

SafeXing™ Multi-Mode Speed Radar, VMS, & Advanced Warning Sign Specifications

1.0 Physical Specifications

1.1 Alpha-Numeric Characters (Sign Letters & Numbers)

- 1.1.1 Consistent with guidelines under MUTCD Section 2B.13, the alpha-numeric characters of the sign shall be yellow (amber) legend on a black background, or inverse.
- 1.1.2 Sign shall contain 1,350 yellow/amber (592 nm), AlInGaP LEDs for optimum visibility.
 - 1.1.2 Nominal dimensions of *alpha* characters shall be one row at 6”(h) x 4”(w). Number of characters (letters) per row <6.
 - 1.1.3 Total *alpha* display area shall consist of 270 pixels, 30 pixels wide x 9 pixels high.
 - 1.1.4 Average LED life shall be 100,000 hours of continuous operation, or >10 years.
 - 1.1.5 Standard Messages to read; “LIMIT 25”, “25MPH”, and “SLOW DOWN”.
 - 1.1.6 Sign shall be user-programmable to display a variety of custom messages.
- 1.2 Overall sign dimensions are 12”(h) x 28.5”(w) x 5”(d).
- 1.3 Actuator box dimensions are 8.5”(w) x 13”(h) x 5.25”(d)(not including actuator).

2.0 Power

2.1 Solar power

- 2.1.1 Solar Panels (20 Watts x2)
 - 2.1.1.1 Dimensions: 24”(w) x 11.5”(h)
 - 2.1.1.2 18 polycrystalline cells
 - 2.1.1.3 Max voltage: 17.5V
 - 2.1.1.4 Max current: 1.14A
 - 2.1.1.5 Degradation: 90% (10 years) 80% (20 years)
- 2.1.2 Batteries: 3 x 12AH
- 2.2 In case of Power Outage (Blackout), once the backup battery is drained no words or numerals shall be displayed on the sign in order to reduce driver confusion and potential liability to the owner.
- 2.3 0.4 amps @ 12 VDC depending upon mode used, volume of speeding drivers, dimming settings, and total hours operated per day.
- 2.4 25-150 Watts depending upon mode used, volume of speeding drivers, volume of pedestrians, dimming settings, and total hours operated per day.

3.0 Radar

- 3.1 Low Power – (K-Band).
- 3.2 Part 15 Certified.
- 3.3 Operating license not required.

4.0 Low voltage data surge protection optional

- 4.1 Three-stage hybrid protection
- 4.2 Sneak/Fault current protection with reset-able fuses (PTC's)

5.0 Actuator

- 5.1 Color: black and yellow (standard) black and gray (optional)
- 5.2 Construction: highly durable corrosion-proof chip resistant UHMWPE
- 5.3 ADA: highly visible large actuator
- 5.4 Switch
 - 5.4.1 Triple-seated magnetic reed
 - 5.4.2 Operating Life: >10,000,000 Cycles

6.0 Intercommunication

- 6.1 900Mhz low-profile uni-directional antenna
- 6.2 Transmitter supports multiple receiving channels
- 6.3 Actuation range: 1mile

7.0 Weight

- 7.1 VMS Display Unit: 39lbs
- 7.2 Actuator Box: 15.5lbs
- 7.3 Solar Panels with mounting brackets: 7.5lbs

8.0 Construction

- 8.1 Enclosure - Heavy duty (.090 Gauge) continuous formed aluminum.
- 8.2 Door/Lens – 3/8” Poly Carbonate.

9.0 Paint

- 9.1 Standard color “Glossy Black”
- 9.2 Also available in “Safety Orange” and “White”.
- 9.3 All paint finishes are powder-coat.

10.0 Controller and Software Functions

- 10.1 On board real time clock with built in daylight savings. This setting can be programmed via RS-232 hardware, SD card, (optional) wireless modem, or (optional) wireless WIFI using a PC or Pocket PC or automatically configured using (optional) GPS positioning device.
- 10.2 Clock shall have a battery backup with a three-year shelf-life capacity.
- 10.3 Controller shall be made using Surface-Mount Technology (SMT) to minimize mfg. costs.
- 10.4 Controller/software shall allow radar to operate independently from the display so that the radar can be turned “on” while the display is blank or “off”.
- 10.5 Modes: at least ten (10) combinations of operating modes shall be available. (see chart below). For ease of selection, the following chart shall be available as a help window within the “Mode” screen showing *sign photos* of all available mode combinations.

Mode	Static Display	Dynamic Display	Flashing Display	Actuated Display
0	LIMIT	SPEED	BLANK	BLANK
1	LIMIT	SPEED	DOWN	BLANK
2	LIMIT	DOWN	DOWN	BLANK
3	BLANK	DOWN	DOWN	BLANK
4	BLANK	SPEED	DOWN	BLANK
5	BLANK	LIMIT	DOWN	BLANK
6	BLANK	SPEED	DOWN	BLANK
7	BLANK	SPEED	SPEED	BLANK
8	BLANK	SPEED	DOWN	BLANK

9	BLANK	LIMIT	DOWN	BLANK
10	BLANK	LIMIT	SPEED	BLANK
11	LIMIT 25	VEHICLE SPEED	SLOW DOWN	PED XING

Modes 0 - 10 "Dynamic Display" is activated when a vehicle travels above the programmed "Threshold" speeds.

- 10.6 Max Speed: A user-selectable "Max Speed" setting shall provide Max Speed in mph for all six (6) events of the selected day.
- 10.7 Max2 Display Speed: A second global Max2 shall be available to close a contact or trigger blank-out or other modes.
- 10.8 Conditional or Variable "Speed Limit" (VSL): The sign shall be able to function as a *Conditional* or *Variable Speed Limit* (VSL) sign with user-selectable Speed Limits for all six (6) events of the selected day(s).
- 10.9 Dimming
 - 10.9.1 Controller shall have a dimming capability via "time-of-day" or "automatic". Dimming shall be linear over a range from 5 to 99 where 5 = 5% of full bright and 99 = maximum brightness.
 - 10.9.2 Time-of-Day Dimming: Up to six (6) daily dimming levels can be programmed via RS-232 hardwire, SD card or (optional) wireless modem.
 - 10.9.3 Automatic, linear dimming shall be available via multiple, on-board photo diodes. Two dimming levels ("Day" and "Night") shall be user-selectable from 5 to 99.
- 10.10 Threshold: Controller shall have a programmable threshold. This allows a user to adjust the "YOUR SPEED" trip point. Threshold adjustments are in 1 mile per hour increments over a range of 1 to 99 mph. (Note: km/hr available for international users).
- 10.11 Programming
 - 10.11.1 "Events" screen. In addition to the five parameters described above (i.e., Speed Limit, Threshold Speed, Max Speed, Mode, and Dimming Level), three (3) *Power On-Off* parameters (i.e., Sign Power, Radar Power, & Modem Power) shall be programmable for up to six events per day.
 - 10.11.2 "Copy" Command: When programming daily events and operating modes, the sign shall have the ability to "Copy" one day's settings to another day, all days of the week or all weekdays.
- 10.12 VMS (Variable Message Sign)
 - 10.12.1 Sign shall provide VMS capability via software to allow custom messages such as: "DUI CHECK", "AMBER ALERT", "PED XING", "FINE \$225", "PHOTO RADAR", "SCHOOL ZONE", "ICY ROADS", "WORK ZONE", etc.
 - 10.12.2 "Messages": The ability to create and store custom messages into a "Library" shall be a standard feature.
 - 10.12.2.1 Four (4) different messages may be selected from the library for display in the Static, Dynamic, Max I and Max II conditions.
 - 10.12.3 Display colors shall be amber on black or black on amber per MUTCD guidelines.
- 10.13 "AMBER ALERT" compatibility shall be available via wireless modem.

- 10.14 Power and Battery Monitoring
 - 10.14.1 Utility Power Monitoring: The following AC power conditions shall be monitored and logged to a file for future retrieval:
 - 10.14.1.1 Low voltage conditions
 - 10.14.1.2 Power outages
 - 10.14.2 Battery Monitoring: When battery power/solar power is present, the sign shall monitor the following parameters that can be logged to a file for future retrieval:
 - 10.14.2.1 Battery voltage
 - 10.14.2.2 Load amps

11.0 Communications

- 11.1 RS-232 hardware, SD card, (optional) wireless modem, or (optional) wireless WIFI using a PC or Pocket PC.
- 11.2 The communications port shall allow uploading and downloading of traffic data. Traffic data shall include: Time of Day, Special Event, Master Shutdown, Peak Speeds, Counts, Maintenance, Defaults and Mode Operation data and reports.
- 11.3 An “SD” (Secure Digital) Card port shall be provided as a standard feature to facilitate sign programming and traffic data downloads.
- 11.4 Wireless, Web-based Modem (optional): Modem shall be FCC Compliant:
 - 11.4.1 FCC Part 15, subpart B
 - 11.4.2 FCC Part 90, subpart S
 - 11.4.3 Class B Digital device Modem Features and Description chart (see below)

Modem Features	Description
Data Interface	3 RS-232 connectors for data, GPS and diagnostics
Power Requirements	12 VDC nominal; 10-16 VDC operating
Antenna Inputs	50-Ohm impedance; mini UHF RF connector
Durability Conformance	Tested to Military Standard 810E for resistance to dust, shock, vibration and water
Protocols	TCP/IP; AT commands; ASCII text; NMEA 0183; TAIP and TSIP (Optional)
Case	Black aluminum chassis with pre-drilled flanges
Dimensions	5.0”W x 2.2”H x 7.0”D
Operating Temperature	-40 C to + 70 C

- 11.5 An optional, weather-proof “Direct Connect” box shall be available for easy, ground-level access to the SD Port or serial port.

12.0 TDAS (Traffic Data Acquisition System)

- 12.1 TDAS software and port shall be provided to record, store, download and report the following information:
 - 12.1.1 Low and Peak (Min/Max) Speeds:
 - 12.1.1.1 Peak and Min Speeds logged per day = 100,000 for 30 days (nominal)
 - 12.1.1.2 Maximum capacity of data logged limited only by size of SD memory card.
 - 12.1.1.3 Each Speed record shall have a Year, Month, Day, Hour and Minute stamp.

- 12.1.2 Sample size:
 - 12.1.2.1 # of samples per file: sample size capacity shall be 0 - 999,999
 - 12.1.2.2 Memory capacity = limited to the size of SD memory card.
 - 12.1.2.3 Bin data size = 65,536 (max size accepted by MS Excel)
 - 12.1.2.4 Each Bin shall have a Month, Day, Year, Hour and Minute stamp.
- 12.1.3 Power Monitoring data
 - 12.1.3.1 System shall monitor and log low voltage or power outage conditions and log data as often as required by user.
 - 12.1.3.2 In case of solar power installation, battery voltage and load current are logged on a periodic basis; frequency is selected and programmed by the end-user.
- 12.2 Download Function
 - 12.2.1 Low and Peak (Min/Max) Speeds and Vehicle Sample Data shall be downloadable by periods or dates.
- 12.3 Calculations: the software shall provide standard calculations as follows:
 - 12.3.1 Samples Found – shows total number of vehicles in the date range selected.
 - 12.3.2 Calculated – the total number of samples used in the calculations.
 - 12.3.3 Sample Period – Number of minutes of each data sampling file or package
 - 12.3.4 Range – Shall show the Low (Slowest) and Peak (Fastest) speeds.
 - 12.3.5 Max Speed by Percentiles – the Max Speed shall be shown for the 95th, 85th, 50th, and 15th percentiles.
 - 12.3.6 10 MPH Pace – Shall show the 10 MPH increment that includes the most vehicles
 - 12.3.7 “# In Pace” – Number of vehicles actually in the pace.
 - 12.3.8 “% In Pace” – Percentage of cars in the pace.
- 13.0 Auxiliary Contacts**
 - 13.1 Sign shall provide up to eight (8) contact closures to interface with external accessories and devices such as:
 - 13.1.1 Flashing beacons for school zones, crosswalks, etc.
 - 13.1.2 Photo-enforcement and surveillance camera
 - 13.1.3 Strobe light for simulated or actual photo-enforcement
 - 13.1.4 Worker alert horn or siren to alert workers when a speeding vehicle is approaching
 - 13.1.5 Automatic Flagger Assistance Devices (AFADs)
 - 13.2 Each contact shall be rated for up to 3Amps
- 14.0 Standard Warranty: One Year Parts from date of purchase.**