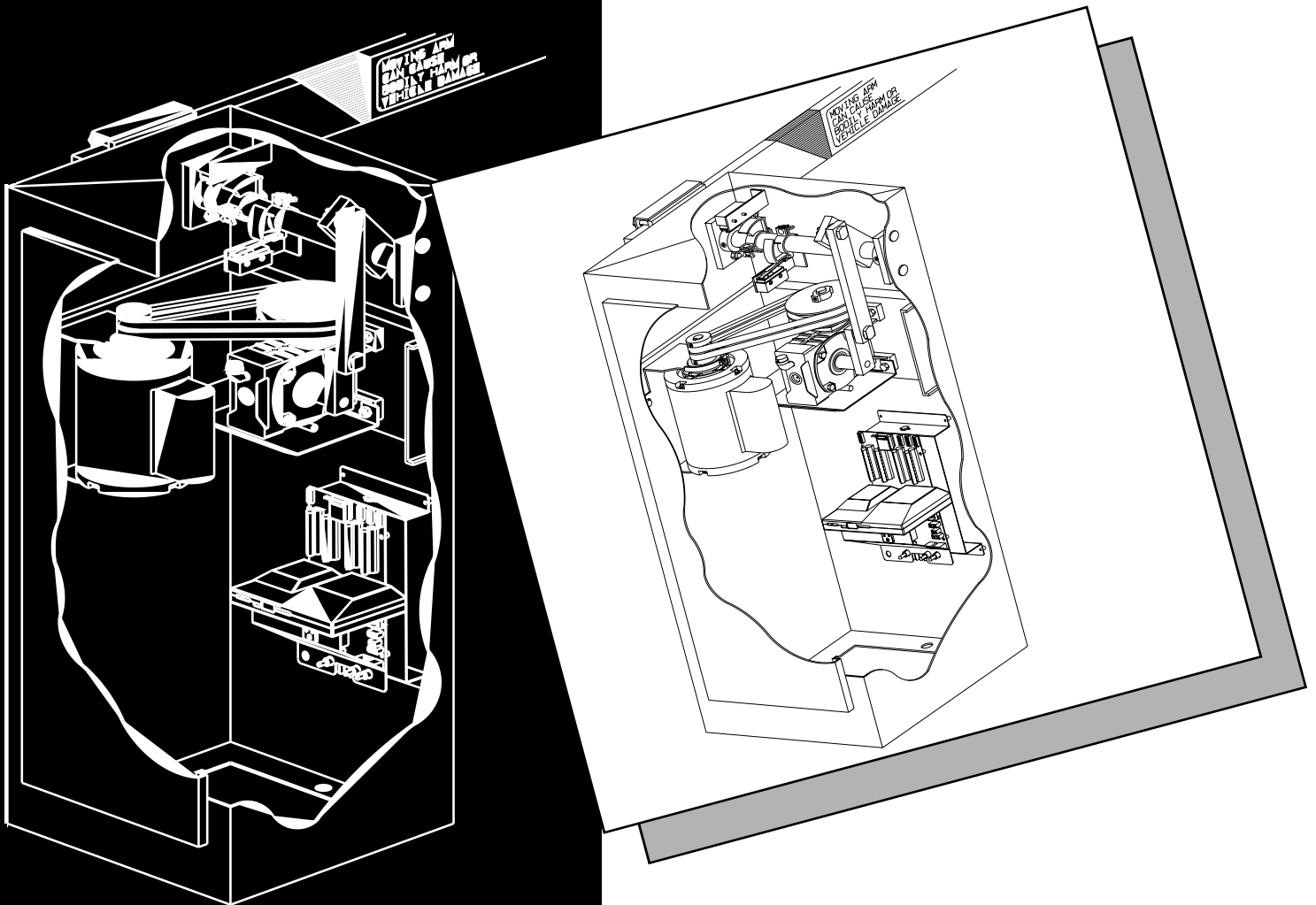


G-90 CD Series Barrier Gate

Operator Manual



FEDERAL APD
Federal Signal Corporation

Safety Notice



CAUTION! To reduce the risk of severe personal injury or damage to equipment, turn off the power to the equipment before performing any maintenance or repairs.
- Failure to heed this warning could result in injury or even death of those who come in contact with the product -

Failure to turn off the power before performing any maintenance or repairs may result in damage to the equipment that is not covered by the warranty.

People’s lives and property depend on your safe installation of equipment. Listed below are some important safety instructions and precautions which you should follow when working on any Federal APD equipment. Failure to follow all safety precautions and instructions can result in serious injury or property damage. Refer to the specific operational manual for a particular piece of equipment before beginning any service work.

- ☐ Frequently inspect the equipment to ensure that it is operating properly.
- ☐ Ensure that maintenance is performed by the factory or an authorized distributor at least twice a year.

Safety Hints

- ☐ Use vibrant colors on parking equipment at entrance lanes and exit lanes.
- ☐ Always provide proper signage, both on the roadway and on other equipment.
- ☐ Maintain the manufacturer’s warning stickers on gate arms and on other equipment.
- ☐ Encourage the use of safety devices such as buzzers or flashing lights.
- ☐ Always recommend that sidewalks be parallel to entrance lanes and exit lanes.

Safety Notice

Any activity in relation to entrance lanes and exit lanes should be monitored to ensure against accidental lowering or raising of barrier gates or manipulation of equipment so as to prevent injury of pedestrians, maintenance personnel, persons on bicycles or motorcycles. Take special care when commanding any equipment action from a centralized computer system, especially when the control equipment is not in your line of vision.

Use Pictograms

Federal APD strongly recommends that you use universally identifiable icons, or pictograms, in all entrance lanes and exit lanes, roadways, posts and walls. It is also recommended that a “No Pedestrian” pictogram be painted on the roadway immediately adjacent to a parking barrier gate. Pictograms depicting “No Motorcycles,” “No Wheelchairs,” “No Bicycles,” and “No Trucks” are also recommended.

Safety Is Good Business

As an institution, municipality, or private operator, it is important to be aware of the potential liabilities which may arise in normal parking operations. Adapting a “Safety First” attitude will provide your business and your patrons with a safer environment. After all, safety is good business!

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Model G-90 CD Series Barrier Gate
ZMA-200, Ver. 5

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Table of Contents

List of Figures	v
List of Tables.....	vii
Chapter 1: Getting Started.....	1
Reviewing the Components.....	1
Working with the Menus	9
Navigating the Omega LCD Controller Menus	9
Chapter 2: Loop Components and Installation.....	13
Loop Overview	13
Hardware Requirements.....	13
Loop Detector Operation	14
Typical Loop Layout	14
Loop Installation.....	15
Setting the Size of the Loop	16
Setting the Loop Lead Length	18
Crosstalk and Loop Coil Frequency	19
Viewing Current Loop Frequencies.....	20
Loop Sensitivity.....	22
Detecting Vehicles that Tailgate.....	23
Tuning Loops	24
Troubleshooting the Loop Detector	24
Chapter 3: G-90 CD Gate Electronics Installation	29
Field Connections on the Connection Panel.....	29
Installing the Configuration Module	31
Removing the Configuration Module	32
Installing the Omega LCD Controller	34
Removing the Omega LCD Controller	35

Setting the DIP Switches on the Connection Panel	36
Starting the G-90 CD Gate	41
Setting the Time and Date on the Omega LCD Controller	43
Operating the Gate without a Configuration Module (“No Config” Mode).....	46
Chapter 4: G-90 CD Gate Mechanical Installation.....	51
Installing the G-90 CD Gate Cabinet.....	51
Installing a Standard Gate Arm.....	54
Installing a Folding Gate Arm.....	55
Up and Down Cam Adjustment for Arm Travel.....	56
Setting the Gate for Normal Operation	58
Chapter 5: Additional Programming Options.....	59
Setting Sensitivity	59
Programming Timer Features.....	64
Resetting Counters	68
Setting Function Time Zones	69
Programming Differential Counters (Optional Feature).....	73
Programming an Alarm Message	75
Chapter 6: Viewing Data in the Omega LCD Controller.....	79
Viewing the G-90 CD Gate Diagnostic Information.....	79
Viewing the Software and Hardware Options	82
Reviewing Lane Transaction Information	88
Working with Report Messages	91
Reviewing Count Information.....	93
Viewing Lane Status Functions.....	98
Chapter 7: Sending Commands to the Gate	101
Overview of the Commands Menu.....	101
Sending Commands.....	103
Chapter 8: Updating Firmware for the Omega LCD Controller	107

Before You Start	107
Installing the FlashProgrammer Program.....	107
Connecting the Computer to the Omega LCD Controller	109
Loading Firmware to the Omega LCD Controller.....	110
Chapter 9: Diagnostics and Troubleshooting	115
Diagnostics.....	115
Troubleshooting	121
Chapter 10: Preventive Maintenance	125
Appendix A: Configuration Features.....	127
Single Differential Counter	127
Dual Differential Counter	127
Dual Direction Operation	127
Communication Options	128
Directional Arming.....	128
Third Loop Detector (Loop C)	128
Automatic Time Zone Control Options.....	128
Inputs	129
Outputs	130
Internal Resettable and Non-Resettable Counters.....	133
Hourly Count Reports.....	135
Appendix B: Lane Operation	137
Mode Logic.....	137
Directional Logic.....	138
Setting Connection Panel DIP Switches for Lane Operation (Base Modes and Sub Modes)....	138
Vends	138
Lane Layout Samples	141
Appendix C: Orders, Repair Procedures, and Part Numbers	165
Placing an Order.....	165

Requesting a Repair	165
Ordering Parts	166
Parts for Upgrading G-90 and G-90 LCD Gates	168
G-90 CD Series Barrier Gate Assembly	169
Folding Gate Arm Assembly (53-18037)	172
Appendix D: Getting Additional Support.....	175
Glossary	179
Index	181

List of Figures

Figure 1.1: Gate Warning Label.....	2
Figure 1.2: Gate Arm Warning Label.....	2
Figure 1.3: G-90 CD Connection Panel.....	4
Figure 1.4: Omega LCD Controller.....	5
Figure 1.5: Omega LCD Controller Keypad	6
Figure 1.6: Configuration Module.....	7
Figure 1.7: G-90 CD Gate Internal View	8
Figure 1.8: Omega LCD Controller Menu	9
Figure 2.1: Typical Loop Layout.....	14
Figure 2.2: Loop Installation in Concrete.....	15
Figure 2.3: Electrical Field	18
Figure 2.4: Loop with Shorted Inductor Nearby	27
Figure 3.1: G-90 CD Gate Connection Panel with Standard Configuration Module.....	30
Figure 3.2: Configuration Module on Connection Panel	32
Figure 3.3: Control Power Switch and Configuration Module	33
Figure 3.4: Omega LCD Controller and Open DIP Switches	34
Figure 3.5: Control Power Switch and Omega LCD Controller	36
Figure 3.6: Location of DIP Switch Banks on the Connection Panel	37
Figure 3.7: Control Power Switch on the Connection Panel.....	42
Figure 3.8: Omega LCD Controller and Programming Keys.....	43
Figure 3.9: Time and Date Menu.....	44
Figure 4.1: Center Cabinet Alignment for G-90 CD Barrier Gate	52
Figure 4.2: Mounting Gate in Sloping Lane.....	53
Figure 4.3: Anchor Bolt Installation.....	54
Figure 4.4: Standard Gate Arm Assembly.....	55
Figure 4.5: Folding Gate Arm Assembly	56
Figure 4.6: Cams.....	57
Figure 5.1: Omega LCD Controller Menu	60
Figure 5.2: Omega LCD Controller Menu	65
Figure 5.3: Omega LCD Controller Menu	68
Figure 5.4: Omega LCD Controller Menu	70
Figure 5.5: Omega LCD Controller Menu	74
Figure 5.6: Omega LCD Controller Menu	76
Figure 6.1: Sample SW 1-3 Menu	80
Figure 6.2: Omega LCD Controller MISCELLANEOUS Menu	81
Figure 6.3: Omega LCD Controller SETTINGS Menu	83
Figure 6.4: Omega LCD Controller OPTIONS Menu	84
Figure 6.5: Omega LCD Controller INPUTS Menu	85
Figure 6.6: Omega LCD Controller OUTPUTS Menu	86
Figure 6.7: Omega LCD Controller REPORTS Menu.....	91
Figure 6.8: Omega LCD Controller Non-Resettable/ Resettable COUNTS Menu.....	94
Figure 6.9: Omega LCD Controller Differential COUNTS Menu.....	95
Figure 6.10: Omega LCD Controller Hourly COUNTS Menu.....	96
Figure 6.11: Omega LCD Controller LANE STATUS Menu.....	98
Figure 7.1: Omega LCD Controller COMMANDS Menu.....	102
Figure 8.1: RS-232 Cable Pin-Out	110
Figure 8.2: RJ-11 Port Location	110

Figure 9.1: DIP Switches in the Open Position	117
Figure 9.2: RS 422 Loopback Connector	117
Figure 9.3: Keypad Numbers.....	119
Figure 9.4: Sample Input/Output Diagnostic Message.....	120
Figure 9.5: Up and Down Limit Switches.....	123
Figure 9.6: Omega LCD Controller.....	124
Figure 9.7: DIP Switches in the Open Position	124
Figure B.1: Pay In No Arming	141
Figure B.2: Pay In/Free Out	142
Figure B.3: Pay In with Arming Loop for Auto Spitter Only	143
Figure B.4: Pay In w/Arming Loop for Push-Button Spitter/Card Reader	144
Figure B.5: Pay In with Arming Loop for Spitter Only	145
Figure B.6: Pay Out with Arming Loop for Reader and Fee Computer	146
Figure B.7: Pay Out with Arming Loop for Fee Computer Only	147
Figure B.8: Free Gate with Opening Loop.....	148
Figure B.9: Pay Operation w/Arming Loop for Card Reader/Auto Spitter.....	149
Figure B.9: (Base Mode 2 - Sub Mode 2 with Special Wiring).....	149
Figure B.10: Special Wiring for Base Mode 2 - Sub Mode 2	150
Figure B.11: Escape Lane.....	151
Figure B.12: Pay In w/Directional Arming for Push-Button Spitter/Card Reader	152
Figure B.13: Pay In with Directional Arming for Auto Ticket Spitter Only.....	153
Figure B.14: Pay In/Pay Out, Single Loop	154
Figure B.15: Pay In/Pay Out with Arming Loop for Auto Spitter Only	155
Figure B.16: Pay In/Pay Out w/Arming for PB Ticket Spitter & Card Reader Only	156
Figure B.17: Pay In/Pay Out with Arming for Entry Ticket Spitter/Reader and Exit Reader/Fee Computer	157
Figure B.18: Pay In/Pay Out with Arming Loop for Entry Auto Spitter and Exit Reader/Fee Computer.....	158
Figure B.19: Pay In/Pay Out with An Arming Loop for Entry Auto Ticket Spitter and Exit Fee Computer.....	159
Figure B.20: Pay In/Pay Out w/Arming for Entry Reader, Auto Spitter Only.....	160
Figure B.21: Pay In/Pay Out with Escape Lane Entry	161
Figure B.22: Pay In/Pay Out w/Directional Arming for Entry Spitter/Card Reader.....	162
Figure B.23: Pay In/Pay Out w/Directional Arming for Entry Auto Spitter Only	163
Figure C.1: G-90 CD Series Barrier Gate Assembly.....	169
Figure C.2: Folding Gate Arm Assembly.....	172

List of Tables

Table 1.1: Navigating Menus on the Omega LCD Controller	9
Table 2.1: Standard Loop Sizes	17
Table 2.2: Loop Lead Table	19
Table 2.3: Omega LCD Controller DIP Switch Settings for Loop Frequency.....	20
Table 2.4: Loop Sizes and Operating Frequency	22
Table 3.1: Minimum Inputs and Outputs for the G-90 CD to Function	31
Table 3.2: Omega LCD Controller DIP Switch Settings.....	35
Table 3.3: DIP Switch Settings for Base Mode/Sub Mode	38
Table 3.4: DIP Switch Settings for Device Number	38
Table 3.5: DIP Switch Settings for Rebound Features.....	39
Table 3.6: DIP Switch Settings for Loop Sensitivity	40
Table 3.7: DIP Switch Settings for Tailgate Detection and Sensitivity	41
Table 3.8: DIP Switch Setting for Broken Gate Arm Sensitivity.....	41
Table 3.9: “No Config” Mode Inputs and Outputs.....	47
Table 3.10: DIP Switch Settings for Base Mode/Sub Mode in No Config Mode.....	48
Table 3.11: Loop A Sensitivity DIP Switch Settings for No Config Mode	48
Table 3.12: Loop B Sensitivity DIP Switch Settings for No Config Mode	48
Table 6.1: Hexadecimal Values of DIP Switches.....	80
Table 6.2: Reports Messages	88
Table 9.1: Run-Time Diagnostics Messages	115
Table 10.1 Maintenance Schedule and Service Record	125
Table A.1: Available Inputs.....	129
Table A.2: Available Outputs	131
Table A.3: Available Resettable and Non-Resettable Counts.....	134
Table B.1: Vends	139
Table C.1: G-90 and G-90 LCD Upgrade Parts	168
Table C.2: G-90 CD Series Barrier Gate Assembly.....	170
Table C.3: Folding Gate Arm Assembly (53-18037).....	173
Table D.1: Federal APD Technical Support Numbers.....	175

Chapter 1: Getting Started

Federal APD, Inc. Model G-90 CD Series Barrier Gate has been designed to provide modern, reliable barrier gates for your parking system. The gate includes field programmable features in the gate controller, and also includes an internal motor current sensing system, also known as a safety edge, input LEDs, power supply LEDs, built-in diagnostics, a seven-day Supercap memory backup, an event history report, and a built-in, back-out timer. Some of the additional features include a third internal loop detector, internal totalizing and differential counters, true directional arming, statistical reporting at the gate itself, and programmable time zone control of basic gate functions such as override, raise/lower, and device enable/disable.

The G-90 CD Series Barrier Gate retrofits to existing G-90 and G-90 LCD Gates. You may upgrade your G-90 or G-90 LCD gate by ordering the appropriate upgrade package. See “Parts for Upgrading G-90 and G-90 LCD Gates,” page 168 for more information about these part numbers.

This chapter describes the various components of the G-90 CD Gate, as well as the parking configuration in which it is used. This chapter contains the following:

Reviewing the Components.....	1
Gate Housing	1
Gate Arm.....	2
G-90 CD Connection Panel	2
Understanding the Omega LCD Controller	5
Configuration Module.....	6
Configuration Module.....	6
Detector Loops.....	7
Mechanical Components.....	7
Working with the Menus	9
Navigating the Omega LCD Controller Menus.....	9

Reviewing the Components

Gate Housing

The G-90 CD Gate housing is constructed of heavy duty aluminum with a weatherproof, gasketed door. The door is equipped with a flush-mounted T-handle lock and one key. The enclosure and gate are painted with a heavy duty powder coating.

Note: A yellow caution sticker stating “AUTOS ONLY NO MOTORCYCLES, BICYCLES OR PEDESTRIANS” is required on both sides of the gate cabinet. Figure 1.1 illustrates the gate warning label. (FAPD part #20-3469 - English; other languages available.)

Figure 1.1
Gate Warning Label

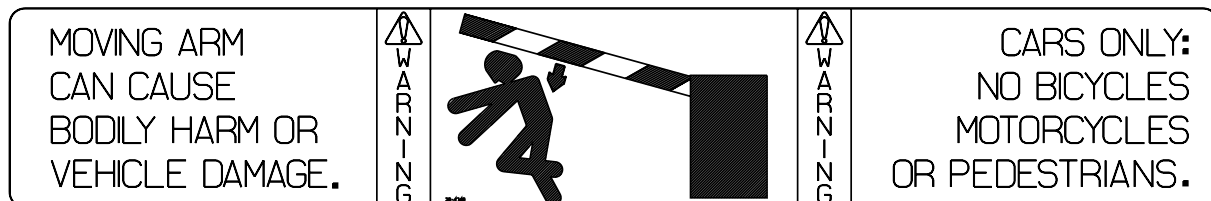


Gate Arm

The standard gate arm is 10 ft. (3.05 m) in length and is constructed of clear white pine. It is finished in diagonal stripes of black and white enamel.

Note: A bright orange warning label is required to be affixed to both sides of the gate arm. Figure 1.2 illustrates a gate arm warning label. (FAPD part #20-4348 - English; other languages available.)

Figure 1.2
Gate Arm Warning Label

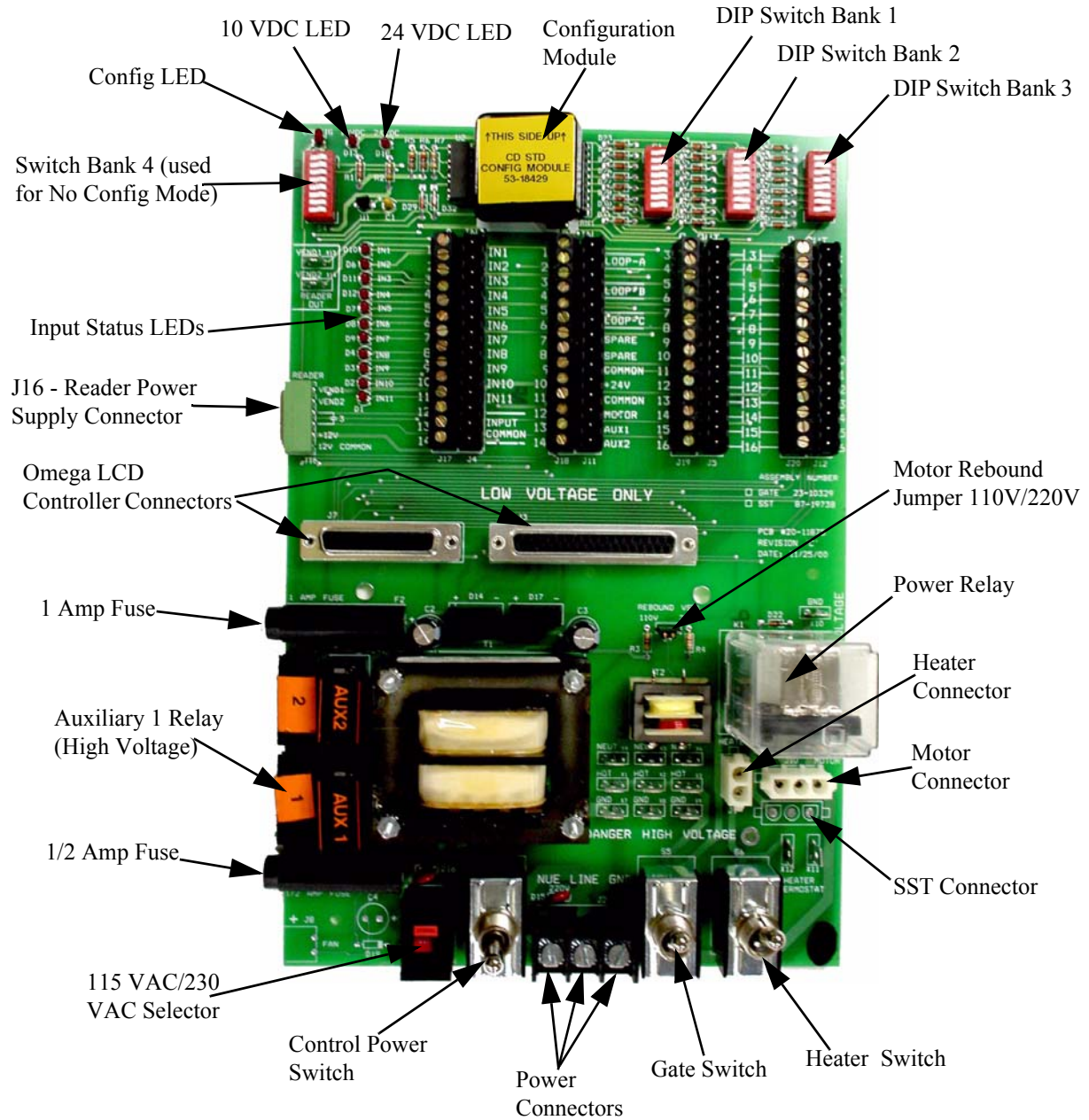


G-90 CD Connection Panel

The G-90 CD Connection Panel is a plug-in assembly that contains field connections and is used to mount the Omega LCD Controller. The terminal blocks are removable.

In the G-90 CD Gate, the Connection Panel is a single unit that also houses three DIP switch banks and the Configuration Module. You can change the mode of operation by adjusting these DIP switches. The Connection Panel also has a fourth DIP switch bank, which you can adjust to operate the gate in a No Config Mode. A PC-board mounted high voltage relay is located on the Connection Panel. A second high voltage relay is optional. Figure 1.3 illustrates a G-90 CD Connection Panel.

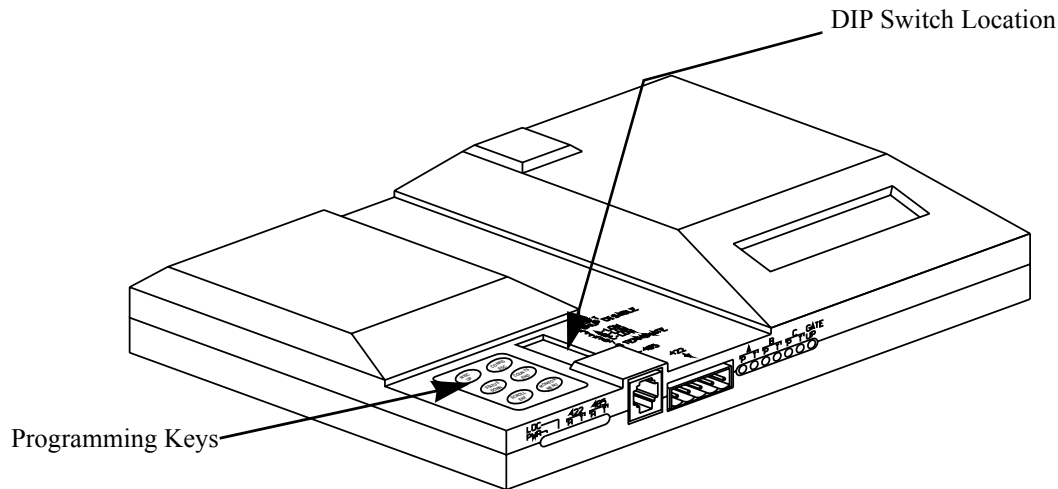
Figure 1.3
G-90 CD Connection Panel



Understanding the Omega LCD Controller

The Omega LCD Controller is a microprocessor-based unit that controls the logic functions of the gate. Figure 1.4 illustrates an Omega LCD Controller.

Figure 1.4
Omega LCD Controller

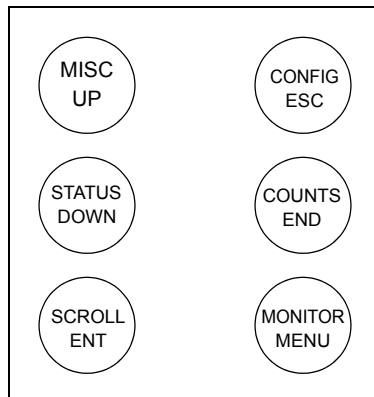


The Omega LCD Controller is equipped with a six-key keypad that you can use to program and monitor the functions of the gate. Each key on the keypad is assigned two functions and is color-coded to differentiate between the two functions:

- ☐ **Monitor Mode** (yellow legend). You can review information about the status and settings of the Configuration Module, the Omega LCD Controller, the Connection Panel, lane status, etc. in the Monitor Mode.
- ☐ **Menu Mode** (blue legend). You can program the gate options, review reports, and send gate commands in the Menu Mode.

The keys on the keypad interface with a 16-character LCD display on the Omega LCD Controller. Figure 1.3 illustrates an Omega LCD Controller keypad.

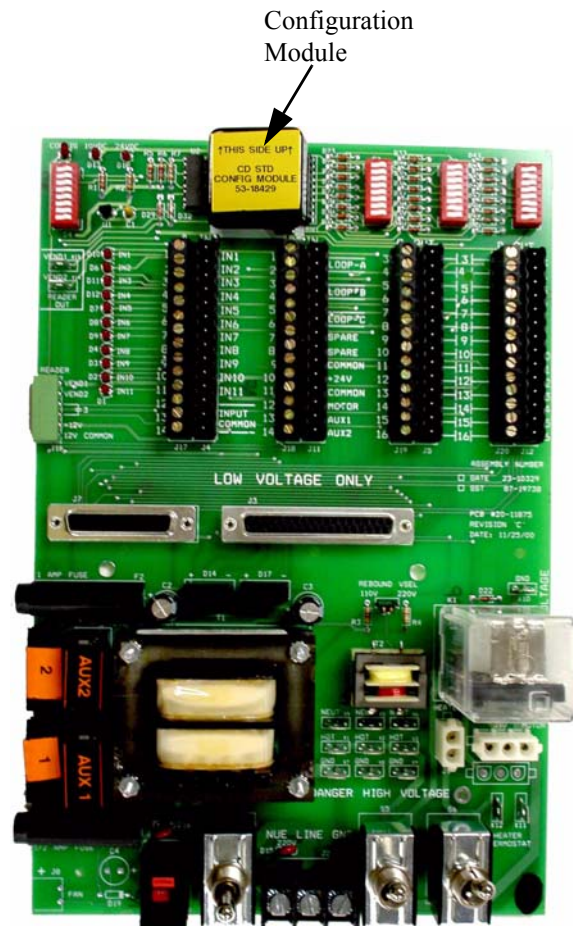
Figure 1.5
Omega LCD Controller Keypad



Configuration Module

The Configuration Module is a factory-programmed, plug-in cartridge that defines the software options in the G-90 CD Gate. It plugs into the Connection Panel and defines the options for the gate, so you can plug any Omega LCD Controller into the gate without concern for software options and previous programming. Figure 1.6 illustrates the location of the G-90 CD Gate Configuration Module on the Connection Panel. For information about the configuration features that are available in the Configuration Module, see Appendix A: “Configuration Features,” page 127.

Figure 1.6
Configuration Module



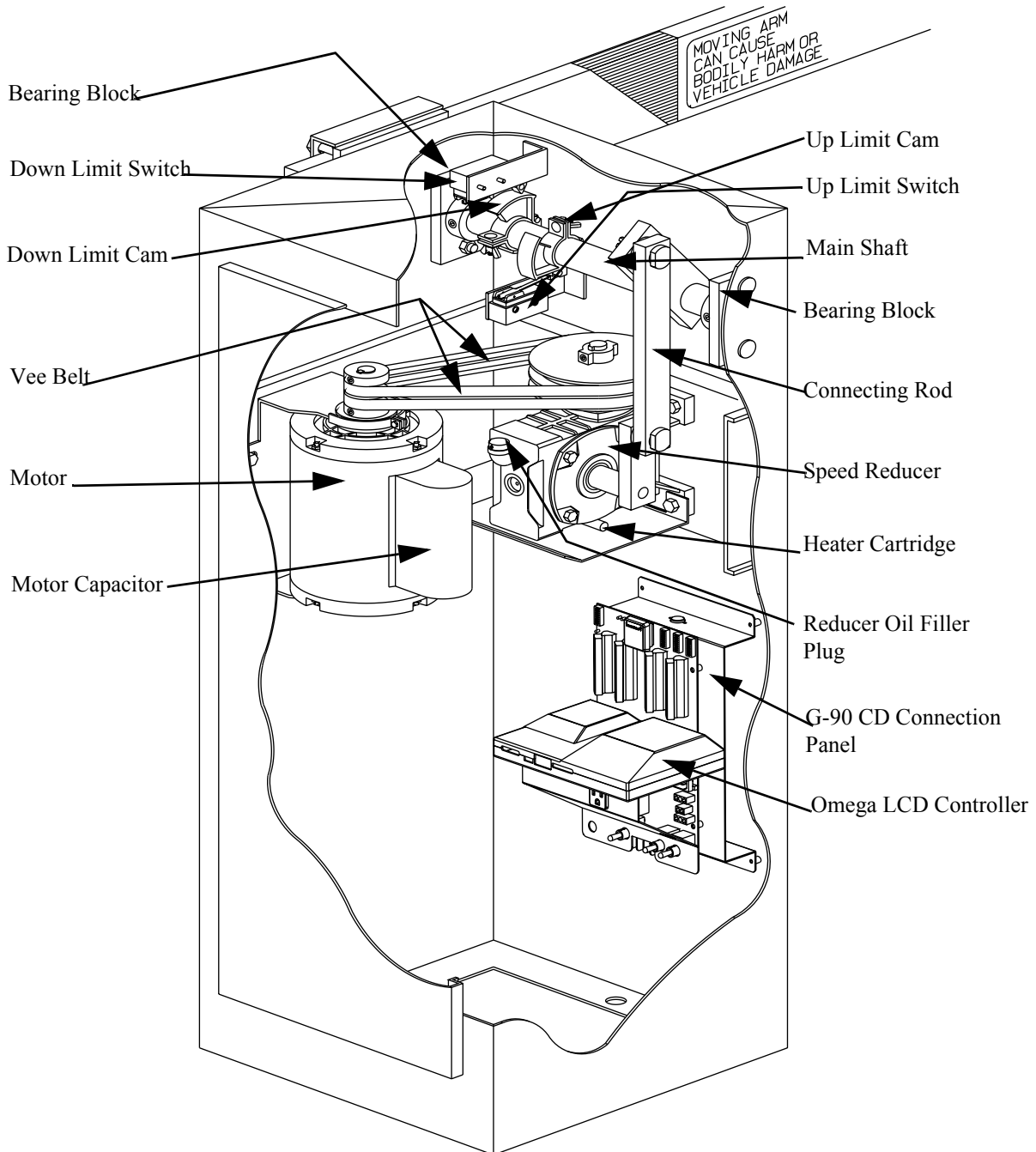
Detector Loops

The standard G-90 LCD Series detector loops are 2 ft. 6 in. x 6 ft. (.76 m x 1.8 m), 3 turns of 16 gauge, THHN insulated wire. For information about loops, see Chapter 2: “Loop Components and Installation,” page 13.

Mechanical Components

A 1/3 HP 115 VAC single phase instant-reversing motor drives the gate arm. The motor is connected by double V-belts to a heavy duty 60-1 single reduction speed reducer. Power is transmitted to the gate arm drive shaft through a crank and connecting rod. Adjustable cams limit gate arm travel. The crank and drive shaft are constructed of cold-rolled steel. The connecting rod is cut from heavy duty cold rolled steel with self-lubricating oil lite bearings. All metal parts are plated in order to prevent rust and corrosion. Refer to Figure 1.7 for a view of the mechanical components.

Figure 1.7
G-90 CD Gate Internal View



Working with the Menus

Hardware and software control how the G-90 CD Series Barrier Gate functions. This is done in two ways:

- ❑ **Configuring the DIP switches.** DIP switches determine the mode of operation for the lane.
- ❑ **Programming the software that controls the gate.** Software controls the information that the system will process. Software also allows you to customize the parts of your system that may change on a regular basis and further controls some of the hardware. Provided that you have set the DIP switches correctly and have the appropriate firmware, you can program a variety of options.

Appendix A: “Configuration Features,” page 127 describes all of the configuration module features that are specific to the G-90 CD Gate. Chapter 3: “G-90 CD Gate Electronics Installation” and Chapter 5: “Additional Programming Options” provide instructions for programming the gate.

Navigating the Omega LCD Controller Menus

You can navigate the Omega LCD Controller menus by using the keys on the Omega LCD Controller. Figure 1.8 shows an example of an Omega LCD Controller menu.

Figure 1.8
Omega LCD Controller Menu

PROGRAMMING.....

The following table describes how to move through menus and screens, and how to select an option.

Table 1.1: Navigating Menus on the Omega LCD Controller

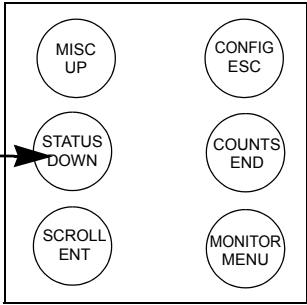
If You Want To...	Do This...	Keypad
Go to the next screen.	Press the STATUS/DOWN key.	

Table 1.1: Navigating Menus on the Omega LCD Controller

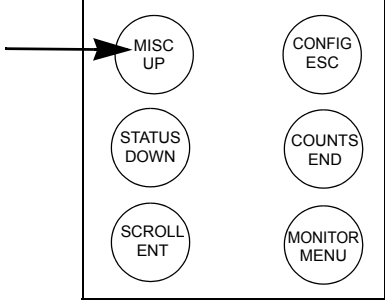
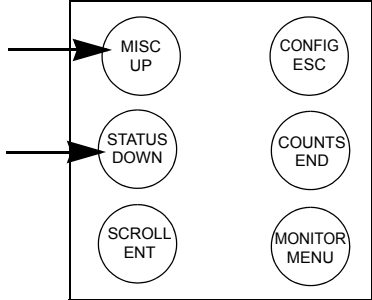
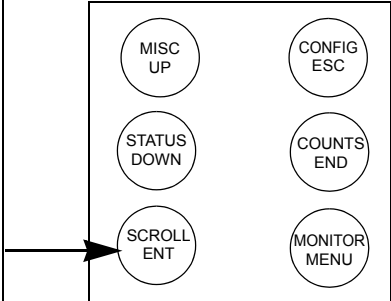
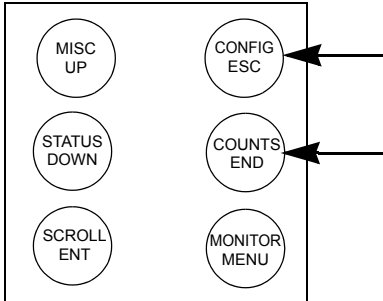
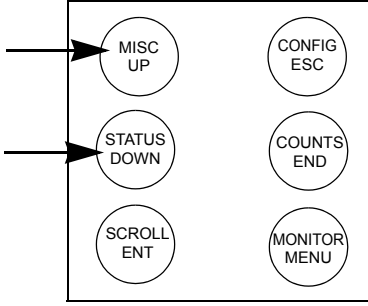
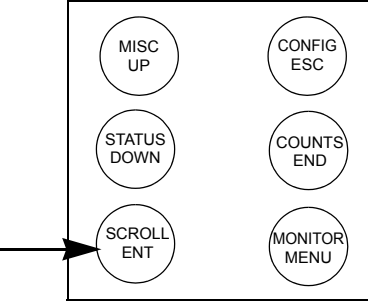
If You Want To...	Do This...	Keypad
Go to the previous screen.	Press the MISC/UP key.	 The diagram shows a 3x2 grid of circular keys. The keys are labeled: MISC UP, CONFIG ESC, STATUS DOWN, COUNTS END, SCROLL ENT, and MONITOR MENU. An arrow points to the MISC UP key in the top-left position.
Scroll through the menu.	Press the MISC/UP or Status/Down key.	 The diagram shows the same 3x2 grid of keys. Two arrows point to the MISC UP key (top-left) and the STATUS DOWN key (middle-left).
Select a menu item.	Press the SCROLL/ENT key.	 The diagram shows the same 3x2 grid of keys. An arrow points to the SCROLL ENT key in the bottom-left position.
Exit from a menu option.	Press the CONFIG/ESC or COUNTS/END key.	 The diagram shows the same 3x2 grid of keys. Two arrows point to the CONFIG ESC key (top-right) and the COUNTS END key (middle-right).

Table 1.1: Navigating Menus on the Omega LCD Controller

If You Want To...	Do This...	Keypad
Display the options in fields that you can choose from.	Press the STATUS/DOWN or MISC/UP key.	 The diagram shows a 2x3 grid of circular keys. The top row contains 'MISC UP' and 'CONFIG ESC'. The middle row contains 'STATUS DOWN' and 'COUNTS END'. The bottom row contains 'SCROLL ENT' and 'MONITOR MENU'. Two arrows point to the 'MISC UP' and 'STATUS DOWN' keys from the left.
Select an option in the field.	Press the SCROLL/ENT key.	 The diagram shows the same 2x3 grid of circular keys as above. One arrow points to the 'SCROLL ENT' key from the left.

Chapter 2: Loop Components and Installation

This chapter contains the following:

Loop Overview	13
Hardware Requirements	13
Loop Detector Operation.....	14
Typical Loop Layout	14
Loop Installation.....	15
Setting the Size of the Loop	16
Setting the Loop Lead Length	18
Crosstalk and Loop Coil Frequency	19
Loop Sensitivity.....	22
Detecting Vehicles that Tailgate	23
Tuning Loops.....	24
Setting the Loop Lead Length	18
Troubleshooting the Loop Detector.....	24
Loop Detector Malfunction.....	24
Shorted Loops	25
Crosstalk	25
Hidden Inductors.....	26
Using a Loop Locator	27

Loop Overview

Loop detectors detect the presence of a vehicle within a specific zone around and above the loop. Before you install a gate in your parking facility, you must install the loops.

The loop or coil of wire is embedded in the ground. The gate's internal loop detector circuit generates an electronic signal that passes through loops. When the signal is applied to the loop coil, an electromagnetic field is generated around the loop. Metal passing through this field causes a change in the signal. The gate detects this change and the controller generates an output that indicates vehicle presence on the loop.

Hardware Requirements

The loop coil consists of a number of turns of insulated, stranded wire embedded in a sawslot cut into the pavement. The wire should have a minimum insulation thickness of 0.045 in (1.13 mm), and exhibit a stable dielectric constant. A 16 -18 gauge stranded, THHN insulation wire is recommended. Other wire types may not be able to withstand the chemical attack and environmental stress exerted on loops. This is especially important in areas where temperature extremes cause the pavement to expand and contract. In areas where loops are exposed to these extreme conditions, a PVC pre-formed loop is recommended for greater longevity and more reliable service.

Note: Wire with improper insulation will eventually break down, which can cause false detections, impaired sensitivity, or complete inoperability of the loop detector circuit.

Loop Detector Operation

The loop coil is the inductive component of an oscillator located in the electronic module. The oscillator generates a signal whose frequency is dependent on internal components and the external loop.

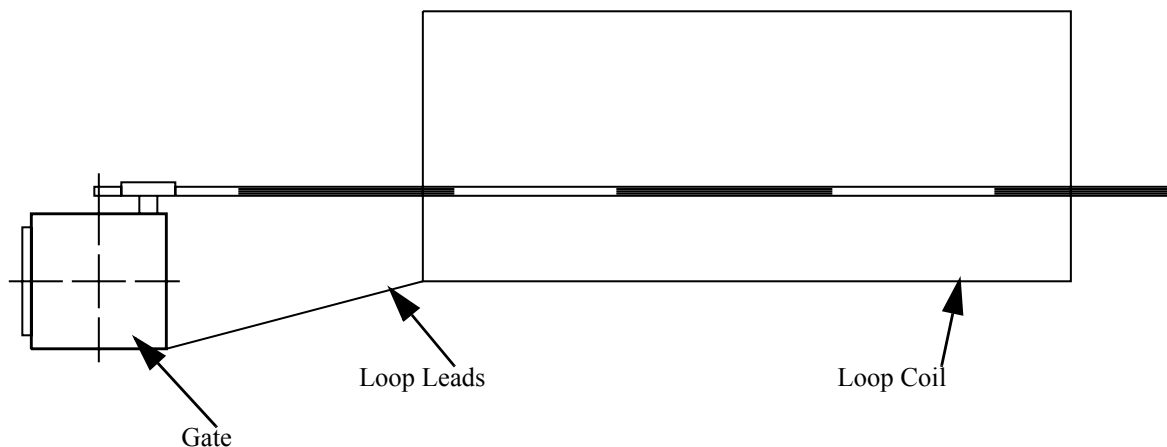
Metal passing over the inductance loop alters the frequency of the loop. When this occurs, the electronic module in the Omega LCD Controller detects the change in frequency. This indicates that a vehicle is on the loop. The Omega LCD Controller generates an output signal to enable either the Card Reader (Vend A) or the Ticket Spitter (Vend B). This indicates that a vehicle is present on the loop.

The loop detector generates a pulse output representing each vehicle passing over the loop, along with a constant presence output that stays on as long as the vehicle remains on the loop. The pulse output, which “closes” for about a 1/4 second, is generally used for vehicle counts, whereas the presence output closes for the duration a vehicle is on the loop.

Typical Loop Layout

A typical loop layout is shown in Figure 2.1.

Figure 2.1
Typical Loop Layout



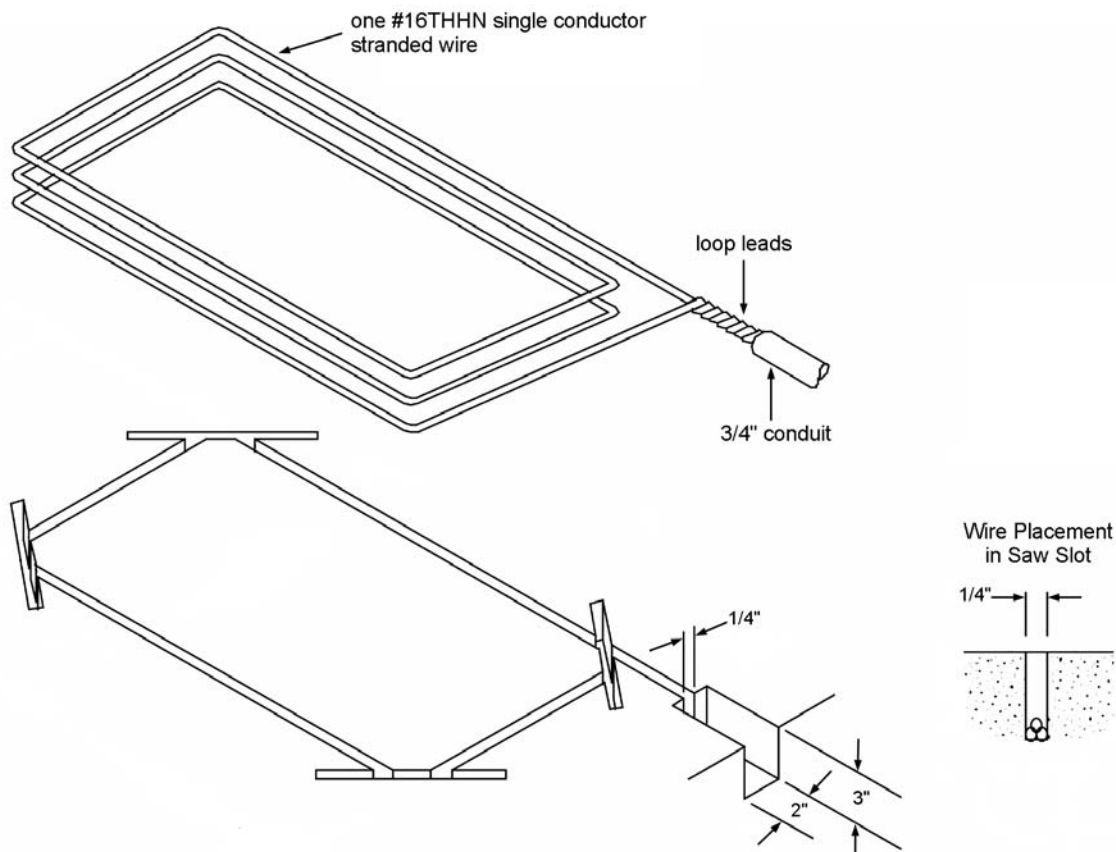
Your lane layout determines where you place the loop in a lane. Refer to the equipment layout drawings provided in your engineering package for specific instructions on positioning the loops.

Warning! Be sure of the loop location! Loops installed improperly can cause problems with the normal operation of the lane.

Loop Installation

Figure 2.2 illustrates the loop installation in concrete. A saw slot is cut 1/4 inch wide by 1 inch deep. The saw slot is a rectangular shape to the specified loop dimensions plus a slot for lead conduit. (See “Setting the Size of the Loop,” page 16.) The saw slot is grouted with Bondo P-606 detector loop sealant or equivalent.

Figure 2.2
Loop Installation in Concrete



Use these guidelines when installing the loop:

- ☐ Keep loop leads to maximum length of 100 ft. (30.5 m). See “Setting the Loop Lead Length,” page 18.
- ☐ Typically, the primary and secondary loops are positioned approximately 2 ft. - 4 ft. apart; however, the specific locations of the loops depend upon the application.
- ☐ Loop lead in wires must be twisted a minimum of 10 turns per foot.
- ☐ Loop leads must not share conduit with any other power or signal conductors.
- ☐ Loop wire must be 16 -18 THHN type insulation, single conductor stranded wire.

- ☐ Loop must be constructed from a single continuous conductor without splicing.
- ☐ The sides of any loop must be positioned a minimum of 2 inches from parallel lengths of reinforcement rod whose diameter is larger than 1/4 inch.
- ☐ Stationary reinforcement metal, if necessary, may be positioned below the horizontal plane of the detector loop. The presence of stationary metal in the field will decrease the sensitivity of the loop. If sensitivity problems occur, settings may have to be set higher to compensate for the change. See “Loop Sensitivity,” page 22, for information about setting loop sensitivity.
- ☐ Do not splice wire.
- ☐ Do not fracture wire insulation. Loops shorted to ground will cause detector malfunction.
- ☐ When placing wire in the slot do not use a screwdriver or other sharp tool.
- ☐ Do not place loop over expansion joints.
- ☐ Do not connect loop directly to wire mesh.

Install the loop wires so that loop wire movement is eliminated. Any movement could cause false detects. Remove all sharp bends and corners in the sawslot before the wire is inserted. Be very careful not to score or abrade the insulation jacket.

Loops installed in concrete typically outlast those installed in asphalt. Asphalt, being softer, tends to move or slide in the path where vehicles stop, particularly where the base is not stable or may be subject to water retention. Loops will appear stretched in the direction of the traffic flow, sometimes three to four inches beyond their original outline. Loops exposed to this type of stress are subject to premature failure.

Remember the loop coil is an integral part of the detector circuit. Install it carefully.

Setting the Size of the Loop

The Loop Detector in the G-90 Omega LCD Controller works with various sizes of loops. In general, a larger loop size will increase the height and width of the electromagnetic field generated by the loops, enabling the detector to detect a wide range of vehicles.

Table 2.1 shows standard, recommended loop sizes for different applications.

Table 2.1: Standard Loop Sizes

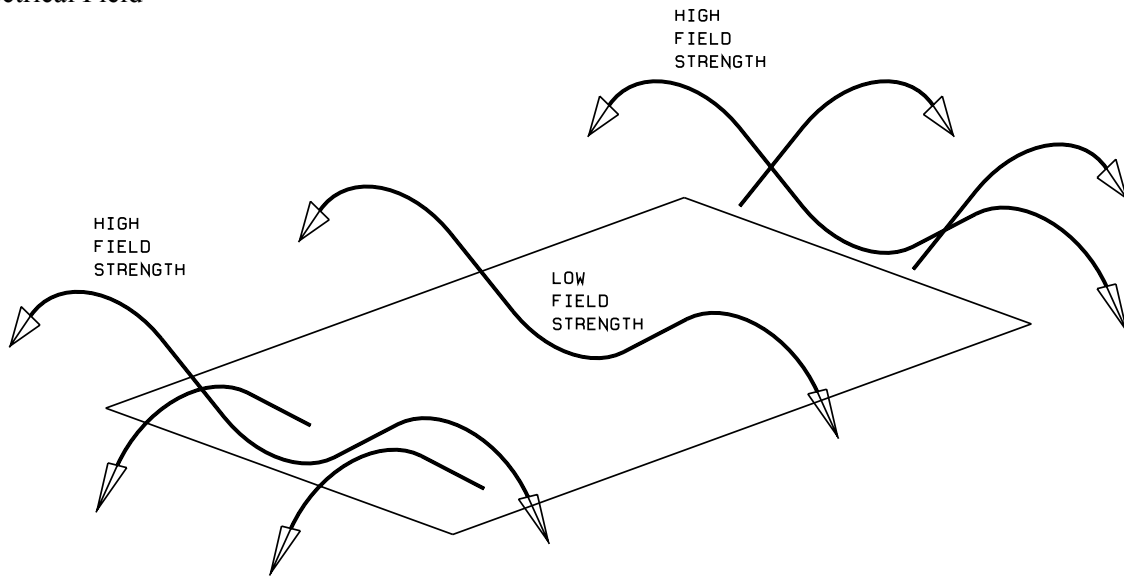
Loop Size (L x W)		Area		Perimeter		Lane Use
Feet	Meters	Fee	Meters	Feet	Meters	
2.5 x 6	.76 m x 1.8 m	15 sq. ft.	1.35 m ²	17 ft.	5.2 m	- Standard size passenger vehicles. Use this loop size to ensure tailgate detection (a second vehicle following within six inches of another vehicle). With this loop size, if the conditions of the installation are not optimal, some higher bed vehicles may not be consistently detected.
4 x 6	1.2 m x 1.8 m	24 sq. ft.	2.23 m ²	20 ft.	6.1 m	- Standard size passenger vehicles. - High bed vehicles. In some applications tailgate detection may not work as consistently as the 2.5 ft. x 6 ft. loop size. Tailgate sensitivity must be adjusted to achieve optimal performance.
5 x 9	1.5 m x 2.7 m	45 sq. ft.	4.05 m ²	28 ft.	8.5 m	- Tractor trailers - Oil tankers - Dump trucks Tailgate detection within six inches of another vehicle typically will not work for a loop this size.

The size of the loop used depends on the application. For example, if standard size passenger vehicles as well as high bed vehicles use the lane, use the 4 ft. x 6 ft. loop size. If you use the 2.5 ft. x 6 ft. (.76 m x 1.8 m) loop size, the height of the electromagnetic field may be too short to continuously detect high bed vehicles such as modified pickup trucks.

Note: If you use a loop size wider than 2 1/2 ft. (.76 m) you may lose the tailgate option.

Figure 2.3 illustrates the shape of the field that the loop coil generates. The field strength is greatest along the edges of the loop and decreases toward the middle of the loop. In general, as the perimeter of the loop increases, the size of the electrical field along the loop wire also increases.

Figure 2.3 Electrical Field



A lead-in cable should be used when the lead-in length exceeds 30 ft. (1 m). The length of the loop lead-in cable depends on the inductance of the loop itself, but the length should not exceed 100 ft. (30.49 m). The inductance of the lead-in cable should not be more than 20 percent of the total inductance seen at the loop lead input of the detector module.

Note: Splicing is not recommended, but if you splice the lead cable, twist and solder the wires before sealing. This will ensure that the cable is water proof.

Lead cable has approximately 0.1 to 0.2 microhenries inductance per foot (.3 m) and 24 picofarads capacitance per foot (.3 m). Table 2.2 shows maximum lead lengths for various loop inductances.

Table 2.2: Loop Lead Table

Total Inductance (microhenries)	Max. Lead-in Inductance (microhenries)	Loop Inductance (microhenries)	Loop Lead-in Length	
			Feet	Meters
50	10	40	66.6	20.3
55	11	44	73.3	22.3
60	12	48	80	24.4
65	13	52	86.6	26.4
70	14	56	93.3	28.4
75	15	60	100	30.5
80	16	64	106.6	32.5

Warning! These instructions and specifications are based on laboratory conditions and are subject to change depending on actual field situations, existing layouts, and pavement and soil conditions as well as any unique circumstances of traffic flow.

Crosstalk and Loop Coil Frequency

“Crosstalk” may occur when two coil loops are placed within close proximity of each other and are operating at or near the same frequency. Crosstalk causes the detectors to operate incorrectly and detect vehicle presence on the adjacent loop. To avoid crosstalk, frequencies of loops installed in adjacent lanes should be separated by at least 20 KHZ.

If you think you are experiencing crosstalk, use the Crosstalk option on the Omega LCD Controller to view the current loop frequencies. See “Viewing Current Loop Frequencies,” page 20.

Each loop frequency DIP switch on the Omega LCD Controller has two possible frequency settings: high or low. When you receive the gate from the factory, the loop frequency DIP switches are set to high frequency. Normally, you should not need to change the frequency settings for the loops, but if you are experiencing crosstalk, you may use the DIP switches to change the frequency of adjacent loops that are operating within 20 KHZ of each other. Refer to Figure 3.4 on page 34 for the location of the DIP switch bank. Table 2.3 shows the DIP switch settings for the loop frequencies.

Note: Frequencies of loops installed in adjacent lanes should be separated by at least 20 KHZ.

Table 2.3: Omega LCD Controller DIP Switch Settings for Loop Frequency

Omega LCD Controller DIP Switch Bank			
DIP Switch	Loop	Frequency When DIP Switch OPEN	Frequency When DIP Switch CLOSED
4	A	High Frequency	Low Frequency
5	B		
6 (Note: This switch is used only if you have a third loop.)	C		

Viewing Current Loop Frequencies

If you think you are experiencing crosstalk, run a crosstalk test on each of the loop detectors in your G-90 CD Gate. Follow these steps to run the test:

MENU MODE

- 1 On the Omega LCD Controller, press the **MONITOR/MENU** key until the MENU MODE screen is displayed on the LCD display. The Omega LCD Controller will then automatically scroll to the PROGRAMMING screen.
The PROGRAMMING screen will be displayed.

MISCELLANEOUS

- 2 Press the **MISC/UP** key until the MISCELLANEOUS screen is displayed. Press the **SCROLL/ENT** key.
The next screen will be displayed.

CROSSTALK

- 3 Press the **MISC/UP** key until the CROSSTALK screen is displayed. Press the **SCROLL/ENT** key.
The next screen will be displayed.

- 4 Do one of the following:

LOOP A

- ☐ Press the **MISC/UP** key until the LOOP A screen is displayed. Press the **SCROLL/ENT** key. Go to step 5.
The next screen will be displayed.

LOOP B

- ☐ Press the **MISC/UP** key until the LOOP B screen is displayed. Press the **SCROLL/ENT** key. Go to step 5.
The next screen will be displayed.

LOOP C

- ☐ Press the **MISC/UP** key until the LOOP C screen is displayed. Press the **SCROLL/ENT** key. Go to step 5.
The next screen will be displayed.

+ 00 - 10 00

- 5 The current loop frequency separation will be displayed. Values of 30 or greater difference between A, B, and C usually indicates intermittent crosstalk trouble. Press the **COUNTS/END** key until the MISCELLANEOUS screen is displayed.
The next screen will be displayed.

MISCELLANEOUS

- 6 Press the **MONITOR/MENU** key. The MONITOR MODE screen will be displayed.

Once you know the current loop frequencies, refer to Table 2.4 to make sure that the loop is operating within the optimum frequency range. Table 2.4 shows various loop sizes, number of turns, typical corresponding loop inductance, and operating frequency.

Table 2.4: Loop Sizes and Operating Frequency

Loop Size (Recommended)		Perimeter		Turns	Typical Inductance (micro-henries)	Frequency (kHz) +/- 10%			
Feet	Meters	Feet	Meters			A Low	A High	B Low	B High
2.5' x 6'	.76 m x 1.8 m	17'	5.2 m	3*	51 μ H	212.9	273.2	239.4	322.7
2.5' x 6'	.76 m x 1.8 m	17'	5.2 m	4	85 μ H	166.9	214.3	188.1	251.9
2.5' x 6'	.76 m x 1.8 m	17'	5.2 m	5	127 μ H	137.2	175.9	154.2	205.7
4' x 7'	1.2 m x 2.1 m	22'	6.7 m	2	33 μ H	273.8	346.0	300.4	406.1
4' x 7'	1.2 m x 2.1 m	22'	6.7 m	3*	66 μ H	191.1	243.7	209.7	282.3
5' x 9'	1.5 m x 2.7 m	28'	8.5 m	2*	42 μ H	238.5	303.3	263.6	355.8
5' x 9'	1.5 m x 2.7 m	28'	8.5 m	3	84 μ H	168.2	216.2	188.8	253.2
8' x 8'	2.4 m x 2.4 m	32'	9.8 m	2*	48 μ H	230.8	292.5	253.4	341.6

* Recommended number of turns

You can estimate loop inductance by using the following formula:

Inductance = $(N \times P) \times (N + 1)/4$, where N = Number of Turns and P = Perimeter of Loop.

You can correct crosstalk by changing the frequency of one of the detectors or by switching the leads of one of the detector loops. You can change the loop frequency from high frequency to low frequency by setting the DIP switch on the Omega LCD Controller. Refer to Table 2.3 for the DIP switch settings.

Loop Sensitivity

You may program the sensitivity of the loop detectors to determine the distance at which a vehicle is detected as it approaches the loop coil. Sensitivity settings range from 1 to 9, with 1 being the most sensitive and 9 being the least sensitive. To program loop sensitivity settings, see “Setting Sensitivity,” page 59.

To determine the correct sensitivity setting, take into account the amount of metal in the environment, as well as the type of vehicles that will be using the lane. For example, if you use 2 ft. 6 in. x 6 ft. (.76 m x 1.8 m) loops that are in close proximity, such as in multiple entrance lanes in a parking garage, you should use a mid-level sensitivity setting. This would minimize adjacent lanes affecting each other. If small pick-up trucks are being detected, a high sensitivity setting may be used.

Note: If you set the sensitivity too high, you may get unnecessary detect situations or the detector may lock up. Also, when you increase the loop size, you increase the *range* of sensitivity, but you lower the *level* of sensitivity.

If crosstalk occurs, and the frequencies have been offset, the next lowest sensitivity may have to be used. See “Crosstalk and Loop Coil Frequency,” page 19.

Note: Reinforcement rods in the concrete in the area of the loop will decrease the loop sensitivity.

To program the tailgate sensitivity settings from 1 to 9 on the Omega LCD Controller, see “Setting Sensitivity,” page 59.

You may also set loop sensitivity settings using the Connection Panel DIP switches. However, Connection Panel DIP switch settings are limited--you may set only 2 (high sensitivity) or 5 (medium sensitivity). The Omega LCD Controller will respond to the values you last programmed--from either the Controller or the DIP switches. However, if you cold start the gate, loop sensitivity settings will default to the settings defined by the DIP switches on the Connection Panel. Refer to “Setting the DIP Switches for Loop Sensitivity,” page 39 for information about setting DIP switches for loop sensitivity.

Detecting Vehicles that Tailgate

The tailgate detection feature allows the Omega LCD Controller to detect the presence of a second vehicle following within six inches of another vehicle passing over a 2 ft. 6 in. x 6 ft. (.76 m x 1.8 m) loop coil. By detecting this condition as a tailgate, the controller can accurately count this as two vehicles instead of one.

Tailgate detection maintains the integrity of any vehicle counting system, even in high traffic volume. For information on reviewing tailgate counts, see “Viewing Data in the Omega LCD Controller,” page 79.

Note: Disable the tailgate option in lanes where vehicles pulling trailers are using the lane, such as at campgrounds and boat launching areas. Also, if your loop size is larger than 2 1/2 ft. (.76 m) you may lose the tailgate function. For more information about loop size and optimal performance, see “Setting the Size of the Loop,” page 16.

When you choose to have tailgate detection turned on, you may program tailgate sensitivity settings from 1 to 8, with 1 being the most sensitive and 8 being the least sensitive. A setting of 9 disables the tailgate function. To program the tailgate sensitivity settings on the Omega LCD Controller, see “Setting Sensitivity,” page 59.

To turn on tailgate detection, you must set DIP switch 7 on the Connection Panel (open = tailgate detection off; closed = tailgate detection on). You may also set tailgate sensitivity settings using the Connection Panel DIP switches. However, Connection Panel DIP switch settings are limited--you may set only 2 (high sensitivity) or 5 (medium sensitivity). The Omega LCD Controller will respond to the values you last programmed--from either the Controller or the DIP switches.

However, if you could start the gate, tailgate sensitivity settings will default to the settings defined by the DIP switches on the Connection Panel. Refer to “Setting the DIP Switches for Tailgate Detection and Sensitivity,” page 40 for information about setting DIP switches for tailgating features.

Tuning Loops

Periodically, the loops self-tune in order to track frequency changes caused by temperature changes. Changes in the environment can cause the frequency to drift. The tuning process sets the current loop frequency as the new base frequency (called the free run frequency) and calculates the new detection points based on the new frequency. Self-tuning occurs only when the loop does not detect the presence of a vehicle (called presence mode). If a loop remains in presence mode, even when a vehicle is not present, you may need to manually tune the loops by using the Tune Loops command on either the Omega LCD Controller (see “Sending Commands,” page 103) or in ScanNet (Commands>Gate>Tune Loops).

When a vehicle stays on the loop longer than usual, the loop's non-presence frequency setting may drift upward. When the vehicle leaves, the loop might remain in presence mode, even though there is no vehicle present. If this happens, the loop will self-correct the situation if the loop frequency remains below the system-specified drift detection point and remains stable for a system-specified period of time.

Warning! Do not tune loops when vehicles are present on the loops. Tuning a loop will cause the vehicle to be undetected, and the gate arm could lower, causing bodily injury or damage to the vehicle.

Troubleshooting the Loop Detector

Several factors, such as climatic conditions, crosstalk, hidden inductors, etc., may cause your loop detector or loop itself to function improperly. You can take certain preventive measures to maintain the integrity of the loop.

Loop Detector Malfunction

Breakdown of wire insulation allows water to penetrate to the wire, causing loop failure. A typical sawcut in cement should last three to four years. However, one or more of the following factors may cause a defective loop:

- ☐ Sharp objects such as screwdrivers were used to install the loop.
- ☐ THHN cross-linked polyethylene wire was not used for loop.
- ☐ Faulty loop sealant was used, exposing wires to tire abuse.
- ☐ The loop was punctured by debris, such as sharp rocks, nails, etc., caught in the saw slot.
- ☐ Lightning or induced voltage surges occurred.

- Warning!** If your megger has a 500 volt and 1200 volt setting, make sure it has been set to 500 volt. If you test a good loop with the 1200 volt setting, you may damage the insulation (rated for only 600 volt) and cause the loop to fail.

You can test the integrity of your loop's insulation with a Megohm meter or "megger." The megger produces a 500 volt potential between the loop wire and a good earth ground.

Follow the instructions on the megger and make sure you disconnect both loop wires from the terminal or detector unit before proceeding with the test. If you are checking loops suspected of intermittent failure or in dry climates, soak the area around the loop with water one hour prior to testing. Doing so will ensure an accurate reading. The meter should indicate a reading in excess of 100 megohms of resistance to ground. Record the readings for future reference.

The loop's environment can affect loop life. Damaged loops installed in dry climates may operate several months before a problem is detected, as there is no water to short the loop out to earth ground. However, soon after a good rain, the loop will begin to fail as water penetrates the insulation, shorting it out.

- ☐ Erratic detector behavior as vehicles pass over the loop
- ☐ Failure to consistently detect cars
- ☐ Failure to detect high bed vehicles
- ☐ Detector starts failing shortly after a rain shower

Note: A shorted loop must be removed and replaced.

Another less common cause for loop failure is crosstalk from adjacent loops. Crosstalk usually occurs when two loops in close proximity are operating in the same frequency range. Crosstalk can be corrected by adjusting the frequency settings of the detectors so that adjacent loops do not operate within the same frequency range. Refer to “Setting the Loop Lead Length,” page 18, for adjusting the frequency setting. If you have changed the frequencies and are still experiencing crosstalk, you may need to change the sensitivity. Refer to “Loop Sensitivity,” page 22, for instructions on setting loop sensitivity.

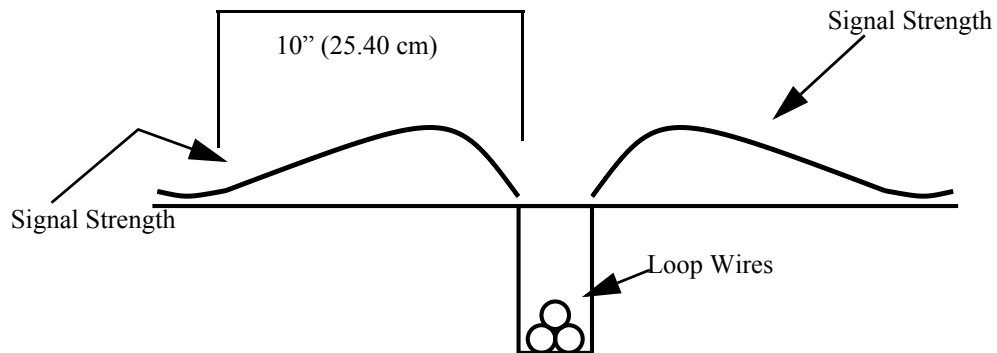
Hidden Inductors

Reinforcement bars or mesh may affect the operation of a loop detector if the bars or mesh exist in the form of a closed loop located in close proximity of the active loop. Occasionally, you may encounter a situation where mutual coupling is occurring due to a shorted abandoned loop or grid of rebar that is acting like a shorted or “closed” loop. The closed loop reduces an active loop’s sensitivity and causes intermittent lane failure.

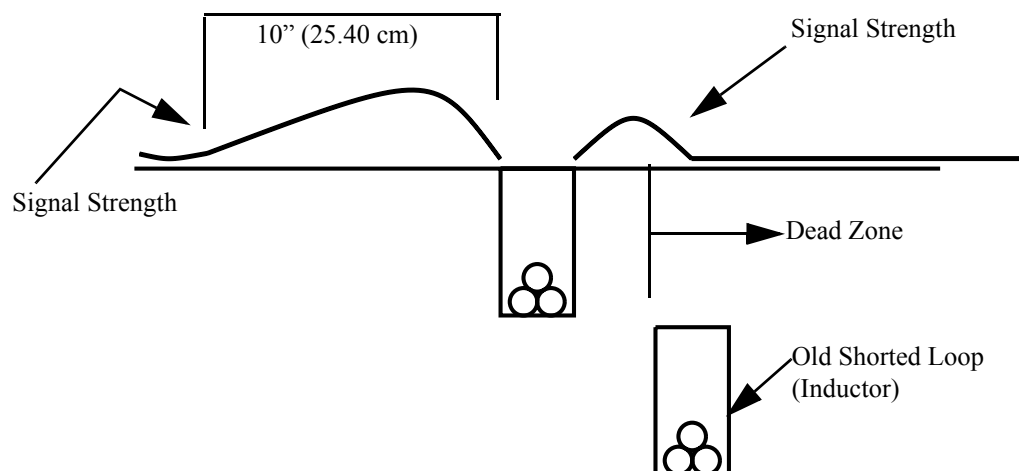
The condition created by the closed loop, sometimes referred to as swamping, causes the active loop’s field to induce eddy currents into the nearby closed loop. The eddy currents in turn create a magnetic field in the closed loop. This diminishes the active loop’s field and raises its base operating frequency. The closed loop draws the magnetic flux of the active loop down toward itself, effectively reducing the height of the active loop’s magnetic lines of flux. Figure 2.4 illustrates the signal strength of a typical loop as compared to the effect of a hidden inductor on signal strength.

Figure 2.4
Loop with Shorted Inductor Nearby

Typical Loop Signal Strength



Loop With Shorted Inductor Nearby



Using a Loop Locator

Use a Loop Locator such as the Intersection Development Corporation's Model 505 Loopfinder to locate the loop and find its field strength. The loop finder also indicates the presence of hidden, "closed loops."

To test the strength of the loop, follow these directions:

- 1 Run the tester probe perpendicularly across the loop edges.
- 2 As you pass the probe tip over the loop perimeter, there should be a linear rise in signal strength.

Note: The linear rise in strength starts at about 10 in (25.40 cm) from either side of the loop, and peaks at about one inch (2.5 cm) from the loop. Refer to Figure 2.4 for the signal strength of a typical loop.

- 3 As you pass the probe directly over the active loop wires, the meter will drop to zero. It stays at zero as you pass the probe between the opposing magnetic fields.
- 4 As you move the probe past the center line, the meter should rise, peaking immediately. As you continue to move the probe away from the loop edge, the meter should decrease in a linear fashion.

Chapter 3: G-90 CD Gate Electronics Installation

This chapter describes how to install the electrical components of the G-90 CD Gate. This chapter contains the following:

Field Connections on the Connection Panel.....	29
Installing the Configuration Module	31
Removing the Configuration Module.....	32
Installing the Omega LCD Controller	34
Removing the Omega LCD Controller.....	35
Setting the DIP Switches on the Connection Panel.....	36
Starting the G-90 CD Gate	41
Cold Starting the Gate.....	42
Warm Starting the Gate.....	43
Setting the Time and Date on the Omega LCD Controller	43
Operating the Gate without a Configuration Module (“No Config” Mode)	46
No Config Mode Inputs and Outputs.....	47
DIP Switch Settings for Lane Operation Modes in No Config Mode	47
Loop Sensitivity Setting for No Config Mode.....	48

Field Connections on the Connection Panel

You can order the G-90 CD Gate in a large variety of configurations. The Connection Panel connections will vary depending upon the options.

The recommended minimum size to be used for field connection signal control wires is #18 gauge.

Note: Before you install the Connection Panel, check to make sure that the 115/230 volt switch on the Connection Panel is in the correct position.

Figure 3.1 illustrates terminal connections for a G-90 CD Gate with the standard configuration module, without any optional software or inputs and outputs. If your gate includes any software options, the Input and Output terminals may be defined differently.

Warning! Check your Engineering Package for actual terminal usage diagrams to determine Input and Output definitions.

Table 3.1 lists the minimum inputs and outputs for the G-90 CD gate to function.

Table 3.1: Minimum Inputs and Outputs for the G-90 CD to Function

INPUTS		OUTPUTS	
1	Vend A	3	Vend A Enable
2	Vend B	4	Vend B Enable
3		5	Pulse A
4		6	Pulse B
5		7	Presence A
6		8	Presence B
7	Ticket Request	9	
8		10	
9		11	
10		12	
11		13	
12	Common	14	
13	Common	15	
14	Common	16	

Installing the Configuration Module

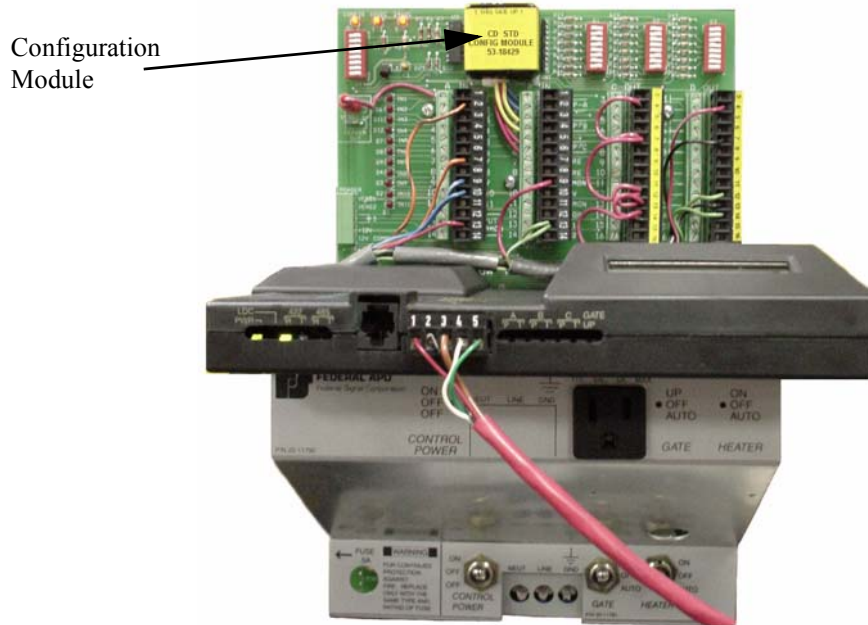
The Configuration Module is required to access all the features you ordered with the gate. It contains the input and output definitions and the options and reports for the gate. Figure 3.2 illustrates the location of the Configuration Module.

Note: If the Configuration Module is not installed in the gate, you will still be able to operate the gate, but will be unable to access all the features purchased with the gate.

When you first receive your G-90 CD Gate, the Configuration Module will already have been installed at the factory. If you remove it for repairs/maintenance, follow these steps to reinstall it:

- 1 Spray the Configuration Module Connector with contact cleaner to ensure a good connection.
- 2 With the power OFF, plug the Configuration Module into the Configuration Module Connector on the Connection Panel. Figure 3.2 shows the location of the Configuration Module.

Figure 3.2
Configuration Module on Connection Panel



- 3 Cold start the Omega LCD Controller. See “Starting the G-90 CD Gate,” page 41 for instructions.

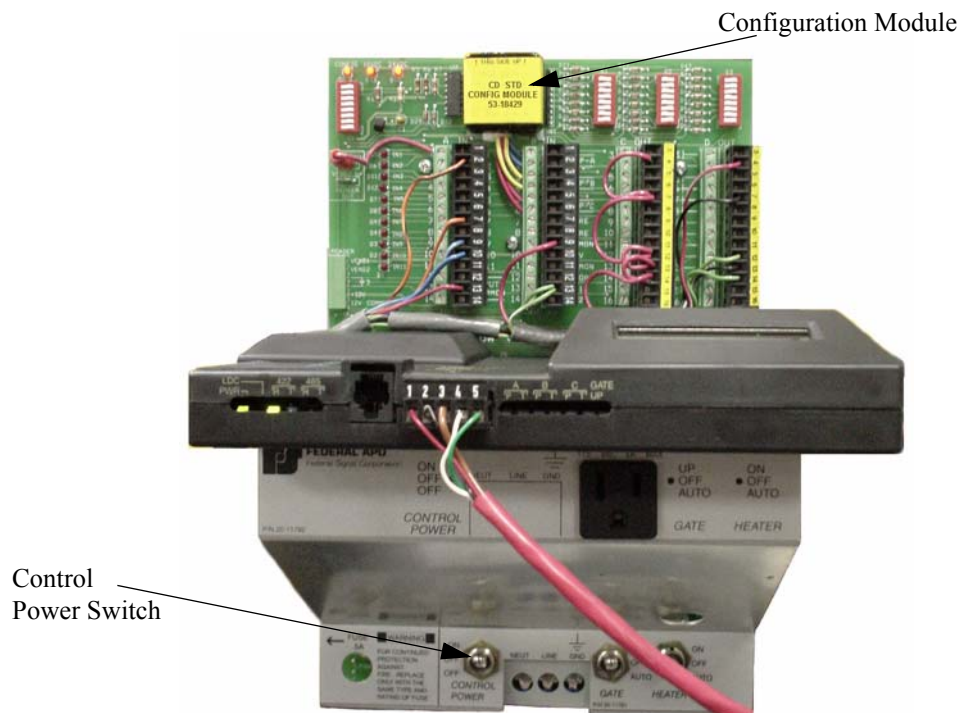
Removing the Configuration Module

Follow these steps if you need to remove the Configuration Module to send it to the factory for repair:

Warning! Do not plug or unplug the Configuration Module with the power on, otherwise you may damage the unit.

- 1 Make sure the Control Power switch is OFF. (Failure to terminate power may result in damage to the Configuration Module.) Figure 3.3 illustrates the location of the Control Power switch.

Figure 3.3
Control Power Switch and Configuration Module



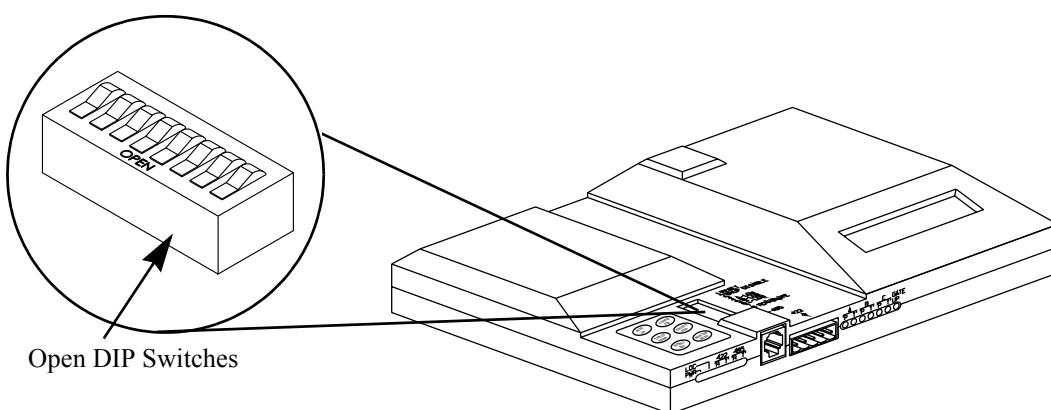
- 2 Remove the Configuration Module by pulling it out and away from the Configuration Module Connector on the front of the Connection Panel. Figure 3.3 illustrates the location of the Configuration Module.

Installing the Omega LCD Controller

The Omega LCD Controller and Configuration Module control the way in which your G-90 CD Gate functions. Figure 3.4 illustrates the location of the DIP switches on the Omega LCD Controller and the position of the DIP switches if they are open.

Figure 3.4

Omega LCD Controller and Open DIP Switches



To secure the Omega LCD Controller and set the DIP switches, complete the following steps.

- 1 Make sure the Control Power switch and the AUTO/UP/OFF switches on the Power Supply are in the OFF position.

Warning! Do not plug or unplug the Omega LCD Controller with the power on. Otherwise, you may damage the unit.

- 2** Set the DIP switches on the Omega LCD Controller as shown in Table 3.2.

Note: When you receive the gate from the factory, the Loop Frequency DIP switches will be set to the high frequency. You should not need to change the frequency unless you are experiencing crosstalk. See “Crosstalk and Loop Coil Frequency,” page 19. To set detector loop frequency to low, close the DIP switches.

Model G-90 CD Series Barrier Gate

ZMA-200, Ver. 5

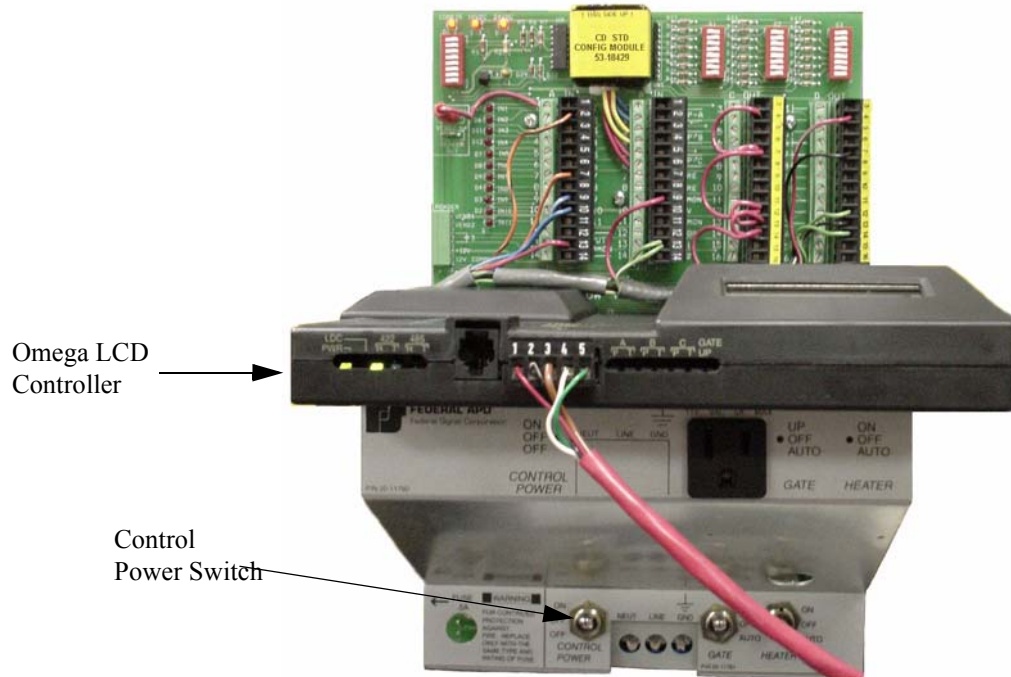
G-90 CD Gate Electronics Installation • 35

Removing the Omega LCD Controller

Warning! Do not plug or unplug the Omega LCD Controller with the power on; otherwise you may damage the unit.

- 1 Turn the Control Power switch to OFF. Figure 3.5 illustrates the location of the Control Power switch.

Figure 3.5
Control Power Switch and Omega LCD Controller

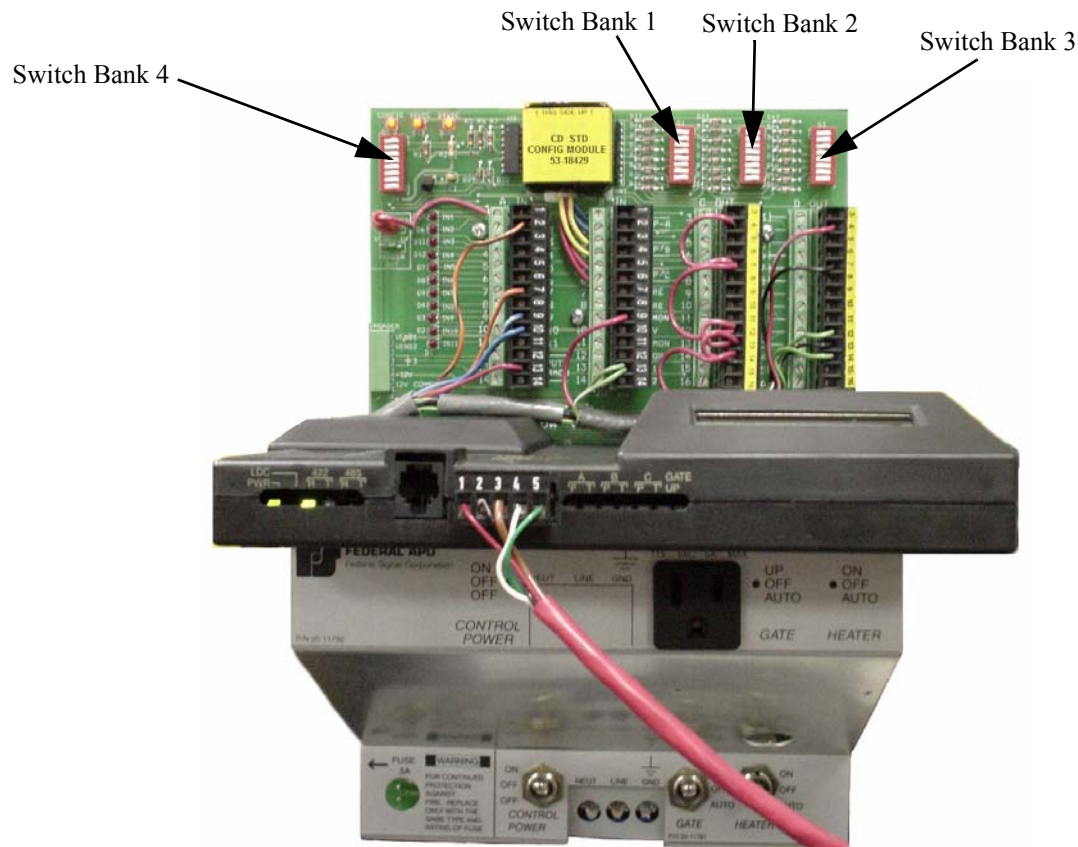


- 2 Pull the Omega LCD Controller forward to release it from the key slots and Connector on the Connection Panel. Figure 3.5 illustrates the location of the Omega LCD Controller.
- 3 Remove the Omega LCD Controller from the gate.

Setting the DIP Switches on the Connection Panel

In the G-90 CD Gate, the DIP switches that determine lane operation are located on the Connection Panel. Follow the steps in this section to set the DIP switches on Switch Banks 1, 2, and 3. Figure 3.6 shows the location of the switch banks.

Figure 3.6
Location of DIP Switch Banks on the Connection Panel



Setting the DIP Switches for Base Mode/Sub Mode

The DIP switches on DIP Switch Bank 1 are used to set the lane operation, also known as the mode setting. Refer to Appendix B: “Lane Operation” for diagrams of the lane configurations showing how these mode settings are used.

DIP switches 1-3 set the placement of the loop(s) in the lane, called Base Mode setting. DIP switches 4 and 5 set the placement of devices in the lane, called Sub Mode setting. DIP switches 6-8 are always closed. Set the DIP switches as shown in Table 3.3.

Note: DIP switches 6, 7, and 8 must be closed for all mode settings. If they are open, the gate will work properly but the mode setting for the gate will appear incorrectly in the ScanNet System Activity Monitor.

Table 3.3: DIP Switch Settings for Base Mode/Sub Mode

Switch Bank 1 DIP Switches								
Mode	1	2	3	4	5	6	7	8
Base Mode 1 - Sub Mode 1	closed	closed	OPEN	closed	closed	closed	closed	closed
Base Mode 2 - Sub Mode 1	closed	OPEN	closed	closed	closed	closed	closed	closed
Base Mode 2 - Sub Mode 2	closed	OPEN	closed	closed	OPEN	closed	closed	closed
Base Mode 2 - Sub Mode 3	closed	OPEN	closed	OPEN	closed	closed	closed	closed
Base Mode 3 - Sub Mode 1	closed	OPEN	OPEN	closed	closed	closed	closed	closed
Base Mode 3 - Sub Mode 2	closed	OPEN	OPEN	closed	OPEN	closed	closed	closed
Base Mode 3 - Sub Mode 3	closed	OPEN	OPEN	OPEN	closed	closed	closed	closed
Base Mode 5 - Sub Mode 2	OPEN	closed	OPEN	closed	OPEN	closed	closed	closed
Base Mode 6 - Sub Mode 1	OPEN	OPEN	closed	closed	closed	closed	closed	closed
Base Mode 6 - Sub Mode 2	OPEN	OPEN	closed	closed	OPEN	closed	closed	closed

Setting the DIP Switches for Device Number

DIP switches 1-5 on Switch Bank 2 are used to set the device number. Set the DIP switches as follows:

- 1 If the gate is an offline (non-communicating) device, close DIP switches 1-5.
- 2 If the gate is online (communicating), assign a device number to the gate by opening one or more of DIP switches 1-5 on Switch Bank 2 so that their values total the device number. Refer to Table 3.4 for the value of the DIP switches when they are open.

Table 3.4: DIP Switch Settings for Device Number

Switch Bank 2	
DIP Switch	Value When Open
1	1
2	2
3	4
4	8
5	16
For example, to assign device number 5 to the gate, you would open DIP switches 1 and 3.	

Setting the DIP Switches for Rebound Features

DIP switches 7 and 8 on Switch Bank 2 are used to set rebound features. DIP switch 6 is unused; it does not matter whether the DIP switch is open or closed.

You may set the rebound sensitivity setting from either the Connection Panel or by programming the settings in the Omega LCD Controller. The Connection Panel DIP switch sensitivity setting is limited to 1 (high) or 5 (medium). In the Omega LCD Controller, you can program the sensitivity setting in a range from 1 to 9. The Omega LCD controller will respond to the values you last programmed. Refer to “Setting Sensitivity,” page 59 for instructions on programming rebound sensitivity in the Omega LCD Controller.

- 1 DIP switch 7 on Switch Bank 2 is used to enable or disable the Presence B Rebound feature. If you disable the feature, the gate arm will rebound only if it encounters an object as it lowers. If you enable this feature, the gate arm will rebound when a vehicle presence is detected on Loop B. Set DIP switch 7 as shown in Table 3.5.
- 2 DIP switch 8 on Switch Bank 2 is used to set the sensitivity of the gate motor current sensing system, which causes the gate arm to rebound if it senses a vehicle under the arm. Set DIP switch 8 as shown in Table 3.5.

Table 3.5: DIP Switch Settings for Rebound Features

Switch Bank 2			
DIP Switch	Feature	Value when Open	Value when Closed
6	Unused (does not matter how DIP switch is set)	--	--
7	Reset loop rebound delay	Disabled	Enabled
8	Motor current rebound sensitivity	5 (medium sensitivity)	1 (high sensitivity)

Setting the DIP Switches for Loop Sensitivity

Loop sensitivity determines at what distance from the loop coil that the loop detector detects the presence of a vehicle. You may set different sensitivities for three different loops. Set the DIP switches as shown in Table 3.6.

You may set the loop sensitivity settings from either the Connection Panel or by programming the settings in the Omega LCD Controller. Connection Panel DIP switch sensitivity settings are limited to 2 (high) or 5 (medium). In the Omega LCD Controller, you can program sensitivity settings in a range from 1 to 9. The Omega LCD Controller will respond to the values you last programmed. However, if you cold start the Omega LCD Controller, loop sensitivity settings will default to the settings defined by the DIP switches on the Connection Panel. Refer to “Setting

Sensitivity,” page 59 for instructions on programming loop sensitivity in the Omega LCD Controller.

Table 3.6: DIP Switch Settings for Loop Sensitivity

Switch Bank 3			
DIP Switch	Feature	Value when Open	Value when Closed
1	Detector Sensitivity for Loop A	5 (medium sensitivity)	2 (high sensitivity)
2	Detector Sensitivity for Loop B		
3	Detector Sensitivity for Loop C		

Setting the DIP Switches for Tailgate Detection and Sensitivity

Four DIP switches on Switch Bank 3 control whether tailgate detection is enabled and the sensitivity at which it operates. The tailgate detection feature detects the presence of a second vehicle following within six inches of another vehicle passing over a 2 ft. 6 in. x 6 ft. (.76 m x 1.8 m) loop coil. Tailgate sensitivity determines how sensitive the loop detector is at detecting the presence of the second vehicle. You may set different sensitivities for three different loops.

You may set the tailgate sensitivity settings from either the Connection Panel or by programming the settings in the Omega LCD Controller. Connection Panel DIP switch sensitivity settings are limited to 2 (high) or 5 (medium). In the Omega LCD Controller, you can program sensitivity settings in a range from 1 to 8. (A setting of 9 disables tailgate detection.) The Omega LCD Controller will respond to the values you last programmed. However, if you cold start the Omega LCD Controller, tailgate sensitivity settings will default to the settings defined by the DIP switches on the Connection Panel. Refer to “Setting Sensitivity,” page 59 for instructions on programming tailgate sensitivity in the Omega LCD Controller.

- 1 Set DIP switch 7 to turn tailgate detection on or off, as shown in Table 3.7.
- 2 Do one of the following to set tailgate sensitivity:
 - ☐ If you set DIP switch 7 to open to turn off tailgate detection, you may skip this step. It does not matter how you set tailgate sensitivity on DIP switches 4, 5, and 6, as tailgate sensitivity for all loops will automatically be set at 9 in the Omega LCD Controller, which will disable tailgate detection.
 - ☐ If you set DIP switch 7 to closed to turn on tailgate detection, set DIP switches 4, 5, and 6 as shown in Table 3.7.

Table 3.7: DIP Switch Settings for Tailgate Detection and Sensitivity

Switch Bank 3			
DIP Switch	Feature	Value when Open	Value when Closed
4	Tailgate Sensitivity for Loop A	5 (medium sensitivity)*	2 (high sensitivity)*
5	Tailgate Sensitivity for Loop B		
6	Tailgate Sensitivity for Loop C		
7	Tailgate Detection	Off (tailgating is allowed)	On (tailgating is not allowed)

* If DIP switch 7 is open (tailgate detection is off), it does not matter how DIP switches 4, 5, and 6 are set. Tailgate sensitivity for all loops will automatically be set at 9 in the Omega LCD Controller, which will disable tailgate detection.

Setting the DIP Switch for Broken Gate Arm Sensitivity

Broken gate arm sensitivity determines the sensitivity of the broken gate arm sensor, which monitors the motor current to determine whether the arm on the gate is broken.

You may set the broken gate arm sensitivity setting from either the Connection Panel or by programming the settings in the Omega LCD Controller. The Connection Panel DIP switch sensitivity setting is limited to 1 (high) or 5 (medium). In the Omega LCD Controller, you can program the sensitivity setting in a range from 1 to 9. The Omega LCD controller will respond to the values you last programmed. Refer to “Setting Sensitivity,” page 59 for instructions on programming broken gate arm sensitivity in the Omega LCD Controller.

Set the DIP switch for broken gate arm sensitivity as shown in Table 3.8.

Table 3.8: DIP Switch Setting for Broken Gate Arm Sensitivity

Switch Bank 3			
DIP Switch	Feature	Value when Open	Value when Closed
8	Broken Gate Arm Sensitivity	5 (medium sensitivity)	1 (high sensitivity)

Starting the G-90 CD Gate

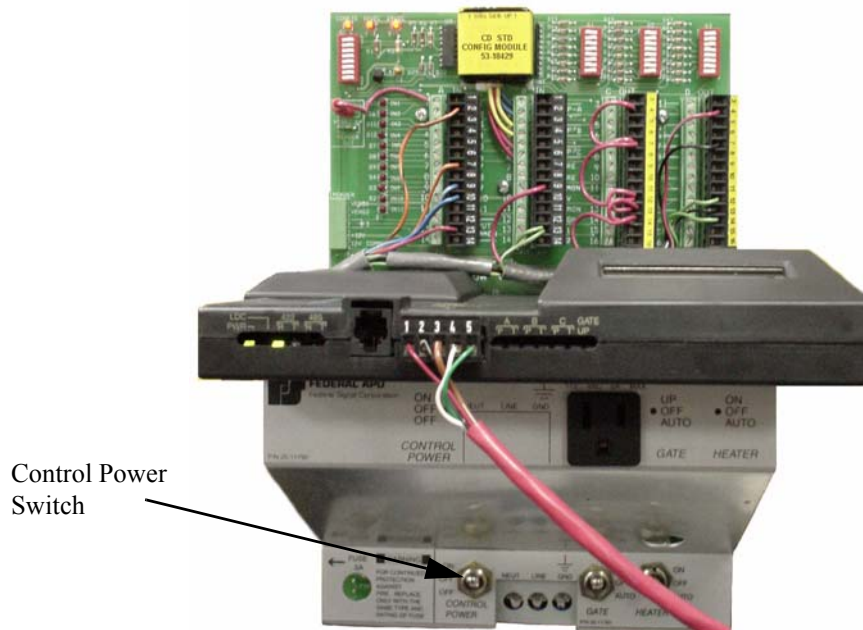
You may “cold start” or “warm start” the G-90 CD gate. The method you use depends on whether or not you are operating in No Config Mode and whether or not you have changed DIP switch settings.

Cold Starting the Gate

There are two different conditions in which you will “cold start” the gate:

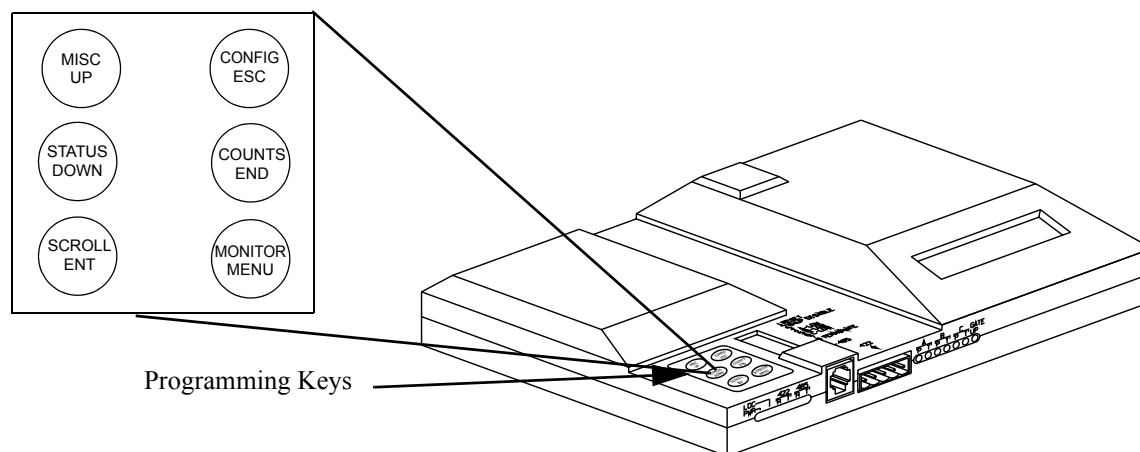
- ☐ When you change DIP switch settings and you want the settings to take effect when you turn on the gate.
 - ☐ When there is no configuration module in the Omega LCD Controller; you want to operate the gate in No Config mode.
- 1 Turn the Control Power switch on the Connection Panel to ON, and at the same time, hold down the **MONITOR/MENU** key on the Omega LCD Controller. Figure 3.7 shows the location of the Control Power switch, and Figure 3.8 shows the keys on the Omega LCD Controller.

Figure 3.7
Control Power Switch on the Connection Panel



- 2 Continue to hold down the **MONITOR/MENU** key until MENU MODE is displayed on the LCD screen.

Figure 3.8
Omega LCD Controller and Programming Keys



3 Release the **MONITOR/MENU** key.

Note: If the Omega LCD Controller has no configuration module, when you start the gate without holding down the **MONITOR/MENU** key, the Omega LCD Controller will not operate.

Warm Starting the Gate

To warm start the gate, you need only to place the Control Power switch in the ON position.

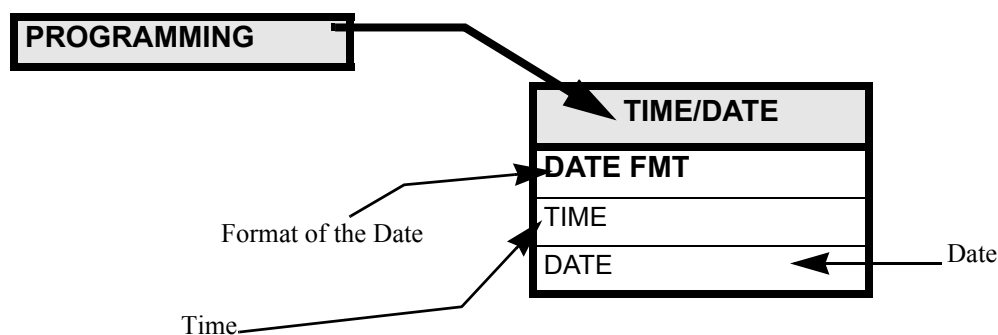
Setting the Time and Date on the Omega LCD Controller

Once you install the hardware, connect the wiring, and set the DIP switches, you must program the Omega LCD Controller. To do this, use the programming buttons, located on the lower left corner of the Omega LCD Controller. The changes will be reflected on the LCD display on the Omega LCD Controller. In order for the G-90 CD to function minimally, you must program the time and date. See Chapter 5: “Additional Programming Options” for more information about programming the Omega LCD Controller.

When you initially turn on the G-90 CD Gate, the system uses January 1, 1993 as a default value. In order for the G-90 CD Gate to function properly, you must reset the time and date. Figure 3.9

illustrates the menu on the Omega LCD Controller that you should use. If the gate is online with ScanNet, you may also send the time and date to the gate using Device Commands in ScanNet.

Figure 3.9
Time and Date Menu



To reset the time and date, use the following steps:

MENU MODE

- 1 Hold down the **MONITOR/MENU** key until you are in the MENU Mode. Press the **MISC/UP** key until the PROGRAMMING screen is displayed.

PROGRAMMING

- 2 From the PROGRAMMING screen, press the **SCROLL/ENT** key.
The next screen will be displayed.

TIME/DATE

- 3 If the TIME/DATE screen is not displayed, press the **MISC/UP** key until it is displayed. Then press the **SCROLL/ENT** key.
The next screen will be displayed.

DATE FMT: M/D/Y

- 4 Select the date format, by pressing the **MISC/UP** key until the format you want to select is displayed. You may select either M/D/Y or D/M/Y. Then press the **SCROLL/ENT** key.
The next screen is displayed.

20:53 01/01/96

- 5 Set the time, by completing the following steps:

- a** Change the hour, by pressing the **MISC/UP** key to increase the number or press the **STATUS/DOWN** to decrease the displayed number.
The screen will reflect the changes you make.
- b** When the hour you want to set is displayed, press the **SCROLL/ENT** key.
The cursor will move to the minutes field.
- c** Change the minutes, by pressing the **MISC/UP** key to increase the number or press the **STATUS/DOWN** key to decrease the number.
The screen will reflect your changes.
- d** When the minutes you want to set are displayed, press the **SCROLL/ENT** key.
The cursor will move to the first date field.

6 Set the date, by completing the following steps:

20:53	01/01/96
-------	----------

- a** For each number of the date, press the **MISC/UP** key to increase the number, or press the **STATUS/DOWN** key to decrease the number.
The screen will reflect the changes you make.
- b** When the number you want to set is displayed, press the **COUNTS/END** key.
The cursor will move to the date field.
- c** After you set the day, month, and year, press the **SCROLL/ENT** key.
The first line of the TIME/DATE screen will be displayed again.

Operating the Gate without a Configuration Module (“No Config” Mode)

The G-90 CD Gates will continue operating when the Configuration Module fails or is removed after the power has been turned OFF. You can perform the following functions in the Omega LCD Controller in a No Config mode:

- ☐ Set the time and date in the Omega LCD Controller.
- ☐ Program the timers, such as back-out timer, etc.
- ☐ Send commands from the Omega LCD Controller.
- ☐ Perform crosstalk and run-time diagnostics tests.
- ☐ View the Exception Event Report.

Note: Configuration Module options such as counters and time zone features are not available in the No Config Mode.

You must set the DIP switches on Switch Bank 4 on the Connection Panel when operating in the No Config Mode. Switch Banks 1-3 are not used for No Config Mode. See “DIP Switch Settings for Lane Operation Modes in No Config Mode,” page 47, to set the Connection Panel DIP switches.

If you start up the gate without holding down the **MONITOR/MENU** key on the Omega LCD Controller (warm starting), and the Omega LCD Controller does not detect the presence of the Configuration Module for two seconds after being powered up, the Omega LCD Controller will not operate, and the following will occur:

Note: If the Omega LCD Controller detects the re-appearance of the Configuration Module within two seconds, it continues to function normally.

- ☐ If it is a communicating gate, it sends a latched alarm message “CONFIG FAILURE” to ScanNet.

Note: If you plug in a new Configuration Module after the alarm message is sent, the Omega LCD Controller will ignore the re-appearance of the Configuration Module. You must reset the Omega LCD Controller to enable it to recognize the Configuration Module, by turning it off and then on again.

- ☐ The Omega LCD Controller waits for an additional five seconds to allow the alarm message to be forwarded to ScanNet. After this, the Omega LCD Controller does the following:
 - Resets the gate and mode logic.
 - Sends a “BAD CFG” event message to the Total and Exception Event Reports.
 - Displays the message “CONFIG FAILURE” on the LCD display.

No Config Mode Inputs and Outputs

You can temporarily operate your gate without the Configuration Module. Refer to Table 3.9 to review the Inputs and Outputs for your G-90 CD Gate when you operate it in a No Config Mode.

Table 3.9: “No Config” Mode Inputs and Outputs

Inputs		Outputs	
1	Vend A	3	Gate Up (active if raised)
2	Vend B	4	Gate Up (active if lowered)
3	Rebound	5	Pulse A
4	Override	6	Pulse B
5	undefined	7	Presence A
6	undefined	8	Presence B
7	Ticket Request	9	Illegal Forward
8	undefined	10	Illegal Reverse
9	undefined	11	Monthly Forward
10	undefined	12	Transient Forward
11	Sensitivity B - Switch 8 (B2)	13	undefined
12	Common	14	undefined
13	Common	15	Unused
14	Common	16	Unused

DIP Switch Settings for Lane Operation Modes in No Config Mode

The G-90 CD Gate may be used in four different lane operation modes in No Config mode, referred to as Base Mode/Sub Modes. To set the lane operation mode for a gate in No Config mode, you must set DIP switches 1-4 on Switch Bank 4 of the Connection Panel. (Switch banks 1-3 are not used for No Config mode.) After you set the DIP switches, you must cold start the Omega LCD Controller for the settings to take effect. For instructions on cold starting, see “Starting the G-90 CD Gate,” page 41.

Table 3.10 shows the DIP switch settings for these modes on the Connection Panel DIP Switch Bank 4. Base Mode 1, Sub Mode 1 is a one loop lane operation; the other three modes are two-

loop lane operations. Refer to Appendix B: “Lane Operation” for graphic illustrations of these modes.

Table 3.10: DIP Switch Settings for Base Mode/Sub Mode in No Config Mode

Switch Bank 4				
Setting	DIP Switch 1	DIP Switch 2	DIP Switch 3	DIP Switch 4
Base Mode 1 - Sub Mode 1	closed	OPEN	OPEN	OPEN
Base Mode 2 - Sub Mode 2	OPEN	closed	OPEN	OPEN
Base Mode 2 - Sub Mode 1	closed	closed	OPEN	OPEN
Base Mode 2 - Sub Mode 3	OPEN	OPEN	OPEN	OPEN

Loop Sensitivity Setting for No Config Mode

If you operate your G-90 CD Gate in a No Config mode, you must use DIP switches 5-8 on DIP Switch Bank 4 of the Connection Panel to set loop sensitivity, as follows:

- ☐ DIP switches 5 and 6 determine Loop A sensitivity. Refer to Table 3.11 to determine the setting for these switches.

Table 3.11: Loop A Sensitivity DIP Switch Settings for No Config Mode

Switch Bank 4		
Setting	DIP Switch 5	DIP Switch 6
Medium Sensitivity	OPEN	OPEN
Low Sensitivity	closed	OPEN
Medium Sensitivity & Tailgate Detection Off	OPEN	closed
High Sensitivity	closed	closed

- ☐ DIP switches 7 and 8 determine Loop B sensitivity. Refer to Table 3.12 to determine the setting for these switches.

Table 3.12: Loop B Sensitivity DIP Switch Settings for No Config Mode

Switch Bank 4		
Setting	DIP Switch 7	DIP Switch 8
Medium Sensitivity	OPEN	OPEN
Low Sensitivity	closed	OPEN
Medium Sensitivity & Tailgate Detection Off	OPEN	closed
High Sensitivity	closed	closed

Chapter 4: G-90 CD Gate Mechanical Installation

This chapter describes how to install the hardware components of the G-90 CD Gate. This chapter contains the following:

Installing the G-90 CD Gate Cabinet	51
Installing a Standard Gate Arm	54
Installing a Folding Gate Arm.....	55
Up and Down Cam Adjustment for Arm Travel	56
Setting the Gate for Normal Operation	58
Gate Operation During Power Failure	58
Opening the Gate in an Emergency	58

Installing the G-90 CD Gate Cabinet

Warning! When you install your Federal APD equipment, it becomes permanently connected to a power source. As a result, the equipment must have a readily accessible disconnect device incorporated in the fixed wiring. The disconnect must have a control separation of at least 3 mm.

The first step in setting up your G-90 CD Gate is to install the cabinet that houses the gate. To set up the cabinet, complete the following steps:

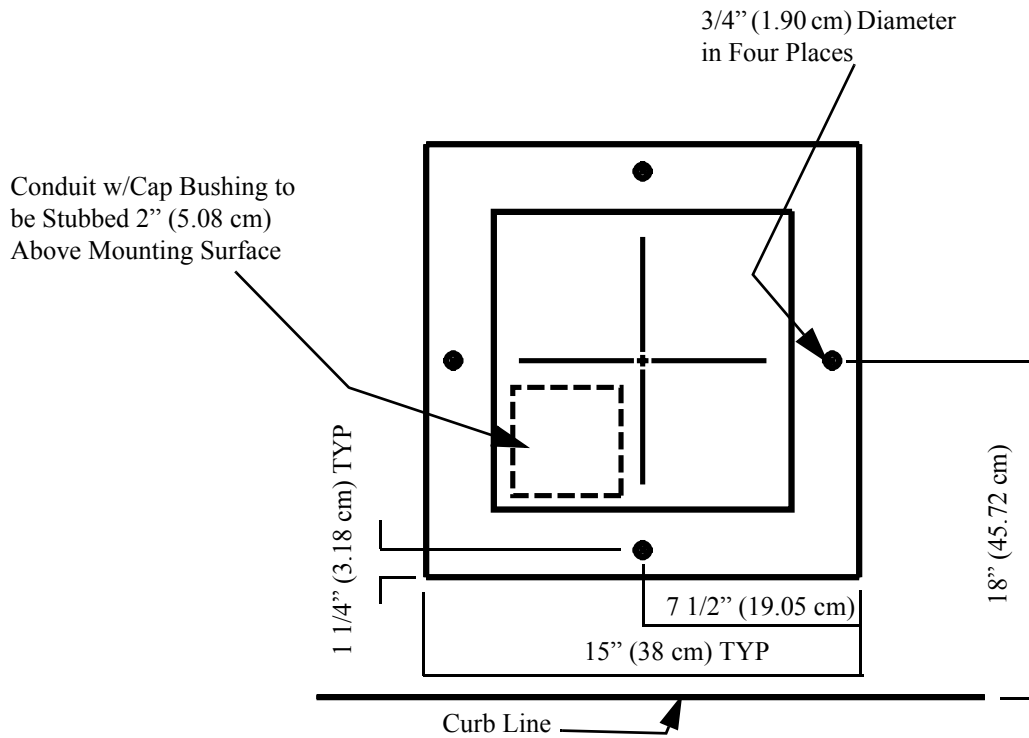
Warning! Install the cabinet so that the end portion of the gate arm is more than 2 ft. (62 cm) from any rigid object, such as a wall, when fully extended in the down position. If the distance is less than 2 ft. (62 cm), a person may get trapped between the end portion and the rigid object, causing bodily injury to the individual.

- 1 Remove the cabinet from the carton or packaging. Leave the cabinet bolted to bottom pallet until you are ready to install it.

Note: Be careful not to damage the cabinet finish.

- 2 Using the key provided, unlock the cabinet doors.
- 3 Remove the bolts that fasten the cabinet to the pallet and place the cabinet in position on the curb, as shown in Figure 4.1.

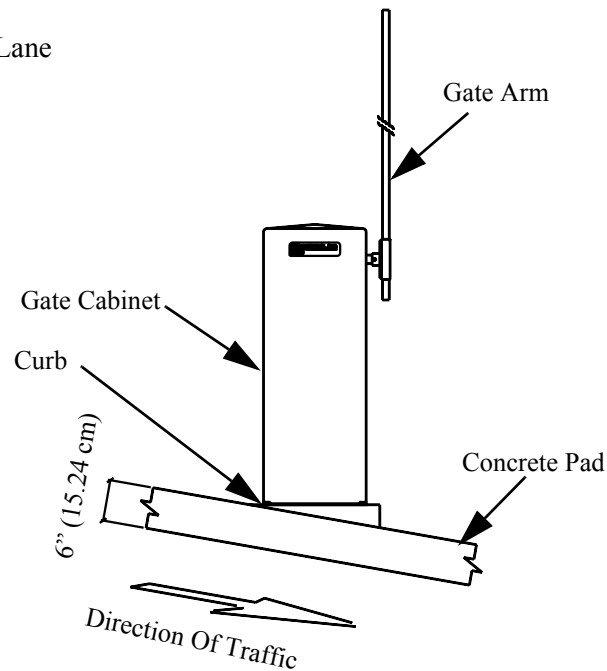
Figure 4.1
Center Cabinet Alignment for G-90 CD Barrier Gate



Note: Make sure that the gate arm flange is facing in the opposite direction from which the traffic approaches.

Note: Mount the cabinet in an upright position. If the lane slopes, place the cabinet on a concrete pad as shown in Figure 4.2.

Figure 4.2
Mounting Gate in Sloping Lane

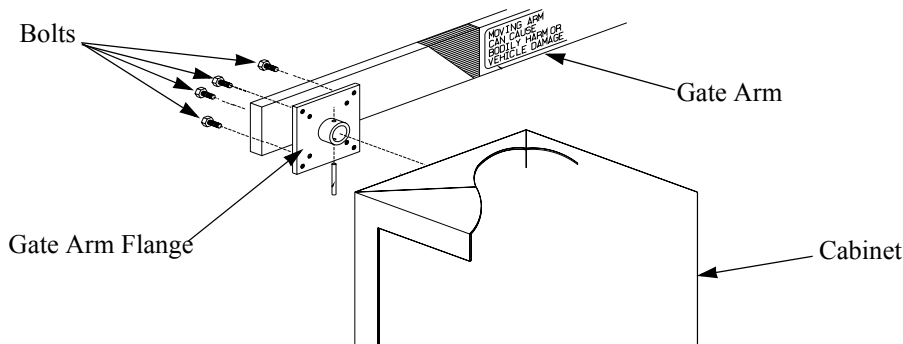


- 4 Mark the location of the mounting holes on the concrete. Make sure that the center line of the cabinet base is 18 inches (45.72 cm) from the curb line.
- 5 Remove the cabinet from the position, and follow the manufacturer's instructions for installing the anchor bolts. The recommended bolt is Redhead #JS-38H, 3/8" x 3" stud anchor, or equivalent.
- 6 With the bolts installed, place the mounting gasket over the bolts, and the set the cabinet on top of the gasket, aligning the bolts up through the holes of the cabinet.

Note: The gate arm flange has two sets of four holes. Use the inner set of holes for installing the folding gate arm.

- 6 Bolt the gate arm to the folding gate arm flange. Figure 4.5 illustrates the assembly.

Figure 4.5
Folding Gate Arm Assembly

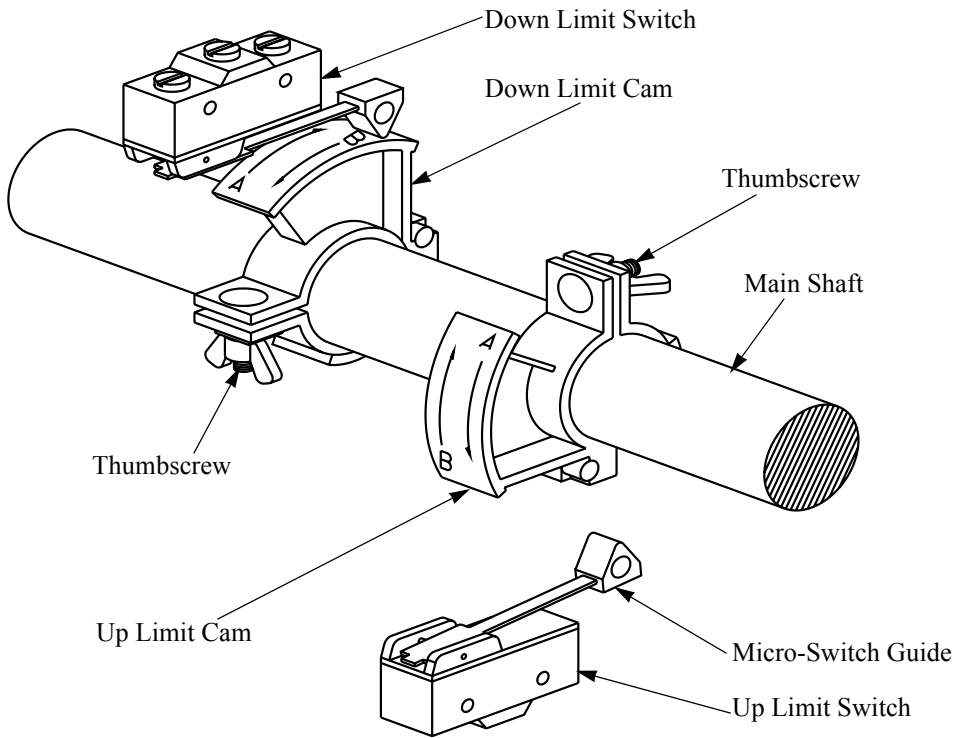


- 7 Connect one end of the gate arm cable to the stabilizer in the gate arm. Connect the other end to the opening in the side of the gate cabinet, adjacent to the gate arm flange.
- 8 Position limit switches and cams correctly and tighten them. If the gate arm drops before starting up, adjust the limit switch cams. Refer to the section on *Up and Down Cam Adjustment for Arm Travel* in this chapter for instructions on cam adjustment.

Up and Down Cam Adjustment for Arm Travel

You can control how far the gate arm will travel in either direction by adjusting the screws on the Up Limit Cam and/or the Down Limit Cam, as illustrated in Figure 4.6.

Figure 4.6 Cams



Do one of the following to adjust the gate arm:

Warning! Turn power off before adjusting the cams. If power to the gate is not turned off, severe personal injury may occur.

- ❑ To adjust the gate arm for **more downward** travel, loosen the thumbscrew on the Down Limit Cam, and then rotate the screw slightly in the “B” direction. Tighten the thumbscrew, turn on the power, and test the gate arm travel by operating the UP-OFF-AUTO switch.
- ❑ To adjust the gate arm for **less downward** travel, loosen the thumbscrew on the Down Limit Cam, and then rotate it slightly in the “A” direction. Tighten the thumbscrew, turn on the power, and test the gate arm travel by operating the UP-OFF-AUTO switch.
- ❑ To adjust the gate arm for **more upward** travel, loosen the thumbscrew on the Up limit Cam, and then rotate it slightly in the “B” direction. Tighten the thumbscrew, turn on the power, and test the gate arm travel by operating the UP-OFF-AUTO switch.
- ❑ To adjust the gate arm for **less upward** travel, loosen the thumbscrew on the Up Limit Cam, and then rotate it slightly in the “A” direction. Tighten the thumbscrew, turn on the power, and test the gate arm travel by operating the UP-OFF-AUTO switch.

Note: On some gates, cam adjustment also requires you to loosen and retighten a set screw on the back side of each cam assembly, as shown in Figure 4.6.

After completing the gate installation, remove the small screw from the cap of the gear reducer. This allows the gear reducer to have a vent.

Warning! If you do not remove the screw, expansion and contraction can cause the seals in the reducer to leak oil.

Setting the Gate for Normal Operation

You will normally use automatic operation to operate the gate. Your gate will open in response to a vend signal from devices such as a Ticket Spitter, vehicle detector, card reader, ScanNet command, or push button.

To operate the gate, follow this procedure:

- ☐ Open the gate door.
- ☐ Place the UP-OFF-AUTO switch in the AUTO position. The gate controls are now set for normal operation.

Gate Operation During Power Failure

If the power fails, follow this procedure to open or close the gate:

- ❑ Turn off the power to the gate at its source, such as a breaker, power panel, etc.

Warning! If you do not turn the power off, severe personal injury may occur.

- ❑ Rotate motor pulley manually by pulling on Vee-belts until the gate arm is in the desired position.

Opening the Gate in an Emergency

To open the gate in an emergency, follow these steps:

- ❑ Move the UP-OFF-AUTO switch to its UP position. This will raise the gate arm, which will remain in the up position. You cannot lower the gate arm again while the switch is in the UP position.
- ❑ Return the switch to the AUTO position to resume normal gate operation.

Chapter 5: Additional Programming Options

In order for the G-90 CD to function minimally, you must program the time and date. See “Setting the Time and Date on the Omega LCD Controller,” page 43.

This chapter describes how to program other menu items in the Omega LCD Controller. These optional programming items will help you set up your G-90 CD Barrier Gate so that it functions the way that you intend. This chapter contains the following:

Setting Sensitivity.....	59
Programming Timer Features.....	64
Resetting Counters.....	68
Setting Function Time Zones	69
Programming Differential Counters (Optional Feature)	73
Programming an Alarm Message	75

Note: If the gate is online with ScanNet, you may program the gate in G-90 CD Programming in ScanNet instead of using the Omega LCD Controller.

Setting Sensitivity

You may program four types of sensitivity settings in the Omega LCD Controller:

- ☐ **Loop Sensitivity.** Determines at what distance from the loop coil that the loop detector detects the presence of a vehicle. You may set different sensitivities for three different loops.
- ☐ **Tailgate Sensitivity.** Determines how sensitive the loop detector is at detecting the presence of a second vehicle following within six inches of another vehicle over a 2 ft. 6 in. x 6 ft. (.76 m x 1.8 m) loop coil. You may set different sensitivities for three different loops.
- ☐ **Rebound Motor Sensitivity.** Determines the sensitivity of the gate motor current sensing system, which causes the gate arm to rebound if it senses a vehicle under the arm.
- ☐ **Broken Gate Arm Sensitivity.** Determines the sensitivity of the broken gate arm sensor, which monitors the motor current to determine whether the arm on the gate is broken.

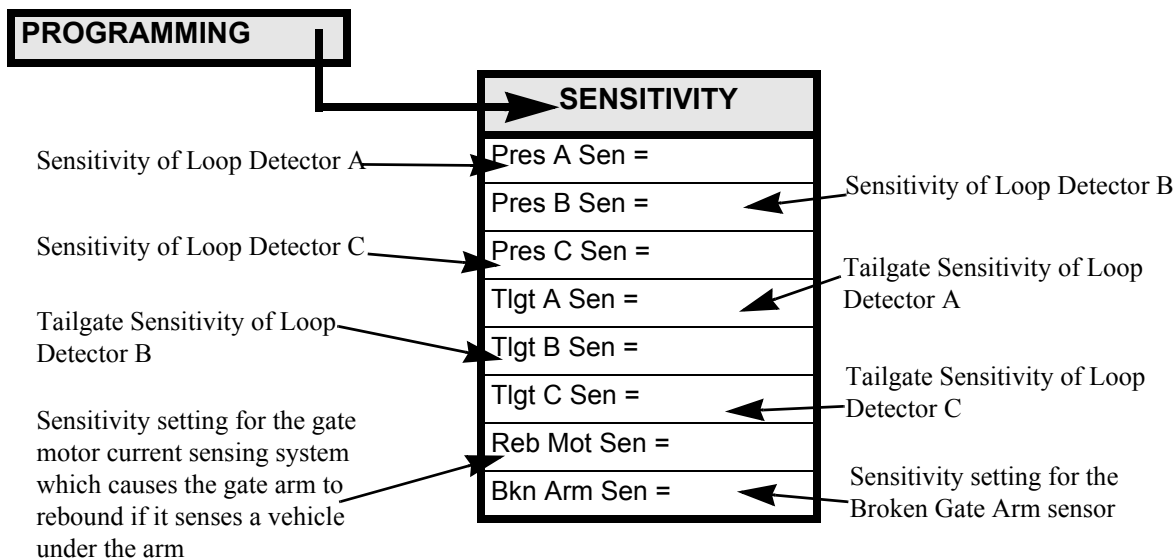
You can program sensitivity settings from 1 to 9, with 1 being the most sensitive and 9 being the least sensitive, except for tailgate sensitivity, in which 1 is the most sensitive, 8 is the least sensitive, and 9 disables the tailgate function.

Sensitivity settings may also be set from the Connection Panel. However, Connection Panel DIP switch settings are limited. Some sensitivity settings will default to the sensitivity settings defined by the DIP switches on the Connection Panel when you cold start the gate. Refer to “Setting the

DIP Switches on the Connection Panel,” page 36 for Connection Panel DIP switch sensitivity settings.

Figure 5.1 illustrates the location of the menu items to set your sensitivity settings.

Figure 5.1
Omega LCD Controller Menu



To program the sensitivity settings, complete the following steps:

PROGRAMMING

- 1 From the PROGRAMMING screen, press the **SCROLL/ENT** key once.
The first programming item will be displayed.

SENSITIVITY

- 2 Press the **MISC/UP** key until the SENSITIVITY screen is displayed. Then press the **SCROLL/ENT** key.
The next screen will be displayed.

Pres A Sen = 5

- 3 Do one of the following to select the function for which you want to set the sensitivity:

☐ To set the rebound motor sensitivity:

- a Press the **MISC/UP** key until the Reb Mot Sen screen is displayed. Then press the **SCROLL/ENT** key.
The Reb Mot Sen screen will be displayed.

Reb Mot Sen = 5

- b Press the **MISC/UP** key to increase the number, or press the **STATUS/DOWN** key to decrease the number (1 = most sensitive, 9 = least sensitive). When the number you want to select is displayed, press the **SCROLL/ENT** key.

☐ To set the broken gate arm sensitivity:

- a Press the **MISC/UP** key until the Bkn Arm Sen screen is displayed. Then press the **SCROLL/ENT** key.
The Bkn Arm Sen screen will be displayed.

Bkn Arm Sen = 5

- b** Press the **MISC/UP** key to increase the number, or press the **STATUS/DOWN** key to decrease the number (1 = most sensitive, 9 = least sensitive). When the number you want to select is displayed, press the **SCROLL/ENT** key.

- ☐ To set the presence A sensitivity:

- a** Press the **MISC/UP** key until the Pres A Sen screen is displayed. Then press the **SCROLL/ENT** key.
The Pres A Sen screen will be displayed.

Pres A Sen = 5

- b** Press the **MISC/UP** key to increase the number, or press the **STATUS/DOWN** key to decrease the number (1 = most sensitive, 9 = least sensitive). When the number you want to select is displayed, press the **SCROLL/ENT** key.

- ☐ To set the presence B sensitivity:

- a** Press the **MISC/UP** key until the Pres B Sen screen is displayed. Then press the **SCROLL/ENT** key.
The Pres B Sen screen will be displayed.

Pres B Sen = 5

- b** Press the **MISC/UP** key to increase the number, or press the **STATUS/DOWN** key to decrease the number (1 = most sensitive, 9 = least sensitive). When the number you want to select is displayed, press the **SCROLL/ENT** key.

- ❑ To set the presence C sensitivity:

- a Press the **MISC/UP** key until the Pres C Sen screen is displayed. Then press the **SCROLL/ENT** key.
The Pres C Sen screen will be displayed.

Pres C Sen = 5

- b Press the **MISC/UP** key to increase the number, or press the **STATUS/DOWN** key to decrease the number (1 = most sensitive, 9 = least sensitive). When the number you want to select is displayed, press the **SCROLL/ENT** key.

- ❑ To set the tailgate sensitivity of loop A:

- a Press the **MISC/UP** key until the Tlgt A Sen screen is displayed. Then press the **SCROLL/ENT** key.
The Tlgt A Sen screen will be displayed.

Tlgt A Sen = 5

- b Press the **MISC/UP** key to increase the number, or press the **STATUS/DOWN** key to decrease the number (1 = most sensitive, 8 = least sensitive, 9 = disabled). When the number you want to select is displayed, press the **SCROLL/ENT** key.

- ❑ To set the tailgate sensitivity of loop B:

- a Press the **MISC/UP** key until the Tlgt B Sen screen is displayed. Then press the **SCROLL/ENT** key.
The Tlgt B Sen screen will be displayed.

Tlgt B Sen = 5

- b** Press the **MISC/UP** key to increase the number, or press the **STATUS/DOWN** key to decrease the number (1 = most sensitive, 8 = least sensitive, 9 = disabled). When the number you want to select is displayed, press the **SCROLL/ENT** key.

- ☐ To set the tailgate sensitivity of loop C:

- a** Press the **MISC/UP** key until the Tlgt C Sen screen is displayed. Then press the **SCROLL/ENT** key.
The Tlgt C Sen screen will be displayed.

Tlgt C Sen = 5

- b** Press the **MISC/UP** key to increase the number, or press the **STATUS/DOWN** key to decrease the number (1 = most sensitive, 8 = least sensitive, 9 = disabled). When the number you want to select is displayed, press the **SCROLL/ENT** key.

PROGRAMMING

- 4** When you have finished programming the sensitivity, press the **COUNTS/END** key until the PROGRAMMING screen is displayed.

Programming Timer Features

Miscellaneous standard timers designate the amount of time the gate arm remains in a raised position. There are four programmable time features:

- ☐ **No Loop Backout Timer.** This feature sets the number of seconds, from 0 to 99, that the gate will wait after a vend before the arm automatically lowers if no vehicle travels over the reset loop. The default is 0 seconds, which turns the timer off; with this setting, the arm will remained raised for approximately 1 1/4 hours if no vehicle travels over the reset loop.
- ☐ **Loop Backout Timer.** This option sets the number of seconds, from 0 to 9.5, that you wish to allow a vehicle to travel between Loop A and Loop B before the gate

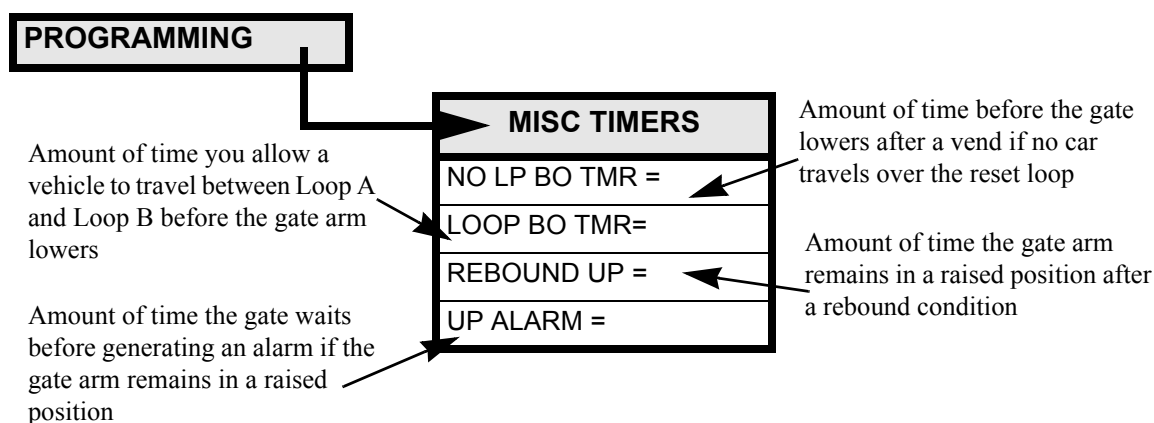
arm lowers. The timer begins when the vehicle moves off Loop A. If the timer is set to 0, the gate arm lowers as soon as the vehicle leaves Loop A. The default is 0.5 seconds.

Note: If Loop A and Loop B are 8 ft. 3in. (2.52 m) apart, set the timer at 0.

- ❑ **Rebound Up Timer.** This feature sets the number of seconds, from 0 to 99, that the gate remains in the raised position if a rebound condition occurs. The default is 0 seconds. If set to 0, the gate arm comes down immediately after the arm is raised in a rebound condition.
- ❑ **Up Alarm Timer.** This option sets the number of seconds, from 0 to 999, that the gate waits, prior to generating an alarm, when the gate arm remains in the raised position. The default is 105 seconds.

The following menu tree illustrates where you can access the Miscellaneous Timers option in the Omega LCD Controller.

Figure 5.2
Omega LCD Controller Menu



To assign timers, complete the following steps:

PROGRAMMING

- 1 From the **PROGRAMMING** screen, press the **SCROLL/ENT** key once.
- 2 If the **MISC. TIMERS** screen is not displayed, press the **MISC/UP** key until the **MISC TIMERS** screen is displayed. Press the **SCROLL/ENT** key.

MISC. TIMERS

- 3 Do one of the following to select the type of timer you want to set:

☐ To set the no loop backout timer:

- a** Press the **MISC/UP** key until the NO LP BO TMR screen is displayed. Then press the **SCROLL/ENT** key. *The NO LP BO TMR screen will be displayed.*

NO LP BO TMR= 00

- b** For the first digit of the number of seconds, press the **MISC/UP** key to increase the number, or press the **STATUS/DOWN** key to decrease the number. When the number you want to select is displayed, press the **SCROLL/ENT** key. Repeat this for the second digit of the number of seconds.

☐ To set the loop backout timer:

- a** Press the **MISC/UP** key until the LOOP BO TMR screen is displayed. Then press the **SCROLL/ENT** key. *The NO LP BO TMR screen will be displayed.*

LOOP BO TMR =0.0

- b** For the first digit of the number of seconds, press the **MISC/UP** key to increase the number, or press the **STATUS/DOWN** key to decrease the number. When the number you want to select is displayed, press the **SCROLL/ENT** key. Repeat this for the second digit of the number of seconds.

☐ To set the rebound up timer:

REBOUND UP = 00

- a Press the **MISC/UP** key until the REBOUND UP screen is displayed. Then press the **SCROLL/ENT** key. *The REBOUND UP screen will be displayed.*

- b For the first digit of the number of seconds, press the **MISC/UP** key to increase the number, or press the **STATUS/DOWN** key to decrease the number. When the number you want to select is displayed, press the **SCROLL/ENT** key. Repeat this for the second digit of the number of seconds.

- ☐ To set the up alarm timer:

- a Press the **MISC/UP** key until the UP ALARM screen is displayed. Then press the **SCROLL/ENT** key. *The UP ALARM screen will be displayed.*

UP ALARM = 000

- b For the first digit of the number of seconds, press the **MISC/UP** key to increase the number, or press the **STATUS/DOWN** key to decrease the number. When the number you want to select is displayed, press the **SCROLL/ENT** key. Repeat this for the second and third digits of the number of seconds.

PROGRAMMING

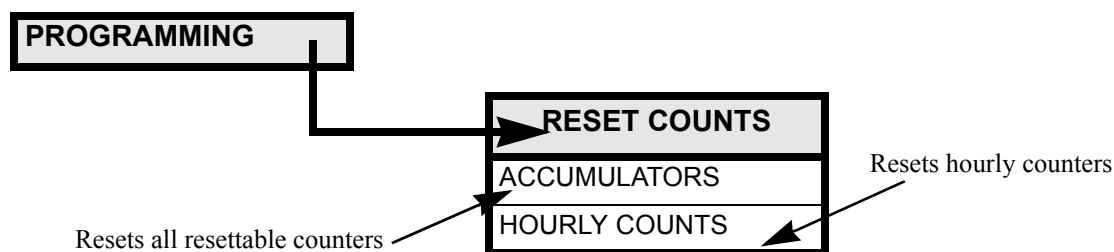
- 4 When you have finished programming the sensitivity, press the **COUNTS/END** key until the PROGRAMMING screen is displayed.

Resetting Counters

The Omega LCD Controller stores counters that provide a variety of information such as the number of times a presence was detected on each loop, number of monthly vehicles that entered the facility, number of transient vehicles that entered the facility, etc. These counters may be resettable or non-resettable. Each counter acts as an accumulating counter and stores 999,999 counts before returning to zero and restarting the counts. For a description of available counters, see Appendix A: “Configuration Features,” page 127. To review counts, see “Reviewing Count Information,” page 93.

Resettable counts can be reset from the Programming Menu in the Omega LCD Controller. Figure 5.3 illustrates where you can find the menu items for resetting counters.

Figure 5.3
Omega LCD Controller Menu



To reset the counters, complete the following steps:

PROGRAMMING

- 1 From the PROGRAMMING screen, press the **SCROLL/ENT** key.
The next screen will be displayed.

RESET COUNTS

- 2 If the RESET COUNTS screen is not displayed, press the **MISC/UP** key until the RESET COUNTS screen is displayed. Then press the **SCROLL/ENT** key.
The RESET COUNTS screen will be displayed.

RESET COUNTS

3 Do one of the following:

☐ To reset all resettable counters:

a If the **ACCUMULATORS** screen is not displayed, press the **MISC/UP** key until the **ACCUMULATORS** screen is displayed.

ACCUMULATORS

b Press the **SCROLL/ENT** key to reset the counters.
The RESET COUNTS screen is displayed again.

☐ To reset all hourly counters:

a Press the **MISC/UP** key until the **HOURLY COUNTS** screen is displayed.

HOURLY COUNTS

b Press the **SCROLL/ENT** key to reset the counters.
The RESET COUNTS screen is displayed again.

PROGRAMMING

4 When you are done resetting counters, press the **COUNTS/END** key until the **PROGRAMMING** screen is displayed.

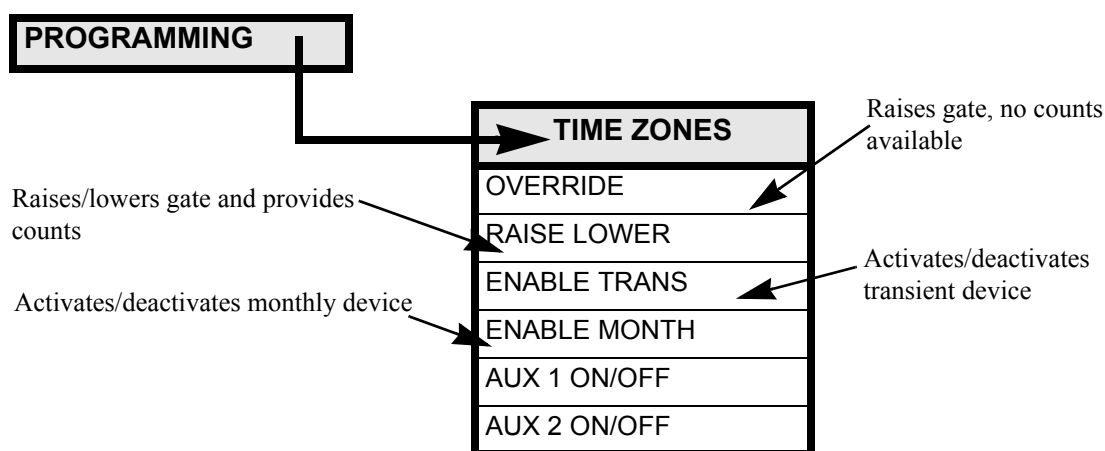
Setting Function Time Zones

You can program time periods during which specific functions are activated/deactivated. Six programmable timer options are available:

- ❑ **Time Zone for Override** allows you to program the Override function that raises the gate without storing counts. It also enables you to deactivate the Override function at specific times.
- ❑ **Raise/Lower Time Zone** allows you to program the Raise/Lower function that raises the gate and continues to store counts. It also enables you to deactivate the Raise/Lower function at specific times.
- ❑ **Monthly Device Time Zone** enables you to program the Omega LCD Controller to activate or deactivate a monthly device at specific times.
- ❑ **Transient Time Zone** enables you to program the Omega LCD Controller to activate or deactivate a transient device at specific times.
- ❑ **Auxiliary On/Off Time Zone (available in a custom configuration)** enables you to program the Omega LCD Controller to activate or deactivate a relay contact at specific times.
- ❑ **Auxiliary 2 On/Off Time Zone (available in a custom configuration)** enables you to program the Omega LCD Controller to activate or deactivate a relay contact at specific times.

Figure 5.4 illustrates how you can access the options for programming time zones.

Figure 5.4
Omega LCD Controller Menu



To determine when a function is activated/deactivated, complete the following steps:

PROGRAMMING

- 1 From the **PROGRAMMING** screen, press the **SCROLL/ENTER** key once.
The first programming screen will be displayed.

TIME/DATE

- 2 Press the **MISC/UP** key until the **TIME ZONES** screen is displayed. Then press the **SCROLL/ENTER** key.
The TIME ZONES screen will be displayed.

TIME ZONES

- 3 Do one of the following:

OVERRIDE

- ☐ **Press the MISC/UP key until the OVERRIDE screen is displayed.** Then press the **SCROLL/ENTER** key. Go to step 4.
The next screen will be displayed, with cursor under the first digit in the time zone field.

RAISE/LOWER

- ☐ **Press the MISC/UP key until the RAISE/LOWER screen is displayed.** Then press the **SCROLL/ENTER** key. Go to step 4.
The next screen will be displayed, with cursor under the first digit in the time zone field.

ENABLE TRANS

- ☐ **Press the MISC/UP key until the ENABLE TRANS screen is displayed.** Then press the **SCROLL/ENTER** key. Go to step 4.
The next screen will be displayed, with cursor under the first digit in the time zone field.

ENABLE MONTH

- ☐ **Press the MISC/UP key until the ENABLE/MONTH screen is displayed.** Then press the **SCROLL/ENTER** key. Go to step 4.
The next screen will be displayed, with cursor under the first digit in the time zone field.

RELAY 1 ON/OFF

- ☐ **Press the MISC/UP key until the RELAY 1 ON/OFF screen is displayed.**

played. Then press the **SCROLL/ENTER** key. Go to step 4.

The next screen will be displayed, with cursor under the first digit in the time zone field.

RELAY 2 ON/OFF

- ☐ **Press the MISC/UP key until the RELAY 2 ON/OFF screen is displayed.** Then press the **SCROLL/ENTER** key. Go to step 4.

The next screen will be displayed, with cursor under the first digit in the time zone field.

A# 01: U 00:00 SU

- 4 Set the Time Zone number. Press the **MISC/UP** key to increase the number. Press the **STATUS/DOWN** key to decrease the number. When the number you want to select is displayed, press the **SCROLL/ENT** key.
The screen will be reflect your changes and the cursor will move to the next field.

A# 01: U 00:00 SU

- 5 Do one of the following:

A# 01: E 00:00 SU

- ☐ **Enable the Time Zone.** Press the **MISC/UP** key until E is displayed in the field. Then press the **SCROLL/ENT** key.
The screen will reflect your changes and the cursor will move to the next field.

A# 01: D 00:00 SU

- ☐ **Disable the Time Zone.** Press the **MISC/UP** key until D is displayed in the field. Then press the **SCROLL/ENT** key.
The screen will reflect your changes and the cursor will move to the next field.

A# 01: U 00:00 SU

- ☐ **Do not use the Time Zone.** Press the **MISC/UP** key until U is displayed in the field. Then press the **SCROLL/ENT** key.

The screen will reflect your changes and the cursor will move to the next field.

A# 01: D 00:00 SU

- 6 Set the hour for activating/deactivating the function. Press the **MISC/UP** key to increase the number. Press the **STATUS/DOWN** key to decrease the number. When the number you want to select is displayed, press the **SCROLL/ENT** key.

The screen will reflect your changes and the cursor will move to the minutes field.

A# 01: D 00:00 SU

- 7 Set the minutes. Press the **MISC/UP** key to increase the number. Press the **STATUS/DOWN** key to decrease the number. When the number you want to select is displayed, press the **SCROLL/ENT** key.

The screen will reflect your changes and the cursor will move to the day field.

A# 01: D 00:00 SU

- 8 Set the day for activating/deactivating the function. Press the **MISC/UP** key to until the day you want to select is displayed. Then press the **SCROLL/ENT** key.

The screen will reflect your changes.

PROGRAMMING

- 9 Repeat steps 3-8 until you have completed programming the Time Zones. When you finish, press the **CONFIG/ESC** key until the **PROGRAMMING** screen is displayed.

The PROGRAMMING screen will be displayed.

Programming Differential Counters (Optional Feature)

If your gate includes a Single or Dual Differential Counter, you can program the total number of parking spaces available for each counter. For example, if your facility has 1,000 spaces, you can program the differential facility counter as “1000.” The Differential Counter is capable of storing up to 9,999 counts to track vehicles in a facility with up to 10,000 spaces.

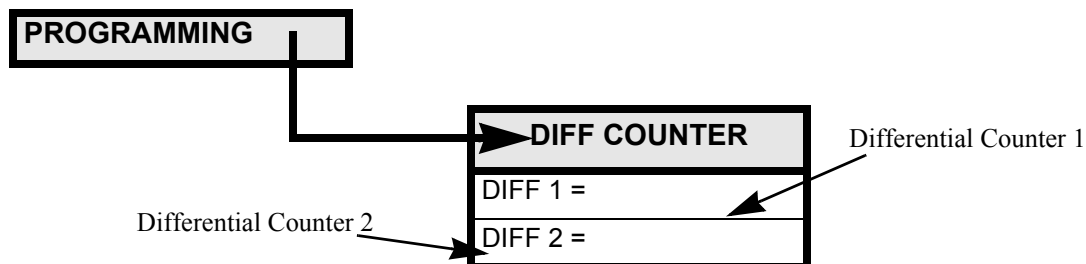
If you are defining the Differential Counter as a total facility space counter, the Omega LCD Controller subtracts a count each time a vehicle enters the facility and adds a count each time a vehicle exits the facility.

If you are defining a Differential Counter as either a monthly or transient counter, the Omega LCD Controller subtracts a count each time a monthly or transient vehicle enters the facility and adds a count each time a monthly or transient vehicle exits the facility.

When the count reaches zero, the Full Output is activated.

Figure 5.5 illustrates the menu item for programming Differential Counters.

Figure 5.5
Omega LCD Controller Menu



To program the Differential Counters, complete the following steps:

PROGRAMMING

- 1 From the PROGRAMMING screen, press the **SCROLL/ENT** key.
The first programming screen will be displayed.

TIME/DATE

- 2 Press the **MISC/UP** key until the DIFF COUNTER screen is displayed. Then press the **SCROLL/ENT** key.
The next screen will be displayed.

DIFF. COUNTER

- 3 Do one of the following:

DIFF 1 = +0000

- ☐ **Press the MISC/UP key until the DIFF 1 screen is displayed.** Go to step 4.
The DIFF 1 screen will be displayed, with the cursor under the + or - sign.

DIFF 2 = +0000

- ☐ **Press the MISC/UP key until the DIFF 2 screen is displayed.** Go to step 4.
The DIFF 2 screen will be displayed, with the cursor under the + or - sign.

DIFF 1 = +0000

- 4 Press the **MISC/UP** key to select either + to add to the count or - to deduct from the

count. Then press the **SCROLL/ENT** key.
For example, if the counter is used to count spaces, and 25 spaces in your lot are under construction and not usable, you may set the differential counter to -25.
The cursor moves to the first digit field.

DIFF 1 = -0000

- 5 Set the first digit of the differential count. Press the **MISC/UP** key to increase the number, or press the **STATUS/DOWN** key to decrease the number. When the number you want to select is displayed, press the **SCROLL/ENT** key.
The screen will reflect your changes and the cursor will move to the next digit.

DIFF 1 = -1000

- 6 Repeat step 5 to set the remaining digits of the counter. Then press the **SCROLL/ENT** key.

PROGRAMMING

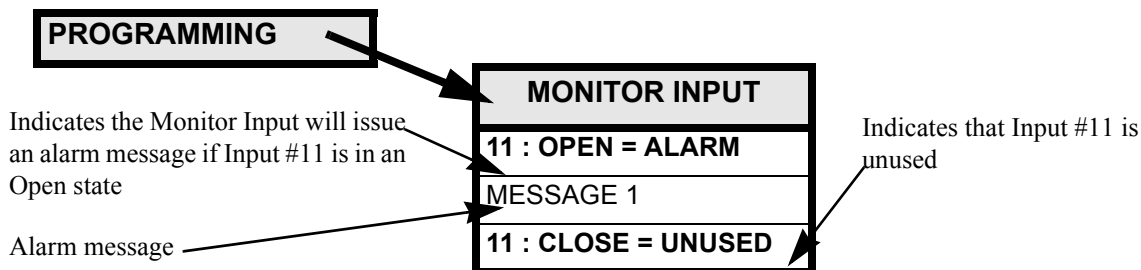
- 7 Follow steps 3-6 to program another differential counter (DIFF 2), if necessary. When you have finished, press the **COUNTS/END** key until the **PROGRAMMING** screen is displayed.
The PROGRAMMING screen will be displayed.

Programming an Alarm Message

The current standard configuration module and configuration module packages include an Input, defined as a Monitor Input, that you can program to generate an alarm message either when the Input is in an open state or in a closed state. When you access Monitor Input programming, the Omega LCD Controller display indicates which terminal is defined as the Monitor Input.

Figure 5.6 illustrates how you can access the menu items for programming the Monitor Input.

Figure 5.6
Omega LCD Controller Menu



You can specify whether the Monitor Input generates an alarm message in an Open state or a Closed state, and program the message itself, by completing the following steps:

Note: The default setting for Monitor Input is “Unused.” You should program this option only if you want the Monitor Input to generate an alarm message.

PROGRAMMING

- 1 From the PROGRAMMING screen, press the **SCROLL/ENT** key once.
The first programming screen will be displayed.

TIME/DATE

- 2 Press the **MISC/UP** key until the MONITOR INPUTS screen is displayed. Then press the **SCROLL/ENT** key.
The next screen will be displayed.

MONITOR INPUTS

- 3 Do one of the following:

11: CLOSE= UNUSED

- ☐ **Generate an alarm in the Closed state.**
Press the **MISC/UP** key until CLOSE is displayed in the Monitor Input status field. Then press the **SCROLL/ENT** key.
Go to step 4.
The screen will reflect your changes and the cursor will move to the alarm field.

11: OPEN = UNUSED

☐ **Generate an alarm in the Open state.**

Press the **MISC/UP** key until OPEN is displayed in the Monitor Input status field. Then press the **SCROLL/ENT** key.

Go to step 4.

The screen will reflect your changes and the cursor will move to the alarm field

11: OPEN = ALARM

4 Press the **MISC/UP** key until ALARM is displayed in the alarm field. Press the **SCROLL/ENT** key.

The next screen will be displayed, with the cursor under the first letter of the message.

—

5 Program the alarm message. Press the **MISC/UP** or **STATUS/DOWN** key to scroll through the list of alphanumeric characters. When the character you want to select is displayed, press the **SCROLL/ENT** key.

The screen will reflect your changes and the cursor will move to the next character field.

MESSAGE 1

6 Repeat step 5 until you have finished programming the alarm message. Press the **COUNTS/END** key until the PROGRAMMING screen is displayed.

The PROGRAMMING screen will be displayed.

Chapter 6: Viewing Data in the Omega LCD Controller

This chapter contains the following:

Viewing the G-90 CD Gate Diagnostic Information.....	79
Understanding the Hexadecimal Representation of DIP Switches.....	79
Viewing the Diagnostics Items on the Miscellaneous Menu.....	81
Viewing the Software and Hardware Options.....	82
Reviewing Lane Transaction Information.....	88
Working with Report Messages.....	91
Reviewing Count Information.....	93
Viewing Lane Status Functions.....	98

Viewing the G-90 CD Gate Diagnostic Information

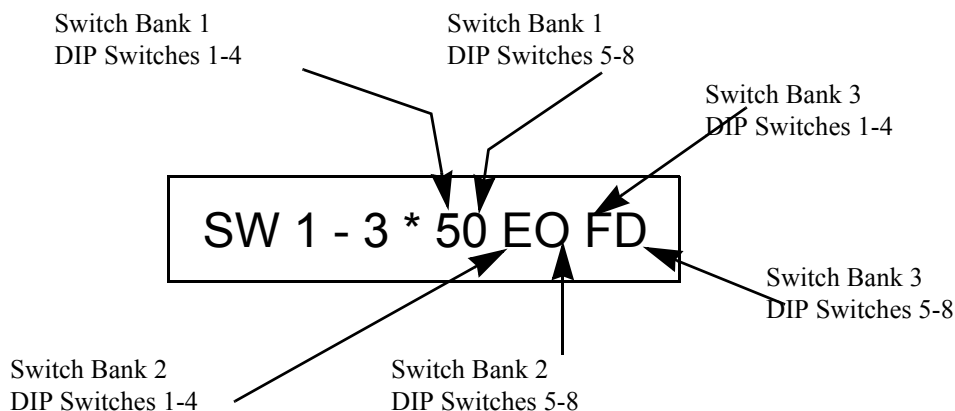
The Omega LCD Controller provides several pieces of information that will help you troubleshoot your gate if problems occur. This information includes the following:

- ☐ The date and time in the Omega LCD Controller
- ☐ The version of firmware the Omega LCD Controller is using
- ☐ The hexadecimal representation settings of the Configuration Module DIP switch banks
- ☐ The analogue to digital conversion data
- ☐ Information about the 12V power signature
- ☐ Whether the Watchdog timer is operating

Understanding the Hexadecimal Representation of DIP Switches

To verify that the Omega LCD Controller is reading the Configuration Module DIP switches correctly, use the SW 1-3 (Switchbank 1 - 3) item in the MISCELLANEOUS menu. The SW 1-3 menu item is a hexadecimal representation of the DIP switches on each switch bank. Figure 6.1 illustrates how to read the SW 1-3 menu.

Figure 6.1
Sample SW 1-3 Menu



The first hexadecimal digit corresponds to DIP switches 1-4. The second hexadecimal digit corresponds to DIP switches 5-8. To convert the hexadecimal value, use the table on the left for the first hexadecimal digit. Use the table on the right for the second hexadecimal digit. 1 indicates the DIP switch is open. 0 indicates that the DIP switch is closed.

Table 6.1: Hexadecimal Values of DIP Switches

HEXADECIMAL VALUES	BINARY EQUIVALENT			
	DIP SWITCH			
	1	2	3	4
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
A	1	0	1	0
B	1	0	1	1
C	1	1	0	0

HEXADECIMAL VALUES	BINARY EQUIVALENT			
	DIP SWITCH			
	5	6	7	8
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
A	1	0	1	0
B	1	0	1	1
C	1	1	0	0

Table 6.1: Hexadecimal Values of DIP Switches (Continued)

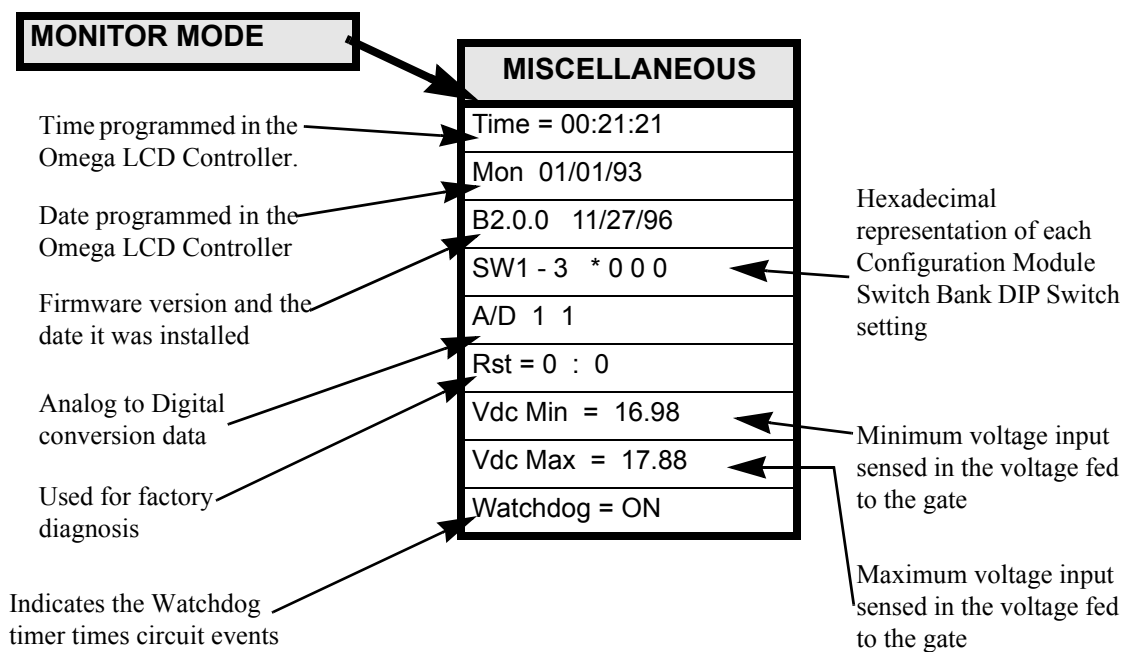
HEXADECIMAL VALUES	BINARY EQUIVALENT			
	DIP SWITCH			
	1	2	3	4
D	1	1	0	1
E	1	1	1	0
F	1	1	1	1

HEXADECIMAL VALUES	BINARY EQUIVALENT			
	DIP SWITCH			
	5	6	7	8
D	1	1	0	1
E	1	1	1	0
F	1	1	1	1

Viewing the Diagnostics Items on the Miscellaneous Menu

Figure 6.2 illustrates the diagnostic information and where to find it in the Omega LCD Controller.

Figure 6.2
Omega LCD Controller MISCELLANEOUS Menu



To view the diagnostic information, complete the following steps

MONITOR MODE...

- 1 Press the **MONITOR/MENU** key until the **MONITOR MODE** screen is displayed.

MISCELLANEOUS

- 2 Press the **MISC/UP** key to scroll to the MISCELLANEOUS menu
- 3 Do one of the following:

- ☐ **To scroll through the screen, line by line**, press the **SCROLL/ENT** key.
- ☐ **If you want the unit to automatically scroll through the information** hold the **SCROLL/ENT** key until you see the message SCROLL START... To end the automatic scrolling process, press the **SCROLL/ENT** until you see the message SCROLL STOP...

MISCELLANEOUS

- 4 To return to the MISCELLANEOUS screen, press the **MISC/UP** key.
The MISCELLANEOUS screen will be displayed.

MENU MODE

- 5 Press the **MONITOR/MENU** key.
The MENU MODE screen will be displayed.

Viewing the Software and Hardware Options

You can review the hardware and software configurations of the G-90 CD Gate. You can find out information about the following settings:

- ☐ **Settings.** The Settings screen displays the DIP switch settings on the Connection Panel. The factory presets these before they send the gate to you.
- ☐ **Options.** The Options screen displays the software options that are included in your G-90 CD Gate configuration module. You will see the line items only for the options present in your system.
- ☐ **Inputs.** The Inputs screen displays the software function of each Input terminal connection. These vary with the options included with your configuration module. To review the Inputs that are available, see Appendix A: “Configuration Features,” page 127.

- ❑ **Outputs.** The Outputs screen displays the software function of each Output terminal connection. These vary with the options included with your configuration module. To review the Outputs available, see Appendix A: “Configuration Features,” page 127.

Figure 6.3 illustrates the SETTINGS menu that you can review from the Monitor Mode.

Figure 6.3
Omega LCD Controller SETTINGS Menu

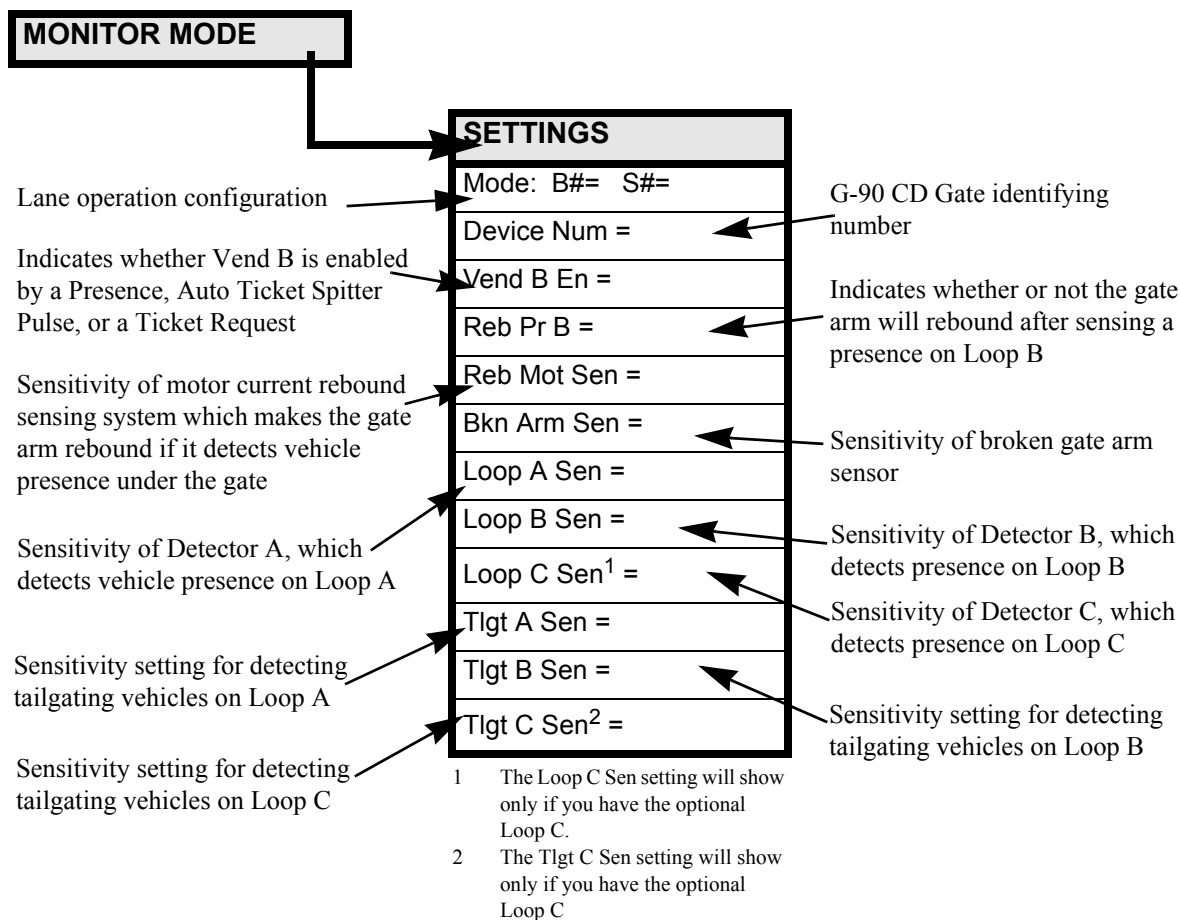


Figure 6.4 illustrates the OPTIONS menu that you can review from the Monitor Mode.

Figure 6.4
Omega LCD Controller OPTIONS Menu

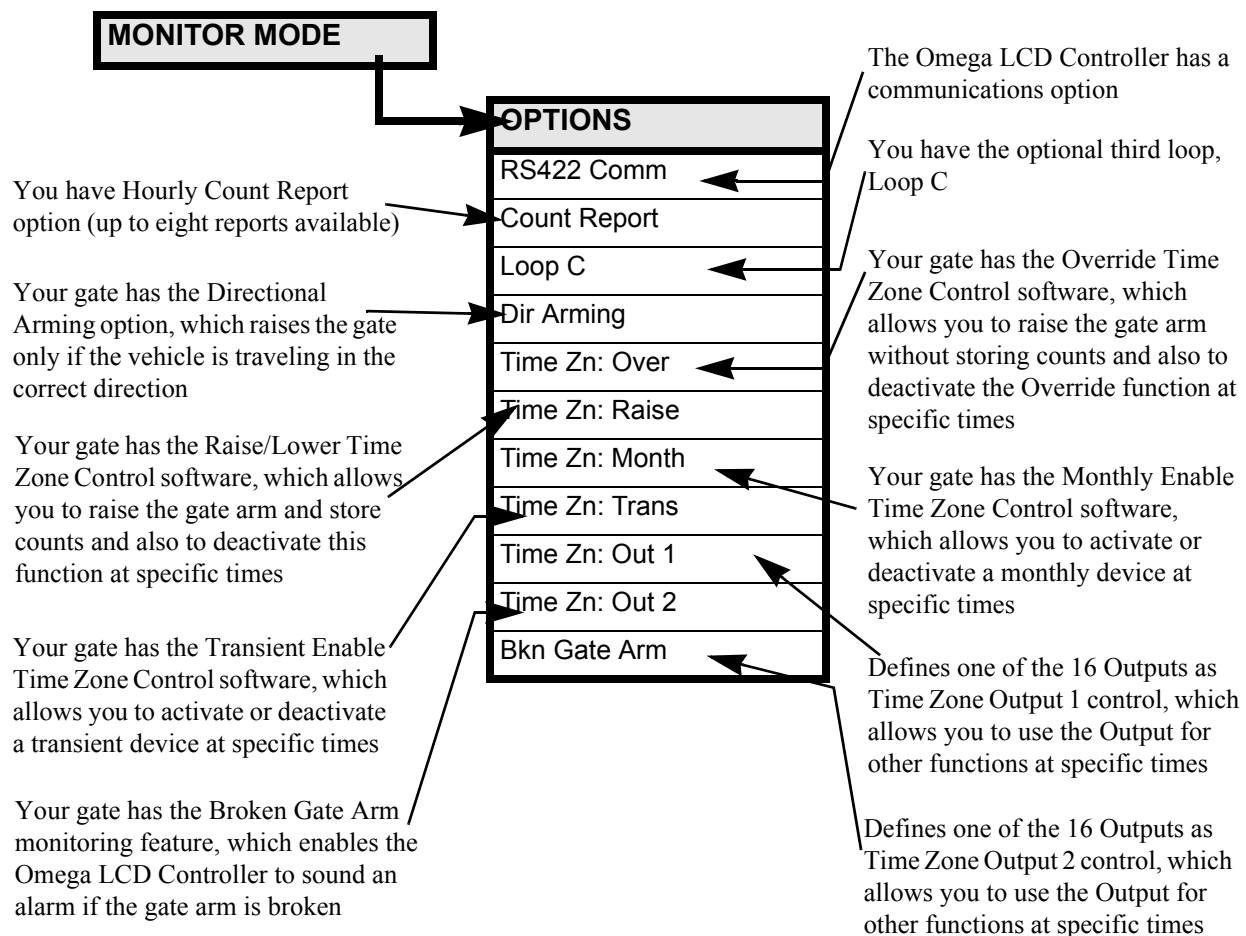


Figure 6.5 illustrates the INPUTS menu that you can review from the Monitor Mode. The inputs in your system may vary from this example.

Figure 6.5
Omega LCD Controller INPUTS Menu

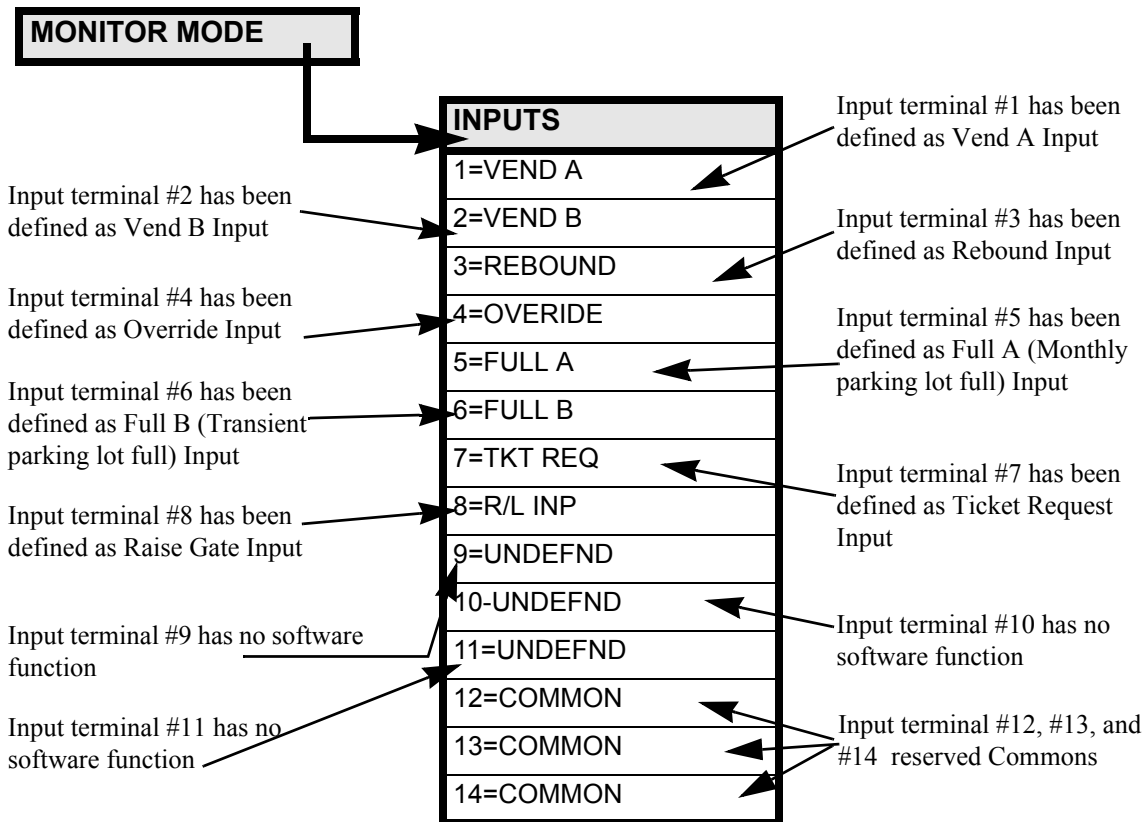
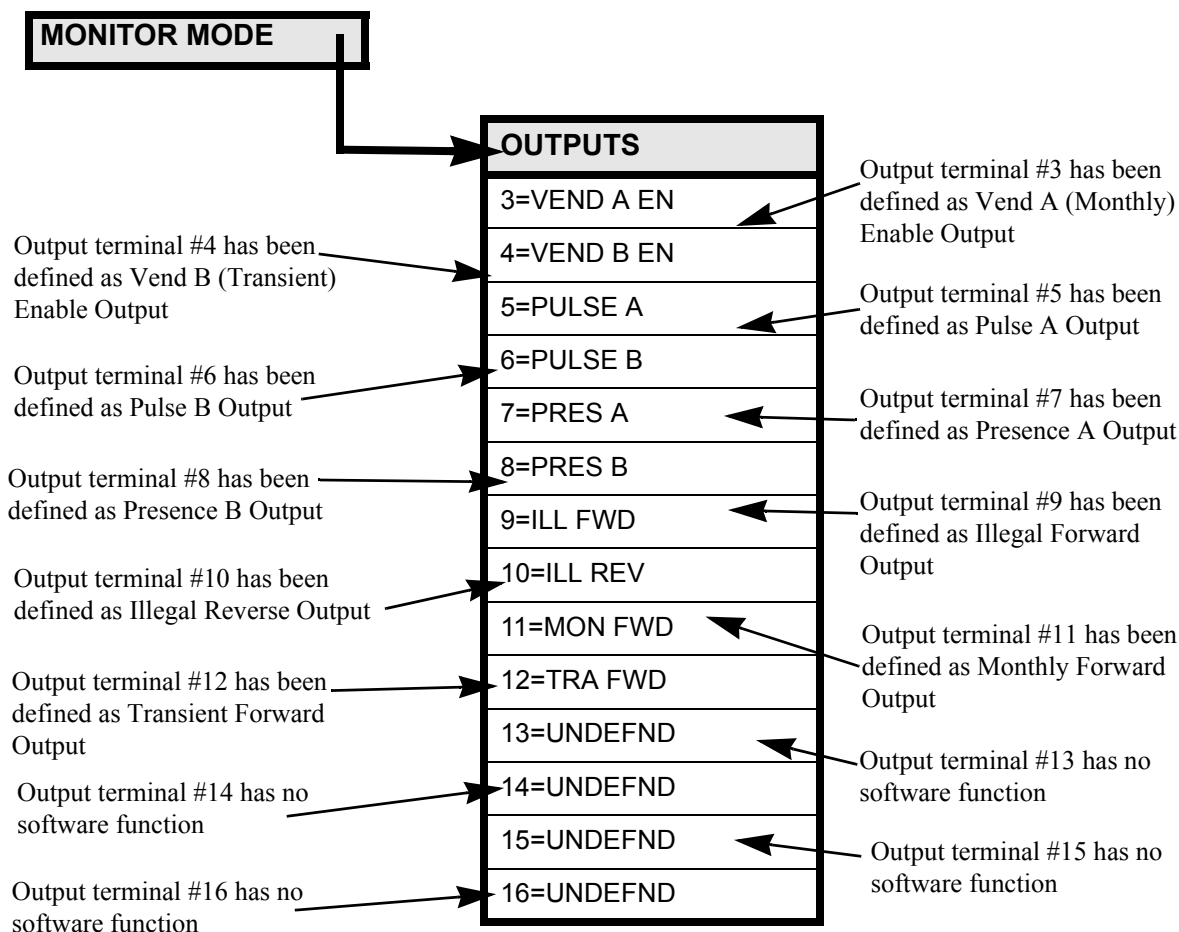


Figure 6.6 illustrates the OUTPUTS menu that you can review from the Monitor Mode. The outputs in your system may vary from this example.

Figure 6.6
Omega LCD Controller OUTPUTS Menu



To see the configuration of the G-90 CD Gate, complete the following steps:

- 1 Press the **MONITOR/MENU** key until the MONITOR MODE screen is displayed.

MONITOR MODE

- 2 Press the **CONFIG/ESC** key. One of the following screens will be displayed:

- ☐ SETTINGS
- ☐ OPTIONS
- ☐ INPUTS

☐ OUTPUTS

SETTINGS

- 3 Press the **CONFIG/ESC** key to scroll to the menu that you want to display. Then press the **SCROLL/ENT** key. (After a few seconds, the Omega controller automatically goes to the first menu item for the menu that is displayed.)

The first line of the appropriate screen will be displayed.

MODE:B#=2 S#=1

- 4 Do one of the following:

- ☐ **To scroll through the screen, line by line**, press the **SCROLL/ENT** key.

- ☐ **If you want the unit to automatically scroll through the information**, hold the **SCROLL/ENT** until you see the message SCROLL START... To end the automatic scrolling process, press the **SCROLL/ENT** key until you see the message SCROLL STOP...

The Omega LCD Controller will scroll through each of the lines on the screen.

- 5 To return to the option you first selected, or to choose another option under the Config key, press the **CONFIG/ESC** key.

The appropriate screen will be displayed.

MONITOR MODE

- 6 To return to the MENU MODE screen, press the **MONITOR/MENU** key.

The MENU MODE screen will be displayed. The Omega LCD Controller will automatically scroll to the PROGRAMMING screen.

Reviewing Lane Transaction Information

The G-90 CD Gate stores information about all of the activities that occur in a lane. You can display a summary of the information on the Omega LCD Controller LCD display in one of the following formats:

- ❑ **Total Event Reports.** This provides a list of all standard and exception lane activity in a lane. These messages provide a short description of the event along with the time at which the event occurred.
- ❑ **Exception Events Reports.** This report provides a list of all unusual events in the lane. This includes events such as component malfunctions and diagnostic events.

Table 6.2 defines the messages that may appear on the reports.

Table 6.2: Reports Messages

MESSAGE	REPORT		DEFINITION
	TOTAL	EXCEPTION	
Arm OK	X	X	Gate arm is OK (has been replaced).
Bkn Arm	X	X	Gate arm is broken.
Clr LpA	X		Vehicle cleared Loop A.
Clr LpB	X		Vehicle cleared Loop B.
Clr LpC	X		Vehicle cleared Loop C.
DnLm OK	X	X	Down limit switch is OK (fixed).
DoorOff	X		Gate door is open (requires Gate Door Input).
EmA Clr	X		Vehicle cleared Loop Emulator A.
EmB Clr	X		Vehicle cleared Loop Emulator B.
EmC Clr	X		Vehicle cleared Loop Emulator C.
Emul A	X		Presence detected from Loop Emulator A Input.
Emul B	X		Presence detected from Loop Emulator B Input.
Emul C	X		Presence detected from Loop Emulator C Input.
Fre Vnd	X		Free vend (in free Gate modes)
FuA Off	X		Full A Input deactivated.
FuB Off	X		Full B Input deactivated.
FuC Off	X		Full C Input deactivated.
FuD Off	X		Full D Input deactivated.
Full A	X		Full A Input activated.
Full B	X		Full B Input activated.
Full C	X		Full C Input activated.
Full D	X		Full D Input activated.

Table 6.2: Reports Messages

MESSAGE	REPORT		DEFINITION
	TOTAL	EXCEPTION	
Gate Dn	X		Gate arm lowered.
Gate Up	X		Gate arm up.
II Tgt	X		Illegal tailgate occurred in either forward or reverse direction.
III Fwd	X	X	Illegal Forward occurred.
III Rev	X	X	Illegal Reverse occurred.
III V A	X	x	Illegal Vend A occurred.
III V B	X	X	Illegal Vend B occurred
III V C	X	X	Illegal Vend C occurred
III V D	X	X	Illegal Vend D occurred
M F Bck	X		Monthly Forward back-out occurred.
M R Bck	X		Monthly Reverse back-out occurred.
Man G U	X	X	Gate raised by manual gate up switch.
Man Off	X	X	Manual gate up switch off.
Mnth Ds	X		Monthly device does not function as Monthly Time Zone is disabled.
Mnth En	X		Monthly device functional as Monthly Time Zone is enabled.
Mon Fwd	X		Monthly Forward count.
Mon Rev	X		Monthly Reverse count.
No DnLm	X	X	Down limit switch failure.
No UpLm	X	X	Up limit switch failure.
Override	X		Gate arm raised by Override command or Input
Ovr Cmd	X		Gate arm raised by Override command.
Ovr Inp	X		Gate arm raised by Override Input.
Over TZ	X		Override Time Zone activated. Omega LCD Controller raises gate arm without storing counts.
Ovr Off	X		Override Time Zone deactivated.
Pres A	X		Presence detected on Loop A.
Pres B	X		Presence detected on Loop B.
Pres C	X		Presence detected on Loop C.
Pwr Dwn	X	X	Power to gate is Off.
Pwr Up	X	X	Power to gate is On.

Table 6.2: Reports Messages

MESSAGE	REPORT		DEFINITION
	TOTAL	EXCEPTION	
R/L Inp	X		Raise/Lower Input is active.
R/L Off	X	X	Raise/Lower Time Zone deactivated.
Rai Cmd	X		Raise/Lower command sent.
Rai TZ	X		Raise/Lower Time Zone activated. Omega LCD Controller raises/lowers gate and stores counts.
Reb Ext	X	X	Rebound occurred due to external rebound Input signal.
Reb PrB	X	X	Rebound occurred due to motor current rebound activation, which sensed a presence under the gate arm.
T F Bck	X		Transient back-out occurred.
Tkt Jam	X		Ticket jam in Ticket Spitter. Please service.
Tkt Low	X	X	Tickets low in the Ticket Spitter
Tkt Pre	X		Ticket in Ticket Spitter throat.
Tkt Req	X		Ticket Request Input active.
Tlgt A	X		Tailgate detected on Loop A.
Tlgt B	X		Tailgate detected on Loop B.
Tlgt C	X		Tailgate detected on Loop C.
Tra Fwd	X		Transient Forward count.
Tran Ds	X	X	Transient device does not function as Transient Time Zone is disabled.
Tran En	X	X	Transient device functional as Transient Time Zone is enabled.
Tune Lp	X	X	Tune Loop command sent.
TZ01 En	X		Time Zone Output 1 enabled.
TZ01 Ds	X		Time Zone Output 1 disabled.
TZ02 En	X		Time Zone Output 1 enabled.
TZ02 Ds	X		Time Zone Output 2 disabled.
U F Bck	X		Unknown forward back-out occurred (in free gate modes).
U R Bck	X		Unknown reverse back-out occurred (in free gate modes).
Ukn Fwd	X		Unknown forward occurred (in free gate modes).
Ukn Rev	X		Unknown reverse occurred (in free gate modes).
UpLm OK	X	X	Up limit switch is OK (fixed).

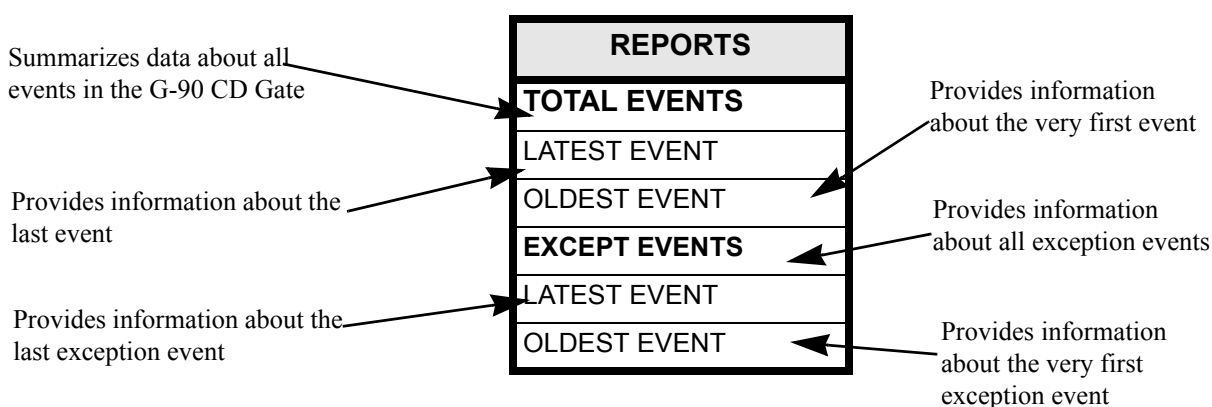
Table 6.2: Reports Messages

MESSAGE	REPORT		DEFINITION
	TOTAL	EXCEPTION	
Vnd MF1	X		Monthly Forward 1 (no arming) occurred.
Vnd MF2	X		Monthly Forward 2 (arming) occurred.
Vnd MR 1	X		Monthly Reverse 1 (no arming) occurred.
Vnd MR 2	X		Monthly Reverse 2 (arming) occurred.
Vnd TF1	X		Transient Forward 1 (no arming) occurred.
Vnd TF2	X		Transient Forward 2 (arming) occurred.
Vnd TR1	X		Transient Reverse 1 (no arming) occurred.
Vnd TR2	X		Transient Reverse 2 (arming) occurred.
VndA En	X		Vend A enabled.
VndB En	X		Vend B enabled.
VndC En	X		Vend C enabled.
VndD En	X		Vend D enabled.

Working with Report Messages

Figure 6.7 illustrates the menu that you will find under the REPORTS Screen.

Figure 6.7
Omega LCD Controller REPORTS Menu



To review transaction information, complete the following steps.

MENU MODE

- 1 Press the **MONITOR/MENU** key until the **MENU MODE** screen is displayed.

The next screen will be displayed.

REPORTS

- 2 Press the **MISC/UP** key until the REPORTS screen is displayed. Press the **SCROLL/ENT** key.
One of the reports screens will be displayed.

- 3 Do one of the following:

TOTAL EVENTS

- ☐ **View summary of all of the information pertaining to a lane.** Press the **MISC/UP** key until the TOTAL EVENTS screen is displayed. Then press the **SCROLL/ENT** key. Go to step 4.
The LATEST screen will be displayed.

EXCEPT. EVENTS

- ☐ **View a summary of only the items that are not part of normal lane operations.** Press the **MISC/UP** key until the EXCEPTION screen is displayed. Then press the **SCROLL/ENT** key. Go to step 4.
The LATEST screen will be displayed.

LATEST EVENT...

- 4 Press the **SCROLL/ENT** key. Information about the most recent events will be displayed on the LCD screen. (After a few seconds, the unit automatically displays Latest Event information on the screen.)
- 5 Scroll down the report by pressing the **STATUS/DOWN** key. When you finish viewing the report, choose from one of the following options:

PROGRAMMING

- ❑ **Return to the Menu Mode.** Press the **MONITOR/MENU** key until Menu Mode is displayed.
*The Menu Mode screen will be displayed.
The Omega LCD Controller will then automatically scroll to the PROGRAMMING screen.*

OLDEST EVENT

- ❑ **View information about the oldest events.** Scroll down the report using the **STATUS/DOWN** key until the OLDEST screen is displayed. Then press the **SCROLL/ENT** key. Go to step 6.
The Omega LCD Controller will display the information on the LCD screen.

PROGRAMMING

- 6 Scroll down the report by pressing the **STATUS/DOWN** key. When you finish viewing the report, press the **MONITOR/MENU** key until the Menu Mode screen is displayed.

Reviewing Count Information

The Omega LCD Controller stores count information for a variety of functions, including the number of times the gate raised, the number of monthly and transient vends occurred, etc. You can review four types of counts under the Counts menu:

- ❑ **Resettable Counts.** Provide count data for a selected time period, such as on a monthly, weekly, or even daily basis. You must reset the counters in the Omega LCD Controller. See “Resetting Counters,” page 68, for the instructions.
- ❑ **Non-Resettable Counts.** Provide count data from the time the gate was first set up in the facility.
- ❑ **Differential Counts** (Single is included in an optional package; Dual is available in a custom configuration.)
- ❑ **Hourly Counts** (available in custom configuration)

The menu items for the Resettable and Non-Resettable counts are exactly the same. Figure 6.8 illustrates a Non-Resettable Counts menu with all of the counts available for the gate. If your gate does not include some of these counters, these items will not be displayed under the COUNTS menu.

Figure 6.8
Omega LCD Controller Non-Resettable/ Resettable COUNTS Menu

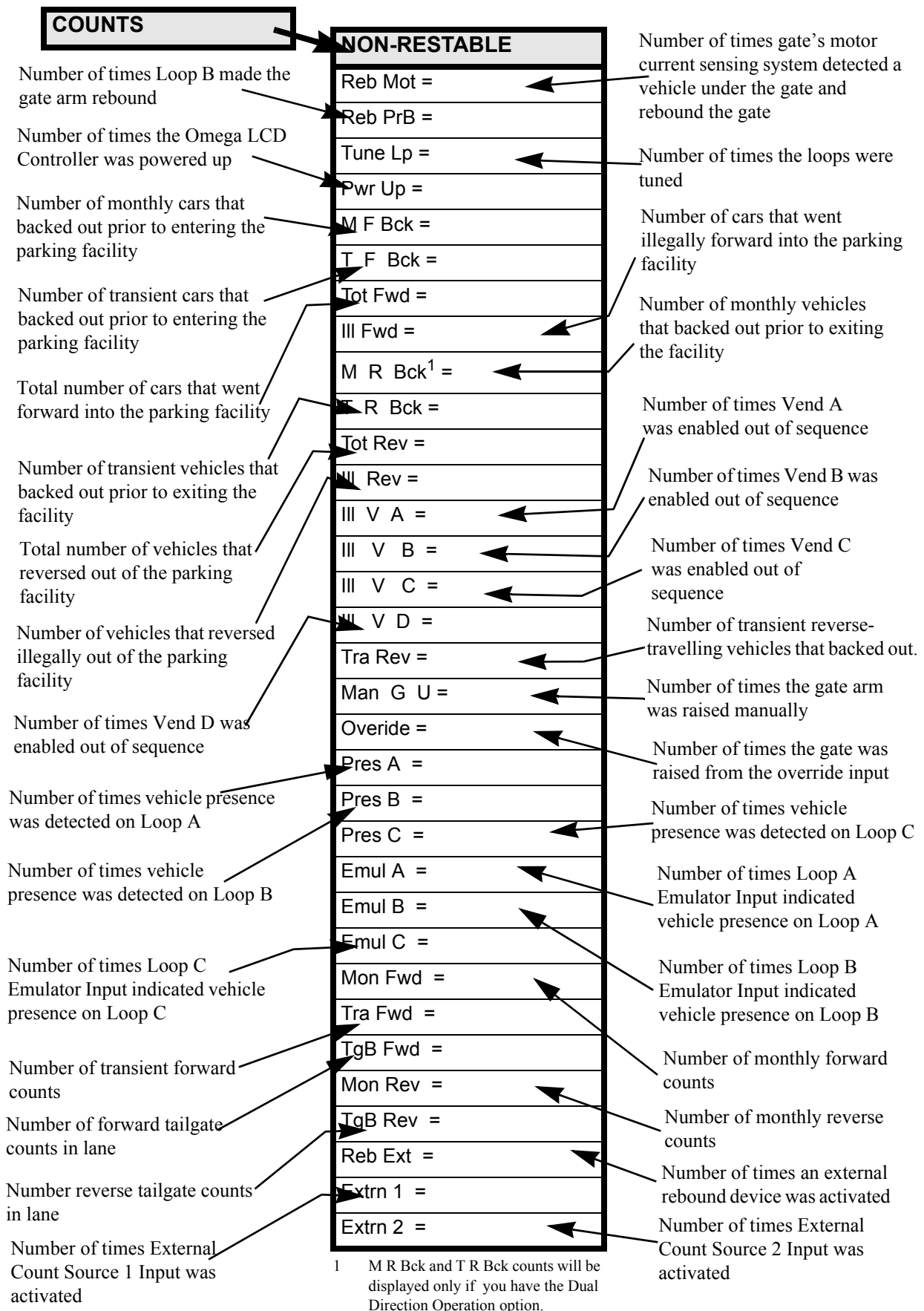
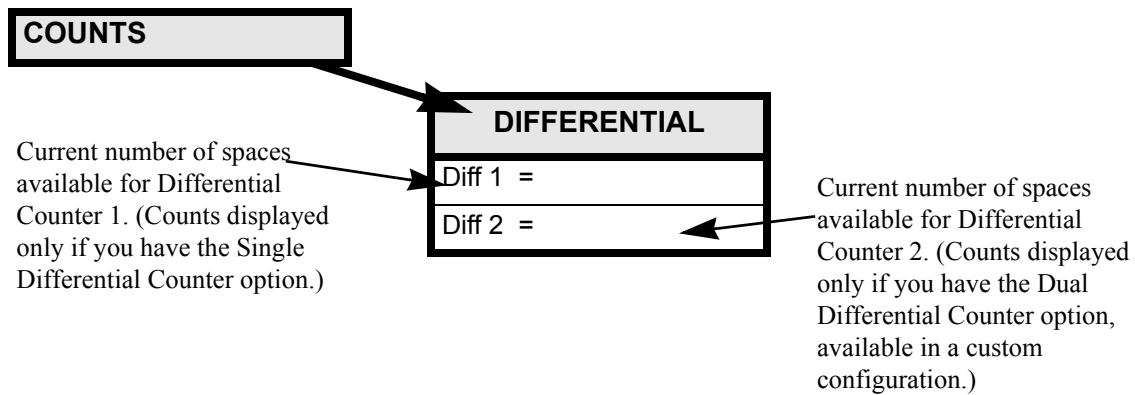


Figure 6.9 illustrates a Differential Counts menu.

Note: If your gate does not include a Differential Counter package, DIFFERENTIAL will not be displayed as an option under the COUNTS menu.

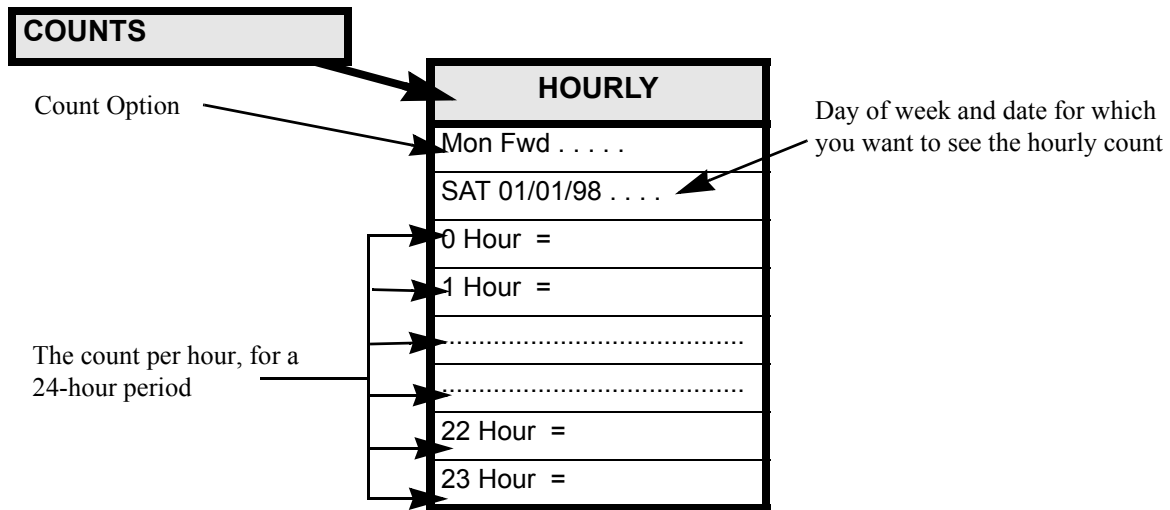
Figure 6.9
Omega LCD Controller Differential COUNTS Menu



The Hourly Counts menu shows the counts *per hour* for all of the hourly counts options you have ordered (available in a custom configuration). For example, if you have ordered the Monthly Forward and Transient Forward counts with your gate, hourly counts for these two options will be displayed under the Hourly Counts menu on the Omega LCD Controller. Figure 6.10 illustrates a sample Hourly Counts menu with the Monthly Forward option.

Note: If your gate does not include any Hourly Count Reports, HOURLY will not be displayed as an option under the COUNTS menu. Hourly counts are available in a custom configuration.

Figure 6.10
Omega LCD Controller Hourly COUNTS Menu



To review Counts information, complete the following steps.

MONITOR MODE....

- 1 Press the **MONITOR/MENU** key until the **MONITOR MODE** screen is displayed.
The MONITOR MODE screen will be displayed.

- 2 Press the **COUNTS/END** key. One of the following will be displayed:
 - ☐ RESETABLE
 - ☐ NON-RESETABLE
 - ☐ DIFFERENTIAL
 - ☐ HOURLY

- 3 Do one of the following:

NON-RESETABLE....

- ☐ **Press the COUNTS/END key until the NON-RESETABLE screen is displayed. Go to step 4.**
The NON-RESETABLE screen will be displayed.

RESETABLE....

- ☐ **Press the COUNTS/END key until the RESETABLE screen is displayed.**
Go to step 4.
The RESETABLE screen will be displayed.

DIFFERENTIAL....

- ☐ **Press the COUNTS/END key until the DIFFERENTIAL screen is displayed.** Go to step 4.
The DIFFERENTIAL screen will be displayed.

HOURLY....

- ☐ **Press the COUNTS/END key until the HOURLY screen is displayed.**
Go to step 4.
The HOURLY screen will be displayed.

4 Do one of the following:

- ☐ **Scroll through the screen, line by line.** Press the **SCROLL/ENT** key.
- ☐ **Scroll through the information automatically.** Hold the **SCROLL/ENT** key until you see the message **SCROLL START**. To end the automatic scrolling, press the **SCROLL/ENT** key until you see the message **SCROLL STOP**.
The Omega LCD Controller will scroll through each of the lines on the screen.

NON-RESETABLE....

- 5** When you finish reviewing the information, return to the screen you first selected by pressing the **COUNTS/END** key.
The appropriate screen will be displayed.

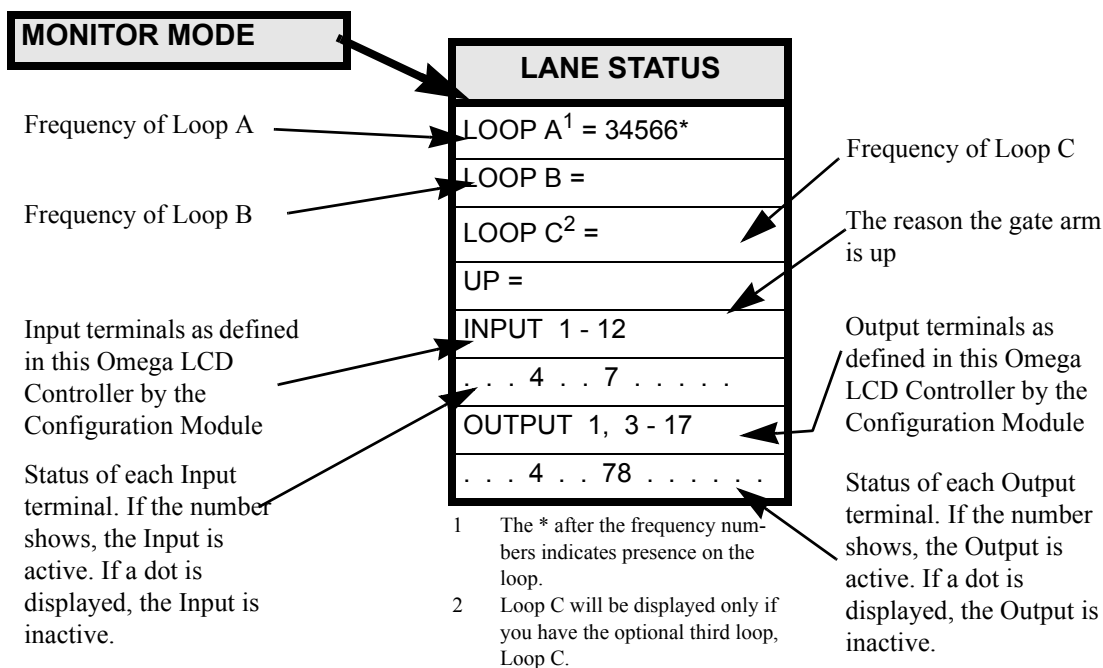
MENU MODE....

- 6 Press the **MONITOR/MENU** key.
The MENU MODE screen will be displayed. The Omega LCD Controller will then automatically scroll to the PROGRAMMING screen.

Viewing Lane Status Functions

The Omega LCD Controller stores information about lane status functions, including the loop frequency, available Inputs and Outputs, and which Inputs and Outputs are active. You can access this information by using the **STATUS/DOWN** key from the Monitor Mode. Figure 6.11 illustrates the menu items that you can review in the MONITOR MODE by using the **STATUS/DOWN** key.

Figure 6.11
Omega LCD Controller LANE STATUS Menu



To review Lane Status information, complete the following steps.

MONITOR MODE

- 1 Press the **MONITOR/MENU** key until the MONITOR MODE screen is displayed.
The MONITOR MODE screen will be displayed.

LANE STATUS

- 2 Press the **STATUS/DOWN** key until the LANE STATUS screen is displayed.

The LANE STATUS screen will be displayed.

3 Do one of the following:

- ☐ **Scroll through the screen, line by line.** Press the **SCROLL/ENT** key.

- ☐ **Scroll through the information automatically.** Hold the **SCROLL/ENT** key until you see the message **SCROLL START**. To end the automatic scrolling, press the **SCROLL/ENT** key until you see the message **SCROLL STOP**.
The Omega LCD Controller will scroll through each of the lines on the screen.

MENU MODE

4 When you finish reviewing the information, press the **MONITOR/MENU** key.
The MENU MODE screen will be displayed. The Omega LCD Controller will then automatically scroll to the PROGRAMMING screen.

Chapter 7: Sending Commands to the Gate

The Omega LCD Controller enables you to send commands to the gate so that you can have additional control over the way your gate operates. When you send this command, the action it initiates occurs immediately. Many commands initiate a condition that stays in effect until you send the opposite command to disable the condition. This chapter contains the following:

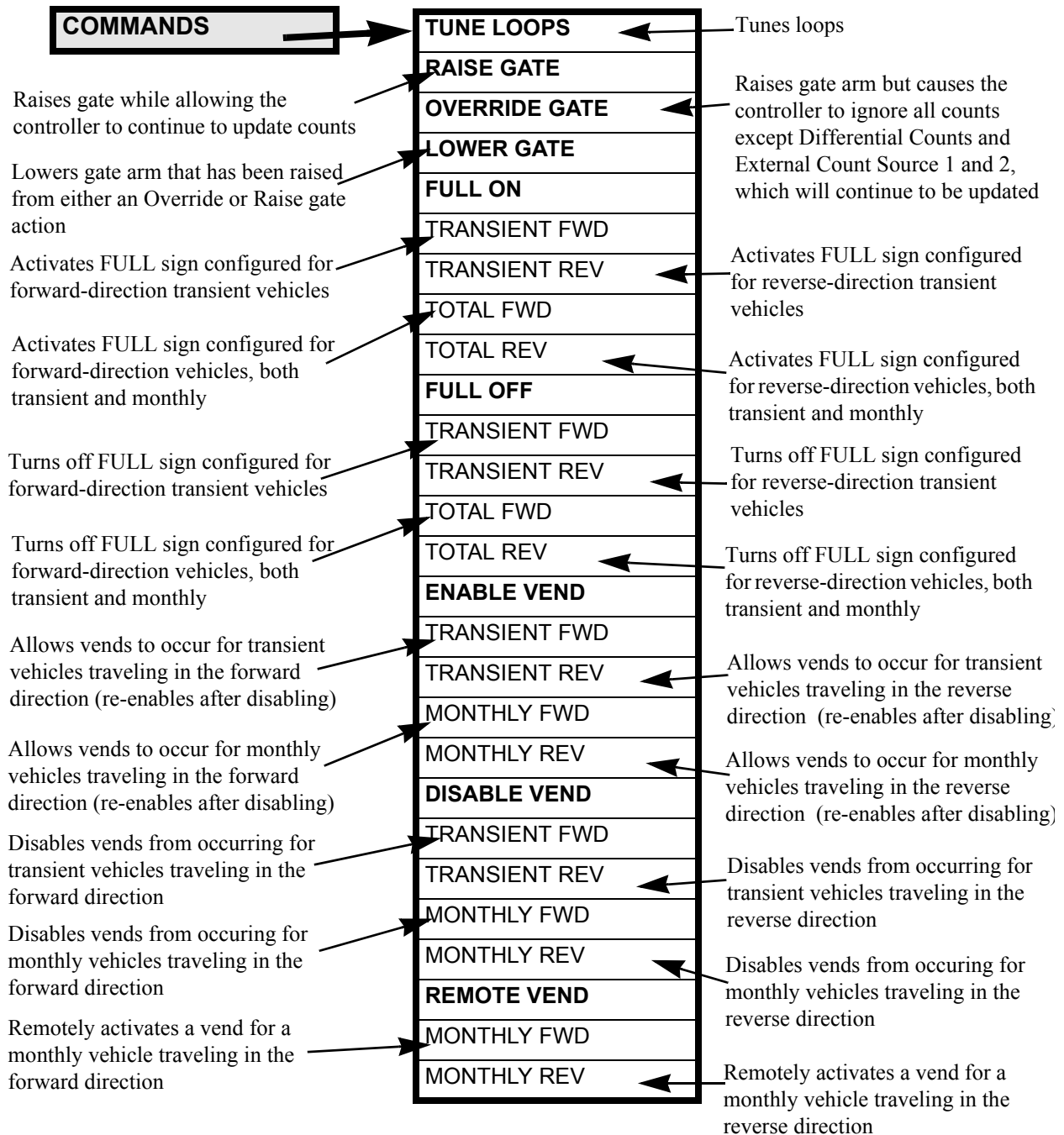
Overview of the Commands Menu.....	101
Sending Commands.....	103

Overview of the Commands Menu

Figure 7.1 illustrates the COMMANDS menu items you can access in the Menu Mode.

Note: Not all commands may be available in your system. Some are dependent on optional features that may not be available in your system.

Figure 7.1
Omega LCD Controller COMMANDS Menu



Sending Commands

To send a command to the G-90 CD Gate, complete the following steps:

MENU MODE

- 1 Hold down the **MONITOR/MENU** key until you are in the MENU MODE. Press the **MISC/UP** key until the COMMANDS screen is displayed.

COMMANDS

- 2 From the COMMANDS screen, press the **SCROLL/ENT** key.
The following screen will be displayed.

TUNE LOOPS

- 3 Send one of the following commands:

- ☐ **Tune the loops.** Press the **MISC/UP** key until TUNE LOOPS is displayed. Then press the **SCROLL/ENT** key to send the command.

RAISE GATE

- ☐ **Raise the gate arm while maintaining counts.** Press the **MISC/UP** key until RAISE GATE is displayed. Then press the **SCROLL/ENT** key to send the command.

OVERRIDE GATE

- ☐ **Raise the gate arm but disable counts.** Press the **MISC/UP** key until OVERRIDE GATE is displayed. Then press the **SCROLL/ENT** key to send the command.

LOWER GATE

- ☐ **Lower the gate arm.** Press the **MISC/UP** key until LOWER GATE is displayed. Then press the **SCROLL/ENT** key to send the command.

FULL ON

- ☐ **Turn on a full sign.** Follow these steps:
 - a Press the **MISC/UP** key until FULL ON is displayed. Then press the **SCROLL/ENT** key.
The first full sign type is displayed.
 - b Press the **MISC/UP** key until the type of full sign you want to turn on is displayed. Then press the **SCROLL/**

ENT key to send the command.

☐ **Turn off a full sign.** Follow these steps:

FULL OFF

- a** Press the **MISC/UP** key until FULL OFF is displayed. Then press the **SCROLL/ENT** key.
The first full sign type is displayed.
- b** Press the **MISC/UP** key until the type of full sign you want to turn off is displayed. Then press the **SCROLL/ENT** key to send the command.

☐ **Enable a vend.** Vends are, by default, enabled. But if you send a command to disable a vend, you must send the command to enable it if you want it to function again. Follow these steps:

ENABLE VEND

- a** Press the **MISC/UP** key until ENABLE VEND is displayed. Then press the **SCROLL/ENT** key.
The first vend type is displayed.
- b** Press the **MISC/UP** key until the type of vend type you want to enable is displayed. Then press the **SCROLL/ENT** key to send the command.

☐ **Disable a vend.** Vends are, by default, enabled. For example, if the transient forward input is activated, the gate vends. If you do not want the gate to vend when the input occurs, you send the Disable Vend command to disable the vend. Follow these steps:

DISABLE VEND

- a** Press the **MISC/UP** key until DISABLE VEND is displayed. Then press the **SCROLL/ENT** key.
The first vend type is displayed.
- b** Press the **MISC/UP** key until the type of vend type you want to disable is displayed. Then press the **SCROLL/ENT** key to send the command.

REMOTE VEND

- ❑ **Activate a vend.** Activating a vend raises the gate until a vehicle drives off the detector loop. Follow these steps:
 - a** Press the **MISC/UP** key until REMOTE VEND is displayed. Then press the **SCROLL/ENT** key.
The first vend type is displayed.
 - b** Press the **MISC/UP** key until the type of vend type you want to activate is displayed. Then press the **SCROLL/ENT** key to send the command.

Chapter 8: Updating Firmware for the Omega LCD Controller

Beginning with revision K, the Omega LCD Controller no longer has a socketed EPROM. Firmware is instead stored in a Flash memory device on the circuit board, so you can load or update firmware via a serial connection from a computer with the FlashProgrammer program.

This chapter contains the following:

Before You Start	107
Installing the FlashProgrammer Program.....	107
Connecting the Computer to the Omega LCD Controller.....	109
Loading Firmware to the Omega LCD Controller	110

Before You Start

To load firmware to the Omega LCD Controller, you must have the following:

- ☐ Laptop or desktop computer with a serial port
- ☐ RS232 serial cable (with special pin-out, available for purchase from Federal APD, part number 52-18433)
- ☐ FlashProgrammer program installed on the computer, available from the Federal APD web site (instructions included in this chapter)
- ☐ Firmware file, available from the Federal APD web site
- ☐ oload.bin file available from the Federal APD web site

Note: The oload.bin file must be located in the same folder as the firmware file.

Installing the FlashProgrammer Program

The FlashProgrammer program allows you to upgrade firmware on the Omega LCD Controller (and other Federal APD devices). You must install this program on the computer you will be using to load the firmware to the Omega LCD Controller. If you do not already have this program installed, install it as follows:

- 1** Obtain the FlashProgrammer Program files from the Federal APD web site, your distributor, or your Federal APD support technician, and copy the files to your computer.

- 2 Double-click the **setup.exe** file from the folder where you copied the FlashProgrammer files. The following window is displayed.

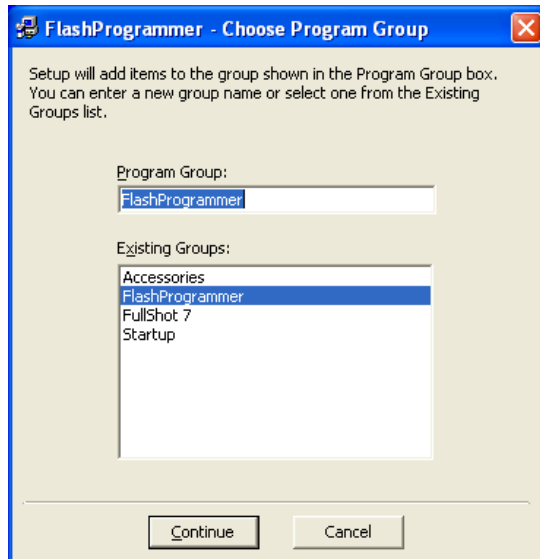


- 3 Click **OK**.

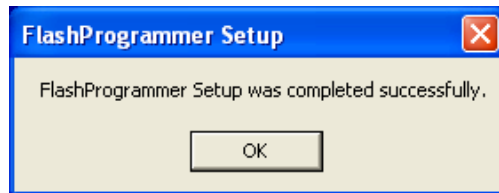


- 4 The program will be installed to the C:\Program Files\FlashProgrammer folder. To use this default, click the installation button. If you want to change the destination, click **Change**

Directory, find and select the folder you want to install to, and then click the installation button.



- 5 Select the program group this application will reside in, and then click **Continue**.



- 6 After the program is installed and the above message box is displayed, click **OK**.

Connecting the Computer to the Omega LCD Controller

Connect the computer with the FlashProgrammer program to the Omega LCD Controller using an RS-232 serial cable.

The cable connects to a communications port on the computer and to the RJ-11 port on the Omega LCD Controller. See Figure 8.2 for the location of this port. Make sure the connection cable has the following pin-out:

Figure 8.1
RS-232 Cable Pin-Out

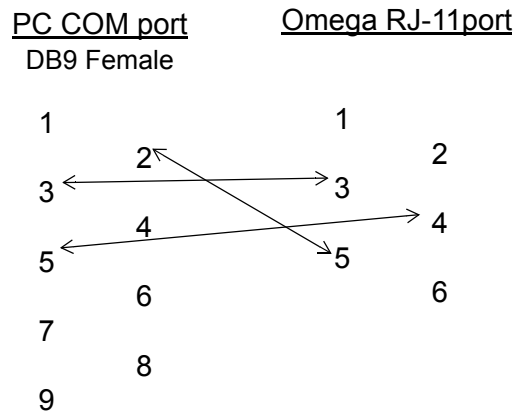
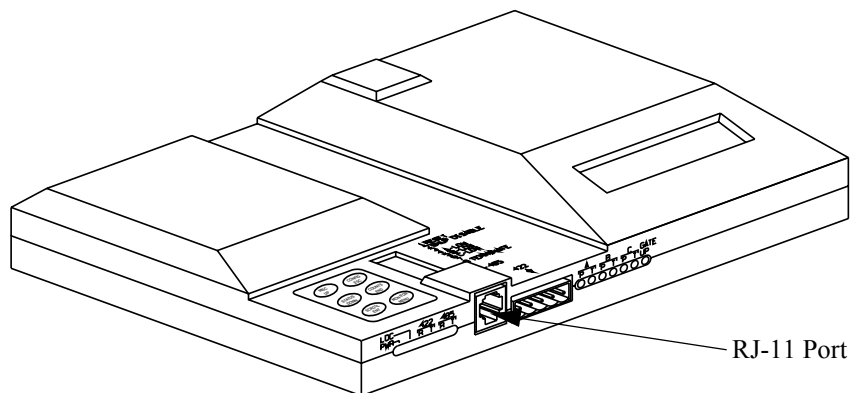


Figure 8.2
RJ-11 Port Location



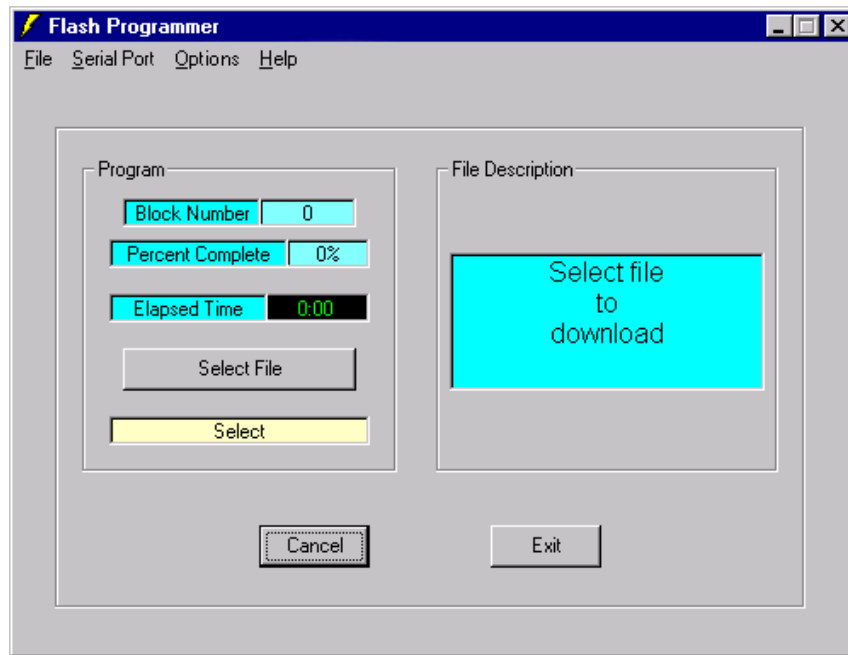
Loading Firmware to the Omega LCD Controller

After you have installed the FlashProgrammer program and connected the computer to the Omega LCD Controller, follow these steps to load the Omega LCD Controller firmware:

- 1 Copy the firmware installation files from the Federal APD web site to the hard drive on the computer you are using to load the firmware.

Note: The oload.bin file must be located in the same folder as the firmware file.

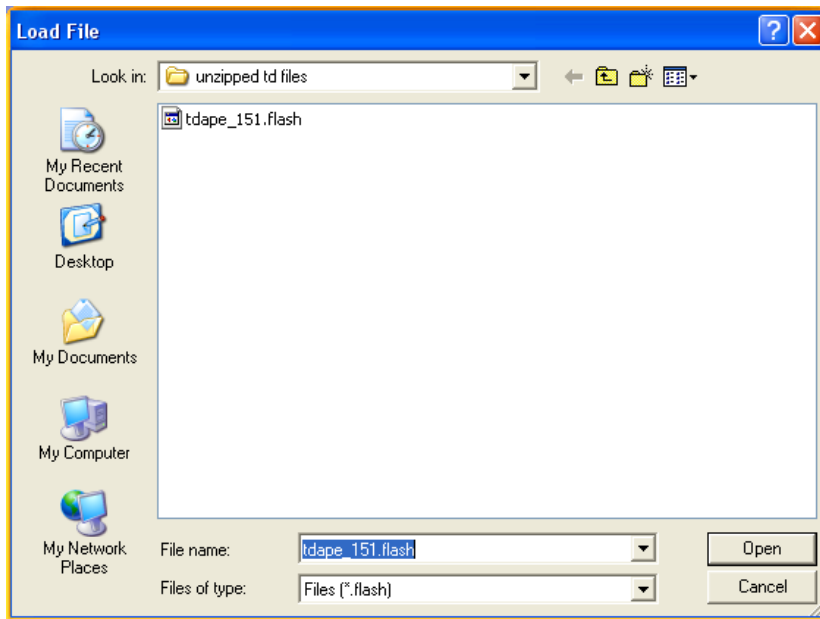
- 2 Disconnect the RS-422 communication cable from the Omega LCD Controller, so that the rest of the system is not affected by the data being transmitted to the Omega LCD Controller from the computer.
- 3 On the Omega LCD Controller, close DIP switch 7.
- 4 Reset the Omega LCD Controller by closing DIP switch 1. Wait about 5 seconds, and then open DIP switch 1 again.
- 5 Start the FlashProgrammer program by clicking Start>Programs>FlashProgrammer. An introduction window is displayed and then the following window is displayed:



- 6 From the **Serial Port** menu, click **Setup**, and make sure that the correct COM port is selected, typically COM 1.
- 7 From the **Options** menu, select **Omega**.
- 8 Either click the **Select File** button, or from the File menu, click **Select File**.

A warning window will be displayed. Make sure you consider it carefully. You must select the correct firmware file for the equipment you want to update, or the device may be inoperative.

Click the warning window to close it, and then a window **similar** to the following will be displayed:



- 9 Select the desired Omega firmware file. The file must end with the “.flash” extension. Then, click **Open**.
- 10 A window will be displayed, confirming your selection. Either click **Continue** to accept your selection, or click **Cancel** to return to the Flash Programmer window.
- 11 After you click Continue, the program will attempt to connect to the device. The message box in the window will display “Connecting...”

Once a connection is established, the message box in the window will display “Downloading...” and it will download the selected firmware file. Do not click Cancel or Exit during the download unless absolutely necessary. The firmware will not be properly updated. If you do click Cancel or Exit, you must start the procedure again with step 4.

During the download, the following will occur:

- ☐ The communication LEDs on the Omega LCD Controller should begin blinking immediately. If they do not, the serial cable may not be connected properly or the correct COM port may not be selected.
- ☐ Within about 20 seconds from the start of the download, the red loop status LEDs should begin blinking rapidly and continue to blink until either the firmware download is complete or an error occurs. If the LEDs do not begin blinking within 20 seconds, an error in the transfer of the bootstrap program may have occurred. If this occurs check the cable connection and DIP switch settings and begin the procedure again with step 2.

If the red loop status LEDs light solidly at any time during the download, an error has occurred, which could be caused by one of the following: a corrupt flash file,

a defective serial port or cable, or electrical noise interfering with the serial data transfer. If this happens, try starting the procedure again with step 4.

If an error occurs during the download, one of the following two error messages will display in the message box in the window:

- ☐ **Download Error.** An error occurred downloading the file or burning the flash. In this case, click **Cancel** and start the procedure again at step 4.
- ☐ **Error.** An error occurred in the connection between the device and the PC. Make sure the cables are connected securely. Click **Cancel**, and start the procedure again at step 4.

12 When the firmware download is complete, the red loop status LEDs should no longer be lit. The message box in the window will display “Download Complete.” When the download is completed, do the following:

- a** On the Omega LCD Controller, open DIP switch 7.
- b** Reset the Omega LCD Controller by closing DIP switch 1. Wait about 5 seconds, and then open DIP switch 1 again.

13 Click **Exit** to close the FlashProgrammer program.

Chapter 9: Diagnostics and Troubleshooting

This chapter contains the following:

Diagnostics	115
Run-Time Diagnostics	115
Manually Running Diagnostics.....	116
Exception Event Report	120
Troubleshooting.....	121
Gate Does Not Operate	121
Gate Arm Raises and Lowers Without Stopping	121
Detector Operates Incorrectly and Adjacent Loop's Vehicles Detected	122
Gate Arm Does Not Travel Far Enough	122
No Text On Omega LCD Display	123
Black Dust Inside Cabinet	124

Diagnostics

Run-Time Diagnostics

The Omega LCD Controller continuously performs run-time diagnostics on all its hardware components while the gate is in operation. If the Omega LCD Controller determines that one or more of these checks has failed or a component is malfunctioning, it sends a message to the Exception Event Report, indicating which component failed and the time of the failure. Table 9.1 lists the messages that will appear if a component fails.

Table 9.1: Run-Time Diagnostics Messages

Message	Description	Solution
Bad Ram	RAM test failed - RAM chip needs replacing.	Call the factory.
Bad Rom	ROM test failed - ROM chip needs replacing.	Call the factory.
Bad Clock	Internal Clock Test failed.	Call the factory.
Slow Cfg	Frequency Error - Config test failed.	Call the factory.
Bad Cfg	Check Sum Error - Config test failed.	Call the factory.
Bad LpA	Loop frequency too high, too low, or unstable in Loop A.	
XPr LpA	Extended presence on Loop A.	Tune Loop A.
Bad LpB	Loop frequency too high, too low, or unstable in Loop B.	
XPr LpB	Extended presence on Loop B.	Tune Loop B.
Bad LpC	Loop frequency too high, too low, or unstable in Loop C.	

Table 9.1: Run-Time Diagnostics Messages (Continued)

Message	Description	Solution
XPr LpC	Extended presence on Loop C.	Tune Loop C.
Vdc Max	110 line voltage too high.	
Vdc Min	110 line voltage too low.	

Manually Running Diagnostics

In addition to run-time diagnostics, you can perform manual diagnostics on the following components:

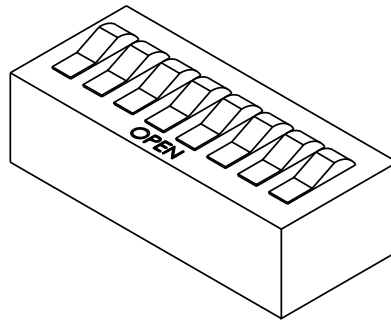
- ☐ Communication Port
- ☐ Input and Output Logic
- ☐ Keypad Keys
- ☐ LCD Display

Follow this procedure to perform manual diagnostics. In addition, to view information that may be helpful to diagnostics, see “Viewing the G-90 CD Gate Diagnostic Information,” page 79.

- 1** Set the DIP Switches on Switch Bank 1 of the Connection Panel in the OPEN position, as shown in Figure 9.1.

Warning! If DIP Switches 6, 7, and 8 are not open, you will be unable to run Communication, Keypad, and Input/Output Diagnostics.

Figure 9.1
DIP Switches in the Open Position

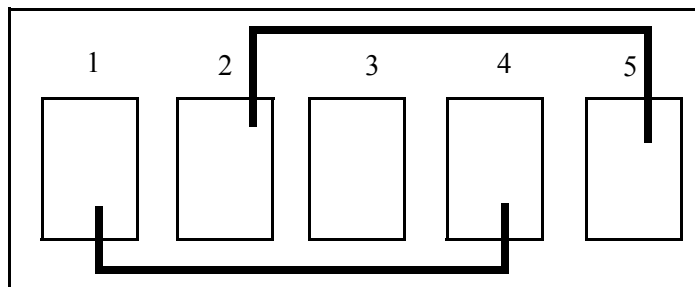


- 2 To test the RS 422 (ScanNet Port Controller) communication port, connect an RS 422 Loopback Connector into the RS 422 communication port of the Omega LCD Controller. Figure 9.2 illustrates an RS 422 Loopback Connector.

Note: If you do not use the RS 422 Loopback Connector, the communications portion of the diagnostics will fail.

Figure 9.2

RS 422 Loopback Connector



- 3 If you are not using an Omega LCD Tester, contact the factory for the appropriate input and output connections in order to run Input/Output diagnostics.
- 4 If you are using an Omega LCD Tester, press the Loop Back switch to close it. The LED on the switch will light to indicate that the switch is closed.

Note: If the Loop Back Test switch is not closed, you will get a lot of failures in the Input/Output diagnostics.

- 5 Cold start the Omega LCD Controller to reset it. Hold down the **MONITOR/MENU** key while powering up the Omega LCD Controller.
- 6 The Omega LCD Controller will begin running diagnostic tests, beginning with the communication test, the LCD display test, the keypad test, and ending with Input/Output diagnostics. The Omega LCD Controller will simultaneously display the Exception Event Report on the LCD display. You will see the following message on the LCD display:

LATEST EVENT

The Omega LCD Controller will begin running Communication Diagnostics.

Communication Diagnostics

If the communication test fails either from a malfunction of the port or a missing Loopback Connector, you see the following message after the “LATEST EVENT” message:

BAD 422 10:23:99

Otherwise, you see the following message on the LCD display:

Pwr Up 10:23:99

The Omega LCD Controller will run the LCD display diagnostics next.

LCD Display Diagnostics

The LCD display will blink and blank out three times successively, as shown below. If one of the “bars” is missing, you may have a problem with the LCD display. Please contact the factory for assistance.



After the Omega LCD Controller has completed the LCD display diagnostics, you will see the following message on the LCD display, as the Omega LCD Controller begins Keypad diagnostics:

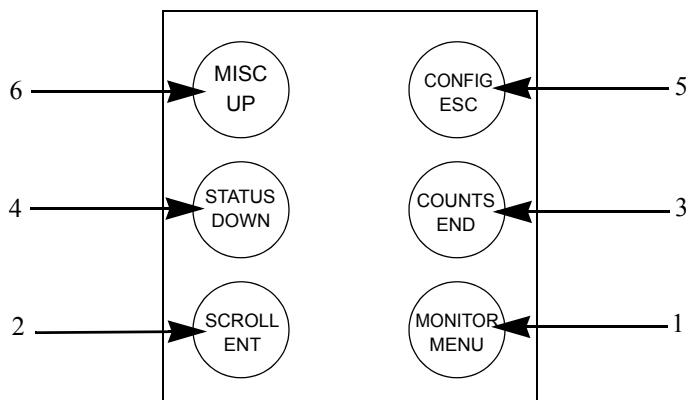
KEYPADS

Keypad Diagnostics

Keypad diagnostics enable you to determine that none of the keys are stuck and the keypad is functioning properly.

Each key on the keypad has a corresponding number, as shown in Figure 9.3

Figure 9.3
Keypad Numbers



To check the operation of each key, press the key. If the key is functioning properly, you will see the number corresponding to the key on the LCD display, as shown below:

KEYPADS . . . 4 . .

If the number does not display when you press a key, the keypad may have an internal malfunction. Please call the factory for assistance.

Note: The only exception to this is key 6. When you press key 6, the number 6 will not display. Pressing key 6 will end Keypad diagnostics and the Omega LCD Controller will begin Input/Output diagnostics.

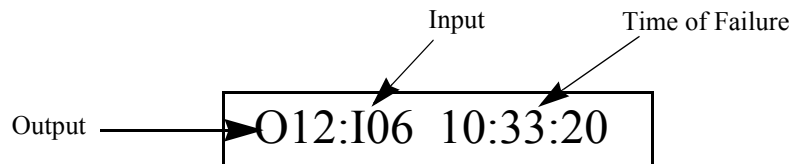
If you do not press a key and still see a number after “KEYPADS,” the key is stuck. If this occurs, press and release the key. If you are unable to release the stuck key, the keypad may have an internal malfunction. Please call the factory for assistance.

Input/Output Diagnostics

If any of the inputs or outputs fail during the diagnostics, you will see a message similar to the one shown in Figure 9.4.

Note: If you do not use an Omega LCD Tester or do not wire the inputs and outputs for testing, it will appear as if all the input/output pairs failed.

Figure 9.4
Sample Input/Output Diagnostic Message



This type of message indicates that there is a failure of *either* the output, identified by the number to the left of the colon, *or* a failure of the input, identified by the number to the right of the colon. If you see this type of message, please contact the factory for assistance.

Note: If the Loop Back Test switch is not on, or closed, it will appear as if all the input/output pairs failed

The Omega LCD Controller will continue to cycle through Input/Output diagnostics until you reset the Omega LCD Controller. The 12v LED on the Omega LCD Tester will turn off for a couple of seconds at the beginning of each test cycle. Follow this procedure to reset the Omega LCD Controller:

- 1 Turn the power to the Omega LCD Controller to OFF.
- 2 Press the Loop Back Test switch on the Omega LCD Tester to open the switch. The LED on the switch will go off to indicate that the switch is open.
- 3 Reset the DIP Switches on Switch Bank 1 of the Connection Panel to their original position.
- 4 Cold start the Omega LCD Controller. Hold down the **MONITOR/MENU** key and turn the power to Omega LCD Controller ON.

The Omega LCD Controller is now ready for normal operation.

Exception Event Report

The Exception Event Report provides a list of all component malfunction and diagnostic events. You can review the diagnostic information in the Exception Event Report during the diagnostics or after you have completed all diagnostics. Refer to Chapter 6: "Viewing Data in the Omega LCD Controller" for instructions on how to access the Exception Event Report.

Troubleshooting

Gate Does Not Operate

If your gate fails to operate, first check the electrical gate function. Put the UP-OFF-AUTO switch on the Connection Panel in the UP position. The gate arm should raise. If it does not raise, check the following:

- ☐ Check the main power supply to ensure that the gate is receiving power, there are no blown fuses, and the wiring is intact.
- ☐ Check the motor circuit breaker at the bottom of the gate motor to make sure that the breaker has not tripped.
- ☐ Check to make sure that the ON-OFF switch on the Connection Panel is in the ON position.
- ☐ Turn off the main power source and check all wiring connections on the Connection Panel. Make sure that all terminal screws are tight and all wires are firmly anchored under the screw. Also check wire connections to the gate and limit switches. Turn on the power and check the electrical gate function again. If you are still unable to obtain a gate cycle, please call the factory for assistance.

Gate Arm Raises and Lowers Without Stopping

If the gate arm raises and lowers without stopping, check the following:

- ☐ Check the limit switches for proper cam adjustment. Refer to Chapter 3: “G-90 CD Gate Electronics Installation” for instructions on cam adjustment.
- ☐ If the limit cams are properly adjusted and the gate continues to raise and lower without stopping, you may have a faulty limit switch. If the gate runs when the limit switch is in the UP position, you may have a faulty up limit switch. If the gate runs when the limit switch is in the AUTO position, you may have a faulty down limit switch. Contact the factory for assistance.
- ☐ Improper belt tension may also cause this problem. Tighten the Vee-belt on the motor. If this does not solve the problem, you may need to replace the Vee-belt and/or pulleys.

If the gate runs properly, raising and lowering when the UP-OFF-AUTO switch is operated, but does not operate as a system (for example, with a Ticket Spitter, Card Reader, etc.) perform diagnostics on the Omega LCD Controller. Refer to Chapter 9: “Diagnostics and Troubleshooting” for instructions on performing diagnostics. If you continue to have problems, please contact the factory for assistance.

Detector Operates Incorrectly and Adjacent Loop's Vehicles Detected

When two or more loops are placed within close proximity of each other and are operating at or near the same frequency, “crosstalk” may occur. Crosstalk causes the detectors to operate incorrectly and detect vehicle presence on the adjacent loop. If you think you are experiencing crosstalk, see “Crosstalk and Loop Coil Frequency,” page 19.

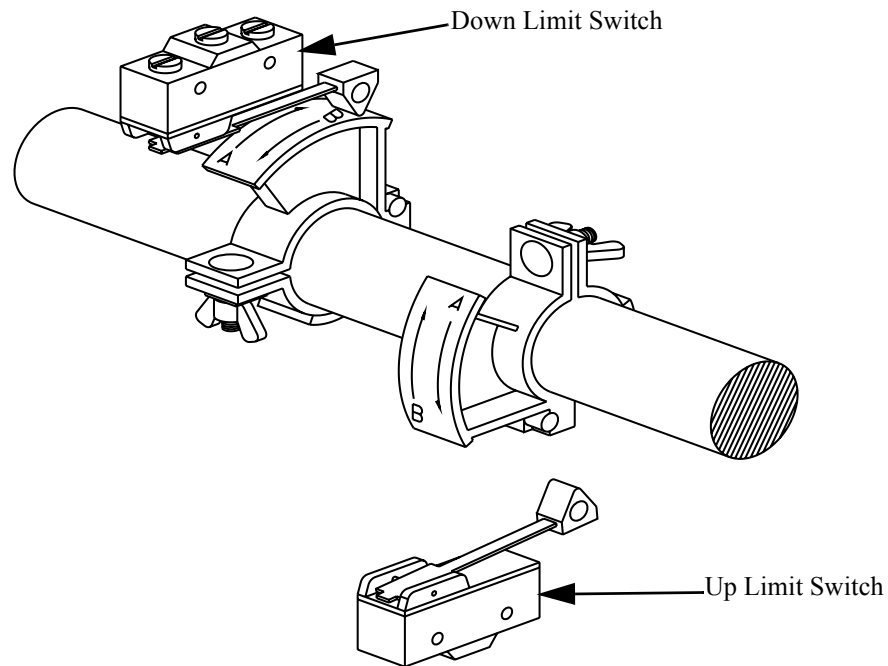
Gate Arm Does Not Travel Far Enough

Extreme temperature changes will affect how far the gate arm travels after the limit switch has been activated. You may find that on the first cold day, the gate arm stops before reaching a horizontal position. If the gate is used infrequently, the lubricant in the speed reducer will not warm up enough to restore the desired arm position. You should adjust the down limit switch to compensate for the temperature change. Refer to Chapter 3: “G-90 CD Gate Electronics Installation” for instructions on limit switch adjustment.

Warning! All power to the gate must be turned off before attempting cam adjustment. Remove the fuse from the Power Supply Assembly. If power is not shut off, severe personal injury may occur.

Check to make sure that the limit switch has not become loose. If the switch is loose, the cam may not depress the limit switch enough to activate it. Adjust the switch if necessary. Figure 9.5 illustrates up and down limit switches.

Figure 9.5
Up and Down Limit Switches



No Text On Omega LCD Display

You may encounter a situation where the Omega LCD display shows only black bars and no text. This can occur upon installation or even suddenly after your G-90 CD Gate has been working properly.

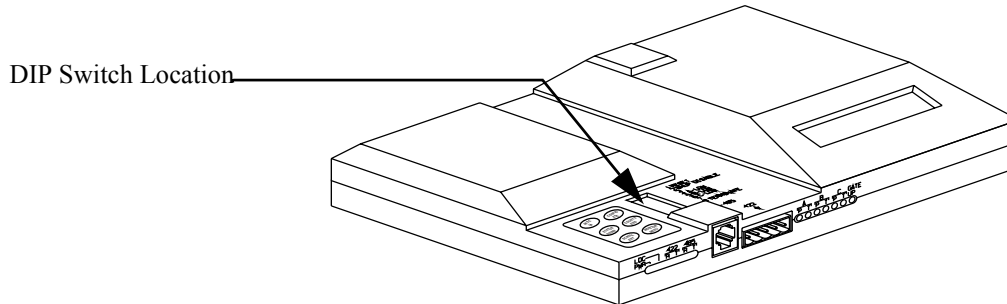
One of the possible reasons for the Omega LCD failure is that the Omega LCD program may have degraded. This happens if the Omega LCD Controller was left unplugged for several weeks, discharging the backup Supercap power. The Supercap did not completely discharge and the Omega LCD program did not totally collapse.

To prevent Omega LCD failure, follow these steps after you have installed your G-90 CD Gate or after you retrieve the Omega LCD Controller from storage:

- 1 Turn the power to the Omega LCD Controller to OFF.

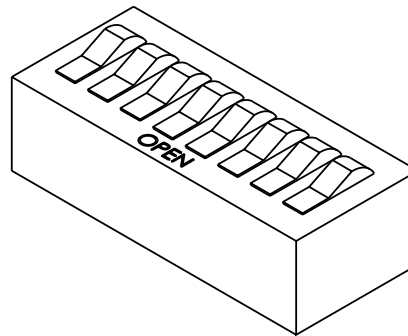
- 2 Close DIP switch 2 on the Omega LCD Controller. Refer to Figure 9.6 for location of the DIP switches.

Figure 9.6
Omega LCD Controller



- 3 Wait for two minutes, then open DIP switch 2. Figure 9.7 shows DIP switches in the Open position.

Figure 9.7
DIP Switches in the Open Position



- 4 Hold down the MONITOR/MENU key while turning the power to the Omega LCD Controller to ON. Continue holding down the MONITOR/MENU key until you can read the configuration module settings.

Black Dust Inside Cabinet

A buildup of black dust inside the cabinet may indicate that the pulleys are misaligned and are cutting the Vee belt. The dust that you see is actually pieces of the belt. Realigning the pulleys should solve the problem.

Chapter 10: Preventive Maintenance

The G-90 CD Gate has been designed to provide years of service. In order to maximize the service of your gate and to ensure the greatest available equipment uptime, follow the prescribed maintenance schedule. This will allow you to perform maintenance at a time of your choosing, and not as a result of a peak-time emergency. Refer to Table 10.1 for a maintenance schedule. You may also use this chart to keep a service record for your gate.

Table 10.1 Maintenance Schedule and Service Record

Gate Serial Number: Config Module Serial Number:				
Maintenance Item	Minimum	Date	Date	Date
Inspect Cabinet for Vehicular Damage	Every 30 days			
Check Belt Tension	Every 30 days			
Check Limit Switches	Every 30 days			
Check Speed Reducer Fluid ^a	Every 30 days			
Check and Tighten Nuts, Bolts, Screws	Every 30 days			
Unplug & Replug Sockets, Cables, Connectors	Every 30 days			
Check Heater and Thermostat ^b	Every 30 days			
Check Power Inputs (max/min)	Every 30 days			
Perform Manual Diagnostics	Every 30 days			
Wash & Wax Cabinet Exterior	Every 3 months			
Spray Omega LCD Controller pins and connectors with Contact Cleaner	Every 3 months			
Spray Configuration Module Connector with Contact Cleaner	Every 3 months			
Check Loop Frequencies ^c (See "Viewing Current Loop Frequencies," page 18.)	Every 6 months			
Change Vee Belts	Every 6 months			
Check Bearings ^d	Every year			
Check Loop Sealant	Every year			

Table 10.1 Maintenance Schedule and Service Record (Continued)

Gate Serial Number: Config Module Serial Number:				
Maintenance Item	Minimum	Date	Date	Date
Check/Replace Loop Wires	Every 4 years			
Replace Gate Cabinet Safety Sticker	Every 4 years			

- a. The Sight Glass located at the top of the Speed Reducer shows an air pocket when the fluid is at an acceptable level. You should not need to drain and refill unless you observe an external leak. If you need to refill the lubricant, use Mobil SHC 634 synthetic gear lubricant. If this is not available, use American Multipurpose Gear Lubricant #80/90. **Do not mix synthetic lubricant with a standard petroleum based gear lubricant.**
- b. When the outside temperature is below 50° F (10° C), place the manual heater switch in the AUTO position during hours of operation to keep the heater running.
- c. At the first sign of any detector malfunction, inaccurate counts, or unusual mechanical noises in the gate, document the problem and contact your Federal APD distributor for service.
- d. Pay special attention to the two bearings in the gate cabinet and the two bearings located between the Speed Reducer and the output shaft. If these bearings wear out, it will produce excessive wear on the Speed Reducer.

Appendix A: Configuration Features

The G-90 CD standard configuration module includes many features. Additional features may be purchased in one of several configuration module packages offered by Federal APD. In addition, a configuration module with custom programming is available. Refer to the *Federal APD Price Book* for more information about configuration module packages. This appendix describes all the configuration features available for the G-90 CD Gate. This appendix contains the following:

Single Differential Counter	127
Dual Differential Counter	127
Dual Direction Operation	127
Communication Options.....	128
Directional Arming.....	128
Third Loop Detector (Loop C)	128
Automatic Time Zone Control Options.....	128
Inputs	129
Outputs	130
Internal Resettable and Non-Resettable Counters.....	133
Hourly Count Reports.....	135

Single Differential Counter

A Differential Counter adds to and subtracts from the total number of spaces in a facility to provide a count of the number of spaces available in the facility or a particular area. This calculation is based on entries and exits.

The Differential Counter is set up with the total number of spaces available. As vehicles enter the facility, the count decreases. As vehicles exit the facility, the count increases. A Differential Counter Output is activated when the count reaches 0.

This option, available in a configuration module package, provides you with one internal differential counter — Differential Count #1 — and includes one Add Input and one Subtract Input.

Dual Differential Counter

The Dual Differential Counter works in the same way as the Single Differential Counter but it provides you with two internal differential counts: Differential Count #1 and Differential Count #2. You can use one counter to count the monthly spaces available and the second counter to count the transient spaces available. The Dual Differential Counter is available in a custom configuration module.

Dual Direction Operation

Dual Direction Operation includes the third loop — Loop C — and Vends C and D Inputs for reverse direction monthly and transient vend inputs. It allows you to use Base Modes 4-6 for lane

operation (See Appendix B: “Lane Operation” for additional information on lane functions.) You can also accurately track reverse direction counts with this option.

Dual Direction Operation is used for two-way lanes with vend devices placed on both sides of the gate. When Dual Direction Operation is used with Loop C, you can arm both forward and reverse direction devices. Dual Direction Operation is available in a configuration module package.

Communication Options

The G-90 CD standard configuration includes a communication feature that allows you to interface with ScanNet Central Management System. The communication option allows the gate to send count information and status conditions to ScanNet, and allows ScanNet to send commands to the gate.

Directional Arming

The G-90 CD standard configuration includes Directional Arming logic, which enables you to arm a device only if the vehicle is traveling in the proper direction. In modes using Directional Arming, the gate will not arm the transient device, usually a Ticket Spitter, unless it sees Presence A followed by Presence C. See Appendix B: “Lane Operation” for sample lane layouts using Directional Arming logic.

Note: A third Loop Detector (Loop C) is required for Directional Arming and is included in this software package.

Third Loop Detector (Loop C)

The G-90 CD standard configuration includes a third loop detector, which provides an additional loop with Pulse and Presence. Loop C may be used in conjunction with the Loop A and Loop B detectors to provide directional counting and/or directional arming. If you use Dual Directional Operation software with this option, Loop C enables the Ticket Spitter to be armed in both the forward and reverse direction of the lane. Refer to Appendix B: “Lane Operation” for sample lane layouts using the Loop C detector.

Automatic Time Zone Control Options

The G-90 CD standard configuration allows the Omega LCD Controller logic to control the following four programmable timer options that require no relay:

- ☐ **Time Zone for Override** allows you to program the Override function that raises the gate without storing counts. It also enables you to deactivate the Override function at particular times.
- ☐ **Raise/Lower Time Zone** allows you to program the Raise/Lower function that raises the gate and continues to store counts. It also enables you to deactivate the Raise/Lower function at particular times.
- ☐ **Monthly Device Time Zone** enables you to program the Omega LCD Controller to activate or deactivate a monthly device at particular times.
- ☐ **Transient Time Zone** enables you to program the Omega LCD Controller to activate or deactivate a transient device at particular times.

Each Time Zone Control option corresponds to 20 actions that enable or disable the function. You define each action by indicating whether the action should enable or disable the function. You also set the time of day and day of the week when the action should take place. For example, you want to lock a Ticket Spitter at night and unlock it for transient use each morning. You would use one action to lock it and another action to unlock it, for a total of two actions each day. You would use a total of 14 actions to enable and disable the Ticket Spitter for the entire week.

Note: Hours for Time Zone options are defined in military time.

Inputs

The G-90 CD gate may use up to 11 inputs, depending which features are programmed into the configuration module. Many inputs are included in the standard configuration module and others are available with a configuration module package or custom programmed configuration module. Refer to “Viewing the Software and Hardware Options,” page 82, to determine which are programmed in your gate’s configuration module. Refer to Table A.1 for a list of all available Inputs.

Refer to your Engineering Package for information on which input features are located on each numbered terminal. *Always refer to your Engineering Package for the exact location of each input function.*

Table A.1: Available Inputs

Input	Description
Vend A	Monthly device forward direction input pulse that signals the gate arm to raise.
Vend B	Transient forward direction device input pulse that signals the gate arm to raise.
Full A	When the Monthly lot is full, this input is activated. It locks out Vend A input signals and does not let any monthly parkers into the facility. The input may be connected to a switch, a Differential Counter, or a Full Output.
Full B	When the Transient lot is full, this input is activated. It locks out Vend B input signals and does not let any transient parkers into the facility.
Raise/Lower	Signals gate arm to raise or lower. When gate arm is raised with a Raise Input signal, counts will continue to be stored.
Override	Signals gate arm to raise. Counts will not be stored when a gate is raised with the Override Input signal.
Rebound	Signals gate arm to raise when external safety edge rebound device is activated.
Ticket Request	Prevents parking patrons from simultaneously using a Ticket Spitter and a monthly card.
Full C	Locks out Vend C Input signals when active.
Full D	Locks out Vend D Input signals. Must be used with all Free In gate operations.

Table A.1: Available Inputs (Continued)

Input	Description
Loop A Emulator	Presence A Input signal from external detection device output acts as a Loop Detector A Input for the G-90 CD Gate.
Loop B Emulator	Presence B Input signal from external detection device output acts as a Loop Detector B Input for the G-90 CD Gate.
Loop C Emulator	Presence C Input signal from external detection device output acts as a Loop Detector C Input for the G-90 CD Gate.
Vend C (Used with Dual Directional Operation)	Reverse device Input pulse that signals the gate arm to raise for Monthly vehicles exiting the facility in a forward direction.
Vend D (Used with Dual Directional Operation)	Reverse device Input pulse that signals the gate arm to raise for Transient vehicles exiting the facility in a forward direction.
External Count Source 1	Internal counter input signal. Counts the number of times Input has been activated.
External Count Source 2	Internal counter input signal. Counts the number of times Input has been activated.
Monitor (Communicating gate only)	Programmable Input used to monitor activities in the facility. A programmable 16-character string message is sent to ScanNet when this Input is activated.
Vend E (Used with ValueCard/Credit Card)	Input signal from ValueCard/credit card use that signals the gate to raise.
In Sense (Used with ValueCard/Credit Card)	Input signal from ValueCard/credit card use that signals the gate to respond to a ValueCard/credit card transaction.
DC1 Add (Used with Single Differential Counter)	Input to Omega LCD Controller differential counter to add a count.
DC2 Sub (Used with Single Differential Counter)	Input to Omega LCD Controller differential counter to subtract a count.

Outputs

The G-90 CD gate may use up to 16 outputs, depending on which features are programmed into the configuration module. Many outputs are included in the standard configuration module and others are available with a configuration module package or custom programmed configuration module. Refer to “Viewing the Software and Hardware Options,” page 82, to determine which are programmed in your gate’s configuration module. Table A.2 lists all Outputs available for the G-90 CD Gate.

See your Engineering Package for information on which output features are located on each numbered terminal. *Always refer to your Engineering Package for the exact location of each output function.*

Table A.2: Available Outputs

Output	Description
Presence A	Use this Output to monitor when a vehicle is detected on Loop A.
Presence B	Use this Output to monitor when a vehicle is detected on Loop B. You can also use it as a safety loop for Swing and Slide gates or an overhead door.
Pulse A	This Output will pulse for approximately 1/4 second when a vehicle is detected on Loop A. It is used mainly as a counter output.
Pulse B	This Output will pulse for approximately 1/4 second when a vehicle is detected on Loop B. It is used mainly as a counter output.
Vend A Enable	This Output enables or disables the monthly device for vehicles traveling in a forward direction. May be used for Interlock. We recommend that you use the Vend Enable Output instead of the Presence A Output to interlock a device. Presence A closes only if a vehicle is on Loop A, whereas Vend Enable provides the following additional checks to ensure that the device is enabled: ☐ Vend enable/disable command status ☐ Full Command and communication status ☐ Directional status and position of vehicles in the lane
Vend B Enable	This Output enables or disables the transient device for vehicles traveling in a forward direction.
Monthly Forward Count	Counter output for total number of monthlies traveling in a forward direction over the loops with a valid vend.
Transient Forward Count	Counter output for total number of transients traveling in a forward direction over the loops with a valid vend.
Illegal Reverse Count	Counter output for total number of monthlies and transients traveling in a reverse direction over the loops which did not have a valid vend. (For example, the gate was broken.)
Illegal Forward Count	Counter output for total number of monthlies and transients traveling in a forward direction over the loops which did not have a valid vend. (For example, the gate was broken.)
Presence C Output	Use this Output to monitor when a vehicle is detected on Loop C.
Pulse C Output	Use this Output to count the number of times a vehicle was detected on Loop C.

Table A.2: Available Outputs (Continued)

Output	Description
Monthly Forward Back-Out Count	Counter output for total number of monthlies traveling over the loops in a forward direction with a valid vend but then backing out. For example, On A, Off A, or On A, On B, Off B, Off A. When you are using Anti-Passback in a monthly access system, you may detect backouts of <i>host-based</i> monthly cards by programming a Monitor input in the reader. When you do this, a message will appear in the ScanNet Monitor window, and the card ID will be updated with the correct in/out status, allowing Anti-Passback to accurately prevent misuse. For this to work, the G-90 CD gate must have a configuration module with the Monthly Forward Backout output, and the gate output must be wired to the input on the reader. Also, you must be using ScanNet version 5.0 or later, and you must be running CAMP.
Transient Forward Back-Out Count	Counter output for total number of transients traveling over the loops in a forward direction with a valid vend but then backing out. For example, On A, Off A, or On A, On B, Off B, Off A.
Monthly Reverse Back-Out Count	Counter output for total number of monthlies traveling over the loops in a reverse direction with a valid vend but then backing out. For example, On B, Off B, or On B, On A, Off A, Off B.
Transient Reverse Back-Out Count	Counter output for total number of transients traveling over the loops in a reverse direction with a valid vend but then backing out. For example, On B, Off B, or On B, On A, Off A, Off B.
Monthly Reverse Count	Counter output for total number of monthlies who travelled in a reverse direction, with a valid vend, over the loops.
Transient Reverse Count	Counter output for total number of transients who travelled in a reverse direction, with a valid vend, over the loops.
Total Reverse Count	Counter output for total number of monthlies and transients who travelled in a reverse direction over the loops. Count also includes illegal reverse.
Total Forward Count	Counter output for total number of monthlies and transients who travelled in a forward direction over the loops. Count also includes illegal forward.
Vend C Enable Output	This output enables or disables the monthly device for vehicles traveling in the reverse direction in a dual direction lane.
Vend D Enable Output	This output enables or disables the transient device for vehicles traveling in the reverse direction in a dual direction lane.
Transient Forward Full Output (Communicating gate only)	This output allows you to use the extra high voltage relay offered in the gate to turn on the "Transient Full" signs when transient spaces in a facility are no longer available. This output may be driven by ScanNet's Count Control system. When transient space becomes available, the output is deactivated. This deactivates the gate's high voltage, which then turns the "Transient Full" sign off.
Lot Forward Full Output (Communicating gate only)	This output allows you to use the extra high voltage relay offered in the gate to turn on the "Full" signs when monthly and transient spaces in a facility are no longer available. This output may be driven by ScanNet's Count Control system. When monthly or transient space becomes available, the output is deactivated. This deactivates the gate's high voltage, which then turns the "Full" sign off.

Table A.2: Available Outputs (Continued)

Output	Description
Transient Reverse Full Output (Communicating gate only)	This output allows you to use the extra high voltage relay offered in the gate to turn on the “Transient Full” or some other signs when transient spaces in a particular area are no longer available. This output may be driven by ScanNet’s Count Control system or a command from ScanNet. When transient space becomes available, the output is deactivated. This deactivates the gate’s high voltage, which then turns the “Transient Full” sign off.
Lot Reverse Full Output (Communicating gate only)	This output allows you to use the extra high voltage relay offered in the gate to turn on the “Full” or some other signs when monthly or transient spaces in a particular area are no longer available. This output may be driven by ScanNet’s Count Control system. When monthly or transient space becomes available, the output is deactivated. This deactivates the gate’s high voltage, which then turns the “Transient Full” sign off.
Time Zone Output	This output may be used to activate Full signs, disable transient devices at night, or turn on a closed circuit TV camera (CCTV) at a preprogrammed time each day. Since this is a continuous output, not a pulse output, it will remain activated until the programmed time has elapsed. Two timer outputs are available. Each Time Zone Control option corresponds to 20 actions that enable or disable the function. You define each action by indicating whether the action should enable or disable the function. You also set the time of day and day of the week when the action should take place. For example, you want to lock a Ticket Spitter at night and unlock it for transient use each morning. You would use one action to lock it and another action to unlock it, for a total of two actions each day. You would use a total of 14 actions to enable and disable the Ticket Spitter for the entire week. <i>Note:</i> Hours for Time Zone options are defined in military time.
Differential 1	This output is activated when the difference between the total number of spaces in the facility and the number of occupied spaces is zero, based on counts in the Omega LCD Controller differential counter.
Vend E Enable	This output enables the ValueCard/credit card device for vehicles traveling in a forward direction.

Internal Resettable and Non-Resettable Counters

Internal Resettable and Non-Resettable Counters are stored in the Omega LCD Controller’s memory. Each counter acts as an accumulating counter and can store 999,999 counts before

returning to zero and beginning the counts again. Refer to Table A.3 for a list of all available internal counters.

Table A.3: Available Resettable and Non-Resettable Counts

Count	Description
Pres A	Number of times vehicle presence was detected on Loop A.
Pres B	Number of times vehicle presence was detected on Loop B.
Pres C	Number of times vehicle presence was detected on Loop C.
Emul A	Number of times the Loop A Emulator input indicated vehicle presence from external detection device A.
Emul B	Number of times the Loop B Emulator input indicated vehicle presence from external detection device B.
Emul C	Number of times the Loop C Emulator input indicated vehicle presence from external detection device C.
Mon Fwd	Number of Monthly Forward Counts (Card Reader Vend A)
M F Bck	Number of Monthly Forward Back-Out Counts
Tra Fwd	Number of Transient Forward Counts (Ticket Spitter Vend B)
T F Bck	Number of Transient Forward Back-Out Counts
Tot Fwd	Total number of Transient and Monthly vehicles which traveled in forward direction in the lane.
Ill Fwd	Number of illegal forward counts (vehicle crashing through the gate without a vend).
TgB Fwd	Number of times a vehicle tailgated through lane over Loop B in a forward direction.
Mon Rev	Number of Monthly reverse counts (Card Reader Vend C).
M R Bck	Number of Monthly reverse back-out counts.
Tra Rev	Number of Transient reverse counts (Ticket Spitter Vend D).
T R Bck	Number of Transient reverse back-out counts.
Tot Rev	Total number of Monthly and Transient reverse counts.
Ill Rev	Number of illegal reverse counts (vehicle crashing through the gate or exiting without a vend when gate arm is up).
TgB Rev	Number of reverse tailgate counts in the lane.
Ill V A	Number of illegal Vend A Inputs (card holder used card without vehicle presence in forward Vend A).
Ill V B	Number of illegal Vend B Inputs (ticket pulled from spitter without vehicle presence in forward Vend B).
Ill V C	Number of illegal Vend C Inputs (card holder used card without vehicle presence in reverse Vend C).
Ill V D	Number of illegal Vend D Inputs (ticket pulled from spitter without vehicle presence in reverse Vend D).

Table A.3: Available Resettable and Non-Resettable Counts (Continued)

Count	Description
Gate Up	Number of times gate was raised by a legal vend. This count includes overrides and rebounds but not illegal events such as tailgates.
Man G U	Number of times gate was raised manually.
Override	Number of times the gate was raised from the Override Input.
Reb Ext	Number of times an external rebound device was activated.
Reb Mot	Number of times the gate's motor current sensing system detected a vehicle under the gate's arm and rebounded the gate.
Reb PrB	Number of times the gate rebounded due to detection of presence on Loop B.
Tune Lp	Number of times the loops were tuned.
Pwr Up	Number of times the CPU in the Omega LCD Controller went through a power cycle of DIP Switch reset procedure.
Extrn 1	Number of times External Count Source 1 Input was activated.
Extrn 2	Number of times External Count Source 2 Input was activated.
R/L Input	Number of times the Raise/Lower Input occurred.
Reb Input	Number of times the Rebound Input occurred.

Hourly Count Reports

Hourly Count Reports are available in custom configuration modules. They enable you to store total hourly counts for up to eight internal counters in each gate (chosen from the list of resettable and non-resettable counts in Table A.3). Each counter will store the activity for the last seven days. You can generate a statistical report detailing the total hourly counts for each of the count features you select.

Note: If you have the Single Differential Counter and Dual Differential Counter features you can also store Starting, Hourly Minimum, or Hourly Peak Counts in Hourly Count Reports.

Appendix B: Lane Operation

The G-90 CD Gate has a variety of features which allow you total control of your facility. This chapter provides information on Connection Panel DIP Switch settings, device and loop placement, and a brief description of lane options. This appendix contains the following:

Mode Logic	137
Directional Logic.....	138
Setting Connection Panel DIP Switches for Lane Operation (Base Modes and Sub Modes)	
138	
Vends	138
Lane Layout Samples	141
Figure B.1 Pay In No Arming	141
Figure B.2 Pay In/Free Out	142
Figure B.3 Pay In with Arming Loop for Auto Spitter Only	143
Figure B.4 Pay In w/Arming Loop for Push-Button Spitter/Card Reader	144
Figure B.5 Pay In with Arming Loop for Spitter Only	145
Figure B.6 Pay Out with Arming Loop for Reader and Fee Computer	146
Figure B.7 Pay Out with Arming Loop for Fee Computer Only.....	147
Figure B.8 Free Gate with Opening Loop	148
Figure B.9 Pay Operation w/Arming Loop for Card Reader/Auto Spitter.....	149
Figure B.10 Special Wiring for Base Mode 2 - Sub Mode 2	150
Figure B.11 Escape Lane.....	151
Figure B.12 Pay In w/Directional Arming for Push-Button Spitter/Card Reader.....	152
Figure B.13 Pay In with Directional Arming for Auto Ticket Spitter Only.....	153
Figure B.14 Pay In/Pay Out, Single Loop.....	154
Figure B.15 Pay In/Pay Out with Arming Loop for Auto Spitter Only	155
Figure B.16 Pay In/Pay Out w/Arming for PB Ticket Spitter & Card Reader Only.....	156
Figure B.17 Pay In/Pay Out with Arming for Entry Ticket Spitter/Reader and Exit Reader/Fee Computer.....	157
Figure B.18 Pay In/Pay Out with Arming Loop for Entry Auto Spitter and Exit Reader/ Fee Computer	158
Figure B.19 Pay In/Pay Out with An Arming Loop for Entry Auto Ticket Spitter and Exit Fee Computer	159
Figure B.20 Pay In/Pay Out w/Arming for Entry Reader, Auto Spitter Only.....	160
Figure B.21 Pay In/Pay Out with Escape Lane Entry	161
Figure B.22 Pay In/Pay Out w/Directional Arming for Entry Spitter/Card Reader.....	162
Figure B.23 Pay In/Pay Out w/Directional Arming for Entry Auto Spitter Only	163

Mode Logic

The G-90 CD Gate has expanded mode logic with a number of features. Some of these features are:

- ❑ The Omega LCD Controller provides programmable back-out timers to prevent the gate from resetting if a car gets between loops.

- ❑ The Omega LCD Controller also provides a back-out timer for operation without an arming loop.
- ❑ Directional Loop arming logic includes a reset loop that recognizes a back-out condition even if a vehicle moves completely off dual arming loops and onto the reset loop prior to backing out.
- ❑ The Ticket Request Input prevents the operation of any other entry control device once the Ticket Spitter has been vended. This prevents someone from pushing the button on the Ticket Spitter to dispense a ticket, then using the Card Reader to vend the gate prior to pulling the ticket.

Directional Logic

Directional Logic provides you with the following features for additional lane operation control:

- ❑ The directional logic feature allows the Omega LCD Controller to recognize the direction of vehicle traffic over the loops. Used with a free exit gate, this feature prevents the gate from vending if a vehicle drives far enough under the arm to activate the opening loop from the wrong direction.
- ❑ Because of the Directional Arming option, the Omega LCD Controller requires the vehicles to travel in a specific direction over the loops (on Loop A, on Loop C) to arm the vend device(s). The Dual Direction Operation option, along with the Omega LCD Controller's directional logic, allows you to control a reversing lane with a single barrier gate and also allows you to monitor and control devices on either side of the gate.

Setting Connection Panel DIP Switches for Lane Operation (Base Modes and Sub Modes)

The Base Mode generally refers to the placement of the loop or loops in the lane. Sub Mode generally refers to the placement of devices in the lane.

DIP switches 1-3 on Switch Bank 1 of the Connection Panel determine the Base Mode of the lane operation, while DIP Switches 4 and 5 on Switch Bank 1 of the Connection Panel determine the Sub Mode of the lane. For more information about how to set these DIP switches, see "Setting the DIP Switches for Base Mode/Sub Mode," page 37.

Note: Configurations which use Vends C and D require the Dual Direction software package. Configurations which use Loop C require the Third Loop software package. If your gate is not ordered with these options, you will be unable to use Base Mode - Sub Mode configurations which use Vends C and D and or Loop C.

Vends

If you do not use the appropriate vend inputs for devices, as shown in the lane configurations on the following pages, the Omega LCD Controller will not interpret counts correctly and the lane

will not function properly. For example, you should not use a Card Reader, which is a Vend A, as Vend B. Refer to Table B.1 for a description of the different vends.

Table B.1: Vends

Vend	Description
Vend A	Monthly device (Card Reader) in forward direction ¹
Vend B	Transient device (Ticket Spitter, Fee Computer, Token Unit, Coin Acceptor) in a forward direction
Vend C	Monthly device (Card Reader) in a reverse direction
Vend D	Transient device (Fee Computer, Token Unit, Coin Acceptor) in a reverse direction

¹ The Omega LCD Controller considers vehicle travel on A then B as a forward count, regardless of the position of the devices in the lane. Similarly, B to A travel is always considered a reverse count.

In the sample layout drawings on the following pages, possible device/vend configurations are shown. However, you need not use all the vends available in a particular configuration if the application does not require it. For example, Figure B.4 shows Base Mode 2 - Sub Mode 3 with a Push-Button Spitter and Card Reader in a lane. Figure B.5, Figure B.6, Figure B.7, and Figure B.8 show this same Base Mode - Sub Mode configuration with different device combinations.

Setting Vend B Enable Output to Pulse

The Vend B Enable Output for the Omega LCD Controller enables the transient (Vend B) device. This output may be set to either the Pulse or Presence output signal.

Note: Vends A, C, and D are always Presence Vend Enable outputs.

Both Auto and Push-Button Ticket Spitters require a Pulse signal from the Vend B Enable output. Auditors, and Coin and Token Units require Presence for Vend B Enable output.

For Auto Ticket Spitters, Vend B Enable should be a Pulse signal. However, when a vehicle drives onto the arming loop, the Ticket Spitter automatically issues a ticket.

Note: The Omega LCD Controller ignores the Ticket Request input in modes defined for Auto Ticket Spitters.

For Push-Button Ticket Spitter modes, a Ticket Request Input signal is required before Vend B Enable output will pulse to allow the Ticket Spitter to issue a ticket. The Ticket Request Input is activated when the push button is pressed.

Setting Vend B Enable Output to Presence

For all transient devices except ticket spitters (Fee Computers, Token Units, Coin Units), you must set Vend B Enable for Presence. To set Vend B Enable for Presence, follow this procedure:

- 1 Install a jumper between Input #7 (Ticket Request Input) and Input #13 (Input Common).
- 2 Cold start the Omega LCD Controller. Hold own the **MONITOR/MENU** key while powering up the Omega LCD Controller.

Lane Layout Samples

Figure B.2 - Figure B.8 provide examples of one-way, two loop lanes. Figure B.9 - Figure B.13 show examples of one-way, three loop configurations. Figure B.14 - Figure B.23 provide examples of two-way lane configurations for single loop, two loop, and three loop configurations. The configurations shown in Figure B.15 - Figure B.23 are available in the G-90 CD Gate only if Dual Direction Operation software is included in the gate.

Note: The devices shown in these diagrams are examples of typical lane operation. Your actual operation may require devices which differ from those shown. For example, the diagram may show a Ticket Spitter in the forward direction of the lane for transient Vend B. However, you could also use a Fee Computer for a transient Vend B in this configuration

Figure B.1
Pay In No Arming
(Base Mode 1 - Sub Mode 1)
 SKB 1647

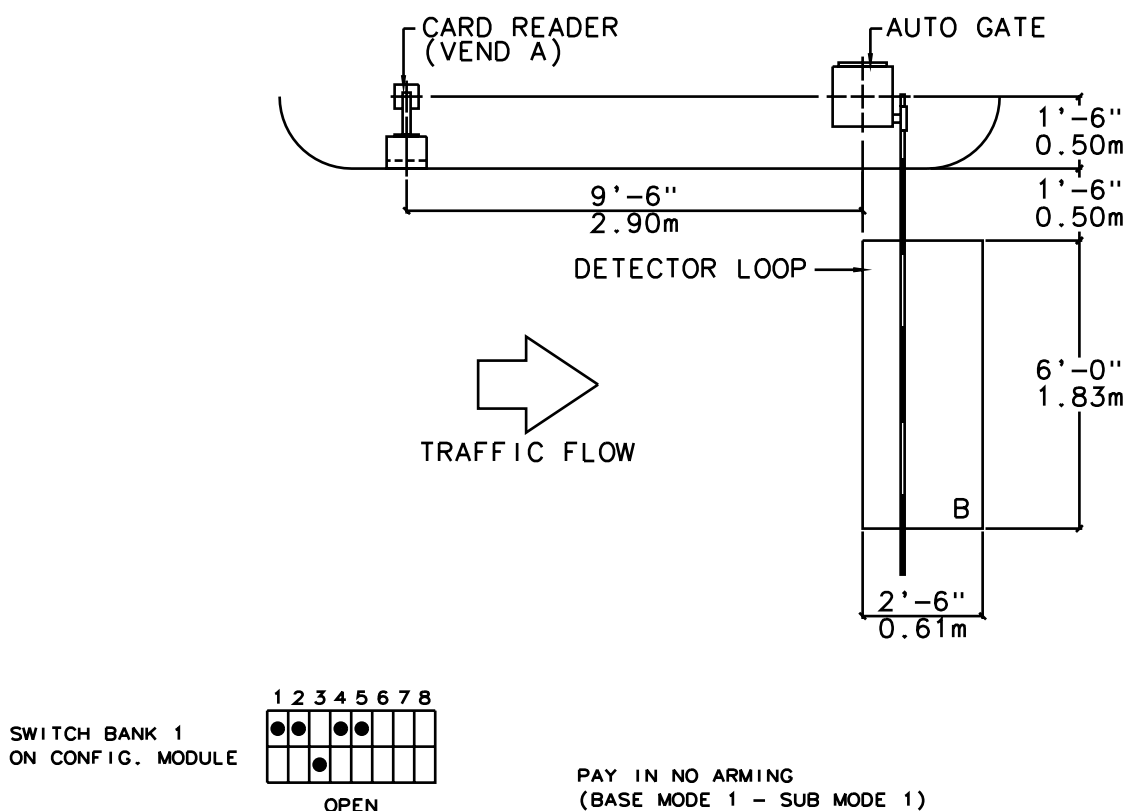


Figure B.1 shows a single detector loop, for a one-way exit or entry lane for controlling monthly (Vend A) and/or transient (Vend B) traffic. As only one loop is used, the entry control devices are always enabled.

Only Vend A is used in the example.

Figure B.2
Pay In/Free Out
(Base Mode 2 - Sub Mode 1)
 SKB-1648

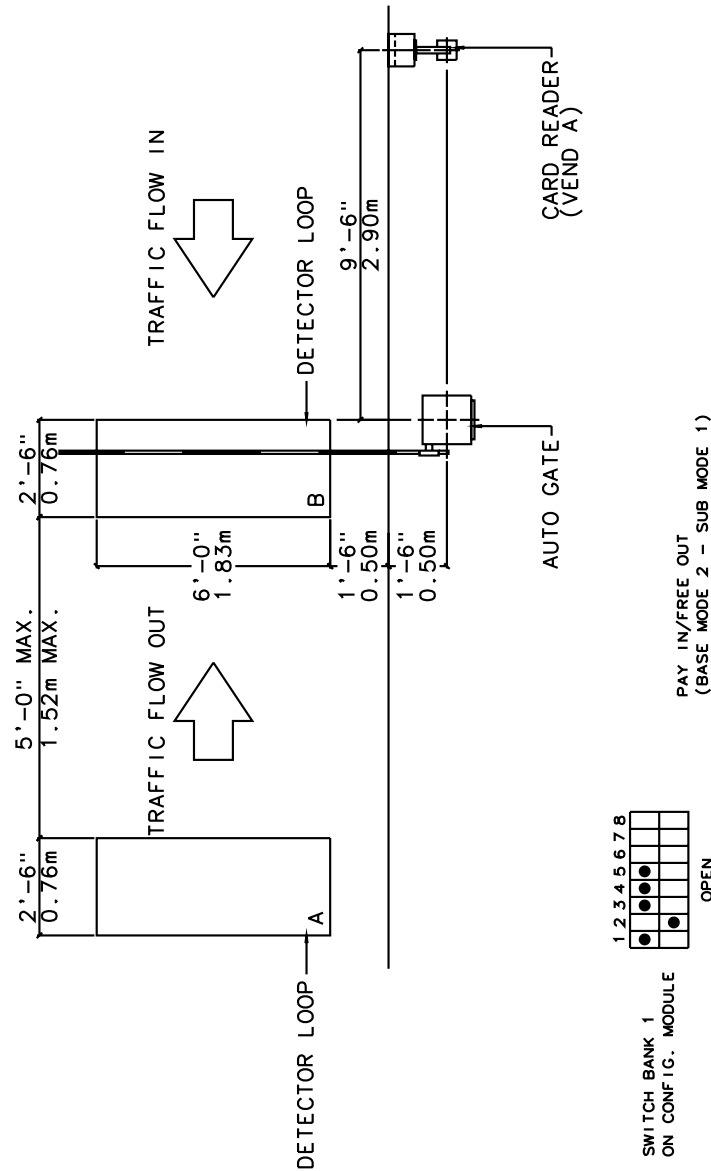


Figure B.2 shows a two-way lane with entry control device and automatic fee exit vend. Vend A or Vend B opens the gate in the entry direction. (This example shows only Vend A.) Presence on Loop A vends the gate for free exit. Counts for free exit are forward counts.

Note: In this configuration, the monthly/transient entry counts will be reverse counts as the Omega LCD Controller always considers A to B vehicle travel as a forward count regardless of the position of devices in the lane. Similarly, B to A travel is always considered reverse counts.

This configuration can also be used for a Free In/Pay Out lane.

Figure B.3
Pay In with Arming Loop for Auto Spitter Only
(Base Mode 2 - Sub Mode 2)
 SKB-1649

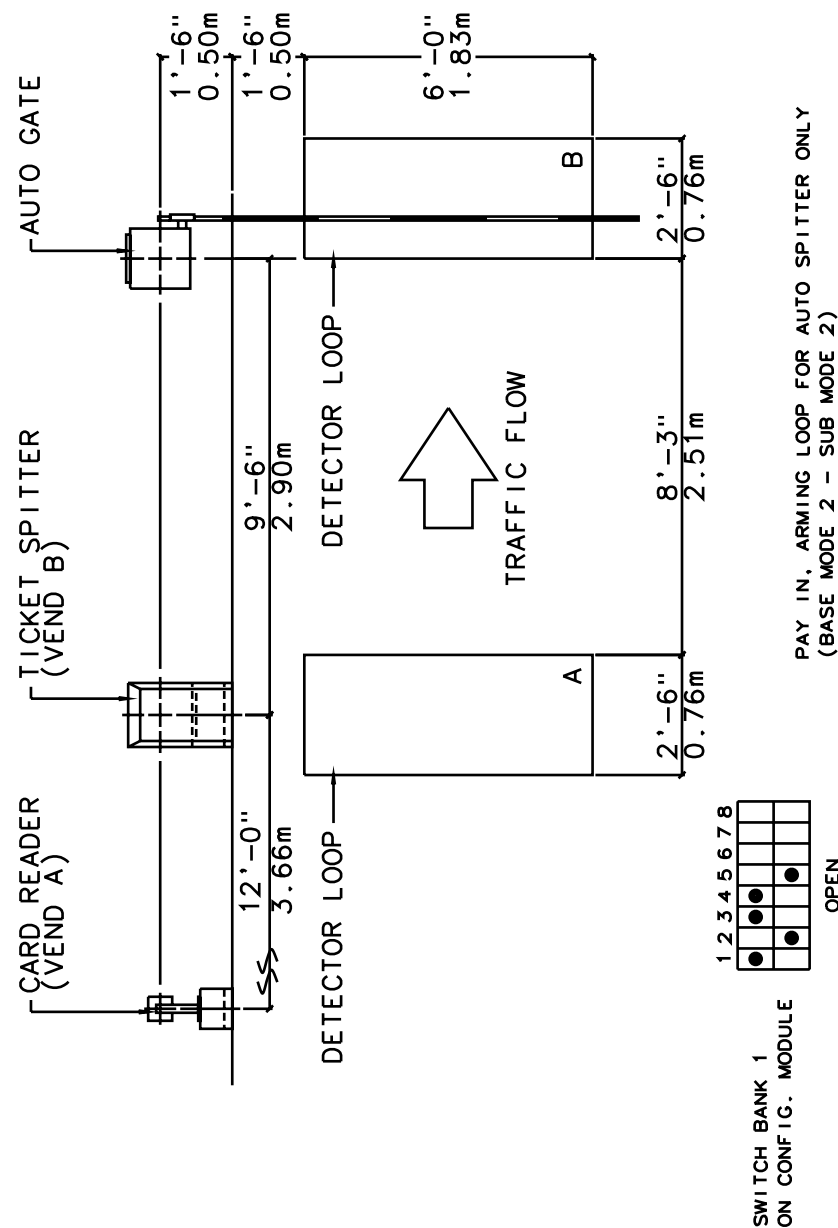


Figure B.3 shows a one-way lane with a remote Card Reader followed by an auto Ticket Spitter. Unless the Card Reader has been used, the Ticket Spitter automatically issues a ticket when a car drives onto Loop A in the forward direction. The gate arm lowers after the vehicle clears Loop B.

Figure B.4
Pay In w/Arming Loop for Push-Button Spitter/Card Reader
(Base Mode 2 - Sub Mode 3)
 SKB-1650

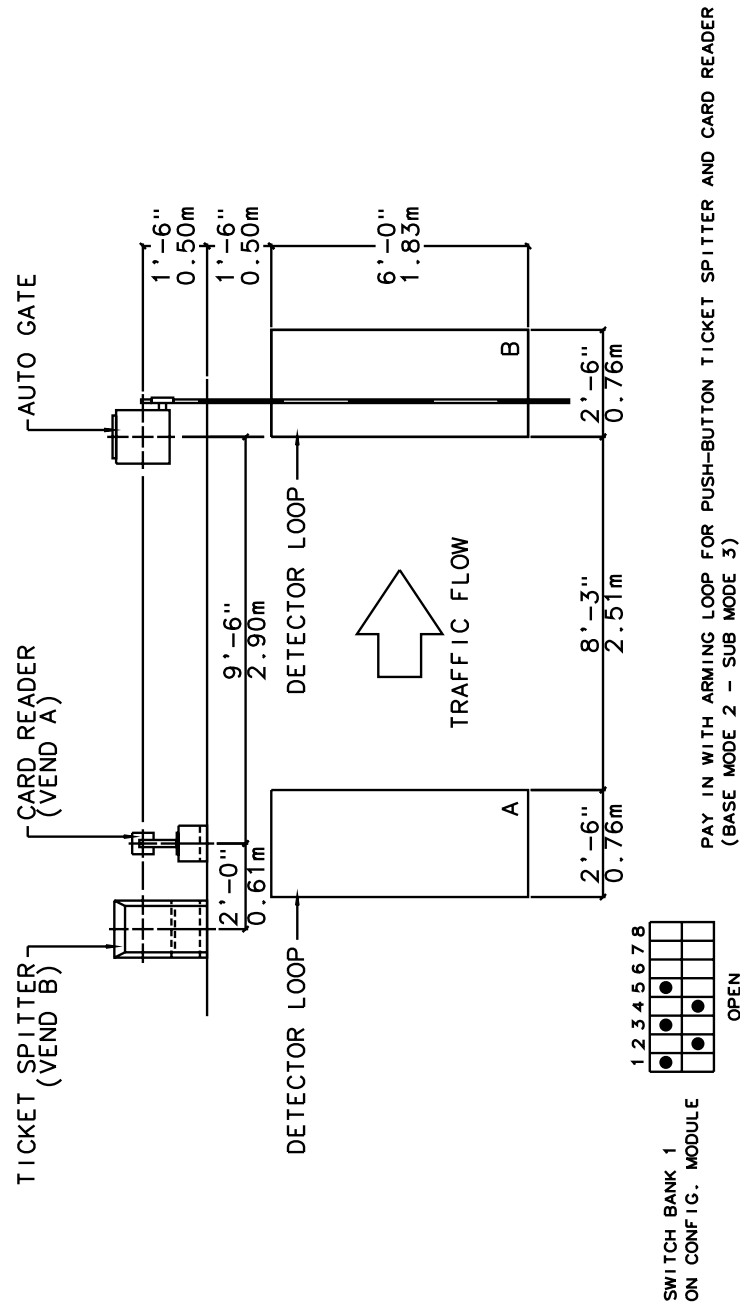


Figure B.4 shows a one-way entry lane with monthly (Card Reader) and transient (Ticket Spitter) control devices mounted side by side in a forward direction. These devices are interlocked with Loop A, preventing their operation unless a vehicle is present on the loop.

Figure B.5, Figure B.6, and Figure B.7 provide additional examples of the Base Mode 2 - Sub Mode 3 configuration, showing the different device combinations available.

Figure B.5
Pay In with Arming Loop for Spitter Only
(Base Mode 2 - Sub Mode 3)
 SKB-1651

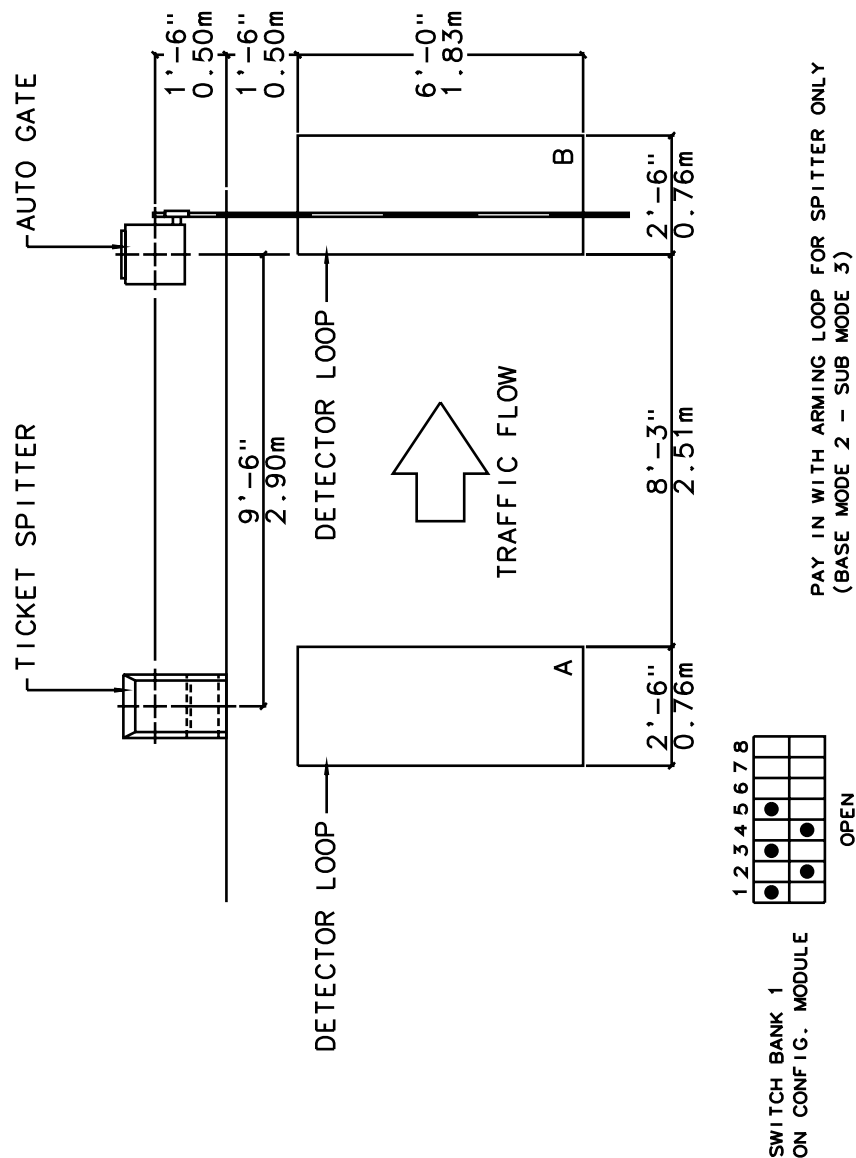


Figure B.5 shows a one-way entrance lane with a transient control device (Ticket Spitter - Vend B) in a forward direction. The device is interlocked with Loop A, preventing its operation unless a vehicle is present on the loop.

Figure B.4, Figure B.6, and Figure B.7 provide additional examples of the Base Mode 2 - Sub Mode 3 configuration, showing the different device combinations available.

Figure B.6
Pay Out with Arming Loop for Reader and Fee Computer
(Base Mode 2 - Sub Mode 3)
 SKB-1652

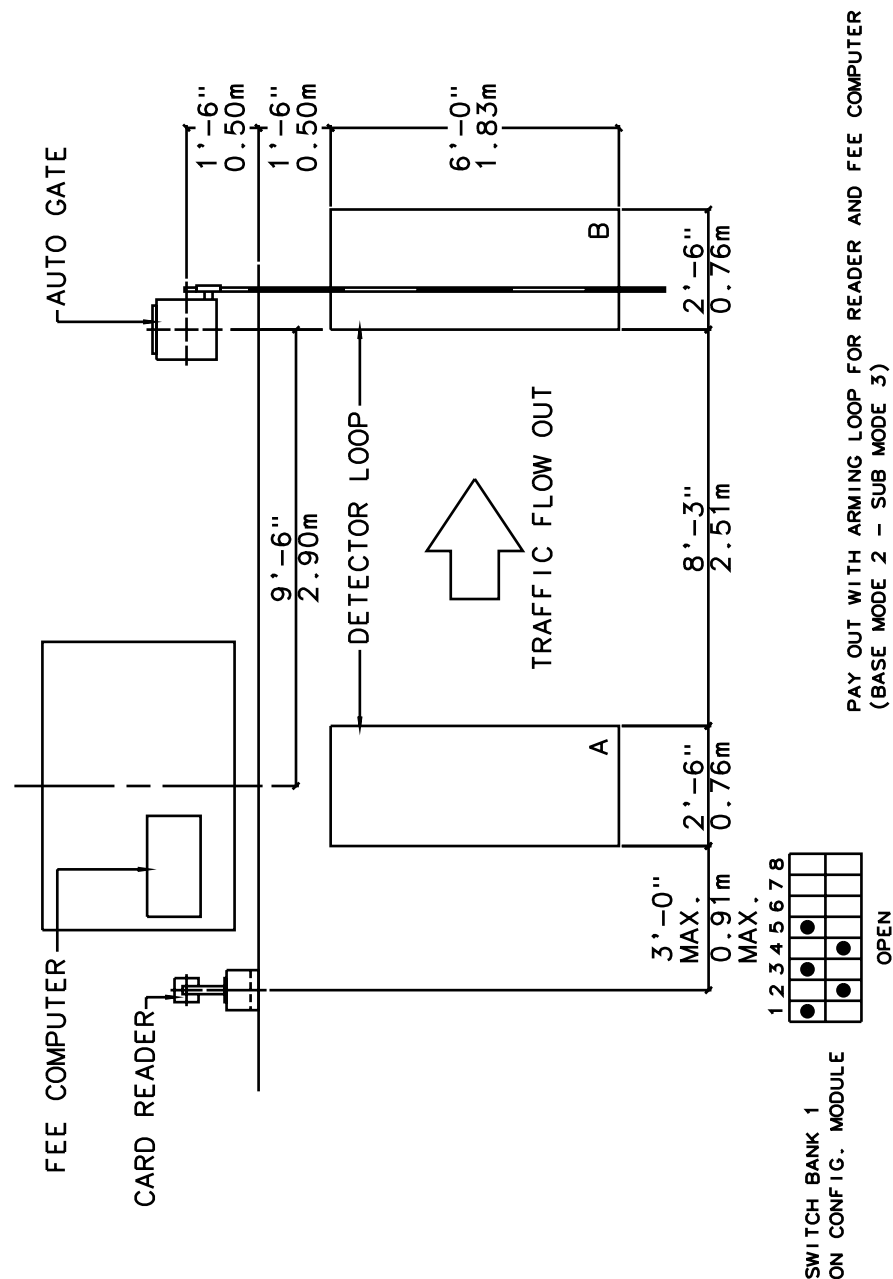


Figure B.6 shows a one-way exit lane with monthly (Vend A) and transient (Vend B) control devices mounted side by side in a forward direction. These devices are interlocked with Loop A, preventing their operation unless a vehicle is present on the loop.

Figure B.4, Figure B.5, and Figure B.7 provide additional examples of the Base Mode 2 - Sub Mode 3 configuration, showing the different device combinations available.

Figure B.7
Pay Out with Arming Loop for Fee Computer Only
(Base Mode 2 - Sub Mode 3)
 SKB-1653

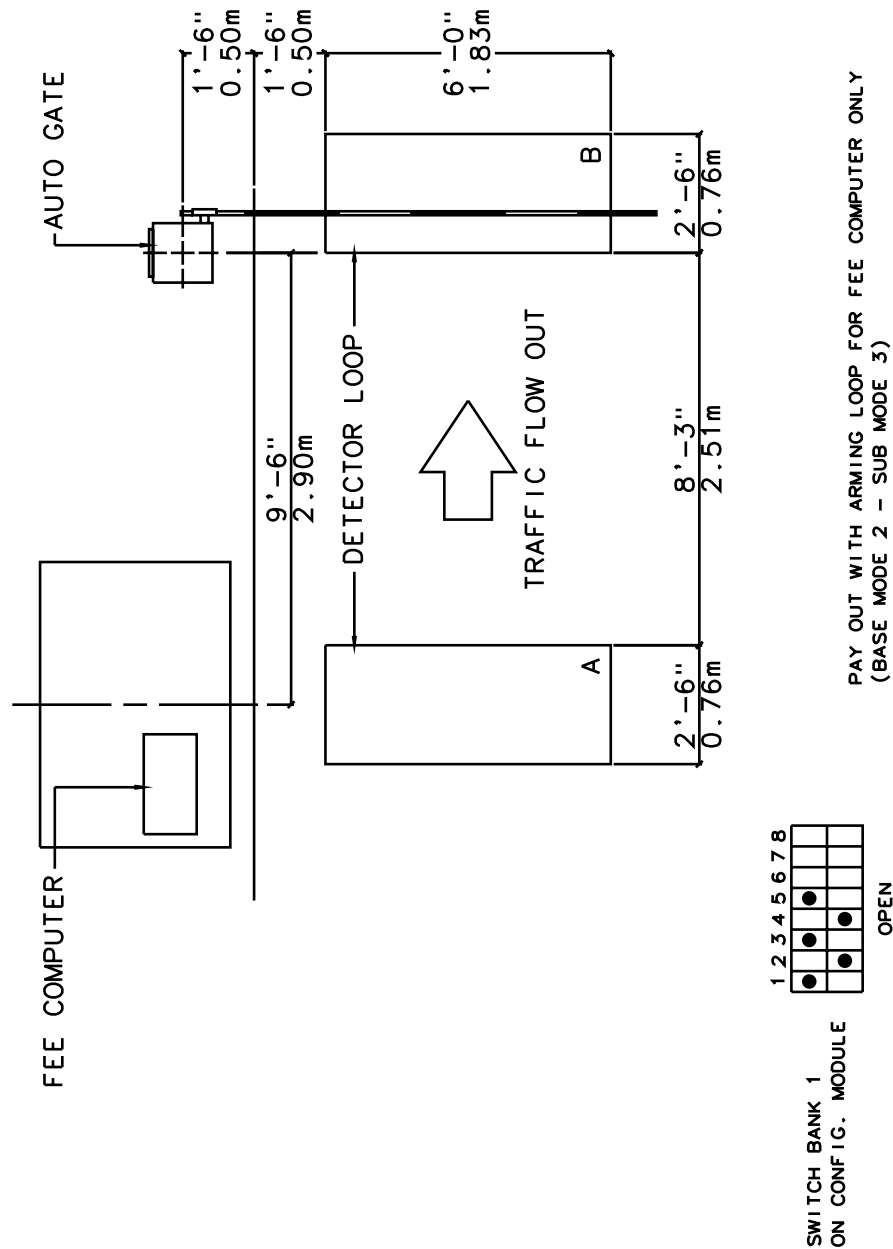


Figure B.7 shows a one-way exit lane with a transient control device (Fee Computer - Vend B) in a forward direction. The fee computer is interlocked with Loop A, preventing computer operation unless a vehicle is present on the loop.

Figure B.4, Figure B.5, and Figure B.6 provide additional examples of the Base Mode 2 - Sub Mode 3 configuration, showing the different device combinations available.

Figure B.8
Free Gate with Opening Loop
(Base Mode 2 - Sub Mode 1)
 SKB-1654

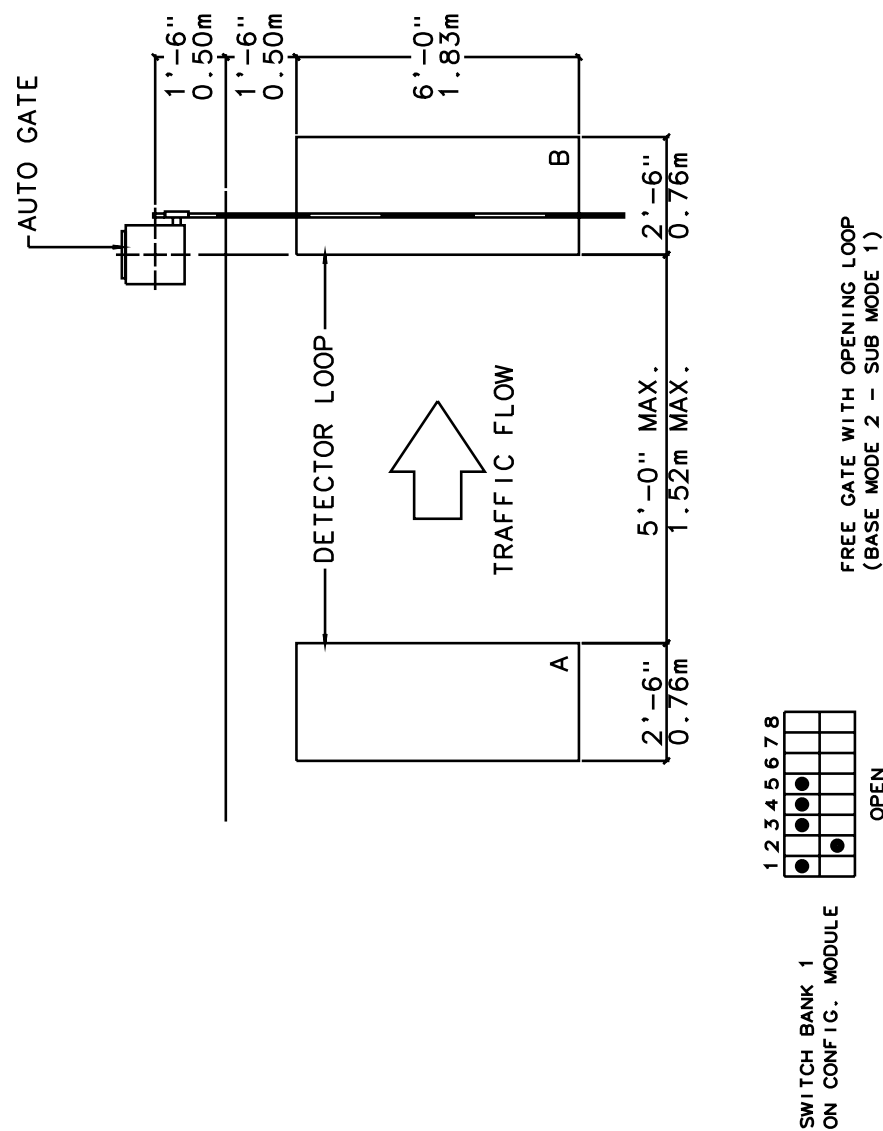
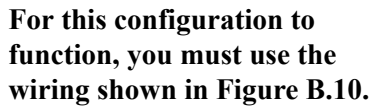


Figure B.8 shows a free gate, with no entry control devices. The lane is a one-way forward direction lane. Presence on Loop A vends the gate. Vehicles travel over Loop A, then on and off Loop B, which resets the gate.

ŠKB-1660



onto Loop A in the forward direction, unless the Card Reader has been used. Loop C arms the monthly device (Vend A). The gate arm lowers after the vehicle clears Loop B.

Figure B.10
Special Wiring for Base Mode 2 - Sub Mode 2

Use this wiring for:

Pay Operation w/Arming Loop for Card Reader/Auto Spitter as shown in Figure B.9

Pay In/Pay Out w/Arming for Entry Reader, Auto Spitter Only as shown in Figure B.20

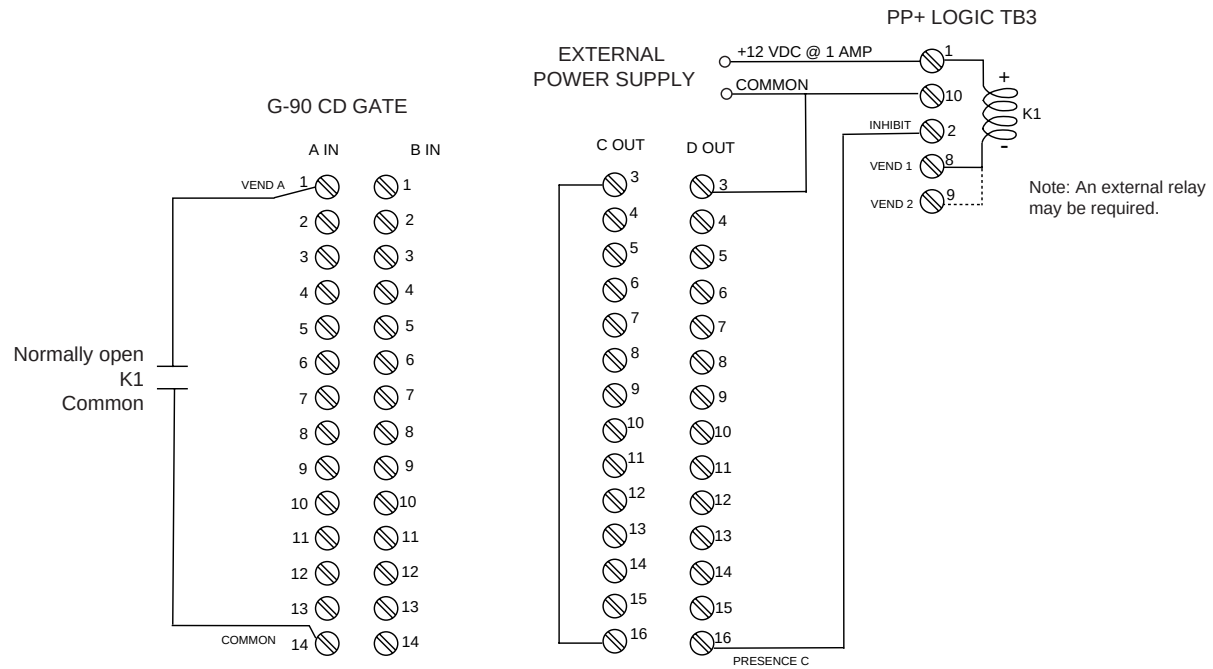


Figure B.11
Escape Lane
(Base Mode 5 - Sub Mode 2)
 SKB-1661

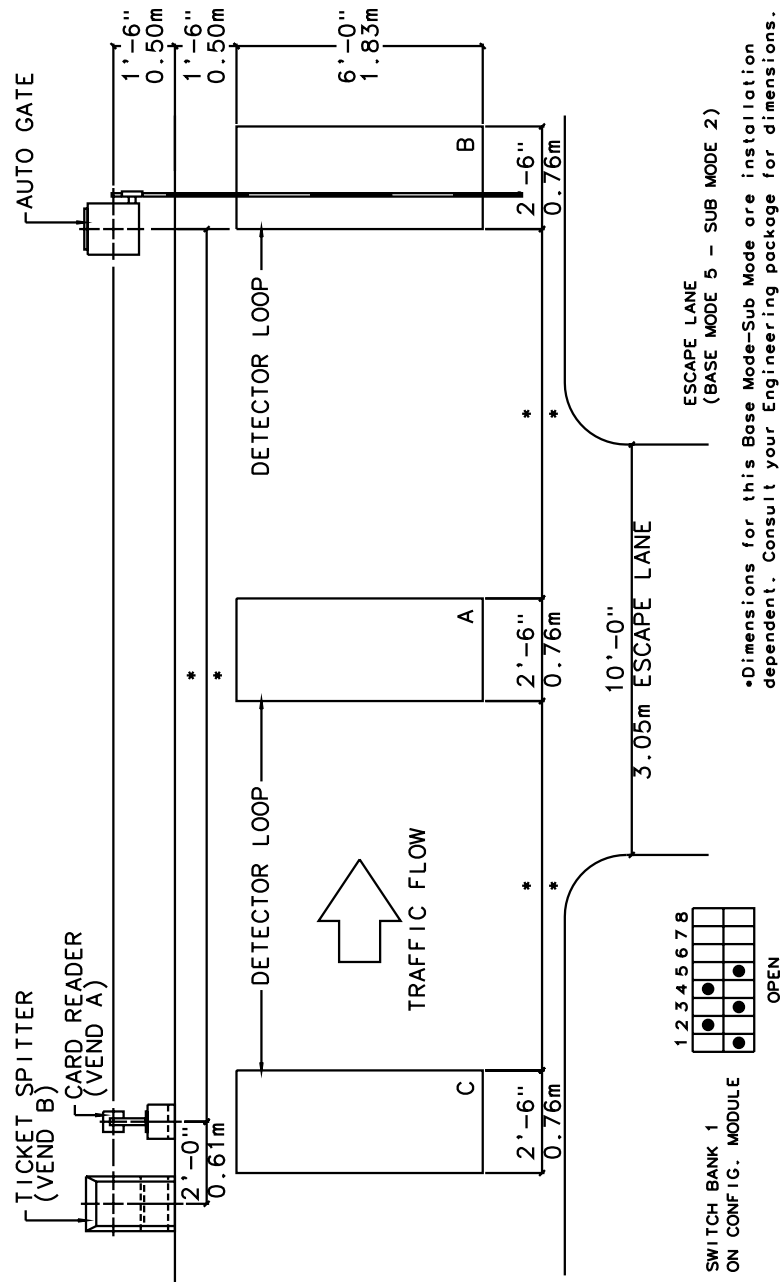
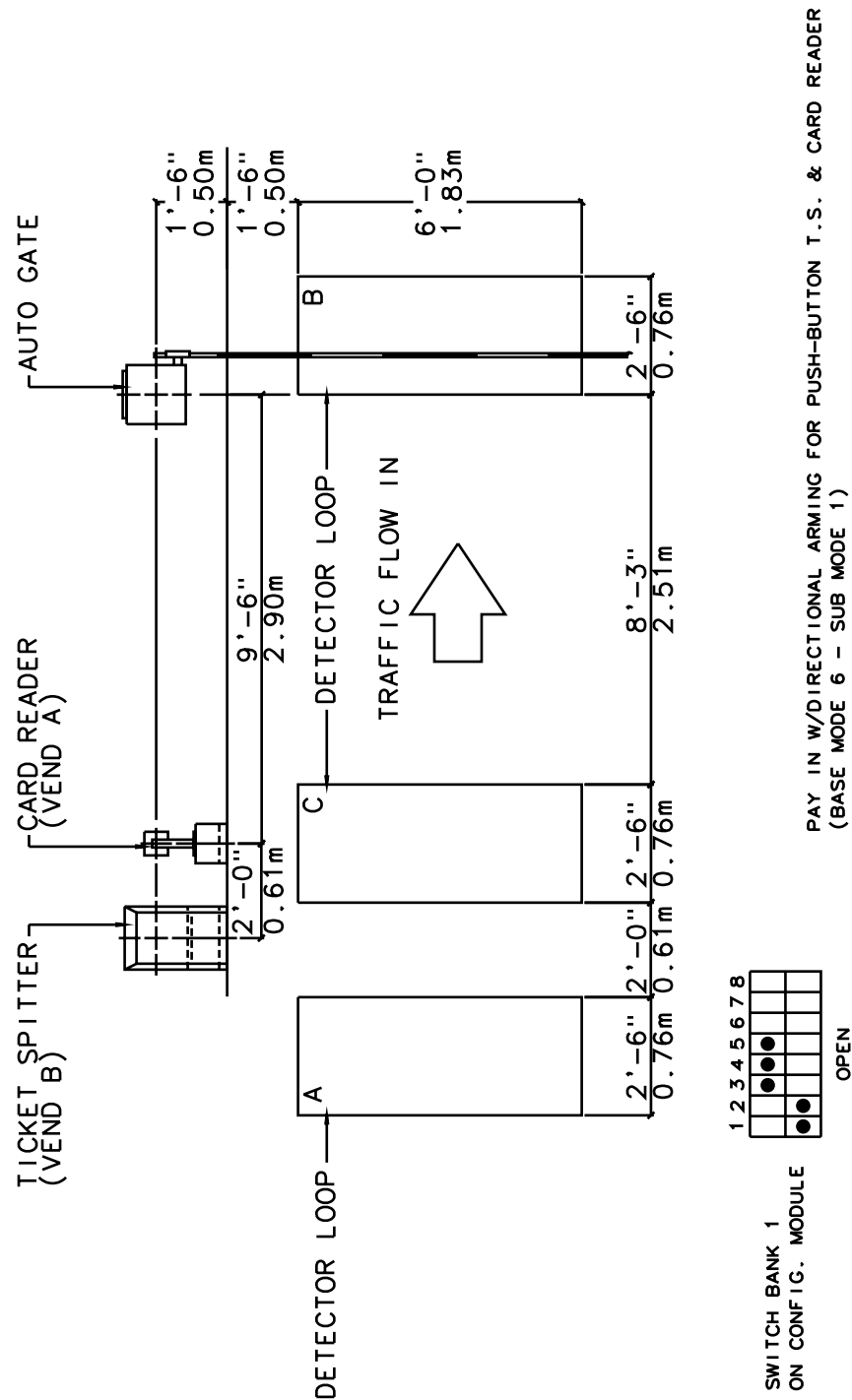


Figure B.11 shows a one-way lane with monthly and transient control devices mounted side by side in a forward direction. If there is no vehicle on Loop C, these devices will not operate. Loop A is provided as an escape lane monitor or may be used if vend devices are located far from the gate.

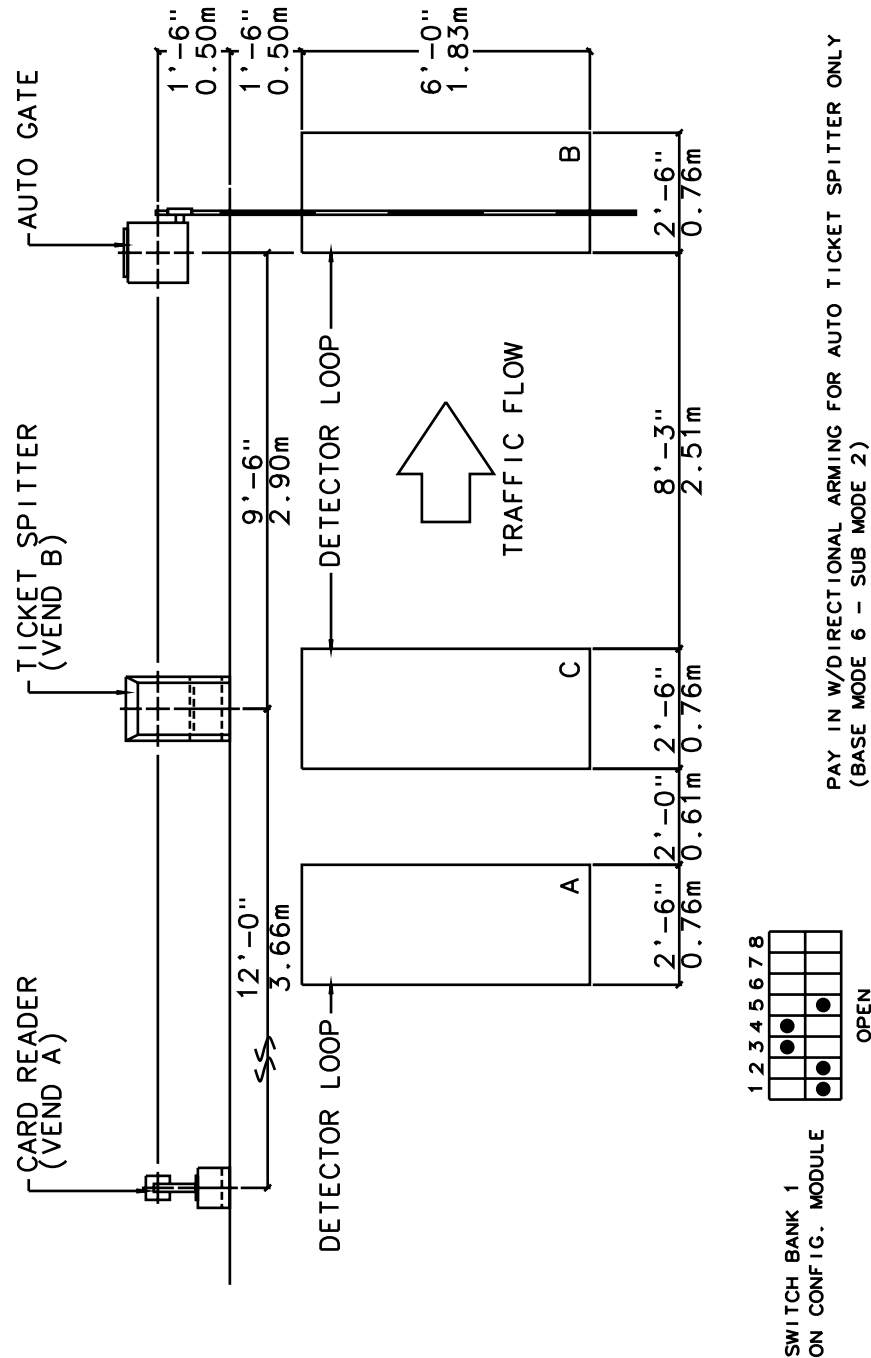
When Loop C detects a presence and either Vend A or Vend B is activated, if Loop A detects a presence with no presence on Loop B, the gate lowers. The Omega LCD Controller then assumes that the vehicle exited via the escape lane.

Figure B.12
Pay In w/Directional Arming for Push-Button Spitter/Card Reader
(Base Mode 6 - Sub Mode 1)
 SKB-1662



In Figure B.12, the monthly (Vend A) and transient (Vend B) devices are interlocked with Loop A and Loop C. The vehicle must travel from Loop A to Loop C to enable Vends A and B. The gate arm lowers after the vehicle clears Loop B.

Figure B.13
Pay In with Directional Arming for Auto Ticket Spitter Only
(Base Mode 6 - Sub Mode 2)
 SKB-1663



In the configuration in Figure B.13, the Ticket Spitter automatically issues a ticket when the car drives onto Loop A and then Loop C in the forward direction, unless the Card Reader has been used. Loop A and Loop C act as the arming loop for the transient device (Vend B). The gate arm lowers after the vehicle clears Loop B.

Figure B.14
Pay In/Pay Out, Single Loop
(Base Mode 1 - Sub Mode 1)
 SKB-1664

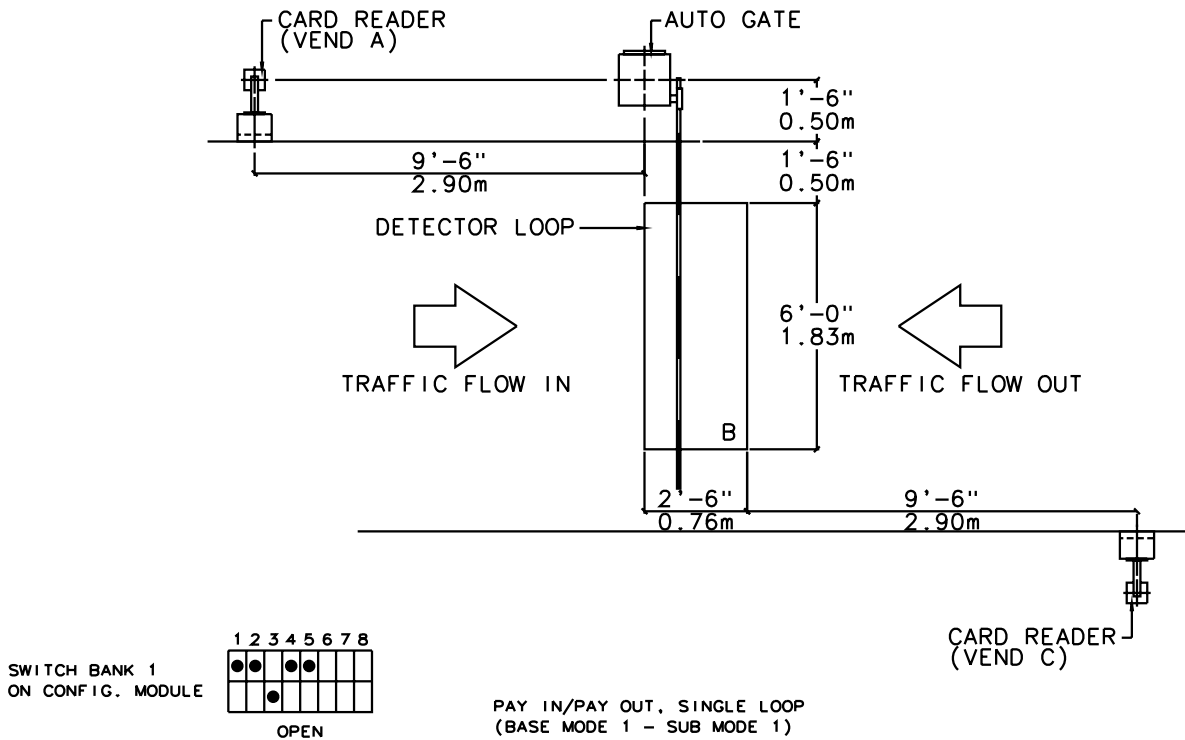


Figure B.14 shows a two-way, single detector loop lane for controlling monthly and/or transient traffic without arming. This configuration is usually used with monthly (Vend A) in the forward direction and monthly (Vend C) in reverse direction. If transient devices are used, Token Units or Coin Acceptors are more likely to be used due to the lack of an arming loop. This configuration is recommended for use with offline (no communication) and non-counting systems only.

Figure B.15
Pay In/Pay Out with Arming Loop for Auto Spitter Only
(Base Mode 2 - Sub Mode 2)
 SKB-1665

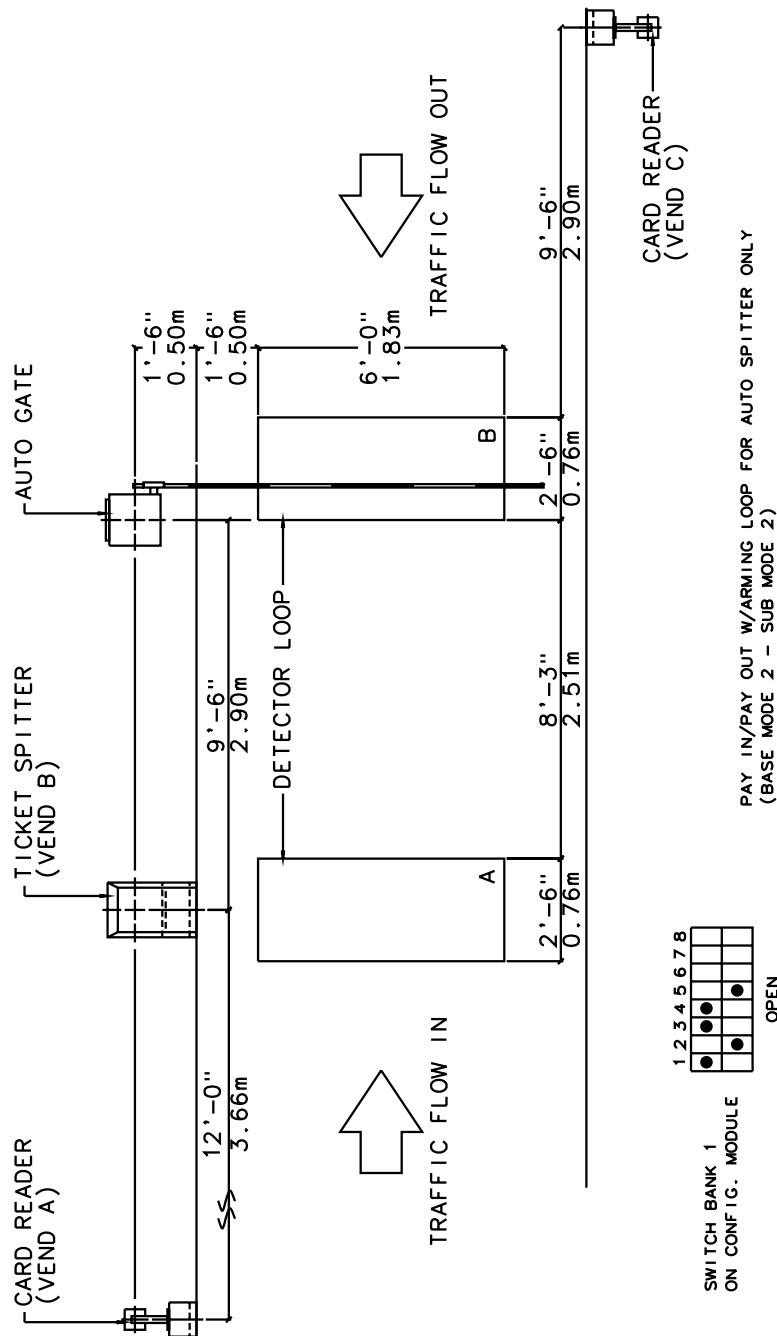


Figure B.15 shows a two-way lane with a remote Card Reader, followed by an Auto Ticket Spitter, as the entry control devices. The Ticket Spitter automatically issues a ticket when a vehicle drives onto Loop A in the forward direction, unless the Card Reader has been used. If you have ordered optional Vend C and Vend D with the gate, a vend in the reverse direction from either a monthly device (Vend C) or a transient device (Vend D) vends the gate. In either direction, the gate arm lowers after the vehicle clears Loop B. **You need Dual Direction option for this configuration.**

Figure B.16
Pay In/Pay Out w/Arming for PB Ticket Spitter & Card Reader Only
(Base Mode 2 - Sub Mode 3)
 SKB-1666

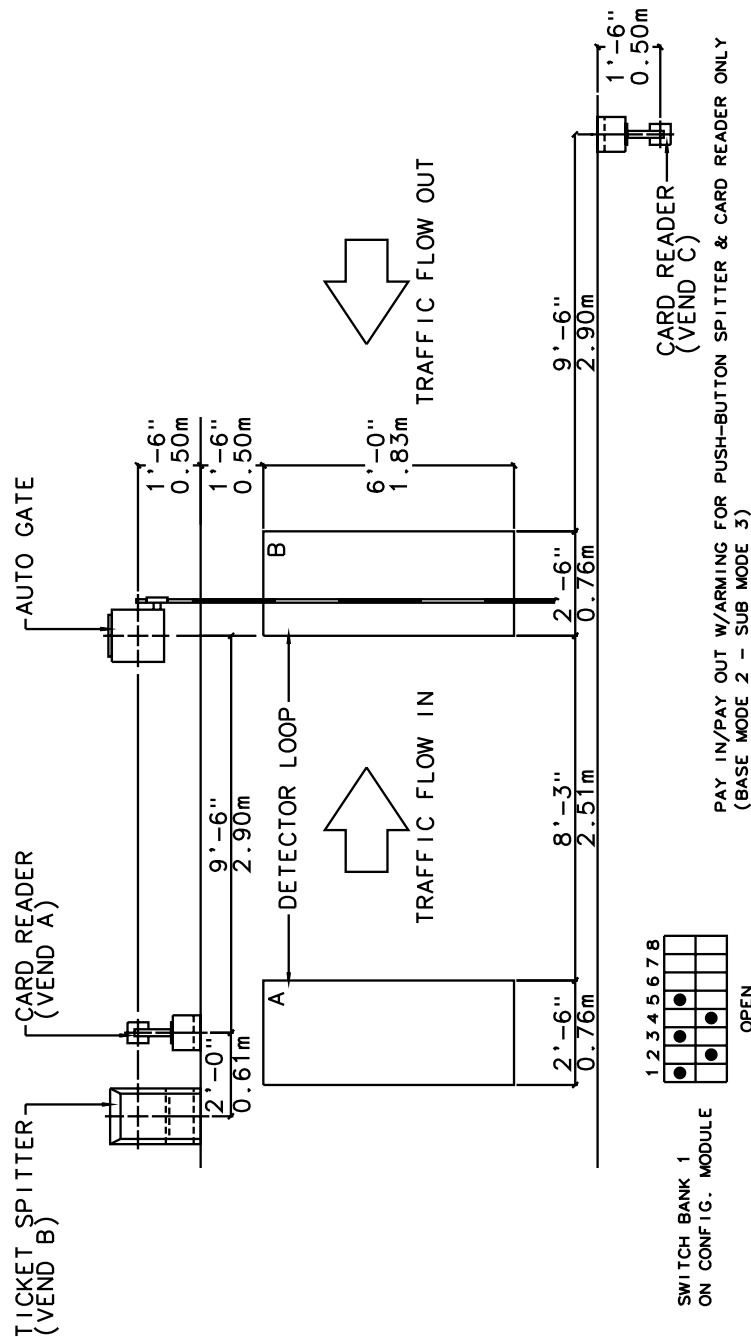


Figure B.16 shows a two-way lane with monthly and transient control devices mounted side by side in both forward and reverse direction. Forward direction devices interlock with Loop A to prevent operation of the devices unless there is a vehicle present on Loop A. There are no interlocking loops for optional reverse direction devices.

You need Dual Direction option for this configuration.

Figure B.17
Pay In/Pay Out with Arming for Entry Ticket Spitter/Reader and Exit Reader/Fee Computer
(Base Mode 3 - Sub Mode 1)
 SKB-1667

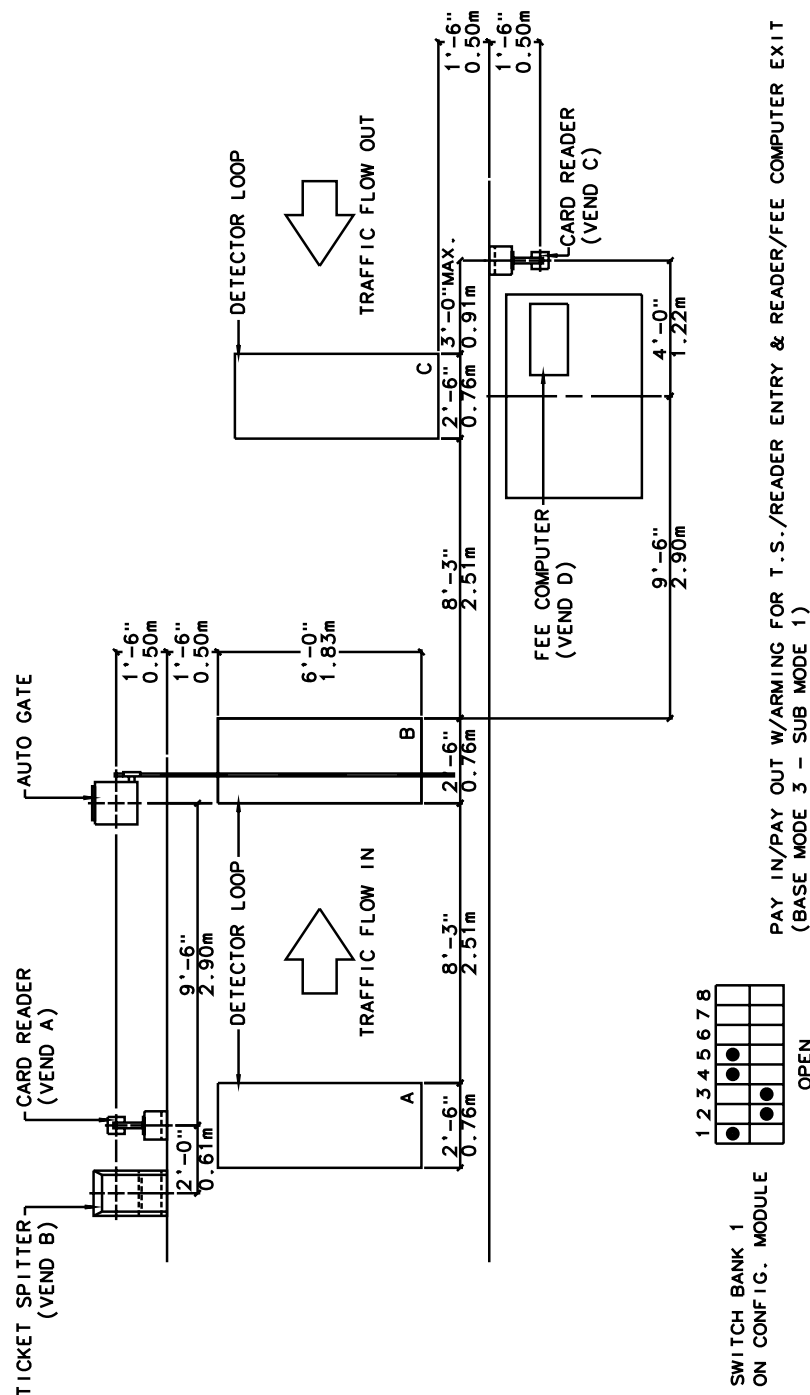
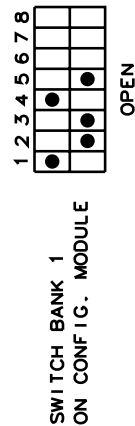


Figure B.17 shows a two-way lane with transient/monthly control devices interlocked with Loop A in the forward direction and with Loop C in the reverse direction. If a vehicle is not present on Loop A (forward direction) or Loop C (reverse direction), the devices will not operate. Vend A and Vend B open the gate in the forward direction and Vend C and Vend D open the gate in the reverse direction. **You need Dual Direction option for this configuration.**

SKB-1668



(reverse direction), the devices will not operate. **You need Dual Direction option for this configuration.**

Figure B.19
Pay In/Pay Out with An Arming Loop for Entry Auto Ticket Spitter and Exit Fee Computer
(Base Mode 3 - Sub Mode 3)
 SKB-1669

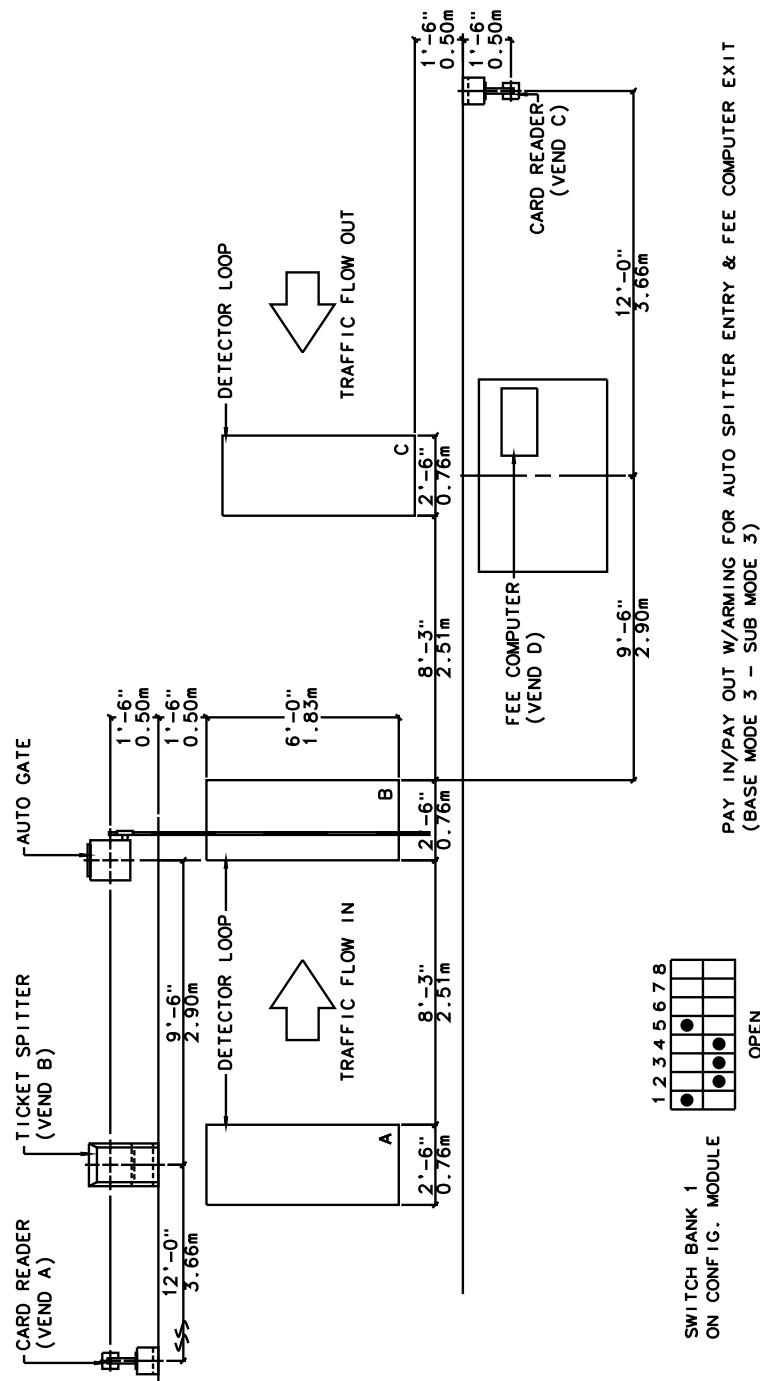
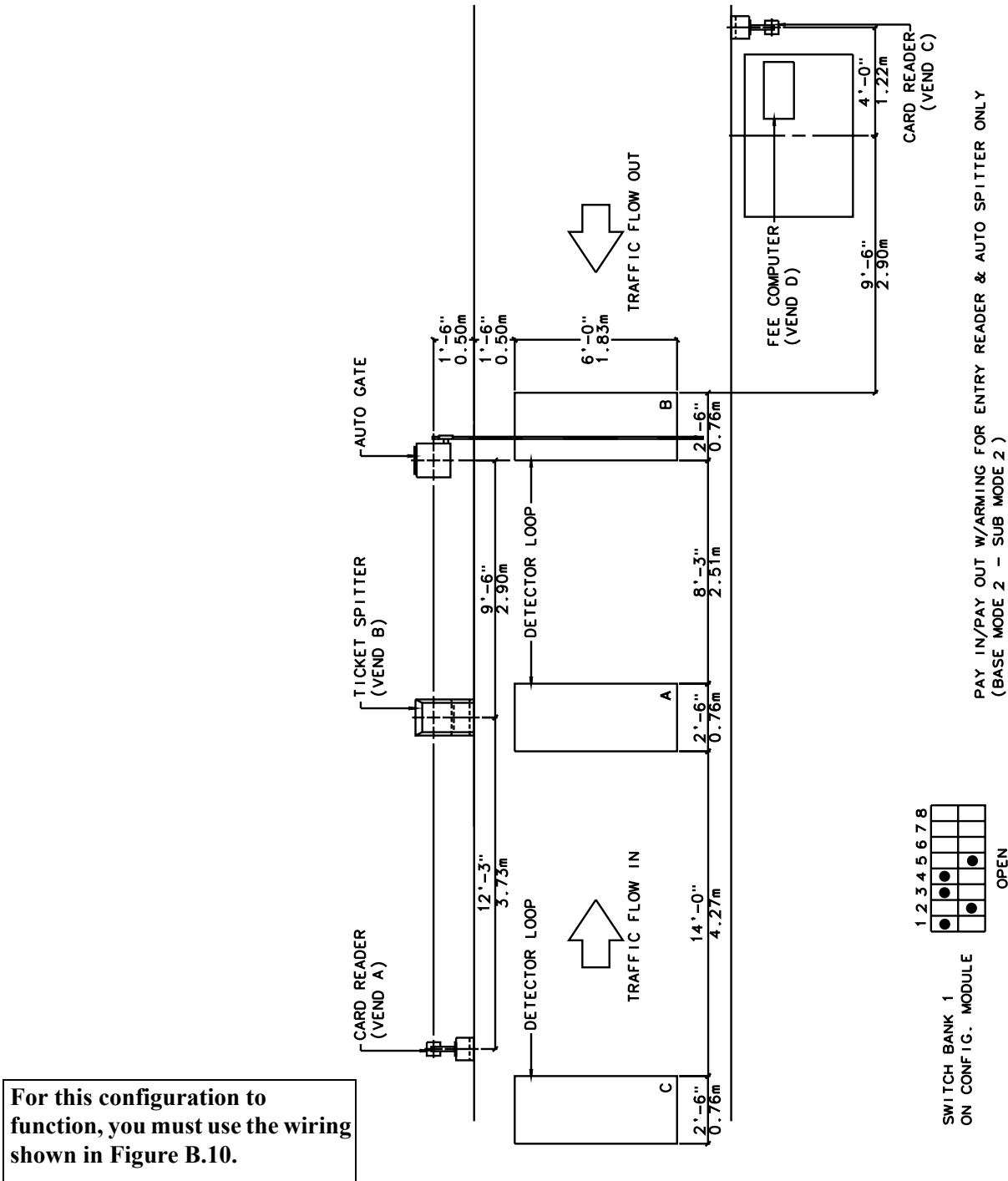


Figure B.19 shows a two-way lane with a remote reader and a transient device interlocked with Loop A in the forward direction. A remote reader and a transient control device are interlocked with Loop C in the reverse direction. If a vehicle is not present on Loop A (forward direction) or Loop C (reverse direction), the devices will not operate. Vend A and Vend B open the gate in the forward direction and Vend C and Vend D open the gate in the reverse direction. **You need Dual Direction option for this configuration.**

Figure B.20
Pay In/Pay Out w/Arming for Entry Reader, Auto Spitter Only
(Base Mode 2 - Sub Mode 2 with Special Wiring)
 SKB-1670



In the configuration shown in Figure B.20, a ticket is automatically issued when a vehicle drives onto Loop A in the forward direction, unless the Card Reader has been used. Loop C is interlocked with the monthly device (Vend A). In the reverse direction, a vend from the monthly device (Vend C) or the transient device (Vend D) vends the gate. In either direction, the gate arm lowers after the vehicle clears Loop B. **You need Dual Direction option for this configuration.**

Figure B.21
Pay In/Pay Out with Escape Lane Entry
(Base Mode 5 - Sub Mode 2)
 SKB-1671

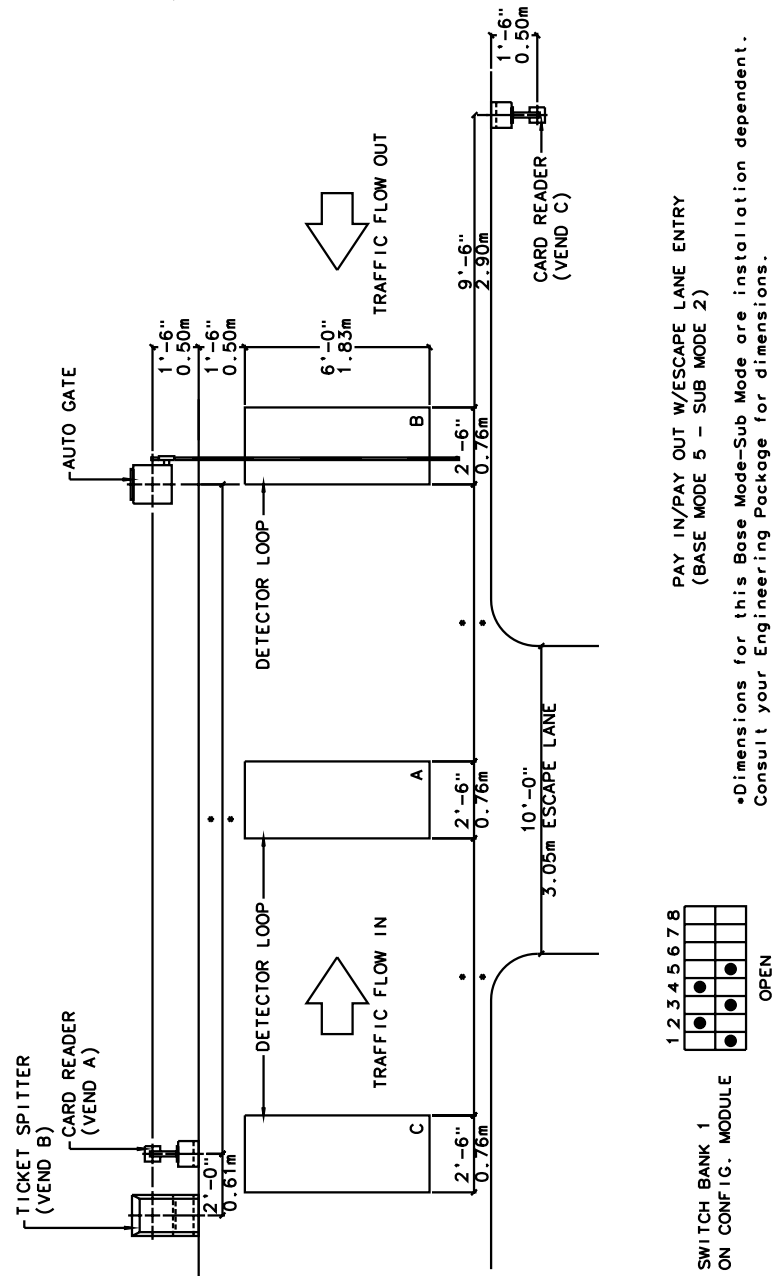
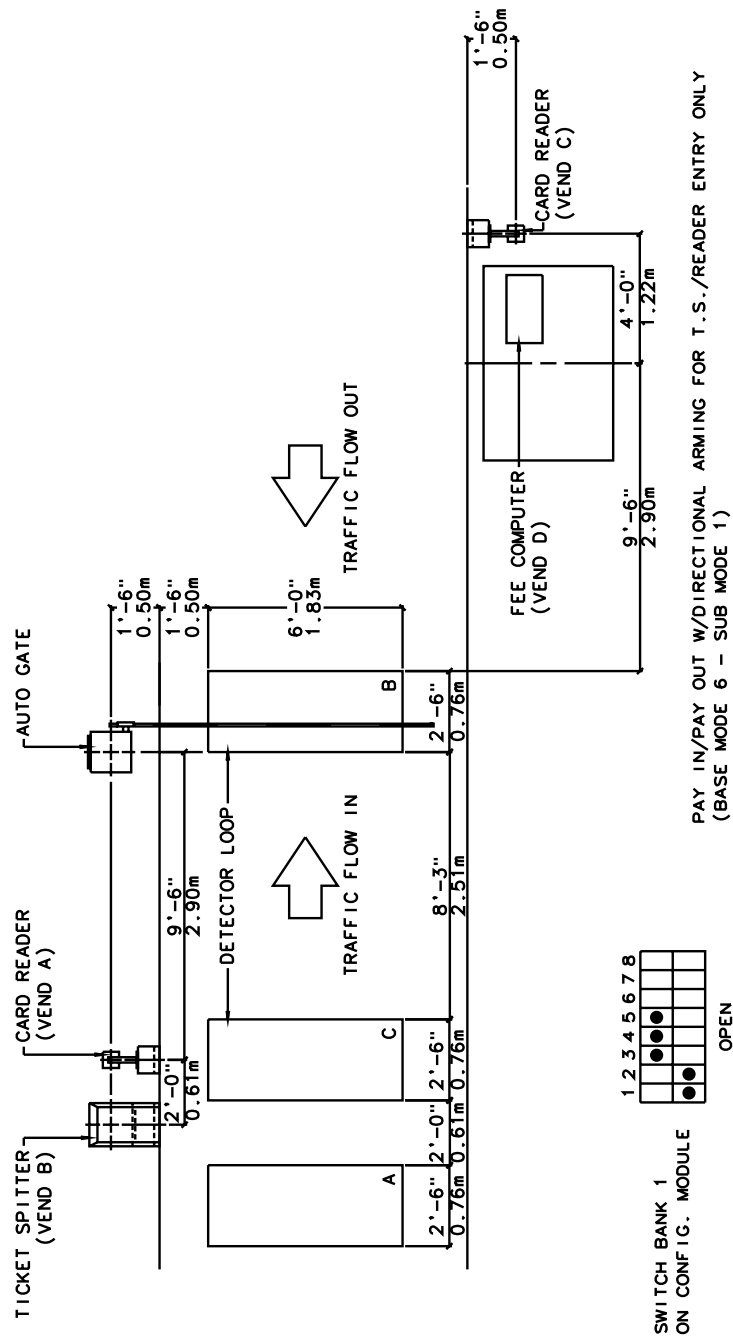


Figure B.21 shows a two-way lane with monthly and transient control devices mounted side by side in both forward and reverse direction. (This example shows only Vend C in the reverse direction.) Forward direction devices are interlocked with Loop C to prevent their operation unless a vehicle is present on Loop C. Loop A is provided as an escape lane monitor and may also be used if the vend devices are far from the gate. (Use two loops to extend presence so that a vehicle traveling through the lane will always be on Loop C or Loop A.)

If Loop C detects a presence, either Vend A or Vend B occurs, and Loop A detects a presence without a presence on Loop B, the gate lowers and the Omega LCD Controller assumes that the vehicle exited through the escape lane. **You need Dual Direction option for this configuration.**

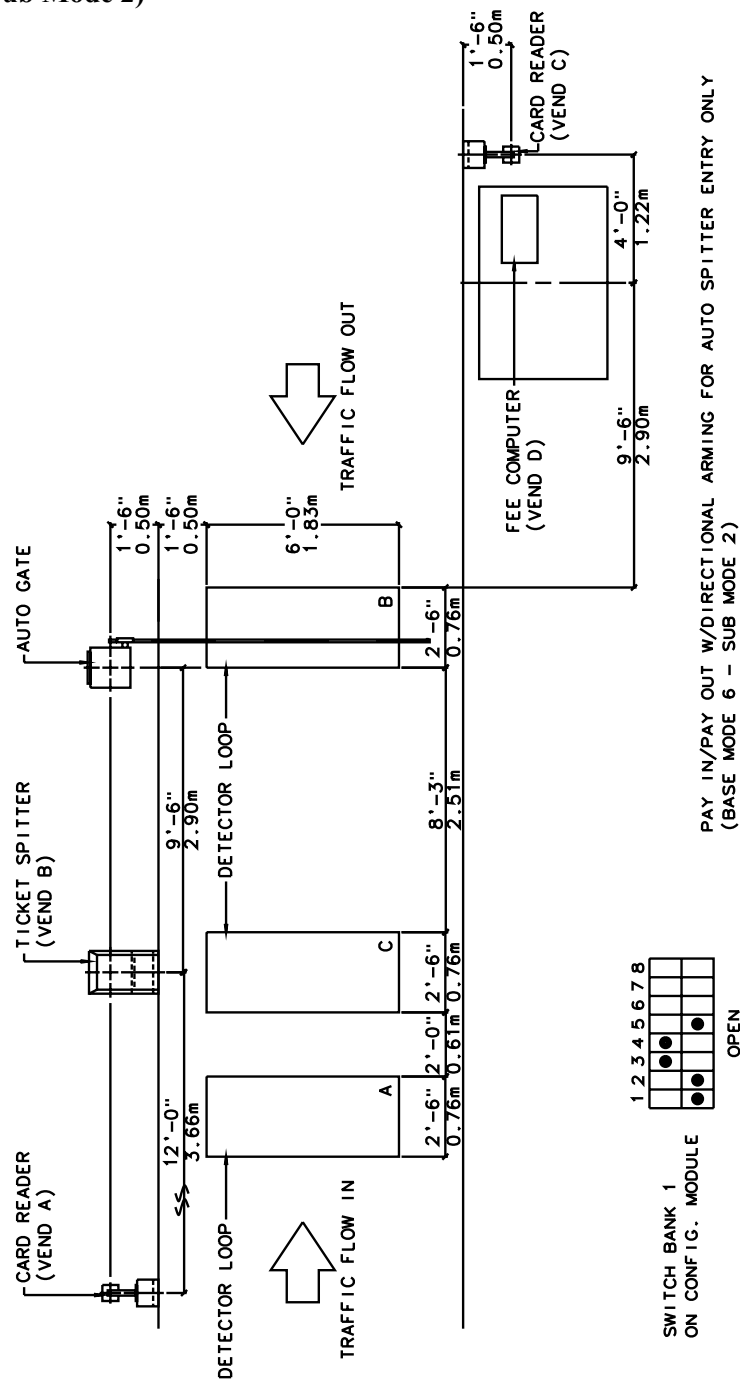
Figure B.22
Pay In/Pay Out w/Directional Arming for Entry Spitter/Card Reader
(Base Mode 6 - Sub Mode 1)
 SKB-1672



In the configuration shown in Figure B.22, Loop A and Loop C are interlocked with the monthly (Vend A) and transient (Vend B) devices. The transient device in this example is a Push-Button Ticket Spitter. The vehicle must travel from Loop A to Loop C to enable Vends A and B. In the reverse direction, a vend from either a monthly device (Vend C) or a transient device (Vend D) vends the gate. In either direction, the gate arm lowers after the vehicle clears Loop B.

You need Dual Direction option for this configuration.

Figure B.23
Pay In/Pay Out w/Directional Arming for Entry Auto Spitter Only
(Base Mode 6 - Sub Mode 2)
 SKB-1673



In the configuration shown in Figure B.23, a ticket is automatically issued when a car drives onto Loop A and then Loop C in the forward direction, unless the Card Reader has been used. Loop A and Loop C provide arming for the transient device (Vend B). In the reverse direction, a vend from either a monthly device (Vend C) or a transient device (Vend D) vends the gate. In either direction, the gate arm lowers after the vehicle clears Loop B. **You need Dual Direction option for this configuration.**

Appendix C: Orders, Repair Procedures, and Part Numbers

The following section provides the information that you need to order parts used in the G-90 CD Series Barrier Gate. This appendix contains the following:

Placing an Order	165
Requesting a Repair	165
Ordering Parts	166
Parts for Upgrading G-90 and G-90 LCD Gates	168
G-90 CD Series Barrier Gate Assembly	169
Folding Gate Arm Assembly (53-18037)	172

Placing an Order

- ☐ Determine the part number of the part or product you want to order by referring to this manual. If the part number is not included in this manual, refer to the *Federal APD Price Book* or contact Customer Service for part names, part numbers, prices, and delivery information.

Customer Service: (800) 521-9300 or (248) 374-9600

Customer Service in Canada: (800) 331-9144

- ☐ Fill out a purchase order from your company.
- ☐ Sign the purchase order.
- ☐ Fax or mail the purchase order to:

Federal APD, Inc.
Attn: Customer Service
42775 Nine Mile Road
Novi, Michigan 48375

Fax: (248) 374-9610

Requesting a Repair

If any problem occurs with the parts of your Federal APD, Inc. product, in many cases you can return them to the service center for repair. All repairs require a Service Request Order (SRO) and purchase order for service. Request for expedited service must be given at the time the SRO is requested to ensure special handling. To obtain an SRO authorization, you must e-mail or fax the Federal APD Service Request Order (SRO) Form to Customer Service.

E-mail: sro@federalapd.com

Fax: (248) 374-9610

You will be assigned an SRO number that will be e-mailed or faxed back to you within 24 hours (excluding non-business days).

Federal APD also offers Expedited Repair Service, which guarantees two working days turnaround time on all repairs from the date we receive the part at our repair center in Novi. You must request expedited service when the SRO number is issued to ensure special handling.

Ship the items to be repaired to the following address:

Federal APD, Inc.
Depot Repair Center (DRC)
42775 Nine Mile Road
Novi, MI 48375

Note: Mark the SRO number clearly on the package label. Federal APD, Inc. cannot accept packages without an SRO number.

Ordering Parts

The following section provides the information that you need to order parts used in the G-90 CD Series Barrier Gate.

About G-90 CD Gate Part Numbers

For each gate you order, you must order the following:

- ☐ Gate (includes cabinet and mechanical components)
- ☐ Gate Arm
- ☐ Configuration Module (for all gates except Raise/Lower functionality)
- ☐ Foreign Language Option for Gate Label (optional)

Gate Cabinet and Mechanical Component Options

When you order a gate, you may choose any combination of the following:

- ☐ Right Hand or Left Hand arm location
- ☐ 120 volt¹ or 220 volt
- ☐ Yellow, White, or Special paint
- ☐ Door on Driveway Side (lane side, instead of back of cabinet)
- ☐ Raise/Lower functionality only (no controller)
- ☐ CE certified²

¹ Not available for CE certified gates.

² Not available with 120 volt.

Each combination of the above has a different part number. For example, you may order a gate that has a Left Hand arm location, 120V, White, Door on Driveway Side, and Raise/Lower functionality only. The part number for this would be 53-18137W.

For a complete listing of part numbers, refer to the *Federal APD Price Book* or contact your distributor.

Gate Arm Options

When you order a gate, you may choose any combination of the following:

- ☐ 10 foot or 12 foot
- ☐ Left Hand or Right Hand (must be compatible with gate cabinet)
- ☐ Folding or not
- ☐ Folding to meet American Disability Act requirements
- ☐ Door on Driveway Side (must be compatible with gate cabinet)

Each combination of the above has a different part number. For example, you may order a 12 foot, folding gate arm with a left hand arm location. The part number for this would be 53-18038.

For a complete listing of part numbers, refer to the *Federal APD Price Book* or contact your distributor.

Configuration Module Options

When you order a gate, you may order one of the following configuration module packages. However, a gate with Raise/Lower functionality only does not require a configuration module.

- ☐ Standard
- ☐ Dual Direction
- ☐ ValueCard/Credit Card
- ☐ Single Differential Counter
- ☐ Custom Configuration

For a complete listing of part numbers, refer to the *Federal APD Price Book* or contact your distributor.

Language Options

If your gate will be installed at a non-English-speaking location, you may need to order a language option for the gate labels. These labels are available in several languages, for the gate cabinet, gate arm, or both.

For a complete listing of part numbers, refer to the *Federal APD Price Book* or contact your distributor.

Parts for Upgrading G-90 and G-90 LCD Gates

The G-90 CD Series Barrier Gate retrofits to existing G-90 and G-90 LCD gates. You can upgrade these gates with the following parts, which include all necessary items for the upgrade:

Table C.1: G-90 and G-90 LCD Upgrade Parts

Part #	Description
23-10279	Upgrade, G-90 LCD to G-90 CD
23-10281	Upgrade, G-90 LCD to G-90 CD 220 Volt
23-10278	Upgrade, G-90 to G-90 CD
23-10280	Upgrade, G-90 to G-90 CD 220 Volt

G-90 CD Series Barrier Gate Assembly

Figure C.1
G-90 CD Series Barrier Gate Assembly
SKD-1735

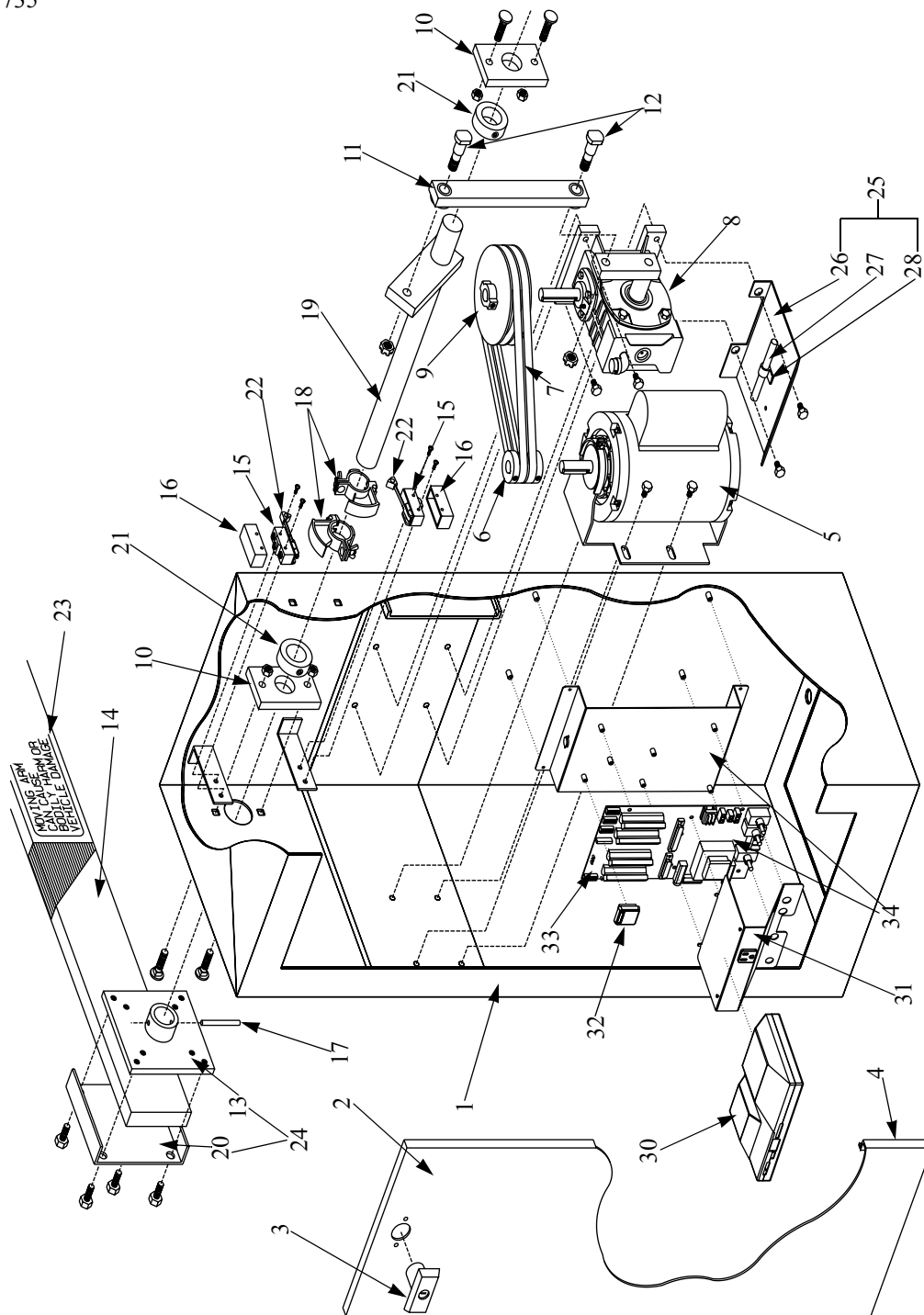


Table C.2: G-90 CD Series Barrier Gate Assembly

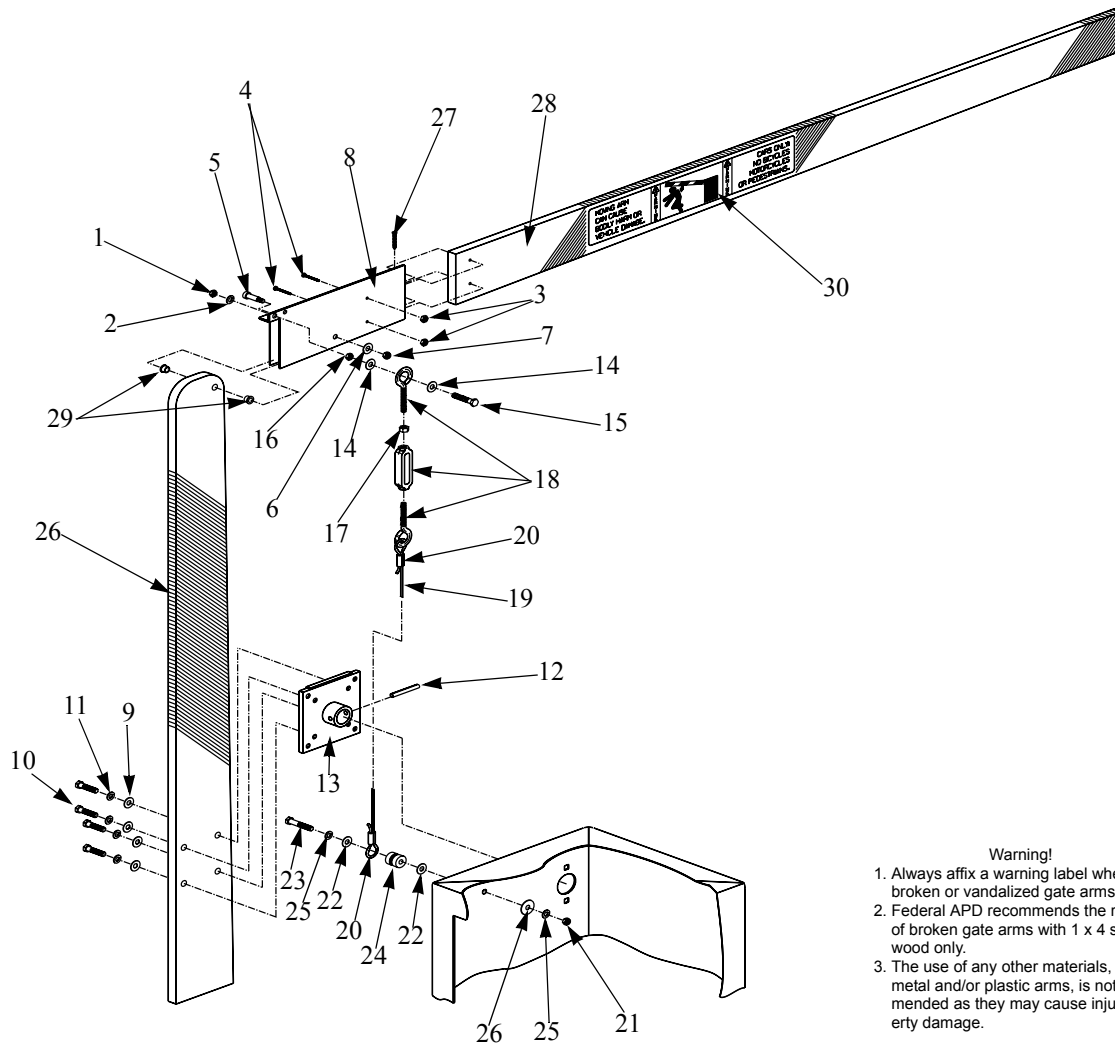
Drawing SKD-1512		
Ref#	Part #	Description
1	51-25276Y/W 51-25276S 51-25277Y/W 51-25277S	G-90 Universal Drive, Cabinet, Yel/Wht G-90 Universal Drive, Cabinet, Spec Coverplate, G-90 Universal Drive, Cabinet, Yel/Wht Coverplate, G-90 Universal Drive, Cabinet, Spec (51-25277 covers one of the main shaft holes, right or left)
2	50-18008Y/W 50-18008S	Door, G-90 Gate Series Aluminum, Yel/Wht Door, G-90 Gate Series Aluminum, Spec
3	11-0003	Lock, T-Handle
4	11-2453	Weatherstripping, 1/8 x 1/2 Closed Cell
5	21-3358 21-3280	Motor, 1/3 HP 50/60 CYC 1 PH w/Capacitor Motor, 220 VAC 50/60 CYC w/Cap Drive
6	20-1653	Pulley, Gate Double
7	21-0656	Vee Belt, 27"
8	22-2750 20-4572	Reducer Label, Gear Reducer Lubrication
9	20-0013	Pulley, 4" x 5/8" Gear Reducer
10	23-0004	Bearing Block Assy, Metal
11	22-0014	Connecting Rod Assy, Metal
12	20-0015	Stud
13	20-4184	Flange, Gate Universal w/Cutter Blade
14	53-18035 53-18036	Gate Arm, 10' Finished Gate Arm, 12' Finished
15	11-0045	Switch, Limit
16	11-0046	Switch Cover, Limit
17	20-0009	Drive Pin, 5/16 x 2 1/2
18	20-0010	Cam, Limit
19	20-0626 20-0006	Main Shaft, Left Hand Main Shaft, Right Hand
20	20-3024	Flange Cover
21	20-0007	Collar, w/Set Screw 1 1/4"
22	10-2234	Guide, Limit Switch (11-0045)
23	20-4348	Label, Gate Arm Caution Foldover (English; other languages available)
24	23-7366	Flange Assy, Break Away
25	23-7811	Heater Assy, G-90 Series U/L
26	10-3458	Bracket, G-90 Heater

Table C.2: G-90 CD Series Barrier Gate Assembly (Continued)

Drawing SKD-1512		
Ref#	Part #	Description
27	21-3955	Heater, G-90 Series Cartridge (2 required for 220V models)
<i>not shown</i>	11-3459	Plug, Nylon 2 Pin Male
<i>not shown</i>	11-2591	Amp Pin, Male 18 AWG Hook-Up
28	21-3956	Clamp, 3/8" Tube Heater
30	53-18435	Controller, Omega LCD V2
31	20-11762	Connections Panel Cover, G-90 CD/SST
32	53-18429 53-18432 53-18431 53-18430 53-18156	Config Package, CD Gate Standard Program Config Package, CD Gate Dual Direction & Standard Config Package, CD Gate Single Differential Counter & Standard Config Package, CD Gate ValueCard/Credit Card & Standard Config Package, CD Gate w/Custom Programming
33	52-18121 52-18122	G-90 CD Connection Panel, 120V G-90 CD Connection Panel, 220 VAC
34	20-11761	Connections Panel Adaptor, G-90 CD/SST
<i>not shown</i>	20-3469	Label, Gate Post Warning
<i>not shown</i>	20-4236	Label, Gate Arm Warning (Flange)
<i>not shown</i>	20-4237	Label, Mechanical/Electrical Warning
<i>not shown</i>	20-3951	Gasket, Gate Cabinet Mounting

Folding Gate Arm Assembly (53-18037)

Figure C.2
Folding Gate Arm Assembly
(Part No. 53-18037)



Warning!

1. Always affix a warning label when replacing broken or vandalized gate arms.
2. Federal APD recommends the replacement of broken gate arms with 1 x 4 soft pine wood only.
3. The use of any other materials, such as metal and/or plastic arms, is not recommended as they may cause injury or property damage.

Note: An ADA folding gate arm is also available: part #53-18047 (left hand) and part #53-18048 (right hand).

Table C.3: Folding Gate Arm Assembly (53-18037)

Ref#	Part #	Description
Stabilizer Assembly		
	23-2276	Gate Arm, Stabilizer Assy (Not Shown)
1		3/8-16 Nut
2		3/8" Lock Washer
3		10/24 Nut
4		10/24 1 1/2" Screw
5	21-1228	Screw, 3/8 x 1 Shoulder
6		3/8" Flat Washer
7	11-0055	Locknut, 5/16" - 18
8	20-0051	Stabilizer, Gate Arm
Folding Arm Flange Assembly		
9		3/8" Flat Washer
10		3/8-16 x 1 3/4" Bolt
11		3/8" Lock Washer
12	20-0009	Drive Pin, 5/16 x 2 1/2
13	20-4184	Flange, Gate Universal w/Cutter Blade
Cable Assembly		
	23-7881	Cable Assy, G-89/G-90 Folding Arm (Not Shown)
14		3/8" Flat Washer
15		3/8-16 x 1 1/2" Bolt
16		3/8" Nut
17		10/24 Nut
18	11-4127	Turnbuckle, 3"
19	11-3335	Cable, 3/16" Diameter Steel
20	11-3333	Swedge Fitting
21		3/8-16 Lock Nut
22		3/8" Flat Washer
23		3/8-16 x 2" Bolt
24	20-3332	Spacer, G-89/G-90 Folding Gate Arm Cable
25		3/8" Lock Washer

Table C.3: Folding Gate Arm Assembly (53-18037)

Ref#	Part #	Description
26		3/8" ID, 1 1/4" OD Fender Washer
27		8-1 1/2" Sheet Metal Screw
10 ft. Gate Arm Assembly		
28	23-7882	Gate Arm Assy, 10' G-90 Cut for Folding Replacement (includes Bushing 20-0056)
29	20-0056	Bushing, 3/8"
30	20-4348	Label, Gate Arm Caution Foldover (English; other languages available)

Appendix D: Getting Additional Support

If you have a question about this product that is not addressed in this manual, contact your Federal APD distributor. If you are a distributor or do not have a distributor, call the support number listed for your region in the following table. You may also visit the Distributor Resource Center on our Web site at www.FederalAPD.com to access product information, to download software upgrades when they are available, and to review Frequently Asked Questions. You must have a password to use the Distributor Resource Center. If your office has not already obtained a password, contact Federal APD's Customer Service Center for one.

Whether you call, write, or fax, please have the following information available:

- ☐ A description of the events and the order in which they occurred
- ☐ The type of hardware you are using, with serial number and model number
- ☐ Firmware version
- ☐ The type and configuration of software you are using
- ☐ Original sales order number
- ☐ Any messages that appear on your display screen and the exact wording
- ☐ Project Name
- ☐ SRO¹ number, if applicable

Table D.1: Federal APD Technical Support Numbers

Location	Region	Support Number	Fax Number
Michigan Kentucky Ohio Tennessee Newfoundland, Canada Ontario, Canada Quebec, Canada	5, 91	(248) 374-9629	(248) 374-9610

¹ Service Request Order (SRO) is the new name for the Return Material Authorization (RMA) process and form.

Table D.1: Federal APD Technical Support Numbers (Continued)

Location	Region	Support Number	Fax Number
Connecticut Delaware New York Maine Maryland Massachusetts New Hampshire New Jersey North Carolina Pennsylvania Rhode Island South Carolina Vermont Virginia Washington D.C. West Virginia	2, 12	(248) 374-9629	(248) 374-9610
Alabama Florida Georgia Mississippi Caribbean	4	(813) 870-3273	(813) 870-3273
Illinois Indiana Minnesota Wisconsin	6, 7	(773) 586-9001	(773) 586-8002
Iowa Kansas Missouri Nebraska North Dakota South Dakota	16	(248) 374-9629	(248) 374-9610
Arkansas Colorado Louisiana Oklahoma Texas Mexico	8	(248) 374-9629	(248) 374-9610
Arizona California Hawaii Nevada New Mexico Utah	9, 13	(714) 632-0670	(714) 632-0674
Alaska Idaho Montana Oregon Washington Wyoming Alberta, Canada British Columbia, Canada Manitoba, Canada Saskatoon, Canada	10	(248) 374-9629	(248) 374-9610

Table D.1: Federal APD Technical Support Numbers (Continued)

Location	Region	Support Number	Fax Number
Central America South America	89	(248) 374-9629	(248) 374-9610
Asia Australia China Hong Kong India Indonesia Korea Malaysia New Zealand Philippines Singapore Taiwan Thailand Vietnam	90, 96	(852) 2671-9880	(852) 2402-1912
Bahrain Egypt Europe Greece Greenland Iceland Jordan Saudi Arabia Turkey UAE	93, 94,95	(248) 374-9629	(248) 374-9610

Glossary

Accumulators. These are counters that provide a variety of information such as the number of times a presence was detected on each loop, number of monthly vehicles that entered the facility, number of transient vehicles that entered the facility, etc. These counters are non-resettable.

Base Mode. The placement of loops in the lane is known as Base Mode.

Config Mode. Indicates that the G-90 CD Gate is operating with a Configuration Module.

Configuration Module. Hardware piece that connects to the gate's Connection Panel, which includes the standard, package, or custom software features that control many functions of the gate. SST Ticket Spitters/Exit Verifiers also use Configurations Modules.

Connection Panel. The Connection Panel is an assembly that contains field connections and DIP switch banks for lane operation, and is used to mount the Omega LCD Controller as well as the Configuration Module.

Counters. Counters in the Omega LCD Controller provide a variety of information such as the number of times a presence was detected on each loop, number of monthly vehicles that entered the facility, number of transient vehicles that entered the facility, etc. These counters may be resettable or non-resettable. Each counter acts as an accumulating counter and stores 999,999 counts before returning to zero and restarting the counts.

Crosstalk. When two coil loops are placed within close proximity of each other and are operating at or near the same frequency, their fields can interact with each other. This effect, known as crosstalk, causes the detectors to operate incorrectly and detect vehicle presence on the adjacent loop.

Date Format. The way that you display a date.

Differential Counters. A Differential Counter adds to and subtracts from the total number of spaces in a facility to provide a count of the number of spaces available in the facility or a particular area.

DIP Switches. Small series of switches located on switch banks on CPU Boards that enable you to determine various functions such as mode of operation, sensitivities, etc.

Directional Arming. Directional Arming logic enables you to arm a device only if the vehicle is traveling in the proper direction.

Dual Differential Counters. Two counters, Differential Count #1 and Differential Count #2, add to and subtract from the total number of spaces available in a facility to provide a count of the number of spaces available in the facility or a particular area. You can use one counter to count the monthly spaces available and the second counter to count the transient spaces available.

Input. A signal to the system that an action has occurred.

Installing. Electrically connecting, and if applicable, programming the software, on a device

LED. Light emitting diode contained on some devices that indicates a unit has power or is operating correctly.

LCD. Liquid crystal display on the Omega LCD Controller.

Loop Detector. Detects the presence of a vehicle within a specific zone around and above the loop. Consists of the loop or coil of wire embedded in the ground, loop lead-in, and the electronic module which generates the signal that is passed through the loop.

Menu. A screen that you see when you program devices. This enables you to select which option you want to program.

Mode Setting. The first five DIP Switches on Switch Bank 1 determine the lane operation. This is known as Mode setting.

Monitor Mode. One of the two configurations on the Omega LCD Controller. In the Monitor Mode, you can review information about the status and settings of the Configuration Module, the Omega LCD Controller, the Connection Panel, lane status, etc.

Menu Mode. One of the two configurations on the Omega LCD Controller. In Menu Mode, you can program the gate options, review reports, and send gate commands.

No Config Mode. Indicates that the G-90 CD Gate is operating without a Configuration Module.

Non-Resettable Counters. The Omega LCD Controller stores counters that provide a variety of information such as the number of times a presence was detected on each loop, number of monthly vehicles that entered the facility, number of transient vehicles that entered the facility, etc. These counters may be resettable or non-resettable. Each counter acts as an accumulating counter and stores 999,999 counts before returning to zero and restarting the counts.

Omega LCD Controller. Unit that houses the logic for the G-90 CD Gate.

Resettable Counters. The Omega LCD Controller stores counters that provide a variety of information such as the number of times a presence was detected on each loop, number of monthly vehicles that entered the facility, number of transient vehicles that entered the facility, etc. These counters may be reset to zero. Each counter acts as an accumulating counter and stores 999,999 counts before returning to zero and restarting the counts.

Single Differential Counter. A Single Differential Counter adds to and subtracts from the total number of spaces in a facility to provide a count of the number of spaces available in the facility or a particular area.

Sub Mode. The placement of devices in the lane is known as Sub Mode.

Switch Bank. Component on CPU Boards for housing DIP Switches.

Tailgate. The tailgate option detects the presence of a second vehicle following within six inches of another vehicle passing over a 2 ft. 6 in. x 6 ft. (.76 m x 1.8 m) loop coil. This option maintains the integrity of any vehicle counting system.

Index

A

- accumulators, programming, 68
- alarm message, programming, 75
- automatic time zone control option, 128
 - monthly device time zone, 128
 - raise/lower time zone, 128
 - time zone for override, 128
 - transient time zone, 128
- auxiliary 1 on/off time zone, programming, 70
- auxiliary 2 on/off time zone, programming, 70

B

- base mode, 138
 - DIP switch, setting, 138
- broken arm sensor, 59
- broken gate arm sensor
 - sensitivity setting, 61

C

- cabinet, installing, 51
- cam adjustment, 56
- cold starting, 42
- commands menu, 101
- communication option, 128
- communication port diagnostics, 118
- components
 - configuration module, 6
 - Connection Panel, 2
 - detector loops, 7
 - gate arm, 2
 - gate housing, 1
 - mechanical, 7
 - see also** installing
- configuration module, 6
 - DIP switches, 39
 - removing, 32
- configurations, viewing, 86
- Connection Panel, 2
 - DIP switches, 37, 38
 - field connections, 29
 - inputs/outputs, 31
 - inputs/outputs, no config mode, 47
 - installing, 36
- counts

- Emul A, 134
- Emul B, 134
- Emul C, 134
- Extrn 1, 135
- Extrn 2, 135
- Gate Up, 135
- Ill Fwd, 134
- Ill Rev, 134
- Ill V A, 134
- Ill V B, 134
- Ill V C, 134
- Ill V D, 134
- M F Bck, 134
- M R Bck, 134
- Man G U, 135
- Mon Fwd, 134
- Mon Rev, 134
- Override, 135
- Pres A, 134
- Pres B, 134
- Pres C, 134
- Pwr Up, 135
- R/L Input, 135
- Reb Ext, 135
- Reb Input, 135
- Reb Mot, 135
- Reb PrB, 135
- T F Bck, 134
- T R Bck, 134
- TgB Fwd, 134
- Tot Fwd, 134
- Tot Rev, 134
- Tra Fwd, 134
- Tra Rev, 134
- Tune Lp, 135
- counts features, 134
- counts information, viewing, 96
- counts, types, 93
- crosstalk, 25
 - test, 122

D

- date, programming, 43
- DC1 Add Input, 130
- DC2 Sub Input, 130

- detector loops, 7
- diagnostic information, viewing, 79, 81
- diagnostics, Omega LCD Controller
 - communication port, 118
 - input/output, 120
 - keypad, 119
 - LCD display, 118
 - manual, 116
 - run-time, 115
 - run-time messages, 115
- Differential 1 Output, 133
- differential counters
 - dual, 127
 - programming, 73
 - single, 127
- differential counts
 - menu, 95
 - viewing, 96
- DIP switch
 - configuration module, 39
 - Connection Panel, 38
 - hexadecimal representation, 79
 - menu, 80
 - setting
 - base mode, 138
 - detector sensitivity, 39, 40
 - frequency, 20
 - lane operation, 37, 138
 - lane operation, no config mode, 47
 - Omega LCD Controller, 35
 - sensitivity, config mode, 59
 - sensitivity, no config mode, 48
 - sub mode, 37, 138
 - switch bank 1, 37
 - tailgate sensitivity, 39, 40, 41
- directional arming, 128
- directional logic, 138
- disable vend command, 102, 104
- dual differential counter, 127
- dual direction operation, 127

E

- electrical field, inductance loop, 17
- emergency gate operation, 58
- Emul A, 134
- Emul B, 134
- Emul C, 134
- enable vend command, 102, 104
- escape lane, lane layout sample, 151

- exception events
 - report, 88, 120
 - viewing, 91
- External Count Source 1 Input, 130
- External Count Source 2 Input, 130
- Extrn 1, 135
- Extrn 2, 135

F

- facility space counters, programming, 73
- field connections, Connection Panel, 29
- folding gate arm, installing, 55
- free gate with opening loop, lane layout
 - sample, 148
- full off command, 102, 104
- full on command, 102, 103
- full sign, 102

G

- gate arm, 2
 - installing, 54
 - troubleshooting, 121, 122
 - warning label, 2
- gate arm assembly
 - folding gate arm, 56
 - non-folding, 55
- gate arm assembly, folding
 - part numbers, 172
- gate assembly, part numbers, 169
- gate cabinet
 - installing, 51
 - troubleshooting, 124
- gate housing, 1
- gate operation
 - emergency, 58
 - no config mode, 46
 - power failure, 58
- Gate Up, 135

H

- hardware options, 82
- hardware requirements, inductance loop, 13
- hexadecimal representation, DIP switches, 79
- hidden inductors, 26
- hourly count reports, 135
- hourly counts
 - menu, 96
 - programming, 68

viewing, 96

I

III Fwd, 134

III Rev, 134

III V A, 134

III V B, 134

III V C, 134

III V D, 134

Illegal Forward Count Output, 131

Illegal Reverse Count Output, 131

In Sense Input, 130

inductance loop

electrical field, 17

estimating loop inductance, 22

hardware requirements, 13

hidden inductors, 26

installation, 15

lead-in cable, 18

loop detector malfunction, 24

loop locator, using, 27

operating frequency, 22

See also loop

sensitivity, 22

shorted loops, 25

size, 22

tailgate option, 23

troubleshooting, 24

loop detector malfunction, 24

shorted loops, 25

tuning, 24

input terminals, viewing, 98

input/output diagnostic message, sample, 120

input/output diagnostics, Omega LCD

Controller, 120

inputs

active inputs, viewing, 98

available inputs, 129

Connection Panel, 31

DC1 Add, 130

DC2 Sub, 130

External Count Source 1, 130

External Count Source 2, 130

In Sense, 130

menu, 85

Monitor, 130

no config mode, 47

Omega LCD Controller, 82

Vend C, 130

Vend D, 130

Vend E, 130

installing

Connection Panel, 36

folding gate arm, 55

gate cabinet, 51

inductance loop, 15

Omega LCD Controller, 34

standard gate arm, 54

internal view, G-90 CD Gate, 8

K

keypad diagnostics, Omega LCD Controller, 119

keypad, Omega LCD Controller, 5, 6

L

lane layout sample, 141–163

escape lane, 151

free gate with opening loop, 148

pay in no arming, 141

pay in with arming loop for push-button spitter
and card reader, 144

pay in with arming loop for spitter only, 145

pay in with directional arming for auto spitter
only, 153

pay in with directional arming for push-button
spitter and card reader, 152

pay in, arming loop for auto spitter only, 143

pay in/free out, 142

pay in/pay out with arming for entry reader and
auto spitter only, 160

pay in/pay out with arming for entry spitter/
reader and exit reader/fee computer, 157

pay in/pay out with arming for push-button
spitter and card reader only, 156

pay in/pay out with arming loop for auto spitter
only, 155

pay in/pay out with arming loop for entry auto
spitter and exit fee computer, 159

pay in/pay out with arming loop for entry auto
spitter and exit reader/fee computer, 158

pay in/pay out with directional arming for entry
auto spitter only, 163

pay in/pay out with directional arming for ticket
spitter/card reader, 162

pay in/pay out with escape lane entry, 161

pay in/pay out, single loop, 154

pay operation with arming loop for card reader
and auto spitter, 149, 150

- pay out with arming loop for fee computer only, 147
 - pay out with arming loop for reader and fee computer, 146
- lane operation
 - base mode, 138
 - DIP switches, setting, 37, 138
 - directional logic, 138
 - mode logic, 137
 - sub mode, 138
 - vends, 138
- lane status, 98
 - information, viewing, 98
 - menu, 98
- latest event, viewing, 91
- LCD Controller **see** Omega LCD Controller
- LCD display
 - diagnostics, 118
 - troubleshooting, 123
- lead-in cable, inductance loop, 18
- loop backout timer, programming, 64
- loop C, 128
- loop detector
 - malfunction, 24
 - operation, 14
 - presence output, 14
 - pulse output, 14
 - sensitivity, 22, 59
 - see also** inductance loop
- loop frequency
 - setting DIP switches, 20
 - viewing, 98
- loop inductance, estimating, 22
- loop layout, 14
- loop locator, using, 27
- loop size, 17
- loop, overview, 13
- Lot Forward Full Output, 132
- Lot Reverse Full Output, 133
- lower gate command, 102, 103

M

- M F Bck, 134
- M R Bck, 134
- maintenance schedule, 125
- malfunction, loop detector, 24
- Man G U, 135
- manual diagnostics, Omega LCD Controller, 116
- mechanical components, 7

- menu
 - commands, 101
 - differential counts, 95
 - DIP switches, 80
 - hourly counts, 96
 - inputs, 85
 - lane status, 98
 - navigating, 9
 - non-resettable counts, 94
 - Omega LCD Controller, using, 9–??
 - options, 84
 - outputs, 86
 - reports, 91
 - resettable counts, 94
 - settings menu, 83
- menu mode, 5
- message, lane transaction, 88
- miscellaneous features
 - menu, 81
- miscellaneous timers, programming, 65
- mode logic, 137
- Mon Fwd, 134
- Mon Rev, 134
- Monitor Input, 130
 - programming, 75
- monitor mode, 5
- monthly device time zone, 128
 - programming, 70
- Monthly Forward Back-Out Count Output, 132
- Monthly Forward Count Output, 131
- Monthly Reverse Back-Out Count Output, 132
- Monthly Reverse Count Output, 132

N

- no config mode
 - DIP switch settings
 - lane operation, 47
 - sensitivity, 48
 - gate operation, 46
 - inputs/outputs, 47
 - warm start, 46
- no loop backout time, programming, 64
- non-resettable counters, 133
- non-resettable counts
 - menu, 94
 - viewing, 96
- numbers, parts, 165, 166

O

oldest event, viewing, 91

Omega LCD Controller

accumulators, programming, 68

commands menu, 101

communication port diagnostics, 118

date, programming, 43

diagnostics, manual, 116

DIP switch menu, 80

exiting from an option, 10

going to the next screen, menu, 9

going to the previous screen, menu, 10

input/output diagnostics, 120

inputs, 82

inputs menu, 85

installing, 34

keypad, 5, 6

keypad diagnostics, 119

LCD display

diagnostics, 118

troubleshooting, 123

menu

differential counts, 95

hourly counts, 96

lane status, 98

miscellaneous, 81

reports, 91

settings, 83

menu mode, 5

monitor mode, 5

navigating menus, 9

non-resettable counts

menu

standard, 93

non-resettable counts menu, 94

options, 82

options menu, 84

options, displaying, 11

outputs, 83

outputs menu, 86

overview, 5

removing, 35

resettable counts

menu, 93

resettable counts menu, 94

run-time diagnostics, 115

scrolling through the menu, 10

selecting an item, menu, 10

selecting an option, menu, 11

setting DIP switches, 35

settings, 82

time, programming, 43

operating frequency, inductance loop, 22

operation, gate

emergency, 58

no config mode, 46

power failure, 58

options menu, 84

options, Omega LCD Controller, 82

orders, placing, 165

output terminals, viewing, 98

outputs

available, 131

Connection Panel, 31

Differential 1, 133

Illegal Forward Count, 131

Illegal Reverse Count, 131

Lot Forward Full, 132

Lot Reverse Full, 133

Monthly Forward Back-Out Count, 132

Monthly Forward Count, 131

Monthly Reverse Back-Out Count, 132

Monthly Reverse Count, 132

no config mode, 47

Omega LCD Controller, 83

Presence A, 131

Presence B, 131

Presence C, 131

Pulse A, 131

Pulse B, 131

Pulse C, 131

Time Zone, 133

Total Forward Count, 132

Total Reverse Count, 132

Transient Forward Back-Out Count, 132

Transient Forward Count, 131

Transient Forward Full, 132

Transient Reverse Back-Out Count, 132

Transient Reverse Count, 132

Transient Reverse Full, 133

Vend A Enable, 131

Vend B Enable, 131

Vend C Enable, 132

Vend D Enable, 132

Vend E Enable, 133

outputs menu, 86

Override, 135

P

- part numbers, 165, 166
 - G-90 CD Gate, 166
 - gate arm assembly, folding, 172
 - gate assembly, 169
- parts **see** components
- parts, ordering, 165, 166
- pay in no arming, lane layout sample, 141
- pay in with an arming loop for push-button spitter and card reader, lane layout sample, 144
- pay in with arming loop for auto spitter only, lane layout sample, 143
- pay in with arming loop for spitter only, lane layout sample, 145
- pay in with directional arming for auto spitter only, lane layout sample, 153
- pay in with directional arming for push-button spitter and card reader, lane layout sample, 152
- pay in/ free out, lane layout sample, 142
- pay in/pay out with arming for entry reader and auto spitter only, lane layout sample, 160
- pay in/pay out with arming for entry spitter/reader and exit reader/fee computer, lane layout sample, 157
- pay in/pay out with arming for push-button spitter and card reader only, lane layout sample, 156
- pay in/pay out with arming loop for auto spitter only, lane layout sample, 155
- pay in/pay out with arming loop for entry auto spitter and exit fee computer, lane layout sample, 159
- pay in/pay out with arming loop for entry auto spitter and exit reader/fee computer, lane layout sample, 158
- pay in/pay out with directional arming for entry auto spitter only, lane layout sample, 163
- pay in/pay out with directional arming for entry spitter/card reader, lane layout sample, 162
- pay in/pay out with escape lane entry, lane layout sample, 161
- pay in/pay out, single loop, lane layout sample, 154
- pay operation with arming loop for card reader and auto spitter, lane layout sample, 149, 150
- pay out with arming loop for fee computer only, lane layout sample, 147
- pay out with arming loop for reader and fee computer, lane layout sample, 146
- power failure, gate operation, 58
- power supply **see** Connection Panel

- power switch, 42
- Pres A, 134
- Pres B, 134
- Pres C, 134
- Presence A Output, 131
- Presence B Output, 131
- Presence C Output, 131
- presence output, 14
- programming

- accumulators, 68
- alarm message, 75
- auxiliary 1 on/off time zone, 70
- auxiliary 2 on/off time zone, 70
- date, 43
- differential counters, 73
- facility space counters, 73
- hourly counts, 68
- loop backout timer, 64
- miscellaneous timers, 65
- monitor input, 75
- monthly device time zone, 70
- no loop backout timer, 64
- raise/lower time zone, 70
- rebound up timer, 65
- resettable counters, 68
- sensitivity, 61
- time, 43
- time zone for override, 70
- time zones, 69
- transient time zone, 70
- up alarm timer, 65

- Pulse A Output, 131
- Pulse B Output, 131
- Pulse C Output, 131
- pulse output, 14
- Pwr Up, 135

R

- R/L Input count, 135
- raise gate command, 102, 103
- raise/lower time zone option, 128
- raise/lower time zone, programming, 70
- Reb Ext, 135
- Reb Input count, 135
- Reb Mot, 135
- Reb PrB, 135
- rebound motor sensitivity, 59
 - DIP switch, setting, 39
 - programming, 61

- rebound up timer, programming, 65
- remote vend command, 102, 105
- removing
 - configuration module, 32
 - Omega LCD Controller, 35
- repair
 - requesting, 165
- reports
 - exception events, 88, 120
 - lane transaction, messages, 88
 - menu, 91
 - total events, 88
- requirements, hardware
 - inductance loop, 13
- resettable counters, 133
 - programming, 68
- resettable counts
 - menu, 94
 - viewing, 96
- run-time diagnostic messages, 115
- run-time diagnostics, Omega LCD Controller, 115

S

- sensitivity
 - broken arm, 59
 - programming, 61
 - loop detector, 59
 - distances, 22
 - programming, 62
 - rebound motor, 59
 - programming, 61
 - tailgate, 59
 - programming, 63
- setting Vend B enable output, 139
- settings
 - Omega LCD Controller, 82
- settings menu, 83
- shorted loops, 25
- single differential counter, 127
- size, inductance loop, 22
- software options, 82
 - automatic time zone control, 128
 - communication option, 128
 - directional arming, 128
 - dual differential counter, 127
 - dual direction operation, 127
 - inputs, 129
 - loop C, 128
 - monthly device time zone, 128

- non-resettable counters, 133
- outputs, 130
- raise/lower time zone, 128
- resettable counters, 133
- single Differential Counter, 127
- third loop detector, 128
- time zone for override, 128
- transient time zone, 128

SRO, 165

sub mode, 37, 138

- DIP switch, setting, 37, 138

switch bank 1, 37

- DIP switches, setting, 37

T

T F Bck, 134

T R Bck, 134

tailgate detection, 23, 40

tailgate sensitivity, 59

- DIP switch setting, 39, 40, 41

technical support

- overview, 175

TgB Fwd, 134

third loop detector, 128

time

- programming, 43

time zone for override, 128

- programming, 70

Time Zone Output, 133

time zones, programming, 69

Tot Fwd, 134

Tot Rev, 134

total events reports, 88

Total Forward Count Output, 132

Total Reverse Count Output, 132

Tra Fwd, 134

Tra Rev, 134

transaction information, lane, 88

transaction information, viewing, 91

Transient Forward Back-Out Count Output, 132

Transient Forward Count Output, 131

Transient Forward Full Output, 132

Transient Reverse Back-Out Count Output, 132

Transient Reverse Count Output, 132

Transient Reverse Full Output, 133

transient time zone option, 128

transient time zone, programming, 70

troubleshooting

- black dust inside cabinet, 124

- gate arm, 121, 122
- inductance loop, 24
- LCD display, 123
- loop detector malfunction, 24
- shorted loops, 25

tune loops, 102, 103

Tune Lp, 135

tuning inductance loop, 24

U

up alarm timer, programming, 65

V

vend

- disable, 102, 104

- enable, 102, 104

- remote, 102, 105

Vend A, 139

Vend A Enable Output, 131

Vend B, 139

Vend B Enable Output, 131

Vend B enable output

- setting, 139

Vend C, 139

Vend C Enable Output, 132

Vend C input, 130

Vend D, 139

Vend D Enable Output, 132

Vend D input, 130

Vend E Enable Output, 133

Vend E Input, 130

vends, 138

viewing

- active inputs, 98

- active outputs, 98

- available inputs, 98

- available outputs, 98

- configurations, G-90 CD Gate, 86

- counts information, 96

- diagnostic information, 79, 81

- differential counts, 96

- exception events, 91

- hourly counts, 96

- input terminals, 98

- lane status information, 98

- latest event, 91

- loop frequency, 98

- non-resettable counts, 96

- oldest event, 91

output terminals, 98

resettable counts, 96

transaction information, 88, 91

W

warm starting, 43

- no config mode, 46

warning label

- G-90 CD Gate, 2

- gate arm, 2



FEDERAL APD
Federal Signal Corporation

42775 Nine Mile Road • Novi, Michigan 48375 • USA

Tel: (248) 374-9600 • Fax: (248) 374-9610

USA Toll Free: (800) 521-9330 • CN Toll Free: (800) 331-9144

<http://www.FederalAPD.com>

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