



# ***OASIS Controller***

## ***User Guide***



***Version 3.03.34E, 4 March 2015***

***OPEXEC Software Version 3.03.34E***

***OASIS Controller User Guide,  
Part Number 120-0903-001 Rev. 04***

**Econolite Control Products, Inc.**

2950 Professional Place  
Colorado Springs, CO 80904  
Main Number + (719) 471-9866  
Customer Support + (719) 785-2642  
Fax + (719) 471-9063



# TABLE OF CONTENTS

1	LEGAL NOTICES.....	1-1
1.1	COPYRIGHT NOTICES.....	1-1
1.1	LIMITS OF LIABILITY .....	1-1
1.2	INDEMNIFICATION.....	1-1
1.3	WARRANTY .....	1-1
2	OVERVIEW .....	2-1
2.1	FEATURES.....	2-1
2.1.1	Hardware Support .....	2-1
2.1.2	Operating System (OS).....	2-1
2.1.3	Real-Time Clock (RTC).....	2-1
2.1.4	Memory Monitor.....	2-1
2.1.5	Phases.....	2-1
2.1.6	Communication Integration .....	2-1
2.1.7	Multiple Phase Timing Tables .....	2-1
2.1.8	Vehicle Programmable Overlaps (OL) .....	2-2
2.1.9	Programmable Inputs .....	2-2
2.1.10	Programmable Outputs .....	2-2
2.1.11	Standard Preemption .....	2-2
2.1.12	Central Computer Communications .....	2-2
2.1.13	Event Scheduling .....	2-3
2.1.14	Coordination/Timing Plans .....	2-3
2.1.15	Detector Count Station Capabilities .....	2-3
2.1.16	Other Features .....	2-4
2.2	SYSTEM OVERVIEW.....	2-5
2.2.1	Logic Layer .....	2-5
2.2.2	Data Layer .....	2-5
2.2.3	Management Layer .....	2-6
2.2.4	Operating System (OS) Layer.....	2-6
2.2.5	Hardware Layer.....	2-6
3	FIRMWARE INSTALLATION .....	3-1
3.1	INSTALLATION REQUIREMENTS .....	3-1
3.2	INSTALLATION PROCEDURE .....	3-1
3.3	OPENING AN OS-9 SESSION .....	3-3
3.4	LOADING OASIS (OPEXEC) FROM PC TO 2070 CONTROLLER.....	3-4
3.5	COPYING THE OPEXEC FILE.....	3-6
3.6	UN-INSTALL INFORMATION.....	3-7
4	PROGRAMMING INTRODUCTION.....	4-1
4.1	FRONT PANEL DISPLAY SCREEN.....	4-2
4.2	FRONT PANEL KEYPAD MANIPULATION .....	4-2
4.4	OASIS MAIN MENU.....	4-4
5	OASIS LOCAL CONTROLLER MAIN MENU.....	5-1
5.1	STATUS DISPLAY MENU .....	5-2
5.1.1	General Status Display.....	5-2
5.1.2	Manual Commands .....	5-5
5.1.3	Diagnostics .....	5-7
5.1.4	Detector Presence.....	5-9
5.1.5	Inputs.....	5-9
5.1.6	Outputs.....	5-10
5.1.7	Detector State.....	5-11
5.1.8	Overlaps .....	5-12

5.1.9	Coordination .....	5-12
5.1.10	Source View .....	5-15
5.1.11	Scheduling.....	5-16
5.1.12	Recent Alarms .....	5-16
5.1.13	Recent Events .....	5-16
5.2	PHASE CONTROL .....	5-16
5.2.1	Phase Control Functions (Group 1 Permissions).....	5-17
5.2.2	Dynamic/Backup Control Functions (Group 1 Permissions).....	5-23
5.3	PHASE TIMING (GROUP 1 PERMISSIONS).....	5-24
5.4	PHASE SEQUENCER (GROUP 1 PERMISSIONS) .....	5-29
5.4.1	OASIS Phase Sequencer Tables .....	5-31
5.4.2	OASIS Phase Sequencer Options .....	5-32
5.4.3	Phase Selection Points .....	5-32
5.4.4	Phase Sequencing Examples .....	5-33
5.5	INPUTS.....	5-41
5.5.1	Input Assignments - Programming.....	5-41
5.5.2	Default Input/Output Map Chart .....	5-44
5.6	OUTPUT ASSIGNMENTS AND SETTINGS MENU (GROUP 3 PERMISSIONS) .....	5-46
5.6.1	Output Assignments .....	5-47
5.6.2	Output Beacon Settings (Group 3 Permissions).....	5-49
5.6.3	Logical Input/Output (I/O) Command (Group 3 Permissions).....	5-50
5.7	DETECTOR ASSIGNMENTS AND SETTINGS MENU (GROUP 3 PERMISSIONS).....	5-53
5.7.1	Vehicle Detector Assignments .....	5-53
5.7.2	Pedestrian Detector Assignments.....	5-58
5.7.3	General Vehicle Detector Settings .....	5-59
5.8	OVERLAP SETTINGS MENU (GROUP 1 PERMISSIONS).....	5-59
5.8.1	Vehicle Overlap Settings.....	5-60
5.8.2	Pedestrian Overlap Settings.....	5-62
5.9	COORDINATION PLAN DATA (GROUP 2 PERMISSIONS) .....	5-62
5.9.1	Coordinator Terminology.....	5-63
5.9.2	Coordination Features.....	5-64
5.9.3	Coordinator Operation.....	5-64
5.9.4	Coordination Plan Data – Programming .....	5-65
5.10	OASIS PREEMPTION MENU (GROUP 5 PERMISSIONS).....	5-68
5.10.1	Standard Preemption Settings .....	5-68
5.11	EVENT SCHEDULING (GROUP 2 PERMISSIONS).....	5-73
5.11.1	Event Priority .....	5-74
5.11.2	Scheduling Structure .....	5-74
5.11.3	Programming Events.....	5-75
5.12	OASIS USER PROFILES (GROUP 1 PERMISSIONS).....	5-78
5.13	OASIS GENERAL MENU .....	5-79
5.13.1	Set Clock (Groups 1-6 Permissions).....	5-79
5.13.2	General Communications Configuration and IP Address Configuration (Group 4 Permissions).....	5-80
5.13.3	Communications Port Configuration (Group 4 Permissions) .....	5-81
5.13.4	Logging Controls (Group 4 Permissions).....	5-83
5.13.5	Conflict Monitor.....	5-85
5.13.6	Manage System Files (Group 6 Permissions).....	5-86
5.13.7	Sound is Off/On.....	5-89
5.13.8	Uninstall OASIS (Group 6 Permissions) .....	5-89
6	OASIS ON-STREET MASTER MAIN MENU (GROUP 2 PERMISSIONS).....	6-1
6.1	STATUS DISPLAY.....	6-3
6.1.1	Master Status .....	6-4
6.1.2	Manual Commands .....	6-4
6.1.3	Diagnostics .....	6-5
6.1.4	System Detectors .....	6-6
6.1.5	Communications.....	6-6
6.1.6	Local Status.....	6-7

6.1.7	Traffic Responsive.....	6-8
6.1.8	Scheduling.....	6-8
6.1.9	Test TR (Traffic Responsive) .....	6-9
6.2	MASTER SETTINGS.....	6-10
6.3	ZONE ASSIGNMENTS.....	6-11
6.4	SYSTEM DETECTORS.....	6-12
6.5	COMPUTATIONAL CHANNEL SETUP.....	6-12
6.6	COMPUTATIONAL CHANNEL ASSIGNMENT.....	6-13
6.7	TRAFFIC RESPONSIVE (TR) THRESHOLD .....	6-14
6.8	PLAN SELECTION .....	6-16
6.9	DIALUP-PAGER.....	6-17
6.10	SCHEDULING (GROUP 2 PERMISSIONS).....	6-19
6.11	USER PROFILES .....	6-21
6.12	GENERAL MENU .....	6-22
6.12.1	Set Clock (Groups 1-6 Permissions).....	6-22
6.12.2	Communications Configuration Is Not An Option On Master Menu.....	6-23
6.12.3	Communications Port Configuration (Group 4 Permissions) .....	6-23
6.12.4	Logging Controls (Group 4 Permissions).....	6-26
6.12.5	Conflict Monitor Is Not An Option On Master Menu .....	6-26
6.12.6	Manage System Files (Group 6 Permissions).....	6-27
6.12.7	Sound is Off/On.....	6-30
6.12.8	Uninstall OASIS (Group 6 Permissions) .....	6-30
7	WORKSHEETS.....	7-1
	PHASE TIMINGS WORKSHEET.....	7-1
	PHASE CONTROL FUNCTIONS WORKSHEET .....	7-2
	SEQUENCER WORKSHEETS .....	7-4
	SCHEDULED EVENTS WORKSHEET .....	7-5
8	REFERENCE.....	8-1
	GLOSSARY .....	8-1
	INDEX .....	2

# 1 LEGAL NOTICES

## 1.1 COPYRIGHT NOTICES

Under the copyright laws of the United States of America, OASIS Program (the “Software”) and this Firmware Specifications (the “Guide”) may not be copied, photocopied, reproduced, translated, or reduced to any electronic medium or machine-readable form, in whole or part, without prior express written permission from Econolite Control Products, Inc. (hereinafter known as “Econolite”). Econolite is the owner and sole distributor of this Software and Documentation and owns all associated copyrights, trademarks, or other intellectual property rights covering subject matter in this document. The United States Code, Title 17, protects the Software and Documentation (The Copyright Act). Econolite has or may have patents, patent applications, trademarks, copyrights, or other intellectual property rights covering subject matter in this software guide. Except as expressly provided in a written license agreement from Econolite, the furnishing of this guide does not give any entity or individual (the user) any license to the patents, trademarks, copyrights, or other intellectual property. ANY SUCH ACTIVITY OR PRODUCT BECOMES THE ABSOLUTE PROPERTY OF THE COPYRIGHT HOLDER.

## 1.1 LIMITS OF LIABILITY

Econolite SHALL NOT BE LIABLE for loss of data, loss of profits, loss of savings, special incident, consequential, indirect, or other similar damage arising from breach of warranty, breach of contract, negligence, or other legal theory, even if Econolite or its agent(s) have been advised of the possibility of such damages, or for any claim by any party. Except as expressly set forth herein. The software is licensed as an “AS IS” basis, without warranty of any kind, either expressed or implied. This includes but is not limited to the implied warranties of merchantability and fitness for a particular purpose.

## 1.2 INDEMNIFICATION

This software is NOT intended to perform any Traffic Control Hardware verification testing. The customer agrees to use this program as it is intended and accepts all responsibility for review, application, and the use of the program output by NOT USING the software to perform any Traffic Control Hardware verification testing. The customer hereby indemnifies and shall hold harmless Econolite, its agents, officers, and/or employees (past or present) from and against any and all liability, damage, loss, cost, and expense which may be asserted against or sustained by Econolite, its agents, officers, or employees, on account or any claim, suit or action made or brought against any of them, related to the software past or present.

## 1.3 WARRANTY

With respect to the distribution vehicle (CD-ROM and/or Floppy Disks) and documentation supplied with the licensed software, Econolite warrants the same to be free from defects in material and workmanship under normal use for a period of ninety (90) days from date of purchase, NOT the date of the finished install, unless specified in contract form. In the event of notification within the warranty period of defects in material or workmanship, Econolite will exchange the defective distribution vehicle or documentation. In the event of a breach of warranty, limited replacement will be provided however will not encompass any other damages, including but not limited to special, incidental, consequential, or other similar claims.

## TRADEMARKS

OS-9® is a registered trademark of Radisys Corporation, Hillsboro, OR.

Trimble Acutime™ is a trademark of Trimble Navigation Limited, Sunnyvale, CA.

Datakey® is a registered trademark of Datakey Electronics, Inc., Savage, Minn

## 2 OVERVIEW

OASIS is traffic control firmware developed by Econolite for implementation in an Advanced Transportation Controller (ATC) Type 2070 Controller. OASIS was designed to facilitate and expedite the movement of pedestrian and vehicle traffic.

### 2.1 FEATURES

This section presents an overview of the features provided by OASIS. A detailed description of the programming features is presented later in the text.

#### 2.1.1 Hardware Support

OASIS is fully compatible with equipment manufactured in accordance with the specifications for the type 2070 controller published by AASHTO, ITE, NEMA, and CALTRANS. OASIS is designed to fully utilize either the 4 x 40 or the 8 x 40 display provided on the 2070 controller.

#### 2.1.2 Operating System (OS)

OASIS is fully capable of interfacing with the OS-9® operating system and its related Application Programming Interface (API). All firmware is written in the ANSI C programming language.

#### 2.1.3 Real-Time Clock (RTC)

The OASIS real-time clock (RTC) keeps track of time from the year down to 1/120ths of a second. The RTC is used to provide a common “clock” or zero point for coordination. The RTC has the ability to automatically adjust for leap year and daylight savings (when daylight savings adjust is enabled). The RTC also has the ability to be corrected for drift by the central computer, continually corrected by an external Trimble Acutime™ Global Positioning System (GPS), and/or synchronized by parallel inputs, and front panel entry.

#### 2.1.4 Memory Monitor

OASIS stores all of its configuration data on the FLASH drive and non-volatile SRAM drive of the 2070. At startup, OASIS loads the latest configuration data from either the non-volatile SRAM drive or the FLASH drive. The memory monitor verifies the integrity of the loaded data at startup and continuously verifies the data integrity as long as the program is running.

Each configuration table is stored with a calculated 16-bit Cyclic Redundancy Check (CRC). The memory monitor, running as a background process, continuously calculates a CRC for each data table and compares it to the CRC stored within the data. When the stored and calculated CRCs are equivalent, the record of data is determined to be correct and usable; otherwise, a corrupted configuration data alarm is generated and the data is restricted from any calculations or decision-making processes.

#### 2.1.5 Phases

OASIS is capable of supporting up to sixteen (16) vehicle phases and sixteen (16) pedestrian phases with the ability to sequence various combinations of leading, lagging, exclusive and sequential phases. Each phase has independent control and timing functions and/or features.

#### 2.1.6 Communication Integration

OASIS is capable of being integrated with distributed processing and closed-loop signal system software. It supports the following communications protocols:

- Econolite OASIS/CIP (Communications Interface Protocol)

#### 2.1.7 Multiple Phase Timing Tables

OASIS supports four (4) separate phase timing and control (phase, overlap, input and output) banks, and (12) phase sequencer banks. These banks are selectable by Central Control, Internal Scheduler or External Inputs.

## 2.1.8 Vehicle Programmable Overlaps (OL)

OASIS supports up to sixteen (16) programmable vehicle overlaps and sixteen (16) pedestrian overlaps. Each vehicle overlap has the following capabilities:

- Allows up to sixteen (16) parent phases
- Extends the Green, Yellow and Red time by utilizing Clearance Timing
- Not Vehicle, Not Pedestrian Conditional Service
- Selectable Overlap Omission under Preemption
- Overlap Output through Phase Load Switch

## 2.1.9 Programmable Inputs

By default, OASIS supports all of the 44 inputs that are defined in the standard cabinet wiring for the CALTRANS 332 cabinet. These inputs support vehicle detectors, pedestrian pushbuttons, emergency vehicle/railroad preemptions, and special functions. Any one or all of these inputs have the capability to be reassigned to any user defined C1 or C11 input pin. In the event that a 2070 N module is used OASIS will default to the standard NEMA MS-A, MS-B, MS-C and MS-D connectors. Up to 64 inputs can be assigned.

## 2.1.10 Programmable Outputs

By default, OASIS supports all of the 56 outputs that are defined in the standard cabinet wiring for the CALTRANS 332 cabinet. These outputs support vehicle indications, pedestrian indications, flashers, and other auxiliary output devices. Any one or all of these outputs have the capability to be reassigned to any user defined C1 or C11 output pin. In the event that a 2070 N module is used OASIS will default to the standard NEMA MS-A, MS-B, MS-C and MS-D connectors. Up to 64 outputs can be assigned.

## 2.1.11 Standard Preemption

OASIS supports up to ten (10) preemption plans from 10 different inputs. Each plan can be configured for railroad, emergency vehicle, or any other type of preemption. Each plan provides to 5 intervals which allow separate sets of clearance, dwell or exit phases. Each of the preemption sequences can be linked together to support a preemption sequence of up to 50 intervals.

## 2.1.12 Central Computer Communications

OASIS supports the following communications messages:

- Detailed Observe (e.g. status, phase feedback, etc.)
- Upload/Download of Configuration
- Upload Internal Logs (e.g. power fail, preemption, detector count, etc.)
- Upload/Download RTC (Real Time Clock)
- Run Plan (also includes free and flash operation)
- Implement General Function (e.g. change omits, recalls, or other control feature)

### **2.1.13 Event Scheduling**

OASIS provides a real-time event scheduler that can execute 200 distinct events and can be scheduled by:

- Time of Day (TOD)
- Day of the Week (DOW)
- Specific Day or Days of the Year (DOY)

Scheduled events can be an implementation of a coordination plan, including “free” and “flash”, with one of three (3) priority levels or an implementation of a control function.

### **2.1.14 Coordination/Timing Plans**

OASIS supports sixty-six (66) timing/coordination plans (1-64 = coordination, 65 = flash, 66 = free). Each coordination plan provides the following functions:

- Cycle Length
- 4 Offsets
- 4 Phase Control Sets
- 4 Phase Timing Sets
- 12 Phase Sequences
- 3 Offset correction methods
- 4 Permissive methods
- 1 Set of Splits for each of the 16 phases

### **2.1.15 Detector Count Station Capabilities**

OASIS provides the following detector count station capabilities:

- Occupancy
- Volume
- Speed
- Gap

Data can be collected using single loop detection points. Speed is estimated using a programmable vehicle length.

Monitoring features include the following:

- Failure Detection
- Volume and occupancy data collection for single loop detection points and speed trap detection points
- Average speed approximation for single loop detection points
- Programmable sampling period
- Logging of status, volumes, occupancy, speed and time
- Access by Central Computer of Log

## 2.1.16 Other Features

The following is a list of other features that are included in OASIS:

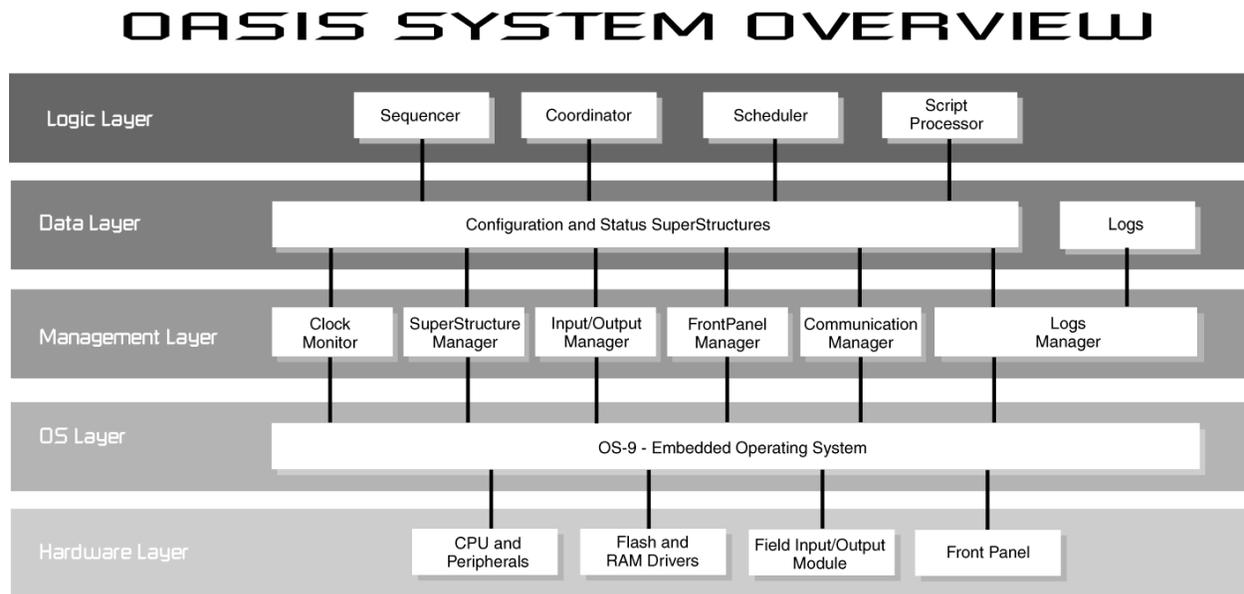
- 4 Ring Sequencing Operation
- 8 Barriers Phase Sequence Operation
- Pedestrian Clearance through Yellow and Red
- Manual permissives by phase for Pedestrian and Vehicle Phases
- Signal Dimming selectable by phase and signal
- Output Redirection – by Time of Day, Internal Logic, or External Inputs
- Input Redirection – by Time of Day, Internal Logic, or External Inputs
- Internal Custom Programmable Logic using a logical I/O processor
  - Testable elements
  - Inputs (active or inactive)
  - Outputs (active or inactive)
  - Phase States / Conditions
  - User Defined Flags (true or false – settable via scheduler or script)
  - Delay Timers (reset, running or done)
  - Logic Functions ('and,' 'or,' and 'xor,)
- Assignable Inputs for the following functions:
  - System Detector
  - Maximum Inhibit
  - Force Off Ring
  - Call to Non Actuated (CNA)
  - National Electrical Manufacturer's Association (NEMA) Hold
  - Maximum Recall
  - Minimum Recall
  - Time Based Coordination (TBC) Plan Selection
  - Time of Day Reset/Sync
  - Stop Time
  - Cabinet Flash
  - Manual Control Enable and Advance
  - External Alarms
  - Phase Timing Bank Select
  - Flash/Free Select
  - Exclusive Pedestrian Omit
  - 10 Preemption Sequences
- Assignable Output functions:
  - Time of Day (TOD) Special Function Outputs
  - Exclusive Pedestrian Signals
  - 4 Advance Warning Beacons
  - Flasher Outputs
  - TBC Plan Select/Status
  - 10 Preemption Sequences Select/Status
  - Free/Flash Select/Status

## 2.2 SYSTEM OVERVIEW

A 2070 controller running OASIS firmware is separated by functionality into five (5) layers:

- Logic Layer
- Data Layer
- Management Layer
- Operating System Layer
- Hardware Layer

The logic, data, and management layers are provided by OASIS. The operating system layer is provided by OS-9® from the Microware Systems Corporation. The 2070 controller provides the hardware layer. Each of these layers are diagrammed below:



### 2.2.1 Logic Layer

The logic layer is the decision-making core of the OASIS system. This layer consists of a sequencer, coordinator, scheduler, and script processor. The sequencer controls the present state of the local 2070 controller. The sequencer executes all phase timers and phase control functions. The coordinator controls the phase splits, cycle lengths, holds and force offs, thereby coordinating the local controller with other controllers. The scheduler allows users to program coordination plans and sequencer functions by time of the day, day of the week, and day(s) of the year. The script processor allows the user to build custom-configured operation of the sequencer and coordinator.

### 2.2.2 Data Layer

The data layer consists of the configuration super structure, the status super structure, and the logs. The configuration super structure retains all configuration data for the system. The configuration super structure can be programmed by the user via the front panel or downloaded from a central computer. This data is stored on the FLASH drive and/or the non-volatile SRAM drive of the controller. The current state of the controller is stored in the status super structure. This data structure consists of the active configuration data as well as current system state data. This data is periodically stored in the non-volatile RAM memory and is updated upon power reset. The last component of the data layer is the logs. There are seven (7) logs that provide a history of system events. These events include, system alarms, special events, front panel data entry, coordination plans, implemented functions, split monitoring, and detector count station data. The logs are stored in the non-volatile RAM memory and can be cleared upon upload from a central computer.

### 2.2.3 Management Layer

The management layer performs several roles. This layer monitors changes in the hardware layer, updating these changes to the status super structure and logs. It also monitors the changes in the super structures, sending appropriate commands to the hardware and logs. In addition to these roles, the management layer provides utilities for the logic layer.

The management layer consists of 6 components:

- Clock Monitor manages the system clock features
- Super Structure Manager loads, stores, and validates super structures of the data layer
- Input/Output Manager manages the communication between the status super structure and the Field Input/Output (FIO) module
- Front Panel Manager provides the user interface
- Communications Manager manages the serial communications with a central computer or master controller. Additionally, Communications Manager manages Ethernet communications with a central computer.
- Logs Manager maintains the data logs and their associated features

### 2.2.4 Operating System (OS) Layer

The operating system layer is comprised of the OS-9® operating system. This operating system supports an application-programming interface (API) that allows the management layer to receive data from and send commands to the devices in the hardware layer.

### 2.2.5 Hardware Layer

The hardware layer consists of 4 basic hardware categories:

- CPU and peripheral logic devices
- Flash and RAM memory storage devices
- Field Input/Output devices
- A front panel providing the user interface

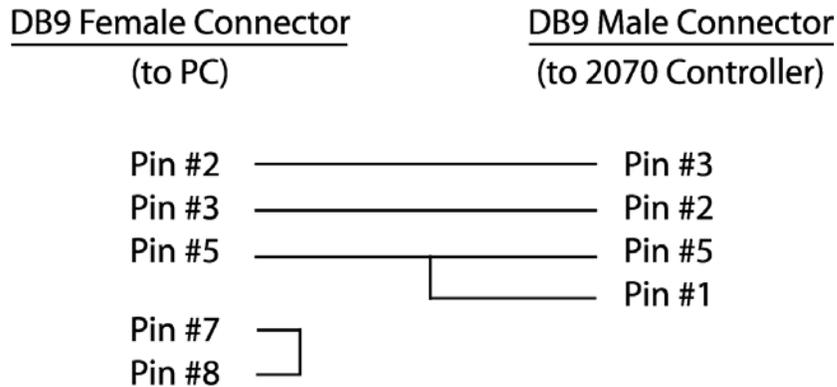
OS-9® and its API manage all of these hardware categories. Specification for and functionality of each of these categories is detailed in the specification for the ATC Type 2070 Controller published by AASHTO, ITE and NEMA. Hardware specification is also provided by CALTRANS.

# 3 FIRMWARE INSTALLATION

## 3.1 INSTALLATION REQUIREMENTS

Installation requires the following:

- ATC Type 2070 Controller
- Econolite OASIS firmware CD-ROM
- PC with an available serial port. The PC must also have HyperTerminal or an equivalent serial communications program.
- DB9 serial cable with the following wiring. **NOTE:** earlier versions of 2070 controllers from some manufacturers require pins 2 and 3 to be wired straight through.

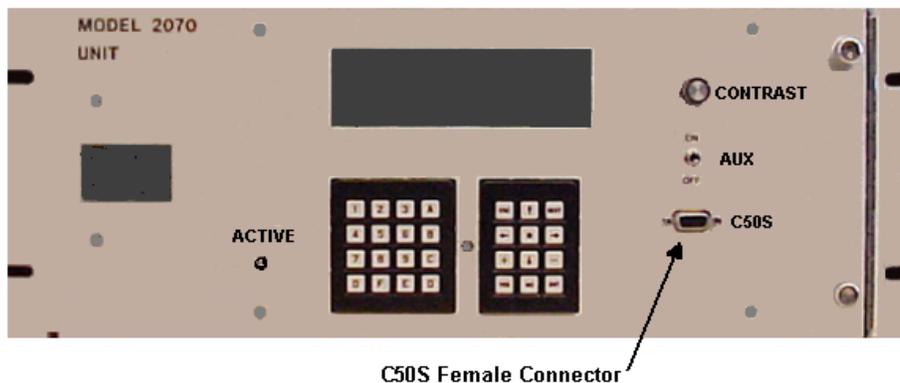


## 3.2 INSTALLATION PROCEDURE

Firmware installation requires the following procedures. This installation will load OASIS at 9600-baud, using Microsoft® HyperTerminal®. Alternate methods are available to increase the transmission baud rate. Additionally, Econolite highly recommends using Procomm® Plus, and provides script files which can be used with Procomm® Plus, which will greatly reduce installation times, and automate the processes described in sections 3.2 – 3.5.

Firmware installation requires the following installation procedure:

- Connect the DB9 null modem cable from the PC to the 2070 controller.
- Female end of the DB9 null modem cable to the available serial port on the PC.
- Male end of the DB9 null modem cable to the C50S female connector on the front of the 2070 controller.

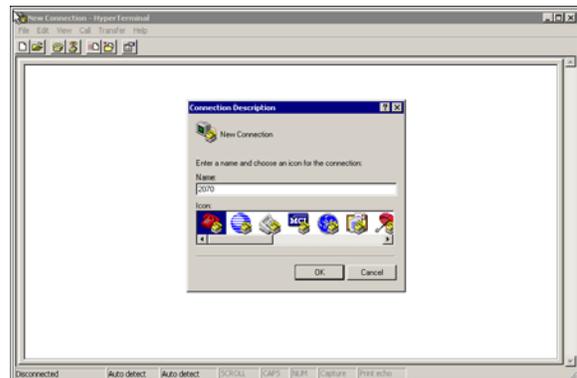


- Begin a HyperTerminal session:
  - Start Menu
  - Programs
  - Accessories
  - Communications
  - HyperTerminal



When HyperTerminal is started the Connection Description Dialog box is immediately opened.

- Enter the Name – 2070
- OK – For connection



The “Connect To” dialog box is opened.

- From the “Connect using” drop down menu:
  - Select the COM Port that the DB9 null modem cable is connected to on the PC
- OK





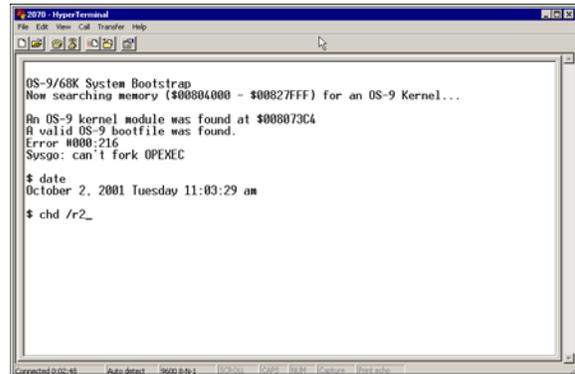
### 3.4 LOADING OASIS (opexec) FROM PC TO 2070 CONTROLLER

- Load OASIS from the CD-ROM to the controller using the Kermit protocol

**NOTE:** Experienced OS-9 users may wish to decrease the download time by utilizing the following command:

```
tmode baud=38400
```

**NOTE:** if this command is sent to the controller HyperTerminal must be restarted as described above, except set the baud rate to 38400. **DO NOT RESTART THE CONTROLLER.**



- From the '\$' prompt type the following command and press enter:

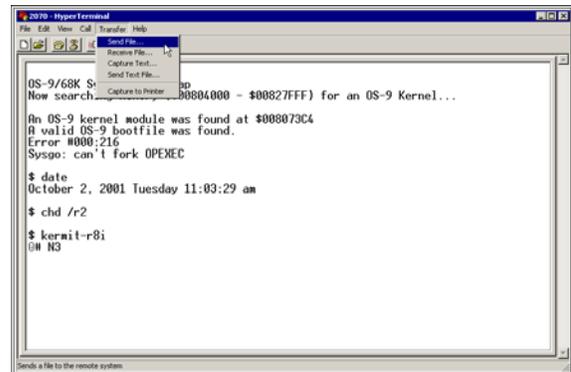
```
$ chd /r2 "chd(space)/r2" <enter>
```

Begin a kermit (communications protocol) session to receive an 8-bit binary file.

- From the '\$' prompt type the following commands and press enter:

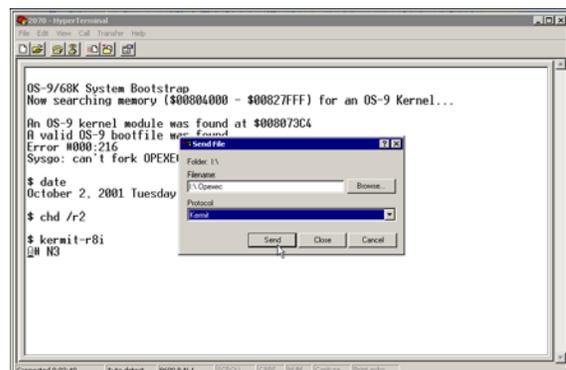
```
$ kermit -r8i  
"kermit(space)-r8i"<enter>
```

- # N3 will be displayed
- Select:
- Transfer from the HyperTerminal Menu Bar
- Send File

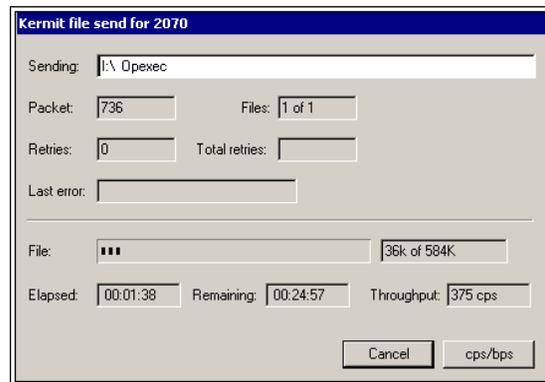


The Send File dialog box will appear.

- Browse CD-ROM drive
- Select (in order):
  - Filename "OPEXEC"
  - Protocol – Kermit
  - Send

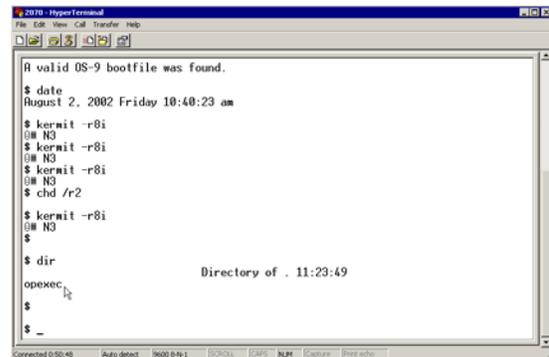


This is an example of the send status. The download will take approximately 20-30 minutes at 9600-baud (8-12 minutes at 38400-baud).



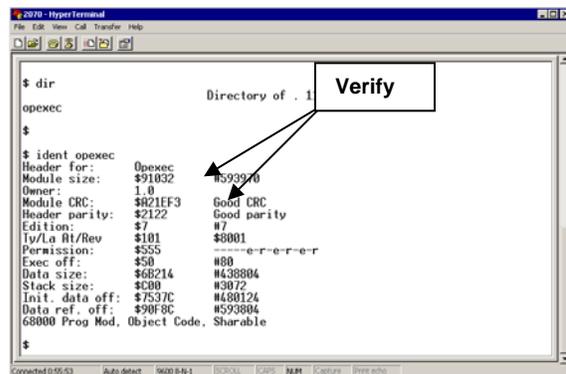
A '\$' prompt will appear upon completion of file transfer.

- Verify that the "opexec" file transferred successfully
- From the '\$' prompt type:
  - \$ dir
- If the returned filename has a period at the end of the filename, it must be renamed. To rename the file use the following command:
  - \$ rename opexec. opexec
  - "rename(space)opexec.(space)opexec"<enter>



Check the CRC validity of the file transfer.

- From the '\$' prompt type:
  - \$ ident opexec
  - "ident(space)opexec"<enter>
- Verify that the returned information lists a good CRC check.
- If the file returns a bad CRC:
  - o Repeat the loading process from the CD-ROM



### 3.5 COPYING THE OPEXEC FILE

Copying the opexec file to the flash drive.

- From the "\$" prompt type:

```
$ copy opexec -w=/f0
"copy(space)opexec(space)-w=(forward slash)f0" <enter>
```

If the OPEXEC file already exists:

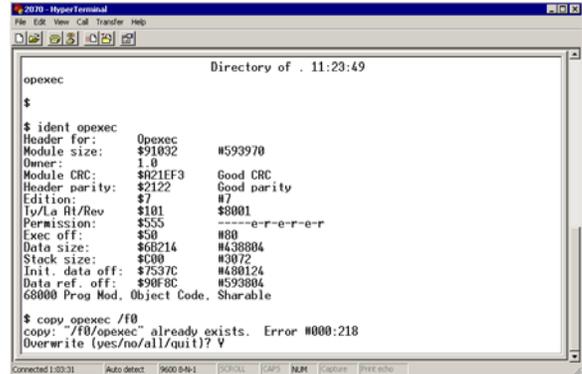
- Press "Y" to overwrite the existing file.
- Press "N" to cancel the copy procedure.

To keep the old opexec on the controller for future use, but run the new opexec:

```
$ chd /f0
"chd(space)(forward slash)f(zero)"<enter>
```

```
$ rename opexec oldopexec
"rename(space)opexec(space)oldopexec"<enter>
```

Then repeat the copy procedure in the preceding step.



**NOTE:** Copying opexec from /r0 to /f0 will take approximately 30 seconds. Wait for the '\$' prompt to return.

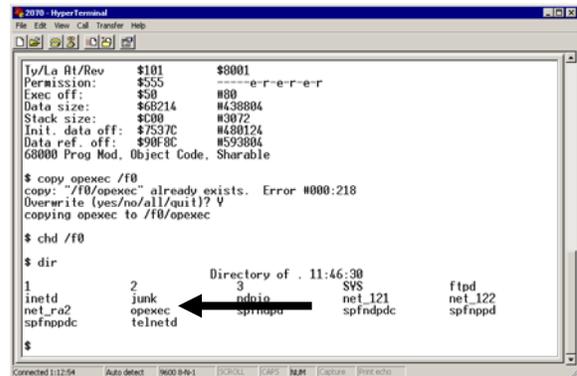
Verify the file copy to the flash drive.

- From the '\$' prompt type:

```
$ chd /f0
"chd(space)/f(zero)"<enter>
```

```
$ dir <enter>
```

The file opexec will be displayed in the directory.

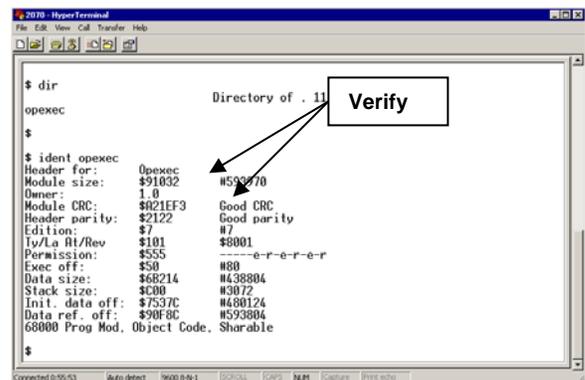


After Copy opexec from /r2 to /f0 drive, it is good practice to verify the CRC again to ensure that the copy did not corrupt the opexec file.

- Check the CRC validity of the file transfer.
- From the '\$' prompt type:

```
$ ident opexec
"ident(space)opexec"<enter>
```

- Verify that the returned information lists a good CRC check.



If the file returns a bad CRC, repeat the loading process from the CD-ROM

- Set executable attribute for the opexec file.
- From the '\$' prompt type:

```
$ attr -e opexec
"attr(space)-e(space)opexec"<enter>
```

```

2070 - HyperTerminal
File Edit View Call Transfer Help
[Icons]
A valid OS-9 bootfile was found.
$ chd /f0
$ ident opexec
Header for:   Opexec
Module size:  #91832      #593970
Owner:        1.0
Module CRC:   #821EF3    Good CRC
Header parity: #2122     Good parity
Edition:      #7
Iy/La R1/Rev #101      #8001
Permission:   #555      -----e-r-e-r-e-r
Exec off:     #50       #80
Data size:    #6E214    #438804
Stack size:   #C00      #3072
Init. data off: #7537C  #480124
Data ref. off: #90F8C   #593804
68000 Prog Mod, Object Code, Sharable

$ attr -e opexec
-----e-r-e-r-e-r
$ _
Connected 4-19-12 Auto detect 3600 B-N-1 ESCROLL CAPS NUM Lock Print mode

```

This completes a successful installation of OASIS. Cycling power on the controller will automatically launch the OASIS firmware.

### 3.6 UN-INSTALL INFORMATION

- The OASIS program can be uninstalled from the 2070 front panel. Select the General Menu from the Main Menu. Then select Uninstall Oasis and press the 'ENT' button to confirm the Un-installation. Cycle Power on the controller.

## 4 PROGRAMMING INTRODUCTION

The following features provide flexibility to OASIS, allowing the controller to be configured to meet a very wide range of operational requirements. The cost of this flexibility is the user's responsibility to fully understand and program a large set of configuration settings. OASIS provides the following features to simplify the configuration process:

- All configuration data is entered and modified through the OASIS user interface. The OASIS user interface is a menu-based interface that provides both a user-friendly and highly efficient means of entering configuration data.
- Configuration data is stored as a separate configuration file on the FLASH drive and/or the non-volatile RAM drive of the controller. This file format allows configuration files to be easily uploaded to and downloaded from a central computer, thereby eliminating the need to program redundant data sets. Multiple data sets can be stored in the central computer or at a single controller to allow efficient reconfiguration.
- Configuration data can be entered through the Centracs®, PYRAMIDS, and TransLink 32 PC interfaces and downloaded to the controller. This feature allows a user to completely configure any controller in the network from a single workstation. Details of this PC interface are presented in the Centracs®, PYRAMIDS, and TransLink 32 user guides.

The configuration data provides a set of guidelines for the controller's operation. As described in the system overview, the logical operation of OASIS requires not only the configuration data, but the current status data as well. The OASIS user interface provides 6 dynamic displays of the following status data:

- General Status
- Active Events
- Coordination
- Inputs
- Outputs
- Detectors

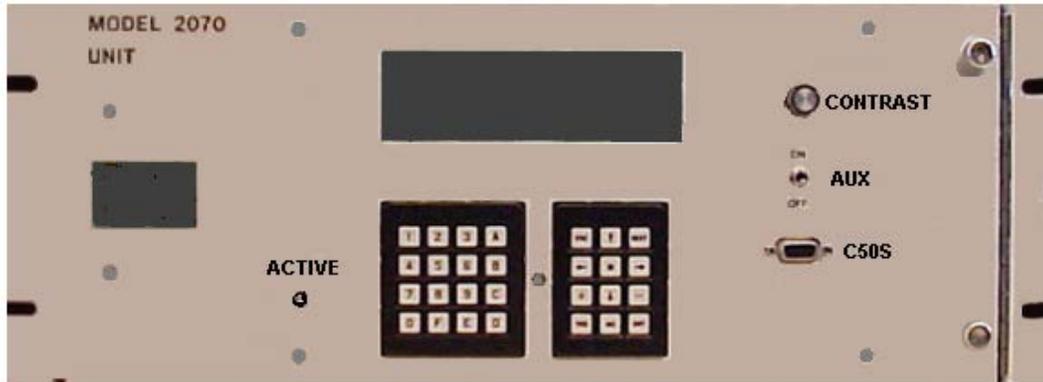
These dynamic displays, along with the configuration data menus, allow traffic engineers and technicians to fully monitor all aspects of the controller's operation.

This section provides instructions for programming OASIS via the user interface. There are two components provided in these instructions. The first of these components is a description of the functionality for each of these features. This description is followed by instructions for viewing and enabling the features through the front panel user interface of the 2070 controller.

The user interface is organized upon a hierarchy of menus. The features presented in this section follow this user interface menu hierarchy.

## 4.1 FRONT PANEL DISPLAY SCREEN

The 2070 controllers are manufactured with either an 8-line x 40-character or a 4-line x 40-character LCD display. OASIS is designed to fully maximize the viewing area for both display sizes of the 2070 controllers. The user commands and menus are identical for either display type. The menus depicted in this guide reflect the viewing area for the 8-line display. A horizontal line is placed beneath the 8<sup>th</sup> line of text to illustrate the screen display of the controller. Scroll down using the cursor to view information beneath this line. Controllers with a 4-line screen will be displayed and information accessed in the same manner.



## 4.2 FRONT PANEL KEYPAD MANIPULATION

The front panel of the 2070 controller has a 4x4 hexadecimal keypad with the numbers 0-9 and letters A-F. There is also a 3x4 keypad with cursor arrows and special function keys. These keys have the following general functionality.

<u>KEY</u>	<u>FUNCTIONALITY</u>
0-9	Enters data/timing values or selects menu item
A-F	Selects menu item where applicable
←,→	Move cursor left or right
↑,↓	Move cursor or scroll display up/down
ESC	Return to previous menu or restore to previous data entry
NEXT	Select submenu or next page of data set
+	Increment current data set
-	Decrement current data set
*	Context Sensitive Help
YES	Select/enable current menu item
NO	Deselect/disable current menu item
ENT	Reaffirm selections

Movement of a flashing cursor, 'ζ' or '\_' manipulates all data entry screens. Cursor movement is achieved through the cursor arrows, (↓, ↑, ←, →) on the 3x4 keypad. The topmost line(s) remains static in view, and the remaining menu selections scroll vertically into view. Menus are selected by depressing the appropriate key (0-9, A-F) one time.

## 4.3 USER LOGON SCREEN

The user begins a session by entering their 4 digit Personal Identification Number (PIN) on the 2070 controller. The first keystroke illuminates the user logon screen. The main menu is displayed once a valid PIN is entered. If OASIS does not have any user accounts programmed, any 4 digit PIN will allow full access to the OASIS controller.

```
OASIS 2070 CONTROLLER (VERSION)
USER LOGON
ENTER USER PIN #:
```

- **Invalid Logon Screens**

If the user enters an invalid PIN, one of two invalid message screens will be displayed. The 'ESC' key returns the user to the logon screen. The following message is displayed if an invalid PIN number is entered for an authorized user.

```
OASIS 2070 CONTROLLER
USER LOGON
INVALID PIN ENTERED
```

The following message is displayed if the user enters a PIN that corresponds to an account that has been disabled.

```
OASIS 2070 CONTROLLER
USER LOGON
ACCOUNT DISABLED
```

- **Automatic Logout Screen**

The user session is automatically logged out if there are no keystrokes for 20 minutes. Upon automatic logout, a dynamic display of the controller's current state is displayed.

```
OASIS 2070 CONTROLLER
12/30/00
16:30:59
PHASE/FUNCTION |12345678910111213141516
PHASE STATE   |RGRRRGRR
VEHICLE CALLS | X X
PEDESTRIAN CALLS|
COORDINATION PLAN.....FREE
```

Pressing any key will return the user to the logon screen.

- **Exit**

Users may also logout by selecting Exit from the main menu. Exit will return the user to the login screen.

## 4.4 OASIS MAIN MENU

The OASIS Main Menu will appear when logged into the controller with a valid PIN. Dynamic displays, controller configuration data, and other options are available from the selections of the main menu. Depressing the ESC key from any subsequent menu in the user interface will return the user up one level until this main menu is displayed. Each of these menu items is covered in subsequent sections of this manual.

Example: OASIS Local Controller Main Menu

<b>OASIS LOCAL CONTROLLER MAIN MENU:</b>	
<b>1 STATUS DISPLAYS</b>	<b>8 OVERLAPS</b>
<b>2 PHASE CONTROL</b>	<b>9 COORDINATION</b>
<b>3 PHASE TIMING</b>	<b>A PREEMPTION</b>
<b>4 PHASE SEQUENCE</b>	<b>B SCHEDULING</b>
<b>5 INPUTS</b>	<b>C USER PROFILES</b>
<b>6 OUTPUTS</b>	<b>D GENERAL MENU</b>
<b>7 DETECTORS</b>	<b>ENT MASTER, E EXIT</b>

Pressing ENT on the local Main Menu will bring up the Master Main Menu.

Example: OASIS On-Street Master Main Menu

<b>OASIS ON-STREET MASTER MAIN MENU:</b>	
<b>1 STATUS DISPLAYS</b>	<b>8 PLAN SELECTION</b>
<b>2 MASTER SETTINGS</b>	<b>9 DIALUP-PAGER</b>
<b>3 ZONE ASSIGNMENTS</b>	
<b>4 SYSTEM DETECTORS</b>	<b>B SCHEDULING</b>
<b>5 COMP CHANNEL SETUP</b>	<b>C USER PROFILES</b>
<b>6 COMP CHANNEL ASSIGN</b>	<b>D GENERAL MENU</b>
<b>7 TR THRESHOLD</b>	<b>ENT LOCAL MENU</b>

Pressing ENT on the master Main Menu will bring up the Local Main Menu.

Example of the keystrokes display:  
Required keystrokes for the menu are displayed directly above each menu example in this user guide.

D-8

## 5 OASIS LOCAL CONTROLLER MAIN MENU

The OASIS Local Controller Main Menu displays the categories of configuration and status data available in the OASIS Local Controller. The data is organized into thirteen (13) top-level menus.

OASIS LOCAL CONTROLLER MAIN MENU:	
1 STATUS DISPLAYS	8 OVERLAPS
2 PHASE CONTROL	9 COORDINATION
3 PHASE TIMING	A PREEMPTION
4 PHASE SEQUENCE	B SCHEDULING
5 INPUTS	C USER PROFILES
6 OUTPUTS	D GENERAL MENU
7 DETECTORS	ENT MASTER, E EXIT

- **Status Displays**
  - o General Status
  - o Manual Commands
  - o Diagnostics
  - o Detector Presence
  - o Inputs
  - o Outputs
  - o Detector State
  - o Overlaps
  - o Coordination
  - o Source View
  - o Scheduling
- **Phase Control**
  - o Phase Control Functions
  - o Dynamic/Backup Control Functions
- **Phase Timing**
- **Phase Sequence**
- **Inputs**
- **Outputs**
  - o Output Assignments
  - o Output Beacon Settings
  - o Logic I/O Processor
- **Detectors**
  - o Vehicle Detector Assignments
  - o Pedestrian Detector Assignments
  - o General Vehicle Detector Settings
- **Overlaps**
  - o Vehicle Overlap Settings
  - o Pedestrian Overlap Settings
- **Coordination**
- **Preemption**
  - o Standard Preemptions
  - o Soft Preemptions (Not Available)
- **Scheduling**
- **User Profiles**
- **General Menu**
  - o Set Clock
  - o General Communications Configuration
  - o Communications Port Configuration
  - o Logging Controls
  - o Conflict Monitor
  - o Manage System Files
  - o Sound is On/Off
  - o Uninstall OASIS
- **ENT MASTER, E Exit**

## 5.1 STATUS DISPLAY MENU

Status displays provide status data of the controller's current state. This data enables traffic engineers and technicians to analyze the operation of the controllers. The dynamic data is organized into ten (10) menus. Each submenu will display read-only data for the current state of the controller.

STATUS DISPLAY MENU:	
1 GENERAL STATUS	8 OVERLAPS
2 MANUAL COMMANDS	9 COORDINATION
3 DIAGNOSTICS	A SOURCE VIEW
4 DET PRESENCE	B SCHEDULING
5 INPUTS	C RECENT ALARMS
6 OUTPUTS	D RECENT EVENTS
7 DETECTOR STATE	

**NOTE:** The status display Refresh Rate is 1Hz. Displayed data is accurate to within 1 second.

### 5.1.1 General Status Display

The General Status Dynamic Display shows a general overview of the current state of the controller.

1-1	
P1-1 CL=100 OFF0 MC60 LC60 09/20/07	
PAGES:SQ1 TM1 PH1 OV1 IN1 OUT1 23:59:01	
PHA 2: MIN: 10 MAX:30 GAP:5.0 WLK:5	
PHA 6: MIN: 10 MAX:30 GAP:5.0 WLK:5	
PHASE/FUNCTION	12345678910111213141516
VEHICLE STATE	RRRRRGR
VEHICLE CALLS	X X
HOLD FORCE ALLOW	
PED CALLS	
PEDESTRIAN	DDDDDDDD
OVERLAP	
PED OVERLAP	
LOGIC FLAGS	
PREEMPT INPUTS	

**NOTE:** Newer versions of Oasis show the 1/10th second resolution of the Gap Timer.

Each line has the ability to display several conditions described as follows:

- **LINE 1 –Errors / Preemptions / Coordination Data**

Line 1 displays any error or status conditions. The user can select the next key to remove the error message from this line and display subsequent information. The possible conditions are listed in descending priority. **NOTE:** 'Controller Date' is also part of line 1.

- Manual Override Active
- Hardware Failure (plus error code) - For a list of errors see section 5.1.3 - Diagnostics
- Clock Failure
- Configuration Failure
- Conflict Monitor VAC Failure
- Conflict Monitor Failure
- Cabinet Flash
- Stop Time
- Manual Advance
- Manual Advance Enabled
- Coordination Error: Bad Split on Phase #
- Coordination Error: Excessive Splits

- Coordination Error: Invalid Plan Specified
- Coordination Error: No Coordinated Phases Specified
- Coordination Error: Incompatible Phases
- Coordination Error: No Coordinated Splits
- Communication Failure with Conflict Monitor
- Communication Failure with GPS

If there is an Active Preemption – Line 1 displays the following preemption data:

- Preemption Type – Standard Preempts 1-10.
- Interval Status – Delaying, Advancing, Clearances, Dwell Service, Hold Over, Yielding, Flashing, Red Rest
- Interval Timer – Countdown timer in seconds

If there are no Preemptions or Error Conditions – Line 1 displays Coordination Plan data:

- Coordination Plan Number 1-64, Flash, Free.
- Cycle Length (< or > used during transition cycles)
- Offset (in seconds) for Plans 1-64 only
- Master Clock timer (MC)
- Local Clock timer (LC)
- Transition to coordination – if a coordination command has been received but the coordinator is not yet in coordinated operation.
- Controller Date

- **LINE 2 – Active Pages**

Line 2 displays active pages.

- SQ – Phase Sequence Page 1-12
- TM – Phase Timing Page 1-4
- PH – Phase Control Page 1-4
- OV – Overlap Control Page 1-4
- IN – Inputs Page 1-4
- OUT – Outputs Page 1-4
- Controller Timer

- **LINES 3/4/5/6 – Ring Timers**

Lines 3 – 6 display data for the active timers of Rings 1 – 4 respectively. If the sequencer has no phases programmed in a ring, in the active barrier, the line will be removed from the display, temporarily. The information for the active rings will be displayed as follows:

- CONTROLLER RESTART YELLOW/RED CLEARANCE TIMERS – If the controller is restarting, the startup yellow and red clearance timers will be displayed.
- INACTIVE RING # – Displayed when there is no phase currently active for the corresponding ring. During Flash all rings will be displayed as inactive.
- PHA 1-16 – Active phase on the ring.
- MIN – MIN Green Timer (in seconds) for the Green Interval of the phase listed in PHA.
- MAX – MAX Green Timer (in seconds) for the Green Interval of the phase listed in PHA.
- GAP – Gap or Passage Timer (in seconds) for the Green Interval of the phase listed in PHA.
- YELLOW CLEAR – Yellow Clearance Timer (in seconds) for the Yellow Interval of the phase listed in PHA. During the yellow clearance interval, the controller will also display the reason for phase termination: RED REST, FORCED OFF, GAPPED OUT or MAXED OUT.
- RED CLEAR – Red Clearance Timer (in seconds) for the Red Interval of the phase listed in PHA. During this interval, if the next phase in this ring is the same as the current phase, the controller will display RED REVERT during the timing of the red revert interval. The value of the red revert timer will also be displayed.
- ADVWLK – Advanced Walk Timer (in seconds) for the ring's active Pedestrian Interval.
- DLYWLK – Delayed Walk Timer (in seconds) for the ring's active Pedestrian Interval.
- WALK – Walk Timer (in seconds) for the ring's active pedestrian interval. If the ring is resting in walk, WALK:REST will be displayed instead of the timer value.

- FDWALK – Flashing Don't Walk Timer (in seconds) for the ring's active Pedestrian Interval.

If no phase is currently timing, the following information will be displayed under the specified conditions:

- GRN SELECT – If there is a conflicting call but the ring is waiting on another ring to finish timing before crossing the barrier.
- GREEN REST – If there is neither a conflicting call nor a guaranteed passage time for this phase.
- GUAR PASS – If there is no conflicting call but the phase is timing guaranteed passage.

- **Phase/Function #s**

Permitted Phase/Function Numbers 1-16 are displayed on Line 6. The remaining lines beneath Phase/Function display the current state of the controller by phase, overlap, or function number.

To manually set or clear vehicle calls, pedestrian calls, logic flags or preemption calls – Place the cursor on the desired line and selecting a numeric entry:

- Numerical input 1-9 – Toggles Phase/Functions Number 1-9
- Numerical input 0 – Toggles Phase /Function Number 10
- Alpha input A-F – Toggles Phase/Functions Number 11-16
  - A - 11    C -13    E - 15
  - B - 12    D -14    F - 16

- **Vehicle State**

Displays the current color of the vehicle indication by phase:

- R – Red
- Y – Yellow
- G – Green
- N – Phase Next
- \_ (Space) – An empty cell indicates a dark head (outputs off) for that phase. Phases that are not permitted will also not be displayed.

- **Vehicle Calls/Recalls**

Displays Vehicle Calls and Recalls by phase. This line can be manually overridden. The characters listed in descending priority:

- R – A Maximum Timing Recall has been placed on the phase. (MAX1, MAX2, CNA1, CNA2)
- r – (Lower case r) A Minimum Recall has been placed on the phase.
- C – Coordinated Phase.
- X – A Call to Service has been placed on the phase.
- S – A Soft Recall has been placed on the phase.
- D – There is a dynamic call (backup prevent) placed on the phase.

- **Hold/Force-Off/Allowed**

Displays any constraints placed on the phase by the coordinator, preemptor, or external input. The following characters may be displayed:

- H – The Coordinator has placed a Hold on the phase.
- h – An External Input has placed a Hold on the phase.
- F – The Coordinator is forcing off the phase.
- f – An External Input is forcing off the phase.
- A – The phase is currently allowed or permitted by the coordinator or preemptor.
- O – A dynamic Omit has been placed on the phase.

- **Pedestrian Calls**  
Displays Pedestrian Calls and Recalls by phase. This line can be manually overridden. The characters listed in descending priority:
  - X – A Call to Service has been placed on the phase.
  - R – A PED Recall has been placed on the phase.
  - S – A PED Soft Recall has been placed on the phase.
  - O – Inhibit Ped is applied to the phase.
  
- **Pedestrian State**  
Displays the current state of the pedestrian indication. The following characters may be displayed:
  - W – The Pedestrian Phase is displaying Walk.
  - D – The Pedestrian Phase is displaying a solid Don't Walk.
  - \_ (Dash) – An empty cell indicates that the pedestrian head is dark (outputs off).
  - F – The Pedestrian Phase is displaying a flashing don't walk (Pedestrian Clearance).
  
- **Overlap**  
Contains the current color of the Vehicle Overlap indication. Overlap A is aligned with the number 1, Overlap B with # 2, etc. The following colors may be displayed:
  - R – Red
  - Y – Yellow
  - G – Green
  - \_ (Dash) – An empty cell indicates a dark head (outputs off) for that phase.
  
- **Pedestrian Overlap**  
Displays the current state of the Pedestrian Overlap indication. Pedestrian Overlap A is aligned with Phase 1, Pedestrian Overlap B with Phase 2, etc. The following characters may be displayed:
  - W – The Pedestrian Phase is displaying Walk.
  - D – The Pedestrian Phase is displaying a solid Don't Walk.
  - \_ (Dash) – An empty cell indicates that the pedestrian head is dark (outputs off).
  - F – The Pedestrian Phase is displaying a Flashing Don't Walk (Pedestrian Clearance).
  
- **Logic Flags**  
Displays all active (set) Logic flags. This line can be manually overridden.
  - X – Active
  - Blank – Inactive
  
- **Preempt Inputs**  
Displays all active (set) Preemption Inputs. This line can be manually overridden.
  - X – Active
  - Blank – Inactive

## 5.1.2 Manual Commands

Manual overrides from the front panel can be set/cleared from this menu directly by moving the cursor to the desired field and entering the manual override or selecting YES/NO to change function. Note that commands from central (Centrac<sup>®</sup>, Translink32 or Pyramids) will be applied to the controller at the same priority as commands entered through the front panel. Any command issued from a master (Oasis/OSM) will have a lower priority than manual commands issued at a local controller.

- Numerical input 0 = No override active
- Numerical input # = Active Manual Override
- YES – Sets the current phase control function on for the selected phase
- NO – Sets the current phase control function off for the selected phase
- ENT – Clears all manual overrides.
  - Exit display and return to display.
  - Before hitting any other key, press ENT. This will clear all manual commands.

```

SOURCE:MANUAL/CENTRAL 10:33:58 6/17/04
PLAN (65=FLASH,66=FREE):0 OFFSET:0
PAGE SQO TMO PHO OVO INO OUTO
ENT: CLEAR ALL |12345678910111213141516
TIME MIN 2
TIME EXTENSION 2|
TIME MAX 2
SOFT RECALL
-----
MINIMUM RECALL
MAXIMUM RECALL 1|
MAXIMUM RECALL 2|
CALL NON-ACT 1
CALL NON-ACT 2
OMIT PHASE
DUAL ENTRY
NO SKIP
ADDED EXTENSION
SIMULTANEOUS GAP
GUAR PASSAGE
GREEN INT FLASH
FAST GREEN FLASH
RED REST
BACKUP PROTECT
INH RESERVICE
INH MAX (COORD)
INHIBIT COORD
DYNAMIC MAX/MAX3|
VARIABLE INITIAL
GAP REDUCTION
OMIT PEDESTRIAN
TIME WALK 2
TIME FDWALK 2
PED SOFT RECALL
PED RECALL
REST IN WALK
MOD REST IN WALK
PED RESEVICE
FLASHING WALK
ADVANCED WALK
DELAYED WALK
PED YELLOW CLEAR|
PED RED CLEAR
STARTUP IN GREEN|
STARTUP IN YEL
STARTUP RED CLR
FIRST PHASES
STARTUP CALL
STARTUP PED CALL|
FLASH ENTRY
YELLOW FLASH
WAG PHASES
WAG OVERLAPS
MANUAL CONTROL
MAN CON OMIT PED|
RED DET LOCK
YELLOW DET LOCK
ACT LOGIC 1-16
ACT LOGIC 17-32
DYNAMIC/BACKUP

```

For function definitions, see section 5.2.1 (Phase Control Functions).

### 5.1.3 Diagnostics

The Diagnostics Menu displays any status or error conditions for the controller.

1-3

```
SYSTEM DIAGNOSTICS 16:64:40 06/18/04  
COMMUNICATIONS ADDR#260 STATUS: NO COMM  
GPS INTERFACE: NOT CONNECTED  
CONFLICT MONITOR: NOT CONNECTED
```

LINE 2 – The following status is displayed.

- Asset # 0-15999
- Communications Status:
  - COMM OK – The controller has received communication from the central system / master within the last minute
  - UP/DNLD – The controller is currently uploading or downloading a configuration table
  - NO COMM – The controller has not been communicated with from the central system / master within the last minute.
  - INTERNL – The controller is configured as a combination on-street master as well as a local. The local in this case is considered to be an “internal” local because it has no external communication with the OSM.

LINE 3 – Displays the status of the GPS interface.

- NOT CONNECTED – No serial port is configured to receive time updates from a GPS device.
- COMM FAILURE – The GPS is not communicating with the controller.
- INITIALIZING COMM – At startup the controller is opening the serial port and waiting to receive messages from the GPS.
- ACQUIRING GPS SATELLITES – The GPS unit has not acquired enough information from the satellites to make an accurate time estimate.
- GETTING GPS TIME – The GPS has acquired enough satellites and the controller is now waiting for a time update message from the GPS unit.
- GPS TIME VALID – A time update message has been received from the GPS device and the controller time is in sync with it.

LINE 4 – Displays the status of the conflict monitor interface.

- NOT CONNECTED – No serial port is configured to communicate with the conflict monitor.
- COMM FAILURE – An error has occurred attempting to communicate with the conflict monitor.
- INITIALIZING COMM – The controller is configuring the serial port to communicate with a conflict monitor.
- COMM OK – Successful communications with the conflict monitor has been established.

LINE 5 and greater – Displays the status if any of these conditions exist

- Manual Override Active
- Hardware Failure (plus error description)
- Clock Failure
- Configuration Failure

- Conflict Monitor VAC Failure
- Conflict Monitor Failure
- Cabinet Flash
- Stop Time
- Manual Advance
- Manual Advance Enabled
- Coordination Error: Bad Split on Phase #
- Coordination Error: Excessive Splits
- Coordination Error: Invalid plan number
- Coordination Error: Incompatible Phases
- Coordination Error: No Coordinated Splits
- Communication Failure with Conflict Monitor
- Communication Failure with GPS Unit
- System: Normal Operation

The complete list of hardware errors is listed in the table below:

Hardware error code	Reason for Failure
1	Unable to retrieve serial port configuration
2	Unable to set serial port configuration
3	Reserved for future use
4	Reserved for future use
5	Reserved for future use
6	Reserved for future use
7	Reserved for future use
8	Unable to open port to Field IO Module
9	3 consecutive communications failures to Field I/O Module
10	Status error returned from Field IO Module
11	Unable to write to /r0 drive
12	Unable to write to /r0 drive
13	Configuration data corrupted on /r0 drive
14	Unable to write to /r0 drive
15	Unable to read from /r0 drive
16	Unable to read from /r0 drive
17	Unable to write to /r0 drive
18	Unable to write to /r0 drive

## 5.1.4 Detector Presence

The Detector reflects the status data used by the Input/Output Manager for each Vehicle Detectors.

1-4										
DETECTOR PRESENCE	1	2	3	4	5	6	7	8	9	10
0+.....										
10+.....										
20+.....										
30+.....										
40+.....										
50+.....										
60+.....										

- Line 1 – Detector Presence: Displays the Active/Inactive Detector Numbers
- Line 2 – Detector # 0+ : Displays status of Detector Presence 1-10
- Line 3 – Detector # 10+: Displays status of Detector Presence 11-20
- Line 4 – Detector # 20+: Displays status of Detector Presence 21-30
- Line 5 – Detector # 30+: Displays status of Detector Presence 31-40
- Line 6 – Detector # 40+: Displays status of Detector Presence 41-50
- Line 7 – Detector # 50+: Displays status of Detector Presence 51-60
- Line 8 – Detector # 60+: Displays status of Detector Presence 61-64

- Active Detector Presence – Cell containing an 'X'
- Inactive Detector Presence – Cell is blank

## 5.1.5 Inputs

The Active Input dynamic display reflects the current state of the sixty-four (64) possible Input Assignments.

1-5											
ACTIVE INPUT #	L	1	2	3	4	5	6	7	8	9	10
0+ (#: LOCK ON)		X	X	X	X						
10+.....								X	X	X	X
20+.....											
30+.....											
40+.....											
50+.....											
60+.....											

- Line 1 – Active Input #: Displays the Input Assignment Numbers
- Line 2 – Input # 0+ : Displays status of Input Assignments 1-10
- Line 3 – Input # 10+: Displays status of Input Assignments 11-20
- Line 4 – Input # 20+: Displays status of Input Assignments 21-30
- Line 5 – Input # 30+: Displays status of Input Assignments 31-40
- Line 6 – Input # 40+: Displays status of Input Assignments 41-50
- Line 7 – Input # 50+: Displays status of Input Assignments 51-60
- Line 8 – Input # 60+: Displays status of Input Assignments 61-64

- Active Input Assignment – Cell containing an 'X'.
- Inactive Input Assignment – Cell is blank.

To manually lock an Input “on” – Place the cursor on the desired line and select a numeric entry:

- Numerical input 1-9 – Locks Input “on” in current line under column heading 1-9 respectively.
- Numerical input 0 – Locks Input “on” in current line under column heading 10.

Inputs cannot be locked “off” by this method. To prevent inputs from coming into controller, the device providing the input must be removed from the cabinet, or turned off.

## 5.1.6 Outputs

The Active Outputs dynamic display reflects the current state of the sixty-four (64) possible Input Assignments.

1-6		SL	1	2	3	4	5	6	7	8	9	10
<b>ACTIVE OUTPUT #</b>	<b>0+ (#: SET/LOCK)</b>		X	X			X				X	
	<b>10+</b> .....				X	X			X		X	
	<b>20+</b> .....		X				X				X	X
	<b>30+</b> .....								X		X	
	<b>40+</b> .....		X				X			X		X
	<b>50+</b> .....							X				
	<b>60+</b> .....											

- Line 1 – Active Output: Displays the Output Assignment Numbers
- Line 2 – Output # 0+ : Displays status of Output Assignments 1-10
- Line 3 – Output # 10+: Displays status of Output Assignments 11-20
- Line 4 – Output # 20+: Displays status of Output Assignments 21-30
- Line 5 – Output # 30+: Displays status of Output Assignments 31-40
- Line 6 – Output # 40+: Displays status of Output Assignments 41-50
- Line 7 – Output # 50+: Displays status of Output Assignments 51-60
- Line 8 – Output # 60+: Displays status of Output Assignments 61-64

- Active Output Assignment – Cell containing an 'X'
- Inactive Output Assignment – Cell is blank

The Output can be overridden to set “on” or locked in its current state. Place the cursor on the desired line and selecting a numeric entry:

- Numerical input 1-9 – Toggles Output in current line under column heading 1-9 respectively.
- Numerical input 0 – Toggles Output in current line under column heading 10.

When the cursor is aligned with the 'S' on row 2, the output will be toggled on / off. When the cursor is aligned with the 'L' on row 2 the current state of the output will be locked / unlocked.

## 5.1.7 Detector State

The Detector State reflects the status data used by the Input/Output Manager for each Vehicle Detectors.

1-7

VEHICLE DETECTOR #1	15:57:40	6/18/04
FAILURES. . . . .	.NONE	
DELAY TIMER. . . . .	0	
STRETCH TIMER. . . . .	0.0	
STRETCH / DELAY INHIBITED. . . . .	N	
STOP BAR TIMER. . . . .	.0	
SWITCH/DUPLICATION INHIBITED. . . . .	.N	
AVERAGE WAIT. . . . .	.0	
AVERAGE GAP. . . . .	0	
AVERAGE SPEED. . . . .	0	
PRESENCE (SEC). . . . .	0.0	
CLASS 1 VOLUME. . . . .	.1	
CLASS 2 VOLUME. . . . .	.0	
CLASS 3 VOLUME. . . . .	.0	
CLASS 4 VOLUME. . . . .	.0	

### Active Detector Beep Signal

If the detector you select on this screen has an active presence on its input and the sound is On, there is a 3 beep-per-second tone during the time the detector is active.

To set the sound On/Off, see section 5.13.7 – Sound is Off/On.

### ITEM

### DESCRIPTION (data ranges)

#### Failures

Displays failure status of indicated detector  
 < MIN – Absence failure, the latest count is below the threshold value for failure.  
 > MAX – Erratic failure, too many counts have been received in the most recent diagnostic period.  
 HI OCCUP – Locked failure, the occupancy has exceeded the threshold value.

#### Delay Timer

Displays the current value of the delay timer for indicated detector (0 – 255 seconds)

#### Stretch Timer

Displays the current value of the stretch timer for indicated detector (0 – 25.5 seconds)

#### Stretch / Delay Inhibited

Displays status of stretch/extend/delay feature for indicated detector (Y/N)

#### Stop Bar Inhibited

Displays status of stop bar feature for indicated detector (Y/N)

#### Switch/Duplication Inhibited

Displays status of detector switching/duplication feature for indicated detector (Y/N)

#### Average Wait

Displays the average wait for indicated detector (0 – 255 seconds)

#### Average Gap

Displays the average gap for indicated detector (0 – 255 seconds)

#### Average Speed

Displays the average speed for indicated detector (0 – 125 mph)

#### Occupancy

Displays the current occupancy of the indicated detector (0 – 6553.5 seconds)

#### Class # Volume

Displays the current volume of each length class for indicated detector (0 – 255)

## 5.1.8 Overlaps

The Overlaps display reflects the status of any programmed overlaps (A-P). Information may be displayed for each of the overlaps with a programmed parent phase. Overlaps that do not have a programmed parent phase are not included in this display.

- Overlap (A-P) Green
- Overlap (A-P) Green Extension with Timer
- Overlap (A-P) Yellow Clearance with Timer
- Overlap (A-P) Red Clearance with Timer
- Overlap (A-P) No Active Parent (Overlap Red State)

1-8

OVERLAP	STATE	TIMER
OVERLAP A:	NO ACTIVE PARENT	
OVERLAP B:	GREEN	
OVERLAP F:	GREEN	
OVERLAP H:	NO ACTIVE PARENT	
OVERLAP I:	NO ACTIVE PARENT	

## 5.1.9 Coordination

The Coordination dynamic display contains the status data used by the coordinator. This display is updated once a second.

1-9

PLAN #2	OFFSET #1	IN STEP	09/20/07
PAGE: SQ1	TM1 PH1	OV1 IN1	OUT1 15:10:40
CYCLE=100	OFF:20	MC:50	LC:40 %ADJ:110
PHASE:	12345678910111213141516		
HOLD-FORCE-OFF	AAAAAAAA		
PHASE STATE	RG RRG R		
PHASE CALLS	C C		
PERMISSIVE	OX OX		

- **LINE 1 – Active Coordination Plan**

- PLAN - Displays the active coordination plan 1 – 64, Flash, Free
- OFFSET – Displays the active offset number 1-4
- DELTA - Displays the difference in seconds between the actual local clock and the ideal (in step) local clock. Display changes to read "IN STEP" when transition is completed. The display indicates WAITING on entry into coordination while waiting for both of the coordinated phases to be serviced simultaneously.
- COORDINATION ERROR – In the case of a coordination error, this message is displayed instead of the above. In addition, the nature of the error is displayed. These are listed in order of priority. If multiple errors exist, this is the order in which they will be displayed.
  - BAD SPLIT PHASE # - The phase specified has a programmed split that is less than the minimum time to service the phase. . Note that this calculation will ignore ped. times for phases marked as HI PRIORITY PED.
  - EXCESSIVE SPLITS – The sum of the splits for one or more rings is greater than the cycle length. Note that this calculation will ignore ped. times for phases marked as HI PRIORITY PED.
  - INVALID PLAN NUMBER – A plan outside the range of 0-66 has been specified. Note that this situation should never occur because everything at central, in the master and in the controller is range-checked. However, this provides additional protection.

- INCOMPATIBLE PHASES – This error occurs if the all of the coordinated phases are not mutually compatible. It also occurs if the coordinator remains in the “TRANSITION TO COORDINATION” state for more than two complete cycle lengths of time.
  - NO COORD SPLITS – Non-zero splits have not been configured for the coordinated phases. The coordinator requires a coordinated phase to be specified in each plan.
  - CYCLE LENGTH ERROR – OASIS requires that the cycle length be non-zero and in addition, it must not equal both the minimum and maximum cycle lengths. This error will be displayed if both of these conditions are not met.
  - NO COORD PHASES – This displayed if no coordinated phases have been programmed for the current coordination plan.
  - CONTROLLER DATE
- **LINE 2 – Active Pages**  
Line 2 displays active pages.
    - SQ – Phase Sequence Page 1-12
    - TM – Phase Timing Page 1-4
    - PH – Phase Control Page 1-4
    - OV – Overlap Control Page 1-4
    - IN – Inputs Page 1-4
    - OUT – Outputs Page 1-4
    - Controller Time
- **LINE 4 – Phase**  
Line 4 displays the phases.
- **LINE 3 – Active Timers**  
Line 3 displays active timers.
    - CYCLE: Displays the current programmed cycle length in seconds (0-999) An ‘=’ is displayed if the coordinator is in step. A ‘>’ is used if the coordinator is using a longer cycle length under transition. A ‘<’ is used if the coordinator is using a shorter cycle length under transition.
    - OFF: Programmed Offset in seconds
    - MC: Master Clock in seconds (referenced to midnight, and based upon cycle length).
    - LC: Local Clock in seconds (based upon cycle length, and adjusts in length to transition to programmed offset from master clock).
    - %ADJ: Percent cycle adjustment in transition
- **LINE 5 – Hold/Force-Off**  
Displays any hold or force-off signals placed on the phase by the coordinator. The following characters may be displayed:
    - H – The Coordinator has placed a Hold on the phase.
    - F – The Coordinator is forcing off the phase.
- **LINE 6 – Phase State**  
Displays the current color of the vehicle indication by phase:
    - R – Red
    - Y – Yellow
    - G – Green
    - N – Phase Next
    - – (Blank) An empty cell indicates a dark head (outputs off) for that phase. Phases that are not permitted will also not be displayed.

- **LINE 7 – Phase Calls**

Displays demand for service by phase. The characters listed in descending priority:

- R – A Maximum Timing Recall has been placed on the phase. (MAX1, MAX2, CNA1, CNA2)
- r – (Lower case r) A Minimum Recall has been placed on the phase.
- C – Coordinated Phase.
- X – A Call to Service has been placed on the phase.
- S – A Soft Recall has been placed on the phase.
- D – There is a dynamic call (backup prevent) placed on the phase.

- **LINE 8 – Permissive**

Displays Permissive Windows by phase. The characters listed in descending priority:

- X – Both Vehicle and Pedestrian service is permissive
- V – Only Vehicle service is permissive
- P – Only Pedestrian service is permissive
- O – A dynamic Omit has been placed on the phase.
- – (Blank) Phase is not permissive

### 5.1.10 Source View

On top of the standard programmed configuration, OASIS Provides 4 sources of phase control override.

- Manual overrides from the front panel and centrally commanded overrides
- Scheduled overrides
- Input override
- Master overrides.

The source view menu allows the user to verify the current overrides from any of these sources.

Selecting the 'NEXT' key will toggle through all 4 sources of overrides, as well as the combined set of implemented functions (from all sources + configuration), with which the controller is currently operating.

1-A

```
SOURCE:FRONT PANEL 10:33:58 10/09/07
PLAN (65=FLASH,66=FREE):0 OFFSET:0
PAGE SQ0 TMO PH0 OVO IN0 OWT0
ENT: CLEAR ALL | 12345678910111213141516
TIME MIN 2
TIME EXTENSION 2 |
TIME MAX 2
SOFT RECALL
-----
MINIMUM RECALL
MAXIMUM RECALL 1 |
MAXIMUM RECALL 2 |
CALL NON-ACT 1
CALL NON-ACT 2 |
OMIT PHASE
DUAL ENTRY
NO SKIP
ADDED EXTENSION
SIMULTANEOUS GAP
GUAR PASSAGE
GREEN INT FLASH
FAST GREEN FLASH
RED REST
BACKUP PROTECT
INH RESERVICE
INH MAX (COORD)
INHIBIT COORD
DYNAMIC MAX/MAX3 |
VARIABLE INITIAL
GAP REDUCTION
OMIT PEDESTRIAN
TIME WALK 2
TIME FDWALK 2
PED SOFT RECALL
PED RECALL
REST IN WALK
MOD REST IN WALK
PED RESERVICE
FLASHING WALK
ADVANCED WALK
DELAYED WALK
PED YELLOW CLEAR
PED RED CLEAR
STARTUP IN GREEN
STARTUP IN YEL
STARTUP RED CLR
FIRST PHASES
STARTUP CALL
STARTUP PED CALL
FLASH ENTRY
YELLOW FLASH
WAG PHASES
WAG OVERLAPS
MANUAL CONTROL
MAN CON OMIT PED
RED DET LOCK
YELLOW DET LOCK
ACT LOGIC 1-16
ACT LOGIC 17-32
DYNAMIC/BACKUP
```

**NEXT on the keypad will change Source**

## 5.1.11 Scheduling

The Scheduling Display shows the current active coordination plans with their associated offsets. Plans are listed in descending order of priority. Active scheduled functions are displayed beneath all queued coordination plans.

1-B		
ACTIVE EVENTS		15:02:40 06/18/02
#	DESCRIPTION	PRIORITY
2	COORD PLAN 1 OFFSET 1	LOW

Four levels listed in order of priority:

- MAN Highest Priority – Plan implemented directly from the front panel or as an override from central.
- HIGH High Priority – Plan implemented from the scheduler
- MED Medium Priority – Plan implemented from the scheduler
- LOW Low Priority – Plan implemented from the scheduler

When several active plans have the same priority level:

- The most recently implemented is considered to have the highest priority and will be listed first.
- All other plans will follow in the list.

All active scheduled functions are listed by event # (1-200)

## 5.1.12 Recent Alarms

The Recent Alarms display shows a series of accumulated Oasis alarms sorted most recent at the top at the top of the list.

## 5.1.13 Recent Events

The Recent Events display shows a series of accumulated Oasis events sorted most recent at the top of the list.

## 5.2 PHASE CONTROL

The Phase Control Functions menu allows the user to configure the phase-dependent control features provided by OASIS. There are four (4) separate pages of Phase Control Function data. Page selection can be accomplished through the scheduler, front panel, central computer, or external input.

2	
PHASE CONTROL FUNCTIONS MENU:	
1...	PHASE CONTROL FUNCTIONS
2...	DYNAMIC/BACKUP CONTROL FUNCTIONS

## 5.2.1 Phase Control Functions (Group 1 Permissions)

The Phase Control Functions are used to assign operational controls to each phase independently. The header displays the current Phase Control Functions page. The 'NEXT' button displays subsequent Phase Control pages (1-4). Values are changed by moving the cursor to the desired line, then pressing the desired numeric (or alpha) key. Values can also be changed by moving the cursor to the desired line and phase (or function), then pressing the YES/NO key. Function changes can be made to non-permitted phases, since the permitted phases may change by time of day (sequence page change).

2-1	
PHASE CONTROL SET: PAGE 1 (NEXT:PAGES)	
PHASE#	12345678910111213141516
PERMITTED	XXXXXXXX
TIME MIN 2	
TIME EXTENSION 2	
TIME MAX 2	
SOFT RECALL	
MINIMUM RECALL	X X
MAXIMUM RECALL 1	
MAXIMUM RECALL 2	
CALL NON-ACT 1	
CALL NON-ACT 2	
OMIT PHASE	
DUAL ENTRY	
NO SKIP	
ADDED EXTENSION	
SIMULTANEOUS GAP	XXXXXXXX
GUAR PASSAGE	
GREEN INT FLASH	
FAST GREEN FLASH	
RED REST	
BACKUP PROTECT	
INH RESERVICE	
INH MAX (COORD)	XXXXXXXXXX X X X X X X X
INHIBIT COORD	
DYNAMIC MAX/MAX3	
VARIABLE INITIAL	
GAP REDUCTION	
OMIT PEDESTRIAN	
TIME WALK 2	
TIME FDWALK 2	
PED SOFT RECALL	X X
PED RECALL	
REST IN WALK	
MOD REST IN WALK	
PED RESERVICE	
FLASHING WALK	
ADVANCED WALK	
DELAYED WALK	
PED YELLOW CLEAR	
PED RED CLEAR	
STARTUP IN GREEN	
STARTUP IN YEL	
STARTUP RED CLR	
FIRST PHASES	X X
STARTUP CALLS	
STARTUP PED CALL	
FLASH ENTRY	X X
YELLOW FLASH	
WAG PHASES	
WAG OVERLAPS	
MANUAL CONTROL	
MAN CON OMIT PED	
RED DET LOCK	
YELLOW DET LOCK	
ACT LOGIC 1-16	
ACT LOGIC 17-32	
DYNAMIC/BACKUP	

Changes are made permanent upon entry and will take effect at the end of the current cycle.

#### **Permitted Phases – (PERMITTED) - View Only**

Permitted Phases designate which phases can be serviced when there is a call or demand placed on that phase. The remaining control functions have no effect on phases that are not set as permitted phases.

The permitted phases are derived from the active sequence page. Any phase in the active sequence is a permitted phase.

#### **Time Minimum 2 (TIME MIN 2)**

The Time Minimum setting 2 causes the controller to utilize the Minimum Green 2 timing interval. If not selected, the controller will use the Minimum 1 timing interval.

#### **Time Extension 2 (TIME EXTENSION 2)**

The Time Extension 2 setting causes the controller to utilize the Extension 2 timing interval. If not selected, the controller will use the Extension 1 timing interval.

#### **Time Maximum 2 (TIME MAX 2)**

The Time Maximum 2 setting causes the controller to utilize the Maximum Green 2 timing interval. If not selected, the controller will use the Maximum 1 timing interval.

#### **Vehicle Soft Recall (SOFT RECALL)**

Vehicle Soft Recall places a demand for Vehicle service on those designated phases that do not have demand for service or other recall conditions placed on them. Once serviced, the phase then rests in the Green interval until demand is placed on other conflicting Permitted phases.

#### **Vehicle Minimum Recall (MINIMUM RECALL)**

Vehicle Minimum Recall (MIN Recall) places a recurring demand for vehicle service on a phase when that phase is not in its Green interval. This feature allows the phase to be serviced every cycle\* for the Minimum Green interval even without vehicle presence.

\* The coordinator may inhibit service to phases that have Minimum Recall enabled. Refer to the Coordination Section.

#### **Vehicle Maximum Recall 1 & 2 (MAXIMUM RECALL 1 / MAXIMUM RECALL 2)**

Vehicle Maximum Recall (MAX Recall) places a constant recurring demand for vehicle service on a phase. The phase will be serviced every cycle\*; as in the case of Minimum Recall. In addition to this, the timing of the Green interval for that phase will be extended to its Maximum Green time, as defined in the Phase Timing Table.

MAX Recall 1 extends the Green interval to the MAX 1 timing setting. Maximum Recall 2 extends the Green interval to the MAX 2 timing setting. The Vehicle Maximum Recall 1 or 2 setting can be enabled by the scheduler, central computer, or by an external input.

\* The coordinator may inhibit service to phases that have Maximum Recall 1 or 2 enabled. Refer to the Coordination Section.

#### **Call to Non-Actuated 1 & 2 (CALL NON-ACT 1 / CALL NON-ACT 2)**

Call to Non-Actuated (CNA) enables a non-actuated operation for the selected phases. All CNA phases time the corresponding MAX Recall period (MAX 1 or MAX 2) and a Pedestrian (PED) Recall is placed on all corresponding pedestrian phases.

CNA is programmed for all Coordinated Hold phases.

#### **Omit Phase (OMIT PHASE)**

Omit Phase omits the selected phase from service.

### **Dual Entry (DUAL ENTRY)**

Dual Entry is a mode of operation in which one phase in each ring will be serviced, whenever possible, subject to compatibility. If a service request does not exist in a ring when a commitment is made to service a phase compatible to the ring, a Dual Entry phase can be selected to be active in that ring.

### **No Skip (NO SKIP)**

No Skip places a demand for service on the selected phase if a call comes in on a phase normally serviced after the selected phase.

For example, if the controller has lead Phases of 1 & 5 and compatible Phases of 2 & 6, No Skip enabled on Phase 1 assures service on Phase 1 prior to service on Phase 2. No Skip phases will be serviced for the Minimum Green time if no additional calls extend the Green interval.

### **Added Extension (ADDED EXTENSION)**

Added Extension delays the actuation of the Passage Timer until the Minimum Green interval is completed. Upon expiration of the Minimum Green timer, the Green interval will be extended at least one subsequent Passage Interval.

### **Simultaneous Gap-Out (SIMULTANEOUS GAP)**

Simultaneous Gap Out forces compatible phases to simultaneously “Gap Out” prior to servicing cross-barrier calls. Simultaneous Gap Out ensures that all phases, which will terminate, need to simultaneously reach a decision point to terminate before Green interval timing termination will begin (e.g. Gap-Out, MAX-Out or Force-Off). When all phases have not reached such a point, any gapped-out phase will revert to the extendable portion of the Passage time intervals based on Vehicle calls.

Under the conditions as defined above (Simultaneous Gap Out), if disabled, allows a phase to reach a point of being committed to terminate independently of any other phase and will not revert back to the extendable portion from a gapped-out condition.

### **Guaranteed Passage (GUAR PASSAGE)**

When Guaranteed Passage is enabled, the controller will extend the Green interval for one extension if the phase reaches MAX Green termination and the phase has not gapped out.

### **Green Interval Flash (GREEN INT FLASH)**

Green Interval Flash causes the Green indication for each phase to flash when the Green interval is active. When enabled, the Green interval flashes at a rate of 0.5 Hz and 50% duty cycle.

### **Fast Green Flash (FAST GREEN FLASH)**

Fast Green Flash causes the Green indication to flash at a rate specified by the Green Flash Frequency when the Green interval is active. The Green interval flashes with a 50% duty cycle.

Output frequencies and duty cycles can also be adjusted through the output assignment configuration.

### **Red Rest (RED REST)**

Red Rest causes any active phase to terminate even in the absence of a conflicting call. This setting supersedes a Soft Recall placed on the same phase. A phase that has both Soft Recall and Red Rest enabled will terminate and rest in Red until a conflicting call is present.

### **Backup Protect (BACKUP PROTECT)**

Backup Protect causes all phases in the controller to revert to red when the next phase to be serviced is a previous phase in the same barrier. For example, with Backup Protect selected on phases 2 and 6 in a standard dual-quad sequence, the controller will force both phases 2 and 6 to clear when transitioning from 2 & 6 to 2 & 5. Phase 2 will utilize the red revert timing interval for this transition.

### **Inhibit Reservice (INH RESERVICE)**

Inhibit Reservice causes a re-service phase in the sequence to be omitted from the cycle.

### **Inhibit Maximum Termination (INH MAX (COORD))**

Inhibit Maximum Termination should be enabled for all phases for proper coordinator operation. Inhibit Maximum Termination prevents any phase from terminating its Green interval if a Hold has been placed on the phase by the coordinator. When Inhibit Maximum Termination is not enabled, the phase will MAX out, even when a hold is placed on that phase.

Inhibit Maximum Termination is ignored during Free Operation. Preemption sequences have a separate timing sequence and will inhibit MAX termination on all phases regardless of their Inhibit Maximum Termination setting.

### **Inhibit Coordination (INHIBIT COORD)**

**Inhibit Maximum Termination should be enabled for all phases for proper coordinator operation.**

Inhibit Coordination causes the coordinator to ignore specific phases in the sequence. Split times do not have to be programmed for these phases to be active. MIN and MAX timers are used instead. The feature allows these phases to come up at any time while any other phase in the same barrier is being served, that are not inhibited in the coordinator. This feature is frequently utilized for busway preemption or other advanced implementations, because it may cause the coordinator to become out of step easily.

### **Dynamic Maximum/MAX 3 (DYNAMIC MAX/MAX3)**

Dynamic Maximum causes the maximum timing interval to be adjusted based upon demand. For every 2 successive maximum terminations, the maximum timing will be increased by the Dynamic Max Adjust timing parameter. For every 2 successive gap out terminations, the maximum timing will be decreased by the Dynamic Max Adjust timing parameter. The dynamic maximum begins and is lower bounded by the MAX 1 time and is upward bounded by the Dynamic Max time. If the Dynamic Max Adjust timing parameter is set to 0, the controller will always utilize the full Dynamic Max time. (MAX 3)

### **Variable Initial (VARIABLE INITIAL)**

Variable Initial provides adjustment to the initial Green interval. When enabled, the Initial Green interval is calculated by multiplying the number of vehicle actuations during the Yellow and Red intervals by the seconds per actuation timing value. In the case that this value does not exceed the Minimum Green timing value set for the phase, the Minimum Green will be timed. The Variable Initial time is not to exceed the Maximum Variable Initial setting for the phase.

### **Gap Reduction (GAP REDUCTION)**

Gap Reduction provides adjustment of the Gap (Passage) Timer. The Gap Timer's reset value will be reduced from the Initial Extension setting to the Minimum Gap setting. The reduction begins after the Green interval has timed the Time Before Reduction (TBR) interval. The Gap Timer's reset value will then be linearly reduced over the Time To Reduce (TTR) interval.

### **Omit Pedestrian (OMIT PEDESTRIAN)**

Omit pedestrian causes the pedestrian component of a phase to be omitted.

### **Time Walk 2 (TIME WALK 2)**

The Time Walk 2 setting causes the controller to utilize the Walk 2 timing interval. If not selected, the controller will use the Walk 1 timing interval.

### **Time Flashing Don't Walk 2 (TIME FDWALK 2)**

The Time Flashing Don't Walk 2 setting causes the controller to utilize the Flashing Don't Walk 2 timing interval. If not selected, the controller will use the Flashing Don't Walk 1 timing interval.

### **Pedestrian Soft Recall (PED SOFT RECALL)**

Pedestrian Soft Recall will service the selected PED phase every time that the parent vehicle phases are serviced. If the Vehicle Phase is serviced than the Pedestrian Phase will also be serviced.

### **Pedestrian Recall (PED RECALL)**

Pedestrian Recall places a recurring pedestrian demand on the designated pedestrian phases. This condition functions in the same manner as an external Pedestrian demand except that it will not recycle the pedestrian service until a conflicting phase has been serviced.

### **Rest in Walk (REST IN WALK)**

Rest in Walk causes the active pedestrian phase to rest in the walk state at the end of its walk interval until a conflicting call is present. In coordination mode, even if rest in walk is enabled, the walk will terminate at the end of the coordinated phase split time, in anticipation of vehicle demand on conflicting phases. Rest in Walk should be enabled if Pedestrian Re-Service is also enabled during coordination.

### **Modified Rest in Walk (MOD REST IN WALK)**

Modified Rest in Walk causes the active pedestrian phase to rest in the walk state at the end of its walk interval until a conflicting call is present. If the conflicting call terminates prior to the Yellow clearance of the serviced phase, the Walk is re-timed. This is only active if outside of coordination mode.

### **Pedestrian Re-Service (PED RESERVICE)**

Pedestrian Re-Service allows a pedestrian movement to be re-serviced during the same cycle, if a Hold is applied to the parent phase of a pedestrian movement and a pedestrian call is present. Only takes effect when a hold is applied to the Vehicle Phase.

### **Flashing Walk (FLASHING WALK)**

Flashing Walk selects which pedestrian phase(s) will flash the walk indication when the walk interval is active. The walk indication flashes at a rate of 1.0 Hz and 50% duty cycle when enabled.

### **Advanced Walk Phases (ADVANCED WALK)**

Advanced Walk advances service of the associated pedestrian phase before the start of the associated vehicle phases. Upon entry into a phase that has the Advanced Walk ACTIVE and a pedestrian call is present, the Walk is serviced while the parent phase waits in Red. Once the Advanced Walk interval has timed out, the vehicle phase will be allowed to advance to the Green interval. Once the Advanced Walk timer expires, the normal pedestrian and vehicle timer begins.

### **Delayed Walk Phases (DELAYED WALK)**

Delayed Walk delays the service of the associated pedestrian phase beyond the start of the associated vehicle phases. The pedestrian service will be delayed for the Walk Delay Time interval. The standard pedestrian interval timing is utilized once the pedestrian phase is serviced. The Walk delay time is set in the Phase Timing Walk Delay Time.

### **Pedestrian Yellow Clearance (PED YELLOW CLEAR)**

Pedestrian Yellow Clearance allows the pedestrian clearance interval to remain active through the Yellow Clearance interval of the parent vehicle phase. When Pedestrian Yellow Clearance is not enabled, vehicle phases will not be permitted to terminate Green until the associated pedestrian phases have completed service.

### **Pedestrian Red Clearance (PED RED CLEAR)**

Pedestrian Red Clearance allows the pedestrian clearance interval to remain active through the Red clearance interval of the parent vehicle phase. Pedestrian Yellow Clearance needs to be enabled for each corresponding Pedestrian Red Clearance phase for this function to operate correctly.

### **Startup in Green Phases (STARTUP IN GREEN)**

Startup in Green phases are the phases that begin in a Green interval from a long power failure (greater than 2 seconds). The Green startup period will be timed in accordance with the values set for the Minimum Green 1 for that corresponding phase, as defined in Phase Timings. When Startup in Green phases are selected, there will not be Yellow or all Red startup intervals. If multiple phases are selected as Startup in Green phases, they need to be compatible phases within the same barrier.

### **Startup in Yellow Phases (STARTUP IN YELLOW)**

Startup in Yellow phases are the phases that begin in the Yellow clearance interval from a long power failure (greater than 2 seconds). The Yellow startup period will be timed in accordance with the values set for the Yellow Clearance for that corresponding phase, as defined in Phase Timings. If multiple Startup in Yellow phases are selected, all selected phases need to be compatible with one another according to the phase sequencer. If no Startup in Yellow phases are selected and no Startup in Green phases are selected, an All-Red startup interval will be timed before any calls are serviced.

### **Startup Red Clearance (STARTUP RED CLEAR)**

Startup in Red phases are the phases that begin in the Red clearance interval from a long power failure (greater than 2 seconds). The Red startup period will be timed in accordance with the values set for the Red Clearance for that corresponding phase, as defined in Phase Timings. If multiple Startup Red phases are selected, all selected phases need to be compatible with one another according to the phase sequencer. If no Startup Red Clearance phases, Startup Yellow phases, or Startup Green phases are selected, an All-Red startup interval will be timed before any calls are serviced.

### **First Phases (FIRST PHASES)**

First Phases will select the phase(s) that are to be serviced after the Yellow and All-Red startup initial phase intervals. If no Yellow start phases are selected, the controller will startup in All-Red, time the Red startup time, and execute the First Phases immediately thereafter. If multiple First Phases are selected, all selected phases need to be compatible with one another according to the phase sequencer. If no First Phases are selected, the sequencer will begin service with the first column in the sequencer table.

### **Startup Vehicle Calls (STARTUP CALLS)**

Startup Vehicle Calls allow selection of the vehicle phases to receive calls at startup. If no phases are selected, all permitted phases will receive a call to service at startup.

### **Startup Pedestrian Calls (STARTUP PED CALL)**

Startup Pedestrian calls allow selection of the pedestrian phases to receive calls at startup. Unlike Startup Vehicle Call, if no phases are selected, no pedestrian phases will receive a call to service at startup.

### **Flash Entry Phases (FLASH ENTRY)**

Flash Entry Phases designate the last phases to be serviced prior to the controller entering controller (software) flash. When a command to enter flash is received, the controller will place calls on all permitted phases and cycle normally until the flash entry phases have serviced their MIN Green intervals. Upon MIN Green service of the flash entry phases, the controller will proceed into the normal clearance intervals, followed by controller flash. If no flash entry phases are designated, the controller will place calls on all permitted phases and proceed into flash upon the next barrier crossing.

### **Yellow Flash (YELLOW FLASH)**

Yellow Flash selects which phase(s) flash Yellow when the Controller Flash or the Time of Day (TOD) Flash is initiated. Phases not selected as Yellow Flash phases will flash Red when the controller flash or TOD flash is initiated.

### **Wag Phases (WAG PHASES)**

Phases selected, as Wag Phases, will flash out of sync of phases not selected (Wig phases), when controller flash is enabled.

### **Wag Overlaps (WAG OVERLAPS)**

Overlaps selected as Wag Overlaps will flash in sync with Wag phases programmed in Wag Phases, when controller flash is enabled.

### **Manual Control Phase Calls (MANUAL CONTROL)**

Manual Control Phase Calls will designate which phases the Manual Advance Input can manually advance. If a phase does not have Manual Control Phase Calls enabled, then the controller will time the Minimum Green time for that phase (ignoring the Manual Advance Input) and then advance to the next phase.

### **Manual Control Omit Pedestrian (MAN CON OMIT PED)**

Manual Control Omit Pedestrian will designate a phase that does not allow pedestrian service when the Manual Control Enable input is active.

### Red Detector Lock (RED DET LOCK)

Red Detector Lock locks a detector call on a phase that is in its Red interval. The lock ensures service on this phase even if the detector input terminates prior to phase service. The call on the phase will be cleared once the phase begins its Green interval.

Phase detectors continue counting vehicle calls on a locked detector when the Variable Initial setting is enabled.

The Red Detector Lock setting supercedes the Yellow Detector Lock setting.

### Yellow Detector Lock (YELLOW DET LOCK)

Yellow Detector Lock locks a detector call on a phase whenever that phase is not in its Green interval. The lock ensures service on this phase even if the detector input terminates prior to phase service.

The Yellow Detector Lock setting is subordinate to the Red Detector Lock Setting. If the Red Detector Lock and the Yellow Detector Lock are simultaneously enabled, calls placed during the Yellow interval will not be locked.

### Active Logic 1-32 (ACT LOCIC 1-16 / ACT LOGIC 17-32)

This setting allows the user to enable any of the 32 logic processor statements. Logic commands 1-16 are listed on the first of two lines; logic commands 17-32 are listed on the second line.

### Dynamic / Backup (DYNAMIC/BACKUP)

This setting allows the user to select which of the 16 Dynamic/Backup Control functions are to be active.

## 5.2.2 Dynamic/Backup Control Functions (Group 1 Permissions)

Dynamic/Backup Control Functions allow certain phases to be omitted from or recalled to service dynamically. Phase omission / recall can occur conditionally upon service of other phases or overlaps, or occur independent of these conditions. There are 16 Dynamic/Backup Control functions which can be enabled through a phase control function table, coordination plan or enabled independently from the scheduler, external input, or central computer.

2-2

```
DYNAMIC/BACKUP CONTROL FUNCTION #01
                                OVERLAPS : |ABCDEFGHIJKLMNPO
IF OVERLAPS ARE ACTIVE |
OR      PHASES : |12345678910111213141516
IF PHASES ARE ON|
OMIT PHASES      |
CALL PHASES      |
```

The header displays the current Dynamic/Backup Control Function viewed. The 'NEXT' button displays subsequent Dynamic/Backup Control functions (1-16). Values are changed by moving the cursor to the desired line, then pressing the desired numeric (or alpha) key. Values can also be changed by moving the cursor to the desired line and phase (or overlap), then pressing the YES/NO key.

- IF OVERLAPS ARE ACTIVE – Conditional restrictions on the omitted phases.
- OR/IF PHASES ARE ON – Conditional restrictions on the omitted phases.
- OMIT PHASES – Phases to be omitted.
- CALL PHASES – Calls to be placed.

There are 4 scenarios for a conditional omit:

- If a phase is selected from the IF OVERLAPS ARE ACTIVE line, the phases selected as an Omit Phase will only be omitted when at least one of the IF OVERLAPS ARE ACTIVE overlaps is currently being serviced.
- If a phase is selected from the OR PHASES ARE ON line, the phases selected as an Omit Phase will only be omitted when at least one of the OR PHASES ARE ON phases is currently being serviced or has been selected as a next phase to be serviced.
- If phases are selected from both the IF OVERLAPS ARE ACTIVE and OR PHASES ARE ON lines, the phases selected as an Omit Phase will only be omitted when at least one of the IF OVERLAPS ARE ACTIVE overlaps or one of the OR PHASES ARE ON phases are currently being serviced.
- If there are no phases selected from either the OMIT IF OVERLAP IS ON lines or from the OR PHASES ARE ON, the phases selected as an Omit Phase will be omitted unconditionally.

There are 2 scenarios for a conditional recall:

- If no omit phases are selected, the phases selected on the CALL PHASES line will be recalled with the same conditional logic as the conditional omit above.
- If omit phases are selected, the CALL PHASES will only be called when an omit phase has demand and is omitted from service.

These changes are made permanent upon entry, and will take effect at the end of the current cycle.

### 5.3 PHASE TIMING (Group 1 Permissions)

Phase Timing data defines the actual timing values for each phase. The Phase Timing Data consists of four (4) separate timing pages. Each of these timing pages contains the timing parameters required to configure the controller. The active timing page can be included in a coordination plan or selected directly by the scheduler, central computer, external input, or manual selection.

The Phase Timing parameters are entered as a range of values from 0 to 255 seconds or 0.0 to 25.5 seconds for each phase. The header displays the current Phase Timing page. The 'NEXT' button displays subsequent Phase Timing pages (1-4). Times are entered by aligning the cursor under the phase and to the right of the value to be changed, then using the numeric keypad, press in the correct value. Pressing ENT or scrolling to a new location saves the value.

The rows contain the timing functions and the columns correspond to a specific phase. Cursor movement beyond the rightmost visible column or beneath the lowest visible row will scroll in the remaining data.

3

PHASE TIMING SET: PAGE 1 (NEXT:PAGES)															
PHASE	...	1	...	2	...	3	...	4	...	5	...	6	→	...	16
MINIMUM GREEN 1		10		10		10		10		10		10			
MINIMUM GREEN 2		10		10		10		10		10		10			
RESERVICE GREEN		10		10		10		10		10		10			
EXTENSION 1 (GAP 1)		3.0		3.0		3.0		3.0		3.0		3.0			
EXTENSION 2 (GAP 2)		3.0		3.0		3.0		3.0		3.0		3.0			
MAXIMUM GREEN 1		30		30		30		30		30		30			
MAXIMUM GREEN 2		30		30		30		30		30		30			
YELLOW CLEARANCE		5.0		5.0		5.0		5.0		5.0		5.0			
RED CLEARANCE		1.0		1.0		1.0		1.0		1.0		1.0			
RED REVERT		1.0		1.0		1.0		1.0		1.0		1.0			
WALK 1		0		7		0		7		0		7			
WALK 2		0		7		0		7		0		7			
DONT WALK 1		0		20		0		20		0		20			
DONT WALK 2		0		20		0		20		0		20			
WALK ADVANCE TIME		0.0		0.0		0.0		0.0		0.0		0.0			
WALK DELAY TIME		0.0		0.0		0.0		0.0		0.0		0.0			
ALTERNATE WALK		0		7		0		7		0		7			
ALTERNATE DONT WALK		0		20		0		20		0		20			
ALTERNATE MIN GREEN		10		10		10		10		10		10			
DYNAMIC MAX/MAX 3		0		0		0		0		0		0			
DYNAMIC MAX ADJUST		0.0		0.0		0.0		0.0		0.0		0.0			
SECONDS / ACTUATION		1.5		1.5		1.5		1.5		1.5		1.5			
MAX VARIABLE INITIAL		20		20		20		20		20		20			
TIME BEFORE REDUCTN		10		10		10		10		10		10			
TIME TO REDUCE		10		10		10		10		10		10			
MINIMUM GAP		0.0		0.0		0.0		0.0		0.0		0.0			
ALT FLASH FREQUENCY (0-25.5 HZ)		...		0											

Changes are made permanent upon entry and will take effect at the end of the current sequence.

## Vehicle Interval Timing

The Vehicle Green Timing interval is active for two timing intervals. The first of these intervals is the MIN Green interval. Upon completion of the MIN Green interval, an extension interval will extend the Green interval. This extension is dependent upon vehicle actuations. The Green interval is limited by the MAX Green time and will terminate upon timing the MAX Green Time (MAX Out). Upon green termination, the vehicle phase will service the yellow clearance interval followed by a red clearance interval.

### MIN Green 1

MIN Green 1 is the first portion of the Green interval, it is a guaranteed minimum Green time for the phase. This timing parameter is required on all vehicle phases.

- Numerical input 0 – 255 seconds

### MIN Green 2

MIN Green 2 is a secondary MIN Green interval timing that can be selected by either Time of Day control or External Input. This timing parameter is an optional setting for vehicle phases, and if activated, replaces MIN Green 1.

- Numerical input 0 – 255 seconds

### Reservice Green

Reservice Green is the MIN Green interval to be used for Reservice phases. If a time is not specified, the default MIN Green timing will be used for the phase.

- Numerical input 0 – 255 seconds

### Extension 1 (Gap 1)

Extension 1 controls the extendable portion of a phase's Green interval. The controller will remain in a phase's Green interval until one of the following situations occur:

- An absence of detector actuation that exceeds the Extension 1 value
- A Force-Off is applied (during coordination)
- The Max Green timer has expired (during Free Run)

The Extension interval times concurrently with the MIN Green unless the Added Extension Phase Function is enabled. When timing this portion of the Green interval, the Extension timer will be Reset with each subsequent vehicle actuation and will not commence timing until the vehicle actuation has been removed. When the extension timer reaches zero, the Green interval will be terminated. This timing parameter is required on all vehicle phases.

- Numerical input 0.0 – 25.5 seconds

### Extension 2 (Gap 2)

Extension 2 is a secondary Extension interval timing that can be selected by either Time of Day control or External Input. This timing parameter is an optional setting for vehicle phases, and if activated, replaces Extension 1 timings.

- Numerical input 0.0 – 25.5 seconds

### MAX Green 1

The MAX Green 1 time defines the maximum time that a phase will remain in the Green interval. When MAX Recall is ACTIVE, the phase will always time to the MAX Green time, regardless of demand on that phase. This is required on all vehicle phases.

- Numerical input 0 – 255 seconds

### MAX Green 2

MAX Green 2 is a secondary MAX Green time that can be selected by either Time of Day control or external input. This timing parameter is an optional setting for vehicle phases, and if activated, replaces MAX Green 1 timings.

- Numerical input 0 – 255 seconds

### Yellow Clearance

This setting defines the Yellow Clearance interval that is required on all vehicle phases.

- Numerical input 3 – 25.5 seconds

### **Red Clearance**

This setting defines the Red Clearance interval and is required on all vehicle phases.

- Numerical input 0 – 25.5 seconds

### **Red Revert**

This setting defines the Red Revert Clearance interval. This is the red clearance timing used any time the next phase is the same as the terminating phase, or in Backup Protection operation.

- Numerical input 0 – 25.5 seconds

## **Pedestrian Interval Timing**

### **Walk 1**

The Walk time allows pedestrians adequate opportunity to leave the curb before the Pedestrian Clearance begins. The Walk indication will be active for the enabled Walk timing interval. Walk 1 is the default Walk interval timing. This timing parameter is required on all pedestrian phases.

- Numerical input 0 – 255 seconds

### **Walk 2**

Walk 2 is a secondary Walk interval timing that can be selected by either Time of Day control or External Input. This timing parameter is an optional setting for pedestrian phases, and if activated, replaces Walk 1 timings.

- Numerical input 0 – 255 seconds.

### **Dont Walk 1**

The Don't Walk or Pedestrian Clearance interval allows pedestrians an opportunity to cross the street before the Vehicle clearance interval for the parent phase begins. If the PED Yellow Clearance or PED Red Clearance is enabled for the phase, the pedestrian clearance interval may respectively extend into the vehicle Yellow or Red clearances of the vehicle phase. This timing parameter is an optional setting for pedestrian phases.

- Numerical input 0 – 255 seconds

### **Dont Walk 2**

Don't Walk 2 is a secondary pedestrian clearance interval timing that can be selected by either Time of Day control or external input. This timing parameter is an optional setting for pedestrian phases, and if activated, replaces Dont Walk 1 timings.

- Numerical input 0 – 255 seconds

### **Walk Advance Time**

The Walk Advance Time designates the amount of time that the controller will advance a Walk movement before servicing the vehicle phase. This timing parameter is required on all vehicle phases that have the Advance Walk control function enabled.

- Numerical input 0 – 255 seconds

### **Walk Delay Time**

The Walk Delay Time designates the amount of time that the controller will time the parent phase of a Walk movement before starting the Walk timer and displaying the Walk indication. This timing parameter is required on all vehicle phases that have the Delayed Walk control function enabled.

- Numerical input 0 – 255 seconds

### **Alternate Walk**

Alternate Walk is an alternate walk interval timing that can be enabled by an external input. This setting is commonly used for timing a handicapped walk interval and is an optional setting for pedestrian phases. When a handicapped pedestrian input is serviced, the Alternate Walk, Alternate Don't Walk, and Alternate MIN Green timing will all be utilized if programmed.

- Numerical input 0 – 255 seconds

### **Alternate Don't Walk**

Alternate Don't Walk is an alternate pedestrian clearance interval timing that can be enabled by an external input. This setting is commonly used for timing a handicapped pedestrian clearance

interval and is an optional setting for pedestrian phases. When a handicapped pedestrian input is serviced, the Alternate Walk, Alternate Don't Walk, and Alternate MIN Green timing will all be utilized if programmed.

- Numerical input 0 – 255 seconds

#### **Alternate MIN Green**

Alternate MIN Green is an additional MIN Green interval timing that can be enabled by an external input and is an optional setting for vehicle phases. When a handicapped pedestrian input is serviced, the Alternate Walk, Alternate Don't Walk, and Alternate MIN Green timing will be utilized, instead of MIN Green 1 or MIN Green 2, if programmed.

- Numerical input 0 – 255 seconds

### **Volume Density Operation**

#### **Dynamic Maximum Function**

Dynamic Maximum causes the maximum timing interval to be adjusted based upon demand. For every 2 successive maximum terminations, the maximum timing will be increased by the Dynamic Max Adjust timing parameter. For every 2 successive gap out terminations, the maximum timing will be decreased by the Dynamic Max Adjust timing parameter. The dynamic maximum begins and is lower bounded by the MAX 1 time and is upward bounded by the Dynamic Maximum time. If the Dynamic Maximum Adjust timing parameter is set to 0, the controller will always utilize the full Dynamic Maximum time (MAX 3).

#### **Dynamic Maximum/MAX 3**

- Numerical input 0 – 255 seconds

#### **Dynamic Maximum Adjust**

- Numerical input 0 – 25.5 seconds

### **Variable Initial Function**

Variable initial operation increases the MIN Green interval in a manner dependent upon the number of vehicle actuations placed on the phase while it is in the Yellow or Red interval. The variable initial interval is calculated as a function of the vehicle actuations and the MIN Green, Seconds Per Actuation, and MAX Variable Initial settings. The following relation calculates the variable initial interval:

$$\text{Initial Interval} = (\# \text{ of Vehicle Actuations}) \times (\text{Seconds Per Actuation Setting})$$

If the calculated initial interval is less than the MIN Green setting, the MIN Green time will be used as the initial interval. If the calculated initial interval is greater than the MAX Variable initial setting, the MAX Variable initial will be used as the initial interval.

#### **Seconds Per Actuation**

Seconds Per Actuation determines the time by which the Variable Initial time is increased for each vehicle actuation received during the associated phases Yellow and Red intervals. This timing parameter is required on all vehicle phases that have the variable initial phase control function enabled.

- Numerical input 0 – 25.5 seconds

#### **MAX Variable Initial**

The MAX Variable Initial is the Maximum Initial interval that will be computed under variable initial operation. The MAX Variable Initial is subordinate to the MIN Green interval. This timing parameter is required on all vehicle phases that have the variable initial phase control function enabled.

- Numerical input 0 – 255 seconds

## Gap Reduction Function

Gap Reduction reduces the allowable gap between successive vehicle actuations by dynamically decreasing the extension time. The rate of reduction is based on the setting of the Extension, Minimum Gap, and Time to Reduce settings. Using this method, the gap will be reduced by the following relation:

$$\text{Reduction} = \frac{\text{Extension} - \text{Minimum Gap}}{\text{TTR}} \times (\text{Current Green Interval Time} - \text{TBR})$$

This reduction begins when the Green interval has timed the Time Before Reduction (TBR) setting. Reduction of the allowable gap will continue until the gap reaches a value equal to or less than the Minimum Gap. In the presence of continual vehicle actuations, the phase will not gap out, even if the gap has been reduced to zero.

If at any time the serviceable conflicting call is withdrawn, the gap will revert to the Extension time setting, and the Time Before Reduction timer will be RESET and remain RESET until the next conflicting serviceable call is received.

### Time Before Reduction (TBR)

The Time Before Reduction begins when the phase is in its Green interval and there is a serviceable conflicting call. If the serviceable conflicting call is removed during this time period, the timer will be RESET and will remain RESET until the next serviceable conflicting call is received. Upon completion of the Time Before Reduction period, the reduction of the allowable gap will begin. This timing parameter is required on all vehicle phases that have the Gap Reduction control function enabled.

- Numerical input 0 – 255 seconds

### Time to Reduce (TTR)

Time to Reduce specifies the time frame in which the controller will reduce the phase gap from the Extension settings to the Minimum Gap setting. This timing parameter is required on all vehicle phases that have the Gap Reduction control function enabled.

- Numerical input 0 – 255 seconds

### Minimum Gap

The Minimum Gap specifies the minimum extension value that can be achieved under gap reduction. This timing parameter is required on all vehicle phases that have the Gap Reduction control function enabled.

- Numerical input 0 – 255 seconds

## Phase-Independent Timing Elements

### Alternate Flash Frequency

The Alternate Flash Frequency setting defines the flash frequency for the Green interval when the fast Green flash is enabled on a phase. This timing parameter is required on all vehicle phases with fast Green flash enabled.

- Numerical input 0 – 25.5 Hz

**NOTE:** The flashing operation is limited to a 100ms timer resolution, specific frequencies that can not be uniquely applied with a 100ms sampling rate, may show some deviation from the set frequency.

## 5.4 PHASE SEQUENCER (Group 1 Permissions)

The Phase Sequencer determines the phase sequencing within the cycle length. Detailed descriptions of the Phase Sequencer's functionality along with configuration examples are explained in-depth in this section. There are twelve separate Phase Sequencer tables that can be enabled independently by the scheduler or as a component of a coordination plan. Use 'NEXT' key to scroll from one page to the next, and the arrow keys to scroll between barriers within a page.

The function of the Phase Sequencing is accomplished using an internal algorithm called the "Phase Sequencer" or "Sequencer". The Phase Sequencer determines:

- Phases in use
- The order in which the phases are allowed to be serviced

4

PHASE SEQUENCE: PAGE 1 (NEXT:PAGES)																		
RNG LEAD	BARRIER 1		X-LAG LEAD		BARRIER 2		X-LAG LEAD		BARRIER 3		X-LAG LEAD		BARRIER 4		X-LAG LEAD			
1	11	2	0	0	13	4	0	0	10	0	0	0	0	10	0	0	0	1
2	15	6	0	0	17	8	0	0	10	0	0	0	0	10	0	0	0	1
3	10	0	0	0	10	0	0	0	10	0	0	0	0	10	0	0	0	1
4	10	0	0	0	10	0	0	0	10	0	0	0	0	10	0	0	0	1

PHASE SEQUENCE: PAGE 2 (NEXT:PAGES)																		
RNG LEAD	BARRIER 5		X-LAG LEAD		BARRIER 6		X-LAG LEAD		BARRIER 7		X-LAG LEAD		BARRIER 8		X-LAG LEAD			
1	10	0	0	0	10	0	0	0	10	0	0	0	0	10	0	0	0	1
2	10	0	0	0	10	0	0	0	10	0	0	0	0	10	0	0	0	1
3	10	0	0	0	10	0	0	0	10	0	0	0	0	10	0	0	0	1
4	10	0	0	0	10	0	0	0	10	0	0	0	0	10	0	0	0	1

### GENERAL INFORMATION

The OASIS Phase Sequencer operates under the following definitions:

- **Exclusive Phase** – A phase that is serviced alone. No other phases can be serviced in any manner while an exclusive phase is being serviced.
- **Compatible Phase** – Phases that can be serviced concurrently with other phases. If two or more phases can be serviced concurrently, the phases are said to be compatible with one another. Two or more phases can both be compatible phases, but not compatible with one another. The guidelines for compatibility are based upon the barrier and ring properties of the compatible phases.
- **Barrier** – As stated above, all compatible phases are not necessarily compatible with one another. Compatible phases are categorized into "Barriers." Phases can belong to Barrier A or Barrier B. A standard rule of phase sequencing applies to these barriers:

**“ Phases in one barrier cannot be serviced simultaneously with any phases in a different barrier.”**

All phases serviced in Barrier A need to terminate before any phases in Barrier B can be serviced, hence the term 'Barrier.'

- **Ring** – Compatible phases within the same barrier are categorized into rings. A standard rule of phase sequencing applies to these rings:

**“Any two phases in the same ring cannot be serviced simultaneously.”**

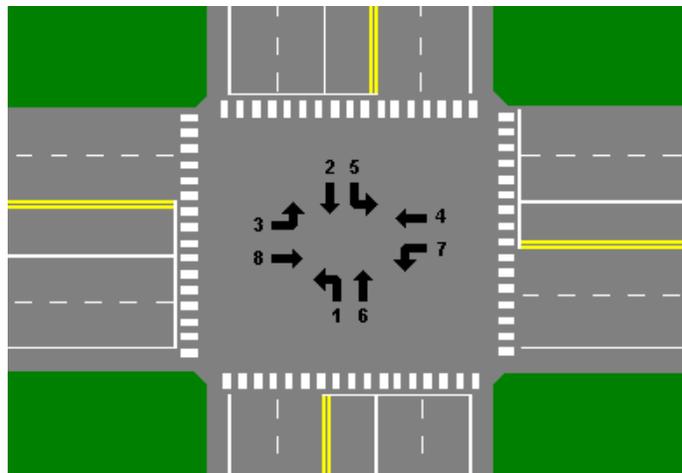
This ring rule and the rule for phase barriers together define which phases are compatible with one another.

- **Adjacent Ring** – Rings have phases that are compatible with one another are said to be adjacent. In the OASIS Phase Sequencer table, Rings 1 – 4 are adjacent rings.
- **Lead Phase** – The first phase(s) to be serviced in a barrier.
- **Lag Phase** – The last phase(s) to be serviced in a barrier.
- **Mutually Exclusive Lead / Lag** – A special circumstance due to intersection geometrics, where it is dangerous to have both left turn movements green at the same time. In this situation, the movements must be mutually exclusive regardless of other demand within the same barrier.
- **Re-Service Phase** – A phase that is permitted to be re-serviced just before the end of a barrier (after the lag phases) if time is available on a compatible phase with demand (or MAX recall).
- **Exclusive Pedestrian Phase** – A phase that only services the pedestrian component of the phase. Any vehicle component of the phase is not serviced.
- **Exclusive Vehicle Phase** – A phase that only services the vehicle component of the phase. Any pedestrian component of the phase is not serviced.

In a typical 8 phase, dual-ring configuration, there are two barriers (A, B) and two rings (1, 2). This illustrates how the phases are arranged for this configuration.

### Eight-Phase Dual-Ring Configuration

Rings	Barrier A		Barrier B	
Ring 1	Phase 1	Phase 2	Phase 3	Phase 4
Ring 2	Phase 5	Phase 6	Phase 7	Phase 8



Utilizing the two basic rules for phase sequencing:

- Two phases in the same ring cannot be serviced simultaneously.
- Two phases in different barriers cannot be serviced simultaneously.

It becomes evident that the phase sequencing table in the figure above allows the following phases to be serviced concurrently:

**(1 & 5) or (1 & 6) or (2 & 5) or (2 & 6) or (3 & 7) or (3 & 8) or (4 & 7) or (4 & 8)**

All of these phases are compatible phases, but only the phase groupings within these sets are compatible with one another. For example: Phase 1 is compatible with Phases 5 and 6, but compatible Phases 5 and 6 are not compatible with each other. The sample intersection in the figure above illustrates the

compatibility between these phases. Notice that any phase combinations not included in one of the sets create conflicting traffic flow. Also note that the 8 sets of compatible phases present no conflicting traffic flow.

### 5.4.1 OASIS Phase Sequencer Tables

The OASIS Phase Sequencer uses a table format to assign phases in accordance with the previously described compatibility rules. OASIS provides 4 Rings of compatible service, allowing up to 4 phases to be serviced independently. OASIS also provides 8 barriers, allowing complex sequences of phases to be serviced. The Phase Sequencer Table defines the compatibility and order of service for all of the phases.

When the Phase Sequencer evaluates phase ordering, the following sequencing pattern is followed:

**Phase Sequencer Table**

RING	Barrier 1				Barrier 2				Barrier 3				Barrier 4			
	1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
4	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

RING	Barrier 5				Barrier 6				Barrier 7				Barrier 8			
	1	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
3	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
4	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32

Phase Sequencer services the phases according to the cell order (1-32) enumerated, evaluating rings 1-4 simultaneously.

- 4 Rings
- 8 Barriers in each Ring
- 4 Cells per Ring in each Barrier

If there is no phase entered in a cell or if the phase entered in the cell does not have a demand for service, that cell will be skipped and the next cell will be evaluated. When the sequencer reaches Barrier 8, the next Barrier to be serviced is Barrier 1.

Each Barrier is composed of 16 cells, four cells per Ring. Phases within the same barrier and on different rings can be serviced concurrently as compatible phases. Phases within different barriers or on the same ring are considered to be conflicting and will not be serviced concurrently. All active phases in one barrier must terminate before any phases in the next barrier can be serviced.

Phases in the first column on each barrier (Cells 1, 5, 9, 13,...) are considered to be lead phases. Phases in the second column on each barrier (Cells 2, 6, 10, 14,...) are considered to be normal phases. Phases in the third column on each barrier (Cells 3, 7, 11, 15,...) are considered to be lag phases. Phases in the last column on each barrier (Cells 4, 8, 12, 16,...) are considered to be Exclusive Lag Phases (or X-Lag). Phases in this location will not be serviced while a lead phase in the same barrier is active (mutually exclusive lead/lag).

**NOTE:** when programming for coordination, make sure that the coordinated phases are in the same column, and that only the coordinated phases are in that column.

The sequencer follows these steps in evaluation of compatible phase service.

- Each Ring (1-4) is scanned for a serviceable phase:
  - The phase entered in the first cell of the barrier is checked for a demand.
  - If there is a serviceable phase in the cell, it is serviced.
  - If the cell cannot be serviced, the second cell in the same ring is checked for a serviceable phase.
  - If there is a serviceable phase in the cell, it is serviced.
  - If the cell cannot be serviced, the next cell in the same ring is checked for a serviceable phase.
  - This process is continued through all four cells in the barrier. The first serviceable phase encountered will be serviced. If no serviceable phases exist, the Ring is ready to terminate compatible service.
- Serviceable phases in each ring are serviced.
  - If no serviceable phases were found in any rings, the next barrier will be selected as the active barrier and the steps listed above will be evaluated for the next barrier.
  - Subsequent compatible phases are serviced. As each compatible phase terminates service, the remaining cells in that ring are checked for a serviceable phase. If the phase in a cell completes service, the subsequent cells will be checked for a serviceable call. The first serviceable phase encountered will be serviced. If no serviceable phases exist the ring is ready to terminate compatible service.
- The barrier is crossed.
  - When all rings are ready to terminate compatible service the next barrier will be selected as the active barrier and the sequencer will begin scanning for a serviceable. Upon completion of Barrier 8, Barrier 1 is selected as the next barrier.

### 5.4.2 OASIS Phase Sequencer Options

Phase Sequencer Options can be assigned to a Phase within each cell. Once a phase is assigned to a cell, an optional mode, for that phase, can be selected by pressing the YES key on the keypad and toggling through the options. The following options will be displayed for each key press:

- XP – Exclusive Pedestrian Phases and will not service the vehicle indications for the phase. These phases can be serviced concurrently with other compatible phases.
- XV – Exclusive Vehicle Phases and will not service the pedestrian indications for the phase. These phases can be serviced concurrently with other compatible phases.
- RES – Re-Service phases. Will only be serviced if the time remaining to complete service on the other rings is longer than the time required servicing the Re-Service phase. Re-Service phases utilize an alternate “Reservice” Minimum Green Timing.
- RXP – Re-Service feature combined with Exclusive Pedestrian Phases.
- RXV – Re-Service feature combined with Exclusive Vehicle Phases.

### 5.4.3 Phase Selection Points

The phase to be serviced next is determined at the end of the Green interval of the terminating phase. If the next phase to be serviced is the same as the current phase, the phase will re-time its MIN Green interval and reset all passage timers for that phase. Under preemption, the next phase selected may be altered during the Yellow or Red clearance to provide immediate service to the preemption clearance phases.

## 5.4.4 Phase Sequencing Examples

### 8 Phase Quad-Left Example #1

R I N G	Barrier 1				Barrier 2				Barrier 3				Barrier 4			
	1	1	2			3	4									
2	5	6			7	8										
3																
4																
R I N G	Barrier 5				Barrier 6				Barrier 7				Barrier 8			
	1															
2																
3																
4																

Illustration of a typical 8 phase quad-left intersection

- Intersection will service phases 1 and 2 sequentially and concurrently with the sequential service of phases 5 and 6.
  - Phases 1 and 5 are lead phases for Barrier 1
- Upon termination of Phases 2 and 6
  - Intersection will service phases 3 and 4 sequentially and concurrently with the sequential service of phases 7 and 8
    - Phases 3 and 7 are lead phases for Barrier 2

## 8 Phase Quad-Left, Lead-Lag Lefts Example #2

RING	Barrier 1				Barrier 2				Barrier 3				Barrier 4			
	1	2			3	4										
	2	6		5	8	7										
	3															
	4															
RING	Barrier 5				Barrier 6				Barrier 7				Barrier 8			
	2															
	3															
	4															

Illustrates a typical 8-phase quad-left intersection:

- Intersection will service Phases 1 and 2 sequentially and concurrently with the sequential service of Phases 6 and 5
  - Phase 1 is in the first column of Barrier 1, setting it as a lead phase for Barrier 1
  - Phase 5 is in the last column of Barrier 1, setting it as a X-lag phase for Barrier 1
  - Since X-lag phases will not be serviced when lead phases are active, Phases 1 and 5 will not be serviced concurrently (Mutually Exclusive lead/lag).

**NOTE:** If phases 1 and 5 are set up for lead/lag due to coordination requirements only, but could be served concurrently, given no demand on phase 2 and 6, then placing phase 5 in column 3 would allow these two phases to be served concurrently, at times.

- Upon termination of the phases in Barrier 1, the Intersection will service Phases 3 and 4 sequentially and concurrently With the sequential service of Phases 8 and 7
  - Phase 3 is in the first column of Barrier 2, setting it as a lead phase for Barrier 2.
  - Phase 7 is in the third column of Barrier 2, setting it as a lag phase for Barrier 2. Since Phase 7 is not in the fourth column (X-lag) of Barrier 2, Phases 3 & 7 can be served concurrently if there is no demand on Phase 8.

### 8 Phase Sequential Example #3

RING	Barrier 1				Barrier 2				Barrier 3				Barrier 4				
	1	1	2	3	4	5	6	7	8								
	2																
	3																
	4																
RING	Barrier 5				Barrier 6				Barrier 7				Barrier 8				
	1																
	2																
	3																
	4																

Illustrates a standard 8 phase sequential operation.

- Each Phases 1-8 will be serviced sequentially and exclusively.

**Phases 1234/56 + 78  
Example #4**

RING	Barrier 1				Barrier 2				Barrier 3				Barrier 4			
	1	1	2	3	4	7	8									
2	5	6														
3																
4																
RING	Barrier 5				Barrier 6				Barrier 7				Barrier 8			
	1															
2																
3																
4																

Illustrates a combination dual ring / sequential operation

- Phases 1, 2, 3, and 4 will be serviced sequentially and concurrently with Phases 5 and 6.

**NOTE:** Phase 5 is compatible with phases 1, 2 and 3, but incompatible with phase 4.

- Upon termination of Phases 4 and 6 – Phase 7 and 8 will be serviced sequentially and exclusively.

**Phases 12345678  
Example #5**

R I N G	Barrier 1				Barrier 2				Barrier 3				Barrier 4				
	1	1				3				4					5		
	2			2													
	3																
	4																
R I N G	Barrier 5				Barrier 6				Barrier 7				Barrier 8				
	1	6	7		8												
	2																
	3																
	4																

Illustrates that Phases 1-8 will be serviced sequentially and exclusively.

- Any phases that do not have a demand for service will be skipped. This is not the most intuitive way of programming this sequential operation, but illustrates the flexibility permitted by the sequencer.

Example 3 provides a more intuitive means of programming the same 8-phase sequential operation.

**Phases 12/56 + 3478  
Example #6**

R I N G	Barrier 1				Barrier 2				Barrier 3				Barrier 4				
	1	1	2			3	4	7	8								
	2	5	6														
	3																
	4																
R I N G	Barrier 5				Barrier 6				Barrier 7				Barrier 8				
	1																
	2																
	3																
	4																

Illustrates that Phases 1 and 2 will be serviced sequentially and concurrently with the sequential service of Phases 5 and 6.

- Phases 1 and 5 are lead phases for Barrier 1.
- Upon termination of Phases 2 and 6 – Phases 3,4,7,8 will be serviced sequentially and exclusively in Barrier 2.

**Phases 123/567 + 48  
Example #7**

RING	Barrier 1				Barrier 2				Barrier 3				Barrier 4				
	1	1	2	3		4	8										
	2	5	6	7													
	3																
	4																
RING	Barrier 5				Barrier 6				Barrier 7				Barrier 8				
	1																
	2																
	3																
	4																

Illustrates that Phases 1, 2, and 3, will be serviced sequentially and concurrently with the sequential service of Phases 5, 6, and 7.

- Phases 1 and 5 are lead phases for Barrier 1.
- Phases 3 and 7 are lag phases for Barrier 1.
- Upon termination of Phases 3 and 7 – Phase 4 and 8 will be serviced sequentially and exclusively in Barrier 2.

## 12 Phase, Six-Left Example #8

<b>R I N G</b>	<b>Barrier 1</b>				<b>Barrier 2</b>				<b>Barrier 3</b>				<b>Barrier 4</b>				
	<b>1</b>	1	2			3	4			5	6						
	<b>2</b>	7	8			9	10			11	12						
	<b>3</b>																
	<b>4</b>																
<b>R I N G</b>	<b>Barrier 5</b>				<b>Barrier 6</b>				<b>Barrier 7</b>				<b>Barrier 8</b>				
	<b>1</b>																
	<b>2</b>																
	<b>3</b>																
	<b>4</b>																

Illustrates phase sequencing for 3 active barriers.

- Phases 1 and 2 are serviced sequentially and concurrently:
  - With sequential service of Phases 7 and 8.
  
- Barrier will then be crossed and Phases 3 and 4 will be serviced sequentially and concurrently:
  - With the sequential service of Phases 9 and 10.
  
- Upon completion of service to these phases, the sequencer will cross into Barrier 3 and services Phases 5 and 6 sequentially and concurrently:
  - With service of Phases 11 and 12.

## 5.5 INPUTS

OASIS has 64 fully programmable inputs in each input assignment set. There are four separate assignment sets or pages that can be enabled through the scheduler. The following features can be set for each input.

- Connector Type
- Pin Assignment
- Debounce Time
- Delay Time
- Hold Over Time
- Assignment Type

### 5.5.1 Input Assignments - Programming

When the user modifies an assignment, the changes will go into effect immediately.

```
5
PAGE: 1 C1 PIN:39 VEHICLE DETECTOR:
INPUT ASSIGNMENT #.....1
DEBOUNCE TIME (0-25.5 SEC).....0.5
DELAY TIME (0-25.5 SEC).....0.0
HOLD-OVER TIME (0-25.5 SEC).....0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)....._
VEHICLE DETECTOR (1-64).....2
-----
PEDESTRIAN DETECTOR (1-16)....._
ALTERNATE MIN/PED TIMING DET (1-16).._
PREEMPT (1-10)....._
INVERTED PREEMPT (1-10)....._
STOP TIME (Y/N)....._
FLASH SENSE (Y/N)....._
DOOR OPEN (Y/N)....._
MANUAL CONTROL ENABLE (Y/N)....._
MANUAL CONTROL ADVANCE (Y/N)....._
SPECIAL FUNCTION ALARM (1-8)....._
TOD HOUR SYNCHRONIZATION (0-23)....._
FORCE OFF RING (1-4)....._
HOLD PHASES (1-16)....._
PLAN (65=FLSH, 66=FREE).. OFFSET#..._
CHANGE PHASE SEQUENCE PAGE (1-12)..._
CHANGE PHASE TIMING PAGE (1-4)....._
CHANGE PHASE CONTROL PAGE (1-4)....._
CHANGE OVERLAP CONTROL PAGE (1-4)..._
CHANGE INPUT PAGE (1-4)....._
CHANGE OUTPUT PAGE (1-4)....._
OVERRIDE PHASE CONTROL FUNCTION (Y).._
```

**NOTE:** If the cabinet provides a manual control enable input then make sure a “Manual Control Enable” input is assigned to ensure proper operation of the manual advance button.

- **C1 / C11/ A / B / C / D Pin Assignment**  
OASIS Supports outputs mapped to the C1 and C11 connectors of the 2070 - 2A Field I/O Connector or mapped to the A / B / C / D connectors for the 2070N NEMA adapter units. The physical pins of the controller can be assigned to any one or multiple output assignments.
  - Numerical input: 0 - 104 – C1 connector  
15 - 30 – C11 connector  
a - PP – NEMA adapter
  - + / - selection – Increases / decreases pin # when cursor is placed on the pin #. Selects connector type when cursor is placed on the connector type.
  
- **Input Assignment**  
The Input Assignment # is the reference for the input assignment. The logic processor, scheduled input functions, uses this reference and manual input commands.
  - Numerical input 1 – 64
  
- **Debounce Time**  
The debounce time settings determine the amount of input signal debounce is used. This debounce is used to filter out any brief signal transients that might not correspond to actual signal activation.
  - Numerical input 0 – 25.5 seconds
  
- **Delay Time**  
Delay Time allows the input actuation to be delayed for a specified interval from the actual signal input.
  - Numerical input 0 – 25.5 seconds
  
- **Hold Over Time**  
Hold Over Time maintains an active input for a specified interval from the actual termination of signal input.
  - Numerical input 0 – 25.5 seconds
  
- **Select Assignment Type**  
Each input can have one of the following assignments. The specified settings are selected upon assignment selection. Available options are presented by the user interface as Assignment Detail Settings.
  - YES – Assignment Type is identified with a “Y”. Once Assignment Type is selected, additional screen may be displayed to complete assignment options.
  - NO

<b>ASSIGNMENT TYPES</b>	
Not Enabled	Assigns no functionality to the input
Vehicle Detector	Assigns the input to one of 64 vehicle detectors
Pedestrian Detector	Assigns the input to one of 16 pedestrian detectors
Alternate Min/Ped Timing Det.	Assigns the input to one of 16 pedestrian detectors. Alternate walk and alternate don't walk timing will be used upon input activation
Preempt	Assigns the input to one of the preemption sequences 1-10
Invert Preempt	Assigns the inverted input to one of the preemption sequences 1-10
Stop Time	Stops the internal clock of the controller
Flash Sense	Enables flash sense on the controller
Door Open	Assigns the input to the cabinet door switch
Manual Control Enable	Enables the manual control advance feature
Manual Control Advance	Manually advances the controller
Special Function Alarm	Triggers a special function alarm
TOD Hour Synchronization	Triggers hour synchronization of the controller's clock
Force Off Ring	Forces off any phases on the specified ring
Hold Phase	Places a hold on specified phases

Run Coordination Plan	Enables one of the sixty-four (64) coordination plans, or flash (use 65) or free (use 66)
Select Offset	Selects one of the four selectable offsets for the current coordination plan
Select Sequence Page	Enables one of the twelve sequencer pages
Select Timing Page	Enables one of the four timing pages
Select Phase Control Page	Enables one of the four phase control pages
Select Overlap Control Page	Enables one of the four overlap control pages
Override Phase Control Function	This selection allows the user to select phases from one row of the phase control function table to override
Change Input Page	Allows users to change inputs and implement it independently on four different pages
Change Outputs Page	Allows user to change outputs and implement it independently on four different pages

## 5.5.2 Default Input/Output Map Chart

This table is the default Caltrans 332 cabinet I/O map. The OASIS controller will default to this map when used with the 2A Field I/O Module. When the 2070 N I/O module is used the standard NEMA MS connector map will be defaulted.

Default I/O Map			
C1 Pin	Logical Assignment	Detector Assignment	Function
1	-	-	GND
2	Output 1	-	Phase 4 – Don't Walk
3	Output 2	-	Phase 4 – Walk
4	Output 3	-	Phase 4 – Red
5	Output 4	-	Phase 4 – Yellow
6	Output 5	-	Phase 4 – Green
7	Output 6	-	Phase 3 – Red
8	Output 7	-	Phase 3 – Yellow
9	Output 8	-	Phase 3 – Green
10	Output 9	-	Phase 2 – Don't Walk
11	Output 10	-	Phase 2 – Walk
12	Output 11	-	Phase 2 – Red
13	Output 12	-	Phase 2 – Yellow
14	-	-	GND
15	Output 13	-	Phase 2 – Green
16	Output 14	-	Phase 1 – Red
17	Output 15	-	Phase 1 – Yellow
18	Output 16	-	Phase 1 – Green
19	Output 17	-	Phase 8 – Don't Walk
20	Output 18	-	Phase 8 – Walk
21	Output 19	-	Phase 8 – Red
22	Output 20	-	Phase 8 – Yellow
23	Output 21	-	Phase 8 – Green
24	Output 22	-	Phase 7 – Red
25	Output 23	-	Phase 7 – Yellow
26	Output 24	-	Phase 7 – Green
27	Output 25	-	Phase 6 – Don't Walk
28	Output 26	-	Phase 6 – Walk
29	Output 27	-	Phase 6 – Red
30	Output 28	-	Phase 6 – Yellow
31	Output 29	-	Phase 6 – Green
32	Output 30	-	Phase 5 – Red
33	Output 31	-	Phase 5 – Yellow
34	Output 32	-	Phase 5 – Green
35	Output 33	-	Not Enabled (Spare)
36	Output 34	-	Not Enabled (Spare)
37	Output 35	-	Not Enabled (Spare)
38	Output 36	-	Not Enabled (Spare)
39	Input 1	Detector 2	Phase 2 – Call/Extend
40	Input 2	Detector 6	Phase 6 – Call/Extend
41	Input 3	Detector 4	Phase 4 – Call/Extend
42	Input 4	Detector 8	Phase 8 – Call/Extend
43	Input 5	Detector 12	Phase 2 – Call/Extend
44	Input 6	Detector 16	Phase 6 – Call/Extend
45	Input 7	Detector 14	Phase 4 – Call/Extend

Continued on Next Page

<b>Continuation – Default I/O Map</b>			
<b>C1 Pin</b>	<b>Logical Assignment</b>	<b>Detector Assignment</b>	<b>Function</b>
46	Input 8	Detector 18	Phase 8 – Call/Extend
47	Input 9	Detector 22	Phase 2 – Call
48	Input 10	Detector 26	Phase 6 – Call
49	Input 11	Detector 24	Phase 4 – Call
50	Input 12	Detector 28	Phase 8 – Call
51	Input 13	-	Preempt 1
52	Input 14	-	Preempt 2
53	Input 15	-	Manual Control Enable (MCE)
54	Input 16	-	Not Enable (Spare)
55	Input 17	Detector 5	Phase 5 – Call/Extend
56	Input 18	Detector 1	Phase 1 – Call/Extend
57	Input 19	Detector 7	Phase 7 – Call/Extend
58	Input 20	Detector 3	Phase 3 – Call/Extend
59	Input 21	Detector 15	Phase 5 – Call/Extend
60	Input 22	Detector 11	Phase 1 – Call/Extend
61	Input 23	Detector 17	Phase 7 – Call/Extend
62	Input 24	Detector 13	Phase 3 – Call/Extend
63	Input 25	Detector 32	Phase 2 – Call/Extend
64	Input 26	Detector 36	Phase 6 – Call/Extend
65	Input 27	Detector 34	Phase 4 – Call/Extend
66	Input 28	Detector 38	Phase 8 – Call/Extend
67	Input 29	PED Detector 2	Phase 2 – PED Call
68	Input 30	PED Detector 6	Phase 6 – PED Call
69	Input 31	PED Detector 4	Phase 4 – PED Call
70	Input 32	PED Detector 8	Phase 8 – PED Call
71	Input 33	-	Preempt 3
72	Input 34	-	Preempt 4
73	Input 35	-	Preempt 5
74	Input 36	-	Preempt 6
75	Input 37	-	Not Enabled (Spare)
76	Input 38	Detector 42	Phase 2 – Call/Extend
77	Input 39	Detector 46	Phase 6 – Call/Extend
78	Input 40	Detector 44	Phase 4 – Call/Extend
79	Input 41	Detector 48	Phase 8 – Call/Extend
80	Input 42	-	Manual Advance
81	Input 43	-	Flash Sense
82	Input 44	-	Stop Time
83	Output 37	-	Not Enabled (Spare)
84	Output 38	-	Not Enabled (Spare)
85	Output 39	-	Overlap D – Red
86	Output 40	-	Overlap D – Yellow
87	Output 41	-	Overlap D – Green
88	Output 42	-	Overlap C – Red
89	Output 43	-	Overlap C – Yellow
90	Output 44	-	Overlap C – Green
91	Output 45	-	Not Enabled (Spare)
92	-	-	GND
93	Output 46	-	Not Enabled (Spare)
94	Output 47	-	Overlap B – Red
95	Output 48	-	Overlap B – Yellow
96	Output 49	-	Overlap B – Green
97	Output 50	-	Overlap A – Red
98	Output 51	-	Overlap A – Yellow

**Continued on Next Page**

<b>Continuation – Default I/O Map</b>			
<b>C1 Pin</b>	<b>Logical Assignment</b>	<b>Detector Assignment</b>	<b>Function</b>
99	Output 52	-	Overlap A – Green
100	-	-	PED Overlap B – Yellow
101	Output 54	-	Controller Flash
102	Output 55	-	Detector Reset
103	Output 56	-	Watchdog
104	-	-	GND

## **5.6 OUTPUT ASSIGNMENTS AND SETTINGS MENU (Group 3 Permissions)**

The Output Assignments and Settings submenu allows selection of the output assignments, output beacon settings and logic processor commands.

6

**OUTPUT ASSIGNMENTS AND SETTINGS MENU:**  
**1...OUTPUT ASSIGNMENTS**  
**2...OUTPUT BEACON SETTINGS**  
**3...LOGICAL I/O PROCESSOR**

## 5.6.1 Output Assignments

OASIS has 64 fully programmable outputs in an output assignment set. There are four separate assignment sets or pages that can be enabled through the scheduler. The following features can be set for each output.

Select:

- Output Assignments and Settings Menu, then
- Output Assignments

6-1

PAGE:1	C1 PIN:12	VEHICLE PHASE
OUTPUT ASSIGNMENT #.....		3
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...		0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...		0
MODE (0=SOLID,1=FLASH).....		0
SELECT ASSIGNMENT:		
NOT ENABLED.....		_
VEHICLE PHASE.....		Y
PEDESTRIAN PHASE.....		_
VEHICLE OVERLAP.....		_
PEDESTRIAN OVERLAP.....		_
WATCHDOG.....		_
DETECTOR RESET.....		_
ADVANCE BEACON.....		_
OUT OF PHASE FLASHER.....		_
CONTROLLER FLASH.....		_
RUN FREE.....		_
RESERVED.....		_
PREEMPT.....		_
SOFT PREEMPT.....		_
ANY PREEMPT.....		_
COORDINATION PLAN.....		_
OFFSET.....		_
PHASE CHECK.....		_
PHASE ON.....		_
PHASE NEXT.....		_

When the user selects an assignment, a selection screen will open to allow the user to specify any assignment details. Changes will go into effect immediately. Sample assignment detail settings:

PAGE: 1	C1 PIN: 12	VEHICLE PHASE
SELECT VEHICLE PHASE (1-16).....		_
SELECT COLOR(0=RED,1=YEL,2=GRN).....		_

- **C1 / C11 / A / B / C / D Pin Assignment**  
 OASIS supports outputs mapped to the C1 or C11 connectors of the 2070 - 6A Field I/O Connector or mapped to the A / B / C / D connectors for the 2070N NEMA adapter units. The physical pins of the controller can be assigned to any one or multiple output assignments.
  - Numerical input: 0 - 104 – C1 connector  
 15 - 30 – C11 connector  
 a - PP – NEMA adapter
  - + / - selection – Increases / decreases pin # when cursor is placed on the pin #. Selects connector type when cursor is placed on the connector type.

- **Output Assignment**

The Output Assignment # is the reference for the output assignment. The logic processor, scheduled output functions, and manual output commands use this reference.

- Numerical input 1 – 64

- **Frequency**

Frequency of the output signal. Any output can be setup to oscillate, including 'not enabled' outputs.

- Numerical input 0 – 25.5 Hz

- **Duty Cycle**

The Duty Cycle of the output signal can be selected. The Duty Cycle is the percentage of time that the signal is active for each period. This feature is used for flashing and signal dimming.

- Numerical input 0 – Always Off
- Numerical input 1 – 99%
- Numerical input 100% – Always On

- **Mode**

A flashing mode of operation will oscillate the output with the specified frequency and duty cycle.

- 0 – Solid
- 1 – Flash

- **Select Assignment Type**

Each output can have one of the following assignments. The specified settings are selected upon assignment selection. Available options are presented by the user interface as Assignment Detail Settings.

Not Enabled	Not enabled for a specific function
Vehicle Phase	Assigns the output to a vehicle phase indication
Pedestrian Phase	Assigns the output to a pedestrian phase indication
Vehicle Overlap	Assigns the output to a vehicle overlap indication
Pedestrian Overlap	Assigns the output to a pedestrian overlap indication
Watchdog	Assigns the output to the watchdog indication
Detector Reset	Asserts a detector-reset output to the input file(s)
Advance Beacon	Activates one of the four advance beacons
Out of Phase Flasher	Activates the output to inverse a specified output
Controller Flash	Output that is activated when the controller is in flash
Run Free	Output that is active when the controller is in free (Non-Coordinated) operation
Reserved	Reserved
Preempt	Output that is active when a Standard Preempt is being serviced
Soft Preempt	Output that is active when a Soft Preempt is being serviced
Any Preempt	Output that is active when a Standard, or SE Preempt is being serviced
Coordination Plan	Output that is active when the specified coordination plan is currently being run
Offset	Output that is active when the specified offset (1-4) is currently being run under an active coordination plan
Phase Check	Output that is active when the specified phase has a conflicting serviceable call
Phase On	Output that is active when the specified phase is Green, Yellow, or under Red clearance.
Phase Next	Output that is active when the specified phase has been determined as the next phase to be serviced.

### Programming Example:

Any unused output can be used as a scheduled output or flasher.

- A 'not enabled' output can be turned on and off as a generic output by the scheduler.
- The output can be enabled as a flasher by programming frequency and duty cycle, and setting its mode to flash.
- A second output can be setup as an 'out of phase flasher' and assigned to the first output. The second output will flash out of phase of the first (wig-wag output).

## 5.6.2 Output Beacon Settings (Group 3 Permissions)

OASIS provides up to four output beacons. Output beacons are outputs designed to activate in conjunction with parent or trigger phases. These outputs can be assigned to any of the 16 phases. In addition to trigger phase assignment, the outputs also have the capability to be delayed and/or held over from the trigger phases Green interval. The output for each beacon needs to be setup as an 'advance beacon' and assigned to the appropriate beacon (1-4). The output can be enabled to flash by programming frequency and duty cycle, and setting its mode to flash. A second output can be setup as an 'out of phase flasher' and assigned to the beacon output. The second output will flash out of phase of the beacon (wig-wag output).

Select:

- Output Assignments and Settings Menu, then
- Output Beacon Settings

6-2

OUTPUT BEACON SETTINGS						
TRIGGER PHASES:		1	2	3	4	
BEACON #1 OFF						
BEACON #2 OFF						
BEACON #3 OFF						
BEACON #4 OFF						
	BEACON:		1	2	3	4
OFF DELAY TIME (0-255)		0	0	0	0	
ON DELAY TIME (0-255)		0	0	0	0	
STOP-TIME HOLD (0-255)		0	0	0	0	

- **Beacon # 1-4**

Beacons can be programmed with any or all of the permitted phases as trigger phases. The beacon will turn off when the trigger phase Green indication becomes active. The beacon will turn back on when the trigger phase Green indication terminates.

  - ON – Beacon will suspend illumination for the on delay time interval.
  - OFF – Beacon will delay deactivation for the delay time interval beyond the start of the Green interval of the trigger phase.
  - Blank – Beacon will turn on when the trigger phase Green indication terminates.
- **Off Delay Time**

The off delay time specifies an interval until the beacon will turn off after the trigger phase turns Green.

  - Numerical input 0 – Off Delay – Beacon will turn OFF when the trigger phase turns Green.
  - Numerical input 1 – 255 seconds. The beacon will turn off this many seconds after the trigger phase turns Green.
- **On Delay Time**

The on delay time specifies the interval that the beacon will turn back on after the trigger phase turns Green.

  - Numerical input 0 – Off Delay – Beacon will turn ON when the trigger phase turns Yellow or as specified by the Stop Time Hold.
  - Numerical input 1 – 255 seconds. The beacon will turn on this many seconds after the trigger phase turns Green.

- **Stop Time Hold**

The Stop Time Hold Setting specifies the interval that the beacon will turn back on prior to the trigger phase turning Yellow. The interval will be served as additional Green time given to the trigger phase, beyond the Gap or MAX termination point.

- Numerical input 0 – Off Delay – Beacon will turn ON when the trigger phase turns Yellow or as specified by the On Delay Time
- Numerical input 1 – 255 seconds. The beacon will turn on this many seconds prior to the trigger phase turning Yellow.

A second method to advance the beacon prior to the trigger phases Green termination is explained as follows:

- Assign an Overlap to the Trigger Phase
- Assign the Overlap outputs to the Trigger Phase's signal head
- Enter the advance warning time as the Green extension for the Overlap

Any data modifications will take effect immediately.

### 5.6.3 Logical Input/Output (I/O) Command (Group 3 Permissions)

OASIS provides a Logical I/O Processor that allows the user to override inputs and outputs based upon conditional logic. There are 32 separate logical commands that are implemented. Each logical command can be independently enabled by the scheduler, allowing the logic processor to operate on a TOD/DOW/DOY basis. Each of these commands has up to 8 conditional statements and 4 executable statements that adhere to the following format:

<b>IF</b>	Selectable Condition is ON or OFF
	(AND, OR, XOR) Selectable Condition is ON or OFF
	(AND, OR, XOR) Selectable Condition is ON or OFF
	(AND, OR, XOR) Selectable Condition is ON or OFF
	(AND, OR, XOR) Selectable Condition is ON or OFF
	(AND, OR, XOR) Selectable Condition is ON or OFF
	(AND, OR, XOR) Selectable Condition is ON or OFF
	(AND, OR, XOR) Selectable Condition is ON or OFF

<b>THEN</b>	Set (Input, Output, Boolean) Assignment (#1-64) is ON or OFF or Delay (0.0 – 409.5) seconds
	Set (Input, Output, Boolean) Assignment (#1-64) is ON or OFF or Delay (0.0 – 409.5) seconds
	Set (Input, Output, Boolean) Assignment (#1-64) is ON or OFF or Delay (0.0 – 409.5) seconds
	Set (Input, Output, Boolean) Assignment (#1-64) is ON or OFF or Delay (0.0 – 409.5) seconds

Selectable Conditions are based upon the current state of the controller. The following list of conditions can be selected:

- Input Assignment (1-64)
- Output Assignment (1-64)
- Boolean (logic flag) Variable (1-32)
- Active Phase (1-16)
- Phase Timing Minimum Green (1-16)
- Phase Timing Green Extension (1-16)
- Phase in Green Interval (1-16)
- Phase in Yellow Interval (1-16)
- Phase in Red Clearance (1-16)
- Phase in Walk Interval (1-16)
- Phase in Pedestrian Clearance (1-16)
- Phase in solid Dont Walk (1-16)

- Active Overlap (1-16 for overlaps A-P respectively)
- Overlap in Green (1-16 for overlaps A-P respectively)
- Overlap in Green Extension (1-16 for overlaps A-P respectively)
- Overlap in Yellow Clearance (1-16 for overlaps A-P respectively)
- Overlap in Red Clearance (1-16 for overlaps A-P respectively)
- Vehicle Call on Phase (1-16)
- Pedestrian Call on Phase (1-16)
- Hold on Phase (1-16)
- Check on Phase (1-16)
- Next phase (1-16)
- Active Preemption
  - 0 – Any
  - 1-10
  - 11 – SE 1 (Future Use)
  - 12 – SE 2 (Future Use)
- Preemption in Dwell
  - 0 – Any
  - 1-10
  - 11 – SE 1 (Future Use)
  - 12 – SE 2 (Future Use)
- Active Coordination Plan
  - 0 – Free
  - 1 – 64
  - 65 – Flash
- Active Offset (1-4)
- Active Timing Page (1-4)
- Active Sequence Page (1-4)
- Active Control Page (1-4)
- Active Status Flag
  - 1 – Hardware Failure
  - 2 – Clock Failure
  - 3 – Configuration Failure
  - 4 – Reserved
  - 5 – Reserved
  - 6 – Communications Failure to GPS
  - 7 – Conflict Monitor in Fault Condition
  - 8 – Communications Failure to Conflict Monitor
  - 9 – Cabinet in Flash
  - 10 – Stop Time Switch Active
  - 11 – Door Switch Active
  - 12 – Reserved
  - 13 – Manual Advance Input Active
  - 14 – Manual Advance Enable Active
  - 15 – Controller Manually Advancing
  - 16 – Alarm Input is active

The topmost eight lines are the conditional statements. All 8 lines are evaluated to determine a single truth or falsehood of the conditional statements. The lines beneath the THEN label are the executable statements. If the result of the conditional statements is true, all of the executable statements are executed, as long as the conditional statements remain true. If the result of the conditional statements is false, nothing is executed for this command.

If a delay interval is selected, the conditional statements need to remain true for the duration of the delay interval before any subsequent executable statements will be processed.

Once a boolean (logic flag) variable is turned on, it remains on even after the conditional statements test false. To turn off the boolean, another logic command must be set up for this purpose.

## PROGRAMMING

Select Logical I/O Processor from the Output Assignments and Settings Menu.

6-3

LOGICAL I/O COMMAND #1 (+/-COMMAND#)			
IF	INPUT	ASSIGNMENT #1	IS OFF
AND	INPUT	ASSIGNMENT #2	IS ON
OR	OUTPUT	ASSIGNMENT #3	IS ON
XOR	BOOLEAN VARIABLE	#4	IS ON
THEN:			
SET	LOGIG FLAG	#1	OFF
	DELAY FOR	3.1	SECONDS
SET	INPUT	ASSIGNMENT #1	ON

The structure of the Logical I/O Command is as follows:

- First line (starting with IF) begins the Logical I/O Command
- Lines 2- 8 allow subsequent conditional constraints to be added to the Logical I/O Command
- The remaining lines beneath the THEN statement are executed if the preceding logical statement is true.

Move the cursor over the desired element to modify/change the conditional statement. Cursor placement over the following item:

- INPUT – Select from the list of available selectable conditions by repeatedly pressing the ‘YES’ or ‘NO’ buttons.
- ASSIGNMENT # – Enter the assignment # from the numeric keypad.
- ON – Select ON or OFF by repeatedly pressing the ‘YES’ or ‘NO’ buttons.

Conditional statements can be added by moving the cursor to an empty line and pressing the ‘YES’ or ‘NO’ buttons. There are four selections possible:

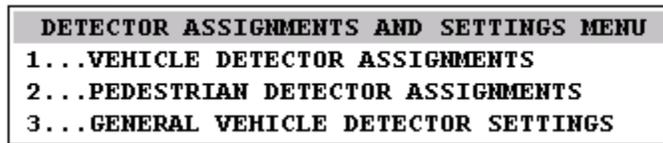
<b>AND</b>	Will place an “AND” into the logical statement for the current line - using the logical results of the previous line with current line logically.
<b>OR</b>	Will place an “OR” into the logical statement for the current line - using the logical results of the previous line with current line logically.
<b>XOR</b>	Will place an “exclusive or” into the logical statement for the current line – using the results of the previous line with the current line logically.
<b>Blank</b>	Will remove the logical statement on the current line. It will not affect the truth of the conditional statements provided by another active line.

Executable statements can be added by moving the cursor to an empty line beneath the THEN statement and pressing the ‘YES’ or ‘NO’ button. Repeated pressing of the ‘YES’ or ‘NO’ button at this location will add / remove the executable statement. Move the cursor over the desired element to modify/change the Executable Statement. Cursor placement over the following item:

- Left edge – Select either I/O/Boolean setting or a delay timer for the Executable Statement.
  - If delay timer is selected, enter the delay time (in seconds).
  - Only one delay can be selected for each logic command.
- INPUT – Select INPUT, OUTPUT, or BOOLEAN by repeatedly pressing the ‘YES’ or ‘NO’ buttons.
- ASSIGNMENT # – Enter the assignment # from the numeric keypad.
  - Input and Output Assignments range from 1–64.
  - Boolean Assignments range from 1– 32.
- ON – Select ON or OFF by repeatedly pressing the ‘YES’ or ‘NO’ buttons.

## 5.7 DETECTOR ASSIGNMENTS AND SETTINGS MENU (Group 3 Permissions)

7



OASIS supports up to 64 assignable vehicle detectors and 16 assignable pedestrian detectors. Each of these detectors provide the following diagnostic functionality:

- Failure Detection
  - Monitoring for no calls
  - Locked calls
  - Oscillating (chattering) calls
- Failure monitoring to be disabled by Time of Day (low volume periods)
- Reporting of detector failures/errors to central system
- Each detector has the ability to be placed on Recall in the event of failure
- All reporting features are available for all detector types

Each detector has the ability to be associated with an individual phase or a combination of phases.

### 5.7.1 Vehicle Detector Assignments

Each of the 64 vehicle detectors has the ability to be assigned to one or more phases and functions. These functions include:

- Call/Extension
- Call
- Extend/Delay
- Stop Bar
- Green Call (Type 3 Detector)
- Queue Preemption
- Counting

Each detector also has the following programmable features:

- Detector Switching
- Detector Duplicating
- Detector Diagnostics
- Failed Recall

Select Vehicle Detector Assignments from the Assignments and Settings menu. The header display will display the current Vehicle Detector Assignment number (1-64).

VEHICLE DETECTOR #1 SETTINGS (+, -, 1-64)	
SETTING:	(Y/N)
ENABLE DETECTOR.....	Y
ENABLE LOGGING.....	Y
ENABLE DIAGNOSTICS.....	Y
SPEED TRAP.....	N
CALL DETECTOR.....	Y
EXTENSION DETECTOR.....	Y
<hr/>	
MODE 2 STOP BAR .....	N
SWITCHING DETECTOR.....	N
DUPLICATING DETECTOR.....	N
ENABLE FULL TIME DELAY.....	N
IF FAILED, SET MIN RECALL?.....	Y
IF FAILED, SET MAX1 RECALL?.....	N
IF FAILED, SET MAX2 RECALL?.....	N
PHASE#	12345678910111213141516
PHASES ASSIGNED	X
SWITCH/DUPLICATE	
LOOP SIZE (0-255 FT).....	6
SPEED TRAP DISTANCE (0-255 FT).....	0
STOP BAR TIME(0-255 SEC).....	0
STRETCH (0-25.5 SEC).....	0.0
DELAY (0-255 SEC).....	0
MAX CALLS/MINUTE (0-255).....	255
MIN CALLS/DIAGNOSTIC PERIOD (0-255).....	0
MAX OCCUPANCY (0-100%).....	100
EXTENSION DISABLE TIME (0-255SEC)...	0
QUEUE MAX OCCUPANCY TIME (0-255)...	0
QUEUE GAP RESET TIME (0-25.5).....	0
PREEMPTION INDEX FOR QUEUE (0-10)...	0

- **Enable Detector**
  - YES – Detector is enabled with the remaining settings active or NO data entry.
  - NO – Detector is turned off. It is recommended to set all unused detectors to 'NO' for increased detector logging memory.
- **Enable Logging**
  - YES – Enables logging of vehicle data.
  - NO – Disables logging. If Enable Detector = YES, but logging = NO, the controller will actually log a 0 (zero) for this detector for each detector sample period. If this detector is not in use, it is recommended to set Enable Detector = NO to eliminate the logging of 0 (zero)
- **Enable Diagnostics**
  - YES – Detector will enable its diagnostic features.
  - NO – No diagnostics are performed on the detector.
- **Speed Trap** (future feature)
  - YES – Detector will function as a speed trap and two inputs need to be assigned to it. The second input needs to be assigned as the trailing loop.
  - NO – Detector functions as a single loop detector.
- **Call Detector**

Call Detector notifies programmed phases when the phases are NOT Green, but does not extend the Extension Timer during the Green portion of the phase.

  - YES – Detector will place calls on a phase when it is in the Red interval.
  - NO – No calls will be placed on a phase.

- **Call/Extension Detector**

Call/Extension Detector notifies programmed phases when the phases are NOT Green, extending the Extension and Variable Initial Timers during the extension interval of the phase.

- YES – Detector will place extensions on a phase when it is in the Green interval and build the initial Green value when it is not Green.
- NO

- **Mode 1 / 2 Stop Bar**

Mode 1 Stop Bar detector operates when the phase associated with the Stop Bar detector turns Green. The Stop Bar Timer begins timing. As long as there is a call present on the detector and the Stop Bar Timer has not reached zero, the phase will be extended. If there is a break in demand or the Stop Bar timer reaches zero, the detector discontinues placing calls for the duration of that Green. When the phase is NOT Green, the detector places calls on that phase.

Mode 2 Stop Bar detector functions the same as the Mode 1 Stop Bar, with the exception that any actuation RESETS the Stop Bar timer. Both Stop Bar modes have the capability of being enabled/disabled by the Event Scheduler.

- YES – Detector will serve as a Mode 2 Stop Bar detector.
- NO – Detector will serve as a Mode 1 Stop Bar detector.

- **Switching Detector**

Detector Switching allows the calls on a phase to be switched to a different phase during the Green interval of a specific phase or set of phases. The phase conditions need to match exactly with the phases programmed into the Detector Switching settings. Detector Switching has the capability to be enabled or disabled by the TOD scheduler.

- YES – Detector switching will be enabled.
- NO

- **Duplicating Detector**

The Detector Duplication allows calls on a phase (or phases) to be placed or duplicated onto other phases. In order to place calls, the phase conditions need to match exactly the phases that are programmed into the Detector Duplication settings.

- YES – Detector duplication features will be enabled.
- NO

- **Full Time Delay**

Full Time Delay enables the delay timer even when the phase is Green.

- YES
- NO

- **Failed Detector Recall**

Failed Detector Recall places the associated phase on recall while a detector is in a failed state. This recall can automatically place the phase in either MIN or MAX Recall.

- **If Failed, Set MIN Recall**

- YES – MIN recall will be activated on the assigned phases in the event that a detector failure is detected.
- NO

- **If Failed, Set MAX1 Recall**

- YES – MAX 1 recall will be activated on the assigned phases in the event that a detector failure is detected.
- NO

- **If Failed, Set MAX2 Recall**

- YES – MAX 2 recall will be activated on the assigned phases in the event that a detector failure is detected.
- NO

**NOTE:** Only one of the above three options can be enabled.

- **Phases Assigned**

Phases can be assigned to the detector. A single detector may be assigned to one or more permitted phases.

- YES – Phases assigned to the detector are visible with an 'X.'
- NO – Removes phase assignment to the detector.

- **Switch/Duplicate**

These phases are the switch phases assigned to the detector. A single detector may be assigned to any or all of the permitted phases. This field controls which phases the detector switches to during the Green state of its assigned phase if detector switching is enabled. It also controls which phases the detector duplicates calls to if detector duplication is enabled.

- Place an "X" in the selected phases.
- Switching mode - A call is switched from the assigned phase to the switched phase when the switched phase is green.
- Duplicating mode - A call is duplicated on the duplicated phase and the assigned phase when the assigned phase is red.

- **Count Detector**

Each detector can function as a single loop count detector. The following data is collected:

- Volume (Class 1 only)
- Occupancy
- Average gap between vehicles
- Average wait of the first vehicle to arrive at a Red before it turns Green
- Estimated average speed (not accurate)

Collected data can be periodically entered into the detector data log. Pedestrian detectors collect volume data. Logging of data can be enabled/disabled by the scheduler.

- **Loop Size** – Designates the length of the loop in feet.
  - Numerical input 0 – 255 feet
- **Speed Trap Distance** – (Future Feature) Designates the distance between the two leading edges of the speed trap loops. This field is ignored if the detector is not configured as a speed trap.
  - Numerical input 0 – 255 feet
- **Stop Bar Time** – Designates the reset timing for the Stop Bar Timer.
  - Numerical input 0 – 255 seconds
- **Stretch/Delay Detector**

Stretch/Delay Detector extends the presence of a detector call by a programmed Stretch value during the programmed phase Greens. The detector also has the capability to delay the detector call by the Delay value when programmed phases are NOT Green. The Stretch and Delay functions of the detector have the capability of being enabled/disabled by Time of Day Event Scheduler.

  - **Stretch Time** – Extends the presence of a detector call by a programmed Stretch value during the programmed phase Greens.
    - Numerical input 0.0 – 25.5 seconds
  - **Delay Time** – Delays the detector call by the delay value while ensuring continuous call.
    - Numerical input 0 – 255 seconds

- **Detector Diagnostics**

Detector Diagnostics provides a means by which the controller can adequately determine if there are detector faults or failures. Diagnostics can be enable/disable by the scheduler. A diagnostic period common to all detectors can be set in the General Vehicle Detector Settings menu. Failed detectors will automatically be brought back online when the action that caused the failure falls below the failure threshold. All failures and restorations are logged, if logging is enabled.

- **Maximum Calls Per Minute** – Provides a monitoring mechanism for detecting and logging, an oscillating detector. MAX Calls/Minute determines the maximum number of calls to be detected in a minute. If the accumulated number of calls exceeds this setting during a minute, the detector is determined to have a failure. More frequent actuations are considered a failure.
  - Numerical input 0 – 255 calls
- **Minimum Calls Per Diagnostic Period** – Provides a monitoring mechanism for detecting and logging, the “absence” of calls from a detector. MIN Calls/Diagnostic Period determines the minimum number of calls to be received during the diagnostic period. If the measured number of calls falls below this setting during the diagnostic period, the detector is determined to have a failure. At the end of this period the actuations accumulated by the detector is compared to the minimum calls that should be expected. The diagnostic period is set common to all detectors in the General Vehicle Detector Settings Menu.
  - Numerical input 0 – 255 calls
- **Maximum Occupancy Per Diagnostic Period** – Provides a monitoring mechanism for detecting and logging, the “stuck on” condition of a detector. MAX Occupancy % determines the Maximum Occupancy Percentage to be received during the diagnostic period. If the measured occupancy percentage exceeds this setting at the end of the diagnostic period, the detector is determined to have a failure. The diagnostic period is set common to all detectors in the General Vehicle Detector Settings Menu.
  - Numerical input 0 – 100 %.

- **Extension Disable Time**

Extension Disable is a timer that starts when the assigned phase turns Green. While the timer is active, Green time extensions are permitted. After the timer expires, extensions are blocked.

- Numerical input 0 – Operation will not occur.
- Numerical input 1 – 255 seconds

- **Queue MAX Occupancy Time** – Occupancy threshold for queue detection. When the detector detects occupancy for this period or longer, the programmed EV preemption is serviced. This feature is only used when a non-zero Preemption Index for Queue is selected.

- Numerical input 1 – 255 seconds

- **Queue Gap Reset Time** – The gap threshold that resets the occupancy timer. When a gap occurs that exceeds this timing parameter, the MAX Occupancy Timer is reset. This feature is only used when a non-zero (1-8) Preemption Index for Queue is selected.

- Numerical input 0 – 25.5 seconds

- **Preemption Index for Queue** – The EV preemption sequence that will be run if the detector is assigned EV Preemption Queue Detector.

- Numerical input 0 – Detector will not function as a Preemption Queue Detector.
- Numerical input 1 – 8 EV preemption that will be run when the MAX Occupancy time is exceeded.

## 5.7.2 Pedestrian Detector Assignments

Each of the 16 pedestrian detectors has the ability to be assigned to one or more phases and functions. These functions include:

- **Pedestrian Call Detector** – Calls its programmed phases when the phase(s) are not ACTIVE.
- **Pedestrian Count Detector** – Provides a means by which pedestrian actuations or calls can be counted and logged. These logs have the ability to be uploaded by the central computer at a later time for evaluation.

**7-2**

PED DETECTOR #1	SETTINGS	(+/- DET)
PHASE#	12345678910111213141516	
PHASES ASSIGNED	X	
SETTING:		(Y/N)
ENABLE DETECTOR.....		Y
ENABLE LOGGING.....		Y
ENABLE DIAGNOSTICS.....		N
RECALL IF FAILED.....		Y
MAX CALLS/MINUTE (0-255).....		255
MIN CALLS/DIAG PERIOD (0-255).....		0
MAX OCCUPANCY % (0-100%).....		100

- **Phases Assigned** – Selection of pedestrian phase(s) that will be called when the detector input is activated.
  - YES – Phases selected are visible with an 'X.'
  - NO – Removes phase assignment to the detector.
- **Enable Detector**
  - YES – Enables the pedestrian detector.
  - NO – Detector is turned off. It is recommended to set all unused detectors to 'NO' for increased detector logging memory.
- **Enable Logging**
  - YES – Enables logging of the pedestrian count.
  - NO – Disables logging. If Enable Detector = YES, but Logging = NO, the controller will actually log a 0 (zero) for this detector for each detector sample period. If this detector is not in use, it is recommended to set Enable Detector = NO to eliminate the logging of 0 (zero).
- **Enable Diagnostics**
  - YES – Detector will enable its diagnostic features.
  - NO – No diagnostics are performed on the detector.
- **Recall If Failed**
  - YES – Places a pedestrian recall on the detector if a detector failure is detected.
  - NO
- **MAX Calls/Minute** – Determines the maximum number of calls to be detected in a minute. If the accumulated number of calls exceeds this setting during a minute, the detector is determined to have a failure.
  - Numerical input 0 – 255 calls
- **MIN Calls/Diagnostic Period** – Determines the minimum number of calls to be received during the diagnostic period. If the measured number of calls falls below this setting during the diagnostic period, the detector is determined to have a failure. The diagnostic period is set common to all detectors in the General Vehicle Detector Settings Menu.
  - Numerical input 0 – 255 calls

- **MAX Occupancy %** – Determines the Maximum Occupancy Percentage to be received during the diagnostic period. If the measured occupancy percentage exceeds this setting at the end of the diagnostic period, the detector is determined to have a failure.
  - Numerical input 0 – 100 %

### 5.7.3 General Vehicle Detector Settings

7-3

GENERAL VEHICLE DETECTOR SETTINGS:	
DIAGNOSTIC PERIOD (0-60 MIN) .....	0
LOGGING PERIOD (0-60 MIN) .....	0
CLASS 1 MAX VEH LENGTH (0-255 FT) ...	20
CLASS 2 MAX VEH LENGTH (0-255 FT) ...	40
CLASS 3 MAX VEH LENGTH (0-255 FT) ...	60
MAXIMUM VEHICLE LENGTH (0-255 FT) ...	100
STANDARD VEHICLE LENGTH(0-255 FT) ...	20

This displays the settings universally applied to all vehicle detectors. Each of the settings is described below:

- **Diagnostic Period** – Determines the duration of the diagnostics period.
  - Numerical input 0 – 60 minutes
- **Logging Period** – Determines the duration of each data collection period for log entries.
  - Numerical input 0 – 60 minutes
- **Class # Maximum Vehicle Length** – (Future Feature) Determines the maximum vehicle length for each length classification category. Vehicles longer than Class 3 maximum are considered Class 4.
  - Numerical input 0 – 255 feet
- **Maximum Vehicle Length** – (Future Feature) Vehicles longer than the value in this field are considered oversized vehicles that are double counted and can cause an alarm.
  - Numerical input 0 – 255 feet
- **Standard Vehicle Length** – Sets the standard vehicle length for speed estimation using single loop detectors.
  - Numerical input 0 – 255 feet

## 5.8 OVERLAP SETTINGS MENU (Group 1 Permissions)

An Overlap is an output that is associated with two or more phase combinations. A typical overlap is active during two or more phase movements. In special cases, these overlap combinations can be useful to provide double clearing capability on a phase. OASIS supports up to 16 vehicle overlaps (A through P) and 16 pedestrian overlaps (A through P).

8

OVERLAP SETTINGS MENU
1...VEHICLE OVERLAP SETTINGS
2...PEDESTRIAN OVERLAP SETTINGS

## 5.8.1 Vehicle Overlap Settings

Select Vehicle Overlap Settings from the Overlap Settings Menu. The header display will display the current Vehicle Overlap Setting (A–P). There are 4 pages of vehicle overlap settings. Page selection follows the active phase control functions page assignment. Use the 'NEXT' key to scroll from one page to the next, and the arrow keys move the cursor and to scroll between fields within a page.

8-1

PAGE 1: VEHICLE OVERLAP 'A' SETTINGS			
PHASE:		12345678910111213141516	
VEH OVL PARENTS:			
VEH OVL NOT VEH:			
VEH OVL NOT PED:			
VEH OVL GRN EXT:			
STARTUP COLOR:	—	RED	— YELLOW — GREEN
FLASH COLORS:	—	RED	— YELLOW GREEN
SELECT VEHICLE OVERLAP OPTIONS: (Y/N)			
FLASH YELLOW IN CONTROLLER FLASH?...	—		
GREEN EXTENSION (0-255 SEC).....	—		
YELLOW CLEAR (0=PARENT, 3-25.5 SEC)..	—		
RED CLEAR (0=PARENT, 0.1-25.5 SEC)...	—		
OUTPUT AS PHASE # (0=NONE, 1-16)....	—		

- **Vehicle Overlap Modes**

- YES – Phases selected are visible with an 'X.'
- NO – Removes phase assignment to the feature.
- **Vehicle OVL PARENTS:**  
Overlaps will provide service when any of the selected parent phases are active. When the last active parent phase terminates, the overlap will terminate. Overlaps will time the Green extension, Yellow clearance, and Red clearance specified in the timing table. If one of these timing elements is not specified in the timing table, the overlap will use the same timing interval as the terminating parent.
- **Vehicle OVL GRN EXT:**  
The Double Clear Overlap operation is used to provide additional Green clearing time to a downstream signal for a phase or phases with multiple signals. This operation is used to prevent traffic moving through a signal from getting 'trapped', in a zone between 2 sets of signals associated with a movement, when the first signal clears (otherwise known as Inside Clearance). Typically, the first signal is associated to the phase, and the second signal is an overlap assigned to one or more phases. Double clearing overlaps require a Green extension interval to be programmed in the active timing page. Enter the phase(s), which will start the extension timer, when they terminate.
- **VEH OVL NOT VEH:**  
NOT vehicle overlaps operate the same as standard overlaps, with the exception that if any of the 'NOT' phases are active; the overlap will not be serviced.

If the overlap is active and demand occurs on one of the 'NOT' phases, the overlap will clear before bringing up the 'NOT' phase. For example, a right turn overlap adjacent to Phase 2 could have parents of 2, 5, and 6, but if Phase 1 (the opposite left turn) is active it will cancel the overlap. If one of the NOT overlap modes is selected the not phase or pedestrian need to be defined.

- **VEH OVL NOT PED:**  
Vehicle overlaps, with a NOT pedestrian phase selected, operate the same as standard vehicle overlaps, with the exception that if any of the 'NOT' pedestrian phases are active, the vehicle overlap will not be serviced.  
**NOTE:** After the pedestrian intervals time, even if the parent vehicle phase remains green, the overlap will not turn on. The overlap will only turn on at the beginning of the phase activation, unless another overlap parent is turned on after the termination of the pedestrian movement.
- **Overlap Startup Color**  
If an overlap is active upon start-up of the controller, a value needs to be programmed into the Overlap Start-up Color field in order to indicate its initial color. Overlap Start-up Color is dependent on its associated phases and their start-up colors.
  - RED
  - YELLOW
  - GREEN
- **Alternate Overlap Flash Control**  
Alternate Overlap Flash allows selected overlaps to flash at a programmed alternate flash rate (number of flashes per second). This function is used primarily for the so-called 'Fast Flash,' which is widely used in Canada. In addition to the Alternate Overlap Flash control, it is also possible to flash the overlap in each color.
  - RED
  - YELLOW
  - GREEN
- **Select Vehicle Overlap Options**
  - **Flash Yellow in Controller Flash**
    - YES – The overlap will indicate Yellow under controller flash.
    - NO – The overlap will indicate Red under controller flash.
  - **Output as Phase #**
    - Numerical input 0 – The overlap will output through the normal output assignments.
    - Numerical input 1-16 – The overlaps Green and Yellow Outputs will override the Red indication for the selected phase..

### Overlap Timing Elements:

The following overlap timing elements determine the clearance intervals for each overlap. Any parameter set here will be unconditionally serviced. If a zero is entered for one of these intervals, that interval will be timed with the same duration as the terminating parent phase. If the terminating parents Yellow and red clearance intervals have been adjusted by a preemption, any Yellow or Red overlap intervals with a zero programmed here will follow the adjusted parents timing. Overlap Green extension timing can be selectively omitted during a preemption advance.

#### Overlap Green Extension Time

The Overlap Green Extension Time settings designates the time the overlap will extend its Green interval beyond the Green termination of the parent phase(s) designated in the VEH OVL GRN EXT field.

- Numerical input 0 – The overlap Green interval will terminate concurrently with the parent phase.
- Numerical input 1 – 255 seconds

#### Overlap Yellow Clearance Time

The Overlap Yellow Clearance Time setting designates the Yellow clearance interval for the overlap. This timing parameter is required on all active overlap phases.

- Numerical input 0 – The Yellow clearance interval of the parent phase(s) will be used to time the overlap Yellow clearance.
- Numerical input 1 – 25.5 seconds

### Overlap Red Clearance Time

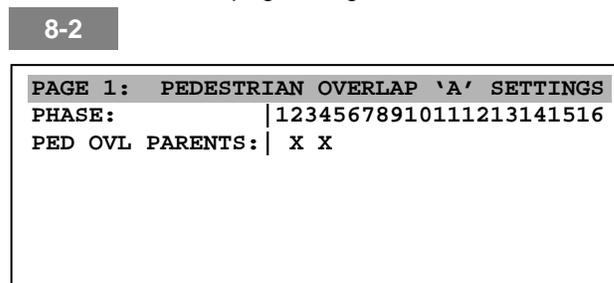
The Overlap Red Clearance Time setting designates the Red clearance interval for the overlap. This timing parameter is required on all active overlap phases.

- Numerical input 0 – The Red clearance interval of the parent phase(s) will be used to time the overlap Red clearance.
- Numerical input 1 – 25.5 seconds

## 5.8.2 Pedestrian Overlap Settings

Pedestrian Overlaps allow a pedestrian movement to be active with more than one phase. A Pedestrian Overlap will be serviced **and cleared** any time a parent phase pedestrian call is serviced. The Pedestrian Overlap timing will be generated from the active parent phase's timing. OASIS provides 16 pedestrian overlaps identified with an alpha character (A–P).

Select Pedestrian Overlap Settings from the Overlap Settings Menu. The header display will display the current Pedestrian Overlap Setting. There are 4 pages of Vehicle Overlap Settings. Page selection follows the active phase control functions page assignment.



- **Pedestrian Overlap Parents**

- YES – Phases selected are visible with an 'X.'
- NO – Removes phase assignment to the feature.

## 5.9 COORDINATION PLAN DATA (Group 2 Permissions)

Coordination is a system of traffic management, which provides traffic signal progression throughout a series or group of intersections. All intersections operate with regard to a common time reference. Each controller within the system operates with a cycle length, offset and splits (timing set for phase allocations). The cycle length will typically be common to all intersections in the coordinated system, but each intersection uses its own offset and splits.

```

COORDINATION PLAN #1 (+/-, 1-64:PLAN)
CYCLE LENGTH (0-999) . . . . .100
MIN TRANSITION CYCLE (0-999 SEC) . . . 80
MAX TRANSITION CYCLE (0-999 SEC) . . . 0
OFFSET # OR RING: (%) 1 2 3 4
OFFSETS 0 0 0 0
ACT COORD PHASE MIN GRN 0 0 0 0
=====
SPLIT %
=====
PHASE 1 2 3 4 5 6 7 8
SPLIT 20 40 15 25 20 40 15 25
PHASE 9 10 11 12 13 14 15 16
SPLIT 0 0 0 0 0 0 0 0
=====
PHASE/FUNCTION SETTINGS:
PHASE/FUNCTION |12345678910111213141516
COORDINATED PHA | X X
FLOAT FORCE OFFS |
HLD TO FORCE OFF |
HI PRIORITY PED |
DYNAMIC/BACKUP |
=====
OPTIONS: (Y/N)
SPLIT/TIMING IN PERCENT? . . . . . Y
PERMISSIVE MODE (ENT: MANUAL) . . . AUTO
ENABLE TRANSITION PERMISSIVE MODE? . . N
ADJUST NON-COORDINATED SPLITS? . . . N
CYCLE ONCE PER CYCLE LNEGTH? . . . . N
ACTIVE PAGES:
PHASE SEQUENCE PAGE (1-12) . . . . . 1
PHASE TIMING PAGE (1-4) . . . . . .1
PHASE CONTROL PAGE (1-4) . . . . . 1
OVERLAP CONTROL PAGE (1-4) . . . . . 1
INPUT PAGE (1-4) . . . . . . . 1
OUTPUT PAGE (1-4) . . . . . . . .1
    
```

### 5.9.1 Coordinator Terminology

- A Cycle refers to the time required to service all phases for an intersection (the time from the start of a phases Green until the next start of its Green).
- An Offset is a time relation (local clock  $T_0$ ) with regard to the system time reference (master clock) to indicate where, in that cycle, this intersection will begin/end it's coordinated phases Green (main street Green).
- A Split (Phase Allocation) is the amount of physical time within a given cycle allocated to each phase (the amount of physical time for service of Green, Yellow and Red intervals including Walk and Clearance if applicable).
- A Permissive Period is a window bounded by start and end permissive values. If, during a cycle, a call is present on a phase during its associated permissive period, the phase may be serviced during that cycle.
- A Force-Off is the point in the cycle when a phase must terminate, in order to be able to serve all other remaining phases, in anticipation of full demand.
- A Hold is used to keep a phase on, in order to maintain coordination or give a phase its full split time. Holds are released in time to allow the Force-Off point to be met.
- Transition is the period of time that the coordinator takes to get the intersection in step. Transition may last several cycles.
- An intersection is considered In Step when it is synchronized to the master clock time reference plus its offset. When the master clock (MC) = 0, the local clock (LC) = Offset.

When the coordinator begins transition (offset seeking), the controller is essentially in "free" operation, allowing all phases to be served. To transition more quickly, the coordination algorithm performs the following evaluation to try to get into step.

- If any phases are being served, at the moment transition begins, wait until the next barrier crossing.
- As the sequencer crosses a barrier, check for coordinated phases being served
  - If a coordinated phase is active, place a hold on that phase.
  - Keep a hold on that phase and add holds until all coordinated phases are on “hold”.
- When all coordinated phases are active, coordination timers begin counting, holds are released, and controller continues to cycle.
- Split times are now served for all phases programmed in the coordination plan.
- Fastest route to “in-step” is calculated, and the cycle length will adjust accordingly.

## 5.9.2 Coordination Features

OASIS provides the following coordination features:

- 64 Coordination Plans
- Each Coordination Plan has selectable Coordinated Phases
- Phase Sequence Page, Phase Timing Page, Phase Control Page, Overlap Control Page, Input Page, and Output Page can be changed by Plan.
- Selectable Coordinated Phases for use with Remote Coordinating Units
- Programmed Walk Time for Coordinated Phases
- Coordinated Lead/Lag Phases
- Programmable CNA Phases
- Programmed Walk Time for Coordinated Phases
- Pedestrian Force Off Adjustment
- Minimum Phase Times During Transition
- Multiple Offsets (up to 4 per plan)
- Interface to the following Coordination Strategies:
  - Stand Alone TBC
  - GPS Synchronized TBC
  - Field Master Coordination via Telemetry
  - Remote Coordinating Units
  - Simplex Telemetry Master/Slave
- Time of Day Central Control Override
- Rest in Walk
- Cross-Arterial Coordination

## 5.9.3 Coordinator Operation

The OASIS coordinator has a variety of coordination methods as outlined in the programming section. When called to a coordination plan, the coordinator will cycle freely until all coordinated phases are active. It will then calculate adjusted splits and transition into step. The master clock repeatedly decrements from the programmed cycle length to zero, and is referenced from midnight. The local clock will decrement from the transitional cycle length to zero. The zero point in the cycle occurs when all coordinated phases become green, given full demand (coordinated phases may return to green early if there is no demand on conflicting phases). Automatic adjustment for lead/lag sequences is provided without adjusting splits. In the event that a preemption or stop time input becomes active the coordinator will release control until the preemption or stop time input has terminated.

Unless manual permissives are programmed, the coordinator will automatically calculate the last available point in the cycle to service pedestrian and vehicle phases independently. Vehicle and PED Omits will be placed when this point is reached and reset at the end of the cycle. Permissive windows regulate when the first non-coordinated phases can be serviced. Once a non-coordinated phase is serviced, all phases are allowed in the sequence until their omits are applied.

Force-off points are automatically calculated based upon full demand conditions. In the event that a phase is either not serviced or gaps out, subsequent phases can be selected to float their force-off points earlier in the cycle or remain fixed. Phases that maintain a fixed force off may receive additional time.

## 5.9.4 Coordination Plan Data – Programming

Select the Coordination Plan menu item from the Main Menu. The header display will display the current Coordination Plan Data (1-64).

Each of the settings is described below:

- **Cycle Length** – Determines the cycle length for plan.
  - Numerical input 0 – 999 seconds.
  
- **Minimum Transition Cycle Length** – Determines the minimum cycle length during transition. If the value is set below the minimum allowed cycle length, due to minimum timing intervals, the minimum allowed timing interval will be automatically used. If the value is set to the cycle length, the controller will always increase the cycle length in transition.
  - Numerical input 0 – 999 seconds
  
- **Maximum Transition Cycle Length** – Determines the maximum cycle length during transition. If the user programs the maximum transition cycle length to 999 seconds, the controller will dwell in the coordinated phases during transition until local zero (in step) operation is achieved.
  - Numerical input 0 – 998 seconds for Max Transition Cycle Length
  - Numerical input 999 seconds for Dwell Transition Mode operation
  
- **Dwell Permissive Cycle Length** – If the user programs the maximum transition cycle length to 999 seconds, the controller will dwell in the coordinated phases during transition until local zero (in step) operation is achieved.
  
- **Offset (SEC or % - depending upon Coordination options)** – Each of these fields determines an offset for the plan. The plan can be run using any one of the four (4) offsets. Offsets are referenced to the beginning of coordinated phase greens.
  - Numerical input 0 – 999 seconds or 0-100% (user selectable in Coordination Options)
  - If an offset is not specified when the plan is selected – Offset 1 will be used as a default.
  
- **Minimum Green for Actuated Coordinated Phases** – Selects the minimum guaranteed green time, during transition, for the coordinated phases by ring under actuated coordination.
  - Numerical input 0 – 255 seconds
  
- **Splits (SEC or %- depending upon Coordination Options)** – Determine the Split Time for each phase, including Yellow and Red clearance. The data can be entered as percent of the cycle or as seconds of phase time
  - Numerical input 0-100% (user selectable in Coordination Options)
  
- **Phase/Function Settings**

These values can be set or cleared by scrolling to the appropriate function and phase and pressing YES/No or simply by pressing the phase number (1-9, 0 = 10, A = 11, B = 12,,, F = 16)

  - **Coordinated Phases** –The selected phases will be the phases that have their Green time coordinated to the offset. These must be compatible phases.
    - YES – Phases selected are visible with an 'X.'
    - NO – Removes selection
  
  - **Float Force-Offs** –The selected phases will have their force-offs moved earlier in the cycle if the phases are serviced early.
    - YES – Phases selected are visible with an 'X.'
    - NO – Removes selection
  
  - **Hold to Force-Off** –The selected phases will be held for the duration of their programmed split time, if the phase has any demand. If there is no demand the phases will be skipped.
    - YES – Phases selected are visible with an 'X.'

- NO – Removes selection
- **High Priority PED** – This feature has two functions, depending upon whether the assigned phases are coordinated or non-coordinated.

For non-coordinated phases, this function allows programming splits that are less than the pedestrian timing intervals. It is usually used for infrequent pedestrian signals. When a pedestrian call is received on a phases selected as high priority PED, the coordinator will allow the controller to cycle freely until the coordinated phases return.

For coordinated phases, this function allows the pedestrian walk interval to remain held until the last second before the clearance intervals are timed (FL, DW., Yellow, Red Clear). If coordinated phases are programmed for High Priority PED, the "Rest in Walk" field on the Phase Control Table must also be enabled for the coordinated phases. Only program High Priority PED on the coordinated phases where walk time is held past T<sub>0</sub> (top of cycle).

- YES – Phases selected are visible with an 'X.'
- NO – Removes selection
- **Dynamic / Backup Control Function** – The selected Dynamic / Backup Control functions will be enabled under the coordination plan
  - YES – Functions selected are visible with an 'X.' If there is at least one Dynamic / Backup Control function selected, all previously active Dynamic / Backup Control functions will be reset to the selected omit/recall functions.
  - NO – If no functions are selected, the previously active omit/recall functions will remain active.
- **Options**
  - **Split/Timing Data in Percent**
    - YES – The split, offset, and permissive timings are interpreted as a percent of the cycle length.
    - NO – The split, offset, and permissive timings programmed are interpreted as seconds of the cycle.

**NOTE:** if a split time greater than 255 seconds is required, this option must be set to percent.
  - **Permissive Mode** – The permissive period is the time in the cycle when non-coordinated phases are allowed to be serviced. OASIS provides four permissive modes:
    - **Automatic Permissive Mode (AUTO)**  
The Automatic Permissive mode is the default method for calculating permissive periods. This mode provides a very powerful and useful tool for programming coordination. This option will automatically calculate the permissive periods for each non-coordinated phase. When a phase becomes omitted from service because the min green cannot be serviced before the phases force off point, the permissive period for the next phase will automatically open. Once a non-coordinated phase is serviced, all phases are allowable until the end of the cycle.
    - **Open Permissive Mode (OPEN)**  
The Open Permissive opens the permissive for all phases at the end of the coordinated green split.
    - **Manual Permissives By Phase (MAN)**  
Each non-coordinated phase can be programmed with an individual permissive point for both vehicle and pedestrian phases. These permissive points are relative to the local clock. The user is granted complete flexibility to set these permissive points, even if the controller may become out of step. Pressing the 'ENT' Key provides the user with a menu to program the timing points.

- **Manual Permissive Windows (WIN)**  
Two Manual Permissive windows can be programmed. The first programmable permissive period automatically begins at the end of the coordinated phase(s) split time, and permits all non-coordinated phases during its duration. Only the end time needs to be programmed. The second permissive period can setup to begin, and end, a programmable period after the end of the coordinated phase(s) split time. All permissive points are relative to the local clock. Pressing the 'ENT' Key provides the user with a menu to program the timing points.
- **Walk Permissive Mode (WALK)**  
Walk Permissive mode is designed for intersections where light vehicular demand exists and preferential service shall be provided to the pedestrian movements. The walk permissive mode will seek any conflicting calls at the yield point of the coordinated phases. If there are conflicting calls, then the controller shall operate in a manner consistent to the OPEN permissive mode. If no conflicting demand exists at this point in the cycle, the coordinated phases shall dwell in walk rest for the remainder of the cycle. During this dwell in walk rest, conflicting calls shall not be serviced until the following cycle.
- **Enable Transition Permissive Mode** (used only in conjunction with Manual Permissives Mode)
  - YES – Manual Permissive Windows are reduced to 10% of their normal values during transition. If 10% is less than 1 second then the period is set to 1 second.
  - NO
- **Adjust Non-Coordinated Splits**
  - YES – Split times of both coordinated and non-coordinated phases (the entire cycle) are adjusted during transition.
  - NO – Only the split timing of the coordinated phases are adjusted during transition.
- **Cycle Once Per Cycle Length**
  - YES – Coordinated phases will be held if serviced before the zero point in the cycle occurs.
  - NO – Coordinated phases will not be held until the zero point in the cycle occurs.

This feature is used to allow the controller to more efficiently serve non-coordinated phases during long cycles. For example, using a standard dual-quad configuration, where phases 2 and 6 are coordinated, if this feature was set to NO, the following sequence could occur:

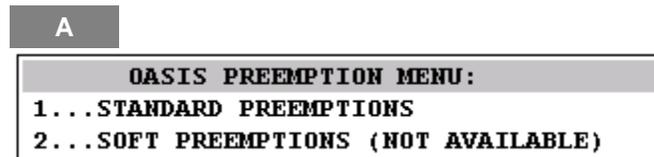
- Phases 2 and 6 would be served as the coordinated phases. Next in the sequence would be phase 3 and 7. If these phases had demand, at the end of the coordinated split these phases would be served.
  - Upon serving 3 and 7, no other demand is present, and they gap out. At this point, 2 and 6 would become active again (CNA phases). However, they would only time minimum green, plus actuations.
  - The permissives for phases 4 and 8 and 1 and 5 may still be open at this time. If demand appeared on these phases and the permissives are still open, 2 and 6 can gap out and serve these phases, thus cycling more than once during a cycle.
  - If the permissives have already closed, then 2 and 6 would remain active, and coordination would be maintained.
- **Active Pages**
    - **Phase Sequence Page** – Determines which page of sequencer data will be used during implementation of the plan.
      - Numerical input 1 – 12
    - **Phase Timing Page** – Determines which page of timing data will be used during implementation of the plan.

- Numerical input 1 – 4
- **Phase Control Page** – Determines which page of phase control functions will be used during implementation of the plan.
  - Numerical input 1 – 4
- **Overlap Control Page** – Determines which page of overlap control functions will be used during implementation of the plan.
  - Numerical input 1 – 4
- **Input Page 1-4** – Determines which page of the input data will be used during implementation of the plan.
  - Numerical input 1 – 4
- **Output Page 1-4** – Determines which page of the output data will be used during implementation of the plan.
  - Numerical input 1 – 4

## 5.10 OASIS PREEMPTION MENU (Group 5 Permissions)

Preemption is the suspension of normal operation to provide service to a pre-configured set of events. This suspension is triggered from a preemption input.

OASIS currently provides one type of preemption sequences, Standard Preemptions, which can be used for emergency vehicle preemption (EVP) or railroad (RR), by selecting priority levels. Soft preemptions (for transit priority) will be available from Econolite in a future release. Select the preemption type to be evaluated from the Preemption Menu:



### PREEMPTION PRIORITY

Preemptions have 4 priority levels (off, low, medium, and high). Lower priority preemption will suspend service to higher priority preemption. If the lower priority preemption has already begun its clearance interval, the lower preemption will not be re-serviced unless the preemption input is still active after service of the higher priority preemption. Priority inputs of the same priority level are serviced on a first come, first served basis. Preemption inputs are set through the Input Assignment menu.

- Standard Preemptions 1-10
  - Low Priority
  - Medium Priority
  - High Priority
- Soft Preemptions 1-2
  - Not Available

### 5.10.1 Standard Preemption Settings

OASIS allows inputs to be assigned to one of ten separate Standard Preemption sequences. Each Standard Preemption sequence follows the same sequence of events:

- (1) Preempt input is enabled
- (2) Delay Timer is set
- (3) When the Delay Timer expires, the intersection advances to the Interval 1 phases
- (4) When all Interval 1 phases are active, the Interval 1 Timer is set
- (5) If any green timer is set to 255, that interval will dwell until the input is released. A maximum of one interval may be programmed with 255 seconds of green time, per preemption plan.

- (6) When the Interval 1 Timer expires, the intersection advances to the Interval 2 phases.
- (7) When all Interval 2 phases are active, the Interval 2 Timer is set.
- (8) This process is repeated for all 5 intervals, any interval that does not have a clearance time programmed will be skipped.
- (9) When the last interval terminates, exit calls are placed and the intersection returns to normal operation.

**A-1**

PREEMPTION #1 SETTINGS (NEXT:1-10)												
INTERVAL/TIMING				CLEAR/DWELL PHASES								
	GRN	YEL	RED		1	2	3	4	5	6	7	8
1	5	0.0	0.0		X							
2	255	5.5	0.5		X							
3	18	0.0	0.0			X						
4	0	0.0	0.0									
5	0	0.0	0.0									
<b>EXIT CALLS</b>												
<b>OPTIONS:</b>												
PRIORITY (Y/N TO SELECT).....OFF												
DELAY TIMER (0-255 SEC).....0												
MIN GREEN BEFORE PRE (0=DEFAULT)...0												
PED CLEAR BEFORE PRE (0=DEFAULT)...0												
YELLOW CLEAR BEFORE PRE (0=DEFAULT).0.0												
RED CLEAR BEFORE PRE (0=DEFAULT)...0.0												
DWELL MIN TIMER (0-255 SEC).....0												
DWELL MAX TIMER (0=OFF,1-255MIN)...0												
DWELL HOLD-OVER TIMER (0-255).....0												
LATCH CALL?.....N												
LINK TO NEXT PREEMPT?.....N												
ENABLE BACKUP PROTECTION? .....N												
HOLD CLEAR 1 PHASES DURING DELAY?...N												
FAST GREEN FLASH DWELL PHASES?.....N												
PED CLEARANCE THROUGH YELLOW?.....N												
INHIBIT OVERLAP GREEN EXTENSION?...N												
SERVICE DURING SOFTWARE FLASH?.....N												
REST IN RED DURING DWELL INTERVAL?...N												
FLASH DWELL INTERVAL?.....N												
ALLOW PEDS IN DWELL INTERVAL?.....N												
RE-TIME DWELL INTERVAL?.....N												
<b>OVERLAPS:</b>				ABCDEFGHIJKLMNPO								
DWELL INT FLASH YELLOW				X X								
<b>OMIT OVERLAPS</b>												

- **Interval/Timing**
  - Enter Green, Yellow and Red interval times for each interval used.
    - Green times must be entered for each interval used.
    - If no times are entered for yellow and red, the timing will be taken from active Timing Table.
  - Intervals prior to dwell interval are clearance intervals.
  - Intervals after dwell interval are exit intervals.
  
- **Clear/Dwell Phases**
  - Clearance phases must be compatible phases with each other, within each clearance interval.
  - For the Dwell interval, non-compatible phases can be selected, if desired.
    - Controller will cycle between non-compatible phases during dwell.
    - Controller will use timings from the active Timing Table.
  - Exit phases must be compatible phases with each other, within each exit interval.
  
- **Exit Calls**

- Select the phases on which to place a vehicle call, once the preemption input has terminated.
- **Priority** – Priority level of the Preemption
  - YES – Toggles selections (Off, Low, Med, High)
- **Delay Timer** – Duration of the delay interval.
  - Numerical input 0 – Off
  - Numerical input 1 – 255 seconds
- **Minimum Green Before Preemption** – An alternate override of the min green interval of any phase that is active when the preemption begins.
  - Numerical input 0 – Use timing for active phase(s) from active Timing Page
  - Numerical input 1 – 255 seconds
- **Pedestrian Clearance Before Preemption** – An alternate override of the pedestrian clearance interval of any phase that is active when the preemption begins.
  - Numerical input 0 – Use timing for active phase(s) from active Timing Page
  - Numerical input 1 – 255 seconds
- **Yellow Clearance Before Preemption** – An alternate override of the yellow clearance interval of any phase that is active when the preemption begins.
  - Numerical input 0 – Use timing for active phase(s) from active Timing Page
  - Numerical input 1 – 255 seconds
- **Red Clearance Before Preemption** – An alternate override of the red clearance interval of any phase that is active when the preemption begins.
  - Numerical input 0 – Use timing for active phase(s) from active Timing Page
  - Numerical input 1 – 255 seconds
- **Dwell Minimum Timer** – Limits the minimum time the preemptor will service the dwell interval.
  - Numerical input 0 – Off
  - Numerical input 1 – 255 minutes
- **Dwell Maximum Timer** – Limits the maximum time the preemptor will service the dwell interval. In the event that this timer expires, the preemption sequence will proceed to the exit intervals. The preemption will not be re-serviced until the input terminates and returns.
  - Numerical input 0 – Off
  - Numerical input 1 – 255 minutes
- **Dwell Hold-Over Timer** – Duration of the hold-over interval.
  - Numerical input 0 – Off
  - Numerical input 1 – 255 seconds
- **Latch Call**
  - YES – Preemption call will be latched. Latching the preemption call ensures service of the preemption regardless of the preemption input duration.
  - NO
- **Link to Next Preempt**
  - YES – When selected the preempt will begin interval 1 of the next preempt sequence upon termination of the current preempt interval sequence. Multiple preemption sequences can be linked together. Dwell intervals can occur in any of the linked sequences. The input should be mapped to the first sequence to be serviced.
  - NO – The preemption will terminated after interval #5 is serviced
- **Enable Backup Protection**
  - YES – Overrides the normal Anti-Backup phase control function
  - NO – Utilizes default operation subject to the phase control table settings.

- **Hold Clearance 1 Phases During Delay**
  - YES – If the Clearance 1 phases are active upon a preempt input, a hold will be placed on those phases.
  - NO – All phases may MAX Terminate during the delay interval.
- **Fast Green Flash Dwell Phases**
  - YES – Preemption will flash the Green indication on the dwell phases. The indication will flash according to the fast Green Flash settings.
  - NO
- **Pedestrian Clearance through Yellow**
  - YES – The Pedestrian Clearance through Yellow feature will be enabled while transitioning into the Clearance 1 phases.
  - NO – The Pedestrian Clearance through Yellow feature will follow the current setting in the phase control table when transitioning into the Clearance 1 phases.
- **Inhibit Overlap Green Extension**
  - YES – Overlap Green extension intervals will be inhibit while transitioning into the Clearance 1 phases.
  - NO – Overlap Green extension intervals will be serviced while transitioning into the Clearance 1 phases.
- **Service during Software Flash**
  - YES – The preemption will be serviced when the controller is in software flash.
  - NO – The preemption will be ignored when the controller is in software flash.
- **Rest in Red During Dwell Interval.**
  - YES – The controller will rest in an all red state for the duration of the dwell and hold over intervals.
  - NO
- **Flash Dwell Interval**
  - YES – The controller will rest in a flashing state for the duration of the dwell and hold over intervals. The programmed clearance phases will flash yellow. The programmed yellow flash overlaps will also flash yellow.
  - NO
- **Allow Pedestrians in Dwell Interval**
  - YES – Pedestrian service is normally omitted under preemption. This setting allows pedestrian service to occur in the dwell interval.
  - NO
- **Re-Time Dwell Interval**
  - YES – The default preemption is to return immediately to interval 1 in the event that the preempt input terminates and is reapplied. If YES is selected, and if the preempt input is reapplied during the hold over interval, the preempt will return to dwell, instead of interval 1.
  - NO
- **Overlaps**
  - **Dwell Interval Flash Yellow**– Overlaps that will flash Yellow if Flash Dwell interval is programmed.
    - YES – Phases selected are visible with an 'X.'
    - NO
  - **Omit Overlaps** – Overlaps that will be omitted when the preemption is active. Omitted overlaps will be returned to service during interval 5 of the preempt sequence. (Interval 5 of the last linked preempt if preempt linking is programmed).
    - YES – Phases selected are visible with an 'X.'
    - NO



## 5.11 EVENT SCHEDULING (Group 2 Permissions)

Event scheduling allows day plans, coordination plans, and special functions to be implemented by the time of day (TOD), day of week (DOW) or days of the year (DOY).

B

```

SCHEDULED EVENT #2 COORDINATION PLAN
START DATE (MM/DD).....01/01
END DATE (MM/DD).....12/31
START TIME (HH:MM).....09:30
STOP TIME (HH:MM).....19:00
DOW      |SUN MON TUE WED THU FRI SAT
ENABLED  | X
EVENT GROUPS |12345678910111213141516
ASSIGNED   |
DELETE EVENT WHEN COMPLETED?.....N
CONTINUOUS EVENT?.....N
INVERT EVENT?.....N

SELECT 1 EVENT TYPE:
EVENT GROUP (1-16)....._

PLAN (65=FLSH,66=FREE).._ OFFSET#..1
PLAN PRIORITY:....LOW X MED _ HIGH _
CHANGE PHASE SEQUENCE PAGE (1-12)..._
CHANGE PHASE TIMING PAGE (1-4)....._
CHANGE PHASE CONTROL PAGE (1-4)....._
CHANGE OVERLAP CONTROL PAGE (1-4)..._
CHANGE INPUT PAGE (1-4)....._
CHANGE OUTPUT PAGE (1-4)....._
SET OUTPUT ON (1-64)....._
SET OUTPUT OFF(1-64)....._
SET INPUT ON (1-64)....._
SET INPUT OFF (1-64)....._
ENABLE FAILURES LOG?....._
ENABLE EVENTS LOG?....._
ENABLE DATA ENTRIES LOG?....._
ENABLE COORDINATION PLANS LOG?....._
ENABLE SPECIAL FUNCTIONS LOG?....._
ENABLE SPLIT MONITOR LOG?....._
ENABLE DETECTOR DATA LOG?....._
ENABLE DETECTOR (1-64)....._
ENABLE DETECTOR DIAGNOSTICS (1-64).._
DISABLE DET STRETCH / DELAY (1-64).._
DISABLE DET STOP BAR MODE (1-64)...._
SET LOGIC FLAG ON (1-16)....._
SET LOGIC FLAG OFF (1-16)....._
OVERRIDE PHASE CONTROL FUNCTION?...._

```

## 5.11.1 Event Priority

The OASIS user interface allows day plans, coordination plans, and special functions to be implemented by the scheduler, central computer, or directly from the front panel. To avoid conflicting commands to the controller, the priority levels are followed:

- Front Panel (Highest Priority)
- External Input
- Central Computer
- Event Scheduler (Lowest Priority)
  - High Priority scheduled event
  - Medium Priority scheduled event
  - Low Priority scheduled event

If a Front Panel plan is implemented, only the Front Panel plan will run due to its priority. If there is not a plan implemented by the front panel, inputs are monitored for plan activity. If no front panel inputs are activating a plan, any plans implemented by the central computer are run based on priority. In the event that neither the front panel, nor inputs, nor the central computer has a plan implemented, the event scheduler will execute the appropriate plan.

### Scheduler Features:

The OASIS Event Scheduler has the following features:

- Supports 200 events
- Schedules events by Time of Day (TOD) and Day of the Week (DOW)
- Schedules events by specific Day or Days of the Year (DOY)
- Selectable events include day plans, coordination plans, and event functions.
- Coordination plans include the following parameters:
  - 3 priority levels
  - 64 coordination plans
  - Flash operation (plan 65)
  - Free operation (plan 66)
- 16 Event Groups (also called Day Plans)

## 5.11.2 Scheduling Structure

The OASIS event scheduler has the following structure:

Event Number	Start Date	End Date	Day(s) of Week		Start Time	End Time	Event Type	Event Priority	Event Groups Assigned
1-256	MM/DD	MM/DD	T/F	Sunday	HH:MM	HH:MM	Plan OR Function	High, Medium, or Low	1-16
			T/F	Monday					
			T/F	Tuesday					
			T/F	Wednesday					
			T/F	Thursday					
			T/F	Friday					
			T/F	Saturday					
			OR						
T/F	All day(s) from start date to end date					AND Continuous			

## 5.11.3 Programming Events

Modify the fields, as described below, to enable and activate scheduled events or functions.

**NOTE:** Be careful not to press the ENT once an event or function has been programmed. ENT will clear a programmed scheduled event.

- **Event Number** – Reference number for each event.
  - Numerical input 1 – 200
  
- **Start/End Date**

Start Date is the first day that the event will be implemented. The End Date is the last day that the event will be implemented. If the event is a coordination or day plan, the plan will occur on this End Date. The End Date must be later than the Start Date. If the event transverse the New Year (12/31 – 1/1), then two scheduled events must be programmed. One event should be programmed to handle up to 12/31; the other to handle 1/1 and beyond.

  - MM/DD – Month/Day – There is no year reference which allows schedules to be repeated every year without modification.
  
- **Start/End Time**

Start Time is the time of day (beginning of minute) that the event will begin. The End Time is the time of day (start of minute) that the event will terminate. The End Time can be earlier than the Start Time, to handle events across midnight. If the event crosses midnight (i.e. 10pm to 3am), the event must be programmed to run on both days. For instance, night flash on Saturday and Sunday, from 10:00pm to 5:00am must be programmed to run on Saturday, Sunday and Monday.

  - HH/MM – Hour/Minute (use military time format – midnight is entered as 00:00 [start time] and 24:00 [end time])
  
- **Day(s) of Week (DOW Enabled)**

Individual days of the week can be selected for the event to run. If the actual day of week is between the start and end date inclusively, the event will begin at the start time and end at the end time on each day selected. If continuous is selected, the event will run continuously from the first DOW to the LAST DOW selected.

  - YES – Days selected are visible with an 'X.'
  - NO – Field will be blank
  
- **Event Groups Assigned**

Event groups allow multiple scheduled events to be grouped together and ran as a single event. For instance, this event is programmed to activate Coord Plan #1 Offset #1. and is assigned to Event Group #1. Then this event will only run when another scheduled event is active, which is programmed to run Event Group #1 under Event Type.

  - YES – Phases selected are visible with an 'X.'
  - NO
  
- **Delete Event When Complete**
  - YES – Event can be deleted upon completion.
  - NO – Event is not deleted.
  
- **Continuous Event**
  - YES – The event will run continuously from the first DOW selected to the last DOW selected inclusive.
  - NO – The event will start and stop at the start and stop times on each DOW selected.
  
- **Invert Event**
  - YES – if YES is selected, the event will turn off the selected functions that enable logs or detector features.
  - NO

- **Event Type (select 1 for each Event Number)**

The following event types can be selected:

- **Event Group**  
Event Groups allow or restrict execution of their member events. All events programmed to run with the programmed Event Group Number (1-16) will become active, when this scheduled event is active.
  - Numerical input 1-16
- **Coordination Plans** (run through the scheduler) allow selection of a Coordination Plan and an offset.
  - **Plan**
    - Numerical input 1-64
      - **With Offset** – Numerical input 1-4
    - Numerical input 65 – Flash
    - Numerical input 66 – Free
- **Plan Priority**  
There are three different priority levels for coordination plans implemented through the scheduler. When 2 or more coordination plans are active concurrently, the plan with the highest priority will be implemented. When 2 or more coordination plans of the same priority level are active concurrently, the most recently activated plan will be implemented.
  - Low – Lowest priority
  - Medium – Overrides low priority
  - High – Overrides medium and low priority
- **Phase Sequence Page**
  - Numerical input 1-12
- **Phase Timing Page**
  - Numerical input 1-4
- **Phase Control Page**
  - Numerical input 1-4
- **Overlap Control Page**
  - Numerical input 1-4
- **Input Page**
  - Numerical input 1-4
- **Output Page**
  - Numerical input 1-4
- **I/O override Sets/Clear input or outputs.**  
Numerical input 1-64
  - Output On
  - Output Off
  - Input On
  - Input Off
- **Enable Logging**  
Yes/No inputs
  - Failures Log
  - Events Log
  - Data Entries Log
  - Coordination Plans Log
  - Special Functions Log
  - Split Monitor Log

- Detector Data Log
- **Modify Detector Configuration**  
Numerical input 1-64
  - Detector Enabled
  - Detector Diagnostics
  - Detector Stretch / Delay
  - Detector Stop Bar Mode
- **Set Logic Flags**  
Numerical input 1-16
  - Logic Flag On
  - Logic Flag Off
- **Override Phase Control Function**
  - YES – This selection allows the user to select phases from one row of the phase control function table to override. Selected phases will be set active unless the event is inverted, in which case the selected phases will be set inactive.
  - NO

**Examples of Scheduled Events:**

The following event example repeatedly implements Plan 3 every week of the year, on Monday – Friday, from 7:00AM to 9:00AM. This event has low priority, allowing higher priority events to implement a different plan when this plan is to be implemented.

Event Number	Start Date	End Date	Day(s) of Week		Start Time	End Time	Event Type	Event Priority	Event Groups Assigned
1	01/01	12/31	F	Sunday	07:00	09:00	Plan 3 Offset 1	Low	
			T	Monday					
			T	Tuesday					
			T	Wednesday					
			T	Thursday					
			T	Friday					
			F	Saturday					

The following event example repeatedly implements Plan 4 every week of the year, on Monday – Friday, from 9:00AM to 6:30PM. This event has low priority, allowing higher priority events to implement a different plan when this plan is to be implemented.

Event Number	Start Date	End Date	Day(s) of Week		Start Time	End Time	Event Type	Event Priority	Event Groups Assigned
2	01/01	12/31	F	Sunday	09:00	18:30	Plan 4 Offset 2	Low	
			T	Monday					
			T	Tuesday					
			T	Wednesday					
			T	Thursday					
			T	Friday					
			F	Saturday					

## 5.12 OASIS USER PROFILES (Group 1 Permissions)

OASIS allows up to 128 users to access the system. OASIS provides 6 permissions groups to restrict users from modifying specific data. All users can view all of the configuration data via the front panel. Select User Profiles from the main menu.

OASIS USER PROFILES							
USERNAME	PERMISSIONS:	1	2	3	4	5	6
Admin	Y	X	X	X	X	X	X

- YES – Adds the permissions group or access for the user at the current cursor location.
- NO – Removes the permissions group or access for the user at the current cursor location.

Users cannot be added or removed via the User Interface, nor can usernames be modified. This must be done via Centracos® or Pyramids Central software. Additionally, can be modified using close-loop systems Translink 32 and Cairo utility software, then downloaded to the controller..

### Group 1 Permissions

Phase Control Functions  
 Phase Timing Data  
 Phase Sequence Data  
 Permitted Phases & Ring Barrier Enabling  
 Omit Functions  
 Recall Functions  
 Overlap Settings  
 Clock Settings

### Group 2 Permissions

Coordination Plans  
 Event Scheduling  
 Clock Settings  
 On Street Master

### Group 3 Permissions

Input Assignments  
 Output Assignments  
 Logical I/O Processor  
 Output Beacons  
 Detector Assignments  
 Clock Settings

### Group 4 Permissions

Communications Configuration  
 Logging Controls  
 Clock Settings

### Group 5 Permissions

Preemption Configuration Settings  
 Clock Settings

### Group 6 Permissions (System Administrator)

User Profiles  
 OASIS Un-installation  
 Configuration File Deletion  
 Clock Settings

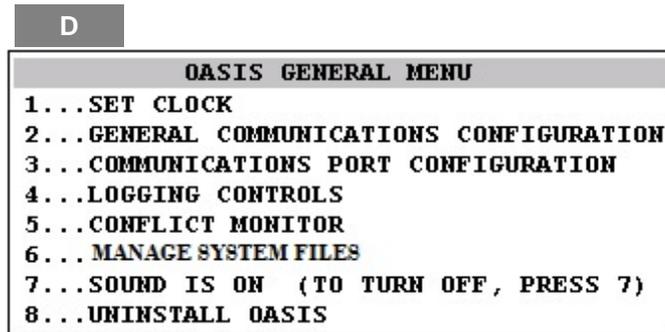
In addition to the Permission Group Assignments, each user has a 6-digit user name and a 4-digit user PIN. User names, PIN # s, and permissions can only be modified through the 3 software programs and downloaded. When OASIS is initially installed on a controller, a default user (Admin) is created. The PIN for this user will be 1111. Admin has permission to all 6 groups. The Admin user should be removed when other users are programmed through the OASIS Utilities.

Any user with a valid PIN can view all of the configuration data unless their account has been disabled. A System Administrator can disable the accounts of any user by selecting 'N' under the permissions column.

Logs record all Front Panel data modifications. The old and new data values, as well as the username and timestamp are logged.

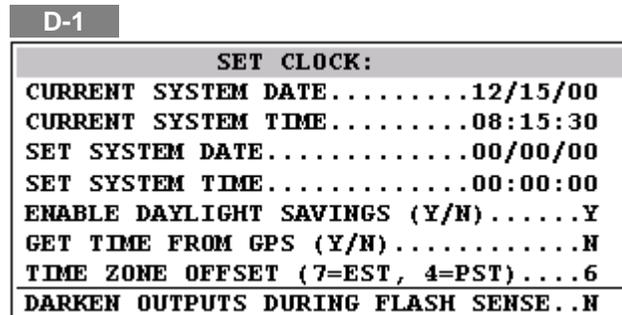
## 5.13 OASIS GENERAL MENU

OASIS provides many additional features and settings can be accessed through the General Menu. Select the General Menu from the Main Menu.



### 5.13.1 Set Clock (Groups 1-6 Permissions)

The OASIS real time clock is maintained as a 24-hour clock (military time).



- **Current System Date** – MM/DD/YY
  - o Month – 01-12
  - o Day of Month – 01-31
  - o Year – 00-99
- **Current System Time** – HH/MM/SS
  - o Hour (0-24)
  - o Minute (0-59)
  - o Second (0-59)
- **Set System Date** – MM/DD/YY
  - o Month – 01-12
  - o Day of Month – 01-31
  - o Year – 00-99
- **Set System Time** – HH/MM/SS
  - o Hour (0-24)
  - o Minute (0-59)
  - o Second (0-59)
- **Enable Daylight Savings**
  - o YES
  - o NO
- **Get Time From GPS**
  - o YES
  - o NO
- **Time Zone Offset**
  - o 7 – Eastern Standard Time
  - o 6 – Central Standard Time
  - o 5 – Mountain Standard Time
  - o 4 – Pacific Standard Time
- **Darken Outputs During Flash Sense**

**NOTE:** Midnight is entered as "24:00:00 – not like scheduled events."

The clock has the ability to automatically enable adjustment for day light savings time. The clock is settable from the front panel, or when OASIS receives a time broadcast from a Zone Master (ZM), Global Positioning System (GPS), or a central computer system.

## 5.13.2 General Communications Configuration and IP Address Configuration (Group 4 Permissions)

Select Communications Configuration from the General Menu.

D-2	
COMMUNICATIONS CONFIGURATION	
CONTROLLER ASSET # (0-15999)	. . . . . 1
SUBORDINATE INTERSECTION SETTINGS:	
SEND PLANS (Y/N)	. . . . . N
SEND TIME (Y/N)	. . . . . N
PASS THROUGH COMMUNICATIONS (Y/N)	. . . . . N
PORT # TO CENTRAL (1-4)	. . . . . 1
PORT # TO SUBORDINATES (1-4)	. . . . . 1
COMM FAIL RETURN TO TOD (0 255-MIN)	. . . . . 0
IP ADDRESS	. . . . . 0. 0. 0. 0
DEFAULT ROUTE	. . . . . 0. 0. 0. 0
# OF BITS IN HOST ADDRESS (8-24)	. . . . . 0

**NOTE:** When communicating the Oasis local controller with the Centrac system, ensure UDP port 4515 is configured on the Centrac side. Refer to the Entity Configuration topic in the Centrac help for additional information.

If the controller is used to communicate with a master or central computer, the following parameters need to be set:

- **Controller Address (for all configurations, including Ethernet communications)** – A unique controller communication address for each 2070 controller. This address is required for system identification from a central computer or zone master.
  - Numerical input 0 – 15999
  
- **Subordinate Intersection Settings** – if the controllers are to be used in a “drop and repeat” fashion, using the internal controller modems, then set the next three options to “YES”, and identify the port #'s accordingly. If the system is set up as daisy chain configuration, the next three options should be set to “NO”
  - **Send Plans**
    - YES – Enables the controller to send coordination plans to subordinate controllers.
    - NO
  - **Send Time**
    - YES – Enables the controller to send the time and date to subordinate controllers.
    - NO
  - **Pass Through Communications**
    - YES -- Enables the controller to pass received communication packets to the subordinate controllers.
    - NO
  - **Port # to Central** – Specifies the port number connected to the central system.
    - Numerical input 1–4
  - **Port # to Subordinates** – Specifies the port number connected to the subordinate controllers.
    - Numerical input 1–4
  - **Communication Failure Return to TOD (Time of Day)** – When controlled by central scheduler, this parameter specifies the length of time the local controller can break communications with central, before reverting to local programmed scheduled events.
    - Numerical input 1–255 minutes

- **IP Address (Centracs only configuration)** – Allows the central computer operators to enter an IP address that has been assigned for a controller by the agency's IT department.
- **Default Route or Gateway (Centracs only configuration)** – Information provided by the agency's IT department.
- **# of bits in host address (8-24) (Centracs only configuration)** – Information provided by agency's IT department.

**NOTE:** The “# of bits in host address (8-24) equates to the following Subnet Mask:

8 = 255.255.255.0  
 12 = 255.255.252.0  
 16 = 255.255.0.0  
 24 = 255.0.0.0

### 5.13.3 Communications Port Configuration (Group 4 Permissions)

Select Communications Port Configuration from the General Menu.

```

D-3
COMM PORT #1 CONFIG (NEXT:PORTS 1-4)
PORT ENABLED (Y/N). . . . . Y
SELECT BAUD RATE:
  X 1200      _ 2400      _ 4800
  _ 7200      _ 9600      _ 14400
  _ 19200     _ 28800     _ 38400
  _ 57600     _ 76800     _ 115200
SELECT TRANSIT FORMAT:
DATA BITS (7/8). . . . . 8
STOP BITS (1/2). . . . . 1
PARITY (0=NONE,1=ODD,2=EVEN) . . 0
SELECT PROTOCOL:
  X OASIS CIP
  _ AB3418 (NOT AVAILABLE)
  _ NTCIP (NOT AVAILABLE)
  _ TRIMBLE TSIP GPS
  _ EDI 210/2010ECL
SELECT INTERFACE:
  0 FLOW CONTROL MODE(0-5)
  _ HALF DUPLEX
  _ FULL DUPLEX
  _ DIALUP MODEM (PRE '99 TEES)
RESPONSE DELAY (0-255 MILLISEC). . 10
BYTE-BYTE TIMEOUT (0-255 MILLISEC).100
RTS-CTS TIMEOUT (0-255 MILLISEC). .100
RTS HOLD-OVER (0-255 MILLISEC). . .1
  
```

Each of the settings is described below:

- **Port Enabled**
  - YES – The port is enabled and ready for communications.
  - NO – Serial port is disabled.
- **Select Baud Rate**
  - YES – The selected baud rate is indicated with 'X.'
  - 1200 2400 4800
  - 7200 9600 14400
  - 19200 28800 38400
  - 57600 76800 115200

- **Select Transit Format**
  - Select Data Bits – Determines the number of data bits per byte. (Recommend – 8 Data Bits).
    - Numerical input 7 – 8
  - Select Stop Bits – Determines the number of stop bits used. (Recommend – 1 Stop Bit)
    - Numerical input 1 – 2
  - Parity – Determines the parity bits used. (Recommend – No parity)
    - Numerical input 0 – 2
- **Select Protocol**
  - YES– The selected communications protocol is indicated with an ‘X.’
  - NO

**OASIS CIP** – Communications with Centracs® or PYRAMIDS systems. Use the following port configuration in conjunction with this protocol:

- 8 Data Bits
- 1 Stop Bit
- No Parity

AB3418 Protocol port configuration:

- This protocol is not currently supported by OASIS

NTCIP protocol port configuration:

- This protocol is not currently supported by OASIS

**Trimble TSIP GPS** protocol – For receiving time from a GPS receiver. Standard Trimble GPS port configuration:

- 9600 baud
- 8 Data Bits
- 1 Stop Bit
- Odd Parity

**EDI 210/2010 ECL** protocol – Polls an EDI conflict monitor for status. Standard EDI monitor port configuration:

- 9600 baud
- 8 Data Bits
- 1 Stop Bit
- Even Parity

- **Select Interface** (choose only one of the following options):
  - Flow Control Mode (0-5)
    - Numerical Input 0-5
      - No Flow Control (FCM 0)– Serial Cable or Fiber Optics
      - FCM mode 1-5 – depending upon communications infrastructure
        - FCM1 – Manual Flow Control Mode: The serial device driver transmits and receives data regardless of the RTS, CTS, and CD states. The user program has absolute control of the RTS state and can inquire of the states of CTS and CD. The states of CTS and CD are set externally by a DCE. The device driver doesn’t assert or de-assert the RTS.
        - FCM2 – Auto-CTS Flow Control Mode: The serial device driver transmits data when CTS is asserted. The CTS state is controlled externally by a DCE. The user program has absolute control of the RTS state. The CD is set asserted internally. The device driver doesn’t assert or de-assert the RTS.
        - FCM3 – Auto-RTS Flow Control Mode: The CTS and CD are set asserted internally. The serial device driver receives and transmits data at all times. Upon a write command, the serial device driver asserts RTS to start data transmission, and de-asserts RTS when data transmission is completed. If the user program asserts the RTS, the RTS remains to be on until user program de-asserts RTS. If user program de-asserts RTS before the transmitting buffer is empty, the driver holds RTS on until the transmitting buffer is empty. Parameters related to delays of the RTS turn-off after last character are user configurable.

- FCM4 - Fully Automatic Flow Control Mode: The serial device driver receives data when CD is asserted. Upon a write command, the serial device driver asserts RTS and wait for CTS, starts data transmission when CTS is asserted, and de-asserts RTS when data transmission is completed. Parameters, related to delays of RTS turn-off after last character, are user configurable. If user program asserts the RTS, RTS remains to be on until user program de-asserts RTS. If user program de-asserts RTS before the transmitting buffer is empty, the driver holds RTS on until the transmitting buffer is empty.
  - FCM5 – Dynamic Flow Control Mode: The Serial device driver maintains a transmit buffer and a receive buffer with fixed sizes, controls the state of RTS and monitors the state of CTS. The serial device driver manages the transmission and reception of data automatically. The serial device driver transmits data when CTS is asserted. The serial device driver asserts RTS when its receiving buffer is filled below certain level (low watermark), and de-asserts RTS when its receiving buffer is filled above certain level (high watermark).
  - Half Duplex – Half Duplex Simple Modem or Data Radio
    - YES – The selected interface is indicated with an ‘X.’
  - Full Duplex – Full Duplex Simple Modem
    - YES – The selected interface is indicated with an ‘X.’
  - Dialup Modem – AT command set, dialup modem. **NOTE:** do not use this setting with a pre-1999 TEES controller. Use FCM4 instead.
    - YES – The selected interface is indicated with an ‘X.’
- **Response Delay** – Determines the period that the controller will wait to respond when queried.
    - Numerical input 0 – 255 milliseconds
  - **Byte-to-Byte Timeout** – Determines the period that the controller will wait for the next byte of an incoming packet before failing the packet.
    - Numerical input 0 – 255 milliseconds
  - **RTS to CTS Timeout** – Determines the period that the controller will wait for CTS after asserting RTS before starting a transmission.
    - Numerical input 0 – 255 milliseconds
  - **RTS Holdover** – When using half-duplex interface this field determines the period that the port will hold RTS active beyond the end of a transmission.
    - Numerical input 0 – 255 milliseconds

### 5.13.4 Logging Controls (Group 4 Permissions)

OASIS maintains seven (9) data logs. The logs provide a history of system events. All data log entries are stored with a time and date stamp. After a log is full, new entries will replace oldest log entries.

The logs are retrieved from a controller by a central computer system. The central computer can display, print, and archive the logs. Logs are non-destructive upon upload, which means multiple computers can upload the same log entries. The log entries can also be set to delete upon upload.

Select Logging Controls from the General Menu.

D-4

LOGGING CONTROLS:			
LOG:	ENTRIES	%FULL	ENABLED
ALARMS . . . . .	61	5	Y
EVENTS . . . . .	1024	100	Y
DATA ENTRIES . . .	1	1	Y
COORD PLANS . . .	256	100	Y
FUNCTIONS . . . . .	0	0	Y
SPLIT MONITOR . .	4096	100	Y
DETECTOR DATA . .	0	0	Y

- **% Full** – Shows the current capacity of the log. (0-100%)
- **Enabled**
  - YES – Log will record data.
  - NO – No subsequent logging will occur. A disabled log will retain all previously logged data.

**System Alarms Log (ALARMS)** – Records system alarms. The source of the alarm as well as the type of alarm is recorded with a timestamp.

- Detector Failures
- Hardware Failures
- Phase Conflict
- Logs Full

**Special Events Log (EVENTS)** – Records special events serviced by OASIS.

- Stop Time
- Police Switch
- Preemptions

**Front Panel Entries Log (DATA ENTRIES)** – Records all data modifications made via the front panel.

- Data element modified
- Old data value
- New data value
- Current user
- Timestamp

**Plans Log (COORD PLANS)** – Maintains a record of all coordination plans implemented.

- Source of plan implementation
- Plan implemented
- Offset
- Timestamp

**Functions Log (FUNCTIONS)** – Maintains a record of all functions implemented.

- Source of function implementation
- Function implemented
- Timestamp

**Split Monitor Log (SPLIT MONITOR)** – Maintains a record of traffic operation for a specified time interval. The following data is logged:

- Active Vehicle Phases
- Active Vehicle Phase State
- Active Pedestrian Phases
- Active Pedestrian Phase State
- Active Overlaps
- Active Pedestrian Overlaps
- Coordination Plan
- Local Clock
- Offset
- Preemptions
- Vehicle Calls
- Pedestrian Calls
- Status Response Packet

**OASIS Change version 3.03.15 and higher** – Beginning in version 3.03.15, OASIS now record split logs during free run operation. Each “cycle” is defined to begin and end at the barrier 1 crossing point.

**Detector Data Log (DETECTOR DATA)** – Maintains a record of detector data for a specified time interval. The following data is logged:

- Detector Reference
- Detector Status
- Average Wait
- Class 1 Volume
- Class 2 Volume – (future feature)
- Class 3 Volume – (future feature)
- Class 4 Volume – (future feature)
- Occupancy
- Average Speed
- Average Gap

### 5.13.5 Conflict Monitor

Conflict Monitor Alarm Settings allow monitoring of induced channel voltages cause by faulty load switches, or floating neutrals, in the cabinet. An EDI 2010 conflict monitor must be connected to a serial port for this feature to operate. An alarm is reported when the measured AC voltages fall between the min and max settings. Typical settings are 8 VAC Min and 20 VAC Max.

D-5

<b>CONFLICT MONITOR ALARM SETTINGS</b>		
<b>ALARM THRESHOLDS (0=OFF, 1-255)</b>	<b>MIN</b>	<b>MAX</b>
<b>RED CHANNEL RMS VOLTAGE</b>	<b>0</b>	<b>0</b>
<b>YELLOW CHANNEL RMS VOLTAGE</b>	<b>0</b>	<b>0</b>
<b>GREEN CHANNEL RMS VOLTAGE</b>	<b>0</b>	<b>0</b>

- **Alarm Thresholds**

Enter the minimum and maximum root-mean-square (RMS) voltage values:

- Numerical input 0 – Off
- Numerical input 1-255 VAC RMS

- **Red Channel RMS Voltage**
- **Yellow Channel RMS Voltage**
- **Green Channel RMS Voltage**

### 5.13.6 Manage System Files (Group 6 Permissions)

Manage System Files provides a utility to save the active configuration to flash (/f0) drive, save the active configuration to a Datakey, delete Manual Commands and System Commands, delete the active configuration file, delete logs, restore the current configuration file from the flash (/f0) drive, restore the current configuration file from a Datakey, and restore the configuration to the factory defaults.

The active configuration file resides on the /r0 drive. The configuration file stores all the controllers programming information such as phase timing, sequence, etc. The manual/system command file contains commands (such as manual overrides and commands sent from a traffic management system) that the controller is currently running. This allows these commands to be persistent across power outages. The log files are the various logs that OASIS maintains, such as the event log, detector log and so on.

```
SELECT OPTIONS AND PRESS THE 'ENT' KEY
SAVE ACTIVE CONFIG TO FLASH . . . . N
SAVE ACTIVE CONFIG TO DATAKEY . . . N
DELETE MANUAL/SYSTEM COMMANDS FILE. N
DELETE ACTIVE CONFIG FILE . . . . . N
DELETE LOGS . . . . . N
RESTORE CONFIG FROM FLASH . . . . . N
RESTORE CONFIG FROM DATAKEY . . . . N
RESTORE TO FACTORY DEFAULTS . . . . N
```

#### General Manage System File Menu Utilization:

- Using the up and down arrows on the OASIS 2070 Controller front panel, scroll down the list and select “YES” or “NO” keys on the front panel to select or de-select the operations to be performed.
- Select ENT from the OASIS 2070 Controller front panel to perform the selected operation.

**NOTE:** When the configuration files are deleted from the /r0 drive, the far-backup configuration file, oasis.config, resident on the flash (/f0) drive will be copied into the /r0 drive upon restart of the controller. If no far-backup file is present, a default intersection configuration will be loaded.

**NOTE:** If **RESTORE TO FACTORY DEFAULTS** is selected, the following communications settings are changed.

- Controller address is automatically reset to “1”
- Communications baud rate on comm ports 1 and 4 are reset to 19200 baud, and OASIS protocol.

If working with Centrac®s, Pyramids, Translink 32 or Cairo, make sure the communications is reconfigured properly (address and baud rate) for the controller before attempting a table download.

- YES – Verification of intended operation

```
THIS OPERATION WILL REQUIRE CONTROLLER
RESTART. ARE YOU SURE YOU WISH TO
CONTINUE? (Y/N)
```

- Power off/on the controller (wait 5 seconds to ensure proper operation).

```
SELECTIONS SUCCESSFULLY COMPLETED:

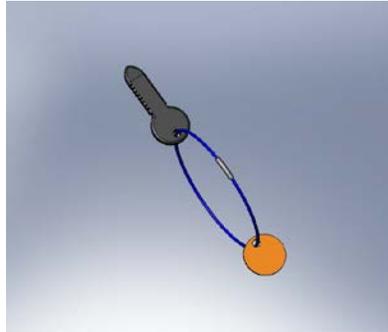
TURN THE CONTROLLER OFF AND BACK ON
```

## OASIS 2070 Data Key

The DATAKEY slot is located on the 2070-1B CPU Module on the back of the controller.

The user can insert a Datakey® into this slot to copy the OASIS configuration files from the controller.

OASIS only supports the TEES 2002 approved Datakey®. The follow Datakey® is recommended:



Datakey® for the OASIS 2070  
Econolite Part No. 100-1096-5XX

### Using the Datakey®

- Apply power to the OASIS 2070 Controller.
- Insert the Datakey® into the **DATAKEY** slot on the 2070-1B. After inserting the Datakey® the user will need to turn it 90° clockwise in order for it to be active.
- From the main menu of the OASIS Local firmware select **D – GENERAL**, then select **6 – MANAGE SYSTEM FILES**. The user will then see two menu options for utilizing the Datakey®, **“SAVE ACTIVE CONFIG TO DATAKEY”** and **“RESTORE CONFIG FROM DATAKEY”**

### Saving OASIS Configuration files to the Datakey®

- Using the up and down arrows on the OASIS 2070 Controller front panel, scroll the cursor down the list to **“SAVE ACTIVE CONFIG TO DATAKEY”** and using the “YES” key, change the “N” to “Y” on the OASIS 2070 front panel. Then press the “ENT” key from the OASIS 2070 Controller front panel to perform the selected operation.

THIS OPERERATION WILL REQUIRE CONTROLLER  
RESTART. ARE YOU SURE YOU WISH TO  
CONTINUE? (Y/N)

- A confirmation message will appear. Press the “YES” key on the OASIS 2070 Controller front panel to verify intended operation. Pressing “NO” or “ESC” will cancel the operation.
- The process will begin immediately, but may take up to 30 seconds to perform. Once the operation is complete the following message will appear.

SELECTIONS SUCCESSFULLY COMPLETED:  
TURN THE CONTROLLER OFF AND BACK ON

- After the message appears, power off/on the controller (wait 5 seconds to ensure proper operation).

## Reading OASIS Configuration files from the Datakey®

- Using the up and down arrows on the OASIS 2070 Controller front panel, scroll the cursor down the list to **“RESTORE CONFIG FROM DATAKEY”** and using the **“YES”** key, change the **“N”** to **“Y”** on the OASIS 2070 front panel. Then press the **“ENT”** key from the OASIS 2070 Controller front panel to perform the selected operation.

```
THIS OPERATION WILL REQUIRE CONTROLLER
RESTART. ARE YOU SURE YOU WISH TO
CONTINUE? (Y/N)
```

- A confirmation message will appear. Press the **“YES”** key on the OASIS 2070 Controller front panel to verify intended operation. Pressing **“NO”** or **“ESC”** will cancel the operation.
- The process will begin immediately, but may take up to 30 seconds to perform. Once the operation is complete the following message will appear.

```
SELECTIONS SUCCESSFULLY COMPLETED:

TURN THE CONTROLLER OFF AND BACK ON
```

- After the message appears, power off/on the controller (wait 5 seconds to ensure proper operation).

## Troubleshooting the Datakey® with the OASIS 2070 Firmware

The **“SAVE ACTIVE CONFIG TO DATAKEY”** and **“RESTORE CONFIG FROM DATAKEY”** OASIS menu options updates the key status every second when the user is on that display.

At the end of the OASIS **“SAVE ACTIVE CONFIG TO DATAKEY”** and **“RESTORE CONFIG FROM DATAKEY”** menu options OASIS will display the following error codes:

- E:246** – Indicates that the device is not ready. Typically this is displayed when there is no data key or the datakey is malfunctioning such that it cannot be recognized by the OASIS Firmware.

```
SELECT OPTIONS AND PRESS THE 'ENT' KEY
SAVE ACTIVE CONFIG TO FLASH . . . . N
SAVE ACTIVE CONFIG TO DATAKEY E:246 N
DELETE MANUAL/SYSTEM COMMANDS FILE. N
DELETE ACTIVE CONFIG FILE . . . . . N
DELETE LOGS . . . . . N
RESTORE CONFIG FROM FLASH . . . . . N
RESTORE CONFIG FROM DATAKEY E:246 . N
RESTORE TO FACTORY DEFAULTS . . . . N
```

- **E:1** – Indicates that the datakey is too small Most likely this is because a 1999 TEES datakey has been inserted in the 2070-1B slot.

```

SELECT OPTIONS AND PRESS THE 'ENT' KEY
SAVE ACTIVE CONFIG TO FLASH . . . . N
SAVE ACTIVE CONFIG TO DATAKEY E:1 . N
DELETE MANUAL/SYSTEM COMMANDS FILE. N
DELETE ACTIVE CONFIG FILE . . . . . N
DELETE LOGS . . . . . N
RESTORE CONFIG FROM FLASH . . . . . N
RESTORE CONFIG FROM DATAKEY E:1 . . N
RESTORE TO FACTORY DEFAULTS . . . . N

```

- Other OS-9 errors may be displayed if encountered. Please refer to the OS-9 User Guide for specific error.

### 5.13.7 Sound is Off/On

OASIS provides the ability to turn the controller sound off or on. The default power on condition has the sound on. Selecting the Sound is ON line from the General Menu turns the controller sound off. The current line will display Sound is OFF. Selection of this line again, will turn the sound back on.

When the sound is turned on, the controller will beep upon data change or function implementation—also, there is a 3 beep-per-second tone during the time a detective selected in the Detector State screen 1-7 has an active input; see section 5.1.7.



### 5.13.8 Uninstall OASIS (Group 6 Permissions)

OASIS provides a utility to uninstall all OASIS firmware from the controller. Select the Uninstall OASIS from the General Menu accesses un-installation.



```

OASIS UNINSTALLATION
THIS PROCEDURE WILL DELETE OASIS
WOULD YOU LIKE TO SAVE THE CURRENT
CONFIGURATION FILES (Y/N)?.....?

```

```

PRESS 'ENT' TO UNINSTALL OR
'ESC' TO CANCEL UNINSTALLATION

```

- ENT – Uninstalls OASIS.
- ESC – Cancels un-installation.

The following screen will appear stating that the uninstalled has been completed successfully.



```

OASIS HAS BEEN SUCCESSFULLY UNINSTALLED
PRESS THE 'ESC' KEY TO CONTINUE

```

- Power off the controller to clear the current process from RAM.

## 6 OASIS ON-STREET MASTER MAIN MENU (Group 2 Permissions)

OASIS On-Street Master settings can be accessed through the On Street Master Settings Menu. Hitting ENT when the Local Settings Menu is displayed on the controller accesses the Master Settings Menu. The Local Settings Menu intentionally has no menu item displayed for Master Menu, to prevent accidental entry by unauthorized personnel.

OASIS ON-STREET MASTER MAIN MENU :	
1 STATUS DISPLAYS	8 PLAN SELECTION
2 MASTER SETTINGS	9 DIALUP-PAGER
3 ZONE ASSIGNMENTS	
4 SYSTEM DETECTORS	B SCHEDULING
5 COMP CHANNEL SETUP	C USER PROFILES
6 COMP CHANNEL ASSIGN	D GENERAL MENU
7 TR THRESHOLD	ENT LOCAL MENU

- **Status Displays**
  - o Master Status
  - o Manual Commands
  - o Diagnostics
  - o Traffic Responsive
  - o System Detectors
  - o Communications Status
  - o Local Status
  - o Scheduling
  - o Test Traffic Responsive
- **Master Settings**
- **Zone Assignments**
- **System Detectors**
- **Computational Channel Setup**
- **Computational Channel Assignment**
- **Traffic Responsive Threshold**
- **Plan Selection**
- **Dialup-Pager**
- **Scheduling**
- **User Profiles**
- **General Menu**
  - o Set Clock
  - o General Communications Configuration
  - o Communications Port Configuration
  - o Logging Controls
  - o Conflict Monitor
  - o Manage System Files
  - o Sound is On/Off
  - o Uninstall OASIS
- **Enter Local Menu**

### On-Street Master Overview

The OASIS On-Street Master features allow a single OASIS controller to control operation of other subordinate OASIS and/or W4IKS Controllers. OASIS OSM supports the following functionality:

- **Data Communications Routing** – All subordinate controllers to the OSM must be connected to a single communications port of the OSM. Communications packets from the central system that are addressed to a subordinate controller can be sent directly to the OSM. The OSM will then route the command to the appropriate local controller. The OSM will forward the response from the local controller back to the central system.
- **Status data concentration of local controllers** – The OSM will continually poll all subordinate controllers for status data. This status data is concentrated for efficient status monitoring from the central system.
- **Time Broadcast** – Allows time synchronization of all subordinate intersections.
- **Zone-wide plan and function implementation** – Allows categorization of all subordinate intersections into one of four zones. Scheduled events at the OSM can be commanded to any or all of the zones.

- **Zone-wide Traffic Responsive Operation** – Traffic Responsive Operation can be implemented to any of the assigned zones. Traffic Responsive Operation is described in detail below.

## Traffic Responsive Overview

Traffic Responsive provides the capability for an operator to organize system detectors into zones for selection of timing plans and offsets. For each zone, the volume and occupancy for each detector are combined into 5 separate computational channels: inbound, outbound, side street and two occupancy override channels. A 6<sup>th</sup> computational channel, the arterial channel, uses a combination of the inbound and outbound channels. The computational channels are then smoothed with previous data, and traffic responsive values are calculated for cycle, offset and split. These are converted into a percentage, which is used to find the optimum cycle level, offset level and split-level. Finally, these levels are used to select the final plan number and offset number that the master will use.

## Traffic Responsive Algorithm

A zone has the following computational channels:

- Arterial
- Inbound
- Outbound
- Side Street
- Occupancy Override 1
- Occupancy Override 2

Each channel (except arterial) consists of up to 16 system detectors. A value called V+kO (volume + k \* occupancy) is computed for each detector. Also for each detector, a scaling (or weighting) factor may be applied for both volume and occupancy and there is also a separate scaling factor for the entire channel. Each channel may also operate in one of three modes: average, highest and 2<sup>nd</sup> highest. In the average mode, the value of the channel equals all of the V+kO values averaged together. In the highest mode, the maximum V+kO value is used and in the 2<sup>nd</sup> highest mode, the maximum value is discarded and the highest remaining value is used. The result of this calculation is a raw V+kO value for each computational channel.

Next these data are smoothed according to the following equation:

$$V\text{kO}(\text{smooth}) = (100 - S) * V\text{kO}_i + S * V\text{kO}_{i-1}$$

Where S is a smoothing factor V<sub>kO</sub><sub>i</sub> is the current V+kO value and V<sub>kO</sub><sub>i-1</sub> is the previous V+kO value. For example value of S = 0, would mean that there is no smoothing and a value of S = 50% would mean that the smoothed value would be the average of the current and previous sample.

A 6<sup>th</sup> computational channel is then computed from the smoothed inbound and outbound V+kO values. The user can select the average, higher or lower values of these two channels to be the final value of the arterial computational channel.

Next, these smoothed V+kO values are converted into percentages (called transfer values) for each TR parameter: cycle, offset and split. The cycle percentage is calculated by comparing the arterial computational channel to a user-defined theoretical maximum value (programmed in the Arterial Computational Channel- **MAX V+kO**), which is equal to the traffic capacity of the arterial.

$$V+kO (\text{arterial}) / V+kO (\text{max})$$

The offset transfer value is equal to:

$$V+kO (\text{inbound}) / (V+kO (\text{inbound}) + V+kO (\text{outbound}))$$

In other words, the offset transfer is the inbound traffic flow expressed as a percentage of the total (inbound + outbound) flow.

The split transfer value is equal to:

$$V+kO \text{ (arterial)} / (V+kO \text{ (arterial)} + V+kO \text{ (side)})$$

That is, the split transfer value is the percentage of main street traffic flow relative to the total flow.

In simple terms, the cycle length is determined by overall volume and occupancy; offset is determined from inbound versus outbound traffic; splits are determined by main street vs. side street traffic. These percentages are used to select a cycle number, offset number and split number by comparing the percentage to a set of thresholds.

Normally the master will only allow each of these values to change by one for each sampling period. In other words, if traffic flow increases enough to go from cycle level 1 to cycle level 3, under normal operation the master will select cycle level 2 and then (assuming the flow continues) will select cycle level 3 on the next computational cycle. This behavior allows for smoother changes in coordination plans.

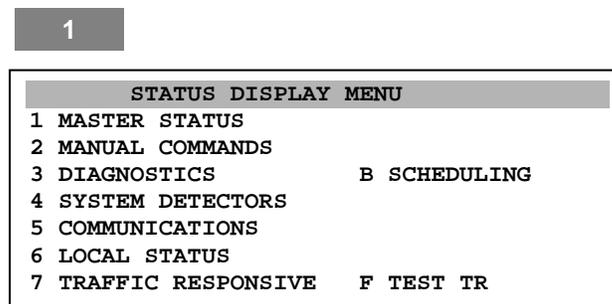
However, there is a parameter for the arterial computational channel that allows the master to override this behavior. It is called the **Immediate Update Threshold** and if the unsmoothed V+kO value increases by more than this percentage from the previous computational cycle, the master will select whatever levels are correct for that computational period.

The final step, once the cycle, offset and split-levels have been determined is to convert them into a plan number. The master looks up the desired plan and offset number to use based on the calculated cycle, offset and split level values.

The occupancy override computational channels are much simpler in operation. Here, the occupancy values are computed and smoothed as before. Then this value is compared to a threshold to determine if a special occupancy override plan should be used or if normal operation should be in effect.

There is also a timer value that prevents the master from changing plans too often. It is called the minimum plan execution time and the master must run a new plan and offset for this length of time before it is allowed to change. Note that the immediate update thresholds mentioned previously also override this timer.

## 6.1 STATUS DISPLAY



**NOTE:** The display refresh rate is 1hz. Display data is accurate to within 1 second.

## 6.1.1 Master Status

The Master Status displays contains the current plans for each zone for TOD and traffic responsive and manual override modes. The current plan in effect is indicated with a '\*'. The top line also displays status information such as computational channel failures, detector failures, communication failures, etc. If a central override is in effect, the word 'MANUAL' will be replaced with 'CENTRAL'.

1-1

GENERAL MASTER STATUS					06/21/02		
NEXT DETECTOR UPDATE			1:30	14:35:09			
(* = ACTIVE)							
	ZONE1		ZONE2		ZONE3		ZONE4
	P#	O#	P#	O#	P#	O#	P# O#
TOD	1	4	* 3	3	1	4	* 1 2
TR	* 1	2	1	4	1	2	1 4
MANUAL	0	0	0	0	* 1	4	0 0
MIN PLN TME	4:10		0:00		0:00		0:00

NEXT DETECTOR UPDATE is calculated from the Detector Sample Period setting. This value shows when the next set of detector data will be retrieved from the locals.

MIN PLN TME (Minimum Plan Time) is calculated from the Min Plan Execution Time setting. Once a zone has selected a plan using Traffic Responsive (TR), this value show the remaining time before that zone can select a new plan to execute.

If a zone is executing a plan 0 – 0, then that zone is running local time of day events.

## 6.1.2 Manual Commands

The Manual Plan and Offset Override display allows the user to assign a plan or offset to an individual intersection or a zone. Manual settings override the plan and offset the controller is currently executing.

1-2

MANUAL ZONE AND INTERSECTION OVERRIDES		
(ENTER TO CLEAR ALL OVERRIDES)		
(FLASH=65, FREE=66)	PLAN	OFFSET #
ALL ZONES . . . . .	22	0
ZONE 1 . . . . .	0	0
ZONE 2 . . . . .	0	0
ZONE 3 . . . . .	0	0
ZONE 4 . . . . .	0	0
INTERSECTION 1 . . . . .	0	0
INTERSECTION 2 . . . . .	0	0
↓		
INTERSECTION 64 . . . . .	0	0

Example: If Intersection 1 is also part of Zone 1, the manual command assigned to Zone 1 will be overridden by the command assigned to the individual intersection. Overrides for Zone 1 will still affect all of the other intersections within the zone. Manual Plans and Offsets placed on an individual intersection have a higher priority than one placed on a Zone.

Pressing the ENT key will clear all overrides.

- **Manual Plan**
  - Numerical input 0 – None or Disabled
  - Numerical input 1-64 number of the assigned Plan
  - Numerical input 65 – Flash
  - Numerical input 66 – Free

- **Manual Offset**
  - Numerical input 0 – None or Disabled
  - Numerical input 1-4 number of the assigned Offset

### 6.1.3 Diagnostics

The Diagnostics Menu Displays any status or error conditions for the controller. Displays the status if any of these conditions exist

1-3

```

MASTER DIAGNOSTICS  ZONE 2      06/21/02
(NEXT CHANGES ZONE)      15:30:40
COMMUNICATION STATUS.....OK
COMP CHANNEL STATUS .....OK
SYSTEM DETECTOR STATUS.....OK
LOCAL CYCLE LENGTH STATUS....FAILED
REAL-TIME CLOCK STATUS.....OK
MANUAL OVERRIDE STATUS.....ACTIVE
TRAFFIC RESPONSIVE TEST.....ENABLED

```

- OK or Failed
  - Communication Status
  - Computational Channel Status
  - System Detector Status
  - Local Cycle Length Status
  - Real-time Clock Status
- Active or Inactive
  - Manual Override Status
- Enabled or Disabled
  - Traffic Responsive Test

## 6.1.4 System Detectors

The volume, occupancy and status of the system detectors of most recent detector polling period are displayed. It also displays the intersection and detector number that each system detector is assigned to.

1-4

SYS DETECTORS NEXT UPDATE 9:09 06/18/04				
15:56:51				
MODE: ALL SYS DET (+/- CHANGES MODE)				
SD#	INT#	LOCDET#	VOL(15MIN)	OCC% STATUS
1	1	1	0	0 OK
2	1	2		NO DATA

Use the + and – keys to toggle between the seven display modes.

- **All System Detectors** (ALL SYS DET) – Displays all assigned system detectors
- **Zone** (BY ZONE) – Displays only the detectors assigned to locals in the selected zone. Use the NEXT key to change zone.
- **Computational Channel** (INBOUND, OUTBOUND, SIDE STREET, OCCUP1, OCCUP2) – Displays only the detectors assigned to the selected computational channel and selected zone. Use the NEXT key to change zone and the + and – keys to change channel. **NOTE:** Traffic Responsive must be configured to display the Computational Channels.

The columns are labeled as follows.

- **SD#** – Displays the system detector number.
- **INT#** - Displays the intersection from which the detector data is retrieved.
- **LOCDET#** - The detector number in the local for this system detector.
- **VOL(SAMPLE PERIOD)** – The volume for the most recent sample period. The sample period is shown in parentheses.
- **OCC%** - The occupancy (in percent) for the most recent sample period.
- **STATUS** – Displays status of individual detectors (OK, FAILED, NO DATA). NO DATA is displayed when the master is retrieving the detector data from the local.

## 6.1.5 Communications

The communications status for all assigned local controllers and the asset number of those controllers is displayed. Controllers that are not assigned to a zone are not displayed.

1-5

COMMUNICATIONS STATUS				
06/20/02				
15:30:40				
LOCAL#	ASSET#	POLLS	FAILS	STATUS
1	1001			OK
3	1003			FAILED

- **FAILS** – displays number of failed communications attempts.
- **STATUS** – (OK, INTERNAL, FAILED) Failed indicates communications to local controller has been broken (5 or more consecutive communications attempts).

## 6.1.6 Local Status

The status of any of the 64 local controllers is displayed.

1-6

Heading changes to reflect intersection status

INT 64 HARDWARE FAILURE 06/21/02

```

INT 1 P# 3 Z1 LC 139 CL 160 06/18/04
(+/- CHANGES INT #) OFF 255* 15:30:40
PHASE/FUNCTION |12345678910111213141516
VEHICLE STATE | G G
PED STATE |
VEH & PED CALLS | P X V
OVERLAP |
  
```

The + and – keys cycle through the local numbers or enter the number directly on the top line. The top line of the display also shows diagnostics such as hardware failures, if such conditions exist. If an alarm exists (such as HARDWARE FAILURE) the NEXT key will display the plan number, etc.

INT– Intersection Number  
P# – Plan Number  
Z# – Zone Number  
LC – Local Clock  
CL – Cycle Length  
OFF – Offset  
Date

- Vehicle State
  - G – Green
  - R – Red
  - Y – Yellow
- Pedestrian State
  - W – Walk
  - C – Pedestrian Clearance
  - D – Don't Walk
- Overlap
  - G – Green
  - R – Red
  - Y – Yellow
- Pedestrian Overlap
  - W – Walk
  - C – Pedestrian Clearance
  - D – Don't Walk
- Vehicle and Pedestrian Calls
  - P – Pedestrian Call
  - V – Vehicle Call
  - X – Both Pedestrian and Vehicle Calls

## 6.1.7 Traffic Responsive

Traffic Responsive displays the final results of the Traffic Responsive Algorithm and the intermediate values used to reach those results. If an immediate update (immediate update threshold exceeded) is being applied, an asterisk will appear next to the 'CURR SMOOTH V<sub>kO</sub>' line. If an occupancy override (occupancy 1 or 2 threshold exceeded) is in effect, an asterisk will appear next to the one that is being applied and the label 'TR-CALC' will change to 'TR-OCC1' or 'TR-OCC2' depending on which one is active.

1-7

TR STATUS	NEXT UPDATE	1:48	06/21/02	
(NEXT CHANGES ZONE)		ZONE 1	15:30:40	
PLANS: TOD: 0-0 TR-CALC 0-0 TR-ACT: 0-0				
		CYCLE	OFFSET	SPLIT
CURRENT LEVEL		0	0	0
CURRENT TR %		0	0	0
PREVIOUS TR %		0	0	0
		ART	IN	OUT SIDE
CURR RAW V <sub>kO</sub>		0	0	0
CURR SMOOTH V <sub>kO</sub>		0	0	0
PREV SMOOTH V <sub>kO</sub>		0	0	0
		OCC-1	OCC-2	
CURR RAW V <sub>kO</sub>		0	0	
CURR SMOOTH V <sub>kO</sub>		0	0	
PREV SMOOTH V <sub>kO</sub>		0	0	

- NEXT UPDATE – time remaining in the Detector Sampling Period (before the next sample is retrieved).
- PLANS – the three Master Timing options.
  - TOD is what is scheduled in the Master scheduler;
  - TR-CALC is what is being calculated by Traffic Responsive;
  - TR-ACT is what Traffic Responsive is implementing.
  - TR-CALC and TR-ACT may be different, depending upon the Minimum Plan Execution Time setting.
- CURRENT LEVEL – Cycle, offset, and split implemented by the Master.
- CURRENT TR % – Current detector sampling period V<sub>kO</sub> % calculated by TR algorithms
- PREVIOUS TR % – Previous detector sampling period V<sub>kO</sub> % calculated by TR algorithms
- CURRENT RAW V<sub>kO</sub> – Current V<sub>kO</sub> values from detector data for all 6 computational channels.
- CURR SMOOTH V<sub>kO</sub> – Current V<sub>kO</sub>, after smoothing values applied for all 6 computational channels.
- PREV SMOOTH V<sub>kO</sub> – Previous V<sub>kO</sub>, after smoothing values were applied for all 6 computational channels.

## 6.1.8 Scheduling

The Scheduling displays the Active Events, which shows the current active coordination, plans with their associated offsets. Plans are listed in descending order of priority. Active scheduled functions are displayed beneath all queued coordination plans.

1-B

SCHEDULING/ACTIVE EVENTS		06/21/04	
(NEXT CHANGES ZONE)		ZONE 1	09:16:30
#	DESCRIPTION		PRI
4	COORD PLAN #2 OFFSET #1		MED

Five levels listed in order of priority:

- Man Highest Priority – Plan implemented directly from the front panel.
- Central Central Override – Plan implemented from central command.
- High High Priority – Plan implemented from the scheduler
- Medium Medium Priority – Plan implemented from the scheduler
- Low Low Priority – Plan implemented from the scheduler

When several active plans have the same priority level:

- The most recently implemented plan is considered to have the highest priority and will be listed first.
- All other plans will follow in the list.

All active scheduled functions are listed by event # (1-100).

### 6.1.9 Test TR (Traffic Responsive)

Test Traffic Responsive allows the user to enter test data for the volume and occupancy of each system detector. It can also be used to debug the Traffic Responsive Settings.

1-F

TRAFFIC RESPONSIVE TEST		
ENABLE .....		N
	VOL	OCC
SYSTEM DETECTOR 1 .....	0 .....	0
SYSTEM DETECTOR 2 .....	0 .....	0
SYSTEM DETECTOR 3 .....	0 .....	0
SYSTEM DETECTOR 4 .....	0 .....	0
SYSTEM DETECTOR 5 .....	0 .....	0
SYSTEM DETECTOR 6 .....	0 .....	0
SYSTEM DETECTOR 7 .....	0 .....	0
↓		
SYSTEM DETECTOR 64 .....	0 .....	0

This feature should only be used for testing purposes. Make sure to disable the Traffic Responsive Test before implementing in the street.

Detector values will remain active as long as the test mode is enabled.

## 6.2 MASTER SETTINGS

The Master Setting display contains the current operational settings for the master controller.

2

MASTER SETTINGS	
TYPE(0=LOCAL, 1=OSM, 2=OSM-LOCAL) . . .	1
TIME SYNC PERIOD (0-720 MIN) . . . . .	0
DETECTOR SAMPLE PERIOD (0-255 MIN) . . .	0
MIN PLAN EXECUTION TIME (0-255 MIN) . . .	0
MASTER ASSET NUMBER (0-15999) . . . . .	0
COMM FAIL TIMEOUT (0-255 MIN) . . . . .	0
COMP CH FAIL TIMEOUT (0-255 MIN) . . . .	0
PASS THROUGH COMMUNICATIONS (Y/N) . . .	N
PORT # TO CENTRAL (1-4) . . . . .	0
PORT # TO SUBORDINATES (1-4) . . . . .	0
MARGINAL COMM THRESHOLD (0-100%) . . .	0

- **Type**
  - Numerical input 0 – Local
  - Numerical input 1 – OSM-Only
  - Numerical input 2 – OSM-Local
- **Time Sync Period** – Controls how often time synchronization messages will be sent to the locals.
  - Numerical input 0 – None
  - Numerical input 1-720 minutes
- **Detector Sample Period** – Controls how often the master will poll the locals for system detector information.
  - Numerical input 0 – None
  - Numerical input 1-255 minutes
- **Minimum Plan Execution Time** – Controls the minimum amount of time the master will run a traffic responsive plan.
  - Numerical input 0 – None
  - Numerical input 1-255 minutes
- **Master Asset Number** – The communications address associated with the master. This number must be unique within any given system.
  - Numerical input 0 – None
  - Numerical input 1-15999
- **Communication Failure Timeout** – Following a communications error with one of its locals, the master will, after this period of time expires, command all locals in the same zone as the failed local to revert to local TOD operation. When communications is restored to the failed local, normal master operation is resumed.
  - Numerical input 0 – None
  - Numerical input 1-255 minutes
- **Computational Channel Fail Timeout** – Following a computational channel failure, the master will, after this period of time expires, revert the affected zone back to TOD operation.
  - Numerical input 0 – None
  - Numerical input 1-255 minutes

- **Pass Through Communications** – Controls whether the unit will forward packets it receives. In master only or master/local modes, this should be set to 'Y'.
  - Yes – If a packet arrives on the central port, it will be forwarded out the subordinate port and vice versa.
  - No – The master will not forward packets.
- **Port # To Central** – Specifies the Comm Port that will be used to communicate with a central computer.
  - Numerical input 0 – None
  - Numerical input 1- 4
- **Port # To Subordinates** – Specifies the Comm Port that will be used to communicate with a locals.
  - Numerical input 0 – None
  - Numerical input 1- 4
- **Marginal Comm Threshold** – A percentage of failed responses that will result in marginal comm. This will not result in any changes in operation. This sets a threshold for logging an error.
  - Numerical input 0 – None
  - Numerical input 1-255 minutes

### 6.3 ZONE ASSIGNMENTS

OASIS OSM allows independent control of four (4) zones. Each zone can independently execute plans, functions, or traffic responsive operation. It also allows control of up to 64 intersections. Each intersection can be assigned to only one zone. Any enabled intersection must be configured to a zone through the Zone Assignment table for the master to be able to control that intersection. Locals not assigned to a zone can still communicate for the purpose of system detector polling, table uploads and downloads, status, etc.

3

```

INTERSECTION #64 ZONE ASSIGNMENT
(+/- TO CHANGE INTERSECTION)
ENABLE INTERSECTION?. . . . . Y
CONTROLLER ASSET #(0-15999) . . . . . 1
ZONE ASSIGNMENT (0=NONE, ZONE 1-4). . . 1
CONTROLLER TYPE (0=OASIS, 1=W4IKS). . . 0

```

- **Intersection # Zone Assignment**
  - + / – Increments / decrements the intersection #1-64. Intersection number can also be entered directly in this field.
- **Enable Intersection**
  - Y – Enables the intersection as a subordinate for master control
  - N – Disables the intersection assignment
- **Controller Asset** – Sets the controller address for the subordinate intersection.
  - Numerical input 0 – None
  - Numerical input 1 – 15999 for the Controller Asset number
- **Zone Assignment**
  - Numerical input 0 – None or Disables the intersection assignment
  - Numerical input 1 – 4 Zone Assignment
- **Controller Type**
  - Numerical input 0 – Defines local as OASIS-2070 controller
  - Numerical input 1 – Defines local as W4IKS-170 controller

## 6.4 SYSTEM DETECTORS

OASIS OSM allows data collection from up to 64 system detectors. Up to eight system detectors can be assigned to each of the 64 intersections (OASIS locals only) under master control. The system detector assignments table assigns the system detectors to local detectors from the subordinate intersections.

4

INTERSECTION #	SYSTEM DETECTORS
(+/- CHANGES INTERSECTION #)	
SYSTEM DETECTOR#	LOCAL DETECTOR#
(0=NONE,1-64)	(0=NONE,1-64)
1 .....	16
0 .....	0
0 .....	0

- **Intersection # System Detectors**
  - +/- Increments / decrements the intersection #1-64. The intersection number can also be entered directly in this field.
- **System Detector**
  - Numerical input 0 – None or Disables the detector assignment
  - Numerical input 1 – 64 number of the assigned system detector number
- **Local Detector #** – Identifies a local detector number (not local input assignment number) that the system detector is assigned to.
  - Numerical input 0 – None or Disables the Detector Assignment
  - Numerical input 1 – 64

## 6.5 COMPUTATIONAL CHANNEL SETUP

5

COMPUTATIONAL CHANNEL SETUP	
COMP CHANNEL: INBOUND	ZONE 2
(+/- CHANGES CHAN, NEXT CHANGES ZONE #)	
MODE (0=AVG, 1=HIGHEST, 2=2ND) .....	0
MINIMUM GOOD DETECTORS (0-16) .....	4
SMOOTHING % (0-99) .....	40
VOLUME SCALING FACTOR (0-255%) .....	100
OCCUPANCY SCALING FACTOR (0-255%) .....	100

The header displays the current Zone Number . The “NEXT” button will display the subsequent zones.

- **Computational Channel** – Reflects the channel being configured. Use the +/- key to cycle through the available Computational Channels.
  - Inbound
  - Outbound
  - Side Street
  - Occupancy Override 1
  - Occupancy Override 2
  - Arterial
- **Mode**
  - Numerical input 0 – Average. The average of the V+kO of the assigned detectors will be used as the value of this computational channel during traffic responsive computations.
  - Numerical input 1 – Highest. The maximum V+kO will be used.
  - Numerical input 2 – 2<sup>nd</sup> Highest. The second highest V+kO will be used.

- **Minimum Good Detectors**
  - Numerical input 0 – None
  - Numerical input 1-16 – The number of correctly functioning detectors required before this channel is considered failed and traffic responsive calculations abandoned for this zone.
  
- **Smoothing %**
  - Numerical input 0 – No smoothing of V+kO data is performed.
  - Numerical input 1-99 – Smoothing factor is applied to the V+kO data, see Traffic Responsive description. Lower numbers emphasize most recent data.
  
- **Volume Scaling Factor %**
  - Numerical input 0 – None
  - Numerical input 1-255 percent – the raw volume will be scaled by this amount in the V+kO calculation.
  
- **Occupancy Scaling Factor %**
  - Numerical input 0 – None
  - Numerical input 1-255 percent – the raw volume will be scaled by this amount in the V+kO calculation.

**NOTE:** The Arterial computational channel will only contain the Mode, Immediate Update Threshold and MAX V+kO fields. The occupancy override channels will not contain the volume scaling factor field.

COMPUTATIONAL CHANNEL SETUP	
COMP CHANNEL:	ARTERIAL                      ZONE 1
(+/- CHANGES CHAN, NEXT CHANGES ZONE #)	
MODE (0=AVG, 1=HIGHEST, 2=2ND).....	0
IMMED UPDATE THRESHOLD (0-255%)....	0
MAX V+K0 (0-65535).....	0

## 6.6 COMPUTATIONAL CHANNEL ASSIGNMENT

6	
COMPUTATIONAL CHANNEL ASSIGN                      ZONE 1	
(+/- CHANGES CHAN, NEXT CHANGES ZONE #)	
COMPUTATIONAL CHANNEL: INBOUND	
SYS DET #	VOL SCALE %                      OCC SCALE %
0	100                      100
0	100                      100
0	100                      100
0	100                      100

The header displays the current Zone Number. The “NEXT” button will display the subsequent zones.

- **System Detector Number** – Number of the system detector being assigned to this computational channel.
  - Numerical input 0 – None
  - Numerical input 1-64 – Detector Number
  
- **Volume Scale Percent** – Weighting to be applied to the volume for this detector in the V+kO calculation (see Traffic Responsive).
  - Numerical input 0 – None
  - Numerical input 1-255 Percent

- **Occupancy Scale Percent** – Weighting to be applied to the occupancy for this detector in the V+kO calculation (see Traffic Responsive).
  - Numerical input 0 – None
  - Numerical input 1-255 Percent

**NOTE:** The occupancy override channels will not contain the volume scaling factor fields.

## 6.7 TRAFFIC RESPONSIVE (TR) THRESHOLD

Thresholds are used to select cycle, offset and split-levels and for transitions from normal operation to occupancy override. Percentages in the right column should generally be lower than those in the left to provide hysteresis (preventing plans from bouncing back and forth). When the values are entered, the Traffic Responsive Algorithms should command the system according to the following scenarios.

- As traffic transitions between outbound flow to neutral flow to inbound flow, the system should transition from OFF1 to OFF2 to OFF3, respectively.
- As traffic transitions between relatively heavy side street to heavy main street V+kO, the system should transition from SPL1 to SPL4, respectively. SPL2 and SPL3 should be implemented by varying degrees of change.

7					
THRESHOLD CONFIGURATION					ZONE 1
(NEXT CHANGES ZONE #)					
FROM	TO	%	FROM	TO	%
LOWV	-> CYC1	0	CYC1	-> LOWV	0
CYC1	-> CYC2	0	CYC2	-> CYC1	0
CYC2	-> CYC3	0	CYC3	-> CYC2	0
CYC3	-> CYC4	0	CYC4	-> CYC3	0
CYC4	-> CYC5	0	CYC5	-> CYC4	0
CYC5	-> CYC6	0	CYC6	-> CYC5	0
OFF1	-> OFF2	0	OFF2	-> OFF1	0
OFF2	-> OFF3	0	OFF3	-> OFF2	0
SPL1	-> SPL2	0	SPL2	-> SPL1	0
SPL2	-> SPL3	0	SPL3	-> SPL2	0
SPL3	-> SPL4	0	SPL4	-> SPL3	0
NORM	-> OCC1	0	OCC1	-> NORM	0
NORM	-> OCC2	0	OCC2	-> NORM	0
OCC SCALING FACTOR, k (0-4000%).....0					
LOW VOLUME PLAN (0-66).....0					
LOW VOLUME OFFSET (0-4).....0					
OCCUPANCY OVERRIDE 1 PLAN (0-66).....0					
OCCUPANCY OVERRIDE 1 OFFSET (0-4).....0					
OCCUPANCY OVERRIDE 2 PLAN (0-66).....0					
OCCUPANCY OVERRIDE 2 OFFSET (0-4).....0					

- **Thresholds**  
The threshold that is required to make the indicated transition. For example, on the field labeled CYC2 -> CYC3, if a 25 was entered, the calculated value must be greater than 25% of the Max V+kO value to transition from cycle level 2 to cycle level 3.
  - Numerical input 0 –100
  
- **Occupancy Scaling Factor**  
The 'k' in the V+kO calculation (see Traffic Responsive). As this value increases, more emphasis is placed upon Occupancy, and less on Volumes.
  - Numerical input 0 – 4000
  
- **Low Volume Plan**  
Plan number to run when the traffic responsive transfer percentage is less than the CYC1 -> LOWV threshold. This defines the plan number to command the local controller to run.
  - Numerical input 0 – 66 (0 = local scheduled TOD plan). **NOTE:** if W4IKS controllers are being used under OSM, limit plans from 0 – 20.
  
- **Low Volume Offset**  
Offset number to run when the traffic responsive transfer percentage is less than the CYC1 -> LOWV threshold. This defines the offset number to command the local controller to run.
  - Numerical input 0 – 4 (0 = local scheduled TOD offset). **NOTE:** if W4IKS controllers are being used under OSM, limit offset to 0 or 1.
  
- **Occupancy Override 1 Plan**  
Plan to use in the case that the Occupancy Override 1 Threshold is exceeded.
  - Numerical input 0 – 66 (0 = local scheduled TOD plan). **NOTE:** if W4IKS controllers are being used under OSM, limit plans from 0 – 20.
  
- **Occupancy Override 1 Offset**  
Offset to use in the case that the Occupancy Override 1 Threshold is exceeded.
  - Numerical input 0 – 4 (0 = local scheduled TOD offset). **NOTE:** if W4IKS controllers are being used under OSM, limit offset to 0 or 1.
  
- **Occupancy Override 2 Plan**  
Plan to use in the case that the Occupancy Override 2 Threshold is exceeded.
  - Numerical input 0 – 66 (0 = local scheduled TOD plan). **NOTE:** if W4IKS controllers are being used under OSM, limit plans from 0 – 20.
  
- **Occupancy Override 2 Offset**  
Offset to use in the case that the Occupancy Override 2 is exceeded.
  - Numerical input 0 – 4 (0 = local scheduled TOD offset). **NOTE:** if W4IKS controllers are being used under OSM, limit offset to 0 or 1.

## 6.8 PLAN SELECTION

Choose the plan to use for each combination of cycle level, offset level and split-level.

8

PLAN & OFFSET SETUP		ZONE 1 CYC LEV # 1			
ENTER PLAN & OFF LEV (FLASH=65, FREE=66)					
NEXT CHANGES ZONE, +/- CHANGES CYC LEV #					
SPLIT LEVEL		1	2	3	4
		P#	0#	P#	0#
		P#	0#	P#	0#
OFFSET LEVEL 1		0	0	0	0
OFFSET LEVEL 2		0	0	0	0
OFFSET LEVEL 3		0	0	0	0

- **Plan Number**

Plan number that will be used for that combination of cycle level, offset level and split level, selected by the computational channels.

- Numerical input 0 – None
- Numerical input 1 – 64 (1 – 18 w/ W4IKS)
- Numerical input 65 – Flash (19 – W4IKS)
- Numerical input 66 – Free (20 – W4IKS)

- **Offset Number**

Offset number that will be used for that combination of cycle level, offset level and split level, selected by the computational channels.

- Numerical input 0 – 4 (0 – 1 w/ W4IKS)

## 6.9 DIALUP-PAGER

The Dialup and Pager Configuration allows configuration of paging and reporting of events that occur throughout the system. In the case of paging, a numeric code will be transmitted that consists of the asset number followed by an alarm code. The alarm codes are shown below.

9

DIALUP AND PAGER CONFIGURATION			
DIALUP ENABLE.	. . . . .		.N
PULSE DIALING.	. . . . .		.N
NUMBER OF DIAL ATTEMPTS.	. . . . .		.0
RETRY DELAY (MIN).	. . . . .		.0
PAGER DELAY (SEC).	. . . . .		.0
PHONE NUMBER 1.	. . . .		
PHONE NUMBER 2.	. . . .		
<hr/>			
PHONE NUMBER 3.	. . . .		
PHONE NUMBER 4.	. . . .		
PHONE NUMBER 1.	. . . .		
PHONE NUMBER 2.	. . . .		
PHONE NUMBER 3.	. . . .		
PHONE NUMBER 4.	. . . .		
PHONE NUMBER 5.	. . . .		
PHONE NUMBER 6.	. . . .		
PHONE NUMBER 7.	. . . .		
PHONE NUMBER 8.	. . . .		
PHONE NUMBER 9.	. . . .		
PHONE NUMBER 10.	. . . .		
PHONE NUMBER 11.	. . . .		
PHONE NUMBER 12.	. . . .		
PHONE NUMBER 13.	. . . .		
PHONE NUMBER 14.	. . . .		
PHONE NUMBER 15.	. . . .		
ALARM CONFIGURATION			
ALARM		REPORT?	PAGER# PRI
(0=LOW, 3=HIGH PRI)		(Y/N)	(0-15) (0-2)
LOCAL DET FAIL		Y	9
IN COORDINATION			
STOP TIME			
CONFL CONFIG DATA			
TOD BACKUP			
TRANSITION			
CABINET FLASH			
CONTROLLER FLASH			
PREEMPTION			
MANUAL CONTROL			
MONITOR FLASH			
HARDWARE FAILURE			
RTC FAILURE			
FRONT PANEL DATA ENTRY			
CABINET DOOR OPEN			
ALARM INPUT ACTIVE			
SYSTEM DET FAIL			
COMP CH FAILURE			
COMM FAILURE			
LOCAL COORD ERROR			
MASTER POWER FAILURE			
TR LEVEL CHANGE			
MASTER PLAN CHANGE			
MARGINAL COMM			

- Enter:
  - **Dialup Enable** – (Y) Yes or (N) No
  - **Pulse Dialing** – (Y) Yes or (N) No
  - **Number of Dial Attempts** – Number of times the master will attempt to dial a phone number when reporting an alarm before moving on to the next phone number.  
Numerical input 0-255 retries
  - **Retry Delay** – Time to wait between retries  
Numerical input 0-255 minutes
  - **Pager Delay** – Time to pause after dialing before the alarm code is transmitted.  
Numerical input 0-255 seconds
  - **Phone Number** – Used for reporting events to a central computer. Up to 20-digit telephone number, including 1 and area code, if needed.  
Example: 1-719-785-XXXX
  - **Pager Number** – Used for reporting events to a numeric pager. Up to 20-digit telephone number, including 1 and area code, if needed.  
Example: 1-719-785-XXXX
- Select events to be reported and/or paging sent:

**Code Alarm**

- 1 Local Detector Failure
- 2 In Coordination
- 3 Stop Time
- 4 Conflicting Configuration Data
- 5 Time of Day (TOD) Backup
- 6 Transition
- 7 Cabinet Flash
- 8 Controller Flash
- 9 Preemption
- 10 Police Switch
- 11 Monitor Flash
- 12 Hardware Failure

**Code Alarm**

- 13 Real Time Clock (RTC) Failure
- 14 Front Panel Data Entry
- 15 Cabinet Door Open
- 16 Alarm Input Active
- 17 System Detector Failure
- 18 Computational Channel Failure
- 19 Communication Failure
- 20 Local Coordination Error
- 21 Master Power Failure
- 22 Traffic Responsive Level Change
- 23 Master Plan Change
- 24 Marginal Communication

## 6.10 SCHEDULING (Group 2 Permissions)

Event scheduling allows day plans, coordination plans, and special functions to be implemented by the time of day (TOD), day of week (DOW), or days of the year (DOY) to be sent to all controllers in a single zone, or broadcast over the whole system (up to 64 controllers).

B

<b>SCHEDULED EVENT #1</b>	<b>NOT ASSIGNED</b>
START DATE (MM/DD) .....	00/00
END DATE (MM/DD) .....	00/00
START TIME (HH:MM) .....	00:00
STOP TIME (HH:MM) .....	00:00
DOW	SUN MON TUE WED THU FRI SAT
ENABLED	X
EVENT GROUPS	12345678910111213141516
ASSIGNED	X X
DELETE EVENT WHEN COMPLETED? .....	N
CONTINUOUS EVENT? .....	N
INVERT EVENT? .....	N
APPLY TO ZONE(0=OFF,1-4,5=ALL) .....	0
SELECT 1 EVENT TYPE:	
EVENT GROUP (1-16) .....	_
TRAFFIC RESPONSIVE? .....	Y
PLAN (65=FLSH,66=FREE) ..	OFFSET# ..
TR/PLAN PRIORITY: LOW	_ MED _ HIGH _

- **Event Number** – Reference number for each event.
  - Numerical input 1 – 100
  
- **Start/End Date**

Start Date is the first day that the event will be implemented. The End Date is the last day that the event will be implemented. If the event is a coordination or day plan, the plan will occur on this End Date.

  - MM/DD – Month/Day – There is no year reference which allows schedules to be repeated every year without modification.
  
- **Start/End Time**

Start Time is the time (beginning of minute) of day that the event will begin. The End Time is the time (end of minute) of day that the event will terminate.

  - HH/MM – Hour/Minute (use military time format – midnight is entered as 00:00 [start time] and 24:00 [end time])
  
- **Day(s) of Week (DOW)**

Individual days of the week can be selected for the event to run. If the actual date is between the start and end date inclusively, the event will begin at the start time and end at the end time on each day selected. If no days are selected, the event will run continuously from the start time on the start date to the end time on the end date.

  - YES – Days selected are visible with an 'X.'
  - NO – Field will be blank
  
- **Event Groups Assigned** – Event groups allow multiple scheduled events to be grouped together and ran as a single event. Indicates which Day Plans (Event Group 1-16) the event belongs to.
  - YES – Event Groups selected are visible with an 'X.'
  - NO

- **Delete Event When Complete**
  - YES – Event can be deleted upon completion.
  - NO – Event is not deleted.

Any event can be deleted upon completion of the event. Any event can also be disabled from implementation.

- **Continuous Event**
  - YES – The event will run continuously from the first DOW selected to the last DOW selected.
  - NO – The event will start and stop at the start and stop times on each DOW selected.
- **Invert Event**
  - YES – Disables the selected phase control function that is normally enabled.
  - NO

- **Apply to Zone**
  - Numerical input 0 – Off
  - Numerical input 1-4 – Zone Number
  - Numerical input 5 – All

- **Select 1 Event Type**

There are three different types of events:

- **Event Group** (Day Plans) allows or restricts execution of their member events.
  - Numerical input 1-16
- **Traffic Responsive**
  - YES - Zones selected are visible with a "Y"
  - NO
- **Coordination Plans** (run through the scheduler) allow selection of a Coordination Plan and an offset.
  - Numerical input 1-64 (1 – 18 w/ W4IKS)
    - With Offset 1-4
  - Numerical input 65 – Flash (19 – W4IKS)
  - Numerical input 66 – Free (20 – W4IKS)

- **Plan Priority**

There are three different priority levels for coordination plans implemented through the scheduler. When 2 or more coordination plans are active concurrently, the plan with the highest priority will be implemented. When 2 or more coordination plans of the same priority level are active concurrently, the most recently activated plan will be implemented. For plans and traffic responsive events, a priority must be provided or else the event will not run.

- Low – Lowest priority
- Medium – Overrides low priority
- High – Overrides medium and low priority

## 6.11 USER PROFILES

OASIS allows up to 128 users to access the system. OASIS provides 6 permissions groups to restrict users from modifying specific data. All users can view all of the configuration data via the front panel. Select User Profiles from the main menu.

		C					
OASIS USER PROFILES							
USERNAME	PERMISSIONS:	1	2	3	4	5	6
Admin	Y	X	X	X	X	X	X

- YES – Adds the permissions group or access for the user at the current cursor location.
- NO – Removes the permissions group or access for the user at the current cursor location.

Users cannot be added or removed via the User Interface, nor can usernames be modified. The same requirements apply for Master User Profiles as for Local User Profiles – changes to user names and PIN's must be made using Centracs®, Pyramids, Translink 32, or Cairo, and downloaded.

### Group 1 Permissions

- Phase Control Functions
- Phase Timing Data
- Phase Sequence Data
- Permitted Phases & Ring Barrier Enabling
- Omit Functions
- Recall Functions
- Overlap Settings
- Clock Settings

### Group 2 Permissions

- Coordination Plans
- Event Scheduling
- Clock Settings
- On Street Master

### Group 3 Permissions

- Input Assignments
- Output Assignments
- Logical I/O Processor
- Output Beacons
- Detector Assignments
- Clock Settings

### Group 4 Permissions

- Communications Configuration
- Logging Controls
- Clock Settings

### Group 5 Permissions

- Preemption Configuration Settings
- Clock Settings

### Group 6 Permissions (System Administrator)

- User Profiles
- OASIS Un-installation
- Configuration File Deletion
- Clock Settings

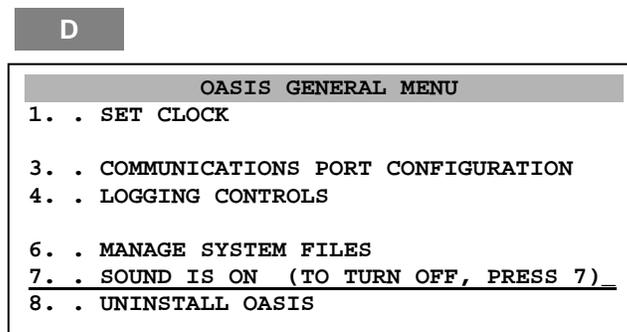
In addition to the Permission Group Assignments, each user has a 6-digit user name and a 4-digit user PIN. User names, PIN # s, and permissions can only be modified through either the Centracos® or Pyramids central software, or the Translink 32 or Cairo Utilities software program. When OASIS is initially installed on a controller, a default user (Admin) is created. The PIN for this user will be 1111. Admin has permission to all 6 groups. The Admin user should be removed when other users are programmed through the OASIS Utilities.

Any user with a valid PIN can view all of the configuration data unless their account has been disabled. A System Administrator can disable the accounts of any user by selecting 'N' under the permissions column.

Logs record all Front Panel data modifications. The old and new data values, as well as the username and timestamp are logged.

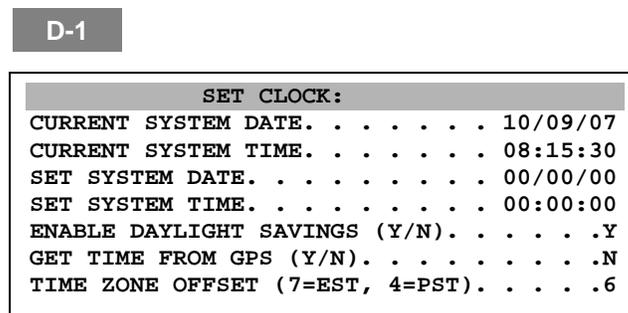
## 6.12 GENERAL MENU

OASIS provides many additional features and settings can be accessed through the General Menu. Select the General Menu from the Main Menu.



### 6.12.1 Set Clock (Groups 1-6 Permissions)

The OASIS real time clock is maintained as a 24-hour clock (military time).



- **Current System Date** – MM/DD/YY
  - o Month – 01-12
  - o Day of Month – 01-31
  - o Year – 00-99
- **Set System Time** – HH/MM/SS
  - o Hour (0-24)
  - o Minute (0-59)
  - o Second (0-59)
- **Current System Time** – HH/MM/SS
  - o Hour (0-24)
  - o Minute (0-59)
  - o Second (0-59)
- **Enable Daylight Savings**
  - o YES
  - o NO

**NOTE:** Midnight is entered as "24:00:00."

- **Set System Date** – MM/DD/YY
  - o Month – 01-12
  - o Day of Month – 01-31
  - o Year – 00-99
- **Get Time From GPS**
  - o YES
  - o NO
- **Time Zone Offset**
  - o 7 – Eastern Standard Time
  - o 6 – Central Standard Time
  - o 5 – Mountain Standard Time
  - o 4 – Pacific Standard Time
- Darken Outputs During Flash Sense

The clock has the ability to automatically enable adjustment for day light savings time. The clock is settable from the front panel, or when OASIS receives a time broadcast from a Zone Master (ZM), Global Positioning System (GPS), or a central computer system.

## 6.12.2 Communications Configuration Is Not An Option On Master Menu

### 6.12.3 Communications Port Configuration (Group 4 Permissions)

Select Communications Port Configuration from the General Menu.

D-3

```

COMM PORT #1 CONFIG (NEXT:PORTS 1-4)
PORT ENABLED (Y/N). . . . .Y
SELECT BAUD RATE:
  X 1200      _ 2400      _ 4800
  _ 7200      _ 9600      _ 14400
  _ 19200     _ 28800     _ 38400

SELECT TRANSIT FORMAT:
DATA BITS (7/8). . . . .Y
STOP BITS (1/2). . . . .1
PARITY (0=NONE,1=ODD,2=EVEN) . .0
SELECT PROTOCOL:
  X OASIS CIP
  _ AB3418 (NOT AVAILABLE)
  _ NTCIP (NOT AVAILABLE)
  _ TRIMBLE TSIP GPS
  _ EDI 210/2010ECL
SELECT INTERFACE:
  0 FLOW CONTROL MODE(0-5)
  _ HALF DUPLEX
  _ FULL DUPLEX
  _ DIALUP MODEM (PRE '99 TEES)
RESPONSE DELAY (0-255 MILLISEC). . 10
BYTE-BYTE TIMEOUT (0-255 MILLISEC).100
RTS-CTS TIMEOUT (0-255 MILLISEC). .100
RTS HOLD-OVER (0-255 MILLISEC). . .1
  
```

Each of the settings is described below:

- **Port Enabled**
  - o YES – The port is enabled and ready for communications.
  - o NO – Serial port is disabled.

- **Select Baud Rate**

- YES – The selected baud rate is indicated with ‘X.’
  - 1200                    2400                    4800
  - 7200                    9600                    14400
  - 19200                   28800                   38400

- **Select Transit Format**

- Select Data Bits – Determines the number of data bits per byte. (Recommend – 8 Data Bits).
  - Numerical input 7 – 8
- Select Stop Bits – Determines the number of stop bits used. (Recommend – 1 Stop Bit)
  - Numerical input 1 – 2
- Parity – Determines the parity bits used. (Recommend – No parity)
  - Numerical input 0 – 2

- **Select Protocol**

- YES– The selected communications protocol is indicated with an ‘X.’
- NO

OASIS CIP – Communications with Centracs® or PYRAMIDS system. Port configuration:

- 8 Data Bits
- 1 Stop Bit
- No Parity

AB3418 Protocol port configuration:

- This protocol is not currently supported by OASIS

NTCIP protocol port configuration:

- This protocol is not currently supported by OASIS

Trimble TSIP GPS protocol – For receiving time from a GPS receiver. Standard Trimble GPS port configuration:

- 9600 baud
- 8 Data Bits
- 1 Stop Bit
- Odd Parity

EDI 210/2010 ECL protocol – Polls an EDI conflict monitor for status. Standard EDI monitor port configuration:

- 9600 baud
- 8 Data Bits
- 1 Stop Bit
- Even Parity

- **Select Interface** (choose only one of the following options:
    - Flow Control Mode (0-5)
      - Numerical Input 0-5
        - No Flow Control (FCM 0)– Serial Cable or Fiber Optics
        - FCM mode 1-5 – depending upon communications infrastructure
          - FCM1 – Manual Flow Control Mode: The serial device driver transmits and receives data regardless of the RTS, CTS, and CD states. The user program has absolute control of the RTS state and can inquire of the states of CTS and CD. The states of CTS and CD are set externally by a DCE. The device driver doesn't assert or de-assert the RTS.
          - FCM2 – Auto-CTS Flow Control Mode: The serial device driver transmits data when CTS is asserted. The CTS state is controlled externally by a DCE. The user program has absolute control of the RTS state. The CD is set asserted internally. The device driver doesn't assert or de-assert the RTS.
          - FCM3 – Auto-RTS Flow Control Mode: The CTS and CD are set asserted internally. The serial device driver receives and transmits data at all times. Upon a write command, the serial device driver asserts RTS to start data transmission, and de-asserts RTS when data transmission is completed. If the user program asserts the RTS, the RTS remains to be on until user program de-asserts RTS. If user program de-asserts RTS before the transmitting buffer is empty, the driver holds RTS on until the transmitting buffer is empty. Parameters related to delays of the RTS turn-off after last character are user configurable.
          - FCM4 - Fully Automatic Flow Control Mode: The serial device driver receives data when CD is asserted. Upon a write command, the serial device driver asserts RTS and wait for CTS, starts data transmission when CTS is asserted, and de-asserts RTS when data transmission is completed. Parameters, related to delays of RTS turn-off after last character, are user configurable. If user program asserts the RTS, RTS remains to be on until user program de-asserts RTS. If user program de-asserts RTS before the transmitting buffer is empty, the driver holds RTS on until the transmitting buffer is empty.
          - FCM5 – Dynamic Flow Control Mode: The Serial device driver maintains a transmit buffer and a receive buffer with fixed sizes, controls the state of RTS and monitors the state of CTS. The serial device driver manages the transmission and reception of data automatically. The serial device driver transmits data when CTS is asserted. The serial device driver asserts RTS when its receiving buffer is filled below certain level (low watermark), and de-asserts RTS when its receiving buffer is filled above certain level (high watermark).
      - Half Duplex – Half Duplex Simple Modem or Data Radio
        - YES – The selected interface is indicated with an 'X.'
      - Full Duplex – Full Duplex Simple Modem
        - YES – The selected interface is indicated with an 'X.'
      - Dialup Modem – AT command set, dialup modem. **NOTE:** do not use this setting with a pre-1999 TEES controller. Use FCM4 instead.
        - YES – The selected interface is indicated with an 'X.'
- **Response Delay** – Determines the period that the controller will wait to respond when queried.
  - Numerical input 0 – 255 milliseconds
- **Byte-to-Byte Timeout** – Determines the period that the controller will wait for the next byte of an incoming packet before failing the packet.
  - Numerical input 0 – 255 milliseconds
- **RTS to CTS Timeout** – Determines the period that the controller will wait for CTS after asserting RTS before starting a transmission.
  - Numerical input 0 – 255 milliseconds
- **RTS Holdover** – When using half-duplex interface this field determines the period that the port will hold RTS active beyond the end of a transmission.
  - Numerical input 0 – 255 milliseconds

## 6.12.4 Logging Controls (Group 4 Permissions)

OASIS OSM maintains three (3) data logs. The logs provide a history of system events. All data log entries are stored with a time and date stamp. After a log is full, new entries will replace oldest log entries.

The logs are retrieved from a controller by a central computer system. The central computer can display, print, and archive the logs. Multiple computers can upload the same log entries. The log entries can also be set to delete upon upload.

Select Logging Controls from the General Menu.

**D-4**

LOGGING CONTROLS:			
LOG:	ENTRIES	%FULL	ENABLED
MASTER ALARMS . .	64	100	Y
SYS DET DATA . . .	4096	100	Y
TR DATA . . . . .	1950	100	Y

- **% Full** – Shows the current capacity of the log. (0-100%)
- **Enabled**
  - YES – Log will record data.
  - NO – No subsequent logging will occur. A disabled log will retain all previously logged data.

**Master Alarms Log (ALARMS)** – Records system alarms. The source of the alarm as well as the type of alarm is recorded with a timestamp. Note, it is not possible to disable this log since dialup/paging will not function correctly without it.

**System Detector Data (SYS DET DATA)** – Maintains a record of volume, occupancy and speed for each system detector. This is updated once per detector sample period.

**Traffic Responsive Data (TR DATA)** – Maintains a record of the traffic responsive calculations. The following data is logged.

- Previous and current raw and smoothed V+kO values
- Previous and current TR percentages
- Cycle, offset and split levels
- Selected plan and offset

## 6.12.5 Conflict Monitor Is Not An Option On Master Menu

## 6.12.6 Manage System Files (Group 6 Permissions)

Manage System Files provides a utility to save the active configuration to flash (/f0) drive, save the active configuration to a Datakey, delete Manual Commands and System Commands, delete the active configuration file, delete logs, restore the current configuration file from the flash (/f0) drive, restore the current configuration file from a Datakey, and restore the configuration to the factory defaults.

The active configuration file resides on the /r0 drive. The configuration file stores all the controllers programming information such as phase timing, sequence, etc. The manual/system command file contains commands (such as manual overrides and commands sent from a traffic management system) that the controller is currently running. This allows these commands to be persistent across power outages. The log files are the various logs that OASIS maintains, such as the event log, detector log and so on.

```
SELECT OPTIONS AND PRESS THE 'ENT' KEY
SAVE ACTIVE CONFIG TO FLASH . . . . N
SAVE ACTIVE CONFIG TO DATAKEY . . . N
DELETE MANUAL/SYSTEM COMMANDS FILE. N
DELETE ACTIVE CONFIG FILE . . . . . N
DELETE LOGS . . . . . N
RESTORE CONFIG FROM FLASH . . . . . N
RESTORE CONFIG FROM DATAKEY . . . . N
RESTORE TO FACTORY DEFAULTS . . . . N
```

### General Manage System File Menu Utilization:

- Using the up and down arrows on the OASIS 2070 Controller front panel, scroll down the list and select “YES” or “NO” keys on the front panel to select or de-select the operations to be performed.
- Select ENT from the OASIS 2070 Controller front panel to perform the selected operation.

**NOTE:** When the configuration files are deleted from the /r0 drive, the far-backup configuration file, oasis.config, resident on the flash (/f0) drive will be copied into the /r0 drive upon restart of the controller. If no far-backup file is present, a default intersection configuration will be loaded.

**NOTE:** If **RESTORE TO FACTORY DEFAULTS** is selected, the following communications settings are changed.

- Controller address is automatically reset to “1”
- Communications baud rate on comm ports 1 and 4 are reset to 19200 baud, and OASIS protocol.

If working with Centrac®s, Pyramids, Translink 32 or Cairo, make sure the communications is reconfigured properly (address and baud rate) for the controller before attempting a table download.

- YES – Verification of intended operation

```
THIS OPERATION WILL REQUIRE CONTROLLER
RESTART. ARE YOU SURE YOU WISH TO
CONTINUE? (Y/N)
```

- Power off/on the controller (wait 5 seconds to ensure proper operation).

```
SELECTIONS SUCCESSFULLY COMPLETED:

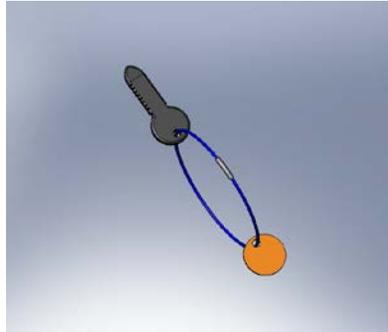
TURN THE CONTROLLER OFF AND BACK ON
```

## OASIS 2070 Data Key

The DATAKEY slot is located on the 2070-1B CPU Module on the back of the controller.

The user can insert a Datakey® into this slot to copy the OASIS configuration files from the controller.

OASIS only supports the TEES 2002 approved Datakey®. The follow Datakey® is recommended:



Datakey® for the OASIS 2070  
Econolite Part No. 100-1096-5XX

### Using the Datakey®

- Apply power to the OASIS 2070 Controller.
- Insert the Datakey® into the **DATAKEY** slot on the 2070-1B. After inserting the Datakey® the user will need to turn it 90° clockwise in order for it to be active.
- From the main menu of the OASIS Local firmware select **D – GENERAL**, then select **6 – MANAGE SYSTEM FILES**. The user will then see two menu options for utilizing the Datakey®, **“SAVE ACTIVE CONFIG TO DATAKEY”** and **“RESTORE CONFIG FROM DATAKEY”**

### Saving OASIS Configuration files to the Datakey®

- Using the up and down arrows on the OASIS 2070 Controller front panel, scroll the cursor down the list to **“SAVE ACTIVE CONFIG TO DATAKEY”** and using the “YES” key, change the “N” to “Y” on the OASIS 2070 front panel. Then press the “ENT” key from the OASIS 2070 Controller front panel to perform the selected operation.

THIS OPERERATION WILL REQUIRE CONTROLLER  
RESTART. ARE YOU SURE YOU WISH TO  
CONTINUE? (Y/N)

- A confirmation message will appear. Press the “YES” key on the OASIS 2070 Controller front panel to verify intended operation. Pressing “NO” or “ESC” will cancel the operation.
- The process will begin immediately, but may take up to 30 seconds to perform. Once the operation is complete the following message will appear.

SELECTIONS SUCCESSFULLY COMPLETED:  
  
TURN THE CONTROLLER OFF AND BACK ON

- After the message appears, power off/on the controller (wait 5 seconds to ensure proper operation).

## Reading OASIS Configuration files from the Datakey®

- Using the up and down arrows on the OASIS 2070 Controller front panel, scroll the cursor down the list to **“RESTORE CONFIG FROM DATAKEY”** and using the **“YES”** key, change the **“N”** to **“Y”** on the OASIS 2070 front panel. Then press the **“ENT”** key from the OASIS 2070 Controller front panel to perform the selected operation.

```
THIS OPERATION WILL REQUIRE CONTROLLER  
RESTART. ARE YOU SURE YOU WISH TO  
CONTINUE? (Y/N)
```

- A confirmation message will appear. Press the **“YES”** key on the OASIS 2070 Controller front panel to verify intended operation. Pressing **“NO”** or **“ESC”** will cancel the operation.
- The process will begin immediately, but may take up to 30 seconds to perform. Once the operation is complete the following message will appear.

```
SELECTIONS SUCCESSFULLY COMPLETED:  
  
TURN THE CONTROLLER OFF AND BACK ON
```

- After the message appears, power off/on the controller (wait 5 seconds to ensure proper operation).

## Troubleshooting the Datakey® with the OASIS 2070 Firmware

The **“SAVE ACTIVE CONFIG TO DATAKEY”** and **“RESTORE CONFIG FROM DATAKEY”** OASIS menu options updates the key status every second when the user is on that display.

At the end of the OASIS **“SAVE ACTIVE CONFIG TO DATAKEY”** and **“RESTORE CONFIG FROM DATAKEY”** menu options OASIS will display the following error codes:

- E:246** – Indicates that the device is not ready. Typically this is displayed when there is no data key or the datakey is malfunctioning such that it cannot be recognized by the OASIS Firmware.

```
SELECT OPTIONS AND PRESS THE 'ENT' KEY  
SAVE ACTIVE CONFIG TO FLASH . . . . N  
SAVE ACTIVE CONFIG TO DATAKEY E:246 N  
DELETE MANUAL/SYSTEM COMMANDS FILE. N  
DELETE ACTIVE CONFIG FILE . . . . . N  
DELETE LOGS . . . . . N  
RESTORE CONFIG FROM FLASH . . . . . N  
RESTORE CONFIG FROM DATAKEY E:246 . N  
RESTORE TO FACTORY DEFAULTS . . . . N
```

- **E:1** – Indicates that the datakey is too small Most likely this is because a 1999 TEES datakey has been inserted in the 2070-1B slot.

```

SELECT OPTIONS AND PRESS THE 'ENT' KEY
SAVE ACTIVE CONFIG TO FLASH . . . . N
SAVE ACTIVE CONFIG TO DATAKEY E:1 . N
DELETE MANUAL/SYSTEM COMMANDS FILE. N
DELETE ACTIVE CONFIG FILE . . . . . N
DELETE LOGS . . . . . N
RESTORE CONFIG FROM FLASH . . . . . N
RESTORE CONFIG FROM DATAKEY E:1 . . N
RESTORE TO FACTORY DEFAULTS . . . . N

```

- Other OS-9 errors may be displayed if encountered. Please refer to the OS-9 User Guide for specific error.

### 6.12.7 Sound is Off/On

OASIS provides the ability to turn the controller sound off or on. The default power on condition has the sound on. Selecting the Sound is ON line from the General Menu turns the controller sound off. The current line will display Sound is OFF. Selection of this line again, will turn the sound back on. When the sound is turned on, the controller will beep upon data change or function implementation.

D-7

### 6.12.8 Uninstall OASIS (Group 6 Permissions)

OASIS provides a utility to uninstall all OASIS firmware from the controller. Select the Uninstall OASIS from the General Menu accesses un-installation.

D-8

```

OASIS UNINSTALLATION
THIS PROCEDURE WILL DELETE OASIS
WOULD YOU LIKE TO SAVE THE CURRENT
CONFIGURATION FILES (Y/N)?.....?

PRESS 'ENT' TO UNINSTALL OR
'ESC' TO CANCEL UNINSTALLATION

```

- ENT – Uninstalls OASIS.
- ESC – Cancels un-installation.

The following screen will appear stating that the uninstalled has been completed successfully.

D-8-Enter

```

OASIS HAS BEEN SUCCESSFULLY UNINSTALLED
PRESS THE 'ESC' KEY TO CONTINUE

```

- Power off the controller to clear the current process from RAM.

# 7 WORKSHEETS

## Phase Timings Worksheet

PHASE CONTROL ELEMENTS		PHASE															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Minimum Green 1																
2	Minimum Green 2																
3	Reservice Green																
4	Extension 1 (Gap 1)																
5	Extension 2 (Gap 2)																
6	Maximum Green 1																
7	Maximum Green 2																
8	Yellow Clearance																
9	Red Clearance																
10	Red Revert																
11	Walk 1																
12	Walk 2																
13	Don't Walk 1																
14	Don't Walk 2																
15	Walk Advance Time																
16	Walk Delay Time																
17	Alternate Walk																
18	Alternate Don't Walk																
19	Alternate MIN Green																
20	Dynamic Maximum/MAX 3																
21	Dynamic Maximum Adjust																
22	Seconds / Actuation																
23	Maximum Variable Initial																
24	Time Before Reduction																
25	Time to Reduce																
26	Minimum Gap																
<b>PHASE INDEPENDENT TIMING ELEMENTS</b>																	
28	Alternate Flash Frequency																

# Phase Control Functions Worksheet

PHASE CONTROL ELEMENTS		PHASE															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Permitted																
2	Time Minimum 2																
3	Time Extension 2																
4	Time Maximum 2																
5	Soft Recall																
6	Minimum Recall																
7	Maximum Recall 1																
8	Maximum Recall 2																
9	Call Non-Actuated 1																
10	Call Non-Actuated 2																
11	Omit Phase																
12	Dual Entry																
13	No Skip																
14	Added Extension																
15	Simultaneous Gap																
16	Guaranteed Passage																
17	Green Interval Flash																
18	Fast Green Flash																
19	Red Rest																
20	Backup Protect																
21	Inhibit Reservice																
22	Inhibit Maximum (Coord)																
23	Inhibit Coordination																
24	Dynamic Maximum/MAX 3																
25	Variable Initial																
26	Gap Reduction																
27	Omit Pedestrian																
28	Time Walk 2																
29	Time Flashing Don't Walk 2																
30	Pedestrian Soft Recall																
31	Pedestrian Recall																
32	Rest In Walk																
33	Modified Rest in Walk																
34	Pedestrian Reservice																
35	Flashing Walk																
36	Advanced Walk																
37	Delayed Walk																
38	Pedestrian Yellow Clearance																
39	Pedestrian Red Clearance																
40	Startup in Green																
41	Startup in Yellow																
42	Startup Red Clearance																
43	First Phases																

Continuation of - PHASE CONTROL FUNCTIONS																	
PHASE CONTROL ELEMENTS		Phases															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
44	Startup Calls																
45	Startup Pedestrian Call																
46	Flash Entry																
47	Yellow Flash																
48	Wag Phases																
49	Wag Overlaps																
50	Manual Control																
51	Manual Control Omit PED																
52	Red Detector Lock																
53	Yellow Detector Lock																
54	Active Logic 1-16																
55	Active Logic 17-32																
56	Dynamic / Backup																

# Sequencer Worksheets

Sequence # \_\_\_\_\_

R I N G	Barrier 1				Barrier 2				Barrier 3				Barrier 4			
	1															
	2															
	3															
	4															
R I N G	Barrier 5				Barrier 6				Barrier 7				Barrier 8			
	1															
	2															
	3															
	4															

Sequence # \_\_\_\_\_

R I N G	Barrier 1				Barrier 2				Barrier 3				Barrier 4			
	1															
	2															
	3															
	4															
R I N G	Barrier 5				Barrier 6				Barrier 7				Barrier 8			
	1															
	2															
	3															
	4															



## 8 REFERENCE

### GLOSSARY

AASHTO	American Association of State Highway and Transportation Officials
API	Application Programming Interface
ATC	Advanced Transportation Controller
CALTRANS	California Department of Transportation
CCITT	Consultative Committee for International Telephone and Telegraph
CIP	Communication Interface Protocol
CHAN	Channel
COM	Communication (COMM)
Comp	Computational
CRC	Cyclic Redundancy Check
DOW	Day of Week
DOY	Day of Year
FIO	Field Input/Output
GPS	Global Positioning System (GPS) - A device that has very accurate real time clocks which are updated by satellite transmissions.
Immed	Immediate
ITE	Institute of Transportation Engineers
NEMA	National Electrical Manufacturer's Association
NTCIP	National Transportation Communication ITS Protocol
OL	Overlap
OS	Operating System
PC	Personal Computer
PHA	Phase
PIN	Personal Identification Number
RAM	Random Access Memory
RTC	Real Time Clock
SE	Special Event
SRAM	Static Random Access Memory
SYNC	Synchronize
TBR	Time Before Reduction
TOD	Time of Day
ZM	Zone Master

# INDEX

## A

A Pin Input Assignment, 5-42  
A Pin Output Assignment, 5-47  
Active Events, 6-4  
Active Logic 1-132, 5-23  
Added Extension, 5-19  
Adjacent Ring, 5-30  
Adjust Non-Coordinated Splits, 5-67  
Advance Walk Phases, 5-21  
Alarm Thresholds, 5-85  
Alarms Log, 5-84, 6-26  
Alternate Don't Walk, 5-26  
Alternate Flash Frequency, 5-28  
Alternate MIN Green), 5-27  
Alternate Overlap Flash Control, 5-61  
Alternate Walk, 5-26  
Apply to Zone, 6-20  
Assignment Type, 5-42, 5-48  
Automatic Permissive Mode, 5-66

## B

B Pin Input Assignment, 5-42  
B Pin Output Assignment, 5-47  
Backup Protect, 5-19  
Backup Protection, 5-70  
Barrier, 5-29  
Baud Rate, 5-81, 6-24  
Beacon # 1-4, 5-49  
Byte-to-Byte Timeout, 5-83, 6-25

## C

C Pin Input Assignment, 5-42  
C Pin Output Assignment, 5-47  
C1 Pin Input Assignment, 5-42  
C1 Pin Output Assignment, 5-47  
C11 Pin Input Assignment, 5-42  
C11 Pin Output Assignment, 5-47  
Call Detector, 5-54  
Call to Non-Actuated 1 & 2, 5-18  
Call/Extension Detector, 5-55  
Central Computer Communications, 2-2  
Class # Maximum Vehicle Length, 5-59  
Clear/Dwell Phases, 5-69  
Clearance 1 Phases during Delay, 5-71  
Clock Setting, 5-79  
Communication Failure to TOD, 5-80  
Communication Integration, 2-1  
Communications, 6-6  
Communications Port Config, 5-81, 6-23  
Comp Channel Assignment, 6-13  
Compatible Phase, 5-29  
Conflict Monitor, 5-85

Continuous Event, 5-75, 6-20  
Controller Address, 5-80  
Coordinated Phases, 5-65  
Coordination, 5-12  
Coordination – Programming, 5-65  
Coordination Features, 5-64  
Coordination Plan Data, 5-62  
Coordination Plan Data, 5-65  
Coordination Plans, 5-76  
Coordination/Timing Plans, 2-3  
Coordinator Modes, 5-64  
Coordinator Operation, 5-64  
Coordinator Terminology, A9, 5-63  
Copying the OPEXEC File, 3-6  
Copyright Notices, 1-1  
Count Detector, 5-56  
Cycle Length, 5-65  
Cycle Once Per Cycle Length, 5-67

## D

D Pin Input Assignment, 5-42  
D Pin Output Assignment, 5-47  
Data Bits, 5-82, 6-24  
Data Key, 5-87, 6-28  
Data Layer, 2-5  
Day(s) of Week, 5-75, 6-19  
Debounce Time, 5-42  
Default Input/Output Map Chart, 5-44  
Delay Time, 5-42, 5-56  
Delay Timer, 5-70  
Delayed Walk Phases, 5-21  
Delete Event When Complete, 6-20  
Delete Event When Complete, 5-75  
Detector – Enable, 5-58  
Detector Assignments, 5-53  
Detector Count Station Capabilities, 2-3  
Detector Data Log, 5-84  
Detector Diagnostics, 5-57  
Detector Duplication, 5-55  
Detector Presence, 5-9  
Detector State, 5-11  
Detector Switching, 5-55  
Diagnostic Period, 5-57, 5-59  
Diagnostics, 5-7, 6-5, 6-8, 6-9  
Diagnostics – Enable, 5-58  
Dialup-Pager, 6-17  
Don't Walk 1, 5-26  
Don't Walk 2, 5-26  
Dual Entry, 5-19  
Duplicating Detector, 5-55  
Duty Cycle, 5-48  
Dwell Hold-Over Timer, 5-70  
Dwell Interval Flash Yellow, 5-71  
Dynamic / Backup, 5-23  
Dynamic Maximum, 5-20, 5-27  
Dynamic Maximum Adjust, 5-27

Dynamic/Backup Function, 5-66  
Dynamic/Backup Functions, 5-23

## E

Eight Phase Dual-Ring Configuration, 5-30  
Emergency Vehicle (EV) Preemption, 2-2  
Enable Detector, 5-54  
Enable Diagnostics, 5-54  
Enable Logging, 5-54, 5-76  
Event Groups Assigned, 6-19  
Event Groups Assigned, 5-75  
Event Number, 6-19  
Event Number, 5-75  
Event Priority, 5-74  
Event Scheduling, 2-3, 5-73  
Event Type, 5-76, 6-20  
Events Log, 5-84  
Exclusive Pedestrian Phase, 5-30  
Exclusive Phase, 5-29  
Exit, 4-3  
Extend Time, 5-56  
Extend/Delay Detector, 5-56  
Extension 1, 5-25  
Extension 2, 5-25

## F

Failed Detector Recall, 5-55  
Fast Green Flash, 5-19  
Fast Green Flash Dwell Phases, 5-71  
FCM, 5-82, 6-25  
Firmware Installation, 3-1  
First Phases (42), 5-22  
Flash Dwell Interval, 5-71  
Flash Entry Phases, 5-22  
Flash Yellow in Controller Flash, 5-61  
Flashing Walk, 5-21  
Float Force Offs, 5-65  
Flow Control Mode (0-5), 5-82, 6-25  
Frequency, 5-48  
Front Panel Display Screen, 4-2  
Front Panel Entries Log, 5-84  
Front Panel Keypad, 4-2  
Full Time Delay, 5-55  
Functions Log, 5-84

## G

Gap Reduction, 5-20  
Gap Reduction Function, 5-28  
Gap Reset Time - Queue, 5-57  
General Communications Config, 5-80  
General Menu, 5-79, 6-22  
General Status Display, 5-2  
General Vehicle Detector, 5-59  
Green Call (Type 3 Detector), 5-57  
Green Interval Flash, 5-19  
Guaranteed Passage, 5-19

## H

Hardware Layer, 2-6  
Hardware Support, 2-1  
High Priority PED, 5-66  
Hold Over Time, 5-42  
Hold to Force Off, 5-65

## I

I/O override Sets/Clear input or outputs, 5-76  
Indemnification, 1-1  
Inhibit Coordination, 5-20  
Inhibit Maximum Coord, 5-20  
Inhibit Reserve, 5-19  
Input Assignment, 5-42  
Input Page, 5-76  
Input Page 1-4, 5-68  
Inputs, 5-9, 5-41  
Installation Procedure, 3-1  
Installation Requirements, 3-1  
Interval/Timing, 5-69  
Invalid Logon Screens, 4-3  
Invert Event, 5-75, 6-20

## K

Key 1 - Status Display, 5-2  
Key 1 - Status Display - OSM, 6-3  
Key 1.1 - General Status Display, 5-2  
Key 1.1- Master Status - OSM, 6-4  
Key 1.2 - Active Events - OSM, 6-4  
Key 1.3 - Coordination Status, 5-12  
Key 1.4 - Inputs, 5-9  
Key 1.4 - System Detectors - OSM, 6-6  
Key 1.5 - Communications - OSM, 6-6  
Key 1.5 - Outputs, 5-10  
Key 1.6 - Detector Presence, 5-9  
Key 1.6 - Local Status - OSM, 6-7  
Key 1.7 - Detector State, 5-11  
Key 1.7 - Diagnostics - OSM, 6-5, 6-8, 6-9  
Key 1.8 - Manual Commands, 5-5  
Key 1.9 - Diagnostics, 5-7  
Key 1.B - Scheduling, 5-16  
Key 2 - Master Settings - OSM, 6-10  
Key 2 - Phase Control, 5-16  
Key 2.1 - Phase Control Functions, 5-17  
Key 2.2 - Dynamic/Backup Functions, 5-23  
Key 3 - Phase Timing, 5-24  
Key 3 - Zone Assignments - OSM, 6-11  
Key 4 - Phase Sequencer, 5-29  
Key 4 - System Detectors - OSM, 6-12  
Key 5 - Inputs, 5-41  
Key 6 - Comp Channel Assignment - OSM, 6-13  
Key 6 - Output Assignments, 5-46  
Key 6.1 - Output Assignments, 5-47  
Key 6.2 - Output Beacon, 5-49  
Key 7 - Detector Assignments, 5-53  
Key 7 - TR Threshold - OSM, 6-14

Key 7.1 - Vehicle Detector Settings, 5-53  
 Key 7.2 - PED Detector Assignments, 5-58  
 Key 7.3 - General Veh Detector, 5-59  
 Key 8 – Overlap Settings, 5-59  
 Key 8 - Plan Selection - OSM, 6-16  
 Key 8.1 - Vehicle Overlap, 5-60  
 Key 8.2 - Pedestrian Overlap, 5-62  
 Key 9 - Coordination Plan, 5-62  
 Key 9 - Dialup-Pager - OSM, 6-17  
 Key A - Preemption Settings, 5-68  
 Key B - Event Scheduling, 5-73  
 Key B – Scheduling - OSM, 6-19  
 Key C - User Profiles, 5-78  
 Key C - User Profiles - OSM, 6-21  
 Key D – General Menu, 5-79  
 Key D - General Menu - OSM, 6-22  
 Key D.1 - Clock Setting - OSM, 6-22  
 Key D.1 - Set Clock, 5-79  
 Key D.2 - General COMM Config, 5-80  
 Key D.3 - COMM Port Config, 5-81, 6-23  
 Key D.4 - Logging Controls, 5-83  
 Key D.4 - Logging Controls - OSM, 6-26  
 Key D.5 - Conflict Monitor, 5-85  
 Key D.6 - Manage System Files, 5-86, 6-27  
 Key D.7 - Sound is Off/On, 5-89  
 Key D.7 - Turn Sound Off/On, 6-30  
 Key D.8 - Uninstall OASIS, 5-89, 6-30

**L**

Lag Phase, 5-30  
 Latch Call, 5-70  
 Lead Phase, 5-30  
 Limits of Liability, 1-1  
 Link to Next Preempt, 5-70  
 LOADING OASIS (opexec) FROM PC TO 2070  
 CONTROLLER, 3-4  
 Local Controller Main Menu, 5-1  
 Local Status, 6-7  
 Logging – Enable, 5-58  
 Logging Controls, 5-83, 6-26  
 Logging Period, 5-59  
 Logic Layer, 2-5  
 Logical I/O Processor, 5-50  
 Logout Screen, 4-3  
 Loop Size, 5-56

**M**

Main Menu, 4-4  
 Manage System Files, 5-86, 6-27  
 Management Layer, 2-6  
 Manual Commands, 5-5  
 Manual Control Omit Pedestrian, 5-22  
 Manual Control Phase Calls, 5-22  
 Manual Permissive Windows, 5-67  
 Manual Permissives By Phase, 5-66  
 Master Settings, 6-10  
 Master Status, 6-4

MAX Calls/Minute, 5-58  
 MAX Dwell Timer, 5-70  
 MAX Green 1, 5-25  
 MAX Green 2, 5-25  
 MAX Occup Per Diagnostic Period, 5-57  
 MAX Occupancy %, 5-59  
 MAX Occupancy Time – Queue, 5-57  
 MAX Variable Initial, 5-27  
 MAX1 Recall Failed, 5-55  
 MAX2 Recall Failed, 5-55  
 Maximum Calls Per Minute, 5-57  
 Maximum Cycle Length, 5-65  
 Maximum Vehicle Length, 5-59  
 Memory Monitor, 2-1  
 MIN Calls Per Diagnostic Period, 5-57  
 MIN Calls/Diagnostic Period, 5-58  
 MIN Dwell Timer, 5-70  
 MIN Green 1, 5-25  
 MIN Green 2, 5-25  
 MIN Green Before Preemption, 5-70  
 MIN Recall Failed, 5-55  
 Minimum Cycle Length, 5-65  
 Minimum Gap, 5-28  
 Mode, 5-48  
 Modified Rest in Walk, 5-21  
 Modify Detector Configuration, 5-77  
 Multiple Phase Timing Tables, 2-1  
 Mutually Exclusive Lead / Lag, 5-30

**N**

No Skip, 5-19  
 NOT Pedestrian, 5-61

**O**

Off Delay Time, 5-49  
 Offset, 5-65  
 Omit Overlaps, 5-71  
 Omit Pedestrian, 5-20  
 Omit Phase, 5-18  
 On Delay Time, 5-49  
 On-Street Master Main Menu, 6-1  
 Opening an OS-9 Session, 3-3  
 Operating System (OS), 2-1  
 Operating System (OS) Layer, 2-6  
 Other Features, 2-4  
 Output as Phase #, 5-61  
 Output Assignment, 5-48  
 Output Assignments, 5-46  
 Output Assignments, 5-47  
 Output Beacon Settings, 5-49  
 Output Page, 5-76  
 Output Page 1-4, 5-68  
 Outputs, 5-10  
 Overlap Control Page, 5-68, 5-76  
 Overlap Green Extension, 5-71  
 Overlap Green Extension Time, 5-61  
 Overlap Red Clearance Time, 5-62

Overlap Settings, 5-59  
Overlap Startup Color, 5-61  
Overlap Timing Elements, 5-61  
Overlap Yellow Clearance Time, 5-61  
Overlaps, 5-12  
Override Phase Control Function, 5-77

## P

Parity, 5-82, 6-24  
Pass Through Communications, 5-80  
PED Clearance Before Preemption, 5-70  
PED Clearance through Yellow, 5-71  
PED in Dwell Interval, 5-71  
Pedestrian Call Detector, 5-58  
Pedestrian Count Detector, 5-58  
Pedestrian Detector Settings, 5-58  
Pedestrian Interval Timing, 5-26  
Pedestrian Overlap Parents, 5-62  
Pedestrian Overlap Settings, 5-62  
Pedestrian Recall, 5-20  
Pedestrian Red Clearance, 5-21  
Pedestrian Re-Service, 5-21  
Pedestrian Soft Recall, 5-20  
Pedestrian Yellow Clearance, 5-21  
Permissive Mode – Automatic, 5-66  
Permissives – Enable, 5-66  
Permitted/Allowed Phases, 5-18  
Phase Control, 5-16  
Phase Control Function Table, 7-2  
Phase Control Functions, 5-17  
Phase Control Page, 5-68, 5-76  
Phase Selection Points, 5-32  
Phase Sequence Page, 5-67  
Phase Sequencer, 5-29  
Phase Sequencer Options, 5-32  
Phase Sequencer Tables, 5-31  
Phase Sequencing Examples, 5-33  
Phase Timing, 5-24  
Phase Timing Page, 5-67  
Phase Timings Table, 7-1  
Phase-Independent Timing Elements, 5-28  
Phases, 2-1  
Phases Assigned, 5-56, 5-58  
Plan Priority, 5-76, 6-20  
Plan Selection, 6-16  
Plans Log, 5-84  
Port # to Central, 5-80  
Port # to Subordinates, 5-80  
Port Enabled, 5-81, 6-23  
Preemption Index for Queue, 5-57  
Preemption Priority, 5-68  
Preemption Settings, 5-68  
Preemptions Settings, 5-68  
Priority, 5-70  
Programmable Inputs, 2-2  
Programmable Outputs, 2-2  
Programmable Overlaps (OL), 2-2  
Programming – Input Assignments, 5-41

Programming Coordination, 5-65  
Programming Events, 5-75  
Programming Introduction, 4-1  
Protocol, 5-82, 6-24

## Q

Queue Gap Reset Time, 5-57  
Queue MAX Occupancy Time, A7, 5-57  
Queue Preemption Index for Queue, 5-57

## R

Real-Time Clock (RTC), 2-1  
Recall If Failed, 5-58  
Red Clearance, 5-26  
Red Clearance Before Preemption, 5-70  
Red Detector Lock, 5-23  
Red Rest, 5-19  
Red Revert, 5-26  
Reservice Green, 5-25  
Re-Service Phase, 5-30  
Response Delay, 5-83, 6-25  
Rest in Red During Dwell, 5-71  
Rest in Walk), 5-21  
Re-Time Dwell Interval, 5-71  
Ring, 5-29  
RTS Holdover, 5-83, 6-25  
RTS to CTS Timeout, 5-83, 6-25

## S

Scheduled Events Table, 7-5  
Scheduler Features, 5-74  
Scheduling, 5-16, 6-19  
Scheduling Structure, 5-74  
Seconds Per Actuation, 5-27  
Select Vehicle Overlap Options, 5-61  
Send Plans, 5-80  
Send Time, 5-80  
Sequencer Table, 7-4  
Service during Software Flash, 5-71  
Set Clock, 5-79, 6-22  
Set Logic Flags, 5-77  
Simultaneous Gap-Out, 5-19  
Source View, 5-15  
Speed Trap, 5-54  
Speed Trap Distance, 5-56  
Split Monitor Log, 5-84  
Split/Timing Data, 5-66  
Standard Vehicle Length, 5-59  
Start/End Date, 5-75, 6-19  
Start/End Time, 5-75, 6-19  
Startup in Green Phases, 5-21  
Startup in Yellow Phases, 5-21  
Startup Pedestrian Calls, 5-22  
Startup Red Clearance, 5-22  
Startup Vehicle Calls, 5-22  
Status Display, 5-2, 6-3

Stop Bar, 5-55  
Stop Bar Time, 5-56  
Stop Bits, 5-82, 6-24  
Stop Time Hold, 5-50  
Subordinate Intersection, 5-80  
Switch/Duplicate, 5-56  
Switching Detector, 5-55  
System Detectors, 6-12  
System Detectors, 6-6  
System Overview, 2-5

## T

Time Before Reduction (TBR), 5-28  
Time Extension 2, 5-18  
Time Flashing Don't Walk 2, 5-20  
Time Maximum 1, 5-18  
Time Minimum 2, 5-18  
Time to Reduce (TTR), 5-28  
Time Walk 2, 5-20  
Traffic Responsive Algorithm, 6-2  
Traffic Responsive display, 6-8  
Traffic Responsive Overview, 6-2  
Traffic Responsive Threshold, 6-14  
Transition Permissive, 5-67  
Turn Sound Off/On, 5-89, 6-30

## U

Un-Install Information, 3-7  
Uninstall OASIS, 5-89, 6-30  
User Logon Screen, 4-3  
User Profiles, 6-21  
User Profiles, 5-78

## V

Variable Initial, 5-20  
Variable Initial Function, 5-27  
Vehicle Detector Assignments, 5-53  
Vehicle Interval Timing, 5-25  
Vehicle Maximum Recall 1 & 2, 5-18  
Vehicle Minimum Recall, 5-18  
Vehicle Overlap Modes, 5-60  
Vehicle Overlap Settings, 5-60  
Vehicle Soft Recall, 5-18  
Volume Density Operation, 5-27

## W

Wag Overlaps, 5-22  
Wag Phases, 5-22  
Walk 1, 5-26  
Walk 2, 5-26  
Walk Advance Time, 5-26  
Walk Delay Time, 5-26  
Warranty, 1-1

## Y

Yellow Clearance, 5-25  
Yellow Clearance Before Preemption, 5-70  
Yellow Detector Lock, 5-23  
Yellow Flash, 5-22

## Z

Zone Assignments, 6-11