AAL®

Autometers Alliance Ltd

Audio & Display Systems

For Metro & Railway Coaches & Stations

Make in India Company

www.autometers.com

Autometers Alliance Ltd is an ISO9001, ISO14001, OHSAS18001 certified Indian company manufacturing high technology products to international standards.

The company ranks amongst the country's premier hi-tech engineering solutions provider for Switchgear, Data Acquisition, Power Electronics, Audio & Display Systems, Escalators and UPS Systems for Metro and Railway networks and for industrial applications.

- Research and Development Centre, recognised by Department of Science and Industrial Research (DSIR), Government of India, Ministry of Science and Technology
- Advanced CAD/CAM software for precision mechanical designing including 3D and surface modeling
- In-house multilayer PCB designing employing fine pitch component and BGAs using advanced software tools
- Competence in development of embedded software on different platforms
- Thermal management and system design capability
- Conversant with International Standards such as IEC, DIN, IEEE, EN, MIL etc. and competent to develop products in compliance

- Comprehensive manufacturing facility for assembly and testing of multilayer PCBs both with surface mount and through-hole technologies
- Surface mount PCB manufacturing line, equipped with Semi-automatic Screen Printer, Fully Automatic "Pick and Place" machine, Programable Reflow Oven, Ultra sonic PCB Cleaner, In-circuit Tester, Customized Automated Test Jigs and Rework Stations
- Through-hole PCB manufacturing line equipped with light guided “Pick and Place” machines, Wave Soldering machine
- ESD - protected Kardex Shuttle and Environmental chambers for temperature and humidity cycling
- State-of-art measuring and test equipment like CRO, Harmonic Analyzer, Temperature Scanners, Power supplies, Multi-meters etc.

- ISO 9001 certified since 1994
- In-house calibration facility (having traceability) with National accredited test labs and full compliance with National and International Standards
- Quality assurance and enhancement plans for all products according to International quality standards and collaborators / customer specifications
- Automated data-loging from instruments through Multiplexers in the computers, thereby eliminating human errors
- Computerised 3-dimensional co-ordinate measuring machine
- Well defined Quality audits for in-process & final stages of production
- State-of-the-art instruments and gauges for testing of electronic, electrical and mechanical components
- Computerised profile projector with magnifying capability up to 100 times for fine measurements of mechanical components
- Product prototypes testing facility, including load test, high voltage / di-electric test, environmental test, heat test, dust test, water-ingress level test and more

Contents

Metro Coaches

General

On-Board Integrated Public Address System (PAS), Passenger Information System (PIS) and CCTV Surveillance System installed in the trains provide broadcasting of audio announcements and visual messages to passengers traveling on the train and on the platform regarding journey information, next station, train destination, train route number, commercial advertisement etc. The system also provides monitoring and recording of real time images from the cameras fitted inside as well as outside the coaches.

The visual equipment comprises of Ultra-bright yellow LEDs (any colour as per application requirement) based Train Number Indicator Displays, Destination Displays, Side Destination Displays, suitable for use in the conditions associated with their locations and full HD (1920×290) resolution LCD Dynamic Route Map (DRM) display inside the coaches for progressive indication of train on the journey route, commercial video clips, animation and images etc.

The visual and audio control equipment comprises of two Main Controller Units one at each end of the train in the driving cabins, two sets of Main Operating Panel one each in two driving cabins, Audio & Visual Amplifier units in each coach and Loudspeakers, LED and LCD Displays in all the coaches.

Main controller unit is housed in standard 19 inch rack, supporting main operating panel for driver interface.

The interior and exterior displays are equipped with LED boards, controller board and limited memory in each display. The displays receive a text string or bitmap pattern from the main controller and displays it.

LCD based DRM receive train information from Main controller unit and display information on LCD dynamically along with images, animation and commercial advertisements. CCTV cameras with Network Video Recorder (NVR) are installed in each coach of the train.

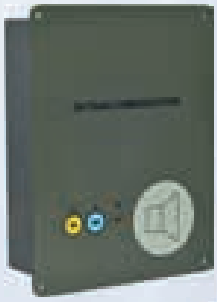
The System:

- Public Address (PA) announcements from the leading or trailing driver's cab to the passenger compartments using microphone(s)
- Full duplex cab-to-cab audio communication between leading cab and trailing cab
- Full duplex emergency audio communication between driver or guard and passengers in the coach using emergency button / talk-back unit installed in every car
- Full duplex emergency audio communication between Operation Control Center (OCC) and passengers in the coach using emergency button and talk-back unit installed in every car
- Availability of manually triggered, from Main Operating Panel (MOP), pre-recorded digitally stored audio messages in Hindi, English and regional languages
- Loudspeakers throughout the train for the audio announcements
- LED based Train Number Indicator (TNI) to show train number or route number
- LED based Destination Indicator Display (DIF) that shows the destination name
- LED based or TFT / LCD based Passenger Information Boards (PIB), provided in each coach, for display of the visual information / video / commercial advertisements, previously programmed and stored in the main controller unit of the system, in Hindi, English and regional language which are synchronously triggered with the audio messages
- TFT / LCD based Dynamic Route Map (DRM) panels, provided in each coach, for progressive indication of the train in the journey route, display of the visual information, video clips, commercial advertisements, previously programmed and stored in the main controller unit of the system, in Hindi, English and regional language
- LED based External Side Destination Display Boards (ESDDB), on both sides of each coach, to display destination information
- Emergency Passenger Announcements on the train by Operation Control Center (OCC) using train radio system through Main Controller Unit
- CCTV surveillance using cameras and Network Video Recorders (NVR) installed in the coach
- Interface with Train Integrated Management System (TIMS)
- Interface with On-board Signaling System and Operation Control Center / Train Radio system for automatic announcements and display of train information
- Connectivity with MP3 player for background music
- Audio recording of all live announcements and passenger emergency communications and data logging of train information received from On-board Signaling System

Metro Coaches

Main Controller Unit

Main Operating Panel



Auxiliary Operating Panel

Destination Indicator

Passenger Information Board

Train Number Indicator

External Side Destination Display Board

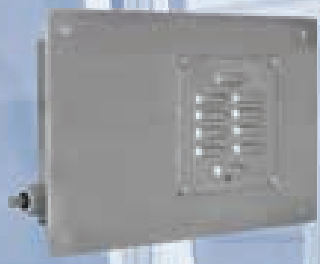
TFT / LCD Based Display

Products

Stretched LCD Based Dynamic Route Map Panel

IP Based Audio-Amplifier Unit

Loudspeaker



Outside Loudspeaker Box

Emergency Talk-back Unit

Side CCTV Camera

Passenger Alarm Button

CCTV Monitor

CCTV Camera

IP Based Network Video Recorder

Main Controller Unit (MCU)

Main Controller Unit is heart of the complete Public Address / Passenger Information System (PA/PIS). This unit is housed in standard Euro Card Frame. This unit is generally fitted in each Driving Trailer (DT) car of the train.

Technical Features

Basic functionality of the main controller unit is described as under:

- Integrated unit to drive and control public audio system, passenger information display system and CCTV surveillance system
- Duplication of critical functions for redundancy
- Automatic switch over between master and slave MCUs over Ethernet link
- Interface with third party On-board signaling system, Train Information management system, Radio System over Ethernet LAN or Serial Link
- Connectivity with LED and TFT panels over Ethernet LAN or Serial Link
- Audio Broadcasting over IP
- Audio Recording of all live announcements and passenger emergency communications and real time train data received from signaling system (ATO / ATP / ATC)
- Data Logging of all of the events and equipment status
- Provision to play Music content
- General purpose Input Output (GPIO) to interface with other sub-systems
- 110V DC (typical) operating voltage
- Web based maintenance and configuration tool which can be accessed via wired, wireless interface and upgradable to internet

Technical Specifications

- Acts as a system controller
- 19" rack compatible enclosure
- Interface with train data bus for audio & control functions
- Route data base & Application software storage in SD card
- Interface with Train Radio, Train Information Management System, Automatic Train Controller (ATC), Automatic Train protection (ATP), Automatic Train Operation (ATO), CCTV surveillance system and other external inputs
- Automatic Master / Slave configuration

Main Operating Panel (MOP)

Main Operating Panel is installed in driving car on driver's desk. The driver may perform settings / controls through keyboard of main operating panel such as announcement of manual messages, configuration of cab settings (Master / Slave) etc.

Technical Features

- PA announcement
- Announcement of pre-recorded messages
- Manual Route Selection
- Cab to Cab (C-C) communication
- Passenger Communication (P-C)
- Setting of cab status (Master / Slave)
- The Main Operating Panel is having mode selection controls for PA, C-C & P-C

Technical Specifications

- Microprocessor based control system with touch screen LCD
- Fall back processing logic (in case of failure of software / CPU, basic functions like announcement by the driver will remain functional)
- Microphone pre-amplifier
- Amplifier for monitor loudspeaker
- Monitor loudspeaker: 500mW nominal (1.5W maximum)
- Cab control panel
- Internal loudspeaker with volume control feature
- Hindi , English & Regional display
- Facility to select message broadcasting (PA), C-C & P-C communication

Auxiliary Operating Panel (AOP)

Auxiliary Operating Panel is installed in driving car on driver's desk. The unit acts as standby device for Main Operating Panel with limited functionality. The auxiliary operating panel is having mode selection controls for PA & C-C.

Technical Features

- PA Announcement
- Cab to Cab (C-C) communication
- Passenger Communication (P-C)
- The Auxiliary Operating Panel is having mode selection controls for PA, C-C

Technical Specifications

- Microprocessor based control system
- Microphone pre-amplifier
- Amplifier for monitor loudspeaker
- Monitor loudspeaker : 500mW nominal (1.5W maximum)

Destination Indicator (DIF)

Destination Indicator Display is generally installed on each driving cab window. The Destination Indicator shows destination information to passengers.

Technical Features

- The Destination Indicator is a LED dot matrix display using 3mm diameter ultra-bright yellow LEDs pitched on 4mm center (customizable)
- The LED matrix is 48 LED's high by 96 LEDs wide (customizable)
- The enclosure is made of CRCA sheet with paint finish having screen of tinted toughened glass / poly carbonate sheet

Technical Specifications

- Microprocessor based control
- Ethernet / Serial interface to receive data and configuration
- Software controlled multiplexed data for LED driving
- Individual LED accessibility for controlling
- LED specification – Size: 3mm oval LED
- Hindi, English and Regional language alphanumeric display
- Display size: 48 pixel high × 96 pixel wide
- Tinted toughened glass / poly carbonate screen to protect and enhance contrast ratio
- Comprehensive self-test facilities
- CRCA enclosure with powder coating / paint finish

Passenger Information Board (PIB) (Internal Display)

LED based display panels:

These units are installed inside the coaches to communicate visual message to on-board passengers. The visual message may be information related to departure from station, arrival to station, train delay information, emergency message to passenger, journey messages etc. which are stored in the memory of the Main Controller Unit.

Technical Features

- Passenger Information Board employ LED dot matrix display using 3mm LEDs, pitched at 4mm centre (customizable)
- The LED matrix is of 32 LEDs unit height and 160 LEDs unit wide (customizable)
- The effective display area is not less than 127 mm height and 639 mm wide
- The enclosure is made of CRCA sheet with paint finish having screen of tinted toughened glass / poly-carbonate sheet

Technical Specifications

- Microprocessor based control.
- Ethernet / Serial interface to receive data and configuration
- Software controlled multiplexed data for LED driving
- Individual LED accessibility for controlling
- LED specification – Size : 3mm round LED centered at 4mm pitch
- Colour: Tri-colour (Red, Green and Amber) or Mono colour
- Hindi, English and Regional language alphanumeric display for journey messages
- Display size: 32 pixel high × 160 pixel wide
- High intensity 3mm round LED block in 8 × 8 matrix
- Enclosure and fixing to meet vehicle interior requirements
- Tinted toughened glass / poly carbonate screen to protect and enhance contrast ratio
- Comprehensive self-test facilities
- CRCA enclosure with powder coating / paint finish

Train Number Indicator (TNI)

Train Number Indicator is generally installed on each driving cab front window. The TNI display shows route number or train number to passengers.

Technical Features

- The Train Number Indicator is a LED dot matrix display using 3 mm diameter ultra-bright yellow LED's pitched on 4 mm center (customizable)
- The LED matrix is 32 LED's high by 96 LED's wide (customizable)
- The enclosure is made of CRCA sheet with paint finish having screen of tinted toughened glass / poly carbonate sheet

Technical Specifications

- Microprocessor based control
- Software controlled multiplexed data for LED driving
- Individual LED accessibility for controlling
- Ethernet / Serial interface to receive data and configuration
- LED specification – Size: 3 mm oval LED
- Display size: 32 pixel high × 96 pixel wide
- Tinted toughened glass / poly carbonate screen to protect and enhance contrast ratio
- Comprehensive self-test facilities
- CRCA enclosure with powder coating / paint finish

External Side Destination Display Board (ESDDB)

These displays are fitted on both sides of the each car. The fixing points can be modified to suit customer requirements. The External Side Destination Display shows destination information to passengers standing on the platform.

Technical Features

- External Side Destination Display Board (ESDDB) is made using 3 mm diameter LEDs mounted on 6mm centre (customizable)
- The LED matrix is 16 LEDs high by 128 LEDs wide (customizable)
- The enclosure is made of CRCA sheet with paint finish having screen of tinted toughened glass / poly-carbonate sheet

Technical Specifications

- Microprocessor based control
- Software controlled multiplexed data for LED driving
- Individual LED accessibility for controlling
- Ethernet / Serial interface to receive data and configuration
- LED specification – Size: 3 mm LED
- Display size: 32 pixel high × 96 pixel wide
- Tinted toughened glass / poly carbonate screen to protect and enhance contrast ratio
- Comprehensive self-test facilities
- CRCA enclosure with powder coating / paint finish

TFT / LCD based Display Panels (Internal Display)

The LCD display panel receive data from MCU over Ethernet / Serial communication link and display the train information to passengers.

The panel displays the following information to passengers traveling on the train:

- Welcome messages
- Route information and Station Information Messages
- General information related to passenger safety
- Door side information

The above messages is displayed in English Hindi & regional language alternatively

Technical Features

- Wide view angle for better visibility
- Elegant corrosion resistant Mechanical Enclosure with powder finish
- Low power consumption

Technical Specifications

Size	9" – 18" (Customizable)
Resolution	1280 × 768 pixels
Display colour	Better than 16K
Brightness	Better than 250 cd / m2 (As per customer requirement)
Contrast Ratio	Better than 500:1
Input signal	From MCU over Ethernet / Serial link
Power supply	110V DC (Typical)
Mechanical enclosure	CRCA sheet elegant enclosure with colour to match with coach exterior
Relative humidity	Up to 90% (non-condensed)
Mounting	Mounting with M6 hole

Stretched LCD Based DRM

LCD based Dynamic Route Map Display provides real time location information of the train to the passengers during the journey in the user friendly format with door side open / close information.

The position of the train throughout the journey is indicated by a progressive bar along with commercial advertisement (pictures and video clips).

Stretched LCD based Dynamic Route Map (DRM) provides the following functions:

- Provides passengers the real time location of the train during the journey along with real time clock
- The position of the train throughout the journey is indicated by a progressive bar
- Door information (open / close) on the displays updates according to real time door information received from Train Signaling System e.g Automatic Train Controller (ATC), Automatic Train protection (ATP), Automatic Train Operation (ATO)
- Destination station and interchange station information
- Commercial video advertisements

Technical Features

- Stretched LCD Digital Route Map display boards are LCD technology based
- These displays offer the best visibility, high level of brightness together with the optimal contrast ratio, high quality images and enhance readability

Technical Specifications

- Customized design to meet customer's requirements.
- Individual operation of each Display Panel, different content can be shown on left and right side Panel
- Powerful CPU board manages static images and dynamic images
- Full HD resolution : 1920 × 290 pixels
- Ethernet / Serial interface to receive data and configuration
- Viewing Angle - ±80° in horizontal & vertical directions
- Backlighting – LED
- Brightness – Better than 500 cd/m2
- Approximate mechanical size: 1495 mm (L) × 190 mm (W) × 74 mm (H)
- Input Voltage – 110 V DC (Typical)
- Power Rating – 100 W
- Operating Temp. – up to 50°C

IP based Audio Amplifier Unit (AAU)

This unit is installed in every car of the train. It contain audio amplifier to drive the associated loudspeakers.

Technical Features

- The Public Address Amplifier unit is a microprocessor based intelligent unit
- Sound Operated Automatic Level Adjusting System (SOALAS) to provide optimize sound output as per ambient noise level
- IP based Amplifier unit having four independent channels for inside coach speaker, external side speaker right and external side speaker left and one spare channel. Entire system is designed to work on Ethernet interface
- Web based maintenance and configuration tool which can be accessed via Ethernet interface
- The power amplifier designed on modular approach and rated to deliver up to 200W r.m.s (under minimum DC supply conditions)

Technical Specifications

- Microprocessor based control
- In Built Audio equalizer functions
- Functionality to adjust gain as per sampled ambient level for PA announcement
- Configuration & setting through Ethernet / Serial interface
- Aluminum natural colour extrusion enclosure
- Driving of loudspeakers
- Upto 200W audio amplifier
- Interface to speech pair and train data bus

Loudspeaker

Loudspeakers are powered by the audio amplifier unit and provide audio announcement information to passengers inside the coaches.

Technical Features

- Each loudspeaker can be driven with 4W of power
- Loudspeaker are driven by the audio amplifier unit
- 100V line distribution system
- The loudspeakers are supplied with impedance matching transformer

Technical Specifications

Drive power	4 W
Sensitivity	87dB @ 1 W/m
Nominal diameter	130mm
Voice coil	Dia 25mm
Nominal impedance	4
Frequency response	90 Hz to 20 KHz
Weight	0.91 kg

Outside Loudspeaker Box

Outside Loudspeakers are powered by the audio amplifier unit and provide emergency audio announcement or chimes to passenger standing on the platform.
The Outside Loudspeaker Box are installed at suitable locations outside the coaches.

Technical Features

- Each loudspeaker can be driven with 4W of power
- Loudspeaker are driven by provided by the audio amplifier unit
- 100V line distribution system
- Stainless steel IP65 design

Technical Specifications

Drive power	4 W
Sensitivity	94dB @ 1 W/m
Voice coil	Dia 20mm
Nominal impedance	8
Frequency response	350 Hz to 5800 Hz

Emergency Talk Back Unit

The emergency talk-back units are installed at suitable locations inside the coach, with the microphone/ loudspeaker.
The function of emergency talk-back unit is to provide communication between driver / Operation Control Center and passenger. After pressing passenger alarm button switch by passengers, the driver receives signal on main operating panel screen along with vehicle car and door information where the switch was pressed. If the driver is not busy and he wants to talk with passenger, he can do so simply by pressing PEA mode button on main operating panel. There will be “Driver Aware” and Speak to driver indication” on emergency talk-back unit screen.

Passenger Alarm Button

A Passenger Alarm Button (PAB) is installed at passenger exterior doorway in the car. A passenger shall press this button when any emergency condition needs to be informed to train driver / guard. The passenger alarm button shall provide one Normally Closed (NC) and one Normally Open (NO), volt free contact. NO contacts are used by PA/PIS system for it's internal use while NC contacts are available as spare. Coach wiring shall be terminated directly to the screw terminals on the contact block assembly of the passenger alarm button.

The large red circular button is latched and is reset manually or by sending command from Main controller Unit.

CCTV Monitor

CCTV Monitor is installed in driving car on driver's desk and shows live feeds from the cameras installed in the coaches. Under normal operation, the views gathered from each of the camera located in the train shall be sequentially played. The driver may also choose or set the view as per his requirement. In case of an Emergency a particular camera is automatically selected as per the location of activated Passenger Alarm Button.

Technical Features

- Wide view angle for better visibility
- Ability to choose various mode of viewing
- Elegant corrosion resistant Mechanical Enclosure with powder finish
- Low power consumption

Technical Specifications

Size	15" – 18" (Customizable)
Resolution	1280 × 768 pixels
Display colour	Better than 16K
Brightness	Better than 250 cd/m2 (Customizable)
Contrast Ratio	Better than 500:1
Input Video signal	From NVR over Ethernet
Power supply	110V DC (Typical)
Mechanical enclosure	CRCA sheet elegant enclosure with black texture colour to match with coach exterior
Relative humidity	Up to 90% (non-condensed)
Mounting	Mounting with M6 hole

CCTV Camera

Camera is specially designed for video surveillance in rolling stock applications. There are used as indoor cameras. All cameras are Power Over Ethernet (POE) based.

Technical Features

- The compact, discreet, and rugged cameras
- Can withstand tough conditions such as vibration, shock and temperature fluctuations

Technical Specifications

- DOME Camera
- C-MOS image sensors
- High resolution LENS
- POE based

Side CCTV Camera

Camera is specially designed for video surveillance in rolling stock applications. There are front, side outdoor cameras. All cameras are Power Over Ethernet (POE) based.

Technical Features

- The compact, discreet, and rugged cameras
- Can withstand tough conditions such as vibration, shock and temperature fluctuations
- Suitable for out door environments

Technical Specifications

- Hi-Definition Camera
- C-MOS image sensors
- POE based

IP based Network Video Recorder (NVR)

IP based NVR are intended for the reliable and steady recording of video, diagnostics into recording disks. Recorded data can be transmitted by directly connecting an Ethernet / Serial cable to the recording unit and by retrieving data remotely or directly from storage disks using reading units.

The recording units are industrial computer-based devices using the Linux operating system. The units are intended for the reliable and steady recording of video, diagnostics and metadata into recording disks. Recorded data can be transmitted by directly connecting an Ethernet / Serial cable to the recording unit and by retrieving data remotely or directly from storage disks using reading units.

The unit supports the recording of audio and video formats transmitted through the RTP protocol. An Analysis software is supplied together with a recording unit, which retrieves data from the CCTV system to manage and analysis the video information.

Technical Features

- Captures camera stream over IP
- Sufficient storage place to store continuous video streams
- Web based maintenance and configuration tool which can be accessed via Ethernet interface
- USB pen drive interface for easy transfer of data
- Provision to geo tag video streams
- LCD / DVI connector to locally view videos

Technical Specifications

- Microprocessor based control
- 8, 12, 16, and 20-channel
- Record images at variable fps rate
- Configuration & setting through Ethernet / Serial interface
- POE port to connect cameras directly (Optional)
- Suitable for railway environment

IP based Public Address System, Passenger Information System and CCTV Surveillance System for Metro Trains

Passenger Information Board

Front CCTV Camera

Side CCTV Camera

IP Wired

IP Wired

IP Wired

LCD Dynamic Route Map Display

IP Wired

Train Number Indicator (LED)

Destination Indicator (LED)

Side Destination Display

IP Wired

Main Controller Unit

- GPS
- Background Music Source
- Wi-Fi / GSM/ 3G / 4G
- Door Interface

OTHER THIRD PARTY SYSTEMS
- Automatic Train Controller (ATC / ATP / ATO)
- Train Radio
- Train Information Management Systems (TIMS)

IP Wired or Serial Interface (CAN, RS232, RS485)

Audio Lines

IP Wired

Microphone

Main Operating Panel

CCTV Video Analysis and Management Software with Database Generation Tool

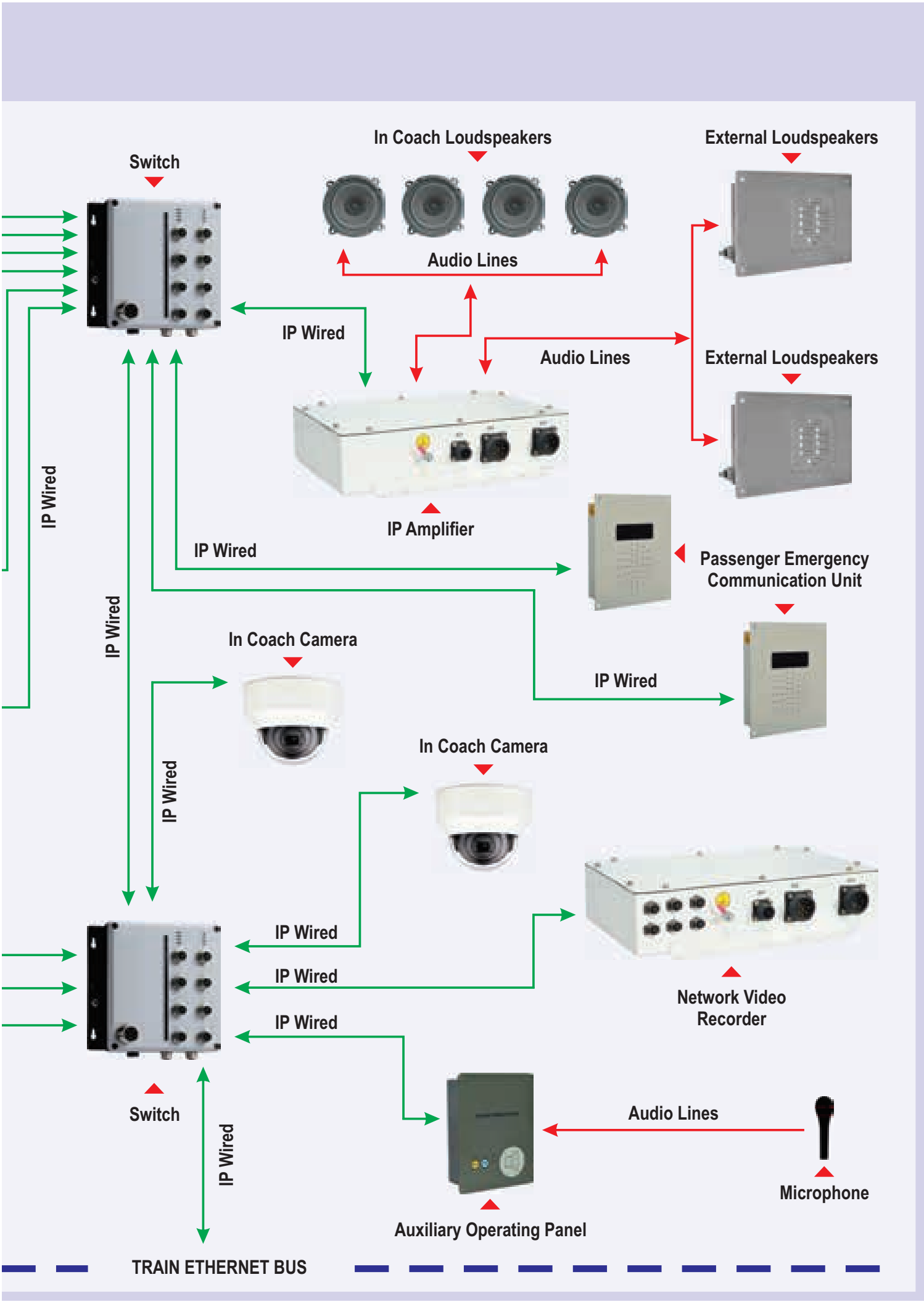
IP Wired

IP Wired

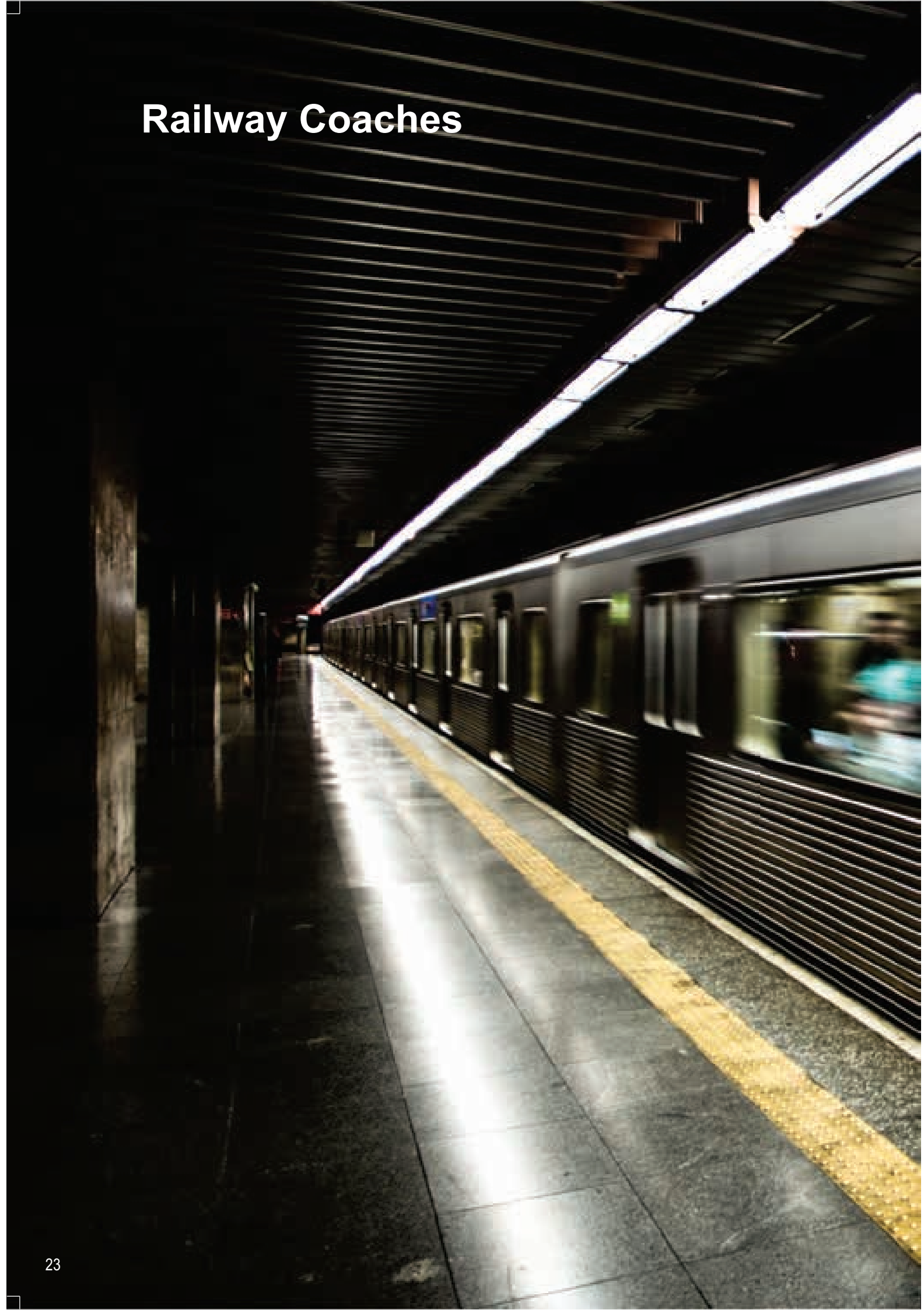
CCTV Monitor

LCD Passenger Information Board

LEGEND
- Analogue
- Ethernet / LAN (Local)
- Ethernet / LAN (Train Bus)
- Third Party Interfaces


In Coach Loudspeakers
External Loudspeakers
Switch
Audio Lines
IP Wired
Audio Lines
External Loudspeakers
IP Wired
IP Amplifier
IP Wired
Passenger Emergency Communication Unit
IP Wired
In Coach Camera
IP Wired
In Coach Camera
IP Wired
IP Wired
IP Wired
Network Video Recorder
Switch
IP Wired
Audio Lines
Microphone
Auxiliary Operating Panel
TRAIN ETHERNET BUS

Railway Coaches



General

The Passenger Information System, Public Address System, Destination Boards and Closed Circuit Television (CCTV) system installed in railway coaches provide broadcasting of audio announcements and visual messages to passengers traveling on the train regarding originating station name, current location, destination station name, next halting station, late running status, train details, current time and information related to passenger safety inside the coaches. The system also provide recording of real time images from the cameras fitted inside as well as outside the coaches.

The visual and audio equipment comprises of Master Board Unit, LED display board and LCD display panels inside the coaches for indication of journey Information, welcome messages, commercial video clips, animation and images and Audio Amplifier unit and Loudspeakers in each coach for PA announcement.

Master Board Unit is a touch screen based device used as user interface for railway staff.

LED displays are equipped with LED boards, controller board and limited memory in each display. The displays receive a text string or bitmap data from the Master Board unit and display it.

LCD based displays receive train information from Master Board unit and display information on LCD dynamically along with images, animation and commercial advertisements.

CCTV cameras with Network Video Recorder (NVR) are installed in each coach of the train.

The system also provides infotainment services for connected passenger gadgets (laptop, mobile phones, tablets) over Wi-Fi.

The System:

- Master Board Unit
- LCD Display Panels
- LED Display Boards
- Audio Amplifier Unit
- Loudspeaker
- CCTV Recorder
- CCTV Cameras

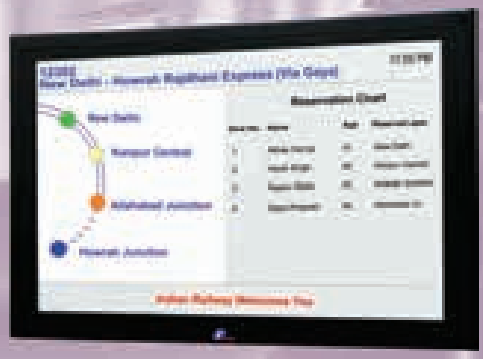
The System Provides

- Public Address (PA) announcements throughout the coach
- Availability of automatically triggered, from Master Board Unit (MBU), pre-recorded digitally stored audio messages in Hindi, English and regional languages
- Loudspeakers throughout the coach for the audio announcements
- LED based displays panel to show train or route information
- LCD based panel, for display of the visual information / video / commercial advertisements, previously programmed and stored in the master board unit, in Hindi, English and regional language which are synchronously triggered with the audio messages
- CCTV surveillance using cameras and Network Video Recorders (NVR) installed in the coach
- Infotainment services for connected passenger gadgets (laptop, Mobile phones, tablets) over Wi-Fi

Railway Coaches

Master Board Unit

LCD Display Panel



LCD Based Reservation Chart

LED Display Board

Products

Destination Board

CCTV Recorder

Loudspeakers

Audio-Amplifier Unit

CCTV Camera

CCTV Camera

Master Board Unit (MBU)

The Master Board Unit (MBU) is the heart of the system. The unit is fitted at suitable accessible location so that Railway staff is able to set route / train number and other configurable parameters through LCD display provided on the unit.

The system is designed around powerful processor and is equipped with sufficient on-board memory for storage of train routes data and RAM for system functioning. GPS receiver module is built inside the unit to receive the coordinates (longitude and latitude) information of the current location from geostationary satellites through GPS antenna mounted on the roof of the coach and gives the information to CPU board of the MBU.

Depending upon the position information received and calculated station name from the stored route data base, the CPU forms a message. The corresponding messages are displayed on the LCD display panels, LED display boards and Destination boards.

The messages may be of following types :

- Welcome messages
- Message for originating station name
- Message for next halting station
- Message for displaying the name of destination station
- General information related to passenger safety

A dedicated Serial / USB port is provided in the unit to upload route data base through a Laptop PC or USB device .

Technical Features

- Equipped with in-built GPS receiver
- Touch Screen based Display
- Internal memory to store route database
- Wi-Fi, GPRS, 3G, 4G interface compatible
- Wi-Fi based entertainment Content of Demand (CoD) / Media on Demand (MoD) for passengers using their personal gadgets like Laptops, Tablets, Mobile Phones for playing of contents. Possibility to stream other route journey, news, other information onto personal gadgets like Laptops, tablets, Mobile Phones
- Data Logging of all of the events and equipment status
- Provision to play Music content
- General purpose Input Output (GPIO) to interface with other sub-systems
- 110V DC (typical) operating voltage
- Web based maintenance and configuration tool which can be accessed via wired, wireless interface and internet

Technical Specifications

Data Interface	Over Wired or Wireless communication link
MENU interface	Touch Screen Input
User Interface	Touch Screen / Keypad
Power supply	Suitable 220V AC / 110V DC
Mechanical enclosure	CRCA sheet elegant enclosure with Black Texture colour to match with coach exterior
Operating temperature	upto 55ºC
Relative humidity	Up to 95% (non-condensed)
Mounting	Mounting with 4 nos. of M6 screws

LCD Display Panel

The LCD display panel receive data from MBU over wired / wireless communication link and display the information to passengers.

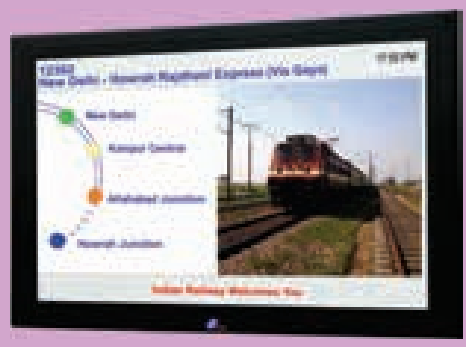
The display board will display the following information to passengers traveling on the train:

- Welcome messages
- Message for next approaching station
- Message for displaying the name of approaching station
- General information related to passenger safety

The above messages will be displayed in English Hindi & regional language alternatively

Technical Features

- Wide view angle for better visibility
- Elegant corrosion resistant Mechanical Enclosure with powder finish
- Low power consumption



Technical Specifications

Size	9" – 18" (Customizable)
Resolution	1280 × 768 pixels
Display colour	Better than 16K
Brightness	Better than 250 cd/m2 (Customizable)
Contrast Ratio	Better than 500:1
Input signal	From MBU over wired or wireless communication link
Power supply	24V DC or 110V DC (as per requirement)
Mechanical enclosure	CRCA sheet elegant enclosure with Black Texture colour to match with coach exterior
Relative humidity	Up to 95% (non-condensed)
Mounting	Mounting with M6 hole

LCD Based Reservation Chart

The LCD Reservation display panel receive data from MBU over wired / wireless communications link and displays the reservation information to passengers.

The display board will display the following information to passengers travelling on the train:

- Next approaching station
- Destination Station
- Current Time
- General information
- Passenger Name
- Passenger boarding & de-boarding information
- Seat wise Reservation Chart Information

Technical Features

- Wide view angle for better visibility
- Elegant corrosion resistant Mechanical Enclosure with powder finish
- Low power consumption

Technical Specifications

Size	18" (Customizable)
Resolution	1280 × 768 pixels
Display colour	Better than 16K
Brightness	Better than 500 cd/m2 (Customizable)
Contrast Ratio	Better than 500:1
Input signal	From MBU over wired or wireless communication link
Power supply	24V DC or 110V DC (as per requirement)

LED Display Board

The LED display board is designed around powerful digital signal processor CPU. Automatic brightness control according to ambient light conditions is incorporated in the display board to provide good legibility of the texts displays under the varying light conditions and also to provide optimum power consumption.

The LEDs used in the display boards are of mono colour (yellow / amber or any other colour) and with wide view angle to provide good visibility of the text messages.

The display board is also an Intelligent unit, receive data from MBU over wired / wireless communication link and display the following information to passengers:

- Display of train number and train name
- Display of source station, next halting station & destination station name
- Display of train journey and passenger safety related messages

The above information will be displayed in English & Hindi & Regional language alternatively.

Technical Features

- Wide view angle for better visibility
- Automatic Brightness control as per ambient light conditions for energy saving and good readability in varying light conditions
- Elegant corrosion resistant Mechanical Enclosure with powder finish
- Low power consumption
- Yellow / amber or any other colour LEDs
- Tinted toughened glass / poly carbonate screen to protect and enhance contrast ratio
- No routine maintenance required
- Comprehensive self test facility
- Easy servicing access

Technical Specifications

LED matrix	16 rows × 96 columns (Customizable)
LED type	3 mm, SMD type
Display Size	380 mm × 60 mm (Customizable)
LED pitch	4 mm in horizontal & vertical direction
LED colour	Mono colour (Yellow / Amber) / Multi-colour (Red, Amber, Green)
Brightness control	Intensity is controlled automatically using light sensor according to ambient light conditions
Data Interface	Wired or Wireless communication interface with MBU
Power supply	110V DC (Typical)
Mechanical enclosure	CRCA sheet elegant enclosure with Black Texture colour to match with coach exterior
Operating temperature	upto 55ºC
Relative humidity	Up to 95% (non-condensed)
Mounting	Mounting with 4 nos. of M6 screws

Destination Board

The Destination Board is designed around powerful digital signal processor CPU. Automatic brightness control according to ambient light conditions is incorporated in the display board to provide good legibility of the texts displays under the varying light conditions and also to provide optimum power consumption.
The LEDs used in the proposed display boards are of mono colour yellow / amber and with wide view angle to provide good visibility of the text messages.
The display board is also an Intelligent unit, receive data from MBU over wired / wireless communication link and display the following information to passengers standing on the platform:

- Display of train number and train name
- Display of source station & destination station name

The above information will be displayed in English & Hindi & Regional language alternatively.

Technical Features

- Wide view angle for better visibility
- Automatic Brightness control as per ambient light conditions for energy saving and good readability in varying light conditions
- Elegant corrosion resistant Mechanical Enclosure with powder finish
- Low power consumption
- Yellow / amber or any other colour LEDs
- Tinted toughened glass / poly carbonate screen to protect and enhance contrast ratio
- No routine maintenance required
- Comprehensive self test facility
- Easy servicing access

Technical Specifications

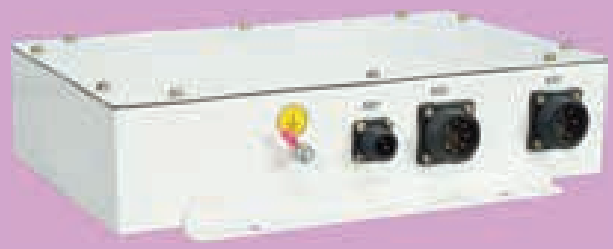
LED matrix	32 rows × 64 columns (Customizable)
LED type	3.9 mm, Through Hole type
Display Size	370 mm × 185 mm
LED pitch	5.8 mm in horizontal & vertical direction (Customizable)
LED colour	Mono colour (yellow / amber or any other colour)
LED Intensity	>1000 mcd
Brightness control	Intensity is controlled automatically using light sensor according to ambient light conditions
Data Interface	Wired or Wireless communication interface with MBU
Power supply	110V DC (Typical)
Mechanical enclosure	CRCA sheet elegant enclosure with Black Texture colour to match with coach exterior
Operating temperature	upto 55ºC
Relative humidity	Up to 95% (non-condensed)
Mounting	Mounting with 4 nos. of M6 screws

Audio Amplifier Unit

The audio amplifier unit is provided in each coach, receives audio signals and amplifies. The amplified audio is broadcasted for announcement through loudspeakers fitted in the coach.

Technical Features

- The Public Address Amplifier unit is a microprocessor based intelligent unit
- Provides optimize sound output as per ambient noise level
- IP based Amplifier unit
- Entire system is designed to work on Ethernet interface
- Web based maintenance and configuration tool which can be accessed via Ethernet interface
- The power amplifier is rated to deliver 80W r.m.s (under minimum DC supply conditions)



Technical Specifications

Data Interface IN	Audio In from MBU (Wired / Wireless)
Data Interface OUT	Audio OUT to Speakers
Power supply	110V DC / 24V DC
Mechanical enclosure	CRCA sheet elegant enclosure with Black Texture colour to match with coach exterior
Operating temperature	upto 55ºC
Relative humidity	Up to 95% (non-condensed)

IP based Network Video Recorder (NVR)

IP based NVR are intended for the reliable and steady recording of video, diagnostics into recording disks. Recorded data can be transmitted by directly connecting an Ethernet / Serial cable to the recording unit and by retrieving data remotely or directly from storage disks using reading units.

The recording units are industrial computer-based devices using the Linux operating system. The units are intended for the reliable and steady recording of video, diagnostics and metadata into recording disks. Recorded data can be transmitted by directly connecting an Ethernet / Serial cable to the recording unit and by retrieving data remotely or directly from storage disks using reading units.

The unit supports the recording of audio and video formats transmitted through the RTP protocol. An Analysis software is supplied together with a recording unit, which retrieves data from the CCTV system to manage and analysis the video information.

Technical Features

- Captures camera stream over IP
- Sufficient storage place to store continuous video streams
- Web based maintenance and configuration tool which can be accessed via Ethernet interface
- USB pen drive interface for easy transfer of data
- Provision to geo tag video streams
- LCD/DVI connector to locally view videos

Technical Specifications

- Microprocessor based control
- 8, 12, 16, and 20-channel
- Record images at variable fps rate
- Configuration & setting through Ethernet / Serial interface
- POE port to connect cameras directly (Optional)
- Suitable for railway environment

Audio Equipment

Loudspeaker

Loudspeakers are powered by the audio amplifier unit and provide audio announcement information to passenger inside the coaches.

Technical Features

- Each loudspeaker can be driven with 4W of power
- Loudspeaker are driven by the audio amplifier unit
- 100V line distribution system
- The loudspeakers are supplied with impedance matching transformer

Technical Specifications

Drive power	4 W
Sensitivity	87dB @ 1 W/m
Nominal diameter	130mm
Voice coil	Dia 25mm
Nominal impedance	4
Frequency response	90 Hz to 20 KHz
Weight	0.91 kg

Surveillance Equipment

CCTV Camera

Camera is specially designed for video surveillance in rolling stock application. There are front, side outdoor cameras and indoor cameras. All cameras are Power Over Ethernet (POE) based.

Technical Features

- The compact, discreet, and rugged cameras
- Can withstand tough conditions such as vibration, shock and temperature fluctuations

Technical Specifications

- DOME Camera
- C-MOS image sensors
- High resolution LENS
- POE based

IP based Public Address System, Passenger Information System and CCTV Surveillance System for Metro Trains

Passenger Information Board

Front CCTV Camera

Side CCTV Camera

IP Wired

IP Wired

IP Wired

LCD Dynamic Route Map Display

IP Wired

Train Number Indicator (LED)

Destination Indicator (LED)

Side Destination Display

IP Wired

Main Controller Unit

- GPS
- Background Music Source
- Wi-Fi / GSM/ 3G / 4G
- Door Interface

OTHER THIRD PARTY SYSTEMS
- Automatic Train Controller (ATC / ATP / ATO)
- Train Radio
- Train Information Management Systems (TIMS)

IP Wired or Serial Interface (CAN, RS232, RS485)

Audio Lines

IP Wired

Microphone

Main Operating Panel

CCTV Video Analysis and Management Software with Database Generation Tool

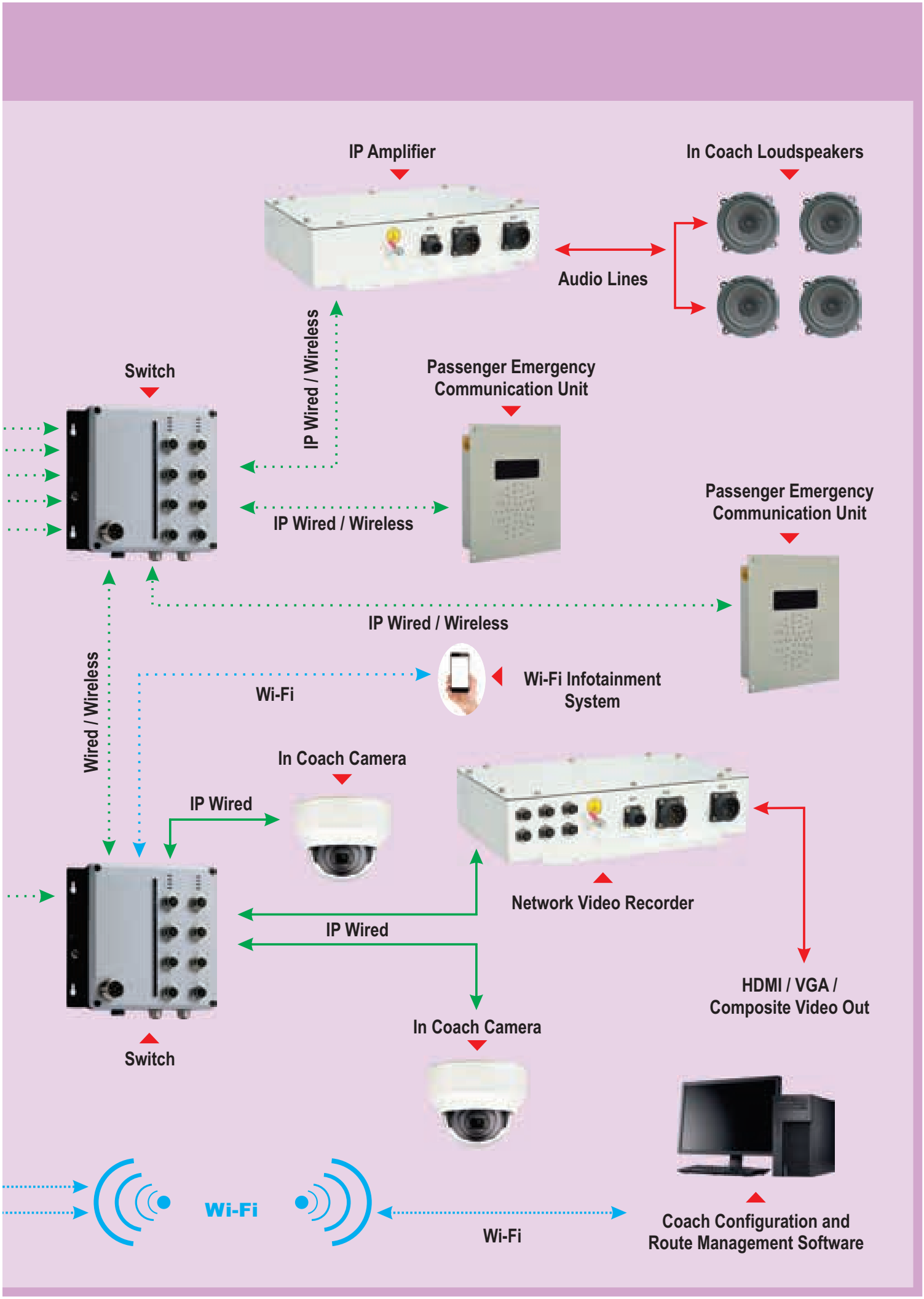
IP Wired

IP Wired

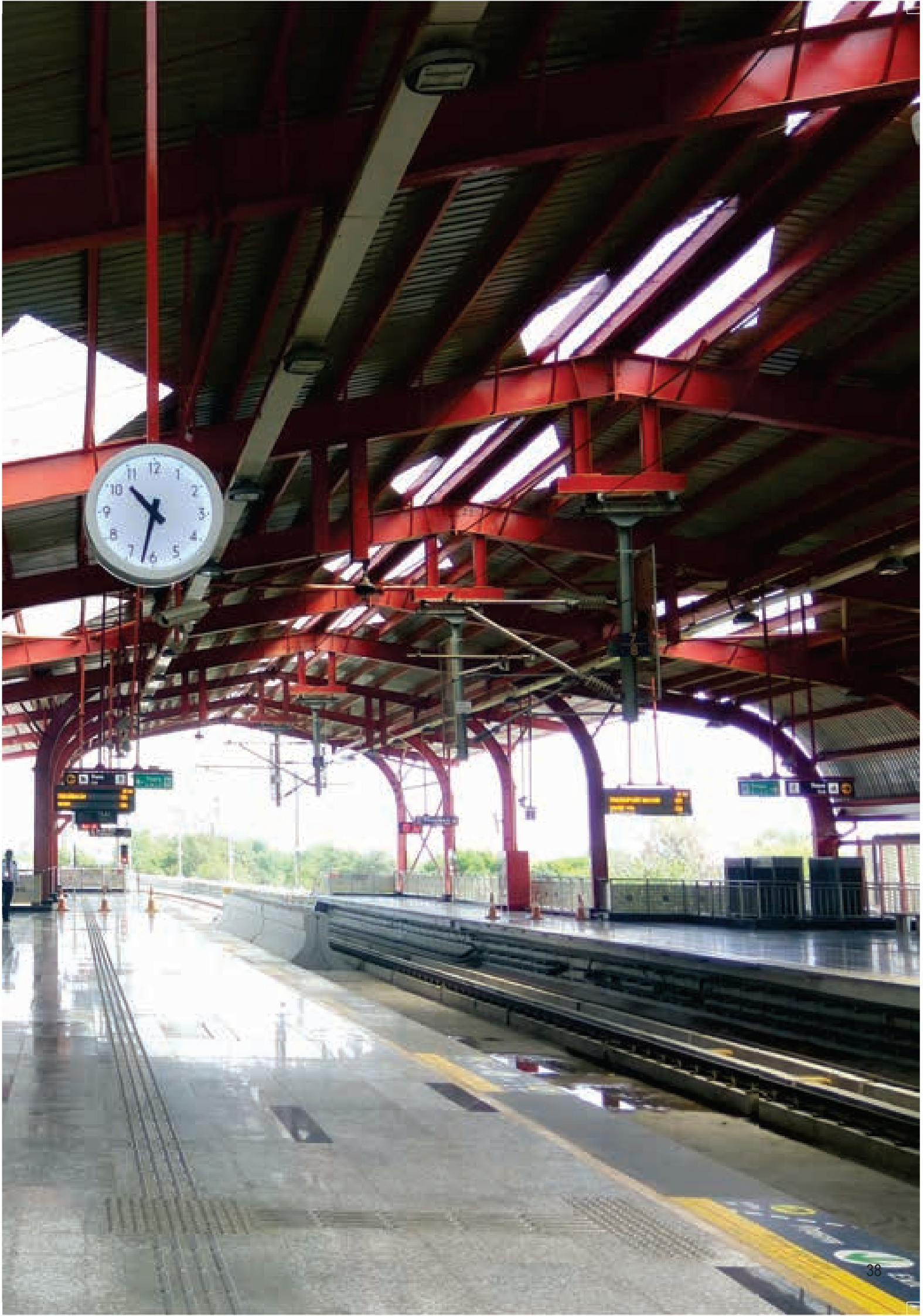
CCTV Monitor

LCD Passenger Information Board

LEGEND
- Analogue
- Ethernet / LAN (Local)
- Ethernet / LAN (Train Bus)
- Third Party Interfaces


IP Amplifier
In Coach Loudspeakers
Audio Lines
IP Wired / Wireless
Switch
Passenger Emergency Communication Unit
IP Wired / Wireless
Passenger Emergency Communication Unit
IP Wired / Wireless
Wired / Wireless
Wi-Fi
Wi-Fi Infotainment System
In Coach Camera
IP Wired
Network Video Recorder
IP Wired
HDMI / VGA / Composite Video Out
Switch
In Coach Camera
Wi-Fi
Wi-Fi
Coach Configuration and Route Management Software

Metro & Railway Stations



General

Autometers Alliance Ltd offers comprehensive solution for Integrated Public Address System (PAS), Passenger Information Display System (PIDS) & Master Clock System (MCS) which is used in networked metro / railway stations. The purpose of the system is to provide useful journey information to commuters in the station premises regarding train arrival, train departure, journey message, emergency / special message, real time clock information by means of audio announcements & visual information.

The Integrated Passenger Audio & Visual Information System – PAS/PIDS is a generic control system that provides long line and local control of both visual and audio passenger information and public address systems, through the use of interactive and intuitive man machine interfaces.

The PAS (Public Address System) is a generic audio matrix and power amplifier system that provides audio routing, audio amplification, ambient noise sensing and loudspeaker circuit health monitoring facilities.

Passenger Information Display System (PIDS) employs ultra- bright SMD LED technology & high end TFT / LCD technology for providing visual information to passengers and are equipped with ambient light sensor to display information with good readability in all weather conditions.

The integrated PAS, PIDS, MCS system consists of following components:

- Public Address System
- Passenger Information Display System – LED and TFT Display Units
- Master Clock System

The System:

The IP based Integrated Public Address System, Passenger Information Display System & Master Clock System consist of the following sub-systems:

A central system to manage the information for complete line located at Central Location with redundancy.

A local system is installed in each station. In each station, the system is based on a Station server to simultaneously control the visual and audio information within the station.

At the central position, the Central servers give to the user the functions to manage the information in each station and to inform passengers in real time according to the Train arrival & departure information through Train Central and Signaling system (TC & S).

The Overall system including audio working on IP based design with Audio over IP technology.

Composition of Integrated Passenger Address System, Passenger Information System and Master Clock System :

- Central Integrated Public Address System and Passenger Information System Server (redundant)
- Local Station Integrated Public Address System and Passenger Information System Server
- Network Management Server for Public Address System and Passenger Information System & Master Clock System
- Central Workstation MMI
- Station Workstation MMI
- Network Management Server Workstation MMI
- IP based Call Stations for Central, Stations and Depot
- IP based Zone Controllers
- PABX Units
- Amplifier units
- Ambient Noise Sensors
- Loudspeakers
- Audio Recorder Unit
- LED backlit TFT panels
- LED Display Boards
- Master Clock units
- Sub-Master Clock units
- NTP or AFNOR based Slave Clock unit - Digital Clocks, Indoor & Outdoor types and Analogue Clock

All the sub-systems and system components are integrated with each other to provide required functionality of coordinated audio message broadcasting with visual information display and time synchronization signal to all other sub-system as per customer's requirements.

The system components are installed both at central location in Operation Control Center (OCC) / Backup Control Center (BCC) and station level for controlling the operation remotely as well as locally.

At Central level, following sub-systems are installed:

- Central Integrated PAS/PIDS Server with Man machine Interface (MMI) at OCC
- Backup of central PAS / PIDS Server with MMI as backup at BCC
- Workstations with IP based call station
- Administrative System Network Management System Server
- Administrative System Network Management System Workstation
- IP based Public Address Cabinet

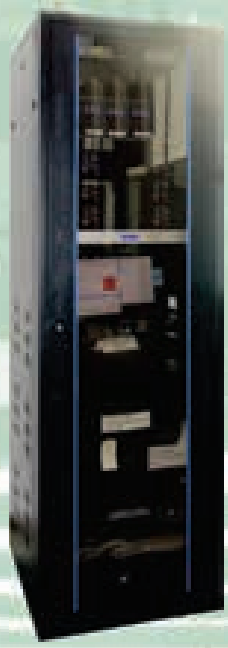
Central PAS/PIDS Servers are to provide redundancy in case of single point of failure. Workstations are provided to drive the remote user MMI in the OCC control rooms. An administration/maintenance MMI are supplied in the OCC / BCC equipment rooms for alarm review & system management purposes.

At station level, following sub-systems are installed:

- Station Integrated PAS / PIDS Server
- Station Workstation
- IP based Station call station
- IP based Zone Controllers for routing audio sources to pre-selected zones
- Power Amplifiers to drive each zones loudspeakers and tracking of ambient noise
- Power Amplifier as backup
- PAS Control Monitoring Panel
- Noise Sensors
- Loudspeakers
- LED Displays Boards
- LED backlit TFT display panels
- Sub-Master Clocks
- NTP or AFNOR based Digital Clocks – Outdoor & Indoor types
- NTP or AFNOR based Analogue Clocks

Metro & Railway Stations

IP based Passenger Information
Display System – LED Display Board



Passenger Announcement
System Cabinet

IP based Passenger Information
Display System – TFT Display Panel

Digital Outdoor Real Time Clock

Analogue Real Time Clock

Indoor Real Time Clock

Products

IP based Zone Controller

PABX Interface Unit

IP Call Station Unit

Amplifier

Loudspeaker

Master Clock Unit

Sub Master Clock Unit

Central / Local Servers & Workstation

IP based Passenger Information Display System – LED Display Board

Intelligent Display Boards to display messages for Passenger Information. These Display Boards are useful for Installation at public places like Railways Workshop, Station Concourse, Station Platform area or similar Applications. The Display Board receives messages to be displayed on it from a remotely located computer over wired/wireless serial communication link and displays the Information in Hindi, English & any Indian regional language accordingly.

The system is designed around powerful CPU having sufficient memory in order to store bit map data of language character fonts. Automatic brightness control according to ambient light conditions is incorporated in the system to provide good legibility under direct sunlight.

The LEDs used for Information Display are ultra-bright Amber/Red/Green colored with wide viewing angle. These LEDs are arranged in 48×16 or 32×16, 16×16 (Customizable) matrix boards to provide characters of sufficient size for good visibility.

The System is a Standalone and Compact Unit that requires cable connections for power supply and data. Power supply required for operation of the unit is 230V, 50 Hz AC (Typical).

Technical Features

- Ultra Bright, wide viewing angle LED's for better visibility
- Automatic Brightness control as per Ambient light conditions for good view ability under Direct sunlight
- Easy mounting
- Multi-lingual (Hindi, English or Indian regional language) message generation through PC loaded with customized user friendly software
- Compact design
- Elegant mechanical enclosure and fixings to meet application requirements
- Low power consumption

Applications

Information display in public area like:

- Station Concourse
- Station Platform
- Depot
- Entry / Exit Gates of the Station

Technical Specifications

Nos. of horizontal lines	2 / 3 (Customizable)
Nos. of LED's per row	240 (Customizable)
Nos. of horizontal rows/line	16 / 24 (Customizable)
Display area per line	240 ×16 LED's or 240 × 24LED's (Customizable)
LED type	SMD / Through hole type
LED pitch	8.9 mm (Customizable)
LED colour	Red or Amber or Green (Customizable)
Brightness control	Intensity is controlled automatically using light sensor according to ambient light conditions
Power supply	230V, 50 Hz AC (Typical)
Mechanical enclosure	Elegant mechanical enclosure and fixings to suit application requirements
Operating temperature	Up to 55°C

IP based Passenger Information Display System – TFT Display Panel

Display units are of LED-Backlight TFT type with 40", 42" 49" screen size or as per requirements. The displays are driven via IP network from the computer.
These large, high bright, low power consumption TFT displays are specially designed for passenger information system at Railway station, Metro, Airport, to operate in extreme environmental conditions.

Technical Features

- All electronic parts are robust and anti-vandal aluminium housing, with rear mounting arrangement
- The TFT panel is protected in front by an Poly-carbonate / Toughened glass screen
- A LDR sensor is used which adapt the screen brightness according to the ambient light conditions
- The LED backlight TFT multimedia having an internal audio amplifier and loudspeaker to broadcast the audio of any multimedia visual information that is being displayed
- TFT has redundant servers connection, if one server fails TFT panel will switch to secondary sever automatically

Technical Specifications

Display resolution	1920 (H) × 1080 (V) pixels
Brightness	Better than 700 cd/m²
Viewing angle	178º (H) & 178º (V)
Colours	1.07 Billion (10-bits)
Operating voltage	230V, 50 Hz AC
Operating conditions	upto +50ºC
Outside interface ports	1 × RJ45 Ethernet / 1 × Fibre Port

Analogue Real Time Clock

The Analogue Clock units are constructed of a flat aluminium case, a white dial with black Arabic numerals and hands, ensuring easy visibility. Analogue clocks are valued for easy reading of time at a quick glance. It allows the users to have a visual position relative to the time. The professional analogue clocks can display the same time information, synchronized by a master clock or a time server. The Analogue Clock units provide efficient backlight for night time visibility
These Clock units are operated with 230V, 50 Hz AC (Typical) supply.

Technical Features

- Efficient reading of time
- Wall mounting or ceiling mounting with bracket
- Time setting by synchronization source.
- Supervision alarms
- Remote configuration and time setting via WEB interface
- Multiple data interfaces AFNOR, TCP/IP etc
- Enclosures and fixings to satisfy exterior requirements
- Automatic time zone choice and daylight saving time change
- Easy Servicing Access
- High reliability, in excess of 80,000 hours MTBF
- Flat aluminium case

Technical Specifications

Dimensions	600 mm Diameter (case) Customizable
Distance of legibility	30 mtrs
Synchronization input	Open Industry Protocol NTP / AFNOR
Power supply	230V, 50 Hz AC (Typical) / POE (Power Over Ethernet)
Mounting	Wall Mount / Ceiling Mount
Colour of case	Aluminium
Operating temperature	upto 55°C
Relative humidity	95% @ 40°C

Outdoor Real Time Digital Clock

The Digital Clock units are constructed using RED colour LEDs (can be customized for any other colour) and used for outdoor locations. The professional clocks can display the same time information, synchronized by a master clock or a time server. The clock units are intelligent to cater for changing ambient light conditions. A brightness sensor is incorporated in the unit to sense the ambient light and convert the light signal to appropriate voltage signal, which is fed to electronic circuit inside the unit to control the LED driving. This features good visibility and viewing distance.

The clock has its own temperature compensated TCXO time base which allows accuracy about 0.1 sec / day between 0° to 40°C in case of synchronization loss. These Clock units are operated with 230V, 50 Hz AC (Typical) supply.

Technical Features

- Direct sunlight legible using ultra bright LEDs
- Wide viewing angle
- Automatic brightness control with in-built light sensor
- Single sided HH:MM display configuration
- High reliability, in excess of 80,000 hours MTBF
- No routine maintenance required
- Long life
- Multiple data interfaces AFNOR, TCP / IP etc
- Enclosures and fixings to satisfy exterior requirements
- Low power consumption
- Easy Servicing Access
- Casework is CRCA / Aluminium painted black & IP-65 protection class
- Backup of time information in case of main supply failure
- Weight : 20Kg (approx.)

Technical Specifications

Dimensions	990 × 480 × 100mm (Customizable)
Height of digit	210mm (Customizable)
Distance of legibility	60 mtrs
LED colour	Red or any other color as per customer requirement
Synchronization input	Open Industry Protocol NTP / AFNOR
Power supply	230V, 50 Hz AC (Typical)
Mounting	Wall / Ceiling Mount
Color of case	Black (Customizable)
Operating temperature	upto 50°C
Relative humidity	95% @ 40°C

Indoor Real Time Digital Clock

The Digital Clock units are constructed using RED colour LEDs (can be customized for any other colour) and used for indoor locations. The professional clocks can display the same time information, synchronized by a master clock or a time server. The clock units are intelligent to cater for changing ambient light conditions. A brightness sensor is incorporated in the unit to sense the ambient light and convert the light signal to appropriate voltage signal, which is fed to electronic circuit inside the display unit to control the LED driving. This features good visibility and viewing distance.

The clock has its own temperature compensated TCXO time base which allows accuracy about 0.1 sec / day between 0° to 40°C in case of synchronization loss. These Clock units are operated with 230V, 50 Hz AC (Typical) supply.

Technical Features

- Direct sunlight legible using ultra bright LEDs
- Wide viewing angle
- Automatic brightness control with incorporated light sensor
- Single sided HH:MM or HH:MM:SS display configuration
- High reliability, in excess of 80,000 hours MTBF
- No routine maintenance required
- Long life
- Multiple data interfaces AFNOR, TCP/IP etc
- Enclosures and fixings to satisfy exterior requirements
- Low power consumption
- Easy Servicing Access
- Casework is CRCA / Aluminium painted black & IP-65 protection class
- Backup of time information in case of mains supply failure
- Weight : 3 Kg (approx.)

Technical Specifications

Dimensions	350 × 160 (Customizable)
Height of digit	65mm (Customizable)
Distance of legibility	30 mtrs
LED colour	Red or any other colour as per customer requirement
Synchronization input	Open Industry Protocol NTP / AFNOR
Power supply	230V, 50 Hz AC (Typical)
Mounting	Wall Mount
Color of case	Black
Operating temperature	upto 55°C
Relative humidity	95% @ 40°C

IP based Zone Controller

IP based Zone Controllers are the interface between all the audio sources: Station Public Address audio channels, Station call station, Platform call stations, Telephone or Radio interface, Live call interfaces, Recorder and all Audio amplifiers for broadcasting of the audio announcements.

Every Zone Controller is unique to a zone in a station, central location or depot and any announcement (pre-recorded or live) can be sent to the zone controller over IP interface using Audio over IP technology.

The Zone Controllers are designed to mount on to the Public address Rack. It contains not only the IP-audio interface, but also Web server for complete configuration from any computing or display device that hosts a Web browser. The IP based Zone Controller represents a combination of audio and networking technology combined to give high quality and high fidelity audio.

Technical Features

- Dynamic or Static IP Address
- 10 /100 Mbit with IEEE 1588 Ethernet
- IEEE 802.11AT Compliant
- Audio Over IP
- Web based User Interface for System Configuration
- Audio out Interface for Amplifiers
- 2 General Purpose Inputs for Fire Alarm Interface
- Back ground music interface
- External Power Supply Option
- Software upgrade via USB or Web Interface

Technical Specifications

- Unbalanced audio output for Amplifiers
- Power Over Ethernet PoE or External powered IP Zone Controller
- Microprocessor based design
- RJ 45 Network Interface
- USB 2.0 Interface
- Operational on 230V, 50 Hz AC (Typical)
- Power, faulty and activity LED indicators
- Aluminium lacquered Black or CRCA enclosures
- Rack mountable option
- Robust Embedded Linux Operating System

PABX Interface Unit

PABX Interface Unit acts as an interface to the telephone system and the Public Address system to facilitate audio announcement via the telephone system. It is designed to be integrated in a cabinet at the standard 19" rack. This unit also provide an input for back ground music system.

Technical Features

- Connection with a telephone line PABX or PSTN over RJ11 connector
- Dynamic or Static IP Address
- 10 / 100 Mbit with IEEE 1588 Ethernet
- IEEE 802.11AF Compliant
- Audio Over IP for Audio out interface
- External Power Supply Option
- Software upgrade via USB or Web Interface

Technical Specifications

- Audio Over IP output for IP based Zone Controllers
- PoE or External powered option
- Microprocessor based design
- Operational on 230V, 50 Hz AC (Typical)
- Line, Audio, fault LED indicator
- Aluminium lacquered Black or CRCA enclosures
- Rack mountable option
- Configurable function for Zone Allocations
- Configurable password and key settings

IP Call Station Unit

IP based Call station is an intrusive visual man-machine interface for operator at central location or stations. It has a back-lit touch screen design for simple and user-friendly operation. All parameters needed for operation can be programmed into the device such as zones assignment to different buttons, name of zones, group of zones, audio levels adjustments and pre-call chime setting. Goose neck Microphone is provided to enable the operator to make live calls. The microphones is generally desk mounted on the call station, with noise canceling, unidirectional, wide frequency response features.
The audio message being broadcasted to a pre-defined zone can be monitored on the speaker. Live audio is transferred directly to Zone Controller over IP interface.
IP based Call stations can be used at Central location to send live audio to all stations or individual zones in a particular station.
IP based Call stations can be used at Station location to send live audio to individual zones in that station.

Technical Features

- Dynamic or Static IP Address
- 10 /100 Mbit with IEEE 1588 Ethernet
- IEEE 802.11AF Compliant
- Audio Over IP for Audio out interface
- External Power Supply Option
- Software upgrade via USB or Web Interface
- Touch screen interface for key operations (Also available in standard keypad versions)

Technical Specifications

- Audio Over IP output for IP based Zone Controllers
- PoE or External powered
- Microprocessor based design
- RJ 45 Network Interface
- Customizable Touch screen Interface
- USB 2.0 Interface
- High quality goose neck microphone
- Microphone frequency response 50-15,000Hz
- Microphone Sensitivity 2.5mV / Pa
- Microphone Impedance 600Ω
- Operational on 230V, 50 Hz AC (Typical)
- Power, faulty and activity LED indicators
- Aluminium lacquered Black or CRCA enclosures

Audio Amplifier

Audio Amplifiers are provided for each Public Address zone. There are directly addressed by the outputs of the IP based Zone Controllers. Each Audio Amplifier comprises two duplicated 100 volt line 150W (A and B) – Total of 300W per amplifier unit for driving the loudspeaker circuits of each zone.

Technical Features

- Load impedance sensing facility for monitoring the health of each loudspeaker circuit
- Digital equalizer in each amplifier allowing the tuning of upto 5 parametric bands
- Change of Gain of the pre-amplifier as per signal level received from the Ambient Noise Sensors
- Back-up amplifier feature in the event of any amplifier failure
- Mute button option to manually mute desired amplifier
- LED based VU-meter for input audio level verification
- LED to provide Loudspeakers lines state
- 230V, 50 Hz AC (Typical) Power supply
- Manual gain setting in the front panel of amplifier

Technical Specifications

Input level	0 dB
SNR	> 80 dB
Bandwidth	40Hz to 20 KHz
Wattage	150W × 2 (RMS)

Noise sensor input for audio variations as per crowd density

Loudspeaker

Loudspeakers are of heavy duty, high performance type, resistant to corrosion and designed to be used in outside environments.

Impedance matching line transformers are used with the loudspeakers with minimum of three output taps to enable individual speaker output to be adjusted in order to achieve a uniform level of coverage.

Technical Features

- Each loudspeaker selectable output power
- Loudspeaker are driven by the amplifier unit
- 100V line distribution system
- The loudspeakers are supplied with impendence matching transformer

Technical Specifications

Power range	3.5 – 7.5 – 15 W or 1.5 – 3 – 6 W
Bandwidth	100 Hz – 15 KHz
Line input	70V or 100V

Master Clock

The master clock (Time Server) has a front display for showing Date and Time. It is equipped with automatic adjustment feature and manual adjustment for maintenance and testing purpose(Date and Time).

The master clock system is designed in accordance with ITU-T standards. The master clock is used to generate the date / time information for the sub master clocks, interfacing systems such as CCTV, PIDS, PAS, Radio, Telephone system and 48V DC Power system, FOTS, AFC, Signaling System, Rolling Stock (through Signaling system) and SCADA (Traction Power Supply and E&M). Network Time Protocol (NTP) is used for time synchronization of all these applications.

Technical Features

- Dual Power Supply option- 36-72 VDC with 115-230 VAC
- Configurable priorities of synchronization inputs
- Time Base and algorithm ensuring output accuracy up to 50ns when synchronized to GNSS
- Time can be configured individually on each output, via DST and Offset
- 10 MHz frequency output signal (available with OCXO oscillator only) via BNC connectors
- Alarm management via SNMP TRAP for synchronization and power supply alarms
- Local or UTC time on the digital display
- In free running mode (without input of GPS signal) Master Clock Unit accuracy will be better than 1×10−5 seconds

Technical Specifications

- Time synchronization from GPS receiver or from NTP server
- Incorporated battery and its oscillator allow to provide stable time code output in case of synchronization or power supply failure.
- NTP
- NTP Client / Server, Broadcast, Multicast
- SNTP
- HTTPS
- SNMP
- IPv4 / IPv6 (DHCP compatible)
- FTP
- SYSLOG
- Power Supply 230V, 50 Hz AC (Typical)
- Display 4 × 20 Blue Character LCD display with backlight

Sub Master Clock

The Sub-master clock units are installed at each of the stations and Depot. These clock units are connected to FOTS network for receiving of master time signals from Master clock units installed at OCC & BCC, and supply reference NTP / AFNOR clock signals to slave clocks and PAS/PIDS control equipment for various functionalities.

In the absence of valid synchronization clock signal, Sub Master clock will operate in free running mode with an internal clock supplying the time signals. On restoration of the valid synchronization clock signal, Sub-Master clock shall self-correct.

Technical Features

- Threshold setting for security
- Alarm management via SNMP TRAP
- Time base and algorithm to ensure output accuracy up to 100ns in GPS synchronization
- Time synchronization from NTP server

Technical Specifications

- NTP
- SNTP
- HTTPS
- SNMP
- IPv4 / IPv6 (DHCP compatible)
- FTP
- SYSLOG
- Power Supply 230V , 50 Hz AC (Typical)
- Display 4 × 20 Blue Character LCD display with backlight

Central Servers & Workstation

The Central Server is comprised of control equipment for Public Address System (PAS) and Passenger Information Display System (PIDS). The server is connected to Fibre Optical Transmission System (FOTS) for control signal and digitized audio data communication with the stations. It is interfaced with Master Clock System for time signals and Train Control and Signaling System (TC&S) for real time train information.

The Workstations hosts the Central Man Machine Interface (MMI) are the interface for the operator to manage the Public Address System (PAS) and Passenger Information Display System (PIDS). The Workstation is connected to the LAN for the data exchange with the Central Server and for digitized audio data communication with the station PAS. The Workstation is provided as the means of system command entry and system interrogation by the Central Servers.

The Administration Workstation NMS is the tool for the maintenance people to tune and control the Public Address System (PAS) and Passenger Information Display System (PIDS). The Administration Workstation is connected to the LAN for the data exchange with the Central Server and the station computer. The Administration Workstation is provided as the means of PAS/PIDS system supervision and alarms/status management.

The main features of the Central Server & Workstation software are:

- Dispatch of automatic data from the TC&S system to the Station Servers
- Dispatch command from each Central Workstation :
- Dispatch of fixed, pre-formatted or pre-recorded / instantly constructed audio/visual messages to one or multiple Station servers
- Dispatch of live audio messages to one or multiple Station servers
- Dispatch of scheduled audio and/or visual messages to one or multiple Station servers
- Dispatch the central database updated from the Central Workstation Administration to the Station servers

The main features of the Server & Workstation software are:

- Dispatch of fixed, pre-formatted or pre-recorded audio and/or visual messages to one or multiple audio zones and/or display screens
- Dispatch of scheduled audio and/or visual messages to one or multiple audio zones and/or display screens
- To dispatch the audio and / or visual messages triggered by the Train Control and Signaling, forwarded by the Central server, to one or multiple audio zones and/or display screens
- To record the audio signals providing by the Public Address system, during an announcement
- To notify the Station Workstation and the Central server of the status of the PIDS / PAS system

Passenger Announcement System Cabinet

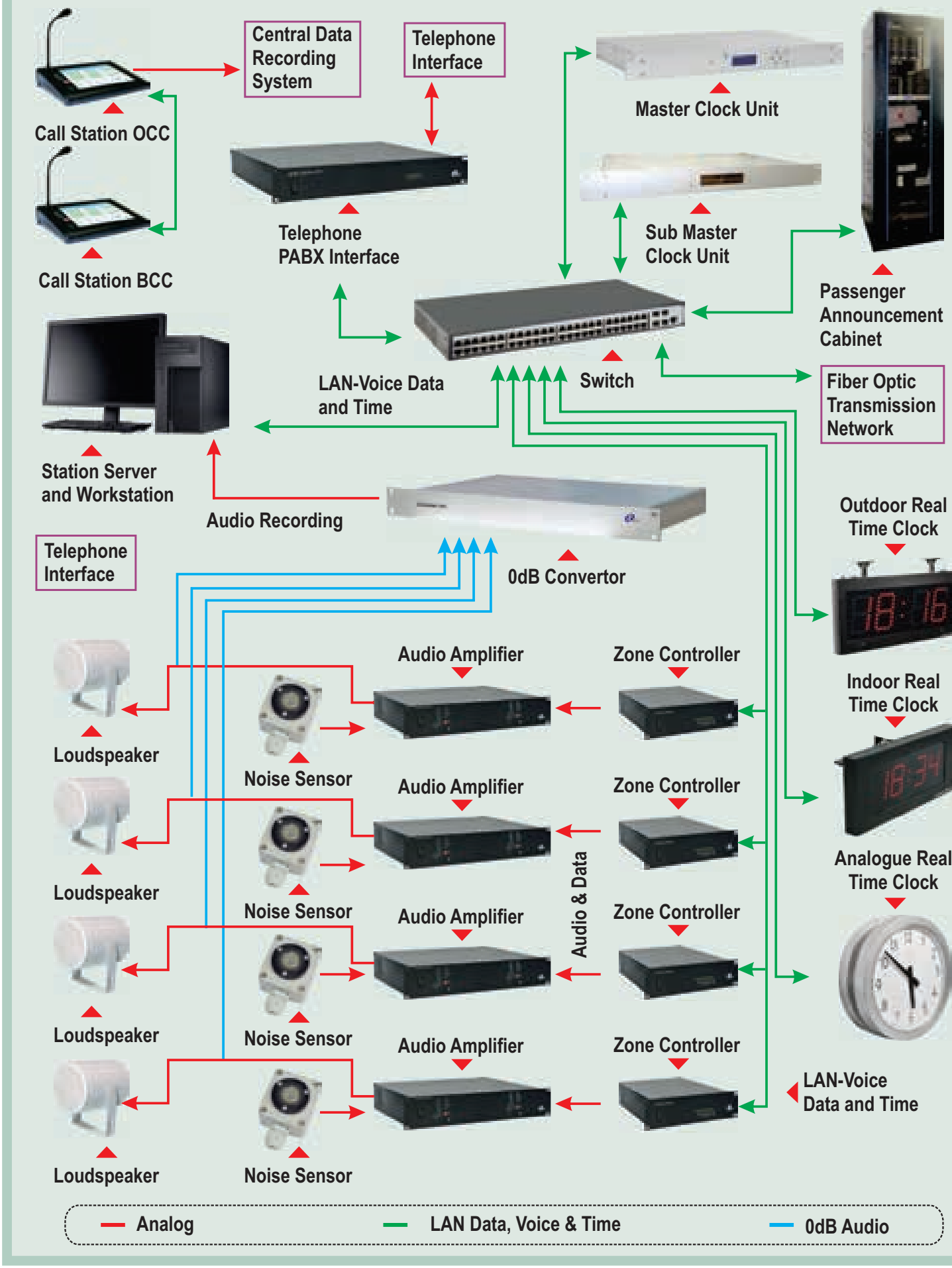
PA rack is in form of standard 19", 42 U size rack generally with front side protective glass door and controls overall operation of Public Address System (PAS), Passenger Information Display System (PIDS) and Mater Clock System (MCS) at station and central location.

The rack consists of various PAS equipment, MCS equipment, and PC, Server, Workstation and other signal conversion accessories which constitute a complete control system responsible for functioning of the PAS / PIDS / MCS system.

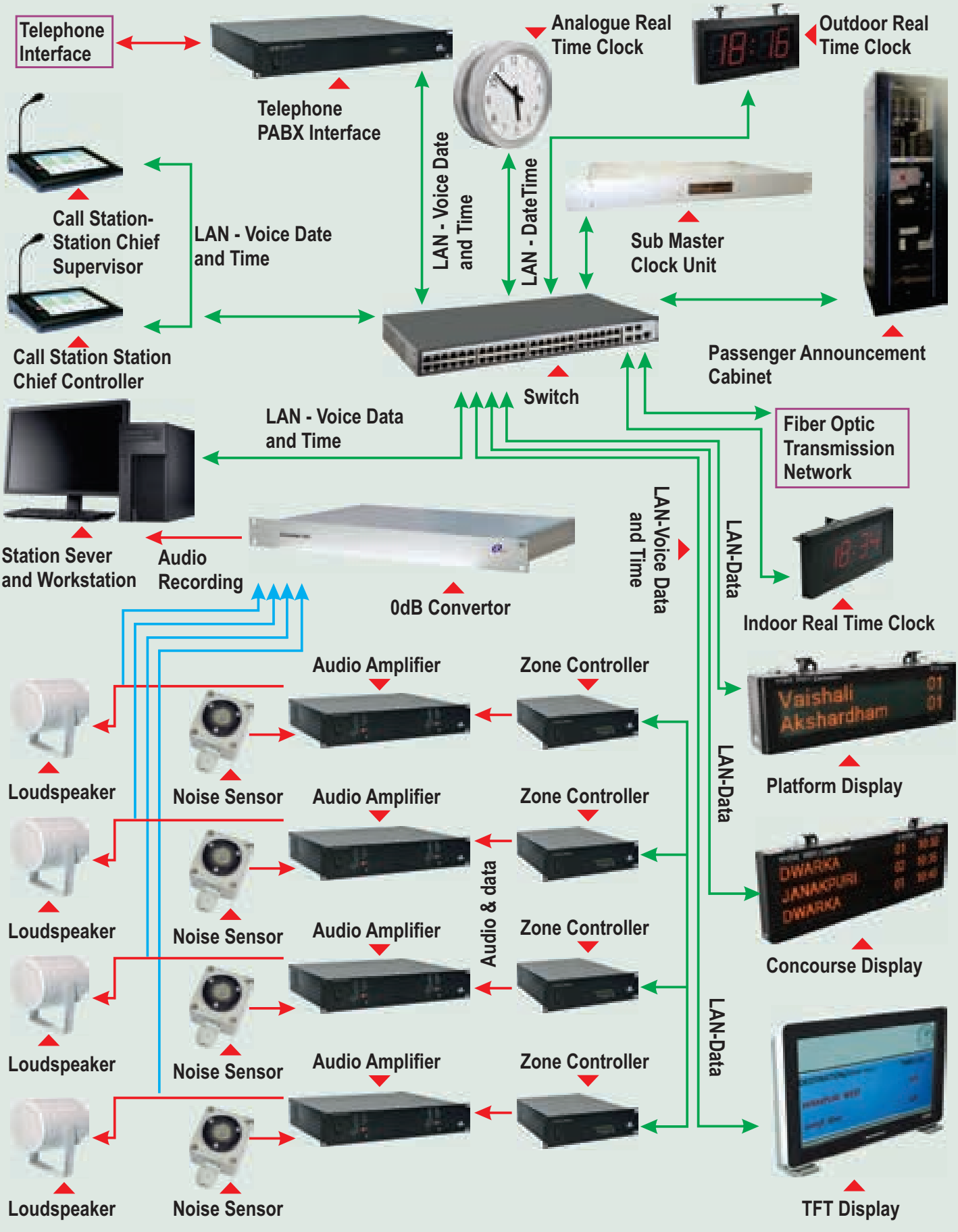
PA Cabinet Comprises of following major equipment:

- Audio Decoder Unit
- Audio Encoder Unit
- Control and Monitoring Panel
- Zone Controllers
- PABX Interface Unit
- Amplifier Unit
- Ethernet to serial convertors
- Ethernet Switch
- Media Convertor
- Power Distribution Switch
- Loudspeaker output distribution

Public Address System, Passenger Information Display System and Master Clock System at Central Locations



Public Address System, Passenger Information Display System and Master Clock System at Stations



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