



when nighttime headlight reflections occur, or when fog obscures the video. It will improve the crispness of detection outputs.

### **2.12 Environmental**

The detection system will operate reliably in the adverse environment found in the typical traffic intersection and cabinet. It will meet the environmental requirements set forth by the NEMA (National Electrical Manufacturers Association) TS1 and TS2 standards, as well as the environmental requirements set forth in the TEES standard. In the cabinet, operating temperature will be from -34 C to +74 degrees C (-29 F to +165 F) at 0% to 95% relative humidity, non-condensing.

### **2.13 Electrical**

The hybrid detection system will be powered by 110 or 220 VAC to the interface panel, typically from the protected side of the cabinet power distribution. The detection module will consume 11 watts at 12 or 24 VDC, typically from the protected side of the cabinet power distribution. The sensor will consume 8 watts at 24 VDC as provided by the interface panel.

The detection module will include transient protection sufficient to meet the requirements set forth in the NEMA TS1 and TS2 standards. The interface panel and sensor will have appropriate surge protection. No supplemental surge suppression will be required.

The manufacturer of the hybrid detection system will have a Quality System that is ISO9001 registered. Written confirmation of the ISO9001 registration will be available from the manufacturer prior to bid acceptance if requested.

Communications will be via RJ45 connector for Ethernet 10/100MB/s communications on the front of the detection module. This port will be able to download traffic data stored in non-volatile memory as well as the real-time detection information to show detector actuations. The detection module unit will also include one (1) USB 2.0 connector for RS-485/USB communications from the sensor through the interface panel.

The detection module will be equipped with one (1) NTSC composite video input. The detection module will be equipped with a single composite video output BNC connector on the front of the detection module. The detection module will output standard NTSC or PAL video format via BNC connector at 1 Vpp.

The detection module software will be stored in flash memory within the detection module. This software will be capable of being updated without the removal of modules or memory devices. The detection module software and the supervisor will include diagnostic software to allow testing of the detection module functions. This will include the capability to set and clear individual detector outputs and display the status of inputs to enable setup and troubleshooting in the field.

The video output of the sensor will be isolated from earth ground. All video connections from the sensor to the interface panel will also be isolated from earth ground. The video output stage of the image sensor will include transient protection to prevent damage to the sensor due to voltage transients occurring on the coaxial video cable leading from the sensor to the detection module.

### **2.14 Detection Module Operations Log**

The detection module will maintain a non-volatile operations log, which minimally contains: revision numbers for the current detection module hardware and software components; title and comments for the detector