

MAXTIME ADAPTIVE

LOCAL ADAPTIVE SIGNAL CONTROL TECHNOLOGY



OVERVIEW

Q-Free MAXTIME adaptive automatically adjusts traffic signal timing in response to demand, optimizing the traveler experience while improving road and travel safety.

MAXTIME adaptive is a locally distributed software which leverages the ATC controller's processing power/memory thereby eliminating the need for extra hardware or central system. It achieves this by utilizing ATC API to run alongside MAXTIME ic as a secondary application.

Together, MAXTIME ic controls the traffic signal, and MAXTIME adaptive publishes the proposed changes to a user-designated pattern. As a result, it is compatible with transit priority, preemption, advanced phase and coordination options, user logic, and more. It also delivers corridor-based optimizations with the ability to handle cross streets.

Using real-time data to improve traffic flow, Q-Free's solution:

- Automatically adjusts traffic signal timing
- Boosts road safety and efficiency
- Minimizes harmful pollution and congestion

Maximize existing roadways by accurately detecting vehicles and moving them through intersections and traffic corridors with green lights at just the right time.

BENEFITS

- Reduce congestion and improve travel time without adding capacity
- Eliminate the need for a central system to run an adaptive solution
- Adjust traffic signal timing automatically
- Optimize adaptive cycles, offsets, and splits along traffic corridors automatically in real-time
- Transition between plans seamlessly when coupled with Q-Free MAXTIME ic
- Retain local programming and seamlessly serve preemption, priority, and advanced user defined features



OPTIMIZE
TRAFFIC SIGNAL
TIMING



MAXIMIZE
EXISTING
ROADWAYS

A UNIQUE PLATFORM

Contrary to black-box solutions, Q-Free's local MAXTIME adaptive solution utilizes widely-accepted algorithms developed jointly by Purdue University, Indiana, and Utah DOT.

ADDITIONAL BENEFITS

- Enable database editing through an onboard web server using a web browser — no proprietary database editor required
- Monitor and modify configurations from any HTML 5 compliant browser such as Google Chrome, Apple Safari, Microsoft Edge, etc.
- Store and load hundreds of configuration databases on the controller
- Automate software updates via network or USB flash drive while intersection continues to run traffic signal operations
- Retain existing signal programming and continue to serve preemption/priority
- Write optimized timings to MAXTIME ic

INFRASTRUCTURE REQUIREMENTS

DETECTION REQUIREMENTS

- Consistent detection requirements allowing streamline setup and operations
- Detector agnostic solution. Compatible with radar, video, inductance loop, magnetometer, and various other detection technologies
- For cycle/offset optimization, advanced detection on the coordinated/mainline should be placed in advance of normal queueing 300 - 600 feet (91.4 - 182.9 m) from the stop bar
- For split optimization, stop bar detection on all approaches

HARDWARE/SOFTWARE

- Q-Free ATC with 1883 engine board or newer (NEMA or 2070) with ATC API
- Ethernet communications via fiber, wireless, or Ethernet over copper between signal controllers

OPTIMIZATION FUNCTIONALITY

CYCLE/OFFSET OPTIMIZATION

- Optimize cycle lengths to maximize green bands and adjust the offsets based on time space relationships (geometric) as well as 1/10th second hi-resolution vehicle arrival data (link pivot)
- Customize calculation periods, cycle length ranges and magnitude of change between consecutive adjustments
- Choose between geometric vs link-pivot offset relationships or use both concurrently
- Dynamic sequence modifications and optional half cycling

SPLIT OPTIMIZATION

- Balance splits using approach/stop bar occupancy at local intersection
- Balance time across rings and barrier groups to ensure optimum and equal split utilization across all phases of the intersection
- Utilize a combination of green occupancy (GreenOcc) and detector occupancy during the first five seconds of phase movement red (RedOcc5)
- Weight split adjustments based on a user-defined sliding scale
- Flexible pedestrian control, configurable min/max split times and percentage based transit signal priority programming

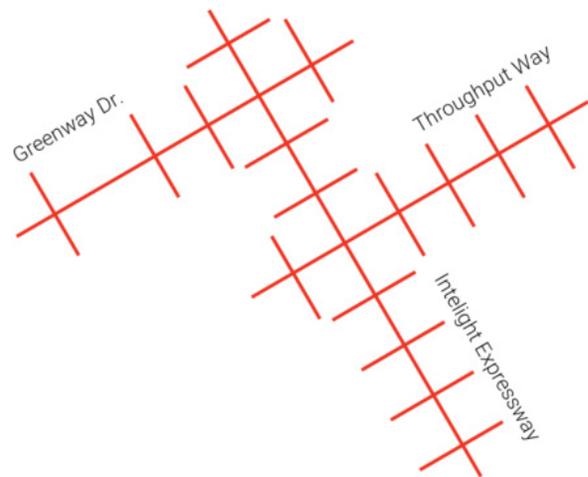


Illustration of MAXTIME adaptive "open grid" network