Controller Bike Operation
ASC/3, ASC/3-2070, Cobalt, and Cobalt RM

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For information about bicycle detection, refer to these other application notes:
AN2156 – Bicycle Detection & Differentiation Overview
AN2157 – Configuring Bicycle Detection & Differentiation for a 64-Input Controller
AN2158 – Configuring Bicycle Detection & Differentiation for an 8-Input Controller
AN2159 – Configuring Bicycle Detection & Differentiation – Detailed Example

Purpose of Document
This application note describes the programming of Econolite controllers to maximize efficiency and safety for bicycles at signalized intersections.

Introduction
There was a law passed in California that requires that any newly-constructed or refurbished intersection be able to detect bicycles in any lane and give bicycles enough time to make it safely through the intersection—thus, the need to differentiate bicycles from other types of vehicles. Other states are also interested in bicycle differentiation.

Econolite’s Autoscope video detection products have long had the ability to detect bicycles when the bicycles are in their own designated lane or area. Newer releases of Autoscope now have the added ability to differentiate between bicycles and automobiles in the same lane. This provides even more opportunities to improve the efficiency and safety of intersections.

There are three necessary functions for a controller to efficiently & safely serve bicycles at signalized intersections:
- One of four possible separate bike detector inputs:
  - Activated by a “Bike” pushbutton
  - Bike-only lanes using Autoscope detection or other bike lane detection
  - A separate input to the traffic controller for a bicycle when the bicyclist shows a known behavior. For example, if bikes stop on a painted symbol on the street (e.g., Caltrans Standard Plan A24C) or the detector observes that a bicycle behaves differently than other vehicles, then an Autoscope (or other detector) can place a separate bike call to the controller.
  - A bike-differentiated input from an Autoscope (or other detection device) that can distinguish between a bicycle and automobile or other large vehicles in the same lane.
- A bike minimum green that can be programmed longer than vehicle minimum green, but shorter than the pedestrian timing of walk plus pedestrian clearance.
- A method to extend the green if bicycles are detected during green.

Applications
Below is a high-level procedure to program the controller to serve bicycles. For more detailed programming for Classic/ASC/3 programming and also for Cobalt Graphics Mode (touch-screen) programming, refer to the sections at the end of this application note.

1. Program a Bike Detector by selecting one of the 64 detector inputs and remapping the input as a Bike Detector using the PC software ASC/3-Configurator Version 12.58.00 or newer.
2. Program the desired detector as a type BIKE and assign a phase to call.
3. Program a Bike Extension time.
   Note: The Bike Detector extension time extends the assigned phase after the termination of the input.
4. Program a Bike minimum green.
Features & Benefits

Unsatisfactory Possible Solutions
- If a bicycle were to just call the vehicle input, the normal vehicle minimum green and vehicle extension would not be long enough to provide a safe crossing time for the bicycle.
- Adjusting the vehicle times to always provide enough time for bicycles, whether bicycles are present or not, is obviously inefficient for most applications.
- A bicycle could call pedestrian timing but this would be inefficient because a bike can cross the street faster than a pedestrian.

Best Solution
By sensing a unique input for bicycles and programming the controller to use an applicable minimum green and green extension for bicycles, the intersection can operate more efficiently and safely.

Programming the Database with the Configurator and Wiring the Cabinet
This section describes how you use the ASC/3-Configurator to remap a detector input to a bike detector for a TS2 Type 2 or a TS1 controller.

Note: For TS2 Type 1 operation of a controller, selected in the Configurator as shown to the left, it is NOT necessary to remap the input because an SDLC connector receives the detector inputs.

This example remaps expanded detector 1 MSD Pin 17 (Detector 9) as a Phase 2 Bike Detector.

In the Configurator
1. Select the correct Controller Type and Cabinet Type for the controller you are programming.

For example:
2. Complete the remapping:

3. Save your changes.
4. Download the database file to the controller.

**In the Cabinet**

Wire the Bike detector input to the controller input you programmed in the Configurator.
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ASC/3 or Classic Programming

MM-6-2, Vehicle Detector Setup
Program:
1. The detector input as a type B-BIKE (Detector 9 in this example)
2. The phase (PH) to be called by the input (Phase 2 in this example)
3. The bike detector Extension Time (EXTEND TIME) for the time (in seconds) to extend the assigned phase after the termination of the input.

```
TYPE: B-BIKE
TS2 DETECTOR .... X ECPI LOG .... NO
DET PH: 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
         2
EXTEND TIME... 5.0 NTCIP VOL, OR OCC
```

MM-2-1, Timing Plan
Program the Bike Minimum Green (BK MGRN) for the bike timing (10 seconds for phase 2 in this example):

```
TIMING PLAN [ ] PHASE DATA

PHASE 1 2 3 4 5 6 7 8
MIN GRN 5 5 5 5 5 5 5 5
BK MGRN 0 10 0 0 0 0 0 0
CS MGRN 0 0 0 0 0 0 0 0
DLY GRN 0 0 0 0 0 0 0 0
WALK 0 10 0 10 0 10 0 10
WALK2 0 0 0 0 0 0 0 0
MLK MGRN 0 0 0 0 0 0 0 0
PED CLR 0 16 0 16 0 16 0 16
PD CLR2 0 0 0 0 0 0 0 0
PC MGRN 0 0 0 0 0 0 0 0
PED CD 0 0 0 0 0 0 0 0
VEH EXT 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0
VEH Ext2 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
MAX1 35 35 35 35 35 35 35 35
```
Cobalt Touch-Screen Programming

Detector Setup: Home > Detection > Vehicle Detection

Program:
1. The detector input as a type Bike (Detector 9 in this example)
2. The phase to be called by the input (Phase 2 in this example)

| Note: A bike detector Extension Time extends the assigned phase after the termination of the input. For now, to program Extension Time, you must use the Classic mode screen (as shown above). We plan to add the Extension Time parameter to the touch screen in a future release. |

Phase Timing: Home > Timing Plans > Min Green

Program the Bike Min Green for the bike timing (10 seconds for Phase 2 in this example):