((((APC)))) Automation Systems

APC-CBSW-24 V1.6
SMART 24V System
Installation Guide
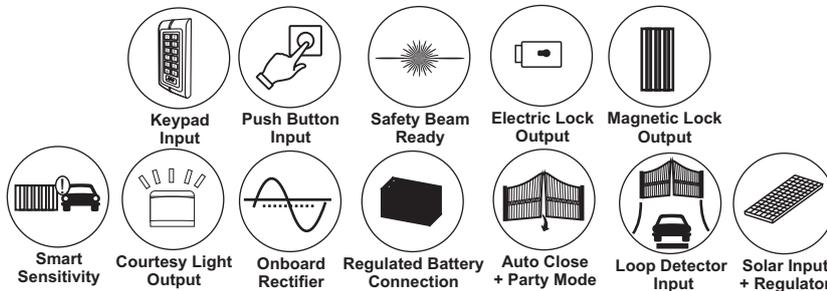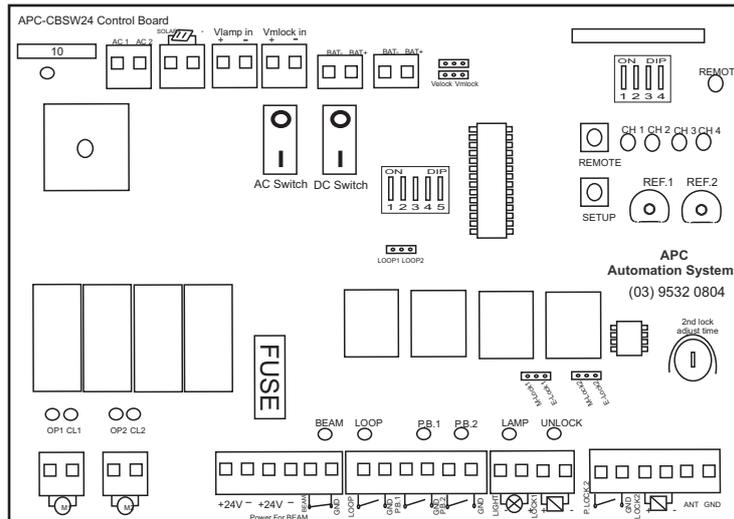
APC-CBSW24 Control Board

Keypad Input	**Push Button Input**	**Safety Beam Ready**

Electric Lock Output **Magnetic Lock Output**

Smart Sensitivity **Courtesy Light Output** **Onboard Rectifier** **Regulated Battery Connection** **Auto Close + Party Mode** **Loop Detector Input** **Solar Input + Regulator**

⚠ When running any wiring you MUST always switch off the system power switches AND also unplug the input power source and the batteries.

Before beginning your installation please read this manual thoroughly and observe the wiring for the connection of any and all accessories related to your installation

090221

Attention Installer

There is no substitute to the benefits of reading and understanding the manual

The warranty covers faulty products only and not problems or damage caused by the installer
Pictures of the installation are always requested for troubleshooting or technical support

As an installer or DIY you have undertaken the responsibility to install this automation system
It is of utmost importance to read the instruction manual and understand it before proceeding.
If in doubt after reading please call us and ask questions before proceeding.

In addition to the above the following must be observed to make the installation process

1

The remote controls combined in this kit are already paired into the system. If Wireless buttons have also been purchased together with the kit then they have also been paired into the system.

2

This Gate automation control panel has been tested and pre-configured with the factory default setting.
This means that the automation kit will work correctly for most size and weight gates with only the Setup procedure. A small adjustment to the over current setting may be required for your gates.
DO NOT ADJUST OVER CURRENT SENSING UNTIL ALL SETUP AND TROUBLESHOOTING PROCEDURES HAVE BEEN USED
* See REF1 & REF2 in the control panel manual

3

Motor(s) test and limit switch setup (if applicable) must be carried out according to the description in the motor manual prior to connection to the control panel. Failure to do so will result in damage to the control panel.

4

The M1 and M2 on the control board are voltage OUT and NOT VOLTAGE IN, DO NOT connect a power source to this output. Doing so will immediately burn the control board.

5

M1 & M2 have LED indicators (Green for Opening and Red for Closing) The LED's are above the M1 & M2 outputs it is of utmost importance that you must be aware of the following:
A. Observe the colours sequence during the cycles (Green while Opening and Red while Closing)
B. The LED's must switch off within 5 seconds once the gate(s) reach the full open or full close

6

The battery/batteries system must be connected correctly and according to the manual to avoid damaging the control board, incorrectly connecting the battery/batteries will result in damage to the control board.

Congratulations on the purchase of your APC Automation Systems® Gate Automation Kit.

For your convenience any Remote's and wireless buttons supplied with the kit are already paired with the system.

Contents

Preliminary Checks

To ensure safety and an efficient automation make sure the following requirements are met:

1. The gate structure must be suitable for automation.
2. Make sure that the gate leafs move properly and uniformly without any irregular friction during their entire travel.
3. The gates hinges must be in good condition with no bitting, no rust and must be well greased.
4. The gates should be able to be freely opened and closed before installing the gates automation system.
5. It is strongly suggested to have a gate stop installed for the closed position.

Important Safety Information

Installer and owners should observe the following:

1. Make sure that there is sufficient space for the gate(s) to swing open fully to the desired opening angle.
2. The control Panel Box must be installed in the area within 9 meters maximum cable distance from motor and cannot be damaged.
3. Do not change with parts or components not supplied by the manufacturer, this includes sensors, buttons, solar panels, transformers and any component not listed in the compatibility list.
4. Make sure all wiring works are correct and in good condition before connecting the battery, solar panel or transformer to the control panel.
5. Turn off the power and disconnect the battery when doing any maintenance.
6. Ensure the control panel box is free from water leakage to avoid short circuiting of the control panel.
7. Do not supply mains power directly to the motor, control box or any accessories.
8. Do not install the operating system if in doubt. Contact the manufacturer.
9. Do not cross the gate while it is operating, Safety sensors are only to assist in preventing accidents or injuries.
10. Keep the remote controls in safe place and away from children.

Control Panel Features

Low Consumption (Standby ~30mA)
Over Current Sensitivity
Built in Solar Regulator
Remote and Wireless Button Compatibility
Automatic Close
Party Mode (Cancel Auto Close)
Dedicated Safety (PE) Sensor Output
Dedicated constant 24v Output
Loop/Exit Wand Input
Input for Push Button, keypad, fingerprint reader and other access control compatibility
Automatic Lock Output
Pedestrian Gate Lock Output Electro-Mechanical Lock Support
Courtesy Lamp Output

Phoenix Connectors

All Connectors are Pull-Out Connectors for ease of installation.

1. Remove Connector from Control Board.

2. Use a Flat head screw driver to loosen the top screw which will open the clamp point.

3. The casing should be stripped to expose ~12mm of the conductor. The conductor should be then folded back to leave a length of ~7-8mm. This method will allow the conductor to have maximum hold whilst in the connector.

1.   12mm   2.   7-8mm   3.

EASY PULL OUT
←
CONNECTOR

4. Tighten the screw CLOCKWISE to clamp.

Double Swing Gate

1	Control Box
2	Antenna
3	Exit Push Button/Keypad
4	Entry Push Button/Keypad
5	Gate Stop
6	Induction Loop
7a	PE Sensor Transmitter
7b	PE Sensor Receiver (Not required for Retro Reflective Sensor)
8	Power Source
9	Gate Motor 1
10	Gate Motor 2

Accessories Requiring Wiring:

Keypad - 4 Core
PBD/PBD-K - 4 Core
PBS/PBS-K - 2 Core
PE Sensor
      Receiver - 4 Core
      Transmitter - 2 Core

Single Swing Gate

1	Control Box
2	Antenna
3	Exit Push Button/Keypad
4	Entry Push Button/Keypad
5	Gate Stop
6	Induction Loop
7a	PE Sensor Transmitter
7b	PE Sensor Receiver (Not required for Retro Reflective Sensor)
8	Power Source
9	Gate Motor

Accessories Requiring Wiring:

Keypad - 4 Core
PBD/PBD-K - 4 Core
PBS/PBS-K - 2 Core
PE Sensor
      Receiver - 4 Core
      Transmitter - 2 Core

Required Tools

Power Drill & Drill Bits (Required)	Screwdriver Set (Required)	Electrical Tape/ Heat Shrink Tubing (Required)	Wire Cutter & Stripper (Required)	Soldering Iron (Recommended)	Multimeter/Voltmeter (Recommended)	2mm Hex Key (Required)

Solar Panel and Bracket Assembly

① Assemble the 2 clamps to the base plate.

② Insert the post into the clamps and tighten.

③ Line up the solar mounting bracket just above the centre of the solar panel and use short self drilling tek screws to fasten and secure.

④ Use the flat rubber gasket behind the fixing clamps as shown in fig 4.

⑤ Assembled solar panel
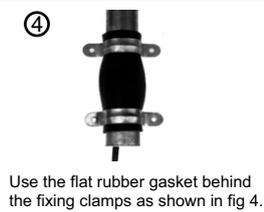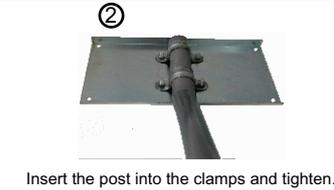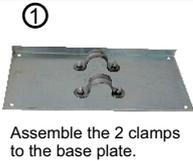
1. The solar panel should be installed at 45º facing mid-day to afternoon sun.

2. Assemble and install the solar panel in a place that is exposed to the sun most of the day and as far as possible from any walls or trees.

3. Make sure that the two wires of the solar panel do not touch each other at any time during installation.

4. Install the solar panel at least 2m above the ground to protect it from dust and small stones.

Successful SETUP flowchart

Ensure Limit switch(es) and motor polarity is set correctly as per motor manual

↓

Connect Battery setup into system only (Page 10) & Switch ON DC Switch

↓

Observe Motor LED to Ensure LED's corresponds to motor operating direction

← **PROBLEM** Wrong Operating Direction, Reverse wiring on the problem motor port. (M1 or M2 ON THE CONTROL BOARD) (NOT THE BATTERY)

OK ↓

Connect in remaining power source (Transformer or Solar panel) Page 6/7 and Switch ON AC Switch if applicable

↓

Return Gate to Closed position using Manual override of the Gate Motor

↓

Run the SETUP
Single gate system Page 9
Double gate system Page 10

↓

Ensure gate(s) open and closes fully during SETUP

← **PROBLEM** Partial operation or operation failure adjust Over Current Sensing Page 9

OK ↓

Test gate using the remote
Single gate system button "2"
Double gate system button "1"

← **PROBLEM** Partial operation or operation failure adjust Over Current Sensing Page 9

OK ↓

Completed

26 APC-CBSW24 Control Board
25 AC 1 AC 2
24 SOLAR + −
9b Vlamp in + −
10b Vmlock in + −
16b Velock Vmlock
23 BAT− BAT+   BAT− BAT+

10

ON DIP
1 2 3 4
REMOTE
22
REMOTE   CH 1 CH 2 CH 3 CH 4

AC Switch   DC Switch
27   **28**

19 ON DIP 1 2 3 4 5

18 LOOP1 LOOP2

21 SETUP   REF.1   REF.2   **20**

APC Automation Systems
(03) 9532 0804

2nd lock adjust time
29

17 FUSE

16a M.LOCK1 / E.LOCK1   **16c** M.LOCK2 / E.LOCK2

BEAM   LOOP   P.B.1   P.B.2   LAMP   UNLOCK   **15**

14 OP1 CL1   OP2 CL2

M1 **1**   M2 **2**

+24V − +24V −   BEAM GND   LOOP GND P.B.1   GND P.B.2   GND   LIGHT −   LOCK1 + −   P.LOCK2   GND LOCK2 + −   ANT GND
Power For BEAM
3   **4**   **5**   **6**   **7**   **8**   **9a**   **10a**   **11**   **12**   **13**

1. **Motor 1 Output**
2. **Motor 2 Output**
3. **Constant 24V DC output**
4. **PE Sensor 24V DC output** (Closing Only)
5. **PE Sensor Input** (LATCHING N/C DRY Contact)
6. **Loop Input** (MOMENTARY N/O DRY Contact)
7. **Single/Pedestrian Gate push Button Input** (MOMENTARY N/O DRY Contact)
8. **Double Gate push Button Input** (MOMENTARY N/O DRY Contact)
9a. **Light DC Voltage Output**
9b. **Light DC Voltage Input**
10a. **Automatic Gate Lock Output**
10b. **Magnetic Lock DC Voltage Input**
11. **Lock 2 Push Button Input** (CH4) (MOMENTARY N/O DRY Contact)
12. **Lock 2 Output** (CH4) (12V DC)
13. **433MHZ Antenna**

14. **Motor Status Indicators**
15. **Accessories Status indicators**
16. **Lock Type Selection**
17. **Accessories Output Fuse** 0.5A
18. **Loop Configuration** (Single/Double opening)
19. **Motor Delay & Auto Close Configuration**
20. **REF 1 & 2 Adjusters**
21. **Travel Time Programming**
22. **Remote Configuration/Programing/Status**
23. **Battery Output**
24. **Solar Input**
25. **24V AC Input**
26. **10A AC Fuse**
27. **AC ON/OFF Switch**
28. **DC ON/OFF Switch**
29. **Lock 2 Time Adjustment**

Motor Output Status

OP1 The Green LED will be ON during the opening cycle of M1 Motor Output (GATE 1)

OP2 The Green LED will be ON during the opening cycle of M2 Motor Output (GATE 2) **Double Gate System Only**

CL1 The Red LED will be ON during the Closing cycle of M1 Motor Output (GATE 1)

CL2 The Red LED will be ON during the Closing cycle of M2 Motor Output (GATE 2) **Double Gate System Only**

Chanel Status

CH1 CH 1: Double Gate Channel: Illuminated whilst CH1 Button is pressed on Controller Or PB2 Circuit is activated

CH2 CH 2: Single Gate Channel: Illuminated whilst CH2 Button is pressed on a Controller Or PB1 Circuit is activated

CH3 CH 3: Cancel Auto Close Channel (Party Mode): Illuminated whilst CH3 Button is pressed on a controller

CH4 CH 4: Lock 2 for Pedestrian Gate: Illuminated whilst CH4 Button is pressed on a controller Or P.Lock2 Circuit is activated

SETUP Press and hold to initiate the Time Travel learning cycle

REMOTE Press once to begin the remote pairing.

BEAM The GREEN LED is OFF in Standby & Opening. It will be ON during the closing cycle to indicate that the safety beam circuit is operational and not Interrupted.

Loop The GREEN LED will pulse ON once when receiving contact indicating that the signal was received.

PB.1 The GREEN LED will pulse ON once when receiving contact indicating that the signal was received.

PB.2 The GREEN LED will pulse ON once when receiving contact indicating that the signal was received.

LAMP This GREEN LED will be ON during the opening operation of the gate(s). It will stay ON while the gates are open, and it will switch OFF after the gate(s) are closed.

UNLOCK This GREEN LED will be ON for the first 3 seconds of opening to indicate the lock output is active.

AC POWER The RED led will illuminate if an AC power source is switched ON.

Fixing the Control Box

The supplied fixing screws and wall plugs are for Masonry fixing. When fixing to other surfaces use the appropriate fasteners.

Eg. For metal surfaces use Tek Screws and for Timber fixing use timber screws.

1. Install the corner tabs supplied with your kit to the rear of the control box using the 10mm Pan head screws.

2. Choose a location in which to mount the control box. The control box must be kept within 9 metres away from the motor(s) in cabling distance and a minimum of 1m height from the ground.

3. Mark the fixing points of the control box on the mounting surface whilst the box is held perfectly level. A bubble level is ideal to assist in keeping the box level.

4. If fixing to a masonry surface use a 6mm masonry drill bit to drill the fixing points for the wall plugs.

5. Gently tap the wall plugs into place until they are flush with the fixing surface.

6. Hold the control box in place whilst aligning the holes of the corner tabs with the wall plugs then fix into place using the 38mm pan head screws.

7. Apply LIGHT tension to the top of the control box to ensure that it is secured in place.

201mm
184mm
297mm
280mm

Min. 1000mm From ground

| 4x Corner Fixing Tabs | 4x 10mm Pan Head Machine Screws | 4x 38mm Pan Head Tapping Screws | 4x Nylon Wall Plugs |
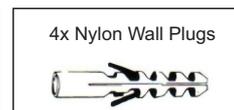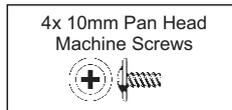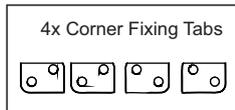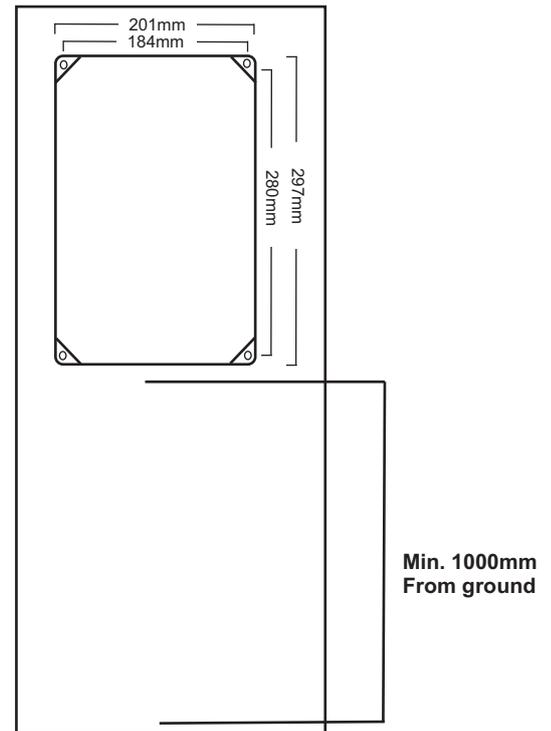
Power Input Connection

 Please follow the instructions below carefully as this will be the Primary source of power for the Control Board.

1. Ensure that there are no loose strands before inserting the wire into the connector to avoid short circuit.
2. Ensure that the Polarity is correct to avoid short circuit.
3. Ensure all power switches are OFF before connecting.

⚠ **DO NOT Connect more than one PRIMARY power source at a time. This Will damage the control board and VOID your Warranty.**

ON/OFF Switches

Powered Systems:
When the AC Switch is in the ON state it will allow the low voltage AC supply to pass through the system. This switch will NOT charge the batteries until the DC switch is also in the ON state.

Solar Systems:
When the DC Switch is in the ON state it will allow the low voltage DC current to enter the system.

Please note that if the relevant switch is in the off state the system will discharge the batteries.
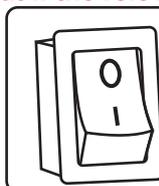
When the switch is pressed in towards the "O" it is in the OFF STATE
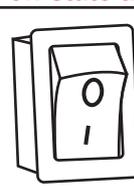
When the switch is pressed in towards the "I" it is in the ON STATE

⚠ **When running any wiring you MUST always switch off the system power switches AND also unplug the input power source and the batteries.**

> ⚠ **When running any wiring you MUST always switch off the system power switches AND also unplug the input power source and the batteries.**

Extending the APC External AC Transformer (Low Voltage)

Maximum cable distance: The low voltage transformer can be run upto 80m in cable distance when using a 2mm pair conductor. To run the transformer to maximum capacity the cable must be cut at the LOW VOLTAGE SIDE within 10cm from the output.

Note: Use a weatherproof junction box to terminate the new cable to the transformer.

Weatherproof Enclosure
for outdoor connection

New Cable
Upto 80m in length

Cut to 10cm
at Low Voltage Side

AC ADAPTOR
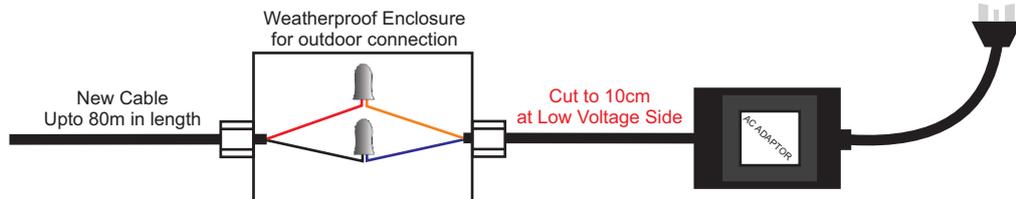
APC External AC Transformer (Low Voltage Systems)

AC ADAPTOR

NO POLARITY

10

AC 1 AC 2   SOLAR   - Vlamp in   Vmlock in
                          +   -   +   -

AC Switch DC Switch
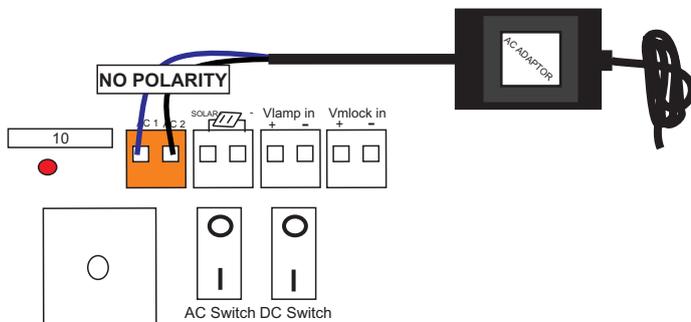
> ⚠ **Ensure all power switches are in the OFF position before connecting.**

Once the AC Supply is powered and switched ON the RED LED will illuminate indicating the board is powered.

APC Solar Panel Connection (Solar Systems)

Multiple APC Solar Panels can be wired in parallel to speed up the charging process (see below), When installing multiple collectors consider installing them facing in different directions to gather morning and afternoon sun.

SUPPORTS APC-SP24-20W, 40W & 60W Panels
MAXIMUM TOTAL INPUT MUST NOT EXCEED 60W

10

AC 1 AC 2 SOLAR - Vlamp in Vmlock in
                      +   -   +   -

AC Switch DC Switch

10

AC 1 AC 2 SOLAR - Vlamp in Vmlock in
                      +   -   +   -

AC Switch DC Switch
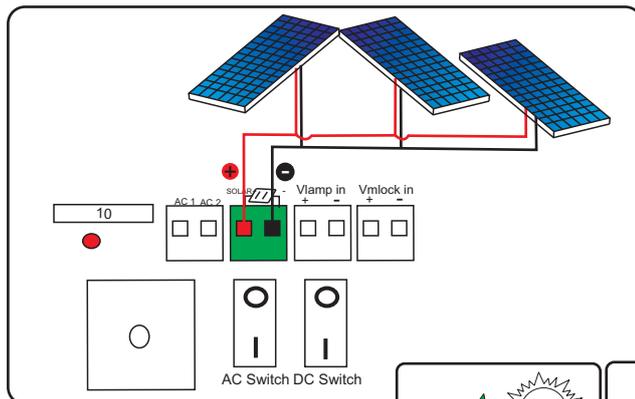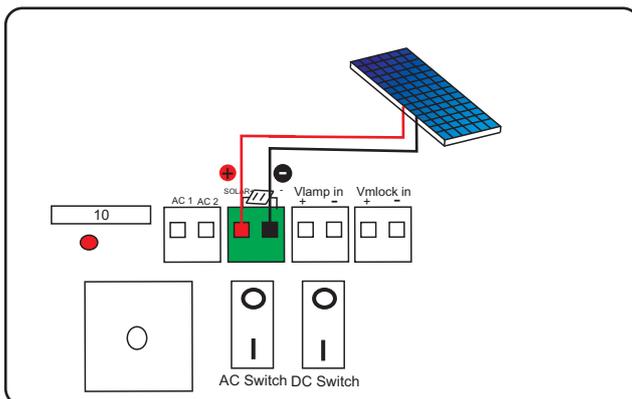
Understanding Solar

1. A solar panel CANNOT be installed under a tree or a shaded area, it requires sun to charge and maintain the batteries.

2. A solar system is often maintenance free BUT the batteries may require an occasional external charge in the winter months due to lack of sun.

3. Constantly powered accessories such as wired keypads will increase the standby current draw, solar panel or battery upgrades may be required if insufficient sun collection is not achieved.
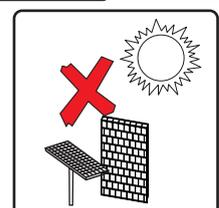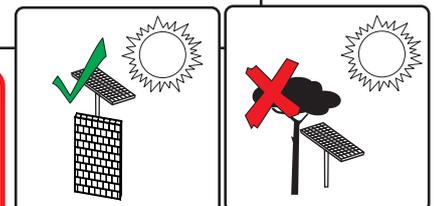
Battery Connection

⚠️ **Incorrect connection of the battery will cause damage and will immediately VOID warranty**

Before connecting your batteries enure that the "DC Switch" is in the OFF Position.

1. Unplug battery connector from control panel.
2. Connect the Red battery lead to the Red (Positive) terminal on the battery 1.
3. Connect the Black battery lead to the Black (Negative) terminal on the battery 2.
4. Connect Negative of battery 1 to positive of battery 2.
5. Plug connector into battery input port on the control board.

Repeat the above if dual batteries are to be connected (Solar systems).
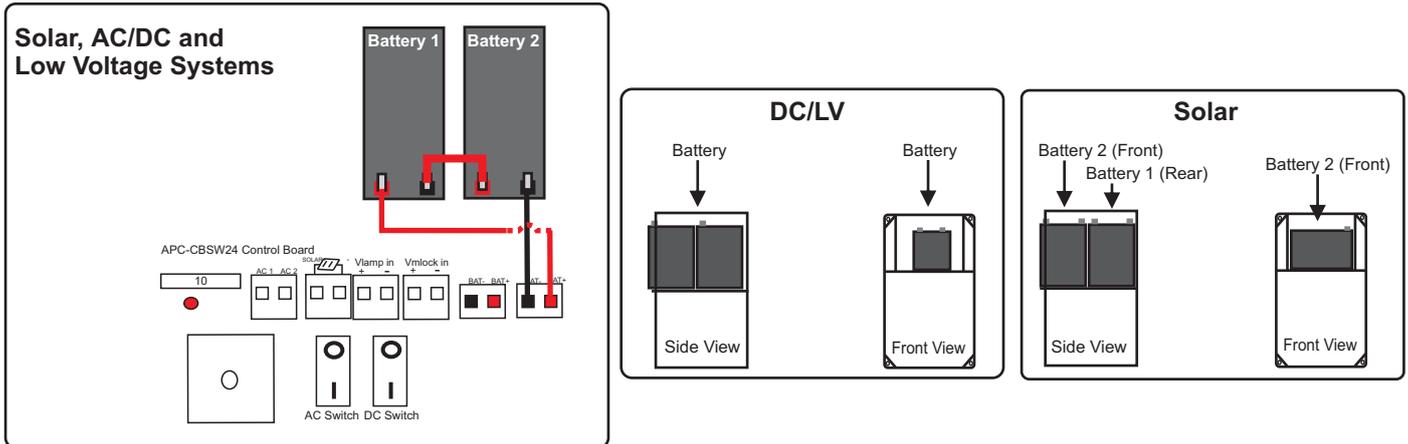
Gate Motor Connection

⚠️ **MAXIMUM CABLE DISTANCE BETWEEN MOTOR AND CONTROL PANEL IS 9 METRES**

Please refer to your gate motor manual for the correct wiring connection to the control box.

Motors are generally supplied with a 5 meter cable, for distances up to 9 meters the cable should be replaced with a 2mm pair.

M1/M2 Output

M1 Motor Output - (First motor output/Single gate motor output)
Motor output for the Master (Leading) gate when opening in a double gate installation, second gate to close in a double gate installation.

Motor output for a Single gate in a Single gate installation.

M2 Motor Output - DOUBLE GATE SYSTEMS ONLY
Motor output for Slave(Trailing) gate when opening in a double gate installation, first gate to close in a double gate installation.

Always run the motor cables at similar if not equal lengths to avoid a speed difference between the two motors.
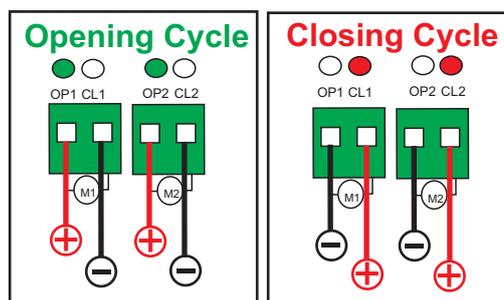
Setting the Motor Delay (Double Gate Systems only)

Three choices are available for the time difference between Gate 1 operating and Gate 2 operating.
No Delay, 2 second Delay and 5 Second Delay.

If a rebate, lip or tab is installed on one of the gates and the gates are the same size a 2 second delay will be required.
If a rebate, lip or tab is installed on one of the gates and the gates are a different size a 5 delay will be required.
If the gates do not have a rebate, lip or tab NO DELAY is required.

NO DELAY
4 & 5 DOWN

2 Seconds
4 & 5 UP
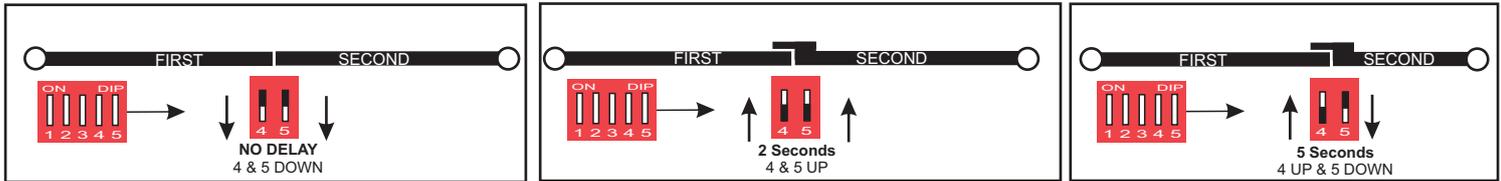
5 Seconds
4 UP & 5 DOWN

Setting the Auto Close Duration

The simple to set Auto Close has 4 easy to adjust settings; 5,30,90 and 180 Seconds.

To turn on Auto Close Set DIP Switch 1 in the ON position followed by DIP 2 and 3 based on your desired Auto Close duration.

ON
1 UP

OFF
1 DOWN

5 Seconds
2 & 3 UP

30 Seconds
2 UP & 3 DOWN

90 Seconds
2 Down & 3 UP

180 Seconds
2 & 3 Down
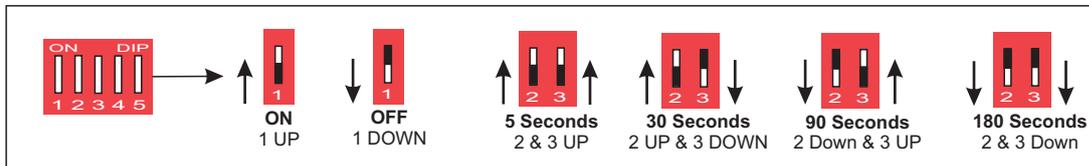
⚠️ **A PE Sensor or Reflective sensor MUST be connected when using the Auto Close Feature**

Over Current Sensing

REF.1   REF.2

Ref 1 and Ref 2 Trim Pot   More Sensitive   Less Sensitive

What are the Ref 1 and Ref 2 Trim Pots

These trim pots directly adjust the over current sensitivity of the control board, they are adjusted ONLY when the gate(s) fail to fully open/close **UNDER NORMAL OPERATING CONDITIONS**. Adjusting these dials should only be considered after ALL aspects of the installation are confirmed.

REF 1 Directly controls the over current sensitivity for the **FULL SPEED** portion of the normal operating cycle.
Furthermore because the SETUP cycle is only run in the fast speed the REF 1 is the only trim pot that should be adjusted if the problem is occurring in SETUP.

REF 2 Directly controls the over current sensitivity for the **SLOW SPEED** portion of the operating cycle and also the TRANSITION speed between full speed and slow speed. It is not used in the SETUP cycle.

IMPORTANT: This step must be adjusted correctly to ensure that the gate is not inconsistent in its operation BUT will continue to sense obstructions and wind loading. The adjustment needs to be set taking into consideration that a different temperature after installation will cause a greater resistance.

How to adjust

Adjusting the pots **CLOCKWISE** will **DECREASE** the sensitivity thus making the system **LESS sensitive** to weight and resistance.

Adjusting the pots **ANTI-CLOCKWISE** will **INCREASE** the sensitivity thus making the system **MORE sensitive** to weight and resistance.

The pots should be adjusted only in 1mm increment turns until the gate does not over current sense during its travel.

GATES MUST BE CLOSED BEFORE BEGINNING THE STEPS BELOW

Double Gate System SETUP Cycle

Before beginning this step you must first ensure that all your motor wiring connections are connected correctly, there are no loose wire strands and all connection points are joined and insulated correctly.

If you are using a limit switched motor ensure that the limit switches have been set correctly using the backup battery PRIOR to connecting to the system.

The purpose of the SETUP cycle is so that the gate control panel can learn its opening and closing limits and learn its slowdown. If the control panel is not setup it may run inconsistently and/or may not reach its stopping points and/or slow down incorrectly.

Preliminary checks prior to setup cycle

Ensure gate hinges are free with ZERO resistance
Ensure gate is free of ALL sagging and bowing
Ensure that the arm is straight and not being pulled up or down (Folding Arm Systems)
Ensure that the Actuator is straight and not being pulled up or down (Linear Actuator Systems)
Ensure that limit switches are set correctly
Ensure that the motor polarity is set correctly

IMPORTANT

If your gate is not open frame and is covered with pickets, sheeting, cladding or any other material the system must not be setup with the presence of ANY wind load. The protection purposes the systems are designed to over current sense under all loads to protect the system from overloading damage.

1

Press and **HOLD** the "Setup" Button.
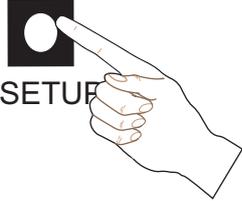
SETUP

2

Release the setup button **IMMEDIATELY** after the buzzer sounds.

BEEP

3

Press and **HOLD** "**1**" on the remote control for one second then release.
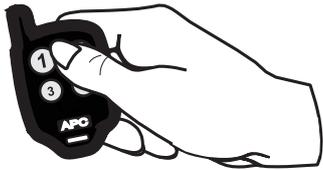
The SETUP cycle will now open and close each gate independently at full speed so that it can learn the time travel distance. It will follow the sequence illustrated below. Once the cycle below is completed the buzzer will sound indicating completion.

4 Opening M1

OP1 CL1 OP2 CL2
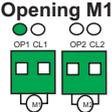
Gate 1 will open to the full open position at full speed. Once at the open position the motor and the **GREEN** OP1 indicator LED will switch off.

5 Opening M2

OP1 CL1 OP2 CL2
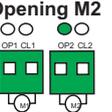
Gate 2 will open to the full open position at full speed. Once at the open position the motor and the **GREEN** OP2 indicator LED will switch off.

6 Closing M2

OP1 CL1 OP2 CL2
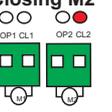
Gate 2 will close to the full close position at full speed. Once at the closed position the motor and the **RED** CL2 indicator LED will switch off.

7 Closing M1
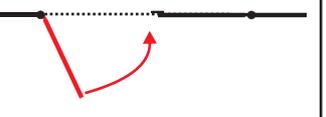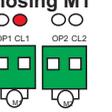
OP1 CL1 OP2 CL2

Gate 1 will close to the full close position at full speed. Once at the closed position the motor and the **RED** CL1 indicator LED will switch off.

Important !

Observe the LED indicators as illustrated and detailed above, if the gate(s) reach the open or close position and the motor LED does not switch off immediately switch off both the AC and DC switches immediately and see the troubleshooting section.

8

BEEP

The Buzzer will now sound indicating completion of the setup cycle.
If the gate(s) did not reach any of the full open or close cycles or has missed part of the cycle see the troubleshooting section.

GATES MUST BE CLOSED BEFORE BEGINNING THE STEPS BELOW

Single Gate System SETUP Cycle

Before beginning this step you must first ensure that all your motor wiring connections are connected correctly, there are no loose wire strands and all connection points are joined and insulated correctly.

If you are using a limit switched motor ensure that the limit switches have been set correctly using the backup battery PRIOR to connecting to the system.

The purpose of the SETUP cycle is so that the gate control panel can learn its opening and closing limits and learn its slowdown. If the control panel is not setup it may run inconsistently and/or may not reach its stopping points and/or slow down incorrectly.

Preliminary checks prior to setup cycle

Ensure gate hinges are free with ZERO resistance
Ensure gate is free of ALL sagging and bowing
Ensure that the arm is straight and not being pulled up or down (Folding Arm Systems)
Ensure that the Actuator is straight and not being pulled up or down (Linear Actuator Systems)
Ensure that limit switches are set correctly
Ensure that the motor polarity is set correctly

IMPORTANT

If your gate is not open frame and is covered with pickets, sheeting, cladding or any other material the system must not be setup with the presence of ANY wind load. The protection purposes the systems are designed to over current sense under all loads to protect the system from overloading damage.

1	**2**	**3**
Press and **HOLD** the "Setup" Button. SETUP	Release the setup button **IMMEDIATELY** after the buzzer sounds. BEEP	Press and **HOLD** "**2**" on the remote control for one second then release.

The SETUP cycle will now open and close the gate at full speed so that it can learn the time travel distance. It will follow the sequence illustrated below. Once the cycle below is completed the buzzer will sound indicating completion.

4 Opening M1	**5** Closing M1
OP1 CL1 OP2 CL2	OP1 CL1 OP2 CL2
Gate 1 will open to the full open position at full speed. Once at the open position the motor and the **GREEN OP1** indicator LED will switch off.	Gate 1 will close to the full close position at full speed. Once at the closed position the motor and the **RED CL1** indicator LED will switch off.
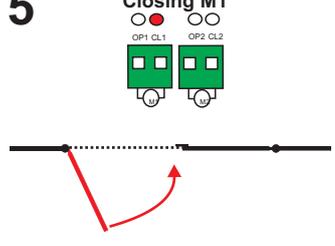
Important !

Observe the LED indicators as illustrated and detailed above, if the gate reaches the open or close position and the motor LED does not switch off immediately switch off both the AC and DC switches immediately and see the troubleshooting section.

6	BEEP	The Buzzer will now sound indicating completion of the setup cycle. **If the gate did not reach any of the full open or close cycles or has missed part of the cycle see the troubleshooting section.**

APC Smart Receiver Configuration

The APC Smart remote system is designed for user friendly operation. Once a controller is paired into the system it will automatically function based on your system configuration.

To adjust your Control panels functions adjust the DIP switches based on your configuration requirements.

Double Gate Opening

CH 1 ON   CH 1 OFF
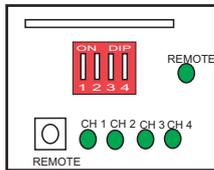
Set DIP 1 to the ON Position to Activate the Double Gate opening Function.

Single Gate Opening

CH 2 ON   CH 2 OFF

Set DIP 2 to the ON Position to Activate the Single Gate opening Function.

Party Mode

CH 3 ON   CH 3 OFF

Set DIP 3 to the ON Position to Activate the Party Mode Function on your remote.
Only Required if you are using auto close and wish to cancel from your remote for ONE cycle.
Note: Using the Party Mode Button will turn off the light output regardless of the auto close status.

Lock 2

CH 4 ON   CH 4 OFF

Set DIP 4 to the ON Position to Activate the Lock 2 Function.

APC Remotes and Wireless Equipment

Pairing

The original remote's supplied with the gate opener system are already paired.
- Press the small REMOTE button once on the circuit board and the LED Indicator will start to flash.
- Press (1 for DOUBLE gates) or (2 for SINGLE gates)
- Press (1 for DOUBLE gates) or (2 for SINGLE gates) again to test operation

Pairing APC Wireless Push Buttons
Ensure the switch is in the ON state using the supplied key
- Press the small REMOTE button once on the circuit board and the LED Indicator will start to flash
- Press the wireless push button for 1 second.
- Press the button to test operation.

Pairing APC Wireless Keypads
Use the default pin codes, after successful pairing then you can change the pin numbers
- Press the small REMOTE button once on the circuit board and the LED Indicator will start to flash
- Type (1 1 1 1 # for DOUBLE gates) or (2 2 2 2 # fo Single Gates)
- Type (1 1 1 1 # for DOUBLE gates) or (2 2 2 2 # fo Single Gates) again to test operation.

LED Indicator

Remote Learning Button

1
Press this REMOTE button once and the LED indicator will start to flash.

2
Press the button on the remote button for 1 second.

OR

Press the Wireless Push button.

OR

Type in the pin code on the Wireless Keypad.
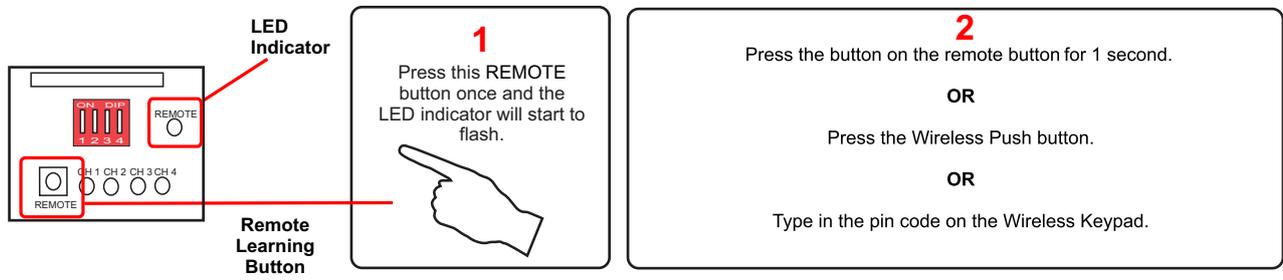
Deleting

- Press and hold the REMOTE button on the control board until the LED indicator is on solid then release the REMOTE button.

WARNING: This will delete all wireless equipment from the system.

Using your Wireless Equipment

Double Gate ① ② **Single Gate**
Party Mode ③ ④ **Lock 2**
APC

APC-RC4S
20 Metre Operational Range*

* All guideline distances will vary from site to site
* All operating ranges are based on a clear environment (interference free)
* Metal fences will drastically decrease operating ranges
* All operating ranges can be boosted with the ANT-1 Antenna (page 19)

① ② ③
④ ⑤ ⑥
⑦ ⑧ ⑨
✳ ⓪ #
(((APC)))
Automation Systems

Type in the 4 digit pin code then press #

Default:
1111# For Double Gate

2222# For Single Gate

APC-KP2W
15 Metre Operational Range*

Activate the Push Button by turning the key switch to the ON position.

Press the button to operate.

OFF ON
Open/Close
(((APC)))
Automation Systems
PBS-KW

OFF ON
Open/Close — Double Gate
Open/Close — Master Gate
(((APC)))
Automation Systems
PBD-KW

5 Metre Operational Range*

Ⓐ **Double Gate**
Ⓑ **Single Gate**
Ⓒ **Party Mode**
Ⓓ **Lock 2**
⇕ On/Off Switch

APC-RC450S
400+ Metres
Operational Range*

Party Mode (Cancel Auto Close)

To Cancel the Auto Close feature for ONE cycle

RC450S Remote: Simply press and HOLD the "C" button on your RC450S Remote for 5 SECONDS whilst the gate is in the OPEN position.
RC4S Remote: Simply press and HOLD the CH3 button on your RC4S Remote for 5 SECONDS whilst the gate is in the OPEN position.

APC Smart Wireless Button Configuration

APC Australia (03) 9532 0804
+ −
A ⌈1⌉2
Button Terminal "A" Function Jumper
B ⌈1⌉2
Button Terminal "B" Function Jumper
Button Terminal "A" |A|
Button Terminal "B" |B|
Antenna
Re-Order Code APC-TX2

Configuration for PBD-KW
(Double Push Button Switch)
Keyswitch
OFF ON
Open/Close — Ⓐ Double Gate
Open/Close — Ⓑ Master Gate
(((APC))) Automation Systems PBD-KW
APC Australia (03) 9532 0804
+ − |A| |B|
23A 12V
Re-Order Code APC-TX2

Configuration for PBS-KW
(Single Push Button Switch)
Keyswitch
OFF ON
Open/Close Ⓑ
(((APC))) Automation Systems PBS-KW
APC Australia (03) 9532 0804
+ − |A| |B|
23A 12V
Re-Order Code APC-TX2

When the jumper is set to "1" and center pin the designated output will operate double gates. ⌈1⌉2 Double Gate Setting

When the jumper is set to "2" and center pin the designated output will operate a single gate. 1⌈2⌉ Single Gate Setting

APC-KP2W Pin number programming (4 Digit)

The APC-KP2W has TWO channels, each channel can control a different function on an APC Smart control board. To continue adding pin numbers after adding the first repeat the steps bellow.

Note: When you add your first pin number to each channel the default pin code will automatically be erased.

-Channel 1 Double Gate
(Supports 8 Pin Codes)

| Master Code | * |
| 0 1 # |
| Pin Code # |

-Channel 2 Single Gate
(Supports 3 Pin Codes)

| Master Code | * |
| 0 2 # |
| Pin Code # |

APC Connect4 GSM Reciever

A GSM Receiver is the absolute most flexible form of access control. Providing there is good mobile reception at the gate the GSM switch can operate the gate from anywhere in the world. When receiving a call it will automatically reject the call and open or close the gate. SIM CARD IS NOT SUPPLIED.

APC Connect 4

Power
+ -

Relay Output
NO COM NC

+ −

NO   COM

Full Gate opening connect to **PB2**
Pedestrian Gate opening connect to **PB1**

+24V   −   GND

+24V +24V − BEAM GND LOOP GND P.B.1 GND P.B.2 GND LAMP LOCK1 PLOCK.2 GND LOCK2 ANT GND
Power For BEAM
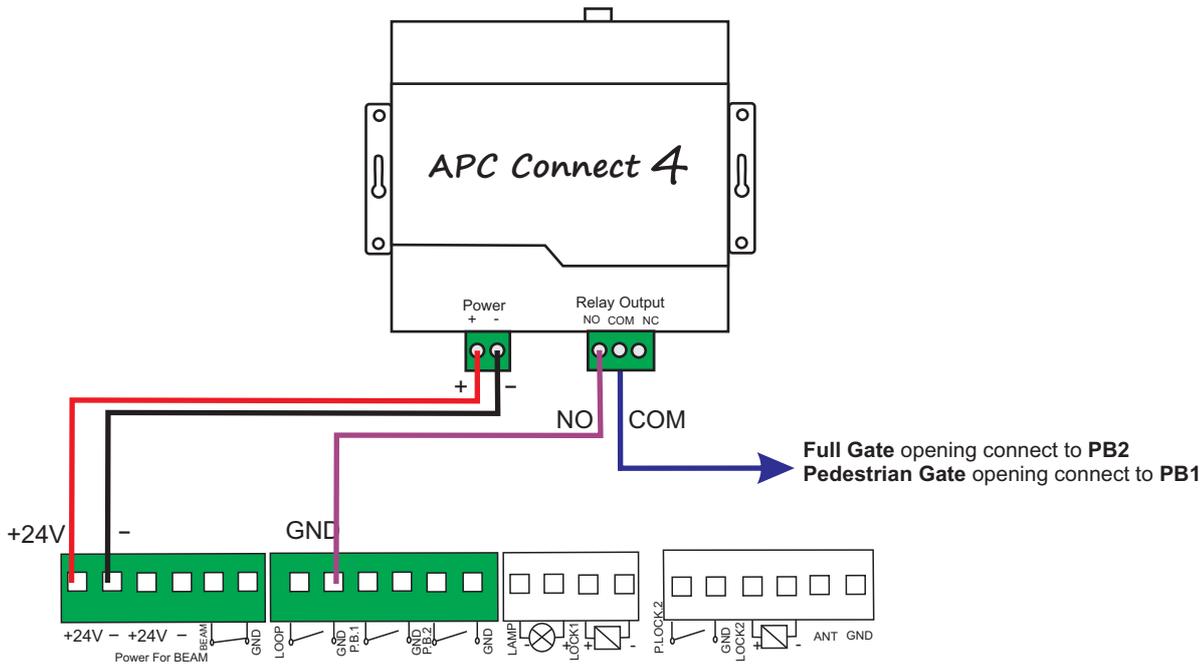
APC LD 1 Loop Detector For Auto Gate Opening   (NOT SUITABLE FOR SOLAR USE)

The APC Loop Detector will detect vehicles over the induction loop and automatically operate the gates to open.

i   When the LOOP is Triggered the LOOP LED will momentarily illuminate.

LOOP

+24V +24V − BEAM GND LOOP GND P.B.1 GND P.B.2 GND LAMP LOCK1 PLOCK.2 GND LOCK2 ANT GND
Power For BEAM

+24V

−

Relay 1 (Pulse N/O)

Relay 1 (COM)
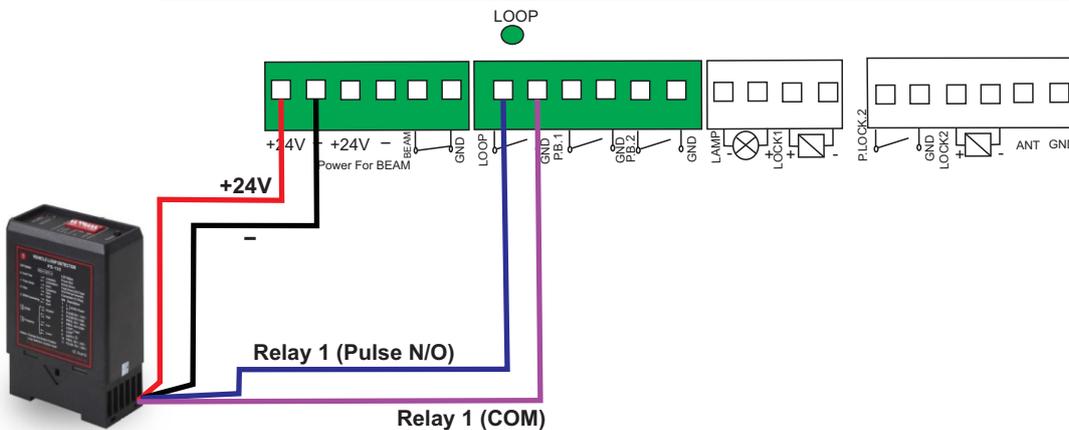
For Double Gate Opening Set the Loop Configuration Jumper to LOOP 2 and Centre Pin.

LOOP1 LOOP2
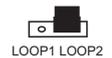
For Single Gate/Pedestrian Opening Set the Loop Configuration Jumper to LOOP 1 and Centre Pin.

LOOP1 LOOP2

⚠️   A Dual PE sensor setup set MUST be used in this application.

Please refer to the loop detetor installation manual for the specific instructions for installation.

APC-KP1-C Keypad with Swipe Reader Wiring

Unlike a push button entry switch using a keypad can provide a much higher security access control for guests, workers, tenants etc.
Using a keypad will allow you to manage the users by adding and deleting as required. Its backlit illumination also allows for ease of use at night.

Wiring a Single Keypad

RED (Positive)
BLACK (Negative)
BLUE
PURPLE

Cut remaining wires staggered lengths (uneven) and insulate using electrical tape
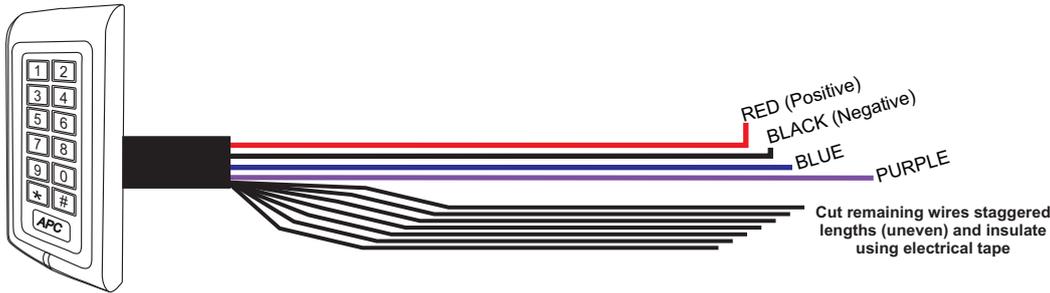
Wiring in a Second Keypad

RED (Positive)
BLACK (Negative)
BLUE
PURPLE

Cut remaining wires staggered lengths (uneven) and insulate using electrical tape

Single Gate

P.B.1   P.B.2

−V   +V   −   BEAM
Power For BEAM   GND   LOOP   GND   P.B.1   GND   P.B.2   GND

RED (Positive)   BLACK (Negative)   BLUE   PURPLE

Double Gate

P.B.1   P.B.2

−V   +V   −   BEAM
Power For BEAM   GND   LOOP   GND   P.B.1   GND   P.B.2   GND
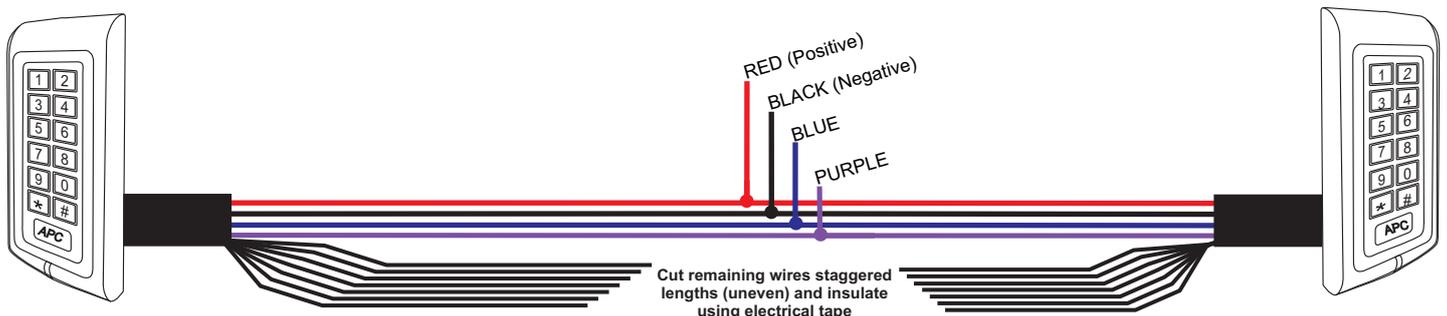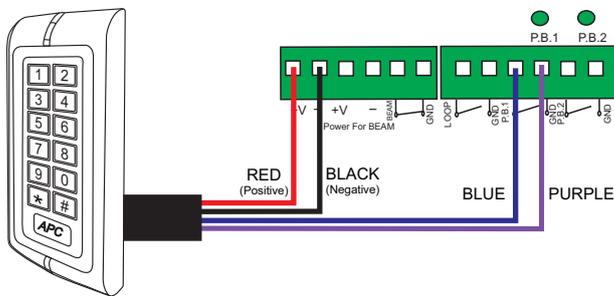
RED (Positive)   BLACK (Negative)   BLUE   PURPLE
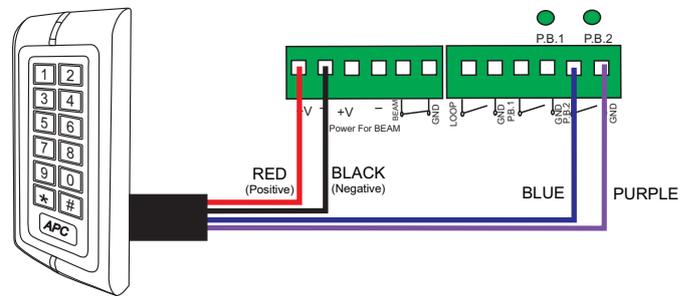
i When the Input is Triggered the PB1/PB2 LED will momentarily illuminate

Quick Programming Pin Code

`*888888#`	Master Code used to enter programming only
`1`	To enter Pin code programming
`User ID #`	Any number between 1-999, this number is unique to each pin code/swipe tag and cannot be used twice
`Pin Code #`	The Pin code you would like to use to open the gate (4-6 Digits)
`*`	To Exit programming and return to standby state
`*`	

Quick Programming Swipe Tag

`*888888#`	Master Code used to enter programming only
`1`	To enter Pin code programming
`User ID #`	Any number between 1-999, this number is unique to each pin code/swipe tag and cannot be used twice
`SWIPE #`	Swipe the tag past the black APC window
`*`	To Exit programming and return to standby state
`*`	

APC Wired Push Button Connection

Push buttons are used for opening and closing the gates without using a remote.
Push buttons can be used for a vast amount of purposes ranging from basic access control for visitors, workers or taking out the bins.

For **Single Gate** operation connect the Button component to **PB1 and GND**
For **Double Gate** operation connect the Button component to **PB2 and GND**

Two PBS-K to operate a Single Gate

Two PBS-K to operate a Double Gate

One PBS-K to operate a Single Gate
One PBD-K to operate a Single Gate and also Double Gates

One PBS-K to operate a Double Gate
One PBD-K to operate a Single Gate and also Double Gates

Two PBD-K to operate a Single Gate and also Double Gates
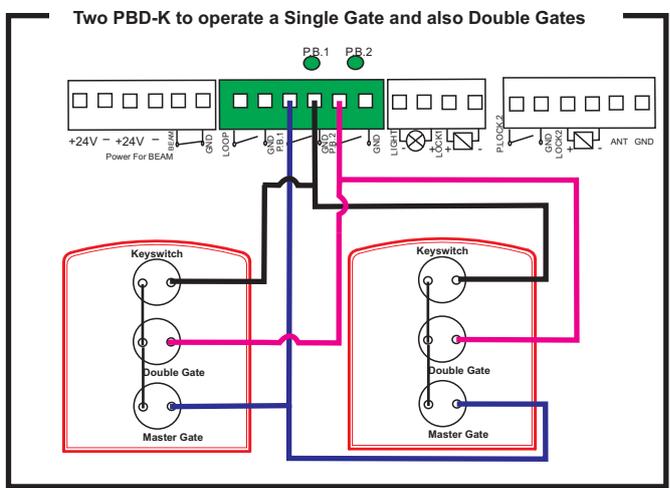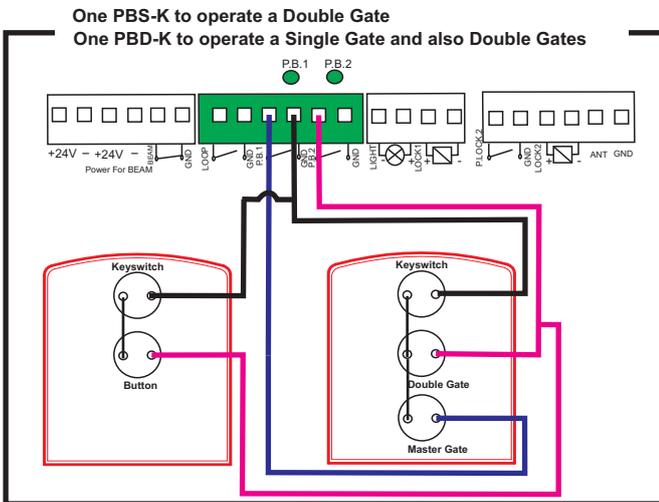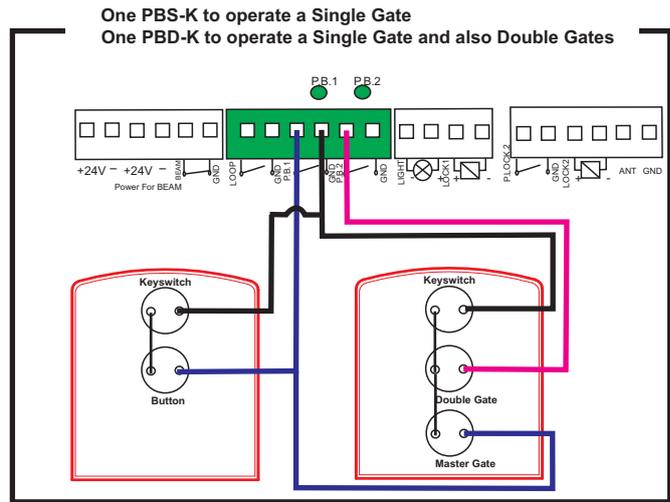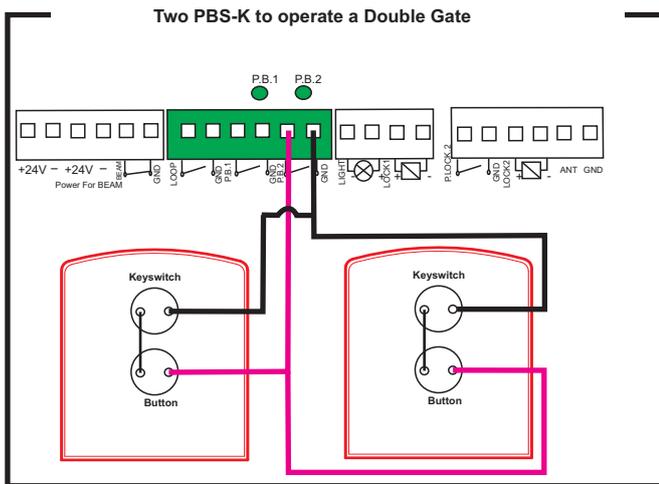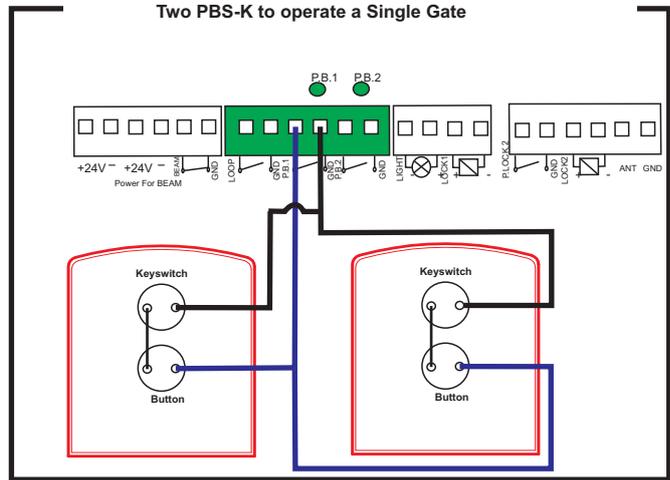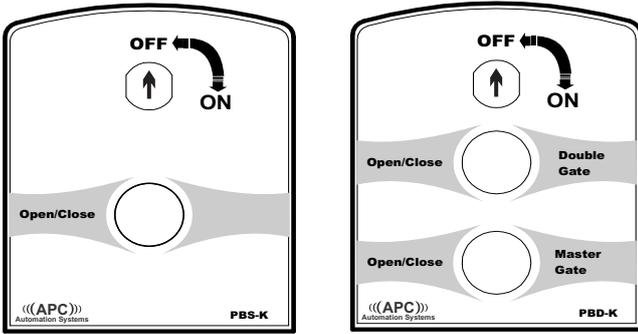
i When the push button is pressed the corresponding LED indicator will illuminate momentarily.

eg. When a button connected to PB1 is pressed the PB1 LED will illuminate for the duration the button is held.

Eyevision® Intelli Series

12V Supply (Pg. 19)

4

P.B.1 P.B.2

LOOP | GND | PB.1 | GND | PB.2 | GND

Orange (Relay Common)
Green (Normally Open Circuit)

Double Gate opening connect to **PB2**
Single Gate opening connect to **PB1**
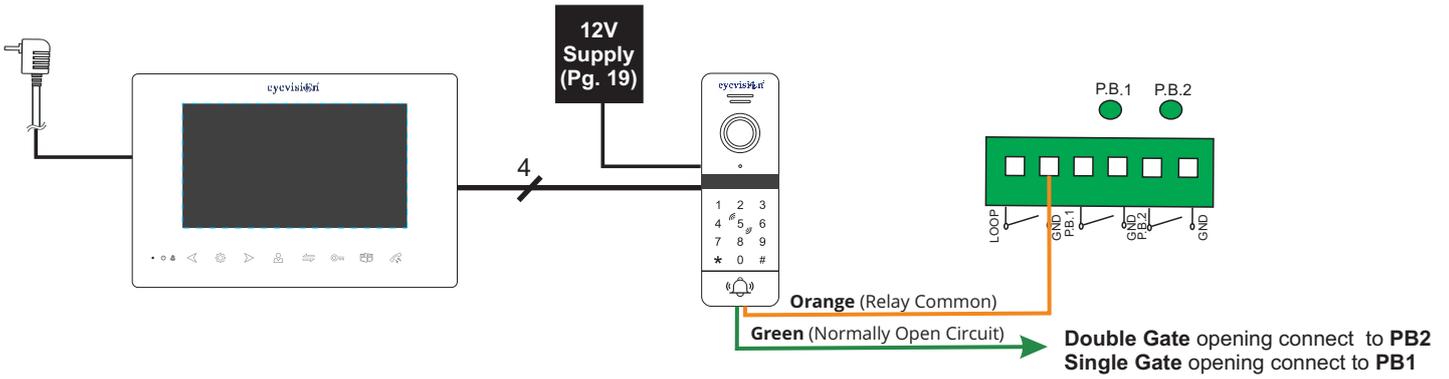
Eyevision® 2 Wire Intercom System Connection

P.B.1 P.B.2

LOOP | GND | PB.1 | GND | PB.2 | GND

2   2   2

PL   **GND**

S1+

Double Gate opening connect to **PB2**
Single Gate opening connect to **PB1**
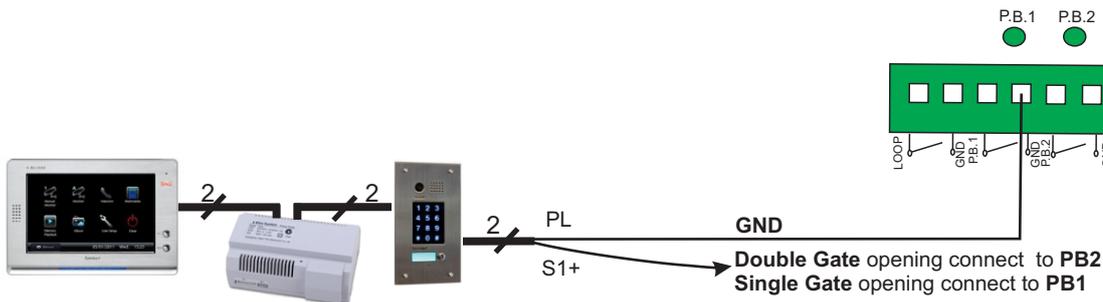
Eyevision® 4 Wire HYBRID Intercom and WIFI intercom System Connection

Power + (2 Pin)
Power - (2 Pin)

12V Supply (Pg. 19)

P.B.1 P.B.2

LOOP | GND | PB.1 | GND | PB.2 | GND

Blue (5 Pin)   **GND**

Green (5 Pin)   **Double Gate** opening connect to **PB2**
Single Gate opening connect to **PB1**

APC WF-CH1 WiFi Switch

P.B.1 P.B.2

+V | +V | — | BEAM | GND | LOOP | GND | PB.1 | GND | PB.2 | GND

Power For BEAM

NC IS Not Used

Double Gate opening connect to **PB2**
Single Gate opening connect to **PB1**

(((APC)))
Automation Systems

Config/ Test   Relay Setting

Set to a **3 Second** Relay time
Latching LED must be **OFF**

Connecting a Single PE-2000 set

APC-PE-2000 PE sensor (Transmitter & Receiver) **must be connected back to the control panel.**
Install the PE-2000 Photoelectric sensor on the first entry point of the driveway from post to post at approx. 500mm above ground level.

The Transmitter and the Receiver must be inline with each other
(The inline LED will be off when aligned with the transmitter).

i **The PE Sensor output will only output voltage to the PE senor connection terminal during the closing cycle**
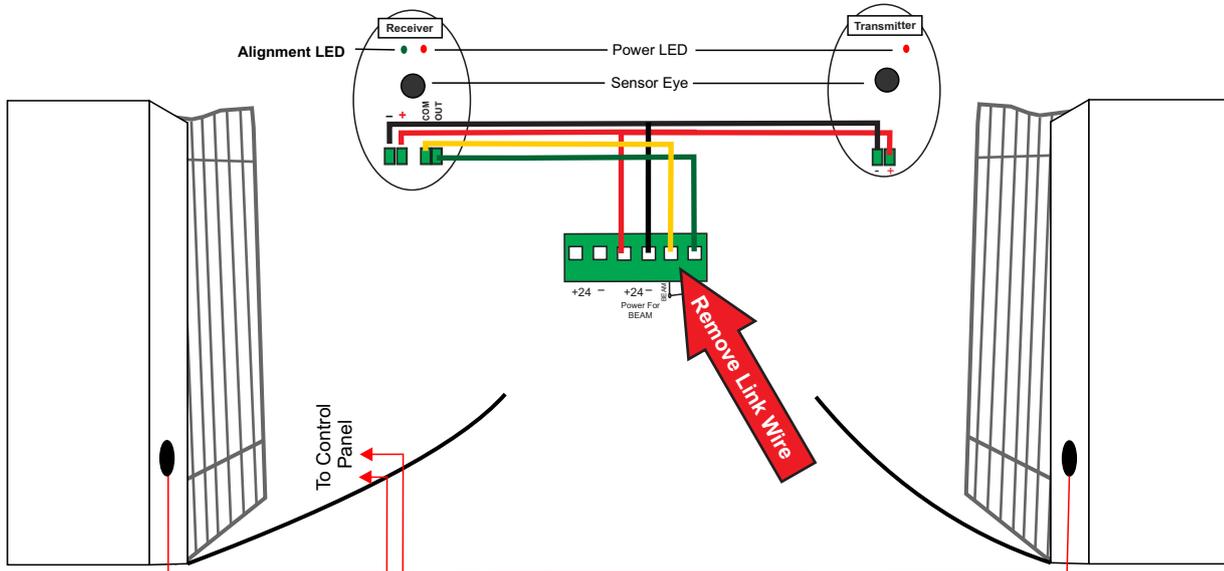
Connecting Dual PE-2000 sets

Connect Dual PE Sensors in Series for maximum protection for occupants and vehicles. Unlike connecting a single sensor set the dual sensor will detect pedestrians or vehicles entering AND exiting.

BOTH the Transmitter and the Receiver must be inline with each other
(The inline LED will be off when aligned with the transmitter).

i **The PE Sensor output will only output voltage to the PE senor connection terminal during the closing cycle**
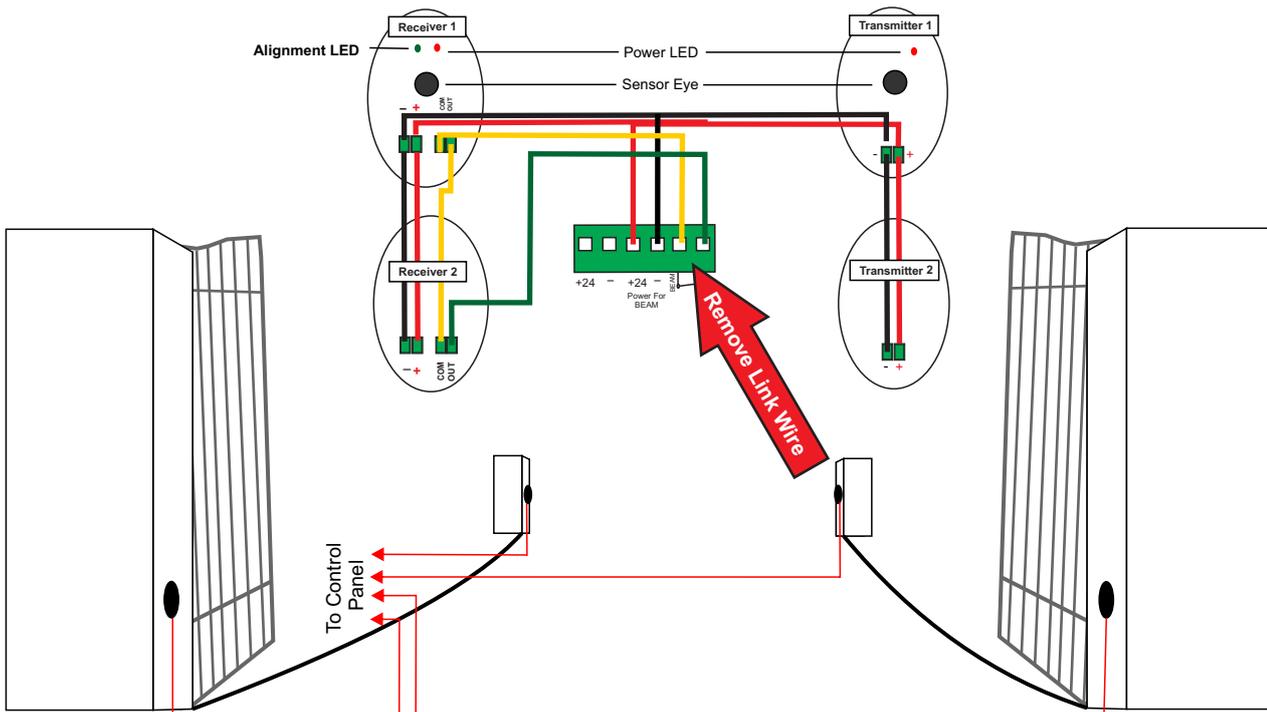
Connecting a Single RR-11 set

APC-RR-11 Reflective sensor (Transmitter only) **must be connected back to the control panel** *(see wiring diagram)*.
Install the RR-11 Reflective sensor on the first entry point of the driveway from post to post at approx. 500mm above ground level.

The Transmitter and the Reflector must be inline with each other
(The yellow inline LED will be ON when Aligned with the transmitter).

i **The PE Sensor output will only output voltage to the PE senor connection terminal during the closing cycle**

Black (Not Used)

Blue | Brown | Grey | White

+24 − +24 −
Power For
BEAM

BEAM

Remove Link Wire

To Control Panel

LED Status when
Aligned With Reflector

LED Status when
Mis-Aligned or Broken Beam

← Reflector
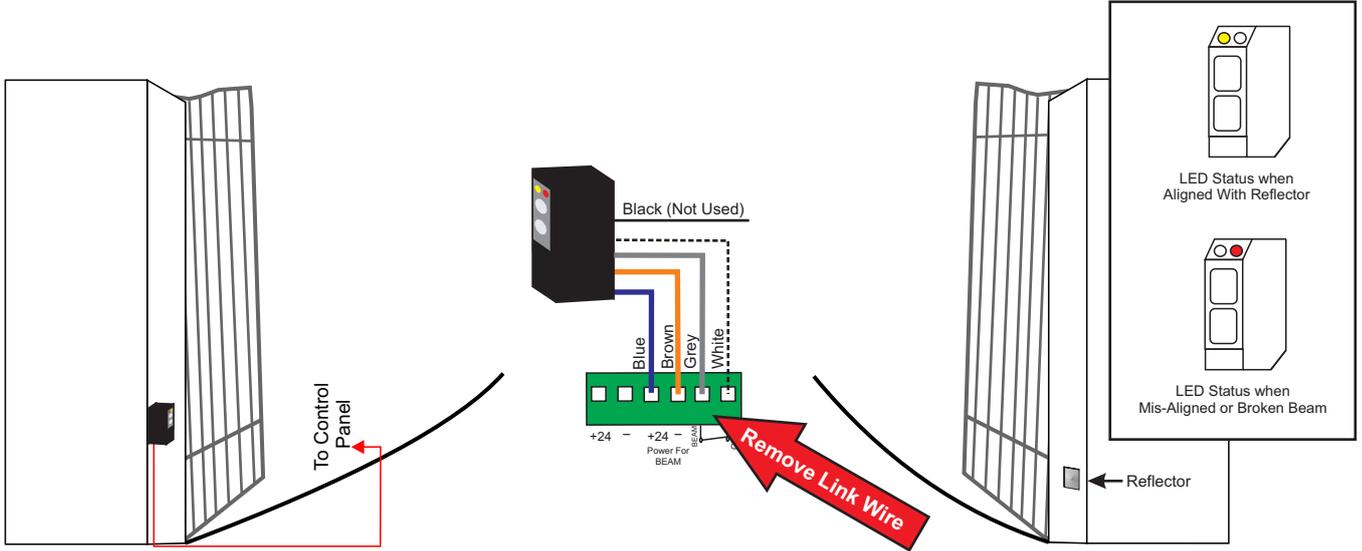
Connecting Dual RR-11 sets

Connect Dual Sensors in Series for maximum protection for occupants and vehicles. Unlike connecting a single sensor set the dual sensor will detect pedestrians or vehicles entering AND exiting.

BOTH transmitter and the receiver must be inline with each other
(The inline LED will be ON when Aligned up with the transmitter).

i **The PE Sensor output will only output voltage to the PE senor connection terminal during the closing cycle**

Black (Not Used on both sensors)

Blue | Brown | White ⇄ Grey

Blue | Brown | Grey | White

+24 − +24 −
Power For
BEAM

BEAM | GND

Remove Link Wire

Reflector

To Control Panel

LED Status when
Aligned With Reflector

LED Status when
Mis-Aligned or Broken Beam

← Reflector
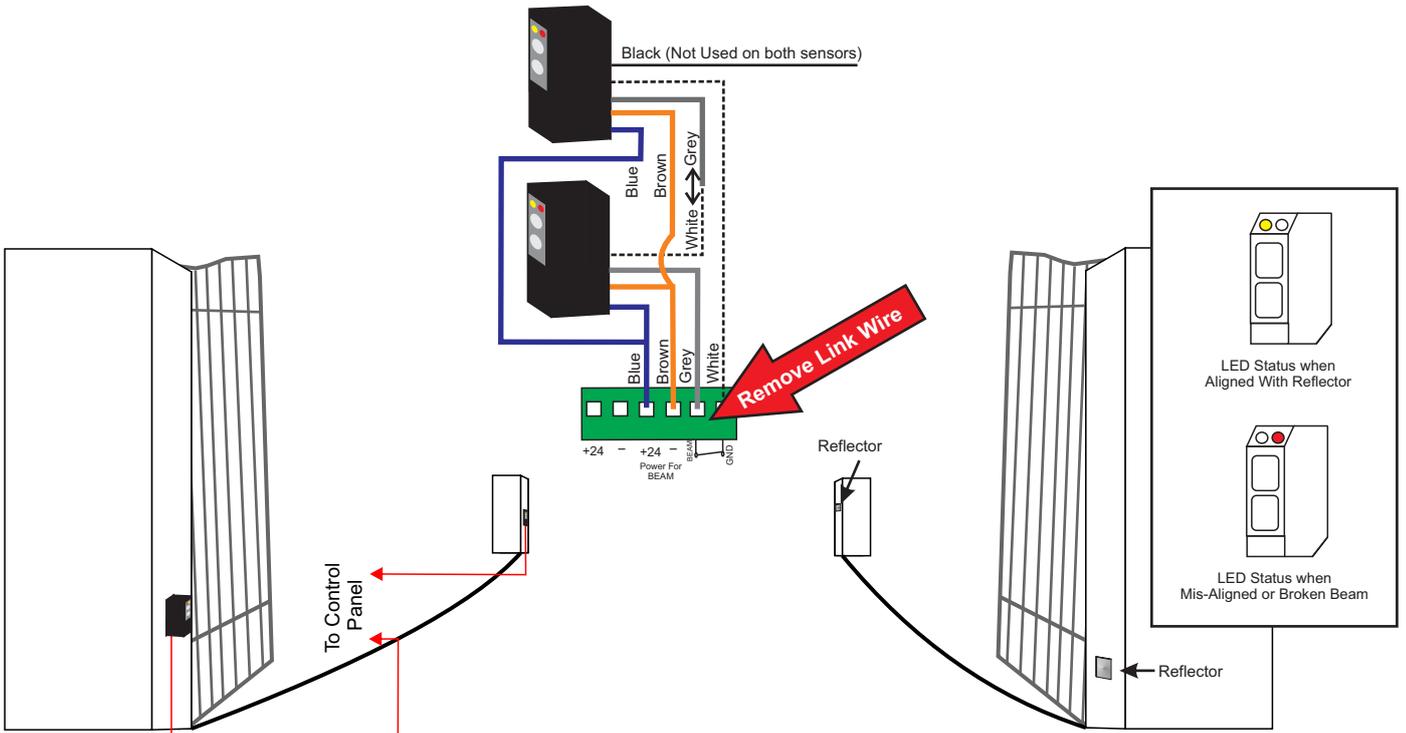
Connecting the APC-ULA Courtesy Light with Antenna

Courtesy Lights are used to alert pedestrians to be cautious as there may be vehicles entering and exiting.
A Strobe light is generally used due to there low drawing consumption to operate.

This internal relay will support an output of 24V 10W Maximum, The 24V power source used must be external to the system.
Failing to follow the above will cause damage to the system.

⚠ THIS OUTPUT IS NOT USED TO CONNECT DRIVEWAY LIGHTS

DC Lights only (24V maximum 10W)

1. Connect the 24V DC Power Supply into the INPUT as illustrated.

EXTERNAL 24V DC POWER SUPPLY

2. Connect the 24V DC Light into the OUTPUT as illustrated.
Connect the antenna as illustrated.

LIGHT

Inner Core to ANT
Outer Core to GND

RG 58

T2 Antenna

T1 Light Output
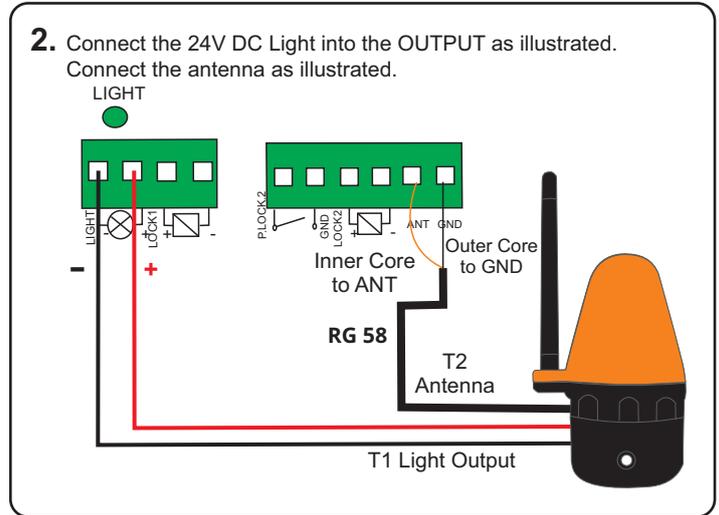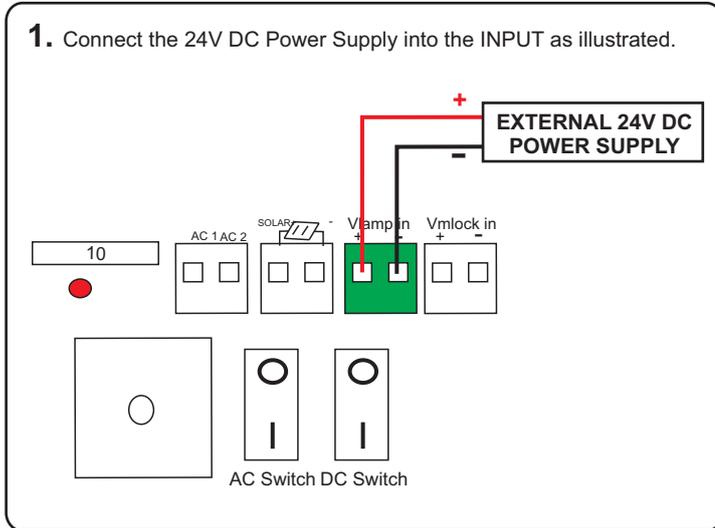
i - This output is active when the gate is Opening, Idle in the open position and closing.
- The output will turn off when the gate is Closed or Party Mode has been activated.

Connecting an APC-ANT1 External Antenna

The ANT-1 external antenna can boost the remote range drastically in most installations.

Suitable for Residential, commercial and rural installations this antenna used in conjunction with the **APC-RC450S** remote can boost functionality **UPTO 800m** distance. When used in conjunction with **APC-RC4S** it can boost functionality **UPTO 80m** distance.
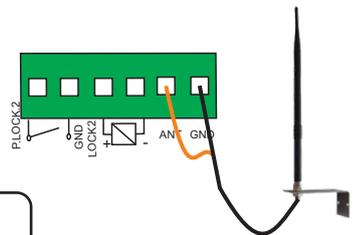
Inner core of the antenna cable to **ANT** on the control board.
Outer core/shield of the antenna to **GND** on the control board.

12V DC Output

The Pedestrian gate lock output can be used as a 12V DC output instead to power accessories such as GSM receivers and others accessories which have a limitation on voltage.
Note: When using this feature the LOCK 2 feature will be lost.

1. APC-CBSW24 Control Board

SET TO M-LOCK2 **16c**

2.

+24V − +24V −
Power For BEAM

+12V DC

- NEGATIVE
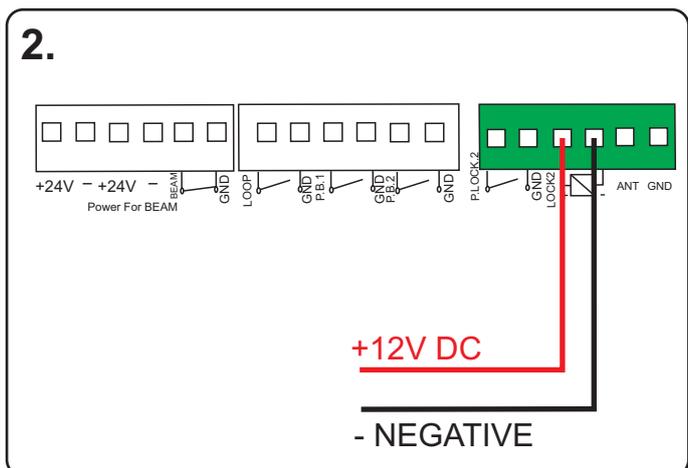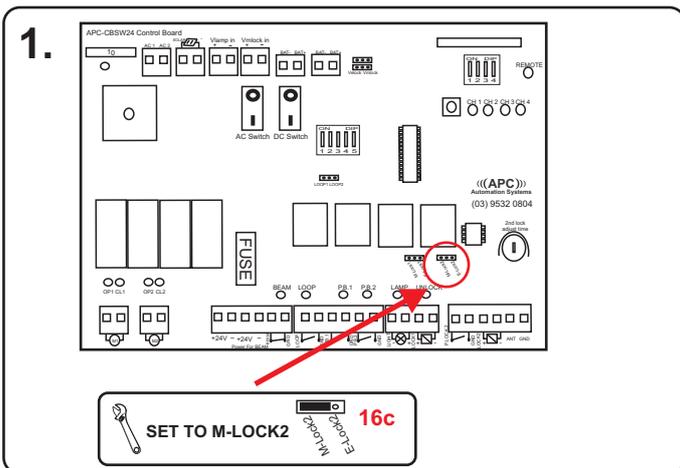
Setting your Electric/Magnetic Lock type

There are two types of Locks that can be used:
1. Standard Electro-mechanical lock
2. Magnetic Lock
For Lock 1 you Must set the jumpers for 16a and 16b according to the diagrams.
For Lock 2 you Must set the jumper for 16c ONLY.
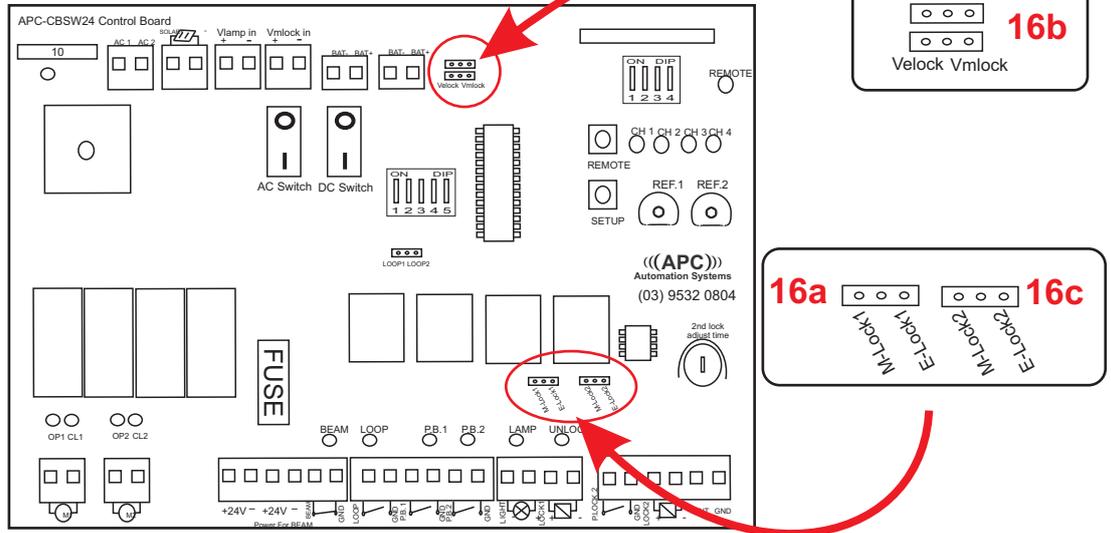
Connecting a Electro Mechanical Lock (EL-24V) as an Automatic Gate Lock

1.

⚠️

a) Turn off the power point or unplug the solar panel.

b) Turn all power switches on the control board to the OFF state.

c) Unplug the battery connection.

2. Set the jumpers as per the illustration below.

SET TO VE-LOCK **16b**

+

SET TO E-LOCK1 **16a**
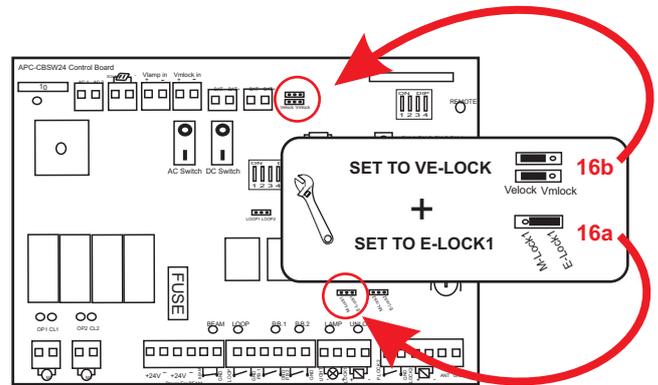
3. Connect the EL-24 Electric lock into the OUTPUT as illustrated.

UNLOCK

UNLOCK

Capacitor on lock terminals
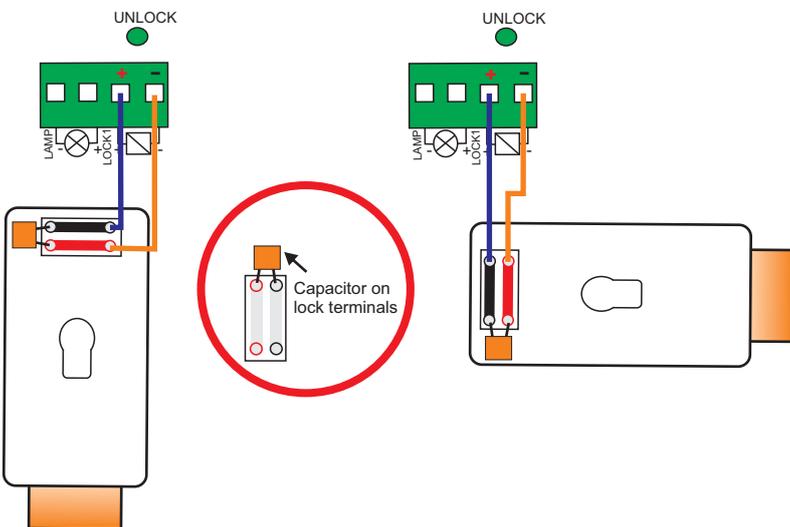
i

You can wire to either side of the coil as shown in the illustrations above.
When installing you must install both wires Side-By-Side.
A CAPACITOR MUST BE INSTALLED IN CONJUNCTION WITH ANY ELECTRIC LOCK
This lock is NOT Polarity Sensitive.

NOT SUITABLE FOR SOLAR

Magnetic Locks can be installed on Gate to Post for Single Gates and Gate to Gate for double Gates.
A bracket set is available for each type of installation

APC ML-500W ONLY (Internal Power Supply)

1.

⚠️

a) Turn off the power point.

b) Turn all power switches on the control board to the OFF state.

c) Unplug the battery connection.

2. Set the jumpers as per the illustration below.

SET TO VE-LOCK **16b**
Velock Vmlock
+
SET TO M-LOCK1 **16a**
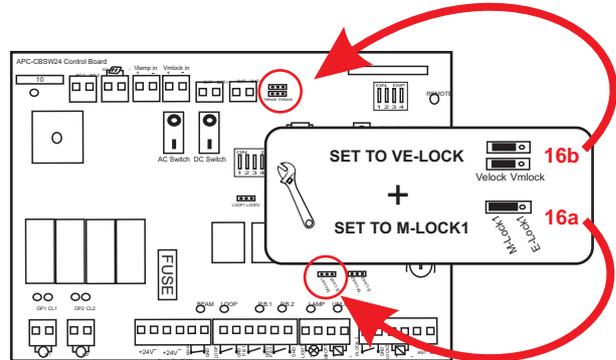
3. Connect the ML-500 Magnetic lock into the OUTPUT as illustrated.

UNLOCK 🟢

Black (-)
YELLOW
WHITE
Red (+)

⚠️ **Please ensure polarity is correct before connecting**
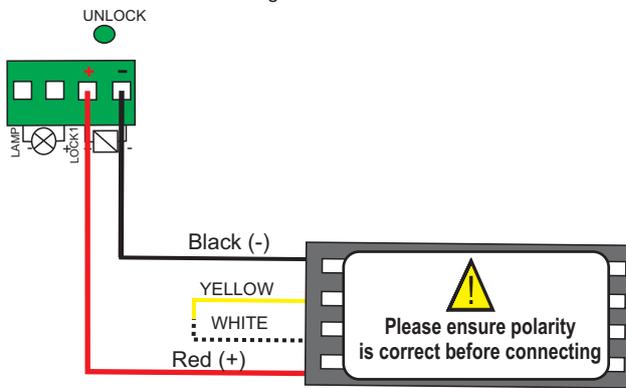
Other Model/Voltage Magnetic Locks (External power supply)

1.

⚠️

a) Turn off the power point.

b) Turn all power switches on the control board to the OFF state.

c) Unplug the battery connection.

2. Set the jumpers as per the illustration below.

SET TO VM-LOCK **16b**
Velock Vmlock
+
SET TO M-LOCK1 **16a**
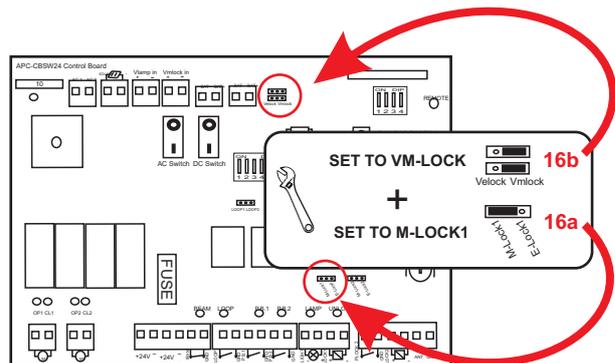
3. Connect the APPROPRIATE 12-24V DC Power Supply into the INPUT as illustrated.
DO NOT USE THE CONTROL BOARD POWER

EXTERNAL DC POWER SUPPLY
−
+

10
SOLAR   Vlamp in   Vmlock in
AC 1 AC 2   + −   + −

AC Switch DC Switch
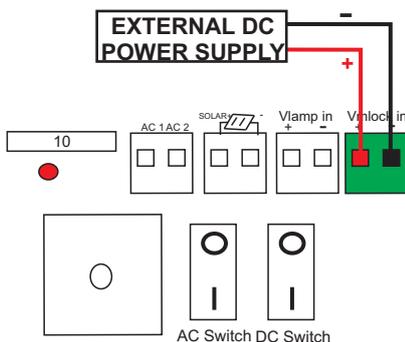
4. Connect the 12V-24V Magnetic lock into the OUTPUT as illustrated.

UNLOCK 🟢

−

+

⚠️ **Please ensure polarity is correct before connecting**
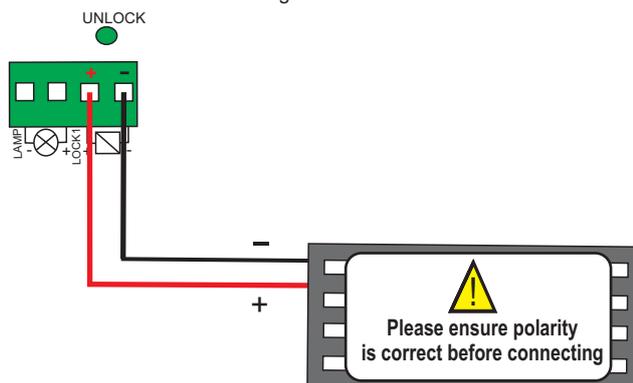
Connecting and setting an Electric Striker for a Pedestrian Entry Gate

The Pedestrian gate lock is controlled by a momentary button connected to P.Lock 2 or CH4 on your remote.
To Adjust the unlocking time of the second lock (pedestrian gate lock) use the 2nd lock adjust time dial located in the bottom right corner of the control board.

The minimum unlocking time is 1 second (fully anti-clockwise)
The maximum unlocking time is 10 seconds (fully clock-wise)

2nd lock adjust time

PBS-K
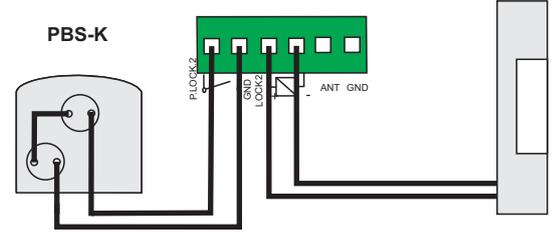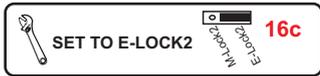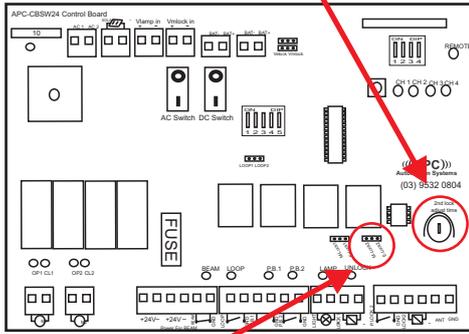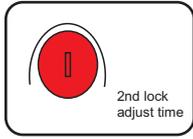
Wired Push Button Release (with Isolation Key)
For Electric Striker

APC-CBSW24 Control Board

Automation Systems
(03) 9532 0804

SET TO E-LOCK2   **16c**

Red
Black
Blue
Purple
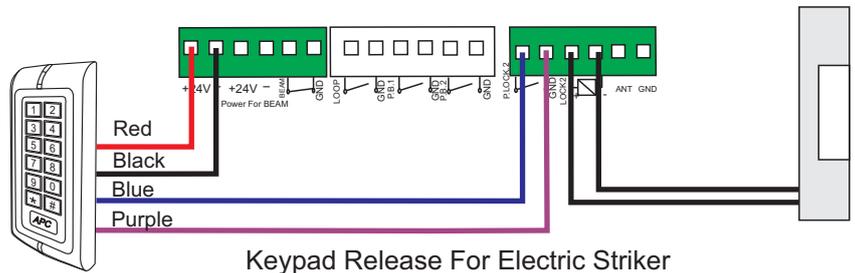
Keypad Release For Electric Striker

Troubleshooting

Scenario 1

Problem:
Gate will not OPEN/CLOSE Fully.

Possible Cause:
Step 1: Review the preliminary steps found in the setup section of the manual.
Step 2: ONLY after completing step 1: Adjustment of System Sensitivity (REF 1/2).

Solution:
Run the SETUP cycle from the CLOSED position, each gate must open once and close once.
if the gates do not run the full cycle an adjustment of REF 1 may be required.
Further Information:
Contact technical support prior to adjusting REF 1 and 2.

Scenario 2

Problem:
System will not power ON.

Possible Cause:
Power supply not powered.
AC or DC switch is not ON.

Solution:
Ensure that your power Source is ON.
Ensure that the AC and DC switches on the control board are both ON.

Scenario 3

Problem:
Gate will not slow down before reaching the open and close positions.

Possible Cause:
Setup Cycle not completed correctly.

Solution:
Run the SETUP cycle from the CLOSED position, each gate must open once and close once.
If the gates do not run the full cycle refer back to scenario 1.
Ensure that the motors switch off at the end of each cycle (using the motor status indicators).

Further Information:
If the gates do NOT switch off at the end of there OPEN/CLOSE an adjustments of REF 1/2 will be required.

Scenario 4

Problem:
Double gate system-One Gate is opening and one gate is closing.
Single gate system- Opening instead of closing.
Double and Single systems: Auto opening (instead of Auto closing).

Possible Cause:
Gate motor polarity is incorrect.

Solution:
- Identify the gate which is functioning backwards using the OPN/CLS LED indicators
- Reverse the polarity of the incorrectly wired motor

Further Information:
If the gate motor in question is a folding arm motor the limit switches may need to be reversed or adjusted

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Scenario 5:

Problem:
Gate opens but does not close.

Possible Cause:
Broken Beam Circuit.

Solution:
Reconnect the original loop wire between Beam and Com and check if it is now functional.

Further Information:
If the unit becomes functional first check the accessories fuse then check the wiring and alignment of your safety sensor.

Scenario 6:

Problem:
Will not operate by Remote or Wireless button ONLY (Push button and other access control work).

Possible Cause:
Remote DIP configuration is not set correctly (Active Operating Channels).
Remote or wireless button may not be programmed.

Solution:
Check your DIP settings on the control board to ensure that the operating channel is active.
Try re programming the remote or wireless button.

Further Information:
Ensure that you activate the relevant Chanel for your system.
DIP 1 ON=Double Gate.
DIP 2 ON=Single Gate.

Scenario 7:

Problem:
Solar system will not operate but lights are ON.
Control panel beeps 3 times.

Possible Cause:
Low battery voltage.

Solution:
Test your battery voltage. If voltage is low allow the system time to charge through the system.

Further Information:
Alternately the batteries can be charged using a trickle charger whilst DISCONNECTED from the system.

Scenario 8:

Problem:
Both gates open simultaneously.
One gate opens first and the other gate follows after.

Possible Cause:
DIP Settings for MOTOR DELAY are incorrect.

Solution:
Adjust the MOTOR DELAY settings.

Compatible Equipment

The equipment listed below does not affect the warranty of the control panel and have been tested and approved for use.
Limited warranty is applied to the control panel when used with third party equipment.

Gate Motors
- APC-520 & APC-620
- APC-790 & APC-890
- APC-W599 & APC-W699
- APC-UG1400DC & 2400DC
- APC-UG1400C DC & 2400C DC
- APC-T575 & APC-T675
- APC-T700S & APC-T800S
- APC-T750L & APC-T850L

Sensors
- APC-PE2000
- APC-RR-11
- APC-LD1-24

Keypads
- APC-KP1-C
- APC-KP1-D
- APC-KP2W

Push Buttons
- APC-PBS (K/KW)
- APC-PBD (K/KW)
- APC-PBD211
- APC-PBD164

Remotes
- APC-RC4S
- APC-RC450S

Solar Panels
- APC-SP24-20W
- APC-SP24-40W
- APC-SP24-60W

Receivers
- APC-WF-CH1
- APC-CONNECT4

Internal Transformer
- PS-24INT

External Transformers
- PS-24EXT

Courtesy Light
APC-ULA

(((APC)))
Automation Systems

APC WARRANTY

APC warrants the original purchasers or the APC gate(s) opening system for a period of
twelve months from the date of purchase (not installation), the product shall be free of defects in materials and
workmanship under normal use.
During the warranty period, APC shall, as its option, repair or replace any defective product upon return of the
product to its factory, at no charge for labour and materials.
Any replacement and/or repaired parts are warranted for the remainder of the original warranty,
The original owner must promptly notify APC in writing that there is defect in material or workmanship, such written
notice must be received in all events prior to expiration of the warranty.

International Warranty

APC shall not be responsible for any freight fees, taxes or customs fees.

Warranty Procedure

To obtain service under this warranty, AND AFTER CONTACTING APC, please return the item(s) in question to
the point of purchase.
All authorized distributors and dealers have a warranty program, anyone returning goods to APC must first
obtain an authorization number. APC will not accept any shipment for which prior authorization has not been used.

Conditions to Void Warranty

This warranty applies only to defects in pairs and workmanship relating to normal use. It does not cover:
- Damage incurred in shipping or handling
- Damage caused by disaster such as fire, flood, wind, earthquake or lightning
- Damage due to causes beyond the control of APC such as excessive voltage, mechanical shock or water damage
- Damage caused by unauthorized attachment, alterations, modifications, or foreign objects.
- Damage caused by peripherals (unless such peripherals were supplied by APC)
- Defects caused by failure to provide a suitable installation environment for the products
- Damage caused by usage of the products for purpose other than those for which it was designed.
- Damage from improper maintenance
- Damage arising out of any other abuse, mishandling, and improper application of the products.

Under no circumstances shall APC be liable for any special, incidental, or consequential damages based upon breach
of warranty, breach of contract, negligence, strict liability, or any other legal theory. Such damages include, loss of
profits, loss of the product or any associated equipment, cost of capital, cost of substitute or replacement equipment,
facilities or services, down time, purchaser's time, the claims of third parties, including customers, and injury to property.

Disclaimer of Warranties

This warranty contains the entire warranty and shall be in lieu of any and all other warranties, whether expressed or
implied (including all implied warranties of merchantability or fitness for a particular purpose). And of all other
obligations or purporting to act on its behalf to modify or to change this warranty, nor to assume for it any other
warranty or liability concerning this product.

Out of Warranty Repairs

APC will at its option repair or replace out-of-warranty products which are returned to its factory according to the
following conditions. Anyone returning goods to APC must first obtain an authorization number.
APC will not accept any shipment whatsoever for which prior authorization has not been obtained. Products which
APC determines to be repairable will be repaired and returned. A set fee which APC has been predetermined and which
may be revised from time to time will be charged for each unit repaired. Products which APC determines not repairable
will be replaced by the nearest equivalent product available at that time. The current market price for the replacement
product will be charged for each replacement unit.