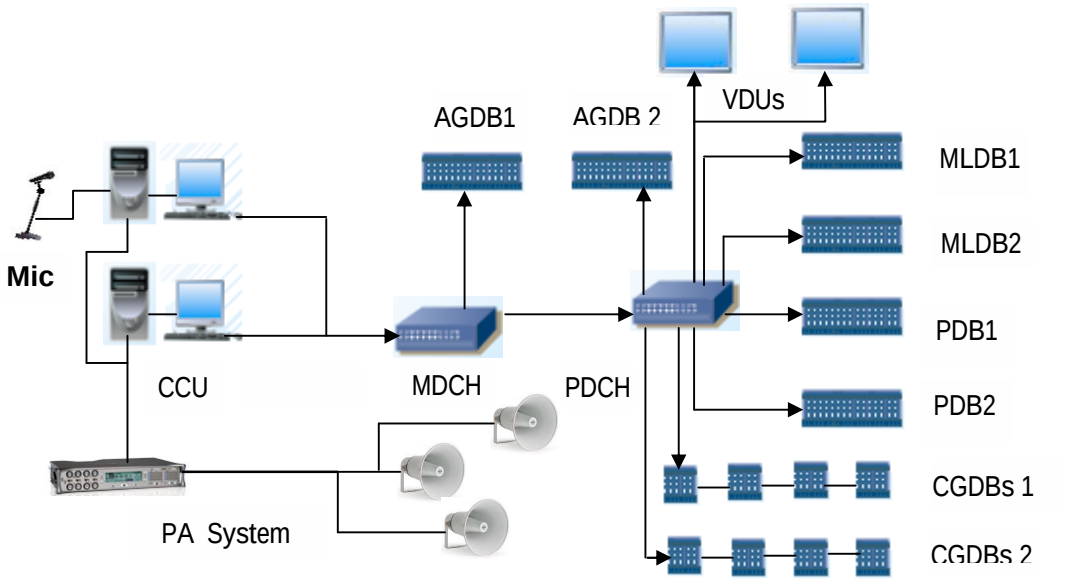


**Fig. 1.5** Layout of IPIS Network

**Exercise-1:** List out different devices present in the Lab PIS network. Without disturbing the existing set up trace the connectivity between them and show the same thing with a neat diagram in the space given below.

## Review Questions

1. Identify the types of display boards that are available in the PIS lab of IRISET?
2. Among these which are double-sided display boards?

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**I R I S E T**

**PASSENGER INFORMATION SYSTEMS LABORATORY**

**EXPERIMENT NO. PI- 2**

नाम
Name : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

अनुक्रमांक
Roll No : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

प्राप्त अंक
Marks Awarded :

पाठ्यक्रम
Course : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

दिनांक
Date : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

अनुदेशक का अधाक्षर
Instructor Initial :

**Experiment No. PI -2**

## Display of Trains Information

The information of trains required to be displayed on display boards in a station is entered through the CCU consoles placed at a central location in the station. IPIS software installed in the CCU consoles facilitates the train data entry/edit and display management functions.

### IPIS Software

As per the RDSO specification IPIS software has to be menu-driven and its main screen should contain all the provisions as shown in the fig.2.1 below.

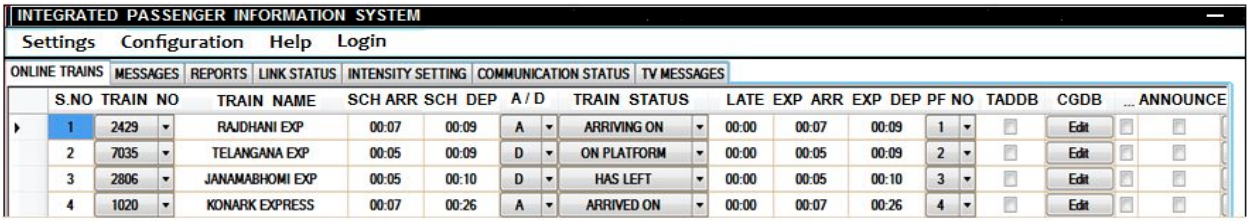


**Fig 2.1**

### Executing IPIS Software

**Procedure:**

1. To open the IPIS program double click on the **icon** shown below

2. The following window appears and takes some time to load the PIS program.


3. And after some time the screen shown in fig.2.2 will appear.


**Fig. 2.2** First Screen of IPIS Software.

4. Try to change the timings of any train in *Late*, *Exp. Arr* and *Exp. Dep* columns.
5. You will find that it is not be possible to change any of these. Because **Login** into the PIS system is needed for altering or entering train display data.
6. Hence, click on **Login menu** on the first screen shown above in fig. 2.2.
7. **Login screen** appears as shown in fig.2.3. Enter User Name & Password in the respective fields and press OK


**Fig. 2.3** IPIS – Login Screen

8. The following **Main Screen** appears. The **Link Status** button on this screen should be **green** which indicates the connectivity in the network is all right.

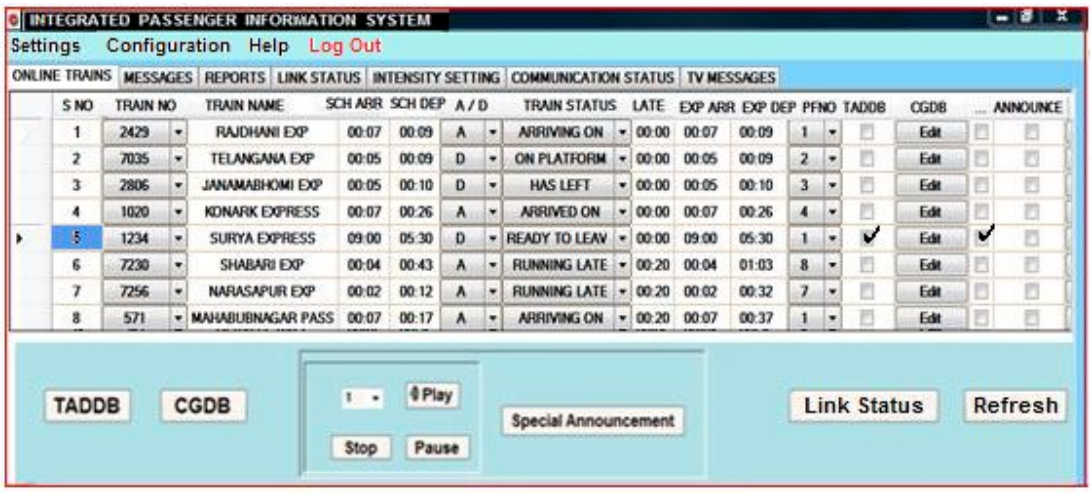


**Fig. 2.4** PIS Main Screen after Login

9. Press <***On Line Trains*** > tab in the screen if trains list does not appear on the screen.
10. Select any one train from the List of trains appearing on the screen by clicking in the <**TRAIN NAME**> column.
11. To display its info on display boards click on check box of column <***TADDB***>.
12. Select **platform no.1** in <***PFNO***> column in the same row of the selected train and
13. Select a <**TRAIN STATUS**> message. Ex: < **Arriving On**> for the train
14. And also click the check box in <***CGDB***> column and press <***Edit***> for editing/feeding data for the CGDB boards. The below given window opens. Enter data - S1, S2, S3, S4 in the data boxes of the window and press OK. You can also enter up to S26 sequentially to see display on the 3rd line of AGDB.

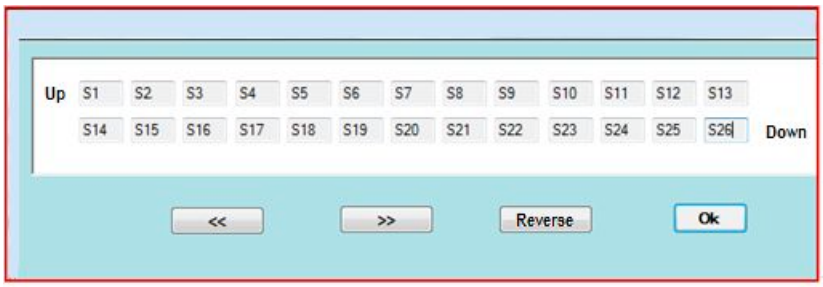


**Fig. 2.5**

15. You will return to main screen of fig.2.4. Then, press **TADDB** and **CGDB** buttons in the bottom of the window.
16. Now, the selected **train information** should be displayed on display boards AGDB(in front of you) & PDB (hanging behind you), coach positions on CGDBs placed on right-side wall and **train-formation** sequence on AGDB in second and third rows. (In case of connectivity problem nothing is displayed on the boards. In such case the link status button, in the ON Line Trains screen, shows RED.)

17. Similarly, select **one more train** and enter data for **platform no.2** following the same sequence of operations. Press **TADDB** and **CGDB** buttons in the window to send information of this train also to display boards.
18. Now observe the information on display boards AGDB, PDB and CGDB.

**Question:** What information did appear on each of these boards? Record below.

## Display Effects:

The information on the display boards can be displayed with a **special effect** which can be chosen from the list box of Display Effect. (Seer window shown below in fig. 2.6). By default **normal** is selected for all boards.

**Exercise:** Find out from the display board effects window the different types of display effects that are available and list them all in the below given space.

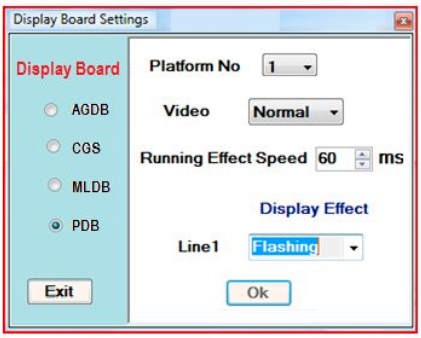


**Fig. 2.6**

**Procedure:**

1) In the main screen select <***display board effects***> in <***Settings***> menu
2) Display board settings window shown in fig.2.6 opens. Select PDB and Platform No 1.
3) Click list box on the right of <***Line1***> and select < ***Flashing*** > as display effect.
4) Press OK and watch for flashing on the display boards.
5) The speed of Flashing can be changed by < ***Running Effect Speed*** >
6) Similarly, try other display effects also.

## Display Boards Intensity

Intensity of LED display boards can be set properly for day and night times not only to improve visibility but also to conserve power. This can be done as follows.

1) Select <Intensity Setting>
2) A window shown in fig.2.7 opens
3) Select values for <**Intensity**> and <**Time**> fields for Day and Night times as shown in the window of fig.2.7.

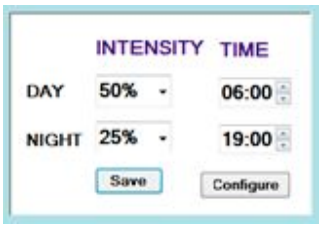


**Fig. 2.7**

### Review Question

1. Find out what can be the maximum value you can set for **< *Running Effect Speed* >** in the above window.

नाम
Name : _____ ____
अनुक्रमांक
Roll No : _____
पाठ्यक्रम
Course : _____
दिनांक
Date : _____

प्राप्त अंक
Marks Awarded :

अनुदेशक का अधाक्षर
Instructor Initial :

**Experiment No. PI -3**

# Addition/Deletion To/From Train List

## Addition To Train List

For adding a train to the <**Trains-On-Line**> list the procedure is

1. Click on < **Configuration** > menu in main screen.
2. Select < **Train** >. The following screen appears

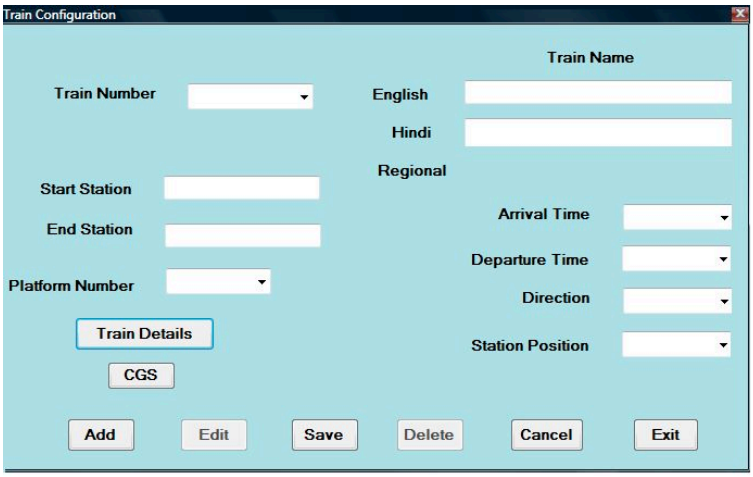


**Fig. 3.1** Train Data Entry Screen

3. Press < **Add** > button in this screen.
4. Now feed the train data given below in table 3.1 (or data of any train you like to add) in the screen of fig 3.1

| Train No | Train Name (in 3 Languages) | | | Start Station | End Station | Platform No | Arrival Time | Dep. Time | Direction | Station Position |
|---|---|---|---|---|---|---|---|---|---|---|
| | English | Hindi | Regional | | | | | | | |
| 1234 | IRISET Express | | | PIS Lab | Control Lab | 1 | 12.30 | 12.40 | UP | Start Station |

**Table 3.1**

5. After this, press <**Train Details**> which opens another screen shown below.

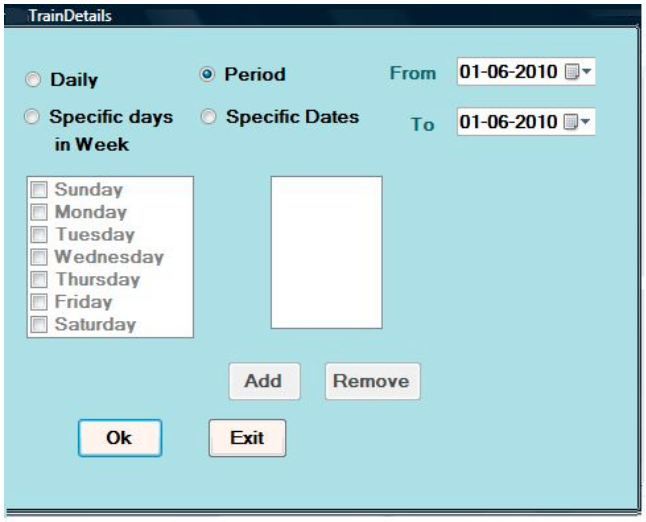


**Fig. 3.2**

6. In this screen specify type of train operation like, whether it runs <**Daily**> or on < **Specific Days**> or over a < **Period**> or on <**Specific Dates** > only.
7. If item <**Specific Dates** > is selected enter dates using <**Add**> button.
8. Click <**Ok**> to go back to screen of fig.3.1
9. Click <**CGS**> button and feed in the CGS screen, coach numbers of the train as per its formation order. Return from CGS by clicking on <**Ok**>
10. In the screen of fig.3.1 click on <**Save**>
11. Press <**Exit**> to go back to <**Trains-On-Line**> screen.
12. For sending info of this new entry on to the display boards using mouse tick check boxes as shown in figure 3.3 below.
13. Similarly, you can enter data of any no. of trains and get it displayed in the same way.

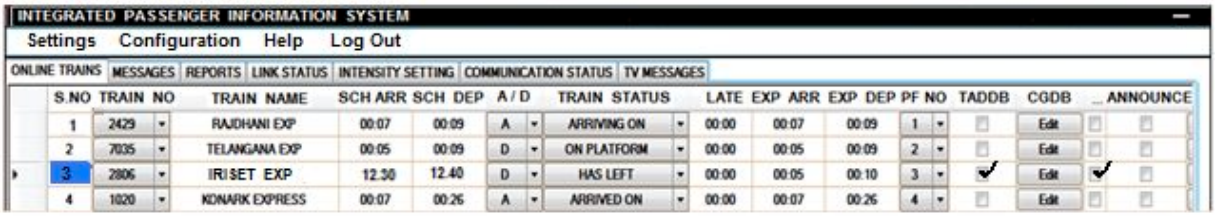


**Fig. 3.3**

**Exercise1:**

Enter the data of trains given below in table 3.2 using the same procedure as above and display their info on all display boards.

| Train No | Train Name (in 3 Languages) | | | Start Station | End Station | Platform No | Arrival Time | Dep. Time | Direction | Station Position |
|---|---|---|---|---|---|---|---|---|---|---|
| | English | Hindi | Regional | | | | | | | |
| 2721 | Nizamuddin Express | | | Hyderabad | H.Nizamuddin | 1 | 5.00 | 22.30 | UP | Start Station |
| 2785 | Bengalur Express | | | Kachiguda | Bengalur | 2 | 5.40 | 19.05 | UP | Start Station |
| 2650 | Sampark Kranti | | | Kachiguda | Yesvantpur Jn | 1 | 7.15 | 8.25 | DN | Mid Station |
| 7057 | Devagiri Express | | | Secunderabad Jn | Mumbai CST | 9 | 21.05 | 14.15 | DN | End Station |

**Table 3.2**

## Deletion From Train List

1. First three steps shown above are same
2. In the screen of fig 3.1 select a Train No using the list box, for example 1234
3. All the details of this train appear on the screen
4. Then press <**Delete**> button
5. Press <**Exit**> to return to Trains List Screen
6. Now details of the deleted train do not appear in the screen.

## Duration of Trains Information Display

To change the display of trains in the main screen based on the time of the day this feature is used. This means, there may be a number of trains passing through a railway station. But all trains need not be displayed always around the clock. Every train entered in the list is to be displayed only during a required period or duration of the day. Hence, there must be provision to show different trains during different time periods. This is done using <**Online Train Display Interval**> function. The procedure for selecting this function is as given below.

1. Select <**Settings**> menu.
2. Click on <**Online Train Display Interval**>.
3. The following screen of fig. 3.4 appears

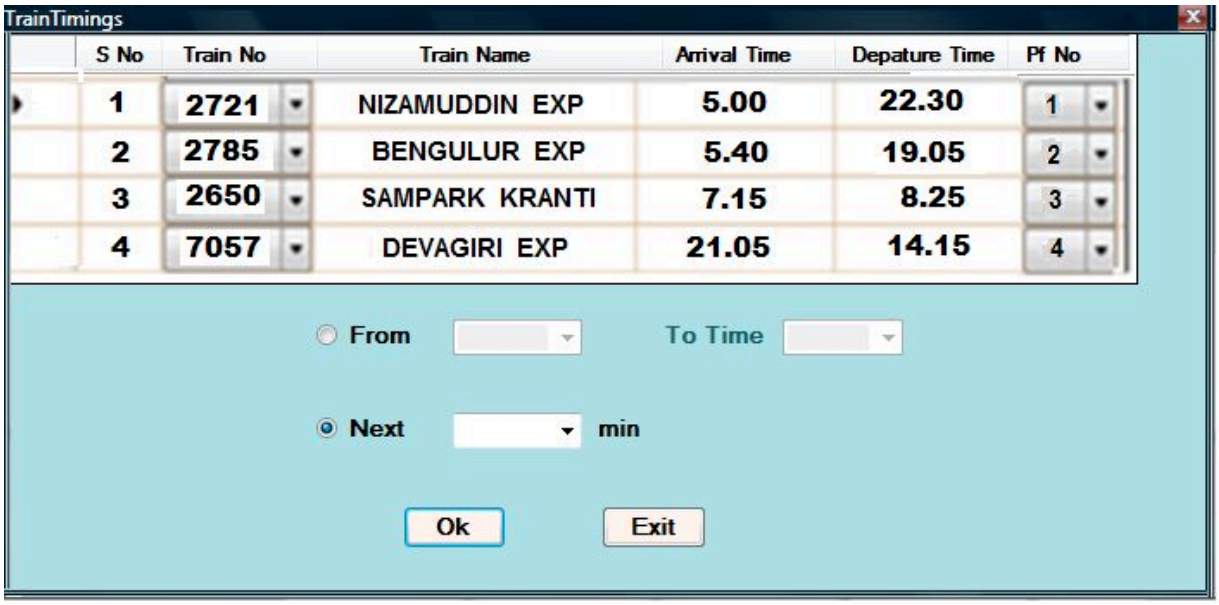


**Fig. 3.4**

4. Select with mouse first three trains in the list on the screen and then
5. Select **From** and **To** and enter time. Example: From **8.00** to **10.00** or
6. Instead, you can also select <**Next**> and enter duration in minutes. Example: Next **120** min.
7. Press <**Ok**>.
8. Observe what is displayed in the train list on the screen.
9. Write down your observation below.

10. Select different trains in the list and give different timings and observe.

**Review Questions**

1. If two trains information is selected what is the interval between display of the two trains information?
2. What happens if for **Online Train Display Interval** same time is entered in **From** and **To** fields.

नाम
Name : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

अनुक्रमांक
Roll No : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

पाठ्यक्रम
Course : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

दिनांक
Date : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

प्राप्त अंक
Marks Awarded :

अनुदेशक का अधाक्षर
Instructor Initial :

## Experiment No. PI - 4

# Message Display on IPIS System

### Introduction

In addition to displaying train related information it is also possible to display messages for the passengers in three languages and also make audio announcements using the PIS network.

### Display of Messages

#### a) Default Messages on AGDB and CGDB:

These messages are displayed during idle periods when there is no specific train information for display. The procedure for feeding default messages for AGDBs and CGDBs is as follows.

1. Select **<Station Details>** in <**Settings**> menu. The window shown below opens.

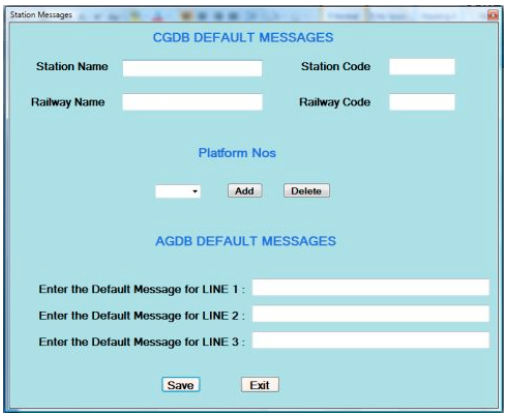


**Fig. 4.1**

2. Enter default data for both CGDB and AGDB as given below in fig. 4.2.

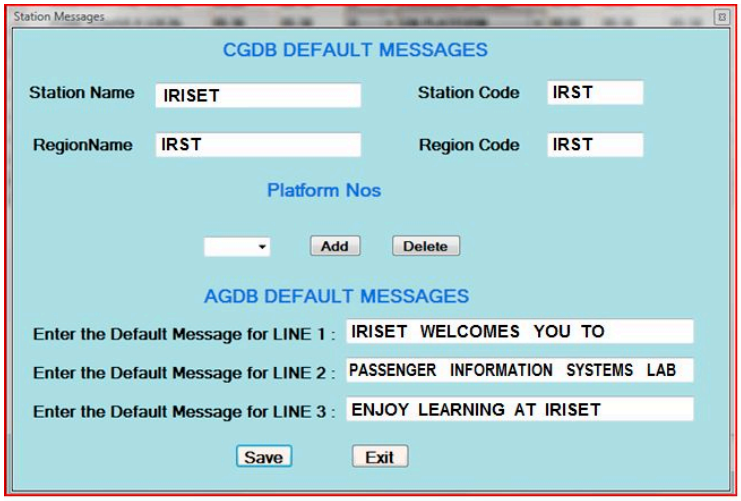


**Fig. 4.2**

3. Select Platform Nos for display using list box.
4. For adding new Platform Nos click on <**Add**> and enter platform nos.
5. After entering all the messages click <**Save**> and then <**Exit**>.

**b) Messages on PDB and MLDB:**

For displaying any of the messages which are already available in the database on PDBs and MLDBs the sequence given below is followed.

1. Select <**Messages**> tab on the main screen.
2. The following screen appears with list of messages already available.

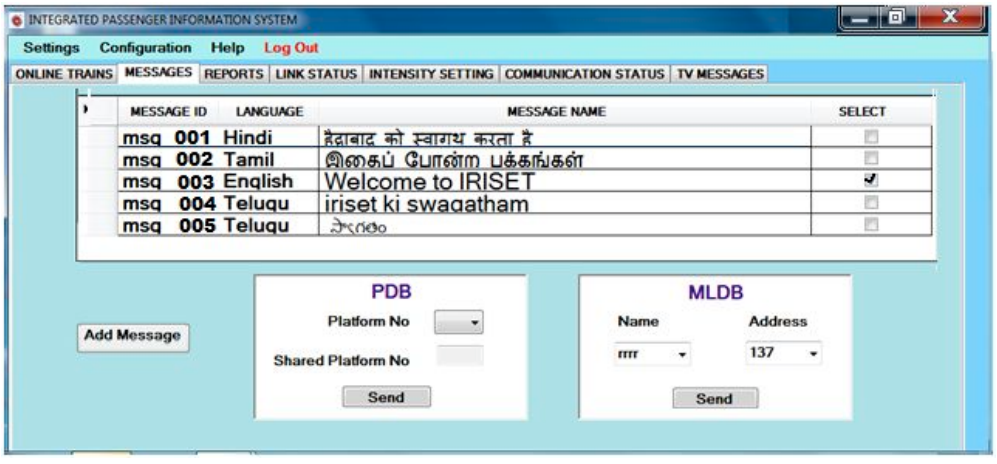


**Fig. 4.3**

3. Select the required message from the list by clicking in the check box.
4. For example in the above list message 3 is selected.

5. To send this to a PDB select platform no.1 or 2 in the PDB window. Shared platform no. automatically appears.
6. Then press <**Send**> button. The message is displayed on PDB of selected platform.

### c) Displaying a New Message on PDB and MLDB

1. To add a new message to the list of messages, press <**Add Message** >.
2. A small window as shown below in fig.4.4 opens. Press <**Add**> button.

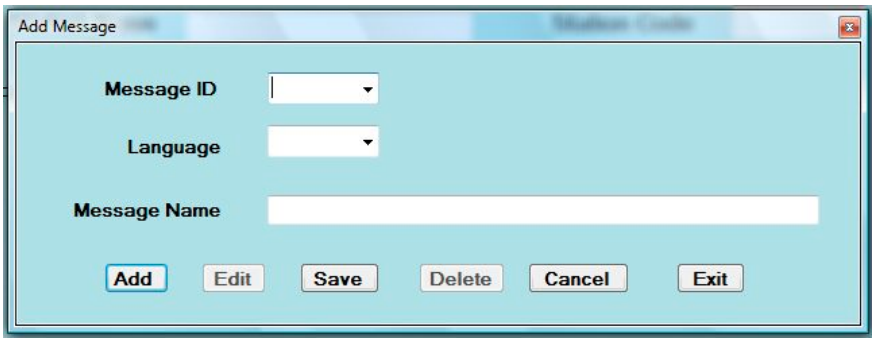


**Fig. 4.4**

3. Enter a unique <Message ID>, select <Language>, and type the <Message>.
4. Press <**Save**> and then <**Exit**>.
5. Now, the newly added message is saved in messages database file and it appears in the list of messages in messages-screen shown in fig.4.3.
6. Now, it can be displayed on PDB and MLDB by selecting from the list.

### d) Display of Train Status Messages on PDB:

When a train is selected on the <**Online Trains**> screen for displaying its information on TADDBs its status, as seen on the screen, is also displayed on PDBs. To display the status information in three languages the following procedure is used.

1. Select <**Train Status Messages**> in <**Configuration**> menu on Main Screen
2. Window of fig.4.5 opens


**Fig. 4.5**

3. Select required status message, ex: *Arrived on* from list box for <**English**>
4. Type selected message in <Regional language> and in <Hindi> in the given fields.
5. Select display effect you want in <**Effect**> field.
6. Click <**Ok**> to save message and then <**Exit**>
7. Now the status of selected train is displayed in three languages on PDBs.

**e) Adding New Status Messages:**

Adding new <Train Status messages > is possible only to the administrative user of IPIS system who can add directly in the database which is password protected.

**Exercise:**

1. Feed your railway name and headquarters station name as default data for CGDBs of platform no- 2. Verify whether it is displayed on CGDBs.
2. Add a new message '***I am a member of the Indian Railways family*** ' in your regional language and display it on the PDB.

**Review Questions**

1. How do you enter default message for displaying on TADDB?
2. Mention briefly the procedure for train status display on PDB.

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प्रयोग सं : पी आई 5

**I R I S E T**

**PASSENGER INFORMATION SYSTEMS LABORATORY**

**EXPERIMENT NO. PI- 5**

| | | | |
|---|---|---|---|
| नाम Name | : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ | | |
| अनुक्रमांक Roll No | : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ | प्राप्त अंक Marks Awarded | : |
| पाठ्यक्रम Course | : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ | | |
| दिनांक Date | : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ | अनुदेशक का अधाक्षर Instructor Initial | : |

**Experiment No. PI -5**

# Audio Announcements over PIS Network

## Audio Announcements

The following type of audio announcements are made in the railway stations through the PIS network.

1. Train Arrival/ Departure Announcements
2. Train Status Announcements
3. Special Message Announcements

For making any type of audio announcement through the PIS system the following **processes** are needed.

1. **Recording Voice:** Voice for messages must be pre-recorded and saved as voice files in the C:\IPIS\Voice folder in CCU computers. Separate Voice files are required in three languages for

   (a) Train Numbers
   (b) Train Names
   (c) Station Names
   (d) Train Status and
   (e) Numerals
   (f) Other Required Terms like, platform, from - to etc. and
   (g) Special announcements.

2. **Compiling Audio Messages by Attaching Voice Files:** For train arrival/departure or train status announcements messages are to be compiled by selecting <**Voice**> in <**Settings**> menu and then attaching the ***Train No, Train name, Station names, platform***

***numbers, Train Status*** etc, files separately by specifying path-addresses of these voice files for every train available in the <**Trains Online**> window.

3. **Playing Compiled Audio Messages:** After compiling an audio message for a train information or any special information, the announcement can be made by playing this compiled message.

## Recording Voice for Train Information Announcements

### a) Voice Record for Train No:

1. Open <**Sound Recorder**> program or any other sound recording program.
2. To record voice for <Train No> ex: 2723. Press <**Start Recording**> button and pronounce <2723> and then press <**Stop Recording**> button.
3. Save the sound/voice file in **C:\IPIS\Voice\TrainNo** folder.
4. Repeat this for all the trains in the list.

### b) Voice for Train Name:

1. To record voice for <Train Name> press <**Start Recording**> button and pronounce < A.P Express> and then press <**Stop Recording**> button.
2. Save the voice file in **C:\IPIS\Voice\TrainName** folder.
3. Repeat this for all train names

### c) Voice for Station Names:

1. To record voice for <Station Names>, press <**Start Recording**> button and pronounce start and end stations <Secunderabad to New Delhi > and then press <**Stop Recording**> button.
2. Save the sound/voice file in **C:\IPIS\Voice\StationName** folder.
3. Repeat this for all station names.

Follow same procedure to record Voice for **Train Status** and **other required terms**.

## Recording Voice for Special Announcements

1. Click on < **Special Announcements**> button in the bottom of PIS main screen.
2. The window shown in fig.5.1 opens
3. Click on <**Record**> in < Recording Messages > frame at the bottom of window.
4. Recording bar appears.
5. Press <**Start Recording**> and speak out the message to be recorded.
6. Click <**Stop Recording**> button. System prompts to save the recorded message.
7. Save the message in **C:\IPIS\Voice\record_play_ msg** folder.
8. Now add this message to the list by <Add Message>button and assign a unique Message ID and message name and attach the saved voice file.


**Fig. 5.1**

## Compiling Messages for Audio Announcement

The procedure for compiling messages for **audio announcement for trains** is given below.

1. Click on < **Voice** > in <**Settings**> menu on the main screen.
2. A small window shown in fig. 5.2 opens.
3. Press <**Add Train Voice** > button in this window to add Train Name Voice File.

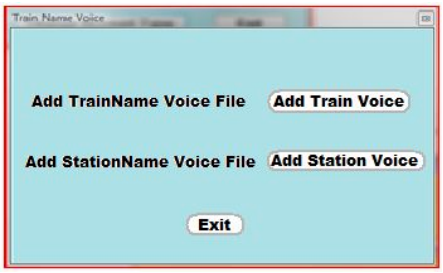


**Fig. 5.2**

4. Window of fig.5.3 opens. Enter Train No, Language.
5. Press <Browse> and select audio file path address.
6. Press <**Save**> and then <**Exit**> to go back to window of fig.5.2

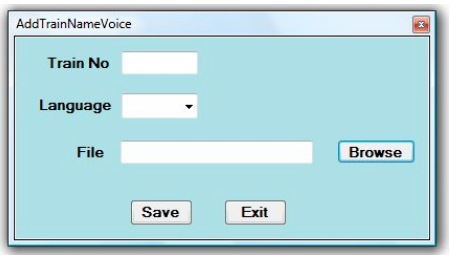


**Fig. 5.3**

7. Press <**Add Station Voice** > button to add Station Name Voice File.
8. Window of fig.5.4 opens. Enter Station Name, Language.

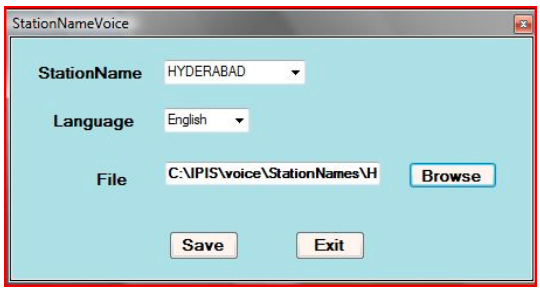


**Fig. 5.4**

9. Press <**Browse**> and select audio file path address.
10. Press <**Save**> and then <**Exit**> to go back to window of fig.5.2
11. Then press <**Exit**> on window of fig.5.2

## Making Announcement for a Train

Announcement for any train available in the list of <**On Line Trains**> can be done by selecting the train and then playing the voice file recorded for it. The procedure for playing these recorded messages is given below.

1. Select a required train by a mouse click on the check box in < **Announce**> column of <**On Line Trains**> screen.
2. A **tick** (✓) mark should appears in the check box.
3. Then press <**Play**> button in the bottom of the train list window.
4. Audible announcement is heard with full information about the selected train such as its starting/destination stations, arrival or departure time, present status, assigned platform no etc.

## Making Announcement of Special Messages

Announcement of special messages is done by selecting required messages from list of messages seen on message window of fig.5.1 and <**play**> it. The procedure is -

1. Click <**Special Announcement**> in the main screen.
2. Messages window shown in fig.5.1 appears
3. Select required message by a click in check box column.
4. Press <**Play**> seen below special messages.
5. The message announcement is heard in system speakers or in the headphone.

**Exercise:**

1. Effect audio announcements for any three trains in the list.
2. Add a new train to the list and provide announcement for it by going through all necessary steps.

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**I R I S E T**

**PASSENGER INFORMATION SYSTEMS LABORATORY**

**EXPERIMENT NO. PI- 6**

नाम
Name : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

अनुक्रमांक
Roll No : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

पाठ्यक्रम
Course : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

दिनांक
Date : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

प्राप्त अंक
Marks Awarded :

अनुदेशक का अधाक्षर
Instructor Initial :

## Experiment No. PI -6

# Study of PIS Network Configuration

PIS network is a computer based data transmission network. Hence the devices in the PIS network need to be configured before putting them to actual working. Configuration involves performing the following operations.

- Assigning **name** and **port / device address**
- Specifying data parameters

Every device used in PIS network has to be assigned a **Unique Address** which is needed for controlled transmission of data throughout the network. This address must be in the range of **1 to 255**.

- Device addresses of display boards are set by two DIP switches provided on their PCBs.
- One DIP switch is used for assigning **unique device address** and the other one for assigning **multicast address** which is common for all boards on a platform.
- CCU address must be either **253 or 254.**
- Address range for MDCH, PDCH, AGDB, PDB (SLDB) and MLDB is between **1 to 239** and
- Address range for CGDBs is between **1 to 252**
- Device addresses of MDCH and PDCH are fixed and cannot be changed by the user as these are assigned by manufacturer through a software.

Let us see the features of MDCH and PDCH.

**MDCH-** Main Data Communication Hub

- The two PCs of CCU are directly connected to RS232C serial ports on MDCH.
- Its speed is to be set to **57.6 kbps**
- It passes on the data collected from CCU to different display boards using RS485 serial interface at **4.8 kbps** speed.
- RS 232C is **point-to-point** interface standard whereas the **RS485** interface is a **point-to-multipoint** interface. This means two or more devices can be connected to one RS485 port.
- There are 16 **RS485** ports on MDCH
- Each port can be connected to any **FOUR** devices at a time which are to be selected from the following three only.
  1) PDCH
  2) MLDB
  3) AGDB

**PDCH –** Platform Data Communication Hub

- It receives and sends data through RS485 interface.
- There are 16 RS485 ports on PDCH also.
- Each port can be connected to any **EIGHT** devices at a time.
- These devices can be selected from the following three only.

  1) PDB
  2) AGDB
  3) CGDB

## Verifying Present Configuration of Network:

Find out the present configuration of PIS network and note down the port/device addresses of all devices in the Table 6.1 given below. Procedure is given below.

| S.No | Device | Address | | | | Multicast Address (if any) |
|---|---|---|---|---|---|---|
| 1 | CCU | | | | | |
| 2 | MDCH | | | | | |
| 3 | PDCH | | | | | |
| 4 | AGDB | | | | | |
| 5 | SLDB/PDB | | | | | |
| 6 | CGDBs- on PF1 | | | | | |
| 7 | CGDBs- on PF2 | | | | | |

**Table 6.1**

**Procedure:**

1) Go to <**Configuration**> menu in the main screen
2) Select <**Network**>
3) MDCH ports configuration window with 16 port names opens as shown in Fig.6.1.

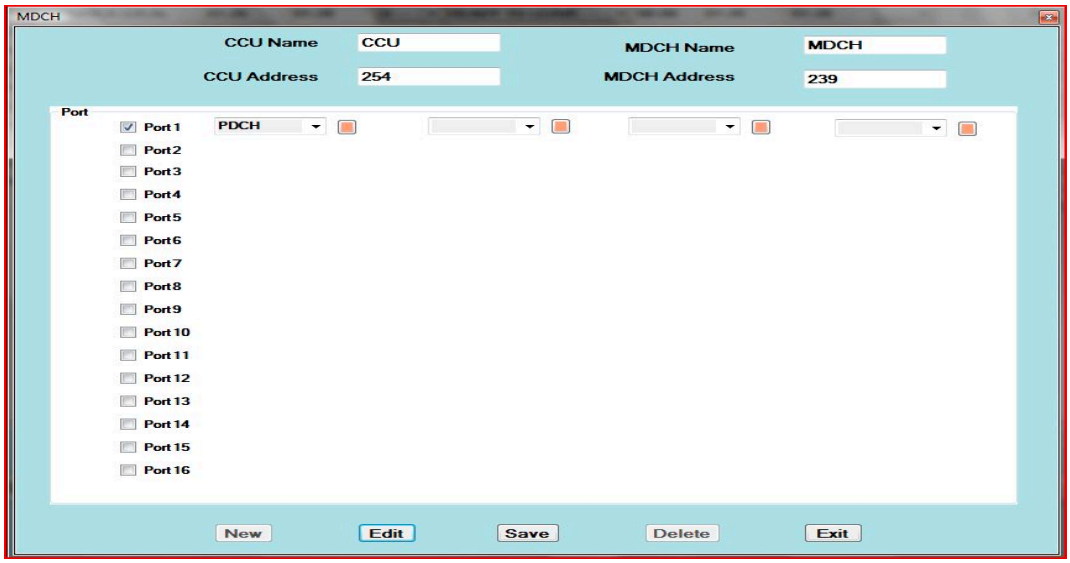


**Fig.6.1 –** Configuration window of MDCH

4) Observe whether any names and addresses of devices appear on the window.
5) Note down them in Table 6.1.
6) Try to Click on check boxes of any of the ports.
7) Tick mark does not appear in the check box.
8) Then, click <**Edit**> button. Ports in use appear with tick marks and also with four device name list boxes.
9) Names of devices connected to the ports appear in these name list boxes. The device names include either PDCH or AGDB or MLDB.
10) Click on the **Configuration button (**Red button**)** beside any device name to know its configuration.
11) It opens **device configuration window**. See: AGDB and CGDB windows in Fig.6.2.
12) Name, address, platform no etc appear in the window. Note down the same in Table 6.1.
13) Press <**Exit** > to return to MDCH ports window.
14) Press red button beside PDCH to verify its configuration.
15) Similarly, find out **configuration** of all other **devices** connected to different ports and note down the same in Table 6.1.
16) Ensure that in Table 6.1 names and addresses of all devices in the network appear.
17) Press <**Save**> . '**Save Network Configuration (Y/N)**' message appears.
18) Press <**Yes**>. Then message '**Network Configuration Successful**' is displayed.
19) Press <**Exit**> in MDCH window to come out of network configuration mode.

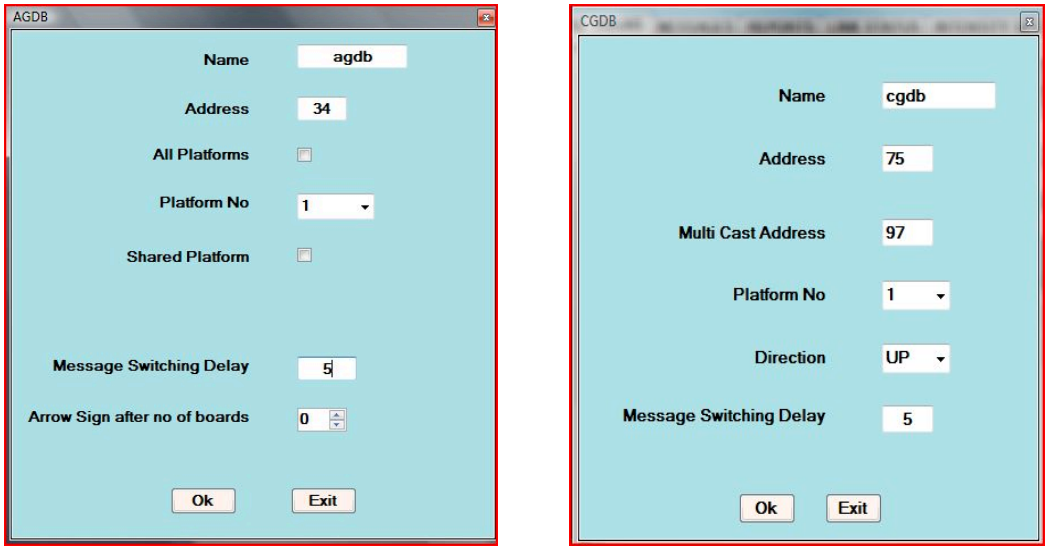


**Fig. 6.2** Configuration windows of AGDB and CGDB

## Review Questions:

1. From the Table 6.1 state the devices which are having multicast address and why is it required ?

2. Study the connection plan of Lab PIS network and show it with neat diagram.

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**I R I S E T**

**PASSENGER INFORMATION SYSTEMS LABORATORY**

**EXPERIMENT NO. PI- 7**

नाम
Name : _____

अनुक्रमांक
Roll No : _____

पाठ्यक्रम
Course : _____

दिनांक
Date : _____

प्राप्त अंक
Marks Awarded :

अनुदेशक का अधाक्षर
Instructor Initial :

**Experiment No. PI -7**

# Troubleshooting of PIS Network

The PIS network may stop functioning due to any of the following reasons.

1. **If there is a fault in any device or**
2. **A fault in the connectivity or**
3. **Fault in any of the com ports of MDCH and PDCH or**
4. **Wrong configuration of any device parameters.**

**Fault Indication:** Any fault of this sort in the PIS network is visually indicated on the front panel of the two Hubs. A **Red LED** pertaining to the port concerned is lit indicating a problem in communication which can be due to any one of the above mentioned faults.

**To ascertain the actual fault and restore the system to normal working the following functions are to be performed.**

1. Reset the Hub/Hubs showing the fault indication by switching off for a few seconds and then switching on the power.
2. If the fault indication still persists, perform physical check up of connecting cables for proper connectivity.
3. After ensuring proper connectivity of cables, perform '**Link Check**' test for the devices concerned with the problem. This may include display boards as well as communication Hubs.
4. Even after this if the problem is not solved, then the concerned port of Hub may be suspected to be faulty.
5. Then release the cable from the suspected port on the Hub and connect it to a new port on the same hub.

6. Now configure the new port with the device parameters and set the new configuration on to the Hub.

The detailed procedure for performing these fault ascertaining and restoration measures is given below.

## I. Link Check

For confirming a port failure or link up problem run Link Check test as follows.

1. Open <**Communication Status**> tab in PIS main screen which is shown in Fig.7.1
2. Select MDCH/PDCH in the 1st column of window.
3. Feed its **name** and **address** (also Platform No. for PDCH) in the 2nd column of window
4. Press <**Link Check**> button.
5. In the message space of window (3rd column) link check function result is displayed.
6. If link check is not successful press <**Soft Reset**> button and observe the front panel of Hub. All LEDs on it should glow if PC to Hub link is ok. If this did not happen check the cable from PC to MDCH or MDCH to PDCH as the case may be. Replace the cable if it is found faulty.
7. After replacing the cable confirm its condition with <**Link Check**>
8. In the window, then select the display board having **link up problem**.


**Fig. 7.1** Communication Status Window for Link Check up

9. Enter **name** and **address** (if required platform no also) of the display board.
10. Perform <**Link Check**> function.
11. Link check function result is displayed in the message window.
12. Perform < **Test Command** > function which should illuminate all LEDs on the display board. Similarly, test other display boards connected to suspected port.
13. After issuing Test command use <**Soft Reset**> to blank display board.

## II. Configuring a New Port of Hub

When switched over to a new port in a Hub that port must be configured first. For configuring a new port on either MDCH or PDCH, follow the procedure given below.

1. Switch off supply to the Hub and change the serial cable from faulty port to a new port.
2. Switch on Hub and go to <**Configuration**> menu in the main screen of PIS program.
3. Select <**Network**>. Then MDCH ports window opens and displays its configuration.
4. Press <**Edit**> button in the bottom of window.
5. Then all ports-in-use appear with a **tick mark** (✓) in check boxes against their names.
6. Also the devices connected to each of these ports will appear in the list boxes. (press PDCH configuration button if a new port on PDCH is to be configured.)
7. Note down in Table 7.1 the configuration of each device on the defective port by clicking on respective configuration (**red**) buttons.

| **Device S.No.** | Devices on Defective port of MDCH | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| **Device Name** | | | | |
| **Address** | | | | |
| **Multicast Addr.** ( if any) | | | | |

| **Device S.No** | Devices on Defective port of PDCH | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| **Device Name** | | | | | | | | |
| **Address** | | | | | | | | |
| **Multicast Addr.** (if any) | | | | | | | | |

**Table - 7.1**

8. Then**, tick** in the **check** box against the **new port** to which the cable is connected.
9. Name list boxes appear to select names of devices to be connected to the new port.
10. For new port, select the same device names as appeared on the faulty port and noted down in Table 7.1.
11. Click on configuration (Red) buttons to configure each device on the new port.
12. In the opened **configuration window** of each device copy its configuration data, which you have already noted down for all devices connected to the faulty port.
13. Now **uncheck** (remove tick mark) the defective port to remove it from usage.
14. Press <**Save**> and then <**Exit**>
15. Now to effect this new port configuration into the hub run **Hub configuration** as given below.

## III. Running Configuration of Hubs

After configuring the new port the hub configuration also must be performed.

1) Go to <**Configuration**> menu in the main screen
2) Select <**Hub Configuration**>
3) The **Hub configuration window** opens and gives option for configuration of MDCH and PDCH (See Fig.7.1).

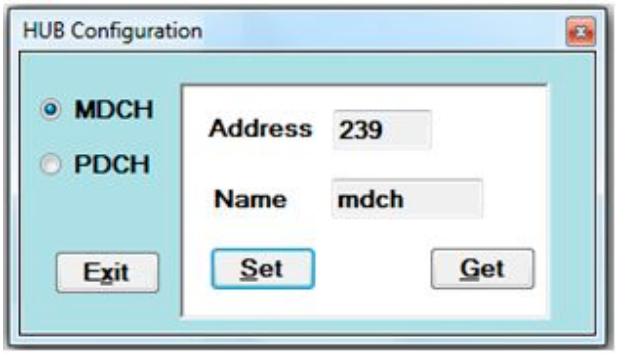


**Fig. 7.1-** Hub Configuration Window

4) Select **MDCH** and press <**Get**> button to read the configuration of MDCH
5) Now **MDCH Port Configuration window** opens displaying at the top MDCH <**address**>, <**Name**> and <**System Status**> fields. (See Fig.7.2).

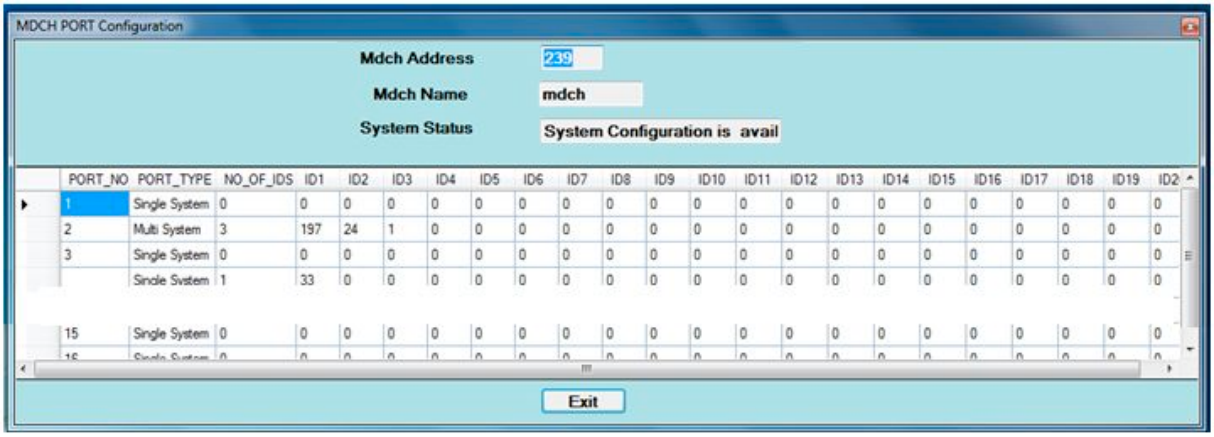


**Fig. 7.2 -** MDCH Port Configuration Window

6) Details of all 16 ports are shown. Ports are displayed in the first column from 1 to 16 .
7) Port type ( ***Single system*** or ***Multiple system***) is displayed in second column.
8) More than one device addresses are seen against ports named ***multiple system***
9) These addresses indicate the devices that are connected to these ports
10) Press <**Exit**> to return to Hub Configuration window.
11) Now click on <**Set**> to configure the Hub.
12) After a short while a message '**MDCH SET Configuration is Successful'** is displayed. Then press <**OK**>.

13) Using the same procedure, **PDCH** configuration can also be set.

**Review Question:**

1) In the Communication Status window what are **other command buttons** available and what is the function of each them?