

# GENERAL NOTES

FED. RD. DIV.	STATE	PROJECT
5	OHIO	T-4030-(13)

4  
38

LAKE COUNTY  
LAK. - 20-14-30  
LAK. - 86-0-25  
AND WASHINGTON STREET  
AND ST. CLAIR STREET

## OPERATING MODE SWITCHES

Each vehicle phase module shall include a selector switch to provide the following operation variations:

1. Recall extendible
2. Recall Maximum
3. Memory Off
4. Memory On
5. Vehicle phase modules equipped with pedestrian timing and exclusive pedestrian modules shall include a two position switch which in the "On" position will place the phase on "Recall-Pedestrian."

## WIRING PANEL

Each controller cabinet shall have mounted therein a wiring terminal and component panel in such manner as to make the wiring and supplemental components neatly done and readily accessible and visible.

1. The main power for the controller shall be 115 Volt  $\pm$  10%, 60 Hertz.
2. The main power supply in the cabinet shall be protected by a 20 amp circuit breaker mounted on the panel.
3. A remote terminal block for system interconnection shall be provided and fused as necessary.
4. Solid state load switching shall be mounted on the panel and full wave green conflict monitors provided.

## COORDINATING UNITS

Dial coordinating units shall be provided in each local controller to interconnect the actuated locals to the traffic responsive master controller.

1. Dial coordinating units shall have three (3) dial units.
2. Each dial shall be plug connected and shall be so constructed that it may be installed or removed without the use of tools.
3. The timing dial of each dial unit shall be driven by a self-starting sealed, synchronous motor requiring no lubrication.
4. The front of the dial shall have a calibrated scale for the setting of each function such as yield and force-off. The dial shall at all times show a visual indication of the percentage of the time cycle allocated to each interval.
5. The timing dial shall have an offset scale for setting the offset relationship between master and secondary dial coordinating unit.
6. Each dial shall be equipped with color coded keys which shall snap in and out easily without tools and shall be self locking.
7. Each dial unit shall be equipped with a five contact dial block wired for the following functions: three reset contacts, one interlock (yield).
8. Each dial unit shall be designed for provision of split transfer through a printed circuit board.
9. All printed circuit board control relays shall be plug-in type and completely inter-changeable with one another.
10. The dial coordinating unit shall be plug-in connected to the controller panel. The plug connection shall be MS type.
11. The coordinating unit shall be equipped with indicating lights for cycle, offset and split functions in effect and include test switches to determine cycle and split called for by the master.
12. An external free operation relay assembly shall be included to allow free operation of the timer when the coordinating unit is removed from the circuit.

## CABINETS

Local controllers shall be housed in base mounted, weatherproof cabinets, clean cut in design and appearance.

1. The size of the cabinet shall be such to provide ample space for housing the timer, panel, coordinating unit, detector amplifiers, conflict monitors and other associated electrical devices which are furnished with the controller.
2. Metal shelves shall be furnished for the timer and accessories as required.
3. A hinged door shall be provided permitting complete access to the interior of the cabinet. When closed the door shall fit tight against a gasket and provide a strong lock and key.
4. The cabinet shall be bolted to a concrete base by anchor bolts. The concrete base shall be of sufficient size as to protect the controller cabinet from damage by vehicles.

## ENVIRONMENTAL PROTECTION

The following protections shall be built into the timer:

1. Electrical - The timer shall operate at 115 Volts AC,  $\pm$  10%. All timer inputs shall be capacitor filtered and include power line surge protection. A power interruption of less than 0.5 seconds shall not affect the continued cyclic operation of the timer. Power failures longer than 0.5 seconds shall cause the timer to re-initialize when power is resumed.

The timer power supply shall be designed to prevent over voltage from damaging any internal timer components.

2. Temperature - The timer shall operate satisfactorily over the range of  $-30^{\circ}$  F to  $+165^{\circ}$  F.
3. Humidity - The timer shall operate satisfactorily up to 95% relative humidity and shall be capable of passing MIL - E - 005272C.
4. Vibrations - The equipment shall be capable of withstanding a .5G acceleration at any resonant frequency from 5 to 30 hertz in any of the three mutually perpendicular planes.
5. Dust Resistance - The timer shall be fully enclosed to deter the entrance of dust and dirt.

Payment for Semi-Vehicle actuated, three phase full vehicle actuated and four phase full vehicle actuated controllers will be made at the contract unit price bid per each Item 625 Signal Controller Secondary, Type III completely installed, wired, tested and accepted.

## 625 MASTER CONTROLLER

### GENERAL SPECIFICATIONS

All component parts shall be a high quality, meeting the acceptable standards of good engineering practices. The controller shall operate satisfactorily between a temperature range of  $-35^{\circ}$  F and  $120^{\circ}$  F.

### POWER

The controller shall be designed to operate on a 120 volt, 60 cycle normal power supply.

The controller shall function satisfactorily at any voltage within plus or minus 10 per cent of the rated voltage.

### DESCRIPTION

The master controller shall act as a supervisor of the entire system of local controllers and shall act as the coordinating unit for the system supplying a synchronizing signal for the offset circuit selected by the master control. This signal occurs once per cycle and ensures that all secondary intersection controllers in the system remain in the proper offset relationship with the master.

The Master Controller shall be so designed as to encompass the following equipment:

Three dial master coordinating unit  
Three dial offset interrupter  
Weekly programmer and time switch  
Master control panel lights and switches  
Free standing rack type cabinet

### MASTER COORDINATING UNIT

1. The coordinating unit shall be equipped with master supervisory dial unit contacts for automatically establishing the offset relationship of the secondary dial coordinating units within the system.
2. All dial coordinating units shall have provision to utilize three dials.
3. Each dial coordination unit shall be designed for provision of split transfer through use of an optional printed circuit board to provide split transfer capability in association with 5 contact dial unit (s).
4. All printed circuit board control relays shall be plug-in type and completely interchangeable with one another to simplify maintenance requirements.
5. The dial coordinating unit shall be plug-connected to the controller panel so that it may be replaced with a similar unit without the necessity of disconnecting or reconnecting individual wires. The plug connection shall be MS type.
6. The coordinating unit shall be equipped with indicating lights for cycle, offset and/or split functions in effect and include test switches to determine cycle and/or split called for by the master.

### OPERATION

#### SEQUENCE

1. The coordinating unit shall provide and allow for consecutive divisions of a time cycle hereafter termed intervals.

#### TIMING

1. It shall be possible to set up a separate and distinct program of interval timing on each dial unit.
2. It shall be possible, when specified, to transfer operation from one dial to another, and/or one split to another, remotely or automatically. Automatic transfer shall be accomplished through the use of weekly programmer and time switch.
3. The switching from one dial to another and/or one split to another, shall be accomplished through the use of electrically latched relays.

## DESIGN

### DIAL UNIT

1. Each dial unit shall be plug-connected and shall be so constructed that it may be installed or removed without the use of tools.
2. The timing dial of each dial unit shall be driven by self-starting sealed, synchronous motor requiring no lubrication. This motor shall have ample torque to drive the dial at constant speeds under all normal operating conditions.
3. Each dial shall be equipped with color coded keys which shall snap in and out easily without tools and shall be self-locking.
4. The dial shall be equipped with an easily removable time cycle gear, available 30 - 120 seconds in 5 second steps.
5. Each dial unit shall have a visual indication of the time cycle set on the dial.

### OFFSET INTERRUPTER

1. The offset interrupter shall be identical in all respects, and interchangeable with the Master Dial Coordinating Unit with the exception of the programming jumpers.
2. The interrupter shall be a three dial unit capable of supplying three different cycle lengths.
3. The interrupter dials shall be equipped with cycle gears giving it a cycle length five seconds faster than the corresponding master and secondary dials in the system. The four reset keys on each interrupter dial shall be placed to divide the cycle into four equal parts.
4. Interrupter unit shall be equipped with indicating lights for cycle, offset and/or split called for by the master.
5. The interrupter unit shall be plug connected to the controller panel.
6. Dial units used in the interrupter shall be identical to and interchangeable with the dial units of the Master Coordinating Units.

### WEEKLY PROGRAMMER AND TIME SWITCH

1. The programmer shall be used to program up to ten functions at twelve daily intervals.
2. The programmer shall be an electronically controlled, solenoid operated device used in conjunction with a time switch to close ten miniature switches.
3. The cylindrical dial on the face of the programmer shall have 84 equally spaced slots divided into 12 daily intervals for each of the seven days of the week.
4. Snap-in type keys, each with 10 break-off tabs shall be placed into the slots. Each key shall be capable of programming up to 10 daily functions.
5. A recessed 18 point multi-pole plug shall be mounted on the front of the frame which will electrically connect the switches to the rear panel through a multi-pole receptacle and color coded wiring harness.
6. A time switch shall be used to energize the rotary type solenoid in the program unit.
7. The time switch shall contain 96 2-position keys in 15 minute increments.
8. The keys shall be permanently retained in the outer rim of the dial on the front of the time switch.
9. The keys shall actuate the switch arm of the time switch sending an impulse to the solenoid of the program unit and, in turn, causing the drum of the program unit to move one position.
10. Devices which provide output capabilities equal to that of the unit described in items 1 - 9 above, but not necessarily having the exact mechanical and electrical construction described will be acceptable.

### PANEL LIGHTS AND SWITCHES

1. The Master Controller shall contain a panel of indicating lights and switches.
2. The panel lights shall be lamps of sufficient size to properly illuminate a red color screen and provide a clear indication even in bright sunlight.
3. The indicating lights shall be used for all the functions called for by the master: dial, offset and split in effect.
4. Each of the indicating lights shall be properly marked.
5. The switches shall be double pole, double throw, maintained contact and shall be located on the panel directly beneath the corresponding pilot light.
6. The switches shall permit override of the Master Controller or manually select program functions.