TAPCO®

Safe travels.™

Icy Road Intelligent Warning System

BlinkerSign®, 120VAC,

Surface Sentinel Activated Single Pole System

Specification Guide

STINSON ITS

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Primary Function:

The primary function of the TAPCO Icy Road Intelligent Warning System (IWS) utilizing the Surface Sentinel sensor is to provide a highly visible, enhanced warning to alert road users from both traffic directions that the conditions exist for icy roads.

Description of Components:

The Manufacturer shall provide components for a 120VAC powered back to back Warning BlinkerSign® System triggered by a sensor mounted on a single pole. Components include:

> BlinkerSigns, Surface Sentinel Sensor, and Control Cabinet with Flash Controller and System Power Supply. Mounting Hardware is included for pole mounting. Optional Static Signage and Pole Package provided as needed to meet requirements.

The Icy Road IWS shall consist of a single pole assembly that shall contain two Warning BlinkerSigns, the System Control Cabinet and a Surface Sentinel Sensor for system activation.

Active vehicle warning indications shall be visible in a direct line of sight at distances over 1000 feet during the day, and over 1 mile at night.

General Requirements:

The BlinkerSign® Manufacturer shall have a minimum of ten years of relevant intelligent traffic product manufacturing experience, as well as a minimum of three years of BlinkerSign manufacturing experience.

Specific Functional and Electrical Hardware Requirements:

System

- Each Icy Road Warning System shall consist of the following:
    - BlinkerSign® Warning Assemblies
    - 120VAC Control Cabinet with Flash Controller
    - Non-intrusive Surface Sentinel Sensor
- When a preset combination of thresholds are crossed that indicate the conditions exist for icy roads, the Surface Sentinel shall trigger the BlinkerSign controller to activate the Warning BlinkerSigns simultaneously. BlinkerSigns shall flash synchronously and then cease operation after the road conditions have improved.

Control Cabinet

- Shall be NEMA 3R Type
- Shall be 15.0” tall x 12.5” wide x 9.9” deep and constructed of minimum 0.080" thick aluminum.
- To promote airflow for internal components, the cabinet shall be vented with screening included on all vents and drains to prevent insects and other foreign matter from entering.
- For security, the cabinet must include at least two tamper-resistant stainless steel hinges and a replaceable #2 traffic lock with keys.
- To facilitate maintenance or repairs, the cabinet shall include a removable control panel to which all control circuit components either mount or connect.
- For easy installation on a wide range of pole sizes and types, the cabinet shall utilize four 5/16"-18 stainless steel mounting studs that mate to a range of bracket options. To ensure a secure mount to the supporting post, two banding style brackets that fit poles with a 2-3/8” or larger diameter shall be included as standard equipment. Mounting brackets also available for square pole, wooden post, and wall mount applications.
- To prevent corrosion, all materials used in the construction or mounting of the control cabinet shall be either aluminum or stainless steel. Anti-vandal mounting hardware shall be available as an option.
- A UV resistant label shall be applied to the exterior of the cabinet and include system specific information including model number, serial number, date of manufacture, as well as any applicable regulatory compliance information.

BlinkerSign® Controller

The BlinkerSign Programmable Flash Controller is housed within the NEMA 3R type Control Cabinet, and shall:

- Include integrated constant-current LED drivers with a minimum of two-channel output for driving one or two BlinkerSign units.
- Flash the BlinkerSign LEDs 50 to 60 flashes per minute.
- Have multiple programmable function options:
    - Run 24 hours per day, 7 days per week

    - Run from dusk to dawn
    - Run for a programmable time period when activated via switch, button contact closure or when triggered from an external sensor such as a wireless transmitter, radar, presence detector or loop detector with a compatible sensor output.
    - Run on a timeclock schedule that is programmed to the controller and determines days of the week and times of the day that the sign flashes.
- Provide multiple levels of BlinkerSign LED brightness through LED drive current control
- If specified, automatically adjust the BlinkerSign LED drive current control to optimize brightness for the ambient lighting conditions.
- If specified, automatically adjust the BlinkerSign LED duty cycle to save battery during nighttime operation.
- Have the BlinkerSign LED drive outputs reach the full output current as programmed within the duration of the 100ms on-time.
- Include an integrated Real Time Clock (RTC) with on-board battery backup.
- Have the capability of RS232 communication for programming with Windows-based software.
- Include a minimum of two General Purpose Inputs and Outputs (GPIO).
- Be internally housed in its own IP67 type enclosure.
- Be independently replaceable of other control panel components
- Be able to monitor internal temperature.
- Operate between the temperatures of -40° to +176°F (-40° to +80°C).

Universal Switching Power Supply

The Universal Switching Power Supply shall:

- Accept a universal AC input, 100-240VAC, 50/60 hz
- Output 12 VDC regulated to +/- 1%
- Have Short Circuit, Overload and Over Voltage protection
- Be convection cooled, DIN rail mount
- Have an LED power on indicator
- Be UL60950-1, TUV EN60950-1, Class I, Div. 2 Group A,B,C,D and Hazardous Locations T4 Approved
- Operate in a relative humidity of 20 to 90% non-condensing
- Operate from -4° to +158°F (-20° to +70°C)

BlinkerSign® LED Signs

- All signs shall conform to 2009 Federal Highway Administration's MUTCD section 2A.07 on retro reflectivity and illumination.
- Each sign shall have eight quantity Day-Viz® Daylight-Visible, high power 1 watt LEDs.
- Each sign blank material shall be a minimum of 0.080" thick aluminum and sized to meet the requirements.

- Each sign face shall consist of 3M™ Diamond Grade™ DG3 reflective fluorescent yellow sheeting, as required.
- Sign sheeting shall be applied to the sign blank with a 3M™ 1160 Premium Protective Overlay film to provide an additional layer of graffiti protection.
- The BlinkerSign legend shall be a MUTCD approved unless specified otherwise.
- The LEDs shall be embedded individually into 1" diameter holes around the perimeter of the sign and shall be ultrasonically welded to the sign assembly to provide maximum strength and rigidity.
- LED color shall be amber.
- Each LED shall be sealed within a 7/8" diameter, heat-dissipating plastic enclosure to provide resistance to weather and vibration.
- LEDs shall be wired in parallel electrically so that remaining LEDs continue to flash in the unlikely event of the failure of any individual LED.
- Wiring between BlinkerSign® LEDs shall be encapsulated inside 1" x 3/8" aluminum extrusions secured to the back of each sign assembly, to provide weather resistance and protection.
- Each sign shall have adequate holes for mounting to a pole or post. Optional vandal-resistant fasteners to mount the BlinkerSign® LED sign assembly to a pole or post shall be available.
- UV-resistant label(s) shall be applied to the back of each sign assembly and shall include specific information such as the manufacturer, manufacturer phone number, model number, serial number, date of manufacture and any applicable regulatory compliance information.

Surface Sentinel Sensor

- Shall be manufactured by High Sierra
- Shall contain a non-intrusive, infrared road surface temperature sensor
- Shall contain air temperature and relative humidity sensors
- Shall provide a dew point measurement as derived from the air temperature and relative humidity measurements
- Shall contain an aspiration fan for accurate temperature and relative humidity readings
- Shall have the ability to trigger an output based upon a user programmed combination of road surface temperature, air temperature, relative humidity and dew point measurement conditions being met
- Shall be able to measure the road surface temperature from a distance of 3 to 50 feet
- Shall be able to measure road surface temperature within a range of -40°F to 185°F, accurate to +/- 1°F at 32°F
- Shall be able to measure air temperature within a range of -40°F to 149°F, accurate to +/- 0.4°F at 32°F
- Shall be able to measure relative humidity within a range of 0% to 100%, accurate to +/- 1.8% from 10% to 90% RH.
- Shall operate from -40° to +185°F (-40° to +85°C)
- Shall be provided with all necessary mounting hardware and wiring

Warranty

The Manufacturer shall offer a three-year unconditional warranty against all defects in material and workmanship.