Triplesign System AB

-Sustainable-

-Reliable-

-Cost Efficient-

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Triplesign – Short summary

- Solar energy
- Power consumption: 1 Watt
- Easy installation and control
- Low investment!
- 100% reliable
- Maintenance free

CE marking

-EN-12966 Certified-

Triplesign VMS Application Areas

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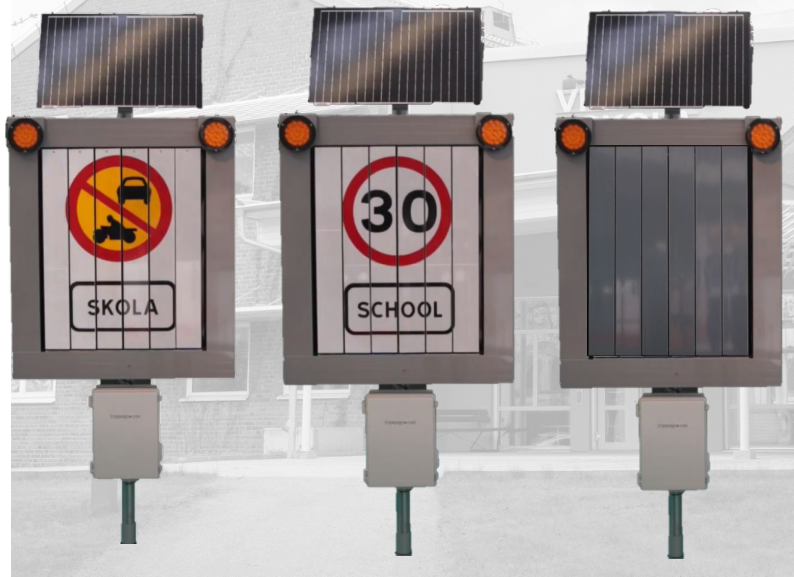
Temporary re-direction or restrictions

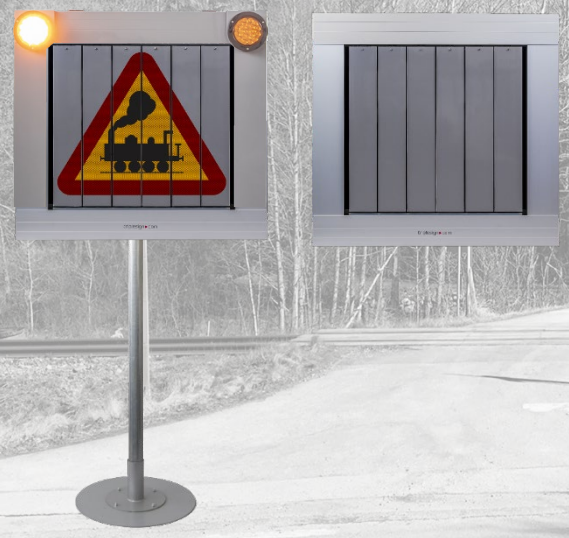
Cycle Lane - Slippery road-

School Zones



Construction Areas

Unattended Railway Crossing



Slippery Road Warning

Animals Crossing Warning

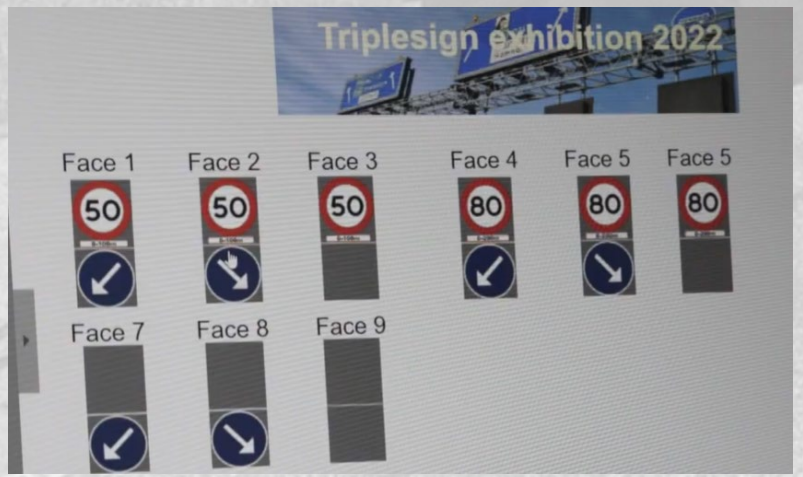
Speed Variation

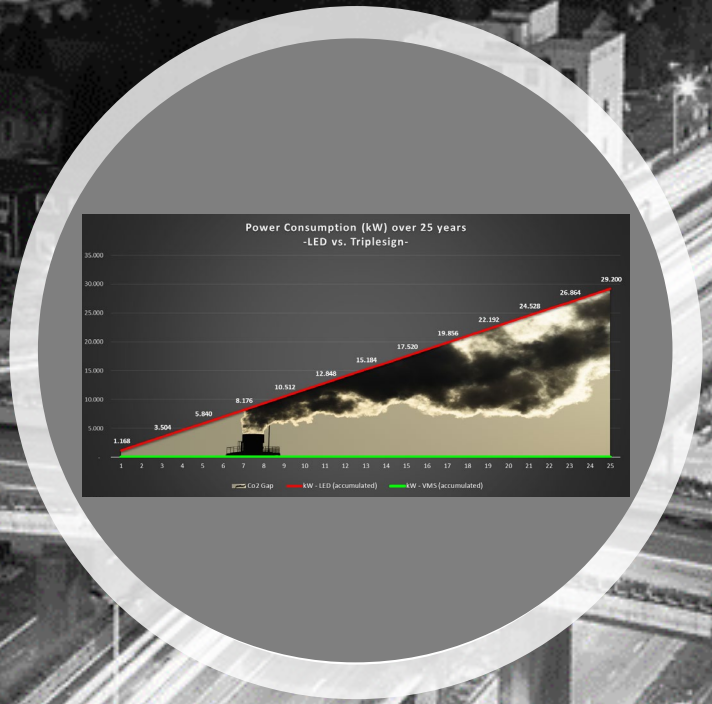
Multi-message Triplesign

Several Triplesigns in 1

Eurotunnel 2021 - UK

Vehicle Mounted sign (TMA)





Triplesign Sustainability

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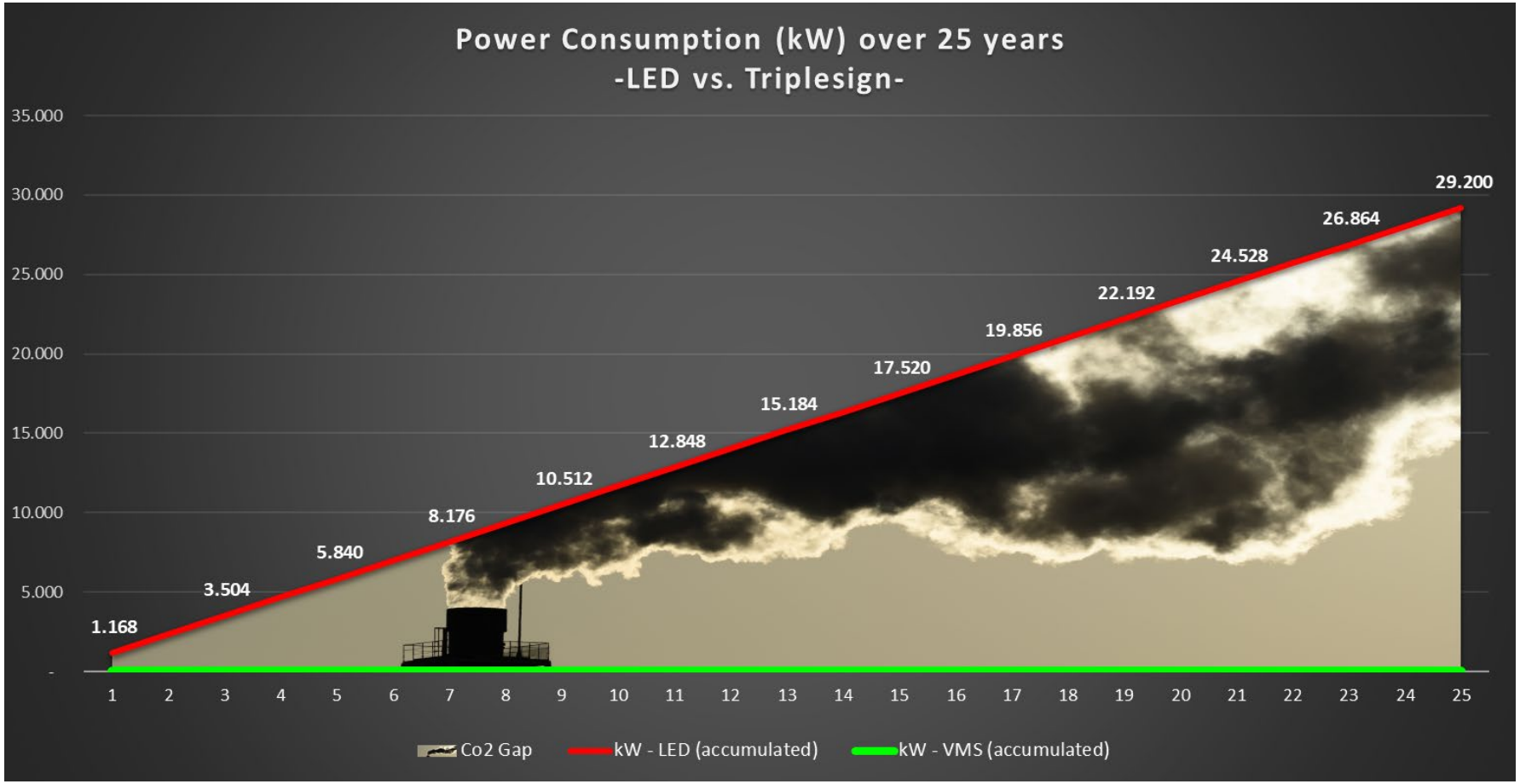
LED VMS vs. Triplesign VMS



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Assumptions:

- Full colour, full matrix LED VMS
- Power consumption of an LED VMS is around 400W/hour
- Message displaying for 8 hours a day

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The sustainable solution for the future

Sustainability score

TRIPLESIGN VMS	VS	LED VMS
Almost Zero	Power consumption	High
Low	Installation Costs	High
High	Reliability	Medium
High	Visibility	Medium
Low	Maintenance	Medium
Very long	Lifetime	Short
High	Readability/TSR	Medium

Power consumption

The power consumption of a Triplesign is 1Watt per hour, no matter the size of the sign. A LED VMS uses up to 600W/h per sqm and the bigger the size, the higher the power consumption. A Triplesign can be operated on solar energy.

Installation Cost

The installation cost of a Triplesign are much lower as there is no need for excavation for cables. Installation is simple and takes little time, so limited disruption for traffic during installation. No heavy machinery needed so lower CO2 emission during installation.

Maintenance

Triplesign VMS only need a yearly inspection. No other maintenance is needed. In the rare occasion there is a failure, it can be solved easily as the technology is very simple. The maintenance of LED VMS is intensive and more complicated.

Reliability

A triplesign does not need power to display a message. In case of a power outage a LED VMS is not showing a message – it will need a big back-up battery to display a message and it can do so for a limited time only. MTBF for a Triplesign is much lower than for an LED VMS.

Lifetime

The lifetime of a Triplesign is more than 20 years. After 20 years the mechanical package can easily be exchanged without having to change the frame. An LED VMS has an average lifetime between 6-8 years. It needs to be replaced completely, generating a lot of waste.

Visibility

A Triplesign can bee seen from all angles. A LED VMS is not visible from all angles. Also, if the surrounding light is very bright the LED VMS needs to be at maximum brightness to compete with the sunlight. At night the LED VMS must be dimmed correctly not to distract the drivers.

Readability/TSR

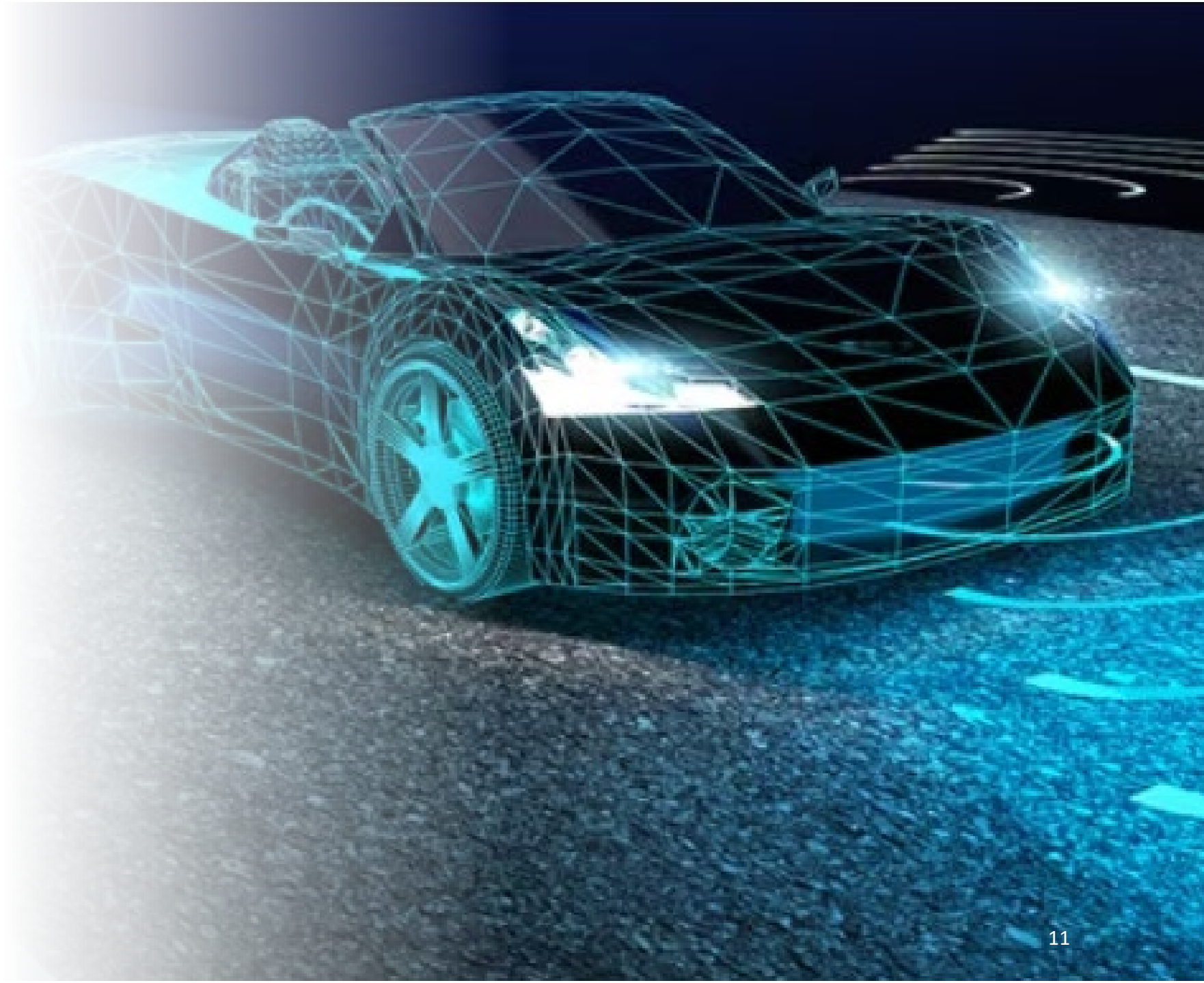
Triplesign VMS are the same as normal traffic signs and are readable by cars with ADAS/cameras. Traffic Signs Recognition (TSR) for Triplesign VMS is 100%. LED VMS are not always recognized by TSR. In future with cars that are more and more self-driving the Triplesign is more reliable.

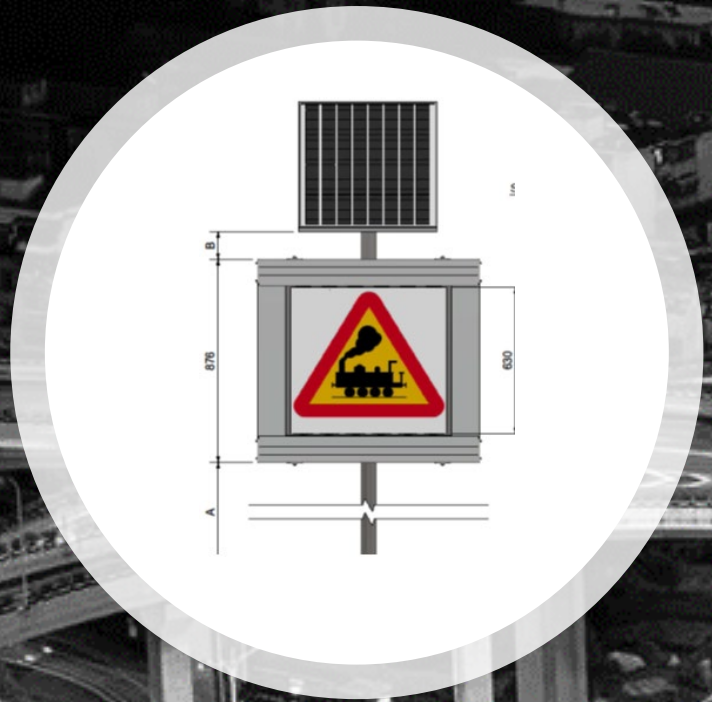
Future Proof

Many car manufacturers use Advanced Driver Assistance Systems (ADAS) and Traffic Sign Recognition (TSR) technology.

Research has shown that a Prismatic VMS have better readability than discontinued LED VMS.

If the LED VMS is black due to flickering at the moment of the TSR-reading, no reading will be performed.





Triplesign VMS Specifications

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Back panel & Fixings

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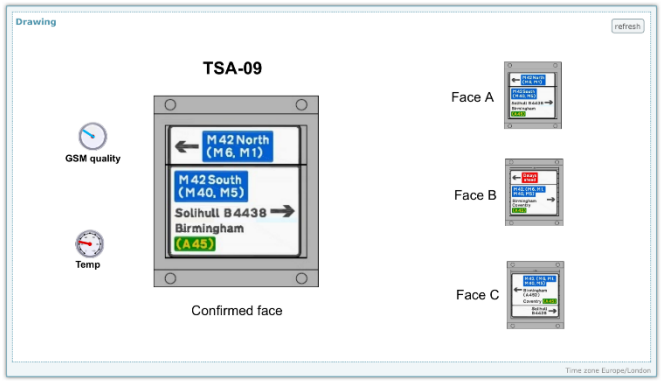
Control Options

- **Program operated**
- **Sensor operated**
- **Central (control room)**
- **Operated on site**



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Communication

- Secure & Low Energy -

Wireless

- **3G/4G/5G**
- **Wi-Fi, Bluetooth**

Wire Communication

- **Ethernet Cable (Modbus TCP/IP*)**
- **Cable RS485 (Modbus RTU)**
- **Dry Contacts***

On Site

- **Directly on PLC***
- **Manual Crank**

included as standard

Triplesign Internet Management (TIM)

- Web Interface-

The TIM enables wireless communication, including a Triplesign web interface accessible from any computer, smartphone or tablet.

Výskumný ústav dopravný, a.s.

Certificate of constancy of performance

1358 – CPR – 0159/1

In compliance with *Regulation (EU) 305/2011 of the European Parliament and of the Council of 9 March 2011 (the Construction products Regulation or CPR)*, this certificate applies to the construction product

Triplesign XP Traffic

which as variable message traffic sign is used for the information, guidance, warning and direction of road users

Placed on the market under the name or trade mark of

Triple Sign System AB,
Värmövägen 716, 132 35 Saltsjö-Boo,
Sweden

and produced in the manufacturing plant

Triple Sign System AB,
Källebergavägen 9, 570 96 Vrigstad,
Sweden.

This certificate attests that all provisions concerning the assessment and verification of constancy of performance described in Annex ZA of the standard

EN 12966-1: 2005+A1: 2009

under system 1 for the performances set out in the certificate are applied and that the factory production control conducted by the manufacturer is assessed to ensure the

constancy of performance of the construction product.

This certificate was first issued on 29 June 2017 and will remain valid as long as neither the harmonized standard, the construction product, the assessment and verification of constancy of performance methods nor the manufacturing conditions in the plant are modified significantly, unless suspended or withdrawn by the notified product certification body.

Zilina 09 January 2020

Ing. Vladimír Majerík
Head of Certification body
for products

122523

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Triplesign Specifications

Standards & Certifications

- EN 12966-1; 2005+A1; 2010 -
Certificate of consistency of performance

- TRC2130C -
Environmental Tests for Motorway Communications, Equipment and Portable and Permanent Road Traffic Control Equipment

- Resistance to shock – tested and approved
- Resistance to vibration – tested and approved

Standards & Certifications

- EN12966 -

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Transport Research Institute, J.S.Co.
Veľký Diel 3323, 010 08 ŽILINA

SNAS
Reg. No. 033/P-001

Autorizovaná osoba SKTC-125, Autorizovaná osoba SK05, Notifikovaný orgán 1358
Authorized Body SKTC-125, Authorized Body SK05, Notified Body 1358

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Žilina 09 January 2020

VÝSKUMNÝ ÚSTAV DOPRAVNÝ, a.s. TRANSPORT RESEARCH INSTITUTE, J.S.Co. Notified Body No. 1358 Notifikovaná osoba č. 1358 ŽILINA

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Head of Certification body
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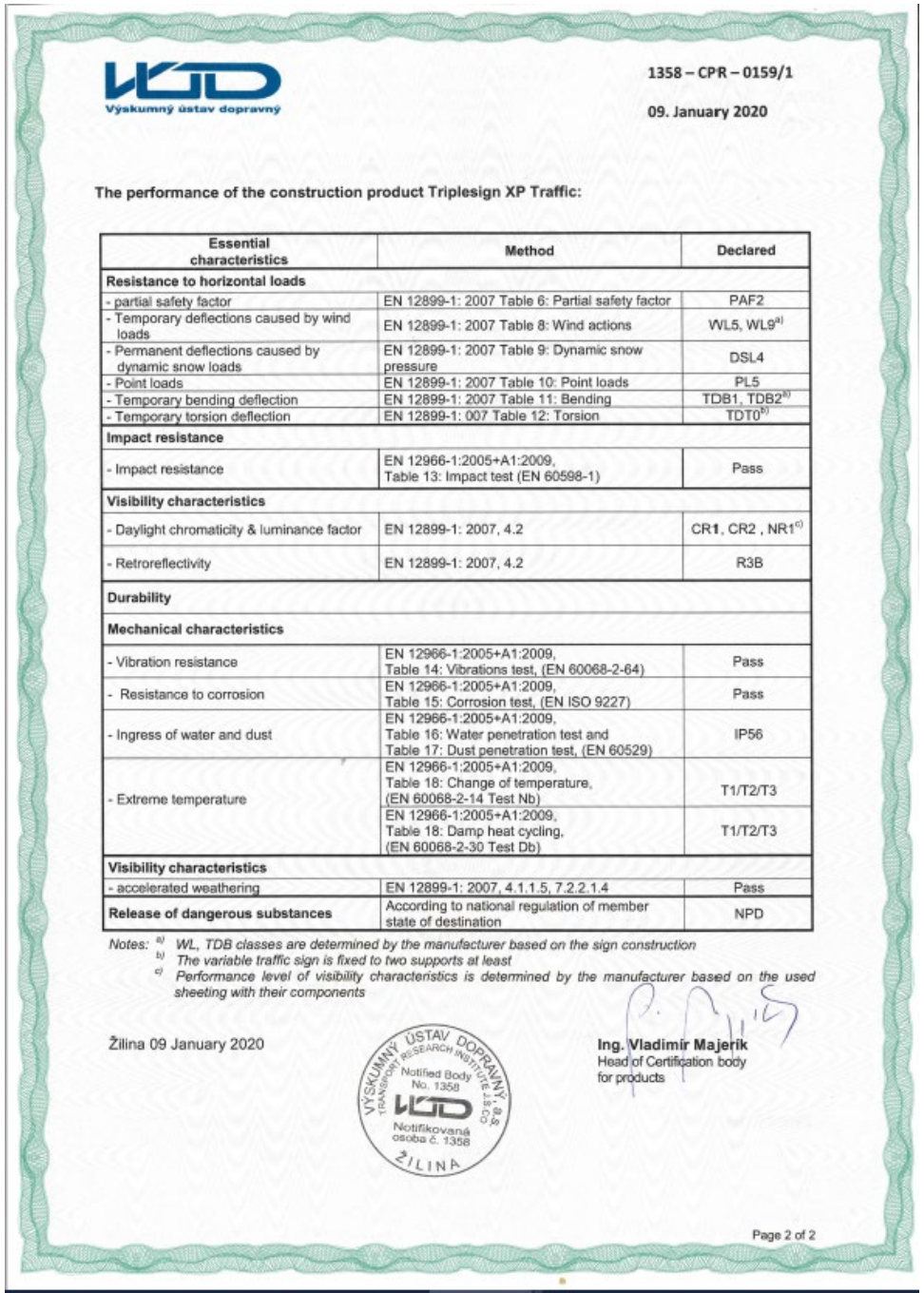

Výskumný ústav dopravný

1358 – CPR – 0159/1

09. January 2020

The performance of the construction product Triplesign XP Traffic:

Essential characteristics	Method	Declared
Resistance to horizontal loads		
- partial safety factor	EN 12899-1: 2007 Table 6: Partial safety factor	PAF2
- Temporary deflections caused by wind loads	EN 12899-1: 2007 Table 8: Wind actions	WL5, WL9[a)]
- Permanent deflections caused by dynamic snow loads	EN 12899-1: 2007 Table 9: Dynamic snow pressure	DSL4
- Point loads	EN 12899-1: 2007 Table 10: Point loads	PL5
- Temporary bending deflection	EN 12899-1: 2007 Table 11: Bending	TDB1, TDB2[a)]
- Temporary torsion deflection	EN 12899-1: 007 Table 12: Torsion	TDT0[b)]
Impact resistance		
- Impact resistance	EN 12966-1:2005+A1:2009, Table 13: Impact test (EN 60598-1)	Pass
Visibility characteristics		
- Daylight chromaticity & luminance factor	EN 12899-1: 2007, 4.2	CR1, CR2 , NR1[c)]
- Retroreflectivity	EN 12899-1: 2007, 4.2	R3B
Durability		
Mechanical characteristics		
- Vibration resistance	EN 12966-1:2005+A1:2009, Table 14: Vibrations test, (EN 60068-2-64)	Pass
- Resistance to corrosion	EN 12966-1:2005+A1:2009, Table 15: Corrosion test, (EN ISO 9227)	Pass
- Ingress of water and dust	EN 12966-1:2005+A1:2009, Table 16: Water penetration test and Table 17: Dust penetration test, (EN 60529)	IP56
- Extreme temperature	EN 12966-1:2005+A1:2009, Table 18: Change of temperature, (EN 60068-2-14 Test Nb)	T1/T2/T3
	EN 12966-1:2005+A1:2009, Table 18: Damp heat cycling, (EN 60068-2-30 Test Db)	T1/T2/T3
Visibility characteristics		
- accelerated weathering	EN 12899-1: 2007, 4.1.1.5, 7.2.2.1.4	Pass
Release of dangerous substances	According to national regulation of member state of destination	NPD

Notes: [a)] *WL, TDB classes are determined by the manufacturer based on the sign construction*
[b)] *The variable traffic sign is fixed to two supports at least*
[c)] *Performance level of visibility characteristics is determined by the manufacturer based on the used sheeting with their components*

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Standards & Certifications

- TRC2130C -

Environmental Tests for Motorway Communications, Equipment and Portable and Permanent Road Traffic Control Equipment
According to standard EN 60068-2-27

-Resistance to chock ✓
-Resistance to vibration ✓

Triplesign – Benefits

Solar

No cables -
No excavation

Low cost plug & play

Multiple warning points

Triplesign saves lives

Low Energy -1 Watt