

# VMS: STATE OF THE ART TECHNOLOGIES AND THE CHALLENGES THEY CREATE

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# TOPICS

- **Standardisation of VMS by harmonized EN 12966**
- **Objective of VMS**
- **Availability and durability**
- **Efficiency**

# Standardisation of VMS by harmonized EN 12966

The European Standard has been developed under a contract between the European Commission and CEN (Comité Européen de Normalisation) by CEN/TC226/WG3/SG3.1, later by CEN/TC226/WG11 between 1990 and 2014.

The European Standard covers mobile, temporary and permanently installed VMS used in circulation areas, on public and private land, including tunnels for the information, guidance, warning and/or direction of traffic. Test modules are used to demonstrate compliance with the requirements.

The European Standard specifies visual and physical characteristics of VMS as well as their durability aspects. It also provides relevant requirements and corresponding test methods, assessment and verification of constancy of performance (AVCP) and marking.

# **Standardisation of VMS by harmonized EN 12966**

**International European experts representing VMS manufacturers, Universities, test institutes, road administrations and consultants for installations and maintenance have been delegated to the working group by member states Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Italy, Malta, Netherlands, Norway, Poland, Portugal, Slovenia, Sweden, Spain and UK. 32 European countries have integrated EN 12966 into their national legislation.**

**Unites Stated of America have adopted main parts of visual performance requirements in NEMA TS4. Public tenders in the Arabic countries refer to the European requirements, others in Australia, South Africa and south America are also interested.**

# Standardisation of VMS by harmonized EN 12966

Due to the existence of many different national Standards it took almost 15 years to finalize a draft version, which has been approved 2005 with 97,66% in formal voting.

Amendment to the Standard has been worked out in 2009, correcting and clarifying some errata.

From 2010 to 2013 Working Group 11 of CEN/TC226 has drafted a revision.

Now various informative annexes provide guidance in design of messages and graphical displays, depending on different applications.

The detailed appearance of traffic signs (size, design of graphics, letter fonts, text messages ) is not yet harmonized, is still under national legislation.

In September 2014 the draft of the revision has been accepted with 100% (!) agreement by 32 member states, by 24 approvals and 8 abstains.

Date of availability of EN12966:2014 will be December 3<sup>rd</sup>.

# Standardisation of VMS by harmonized EN 12966

This level of acceptance was only possible by creating a functional description of VMS (Variable Message traffic signs) , describing basic functionalities of physical performance - resistance against extreme temperature, humidity, wind- and snow loads, corrosion, vibration, resistance against water and dust ingress etc.

visual performance – visibility characteristics as luminance, contrast, beam width of light distribution, colour, uniformity

durability of all performances .

For many of above mentioned performances EN 12966 provides several quality levels, to allow best customization to environmental conditions and applications.

# Standardisation of VMS by harmonized EN 12966

Typical VMS are using different ways for light emitting and reflecting, e.g. LED technology or rotating prisms, used in side tunnels





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# Standardisation of VMS by harmonized EN 12966

Typical VMS are using different ways for light emitting and reflecting, e.g. LED technology or rotating prisms, used in side tunnels, in hot and cold environment, as parking guidance, as traffic guidance on highways, for toll stations and on many more applications.





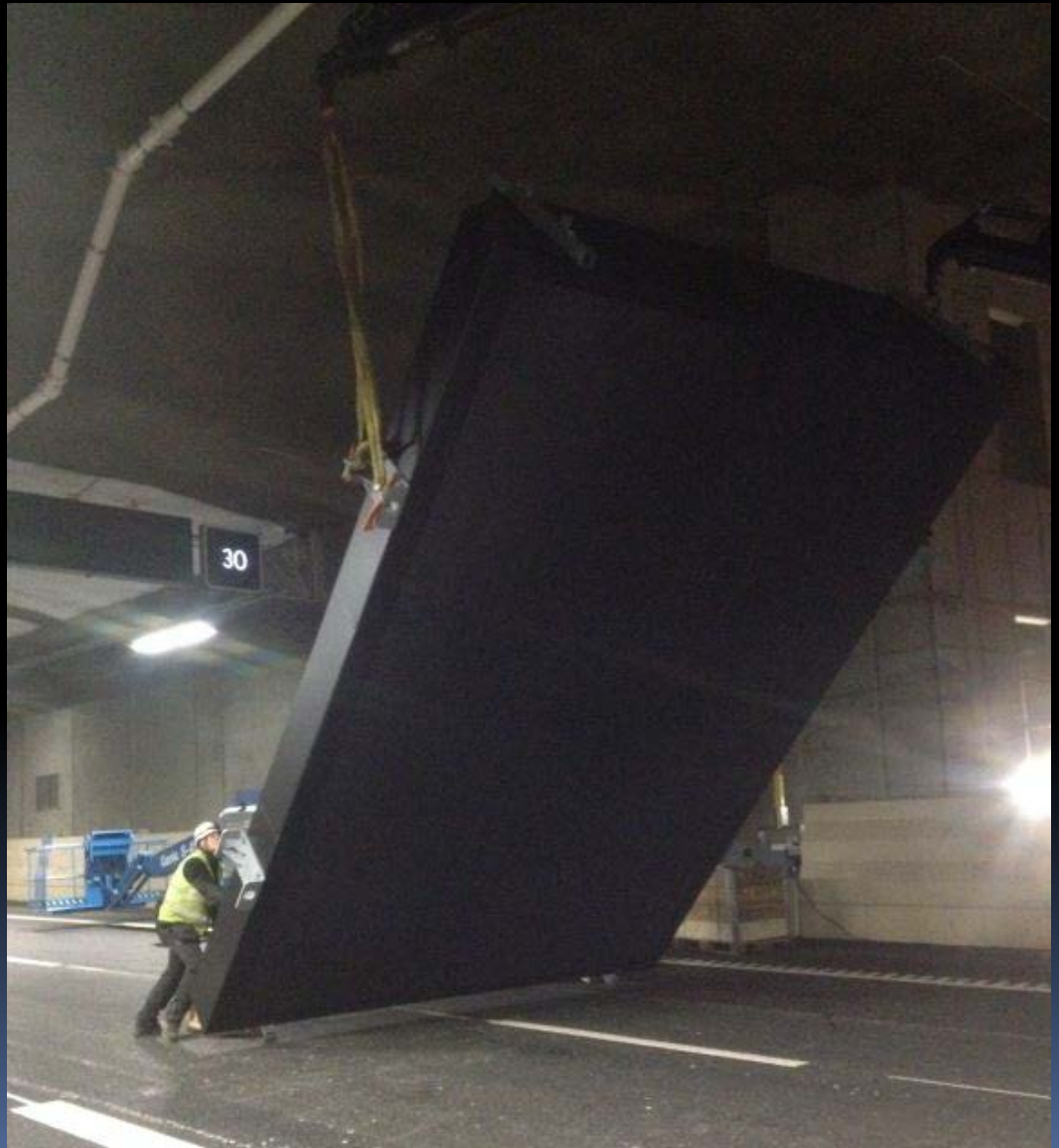
# Standardisation of VMS by harmonized EN 12966

... and they can be huge!



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# Availability and durability of Variable Message Traffic Signs

**Variable message traffic signs shall present important information for road users in due time , readable and understandable at all environmental circumstances and weather conditions, warning of or avoiding dangerous and hazardous situations, and / or provide road and traffic guidance to reduce travel times and the forming of traffic jams.**

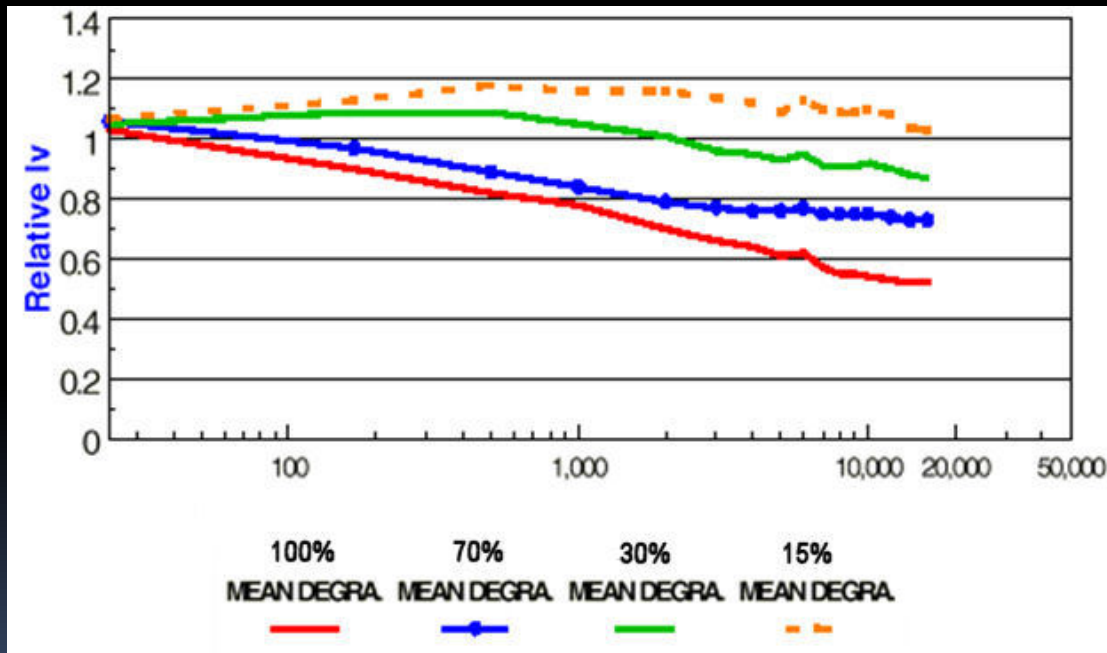
**The most restrictive requirements of EN 12966 providing functionality of VMS to fulfil above demands to be “fit for purpose” for at least 10 years, means to fulfil all declared physical and visual performance for at least 10 years.**

**Therefore it is the challenging objective in the design of VMS to offer best possible availability and durability, even when exposed to harsh environmental conditions.**

**With state of the art LED-technologies it is today possible the achieve this tough demand.**

# Availability and durability of Variable Message Traffic Signs

Degradation of LEDs is the biggest obstacle for VMS against being “fit for purpose”. Aging effects can be only avoided by driving LEDs with very low operating current.



The graphic shows, that only driving the LEDs with less than 15% of their rated current can avoid reduction of light output.

By the use of state of the art secondary lens systems the efficiency of LEDs can be increased significantly.



# Availability and durability of Variable Message Traffic Signs

LED VMS of today's generation can be driven by far less than 10% of their rated ability.

Not only LED's benefit of the gentle method of operation, all other electronic parts of the VMS as integrated driver circuits, power supplies, controllers and other electronic components as capacitors etc. take advantage by increased lifetime and MTBF-ratings, finally increasing the availability of the VMS as unit.

# Efficiency of Variable Message Traffic Signs

By driving the LED VMS with less than 10% of their rated ability, also the power consumption is reduced by the same factor.



Max. power consumption per VMS: 12W

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Max . power consumption: 1.850 W  
Typ. power consumption: 650 W  
Average power consumption: 410 W  
Operating cost per year: 320€  
based on 0,10€ / kWh  
Supply on 1-Phase 230V/10A

Data:  
Walk-In VMS  
512 x 88 RGB-pixel with 20mm pp.  
Light output (white): 15.000 cd/m<sup>2</sup>  
Contrast: 27  
Beam width: 30°

# Efficiency of Variable Message Traffic Signs

Because of significant reduction of power consumption the use of solar energy is possible, even in Central Europe.



## Solar Trailers (Netherlands)

112x80 full graphic RGB (20 mm PP)

Display area 3.6 m<sup>2</sup> (38 ft<sup>2</sup>)

Control via GPS / GPRS

Low-power consumption (av. 68W)

12 signs shipped March '13

Working 20 month only powered by solar energy without recharging

Light output (white): 15.000 cd/m<sup>2</sup>

Contrast: 27

Beam width: 30°

Operating cost per year: 0,00 €

**VMS: State of the art technologies  
and the challenges they create**

**THANK YOU FOR YOUR  
ATTENTION**

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