

# Vanguard® Features

Daktronics Vanguard® LED VMS are built to perform in the challenging roadway environment. Listed below are those features that set Vanguard VMS apart from other electronic or dynamic message signs. These features ensure the effective and reliable operation of every Vanguard VMS unit.



## Common Vanguard® Features:

- Superior visibility in all weather and lighting conditions
- Offers viewing angle choices (15-, 30- or 70-degree)
- High quality LEDs ensure uniform intensity and color across the display face
- Solid-state LED technology and electronics mean less maintenance and reduced life cycle cost
- NTCIP-compliant controller
- Amber and full-color LED models are available
- Display logos and other graphics on full-matrix VMS models
- VMS automatically reports sign status to central controller
- Aluminum mask over polycarbonate or louvers protect the display face and provide excellent contrast
- Vanguard® VMS Central Control Software offers simple, powerful control of VMS
- Tested to NEMA TS-4 requirements
- All aluminum sign housings are weather resistant
- Sign housings are designed to withstand a 130 mph wind load and truck gusting-induced fatigue
- Functional status of key sign components can be diagnosed from a remote location, eliminating unnecessary maintenance trips
- Housing design provides safe and convenient maintenance
- Automatically controlled brightness of the LEDs based upon ambient lighting levels measured by multiple light sensors
- Sign controller includes powerful, easy-to-use keypad interface with LCD display for on-site display control and maintenance
- Ground-mounted traffic cabinet contains VMS sign controller, power termination and communication equipment
- Thermostatically-controlled cooling/ventilation system maintains optimum cabinet temperature
- Temperature sensors measure and report internal and external temperatures

## Optional Vanguard® Features:

- Fiber optic interface between sign controller and sign eliminates electrical interference
- Upgraded HVAC system includes heaters, humidity sensors and electronic fan control to eliminate display face fogging
- Flashing beacons attract the attention of motorists
- Pole- or sign-mounted VMS sign controller eliminates need for bulky ground-mounted traffic cabinet

### Vanguard® Technical Notes (these notes apply to tables on pages 22-29):

1. Sign housings include 3" zee-extrusion mounting brackets. Contact Daktronics for specific mounting details.
2. Maximum power includes a fully-loaded LED sign and environmental control (no utility outlets included).
3. Sign sites require 120/240 VAC single phase power (three-wire plus ground).
4. Typical power consumption is approximately 15 percent of maximum.
5. Sign housings paint color is flat black on the front. Other sides are mill finish aluminum.
6. Additional model-specific information is available on individual VMS shop drawings and/or cut sheets.
7. Consistent with Daktronics continuous improvement program, all product features are subject to change.

# Standards Compliance

Vanguard® VMS systems conform to relevant codes and ITS industry standards. Daktronics actively participated in the development of the new NTCIP 1203 DMS Version 2 standard and the new NEMA TS-4 standard. Daktronics Vanguard VMS systems conform to the following standards:

## Vanguard® VMS Standards Compliance:

- AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals, Third Draft
- National Transportation Communications for ITS Protocol (NTCIP) – (see details below)
- NEMA TS-4 (Draft) Hardware Standards for Dynamic Message Signs (DMS), with NTCIP Requirements
- ANSI/AWS (American Welding Society) D1.2 – Structural Welding Code – Aluminum
- NCHRP Report 412, Fatigue-Resistant Design of Cantilevered Signal, Sign, and Light Supports
- National Electric Code (United States)
- NEMA Standards Publication 250 – Enclosures for Electrical Equipment
- UL Listed to UL 48, Electric Signs
- C-UL Listed to C22.1 No. 207-M89 for Electric Signs
- UK Highways Agency Standard TR-2136, Issue B2, Performance Level 1 – Optical Performance Specification for Discontinuous Variable Message Signs

## NTCIP Standards Conformance:

- 1101 – Simple Transportation Management Framework (STMF)
- 1102 – Octet Encoding Rules (OER)
- 1201 – Global Object Definitions
- 1203 – Object Definitions for Dynamic Message Signs (DMS)
- 2001 – Class B Communication Profile
- 2101 – Point to Multi-Point Protocol (PMPP) Subnetwork Profile
- 2103 – Point to Point Protocol (PPP) Subnetwork Profile
- 2104 – Ethernet Subnetwork Profile
- 2201 – Transportation Transport Profile
- 2202 – Internet (TCP/IP and UDP/IP) Transport Profile
- 2301 – Simple Transportation Management Framework (STMF) Application Profile

## System Integrator Support:

To support ITS system integrators Daktronics offers an NTCIP VMS software developer's kit (SDK). The Vanguard® VMS SDK includes the following items:

- Fully functional VMS simulator software that runs on Windows®-based computers
- Daktronics NTCIP MIB, including all standard and custom objects supported by Vanguard® VMS
- Expert e-mail technical support from Daktronics engineering staff

The Vanguard VMS SDK documents the advanced features of our sign controllers and helps simplify the NTCIP software integration process.