

# **ENVOYS ELECTRONICS Pvt. Ltd.**

## **SPECIFICATION FOR ROAD TRAFFIC SIGNAL CONTROLLER – Actuated controller ( vehicular / pedestrian ) . with I/ p channels**

(Model no : EMTC –05 )

### **MULTI PHASE – MULTI PROGRAMMED – ACTUATED CONTROLLER**

#### **1. GENERAL**

**1.1** These Traffic Controllers have been designed to confirm to Indian Standard specification IS : 7537 – 1974 and British Standard Specification No. BS : 505 – 71 wherever applicable and standard international practices.

**1.2** The Controller is fully Solid State and has no moving parts. The controller employs fully Micro controller based Circuitry on double side glass epoxy PCBs which have green masking to counter, tracking problem and is modular in design, having plug in system for easy maintenance and operations. System design is such that it takes care of conflicting lights on opposite roads and has short circuit protection and optically isolated outputs.

#### **2. CAPABILITY OF THE CONTROLLER**

**2.1** The basic controller is capable of being operated in any of the following modes :-

**2.1.1** As an independent fixed time controller at an isolated intersection. Multiplan

**2.1.2** As a manually operated controller with optional remote station at police booth .

**2.2** The main frame of the controller will have facilities for extending the capability of the controller for any of the following additional modes of working by addition of suitable modules at any stage.

**2.2.1** .

**2.2.2** As a part of micro controller based multi programmable system.

**2.2.3** As part synchronized green wave system with neighboring intersection . (optional )

**2.2.4** Vehicle / pedestrian actuated mode , with optically isolated input channels . with comm. Port for reverse count down timer . (RS 232 + RS 422 / RS 485 )

### **3. CAPACITY**

**3.1.0** The basic controller is designed to provide for control of vehicular and Pedestrian traffic having control of 32 outputs, as per requirement. The Controller will be capable of providing any required o/p signal sequence.

**3.1.1.** The controller will have 24 cycle plans (including one for night flashing). And can select multiple day plans including Actuated mode , peak hours timing , off peak hours , any scheme as and when required in the day Plan .

**3.1.2.** It will be possible to buildup a 24 hours day plan from the combination of Cycle plans such that a particular cycle plan is in operation during any Desired period of the day. It will be possible to provide more than 24 Changes of cycle plans in a period of 24 hours.

**3.1.3** With the help of key board & display unit or through PC with help of windows based software in Simple English menu, system can be programmed or edited at site by operator / police man even without knowledge or training of electronics or software programming. ( transmit the data & also retrieve the data . )

**3.1.4** Controller can be programmed for weekdays of the month and for holidays Or any special day of the year .

**SELF DIAGNOSTIC TYPE :** typical faults .

- 1) Conflicting signal
  - 2) Time errors
  - 3) Memory checksum error
  - 4) Power supply fault
- And other as required by user .

## **4. BASIC CONTROLLER REQUIREMENTS**

**4.1.** The operation of all signals will be positive without dark intervals or flickering lights. The signal light switching wiring is interlocked to prevent simultaneous display of conflicting green signals.

**4.2.** The controller will have facility to set each stage time for any duration from 1 to 199 seconds. ( can switch On / Off / Blink any output )

**4.3.** *The change from one cycle plan to the next cycle plan will occur at the end of a cycle and not halfway through a cycle. Similarly the first cycle of the new plan will start with stage one and not midway through a cycle.*

**4.4.** In any day plan, it will be possible to repeat the same cycle setting for multiple cycle plans.

## **5. FRONT PANEL CONTROLS**

The traffic control unit will incorporate the following controls on the front panel:

**5.1.** ON / OFF Switch.

**5.2.** Control circuit fuse.

**5.3.** Control Circuit Supply Indicator.

**5.4.** LAMP TEST SWITCH

**5.5.** Stage Indicators.

**5.6.** LCD DISPLAY 2 LINE 16 DIGIT WITH BACK LIGHT

**5.7** **Key Board / PC interface ports .**

**5.8.** AUTO MANUAL SWITCH.

**5.9.** Police man control box ( optional)

**5.10** Flash MODE switch.

## **6. FLASHING SIGNAL**

The controller will be equipped with a reliable electronic flashing unit that would flash Amber signals in the following conditions:

- a) When the day plan provides for it.
- b) When fault monitor alarm has detected a fault in the signaling system.
- c) When switched to this mode by manual control.

The flashing unit will conform to the following specifications: -

**6.1.** A solid state blinker will be provided for flashing Amber signal lights.

**6.2.** The flashing rate will be within the range of 30 flashes per minute when this applied voltage varies in the range between +15% and -20% of its nominal values  $\pm 4\%$  of its nominal frequency over an ambient temperature range of 0 to 55c.

## **HARDWARE**

1. CPU : 89C series (Atmel / Philips)
2. Memory :: EEprom.
3. Clock : Built in RTC with 10 years battery backup
4. Protection : : Auto Shut down on fluctuation beyond limits and Auto Start up on restoration .
5. Output switching : Through solid state devices with zero cross over & optically isolated .
6. Input / Output isolation : Output switching isolated from control circuit by optical isolation.
7. Police Control Panel : Output OFF, Auto / Manual Step & Flash , Lamp Test
8. Programming Facility :
  - i. PC Compatible by RS 232 / 422 communication.
  - ii. Built in Keyboard & LCD display.
  - iii. Comm . port for count down timer 4 ports RS 422 one for each road cdt.
  - iv. RS 232 serial comm. Port for PSTN / GSM modem attachment . ( Optional)

## **MODES OF OPERATION**

1. CABLESS LINKING MODE
2. CABLED LINKING MODE .
3. FIXED TIME
4. MANUAL OPERATION
5. VEHICLE ACTUATED
6. FLASH MODE

**With windows based software for easy programming for fixed time , multiple time & actuated mode with preview option , retrieving data from controller , 2 way communication .**

# **VEHICLE ACTUATED MODE**

## **GENERAL**

Vehicular actuated systems operate the Traffic lights by detecting the movement of the arriving vehicles in the controlled zone. A detecting loop is buried below the ground at a suitable point for sensing the vehicles. The loop is connected to an Electronic vehicle detector. This is a very precise and discriminatory device with adjustable sensitivity and gives an input signal to the controller every time a vehicle passes over the sensor. The controller operates the Traffic lights as per a pre-scheduled flexible program.

## **SUITABILITY**

MINIMUM 4 detector controller suitable for a section where the Road is not wide enough to allow bi-directional movement of vehicles ( 1 DETECTORS FOR EACH ROAD ) . The controller allows the traffic in single direction and the timings are automatically schedules by the controller on the basis of information provided by the Vehicle sensors.

## **EQUIPMENT**

The essential equipment for the system will comprise following items .

Traffic Lights Signals to be installed at the entry points of the Road section to be controlled.

Vehicle detectors at sensing point :-

channel Vehicle Detectors.:- as per customer requirments max 16

Twisted high frequency Cable and other installation material as required. .extra

## TECHNICAL DATA of CONTROL UNIT

1.	Working Supply	110 / 220 VOLTS A.C. 50 HZ
2	No Of Detectors	16
3	Controller Outputs	Max 32
4	Electronic Design	Micro-controller based circuits for sequence programming and vehicle detection.
5	Timers	Adjustable from 0 to 199 seconds
6	Programming	By means of HHT on the front panel with 16 character Alphanumeric LCD display , keyboard or through PC by windows based software
7	Mode of operations	1.Actuated mode 2. SYNCHRONOUS MODE .( optional) 3. Manual mode with stage advancing at the press of push button manually 3. Multiple day plan mode 4. Blinking mode
8	Lamp Switching devices	Solid state Relays (SSR)
9	Execution	The control unit with Programmer and Detector units is assembled in a standard 483 mm 3U cabinet. The MCBs, and SSRs are mounted in a MS panel. Both the above assemblies are housed in an outdoor type cabinet .

## THE OPERATING SCHEDULE

Abbreviations used are explained below .

Each stage ( sequence ) is allotted with minimum time , maximum time and channel sensing delay . These are variable and can be modified end number of times by user as per the requirement with the help of Windows based software & at site also .

Minimum time : Duration allotted to the stage for minimum green period & also decrease the cycle time of that particular stage in case no vehicle is sensed.

Maximum time : Maximum duration of time allotted to the particular stage in the sequence ( scheme) .

Channel sensing delay : duration of time allotted for vehicle detection .

When switched on the system will operate as under: ■

**The green period of that particular stage will be pre setted to maximum time allotted for the stage & same will be displayed at count down timer of that particular road . In case of no detection ( as per channel sensing delay ) same will be deducted in slab of minimum time allotted to that stage and will not decrease the time less than minimum time allotted for that stage . There will be no changes once the flashing last 10 seconds display in count down timer of that stage .**

**In same manner will proceed to next stage in cycle as per the scheme of the Plan .**

## 7. MANUAL OPERATION

It will be possible to bring the controller under manual control by operation of auto manual switch in police box. The operation of the switch would result in transfer control over the duration of each stage from the electronic timing unit of the controller through a push button only manual control switch. The sequence of stages preset on the electronic unit will remain undisturbed.

Each time of push button is pressed, the current stage will changeover to the next stage in the controller. The duration of the stage in manual control is determined by the interval between successive operation of the push button.

A separate over-riding switch is also provided in the police box such that the operation of the switch puts the controller to flashing Amber mode.