



The Topping Electronics Model 212E is a solid-state microcontroller-based Conflict Monitor designed to work reliably in the harsh environments found in traffic control applications. The Model 212E is designed to replace the Model 210 Monitor for circumstances where enhanced monitoring is desired. The Model 212E can be plugged into the slot for a Model 210 and will monitor the same inputs. If the expanded monitoring capabilities of the Model 212E are required, only minor cabinet wiring changes are required to connect the extra signal leads to the monitor connector.

Field programming of the monitor is accomplished by means of a series of DIP switches on the main board and by clipping out diodes, for non-conflicting signals, from the plug-in programming card. The standard diode programming card is supplied for a full 8-phase configuration with pedestrian signals.

**Monitors 8 red input signals in addition to the 16 green & amber inputs of the Model 210 conflict monitor.**

**Treats the Ontario advance flashing green ball as a green turn arrow.**

**Detects any missing or multiple signals on a phase.**

**Enhanced watchdog operation detects missing, slow or fast watchdog signals.**

**Meets or exceeds Ontario Ministry of Transportation specifications.**

## SPECIFICATIONS

**Dimensions:** 9.3" high x 11.2" deep x 1.375" wide  
(49cm x 28.5cm x 3.5cm)

**Weight:** 2lb (0.9 kg)

**Power Requirement:** 88 to 135VAC, 60Hz  $\pm$  3Hz, 7.5VA maximum

**Environment:** -50°C to +74°C, 0-95% relative humidity.  
All units are given a minimum 100 hours burn-in and full range temperature test prior to shipment.

**Mounting:** P.C. card slot designed for standard 210 Conflict Monitor. Additional cabinet wiring to the monitor edge connector is required to monitor 8 red signal inputs.

### Microcontroller

The Model 212E uses an 8 bit Motorola MC68HC711D3 processor chip with a system clock frequency of 2MHz. This chip contains internal one time programmable memory, static RAM and a multiplexed address/data buss to access external devices.

### Inputs

The 212E has 40 input lines for monitoring signal head line voltages, 3 x 170 controller compatible logic input lines, and a 24V DC supply input monitor.

### Outputs

The 212E has 3 x 170 controller compatible logic output lines, and one relay output. The relay output is rated for 4 Amps @ 250VAC or 3 Amps @ 30VDC.

### Front Panel

The front panel of the monitor has a slot for the programming card, a pull handle, and mounts the displays, fuse and reset switch.

### Displays

The front panel display comprises 23 red, ultra bright LED's. These are used to indicate active phases, any conflict status, overlap and spare inputs, 24V DC supply status, watchdog failure monitor processor failure and AC power status.

### Approval

The Topping Electronics Model 212E Conflict Monitor is approved by the Ontario Ministry of Transportation and is on their Qualified products list.