



D4 Traffic Signal Controller Feature Summary (Version 1.4o)

General Controller Features

- 16 phases
 - Three maximum times per phase with dynamic max operation
 - Minimum, maximum, soft recall modes
 - Early and delayed “Walk” timing
 - Conditional service during free and coordination, with conditional service minimum green time
 - Manual control operation with selectable call, omit, and protected pedestrian clearance phases
 - Per phase preempt timing
- 4 rings (Single intersection or two independent intersections)
- 16 timed overlaps
 - Vehicle and pedestrian movement for each overlap
 - Actuated pedestrian movements
 - Early and delayed “Walk” timing
 - Pedestrian overlap rest-in-walk across multiple phases
 - Per overlap preempt timing
- 8 transit phases
 - Two and three section signal head controls for light rail vehicles
 - Advanced warning sign control per transit phase
 - Recall or actuated operation
 - Normal or priority service

Detector Features

- 64 vehicle detectors
 - Programmable call and extend phases
 - Extend and delay timing
 - Stop bar disconnect mode with carryover (extend) timer
 - Detector cross-switching
 - No presence and max fail detector diagnostics (disabled by TOD)
- 16 queue detectors
 - Detects traffic backups
 - Capable of selecting alternate coordination patterns, selecting alternate maximum green times, or calling a preempt

- Advanced green to clear vehicle movements prior to transit vehicle arrival
- 16 pedestrian detectors
 - Programmable calls for pedestrian and vehicle phases
 - Pedestrian cascade mode (sequential calling of two pedestrian movements)
- 8 transit detectors
 - Programmable calls for transit and vehicle phases
 - Extend and delay timing
 - Travel time delay
 - Alternate travel times by TOD
 - Adaptive arrival time adjustment
- 32 remote transit detectors
 - Calls received by transit detectors at other intersections (on peer-to-peer Ethernet network)
 - Travel time delay
 - Alternate travel times by TOD
 - Adaptive arrival time adjustment

Coordination Features

- 32 coordination patterns
 - Cycle time and three offsets per pattern
 - Flexible per phase split expansion and shrinking during transition
 - Fixed or floating force-offs (per phase)
 - Automatic permissive calculations
 - Single-band or multi-band permissive modes with permissive limit timer
 - Three pedestrian permissive modes
 - Programmable recalls and omits active during each pattern
 - Actuated coordinated phases can gap-out early and distribute unused time to movements with greater demand
 - Selectable reservice phases (a.k.a. “fully actuated coordination”)
- Multiple interconnect modes
 - Time based scheduler
 - Central system command (over twisted pair or Ethernet connection)
 - 120 volt interconnect cable
- Master controller mode
 - Controller can operate as a twisted pair, Ethernet, or 120 volt cable master in the absence of a central management system

Preemption Features

- 10 prioritized preempts
 - Two track clearance states, dwell state, and exit state per preempt

- Permit or allow any phase and overlap individually for each preempt state
- Presence preempt input with optional fail-safe interlock input
- “Check-in / Check-out” preempt detection option with check-out override timer
- 4 soft preempts
 - “Step-by-step” preempt (special preempt sequence)
 - 8 states per soft preempt sequence (timed or actuated)
 - Each state allows programmable calls, omits, holds, and force-offs for each phase and overlap

Transit Priority Features

- Programmable transit priority options for each transit phase
- Operates based on estimated arrival times using local intersection detection and remote (“peer-to-peer”) detection from upstream intersections
- Separate options for free or coordinated operation
 - Extend only (no phase abbreviation) or Early/Extend operation
 - Minimum phase green times
 - Maximum extend limit
 - Optional vehicle/pedestrian phase omits
 - Ability to switch to alternate sequence to better serve early arriving transit vehicle
- Adaptive arrival times to automatically compensate for fluctuating station dwell times

Status / Diagnostic Features

- Detailed controller status displays through the 2070 LCD display
 - Phase, ring, and overlap status
 - Transit phase/priority status
 - Coordination status
 - Preemption status
 - Vehicle and pedestrian detector status
 - Cabinet / Field I/O status
 - System communication status
- 6000 controller event log
 - Multiple classes of events can be individually enabled for logging
 - Retrieved and reset from central connection (serial or Ethernet)
- 62.5 day detector VOS log
 - Log VOS for 16 system detectors each 15 minutes
- 600 MMU event log
 - Detailed MMU events, including reason for failure and state of field outputs

Cabinet Support

- NEMA TS1, TS2-Type 1 and Type 2, Caltrans 332/336, and ITS cabinet support
- All controller input and output functions can be mapped to any physical cabinet input and output
- “Peer-to-Peer” interconnect over Ethernet (select outputs or inputs from the source intersection to activate a function at the local intersection)
- Cabinet logic channels to accomplish custom controller I/O operation

Protocol Support

- Communications over serial port, twisted pair, or Ethernet (fiber-optics)
- Caltrans AB3418E with extended messages for extended status and D4 specific functionality
- Future NTCIP compliance