



Product Type: ASC/3 Controller

Reference: AN2077

Logic Processor – Flashing Green Before Yellow Clearance

Date: July 13, 2007

The Peoples Republic of China and other countries around the world sometimes utilize a Flashing Green signal as an indication that the signal on an approach is about to change to Yellow. This function can be implemented in an ASC/3 Controller by utilizing the Logic Processor.

To implement the flashing green function it is necessary to divide the normal controller Yellow Clearance interval into two logical intervals. The first logical interval to time is the Flashing Green followed by a solid Yellow interval. This yields a signal indication sequence of Red – Green – Flashing Green – Yellow – Red. Placing the logic for this in the Yellow Clearance interval has the advantage of allowing the other controller functions such as the Coordinator to run normally with no additional modifications. This approach does require knowledge of the intersections phasing (Ring Structure) and desired nominal Yellow timing values before programming the Logic Processor.

For this example we will assume a typical 8-phase intersection in a Dual-Quad configuration with the Flashing Green on the Main Street phases, 2 and 6. The desired operation is to have 3-seconds of Flashing Green followed by 4-seconds of solid Yellow. The Logic Processor programming is as follows:

Step 1:

```
IF Yellow on Phase 2 is ON
AND Ring 1 Yellow Timer (is) > 4
THEN Set Logic Flag 1 ON
     Set Yellow Phase 2 OFF
ELSE Set Logic Flag 1 OFF
```

Step 2:

```
IF Yellow on Phase 6 is ON
AND Ring 2 Yellow Timer (is) > 4
THEN Set Logic Flag 2 ON
ELSE Set Logic Flag 2 OFF
```

Step 3:

```
IF Logic Flag 1 (is) ON
AND COB On 546
THEN SET Phase Green 2 ON
```

Step 4:

```
IF Logic Flag 2 (is) ON
AND COB On 546
THEN SET Phase Green 6 ON
```

Lastly, program the Yellow Clearance time for phases 2 and 6 in MM-2-1 to 7-seconds.

In the above example, two logic steps are used for each phase. The first step (#1) selects the desired phase (2) Yellow interval and divides it into two parts, Ring 1 Yellow Timer > 4. It then sets or clears a Logic Flag as appropriate as well as turning OFF the Yellow Phase output when the Ring 1 Yellow Timer is



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greater than 4-seconds. Step #3 then, based on the Logic Flag (1), sets Phase 2 Green On or Off based on the 1Hz signal in Controller Output Buffer bit #546 to produce the flashing green output.

It should be noted that the 1Hz signal in Output Buffer 546 **is not** synchronous with the controller phase timing. This can produce a very short off time at the beginning of flashing green and/or a very short on time at the end of flashing green. Depending on the type of display used in the intersection (Incandescent or LED) this may or may not be noticeable to the driving public.

If the Flashing Green is to be implemented on a Time-of-Day basis it is necessary to utilize two Timing Plans in the ASC/3 (MM-2-1). In one plan the Yellow Clearance time is set to include the flashing green interval (7-seconds in the example) while in the second plan the Yellow Clearance time is set for just the desired Yellow time (4-seconds in the example). Just disabling the Logic Processor steps by TOD will result in long Yellow Clearance intervals (7-seconds).

Due to the potential variability of Yellow Timing at an intersection this Logic Processor sequence may not be suitable for use in the “hidden area” (above step 100) with an EXT file since both the Logic Processor programming and the Yellow Clearance timing must be changed to correctly implement any desired reduction or increase of either the Flashing Green or Yellow Clearance times. However, placing the programming in the upper numbered steps can obscure the programming from a casual observer while still allowing modification from the controller keyboard. When placing the programming in the upper steps be aware of the processing sequence restrictions for the Logic Processor. Refer to the base ASC/3 Logic Processor Programming Application Note for further details.