CB-6 CONTROL BOARD INSTRUCTION MANUAL
VERSION 1.20 DATE 15/09/98

A.T.A encourages 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 through 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 so as 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 <u>licensed electrician</u>. All transformers must be <u>Safety Isolating Transformers</u> which comply with <u>AS3108</u>.**

When installed correctly this product will provide safe and reliable operation for many years. A.T.A would like to thank you for choosing the CB-6 and will be happy to answer any questions you may have.

<u>NOTE ABOUT MANUAL'S CONTENTS</u>

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.

1   GENERAL DESCRIPTION AND FEATURES.

The CB-6 control board is designed to automate 1 or 2 single phase or three phase motors incorporated into drive units with or without limit switches. Typical applications include swing gates, sliding gates and roller shutter doors. The CB-6 is intended to supersede the CB-12 and CB-4 control boards. 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 tested after production.
- Controlled by a powerful custom programmed microcontroller.
- The microcontroller circuitry is electrically isolated from all control and limit switch inputs.
- All control and limit switch inputs accept **dry** switch contacts and have a high noise immunity.
- The limit switch inputs are physically interlocked to the motor drive relays. This means that in the unlikely event of the microcontroller malfunctioning, the motors will still be prevented from being driven beyond the positions set by the limit switches (if used). This feature can also be used to interlock the safety inputs with the motor drive relays.
- A motor drive timer prevents the motors being driven for periods longer than normally required.
- Fuse protection is provided for motor outputs.
- Mains transient protection provided on board.
- Terminal block and mode selection labelling is clear and informative.
- A small size of 130mm x 105mm x 30mm is smaller than CB-12 control board (130mm x 105mm x 40mm)
- Directly controls one or two single phase 240VAC motors of up to 5 Amps in total.
- Controls one or two large single or three phase motors with the addition of suitable contactors etc.
- Control inputs for open, close, stop, open/close/stop, pedestrian access, card swipe and photoelectric safety beams are provided.
- Plug in remote control radio receiver provides remote open/stop/close operation via hand held or keypad transmitters.   **Comment:**
- A 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 L.E.Ds show status of control board, control board inputs and gate/door.
- A light control output can be selected to turn on driveway lighting each time the gates are operated and then automatically turning it off after a pre-set time.
- The light control output can be selected to control a warning light which is illuminated while the gates are in motion. A pre-motion warning can also be selected.
- 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 power 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. The delay is adjustable for each motor.
- The motor 2 output can be selected to drive 240VAC lights to indicate the gate's status and position.

2 LOCATION OF INPUTS, OUTPUTS AND ADJUSTMENTS.

2.1 CONTROL BOARD VIEW.
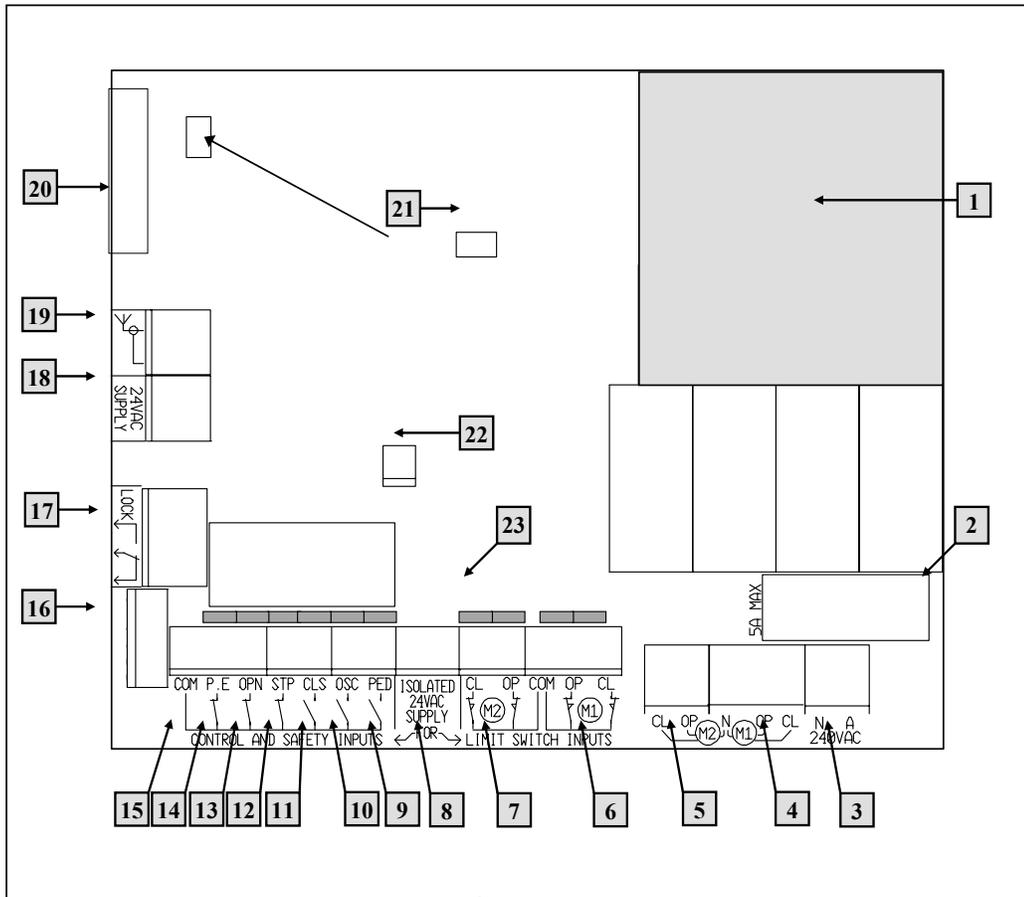
FIGURE 1

1.   MODE SELECTION AND ADJUSTMENT (SEE SECTION 2.2).
2.   MOTOR PROTECTION FUSE.
3.   MAINS 240VAC INPUT TERMINALS.
4.   MOTOR 1 DRIVE OUTPUT TERMINALS.
5.   MOTOR 2 DRIVE OUTPUT TERMINALS.
6.   MOTOR 1 LIMIT SWITCH INPUTS.
7.   MOTOR 2 LIMIT SWITCH INPUTS.
8.   TERMINALS FOR ISOLATED 24VAC SUPPLY FOR LIMIT SWITCH AND CONTROL
      INPUTS.
9.   PEDESTRIAN ACCESS CONTROL INPUT.
10. OPEN/STOP/CLOSE CONTROL INPUT.
11. CLOSE CONTROL INPUT.
12. STOP CONTROL INPUT.
13. OPEN CONTROL INPUT.
14. PHOTOELECTRIC SAFETY BEAM INPUT.
15. COMMON TERMINAL FOR [9] TO [14] ABOVE
16. CONTROL INPUT HARNESS CONNECTOR.
17. ELECTRIC LOCK CONTROL TERMINALS.
18. TERMINALS FOR 24VAC SUPPLY FOR CONTROL LOGIC.
19. PLUG IN RECEIVER'S ANTENNA TERMINALS WITH OPTIONAL SHIELD.

MODE SELECTION

OFF ☒ ON

SYNCHRONISING DELAY
PULSE LOCK OUTPUT
LIGHT OUTPUTS WARNING
SWIPE MODE (OSC INPUT)
M2 OUTPUTS STATUS
P.E STOPS CLOSE CYCLE
P.E STOPS OPEN CYCLE
P.E TRIGGERED AUTO-CLS
PEDESTRIAN AUTO-CLS
STANDARD AUTO-CLS

OPN

CLS

RUN

set

OPN	CLS	PED	STP	OSC	P.E
open cycle timer	close cycle timer	ped cycle timer	std auto-cls	ped auto-cls	p.e auto-cls
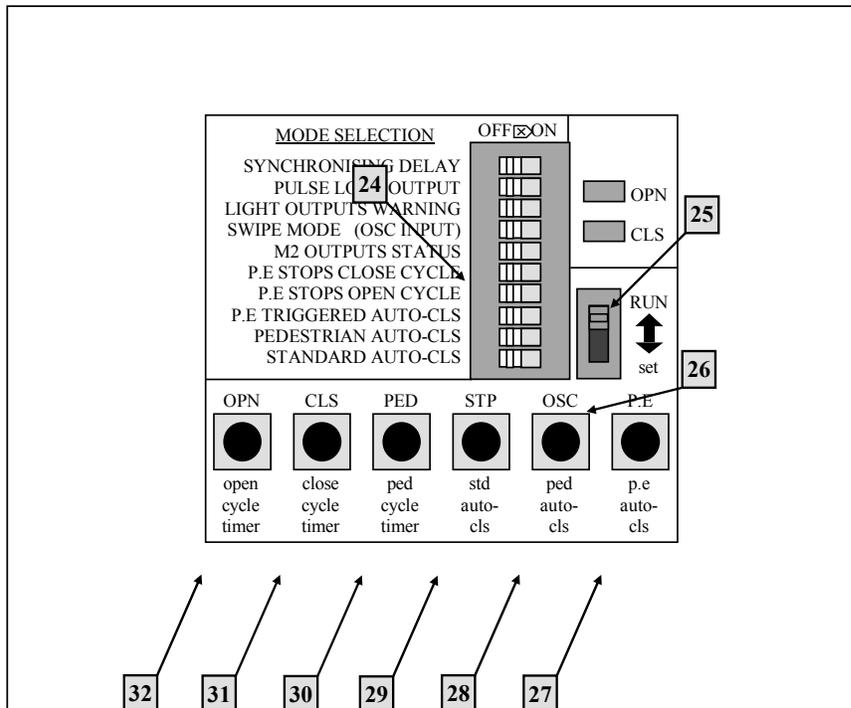
20. CONNECTOR FOR PLUG-IN RECEIVER (NOT SHOWN)
21. PLUG-IN RECEIVER TRIGGER ISOLATION SWITCH INPUTS (OSC = LK1, PED = LK2).
22. LIGHT CONTROL RELAY INTERFACE CONNECTOR.
23. INPUT STATUS L.E.Ds (illuminated when input is connected to COM)

2.2 MODE SELECTION AND ADJUSTMENT VIEW.

FIGURE 2

24. MODE SELECTION DIP-SWITCHES.
25. STATUS INDICATION L.E.Ds.
26. "RUN / set" SELECTION SLIDE SWITCH.

Each of the push button switches [27] to [32] have three functions. The two most commonly used functions are selected by the position of the "RUN / set" slide switch [26] the third function is selected by the special adjustment mode, see section 7 for details. Table 1 shows the function of each push button with the slide switch in the "RUN" and "set" positions. See section 6 for details about using the buttons [27] to [32] to make adjustments when the "set" position is selected.

	FUNCTION WHEN "RUN" POSITION IS SELECTED ON THE SLIDE SWITCH [26].	FUNCTION WHEN "set" POSITION IS SELECTED ON THE SLIDE SWITCH [26]
27	SIMULATES P.E CONTROL INPUT	P.E TRIGGER AUTOCLOSE TIMER SET
28	OPEN/STOP/CLOSE INPUT	PEDESTRIAN AUTOCLOSE TIMER SET
29	STOP INPUT	STANDARD AUTOCLOSE TIMER SET
30	PEDESTRIAN ACCESS INPUT	PEDESTRIAN ACCESS CYCLE TIME SET
31	CLOSE INPUT	CLOSE CYCLE TIME SET
32	OPEN INPUT	OPEN CYCLE TIMER SET

TABLE 1

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 dip-switches in the off position, the slide switch [26] in the "RUN" position and factory programmed parameters in memory. Refer to section 8 if you wish to return the control board's memory to its original factory programmed parameters.

3.1 MOTOR CONTROL OPERATION

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) The motors travel time has exceeded 60 seconds.
   c)   A motor's limit switch input for the current direction of travel has been activated.
When the motor direction is changed the controller allows 0.5 seconds for the motors to come to rest before attempting to drive the motors in the other direction.

3.2 LOCK RELEASE OUTPUT OPERATION

The lock release output is activated at the same time as the motors are turned on at the start of each cycle and deactivated a short time after the motors are turned off at the end of the cycle. If while opening or closing the controller is instructed to change the motor direction, the lock release output remains active while the motor direction change is being made.

3.3 COURTESY LIGHT OPERATION (REQUIRES OPTIONAL MODULE).

With the addition of a module which plugs into the control board, the control board will control courtesy lighting which will illuminate the driveway etc, each time the gate is activated (day and night). The light will be automatically turned off 1 minute after the last drive cycle has finished.

3.4 OPEN / STOP / CLOSE (OSC) INPUT OPERATION.

The OSC input can be activated by a switch connected to the OSC terminal [10] or by pressing the OSC button [28]. Table 2 shows how a gate's motion is controlled by the OSC input. The status of each input terminal is shown by status L.E.Ds [23] located directly behind each input terminal.

STATE OF GATE BEFORE OSC INPUT IS ACTIVATED	STATE OF GATE AFTER OSC INPUT IS ACTIVATED
GATE IS OPEN	GATE STARTS TO CLOSE
GATE IS CLOSED	GATE STARTS TO OPEN
GATE IS OPENING	GATE STOPS (WHILE OPENING)
GATE IS CLOSING	GATE STOPS (WHILE CLOSING)
GATE IS STOPPED (WHILE OPENING)	GATE STARTS TO CLOSE
GATE IS STOPPED (WHILE CLOSING)	GATE STARTS TO OPEN
GATE PARTLY OPENED FOR PEDESTRIAN ACCESS	GATE STARTS TO OPEN
POWER IS TURNED ON TO CONTROL BOARD (POSITION OF GATE IS UNKNOWN)	GATE STARTS TO OPEN

TABLE 2

3.5   PEDESTRIAN ACCESS (PED) INPUT OPERATION.

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 it in the open direction for 5 seconds. The gate can then be closed (pedestrian close cycle) again by reactivating the PED input. If the P.E input is activated during a pedestrian close cycle the gate leaf will stop but will not reopen. The PED input is normally activated by a switch connected to the PED terminal [9] but can also be activated by pressing the PED button [30]. Table 3 shows how a gate's motion can be controlled by the PED input. The status of each input terminal is shown by status L.E.Ds [23] located directly behind each input terminal.

STATE OF GATE BEFORE PEDESTRIAN INPUT IS ACTIVATED	STATE OF GATE AFTER PEDESTRIAN INPUT IS ACTIVATED
GATE IS OPEN	BOTH LEAFS OF GATE START TO CLOSE
GATE IS CLOSED	GATE LEAF DRIVEN BY MOTOR 1 STARTS TO OPEN PART WAY
GATE IS OPENING	GATE STOPS
GATE IS CLOSING	GATE STOPS
GATE IS STOPPED	BOTH LEAFS OF GATE START TO CLOSE
GATE PARTLY OPEN FOR PEDESTRIAN ACCESS	GATE STARTS TO CLOSE
POWER IS TURNED ON TO CONTROL BOARD(POSITION OF GATE IS UNKNOWN)	GATE STARTS TO CLOSE

TABLE 3

3.6   CLOSE (CLS) INPUT OPERATION.

The CLS input is normally activated by a switch connected to the CLS input terminal [11] but can also be activated by pressing the CLS button [31]. Activating the CLS input will cause the gate to close. The status of each input terminal is shown by status L.E.Ds [23] located directly behind each input terminal.

3.7   OPEN (OPN) INPUT OPERATION.

The OPN input is normally activated by a switch connected to the OPN input terminal [13] but can also be activated by pressing the OPN button [32]. Activating the OPN input will start to open the gate. The status of each input terminal is shown by status L.E.Ds [23] located directly behind each input terminal.

3.8   STOP (STP) INPUT OPERATION.

The STP input is normally activated by a switch connected to the STP input terminal [12] but can also be activated by pressing the STP button [29]. Activating the STP input while the gate is moving will cause the gate to be stopped. The status of each input terminal is shown by status L.E.Ds [23] located directly behind each input terminal.

3.9   PHOTOELECTRIC SAFETY BEAM (P.E) INPUT OPERATION.

The P.E input is normally activated by a switch connected to the P.E input terminal [14] but can also be activated by pressing the P.E button [27]. When the P.E input is active the gate is prevented from being closed. If the P.E input is activated while the gate is closing the controller will stop the motors and then reopen 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 3.5 above. The status of each input terminal is shown by status L.E.Ds [23] located directly behind each input terminal.

3.10 REMOTE CONTROL OPERATION.

When an optional remote control receiver is fitted to the connector [20] the controller can be remotely operated by a radio transmitter. The controller will respond to a transmission using the OPEN/STOP/CLOSE (O/S/C) operation and/or the PEDESTRIAN ACCESS (PED) operation.

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

Table 4 shows the action taken by the controller when multiple inputs are activated. The table shows the initial gate status at the top right. The new input state is shown on the left and the resulting gate status is shown in the shaded area. Please note that the CLS push button [30] has a slightly different effect to the CLS terminal [11] which is used in table 4.

LEGEND: ☞ INPUT IS TRIGGERED

φ INPUT IS ALREADY ACTIVE

— INPUT IS INACTIVE

. . . HAS NO EFFECT (CAN BE ALREADY ACTIVE, INACTIVE OR TRIGGERED)

INPUT STATE					INITIAL GATE STATUS				
OPN	STP	CLS	OSC	PED	OPENED	CLOSED	STOPPED	OPENING	CLOSING
. . .	φ	. . .	. . .	. . .	*NO CHANGE*	*NO CHANGE*	*NO CHANGE*		
. . .	☞	. . .	. . .	. . .	*NO CHANGE*	*NO CHANGE*	*NO CHANGE*	*STOPS*	*STOPS*
φ	—	☞	. . .	. . .	*NO CHANGE*	*NO CHANGE*	*NO CHANGE*	*STOPS*	
☞	—	φ	. . .	. . .	*NO CHANGE*	*NO CHANGE*	*NO CHANGE*		*STOPS*
φ	—	—	☞	—	*NO CHANGE*	*OPENS*	*OPENS*	*STOPS*	
φ	—	—	—	☞	*NO CHANGE*	*OPEN (PED'N)*	*NO CHANGE*	*STOPS*	
—	—	—	☞	☞	*CLOSES*	*NO CHANGE*	*CLOSES*	*CLOSES*	*NO CHANGE*
—	—	. . .	. . .	φ	*NO CHANGE*	*NO CHANGE*	*NO CHANGE*	*NO CHANGE*	*NO CHANGE*
—	—	. . .	φ	. . .	*NO CHANGE*	*NO CHANGE*	*NO CHANGE*	*NO CHANGE*	*NO CHANGE*
—	—	φ	. . .	. . .	*NO CHANGE*	*NO CHANGE*	*NO CHANGE*	*NO CHANGE*	*NO CHANGE*
φ	. . .	φ	. . .	. . .	*NO CHANGE*	*NO CHANGE*	*NO CHANGE*		
☞	—	—	φ	—	*NO CHANGE*	*OPENS*	*OPENS*	*NO CHANGE*	*OPENS*
☞	—	—	—	φ	*NO CHANGE*	*OPENS*	*OPENS*	*NO CHANGE*	*OPENS*

TABLE 4

4   DESCRIPTION AND SELECTION OF OTHER OPERATING MODES

Section 4 explains user selectable modes of operation and how to select them.

4.1   SYNCHRONISED TRAVEL OF OVERLAPPING GATE LEAFS.

SYNCHRONISING DELAY > ON   (DELAY = 2 SECONDS)

When dual swing gates are used it is common for a back stop 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 back stop 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 dip-switch 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 7.6 and 7.7 for details.

4.2   PULSE LOCK RELEASE OUTPUT.

PULSE LOCK OUTPUT > ON   (PULSE = 0.3 SECONDS)

Some locking mechanisms require a quick pulse of power to release. The controller can be made to pulse the lock release output [17] for 0.3 seconds at the start of each cycle. To select this action place the mode selection dip-switch labelled "PULSE LOCK OUTPUT" into the "ON" position. The factory set pulse duration of 0.3 seconds can be changed if desired, see section 7.1 for details.

4.3   WARNING LIGHT (REQUIRES OPTIONAL MODULE).

LIGHT OUTPUTS WARNING > ON

The light output module can be used to control a warning light. The warning light will be activated whenever the gate is moving. To select this mode place the mode selection dip-switch labelled "LIGHT OUTPUTS WARNING" into the "ON" position.

4.4   MOTOR 2 OUTPUT USED TO CONTROL GATE STATUS LIGHTS.

M2 OUTPUTS STATUS > ON

If only one motor is being controlled, it is possible to use motor 2's output to control two lights which can show the gate's status. This is selected by placing the mode selection dip-switch labelled "M2 OUTPUTS STATUS" into the "ON" position. The way the outputs show status is shown in table 5.

GATE'S STATUS	M2 CL OUTPUT	M2 OP OUTPUT
OPEN	OFF	ON
CLOSE	ON	OFF
OPENING	OFF	FLASHING
CLOSING	FLASHING	OFF
STOPPED IN MIDDLE	FLASHING	FLASHING
PARTLY OPENED FOR PEDESTRIAN ACCESS	ON	ON
AFTER POWERING UP (POSITION OF GATE UNKNOWN)	FLASHING	FLASHING

TABLE 5

4.5 P.E INPUT STOPS MOTORS FROM BEING CLOSED BUT DOES NOT REVERSE THE MOTORS.

P.E STOPS CLOSE CYCLE > ON

When the mode selection dip-switch labelled "P.E STOPS CLOSE CYCLE" is placed into the "ON" position the P.E input's operation is changed. When the P.E input is activated while the gate is closing the controller stops the gate leaves but does not reopen them.

4.6 P.E INPUT PREVENTS MOTORS BEING DRIVEN CLOSED OR OPEN.

P.E STOPS OPEN CYCLE > ON

When the mode selection dip-switch labelled "P.E STOPS OPEN CYCLE" is placed into the "ON" position the P.E input operation changes. In this mode, when the P.E input is active the controller prevents the motors being driven in either direction.

4.7 SWIPE INPUT

SWIPE MODE (OSC INPUT) > ON

With this mode selected the OSC control input's [10] (and the remote control OSC input) operation is changed so that it only opens the gate. The exact operation is shown below in table 6. The input can be activated by a switch connected to the OSC terminal [10], by pressing the OSC button [28] or by activating the remote control OSC input using a remote control transmitter. Note the P.E TRIGGERED AUTOCLOSE mode is affected by this input. For details see section 4.8.

STATE OF GATE BEFORE SWIPE INPUT IS ACTIVATED	STATE OF GATE AFTER SWIPE INPUT IS ACTIVATED
GATE IS OPEN	NO CHANGE
GATE IS CLOSED	GATE STARTS TO OPEN
GATE IS OPENING	NO CHANGE
GATE IS CLOSING	GATE STARTS TO OPEN
GATE IS STOPPED	GATE STARTS TO OPEN
GATE PARTLY OPEN FOR PEDESTRIAN ACCESS	GATE STARTS TO OPEN
POWER IS TURNED ON TO CONTROL BOARD(POSITION OF GATE IS UNKNOWN)	GATE STARTS TO OPEN

TABLE 6

4.8 AUTOCLOSE MODES

The auto-close modes automatically close the gate after it has been operated. To implement this the controller sets an internal 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 the P.E input or other inputs depending on the mode selected. When the suspending input is deactivated the timer is reloaded and the count down recommenced. The timer's count down can be stopped altogether by activating the STP input. See the sections below for details about the three auto-close modes.

a) AUTOCLOSE AFTER REACHING THE OPEN POSITION.

STANDARD AUTO-CLS > ON   (DELAY = 30 SECONDS)
In this auto-close mode the gate will auto-close 30 seconds after being fully opened. The auto-close timer's count down can be suspended by the OPN and P.E inputs. If the timer's count down has been stopped by

the STP input being activated, it can be restarted by activating the OPN input. This mode is selected by placing the mode selection dip-switch labelled "STANDARD AUTO-CLS" into the "ON" position.

b)   AUTOCLOSE AFTER BEING OPENED FOR PEDESTRIAN ACCESS.

PEDESTRIAN AUTO-CLS > ON   (DELAY = 15 SECONDS)
In this auto-close mode the gate will auto-close 15 seconds after being partly opened for pedestrian access. If the PED or P.E inputs are active while the leaf is partly opened for pedestrian access the auto-close timer's count down will be suspended until the inputs are released. If during the pedestrian auto-close cycle the P.E input or the PED input are activated the gate leaf will stop but not reopen. A new count down will be initiated once the inputs are deactivated.
This mode is selected by placing the mode selection dip-switch labelled "PEDESTRIAN AUTO-CLS" into the "ON" position.

c)   AUTOCLOSE AFTER CYCLE IF P.E HAS BEEN TRIGGERED.

P.E TRIGGERED AUTO-CLS > ON   (DELAY = 0 SECONDS)
In this auto-close mode the controller will only auto-close the gate if the P.E input (in any mode) has been activated and then released since
    A) the gate was last fully closed,
    B) the SWIPE (OSC) input was activated,
    C) the PED input was activated or
    D) the gate was stopped (stopped by P.E input excluded).
The auto-close timer's count down can be suspended by activating the OPN input if the gate is in the open position. The P.E TRIGGERED auto-close mode is selected by placing the mode selection dip-switch labelled "P.E TRIGGERED AUTO-CLS" into the "ON" position. Since there are three different modes of P.E operation it is best to describe the operation of this auto-close function with respect to each of the P.E modes. The descriptions follow.

P.E IN STANDARD MODE   (P.E STOPS OPEN CYCLE and P.E STOPS CLOSE CYCLE both OFF)
The controller will auto-close the gate from the open position provided the P.E input was activated while the gate was opening or in the open position.

P.E STOPS CLOSE CYCLE > ON
The controller will auto-close the gate if the P.E input was activated while the gate was opening or is activate while the gate is open. In addition it will also auto-close the gate if the P.E input is activated while the gate is closing, in which case the gate stops and then auto-closes from its stopped position when the P.E input is deactivated.

P.E STOPS OPEN CYCLE > ON
The controller will auto-close the gate if the P.E input is activated while the gate is open. In addition it will also auto-close the gate if the P.E input is activated while the gate is closing or opening, in which case the gate stops and then auto-closes from its stopped position once the P.E input is deactivated.

d)   MIXING AUTOCLOSE 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 WIRING TERMINALS AND CONNECTORS.

5.1 REMOTE CONTROL RECEIVER CONNECTOR AND ISOLATION SWITCH.

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 a trigger output. If desired the trigger output can be disabled using a user supplied switch connected across the plug-in receiver's trigger isolation switch input [21]. This can be done by de-soldering the wire link provided and soldering a toggle switch across the two vacated holes. If isolation is not required the wire link can be left intact.

5.2 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 3. 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.
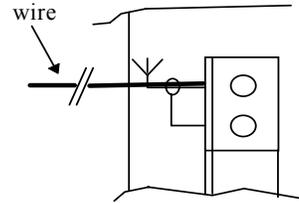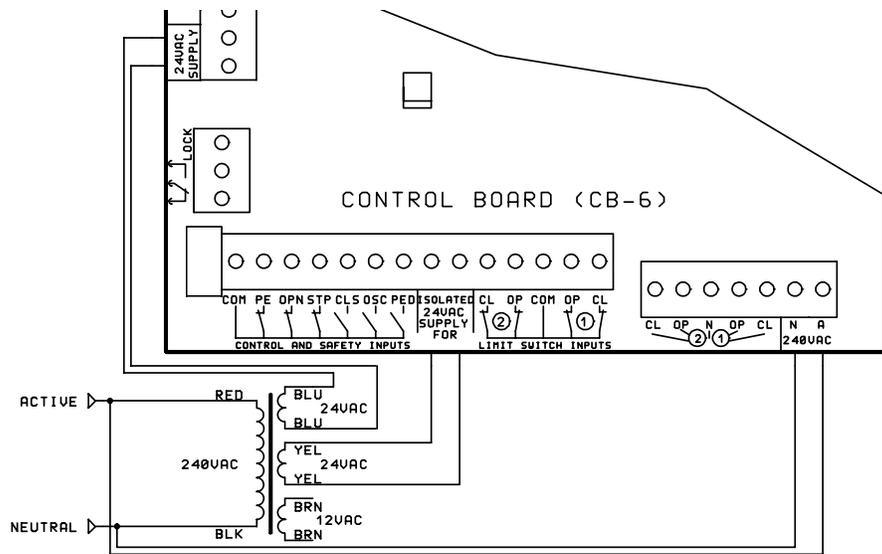

FIGURE 3

## 5.3 POWERING CONTROL BOARD (PREFERRED METHOD).

The control board has two 24VAC supply inputs. The control supply [18] is used to power the control circuits while the 24VAC supply [8] is used to power the control, safety and limit switch inputs as well as the motor control relays. The two halves of the control board are electrically isolated from each other so that any electrical "noise" picked up by the wiring associated with the control, safety or limit switch inputs is prevented from interfering with the control circuits. Figure 4 shows how to connect the two 24VAC transformer outputs to the control board. The 240VAC input is used to power the motors connected to the control board. If a lower voltage motor supply is required then it can be connected to the 240VAC A and N terminals instead. The 12VAC transformer output is provided to power an electric lock or other devices (if required). Note the transformer used must be a safety isolating transformer which meets AS3108. All 240V A.C. wiring must be performed by a licensed electrician. Make sure that the control box is properly earthed.

FIGURE 4
**5.4   POWERING CONTROL BOARD (ECONOMY METHOD).**

If the control, safety and limit switch inputs are not used or the associated wiring is very short (<0.5m) and kept away from sources of electrical interference, the control board can be powered as shown in figure 5. Note both the control board's 24VAC supplies are powered from a single secondary transformer. It should also be noted that the transformer should not be used to supply any other device, for example electric lock, lights, photoelectric beam, etc. The transformer should also be located close to the control board. The 240VAC input is used to power the motors being controlled. If a lower motor supply voltage is required it can be connected to the 240VAC A and N terminals instead of 240VAC. Note the transformer used must be a safety isolating transformer which meets AS3108. Make sure that the control box is properly earthed.

FIGURE 5
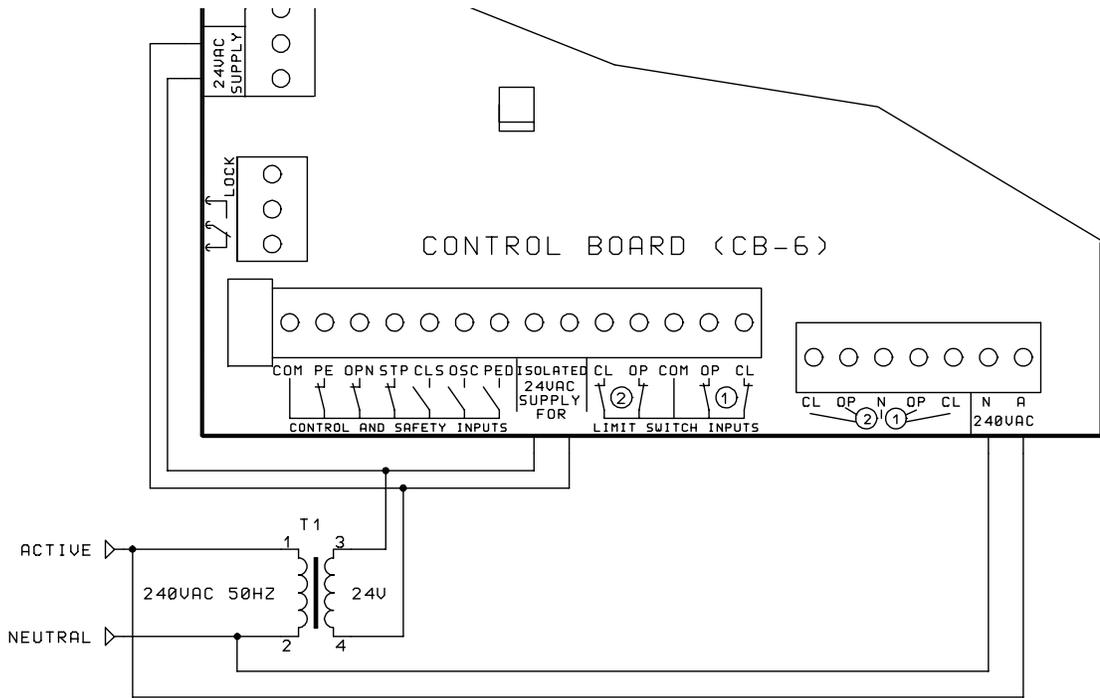
5.5   CONTROLLING SINGLE PHASE MOTORS.

Figure 6 shows how to connect two single phase motors and associated limit switches (if used) to the control board. If the limit switches are not used then simply place a wire link from the limit switch inputs to COM. If only one motor is to be controlled simply ignore the motor and limit switch connections for motor 2. Note the state of the limit switch inputs is indicated by the L.E.Ds [23] located behind the limit switch terminals. The L.E.D for a particular input will light if that input terminal is connected to the COM terminal. Make sure that the motors are earthed correctly.
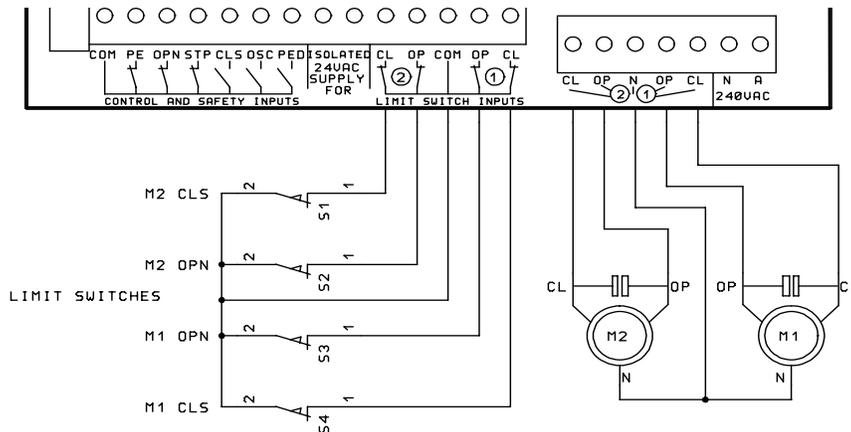
FIGURE 6
5.6 CONTROLLING 3 PHASE MOTORS.

Figure 7 shows an example of the connections required to control a three phase motor with limit switches. The control board's motor outputs directly drive the coils of the open and close contactors. The other side of the contactor coils are connected to neutral via the normally closed motor limit switches (S1 and S2). This forms an interlock which turns off the contactor and prevents it from being operated when its associated limit switch is activated. This interlock action is desirable in the unlikely event of the control board malfunctioning. Note that the contactors are mechanically and electrically interlocked via a set of normally closed auxiliary contacts placed in series with the COIL drive output from the control board. The normally open auxiliary contacts of each contactor are connected to the control board's limit switch inputs and used to indicate when the contactor has been turned off by the limit switch interlock. As mentioned earlier the control board's limit switch inputs interlock with the motor output relays. Because the auxiliary contacts connected to the limit switch inputs are normally open the motor output relays are prevented from being operated. This is where the two diodes connected to COM via the lock output in PULSE mode come into play. At the start of each drive cycle the lock output connects the limit switch inputs to COM for ~ 0.3 seconds which is long enough for the control board's output to turn on and energise the contactor coil provided the limit switches are closed.. This closes the auxiliary contact which then maintains a closed contact on the limit switch input when the lock pulse output turns off. This state remains until either the control board turns off the motor output or when the motor's limit switch is reached in which case the power to the contactor coil is interrupted and the auxiliary contact opens. The opening auxiliary contact signals to the control board that the motor's travel limit has been reached. By signalling to the control board when the motor has finished a drive cycle, all of the control functions can be utilised. If two motors are to be controlled simply duplicate the limit switches, contactors, etc. for motor 2. Make sure that the motors are properly earthed.


CB6DETCUST

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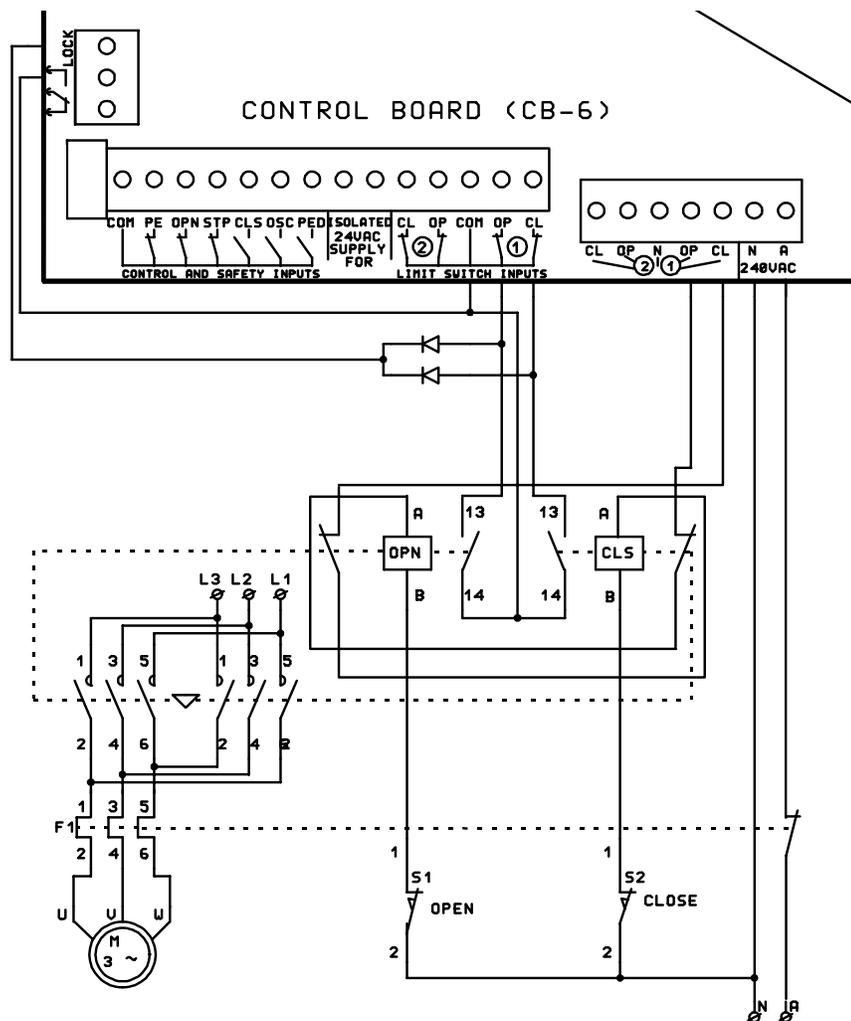
FIGURE 7
5.7   WIRING CONTROL AND SAFETY INPUT TERMINALS.

Figure 8 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. If not used replace the switch with a wire link. The
CLS, OSC and PED inputs require a normally open switch contact. If not used these inputs should be left
unconnected.
**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
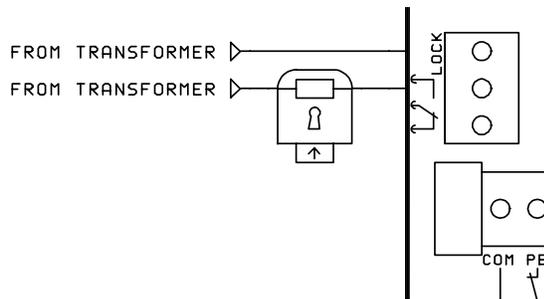THE CONTROL BOARD'S INPUTS.**
If the switch is to be located away from the control board or the switch supplies a voltage, the isolation
module IM-1 available from A.T.A or a similar device should be used to isolate the switch and/or the long
wiring from the control board input. Note that the condition of each input is indicated by the L.E.Ds [23]
located behind each input terminal. The L.E.D for a particular input terminal will light when that input is
connected to the COM terminal [15].
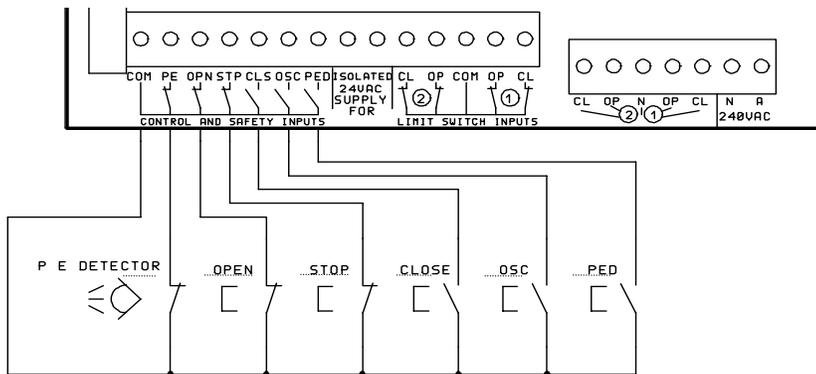
FIGURE 8

5.8   WIRING LOCK RELEASE OUTPUT TO CONTROL SOLENOID LOCKS.

Figure 9 shows how to connect an electric solenoid lock (LOPU100 available from A.T.A) 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. The 12VAC output from the transformer supplied from
A.T.A is designed to power small pulse action locks such as the LOPU100. Do not use either of the
24VAC supplies connected to the control board to power the lock as the large current draw can interfere
with the control boards operation. Note the transformer used must be a safety isolating transformer which
meets AS3108.

FIGURE 9

5.9 WIRING LOCK RELEASE OUTPUT TO CONTROL ELECTROMAGNETIC LOCKS.

Figure 10 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. 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.
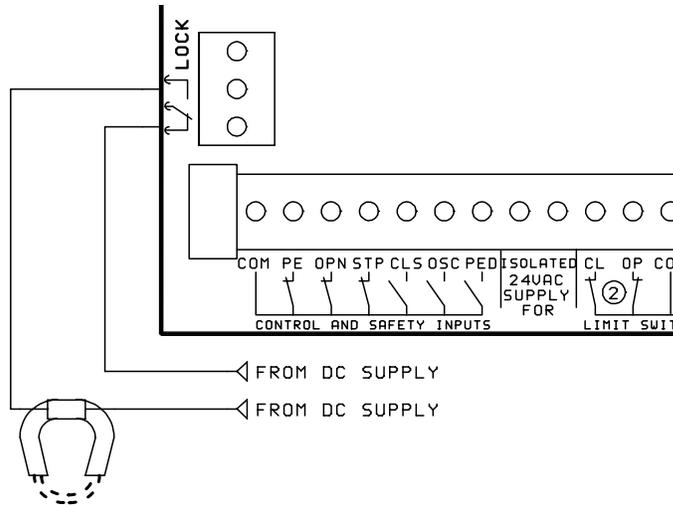
FIGURE 10

5.10 WIRING LIGHT RELAY MODULE TO CONTROL A COURTESY / WARNING LIGHT.

Figure 11 shows how to connect the optional relay module to the control board's connector [22]. 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 9. The light should not be powered from either of the control board's 24VAC supplies as the large current draw may interfere with the control board's operation. Make sure any mains voltage lighting is properly earthed.
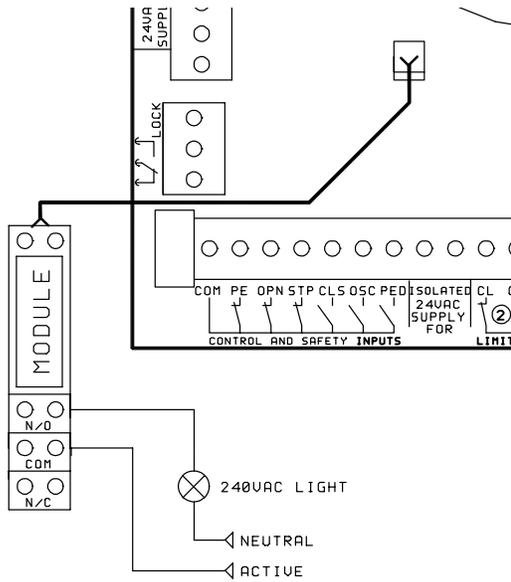
FIGURE 11

5.11 WIRING M2 OUTPUT LIGHTS TO SHOW GATE STATUS.

Figure 12 shows how to connect two 240VAC lights to the control boards motor 2 output to show the status of the gate. If desired only one of the status lights need be connected. The limit switch inputs for motor 2 can be used as extra low voltage off/on control of the status lights. Make sure that the lights are properly earthed.
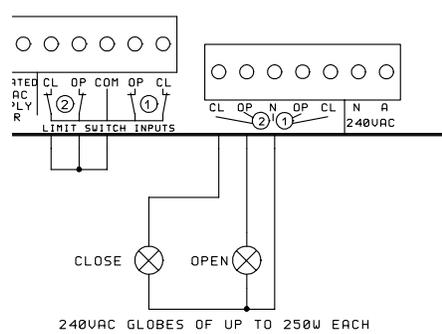
FIGURE 12

5.12 USING CONTROL INPUT HARNESS CONNECTOR.

Figure 13 shows the connections for using a control input harness connected to the control board's connector [16]. Note the normally closed switch inputs (OPN and STP) can not be used on both the harness inputs and the terminal block inputs ([12] and [13]). That is if the harness's OPN input is connected to a switch then the OPN terminal block input must be left open circuit and visa versa.
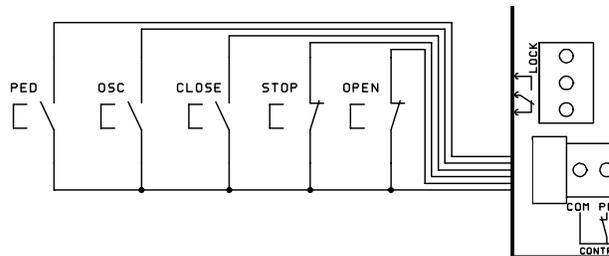
FIGURE 13

5.13 INTERLOCKING MOTOR DRIVE AND SAFETY INPUTS

The control board has been designed so that the fail safe interlocking action of the limit switch inputs with the motor drive outputs can be utilised to also interlock the motor drive outputs with the required safety inputs. Figure 14 is an example of how this can be achieved. Note the open limit switches are connected to COM via the STP switch. This prevents the motors being opened when the stop switch is activated. The stop switch is still connected to the STP input which like the other control and safety inputs responds quicker than the limit switch inputs. This ensures that when the stop switch is activated and the motor drive is turned off via the interlock, the control board responds to the STP input and not the limit switch inputs which would signal that the limits had been reached. Note the close limit

FIGURE 14

switches are connected to COM via both the P.E detector and the stop switch. This prevents the motors being driven in the close direction if either the stop switch or the P.E detector are activated. The P.E detector is still connected to the P.E input so that the control board can respond appropriately. The open limit switches could be wired the same as the close limit switches in figure 14 if the P.E is required to prevent the motors opening (P.E STOPS OPEN CYCLE > ON). An open switch could also be interlocked with the close limit switches is a similar way so that the motors could not be closed if the open switch was activated. Note that this feature can still be utilised if limit switches are not used. Simply follow the example in figure 14 with the limit switches omitted and replaced by a "short circuit". Note the status of the control, safety and limit switch inputs is indicated by the L.E.Ds [23] located behind the input terminal blocks. A particular input terminal's L.E.D will light when that terminal is connected to COM.
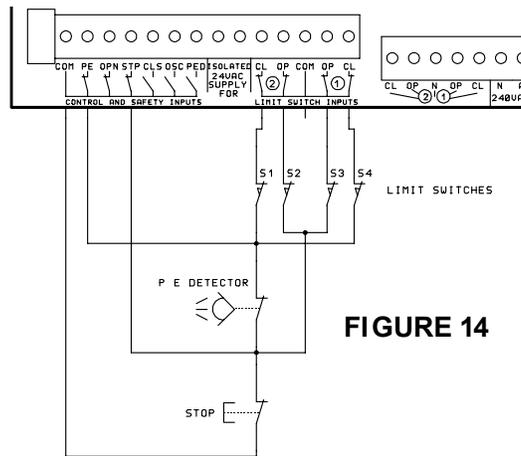
6 ADJUSTING CYCLE AND AUTOCLOSE TIMES.

The factory set default drive cycle times as well as the auto-close times can be adjusted to suit the needs of each installation. When the slide switch [26] is placed into the "set" position, the buttons [27] through [32] are used to set the cycle and auto-close times. The method is the same for each time to be set and involves pressing and holding the appropriate button for the required duration. The time the button is held down for is then stored within the controller's memory and used when the controller is in the "RUN" mode. When the motor drive cycle times are being set the controller also drives the motors as if a real drive cycle is being executed. The difference being that the motors stop as soon as the button is released. This feature can be used to help adjust and test the limit switch positions by "inching" the motors open and closed. To aid adjustment of the auto-close timers the CLS status led [25] illuminates to indicate when timing adjustment starts and the OPN status led [25] flashes at one second intervals while the button is pressed. Make sure that the slide switch [26] is placed into the "RUN" position after each required timer has been adjusted and before trying to test the new values.

6.1 SETTING OPEN, CLOSE AND PEDESTRIAN ACCESS CYCLE TIMES.

Follow the steps below to set the open, close and pedestrian access cycle times.

a) Place the slide switch [26] into the "set" position.
b) Close the gate by pressing and holding the "close cycle timer" button [31] until both motors are closed.
c) To set the open cycle time press and hold the "open cycle timer" button [32] until the gate has reached the desired open position, or if limit switches are used wait until a few seconds after the limit switches are reached before releasing.
d) To set the close cycle time press and hold the "close cycle timer" button [31] until the gate has reached the desired closed position, or if limit switches are used wait until a few seconds after the limit switches are reached before releasing.
e) Go to step (g) if pedestrian access is not used.

f) To set the pedestrian access part open position press and hold the "ped cycle timer" button [30] until the gate leaf driven by motor 1 has opened far enough for pedestrian access.

g) Place the slide switch [26] into the "RUN" position and test operation.

The open, close and pedestrian access cycle times can be set individually if desired by placing the gate in the desired starting position and then moving the slide switch into the "set" position and pressing the appropriate button. Make sure the slide switch is placed back into the "RUN" position before testing operation.

6.2   SETTING P.E TRIGGERED AUTOCLOSE DELAY TIME.

Follow the steps below to set the P.E triggered auto-close delay time.
a) Place the slide switch [26] into the "set" position
b) Press and hold the "p.e auto-cls" button [27] for the required delay time.
c) Place the slide switch [26] into the "RUN" position and test operation.

6.3   SETTING PEDESTRIAN ACCESS AUTOCLOSE DELAY TIME.

Follow the steps below to set the pedestrian access auto-close delay time.
a) Place the slide switch [26] into the "set" position.
b) Press and hold the "ped auto-cls" button [28] for the required delay time.
c) Place the slide switch [26] into the "RUN" position and test operation.

6.4   SETTING STANDARD AUTOCLOSE DELAY TIME.

Follow the steps below to set the standard auto-close delay time.
a) Place the slide switch [26] into the "set" position.
b) Press and hold the "std auto-cls" button [29] for the required delay time.
c) Place the slide switch [26] into the "RUN" position and test operation.

7   SPECIAL ADJUSTMENTS.

This section gives instructions on how to make some of the less common adjustments. To do this the controller must be placed in the special adjustment mode. This is done by following the steps below.
a) Turn the control board's power off
b) Place the slide switch [26] into the "set" position
c) Press and hold the CLS button [31]
d) Turn the control board's power on. (Keep holding the CLS button)
e) Wait until both the status L.E.Ds [25] turn off and then release the CLS button [31].
f) Both the status L.E.Ds [25] will come on to indicate that the special adjustment mode is selected.

The controller is now ready to adjust the special parameters. The sections 7.1 through 7.7 below give details on the adjustments and how to make them. Make sure the slide switch [26] is placed into the "RUN" position after adjustment. To aid adjustment the status L.E.Ds [25] will both be turned off when timer adjustment starts and the CLS status led [25] will flash at one second intervals while the button is pressed. For a summary of all adjustments see table 7 in section 9.

7.1   SETTING LOCK PULSE LENGTH.

The lock pulse time is the time the controller activates the lock release output for at the start of each cycle. The adjustment only applies when the PULSE LOCK OUTPUT dip-switch is in the ON position. To set the pulse time - Press and hold the OPN button [32] for the required lock pulse time.

7.2   SETTING TIME FROM WHEN WARNING LIGHT IS ACTIVATED TO WHEN MOTORS ARE STARTED.

The controller can be made to turn the warning light on before the motors are started. To adjust the duration of the delay - Press and hold the CLS button [31] for the required pre-drive delay time. Note the LIGHT OUTPUTS WARNING dip-switch must be on.

7.3   SETTING COURTESY LIGHT TIMER DURATION.

To set the courtesy light timer duration - Press and hold the CLS button [31] for the required light timer duration. Note that each second the button is held represents 10 seconds for timer, ie., holding the button for 6 seconds will set the timer to 60 seconds. Note the LIGHT OUTPUTS WARNING dip-switch must be off.

7.4   SETTING MOTOR STOPPING TIME.

The time the motors are given to come to rest after being switched off is adjusted by - Pressing and holding the STP button [29] for the required motor stopping time.

7.5   SETTING TIME FROM WHEN LOCK RELEASE OUTPUT IS ACTIVATED TO WHEN MOTORS ARE STARTED.

The controller can be made to activate the lock release output before the motors are started. To set the duration of the pause - Press and hold the OSC button [28] for the required pre-drive lock activation time.

7.6   SETTING DURATION OF GATE LEAF SYNCHRONISING DELAY.

To adjust the gate leaf synchronising delay - Press and hold the P.E button [27] for the required synchronising delay time. This adjustment overwrites the close synchronising delay set using section 7.7.

7.7   SETTING DURATION OF CLOSING GATE LEAF SYNCHRONISING DELAY.

To adjust the gate leaf synchronising delay for the close cycle only - Press and hold the PED button [30] for the required synchronising delay time. This adjustment does not affect the synchronising delay set for the open cycle. To set the open and close synchronising delays to different values, set the open cycle synchronising delay using step 7.6 above and then set the close synchronising delay using this section.

8   RELOADING MEMORY WITH FACTORY SET DEFAULT TIMES.

The control board comes programmed with factory set values for all of its operating parameters. These values can be reloaded back into the controller's memory by following the steps below.
a) Turn the control board's power off.
b) Place the slide switch [26] into the "set" position.
c) Press and hold the CLS button [31].
d) Turn the control board's power on. (Keep holding the CLS button)
e) Wait until both the status L.E.Ds [25] turn off.
f) While still holding the CLS button [31] place the slide switch [26] into the "RUN" position.
g) Wait until the OPN status led [25] is turned on.
h) Release the CLS button [31].
i) Wait for status L.E.Ds [25] to start flashing - Now ready to be used.

Note that the controller is normally supplied with all mode selection dip-switches in the "OFF" position and the slide switch in the "RUN" position. However check the instructions of the access controller purchased.

9 SPECIFICATIONS.

MAXIMUM RATINGS
Exceeding these values may cause serious damage to the control board. Note these are fault rating not normal operating conditions.

Supply voltages
240VAC SUPPLY   450V peak
24VAC SUPPLYS   29VAC

Input voltages
Note that the maximum ratings shown below are an indication of the input's ability to withstand being incorrectly connected to an external voltage source. In normal operation NO voltage should be connected to the control board's inputs. Although the inputs will not be damaged by an input voltage less than or equal to the maximum rating it is not implied that the control board will function correctly while that input is under such a condition.

CONTROL AND SAFETY inputs   min = -50V   max = 100V
LIMIT SWITCH inputs   min = -50V   max = 100V
ANTENNA input (relative to earth)   +/- 50V

Outputs
LOCK OUTPUT switching voltage   max = 30VAC/DC
LOCK OUTPUT switching current (inductive)   max = 3A
LIGHT OUTPUT MODULE switching voltage   max = 250VAC / 30VDC
LIGHT OUTPUT MODULE switching current   max = 10A AC/DC
TOTAL MOTOR OUTPUT CURRENT   max = 5A (5A fuse protected)

TYPICAL POWER SUPPLY REQUIREMENTS

ISOLATED 24VAC SUPPLY   22 - 26VAC @ 250mA max
24VAC SUPPLY   22 - 26VAC @ 250mA max
240VAC SUPPLY   240VAC @ 5A max (or lower if required by motor)

TYPICAL INPUT CHARACTERISTICS

OPN, STP, OSC, PED inputs
    Logic low input current   5mA DC (input shorted to COM terminal)
    Logic high input current   0mA DC (input open circuit)
    Logic low/high threshold   2.5mA DC
    Response time   0.1s
CLS input
    Logic low input current   10mA DC (input shorted to COM terminal)
    Logic high input current   0mA DC (input open circuit)
    Logic low/high threshold   5mA DC
    Response time   0.1s

TYPICAL INPUT CHARACTERISTICS (cont.)

LIMIT SWITCH inputs
    Logic low input current   20mA DC (input shorted to COM terminal)
    Logic high input current   0mA DC (input open circuit)
    Min low level input current   16mA DC (300 ohm resistor from input to COM terminals)
    Response time   0.2s   (This is microcontroller's response time. The limit switches are interlocked with the motor drive and therefore act immediately).

OPERATING PARAMETERS

Table 7 shows the operating parameters which can be changed by the user. The "ADJUSTMENT METHOD" states the button and adjustment mode required to change the parameter's value. The "FACTORY" value is programmed into the control board during manufacture or can be reloaded into the controller's memory by using the steps in section 8. The values in "( )" are selected by the appropriate dip-switch, if applicable. For details about selecting the ( ) values see the appropriate section. The "RANGE" is the range of values the parameter can be programmed to be. The "STEP" is the smallest adjustment that can be made to a parameter's value. All values are in seconds. Note that the PRE-DRIVE WARNING ACTIVATION TIME and the COURTESY LIGHT TIME are both adjusted using the CLS button in the special adjustment mode. The position of the LIGHT OUTPUTS WARNING dip-switch determines which of the two parameters is being adjusted.

PARAMETER	ADJUSTMENT METHOD	FACTORY	RANGE	STEP
OPEN CYCLE TIME	open cycle timer [set]	60	0-6553	0.1
CLOSE CYCLE TIME	close cycle timer [set]	60	0-6553	0.1
PEDESTRIAN CYCLE TIME	ped cycle timer [set]	5	0-6553	0.1
P.E TRIGGERED AUTOCLOSE TIME	p.e auto-cls [set]	0	0-6553	0.1
PEDESTRIAN AUTOCLOSE TIME	ped auto-cls [set]	15	0-6553	0.1
STANDARD AUTOCLOSE TIME	std auto-cls [set]	30	0-6553	0.1
LOCK PULSE LENGTH	OPN [special adj mode]	0.3	0-25.5	0.1
PRE-DRIVE LOCK ACTIVATION TIME	OSC [special adj mode]	0	0-25.5	0.1
PRE-DRIVE WARNING ACTIVATION TIME	CLS [special adj mode]	0	0-25.5	0.1
COURTESY LIGHT TIME	CLS [special adj mode]	60	0-6553	1
MOTOR STOPPING TIME	STP [special adj mode]	0.5	0-25.5	0.1
GATE SYNCHRONISING DELAY	P.E [special adj mode]	0 (2)	0-25.5	0.1
GATE SYNCHRONISING DELAY (CLOSE)	PED[special adj mode]	0(2)	0-25.5	0.1

TABLE 7

10 SPECIALISED OPERATING MODES.

As there are countless ways of controlling motorised devices the CB-6 has been designed so that it can be easily upgraded to accommodate new functions and modes of operation as required. To select one or more of these "specialised operating modes" the user simply has to follow the steps below.

a) Turn the power to the control board off.
b) Set the dip-switches [24] as required to select the required specialised operating modes (shown in table 8).
c) Place the RUN / set switch [26] into the "set" position.
d) Press and hold the "CLS" button [31]. (Don't release the "CLS" button until step "h").
e) Turn on the power to the control board while holding the "CLS" button. (Both status L.E.Ds [25] will turn on).
f) Wait for the status L.E.Ds [25] to turn off and then place the RUN / set switch [26] into the "RUN" position.
g) Wait for the "OPN" status L.E.D [25] to light and then place the RUN / set switch [26] into the "set" position.
h) Wait for the "OPN" status L.E.D [25] turn off and the "CLS" status L.E.D [25] to turn on and then release the "CLS" button [31].
i) Wait until both the status L.E.Ds [25] have turned off.
j) The selected specialised operating modes are now loaded.
k) Turn the power to the control board off and then continue to set the control board up as per normal.

Note if a control board is to be returned to the factory set "state" follow the instructions in section 8.
 The currently available specialised operating modes are shown in table 8 below. As the number of modes is growing all the time it may be best to check with A.T.A or one of their distributors if you don't see the mode you desire.

DIP-SWITCH NUMBER	SPECIALISED OPERATING MODE DESCRIPTION	IMPLEMENTED FROM CODE VERSION †
1 > ON	ANTI JAM CLOSED (drives gate in closed direction for 0.5s before opening). Only suitable for non-limit switch operators. The Lock output [17] is not activated until the actual open cycle is started.	1.05
2 > ON	ANTI JAM OPEN (drives gate in open direction for 0.5s before closing). Only suitable for non-limit switch operators. The Lock output [17] is not activated until the actual close cycle is started.	1.05
3 > ON	TIMED RETURN (only allows the time driven in an interrupted cycle for the return part cycle). The exact time allowed is the time travelled plus ~12.5%.	1.05
4 > ON	OPTIONAL TIMED RETURN OVERRUN TIME. Overrun time of 25% selected instead of standard 12.5%.	1.05
5 > ON	TIMED RETURN FOR PEDESTRIAN ACCESS with 12.5% overrun time.	1.05
6 > ON	PED has an Open / Stop / Close action in pedestrian access mode. Also P.E reverses pedestrian close cycle if P.E STOPS CLOSE CYCLE dip-switch is 'off'.	1.05
7 > ON	PED inputs have swipe action in pedestrian access mode.	2.10
8 > ON		
9 > ON		
10 > ON		
† The large chip "U4" on the control board has the code version marked on it.		

TABLE 8