supplied to ODOT. The specifications for connectors, components, mechanical workmanship, engineering and environmental testing shall comply with CalTrans Specifications

B. Indicator Lights. All indicator lights shall be water-clear (not colored or diffused lenses), ultra-bright light emitting diodes (LED) whose states are clearly readable in direct sunlight. Each conflict monitor channel shall provide separate red, yellow and green LEDs.

1. A GREEN AC POWER indicator light shall be provided.
2. Indicator lights shall be arranged in a vertical pattern with FAULT status lights as the upper indications and the output channel lights as the lower indications (See sections 962.06, A and I). An acceptable alternative is to provide a single fault indication and a supplemental display that clearly indicates the fault type.
3. A failure shall cause its respective indicator light to display.

C. Monitor Power. The Monitor shall not use the 24VDC power supply being sensed to run any of its internal circuitry. The watchdog, stop time, external reset, and 24VDC monitor input circuits shall be optically isolated from the Monitor internal power supply and shall be conditioned to provide proper sense circuit operation throughout the operating range.

D. Power Fail. A line voltage less than 85 V ac ± 2 V ac shall be considered a power failure. A power failure shall not result in resetting the Monitor. The Monitor once triggered by detection of a fault shall remain in that state until a Reset Command is issued. Reset is issued only by the Front Panel Control Switch or by the External Test Reset input.

E. Power up. The Monitor shall be compatible with the Model 170E controller as well as the Model 2070 controller unit which requires several seconds to power-up. When power is established, > 103 ± 2 Vac, the 2010 will power up in the FAULT RELAY RECOVERY mode:

When power is established, FAULT RELAY RECOVERY shall be initiated. For an interval of 6.0 ± 0.5 seconds, the following will take place:

The Output Relay contacts remain closed, and the Stop Time output remains active.
All fault monitoring functions remain suspended.
The AC POWER indicator light flashes at a 2 Hz rate.

At the end of this time interval, the Monitor begins counting Watchdog transitions from the controller and prepares to resume normal fault monitoring.

The resumption of normal Fault monitoring shall occur when either:

The Monitor has counted 5 transitions between the True and False state from the controller Watchdog; or
10 ± 0.5 seconds has elapsed from the time of LINE RECOVERY.

If the controller Watchdog output does not become active, the Monitor shall go into a Latched Fault condition.

F. Cabinet Signals Monitored. The Monitor shall be designed to monitor Green, Yellow and Red AC circuits at the field output terminals of traffic signal cabinets. In addition, the cabinet 24VDC supply, and the Model 170E/2070 controller Watchdog Timer output shall be monitored. These signals are processed by the Monitor circuitry, and if a failure is determined to have occurred, a relay output contact closure (FAILED state) places the cabinet and intersection into flashing operation.

G. Failed State Output Circuits.

1. An electro-mechanical relay shall be used to provide the FAILED STATE output circuit. The relay contacts shall be normally closed (FAILED STATE). In a NON-FAILED state (relay coil energized), the contacts shall be open. The function of this output circuit is to initiate flash operation within the cabinet and transfer field circuits from the switch pack outputs to the flash bus during a FAILED STATE.

2. The relay contacts shall be rated for a minimum of 3 amperes at 120 V ac and 100,000 operations. Contact opening/closing time shall be 30 ms or less. The contacts shall present a minimum impedance of 50,000 ohms in the open state.

3. The Stop Time output shall be active whenever the output relay contacts are in the FAILED STATE (closed). It shall be inactive whenever the output relay contacts are in the NON-FAILED (open) STATE.

H. Monitor Unit Reset. A front panel momentary SPST pushbutton switch labeled "RESET" shall be provided to reset the Monitor to a Non-FAILED state and restore normal monitoring operation. The switch shall be so positioned on the front panel that the switch can be operated while gripping the front panel handle.

The External Test Reset input line shall reset the Monitor circuitry to a Non-FAILED state and restore normal monitoring operation. It shall be optically isolated from the internal circuitry. A reset issuance by either source (Unit Reset) shall be triggered by only the leading edge of the input signal (this will prevent a constant reset due to either a switch failure or a constant external input). A constant reset input shall be ignored within 5 seconds of issuance.

I. Input Impedance. Input impedance for all monitored AC inputs shall be 200 kohms ±100 kohms.

J. Connectors. Both Monitor and Conflict Program Card Connectors shall be PCB 28/56P Type. All edge connectors shall use the "bifurcated bellow" type contact or equivalent.

K. Door Ajar Circuit. Pin 24 shall be connected to pin 25 on the Monitor PCB at the edge connector and be capable of carrying one ampere per CalTrans specifications.

L. Handle. The handle placement and design shall be such that no interference between the handle and a closed cabinet door exists.