CB-9 3.02 CONTROL BOARD INSTRUCTION MANUAL VERSION 1.03 DATE 30/10/2000

FIRMWARE VERSION 1.09

Thank you for choosing the CB-9 control system. We encourage you to read and understand this manual prior to attempting to install the control board. Some features and concepts are new and may seem confusing at first. So, take some time to read the manual to become familiar with the control board. Keep in mind that including some of the new features as options in your project quotation may be all that is required to turn things in your favour. Having a good understanding of the control board will save time during installation.

Keep in mind that the electricity and the power of the motors associated with this product can be fatal or at least cause serious injury. A.T.A suggests that photoelectric beam detectors be used and strategically placed to prevent personnel from being injured by the motorised device being controlled. Make sure that all personnel, who are intended to operate or be near the device being controlled, are fully trained on its use and how to prevent injury. Do not cut corners or costs if it is at the expense of safety. Make sure all wiring and other aspects of the project meet the appropriate authority's standards. All mains voltage wiring must be installed by a licensed electrician. All transformers must be Safety Isolating Transformers that comply with AS3108.

NOTE ABOUT MANUAL'S CONTENTS

In order to simplify this manual all operational descriptions refer to a swing gate installation unless stated otherwise. For simplicity all control and safety inputs with the exception of the P.E input are described as being activated by a simple switch, as it is not possible or desirable to cover all input devices. It is therefore up to the reader to interpret the concepts given and extend them to other operators and input devices such as time clocks, loop detectors, stand alone relay receivers, etc.
Note that some of the functions and adjustments detailed in this manual require the use of an ATA PROGRAMMER which can be purchased from A.T.A. The programmer is only required for advanced functions and adjustments which are not normally encountered in standard installations.

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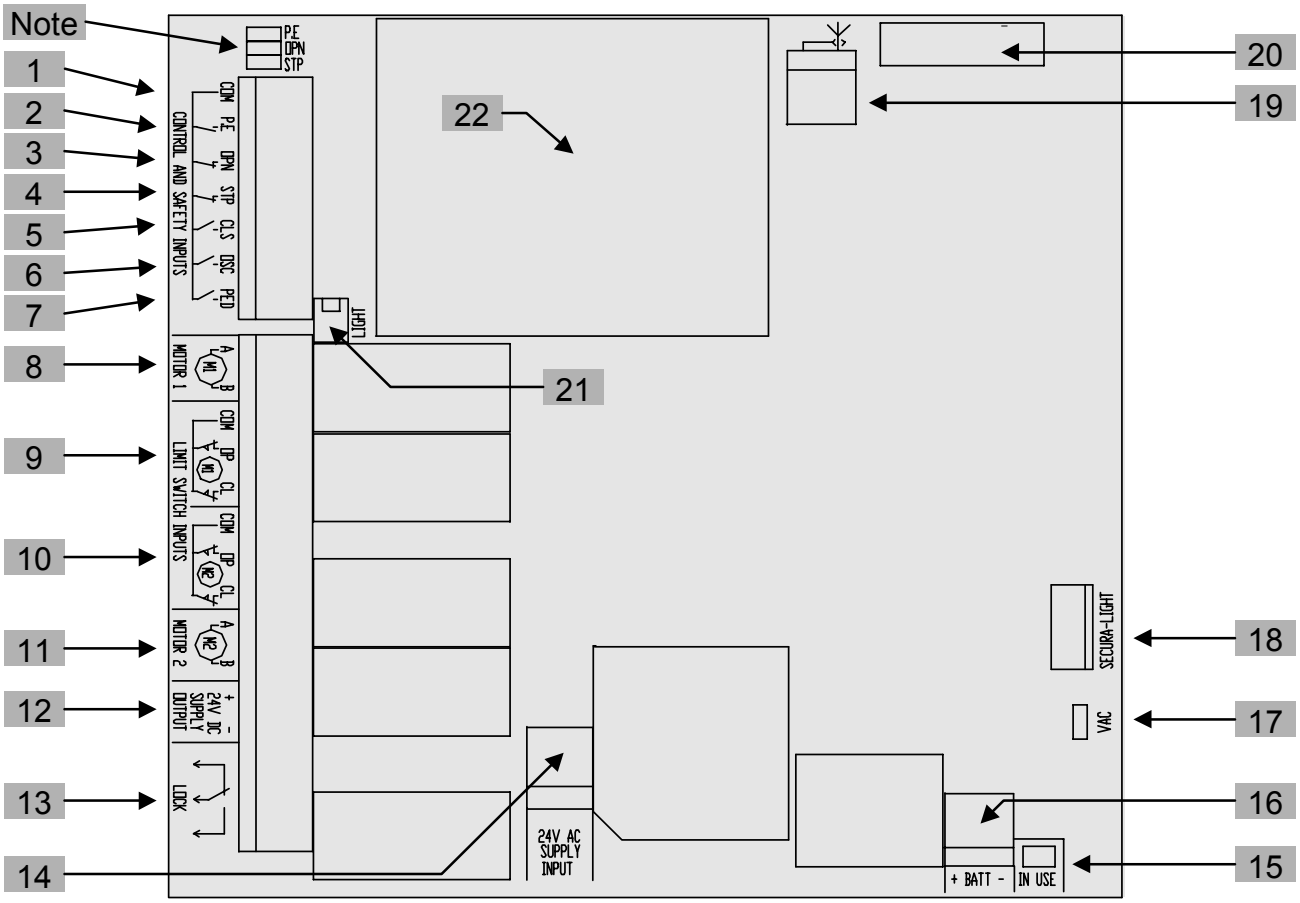
1. GENERAL DESCRIPTION AND FEATURES

The CB-9 3.02 control board is designed to automate one or two 24V DC swing or sliding gate drive units with limit switches. The CB-9 3.02 supersedes earlier CB-9 versions. A list of some of the features of the control board follows.

- Control board constructed using state of art assembly techniques such as SMT and industrial quality materials and components.
- Each control board is visually and electronically checked after production.
- Controlled by a powerful custom-programmed micro-controller.
- All control and limit switch inputs accept dry switch contacts and have high noise immunity.
- The limit switch inputs are electrically interlocked to the motor drive relays. This means that in the unlikely event of the micro-controller malfunctioning, the motors will still be prevented from being driven beyond the positions set by the limit switches.
- A motor drive timer prevents the motors being driven indefinitely, should a limit switch fail.
- On board mains transient protection is provided.
- Terminal block and mode selection labelling is clear and informative.
- A small size of 130mm x 140mm x 45mm.
- Control inputs for open, close, stop, open/close/stop (swipe), pedestrian access and photoelectric safety beams are provided.
- Plug in remote control radio receiver provides remote open/stop/close (swipe) and pedestrian operation via hand held or keypad transmitters.
- The Pedestrian access input is provided to partially open one gate leaf for pedestrian access. The distance the gate is opened is adjustable.
- The photoelectric safety beam input can be programmed to either stop or reverse the motors if tripped while being driven closed.
- The photoelectric safety beam input can be programmed to prevent the motors being driven in the open or close directions.
- The controller can be programmed to automatically close the gate after it has been opened, partly opened for pedestrian access or after the photoelectric safety input has been triggered and then released. The time the gate stays open is adjustable and independent for each of the three auto-close types.
- On board status LEDs show status of the gate/door and backup battery charger.
- A light control output can be selected to turn on courtesy lighting each time the gates are operated. The lights are then automatically turned off after a pre-set time.
- The light control output can be selected to control a warning light that is illuminated while the gates are in motion.
- A lock control output is provided which can be used to deactivate a locking mechanism at the start of each cycle. An adjustable pulse or hold action can be selected to release the lock. The time from when the lock is activated to when the motors are started can also be adjusted.
- When over lapping gate leaves are used, a delay can be introduced so that the overlapping leaf reaches/leaves the closed position before the other leaf.
- An integrated back-up battery charger is included.
- Secura-light monitor supported.
- Automatic setting of motor overload levels.
- Maximum motor speed is adjustable via a 10-position dial.
- Mechanical wear and tear reduced by slowing motor as the end of a drive cycles is approached.

2. CONTROL BOARD LAYOUT

2.1. CONTROL BOARD VIEW

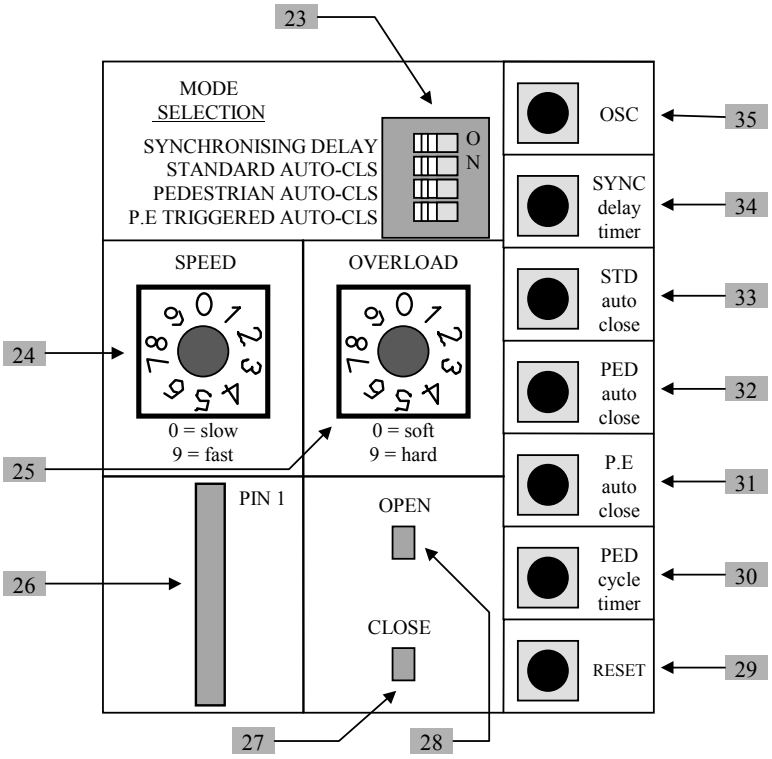


1. COMMON TERMINAL FOR [2] TO [7] BELOW.
2. PHOTO-ELECTRIC SAFETY BEAM INPUT.
3. OPEN CONTROL INPUT.
4. STOP CONTROL INPUT.
5. CLOSE CONTROL INPUT.
6. OPEN/STOP/CLOSE CONTROL INPUT.
7. PEDESTRIAN ACCESS CONTROL INPUT.
8. MOTOR 1 TERMINALS.
9. MOTOR 1 LIMIT SWITCH INPUTS.
10. MOTOR 2 LIMIT SWITCH INPUTS.
11. MOTOR 2 TERMINALS.
12. TERMINALS FOR 24VDC SUPPLY OUTPUT (TO ACCESSORIES).
13. ELECTRIC LOCK CONTROL TERMINALS.
14. 24V AC SUPPLY INPUT (FROM TRANSFORMER).
15. BACKUP BATTERY SUPPLY IN USE L.E.D.
16. BACKUP BATTERY TERMINALS.
17. VACATION SHUT DOWN LINK.
18. SECURA-LIGHT INTERFACE CONNECTOR
19. REMOTE CONTROL RECEIVER ANTENNA CONNECTOR.
20. PLUG-IN REMOTE CONTROL RECEIVER CONNECTOR.
21. LIGHT CONTROL RELAY INTERFACE CONNECTOR.
22. MODE SELECTION AND ADJUSTMENT (SEE SECTION 2.2).

Note: These links can be used to short the P.E, OPN and/or STP inputs to COM when the inputs are not used.

Figure 1 View Of Control Board Layout

2.2. MODE SELECTION AND ADJUSTMENT VIEW



23. MODE SELECTION DIP-SWITCHES.
24. SPEED SELECTION DIAL.
25. MOTOR OVERLOAD SENSITIVITY DIAL.
26. PROGRAMMER INTERFACE CONNECTOR.
27. CLOSE STATUS LED (see Appendix B).
28. OPEN STATUS LED (see Appendix B).
29. RESET BUTTON.
30. PEDESTRIAN ACCESS CYCLE TIMER SET BUTTON.
31. P.E AUTO-CLOSE TIME SET BUTTON.
32. PEDESTRIAN AUTO-CLOSE TIME SET BUTTON.
33. STANDARD AUTO-CLOSE TIME SET BUTTON.
34. SYNCHRONISING DELAY TIME SET BUTTON.
35. OPEN/STOP/CLOSE BUTTON

Figure 2 View Of Mode Selection Controls

3. DESCRIPTION OF STANDARD OPERATION

This section describes the operation of the control board as it is supplied. The control board is supplied with all the mode selection dipswitches in the off position, the SPEED dial set to '9', the OVERLOAD dial set to '5' and factory programmed parameters in memory. Refer to section **10 RELOADING FACTORY SETTINGS** on page 24 if you wish to return the control board's memory to its original factory programmed parameters.

MOTOR CONTROL.

The controller drives the motors in the appropriate direction as instructed by the control inputs. Both motors are started at the same time and are turned off when:

a) The controller is instructed to by a control input.
b) Motor travel time has exceeded 60 seconds.
c) A motor's limit switch input for the current direction of travel has been activated.
d) A motor is overloaded. (See section **3.1 MOTOR OVERLOAD DETECTION**)

When the control inputs instruct the control board to change the motor direction, the controller turns off the motors, waits 0.5 seconds and then starts the motors in the other direction.

3.1. MOTOR OVERLOAD DETECTION

If a motor is overloaded while opening, both motors are stopped. If a motor is overloaded while closing, both motors are stopped and then reversed to the open position. Overload detection is achieved by monitoring each motor's current draw. If the current drawn by a motor exceeds the 'normal' current draw by a certain amount, then the motor is said to be overloaded. The 'normal' motor current for each motor in each direction is found during initialisation. See section **7.2 INITIALISING (RECORDING THE MOTOR TRAVEL TIMES AND CURRENTS)** for details on how to initialise the control board. The overload sensitivity is adjustable using the OVERLOAD dial [25], with dial position 0 making it easy to overload a motor, increasing through positions 1 to 8, with position 9 being the hardest to overload a motor. Overload detection is disabled during the first 1.5 seconds of each motors travel so that the motor's high starting current does not cause an overload. It is also important to note that while the controller is initialising, overload detection is partly disabled. An additional feature is that an overload will be detected if the sum of the two motor currents exceeds a fixed level. This feature is included as the transformer powering the control board can only supply a limited current. When both motors are heavily loaded, it is possible that each motor's current will not be sufficient to cause a normal overload. In addition to the normal motor overload detection which is used to detect an obstruction, a motor 'Cut Out' facility is used to protect the control board in the event that the motor outputs are short circuited.

3.2. MOTOR SPEED CONTROL

Each motor's speed is controlled independently. When a motor is started, it is turned on at the speed selected using the SPEED dial [24] with 0 being the slowest and 9 being the fastest. The motor will be driven at this speed until it nears the end of the travel, at which time it will be slowed down. The motor slows down to the speed represented by '3' on the speed dial. In order for the controller to determine when to slow the motors down towards the end of each cycle, a complete open and a complete close cycle must be performed and the travel times of each motor in each direction found. This function is carried out during initialisation. See section **7.2 INITIALISING (RECORDING THE MOTOR TRAVEL TIMES AND CURRENTS)** for details on how to initialise the control board. The factory set slow motor speed of '3' can be altered if desired, see section **5.6 SLOW MOTOR SPEED** or section **9.8.h SLOW SPEED** for details.

3.3. LOCK RELEASE OUTPUT

The lock release output is configured for PULSE operation and activated for 0.5 seconds at the start of each cycle.

3.4. COURTESY LIGHT

With the addition of a module which plugs into the control board connector [21], the control board will control a courtesy light. The light is normally used to illuminate the driveway etc. The light will be turned on each time the gate is activated (day or night) and automatically turned off 1 minute after the drive cycle has finished.

3.5. OPEN / STOP / CLOSE (OSC) INPUT

The OSC input can be activated by: 1) a switch connected to the OSC terminal [6]
2) The OSC button [35]
3) The OSC button on a Secura-light monitor connected to [18]
4) The OSC output of a plug-in receiver connected to [20]

Figure 3 shows how a gate's motion is controlled by the OSC input.

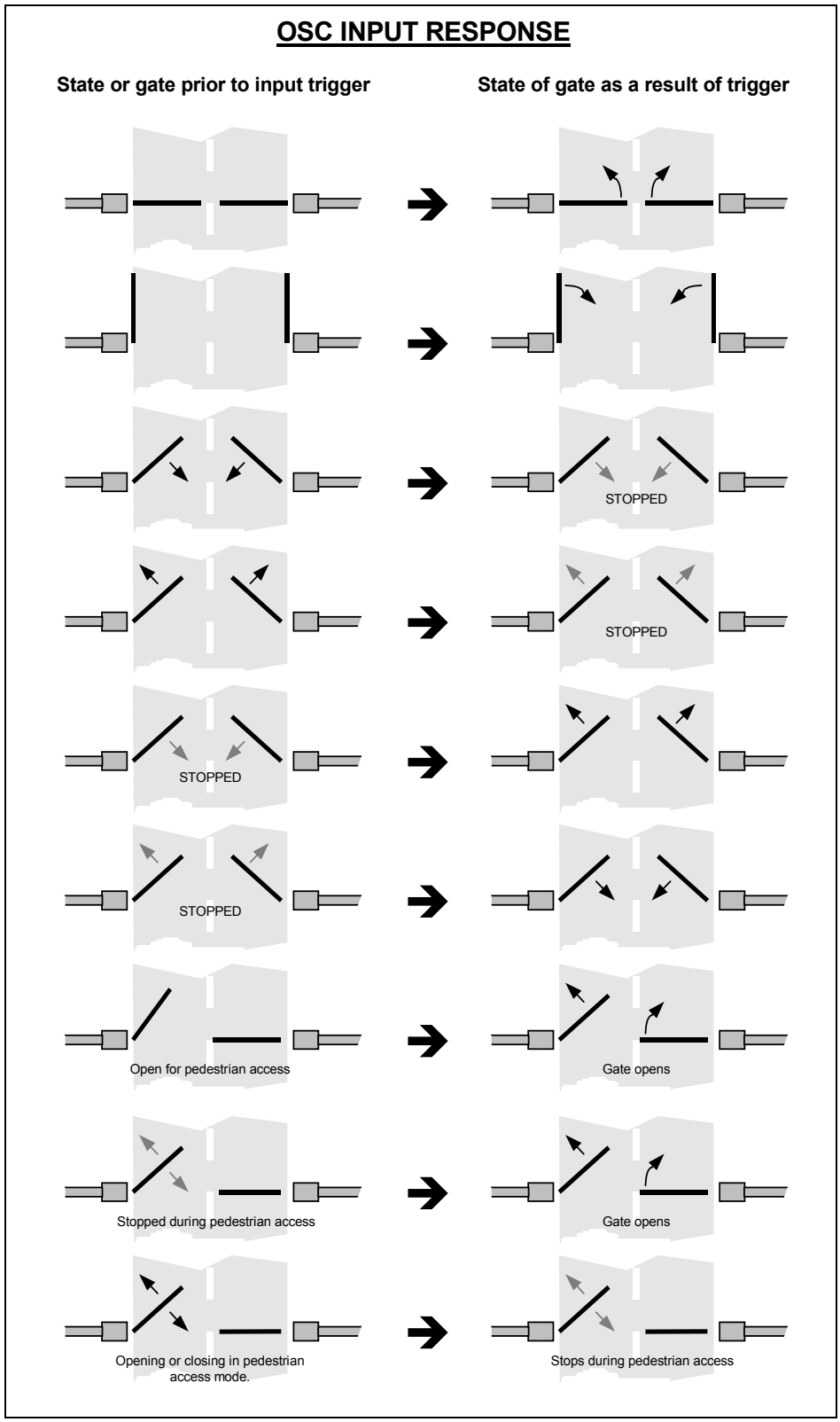


Figure 3 OSC Input Response

3.6. PEDESTRIAN ACCESS (PED) INPUT

The pedestrian access operation partly opens the gate leaf driven by motor 1 to allow pedestrian access but prevent vehicle access. The gate leaf is partly opened by driving motor 1 in the open direction to the previously programmed pedestrian access position. The gate can then be closed or stopped by reactivating the PED input. See **Figure 4** for details on how the gate is controlled using the PED input. Note motor 1 drives the left-hand gate leaf in the diagrams of **Figure 4**. Also note, only the gate states are shown while in the pedestrian access mode. The pedestrian access mode is entered by activating the PED input when the gate is in the closed position. If the gate is not in the pedestrian access mode, the PED input will stop the gates if moving, or close the gates, if stopped. The PED input can be activated by a switch connected to the PED terminal [7] or by activating the PED output of a plug-in receiver connected to connector [20].
While in the standard pedestrian access mode (described here) the gate will stop but not re-open either if an overload is detected or if the P.E input is activated while closing. The SWIPE and PSC pedestrian access modes behave differently, see section **9.8.k PED INPUT MODE & PED SPECIAL MODE** for details. **Note in order to use the pedestrian access feature, the pedestrian access position must be programmed.** For details see section **5.5 PEDESTRIAN ACCESS CYCLE TIME**

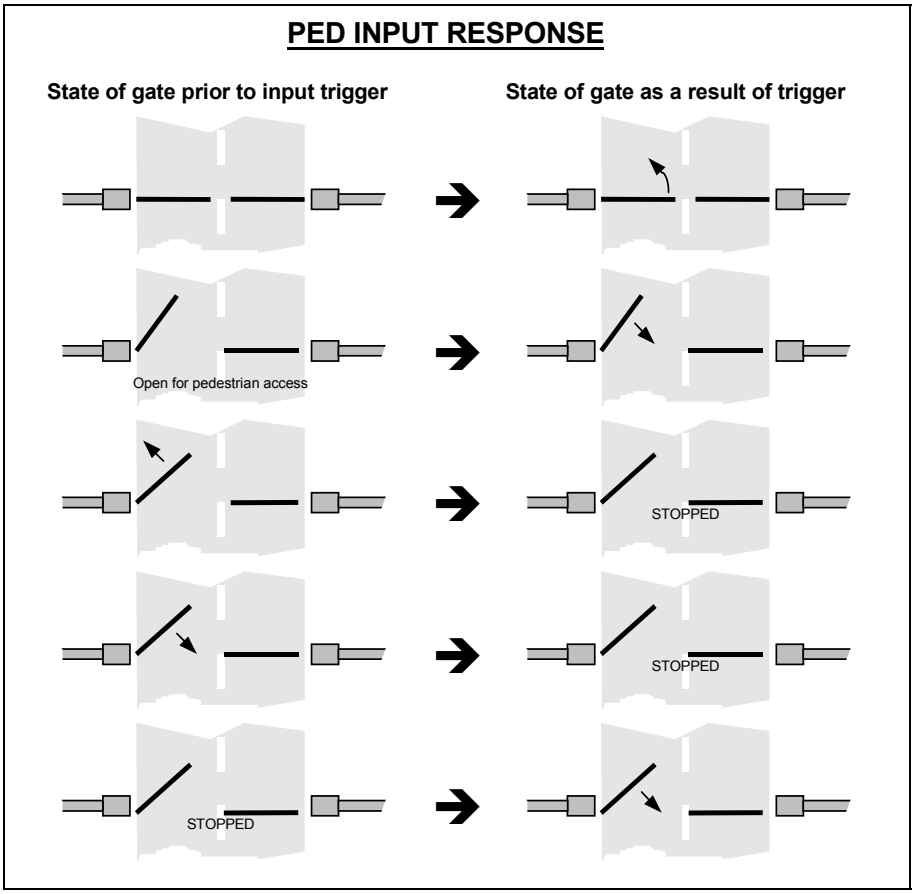


Figure 4 PED Input Response

3.7. CLOSE (CLS) INPUT

The CLS input is activated by a switch connected to the CLS input terminal [5]. Activating the CLS input will cause the gate to close.

3.8. OPEN (OPN) INPUT

The OPN input is activated by a switch connected to the OPN input terminal [3]. Activating the OPN input will cause the gate to open.

3.9. STOP (STP) INPUT

The STP input is activated by a switch connected to the STP input terminal [4]. Activating the STP input while the gate is moving will cause the gate to be stopped.

3.10. PHOTOELECTRIC SAFETY BEAM (P.E) INPUT

The P.E input is activated by a switch contact connected to the P.E input terminal [2]. When the P.E input is active, the gate is prevented from being closed. If the P.E input is triggered while the gate is closing, the controller will stop the motors and then open the gate. The P.E input has no effect while the gate is opening. For details about how the P.E input affects a pedestrian close cycle see section **3.6 PEDESTRIAN ACCESS (PED) INPUT**

3.11. REMOTE CONTROL

When an optional remote control receiver is fitted to the connector [20], the controller can be remotely operated by a remote control transmitter. The receiver can operate both the OSC and PED inputs. For operation of the OSC and PED inputs see sections **3.5 OPEN / STOP / CLOSE (OSC) INPUT** and **3.6 PEDESTRIAN ACCESS (PED) INPUT**

3.12. WHAT HAPPENS WHEN MORE THAN ONE INPUT IS ACTIVATED AT A TIME

As the controller has several inputs, it is possible that more than one of the inputs will be active at any one time. For example, the OSC input may be triggered while the P.E input is active. The controller is programmed so that it will respond is a sensible manner regardless of how many inputs are active at one time. The following 'rules' are programmed into the controller's logic:

a) The gate can not be driven in the close direction if the OPN input is active.
b) The gate can not be driven in the open direction if the CLS input is active.
c) The gate can not be moved if the STP input is active or if both the OPN and CLS inputs are active.
d) The gate can not be driven in the close direction if the P.E input is active.
e) The level of the OSC and PED inputs has no effect on the operation of the other inputs, i.e. holding one of these inputs active will not mask or effect the operation of any of the other control inputs. These inputs are 'trigger' sensitive only.

4. DIP-SWITCH SELECTED OPERATING MODES

This section describes the operating modes which can be selected by the user using the control board's dipswitches [23].

4.1. SYNCHRONISED OVERLAPPING GATE LEAFS

SYNCHRONISING DELAY > ON (DELAY = 2 SECONDS)

When dual swing gates are used, it is common for a backstop to be mounted on one of the gate leaves so that the gate leaves are aligned when closed. To prevent the gate leaves interfering with each other the gate leaf with the backstop must be made to reach the close position first when closing and be made to start to open last. The controller can be made to do this by placing the mode selection dipswitch labelled "SYNCHRONISING DELAY" into the "ON" position. This will result in the gate leaf driven by motor 1 starting to open 2 seconds before the gate leaf driven by motor 2 and the gate leaf driven by motor 2 starting close 2 seconds before that of motor 1. Note, if a lock is to be mounted on a gate leaf, it should be mounted on the leaf driven by motor 1. If the delay of 2 seconds is not suitable it can be altered, see sections **5.1 SYNCHRONISING DELAY TIME** or if different times are required for open and close directions, see sections **9.8.f OPEN SYNC DELAY** and **9.8.g CLOSE SYNC DELAY.**

4.2. AUTO-CLOSE MODES

The auto-close modes automatically close the gate after it has been operated. To implement this, the controller starts a timer once the gate has reached its desired open position. The timer then counts down and when it expires the controller starts to close the gate. The timer's count down can be suspended by activating a suspending input (which inputs 'suspend' depends on which auto-close mode is selected). When the input is deactivated the auto-close timer is reloaded and the count down recommenced. The auto-close functions are temporarily disabled by certain actions. When this happens the controller will not auto-close the gate again until the user performs some action to re-enable the function. Details about the three auto-close modes follow.

4.2.a STANDARD AUTO-CLOSE

STANDARD AUTO-CLS > ON (DELAY = 30 SECONDS)

This mode is selected by placing the mode selection dipswitch labelled “STANDARD AUTO-CLS” into the “ON” position. When selected the gate will auto-close 30 seconds after being fully opened. The following gives details about this auto-close mode.

Auto-closes after being:

1. Fully opened. (except when the gate is reversed to the open position after a motor overload is detected while closing)

Countdown suspended by:

1. The P.E input being active.
2. The OPN input being active.

Function temporarily disabled by:

1. Activating the STP input while the gate is open.
2. A motor overload causing the gate to reverse open.

Function re-enabled by:

1. Activating the OPN input while the gate is open.
2. Activating the OSC input, in SWIPE mode, while the gate is open. See section **9.8.j O/S/C INPUT MODE** for SWIPE mode details.
3. By activating any input which cases the gate leaf to start to close. The auto-close function will then be enabled once the gate is re-opened.

The standard delay time of 30 seconds can be altered, for details see sections **5.2 STANDARD AUTO-CLOSE DELAY TIME** or **9.8.a STD AUTOCLOSE TIME**.

4.2.b PEDESTRIAN ACCESS AUTO-CLOSE

PEDESTRIAN AUTO-CLS > ON (DELAY = 15 SECONDS)

This mode is selected by placing the mode selection dipswitch labelled “PEDESTRIAN AUTO-CLS” into the “ON” position. When selected, the gate leaf will auto-close 15 seconds after being opened for pedestrian access.

Auto-closes after being:

1. Driven to the programmed pedestrian access position. (Except when the gate leaf is reversed after a motor overload is detected. Reversing during pedestrian access is only implemented when special PED modes are selected.)
2. Stopped by the P.E input when closing after pedestrian access (standard PED mode only).

Countdown suspended by:

1. The P.E input being active.
2. The PED input being active.

Function temporarily disabled by:

1. Activating the STP input while the gate leaf is in the programmed pedestrian access position.
2. Activating the STP input in condition 2 of **'Auto-closes after being:'** above.
3. A motor overload causing the gate to reverse back to the programmed pedestrian access position. (Reversing is only implemented when special PED modes are selected.)

Function re-enabled by:

1. Activating the PED input, in SWIPE mode, while the gate is in the pedestrian access position. See section **9.8.k PED INPUT MODE & PED SPECIAL MODE** for SWIPE mode details.
2. Activating the PED input and causing the gate leaf to start to close. The auto-close function will be re-enabled once the gate leaf is placed in one of the positions above.

There are three different modes of PED operation, see section 9.8.k PED INPUT MODE & PED SPECIAL MODE on page 20 for details. The standard delay time of 15 seconds can be altered, for details see sections **5.3 PEDESTRIAN ACCESS AUTO-CLOSE DELAY TIME** or **9.8.b PED AUTOCLOSE TIME**

4.2.c P.E TRIGGERED AUTO-CLOSE

P.E TRIGGERED AUTO-CLS > ON (DELAY = 1 SECONDS)

This mode is selected by placing the mode selection dipswitch labelled "P.E TRIGGERED AUTO CLS" into the "ON" position. When this auto-close mode is selected, the gate will auto-close after the P.E input has been activated and released since:

1. the gate was last closed
2. The P.E triggered auto-close function was re-enabled after being disabled.
3. The SWIPE input was activated.

Auto-closes after the P.E input has been activated and then released and the gate:

1. Is fully opened. (except when the gate is reversed to the open position after a motor overload is detected while closing)
2. The gate has been stopped by the P.E input.

Countdown suspended by:

1. The P.E input being active.
2. The OPN input being active.

Function temporarily disabled by:

1. Activating the STP input.
2. A motor overload causing the gate to stop or reverse open.

Function re-enabled by:

1. Activating the OPN input while the gate is open.
2. Activating the SWIPE input.
3. By activating any input which cases the gate to start to open or close. The auto-close function will then be enabled once the gate is re-opened or the P.E input causes the gate to stop.

If the P.E input is configured to stop the gate on either opening or closing, then the gate can auto-close from a midway position. This feature is implemented so that once a vehicle has entered the gateway and broken the P.E beam, the gate will stop. When the P.E beam is cleared the gate will auto-close from the stopped position. This results in the gate not having to fully open and thus reducing the time unwarranted access through the gate is possible. The factory set delay time of 1 second is adjustable; see sections **5.4 P.E TRIGGERED AUTO-CLOSE DELAY TIME** or **9.8.c P.E AUTOCLOSE TIME**

4.2.d MIXING AUTO-CLOSE MODES

The PEDESTRIAN AUTO-CLS mode and the STANDARD AUTO-CLS mode do not affect each other as one operates during standard operation and the other during pedestrian access. However the P.E TRIGGERED AUTO-CLS mode can be selected to operate at the same time as the PEDESTRIAN AUTO-CLS and STANDARD AUTO-CLS modes. For example, it is possible to have P.E triggered pedestrian auto-close by selecting both the PEDESTRIAN AUTO-CLS and P.E TRIGGERED AUTO-CLS modes. In this case the gate would partly open for pedestrian access and then either the P.E TRIGGERED AUTO-CLS would cause the gate to auto-close when a pedestrian walks through and activates the P.E beam or, if no one walked through the PEDESTRIAN AUTO-CLS would close the gate. This way the gate is only kept open long enough for a person to walk through, but with the backup that if no one walks through the gate will still close. The same concept can be used with standard operation by selecting both the STANDARD AUTO-CLS and the P.E TRIGGERED AUTO-CLS modes. That is, the gate would only stay open long enough for the vehicle to pass through but would still auto-close if no vehicle enters. Note P.E TRIGGERED AUTO-CLS will not operate during pedestrian access unless the PEDESTRIAN AUTO-CLS mode is also selected.

5. CONTROL BOARD ADJUSTMENTS

This section covers details on how to adjust several parameters via the control boards buttons and dials. Other adjustments can be performed using an ATA PROGRAMMER, see section **9 ATA PROGRAMMER SELECTED**

MODES AND ADJUSTMENTS on page 18 for details. Sections **5.1, 5.2, 5.3** and **5.4** use **Procedure 1 Adjustment method for auto-close and synchronising delay times.** at the end of this section.

5.1. SYNCHRONISING DELAY TIME

The synchronising delay time is adjusted using the 'SYNC delay timer' button [34]. The synchronising delay time is adjustable in 0.1 second steps.

5.2. STANDARD AUTO-CLOSE DELAY TIME

The standard auto-close delay time is adjusted using the 'STD auto-close' button [33]. The standard auto-close delay time is adjustable in 1 second steps.

5.3. PEDESTRIAN ACCESS AUTO-CLOSE DELAY TIME

The pedestrian auto-close delay time is adjusted using the 'PED auto-close' button [32]. The pedestrian auto-close delay time is adjustable in 1 second steps.

5.4. P.E TRIGGERED AUTO-CLOSE DELAY TIME

The P.E triggered auto-close delay time is adjusted using the 'P.E auto-close' button [31]. The P.E triggered auto-close delay time is adjustable in 1 second steps.

5.5. PEDESTRIAN ACCESS CYCLE TIME

The pedestrian access cycle time set how far gate leaf 1 opens for pedestrian access. Use the following procedure to set the pedestrian access cycle time.

1 Drive the gate to the closed position using the OSC button [35] or another control input.
2 Press and hold the 'PED cycle timer' button [30]. The gate leaf driven by motor 1 will start to open.
3 When the gate leaf has reached a position suitable for pedestrian access, release the button.
4 The pedestrian access drive timer has now being set. Either press the OSC button [35] and exit the time set mode or continue and adjust one of the synchronising delay or auto-close times.

5.6. SLOW MOTOR SPEED

The speed the motor slows down to towards the end of a cycle can be adjusted using the following procedure.

1 Note the current maximum speed selected by the speed selection dial [24].
2 Using the speed selection dial [24] select the desired slow speed.
2 Press and hold the 'RESET' button [29] and count 5 flashes of the OPEN status led [28].
3 Release the button.
4 Place the speed selection dial [24] back in the desired maximum speed position.

Procedure 1 Adjustment method for auto-close and synchronising delay times.

1. Press and hold the required button for the desired time.
2. Press the OSC button [35] to exit the time setting mode or restart from 1 to set another time.

Notes
a) The time setting mode is indicated by both the OPEN and CLOSE status LEDs being off.
b) Each flash of the OPN led represents 1 second.
c) When a button is first pressed, the CLOSE status led [27] turns on. The time delay is set to zero when the CLOSE led turns off and then increases for as long as the button is held.

6. WIRING TERMINALS AND CONNECTORS

6.1. WIRING MOTORS AND MOTOR LIMIT SWITCHES

Figure 5 shows the connections required to control two motors with limit switches. Note five wires are required for each motor to be controlled. If only one motor is to be controlled, ignore the connections for motor 2 and ensure that motor 2's limit switch inputs are left unconnected. Connection of the limit switch wiring in a fashion other than that discussed can result in human injury or damage to the control board.

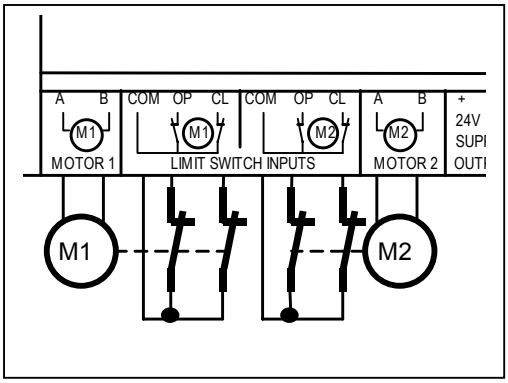


Figure 5 Wiring Motors And Limit Switches

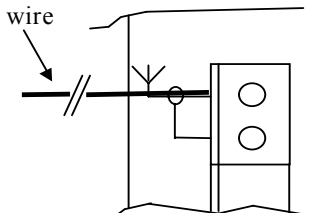
6.2. REMOTE CONTROL RECEIVER

For remote control operation an A.T.A remote control plug-in receiver can be plugged into the control board's connector [20]. The plug-in receiver operates the control board via the OSC and/or PED inputs.

6.3. REMOTE CONTROL ANTENNA CONNECTION

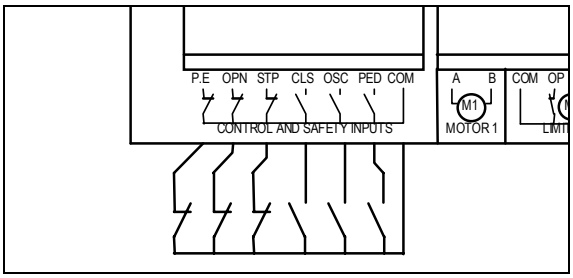
If a remote control receiver is plugged into connector [20] an antenna must be connected to connector [19]. The standard antenna requirement is a simple wire approximately 1.5m in length connected as shown in **Figure 6**. The wire should be stretched out and oriented for best reception. There is usually no need to use the shield terminal of [19] but it is provided for connection of other antenna types.

Figure 6 Wiring Antenna



6.4. CONTROL AND SAFETY INPUT TERMINALS

Figure 7 shows how to wire the control and safety input terminals to switches. Note that the P.E, OPN and STP inputs require a normally closed switch contact, which if not used should be replaced by a wire link or a jumper can be placed on the appropriate shorting link located to the left of the terminal block. The CLS, OSC and PED inputs require a normally open switch contact, which if not used should be left unconnected. If the switch is to be located away from the control board or the switch supplies a voltage, the isolation module IM-1 available from A.T.A should be used to isolate the switch and/or the long wiring from the control board input.



AT NO TIME SHOULD A VOLTAGE OR CURRENT BE APPLIED TO THE INPUTS AS THIS MAY PERMANENTLY DAMAGE THE CONTROL BOARD OR SEVERELY REDUCE ITS RELIABILITY. SWITCH WIRING SHOULD BE KEPT AS SHORT AS POSSIBLE AND AWAY FROM SOURCES OF ELECTRICAL INTERFERENCE AS THIS MAY FALSELY TRIGGER THE CONTROL BOARD'S INPUTS.

Figure 7 Wiring Control And Safety Inputs

6.5. LOCK RELEASE OUTPUT FOR SOLENOID LOCKS

Figure 8 shows how to connect an electric solenoid lock (ATA's LOPU100) to the control board's lock output. The lock output only switches the applied voltage to the lock and must be "wetted" with the appropriate voltage.

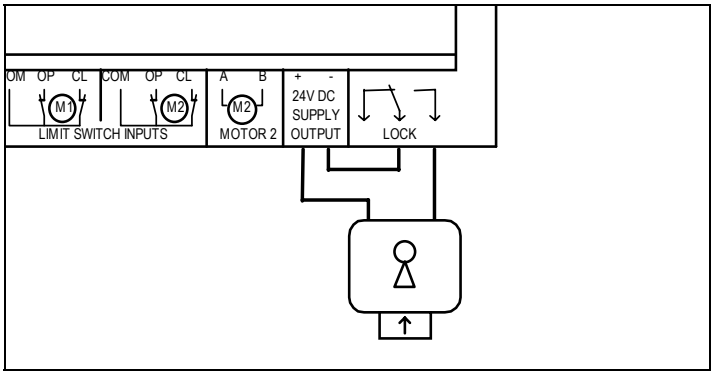


Figure 8 Wiring Solenoid Locks

6.6. LOCK RELEASE OUTPUT FOR MAGNETIC LOCKS

Figure 9 shows how to connect an electromagnetic lock to the control board's lock release output. Note the lock release output only switches the applied voltage to the lock and must be wetted with the appropriate voltage (24VDC in the example shown). Note that the lock is connected to the normally closed contact of the lock release output as the lock is energised when the controller is idle and not driving the motors. Note the lock output's action will need to be programmed for a hold action when this type of lock is used. See section **9.8.e LOCK PULSE TIME (0=HOLD)** for details on how to select the 'hold' lock mode.

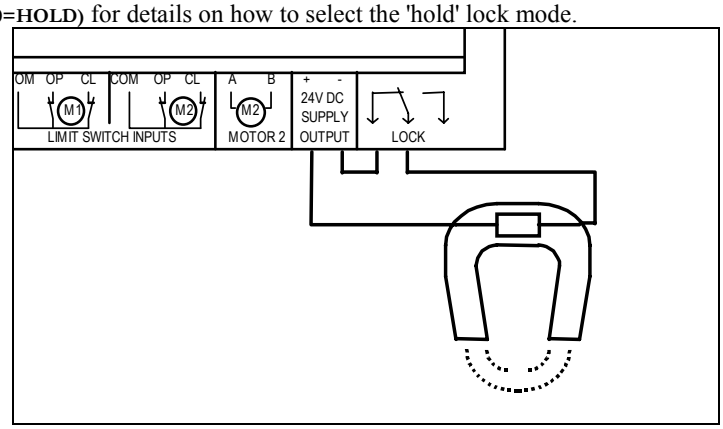


Figure 9 Wiring Magnetic Locks

6.7. LIGHT CONTROL RELAY MODULE

Figure 10 shows how to connect the optional relay module to the control board's connector [21]. It also shows how to wire a light to the relay module. The example shows a 240VAC light but any light of any voltage can be used, provided the relay module is able to switch the required voltage and current. See light relay module specifications in section **11.1 VOLTAGES AND CURRENTS**. Make sure any mains voltage lighting is properly earthed.

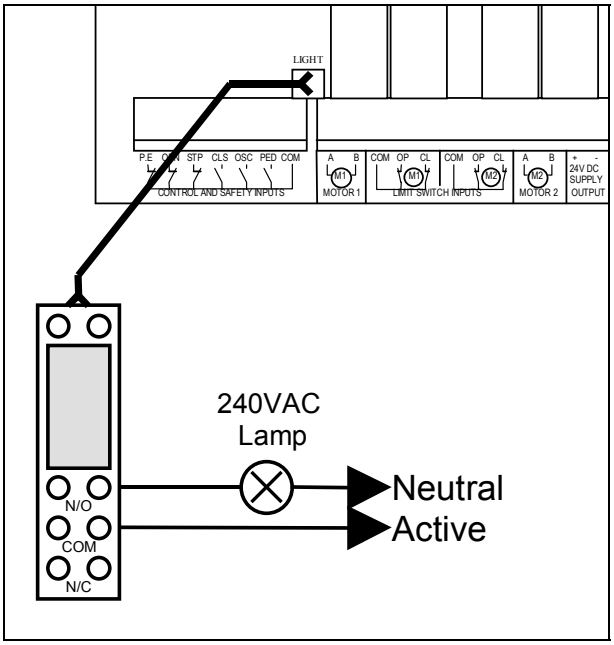


Figure 10 Wiring Light Control Relay Module

6.8. SECURA-LIGHT MONITOR

The Secura-light monitor, available from A.T.A, is a gate status indicator module which will indicate the status of the control board/gate in a remote location via two L.E.Ds and a small beeper. In addition to this, the control board's OSC input can be activated via a press button on the Secura-light. The Secura-light monitor connects directly to the control board connector [18].

7. GETTING STARTED

Once you are familiar with the operation described in the previous sections and the motors and control / safety inputs have been wired, use this section to get the control board up and running.

7.1. INCHING THE MOTORS

In order for the control board to slow the motors down at the correct position and to automatically detect motor overloads, it needs to record the normal cycle time of each motor in each direction and also sample each motors normal running current. This process is called “initialising”. Prior to initialising the control board for the first time or after re-configuration, the control inputs are disabled except for the OSC input which behaves with a momentary action. That is, the motors only drive when the OSC input is activated. This allows the motors to be driven so that the travel limits can be set but prevents the control board being used in a normal way without first being initialised.

7.2. INITIALISING (RECORDING THE MOTOR TRAVEL TIMES AND CURRENTS)

Once the control board has been configured and the motors’ travel limit switches set, the control board is ready to be initialised. Follow the procedure below to initialise the control board.
Note during the initialising process the motors will not slow down towards the end of travel and the motor overload detection is partly disabled. Also note it is advised that this procedure be repeated after changing any operating modes or the position of motor travel limits.

1. Close the gate using the OSC button [35]
2. Press and hold the control board reset button [29] for 3 Secs then release.
3. The gates with now drive open to the open limits, stop, and the close again. The control board is now initialised and can be checked for correct operation. Once tested, more advanced features can be selected.

8. BACKUP BATTERY CONNECTION AND OPERATION

A battery backup system is provided so that the gate can be controlled (for a limited time) in the event of power failure. When the backup system is utilized, the control board detects the presents of mains voltage. When the mains power fails the control board switches to the backup supply provided by a 24V DC battery. When mains power is reinstated the control boards switches back to the mains supply.

The following items are required to use the battery backup system:

a) A 24VDC battery connected to the control board connector [16] (note polarity).
b) A linking jumper placed on the VAC header [17]

The control board has a built in charger that maintains battery charge when mains is present. The control board monitors the battery voltage during use and prevents over discharging by shutting down the control board if the battery voltage gets too low.

The 'IN USE' indicator [15] illuminates when mains is not present and the battery is being used.
The 'VAC' link can be removed to prevent the battery system being used when mains power fails. Note the battery charge is still maintained provided mains is present. This link is provided so that the controller can be turned off when a backup battery is connected.

9. ATA PROGRAMMER SELECTED MODES AND ADJUSTMENTS

The CB-9 control board provides buttons, switches and dials for making all the common adjustments required for a large range of gate installations. However, many other adjustments and modes can also be selected using the ATA PROGRAMMER available form A.T.A. The following is a guide for the ATA PROGRAMMER. The following sections give instruction on how to connect the ATA programmer and make changes to the control board's settings using it.

9.1. CONNECTING THE PROGRAMMER TO THE CONTROL BOARD

1. Turn the power to the control board off.
2 Remove the VAC jumper [17] if battery backup is used
3. Plug the programmer into the control board using the programmer interface connector. Taking special care with the polarity of the connector.

9.2. POWERING UP THE PROGRAMMER AND CONTROL BOARD

To turn on the programmer and control board simply turn the power to the control board on. After powering up, the programmer will 'talk' to the control board to identify its type etc. The programmer will then display the main menu.
To turn off the programmer, simply return to the main menu and then switch the control board off. The programmer can now be disconnected and the VAC jumper [17], if removed earlier, replaced.

9.3. MAIN MENU

Note: Whenever the main menu is displayed the control board can be operated.
The main menu displays several menu selections. A selection is made by pressing the number key displayed to the left of each menu item.

9.4. VIEWING PARAMETERS / MODES

By selecting 1 VIEW SETTINGS on the main menu the control board parameters can be viewed and edited. After selecting the View Settings menu the programmer will 'connect' to the control board and then display the first parameter stored in its memory. The NEXT and PREV buttons are used to step through the parameter/ settings list. The abort button is used to return to the main menu.

9.5. EDITING A NUMERIC PARAMETER

A numeric parameter is one that has a numeric value. To edit a numeric parameter, simply press the EDIT button while the parameter is being viewed on the ATA PROGRAMMER'S screen. After pressing the edit key, the range of values the parameter can be set to is displayed between square brackets '[ ]' and a prompt for a new value shown. Use the number keys followed by the ENTER key to enter the new value. Use the Del key to correct typing mistakes. Press ABORT to abort editing and leave the original value unchanged.

9.6. EDITING A MODE SETTING

A mode is a parameter that has a text label for a value, for example ON, OFF, YES, NO, etc. To edit a mode's setting, simply press the EDIT button while the setting is being viewed on the ATA PROGRAMMER'S screen. After pressing the edit key a prompt for a new setting will be displayed with the default setting shown. Use the NEXT / PREV keys view the available selections, once the desired selection is displayed press the ENTER key to make your selection or press ABORT to exit without making any changes.

9.7. SPECIAL FUNCTIONS

Select the special function menu item from the main menu to display a menu of special functions available. Simply press the number key shown at the left of the menu item to carry out the special function.

9.7.a FACTORY SETUP

Make this selection from the special functions menu if you wish to reload the factory defaults. After selecting this item you will be prompted to confirm that you wish to overwrite all the current control board settings, Press ENTER to continue or ABORT to cancel.

9.8. PARAMETERS AND MODES LIST

The following is a list of the parameters and modes that can be viewed / edited using the ATA PROGRAMMER.

9.8.a STD AUTOCLOSE TIME

Used to adjust the standard auto-close delay time.

9.8.b PED AUTOCLOSE TIME

Used to adjust the pedestrian auto-close delay time.

9.8.c P.E AUTOCLOSE TIME

Used to adjust the P.E triggered auto-close delay time.

9.8.d LIGHT ON TIME (0=WARNING)

Used to select the 'courtesy' or 'warning' light modes. A time of zero will select the warning light mode while a nonzero value will select the courtesy light mode.
When the **warning light mode** is selected, the light output will be activated when the motors start a drive cycle and will turn off after the cycle is completed. This mode is designed to control a flashing light or alarm to warn that the gates are moving. When the **courtesy light mode** is selected, the light will turn on at the start of a drive cycle and remain on for the selected time after the cycle is completed. If a new cycle is started before the light timer has expired, then the timer is restarted at the completion of the new cycle.

9.8.e LOCK PULSE TIME (0=HOLD)

Used to select the pulse or hold lock action modes. When a time of zero is selected, the lock output acts in the hold mode while a nonzero value selects the pulse mode. Note that the lock can be activated prior to the motors starting; see section **9.8.i PREDRIVE LOCK TIME**. In the **hold mode**, the lock output is activated for the duration of a drive cycle. In the **pulse mode** the lock output is activated for the selected time at the start of each drive cycle.

9.8.f OPEN SYNC DELAY

Used to set the open synchronising delay time.

9.8.g CLOSE SYNC DELAY

Used to set the close synchronising delay time.

9.8.h SLOW SPEED

Used to set the minimum speed the motors are driven at. The number entered corresponds to a SPEED dial [24] position. For example, if 1 is entered then the minimum speed is set to the speed represented by dial position 1. Note that very low speed settings may cause the motors to fail to drive, as the amount of power supplied to a motor may not be sufficient to overcome friction on heavy gates.

9.8.i PREDRIVE LOCK TIME

Sets the time the lock output is activated prior to the first motors being started.

9.8.j O/S/C INPUT MODE

The OSC input normally operates as an OPN / STP / CLS input. When the **SWIPE mode** is selected the input will only open the gate. **Figure 11** gives details on how the gate is controlled using the OSC input in SWIPE mode. The swipe input also has the effect of resetting the P.E auto-close mode, i.e. if the SWIPE input is triggered while the P.E auto-close timer is counting down, the P.E auto-close timer will be stopped. Thus, the P.E input will have to be triggered again to restart the P.E auto-close timer. Note that **Figure 11** shows no way of closing the gate using the OSC (SWIPE) input. It is intended that the STD auto-close and / or P.E triggered auto-close modes are selected so that the gate is automatically closed after access.

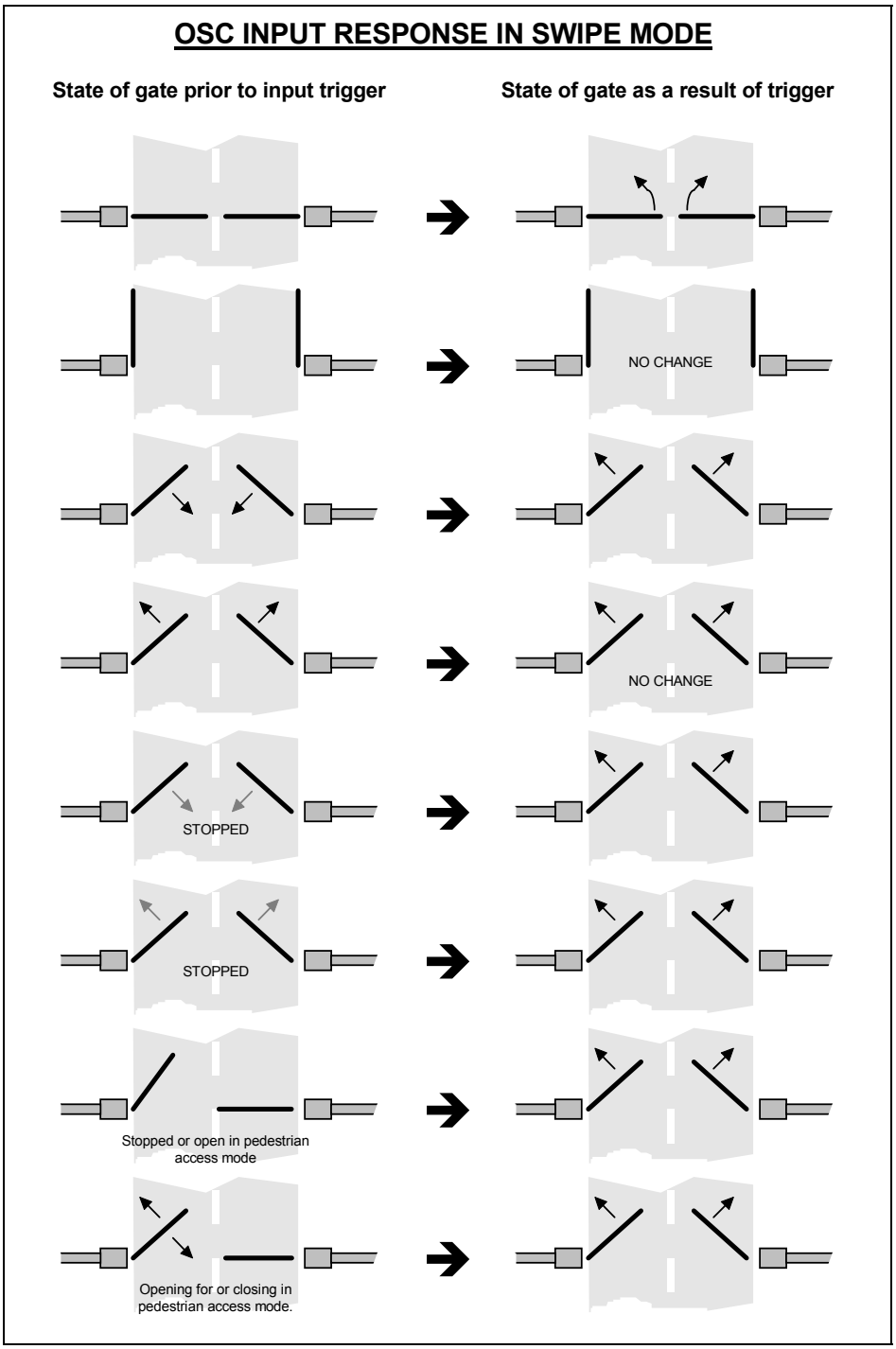


Figure 11 OSC Input Response In SWIPE Mode

9.8.k PED INPUT MODE & PED SPECIAL MODE

The PED input can operate in several modes. The mode is selected using the two settings below.

PED INPUT RESPONSE MODE =
The PED input can be selected to respond in the standard way, detailed in section **3.6 PEDESTRIAN ACCESS (PED) INPUT**, by selecting 'PED' or in a special mode by selecting 'SPECIAL'. When the special mode is selected the input responds according to the following setting.

PED INPUT SPECIAL MODE =
When PED/STP/CLS mode (PSC) is selected, the PED input acts like an O/S/C input except that the open position is the preset pedestrian access position. **Figure 12** details how the gate is controlled by the PED input when the PSC mode is selected. Note, only gate states in the pedestrian access mode are shown. The pedestrian access mode is entered by activating the PED input when the gate is in the closed position. If the gate is not in the pedestrian access mode, the PED input will stop the gates if moving or close the gates if stopped. In the PSC mode, a motor overload while the gate is closing will cause the gate leaf to be re-opened. In the PSC mode the P.E input will cause the gate leaf to be re-opened if P.E reversing is enabled, (see section 9.8.k).

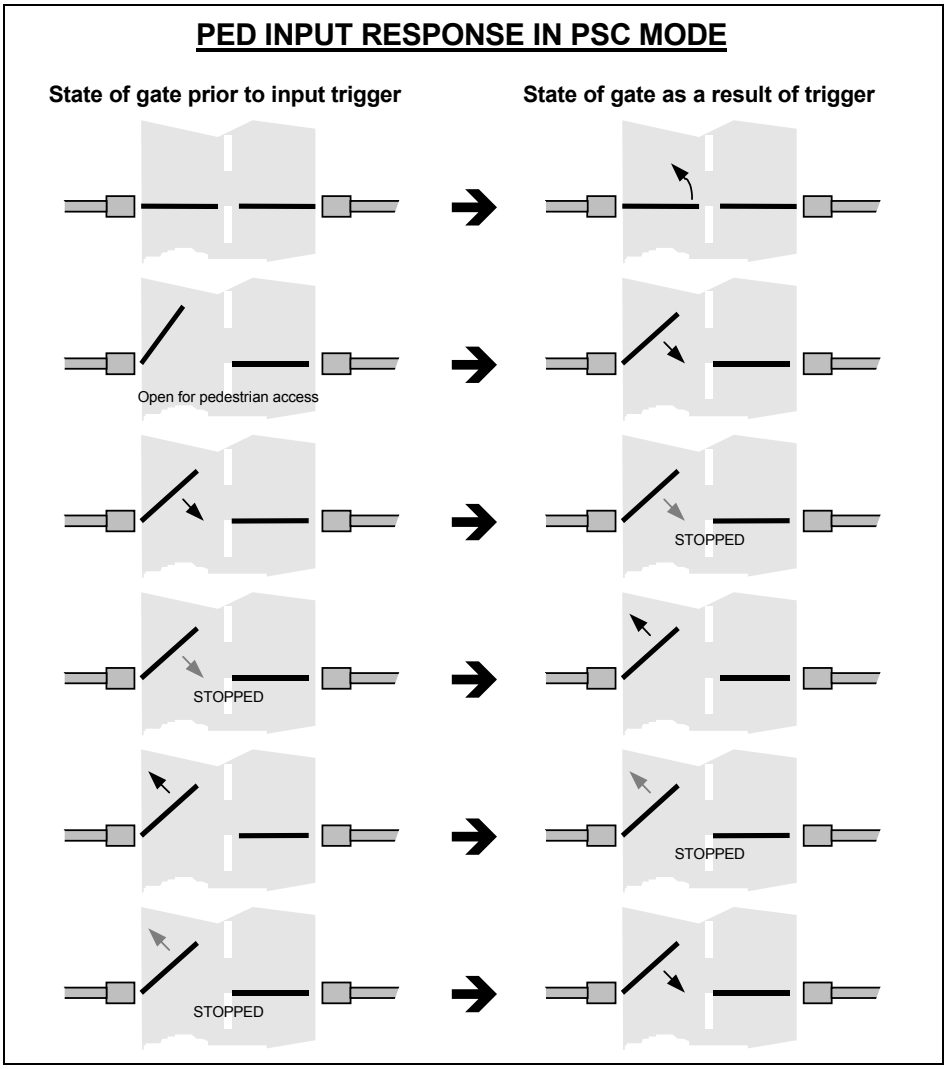


Figure 12 PED Input Response In PSC Mode

When SWIPE mode is selected, the PED input acts like the OSC SWIPE input except that the open position is now the pedestrian access position. **Figure 13** below details how the gate is controlled by the PED input when SWIPE is selected. Note, only gate states in the pedestrian access mode are shown. The pedestrian access mode is entered by activating the PED input when the gate is in the closed position. If the gate is not in the pedestrian access mode, the PED input will stop the gates if moving or close the gates if stopped. In the SWIPE mode, a motor overload while the gate is closing will cause the gate leaf to be re-opened. In the PSC mode the P.E input

will cause the gate leaf to be re-opened if P.E reversing is enabled, see section **9.8.l P.E STOPS CYCLES (NO REV) & P.E REVERSES CLOSE**). Note that in the SWIPE mode, the PED input will reset the P.E auto-close timer. This means that the P.E input will have to be triggered after the PED input in order for the P.E auto-close timer to be initiated. Note that in **Figure 13** there is no way of closing the gate leaf. It is intended that the PED auto-close and / or the P.E auto-close modes be selected to close the gate after pedestrian access.

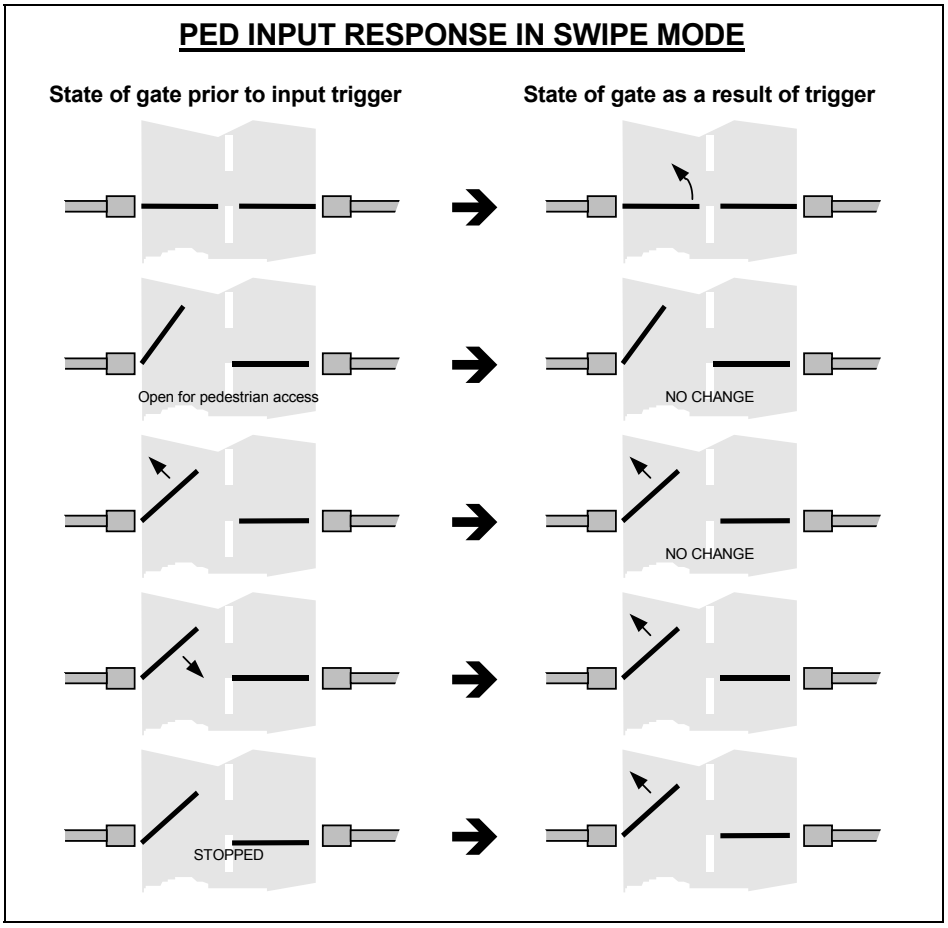


Figure 13 PED Input Response In SWIPE Mode

9.8.l P.E STOPS CYCLES (NO REV) & P.E REVERSES CLOSE

The PE input can operate in several modes. The mode selected depends on the two settings below.

P.E STOPS ALL CYCLES (NO REVERSING) >
When this mode is selected, the P.E input will cause the gate to be stopped when opening or closing. When this mode is not selected, the following setting controls the P.E inputs action.

P.E INPUT REVERSES CLOSE CYCLES >
When this mode is selected, activating the P.E input while the gate is closing will cause the gate to be reversed. If this mode is turned off, activating the P.E input while the gate is closing will cause the gate to stop. The P.E input has no effect while opening in these modes. During pedestrian access, the P.E input will only reverse the gate leaf while closing if the pedestrian access mode is set to SWIPE or PSC.

9.8.m MAX OPEN CYCLE TIME

This setting sets the maximum time allowed for the gate to open.

9.8.n MAX CLOSE CYCLE TIME

This setting sets the maximum time allowed for the gate to close.

9.8.o SLOW DOWN TIME AT MAX SPEED

Used to set the length of the slow down phase at the end of a drive cycle. If, for example, a time of 2 seconds is selected then each motors will be slowed down at a position that is 2 seconds away from the travel limit (when travelling at maximum speed).

9.8.p SLOW DOWN STEP TIME

This setting sets the rate at which the motor speed is slowed down towards the minimum speed at the end of a cycle. The motor is slowed by driving it at each of the speed levels between the dial setting and the selected slow speed. This adjustment sets the time the motor is driven at each of the intermediate speed levels when slowing down.

9.8.q CAL SLOW DOWN ON PART CYC & EARLY SLOW DOWN PART CYC

There are two adjustments which relate to how motors are slowed down during the cycle following a partly completed drive cycle. For example, how the motors are slowed on their approach to the open limits after a close cycle was aborted due to the P.E input causing the gate to reverse. These adjustments are provided because the controller has no direct way of telling where each of the gate leaves are except when they are on either their open or close limits. The controller estimates the position of each gate leaf during a drive cycle by timing how long the motors take to complete the cycle and using the time driven 'so far' to give an approximate position. This technique works well when the speed over the cycle is constant. However due to friction, etc this is not always the case. The following two modes can be altered as required.

CALCULATE SLOW DOWN FOR PART CYCLES >
When calculation is selected, the controller uses the proportion of the previous part cycle travelled to calculate the time to return or the time to continue. When not selected the controller assumes that a complete cycle is required (as far as slowing down is concerted).

EARLY SLOW DOWN ON PART CYCLES >
When selected the controller will slow the motors down at a distance that is twice that which is calculated above.

9.8.r MOTOR STOPPING TIME

This setting sets the time the control board allows for the motor to come to rest after being turned off. The delay is also used when changing motor direction.

9.8.s CURRENT SETTLE TIME

When a motor starts, its current is much larger than its normal running current. In order that the control board does not interpret this higher level as an overload condition, overload detection is disabled when a motor is starting. This parameter sets the time given for a motor to start and thus let its current stabilise. The time should be long enough to ensure that the motors current surge has passed but short enough not to ignore a real overload condition early in the drive cycle.

10. RELOADING FACTORY SETTINGS

The control board is supplied with factory set values for all of its operating parameters. These values can be reloaded back into the controllers memory by following the steps below.

1. Press and hold the control board reset button [29]
2. Count 10 flashes of the OPEN status led [28]
3. Release the reset button.

The factory settings can also be reloaded using the ATA PROGRAMMER. See section **9.7.a**

11. CONTROL BOARD SPECIFICATIONS

11.1. VOLTAGES AND CURRENTS

MAXIMUM 24VAC SUPPLY VOLTAGE = 29VAC

OUTPUT RATINGS

LOCK OUTPUT	max = 30VAC/DC @ 3A
LIGHT OUTPUT MODULE switching voltage	max = 250VAC / 30VDC @ 10A
24V DC SUPPLY OUTPUT	max = 5A peak 1A continuous

BACKUP BATTERY SYSTEM

Battery charge voltage	= 27.5V Typical
Battery shut down voltage	= 20.7V Typical
Recommended capacity	= 2 X 12V 2.2Ah min

11.2. PARAMETER RANGES AND DEFAULT VALUES

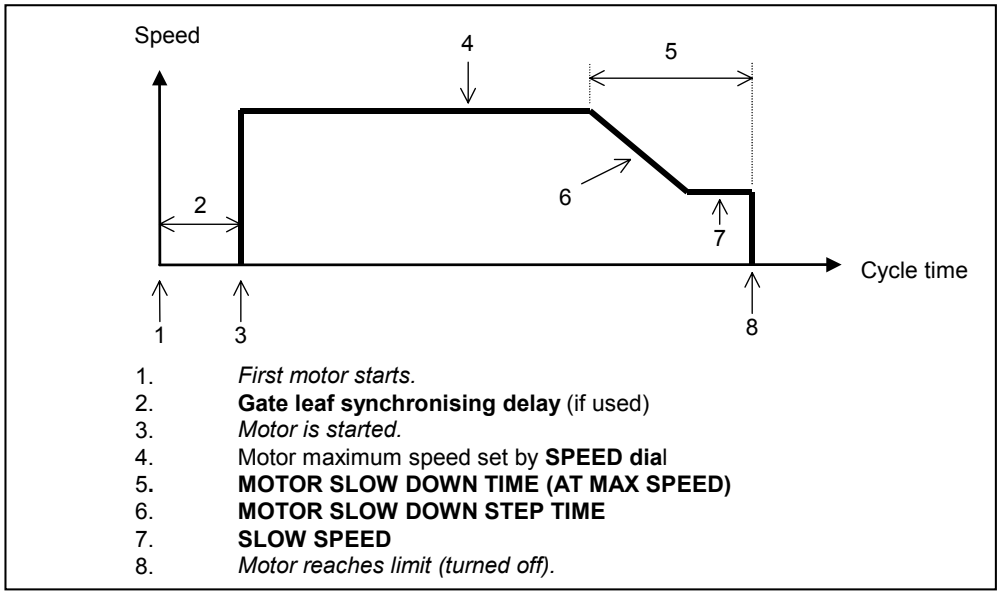
Figure 14 Parameter Table shows the operating parameters that can be changed by the user.

PARAMETER	ADJUSTMENT	DEFAULT	RANGE	STEP
STD AUTOCLOSE TIME	BUTTON / PROG	30 s	1-255 s	1 s
PED AUTOCLOSE TIME	BUTTON / PROG	15 s	1-255 s	1 s
P.E AUTOCLOSE TIME	BUTTON / PROG	1 s	1-255 s	1 s
LIGHT ON TIME (0=WARNING)	PROGRAMMER	60 s	0-255 s	1 s
LOCK PULSE TIME (0=HOLD)	PROGRAMMER	0.5 s	0-25.5 s	0.1 s
OPEN SYNC DELAY	BUTTON / PROG	2.0 s	0-25.5 s	0.1 s
CLOSE SYNC DELAY	BUTTON / PROG	2.0 s	0-25.5 s	0.1 s
PREDRIVE LOCK TIME	PROGRAMMER	0.1 s	0-25.5	0.1 s
SLOW DOWN TIME AT MAX SPEED	PROGRAMMER	2.0 s	0-25.5	0.1 s
SLOW SPEED	BUTTON / PROG	3	0-9	1
MAX OPEN CYCLE TIME	PROGRAMMER	60 s	1-255 s	1 s
MAX CLOSE CYCLE TIME	PROGRAMMER	60 s	1-255 s	1 s
MOTOR STOPPING TIME	PROGRAMMER	0.5 s	0.1-25.5 s	0.1 s
SLOW DOWN STEP TIME	PROGRAMMER	0.2 s	0.1-25.5 s	0.1 s
CURRENT SETTLE TIME	PROGRAMMER	1.0 s	0.1-25.5 s	0.1 s

Figure 14 Parameter Table

11.3. MOTOR SPEED CONTROL PARAMETERS

Figure 15 Motor Speed Control shows how motor speed control is adjusted using the control board's SPEED dial and some of the parameters listed above.



1. *First motor starts.*
2. **Gate leaf synchronising delay** (if used)
3. *Motor is started.*
4. Motor maximum speed set by **SPEED dia**l
5. **MOTOR SLOW DOWN TIME (AT MAX SPEED)**
6. **MOTOR SLOW DOWN STEP TIME**
7. **SLOW SPEED**
8. *Motor reaches limit (turned off).*

Figure 15 Motor Speed Control

11.4. STATUS INDICATION LEDS

The CB-9 control board provides two status LEDs, [27] & [28], which indicated the state of the gate. The table below shows the gate state indicated by the various conditions of the status LEDs.

STATE OF OPEN AND CLOSE LEDS	INDICATES
Open LED on, Close LED off	Gate Is Open
Close LED on, Open LED off	Gate Is Closed
Both flashing (in phase)	Gate Is Stopped
Open LED flashing, Close Led off	Gate Is Opening Or Opening For Pedestrian Access
Close LED flashing, Open LED off	Gate Is Closing Or Closing After Pedestrian Access
Both LEDs On	Gate Is Open For Pedestrian Access
Both flashing (out of phase)	Motor has "Cut Out" due to excessive loading.

Figure 16 Status Indication Table