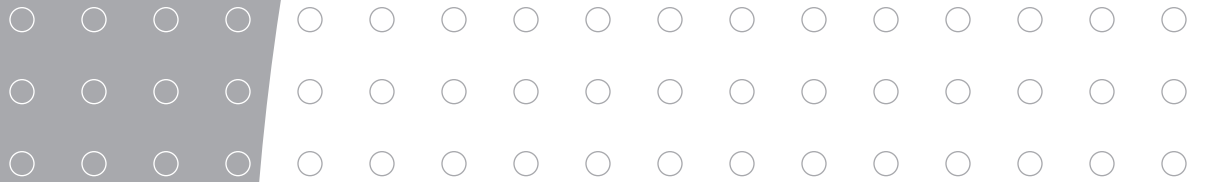




TELEGRA

Smart Traffic Management®



LED VARIABLE MESSAGE SIGNS

« **SIGNS OF INTELLIGENCE®** »



LED Variable Message Signs

**CERTIFIED FOR THE MOST STRINGENT
OPTICAL, MECHANICAL AND ENVIRON-
MENTAL PERFORMANCE REQUIREMENTS.**

Telegra LED Variable Message Signs (VMS) offer the most visible – and the most failsafe – dynamic messaging solutions in the intelligent transportation system (ITS) industry. Backed by more than 20 years of experience and 3,000 successful installations worldwide, Telegra's LED VMS products are approved, tested and certified by all relevant international standards.

More importantly, Telegra is the *only* producer of intelligent traffic management solutions that's 100% dedicated to the transportation industry. That means Telegra's products are custom-tailored to meet *your* specific needs. Our LED VMS options offer:

- » Engineering of the highest quality
- » Exceptional durability and longevity
- » Intelligent error detection
- » Crisp and easily legible text
- » Clear and quickly recognizable pictograms
- » Versatile design and display options
- » Multiple interfaces, protocols and communication choices
- » Fast, easy and reliable control
- » Modular design for easier maintenance
- » Proven reliability

That's why in October 2007 Telegra won the International Road Federation's Global Road Achievement Award in Traffic Management and Intelligent Transportation Systems. It's also why we offer the most comprehensive warranty in the ITS industry. And why we can deliver award-winning LED VMS solutions for you.

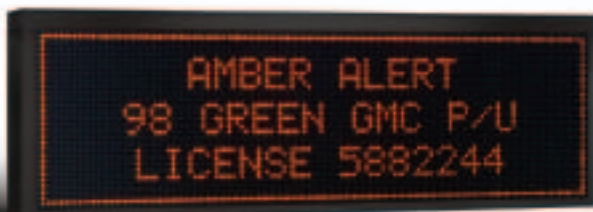
FEATURES THAT SET THE INDUSTRY STANDARD

Telegra LED VMS products are manufactured with the latest generation of LEDs. You can display multiple traffic signs with high light intensity at the lowest power consumption rates.

Basic features include:

- » Independent control, adjustment and reporting on every single LED
- » Symbol display sequences at a rate of 10 symbols per second
- » Error detection and event logging for each pixel in both "on" and "off" states
- » LED drive with or without multiplexing
- » Specially designed optical system applies lower current through the LED to increase light intensity, improving LED light output and efficiency while significantly increasing LED life
- » Enhanced message and graphic image quality ensures visibility under the most adverse weather and environmental conditions
- » State-of-the-art prismatic optical system delivers superior clarity and high contrast ratios while optimizing light output, LED performance and longevity
- » Highly recognizable and outstanding symbol uniformity with character display in TrueType fonts
- » Uniform monochromatic and full color display modules for easy maintenance
- » State-of-the-art color mixing technology increases luminance factors on all RGB full color signs
- » Measurement and monitoring of internal environmental conditions with safety alerts
- » Adjustable light intensity from 0 to 100% in 1% increments
- » Customized dimension, color combination and pixel pitch options
- » Certified for highest optical requirements according to EN 12966
- » EMC immunity
- » High mechanical protection

Telegra's LED Lane Usage Signs (LUS) are effective in tunnels and on open roads above the traffic lanes and can be remotely controlled from a traffic management center.





CORE COMPONENTS – AND MORE

LED variable message signs from Teagra are specifically designed for outdoor environments, no matter how extreme. Back-panel service doors make maintenance easier, and highly durable self-cleaning front-panel lenses minimize system disruption and down times.

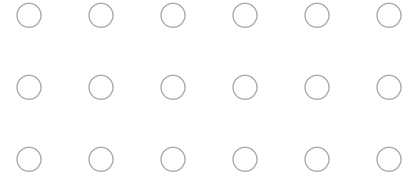
With Teagra's customized approach, you can select features and components specifically suited for your own environmental needs. Components include:

- » Highly durable external housing
- » Intelligent control and drive modules
- » LED mounting on printed circuit boards
- » Control and drive of single LEDs
- » Single LED current control and anti-aliasing techniques
- » Power supply modules (AC-DC SMPS)
- » Temperature supervision modules
- » Circuits and equipment for environmental monitoring (thermostat, hydrostat, ventilation system)

- » Multiple communication options:
 - Hardware interfaces (relay contact, copper wire, fiber optics, serial, Ethernet, wireless (GSM/GPRS/Bluetooth))
 - Communications protocols (TLS, TLS over IP, Profibus, OPC, XML, NTCIP)
- » An optional ambient (external) light intensity measuring module
- » Stand-alone system manager (Windows XP and handheld PDA versions)

Teagra's LED variable message signs typically exceed the most stringent quality standards. Like all our LED products, they utilize the most advanced environmental control systems to intelligently monitor and regulate internal temperature and power usage while external systems track and measure light intensity for optimum LED output.





CERTIFICATIONS

Telegra's LED VMS products meet and often exceed all international standards. Our products are UL and CUL listed, and approved for EN 12966, TUV, CE, RoHS, BAST and ISO 9001:2000 standards. Telegra LED VMS products also comply with:

- » NEMA TS4 and all NTCIP requirements
- » ANSI, IEEE, AASHTO, and AWS certification criteria
- » IEC60068-2-64 standard for vibration and shock endurance
- » MIL-STD-810F standard for sand and dust, vibration and icing/freezing rain
- » IEC60950-1, HD384.4 and HD638 safety standards



American Welding Association | ISO 9001:2000 Certification

Telegra is a member of AAAE, AASHTO, ATSSA, IBTTA, IEEE, IMSA, IRF, ITE, ITS America, NEMA, TEAM Florida, TEAM Texas and TRB

PRODUCT SPECIFICATIONS

Cabinet Welding	Process and fabrication meet ISO EN 131 (GMAW process) and ISO EN 141 (GTAW process) standards; also certified for EN 287
Character Heights	Adjustable to 9", 12", 18" or 24"
Client/Server Architecture	Designed for server and multiple client modules over TCP/IP networks; meets NTCIP standard
Communication Modes	RS485/422/232, Ethernet, GSM/GPRS, Bluetooth, wireless; TLS, PROFIBUS, MODBUS, TCP/IP; SM/MM fiber, twisted copper pairs, radio; others on demand
Contrast Ratio	R2-R3 according to EN 12966
Control Panel	NEMA 3R design and fabrication standards
DC Power Supply	Stabilized, 5 V-12 V
Electromagnetic Interference	LED signs meet electromagnetic interference immunity levels as defined in EN 50293:2000: EN 55022: terminal disturbance voltage, class: B EN 55022: radiated emissions, class: B EN 55014-1: terminal disturbance voltage, discontinuous, clicks EN 61000-3-2: limits for harmonic current emissions, class: A EN 61000-3-3: limitation and voltage fluctuations and flicker low voltage supply system EN 61000-4-2: immunity to electrostatic discharge, failure criteria: B EN 61000-4-3: immunity to radiated electromagnetic fields, failure criteria: A EN 61000-4-4: immunity to fast transients (burst), failure criteria: B EN 61000-4-5: immunity to surges, failure criteria: B EN 61000-4-6: immunity to conducted high frequency interference, failure criteria: A EN 61000-4-11: immunity to voltage drops, short interruptions and voltage variations
EN 12966 Compliance Classification	LED intensity (luminance): L3, L3(*), L3t Luminance ratio: R2-R3 Beam width: B1-B7 Color class: C2 in amber or RGB Temperature: T1, T2, T3 (-38° to +140° F) IP protection: P2, P3 (IP55-IP56)
Exterior Finish	Electrostatic powder coating with chemical preparation using TIGER Drylac RAL matte (based on polyester)
Front Plate	Two-component black matte paint for low light reflection rate
Graphics Software	All standard graphical formats: JPEG, BMP, WMF and more
LED Color	Color class C2; various dimensions and combinations
LED Control	Discreet control of each LED
Message Display Formats	Static, multi-page and scrolling formats available in alpha-numeric text
Options	Flashing signals installed on sign to alert drivers
Pixel Pitch	12 mm. minimum (.5")
Power Requirements	120-240 VAC, 50-60 Hz; 12 V, 24 VDC; low power consumption; power consumption for walk-in model signs may vary substantially due to environmental factors
Pre-Programmed Messages	LED display can store up to 100 pre-programmed messages
Surge Protection	Varistors, fuses, opto-couplers, suppressors, gas dischargers
Warranty	10 years on the external casing; two years on products and services

