



DYNAMIC MESSAGE SIGNS

**NEXTGEN**  
SERIES

## DYNAMIC MESSAGE SIGNS

### NEXTGEN SERIES

## QUANTUM LEAP IN LED SIGN TECHNOLOGY



- ✓ **Almost No Maintenance**  
(Compared to today's industry average)
- ✓ **No Heating, No Ventilation**  
(Record Low Power Consumption compared to today's industry average)
- ✓ **Meets All Standards**
- ✓ **Cutting-Edge Performance**

The NextGen series of LED Dynamic Message Signs (DMS) are lightweight, standard, modularized and hermetically sealed panels that can be assembled to create any size DMS. This innovative modularized construction simplifies maintenance to the level of uncharted territory in the transportation industry. State of the art technology has reduced power consumption of LED diodes and completely eliminated the need for internal heating and ventilation.

### SAVINGS OF UP TO 60%

**Operation & Maintenance (O&M) costs estimated savings may reach 60% with NextGen signs.**

Do you know how much DMS really costs?

USDOT ITS costs database states that operation and maintenance (O&M) cost of average installed DMS reaches up to 5% of its capital cost annually (source: [www.itscosts.its.dot.gov](http://www.itscosts.its.dot.gov)). For example, on a \$4,000,000 DMS installation, annual O&M cost is expected to reach \$200,000.



■ Operation & Maintenance Costs (percentage of annual O&M expected cost as per USDOT costs database\*)

■ Operation & Maintenance Costs Estimated Saving with Telegra NextGen (percentage of annual O&M expected cost as per USDOT costs database\*)



## ALMOST NO MAINTENANCE (compared to today's industry average)

- **Hermetically sealed sign housing**
  - extended MTBF of sign panel (>40,000 hrs expected)
- **No regular maintenance**
- **Superior performance in cold climates**
  - front face defrosting system
- **Hassle-free replacement of any sign segments**
- **Quick and simple repair**
  - only 1 replaceable module in sign display matrix

IP67/NEMA 6 technology provides optimum working conditions for all active components. The high efficiency and low current optical system ensures no deterioration of LEDs over the lifetime. There are no consumable parts, no filters, and no ventilation fans. The most efficient, on-demand, front face defrosting system is energized from DC input on the sign's power cable, triggered from TMC or automatically, using 210 W/m<sup>2</sup>. Modular construction allows replacement of a single display panel in case of damage. The LED module is the only active component in the sign panel that needs replacement, which can be completed in a few short minutes without tools (tool-free execution is optional). Controller and power supply units are located inside the roadside cabinets.

## FLAWLESS DESIGN AND EXECUTION

- **Tested for minimum 10 year durability** by accelerated weathering test methods
- **Superior resistance to loads and deflections**
  - reinforced die-casted aluminium
- **Superior impact resistance**
  - multiply rein forced front face
- **Welding process eliminated**
- **Only industrial operating range rated electronic components**
- **Completely automated production**
  - no room for human errors
- **Superior vibration performance**
  - no wiring in sign modules

Entire diligently collected experience with customers and their operational problems in different climates and environments all around the world is embedded in the design and carefully organized production process of these products.

Flawless design is certified through highest grades in all available performance tests (structural performance, durability performance, optical performance). These Signs have been designed and widely tested for the most demanding traffic applications under the most severe environmental conditions.



## COMMITMENT TO THE CLIENT IS COMMITMENT TO THE HIGHEST QUALITY STANDARDS

Telegra's NextGen has to be delivered with the highest possible quality standards. For us in Telegra, providing the best possible quality means producing signs without defects throughout all stages of production.

Each stage of production carries its own quality control mark and is traceable at any moment. Entire electronics are functionally tested in extended temperature range before final assembly in the sign module. Each sign module is functionally tested while submerged in water to ensure perfect sealing.

After it is assembled and prior to its delivery, each sign is burn-in tested by the most experienced employees for a minimum of 168 hours.

## TROUBLE-FREE REPAIR

What is the cost of traffic regulation during maintenance?

How long does it take to repair a faulty LED module?

What tools are required for repair?

What level of education is required by a maintenance technician to perform it?

How many spare parts does a maintenance technician need to have with him/her during the repair process?

How big of a problem is it if a rock or a bird damages the front face of a big display?

These problems become almost irrelevant with NextGen signs:

- Power supplies and controller are located inside roadside cabinet
- Extraordinarily fast and straightforward repair process
- No tools required
- Only basic training needed
- Sign module is the only replaceable component in sign display matrix
- Each segment is replaceable independently in case of mechanical damage.



## RECORD LOW POWER CONSUMPTION (compared to today's industry average)

- Ventilation and heating are not required for operation under full load in wide temperature range of -40 to +165°F (-40 to +74 °C)
- Record energy savings in warm climates
- Maximized light output using superior lens technology
- Ideal sign for solar applications

DC power consumption reduced up to 125 W/m<sup>2</sup> while the typical industry average is 200 W/m<sup>2</sup> or more (for full color at toughest performance classes defined by EN12966 B6 and NEMA TS-4 class e). The cutting edge optical lens technology ensures ultra low current drive of LED, significantly reducing its aging.

In that regard the NextGen series truly is a green technology, measured by all standards.

## INTELLIGENT LIGHT BEAM WIDTH SHAPING

Traditional design Dynamic Message Signs rely on a raw unshaped LED light spread pattern. Standard LED emits a round symmetrical cone of light not suited for display applications. It is comparable to using a simple light bulb in a car's headlight.

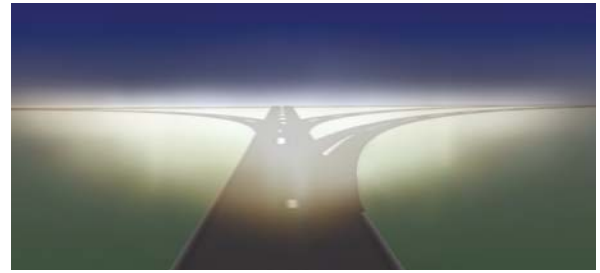
NEMA TS-4 and European EN-12966 standards are created to define the most usable light beam shapes to be used in traffic applications. Telegra DMS optical system is made of LEDs, but raw light output is shaped by a custom made lens system.

Typical light shape for highway applications is usually NEMA class e or EN12966 class B6 (30° horizontally and 10° vertically).

Such optimized approach is far more efficient than traditional DMS simply because light is not wasted, but rather focused and directed exactly where it is needed - to the drivers. This reduces overall DMS power consumption and thus allows hermetically sealed sign execution, bringing numerous operational benefits to the users.



Large portion of the light projected to the road is wasted in **traditional DMS** because beam shape is symmetrical



**Telegra optical system** optimally shapes the light so that no light is wasted

## OPTIMAL LIGHT PATTERN

Far approaching vehicles are most likely not situated in a narrow area covered by the typical light beam projected on the road. That is because the road bends and the driver's vision is disrupted by the nearby access roads. Based on that, the most desirable sign's light beam is a T-shape pattern in which the part further away from the sign is wider, and the part closer to the sign is narrower (in the figure above the light beams are presented from the sign's perspective).

## LOW REFLECTION FRONT PLATE

Traditionally DMS is designed with polycarbonate front plate in front of raw LEDs. This approach often leads to severe problems when the sun is positioned low behind the driver. Reflection can be so severe that the sign becomes simply illegible under such conditions. Deformations of the front plate make things even worse, creating phantom patterns due to the reflection.

Traditionally, DMS will typically increase LED output to neutralize the phantom effect on the front plates and make messages legible. This will additionally increase already high power consumption and increase heat dissipation and temperature inside the sign, which will inevitably shorten the LED lifecycle.

Another problem is fogging and condensation on such surfaces that require power demanding anti fogging system.

The benefit of Telegra's front face is that it achieves extremely low reflections from the front face (typically, less than 700 cd/m<sup>2</sup>).

Low reflection enables Telegra signs to achieve a superb contrast ratio using minimum current through LEDs, much lower than current needed

in most of the signs available on the market. As LED modules are hermetically sealed with dry air inside, a defogging system is unnecessary.

## CUTTING EDGE PERFORMANCE

### THE ULTIMATE MISSION IS SAFETY

- **Superb legibility** - increases safety of traffic participants
- **High resolution** - Identical clarity to static signs
- **Speed reading** - True-type fonts embedded
- **Faster recognition** - Anti-aliasing smoothens images and text
- **Smart intensity control** - increases safety of traffic participants
- **Fully controllable matrix** - flexibility to transfer *any* user definable message

### SIGN CONTROLLER

As multiple signs on one structure became common practice, Telegra introduced the Modular Controller, a 19-inch rack that can be populated with as many controllers as needed for custom location. All controllers shared the same power source, housing and GUI. This way power, space, time and money needed for installation are saved.

With the new model sign controller, Telegra takes it a step further. The Sign Controller is now a single unit that can be placed inside the sign or inside the Roadside cabinet and can control multiple DMS signs.

Instead of large cabinets on the concrete foundation next to the gantry, a simple economic cabinet can now be placed on the leg of the gantry.

## STANDARDS COMPLIANCE & TECHNICAL FEATURES

<b>Sign display</b>	Sign display is assembled with LED modules. LED modules form the LED matrix. Entire sign assembly is certified according to EN12966 and meets or exceeds NEMA-TS4 NextGen's evolutionary design has eliminated 100% of welding process in fabrication of the sign display.
<b>Sign controller</b>	Sign controller and power supply are located in remote roadside location (or pole mounted) cabinet. Each sign controller assembly consists of one controller and necessary converter box for communication between sign controller to sign assembly. Interface between sign controller and sign assembly is twisted pair or fiber optics
<b>Maintenance access</b>	Front and rear access possible
<b>LED module dimensions</b>	720,0 x 360,0 x 56,6 and 360,0 x 360,0 x 56,6 (for 15,00; 20,00 pixel pitch) 666,6 x 333,3 x 56,6 and 333,3 x 333,3 x 56,6 (for 18,52; 22,23; 27,78 pixel pitch) - on demand All dimensions are in mm
<b>Pixel color</b>	Full color (RGB); Amber; White; BI-color
<b>Pixel pitches</b>	20,00 mm; 15,00mm; 18,52mm; 22,23mm; 27,78mm
<b>Optical system</b>	Based on lens in front of LED
<b>Optical performance according to NEMA-TS4/ EN12966</b>	Color: white, red, blue, green, amber class C2 Beam width: (+-15 degrees horizontally, +0-10 degrees vertically) Class E according to NEMA-TS4; Class B6 according to EN12966 (B4 available on demand) Minimum Light intensity: L3 According to EN12966 and NEMA-TS4 Yellow 7440 CD/m <sup>2</sup> ; White 12400 CD/m <sup>2</sup> ; Green 3720 CD/m <sup>2</sup> ; Red 3100 CD/m <sup>2</sup> ; Blue 1240 CD/m <sup>2</sup> Contrast ratio: R3 According to EN12966; exceeds NEMA-TS4 requirements
<b>Sign durability</b>	All sign panel structural components exposed to environmental influences are environmentally tested using accelerated weathering ISO standard to verify minimum 10 year durability. All sign panel materials are certified to durability compliance with EN12966 standard. Vibration test, EN60068-22-64; test Fh, Class AJ2 Change of temperature, IEC 60068-2-14 - classes T1, T2 and T3 Damp heat, EN 60068-2-30 - classes T1, T2 and T3 Impact resistance, EN 60598-1 Water ingress, EN 60529 - class x7 Dust ingress, EN 60529 - class 6x Corrosion test (neutral salt spray test), EN ISO 9227
<b>Front face coating</b>	As a part of EN12966 certification process, NextGen series is, certified for durability according to ISO 11997 (corrosion), and according to ISO 4892 (accelerated weathering), which guarantees at least a 10 year front face lifecycle
<b>Environmental protection degree of sign panel housing</b>	IP67 / NEMA 6



<b>Heating and ventilation</b>	Not required
<b>Ambient temperature range</b>	Exceeds Class T1, T2 and T3 According to EN12966 -40...+74°C; -40...+165°F Fans or other equipment are not required to provide acceptable temperature levels inside the sign. -40...+74°C; -40...+165°F
<b>Structural performance</b>	Designed and constructed to comply with AASHTO requirements Certified EN12966 classes: Wind load: up to WL9 Dynamic snow load: DSL4 Point load: PLO Temporary deflection - bending: TDB2 Temporary deflection - torsion: TDT0
<b>Front face defrosting system</b>	270W/m <sup>2</sup> , equally distributed over entire active matrix area; available on demand
<b>Communication interface and functionality compliance</b>	Conforms to all relevant subsets of NTCIP standards TLS FG4; ModBus TCP; Profibus; XML-DA; Simple ASCII; I/O-interface Others on demand
<b>Maintenance features</b>	All components and modular assemblies are removable, transportable, and capable of being installed as a single unit by a single technician. Quick connect - Sign panel segments are accessible from the outside to allow easy disconnect of one segment (module) without affecting functionality of any other segment. It is possible to replace entire segment (module) of display panel in case of damage without affecting functionality of any other segment. Modules can be replaced without using any tools. Controller and power supply units are located in controller cabinet near the gantry to allow easy maintenance access.
<b>Servicing interface</b>	Web based over Ethernet; Ethernet port located on sign controller located in cabinet by the gantry. No need to access sign panel itself.
<b>Functionality of servicing interface</b>	Status and error information; Control options; Configuration options; Log status
<b>Firmware upload</b>	Over sign controller Ethernet port located in controller cabinet by the gantry. No need to access sign panel itself.
<b>Electrical safety</b>	HD638 and 384.4 certified Power supply units and all electric components operating at voltages higher than 24VDC are UL listed
<b>Applicable standards</b>	EN12966; NEMA-TS4; AASHTO; NTCIP, NEC