



ELLAMP
SYSTEMS

Driving The Future
Interior Design



Part of **PRETTL** group

Who We Are



Part of **PRETTL** group



Innovators

We are always looking for future solutions



Financial Discipline

Constant attention to cost-effective solutions



Strategic Partnership

Collaboration with more than 40 companies



Sustainability Leadership

We offer energy saving solutions

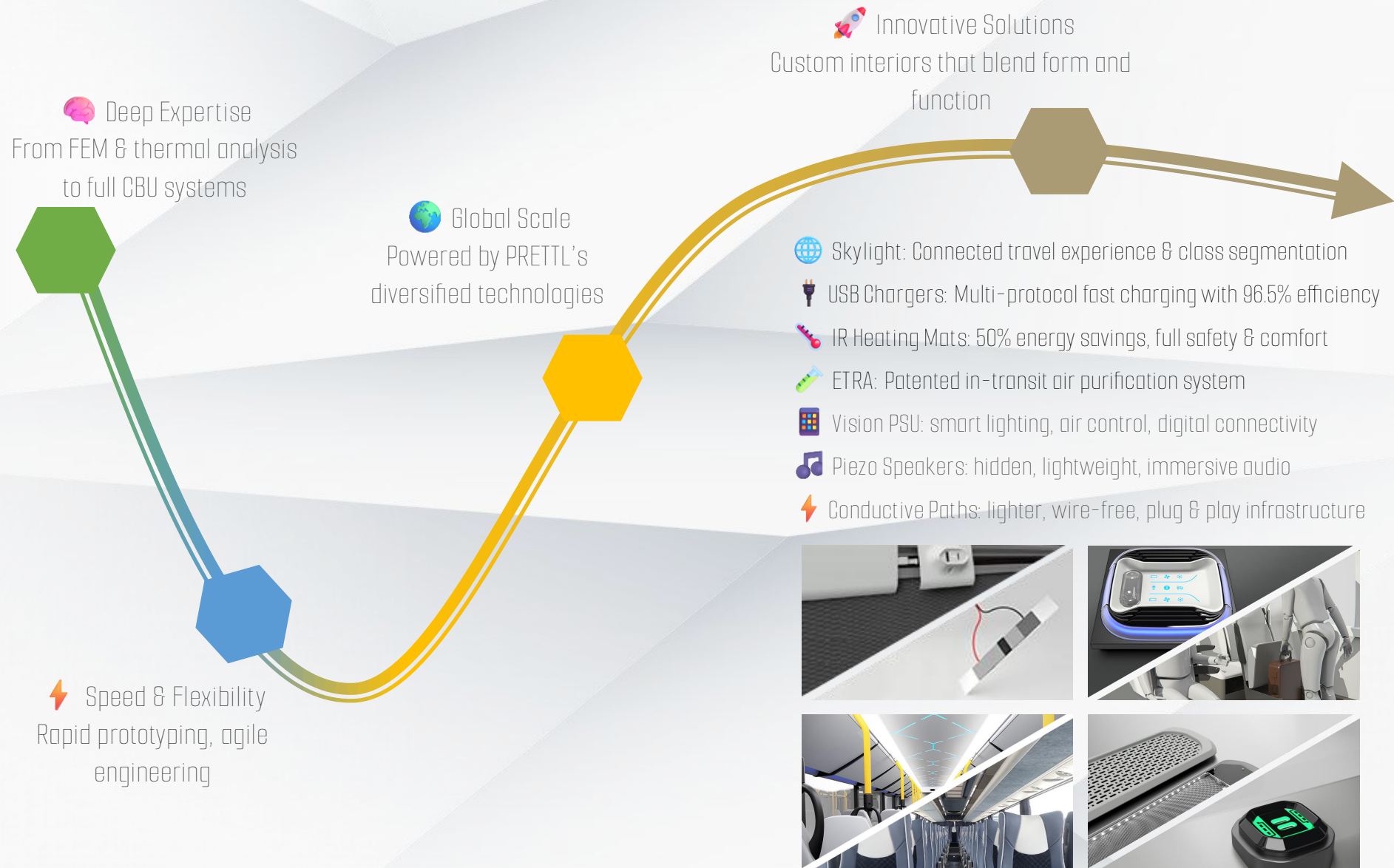


ELLAMP
SYSTEMS

Our Value Proposition



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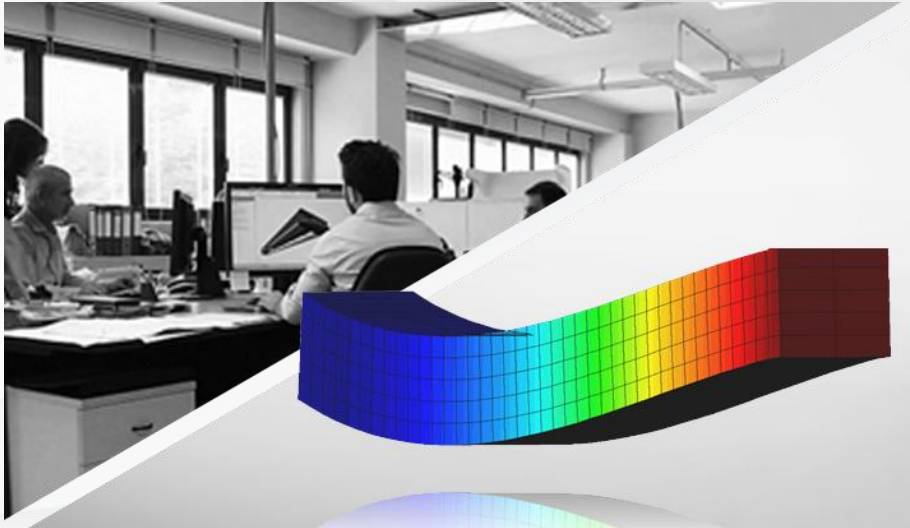
Our Capabilities

Right Next to You



INNOVATION · TO · MOVE
Essential for Life

Part of **PRETTL** group



Right Next to You



- ❑ Provide Innovative Design and Flexible Service
- ❑ Solve rapidly and radically any potential constraints.
- ❑ Use of FEM Analysis (Finite Element Method)
- ❑ Dynamic loading Test (Crash Analysis)
- ❑ Thermal Analysis
- ❑ Vibration and Fatigue Life Analysis
- ❑ CFD (Computational Fluid Dynamics)

- ☐ Electronics
- ☐ Machining
- ☐ Composite
- ☐ Welding
- ☐ Gluing

- Strength (structural elements) and Adhesion tests (upholstering)
- Temperature (cold, heat, cycling, thermal stability, operation, storage)
- Electrical (supply voltage, overvoltage, load dump, current absorption), EMC, ESD
- Lighting (darkroom simulation)
- Long run (lighting)
- Fatigue (mechanical parts)
- Vibration and shock analysis

- ❑ CBU: Interior system FULLY ASSEMBLED
- ❑ SKD: Interior system PARTIALLY ASSEMBLED e.g. Lighting channel is supplied equipped with led strip modules and cables or panels already upholstered. All other parts from BOM are supplied loosen and dismantled
- ❑ CKD: Interior system FULLY DISASSEMBLED (Normally used for Buses) All parts from BOM are supplied loosen and dismantled but machining generally are included

Our Solutions

A world of interiors



Part of **PRETTL** group



Our Solutions

A world of interiors



Part of **PRETTL** group

Interior Systems

- Urban
- Coach
- Mini
- Midi
- Intercity
- Tram & Trains

Components

- Personal Service Units
- Spotlights and air nozzles
- ETRA (Air Filtration System)
- Handrail Connector
- Handrail Systems
- Partition Walls
- Pillar Cover, Stop Button,
- Elbow-rest Profile
- PU, Alu Core & Paper Core panels
- PP Honeycomb Embossed
- PP Honeycomb + PVC upholstery
- PHC + PVC Flooring
- Glass Fiber & Long Fiber Inj. Panels
- Air Curtain, Dashboards

Electronics & Lighting

- High efficiency LED lighting
- ILC - Intelligent Lighting Control
- Photo biologic LED Lighting
- LED STRIP RGB – Blue –White
- USB Charger (A+A/A+C/C+C) BL- Custom Color
- Mini Digital Clock
- Lighting Reglette
- Single Spotlights - Standard & Custom design

Innovation

- Infra-Red Heating Systems
- Vision Service set unit
- Piezo Speaker
- Skylight
- Conductive paths



A world of Interiors

Coach Bus



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A world of Interiors

City Bus



INNOVATION · TO · MOVE
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Intelligent Lighting Control



LED Lighting



Accessories



Air Channels



Pillar covers



IR Heating



Air sanitizing



Connectors + Poles



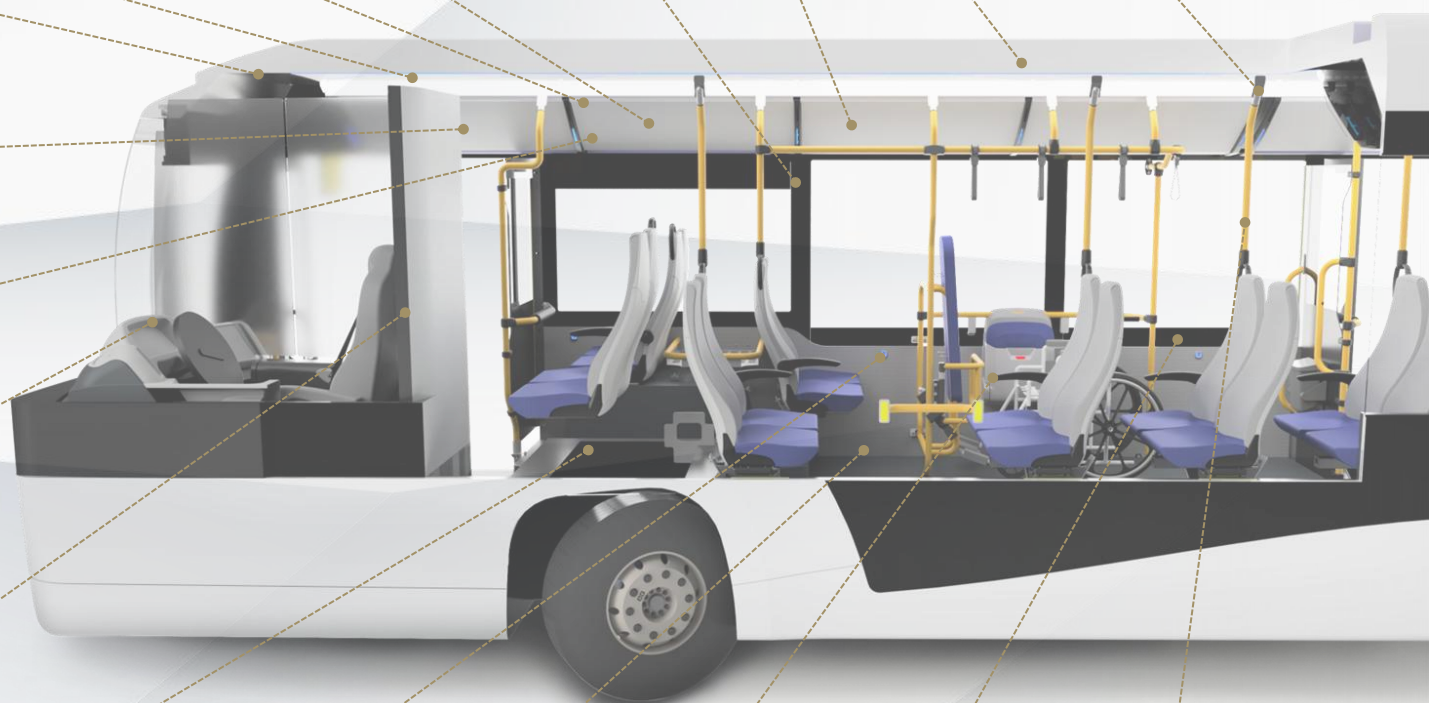
Air Curtain



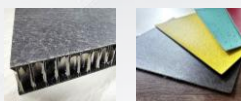
Piezo Speaker



Dashboards



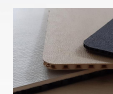
Driver walls



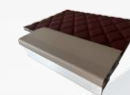
Flooring



USB charger



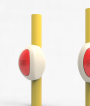
Side panels



Elbow profiles



EL Paths



Buttons





Urban, Coach, Mini, Midi, Intercity



Standard Bus Interior Systems

A Complete Bus Gamma



INNOVATION - TO - MOVE

Essential for Life

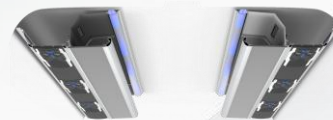
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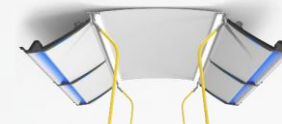
Aquarius



Orion



Perseus X/XL



EDGE / Mini EDGE



Cassiopea

INTERCITY Bus



Columba



Sagittarius



Lyra X/XL



Phoenix



Centaurus



Andromeda



Lynx

MINI Bus

MIDI Bus

COACH Bus

CITY Bus





- Height: 190mm
- Width: 360mm
- Available Lengths: 4.500/5.000mm

- L4500mm: 65 Kg (per side)
- L5000mm: 70 Kg (per side)

- 12 VDC

- Bracket in PA6+GF30% Black
- Direct light Aluminum lamp arrangement
- Handrail profile Aluminum painted RAL7044 textured finish
- Window profile Aluminum painted RAL7044 textured finish
- Upholstered carpet grey inner panel
- Sandwich panel RAL7035 (painted outside)

- Main direct lighting LED 6500K with separate illuminance profile

- Glass fiber panel, aesthetic side covered with Polyester Fabric
- Glass fiber panel, aesthetic side covered with PU+PVC Artificial Leather

- Undirect lighting LED 6500K from handrail profile

- Wood caps covered with Polyester Textile or Artificial Leather

CASSIOPEA

Standard Interior Systems for Minibus - Technical Data



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Base Configuration



Medium Configuration



Top Configuration

DIMENSIONS

- Height: 310mm
- Load access Height: 180mm
- Width: 390mm
- Available Lengths: 4.500/5.000 m

WEIGHTS

- L4500mm 6+6 PSU: 65 Kg (per side)
- L5000mm 7+7 PSU: 70 Kg (per side)

POWER SUPPLY

- 12 VDC

PHYSICAL ASPECTS

- Bracket in PA6+GF30% Dark Grey
- Handrail profile Aluminum painted RAL7024 textured finish
- Window profile Aluminum painted RAL7024 textured finish
- Service set Aura Basic 12V L+L RAL7035 (body)+7011 (details)
- Upholstered carpet grey inner panel

LIGHTING SYSTEM

- Main direct lighting LED 6500K

AIR FLOW SYSTEM

- Air slots line along handrail and window profiles
- Service set integrated air vents

OPTIONAL UPGRADES

PSU (Personal Service Unit)

- Hydrus Basic: 2 spotlights, ambient light, screw covers RAL7035
- Hydrus Top: 2 spotlights + Stop/Host/Mute/2xUSB/C, screw covers RAL7035 customizable in chrome or paint RAL9006
- Aura Top: 2 spotlights, Stop and Mute functions

AMBIENT LIGHTING TYPOLOGIES

- Direct + undirect Blue LED ambient lighting integrated with brackets
- Direct ambient lighting from window side profile

OPTIONS

- Wooden caps covered with Polyester Textile or Artificial Leather





- Height: 340mm
- Load access Height: 170mm
- Width: 358mm
- Available Lengths: 4.500/5.000mm

WEIGHTS

- L4500mm 6+6 PSU: 95 Kg (per side)
- L5000mm 7+7 PSU: 105 Kg (per side)

POWER SUPPLY

- 12 VDC

PHYSICAL ASPECTS

- Bracket in PA6+GF30% Black
- Main lighting profile Aluminum painted RAL7035 textured finish
- Handrail profile Aluminum painted RAL7044 textured finish
- Window profile Aluminum painted RAL7044 textured finish
- M/Set Aura 12V TOP RAL7035+7011

- Carpet upholstered inner panel
- Carpet upholstered loading panel

LIGHTING SYSTEM

- Main direct lighting LED 6500K
- **AIR FLOW SYSTEM**
- Slots line on handrail and upper light profile
- Service set integrated air vents

OPTIONAL UPGRADES

PSU (Personal Service Unit)

- Hydrus Basic: 2 spotlights, ambient light, screw covers RAL7035
- Hydrus Top: 2 spotlights + Stop/Host/Mute/2xUSB/C, screw covers RAL 7035 customizable in chrome or paint RAL9006 (silver)
- Gemini Basic: 2 spotlights, ambient light, screw covers RAL7035
- Gemini Top: 2 spotlights + Stop/Host/Mute/2xUSB/C,

- screw covers RAL 7035 customizable in color or paint
RAL9006 (silver)

AMBIENT LIGHTING TYPOLOGIES

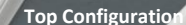
- Ambient undirect built on handrail profile
- Ambient undirect built on m/Set corridor profile
- Ambient undirect built on m/Set windows profile

UPHOLSTERY

- Polyester Top/PU/PVC

OPTIONS

- Thermoformed Flaps
- Wooden caps covered with Polyester Textile or Artificial Leather
- Thermoformed Caps



- Height: 280mm
- Load access Height: 168mm
- Width: 700mm
- Available Lengths: 7.000/8.500mm

- L=7000mm 9+8 M/set (35pt): 120Kg (per side)
- L=8500mm 10+9 M/set (39pt): 146Kg (per side)

- 12/24 VDC

- Bracket die cast Aluminum painted RAL 9006
- Main indirect lighting profile, Aluminum Ox. Ag. finish
- Handrail profile, Aluminum Ox. Ag. finish
- PSU line profiles Aluminum Ox. Ag. finish
- Window side profile, Aluminum Ox. Ag. finish
- Service set Aura Top 24V L+L RAL7035+7011
- Inner panel in glass fiber covered with grey colored

- polyester fabric
- Window side panel in glass fiber covered with grey colored polyester fabric
- Loading panel covered with upholstered carpet

- Main indirect lighting LED 6500K
- **AIR FLOW SYSTEMS**
- Air slots on main lighting profile
- Window side and inner panel ABS air vents RAL9005 (black) or RAL7038 (grey)
- Service set integrated air vents

PSU (Personal Service Unit)

- Hydrus Basic: 2 spotlights, ambient light, screw covers RAL7035
- Hydrus Top: 2 spotlights + Stop/Host/Mute/2xUSB/C, screw covers RAL 7035 customizable in chrome or paint RAL9006 (silver)

- Gemini Basic: 2 spotlights, ambient light, screw covers RAL7035
- Gemini Top: 2 spotlights + Stop/Host/Mute/2xUSB/C, screw covers RAL 7035 customizable in color or paint RAL9006 (silver)
- TWO PSU
- ECLIPSE PSU

- Undirect blue LED lighting inside main lighting profile
- Undirect blue LED lighting inside slot area

- Polyester Top/PU/PVC

- Thermoformed Flaps
- Wooden caps covered with Polyester Textile or Artificial Leather
- Custom design header (UFO)



PHOENIX

Standard Interior Systems for Coach Bus - Technical Data



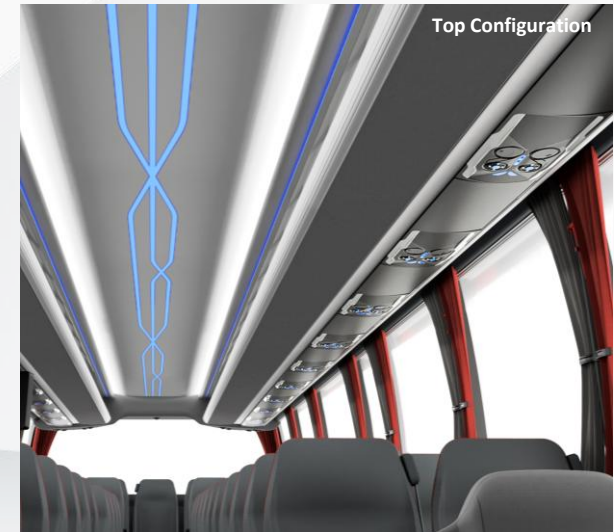
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Base Configuration



Medium Configuration



Top Configuration

DIMENSIONS

- Height: 280mm
- Load access Height: 168mm
- Width: 700mm
- Available Lengths: 10.000/12.000mm

WEIGHTS

- L=10.000mm 13+12 PSU: 160 Kg (per side)
- L=12.000mm 13+15 PSU: 190 Kg (per side)

POWER SUPPLY

- 12/24 VDC

PHYSICAL ASPECTS

- Bracket die cast Aluminum painted RAL 9006
- Main undirect lighting profile, Aluminum Ox. Ag. finish
- Handrail profile, Aluminum Ox. Ag. finish
- PSU line profiles Aluminum Ox. Ag. finish
- Window side profile, Aluminum Ox. Ag. finish
- Service set Aura Top 24V L+L RAL7035+7011
- Glass fiber inner panel covered with upholstered polyester

fabric

- Glass fiber window side panel covered with upholstered polyester fabric
- Upholstered carpet loading panel

LIGHTING SYSTEM

- Main undirect lighting LED 6500K

AIR FLOW SYSTEMS

- Air slots on main lighting profile
- Window side and inner panel ABS air vents RAL9005 (black) or RAL7038 (grey)
- Service set integrated air vents

OPTIONAL UPGRADES

PSU (Personal Service Unit)

- PSU (Personal Service Unit)
- Hydrus Basic: 2 spotlights, ambient light, screw covers RAL7035
- Hydrus Top: 2 spotlights + Stop/Host/Mute/2xUSBA/C, screw covers RAL 7035 customizable in chrome or paint

RAL9006 (silver)

- Gemini Basic: 2 spotlights, ambient light, screw covers RAL7035
- Gemini Top: 2 spotlights + Stop/Host/Mute/2xUSBA/C, screw covers RAL 7035 customizable in color or paint RAL9006 (silver)
- TWO PSU
- ECLIPSE PSU

AMBIENT LIGHTING TYPOLOGIES

- Undirect blue LED lighting inside main lighting profile
- Undirect blue LED lighting inside slot area

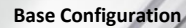
UPHOLSTERY

- Polyester Top/PU/PVC

OPTIONS

- Thermoformed Flaps
- Wooden caps covered with Polyester Textile or Artificial Leather
- Custom design header (UFO)
- Custom design ceiling panel - Backlit opt. available





- Height: 400mm (CUSTOMABLE)
- Width: 700mm (CUSTOMABLE)
- Available Lengths: 10.000/15.000mm
- Air channel section area ($A=128400\text{mm}^2$)

- 5,7 Kg/meter
- L=10.000mm: 57 Kg (per side)
- L=15.000mm: 85,5 Kg (per side)

- 24 VDC

- Bracket PA6+GF30%
- Main direct lighting profile Aluminum Ox. Ag.
- Flap hinge profile Aluminum Ox. Ag.

- Openable flap in Sandwich Aluminum RAL9006
- Screw closing system
- Oval 8 Ohm Loudspeaker

- Main direct lighting LED 6500K

- Air slots on Lighting profile

- ABS air vents RAL9005 (black) or RAL7038 (grey) installed on flap panels

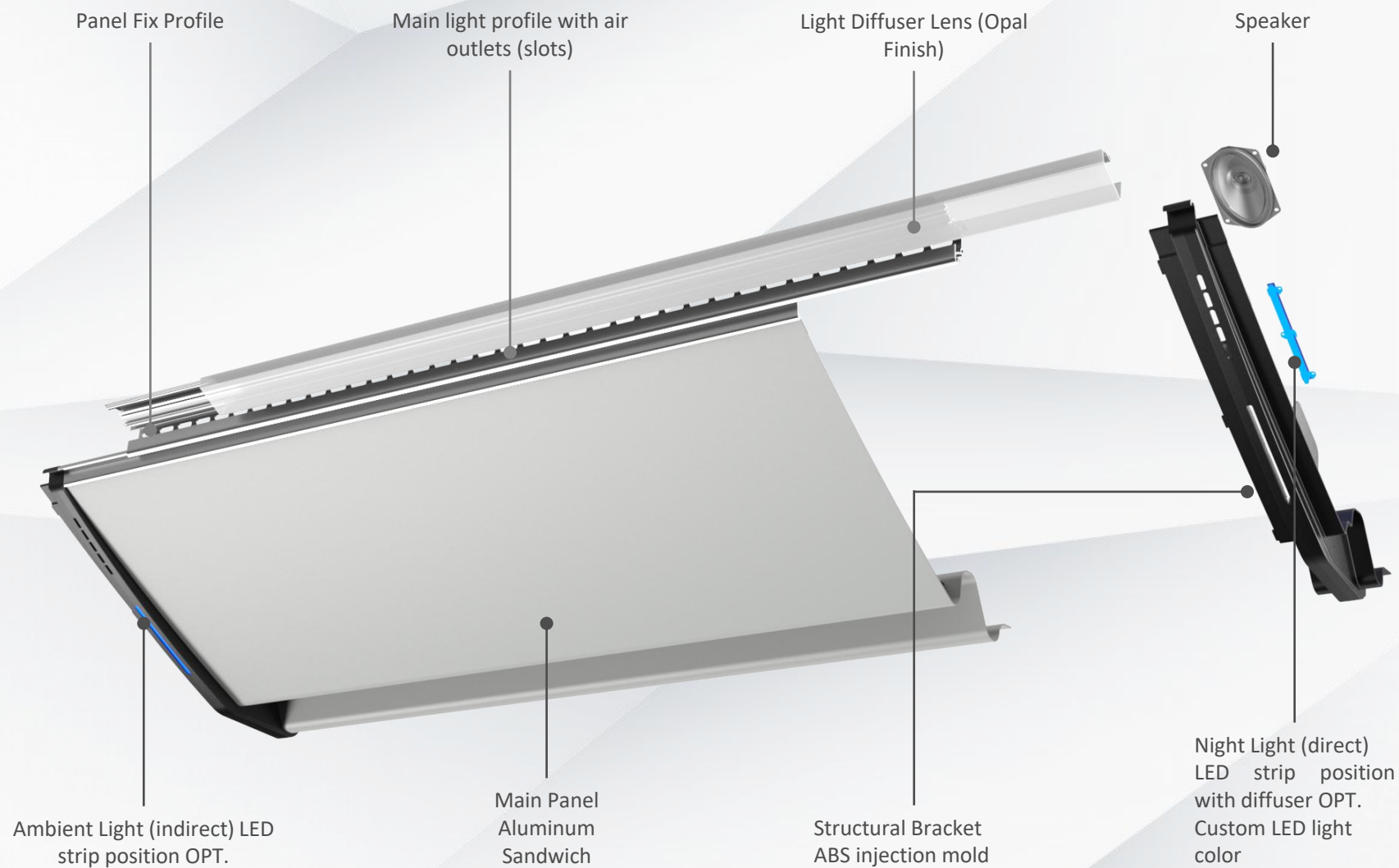
- Handrails
- Handrail connectors

- Wireless push button
- Piezo speaker
- Ceiling panel
- Backlit ceiling panel

- LED Blue direct ambient lighting on main lighting profile
- LED Night lighting on brackets (color customizable)
- LED Ambient lighting on flap panel (color customizable)

- By 1/4 rotation screws

EDGE

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CENTAURUS

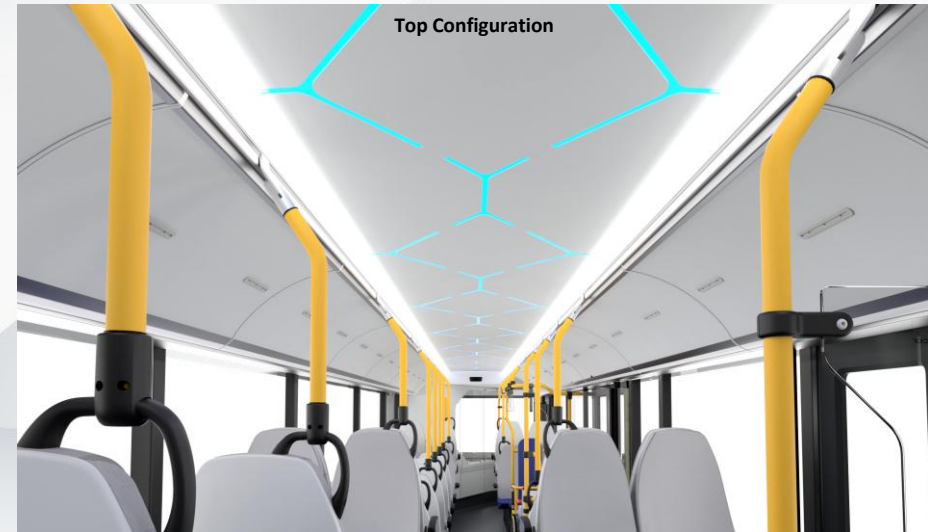
Standard Interior Systems for City Bus - Technical Data



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Base Configuration



Top Configuration

DIMENSIONS

- Height: 385mm
- Width: 745mm
- Available Length: 10000/15000mm

WEIGHTS

- L=10000mm: 75 Kg (per side)
- L=15000mm: 100 Kg (per side)

POWER SUPPLY

- 24 VDC

PHYSICAL ASPECTS

- Bracket PA6+GF30%
- Main direct light profile Aluminum Ox. Ag.
- Flap hinge profile Aluminum Ox. Ag.
- Lower flap profile Aluminum Ox. Ag.
- Sandwich flap Aluminum RAL9006

- Windows profile Aluminum Ox. Ag.
- Screw closing system
- Oval 8 Ohm Loudspeaker

LIGHTING SYSTEM

- Main direct lighting LED 6500K

AIR FLOW SYSTEM

- Air slots on Lighting profile

OPTIONAL UPGRADES

AIR NOZZLES

- ABS air vents RAL9005 (black) or RAL7038 (grey) installed on flap panels

ACCESSORIES

- Handrails
- Handrail connectors

- Wireless push button
- Piezo speaker
- Ceiling panel
- Backlit ceiling panel

CLOSURE SYSTEM

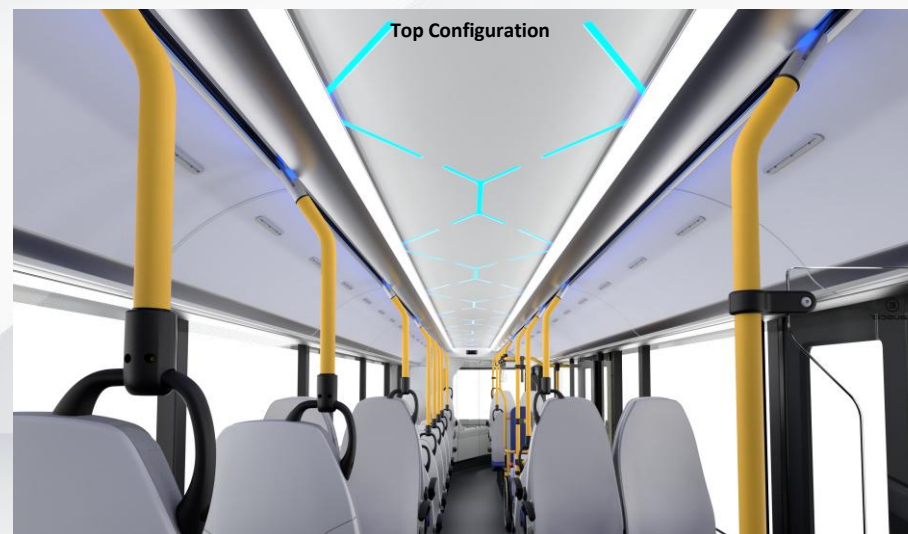
- By 1/4 rotation screws

Color profile





Base Configuration



Top Configuration

DIMENSIONS

- Height: 396mm
- Width: 821mm
- Available Lengths: 10.000/15.000mm

WEIGHTS

- L=10.000mm: 120Kg (per side)
- L=15.000mm: 170Kg (per side)

POWER SUPPLY

- 24 VDC

PHYSICAL ASPECTS

- Bracket PA6+GF30%
- Main double indirect lighting profile Aluminum Ox. Ag
- Flap hinge profile Aluminum Ox. Ag
- Lower flap profile Aluminum Ox. Ag
- Sandwich flap Aluminum RAL9006

- Windows profile Aluminum Ox. Ag
- Lock closing system
- Oval 8 Ohm Loudspeaker

LIGHTING SYSTEM

- Main undirect lighting LED 6500K

AIR FLOW SYSTEM

- Air slots on Lighting profile

OPTIONAL UPGRADES

AIR NOZZLES

- ABS air vents RAL9005 (black) or RAL7038 (grey) installed on flap panels

ACCESSORIES

- Handrails
- Handrail connectors

- Wireless push button
- Piezo speaker
- Ceiling panel
- Backlit ceiling panel

LIGHT TYPOLOGY

- Blue LED Ambient indirect lighting profile

CLOSURE SYSTEM

- By 1/4 rotation screws

Color profile

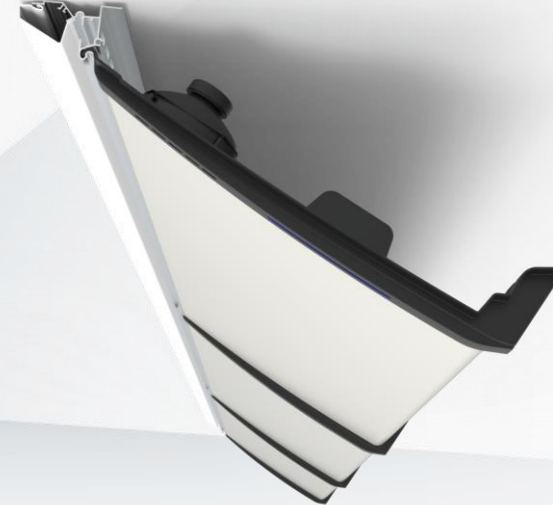
Mini EDGE

Standard Interior Systems for Mini City Bus – Technical Data



Part of **PRETTL** group

Color palette



DIMENSIONS

- Height: 400 mm (CUSTOMABLE)
- Width: 680 mm (CUSTOMABLE)
- Available Lengths: 3.500/5.500 mm

WEIGHTS

- 4,5 Kg/meter
- L=3.500 mm: 16 Kg (per side)
- L=5.500 mm: 25 Kg (per side)

POWER SUPPLY

- 24 VDC

PHYSICAL ASPECTS

- Bracket PA6+GF30%
- Main direct light profile Aluminum Ox. Ag.
- Flap hinge profile Aluminum Ox. Ag.
- Lower flap profile Aluminum Ox. Ag.

- Sandwich flap Aluminum RAL9006
- Windows profile Aluminum Ox. Ag.
- Screw closing system
- Oval 8 Ohm Loudspeaker

LIGHTING SYSTEM

- Main direct lighting LED 6500K

AIR FLOW SYSTEM

- Air slots on Lighting profile

OPTIONAL UPGRADES

AIR NOZZLES

- ABS air vents RAL9005 (black) or RAL7038 (grey) installed on flap panels

ACCESSORIES

- Handrails

- Handrail connectors
- Wireless push button
- Piezo speaker
- Ceiling panel
- Backlit ceiling panel

LIGHTING TYPOLOGIES

- LED Blue direct ambient lighting on main lighting profile
- LED Night lighting on brackets (color customizable)
- LED Ambient lighting on flap panel (color customizable)

CLOSURE SYSTEM

- By 1/4 rotation screws



COLUMBA - SAGITTARIUS

Standard Interior Systems for Mini City Bus - Technical Data



Color palette

Sagittarius panel

DIMENSIONS

- Height: 330mm (mini city): 470mm
- Width: 610mm (mini city): 290mm
- Available Lengths: 3.500/5.500 mm

WEIGHTS

- 5 Kg/meter
- L=3.500mm: 18 Kg (per side)
- L= 5.500mm: 27 Kg (per side)

POWER SUPPLY

- 24 VDC

PHYSICAL ASPECTS

- Bracket in Aluminum plate 5mm
- Main lighting profile Aluminum Ox. Ag.
- Flap hinge profile Aluminum painted RAL7004
- Lower flap profile Aluminum painted RAL7004

- Screw closing system
- Diffuser profile co-extruded PC (opaline + matte)

LIGHTING SYSTEM

- Main direct lighting LED 6500K

AIR FLOW SYSTEM

- Standard Air vent, ABS RAL 9005. Air channel section area (A=70100 / 114000mmq)

OPTIONAL UPGRADES

ACCESSORIES

- Handrails
- Handrail connectors
- Wireless push button
- Piezo speaker
- Ceiling panel

LIGHTING TYPOLOGIES

- LED Blue direct ambient lighting on main lighting profile

CLOSURE SYSTEM

- By 1/4 rotation screws

LOUDSPEAKER

- Oval 8 Ohm Loudspeaker on flap panel

CUSTOMIZED AIR FLOW AREA

- Changing flaps shape
- SAGITTARIUS panel shape available

Color palette





Trams & Trains



Interior Systems References

Client Solution (Restyling)



The Revamping activity, interested a scope of supply composed by cover panels, Lighting System, Modular luggage racks and compact reading lights modules. Luggage rack has been designed to fit different client configurations (with glass, with strips) and to adapt on existing vehicle section.



Some of Our Projects

Trams & Trains



FLEXITY ZÜRICH
Lighting



FLEXITY BRUSSELS
Lighting



SIEMENS AVENIO BREMEN
Lighting



SIEMENS AVENIO MONACO
Lighting



Some of Our Projects

Trams & Trains



ALSTOM Series 6000 - Turin Italy
Lighting



ALSTOM PENDOLINO - Trenitalia Italy
Ceiling panels - Lighting - Individual reading lights



BOMBARDIER TALENT - OEBB Austria
Lighting



ALSTOM CTR - Trenitalia Italy
Sound - Absorbing Wooden floor

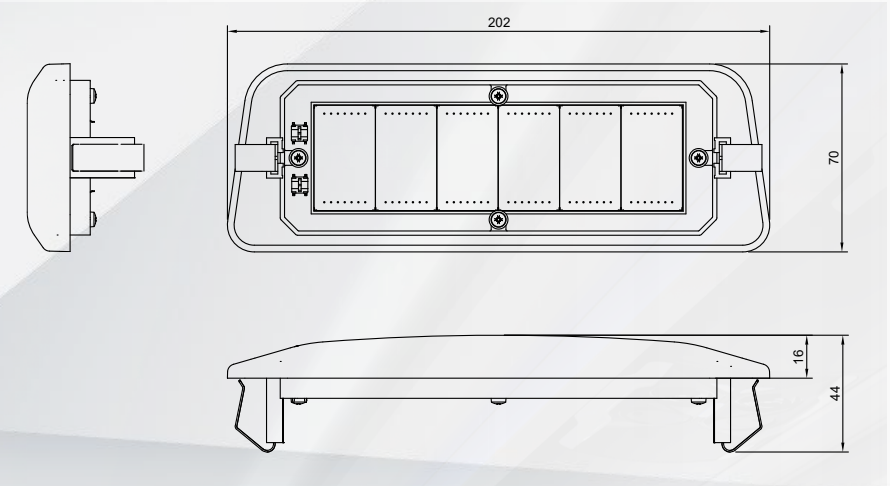




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Electronics & Lighting



- ❑ White, Blue and Red display
- ❑ Square display
- ❑ Different logo options
- ❑ Single or double Temperature Sensor (interior and exterior)
- ❑ Several Software Options
- ❑ Can Bus Communication

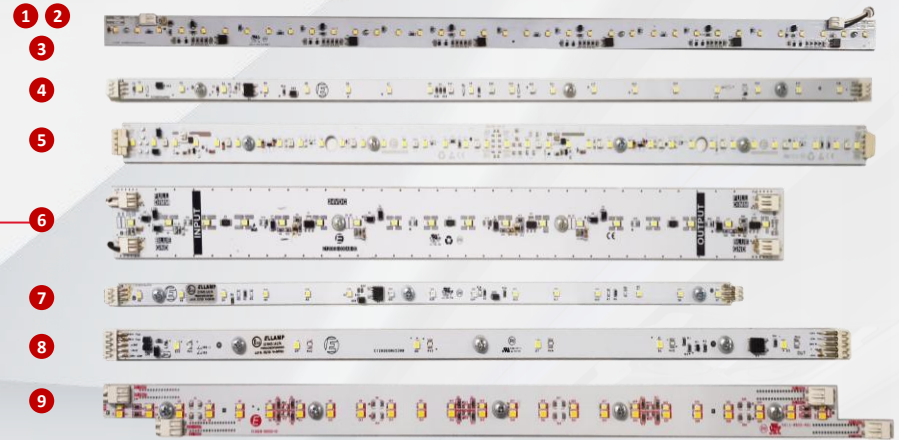
Electronics & Lighting



- Dimmable Brightness of LED Strips
- Supply Voltage 15-36VDC
- Operating Temperature : -40C - +85C
- Overall Dimensions: 198 x 140mm
- Isolated CanBus (J1939 Protocol CAN 2.0B) 250kbit/s
- EMC ECE R10
- Short Circuit Protection (ENS0310)
- Over Current Protection (ENS0310)
- Reverse Voltage Protection (ENS0310)
- Over Voltage Protection (ENS0310)

- Software Adaptation for specific Vehicle Application and Type
- Optional Power Consumption Data Feedback for Each Channel
- Optional Leakage Current Detection

 Custom Items:

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- ❑ HIGH EFFICIENCY Rigid LED Strip Type A - L=600mm - 208 Lm/W
- ❑ PHOTOBIOLOGIC Protection rigid LED Strip Type - L=600mm No Blue Peak
- ❑ Rigid LED Strip Type B - L=600mm - 187 Lm/W
- ❑ 12Vdc & 24Vdc / 18 LEDs + 3 LEDs Blue 500x11 mm - TTAF Connection
- ❑ 12Vdc & 24Vdc / 36 LEDs 500x21 mm - Modular Connection
- ❑ 24Vdc / 18 LEDs Blue 425x38 mm - WAGO Connection
- ❑ 12Vdc & 24Vdc / 12 LEDs Blue 400x12 mm - TTAF Connection
- ❑ 24Vdc / 6 LEDs 400x15 mm - TTAF Connection
- ❑ 24Vdc / ILC LED Strip 3000/6000K White - WAGO Connection

Electronics & Lighting



Main Features:

- ❑ Supply Voltage : 8.2-32VDC Nominal Voltage : 12-24VDC
 - ❑ Operating Temperature : -40°C - +85°C
 - ❑ Support input over voltage and under voltage protection, support output short circuit, over current and over temperature protection
 - ❑ DP/DM/CC over voltage protection
 - ❑ DP/DM/CC withstand voltage of 30V
 - ❑ ESD 4KV, DC withstand voltage of 40V
 - ❑ USB-C1 and USB-C2 PDO Output : 5V/3A, 9V/3A, 12V/2.25A, 3.3V-5.9V/3A, 3.3A-11V/3A
 - ❑ The output voltage and current is auto adjusted dynamically based on the fast charge requirement. USB Charger has a conversion efficiency of up to 96.5% when output 5V/3A.
 - ❑ USB-C1 and USB-C2 QC[1] Output : 5V/3.6A, 9V/2.25A, 12V/2A
 - ❑ [1] QC : QC represents the output power of high voltage fast charge.
 - ❑ Support 2 ports of Type-C PD output
 - ❑ Support 2 ports of BC1.2, IOS, Android
 - ❑ Support 2 ports of QC3.0 and QC2.0
 - ❑ Support 2 ports of MTK PE+2.0 and PE+ 1.1
 - ❑ Support 2 ports of FCP and SCP
 - ❑ Support 2 ports of fast charge: AFC
 - ❑ Support 2 ports of fast charge: VOOC
- PD3.0**
Apple

PPS
Samsung

AFC
Samsung



Lighting Reglette

Custom design Lighting Modules

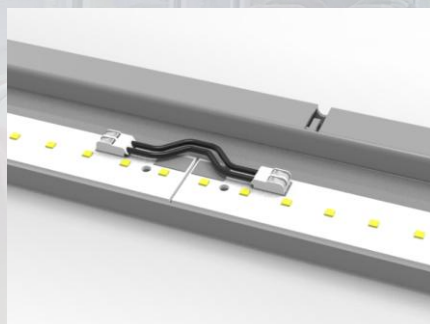
Custom design Lighting Modules

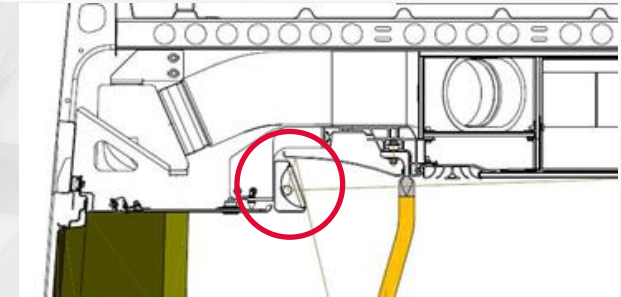
Flexity Brussels



As for Flexity Zürich, also on Flexity Brussels and Siemens Avenio, has been realized custom Reglette complete of Custom LED Strip, Connectors and Base Aluminium for Light Channel fix tests and Lighting simulations.

Siemens Avenio

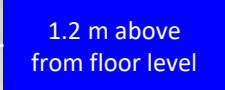




Light Source	
LED (general, emergency, portal lighting sources)	SEOUL SEMICONDUCTOR STW8C2PB-E1 Mid-Power LED 3030 Series Selections: U0–Y1–G22 WW 3000°K (65 mA driver current)
LED Quantity	600 pcs. (main lighting double rows) – 96 pcs. (portal lighting 24/each)
Luminous Flux	26 lumen per LEDs
Orientation of Filament	Not Applicable
Ray Model	STW8A12D_1M_LucidShape_151109.ray
Bulb Hole in Diameter	Not Applicable
LED (door lighting)	OSRAM Opto Semiconductors OSRON SSL 80
LED Quantity	3
Luminous Flux	272 lumen (tot)

Sensor	
Type of Sensor	illuminance & glare sensor (lux & cd/m ²)
Distance	Sensor surfaces are at floor, 0.8 m above from floor and 1.2 m above from floor level.
Goniometer Measure Point	Not applicable
Number of Rays	1 x 10 ⁶ rays for each LED
Filter / Resolution	No Filter / 10 x 10 mm ² resolution
Scale of Sensor	-

Simulation Parameters	
Spread on Reflector	Main reflector coefficient is 0.7 Secondary reflectors coefficient are 0.35
Inner Lens	-
Outer Lens	BWF product, Collection Type Colour LED white no. 2 in 3mm thick.
Collimator	-
Light Guide	-
Additional Lens	-
Housing	Aluminum



0.8 m above
from floor level

Floor level

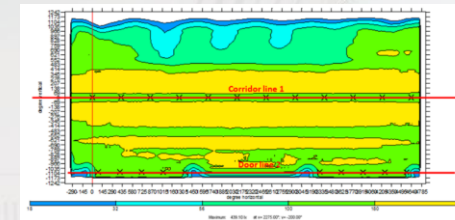
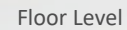
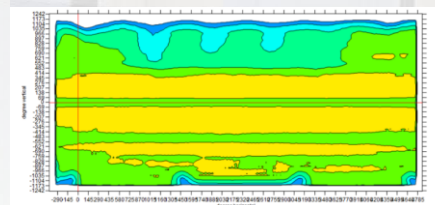
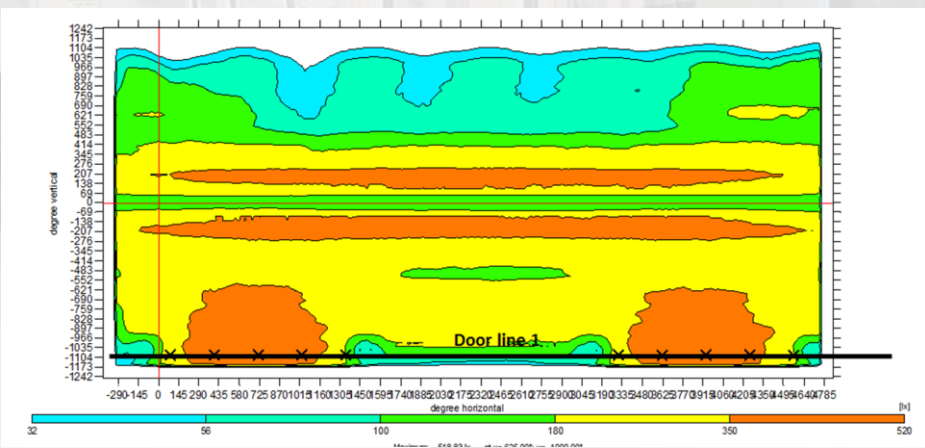


Figure 1 is a 2D cross-section plot of the simulated system. The vertical axis is labeled 'Depth (cm)' and ranges from 0 to 100. The horizontal axis is labeled 'Position (cm)' and ranges from -100 to 100. The plot shows a central 'Controlled zone' (red/orange) and a 'Soil layer' (green). A red arrow points to the 'Controlled zone'.

Floor Level



Floor Level

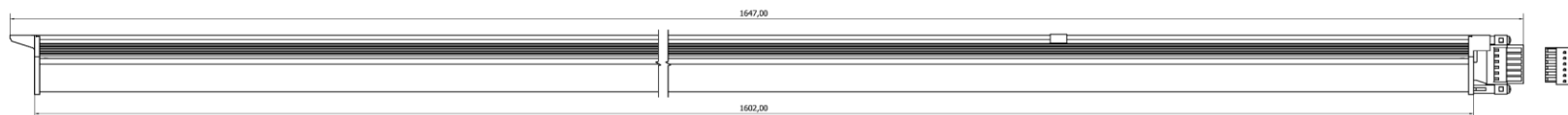


Connectors Customization

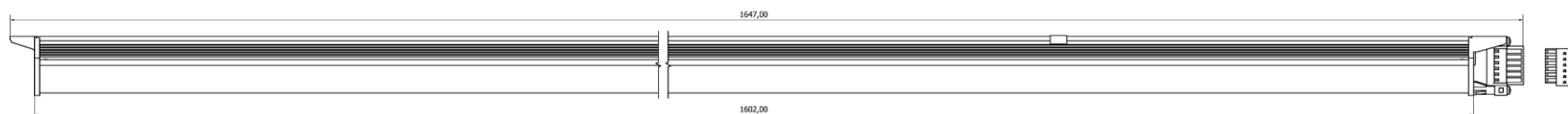
Vehicle Revamping - Lighting scope of supply: Connector Types

3 Proposals of Connector Caps for avoid any usage of external wire/cables and simplify install/dismount of every single Light Bar for maintenance

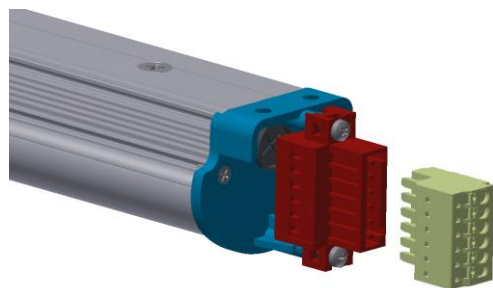
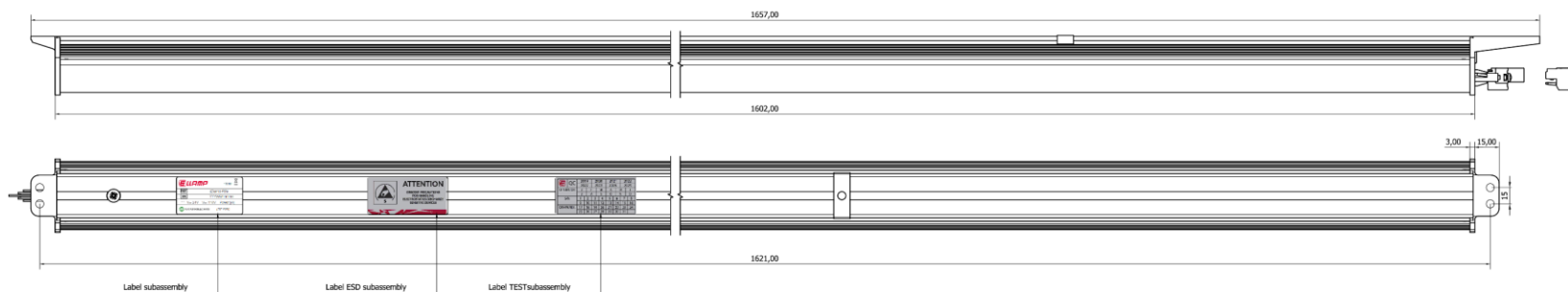
Proposal 1



Proposal 2



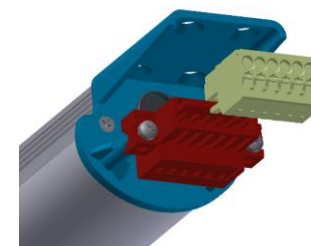
Proposal 3



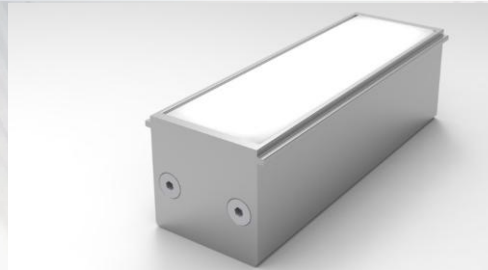
Connector Solution 1 mounted on lamp cap



Connector Solution 2 mounted on lamp cap



Connector Solution 3 mounted on lamp cap



Lamp 115x40x35 (mm) - Main features:

- o Overall Dimensions: 115x40x35 mm
- o Supply voltage (nominal): 24 Vdc
- o Supply voltage range: 16.8V – 32V
- o LED Color temperature : 3000°K Ra=90
- o Chromaticity range: RANKS 303
- o LED Type NICHIA NF2W757GT-V2F1
- o LED number: 6pcs
- o Lumen maintenance: 80.000h L70
- o Connector type : 2 poles Wago 2060-452/998-404
- o Operating Temperature Range: -30°C +70°C
- o Storage Temperature Range: -40°C +85°C
- o PC diffuser
- o Lamp Body Aluminum profile and laser cut header
- o IP64 - hermetic sealing of components
- o Protection from dust, contacts and LED damage



Spot $\varnothing 90 \times 30$ (mm) - Main features:

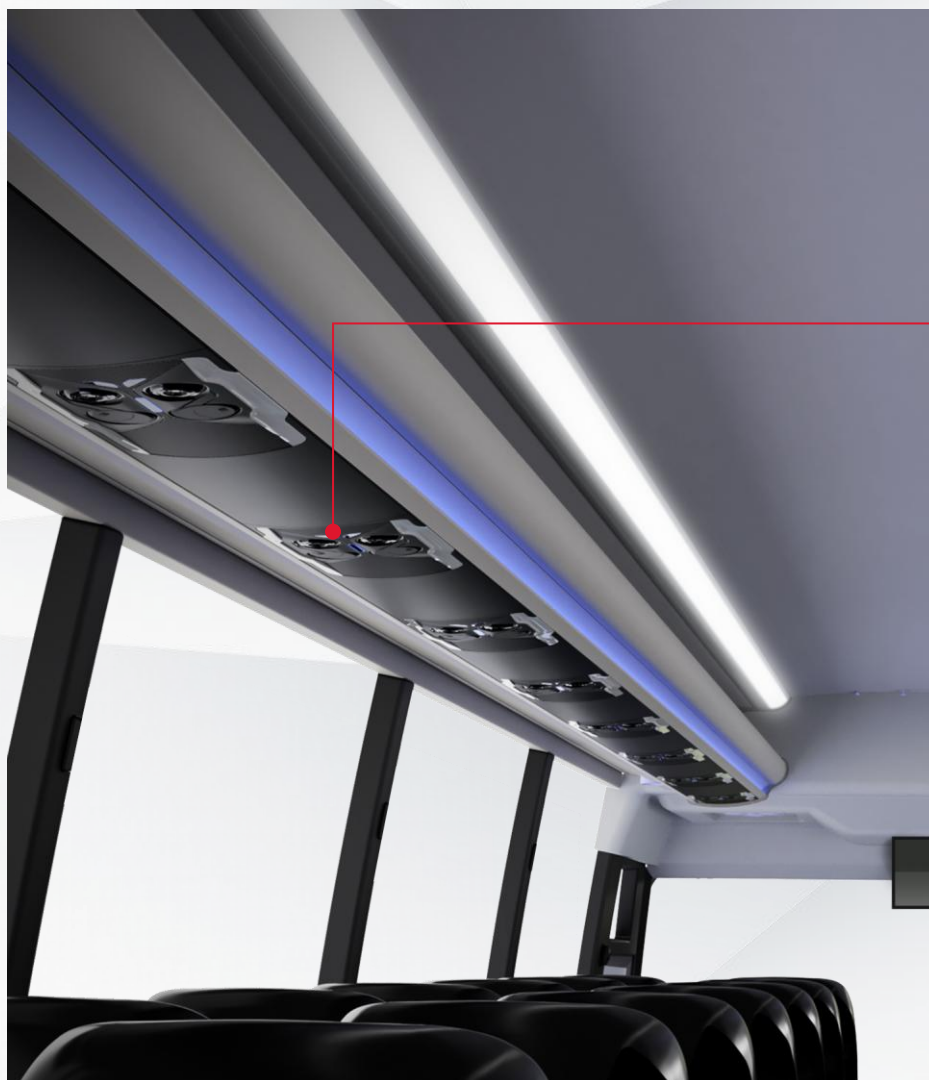
- o Overall Dimensions: 115x40x35 mm
- o Supply voltage (nominal): 24 V dc
- o Supply voltage range: 16.8V – 32V
- o LED Color temperature : 3000°K Ra=90
- o Chromaticity range: RANKS 303
- o LED Type NICHIA NF2W757GT-V2F1
- o LED number: 6
- o Lumen maintenance: 80.000h L70
- o Operating Temperature Range: -30°C +70°C
- o Storage Temperature Range: -40°C +85°C
- o Wiring cable with WAGO 734 103
- o Lamp Body Aluminum lathe machining a plastic cap
- o IP64 - hermetic sealing of components
- o Protection from dust, contacts and LED damage



Components



Components

Part of **PRETTL** group

1- Hydrus Spacer & Cutout

Adjustable reading lights, adjustable air nozzles, Stop Function, Hostess Function, Mute & Remote Functions, 100/130mm loudspeaker, 2x USB type A+C ports, Screw Covers color customizable

2- Aura

Adjustable reading, adjustable air nozzles lights, Stop Function, Hostess Function, oval loudspeaker.

3- Sprinter

Adjustable reading lights, adjustable air nozzles, Stop Function, Hostess Function.

4- Gemini spacer & Cutout

Adjustable reading lights + backlit button, adjustable air nozzles, Stop Function, Hostess Function, Mute & Remote Functions, 100/130mm loudspeaker, 2x USB type A+C ports, Screw Covers color customizable

5- Two

Adjustable reading lights, adjustable air nozzles, Stop Function, Hostess Function, Mute & Remote Functions, 100/130mm loudspeaker module (split), Screw Covers color customizable

6- Eclipse

Adjustable reading, adjustable air nozzles lights, Stop Function, Hostess Function, Mute & Remote Functions, oval loudspeaker.



Components



Circular cut-out air nozzle Ø60mm, adjustable as direction thanks to 360° rotation, and air flow with flaps inclination. Standard color RAL 7035(light grey) + chrome ring

Circular cut-out + frame air nozzle Ø60mm, adjustable as direction thanks to 360° rotation, and air flow with cursor rotation. Available colors RAL9005(black), 7012(medium grey).

Linear cut-out air nozzle L=200mm, not adjustable, designed to increase air flow, solution fit on many panels . Available colors RAL9005 (black), 7035(light grey) and 7006(medium grey).

Linear cut-out air nozzle L=190mm, not adjustable, designed to increase air flow, solution fit on many panels . Available colors RAL9005 (black), 7038(light grey).

Circular cut-out air nozzle Ø60mm, adjustable as direction thanks to 360° rotation, and air flow with flaps inclination. Standard color RAL 9005(black) and 7030(medium grey).

Circular cut-out LED 6000K spotlights Ø60mm, adjustable as direction thanks to 360° rotation.
Available onboard ON/OFF button on Quadrifoglio. Std colors RAL9005(black) and 703(medium grey).

Components - Patented Product



- Working safety with a simple visible LED strip as lighting source
- Any light source shield is needed, and system can operate continuously even in the presence of passengers, in addition, the tungsten trioxide does not combine with pathogenic elements producing other dangerous substances
- Long Life coating
- The catalyst does not wear out and loses its effectiveness, it does not get deteriorated, and electrons released to the formation of radicals are regenerated thanks to the air contact
- Affordable & Scalable Modular solution, easily adaptable to specific vehicle project of air recirculation and air conditioning.

Components



Different section & surface finish handrail pipes available

- Powder coating, chrome, aluminum alloy, stainless steel, PVC and Magnesium pipes, available color on request, possibility to embossing surface treatment

Handrail pipe connectors for separation walls

- Die casting aluminum or stainless-steel material, different colors available on request, cross connectors, T- connectors, glass clamps, pole bases etc.

Handrail pipe connectors for complete city bus ceiling systems

- ❑ Aluminum die casting alloy EN AB 43400, colors on request, additional Mounting Plate on request
- ❑ Invisible fix screws, suitable for different angles, suitable for different pipe diameters (outside 38mm – inside 31mm), high Strength, hidden wiring passage.

Components

Components



Various driver separation wall models available on standard catalogue.

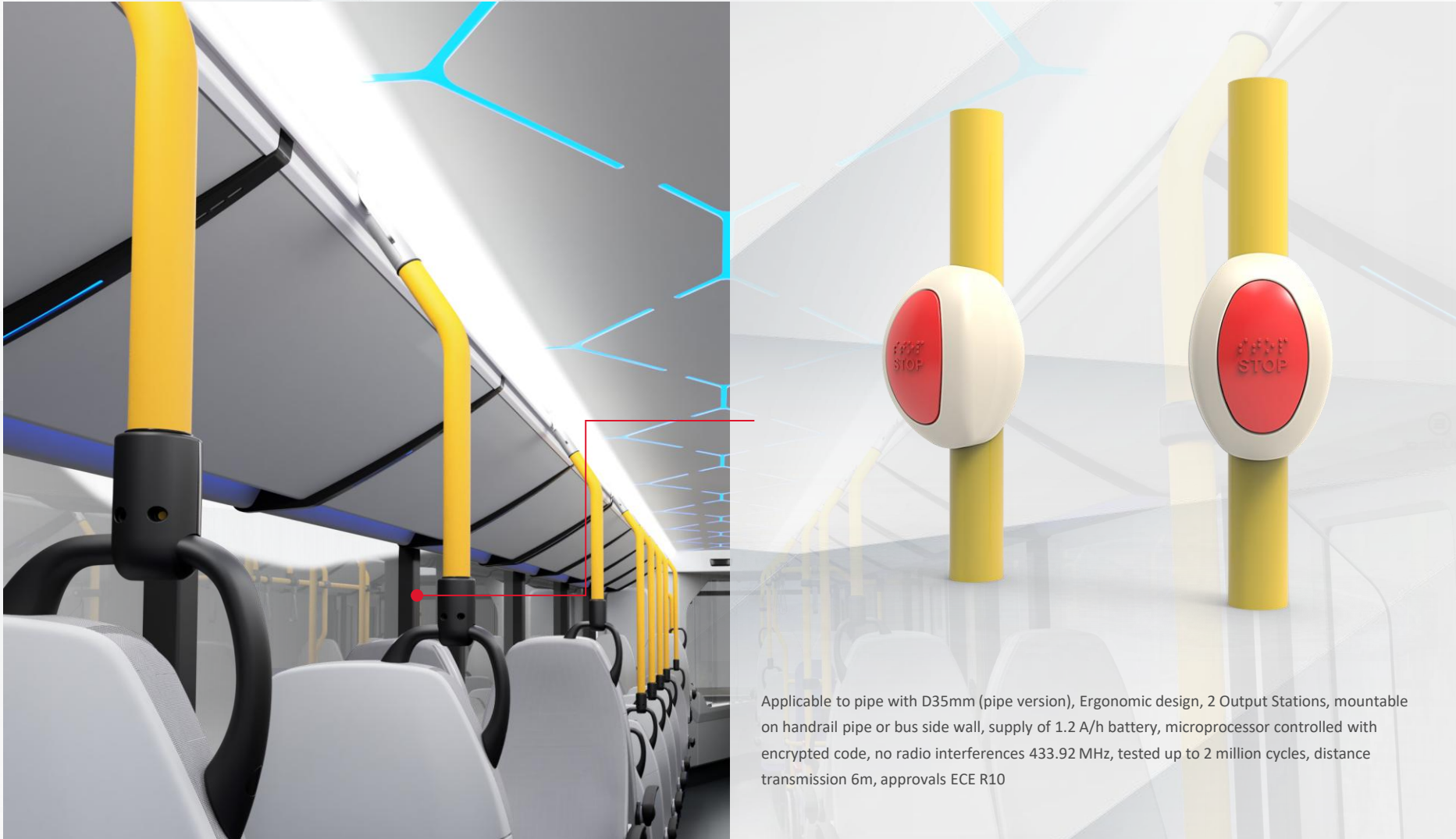
Various colors and materials. R118 Regulation Compliant.

Wireless Stop Call Button

Components

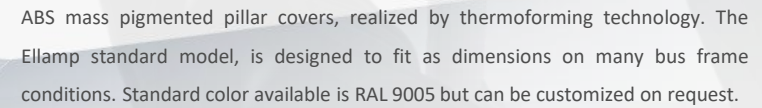


Part of **PRETTL** group



Applicable to pipe with D35mm (pipe version), Ergonomic design, 2 Output Stations, mountable on handrail pipe or bus side wall, supply of 1.2 A/h battery, microprocessor controlled with encrypted code, no radio interferences 433.92 MHz, tested up to 2 million cycles, distance transmission 6m, approvals ECE R10



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Material	Type of skin	Minimum Thickness	Weight per part (Kg)	R118
ABS thermoformed	Embossed	3mm	0,5	YES

Part of **PRETTL** group Essential for Life

Part	Material	Type of skin	Minimum Thickness	Weight per m (Kg)	R118
Main profile	Aluminum extruded	Draft	1.7mm	0.8	N/D
Profile cover	Extruded ABS	Matte	3mm	0.3	YES

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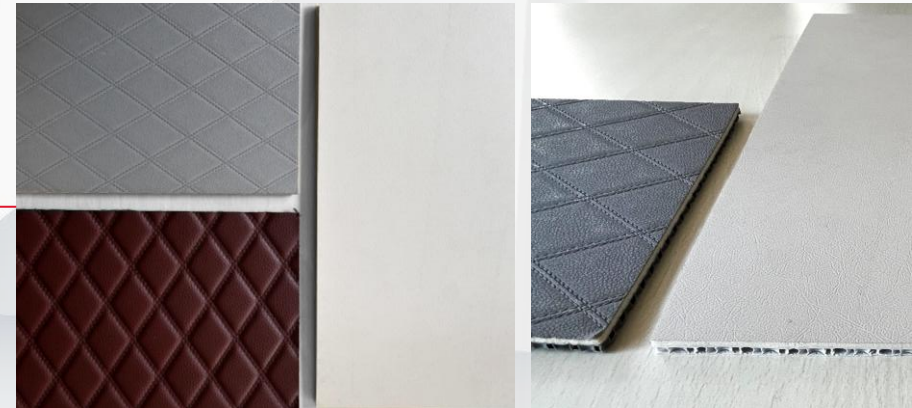
Material	Type of skin	Minimum Thickness	Weight per flap (Kg)	R118
PP Honeycomb	ABS embossed	3	1,5	YES
PP Honeycomb	ABS embossed	5	1,7	YES

Components

Components



Quartz sand floor leather, using advanced coating and scraping technology, based on the substrate through coating and scraping process step by step PVC layer, stable layer and wear-resistant layer firmly bonded together. Wear-resistant and skid-resistant product. Wide range of application, use of renewable, non-toxic polyethylene material. On surface of the product not only are used high-density material printing layer to make the product look beautiful, but also ensures wear resistance, and the use of rough embossing effectively improve the anti-skid. Good product stability, resistant to deformation, anti-pollution and antibacterial treatment easy to clean.

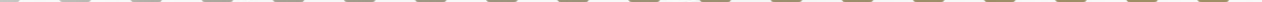
Part of **PRETTL** group Essential for Life

PVC Adding layer, enrich the panel quality feeling to look and touch. Best option for coach and premium buses.

Model	Material	Type of skin	Minimum Thickness	Weight per flap (Kg)	R118
1	PP + PCV	PU + PVC	8	2,2	YES
2	PP + PVC	PU + PVC	9	2,4	YES
3	PP + PVC	PU + PVC	9	2,6	YES

Part of **PRETTL** group Essential for Life

- Lightweight solution
- Good bending and pressure resistance



Material Overview & Application



- Lightweight solution
- Good bending and pressure resistance
- Fire retardant and water resistant
- Trampling resistant

Resistance to **temperature and humidity** -> OK

Fire resistance: the proposed product can comply with the EN 45545 regulation, part 1-7, class OC3, design class D (min. danger level HL2)

13mm (Upper deck) - min 2600x1500mm
16.5mm (Driver's cab) - min 2200x1000mm
18mm (Entrance) - min 2600x1500mm
22mm (Lower Deck) - min 3000x1600mm

Dashboards

Components



Part of **PRETTL** group



ABS+PVC+PU+GF materials. PU Base material has advantages of lightweight and high energy absorption capability. Foamed resin molds.

Good overall rigidity, impact resistance, weather resistance and variety of structures and style realization.

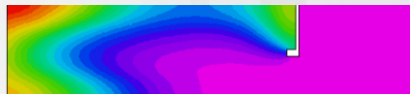
Solutions applicable to vehicle of 6-18m



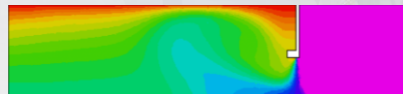
Components



- ❑ Stability - The surface represented is divided in two parts: on the left side the indoor is heated and on the right side the outdoor have a lower temperature with some wind. The two areas are divided with a door closed
- ❑ Comfort - The condition of “door open” without the air curtain effect let the outside cold air go through and have a severe impact on the average temperature
- ❑ Saving - The air flow provided by the air curtain block can keep separated the two areas and to stop the influence of the outdoor condition



Bus interior Vs exterior
environment without air
curtain



Bus interior Vs exterior
environment with air
curtain

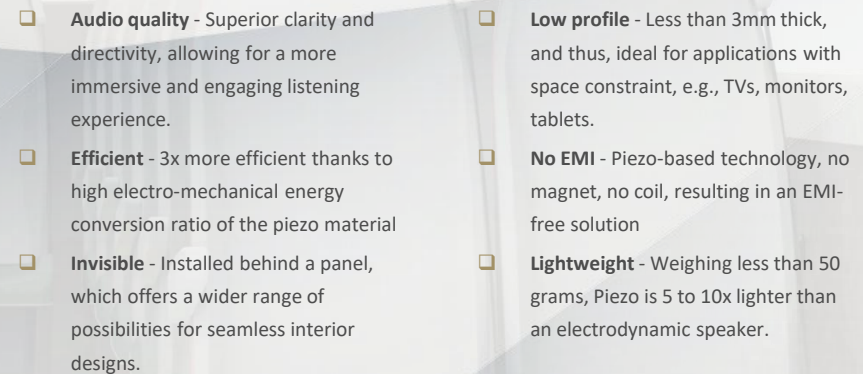




Innovation

• • • • •



Part of **PRETTL** group Essential for Life

Conductive Paths

Innovation



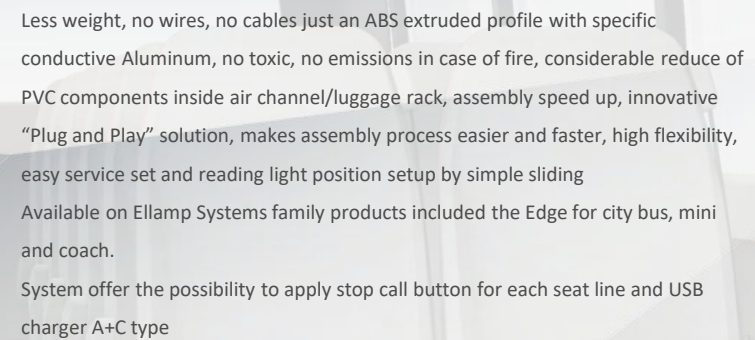
Part of **PRETTL** group



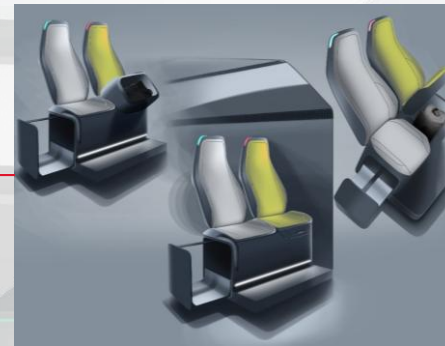
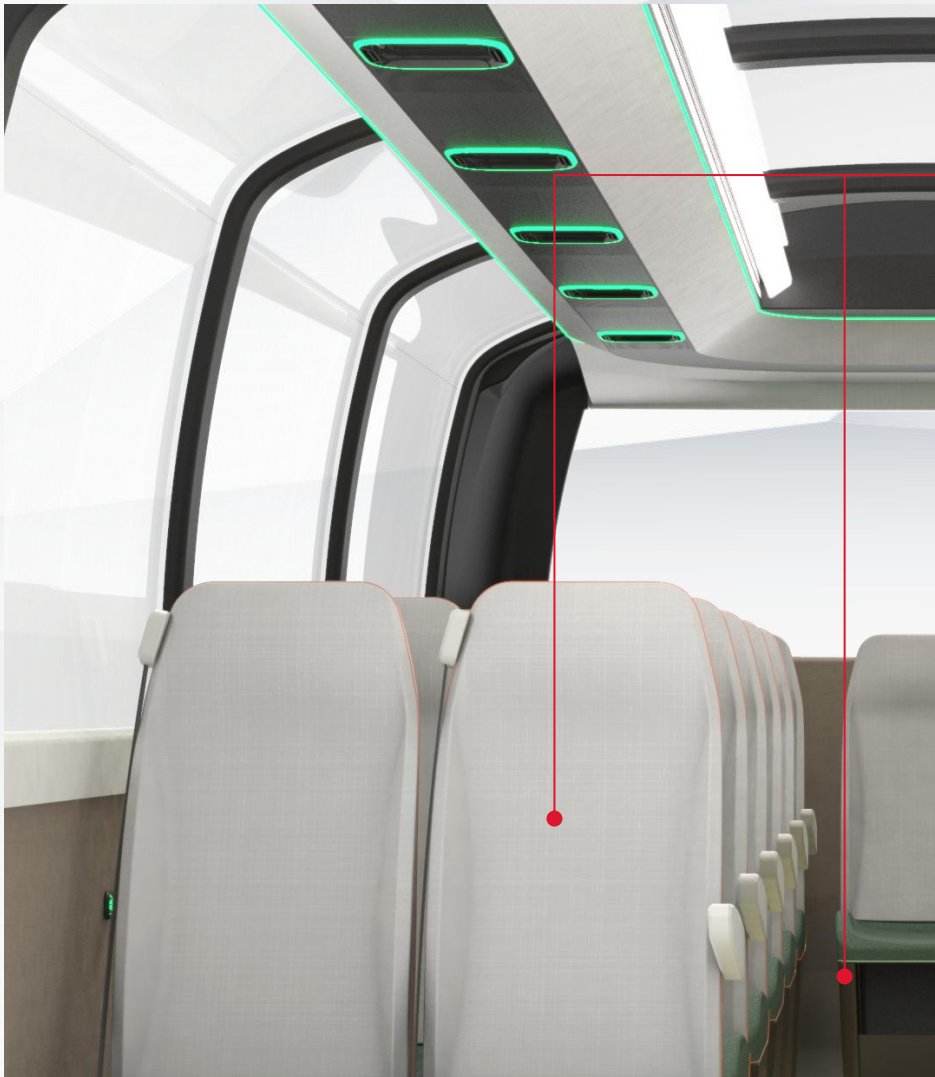
ELECTRIFIED PATHS a new product designed for simplify luggage rack assembly process, reduce material amount and overall weight.

Weight and Wires reduction, high customization, easy to install on existing or new design Alu profiles, Plug and Play service set with specific connection pins, available with High Power Line configuration, ABS + Aluminum support profiles



Part of **PRETTL** group Essential for Life

Innovation



SKYLIGHT a revolutionary bus interior reset, for increase passenger comfort, ergonomics and better Travel Experience

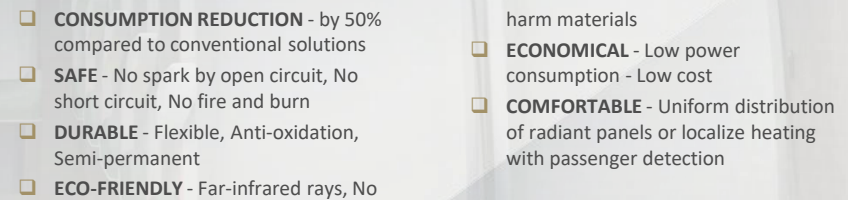
Imagine getting on the bus only with hand luggage and being guided to your reserved seat thanks to the specific App, combined with the colored lights installed on the seat. Open the load compartment under the seat, without having to lift loads, and be sure that your luggage is safe. Sit down and have a wider panoramic view from the bus interior to exterior environment, thanks to the lack of the luggage compartment, replaced by a compact air duct + lights. Finally, use your smartphone to access travel functions such as stage control, remote service set adjustments and mini chats with passengers, thanks to the Onboard App. Imagine all these functions and other more, just on a single innovative compact product, Imagine Skylight.

- Easier and safe luggage loading process
- Freedom to re-design all light roof or sky roof
- Consistent weight reduction
- Center of gravity decreasing
- Better Ambient Livability for passengers
- Medium luggage rack load space safe
- Increased seats and passenger visibility
- Fast and Safe connected passengers
- Social Connected Travel Experience
- Introduction of a 1st and 2nd class categories



On Board creates inside the vehicle a wireless local area network, limited access, reserved for passengers which includes the use of tools such as smartphones and tablets integrated through which allow the passenger the fruition of functional content. The mobile device becomes the only interface through which each passenger can relate to the means of transport by acquiring the domain of the functions of comfort and access to specific media content. PSU Vision, offer possibility to access infotainment contents as movies, music, news and path information, to give a new experience perception to the travel.

- Independent Loudspeaker module customizable
- RGB LED reading lights adjustable during product installation
- Adjustable air vents, electrically closeable and openable
- Hostess call with ring light guide
- Stop call (as alternative to Host call)
- Mute speaker function
- Seat number option
- On-Board system applicable for remote control with personal smartphone, of all the provided functions

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Part of **PRETTL** group Essential for Life

A photograph showing the interior of a modern train car. Rows of red upholstered seats with a grid pattern are visible. Above the seats are overhead luggage racks and long, rectangular fluorescent light fixtures. Large windows on the right side of the car provide a view of the exterior. A yellow graphic element is present in the bottom left corner.

Overview

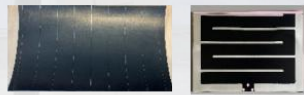
The first version of PTC heater product can be used as a flexible foil (polyethylene) that integrates conductor structure, as shown in the picture, but also over molded and configured as a rigid heating component.

The heater can be converted into a rigid element, composed by the PTC heater foil with back injected PP structure.

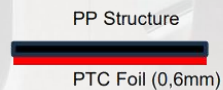
FEATURES

- Customized solution only.
- Dimensional limitation: **current Manufacturing process limits to the size of DIN-A4**, higher Dimensions und development.
- Voltage: customized according to needs
- Energy absorption: customized according to needs
- Max surface temperature never exceeds 80°C due to PTC effect. The PTC effect leads to an dT dependent Power characteristic.
- Means high Env. Temperature = low Heater Power.
- Thermal insulation: the non heating side needs to be isolated to direct the heat into the needed position.
- Overheating excluded due to PTC effect.
- Process-safe production through injection molding.
- Simple contacting through injected poles / contacts.

1. Apply Conductor structure to PTC Foil



2. Back Injection of PTC Foil



Application example





Let's Build the Future
Together!

Contact us:
sales@ellampsystems.com



Main Bus References

**IVECO
IRISBUS**



SITCAR



VOLVO



**DAIMLER
TRUCK**
Daimler Buses



Otokar

BMC

