



SOLAR TRAFFIC CONTROLS

“Wireless” Traffic Control Solutions

Warehouse / Industrial Traffic Controller

Model 80ITSWHTC-4uW-SO 60139

Approach Only Sensors with Extended Operation Range for Single Lane Vehicle Test Tracks

Rev. 1.0, 08/25/06, Software: EATON HILLS-TEST-TRACK-A

General

This is an enhanced version of the single lane industrial traffic control unit which employs long range sensors over a track that can extend several hundred feet long. It is designed to increase safety for users in single lane traffic control situations, both at the entry and while in path. The system consists of 4 directional microwave detectors, the control unit, 2 red/green traffic indicators located at each end of single lane path and supplemental flashing yellow lamps. Figure 1 shows a diagram of the system set up on a single lane path. Figure 2 provides a conceptual overview of the hardware for the project.

Theory of Operation

Refer to Figure 1 for the following discussion. This system is sensor activated. The sensors are configured as directional-sensing devices at each end of the single lane path. Sensors 1 and 4 are at one end of the tunnel (A side) and arranged as approach-only detectors. Sensors 2 and 3 are located at the other end of the tunnel (B side) and are configured as approach-only detectors.

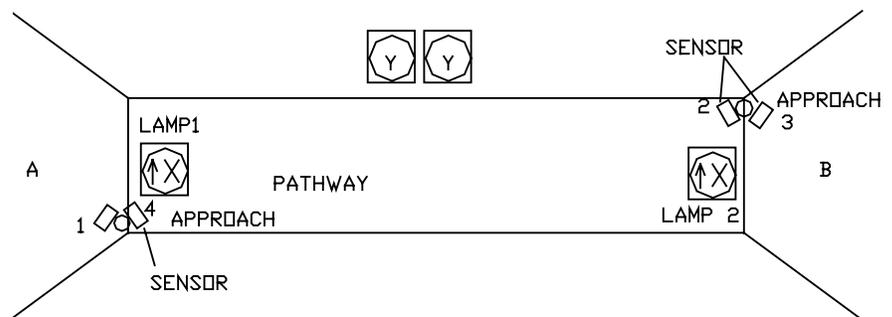


Figure 1: Typical single lane application with approach-only sensors

Under normal conditions, the system will be in the green rest mode where a solid green lamp will be displayed at both points A and B. Assuming a vehicle approaches from the A side, sensor 1, an approach detector, will sense the vehicle and trigger the system. The lamp at point A then remains in green while the lamp at B goes red thus allowing traffic into the path through the A side. Side A will remain in the green mode for a preset amount of time after the detection, which is referred to as the IN TIMER 1 (field adjustable variable, IN1 TMR) and set to a default value of 10 seconds. This value allows multiple vehicles to travel into the path after the first one is detected. At the end of the IN TIMER 1 period both lamps will change to the red solid state thus closing the lane.

As vehicles travel from side A to B, a RED CLEAR timer is counting up (field adjustable value, 1.5 minutes default, programmed in fractions of a minute, RED CLR). During this time, vehicles in the path must clear the pathway at point B. If the RED CLEAR value reaches its maximum, the system will reset and return to the red flash state with both approach sensors inputs available. The logic behind travel from A to B is that the vehicles in the pathway will not stop or slow down since they were given the right of way by the controller. Upon approaching the exit at B sensor 2 will detect the vehicles approaching the end of the pathway. Both lamps remain in a red solid state but an EXIT TIMER is started. This timer holds the system in solid red until it times out and resets the system thereby returning

it to green solid, the rest state. The EXIT TIMER is field programmable and should not be set to less than half the IN TIMER 1 value since some time for multiple vehicles to clear the pathway after the first one is detected approaching point B is required prior to returning to green solid. The exit timer for travel from A to B is XT2 TMR and is preset to a value of 6 seconds.

Vehicles traveling from side B to side A will cause the system to function as described above except that the lamp at B will go green and sensors 3 and 4 will drive the controller functions.

In addition to the lamps at points A and B, a third lamp set will be employed. The reasoning for the third set of lamps is to inform vehicles of the presence of vehicles waiting to enter the path from the other side since a hill in the path will obscure the view from point A to point B. In the preceding example the vehicles traveling from A to B may not see a vehicle approaching the stop bar at B due to the hill. Sensor 3 detects the approaching vehicle and passes this to the controller. Since the controller has already given right of way to the vehicles traveling from A to B and now detects an approaching vehicle through sensor 3 the yellow lamps are activated to warn of vehicles waiting at B. This condition will be held until the XT2 TMR times out and resets the system to green rest. The same is true for vehicles traveling from B to A.

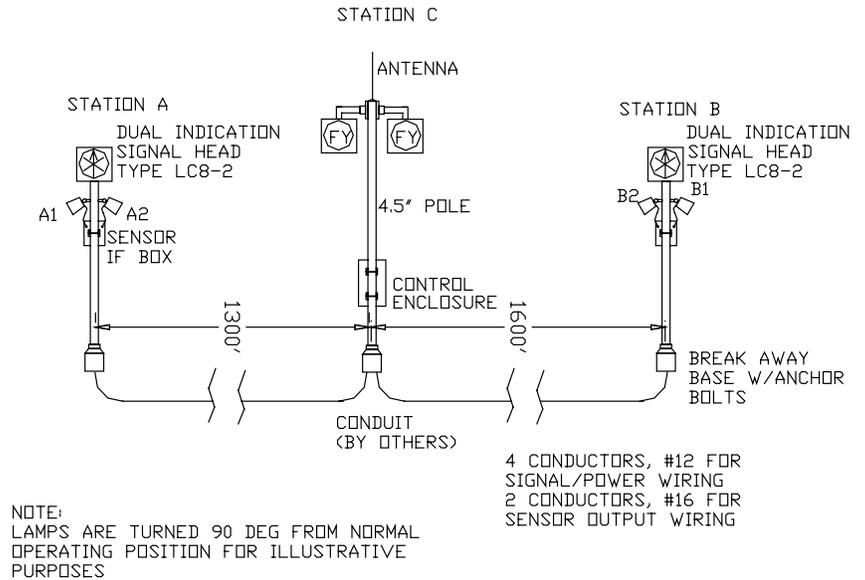


Figure 2: Typical physical layout of components