



COMPANY PRESENTATION

INTELLIGENT LIGHTING SOLUTIONS





ITALIAN CREATIVITY, GERMAN MINDSET



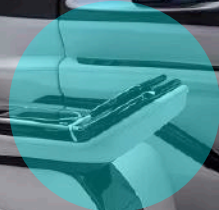
Lighting customization at the optimal cost, quality, weight, and time-to-market enables brand differentiation across OEM vehicle models



HSL PROPRIETARY PRODUCT PLATFORM



Groundbreaking additive manufacturing process for headlights, emblems, taillights, and in-mold electronics



HSL MILESTONES / HISTORY



1988

Specialization on Lighting System



2014

Full System Engineering In-House



2018

Installment Production Line for Mid Series Production



2023

Foundation of HSL

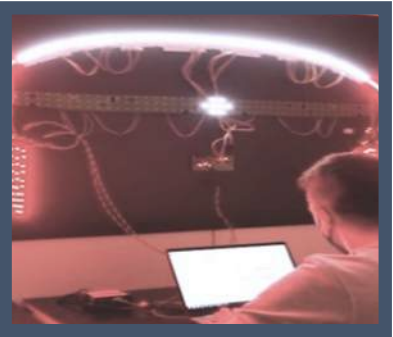
1st 3D Printing for Commercial Use

1998



System Assembly as Tier-2 for Automotive Industry

2016



First Tier-1 Series Supply for Exterior Lighting System

2022



Ownership Change
Dr. Frank Huber
Christian Päschel

HSL PROPRIETARY PRODUCT PLATFORM

Light.

Modul "X"



Functional Clusters which enables individual headlamp design without additional tooling and engineering effort. With a lens height of 16mm the module is the right choice for ultra-slim headlamp designs.

Headlamp "X"



Compact Off-the-Shell Headlamp based on Module "X" functional cluster provides a plug & play solution. With a A-Surface Lens-height of 24 mm it will be one of the smallest headlamps in the market.

Standard Parts



With his extensive network HSL has access to several Light Modules as well standard support parts from 1- and 2-Tier supplier which can be utilized for efficient project realization.

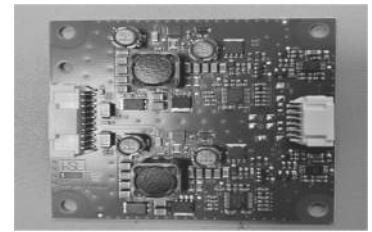
Modul Lightbox:



Combining additive manufacturing and strategic design support to individualize and modularize lighting functions

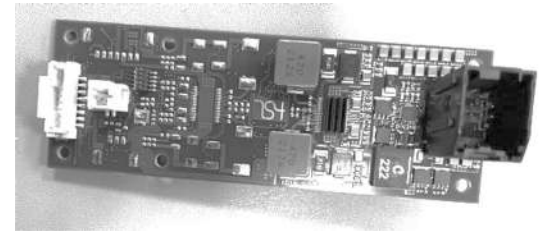
Control.

P-Drive²



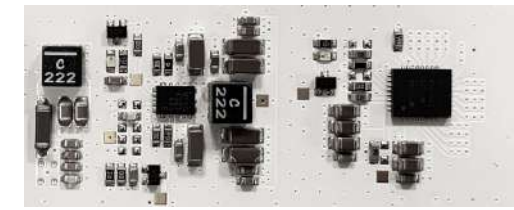
State of the Art analog driving boards for high power lighting functions in small package. Validated according standard automotive requirements.

mevo



Intelligent Lighting ECU series for seamless integration in digital Electronic architectures. Validated and in different options available.

Animo



Standardize and scalable multichannel LED driver with onboard diagnostic for unlimited freedom to create animation scenarios.

Li-OS



Scalable Software platform for short development cycles and innovative Lighting Architectures

HSL delivers full-service design through production capabilities using proprietary in-house system solutions that enable specialized performance lighting at high quality

Design → Production

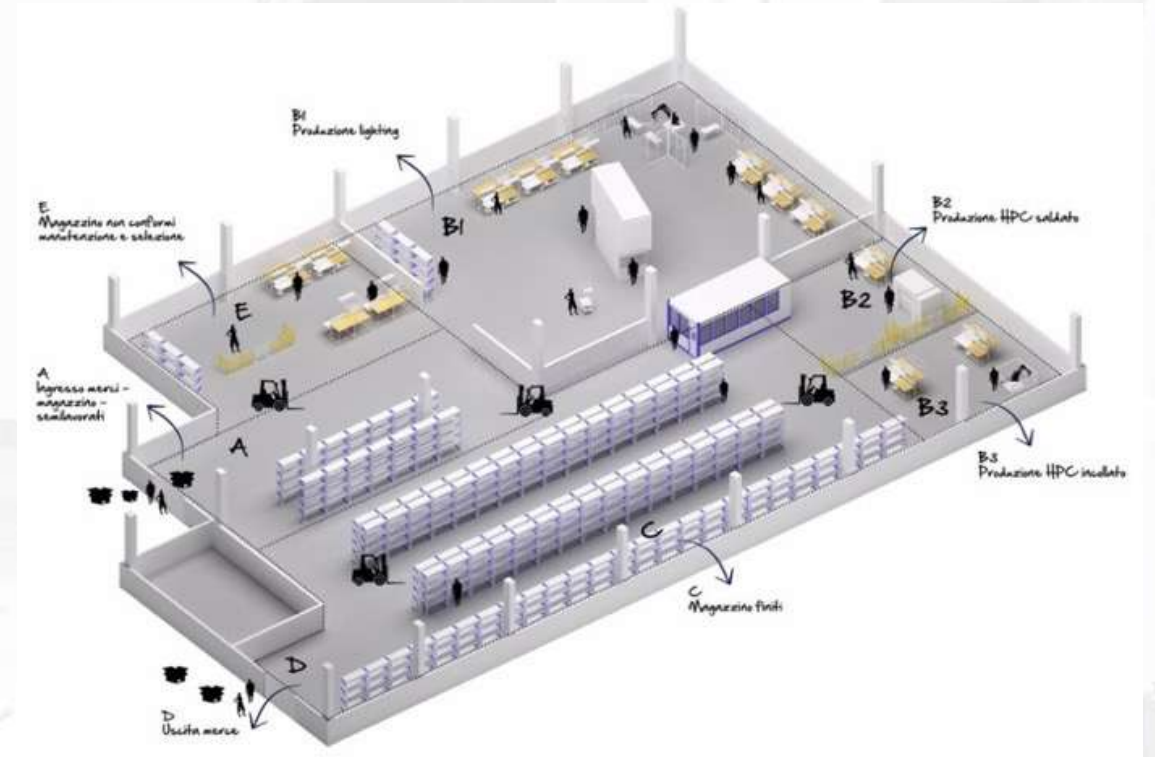
Save time, increase efficiency

30 **»»** **4-12** via iterative design and advanced manufacturing processes
Months Months

Hybrid Solution

Lower cost, lighter weight

Achieving homologation by integrating traditional tools and processes with digital manufacturing and rapid prototyping



HSL MANUFACTURING PLATFORM

Capacity & Machineries

5.000 m²

Manufacturing Area

5

CNC Milling

15

Dedicated Team of high skilled Artisans for product-series finalization

6

Production system

5.5 M€

Technology & Tools Investment

11

3D Additive Machines

3D Metal Facility (Unit 3)



Exclusive Partnership with Provincia Autonoma di Trento & ProM Mechatronic Hub

Operating Units (ITALY)

Trento



Headquarter
UNIT 1

Prototype Shop Floor
Varnishing Plan
Finishing
Project Management
Design Metrology

Trento



New (2019)
UNIT 2

Small Series Assembly Lines
Medium Series Assembly Lines
Glueing Robotics
Welding Stations

Rovereto



Mechatronic Facility
UNIT 3

3D Metal Additive
Testing Lab
Validation

Turin



Engineering Center

Engineering Center
Innovation
Sales Representative

HSL MANUFACTURING PLATFORM



Installments in Unit 2:

- 2 x Pallett conveyor Lines (Headlamp & Rearlamp)
- 5 x Single Workstations (Small & Module Assembly)

Capacity:

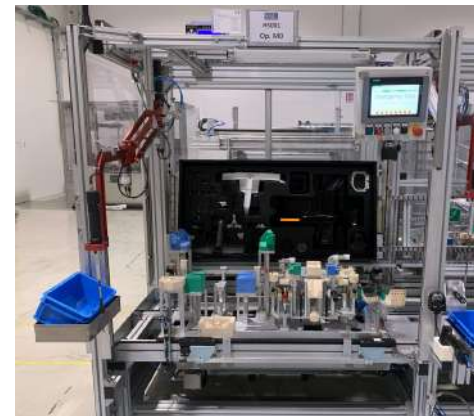
Up to 200.000 units p.A. (each line)

Technology:

- Welding (Vibration / Ultrasonic)
- Gluing (Glue-Cell with 3 Arm Robot)

Specials:

- Multi-Product Line concept suitable for big dimension (1,30 m)
- Grey-Room Condition
- Industry 4.0 with Highest Traceability standard



IN-MOULD ELECTRONICS



With his dedicated IMSE® Team HSL offers Full System Engineering from early concept design until Start of Production.



HSL is the first company who introduced Additive Manufacturing to IMSE® part production from prototyping. HSL unique prototyping capabilities for IMSE parts will secure fast and cost-effective prototyping.



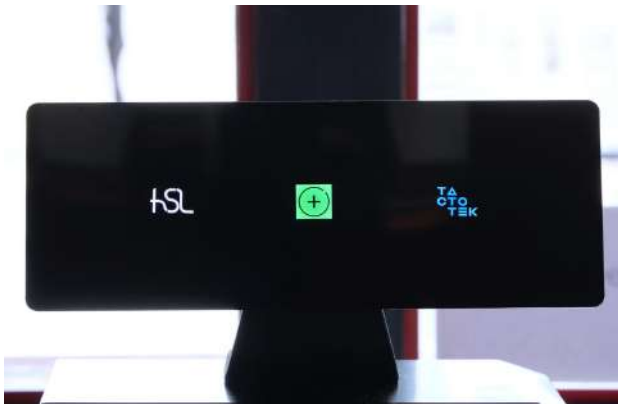
With his final assembly and system know-How HSL integrates IMSE® parts into complex lighting systems for small up to medium size series.



PARTNERS

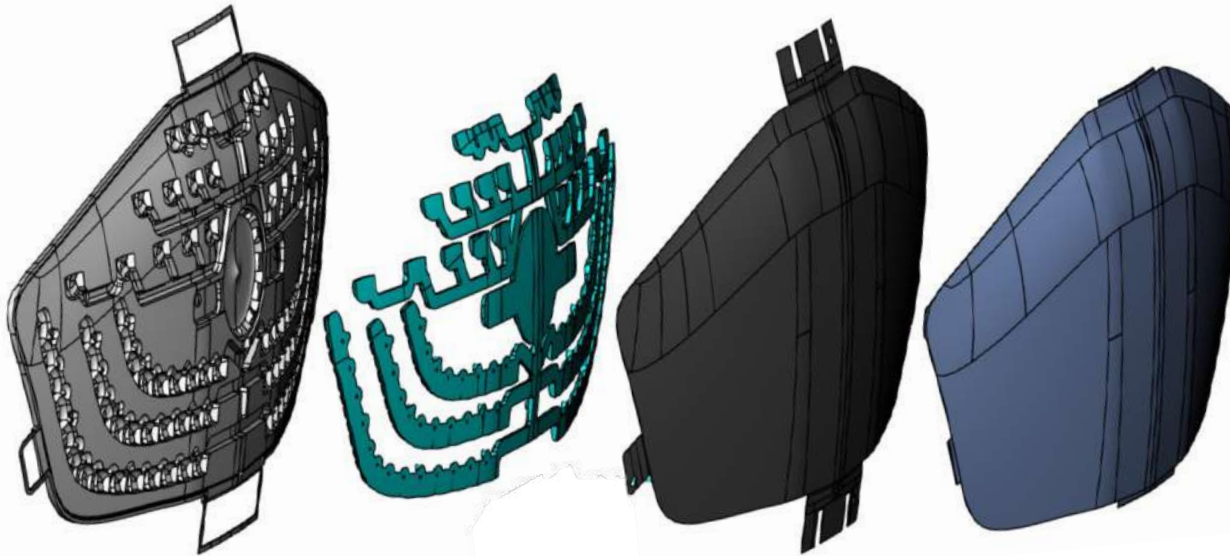
HSL srl and TactoTek® sign Licensing Agreement to expand IMSE® reach in prototyping and industrialization of exclusive series

1.3.2023 | Media Relations | Press Releases



WORLD PREMIER FULLY INTEGRATED FRONT GRILL BY IMSE®

Visit our booth at **CES** to experience **Hybrid Production Parts**



PC-ABS II shot body

PC I Shot Optics

IMSE® Film with LEDs

PUR Coating

Key Facts:

Dimension:	570*290 mm
Thickness:	< 6 mm (max. 14 mm)
Weight:	~1kg
BOM Parts:	1
Brightness:	1500 cd/m ²
Homogeneity:	> 90%
Realization Time:	< 4 month

HSL CO-OWNERS & TEAM



DR. FRANK HUBER
Co-Owner



EVP, President Automotive Seating



CEO Lighting Division
Member of HELLA Management Board



CHRISTIAN PÄSCHEL
Co-Owner & CEO



Global CEO



EVP Sales Lighting Division
Member of Executive Board Lighting

Key Team Figures

77+

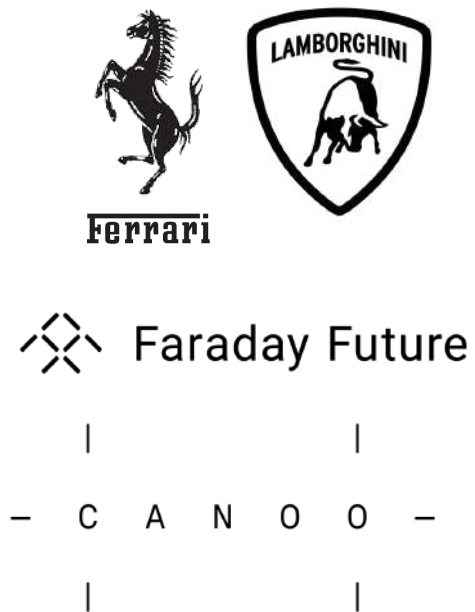
Engineers
(incl. Strategic Partner)

80%

Engineering

2

Engineering Locations



HSL LIGHTING REFERENCE PROJECTS

New Technology & Innovation



Laser Technology



In-Mold Electronic



Matrix Display

Concept & Series Engineering



Series Engineering & Small Series Production

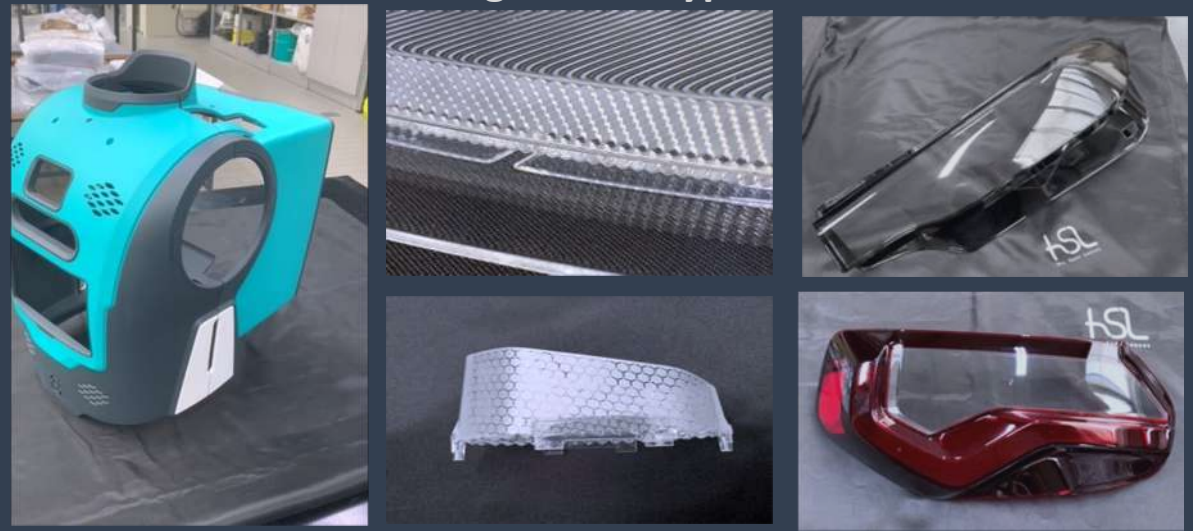


Series Engineering & Mid Series Production



HSL PROTOTYPING REFERENCES

Single Prototype



Special Finishing



Exhibition & Functional Mock Ups



Next Level Prototyping



HSL Srl a socio unico
Via dei Masadori n°46, Loc. Spini di Gardolo, 38121 Trento, Italy

Tel. +39 0461 955411
Fax +39 0461 955422

www.hsl-italia.com



Intelligent Lighting Solution
our vision for the automotive industry