



Product Type: Controllers

Reference: AN2112

Date: 23 Feb 2009

ASC/3 HAWK Pedestrian Operation

Purpose

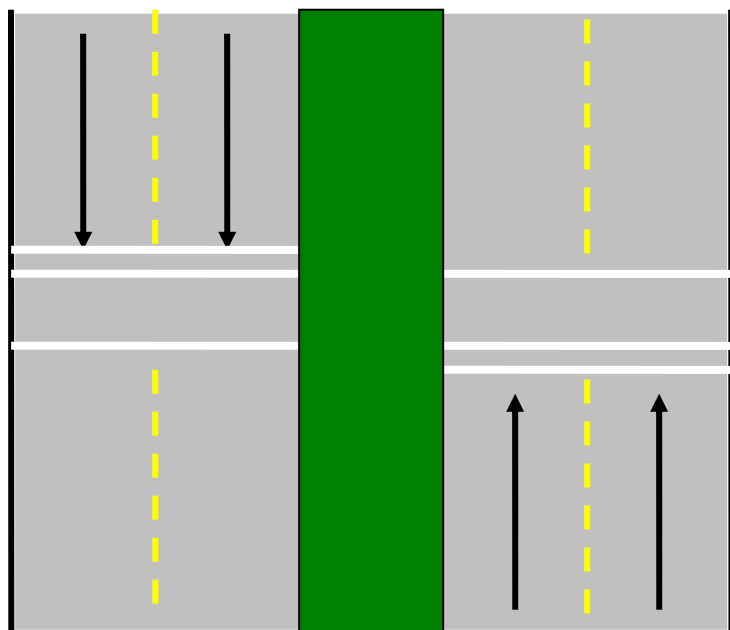
Program the ASC/3 logic processor to High-Intensity Activated Cross Walk (HAWK) pedestrian signal indication

Introduction

To increase pedestrian safety at school crossing locations, the City of Tucson, AZ developed a traffic signal control application called the HAWK. The HAWK uses traditional traffic and pedestrian signal heads in a different configuration than is usually encountered. It includes a sign instructing motorists to “Stop on Red” and a “pedestrians” overhead sign. There is also a sign informing pedestrians on how to cross the street safely.

When not activated, the vehicle signal is blanked out. The HAWK signal is activated by a pedestrian push button. The overhead vehicle signal begins flashing yellow and then transitions to solid yellow, advising drivers to prepare to stop. The vehicle signal then displays a solid red and the pedestrian shows the pedestrian a “Walk” indication. Finally, after the walk signal expires, an alternating flashing red signal indicates that motorists may proceed when safe (after coming to a full stop), while simultaneously the pedestrian is shown a flashing “Don’t Walk” with a countdown indicating the time left to cross.

Below is the basic intersection that will be used for this operation.



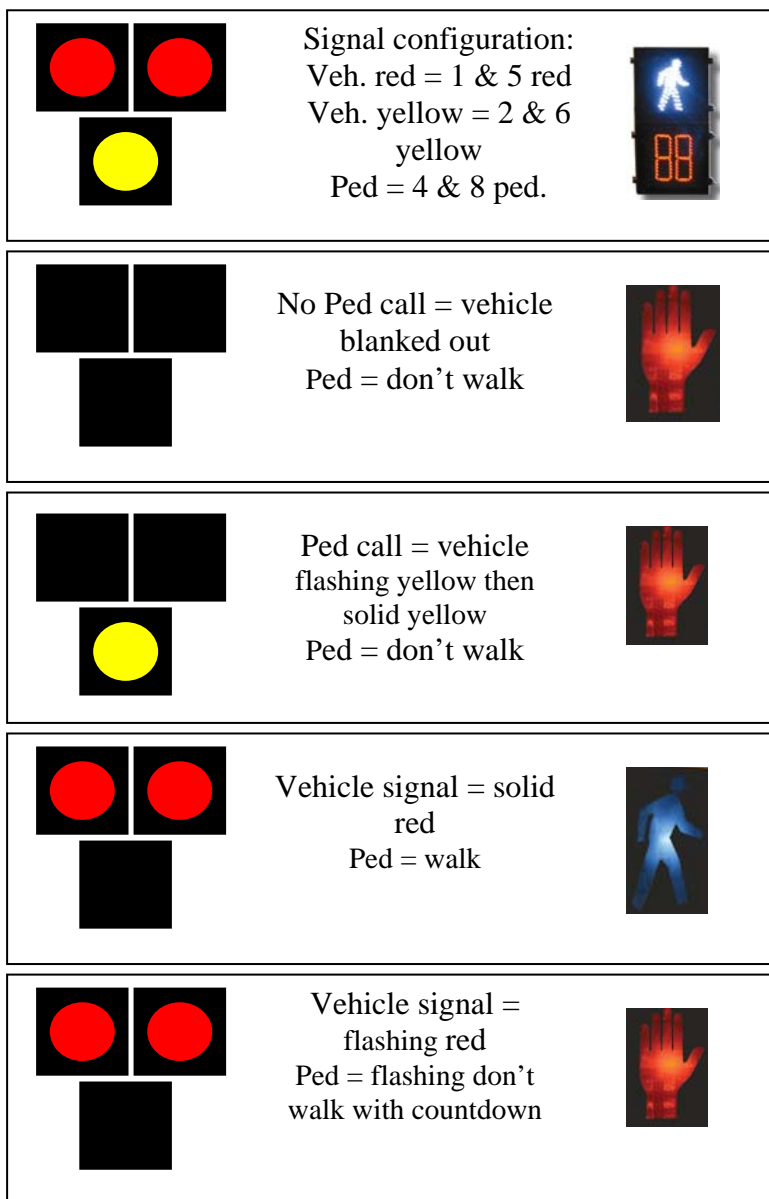
Typical Hawk Intersection diagram



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The following diagram shows the traffic signal heads as well as the pedestrian signals



Vehicle and Pedestrian Signal heads seen at Intersection.

Normal operation:

The vehicle signals are dark and the pedestrian signals are displaying solid "Don't Walk". The signal will not cycle until the pedestrian pushbutton is actuated. Phases 2 and 6 are not visibly displayed to the intersection



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while the controller is in a Walk Hold condition. Once a call is received, the through vehicle signals begin flashing yellow. The flashing yellow is associated internally to the controller during the timing of Phase 2/6 Pedestrian Clearance. Once timed, Phases 2/6 will time the Yellow interval, displaying a solid yellow on the same vehicle signal head. When Phases 2/6 Yellow interval time is complete, the next interval will be Red Clear, which will display a solid Red output on the vehicle signal head. During this time the pedestrian signals have been displaying solid Don't Walk.

Once the Phase 4 or 8 Walk cycle has timed out and Pedestrian Clearance interval begins, both Red vehicle signals will flash in an alternating fashion. This will continue through Red Clear interval until Phases 4 or 8 have completed timing.

Applications

Program the controller as follows:

MM 1-1-1 Program the phases sequence and ring assignments as follows:

```

CONTROLLER SEQUENCE [ 1 ] >
SEQUENCE COMMANDS . HW ALT SEQ ENA. NO
  01 02 03 04 05 06 07 08 09 10 11 12
BC-B B B - - - - -
R1-| 2| 4| . . . . .
R2-| 6| 8| . . . . .
R3-| 1| .| . . . . .
R4-| 5| .| . . . . .

R1-R4=RING 1-4, DATA ENTRY, PHASES 1-16
BC=BARRIER CONTROL, VALUES: B,C
B=BARRIER MODE
C=COMPATIBILITY MODE

```

MM 1-2 Program the phases used as follows:

```

PHASES IN USE / EXCLUSIVE PED
  PHASE  1  2  3  4  5  6  7  8
IN USE.....  X  X  .  X  X  X  .  X
EXCLUSIVE PED . . . . .

  PHASE  9 10 11 12 13 14 15 16
IN USE..... . . . . .
EXCLUSIVE PED . . . . .

```



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MM 1-3 Program load switch assignments as follows:

LD	SWITCH	ASSIGN		DIMMING			---FLASH---			v
		PHASE /OVLP	TYPE	R	Y	G	D	PWR	AUT	
1	1	V		.	.	.	+	A	R	.
2	2	V		.	.	.	+	A	R	X
3	5	V		.	.	.	+	A	R	.
4	6	V		.	.	.	+	A	R	.
5	4	P		.	.	.	-	A	R	.
6	8	P		.	.	.	-	A	R	X
7	0	V		.	.	.	-	A	.	.
8	0	V		.	.	.	-	A	.	.
9	0	P		.	.	.	+	A	.	.
10	0	P		.	.	.	+	A	.	.
11	0	P		.	.	.	-	A	.	.
12	0	P		.	.	.	-	A	.	.
13	0	0		.	.	.	+	A	.	.

Logic Processor Programming

MM-1-8-2 Program LP steps 101-105 as follows (or other LP steps could be used)

LP 101

```

IF      LOGIC FLAG           16 IS ON

THEN   DELAY FOR             0.5 SECONDS
       SET LOGIC FLAG       16   OFF

ELSE   DELAY FOR             0.5 SECONDS
       SET LOGIC FLAG       16   ON

```

LP 102

```

IF      GREEN ON PHASE       2 IS ON
AND     WALK ON PHASE        2 IS ON
AND     PED CHECK ON PHASE   4 IS OFF

THEN   HOLD PHASE           2     ON

ELSE

```



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LP 103

```

IF    PED CLEAR ON PHASE    2 IS ON
AND  LOGIC FLAG             16 IS ON

THEN SET PHASE YELLOW      2    ON
     SET PHASE YELLOW      6    ON

```

LP 104

```

IF    PED CLEAR ON PHASE    4 IS ON
OR    RED ON PHASE          4 IS ON
AND  RED ON PHASE          2 IS ON
AND  LOGIC FLAG            16 IS ON
AND  PHASE TIMING          4 IS ON

THEN SET PHASE RED          1    ON
     SET PHASE RED          5    OFF

```

LP 105

```

IF    OVERLAP GREEN        2 IS ON
AND  PHASE TIMING          4 IS ON
AND  PHASE TIMING          7 IS OFF
AND  LOGIC FLAG            2 IS ON

THEN SET PHASE PED CLR      4    ON
     DELAY FOR              0.5 SECONDS
     SET LOGIC FLAG         2    OFF

ELSE SET PHASE PED CLR      4    OFF
     DELAY FOR              0.5 SECONDS
     SET LOGIC FLAG         2    ON

```

Extended Options File

Edit the ASC3.ext file to include the following:

CONFIG=HAWK PED OPERATION

1.101.105. HAWK PED ph 4

Download the ASC3.ext to the controller



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MMU Monitoring

The MMU must be configured for the FYA Type 12 mode of operation, with the MMU monitoring the Flashing Yellow arrow on the load switches. Also ballast resistors must be placed on all un-used load switch outputs.