



# Cobalt Programming Manual

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## Cobalt® Mobile

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# Cobalt Shelf Mount QuickStart Guide

## Welcome



Thank you for purchasing the Econolite Cobalt™ ATC controller. With Cobalt's intuitive touch screen and easy-to-use operating system, you will quickly be able to find and start using its many features. This QuickStart Guide is designed to help you become familiar with the basic operation of the Cobalt controller.

### More Information

For online information, scan the QR code at the end of this guide or go to <http://www.econolite.com/qr/controller/cobalt/>. For further assistance, please contact your Cobalt Representative or EGI Technical Support at +1.800.225.6480 x8982, +1.714.630.3700 x8982, or [support@econolite.com](mailto:support@econolite.com).

## Power Connection



Connector enlarged to show detail

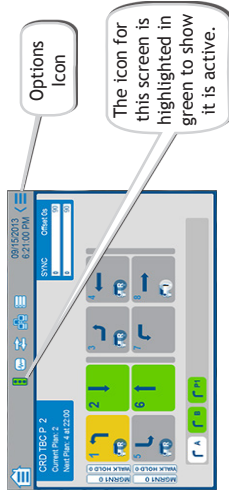
### Power Connection on Cobalt Shelf Mount

1. For basic operation, first connect power to the circular male 55-pin "A" plug (MSA) on the Cobalt front panel (see above). If the power connector in your cabinet is a circular 10-pin MSA female plug, use a 33274G4 MSA adaptor cable to connect to the circular 55-pin MSA plug on Cobalt.
2. Connect the other I/O connectors per your application.
3. Apply power.

## Initial Start-up

### Signal Status Screen

After connecting power to Cobalt, you see the Signal Status screen (example below), a Ring Diagram that shows intersection status in real time. See reverse page for other Status Bar icons.



### Changing Basic Settings

Press the Home icon, then +/- (top right corner) to show or hide the Application Icons (Using the Home Screen on reverse page). Press the Settings icon to set the Backlight Timeout duration, the unit Date & Time, to check the system information, & more.

### Options Icon

Press the Options icon (shown above) to select [Guided Setup] or this [Quick Start Help] from the Home screen or, from any screen, to go to context-sensitive [Help] and options.

## Navigation Tips



- Navigate the menus using either the touch screen or keyboard to view status and enter configuration data.

**!** Note: The Cobalt touch screen requires actual tactile pressure to operate. As a result, users can navigate the system even while wearing gloves.

- The Cobalt Graphical User Interface (GUI) is designed to allow you to navigate as you would with a smartphone or a tablet. For example, you can enter numerical values with a touch keyboard or scrubber, or swipe right/left to go from one screen to another.
- The Cobalt screen is easy to read, even in bright sunlight. To reactivate the screen after a timeout, press the screen itself or any key.

**!** Note: To search inside a help screen: select Options > Search, enter the topic, then select the down arrow.



## ATC Controller



## QuickStart

## ECONOLITE

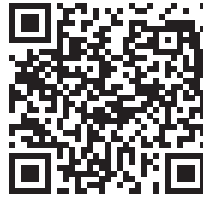
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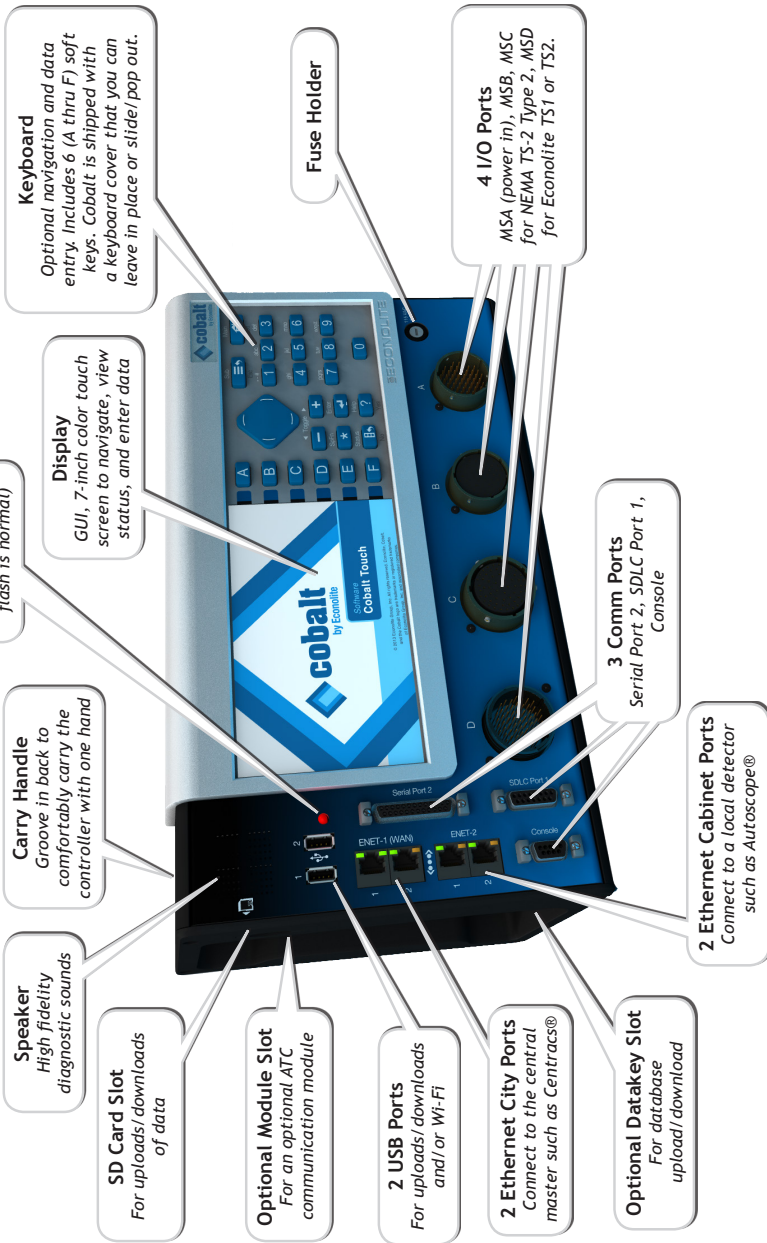
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# Introduction to Cobalt



## Status Bar Icons and Options Icon

	Ring Diagram that shows the intersection status in real time
	Historic activity and events of the intersection
	Status of all the components connected to Cobalt. The arrows signify the I/O connections between Cobalt and other cabinet hardware.
	Cobalt communications connection information, including Ethernet and serial.
	Gives database information and access to Consistency and Warning Check messages. Operations with the database, e.g. create/restore configuration defaults.
	Status of the USB Port—and access to USB device (icon only shown if USB Port is in use)
	Additional application functions for the active screen and context-sensitive Help



# Using the Home Screen

To program Traffic Applications, press the Home icon at any time to access the Application Icons, described below. You always know what screen is open because its icon, highlighted in green, is next to the Home icon (upper left).

	Cabinet Config	Load switch assign for channel mapping, SDLC device cabinet interfaces
	Phase Order	Set up the phase sequence
	Overlap	Set vehicle overlaps
	Ped Overlap	Configure unique signal drivers to replace the selected phase pedestrian outputs
	Detection	Vehicle and pedestrian detector assignments, logging and diagnostics
	Flash	Start up flash and automatic flash
	Timing Plans	Phase timing
	Phase Options	Phase functions
	Preemptions	10 preemption sequences
	Transit Signal Priority	Optional feature—decreases bus delays and maintains normal coordination
	Coordination	Coordination patterns
	Split Demand	Detector occupancy events to trigger special coordination split times
	Event Plans	Set time-of-day events
	Scheduler	Define Event Plans that occur in Day Plans, Calendar Plans and Exception Days.
	Settings	General system information, date & time, user accounts, and applications
	Video Viewer	View digital video streams, such as those viewable from Autoscope® sensors
	Logic Processor	Program up to 100 logic gates with conditions to control the inputs and outputs
	Peer to Peer	Operates with Logic Processor screen to implement Peer-to-Peer between controllers

# Cobalt RackMount QuickStart Guide

## Welcome



Thank you for purchasing the Safetran Cobalt™ RackMount ATC controller, designed to operate in a 33x cabinet environment (as a 2070 or 170 controller). With Cobalt's intuitive touch screen and easy-to-use operating system, you will quickly be able to find and start using its many features. This QuickStart Guide is designed to help you become familiar with the basic operation of the Cobalt RackMount controller.

### More Information

For online information, scan the QR code at the end of this guide or go to <http://www.econolite.com/qr/controller/cobalt/>. For further assistance, please contact your Cobalt Representative or EGI Technical Support at +1.800.225.6480 x8982, +1.714.630.3700 x8982, or [support@econolite.com](mailto:support@econolite.com).

## Power Connection



Connector enlarged to show detail

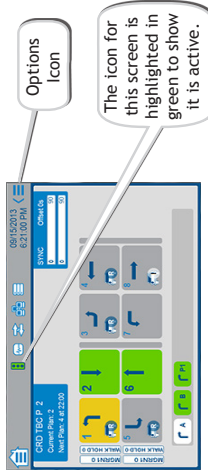
### Power Connection on Cobalt RackMount

1. For basic operation, first connect a 10-pin MS female power connector, NEMA Type 1, to the male 10-pin MS plug on the Cobalt rear panel (shown above).
2. Connect the other I/O connectors per your application.
3. Apply power to the power connector.
4. On front panel, set the AC Power switch (bottom left) to ON.

## Initial Start-up

### Signal Status Screen

After connecting power to Cobalt, you see the Signal Status screen (example below), a Ring Diagram that shows intersection status in real time. See reverse page for other Status Bar icons.



Options Icon

The icon for this screen is highlighted in green to show it is active.

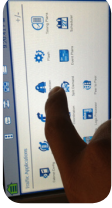
### Changing Basic Settings

Press the Home icon, then +/- (top right corner) to show or hide the Application icons (Using the Home Screen on reverse page). Press the Settings icon to set the Backlight Timeout duration, the Unit Date & Time, to check the system information, & more.

### Options Icon

Press the Options icon (shown above) to select [Guided Setup] or this [Quick Start Help] from the Home screen or, from any screen, to go to context-sensitive [Help] and options.

## Navigation Tips



- Navigate the menus using either the touch screen or keyboard to view status and enter configuration data.

**!** Note: The Cobalt touch screen requires actual tactile pressure to operate. As a result, users can navigate the system even while wearing gloves.

- The Cobalt Graphical User Interface (GUI) is designed to allow you to navigate as you would with a smartphone or a tablet. For example, you can enter numerical values with a touch keyboard or scrubber, or swipe right/left to go from one screen to another.

- The Cobalt screen is easy to read, even in bright sunlight. To reactivate the screen after a timeout, press the screen itself or any key.

**!** Note: To search inside a help screen: select Options > Search, enter the topic, then select the down arrow.



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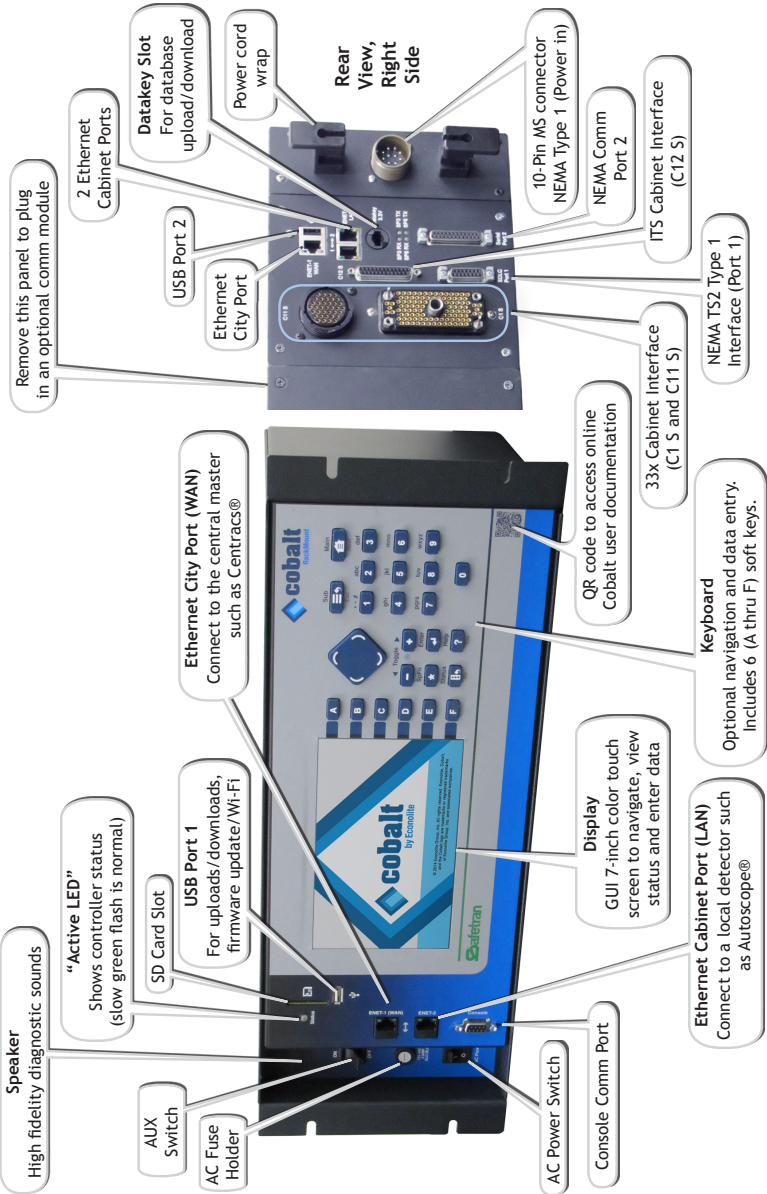
# ATC Controller



## QuickStart

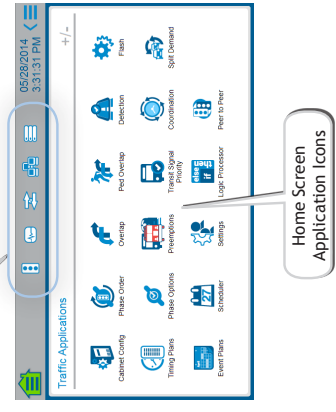


# Introduction to Cobalt



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	Cobalt communications connection information, including Ethernet and serial.
	Gives database information and access to Consistency and Warning Check messages. Operations with the database, e.g. create/restore configuration defaults.
	Status of the USB Port—and access to USB device (icon only shown if USB Port is in use)
	Additional application functions for the active screen and context-sensitive Help



# Using the Home Screen

To program Traffic Applications, press the Home icon at any time to access the Application Icons, described below. You always know what screen is open because its icon, highlighted in green, is next to the Home icon (upper left).

	Cabinet Config	Load switch assign for channel mapping, SDLC device cabinet interfaces
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	Video Viewer	View digital video streams, such as those viewable from Autoscope® sensors
	Logic Processor	Program up to 100 logic gates with conditions to control the inputs and outputs
	Peer to Peer	Operates with Logic Processor screen to implement Peer-to-Peer between controllers

## Additional online help scheduled for next release

Updates will be available on a regular basis. Scan the QR Code below to access the latest Cobalt documentation and reference material. ( <http://www.econolite.com/qr/controller/cobalt/> )



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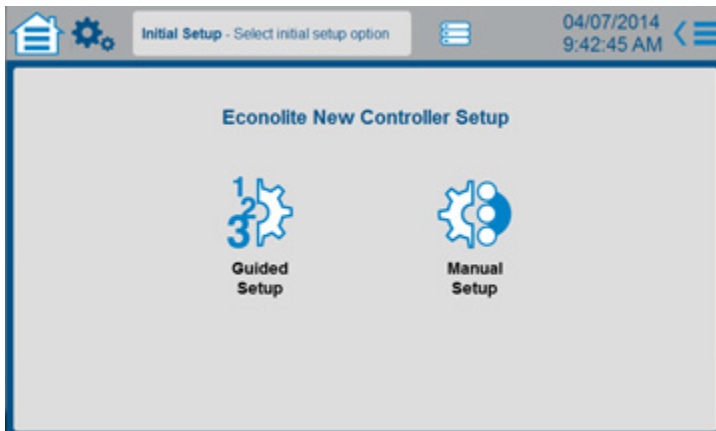
Home



Options

## New Controller Setup

### New Controller Setup



### Guided Setup

If you want a step-by-step guide to program basic Cobalt controller parameters, select **Guided Setup**:

- This takes you to the first of a series of basic screens to do essential programming.
- You can navigate to the next or previous screen with the right and left arrows at the top of each screen.
- For help in each screen, select **Options > Help** (**Options** is the icon in the upper right corner with three horizontal bars).

### Manual Setup

If you want to manually program the Cobalt controller, select **Manual Setup**.

- This takes you to the **Home** (Traffic Applications) screen.
- From the **Home** screen, select the related icon for the function you want to program.
- At any time, from the **Home** screen, you can go to the Guided Setup from the **Options** drop-down menu (**Options > Guided Setup**) (**Options** is the icon in the upper right corner with three horizontal bars).



Home

## Traffic Applications

### Home - Traffic Applications

#### Default Home Screen



This is the main Home screen from which you access the screens to program Cobalt for your application.

In future software versions, this screen may have more application programming screens.

Select the applicable icon to program:

- Cabinet Config
- Phase Order
- Overlap
- Ped Overlap (default is hidden)
- Detection
- Flash
- Timing Plans
- Phase Options
- Preemptions
- Transit Signal Priority

- Coordination
- Split Demand
- Event Plans
- Scheduler
- Settings
- Video Viewer (default is hidden)
- Logic Processor
- Peer to Peer

To program whether you want to show (**Yes**) or hide (**No**) these icons, go to:

**Settings > Applications** or select **+/-** in the upper right corner of this screen

When you are in the Applications screen, select an icon to see a description of the purpose of its screen.

## Home > Options

From the Home screen you can select the Options icon to access:

- Guided Setup - leads you step-by-step to program basic parameters
- Quick Start Help - gives you basic information about Cobalt

## Time/Date Settings

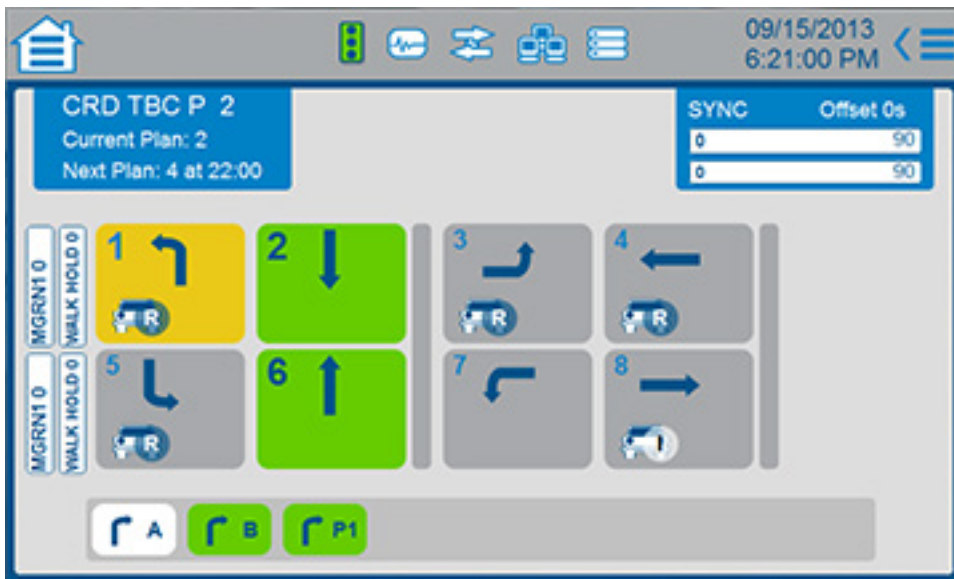
From any screen, to set the date and time (in the **Date & Time** settings screen), press the date-and-time display in the top right of the screen.



## Signal Status

### Signal Status

This Signal Status screen shows the real-time status of the displayed functions.



### Active Phase

The example screen above shows the status for the current Event Plan, a Coordination Pattern that is commanded by Time-Based Control with active Pattern 2 (CRD TBC P 2) as shown in the upper left corner of the screen. The current plan is Plan 2 and the Next Plan is Plan that is scheduled to start at 22:00 hours (10 pm).

### Timing Status

The rectangular fields on the far left of the screen give the active phase timing status.

### Offset Value and Timing

This field is in the upper right corner.

### Overlaps

This field is at the bottom. The example shows vehicle overlaps A and B and pedestrian overlap, P1.

## Vehicle and Pedestrian Calls

The circles with letters with a vehicle icon represent Vehicle Calls as follows:

Vehicle Call	Definition
O	Phase Omitted
E	Red extension call
C	Active vehicle detector call
B	Bike call
N	Phase is non-actuated (CNA1, CNA2, Pre-timed)
F	Call placed by detector diagnostic (Failed Detector)
M	Max recall programmed for phase
R	Vehicle recall programmed for phase
X	Call placed by Max out
I	Call placed by internal application (Power Up, Preemptor, Keypad input)
L	Locked vehicle detector call
S	Call placed by Soft recall or do not rest here

If the circle is red, the phase has passed its coordination permissive period.

The circles with letters with a pedestrian icon represent Pedestrian Calls as follows:

Pedestrian Call	Definition
O	Ped Omitted
C	Active Pedestrian Detector Call
2	Active Pedestrian 2 Detector Call
N	Pedestrian Phase is non-actuated (CNA1, CNA2, Pre-timed)
F	Call placed by detector diagnostic (Failed Detector)
R	Pedestrian Recall
I	Call placed by internal application (Power Up, Keypad input, Logic)
L	Locked pedestrian call on the phase

## Manual (Internal) Calls

To make a Vehicle or Ped call on a phase:

1. Select the phase
2. Select either [Vehicle Call] or [Ped Call]

To make a Preempt call on a phase:

1. Select the drop-down Options menu.
2. Select [Preemption Call]
3. Select the Preemption Plan number
4. Select [OK]

## Signal Status Screen Colors

In the Signal Status screen, you see the phases that are timing and their colors in real-time as given below.

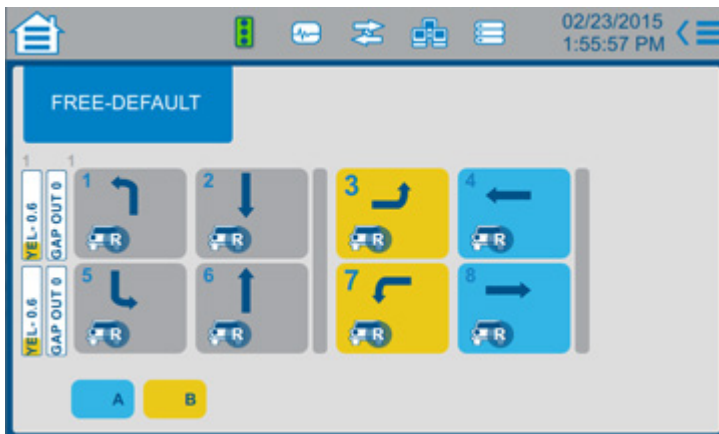
Phase State	Cobalt Touch-Screen Color	Classic View Character
Disabled	Hidden	-
Next	Baby Blue	N
Time Red	Red	R
Time Yellow	Yellow	Y
PPLT	Flash Yellow	y
Delay Green	Red	D
Green	Green	G
Omitted	Grey	O
Red Not Timing	Grey	.
(Reserved)	Blue	X
Flashing Green	Flash Green	f



Overlap State	Cobalt Touch-Screen Color	Classic View Character
Disabled	Hidden	-
Advance	Green	A
Next	Blue	N
Yellow	Yellow	Y
PPLT	Yellow	y
Dark	Dark Grey	D
Green	Green	G
Flashing Green	Green	f
Lagging Green	Green	L
Omitted	Grey	O
Red	Red	R

Ped Overlap State	Cobalt Touch-Screen Color	Classic View Character
Disabled	Hidden	-
Next	Baby Blue	N
Walk	Blue	W
Ped Clear	Yellow	C
Omitted	Grey	O
Dont Walk	Red	D

### Example of Screen with Next Phases in Blue



In the screen above:

- Yellow clearance Phases 3 and 7 are timing Now
- Green Phases 4 and 8 will time Next (shown by baby blue highlight)



## Event Logs

### Event Logs

#### What is an Event Log?

Event Logs give historic activity and events of the intersection. There are four logs. Each log records events with a time stamp and has a maximum number of events in its buffer. Below, the maximum number of events for which each event log is capable are shown in parentheses. When the controller reaches the maximum limit, it starts to discard the oldest events.

Controller Events (500)

Detector Events (300)

Detector Activity (228)

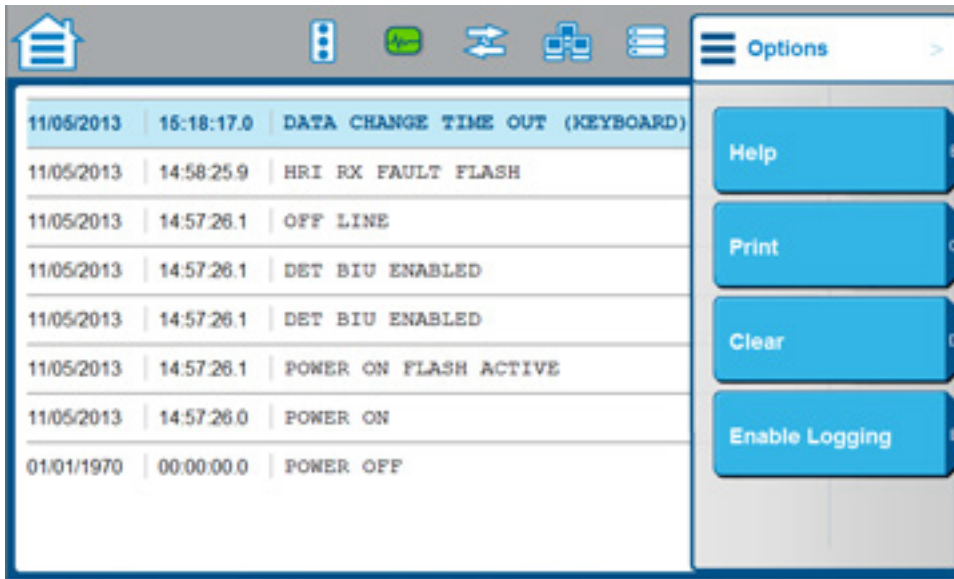
MMU Events (50)

To show a display, select the related soft key. The controller events event log is shown below:

Date	Time	Event Description	...
09/12/2013	07:00:00.0	COORDINATOR ACTIVE	--
09/11/2013	22:00:00.0	COORDINATOR LOCAL FREE	--
09/11/2013	10:56:53.9	COORDINATOR ACTIVE	--
09/11/2013	10:56:42.9	ON LINE	--
09/11/2013	10:56:42.9	COORDINATOR LOCAL FREE	--
09/11/2013	10:56:42.9	POWER ON FLASH INACTIVE	--
09/11/2013	10:56:41.5	OFF LINE	--
09/11/2013	10:56:41.5	DET BIU ENABLED	--
09/11/2013	10:56:41.5	DET BIU ENABLED	--

## Operations with Event Logs

To Print, Clear and Enable Logging, select the drop-down Options menu, as shown below:



- When you select [Enable Logging] a list opens of the possible events to log. Select Yes or No whether to record each event in the log.
- When you select [Print], the Print Log screen opens. Select Controller Events, Detector Events, Detector Activity or MMU Events to print. Insert a USB or SD device to record the printout.



## Cabinet Hardware

### Cabinet Hardware

#### Front Panel LED Indicator

The front-panel LED logics provide at-a-glance controller status feedback. The color and state of the LED indicate the status of the controller as listed in the tables below for Tri-Color (default) or Single-Color LED mode.

For early versions of Cobalt, to change Cobalt to Single-Color mode, you must use the Classic View mode (**Home > Settings > General > Display > Switch to Classic View**), MM-1-7-2, and toggle the LED MODE parameter to SINGLE COLOR.

#### Tri-Color Mode LED Indications

With the Tri-Color mode, the color of the LED can be Yellow, Green or Red as listed below.

Color and Frequency	Indication
Yellow Solid	Datakey in Use (warning to NOT remove the Datakey)
Yellow Fast	Transaction Mode that was caused by data input
Yellow Slow	Configuration Diagnostic Warning (to view Warning Checks, select the <b>Database</b> icon in the Status Bar)
Green Solid	Reserved
Green Fast	Reserved
Green Slow	Controller is OK
Red Solid	Boot: Upgrading OS. Do NOT power OFF.

Color and Frequency	Indication
Red Fast	Boot: Could not start traffic application
Red Slow	Reserved

### Single-Color Mode LED Indications

With the Single-Color mode, the color of the LED is always Red.

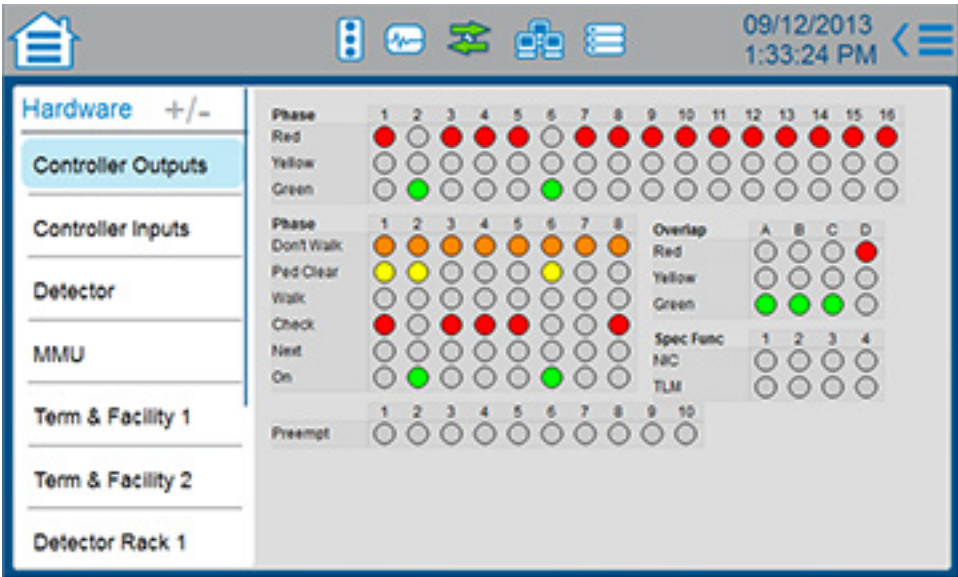
Color and Frequency	Indication
Red Solid	Controller is OK
Red Fast	Transaction Mode that was caused by data input
Red Slow	Configuration Diagnostic Warning (to view the Warning Checks, select the <b>Database</b> icon in the Status Bar)

### Cabinet Hardware Screens

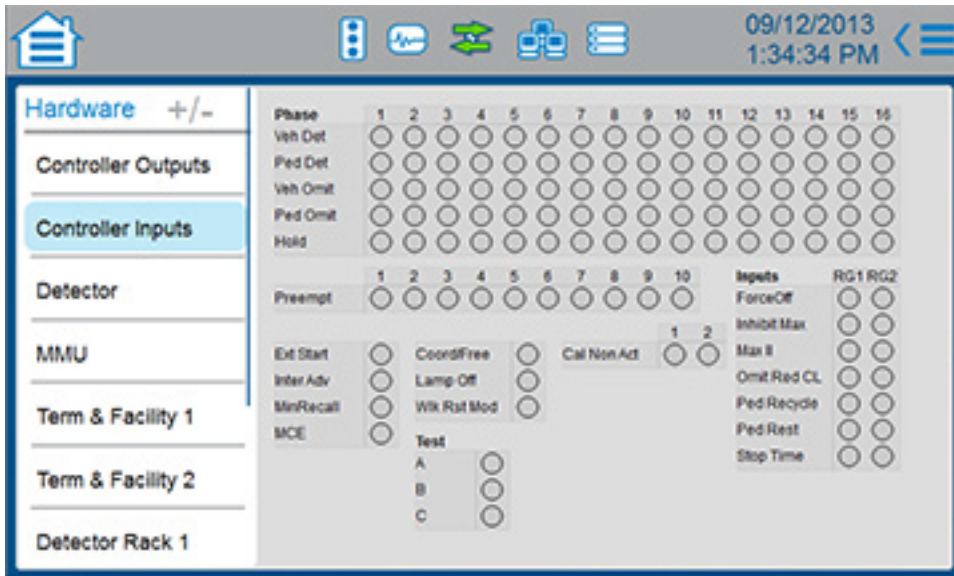
There are six screens for Cabinet Hardware:

- These screens show the real-time status of the displayed functions.
- From the MMU screen, you access screens for MMU Channel Concurrency and MMU Color Check.

### Controller Outputs



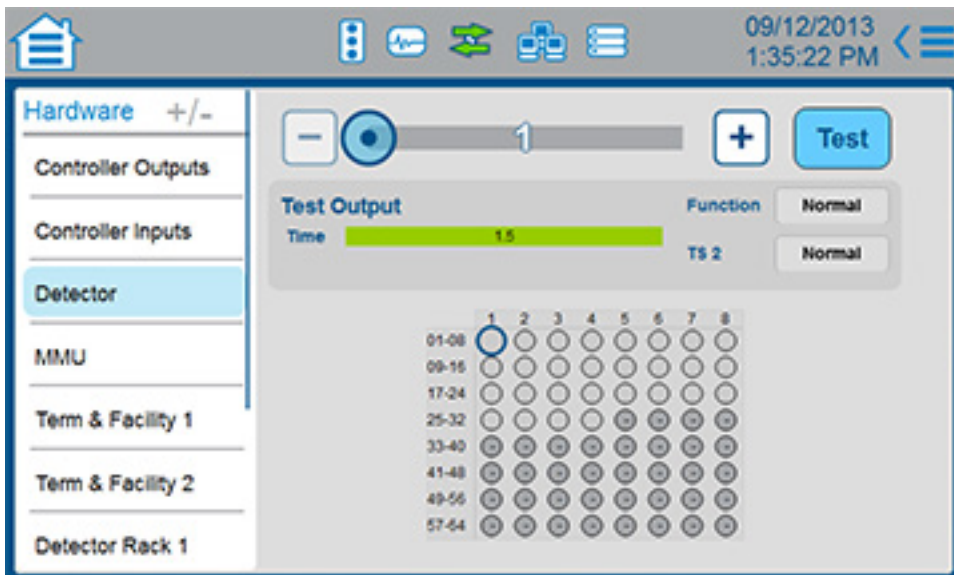
## Controller Inputs



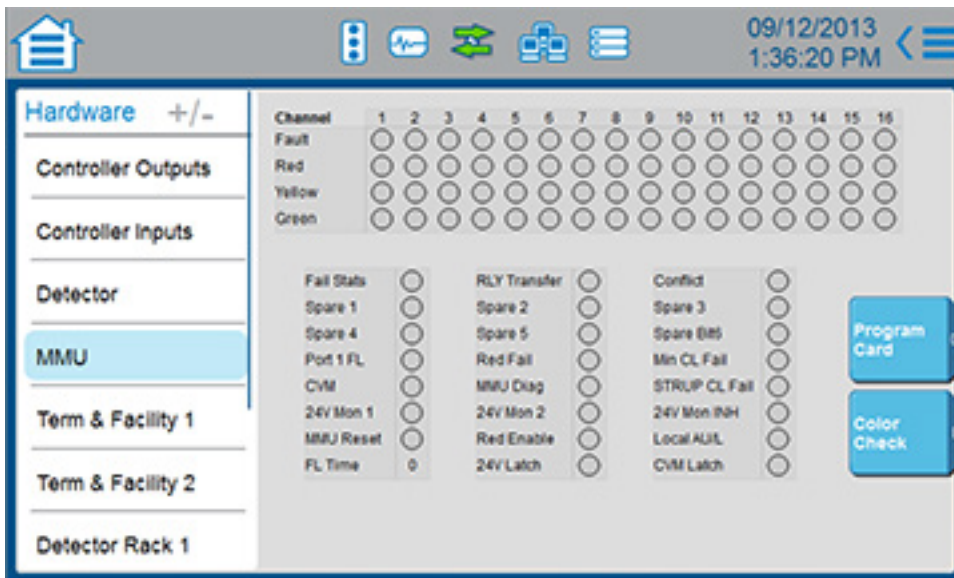
## Detector Inputs

You can place an internal call to test the input of a detector:

1. Select the Detector number (1-64).
2. Select [Test].

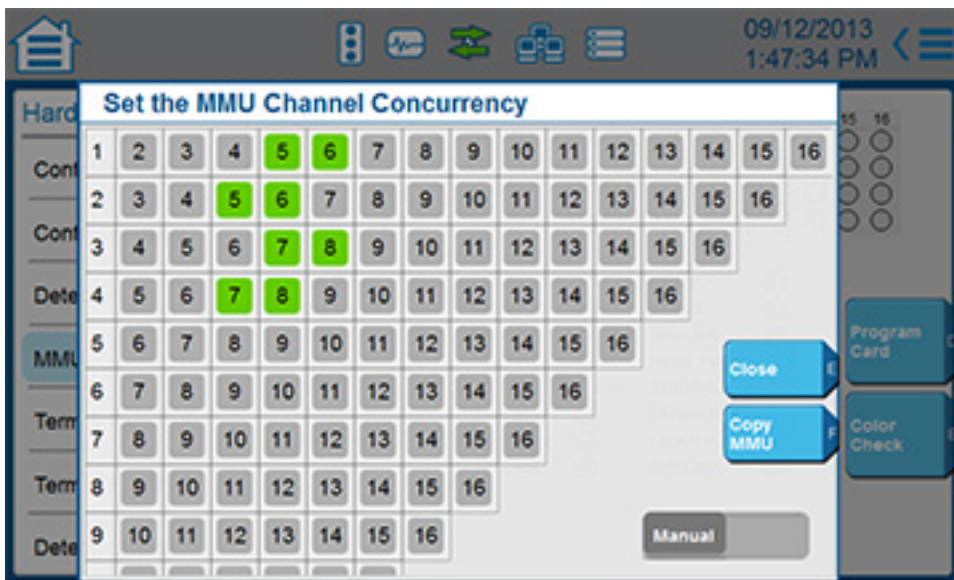


## Maintenance Management Unit (MMU)



To set the MMU Channel Concurrency:

1. From the MMU screen, select [Program Card].
2. The screen below opens.



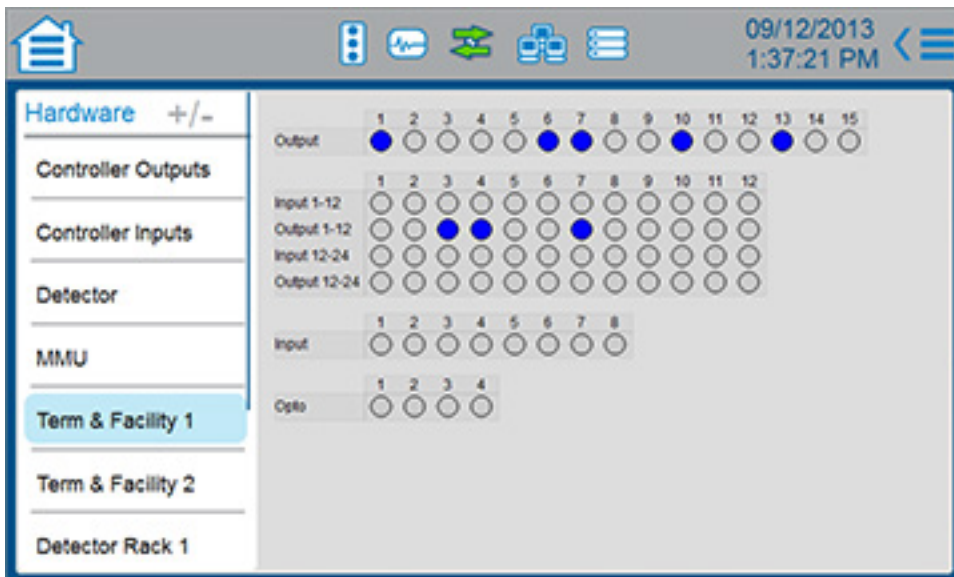
For an MMU Color Check:

1. From the MMU screen, select [Color Check].
2. The screen below opens.



## Terminal and Facility Screens

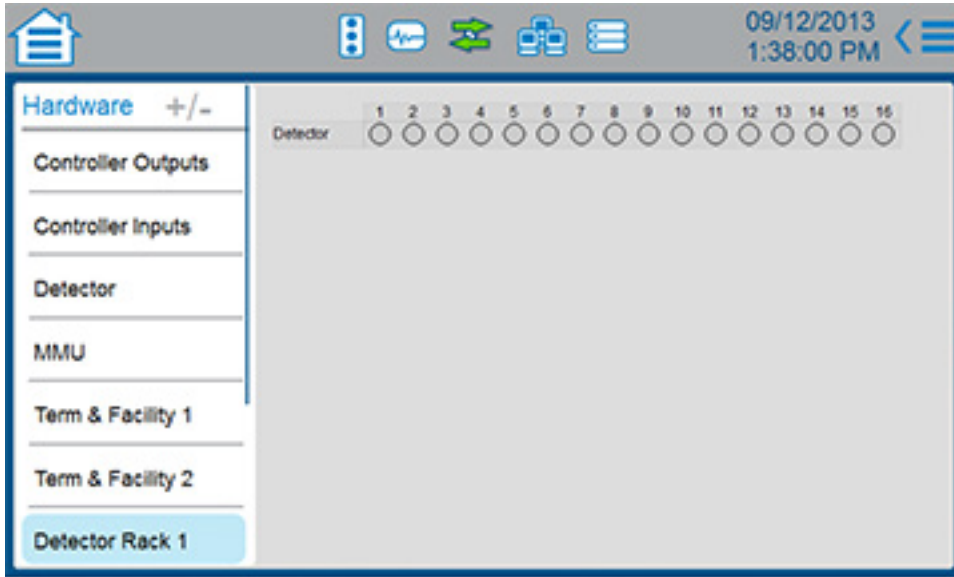
BIU 1 is shown.





# Detector Racks

BIU 1 is shown.





## Network

### Network

Configure and see status for the ENET1 IP address of the unit and adjust protocols and serial in the scrollable list. Contact your Internet Protocol (IP) specialist to determine the correct setting for each of the parameters.

### Example Configuration

ENET1 (IP Allocation set to **Static**)

IP Address: 10.1.15.64

Net Mask: 255.255.248.0

Gateway: 10.1.8.1

Ping Server: 10.1.15.51

NTCIP

Ethernet UDP Port: 55502

### Procedure for Example

Enter the different **ENET1** addresses:

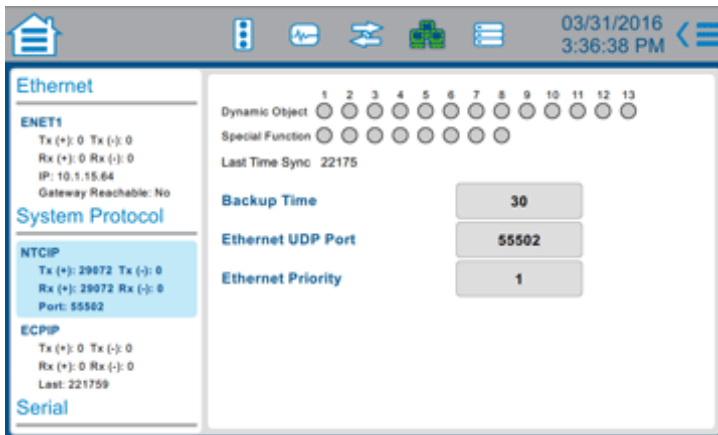
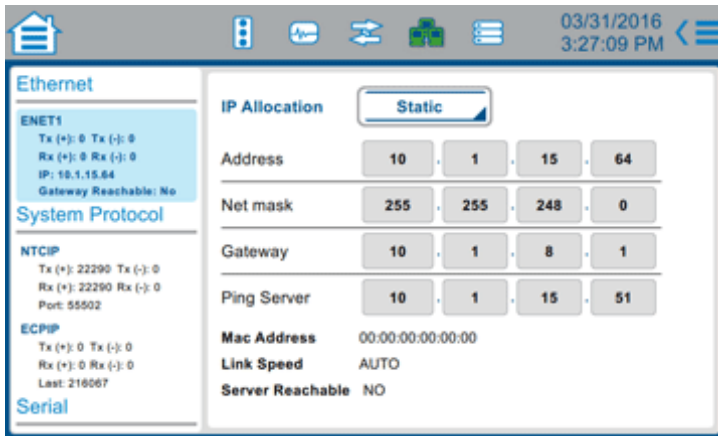
1. Set **IP Allocation** to **Static**.
2. Select the number you want to change.
3. Use the number keys at the bottom of the screen to enter the correct value.
4. Select **Apply** to save the value (or press **Enter** on the keyboard).

**Note:** You can enter numbers with the keyboard. Also, you can navigate to the next address with the keyboard right cursor (works like the Tab on a computer).

Enter the NTCIP **Ethernet UDP Port** value:

1. Select **NTCIP**.
2. Select the **Ethernet UDP Port** field.
3. Use the number keys at the bottom of the screen to set the value 55502 (or enter the value with the keyboard).
4. Touch an open area of the screen to save the value (or press **Enter** on the keyboard).

## Completed Screens for Example



## Ethernet

### ENET1

This Ethernet Port can connect 100 Mbs between the controller and external devices.

Ethernet communication supports NTCIP and ECPIP protocols. Settings for these two protocols are under **System Protocol** in the center of this screen. You configure Ethernet UDP Port for NTCIP in System Protocol, NTCIP. The UDP port for ECPIP is fixed at 2101.

**Note:** Contact your Internet Protocol (IP) specialist to determine the correct setting for each of the programmable parameters defined below.

ENET1 Parameter	Description
IP Allocation (Static, DHCP)	Select <b>Static</b> for manual IP Allocation Select <b>DHCP</b> for dynamic IP Allocation Dynamic Host Configuration Protocol (DHCP) is a standardized network protocol used on Internet Protocol (IP) networks for dynamically distributing network configuration parameters—for example, IP addresses—for interfaces and services. With DHCP, computers request IP addresses and networking parameters automatically from a DHCP server. Thus, it is not necessary for a network administrator or user to configure these settings manually.

ENET1 Parameter	Description
Address (0-255)	A unique address used by the Ethernet interface. The format follows the Transmission Control Protocol/Internet Protocol (TCP/IP) standard dot notation. When used, the address must be assigned from the same subnet as the other network devices with which it may communicate, such as a system controller or File Transfer Protocol (FTP) server. If the controller is connected to an IP router, the address must be valid for that router.
Net Mask (0-255)	The Net Mask must be the same as the other devices on the IP subnet to which the controller is attached (when an Ethernet interface is being used). This configures the Ethernet port ENET2.
Gateway (0-255)	The default IP address must be that of the Ethernet interface which is on the same subnet as this controller. This gateway address will be used for transmitting IP messages to end systems, which are not on the same subnet as this controller. This configures the ethernet port ENET2..
FTP Server	This address is optional, and is only required when the IP-based file download options are to be used. The address must be that of the system where the FTP server resides. This field is only used for local downloads from an FTP server host on the local area network.

The parameters listed below are read-only:

ENET1 Parameter	Description
Mac Address	The factory-set controller MAC address.
Link Speed	This is the selected link speed and duplex setting for your Ethernet LAN. This setting is auto-negotiated or auto-sensed.
Server Reachable	Yes = Successful Ping No = Unsuccessful Ping

## System Protocols

### NTCIP

Port parameters define the NTCIP backup time, UDP Port and priority of the port communications. This programming is only required when the controller is communicating through one of its ports.

From this screen, you specify the NTCIP Backup Time parameters and Ethernet Priority values for Port 2:

NTCIP Parameter	Description	Range
Backup Time	Use the scrubber to enter the appropriate NTCIP Backup Time value in seconds. Value entered (1-65535) establishes the time that the parameters are under control of the SET command and will remain if no SET command is received by the controller. Value 0 disables clearing of the parameters that were set regardless of the time between SET commands.	0 disables 1-65535 sets time
Ethernet UDP Port	STMP or IP over PMPP using SNMP or STMP Frame should use this port setting. You can set port 161 to support applications that have a fixed SNMP port setting.	161, 500-65535
Ethernet Priority	Use the scrubber to enter appropriate priority level value (1-9, with 1 highest) for the port. Value selects the priority of commands from that port. While a higher priority port is in control, the lower priority port can continue to retrieve status information. The order of priority when ports have the same priority number is (from highest to lowest) Ethernet, Port 2.	1-9, with 1 highest

## Serial Communication Protocols

### TERM (Terminal)

Provides VT100-compatible communication.

### NTCIP

Provides NTCIP-compatible communication.

### ECPIP

Provides ECPPI-compatible communication. This protocol is tailored to function in an Econolite Aries or Zone Master system.

### AB3418

Provides AB3418-compatible communication. This protocol is tailored to comply with the California AB3418 specification.

**Note: Metro Rapid and IEEE 1570 protocols are for future development.**

## GPS NMEA

Provides a connection to process a GPS NMEA message to set the time and date (or longitude/latitude). The controller supports an Eltec GPS unit and all other standard GPS devices that support a GPS NMEA Protocol message \$GPRMC on serial **COMM PORT2**. This feature is compatible with *Centracs* Version 1.5.3 or later. Information to order a GPS unit (antenna, antenna cable and serial interface cable) from Econolite is given below:

Part No.	Connector	Name
171-1369-502	25 Pins for Serial Port 2	GPS 16X with DB25 Cable Assembly

## COMM PORT 2

1. In the **Protocol** drop-down menu, select the protocol for your application (TERM, NTCIP, ECIPI, AB3418, or GPS NMEA). The screen populates automatically with the applicable fields to set the parameters that are related to the protocol you select.
2. Program the parameters per the table that follows.
3. After you program the parameters, in the **Enabled** field, select **Yes**

Comm Port 2 Parameter	Description	Range
Enabled	After you program the parameters, select <b>Yes</b> . <b>Note:</b> The port should not be enabled during setup or non-use.	Yes, enables No, disables
Protocol	Select from the drop-down menu	TERM, NTCIP, ECIPI, AB3418, GPS NMEA
Speed	Select from the drop-down menu	port1200, 4800, 9600, 19200, 38400, 57600, 115200
Data Bits	Select from the drop-down menu. This is of the form D/P/S Where D = Data bits of 7 or 8 P = Parity of E (Even), Z (odd), N (None) S = Stop bits of 1	7/E/1, 8/N/1, 8/O/1, 8/E/1,;7/N/1, 7/O/1
Duplex	<b>Important:</b> Please consult with the factory before changing this setting. As required by modem specifications, the port may be configured as Half or Full Duplex. From the drop-down menu, select HALF or FULL. HALF duplex can receive data only after transmission of a response is complete. FULL duplex can receive and transmit data at the same time.	FULL, HALF
Flow Control	Modem control signals sent over serial ports: Carrier Detect (CD) Data Set Ready (DSR) Data Terminal Ready (DTR) Set this to NO when using devices that do not support modem control signals, such as fiber modems.	Yes, enables No, disables

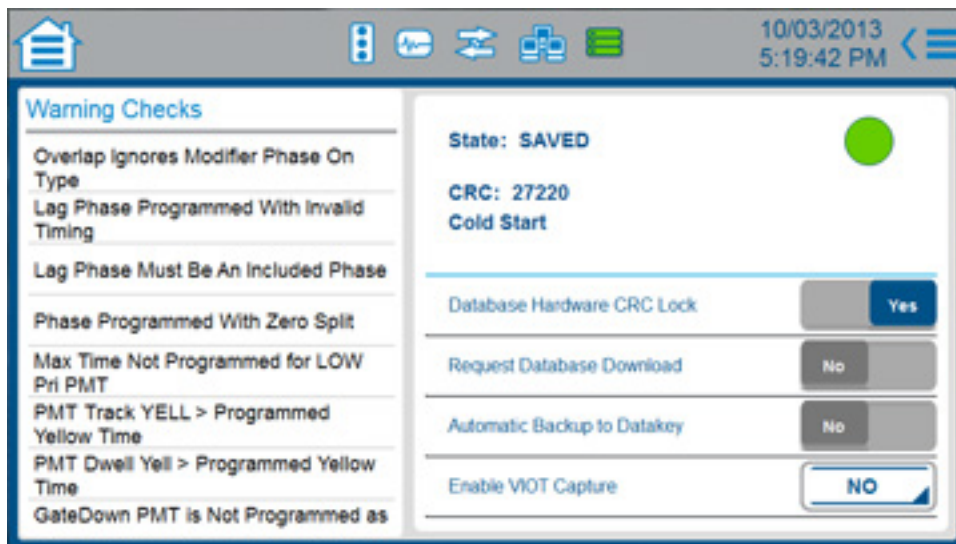
Comm Port 2 Parameter	Description	Range
Telemetry Address	Select the value with the scrubber to specify a unique address number (1-8191) to which this port will respond. Zero (0) disables responding to any address.	<p><b>NTCIP/AB3418</b> protocol: 1-8191: Address to respond to. 0: Disables responses</p> <p><b>ECPIP</b> protocol: 1-24: Address to respond to. 0 &amp; 25-8191: Disables responses</p>
Group Address	Select the value with the scrubber to specify an address number that allows a master station to access this slave station via group command of NTCIP protocol. 1-62 and 64-65535 for AB3418. 1-62 for NTCIP. Address 63 is reserved as an all-stations group address. Address zero (0) excludes the station from any group.	0-65535 except 63
Drop Out Timer	Select the value with the scrubber to enter the time in seconds (1-65535) from when the last valid command occurs before the controller is returned to local control. Zero (0) disables the dropout feature.	1-65535 seconds 0 disables
Single Flag	For AB3418 or NTCIP. Select <b>YES</b> (enable) or <b>NO</b> (disable). <b>Yes:</b> The frame flag is used as both the closing flag for one frame and the opening flag for the next frame. <b>No:</b> Each response frame contains an opening and a closing flag.	Yes, No
Modem	From the drop-down menu, select one of the internal modem setup string options (NONE, 56K, or USER). Use this typically for the optional Intersection Monitor module.	NONE, 56K, USER
User	Specifies the unique modem setup string required for the modem being used. This string is only used if the MODEM SETUP STRING is set to USER. The on-screen keyboard is in view when you are in this field. Consult the manual for your modem to determine the setup string required. Use this typically for the optional Intersection Monitor module.	0-9, A-Z
Response Delay	ECPIP Only Telemetry Response Delay (TRD) compensates response timing for overall communication delays. Decrease (start communication earlier) to compensate for longer delays and increase (start communication later) to compensate for shorter delays.	0.0-30.0 msec



## Database

## Database

This screen gives access to Consistency and Warning Checks and has a Database Copy Utility.



## What is a Warning Check?

In the Cobalt controller, following a database download or object data alteration via key board, the controller runs Consistency Checks to look for critical errors. If it detects errors, they must be corrected or all database changes are discarded.

After you program the controller, it may appear that a certain feature does not operate correctly, but it may be because of incorrect programming. To call attention to a possible incorrect programmed entry, the controller generates a Warning. The controller generates a Warning if, in the opinion of Econolite, you override the programmed parameter setting from a database with an unusual selection, or select a combination of programmed values that may not give you the operation you probably expect. Warning Checks are intelligent diagnostics designed to tell you of data entries that, by themselves or in combination with other entries, may result in unexpected operation.

**Important: One thing to keep in mind: a warning is not an error.**

Occasionally, it could be that programming results in incorrect operation, but is acceptable to you because it provides a benefit to you that compensates for an occasional operational anomaly. For example, some users routinely program Walk and Pedestrian Clearance times that exceed phase split times in coordinated operation because there are very few pedestrian calls and the user does not mind the occasional coordinator resynchronization that follows the service of a pedestrian call. Because we cannot possibly anticipate what you have in mind, it is left to you to decide what action, if



any, to take to correct the situation that caused a Warning message.

Initially, the software framework and a limited set of diagnostics will be available. Warning Checks are viewed as a long-term **work-in-progress**. These checks will be expanded as users and developers find situations that cause an unexpected controller operation.

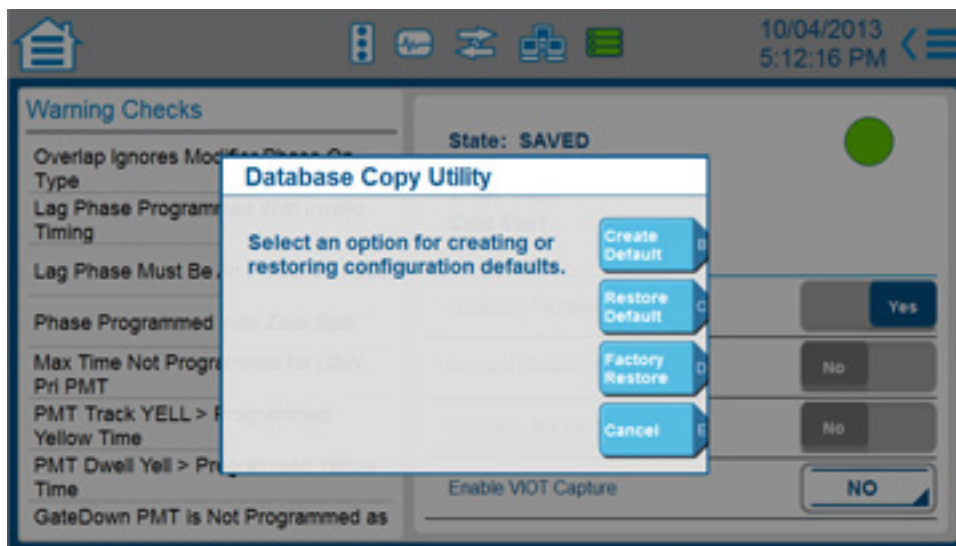
**Note:** The LED on the front panel of Cobalt indicates the state of the controller. In LED Tri-Color mode, a Yellow Slow LED indicates that there is a Warning Check statement in this screen. In LED Single-Color mode, a Red slow LED indicates there is a Warning Check. For other LED indications and how to set LED Single-Color mode, refer to **Cobalt Front Panel LED Indicator** and the tables that follow at the end of this section.

## Database Copy Utility

**Note:** When you program Cobalt, you select Commit as necessary to enable the change to the database. For an explanation of Transaction Mode (that runs when you make a critical change to programming), refer to the Help for **Home > Phase Order > Phase Order**.

To access the Database Copy Utility:

1. Select the **Options** drop-down menu.
2. Select [Copy Database].
3. The screen shown below opens. Use this screen to:
  - **Create a Default Database** - Before you upgrade the software, select [Create Default] to save and copy the current database as the Default Database.
  - **Restore your Default Database**
  - **Restore the Factory Default Database**



## State: SAVED/TRANSACTION Circle

The colored circle on the top of the right screen tells you the state of the database:

- SAVED with Green Circle: the database is saved to flash
- TRANSACTION with Red Circle: the controller is in transaction mode in which a database consistency check is in progress. For a description of transaction mode, refer to the Help in **Home > Phase Order > Phase Order**.

To do a database consistency check, select the green circle. The circle changes to a red circle labeled TRANSACTION. Select [Rollback] or [Commit] for the database.

**Cold Start** = a non-volatile RAM has been cleared or no prior configuration was detected

## Database Parameters

Refer to the table below and select the conditions for your application:

Database Hardware CRC Lock (Yes, No)

Request Database Download (Yes, No)

Automatic Backup to Datakey (Yes, No)

Enable VIOT Capture (Yes, No, Y + C)

Database Parameter	Description	Range
CRC	<b>Controller Database CRC</b> This CRC is computed over the entire <i>Cobalt</i> Database.	0 to 0xffff
Database Hardware CRC Lock	<b>Yes:</b> Enables checking of the database 16-bit CRC and the CRC wired in the cabinet to the controller inputs. When there is a discrepancy, the controller will go to flash. <b>IMPORTANT:</b> The 16-bit CRC input must match the database CRC. With this option enabled, there is NO data entry or download. <b>No:</b> Disables the CRC check and allows for data entry and download. <b>Note:</b> When this option is used, the cabinet must be wired to reflect any change to the Cobalt database before the controller is put in service.	Yes enables No disables
Request Database Download	<b>Yes:</b> requests the download of this controller database from the Traffic Operations Center. This entry is temporary and not part of the database. It automatically sets to No when the download is complete or access is logged off.	Yes enables No disables
Automatic Backup to Datakey/SD Card	<b>Yes:</b> Enables the controller to backup database changes to the Datakey and/or SD Card 20 minutes after the change has occurred. <b>No:</b> Disables this function.	Yes enables No disables

Database Parameter	Description	Range
Enable VIOT Capture	<p><b>VIOT</b> = Virtual Input/Output Trace This is an Econolite feature Select from the drop-down to enable (<b>Yes</b>), disable (<b>No</b>) or enable and clear VIOT files at power up (Y+C). <b>Yes:</b> Enables VIOT Tracing. All latest I/O events are captured in real time within a fixed number of records. The more I/O events, the shorter the time duration of the trace will be. When a Fault Flash event occurs, CIBCOB.CAP file will be saved. <b>No:</b> Manual save of the CIBCOB.CAP file and disable VIOT Tracing. <b>Y+C (Yes + Clear):</b> Same as (Yes) except that all VIOT files including CIBCOB.CAP will be deleted at power up. <b>Note:</b> CIBCOB.CAP will not be overwritten until the next saved events. The file is in /app1 directory or use USB retrieve. This feature does not operate if data collection is enabled.</p>	Yes, No, Y+C

## Controller/Cabinet Interlock CRC Application Procedure

- Map all designated Controller/Cabinet Interlock CRC Input signals in the cabinet.  
Enabled Remote flash - Tied to Logic Ground. This is to signify that Controller/Cabinet Interlock CRC is enabled in the cabinet. Auto Flash input is inverted in this operation so that any non CRC enabled controller will have a true flash command.
- Complete the programming of the Database to make sure valid Controller/Cabinet Interlock CRC is completed and final.
- Select **Yes** for Database Hardware CRC Lock.
- Check for the computed CRC value (Controller/Cabinet Interlock CRC value). Make sure the bits that have 1 value are grounded.
- Turn ON the controller/cabinet.

## Controller/Cabinet Interlock CRC Example

Assuming the designated signals are the following (Typical TS1 IDOT cabinet):

CRC Bit Designation	Input Signal
00	INHIBIT MAX TERM (Ring 1)
01	IND. LAMP CONTROL
02	WAS FORCE OFF (Ring 1)
03	OMIT RED CLEAR (Ring 1)
04	RED REST (Ring 1)
05	CALL NON-ACT II
06	WALK REST MODIFIER
07	PED RECYCLE (Ring 1)

CRC Bit Designation	Input Signal
08	MAX 2 SELECTION (Ring 1)
09	PED RECYCLE (Ring 2)
10	MAX 2 SELECTION (Ring 2)
11	FORCE OFF (Ring 2)
12	INHIBIT MAX TERM (Ring 2)
13	TEST B
14	RED REST (Ring 2)
15	OMIT RED CLEAR (Ring 2)

**Computed CU/Cabinet Interlock CRC Value is 51DD as seen in the Database screen:**

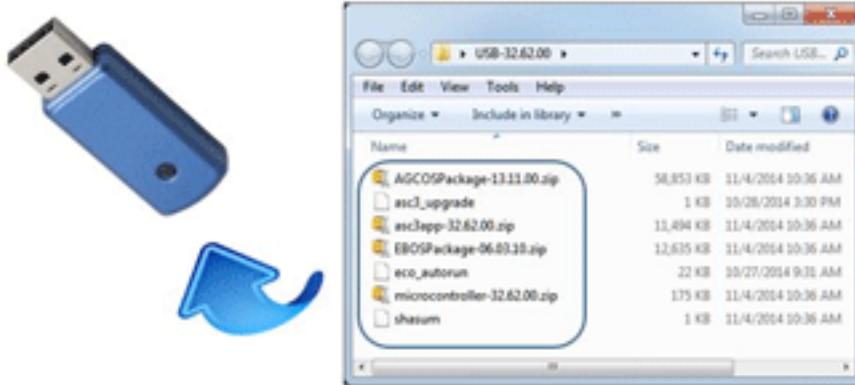
Interlock CRC in Hex	5				1				D				D			
Bit #	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
CRC (Binary)	0	1	0	1	0	0	0	1	1	1	0	1	1	1	0	1
Grounded Inputs	14		12					8	7	6	4		3	2	0	

ON Bits	Tie these Input Signals to Logic Ground
N/A	REMOTE FLASH Input
14	RED REST ( 2 )
12	INHIBIT MAX TERM ( 2 )
8	MAX 2 SELECTION ( 1 )
7	PED RECYCLE ( 1 )
6	WALK REST MODIFIER
4	RED REST ( 1 )
3	OMIT RED CLEAR ( 1 )
2	FORCE OFF ( 1 )
0	INHIBIT MAX TERM ( 1 )

## Transfer Software Files to a USB Flash Drive

1. Unzip the USB-32.xx.00.zip file. This unzips the 7 individual files.
2. Copy the 7 individual files to the root directory in the USB drive as the destination.

**Note:** These files should NOT be unzipped, or files may be unusable or corrupted.



## Front Panel LED Indicator

The front-panel LED logics provide at-a-glance controller status feedback. The color and state of the LED indicate the status of the controller as listed in the tables below for Tri-Color (default) or Single-Color LED mode.

For early versions of Cobalt, to change Cobalt to Single-Color mode, you must use the Classic View mode (**Home > Settings > General > Display > Switch to Classic View**), MM-1-7-2, and toggle the LED MODE parameter to SINGLE COLOR.

## Tri-Color Mode LED Indications

With the Tri-Color mode, the color of the LED can be Yellow, Green or Red as listed below.

Color and Frequency	Indication
Yellow Solid	Datakey in Use (warning to NOT remove the Datakey)
Yellow Fast	Transaction Mode that was caused by data input
Yellow Slow	Configuration Diagnostic Warning (to view Warning Checks, select the <b>Database</b> icon in the Status Bar)
Green Solid	Reserved

Color and Frequency	Indication
Green Fast	Reserved
Green Slow	Controller is OK
Red Solid	Boot: Upgrading OS. Do NOT power OFF.
Red Fast	Boot: Could not start traffic application
Red Slow	Reserved

## Single-Color Mode LED Indications

With the Single-Color mode, the color of the LED is always Red.

Color and Frequency	Indication
Red Solid	Controller is OK
Red Fast	Transaction Mode that was caused by data input
Red Slow	Configuration Diagnostic Warning (to view the Warning Checks, select the <b>Database</b> icon in the Status Bar)



## USB Status

### USB Status

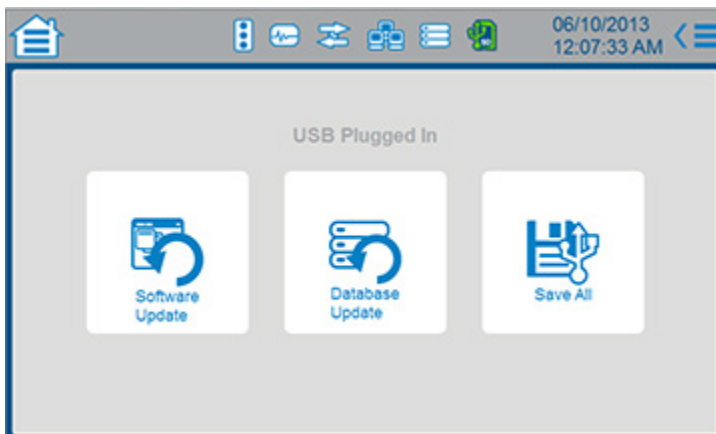
#### Using Database Update to Transfer an Application Database

If you have a controller with Econolite ASC/3 software, you can transfer its application database to a *Cobalt* controller. To transfer your database, use the procedure below that applies to your controller. You will need a USB flash drive (memory stick).

When you insert a USB flash drive into a Cobalt controller, this External Drives icon is added to the Status Bar:



When you select the External Drives icon, this screen opens and the External Drives icon turns green:



For the screen after a database transfer, refer to the end of this section.

## Current Econolite Database

## Procedure to Load Database into a Cobalt

*ASC/3 or ASC/3-2070 controller connected to Centrats*

1. Upload the database into the *Centrats ASC/3* editor.
2. Export the database files.
3. Copy the database files to a USB flash drive.
4. Insert the USB flash drive into a *Cobalt* controller.
5. In the Status Bar at the top of the screen, select the External Drives icon.
6. In the center of the screen, select Database Update.

*ASC/3 controller not connected to Centrats*

1. Run the *ASC/3 Utility* to upload the database from the *ASC/3*.
2. Copy the database files to a USB flash drive.
3. Insert the USB flash drive into a *Cobalt* controller.
4. In the Status Bar at the top of the screen, select the External Drives icon.
5. In the center of the screen, select Database Update.

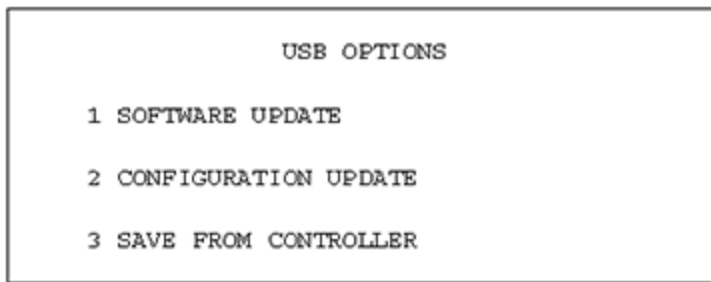
*ASC/3-2070 software on a 2070 controller not connected to Centrats*

1. Run the *ASC/3-2070 Utility* to upload the database from the 2070.
2. Copy the database files to a USB flash drive.
3. Insert the USB flash drive into a *Cobalt* controller.
4. In the Status Bar at the top of the screen, select the External Drives icon.
5. In the center of the screen, select Database Update.

*ASC/3-LX software on a 2070E controller with a 2070-1C CPU module*

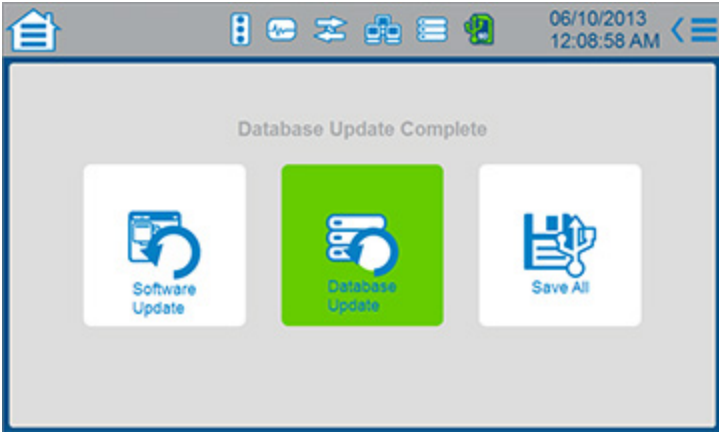
1. Insert a USB flash drive into the 2070-1C CPU module.
2. The screen shown below opens.
3. Select 3 SAVE FROM CONTROLLER.
4. Select 1 SAVE CURRENT CONFIGURATION.
5. After the copy to USB, a SUCCESSFUL COMPLETION screen opens.
6. Insert the USB flash drive into a *Cobalt* controller.
7. In the Status Bar at the top of the screen, select the External Drives icon.
8. In the center of the screen, select Database Update.

Screen that opens when you plug a USB flash drive into a 2070-1C CPU module:



After a successful database transfer, and you see this screen, remove the USB flash drive.







Home



Cabinet Config

## Load Switch Assign

### Cabinet Config

#### Load Switch Assign

The **Load Switch** pages configure the channels of the unique geometry of an intersection

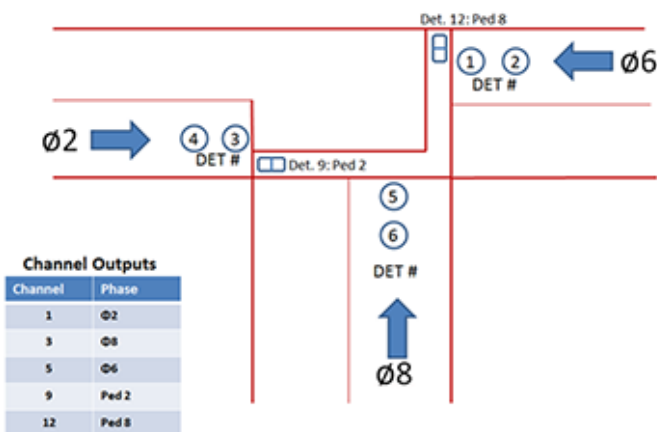
In this Load Switch screen, you configure the 16 Channel Outputs by assigning phase, overlap or pedestrian drivers.

For each Channel Output you program:

- The Channel **Type**: None, Vehicle, Pedestrian or Overlap
- Phase pedestrian or overlap **Assignment**
- **Approach**: the eight directions (for example, North, South, East, West, Northeast, Northwest, Southeast or Southwest)
- **Movement**: select from all possible combinations of straight, left and right arrows
- **Dimming**: Select Red, Yellow, Green and which half cycle to use

#### Example Configuration

##### Basic T-Intersection



Channel	Driver
1	Phase 2

Channel	Driver
3	Phase 8
5	Phase 6
9	Ped 2
12	Ped 8

## Procedure for Example

### Type

Per the table above, select the Vehicle or Pedestrian button at the bottom. To go to the Channel 9 thru 16 screen, select > in the top right corner.

### Assignment (Phase/Overlap)

- Slide the scrubber and/or select the +/- buttons, to set the values per the table.  
For unused phases, enter **0**.
- For each value, select **[Commit]** or select **[Commit]** after you complete the channel programming.

### Approach

Select one of eight directions (for example, North, South, East or West) for each channel per the intersection diagram.

### Movement

Select the straight, right, left, or combination of arrows for each channel that is used.

**Note:** The completed screens for this example configuration are shown below.

## Notes for the Channel Outputs (Load Switch Assign)

**Numbers at the Top** - 1 thru 8 (first screen) and 9 thru 16 (next screen) are the load switch and MMU channel numbers, 1 thru 16.

**Type** - Vehicle, Pedestrian, Overlap or None (other not defined)

- Select Vehicle, Pedestrian or Overlap indication (Walk, Pedestrian Clear, and DONT WALK) as the source of each load switch and MMU channel.
- This selection applies only to TS2 operation with a TS2 MMU. It provides the selection of and correlation between the indication and MMU channel to make sure that the load switch output sensed by the MMU corresponds to the BIU command.
- This selection also allows the controller to redundantly check and verify the load switch outputs indications as sensed by the MMU are as it commanded.

**Assignment** - 0 thru 16 for Vehicle and Pedestrian phases; A thru P for Overlaps (Green/Walk, Yellow/Ped Clear and Red/DONT WALK)

- Select a number (with the scrubber) or letter (from the selection boxes) for the assignment
- Select **[Commit]** at the top of the screen (or **[Rollback]** if you want to undo your selection)

Assignments are for each load switch and MMU channel.

**0** (zero): deselects any control for that load switch.

This assignment applies only to TS2 operation with a TS2 MMU. It provides the assignment of and correlation between the indication and MMU channel for verifying that the load switch output sensed by the MMU corresponds to the BIU command.

**Note:** For TS2 operation, unused load switch/MMU Channels should be cleared of all **Type** and **Assignment** programming.

## Completed Screens for the Example Configuration above (Guided Setup Screens)

Channel Outputs - Configure 16 channel outputs by assigning phase, overlap, and ped drivers.

	1	2	3	4	5	6	7	8
Type	Car	-	Car	-	Car	-	-	-
Assignment	2	0	8	0	6	0	0	0
Approach	→		↑		←			
Movement	↑		↑		↑			
Dimming	[Dropdown menu]							

Channel Outputs - Configure 16 channel outputs by assigning phase, overlap, and ped drivers.

	9	10	11	12	13	14	15	16
Type	Ped	-	-	Ped	-	-	-	-
Assignment	2	0	0	8	0	0	0	0
Approach	→			↑				
Movement	↑			↑				
Dimming	[Dropdown menu]							

**Approach** - select one of eight directions (for example, North, South, East or West) for each channel

**Movement** - select from all possible combinations of straight, left and right for each channel

**Dimming** - select Red, Yellow, Green and which Half Cycle to use for each channel

**Note:** After you select the drop-down menu, scroll down to see the selections.

**For Dim Red, Yellow, Green:**

Checked - To allow a load switch indication(s) to be dimmed when dimming is enabled

No check - To inhibit a load switch indication(s) to be dimmed when dimming is enabled

**For Half Cycle:**

Checked - To select the positive (+) half cycle for dimming

No check - To select the negative (-) half cycle for dimming

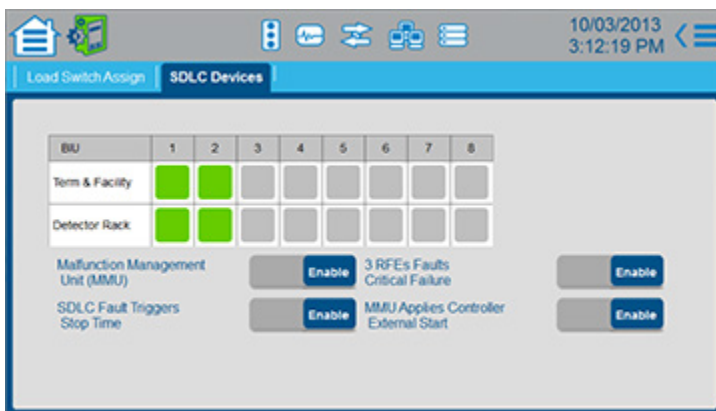
**Note:** When dimming, the indication load current should be balanced for the positive and negative half cycles of the AC line.



## SDLC Devices

### If you have a TS2 cabinet,

use this screen to select the BIU devices, MMU, and related behaviors.



or

### If you have a TS1 cabinet,

this screen does not apply. If you are in the Guided Setup, press the right arrow to go to the next screen.

### Example Configuration

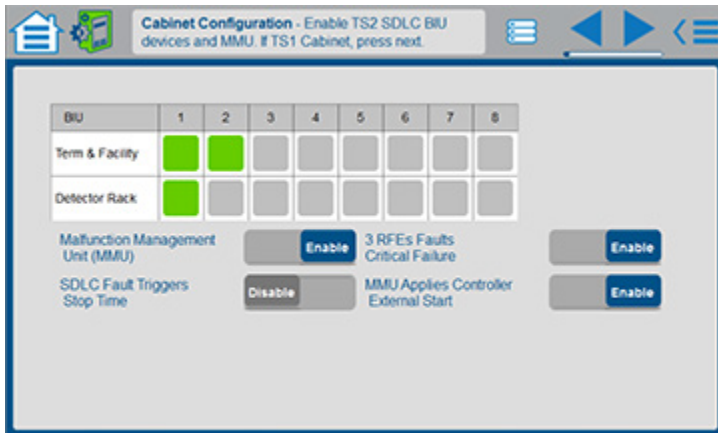
- Terminal and Facility: 1, 2
- Detector Rack: 1
- Malfunction Management Unit (MMU): Enable

### Procedure for Example

1. Touch buttons to enable communication with the respective BIUs. In our example:
  - There are two Terminals and Facilities BIUs; touch the fields for 1 and 2 next to **Term & Facility**. They become green squares.
  - There is one Detector Rack BIU; touch the field for 1 next to Detector Rack. It becomes a green square.
2. Touch to Enable the Malfunction Management Unit (MMU).

**Note:** You will also have to make sure the jumpers are correct on the MMU Compatibility Card.

## Completed Screen for Example (Guided Setup screen)



### General

TS2 controllers use the Port SDLC controller interface which connects to the Malfunction Management Unit (MMU), Terminals and Facilities (TF), and/or Detector Rack. Synchronous Data Link Control (SDLC) protocol is used to communicate with various devices where the controller is the master and Bus Interface Units (BIUs) and MMU are slaves. Only the controller can send or request data from the BIUs or MMU. Up to eight TF BIUs, eight DET rack BIUs, and one MMU can be attached to the controller network.

**Important:** If you incorrectly program TF BIUs or MMU Enable, the controller immediately goes into intersection flash.

### Term and Facilities

When the controller is operating in a NEMA TS2 Type 1 cabinet, press buttons to enable Term & Facility BIUs. Buttons are green when they are enabled.

### Detector Rack

When the controller is operating in a NEMA TS2 Type 1 or Type 2 cabinet, press buttons to enable Detector Rack BIUs. Buttons are green when they are enabled.

### Malfunction Management Unit (MMU)

For NEMA TS2 installations, press button to **Enable**.

For NEMA TS1 installations, leave as **Disable** (default)

For a NEMA TS2 Type 1 installation (Malfunction Management Unit (MMU) set to **Enable**), the MMU communication is enabled.

For a NEMA TS2 Type 2 installation (no Term & Facility BIUs enabled), the MMU communication must be enabled.

For a NEMA TS1 installation, no Term & Facility BIUs, Detector Rack BIUs, or MMU are enabled.

## SDLC Fault Triggers Stop Time

**Note:** The MMU must be enabled for this option to be useable.

Leave as **Enable** (default) to enable the MMU FAIL (output relay transferred) response to apply stop time to the controller.

Press the button to **Disable** MMU FAIL response from stopping the controller timing. This option allows a cabinet STOP TIME: AUTO-OFF-ON switch to control the TF BIU stop time and/or the TS2 connector stop time input.

## 3 RFEs Faults Critical Failure

Enable/Disable Critical RFE Failure Lockup

This is an Econolite Control Products Inc. (ECPI) Feature.

Press button to **Disable** to disable latching of the 3rd critical RFE within 24 hours.

Leave as **Enable** (default) and the controller will latch the 3rd critical RFE within 24 hours as required by NEMA TS2-2003, 3.9.3.1.3 Port 1.

**Note:** A critical RFE occurs when more than 5 of the last 10 critical response frames are not received.

## MMU Applies Controller External Start

The default is **Enable**. The other setting is **90 min.**

If you set this to **90 min.**, after 90 minutes or a power cycle, then this will be set to **Enable**. This is to make sure that this function is always enabled.





## Phase Order



The Phase Order pages configure the priority, concurrency, and order in which phases will be serviced.

## Phase Ring Sequence & Assignment Programming Guidelines

*Cobalt* phases are in Barrier Mode.

- **Barriers** are shown as vertical bars.
- **Rings** are shown as rows of phases represented as boxes with the row for Ring 1 at the top. You can program up to four rings. Phase Ring assignments can be made in any order. The order defines service order.

## Sequences

- Sequence 1 is the master sequence. If you change the phase order in Sequence 1 and select [Commit] to save it to the database, this same phase order is then copied to all the other phase sequences (2 thru 16).
- Sequences 2 thru 16 are independent. When you change one of these sequences, it does not affect any other sequence.
- When you program phase Sequence 1, you can edit phases anywhere in the ring barrier, but when you program phase Sequences 2 thru 16 you can only swap phases within a ring barrier group.

To copy one phase sequence to another:

1. In the Sequence drop-down menu, select the phase sequence to which to copy
2. Select **Options > Copy Phase Order**
3. Select the sequence to copy
4. Select OK

**Note:** The copy action only copies Sequences and Phase in Use. It does not copy Load Switch Assignment

## Soft Key programming

- To **add** a phase ring assignment, select an empty phase and select [Add Phase].
- To **remove** a phase ring assignment, select [Remove Selected].
- To **swap** two phases, select the two phases then select [Swap Selected].
- To **add a barrier**: select a phase that does not have a barrier to its right then select [Add Barrier]
- To **remove a barrier**: select a phase that has the barrier to its right then select [Remove Barrier]
- To program a phase as an **Exclusive Ped** Phase, select the phase and then select [Exclusive Ped]. An Exclusive Ped Phase shows a P in the top left corner of its box.

**Note:** You can only program an Exclusive Ped in phase Sequence 1. For this programming, it is common to use Phase 9 for an Exclusive Ped.

**Note:** Use Exclusive Ped for applications that require phases to only time pedestrian intervals without concurrent vehicle movement. An example is diagonal pedestrian crossings at an intersection where vehicle traffic is stopped in all directions and only pedestrian intervals are displayed to allow pedestrian traffic to cross in any number of directions at one time.

## Notes for Phase Order

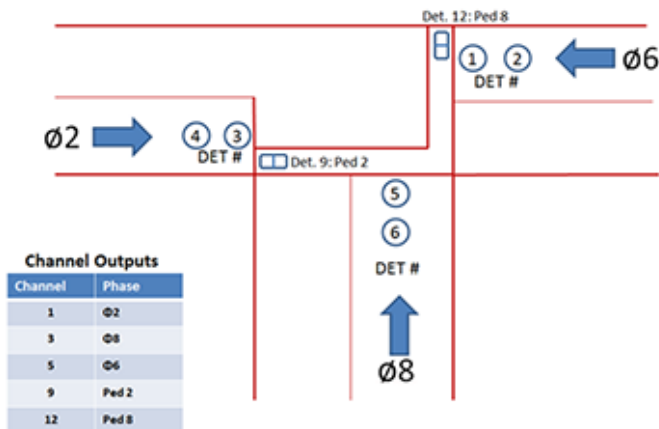
Phase Order Parameter	Description	Range
Sequence	<p><b>Controller Sequence</b> Phase order-of-rotation by ring. NTCIP 1202 2.8.3 In the drop-down menu, select a sequence (1-16) to use with the controller. If you have a factory default database, the sequences are as listed below. <b>Econolite factory default controller phase sequences:</b> 1 - Standard Quad 2 - Alt Seq A reverses phases 1-2 &amp; 9-10 3 - Alt Seq B reverses phases 3-4 &amp; 13-14 4 - Alt Seq A &amp; B reverses phases 1-2, 3-4, 9-10 &amp; 13-14 5 - Alt Seq C reverses phases 5-6 &amp; 11-12 6 - Alt Seq A &amp; C reverses phases 1-2, 5-6, 9-10 &amp; 11-12 7 - Alt Seq B &amp; C reverses phases 3-4, 5-6, 11-12 &amp; 13-14 8 - Alt Seq A, B &amp; C reverses phases 1-2, 3-4, 5-6, 9-10, 11-12 &amp; 13-14 9 - Alt Seq D reverses phases 7-8 &amp; 15-16 10 - Alt Seq A &amp; D reverses phases 1-2, 7-8, 9-10 &amp; 15-16 11 - Alt Seq B &amp; D reverses phases 3-4, 7-8, 13-14 &amp; 15-16 12 - Alt Seq A, B &amp; D reverses phases 1-2, 3-4, 7-8, 9-10, 13-14 &amp; 15-16 13 - Alt Seq C &amp; D reverses phases 5-6, 7-8, 11-12 &amp; 15-16 14 - Alt Seq A, C &amp; D reverses phases 1-2, 5-6, 7-8, 9-10, 11-12 &amp; 15-16 15 - Alt Seq B, C &amp; D reverses phases 3-4, 5-6, 7-8, 13-14, 11-12 &amp; 15-16 16 - Alt Seq A, B, C &amp; D reverses phases 1-2, 3-4, 5-6, 7-8, 9-10, 11-12, 13-14 &amp; 15-16</p>	1-16
Hardware Alternate Sequence Enable	<p><b>Hardware Alternate Sequence Enable</b> <b>Yes:</b> Enables the NEMA Alternate Sequence Hardware inputs (refer to TS2-2003, Table 3-12, page 113). If this parameter is enabled, the Power Start sequence programmed in <b>Home &gt; Flash &gt; Startup Flash</b> may be overwritten by these inputs (refer to the note below). <b>No:</b> The NEMA Alternate Sequence hardware Inputs are ignored. <b>Note:</b> This Hardware entry, if enabled, is selected according to the hierarchy that follows: System, Coordination, Time-Base, Hardware.</p>	Yes, No

## Guided Setup Example

Program the order and concurrency of phases by selecting the ring barrier phases. Options for adding/removing/swapping are dynamic tabs.

## Example Configuration

### Basic T-Intersection



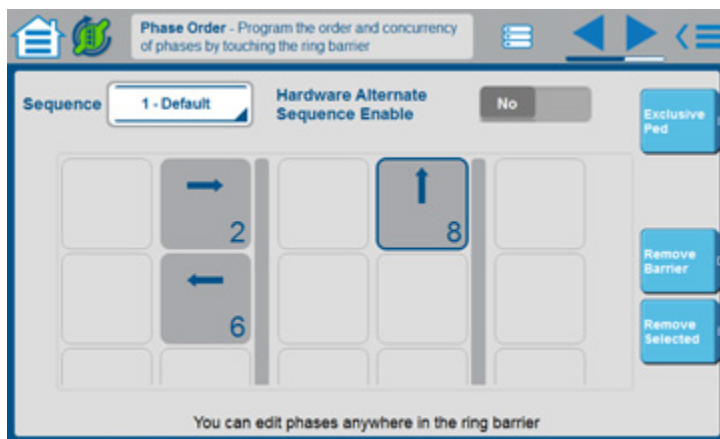
Ring	Barrier 1 Phases	Barrier 2 Phase
1	Phase 2	Phase 8
2	Phase 6	

### Procedure for Example

- As necessary to configure as specified:
  - Select two phases (4 and 8) and then select [**Swap Selected**]
  - Select a single phase and then select [**Remove Selected**] for phases 1, 3, 4, 5, and 7.
- After each operation, select [**Commit**] or select [**Commit**] after programming is complete.
 

**Note:** If you incorrectly delete a phase, select [**Rollback**] to start over.
- You may get a Please Wait message after you select [**Commit**]

### Completed Screen for the Example Configuration (Guided Setup Screen)



## Transaction Mode

**IMPORTANT:** To program a Cobalt controller, it is necessary for you to understand Transaction Mode, described in this section.

**Note:** The LED on the front panel of Cobalt indicates the state of the controller. In LED Tri-Color mode, a Yellow Fast LED indicates that the controller is in Transaction Mode. In LED Single-Color mode, a Red Fast LED indicates Transaction Mode. For other LED indications and how to set LED Single-Color mode, refer to the help for the **Cabinet Hardware** screen in the Status Bar.

## Introduction

A Cobalt Controller contains a wide variety of Traffic features designed to give you maximum flexibility in configuring an intersection. This broad base of applications requires database functions which, in many cases, depend on other data entries to work correctly. To make sure that critical data is entered correctly, the controller must run consistency checks on the database. These tests make sure interrelated database functions are compatible with each other.

The consistency checks are done in what is called **Transaction Mode**.

Some data is relatively independent, such as timing entries. Other data, like the selection of controller startup phases, depends on the phases and compatibilities of programmed sequence. These data must be done within the Transaction Mode. Another type of data that triggers Transaction Mode is one that has 2 or more functions; examples include HH:MM or 10.70.10.51.

You can change controller data manually with the touch screen or keyboard or remotely using SNMP or STMP messages. But critical data changes must be protected from incorrect/inconsistent changes.

## Changing Data with the Touch Screen or Keyboard

If you attempt to change critical data with the touch screen or keyboard (for example, controller start-up phases), the controller automatically goes to Transaction Mode. At this time, all changed data is stored in a temporary buffer until you exit Transaction Mode.

When the Cobalt is in Transaction Mode, the controller gives you indications as explained below:

- Next to the Database icon in the Status Bar, there is a rotating circular symbol and the option to select [Rollback] (do not make a database change) or [Commit] (add the change to the database).
- Every 30 seconds (default), there is a pop-up message to remind you that Cobalt is in Transaction Mode. To continue, select [Rollback], [Commit] or [Continue]. Press [Continue] to exit the pop-up screen and return to programming. To exit Transaction Mode, you must select [Commit] or [Rollback].
- The front-panel LED will blink Fast Yellow (or Fast Red if your database has Single Color LED).

**To exit Transaction Mode without saving the data, select [Rollback].**

**To initiate the VERIFY state, after you have completed all of the changes, select [Commit].**

During the verify state, the controller runs its consistency checks on the newly entered data. If the data passes, then the changes are copied to the active database and Transaction Mode is terminated. If the Consistency Checks find an error (for example, incompatible Startup Phases), then the controller displays a description of the problem and gives you the option to disregard/throw away all changes or to go back into Transaction Mode to correct the data.

Although the controller screen will show your changes, it is important to note that those changes will NOT take effect in the controller operation until Transaction Mode has exited. Also, if you cycle power during Transaction Mode, then upon start-up all modified data will be lost. This is because the changed data was only stored in the temporary buffer and was not officially copied to the database.

Please note that not all data changes force the controller to Transaction Mode. Timing parameters such as Minimum Green and Yellow Clearance may be changed as soon as you enter the data. These changes take effect immediately.

## **Changing Data with SNMP/STMP**

You may also change the Cobalt database with an SNMP or STMP SET message from Central. For this, it is the responsibility of Central to force the controller into Transaction Mode if critical data is to be changed. Before SETs will be accepted on any P2 (or critical) objects, Central must send a SET to dbCreateTransaction.0, changing it to a value of 2- transaction. At this point, Central may send any number of SETs to database objects. These values are stored in a temporary buffer, the same as with the manual touch screen or keyboard entry.

After Central has completed its SNMP/STMP SETS and is ready to commit the new data to the database, Central must send a 3-Verify to dbCreateTransaction.0. Cobalt will run the same Consistency Checks as for the touch screen or keyboard entry. After completion, the controller internally sets the transaction state to 6-DONE. If no errors were found, the new data is automatically copied to the active database. Otherwise, the data is held in the temporary buffer until the discrepancies have been corrected (Central can see the error messages by doing a GET on the object, dbVerifyError.0).

## **Summary**

The Cobalt contains many database elements which are dependent on other entries. To make sure the controller operates correctly, these dependencies must be checked before data is committed to the active controller database.

There are two ways to change the database: at the controller or through NTCIP communications. Both require Cobalt to enter a Transaction Mode state to allow Consistency Checks to run on the changed data. If you cycle power BEFORE these checks can be run, then the changed data will be lost.

Also note that while the changes may appear on the controller screens, those values will NOT be implemented in the controller operation until Transaction Mode is complete. That is, the Consistency Check must be done before the new data is officially copied to the database.



The Phase Order pages configure the priority, concurrency, and order in which phases are serviced.

## ***Backup Prevent***

A backup condition occurs when a phase is at rest and there is a call on a specified phase in the same ring. This Backup Prevent Phases screen programs the action that is to take place when a backup condition occurs.

## **Procedure**

The screen prompts you in the selection process:

1. Select Timing Phase.
2. Select Backup Phase.
3. Select [Add Backup Phase Pair].

In the drop-down menu for each Phase Pair, select **Unconditional** or **All Red**.

The phase pairs are listed to the left. The syntax is Timing Phase number > Backup Phase number.

To delete a phase pair:

1. In the list to the left, select the phase pair.
2. Select [Remove Phase Pair].





Home



Phase Order

## Simultaneous Gap

### *Simultaneous Gap*

#### Example Procedure

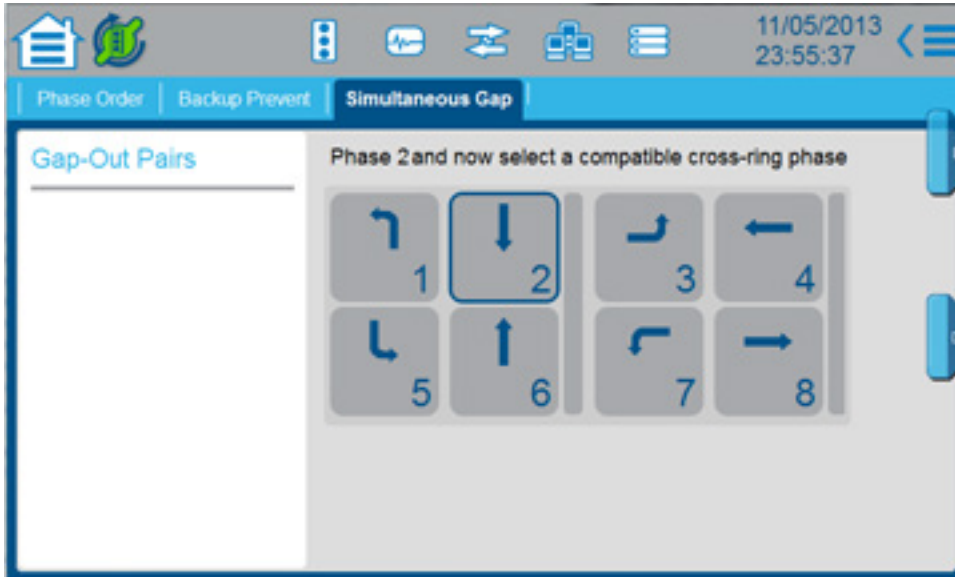
To show how to select a pair of phases that will Gap-Out or Max-Out together, we make Phase 2 and Phase 6 into a Gap-Out Pair.

**Note:** This screen prompts you through this process.

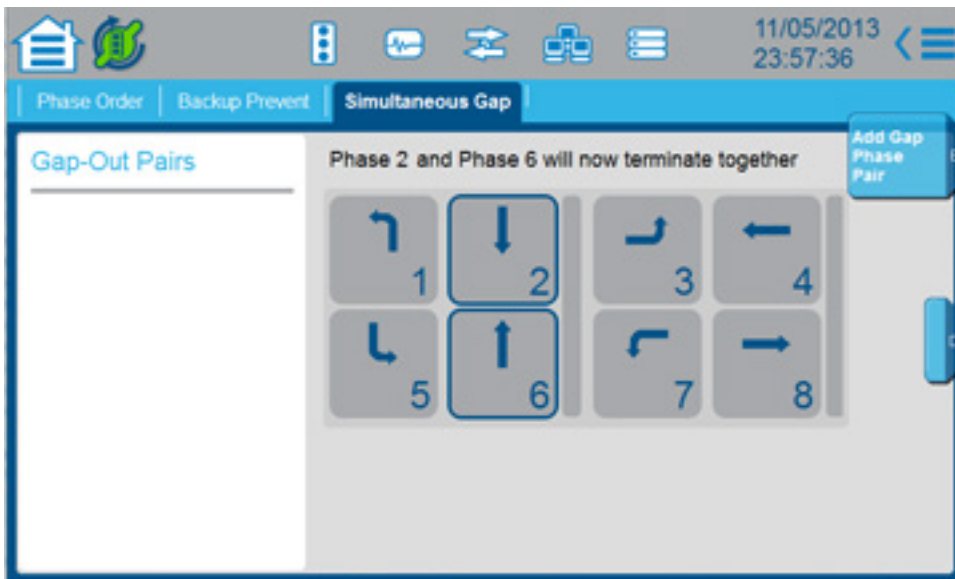




1. Select Phase 2:



2. Select the Phase 6:



3. Select [Add Gap Phase Pair].

4. You have now created a Gap-Out Pair that terminate together:



**Notes:**

- Each Gap-Out Pair that you create is listed in the Gap-Out Pairs column on the left.
- To delete a Gap-Out Pair:
  1. Select the Gap-Out Pair in the column on the left.
  2. Select [Remove Phase Pair]

The two phases selected must simultaneously gap when terminating together to service a conflicting demand. If one phase is terminating to service a phase that is permissive with the other phase, then it will not wait to gap simultaneously with the other phase. If a phase is not selected, it is allowed to gap independently with the phase in the other ring.



Home



Overlap

## Overlaps

### Overlaps

The overlaps page configures unique signal drivers outside of common phase control such as right turns or permissive left turns.

### Types of Overlaps

You can program four types of overlaps:

- Normal
- -Green Yellow
- PPLT/FYA
- Econolite

Normal and Minus Green Yellow operate per the requirement specified in NTCIP 1202 paragraph 2.10.2.2. PPLT/FYA uses overlap so you can program Protected Permissive left hand turns. Type Econolite identifies overlaps that supplement the Normal overlap with the Econolite-specific options.

### Procedure to program an Overlap

**Note:** Throughout these procedures, select [Commit] as necessary to enable the change to the database. For an explanation of Transaction Mode (that runs when you make a critical change to programming), refer to the Help for **Home > Phase Order > Phase Order**.

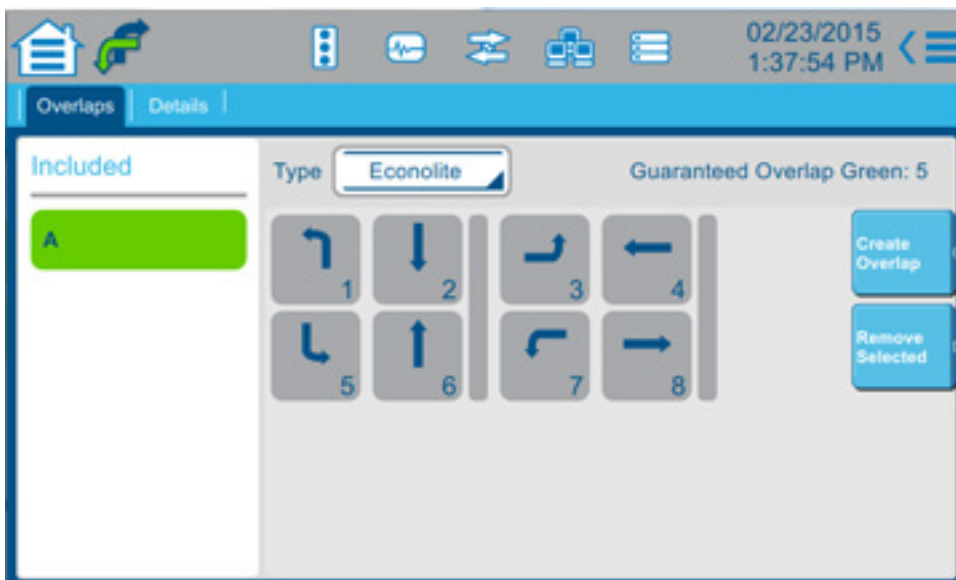
**Note:** For the PPLT/FYA type of overlap there are prompts at the bottom of this screen to tell you what to do. With PPLT/FYA type of overlap you can select overlaps as well as phases to program movements with multiple phases in the overlap. For more information, refer to the help in its Details screen.

1. When you go to **Home > Overlap**, this is the first screen you see:



2. Select [Create Overlap]. You can create up to 16 overlaps (A thru P).

3. The screen for an Econolite type overlap opens with Overlap A highlighted to the left:



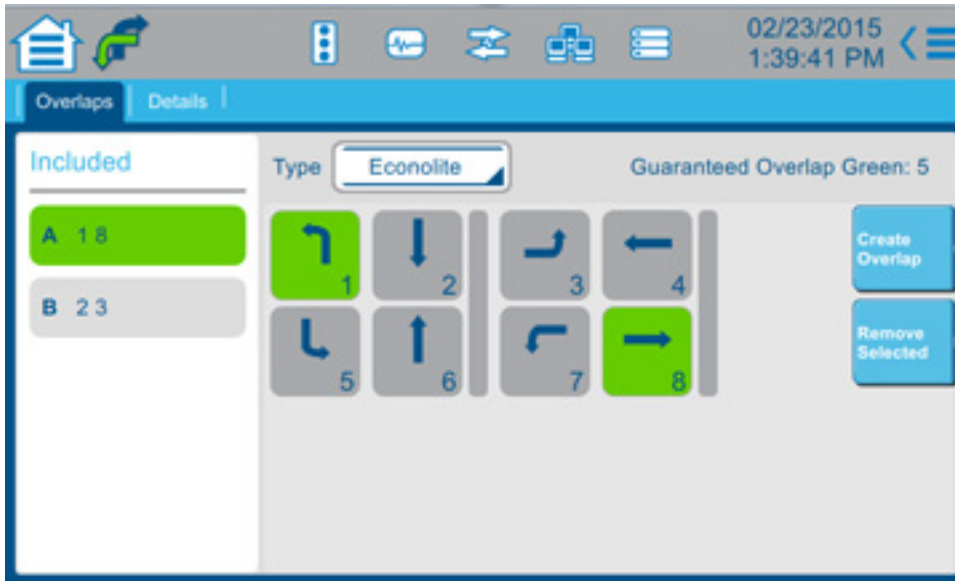
**Note:** There is now a **Details** tab and, at the top right, is listed the read-only **Guaranteed Overlap Green** time, in seconds. You set this value in **Home > Timing Plans > Guaranteed**.

4. In the **Type** drop-down menu, select the type of overlap (Normal, -Green/Yellow, PPLT/FYA, or Econolite).

5. Select a phase to Include in the overlap.

**Note:** The Included Phases specify the phases whose timing state is used to derive the state of the overlap. In general terms, when any included phase is timing its green interval or the controller is advancing from one included phase to another included phase, the overlap will be green. If no included phase is green, then the overlap will be yellow when any included phase is yellow. If no included phase is green or yellow, the overlap will be red. The usual derivation of the overlap state can be altered by more programming in the **Details** tab.

6. Repeat Step 5 as necessary. For example, here is the screen programmed for Econolite Overlap A (Phases 1 and 8) and Overlap B (Phases 2 and 3):



7. In the **Included** list on the left of the screen, each overlap is listed with the phases included in that overlap.

**Note:** To delete an overlap, select the overlap and then select [Remove Selected].

8. Select the **Details** tab.

9. In the Details screen for the type of overlap you have selected, program the parameters for your application.

**Note:** When you are in the Details screen, refer to the Help for that screen for descriptions of the parameters in that screen.



Home



Overlap

## PPLT/FYA Overlaps

### *PPLT/FYA Overlaps*

#### **Overlap Outputs for the PPLT/FYA Type of Overlap**

PPLT/FYA = Protected/Permissive Left Turn / Flashing Yellow Arrow

In the **Type** drop-down menu, you selected a **PPLT/FYA** type of overlap and have selected the **Details** tab. Below are programming instructions for the **Overlaps** tab as well as the **Details** tab.

This is a special Econolite overlap type for Protected/Permissive Left Turns using the Flashing Yellow Arrow. It changes programmed controller outputs to meet NEMA specification.

**Note:** With PPLT/FYA, you can select overlaps as well as phases to program movements with multiple phases in the overlap. You can use this feature to program a Diamond Configuration that does not use a standard 8-phase quad intersection.

Below are two procedures, the first to program a PPLT/FYA with single-phase movements and the second to program a PPLT/FYA overlap that has a multiple-phase movement(s).

#### **Procedure to program a PPLT/FYA Overlap with two single-phase movements**

**Note:** Throughout these procedures, select [Commit] as necessary to enable the change to the database. For an explanation of Transaction Mode (that runs when you make a critical change to programming), refer to the Help or manual section for **Home > Phase Order > Phase Order**.

1. Select the **Overlaps** tab then select [Create Overlap].
2. A new **Included** field is shown to the left to list the phases included in the overlaps (A, B, C, etc.). You can create up to 16 overlaps (A thru P).
3. Notice, at the bottom of the screen, there is a prompt, **Select Protected Movement**.
4. Select a Protected Phase (left turn) to Include in the overlap. This phase represents the protected turning movement.
5. Notice, at the bottom of the screen, the Protected Phase you selected in Step 4 is listed and there is a prompt, **Select Permissive Movement**.

6. Select a Permissive Phase to Include in the overlap. This phase is the opposing through movement in which the left turn phase is permitted for PPLT/FYA. When the assigned phase is timing Green or timing with the protected left turn as a next phase decision, then the Flashing Yellow Arrow output is active.



7. In the example screen above, notice:
- At the bottom of the screen, the Protected Movement you selected in Step 4 and the Permissive Movement you selected in Step 6 are listed.
  - In the **Included** list on the left of the screen, each PPLT/FYA overlap is listed with the phases included in that overlap.
- Note:** To delete an overlap, select the overlap and then select [Remove Selected].
8. Select the **Details** tab and program the parameters as described in the table under **Notes for PPLT/FYA Overlaps** at the end of this chapter.

## Procedure to program a PPLT/FYA Overlap with multiple-phase movements

**Note:** The procedure below is an example that programs a PPLT/FYA Overlap A (Phases 1, 2, and 8) using Overlap F (Phases 2 and 8). In general, in the **Edit PPLT/FYA Assignments** screen, select **Phase** or **Overlap** for the Protected and Permissive Movements as applicable.

1. For your application with PPLT/FYA overlaps, program overlaps with single-phase movements as given in the procedure above. For example:



2. With Overlap A selected, select [Edit Protected Permissive] in the lower right corner.



**Note:** The screen above only shows Left Turn and unlabeled phases for Protected Movement Phase selections and shows Through and unlabeled enabled phases for Permissive Movement Phase selections. You may not select the same overlap for both movements. Other FYA overlaps are not shown for selection because they may not be selected as a Protected or Permissive movement for another FYA overlap.

**Note:** You may only select one phase/overlap movement at a time. Thus, if you were to select the phase/overlap for another movement, it would automatically deselect it from the previous



selection.

3. In **Permissive Movement**, in the Phase/Overlap toggle, select **Overlap**.

4. Select Overlap **F**.



5. Select [Save].



6. At the top of the screen, select **Commit**.

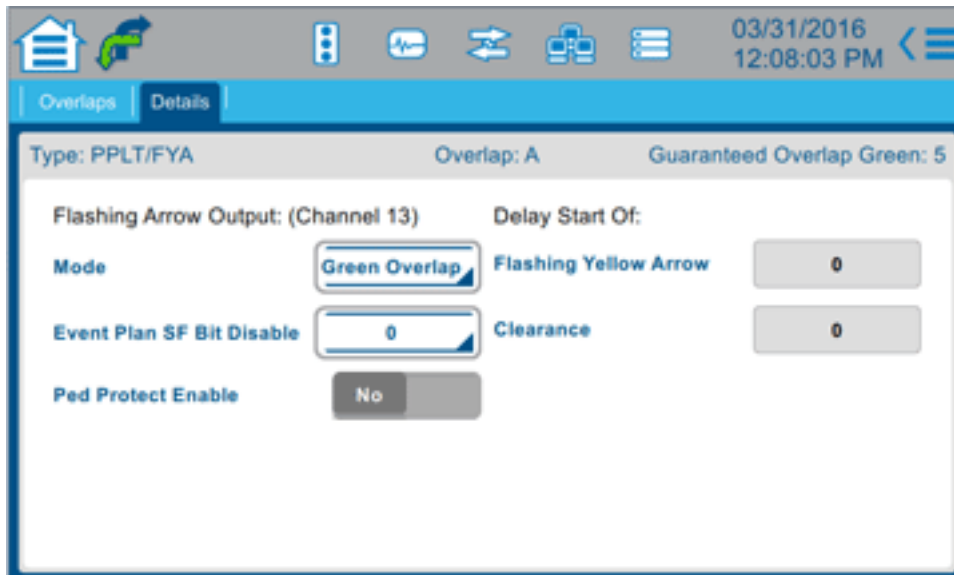


7. In the example screen above, notice:

- At the bottom of the screen, the Protected Movement 1 and the Permissive Movement F are listed.
- In the Included phases list on the left of the screen, Overlap A is listed with the included Phases 1, 2 and 8. Phases 2 and 8 are from Overlap F, listed at the bottom of the screen. You must select Commit for all the phases to be listed as in the Included phases list.

**Note:** To delete an overlap, select the overlap and then select [Remove Selected].

8. Select the **Details** tab and program the parameters as described in the table below.



## Notes for PPLT/FYA Overlaps

PPLT/FYA Overlap Parameter	Description	Range
Mode	<p><b>Flashing Arrow Output Channel Mode</b></p> <p><b>Note:</b> In the example screen above, Channel 13 was selected for Overlap A in <b>Home &gt; Cabinet Config &gt; Load Switch Assign</b></p> <p>In the Mode drop-down menu, select as necessary:</p> <p><b>Green Overlap:</b> Connect the wire of the Flashing Yellow Arrow (FYA) signal to the Green output on the assigned overlap load switch channel (<b>Home &gt; Cabinet Config &gt; Load Switch Assign</b>) that is indicated by the (Channel xx) read-only field. Note that the protected and permissive left turn clearance intervals will be the same on the overlap and phase load switch channels.</p> <p><b>Ped Yellow:</b> Connect the wire of the Flashing Yellow Arrow (FYA) signal to the Yellow output on the assigned permissive through load switch channel (<b>Home &gt; Cabinet Config &gt; Load Switch Assign</b>) that is indicated by the (Channel xx) read-only field.</p> <p><b>Isolate (Isolate Protected Green):</b> Connect the wire of the Flashing Yellow Arrow (FYA) signal to the Green output on the assigned overlap load switch channel. The protected and permissive left turn clearance outputs will also be located on the overlap load switch channel. Isolate refers to the isolated green indication remaining on the original protected left turn channel. This is based on the EDI Basic FYA Mode.</p>	Green Overlap, Ped Yellow, Isolate
Event Plan SF Bit Disable	<p><b>Flashing Arrow Output Channel Event Plan Special Function Bit Disable 1-8:</b> Assign the bit number that can be used in an Event Plan to disable the permissive left turn by time-of-day. Refer to <b>Home &gt; Event Plans &gt; Overview &gt; Special Output Flags</b>.</p> <p><b>0 (zero):</b> PPLT/FYA will not be disabled by a Special Function Bit.</p> <p><b>Note:</b> A disable of PPLT/FYA while the permissive phase is either timing or assigned as a next phase will not take effect until the permissive phase has completed the timing interval.</p>	0 - 8
Ped Protect Enable	<p><b>Pedestrian Protect</b></p> <p>This protects a pedestrian from the opposing through phase movement.</p> <p><b>Note:</b> If Ped Protected is enabled, Pedestrian Reservice is disabled. To set/review programming of Pedestrian Reservice, go to: <b>Home &gt; Phase Options &gt; Service &gt; Pedestrian Reservice</b> and <b>Home &gt; Coordination Options &gt; Allow Ped Reservice</b></p>	Yes, enable No, disable
Flashing Yellow Arrow	<p><b>Delay Start of Flashing Yellow Arrow</b></p> <p>Assign the period of time in tenths of a second to delay flashing the yellow arrow output when the permissive through movement starts timing green. This is a safety feature that will limit the exposure of left turning vehicles because it is assumed that opposing queued vehicles will not provide adequate headway. This delay timer will not apply during preemption. The channel output will be red.</p> <p><b>Note:</b> To make sure that the flashing interval duration is at least two seconds, a phase Hold is applied to make sure the parent opposing through movement does not terminate too soon. If the opposing through phase has reached yellow clearance before the delay start timer expires, then the FYA channel output remains in red.</p>	0 -25.5 seconds
Clearance	<p><b>Delay Start of Clearance</b></p> <p>Assign the period of time in tenths of a second to continue flashing the yellow arrow output after the permissive through movement reaches yellow clearance. This is a safety feature that will limit the exposure of providing two conflicting solid yellow clearance arrows in PPLT/FYA operation.</p>	0-25.5 seconds



Home



Overlap

## Normal Overlaps

### Normal Overlaps

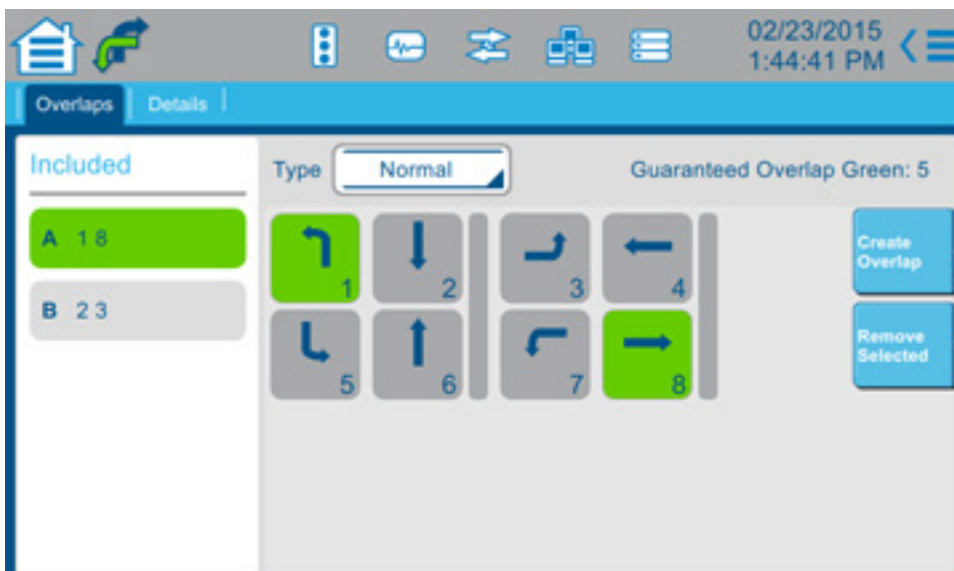
In the **Type** drop-down menu, you selected a **Normal** type of overlap and have selected the **Details** tab. Below are programming instructions for the **Overlaps** tab as well as the **Details** tab.

### Overlap Outputs for the Normal Type of Overlap

The state of the Included Phases of the overlap determines the output, as given below:

Included Phase	Overlap Output
Green	Green
Yellow or Red Clearance -and- one of these phases is Next (For example, Overlap A = 1+2. 1 Terminates and 2 is Next)	Green
Yellow and no included phase is Next	Yellow
Green and Yellow OFF	Red

**Note:** In this Normal overlap screen, at the top right, is listed the read-only Guaranteed Overlap Green time, in seconds. You set this value in **Home > Timing Plans > Guaranteed**.



## Procedure to program a Normal Overlap

**Note:** Throughout this procedure, select Commit as necessary to enable the change to the database. For an explanation of Transaction Mode (that runs when you make a critical change to programming), refer to the Help for **Home > Phase Order > Phase Order**.

1. Select the **Overlaps** tab and then select [Create Overlap].
2. A new **Included** field is shown to the left to list the phases included in the overlaps (A, B, C, etc.). You can create up to 16 overlaps (A thru P).

3. Select a phase to Include in the overlap.

**Note:** The Included Phases specify the phases whose timing state is used to derive the state of the overlap. In general terms, when any included phase is timing its green interval or the controller is advancing from one included phase to another included phase, the overlap will be green. If no included phase is green, then the overlap will be yellow when any included phase is yellow. If no included phase is green or yellow, the overlap will be red. The usual derivation of the overlap state can be altered by more programming in the **Details** tab.

4. Repeat Step 3 as necessary.
5. In the **Included** list on the left of the screen, each Normal overlap is listed with the phases included in that overlap.

**Note:** To delete an overlap, select the overlap and then select [Remove Selected].

6. Select the **Details** tab and program the parameters as described in the table below.

Parameter	Value
Lag Green	5
Yellow	3.5
Red	1.5

## Notes for Normal Overlaps

Normal Overlap Parameter	Description	Range
Lag Green Yellow Red	<p><b>Lag (Trailing) Green, Yellow and Red times</b></p> <p>Normally, if an included phase is terminating and no other included phase is timing or a phase next selection, the terminating included yellow and red of the phase are also output to the overlap. Trailing Green, Yellow, and Red provide a means of extending the green of the overlap and then timing a specified yellow and red. When the last timing overlap included phase begins its yellow change, the green interval of the overlap is extended by the specified Trailing Green time. After Trailing Green has timed, Trailing Yellow and Trailing Red times are used to time the yellow change and red clearance intervals of the overlap.</p> <p><b>Note:</b> Lagging times take effect only if the if the Green and Yellow entries are both non-zero.</p>	0-25.5 sec.



Home



Overlap

## - Green / Yellow Overlaps

### **-Green / Yellow Overlaps**

In the **Type** drop-down menu, you selected a **-Green/Yellow** type of overlap and have selected the **Details** tab. Below are programming instructions for the **Overlaps** tab as well as the **Details** tab.

### **Overlap Outputs for the Minus Green Yellow Type of Overlap**

The state of the Included Phases and the Modifier Phase Assignments of the overlap determine the output.

This is used to avoid conflicting movements between modifier phase and overlap.

For example, Overlap A=1. Modifier phase is 6. Phase 6 is in conflict with Overlap A. When 6 is ON or Next, Overlap A is NOT ON.

Included Phase	Modifier Phase	Overlap Output
Green	NOT Green	Green
Yellow or Red Clearance and one is Next	NOT Yellow	Yellow
Green and Yellow OFF	-----	Red

**Note:** In this -Green/Yellow overlap screen, at the top right, is listed the read-only Guaranteed Overlap Green time, in seconds. You set this value in **Home > Timing Plans > Guaranteed**.



## Procedure to program a Minus Green Yellow Overlap

**Note:** Throughout this procedure, select [Commit] as necessary to enable the change to the database. For an explanation of Transaction Mode (that runs when you make a critical change to programming), refer to the Help for **Home > Phase Order > Phase Order**.

1. Select the **Overlaps** tab and then select [Create Overlap].
2. A new **Included** field is shown to the left to list the phases included in the overlaps (A, B, C, etc.). You can create up to 16 overlaps (A thru P).
3. Select a phase to Include in the overlap.

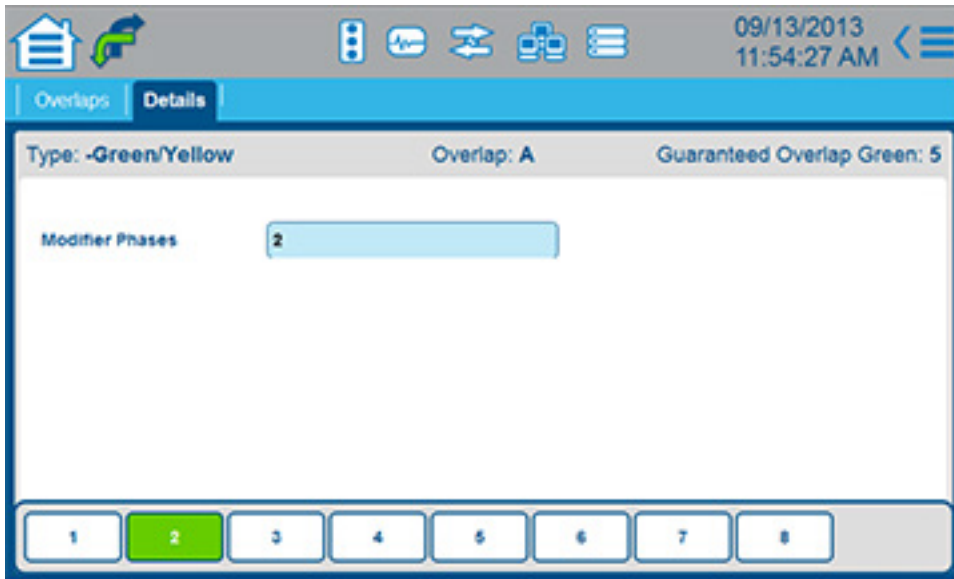
**Note:** The Included Phases specify the phases whose timing state is used to derive the state of the overlap. In general terms, when any included phase is timing its green interval or the controller is advancing from one included phase to another included phase, the overlap will be green. If no included phase is green, then the overlap will be yellow when any included phase is yellow. If no included phase is green or yellow, the overlap will be red. The usual derivation of the overlap state can be altered by more programming in the **Details** tab.

4. Repeat Step 3 as necessary.
5. In the **Included** list on the left of the screen, each Minus Yellow Green overlap is listed with the phases included in that overlap.

**Note:** To delete an overlap, select the overlap and then select [Remove Selected].

6. Select the **Details** tab and program the parameter as described in the table below.





## Notes for - Green / Yellow Overlaps

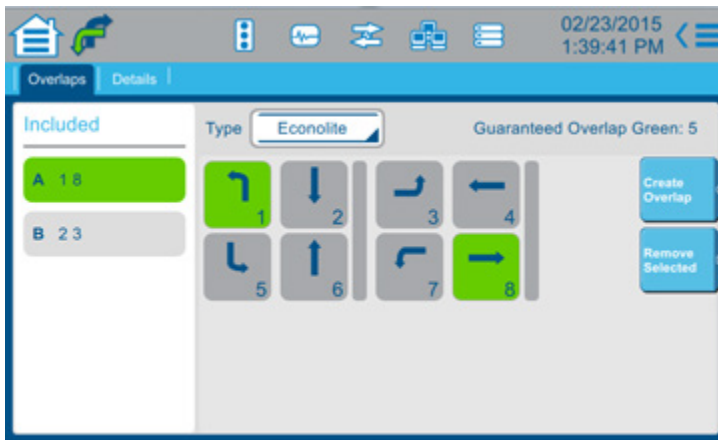
Minus Green Yellow Overlap Parameter	Description	Range
Modifier Phases	<p><b>Modifier Phases</b>            Select the Modifier Phase(s).            These Modifier Phases are used when the overlap type is Minus Green Yellow to provide an overlap that will terminate to red during a modifier phase green and yellow.</p> <p><b>Note:</b> When Modifier phases are assigned, only they and the Included Phases option are used to decide the state of the overlap. All other overlap programming options are ignored.</p>	Phases 1-16



## Econolite Overlaps

In the **Type** drop-down menu, you selected an **Econolite** type of overlap and have selected the **Details** tab. Below are programming instructions for the **Overlaps** tab as well as the **Details** tab.

**Note:** In this Econolite overlap screen, at the top right, is listed the read-only Guaranteed Overlap Green time, in seconds. You set this value in **Home > Timing Plans > Guaranteed**



## Procedure to program an Econolite Overlap

**Note:** Throughout this procedure, select [Commit] as necessary to enable the change to the database. For an explanation of Transaction Mode (that runs when you make a critical change to programming), refer to the Help for **Home > Phase Order > Phase Order**.

1. Select the **Overlaps** tab and then select [Create Overlap].
2. A new **Included** field is shown to the left to list the phases included in the overlaps (A, B, C, etc.). You can create up to 16 overlaps (A thru P).
3. Select a phase to Include in the overlap.

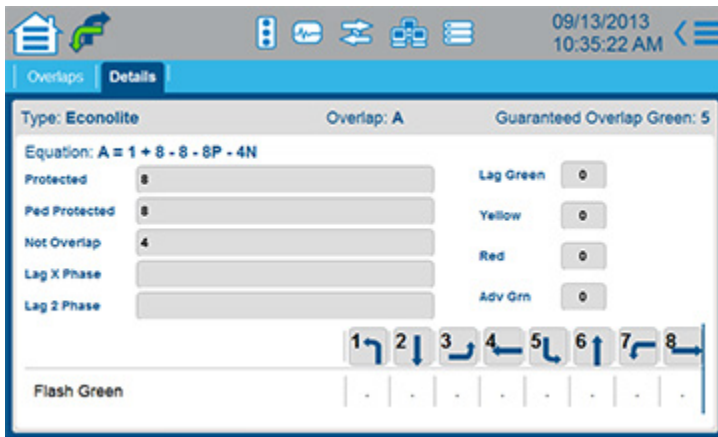
**Note:** The Included Phases specify the phases whose timing state is used to derive the state of the overlap. In general terms, when any included phase is timing its green interval or the controller is advancing from one included phase to another included phase, the overlap will be green. If no included phase is green, then the overlap will be yellow when any included phase is yellow. If no included phase is green or yellow, the overlap will be red. The usual derivation of the overlap state can be altered by more programming in the **Details** tab.

4. Repeat Step 3 as necessary.

5. In the **Included** list on the left of the screen, each Econolite overlap is listed with the phases included in that overlap.

**Note:** To delete an overlap, select the overlap and then select [Remove Selected].

6. Select the **Details** tab and program the selected use of the parameter as described in the table below.



## Notes for Econolite Overlaps

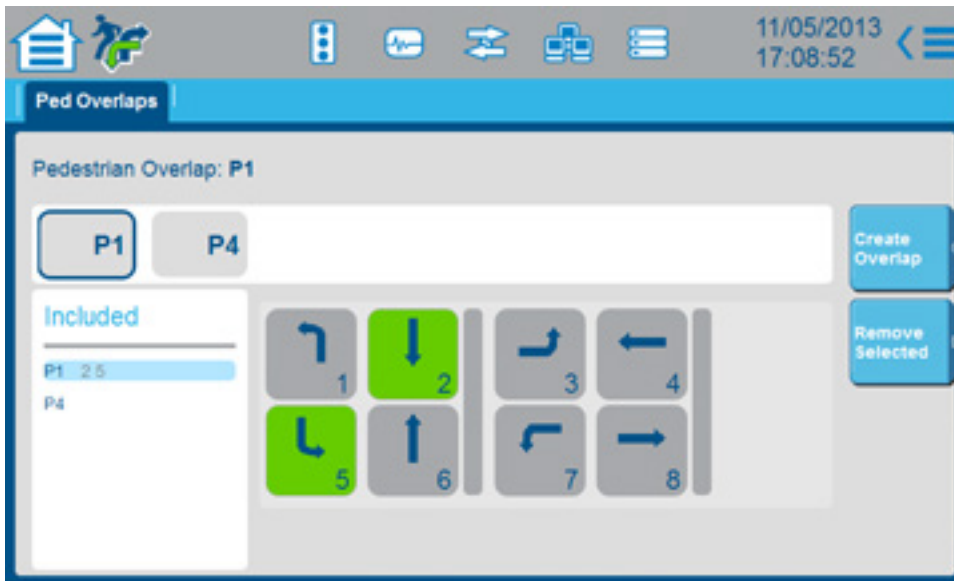
Econolite Overlap Parameter	Description	Range
Protected	<p><b>Protected Overlap</b></p> <p>The Protected Overlap is a movement having a protected green arrow (no conflicting phases timing).</p> <p><b>Note:</b> When a phase has protected overlap phase assignments, Modifier, Lead, and Trailing assignments are ignored (inhibited).</p> <p>Select the phases for this type of overlap.</p>	Phases 1-16
Ped Protected	<p><b>Pedestrian Protected</b></p> <p>The Pedestrian Protect option provides for the specification of phase pedestrian movements that cannot be serviced while the overlap is active. If a pedestrian call is present on a pedestrian protected phase when that phase becomes the phase next selection, the overlap is terminated while the ring transitions from the timing phase to the phase with the protected pedestrian service. If a pedestrian call is not present when the pedestrian protected phase becomes the phase next selection, the overlap remains active if an included phase is timing or a phase next selection. Should a pedestrian call be input while the ring is in yellow change or red clear on the way to the pedestrian protected phase, the overlap is not terminated until the pedestrian protected phase starts and then only if there is enough time to terminate the overlap and time the pedestrian movement before the phase will max out.</p> <p>Select the phases for this type of overlap.</p>	Phases 1-16
Not Overlap	<p><b>Not Overlap</b></p> <p>The Not Overlap option is provided to inhibit the activation of an overlap when selected phases are timing. If an overlap is active when a call is placed on a not overlap phase, the phase is not allowed to time until the overlap is terminated. If the order of rotation would normally allow the not overlap phase to time, overlap termination will be initiated even if an overlap included phase is timing or a phase next selection.</p> <p>Select the phases for this type of overlap.</p>	Phases 1-16

Econolite Overlap Parameter	Description	Range
Lag X Phase	<p><b>Lag (Trailing) Overlap Phase</b></p> <p>The Lag (Trailing) Overlap Phases option identifies which phases are to time programmed trailing green, yellow, and red. If Trailing phases are defined, only those phases will time trailing green, yellow, and red when they advance to yellow change and no other included phase is timing or a phase next selection. If no Trailing phases are defined, then trailing green, yellow, and red are disabled. Select the phases for this type of overlap.</p>	Phases 1-16
Lag 2 Phase	<p><b>Lag 2 Phase</b></p> <p>For Lead Overlap Phases, when the overlap is active, the last timing overlap included phase is advancing to yellow, no included phase is a phase next selection, and a Lead phase (that is not an included phase) is next, trailing green, yellow, and red will be timed. This operation may be thought of as timing a lagging overlap when proceeding to a particular phase.</p> <p>When the overlap is not active and a Lead phase that is an included phase is a phase next selection, overlap advance green will be displayed. Overlap advance green output starts, defined by the ADV GRN time, when the phase of the ring that is transitioning to the included Lead phase begins its yellow service.</p> <p><b>Note:</b> The <b>Adv Grn</b> time takes effect only if the lagging <b>Yellow</b> time is non-zero.</p> <p>Select the phases for this type of overlap.</p>	Phases 1-16
Lag Green, Yellow, Red	<p><b>Lag Green, Yellow, Red</b></p> <p>For Lag (Trailing) Green, Yellow and Red times, normally, if an included phase is terminating and no other included phase is timing or a phase next selection, the terminating included phase yellow and red are also output to the overlap. Trailing Green, Yellow, and Red provide a means of extending the overlap green and then timing a specified yellow and red. When the last timing overlap included phase begins its yellow change, the overlap green interval is extended by the specified Trailing Green time. After Trailing Green has timed, Trailing Yellow and Trailing Red times are used to time the overlap yellow change and red clearance intervals.</p> <p><b>Note:</b> Lagging times take effect only if the if the Green and Yellow entries are both non-zero.</p>	0 to 25.5 seconds
Adv Grn	<p><b>Advance Green</b></p> <p>Advance Green specifies the minimum amount of overlap advance green to be displayed before a phase next selected included lead phase is started. If the amount of advance green is less than the yellow change time and red clear timed by a ring before its phase next included lead phase can be started, the overlap advance green is extended. If the amount of advance green is greater than the yellow change and red clear timed by the ring before the overlap lead phase next selection would normally start, the terminating ring phase red clearance is extended until the advance green time is satisfied.</p> <p>Overlap advance green output starts when the phase of the ring that is transitioning to the included Lead phase begins its yellow service.</p>	0 to 25.5 seconds

Econolite Overlap Parameter	Description	Range
Flash Green	<p><b>Flash Green</b></p> <p>Flash Overlap Green is specified for each included phase of an overlap and defines the rate at which the overlap green interval is to flash when the included phase is timing.</p> <p>For each phase, select a flash rate:</p> <ul style="list-style-type: none"> <li>NF = no flash or phase is not an included phase for the overlap</li> <li>F1 = flash at 1 pps.</li> <li>F2 = flash at 2.5 pps.</li> <li>F5 = flash at 5 pps.</li> </ul> <p>The flash is extended across the transition from one included phase to another included phase if their flash rates are the same.</p> <p>Overlap green will be solid when transitioning between included phases that have different flash rates.</p>	NF, F1, F2, F5



## *Ped Overlaps*



**Note:** For the default Home (Traffic Applications) screen, the **Ped Overlap** icon is not shown. To show this icon:

1. Select +/- in the upper right of the **Home** screen or select **Settings > Application**.
2. Set the **Ped Overlap** icon to Yes.

Use this screen to program Pedestrian Overlaps:

1. Select [Create Overlap]. You can program up to 16 Pedestrian Overlaps, P1 thru P16.

**Note:** In the example screen above, to program the non-consecutive Pedestrian Overlaps, P1 and P4:

Select [Create Overlap] four times until Pedestrian Overlaps P1, P2, P3 and P4 are shown.

Delete the unnecessary overlaps (P2 and P3):

Select each unnecessary overlap.

Select [Remove Selected].

2. Select the phases to include in the overlap.

- The included phases are highlighted in green and listed under Included on the left
- In the example above, Phase 2 and Phase 5 are highlighted and their Pedestrian Overlap is shown to the left as P1 2 5

## Information about Pedestrian Overlaps

Each pedestrian overlap output replaces the selected phase pedestrian output. This gives a total of 16 possible pedestrian overlaps. When a pedestrian overlap programming consists of two or more phases, the overlap operates as follows:

Phase next decision is made at the end of walk. If other rings have pedestrian overlaps, with different walk times and a barrier is being crossed, the phase next decision is made at the end of the longest walk with the other rings being held at the end of walk.

At the end of walk, if the phase next has a pedestrian movement with a demand, which is part of the pedestrian overlap, the pedestrian clearance will not start or time. The phase terminates normally with walk displayed. In a pedestrian overlap, the walk will time in the first phase and every additional phase until a non-included phase next terminates the walk and initiates pedestrian clearance.

Whenever a pedestrian overlap included phase is timing a walk or the controller is transitioning from a walk end condition on a timing phase to a walk service on another overlap included phase, the overlap will display walk. When no ped included phase is timing a walk and is not a phase next selection with a ped call, the overlap will display pedestrian clearance as long as any included ped phase is timing a ped clearance. When all included ped phases are in DONT WALK, the ped overlap will show DONT WALK.

## Preemption

A preemptor can terminate a pedestrian overlap at any time. The preemption can override a preempted phase ped walk and clearance time and those override times will be used to terminate the overlap. The walk and Pedestrian Clearance times are those programmed for the preemptor (**Home > Preemption > Entry > Minimum Phase Service Timings > Pedestrian and Walk**). The pedestrian overlap will terminate even if the phase is halted in red transfer.

## Coordination

If a coordinated phase is part of a ped overlap, the phase must be non-actuated and Walk Rest Modifier must be applied.



Home



Detection

## Vehicle Detection

### Detection

The **Detection** pages configure the detection of the unique geometry of an intersection.

### Vehicle Detection

Use this display to view or edit all of the parameters listed for four Vehicle Plans. It is repeated for plans 2-4 and detectors 2-64.

Detectors are identified by numbers 1 through 64. These are assigned various functions, times, and phases. Detectors must be defined at this data entry page to use for phases and/or logging.

To assign vehicle detectors 1-64 to any of the 16 system detector phases:

1. Select the detector number (Detector).
2. Select the vehicle plan number (Plan).
3. Assign the type of detector (Type).



**Note:** There are 8 Types of Vehicle Detection:

- Standard Delay
- NTCIP
- Green Extension/Delay
- Passage Queue/Stopbar
- Red Extension
- Disconnect Queue/Stopbar
- Calling
- Bike

**Note:** The Vehicle Detection screens are dynamic such that the only parameters shown are those that apply to the Type of vehicle detection you select.

4. Refer to the table below and set the parameters per your application.

### Notes for Vehicle Detection

Vehicle Detection Parameter	Description	Range
Detector	Select the detector to which you want to assign a phase or phases.	1 - 64
Plan	<b>Vehicle Detector Plan Number</b> <b>1</b> NTCIP 1202 2.3.2 <b>2-4</b> ECPI (Econolite) Feature Select the detector plan (1-4) to view or edit.	1 - 4
	<b>Assigned Phase</b> NTCIP 1202 2.3.2.3 Select enable (1-16) or inhibit (0) the phase to which this detector is assigned. <b>0 (zero):</b> Inhibits the detector from calling or extending any phase. This is used when the detector is an NTCIP system detector logging or ECPI system detector exclusively ( <b>Home &gt; Detection &gt; Detector Logging</b> ). <b>1-16:</b> Enables the detector to call and extend that phase depending on programming.	0 - 16

Vehicle Detection Parameter	Description	Range
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Type	<p><b>Detector Type</b></p> <p>Use this menu to select the correct detector type and the associated parameters for your needs. Except for Green Extension/Delay, Passage Queue/Stopbar, and Red Extension, all detectors types are NTCIP 1202 compliant. The un-related NTCIP parameters for each NTCIP 1202 compliant detector type are hidden to reduce programming complexity. NTCIP detector type is retained for backward visual compatibility.</p> <p>In the drop-down menu, select the detector type:</p> <p><b>Standard Delay (with Extend/Delay)</b></p> <p>The detector output will call for the phase(s) and Resets the phase green <b>Vehicle Extension</b> time (<b>Home &gt; Timing Plans &gt; Passage</b>).</p> <p><b>Vehicle Extension</b> time, if used: When there is a gap in the input to this detector this feature extends the output call to the phase(s) by the time that is programmed on the <b>Vehicle Extension</b> time</p> <p><b>Delay Time</b>, if used: Delays the call to the phase (when in yellow or red) until the delay timer times out. Then the detector will call the phase. If the detector call drops and another call is placed, the delay feature will start again.</p> <p><b>NTCIP</b></p> <p>NTCIP defined detector. Supports all NTCIP functionality.</p> <p><b>Note:</b> Passage/Queue and Yellow/Red locks have been combined for ease of programming.</p> <p><b>Green Extension/Delay</b></p> <p>Using this detector type enables the delay timer and extension timer to function during the green time of all assigned phases.</p> <p>The detector extension timer works normally. The first call received when the phase goes green, whether present when green starts or received later, is recognized immediately. Calls received before the extension time gaps out will reset the Extension Time timer. When the extension timer times out, all further calls are delayed by the Delay Timer.</p> <p>The delay timer of this detector does not function during the Not Green time of the assigned phase(s).</p> <p>Delay only works if the assigned phase is green and the extension time is set to zero.</p> <p><b>Passage Queue/Stop Bar</b></p> <p>This is a Stop Bar disconnect detector.</p> <p>This detector will disconnect when there is a gap in the detector input that is greater than the Passage timer.</p> <p><b>Note:</b> For this detector to operate, there must be a call on this detector input before the phase goes green.</p> <p><b>Red Extension</b></p> <p>When you enable this feature, the phase Red Clear interval can be Extended to time up to the Red Max interval programmed in <b>Home &gt; Timing Plans &gt; Clearance</b>.</p>	Standard Delay, NTCIP, Green Extension/Delay, Passage Queue/Stop Bar, Red Extension,
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Vehicle Detection Parameter	Description	Range
Type (cont'd)	<p><b>Disconnect Queue/Stop Bar</b>  This is a Stop Bar disconnect detector.  The reasons this detector will disconnect are:  - There is a Gap to the detector input.  - The detector Disconnect Time times out.  <b>Note:</b> The Disconnect Time should be greater than Zero.  <b>Note:</b> For this detector to operate, there must be a call on this detector input before the phase goes green.</p> <p><b>Calling</b>  Places a call on the phase(s) only when the phase is not Green.</p> <p><b>Bike</b>  Operates like the standard detector but enables the bike minimum green interval when the phase is served. Bike minimum green times concurrently with phase minimum green. During phase green the detector operates in extend mode and phase green is extended by the detector extend time.</p>	Disconnect Queue/Stop Bar, Calling, Bike
Length	<p><b>Effective Trap Length Distance</b>  Enter this length (0-999) in either inches or centimeters.  For one-detector speed trap calculation, it is the effective detection distance from start edge to stop edge of detection.  For two-detector speed trap calculation it is the effective detection distance between two detectors from start edge to start edge of detection.  <b>Note:</b> The effective detection zone will differ from physical length due to a variety of electrical and magnetic factors. Enter the length that produces the most representative speeds.</p>	0-999 Inches 0-999 Centimeters
Length Units	<p>Selects units of inches or centimeters for all parameters related to distance. This affects the calculations display and logging of speed.  In the drop-down menu, select Inch or Cm (centimeters), as applicable.  <b>Note:</b> Inches calculates speed in miles per hour. Centimeters calculates speed in kilometers per hour.</p>	Inch, Cm
Lock In	<p><b>Lock Detector During Phase Yellow or Red</b>  In the drop-down menu, select:  <b>None:</b> Disables: no lock on the detector  <b>Red:</b> Start locking detector on Red when not timing  <b>Note:</b> When set to Red, this sets a Red Smart Lock state in which the detector only locks on Red after the phase stops timing. The red clear interval is not included so an unnecessary call will not remain for a left turn vehicle that is in the intersection during a red clear.  <b>Yellow:</b> Start locking detector on Yellow.</p>	None, Red, Yellow

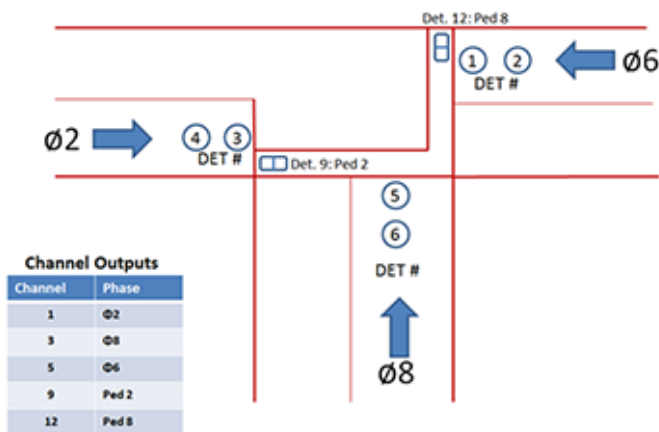
Vehicle Detection Parameter	Description	Range
TS2	<p><b>NEMA TS2 Rack Detector Enable</b>            Allows a NEMA TS1 detector to be installed in the TS2 detector rack without failing because of a failed detector processor. The TS1 rack detector did not have this signal.</p> <p><b>No:</b> The installed detector is not a TS2 detector. The enabled detector and its companion output will not be forced True when a detector process monitor failure is reported. This allows the use of non-NEMA TS2 detectors, such as TS1 detector, in the NEMA TS2 detector rack.</p> <p><b>Yes:</b> The installed detector is a TS2 detector. This and its companion output must comply with the NEMA TS2 specification.</p> <p><b>Note:</b> Detectors are companions (occupy the same detector rack slot) if they are odd-even pair (for example, 5-6 are companions).</p> <p>Non-NEMA TS2 detectors do not supply Processor Monitor, Shorted Loop, Open Loop or Excessive Inductance change information.</p>	Yes, enable No, disable
Also Calls	<p><b>Phases Called By This Detector</b>            This is an ECPI Feature.            Select the phases for this detector to call and extend phases in addition to the assigned phase.</p> <p><b>Note:</b> This is displayed as read-only in a status screen</p> <p>Entries for each of 64 detectors:            NEMA TS1 or TS2 Type controller detectors:  <b>1-8</b> are available on the A, B, C connectors.  <b>9-16</b> are available on the D connector.  <b>17-24</b> are available on the optional 25-pin telemetry module.</p> <p>NEMA TS2 Type 1 and 2 controller detectors:  <b>1-16</b> are available through Det BIU 1.  <b>17-32</b> are available through Det BIU 2.  <b>33-48</b> are available through Det BIU 3.  <b>49-64</b> are available through Det BIU 4.</p>	0 - 16
ECPI Log	<p><b>Log of Detector Activity</b>  <b>Yes:</b> Enables the local logging of this detector volume and occupancy activity  <b>No:</b> Disables</p> <p><b>Note:</b> The period of the log is ECPI Log Period (<b>Home &gt; Detection &gt; Detector Logging</b>) and Detector Logging Interval (<b>Home &gt; Event Plans &gt; Overview</b>) in the Event Plan in effect.</p>	Yes, enable No, disable

Vehicle Detection Parameter	Description	Range
Cross Switch Phase	<p><b>Vehicle Detector Switch Phase</b> Select to enable (1-16) or disable (0) switching of this detector output. <b>1-16:</b> Switches the detector call and vehicle extension time to this phase when the assigned phase is not green and the switch phase is green. <b>Note:</b> When you assign cross switching to a detector, the cross switching is functional for multiple phases assigned to that detector.</p> <p><b>0 (zero):</b> Disables any switching of the detector output. <b>Note:</b> This is suggested for a permissive movement that is allowed to extend with calls from a concurrent phase. The cross-switched Gap Time will never override a greater active vehicle extension timer. If the switch phase reaches a Gap Out state, it can no longer be extended and you should use Simultaneous Gap programming (<b>Home &gt; Phase Order &gt; Simultaneous Gap</b>).</p> <p>When there is a phase switch, the extension timer is included with the call. The timer used for the gap time will always be the greater of the active vehicle extension time and the gap time.</p>	1-16 enable 0 disable
NTCIP Log Volume	<p><b>NTCIP Volume Detector</b> Toggle to enable (Yes) or disable (No) this detector. <b>Yes:</b> Enables this detector to accumulate volume counts according to NTCIP. <b>Note:</b> This is the volume count over the NTCIP Log Period (<b>Home &gt; Detection &gt; Detector Log</b>).</p>	Yes, enable No, disable
Delayed Time	<p><b>Detector Delay Time</b> Use the scrubber or keyboard to define the time (0.0 - 255.0 seconds) that the raw detector input is ignored or delayed when the assigned or called phase(s) is not green. <b>Note:</b> The controller does not skip a phase that has an active but delayed detector. A delayed detector (that has a delay time in this field) is serviced when Dual Entry is enabled (<b>Home &gt; Phase Options &gt; Service &gt; Dual Entry</b>).</p>	0.0 - 255.0 seconds
Extend/ Passage Time	<p><b>Detector Extend/Passage Time</b> Use the scrubber or keyboard to specify the extend time (0.0 to 25.5 or 0 to 255 seconds) that a passage detector extends the assigned phase after termination of the input. <b>Note:</b> The assigned phase may also be extended additionally by the phase extension time (<b>Home &gt; Timing Plans &gt; Passage &gt; Vehicle Extension</b>).</p>	0.0 - 25.5 sec or 0 - 255 sec
NTCIP Log Occupancy	<p><b>NTCIP Occupancy Detector</b> Select to enable (Yes) or disable (No) this detector. <b>Yes:</b> Enables this detector to accumulate occupancy data according to NTCIP. <b>Note:</b> The occupancy count is in .05% counts over the NTCIP Log Period (<b>Home &gt; Detection &gt; Detector Log</b>).</p>	Yes, enable No, disable
Added Initial Calculate	<p><b>Use Added Initial</b> Select to enable (Yes) or disable (No) this detector to accumulate counts used in the added initial calculation by the assigned or called phase(s). Counts are accumulated for a phase from the beginning of the yellow interval, through red, the beginning of the next green interval. <b>Note:</b> The phase uses the most active detector unless the Maximum Added Initial option (<b>Home &gt; Timing Plans &gt; Min Green &gt; Variable Initial Phase</b>) is enabled for the phase. It allows this detection to extend a concurrent timing phase.</p>	Yes, enable No, disable

Vehicle Detection Parameter	Description	Range
Preempt Queue Delay Calculate	<p><b>Preempt Queue Delay Detector Select</b></p> <p>When selected, this detector is used to calculate the wait time of its assigned phase since last demand and the number of actuations (cars waiting) of that phase.</p> <p><b>Note:</b> To use wait times and cars waiting values in preempt, you must set Preempt Queue Delay Calculate here to Yes and also set Queue Delay Recovery to Yes in <b>Home &gt; Preemption &gt; Exit</b>.</p>	Yes, enable No, disable

## Example Configuration

### Basic T-Intersection



Parameter	Value
Detector Type	Standard Delay
Detector #1 and Detector #2	Phase 6
Detector #3 and Detector #4	Phase 2
Detector #5 and Detector #6	Phase 8

## Procedure for Example

1. Select the Type drop-down box.
2. Select Standard Delay.
3. Per the specified configuration, select the **Detector** and **Phase** fields and program them accordingly.
4. Check your entries: step through the Detectors and make sure that the phases are correct.

# Completed Screen for the Example Configuration (Guided Setup Screen)

The screenshot shows a configuration window titled "Vehicle Detection - Program up to 64 vehicle detectors and 4 plans using the type modifiers". The window contains several fields and controls:

- Plan:** 1
- Detector:** 1
- Phase:** 6
- Type:** Standard Delay
- Length:** 0
- Lock In:** none
- TS2:** Yes
- Also Calls:** 6
- ECPI Log:** No
- Cross Switch Phase:** 6
- NTCIP Log Volume:** No
- Delayed Time:** 2
- NTCIP Log Occupancy:** No
- Added Initial Calculate:** No
- Preempt Queue Delay Calculate:** No

At the bottom of the window is a numeric keypad with buttons for digits 0 through 9. The digit '6' is highlighted in green.



Home



Detection

## Ped Detection

The **Detection** pages configure the detection of the unique geometry of an intersection.

### ***Ped Detection***

In this screen, you configure the Pedestrian Detection operation.

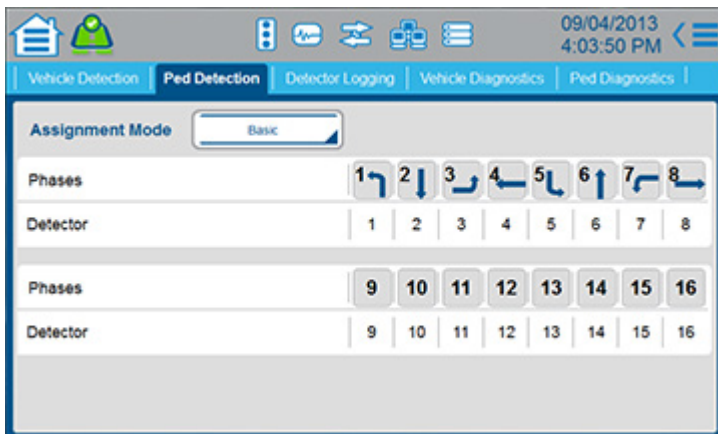
### **Description**

You can select from two modes of operation, as shown below:

Ped Detection Parameter	Description	Range
Assignment Mode	<p><b>Basic:</b> Use this mode to assign multiple phases to a single detector.</p> <p><b>Advanced:</b> This mode gives you more flexibility because you can use it to assign multiple phases to multiple detectors.</p> <p>The data assignment is not interchangeable between these two modes; you must select one or the other.</p> <p>When you change the mode, it is necessary for the system to go through Transaction Mode before it enables the new mode. Select [Commit] to enable the selection to the database.</p>	Basic, Advanced

### **Two Different Screens**

In the **Assignment Mode** drop-down menu, when you select from the two Pedestrian Detector Phase Assignment Modes, **Basic** or **Advanced**, each mode has a different screen as shown below:







## Basic Mode

Assign pedestrian detectors 1-16 to any of the 16 phases.

Basic Parameter	Description	Range
Detector	<p><b>Phase For Pedestrian Detector</b></p> <p><b>1-16:</b> For each phase number (1-16), select the pedestrian detector input number (1-16) for that phase.</p> <p><b>0 (zero):</b> Disables any pedestrian detector input to that phase.</p> <p><b>Note:</b> The same pedestrian detector can be assigned to multiple phases.</p>	<p>1-16</p> <p>0 disables</p>

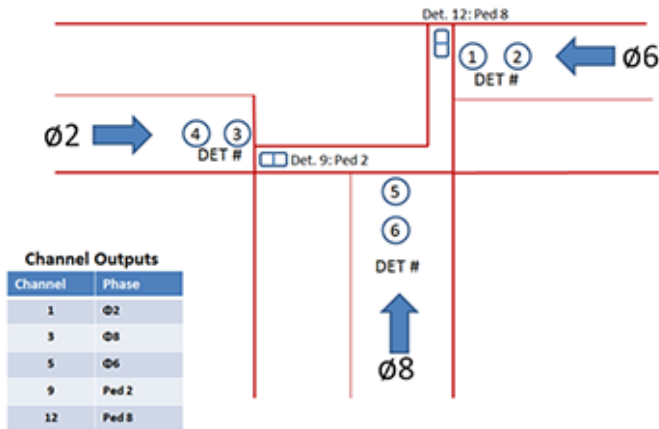
## Advanced Mode

Assign multiple phases to multiple pedestrian detectors.

Advanced Parameter	Description	Range
Phase	<p><b>Phases for the detector to Call</b></p> <p>Select the phase(s) you want each detector to call.</p>	1-16
Type	<p><b>Type of Pedestrian Detector</b></p> <p>In the drop-down menu, select the type of pedestrian detector to call the assigned phase(s).</p> <p>- = No assignment, disabled</p> <p><b>PPB</b> = Assigns Pedestrian Push Button (PPB) to call the phase or phases</p> <p><b>2</b> = Call for Ped timing 2</p> <p><b>B</b> = Allows for the PPB to call for Min Green 2 (Bike Green)</p>	<p>-</p> <p>PPB</p> <p>2</p> <p>B</p>

## Example Configuration

### Basic T-Intersection

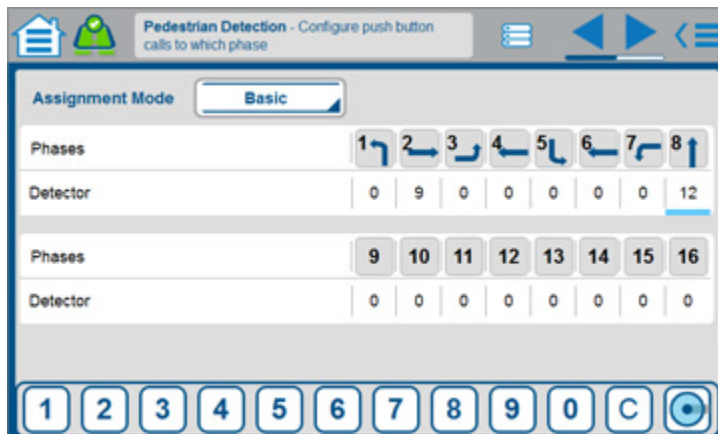


Phase	Detector
Pedestrian 2	Detector #9
Pedestrian 8	Detector #12

### Procedure for Example

1. Per the specified configuration, select the respective **Detector** fields and program them accordingly.
2. There is no need to set the other Detector fields because they are not used.

### Completed Basic Mode Screen for the Example Configuration (Guided Setup Screen)





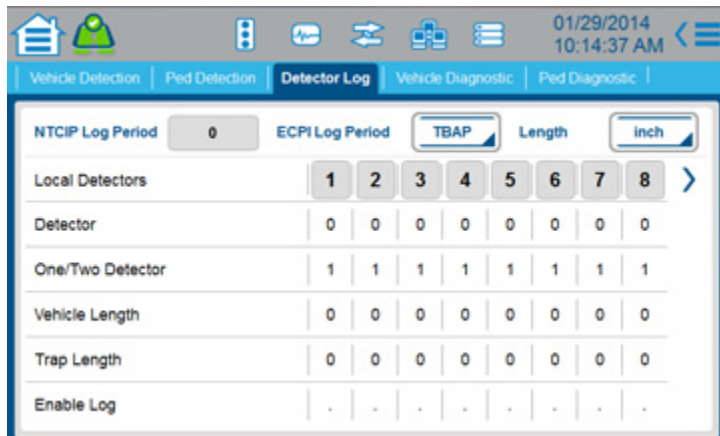
Home



Detection

## Detector Log

### Detector Log



Use this display to view or edit the NTCIP and ECPI Log Period settings and, with horizontal scrolling, view or edit the settings for five different parameters on 16 Speed Detectors.

### Notes for Detector Log

Detector Log Parameter	Description	Range
<b>NTCIP Log Period</b>	<p><b>Period for Logging of NTCIP Detectors</b> Use the scrubber to select the number of seconds in each period of volume and occupancy data collection.</p> <p><b>Note:</b> Observe the programming notes below:</p> <ul style="list-style-type: none"> <li>Changing this entry resets the data collection period and deletes any accumulated data.</li> <li>Only NTCIP Volume or Occupancy enabled detectors will be logged (NTCIP Log Volume and/or NTCIP Log Occupancy set to Yes in <b>Home &gt; Detection &gt; Vehicle Detection</b>).</li> <li>Only the last complete sample is maintained in memory.</li> </ul>	0-255 seconds

Detector Log Parameter	Description	Range
ECPI Log Period	<p><b>Period for Logging of ECPI Log Detectors</b>            In the drop-down menu, select the number of minutes (5, 15, 30, or 60) for local logging of detector data or select TBAP to allow the Time Base Event Plan (TBAP) to select the log interval.</p> <p><b>Note: Observe the programming notes below:</b></p> <ul style="list-style-type: none"> <li>• Changing of this entry will take place when the present log interval is complete.</li> <li>• Only ECPI Log enabled detectors will have volume and occupancy logged.</li> <li>• Only enabled speed detectors will have their speed logged (ECPI Log set to <b>Yes</b> in <b>Home &gt; Detection &gt; Vehicle Detection</b>).</li> <li>• The logs are maintained until the log buffer is full. When full, the log buffer deletes the oldest entry to make space for the newest.</li> </ul>	TBAP=Time Base Event Plan or 5, 15, 30, 60 minutes
Length	<p>Selects units of inches or centimeters for all parameters related to distance. This affects the calculations display and logging of speed.</p> <p>Toggle to select inch or cm (centimeter), as appropriate.</p> <p><b>Note:</b> Inches calculates speed in miles per hour. Centimeters, calculates speed in kilometers per hour.</p>	inch, cm
Detector	<p><b>Speed Detector Local Detector Number</b>            Position the cursor beneath the number (0-16) of the Local Detectors to be edited, then use the scrubber to enter the number (1-64) of the Vehicle Detector to be assigned or enter 0 to disable that Speed Detector.</p> <p><b>Note:</b> Observe the programming notes listed below:</p> <ul style="list-style-type: none"> <li>• Detectors assigned to a phase may be used as a speed detector.</li> <li>• One-detector speed calculation can use even or odd-numbered detectors.</li> <li>• Two-detector speed calculation requires an odd-numbered detector to be assigned. The next even-numbered detector is the second detector for the speed calculations.</li> </ul>	1-64 0 = not active
One/Two Detector	<p>Select 1 or 2 speed calculations for Local Detectors 1-16.</p> <ol style="list-style-type: none"> <li>1. <i>One-detector Speed.</i> The detector encountering a passing vehicle starts a counter by an actuation and stops the counter when it is deactivated. Speed is calculated using the vehicle travel time over the detection zone and the vehicle length.</li> <li>2. <i>Two-detector speed calculation.</i> The first detector encountered by a passing vehicle is the Start Detector and the second is the End Detector. A travel time counter is started by an actuation of the Start Detector and stopped by an actuation of the End Detector. Speed is calculated using the vehicle travel time and distance between detectors.</li> </ol> <p><b>Note:</b> Observe the programming notes below:</p> <ul style="list-style-type: none"> <li>• The Length entry inch calculates speed in miles per hour. cm (centimeters) calculates speed in kilometers per hour.</li> <li>• Speed that reads back to the arterial master is used to generate a log of speed readings in low, nominal, and high speed bands.</li> </ul>	1 or 2
Vehicle Length	<p><b>Average Vehicle Length</b>  <b>0-999:</b> Use the keyboard or scrubber to enter the average vehicle length in centimeters or inches encountered in the traffic lane for one-detector speed calculations.</p> <p><b>Note:</b> This length is used in conjunction with the effective length of the detection zone (Trap Length) and the time that the detector is occupied to determine the one-detector speed.</p>	0-999 inches 0-999 cm.

Detector Log Parameter	Description	Range
<b>Trap Length</b>	<p><b>0-999:</b> The effective Trap Length distance.</p> <p>For one-detector speed trap calculation, it is the effective detection distance from start edge to stop edge of detection.</p> <p>For two-detector speed trap calculation it is the effective detection distance between two detectors from start edge to start edge of detection.</p> <p><b>Note: The effective detection zone will differ from physical length due to a variety of electrical and magnetic factors. Enter the length that produces the most representative speeds.</b></p>	<p>0-999 inches 0-999 cm.</p>
<b>Enable Log</b>	<p><b>Enable Speed Trap Log</b></p> <p><b>X:</b> Enables local logging of speed data (select On). .: Disables logging (select Off).</p>	<p>X enables . disables</p>



Home



Detection

## Vehicle Diagnostic

### Vehicle Diagnostic

The screenshot shows a mobile application interface for 'Vehicle Diagnostic'. At the top, there is a navigation bar with icons for Home, Detection, and other functions. Below the navigation bar, there are tabs for 'Vehicle Detection', 'Ped Detection', 'Detector Log', 'Vehicle Diagnostic', and 'Ped Diagnostic'. The main content area contains several input fields: 'Plan Number' (set to 1), 'Detector' (set to 1), 'Erratic Counts' (0), 'No Activity' (0), 'Max Presence' (0), 'Fault Time Multiplier' (1), 'Fail Time' (255), and 'Call Delay' (0). The date and time '01/29/2014 10:18:23 AM' are displayed in the top right corner.

Screen above is repeated for Plan Numbers 2 thru 4.

#### For this screen:

1. Enter vehicle diagnostic Plan Number to view or edit.
2. As explained in the descriptions in the table below, for each of 64 detectors (Detector field), enter necessary diagnostic parameters in the Erratic Counts, No Activity, Max Presence, Fault Time Multiplier, Fail Time, and Call Delay fields.

**Note:** The Detector Diagnostic Plans are enabled by the Time Base Event Plan.

#### Notes for Vehicle Diagnostic

Vehicle Diagnostic Parameter	Description	Range
<b>Plan Number</b>	In the drop-down menu, select the number (1-4) of the Vehicle Diagnostics Plan to view or edit.	1-4
<b>Detector</b>	<b>Vehicle Detector Number</b> Use the keyboard or scrubber to select the desired detector number (1-64).	1-64
<b>Erratic Counts</b>	<b>Vehicle Erratic Counts</b> <b>1-255:</b> Specifies the vehicle detector Counts Per Minute (CPM) that, when exceeded, logs a failed vehicle detector if logging is enabled. <b>0 (zero):</b> Disables this diagnostic calculation for that vehicle detector.	1-255 CPM 0 disables

Vehicle Diagnostic Parameter	Description	Range
<b>No Activity</b>	<p><b>Vehicle No-Activity</b></p> <p><b>1-255 minutes:</b> Time interval between vehicle detections that, when exceeded, logs a failed vehicle detector if logging is enabled.</p> <p><b>0 (zero):</b> Disables the No Activity diagnostic.</p>	0-255 min.
<b>Max Presence</b>	<p><b>Vehicle Maximum Presence</b></p> <p><b>1-255 minutes:</b> Time for continuous vehicle detection that when exceeded, logs a failed vehicle detector if logging is enabled.</p> <p><b>0 (zero):</b> Disables Maximum Presence diagnostic.</p>	0-255 min.
<b>Fault Time Multiplier</b>	<p><b>Multiplier (Scaling Factor)</b></p> <p>Determines length of the No-Activity and Maximum Presence periods.</p> <p><b>1, 2, 15, 60:</b> No-Activity and Maximum Presence periods that have values between 1 and 255 minutes will be multiplied by these values resulting in desired period length.</p> <p><b>Examples:</b></p> <p>No Activity period = 60 min, Multiplier = 2. Result: No Activity is reported if detector is inactive for (60 x 2) or 120 minutes.</p> <p>Maximum Presence period = 50 sec, Multiplier = 15. Result: Max presence failure is reported if detector is active for (50 x 15) or 750 minutes.</p>	1, 2, 10, 15, 60
<b>Fail Time</b>	<p><b>Failed Detector Extend Time</b></p> <p>Use the keyboard or scrubber to specify the time (0-255 seconds) the failed detector can extend the assigned phase.</p> <p><b>1-254:</b> Allows the failed detector to call and extend the assigned phase for the programmed time.</p> <p><b>255:</b> Places a max recall on the phase.</p> <p><b>0 (zero):</b> Disables the failed detector from calling or extending the assigned phase.</p> <p><b>Note:</b> NTCIP 1202 2.3.2.12 Bits 0-3 defines an NTCIP failed detector. Bit 7 defines a detector that failed the internal detector diagnostics (MM-6-6).</p>	0-255 seconds
<b>Call Delay</b>	<p><b>Failed Detector Delay Time</b></p> <p>Use the keyboard or scrubber to specify the time (0-255 seconds) that a failed detector will be delayed.</p> <p><b>1-255:</b> Defines the time that a failed detector will not put a call on the assigned phase after it terminated green.</p> <p><b>0 (zero):</b> Disables the delay.</p>	0-255 seconds



Home



Detection

## Ped Diagnostic

### Ped Diagnostic

The screenshot shows a software interface for 'Ped Diagnostic'. At the top, there is a navigation bar with icons for Home, Detection, and other functions, along with a date and time display (01/29/2014 10:32:06 AM). Below the navigation bar, there are tabs for 'Vehicle Detection', 'Ped Detection', 'Detector Log', 'Vehicle Diagnostic', and 'Ped Diagnostic'. The main content area contains several input fields: 'Plan Number' (a dropdown menu set to '1'), 'Ped Detector' (a dropdown menu set to '1'), 'Erratic Counts' (a text input field set to '0'), 'No Activity' (a text input field set to '0'), 'Max Presence' (a text input field set to '0'), and 'Fault Time Multiplier' (a dropdown menu set to '1').

Screen above is repeated for plan numbers 2 thru 4.

### For this screen:

1. Enter the pedestrian diagnostic Plan Number (1-4) to view or edit.
2. As explained in the descriptions in the table below, for each of 16 detectors (Ped Detector Field), enter the necessary diagnostic parameters in the Erratic Counts, No Activity, Max Presence, and Fault Time Multiplier fields.

**Note:** The Detector Diagnostic Plans are enabled by the Time Base Event Plan.

### Notes for Ped Diagnostic

Ped Diagnostic Parameter	Description	Range
<b>Plan Number</b>	In the drop-down menu, select the number (1-4) of the Pedestrian Diagnostic Plan to view or edit.	1-4
<b>Ped Detector</b>	<b>Pedestrian Detector Number</b> Use the keyboard or scrubber to select the desired detector number (1-16).	1-16
<b>Erratic Counts</b>	<b>Pedestrian Erratic Counts</b> <b>1-255:</b> Specifies the pedestrian detector Counts Per Minute (CPM) that, when exceeded, logs a failed pedestrian detector if log is enabled. <b>0 (zero):</b> Disables this diagnostic calculation for the pedestrian detector.	0-255 CPM



Ped Diagnostic Parameter	Description	Range
<b>No Activity</b>	<p><b>Pedestrian No-Activity</b>  <b>1-255 minutes:</b> Time interval between pedestrian detections that, when exceeded, logs a failed pedestrian detector if logging is enabled.  <b>0 (zero):</b> Disables the No Activity diagnostic.</p>	0-255 min.
<b>Max Presence</b>	<p>Pedestrian Maximum Presence  <b>1-255 minutes:</b> Time for continuous pedestrian detection, that when exceeded, logs a failed pedestrian detector if logging is enabled.  <b>0 (zero):</b> Disables Maximum Presence diagnostic.</p>	0-255 min.
<b>Fault Time Multiplier</b>	<p><b>Multiplier (Scaling Factor)</b>  Determines the length of the No-Activity and Maximum Presence periods.  <b>1, 2, 10, 15, 60:</b> No-Activity and Maximum Presence periods that have values between 1 and 255 minutes are multiplied by these values resulting in period length.  <b>Examples:</b></p> <ul style="list-style-type: none"> <li>No Activity period = 60 min, Multiplier = 2. Result: No Activity is reported if detector is inactive for (60 x 2) or 120 minutes.</li> <li>Maximum Presence period = 50 min, Multiplier = 15. Result: Max presence failure is reported if detector is active for (50 x 15) or 750 minutes.</li> </ul>	1, 2, 10, 15, and 60



Home



Flash

## General Flash

### Flash

#### General Flash

The screenshot shows a mobile application interface for configuring flash settings. At the top, there is a navigation bar with a home icon, a gear icon, and a date/time display (12/30/2013 3:43:38 PM). Below the navigation bar, there are three tabs: "General Flash", "Startup Flash", and "Automatic Flash". The "General Flash" tab is selected. The main content area contains the following settings:

- MUTCD 2009**: A toggle switch set to "No".
- Yellow > Green**: A toggle switch set to "No".
- All Red Time**: An empty input field.
- Channels Flash Together**: A grid of 16 checkboxes, numbered 1 through 16, all of which are currently unchecked.

## Notes for General Flash

General Flash Parameter	Description	Range
MUTCD-2009	<p>MUTCD = Manual on Uniform Traffic Control Devices</p> <p><b>No:</b> Econolite Flash Operation that affects Startup, Automatic and Preempt Flash operations.</p> <p><b>Yes:</b> MUTCD-2009 Flash Operation that affects Startup, Automatic and Preempt Flash operations.</p> <p>MUTCD Operation specifies these phase sequences for the respective initial flashing color:</p> <p><b>Flashing Red</b></p> <ol style="list-style-type: none"> <li>1. Flashing Red</li> <li>2. Solid Red (all phases)</li> <li>3. Start Phases</li> </ol> <p><b>Flashing Yellow</b></p> <ol style="list-style-type: none"> <li>1. Flashing Yellow</li> <li>2. Solid Yellow (same phase as Flashing Yellow)</li> <li>3. Solid Red (all phases)</li> <li>4. Start Phases</li> </ol> <p><b>Flashing Yellow</b> (when <b>Yellow &gt; Green</b> in this screen is set to <b>Yes</b>)</p> <ol style="list-style-type: none"> <li>1. Flashing Yellow</li> <li>2. Solid Green (same phase as the Flashing Yellow)</li> </ol> <p><b>Programming that is affected by this parameter:</b></p> <ul style="list-style-type: none"> <li>• Startup and Automatic Flash (<b>Home &gt; Flash &gt; Startup Flash</b> and <b>Home &gt; Flash &gt; Automatic Flash</b>)</li> <li>• Startup Flash All Red time, 6 sec default</li> <li>• Startup Flash Phases (Yellow is not allowed)</li> <li>• Automatic Flash Exit Color (Yellow is not allowed)</li> </ul> <p>Consistency Checks have been added to prevent database entries that would allow incorrect MUTCD operation.</p> <p><b>External Start application:</b></p> <ul style="list-style-type: none"> <li>• In general, applying External Start will force the controller to its All Red Startup state and wait until External Start is released.</li> <li>• However, applying External Start during Preempt will first force the controller to Fault Flash state which drops CVM. Fault Flash will continue until External Start and All Preempt inputs are removed, at which point the controller will time its All Red Startup state and then start its programmed start phases.</li> <li>• When External Start is applied during Startup Flash, the controller will complete the flash time and then wait in MUTCD Red until External Start is released.</li> </ul>	Yes, enable No, disable
Yellow > Green	<p>For this parameter to operate, the MUTCD 2009 parameter must be enabled (set to Yes).</p> <p>Refer to the detailed explanation of this in the MUTCD 2009 description above.</p> <p><b>Yes</b> = Enables MUTCD 2009 Yellow &gt; Green for Flashing Yellow</p> <p><b>No</b> = Disables MUTCD 2009 Yellow &gt; Green for Flashing Yellow</p>	Yes, enable No, disable

General Flash Parameter	Description	Range
All Red Time	<p>For this parameter to operate, the MUTCD 2009 parameter must be enabled (set to Yes).</p> <p><b>All Red Interval Time After Flash</b> Time during which all phases are red after a flash condition except preempt flash.</p> <p><b>Note:</b> MUTCD 2009 requires the controller to exit red/red-flash to a minimum of 6 seconds of all red. To meet the MUTCD requirement, you must set this parameter to 6 seconds or greater. The MUTCD default time is 6 seconds. This function was mandatory as of December 2013, although many agencies required it before that date.</p> <p><b>Note:</b> If the intersection cabinet is equipped with an MMU or CMU that latches Fault Monitor (FM) or Controller Voltage Monitor (CVM), the monitor power-on flash time must be set to 9 seconds or larger.</p>	0-255 sec.
Channels Flash Together	For your application, <b>check</b> the channels whose phases should flash together.	Checked, Un-Checked



Home



Flash

## Startup Flash

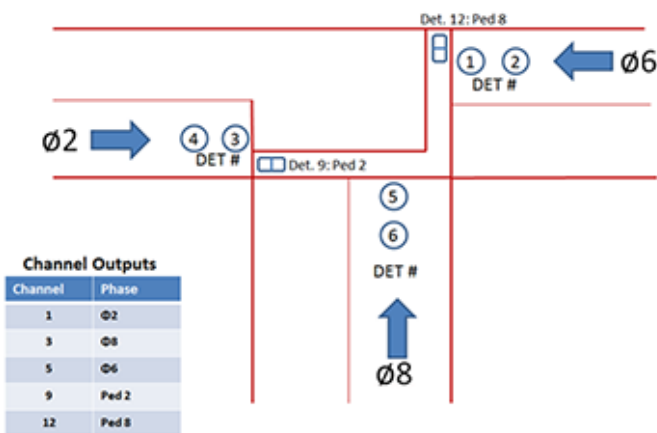
### Startup Flash

The **Startup Flash** pages describe how to exit flashing signal operations, how they flash, and the startup phase(s) and color.

Configure the Startup Flash and External Start behavior.

### Example Configuration

#### Basic T-Intersection



Startup Flash Parameter	Value
Start Sequence	1
Flash Time	6 Seconds
All Red Time	6 Seconds
Flash Relay	No
Startup Phase	8 Green
Flash Color	Channels 1, 5 Yellow (Phases 2 and 6)

## Procedure for Example

### Start Sequence

1 is the default

### Flash Time

Enter **6**

### All Red Time

**6** is the default

### Flash Relay

**No** is the default (**No** = flash through the Load Switches, a Soft Flash; **Yes** = flash through the CVM).

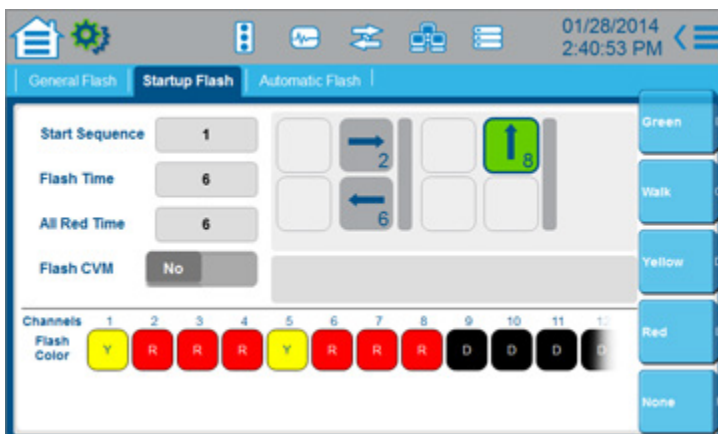
### Startup Phases

1. For default Yellow Phases **2** and **6**, select them in turn and select **[None]**
2. For each phase you set, select **[Commit]** or select **[Commit]** once done programming.
3. Select Phase **8**
4. Select **[None]**

### Flash Color

1. In turn, select Channel **1** then **5** and select **[Yellow]** for each
2. For each channel you set, select **[Commit]**
3. Except for Channel 9 thru **12 (Dark)** set the other channels to **Red**. To access channels **13** thru **16**, swipe the screen to the left.

## Completed Screen for the Example Configuration



## Notes for Startup Flash

Startup Flash Parameter	Description	Range
Start Sequence		1 - 16 or 17 - 20
Flash Time		0 - 255 seconds
All Red Time		0 - 255 seconds
Flash CVM	Select the path of the Startup Flash	No = Through Load Switches Yes = Through Controller Voltage Monitor (CVM)
Power Start Phase Interval		Green, Walk, Yellow, Red, None
Start Up Overlap		0 - 255 actuations

### General Notes for Startup Flash & Automatic Flash Screens

The layout of the phases in the screen:

- They are in barrier groups, separated by a vertical bar.
- The top row is Ring 1 and the bottom row is Ring 2

When programming the phases, remember:

- You can have one phase per ring.
- For two phases:
  - One must be in Ring 1 and the other in Ring 2
  - They must be in the same barrier group

You cannot put two phases in different barrier groups.

**Flash Color (for load switch power up only)** -The flash color buttons represent Channels 1 thru 16.

Because channels 9 thru 12 are pedestrians and overlaps, they are programmed as **Dark**.

**Red:** Indicates that the channel will flash red. These load switches must represent compatible MMU channels.

**Dark:** Indicates that the channel will be dark.

**Yellow:** Indicates that the channel will flash yellow. These load switches must represent compatible MMU channels.

**Automatic:** Indicates that the channel color will follow Automatic Flash. If any PWR is programmed R or Y, then the controller cannot have A programmed for any other PWR channels.

**Important:** It is your responsibility to match this Flash Color load switch setting with the actual cabinet flash output.



Home



Flash

## Automatic Flash

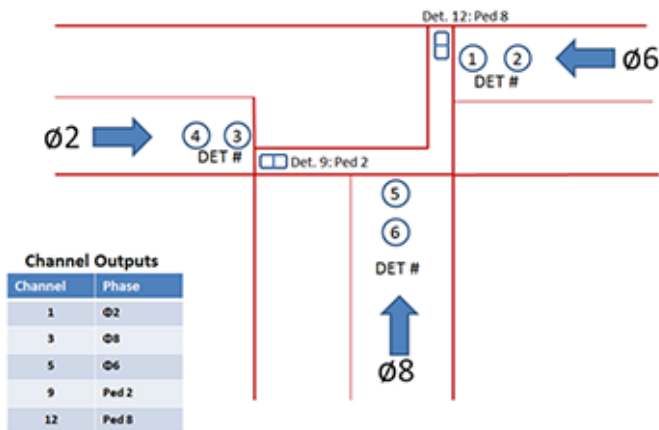
### Automatic Flash

The Automatic Flash pages describe how to exit and enter automatic flashing signal operations along with how they flash.

In this screen, you configure the Automatic Flash entrance and exit behavior.

### Example Configuration

#### Basic T-Intersection



Automatic Flash Parameter	Value
Direct to Entry Phase flash	Phase 8
Exit to Walk	Phase 8
Flash Color	Channel 1 and Channel 5 both Yellow

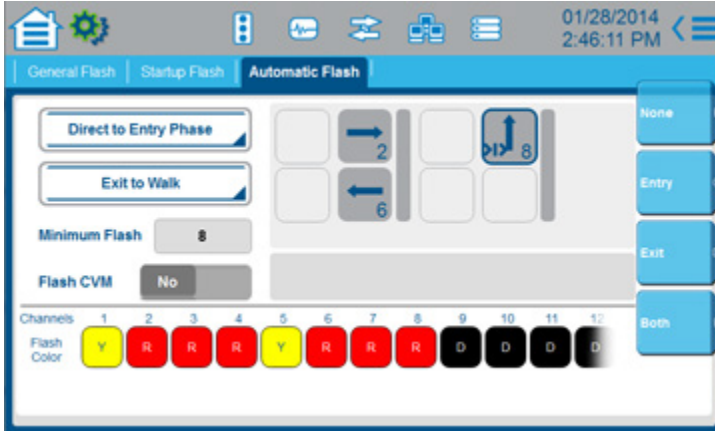
### Procedure for Example

1. In the drop-down menus, select **Direct to Entry Phase** and **Exit to Walk**
2. For default Entry and Exit Phases **2** and **6**, select them in turn and select **[None]**
3. For each phase you set, select **[Commit]**
4. Select Phase **8**



5. Select **Both** (Entry and Exit). Notice the blue arrow heads show entry and exit directions.
6. Select [**Commit**]
7. In turn, select Channel 1 and 5 and select [**Yellow**]
8. For each channel you set, select [**Commit**] or select [**Commit**] when done programming.

## Completed Screen for the Example Configuration



### For the Automatic Flash Screen

#### Entry Behavior Selection drop-down list:

- Direct to Entry Phase (default)
- Active Calls to Entry
- Recalls Until Entry
- All Phases Once Entry

#### Exit Behavior Selection drop-down list:

- Ignore Exit Phases
- Exit to Walk (default)
- Exit to Green
- Exit to Yellow
- Exit to Red

## Notes for Automatic Flash

Automatic Flash Parameter	Description	Range	
Entry Behavior (drop-down menu)	Direct to Entry Phase (default)		
	Active Calls to Entry		
	Recalls Until Entry		
Exit Behavior (drop-down menu)	All Phases Once Entry		
	Exit to Walk (default)		
	Exit to Green		
	Exit to Yellow		
	Exit to Red		
	Minimum Flash		
	Flash CVM	Select the path of the Power Start Flash	No = Through Load Switches Yes = Through Controller Voltage Monitor (CVM)
In the phase diagram	Entry/Exit phase assignment	Select for each phase if it is an Entry and/or Exit phase	None, Entry, Exit, Both
	Flash Color		

## General Notes for Startup Flash & Automatic Flash Screens

The layout of the phases in the screen:

- They are in barrier groups, separated by a vertical bar.
- The top row is Ring 1 and the bottom row is Ring 2

When programming the phases, remember:

- You can have one per ring phase.
- For two phases:  
One must be in Ring 1 and the other in Ring 2  
They must be in the same barrier group

You cannot put two phases in different barrier groups.

**Flash Color (for load switch power up only)** -The flash color buttons represent Channels 1 thru 16.

Channels 9 thru 12 are pedestrians and overlaps so they are programmed as **Dark**.

**Red:** Indicates that the channel will flash red. These load switches must represent compatible MMU channels.

**Dark:** Indicates that the channel will be dark.

**Yellow:** Indicates that the channel will flash yellow. These load switches must represent compatible MMU channels.

**Automatic:** Indicates that the channel color will follow Automatic Flash. If any PWR is programmed R or Y, then the controller cannot have A programmed for any other PWR channels.

**Important:** It is your responsibility to match this Flash Color load switch setting with the actual cabinet flash output.



Home



Timing  
Plans

Min Green

## Timing Plans

### Min Green

The Phase interval timers are programmed in this page.

The parameters in this screen:

Timing Plan (1 - 4)

Minimum Green (0 - 255 seconds)

Bike Minimum Green (0 - 255 seconds)

Conditional Service Minimum Green (0 - 255 seconds)

Delayed Green (0 - 255 seconds)

Variable Initial Phase:

Actuations before incrementing actu... (0 - 255 actuations)

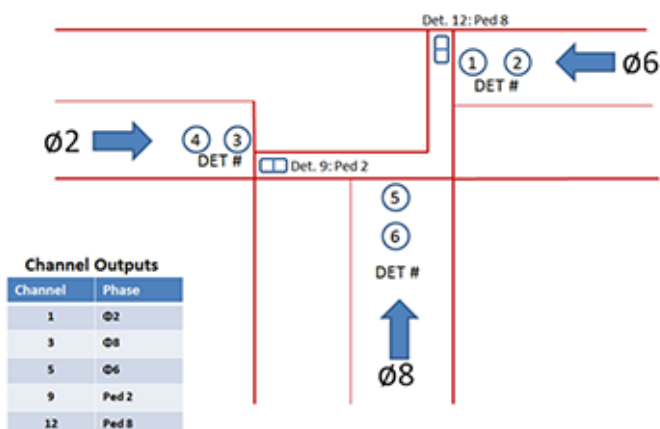
Seconds per Actuation (0 - 25.5 seconds)

Maximum Added Initial (0 - 255 seconds)

Define initial phase timing (green or delayed) intervals in the rows below.

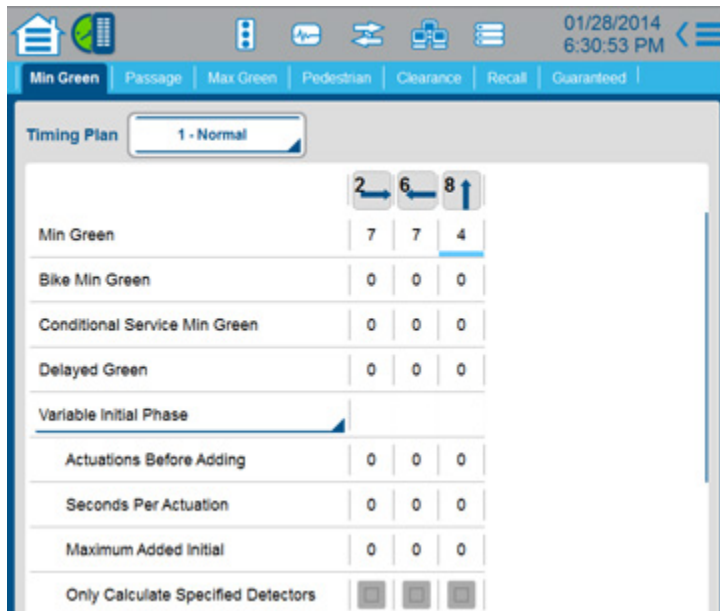
### Example Configuration

#### Basic T-Intersection



Parameter	Phase 2	Phase 6	Phase 8
Min Green	7 seconds	7 seconds	4 seconds

## Completed Screen for the Example Configuration



## Notes for Minimum Green (initial green) Timing Plans

Min Green Parameter	Description	Range
Timing Plan	Use the drop-down menu to select a timing plan. To name the timing plan, go to <b>Options &gt; Rename Plan</b> .	1 - 4
Minimum Green	The shortest possible vehicle green time, before any added initial or vehicle extensions. <b>Note:</b> Actual minimum green indication is the longest of the minimum green plus any added initial, vehicle extension, bike minimum green, ped walk plus ped clearance, or guaranteed minimum green*.	0 - 255 seconds
Bike Minimum Green	The minimum green due to a bike detector call. Bike minimum green has no effect if the phase has no bike detector input.	0 - 255 seconds
Conditional Service Minimum Green	The minimum green time for a phase being conditionally serviced.	0 - 255 seconds
Delayed Green	The time that the vehicle green indication is delayed from the start of the walk interval. The delay is ignored if there is no pedestrian service call when the phase is started. If the delay time is greater than the Walk time, the walk is extended to the end of delay green.	0 - 255 seconds
<b>Variable Initial Phase</b>		
Actuations Before Adding	Number of actuations that must be received during the phase yellow and red intervals before seconds per actuation time is added to initial green.	0 - 255 actuations
Seconds per Actuation	Time by which the phase added initial time period is increased from zero for each vehicle actuation received during the phase yellow and red intervals that exceed the Actuations Before limit.	0 - 25.5 seconds

Min Green Parameter	Description	Range
Maximum Added Initial	Maximum time that added initial green can attain. The number of vehicle actuations received during a phase yellow and red intervals multiplied by the seconds per actuation time cannot exceed this time.	0 - 255 seconds
Only Calculate Specified Detectors	<b>Check:</b> Do calculations for this detector <b>No Check:</b> Do not do calculations for this detector	Checked (Yes) No Check (No)

\* Guaranteed minimum values are programmed in **Home > Timing Plans > Guaranteed**



Home



Timing  
Plans

## Passage

### Passage

The Phase interval timers are programmed in this page.

Define the time it takes a vehicle to pass over the detector and through the intersection.

The parameters in this screen:

Timing Plan (1 - 4)

Vehicle Extension (0.0 - 25.5 seconds)

Volume Density

Time Before Reduction (1 - 255 seconds, 0 disables)

Cars Waiting (1 - 255 seconds, 0 disables)

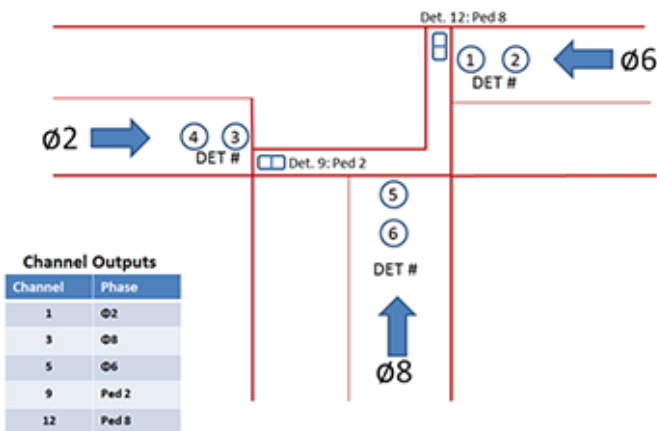
Steps to Reduce (0.1 - 25.5 seconds/step, 0 = linear)

Time to Reduce (1 - 255 seconds, 0 disables)

Minimum Gap Time (0.0 - 25.5 seconds)

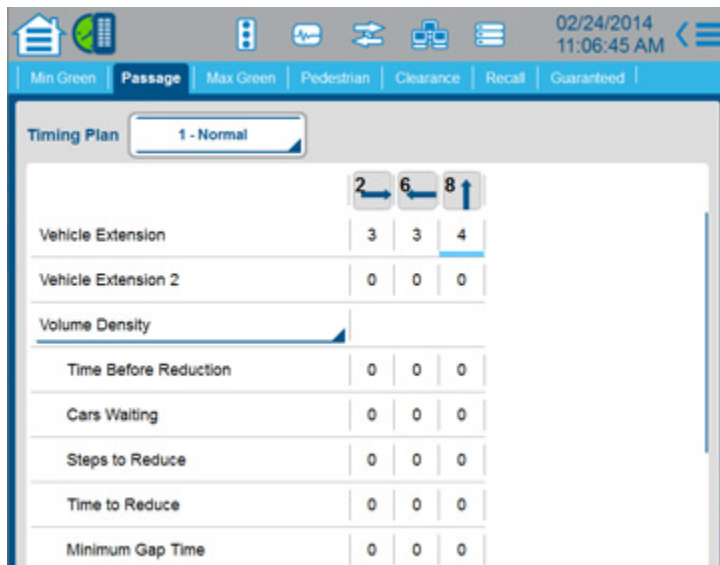
### Example Configuration

#### Basic T-Intersection



Passage Parameter	Phase 2	Phase 6	Phase 8
Vehicle Extension	3 seconds	3 seconds	4 seconds

## Completed Screen for the Example Configuration



## Notes for Passage Timing Plans

Passage Parameter	Description	Range
Timing Plan	Use the drop-down menu to select a timing plan. To name the timing plan, go to <b>Options &gt; Rename Plan</b> .	1 - 4
Vehicle Extension	<b>Phase Vehicle Extension (Preset Gap, Passage Time).</b> When minimum green finishes timing, the green interval is allowed to extend for a length of time equal to maximum time in effect. Actual length of extension period depends on this phase vehicle extension time, frequency of vehicle actuations and minimum gap setting. Detector-by-Detector extension time can be set in the vehicle detector setup screen ( <b>Home &gt; Detection &gt; Vehicle Detection</b> ).	0.0 - 25.5 seconds
Vehicle Extension 2	<b>Phase Vehicle Extension 2.</b> Vehicle Extension period 2 operates like Vehicle Extension. Vehicle Extension 2 replaces Vehicle Extension when it is enabled by the selected time-base Event Plan ( <b>Home &gt; Scheduler &gt; Calendar Events</b> ).	0.0 - 25.5 seconds
<b>Volume Density drop-down menu</b>		
Time Before Reduction	Length of time before start of gap reduction. Begins timing when phase is green and there is a conflicting serviceable call. <b>Note:</b> Start of gap reduction (time to reduce or step to reduce) is initiated by <b>Time Before Reduction</b> or <b>Cars Waiting</b> , whichever reaches its programmed value first.	1 - 255 seconds, 0 disables
Cars Waiting	<b>Cars Waiting Before Reduction.</b> Number of vehicle detections that have been recorded on all conflicting phases during their yellow and red intervals. <b>Note:</b> Start of gap reduction (time to reduce or step to reduce) is initiated by <b>Time Before Reduction</b> or <b>Cars Waiting</b> , whichever reaches its programmed value first.	1 - 255 seconds



Passage Parameter	Description	Range
Steps to Reduce	<p>Step reduction: When gap reduction starts and <b>Steps to Reduce</b> is not zero, <b>Time to Reduce</b> multiplied by 10 is divided by <b>Steps to Reduce</b> to calculate the number of 1/10 second cycles timed between each reduction step. By the time the <b>Time to Reduce</b> interval has completed its timing, vehicle extension in effect will have been reduced the <b>Minimum Gap Time</b>.</p> <p>Linear reduction: When gap reduction starts and <b>Steps to Reduce</b> is zero, <b>Minimum Gap Time</b> is subtracted from the vehicle extension in effect and that value is divided by the product of <b>Time to Reduce</b> multiplied by 10. The result is subtracted from vehicle extension in effect every 1/10 second until vehicle extension in effect is reduced to the <b>Minimum Gap Time</b>.</p>	0.1 - 25.5 seconds/step 0 = linear
Time to Reduce	Length of time between the start and end of gap reduction. During the Time to Reduce interval, the vehicle extension in effect is reduced from its initial time down to the specified <b>Minimum Gap Time</b> .	1 - 255 seconds 0 disables
Minimum Gap Time	Minimum vehicle extension to be timed for each vehicle actuation. If the minimum vehicle extension times out before a vehicle actuation is received and the timer is restarted, gap out occurs.	0.0 - 25.5 seconds



Home



Timing Plans

## Max Green

### Max Green

The Phase interval timers are programmed in this page.

Define the maximum green times that can be timed when selected:

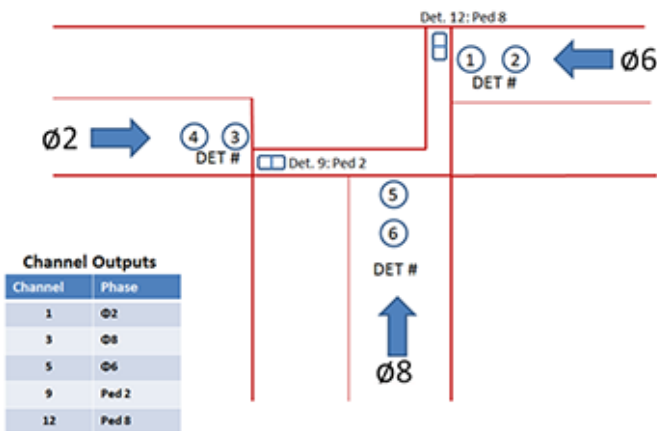
- Event Plans (Max 2,3) or
- Consecutive Max-Outs (Dynamic)

The parameters in this screen:

- Timing Plan (1 - 4)
- Maximum Green 1 (0 - 255 seconds)
- Maximum Green 2 (0 - 255 seconds)
- Maximum Green 3 (0 - 255 seconds)
- Dynamic Maximum (0 - 255 seconds, 0 disables)
- Dynamic Step (0.0 - 25.5 seconds)

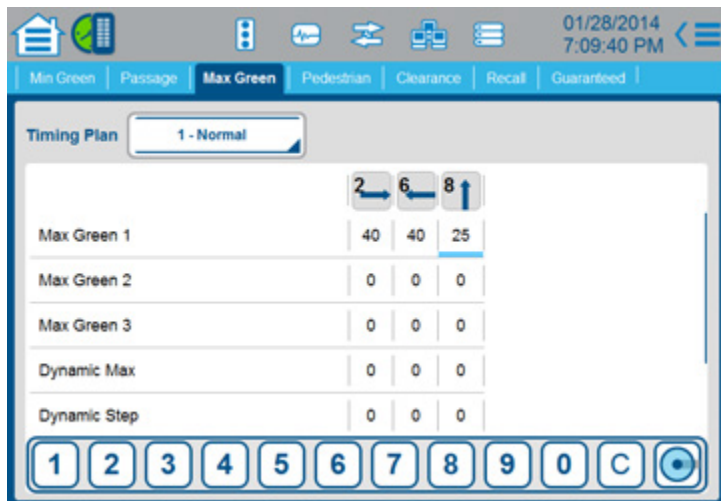
### Example Configuration

#### Basic T-Intersection



Max Green Parameter	Phase 2	Phase 6	Phase 8
Max Green 1	40 seconds	40 seconds	25 seconds

## Completed Screen for the Example Configuration



## Notes for Max Green Timing Plans

Max Green Parameter	Description	Range
Timing Plan	Use the drop-down menu to select a timing plan. To name the timing plan, go to <b>Options &gt; Rename Plan</b> .	1 - 4
Maximum Green 1	Maximum green time allowed in the presence of an opposing call. <b>Note:</b> The higher numbered maximum green selected is in effect.	0 - 255 seconds
Maximum Green 2	Maximum green time allowed in the presence of an opposing call. <b>Note:</b> The higher numbered maximum green selected is in effect.	0 - 255 seconds
Maximum Green 3	Maximum green time allowed in the presence of an opposing call. <b>Note:</b> The higher numbered maximum green selected is in effect.	0 - 255 seconds
Dynamic Maximum	Determines the upper limit of the running max time. The max in effect (Maximum 1, 2, or 3) determines the other limit. When a phase maxes out twice in a row, and on each successive max out thereafter, the running max is incremented one dynamic max step until it reaches the dynamic maximum upper limit. When a phase gaps out twice in a row, and on each successive gap out thereafter, the running max is decremented one dynamic max step until it reaches the dynamic maximum lower limit. If a phase gaps out in one cycle and maxes out in the next cycle, or vice versa, the running max is not changed. Refer to Phase Dynamic Max Limit described in NTCIP 1202 paragraph 2.2.2.17 for a more complete explanation. <b>Note:</b> When Dynamic Maximum is not used (Dynamic Maximum = 0), the maximum green time is equal to the selected max timer (Maximum 1, 2 or 3).	0 - 255 seconds 0 disables
Dynamic Step	The amount of time that the running max time is increased or decreased by max or gap out. Refer to Phase Dynamic Max Step described in NTCIP 1202 paragraph 2.2.2.18 for a more complete explanation.	0.0 - 25.5 seconds



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**Pedestrian**

## ***Pedestrian***

The Phase interval timers are programmed in this page.

Define the Pedestrian times and use Walk 2 for special Event Plan or Detector actuation. Extension times are for Ped Extend input limits.

The parameters in this screen:

Timing Plan (1 - 4)

Walk (0 - 255 seconds, 0 disables)

Ped Clearance Time (0 - 255 seconds)

Walk 2 (0 - 255 seconds)

Ped Clearance 2 (0 - 255 seconds)

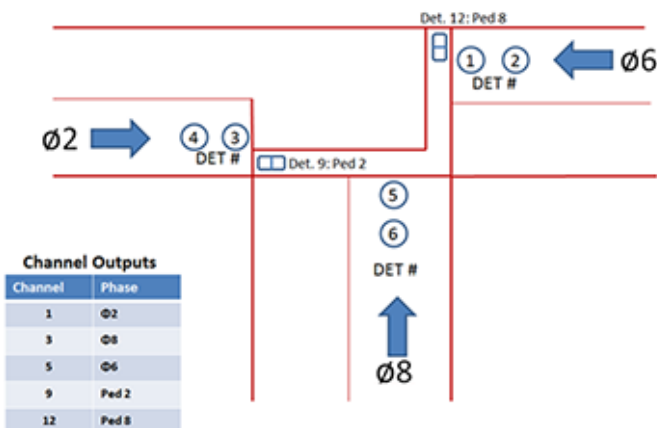
Ped Clearance Extension Max (0 - 255 seconds)

Walk Extension Max (0 - 255 seconds)

Carry Over to Phase Number (0 - 16)

## **Example Configuration**

### **Basic T-Intersection**



Pedestrian Parameter	Phase 2	Phase 6	Phase 8
Walk	7 seconds	0	5 seconds
Ped Clearance	10 seconds	0	9 seconds

## Completed Screen for the Example Configuration



## Notes for Pedestrian Timing Plans

Pedestrian Parameter	Description	Range
Timing Plan	Use the drop-down menu to select a timing plan. To name the timing plan, go to <b>Options &gt; Rename Plan</b> .	1 - 4
Walk	Time during which WALK or walking person symbol is displayed when servicing a ped call. Walk or Clearance Time timing cannot be programmed to zero if the phase is the ped carryover start phase or part of a ped overlap. <b>Note:</b> Actual walk time is the longer of the walk time in effect or guaranteed* walk.	0 - 255 seconds 0 disables
Ped Clearance	Time during which DONT WALK or hand symbol is flashing following pedestrian WALK time. Walk or Clearance Time timing cannot be programmed to zero if the phase is the ped carryover start phase or part of a ped carryover. <b>Note:</b> Actual pedestrian clearance time is the longer of the pedestrian clearance in effect or guaranteed* pedestrian clearance	0 - 255 seconds
Walk 2	Walk 2 defines the duration of the interval in which WALK or the walking person symbol is displayed following a ped call from the Walk 2 input. If it is not a larger value, it is replaced by guaranteed WALK Time ( <b>Home &gt; Timing Plans &gt; Guaranteed</b> ). If WALK 2 is zero and enabled, the Walk time is substituted. <b>Note:</b> Actual walk time is the longer of the walk time in effect or guaranteed* walk.	0 - 255 seconds

Pedestrian Parameter	Description	Range
Ped Clearance 2	<p>Pedestrian clearance time that is to be in effect when WALK 2 is enabled by a time base Action Plan (<b>Home &gt; Scheduler &gt; Calendar Events</b>).</p> <p>This is the time during which DONT WALK or the hand symbol is flashing following ped WALK time.</p> <p><b>Note:</b> Actual pedestrian clearance time is the longer of the pedestrian clearance in effect or guaranteed* pedestrian clearance.</p>	0 - 255 seconds
Ped Clearance Extension Max	<p>This is an ECPI feature. (Applies to TS1 and TS2 operation)</p> <p>The Pedestrian Clearance indication can be extended to the smaller of the two values by the phase ped extend input.</p> <ul style="list-style-type: none"> <li>• Clearance Extension Max time</li> <li>• Phase Max time remaining</li> </ul>	0 - 255 seconds
Walk Extension Max	<p>When the walk in effect has been timed: if the phase Ped Extend Detector is TRUE, the walk is extended until 1) its total length reaches Walk Maximum, or 2) the elapsed length of the walk extension plus the ped clear equals the max in effect, or 3) the Ped Extend Detector input goes false. Walk maximum time has no effect when there is not a pedestrian extend detector for the phase.</p>	0 - 255 seconds
Carry Over to Phase Number	<p>If phase pedestrian service can be carried over into another phase in the same ring when that phase times next, enter the phase that is allowed to time next while the pedestrian service (pedestrian carryover) is completed. If the phase identified as the pedestrian carryover phase does not have a vehicle call or will not to be serviced next, the pedestrian service will be completed before the initiating phase is allowed to terminate. This option allows two vehicle movements while pedestrians are crossing wide streets.</p> <p><b>Note:</b> A pedestrian carryover service is not permitted to be part of a Pedestrian Overlap.</p>	0 - 16

\* Guaranteed minimum values are programmed in **Home > Timing Plans > Guaranteed**



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## Clearance

### Clearance

The Phase interval timers are programmed in this page.

Define the Yellow and Red Clearance intervals. Revert time applies to timing phase going red back to green.

The parameters in this screen:

Timing Plan (1 - 4)

Yellow Change (0.0 - 25.5 seconds)

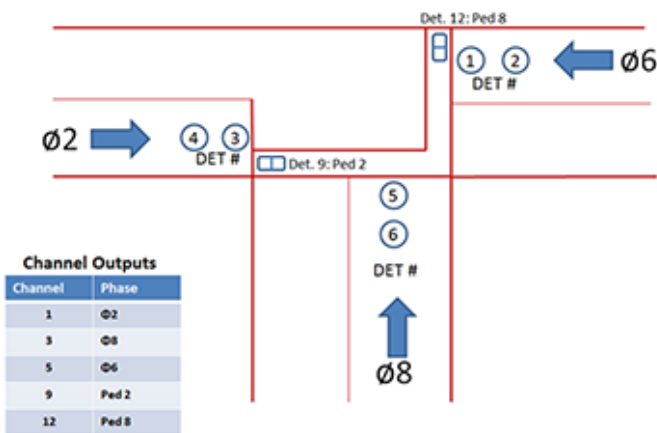
Red Clearance (0.0 - 25.5 seconds)

Red Revert (0.0 - 25.5 seconds)

Red Max (0.0 - 25.5 seconds)

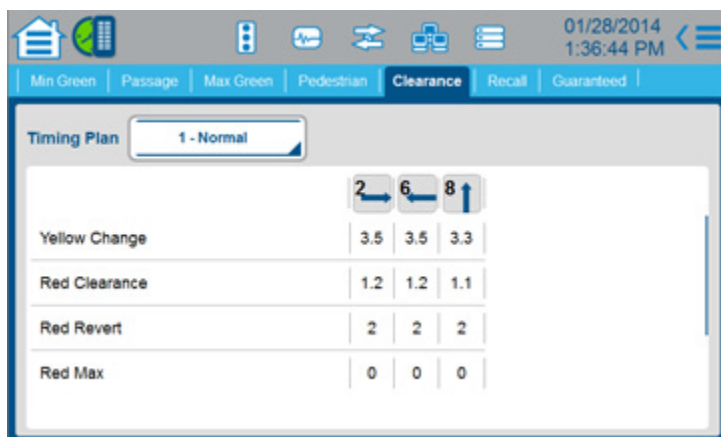
### Example Configuration

#### Basic T-Intersection



Clearance Parameter	Phase 2	Phase 6	Phase 8
Yellow Change	3.5 seconds	3.5 seconds	3.3 seconds
Red Clearance	1.2 seconds	1.2 seconds	1.1 seconds

## Completed Screen for the Example Configuration



## Notes for Clearance Timing Plans

Clearance Parameter	Description	Range
Timing Plan	Use the drop-down menu to select a timing plan. To name the timing plan, go to <b>Options &gt; Rename Plan</b> .	1 - 4
Yellow Change	The time that the phase yellow indication is displayed following a green interval. <b>Note:</b> Actual yellow change in effect is the longest of yellow change or guaranteed* yellow.	0.0 - 25.5 seconds
Red Clearance	The time that the phase red indication is displayed following a yellow change interval when terminating the phase. <b>Note:</b> Actual red clearance time in effect is the longest of the red clearance or guaranteed* red clearance.	0.0 - 25.5 seconds
Red Revert	Minimum red time before a phase can be re-serviced. Red revert begins timing at the start of red clearance. The actual red revert time for any phase is the larger of this and the Unit Red Revert time. <b>Important:</b> NEMA mandates minimum limit time setting at 2 seconds. NTCIP allows for this value to be set lower.	0.0 - 25.5 seconds
Red Max	When the red clearance in effect has been timed, if the phase Red Extend Detector is TRUE, red clearance is extended until its total length reaches Red Maximum or the Red Extend Detector input goes FALSE. Red Maximum has no effect when there is not a red extend detector for the phase.	0.0 - 25.5 seconds

\* Guaranteed minimum values are programmed in **Home > Timing Plans > Guaranteed**





Home



Timing Plans

## Recall

### Recall

The Phase interval timers are programmed in this page.

Define the phase demand through recalls and latched detector calls. Soft Recall and No Rest apply when no opposing demand is present.

The parameters in this screen:

Timing Plan (1 - 4)

Locking Memory (Enable/Disable)

Min Veh Recall (Enable/Disable)

Max Recall (Enable/Disable)

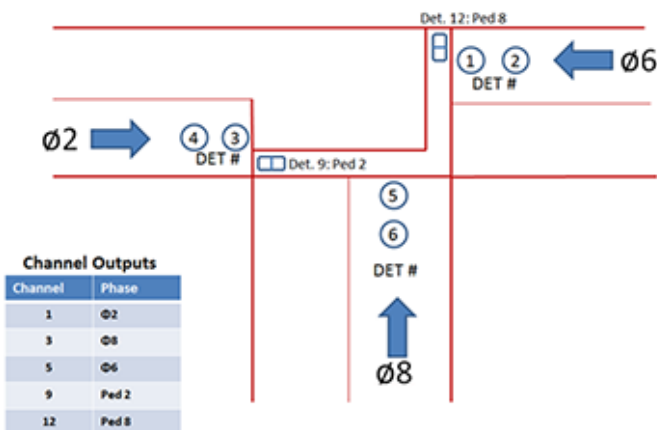
Ped Recall (Enable/Disable)

Soft Recall (Enable/Disable)

No Rest (Enable/Disable)

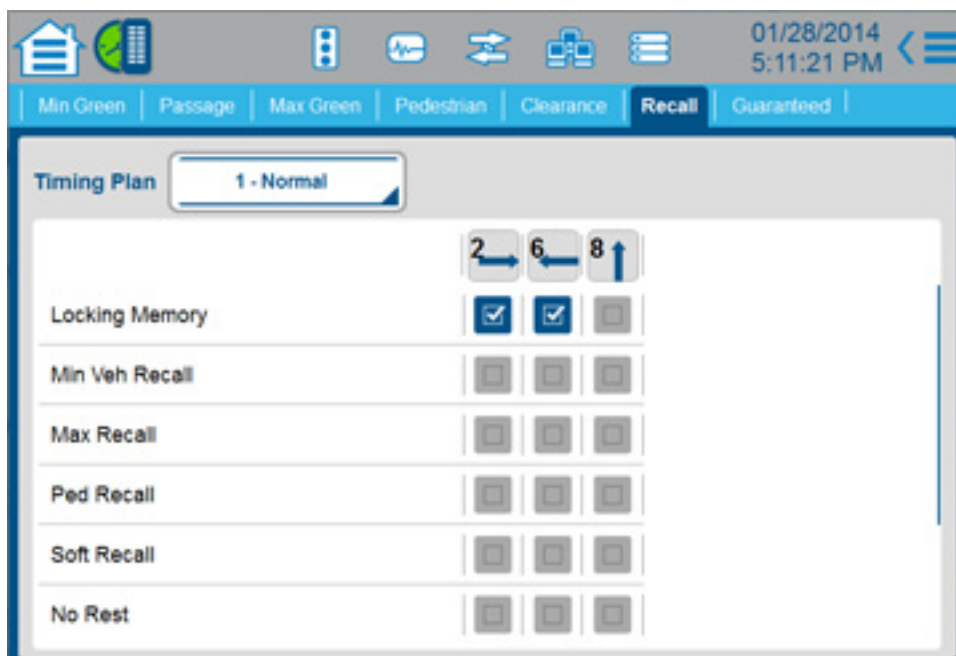
### Example Configuration

#### Basic T-Intersection



Recall Parameter	Phase 2	Phase 6	Phase 8
Locking memory	Check (Enable)	Check (Enable)	No Check (Disable)

## Completed Screen for the Example Configuration



## Notes for Recall Timing Plans

Recall Parameter	Description	Range
Timing Plan	Use the drop-down menu to select a timing plan. To name the timing plan, go to <b>Options &gt; Rename Plan</b> .	1 - 4
Locking Memory	This locks the detector inputs. When locking memory is enabled, an actuation on any detector input assigned to the associated phase during yellow or red is remembered as a vehicle call and is not reset when the vehicle call is no longer present. Reset occurs during green. <b>Note:</b> Locking memory function can be assigned per detector for each detector associated with a phase. To do this, go to <b>Home &gt; Detection &gt; Vehicle Detection &gt; Lock In</b>	Check (Enable) No check (Disable)
Min Veh Recall	Vehicle recall places a demand for vehicle service on a phase by registering a call while the phase is not in the green interval.	Check (Enable) No check (Disable)
Max Recall	Places a continuous vehicle call on the phase. The phase times to the maximum green time. Maximum green timer begins timing as though an opposing call was present, but the phase does not terminate unless there is an actual opposing call.	Check (Enable) No check (Disable)
Ped Recall	Pedestrian recall places a demand for pedestrian service on a phase by registering a call while the phase is not in the walk interval.	Check (Enable) No check (Disable)
Soft Recall	Soft recall places a call on these enabled phase(s) when the controller goes to rest in other phases. <b>Note:</b> Typical Soft Recall phases are through-phases such as 2 and 6.	Check (Enable) No check (Disable)
No Rest	Absence of detector calls, the controller automatically goes to the next phase that is allowed to rest. <b>Note:</b> Soft Recall overrides the No Rest entry.	Check (Enable) No check (Disable)



Home



Timing  
Plans

Guaranteed

## Guaranteed

	1	2	3	4	5	6	7	8
Min Green	5	5	5	5	5	5	5	5
Walk	0	0	0	0	0	0	0	0
Ped Clear	7	7	7	7	7	7	7	7
Yellow	3	3	3	3	3	3	3	3
Red Clear	0	0	0	0	0	0	0	0
Overlap Green	5	5	5	5	5	5	5	5

In this screen you set Guaranteed Minimum Times for phase or overlap intervals. These entries establish the lower limit that the phase or overlap intervals must time.

## Notes for Guaranteed Minimum Times

Guaranteed Parameter	Description	Range
Min Green	<p><b>Guaranteed Minimum Green:</b> The shortest possible vehicle green time, before any added initial or vehicle extensions.</p> <p><b>Note:</b> Actual minimum green time will be the longest of the following: minimum green plus any added initial, vehicle extension, bike minimum green, ped walk plus ped clearance and guaranteed minimum green.</p>	0-255 sec.
Walk	<p><b>Guaranteed Pedestrian Walk:</b> The shortest possible pedestrian walk time.</p> <p><b>Note:</b> Actual minimum walk time will be the longer of the Walk time in effect or guaranteed* walk.</p>	0-255 sec.
Ped Clear	<p><b>Guaranteed Pedestrian Clearance:</b> The shortest possible pedestrian clearance time.</p> <p><b>Note:</b> Actual minimum pedestrian clearance time will be the longer of the Pedestrian Clearance in effect or guaranteed* pedestrian clearance.</p>	0-255 sec.

Guaranteed Parameter	Description	Range
Yellow	<p><b>Guaranteed Yellow Change:</b> The shortest possible phase yellow indication following a green interval.</p> <p><b>Note:</b> Actual minimum yellow change time will be the longer of the Yellow time or guaranteed* yellow.</p>	0-25.5 sec.
Red Clear	<p><b>Guaranteed Red Clearance:</b> The shortest possible red indication following a yellow change interval when terminating the phase.</p> <p><b>Note:</b> Actual minimum red clearance time will be the longer of the Red Clearance time in effect or guaranteed* red clearance.</p>	0-25.5 sec.
Overlap Green	<p><b>Guaranteed Overlap Green:</b> Minimum overlap green that must be timed before the overlap is allowed to terminate.</p> <p><b>Note:</b> If an overlap guaranteed green has not been satisfied by the time the overlap initiating included phase is ready to terminate its green interval, the phase green interval is extended until the overlap guaranteed green has been timed.</p>	0-255 sec.

\* Circumstances that can alter this minimum time include: Manual Advance input, Preemptor timing, and External Start input.



## Phase Options

The Phase Options screen gives options for flashing and special service; for example, pre-timed phases.



## Notes for Phase Options

Phase Option Parameter	Description	Range
Enable Ped Clear Protect	<p><b>Pedestrian Clearance Protection</b>            Select <b>Yes</b> (enable) or <b>No</b> (disable).            Pedestrian clearance protection requires the controller to time pedestrian clearance on all phases with pedestrian clearance settings when manual control is enabled. Manual advance inputs are ignored during the pedestrian clearance interval.</p>	Yes, enables No, disables

Phase Option Parameter	Description	Range
Dont Walk 3 Second Protect	<p><b>MUTCD 3 Seconds DONT WALK</b></p> <p>This conforms to MUTCD 2009, Section 4E.06, Pedestrian Intervals and Signal Phases, Paragraph 04, that states:</p> <p>Following the pedestrian change interval, a buffer interval consisting of a steady UPRAISED HAND (symbolizing DONT WALK) signal indication shall be displayed for at least 3 seconds prior to the release of any conflicting vehicular movement.</p> <p><b>No:</b> If Ped protected overlap is enabled, after serving an included protected phase pedestrian demand, it starts the overlap if there is enough time before maxout to service the overlap minimum green.</p> <p><b>Yes:</b> If Ped protected overlap is enabled, after serving an included protected phase pedestrian demand, stays in DONT WALK for 3 seconds and then starts the overlap if there is enough time before maxout to service the overlap minimum green.</p>	Yes, enables No, disables
Unit Red Revert	<p><b>Unit Red Revert</b></p> <p>Provides the minimum red revert time for every phase. The actual red revert time for any phase will be the larger of this and the phase Red Revert time (<b>Home &gt; Timing Plans &gt; Clearance &gt; Red Revert</b>).</p> <p><b>Note:</b> Red Revert is the minimum phase red indication to be timed after the yellow change interval before a phase can once again display green. The greater of the Unit Red Revert or the Red Revert of the phase is timed.</p> <p><b>Note:</b> NEMA mandates minimum limit time setting at 2 seconds. NTCIP allows for this value to be set lower.</p>	0.0-25.5 sec.
Enable Pre-Timed Mode	Select <b>Yes</b> (enable) or <b>No</b> (disable) to program Pre-timed Phases at the bottom of this screen.	Yes, enables No, disables
Pre-Timed Free Input Disable	<p><b>Yes:</b> Allows a Free mode input to operate and disable pre-timed programming</p> <p><b>No:</b> Does not allow a Free mode input to operate when pre-timed programming is in operation</p>	Yes, enables No, disables
<b>Flashing drop-down menu</b>		
Green	<p><b>Flashing Green Phase</b></p> <p>This is an ECPI Feature (applies to TS1 and TS2 operation). Select Phase Green Solid or Flashing operation:</p> <p><b>NF (no flash):</b> The Phase Green is solid during service. <b>F1:</b> The Phase Green is Flashed at 1 PPS during service. <b>F2:</b> The Phase Green is Flashed at 2 PPS during service. <b>F5:</b> The Phase Green is Flashed at 5 PPS during service.</p> <p>Use this Flashing Green Phase option to easily select the phases and their respective flashing rates (there is no need to use the Logic Processor).</p> <p><b>Note:</b> This setting does not affect Preempt Track and Dwell phase selection. Preempt programming has separate data entries to flash phases while in Track and Dwell intervals. However, the Cycle phases are the same as those programmed here.</p>	F1, F2, F5, NF disables

Phase Option Parameter	Description	Range
Walk	<p><b>Flashing Walk</b></p> <p>Select <b>Check</b> (enable) or <b>Un-Check</b> (disable) for the pedestrian service of the phase for flashing walk.</p> <p>Pedestrian walk output is turned ON for half a second and then OFF for half a second. The ON and OFF flash is repeated for the duration of the walk interval.</p>	<p>Check, enable</p> <p>Un-Check, disable</p>
<b>Timing drop-down menu</b>		
Guaranteed Passage	<p><b>Guaranteed Passage</b></p> <p>Select <b>Check</b> (enable) or <b>Un-Check</b> (disable) the phase for Guaranteed Passage.</p> <p>If the vehicle extension of a phase times out while timing a reduced vehicle extension and guaranteed passage is selected, the difference between the reduced interval and the initial vehicle extension is timed before a vehicle extension time out is reported. This option guarantees the timing of a full vehicle extension for the last detected vehicle.</p>	<p>Check, enable</p> <p>Un-Check, disable</p>
Ped Clr - Yellow	<p><b>Pedestrian Clearance through Yellow Change</b></p> <p>Select <b>Check</b> (enable) or <b>Un-Check</b> (disable) the pedestrian clearance interval of the phase from being extended to the end of the Yellow Change interval.</p> <p>This enables a phase pedestrian clearance indication to time through the yellow change interval. The pedestrian clearance time remains the same but the last portion is timed during the Yellow Change interval.</p>	<p>Check, enable</p> <p>Un-Check, disable</p>
Ped Clr - Red	<p><b>Pedestrian Clearance through Red Clearance</b></p> <p>Select <b>Check</b> (enable) or <b>Un-Check</b> (disable) the pedestrian clearance interval of the phase from being extended to the end of the Red Clearance.</p> <p>This enables a phase pedestrian clearance indication to time through the Yellow Change and Red Clearance intervals. The pedestrian clearance time remains the same but the last portion is timed during the Yellow Change and Red Clearance intervals.</p>	<p>Check, enable</p> <p>Un-Check, disable</p>
Start of Vehicle Extension	<p><b>Initial Green times then Vehicle Extension Starts</b></p> <p>Select <b>Check</b> (enable) or <b>Un-Check</b> (disable) this phase timing option.</p> <p>This option requires a phase time in its initial green interval before starting vehicle extension timing. During normal operation, the initial green and vehicle extension intervals both start timing at the start of the green interval of the phase.</p>	<p>Check, enable</p> <p>Un-Check, disable</p>

Phase Option Parameter	Description	Range
Rest in Walk	<p><b>Actuated Rest in Walk</b>            Select <b>Check</b> (enable) or <b>Un-Check</b> (disable) the Actuated Rest In Walk option for the pedestrian service of a phase.            Allows a phase with an actuated pedestrian call to rest at end of the pedestrian walk interval until a serviceable conflicting call is received.</p>	Check, enable Un-Check, disable
<b>Service drop-down menu</b>		
Dual Entry	<p><b>Dual Entry</b>            Select <b>Check</b> (enable) or <b>Un-Check</b> (disable) the Dual Entry assignment of a phase.            Dual entry is a mode of operation in which one phase in each ring must be in operation. If there is no call on a ring when the controller crosses a barrier, a call is automatically placed on a compatible dual entry phase in that ring.  <b>Note:</b> Dual Entry processing includes actively delayed detectors as a serviceable call. The controller does not skip a phase that has an active but delayed detector. A Delayed Detector (with a <b>Delayed Time</b> in <b>Home &gt; Detection &gt; Vehicle Detection</b>) is serviced when this Dual Entry is enabled.</p>	Check, enable Un-Check, disable
Conditional Service	<p><b>Conditional Service</b>  <b>Checked</b> = enables conditional service from an actuated phase  <b>Un-Checked</b> = disables conditional service for a phase            This allows the order of service to be modified. It permits an actuated preceding phase in the same ring as the specified phase to be timed if it has a call and is compatible with the phases timing in the other rings. Such timing is only allowed when a cross ring phase not ready to terminate is timing max green and the time remaining until max out is greater than or equal to time required to transition to the preceding phase and time its conditional service minimum green.</p>	Checked, Un-Checked
Conditional Reservice	<p><b>Conditional Reservice</b>            This allows conditional service phases to be reserviced after a ring phase that precedes it has been conditionally serviced and is ready to terminate. Such timing is only allowed when a cross ring phase not ready to terminate is timing max green and the time remaining until max out is greater than or equal to time required to transition back to the conditional service phase and time its conditional service minimum green.  <b>Checked</b> = enables conditional reservice for an actuated phase that is also enabled for conditional service  <b>Un-Checked</b> = disables conditional reservice for a phase</p>	Checked, Un-checked



Phase Option Parameter	Description	Range
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Pedestrian Reservice	<p><b>Pedestrian Re-service</b>  Select <b>Check</b> (enable) or <b>Un-Check</b> (disable) the phase for Pedestrian Re-service.  This option enables the pedestrian movement of the phase to be serviced or re-serviced any time if there is adequate time for its walk and pedestrian clearance intervals to be completed before a Max out or coordinated force off. If re-service is enabled for a pedestrian service that is already in walk or pedestrian clearance when a call for service is input, the pedestrian movement returns to start of walk.</p> <p><b>Note:</b> If Pedestrian Protect is enabled, Pedestrian Re-service is disabled.  Refer to <b>Home &gt; Overlap &gt; Details &gt; Ped Protect Enable</b></p>	Check, enable Un-Check, disable
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**Non-actuated Phases drop-down menu**

Non-actuated I	<p><b>Call-to-Non-Actuated (CNA) Mode Input I</b>  Select Check (enable) or Un-Check (disable) No170n-Actuated service for the phase.  CNA I mode input is used to enable and disable the NON-ACT I settings. In Dual Coordination, the phases programmed as call-to-nonactuated II are the crossing artery phases.</p> <p><b>Note:</b> Non-actuated phases normally have pedestrian time settings.</p>	Check, enable Un-Check, disable
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Non-actuated II	<p><b>Call-to-Non-Actuated (CNA) Mode Input II</b>  Select <b>Check</b> (enable) or <b>Un-Check</b> (disable) Non-Actuated service for the phase.  CNA II mode input is used to enable and disable the NON-ACT II settings. In Dual Coordination, the phases programmed as call-to-nonactuated II are the crossing artery phases.</p> <p><b>Note:</b> Non-actuated phases normally have pedestrian time settings.</p>	Check, enable Un-Check, disable
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Pre-timed Phases	<p>Select <b>Check</b> (select phase) or <b>Un-Check</b> (deselect phase) for Pre-Timed Operation Mode.  Pre-timed Mode provides Fixed Time capability on selected phases. The phases not selected operate as programmed.</p> <p><b>Fixed Time means:</b></p> <ul style="list-style-type: none"> <li>• The phase is placed on Max vehicle and pedestrian recall.</li> <li>• The Walk interval is expanded to make walk plus ped clearance equal to the phase max in effect time. If the programmed Walk plus Pedestrian Clearance intervals are longer than the max in effect time, the phase will time the programmed Walk and Pedestrian clearance.</li> <li>• Phases programmed as <b>Rest in Walk</b> (in the <b>Timing</b> drop-down menu in this screen) are commanded to fixed time.</li> </ul> <p><b>Pre-timed operation can be disabled by:</b></p> <ul style="list-style-type: none"> <li>• External input by mapping an input (<b>Home &gt; Logic Processor</b>)</li> <li>• Time Base</li> <li>• Logic Processor activating the INHIBIT PRE-TIME input.</li> </ul>	Check, select Un-Check, deselect
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## Preemptions

### Overview

You can program up to 10 Preemption Plans. A programmed Preemption Plan is used when it is enabled (its icon is highlighted in blue) and not used when it is disabled (its icon has a gray background). Service is prioritized so that the lowest number preem141ptor with Priority Override set to Yes (in the Entry screen) has the highest priority or service can be programmed as first come, first served.

### Initial Overview Screen



In the screen above, notice:

- Preemption Plan 1 is a **Rail** type and Preemption Plans 3, 4 and 7 are **Emergency** type.
- If a Preemption Plan is enabled, it is highlighted in blue. Preemption Plans 3 and 4 are enabled and Preemption Plans 1 and 7 are disabled (gray background).

To start to program preemptions in this screen, select a Preemption Plan (1 thru 10) in the Preemption Plan fields.

- For a **Rail** preemption, this is the first of six screens (Overview, Entry, Track Clear, Dwell, Cycle and Exit).
- For **Emergency** preemption, this is the first of five screens (Overview, Entry, Dwell, Cycle, Exit).

## Example Overview Screen for a Rail Preemption Plan

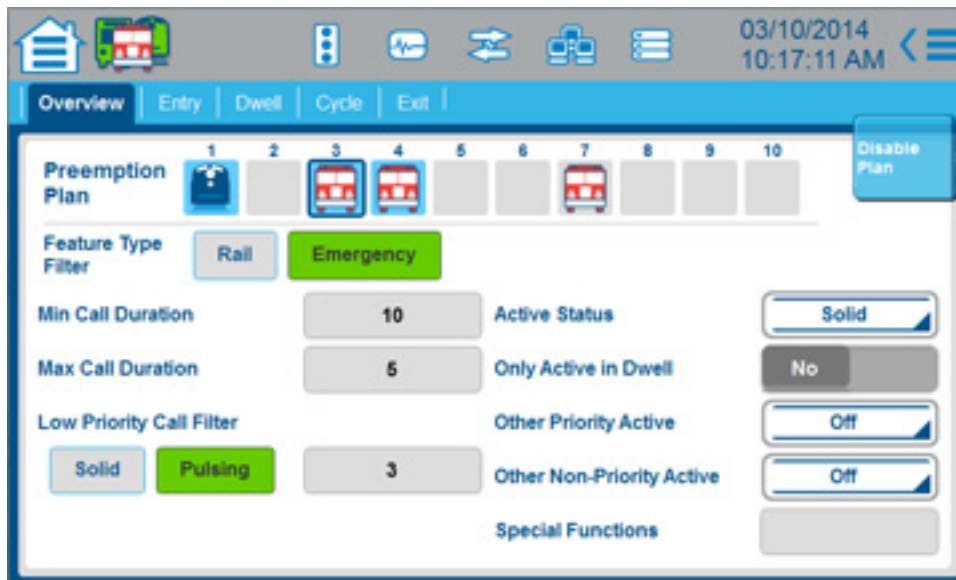


For the screen above:

- **Preemption Plan:** Preemption Plan 1 is selected.
  - **Feature Type Filter:** Rail preemption is selected.
  - There is a Track Clear tab after the Entry tab (because it is a Rail preemption).
- Note:** For a Rail preemption, make sure you program the parameters in the Track Clear tab. If you do not program the Track Clear screen, the type changes to Emergency (as written in red in this screen).
- The preempt input is not filtered (filtering is bypassed):
    - No **Low Priority Call Filter** is selected.

**Note:** If you want to bypass the filter of the input and Solid or Pulsing is selected, tap the selected field to de-select it. But, if you want to filter the input, select a **Low Priority Call Filter, Solid or Pulsing**.
    - The hard-wired preempt Input 1 routes directly to Preemptor 1 (when the input is bypassed, the number of the hard-wired input and the number of the preemptor is the same).
    - The **Low Priority Call Filter** time field is automatically set to 0 because the filtering for this Preemption Plan is bypassed.
  - **Active Status** (the output during a preemption) is **F1 pps** (a 1-pulse-per-second signal).
  - **Min Call Duration** (the required minimum time that the preempt run must be active) is 10 seconds.
  - **Only Active in Dwell** is **No** (a restriction of the Output Status to only during the Dwell/Cycle interval is disabled).
  - There are no **Special Functions** enabled.
  - This Preemption Plan disabled (gray background); to enable this plan, select [Enable Plan], then [Commit].

## Example Overview Screen for Emergency Preemption Plan



For the screen above:

- **Preemption Plan:** Preemption Plan 3 is selected.
- **Feature Type Filter:** **Emergency** preemption is selected.
- There is not a Track Clear tab after the Entry tab.
- The preempt input is filtered:
  - The **Call Method** is **Pulsing** for the controller to filter the input for a pulsing preempt signal from an emergency vehicle.
  - For this example, the Filtered Input is set to 3 (with the preemptor number the same as the number of the hard-wired input). But it is possible to select another number (1 thru 10) to connect this preemptor to a hard-wired input with a different number.
- **Active Status** (the output during a preemption) is **Solid** (a solid signal).
- **Min Duration** (the required minimum time that the preempt run must be active) is **10** seconds.
- **Only During Dwell** is **No** (a restriction of the Output Status to only during the Dwell/Cycle interval is disabled).
- There are no **Special Functions** enabled.
- This Preemption Plan is enabled (highlighted in blue); to disable this plan, select [Disable Plan].

Throughout this procedure, select **[Commit]** as necessary to enable a change to the database. For an explanation of Transaction Mode (that runs when you make a critical change to programming), refer to the Help (**Options > Help**) for **Home > Phase Order > Phase Order**.

## Notes for Preemption Overview

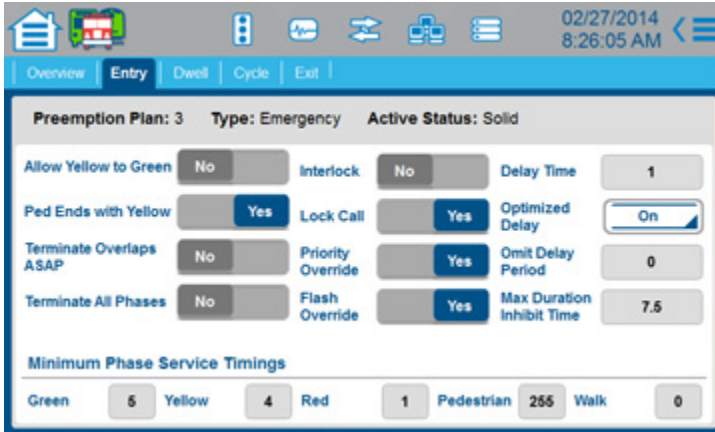
Overview Parameter	Description	Range
Preemption Plan	In the Preemption Plan fields, 1 thru 10, select a Preemption Plan to edit or view.	1 thru 10
[Enable Plan] or [Disable Plan]	<p><b>[Disable Plan]:</b> When this soft key is shown, the selected Preemption Plan is highlighted in blue that shows it is enabled. To disable the Preemption Plan selected:</p> <ol style="list-style-type: none"> <li>1. Select [Disable Plan].</li> <li>2. Select [Commit].</li> </ol> <p><b>[Enable Plan]:</b> When this soft key is shown, the selected Preemption Plan has a gray background that shows it is disabled. To enable the Preemption Plan selected:</p> <ol style="list-style-type: none"> <li>1. Select [Enable Plan].</li> <li>2. Select [Commit].</li> </ol>	[Enable Plan], [Disable Plan]
Feature Type Filter	<p><b>Type of Preemption</b></p> <p><b>Rail:</b> Select this for a Preemption Plan for a train.</p> <p><b>Emergency:</b> Select this for a Preemption Plan for an emergency vehicle.</p> <p><b>Note:</b> To delete a Rail or Emergency Preemption Plan:</p> <ol style="list-style-type: none"> <li>1. Select the Preemption Plan</li> <li>2. Select the Feature Type Filter button that is highlighted in green (this grays it out and de-selects the type).</li> <li>3. Select [Commit].</li> </ol>	Rail, Emergency
Min Call Duration	<p><b>Minimum Duration Time</b></p> <p>This is the required minimum time that the preempt run must be active. It starts timing at the end of the Delay Interval. A preempt run May Not Exit until this timer has expired.</p> <p>With no Dwell phases programmed, a Zero entry allows preempt to exit immediately after the Track Clearance interval if the preempt input is no longer present. But, if Dwell phases are programmed, then the Dwell phases will be serviced for their <b>Minimum Dwell</b> time before the preemptor exits. Select the <b>Dwell</b> tab to see the programming for the Minimum Dwell time.</p>	0-65535 sec.
Active Status	<p><b>Preemption Active Output</b></p> <p>From the drop-down menu, select the status output for an active preempt:</p> <p><b>Off:</b> Disable</p> <p><b>Solid:</b> Enable solid</p> <p><b>F1 pps:</b> Enable flash at 1 pps</p> <p><b>F2 pps:</b> Enable flash at 2.5 pps</p> <p><b>F5 pps:</b> Enable flash at 5 pps</p> <p>The setting in Only During Dwell in this screen determines if this is active only during the <b>Dwell/Cycle</b> interval.</p>	Off, Solid, F1 pps, F2 pps, F5 pps

Overview Parameter	Description	Range
Max Call Duration	<p><b>Maximum Call Duration</b> Enter the maximum time that a low-priority preemption call can be active and be recognized by the controller. When it has failed, the input must return to inactive state to be recognized again. Zero (0) entry disables the maximum time checking of the preemption call.</p> <p><b>Note:</b> This feature is disabled if the preemptor is not called by a low priority input, programmed with the Low Priority Call Filter parameter in this screen.</p>	0-65535 sec.
Only Active in Dwell	<p><b>Preemption Active Output Only In Dwell</b> Select <b>Yes</b> (enable) or <b>No</b> (disable) for the Preemptor Status to give an output only during the Dwell/Cycle interval.</p> <p><b>Note:</b> When this is enabled, it is only enabled during the green dwell interval; it is not enabled during the dwell clearance interval.</p> <p>When this is set to No (disabled), the Preemptor Status is output continuously when the preemptor is active.</p>	Yes, enable No, disable
Low Priority Call Filter	<p><b>Solid:</b> Select this if you want to filter the call for this preemptor for a solid signal. <b>Pulsing:</b> Select this if you want to filter the call for this preemptor for a pulsing signal.</p> <p><b>Note:</b> Filtering is typically used for a low priority preemption such as an emergency vehicle.</p> <p><b>No selection:</b> The call for this preemptor is not filtered (filtering bypassed). If you want this condition and Solid or Pulsing is selected, tap the selected field to de-select it. When you do this, the Filtered Input field automatically sets to 0.</p> <p><b>Note:</b> When no call method is selected, filtering is bypassed and the input connects directly to the preemptor of the same number - usually for highest priority preempts such as a train.</p>	Solid, Pulsing, No selection
(Filtered Input)	<p><b>1 thru 10:</b> Select (1 thru 10) for the number of the hard-wired input to connect to this preemptor.</p> <p><b>0:</b> This is set automatically when Solid and Pulsing are both not selected for the Call Method. This indicates that the input filtering is bypassed and the hard-wired input connects to the preempt with the same number.</p>	1 thru 10, 0
Other Priority Active	<p><b>Other Priority Active</b> From the drop-down menu, select the preemptor status outputs of the other priority preemptors:</p> <p><b>Off:</b> Disable <b>Solid:</b> Enable solid <b>F1 pps:</b> Enable flash at 1 pps <b>F2 pps:</b> Enable flash at 2.5 pps <b>F5 pps:</b> Enable flash at 5 pps</p> <p><b>Note:</b> If the preemptor is not enabled, the status output is Off.</p>	Off, Solid, F1 pps, F2 pps, F5 pps
Other Non-Priority Active	<p><b>Other Non-Priority Active</b> From the drop-down menu, select the preemptor status outputs of the other non-priority preemptors:</p> <p><b>Off:</b> Disable <b>Solid:</b> Enable solid <b>F1 pps:</b> Enable flash at 1 pps <b>F2 pps:</b> Enable flash at 2.5 pps <b>F5 pps:</b> Enable flash at 5 pps</p> <p><b>Note:</b> If the preemptor is not enabled, the status output is Off.</p>	Off, Solid, F1 pps, F2 pps, F5 pps

Overview Parameter	Description	Range
Special Functions	<p><b>Preemptor Special Function Outputs</b></p> <p>Select up to eight Special Function outputs when this Preemption Plan is in effect.</p> <p>These outputs are typically mapped to a controller output, input, or used by a Logic Processor Statement (refer to <b>Home &gt; Logic Processor</b>).</p>	1 thru 8



## Entry



Use this screen to program how to make the transition from the Day Plan in effect to a Preemption Plan after the Entry of a preempt signal.

## Top of the Screen

The settings at the top of this screen are read-only; you set these parameters in the **Overview** screen: **Preemption Plan** (1 thru 10), **Feature Type Filter** (Rail, Emergency) and **Active Status** (Off, Solid, F1 pps, F2 pps, F5 pps).

Throughout this procedure, select [Commit] as necessary to enable a change to the database. For an explanation of Transaction Mode (that runs when you make a critical change to programming), refer to the Help (**Options > Help**) for **Home > Phase Order > Phase Order**.

## Notes for Preemption Entry

Entry Parameter	Description	Range
Allow Yellow to Green	<p><b>Yellow Clearance Reverts to Green</b></p> <p><b>Yes:</b> Lets a phase go immediately to green if it has been timing a Yellow Clearance interval when the preemption call is received and the interval to time next during preemption is that same phase green.</p> <p><b>No:</b> Forces the phase and will proceed through red revert in the normal sequence.</p> <p><b>Note:</b> In this screen, you cannot set this parameter to <b>Yes</b> (enable) and also set <b>Terminate All Phases</b> to <b>Yes</b> (enable) because they would be in direct conflict with one another. This feature is automatically disabled if a Lagging Ovp Green starts timing on the way to Preempt.</p>	Yes, No



Entry Parameter	Description	Range
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**Preemptor Interlock Enable**

**Yes:** Enables Preemptor Interlock. The Preemptor Interlock input must remain at logic ground or TRUE state until that preemptor has an active input and at logic high or FALSE state when that preemptor input is active. If this condition is not met for at least 1 second and the preemptor is programmed, the controller reverts to flash.

**Note:** Each of the 10 preempt inputs have a corresponding Interlock Input EXCEPT for Preempts 1 & 2 which SHARE Interlock Input #1. As a result, Interlock Input #2 is NEVER used.

**No:** Disables Preemptor Interlock. The preemptor interlock input has no effect on controller operation.

**Preemptor Interlock Enable**

**Example:** Preemptor 1-2 Interlock enabled.

Preemptor 1 or 2 are not active or timing Initial/Track Clearance:

1. Activate preemptors 1 and 2.
2. Clear to all red after Track Clearance.
3. Go to a latched flash condition by forcing Voltage Monitor/ Fault Monitor FALSE.

Preemptor 1 is active after termination of Track Clearance:

1. Clear to all red.
2. Go to a latched flash condition by forcing Voltage Monitor/ Fault Monitor FALSE.

Preemptor 2 is active and after termination of Track Clearance and Preemptor 1 is not programmed:

1. Clear to all red.
2. To go to a latched flash condition, force Voltage/Fault Monitor false.

Preemptor 2 is active and after termination of Track Clearance and Preemptor 1 is programmed:

1. Activate preemptor 1 and 2 inputs.
2. Clear to all red after Track Clearance.
3. Go to a latched flash condition by forcing Voltage Monitor/ Fault Monitor FALSE.

Any preemptor is terminating (going to Exit phase(s) or exiting Preemptor Flash):

1. Restart the Preemptor 1 or 2 if either is timing
2. Activate preemptor 1 and 2 inputs
3. Clear to all red after Track Clearance.
4. Go to a latched flash condition by forcing Voltage Monitor/ Fault Monitor FALSE.

**Note:** The preempt logic gives the preempt and interlock inputs 3 seconds to stabilize before it checks if they are logically opposite.

Interlock

Yes,  
No

Entry Parameter	Description	Range
Delay Time	<p><b>Delay Time</b> This is the time between receipt of a preemptor call and the start of preemption movements. If preemption is not active when the call is not locked, then preemption is removed before the delay timing period expires. Zero entry causes no delay before the preempt input is acknowledged and the <b>Optimized Delay</b> parameter in this screen is grayed out.</p>	0-65535 sec.
Ped Ends with Yellow	<p><b>Pedestrian Clearance Through Yellow</b> <b>Yes:</b> Allows the Yellow Change indication to time with the completion of Pedestrian Clearance interval when entering preemption. <b>No:</b> Provides normal pedestrian termination when entering preemption. The Yellow Change interval is after the completion of Pedestrian Clearance.</p>	Yes, No
Lock Call	<p><b>Locked Preemptor Call During Delay</b> A preemptor may have either Locked (Yes) or non-locked (No) detector inputs. The non-locked parameter is in effect only during delay time. <b>No</b> (Detector not Locked): If a preemptor call is dropped during delay time, the preemptor is not serviced. <b>Yes</b> (Detector is Locked): If a preemptor call is dropped during delay time, the preemptor is serviced. The call is Locked until the preemptor is serviced.</p>	Yes, No
Optimized Delay	<p><b>Optimized Delay Entrance Option</b> <b>Note:</b> To enable this function, you must enter a non-zero value for the Delay Time in this screen. If the Delay Time is set to 0, this parameter is grayed out. Select from the drop-down menu to enable/disable the optimized delay to decide whether or not to apply omits to movements, as explained below: <b>Off:</b> Disabled <b>On:</b> Always Enabled <b>Time of Day:</b> Enabled only by Time of Day. This function is then controlled by <b>Home &gt; Event Plans &gt; Advanced &gt; Allow Optimized Delay</b> (set to Yes or No). When this is enabled, and a preempt is activated, the preemptor compares its delay time to the minimum time required to service phase and pedestrian movements. If the amount of time left in the delay timer is less than the amount required to service a phase or ped, then the preemptor applies omits to those movements. When all phases have been omitted because of lack of time, the preemptor will direct the controller to the preempt Entry Phases so it can start the preempt as soon as the Delay Timer reaches 0 (zero).</p>	Off, On, Time of Day
Terminate Overlaps ASAP	<p><b>Terminate Overlaps As Soon As Possible.</b> <b>Yes:</b> Forces overlaps to terminate immediately with their included phase and ignore any Lagging Overlap programming. <b>No:</b> Allows overlaps to terminate nominally when the last overlap included phase reaches the preemptor minimum yellow interval.</p>	Yes, No

Entry Parameter	Description	Range
Priority Override	<p><b>Preemptor Overrides Higher Numbered Preemptor Disable</b></p> <p><b>Note:</b> A Higher Priority preempt cannot interrupt a preempt currently entering or timing Track Clear. The interrupted preempt will complete timing its Track Clear and only then will it terminate so that the Higher Level Preempt can run.</p> <p><b>Yes:</b> Allows this preemptor to override all higher numbered preemptors. (Example: 2 = Yes overrides 3 through 10)</p> <p><b>No:</b> Disables this preemptor from overriding the next active higher-numbered preemptor.</p> <p><b>Example:</b></p> <ul style="list-style-type: none"> <li>• Preemptor 1 is the highest priority preemptor.</li> <li>• Preemptor 2 has priority over all other active preemptions except Preemptor 1.</li> <li>• Preemptors 3-6 are equal and are serviced on a first-come, first-served basis. They all override Preemptors 7-10.</li> <li>• Preemptors 7- 10 are equal and are serviced on a first-come, first-served basis.</li> </ul> <p>To program the above example, set Priority Override in the preemption plans as shown:</p> <p>1 = No  2 = Yes  3 = No  4 = No  5 = No  6 = Yes  7 = No  8 = No  9 = No  10 = Yes or No (this has no effect)</p>	Yes, No
Omit Delay Period	<p><b>Omit Delay Period</b></p> <p><b>Note:</b> This parameter is only shown for an Emergency vehicle type of preemption. For a Rail type of preemption, this parameter is not shown.</p> <p>This is the last part of delay time, during which phases that are not scheduled for service at the start of the preemption sequence, and all pedestrian movements are inhibited. This inhibit time must be less than or equal to Delay Time. Zero entry causes no inhibit time at the start of the preemption sequence.</p>	0-255 sec.
Terminate All Phases	<p><b>Preemptor Terminate All Phases</b></p> <p>Select <b>Yes</b> or <b>No</b> for the controller to always terminate all timing phases before it enters a preempt run. This forces an All Red condition before the preempt starts.</p> <p><b>Yes:</b> Terminate all timing phases and force an All Red condition before the start of the activated preempt. Phases will not be terminated if the current Green phases exactly match the entry phase(s) of the Preempt and the entry phase(s) will not cause a Yellow Trap for settings that conflict with this as programmed in <b>Home &gt; Overlap &gt; Details</b> for a PPLT/FYA type overlap.</p> <p><b>No:</b> Controller only terminates phases not required by the activated Preempt run.</p> <p><b>Note:</b> In this screen, you cannot enter <b>Yes</b> in <b>Terminate All Phases</b> and <b>Yes</b> in <b>Allow Yellow to Green</b> at the same time because they would be in direct conflict with one another.</p> <p>To make a PPLT compatible during preemption, program the designated phase/overlap type that is associated with the PPLT to <b>F1 pps</b> (1 pps flash).</p>	Yes, No

Entry Parameter	Description	Range
Flash Override	<p><b>Preemption Has Priority Over Automatic Flash</b></p> <p><b>No:</b> Lets automatic flash continue. Automatic flash terminates after the preemption input is removed.</p> <p><b>Yes:</b> Lets the preemptor override automatic flash and time the preemptor sequence. The preemptor forces the exit from automatic flash, times the complete preemption sequence and then lets the controller return to automatic flash.</p> <p>This complies with the NEMA TS2 3.4.6 priority list.</p>	Yes, No
Max Duration Inhibit Time	<p><b>Maximum Duration Inhibit Time</b></p> <p>This parameter improves the operation of Maximum Call Duration, which you set in the Preemptions Overview screen. You can program the Maximum Duration Inhibit Time for each of the 10 Preempt Runs.</p> <p>This feature keeps the Maximum Call Duration timing during brief interruptions of reception of the Preempt signal emitted by an emergency vehicle. For example, a high profile truck could drive by and briefly block (Inhibit) the signal and give a false indication that the emergency vehicle has stopped generating the signal. With this parameter, the Maximum Call Duration will continue timing (and not reset) if the Preempt signal is again received before this Max Duration Inhibit Time times out.</p> <p><b>0-25.5:</b> Enter the time (seconds) to let the Maximum Call Duration continue to time during the interruption of the receipt of a Preempt emergency signal.</p>	0-25.5 sec.
Minimum Phase Service Timings	<p><b>Preemption Entrance Minimum Phase Service Times</b></p> <p>Enter the minimum times to serve the phases that are active when the preemptor becomes active.</p> <p><b>Green:</b> 0-255 sec.</p> <p><b>Yellow</b> (yellow change): 0.0-25.5 sec.</p> <p><b>Red</b> (red clearance): 0.0-25.5 sec.</p> <p><b>Pedestrian</b> (pedestrian clearance): 0-255 sec.</p> <p><b>Walk:</b> 0-255 sec.</p>	
Green		0-25.5 sec.
Yellow	<p><b>Note:</b> Programming these values to 255 and 25.5 respectively, lets the phase minimum times be used. There is no way for the phase indication times to be larger than their programming when the phases enter preemption.</p>	or 0-255 sec
Red		
Pedestrian	<p><b>Important:</b> If these values are set to zero and the Guaranteed Minimum Times (<b>Home &gt; Timing Plans &gt; Guaranteed</b>) are also zero, the indication will terminate immediately when it enters preemption, regardless of the time on the phase. This can result in a clearance indication omission or shorter than the MMU minimum clearance time that would cause a Latched MMU Minimum Clearance failure.</p>	
Walk		



Home



Preemptions

## Track Clear

### Track Clear

#### Top of the Screen

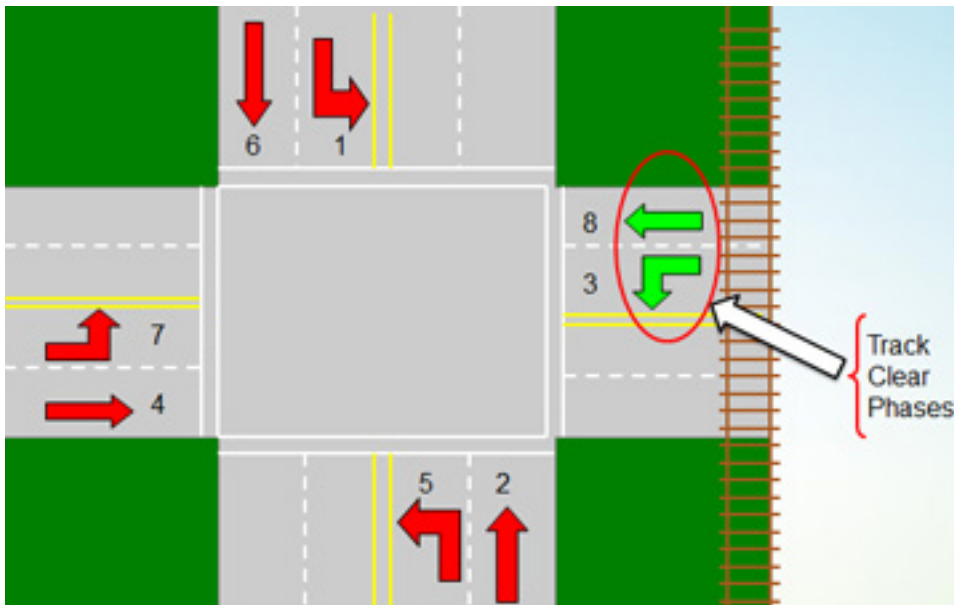
The settings at the top of this screen are read-only; you set these parameters in the **Overview** screen: **Preemption Plan** (1 thru 10), **Feature Type Filter** (Rail, Emergency) and **Active Status** (Off, Solid, F1 pps, F2 pps, F5 pps).

**Note:** This Track Clear tab and screen is only shown for **Type: Rail**. It is hidden for **Type: Emergency**.

Use this screen to program Track Clear Phases.

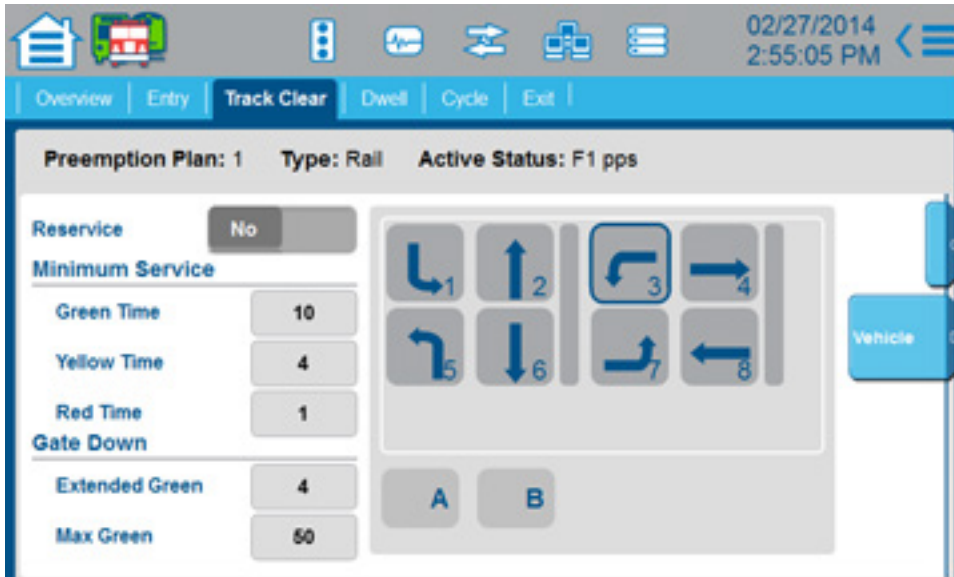
#### Example

In the example shown below, the path of a train blocks Phase 3 and Phase 8; these are the Track Clear Phases. When you program Phase 3 and Phase 8 as Track Clear Phases, the controller first clears the traffic on these phases after it receives a preemption input for the approach of a train.



For this example, program as follows:

1. Select Phase 3.
2. Select the [Vehicle] soft key.

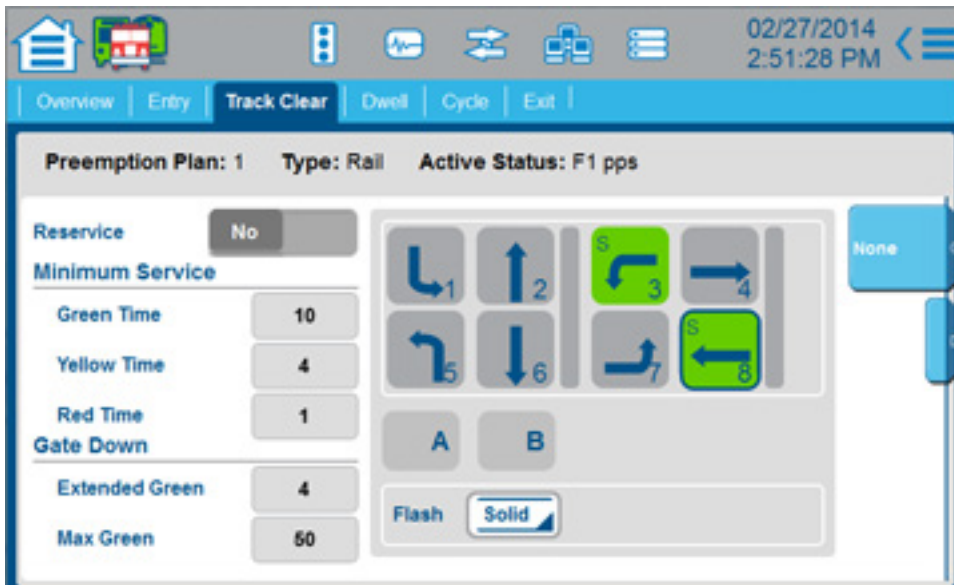


3. From the **Flash** drop-down menu, select the phase output (Solid, F1 pps, F2 pps, F3 pps). In this example, **Solid** is selected (also shown by the S in the top corner of the field for Phase 3).
4. Select **[Commit]**.



5. Repeat Step 1 thru Step 4 for Phase 8.

6. This is the final screen:



To program the other parameters in this screen, refer to the table that follows.

**Notes:**

- Track Clear phases are highlighted in green.
- To remove a Track Clear phase, select the phase and then select [None].
- The row below the phases shows overlaps A and B. You can also program overlaps as Track Clear phases. To program overlaps in Track Clearance, refer to the last row in the table that follows.

Throughout this procedure, select [Commit] as necessary to enable a change to the database. For an explanation of Transaction Mode (that runs when you make a critical change to programming), refer to the Help (**Options > Help**) for **Home > Phase Order > Phase Order**.

## Notes for Preemption Track Clear

Track Clear Parameter	Description	Range
Reservice	<p><b>Track Clearance Reservice</b></p> <p><b>Yes:</b> Allows the preemptor to re-service the track clearance phases when the preemption call goes away and returns before the preemption sequences terminate. With this option enabled, the <b>Post Call Extended</b> option is disabled (programmed in the <b>Cycle</b> screen).</p> <p><b>No:</b> Disables re-servicing the preemption track clearance phases while in the preemption sequence.</p>	Yes, No
<b>Minimum Service Times</b>		
Green Time	<p><b>Track Clearance Time, Minimum Green</b></p> <p><b>0-255 sec:</b> For Track Clear Green, the preemptor times this setting regardless of the phase timing. The indications at least time the Guaranteed Minimum Times (<b>Home &gt; Timing Plans &gt; Guaranteed</b>).</p> <p><b>Notes:</b></p> <p><b>0 (zero):</b> Track clearance green time omits the track clearance interval regardless of programming.</p> <p>Programming this value to 255 allows the phase minimum times to be used.</p> <p><b>Important:</b> If the setting of these clearance values is zero and the Guaranteed Minimum Times are also zero, the indication will terminate immediately when exiting track clearance regardless of the time on the phase. This can result in a clearance indication being omitted or shorter than the MMU minimum clearance time resulting in a Latched MMU Minimum Clearance failure.</p>	0-255 sec.
Yellow Time	<p><b>Track Clearance Time, Yellow or Red</b></p> <p><b>0.0 - 25.5 sec:</b> Track Clear Yellow or Red also times the programmed value unless a value of 25.5 is set. With a value of 25.5, the controller uses the phase programmed time (<b>Home &gt; Timing Plans</b>). Regardless, the indications at least time the Guaranteed Minimum Times (<b>Home &gt; Timing Plans &gt; Guaranteed</b>).</p> <p><b>Note:</b> Setting these values to 25.5 allows the phase minimum times to be used.</p>	0.0 - 25.5 sec.
Red Time	<p><b>Important:</b> If the setting of these clearance values is zero and the Guaranteed Minimum Times are also zero, the indication will terminate immediately when exiting track clearance regardless of the time on the phase. This can result in a clearance indication being omitted or shorter than the MMU minimum clearance time resulting in a Latched MMU Minimum Clearance failure.</p>	
<b>Gate Down</b>		
Extended Green	<p><b>Preemptor Gate Down Extended Green</b></p> <p><b>Note:</b> For this feature to operate, you must set a non-zero value for this <b>Gate Down Extended Green</b> and also <b>Gate Down Max Green</b>.</p> <p><b>0.0</b> (zero) disables the Gate Down option.</p> <p><b>0.1 to 25.5 sec.:</b> This timing will extend the Track Clear green time after the Gate Down input is received.</p> <p>This enables any cars that have just crossed the tracks to get through the intersection on a Green light.</p> <p><b>Important:</b> If the gate down maximum green timer times out, the preemptor will force the intersection into flash!</p> <p><b>Note:</b> This timing only takes effect after the Track Clear Minimum Green time is complete and the Gate Down input has been received. If the Gate Down signal never happens, then the Extend Green Time will never time and eventually the controller will go into Gate Down Fault Flash.</p>	0 - 25.5 sec.



Track Clear Parameter	Description	Range
Max Green	<p><b>Track Clearance Time, Maximum Track Clear Green</b>  <b>Note:</b> For this feature to operate, you must set a non-zero value for <b>Gate Down Extended Green</b> as well as this <b>Gate Down Max Green</b>.</p> <p><b>0</b> (zero) disables the Gate Down option.  <b>1 - 255 sec.:</b> The maximum time that Track Clear Green may be serviced when being extended by the Gate Down feature.</p> <p><b>Important:</b> If the gate down maximum green timer times out, the preemptor will force the intersection into flash!</p>	0 - 255 sec.
(Phase Diagram)	<p><b>Track Clearance Phase(s)</b>  To program phases for Track Clearance, refer to the example before this table. These are the phases serviced first following Initial Clearance. Each ring will time according to the Track Clearance Green, Yellow Change and Red Clearance intervals. Each ring then holds in Red transfer until all have finished their Track Clearance timing. All rings then advance to the preemptor Dwell interval together. The Yellow and Red indication will be solid but the green will be as follows:</p>	Solid, F1 pps, F2 pps, F5 pps [None] disables
[Vehicle]	<ul style="list-style-type: none"> <li>• <b>Solid:</b> Solid Green when the phase is green.</li> <li>• <b>F1 pps:</b> Flashing Green at 1 pps when the phase is green</li> <li>• <b>F2 pps:</b> Flashing Green at 2.5 pps when the phase is green.</li> </ul>	
Flash	<ul style="list-style-type: none"> <li>• <b>F5 pps:</b> Flashing Green at 5 pps when the phase is green.</li> </ul> <p><b>Note:</b> Changes in flashing rate will take place when the phase green starts to time. All Track Clearance vehicle movements must be permissive and compatible with each other. Track Clearance vehicle movements cannot be Dwell or Cycle vehicle movements.</p>	

Track Clear Parameter	Description	Range
(Overlap Diagram)	<p><b>Track Clearance Overlap(s)</b>  Refer to the illustrations before this table.  To enable an overlap during Track Clearance:  1. Select the overlap phase (A, B, C, etc.).  2. In the Flash drop-down menu, select <b>Solid, F1 pps, F2 pps, or F5 pps</b> (described below).  The Yellow and Red indication are solid, but the Green is as follows:</p> <ul style="list-style-type: none"> <li>• <b>Solid:</b> Solid Green when the overlap is green or timing between two included phases.</li> <li>• <b>F1 pps:</b> Flashing Green at 1 pps when the phase is green or timing between two included phases</li> <li>• <b>F2 pps:</b> Flashing Green at 2.5 pps when the phase is green or timing between two included phases</li> <li>• <b>F5 pps:</b> Flashing Green at 5 pps when the phase is green or timing between two included phases</li> </ul>	Solid, F1 pps, F2 pps, F5 pps
Flash	<p>To disable an overlap during Track Clearance:  1. Select the overlap phase (A, B, C, etc.).  2. In the Flash drop-down menu, select Off.</p> <p>Observe the information below:</p> <ul style="list-style-type: none"> <li>• Changes in flashing rate will take place when the phase green starts to time.</li> <li>• All Track Clearance vehicle movements must be permissive and compatible with each other.</li> <li>• Track Clearance vehicle movements cannot be dwell or cycling movements.</li> <li>• Track Clearance overlap indications will only be active if they have an Included phase programmed (in <b>Home &gt; Overlap &gt; Overlaps</b>) as a Track Clearance vehicle movement.</li> </ul> <p>All overlap operations (including lead/lag timing, protect, modified and not-overlap) will be active coming to, during, and exiting Track Clearance.</p>	Off disables



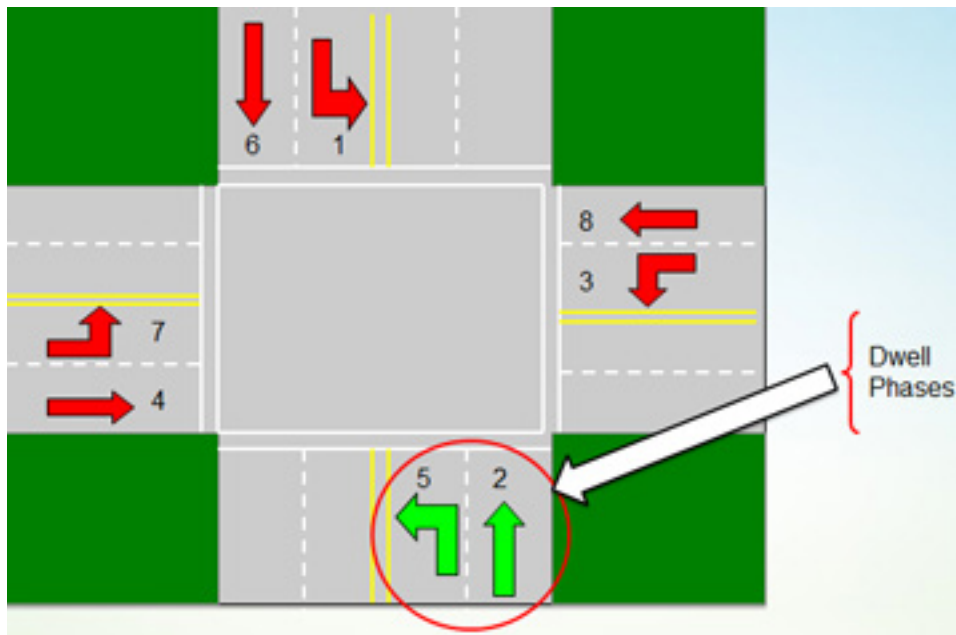
## Dwell

### Top of the Screen

The settings at the top of this screen are read-only; you set these parameters in the Overview screen: Preemption Plan (1 thru 10), Feature Type Filter (Rail, Emergency) and Active Status (Off, Solid, F1 pps, F2 pps, F5 pps).

### Example of Dwell Phases

In the example shown below, there is an ambulance whose path is on Phase 2. The ambulance sends a preemption signal after which the controller times Phase 2 and Phase 5 in Dwell Green and the other phases in Dwell Red. The ambulance can then proceed safely through the intersection.



### Procedure

**Note:** Throughout this procedure, select [**Commit**] as necessary to enable a change to the database. For an explanation of Transaction Mode (that runs when you make a critical change to programming), refer to the Help (**Options > Help**) for **Home > Phase Order > Phase Order**.

For the above example, you could program as follows, as shown in the screen below:

1. Select Phase 2.
2. Select the [Vehicle] soft key.
3. In the Flash drop-down menu, select Solid.
4. Repeat Step 1 thru Step 3 for Phase 5.



To program the other parameters in this screen, refer to the table that follows.

**Notes:**

- Dwell phases are highlighted in green.
- To remove a Dwell phase, select the phase and then select [None].
- The row below the phases shows overlaps A and B. You can also program overlaps as Dwell phases. To program overlaps as Dwell, refer to second to the last row in the table that follows.

## Notes for Preemption Dwell

Dwell Parameter	Description	Range
Minimum Dwell	<p><b>Preemptor Minimum Dwell Time</b></p> <p><b>0 - 255:</b> The minimum time (in seconds) for the Dwell Phases. After this time, the preemptor waits for the duration time to be complete and the preemption input to go FALSE before it exits.</p>	0 - 255 sec
Flashing	<p><b>Dwell Phases Flash During the Dwell Interval</b></p> <p>When the preemptor advances to the dwell interval (dwell phases may or may not be programmed), the load switch outputs behave as follows:</p> <p><b>Off:</b> Load switch outputs do not flash.</p> <p><b>LDSW (Load Switch):</b> Causes the preemption Dwell phases to flash Yellow while all other phases flash Red. Dwell Flash operation is limited to one phase per ring that is also a permissive phase.</p> <p><b>Note:</b> This Flash exits to either the Exit Phases or (if no exit phases) to the Dwell Phases.</p> <p><b>Monitor:</b> On NEMA cabinet, controller forces the controller to drop CVM and puts the intersection into Cabinet Flash. On 300 Series cabinet, for this to work, Conflict Monitor needs to have watchdog latching disabled. In this mode, Watchdog can be stopped to produce cabinet flash.</p> <p>Upon exiting Preemption, the controller will time the Power-Up Red before going to the Start-up phases as programmed in <b>Home &gt; Flash &gt; Startup Flash</b>.</p>	Off, LDSW, Monitor
Exit Color	<p><b>Dwell Flash Exit Color</b></p> <p>In the Exit Color drop-down menu, select Red, Yellow or Green. The controller will exit from Dwell phase flash to the selected color indication.</p> <p><b>Note:</b> For this option to operate, you must also select either Dwell Phases and/or Exit Phases. Track Clearance vehicle movements cannot be an Exclusive Ped Phase.</p>	Red, Green, Yellow
Ped Dark	<p><b>Pedestrian Indications Dark</b></p> <p><b>Yes:</b> Turns OFF all pedestrian output indications while the preemptor is Active.</p> <p><b>No:</b> Lets pedestrian indications follow other preemptor programming.</p>	Yes, No
Phase Diagram	<p><b>Dwell Phase(s)</b></p> <p>These are the phases that will be first served following the Track Clearance interval. The Yellow and Red indication will be solid but the Green indication will be as described below.</p> <p>For each Dwell Phase:</p> <ol style="list-style-type: none"> <li>In the phase diagram, select the phase (highlighted in green).</li> <li>In the <b>Flash</b> drop-down menu select the Green indication as described below:</li> </ol> <p><b>Solid:</b> Solid Green when the phase is green.</p> <p><b>F1 pps:</b> Flashing Green at 1 PPS when the phase is Green</p> <p><b>F2 pps:</b> Flashing Green at 2.5 PPS when the phase is Green.</p> <p><b>F5 pps:</b> Flashing Green at 5 PPS when the phase is Green.</p> <p><b>Observe the notes below:</b></p> <ul style="list-style-type: none"> <li>Changes in flashing rate will take place when the phase green starts to time.</li> <li>All Dwell vehicle movements must be permissive.</li> <li>Dwell vehicle movements cannot be Track Clearance vehicle movements.</li> <li>Dwell phases may not be Identical to the Cycle phases. For example, Dwell 2/5, Cycle 2/5 is not permitted.</li> <li>An Exclusive Ped phase may be used as a Dwell phase but its corresponding Dwell Ped phase must also be selected.</li> </ul>	Solid, F1 pps, F2 pps, F5 pps

Dwell Parameter	Description	Range
Overlap Field (bottom of screen)	<p><b>Dwell Overlap(s)</b>            These are the Overlaps to be first served following Track Clearance. Dwell overlap Yellow and Red indication will be solid, but the green will be as described below.            For each Overlap:            1. In the Overlap field, select the overlap (highlighted in green).            2. In the Flash drop-down menu select the Green indication as described below:  <b>Solid:</b> Solid Green when the Overlap phase is green.  <b>F1 pps:</b> Flashing Green at 1 PPS when the phase is green.  <b>F2 pps:</b> Flashing Green at 2.5 PPS when the phase is green.  <b>F5 pps:</b> Flashing Green at 5 PPS when the phase is green.  <b>Observe the notes below:</b></p> <ul style="list-style-type: none"> <li>• All Dwell vehicle movements must be permissive.</li> <li>• Dwell vehicle movements cannot be Track Clearance vehicle movements.</li> <li>• Dwell overlap indications will only be active if they have an included phase (<b>Home &gt; Overlap &gt; Overlaps</b>) programmed as a Dwell vehicle movement.</li> <li>• All overlap operations (including lead/lag timing, protect, modified, and not-overlap) will be active coming to, during, and exiting Dwell interval.</li> </ul>	Solid, F1 pps, F2 pps, F5 pps
[Ped and Vehicle]	<p><b>Dwell Pedestrian(s)</b>            After you select a phase, if you want to serve Dwell phase Pedestrian movements as well as Vehicle movements, select [Ped and Vehicle].  <b>Note:</b> If Dwell Flash option is enabled, no pedestrian indications can be serviced.</p>	



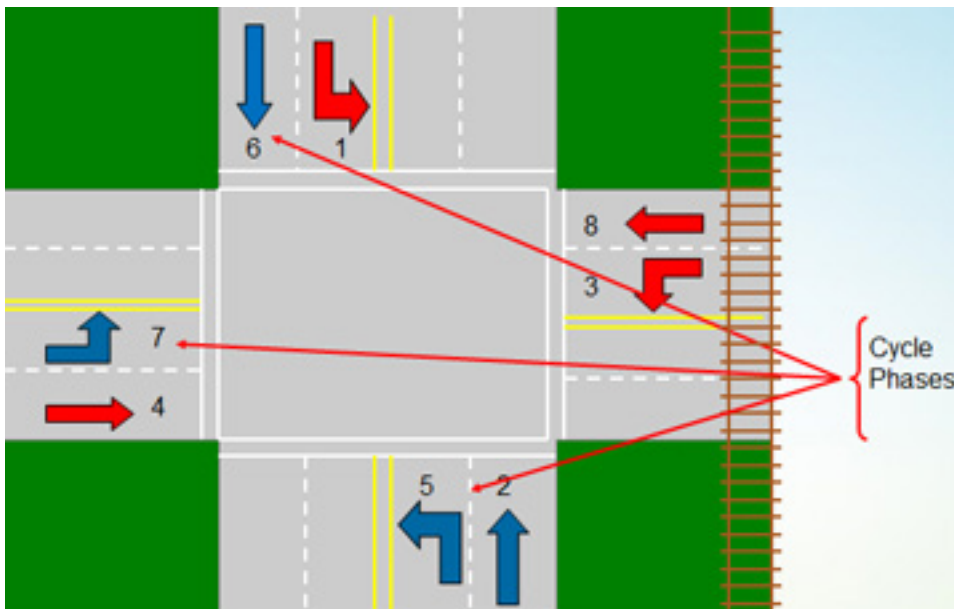
## Cycle

### Top of the Screen

The settings at the top of this screen are read-only; you set these parameters in the **Overview** screen: **Preemption Plan** (1 thru 10), **Feature Type Filter** (Rail, Emergency) and **Active Status** (Off, Solid, F1 pps, F2 pps, F5 pps).

### Example of Cycle Phases

In the example shown below, there is a Rail preemption timing. It is safe for Phases 2, 5, 6 and 7 to continue timing their normal cycle while Phases 1, 4, 8 and 3 are Red. Phases 2, 5, 6 and 7 are the Cycle Phases.

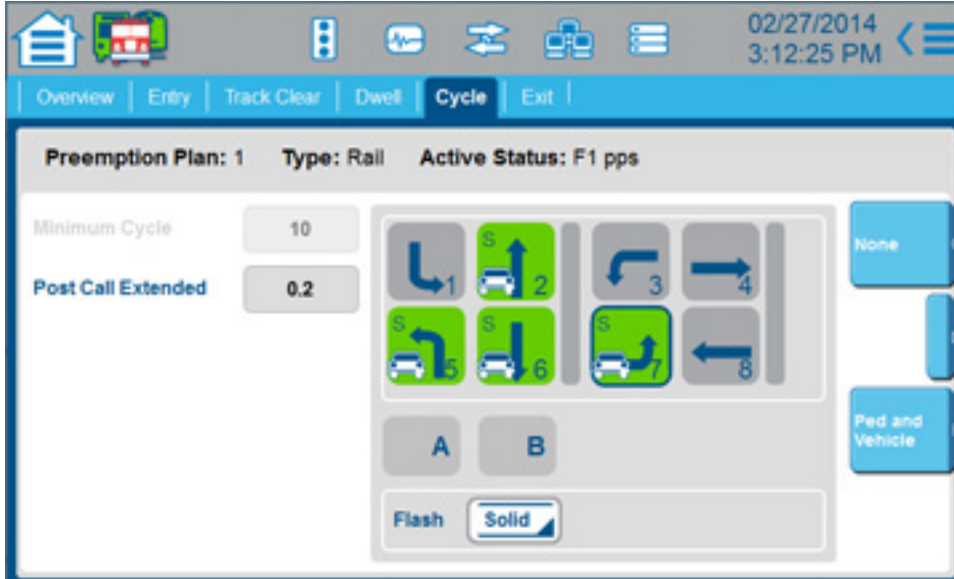


### Procedure

**Note:** Throughout this procedure, select **[Commit]** as necessary to enable a change to the database. For an explanation of Transaction Mode (that runs when you make a critical change to programming), refer to the Help (**Options>Help**) for **Home > Phase Order > Phase Order**.

For the above example, you could program as follows, as shown in the screen below:

1. Select Phase 2.
2. Select the [Vehicle] soft key.
3. In the Flash drop-down menu, select Solid.
4. Repeat Step 1 thru Step 3 for Phases 5, 6 and 7.



To program the other parameters in this screen, refer to the table that follows.

**Notes:**

- Cycle phases are highlighted in green.
- To remove a Cycle phase, select the phase and then select [None].
- The row below the phases shows overlaps A and B. You can also program overlaps as Cycle phases. To program overlaps as Cycle, refer to second to the last row in the table that follows.

**Notes for Preemption Cycle**

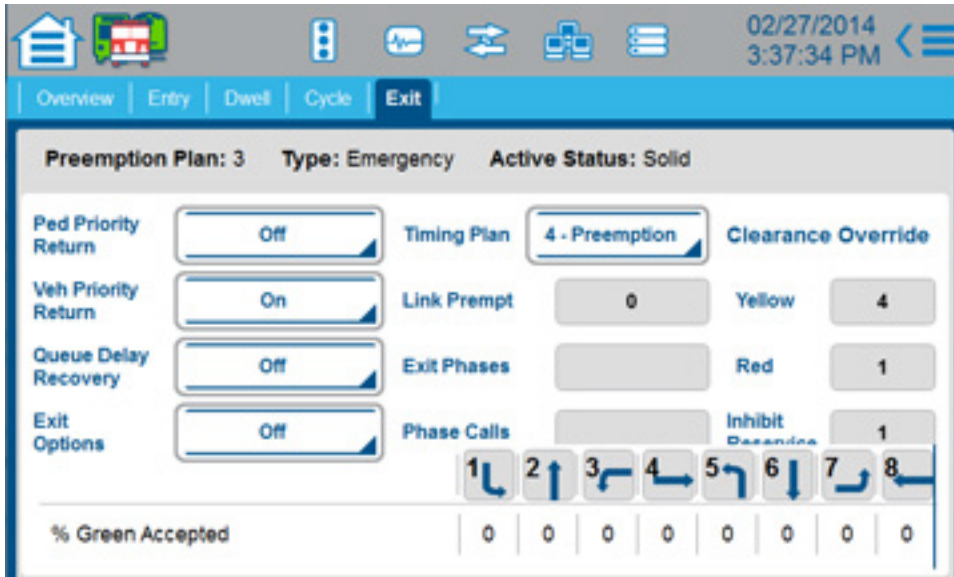
Cycle Parameter	Description	Range
Minimum Cycle	<b>Preemptor Minimum Cycle Time</b> 0 - 255: The minimum time (in seconds) for the Dwell Phases. After this time, the preemptor waits for the duration time to be complete and the preemption input to go FALSE before it exits.	0 - 255 sec
Post Call Extended	<b>Preemption Input Extension Time</b> Preemptor remains in Dwell interval for Extend Input time when preempt call is removed. If preempt call is reapplied during this time, the preemptor reverts to start of dwell interval. Zero entry causes no input extension time and Dwell interval ends when the preempt call is removed.	0.0 - 25.5 seconds



Cycle Parameter	Description	Range
Phase Diagram	<p><b>Cycle Phase(s)</b>            These are the phases that will be served after the Dwell Phases. The Yellow and Red indication will be solid but the Green indication will be as described below.            For each Cycle Phase:</p> <ol style="list-style-type: none"> <li>In the phase diagram, select the phase (highlighted in green).</li> <li>In the Flash drop-down menu select the Green indication as described below:</li> </ol> <p><b>Solid:</b> Solid Green when the phase is green.  <b>F1 pps:</b> Flashing Green at 1 PPS when the phase is Green  <b>F2 pps:</b> Flashing Green at 2.5 PPS when the phase is Green.  <b>F5 pps:</b> Flashing Green at 5 PPS when the phase is Green.</p> <p><b>Observe the notes below:</b></p> <ul style="list-style-type: none"> <li>Changes in flashing rate will take place when the phase green starts to time.</li> <li>Cycle vehicle movements cannot be Track Clearance vehicle movements.</li> <li>It is not <b>valid</b> to use <b>exactly</b> the same phase for both a Cycle movement and Dwell movement, for example Dwell 2,5 and Cycle 2,5. However, for example, Dwell 2,5 and Cycle 2,6,7,8 would be acceptable; in this example, the Dwell programming tells the preemptor to service 2, 5 first and then continue to the cycle phases as they have demand.</li> <li>If no calls exist on any of the Cycle phases, then the preemptor will automatically apply Vehicle calls to all Cycle phases so the Cycle Phases will be serviced at least once.</li> <li>An Exclusive Ped phase may be used as a Cycle phase but its corresponding Cycle Ped phase must also be selected.</li> </ul>	Solid, F1 pps, F2 pps, F5 pps
Overlap Field (bottom of screen)	<p><b>Cycle Overlap(s)</b>            These are the Overlaps to be first served after Dwell vehicle movements. Dwell overlap Yellow and Red indication will be solid, but the green will be as described below.</p> <p><b>For each Overlap:</b></p> <ol style="list-style-type: none"> <li>In the Overlap field, select the overlap (highlighted in green).</li> <li>In the Flash drop-down menu select the Green indication as described below:</li> </ol> <p><b>Solid:</b> Solid Green when the Overlap phase is green.  <b>F1 pps:</b> Flashing Green at 1 PPS when the phase is green.  <b>F2 pps:</b> Flashing Green at 2.5 PPS when the phase is green.  <b>F5 pps:</b> Flashing Green at 5 PPS when the phase is green.</p> <p><b>Observe the notes below:</b></p> <ul style="list-style-type: none"> <li>Cycle vehicle movements cannot be Track Clearance vehicle movements.</li> <li>Cycle overlap indications will only be active if they have an included phase (Home &gt; Overlap &gt; Overlaps) programmed as a Cycle vehicle movement.</li> <li>All overlap operations (including lead/lag timing, protect, modified, and not overlap) are active coming to, during, and exiting Dwell and Cycling phases.</li> </ul>	Solid, F1 pps, F2 pps, F5 pps
[Ped and Vehicle]	<p><b>Cycle Pedestrian(s)</b>            After you select a phase, if you want to serve Cycle phase Pedestrian movements as well as Vehicle movements, select [Ped and Vehicle].</p> <p><b>Note:</b> If Dwell Flash option is enabled, no pedestrian indications can be serviced.</p> <p>These pedestrian movements time during the Cycle interval following the Dwell movements.</p> <p><b>Note:</b> Although the preemptor applies Cycle Vehicle calls for Cycle phases, it does not apply Cycle Ped calls.</p>	



## Exit



Use this screen to program how to make the transition from a Preemption Plan to the programmed Day Plan when the controller Exits preemption.

### Top and Bottom of the Screen

**Top:** The settings at the top of the screen are read-only; you set these parameters in the **Overview** screen: **Preemption Plan** (1 thru 10), **Feature Type Filter** (Rail, Emergency) and **Active Status** (Off, Solid, F1 pps, F2 pps, F5 pps)

**Bottom:** The % Green Accepted parameter is shown if Veh Priority Return is set to On or Time of Day. If Veh Priority Return is set to Off, the % Green Accepted parameter is hidden.

**Note:** Whether the Inhibit Reservice parameter (last parameter in the far-right column of this screen) is hidden or shown in this screen depends on the setting of the Feature Type Filter parameter in the **Overview** screen (to go there, select the Overview tab):

- If **Rail** is selected, the **Inhibit Reservice** parameter is hidden in this **Exit** screen.
- If **Emergency** is selected, the **Inhibit Reservice** parameter is shown in this **Exit** screen.

## Exit Strategy Priorities

With respect to the preemptor Exit phase parameters that follow, if you enable multiple exit strategies, they are processed in the order listed below. If a higher priority strategy is not satisfied, then the next highest will be evaluated.

For example, if both **Ped Priority Return** (3rd in the list) and **Veh Priority Return** (4th in the list) are enabled but no Ped Priority Exit Phase is found (Preempt did not interrupt a ped movement), then the preempt exit logic will check if any phases met the criteria for a Veh Priority Return Exit Phase.

1. Exit from CVM preempt flash state (preempt exits to programmed start-up phases)
2. Exit to pending preempt
3. **Ped Priority Return**
4. **Veh Priority Return**
5. **Queue Delay Recovery**
6. The selection for **Exit Options** in this **Preempt Plan: Exit to Coord, Exit to Phase Once** or **Exit to One Cycle** (exit to one free cycle)
7. Programmed exit phases
8. Currently Green phases
9. The next phase in the sequence rotation with a demand

Throughout this procedure, select [Commit] as necessary to enable a change to the database. For an explanation of Transaction Mode (that runs when you make a critical change to programming), refer to the Help (**Options > Help**) for **Home > Phase Order > Phase Order**.

## Notes for Preemption Exit

Exit Parameter	Description	Range
Ped Priority Return	<p><b>Pedestrian Priority Return Exit Option</b></p> <p>Select from the drop-down menu to enable/disable the preemptor to check if the Walk or Ped Clear timing has been interrupted by a preempt:</p> <p><b>Off:</b> Disabled</p> <p><b>On:</b> Always Enabled</p> <p><b>Time of Day:</b> Enabled only by Time of Day. This function is then controlled by <b>Home &gt; Event Plans &gt; Advanced &gt; Allow Ped Priority Return</b> (set to Yes or No).</p> <p>When this is enabled, the preemptor will determine if Walk or Ped Clear timing has been shortened by the preemptor as it attempts to start. If so, then those interrupted Peds will be selected as Ped Priority Return Exit phases.</p>	Off, On, Time of Day

Exit Parameter	Description	Range
Timing Plan	<p><b>Preemption Exit Timing Plan</b> In the drop-down menu, select the controller timing plan (you can program up to four timing plans in <b>Home &gt; Timing Plans</b>) that will be in effect when preemption exits.</p> <p><b>If you select a timing plan (of 4 possible timing plans):</b> Forces the controller to use the selected timing plan for the first controller cycle after preemption. That controller cycle will be complete when all phases have been served that had demand at preemption exit.</p> <p><b>0 - None (Auto):</b> Lets you select the timing plan by normal controller operation. <b>Note:</b> If the preemptor exits directly to coordination (Preemption to Coordination), the timing plan selected by the preemptor will be in effect as coordination is running until all phases with demand at preempt exit have been serviced.</p>	0 4 different possible timing plans
Veh Priority Return	<p><b>Vehicle Priority Return Exit Option</b> <b>Note:</b> The % Green Accepted parameter (at the bottom of this screen) is shown if this Veh Priority Return parameter is set to On or Time of Day. If Veh Priority Return is set to Off, the % Green Accepted parameter is hidden. <b>Note:</b> Interrupted Phases = phases timing when the preemptor tries to start. Select from the drop-down menu to enable/disable the preemptor to decide if an Interrupted Phase will be selected as an exit phase: <b>Off:</b> Disabled <b>On:</b> Always Enabled <b>Time of Day:</b> Enabled only by Time of Day. This function is then controlled by <b>Home &gt; Event Plans &gt; Advanced &gt; Allow Vehicle Priority Return</b> (set to Yes or No). When this is enabled, the preemptor: 1. Calculates the % Green timed of the Interrupted Phases 2. Compares the % Green timed with the % value you entered in % <b>Green Accepted</b> (bottom of this screen) for the Interrupted Phases 3. If the % Green is less than the % value you entered in % <b>Green Accepted</b> for a phase, then the preemptor selects that Interrupted Phase as a Veh Priority Return Exit phase. For details about the % Green Accepted parameter, refer to the last row of this table.</p>	Off, On, Time of Day
Link Preempt	<p><b>Preemptor to be Linked to this Preemptor</b> Select a higher priority (lower numbered) preemptor to link to this preemptor. The linked preemptor will be called when this preemptor completes the programmed minimum dwell time. The call to the linked preemptor will be maintained as long as demand for this preemptor is present. Calls to any lower priority or not valid preemption sequence will be ignored. The linking preemptor feature allows multiple track clearances or complex preemption sequences with one preemptor calling another. <b>Example:</b> Preemptor 3 is linked to 2, it will go through its Track Clearance interval and start the Dwell interval. When the Minimum Dwell/Cycle Green time is elapsed, a call is then placed on Preemptor 2. This transfers control to Preemptor 2. Preemptor 2, in turn, can then be linked to Preemptor 1. This example creates a possibility of five phase clearance prior to getting to the Preemptor 1 Dwell interval and timing its phases. <b>Important:</b> The Max Presence time for each preemptor must be taken into account when this feature is used to make sure the correct operation occurs.</p>	0-9

Exit Parameter	Description	Range
Filtered Input	1 thru 10: Select (1 thru 10) for the number of the hard-wired input to connect to this preemptor. 0: This is set automatically when Solid and Pulsing are both not selected for the Call Method. This indicates that the input filtering is bypassed and the hard-wired input connects to the preempt with the same number.	1 thru 10, 0
Clearance Override Yellow Red	<p><b>Exit Yellow Change and Red Clearance times when Preemption Exits</b> This parameter depends on exit phase and automatic flash priority programming. <b>0.0 - 25.5:</b> The preemptor times (in seconds) the smaller of these settings or the phase programmed times (<b>Home &gt; Timing Plans</b>). Regardless, the indications will not time less than the Guaranteed Minimum Times (<b>Home &gt; Timing Plans &gt; Guaranteed</b>).</p> <p><b>Important:</b> If these values are set to zero and the Guaranteed Minimum Times (<b>Home &gt; Timing Plans &gt; Guaranteed</b>) are also zero, the indication will terminate immediately when it enters preemption, regardless of the time on the phase. This can result in a clearance indication being omitted or shorter than the MMU minimum clearance time resulting in a Latched MMU Minimum Clearance failure.</p>	0.0 - 25.5 seconds
Queue Delay Recovery	<p><b>Queue Delay Recovery Option</b> Select from the drop-down menu to enable/disable as described below: <b>Off:</b> Disabled <b>On:</b> Always Enabled <b>Time of Day:</b> Enabled only by Time of Day When this is enabled, the preemptor: 1. Checks phase wait time (WT) since last demand. 2. Checks the number of cars waiting for service (CW). 3. Selects the phases with the greatest WT x CW values as possible Exit Phases, one phase per ring. If the weighted delays for two phases are equal, the next in the sequence is served first.</p> <p><b>Example:</b> Phase A wait = 50 secs with 10 cars in line; phase B wait = 80 secs with 7 cars in line. <math>80 \times 7 (560) &gt; 50 \times 10 (500)</math> so Phase B is selected. One phase per ring and concurrent group are selected as exit phases. <b>Note:</b> Also, to include a phase in the selection process, you must set <b>Preempt Queue Delay Calculate</b> to Yes in <b>Home &gt; Detection &gt; Vehicle Detection</b>.</p>	Off, On, Time of Day
Exit Phases	<p><b>Preemption Exit Phase(s)</b> Select exit phases (1 thru 16) to enable the operation described below. For the phases you select as exit phases, the preemption sequence terminates when all exit phases are timing. If you do not select an exit phase, there are two possibilities:</p> <ul style="list-style-type: none"> <li>• If the Preemption-to-Coordination option is not active, the preemptor terminates immediately and exits from the Cycling interval directly to normal controller operation.</li> <li>• If the Preemption-to-Coordination option is active, the preemptor will terminate and exit from the Cycling interval directly to the lowest priority phase(s) that have an open coordination permissive window. This allows the preemptor to exit directly into coordination without requiring a pickup cycle or transition.</li> </ul> <p><b>Note:</b> Exit phases must be permissive and compatible with each other.</p>	1-16

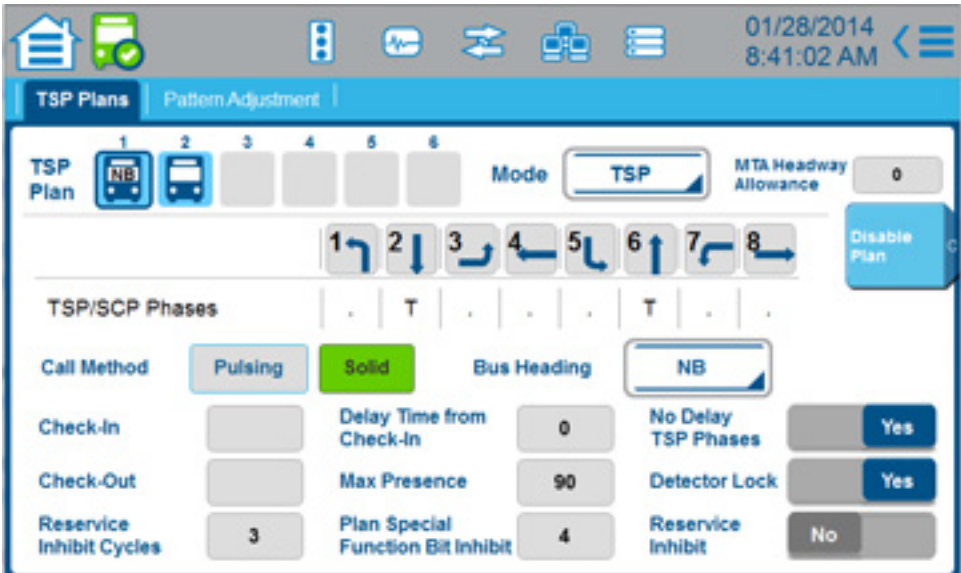
Exit Parameter	Description	Range
Exit Options	<p><b>Preemption Exit Options for Timing Plan</b></p> <p><b>Note:</b> In the descriptions below, Timing Plan refers to the timing plan set in the Timing Plan parameter in this screen. For <b>Exit to Phase Once</b> and <b>Exit to One Cycle</b> to operate, you must set a Timing Plan. <b>Exit to Coord</b>, however, operates with or without a Timing Plan.</p> <p>From the drop-down menu, select the next phase after exit from a preemption:</p> <p><b>Off:</b> Disable</p> <p><b>Exit to Coord:</b> The preemptor exits directly into the coordination sequence and does not require a pickup cycle when the coordinator is active.</p> <p><b>Exit to Phase Once:</b> The preemptor exits directly to the exit phase with a Timing Plan. This preempt exit Timing Plan is used only for the timing of the exit phases.</p> <p><b>Exit to One Cycle:</b> The preemptor exits to Free for one cycle by a Timing Plan. Then the controller returns to Coordination mode. One cycle = all phases that had external calls when the preemption exited; recalls or internal calls are not included.</p>	Off, Exit to Coord, Exit to Phase Once, Exit to One Cycle
	<p><b>Phase Calls</b></p> <p>The phase(s) for which the preemptor enters a vehicle call when it exits preemption.</p>	1-16
Inhibit Reservice	<p><b>Low Priority Preemption Re-service Time</b></p> <p>Selects the time duration that a low priority preemptor is inhibited after preemption.</p> <p><b>Note:</b> Whether this parameter (last parameter in the far-right column of this screen) is hidden or shown in this screen depends on the setting of the <b>Feature Type Filter</b> parameter in the <b>Overview</b> screen (to go there, select the Overview tab):</p> <ul style="list-style-type: none"> <li>• If <b>Rail</b> is selected, this <b>Inhibit Reservice</b> parameter is hidden in this <b>Exit</b> screen.</li> <li>• If <b>Emergency</b> is selected, this <b>Inhibit Reservice</b> parameter is shown in this <b>Exit</b> screen.</li> </ul> <p><b>0:</b> Disables re-service Operation</p> <p><b>1 - 254:</b> Specifies the minimum time allowed between low-priority preempt calls.</p> <p><b>255:</b> Requires all active phases with calls, when the preemptor exits, to be serviced before preemption can be serviced.</p>	0-255 sec.
	<p><b>Vehicle Priority Return Green Percent Values</b></p> <p><b>Note:</b> This % <b>Green Accepted</b> parameter (at the bottom of the screen) is shown if <b>Veh Priority Return</b> in this screen is set to <b>On</b> or <b>Time of Day</b>. If <b>Veh Priority Return</b> is set to <b>Off</b>, this % <b>Green Accepted</b> parameter is hidden.</p> <p><b>Note:</b> Interrupted Phases = phases timing when the preemptor tries to start.</p> <p>Enter the minimum percent of green that is necessary to time in an Interrupted <b>Phase:</b></p> <p><b>0:</b> Disables</p> <p><b>1 - 100:</b> For an Interrupted Phase, minimum % of green to time</p> <p>When you enter a % value (1-100), the preemptor:</p> <ol style="list-style-type: none"> <li>1. Calculates the % Green timed of the Interrupted Phase.</li> <li>2. Compares the % Green timed with the % value you entered for this parameter for that phase.</li> <li>3. If the % Green is less than the % value you entered for this phase, then the preemptor selects that Interrupted Phase as a Veh Priority Return Exit phase.</li> </ol>	0 - 100



## Transit Signal Priority

### TSP Plans

Use this screen to program Transit Signal Priority configuration events for mass transit vehicles.



For TSP Theory of Operation, refer to Chapter 2 of the *ASC/3 TSP User Guide*, P/N 100-0903-003.

### To program TSP

1. At the top left of the screen, select a TSP Plan (1 - 6) you want to program.
2. At the top right of the screen, select the [Enable Plan] soft key.
3. Set the parameters as described in the table below.
4. Select the [Pattern Adjustment] tab and set the parameters as described in the next chapter.

### Notes for TSP Plans

TSP Plans Parameter	Description	Range
TSP Plan	<b>TSP Plan</b> Select the square with the number for the TSP Plan you want to program or view in this screen.	1 - 6

TSP Plans Parameter	Description	Range
Mode	<p><b>Mode</b></p> <p><b>TSP (Transit Signal Priority):</b> Econolite TSP operation is enabled. The TSP minimum splits for phases associated with TSP are computed by subtracting each SCP Max Reduction value (<b>Home &gt; Transit Signal Priority &gt; Pattern Adjustment</b>) from its coordination split (<b>Home &gt; Event Plans &gt; Splits &gt; Split</b>). The TSP split maximums are computed from the cycle length (<b>Home &gt; Event Plans &gt; Pattern &gt; Cycle</b>) for each ring: The length of the longest timing ring is subtracted from the specified cycle length, and that difference is added to the minimum TSP splits of the TSP phases.</p> <p><b>Example:</b> Standard Quad with phases 1, 2, 3, 4 in Ring 1 and phases 5, 6, 7, 8 in Ring 2.</p> <p>Cycle Length = 100s All coordination phase splits are 25 s and Phase Max Reduction are 10 s</p> <p>TSP phase split minimum: 25 s - 10 s = 15 s</p> <p>TSP phase split maximum: (100 - 15 - 15 - 15 - 15) + 15 = 55 s</p> <p><b>SCP (Signal Control and Prioritization):</b> NTCIP SCP operation is enabled. During SCP operation, the Max and Min phase split or Max green times are determined as follows:</p> <ul style="list-style-type: none"> <li>- Max phase split = Phase split in coordination split pattern plus the corresponding SCP split pattern SCP Max Extension time (Home &gt; Transit Signal Priority &gt; Pattern Adjustment &gt; Max Extension).</li> <li>- Min phase split = Phase split in coordination split pattern minus the corresponding SCP split pattern Max Extension time. This reduction is limited to the minimum time the phase requires to time.</li> </ul> <p><b>Enhanced:</b> Enhanced TSP operation is selected. This operation is the same as TSP operation except that it allows lagging TSP phases to be serviced before their preceding phases in the same current group if:</p> <ul style="list-style-type: none"> <li>- Call is initiated from an advanced TSP detector.</li> <li>- At check-in, timing or next phases are not compatible with TSP phases.</li> <li>- TSP phases are coordinated phases in coordination.</li> <li>- TSP phases are lagging phases in their current group.</li> </ul> <p><b>Example:</b></p> <pre>  1 2   9   3 4     5 6   10   7 8  </pre> <p>where phase 2, 6 are TSP phases and phase 1, 5 are leading phases.</p> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>- All TSP check-in and check-out are SOLID signals.</li> <li>- When the leading phases are being serviced after TSP phases and there is TSP demand on the normal or reverse direction (direction of each TSP 1-4 can be specified by the Bus Heading settings), calls will be placed on immediate next phases in the sequence (phase 9 and 10 in the above example.)</li> </ul>	TSP, SCP, Enhanced
MTA Headway Allowance	<p><b>Bus Headway Allowance</b></p> <p>This specifies the percentage of headway allowance that the controller will respond to the Metropolitan Transportation Authority (MTA) Priority Request. This is only applicable with Metro Rapid Protocol that you set in the Status Bar in <b>Network &gt; Serial &gt; COMM PORT 2 &gt; Protocol &gt; METRO RAPID.</b></p>	0-255 %



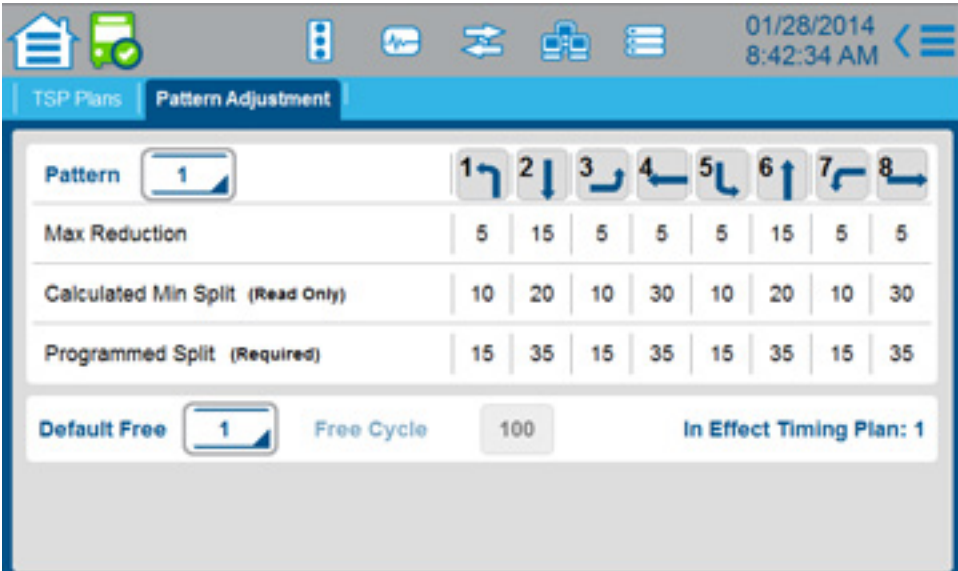
TSP Plans Parameter	Description	Range
TSP/SCP Phases	<p><b>TSP/SCP Phase Assignment</b></p> <p>. = No programming  <b>T</b> = TSP/SCP Phase  <b>V</b> = (Vehicle) Phase Omit  <b>P</b> = Ped Omit</p>	. T V P
[Enable Plan], [Disable Plan]	<p><b>Enable Plan Soft Key</b></p> <p>Select this to enable the TSP Plan and its parameters for the TSP Plan (1 thru 6) that is selected for this screen.</p> <p>After you select [Enable Plan] and commit the change, this field changes to [Disable Plan]. Select [Disable Plan] to disable the TSP Plan that is selected for this screen.</p>	Enable Plan, Disable Plan
Call Method	<p><b>Call Method</b></p> <p>Select the type of signal that the bus uses to check in and check out. For this TSP/SCP plan, the detector (1 thru 10) is used as a filter to sense whether the bus that is approaching/clearing the intersection is transmitting a solid or pulsing signal.</p> <p><b>Pulsing:</b> Have the detector look for pulsing signals for this TSP/SCP plan.  <b>Solid:</b> Have the detector look for solid signals for this TSP/SCP plan.</p>	Pulsing, Solid
Bus Heading	<p><b>Direction the Bus is Heading</b> (for labeling purposes only—does not affect programming)</p> <p>Bus Heading to TSP inputs 1-4 mapping for Metropolitan Transportation Authority (MTA) priority request (only applicable with Metro Rapid Protocol that you set in the Status Bar in <b>Network &gt; Serial &gt; COMM PORT 2 &gt; Protocol &gt; METRO RAPID</b>)</p> <p>NB = Northbound bus  SB = Southbound bus  EB = Eastbound bus  WB = Westbound bus</p> <p><b>Defaults:</b>  TSP 1 = NB  TSP 2 = SB  TSP 3 = EB  TSP 4 = WB</p>	NB, SB, EB, WB
Check-In	<p><b>Detector Number to Filter the Input for Check-In</b></p> <p><b>1 – 10:</b> Select the detector to use for the check-in signal for this TSP/SCP Plan.</p>	1 - 10
Delay Time from Check-In	<p><b>Delay Time from Check-In</b></p> <p><b>0-255:</b> The number of seconds between the TSP/SCP Check-In and the start of the TSP/SCP operation.</p>	0-255 sec
No Delay TSP Phases	<p><b>No Delay When in TSP Phases</b></p> <p><b>Yes:</b> No delay time when a TSP/SCP phase is timing in green.  <b>No:</b> TSP/SCP will be serviced when the delay time is complete.</p>	Yes, No
Check-Out	<p><b>Check-Out</b></p> <p><b>Note:</b> Only Solid signals are used for Check-Out. Thus, this parameter is grayed out for a Pulsing Call Method.</p> <p><b>1 - 10:</b> Select the detector to use for the check-out signal for this TSP/SCP Plan.</p>	1 - 10 (Detectors)

TSP Plans Parameter	Description	Range
Max Presence	<p><b>Maximum Presence</b></p> <p><b>1-255:</b> Specifies the max time in seconds a TSP/SCP call can be held or that the TSP/SCP movement can be active.</p> <p><b>0:</b> Allows the TSP/SCP call and active TSP/SCP movement to NOT be terminated until:</p> <ul style="list-style-type: none"> <li>- A check-out (CO) signal is received</li> <li>- Preemption sequence becomes active or</li> <li>- An Event special function inhibits this TSP/SCP sequence</li> </ul>	0 - 255 sec
Detector Lock	<p>If the input is set to Pulsing, select locking Check-In (CI) input (<b>Yes</b>) or non-locking CI input (<b>No</b>).</p> <p><b>Yes</b> - Momentary pulsing CI input will be locked. TSP/SCP is released under the conditions that follow:</p> <ul style="list-style-type: none"> <li>- TSP/SCP phases are active: when delay terminates, the TSP/SCP releases the end of TSP/SCP phase extension period, or when a check-out is received.</li> <li>- TSP/SCP phases are not active: when delay terminates, then TSP/SCP is released at the beginning of the TSP/SCP phase(s).</li> </ul> <p><b>No</b> - Momentary pulsing input will not be locked.</p> <p><b>Note:</b> When inputs are set to Solid, the check-in is locked until a check-out is received or the TSP operation forces a check-out.</p>	Yes, No
Reservice Inhibit Cycles	<p><b>0-255:</b> The number of cycles that all TSP/SCP inputs will be inhibited following a TSP/SCP movement that is activated by this input.</p> <p><b>Coordinated mode:</b> The cycle length is determined from the coordinated pattern in effect.</p> <p><b>Free mode:</b> The cycle length is determined from the selected Free pattern. If there is no free pattern programmed, the re-service time is zero. <b>Note:</b> The re-service operation will inhibit all.</p>	0 – 255 Cycles
Plan Special Function Bit Inhibit	<p><b>Plan Special Function Bit Inhibit</b></p> <p><b>1-8:</b> This TSP/SCP sequence is inhibited when the Event Plan in effect has the entered Special Function enabled.</p> <p><b>0:</b> This TSP/SCP sequence is not inhibited by the Event Plan in effect.</p>	0 - 8
Reservice Inhibit	<p><b>Reservice Inhibit</b></p> <p>With this option, you can inhibit the TSP/SCP operation after preemption until after the specified reservice cycles.</p> <p><b>Yes:</b> Inhibit TSP/SCP operation until after the reservice cycles.</p> <p><b>No:</b> The TSP/SCP sequence can be active immediately after a preemption sequence</p>	Yes, No



**Pattern Adjustment**

Use this screen to program Transit Signal Priority configuration events for mass transit vehicles.



**Notes for Pattern Adjustment**

Pattern Adjustment Parameter	Description	Range
Pattern	<b>TSP Coordinator Pattern</b> Select a Coordinator Pattern number that is not already in use for a TSP pattern during Coordinated Mode operation.	1 - 120
Max Reduction	<b>Maximum Reduction</b> This is a per-phase and per-split pattern parameter that specifies the maximum number of seconds that the split of a phase can be reduced during TSP. This effective value may be reduced based on the operating phase minimum service requirements.	0 - 255 sec

Pattern Adjustment Parameter	Description	Range
Max Extension	<p><b>Phase Maximum Extension</b> NTCIP 1211 4.2.6.1.2</p> <p><b>Note:</b> This parameter is only used when <b>Home &gt; Transit Signal Priority &gt; TSP Plans &gt; Mode</b> is set to <b>SCP</b> (not shown for TSP).</p> <p><b>0-255:</b> The maximum number of seconds that the split of a phase can be extended during a priority strategy.</p> <p>The effective value may be modified by the coordination based on the time gained from the reductions of the non-priority phases.</p> <p>This is a per-phase and per-split pattern parameter that specifies the maximum number of seconds that the split of a phase can be extended during SCP.</p>	0 - 255 sec
Calculated Min Split (Read Only)	<p><b>Minimum Green + Clearance Time</b></p> <p><b>Note:</b> This parameter is only used when <b>Home &gt; Transit Signal Priority &gt; TSP Plans &gt; Mode</b> is set to <b>TSP</b> (not shown for SCP).</p> <p>This is a per-phase and per-split pattern parameter. This automatic calculation is the coordination split minus the Max Reduction = TSP Min. Green + clearance time.</p>	sec
Programmed Split (required)	<p><b>Split Intervals of the Cycle Time</b></p> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>- You can also program splits in <b>Home &gt; Event Plans &gt; Splits &gt; Split</b></li> <li>- You set the unit of measure (seconds or percent) in <b>Home &gt; Coordination &gt; Coordination Options &gt; Split Units</b></li> </ul> <p>Here you divide the cycle time into sections (split intervals) to assign the maximum amount of time to each timing phase during coordination.</p> <p><b>Important:</b> Observe the Cautions listed below.</p> <p>If ECPI Coordination is set to <b>No</b> (in <b>Home &gt; Coordination &gt; Coordination Options</b>), the coordinator will go free when:</p> <ul style="list-style-type: none"> <li>- Entering zero for any active phase-split.</li> <li>- Entering phase-splits that are smaller than the minimum phase time Entering splits that exceed the cycle length.</li> </ul> <p>If ECPI Coordination is set to <b>Yes</b> (in <b>Home &gt; Coordination &gt; Coordination Options</b>), then:</p> <ul style="list-style-type: none"> <li>- Entering zero for any active phase-split will omit that phase.</li> <li>- Entering phase-split(s) that are smaller than the minimum phase time(s) or that exceed the cycle length may cause loss of coordination.</li> </ul> <p><b>Note:</b> A Phase Split is the maximum amount of time available to a phase during coordination if <b>Floating Force-Offs</b> is in effect. If using <b>Fixed Force-Offs</b> are in effect and the split timer starts early due to time left over from preceding phases, the phase can be extended by demand up to the force-off point. The maximum time available can only be lowered if you have a Max Select (Max 1, 2 or 3) (set in <b>Home &gt; Coordination &gt; Coordination Options &gt; Default Split Max Select</b> or in <b>Home &gt; Event Plans &gt; Pattern &gt; Max Select</b>) and if the max time in effect is shorter than the split.</p>	0 – 255 sec, 0 – 100%
Default Free	<p><b>Default Free Mode Pattern</b></p> <p>Select the Coordinator Pattern that the controller will use when if it is in Free Mode after it receives a TSP Check-In signal.</p>	1 – 120
Free Cycle (read only)	<p>Cycle length of the Default Free Mode Pattern</p> <p><b>Note:</b> This parameter is for TSP Only (not shown for SCP).</p>	sec
In Effect Timing Plan (read only)	<p>This is the Timing Plan that is in effect when this TSP Coordinator Pattern is in effect.</p>	1 – 4



Home



Coordination

## Coordination Options

### Coordination

#### Coordination Options

### Programming Summary for Coordination Options

Use this screen to specify 18 different coordinator option values as follows (for details, refer to **Notes for Coordination Options**):

Coordination Parameter	Programming Summary
Default Force Off	Selects the method of determining the position of the phase force off
Offset Reference	Selects the local zero reference point for the programmed offset
Priority System Source	Move the indicated source option to the highest priority source for selection of the coordination pattern.
Split Unit	Selects the split units as seconds or percent
Offset Unit	Selects the offset units as seconds or percent
System Coord Select Format	Determines the format in which the source is presenting the coordination pattern selection
Default Split Max Select	Allow the maximum split time in coordination to be either the phase split (inhibit maximum) or selected Max 1, 2, or 3.

Coordination Parameter	Programming Summary
Transition Method	Selects the method that the coordinator uses to get into coordination synchronization
Min Cycle Calc Ped Time	Allows the smooth transition algorithm to use or not to use the pedestrian times in determining the smooth transition direction
Correction Max Time	Enters the maximum time that the coordinator can dwell or add when transitioning.
Self Sync Count	Selects the number of missed syncs allowed from an external source before reverting to time-base.
Force-Off Add Initial Green	Allows the coordinator to terminate the phase green when added initial is timing. This only has an effect when added initial is programmed during volume-density operation ( <b>Home &gt; Timing Plans &gt; Passage &gt; Volume Density</b> ).
Allow Ped Recall	Allows the programmed pedestrian recall ( <b>Home &gt; Detection &gt; Ped Detection</b> ) to recycle the pedestrian movement when the Coordinator Pattern has Actuated Walk programmed
Allow Ped Reservice	Allows pedestrian movement when walk plus ped clearance can time before force-off point
Walk Delayed to Local Zero	Enable the coordinated phase walk to be prevented from starting until the local zero. Normally, the coordinated phase walk starts as soon as it is able to after the last permissive is closed.
ECPI Coordination	Allows ECPI coordination operation and parameters
Local Zero Override	Allows the non-coordinated phase/s to use a portion of the coordinated phase split before the coordinated phase becomes green. The movement continues to run and remain in sync with the Local Master Dial until the coordinated phase would violate the Yield point. At that time, the Local Dial stops until the coordinated phase is green and reports a local zero error. Note: Typically used on short cycles that have seldom used non-coordinated movements.
Multi-Sync	Allows the coordinator to receive multiple sync pulses. The coordinator will synchronize to the pulse that represents cycle in effect.

## Notes for Coordination Options

Coordination Parameter	Description	Range
<b>Default Force Off</b>	<p><b>Determines position of the phase force off</b></p> <p><b>Fixed:</b> The phase will force off at the fixed position in the cycle regardless of when it started.</p> <p><b>Floating:</b> The phase will force off after it has serviced its split regardless of when it started.</p>	<p>Fixed</p> <p>Floating</p>
<b>Offset Reference</b>	<p><b>Offset Reference</b></p> <p>In the drop-down box, select Lead, Lag, Yield, Yellow or Ring 1 as the offset reference.</p> <p><b>Lead:</b> References the start of the Local Dial to the start of the first coordinated phase green.</p> <p><b>Lag:</b> References the start of the Local Dial to the start of the last coordinated phase green.</p> <p><b>Yield:</b> References the start of the Local Dial to the start of the yield of the first coordinated phase.</p> <p><b>Yellow:</b> References the start of the Local Dial to the start of the first coordinated phase yellow.</p> <p><b>Ring 1:</b> References the start of Ring 1 coordinated phase.</p> <p><b>Note: Criteria for Ring 1 are listed below.</b></p> <p>If there is no coordinated phase on Ring 1 or the coordinated phase is in a ring that runs independently of Ring 1 (not in the same concurrent group with Ring 1 coordinated phase), the offset reference is the start of the first coordinated phase (same as Lead).</p> <p>In 3 or 4-ring configurations, TSP is not supported if the coordinated phase of Ring 1 is not the first or last coordinated phase.</p>	<p>Lead</p> <p>Lag</p> <p>Yield</p> <p>Yellow</p> <p>Ring 1</p>
<b>Priority System Source</b>	<p><b>System (Coordination) Source</b></p> <p>In the drop-down box, select Hardware, Time-Based or System as the source of coordination commands.</p> <p>Default source priority (Manual-Highest): Manual, Remote Command, Time-Based, Hardware. Selecting the below option to place it at the top priority source of coordination. All other sources will stay with default priority order.</p> <p><b>Hardware:</b> The source of coordination data is the NEMA TS2 inputs.</p> <p><b>Time-Based:</b> The source of coordination data is Time Base.</p> <p><b>System:</b> The source of coordination data is Port 2 or Ethernet per the settings in the Network screen in the Status Bar.</p>	<p>Hardware</p> <p>Time-Based</p> <p>System</p>
<b>Split Unit</b>	<p><b>Split Units</b></p> <p>Seconds NTCIP 1202 2.5.9.3</p> <p>Percent (ECPI feature)</p> <p>In the drop-down box, select Seconds or Percent.</p> <p><b>Seconds:</b> Defines the units programmed in the Split Pattern (<b>Home &gt; Event Plans &gt; Splits and Home &gt; Split Demand &gt; Special Split</b>) as seconds.</p> <p>Percent: Defines the units programmed in the Split Pattern (<b>Home &gt; Event Plans &gt; Splits and Home &gt; Split Demand &gt; Special Split</b>) as percentage of the cycle time.</p> <p><b>Note:</b> When this parameter is changed between Seconds and Percent on any coordination pattern, every pattern is changed.</p>	<p>Seconds</p> <p>Percent</p>

Coordination Parameter	Description	Range
Offset Unit	<p><b>Offset Units</b></p> <p>Seconds NTCIP 1202 2.5.7.3</p> <p>Percent (ECPI feature)</p> <p>In the drop-down box, select Seconds or Percent.</p> <p><b>Seconds:</b> Defines the units programmed in the Offset Value (<b>Home &gt; Event Plans &gt; Pattern</b>) as seconds.</p> <p><b>Percent:</b> Defines the units programmed in the Offset Value (<b>Home &gt; Event Plans &gt; Pattern</b>) as percentage of the cycle time.</p> <p><b>Note:</b> When this parameter is changed between Seconds and Percent on any coordination pattern, every pattern is changed.</p>	Seconds Percent
	<p><b>System (Coordination) Format</b></p> <p>In the drop-down box, select Standard, TS2 or Pattern interconnect format.</p> <p><b>Standard:</b> The coordination patterns are selected by Econolite-Standard cycle/offset/split commands. The pattern with the matched Cycle Offset Split (COS) value is selected.</p> <p>The coordinator is free if the cycle or split is zero.</p> <p><b>TS2:</b> The coordination patterns are selected by TS2 timing plans and offset. The pattern selected is determined by the following:  <math display="block">(((\text{Timing plan}) * 3) + \text{offset}) = \text{pattern number. (Reference NEMA TS2 Table 3-14 TIMING PLAN).}</math></p> <p>The coordinator is free if the offset is zero. Flash is by a separate command.</p> <p><b>Pattern:</b> The coordination pattern (coordination, free or automatic flash mode) is selected directly by the Event Plan (<b>Home &gt; Event Plans &gt; Overview with the [Add New Plan] soft key</b>).</p>	Standard TS2 Pattern
Default Split Max Select	<p>In the drop-down box, select Max Inhibit, Max 1, Max 2 or Max 3.</p> <p><b>Max Inhibit:</b> Allows the coordinator phase split to control the time a phase is allowed to be green in any Coordination Pattern.</p> <p>Max 1, Max 2 or Max 3: Allows the shorter of the Max Green timing (<b>Home &gt; Timing Plans &gt; Max Green</b>) or the coordinator phase split to control the time a phase is allowed to be green in any Coordination Pattern.</p>	Max Inhibit Max 1 Max 2 Max 3
Transition Method	<p>In the drop-down box, select Dwell, Smooth or Add Only to select the method of offset change.</p> <p><b>Dwell:</b> Change is by holding in the coordinated phases for a specified dwell period (refer to NTCIP 1202 2.5.2 Integer 1).</p> <p>Snap offset correction is active at all times. The general operation performs as follows: If a local cycle can be in sync, make it in sync.</p> <p><b>Smooth:</b> Is accomplished by adding or subtracting a maximum of 17% of cycle length per cycle (Ref NTCIP 1202 2.5.2 Integer 3). Econolite lets you change this factor by changing the Dwell / Add Time when it is non-zero.</p> <p><b>Add Only:</b> Is accomplished by adding a maximum of 17% of cycle length per cycle (ref NTCIP 1202 2.5.2 Integer 4). Econolite lets you change this factor by changing the Dwell / Add Time when it is non-zero.</p>	Dwell Smooth Add Only



Coordination Parameter	Description	Range
<b>Min Cycle Calc Ped Time</b>	<p>For Offset Correction, Use Pedestrian Times When Calculating Minimum Cycle Select Yes (to enable) or No (to disable) using pedestrian times for minimum cycle calculations.</p> <p><b>Note:</b> The minimum cycle value has effect only on subtraction during Smooth Transition.</p> <p><b>Yes:</b> Includes pedestrian times in minimum cycle calculation for offset correction.</p> <p><b>No:</b> Omits pedestrian times from the minimum cycle calculation for offset correction.</p> <p><b>Note:</b> No is typically used at intersections that have little or no pedestrian movements.</p>	<p>Yes</p> <p>No</p>
<b>Correction Max Time</b>	<p>Use the scrubber to enter the maximum time that Dwell or Add/Subtract time during transition.</p> <p>When the Offset Correction is Dwell: <b>0 (zero):</b> NTCIP maximum dwell period (ref NTCIP 1202 2.5.2 Integer 2) is 20% of the cycle (if the offset is in percent) or 20 seconds (if the offset is in seconds). <b>1-99:</b> Percentage if the offset is in percent <b>100-255:</b> Seconds if the offset is in seconds</p> <p>When the Offset Correction is Add Only or Smooth Transition: <b>0 (zero):</b> During add only or Smooth Transition, maximum 17% of the cycle to be adjusted (ref NTCIP 1202 2.5.2 Integers 3 and 4) <b>1-99:</b> Maximum percentage of the cycle to be adjusted during Add Only or Smooth Transition <b>Note:</b> During Smooth Transition, the coordinator subtracts a maximum of 17% of the cycle.</p>	<p>0-255 seconds</p> <p>1-99 percent</p>
<b>Self Sync Count</b>	<p>Allows the coordinator to self sync when a sync pulse does not occur at Local Master Zero.</p> <p>0: Defaults to 1 self-sync cycle.</p> <p><b>1-254:</b> Self-sync cycles that will be completed if a sync pulse does not occur; after which, Coordination reverts to Time Base operation.</p> <p><b>255:</b> Allows the coordinator to continue to re-sync until a sync pulse is detected.</p> <p><b>Note: This option is used when the interconnect sync pulses are an even multiple of the local cycle.</b></p> <p><b>Example:</b> Set the re-sync count to 3 when:</p> <ul style="list-style-type: none"> <li>The interconnect sync pulse every 180 seconds.</li> <li>The local cycle is 60 seconds.</li> </ul>	<p>0-255</p>
<b>Force-Off Add Initial Green</b>	<p><b>Force Off Added Initial Green</b></p> <p>Select Yes (to enable) or No (to disable) the Force Off of Added Initial Green by the Coordinator.</p> <p><b>Note: This option allows the use of the Added Initial calculations while maintaining coordination.</b></p> <p><b>Yes:</b> Allows the coordinator to force off the Added portion of Initial Green that was generated by volume density.</p> <p><b>No:</b> Prevents the coordinator from Forcing off the Added portion of Initial Green that was generated by volume density.</p>	<p>Yes</p> <p>No</p>

Coordination Parameter	Description	Range
<b>Allow Ped Recall</b>	<p><b>Coordinated Phase Pedestrian Re-service</b>            Select Yes (to enable) or No (to disable) pedestrian recall (<b>Home &gt; Timing Plans &gt; Recall</b> and <b>Home &gt; Event Plans &gt; Recall</b>) during coordination.</p> <p><b>Yes:</b> Allows the programmed pedestrian recall to recycle the pedestrian movement when the Coordinator Pattern has Actuated Walk programmed. The pedestrian actuations will have no effect.</p> <p><b>No:</b> Allows only pedestrian actuations to recycle the pedestrian movement during coordination. The programmed pedestrian recall will not recycle the pedestrian movement when the Coordinator Pattern has actuated Walk programmed.</p>	Yes No
<b>Allow Ped Re-service</b>	<p><b>Pedestrian Re-service</b>            Select Yes (to enable) or No (to disable) to re-service the Walk during coordination.</p> <p><b>Yes:</b> Allows the pedestrian movements to be re-serviced during coordination.</p> <p><b>No:</b> Prevents the pedestrian movements from being re-serviced during coordination.</p> <p><b>Note:</b> When pedestrian phases are re-serviced, they will return to the start of the Walk interval. Any pedestrian phase can be re-serviced when there is a pedestrian call and Walk plus Pedestrian Clear can be timed in full before the force-off point (Split Time).</p> <p><b>Note:</b> If Pedestrian Protect is enabled, Pedestrian Re-service is disabled. Refer to <b>Home &gt; Overlap &gt; Details &gt; Ped Protect Enable</b></p>	Yes No
<b>Walk Delayed to Local Zero</b>	<p><b>Delay the Coordinated Walk to Local Zero</b>            Select Yes (to enable) or No (to disable) delaying the start of the coordinated phase walks.</p> <p><b>Yes:</b> Delays the start of walk of the coordinated phases until the start of local zero.</p> <p><b>No:</b> Allows the coordinated phase walk to start after the end of the last permissive period is closed.</p>	Yes No

Coordination Parameter	Description	Range
ECPI Coordination	<p>Select Yes (to enable) or No (to disable).</p> <p><b>Yes:</b> The coordinator will:</p> <p>Not be set free if the critical phase (Minimum time to service the phase) time is greater than the split.</p> <ul style="list-style-type: none"> <li>Not be set free if the critical path (Minimum time to service all phases with minimum recall applied) through the phase diagram is greater than the cycle length.</li> <li>Will time 20 seconds of dwell with zero entered in <b>Correction Max Time</b> in this screen.</li> <li>Will time the Smooth transitions add time if the <b>Correction Max Time</b> entry in this screen is greater than zero. If equal to zero, it will time 17%.</li> </ul> <p><b>No (default):</b> The coordinator will:</p> <ul style="list-style-type: none"> <li>Be set free if the critical phase (Minimum time to service the phase) time is greater than the split (Reference NTCIP 1202-2.5.9.3).</li> <li>Be set free if the critical path (Minimum time to service all phases with minimum recall applied) through the phase diagram is greater than the cycle length (Reference NTCIP 1202-2.5.9.3).</li> <li>Will time max dwell regardless of what is programmed in the <b>Correction Max Time</b> parameter in this screen (Reference NTCIP 1202-2.5.2).</li> <li>Will time the Smooth transitions add time if the <b>Correction Max Time</b> parameter in this screen is greater than zero. If equal to zero, it will time 17% (Reference NTCIP 1202-2.5.2).</li> <li>Force the coordinator to Max Inhibit when <b>Default Split Max Select</b> in this screen is set to Max 3.</li> <li>Force the coordinator free when the Cycle is greater than 255.</li> </ul>	Yes No
Local Zero Override	<p><b>Local Zero Override</b></p> <p><b>Yes:</b> Allows the coordinator local dial to continue running and remain in synchronization with the Local Master Dial until the coordinated phase would violate the Yield point. At that time, the Local Dial stops until the coordinated phase is green and reports a local zero error.</p> <p><b>No:</b> Normal coordinator operation. The Local Dial stops at Local Zero until the coordinated phase is green and reports a local zero error.</p> <p><b>Note:</b> Typically used on short cycles that have seldom used non-coordinated movements. Allows the non-coordinated phase(s) to use a portion of the coordinated phase split before the coordinated phase becomes green. The seldom used movement has a phase split that violated the coordinated cycle or phase split because of a pedestrian movement, density, full phase demand, or guaranteed minimum times. There will be not reported or logged errors if the coordinated phase is can yield by the yield point.</p>	Yes No
Multi-Sync	<p>Select Yes (to enable) or No (to disable) the Multi-Sync Operation.</p> <p><b>Yes:</b> Allows the coordinator to receive sync pulses that represent multiple cycle lengths and synchronize to the sync pulse that represents cycle in effect.</p> <p><b>No:</b> Resets the local master dial on every sync pulse.</p>	Yes No



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Coordination

## Auto-Permissive

### *Auto-Permissive*

#### Use this display to specify all Auto-Permissive Minimum Green periods:

- Enter desired automatic permissive minimum green times for each phase 1-8. This time is only used in the auto-permissive calculations and has no effect on the actual phase minimum green.
- Zero entry disables the function for that phase.

#### To enable automatic permissive operation:

Go to **Home > Event Plans > Patterns > Manual Vehicle Permissive Period** and set all three vehicle permissive periods to zero.

#### Notes for Auto-Permissive

Auto-Permissive Parameter	Description	Range
Min Green	Select the phase minimum green time (in seconds) to be used by the coordinator. This Min Green or the phase Min Green time ( <b>Home &gt; Timing Plans &gt; Min Green &gt; Min Green</b> ), whichever is larger, is used by the auto permissive algorithm to determine the permissive for each phase. <b>Note:</b> This entry is only in effect when all three vehicle Permissive fields are set to zero in <b>Home &gt; Event Plans &gt; Patterns &gt; Manual Vehicle Permissive Period</b> .	0-255 seconds



## Split Demand

### *Split Demand*

	Demand 1	Demand 2
Phases	4	8
Detector	10	11
Call Time (sec)	50	80
Cycle Count	1	1

1 2 3 4 5 6 7 8 9 0 C [Eye Icon]

You use the **Split Demand** screens to program split patterns to use in special situations. For example, if there were a long line of cars waiting at a red light as part of the traffic after an event in a stadium, you could enable a split pattern with an extra-long green on that phase to clear the traffic. Use this screen to specify all Split Demand data values.

Enter desired phase(s) timing, detectors and continuous detector activity to enable split Demand 1 or Demand 2. Select the number of coordinator cycles that split demand will be in operation.

## Notes for Split Demand

Split Demand Parameter	Description	Range
	<p><b>Split Demand 1 &amp; Split Demand 2 Phase(s)</b></p> <p>For each Split Demand, select the phases for Split Demand operation. The coordinator uses the split values in <b>Split Demand Pat 1</b> or <b>Split Demand Pat 2</b>, as specified in the Coordinator Pattern (<b>Home &gt; Event Plans &gt; Pattern</b>) when the:</p> <ul style="list-style-type: none"> <li>• Demand phase(s) are timing and</li> <li>• Demand Detector is continuously actuated and</li> <li>• Demand Call Time has been exceeded.</li> <li>• When Split Demand Pattern has been selected, it remains in effect for the number of cycles set in Cycle Count after the above conditions are no longer met.</li> </ul> <p><b>Note:</b> Split demand operation allows the intersection to call a different Split Pattern (<b>Home &gt; Event Plans &gt; Splits</b>) to service local traffic demand.</p>	
Phases		1-16
	<p><b>Split Demand Detector Assignment</b></p> <p>Use the keyboard or scrubber to select the detector to enable the coordinator Split Demand 1 or 2.</p> <p><b>1-64:</b> Selects the Raw detector input to be used. This detector need not be assigned or programmed (<b>Home &gt; Detection &gt; Vehicle Detection</b>).</p> <p><b>0 (zero):</b> Disables Split Demand operation.</p> <p><b>Note:</b> If a detector fails, it disables the Split Demand 1 or 2 selections.</p>	
Detector		0-64
	<p><b>Split Demand Call Time</b></p> <p>Use the keyboard or scrubber to enter a number (1-255) to specify a call time or enter 0 (zero) to disable the split demand operation.</p> <p><b>1-255:</b> Specifies the number of seconds of continuous detector activity while the demand phase(s) are timing. Enables Split Demand operation.</p> <p><b>0 (zero)</b> disables the split demand operation.</p>	
Call Time (sec)		0 disables 1-255 selects time
	<p><b>Split Demand Cycle Count</b></p> <p>Use the keyboard or scrubber to specify 1-255 cycles that Split Demand operation remains in effect after Demand Call Time conditions are no longer met. The coordinator uses the split values in Split Demand Pattern 1 or 2, as specified in Coordinator Pattern (<b>Home &gt; Event Plans &gt; Pattern</b>) when the:</p> <ul style="list-style-type: none"> <li>• Demand phase/s are timing and</li> <li>• Demand Detector is continuously actuated and</li> <li>• Demand Call Time has been exceeded.</li> </ul>	
Cycle Count		1-255



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Split Demand

## Special Split

### Special Split

You use the **Split Demand** screens to program split patterns to use in special situations. For example, if there were a long line of cars waiting at a red light as part of the traffic after an event in a stadium, you could enable a split pattern with an extra-long green on that phase to clear the traffic.

Below is a summary of the programming for this Special Split screen, followed by detailed descriptions to program this screen.

### Programming Summary for Special Splits

Special Split Parameter	Programming Summary
Split Number	In the drop-down menu, select a Split Number to edit or view or select [New Split] and create a new Split Number. If you have the Transit Signal Priority (TSP) option, refer to <b>Home &gt; Transit Signal Priority &gt; Pattern Adjustment &gt; Pattern</b> .
Split Time	Enter the split value for each active phase.
Coord Phases	Select the phase(s) that will be coordinated when the Split Pattern is operational.

**Special Split  
Parameter****Programming Summary**

Max Recall Select the phase(s) where max recalls are placed when the split pattern is operational.

Veh Recall Select the phase(s) where vehicle recalls are placed when the split pattern is operational.

Omit Select the phase(s) that is omitted when the split pattern is operational.

Ped Recall Select the phase(s) where ped recalls are placed when the split pattern is operational.

**Notes for Special Splits**

Special Split Parameter	Description	Range
Split Number	In the drop-down menu, select a Split Number to edit or view or select [New Split] and create a new Split Number.	1-120
Split Time	<p><b>Split Intervals of the Cycle Time</b></p> <p>Here you divide the cycle time into sections (split intervals) to assign the maximum amount of time to each timing phase during coordination.</p> <p><b>Important:</b> Observe the Cautions listed below.</p> <p>If ECPI Coordination is set to No (in <b>Home &gt; Coordination &gt; Coordination Options</b>), the coordinator will go free when:</p> <ul style="list-style-type: none"> <li>• Entering zero for any active phase-split.</li> <li>• Entering phase-splits that are smaller than the minimum phase time</li> <li>• Entering splits that exceed the cycle length.</li> </ul> <p>If ECPI Coordination is set to Yes (in <b>Home &gt; Coordination &gt; Coordination Options</b>), then:</p> <ul style="list-style-type: none"> <li>• Entering zero for any active phase-split will omit that phase.</li> <li>• Entering phase-split(s) that are smaller than the minimum phase time(s) or that exceed the cycle length may cause loss of coordination.</li> </ul> <p><b>Note:</b> A Phase Split is the maximum amount of time available to a phase during coordination if <b>Floating Force-Offs</b> is in effect. If using <b>Fixed Force Offs</b> are in effect and the split timer starts early due to time left over from preceding phases, the phase can be extended by demand up to the force-off point. The maximum time available can only be lowered if you have a Max Select (Max 1, 2 or 3) (set in <b>Home &gt; Coordination &gt; Coordination Options &gt; Default Split Max Select</b> or in <b>Home &gt; Event Plans &gt; Pattern &gt; Max Select</b>) and if the max time in effect is shorter than the split.</p>	0-255 sec. or 0-99%



Special Split Parameter	Description	Range
	<p><b>Coordinated Phases</b>            Select the phases for Coordination.</p> <p><b>Note:</b> Observe the notes below.</p> <ul style="list-style-type: none"> <li>• All coordinated phases must be compatible (in the same concurrent group).</li> <li>• There must be a Coordinated phase entered for each ring in that concurrent group.</li> <li>• It is permissible to have only one ring in the concurrent group.</li> </ul>	
Coord Phases		1-16
	<p><b>Maximum Recalls</b>            Select the phases where max recall is placed in coordination.</p>	1-16
Max Recall		
	<p><b>Vehicle Recalls</b>            Select the phases where vehicle recall is placed in coordination.</p>	1-16
Veh Recall		
	<p><b>Phase Omits</b>            Select the phases that are omitted in coordination.</p>	1-16
Omit		
	<p><b>Pedestrian Recalls</b>            Select the phases where ped recall is placed in coordination.</p>	1-16
Ped Recall		



## Event Plans

### Overview



This is the first of several screens to create, view or edit Event plans that are used for time-based plans for Flash, Free and Coordination.

### In this Overview screen:

- You create Event Plans for which you select the type of pattern (flash, free, coordinated, auto) and assign and enable/disable various functions by time-of-day.
- You can program up to 100 Event Plans. Use these Event Plans to program up to 16 Day Plans, each of which can have up to 50 Event Plan time periods (to program Day Plans, go to **Home > Scheduler > Day Plan**).

### Top Bar

- At the top of all six Event Plan screens (Overview, Pattern\*, Splits\*, Timing Options, Recall, Advanced) are listed the **Event Plan** and the **Type** of Event Plan (Flash, Free, Coordinated or Auto). When you select [Add New Plan] in this Overview screen, you enter the Event Plan Name and its Type and these parameters are read-only in the other Event Plan screens.
- **Manual Override checkbox:**  
**Checked:** You manually enable the Event Plan selected in this screen. The Event Plan remains in effect until you select another Event Plan or until you uncheck this checkbox. This manual selection overrides any other source.  
**Unchecked:** Cobalt automatically selects Time Base Event Plans by time-of-day.
- \* **Patterns & Split tabs only shown if you select a Coordinated pattern for the Event Plan.**

## Notes for Event Plans, Overview

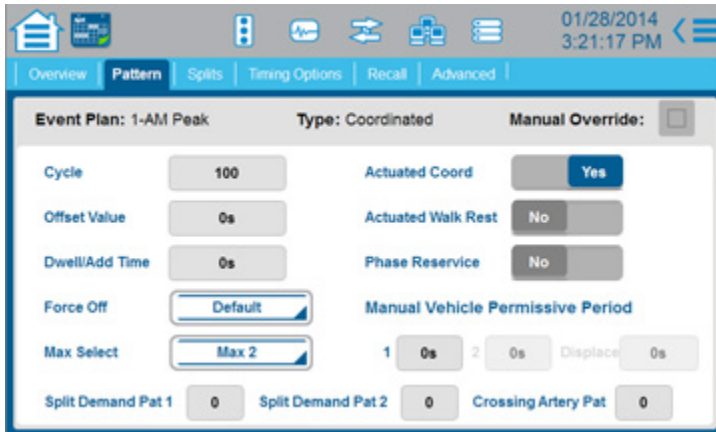
Overview Parameter	Description	Range
Event Plan	<p><b>Event Plan with Number and Name</b></p> <p>In the drop-down menu, select the Event Plan to view or edit.</p> <p>With the [Add New Plan] soft key (described below), you can create up to 100 Event Plans.</p>	Up to 100 different plans
[Add New Plan]	<p><b>Create a New Event Plan</b></p> <ol style="list-style-type: none"> <li>1. Select [Add New Plan].</li> <li>2. In this sub-menu, scroll to assign a Plan Number for this Event Plan.</li> <li>3. Select the Plan Name field and use the keyboard to enter a name for the plan (for example: AM Peak, Off Peak, PM Peak, etc.). The maximum possible number of characters is 12.</li> <li>4. Select the Type of pattern: Flash, Free, Coordinated, Auto</li> <li>5. Select [OK].</li> </ol> <p><b>Flash:</b> Selects Automatic Flash operation. Automatic Flash pattern is treated in the same priority as any other pattern.</p> <p><b>Free:</b> Selects free operation. Sequence defaults to 1 if not specified.</p> <p><b>Coordinated:</b> Selects a coordination pattern for this Event Plan.</p> <p><b>Auto:</b> Indicates that no pattern is selected. The Time Base releases control and allows lower priority control (i.e., hardware interconnect if available).</p> <p><b>Note:</b> If you select a pattern that does not exist or does not meet the timing parameters, the controller sets to Free.</p>	1-100 plans Flash, Free, Coordinated, Auto
[Copy From Plan]	<p>Use this soft key to copy another existing Event Plan to the Event Plan selected in this screen.</p> <ol style="list-style-type: none"> <li>1. Select [Copy From Plan].</li> <li>2. Scroll to the Event Plan you want to copy.</li> <li>3. Select OK.</li> </ol>	All existing Event Plans
[Remove Plan]	<p>Select this soft key to remove the existing plan that you selected in the Event Plan field.</p>	All existing Event Plans
Sequence	<p><b>Controller Sequence</b></p> <p>Selects the controller sequence to operate.</p> <p>Selects the controller sequence, for this Event Plan, when a higher priority routine has not made a selection. Selection priorities from highest to lowest are:</p> <ol style="list-style-type: none"> <li>1. Manual</li> <li>2. System</li> <li>3. Coordinator</li> <li>4. Hardware</li> <li>5. Time Base</li> </ol> <p><b>Auto:</b> Sequence selection is by other means (hardware inputs or Time Base). Defaults to 1 if no sequence number is specified anywhere else.</p> <p><b>1-16:</b> Selects one of 16 possible configurations of sequence data (refer to NTCIP 1202, 2.8.3.3). To program these phase sequences, go to <b>Home &gt; Phase Order &gt; Phase Order</b>.</p>	Auto 1-16

Overview Parameter	Description	Range
Detector Logging Interval	<p><b>Internal Detector Log Enable</b></p> <p>In the drop-down menu, select Disable, 5, 15, 30, or 60 minutes for detector logging. To view Detector Events and Detector Activity, select <b>Event Logs</b> in the Status Bar (second icon from the left in the Status Bar).</p> <p><b>Note:</b> This selection is only in effect when the ECPI Log Period in <b>Home &gt; Detector &gt; Detector Logging</b> is set to TBAP (Time Base Event Plan*).</p> <p>*In Cobalt Classic View, an Event Plan is called an Action Plan.</p>	Disable, 5, 15, 30, 60 minutes
Timing Plan	<p><b>Timing Plan</b></p> <p>In the drop-down menu, select the Timing Plan (1-4) when a higher priority routine has not selected one.</p> <p><b>Auto:</b> Uses the Timing Plan in effect</p> <p><b>1-4</b> (with the name you entered): Selects the Timing Plan (Timing Plans are programmed in <b>Home &gt; Timing Plans</b>).</p>	
Detector Diagnostic Plan	<p>The priorities (from highest to lowest) are:</p> <ol style="list-style-type: none"> <li>1. Manual</li> <li>2. Preemptor</li> <li>3. System</li> <li>4. Coordinator</li> <li>5. Hardware</li> <li>6. Time Base</li> </ol>	Default 1-4 selects by priority
Detector Plan	<p><b>Vehicle Detector Recall Plan</b></p> <p>In the drop-down menu, select the Vehicle Detector Recall Plan for this Event Plan.</p> <p><b>Auto:</b> The Day Plan Event uses the Vehicle Detector Plan already in effect.</p> <p><b>1-4:</b> Selects the Vehicle Detector Plan when a higher priority routine has not selected one.</p> <p>The priorities (from highest to lowest) are:</p> <ol style="list-style-type: none"> <li>1. Manual</li> <li>2. Preemptor</li> <li>3. System</li> <li>4. Coordinator</li> <li>5. Hardware</li> <li>6. Time Base</li> </ol>	Auto 1-4 selects by priority
Pedestrian Diagnostic Plan	<p><b>Pedestrian Detector Diagnostic Plan</b></p> <p>In the drop-down menu, select the Pedestrian Detector Diagnostic Plan if one has not been selected.</p> <p><b>Default:</b> No pedestrian detector diagnostic is selected.</p> <p><b>1-4:</b> Selects the pedestrian detector diagnostic plan when a higher priority routine has not been selected.</p> <p>The priorities (from highest to lowest) are:</p> <ol style="list-style-type: none"> <li>1. Manual</li> <li>2. Hardware</li> <li>3. Time Base</li> </ol>	Default, 1-4

Overview Parameter	Description	Range
Dimming	<p><b>Dimming Enable</b>            Select enable (Yes) or disable (No) dimming by this Event Plan.            Dimming of the signals also requires:</p> <ul style="list-style-type: none"> <li>• Dimming input is TRUE.</li> <li>• Dimming polarity is programmed in <b>Home &gt; Cabinet Config &gt; Load Switch Assign &gt; Dimming</b>.</li> </ul>	Yes/No
Special Output Flags	<p><b>Special Function Output Flags</b>            Select any Time Base Special Function outputs (1-8) by this Event Plan. Refer to Event Plan SF Bit Disable in <b>Home&gt;Overlap</b> in the Details screen for a PPLT/FYA Type Overlap.</p>	1-8
Aux Function Flags	<p><b>Auxiliary Function Flags</b>            Select any Time Base Auxiliary Function outputs (1-3) by this Event Plan.</p>	1-3



## Pattern



## Top Bar

- At the top of this screen are listed the **Event Plan** and the **Type of Event Plan** (Flash, Free, Coordinated or Auto). To program the **Event Plan** and its **Type**, select the **Overview** tab and then select [Add New Plan]; these parameters are read-only in this screen.
- **Manual Override checkbox:**
  - Checked:** You manually enable the Event Plan listed at the top of this screen. The Event Plan remains in effect until you select another Event Plan or until you uncheck this checkbox. This manual selection overrides any other source.
  - Unchecked:** Cobalt automatically selects Time Base Event Plans by time-of-day.

For a brief description of the parameters you program in this Pattern screen, refer to the **Summary for Patterns Programming** section. For detailed information about the programming, refer to the **Notes for Event Plans, Patterns** section.

This **Pattern** screen is one of several screens to create, view or edit Event Plans that are used for time-based plans for Coordination.

**Note:** The Pattern screen and the Splits screen tabs are only necessary for Event Plans with Coordination patterns; Pattern and Splits tabs are hidden for Event Plans with Flash or Free patterns.

## Coordination Pattern

Event Plans with Coordination are controlled with patterns. Each pattern is defined by the associated coordination parameters programmed by the user. To program parameters specific to Coordination, select the Pattern and Splits tabs.

### Summary for Pattern Programming

Pattern Parameter	Programming Summary
Cycle (the coordination cycle length)	Enters the cycle length in seconds that the coordinator will use when this pattern is active. To coordinate, the cycle length must be greater than 30 seconds.
Actuated Coordinated Phase	Makes the coordinated phases non-actuated until the Yield Point, then actuated after the Yield Point. Required when ring split extensions, actuated walk rest or phase re-service is programmed.
Offset Value	Enters the value in seconds or percent that the local cycle zero will lag the system sync. This value must be consistent with the offset in selection.
Actuated Walk Rest	Makes the coordinated phase(s) rest in walk when actuated coordination is programmed.
Dwell/Add Time	A non-zero value will override the Correction Max Time setting in <b>Home &gt; Coordination &gt; Coordination Options</b> when this pattern is in effect.
Phase Reservice	Allows the coordinator to respond to demands on any phase that has an open permissive. For phase Reservice to function, the controller must be fully actuated, including coordinated phases, actuated coordination programmed and automatic permissives enabled.
Force Off	When this pattern is in effect, it overrides the Default Force Off setting in <b>Home &gt; Coordination &gt; Coordination Options</b> .
Max Select	Use this field to override the Default Split Max Select setting in <b>Home &gt; Coordination &gt; Coordination Options</b> when this pattern is in effect.
Manual Vehicle Permissive Periods: 1 2 Displacement	<b>Automatic:</b> Enter 0 (zero) for Manual Vehicle Permissive Period 1 (VPP1), Manual Vehicle Permissive Period 2 (VPP2) and Vehicle Permissive Period 2 Displacement (VPP2D). <b>Single:</b> Enter desired single permissive period for VPP1 and zero for VPP2 and VPP2D. <b>Dual:</b> Enter desired values for VPP1, VPP2 and VPP2D.
Split Demand Patterns 1 and 2	Enter the pattern to be in effect that is used in the split demand screen. You program Split Demand 1 and Split Demand 2 in <b>Home &gt; Split Demand &gt; Split Demand</b> .
Crossing Artery Pattern	Select the coordination pattern to use when you select dual coordination.

## Notes for Event Plans, Pattern

Pattern Parameter	Description	Range
Cycle	<p><b>Coordination Cycle Length (time)</b> Use the keyboard or scrubber to enter the length of the coordination cycle in seconds.</p> <p><b>0 (zero):</b> Forces Free and replaces the phase Max in effect with the split time as the Max for the phase.</p> <p><b>1-29:</b> Forces Free. This is because the coordinator cannot operate with a cycle length less than 30 seconds.</p> <p><b>30-255:</b> Programs the cycle length.</p> <p><b>Note:</b> If the cycle length is between 30 and 255 seconds, you can program Offset Unit and Split Unit values (<b>Home &gt; Coordination &gt; Coordination Options</b>) in seconds or percent.</p> <p><b>256-999:</b> Programs the cycle length.</p> <p><b>Note:</b> If the cycle length is between 256 and 999 seconds, the Split and Offset values will be in percent, regardless of what you select for Split Unit and Offset Unit in <b>Home &gt; Coordination &gt; Coordination Options</b>.</p>	0-999 seconds
Actuated Coord	<p><b>Actuated Coordinated Phase</b> Enables the coordinated phase(s) to respond to vehicle demand(s) and extend the coordinated phase between the ring split extension time before the Yield Point. When enabled, allows actuated walk rest to be enabled.</p> <p><b>Yes:</b> Enables the coordinated phases to respond to vehicle detector inputs and to extend the coordinated phase split after the Yield Point to a maximum of the Split Extension entry in <b>Home &gt; Event Plans &gt; Splits</b>.</p> <p><b>Note:</b> When Actuated Coordinated phase is enabled, Actuated Walk Rest and Phase Reservice are permitted, if enabled.</p> <p><b>No:</b> Disables the coordinated phase from responding to any vehicle or pedestrian detector inputs and forces Vehicle and Pedestrian Recall. It also disables the Phase Reservice.</p>	Yes enables No disables
Offset Value	<p><b>Offset from the System Sync</b> Use the keyboard or scrubber to enter the Offset Value in seconds or percent (the units are set in Offset Unit in <b>Home &gt; Coordination &gt; Coordination Options</b>).</p> <p><b>0 to (Cycle time minus 1):</b> Time or percent that the Local Dial lags the Local Master Dial (synchronization pulse).</p> <p><b>Cycle time to 255:</b> The coordinator goes to Free mode.</p> <p><b>Note:</b> When the cycle length is greater than 255, the acceptable offset value is 0-255 seconds or 0-99%.</p> <p>The setting of Offset Reference (<b>Home &gt; Coordination &gt; Coordination Options</b>) determines if this offset is referenced to the start of the first coordinated phase green, the start of the last coordinated phase green, start of the first coordinated phase yield, or the start of the first coordinated phase yellow.</p>	0-99% 0-255 sec.
Actuated Walk Rest	<p><b>Actuated Rest in Walk</b> <b>Yes:</b> Lets actuated coordinated phase walk rest in Walk and start pedestrian clearance at the Yield Point.</p> <p><b>No:</b> Lets the actuated coordinated phase time Walk and Pedestrian Clearance in response to a demand.</p>	Yes enables No disables



Pattern Parameter	Description	Range
Dwell/Add Time	<p>A non-zero value will override the Correction Max Time setting in <b>Home &gt; Coordination &gt; Coordination Options</b> when this pattern is in effect.</p> <p>When the Offset Correction is Dwell:</p> <ul style="list-style-type: none"> <li>• <b>0 (zero):</b> There is no override and the maximum dwell period in the Correction Max Time setting in <b>Home &gt; Coordination &gt; Coordination Options</b> is in effect.</li> <li>• <b>1-99:</b> If the offset is in percent, this is the Dwell/Add Percentage that is used in place of the Correction Max Time setting in <b>Home &gt; Coordination &gt; Coordination Options</b>.</li> <li>• <b>1-255:</b> If the offset is in seconds, this is the Dwell/Add Time in Seconds that is used in place of the Correction Max Time setting in <b>Home &gt; Coordination &gt; Coordination Options</b>.</li> </ul> <p>When the Transition Method (<b>Home &gt; Coordination &gt; Coordination Options</b>) is set to Add Only or Smooth:</p> <ul style="list-style-type: none"> <li>• <b>0 (zero):</b> Maximum percentage of the cycle to be adjusted is determined by the Correction Max Time setting in <b>Home &gt; Coordination &gt; Coordination Options</b>.</li> <li>• <b>1-99:</b> Maximum percentage of the cycle to be adjusted during Add Only or Smooth transition.</li> </ul> <p><b>Note:</b> During Smooth transition, the coordinator subtracts a maximum of 17% of the cycle.</p>	0-99% 0-255 sec.
Phase Reservice	<p>Lets all phases (including the coordinated phases) cycle between those that have open permissives and to rest in any phase. Automatic calls are only placed on the coordinated phases when it is time to return.</p> <p>Select Yes or No to enable/disable the re-servicing of phases during a single coordination cycle.</p> <p><b>Yes:</b> Enables the coordinator to allow the controller to respond to demands on any phase that has an open.</p> <p><b>No:</b> Disallows re-servicing of phases during a single coordination cycle. After the controller has exited and returned to the coordinated phases, it will not service any demand until the next cycle.</p> <p><b>Note:</b> For phase re-service to function, the controller must be fully-actuated, including coordinated phases, actuated coordination programmed (Actuated Coord = Yes) and automatic permissive enabled.</p>	Yes enables No disables
Force Off	<p><b>Determines position of the phase force off</b></p> <p>When this pattern is in effect, it overrides the FORCE OFF setting in MM-3-1. Select from the drop-down menu:</p> <p><b>Default:</b> The Force Off mode is determined by the Default Force Off setting in <b>Home &gt; Coordination &gt; Coordination Options</b>.</p> <p><b>Fixed:</b> When this pattern is in effect, it overrides the Default Force Off setting in <b>Home &gt; Coordination &gt; Coordination Options</b>. This option will force off the phase at the fixed position in the cycle regardless of when it started.</p> <p><b>Float:</b> When this pattern is in effect, it overrides the Default Force Off setting in <b>Home &gt; Coordination &gt; Coordination Options</b>. This option will force off after it has serviced its split regardless of when it started.</p>	Default, Fixed, Float

Pattern Parameter	Description	Range
Max Select	<p>When this pattern is in effect, use this field to override the Default Split Max Select setting in <b>Home &gt; Coordination &gt; Coordination Options</b>.</p> <p>Select from the drop-down menu:</p> <p><b>Default:</b> Max Select is the setting in Default Split Max Select in <b>Home &gt; Coordination &gt; Coordination Options</b>.</p> <p><b>Max Inhibit:</b> When this pattern is in effect, it overrides the Default Split Max Select setting in <b>Home &gt; Coordination &gt; Coordination Options</b>. This option allows the coordinator phase split to control the time a phase is allowed to be green in the selected coordination pattern only.</p> <p><b>Max 1, Max 2 or Max 3:</b> When this pattern is in effect, it overrides the Default Split Max Select setting in <b>Home &gt; Coordination &gt; Coordination Options</b>. This option allows the shorter of the MAX timing (<b>Home &gt; Timing Plans &gt; Max Green</b>) or the coordinator phase split to control the time a phase is allowed to be green in the selected coordination pattern only.</p>	Default, Max Inhibit, Max 1, Max 2, Max 3

Manual Vehicle Permissive Period 1	<p><b>Manual Vehicle Permissive Period 1 (VPP1)</b></p> <p>This is the portion of the cycle length during which phases other than the coordinated phases may be serviced. This period begins timing at the coordinated phase Yield Point. If Vehicle Permissive Period 2 (VPP2) or Vehicle Permissive Period 2 Displacement (VPP2D) is equal to zero, all non-coordinated phases may be serviced during this period. If VPP2 or VPP2D are not equal to zero (dual permissive operation), then only the first phase(s) that follows the coordinated phase(s) (first permissive phases) is serviced during this period.</p> <p>Use the keyboard or scrubber to enter <b>0</b> to <b>(Cycle time minus 1)</b>. The units of measure are the same as set in Split Unit (seconds or percentage) in <b>Home &gt; Coordination &gt; Coordination Options</b>.</p> <p><b>1 to (Cycle time minus 1)</b> enables the Vehicle Permissive Period 1 (VPP1) that is the portion of the cycle following Yield in which phase(s) following a coordinated phase may be serviced.</p> <p><b>Note:</b> If VPP2 or VPP2D is zero, all phases will be serviced during VPP1.</p> <p><b>0 (zero)</b> enables the coordinator to calculate an Auto Permissive for each phase when VPP2 is also zero.</p> <p>For more details, refer to the Added Parameters section after this table.</p>	0-99% 0-255 sec.
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Pattern Parameter	Description	Range
Manual Vehicle Permissive Period 2	<p><b>Manual Vehicle Permissive Period 2 (VPP2)</b></p> <p>This is the portion of the cycle length during which phases other than the coordinated phases and those directly following may be serviced. This period begins timing immediately after the Vehicle Permissive 2 displacement period. Only phases other than those serviced during the first permissive period can be serviced because phase omits are applied to the first permissive phase(s). Use the keyboard or scrubber to enter <b>0</b> to <b>(Cycle time minus 1)</b>. The units of measure are the same as set in Split Unit (seconds or percentage) in <b>Home &gt; Coordination &gt; Coordination Options</b>.</p> <p><b>1 to (Cycle time minus 1)</b> enables VPP2 that starts after VPP2D has timed out after the Coordinator Yield. It is the portion of the subsequent cycle that phase(s) other than those that directly follow coordinated phase(s) may be serviced.</p> <p><b>Note:</b> If VPP2 or VPP2D is zero, all phases will be serviced during VPP1.</p> <p><b>0 (zero)</b> enables the coordinator to calculate an Auto Permissive for each phase when VPP1 is also zero.</p> <p>For more details, refer to the Added Parameters section after this table.</p>	0-99% 0-255 sec.
Manual Vehicle Permissive Period Displace	<p><b>Manual Vehicle Permissive Period 2 Displacement (VPP2D)</b></p> <p>This starts timing at the coordinated phase Yield Point. At the end of this displacement period, the second permissive period starts timing. Use the keyboard or scrubber to enter <b>0</b> to <b>(Cycle time minus 1)</b>. The units of measure are the same as set in Split Unit (seconds or percentage) in <b>Home &gt; Coordination &gt; Coordination Options</b>.</p> <p><b>1 to (Cycle time minus 1)</b> is the portion of cycle between the Yield Point and the beginning of VPP2.</p> <p><b>0 (zero)</b> enables all phases to be serviced during the first permissive period when VPP 1 is non-zero.</p> <p>For more details, refer to the Added Parameters section after this table.</p>	0-99% 0-255 sec.
Split Demand Pat 1	<p><b>Split Demand Patterns 1 and 2</b></p> <p>In this screen, you select a special Split Demand Pattern to be in effect. You program these split patterns in <b>Home &gt; Split Demand &gt; Special Split</b>. The coordinator uses these phase splits in place of those in the Split Pattern when the Split Demand Pattern is in effect. But the coordinated phase(s) and modes are still taken from the Split Pattern.</p> <p>Use the keyboard or scrubber to enter the Split Number.</p>	0 disables 1-120 selects
Split Demand Pat 2	<p><b>1-120</b> selects the Split Number of the Split Pattern that will be in effect when Split Demand 1 or Split Demand 2 is in effect. If both are in effect, Split Demand Pattern 2 is selected. You program Split Demand 1 and Split Demand 2 in <b>Home &gt; Split Demand &gt; Split Demand</b>.</p> <p><b>0 (zero)</b> disables the split demand operation.</p> <p><b>Note:</b> Crossing artery coordination has priority over Split demand.</p>	

Pattern Parameter	Description	Range
Crossing Artery Pat	<p><b>Crossing Artery Pattern</b> Use the keyboard or scrubber to select and enable the crossing artery operation when the Dual Coordination input is TRUE.</p> <p><b>0 (zero):</b> Disables the crossing artery coordination. <b>1-120:</b> Selects the Split Pattern to use when you request crossing artery operation.</p> <p><b>Note:</b> Crossing artery coordination has priority over Split demand. The crossing artery coordinated phases are programmed as CNA2 phases.</p>	0-120

## More Parameters

The parameters that follow are not shown on any of the data entry screens. They are included here because they are necessary to understand the data entry parameters for this Patterns tab.

Parameter	Description
Permissive Operation	The coordinator is programmed to calculate permissive periods by one of three operations: Automatic, Dual and Single; these are described below.
Auto Permissive	Automatically computed permissive period. Each sequential phase is automatically assigned a vehicle and pedestrian permissive period. The length of the vehicle permissive period is determined by the phase split interval and phase minimum time. Phase minimum time is equal to auto permissive minimum green, bike minimum green, or phase minimum green, whichever is larger, plus the yellow and red clearance time. Auto permissive green time allows you to set the phase minimum green to a low value, yet still ensures that the auto permissive period provides sufficient green time if the controller yields to the phase at the end of the permissive.
Dual Permissive	A permissive operation that requires operator data entry of three parameter values: Manual Vehicle Permissive Period 1, Manual Vehicle Permissive Period 2 and Manual Vehicle Permissive Period Displace. During this permissive operation, the Vehicle Permissive Period 1 times first. This period begins at the yield point. Vehicle Permissive Period 2 begins timing immediately after an adjustable time period (Vehicle Permissive Period 2 Displacement). During the Vehicle Permissive Period 1, only those phases immediately following the coordinated phases are serviced. If the controller yields during the first permissive, all remaining calls are serviced in normal sequence and the second permissive period is not used.
Single Permissive	Single permissive operation is selected by setting the Vehicle Permissive 2 displacement to zero. Only the Vehicle Permissive Period 1 and its associated pedestrian permissive period are timed and begin timing at the yield point. During the Single Permissive period, the controller yields to any phase.

Parameter	Description
Permissive Period End Point	<p>End Point = (Split Sum) - (K Phase Clear) - (Perm Phase Min Green and Clear)</p> <p>Where:</p> <ul style="list-style-type: none"> <li>• Split Sum = Sum of splits from coordinated through permissive phases, inclusive.</li> <li>• K Phase Clear = Coordinated phase Yellow + All Red (If Walk Rest Modifier input = TRUE).</li> <li>• K Phase Clear = Coordinated phase Ped Clear + Yellow + All Red (If Walk Rest Modifier input = FALSE).</li> <li>• Perm Phase Min Green and Clear = Permissive phases minimum green + Yellow + All Red.</li> <li>• Perm Phase Min Green = Permissive Phase minimum green or (Walk + Ped Clear), whichever is greater.</li> </ul>
Yield Point	Yield Point = Coordinated phase split interval - Coordinated phase clearance time (Pedestrian and vehicle clearance times).
Actuated Yield Point	Actuated Yield Point = Coordinated phase split interval - Coordinated phase clearance time(s) – Ring split extension time.
Offset Point	<p>The offset entry establishes the offset point to the:</p> <ul style="list-style-type: none"> <li>• <b>Lead:</b> Referenced the start of the Local Dial to the start of the first coordinated phase green.</li> <li>• <b>Lag:</b> Referenced the start of the Local Dial to the start of the last coordinated phase green.</li> <li>• <b>Yield:</b> Referenced the start of the Local Dial to the start of the first coordinated phase yield.</li> <li>• <b>Yellow:</b> Referenced the start of the Local Dial to the start of the first coordinated phase yellow.</li> </ul>
Yield Points	The coordinator uses multiple yield points; one yield point is computed per ring. There may be four distinct yield points. Hold and Yield are independent calculations based on offset, coordinated phase splits and coordinated phase timing.
Minimum Controller Cycle Time	The shortest possible cycle length allowing all phases to time their minimum vehicle and pedestrian interval times.
Dual Coordination	Dual coordination is established when the dual coordination input is TRUE. This forces the crossing artery (Crossing Artery Pat) phase splits to be used and places a continuous vehicle demand on the call-to-non-actuated 2 (CNA II) phases.



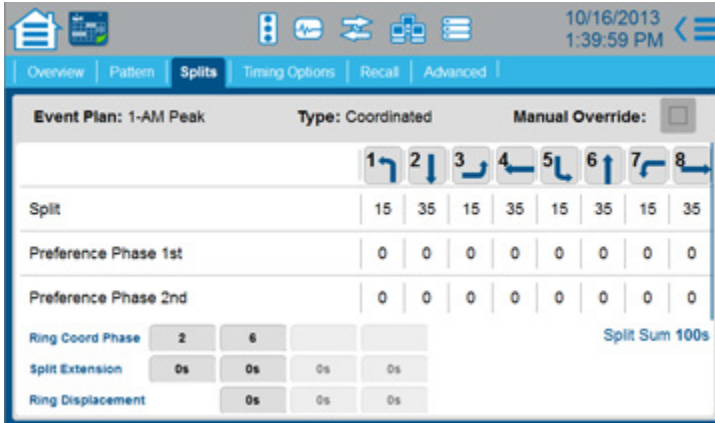
Home



Event Plans

## Splits

### Splits



### Top Bar

- At the top of this screen are listed the **Event Plan** and the **Type** of Event Plan (Flash, Free, Coordinated or Auto). To program the Event Plan and its Type, select the **Overview** tab and then select [Add New Plan]; these parameters are read-only in this screen.

- **Manual Override checkbox:**

**Checked:** You manually enable the Event Plan listed at the top of this screen. The Event Plan remains in effect until you select another Event Plan or until you uncheck this checkbox. This manual selection overrides any other source.

**Unchecked:** Cobalt automatically selects Time Base Event Plans by time-of-day.

For a brief description of the parameters you program in this **Splits** screen, refer to the **Summary for Splits Programming** section. For detailed information about the programming, refer to the **Notes for Event Plans, Splits** section.

This **Splits** screen is one of several screens to create, view or edit Event Plans that are used for time-based plans for Coordination.

**Note:** The Pattern screen and the Splits screen tabs are only necessary for Event Plans with Coordination patterns; Pattern and Splits tabs are not shown for Event Plans with Flash or Free patterns.

## Coordination Patterns

Event Plans with Coordination are controlled with patterns. Each pattern is defined by the associated coordination parameters programmed by the user. To program parameters specific to Coordination, select the Pattern and Splits tabs.

### Summary for Splits Programming

Splits Parameter	Programming Summary
Split	Enter the split value for each active phase.
Split Sum	Because this is an automatic calculation of the split sum based on data entry, this is read only.
Preference Phase 1st Preference Phase 2nd	<p><b>Note:</b> These parameters are only shown if the Force Off parameter is set to Float (for details, refer below to <b>Notes for Event Plans, Splits</b>).</p> Select the phases to receive any non-coordinated phase unused split time. Preference 1 phases have precedence over Preference 2 phases when unused split time is being allocated.
Ring Coordinated Phase(s)	Select the phase(s) that will be coordinated when the Split Pattern operates.
Split Extension	Allows the coordinated phase in each ring to extend by actuations from the split extension time before coordinated phase split termination. After it has gapped, the ring can service any open permissive phase.
Ring Displacement	Select the displacement or offset from ring one that an independent ring coordinated phase will start. When two or more rings have a barrier in common, the higher numbered ring is forced to use the value of the lower numbered ring.

## Notes for Event Plans, Splits

Splits Parameter	Description	Range
Split	<p><b>Split Intervals of the Cycle Time</b></p> <p>Here you divide the cycle time into sections (split intervals) to assign the maximum amount of time to each timing phase during coordination.</p> <p><b>Important:</b> Observe the Cautions listed below.</p> <p>If ECPI Coordination is set to No (in <b>Home &gt; Coordination &gt; Coordination Options</b>), the coordinator will go free when:</p> <ul style="list-style-type: none"> <li>• Entering zero for any active phase-split.</li> <li>• Entering phase-splits that are smaller than the minimum phase time</li> <li>• Entering splits that exceed the cycle length.</li> </ul> <p>If ECPI Coordination is set to Yes (in <b>Home &gt; Coordination &gt; Coordination Options</b>), then:</p> <ul style="list-style-type: none"> <li>• Entering zero for any active phase-split will omit that phase.</li> <li>• Entering phase-split(s) that are smaller than the minimum phase time(s) or that exceed the cycle length may cause loss of coordination.</li> </ul> <p><b>Note:</b> A Phase Split is the maximum amount of time available to a phase during coordination if <b>Floating Force-Offs</b> is in effect. If using <b>Fixed Force Offs</b> are in effect and the split timer starts early due to time left over from preceding phases, the phase can be extended by demand up to the force-off point. The maximum time available can only be lowered if you have a Max Select (Max 1, 2 or 3) (set in <b>Home &gt; Coordination &gt; Coordination Options &gt; Default Split Max Select</b> or in <b>Home &gt; Event Plans &gt; Pattern &gt; Max Select</b>) and if the max time in effect is shorter than the split.</p>	0-255 sec. or 0-99%
Split Sum	<p>This is an automatic calculation of the split sum based on data entry.</p> <p><b>Note:</b> The split sum in Free mode is composed of Minimum Green, Yellow, and Red clearance.</p>	This is read only



Splits Parameter	Description	Range
<p><b>Preference Phase 1st (Initial Phase)</b></p> <p><b>Preference Phase 2nd (Subsequent Phase)</b></p>	<p><b>Preference 1 and 2 Phase Unused Split Allocation</b></p> <p><b>0:</b> Deselect or</p> <p><b>1-16:</b> Select a phase to allocate unused split time.</p> <p><b>Important:</b> For this feature to operate, make sure that the Force Off parameter is set to Float (in <b>Home &gt; Coordination &gt; Coordination Options &gt; Default Force Off</b> or in <b>Home &gt; Event Plans &gt; Pattern &gt; Force Off</b>). If Force Off is set to Fixed, these Preference Phase 1st and Preference Phase 2nd parameters are not shown in this screen.</p> <p>You can program any unused split time from an Initial phase to time in a Subsequent/Preference phase, as needed. The Subsequent/Preference phase must be in the same ring as the Initial phase.</p> <p><b>Procedure:</b></p> <ol style="list-style-type: none"> <li>In Preference Phase 1st, select the field under the number of the phase you want for the Initial Phase (1-16).</li> <li>Use the keyboard or scrubber to select the number of the Subsequent/Preference Phase (1-16) to time any unused split time from the Initial Phase.</li> <li>To program another Subsequent/Preference phase, repeat Steps 1 and 2 with Preference Phase 2nd.</li> </ol> <p><b>Note:</b> A value of 0 in Preference Phase 1st / Preference Phase 2nd means that the related phase is not programmed to use its unused split time.</p> <p>If you program Preference Phase 1st (Pref 1) and Preference Phase 2nd (Pref 2), the unused split time will first be available to the Pref 1 subsequent phase to use if it maxed out in the last cycle. If Pref 1 Subsequent phase does not qualify, the unused split time will be available to the Pref 2 subsequent phase. If Pref 1/Pref 2 subsequent phases do not need the Initial unused split time, the unused split time is added to the coordinated phase. The allocation of the unused split time does not affect the sum of the split time used for each ring.</p> <p><b>Example:</b> Phase sequence is</p> <pre> 2 1   3 4 6 5   7 8 </pre> <p>Phase 2, 6 are coordinated phases. Initial Phase 1 has Preference Phase 1st as Phase 4. If there is any unused split time from Initial Phase 1, and Subsequent Phase 4 is available and maxed out during last cycle, then the unused time could be used by Subsequent Phase 4 if it has the demand.</p>	<p>0 deselects 1-16 selects</p>
<p><b>Ring Coord Phase</b></p>	<p><b>Coordinated Phases</b></p> <p>Select the phases for coordination.</p> <p><b>Note:</b> Observe the information below:</p> <ul style="list-style-type: none"> <li>All coordinated phases must be compatible (in the same concurrent group).</li> <li>There must be a coordinated phase entered for each ring in that concurrent group.</li> <li>It is permissible to have only one ring in the concurrent group.</li> </ul>	<p>1-16 phases</p>
<p><b>Split Extension</b></p>	<p><b>Coordinated Phase Split Extension</b></p> <p>This is the vehicle extension time for an actuated coordinated phase.</p> <p><b>0 to (Cycle time minus 1)</b> seconds or 0-99% allows the coordinated phase in each ring to extend by actuations from the Split Extension time before coordinated phase split termination. After it has gapped, the ring can service any open permissive phase.</p> <p><b>Note:</b> Actuated Coord in <b>Home &gt; Event Plans &gt; Pattern</b> must be set to Yes. Units of measure are the same as the Split option.</p>	<p>0-99% 0-255 sec.</p>

Splits Parameter	Description	Range
Ring Displacement	<p><b>Ring Displacement From Ring 1</b></p> <p>Use the keyboard or scrubber to select the displacement (Offset) from Ring Offset One that independent ring coordinated phase(s) will start.</p> <p><b>0 to (Cycle time minus 1)</b> seconds or <b>0-99%</b> is the displacement Ring 1 for Rings 2, 3 and 4.</p> <p>Cycle time of 255 seconds or 100-255% results in no displacement.</p> <p>The Offset for the rings are as follows:</p> <ul style="list-style-type: none"> <li>• <b>Ring 1 offset</b> is the programmed offset.</li> <li>• <b>Ring 2 offset</b> is the programmed offset plus the Ring 1-2 Offset.</li> <li>• <b>Ring 3 offset</b> is the programmed offset plus the Ring 1-3 Offset.</li> <li>• <b>Ring 4 offset</b> is the programmed offset plus the Ring 1-4 Offset.</li> </ul> <p><b>Note:</b> When two or more rings (1-4) have a barrier in common, the higher numbered ring is forced to use the value of the lower numbered ring.</p> <p><b>Example:</b> Rings 1 and 3 have a barrier in common. The Ring Displacement 1-3 will be ignored and Ring 3 will use the offset of Ring 1.</p>	<p>0-255 seconds (0 to Cycle time minus 1) or (0-99%)</p>



Home



Event Plans

## Timing Options

### Timing Options

This is one of several screens to create, view or edit Event Plans that are used for time-based plans for Flash, Free and Coordination.

In this Timing Options screen, you select the phases for Inhibit Conditional Service, Walk 2 Time, Vehicle Extension 2 Time, Maximum 2, and Maximum 3 Time. You also select phases to Omit and enable or disable Red Rest.

### Top Bar

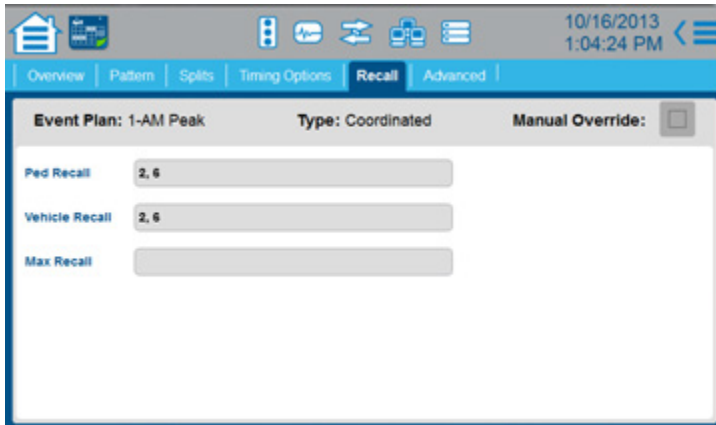
- At the top of this screen are listed the **Event Plan** and the **Type of Event Plan** (Flash, Free, Coordinated or Auto). To program the **Event Plan** and its Type, select the **Overview** tab and then select [Add New Plan]; these parameters are read-only in this screen.
- **Manual Override checkbox:**
  - Checked:** You manually enable the Event Plan listed at the top of this screen. The Event Plan remains in effect until you select another Event Plan or until you uncheck this checkbox. This manual selection overrides any other source.
  - Unchecked:** Cobalt automatically selects Time Base Event Plans by time-of-day.

## Notes for Event Plans, Timing Options

Timing Options Parameter	Description	Range
<b>Omit Phases</b>	<p><b>Omit Phases</b></p> <p>Select the phases to apply Phase Omit in this Event Plan. The selected phases are OR functions with other Phase Omit selections and inputs. Phases you do not select are disabled for Phase Omit by this Event Plan.</p>	1-16 phases
<b>Use Walk 2 Time</b>	<p><b>Use Walk 2 Time</b></p> <p>Select the phases to apply Walk 2 time in this Event Plan. The selected phases are OR functions with other Walk 2 selections and inputs. Phases you do not select are disabled for Walk 2 time by this Event Plan.</p>	1-16 phases
<b>Inhibit Conditional Srv</b>	<p><b>Inhibit Conditional Service</b></p> <p>Select the phases to apply Conditional Service Inhibit in this Event Plan. The selected phases are OR functions with other Conditional Service Inhibit selections and inputs. Phases you do not select are disabled for Conditional Service Inhibit by this Event Plan.</p>	1-16 phases
<b>Use Veh Ext 2 Time</b>	<p><b>Use Vehicle Extension 2 Time</b></p> <p>Select the phases to apply Vehicle Extension 2 time in this Event Plan. The selected phases are OR functions with other Vehicle Extension 2 selections and inputs. Phases you do not select are disabled for Vehicle Extension 2 by this Event Plan.</p>	1-16 phases
<b>Red Rest</b>	<p><b>Red Rest (Call Away)</b></p> <p>Select <b>Yes</b> (to enable) or <b>No</b> (to disable) the request for Red Rest (Call Away) operation by this Event Plan. This request is an OR function with all other requests for Red Rest.</p>	Yes, enable No, disable
<b>Use Max 2 Time</b>	<p><b>Use Maximum 2 Time</b></p> <p>Select the phases to apply Max 2 time in this Event Plan. The selected phases are OR functions with other Max selections and inputs. Phases you do not select are disabled for Max 2 by this Event Plan. Overrides are as listed below: Max 2 selection overrides Max 1. Max 3 selection overrides Max 1 &amp; 2.</p>	1-16 phases
<b>Use Max 3 Time</b>	<p><b>Use Maximum 3 Time</b></p> <p>Select the phases to apply Max 3 time in this Event Plan. The selected phases are OR functions with other Max selections and inputs. Phases you do not select are disabled for Max 3 by this Event Plan. Max 3 selection overrides Max 1 or Max 2.</p>	1-16 phases



## Recall



This is one of several screens to create, view or edit Event Plans that are used for time-based plans for Flash, Free and Coordination.

In this **Recall** screen, you select the phases where you want to program a Recall to continue the phase timing for pedestrian, vehicle and/or maximum recalls.

**Note:** In **Home > Split Demand > Special Split**, you also program Ped Recall, Veh Recall and Max Recall, but they are used in special coordination split patterns. For details, refer to the Help in **Home > Event Plans > Patterns** for **Split Demand Pat 1** and **Split Demand Pat 2**.

## Top Bar

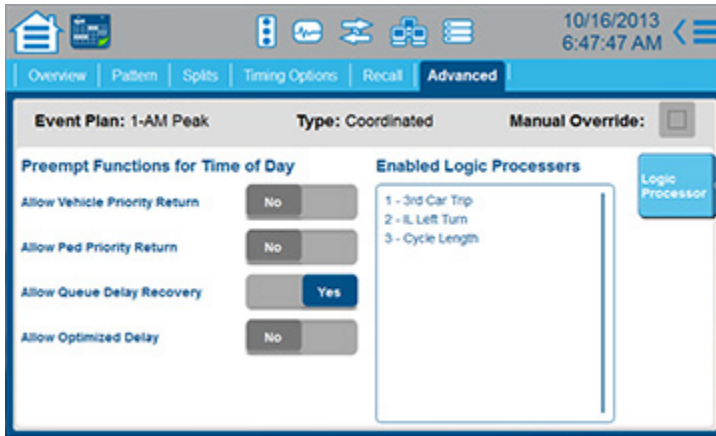
- At the top of this screen are listed the **Event Plan** and the **Type of Event Plan** (Flash, Free, Coordinated or Auto). To program the **Event Plan** and its Type, select the **Overview** tab and then select [Add New Plan]; these parameters are read-only in this screen.
- **Manual Override checkbox:**
  - Checked:** You manually enable the Event Plan listed at the top of this screen. The Event Plan remains in effect until you select another Event Plan or until you uncheck this checkbox. This manual selection overrides any other source.
  - Unchecked:** Cobalt automatically selects Time Base Event Plans by time-of-day.

## Notes for Event Plans, Recall

Recall Parameter	Description	Range
<b>Ped Recall</b>	<b>Pedestrian Recall</b> Select this field and use the keyboard or scrubber to select phases to which this Event Plan applies Pedestrian Recall. This is an OR function with other Pedestrian Recall programming and inputs. Phases you do not select are disabled for Pedestrian Recall by this Event Plan.	1-16 phases
<b>Vehicle Recall</b>	<b>Vehicle Recall</b> Select this field and use the keyboard or scrubber to select phases to which this Event Plan applies Vehicle Recall. This is an OR function with other Vehicle Recall programming and inputs. Phases you do not select are disabled for Vehicle Recall by this Event Plan.	1-16 phases
<b>Max Recall</b>	<b>Maximum Recall</b> Select this field and use the keyboard or scrubber to select phases to which this Event Plan applies Maximum Recall. This is an OR function with other Maximum Recall programming and inputs. Phases you do not select are disabled for Maximum Recall by this Event Plan.	1-16 phases



## Advanced



## Top Bar

- At the top of this screen are listed the **Event Plan** and the **Type of Event Plan** (Flash, Free, Coordinated or Auto). To program the **Event Plan** and its Type, select the **Overview** tab and then select [Add New Plan]; these parameters are read-only in this screen.
- **Manual Override checkbox:**  
**Checked:** You manually enable the Event Plan listed at the top of this screen. The Event Plan remains in effect until you select another Event Plan or until you uncheck this checkbox. This manual selection overrides any other source.  
**Unchecked:** Cobalt automatically selects Time Base Event Plans by time-of-day.

This **Advanced** screen is one of several screens to create, view or edit Event Plans that are used for time-based plans for Coordination. Here, you program:

- Exit and Entry functions for Preempts and
- Enable Logic Processor statements

## Notes:

- For this screen to control a Preempt function by time-of-day, its related function must be programmed for Time of Day in its Preemption screen: for Exit functions, in **Home > Preemptions > Exit** and for the Entry function (Optimized Delay), in **Home > Preemptions > Entry**.
- You program Logic Processor statements in **Home > Logic Processor**.

## Notes for Event Plans, Advanced

Advanced Parameter	Description	Range
<b>Preempt Exit Functions for Time-of-Day</b>		
<b>Allow Vehicle Priority Return</b>	<p><b>Preempt Vehicle Priority Return Time-of-Day Select</b></p> <p>This is an Econolite feature</p> <p>Select <b>Yes</b> (enable) or <b>No</b> (disable) for Preempt Vehicle Priority Return exit operation by this Event Plan. This allows vehicle phases which have been <b>interrupted by a preempt call</b> to be dynamically selected as the exit phases for that Preemptor.</p> <p><b>Note:</b> Veh Priority Return in <b>Home &gt; Preemptions &gt; Exit</b> must be set to Time of Day for this setting to take effect.</p>	<p>Yes, to enable</p> <p>No, to disable</p>
	<p><b>Preempt Pedestrian Priority Return Time-of-Day Select</b></p> <p>This is an Econolite feature</p> <p>Select <b>Yes</b> (enable) or <b>No</b> (disable) for Preempt Pedestrian Priority Return exit operation by this Event Plan. This allows pedestrian movements which have been <b>interrupted by a preempt call</b> to be dynamically selected as the exit phases for that Preemptor.</p> <p><b>Note:</b> Ped Priority Return in <b>Home &gt; Preemptions &gt; Exit</b> must be set to Time of Day for this setting to take effect.</p>	<p>Yes, to enable</p> <p>No, to disable</p>
<b>Allow Queue Delay Recovery</b>	<p><b>Preempt Queue Delay Recovery Time-of-Day Select</b></p> <p>This is an Econolite feature</p> <p>Select <b>Yes</b> (enable) or <b>No</b> (disable) for Preempt Queue Delay Recovery exit operation by this Event Plan. Allow phases, which have been waiting the longest to be serviced or which have the most cars waiting to be dynamically selected as the exit phases for that Preemptor.</p> <p><b>Note:</b> Queue Delay Recovery in <b>Home &gt; Preemptions &gt; Exit</b> must be set to Time of Day for this setting to take effect.</p>	<p>Yes, to enable</p> <p>No, to disable</p>
	<b>Preempt Entry Function for Time-of-Day</b>	
<b>Allow Optimized Delay</b>	<p><b>Preempt Queue Delay Recovery Time-of-Day Select</b></p> <p>This is an Econolite feature</p> <p>Select <b>Yes</b> (enable) or <b>No</b> (disable) for Preempt Optimized Delay operation by this Event Plan. This gives the ability to delay the preempt input based on vehicle and pedestrian service request in relation to the coordinated cycle (Is there enough time to service the phase before going to the dwell phase?).</p> <p><b>Note:</b> Optimized Delay in <b>Home &gt; Preemptions &gt; Entry</b> must be set to Time of Day for this setting to take effect. Delay Time must have a non-zero entry to activate the Optimized Delay field.</p>	<p>Yes, to enable</p> <p>No, to disable</p>
	<b>Logic Processor Statement Control</b>	
<b>Enabled Logic Processors</b>	<p>This field lists the Logic Processor statements that have been enabled for this Event Plan. To enable Logic Processor statements for this Event Plan:</p> <ol style="list-style-type: none"> <li>1. Select the [Logic Processor] soft key.</li> <li>2. A window opens with a list of the Logic Processor statements that have been programmed in the <b>Home &gt; Logic Processor</b> screen.</li> <li>3. To enable a Logic Processor statement, select (highlight) the circular button to the right of the name of the statement.</li> <li>4. To also enable other Logic Processor statements listed, repeat Step 3.</li> <li>5. Select [OK].</li> </ol>	<p>1-100</p>





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Scheduler

## Day Plan

### Scheduler

#### Day Plan

This **Day Plan** screen is one of three screens that you use to schedule the times during a day to enable Event Plans. Use this screen to:

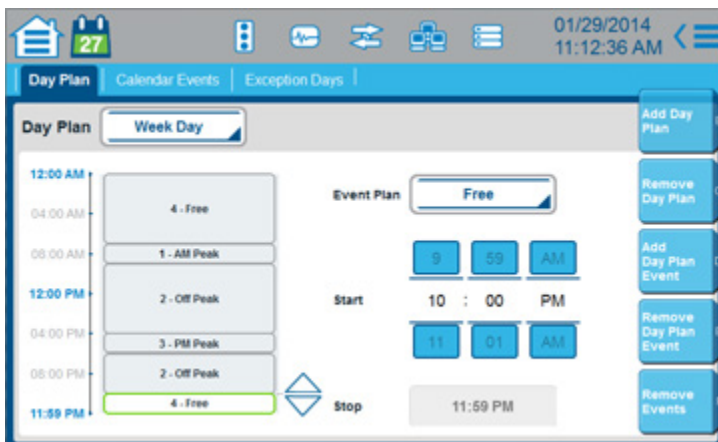
- Create names for up to 16 different Day Plans
- Select an Event Plan to use for each time period in a Day Plan
- Enter start times for each Event Plan in the Day Plan

Add/remove Day Plans and Day Plan Events as necessary

**Caution:** Before you select [Remove Day Plan], make sure you want to delete the Day Plan in view. When you select [Remove Day Plan], you immediately delete the Day Plan in view. But, if you incorrectly delete a Day Plan and want to recover it, select [Add Day Plan] and enter the same name as the Day Plan you deleted.

#### Example Day Plan

This is to program a Day Plan named Week Day. Below is the completed screen for this example (the time format is for an AM/PM clock).



In this example, you have programmed the Event Plans listed below (you can program up to 100 Event Plans in **Home > Event Plans**).

- 1-AM Peak
- 2-Off Peak
- 3-PM Peak
- 4-Free

And you want to program these Event Plans as follows:

Time to Start	Time to Stop	Event Plan
Midnight (00:00)	7 AM (07:00)	4-Free
7 AM (07:00)	9 AM (09:00)	1-AM Peak
9 AM (09:00)	4 PM (16:00)	2-Off Peak
4 PM (16:00)	6 PM (18:00)	3-PM Peak
6 PM (18:00)	10 PM (22:00)	2-Off Peak
10 PM (22:00)	Midnight (24:00)	4-Free

This Day Plan has 6 time periods. You can program up to 50 time periods in a Day Plan.

## Procedure to Program the Example Day Plan

**Note:** You can select the time format for the vertical time scale on the left sidebar and the Start and Stop times shown in this screen. To select the time format, go to **Home > Settings > Date & Time > 24 Hour Time**; if you select **Yes**, the times in this screen are shown as 24-hour clock times or, if you select **No**, the times are shown as AM/PM times.

1. Select [Add Day Plan].
2. In the **New Day Plan** screen, select the **Plan Name** field and use the keyboard to enter the name, Week Day (you can enter a maximum of 12 characters for a name).
3. Select [OK].
4. Select [Add Day Plan Event].
5. In the **New Event Plan** screen, in the drop-down box, select the first Event Plan for the day, 4-Free.
6. Scroll and/or increment the time fields to enter the time to start this Event Plan, 00:00.
7. Select [OK].
8. The screen now shows the information you programmed. Notice:
  - The 4-Free Event Plan and its number/name is shown in a green rectangle that shows as block of time from 00:00 to 24:00 hours.
  - The name of the Event Plan is also shown in a drop-down box. Select this drop-box to see a list of all the available Event Plans.
  - The Start and Stop times are shown for the Event Plan in view.

- To change the Start time, select and move the up/down arrows and/or scroll/increment the Start field. After you set the new time, select [Commit] at the top of the screen. To return to the previous start setting, select [Rollback].
  - There are now more soft keys: [Add Day Plan Event], [Remove Day Plan Event] and [Remove Events]. Refer to the table below for details on the use of these soft keys.
9. To program the subsequent Event Plan for this Day Plan (Week Day), select [Add Day Plan Event].
  10. In the **New Event Plan** screen, in the drop-down box, select the subsequent Event Plan for the day, 1-AM Peak.
  11. Scroll and/or increment the time fields to enter the time to start this Event Plan, 07:00 (07:00 AM).
  12. Select [OK].
  13. At the top of the screen, select [Commit].
  14. The screen now shows this Event Plan with its Start time.
  15. Again select [Add Day Plan Event] and repeat Step 9 thru Step 13 for the other Event Plans for this Day Plan.

## Notes for Day Plans

Day Plan Functions	Description
<b>Day Plan</b>	Use this drop-down box to select a Day Plan to create or edit. When you select this, you see a list of all the Day Plans. You can program up to 16 day plans (to create a Day Plan, refer to the example above).
<b>Event Plan</b>	This drop-down box shows the name of the Event Plan selected for the time period selected. Select this box to: <ul style="list-style-type: none"> <li>• Show a list of all the Event Plans available.</li> <li>• Select an Event Plan for the time period in the block of time selected (in the green rectangle) in the time line on the left.</li> </ul>
<b>Start</b>	Scroll and/or increment the time fields to enter the time to start the Event Plan selected. If you <i>briefly</i> select a blue block, the number will increment one number. If you <i>continuously</i> select one of the blue blocks, the numbers will scroll quickly. You can program up to 50 time periods in a Day Plan, each with an Event Plan.
<b>Stop</b>	This is the stop time for the Event Plan selected. This field is read-only.
<b>[Add Day Plan]</b>	<b>Name a New Day Plan</b> Select this to open the <b>New Day Plan</b> screen where you enter the name (up to 12 characters) for a new Day Plan. You can create up to 16 Day Plans.
<b>[Remove Day Plan]</b>	<b>Delete the Day Plan in View</b> Select this to immediately delete the Day Plan in view. If you incorrectly delete a Day Plan and want to recover it, select [Add Day Plan] and enter the same name as the Day Plan you deleted.

Day Plan Functions	Description
[Add Day Plan Event]	<p><b>Add an Event Plan to this Day Plan</b></p> <p>Select this to open the <b>New Event Plan</b> screen, then:</p> <ol style="list-style-type: none"> <li>1. In the drop-down box, select an Event Plan.</li> <li>2. Scroll and/or increment the time fields to enter the time to start this Event Plan.</li> <li>3. Select [OK].</li> </ol>
[Remove Day Plan Event]	<p>Select this to remove the selected Event Plan during this time period for this Day Plan. Select [Commit] to implement this.</p> <p>After you remove an Event Plan from the Day Plan, the previous Event Plan (above in the diagram) adds this time block to its time period.</p>
[Remove Events]	<p>Select this to remove all the events from the Day Plan in view.</p> <p>Use this to give you a blank screen so you can start over again to program this Day Plan.</p>
Up/Down Arrows	<p><b>Change the Start Time of an Event Plan</b></p> <p>Use these arrows to change the Start time for an Event Plan. If the Event Plan that is before it stops at this same time, this also changes the Stop time for the previous Event Plan to this same time.</p> <ol style="list-style-type: none"> <li>1. On the left side, select the time block for the Event Plan.</li> <li>2. Select these arrows and move them up/down to change the Start time for the Event Plan.</li> <li>3. To increment the Start time more precisely, scroll/increment the Start field on the right of the screen.</li> <li>4. After you set the new time, select [Commit] at the top of the screen or, to return to the previous start setting, select [Rollback].</li> </ol>



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Scheduler

## Calendar Events

### Calendar Events

This **Calendar Events** screen is one of three screens that you use to schedule the times during a day to enable Event Plans.

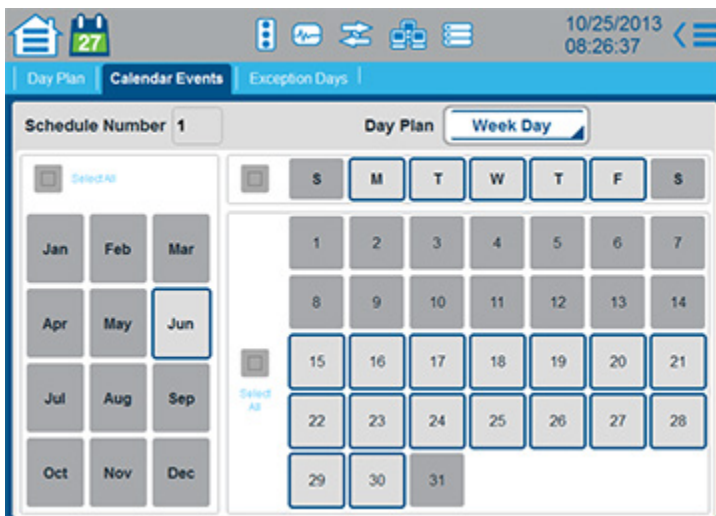
Use this **Calendar Events** screen to create up to 200 Schedules (200 **Schedule Numbers**, each with a **Day Plan**) that assign the days and months that a specified Day Plan can be in effect. Use this screen to:

- Create Day Plan schedule entries
- Enable a Day Plan (you can program up to 16 Day Plans with the Day Plan tab of this screen)
- Enter the month(s) of the year for the Day Plan to be in effect
- Enter the day(s) of the week for the Day Plan to be in effect
- Enter the day(s) of the month for the Day Plan to be in effect

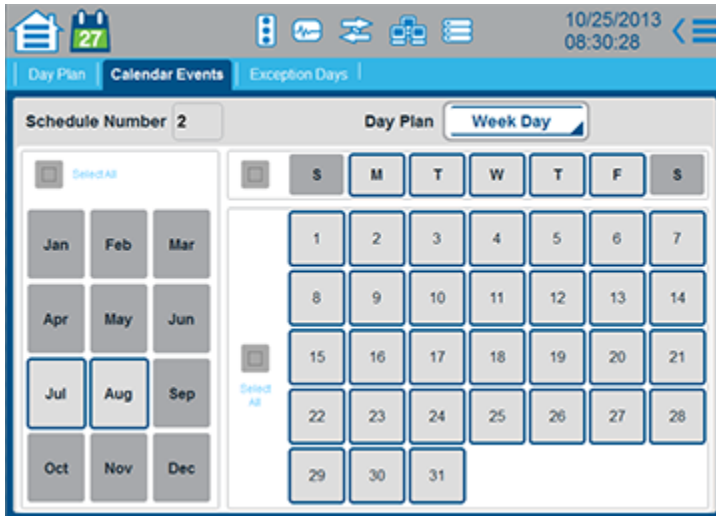
**Note:** A Day Plan is only in effect for the days in a month that the day(s) of the week agrees with the day of the month. But, programming in Exception Days (in the **Exception Days** tab of this screen) overrides this selection.

**Example:** The Day Plan named Week Day is to be in effect during a North American summer break from June 15 to September 3 on Monday through Friday. Program as follows:

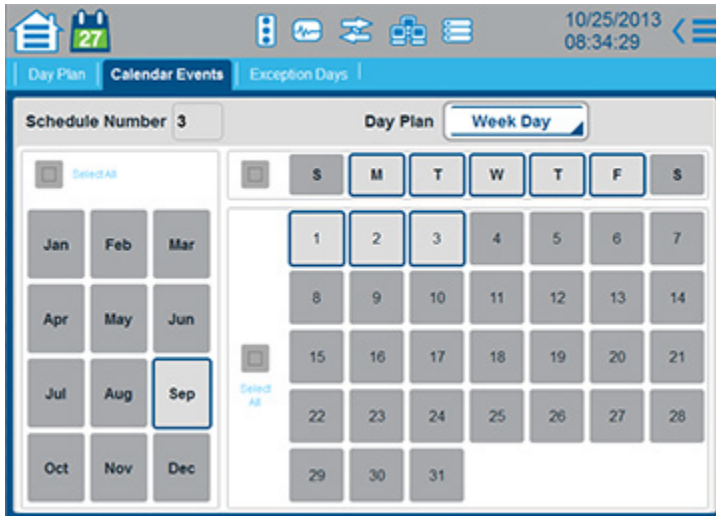
**Schedule Number 1: Day Plan is Week Day** with the month of June (**Jun**), days of the week Monday thru Friday (**M thru F**) and days of the month **15** thru **30** selected:



**Schedule Number 2: Day Plan** is **Week Day** with the months of July and August (**Jul** and **Aug**), days of the week Monday thru Friday (**M** thru **F**) and days of the month **1** thru **31** enabled:



**Schedule Number 3: Day Plan** is **Week Day** with the month of September (**Sep**), days of the week Monday thru Friday (**M** thru **F**) and days of the month **1** thru **3** enabled:



## Notes for Calendar Events

Calendar Event Parameter	Description	Range
<b>Schedule Number</b>	<p><b>Time-Based Schedule Program Number</b></p> <p>Select this field and use the keyboard or scrubber to enter the number of the Schedule of a Day Plan to program and/or view.</p> <p><b>1-200:</b> Specifies the Schedule of a Day Plan to program and/or view</p>	1-200
<b>Day Plan</b>	<p>Use the drop-down menu to select the Day Plan (to program a Day Plan, select the Day Plan tab in this screen).</p> <p><b>None:</b> Disables all programming of this Schedule Number</p>	None Up to 16 Day Plans
<b>Select All (check boxes)</b>	<p><b>Select/Clear All Fields</b></p> <p>Select the related check box to select/clear all the fields in its section (all the months, all the days of the week, or all the days of the month).</p>	All selected All cleared
<b>Months section</b>	<p><b>Select the month(s) to be in effect for this Schedule Number</b></p> <p><b>Note:</b> A Schedule program will be in effect when it is permitted in the programming of the Month, Day-of-the-Week and Day-of-the-Month. But, programming in Exception Days (in the <b>Exception Days</b> tab of this screen) overrides this selection.</p>	Jan thru Dec
<b>Days-of-the-Week section</b>	Select the day(s) of the week to be in effect for this Schedule Number	S (Sunday) thru S (Saturday)
<b>Days-of-the-Month section</b>	Select the day(s) of the month to be in effect for this Schedule Number	1 thru 31



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Scheduler

## Exception Days

### ***Exception Days***

This **Exception Days** screen is one of three screens that you use to schedule the times during a day to enable Event Plans.

Use this screen to view or edit the control parameters for up to 90 Exception Days - that is, any day that has special traffic demands.

#### **Note:**

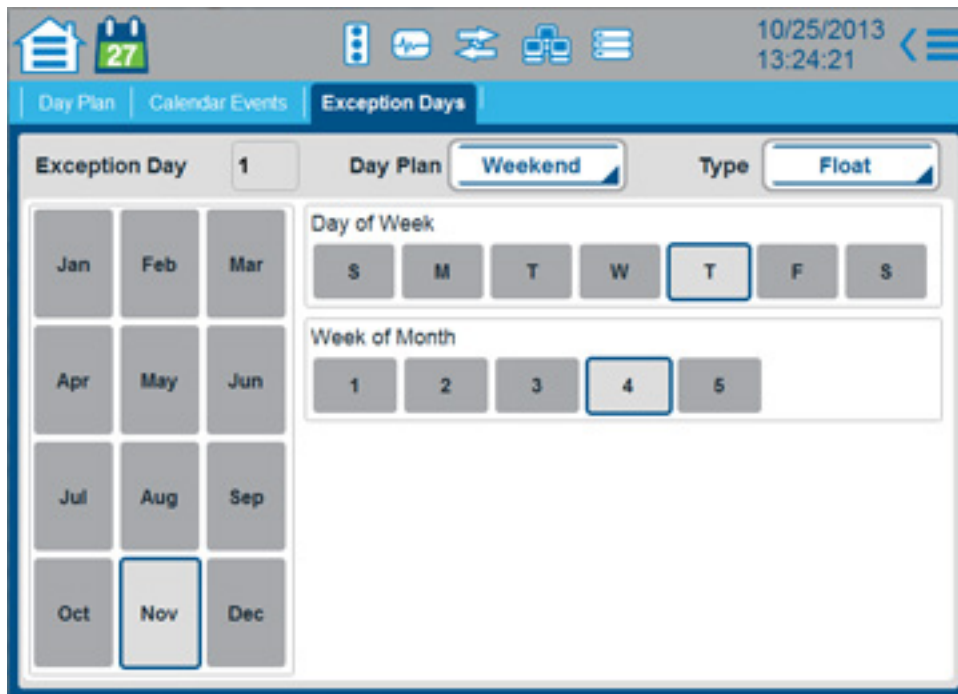
- This screen has two different formats, one for a **Floating** type of Exception Day and another for a **Fixed** type of Exception Day.
- If a day is programmed in as both a Calendar Event and an Exception Day, the Exception Day programming overrides the Calendar Event programming.
- The Exception Day program is effective only if time base (Time of Day) is the command source.

### **Example for a Floating Exception Day**

In the U.S.A., **Thanksgiving** is a floating Exception Day. It always occurs on the 4th Thursday in November.

To program Thanksgiving as an Exception Day, select the fields as shown:





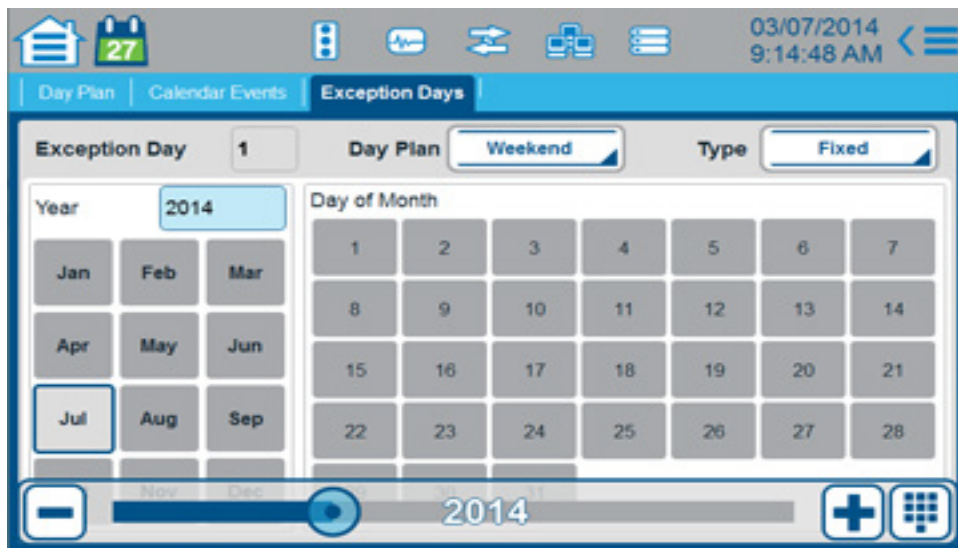
## Detailed Procedure to Program Thanksgiving as an Exception Day

1. **Exception Day:** Use the keyboard or scrubber to select **1**. In general, select a number (1 thru 90) that has not been used.
2. **Day Plan:** In the drop-down menu, select **Weekend** (to name and program up to 16 Day Plans, select the Day Plan tab at the top of this screen).
3. **Type:** In the drop-down menu, select **Float**.
4. On the left side of the screen, select **Nov** (November).
5. **Day of Week:** Select the second **T** (Thursday).
6. **Week of Month:** Select **4** (4th week).

## Example for a Fixed Exception Day

In the U.S.A., **Independence Day** is a fixed Exception Day. It always occurs on July 4th regardless of the day of the week.

To program July 4th as an Exception Day, select the fields as shown:



### Detailed Procedure to Program Independence Day as an Exception Day

1. **Exception Day:** Use the keyboard or scrubber to select **1**. In general, select a number (1 thru 90) that has not been used.
2. **Day Plan:** In the drop-down menu, select **Weekend** (to name and program up to 16 Day Plans, select the Day Plan tab at the top of this screen).
3. **Type:** In the drop-down menu, select **Fixed**.
4. On the left side of the screen, select **Jul** (July).
5. **Day of Month:** Select **4**.
6. **Year:** Use the keyboard or scrubber to select **2014**.

## Notes for Exception Days

Exception Day Parameter	Description	Range
Exception Day	<p>Use the keyboard or scrubber to select the number of an Exception Day (1-90) to view or edit.</p> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>You can create up to 90 different Exception Day programs as Floating exception days and up to 90 different Exception Day programs as Fixed exception days.</li> <li>The Exception Day program is in effect only if the command source is time-based (Time of Day).</li> <li>An Exception Day program overrides the Day Plan program normally used on that specific day.</li> </ul>	1-90
Day Plan	<p><b>Exception Day Plan</b></p> <p>In the drop-down menu, select a Day Plan (to name and program up to 16 Day Plans, select the Day Plan tab at the top of this screen).</p> <p><b>None:</b> Disables the Exception Day.</p>	None Up to 16 Day Plans
Type	<p><b>Floating or Fixed Exception Day</b></p> <p>In the drop-down menu, select Float or Fixed.</p> <p><b>Float:</b> Occurs on an ordinal numbered (1st, 2nd, etc.) Day-of-the-Week of a month.</p> <p><b>Note:</b> The Week of the Month is counted from the first week of the month that contains the Day of the Month. For example, in the USA, Labor Day for 2006 was September 4. For 2006, September 4 (1st Monday in September) is considered as being in the 1st Week of the Month (even though there were 2 days of September in the previous week).</p> <p><b>Fixed:</b> Occurs on a specific date of the year.</p> <p>For procedures to program Floating and Fixed Exception Days, refer to the examples before this table.</p> <p><b>Note:</b> When the current date matches the Floating holiday (Month, Day of the Week and Week of the Month) or Fixed holiday (Month, Day of the Month and Year), the Day Plan assigned to the Exception Day plan replaces the Day Plan selected by the time base schedule (Time of Day).</p>	Float, Fixed

### Floating Exception Day Parameters

Month section	<p><b>Month in which the Exception Day occurs</b></p> <p>Select the month for this Exception Day to be in effect.</p>	Jan thru Dec
Day of Week	<p><b>Day of the Week in which the Exception Day occurs</b></p> <p>Select the day of the week for this Exception Day to be in effect.</p>	S (Sunday) thru S (Saturday)
Week of Month	<p><b>Week of the Month in which the Exception Day occurs</b></p> <p>Select the week of the month for this Exception Day to be in effect.</p>	1 thru 5

### Fixed Exception Day Parameters

Month section	<p><b>Month in which the Exception Day occurs</b></p> <p>Select the month for this Exception Day to be in effect.</p>	Jan thru Dec
Day of Month	<p><b>Day of the Month in which the Exception Day occurs</b></p> <p>Select the day of the month for this Exception Day to be in effect.</p>	1 thru 31



Home



Peer to  
Peer

## Peer to Peer

There are a number of applications that require traffic controllers to share information with one another, independent of the central management system. Because controllers in the same area have the same function, they are said to be peers of one another and the communication of a local controller with a nearby controller is called a Peer-to-Peer communication.

Examples of applications that use Peer-to-Peer communication:

- Light rail preemption along a corridor
- Mitigating spill-back from a freeway on-ramp into a surface arterial
- Congestion mitigation from a critical intersection to its peers during free operation

To implement the Peer-to-Peer special feature:

1. When you start up Cobalt, the Peer-to-Peer icon is shown on the Home, Traffic Application screen.
2. Select the **Peer to Peer** icon.
3. Program the Peer-to-Peer parameters per the instructions below.
4. Program the Logic Processor parameters as explained in the Help for the Logic Processor screen.

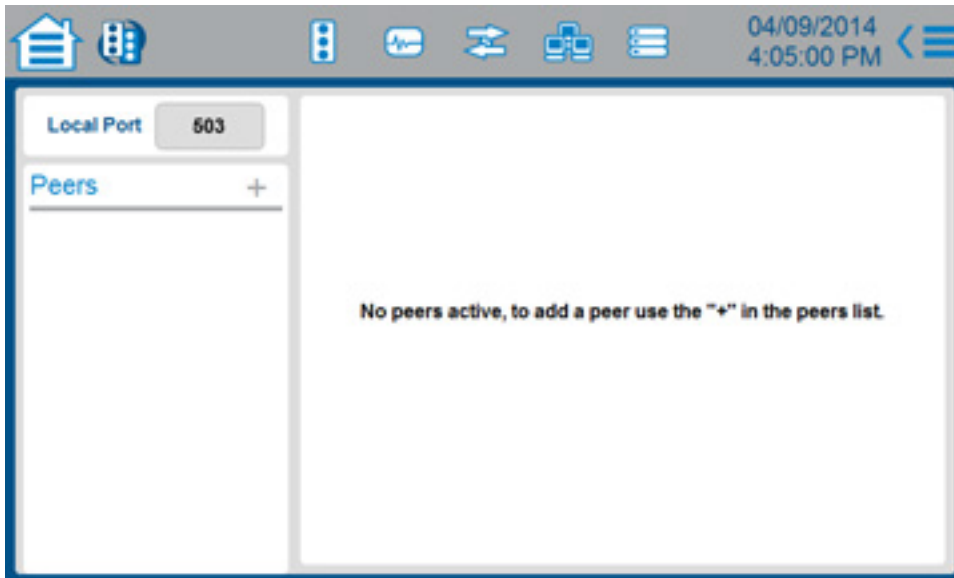
## Peer-to-Peer Programming Screens

To program Cobalt Peer-to-Peer applications, use the Peer-to-Peer screen and the Logic Processor screen. You configure the Logic Processor to test elements sent from peers. Because of the power of the Logic Processor, there are many more applications than the three listed above.

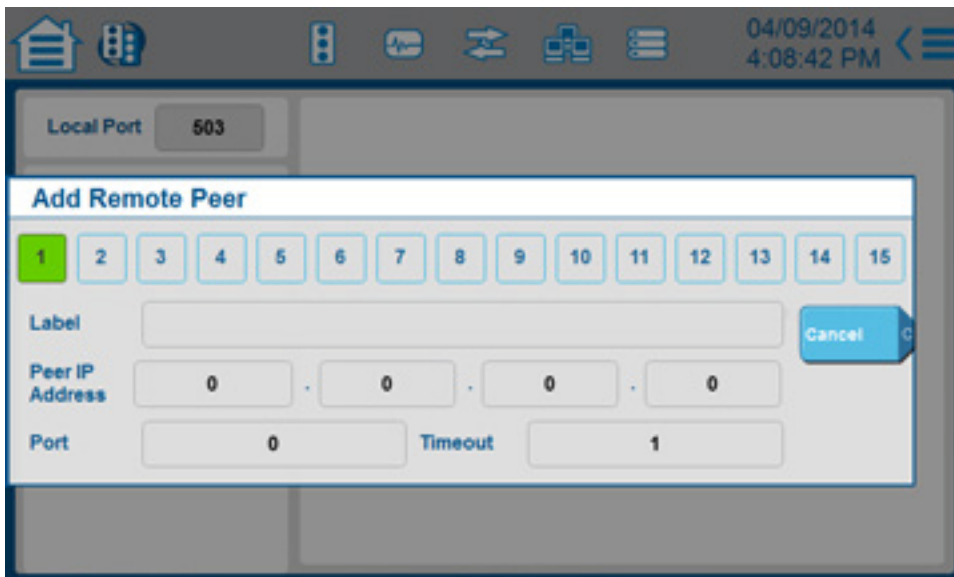
The Peer-to-Peer eligible statements are LP 1-25 although you can use LP statements 1-25 for other testable elements by not programming the Peer-to-Peer address.

## Procedure to Program a Remote Peer

1. Go to **Home > Peer to Peer**:



2. In the **Local Port** field, enter the port number for this Local controller to use with Peer-to-Peer. The range is 0 - 65535.
3. Select the **+** to the right of **Peers**:

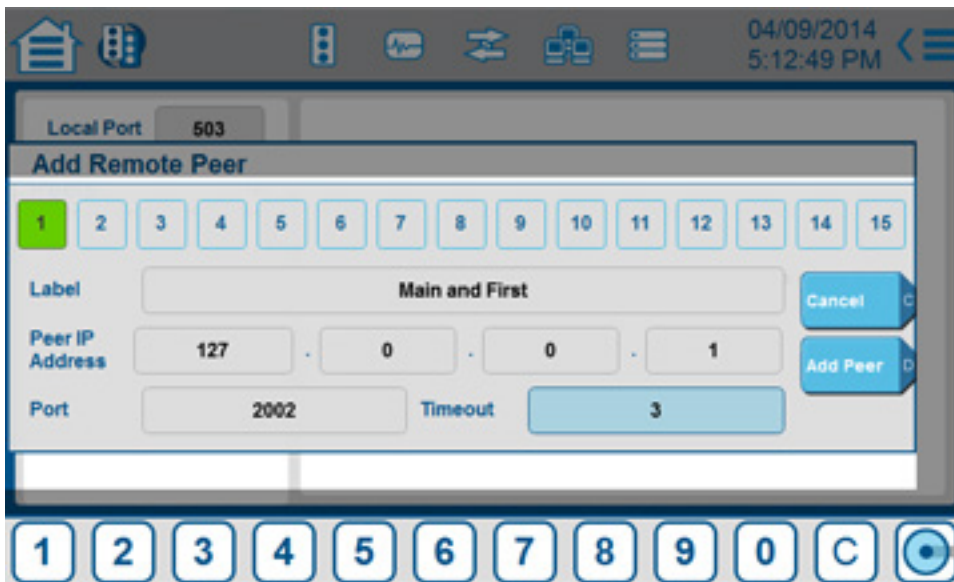


4. Enter parameter values per the table below.

## Notes for Remote Peer

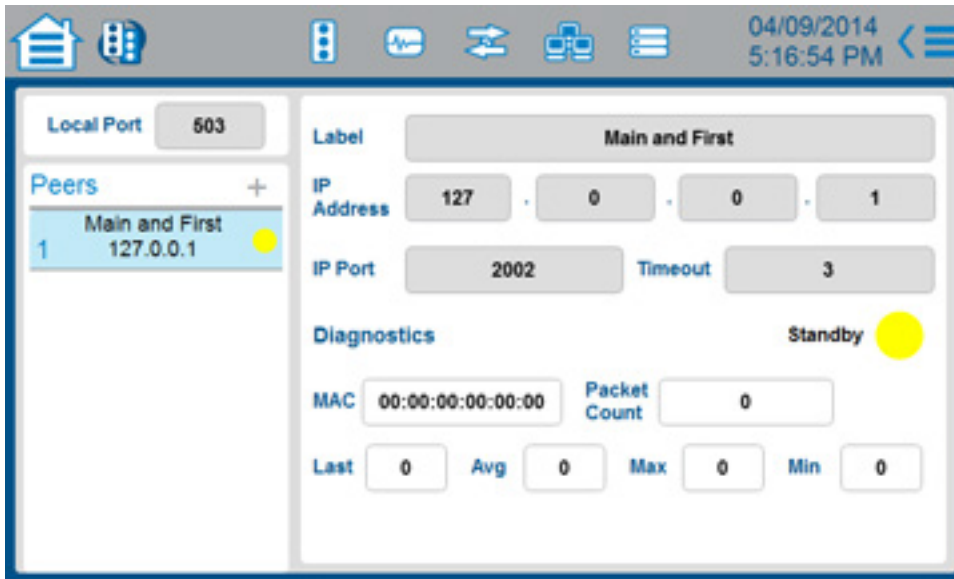
Remote Peer Parameter	Description	Range
Peer Number	<b>Peer Number</b> Select a number for the remote Peer.	1 - 15
Label	<b>Name for the Remote Peer Controller</b> Use the keyboard to enter a name for the remote peer controller (for example, the names of the cross streets at that intersection).	1 - 48 characters
Peer IP Address	<b>Peer IP Address</b> Enter the IP (Internet Protocol) address you want to use to run the Peer-to-Peer protocol with this Remote Peer.	0 - 255 for each of the 4 fields
UDP Port	<b>UDP Port</b> Enter the number for the UDP (User Datagram Protocol) Port to use with this Remote Peer.	0 - 65535
Timeout	<b>Peer Timeout</b> Enter the maximum time (in seconds) to wait for a response.	0 - 256 seconds

## Example Programming Screen with Values Entered



5. Select [Add Peer].

## Example Peer Screen (not yet Referenced in the Logic Processor)



**Local Port** - The port (0 - 65535) on which this peer will listen for messages from other peers.

**Peers** - List of the Remote Peers with their Number, Label, IP Address and Status.

**Right section, top half** - Peer parameters you entered in the screen above. As necessary, to change a parameter value, you could select any field in this screen and enter a different value.

**Right section, bottom half (Diagnostics)** - Activity of the Peer-to-Peer communication. The meanings of these fields are given in the table below. In the above example, the status is **Standby** (yellow) to show that the IP Address and UDP Port of this Remote Peer have been programmed but it has not yet been referenced in a Logic Processor statement.

### Diagnostics section (read only)

Diagnostics Parameter	Description	Range
(Peer Status)	<p><b>Peer Status (listed with its colored circle)</b></p> <p><b>Not Used</b> (gray) - An IP address or Port is not programmed in the Peer-to-Peer screen and it is not referenced in a Logic Processor statement.</p> <p><b>Standby</b> (yellow) - An IP address and Port are programmed in the Peer-to-Peer screen but it is not referenced in a Logic Processor statement.</p> <p><b>Active</b> (green) - The Peer-to-Peer protocol is running.</p> <p><b>Failed</b> (red) - The Peer-to-Peer protocol has failed to run.</p>	Not Used, Standby, Active, Failed
MAC	<p><b>Peer MAC Address</b></p> <p>This is the network MAC address of the peer</p>	
Packet Count	<p><b>Peer Packet Count</b></p> <p>Number of packets received from the peer.</p>	0 - 65535
Last	<p><b>Peer Last Ping Response Time</b></p> <p>This is the response time in milliseconds of the last ping (ICMP*) packet sent to the peer.</p> <p>* ICMP = Internet Control Message Protocol</p>	0-999

Diagnosics Parameter	Description	Range
Avg	<b>Peer Average Ping Response Time</b> This is the Average response time in milliseconds of the ping (ICMP) packets sent to the peer.	0-999
Max	<b>Peer Maximum Ping Response Time</b> This is the Maximum response time in milliseconds of the ping (ICMP) packets sent to the peer.	0-999
Min	<b>Peer Minimum Ping Response Time</b> This is the Minimum response time in milliseconds of the ping (ICMP) packets sent to the peer.	0-999

## Peer to Peer Protocol

The main purpose of this protocol is to provide a mechanism for one peer to request information from another and for that peer to fulfill that request.

When a new testable element from a peer is entered into a logic processor statement, the controller will send a packet to the peer requesting that the state of that element be sent to this controller when the state changes.

The protocol will also identify peers that have gone off-line for whatever reason.

- A *heartbeat* or *keep alive* packet will be exchanged with each peer periodically to make sure that the communications link is still active and that the peer is responding.
- If the peer does not respond to the heartbeat packet, the peer will be tagged as off-line and any testable elements from that peer will be set to their failed state as configured in the logic processor configuration screen.

## Possible Uses

The Logic Processor from an intersection can test its Peer for:

- Occupancy % >, <, =, or != a percentage over the programmed NTCIP sampling period
- Any detector input ON or OFF
- Coordination pattern in effect
- Any signal indication on or off (vehicle, pedestrian or overlap)
- Any input ON or OFF
- Any output ON or OFF
- Any preempt state
- Many more tests

You can combine the testing of multiple statements using AND, OR, NAND, NOR, or Exclusive OR of any of these testable elements



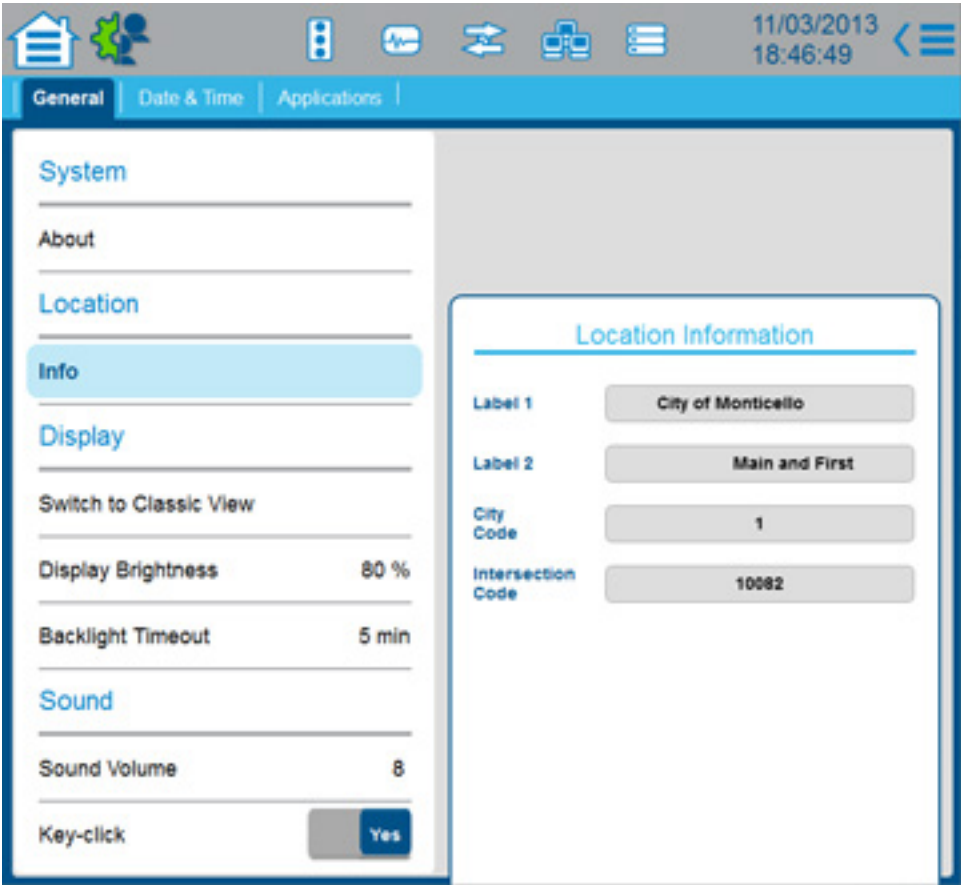
Exception Day Parameter	Description	Range
Year	<b>The Year in which the Exception Day occurs</b> Use the keyboard or scrubber to select the year for this Exception Day to be in effect.	1970 thru 2106



## Settings

### General

**Note:** The screen shot below is expanded to show all the parameters. On your Cobalt, scroll down to view all the parameters.



### System

Select About to see the name, version and part number for all the software modules actually installed in your system:

- Traffic Application
- Engine Board
- Front Panel

- Subsystems
- Graphics Card
- Special Features

## Location

**Info** (Location Information): A typical screen for this is shown above.

- Select Label 1 and Label 2 and enter your information with the keyboard.
- Use the scrubber to set values for the City Code (0-255) and the Intersection Code (0- 65535).

## Display

**Switch to Classic View:** To go to character-based screens (without graphics):

1. Select **Switch to Classic View**.
2. Select [OK].

Use the Cobalt keyboard (refer to the white labels of the keys) to navigate and make entries in the classic view. Press the [Main] key (Home) in the upper right to start at the Main Menu. There are context-sensitive soft keys, [A] thru [F], for which you can press the letter key or tap the touch screen to navigate; for example [Next Data], [Next Screen] and [Next Page].

**Note:** For early versions of Cobalt, there are some features for which it is necessary to use the Classic View. As necessary, instructions are given in the Cobalt Help.

When you are in the Classic View, to return to the touch-screen graphics mode:

1. Go to Main Menu-1-7-2, **Display Options** (press [Main], then [1], [7], and [2]).
2. Cursor to SWITCH TO GRAPHICS MODE.
3. Toggle to YES.
4. Press [Enter].

**Display Brightness and Backlight Timeout.** Use the scrubber to enter values:

**Brightness:** 0 - 100%

**Backlight Timeout:** 0 - 30 minutes of inactivity with Cobalt for the backlight to go OFF.

## Sound

**Sound Volume and Key-click.** Select values:

**Sound Volume:** 0 - 10 (minimum to maximum)

**Key-click** (this is a sound made when you press a key on the keyboard): Yes or No



Home



Settings

## Date and Time

### *Date and Time*

#### Example Configuration

- The date and time now
- Pacific Time Zone
- Daylight Savings Time

#### Procedure for Example

To set the date: Scroll to the correct date. You can also enter the date with the Cobalt keyboard.

To set the time:

1. At the bottom of this screen, select **Yes** or **No** for the 24 Hour Time format.
2. Scroll to enter the current Time-Of-Day (TOD).

This time is used for all time-based functions and logging.

To set the Time Zone:

Standard Local Time from Greenwich Mean Time (GMT)

1. Slide the scrubber to specify the number of hours (-12 to +12) that the local standard (non-day-light-savings-time) is ahead (+) or behind (-) Greenwich Mean Time (GMT). For USA Pacific Time Zone, set to -8 as given below.
2. Select **OK**.

In general, the Eastern hemisphere is ahead (+) and the Western hemisphere is behind (-).

For Non-Day-Time-Saving, observe the differences in time zones listed below:

USA Eastern Time Zone is GMT -5 hours.

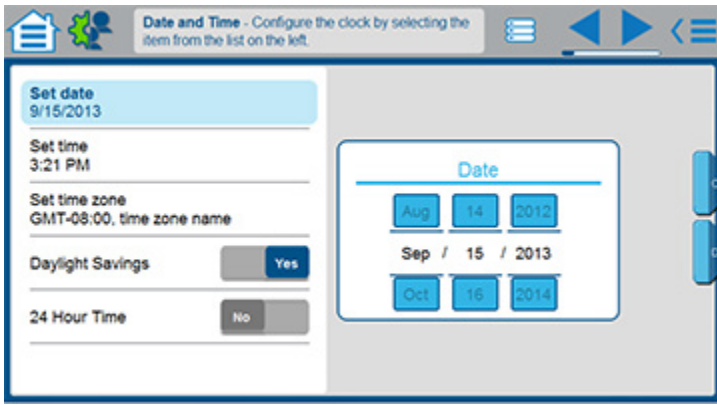
USA Central Time Zone is GMT -6 hours.

USA Mountain Time Zone is GMT -7 hours.

USA Pacific Time Zone is GMT -8 hours.

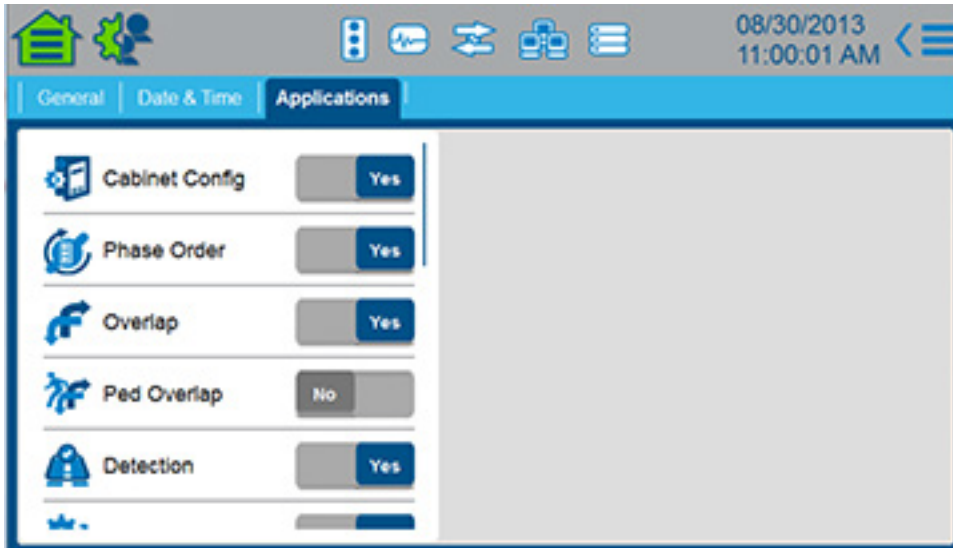
To set for Daylight Savings, select **Yes**.

## Completed Screen for Example (Guided Setup screen)





## Applications



**Note:** There are two options to access this screen:

- Go to **Home > Settings > Applications**
- From the top right corner of the Home (Traffic Applications) screen, select +/-

In this screen, select the icons you want to show in the Home (Traffic Applications) screen.

The default is all icons shown (**Yes**) except for Ped Overlap (**No**) and Video Viewer (**No**).

Select **Yes** for each icon you want to show in the Home screen and **No** for each icon you want to hide in the Home screen.

**Note:** If you select **No** for an icon, and you no longer see it on the Home screen, you may need it in the future and forget that it is available (out of sight, out of mind).

To see (in the field to the right) a brief description of the purpose of the screen(s) for an icon, select the related icon.



Home



Logic Processor

## Logic Processor

### Logic Processor Operation

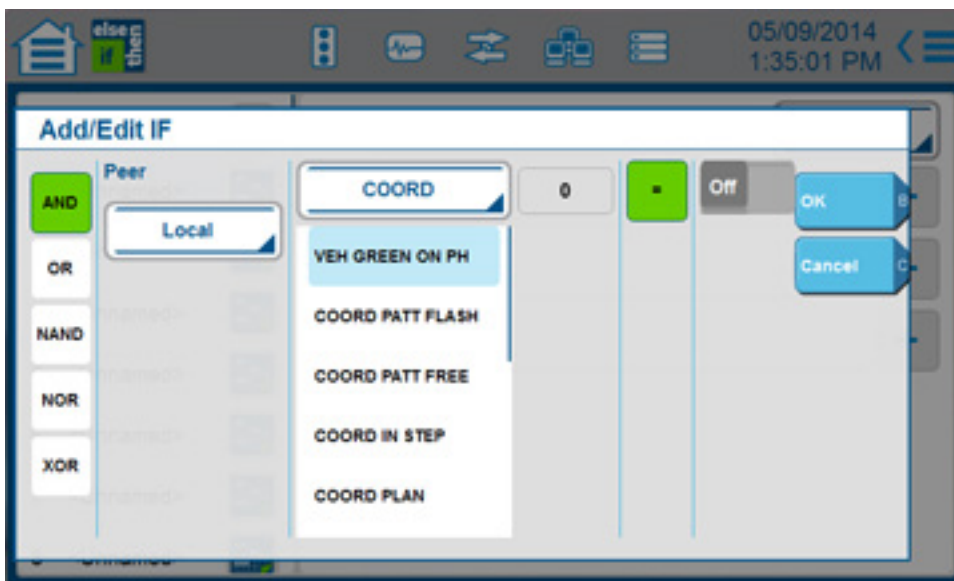
The Logic Processor (LP) can hold up to 100 logic statements.

The Logic Processor Statements screen enables you to program conditions on inputs and outputs to put them under logical control. The logical control may involve the Local controller only or the actions (executable statements) may depend on conditions at other nearby controllers (Peer-to-Peer).

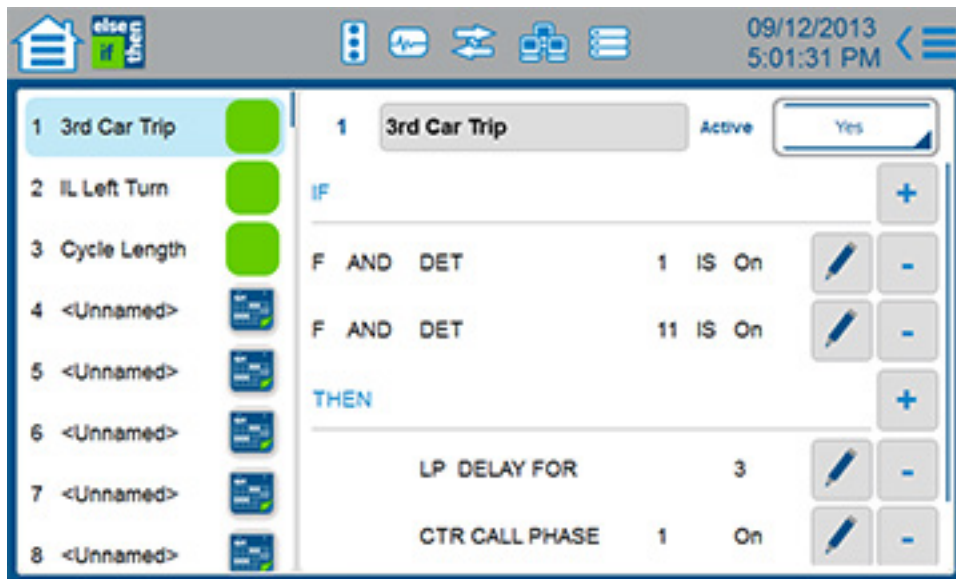
### Local

To program the Logic Processor for Local operation:

1. Go to **Home > Logic Processor**
2. From the initial Logic Processor screen, select **+** to the right of IF
3. The Add/Edit IF screen opens.
4. In the drop-down box under **Peer**, select Local as shown below.



5. Program this IF element per your application.
6. Select [OK].
7. This returns you to the initial Logic Processor screen.



## 8. Program this screen per your application

- Enter a name for this Logic Processor statement
- In the Active drop-down menu, select whether to make this statement active or not (Yes, No) or to have it active by Time of Day.
- In turn, select the + to the right of THEN and ELSE and program their elements per your application.

## Peer-to-Peer

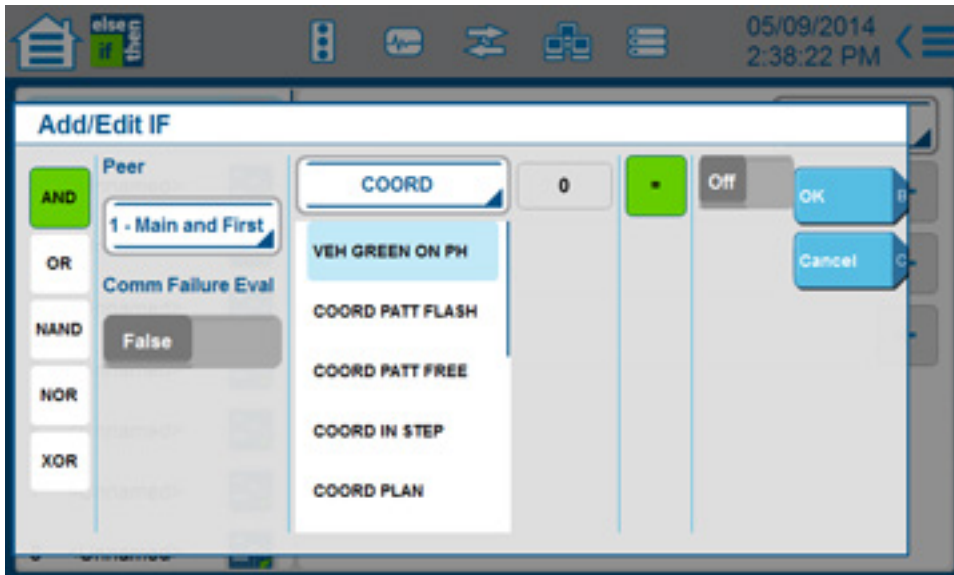
There are a number of applications that require traffic controllers to share information with one another, independent of the central management system. Because controllers in the same area have the same function, they are said to be peers of one another and the communication of a local controller with a nearby controller is called a Peer-to-Peer communication.

You can program up to 10 Peer-to-Peer testable elements in any of the LP statements from 1 thru 25.

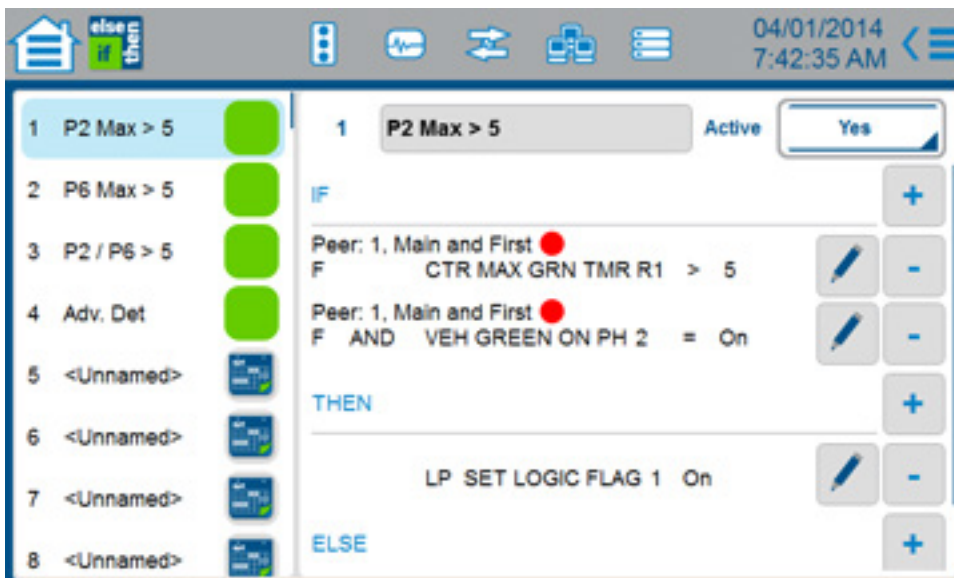
To program the Logic Processor for Peer-to-Peer operation:

1. Go to **Home > Peer to Peer**
2. With instructions from the Help for that screen, enter a name and values for your application
3. Return to this screen (**Home > Logic Processor**)
4. From the initial Logic Processor screen, select + to the right of IF
5. The Add/Edit IF screen opens
6. In the drop-down box under **Peer**, select a Peer to program. In the example screen below, **1 - Main and First** is the Peer selected.





7. Under **Comm Failure Eval**, select the state (False or True) of this element if this Peer fails to communicate with the Local controller
8. Program this IF element per your application
9. Select [OK]
10. This returns you to the initial Logic Processor screen
11. Program this screen per your application
  - Enter a name for this Logic Processor statement
  - In the Active drop-down menu, select whether to make this statement active or not (Yes, No) or to have it active by Time of Day.
  - In turn, select the + to the right of THEN and ELSE and program their elements per your application.



**Note:** The Peer Status is indicated after the name of the Peer with a colored circle as defined below:  
**Not Used (gray)** - An IP address or Port is not programmed in the Peer-to-Peer screen and it is

not referenced in a Logic Processor statement.

**Standby (yellow)** - An IP address and Port are programmed in the Peer-to-Peer screen but it is not referenced in a Logic Processor statement.

**Active (green)** - The Peer-to-Peer protocol is running.

**Failed (red)** - The Peer-to-Peer protocol has failed to run.

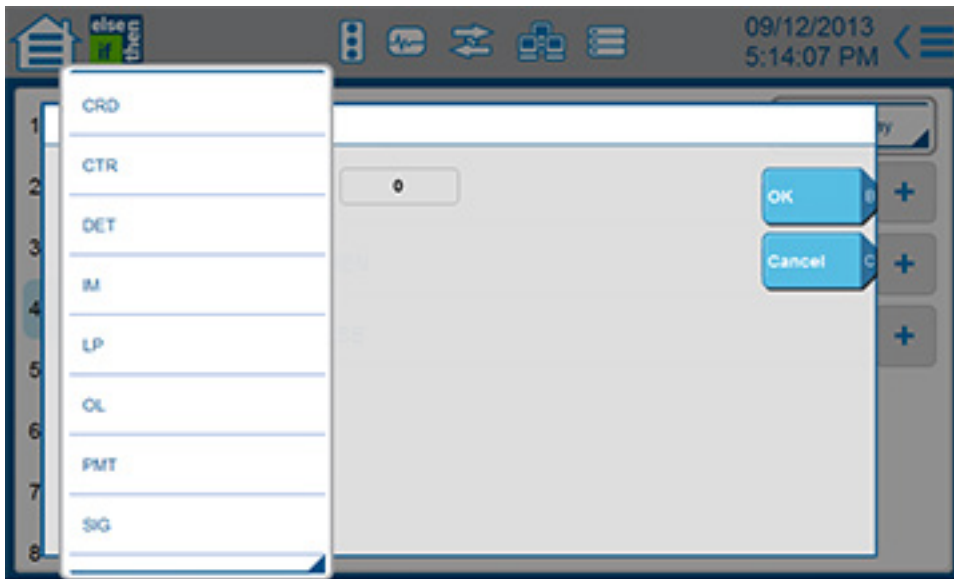
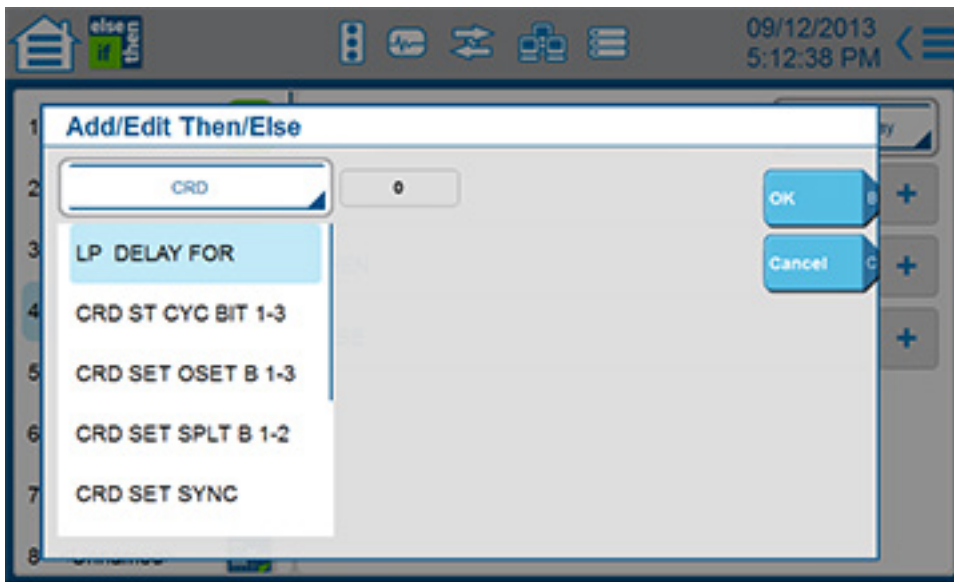
For other Peer-to-Peer status indications, go to **Home > Peer to Peer** and refer to the Diagnostics section of the Peer-to-Peer screen, explained by the help for that screen.

## Terminology

Logic Processor terms are defined in the table that follows.

Logic Processor Terms	Description
Logic Processor # 1 - 100	Logic Processor Statement Name
IF (testable element) (Logical Operator) (testable element)	This is a Testable Element This group is called an IF Condition. Up to 10 elements can be programmed. Logical Operator lines are optional. After the first Testable element, additional Testable elements must have a Logical Operator (e.g. AND, OR, NAND, NOR XOR)
THEN (executable element)	This group is called THEN elements. Up to 5 elements can be programmed.
ELSE (executable element)	This group is called ELSE elements. Up to 5 elements can be programmed.
Logic Processor Statement	The IF, THEN, ELSE parts shown on the initial Logic Statements screen
Logic Processor Expression	The part between the IF and THEN in the LP statement.
Logic Processor Testable Element	Each line of the LP expression. If more than one testable element exists in the expression, they will be separated by AND, OR, NAND, NOR, or XOR.
Several LP statements can be linked together to perform a unique function.	This should be referred to as Linked Logic Processor Statements.

- The first Logic Processor change triggers Transaction mode, for safety reasons. Please use Logic Processor Logic Statement with absolute care.
- The order of the testable elements is important
  - Testable elements are evaluated from top to bottom
- Delay timers can be set as an executable element to temporarily suspend execution of elements that follow.
- There are 64 user-settable logic flags
  - Usually set or cleared in an executable element and then tested in another LP element





Home



Video  
Viewer

## Video Viewer

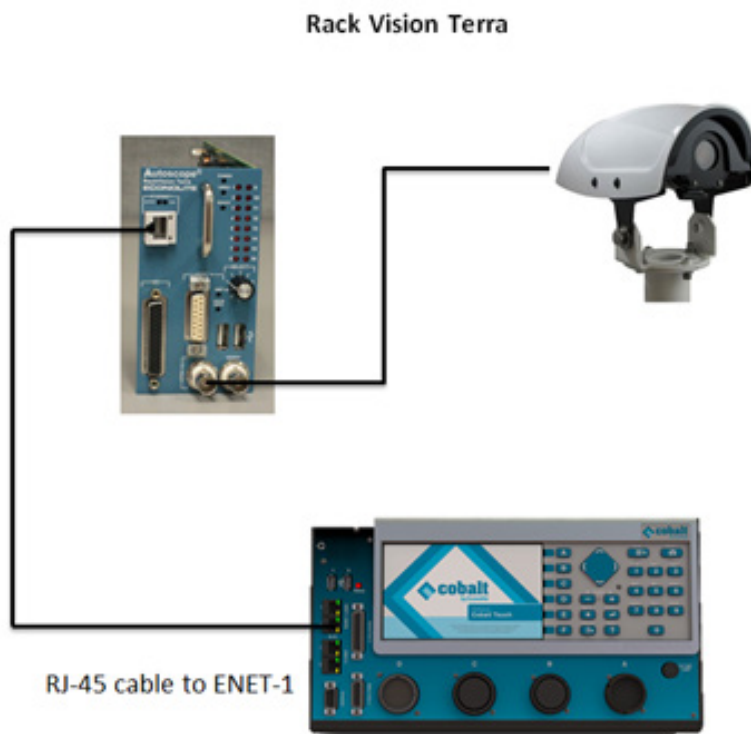
**Note:** For the default Home (Traffic Applications) screen, the **Video Viewer** icon is not shown. To show this icon:

1. Select +/- in the upper right of the Home screen or select **Settings > Application**.
2. Set the **Video Viewer** icon to Yes.

You can use the Cobalt controller color display to view video streaming from the video detection operation at the local intersection from associated local Autoscope cameras—no need for a video monitor or laptop:

1. Disconnect the Ethernet cable from the local cabinet switch for the applicable camera. For Terra and Encore this is the Ethernet cable that connects the TIP; for Rack Vision Terra it is the Ethernet cable to the specific Camera\Card.
2. Connect the Ethernet cable to the ENET1 port of the Cobalt controller.

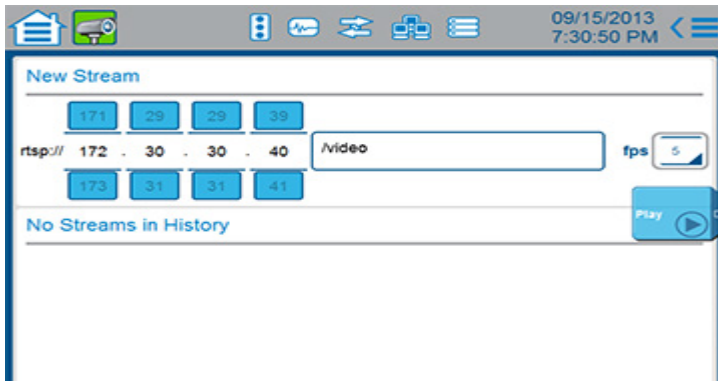
**Note:** For this setup, a compatible Autoscope camera is necessary with a TIP/TAP setup or an Autoscope camera with an Autoscope Rack Vision Terra (shown below).



**Important:** In both configurations, make sure the Ethernet interface between the Autoscope device and Cobalt controller is connected to ENET-1 of the Cobalt controller.

3. Select **Home > Video Viewer Beta**.

4. This initial screen opens:



5. Enter the IP Address that is assigned to the Autoscope camera.

**Note:** If the IP address of the Autoscope is not in the default range or subnet, the **[New/Edit]** soft key will open after you enter the first octet of the IP address. Select **[New/Edit]** to open a screen to set a unique IP address and subnet. If the IP address is not compatible with the entered subnet, an error message pops up.

6. After you correctly set the IP, press [Play].

7. A Starting Video screen (black background) opens to show that Cobalt is connecting the video stream.

8. The streaming video opens.



9. To stop the video, select [Stop].

10. To take a snapshot and to store the image in the Cobalt Video Viewer Application, select [Snapshot].

**Note:** After you stop the stream, Cobalt stores and remembers recent streams that you can scroll through and select. This is shown either as Recent Streams or History. You can also delete cameras in the history.

## Interface Connector Pin Lists

### Default Mapping for Cobalt

**Note:** The Cobalt database is the same as the database used in a 2070 controller with a 2070-1C CPU Module with ASC/3-LX software.

When you upgrade to Cobalt Version 32.59.00 or later, your previous mapping stays the same. But there is a new default mapping (in the table below) that maps existing loadswitch phases as channels so you can reassign loadswitch outputs in TS1 type cabinets to different phase channels (**Home > Cabinet Config > Load Switch Assign**). To change default mapping of the L3000.CFG configuration to that given in the table below:

1. Go to the **Database** screen
2. Select **Options** (icon at the top right)
3. In the **Options** drop-down menu, select **Copy Database**
4. Select [Factory Restore].

This new default mapping is only available on Cobalt and ASC/3-LX (2070-1C). The pins that have different mapping (compared to *Default Mapping for ASC/3 and ASC/3-2070*, next table) are in bold text.

**Note:** This new Cobalt mapping does not operate in a 332 type cabinet. In the table below, LS = Load Switch

Connector A 55-Pin (Plug) Type #22-55P		Connector B 55-Pin (Socket) Type #22-55S		Connector C 61-Pin (Socket) Type #24-61S	
Pin Function	I/O	Pin Function	I/O	Pin Function	I/O
A Fault Monitor	O	A $\phi$ 1 Phase Next	O	A Status Bit A (Ring 2)	O
B +24 VDC External	O	B Preempt 2 Detector	I	B Status Bit B (Ring 2)	O
C Voltage Monitor	O	C $\phi$ 2 Phase Next	O	C <b>LS 12 Red Dont Walk</b>	O
D <b>LS 1 Red Dont Walk</b>	O	D <b>LS 3 Green Walk</b>	O	D <b>LS 8 Red Dont Walk</b>	O
E $\phi$ 1 Dont Walk	O	E <b>LS 3 Yell Ped Clear</b>	O	E <b>LS 7 Yellow Ped Clear</b>	O
F <b>LS 2 Red Dont Walk</b>	O	F <b>LS 3 Red Dont Walk</b>	O	F <b>LS 7 Red Dont Walk</b>	O
G <b>LS 9 Red Dont Walk</b>	O	G <b>LS 4 Red Dont Walk</b>	O	G <b>LS 6 Red Dont Walk</b>	O
H <b>LS 9 Yellow Ped Clear</b>	O	H <b>LS 10 Yell Ped Clear</b>	O	H <b>LS 5 Red Dont Walk</b>	O
J <b>LS 9 Green Walk</b>	O	J <b>LS 10 Red Dont Walk</b>	O	J <b>LS 5 Yellow Ped Clear</b>	O
K Vehicle Detector 2	I	K $\phi$ 4 Check	O	K $\phi$ 5 Ped Clear	O
L Ped Detector 2	I	L Vehicle Detector 4	I	L $\phi$ 5 Dont Walk	O
M $\phi$ 2 Hold	I	M Ped Detector 4	I	M $\phi$ 5 Phase Next	O
N Stop Time (Ring 1)	I	N Vehicle Detector 3	I	N $\phi$ 5 Phase On	O
P Inhibit MaxTerm(Ring1)	I	P Ped Detector 3	I	P Vehicle Detector 5	I
R External Start	I	R $\phi$ 3 Phase Omit	I	R Ped Detector 5	I
S Interval Advance	I	S $\phi$ 2 Phase Omit	I	S Vehicle Detector 6	I
T Indicator Lamp Control	I	T $\phi$ 5 Ped Omit	I	T Ped Detector 6	I
U AC-Common	I	U $\phi$ 1 Phase Omit	I	U Ped Detector 7	I
V Chassis Ground	I	V Ped Recycle(Ring 2)	I	V Vehicle Detector 7	I
W Logic Ground	O	W Preempt 4 Detector	I	W Ped Detector 8	I
X Flashing Logic Out	O	X Preempt 5 Detector	I	X $\phi$ 8 Hold Off	I
Y Status Bit C (Ring1)	O	Y $\phi$ 3 Walk	O	Y Force-Off (Ring 2)	I
Z <b>LS 1 Yellow Ped Clear</b>	O	Z $\phi$ 3 Ped Clear	O	Z Stop Time (Ring 2)	I
a $\phi$ 1 Ped Clear	O	a $\phi$ 3 Dont Walk	O	a Inhibit Max Term (Ring 2)	I
b <b>LS 2 Yellow Ped Clear</b>	O	b <b>LS 4 Green Walk</b>	O	b Test C	I
c <b>LS 2 Green Walk</b>	O	c <b>LS 4 Yell Ped Clear</b>	O	c Status Bit C (Ring 2)	O

Connector A 55-Pin (Plug) Type #22-55P			Connector B 55-Pin (Socket) Type #22-55S			Connector C 61-Pin (Socket) Type #24-61S		
Pin Function	I/O		Pin Function	I/O		Pin Function	I/O	
d $\phi$ 2 Check	O		d <b>LS 10 Green Walk</b>	O		d <b>LS 12 Green Walk</b>	O	
e $\phi$ 2 Phase On	O		e $\phi$ 4 Phase On	O		e <b>LS 8 Yellow Ped Clear</b>	O	
f Vehicle Detector 1	I		f $\phi$ 4 Phase Next	O		f <b>LS 7 Green Walk</b>	O	
g Ped Detector 1	I		g $\phi$ 4 Phase Omit	I		g <b>LS 6 Green Walk</b>	O	
h $\phi$ 1 Hold	I		h $\phi$ 4 Hold	I		h <b>LS 6 Yellow Ped Clear</b>	O	
i Force-Off (Ring 1)	I		i $\phi$ 3 Hold	I		i <b>LS 5 Green Walk</b>	O	
j Ext Min Recall	I		j $\phi$ 3 Ped Omit	I		j $\phi$ 5 Walk	O	
k Manual Control Enable	I		k $\phi$ 6 Ped Omit	I		k $\phi$ 5 Check	O	
m Call To Non Actuate I	I		m $\phi$ 7 Ped Omit	I		m $\phi$ 5 Hold	I	
n Test A	I		n $\phi$ 8 Ped Omit	I		n $\phi$ 5 Phase Omit	I	
p AC+ (Control)	I		p <b>LS 13 Yell Ped Clear</b>	O		p $\phi$ 6 Hold	I	
q I/O Mode Bit A	I		q <b>LS 13 Red Dont Walk</b>	O		q $\phi$ 6 Phase Omit	I	
r Status Bit B (Ring 1)	O		r $\phi$ 3 Check	O		r $\phi$ 7 Phase Omit	I	
s <b>LS 1 Green Walk</b>	O		s $\phi$ 3 Phase On	O		s $\phi$ 8 Phase Omit	I	
t $\phi$ 1 Walk	O		t $\phi$ 3 Phase Next	O		t Vehicle Detector 8	I	
u $\phi$ 1 Check	O		u <b>LS 16 Red Dont Walk</b>	O		u Red Rest Mode (Ring 2)	I	
v $\phi$ 2 Ped Omit	I		v Preempt 6 Detector	I		v Omit Red Clear (Ring 2)	I	
w Omit AllRed Clr(Ring1)	I		w <b>LS 16 Green Walk</b>	O		w <b>LS 12 Yellow Ped Clear</b>	O	
x Red Rest (Ring 1)	I		x $\phi$ 4 Ped Omit	I		x <b>LS 8 Green Walk</b>	O	
y I/O Mode Bit B	I		y Free (No Coord)	I		y $\phi$ 7 Dont Walk	O	
z Call To Non Act II	I		z MaxII Select(Ring 2)	I		z <b>LS 11 Red Dont Walk</b>	O	
AA Test B	I		AA <b>LS 13 Green Walk</b>	O		AA <b>LS 11 Yellow Ped Clear</b>	O	
BB Walk Rest Modifier	I		BB <b>LS 14 Yel Ped Clear</b>	O		BB $\phi$ 6 Check	O	
CC Status Bit A (Ring 1)	O		CC <b>LS 14 Red Dont Walk</b>	O		CC $\phi$ 6 Phase On	O	
DD $\phi$ 1 Phase On	O		DD <b>LS 15 Red Dont Walk</b>	O		DD $\phi$ 6 Phase Next	O	
EE $\phi$ 1 Ped Omit	I		EE <b>LS 16 Yel Ped Clear</b>	O		EE $\phi$ 7 Hold	I	
FF Ped Recycle (Ring 1)	I		FF <b>LS 15 Green Walk</b>	O		FF $\phi$ 8 Check	O	
GG Max II Select(Ring 1)	I		GG <b>LS 14 Green Walk</b>	O		GG $\phi$ 8 Phase On	O	
HH I/O Mode Bit C	I		HH <b>LS 15 Yel Ped Clear</b>	O		HH $\phi$ 8 Phase Next	O	
						JJ $\phi$ 7 Walk	O	
						KK $\phi$ 7 Ped Clear	O	
						LL <b>LS 11 Green Walk</b>	O	
						MM $\phi$ 7 Check	O	
						NN $\phi$ 7 Phase On	O	
						PP $\phi$ 7 Phase Next	O	

## Default Mapping for ASC/3 and ASC/3-2070

Connector A 55-Pin (Plug) Type #22-55P			Connector B 55-Pin (Socket) Type #22-55S			Connector C 61-Pin (Socket) Type #24-61S		
Pin Function	I/O		Pin Function	I/O		Pin Function	I/O	
A	O	Fault Monitor	A	O	φ1 Phase Next	A	O	Status Bit A (Ring 2)
B	O	+24 VDC External	B	I	Preempt 2 Detector	B	O	Status Bit B (Ring 2)
C	O	Voltage Monitor	C	O	φ2 Phase Next	C	O	<b>φ8 Dont Walk</b>
D	O	<b>φ1 Red</b>	D	O	<b>φ3 Green</b>	D	O	<b>φ8 Red</b>
E	O	φ1 Dont Walk	E	O	<b>φ3 Yellow</b>	E	O	<b>φ7 Yellow</b>
F	O	<b>φ2 Red</b>	F	O	<b>φ3 Red</b>	F	O	<b>φ7 Red</b>
G	O	<b>φ2 Dont Walk</b>	G	O	<b>φ4 Red</b>	G	O	<b>φ6 Red</b>
H	O	<b>φ2 Ped Clear</b>	H	O	<b>φ4 Ped Clear</b>	H	O	<b>φ5 Red</b>
J	O	<b>φ2 Walk</b>	J	O	<b>φ4 Dont Walk</b>	J	O	<b>φ5 Yellow</b>
K	I	Vehicle Detector 2	K	O	φ4 Check	K	O	φ5 Ped Clear
L	I	Ped Detector 2	L	I	Vehicle Detector 4	L	O	φ5 Dont Walk
M	I	φ2 Hold	M	I	Ped Detector 4	M	O	φ5 Phase Next
N	I	Stop Time (Ring 1)	N	I	Vehicle Detector 3	N	O	φ5 Phase On
P	I	Inhibit MaxTerm(Ring1)	P	I	Ped Detector 3	P	I	Vehicle Detector 5
R	I	External Start	R	I	φ3 Phase Omit	R	I	Ped Detector 5
S	I	Interval Advance	S	I	φ2 Phase Omit	S	I	Vehicle Detector 6
T	I	Indicator Lamp Control	T	I	φ5 Ped Omit	T	I	Ped Detector 6
U	I	AC-Common	U	I	φ1 Phase Omit	U	I	Ped Detector 7
V	I	Chassis Ground	V	I	Ped Recycle(Ring 2)	V	I	Vehicle Detector 7
W	O	Logic Ground	W	I	Preempt 4 Detector	W	I	Ped Detector 8
X	O	Flashing Logic Out	X	I	Preempt 5 Detector	X	I	φ8 Hold Off
Y	O	Status Bit C (Ring1)	Y	O	φ3 Walk	Y	I	Force-Off (Ring 2)
Z	O	<b>φ1 Yellow</b>	Z	O	φ3 Ped Clear	Z	I	Stop Time (Ring 2)
a	O	φ1 Ped Clear	a	O	φ3 Dont Walk	a	I	Inhibit Max Term (Ring 2)
b	O	<b>φ2 Yellow</b>	b	O	<b>φ4 Green</b>	b	I	Test C
c	O	<b>φ2 Green</b>	c	O	<b>φ4 Yellow</b>	c	O	Status Bit C (Ring 2)
d	O	φ2 Check	d	O	<b>φ4 Walk</b>	d	O	<b>φ8 Walk</b>
e	O	φ2 Phase On	e	O	φ4 Phase On	e	O	<b>φ8 Yellow</b>
f	I	Vehicle Detector 1	f	O	φ4 Phase Next	f	O	<b>φ7 Green</b>
g	I	Ped Detector 1	g	I	φ4 Phase Omit	g	O	<b>φ6 Green</b>
h	I	φ1 Hold	h	I	φ4 Hold	h	O	<b>φ6 Yellow</b>
i	I	Force-Off (Ring 1)	i	I	φ3 Hold	i	O	<b>φ5 Green</b>
j	I	Ext Min Recall	j	I	φ3 Ped Omit	j	O	φ5 Walk
k	I	Manual Control Enable	k	I	φ6 Ped Omit	k	O	φ5 Check
m	I	Call To Non Actuate I	m	I	φ7 Ped Omit	m	I	φ5 Hold
n	I	Test A	n	I	φ8 Ped Omit	n	I	φ5 Phase Omit
p	I	AC+ (Control)	p	O	<b>Overlap A Yellow</b>	p	I	φ6 Hold
q	I	I/O Mode Bit A	q	O	<b>Overlap A Red</b>	q	I	φ6 Phase Omit
r	O	Status Bit B (Ring 1)	r	O	φ3 Check	r	I	φ7 Phase Omit
s	O	<b>φ1 Green</b>	s	O	φ3 Phase On	s	I	φ8 Phase Omit
t	O	φ1 Walk	t	O	φ3 Phase Next	t	I	Vehicle Detector 8
u	O	φ1 Check	u	O	<b>Overlap D Red</b>	u	I	Red Rest Mode (Ring 2)
v	I	φ2 Ped Omit	v	I	Preempt 6 Detector	v	I	Omit Red Clear (Ring 2)
w	I	Omit AllRed Clr(Ring1)	w	O	<b>Overlap D Green</b>	w	O	<b>φ8 Ped Clear</b>
x	I	Red Rest (Ring 1)	x	I	φ4 Ped Omit	x	O	<b>φ8 Green</b>
y	I	I/O Mode Bit B	y	I	Free (No Coord)	y	O	φ7 Dont Walk
z	I	Call To Non Act II	z	I	MaxII Select(Ring 2)	z	O	<b>φ6 Dont Walk</b>



Connector A 55-Pin (Plug) Type #22-55P		Connector B 55-Pin (Socket) Type #22-55S		Connector C 61-Pin (Socket) Type #24-61S	
Pin Function	I/O	Pin Function	I/O	Pin Function	I/O
AA Test B	I	AA <b>Overlap A Green</b>	O	AA <b>φ6 Ped Clear</b>	O
BB Walk Rest Modifier	I	BB <b>Overlap B Yellow</b>	O	BB φ6 Check	O
CC Status Bit A (Ring 1)	O	CC <b>Overlap B Red</b>	O	CC φ6 Phase On	O
DD φ1 Phase On	O	DD <b>Overlap C Red</b>	O	DD φ6 Phase Next	O
EE φ1 Ped Omit	I	EE <b>Overlap D Yellow</b>	O	EE φ7 Hold	I
FF Ped Recycle (Ring 1)	I	FF <b>Overlap C Green</b>	O	FF φ8 Check	O
GG Max II Select(Ring 1)	I	GG <b>Overlap B Green</b>	O	GG φ8 Phase On	O
HH I/O Mode Bit C	I	HH <b>Overlap C Yellow</b>	O	HH φ8 Phase Next	O
				JJ φ7 Walk	O
				KK φ7 Ped Clear	O
				LL <b>φ6 Walk</b>	O
				MM φ7 Check	O
				NN φ7 Phase On	O
				PP φ7 Phase Next	O

### I/O Mode Bits (3 per unit)

Mode	Bit States			State
#	A	B	C	Names
0	OFF	OFF	OFF	TS 1 Compatible
1	ON	OFF	OFF	Hardwire Interconnect
2	OFF	ON	OFF	System Interface
3	ON	ON	OFF	Reserved
4	OFF	OFF	ON	Reserved
5	ON	OFF	ON	Reserved
6	OFF	ON	ON	Manufacturer Specific
7	ON	ON	ON	Manufacturer Specific

Voltage Levels: OFF = +24 ON = 0V

I/O Pin	I/O Functions		
	Mode 0	Mode 1	Mode 2
<b>Inputs</b>			
A-h	Phase 1 Hold	Preempt 1	Preempt 1
A-M	Phase 2 Hold	Preempt 3	Preempt 3
B-i	Phase 3 Hold	Vehicle Detector 9	Vehicle Detector 9
B-h	Phase 4 Hold	Vehicle Detector 10	Vehicle Detector 10
C-m	Phase 5 Hold	Vehicle Detector 13	Vehicle Detector 13
C-p	Phase 6 Hold	Vehicle Detector 14	Vehicle Detector 14
C-EE	Phase 7 Hold	Vehicle Detector 15	Vehicle Detector 15
C-X	Phase 8 Hold	Vehicle Detector 16	Vehicle Detector 16
B-U	Phase 1 Phase Omit	Vehicle Detector 11	Vehicle Detector 11
B-S	Phase 2 Phase Omit	Vehicle Detector 12	Vehicle Detector 12
B-R	Phase 3 Phase Omit	Timing Plan C	Vehicle Detector 17
B-g	Phase 4 Phase Omit	Timing Plan D	Vehicle Detector 18
C-n	Phase 5 Phase Omit	Alternate Sequence A	Vehicle Detector 19
C-q	Phase 6 Phase Omit	Alternate Sequence B	Vehicle Detector 20
C-r	Phase 7 Phase Omit	Alternate Sequence C	Alarm 1
C-s	Phase 8 Phase Omit	Alternate Sequence D	Alarm 2
A-EE	Phase 1 Ped Omit	Dimming Enable	Dimming Enable
A-v	Phase 2 Ped Omit	Automatic Flash	Local Flash Status
B-j	Phase 3 Ped Omit	Timing Plan A	Address Bit 0
B-x	Phase 4 Ped Omit	Timing Plan B	Address Bit 1
B-T	Phase 5 Ped Omit	Offset 1	Address Bit 2
B-k	Phase 6 Ped Omit	Offset 2	Address Bit 3
B-m	Phase 7 Ped Omit	Offset 3	Address Bit 4
B-n	Phase 8 Ped Omit	TBC On Line	MMU Flash Status
<b>Outputs</b>			
A-DD	Phase 1 Phase On	Preempt 1 Status	Preempt 1 Status
A-e	Phase 2 Phase On	Preempt 3 Status	Preempt 3 Status
B-s	Phase 3 Phase On	TBC Auxiliary 1	TBC Auxiliary 1
B-e	Phase 4 Phase On	TBC Auxiliary 2	TBC Auxiliary 2
C-N	Phase 5 Phase On	Timing Plan A	Timing Plan A
C-CC	Phase 6 Phase On	Timing Plan B	Timing Plan B
C-NN	Phase 7 Phase On	Offset 1	Offset 1
C-GG	Phase 8 Phase On	Offset 2	Offset 2

I/O Pin	I/O Functions		
	Mode 0	Mode 1	Mode 2
<b>Outputs, continued</b>			
B-A	Phase 1 Phase Next	Preempt 2 Status	Preempt 2 Status
B-C	Phase 2 Phase Next	Preempt 4 Status	Preempt 4 Status
B-t	Phase 3 Phase Next	Preempt 5 Status	Preempt 5 Status
B-f	Phase 4 Phase Next	Preempt 6 Status	Preempt 6 Status
C-M	Phase 5 Phase Next	Offset 3	Offset 3
C-DD	Phase 6 Phase Next	Timing Plan C	Timing Plan C
C-PP	Phase 7 Phase Next	Timing Plan D	Timing Plan D
C-HH	Phase 8 Phase Next	Reserved	Reserved
A-u	Phase 1 Check	Free/Coord Status	Free/Coord Status
A-d	Phase 2 Check	Automatic Flash	Automatic Flash
B-r	Phase 3 Check	TBC Auxiliary 3	TBC Auxiliary 3
B-K	Phase 4 Check	Reserved	Reserved
C-k	Phase 5 Check	Reserved	System Special Function 1
C-BB	Phase 6 Check	Reserved	System Special Function 2
C-MM	Phase 7 Check	Reserved	System Special Function 3
C-FF	Phase 8 Check	Reserved	System Special Function 4

## Connector D

Pin	Function	Secondary Function	I/O	Notes
7	KEY POSITION			
60	AUTOMATIC FLASH		I	
58	CMU/ABSOLUTE STOP TIME (CONFLICT FLASH)		I	
14	CONTROLLER TIME RESET		I	
17	EXPANDED DETECTOR #1 (17)		I	
47	EXPANDED DETECTOR #2 (18)		I	
31	EXPANDED DETECTOR #2 (19)		I	
18	EXPANDED DETECTOR #2 (20)		I	
30	EXPANDED DETECTOR #2 (21)		I	
39	EXPANDED DETECTOR #2 (22)		I	
40	EXPANDED DETECTOR #2 (23)		I	
13	EXPANDED DETECTOR #2 (24)		I	

Pin	Function	Secondary Function	I/O	Notes
25	EXTERNAL SYSTEM COMMAND CYCLE BIT 1		I	
35	EXTERNAL SYSTEM COMMAND CYCLE BIT 2		I	
6	EXTERNAL SYSTEM COMMAND CYCLE BIT 3		I	
12	EXTERNAL SYSTEM COMMAND OFFSET BIT 1	EXT ADDRESS BIT 0	I	
10	EXTERNAL SYSTEM COMMAND OFFSET BIT 2	EXT ADDRESS BIT 1	I	
36	EXTERNAL SYSTEM COMMAND OFFSET BIT 3	EXT ADDRESS BIT 2	I	
16	EXTERNAL SYSTEM COMMAND SPLIT BIT 1	EXT ADDRESS BIT 3	I	
9	EXTERNAL SYSTEM COMMAND SPLIT BIT 2	EXT ADDRESS BIT 4	I	
4	EXTERNAL SYSTEM COMMAND COORDINATION SYNC		I	
26	FORCE COORDINATOR FREE		I	
38	FORCE DUAL COORDINATION		I	
57	PREEMPTOR CALL #1		I	
49	PREEMPTOR CALL #2		I	
50	PREEMPTOR CALL #3	BUS PREEMPTOR #1	I	
55	PREEMPTOR CALL #4	BUS PREEMPTOR #2	I	
56	PREEMPTOR CALL #5	BUS PREEMPTOR #3	I	
61	PREEMPTOR CALL #6	BUS PREEMPTOR #4	I	
3	SPLIT DEMAND		I	
20	TEST INPUT C		I	
37	TEST INPUT D		I	
19	TEST INPUT E		I	
27	COORDINATOR STATUS		O	
5	CROSS STREET SYNC		O	
43	INTERNAL SYSTEM COMMAND CYCLE BIT 1		O	
44	INTERNAL SYSTEM COMMAND CYCLE BIT 2		O	
29	INTERNAL SYSTEM COMMAND CYCLE BIT 3		O	
33	INTERNAL SYSTEM COMMAND OFFSET BIT 1		O	
42	INTERNAL SYSTEM COMMAND OFFSET BIT 2		O	
2	INTERNAL SYSTEM COMMAND OFFSET BIT 3		O	
21	INTERNAL SYSTEM COMMAND SPLIT BIT 1		O	
46	INTERNAL SYSTEM COMMAND SPLIT BIT 2		O	
53	INTERNAL SYSTEM COMMAND SYNC		O	

Pin	Function	Secondary Function	I/O	Notes
59	PREEMPT CMU INTERLOCK		O	
23	PREEMPTOR #1 ACTIVE		O	Priority preemptors 1 & 2 respond to any NEMA defined input applied to Preemptor Call inputs 1 & 2, respectively.
32	PREEMPTOR #2 ACTIVE		O	
22	PREEMPTOR #3 ACTIVE		O	Priority preemptors 3-6 respond to any NEMA defined input applied for at least 0.8 seconds to Preemptor Call inputs 3-6, respectively. Bus Preemptors 1-4 respond to a pulsing (1pps at 50% duty cycle) NEMA defined input applied to Preemptor Call inputs 3-6, respectively.
34	PREEMPTOR #4 ACTIVE		O	
1	PREEMPTOR #5 ACTIVE		O	
48	PREEMPTOR #6 ACTIVE		O	
15	PREEMPTOR FLASH CONTROL		O	
41	SPARE OUTPUT 4		O	
45	SPARE OUTPUT 5		O	
51	SPARE OUTPUT 6		O	
52	SPARE OUTPUT 7		O	
54	SPARE OUTPUT 8		O	
28	TLM SPECIAL FUNCTION 1		O	
8	TLM SPECIAL FUNCTION 2		O	
24	TLM SPECIAL FUNCTION 3	SPARE OUTPUT 1	O	
11	TLM SPECIAL FUNCTION 4	SPARE OUTPUT 2	O	

## Type 1 Power

Pin	Function	I/O
A	AC Neutral	I
B	Not Used	
C	AC Line	I
D	Not Used	
E	Not Used	
F	Fault Monitor	O
G	Logic Ground	-
H	Chassis Ground	-
I	Not Used	
J	Not Used	

## Port 3B (9-pin Connector on Telemetry Module)

Configured for FSK			
Pin	Function		I/O
1	TXD +	Transmit +	O
2	TXD -	Transmit -	O
3	Reserved		
4	RXD +	Receive +	I
5	RXD -	Receive -	I
6	Chassis Ground		-
7	Reserved		
8	Reserved		
9	Chassis Ground		-

Configured for EIA-232			
Pin	Function	I/O	
1	CTS	I	
2	RXD	I	
3	TXD	O	
4	RTS	O	
5	ISOGRN		
6	Chassis Ground		-
7	+12VISO		
8	Chassis Ground		-
9	Chassis Ground		-

## Port 3B (25-pin Connector on Telemetry Module)

Configured for FSK		
Pin	Function	I/O
1	SYSTEM DETECTOR C2	I
2	SYSTEM DETECTOR A2	I
3	SYSTEM DETECTOR A1	I
4	SYSTEM DETECTOR C1	I
5	SYSTEM DETECTOR B1	I
6	TLM SPARE 2	I
7	SYSTEM DETECTOR D1	I
8	SYSTEM DETECTOR D2	I
9	TLM SPECIAL FUNCTION 1	O
10	TLM SPECIAL FUNCTION 3	O
11	Key Position	-
12	TRANSMIT 1	O
13	TRANSMIT 2	O
14	TLM SPARE 1	I
15	EXTERNAL ADDRESS ENABLE	I
16	DOOR OPEN/MAINTENANCE REQUIRED	I
17	ALARM 1	I
18	LOCAL FLASH	I
19	SYSTEM DETECTOR B2	I

Configured for EIA-232		
Pin	Function	I/O
1	SYSTEM DETECTOR C2	I
2	SYSTEM DETECTOR A2	I
3	SYSTEM DETECTOR A1	I
4	SYSTEM DETECTOR C1	I
5	SYSTEM DETECTOR B1	I
6	TLM SPARE 2	I
7	SYSTEM DETECTOR D1	I
8	SYSTEM DETECTOR D2	I
9	TLM SPECIAL FUNCTION 1	O
10	TLM SPECIAL FUNCTION 3	O
11	Key Position	-
12	TXD	O
13	+12VISO	O
14	TLM SPARE 1	I
15	EXTERNAL ADDRESS ENABLE	I
16	DOOR OPEN/MAINTENANCE REQUIRED	I
17	ALARM 1	I
18	LOCAL FLASH	I
19	SYSTEM DETECTOR B2	I

Configured for FSK		
Pin	Function	I/O
20	CONFLICT FLASH	I
21	ALARM 2	I
22	TLM SPECIAL FUNCTION 2	O
23	TLM SPECIAL FUNCTION 4	O
24	RECEIVE 1	I
25	RECEIVE 2	I

Configured for EIA-232		
Pin	Function	I/O
20	CONFLICT FLASH	I
21	ALARM 2	I
22	TLM SPECIAL FUNCTION 2	O
23	TLM SPECIAL FUNCTION 4	O
24	ISOGND	I
25	RXD	I

## Port 1 SDLC

Pin	Controller Unit Function	I/O	Notes	Other Port 1
1	Tx Data +	O		Rx Data +
2	Logic Ground	-		
3	Tx Clock +	O		Rx Clock +
4	Logic Ground	-		
5	Rx Data +	I		Tx Data +
6	Logic Ground	-		
7	Rx Clock +	I		Tx Clock +
8	Logic Ground	-		
9	Tx Data -	O		Rx Data -
10	Port 1 Disable	I	0VDC=disable	
11	Tx Clock -	O		Rx Clock -
12	Chassis Ground	-		Chassis Ground
13	Rx Data -	I		Tx Data -
14	Reserved			
15	Rx Clock -	I		Tx Clock -

### Note:

TX pins at the BIU are RX pins at the controller.  
 RX pins at the BIU are TX pins at the controller.

## Port 2 Terminal

Pin	Function		I/O
1	GND	Chassis Ground	-
2	TXD	Transmit Data	O
3	RXD	Receive Data	I
4	RTS	Request To Send	O
5	CTS	Clear To Send	I
6	Not Used		
7	GND	Logic Ground	-
8	DCD	Data Carrier Detect	I
9-19	Not Used		
20	DTR	Data Terminal Ready	O
21-25	Not Used		



## Connector C1S Pin Assignment

For the Functions in the table below, an “O” prefix = “Output” and an “I” prefix = “Input”

Pin	Function	Pin	Function	Pin	Function	Pin	Function
1	DCG #2	27	O24	53	I14	79	I44
2	O0	28	O25	54	I15	80	I45
3	O1	29	O26	55	I16	81	I46
4	O2	30	O27	56	I17	82	I47
5	O3	31	O28	57	I18	83	O40
6	O4	32	O29	58	I19	84	O41
7	O5	33	O30	59	I20	85	O42
8	O6	34	O31	60	I21	86	O43
9	O7	35	O32	61	I22	87	O44
10	O8	36	O33	62	I23	88	O45
11	O9	37	O34	63	I28	89	O46
12	O10	38	O35	64	I29	90	O47
13	O11	39	I0	65	I30	91	O48
14	DCG #2	40	I1	66	I31	92	DCG #2
15	O12	41	I2	67	I32	93	O49
16	O13	42	I3	68	I33	94	O50
17	O14	43	I4	69	I34	95	O51
18	O15	44	I5	70	I35	96	O52
19	O16	45	I6	71	I36	97	O53
20	O17	45	I7	72	I37	98	O54
21	O18	47	I8	73	I38	99	O55
22	O19	48	I9	74	I39	100	O36
23	O20	49	I10	75	I40	101	O37
24	O21	50	I11	76	I41	102	O38 DET RES
25	O22	51	I12	77	I42	103	O39 WDT
26	O23	52	I13	78	I43	104	DCG #2

## Connector C11S Pin Assignment

For the Functions in the table below, an “O” prefix = “Output” and an “I” prefix = “Input”

Pin	Function	Pin	Function	Pin	Function	Pin	Function
1	O56	11	I25	21	I54	31	DCG #2
2	O57	12	I26	22	I55	32	NA
3	O58	13	I27	23	I56	33	NA
4	O59	14	DCG #2	24	I57	34	NA
5	O60	15	I48	25	I58	35	NA
6	O61	16	I49	26	I59	36	NA
7	O62	17	I50	27	I60	37	DCG #2
8	O63	18	I51	28	I61		
9	DCG #2	19	I52	29	I62		
10	I24	20	I53	30	I63		

## Connector C12S Pin Assignment

Pin	Function	Pin	Function
1	SP5TXD+	14	SP5TXD-
2	SP5RXD+	15	SP5RXD-
3	SP5TXC+	16	SP5TXC-
4	SP5RXC+	17	SP5RXC-
5	SP3TXD+	18	SP3TXD-
6	SP3RXD+	19	SP3RXD-
7	SP3TXC+	20	SP3TXC-
8	SP3RXC+	21	SP3RXC-
9	LINE SYNC+	22	LINE SYNC-
10	NRESET+	23	NRESET-
11	POWERDOWN+	24	POWERDOWN -
12	BIAS +5 VDC	25	EG
13	DCG #2		

## 3xx Cabinet Pin Assignment

Equipment	170 Controller C1 Default Assignment Per 3xx Cabinet Standard
Connectivity	Controller Type ASC/3-RM, Cobalt-RM or 2070 - C1S Connector

### Input Pins

Input Pin	332	330 TBD	336 TBD	303 TBD	337 TBD
39	VEHICLE DET 02				
40	VEHICLE DET 18				
41	VEHICLE DET 06				
42	VEHICLE DET 22				
43	VEHICLE DET 10				
44	VEHICLE DET 26				
45	VEHICLE DET 14				
46	VEHICLE DET 30				
47	VEHICLE DET 04				
48	VEHICLE DET 20				
49	VEHICLE DET 08				
50	VEHICLE DET 24				
51	PREEMPT CALL 1				
52	PREEMPT CALL 2				
53	MAN CONT ENA				
54	TEST A				
55	VEHICLE DET 17				
56	VEHICLE DET 01				
57	VEHICLE DET 21				
58	VEHICLE DET 05				
59	VEHICLE DET 25				
60	VEHICLE DET 09				
61	VEHICLE DET 29				
62	VEHICLE DET 13				
63	VEHICLE DET 03				
64	VEHICLE DET 19				
65	VEHICLE DET 07				
66	VEHICLE DET 23				
67	PED DET 02				

Input Pin	332	330 TBD	336 TBD	303 TBD	337 TBD
68	PED DET 06				
69	PED DET 04				
70	PED DET 08				
71	PREEMPT CALL 3				
72	PREEMPT CALL 4				
73	PREEMPT CALL 5				
74	PREEMPT CALL 6				
75	SPLIT DEMAND 1				
76	VEHICLE DET 11				
77	VEHICLE DET 27				
78	VEHICLE DET 15				
79	VEHICLE DET 31				
80	INT ADV				
81	LOCAL FLASH				
82	STOP TIME				

## Output Pins

Output Pin	332	330 TBD	336 TBD	303 TBD	337 TBD
2	PH 4 DONT WLK				
3	PH 4 WALK				
4	PH 4 RED				
5	PH 4 YELLOW				
6	PH 4 GREEN				
7	PH 3 RED				
8	PH 3 YELLOW				
9	PH 3 GREEN				
10	PH 2 DONT WLK				
11	PH 2 WALK				
12	PH 2 RED				
13	PH 2 YELLOW				
15	PH 2 GREEN				
16	PH 1 RED				
17	PH 1 YELLOW				
18	PH 1 GREEN				
19	PH 8 DONT WLK				
20	PH 8 WALK				
21	PH 8 RED				
22	PH 8 YELLOW				
23	PH 8 GREEN				
24	PH 7 RED				
25	PH 7 YELLOW				
26	PH 7 GREEN				
27	PH 6 DONT WLK				
28	PH 6 WALK				
29	PH 6 RED				
30	PH 6 YELLOW				
31	PH 6 GREEN				
32	PH 5 RED				
33	PH 5 YELLOW				
34	PH 5 GREEN				
35	OLA GREEN				

Output Pin	332	330 TBD	336 TBD	303 TBD	337 TBD
36	OLB GREEN				
37	OLA YELLOW				
38	OVERLAP B YELLOW				
83	TOD SPEC FUNC 1				
84	TOD SPEC FUNC 3				
85	OLD RED				
86	OLD YELLOW				
87	OLD GREEN				
88	OLC RED				
89	OLC YELLOW				
90	OLC GREEN				
91	COORD FREE STAT				
93	CRD SYNC OUT				
94	OLB RED				
95	OLB YELLOW				
96	OLB GREEN				
97	OLA RED				
98	OLA YELLOW				
99	OLA GREEN				
100	TOD SPEC FUNC 2				
101	AUTOMATIC FLASH				
102	TOD SPEC FUNC 4				
103	WATCHDOG				

***For your notes:***