# Pay2Play

Installation Instructions

Feb 2022
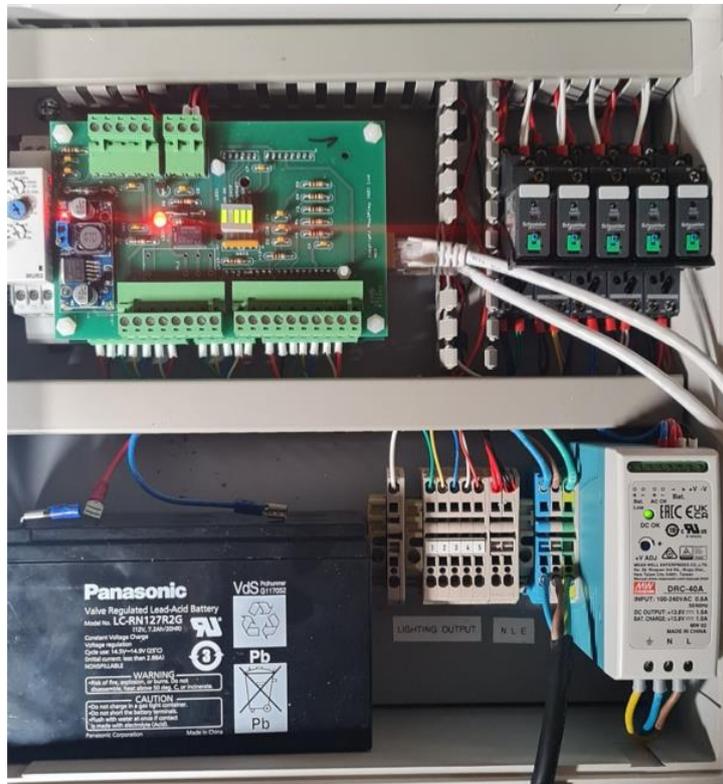
Introduction

The Access & Lighting Controller require connection to the mains power and needs to be installed by a qualified Electrician.

Components

The Control Box contains Ethernet interface with control card(s) that interface with the keypad, the electric door release and the lights *(if a lighting controller is included)*.

The electric door/gate release can vary from site to site and in some cases, we use the existing magnetic lock or existing door strike. If there is no existing system installed, we use an electric door strike that we provide.

If there is a existing exit buttons (not required with a door strike) this will need to be connected to our control box.

Site Preparation

ACCESS CONTROL: The keypad should be located in an easily accessible location and close to the Pay2Play Control Box. The keypad has an existing cable and this can be extended but the length should be minimised to reduce electrical interference.

The Pay2Play Control Box should be located on the inside of the facility high on the wall or in a cupboard close to a 230VAC power supply and ethernet connection.

Where locks are fitted onto an outdoor gate you need to consider water ingress. Although all parts are operated from a relatively safe 12-volt DC the Pay2Play Control Box is powered from 230 VAC and must not make contact with the fence.

In some installations we supply the battery back-up power and the door / gate control card separately from the Pay2Play Control Box. The door / gate card is in a separate plastic box located near the door / gate and can be powered by Power Over Ethernet (POE) power supply that provides a battery backed up power supply over standard CAT 6 Ethernet connection.
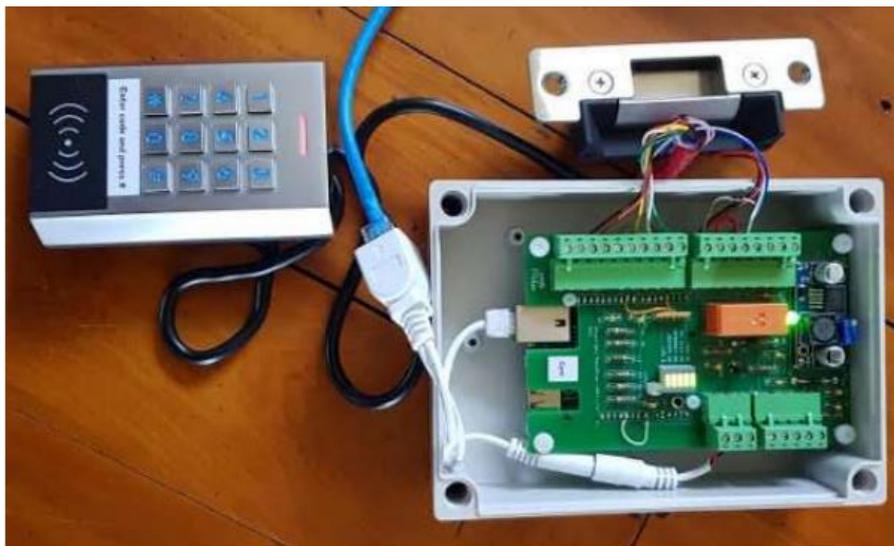
Figure 1: The door controller in a separate box with peripherals connected under test and POE.

It is important that 230 VAC power and an Ethernet connection are available. Normally a power point is fitted close to the Pay2Play Control Box to be fitted with a flexible lead and three pin plug. Alternatively, a permanent 230 VAC connection can be made to the Pay2Play Control Box.

LIGHTING CONTROL: Depending on the configuration the lighting controller might be in the same Pay2Play Control Box as the access controller or it could be in a separate box altogether.

Consider the best location for the Lighting Controller. The centralised court lighting controller must connect to the internet via an Ethernet connection cable. It also must interface with the lights and must be in a location that allows access to the key switches and in a position that allows connection to the external court lighting control relays (often located close to the courts).

The lights should be controlled by interface relays suitably rated for the lighting load they control. Typical relays used are OMROM LY1 brand and model with 12-volt DC coils. The outputs on the lighting control board supply the 12-volt DC controls for these relays and include freewheeling diodes.

Each output can drive 200 mA which means a maximum of two LY1 relays (typically 90mA max).
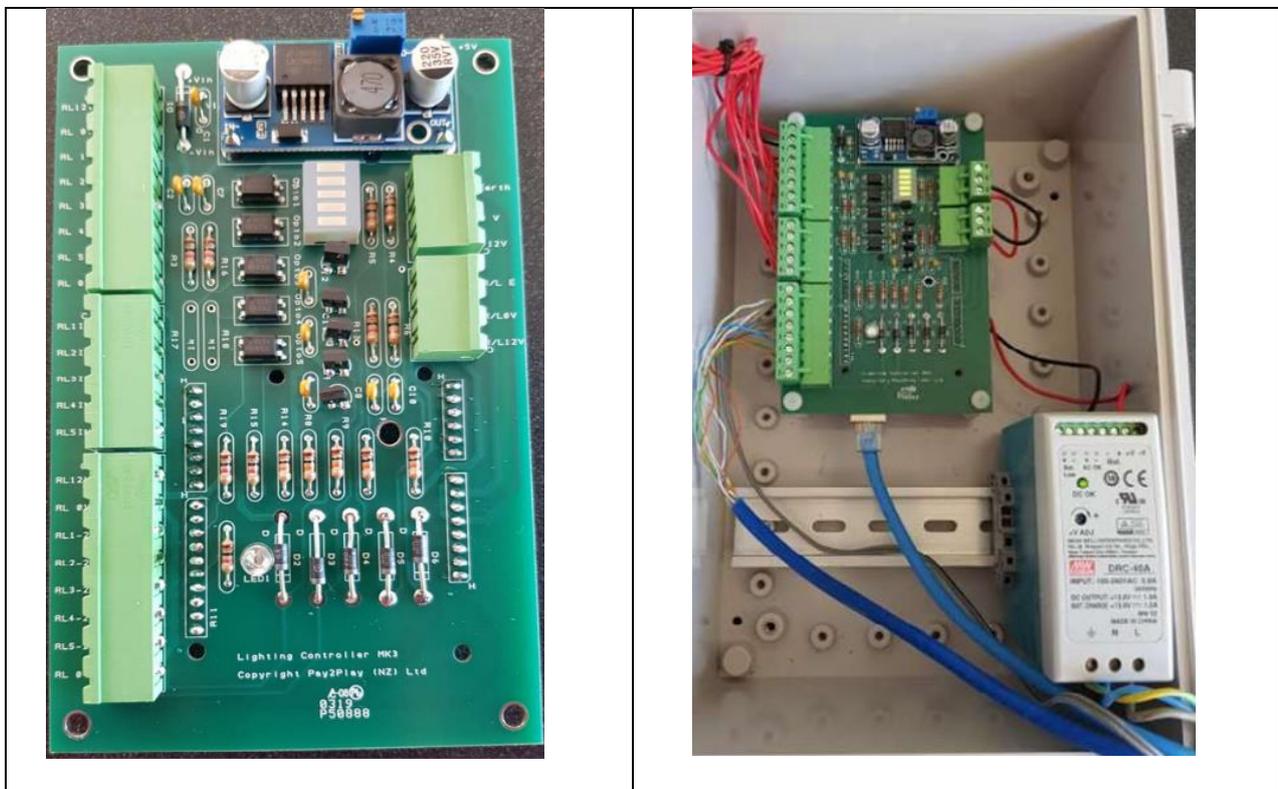
Examining this figure, you can see the DC power supply (bottom right) which produces the 12 Volt nominal (actually around 13.8V to suit battery back-up) from the 230-volt AC connection at the bottom. There are two 3-way connectors on the right. The top is the 12-volt DC input for the control card.

The bottom is the 12-volt DC power supply for the isolated solid-state outputs which feed the external lighting control relays. The board outputs are on the left hard side. The top 8-way connector has the 5 relay outputs along with a 12 V DC and two OV outputs. These are connected to the key switches. The outputs from the key switches are connected onto the middle 5-way connector. The 5 relay outputs from the key switches are simply looped to the bottom connector along with a further 12-volt DC and two OV outputs. The external lighting control relay coils are each connected between each relay output and the OV connections. The 12 V DC output is not normally connected. All the connectors are pluggable and you can see the connector designations if you unplug the various plugs.

If a Pay2Play Electronic Door Controller is fitted then this can be used as the DC power supply for the lighting controllers. The Door Controller has a battery backed up 12-volt DC supply and there is an output available on pins 4 (+12V) and pin 5 (0V) on the 8-way connector. This supply is limited in capacity but can drive up to 2 x lighting control boxes.

The fact that it is battery backed up is an advantage although lights will not work without power anyway but keeping the control powered is beneficial. You can use separate cabling to connect the 12 V DC from the door controller to the Lighting Controller or alternatively Power Over Ethernet (POE).

The only other connection to the Lighting Controller is an Ethernet connection. The controller must be connected to a live Ethernet connection using a standard CAT6 or similar terminated cable. The Ethernet plugs into the RJ45 connector on the bottom of the electronic control board. We strongly suggest verifying the Ethernet connection using a laptop computer or similar.

If using Power Over Ethernet then use the connectors provided as shown in figure 1. The Ethernet cables should be fed from an Ethernet switch and one cable is required for each lighting controller and a separate connection for the Door Controller. If using Power Over Ethernet then use the cables supplied at the Ethernet Switch and connect the 12-volt DC supply to the red (positive) and black (negative) cables provided. As mentioned previously the 12 volts can come from a separate 12-volt DC supply or the door controller output. With Power Over Ethernet, we do not recommend CAT6 cable use over 50 metres due to voltage drop.

Starting the Installation

Take care mounting the electronic control box. We recommend removing the electronic control card before drilling holes for mounting or cables to reduce the chance of damage.

Remove the back-up battery from the Pay2Play Control Box. Drill holes through the box and screw it to the wall.

Decide the best location for the cables to enter the Pay2Play Control Box and drill for cable entry.

Refit the battery but do not fully connect the battery. This can be done by removing the fuse in the positive battery cable. Put the fuse somewhere safe as it must be reinstalled at the end of the installation.

Mounting the Keypad

First consider how the keypad will be mounted. It can mount directly on a wall or facing, a hole will need to be drilled to allow for the connector and surround. Alternatively, a small plastic box can be used to mount the keypad on. The keypad is waterproof but if possible, site it in a location where it is protected from driving rain. Remove the stainless-steel back plate using the Allen key provided. Next drill holes as necessary to allow the keypad cable to run through to the electronic control box.

Locate the keypad back onto the back-plate and secure using the screw and Allen key. Run the keypad cable from the keypad end to the electronic control box.

Figure 2: Keypad assembly

Connect the keypad cable onto the electronic control board using the 10-way removable connector provided (it is the bottom left-hand connector). First remove the connector from the board as it will make connecting wires easier. Take special care with this cabling to ensure there are no errors.

| Pin Number	Cables	Function
1 (top)	Green	Data
2	Brown	Data
3	White	Data
4	Yellow	Data
5	N/C	Data
6	N/C	Earth
7	Red	+12 volts
8	Black	0 volts
9	N/C	+5 volt supply
10	N/C	Earth

Note that the purple, pink, orange, blue and grey cables are not connected and should be taped together. Once the cabling has been completed and checked the plug can be reconnected onto the board.

Exit Button

This is not normally required for Electric Strike locks as you should be able to get free exit using a door handle. It may however be required other lock types. This is a normally open volts free connection input. When the exit button is pushed the lock will open for around 5 seconds to allow exit. Some buttons are illuminated and a 12-volt supply is provided for this if required. Connect cables back to the Pay2Play Control

Box. The connector for the exit button is a 5-way connector on the top right side of the electronic control board.

Pin Number	Cables	Function
5		+12 volt
4		To button
3		To button
2		0 volts
1 (bottom)		Earth screen
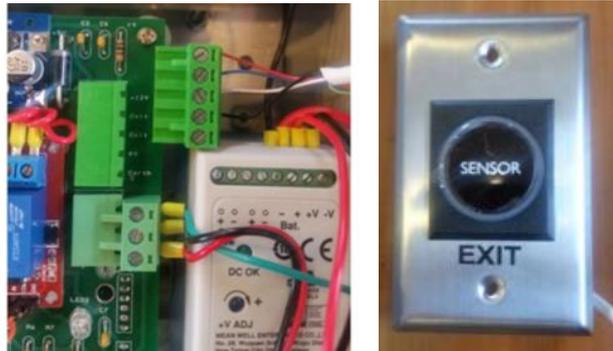
If the cable run to the exit button is more than 4 metres we suggest you used a screened electronic cable to protect from electrical interference, with the screen only connected at the electronic control box end to terminal 1.

The normally open connections on the exit button connect between terminals 3 and 4 on the control board. If a 12-volt illumination option is selected power by connecting the 12 volts (terminal 5) and the ground of this connection to 0 volts (terminal 2). Pay2Play can provide illuminated proximity sensitive exit buttons as shown in the picture below. For outdoor use we use waterproof illuminated green push buttons. Mount and connect the exit button and detailed in its installation information. Check that the cabling connection is correct and plug the 5-way connector back into the electronic control board.

Install the Locking Actuator and Connect

Install the locking actuator (Door Strike) into the door or door frame as detailed in its installation instruction. Cable it back to the Pay2Play Control Box.
If an existing electric locking actuator is in place make sure it is able to be operated from a 12-volt DC supply. It is also important to understand if applying 12-volts unlocks the lock or alternatively locks it. There may be safety issues to consider such as exit in fire, other emergencies and also security.
It is important that you can safety exit any door used as a fire exit even if there is an access system failure.
The Pay2Play system is quite configurable and there will usually be a suitable set-up that will meet your requirements. A common configuration is to use an electric strike lock set in "Fail to secure" mode which means your facility will be left secure if there is complete power failure. Door exit is catered for by having a mechanical lock fitted that allows for emergency key entry and mechanical exit via a door handle at any time. The Pay2Play access system will apply 12-volts to the electric strike when a correct code is entered on the keypad. The strike releases allowing entry for around 5 seconds before the strike is reset.
If there are particular fire exit requirements for your site Pay2Play recommend that you seek expert advice.

Pin Number	Cables	Function

The lock interface 8-way connector can be found on the top left-hand side of the electronic control card.

1 (top)		Earth
2		Lock status I/P
3		Lock status I/P
4		O Volts
5		+12 volts
6		Lock common
7		Lock N/O
8		Lock N/C

The interface above to active the lock is a volts free relay connected to pins 6, 7 and 8 of the connector.

The Normal relay status will connect pins 7 and 8 when the electronic control system is completely unpowered and also, when powered for 5 seconds following a correct code being entered on the keypad.

For a simple 12 V DC operated electric strike lock in "fail secure" mode, the locks solenoid input cables should be connected between 0 V (pin 4) and Lock N/C (pin 8). Connect the +12 V supply from the three-way input power supply connector to the relay Lock Common (pin 7) using a wire.

Other lock types will have slightly different configurations.
For example, a magnetic lock is normally powered and so a 12-volt magnet lock should be connected between 0 V (pin 4) and Lock N/O (pin6) with the header link also in the top position connecting 12 volts onto the relay common.
The relay used to control the lock has a power rating and is suitable for most strikes and maglocks. If you are using it to signal to say an input on another security controller or sliding door your will have to fit a dummy load to make sure you exceed the relay contacts minimum current rating of 10 mA.
Fit a suitably rated resistor so current will flow through the relay contacts when its active contact is closed.
Failure to do this can result in the relay contact going high resistance over time as there isn't enough current to self-clean the contact.

Connection of Ethernet and Power

Ensure that the Ethernet connection is live and that the cable you plan to use to connect the lock is correct by plugging a computer into the cable and ensuring you get an internet connection.

Once this is confirmed you can plug the Ethernet cable into the standard RJ45 plug found at the bottom of the electronic control board.

Please take care when plugging this cable, it to ensure you do not damage or unplug the board on which the Ethernet interface sits.

The next step is to connect 120 VAC power to the lock. Before doing this please check that all other electronic cabling is in place and that plugs are fitted.

The battery connectors should be in place but the battery fuse fitted in the positive battery lead should remain removed.

We will connect the battery as a final step. Please ensure that the 230 VAC supply is safely isolated before connection and ensure you are suitably qualified and experienced to carry out this connection as this is a dangerous voltage.

Double check that the supply is isolated using a suitable meter or tester. Connect phase (to L) neutral (to N) and earth into the electronic power supply at the bottom right of the electronic control box.

A relatively small flat blade screw driver will be required and we recommend that ferrules are used on the cables. Please ensure that the earth connector for the control board is also wired into the earth input with the earth cable from the AC supply.

Do a final check that cabling is correct and turn on the power. The keypad red top LED should light and LEDs should light on the control board. After a minute or so boot up time you should hear the relay change state.

The green LEDs on the diagnostic bar as shown below should light solidly except the "RT chip OK" which should be flashing. If for example the "Internet OK" is not on then you will have to fault find the internet connection. Plugging a computer in to see if you have an internet connection is one good way to do this.
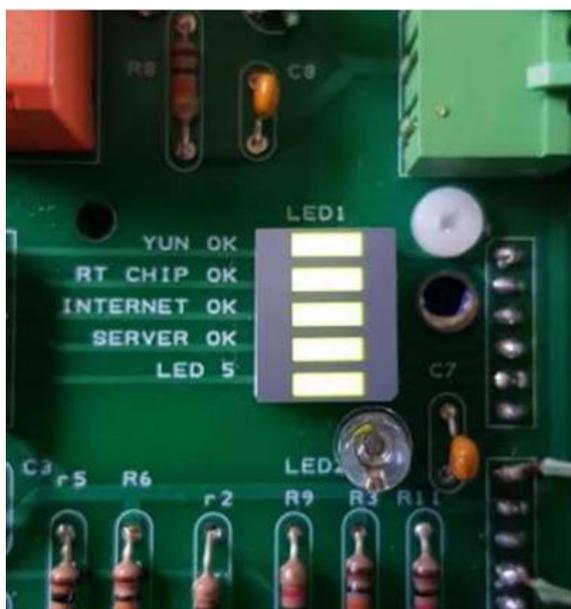
The controller will test these functions on power up and periodically thereafter.

You can force a diagnostic test from the keypad by pressing four 2's, then *, then LED flashes red on keypad.

Wait and once it stops flashing press #.

Test and Final Commissioning

ACCESS CONTROLLER: The first step is to download door codes into the Pay2Play Control Box from the web based Pay2Play system. This will happen automatically every 30 minutes but to force a download go to the keypad and push the start "*" button seven times.

The keypad should beep and both the red and green lights come on for around 10 seconds.

You can then try one of the seven-digit test codes you have been given.

Enter codes and check that they actuate the electronic lock allowing building / gate access.

Incorrect codes will result in a red LED and beep and the lock will not open. Take care in pushing buttons to ensure each push is clean and acknowledged by the keypad with a beep.

If you make a mistake press the # key and start again. If this is successful you are close to finished.

Next check the operation of the exit button if fitted.

If a strike lock is fitted and there is no exit button, check that the door system allows mechanical exit no matter what the state of the Pay2Play system (power on, off etc).

Now you can connect the battery by inserting the fuse into the positive cable.

With a volt meter set on DC setting check that the battery is charging. Assuming the battery is already reasonably charged there should be 13.4 to 13.8 volts across the battery terminals.

Now check that the battery supplied uninterruptible power supply function works by turning off the AC 230-volt supply and checking that the system continues to operate.

The commissioning is now complete so check everything is neat and tidy, shut the electronic control box and fit a screw into the plastic flange to ensure the box cannot be opened without a tool and turn the AC power back on.

Do a final system check entering a code, checking the exit system works and then you are finished.

LIGHTING CONTROLLER: Commissioning is relatively simple. We recommend checking the system before connecting to the lighting interface relays or contactors.

With the Ethernet and power cables connected apply the 12-volts power but turning on the separate supply or the door controller. Check that the green bar LEDs on the top middle of the Lighting Control board come on when courts are booked. The takes a few minutes to boot up and then system polls the cloud-based server every 60 seconds so there could be a small delay before you see a response from a booking. If not then first check the Ethernet connection.

Pay2Play can also see remotely if the controllers are connected. You can now test the system by placing bookings into the Pay2Play booking system and checking that the corresponding relays switch as expected.

If this is all OK then proceed to connect the lighting circuits using the interface relays or contactors.

To customise the lighting control system by court you need administration rights to the booking system at your club. With these rights go to the Pay2Play booking website, login, click on the wheel on the far-left control box as shown below.
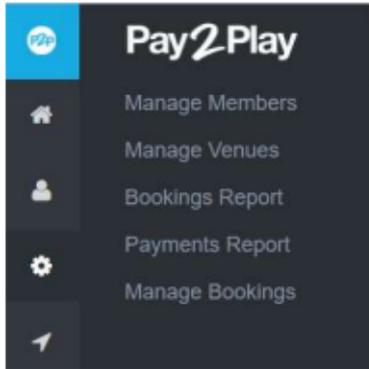
Select "View" on your venue.

In the right top of the page select "Lighting" see below.

You then get the following lighting configuration page which allows you to configure the system by court. Adjust the parameters to suit your requirements.

Havelock North Squash Club Facilities				Select Venue ▾
NAME	PRE START (SECS)	POST FINISH (SECS)	BOOKING DURATION (MINS)	DARKEN DURATION (SECS)
Court 1	120	0	45	10
Court 2	120	0	45	10

PRE START Sets the time in seconds the lights will turn on before the booking start time.

POST FINISH Sets the time in seconds the lights will turn off after the booking finish time unless there is a follow up booking.

BOOKING DURATION This parameter allows you to set a default light on time for the centralised lighting controller.

DARKEN DURATION A time that can be set at the end of the booking where the lights will turn off even if there is a subsequent booking to indicate that the booking time is up and players should leave the court.