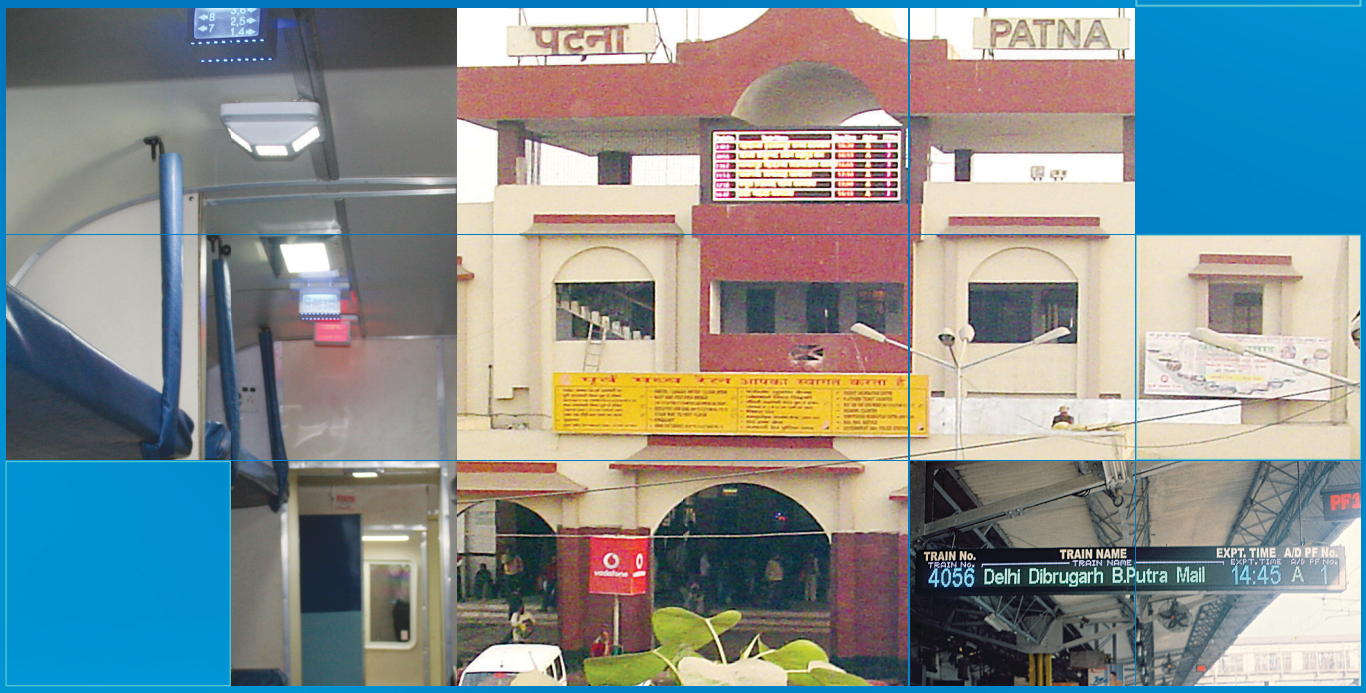
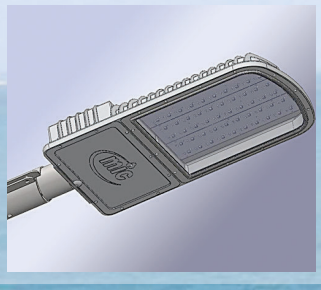
mic
driving innovation

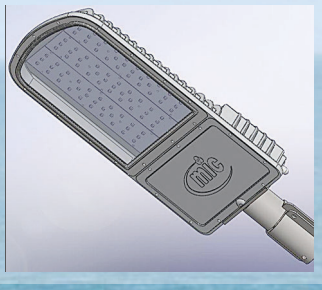
UNLEASHING THE POWER OF LED



Enabling **Indian Railways** to
enhance passenger amenities and LED

Green Lighting Solutions





Indian Railways has one of the biggest railway network in the world. It is the main life line of the Indian common man assisting them in traveling / transporting from one place to another. The Indian railways has announced an ambitious plan to improve passenger amenities at all their stations and inside the Trains viz. On-line Coach Indication Display Board, On-line Train Arrival /Departure Information Board, On-line Reservation Availability Information Board, Provision of Discharge-Free Green Toilets in Passenger Trains.

As per the union budget for railways presented by shri.Lalu Prasad Yadav Hon'ble Minister for Railways, the railways are planning to modernize 100 stations by installing Train Arrival/Departure Information Display systems having capabilities of displaying information in True Color and in multiple languages. These display systems are equipped to display real time train information by directly taking the data from SIMRAN, this feature enables passengers to know information regarding the Arrival/Departure Information of trains and also will know the location at which the train is and at what speed it is traveling.

RDSO

Research Design and Standards Organisation of Indian Railways has released specifications for the initiatives that the Railway Ministry has taken.

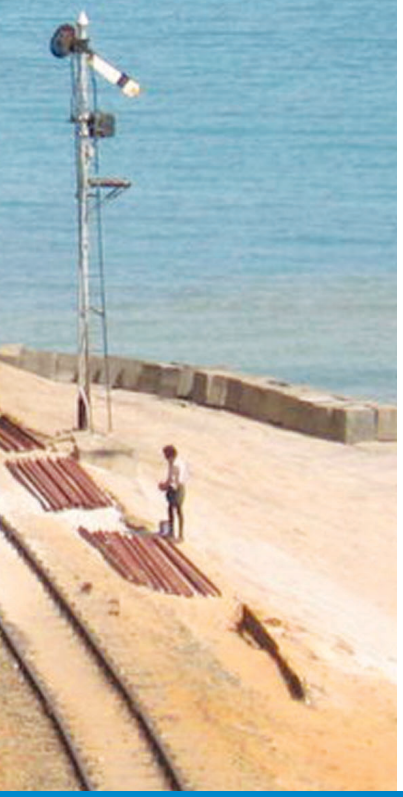
Spec. No. RDSO/SPN/TC/67-Rev1.0 has been released covering Passenger Information Displays.

The items that have been covered under this specification are as follows:

- True Color LED Indoor Video-cum-Train Arrival/Departure Information Display System
- True Color LED Outdoor Video-cum-Train Arrival/Departure Information Display System
- True Color LED Indoor Platform Display System
- True Color LED Indoor At a Glance Coach Guidance Display System
- True Color LED Coach Guidance Display System
- LED Emergency Lamps - Spec. No.ICF/ELEC/917
- LED Coach Lighting - Spec. No. RDSO/PE/SPEC/TL/D/0091-Rev.0-2008

Initiatives being taken by the Ministry of Railways are as follows:

- To install True Color LED Display boards at 100 A & B category stations - These boards will be used to display advertisements and real time Train Arrival / Departure information.
- Name plates of all trains (conventionally wooden) to be converted to LED name plates for changing information through remote control.



MIC's Initiatives & Progress with RDSO Approvals

MIC Electronics Limited has successfully designed and developed products as per RDSO Specifications mentioned above and have got the Approvals for the same. MIC has also developed and demonstrated LED Lighting Products suitable for general lighting applications on Railway properties.

LED Lighting Solutions being offered by MIC will help Indian Railways reduce their power consumption for lighting requirements by more than 50%. This will help in reduction of Green House Gases and a reduction in light pollution.

About MIC

MIC Electronics Limited – an ISO 9001: 2000 company, incorporated during the year 1986 in Andhra Pradesh, India, commenced its operations by manufacturing "Electronic Display systems". Realizing the explosive growth potential of electronic and telecom industry the company forayed into design and development of telecom products for wireline and wireless communication. In 1994 it ventured into Telecom Software and IT services and consequently commenced manufacturing, supply of equipment and software services to the Telecom sector.

It's penchant for perfection and obsession for quality helped to build up an impressive reputation as a trustworthy company. Meanwhile the company expanded its line of activity in designing and manufacturing of Large format Video Displays / Video Walls which happens to be the flagship product and its core competence today. Ultimately the company has transformed over these two decades into a highly reputed innovative wide range products and services company, including LED Video Displays, Telecom Software, IT outsourcing services and communication products.

"MIC" as its name signifies, primarily a tri-fold business enterprise comprising Media Infotech Communication. Thus MIC has come a long way since 1986 and is today a thriving enterprise with a string of high profile clients all over the globe.

Work Force

The Force Behind our achievements

MIC is a team of highly spirited design, research and management professionals who are spread across its various operations and are accelerating the company's growth by developing revolutionary electronics products and taking telecom & networking software solutions to higher orbits of efficiency. MIC has 300 engineers, technicians and managerial staff who aid in providing a portfolio of services un-paralled in their scope.

Achievements

The secret of success

- Awarded the DSIR National award – 2002 from Department of Scientific & Industrial Research, Ministry of Science & Technology, Govt. of India for LED TV & Digital Loop Carrier on STM ¼ on Optical Fibre
- Certified ISO 9001:2000 company as a mark of its commitment to quality
- Achieved more than 25 TEC approvals for its various products
- The Product - LED Video Wall (LED TV) has been put up in the **India Innovators Forum Hall of Fame** - along with other Indian Innovators. Please visit:http://www.indianinnovatorsforum.org/mic_led-tv.htm
- MIC's in-house design facility has been recognized as an approved R&D unit by DSIR, **Ministry of Science and Technology Government of India**
- The testing and manufacturing facilities of the company have been approved by the DoT for bulk telecom equipment manufacturing and by RDSO for manufacturing True Color LED Train Arrival/Departure Information systems.

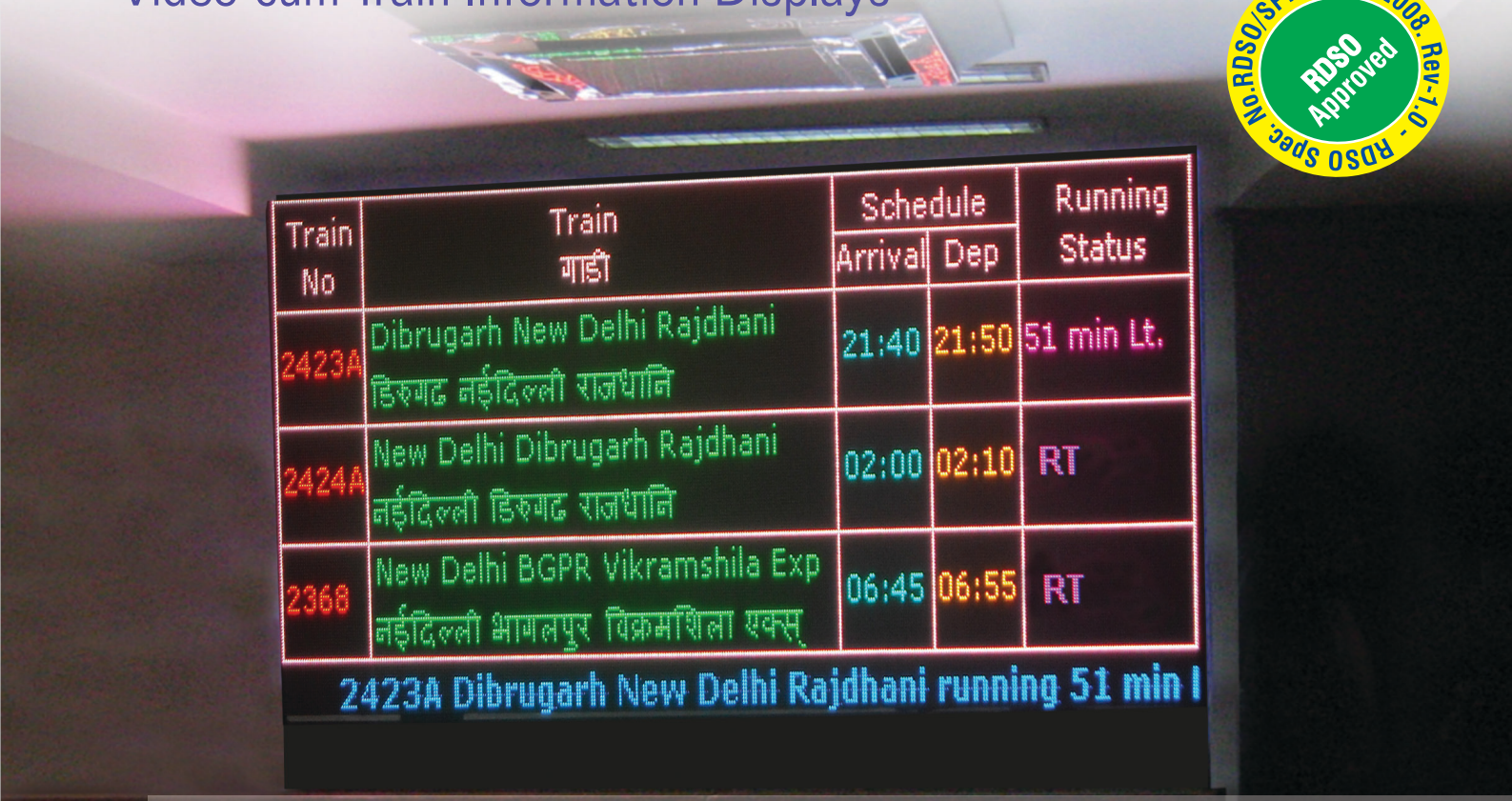
Cutting Edge Technology

MIC is focused on technology driven innovation for new product ideas on an ongoing basis and for providing extensions / up gradations to their existing product range. The company has historically approached the market with cutting edge solutions with concurrent and futuristic technological advancements. The company follows strict quality control measures to achieve and maintain the "preferred vendor" status within the industry. MIC's products are also highly scalable to meet the growing demands of the industry. The company's software credentials and capabilities are of international standards, contributing immensely to its ability to bag prestigious orders from a host of user industries and geographies. MIC is also making efforts to get Intellectual Property Rights (IPR's). MIC's success can be attributed to its key strengths that include:

- An ever evolving culture of constantly updating its technology
- Speed in introducing new products and simplicity & convenience in its product architecture / design
- Adapting to state-of-art manufacturing technologies.

True Color Indoor LED Video-cum-Train Information Displays

RDSO Approved
RDSO/SPN/TC/67/2008. Rev-1.0 - RDSO Spec. No.



Features

- Multi Color Multi Lingual True Color Display
- Soothing to the eyes
- Displays Video-cum-Train Arrival Departure information
- Real time Train Information linked to SIMRAN
- Integrated software to automatically announce train information

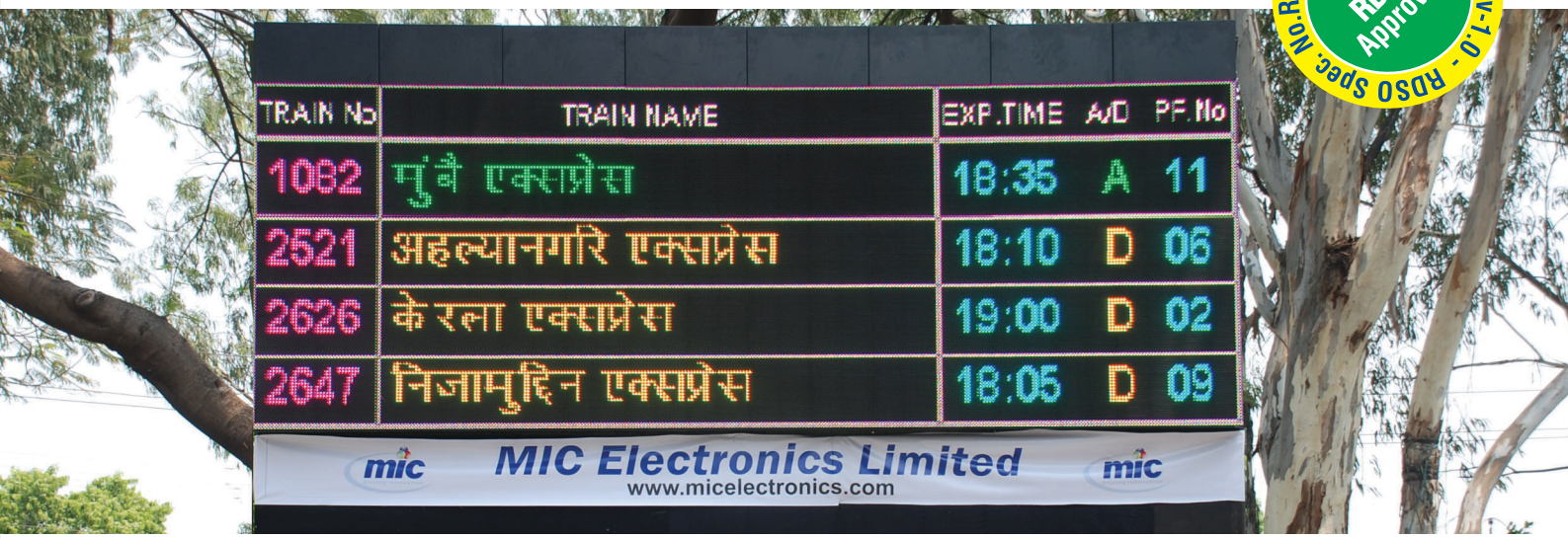
Benefits

- Lowest Operational Costs
- Opportunity for Additional Revenue generation through Advertisements
- Lesser Load at Enquiry Counters

S. No	Description	Specifications		
		5-Line Display	10-Line Display	15- Line Display
1.	Pixel Pitch	9.525mm(+/- 0.1mm)	9.525mm(+/- 0.1mm)	9.525mm(+/- 0.1mm)
2.	Pixel LED		RGB 3-in-One Chip LED (SMD)	
3.	Resolution in Pixels (W x H)	384 x 96	384 x 192	384 x 288
4.	Total Number of Pixels	36864	73728	110592
5.	No. of Modules (W x H)	3 x 1	3 x 2	3 x 3
6.	Module Matrix	128 x 96	128 x 96	128 x 96
7.	Display Board Physical Size (W x H x D) (approx.)	3660mm x915mm x300mm	3660mm x1830mm x300mm	3660mm x2745mmx300mm
8.	Display Area (approx.)	3.3m^2/35sq.feet	6.6m^2/70sq.feet	10.0m^2/105sq.feet
9.	Diagonal distance (approx.)	145 Inch/370cm	160 Inch/400cm	180 Inch/450cm
10.	Surface Luminance (typical)		2500 cd/m^2	
11.	Typical Display Viewing Angle		110^0 (Horizontal & Vertical)	
12.	Color Processing (min.)		12-bit per color	
13.	Installation		Indoor/Platform	
14.	Line/Character Height (min.)		14 pixels (approx.) for English Text	
15.	No. of lines to display (min.) (including Title line)	5 Lines	10 Lines	15 Lines
16.	Total Power (Peak white) (max.)	3.0 K Watts	6.0 K Watts	9.0 K Watts
17.	Typical Operating Load (approx.)	1.0 K Watts	2.0 K Watts	3.0 K Watts
18.	Input Power Requirement	160V - 265V AC, 50Hz	160V - 265V AC, 50Hz	160V - 265V AC, 50Hz

True Color Outdoor LED
Video-cum-Train Information Displays

RDSO Approved
RDSO Spec. No.RDSO/SPN/TC/67/2008. Rev-1.0



Features

- Multi Color Multi Lingual True Color Display
- Soothing to the eyes
- Displays Video-cum-Train Arrival Departure information
- Real time Train Information linked to SIMRAN
- Integrated software to automatically announce train information

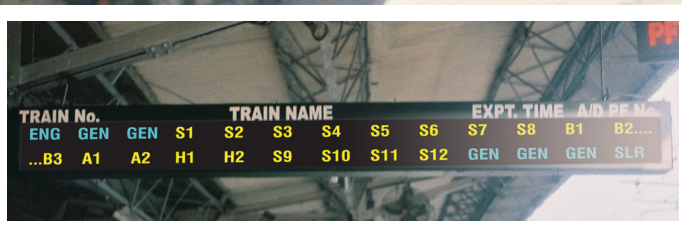
Benefits

- Lowest Operational Costs
- Opportunity for Additional Revenue generation through Advertisements
- Lesser Load at Enquiry Counters

S.No	Descriptions	Specifications		
		5-Line Display	10-Line Display	15-Line Display
1.	Pixel Pitch	16.256 mm(+/- 0.1mm)	16.256 mm (+/- 0.1mm)	16.256 mm(+/- 0.1mm)
2.	Pixel LED	4 Leaded LEDs (2R + 1G + 1B) or 3 Leaded LEDs (R + G + B)		
3.	Resolution in Pixels (W x H)	320 x 80	320 x 160	320 x 240
4.	Total Number of Pixels	25600	51200	76800
5.	No. of Modules (W x H)	8 x 2	8 x 4	8 x 6
6.	Module Pixel Matrix	40 x 40	40 x 40	40 x 40
7.	Display Board Physical Size (W x H x D) (approx.)	5200mm x1300mm x300mm	5200mm x2600mm x300mm	5200mm x3900mm x300mm
8.	Display Area (approx.)	6.5m^2/70sq.feet	13m^2/140sq.feet	20m^2/210sq.feet
9.	Surface Luminance (typical)	7500 cd/m^2		
10.	Typical Display Viewing Angle	Horizontal: 110^0/ Vertical: 50^0		
11.	Color Processing (min.)	12-bit per color (16-bit per color preferred)		
12.	Installation	Outdoor/Platform		
13.	Line/Character Height (min.)	12 pixels (approx.) for English Text		
14.	No. of lines to display (min.) (including Title line)	5 Lines	10 Lines	15 Lines
15.	Total Power (Peak white) (max.)	8.0 K Watts	16.0 K Watts	24.0 K Watts
16.	Typical Operating Load (approx.)	2.66 K Watts	5.33 K Watts	8.0 K Watts
17.	Input Power Requirement	160V - 265V AC, 50Hz	160V - 265V AC, 50Hz	160V - 265V AC, 50Hz

True Color Indoor LED
Platform/At a Glance Coach Guidance Displays

RDSO Approved
RDSO/SPN/TC/67/2008. Rev-1.0 - RDSO Spec. No.



Features

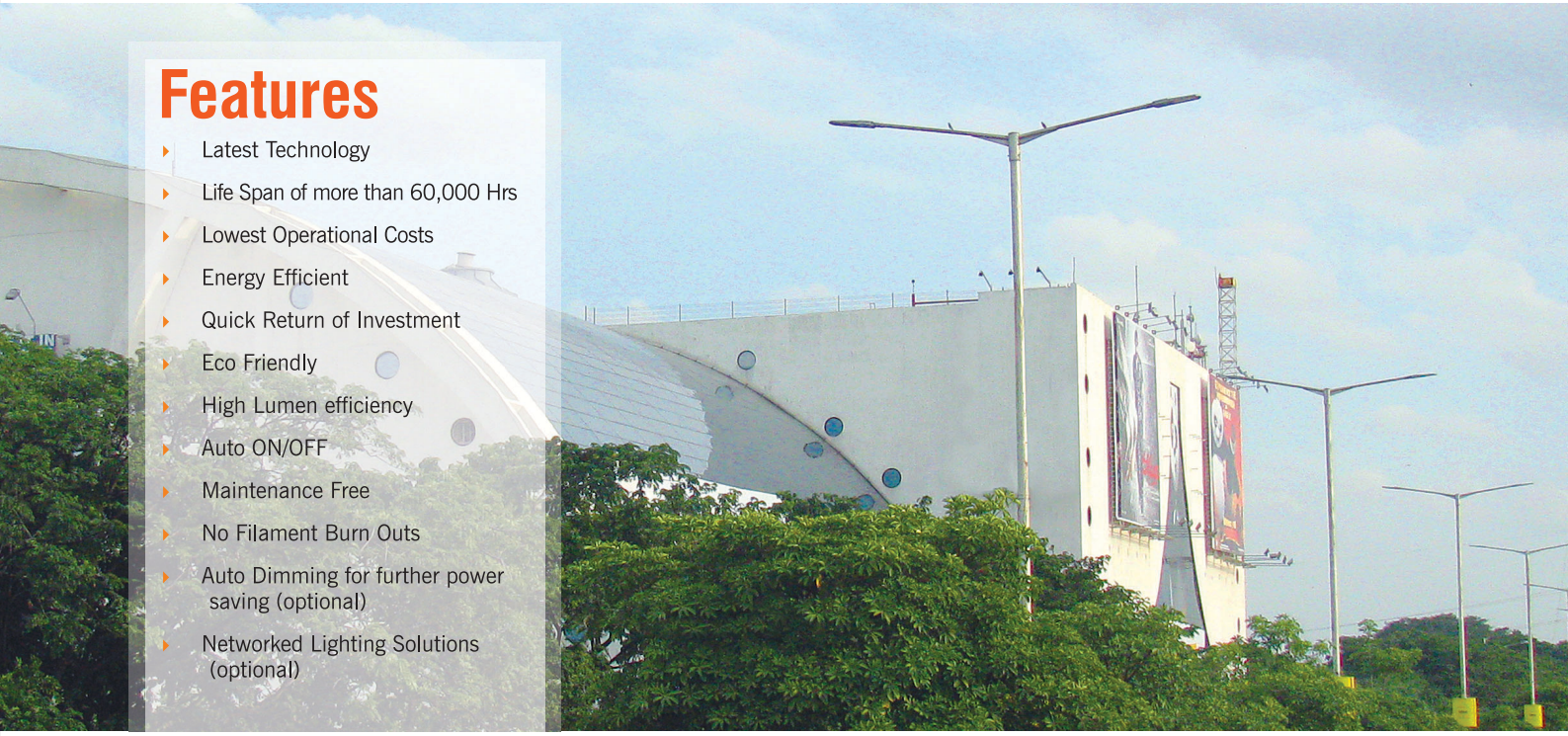
- Multi Color Multi Lingual True Color Display
- Easy to read & pleasing to the Eye
- Displays Video-cum-Train Arrival / Departure information
- Real time Train Information - linked to SIMRAN
- Integrated software to automatically announce train information
- Alternatively displays Train Arrival / Departure Information & Coach Composition

Benefits

- Lowest Operational Costs
- Lesser Load at Enquiry Counters

S.No	Description	Specification	
		Coach Guidance Display	Platform / At a Glance Coach Guidance Display
1.	LED Matrix	64 x 24	384 x 24
2.	No. of Lines	1 Line	1 Line for PD, 2 Lines for At a Glance
3.	No. of Sides	Double Face	Single Phase or Double Phase
4.	Pixel Pitch	9.525mm (+/- 0.1mm)	9.525mm (+/-0.1mm)
5.	LED	RGB 3-in-One Chip LED (SMD)	RGB 3-in-One Chip LED (SMD)
6.	Color	True Color	True Color
7.	Languages Displayed	Alpha Numeric, English	English, Hindi and a Regional Language
8.	Character size	170mm x 130mm (approximately)	170 mm x 120 mm
9.	No. of characters	4 Characters	T. No.-4, T. Name-15, Expt. Time-4, PF. No.-2, A/D-1
10.	Display module	32x24	32 x 24
11.	PCB	Glass epoxy FR-4 Grade	Glass epoxy FR-4 Grade
12.	Power Supply required	230V AC, 50Hz	230V AC, 50Hz
13.	Working Voltage Range	160- 265V AC, 50Hz, Single Phase	160 - 265V AC, 50Hz, Single Phase
14.	Physical dimensions of casing (in mm)	800(L) x 400(H) x 200(D) approx.	3800(L) x 400(H) x 200(D) approx.
15.	Case Material	Aluminum Alloy Sheet	Aluminum Alloy Sheet
16.	Thickness	16 SWG	16 SWG
17.	Mounting Provision	Wall Mounting / Over Hanging	Wall Mounting / Over Hanging
18.	Color	Black	Black
19.	Finish	Powder Coated	Powder Coated

DigiLight - OS4/OS7/OS15/OS25



Features

- Latest Technology
- Life Span of more than 60,000 Hrs
- Lowest Operational Costs
- Energy Efficient
- Quick Return of Investment
- Eco Friendly
- High Lumen efficiency
- Auto ON/OFF
- Maintenance Free
- No Filament Burn Outs
- Auto Dimming for further power saving (optional)
- Networked Lighting Solutions (optional)

DigiLight series of LED Lights from MIC Electronics Limited are the Lighting Fixtures of the Future. They are Energy Efficient and Save upto 50% on the Power consumption. DigiLights can be directly connected to 230 Volts Mains. In LED Light Spectrum, there is NO Ultra Violet, No Infrared rays hence no heat and no radiation produced. As a result MIC's DigiLight Series of LED Lights are Conventional Green Light Sources. The Lamp casing is made of Aluminum alloy through Die Casting. The Lamp cover uses high quality toughened glass which is highly lucent, dust proof and water proof.

The whole set uses stainless steel fasteners. The surface of the product is covered with silver colored fluoro carbon powder that is sprayed on in electrostatic spraying manner, resulting in good self cleaning property. These LED Lights are designed to IP65 standards, Indian Railways will be greatly benefitted with these low power consuming LED lights in their quest to go Green and become environmentally Friendly . These lights are suitable for public Lighting Like Street Lights, Open Spaces, Perimeter Lights, Platform lights and Parking Lot Lights.

Specification	DigiLight - OS4	DigiLight - OS7	DigiLight - OS15	DigiLight - OS25
Equivalent to	40 W FTL	70 W MH Light	150 W MH Light	250 W MH Light
Light Source	Power LEDs	Power LEDs	Power LEDs	Power LEDs
CT	5000 - 5600	5000 - 5600	5000 - 5600	5000 - 5600
Beam Angle	120°	120°	120°	120°
Light Output (Lumens)	1800 lm	2500 - 3600 lm	6000 - 7200 lm	9000 - 10800 lm
Illumination at Center	> 25 lux / 13ft	> 30 lux /15 ft	> 20 lux / 30 ft	> 30 lux / 30 ft
Area of Luminaire	50 ft Radius	50 ft Radius	50 ft Radius	50 ft Radius
Input voltage, frequency	110-240Volts AC 50 Hz	110-240Volts AC 50 Hz	110-240Volts AC 50 Hz	110-240Volts AC 50 Hz
Power factor	> 0.9	> 0.9	> 0.9	> 0.9
Power Consumption	**20W**	**35 - 40W**	**72 - 78W**	**110 - 116W**
Recommended pole height (max)	13 ft	15 ft / 30 ft	15 ft / 30 ft	30 ft
Life span at 70% Light output	60,000 Hrs	60,000 Hrs	60,000 Hrs	60,000 Hrs
LED make	Nichia, Japan	Nichia, Japan	Nichia, Japan	Nichia, Japan
Weight (approximate)	4 Kg	4 Kg	8 Kg	11 Kg
Installation tube diameter	Ø50 mm (max)	Ø50 mm (max)	Ø50 mm (max)	Ø50 mm (max)

Solar LED Lighting Products

LED Street Lighting System – Solar (Model No.: MICSL-S01)

Light Source	:	High Power White - NICHIA LEDs
Light Output	:	10 lux (min), measured from a height of 12 feet and illuminated over an area of 8 feet diameter.
Power consumption	:	9 Watts
Solar Photovoltaic Module	:	37 Wp under STC, measured at 16.4V as Vload, Module Voc minimum of 21V
Battery	:	Sealed maintenance free, Lead acid tubular plate,12V- 40AH
Battery Back Up	:	40 Hours at 75% DoD
Electronics Efficiency	:	> 80%
Protections	:	Battery, SPV Module Reverse Polarity and output short circuit Protection
Mounting	:	Pole

Applications: Ideal to be installed at Level crossings, Rural Street Lighting, Garden Lights, Path Lights and Perimeter Lighting

Industrial Lighting Products

High Bay Light

Light Source	:	1W White LEDs
Light Output	:	6400 lm
Beam Angle	:	86°
Color Temperature	:	5000K - 6500k
Input Voltage	:	100-240V AC
Power Consumption(w)	:	96W
P.F.	:	>0.90
Operating temperature	:	-30°C - +55°C

LED Coach Lighting

AC III-Tier Coach fitted with LED Lights

With the rich experience gained through manufacturing of LED based street lighting and home lighting products MIC has successfully ventured into design and manufacture of LED based Railway Coach Lighting products.

LEDs used

Super bright high intensity white LEDs from NICHA Corporation, Japan

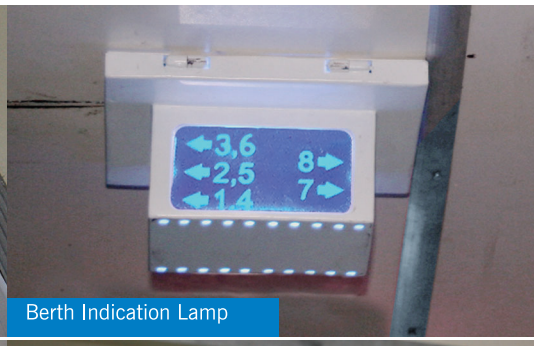
Uniform light output without glare

No IR and UV emission. Electronics efficiency more than 85%

Sl no	Type of Luminaire	Watt	Vertical Distance (Mtrs) from the floor level	Average Illumination Level (Lux)
1.	Passenger area Light (Corridor)	18W	0.84	120
2.	Passenger area Light (Cabin)	18W	0.84	120
3.	Door Way Light	9W	0.84	80
4.	Lavatory	9W	0.50	100
5.	Night Light Luminaire Cum Berth Indication	1W	10.0*	2
6.	Berth Reading Light Cum moile Charger	9W	0.75	100
7.	Emergency Exit Indication Light	1W	10.0*	5
8.	Luminaire for Toilet Indication Light	1W	1.0	5
9.	Reservation Chart Reading Light On Coach	3W	0.25	150
	Passenger Alarm Chain Indication Light	6W	400*	Clear visible
10.	Emergency light suitable for operation on 24V DC	5W	0.84	100

Emergency Exit Indicator


Berth Reading -cum-Mobile Charger



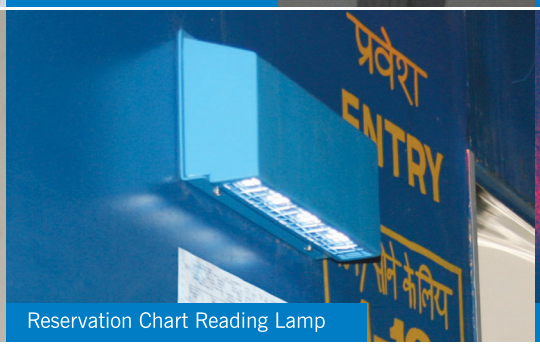
Berth Indication Lamp


Mirror Light

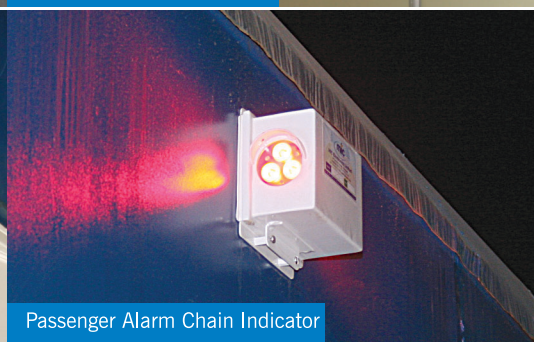

Emergency Light


Pathway Light

Toilet Occupancy Indicator



Reservation Chart Reading Lamp


Passenger Alarm Chain Indicator

Emergency Light

The General Lighting inside the coaches is provided by 110V DC Supply. But during extreme emergencies like derailment and Accidents, etc sometimes the supply system fails causing total darkness inside the coach. To facilitate easy exit of the passengers and their immediate rescue during such emergencies this emergency light will provide illumination continuously for 12hours

Berth Indication & Night Lamp

This single unit works as night lamp-cum-Berth Indication Lamp facilitating the passenger in identifying his Berth Number during Night time

Pathway Light

For a better and High Illumination of complete pathway

Berth Reading-cum-Mobile Charger

The directional feature of the LED Light helps in allowing the Passenger to Read without disturbing co-passengers

Emergency Exit Indicator

Indicates the location of Emergency Exit Window inside the Coach

Toilet Occupancy Indicator

Indicates the status of occupancy of the Toilet

Reservation Chart Reading Lamp

This lamp helps in letting the Passengers go through the Reservation Chart before boarding the train. This light Turns off when the train is in motion

Passenger Alarm Chain Indicator

Helps in easily locating the compartment in which the chain has been pulled so that unnecessary delays can be avoided

MIC's Product Range

True Color

- LED Video Displays
- Digital Posters
- Sports Replay&Perimeter Displays
- LED Passenger Information Displays
- LED Coach Guidance Displays
- LED Platform Displays
- Text and Graphic Displays
- LED Lighting Solutions

Grid based

- High way & Street Lighting
- Yard / Perimeter Lighting
- Sub–Station / Industrial Lighting
- Indoor & Home Lighting
- Platform Lighting

Off-Grid based

Solar Based

- Street Lighting
- Solar Lighting for Unmanned level crossing
- Park Lighting
- Home Lighting
- Lanterns

Coach Lighting

- Emergency Lamps
- Railway Coach Lighting

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